SONAR X2

Reference Guide

Getting started

If you want to get up and running quickly, please use the following tutorials, which are tailored to learning specific tasks in SONAR. If you are new to Cakewalk products, you may want to start at Tutorial 1. If you have used previous versions of Cakewalk, or you want to do a specific task, choose from the following tutorials:

"Tutorial 1 – Creating, playing, and saving projects" on page 101

"Tutorial 2 – Using the Browser" on page 115

"Tutorial 3 – Recording vocals and musical instruments" on page 121

"Tutorial 4 – Playing and recording software instruments" on page 125

"Tutorial 5 – Working with music notation" on page 133

"Tutorial 6 – Editing your music" on page 143

"Tutorial 7 – Mixing and adding effects" on page 149

"Tutorial 8 – Working with video" on page 159

"Tutorial 9 – Exporting, CD burning and sharing" on page 169

"Glossary" on page 1905**.** A list of defined terms.

"Introduction" on page 53**.** An overview of SONAR's features and functionality.

"Troubleshooting" on page 1251**.** Answers to frequently asked questions.

"New features in SONAR X2" on page 1309**.** Descriptions of new features in SONAR X2.

Note: *This documentation covers SONAR X2 Producer, SONAR X2 Studio and SONAR X2 Essential. The documentation indicates if a feature only applies to a specific edition of SONAR X2. For a list of key differences between each edition, see "Comparison" on page 1335.*

Getting started

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Introduction

SONAR is a professional tool for authoring sound and music on your personal computer. It's designed for musicians, composers, arrangers, audio and production engineers, multimedia and game developers, and recording engineers. SONAR supports Wave, MP3, ACIDized waves, WMA, AIFF and other popular formats, providing all the tools you need to do professional-quality work rapidly and efficiently.

SONAR is more than an integrated MIDI and digital audio authoring software package—it's an expandable platform that can function as the central nervous system of your recording studio. With drivers for common high-end audio hardware, full support for audio plug-ins, software synthesizers, StudioWare, MFX MIDI plug-ins, and MIDI Machine Control (MMC) of external MIDI gear, SONAR can handle your most demanding projects.

In This Chapter

About SONAR

SONAR is the flagship product of the Cakewalk line of integrated MIDI and digital audio sequencers for the Windows platform. SONAR has a comprehensive feature set that makes it the single most productive tool for sound and music authoring. Here are some of the ways you can use SONAR.

Publish

Publishing usually means printing your music; it's one way to share your finished product with other performers. After you've recorded and arranged a song in SONAR, you can produce printed lead sheets and small scores with lyrics for sharing. You can also share the music files themselves. SONAR will save your music in a format that you can put on a web site or email to other people.

Music composition and exploration

SONAR is a powerful music-composition application, providing tools to record your own musical performances; enhance or improve the quality of those performances; and edit, arrange, and experiment with the music. With a few simple clicks of the mouse, you can arrange, orchestrate, and audition your composition. Fully integrated sequencing allows you to combine the convenience and flexibility of MIDI composition with the high-quality sound and subtlety of digital audio sound recording and reproduction. Change the feel of a piece by locking it to a musical groove, or add delicate delays, anticipations, or echoes that add richness to the music.

SONAR displays and lets you edit your music using standard musical notation and guitar tablature, so you can adjust individual notes, add performance markings, and print individual parts or full scores. You can graphically draw tempo and volume changes, or add lyrics to display on-screen or to include with printed scores.

Remixing

SONAR's Groove clips allow you to import, create, export and edit loops, making it possible to quickly change tempos and keys for an entire project. The Browser view lets you preview loops in the project's tempo and key before dragging and dropping them onto a track.

Game sound development

There's no better tool than SONAR for composing music for electronic games. Clip-based sequencing lets you create and reuse musical themes freely, so you can associate musical sections with game characters, locations, objects, and actions. Your creations can be saved and replayed using the compact MIDI file format, which adapts its sound automatically to the target hardware for the best possible sound reproduction.

Sound production and engineering

If you want to produce music CDs or master tapes, SONAR has virtually everything you need from recording to mixing and mastering. Multichannel recording lets you capture studio or live performances track by track. Reconfigurable buses provide full control over your mix. Real-time stereo effects like chorus, flange, reverb, and delay/echo can be applied as track inserts, in effects loops, or to the master mix. SONAR supports 44.1 KHz sampling for CD-quality sound, 24-bit/96 kHz sound for DVD-quality sound, and lets you choose from lower or higher sample rates as well. All audio effects are 32-bit floating point for faster processing and high-quality sound reproduction. Many effects now support 64-bit processing for pristine quality.

Web authoring

SONAR is the ideal tool for developing and producing music and sound for the World Wide Web, because it lets you save your work in the formats that are most commonly used on web sites: MIDI, MP3, and Windows Media Advanced Streaming Format. Any SONAR project—musical composition, audio clip, commercial spot, jingle with voice-over—can be stored in a web-compatible format with a few simple mouse clicks.

Film and video scoring and production

SONAR has many of the tools you need to execute audio post-production projects quickly and efficiently. SONAR provides chase lock sync to time code for frame-by-frame accuracy when synchronizing audio or MIDI to film or video. Or, you can turn chase lock off to conserve CPU power. SONAR provides high-quality time stretching and sample-accurate editing with zero-crossing detection so you can make the fine adjustments you need very quickly and easily. In addition, SONAR's support for video files gives you convenient synchronized access to digitized video, making film and video scoring easier than ever.

Next topic:

Publishing music on the Internet

Cakewalk Publisher allows you to easily present and share your music online. With Cakewalk Publisher, you can create a customized streaming music player with a playlist of your music, upload it to your personal or band's Web site, and embed it in any other Web site. You can also update your playlist with album art, links (URLs), and artist, track, & album information.

SoundCloud is an online music sharing service that allows you to upload and share your music with others online. The integrated Cakewalk SoundCloud application enables you to upload sounds, artwork, and metadata to the SoundCloud service directly from SONAR.

Next topic:

Burning audio CDs

SONAR has integrated Audio CD burning, which allows you to write your audio tracks to an audio CD that can be played in any standard CD player.

Next topic:

Flexibility

SONAR works the way you want to work—you can customize screen layouts and audio and MIDI system configurations to make your work more efficient. SONAR integrates with other sound editing tools so you can access them in an instant without leaving SONAR. There are custom software modules to support specialized audio devices from Roland and Yamaha. SONAR's unique StudioWare technology provides software interfaces for common studio hardware.

Next topic:

Computers, sound and music

This section provides some background on the different ways that computers store and play sound and music. Computers work with sound and music in two different forms: *MIDI* and *digital audio*.Next topic:

MIDI

MIDI (short for Musical Instrument Digital Interface) is the way computers communicate with most sound cards, keyboards, and other electronic instruments. MIDI refers to both the type of cables and plugs used to connect the computers and instruments, and to the language those computers and instruments use to talk to each other. The MIDI standard is accepted and used worldwide. Almost any electronic instrument you buy today will have MIDI connectors and can be used with other MIDI instruments and with your computer's MIDI interface. To record MIDI in SONAR, you have to have a MIDI cable connecting the MIDI OUT port on your MIDI instrument to a MIDI IN port on either your sound card or your MIDI interface. You must also make sure that you have installed the software MIDI driver that came with your sound card or MIDI interface.

The MIDI language conveys information and instructions, both from the computer to the instrument and from the instrument to the computer. For example, if your computer wants your keyboard to play a note, it sends a MIDI "Note On" message and tells the keyboard which note to play. When your computer wants the keyboard to stop playing that note, it sends another message that stops the note from playing.

The MIDI language has many other instructions, such as messages to change the sound that is used to play the notes (the bank and patch), messages that enable working with the sustain pedal and the pitch-bend wheel, and others. By sending the right messages at the right times, your computer can control your electronic instrument and make it play music.

MIDI information can be sent on 16 different channels. You can set up your MIDI equipment to listen for messages on all channels or on only a few.

MIDI files contain all the MIDI messages and timing information that are needed to play a song. MIDI files can be read and played by many different programs, including SONAR, and can even be played by programs on other types of computers. MIDI files have the extension .mid.

There are several important advantages of the MIDI format:

- Large amounts of music can be stored in a very compact form
- Different parts of a piece can easily be assigned to any instrument you can imagine
- The music contains information on notes, tempos, and key signatures that makes it possible to display and edit the piece using standard musical notation

The primary disadvantage of MIDI is that the quality of the sound a listener hears will vary depending on the MIDI equipment the listener is using. For example, MIDI usually sounds much better on an expensive synthesizer than it does on an inexpensive sound card.

Digital audio

Digital audio (frequently referred to here as just "audio") is a simple way to record and play sounds of any type. It works like a tape recorder—you record something, then later play it back. Digital audio stores the sound as a long series of numbers. To record audio in SONAR, you have to have an audio cable connecting the audio output of your electronic instrument to the audio input on your sound card or audio hardware. If you're recording vocals or an acoustic instrument, you need to connect a microphone to the audio input on your sound card or audio hardware.

Sound Waves

Sound waves are vibrations in the air. Sound waves are generated by anything that vibrates; a vibrating object causes the air next to it to vibrate, and the vibration is passed through the air in all directions. When the vibrating air enters your ear, it makes your eardrum vibrate, and you hear a sound. Likewise, if the vibrating air hits a microphone, it causes the microphone to vibrate and send electrical signals to whatever it's connected to.

These vibrations are very fast. The slowest vibration frequency you can hear is about 20 vibrations per second, and the fastest is around 16,000 to 20,000 vibrations per second.

Recording digital audio

To record digital audio, your computer monitors the electrical signal generated by a microphone, an electric guitar, or another source. At equal intervals of time (for CD-quality sound, this means 44,100 times a second), the computer measures and saves the strength of the electrical signal from the microphone, on a scale from 0 to 65,535.

That's it. Digital audio data is just a long series of numbers. The computer sends these numbers, in the form of electrical signals, to a speaker. The speaker then vibrates and generates the same sound that was recorded.

The primary advantage of digital audio is the quality of the sound. Unlike MIDI, a digital audio recording is very rich, capturing all the nuances, overtones, and other characteristics of the sound exactly as performed. The main drawback of digital audio is that it takes up a lot of disk space. To record a 1-minute segment of stereo, CD-quality digital audio, you need about 10 megabytes of disk space.On the computer, digital audio is usually stored in Wave files (extension .wav). There are many programs available that let you create, play, and edit these files. SONAR reads, writes, and lets you edit Wave files.

Next topic:

Setup

You can install SONAR on any computer that runs Windows 7 and has a sound card or built-in sound module. If you want to hook up other devices, like a MIDI keyboard, an electric guitar, or a microphone, you need the right cables, and you need to find the right connectors on your computer.

Note: *SONAR X2 Producer and Studio provide native Windows x64 support. SONAR X2 Essential runs as a 32-bit program on a Windows x64 system.*

Before you install SONAR, take a minute to register the software so we can let you know when updates become available and provide you with technical support. To register anytime log onto www.cakewalk.com/register, or call 1.888.CAKEWALK (+1.617.423.9004 outside the U.S.) between 1 PM and 6 PM Eastern Standard Time. If you live outside of North America, please visit our distributor's page at www.cakewalk.com/Dealers/International.asp to get the telephone number of your local distributor. You'll need to supply your serial number, your name, and a valid email address.

To connect a MIDI keyboard to your computer you will need a MIDI interface. Some sound cards include a builti-in MIDI interface. If your model does not, there are many options available at your local music store. Many of these will connect to your computer via USB.

If you have a dedicated MIDI interface, lots of electronic music gear, or work with many different music software packages, see "Hardware setup" on page 1273.Before you attach or detach any cables from your computer, you should shut down your computer and turn off the power to all your equipment. This greatly reduces the chance of electrical damage to your equipment while plugging and unplugging cables.

User accounts

Previous versions of SONAR required a user to have Windows Administrator status. This is no longer the case. Any level of user can now install and run SONAR. Only one copy of SONAR per machine is necessary for multiple users to run SONAR with each user's personal settings.

When you first install SONAR, all application data files and .ini files are installed to the system-specified "all users" application data folders:

Windows 7:

```
C:\ProgramData\Cakewalk
```

When you launch SONAR for the first time, all content files (such as track templates and project templates) will be copied from the global application data folder (All Users) to the user application data folder (User Account), before the program launches.

If you install a SONAR patch on top of the original installation, any updated content files in the patch will *not* overwrite existing content files in your personal user application data folder. However, you can force SONAR to update the default content files in your personal user data folder.

⚠️ **Warning:** *The following action will overwrite any SONAR data files such as track templates and project templates that you may have customized. A message box will prompt you if you want to continue or cancel. Only proceed if you are certain that you will not overwrite any important customized files.*

To force SONAR to update and overwrite any default content files, hold down the CTRL key while starting SONAR.Data in the Program Files folder will be common to all users.

Next topic:

Audio connections

There are several types of audio interfaces (soundcards). CardBus (PCI), USB/USB2 and FireWire are the most common. Laptops can use an audio PCMCIA card. Many audio interfaces also have MIDI inputs and some have built in MIDI synthesizers as well. This section covers the various audio connection options.

Analog and digital Inputs

There are two basic types of audio inputs, analog and digital. Analog inputs allow you to connect a guitar, mic or other instrument to your computer directly. The audio interface converts the analog input to digital. Digital inputs allow other digital devices to connect directly to your computer. Common digital inputs include external analog to digital converters, popular guitar processors like the Line 6 POD, and other digital recording systems like the ADAT decks. Analog inputs are very common, and are standard in virtually all consumer sound cards (the ones that come with your computer). Digital inputs are becoming more popular and are very common on professional and mid-level, "prosumer" interfaces. Analog inputs allow you to record a mono or stereo signal (assuming you have a stereo input) while digital inputs allow you to record 1 to 8 signals depending on the type of digital connection.

The following table describes the various types of analog and digital connections you may encounter.

Cable	Type	Description
	1/4 inch TRS	Balanced analog connection
	XLR	Balanced analog connection Microphones, professional audio equipment
	1/4 inch TS	Unbalanced analog connection Guitar cable, "Hi-Z"
	1/8 inch "Mini" Plug	Balanced analog connection Headphones, desktop computer speakers
	RCA - Phono	Phono analog connection Turntables, analog cassette recorders
	SPDIF	Stereo digital connection
	Optical (Lightpipe)	Stereo digital connection
	MIDI	MIDI connection

Read your hardware documentation carefully to determine what kind of connections you have on your audio interface.

To connect an electric guitar or keyboard to your computer

• If your sound card has a 1/8 inch input jack (built-in sound cards that come with your computer usually do), plug your 1/4 inch mono guitar or audio cable into a 1/8 inch stereo adapter, and then plug the 1/8 inch adapter into the microphone input or line input jack on your computer sound card. If you are connecting a keyboard, the audio cable must go from the keyboard's audio out or line out jack to the sound card input jack. 1/8 inch stereo adapters are available at consumer electronic supply stores.

Or

• If you use a professional or "prosumer" sound card, there is probably a 1/4 inch input jack on your sound card or audio hardware interface that you can plug your guitar cable or audio cable into.

Guitar   DI Box   Computer Sound Card   Headphones or Speakers
(or external audio interface)
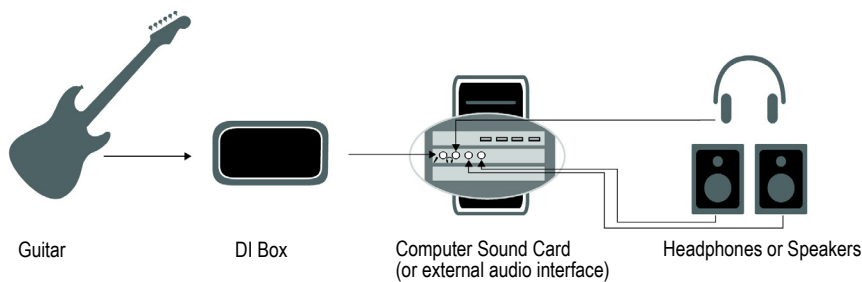
To connect a microphone to your computer

• If your sound card has a 1/8 inch input jack (built-in sound cards that come with your computer usually do), and your microphone cable has a 1/4 inch plug on the end, plug the mic cable into a 1/8 inch stereo adapter, and then plug the 1/8 inch adapter into the microphone input jack on your computer sound card. 1/8 inch stereo adapters are available at consumer electronic supply stores.

• If you use a professional or "prosumer" sound card, there is probably a 1/4 inch input jack on your sound card or audio hardware interface that you can plug your mic cable into.

• If your mic has a cable with an XLR plug on the end, and your sound card or audio hardware interface has a 1/4 inch input jack, plug the mic cable into an XLR-to-quarter inch adapter, and then plug your mic cable into your audio hardware. If your audio hardware has an XLR input, of course it's better to use that.

• You can also plug your mic into a mixer or pre-amp, and connect the mixer or pre-amp to an input jack on your audio hardware. This is usually the best method.

Microphone input

Microphone   Computer Sound Card   Headphones or Speakers
(or external audio interface)

USB connection

USB Microphone   Computer Sound Card   Headphones or Speakers
(or external audio interface)
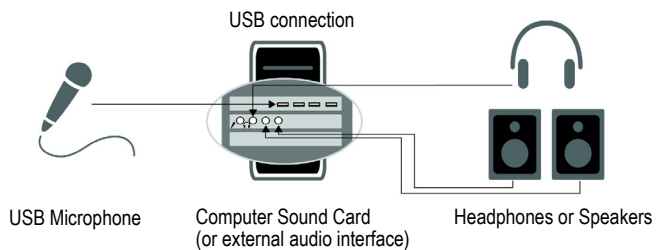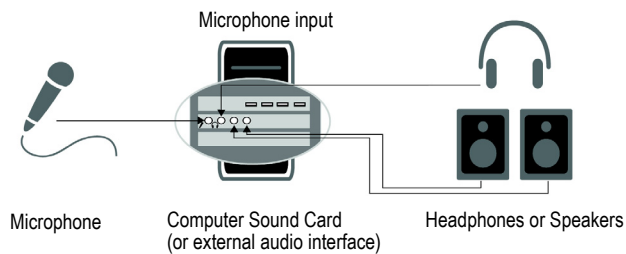
That's it! Now that your instruments are all set to go, you can restart your computer and turn on your keyboard, guitar, and microphone.

For a complete description of audio input options, see "Hardware setup" on page 1273.

See:

MIDI connections

There are three types of MIDI cables in common use. Here's how to connect each of the three types:

- **USB cable**.   This is extremely common. Many electronic keyboards and stand-alone MIDI interfaces use this type of connection. To use this type of connection, simply plug one end of the USB cable into the USB jack on your MDI keyboard or stand-alone MIDI interface, and plug the other end into your computer. If you are using a stand-alone USB MIDI interface, you then need to connect standard MIDI cables between your MIDI keyboard and your stand-alone MIDI interface (see the following procedure). If you haven't already installed the software MIDI driver that came with your keyboard or interface, make sure you do so.

- **Standard MIDI cable**.   This is also very common. MIDI keyboards usually have jacks for these cables even if they have a USB connection. You need two of these cables. To use this type of cable, use one cable to connect the MIDI OUT jack on your MIDI instrument to the MIDI IN jack on your stand-alone MIDI interface or sound card, and one to connect the MIDI IN jack on your MIDI instrument to the MIDI OUT jack on your stand-alone MIDI interface or sound card. Many stand-alone MIDI interfaces and audio interfaces use this type of connector.

> **Note:** *If you are only using an external MIDI controller to trigger software instruments, you only need to connect a single MIDI cable from the MIDI controller's MIDI OUT jack to the MIDI IN jack on your MIDI interface.*

Figure 1.   *Standard MIDI cable—use this if your MIDI interface has standard 5-pin input and output ports*

- **Joystick connector.**   This is becoming less common. This is the type of connection seen on older SoundBlaster type sound cards. To use this type of connection, find the end of one of the MIDI cables that is labeled OUT. Plug this connector into the MIDI IN jack on your electronic keyboard. The other 5-pin connector on the MIDI cable is labeled IN. Plug this connector into the MIDI OUT jack on your electronic keyboard. Plug the 15-pin connector on the MIDI cable into the MIDI/joystick port on your sound card. If you have a joystick, unplug it, plug in the MIDI cable, and plug the joystick into the pass-through connector on the MIDI cable.

Figure 2. *Joystick connector—use this if your MIDI interface is the joystick port on your sound card.*
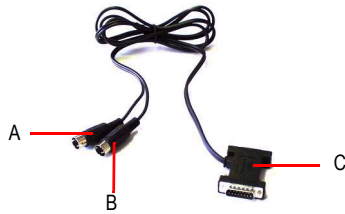
A. *Insert this MIDI IN plug into the MIDI OUT port on your MIDI instrument* **B.** *Insert this MIIDI OUT plug into the MIDI IN port on your MIDI instrument* **C.** *Insert this plug into the joystick port on your sound card*
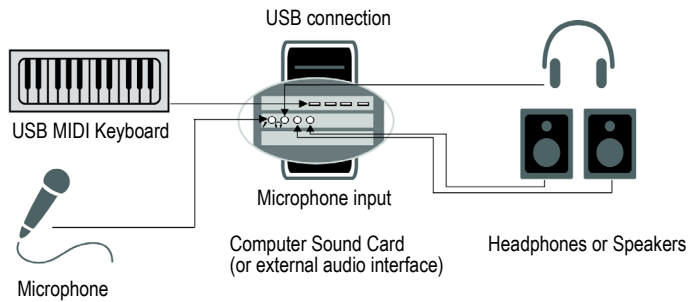
See:

"Changing I/O devices" on page 66

Changing I/O devices

You can add or remove USB/FireWire audio and MIDI devices while SONAR is running, and the audio and MIDI engines will dynamically respond to any changes.

When a device is added or removed, SONAR prompts you to confirm or cancel the change. If you click **Yes**, playback stops and the audio and MIDI engines reload.

Preserve selected audio devices on device changes

Enabled inputs and outputs are persisted per device and per driver mode. This prevents audio ports from shifting around and causing unwanted devices to become selected as active audio inputs and outputs. You can add a device back at any time and SONAR will remember the last set of enabled inputs and outputs for that device.

You can freely add or remove devices without impacting the current working set of enabled devices. Adding a device back will remember its last selected inputs and outputs. You can also switch driver modes and the existing enabled devices will be remembered for the next time when you switch back to that mode.

Loading a project after changing audio devices

When loading a project after changing audio devices, SONAR will attempt to automatically remap any missing device to an equivalent new device. If an equivalent match is not found, the **Missing Audio Outputs** dialog box appears, allowing you to manually reassign any unresolved output ports.

The **Missing Audio Outputs** dialog box will suggest default assignments for any missing devices. You can click **OK** to accept the assignments, or click **Cancel** to preserve the original missing device assignments. You can also preserve the original missing device by selecting **[Unassigned]** from the **Available Devices** list. If you choose not to reassign a missing device, the **Output** port selection in SONAR will show the missing device name prefixed by **MISSING**.
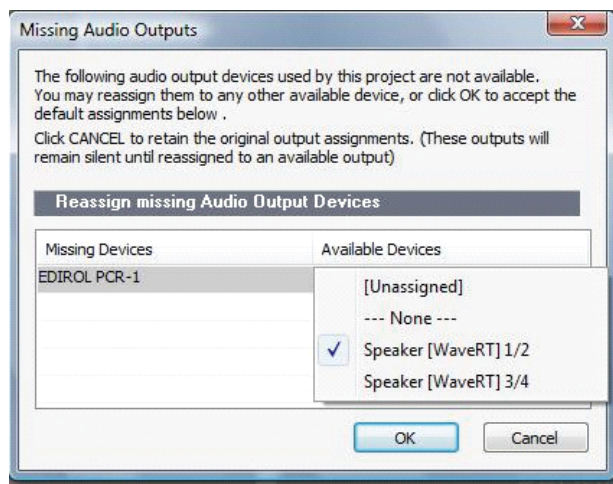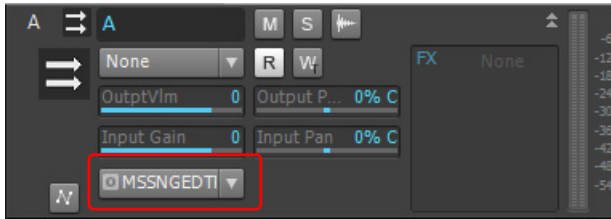
Note: *The **Missing Audio Outputs** dialog box is not shown if there is only a single missing output port and only one available output port. In this case, SONAR will automatically assign the missing output port to the available output port.*

Remapping using friendly driver names

When **Use friendly names to represent audio drivers** is selected in **Edit > Preferences > Audio - Devices**, SONAR can intelligently remap devices across different hardware configurations or driver models by using your assigned friendly driver names, even if the hardware names do not match.

This can be very useful if you switch driver modes and load projects you worked on earlier in another driver mode, or if you collaborate with other people who have different hardware configurations. As long as you set up friendly names that match, all outputs will be automatically remapped.

Note: *Remapping with friendly names takes precedence over the actual hardware device names.*

Changing MIDI Output devices

Changing MIDI output ports in **Edit > Preferences > MIDI - Devices** has the following effect:

- **Enabling a new output port.**   All MIDI tracks and control surfaces retain their current output port assignments.
- **Disabling an unassigned output port.**   All MIDI tracks and control surfaces retain their current output port assignments.
- **Disabling an assigned output port.**   The result is different for MIDI tracks and control surfaces:**MIDI tracks.**   The **Missing MIDI Ports** dialog box appears and lets you remap the missing output ports to available output ports.

Note: *If you do not remap a missing device, the track's Output control will display **MISSING: <name of missing device>**. If the missing device becomes available in the future, the track will automatically be assigned to the correct device.*

  - **Control surfaces.**   The control surface output port is assigned to **None**.

Figure 3.   *The **Missing MIDI Ports** dialog box lets you remap missing output devices*
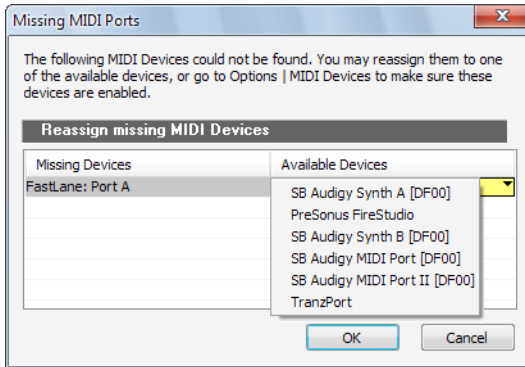
Figure 4.   *A track's **Output** control shows the name of the missing device*
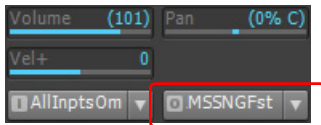
Opening projects after MIDI configuration has changed

If any assigned MIDI output devices are missing when you load a project, which is likely to happen if you transfer projects between different computers, SONAR will do the following:

• **MIDI tracks.**   The **Missing MIDI Ports** dialog box appears and lets you remap the missing devices to available devices.

Note: *If you do not remap a missing devices, the track's **Output** control will display **MISSING: <name of missing device>***. *If the missing device becomes available in the future, the track will automatically be assigned to the correct device.*

• **Control surfaces.**   Control surface output ports are assigned to **None**.

Automatic MIDI port remapping for control surfaces

SONAR persists the names of MIDI ports that are assigned to control surfaces. This ensures that the correct MIDI ports are assigned to control surfaces, even if you add or remove other MIDI devices.

Starting SONAR

There are many different ways to start SONAR. Here are a few:

• Double-click the SONAR icon on your desktop.

• Click the **Start** button, and choose **Programs > Cakewalk > SONAR X2** (Producer, Studio or Essential) **> SONAR X2** (Producer, Studio or Essential).

• Click the **Start** button, point to **Documents**, and choose a SONAR project from the menu.

• Double-click the SONAR program or any SONAR document from the Windows Explorer or the **Find** menu.

When starting SONAR, you will see the **Quick Start** dialog box.

Figure 5. *The **Quick Start** dialog*
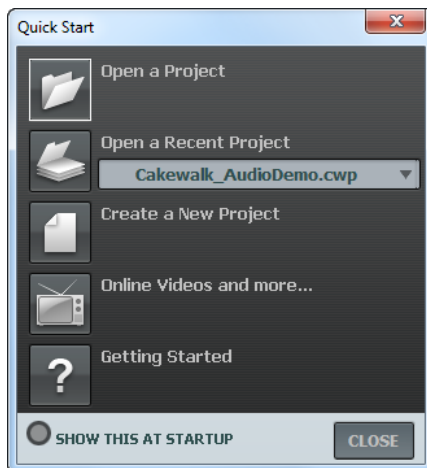
The **Quick Start** dialog box has several options.

Option	How to use it
Open a Project	Choose a project from the **Open File** dialog box to open it
Open a Recent Project	Select a project from the list, and click this button to open it
Create a New Project	Click here to create a new project.
Online Videos and more	Click this link to view our tutorial videos online. An active Internet connection is needed in order to access this content.
Getting Started	Click here to view the "Getting started" on page 3 topic in the Help file. This topic has links to a glossary of terms, as well as some basic procedures.

Table 1.

If you don't want to see the **Quick Start** dialog box in the future, uncheck the box at the bottom of the dialog box, and click **Close**. You can see the **Quick Start** dialog box later by choosing **Help > Quick Start**.

RIFF/MID will not launch SONAR when double-clicked

Note: *Double-clicking RIFF MIDI files and Standard MIDI files will fail to launch SONAR even if these file types are associated with SONAR.*

Migrating preferences

If you have a previous version of Cakewalk installed, SONAR will detect it and give you the option of migrating certain preferences from a single earlier version.

When you choose to migrate preferences, SONAR migrates the following settings from an earlier Cakewalk version.

Setting	Description
Global Options	Global settings in the **Preferences** dialog box. Open by selecting **Edit > Preferences**.
Key Bindings	Your customized key bindings for controlling SONAR using your MIDI keyboard or computer keyboard.

Table 2.

Setting	Description
Instrument Definitions	Files used to control specific MIDI instruments.
Audio data directory (WaveData folder) and Picture Cache directory locations	SONAR uses the Data directory and Picture Cache directories from the previous Cakewalk version for storing project wave files and their waveform image files.

Table 2.

Running Wave Profiler

The first time you start SONAR, it automatically runs the Wave Profiler utility. Wave Profiler determines the proper MIDI and Audio timings for your sound card and writes them to a file that SONAR refers to when using the card. Wave Profiler does not change the sound card's DMA, IRQ, or port address settings.Wave Profiler detects the make and model of your sound card, which determine the card's audio characteristics. If Wave Profiler finds a card that has a WDM driver, it only profiles that card. If you want to use more than one sound card at a time, and they don't both have WDM drivers, you must force the one with the WDM driver to use that driver as an older, MME driver. It is not necessary to run the Wave Profiler for a sound card using an ASIO driver. For more information about Wave Profiler, WDM, and MME, see "The Wave Profiler" on page 1182.

When Wave Profiler determines the kind of card you have, always accept the default settings.Setting

Note: *You can run the Wave Profiler again at a later time (for example, if you install a new sound card or driver) by choosing the **Edit > Preferences > Audio - Driver Settings** command and clicking **Wave Profiler**.*

Note: *You can run the Wave Profiler again at a later time (for example, if you install a new sound card or driver) by choosing the **Edit > Preferences > Audio - Devices** command and clicking **Launch Audio Profiler**.*

up the MIDI In and MIDI Out devices

When you start SONAR for the first time, it checks your computer to find all the MIDI input and output devices you have installed (such as sound cards and MIDI interfaces). However, sometimes you need to tell SONAR exactly which devices you want it to use. If you're not getting sound from your sound card or MIDI keyboard, or if you just want to change the MIDI outputs and devices that you are using, follow the steps in this section.

Choose **Edit > Preferences > MIDI - Devices** to open a dialog box in which you select the MIDI In and MIDI Out devices that SONAR will use. Each item in the list is a MIDI Input or MIDI Output from drivers installed using the Windows Control Panel.Select **Edit > Preferences** to open the **Preferences** dialog box, then click **MIDI - Devices**. This dialog box lets you choose instruments on MIDI inputs and outputs.

Figure 6.   *The MIDI - Devices section*
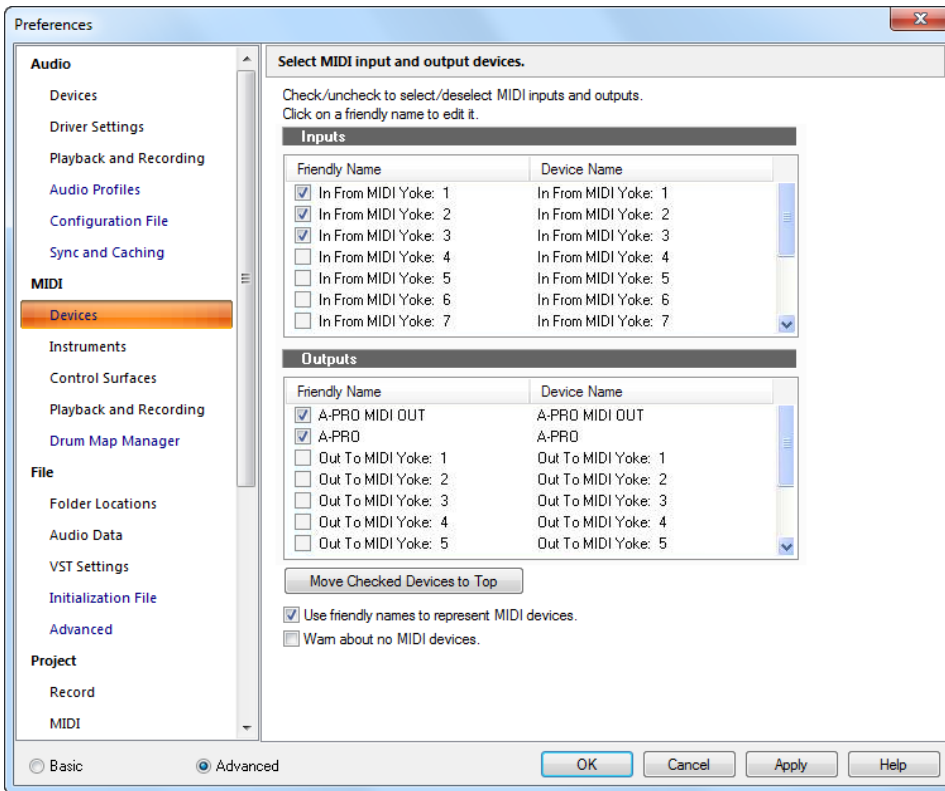
1. Look at the top window. Notice that it shows devices on MIDI **Inputs**; make sure that all devices in this window are checked. If a device isn't checked, click on it once to select it for MIDI Input.

2. Look at the window on the bottom. Notice that it shows devices on MIDI **Outputs**. SONAR numbers its MIDI Outputs by the order of the devices in this window. The device on top is on Output 1, the one below it is on Output 2, and so on.

3. Check one device at a time in the **Outputs** window and click **Move Checked Devices to Top** to change its order. Then check all the devices that appear in the window to select them for output. See "MIDI - Devices" on page 1666.

💡 **Tip:** *Be sure to select MIDI output devices in* **Edit > Preferences > MIDI - Devices**. *If you don't do this, you won't hear any of your MIDI instruments when you play songs in SONAR. You do not need to enable any MIDI output devices if you are strictly using software instruments.*

Using MIDI devices after making driver changes

If you later add or remove drivers using the **Drivers** icon of the Windows Control Panel, SONAR reacts in the following way:

• If you remove a Control Panel driver, SONAR will not use the device it belongs to the next time you run the program. Any other devices you had selected using the **Edit > Preferences > MIDI - Devices** command will remain selected.

• If you add a driver through the Control Panel, SONAR does *not* automatically use it. You must use the **Edit > Preferences > MIDI - Devices** command to enable the new driver in SONAR's list.

Note: *After you add or remove a driver with the **Drivers** icon in the Windows Control Panel, you must restart Windows for the change to take effect.*

Defining your MIDI instrument or sound card

Once you have selected your MIDI Input and Output devices, SONAR, by default, plays back MIDI sequences using a General MIDI instrument definition. If you are using a synthesizer or sound card that does not adhere to the General MIDI standard, you may want to define that instrument. For more information, see "Instrument definitions" on page 1117.

SONAR basics

SONAR's menus and tools give you quick access to all the features of SONAR. Some menu choices and tools display dialog boxes that let you choose among various options, or type in the values you want. If you click in most views, in time rulers, or on certain other items with the right mouse button, you see a pop-up menu that provides quick access to many common operations.

The *project* is the center of your work in SONAR. If you're a musician, a project might contain a song, a jingle, or a movement of a symphony. If you're a post-production engineer, a project might contain a 30-second radio commercial or a lengthy soundtrack for a film or videotape production. By default, every project is stored in a file (known as a *project file*). The normal file extension for a SONAR work file is .cwp.

SONAR organizes the sound and music in your project into tracks, clips, and events.

Tracks are used to store the sound or music made by each instrument or voice in a project. For example, a song that is arranged for four instruments and one vocalist may have 5 tracks—one for each instrument and one for the vocals. Each project can have an unlimited number of tracks (SONAR X2 Essential supports unlimited MIDI tracks and up to 64 audio track). Some of these tracks may be used in your finished project, while others can hold alternate takes, backup tracks, and variations that you might want to keep for future use. Each track can be made up of one or many clips.

Clips are the pieces of sound and music that make up your tracks. A clip might contain a horn solo, a drum break, a bass or guitar riff, a voice-over, a sound effect like the hoot of an owl, or an entire keyboard performance. A track can contain a single clip or dozens of different clips, and you can easily move clips from one track to another.

Groove clips are audio clips which have tempo and pitch information embedded within them, allowing them to follow changes to the project tempo or project pitch. You can click on either edge of a Groove clip and drag out repetitions in the track.

Events are MIDI data (in MIDI tracks) or automation data.

See:

SONAR file types

Projects in SONAR can be saved as a project file with the extension .cwp or as a Bundle file with the extension .cwb.For a complete description of the differences between project files and bundle files, see .

Other types of files

SONAR lets you create and work with several other types of files, in addition to project (.cwp) and bundle (.cwb) files that store your projects.

File type	Description
MIDI files (extension .mid)	Standard MIDI files.
Template files (extension .tpl)	Templates for new files you create
StudioWare (extension .CakewalkStudioware)	To control external MIDI devices from SONAR
OMF (extension .omf)	Open Media Framework format files.

Table 3.

Introduction
SONAR basics

Opening a file

Use the following procedure to open a file.

To open a file in SONAR

1. If you haven't already done so, start SONAR.
2. Choose **File > Open**.
3. In the **Open** dialog box, navigate to the directory where the project you want to open is located and select it.Click the **Open** button.
4. If you are opening an OMF file, the **Unpack OMF** dialog box appears. Set the initial tempo and specify the directory where you want to save the file and its audio. For more information about opening OMF files, see "Unpack OMF dialog" on page 1768.

SONAR loads the project.

See:

"Working on a project" on page 93

"I can't open my project / File Recovery mode" on page 1261

Views

SONAR displays your project in windows on the screen that are known as views. You can have many views open at once, all showing the same project. When you edit a project in one view, the other related views are updated automatically.

The Track view

Track view is the main window that you use to create, display, and work with a project. When you open a project file, SONAR displays the Track view for the project. When you close the Track view for a project, SONAR closes the file.

The Track view is divided into several sections: menu bar (at the top), the **Navigator** pane, the **Video Thumbnails** pane, the **Track** pane**,** the **Inspector** pane**,** the **Clips** pane**,** the **Bus** pane, the **Browser** pane, and the MultiDock.

Figure 7. *The Track view.*
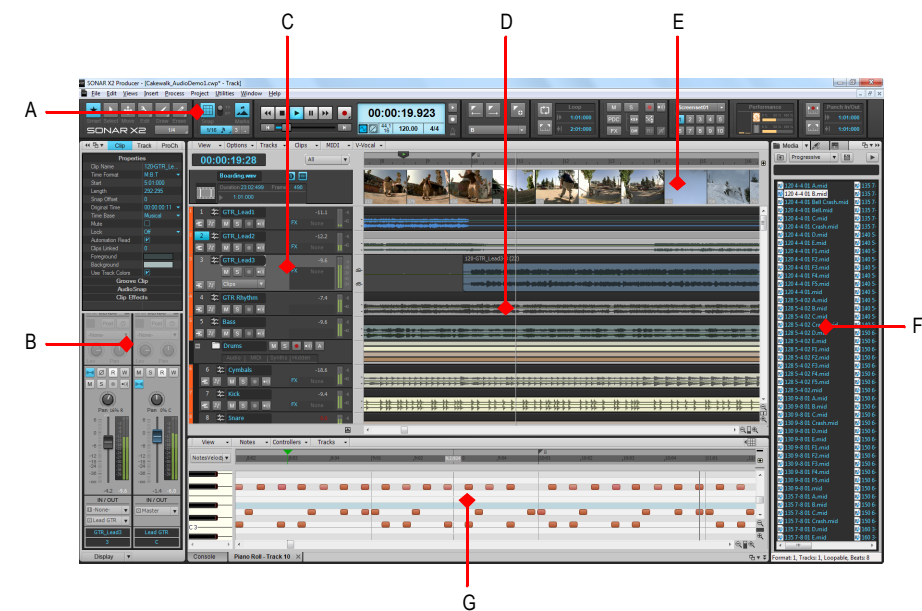
A. Control Bar *B.* Inspector pane *C.* Track pane *D.* Clips pane *E.* Video Thumbnail pane *F.* Browser
G. MultiDock

All of the current track's controls are contained in the Track Inspector, which is an expanded version of the current track's controls located on the far left side of the Track view. You can hide or show the Track Inspector by pressing I on your keyboard (see "Inspectors" on page 523, for more information).

The **Track** pane lets you see and change the initial settings for each track. To change the current track, move the highlight using the mouse or the keyboard as follows.

What it does	Key
Moves the highlight to the next or previous control.	LEFT/RIGHT ARROW
Moves to the same control in the adjacent track, or the next track of the same type if the control only applies to a specific track type (for example, the Patch control only applies to MIDI tracks).	UP/DOWN ARROW
Displays the next page of tracks.	PAGE DOWN
Displays the previous page of tracks.	PAGE UP

Table 4.

What it does	Key
Moves the focus to the first track.	HOME
Moves the focus to the last track.	END

Table 4.

The **Clips** pane shows the clips in your project on a horizontal timeline called the *time ruler* that helps you visualize how your project is organized. Clips contain markings that indicate their contents. The **Clips** pane lets you select, move, cut and copy clips from place to place to change the arrangement of music and sound in your project.

The **Bus** pane shows the buses in the project, and also shows any editing views that are in tabbed (docked) format. The **Show/Hide Bus pane** button ⊡ allows you to show or hide the Bus pane at the bottom of the Track view.

The **Navigator** pane displays a large part of your project so you can see an overview of your song. The **Navigator** pane displays all of your project's tracks.

The Track view makes it easy to select tracks, clips, and ranges of time in a project.For more information, see "Track view" on page 1790 and "Configuring the display of tracks in the Track view" on page 319.

Inspector pane

When working on a project, you will frequently need to access track and clip parameters and mix controls. The Track Inspector and Properties Inspector provide easy access to relevant settings for the selected track(s) or clip(s).

Figure 8. *Use the Track Inspector and Properties Inspector to configure track and clip settings.*

A. Dock/undock Inspector   B. Show/hide Clip Properties Inspector   C. Show/hide Track Properties Inspector
D. Show/hide ProChannel   E. Display area for Properties Inspector   F. Display area for Track Inspectors
G. Show/hide/configure Track Inspector modules   H. Section header bars (click to show controls)   I. Show audio output or MIDI settings (Instrument tracks only)

The Inspector pane appears to the left of the Track view, but can also be moved to the right side. There are three separate inspectors:

- **Track Inspector.** The Track Inspector shows mix settings for the *current* track, bus, or main, and is essentially identical to a channel strip in the Console view. Advanced MIDI settings are also available for MIDI tracks and Instrument tracks. For details, see "Track Inspector overview" on page 529.

- **Properties Inspector.** The Properties Inspector shows properties for the *selected* clip(s) or track(s). For details, see "Properties Inspector overview" on page 544. The Properties Inspector has two modes:

  - **Clip.** The Clip Properties Inspector displays settings for the currently selected clip(s). For details, see "Properties Inspector - Clip Properties" on page 546.

  - **Track.** The Track Properties Inspector lets you type a track name, specify an audio track's AudioSnap render modes, specify the default clip colors, and enter a text description. For details, see "Properties Inspector - Track Properties" on page 553.

- **ProChannel (Producer only).** ProChannel combines compression, equalization, and tube saturation modeling in one convenient processor. ProChannel is available on each audio track, Instrument track and bus. For details, see "ProChannel (Producer only)" on page 963.

For more information about the Inspector pane, see "Inspectors" on page 523.

Control Bar

Much of your time in SONAR is spent recording and listening to your project as it develops. The Control Bar contains the most important tools and other pieces of information you will need to record, edit and play back your project.

The Control Bar consists of several modules that each contain various related controls. You can re-arrange and show/hide each individual module, which allows you to only show the functions you need most often. By default, the Control Bar is docked at the top of SONAR's screen, but can also be undocked or docked at the bottom.

Figure 9.   *The Control Bar.*
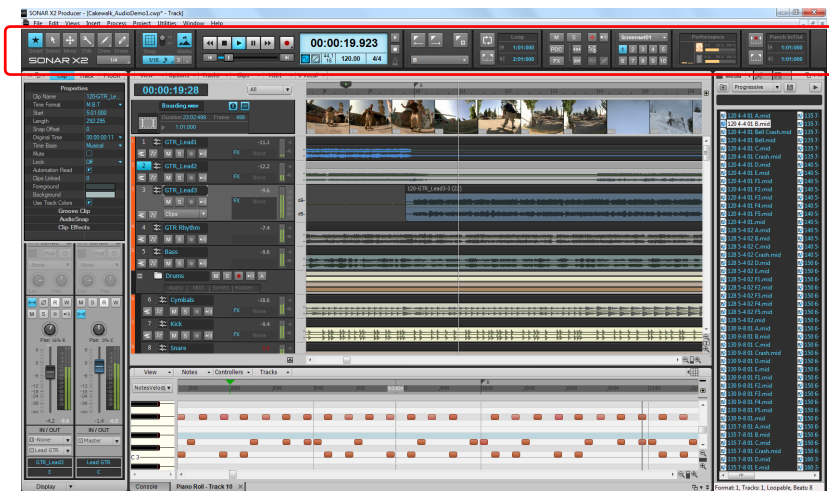
For more information about the Control Bar, see "Control Bar overview" on page 495.

The Console view

The **Console view** is where you can mix the sounds on all the different tracks to create the final mix of your project. While the Track view provides most of the same controls, you may want to use the more familiar interface of the Console view for mixing.You use the Console view to adjust the levels of sound for the different tracks in your project, to change the stereo panning, and to apply real-time effects to an individual track, combinations of tracks, or the final mix.

The Console view contains several modules of controls. There is one channel strip for each track and bus in your project. You can use bus sends to direct certain tracks to special modules that are known as *buses*.

Figure 10.   *The Console view*
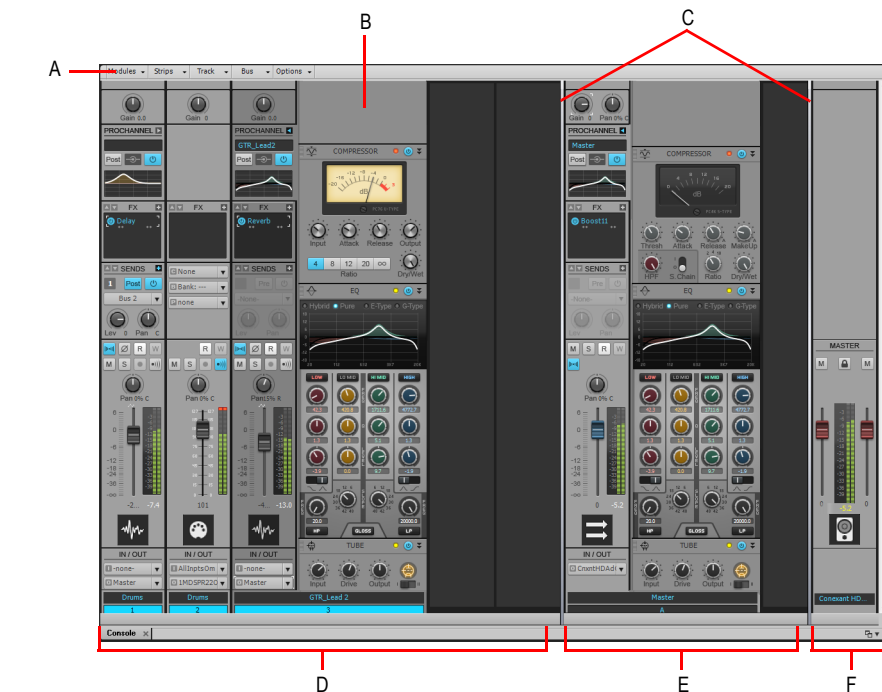
A. Console view menu B. ProChannel (Producer only) C. Pane splitter bars D. Track channel strips E. Bus channel strips F. Main channel strips

As in the Track view, you can change track settings or record new music or sound in the Console view. You may choose to use one view or the other, or the choice you make may depend on which project you are working on.

Other views

SONAR has a number of other views you can use to display and work on your project. To display these view, choose the desired view from the **Views** menu, or press the view's keyboard shortcut.

The **Piano Roll view** shows the notes from a MIDI track or tracks as they would appear on a player-piano roll. You can move the notes around, make them longer or shorter, and change their pitches by just dragging them with the mouse. You can also use the Piano Roll view to display and edit MIDI velocity, controllers, and other types of information. The Piano Roll view also contains the Drum Editor, which allows you to play different drum modules from a single track. For more information, see "Piano Roll view" on page 1798.

Figure 11. *The Piano Roll view*
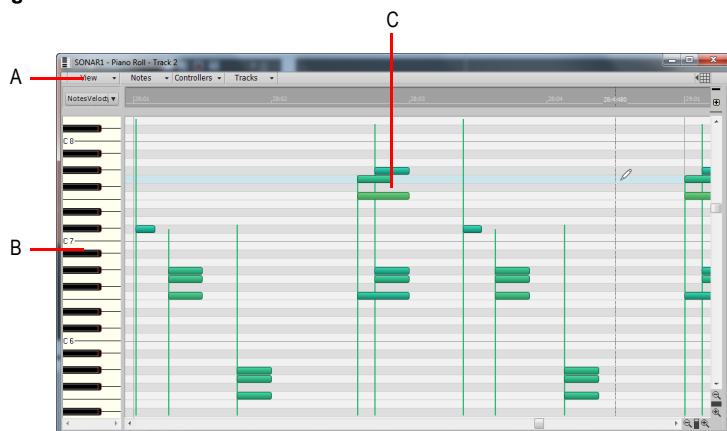
A. Piano Roll view menu B. Key/Pitch pane C. Note pane

The Staff view displays the notes from one or more MIDI tracks using standard music notation, similar to the way the notation would appear on a printed page. You can add, edit, or delete notes; create percussion parts; add guitar chords and other notation markings; display guitar tablature; display the Fretboard pane; and print whole scores or individual parts to share with other musicians.

Figure 12. *The Staff view*
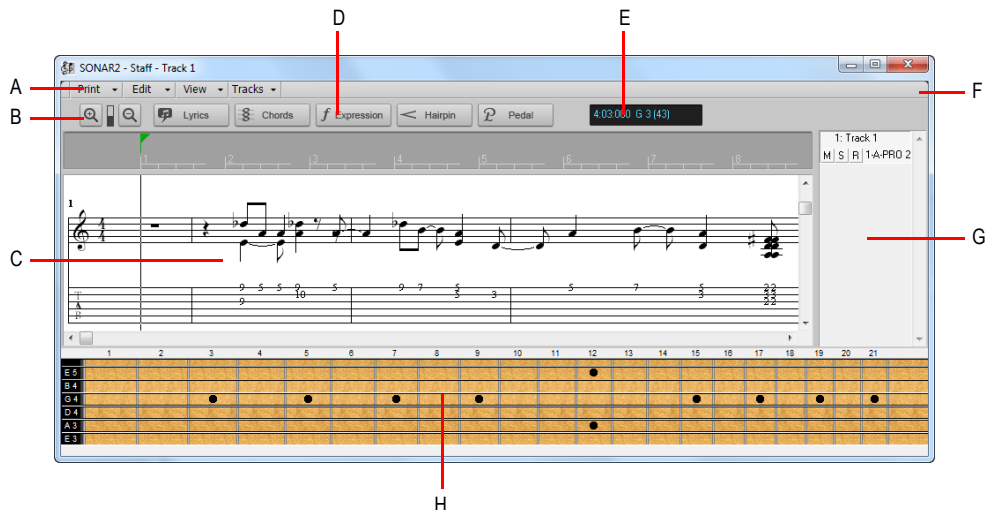
A. Staff view menu B. Zoom in/out C. Staff pane D. Editing tools E. Time and pitch locator F. Dock/undock and expand/collapse G. Track list pane H. Fretboard pane

The Loop Construction view allows you to create and edit Groove clips (SONAR loops that "know" the tempo and key in which they were recorded), and export these clips as ACIDized files. For more information, see "Loop Construction view" on page 1872.

Figure 13. *The Loop Construction view*
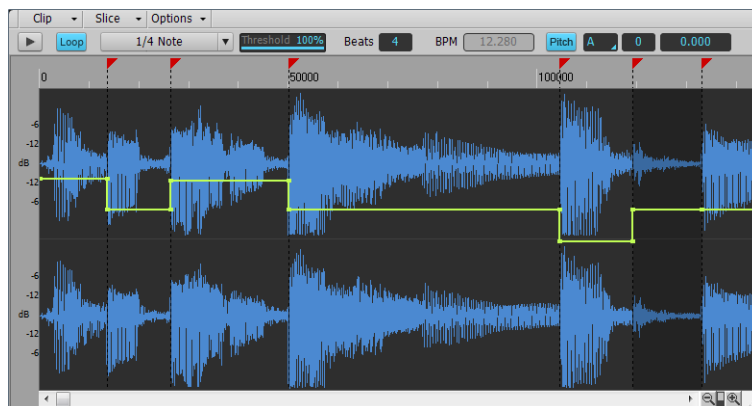
The Browser lets you find and import various types of content into your projects, including audio and MIDI files, track and project templates, track icons, FX Chain presets, effect plug-ins and instruments. You can drag content and plug-ins directly into tracks.

Figure 14. *The Browser.*
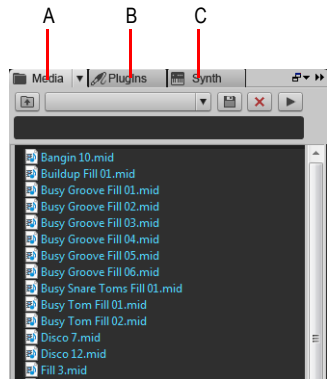
A. Media Browser B. Plug-in Browser C. Synth Rack Browser

The Event List view displays the events in a project individually, so that you can make changes at a very detailed level. For more information, see "Event List view" on page 1832.

Figure 15. *The Event List view*

SONAR has several other views that are used for very specific purposes.

View	How you use it
Meter/Key	To change the meter (time signature) or key signature, or to insert changes in the meter or key signature at specific times in a project. For more information, see "Meter/Key view" on page 1871.
Big Time	To display the Now time in a large, resizable font that you can read more easily. For more information, see "Big Time view" on page 1872.
Markers	To add, move, rename, or delete labels for parts of your project that make it easier to move from one point to another. For more information, see "Markers view" on page 1871.
Lyrics	To add and display lyrics for a track. For more information, see "Lyrics view" on page 1835.
Video	To display a loaded video file. For more information, see "Video view" on page 1868.
Navigator	Manage the Now Time in a project
Surround Panner (Producer and Studio only)	Pan a surround track
Sysx	To create, display, store, and edit System Exclusive MIDI messages used to control instruments and other gear that are MIDI capable. For more information, see "SYSX view" on page 1871.
Tempo	To view and edit the project's tempo changes. For more information, see "Tempo view" on page 1869.
Step Sequencer	Lets you compose patterns by clicking cells in a grid to turn notes on or off. For more information, see "Step Sequencer view" on page 1803.
Matrix	Lets you trigger multiple audio and MIDI patterns, either with a mouse or via MIDI remote control. For more information, see "Matrix view" on page 1876.

Table 5.

Zoom controls

Many of the views contain Zoom tools that let you change the horizontal and vertical scale of the view.

Figure 16. *Zoom controls*
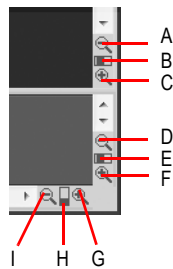
A. Zoom Clips pane out vertically B. Vertical Zoom fader for Clips pane C. Zoom Clips pane in vertically D. Zoom Bus pane out vertically E. Vertical Zoom fader for Bus pane F. Zoom Bus pane in vertically G. Zoom in horizontally H. Horizontal zoom fader I. Zoom out horizontally

The Zoom tools are used as described in the following table.

Tool	How you use it
Zoom out (Clips pane or Bus pane)	Click to zoom out incrementally, or press SHIFT and click to zoom all the way out
Zoom in (Clips pane or Bus pane)	Click to zoom in incrementally, or press SHIFT and click to zoom all the way in
Zoom fader	Click and drag to zoom continuously

Table 6.

You can also zoom with the keyboard.

Key	What it does
CTRL+UP ARROW	Zoom out vertically
CTRL+DOWN ARROW	Zoom in vertically
CTRL+RIGHT ARROW	Zoom in horizontally
CTRL+LEFT ARROW	Zoom out horizontally

Table 7.

SONAR basics

Key	What it does
Hold down Z	Arm the Zoom tool
ALT+Z	Undo the current zoom
ALT+SHIFT+Z	Redo the previous zoom
F	Fit tracks to window
A	Show all tracks
SHIFT+F	Fit project to window
SHIFT+double-click a clip	Maximize track height
F11	Full Screen mode

Table 7.

To undo/redo zoom with mouse buttons

To undo zoom (same as ALT+Z), press and hold down the right mouse button, then click the left mouse button.

To redo zoom (same as ALT+SHIFT+Z), press and hold down the left mouse button, then click the right mouse button.

Auto Zoom the current track

When Auto Zoom is enabled, the current track will automatically zoom and any lanes will be shown at their minimum height, and all other tracks will be minimized. When a new track is focused, it swaps heights with the previously focused track.

Auto Zoom allows you to show more tracks or buses simultaneously as a result of having all but one zoomed out vertically.

Note: *When Auto Zoom is enabled, it is not possible to resize individual tracks. All non-focused tracks always have the same track height. If a non-focused track is resized, all others resize with it. All* **Minimize Strip** *and* **Restore Strip** *buttons are also hidden.*

To enable/disable Auto Zoom

Do *one* of the following:

• Click the Track view **Views** menu and select **Auto Zoom**.

• Press SHIFT+Z.

To specify the default Auto Zoom track height

Resize the current track.

Zooming and scrolling in the time ruler

1. Point the mouse pointer at the top half of the Clips pane or Piano Roll view time ruler until the mouse pointer looks like this: 🔍 .
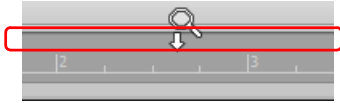
2. Do *one* of the following:

   • Drag up/down to zoom horizontally. Zooming is centered around the Aim Assist line. To zoom faster, hold down the SHIFT key while dragging.

   • Right-click and drag up/down to zoom tracks vertically. The current track is centered.

   • Drag left/right to scroll horizontally.

   • Double-click to show and fit selection (or fit project if there is no selection).

ⓘ **Note 1:** *If multiple time rulers are showing, drag in the top half of the topmost ruler.*

ⓘ **Note 2:** *The Clips pane will stop scrolling while zooming in the time ruler, or if you stop zooming while the Now time is off-screen. To resume scrolling, right-click in the time ruler.*

Docking views in the MultiDock

You can dock any view other than the Console view in the MultiDock by enabling a view's **Dock in MultiDock** option. You can have as many views open in tabbed format as you want. You can toggle through the different views by clicking the tab of the view you want to see (or use the CTRL+SHIFT+LEFT/RIGHT ARROW shortcut). You can also maximize the pane to do detailed work in a view, or drag the splitter bar at the top of the view to enlarge the tabbed view area.The MultiDock.
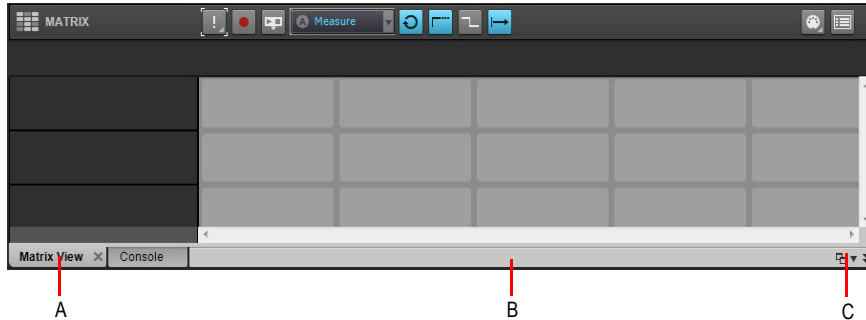
A. Each docked window has its own tab B. Click to the right of the tabs and drag the MultiDock away from the bottom of the screen in order to undock the MultiDock C. Dock/undock and expand/collapse the MultiDock

For more information about docking view, see "MultiDock" on page 1046.

Locking views

By default SONAR allows only one instance of each view, but you can lock the contents of most views, preserving the current view by forcing a new instance of the view to appear if necessary. Locking views is the only way you can have multiple instances of the same view open. Only the Track and Console views cannot be locked.

To lock a view, do *one* of the following:

• Click the upper left corner of a window, and choose **Lock Contents** from the pop-up menu.

• If the view is docked in the MultiDock, right-click the view's tab and choose **Lock Contents**.

For more information about locking view, see "Locking views" on page 1052.

Floating views

When a view is float enabled, you can move it outside of the confines of SONAR. This is particularly useful if you take advantage of SONAR's dual monitor support. Using dual monitor support, you can keep the Track or Console view on one monitor and "float" other views to the other monitor by dragging them to the second screen.

For more information about floating view, see "Floating views and using dual video monitors" on page 1051.

X-Ray windows

The X-Ray Windows feature eliminates the need to constantly minimize, move, or close windows in order to work in other windows. It works by decreasing the opacity of the current window enough so that you can see and work with the window that's behind the current window. You activate the feature by pressing a keyboard shortcut (default shortcut is SHIFT+X) when the mouse cursor is over a window you want to x-ray. You can choose to X-Ray whichever window is underneath the mouse cursor, or automatically X-Ray all FX/synth property pages in one step (**Note**: the mouse cursor does not need to be over any plug-in property pages).

The X-Ray Windows feature works on the following windows:

* AudioSnap palette
* Piano Roll view (when float-enabled)
* Plug-in effects and synths
* Controller/Surface plug-ins

To select key bindings for X-Ray windows

1. Use the **Edit > Preferences** command to open the Preferences dialog box, then select **Keyboard Shortcuts**.

2. If you want to use currently unassigned keys or key combinations, scroll through the options in the **Key** window until the **Assigned to** field that is just under the window reads **Unassigned**. It's a good idea to find two unassigned options that are next to each other or easy to remember.

> **Note:** *For best results with X-Ray Windows, avoid using ALT key combinations.*

3. Once you've decided on two keys or key combinations that you want to use, select Global Bindings in the **Area** field, and scroll to the bottom of the list of commands that are in the window below that field.

4. In the **Key** window, highlight the key or key combination that you want to use for the X-Ray command, then highlight **X-Ray** in the function column of the list of commands, then click the **Bind** button to bind them together.

5. Now highlight the key or key combination that you want to use for the **X-Ray All FX/Synths** command, then highlight **X-Ray All FX/Synths** in the function column of the list of commands, then click the **Bind** button to bind them together.

6. Click **OK** to close the dialog box.

To use X-Ray windows

1. Use the **Edit > Preferences** command to open the **Preferences** dialog box, click **Customization - Display** and make sure the **Enable X-Ray** check box is selected.

2. Make sure that the view windows you want to X-Ray are in the Floating-enabled state: to check this, click the view or fx icon that's in the upper left corner of a window, and select **Enable**

Floating from the drop-down menu. If **Disable Floating** is in the menu, then the **Floating** option is already enabled.

ℹ️ **Note:** *All FX/Synth/Control surface property pages are float-enabled by default.*

3. To X-Ray or un-X-Ray a single window, move the mouse cursor over the window, and press the keyboard shortcut (default is SHIFT+X) for the X-Ray command. The window does not need to have focus (does not need to be the highlighted window).

4. To X-Ray or un-X-Ray all plug-in windows at once, press the key binding for the **X-Ray All FX/ Synths** command.

ℹ️ **Note:** *If a window has focus, and the window's **Give All Keystrokes To Plug-in** button ⌨️ is enabled, X-Ray keyboard commands won't work.*

To Adjust X-Ray Windows Options

1. Use the **Edit > Preferences** command to open the **Preferences** dialog box, then click **Customization - Display**.

2. On the General tab, you can adust these options:

   • **Enable X-Ray.** Enable or disable this check box to turn the X-Ray Windows feature on or off.

   • **Opacity.** Adjust this value by typing in a value, or by clicking and holding the **+** or **-** button to adjust the final opacity percentage value that an X-Rayed window reaches.

   • **Fade Out Time.** Adjust this value by typing in a value, or by clicking and holding the **+** or **-** button to adjust the amount of time that an X-Rayed window takes to reach its final opacity percentage value.

   • **Fade In Time.** Adjust this value by clicking and holding the **+** or **-** button to adjust the amount of time that an X-Rayed window takes to restore its original opacity.

3. Click **OK** to close the dialog box and accept your changes.

To exclude a plug-in from X-Ray capablity

Some plug-ins (very few) use DirectDraw to create their windows. These windows appear jittery when x-rayed.

To exclude a plug-in from X-Ray capablity, follow these steps:

1. Open the Cakewalk Plug-in Manager: use the **Utilities > Cakewalk Plug- in Manager** command.

2. In the **Plug-in Categories** window, select the category that the plug-in you want to exclude is in.

3. In the **Registered Plug-ins** window, select the plug-in that you want to exclude.

4. If the plug-in is a DirectX effect or an MFX, write down (or select and copy) the CLSID value that's in the **CLSID** field at the bottom of the dialog box.

5. If the plug-in is a VST or VSTi, write down the VST ID value that's in the **VST ID** field at the bottom of the dialog box.

6. Close the **Plug-in Manager** dialog box.

7. Open the `Xrayexclude.ini` file that's in your SONAR program folder (use Notepad).

8. At the end of the file, find the `[EffectProps View]` section.

   You will see entries such as the following:

   `; Waves SSL EQ Stereo`

   `XRayExclude11=1397510483`

   `XRayExclude12={E451379E-F7E1-4E82-98D9-BEB87AC45E90}`

9. Exclude your plug-in by creating a blank line below the last entry in the `[EffectProps View]` section, and then typing:

   `;[name of your plug-in, but withour brackets]`

   XRayExclude[type the next available number in XRayExclude list, but without brackets]=[VST ID number, with no brackets, or CLSID number, with curly braces at start and finish]

   For example, if the last entry in the `[EffectProps View]` section was: `; Waves SSL EQ Stereo`

   `XRayExclude11=1397510483`

   `XRayExclude12={E451379E-F7E1-4E82-98D9-BEB87AC45E90}`

   And you wanted to exclude the Cakewalk FxDelay from the X-Ray Windows feature, after creating a blank line you would type:

   `; Cakewalk FxDelay`

   `XRayExclude13={985DAF67-589F-4B8D-8BBC-D7AD651B9022}`

   If there was also a VST version of the Cakewalk FxDelay, you would add another line:

   `XRayExclude14=[some VST ID number, with no brackets]`

10. Save and close the `Xrayexclude.ini` file, and restart SONAR to implement your changes.

Screensets

You may spend a lot of time making sure that all the views are laid out on the screen just the way you want. When you save your work, SONAR automatically saves the screen layout along with it. You can create up to 10 screensets per project and freely switch between screensets at any time.

For more information, see "Screensets" on page 1054.

Next topic: "Working on a project" on page 93.

Working on a project

Every project has a current time, known as the Now time (see:). As you record or play back a project, the Now time shows your current location in the project. When you create a project, the Now time is set to the beginning of the project. The current Now time is saved with your project.

As you work with a project, you can use SONAR's mute and solo features to choose which tracks are played, or you can create loops to play a particular section over and over again. You can also create *markers*, which are named time points you add to your project to make it easy to jump to a particular location.

Screen colors and wallpaper

SONAR lets you customize the colors that are used for virtually all parts of the program using the **Edit > Preferences > Customization - Colors** command. This command also lets you change the background bitmap that is displayed in the SONAR window.

For any SONAR screen element, you can assign a color in two ways:

• Choose one of the colors that is part of your Windows color scheme.

• Assign a custom color.

To assign custom colors

1. Choose **Edit > Preferences** to display the **Preferences** dialog box, then click **Customization - Colors**.

2. Choose the screen element whose color you want to change from the **Screen Element** list.

3. Assign a color to the screen element in one of two ways:

   • To use a color from the Windows color scheme, choose one of the options in the **Follow System Color** list

   • To use a custom color, check **Use Specific Color**, click the **Choose Color** button, and select the color you want

4. To save these changes from session to session, check the **Save Changes for Next Session** box.

5. Click **OK** when you are done.

   SONAR uses the colors you have chosen.

To restore the default colors

1. Choose **Edit > Preferences** to display the **Preferences** dialog box, then click **Customization - Colors**.

2. In the **Screen Elements** window, select the elements that you want to restore; you can CTRL-click or SHIFT-click to select multiple elements.

3. Click the **Defaults** button.

4. Click **OK**.

SONAR uses the default colors for all selected screen elements.

To change the wallpaper

1. Choose **Edit > Preferences** to display the **Preferences** dialog box, then click **Customization - Colors**.

2. Choose the desired wallpaper according to the table.

To do this	Do this
Use the default wallpaper	Check **Default** in the Wallpaper list
Not use any wallpaper	Check **None** in the Wallpaper list
Use a custom bitmap	Check **Custom**, choose a bitmap, and click **Open**

Table 8.

3. Click **OK** when you are done.

See also:

Color presets

Once you create a color arrangement that you like, you can save it as a preset, and then load it whenever you want to use that arrangement. You can also load any of the many factory presets, some of which duplicate the colors of earlier versions of SONAR. You can also import and export color arrangements in the form of .clr files so that SONAR users can share color layouts. And you can back up or export all of your presets with a single command, and import a group of presets that you or another SONAR user created.

Note: *Both single color presets, and collections of presets use the file extension .clr, so when you export either the current color arrangement, or all of your presets at once, give the exported file a name that clearly labels it as either a single preset, or as a collection of presets.*

Figure 17. *The Colors section*
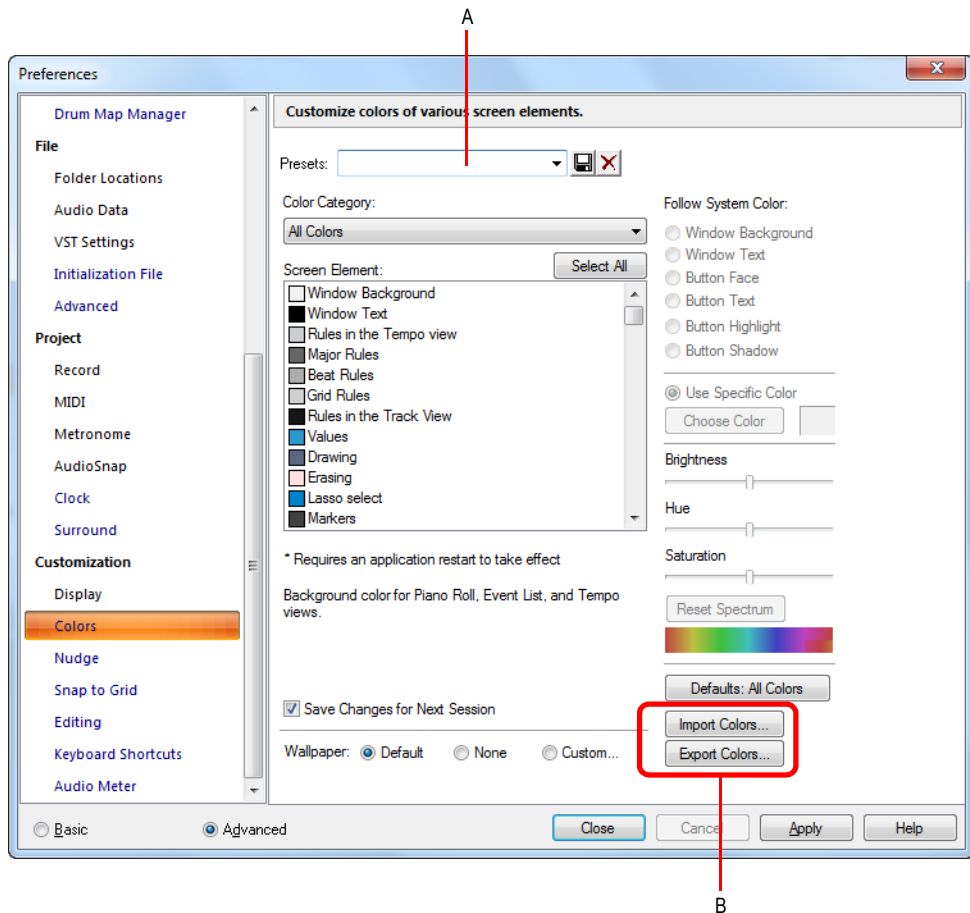
A. Presets menu B. Import and Export buttons

To load a color preset

1. Choose **Edit > Preferences** to display the **Preferences** dialog box, then click **Customization - Colors**.
2. Click the drop-down arrow on the **Presets** menu to display the list of presets, then click the name of the preset you want to load.

To save a color preset

1. Choose **Edit > Preferences** to display the **Preferences** dialog box, then click **Customization - Colors**.
2. Adjust the color settings you want to save.
3. Type a name for your preset in the **Presets** menu.
4. Click the floppy disk icon ![floppy disk icon] that's next to the **Presets** menu to save your preset.
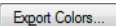
To export the current color arrangement

1. Choose **Edit > Preferences** to display the **Preferences** dialog box, then click **Customization - Colors**.
2. Arrange or load the color arrangement you want to export.
3. Click the **Export Colors** button [Export Colors...].

   The **Export Color Set** dialog box appears.
4. Navigate to the folder where you want to store your new color set file.
5. Type a name for your color set file in the **File Name** field.
6. Make sure that the **Export Current Color Set** check box is enabled.
7. Click the **Save** button.

Screen colors and wallpaper

To import one or more color presets

1. Choose **Edit > Preferences** to display the **Preferences** dialog box, then click **Customization - Colors**.

2. Click the **Import Colors** button [Import Colors...].

   The **Import Color Set** dialog box appears.

3. Navigate to the folder where the color set file you want to import is. Both single presets and groups of presets are stored in color set files, which use the .clr file extension.

4. Click the file that you want to import.

5. Click the **Open** button.

6. If your **Preset** menu in SONAR already contains a preset that is included in the preset collection file you are importing, SONAR asks you if you want to overwrite the file. This happens for each file that has the same name as a preset in the preset collection you are importing. Click **Yes** or **No** for each file in question, or **Yes All** or **No All** to either overwrite or protect all of your current preset files.

To export all your color presets

1. Choose **Edit > Preferences** to display the **Preferences** dialog box, then click **Customization - Colors**.

2. Click the **Export Colors** button [Export Colors...].

   The **Export Color Set** dialog box appears.

3. Navigate to the folder where you want to store your the exported file. This file will contain all or your color presets.

4. Type a name for your file in the **File Name** field. Use a file name that you will recognize as a collection of presets, rather than as a single color arrangement.

5. Make sure that the **Export Color Presets** check box is enabled.

6. Click the **Save** button.

Note: *A file of color presets can be large, and might take a minute or so to export.*

Installing SONAR

SONAR is easy to install. All you need to do is choose the folder where the program and sample project files should be stored. Before you start, make sure you have your serial number handy. Your serial number is located on the back of your DVD case.

To install SONAR

ℹ **Note:** *If you choose to not install the Sample files, you will not have the necessary content to use the tutorials in Chapter 2.*

1. Start your computer.Close any open programs you have running.

2. Place the SONAR installation disc in your disc drive.

   If you have autorun enabled, the SONAR **AutoRun** menu opens automatically, showing you a dialog box with several buttons. If autorun is not enabled, you can open the SONAR **AutoRun** menu by selecting **Start > Run** and entering **d:\AutoRun.exe** (where d:\ is your disc drive).

3. Click the **Install SONAR** button.

ℹ **Note:** *If you exit Setup without completing the installation, choose **Start > Run**, type* D:\AutoRun.exe *(where* D:\ *is your DVD drive), and click **OK**. This will reopen the **AutoRun** window, and you can click **Install** to start installation again.*

4. Follow the installation instructions on the screen.

You can also install SONAR by choosing **Start > Run** and running the application named SETUP.EXE from the DVD.

Uninstalling SONAR

When you installed SONAR, the setup program placed an **Uninstall** icon in the **Start** menu. To uninstall SONAR, click the **Start** button and choose **Programs > Cakewalk > SONAR X2** (Producer, Studio or Essential) **> Uninstall SONAR X2** (Producer, Studio or Essential).

Starting to use SONAR

This chapter has provided you with an overview of SONAR and basic information on how to install the software and configure your system.

The following tutorials will give you some hands-on practice in playing, recording, and mixing your projects. If you have not already done so, you may want to refer to "SONAR basics" on page 73 to get the most out of these tutorials.

Note: *If, during installation, you chose in the **Select Components** dialog box not to install the Tutorials folder (part of the Sample files), you will not have access to the sample tutorial files needed to follow the tutorials in this chapter. If you didn't install these files, insert your product disc and copy the files to your hard drive.*

Introduction
Starting to use SONAR

Tutorial 1 – Creating, playing, and saving projects

Understanding and managing project files is central to your workflow in SONAR. In this tutorial, we are going to cover the basics of getting started with project files and some of the operations that can be performed with them. Whenever you write or record music in SONAR, you are writing it to be saved into a project. A project can contain a variety of elements, including:

- Audio tracks
- MIDI tracks
- Instrument tracks
- Audio effects
- Project settings such as Tempo, Key and Meter changes
- Lyrics and notation

See:

Creating a new project

There are several ways to get started with a project in SONAR. When SONAR is opened, you will be greeted with the **Quick Start** dialog box. Let's take a look at the options available in this dialog box.
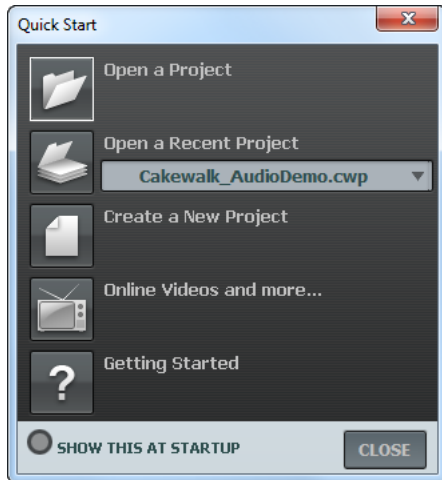
Open a Project.   Opens a standard **File Open** dialog box, which lets you select the project that you want to open.

Open a Recent Project.   The drop-down list shows the most recent projects that have been opened in SONAR. Select the desired project from the list and click the button to the left of the list to open the project.

Create a New Project.   Click this button to open the **New Project File** dialog box, which lets you create a new project based on any available template.

Online Videos and more.   Click this link to view our tutorial videos online. An active Internet connection is needed in order to access this content.

Getting Started.   Click this button to open the SONAR online Help.

Show this at Startup. Clear this check box if you don't want the **Quick Start** dialog box to launch the next time you start SONAR.

Close. Use this button to close the **Quick Start** dialog box.

For this tutorial, we want to create a new project.

• Click the **Create a New Project** button ▢.

Tip: *You can also perform this same operation by clicking **File > New** from the main menu across the top of SONAR's screen.*

The **New Project File** dialog box appears. Whenever you create a new project, you will be presented with this dialog box.

Let's explore some of the things you can do in this window.
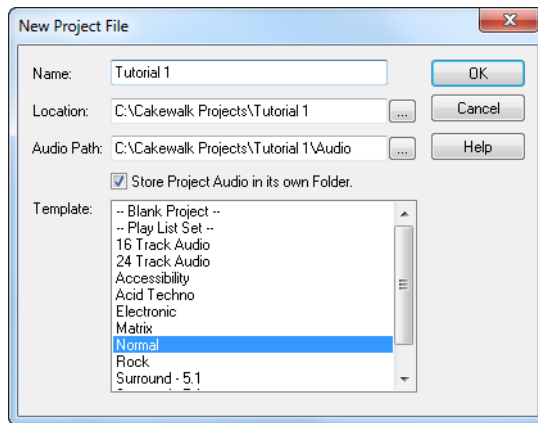
Note: *The list of available project templates shown may vary depending on your version of SONAR (Producer, Studio or Essential).*

Name. Type the name of your project in the **Name** box. For this exercise, let's name your project `Tutorial 1`.

Location. Use the **Location** box to specify where the project should be saved. Click ⌊...⌋ to browse to a specific location. For this tutorial, use the default, as shown in the preceding figure.

Audio Path. Use the **Audio Path** box to specify where to save audio recordings for your project.

Click ⌊...⌋ to browse to a specific location.**Store Project Audio in its own Folder.** Select this check box if you want to store the project's audio files in a separate folder. It is recommended that you select this option.

Template. This list shows all available pre-made templates included with SONAR. This list will also include any custom templates that you create. Your **Template** list may vary from the preceding figure. For this tutorial, select the template named **Normal**.

OK. Click **OK** to create a new project based on the specified settings.

Cancel. Click **Cancel** to close the **New Project File** dialog box.

Help. Click **Help** to open the online Help topic for the **New Project File** dialog box.

Click **OK** now to move forward with this tutorial.

Congratulations, you have just created a new project in SONAR!

See:

Opening project files

Next, we are going to cover how to open existing project files. There are two ways this can be done in SONAR:Click the **Open a Project** button in the **Quick Start** dialog box that is first presented when SONAR starts.

Note: *You can open the Quick Start dialog box at any time by going to **Help > Quick Start**.*

• Select **File > Open** from the menu bar across the top of SONAR's screen.

Let's go ahead and try one of the above methods. Either of them will bring you to the **Open** dialog box as shown in the following figure. The **Open** dialog box functions like any other file browsing dialog box in Microsoft Windows.
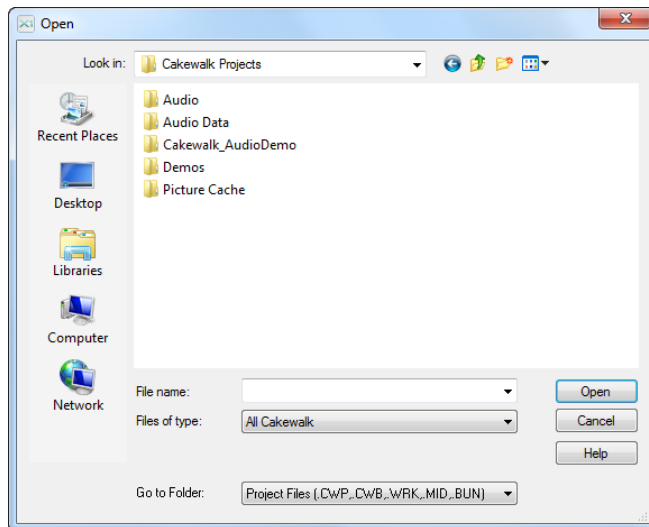
• The vertical navigation buttons let you jump to popular locations on your computer's hard disk.

• The browsing pane lists all the project files and folders that are available in the selected folder.

• The **Go to Folder** drop-down list allows you to quickly move to commonly used folders for project files in SONAR. Typically, you can get to your projects by selecting **Project Files**.

• For more detailed information about all the options and functions in this dialog box, click **Help**.

For this tutorial we want to open one of the sample project files that are included with SONAR.

Navigate to the `Cakewalk Content` folder (default location is `C:\Cakewalk Content\SONAR X2 [Producer, Studio or Essential]\Tutorial Projects\Audio Tutorial Project`) and locate the project named `SONAR_AudioDemo.cwb`.

You can load project files into SONAR in one of two ways:

- Select a file by clicking on it so that it is selected, then click **Open**.
- Double-click the file from the browsing pane.

Note: *If prompted to unpack the bundle, accept the default locations and click **OK**.*

Let's now use one of these methods to open the project file SONAR_AudioDemo.cwb. When the project opens, the File Information window appears. This window can be used for storing notes, comments, credits and other helpful information about a project. For now, close File Information window by clicking the **Close** button ![X button] in the upper right corner of the window.
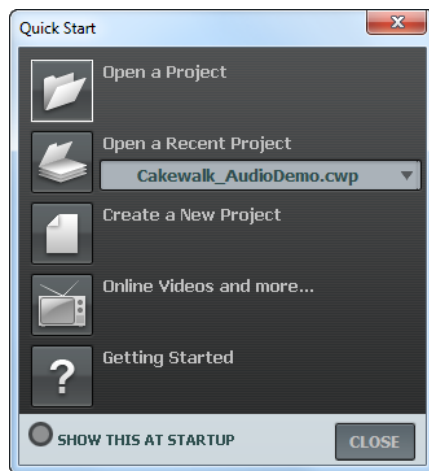
See:

Tutorial 1 – Creating, playing, and saving projects
Opening project files

Playing project files

For this next section we are going to configure the project named `SONAR_AudioDemo1.cwb` for playback in SONAR. If you have not opened the project yet, do so before continuing by using the steps in

Configuring your sound device

Before we can get any sound, we need to ensure that SONAR is communicating with your computer's sound card or audio interface. To do so, click on the **Edit** menu across the top of SONAR's screen, choose **Preferences**, then click **Audio - Devices**.

Before you can hear any sound play in SONAR, you have to ensure that the devices you want to use are selected. An Edirol audio interface is used in the following example, so all the **Input Drivers** and **Output Drivers** check boxes for the Edirol device are selected. Your device list will most likely be different from the following image.
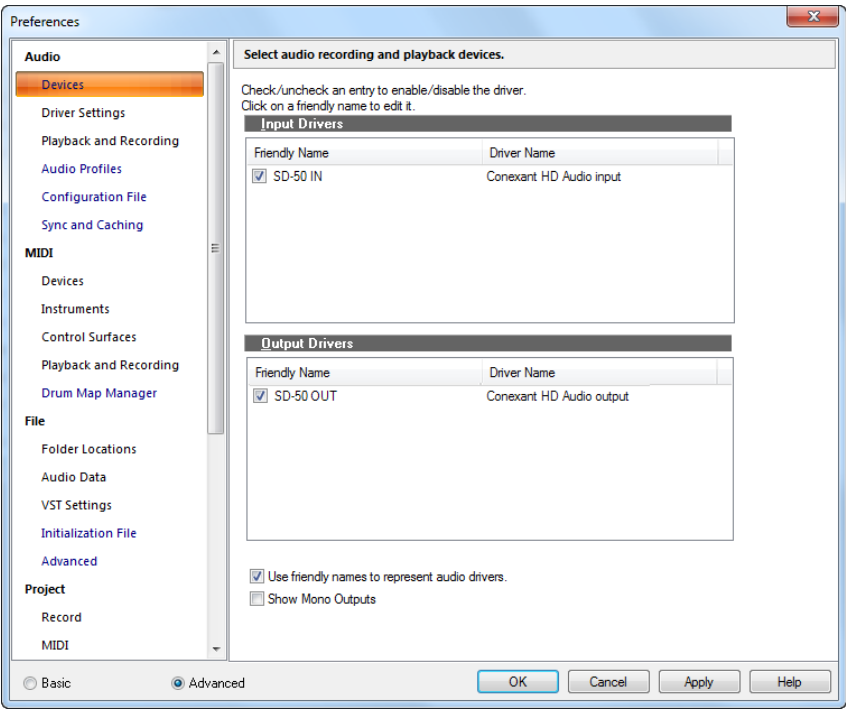
After you have selected the desired Input and Output devices that you plan to use with SONAR, click the **Audio - Driver Settings** page. In the **Playback Timing Master** list, select the audio output

device that you want SONAR to treat as the default or main output device. This should be the output on your sound card that has either speakers or headphones connected to it. In the **Record Timing Master** list, select the input on your sound card that you plan to plug devices into, such as a microphone, keyboard or other instrument.

If you are having trouble with any of the steps in the last section thus far, we have created a helpful set-up guide on our web site that provides step-by-step instructions for configuring your audio hardware. You can find it here: www.cakewalk.com/Support/hardwaresetup/

Setting the track outputs

The next important step is telling SONAR which output on your sound device you would like audio tracks to play on. In some cases, it is desirable to have tracks playing different outputs (such as if you are using external hardware processing for effects). In this scenario, you'll want to set all of the audio tracks to the same output.

Let's start with the Bass track. Locate the track named **Bass** in the project. Let's take a closer look at a few of the track's controls. If the track controls are not all visible, you may need to expand the track to see them all.

To expand a track to make all of its controls visible

1. Point the cursor to the bottom edge of the track.
2. Click and drag down to reveal all track controls.
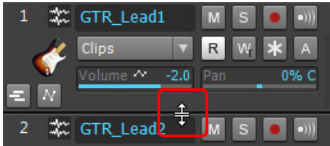
 Tip: *You can also double-click an empty space in the track strip to maximize/restore the track strip.*

Control	Description
	This is the **Mute** button. It is used to silence a track during playback. Any tracks that are muted will not be heard.
	This is the **Solo** button. It is used to silence every track except the one that is soloed. This can be handy for isolating a particular performance or recording for monitoring or mixing purposes. SONAR allows you to solo multiple tracks simultaneously.
	This is the **Arm** or **Record Enable** button, which must be enabled on any track that you want to record onto. For more details, see *Tutorial 3 – Recording vocals and musical instruments.*
	This is the **Input Echo** or **Input Monitor** button. When clicked, this enables the track's input to be heard directly through its output. For more details, see *Tutorial 3 – Recording vocals and musical instruments.*

Tutorial 1 – Creating, playing, and saving projects
Playing project files

Control	Description
R	This is the Read Automation button. It is used to enable/disable automation playback.
W	This is the **Write Automation** button. When enabled, changes to adjustable track parameters during playback are recorded. For more details, see *Tutorial 7 – Mixing and adding effects.*
✳	This is the **Freeze** button. It is used to temporarily convert a synth or instrument track into an audio track to conserve CPU power.

Locate the drop-down list for **Output** and click the small arrow to show all available outputs. Select the output that your speakers or headphones are connected to. If you can't find the **Output** drop-down list, make sure you have expanded the track fully by dragging it down.
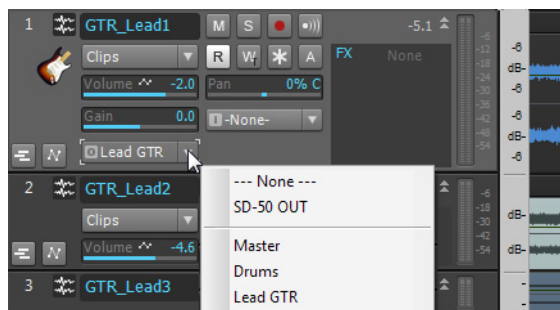
Note: *Your options will be different from the preceding image. Select the output that corresponds to your sound card or audio device.*

Next, you will want to repeat the above process for all of the tracks in your project.

Tip: *If you need to change multiple outputs simultaneously, select the tracks, then hold down the CTRL key while you change the Output setting in any selected track. You can also click a track's Output control and choose* **Selected Track Outputs**, *which opens a dialog box that allows you to change the Audio and MIDI outputs of all selected tracks.*

Playing the project

Now that all of the track's outputs are set to the appropriate device, the next step is to play the project to make sure it can be heard and sounds right.

Locate the Control Bar at the top of SONAR's screen.
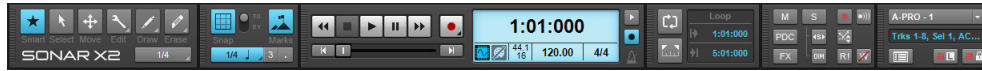
The Control Bar contains many useful functions related to projects in SONAR. To learn more about

the Control Bar, see "Control Bar overview" on page 495. For now, simply click the **Play** button ▶️ to hear the project.

Experiment with the **Mute** Ⓜ and **Solo** Ⓢ buttons on each track. If you solo multiple tracks, you will hear all the soloed tracks. If you mute any tracks, they will not be heard.

💡 **Tip:** *You can also use your keyboard's SPACEBAR key to start and stop playback in SONAR.*

Once you are done listening, click the **Stop** button ⏹️.

See:

"Creating a new project" on page 102

"Opening project files" on page 105

"Looping project files" on page 111

"Saving project files" on page 112

Looping project files

SONAR features a really handy tool that allows you to repeat specified sections of a project file. You may want to do this to rehearse a part or phrase or to listen closely to a specific section. Perhaps you might set up a loop just because it's your favorite part of the song and you want to hear it over and over again. For all of the above, you need to loop a section of the song.You may have noticed this demo file is an example of rock music. Let's pretend for a second that you are the guitar player and you want to practice your solo section right before measure 10. This requires you to do two things:

1. Create a looped section of the **GTR_Rhythm**, **Bass** and **Drums** tracks for you to practice with.
2. Mute the existing **GTR_Lead 1** track.

Enabling looping in SONAR is easy. Simply click the **Loop** button [□] in the Control Bar's Loop module. When enabled, the **Loop** button is lit [□].

Take note of the measure numbers displayed in the preceding image. The first number (10:01:000) indicates the start of the loop region and second number (19:01:000) indicates the end of the loop region.When looping is enabled, the time ruler across the top of SONAR's Track view displays yellow flag markers that indicate where the loop region starts and ends. If you want to change the loop region, you can drag the loop markers to a new location. Drag the loop start marker to measure 10 and the loop end marker to measure 19. This will create a loop of the first solo section.
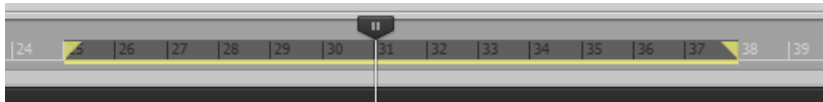
Finally, mute both the **GTR_Lead 3** and **GTR_Lead 2** tracks and click **Play** [▶] to audition the loop region. You will now hear only the **Bass** and **GTR_Rhythm** tracks so that you, the guitarist in our scenario, can practice your solo section.

See:

Saving project files

SONAR offers you many options for saving your work. To investigate these options, click on the **File** menu and choose **Save As**. This opens the **Save As** dialog box. Before doing anything in this window, the first thing you should do is select **Project Files** in the **Go to Folder** list. Even if it already says **Project Files**, click it anyway.
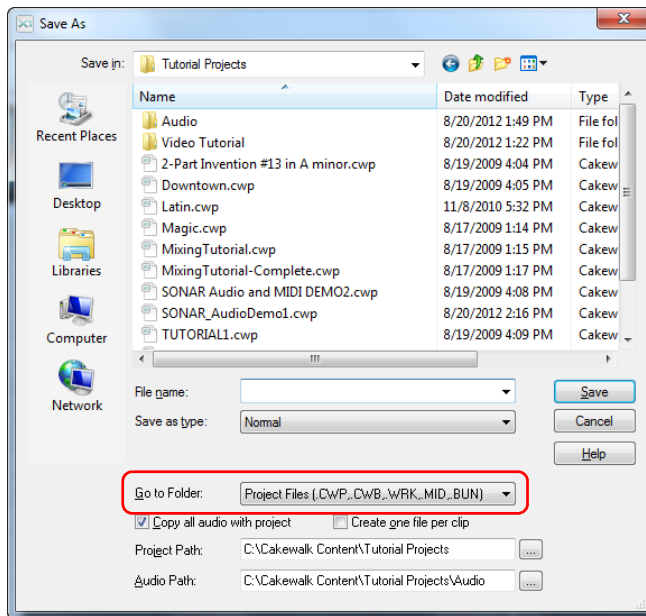
You will notice this window looks very familiar to the **Open** dialog box we looked at earlier in this tutorial. The **Save As** dialog box navigates files much in the same way as Windows does. If you would like to read the finer points and in-depth information about using this window, click the **Help** button. For this exercise, we are going to look at the different types of project files you can save with SONAR.

Take a look at the drop-down list labeled **Save as type**. Click the **Save as type** arrow to see a list of supported file formats. Let's look at these different files formats now:

- **Normal.** This is the first option listed and the most common format used for saving project files. Choosing this will create a Cakewalk Project file with the .cwp file extension. It is important to remember that Cakewalk Project files <u>do not</u> actually store any audio data, but rather reference audio files from where they are saved on your computer's hard drive. You can choose where the audio files are stored by using the **Audio Path** field in the **Save As** dialog box.

- **Template.** Template files are used as a starting point for new projects. Templates can store layout information about your project, such as how many audio and MIDI tracks there are and which

Output ports they are assigned to. For more information about using templates, see *"Templates"* on page 1064.

- **Cakewalk Bundle.** This format is typically used when transferring projects to other people or other computers. Cakewalk Bundle files use the .cwb file extension and are similar to Cakewalk Project files. The main difference is that Cakewalk Bundle files actually contain all of a project's audio data. Cakewalk Bundle files are much larger in size than regular Cakewalk Project files because they contain all of the audio data for a project, so try to avoid using this format unless you need to move a project between computers. When opening a Cakewalk Bundle file, SONAR will "unpack" the embedded audio data and save it to a new audio folder on your computer.

- **MIDI.** This option lets you save a standard MIDI file of your project. MIDI files do not contain any embedded audio or references to external audio files, so any audio data in a project will be discarded when you save a MIDI file. MIDI files can be either Format 0 or Format 1. Format 0 combines all the MIDI events into a single track. This is compatible with many older sequencers and keyboards. MIDI Format 1 files can store up to 7256 tracks and are a better choice if you plan to use your MIDI file with another computer-based sequencing application. Although not as common, SONAR also allows you to save in the RIFF MIDI format. Unless you are positive that the playback system requires a RIFF MIDI file, you want to use the MIDI format.

In most cases, the best choice for saving your files is **Normal**. To save this project, do the following:

1. In the **Go to Folder** list, select **Project Files**. Even if **Project Files** is already selected, select it again for good practice.

2. In the **Save as type** list, select **Normal**.

3. Type a name in the **File Name** box.

4. Click **Save** to save the project.

This completes the tutorial.

See:

"Creating a new project" on page 102

"Opening project files" on page 105

"Playing project files" on page 107

"Looping project files" on page 111

Tutorial 1 – Creating, playing, and saving projects
Saving project files

Tutorial 2 – Using the Browser

The Browser lets you find and import various types of content into your projects, including audio and MIDI files, track and project templates, track icons, FX Chain presets, effect plug-ins and instruments. You can drag content and plug-ins directly into tracks. By default, the Browser is docked on the right side of the screen.
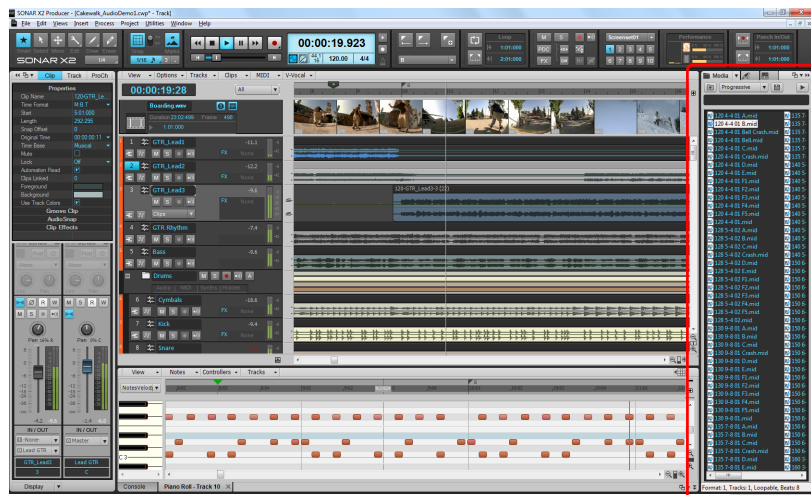
To show or hide the Browser, click the **Views** menu and choose **Browser**, or press B.

Now that we know how to show and hide the Browser, let's take a closer look at some of its features, starting with the controls that span across the top of the Browser. Locate the section on your computer screen that looks like the following image.
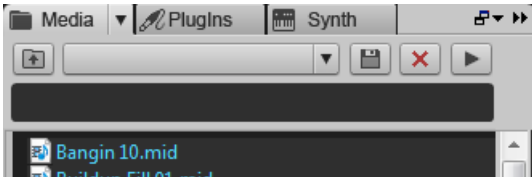
First, let's review the controls at the top of the Browser.

Control	Description
	This is the **Move up** button. It is used to open the folder one level above the active folder.
	Stop is used to stop play back of the selected loop.
	Play is used to listen to the currently selected loop.
	Allows you to save and recall presets to quickly access your favorite folders.

The **Content Location** drop-down list shown in the following figure allows you to quickly jump to popular locations on your hard drive.

Figure 18. *Media Browser*
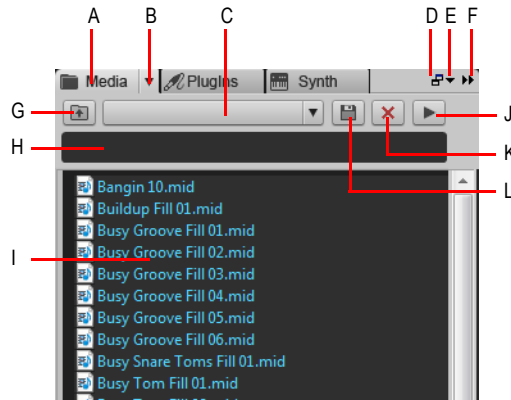
A   B   C   D E F

G ——
H ——
I ——
J ——
K ——
L ——

Bangin 10.mid
Buildup Fill 01.mid
Busy Groove Fill 01.mid
Busy Groove Fill 02.mid
Busy Groove Fill 03.mid
Busy Groove Fill 04.mid
Busy Groove Fill 05.mid
Busy Groove Fill 06.mid
Busy Snare Toms Fill 01.mid
Busy Tom Fill 01.mid

A. Show Media Browser B. Browser menu C. Content Location menu D. Dock/undock E. Docking options
F. Expand/collapse G. Move up one level to the parent directory H. Search filter I. File list J. Play/Stop
K. Delete content preset L. Save content preset

To specify the output device to use for previewing loops and files from the Browser, click the **Media**

button ▣ , point to **Audio Preview Bus**, and choose an output device from the submenu.

To work with software instruments, click the **Synth** button ▥ to open the Synth Rack. The Synth
Rack contains the following controls.

Figure 19. *Synth Rack Browser*
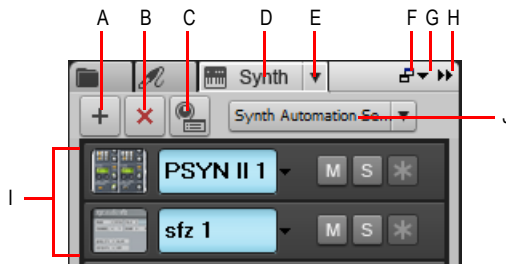
A   B   C   D   E   F G H

I ——
J ——

PSYN II 1   M S ✳
sfz 1   M S ✳

A. Insert Synth B. Delete Synth C. Insert Synth Options D. Show Synth Rack Browser E. Synth Settings menu
F. Dock/undock G. Docking options H. Expand/collapse I. Instrument list J. Synth Automation menu

See:

Finding and previewing audio loops

Now that we have a general idea of how the Browser is laid out, let's find some of the content that is included with SONAR and give it a listen.

1. Create a new project using the Normal Template as explained in the previous tutorial titled "Saving project files" on page 112.
2. Make sure the Browser is open and visible. If it is not, click the **Views** menu and choose

    Browser, or press the B key.Click the **Media** button 📁 to show the Media Browser.
3. In the Browser, click the **Content Location** drop-down list and select **Audio Library**.
4. Double-click the `Loops` folder to open the folder.
5. Double-click the `Loopmasters` folder.
6. Double-click the `ROCK AND FUNK` folder.
7. Double-click the `RAW POWER` and click the loop named `RP_Baggy_140.rx2`.

    The Browser should look something like the following image.
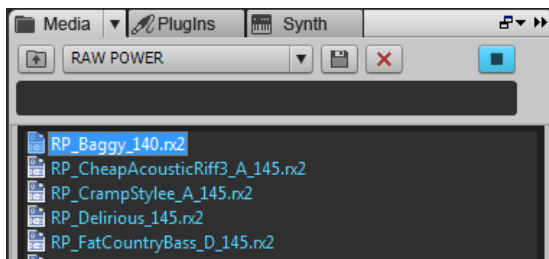
8. Click the **Play** button ▶ in the Browser.

    The selected file is previewed.

If you don't hear anything, revisit the settings of your **Audio Preview Bus,** as discussed above**,** and ensure that it is set to the audio device that your headphones or speakers are connected to.

If you need to preview a lot of loops quickly, click the **Media** button 📁 and enable the **Auto-Preview** option. When enabled, an audio loop will start playing as soon as you select it.

See:

"Previewing MIDI groove clips" on page 119

"Adding audio loops to your project" on page 120

Previewing MIDI groove clips

In addition to audio loops, the Browser also allows you to preview *MIDI groove clips*. Let's try this now with one of the clips included with SONAR. Unlike audio loops, MIDI groove clips require a soft synth or instrument track to play through.

1. Click the Browser's **Synth** button to open the Synth Rack.

2. Click the **Insert** button, point to **Insert Synths** and select **Cakewalk TTS-1**.

   The **Insert Soft Synth Options** dialog box appears.
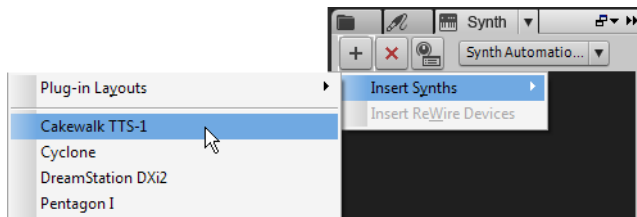
3. Clear all of the check boxes except for **Single Track Instrument, Recall Assignable Controls,** and **Ask This Every Time**.

4. Click **OK**.

   Cakewalk TTS-1 is added to your project.

Now that we have a synth in our project that we can preview MIDI groove clips with, let's find some and give them a listen.

1. Click the **Media** button to show the Media Browser.

2. In the Browser, click the **Content Location** drop-down list and select **MIDI Library**.

3. Double click the `Smart Loops` folder and select the file named `Bangin 10.mid`.

   Before we can preview a MIDI groove clip, we need to tell SONAR what instrument or synth we would like to preview it with.

4. Click the **Media** button, point to **Synth Preview Output** and select **Cakewalk TTS-1 1** on the submenu.

5. Now that SONAR knows what synth to play MIDI groove clips through, select the groove clip named `Bangin 10.mid` just as you did with the audio loop previously.

6. Click the **Play** button in the Browser.

Just like with audio loops, you can set MIDI groove clips to auto-preview by clicking the **Media**

button ▣ and enabling the **Auto-Preview** option.

In addition to using soft synths to preview MIDI groove clips, soft synths also have many other useful and powerful features. For more details and instructions on using them, see .

See:

Adding audio loops to your project

Once you have found an audio loop or MIDI groove clip that you would like to use in your project, the next important step is to add it to your project. Adding loops is easy with SONAR's intuitive drag and drop interface.

To add a loop to your project, do the following:

1. In the Browser, locate the loop you would like to use in your project.
2. Drag the loop to a track. If you are selecting an audio loop, you must drag it to an audio track. If you would like to use a MIDI groove clip, be sure you drag it to a MIDI track.

   You should also notice that, as you drag the file, your mouse pointer changes to an arrow with a

   plus sign ▨ .

3. When you drag a loop or groove clip into a project, it will only show one repetition. You can extend how long a loop is by pointing the mouse pointer to the clip's right edge, then drag the clip edge to the desired duration. When you point the mouse pointer to the right clip edge, a blue

   vertical line appears and the mouse pointer looks like this ▨ .
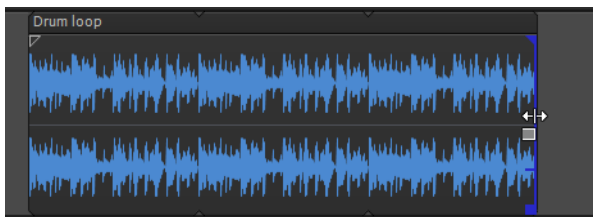
This completes the tutorial. You should now be able to drag loops into your projects and loop them.

Tutorial 3 – Recording vocals and musical instruments

One of the most important aspects of creating music in SONAR is digital audio recording. This is the process of taking the sound from a microphone or an instrument and recording it to an audio track. Once this step is completed, you can edit and mix the song to prepare it to share with the world.

This tutorial will walk you through the steps involved and provide you with some insight on how to get the best possible audio recordings.

Adding an audio track

In Tutorial 1, you learned about opening project templates. Let's open a blank project for this tutorial:On the **File** menu, click **New**.

4. Select the **Blank (no tracks or buses)** template and click **OK**.A new blank project is created.

    With the blank project open, you can insert new tracks as you need them. For the task of recording digital audio you'll need a new audio track. Follow these steps to insert one:

5. Do *one* of the following:

    • Click **Insert** and then click **Audio Track**.

    • Right-click on the Tracks pane and select **Insert Audio Track** on the pop-up menu.

    A new audio track is added to your project.

6. In the new audio track, expand the track to expose all of its controls (for details, see "To expand a track to make all of its controls visible" on page 108).

    The track's controls are exposed.Click the **Input** drop-down menu to select the track's input.

    The available inputs for the track are displayed.

7. Select the physical jack that your instrument is plugged into. If you know, for instance, that your guitar is plugged into input 1, click the **Input** control and select the first option. Some audio interfaces refer to their stereo inputs as pairs, like 1/2, 3/4 or 5/6. Most often left channels are represented by odd numbers and right channels are represented by even numbers.

    Note: *Most microphones and guitars are mono, so you'll want to select either the left or right channel accordingly.*

8. Click the **Output** drop-down menu to select the track's output.

    The available outputs for the track are displayed.

9. Select the output that you want the audio track to play through during playback. You will usually choose 1 and 2, because these are most commonly the outputs that speakers or audio monitors are connected to.Click the track's **Record Enable** button ⏺.

> **Note:** *SONAR only allows recording to tracks that have been record enabled. This is necessary since SONAR allows for multi-track recording. This tells SONAR what track you want your new material recorded to. Otherwise, every track would be recorded to during every take.*

10. Click the **Input Echo** button ◉)) if you want to hear the input during recording. Many sound cards and audio interfaces have an option to do this automatically at the hardware level. If you can already hear the input signal, simply move on to the next section.Getting ready to record

At this point, we need to check the input levels to make sure they are sufficient and not distorting.

Perform as you would if you were recording and watch the meter on the track respond to the sounds you produce.

If the meter never even comes close to the maximum, increase the input level. If the meter even occasionally reaches the maximum, decrease the input level.Input levels are usually adjusted via a knob next to the input jack on the sound card, but features like this may vary slightly between devices. So, if you have never recorded an instrument or microphone with your sound card, you may want to read about doing so in the device's manual.The record meter shows the input level

Input may be too low   Input is too loud
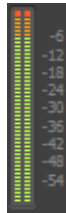
Recording your performance

Now that everything is set up, let's record something!Go to **Edit > Preferences > Project - Metronome** to access metronome settings. You can also right-click the **Playback Metronome on/off** button ▶ or **Record Metronome on/off** button ◉ in the Control Bar's Transport module to access metronome settings.

11. Set the metronome for a 2 measure count-in.

   • Click **Use Audio Metronome**, select the **Recording** check box and set **Record Count-in** to 2 Measures. For details about each metronome option, click **Help**.

12. Make sure the track has been record enabled by clicking the track's **Record Enable** button. The **Record Enable** button on the track should be lit in red like this: ⏺ .Click the **Record** button in the Control Bar's Transport module, or press R on your computer keyboard.You'll hear two

measures counted in by the metronome and then recording will begin. Start performing at the beginning of the third count.

13. When you finish recording, click the **Stop** button ■ or press the SPACEBAR.

A new audio clip appears.Press **Play** to play back the project. If you would like to redo the take, go to **Edit > Undo** to undo the previous recording, then repeat steps 3, 4 and 5 above until you get a perfect take.Now that your first track has been recorded, you can "over-dub" another part. To do so, disable recording on track 1 and repeat the steps in this tutorial. After repeating the steps, you will have recorded to track 2. Both recorded tracks will play during playback. Each will also have its own exclusive volume and pan control, effects bin, and can be muted or soloed. You'll learn more about this in future tutorials.

See:

Troubleshooting

If you weren't able to record successfully by following this tutorial, please check the following:

I only get one side of my guitar or microphone recorded

You may be recording a mono signal through a stereo input. Guitars and microphones produce mono signals. Click the tracks Input control and select the appropriate side of your stereo pair, either left or right as opposed to stereo.

Also, make sure you don't have a mono adapter going into the Line-in and that you have the Left side of your sound card (mono) chosen for input in SONAR.

Previously recorded tracks are mixed into my new recordings

This can happen when your soundcard is set to record everything that comes out of your computer speakers.

1. Open the Windows Volume Control window:

- • Windows 7: Click the Windows **Start** button and go to **Control Panel > Hardware and Sound > Volume Control**.

The Volume Control window appears.

2. On the **Options** menu, click **Properties**.The **Properties** dialog box appears.

3. In the A**djust Volume For** section, click **Recording**.

4. Click **OK** to close the **Properties** dialog box.

The Record Mixer appears.

5. Make sure **What You Hear** or **Stereo Mix** (exact name various depending on the sound card manufacturer) is not selected. If this option is enabled, click the **Select** check box below the desired input (normally **Line In** or **Mic**).

This problem can also occur when you are using an analog mixer in your setup. Carefully follow all of your signal paths to ensure that your sound cards audio output is not being looped back into itself.

You should also consider the possibility of your microphone picking up the signal from your speakers or headphones.

Only a flat line or silence is recorded

Open the Windows Volume Control window:

- Windows 7: Click the Windows **Start** button and go to **Control Panel > Hardware and Sound > Manage audio devices**.

The Windows Mixer controls the volume levels of your sound card inputs and can also mute any input or output device.

The Windows Mixer looks like this:
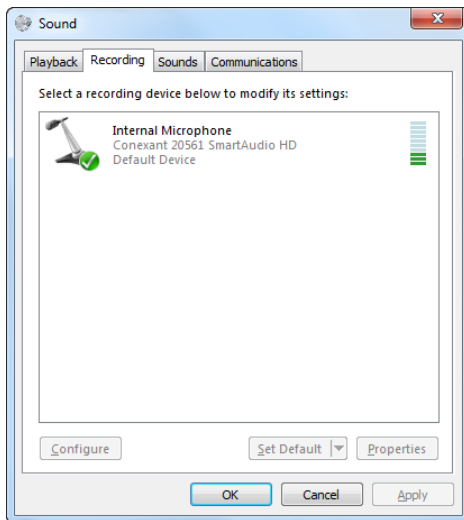
When you open the Windows Mixer it may be labeled **Playback** or **Recording**. We want to see the recording controls.

Tutorial 4 – Playing and recording software instruments

Software instruments, also referred to as *soft synths*, are a major part of computer music. Our goal in this tutorial is to add a software instrument to a project. We'll explore a few different ways they can be used with SONAR and look at some options to make the most of them.

A brief history

Note: *Feel free to skip to the next section if you want to start using synths right away.*

For our purposes, a synth has two basic functions:

- Receive a digital message
- Make a sound based on the information contained in that message

In the early 1980's, all of the major manufacturers of keyboards and drum machines got together to decide on a way for their products to work well with each other. Since they all operated under some version of the two functions listed above, it was a simple goal.They needed to standardize what messages were used to represent particular expressions. For example: if it was a drum machine, everyone would need to use the C note for the bass drum, the D note for the snare drum and so on. That way, messages sent from one drum machine can be fed to another made by a different company. It will play the same beat, but using the drum sounds from the different module.The standard they established is known as MIDI (usually pronounced [mid-ee]). As soon as computers entered the scene, it was clear that there should be a way to connect a synth and send MIDI messages to it from a software sequencer. That's how Cakewalk was born. Our first application was a DOS program that would allow a user to edit the MIDI data in detail, and play it out to a connected synth. You could also record the events from a performance into the computer.

Things have evolved a lot since then. As computers have grown more powerful, the capabilities of Cakewalk software have expanded. Computers are now so fast that software companies are able to make synths and drum machines that are completely software-based. They are essentially the guts of a keyboard in a computer program.

See:

Adding an instrument track to your project

Adding instrument tracks to your project is easy and something you'll find yourself doing often, so let's explore some of the basics. For this exercise, we'll start with a blank project.

1. On the **File** menu, click **New**.

2. Select the **Blank (no tracks or buses)** template and click **OK**.

   A new project opens.

3. Click **Insert >Soft-Synths**.

   A menu lists all available software synths that are installed on your computer.Click **DropZone**.

   The **Insert Soft Synth Options** dialog box appears.

4. Select the following options:

   • **Simple Instrument Track**

   • **Synth Property Page**

   • **Recall Assignable Controls**

   • **Ask This Every Time**

   A new track is inserted in your project. This track is a combination of the two types of tracks you have learned about in the previous tutorials. It holds MIDI data and accepts a MIDI input, but it outputs the sound of the synth, like an audio track would. The DropZone window may also open. If not, you can open it manually by double-clicking on the track icon.

A. Track header icon B. Track icon

> **Note:** *You can always launch a given software instrument's window by double-clicking its track icon.*

Let's take a quick look at DropZone.

One of the first things you'll typically need to do is choose a sound. In DropZone and most other Cakewalk synths, a sound preset is referred to as a *program*.

1. In DropZone's Program window, click **Empty Program**.

The Program Browser appears.

Note: *It may take a minute the first time the Program Browser opens. This is because DropZone is building a list of all available sounds. Once the list has been built, the Program Browser will open faster the next time.*

2. Select a program by double-clicking its name. For this tutorial we'll use **Acid Quinda** from the **Basses** section.DropZone loads the program and displays the program name.

3. Click the keyboard image to hear what the program sounds like.

Note: *Each soft synth uses a different method of choosing and auditioning sounds. This is often outlined in the synth's documentation. You can press the F1 key to open the online Help for a synth.*

Now that we have inserted an instrument and selected one of its sounds we can make use of these sounds in our project. This is where you can get creative. You have the option of recording a performance that you play on a MIDI keyboard (also referred to as a controller) or manually entering notes and events to play out to the software synth. We'll explore each method in the following sections.

See:

Recording MIDI

First, we'll try recording. This only works if you have a MIDI controller. If you do not have a MIDI controller, skip ahead to the next section of this tutorial.

For recording, you don't need the DropZone window open. You can close an instrument by clicking [X] in the upper right corner. This doesn't cause the synth to stop functioning—it will continue to work in the background.

Note: *If you need to see the DropZone window again, just double-click the track icon.*

In the Track view, we can assign the input port. If you only have one MIDI keyboard this should be set up already. Try playing some notes to see if it works. If not, go to **Edit > Preferences > MIDI - Devices** and make sure your keyboard is enabled in the **Input Port** list.

The next step is arming the track for recording. Click the track's **Record Enable** button [●]. This enables recording on the track.Now, click the **Record** button [●] in the Control Bar's Transport module. The Now Time cursor starts to roll. Play some notes and click the **Stop** button [■] when you're done.You have just recorded your first MIDI performance through a software instrument. Press the **Play** button [▶] to hear it play back.

See:

Manually entering MIDI notes

Using this method, you can manually draw notes on a grid called the Piano Roll view (often referred to as the *PRV*). This is the preferred method if you're not much of a keyboard player or don't have access to a MIDI controller. It allows you to edit every detail of a performance.

To get to the PRV, you first need to select the track you would like to see in it. Simply click the track icon once so that it changes color. Next, go to **Views > Piano Roll View** to open the PRV. The PRV opens in the MultiDock below the Track view. To expand the MultiDock, double-click the PRV tab in the MultiDock, or press SHIFT+D.
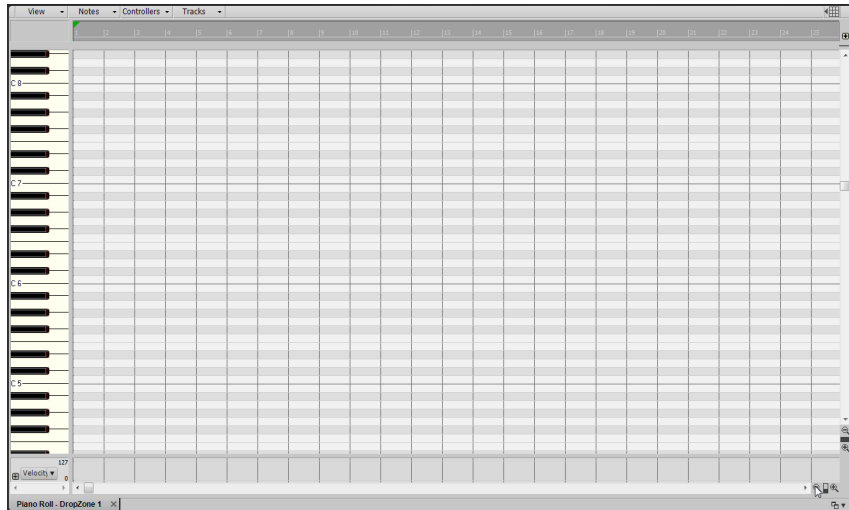
The ruler at the top of this view represents musical measures and beats. The keyboard image on the left represents what notes are being played.

Click on the Smart tool ★ in the Control Bar. You can also enable this tool by pressing the F5 key on your computer keyboard. To draw a note with the Smart tool, click on the grid.

To create a note, click on the grid at measure 1.
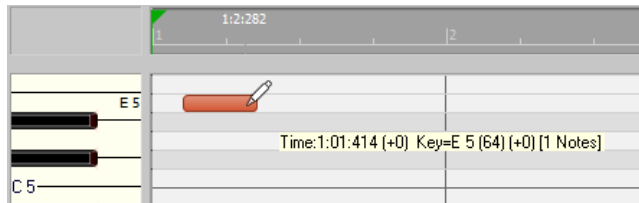
If you click on various sections of a note, the Smart tool performs a different function:

- **Left edge.** Adjusts the start time.
- **Right edge**. Adjusts the end time or the duration.
- **Top**. Adjusts the velocity of the note, which indicates how hard the note is played.
- **Bottom**. Allows you to move the note to another location on the PRV grid.

Try to create a melody using this technique. You might find that you can only create 16th notes or longer. If you want 32nd notes or triplets, specify the desired Musical Time resolution in the Control Bar's Snap module.The Snap module contains the following settings.

Figure 20. *The Snap module.*

You can now draw notes at shorter distances from each other.

To specify the duration of new notes, select the desired duration in the Control Bar's Tools module.

Figure 21. *The Tools module.*

What if I already have a project that contains MIDI tracks?

If you already have a MIDI track that you would like to play through a software instrument, the steps are a bit different.

Let's start by opening a sample project.

1. On the **File** menu, click **Open**.

2. Navigate to `C:/Cakewalk Content/SONAR X2/Tutorial Projects`.

3. Click on the file named `Latin.cwp` and click **OK**.

If you press **Play**, you are not likely to hear anything. That's because this project does not contain a software synth for the MIDI tracks to play through. Since there are 11 tracks in this project, it would be best to use one synth track and route them all to the same instrument. Some instruments, such as the Cakewalk TTS-1 can output more than one type of sound. These instruments are known as *multi-timbral* synths. They know what notes are played through each sound based on the MIDI channel they are sent over. If you examine each track in this project in the Track Inspector or Console view, you'll notice that each one is set to its own channel. No two tracks share the same channel.

Let's insert the Cakewalk TTS-1.

1. Go to **Insert > Soft Synths > Cakewalk TTS-1**.

    The **Insert Synth Options** dialog box appears.

2. In the **Create These Tracks** area, click **First Synth Audio Output**.

3. In the **Open These Windows** area, click **Synth Property Page**.

Note: *If you would like a detailed explanation of each option, click **Help**.*

4. Click **OK**.

A new synth track is inserted in your project.

On some computers, the tracks may play back through the TTS-1 at this point. However, on computers that have hardware MIDI outputs available, you may need to specify the TTS-1 as each track's output. Here's a fast way to do that:

1. Hold down the CTRL key and click each track to select them.

The tracks are highlighted to indicate they are selected.

2. Hold down the CTRL key and click any selected track's Input control and select **Cakewalk TTS-1**.

All selected tracks are assigned to the same input.

Press **Play** to play back the project. If you'd like to add your own track to play through the TTS-1, click **Insert** menu and select **MIDI Track**. On your new MIDI track, set the output to **Cakewalk TTS-1**. Remember, it needs to be on its own discreet MIDI channel. In this project, MIDI channels 1-11 are already used, so let's assign this track to channel 12 in the Track Inspector or Console view. You can also select the sound via the track's Patch control. Then use one of the methods described above to create MIDI data. You can also add MIDI data to your new track from the Browser. See Tutorial 2 for details about the Browser. Another option is using the Staff view as an alternative to the Piano Roll view. That will be covered in the next tutorial: Tutorial 5 - Working with music notation.

Tutorial 4 – Playing and recording software instruments

Tutorial 5 – Working with music notation

A great way to compose in SONAR is by using the Staff view. The Staff pane displays MIDI note events as musical notation. For some musicians, this may be the most familiar and comfortable view in which to work. The Staff pane provides many features that make it easy for you to compose, edit, and print music. You can add notes to your composition with simple point-and-click techniques.

This tutorial will introduce you to the tools and features that SONAR provides for working with notation.

Let's start by opening the Staff view in a new project:

1. On the **File** menu, click **New**.

    The **New Project File** dialog box appears.

2. Select the **Normal** template, specify a project name and save location, then click **OK**.

    SONAR loads the new project, which contains two audio tracks and two MIDI tracks.

3. Click on track 3 labeled **MIDI 1**.

4. On the **Views** menu, click **Staff View**.

    The Staff view opens.
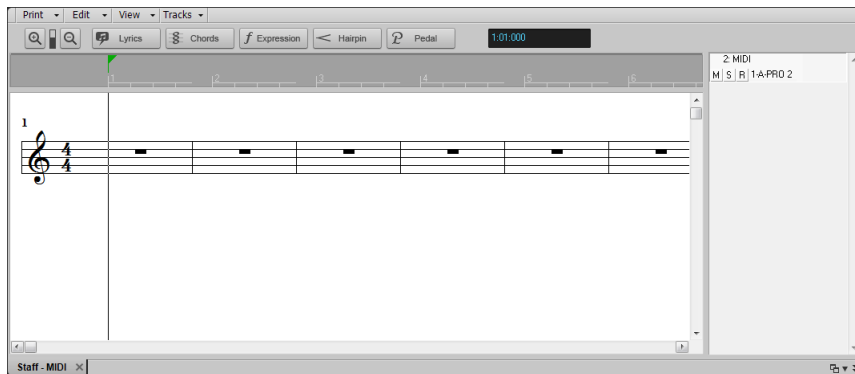
Next we need to configure the Staff view tools for the purpose of this tutorial:

1. Click the Staff view **View** menu, point to **Display Resolution** and select the smallest note value on the submenu.

2. Click the Staff view **Edit** menu and disable the **Fill Durations** and **Trim Durations** options.

3. Select the Smart tool [★] in the Control Bar.

For this tutorial, we will also change the time signature to ¾, the key to G and the staff layout to display a treble and bass clef.

1. On the **Project** menu, click **Insert Meter/Key Change**.

   The **Meter/Key Signature** dialog box appears.

2. Change **Beats per Measure** to **3** and **Key Signature** to **1 Sharp (G**), then click **OK** to close the **Meter/Key Signature** dialog box.
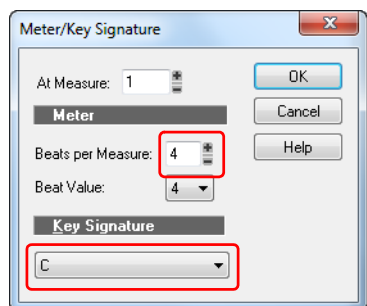
3. Click the Staff view **Edit** menu and choose **Layout**.

   The **Staff View Layout** dialog box appears.
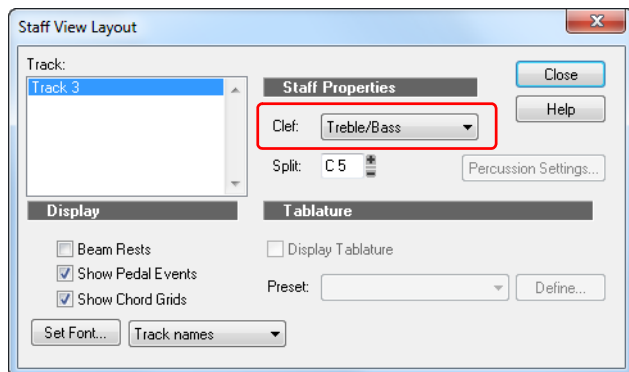
4. In the **Clef** list, select **Treble/Bass**, then click **OK** to close the **Staff View Layout** dialog box.

The Staff view now looks like this:
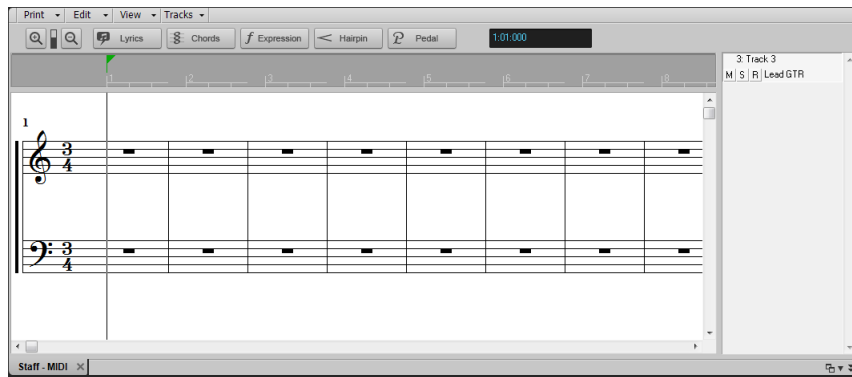
Now that you know how to set up the Staff view, it's time to play! You can either record a MIDI track in this project or manually add notes. The rest of this tutorial will provide you with a basic overview of the notation tools. For more in depth information about all the features and functionality of the Staff view, including using the Fretboard and the Lyrics view, see "Notation and lyrics" on page 1071.Selecting the note value

In the Control Bar's Tools module, click the Duration button and select the desired note duration.

Figure 22. *The Tools module.*

Adding a note

To add a note:

1. Select the Smart tool ⭐ or Freehand tool ✏ in the Control Bar.

2. Do *one* of the following:

   • With the Smart tool ⭐, drag where you want to draw a new note.

   • With the Freehand tool ✏, click where you want to insert a new note

   A note event is inserted.

Selecting notes

To select notes:

1. Select the Smart tool ⭐ or Select tool ▸ in the Control Bar.
2. Do *one* of the following:
   - To select a single note, click the note head.
   - To select multiple adjacent notes, drag with the right mouse button to draw a rectangle around the desired notes.
   - To select discontiguous notes, hold down the CTRL key and click the desired notes.

Moving notes by time or pitch

To move notes:

1. Select the Smart tool ⭐ or Move tool ✛ in the Control Bar.
2. Do *one* of the following:

   - With the Smart tool ⭐, position the pointer over the bottom half center of the note, then drag the note to the desired location.

   - With the Move tool ✛, drag the note or selection to the desired location.

💡 **Tip:** *When moving a note, hold down the SHIFT key to constrain vertical or horizontal movement, depending on the direction you first move.*

Copying notes

To copy notes:

1. Press and hold the CTRL key down while you click the desired note(s).
2. While still holding the CTRL key and the left mouse button, drag the note(s) to the desired location, then release the mouse button.

   The note(s) is copied.

Changing the duration of a note

1. Right click the note head to open the **Note Properties** dialog box.

2. In the **Duration** field, enter in the number of ticks you want for the note, then click **OK** to close the **Note Properties** dialog box.
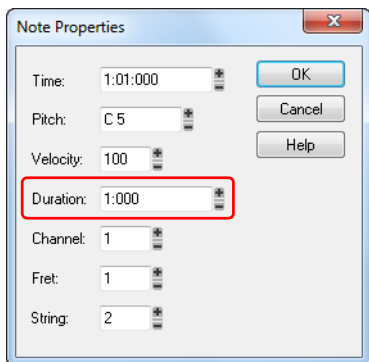
3. Select the Smart tool ⬚ or the Edit tool ⬚ in the Control Bar.

4. Do *one* of the following:

    *   With the Edit tool ⬚, position the pointer over the note's start or end point, then drag left/right to adjust the start/end position.

    *   With the Smart tool ⬚, position the pointer over the note's start or end point, then drag left/right to adjust the start/end position. You can also double-click the note to open the **Note Properties** dialog box, then enter in the number of ticks you want for the note duration.

The following table shows the relationship between note durations and ticks (with the default timebase of 960 ticks per quarter note).
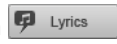
Note	Duration in ticks
Whole	4:000
Half	2:000
Quarter	1:000
Eighth	480
Sixteenth	240
Thirty-second	120

Deleting a note

1. Select the Smart tool or the Erase tool in the Control Bar.

2. Do *one* of the following:

   - With the Smart tool , right-click a note to erase a single note, or keep the right mouse button pressed and drag over notes to erase multiple notes.

   - With the Erase tool , click a note to erase a single note, or drag over notes to erase multiple notes.

Adding lyrics

To add a lyric event below a note:
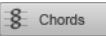
1. Select the Freehand tool in the Control Bar.

2. Click the **Lyric** button in the Staff view.

3. Position the pointer just below the note and click.

   A box appears where lyrics can be typed.

4. Press the space bar to quickly jump to the next note.

Adding chord symbols

To add a chord symbol above a note:

1. Select the Freehand tool in the Control Bar.
2. Click the **Chord** button in the Staff view.
3. Position the pointer above the note you want to add the chord to and click.

   A chord symbol is added above the note.
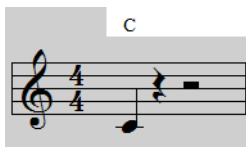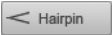
4. To change the chord properties or show a guitar chord grid, right-click the chord name.

   The **Chord Properties** dialog box appears.

Adding expressions

1. Select the Freehand tool in the Control Bar.
2. Click the **Expression** button in the Staff view.
3. Position the pointer just below a note and click.

   A box appears where expressions can be entered.
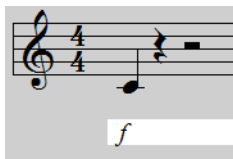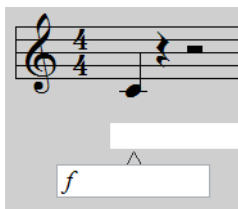
Adding a crescendo or decrescendo/diminuendo

1. Select the Freehand tool in the Control Bar.

2. Click the **Hairpin** button in the Staff view.

3. Position the pointer just below a note and click.

    A hairpin event (crescendo or decrescendo) is inserted.

4. To change the hairpin type and duration, right-click the hairpin event.

    The **Hairpin Properties** dialog box appears.

    Note: *Hairpin events are ornamental only and do not affect playback.*

Adding pedal marks

1. Select the Freehand tool in the Control Bar.

2. Click the **Pedal** button in the Staff view.

3. Position the pointer below the staff and click.

    Pedal down and Pedal up marks are inserted.
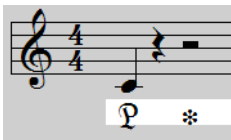
4. Click and drag to move the marks to a new time if needed.

See:

Printing your notation

Once you are finished entering and editing notes you can print out the score or individual parts.

1. Select the MIDI track or tracks you want to print the notation for.

2. On the **Views** menu, click **Staff View**.

The Staff view opens.

3. On the **File** menu, click **Print Preview**.

The Print Preview window opens, allowing you to see how the printed score will look.

4. To change the rastral size of the score, click **Configure**.

The **Staff View Print Configure** dialog box appears. For more information about the different rastral sizes, see "Printing" on page 1106.

5. To print the score, click **Print**.

Tip: *To change the title, composer and copyright information, select **Project > Info** to open the File Info window.*

See:

"Notation and lyrics" on page 1071

Tutorial 5 – Working with music notation

Tutorial 6 – Editing your music

While working on your music, you are likely to find that editing is a major part of the song creation process. Before people started making music on computers, all of the editing was done by cutting tape with a razor blade and piecing it together. You can imagine how difficult it could become. In SONAR, you can actually select a part of your music with the mouse and delete/copy/paste/move it all very easily. This tutorial will introduce some of SONAR's tools for making some common edits and offer a few tips to make it faster and more fun.

See:

Undo and Redo

While editing a project, you might make mistakes or experiment with an idea that doesn't produce the desired results. SONAR has unlimited Undo for such occasions. You can undo one step at a time by selecting **Edit > Undo** or by pressing CTRL+Z. You can also look at your edit history and select a time to go back to. To do so, go to **Edit > History**, choose the edit you'd like to return to and click **OK**.

> **Note:** *When you close a project, the Undo history is erased.*

If you change your mind and want to revert to the previous undo state, select **Edit > Redo** or press CTRL+SHIFT+Z.

See:

Selection

Let's start by opening the tutorial project `Cakewalk Audio Demo.cwb` that we used in earlier tutorials.

One of the most important things to understand in order to edit your music successfully is *selection*. Once you become familiar with selecting, the rest is easy. There are two aspects of selection:

- Time Range
- Tracks

Let's say you'd like to delete the second measure of a certain track. The time range specifies that the edit will need to occur between measures 2 and 3. The track selection specifies what track's clips will be deleted, while leaving its surrounding tracks unchanged.

In order to edit clips, you must set the track's Edit Filter control to **Clips**.

Figure 23. *Assign the track's Edit Filter to Clips in order to edit clips with the global tools.*
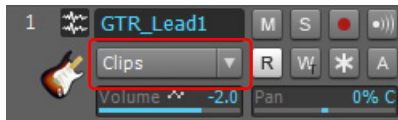
Let's explore some different ways to do this in a sample project. All of the tools described are available in the Tools module in the Control Bar. For a complete description of each tool in the Tools module, see "Tools" on page 407.

Figure 24. *The Tools module.*

> **Note:** *If you would like to try both of the following methods, select **Edit > Undo** after completing the first method. Doing so will revert the project to its previous state.*

Method 1:

1. Select the track that you want to delete measure two from. For this tutorial, let's use the track named **GTR_Lead 1**.

> **Tip:** *Click in the Tracks pane on the left, not the Clips pane on the right.*

2. Drag in the time ruler from measure 1 through measure 6.

The selected time range is highlighted.

3. Press DELETE or select **Edit > Delete**.

Measure two is deleted from the selected track.

Method 2:

1. Select the Select tool in the Control Bar.

2. Click in the center of the clip and drag to select the section you want to delete.

The selected section is highlighted.
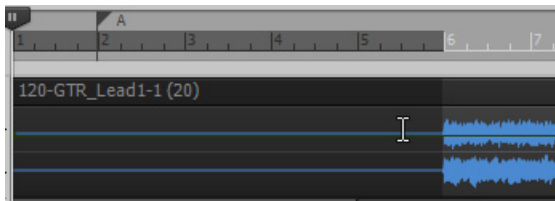
3. Press DELETE or select **Edit > Delete**.

You might have noticed that you're only able to select full measures. What if you need to edit a smaller amount of time? You'll need to turn off Snap To Grid. To do so, click the **Snap to Grid** button in the Control Bar's Snap module. With this button disabled, you will be able to make finer selections. You can also choose different Snap To Grid options in the Snap module.

See:

Moving clips

1. Another common editing task is to move a selected part of a clip, or an entire clip around in a project. If you understand selection, you're half way there. Let's undo the previous edit (go to **Edit > Undo** or press CTRL+Z), and turn on Snap to Grid. If you changed the snap resolution, make sure you change it back to Whole Note. Select the section you want to move. Let's go back to the track named **GR_Lead 1** and select measures 6 through 10.

2. With the Smart tool selected, click the top part of the selection and drag the clip to the desired location. For this tutorial, let's drag the selection to the bottom of the project and create a new Audio track that contains the selected clip.
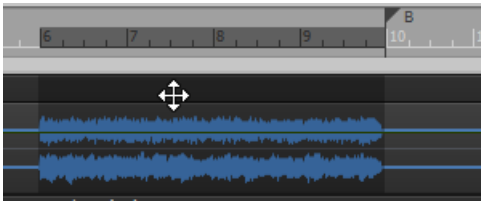
The **Drag and Drop Options** dialog box appears, which lets you specify what to do with any existing data in the target location. You can either replace the existing data or blend the old and new data.

See:

Splitting clips

In some cases, you might want to split a clip. As described later in this tutorial, it can be beneficial to

have clip borders at different points on a track. You can split a clip with the Smart tool or Split

tool .

To split a clip, do one of the following:

• With the Smart tool , position the pointer where you want to split the clip, then hold down ALT and click (or lasso to split a region).

• With the Split tool , position the pointer where you want to split the clip, then click (or drag to split one or more clips at the mousedown and mouseup points).

Note: *The Split tool obeys the Snap to Grid settings. If a split does not occur exactly where you click, disable Snap to Grid and try again.*

Tip: *You can also press the S key to split the selected clip(s) at the current Now time.*

For this tutorial, select the Split tool , position the Now time at measure 10 in the track named **GTR_Lead1**, then click to split the clip.

See:

Cropping clips

You can crop a clip by using a gesture called slip editing. Slip editing lets you "roll out" the beginning or the end of a clip to different places without changing the position of the music. Imagine that the clips are "windows" that allow you to see and hear pieces of audio or MIDI. You can change the size of that window so that less of the data is visible. If it's not visible, it won't be heard during playback. The data still exists, so you can enlarge the "window" by slip editing the clip. The visible data will then be audible.

Select the Smart tool or Edit tool in the Control Bar to use slip editing.

Now, if you point to the left or right clip edge, the cursor changes and you can drag the clip edge to a new location.
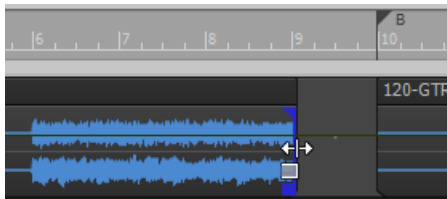
Fading clips

You can fade individual clips by using the Smart tool ![star icon] or Edit tool ![wrench icon]. Drag the upper left corner of a clip to create a fade-in. Drag the upper right corner of a clip to create a fade-out.
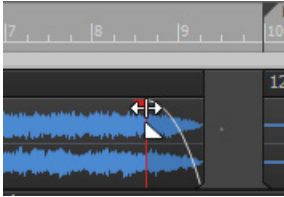
To change the fade characteristics, right-click an existing fade and select the desired fade type from the pop-up menu.
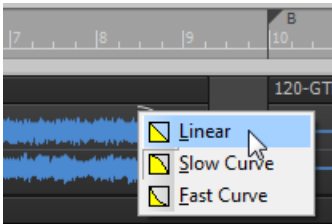
💡 **Tip:** *When cropping clips, you can choose to also move clip fades proportionally, or retain the original fade position. To move the fade position, click the top three quarters of the clip edge when cropping. To retain the clip fade position, click the bottom quarter of the clip edge when cropping. You can also hold down the ALT key while cropping in order to move a clip fade.*

This tutorial has shown you how to use different tools to shape your recordings into well-organized and great sounding projects. The next step is mixing, which is covered in .

See:

Tutorial 7 – Mixing and adding effects

Mixing is an important part of recording that can really help the music you create in SONAR sound its best. Mixing involves placing different instruments and sounds in layers of the frequency spectrum, adjusting levels so that tracks blend nicely, spreading them across the stereo field and adding effects where appropriate.

There are many important decisions to make when mixing, things that are sometimes not considered while writing a song. The choices you make can have a major effect on how pleasurable the listening experience is for your audience.

In this tutorial, we'll discuss some general guidelines. But, it's important to remember that there are no rules. This is another artistic stage of song creation.

We'll start by opening the **MixingTutorial** project:

1. Go to **File > Open** and select the file named `MixingTutorial.cwb`.

   Note: *Tutorial files are located in the* `/Cakewalk Content/SONAR X2/Tutorial Projects` *folder, by default. If you specified another location during installation, navigate to the tutorial folder you specified during installation.*

2. Go to **File > Save As** and save it under a new name. This way, you can save your work without overwriting the original, in case you'd like to start over.

In the same folder is a file named `MixingTutorial-Complete.cwb`, which is a copy of the same project, but after the tutorial has been completed. You can use this project as a reference to which you can compare settings and levels.

See:

Volume and pan

Adjusting volume and pan is always a good place to start when mixing. One of the biggest benefits of SONAR's Console view is that you can easily see the volume and pan controls for many tracks simultaneously, in addition to large meters. Some people also enjoy working in the Console view because it doesn't offer a graphical representation of what the music "looks like". Since the final outcome will be an audio file, the listener will not be distracted by the visual cues that are shown in the project's Track view. You may find that you are better able to focus on the actual sound when not seeing the clips.

To open the Console view

• Do *one* of the following:

  • Click **Views > Console View**.

  • Press ALT+2.

Here, we'll be shaping the song's foundation. If you listen to the project as it is, you'll probably notice that it sounds "muddy". This usually happens because all of the instruments are fighting each other for space in the frequency spectrum and stereo field. They're also all trying to be heard at the same level in the same location.

Normally, when recording a track, it is common to try to get a relatively loud signal. This is done to achieve the best level, knowing that you will eventually adjust the final levels during the mixing stage.

• Some people like to begin "mixing" by turning down every track and then gradually turning up one track at a time, starting with the rhythm section.Begin by increasing the volume of the bass drum to the desired level. Continue with the snare, the rest of the drums and finally the bass guitar, moving on in order of importance. If there was a lead vocal in the song, that would come last, so that it sits on top of the instrumental foundation you have established.

Other people approach mixing the opposite way, turning things down a bit one at a time. If one method doesn't seem more appealing than the other, try both to see which one is more comfortable for you.

⚠ **Important:** *Pay close attention to the master bus meter while mixing. You never want the meter to reach the very top, which will result in undesirable audible noise. This is called clipping.*
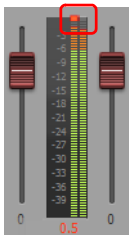
The next thing we'll try is panning. As with mixing in general, there are no rules when it comes to panning. Be creative, trying different ideas to see how they sound. One important thing to consider is that when you pan two tracks that share the same frequency range away from each other they will become clearer. This especially applies to instruments that have been double-tracked. Try it with the two tracks labeled **Cymbals Left** and **Cymbals Right**. Notice how you can hear more definition and detail in the two tracks as you pan them away from each other. When panning double-tracked instruments, try to avoid panning them all the way to the left or right. Doing so may cause the tracks to sound too "separated", which can take away from the fullness of the sound.

See:

Adding effects (FX)

At this point, you should have a basic mix. Everything is generally where you want it to be and it's time to use some audio effects to tweak it all to perfection. Effects placed directly on an audio track are called *inserts*.

Choose an audio track you would like to start with:

1. In the Console view, locate the effects bin for the track you'd like to work with. If you don't see the effects bin, click the Console view **Modules** menu and make sure **FX Bin** is selected.

2. Right-click the effects bin to open the pop-up menu.

3. Point to **Audio FX**, then point to **Cakewalk** or **Sonitus:fx** and choose any one of the available effects.

   The selected effect is inserted into the track's effects bin.Experiment with the controls on the plug-in while the music is playing back. You will hear noticeable changes to the sound.

4. Right-click on the effect in the effects bin and choose **Delete** to remove the effect.

Each of the effect plug-ins listed is designed to change the sound in some specific way. Here's a quick list of some of the included plug-ins and what they're typically used for:

Compressor/Gate.   This plug-in affects the loudness of the sound. It can limit how loud a sound can get. It can also limit how soft a sound can get before it's completely turned off.

EQ.   EQ can accentuate or turn down a certain frequency range in a sound. For example, if you have an unwanted high-pitched buzz on one of your tracks, an EQ may be able to turn that high frequency down without affecting the sound of the instrument.

Reverb.   Reverb creates an artificial space. It produces echoes that are similar to the natural echoes that happen when a sound bounces off the walls in a room.

Delay.   Delay plug-ins have the ability to create an echo. However, it's typically more distinct than that of a reverb. It makes a sound repeat, often in a rhythmic, musical manner.

These are the effects we'll be focusing on in this tutorial. However, other effects are available and you should experiment with each one to discover how they can be used in your mixes. To get online Help for a particular plug-in, simply click one of its controls and press the F1 key on your computer keyboard.

Compression

While adjusting track levels in a song, you might notice that some tracks are too dynamic. Sometimes they're too loud, other times too soft. In most modern music, the important elements in a mix are focused in a specific volume range. This is done with a *compressor*.

The purpose of a compressor is to limit the dynamic range of music or sound. Compression will make the loud parts of the signal quieter, resulting in a more or less even level. That even level can then be increased to fit more specifically in the mix.

Many compressors have an option to allow that loud peak to remain untouched for a certain time, which can add some "punch".

Let's try it on the bass drum:

1. Add the Compressor plug-in to the track labeled **Kick**.

2. Adjust the Threshold. The Threshold value represents the dB level at which compression starts to take place.

3. Adjust Attack. The Attack value represents the time the compressor takes to respond to an increase in the input audio's level once the threshold level has been reached.

4. Adjust the level to the desired output volume.

This approach can be applied to any track you like. It's especially useful when trying to get vocals to stand out in a mix.

Equalization

Each audio track has a dedicated, built-in equalizer (EQ). It is located just above the effects bin in both the Inspector and in the Console View.

Figure 25. *ProChannel EQ module (Producer only).*

A. Equalizer graph

Figure 26. *Per-track EQ (Studio and Essential).*

A. EQ plot

One of the primary uses for EQ is to prevent different instruments from stepping on each other in the frequency spectrum. One instrument might be intended for a certain frequency range, but extends into another instrument's frequency range. This can easily happen with drums and bass. If you turn down the overlapping frequency range for one of the instruments, it will allow the other instrument to stand out better in the mix.

Let's give it a try:

1. Solo the tracks named **Tension Climbing** and **Chirppy Synth**.

2. Add the Sonitus:fx Equalizer plug-in to the **Tension Climbing** track.

    The Sonitus:fx Equalizer interface appears.

3. Grab one of the numbered nodes and drag it around. Boost the selected band until you find the frequency range that interferes with **Chirppy Synth**. When you find it, turn down the selected band by dragging the node downward.

Tip: *Try to cut the band around 1kHz.*

Experiment with the other controls on the EQ to get the best possible results. As with the compressor plug-in, this approach can be applied to any track you like.

Reverb and Delay

Next, we'll add some space to the song. This is done by using time-based effects.

The first thing we'll do is add a delay effect. A delay effect can really enhance an instrument. In our tutorial project, we will add the Delay effect to the track name **Chirppy Synth**, which sounds very dry and lifeless. Applying a delay might give it more depth.

1. Add the Delay plug-in to **Chirppy Synth**.
2. Configure the controls as follows:
    • Tempo Sync = Host
    • Factor = 1/2 (set for both Left & Right channels)

This is a good starting point. Sometimes the best way to familiarize yourself with a new effect plug-in is to dig in and start tweaking.Next, we'll apply some reverb to the project. Think of a reverb effect as an artificial room. We could add a separate reverb to each track, but when multiple reverbs are running at the same time it can sound "cloudy". This might be because our ears are used to hearing sounds bounce of walls naturally. A reverb on each track would sound like you have one instrument in one room, another instrument in another room, and so on.

Instead, we will add a single reverb effect to a bus, then send each track to that bus, at varying levels.This is where SONAR's advanced mixing environment offers a lot of flexibility. We will add a control to each track, which adjusts how loud a copy of the track's sound is sent to the bus. This will sound more natural since it's similar to the behavior of an actual acoustic space. All of the different sounds can interact with each other in the "virtual room" we're creating with the reverb.

> **Note:** *If you are unfamiliar with the term "bus" see*

Follow these steps to create your reverb send from the Console view:

1. We want to add this send to all tracks, so go to **Edit > Select > All** to select all tracks.
2. Right-click on one of your tracks in the Sends section of the strip and choose **Insert Send Assistant.** If you don't see the Sends section in your Console view, click the Console view **Modules** menu and make sure **Sends/Bank/Patch** is selected.

    The Insert Send Assistant appears.
3. Configure the Send Assistant as follows:
    • Click **New Bus**. This will create a new reverb bus instead of routing the tracks to an existing bus.
    • Select **Stereo**
    • In the **Name** box, type **Reverb**.
    • Click **Choose Effect** and select **Audio Effects > Sonitus:fx > Reverb**.
    • Make sure **Pre Fader** is not selected.
    • Select the **Show Effects Property Page** check box.
    • In the **Bus Output** list, select **Master**.
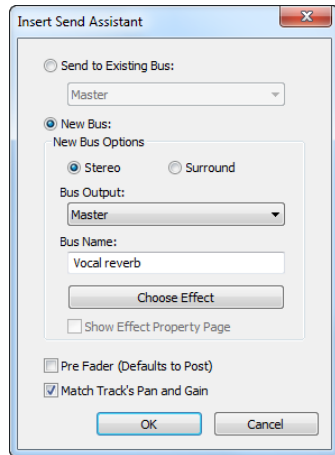
4. Click **OK**.

The Reverb property page appears.

5. Set the **Reverb** control to **0.0 dB** and the **Dry** control to **-Inf**.

Notice that a send control named Reverb has been added to each track. To enable or disable a send, click the **On/Off** button located on each track's **Send** control.

When a send is enabled, you will hear the reverb effect during playback. To adjust how much reverb is applied to each track, use the send's LEVEL control.

Enable the send control for each track that you want reverb on. You'll probably want at least a little reverb on every track except for the kick drum and the bass guitar.

See:

Using Automation

Another feature that is important to mixing is *automation*. Automation lets you record changes to almost any parameter in SONAR, including track parameters, effects, synths and buses. SONAR makes this very easy.

1. Click a track's **Write Automation** button [W] to enable automation writing for that track.

2. Press **Play** [▶] to start playback.

3. During playback, simply make the changes to the parameters in realtime, using either your mouse or a control surface.

4. To disable automation writing, stop playback and click the track's **Write Automation** button [W] again.

When you play back, the parameters will update automatically.

Automation allows you to make gradual or sudden changes to make your song more dynamic. For example, in the tutorial project, you might find that **Whiney Synth** should become lower in volume at measure 25, when the drums and bass change. Try it:

1. Click the **Write Automation** button [W] on the **Whiney Synth** track.

2. Click **Play** [▶] or press SPACEBAR to start playback.

3. At measure 25, turn the track volume down to the desired level.

4. At measure 33, turn the track volume back up.

5. Press **Stop** [■] to stop playback.

6. Disable **Write Automation** by clicking the ⬜W button again.

7. Press **Play** ▶ and notice how the track volume changes automatically.Repeat this process with any other automation you feel the project needs. For more information, see "Automation" on page 1001.

That concludes this tutorial. But don't stop here. Continue to experiment by adding different effects, adding loops through the Media Browser view, etc.

Be creative and listen closely to the mix details in your favorite songs and albums. It's sure to provide you with inspiration for your own projects. There are also many books available on the topic, as well as thousands of add-on plug-ins that can expand your arsenal of FX. For more information, visit www.cakewalk.com.

Tips: www.cakewalk.com/Support

Videos: www.cakewalk.com/CakeTV

Tutorial 7 – Mixing and adding effects

Tutorial 8 – Working with video

SONAR allows you to add music and sound to your videos. This tutorial will guide you through the basics of working with video inside SONAR. If you are new to SONAR, it is highly recommended you review "Tutorial 1 – Creating, playing, and saving projects" on page 101 before going any further.

See:

Importing video

Before you can start working with video, you first t File dialog box.

1. Select the **Normal** template, give your project a name and then click **OK**.

   If you are having trouble with this, please refer to "Tutorial 1 – Creating, playing, and saving projects" on page 101.

2. On the **File** menu, point to **Import** and select **Video**.

   The **Import Video** dialog box appears.
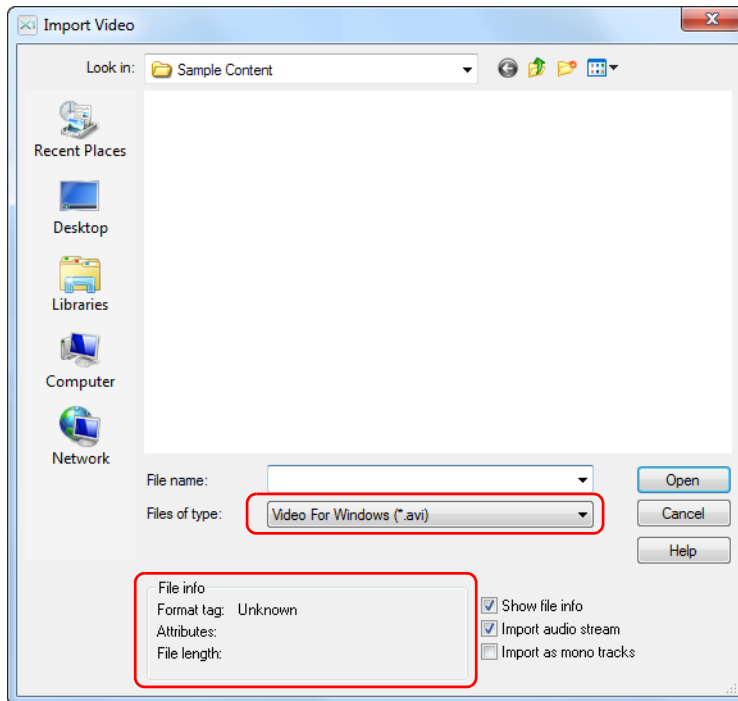
Let's explore some of the options in the **Import Video** dialog box.

The first thing you will notice is that this dialog box is very similar to the **Open** dialog box that was discussed in Tutorial 1. The **Import Video** dialog box functions in very much the same way with the exception of two sections.

First, outlined in the preceding image is the drop-down box **Files of type**. Making a selection here will determine which video formats are displayed in the dialog box. SONAR supports the following digital video formats:

- Windows Media (.wmv and .asf)

- Video For Windows (.avi)
- MPEG Video (.mpg)
- QuickTime Video (.mov)

The file we are interested in for this tutorial is a *Windows Media* file, so let's select **Windows Media (*.wmv, *.asf)** in the **Files of type** list.

Next, outlined in the above image you will see the **File info** area on the left and three options on the right. Let's review what each of these options do.

Option	What it does
Show file info	When selected, this tells SONAR to display video information about the selected file in the **File info** area of the dialog box.
Import Audio Stream	Select this option if you want to import the video file's embedded audio into a new audio track in SONAR.
Import as mono tracks	Select this option if you want to import the video file's embedded audio data as one or more mono tracks.

Table 9.

For now, let's leave the **Import Audio Stream** and **Show file info** check boxes selected.

Just as you would with the **Open** dialog box, navigate to the following location:`/Cakewalk Content/SONAR X2/Demo Projects/Video Tutorial`

Locate and import the file named `Boarding.wmv`. You can open it by either double-clicking on it or highlighting it and then clicking the **Open** button.

💡 **Tip:** *You can quickly get to the* `My Documents` *folder by clicking on its button along the left side of the Import Video dialog box.*

Notice that SONAR imported any audio that is a part of the video as well. If the video does not have any audio already associated with it, then SONAR will create a silent audio track like in our example.You should now see the *Boarding* video in the Video view as well as the Video Thumbnail pane in the Track view.

What if I don't see the Video Thumbnail pane or Video view?

To show or hide the Video Thumbnail pane, drag the splitter bar that separates the Video Thumbnail pane from the Clips pane.
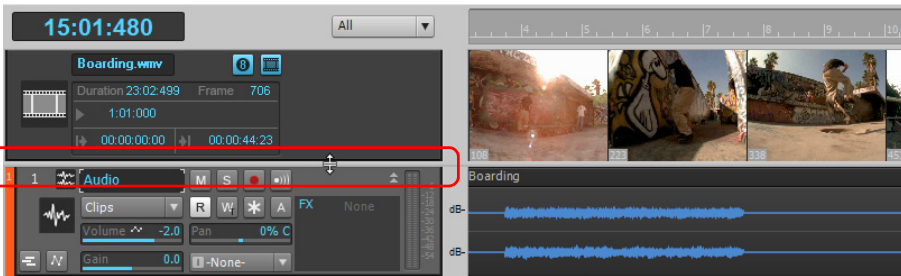
To restore the Video Thumbnail pane, point the mouse pointer over the splitter bar (the mouse pointer will look like ⇕), then drag the splitter bar down to restore and resize the Video Thumbnail pane to your liking. You can also press the V key to show or hide the Video Thumbnail pane.

If you closed the Video view, or if it did not open automatically when you imported the video, you can open it by selecting **Views > Video** or pressing ALT+SHIFT+2.

Changing the video properties

SONAR allows you to make some useful changes to a video's settings for film scoring purposes. To access these settings, simply right-click in the Video view and choose **Video Properties** from the pop-up menu to open the **Video Properties** dialog box.
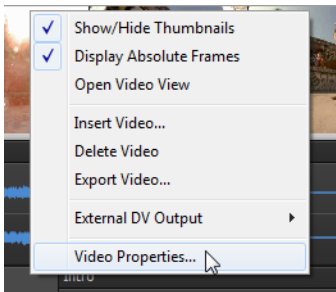
The **Video Properties** dialog box has three tabs: the **Video Settings** tab, the **Info** tab and the **Render Quality** tab. For detailed information about all of these options and settings, see "Video Properties dialog" on page 1770. For this tutorial, we are only going to look at the tools on the **Video Settings** tab.
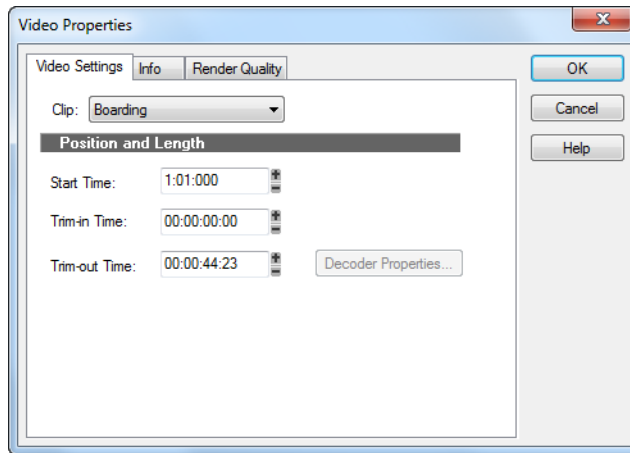
There are three options on this tab that are very important to understand and extremely helpful when working with video. Let's take a closer look at them.

Option	What it does
Start Time	The time in your SONAR project at which you want the video file to start playing.
Trim-in Time	The time in the video file at which you want video playback to start, this is useful if you don't want to see the opening credits or the first few scenes. This is expressed in SMPTE time code.
Trim-out Time	The time in the video file at which you want video playback to stop, this is also expressed in SMPTE time code.

Table 10.

Let's change the **Start Time** value to measure 2. To do this, enter the number 2 in the **Start Time** box.

Now, click the **RTZ** button ▮ in the transport and then click Play. Notice how the video doesn't start playing until measure 2 in your project.

See:

Working with markers

When syncing up audio events to film cues or video, it is common to use markers. Markers are a powerful feature in SONAR that helps to simplify the task of identifying major events in a song or video. They can be used to clarify where a verse or chorus begins in a rock tune or, in the case of film scoring, they can be used to identify hit points (points in the film where you want a musical event to synchronize with a visual event). Before we get started on this next exercise, return to the **Video Properties** dialog box and click the **Video Settings** tab. Set **Start Time** to **1:01:000**, **Trim-in Time** to **00:00:00:00** and **Trim-out Time** to **00:00:44:23**.

Let's say we want our music to start at the beginning of the video right when the sun comes out. This occurs about 4 seconds into the movie. Taking a closer look, this happens at 4 seconds and 10 frames into the clip, which, expressed in SMPTE time code, is 00:00:04:10.

There are several ways to add markers in SONAR:

• Place the *Now Time* at the location where you would like a marker, then select **Project > Insert Marker** or press M.

• Click the **Insert Marker** button in the Control Bar's Markers module.

• Click the **Add Marker** button in the Markers view.

Let's open the Markers view by selecting **Views > Markers**.
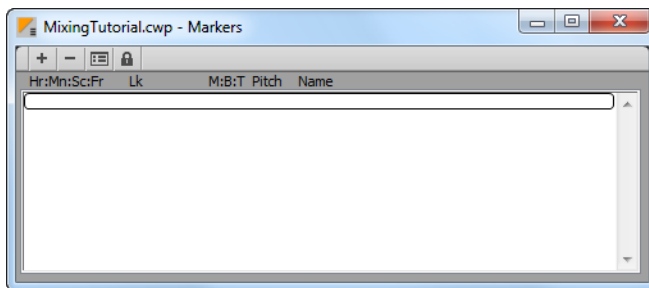
The Markers view is very handy when working with events in a film. The first thing we want to do is add a new marker to the project, indicating the start of the project. To do this, click the **Insert Markers** button ➕ to open the **Marker** dialog box.
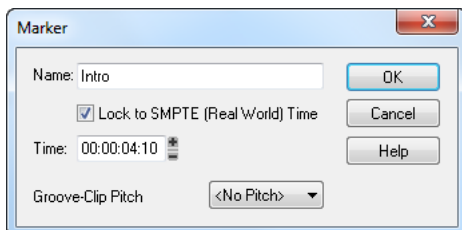
From this dialog box, you can do a lot of very important things. First, let's name this marker by typing **Intro** in the **Name** field.

Next, select the **Lock to SMPTE (Real World) Time** check box. This option is very important when working with video. If a marker is not locked to SMPTE time, its position in relation to events on the video will change with tempo and meter changes in the project.

You might also notice that the **Time** value changes to the SMPTE format after you selected the check box. This determines where the location of the marker will be. We know in the video that the sun comes out at about four seconds and ten frames into the video. Let's set the **Time** value to **00:00:04:10**.

Click **OK** to insert the marker and close the **Marker** dialog box. You can place as many markers as you need for a project to sync up all of your events.The Markers view will now display the marker you just created, with the name **Intro** assigned to it. The Marker view toolbar contains the following commands that apply to selected markers.

Control	Description
—	Click the **Delete Marker** button to delete the currently selected marker.
	Click the **Change Marker Properties** button to open the **Marker** dialog box for the selected marker. This is useful if you want to change the location of a marker.
🔒	Click the **Lock/Unlock Marker** button to lock or unlock the marker to SMTPE time.

Table 11.

Close the Markers view now and take a look at the time ruler in SONAR, which spans the top of the Clips pane in the Track view. You will notice there is now a flag named **Intro** indicating where your new marker is in the project.

See:
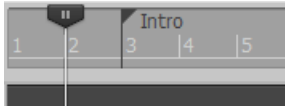
Exporting your video

Once you have finished with all of your music and have your video synced up as you would like it, you'll want to mix it down to a video file that you can share with the world.

1. Select everything in the project that you want to export. If you want to export the entire project, simply select **Edit > Select > All** or press CTRL+A. On the **File** menu, point to **Export** and click **Video**.

    The **Export Video** dialog box opens. You will notice this is very similar to both the **Save As** and **Export Audio** dialogs that were explored in *Tutorial 1* and *Tutorial 9*.
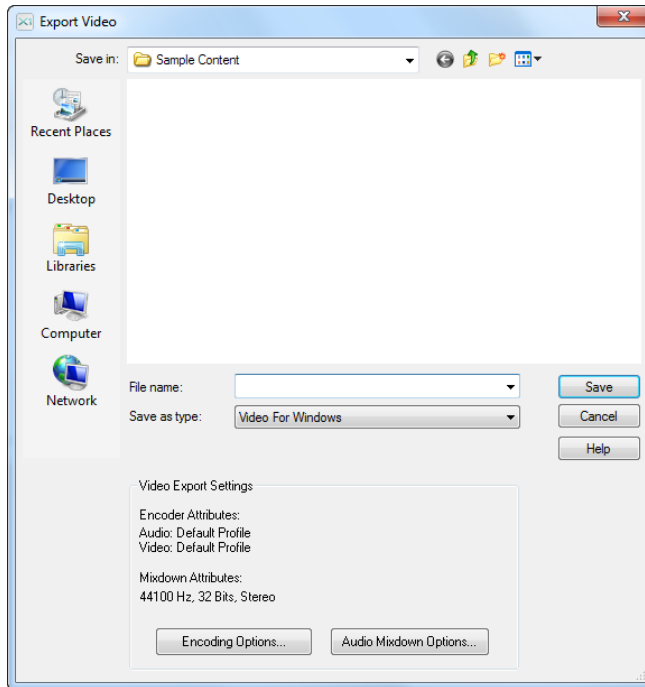
2. Similar to saving project files, you will first want to give your video a name by typing one into the **File name** field.

3. Choose the desired video format by selecting it from the **Save as type** list.

    Clicking the **Encoding Options** button at the bottom will allow you to explore some advanced settings for your video. From this dialog box, you will be able to change the quality and size of your video. This is particularly important if you plan to upload your video to the web. Some codecs work better than others and are more appropriate for different scenarios. Click the **Help** button in this dialog box for more specific details about different formats.

The **Audio Mixdown Options** button will bring up settings specific to the audio in your project. Click the **Help** button for detailed instructions on how to use these settings.

4. Specify the location you want to save the file to and click **Save** to export it.

Tutorial 8 – Working with video
Exporting your video

Tutorial 9 – Exporting, CD burning and sharing

Once your SONAR project is complete, you will want to share it with the world or burn a CD. SONAR offers many tools to help you do this. In this tutorial, we are going to explore some of the basics of these tools.

Before we get started, let's open one of the example audio projects included with SONAR. If you have your own project that already contains audio, you can load that instead. However, your screen will look different from the images in this tutorial.

1. On the **File** menu, click **Open**.

    The **Open** dialog box appears.

2. In the **Go to Folder** list, select **Template Files** and then open the **Tutorials** folder.

3. Browse to the project named SONAR_AudioDemo.cwb and click **Open** to load the project.

Note: *You may have to rename the file if you saved it with the same name during Tutorial 1.*

Now that you have opened the demo project (or your own audio project), click the **Play** button ▶ or press SPACEBAR listen to it. If you do not hear any audio, review the steps in Tutorial 1 to ensure SONAR and your audio device are configured correctly.

Cakewalk Project Files are different from the audio you hear on a CD in that they are often multi-track. In this example, you will notice that there are four audio tracks. In order to burn this mix to a CD or prepare it for distribution, we need to *export* or *mix* it down to a *stereo* track.

First, we need to click **File > Export > Audio**.

This will bring us to the **Export Audio** dialog box. This has many useful functions. Let's explore some of them in detail.
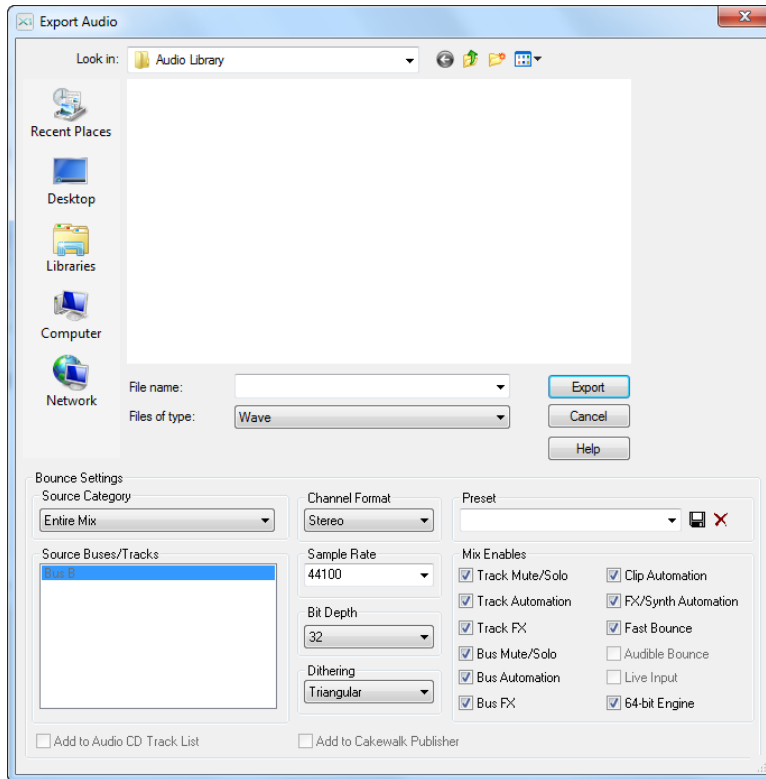
You should notice that the top half of this window is very similar to the **Open** and **Save** dialogs that were discussed in "Tutorial 1 – Creating, playing, and saving projects" on page 101. This is used to navigate to locations on your computer's hard drive and tell SONAR where you want to store the exported audio.

For this Tutorial, we are only going to explore some of the more common settings. If you would like to read about all of the options and settings click the **Help** button.

Control	Function
Channel Format	Specifies if the audio should be exported as stereo or mono.
Sample Rate	Allows you to set the sample rate of your export. 44100 Hz is used for CD quality audio.
Bit-Depth	Allows you to set the bit-depth of your export. 16-bit is used for CD quality and 24-bit is often used for DVD quality audio.
Add to Cakewalk Publisher	Select this option to send your file to Cakewalk Publisher, which is used to put your music on the Internet.

Table 12.

To burn an audio CD of your music

1. Click **File > Export > Audio** to open the **Export Audio** dialog box.
2. In the **Channel Format** list, select **Stereo**.
3. In the **Sample Rate** list, select **44100**.
4. In the **Bit-Depth** list, select **16**.
5. Enter a name for you mix in the **File name** box.
6. In the **File type** list, select **Wave**.
7. Specify where you want to save the file. Make note of this location, because you will need to use it later.
8. Click **Export**.

   A progress bar appears across the bottom of SONAR's screen while a CD quality audio file is exported. When the progress bar disappears, SONAR has finished exporting your project.

Now we need to burn our mix to a CD. SONAR features a powerful built-in CD burning application that can do this for us. Let's open Audio Creator LE and briefly explore its features and how to use it.

See:

Burning an audio CD

Select **Utilities > Burn Audio CD** to open the **Audio CD Burner** dialog box.
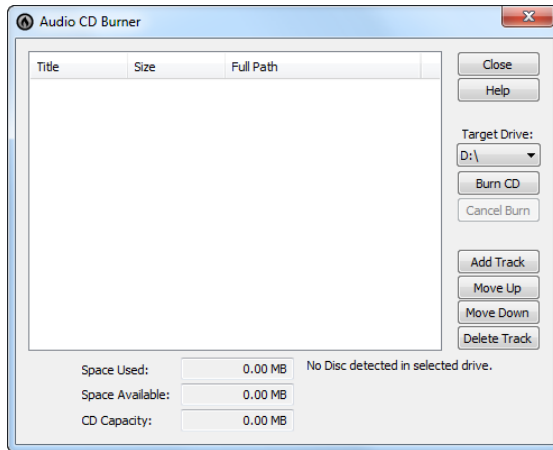
Simply browse to the audio files you want to burn and click the **Add Track** button. You can also drag audio files into the Burner track list.

Note: *Any files that are not in 16 bit, 44.1kHz wav files will automatically be converted to the proper CD format.*

Depending on the type of blank CD you are using, you can fit up to 80 minutes of audio on one CD. Make note of the **Space Available** and **Space Used** fields. These will let you know how many more tracks you can fit on your CD. For the best compatibility with most consumer CD players, you should use a CD-R disc. CD-RW discs, while compatible with some newer CD players, may not play back in all systems.

Once you have finished adding all the songs you would like to burn to a CD, the final step is to burn your disc. To do so, do the following:

1. Insert the writable CD into the CD-R drive.

    The drive containing the writable CD should automatically be detected. If for some reason it isn't detected, manually select the drive letter of your CD Burner from the **Target Drive** drop-down list.

2. Click **Burn CD**.

Cakewalk Publisher

SONAR includes *Cakewalk Publisher*, which is a powerful tool to share your music, artwork and playlists on the Internet. A detailed description of Publisher is beyond the scope of this tutorial, but let's take a quick look at its basic features and how it integrates with SONAR.

To open Publisher, select **Utilities > Publish to Web**.
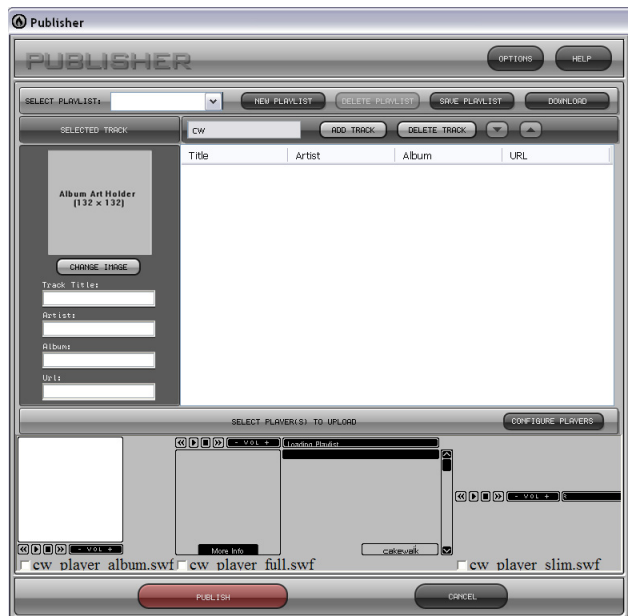
Notice that your recently exported project is already listed in the **Track** list. This is because you selected the **Add to Cakewalk Publisher** check box in the **Export Audio** dialog box.

The following table describes a few of the buttons in the publisher interface. If you would like to explore all of the features in Publisher, click the button labeled **HELP** in the upper right corner of the Publisher window.

Control	Function
CONFIGURE PLAYERS	Used to configure the player and generate the HTML code for pasting into your web site.
CHANGE IMAGE	Lets you associate an image with the selected track. This is useful if you want to include album artwork when you upload your music.
ADD TRACK	Adds new tracks to the current playlist.
DELETE TRACK	Deletes selected tracks from the current playlist.
PUBLISH	Once your player has been configured and your playlist is put together, click **Publish** to upload your files to the Internet.

Table 13.

Tutorial 9 – Exporting, CD burning and sharing | 173

If you want to share your music online

SONAR features a powerful upload utility powered by the online service SoundCloud.

See:

Uploading audio to SoundCloud

SONAR lets you easily mix down and upload the current project directly to SoundCloud, or you can choose to upload an existing audio file.

Cakewalk SoundCloud lets you upload one audio file at a time. Multiple audio files can be uploaded directly from the SoundCloud web site.

SONAR checks to see if there is an active Internet connection before attempting to export and upload files to SoundCloud.

Tip: *By default, Cakewalk SoundCloud lets you upload either a .wav file or an .mp3 file. If you want to upload a different audio format, first use the **File > Export > Audio** command to export to the desired format, then go to **Utilities > Share with SoundCloud** and select the exported file.*

To share the current project with SoundCloud

1. Select the audio track(s) you want to share with SoundCloud.
2. Go to **File > Export > Audio** to open the **Export Audio** dialog box.
3. In the **Files of type** list, select one of the following:
    *   **SoundCloud - CD Quality.**   Creates a 16-bit 44.1kHz .wav file.
    *   **SoundCloud - MP3.**   Creates a 256kBit/s .mp3 file.
    *   **SoundCloud - FLAC.**   FLAC is a royalty-free high quality lossless audio compression codec. Files compressed with FLAC can be 30-50% smaller than the original wav file and, unlike MP3, there is no loss of audio quality.
4. Under **Bounce Settings**, select the desired settings, such as channel format, sample rate and bit depth.
5. Enter a name in the **File name** box.
6. Click **Export**.
7. SONAR exports the selected audio to the specified format, then launches Cakewalk SoundCloud (see "The Cakewalk SoundCloud interface" on page 928). In Cakewalk SoundCloud, the **Title**, **Artwork** and **File Location** fields are pre-populated.
8. Specify the desired settings in Cakewalk SoundCloud. All tags are remembered so you don't have to re-enter the same information the next time you upload another song.
9. Click **Share**.

The **Share with SoundCloud** dialog box appears and shows a progress bar along with the name of the file that is being uploaded. To cancel the upload, click the **Cancel** button.

The **Upload Successful** dialog box appears when the file has been uploaded successfully. Click the displayed link to view the uploaded file on SoundCloud.com.

The **Upload Failed** dialog box appears if the upload is not successful. There are various reasons why an upload may have failed. For troubleshooting help, click the **Help** button or see "Troubleshooting" on page 937.

Note: *By default, Cakewalk SoundCloud lets you upload either a .wav file or an .mp3 file. If you want to upload a different audio format, first use the **File > Export > Audio** command to export to the desired format, then go to **Utilities > Share with SoundCloud** and select the exported file. SoundCloud supports the following file formats; WAV, MP3, MP3, OGG, FLAC, AIFF and AAC.*

To share existing audio files with SoundCloud

1. Go to **Utilities > Share with SoundCloud** to open Cakewalk SoundCloud.

2. Click the **Browse** button ... and select the audio file you want to upload. SoundCloud supports MP3, WAVE, FLAC, OGG, AIFF, MP2 and AAC files.

3. Specify the desired settings in Cakewalk SoundCloud.

4. Click **Share**.

   The **Share with SoundCloud** dialog box appears and shows a progress bar along with the name of the file that is being uploaded. To cancel the upload, click the **Cancel** button.

   The **Upload Successful** dialog box appears when the file has been uploaded successfully. Click the displayed link to view the uploaded file on SoundCloud.

   The **Upload Failed** dialog box appears if the upload is not successful. There are various reasons why an upload may have failed. For troubleshooting help, click the **Help** button or see "Troubleshooting" on page 937.

To share your music on Facebook and Twitter

When you upload a song to SoundCloud, you can choose to also send automatic "push" notifications to your linked Facebook and/or Twitter accounts. You must configure your Facebook and/or Twitter setting using the account management tools at SoundCloud.com first before being able to share on Facebook and/or Twitter.

To link your Facebook and/or Twitter account(s), click the corresponding **Setup** link in Cakewalk SoundCloud.

To include a short message with the push notification, enter text (up to 119 characters, no HTML) in the **Message** field. If this field is empty, the text in the **Description** field will accompany the song post.

To send push notifications to your Facebook account, select the **Share on Facebook** check box.

To send push notifications to your Twitter account, select the **Share on Twitter** check box.

Note: *You can not share a track on Facebook or Twitter if the track is private.*

Figure 27. *Cakewalk SoundCloud sharing options*
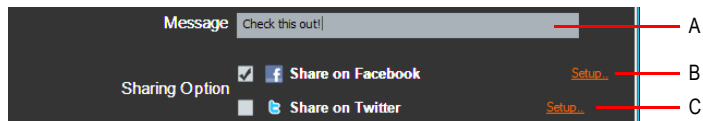
A. Message B. Share on Facebook (click Setup to configure) C. Share on Twitter (click Setup to configure)

Note: *If you have multiple Facebook and/or Twitter accounts that you would like to send push notifications to, you can link to multiple Facebook and Twitter accounts via the account management tools at SoundCloud.com.*

See:

Controlling playback

When you play your SONAR project, you have full control over the tempo or speed of playback, which tracks are played, which sound cards or other devices are used to produce the sound, and what the tracks sound like. You can access all of the playback functions from the Control Bar (see "Control Bar overview" on page 495).

SONAR's multi-MIDI enhancements give you the ability to play multiple synths or tracks from a single keyboard or controller, or let multiple performers play the same or different tracks. You have total control over MIDI echo (MIDI echo refers to where MIDI input signals are sent once SONAR receives them).

Note: *SONAR has a button called the **Audio Engine** button* *in the Control Bar's Transport module, which you click to stop any feedback you may experience if there is a loop somewhere in your mixer setup. Whenever you play a project, SONAR automatically enables the audio engine.*

See also:

The Now time and how to use it

Every project has a current time, known as the **"Now time"** on page 1916, which keeps track of where you are in a project. The Now time appears as a vertical line in the Track view and is displayed in the Transport module in the Control Bar (see "Transport module" on page 504).

Figure 28. *The Transport module in the Control Bar.*

A. Current Now time (click to cycle through the available display formats) *B. Position* *C. Meter*

The Transport module can show the Now time in several formats. Click the time display to toggle between the following time formats:

- **MBT.** Display time as Measure:Beat:Tick.
- **HMSF.** Display time as Hour:Minute:Second:Frame. This format is also referred to as SMPTE time.
- **Milliseconds.** Display time in milliseconds.
- **Samples.** Display time in samples.

The measure, beat, and tick number (MBT) identifies the Now time in musical time units. Ticks are subdivisions of quarter notes and indicate the timebase of the project. For more information about the timebase, see "Setting the MIDI timing resolution" on page 259.Here are some examples of times expressed in measure, beat, and tick (MBT) format:

Time	What it means
1:01:000	First beat of the first measure
9:04:000	Fourth beat of the ninth measure
4:02:060	The 60th tick of the second beat of the fourth measure

Table 14.

The hours-minutes-seconds-frames format is commonly referred to as the SMPTE time. SMPTE is the acronym for the Society of Motion Picture and Television Engineers. In this format, time is measured in hours, minutes, seconds, and frames. It's not necessary for a project to begin at time zero in this format—any time can be used to represent the start of a project. If you are synchronizing

SONAR with an external device whose start time is not 0, you must offset SONAR to match the external device's start time. For more information, see "Synchronizing your gear" on page 1153.

Here are some examples of times expressed in this format (assuming that zero is the start time):

Time	What it means
00:00:00:00	The beginning of the project
00:05:10:00	Five minutes and ten seconds from the beginning of the project
01:30:00:00	One hour and thirty minutes into the project
00:00:00:05	Five frames into the project

Table 15.

SONAR provides many ways to set the Now time. Here are just a few:

To change the Now time

• Click the desired time on the Time Ruler in the Track view, Piano Roll view, or Staff view.
• In the Navigator pane, click anywhere in the view while holding down the CTRL key to change the Now Time to that location.
• Drag the Position slider in the Transport module.
• Click the transport buttons in the Transport module.
• Click on an event in the Event List view.

You can also set the Now time by right-clicking in the Clips pane if you enable the **Right Click Sets Now** option in Track view **Options > Click Behavior** menu.

When entering a time in MBT format, the beat and tick values are optional. You can use a colon, space, decimal point, or vertical bar to separate the parts of the Now time:

You enter	The Now time is set to
2	2:01:000
4 2 0	4:02:000
9	9:01:000
5|1:30	5:01:030

Table 16.

When entering a time in SMPTE format, you can enter a single number (hour), two numbers (hour and minutes), three numbers (hour, minutes, and seconds), or all four numbers.

If you click in the Time Ruler while the snap grid is enabled, the Now time will be snapped to the nearest point in the grid. By setting the grid size to a whole note or quarter note, you can easily set the Now time to a measure or beat boundary.

Note: *The Time Ruler only obeys snap when **Musical Time** or **Absolute Time** is selected in the Control Bar's Snap module.*

When playback or recording is stopped, the Now Time either remains at the point where the project stopped or snaps back to the Now Time Marker. This behavior is specified with the Track view **Options > On stop, Rewind to Now Marker** command (or by pressing CTRL+W). For more information, see "The Now time marker" on page 180.

MIDI note will continue to play If Now time is moved

Changing the Now time while a MIDI note is sounding will cause SONAR to play the full duration of the note. This behavior was introduced in SONAR 4.0.3, and is necessary as a result of addressing various gapping issues when editing MIDI data during playback.

If you prefer a slight hiccup instead of hearing the full note duration, you can change the default behavior with the **Set Now Time with Full Restart** option in the Track view **Options** menu.

Note: *Moving a MIDI note event during playback is affected by this same issue.*

See:"Displaying the Now time in large print" on page 182

"Note that SONAR ignores font styles and effects such as strikeout and underline. Other ways to set the Now time" on page 182

The Now time marker

In the Track view, the Now time appears as a solid vertical line that follows playback. When you set the Now time in the Track view, the Now time marker appears in the Time Ruler. This marker represents the point at which the Now time will snap back to after you stop playback or recording.

Figure 29. *The Now Time marker*
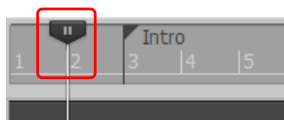
You can drag the Now Time marker during playback. When the mouse button is released, the transport immediately jumps to the new location.

Note: *You can only drag the Now Time marker during playback, not while recording.*

The Now Time marker changes appearance to indicate if playback is paused, running, or recording.

Figure 30.   *The Now Time marker indicates the playback state*
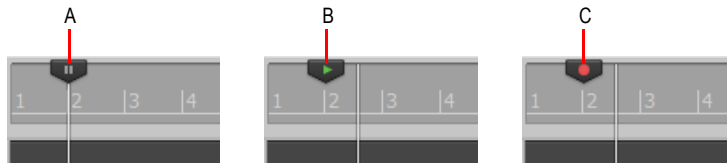
A. *Paused* **B.** *Playback* **C.** *Recording*

You can change the Now time marker behavior so that the marker moves to the current Now time when playback or recording is stopped (on the Track view **Options** menu, clear the **On Stop, Rewind to Now Marker** option or press CTRL+W).

To change the Now time marker behavior

On the Track view **Options** menu, clear the **On Stop, Rewind to Now Marker** option to have the Now time marker move to follow the current Now time when you stop playback.

Or

On the Track view **Options** menu, select the **On Stop, Rewind to Now Marker** option to have the Now time snap back to the Now time marker when you stop playback.

The Track view Now Time display

The Track view displays the Now Time above the track strips in a large and configurable format.

Figure 31.   *The Track view Now time display*
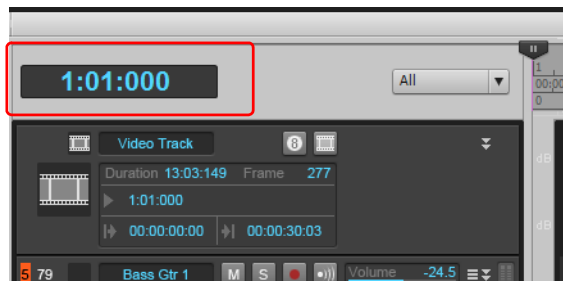
Click the display to display the following time formats:

- **M:B:T (Measure:Beat:Tick).**   Example: 8:01:000.
- **SMPTE (Hours:Minutes:Seconds:Frames).**   Example: 00:00:21:00.
- **Frames.**   Example: 629 (only available if project contains video).
- **Milliseconds (Hours:Minutes:Seconds:Milliseconds).**   Example: 00:00:21:000.
- **Samples.**   Example: 926100.

You can also right-click the display, and choose time formats from the pop-up menu.

The pop-up menu also lets you choose the following display options:

• To hide the time display, choose **None**.

• To show the time display, right-click the empty area and choose one of the available time formats from the pop-up menu.

The time display settings are global and persist between sessions.

Displaying the Now time in large print

SONAR can display the Now time in large print so that it's easier to see when you are far from your monitor (for example, when you're at your keyboard or another instrument) or when several people need to read the Now time from a distance. Here's how:

To display the Big Time view

1. Choose **Views > Big Time** to display the Big Time view.

Figure 32.   *The Big Time view*
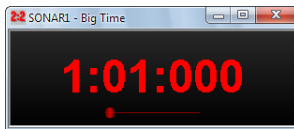
2. Change the settings according to the table:

To do this	Do this
Switch time format	Click on the view to toggle between MBT and SMPTE time
Change font or color	Right-click on the view, choose the font and color you want, and click **OK**
Change the size of the view	Drag any corner of the view to change its size

Table 17.

Note that SONAR ignores font styles and effects such as strikeout and underline. Other ways to set the Now time

There are a variety of commands and keyboard shortcuts you can use to set the Now time:

Shortcut	What it does
G	Lets you enter the Now time in the **Position** toolbar or in a dialog box
SHIFT+G	Sets the Now time to the From time (the start time of the current time selection)

Table 18.

Shortcut	What it does
CTRL+HOME	Sets the Now time to the beginning of the project
CTRL+END	Sets the Now time to the end of the project
CTRL+PAGE UP	Sets the Now time to the start of the current measure if the Now time is not on a barline, or to the start of the previous measure if the Now time is on a barline.
CTRL+PAGE DOWN	Sets the Now time to the start of the next measure

Table 18.

If your project has markers, you can use Markers module in the Control Bar to set the Now time:

To do this	Do this
Skip to the next marker	Click ▣ on the Markers module (or press CTRL+SHIFT+PAGE DOWN).
Skip to the previous marker	Click ▣ on the Markers module (or press CTRL+SHIFT+PAGE UP).
Jump to any marker	Click the drop-down menu on the Markers module and select the marker you want to jump to.

Table 19.

Figure 33. *The Markers module.*
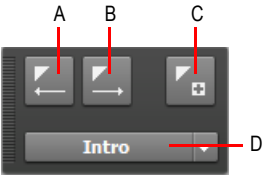
A. Jump to previous marker B. Jump to next marker C. Insert marker D. Current marker

For more information about markers, see "Creating and using markers" on page 357.

The Time ruler

The Time ruler appears in the Track view, Tempo view, Staff view and Piano Roll view. It has several functions, including:

- **Making a time selection.** The Time ruler follows the Snap to Grid settings, if enabled.
- **Changing the Now time**
- **Adding loop, punch, and pitch markers.** You can right-click in the Time ruler to add markers.
- **Zooming and scrolling.** Point the mouse pointer at the top half of the Clips pane or Piano Roll view time ruler until the mouse pointer looks like 🔍, then drag up/down to zoom horizontally, or left/right to scroll. For details, see "Zooming and scrolling in the time ruler" on page 88.

In the Track view and Piano Roll view, the Time ruler has the following time display options or formats:

- Measures, Beats and Ticks (M:B:T)
- Hours, Minutes, Seconds and Frames (H:M:S:F—also called SMPTE)
- Samples
- Milliseconds

Figure 34. *The Time ruler*
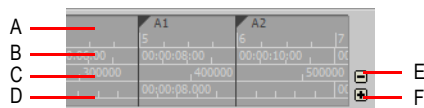
A. M:B:T B. H:M:S:F C. Samples D. Milliseconds E. Remove ruler F. Add ruler

The M:B:T setting follows your settings in the Meter/Key view. If you project is set to 4/4 time, you have four beats in the Time ruler for each measure. If your project is set to 6/8 time, you have six beats in the Time ruler for each measure.

> **Note:** *When **Smart Grid** is enabled in the Control Bar's Snap module, the M:B:T time rulers in the Clips pane and Piano Roll view are optimized to show relevant snap locations.*

If there is only one format displayed in the Time ruler, you can switch the format by right-clicking in the Time ruler and selecting the format you prefer.To switch the Time ruler format to M:B:T

1. Right-click in the Track view Time Ruler.
2. In the menu that appears, select **Time Ruler Format > M:B:T**.

The Now time and how to use it

To switch the Time ruler format to H:M:S:F (SMPTE)

1. Right-click in the Track view Time Ruler.

2. In the menu that appears, select **Time Ruler Format > H:M:S:F**.

To switch the Time ruler format to samples

1. Right-click in the Track view Time Ruler.

2. In the menu that appears, select **Time Ruler Format > Samples**.

To switch the Time ruler format to milliseconds

1. Right-click in the Track view Time Ruler.

2. In the menu that appears, select **Time Ruler Format > Milliseconds**.

Additionally, you can add or remove Time ruler formats using the **Plus**/**Minus** buttons located just outside the right edge of the Time ruler.

> **Note:** *If only one Time ruler format is being used, only the **Plus** button is displayed.*

To add or remove Time ruler formats using the Plus/Minus buttons

- Click the **Plus** button and select a Time ruler format from the pop-up menu.

- Click the **Plus** button and select a Time ruler format you would like to add from the pop-up menu.

- Click the **Minus** button and select from the pop-up menu to remove an active Time ruler format.

- Right-click in the Time ruler and move the cursor to Time ruler format in the pop-up menu. A list of all Time ruler formats appears. Active formats are checked, inactive formats are unchecked.

  - Click a checked format to move it down one row.

  - Click an unchecked format to replace the topmost displayed format.

> **Note:** *Selecting the **Display All Times as SMPTE** check box in **Edit > Preferences > Customization - Display** forces all times in the project to be displayed in SMPTE time, regardless of your setting in the Time ruler.*

See:

Controlling the transport

To control playback, you have your choice of tools, menu commands, and shortcut keys for most common operations.

When you start playback, the Now time updates continuously to show the current time. When you stop playback, the Now time rewinds to the Now Time Marker. When you start playback again, it continues from the same point.

If the Now time is advancing but you don't hear any sound, see "Troubleshooting" on page 1251. If you are using MIDI sync or syncing to MIDI time code, SONAR waits to receive external timing data before it begins playing. If the various views are not updating during playback, make sure the SCROLL LOCK key on your computer keyboard is not enabled. For more information, see "Synchronizing your gear" on page 1153.

Note: *If your Windows setup uses any system sounds that are associated with any typical activity, such as minimizing a window, etc., you should disable these sounds. They can sound extremely loud through your monitors, and also interrupt playback and recording, if you open any dialog boxes or do anything that has a system sound attached to it while a project plays. The quickest way to disable all system sounds is to open the Control Panel (**Start > Settings > Control Panel**), double-click the **Sounds** icon to open the **Sounds Properties** dialog box, and in the **Schemes** field select **No Sounds**. Click **Apply**, and then click **OK**.*

To start and stop playback

To do this	Do this
Start playback	Press the SPACEBAR key, click ▶ in the Transport module, or double-click the bottom half of the Time Ruler
Stop playback	Press the SPACEBAR key or click ■ in the Transport module
Rewind to the start of the project	Click ◄ in the Transport module, or press the W key
Skip to the end of the project	Click ► in the Transport module, or press SHIFT+G

Table 20.

Note: *The default behavior for the Now time when you click the **Stop** button is for it to return to the Now time marker where playback began. If you want the Now time to remain where it is when you stop playback, you can use the keyboard shortcut CTRL+SPACEBAR. If you want to change the default behavior, clear the **On Stop, Rewind to Now Marker** option on the Track view **Options** menu or press CTRL+W.*

To pause playback

- Click the **Pause** button [❚❚].

  Playback stops, but the Now Time cursor and the Now Time marker do not move.

To resume playback again

- Do one of the following:

  - Click the **Pause** button [❚❚].

  - Click the **Play** button [▶].

  - Press SPACEBAR.

  Playback resumes.

Rewinding and fast forwarding

The Transport module has dedicated **Rewind** [◀◀] and **Fast Forward** [▶▶] buttons, which allow you to rewind and fast forward smoothly during playback.

To rewind or fast forward, click the **Rewind** [◀◀] or **Fast Forward** [▶▶] button and keep the button pressed until you want to resume playback.

To audition a selection

1. Select the clips that you want to audition.
2. Press SHIFT+SPACEBAR.

   Only the selected clips play back.

Allow playback with no data

SONAR is able to start playback even if there is no data in a project. This is useful in various cases, such as:

- If you need to trigger playback of external devices.
- If you need to continue playback beyond the end of the project, for example, to allow MIDI notes and sustains to decay naturally and not end abruptly.

To allow playback with no data:

On the Track view **Options** menu, make sure **Stop at Project End** is not selected.

Stop at Project End option

The Track view **Options > Stop at Project End** option determines whether or not playback is allowed beyond the last event in a project. This option is enabled by default.

When enabled (default setting):

- Playback will not engage if there is no data present in the project at all.

- Playback will stop when no more data is present going forward.

When disabled:

- Playback will engage if there is no data present in the project at all.
- Playback will continue past the end of a project until the user manually stops playback.

Auto fade when starting/stopping playback

SONAR makes it possible to render a smooth fade in/out whenever audio playback is interrupted. This can be useful to smooth out abrupt transitions while stopping and starting the transport rapidly and will reduce ear fatigue during long sessions.

The fade is only applied during playback and is ignored while recording or bouncing audio.

To configure the auto fade times

1. Select **Edit > Preferences** to open the **Preferences** dialog box, then click **Audio - Playback and Recording**.

2. Adjust the following options:

    - **Fade On Start (milliseconds).**   When this option is set to a value greater than zero, starting playback will cause a gradual fade in of the audio for the specified duration. The valid range is 0–100000 and the default value is 0.

    - **Fade On Stop (milliseconds).**   When this option is set to a value greater than zero, stopping playback will cause a gradual fade out of the audio for the specified duration. The valid range is 0–100000 and the default value is 0.

Handling stuck notes

Under MIDI, the events that turn notes on are separate from the events that stop notes from playing. Normally, when you stop playback, SONAR attempts to turn off all notes that are still playing. Depending on how your equipment is configured, it's possible for notes to get stuck in the On position. The **Reset MIDI and Audio** button ![icon] in the Transport module is used to stop all notes from playing. The **Reset MIDI and Audio** command also stops feedback from input monitoring.

> ![info icon] **Note:** *You can control the MIDI messages that are sent by the **Reset MIDI and Audio** button ![icon] by changing the* `Panic Strength` *variable in the* `Cakewalk.ini` *file. See* *for more information.*

To clear stuck notes

Click the **Reset MIDI and Audio** button ![icon] in the Transport module.

See:

Looping

Sometimes you want to listen to one portion of a project over and over, either so you can play along and rehearse or because you want to edit that section of the project while it is playing and hear the results as you make changes. SONAR has a playback looping feature that makes this simple.

Looping is defined in the Loop module in the Control Bar.

Figure 35. *The Loop module.*
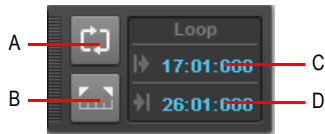
A. Loop On/Off B. Set Loop Time to Select C. Loop Start Time D. Loop End Time

To set up a loop, you do three things:

• Set the start time of the loopSet the end time of the loopEnable looping

From then on, SONAR will automatically jump back to the start of the loop when it reaches the end.

When looping is enabled, the loop times are indicated by special markers in the Time ruler.
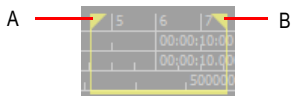
A. Loop From B. Loop Thru

To move a loop in the Time ruler

1. Click the yellow bar that connects the two loop markers

The cursor becomes a horizontal double-headed arrow.

2. Drag the loop to the desired location in the Time ruler.

With the default option settings, SONAR will play the loop over and over again, continuously.

If you start playback before the loop start time, SONAR will play until the loop end time is reached, then jump back to the loop start time.

Note: *If you stop playback while looping is enabled, the Now time jumps to the Now time marker. If you disable the **On Stop, Rewind to Now Marker** option in the Track view **Options** menu, the Now time stays wherever you stopped playback.*

The **Rewind** command operates slightly differently when looping is in effect. The first time you rewind, the Now time is set to the start of the loop. If the Now time is already at the start of the loop, Rewind takes you to the beginning of the project. From then on, Rewind switches back and forth between the loop start time and the start of measure 1.

To set up a playback loop

- Set the loop start and end times in one of the following ways:Drag the mouse between two points in the Time Ruler of the Track view, Staff, or Piano Roll view to select a range of times, then click

  ⬚ in the Control Bar's Loop module to copy the selection time to the loop time.

  - Click between two markers in the Track, Staff, or Piano Roll view to select a range of times,

    then click ⬚ in the Control Bar's Loop module to copy the selection time to the loop time.

  - Type the loop start and end times directly into the Loop module.

  - Select a range of times, then right-click in the Time ruler and choose **Loop > Set Loop Points**.

Looping is automatically turned on when you use the **Set Loop to Selection** command.

To cancel a playback loop

- Click ⬚ in the Control Bar's Loop module, or press the L key, to disable looping.

Using the Transport, Markers, Punch and Loop modules

The Control Bar contains various modules that provide powerful control over playback. To show the Control Bar, click the **Views** menu and choose **Control Bar**, or press the C key.

For controlling playback, the most important Control Bar modules are the Transport, Markers, Punch and Loop modules. For detailed information about all Control Bar modules, see "Control Bar overview" on page 495.

Figure 36. *The Transport module.*
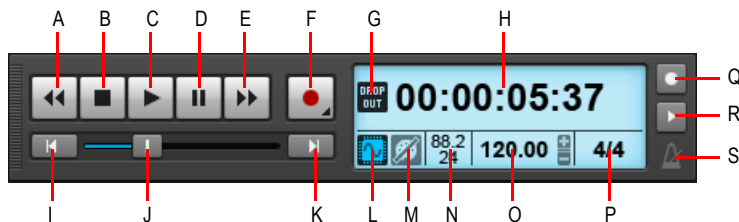
A. Rewind B. Stop C. Play D. Pause E. Fast Forward F. Record G. Dropout indicator H. Current Now time (this space is also used for progress bars and "Waiting for sync" messages) I. Return to zero (RTZ) J. Position K. Jump to project end L. Audio Engine on/off M. Reset/Panic N. Sample rate and bit depth O. Tempo P. Meter Q. Metronome during record R. Metronome during playback S. Click to open metronome settings

Using the Markers module

The Markers module lets you navigate by markers and insert new markers. Inserting markers at important milestones in your project makes it easy to navigate through your project.

To insert a marker, do *one* of the following:

*   Click the **Insert Marker** button ⬛ in the Markers module.
*   Click the **Project** menu and choose **Insert Marker**.
*   Press the M key when the Now time is in the desired location for your marker.
*   Hold down the CTRL key and click the top half of the time ruler.

To jump to a marker, do *one* of the following:

*   Click the **Previous Marker** button ⬛ or **Next Marker** button ⬛ in the Markers module.
*   Click the Marker list in the Markers module and select a marker from the drop-down menu.
*   Press the G key twice and select a marker from the list.

Figure 37. *The Markers module.*
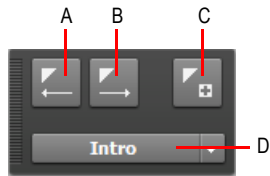
A. Jump to previous marker B. Jump to next marker C. Insert marker D. Current marker

To set options for punch and loop recording

1. Right-click the **Record** button ⬛ in the Transport module to open recording settings.
2. Specify how newly recorded data should affect existing data. Choose either **Sound in Sound (Blend)** or **Overwrite (Replace)**.
3. Select between storing looped takes in a single track or storing looped takes in separate tracks.

For more information see "Loop recording" on page 285.

To use the Punch module

Figure 38. *The Punch module.*
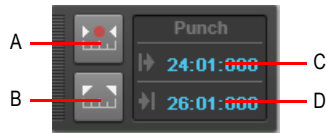
A. Auto-Punch On/Off *B. Set Punch Time to Select* *C. Punch In Time* *D. Punch Out Time*

The Punch module contains the following controls:

- **Auto-Punch on/off** . Enable/disable punch recording. Toggles punch recording on/off.

- **Set Punch Time to Selection** . Set the Punch In time to the start (From) time of the selection, and the Punch Out time to the end (Thru) time of the selection.

- **Punch In Time.** The current Punch In time. Click to modify.

- **Punch Out Time.** The current Punch Out time. Click to modify.

Tip: *If a numeric time field has focus, you can press G to access a list of marker positions.*

To punch record:

1. Click the Auto-Punch Toggle button in the Punch module to activate Auto Punch.
2. To set the auto punch region, do *one* of the following:
   - Drag in the time ruler to make a time selection, then click the **Set Punch Time to Selection** button in the Punch module.
   - Click the Punch In TIme field in the Punch module and specify the desired punch in location, then click the Punch Out Time field and specify the punch out location.
3. Set the Now Time far enough ahead of the Punch In point for you to be ready for it.
4. Click the **Record** button in the Transport module or press the R key.

SONAR plays the project, and begins recording on the selected track at the Punch In time you entered, then stops recording at the Punch Out time.

To use the Transport module

The Transport module contains the following controls:

- **Rewind** . Gradually rewind the project.

- **Stop** ■. Stop playback.

- **Play** ►. Start/stop playback.

- **Pause** ‖. Pause/resume playback.

- **Fast Forward** ►►. Gradually fast forward the project.

- **Record** ●. Start recording (requires at least one track to be armed for recording). Right-click to access global record options. Click and keep the mouse button pressed for a brief moment to enable step recording.

- **Step Record.** Open the Step Record window. For details, see "Step recording" on page 291.

- **RTZ** ◄. Rewind to the start of the project.

- **Progress Bar** ▯. Current position in the project. Drag to skip around in the project.

- **Go to End** ►|. Skip to the end of the project.

- **Time Display.** The time display section shows useful information about the current project, including the Now time, sample rate and bit depth, tempo and meter. The following information is shown:

  - **Current Now Time.** The Now time shows your current location in the project. For details, see "The Now time and how to use it" on page 178. Click the time display to toggle between the following time formats:

    - **MBT.** Display time as Measure:Beat:Tick.

    - **HMSF.** Display time as Hour:Minute:Second:Frame. This format is also referred to as SMPTE time.

    - **Milliseconds.** Display time in milliseconds.

    - **Samples.** Display time in samples.

  - **Current Tempo.** The current tempo at the Now time. Double-click to change the current tempo.

  - **Current Meter.** The number of beats per measure and the note value of each beat at the current Now time. Click to change the meter. For details, see "Setting the Meter and Key signatures" on page 252.

- **Metronome Record on/off** ●. Enable/disable the metronome during recording. Right-click to access Metronome settings.

- **Metronome Playback on/off** ►. Enable/disable the metronome during playback. Right-click to access Metronome settings.

- **Metronome settings** Δ. Click the metronome icon to open the metronome preferences.

To use the Loop module

Figure 39. *The Loop module.*
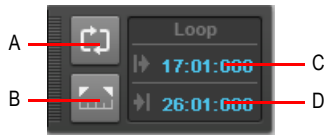
A. Loop On/Off B. Set Loop Time to Select C. Loop Start Time D. Loop End Time

The Loop module contains the following controls:

- **Loop on/off** ⬚.   Enable/disable playback looping.

- **Set Loop Times to Selection** ⬚.   Set the Loop Start time to the start (From) time of the selection, and the Loop End time to the end (Thru) time of the selection.

- **Loop Start Time.**   The current Loop Start time. Click to modify.

- **Loop End Time.**   The current Loop End time. Click to modify.

💡 **Tip:** *If a numeric time field has focus, you can press the G key to access a list of marker positions.*

See:

"Track-by-track playback" on page 195

Track-by-track playback

SONAR lets you play back any combination of tracks at one time by changing each track's *status*. You can control the status of each track with the individual controls that are on every track, or with the global controls in the Control Bar's Mix module. For more information about the Mix module, see "Mix module" on page 509.

Figure 40.   *The Mix module.*
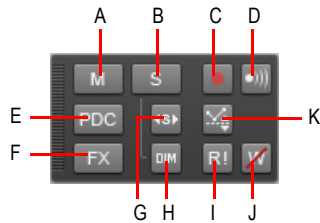
A. Mute *B.* Solo *C.* Arm *D.* Input Echo *E.* Live Input PDC Override *F.* Bypass All Effects *G.* Exclusive Solo
H. Dim Solo *I.* Automation Read (playback) *J.* Automation Write (recording) *K.* Offset mode

There are several different status settings for each track:

Status	What it means
Normal	The track plays unless one or more of your other tracks is soloed.
Muted	The track is not played, but you can turn it on while playback is in progress.
Archived	The track is not played, and you must stop playback to re-enable it. Archived tracks do not tax your CPU during playback so they can be used to store alternate takes.
Soloed	Only those tracks that are designated as solo tracks are played; all others are muted.
Armed	The track is armed for recording.
Mono/Stereo (audio tracks only)	The track plays back in either mono or stereo, depending on what the individual track setting is in the Track Inspector (see "Track Inspector overview" on page 529).
Phase normal or inverted (audio tracks only)	If a track was accidentally recorded out of phase with another track, the **Phase** button in the Track Inspector lets you reverse the phase of a track.

Table 21.

While playback is in progress, you can mute and unmute tracks in any combination, which means you can hear only the tracks that you want. You can change the status of a track in the Track view,

the Console view, the Track Inspector, or the Mix module in the Control Bar. If a track is both muted and soloed, it does not play. Mute has precedence.

The track status is saved with the SONAR project file. If you save a SONAR project as a standard MIDI File, however, all tracks are saved without mute, solo, or archive indicators.

See:

The Mix module

The Mix module lets you configure various playback settings. You can quickly mute/unmute, solo/unsolo and arm/disarm all tracks. You can also configure automation settings and specify the solo behavior.

To show/hide the Mix module

Right-click the Control Bar and select **Mix Module**.

Figure 41. *The Mix module.*
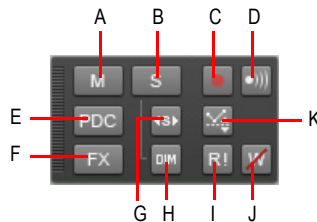
A. Mute B. Solo C. Arm D. Input Echo E. Live Input PDC Override F. Bypass All Effects G. Exclusive Solo H. Dim Solo I. Automation Read (playback) J. Automation Write (recording) K. Offset mode

The Mix module contains the following controls:

• **Mute / Unmute All Tracks** ⬚.   Click to mute/unmute all tracks. The button is lit if at least one track is muted.

- **Solo / Unsolo All Tracks** `S`. Click to solo/unsolo all tracks. The button is lit if at least one track is soloed.

    - **Dim Solo enable/disable** `DIM`. Enable/disable Dim Solo mode. Dim Solo is a mode in which non-soloed audio tracks/buses are still audible but at a reduced level. For details, see "Dim Solo mode" on page 200.

    - **Exclusive Solo enable/disable** `S`. Enable/disable Exclusive Solo mode. With Exclusive Solo mode, you can only solo one track and one bus at a time. For details, see "Exclusive Solo mode" on page 201.

- **Arm / Disarm All Tracks** `●`. Click to arm/disarm all tracks. The button is lit if at least one track is armed.

- **Input Monitor On/Off All Tracks** `●))`. Enable/disable Input Monitoring on all tracks.

- **Bypass all Effects** `FX`. Bypass all effects globally. For details, see "Bypassing effects globally" on page 869.

- **Live Input PDC Override** `PDC`. Enable/disable delay compensation on live tracks, thereby removing the latency during playback and recording of such tracks. Because it's a toggle, you can quickly turn it on to complete your tracking at low latency, and turn it off when finished to hear the track compensated as normal. For details, see "Live Input PDC override" on page 282.

- **Allow Automation Writing** `W`. Globally enable/disable the ability to write automation.

- **Global Automation Playback** `R!`. Globally enable/disable all automation playback.

- **Offset mode** `X`. Enable/disable Offset mode. In Offset mode, you "offset" the current automation in a track using a parameter's controls. For details, see "Envelope mode and Offset mode" on page 1031.

See:

"Silencing tracks" on page 198

"Soloing tracks" on page 198

Silencing tracks

When a track is muted, SONAR processes the track while playback is in progress so that you can unmute the track without stopping playback. If you have lots of muted tracks, this can place a heavy load on your computer. Archived tracks, on the other hand, don't place any load on your computer. Therefore, if there are tracks you want to keep but don't need to play, you should archive them instead.When you mute or unmute a track while playback is in progress, there may be a slight delay before you hear the effect of the change. This is to be expected and does not indicate a hardware or software problem.

To mute or unmute individual tracks

- To mute or unmute a track, click its Mute button ⊞M⊞ in the Track, Console view or Track Inspector.
- To mute or unmute several tracks at once, select the tracks and do *one* of the following:
   - Right-click a track strip and choose **MSR > Mute** on the pop-up menu.
   - To mute all selected tracks of the same track type, hold down the CTRL key and click any selected track's Mute button ⊞M⊞.
   - To mute all tracks, hold down the CTRL key and click any non-selected track's Mute button ⊞M⊞.

To unmute all tracks

Click the **Mute / Unmute All Tracks** button ⊞M⊞ in the Control Bar's Mix module.

To mute all tracks

Do *one* of the following:

- Click the **Mute / Unmute All Tracks** button ⊞M⊞ in the Control Bar's Mix module.
- Hold down the CTRL key and click any track's Mute button ⊞M⊞.

To archive or unarchive tracks

1. Select one or more tracks in the Track view.
2. Do *one* of the following:
   - Click the track's **Archive** button ⊞A⊞.
   - Right-click a track strip and choose **MSR > Archive** on the pop-up menu.

Note: *A track can not be archived during playback.*

Soloing tracks

Sometimes you want to hear a single track, or a few tracks at once, without having to mute all the other tracks. You can do this by soloing the tracks you want to hear.

As soon as any track is marked as a solo track, SONAR ignores all mute settings (unless a soloed track is also muted—mute takes precedence over solo) and plays *only* the track or tracks that are set to solo. Any number of tracks at one time can be marked as solo. All these tracks will play together. As soon as the solo status of the final solo track is turned off, SONAR once again plays back tracks based on their mute settings.

To solo or unsolo individual tracks

- To solo or unsolo a track, click its Solo button $\boxed{S}$ in the Track, Console view or Track Inspector.
- To solo or unsolo several tracks at once, select the tracks and do *one* of the following:
  - Right-click a track strip and choose **MSR > Solo** on the pop-up menu.
  - To solo all selected tracks of the same track type, hold down the CTRL key and click any selected track's Solo button $\boxed{S}$.
  - To solo all tracks, hold down the CTRL key and click any non-selected track's Solo button $\boxed{S}$.

See also:

To unsolo all tracks

Click the **Solo / Unsolo All Tracks** button $\boxed{S}$ in the Control Bar's Mix module.

To solo all tracks

Do *one* of the following:

- Click the **Solo / Unsolo All Tracks** button $\boxed{S}$ in the Control Bar's Mix module.
- Hold down the CTRL key and click any track's Solo button $\boxed{S}$.

See also:

Dim Solo mode

Normally when you solo a track/bus in SONAR, the tracks or buses which are not soloed are essentially muted. Dim Solo is a mode in which non-soloed audio tracks/buses are still audible but at a reduced level. The default gain reduction is -6dB, but can also be configured for -12dB and -18dB.

Dim Solo is useful when you want to focus on a specific track but you still want to edit/mix the track in context with the entire mix. This allows you to hear all tracks while the soloed track stands out from non-soloed tracks.

Note: *Dim Solo mode only applies to audio tracks and buses, not MIDI tracks.*

To enable/disable Dim Solo

Click the **Dim Solo** button ![DIM] in the Control Bar's Mix module.

Figure 42. *The Mix module.*

When Dim Solo is enabled, non-soloed audio tracks will play at a reduced gain rather than 0 gain (mute).

The Dim Solo enable/disable state is saved with each project.

To configure Dim Solo level

When Dim Solo mode is enabled, the amount of gain reduction applied to non-soloed tracks or buses is specified in the **Preferences** dialog box.Go to **Edit > Preferences > Audio - Driver Settings**.

3. Set the **Dim Solo Gain** setting to either **-6dB**, **-12dB** or **-18dB** and click **OK**.

The **Dim Solo dB** setting is saved with each project.

See:

Controlling playback
Track-by-track playback

Exclusive Solo mode

By default, SONAR allows you to solo multiple tracks and buses simultaneously. With Exclusive Solo mode, you can only solo one track and one bus at a time.

When you solo a track or bus in Exclusive Solo mode, all other soloed tracks or buses are automatically unsoloed. This allows you to quickly listen to individual tracks and buses in isolation without having to manually unsolo other tracks or buses.

To enable/disable Exclusive Solo mode

Click the **Exclusive Solo** button in the Control Bar's Mix module.

Figure 43. *The Mix module.*

> **Note:** *When you enable Exclusive Solo mode, currently soloed tracks and buses are not affected until the next time you solo a track or bus.*

There are several situations where soloing one track actually solos more than one track, even when Exclusive solo mode is enabled:

• If you solo a track folder, all tracks within the folder are soloed.

• If you solo a track that is assigned to a soft synth, all other tracks that are assigned to the same soft synth are also soloed.

• If you solo a track or bus that belongs to a Quick Group, all other tracks or buses are also soloed.

See:

"Soloing tracks" on page 198

"Dim Solo mode" on page 200

"Solo Override" on page 202

Solo Override

When you enable Solo Override on a track or bus, that track/bus will never be muted as a result of soloing any other track/bus.

This is a very useful feature when you want to always hear a particular track regardless of which other tracks are soloed. For example, you may want to always hear the vocal track while you solo other instrument tracks. This can be accomplished easily by using Exclusive Solo mode (see) and enabling Solo Override on the vocal track.

To enable/disable Solo Override

• Hold down the SHIFT key and click a track's or bus' Solo button ⬚.

   The **Solo** button is displayed as ◀S▶ to indicate that **Solo Override** is enabled. **Solo Override** prevents the track or bus from being muted when other tracks or buses are soloed.

> ⓘ **Note:** *Mute always takes precedence over **Solo**. A track or bus can still be muted even if **Solo Override** is enabled.*

See:

Inverting the phase of a track

A waveform's exact opposite is called an inversion. It is a shift of 180 degrees. A waveform and its inversion cancel each other out completely, so it is usually not desirable to have two track recordings of the same source if one is phase inverted. It can lead to reduced volume, lowered or distorted response in certain frequencies, or even silence in the case of two tracks which are exactly identical (i.e. cloned tracks).

Occasionally, for example when recording a source using two microphones, one of the microphones may be recording an inversion of the other, the resulting tracks may, to some degree, be cancelling each other out. SONAR allows you to invert the phase of a track to match another.

To invert the phase of a track

1. Open the Track Inspector or Console view.

2. In the track you want to invert the phase, click the **Phase inversion** button ⌀.

Changing tracks' mono/stereo status

SONAR has a **Mono/Stereo** button ||•|| in each track module in the Track Inspector and Console view. The buttons in the track modules force each track to play in either stereo or mono, but preserve the tracks' pan positions in the stereo mix.The **Mono/Stereo** button ||•|| in each track forces the track's audio signal to enter any patched plug-ins as either mono or stereo, whether or not the tracks are mono or stereo. This allows you to use either mono effects on a stereo track or stereo effects on a mono track.

To use a track's Stereo/Mono button

Note: *You may lose important stereo data by using mono effects with stereo tracks because your stereo tracks are summed to mono in order to pass through the effect. If you never want your stereo data to be summed to mono, select stereo.*

1. Open the Track Inspector or Console view.

2. In the track you want to force to either mono or stereo for processing effects, click the **Stereo/ Mono** button ||•|| to the desired position:

  • When the button is lit, the track streams in stereo.

  • When the button is unlit, the track streams in mono.

Mono audio clips may be increased by 3 dB in certain scenarios

There are some situations where the level of a mono clip will be increased by 3 dB if the track's output interleave (mono/stereo toggle) is set to mono:

• If the track has mixed stereo and mono clipsThe track has a synth selected as its input source

• Input Echo is enabled or the track is armed for recording

In summary, whenever the track output interleave is mono and the data interleave is stereo, mono data will be increased in level by 3 dB.

Using mono VST plug-ins on stereo tracks may cause out of sync audio

When using a mono VST plug-in on a stereo track (interleave set to Stereo), the left and right channels will be out of sync. The left channel is processed by the mono effect, and delay compensation is applied, while the right channel is not processed and does not have delay compensation applied. The signal will look something like this:

• Left channel: Wet signal (delayed)

• Right channel: Dry signal (no delay)

A mono VST plug-in will work correctly if **Enable Mono Processing** is checked in the **VST Plug-in Properties** dialog box and the track interleave is set to mono.

Note: *Enable Mono Processing is enabled by default in SONAR. If you are playing back a legacy project in SONAR and notice the project does not sound the same, try to disable **Enable Mono Processing** for any mono plug-ins used in the project.*

See:

Changing track settings

Each track in a project contains MIDI or audio information and has a variety of settings (also called parameters) that determine how the track sounds. By changing these parameters, you can change the sound of your project. For audio tracks, you control parameters such as volume, stereo panning, and the output device that is used to produce the sound. For MIDI tracks, you control many additional parameters, including the type of instrument sound that is used to play the notes stored in the track. Both kinds of tracks contain an **Automation Read** button ☐R and an **Automation Write** button ☐W, which enable or disable automation playback and recording, respectively.

> ℹ️ **Note 1:** *You can control all sliders and knobs in the Console and Track views by clicking a control, then hover over it with the mouse and manipulate the mouse wheel. If you move the mouse cursor away from the slider or knob while using the mouse wheel, you will lose control of the slider or knob you are adjusting.*

> ℹ️ **Note 2:** *You can show and hide controls in track and bus strips in the Track view, and even create presets for your favorite control layouts. For details, see "Configuring Track view controls" on page 324 for more information.*

Audio track parameters

The following figures show the various parameters in audio track strips. The figures are of an audio track that is located in the Track view, however most of these parameters can also be adjusted in the Console view and Track Inspector. Some parameters are only available in the Console view or Track Inspector.

Figure 44. *Audio track*
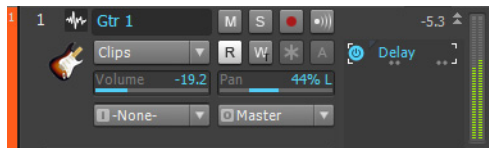
Figure 45. *Audio track header controls*

A. Track number B. Header icon C. Track name D. Peak value E. Maximize/restore F. Meter

Note: *MSR buttons may appear in the header bar if the Track pane is wide.*

Figure 46. *Audio track controls*
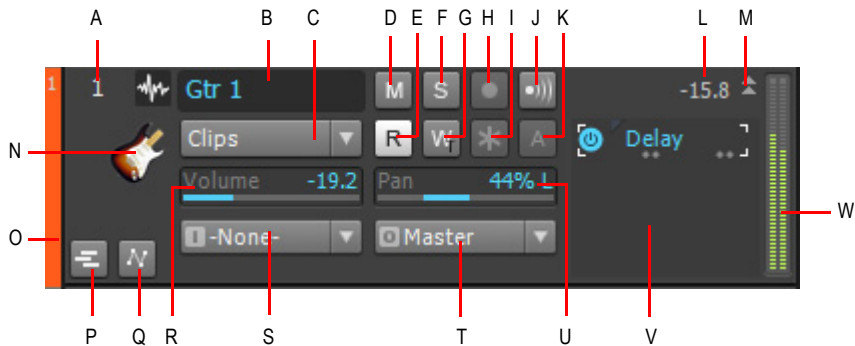
A. Track number B. Track name C. Edit Filter D. Mute E. Automation Read F. Solo G. Automation Write
H. Arm for recording I. Freeze J. Input echo K. Archive L. Peak level M. Expand/collapse track N. Track icon
O. WAI display P. Expand/collapse Take Lanes Q. Expand/collapse Automation Lanes R. Volume slider
S. Input T. Output U. Pan slider V. Effects bin W. Meter

Figure 47. *Audio track effects bin, meter, and track scale*
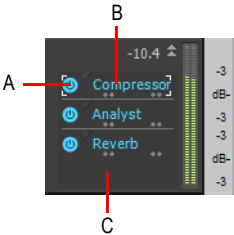
A. Enable/disable plug-in B. Plug-in name C. Right-click to insert new plug-in

Here is a summary table of the different audio track parameters and how they are used.

Parameter	What it means
Number	A sequential track number used for reference.
Name	A name that you assign the track for easy reference. Note that if you do not assign a name to a track, the default name is the track number. This track number will change if you change the order of your tracks.

Table 22.

Controlling playback
Changing track settings

Parameter	What it means
Mute	When enabled, mutes the track.
Solo	When enabled, solos the track.
Arm	When enabled, arms the track for audio recording.
Input Echo	Turns input monitoring on or off.
Automation Read and Write buttons	Enable/disable automation playback and recording, respectively.
Peak value	Displays the Peak value, which is the amplitude of the latest audio peak in the track.
Expand/collapse Take Lanes	Hides or shows Take lanes.
Expand/collapse Automation Lanes	Hides or shows Automation lanes.
Expand/collapse	Expands the track to show more controls, or collapses the track to only show the header bar.
Edit Filter	Specify which data type the global tools should operate on.
Vol (volume)	The current volume level for the track, ranging from -INF (silent) to +6 dB (maximum volume).
Pan	The stereo distribution of the output, ranging from 100% left (hard left) to 100% right (hard right); a value of "C" indicates sound that is centered left-to-right. On stereo tracks, pan acts as balance.
Trim (volume trim) (Track Inspector and Console view only)	Volume Trim is a pre-fader control which allows the fine tuning of a single track's volume. For example, let's say you have four tracks, three tracks have their volume fader set to 0 dB while the fourth track's fader is set to +10 dB. You want to group the faders and do a slow fade out, but the slightly higher level of the fourth track causes its volume to be higher in relation to the other tracks towards the end of the fade out. To balance the fader levels, reduce the fader level for the fourth track to 0 dB and raise the Volume Trim value for that track to +10 dB. The resulting volume levels for the project are the same, but now you can group the faders and perform a fade out with no track standing out disproportionately at the end of the fade out.
Input	The input source for the track, used in recording
Output	The output bus through which the track is played
Send Enable (Track Inspector and Console view only)	Activates a send module, which sends a copy of the track signal to a bus.

Table 22.

Parameter	What it means
Send Level (Track Inspector and Console view only)	Controls volume of audio data sent by this send module.
Send Pan (Track Inspector and Console view only)	Adjusts the send pan setting.
Send Pre/Post switch (Track Inspector and Console view only)	Pre (pre-fader) means that the Send signal goes to the bus prior to the track's volume fader; post means the Send signal goes to the bus after the volume fader.
Send destination (Track Inspector and Console view only)	Displays name of bus that the Send is sending data to.
Mono/Stereo (Track Inspector and Console view only)	A switch that determines whether a track's signal enters an effect or chain of effects as mono or stereo, regardless of the nature of the track.
Phase In/Out (Track Inspector and Console view only)	A switch that inverts the phase of the track.
Effects bin	The patch point for a track's plug-ins or soft synths.
Meters	The recording and playback levels are displayed in the Playback and Record meters.
WAI display	Shows a color-coded bar if the track is being controlled by a control surface.

Table 22.

For more information about audio track controls in the Track Inspector, see "Audio track controls" on page 536.

For more information about audio track controls in the Console view, see "Audio track controls" on page 1845.

MIDI track parameters

The following pictures illustrate MIDI track parameters:

Figure 48. *MIDI track header controls*

A. Track number B. Header icon C. Track name D. Maximize/restore E. Meter

Note: *MSR buttons may appear in the header bar if the Track pane is wide.*

Figure 49. *MIDI track controls*
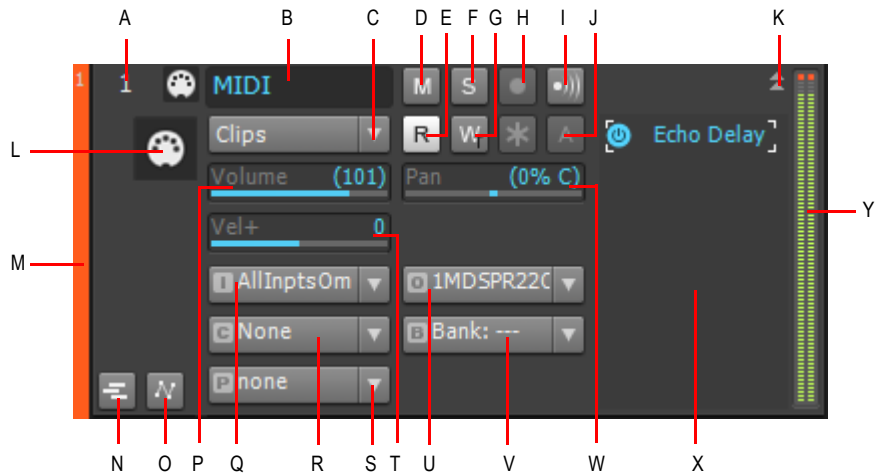
A. Track number B. Track name C. Edit Filter D. Mute E. Automation Read F. Solo G. Automation Write
H. Arm for recording I. Input echo J. Archive K. Expand/collapse track L. Track icon M. WAI display
N. Expand/collapse Take Lanes O. Expand/collapse Automation Lanes P. Volume slider Q. Input R. Channel
S. Patch T. Velocity+ U. Output V. Bank W. Pan slider X. Effects bin Y. Meter

Figure 50. *MIDI track effects bin and track scale*
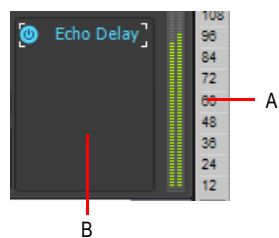
A. *Track scale* **B.** *MIDI effects bin*

Here is a summary table of the different MIDI track parameters and how they are used:

Parameter	What it means
Track number	A sequential track number used for reference
Track name	A name that you assign the track for easy reference. Note that if you do not assign a name to a track, the default name is the track number. This track number will change if you change the order of your tracks.
Mute	When enabled, mutes the track
Solo	When enabled, solos the track
Arm	When enabled, arms the track for MIDI recording.
Input Echo	Controls whether the track will echo MIDI data or not.
Automation Read and Write buttons	Enable/disable automation playback and recording, respectively
Expand/collapse Take Lanes	Hides or shows Take lanes.
Expand/collapse Automation Lanes	Hides or shows Automation lanes.
Expand/collapse	Expands the track to show more controls, or collapses the track to only show the header bar.
Edit Filter	Specify which data type the global tools should operate on.
Vol (volume)	The current volume level for the track, ranging from 0 (silent) to 127 (maximum volume).
Pan	The stereo distribution of the output, ranging from 100% left (hard left) to 100% right (hard right); a value of "C" indicates sound that is centered left-to-right.

Table 23.

Parameter	What it means
Velocity trim (Track Inspector and Console view only)	The change in velocity (volume) that will be applied to notes in this track on playback; ranges from –127 to +127
Input	The input source for the track, used in recording
Output	The output device through which the track is played
Ch (channel) (Track Inspector and Console view only)	The MIDI channel through which the notes will be played
Bank (Track Inspector and Console view only)	The set of patch names available for the track
Patch (Track Inspector and Console view only)	The instrument sound that will be used for playback.
Time+ (Track Inspector only)	An offset applied to the start time of the events in the track
Key+ (Track Inspector only)	The number of steps by which the notes in the track are transposed on playback (e.g., 12 to transpose up one octave)
Chorus (Track Inspector only)	Adds MIDI chorus effect to the track
Reverb (Track Inspector only)	Adds MIDI reverb effect to the track
Snap to Scale scale type (Track Inspector only)	Displays current scale for Snap to Scale feature
Snap to Scale root note (Track Inspector only)	Displays root note of current Snap to Scale scale
Snap to Scale on/off (Track Inspector only)	Turns Snap to Scale feature on or off
WAI display	Shows a color-coded bar if the track is being controlled by a control surface.

Table 23.

For more information about MIDI track controls in the Track Inspector, see "MIDI track and Instrument track controls" on page 538.

For more information about MIDI track controls in the Console view, see "MIDI track controls" on page 1846.

To change a track name

1. Double-click on the current track name.
2. Enter the new track name.
3. Press ENTER.

The default track names (Track 1, Track 2, etc.) are not actually names, but placeholders until you name a track. If you reorder the tracks these placeholders change.

You can rearrange and resize the panes in the Track view as shown in the following table.

To do this	Do this
Change the width of the Track pane and Bus pane	Drag the divider that separates the Track pane from the Clips panes to the left or right
Change the height of the Mains/Buses pane	Drag the divider that separates the Track and Clip panes from the Bus pane up or down

Table 24.

You can customize which tracks are displayed or not displayed, and enlarge or maximize individual tracks while other tracks remain minimized. You can also manually set the exact size of a track's display. The following table shows how to customize the appearance of tracks in the Track pane.

To do this	Do this
Hide or show a track	Open the **Track Manager** dialog box (press H), and check or uncheck a track's check box in the dialog box.
Expand/collapse a track	Click the **Expand/collapse** button in the track
Change the height of a track using splitter bars	Move the cursor over the gap below a track until the cursor looks like this ⬍. Click and drag until the track is the size you want.
Lock or unlock the height of a track	Right-click an empty area in the track's controls and choose **Lock Height** from the menu.

Table 25.

You can display subsets of the Track pane's controls (the titlebar controls are always displayed) by selecting a Control preset from the Track Control drop-down list above the track strips. To choose which controls are displayed in track strips, see

Changing track settings in the Track pane

You can change the values in the Track pane in a number of ways:

Control	How to change the setting
Volume and Pan	Click on the control and move your cursor left or right to adjust values, or press ENTER and type a value.
Input and Output	Click on the black arrow on the right of the control and select a driver from the menu that appears, or double-click on the control and select a driver from the menu.
Buttons	Click to enable or disable

Table 26.

You can also edit Track properties in the Track Inspector. To show or hide the Inspector, select **Views > Inspector** or press the I key.

Figure 51. *The Track Inspector*

You can change the value of a track parameter for several tracks at once by using Quick Groups:

• To adjust the same control in all tracks, hold down the CTRL key and adjust a control in a non-

selected track.

- To adjust the same control in all *selected* tracks of the same type, hold down the CTRL key and adjust a control in any selected channel strip.

For example, to assign a group of tracks to the same output, select the tracks you want to assign, then hold down the CTRL key and assign the Output control in any selected track. All selected tracks will be assigned to the same output.

All track parameters are saved with a SONAR project. However, if you export a project to a standard MIDI File, several of the parameters (Key+, Vel+, Time+, and Chan) are applied to the MIDI data as the file is being exported. Other parameters, including Input, Output, Mute, Solo, and Archive, are lost when you export the project to a MIDI file.The following sections contain more information about many of the parameters in the Track view. For more information about the track inputs and the track **Arm** button, see "Preparing to record" on page 260.

Setting up output devices

The output setting for a track determines which piece of hardware or software synthesizer will be used to produce the sound stored in your project. In a very simple equipment setup, you might have only a computer equipped with a basic sound card. In this case, you want to play all MIDI and audio output through the sound card on your computer.

If your equipment setup also includes a MIDI keyboard attached to the MIDI port on your sound card, you can choose to route MIDI data directly to the sound card or through the sound card MIDI port to the keyboard. If you choose the former, the music will play from your computer speakers. If you choose the latter, the sound will play from the speaker attached to your keyboard. You can even choose to send some MIDI information to each of these devices so that they both play at once.

You can purchase MIDI interfaces that plug into your parallel, serial, or USB port to add MIDI ports to your computer. For more information about complex system configurations, see the online Help topic "Hardware setup" on page 1273.

If your computer has several MIDI outs, select **Edit > Preferences > MIDI - Devices** and put them in the desired order. The order in which your MIDI devices appear in the **Output** menus in the Track and Console views is based solely on the order in which the selected outs appear in **Edit > Preferences > MIDI - Devices**. As a result, the order in which your devices appear in a track's output control may not match the port numbers that appear on your external multiport MIDI device.

Figure 52. *The MIDI - Devices section*
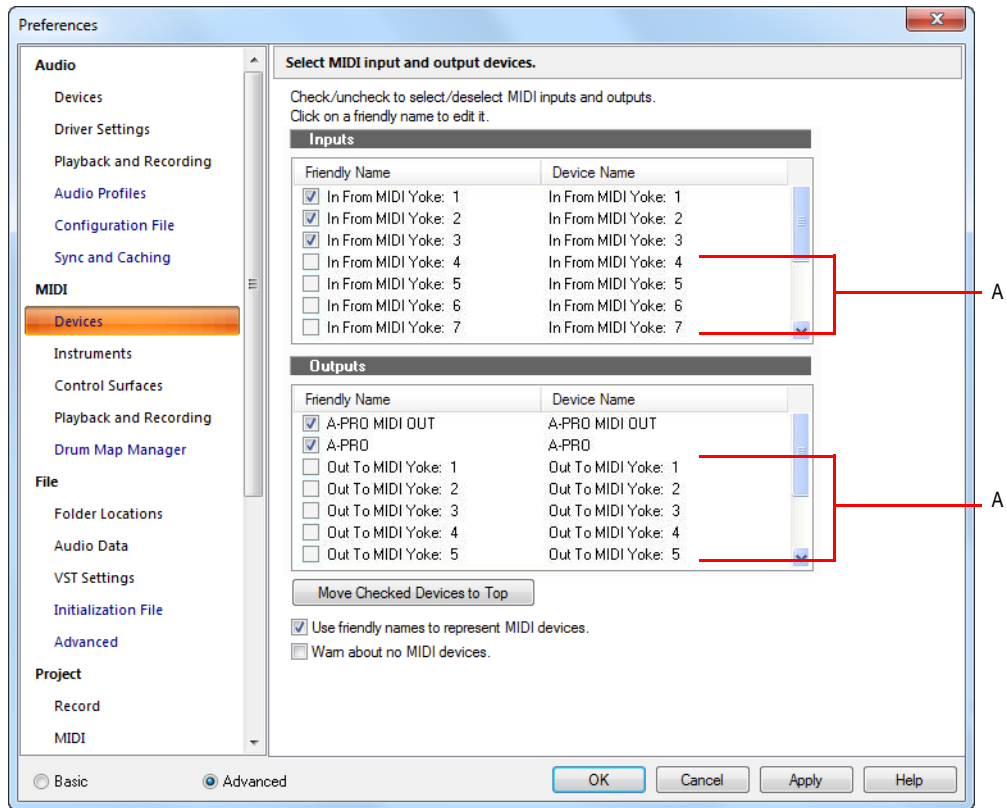
A. These devices are not selected

When you first run SONAR it asks you to select MIDI devices. You may want to change these selections in the future. You can do so by selecting different devices in **Edit > Preferences > MIDI - Devices**.

Your computer is usually equipped with at least one audio device—your computer sound card. Your setup may have several different audio output devices, or you may have a multichannel sound card that presents itself to your computer as though it were several different devices, one for each stereo pair. In SONAR, audio tracks are assigned to main outs or buses. Each main out represents a hardware device. You use the **Output** control to assign a track in a project to the main or bus you want to use.While you need to choose the MIDI output devices you want to use before you assign them to tracks, all of your audio devices can be assigned to tracks freely. You do not need to configure them the way you do MIDI devices. If you have a voice modem or speakerphone in your computer, however, you might want to set up SONAR so that it won't use those devices. Also, note that some dedicated audio equipment has specific setup requirements. For more information, see "Improving audio performance" on page 1181.

To choose MIDI devices

1. Go to **Edit > Preferences > MIDI - Devices**.

2. Click on any MIDI device in the **Outputs** list.

3. To move any device to the top of the list, deselect all other devices and click **Move to Top** to move the selected device to the top of the list.

4. When all devices are selected in the order you want, click **OK**.

See:

Creating friendly names for MIDI output and input devices

You may find that a name you make up yourself for a MIDI device is easier to remember or more descriptive than a device's original name. The friendly name for a MIDI device is the name you will see places such as MIDI track **Input** and **Output** menus, and the **Controllers/Surfaces** dialog box, if you enable the **Use Friendly Names To Represent MIDI Devices** check box at the bottom of the **MIDI Devices** dialog box.

To make up a friendly name:

1. Go to **Edit > Preferences > MIDI - Devices**.

2. Double-click the name of a device in the **Friendly Name** column, type a new name, and press ENTER.

3. Select the **Use Friendly Names To Represent MIDI Devices** check box.

4. Click **OK**.

Assigning Inputs & Outputs

You assign each track to a MIDI or an audio output using the **Output** drop-down in the Track view. From then on, material on that track will be sent to the appropriate output device.

Note: *If you rearrange your MIDI output devices after making output assignments, you may find MIDI information being sent to different instruments than you expect. Also,* SONAR *allows you to define instruments that are associated with certain outputs and channels. If you use this feature, the name of the output will change to reflect the instrument you have chosen.*

To assign a track to an output

1. Click the **Output** drop-down of the track you want to assign.

2. Select the output you want to use.

To assign a group of tracks to the same output, select the tracks you want to assign, then hold down the CTRL key and assign the Output control in any selected track. All selected tracks will be assigned to the same output.
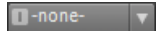
> **Note:** *Outputs that are used by the External Insert plug-in (see "External Insert plug-in (Producer and Studio only)" on page 876) cannot be assigned to track and bus outputs. The only exceptions are master buses that have other instances of the External Insert plug-in routed to them.*

Notification when track/bus outputs are assigned to silent output

When you load a project, SONAR checks to see if the exact same output ports are assigned as when the project was saved. SONAR's port assignments can change if you load the project on a different hardware configuration or change driver models. If there is any discrepancy between the port assignments that were saved and the ports that are used in the current configuration, the ports are set to "None" and the **Silent Buses Detected** dialog box displays all track and bus outputs from the current project that have been assigned to a silent output.

The **Silent Buses Detected** dialog box also appears if any track or bus output is assigned to **None** as a result of changing the audio configuration. For more information, see "Silent Buses Detected dialog" on page 1775.

To assign the same audio input port to multiple tracks

1. In the Track view, select the tracks whose audio input port you want to assign.

2. Click the small drop-down arrow in any selected track's **Input** control ⬛ -none- ▾.

   The **Input Port** menu appears.

3. Choose **Selected Track Inputs** from the context menu.

   The **Track Inputs** dialog box opens with the selected tracks initially highlighted. You can modify the track selection from within the **Track Inputs** dialog box. For more information, see "Track Inputs dialog" on page 1764.

4. Select the desired audio input port and click **OK**.

   The audio input port is assigned to all selected audio tracks.

To assign different audio input ports to multiple tracks
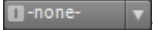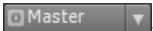
1. In the Track view, select the tracks whose audio input port you want to assign.

2. Click the small drop-down arrow in the first selected track's **Input** control ⬛-none- ▼ .

The **Input Port** menu appears.

3. Choose **Selected Track Input Series** from the context menu.

The **Assign Series of Inputs** dialog box opens, which lets you choose the first input port in the series.

Figure 53. *The **Assign Series of Inputs** dialog*
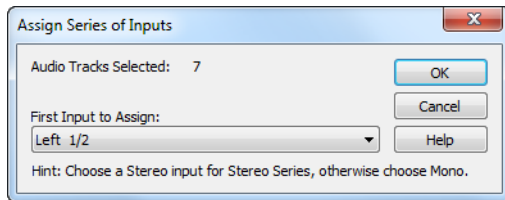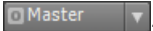
4. Select the audio input port that should be assigned to the first selected track and click **OK**.

SONAR will assign consecutive mono input ports to the selected audio tracks, beginning with the track that was clicked in step 2. If a left or right input is selected, then mono inputs will be assigned. If a stereo input is selected, then stereo inputs will be assigned.

To assign the same audio output port to multiple tracks

1. In the Track view, select the tracks whose audio output port you want to assign.

2. Click the small drop-down arrow in any selected track's **Output** control ⬛Master ▼ .

The **Output Port** menu appears.

3. Choose **Selected Track Outputs** from the context menu.

The **Track Outputs** dialog box opens.

4. Select the desired audio output port and click **OK**.

The audio output port is assigned to all selected audio tracks.

To assign the same audio output port to all stereo buses

1. In the Track view, click the small drop-down arrow in any stereo bus' **Output** control ⬛Master ▼ .

The **Output Port** menu appears.

ℹ **Note:** *Surround buses are ignored.*

2. Choose **Set All Bus Outputs** from the context menu.

   The **Output port** submenu appears.

3. Select the desired audio output port.

   The audio output port is assigned to all stereo buses

Note: *Only hardware main outputs may be assigned, not other buses.*

Assigning tracks to mono hardware outputs

SONAR lets you assign audio track and bus outputs to individual (mono) hardware outputs in addition to stereo pairs.

This is very useful, for example, if you record in SONAR but want to use an external mixing console to mix.

To show mono hardware outputs

SONAR does not show mono hardware outputs by default. To show mono outputs, do the following:

1. Go to **Edit > Preferences > Audio - Devices**.

2. Select the **Show Mono Outputs** check box and click **OK**.

   Mono hardware outputs are now available in all locations that display audio output ports, with the exception of the Media Browser view, Loop Construction view and **Import Audio** dialog box. Each available audio port exposes Left, Right and Stereo channels.

Note: *The Show Mono Outputs option only affects the display of mono hardware outputs in SONAR; it does not affect current output port assignments on tracks and buses. Existing mono output assignments are retained even if you disable the Show Mono Outputs option.*

Assigning stereo tracks to mono outputs

When a stereo track is assigned to a mono hardware output, the left and right channels are downmixed to mono. All track/bus gain and pan settings are applied prior to mono conversion.

Backward compatibility

Loading a SONAR X2 project with mono output assignments in an earlier version SONAR will cause the mono assignments to be lost.

Choosing the instrument sound (bank and patch)

Electronic keyboards and synthesizers often contain hundreds or thousands of different sounds. Each sound is known as a *patch*. The name comes from the early days of synthesizers, for which you physically rewired (using patch cords) the oscillators and modulators to produce different sounds. Patches are normally organized into groups of 128, called *banks*. Most instruments have between 1 and 8 banks, but MIDI supports up to 16,384 banks of 128 patches each (that's over 2 million patches).The Bank and Patch controls in the Console view and Track Inspector control the initial bank and patch of a track during playback. Every time SONAR starts playback at the beginning of a project, the bank and patch settings for the track are set to these initial values.Many instruments have descriptive names for their banks and patches. SONAR stores these names in an instrument definition. If you are using an instrument that supports General MIDI, your patch list will contain the 128 sounds that are defined by the General MIDI specification.

Note: *Different MIDI instruments use different types of commands to change banks. SONAR supports four common methods for changing banks. For information about the bank selection method you should use with your MIDI gear, see your MIDI equipment's documentation.*

Tip: *If your bank name is too long to fit in the **Bank** field, hold your cursor over the bank name. A tooltip appears with the complete bank name.*

Note that a single MIDI channel can only play one patch at a time on each instrument assigned to that channel. Therefore, if two or more MIDI tracks are set to the same output and channel but have different bank and patch settings, the patch of the highest-numbered track will be used for all the tracks.In some projects you want the sound played by a track to change while playback is in progress. You can accomplish this using the **Insert > Bank/Patch Change** command. When you start playback in the middle of a project, SONAR searches back through the track to find the correct patch to use—either the initial bank and patch or the most recent bank/patch change. Note that the Console view and Track Inspector only show the initial bank and patch, even while a different bank and patch are being played back. The only way to see and edit a bank/patch change is in the Event List view. For more information, see "The Event List view" on page 742.

To assign an initial bank and patch to a track

1. Open the Track Inspector or Console view and select the MIDI track you want to configure.
2. Select the desired settings in the Bank and Patch controls.
3. To search for a patch containing specific text, click the **Patch Browser** button in the Track Inspector. You can also open the Patch Browser by right-clicking a bank or patch control in the Track Inspector or Console views.

To insert a bank/patch change

1. Highlight the track whose bank and patch you want to change by clicking on the track number.

2. Set the Now time to the time at which you want the change to occur.

3. Choose **Insert > Bank/Patch Change** to display the **Bank/Patch Change** dialog box.

4. Choose a bank and patch from the lists.

5. Click **OK**.

SONAR inserts a change in bank and patch. When you play back the project, the initial bank and patch shown in the Track view will be used to the point at which the bank/patch change takes place. You can remove a bank/patch change in the Event List view.

To choose patches with the Patch browser

1. Do *one* of the following:

   • In the Track Inspector or Console view, right-click the patch name in the track module you want to change patches in.

   • In the Track Inspector, click the **Patch Browser** button in the track you want to change patches in.

   The **Patch browser** dialog box appears, displaying a list of all the Instrument patch names that have been installed.

2. Search for a patch name, if desired, by filling in text in the **Search** field at the top of the dialog box.

3. When you find the right patch, click its name and click **OK**.

   SONAR changes the patch of the track you selected.

See:

"Patch Browser dialog" on page 1644

Adding effects

You can add both MIDI and audio effects directly from the Track view. SONAR adds these effects in real-time, preserving your track's original data.

To add an audio effect in the Track pane

Do *one* of the following:

- In an audio track, right-click in the effects bin and choose a plug-in from the pop-up menu.
- Click the Insert Plug-in button at the top of the effects bin and choose a plug-in from the pop-up menu.Use the effects bin to add real-time effects
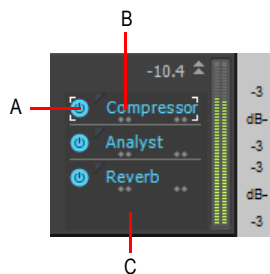
*A. Enable/disable plug-in **B.** Plug-in name **C.** Right-click to insert new plug-in*

You can also drag plug-ins from the Browser to an effects bin. For details, see "Adding effects and instruments to a project" on page 575.

See:

"Audio effects (audio plug-ins)" on page 797

Adjusting volume and pan

The Volume and Pan settings control the initial volume and pan of a track during playback. Every time SONAR starts playback, the Volume and Pan settings for the track are set to these initial levels. SONAR allows you to choose different panning laws if you want (see "Configuring panning laws" on page 223).

In some projects you want the volume or panning of a track to change while playback is in progress. You can accomplish this by drawing a volume or pan envelope in the Track view, or by recording automation. For more information, see "Automation" on page 1001.

Note: *For MIDI tracks, SONAR processes the volume and pan settings by transmitting MIDI volume and pan events (controllers 7 and 10, respectively) when playback starts. If two or more MIDI tracks are set to the same output and channel but have different volume or pan settings, the settings for the highest-numbered track will prevail.*

Note also that not all keyboards and synthesizers respond to these events. Check your instrument's manual for more information.

To set the initial volume setting

1. Move your cursor to the **Volume** control of the track you want to change.
2. Click and drag to the left to lower the volume or the right to raise the volume.

You can also change the volume settings in a variety of other ways, as described under "Changing track settings in the Track pane" on page 213.

To set the initial Pan setting

1. Move your cursor to the **Pan** control of the track you want to change.
2. Click and drag to the left to adjust the pan to the left or to the right to adjust the pan to the right.Hard left is 100% left. Hard right is 100% right. Pan is centered at C.

You can also change the pan and volume settings in a variety of other ways, as described under "Changing track settings in the Track pane" on page 213.

See also:

"Configuring panning laws" on page 223

Configuring panning laws

You can choose from six different panning laws. A panning law is the mathematical formula that a sequencer or mixer uses to control panning.

To change panning laws

1. Go to **Edit > Preferences > Audio - Driver Settings**.
2. In the **Stereo Panning Law** field, choose one of these options:
   • **(Default) 0 dB center, sin/cos taper, constant power.** This choice causes a 3 dB boost in

a signal that's panned hard left or right, and no dip in output level in either channel when the signal is center panned.

- **-3dB center, sin/cos taper, constant power.**   This choice causes no boost in a signal that's panned hard left or right, and 3dB dip in output level in either channel when the signal is center panned.

- **0dB center, square-root taper, constant power.**   This choice causes a 3 dB boost in a signal that's panned hard left or right, and no dip in output level in either channel when the signal is center panned.

- **-3dB center, square root taper, constant power.**   This choice causes no boost in a signal that's panned hard left or right, and 3dB dip in output level in either channel when the signal is center panned.

- **-6dB center, linear taper.**   This choice causes no boost in a signal that's panned hard left or right, and 6dB dip in output level in either channel when the signal is center panned.

- **0 dB center, balance control.**   This choice causes no boost in a signal that's panned hard left or right, and no dip in output level in either channel when the signal is center panned.

3. Click **OK**.

Pan Law compatibility mode

When using a non-default pan law with floating point or 24-bit audio, SONAR would previously apply the pan law twice; once at the clip level and once more at the track level.

In SONAR 8.5.2 and later, pan laws are only applied once at the track level and only for mono tracks. Any clip pan envelopes will continue to work, but behave strictly as a balance control.

If you have existing projects that use a non-default pan law (i.e. other than **0dB center sin/cos taper**), the mix might sound louder in SONAR X2. To address backwards compatibility with projects that were mixed in previous versions of SONAR, the following Aud.ini variable is available to set the pan law compatibility mode:

PanLawCompatMode=<0 or 1> (default=0)

This variable should be set in the `[Wave]` section. For example:

```
[Wave]
```

```
PanLawCompatMode=1
```

When the value is 0 (default), non-default pan laws are not applied at the clip level. Clip pan envelopes always use the **0dB center sin/cos taper** law.

When the value is 1, pan laws are applied at the clip level. It is not recommended that you use this value unless you need to retain backwards compatibility with pre-SONAR X2 projects that use a non-default pan law.

Adjusting volume trim

Volume Trim acts like the trim control on a mixer, raising or lower the level prior to the volume fader. Volume trim is useful for calibrating your faders to match a dB reference level or for aligning your faders for grouping. The **Volume Trim** control has a range of -18dB to +18dB. Raising or lowering the Volume Trim raises or lowers the apparent volume of the track by that amount without affecting the actual fader level.

To set the volume trim level

In the Track Inspector or Console view, adjust the Gain control at the top of the channel strip.

Assigning a MIDI channel (Chn)

MIDI transmits information on 16 channels, numbered 1 through 16. Every MIDI event is assigned to a particular channel. Some MIDI equipment can accept MIDI information on only a single channel. This channel may be preassigned, or you may be able to change it. Other MIDI equipment, including many electronic keyboards and synthesizers, can accept information on several different MIDI channels at once. Usually, these devices use a different instrument sound for each channel.

On playback, the channel number is used to direct the MIDI information to a particular piece of equipment.

The Chn control in the Track Inspector and Console view redirects all events in the track to the specified channel, ignoring the channel number stored with each event. If this parameter is left blank, all events in the track are sent to their original channels.This parameter does not affect the channel information that is stored with each MIDI event. When the track is displayed in other views, like the Piano Roll or Event List view, you will see the original channel that is stored in the file. You can edit the channel values in those views or use the **Process > Find/Change** command.

To set the channel for a track

In the Track Inspector or Console view, click the Chn control and select a MIDI channel.

Adjusting the Key/transposing a track (Key+)

Each MIDI note event has a key number, or pitch. On playback, the *key offset* (Key+) parameter transposes all notes in the track by the designated number of half-steps. The value can range from -127 to +127. A value of 12 indicates that notes will be played back one octave higher than they are written.This parameter does not affect the note number that is stored for each note event. When the clip is displayed in other views, like the Piano Roll, Staff, or Event List view, you will see the original notes as they are stored in the file. To permanently change the pitches, you can edit them individually or use the **Process > Transpose** command.

If the key offset value transposes the key number (MIDI note) outside the allowable MIDI range (0–127), the key number will be transposed to the lowest or highest octave within that range.

You can use the Key+ parameter to assist in preparing scores for instruments whose music is written in something other than "concert" key (such as Bb trumpet). For more information, see "Music notation for non-concert-key instruments" on page 1111.

When you edit the Key+ parameter, pressing [or] changes the value by 12 instead of by 10. This makes it easy to transpose by octaves.

To set the key offset for a track

1. Select the track and open the Track Inspector.
2. In the Track Inspector, click the **Key+** control.
3. Enter a value (1 = a semitone), or press the + or – key to change the key by a single semitone. Use the [or] key to change the key by 12 semitones (one octave).

Figure 54. *The Track Inspector contains advanced MIDI controls.*
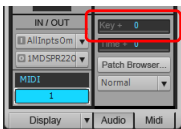
Adjusting the note velocity (Vel+)

Each MIDI note event has a velocity, which represents how fast the key was struck when the track was recorded. On playback, the *velocity offset* parameter adjusts the velocity data for all notes in the track by the designated amount. The value can range from -127 to +127. The effect of changing velocities depends on the synthesizer. Some synthesizers do not respond to velocity information. For others, the effect varies depending on the sound or patch you have chosen. Normally, higher velocities result in louder and/or brighter-sounding notes.This parameter does not affect the velocity that is stored for each note event. When the clip is displayed in other views, like the Piano Roll view, Staff view, or Event List view, you will see the original velocities as they are stored in the file. You can edit the velocity values in those views, or use the **Process > Scale Velocity** or **Process > Find/ Change** command. Velocity is different from volume in that it is an attribute of each event, rather than a controller that affects an entire MIDI channel. Here's an example of where this distinction might be important. Suppose you have several tracks containing different drum parts. All of these parts would probably be assigned to MIDI channel 10 (that's the default channel for percussion in General MIDI). If you change the volume setting for any track that uses channel 10, all the different drum parts—regardless of what track they're in—would be affected. If you change the note velocity for one drum track, it will be the only one whose volume is affected.

To set the velocity offset for a track

1. Open the Track Inspector or Console view.
2. Select the track you want to edit.
3. Adjust the Vel+ knob at the top of the channnel stip.

Adjusting the time alignment of a MIDI track (Time+)

Each event takes place at a known point in the project. On playback, the *time offset* (Time+) parameter adjusts the times for MIDI events in the track by the designated amount. The value can be as small as a single clock tick or as large as you want.This parameter can be used to make a part play behind the beat or in front of it or to compensate for tracks that sound rushed or late. The time shift can be used to create a chorus or slap-back echo effect by making a copy of a track and then applying a small offset to the copy. You can use larger time offsets to shift a track earlier or later by several beats or measures.Note that you cannot shift any event earlier than 1:01:000. For example, if the first event in the track starts at 2:01:000, you cannot shift its start time earlier by more than one measure.

This parameter does not affect the time that is stored for each note event. When the clip is displayed in other views, like the Piano Roll, Staff, or Event List view, you will see the original times as they are stored in the file.

To set the time offset for a track

1. Select the track and open the Track Inspector.

2. In the Track Inspector, click the **Time+** control.

3. Enter a value, or press the + or – key until you reach the value you want.

Figure 55. *The Track Inspector contains advanced MIDI controls.*
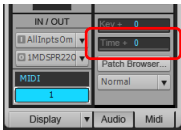
Other MIDI playback settings

Two other MIDI settings can affect what happens when you play back your project, as described in the following table.

Option	How it works
Zero Controllers When Play Stops	If this option is enabled, SONAR zeroes (resets) the pitch wheel, the pedal Controller, and the modulation wheel Controller on all 16 MIDI channels whenever playback is stopped. It also sends a "Zero All Continuous Controllers" MIDI message, which turns off other continuous Controllers on newer synthesizers. If you experience frequent stuck notes when playback stops, try checking this option.
Patch/Controller Searchback Before Play Starts	If this option is enabled, SONAR searches for and sends the most recent patch change, wheel, and pedal events on each output and MIDI channel before starting playback. This ensures that all these settings are correct, even if you start playback at an arbitrary point in your project.

Table 27.

To set these options, go to **Edit > Preferences > Project - MIDI**. If you have set up a playback loop, enabling either of these options can cause an audible delay when the loop is restarted.

See:

Controlling live MIDI playback—MIDI echo

When you play your MIDI keyboard or controller, the sound that SONAR produces is determined by what hardware or software synth SONAR sends the incoming MIDI data to after SONAR receives the data. This is called MIDI echo. By default, SONAR sends the data to the MIDI output or software synth listed in the **Output** field of the *current track*. The current track is the one whose titlebar has the lighter color—press the up and down arrows on your computer keyboard and watch each track turn lighter in succession as you change different tracks into the current track (you can also click any of a track's controls to make it current).

However, you can echo MIDI data to much more than just the current track, or turn echoing off on the current track if you want. With a single keyboard or controller, you can echo MIDI data to as many MIDI tracks as you want, meaning that you can simultaneously play as many hardware and software synths as you can hook up to your MIDI interface or run on your computer. You can also have multiple performers on different controllers sending MIDI data to either the same synth or multiple synths. Each SONAR track allows you to select what MIDI input ports and channels the track will respond to. The **Output** field of the track determines what instrument will sound when the track receives the data. Each track's **Input Echo** button determines whether the track echoes MIDI data.

The Input Echo button

Each MIDI track has an **Input Echo** button, which controls whether the track will echo MIDI data or not. The button has three states: On ![on], Auto ![auto], and Off ![off]. When the button is on, the track echoes MIDI data. In Auto mode, the track echoes MIDI data because the track is the current track. When the button is off, the track does not echo any data, even if it is the current track. The Off position on a current MIDI track is only available if you disable the **Always Echo Current MIDI Track** option in **Edit > Preferences > MIDI - Playback and Recording**. The Auto position becomes unavailable with this setting.

There are several ways to turn Input Echoing on:

• Click a track's **Input Echo** button so that it is on.

• Click a track to make the track the current track (if the **Always Echo Current MIDI Track** option in **Edit > Preferences > MIDI - Playback and Recording** is enabled). In this situation (which is the default), if the track's **Input Echo** button is not on, the button appears as ![auto] to indicate that this track echoes data because it is the current track.

• If the **Always Echo Current MIDI Track** option in **Edit > Preferences > MIDI - Playback and Recording** is disabled, make a track the current track, and click the track's **Input Echo** button ![on].

Storing favorite configurations

If you want a track to respond to more than one port or channel, you must create a preset input configuration. If you create some favorite configurations of MIDI input options, not only will they be stored with the project you created them in, but you can save each one as a preset to load in any MIDI track in any project you want. Clicking the drop-down arrow in a track's **Input** field displays the **Inputs** drop-down menu, which has the **Manage Presets** choice that allows you to create and store your favorite combinations of MIDI input choices.

To play one synth at a time from one or more MIDI keyboards

• Since this is SONAR's default behavior, simply use the UP ARROW or DOWN ARROW keys on your computer keyboard to choose the current track (the current track is highlighted), and use the Track Inspector or Console view to choose the synth you want to play by using the track's **Output, Bank, Patch**, and **Channel** fields. With the default behavior, all MIDI input from all ports and channels is merged and sent through the current track. Notice that the track's **Input** field says **Omni**.

• If you've disabled the default behavior (see next procedure), you must make sure that the current track's **Input Echo** button is lit up (on) before you can play the synth that the track is patched to.

To disable the default MIDI echo setting

• If you want to turn off the automatic MIDI echoing of the current track, disable the **Always Echo Current MIDI Track** in **Edit > Preferences > MIDI - Playback and Recording**. If you then turn off the current track's **Input Echo** button ⏹ and play your keyboard, SONAR will not produce sound.

To play multiple synths from a MIDI keyboard

1. Choose a synth for each track that you want to play by using each track's **Output, Channel, Bank**, and **Patch** fields in the Track Inspector or Console view.

2. In the **Input** field of each track that you want to play, click the drop-down arrow and choose the MIDI input port and channel that you want the track to respond to from the following options:

   • **None.** This option actually sets the **Input** field to **Omni**. With this setting the track will respond to any MIDI input coming in on any port (MIDI interface input driver) on any channel.

   • **(name of MIDI input driver) > MIDI Omni.** Choosing this option causes the track to respond to any MIDI channel coming from the named MIDI interface input driver.

   • **(name of MIDI input driver) > MIDI ch 1-16.** Choosing this option causes the track to respond ONLY to whatever MIDI channel you choose coming from the named MIDI interface input driver.

   • **Preset.** If you've created any preset collections of input ports and channels, you can select one here.

   • **Manage Presets.** If you want to create or edit any preset collections of input ports and channels, you can select this option (see following procedure).

3. Make sure that the **Input Echo** button ⏹ on each track that you want to play is turned on.

To create or edit a preset input configuration

1. In the **Input** field of a track that you want to select inputs for, click the drop-down arrow and choose **Manage Presets** from the drop-down menu.

   The **MIDI Input Presets** dialog box appears.

2. In the **Input Port** column, find the input port that you want to use for this track (if you only use a single-port MIDI interface, you'll only see one choice).

3. To the right of the input port, select the MIDI channels that you want this track to respond to on this MIDI port.

4. Select channels for any other MIDI port that's listed, if you want to use channels on that port also.

5. If you want to save this configuration, type a name for it in the window at the top of the dialog box, and click the **Disk** icon to save it.

Now, when you choose inputs for other tracks, you can choose the preset you saved by clicking the **Presets** option in the track's **Input** drop-down menu. If you want to edit a preset, select it in the top window of the **MIDI Input Presets** dialog box, edit it, and click the **Disk** icon. If you want to delete a preset, select it in the same dialog box and click the **X** button to delete it.

To use multiple performers on multiple tracks

1. For performer number 1, click the **Input** drop-down menu(s) of the track(s) you want that performer to play, and choose the port and MIDI channel that performer 1's keyboard is sending data to SONAR on.

2. Repeat step 1 for all other performers.

3. If there is any track that you want more than one performer to play, create a preset of the input ports and channels that you want that track to respond to (see previous procedure).

4. Make sure the **Input Echo** button ![Input Echo icon] is on for each track you want to play.

To turn MIDI echo (and input monitoring) on or off for all tracks

Click the **Input Echo On/Off All Tracks** button ![Input Echo icon] in the Control Bar's Mix module.

Figure 56.   *The Mix module.*

See:

"Local control" on page 232

Local control

You should normally disable the Local Control setting on your master keyboard to prevent notes from being doubled when you play your keyboard. If you disable Local Control, your keyboard sends notes that you play to SONAR, which echoes them to the synthesizer, which plays them only once.

When SONAR starts, you can have it send a special MIDI message that attempts to disable Local Control automatically. Most modern synthesizers respond to this message. If yours does not, you will need to disable Local Control every time you turn it on for use with SONAR.

To automatically disable all local control whenever you launch SONAR

1. In the directory where SONAR is installed, double-click on the `TTSseq.ini` file to open it.
2. In the `[Options]` section, add the line:

   `SendLocalOff=1`
3. Save the file and close it.
4. When you launch SONAR, it automatically sends a Local Off message to your keyboard.

Note: *Not all keyboards respond to Local Off messages.*

See:

Playing files in Batch mode

SONAR allows you to play several files in sequence automatically using the Play List view. You can use this feature in live performance applications or just for fun.

SONAR's Play List view lets you create and work with a series of project, MIDI, and bundle files. As each file plays, SONAR loads it and displays it in the Track view and other views like any other project file.

See:

The Play List view

The Play List view lets you create, edit, and save a **play list** (or **set**) of up to 999 SONAR projects. Once you have created the list, you can play back the entire sequence automatically. You can even program the list to pause between songs for a fixed amount of time or to wait for a keystroke before proceeding.

The Play List view looks like this:

Figure 57. *The Play List view*
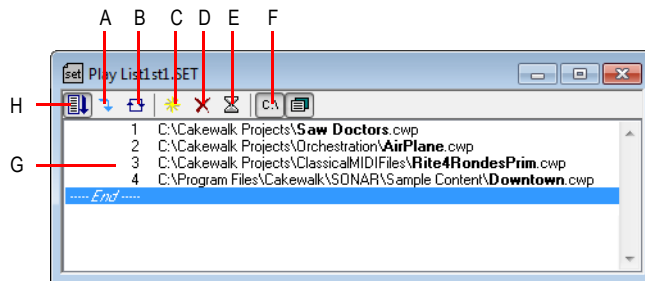
A. Switch to the next song B. Repeat the list C. Add a song D. Drop a song E. Set a delay F. Display full path G. List of songs H. Enable the play list

Play lists can be saved for future use. Play list files have the extension .set.

To create and edit a play list

To create and edit a play list in the Play List view, follow the instructions in the table:

To do this	Do this
Open an existing play list	Choose **File > Open**, choose **Play List** from the **Files of Type** list, choose the file you want and click **Open**
Create a new play list	Choose **File > New,** choose **Play List Set** from the list, and click **OK**
Add songs to the play list	Click ⁂ or press INSERT, choose a file from the **Add Song to Play List** dialog box, and click **Open**
Set the delay after a song	Click on the song in the play list, click ⧖, enter the delay you want, and click **OK**
Change the order of songs	Drag the file to a new location in the play list
Copy a song to another location in the play list	CTRL-drag the file to a new location in the play list
Remove a song from the play list	Select the song and click ✕ or press the DELETE key
Save the play list	Choose **File > Save**; or choose **File > Save As**, enter a file name, and click **Save**

Table 28.

To play files from the Play List view

To play back files from the Play List view, follow the instructions in the table.

To do this	Do this
Activate the play list	Click ▣↓ in the **Play List view** toolbar so that the button is pressed. If this button is not pressed, only a single file will play when you start playback.
Choose the starting song	Double-click the file you want to start with. The project is opened and displayed as usual.
Start playback	Click ▶ in the Control Bar or press the SPACEBAR.
Stop playback	Click ■ in the Control Bar or press the SPACEBAR.
Skip to the next file	Click ↴ in the **Play List view** toolbar.
Loop continuously over the play list	Click the ⟳ button in the **Play List view** toolbar.
Show or hide file name extensions and folder names (path)	Click the C:\ button to enable or disable the display of folders.

Table 29.

Video playback, import, and export

Video files play in the Video view in real time as your project plays. You can also view your video on an external DV device connected to an IEEE 1394 port ("FireWire").

The **File > Import > Video** command lets you include the following video file types in your project:

- AVI (also called Video for Windows).
- MPEG.
- Windows Media Video.
- QuickTime (.mov files only). SONAR supports QuickTime 7, including H.264 support and the ability to import AAC audio files.The **File > Export > Video** command lets you export your audio tracks and your imported video as the following file types:

> **Note:** *Some .mov and .avi files contain no video. You can't import these files with the **File > Import > Video** command. You must use the **File > Import > Audio** command instead, and set the **Files of Type** field to **All Files**.*

- AVI (also called Video for Windows)
- Windows Media Video
- QuickTime

SONAR also has a Video Thumbnails pane at the top of the Track view, which shows individual frames of your video at different places in your project (See for more information).

You open the Video view by using the **Views > Video** command*.* The Video view displays the Now time (as in the Big Time view) and the video itself. The display in the Video view is synchronized with the Now time, giving you convenient random access to the video stream. This makes it easy to align music and digitized sound to the video.

Commands in the Video view's right-click pop-up menu let you set the time display format, the size and stretch options for the video display, the video start and trim times, and other options.QuickTime issues

In order to import/export QuickTime files in SONAR, you must install both the filters AND QuickTime. The following are some other known QuickTime issues:

- It is presently only possible to export QuickTime videos on a 32-bit system. This is a limitation of QuickTime, not SONAR.
- QuickTime Import/Export requires version 6.5.1 or higher of the QuickTime Player to be installed. The QuickTime Player is not included with SONAR, but can be downloaded separately from Apple's web site (www.apple.com/quicktime/download/win.html).
- Audio mixdown to QuickTime must be set to 16 bits stereo or mono, or the resulting export will create a unusable file or abort with an error.
- Audio mixdown to QuickTime must be set to 48 KHz or less or the resulting export will create a file

that plays back incorrectly.

- When exporting to QuickTime, the frame rate of the QuickTime video compressor will default to "best possible". Since not all movies in a SONAR video project correctly report their frame rate, the best practice is manually enter the desired frame rate. This is done in the video settings of the QuickTime video compressor.

- Exports to QuickTime from a SONAR video project created from an AVI using the Indeo video compressor will create a movie with white frames.

- Exports to QuickTime may have an extra white frame on the last frame of the movie. This extra frame can be removed with the QuickTime Pro Player or another QuickTime editing application.

See:

Importing and playing back videos

Here are step-by-step procedures for inserting and playing back videos:

To load a video file into a project

1. Choose **File > Import > Video**, or choose **Insert** from the Video view's pop-up menu.

   The **Import Video** dialog box appears. In the **Files of Type** field, select the kind of video file you're looking for.

   Tip: *You can also drag a video file from the Browser and drop it on the Video Thumbnails pane.*

2. Select a file.

3. Check the **Show File Info** option to display information about the file in the **File Info** section of the dialog box.

4. Check the **Import Audio Stream** option if you want to load the file's audio data.

5. Check the **Import As Mono Tracks** option if you want to import the file's audio data as one or more mono tracks.

6. Click **Open**.

SONAR loads the video file and displays it in the Video view. If you choose to import audio data, SONAR inserts a new track above the currently selected track, and puts the audio data in a clip or clips on the new track.

Note 1: *When you save a project that contains video, SONAR saves the project's video file by reference only; the actual video data remains in the original file. Video data is not saved in bundle files, so it must be backed up on its own.*

Note 2: *After you load a video file into a project, you can play it back either in the Video view, or on an external DV device through a FireWire port. See "Video playback on a FireWire DV device" on page 244 for more information.*

To play a video file in the Video view

1. Open the Video view by choosing **Views > Video**.

2. Press the SPACEBAR to play or stop video playback.

3. To change the display size of the video, right-click in the Video view and choose **Stretch Options > [desired size]** from the pop-up menu.

Note: *When you play a video file that has high temporal compression, such as movies optimized for web delivery, playback may not be smooth unless you disable video thumbnails, (see "Using the Video Thumbnails pane" on page 242 for more information).*

To delete the video from the project

1. Open the Video view by choosing **Views > Video**.

2. Right-click in the Video view and choose **Delete**.

SONAR removes the video from the project. Note that imported audio data is not deleted.

To enable or disable video playback

1. Open the Video view by choosing **Views > Video**.

2. Right-click in the Video view and choose **Animate**.

If your computer is not fast enough to play back video efficiently, you can get better performance by temporarily disabling video animation during playback.

To set the Time display format

• Click the time display to cycle between **MBT**, **SMPTE**, **Frames** and **None**

   Or

• Right-click in the Video view and choose an option from the **Time Display Format** menu:

To do this	Do this
Select a time format	Choose **MBT, SMPTE, Frames or None**
Change font or font color	Choose **Font** and select new font characteristics
Turn off the time display	Choose **None**

Table 30.

To adjust the SMPTE time

1. Move the Now time to the place where you want SMPTE time to be either 00:00:00:00, or a number you can enter.

2. Use the **Project > Set Timecode At Now** command to open the **Set Timecode At Now Time** dialog box.

3. If you want to set SMPTE time to 00:00:00:00 (the dialog's default value) at the current Now time, click **OK** to close the dialog box. If you want to set SMPTE time to some other value at the current Now time, type that value into the **SMPTE/MTC Time** field, and click **OK** to close the dialog box.

To choose a frame rate

Do *one* of the following:

• Go to **Edit > Preferences > Project - Clock** and choose the frame rate you want from the six choices, then click **OK**.

• In the Control Bar's Sync module, click the Timecode Format list and select the desired format.

For more information, see "SMPTE/MIDI time code synchronization" on page 1162).

To set the Video display format

Right-click in the Video view and choose an option from the **Stretch Options** menu:

To do this	Do this
Display the video in its original size	Choose **Original Size**
Stretch the video to fill the Video view	Choose **Stretch to Window**
Stretch the video as much as possible while preserving the original aspect ratio	Choose **Preserve Aspect Ratio**
Make the video display as large as possible, but only enlarge by integral multiples	Choose **Integral Stretch**
Display the video in full screen mode	Choose **Full Screen**

Table 31.

SONAR adjusts the video display according to the selected option. The stretch option is used to recalculate the video display size whenever you resize the Video view.

To set the background color

• Right-click in the Video view and choose a color option from the **Background Color** menu.

To set the Start and Trim times

1. Right-click in the Video view and choose **Video Properties**.

2. Set options as described in the table:

Option	What it means
Start Time	The time in your SONAR project at which you want the video file to start playing
Trim-in Time	The time in the video file at which you want video playback to start
Trim-out Time	The time in the video file at which you want video playback to stop

Table 32.

SONAR synchronizes the video to the project according to the specified Start and Trim times.

Note: *The project's video file is saved in the project by reference only, the actual video data remains in the original file. Video data is not saved in bundle files, so it must be backed up on its own.*

See also:

Exporting video

After you've mixed your audio tracks the way you want them, you can export the inserted video file together with your audio tracks to create a new video file.

When you export a video, any changes you've made to the Start, Trim-In, or Trim-Out times determine how long your new exported video is compared to the original video that you inserted into your SONAR project.

Note: *If you're exporting an AVI file, the **No Compression** option in the **Video Codec** field of the **AVI Encoder Options** dialog box is a good choice. This choice does not change or compress your source video material. If you want your exported AVI file to be compressed, the **Cinepak** option will create an AVI file that plays back smoothly with decent quality. The **MJPEG** option will create an AVI file that does not play back as smoothly, but is a high quality format to archive a file in.*

To export a video

1. Make sure your audio tracks are completely mixed, and your video Start time, Trim-In time, and Trim-Out time are set the way you want them.

2. Use the **File > Export Video** command.

   The **Export Video** dialog box appears.

3. In the **File Name** field, type a name for your new video.

4. In the **Files of Type** field, choose the kind of video file you want the exported file to be.

5. Click the **Encoding Options** button to open a dialog box of encoding options for the kind of file you're creating. *Some codecs do not work:* click the **Help** button in the dialog box for help choosing options.

   Note: *If you're exporting an AVI file to either a 24-bit audio format or to a multi-channel (surround sound) format, set the Audio Codec in the AVI* **Encoding Options** *dialog box to* **No Compression***.*

6. Click the **Audio Mixdown Options** button to open a dialog box of audio mixdown options. Click the **Help** button in the dialog box for help choosing options.

7. Click **Save** to export your video.

Optimizing video performance

Here are a few tips to optimize video performance:

- Viewing your video in on an external DV device will significantly decrease the processor load on your computer if the video stream is a DV AVI file. See "Video playback on a FireWire DV device" on page 244 for more information.

- If you intend to do a lot of seeking around or looping and editing while a video file is loaded, make sure that your video file has sufficient keyframes. Since each frame has to be computed from the last keyframe encountered, if you have very few keyframes in the video, performance may be slow. To change the number of keyframes, you may recompress the file using the **File > Export Video** command and specify more frequent keyframes. Choose a suitable video compressor such as Cinepak and change the KeyFrame Rate parameter to a number between 1-5. A value of 1 makes every frame a keyframe, and higher numbers insert a keyframe after that many frames.

- Changing the video properties of an AVI file, such as Trim and Start time, can make realtime performance slightly slower. You can make these changes permanent (and thereby reduce the load on your CPU) by using the **File > Export Video** command, and then re-importing the file.

- Playing videos at a resolution (video size) of 320x240 is usually a high enough resolution to monitor the video while you're composing a soundtrack. You can still choose to stretch the video to full screen at this resolution. You set the video size on the **Render Quality** tab of the **Video Properties** dialog box. Using a higher resolution can bog down your computer if you're processing audio tracks at the same time.

See also:

"Using the Video Thumbnails pane" on page 242

Using the Video Thumbnails pane

At the top of the Track view in SONAR is the Video Thumbnails pane, which displays individual frames of your video at certain time intervals of your project. The time interval between displayed frames is determined by the zoom level you choose. If you zoom in far enough, you can view each individual frame of your video.

> **Note 1:** *If you're playing back a highly compressed movie (not many keyframes in the file), it can take about a minute to redraw video thumbnails when you're playing the movie or resizing a window.*

> **Note 2:** *Some Windows Media videos do not report their frame rate to SONAR. SONAR can play these files, but cannot create thumbnails from them, so no thumbnails appear in the Thumbnail pane.*

Figure 58. *The Video Thumbnails pane*

*A. Show/hide frame numbers button **B.** Show/hide thumbnails button **C.** Video track strip **D.** Splitter bar*
E. Frame number

Here are the various commands and functions of the Video Thumbnails pane:

- You can show or hide the pane.
- You can show or hide the video thumbnails.
- You can display absolute frame numbers.
- You can resize the thumbnails while preserving the aspect ratio by dragging the splitter bar.
- The video track strip at the top of the Track pane has display fields for **Video File Name**, **Start Time**, **Trim-In Time**, **Trim-Out Time**, **Duration**, and **Current Frame**, as well as a toggle buttons to show/hide the thumbnails (without hiding the Video Thumbnails pane), and to show/hide frame numbers on individual frames. You can edit the **Start Time**, **Trim-in Time**, and **Trim-Out Time** fields.
- SONAR saves the size and state of the Video Thumbnails pane on a per/project basis.
- The Video Thumbnails pane zooms horizontally when you use the standard Track view

commands for horizontal zooming. You control the height of the Video Thumbnails pane by dragging the splitter bar up or down that's at the bottom of the Video Thumbnails pane.

For step-by-step instructions, see the following procedures:

To hide or show the Video Thumbnails pane

Do *one* of the following:

• Drag the splitter bar that separates the Video Thumbnails pane from the Clips pane.

• Click the Track view **View** menu and choose **Video Thumbnail Show/Hide**.

• Press the V key.

To turn Video thumbnails On or Off

Do *one* of the following:

• Right-click the Video Thumbnails pane or the Video Thumbnails track strip and choose **Show/Hide Thumbnails** on the pop-up menu.

• Click the **Show/Hide Thumbnails** button ▦ in the Video Thumbnail track strip.

To hide or show frame numbers on frames

• In the video track strip, click the **Show/Hide Frame Numbers** button ⑧.

To open the Video Properties dialog

• Double-click the video track strip.

To open the Video view

• Double-click the Video Thumbnails pane.

To move the Now time to a thumbnail

• Click the thumbnail.

To change the Start time

• In the video track strip, click the **Start** field, type a new number in Measure/Beat/Tick format, and press ENTER. The start time is the time in your SONAR project at which your video starts to play.

To change the Trim-In time

• In the video track strip, click the **Trim-In** field, type a new number in SMPTE format, and press ENTER (you can press the SPACEBAR instead of typing colons, if you want, and you can type single zeros instead of double zeros). The **Trim-In** time is the time in your video file at which you want to start video playback.

To change the Trim-Out time

- In the video track strip, click the **Trim-Out** field, type a new number in SMPTE format, and press ENTER (you can press the SPACEBAR instead of typing colons, if you want, and you can type single zeros instead of double zeros). The **Trim-Out** time is the time in your video file at which you want to stop video playback.

To use the Video Thumbnails context menu

1. Right-click the Video Thumbnails pane or the Video Thumbnails track strip.
2. Choose any of these options from the pop-up menu that appears:
   - Show/Hide Thumbnails
   - Display Absolute Frames
   - Open Video View
   - Insert Video
   - Delete Video
   - Export Video
   - Video Properties

Video playback on a FireWire DV device

You can view your video projects on an external FireWire DV device.

Note: *This feature will decrease the processor load to your computer if the video stream is a DV AVI file. If the stream is not DV AVI, the CPU load will significantly increase, compared to playing back onscreen with SONAR's Video view.*

To convert a Video project to DV AVI format

1. Use the **File > Export Video** command.

   The **Export Video** dialog box appears.
2. In the **File Name** field, type a name for your new video.
3. In the **Save as Type** field, choose **Video for Windows**.
4. Click the **Encoding Options** button to open the **AVI Encoder options** dialog box, and choose **DV Video Encoder** in the **Video Codec** field. Click **OK**.
5. Click the **Audio Mixdown Options** button to open a dialog box of audio mixdown options. Choose the audio options you want, but remember that if you plan to save the project to DV tape, choose the following audio format:
   - **Channel Format.**   Choose **Stereo**.
   - **Sample Rate.**   Choose **48000**.
   - **Bit Depth.**   Choose **16**.

6. Click **Save** to export your video.

Once you save the video file, it can be re-inserted into a project (see "Importing and playing back videos" on page 237). If the project will ultimately be exported to tape, that project will need to have an audio sample rate of 48 KHz playing back at 16 bits.

To play video on an external DV device

1. Connect your external FireWire device. Make sure Windows recognizes the device, and displays the device's icon on the Windows taskbar.

2. Launch SONAR and open your video project.

3. In SONAR's video view (**Views > Video** command), right-click the Video view and choose **External DV Output > <*name of external DV device*>** from the pop-up menu.

4. Play your SONAR project.

The video disappears from the Video view and appears on your external monitor or camcorder. Leave the Video view open so that you can move the Now Time frame-by-frame with the Video view keyboard shortcuts.

If the Video view is the active window, you can use keyboard shortcuts to advance by a frame or a frame increment. The +/-, and left/right arrow keys move forward/backwards by a single frame. If you hold down the CTRL key, then the frame increment value is used (default = 5 frames). You can also use the [and] keys to seek by the frame increment.

If your video does not play back in sync with your audio, see "Synchronizing external video playback to audio" on page 246.

External DV output (IEEE 1394/FireWire)

SONAR relies on the Microsoft AV/C drivers to communicate with DV devices that are connected to a IEEE 1394 FireWire bus on your computer, in order to control and preview video to digital video devices.

If another software application overwrites or disables these drivers, the Preview to FireWire and Print to Tape feature may not function correctly. If you are going to install a software application that uses DV devices connected to the IEEE 1394 FireWire bus, please check with the software vendor about DV device drivers it may install. Also, please check with the manufacturer of your DV device for AV/C-compliance information. The following devices have been tested and known to work properly with SONAR:

• ADS Pyro A/V Link DV transcoder

• Canopus ADVC-100 DV transcoder

• Canon ZR-85 miniDV camcorder

Note: *When using DV AVI movies, the transcoding unit must be set to the same format (NTSC or PAL) as the video file, or Preview to FireWire and Print to Tape will fail to work properly. Also, CPU consumption will be lower when the source material is in DV format, since the format is native to the FireWire device and doesn't incur a CPU hit for transcoding video.*

Exporting a project to a FireWire DV device

Once your project sounds the way you want it to, you can export the video and audio together to an external FireWire DV device. This is called "printing to tape," if your external device uses tape.

To export a project to an external DV device

1. Use the **File > Export > Video** command to open the **Export Video** dialog box.
2. In the **Save as Type** field, choose **AVC Compliant Device**. You might see a different name in the drop-down menu, depending on what type of external device you are using.
3. Click the **Audio Mixdown Options** button to open the **Audio Mixdown Options** dialog box.
4. In the **Audio Mixdown Options** dialog box, choose the following options, and then click **OK**:
   • **Channel Format.**   Choose **Stereo**.
   • **Sample Rate.**   Choose **48000**.
   • **Bit Depth.**   Choose **16**.
5. In the **Export Video** dialog box, click the **Encoding Options** button to open the property page of your external device.
6. In the property page, use the transport controls to position the tape in your external device to a blank area for recording.
7. Close the property page, and click the **Save** button in the **Export Video** dialog box to start exporting. If you're printing to a device that uses tape, the tape stops rolling when the export process is finished.

Synchronizing external video playback to audio

Because there is more latency in FireWire video playback than in computer digital audio playback, video playback on an external device will probably be playing back later than the audio tracks in SONAR.

To sync external video to audio

1. Right-click the Video view and choose **Video Properties** from the pop-up menu to open the **Video Properties** dialog box.
2. On the **Render Quality** tab of the dialog box, under **External DV Output**, enter an offset number in the **Video Sync Offset** field. The number you enter here causes the Video to start playing sooner than the audio. It's helpful if your video has some pre-roll footage that contains a visual sync point.

Note: *The offset is accurate to 3 decimal places, e.g. 1 ms (a thousandth of a second). One frame of video is approximately 33 ms long for NTSC and 40 ms for PAL; the offset will typically be less than 1 second.*

3. Click **OK** to close the dialog box. Play your video, and readjust the **Video Sync Offset** number as needed.

Locating missing audio

If you try to open a project and SONAR is unable to locate all the audio files that the project references, the **Find Missing Audio** dialog box appears. The **Find Missing Audio** dialog box helps you find any missing audio in your project.

See:

The Find Missing Audio dialog

Use the **Find Missing Audio** dialog box to find missing audio in your project. The following is a brief description of the options you have in this dialog:

- **Open.** Click this button once you have searched for and found the missing audio file.
- **Skip.** Click this button to move to the next missing file. When you skip and audio file your project opens without that piece of missing audio.
- **Skip All.** Click this button to skip all missing audio files. When you skip all missing audio files, you project opens without those pieces of missing audio
- **Search.** Click this button to begin a search of all available hard drives for your missing audio file.
- **After locating the file Options.** You can choose to either move an audio file to the project's audio data folder, copy an audio file to the project's audio data folder, or leave an audio file in its current folder.

For more information, see .

Restoring missing audio files

When you open a project file that references audio files which SONAR can not find, the **Find Missing Audio** dialog box appears. Use the following procedure to restore the missing audio files to your project.

To restore missing audio files

1. In the **Find Missing Audio** dialog box, click the **Search** button.

    The **Search for Missing Audio** dialog box appears and SONAR begins searching all available hard drives for the missing file or files.

2. When SONAR is finished searching, the files that it has found appear in the dialog box.

3. Select the file or files that SONAR has found and click **OK**.

    The **Find Missing Audio** dialog box appears.

4. Select one of the following options:

    •   **Move file to Project Audio Folder.**   Use this option if you are sure that no other projects are referencing this file in its present location.

    •   **Copy file to Project Audio Folder.**   Use this option if the missing file is shared with another project and you want to keep all of your project's audio files together.

    •   **Reference file from present location.**   Use this option if you want to leave the missing file in its current location now that SONAR knows where it is.

5. Click **Open**.

SONAR moves, copies or references the missing file or files as you instructed.

Managing shared and external files

You may want to share files between projects. The files you want to share may be frequently used sound effects or drum loops. SONAR allows you to choose whether to copy imported audio files to your project's audio data directory or to link to them in their current (external) location.

> **Note:** *External files are defined as any file not in the project's audio data folder (or a subfolder within the project's audio data folder).*

To configure SONAR to always copy files to the project Audio Data folder

If you want to keep all of your project's audio in one folder (your project's audio data directory), go to **Edit > Preferences > File - Audio Data** and select the **Always Copy Imported Audio Files** check box.

To configure SONAR to share external files

SONAR allows you to share external files (files not in the project's audio data directory). There are some exceptions, however. Files that have a different sampling rate or bit depth are always copied to the project's audio data directory. Also, if the **Always Copy Imported Audio Files** option is selected in **Edit > Preferences > File - Audio Data**, imported audio is always copied to your project's audio data directory.

Do the following to ensure that you are sharing files:

1. Go to **Edit > Preferences > File - Audio Data** and clear the **Always Copy Imported Audio Files** check box.

2. In the **Open** dialog box, when importing audio, make sure the **Copy Audio to Project Folder** option is unchecked.

Recording

You can add sound or music to a SONAR project in many different ways. You can record your own material using a MIDI-equipped instrument, use a microphone or another audio input to record digital audio information, or import sound or music data from an existing digital data file. With the Input monitoring feature, you can hear your audio instruments exactly how they sound in SONAR, including any plug-in effects (effects are not recorded, however). When you record audio or MIDI tracks, SONAR displays a wave preview of your recorded data as you record it.

You can also input new material using your computer keyboard or mouse using the Piano Roll view, the Staff view, or the Event List view. For more information about entering music using these views, see "The Staff view" on page 1072, "The Piano Roll view" on page 677, and "The Event List view" on page 742.

See:

Creating a new project

You can add music and sound to an existing project or to a new project. Just as in any Windows program, you open an existing project file using the **File > Open** command, and create a new project file using the **File > New** command.

When you create a new SONAR project, there are some additional parameters you can set to make it easier to work on your project. These include:

- Meter and key signatureMetronome and tempo settings
- Audio sampling rate
- MIDI timing resolutionSee:

Using per-project audio folders

For ease of backing up your audio files in a project, SONAR allows you to use a separate audio folder for each project. This feature is off by default.

To enable per-project audio

1. Go to **Edit > Preferences > File - Audio Data**.
2. Select the **Use Per-Project Audio Folders** check box and click **OK**.

> **Note:** *If you use the default project that is created when you open SONAR, you are not using per-project audio. You must use the **Copy All Audio with Project** option in the **Save As** dialog box to create a per-project audio folder. For more information, see "To save an existing project using per-project audio" on page 1176.*

Creating a new project file

When you create a new project you are asked to choose a template to use for your new file. If you have per-project audio folders enabled (for more information, see "Using per-project audio folders" on page 250), you are also asked to specify a file name, the folder where you want to store the file, and the folder where you want to store the file's audio. You can override per-project audio by unchecking the **Store Project Audio in its Own Folder** option.

SONAR includes a set of templates you can use to create a new project. These templates include common types of ensembles, such as rock quartets, jazz trios, and classical full orchestras. When you create a new project using one of these templates, SONAR creates a project that has MIDI settings predefined so that one track is set up for each of the instruments in the ensemble. SONAR

also includes a template with two MIDI and two audio tracks (called the Normal template). If you are creating a new project that will contain only audio material, use the Audio Only template. If you are creating a new project that will contain only MIDI material, use the MIDI Only template.

You can create your own template files and use them as the basis for other new projects. For more information, see "Templates" on page 1064.

To create a new project file

1. Choose **File > New** to display the **New Project File** dialog box.

Figure 59. *The **New Project File** dialog*
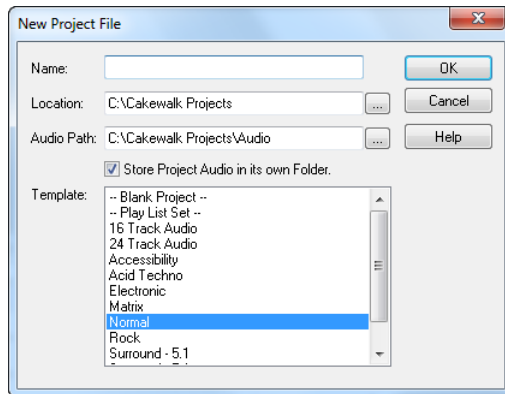
2. If you have the per-project audio folders option enabled, enter a file name, set the folder where you want to store the new file, and set the folder where you want to store the new file's audio.

3. Choose a template from the list.

4. Click **OK**.

SONAR creates the new project file and displays it with the Track view open.

Setting the Meter and Key signatures

By default, a new SONAR project is in 4/4 time and the key of C major. You can change these settings to any desired **"Meter"** on page 1915 or key. These settings apply to all the tracks in a project. You cannot set different meter or key signatures for different tracks.

The meter or key signature of a project can change at any measure boundary. To insert changes in the meter or key signature, use the **Views > Meter/Key** command to display the Meter/Key view, or use the **Project > Insert Meter/Key Change** command. You can also click the Meter display in the Control Bar's Transport module.

If you are creating a new project that will contain only audio material (no MIDI material), you do not need to set the meter and key signature.

> **Note:** *Groove clips do not follow your project's key. Groove clips follow the project pitch that is specified in* **Project > Set Default Groove Clip Pitch**, *in addition to any pitch markers in the Time Ruler. For more information, see* "Working with Groove Clip audio" *on page 659.*

The key signature controls how SONAR displays notes in the Staff view, the Event List view, and elsewhere. The meter tells SONAR the number of beats per measure and the note value of each beat. Common meters include:

- 2/4 (two beats per measure, each quarter note gets a beat)
- 4/4 (four beats per measure, each quarter note gets a beat)
- 3/4 (three beats per measure, each quarter note gets a beat)
- 6/8 (six beats per measure, each eighth note gets a beat)

The top number of a meter, the number of beats per measure, can be from 1 through 99. The bottom number of a meter is the value of each beat. You can pick from a list of values ranging from a whole note to a thirty-second note.

The meter determines the following:

- Where the metronome accents are placed
- How the Now time is displayed
- How the Staff view is drawn
- How grid lines are displayed in the Piano Roll viewTo Set the Meter and Key signature

1. Click the **Views** menu and choose **Meter/Key**.

2. Click ▦ to open the **Meter/Key Signature** dialog box.

   The **Meter/Key Signature** dialog box appears.

Figure 60. *The **Meter/Key Signature** dialog box*
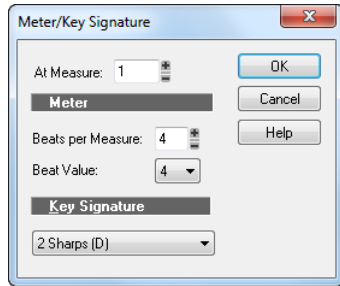
3. Enter the top and bottom meter values in the **Beats per Measure** and **Beat Value** fields.

4. Choose the key signature from the **Key Signature** list.

5. Click **OK**.

You can also set the meter and key signature in the Control Bar's Transport module, or choose **Project > Insert Meter/Key Change**.

Setting the Metronome and Tempo settings

The metronome counts off each beat in a measure, so you can hear the tempo of your project. You can choose to have the metronome sound during recording, during playback, both, or turned off. When you start recording, SONAR can play any number of beats or measures of metronome clicks before recording begins. This can help you "get in the groove" before you start performing. These beats or measures are called the *count-in*.When you create a new project, you should set the metronome to play during the count-in and while recording. If you are adding material to an existing project, you might only need the metronome for the count-in.You can customize the metronome sound to use audio or any note on a MIDI instrument. By default, SONAR uses a hi-hat cymbal sound from a General MIDI drum kit for the MIDI metronome, but you can change this setting to anything you like by changing the MIDI output, MIDI channel, and duration. You can also choose the note and velocity (volume) to use for the first beat of each measure and for all other beats. The metronome settings are stored separately with each project, so you can use different settings for each one.

To enable or disable the metronome during playback or recording, click the **Playback Metronome on/off** button ▶ or **Record Metronome on/off** button ● in the Control Bar's Transport module.

Figure 61. *The Transport module.*

A. Metronome during record B. Metronome during playback C. Click to open metronome settings

To configure metronome settings, click the metronome icon in the Control Bar, right-click the

Playback Metronome on/off button ▶ or **Record Metronome on/off** button ⏺, or go to **Edit > Preferences > Project - Metronome**.

ⓘ **Note:** *If you are synchronized to an external clock source, you cannot use the count-in feature. For more information, see*

To set the tempo and metronome for a new project

1. In the Control Bar's Transport module, click the **Playback Metronome on/off** button ▶ and **Record Metronome on/off** button ⏺.

2. Right-click the **Playback Metronome on/off** button ▶ or **Record Metronome on/off** button ⏺ to show metronome settings.

3. If you want to hear a count-in before recording begins, set the count-in to 1 or more. Select either **Measures** or **Beats** for the count-in.

4. Select **Use Audio Metronome** or **Use MIDI Metronome**.

5. Arm at least one track.

6. Press R or click ⏺ to start recording. The count-in will play, and the Now time will start to advance.

7. If necessary, stop playback and adjust the tempo using the tempo control in the Transport module, the restart playback. Repeat until the metronome plays the desired tempo.

8. Press the SPACEBAR or click ■ to stop recording.

9. Press W, or click ◂◂ to rewind to the beginning of the piece.

Your tempo and metronome settings are now ready. When you save the project file, the metronome and tempo settings will be saved as well.

To change your Metronome settings

1. Do *one* of the following to access metronome settings:

   - Click the metronome icon ▲ in the Control Bar's Transport module.
   - Press SHIFT+F3.
   - Right-click the **Playback Metronome on/off** button ▶ or **Record Metronome on/off** button ⏺ in the Control Bar's Transport module.
   - Go to **Edit > Preferences > Project - Metronome**.

2. Change the metronome settings as indicated in the following table.

To do this	Do this
Enable the metronome during playback	Select the **Playback** check box.
Enable the metronome during recording	Select the **Recording** check box.
Enable the count-in	Enter the number of clicks for the count-in in the **Count-in** box, and select **Measures** or **Beats**. **Note:** The Record count-in always applies if there is a specified value, even if **Playback** and **Record** are not selected.
Use the audio metronome	Select **Use Audio Metronome**.
Use a MIDI note as the sound	Select **Use MIDI Note** and choose the output, channel, and other settings.
Enable beat subdivisions	Select the desired subdivision value in the **Beat Subdivision** list. The selected value is the subdivision for non-accented audible clicks.

Table 33.

3. Click **OK**.

Your metronome settings will be saved with the project file.

To set the MIDI metronome sounds from your MIDI instrument

1. Select a track in the Track view that is assigned to the MIDI device you want to use for the metronome sound.

2. Right-click the **Playback Metronome on/off** button ▶ or **Record Metronome on/off** button ⬤ to show metronome settings.

3. Make sure that the settings in the **Port** and **Channel** fields match those for the track in the Track view.

4. Click on the **Key** box in the **First Beat** or the **Other Beats** section.

5. Play a note on your MIDI instrument. The note number is entered automatically. The velocity is not updated.

6. Click **OK**.

Your metronome settings will be saved with the project file.

For more information about the metronome, see "Project - Metronome" on page 1696.

Setting the audio sampling rate and bit depth

Each SONAR project has an audio "Sampling rate" on page 1918 and an audio driver *"Bit depth"* on page 1910 that indicate the level of accuracy with which audio data are sampled and processed. The same parameters are used for all the digital audio in a project. When you create a new project, if you do not want to use the default setting, you must choose a sampling rate before you start recording audio.

SONAR lets you choose from several different sampling rates: 11025 Hz, 22050 Hz, 44100 Hz, 48000 Hz, 88200 Hz, 96000 Hz, 176400Hz, and 192000 Hz. The default used by SONAR is 44100 Hz, the same rate as audio CDs. However, you may choose a higher rate and later mixdown to 44100. You can also enter any hardware-supported value in the **Sampling Rate** field. Consult your hardware documentation for supported sampling rates.

A higher sampling rate produces better quality sound. However, a higher sampling rate also means that each audio clip takes up more memory and disk space and requires more intensive processing by your computer. If you have an older computer, or a slow hard drive, you might be better off with a lower sampling rate. For more information, see "Improving performance with digital audio" on page 1189.

By default, the audio driver bit depth of audio data is 16 bits. If your sound card supports 18, 20, 22, or 24 bit audio, you can choose to take advantage of these higher resolutions.

If you are creating a new project that will contain only MIDI material (no audio), you do not need to set the audio sampling rate or bit depth. If you import audio from a Wave file or another digital audio file, the sampling rate and audio driver bit depth of the wave file are converted to your default setting, if necessary.

To set the sampling rate and audio driver bit depth for new projects

Note: *If you are planning to move your project to a Digital Audio Tape (DAT) or to some other media via a digital transfer, set your sampling rate and bit depth to match the target unit. For example, use 44,100Hz/16-bit for a project that will be mastered to a CD, so that no sample rate conversion is required.*

1. Go to **Edit > Preferences > Audio - Driver Settings**.
2. Select a value in the **Sampling Rate** drop-down menu, and a value from the **Audio Driver Bit Depth** drop-down menu.
3. Click **OK**.

The sampling rate and audio driver bit depth are saved with the project file.

Sony Wave-64 support

SONAR fully supports reading and writing to the Sony Wave-64 format, which has a limit of 8,388,608 terabytes!

SONAR only creates Wave-64 file when needed. The Wave-64 format allows an application to dynamically switch from classic RIFF WAVE to Wave-64 format even if the data was originally created as a RIFF wave file. SONAR detects when a file will exceed 2GB and will dynamically switch to the new Wave-64 format.

The following table shows the maximum duration for a stereo WAVE file before we hit the 2GB limit, as well as the max duration for a stereo Wave-64 file before we hit the 8,388,608 terabyte limit.

Sample Rate	Bit Depth	RIFF-Wave	Sony Wave-64
44,100 Hz	16	3.38 hours	14,524,080,431 days
44,100 Hz	32	1.69 hours	7,262,040,215 days
44,100 Hz	64	50.7 minutes	3,631,020,108 days
192,000 Hz	16	46 minutes	3,335,999,724 days
192,000 Hz	32	23.3 minutes	1,667,999,862 days
192,000 Hz	64	11.65 minutes	833,999,931 days

Table 34.

When Wave-64 Files are created

Wave-64 files are created behind the scenes automatically under the following usage scenarios:

• When the number of samples recorded exceeds the file size limit of a 32-bit RIFF WAV file (approximately 2GB file size).

• When you export, bounce or freeze tracks or clips and the resultant wave size exceeds 2GB.

• When you destructively process audio effects on a SONAR clip whose duration exceeds 2GB.

• When you import audio and choose a wave file that exceeds 2GB in size (this could be a Wave-64 file).

• When you save a CWB file and the size of any chunk in the CWB file exceeds 2GB, the entire CWB is saved in the new Wave-64 format.

Note: *64-bit CWB files are incompatible with previous versions of SONAR.*

64-bit CWB files

CWB files are RIFF files with multiple WAVE chunks. Therefore, CWB files in previous versions of SONAR were subject to the same file size limitations of normal RIFF Wav files. This could potentially result in a CWB file that failed to save because a chunk was too large.

SONAR will automatically use the Wave-64 format if a CWB file exceeds 2GB.

Note: *64-bit CWB files are incompatible with previous versions of SONAR.*

Wave-64 file extension

Wave-64 files have a .w64 extension associated with them. Whenever a Wave-64 file is written, SONAR saves it with an extension of w64.

CWP file persistence for 64-bit sample offsets

The SONAR project file format supports writing 64-bit sample offsets for regions and clips. When a project containing 64-bit sample times is detected, saving that project automatically rewrites it in this new format.

Note: *Projects that contain 64-bit sample times are incompatible with SONAR 6 and earlier.*

Setting the MIDI timing resolution

Each SONAR project has a setting for the timing resolution, or *timebase,* that indicates the resolution of MIDI data. This resolution is measured in ticks or pulses per quarter note and is often abbreviated as PPQ. The default resolution is 960PPQ, which is accurate enough for most applications. In this timebase, each quarter note is represented by 960 ticks, each eighth note by 480 ticks, each eighth-note triplet by 320 ticks, and so on.

In some projects you may need a different timebase. For example, if you wanted to use eighth-note septuplets (7 eighth notes per quarter note) and represent them accurately, you would need to have a timebase that is divisible by 7, such as 168PPQ. SONAR uses the timebase you choose for a project to determine the range of tick values in the Now time.

To set the timebase for a project

1. Go to **Edit > Preferences > Project - Clock**.
2. Choose the timebase you want from the **Ticks per Quarter Note** list.
3. Click **OK**.

The timebase will be saved with the project file.

Preparing to record

To prepare for recording, you need to do the following:

- Set the recording mode.
- Choose your input(s).
- Arm one or more tracks for recording.
- Check your recording levels (audio only).
- Tune your instrument if necessary (audio only).
- Set the Now time to the point where recording should start.
- Start recording.

After you record, you can use the **Edit > Undo** command to erase the most recently recorded material. You can use the **Edit > Redo** command to restore the recording and toggle between **Undo** and **Redo** as many times as you like. If you are using MIDI Sync or time code sync for the clock source, SONAR waits to receive external timing data before it begins recording. For more information, see "Synchronizing your gear" on page 1153.

See:

Recording modes

Any material you record is stored in a new clip. If you record into several tracks at once, one clip is created in each track. If you record into a track that already contains clips, you can choose one of three *recording modes* to determine what happens to those clips. When you save your project, you also save whatever recording mode you choose together with that project:

Recording mode	How it works
Sound on Sound	The new material is merged with any existing material. This means that any existing clips on the track are left unchanged and all newly recorded material is stored in new clips. While recording, you will be able to hear material from existing clips.

Table 35.

Recording mode	How it works
Overwrite	The new material replaces (overwrites) any existing material. This means that portions of existing clips may be "wiped clean" to make room for newly recorded material. While recording, you will not be able to hear material from existing clips.
Auto Punch	Recording only takes place between the punch-in and punch-out times. You can use **Auto Punch** in either Sound on Sound or Overwrite mode.

Table 35.

To choose a recording mode

Do *one* of the following:

- Right-click the Record button to open recording settings, then choose the desired recording mode.
- Go to **Edit > Preferences > Project - Record**, then choose the desired recording mode.

SONAR saves your recording options with each project, so you can save a different recording mode with each of your projects.

Choosing an input

To record into a track, you must choose an input for the music or sound to be recorded. Usually, you choose **All Inputs - Omni** to record material from a MIDI instrument, or the left or right channel of a digital audio device (such as a sound card) to record audio material, or stereo if you want to record stereo audio in a single track. The input for each track is displayed in the track's **Input** field and at the top of each module in the Console view.

When you choose **All Inputs > Omni** as the input for a track, SONAR merges material from all MIDI inputs and instruments. This means you don't have to worry about input, channel, or other MIDI settings. Sometimes, you may want to record different MIDI channels into different tracks. To learn how to do this, see "Recording specific ports and channels" on page 299.

While each track can have a different input, it is also possible for several tracks to have the same input.

To choose a MIDI input in the Track view

1. Click the drop-down arrow of an **Input** field of a MIDI track.

   A drop-down menu of MIDI inputs appears.

2. Choose an input from the following:

   - **None.**   This option actually sets the **Input** field to **Omni** with this setting the track will record any MIDI input coming in on any enabled port (MIDI interface input driver) on any channel.
   - **All Inputs > (MIDI Omni or MIDI ch 1-16).**   With this setting the track will record any MIDI input coming in on any enabled port (MIDI interface input driver) on any channel, unless you choose a particular MIDI channel instead of MIDI Omni. Then the track will only record input

that's on the MIDI channel you chose.

- **(name of MIDI input driver) > (MIDI Omni or MIDI ch 1-16).** Choosing this option causes the track to record any MIDI channel coming from the named MIDI interface input driver, unless you choose a particular MIDI channel instead of MIDI Omni. Then the track will only record input that's on the MIDI channel you chose, from the named input driver.

- **Preset.** If you want to record multiple data from multiple ports and/or channels, you need to select a preset collection of those ports and channels. You can select one here (to create presets, see next line).

- **Manage Presets.** If you want to create or edit any preset collections of input ports and channels, you can select this option (see "To create or edit a preset input configuration" on page 300).

To choose an audio input in the Track view

1. Click the drop-down arrow of the **Input** field of an audio track.

   A drop-down menu of audio drivers appears.

2. Select the audio driver for the sound card you want to record with from these options:

   - **None.** This choice ensures that you do not record to the track in question.

   - **Left** (name of your sound card). Choose this if you want to record a mono signal on the left channel of your sound card.

   - **Right** (name of your sound card). Choose this if you want to record a mono signal on the right channel of your sound card.

   - **Stereo** (name of your sound card). Choose this if you want to record a stereo signal.

If your sound card has more than one pair of inputs, a pair of numbers appears after the name of each audio driver to indicate which pair of inputs the driver is attached to.

> **Note:** *Inputs that are used by the External Insert plug-in (see "External Insert plug-in (Producer and Studio only)" on page 876) cannot be assigned to track inputs.*

To choose an audio input in the Console view or Track Inspector

1. At the bottom of an audio channel strip, click the **Input** control. A pop-up menu of audio drivers appears.

2. Select the audio driver for the sound card you want to record with from these options:

   - **None.** This choice ensures that you do not record to the track in question. It also turns off input monitoring for this track.

   - **Left** (name of your sound card). Choose this if you want to record a mono signal on the left channel of your sound card.

   - **Right** (name of your sound card). Choose this if you want to record a mono signal on the right channel of your sound card.

   - **Stereo** (name of your sound card). Choose this if you want to record a stereo signal.

If your sound card has more than one pair of inputs, a pair of numbers appears after the name of each audio driver to indicate which pair of inputs the driver is attached to.

To choose a MIDI input in the Console view or Track Inspector

1. At the bottom of a MIDI channel strip, click the **Input** control. A pop-up menu of MIDI channels appears.

2. Choose an input from the following:

    - **None.** This option actually sets the **Input** field to **Omni**. With this setting the track will record any MIDI input coming in on any enabled port (MIDI interface input driver) on any channel.

    - **All Inputs > (MIDI Omni or MIDI ch 1-16).** With this setting the track will record any MIDI input coming in on any enabled port (MIDI interface input driver) on any channel, unless you choose a particular MIDI channel instead of MIDI Omni. Then the track will only record input that's on the MIDI channel you chose.

    - **(name of MIDI input driver) > (MIDI Omni or MIDI ch 1-16).** Choosing this option causes the track to record any MIDI channel coming from the named MIDI interface input driver, unless you choose a particular MIDI channel instead of MIDI Omni. Then the track will only record input that's on the MIDI channel you chose, from the named input driver.

    - **Preset.** If you want to record multiple data from multiple ports and/or channels, you need to select a preset collection of those ports and channels. You can select one here (to create presets, see next line).

    - **Manage Presets.** If you want to create or edit any preset collections of input ports and channels, you can select this option (see "To create or edit a preset input configuration" on page 300).

Arming tracks for recording

SONAR lets you record any number of tracks at one time. You indicate the tracks you want to record by *arming* the tracks. You can arm a single track or several tracks at one time. Each track records material received though its selected input. Whenever a track is armed, not only does the track's **R** button turn red, but the Clips pane that's to the right of that track's controls turns a reddish hue.

To arm one or more tracks for recording

Click the track's **Arm for Recording** button .

> **Note:** *To see the Arm for Recording button in the Track Inspector and Console view, make sure the MSR module is visible.*

To arm several tracks at the same time, select one or more tracks, then hold down the CTRL key and click any selected track's **Arm for Recording** button .

A track's **Arm** button turns red to indicate that the track is armed for recording.

To disarm all tracks at once

Click the **Arm / Disarm All Tracks** button ⬤ in the Control Bar's Mix module, or press CTRL+R.

Figure 62.   *The Mix module.*

Auto arming

You must arm tracks in order to record. To safeguard your data, there is no automatic arming of any tracks.

If you want to record MIDI tracks without arming a track, go to **Edit > Preferences > MIDI - Playback and Recording** and select the **Allow MIDI Recording without an Armed Track** check box.

This feature lets you start recording a new track simply by making it the current track and pressing R or clicking the **Record** button in the Transport module. Auto-arming makes it possible to inadvertently record over existing material in the current track, however.

Arming tracks during playback/recording

SONAR is able to arm and disarm tracks during playback and recording. This allows you to record to different tracks while the transport is rolling, without first having to stop playback in order to arm a track for recording.

To allow arming during playback

Go to **Edit > Preferences > Project - Record** and select the **Allow Arm Changes During Playback/Record** check box.

> **Note:** *The **Allow Arm Changes During Playback/Record** option is disabled by default. When enabled, SONAR must keep all hardware input ports open so that it can dynamically arm tracks on the fly. With some drivers in WDM mode, this can add significant overhead if there are many input devices enabled in **Edit > Preferences > Audio - Devices**. This may lead to more frequent drop outs. When using this option in WDM mode, it is recommended that you disable all unused input drivers in **Edit > Preferences > Audio - Devices** to minimize this overhead. Disabling unused inputs is not required when using ASIO mode.*

SONAR has an option that can reduce CPU overhead when the **Allow Arm Changes During Playback/Record** option is enabled.

When **Allow Arm Changes During Playback/Record** is enabled, SONAR must keep all hardware input ports open so that it can dynamically arm tracks on the fly. With some drivers in WDM mode, this can add significant overhead if there are many input devices enabled in **Edit > Preferences > Audio - Devices**).

The new **Only For Inputs In Project** option instructs SONAR to only open hardware input ports that are currently active in the project (i.e. assigned to a track).

To only open active hardware input ports

Go to **Edit > Preferences > Project - Record** and select the **Only For Inputs In Project** check box.

> **Note:** *If this option is enabled, you will not be able to change inputs while recording.*

Recording music from a MIDI instrument

Once you have set your tempo and metronome, and armed one or more tracks, you are ready to start recording.

To record MIDI

1. Set the Now time to the point in the project where you want to start recording.

2. Click ⬤ or press R. If your metronome count-in is turned on, it will play the count-in.

3. Play or perform the material you want to record. As you record, SONAR displays a clip containing the new material in the Clips pane (unless you have disabled the **Display Waveform Preview While Recording** option in **Edit > Preferences > Customization - Display**).

4. Click ◼ or press the SPACEBAR key to stop recording.

To listen to the new material, set the Now time to the start of the clip and press the SPACEBAR or click ▶. If you're not happy with the recording, use **Edit > Undo** or press CTRL+Z to erase the new material.

When you stop recording, if you do not see a new clip in the Clips pane, you may have a problem with MIDI input. See "Troubleshooting" on page 1251 for more information.

See:

"Recording specific ports and channels" on page 299

Input quantizing

Input quantizing allows you to automatically quantize MIDI input during recording. You can see the results immediately, and hear the results as soon as a track is looped.

> **Note:** *Input quantizing does not destroy your original recording. If you press CTRL+Z after you finish recording with input quantizing enabled, the quantized clip is deleted, and the original unquantized clip appears, just as you recorded it. If you are using loop recording in Sound On Sound mode, all the quantized clips are deleted.*

You control input quantize settings in the Input Quantize section in the Track Inspector. For details, see "Input Quantize section" on page 540.

Figure 63.   *Input Quantize controls are availalbe in the Track Inspector*
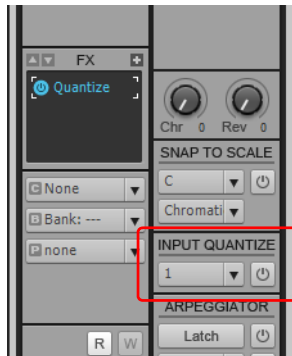
To turn Input quantizing on or off

Click the track's **Enable/Disable Input** button in the Track Inspector.

To set the resolution

Click the track's **Input Quantize resolution** control in the Track Inspector, then choose a resolution from the drop-down menu. You can also click **Quantize Settings** in the resolution menu to open the **Input Quantize** dialog box, and type a number of ticks in the **Resolution** field.

> **Note:** *To quantize to a custom resolution value, open the **Input Quantize** dialog box, and type a custom number of ticks in the **Resolution** field.*

To set options

Click the track's **Input Quantize resolution** menu in the Track Inspector, choose **Quantize Settings** to open the **Input Quantize** dialog box, select the desired settings, then and click **OK**.

> **Note:** *To get explanations of the options in the **Input Quantize** dialog box, press F1 when the dialog box is open.*

Visual indicators

You will see the following visual indicators when **Input Quantizing** is enabled:

- When the track is armed for recording, the track's **Arm** button [Q] displays **Q** instead of a red cirle.
- The red swath that appears in a track in the area where recording is taking place changes color. You can choose a color for this in **Edit > Preferences > Customization - Colors** by choosing Clips Pane in the **Color Category** menu, and changing the entry for **Input Quantize Record Preview Background**.

For more information, see "Quantizing" on page 719.

Arpeggiator

ℹ️ **Note:** *This feature is not available in SONAR X2 LE.*

The arpeggiator lets you play intricate patterns of notes that would otherwise be extremely difficult or impossible to play manually and at speeds and octave ranges that exist beyond the physical limitations of the player or keyboard range.

Arpeggiated events are new events that are based on notes that you play on your controller keyboard. The new events are rhythmically and harmonically specified by the arpeggiator's preset, allowing you to "play" an endless variety sophisticated musical passages with simple key pressing.

The most significant capability of the arpeggiator is its ability to apply algorithmic variations on your input as well as MIDI-based patterns.

In addition to note events, the arpeggiator can send parameter automation such as pan, volume, and even effects automation for the current track.

Each MIDI and instrument track has its own integrated arpeggiator, visually located in the Track view. Running multiple arpeggiators across tracks can help realize exciting melodic and rhythmic textures.

The arpeggiator controls are accessed in the Track Inspector.

Figure 64.   *Arpeggiator controls are availalbe in the Track Inspector*
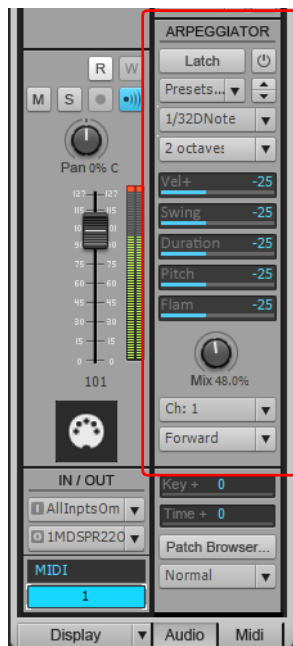
Arpeggiator controls

The following table describes the controls in the Arpeggiator.

Control	Description
Enable/Disable	Enables/disables the arpeggiator on a given track. This control can be assigned to MIDI remote control and modified in real-time during project playback.
Preset Control	You can create and edit arpeggiator presets; all user parameters are stored in the preset. • Arpeggiator settings are included in track templates. • Arpeggiator presets can be saved to a file and exchanged with other users. • Arpeggiator files are stored in a shared directory. For details, see "Using patterns and presets" on page 272.
Rate	Adjusts the relative speed of the arpeggiator sequence by changing all the note durations by a factor of the current tempo. This control can be assigned to MIDI remote control and modified in real-time during project playback.
Octave Range	Sets the number of octaves through which the arpeggio will play. A value of 1 means that a held chord will only arpeggiate the notes that are being held within the octave from which the notes are being transmitted. A value of 2 means a held chord will arpeggiate for two octaves. The held chord always represents the bass octave, meaning that the other octaves sound in a higher register. If you specify a range higher than the standard MIDI specifications, the Arpeggiator will repeat the pattern in the highest available octave as necessary. This control can be assigned to MIDI remote control and modified in real-time during project playback.
Latch	Latch keeps the arpeggio playing after you let go of the keys. This control can be assigned to MIDI remote control and modified in real-time during project playback.
Swing	Sets the amount of swing applied to the selected pattern. You can make a pattern of 8th, 16th, or 32nd notes play back as swing notes instead of straight notes. The amount of swing ranges from 0 (no swing) to 100% (maximum swing).
Velocity	An offset control that scales the arpeggiated note's velocity to a percentage of the original note velocity.
Duration	Controls whether the notes in the pattern are held to their full value, or are held for shorter or longer durations.
Pitch Offset	A transposition control in half-steps, up or down a maximum of 2 octaves.
Flam Amount	If a pattern contains flams, this menu controls how big a difference there is between the attack time of the flam and the note it is attached to.

Table 36. *Arpeggiator controls*

Control	Description
Source Mix	When 0, simultaneously held notes arpeggiate as single notes. At 50%, simultaneously held notes are heard as a chord in addition to the usual arpeggiated notes, both at equal levels. At 100%, only the held chord is audible. Control: Knob (0 – 100%); this control can be assigned to MIDI remote control and modified in real-time during project playback.
Ch	MIDI input and output menu—the Arpeggiator only affects input data that's on the MIDI channels listed on this menu. The arpeggiator always obeys the track's assigned output channel, plus any additional channels specified in the arpeggiators **Ch** menu.
Shapes	Choose a shape that specifies the direction in which currently held notes are to be sequenced. The following shapes are available: • Rhythm (implicit rhythm mode) • Forward • Reverse • Forward Circle 1 • Reverse Circle 1 • Forward Circle 2 • Reverse Circle 2 • Inward • Outward • Inward Circle • Outward Circle • As Played • As Played Circle • Random

Table 36. *Arpeggiator controls (Continued)*

Note: *Most Arpeggiator parameters can be controlled via MIDI remote control, but automation data can not be recorded into tracks. For details, see "To set up remote control for a knob, button, or fader" on page 920.*

See:

"Using the arpeggiator" on page 272

Using the arpeggiator

One arpeggiator device appears on every MIDI and instrument track, located in the Track Inspector.

To enable/disable the Arpeggiator

• Click the **Enable/Disable Arpeggiator** button in the Track Inspector.

Figure 65.   *Arpeggiator controls are availalbe in the Track Inspector*
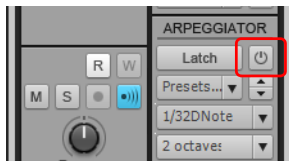
Using patterns and presets

Pre-authored patterns are used to apply rhythmic and melodic variations to the arpeggio. SONAR includes many professionally-authored pattern files for you to experiment with. Pattern files have a .ptn file extension.

An Arpeggiator preset stores a pattern along with the current Arpeggiator parameter settings. Preset files have a .arp file extension.

You use the Arpeggiator's **Preset** control to load patterns and load/save presets.

When playing back through the Arpeggiator, the first pitch in the pattern is moved to the lowest note currently played.

Note: *If the pattern file is a Free Mode pattern, the steps are quantized to the nearest 128th note value in order to better preserve timing nuances.*

To load an Arpeggiator pattern

1. Click the **Preset** control in the Arpeggiator and select **Open Pattern** from the drop-down menu.

2. Navigate to the folder that contains your Arpeggiator pattern files (.ptn) and select the desired pattern.
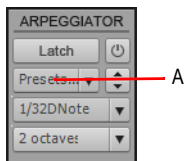
A. Click to load a pattern

To load an Arpeggiator preset

• Click the **Preset** control in the Arpeggiator, point to **Presets** and select the desired preset.
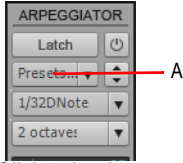
A. Click to load a preset

To load the next/previous Arpeggiator preset

• Click the **Next Preset** or **Previous Preset** button in the Arpeggiator.
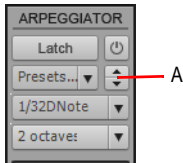
A. Click to load the next/previous preset

To save an Arpeggiator preset

• Click the **Preset** control in the Arpeggiator and select **Save Pattern As** from the drop-down menu.

 The current pattern is saved with the current Arpeggiator parameter settings.
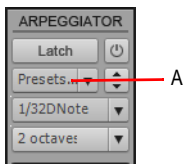
A. Click to save a new preset

Using automation

You can automate the following arpeggiator parameters:

• Source Mix

• Enable/Disable

• Flam Amount

• Duration

• LatchOctave Range

• Pitch Offset

• Rate

- Shape
- Swing
- Velocity

To record arpeggiator automation

1. Right-click the desired arpeggiator parameter in the Track Inspector, and select **Automation Write Enable** on the pop-up menu.

2. Click the **Play** button to start playback.

3. Adjust the arpeggiator control as desired. When you are finished recording automation, click the **Stop** button to stop playback.

Automation (envelope) data appears in the Track view.

To create arpeggiator automation

- In the Track pane, click the track's Edit Filter control, point to **Track Automation > Arpeggiator** and select the desired arpeggiator parameter.

Automation (envelope) data appears in the Track view.

> **Tip:** *Existing envelopes can be reassigned to arpeggiator envelopes and vice versa. To do so, right-click an envelope and select **Assign Envelope** on the context menu.*

To record automation with a MIDI controller

1. Right-click the desired arpeggiator parameter and select **Remote Control** on the context menu.

The **Remote Control** dialog box appears.

2. Specify the MIDI message you want to use for MIDI remote control, then click **OK** to close the **Remote Control** dialog box.

3. Right-click the desired arpeggiator parameter, and select **Automation Write Enable** on the context menu.

4. Click the **Play** button to start playback.

5. Move the assigned MIDI controller widget (knob/slider, etc.). When you are finished recording automation, click the **Stop** button to stop playback.

Automation (envelope) data appears in the Track view.

Recording and editing arpeggiator automation on an instrument track

You can not record or edit automation data on an instrument track. To use automation on an instrument track, you must first split the instrument track into separate audio and MIDI tracks, create or edit the automation data on the MIDI track, then recombine the tracks into an instrument track. For details, see "Splitting an instrument track to separate audio and MIDI tracks" on page 809 and "Converting an audio and MIDI track to a single instrument track" on page 808.

See:

"Arpeggiator" on page 269

Recording audio

Before you record audio, you should check your input levels. If the levels are too low, you may end up with too much hiss and background noise in your recording. If the levels are too high, your recording will be inaccurate or distorted. To check your audio levels, use the audio meters in the either the Track view, Track Inspector or Console view. To adjust the input levels, you must use your sound card's software mixer program (or the Windows 7 mixer) or an external hardware mixer for certain sound cards.

The audio meters indicate the volume at which the audio will be recorded, in units called decibels (dB). The meter values range from -INF (silent) to 0dB (maximum volume). You can change many options in the way SONAR's meters display data: see "Metering" on page 849. To maximize the dynamic range of your recording, you want to set the levels as high as possible without clipping.

When the audio level exceeds 0dB, some of the audio information is lost. This is known as **overload**. Many sound cards use clipping to deal with an overloaded signal, but clipping can distort the audio signal. As a result, you should avoid letting the meter level exceed 0dB.

Note: *Because SONAR is a digital recorder, a level of 0dB indicates digital zero. Digital distortion will occur at 0dB. You will not get analog compression or warmth from pushing the input levels. If you are transferring data from a DAT or another device, you may want to calibrate the input levels of your sound card with the output levels of other devices in your studio. This will ensure that 0dB on one unit will appear as 0dB in SONAR.*

To check the Input levels

1. In the Track view, choose the inputs for the tracks you want to record, and arm the tracks for recording.The default meter range is from 0 dB to -60 dB. To change the range, right-click on the meter and choose a new range from the menu.Perform at the loudest level at which you plan to record.Watch the meters respond. Increase the input volume as high as possible without ever letting the meters move all the way to 0dB, even for an instant, or letting the **Clipping** indicator turn red. If either of these things happen, reduce the input volume just enough to avoid them during the entire performance. Note that some kinds of audio, such as percussive or plucked musical instruments, can produce very short, high-level "transients" when struck or plucked aggressively, which can lead to clipping if the input volume is set too high. Consider the possibility of these transients when examining the meters and setting your record level.

Note: *If the Clipping indicator is illuminated, click on it to reset.*

Once you have set your sampling rate and input levels, you are ready to start recording. If the meters do not move, check your sound card software's mixer program and make sure that you have the proper input enabled for recording.When you record audio, SONAR stores each audio clip in a separate file. These files have the same format as a Wave (.wav) file, but they have special names and are stored in a separate directory on your hard disk. SONAR automatically manages these audio files for you, making it easier for you to manage your projects. If you want to work with these files directly, or to learn more about how SONAR stores audio data, see "System configuration" on page 1182.

To Record Audio

1. Choose the audio inputs for the track(s) you want to record.

2. Arm the tracks for recording. The Clips pane next to each armed track turns a reddish hue when the track is armed.

3. Set the Now time to the point in the project where you want to start recording.

4. Click ⏺ or press R. If your metronome count-in is turned on, it will play the count-in measures or beats.

5. Play or perform the material you want to record.As you record, SONAR displays a waveform preview of the new material in the Clips pane (unless you have disabled the **Display Waveform Preview While Recording** option in **Edit > Preferences > Customization - Display**). If you have turned off the option, SONAR displays a red swath along the area of the Clips pane where you are recording.

6. Click ⏹ or press the SPACEBAR to stop recording.

SONAR displays a clip containing the new material in the Clips pane. To listen to the new material, set the Now time to the start of the clip and press the SPACEBAR or click ▶. If you're not happy with the recording, use **Edit > Undo** to erase the new material.

If you do not see a new clip in the Clips pane, you may have a problem with audio input. See "Troubleshooting" on page 1251 for more information.

⚠ **Important:** *Make sure you have enough space on your hard disk when recording digital audio. Running out of hard disk space when recording can lead to unpredictable results.*

To hear previously recorded material on track while recording

By default, SONAR does not play back any previously recorded material on a track while recording. If you want to always hear previously recorded audio while recording, go to **Edit > Preferences > Project - Record** and select the **Hear previously recorded material on track** check box.

Confidence recording and waveform preview

When you're recording audio or MIDI data, SONAR gives you many visual cues that tracks are armed and that SONAR is recording data.

When one or more tracks are armed:

• The **Arm** button in each armed track turns red.

• The Clips pane next to each armed track gets a reddish hue.

• The **Arm / Disarm All Tracks** button the Control Bar's Mix module is lit.

While you're recording, SONAR displays these cues:

• Audio tracks display a waveform preview in the area in the Clips pane where you're recording. This is actually a visual record of the record meter's progress. When you stop recording, SONAR displays the actual waveform, which is slightly different from the preview. The preview is a snapshot taken at certain time intervals, while the actual waveform represents all the data that is recorded.

• MIDI tracks display the actual data that they record, both in the Clips pane and the Piano Roll view (not the Staff view).

• Automation envelopes and nodes are drawn in real time as the automation data is being recorded.

If you want to turn off the real-time display of audio clips, see the following procedure.

To turn off waveform preview for audio recording

Go to **Edit > Preferences > Customization - Display** and clear the **Display Waveform Preview While Recording** check box.

Now when you record audio tracks, a red swath appears in the Clips pane in the area you're recording.

Input monitoring

Being able to hear plug-in audio effects applied to a live signal is an exciting feature of SONAR. However, there are two issues that users commonly stumble upon when using the **input monitoring** feature. The first is that the monitored signal seems to have an echo associated with it. The second is that live input monitoring can lead to nasty feedback problems, particularly if you have an outboard audio mixer, or you record from a different sound card from the one you are playing back with.

SONAR has several buttons to control input monitoring:

- **Per-track Input Echo button.** Each audio track has an **Input Echo** button ◉)) that turn's that track's input monitoring on or off.

- **Global Input Echo button.** The **Input Echo On/Off All Tracks** button ◉)) in the Control Bar's Mix module turns input monitoring on or off on all audio tracks with one click.

- **Audio Engine button.** To disable all audio activity in SONAR, including input monitoring, click the **Audio Engine on/off** button 🗹 in the Control Bar's Mix module so it lights up.

🛈 **Note:** *When you use input monitoring, make sure that the track you're playing through uses the same audio interface (sound card) for both input and output. Using different audio interfaces for a track's input and output can produce distortion during input monitoring.*

To understand the echo and feedback problems, let's look at how audio signals travel through your sound card, the drivers, and SONAR. The following diagram depicts a simplified version of this signal flow.
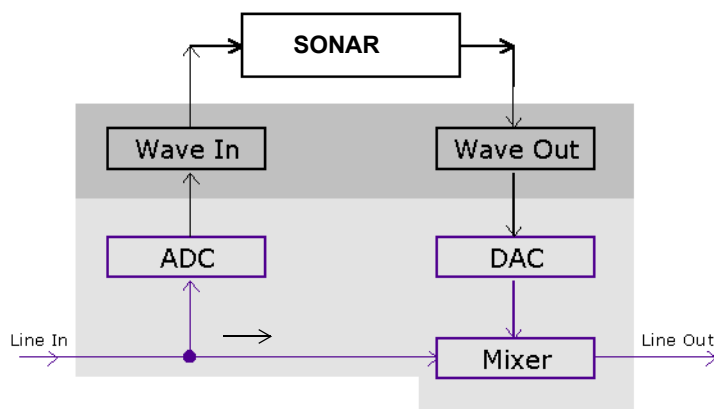
The bottom block of the picture represents the sound card. The shaded area above it represents the audio drivers. The unshaded area at the top represents the main environment of the operating system.

As the diagram shows, analog audio flows into the card's line input (on the left), and is immediately split in two. One branch goes up through the analog-to-digital converter (ADC), where the audio is digitized, buffered and fed to the driver (labeled Wave In in the diagram).

The digital audio data buffers are read by SONAR from the Wave In driver, processed, and then sent out to the Wave Out driver. The driver passes the digital audio buffers through a digital-to-analog converter (DAC), where the audio data is converted back to an analog signal.

Finally, this analog output signal is mixed with the original branch of the input analog signal, and the summed result is presented to the sound card's line output.

With this information in hand, let's follow a simple audio signal through the system to understand how echoes get introduced into the input monitor path.

Suppose you are counting "1, 2, 3" into your sound card very quickly. When you say the first "1," this sound immediately appears in all the places indicated in the illustration above. In other words, the analog audio signal is pure electrical signal traveling at the speed of light, so it is immediately present across all analog audio paths inside the sound card.
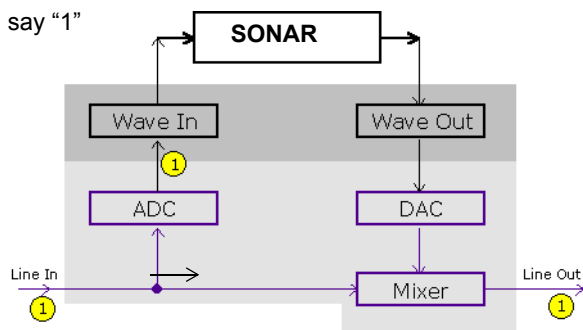
Next, you say "2." In the time it takes you do that, the ADC has converted the "1" to digital form and the Wave In driver has fed it to SONAR for processing. SONAR processes the buffer right away and passes the processed data right back to the Wave Out driver.

Finally, you say "3." By this time the original "1" has been converted back to analog audio by the DAC, and that analog signal is mixed in with the "3" you have just said. The ultimate result is that you hear a "1" and "3" mixed together at the line output of card—seemingly sounding like an echo, but actually just an artifact of the signal flow through the system.
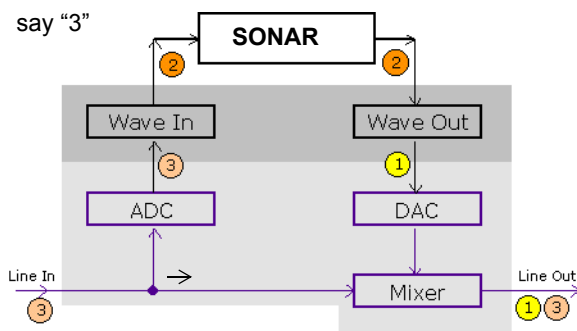
You can eliminate the echo by muting the line-in from playing back (see "To eliminate the echo from input monitoring" on page 281); you'll send only the processed signal to the sound card outputs. This technique introduces a little extra latency to what you hear coming out of your sound card, but if you use WDM or ASIO drivers with your sound cards, the latency is negligible.

The feedback problem results whenever you have a loop in your mixer path: the output of your mixer is patched into the input of your sound card. Feedback can happen with or without input monitoring, but since input monitoring can add several levels of gain to the signal flow, it's of greater concern when you have input monitoring enabled. Input monitoring is disabled by default when you install SONAR, and you enable it with the following procedure.

To enable input monitoring

- Turn your speakers down, and on an audio track that you want to monitor, click the **Input Echo** button so that it's lit up (on) . **To disable monitoring** for this track, click the button off.

  Or

- Turn your speakers down, then click the **Input Echo On/Off All Tracks** button in the Control Bar's Mix module. This enables input monitoring on all tracks. To disable monitoring for all tracks, click the button again.

Now you can hear your instrument in real time with any plug-in effects that you want to patch into the current track. You might also hear an echo, because the dry signal is coming out of your sound card slightly ahead of the processed signal. To eliminate the dry signal, see the next procedure.

To eliminate the echo from input monitoring

1. Open the Windows Volume Control window:
   - Windows 7: Click the Windows **Start** button and go to **Control Panel > Hardware and Sound > Volume Control**.

   The Volume Control window appears.
2. In the Play Control window of the mixer, check the **Mute** check box in the Line-In column, or in the column of whatever jack your instrument is plugged into, and close the mixer window.

Now you can hear only the processed sound when you use input monitoring. Using WDM or ASIO drivers for your sound card keeps latency to a negligible amount.

> **Note:** *This procedure does not eliminate feedback from your system, only the echo. If you experience feedback, you have a feedback loop somewhere in your mixer setup.*

To enable input monitoring when arming tracks

> **Warning:** *Be extremely careful when enabling input monitoring on an armed track if you are working in a room that contains both live microphones and studio monitors. In such a scenario, enabling input monitoring on an armed track can result in an extremely loud feedback loop between the mirophones and monitors and can damage your ears and speakers.*

SONAR makes it possible to automatically enable input monitoring when arming a track for recording. To do so, hold down the SHIFT key while you click on a track's **Arm** button . Likewise, holding down the SHIFT key while disabling record during playback will disable input monitoring.

To automatically disable input monitoring during playback

Go to **Edit > Preferences > Audio - Playback and Recording** and clear the **Disable Input Monitoring during Playback** check box.

When this option is enabled, input monitoring will be disabled on all tracks during playback but not during recording.

See also:

Live Input PDC override

While working with virtual instruments and live input monitored tracks, it is important for audio to be streamed at low latency in order to minimize delay.

Although SONAR supports streaming audio at very low latency, there are cases where internal buffering can cause additional latency. The most common scenario is when using plug-ins that require Automatic Plug-in Delay Compensation (PDC). PDC is the process of delay compensating other normal tracks so they are synchronized with the delayed audio produced by the plug-ins.

Whenever delay compensation takes place on a track that has a live input (an input monitored track or synth track), it is delayed by the required amount to synchronize it with other tracks. In some cases, the delay can be noticeable and make live tracking difficult.

The **Live Input PDC Override** toggle lets you disable delay compensation on live tracks, thereby removing the latency during playback and recording of such tracks. Since it's a toggle, you can quickly turn it on to complete your tracking at low latency, and turn it off when finished to hear the track compensated as normal.

Regardless of whether **Live Input PDC Override** is enabled or disabled, recorded audio is placed on the timeline at the correct position as recorded.

Live Input PDC Override is ignored during a bounce/export or freeze operations.

Tip: *You can control which tracks are delay overridden by enabling input monitoring only for those tracks. For more information, see*

To enable/disable live input PDC override

• Do one of the following:

    • Click the **Live Input PDC Override** button in the Control Bar's Mix module.

    • Press SHIFT+E.

Figure 66. *The Mix module.*

Delay compensation is enabled/disabled on all live input tracks in the project. All other tracks have normal delay compensation applied.

<table>
<tr>
<td>ⓘ</td>
<td>Note: If the live track being monitored also contains track data (or MIDI data in the case of a synth track), the streamed track data will not be delay compensated. As a result the recorded track data will not be in sync with other tracks. You should either mute any clips on the live tracks, work with an empty region of the track, or use an entirely new track while recording.</td>
</tr>
</table>

Some signal routings can cause tracks to be out of sync when **Live Input PDC Override** is enabled. To prevent any potential sync problems, follow these suggestions:

• Output the live input tracks directly to the final bus in the signal flow.Send live tracks directly to a hardware main.

PDC re-sync

Some plug-ins, such as iZotope Ozone 4 and various UAD plugins, change their internal delay (PDC) dynamically when certain parameters are modified, presets are changed or internal plug-in routing is changed. When a plug-in changes its internal delay, SONAR will detect this and re-sync all tracks in the project to this new delay value. While this is done you may hear a momentary interruption in playing audio. This is normal and required in order to keep tracks in sync and delay compensated.

See also:

The Audio Engine button

SONAR has a button in the Control Bar's Transport module called the **Audio Engine** button ![audio engine icon]. This button lets you turn SONAR's audio engine off if you're getting distortion or feedback and want to cut the sound off. When playback or recording are in progress, SONAR enables the button automatically—however, the button appears greyed-out during playback or recording because you can't control the button at that time.

If you experience feedback during input monitoring, you can click the **Audio Engine** button to turn off the audio engine. However, if playback or recording are in progress, the button is unavailable, and you should click the **Reset** button ![reset icon] that's just to the right of it instead, or else stop recording or playback first and then click the **Audio Engine** button.

You may experience slightly better playback and recording performance by turning the **Audio Engine** button off before you press the **Play** or **Record** buttons. This happens if your computer's resources are already stretched to the limit. When you start recording or playback with the audio engine already functioning, there is still some processing that SONAR has to do that's left over when you start the transport. This places an extra load on your system that can cause dropouts if your system is already stretched thin. A more effective solution than disabling the audio engine before starting the transport is to reduce the load on your system by hiding some meters, increasing latency slightly, reducing the number of plug-ins and/or tracks, etc.

See also:

Loop recording

When recording a vocal or an instrumental section, you might want to record several different takes so that you can choose the one you like best. You might even want to record several takes to double a part or merge the best parts of each.Normally, to record each take you would have to arm a track, start recording, perform the take, and then stop recording. You can record multiple takes more easily using a feature called **loop recording**. Loop recording lets you start recording and record as many takes as you like, all in a single step.

SONAR loops between the loop start and loop end time, allowing you to record one take on each pass. SONAR creates a clip for each take. You have three choices for where these clips are stored:

• All clips can be recorded in Sound on Sound mode and stored in a single track, where they are stacked on top of one another. You can use Take lanes to display overlapping clips in separate lanes.

• All clips can be recorded in Overwrite mode in a single track, where each take is successively muted except the last one.

• Each clip can be recorded to a different track. SONAR automatically places each take into a new, empty track. No existing tracks are changed in any way.

When you finish recording, you can use the **Edit > Undo** command or CTRL+Z to erase all your takes in a single step.

To use loop recording

1. Choose the input for the track(s) you want to record, and arm the track(s) for recording.

2. Set the loop start and end times in the Control Bar's Loop module.
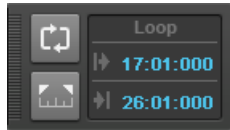
3. Right-click the Record button in the Transport module to access recording settings.

Figure 67. *The Record section*

Loop recording
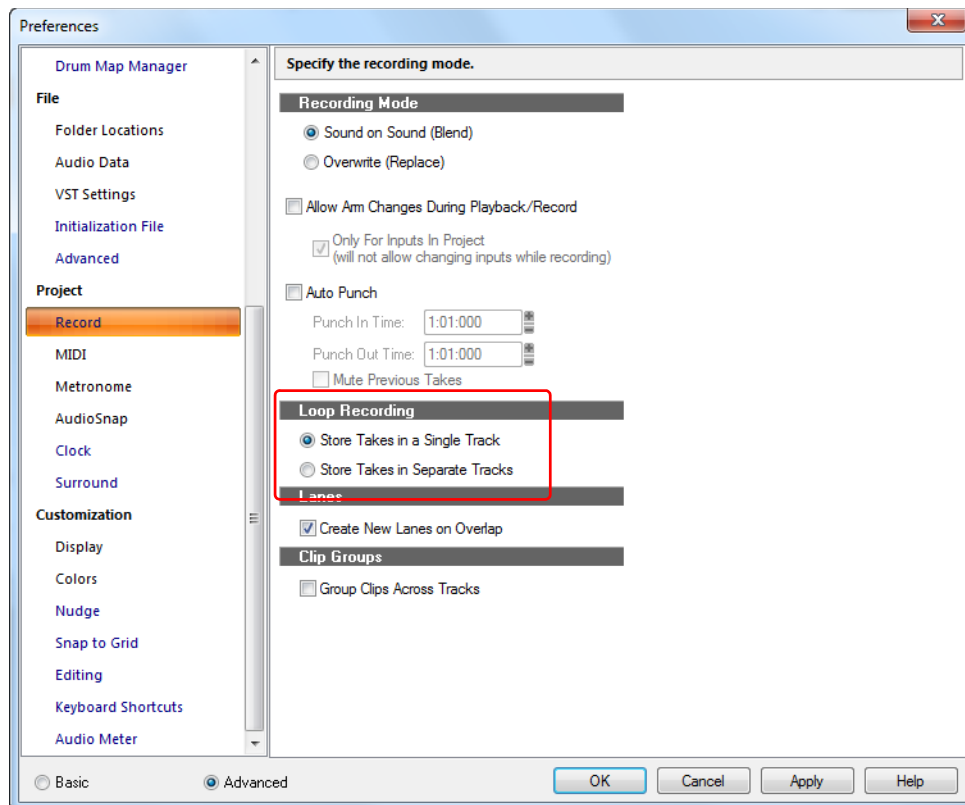
4. Choose to stack all takes in a single track or to store them in separate tracks.

5. If you choose to stack all takes in a single track, choose either Sound on Sound or Overwrite mode.

    If you use single track and Sound on Sound with Track Lanes enabled, selecting the **Create New Lane on Overlap** check box will create another Take lane if your new clip overlaps an existing clip.

6. If you stack all takes in a single track, you can audition them later by using the **Expand/collapse Take Lanes** button ☰ in the bottom left corner of the Track pane (each take will have its own **Mute** and **Solo** buttons).

7. Click **OK** to close the **Preferences** dialog box, and set the Now time to the point in the project where you want to start recording.

8. Click [●] or press R. If your metronome count-in is turned on, it will play the count-in measure.

9. Play or perform the material you want to record. At the end of the loop, SONAR will return to the start of the loop and you can record the next take.

10. Click [■] or press the SPACEBAR when you want to stop recording.

The takes are stored in the manner you requested.

Recording

Loop recording

Punch recording

Suppose you are happy with most of a track but want to replace some sound or add new material in one small section—perhaps as small as a couple of notes. This is where punch recording comes in handy, because it lets you record new material only within a specified range of times.

For example, suppose you recorded a 32-bar keyboard solo but made some mistakes in the 24th and 25th bars. With punch recording, you can play the entire solo again, so you make sure you can get the feel you want. However, only the bars you want to correct are actually recorded. That way, you don't have to worry about introducing new mistakes elsewhere in the recording.

To use punch recording, follow these steps:

• Enable punch recording.

• Set the start and end times of the punch.

• Choose Sound on Sound mode or Overwrite mode.

• Start recording by pressing R or clicking the ⬤ button on the Control Bar's Transport module.

The Control Bar's Punch module shows the punch settings, as shown here:

Figure 68. *The Punch module.*
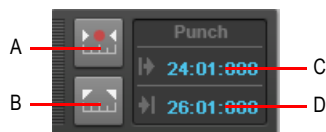
A. Auto-Punch On/Off B. Set Punch Time to Select C. Punch In Time D. Punch Out Time

When punch recording is enabled, the punch times are indicated by special markers in the Time Ruler, which is at the top of the Clips pane:

A. Punch In B. Punch Out

After you punch record, choosing **Edit > Undo** both discards any new material you recorded and restores the original material that had been deleted.

You can also combine loop and punch recording to record several takes of a punch. Say you are working on that perfect take of a guitar solo and you need to hear a couple of bars of the project as "pre-roll" before you punch in. By combining looping with punch, you can have each take begin before you start to play and still have the solo cut in at the appropriate instant.

In the example mentioned previously, you could loop from bar 17 to bar 27 but record only bars 24 and 25. Here's what this looks like:
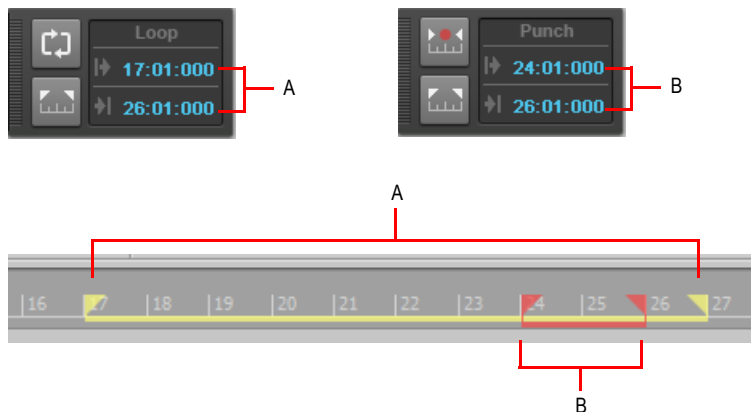
A. The loop starts and ends here B. The punch starts and ends here

To punch record

1. Choose the input(s) for the track(s) you want to record, and arm the track(s) for recording.

2. Enable the **Auto Punch on/off** button in the Control Bar's Punch module.

3. Set the start and end times in one of the following ways:

  - Enter the times directly in the Punch module.

  - Select a range of time and click in the Punch module.

  - Select a range of time, then right-click in the Time Ruler and choose **Set Punch Points**

4. Right-click the Record button to access recording settings, then choose the desired recording mode: **Sound on Sound** or **Overwrite**.

5. Set the Now time to a point where you want to start playback.

6. Click or press R to start recording. If your metronome count-in is turned on, it will play the count-in measures or beats.

7. Play or perform the material you want to record.

8. Click or press the SPACEBAR to stop recording.

The material you play during the punch time is recorded in the chosen track, either replacing any existing material (Overwrite mode) or blending with it (Sound on Sound mode).

To use punch while looping

1. Choose the input for the track(s) you want to record, and arm the track(s) for recording.

2. Set the loop start and end times.

3. Set the punch start and end times, as described previously.

4. Right-click the Record button to access recording settings.

5. Choose to stack all takes in a single track or to store them in separate tracks.

6. Set the Now time to the beginning of the loop.

7. Click or press R to start recording. If your metronome count-in is turned on, it will play the count-in measures.

8. Play or perform the material you want to record. At the end of the loop, SONAR will return to the start of the loop and you can record the next take.

9. Click or press the SPACEBAR when you want to stop recording.

The takes are stored in the manner you requested.

Step recording

Step recording is a method of recording MIDI notes one note or chord at a time. It's a very easy and precise way to record, but can sound mechanical if used in the wrong situation. You use step recording in its typical form by choosing a step size, such as a quarter note, and then playing a note on your MIDI keyboard. When you play the note, SONAR records the note, and moves the insertion point forward by the distance of the step size (moving the insertion point every time you press a note is the default behavior). You can then record more notes of the same duration by playing notes on your keyboard, or you can change the step size while you're recording and record different size notes. You can also choose how long the notes you play will sound, as a percentage of the step size. For example, even though you record some notes that have a step size of a quarter note, if you set the **Duration** field to **50%**, the notes will be recorded and displayed as a series of eighth notes, each followed by an eighth rest. The insertion point for each recorded note in this example moves by a quarter note (the step size) each time you record a note. If the duration is longer than the step size, the notes will overlap with the notes recorded at the next step.

SONAR displays your step-recorded notes in the Staff view, Piano Roll view, Event List, and Clips pane in real time as you step record them. SONAR also lets you:

• Use other commands while step recording

> **Note:** *SONAR doesn't respond to sync signals while the* **Step Record** *dialog box is open and enabled.*

• Change tracks while recording
• Add two step sizes together by pressing the + key between each step size selectionDelete as many step-recorded notes as you want, while moving the insertion point back through the steps you delete
• Configure step recording key bindings (see "Step record keyboard Shortcuts" on page 296)
• Make any kind of tuplet
• Create a custom step size lasting any number of ticks (ticks are divisions of a beat—SONAR uses 960 by default); SONAR will remember the custom step size until you change it
• Move the insertion point by beats, measures, or step size
• Link the position of the Now Time to the insertion point
• Offset the insertion point by the number of ticks that you specify
• Randomize duration
• Record notes with constant pitch, and/or velocity, and/or channel
• Hold notes across steps

> **Tip:** *By using keyboard shortcuts, you can leave your left hand on your MIDI keyboard to enter notes with, and control most step recording functions with your right hand on the NumPad.*

MIDI data is recorded using step record even if the track is not armed. Loop markers are ignored. And **step recording always uses the Sound on Sound (blend) record mode**, regardless of the current record mode.

With **Auto Advance** disabled, you must click **Advance** each time you want to advance to the next step. While this requires more effort, it also provides you with more flexibility. For example, with **Auto Advance** disabled, you do not even need to play the notes at a single step at the same time! You can play any number of notes one at a time, and they will all be recorded at the same step until you click the **Advance** button. You can even record notes of different durations at the same step—simply record the notes of one duration, change the duration, and play more notes, without clicking **Advance**.

The **Step Record** dialog box has two modes: Basic (smaller with fewer options), and Advanced (larger, more options). To use Basic mode, click the **Bas./Adv.** button so that the **Adv.** button is displayed. To use Advanced mode, click the **Bas./Adv.** button so that the **Bas.** button is displayed.

Here's a picture of Basic mode:

Figure 69. *The Step Record - Basic window*
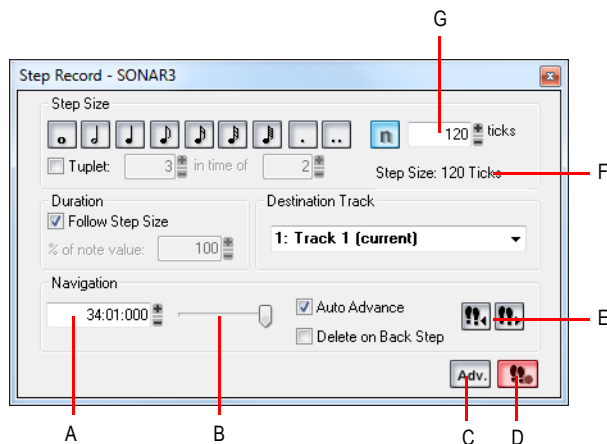
A. Insertion point location B. Position slider C. Basic/Advanced button D. Step Record Toggle button to enable/disable step recording E. Click to move insertion point by step size F. Total step size display G. Custom tick size field

Here's a picture of Advanced mode:

Recording
Step recording

Figure 70. *The Step Record - Advanced window*
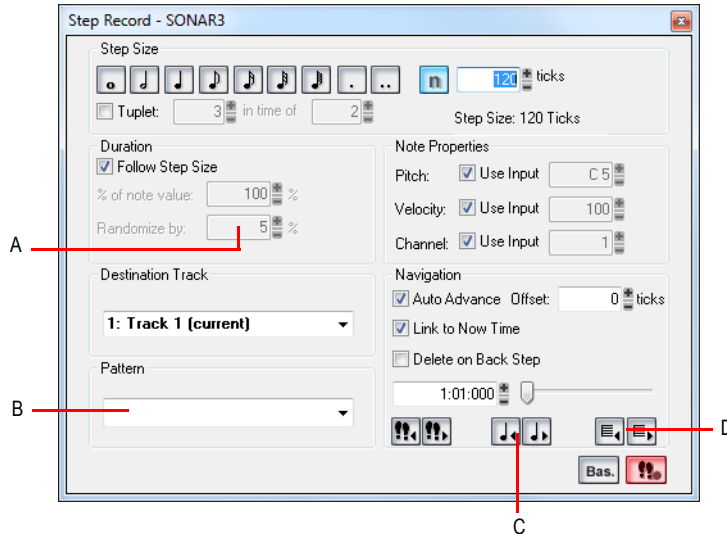
*A. Randomize durations field B. Step pattern recording field C. Click to move insertion point by single beat
D. Click to move insertion point by single measure*

To use basic step recording

1. Click the Record button ● and keep the button pressed for a bried moment until the pop-up menu appears, then choose **Step Record**. The Record button changes to ●.

2. Click the Step Record button ● to open the **Step Record** dialog box.

3. Make sure that the Basic mode of the **Step Record** dialog box is displayed (the **Adv.** button will be showing if the Basic mode is displayed; if the **Bas.** button is showing, click it).

4. Set the insertion point by doing one or more of the following:

   • Click the **Step Advance** button 🎵 to move the insertion point forward by the current step size, or click the **Step Backwards** button 🎵 to move the insertion point backward by the current step size. SONAR displays the insertion point location in the **Insertion point location** field (see Basic mode picture above).

   • Drag the position slider left or right to move the insertion point one measure at a time.

   • Type a location in MBT (Measure-Beat-Tick) format in the **Insertion point location** field.

5. Choose a step size by doing one of the following:

   • For common step sizes, click one of the notehead icons to choose a step size as large as a whole note 𝅝 or as small as a 64th note 𝅘𝅥. You can increase the step size you choose by

50% or 75% by clicking the dot icon ⬚, or double-dot icon ⬚, respectively. You can add different step sizes together by holding down the CTRL key while you click extra icons, or by pressing the + key on the NumPad.

- For a tuplet step size, click a notehead icon to choose the "tuplet unit" (for example, for eighth-note triplets, choose an eighth note). Then enable the **Tuplet** check box and fill in the **"n" in time of "n"** fields. For example, if you want quarter-note triplets, click the quarter-note icon ⬚, enable the **Tuplet** check box, and fill in **3** in the time of **2**, which means 3 quarter notes in the time of 2 quarter notes. If you want eighth-note triplets, click the eighth-note icon ⬚, enable the **Tuplet** check box, and fill in **3** in the time of **2**. If you wanted 5 notes in one beat, click the quarter-note icon, enable the **Tuplet** check box, and fill in **5** in the time of **1**.

- If you want to create a custom step size, click the **n** button ⬚, and fill in the number of ticks in the **Ticks** field.

6. Choose a duration by doing one of the following:

   - If you want duration and step size to be the same, enable the **Follow Step Size** check box.

   - If you want duration and step size to be different, disable the **Follow Step Size** check box and fill in a percentage value in the **% of Note Value** field.

7. Choose a destination track for your recording in the **Destination Track** field.

8. If you want the insertion point to advance automatically when you play your MIDI controller, enable the **Auto Advance** check box.

9. Play a note or chord on your MIDI controller. When you release the note(s), the insertion point moves by the step size, if the **Auto Advance** check box is enabled. If **Auto Advance** is not enabled, you can release the notes and record more notes, or you can use the Navigation controls to advance the insertion point. If you are still holding down a note or notes when you advance the insertion point, the step size of the held notes is extended by the current step size.

10. Continue recording notes of the same step size and duration to the same track, or change any of those parameters and continue recording. To create a rest, advance the insertion point without playing any notes. To delete notes on previous steps, you can press CTRL+Z for each recorded step. If you want to delete previous steps and move the insertion point back at the same time, check the **Delete** on **Back Step** check box, and click the **Step Backward** button.

11. When you're finished recording, close the dialog by clicking the **X** icon in the upper right corner, or by pressing SHIFT+R.

You can press CTRL+Z during or after recording to undo your recording one step at a time.

> **Note:** *Options that you choose in Advanced mode, such as **Link to Now Time**, are still in force when you use Basic mode.*

To use advanced step recording

The procedure for Advanced step recording is the same as for Basic, but with these extra options, which become available when you click the **Bas./Adv.** button in the **Step Record** dialog box so that it displays **Bas.**:

To do this	Do this
Randomize the note duration	Disable the **Follow Step Size** check box, enter a number into the **% of Note Value** field (leave it at **100** if you want to follow step size), and enter the maximum duration that the step size should be randomized in the **Randomize By** field.
Choose a constant pitch and/or velocity and/or MIDI channel for the recorded note(s)	To choose a constant value for pitch, velocity, or channel, disable the **Use Input** check box next to the desired field, and fill in the value you want to use for that particular parameter.
Add two step sizes together	See "To add two step sizes together" on page 295
Link the insertion point to the Now Time	Enable the **Link to Now Time** check box.
Enter notes at an offset distance from the displayed insertion point.	Enter a positive or negative number of ticks in the **Offset** field.
Move the insertion point back or forward by one beat.	Click the **Beat Backward** button ⏮ or the **Beat Advance** ⏭ button.
Move the insertion point back or forward by one measure.	Click the **Measure Backward** button ⏮ or the **Measure Advance** ⏭ button.
Use step pattern recording.	See "Step pattern recording" on page 298.

Table 37.

To add two step sizes together

1. Choose your first step size. If desired, use any combination of tuplet and dotted values.

2. Press the + key on the Num Pad.

   A plus sign appears after the value in the **Step Size "n" Ticks** field.

3. Choose your second step size. If desired, use any combination of tuplet and dotted values.

   The total step size appears in the **Step Size "n" Ticks** field.

4. Press the note on your MIDI keyboard that you want to enter.

The new note appears in your track, and the Now Time moves the distance of the two combined steps that you entered. To toggle the plus sign on or off in the **Step Size "n" Ticks** field, press the + key on the Num Pad. To clear a large value from the **Step Size "n" Ticks** field, click a smaller value, or use a keyboard shortcut for a smaller value.

To use other commands while step recording

• Use the mouse to click the command you want to use.

   or

• Click the **Activate Step Recording** button 🎵 in the **Step Record** dialog box so that the button is not red. This disables step recording, allowing you to use both the mouse, and any keyboard shortcuts that the **Step Record** dialog box uses, for other commands.

By default, opening the Step Record window will automatically enable step recording. SHIFT+R is the default shortcut to open the **Step Record** dialog box. Once the **Step Record** window is open, you can enable/disable step recording at will without closing the Step Record window: just click the **Activate Step Recording** button 🎵 in the **Step Record** dialog box, or press SHIFT+R.

See also:

Step record keyboard Shortcuts

The default keyboard shortcuts for step recording are on the NumPad, so that you can keep one hand on your MIDI keyboard to play notes with, and use the other hand on the NumPad to use shortcuts.

You can use key bindings to configure your own shortcuts. Go to **Edit > Preferences > Keyboard Shortcuts**, choose **Step Record** in the **Area** field, select a key and a function you want to bind, and click the **Bind** button to bind them together. Bind additional keys and commands as needed.

Default setting or option	Default shortcut
Whole note	NumPad 1
Half note	NumPad 2
Quarter note	NumPad 4
Eighth note	NumPad 8
16th note	NumPad 6
32nd note	NumPad 3
64th note	NumPad 7
Custom step size	NumPad 9
Tuplet	NumPad /

Table 38.

Default setting or option	Default shortcut
Dot	NumPad *
Double dot	SHIFT+NumPad *
Add next step size to previous step size	NumPad PLUS key "+"
Toggle the Delete on Back Step option	NumPad MINUS key "-"
Follow step size	CTRL+Num Lock (does not change Num Lock state)
Step backward	NumPad 0
Step advance	NumPad ENTER
Beat backward	SHIFT+NumPad 0
Beat advance	SHIFT+NumPad ENTER
Measure backward	CTRL+NumPad 0
Measure advance	CTRL+NumPad ENTER
Auto Advance	NumPad PERIOD "."
Toggle step recording	SHIFT+ R

Table 38.

See:

Step pattern recording

The **Pattern** option lets you define a repeating rhythmic pattern of notes and rests so that you can use step recording more efficiently. For example, suppose your project is in 4/4 time, and one track has a pattern that is two measures long: quarter notes in the first measure and on the first two beats of the second measure, followed by a half-note rest on the last two beats. This pattern has six quarter notes followed by two quarter-note rests.

When you use step recording with **Auto Advance**, you can play the six quarter notes and SONAR will automatically advance to the next step. However, to skip over the rests, you need to click the **Advance** button two times.

With pattern recording, you define a pattern that indicates where the rests appear in the pattern. SONAR will then skip over the rests automatically, so you don't need to click the **Advance** button at all.

SONAR displays patterns as a combination of digits (which represent beats that contain notes) and dots (which represent beats that contain rests). The pattern described previously looks like this:

1 2 3 4 5 6 . . Here is another example:

1 2 . 4 This pattern automatically skips over every third beat; SONAR interprets this pattern as "one, two, rest, four."

Here is one final example based on 4/4 time, with a step size of eighth-note triplets (twelve steps per measure):

1 2 3 4 . 6 7 . 9 0 . 2

No matter how you enter a pattern, SONAR displays the digits in sequence, with periods replacing digits at each step where a rest would occur. You can create patterns with up to 64 steps.

To use pattern-based step recording

1. Click the Record button ![record button] and keep the button pressed for a bried moment until the pop-up menu appears, then choose **Step Record**. The Record button changes to ![step record button].

2. Click the Step Record button ![step record button] to open the **Step Record** dialog box.
3. Set the insertion point where you want to start recording.
4. Click in the **Pattern** field.
5. Press any number key to indicate a beat at which notes will be played.
6. Press the SPACEBAR, period, or the letter R to indicate a beat on which there is a rest.
7. When the pattern is complete, click elsewhere in the dialog box.
8. Step record as before.

From now on, after you record each step, SONAR automatically advances past all rests to the next step on which notes will be played. If you change step sizes while recording, the size of each rest changes also. To stop pattern-based step recording, simply delete the pattern from the **Pattern** box. SONAR stores up to 10 patterns in the **Pattern** field.

Recording specific ports and channels

Most MIDI instruments are capable of sending information on several different channels at once. By default, SONAR merges all incoming MIDI data and records it on whatever MIDI tracks are armed. However, SONAR also allows you to control which MIDI input ports and channels each track will record. Here are some examples of when this feature might be useful:

- There are several performers, each playing a different MIDI instrument. By setting each instrument to transmit MIDI on a different channel and/or port, you can record each player's performance into a separate track, even though they are all playing at the same time.

- You are using a MIDI guitar controller and want to record the notes played on each string on a separate track.

- Your electronic keyboard has a built-in auto accompaniment feature that plays a drum part and an accompaniment while you play lead. You want to record each of these three parts into a different track in a SONAR project.You have a MIDI sequence stored on your synthesizer's built-in sequencer, and you want to record each channel onto a different track.

> You can use external MIDI synchronization to automate the process of loading multichannel sequences from other MIDI devices. For more information, see "Synchronizing your gear" on page 1153.

You select MIDI inputs for a track by using the Input control in the Track view, Track Inspector or Console view.

SONAR allows you to filter MIDI input so that you can record only certain kinds of MIDI data (see "Input filtering" on page 300), and also allows you to automatically turn off the Local On setting of your master keyboard.

To assign input ports and channels to MIDI tracks

1. Click a track's Input control to display the **Input** drop-down menu. Choose track inputs from these choices:

   - **None.** This option actually sets the **Input** field to **Omni**. With this setting the track will record any MIDI input coming in on any enabled port (MIDI interface input driver) on any channel.

   - **All Inputs > (MIDI Omni or MIDI ch 1-16).** With this setting the track will record any MIDI input coming in on any enabled port (MIDI interface input driver) on any channel, unless you choose a particular MIDI channel instead of MIDI Omni. Then the track will only record input that's on the MIDI channel you chose.

   - (**name of MIDI input driver**) **> (MIDI Omni or MIDI ch 1-16).** Choosing this option causes the track to record any MIDI channel coming from the named MIDI interface input driver, unless you choose a particular MIDI channel instead of MIDI Omni. Then the track will only record input that's on the MIDI channel you chose, from the named input driver.

   - **Preset.** If you've created any preset collections of input ports and channels, you can select one here.

- • **Manage Presets.**   If you want to create or edit any preset collections of input ports and channels, you can select this option (see following procedure).

2. Click **OK**.

SONAR shows new track inputs in the **Input** fields in the Track pane.

To create or edit a preset input configuration

1. In the **Input** field of a track that you want to select inputs for, click the drop-down arrow and choose **Manage Presets** from the drop-down menu (this menu is also available from the **MIDI Inputs** button in the **Track Inputs** dialog).

The **MIDI Input Presets** dialog box appears.

2. In the **Input Port** column, find the input port that you want to use for this track (if you only use a single-port MIDI interface, you'll only see one choice).

3. To the right of the input port, select the MIDI channels that you want this track to respond to on this MIDI port. Clicking the **OMNI** button in this row of MIDI channels clears or fills all the check boxes in this row.

4. Select channels for any other MIDI port that's listed, if you want to use channels on that port also.

5. If you want to save this configuration, type a name for it in the window at the top of the dialog box, and click the disk icon to save it.

Now, when you choose inputs for other tracks, you can choose the preset you saved by clicking the **Presets** option in the track's **Input** drop-down menu. If you want to edit a preset, select it in the top window of the **MIDI Input Presets** dialog box, edit it, and click the disk icon. If you want to delete a preset, select it in the same dialog box and click the **X** button to delete it.

Input filtering

SONAR lets you filter out specific types of MIDI messages or filter the MIDI input stream channel by channel. Any MIDI information that is filtered out is neither recorded nor echoed to any other MIDI devices.

You can use the message type filter to screen out resource-intensive MIDI messages like key and channel aftertouch. By default, SONAR records all types of events except these two.

You can use message-type filtering to record short System Exclusive (Sysx) messages in real-time. These will end up in the track as Sysx data events, which can hold System Exclusive messages up to 255 bytes. Leave the Buffers setting at 128 unless you experience data not being recorded. For more information about Sysx, see "System exclusive data" on page 1139.

To filter event types

1. Go to **Edit > Preferences > MIDI - Playback and Recording**.

2. Check the message types you want recorded.

3. Click **OK**.

From now on, SONAR records only the types of events you have chosen.

Recording specific ports and channels

Importing music and sound

While recording is perhaps the most common way of adding material to a SONAR project, there are several other methods you can also use. SONAR lets you import music into a project from several different types of digital data files, including MIDI files; audio files in Wave, MP3, AIFF, and other formats; audio CD tracks and other SONAR project files.

See:

Importing audio files

SONAR lets you insert digital audio information into any track of a project. If the audio file you are importing is in stereo, then it can be imported into a single stereo track, a pair of mono tracks or a single mono track.

The **File > Import > Audio** command supports the following digital audio file types:

- Wave (extension .wav)
- MPEG (extensions .mpeg, .mpg, .mp2, and .mp3)
- Apple AIFF (extensions .aif and .aiff)
- Active Streaming (extension .asf)
- Next/Sun (extensions .au and .snd)
- REX (extensions .rex, .rx2, and.rcy)
- Sony Wave64 (extension .w64)
- FLAC (extension .flac)
- Sound Designer II (extension .sd2)
- Core Audio Format (extension .caf)

The sampling rate and bit depth for a project is set based on your default settings in **Edit > Preferences > Audio - Driver Settings**. If the sampling rate from the Wave file does not match the sampling rate in your project, then it will be converted to the current project's sampling rate and bit depth.

To import an audio file

1. Set the Now time and current track to indicate where the audio should be placed.
2. Choose **File > Import > Audio** to display the **Open** dialog box.

3. Choose the audio file you want to import. SONAR displays information about the file at the bottom of the dialog box.

4. Click **Play** to listen to the audio file before importing.

5. If the new file is stereo, check the **Stereo Split** option if you want to insert the file into two separate tracks.

6. Click **Open**.

SONAR loads the audio data from the audio file and places it in the selected track at the Now time.

Preview bus

Files in the **Import Audio** dialog box may be selected and previewed in any existing bus in SONAR.

To preview a file

1. Select the desired output bus in the **Preview Bus** combo box

2. Click on the file in the file explorer pane

3. Click the **Play** button.

4. During playback, the **Play** button becomes a **Stop** button. Click **Stop** to stop playback.

Preview Bus: Master

Broadcast Wave files

Broadcast Wave files are wave files with some additional information stored in them. Broadcast Wave files have the following information:

• **Description.**   A brief description of the contents of the Broadcast wave. Limited to 256 characters.

• **Originator.**   The author of the Broadcast wave. This information is taken from the **Author** field in the "File Info dialog" on page 1608.

• **Originator Reference.**   A unique reference identifier created by SONAR.

• **Origination Date.**   The date the file was created.

• **Origination Time.**   The time the file was created.

• **Time Reference.**   The SMPTE time stamp for the beginning of broadcast wave.

To import a Broadcast Wave file:

1. If you want SONAR to import Broadcast Wave files always at their timestamped location, go to **Edit > Preferences > File - Audio Data** and select the **Always Import Broadcast Waves At Their Timestamp** check box. Otherwise, set the Now Time and current track to indicate where the audio should be placed.

2. Choose **File > Import > Audio** to display the **Open** dialog box.

3. Choose the audio file you want to import. SONAR displays information about the file at the bottom of the dialog box.

4. Click **Play** to listen to the audio file before importing.

5. If the new file is stereo, check the **Stereo Split** option if you want to insert the file into two separate tracks.

6. Click **Open**.

If the **Always Import Broadcast Waves At Their Timestamp** option is selected in **Edit > Preferences > File - Audio Data**, the imported Broadcast Wave file appears at its timestamp on the selected track. Otherwise, the file appears at the Now Time on the selected track.

> **Note:** *When importing Broadcast Wave files, you can hold down the SHIFT key to temporarily toggle the behavior of the **Always Import Broadcast Waves At Their Timestamp** global option.*

Importing audio CD Tracks

The **File > Import > Audio CD** command lets you import tracks from audio CD's into any track of a project.

Audio tracks on a CD always have a bit depth of 16, but you can choose to import the tracks at a higher bit depth if desired.

To import a track from an audio CD

1. Set the Now time and current track to indicate where the audio should be placed.

2. Insert an audio CD into the computer's CD drive.

3. Choose **File > Import > Audio CD** to display the box.

4. Make sure the correct CD drive is selected in the **Target Drive** drop-down list.

5. Choose the audio track you want to import. SONAR displays the length and size of all audio tracks.

6. Click **Play** to listen to the audio track before importing.

7. If you want to import the audio with a different bit depth than the original audio track, choose the desired bit depth from the **Import Bit Depth** drop-down list.

8. Click **OK**.

SONAR loads the audio data from the audio CD and places it in the selected track at the Now time.

Importing material from another SONAR project

You use the **Edit > Copy** and **Edit > Paste** commands to import material from one project to another using the Clipboard. The project that contains the material you want to import is the **source project**. The project into which the material is imported is the **target project**.

Normally, if you copy material from several different tracks to the Clipboard, the information will be pasted back into separate tracks. You can choose to paste all the material from the Clipboard into a

single destination track in the target project.You can also copy material from one project to another by displaying the Track view for both projects side by side, then using drag-and-drop editing.

To import material from another project

1. Open the source project, or click in the Track view for that project.

2. In the Track view, select the material you want to import.

3. Choose **Edit > Copy Special** to display the **Copy** dialog box.

4. Make sure that **Events in Tracks** is checked. If you don't want to import tempo changes, meter/key changes, or markers, uncheck those options. Click **OK**.

5. Open the target project, or click in the Track view for that project.

6. Set the Now time and current track to indicate where the material should be placed.

7. Choose **Edit > Paste Special** to display the **Paste** dialog box.

8. Check **Paste to One Track** if you want all material imported into the current track (not recommended if you're importing both MIDI and audio data).

9. Click **OK**.

SONAR imports the material and displays it in the Track view.

Importing OMF projects

With OMFI (Open Media Framework Interchange) support & Broadcast WAVE support SONAR lets you collaborate and exchange project files with users of other programs and platforms. Support for OMFI and Broadcast Wave files provides cross-platform compatibility with OMFI host applications such as Pro Tools, Avid and Logic systems. SONAR also exports projects as OMF files that you can open in Pro Tools and other audio software.

SONAR allows you to select sample rate and bit depth during OMF import.

A few general guidelines for preparing OMF files for import into SONAR:

- OMF version 2 is preferred.

- AIFC can take slightly longer to open, as the data must be converted to WAVE on read, so WAVE is the best choice.

- If exporting from Avid Xpress DV, select "embed" (not "link") when exporting the OMF file, and don't include any video.

OMF explained

The OMF format, or OMFI (Open Media Framework Interchange, means the same as OMF), is a file format that can be read by many professional-level audio programs. OMF files contain two basic types of information:

- Audio and/or video files, referred to as media

- Information needed to put the media data in sequence—known as the Composition

The OMF file supplies the following data and information:

- Tracks
- Clip positions—an OMF file's EDL edit resolution can be either frame accurate or sample accurate. SONAR can read either, but always writes sample accurate. The clip position is specified in absolute samples.
- Slip edits
- Fades and crossfades (as destructive edits)—SONAR renders any fades when it writes OMFs, creating separate clips for any fade-ins or fade-outs. SONAR slip-edits the original clip to make room for the fade-in and fade-out clips. If you export to an audio program that supports slip editing, the user can delete the fade clips and roll out the original clip to return to the original raw audio (without fades) if desired.
- Sample rate and audio bit depth, but only if the media are embedded in the OMF

The OMF file does NOT supply the following data and information:

- Volume and pan envelopes—OMF does actually support limited automation. However, as with Nuendo and most other OMF host programs, gains and pans are ignored (on both read and write) in SONAR as they are only supported on MONO tracks (OMF limitation).
- Plug-in effects.
- MIDI data
- Tempo

Whoever supplies the OMF file that you want to open in SONAR should also send along a text file containing all pertinent information about the project, especially tempo.

To open OMF files in SONAR

1. Use the **File > Open** command, which opens the **Open** dialog box.
2. In the **Files Of Type** field, select **OMF File**.
3. Navigate to the folder that contains your OMF files, select the OMF file you want to open, and then click the **Open** button, which opens the **Unpack OMF** dialog box.
4. If you know the exact tempo of the file, enter it into the **Initial Tempo** field. It is always preferable to know and enter the project tempo at this point. If you don't know the project tempo you can open the file at the default tempo and then change the file's tempo later, but this will cause the clips to move.
5. The **Sample Rate** field displays the sample rate of the imported audio (if the audio is embedded in the OMF). Use this field to change the sample rate, if you need to.
6. The **Bit Depth** field displays the bit depth of the imported audio if the audio is embedded. If the audio is external, the **Bit Depth** field defaults to the **Original** menu option, which will import the audio at the bit depth the audio is currently using. If you want to import the audio at a different bit depth, you can choose the bit depth in this field.
7. If you have previously enabled SONAR's **Use Per-Project Audio Folders** option in **Edit > Preferences > File - Audio Data**, then the **Store Project Audio In Its Own Folder** check box is already enabled, and the fields under it are available. If you want to use this option, fill out the fields below the check box; otherwise, disable the check box.

8. Click **OK**.

SONAR opens the OMF file.

You can also export SONAR projects as OMF files (**File > Export > OMF** command).

See "Exporting OMF files" on page 935.

Importing MIDI files

You can create a new SONAR project from a MIDI file simply by opening the file. SONAR takes material from the file and places it into one or more tracks in the Track view.

To import data from a MIDI file into a project

1. Open the MIDI file as a new, separate project.

2. Choose **Edit > Select > All.**

3. Choose **Edit > Copy Special** to display the **Copy** dialog box.

4. Make sure that **Events in Tracks** is checked. If you don't want to import tempo changes, meter/key changes, or markers, uncheck those options. Click **OK**.

5. Open the target project, or click in the Track view for that project.

6. Set the Now time and current track to indicate where the material should be placed.

7. Choose **Edit > Paste Special** to display the **Paste** dialog box.

8. Check **Paste to One Track** if you want all material imported into the current track.

9. Click **OK**.

SONAR imports the material and displays it in the Track view.

Importing audio / MIDI files from the Clips pane

It is possible to import audio and MIDI files via the Clips pane context menu. Imported files are inserted at the Now time.

To import audio/MIDI files

1. In the Clips pane, right-click the track to which you want to import an audio or MIDI file.

   The Clips pane context menu appears.

2. Do *one* of the following:

   • Select **Import Audio** to import an audio file.

   • Select **Import MIDI** to import a MIDI file.

See:

"Importing music and sound" on page 301

Saving your work

Like most Windows programs, SONAR has a **File > Save** command and a **File > Save As** command to save your work. Normally, you save your projects in the standard project file format, with a file extension of .cwp. This file contains all your MIDI data and all your project settings. Any digital audio that is part of your project is stored in a separate file, as described in "System configuration" on page 1182.

SONAR also lets you save files in several other formats, as described in the table:

File type	Format	Explanation
Standard MIDI	.mid	Used to transfer MIDI-only projects to other software products that support Standard MIDI files.
Bundle	.cwb	A single file that includes all the material in your project: MIDI data, project settings, and audio data. This format is used for projects that contain digital audio, when you want to back up your work or transfer a project to a different computer. See "Backing up projects with digital audio" on page 1177 for more information. **Note:** Bundle files do not save video data.
Template	.cwt	A file that is used as a pattern to create another. Templates make it easy to create and configure new projects. See "Templates and key bindings" on page 1063 for more information.

Table 39.

If you have made changes to a project and then attempt to close the project, either by closing the Track view or by choosing **File > Close**, SONAR asks if you want to save the changes you have made. This prevents you from accidentally losing your work. You can tell whether changes have been made to a project by looking for an asterisk (*) after the project name in the SONAR title bar.

SONAR has an Auto Save feature that periodically saves your work into a special backup file. You can request automatic backups at fixed time intervals or every time a certain number of changes have been made to the file. When the limit is reached, the file is saved automatically. If your original project is called MyProject.cwp, the Auto Save version is called Auto Save Version of MyProject.cwp.

If there is a power failure or if you make a significant mistake, you can recover the last-saved version of your project by opening this file. You should then save your project under a different name by using the **File > Save As** command.

To Save a project

1. Choose **File > Save As** to display the **Save As** dialog box.

2. Choose the type of file you want to save from the **Save as Type** list.

3. Enter a file name and click **Save**.

    SONAR saves the file. You can also use File Versioning instead of using Save As. For more information, see

To change the Auto Save settings

1. Go to **Edit > Preferences > File - Advanced** to access Auto Save settings.

2. To enable Auto Save, set the number of minutes and/or the number of changes between saves.

3. To disable Auto Save, set both values to zero.

4. Click **OK**.

    From now on, your projects are saved automatically according to the settings you entered.Using File Versioning

SONAR can be enabled to keep previously saved versions of your project in a temporary file. You can revert to any of these saved versions or use the default of the most recently saved version.

When file versioning is enabled, SONAR retains a list of previously saved project files in your project folder. The most recent version retains the original name of the project. Previously saved versions are saved with a time stamp following the original project name in order of most recently saved.

To use File Versioning

1. Go to **Edit > Preferences > File - Advanced** to access File Versioning settings.

2. Check the **Enable Versioning Of Project (.CWP) Files** check box.

3. Use the spinner to select the number of versions of your project you would like SONAR to keep.

    Note: *If you exceed the maximum number of saved file versions selected in Step 3, the oldest version is discarded.*

To revert to a previously saved file

1. Choose **File > Revert**.

    A dialog box appears containing a list of dates and file sizes for all previously saved versions of the current project.

2. Select the file version you want to work on.

3. Click **OK**.

    Note: *If the current project is unsaved at the time you choose **File > Revert**, you will be prompted with a warning that reverting the project will cause all unsaved changes to be lost. When the reverted project is loaded, the timestamp is stripped off, and the reverted project assumes the project's original name.*

Labeling your projects

SONAR lets you attach subtitles, composer credits, copyright, and other information to your projects, as shown in the following table.

Label	Description
Title	The title for your project; prints automatically at the top of a Staff view printout.
Subtitle	For a subtitle or dedication; prints directly below the title in a Staff view printout.
Instructions	Use for performance instructions; prints flush left in a Staff view printout.
Author	Put your name here if you are the composer. Prints flush right in a Staff view printout.
Copyright	Copyright information prints flush right, under the author name, in a Staff view printout.
Keywords	Put keywords describing the project here for future reference.
Comments	Free text comments. Type as much as you like. You can enter approximately the same amount of text as you can in Windows *Notepad*.

Table 40.

This information is shown in the "File Info dialog" on page 1608 box, which is displayed using the **Project > Info** command. If the File Info window is open when you save a file, then this window is displayed automatically the next time the file is opened. This is useful if you:

• Share files with others and want them to see special instructions when they open the file

• Want your copyright information to be displayed automatically

If the File Info window is closed when you save the file, it will not be automatically displayed the next time the file is opened.Although you cannot use **Edit** menu commands while working in the File Info window, standard Windows hot keys like CTRL+X, CTRL+C, and CTRL+V can be used to cut, copy, and paste text.

To display and edit project information

1. Choose **Project > Info** to display the File Info window.

2. Edit the information as desired.

Figure 71. *The File Info window*
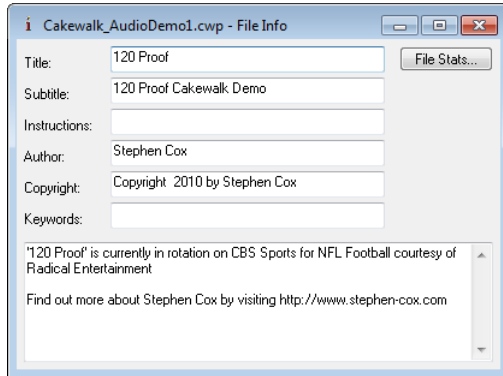
3. If you want the File Info window to display automatically, save the file.

4. Click **Stats** to see statistics about the contents of the file.

5. Choose **File > Print Preview** if you want to print the project information

6. Close the File Info window.

File statistics

To open the **File Statistics** dialog box, select **Project > Info** and click the **Stats** button in the **File Info** dialog box. The **File Statistics** dialog box displays the following information about the contents of the project file:

Statistic	What it means
Created	The date the project was first saved.
Editing time	The total time you've had the project open, from the time it was created to the last time it was saved. This does not include time spent editing the project since you last saved it. If you want to update this value, save the project.
Revision	Each time you save a file that has been changed, this number is incremented. If you open a project, make no changes, then save it, the revision number is not changed.
Events	The total number of events in the project.
Sample rate	The sample rate for digital audio.
Bit depth	The audio driver bit depth of digital audio.
File version	The SONAR version number.

Table 41.

Arranging and editing

The Track view makes it easy to arrange and mix your projects from a single view. From one location, you can select, copy, move, mix, and rearrange the parts of your project, using menu commands or drag-and-drop tools.

You can add real-time audio and MIDI effects from the effects bin and buses.

Markers provide easy-to-use reference points and labels for the different parts of your project, and the snap grid makes it easy to align your clips to the desired time points.

Slip-editing allows you to non-destructively change the start and/or end time of a clip, just by dragging its borders.

With Groove clips, you can easily create repetitions of your clips using your mouse.

Both the Track view and Console view have a full set of record and playback meters, which you can configure in several ways. SONAR also has a variety of tools and commands for changing the tempo of your project.

Composite tracks allow you to keep all your takes in one track if you want, and selectively mute and solo the various clips in the track. Track folders let you edit multiple tracks at once and conserve screen space.

See:

Arranging tracks

SONAR provides a variety of commands that let you work with the tracks in your project. Here are some of the things you can do.

You can	Here's why
Rearrange the tracks in the Track view so that they appear in a different order	This makes it easier to see and work with a subset of tracks, like the rhythm section, or the vocals and vocal backing tracks, or all muted tracks.
Hide individual tracks	This makes it easier to work in a large project. You can display only the tracks you want to see at a given time.
Move tracks into a track folder	Lets you group tracks by function, edit several tracks at once, hide groups of tracks easily, and mute, solo, archive, arm, or input monitor a group or tracks with one click. See "Track folders" on page 378 for more information.
Make copies of a track	Copying a track and then adding a time offset or changing the patch is an easy way to double a part. You can also copy and then transpose a track to add harmony.
Erase or delete a track	Tracks and clips that you are no longer using in your project are distracting and take up space in your project file.

Table 42.

All the commands you use to arrange tracks work on selected tracks. The current track (the one with the lighter titlebar) is always selected. You can select additional tracks as shown in the following table.

To do this	Do this
Select a track	Click the track number in the Track view. The track is selected, and all other tracks—except the current track—are deselected. When a track is selected, both the track number and all the data in the track appear highlighted.
Select several adjacent tracks	Click the track number for the first track in the group, drag the mouse to the last track number in the group, and release the mouse button.
Select/deselect all tracks	Double-click a track number.
Add or remove a single track from the selection	Hold the SHIFT key and click the track number to add it to the selection; hold the CTRL key and click the track number to toggle its selection status.
Select all buses that a track is routed to (via output or sends).	Hold down the ALT key and click the track number.

Table 43.

Note: *Track selection gestures also apply to buses. For details, see "Bus selection" on page 844.*

See:

Changing the order of tracks

There are several ways you can change the order of tracks in the Track view:

- Drag a track to a new position in the Track view.
- Use the Track view **Tracks > Sort Tracks** command to rearrange the tracks in order based on the track name, status, or other setting.

To drag a track to a new position

1. Position the mouse just to the right of the track number, over the track icon of the track you want to move.

   The cursor changes to an up/down arrow.

2. Drag the track to its new location, and release the mouse button.

SONAR rearranges and renumbers the tracks.

You can sort the tracks in a project based on several parameters, in either ascending or descending order:

Sort by	What happens
Name	Ascending puts track in alphabetic order, descending puts them in reverse order
Size, output, or channel	Ascending puts them in increasing numeric order, descending puts them in decreasing numeric order
Muted, archived, selected	Ascending puts qualifying tracks at the end, descending puts them at the beginning

Table 44.

No matter how you sort, blank tracks always go to the end of the list.

Note that track numbers are used for reference only. When you re-arrange the order of tracks, they are automatically assigned sequential numbers based on the order in which they are displayed in the Track view.

To sort the tracks

1. Click the Track view **Tracks** menu and choose **Sort Tracks** to open the **Sort Tracks** dialog box.

2. Choose the attribute by which to sort from the **Sort By** list:

Attribute	How it works
Name	If you choose this attribute, SONAR puts the tracks into alphabetical order, either ascending or descending, depending on what you choose in the Order list.
Muted	If you choose this attribute, SONAR puts all the muted tracks at either the top or bottom of the Tracks window, depending on whether you choose descending (top) or ascending (bottom) in the Order list.
Archived	If you choose this attribute, SONAR puts all the archived tracks at either the top or bottom of the Tracks window, depending on whether you choose descending (top) or ascending (bottom) in the Order list.
Selected	If you choose this attribute, SONAR puts all the selected tracks at either the top or bottom of the Tracks window, depending on whether you choose descending (top) or ascending (bottom) in the Order list.
Size	If you choose this attribute, SONAR puts the tracks in order by size, either in descending or ascending order.
Output	If you choose this attribute, SONAR sorts the tracks by output number, either in descending or ascending order. SONAR considers non-numbered outputs to have lower numbers than numbered outputs.
Channel	If you choose this attribute, SONAR sorts the tracks by channel number, either in descending or ascending order: • If you choose ascending order, SONAR puts all MIDI tracks at the bottom of the Tracks window, with the lower channel numbers first. • If you choose descending order, SONAR puts all MIDI tracks at the top of the Tracks window, with the higher channel numbers first.

Table 45.

3. Choose the order in which to sort from the **Order** list.

4. Click **OK**.

SONAR sorts the tracks according to the settings you chose.

Inserting tracks

You can insert new tracks by a variety of methods. When you insert multiple tracks, you can set track output properties at the same time. If you want new audio tracks to always use the same output bus, you can set that bus as the default bus.

For step-by-step instructions, follow these procedures:

To insert a single track

Do *one* of the following:

• Click the **Insert** menu and choose **Audio Track** or **MIDI Track**.

• Right-click in the Track pane at the place where you want to insert a track, and select **Insert Audio Track** to add an audio track or **Insert MIDI Track** to add a MIDI track.

• Press INSERT to add a track of the same type (audio or MIDI) as the current track.

SONAR shifts the current track and all tracks below it down by one, and inserts a blank, new track at the location of the highlight.

To insert multiple tracks

1. Use the **Insert > Multiple Tracks** command to open the **Insert Tracks** dialog box.

2. If you want to insert audio tracks, do the following:

    • Fill in the number of audio tracks you want to insert in the **Audio** section's **Track Count** field.

    • Pick a main audio output for the tracks in the **Main Destination** field.

    • If you want the main output that you chose to be the default output for new audio tracks, enable the **Set as Default Bus** check box. You can also choose the default bus by right-clicking a bus, and choosing **Set as Default Bus** from the pop-up menu.

    • If you want your new audio tracks to contain a Send module that outputs to a specific bus, choose the bus in the **Send** field. If you choose **None**, the new audio tracks will not contain a Send module.If you want to insert MIDI tracks, do the following:

    • Fill in the number of MIDI tracks you want to insert in the **MIDI** section's **Track Count** field.

    • Pick a MIDI output for the tracks in the **Port** field.

    • Pick a MIDI output channel for the tracks in the **Channel** field.

3. Click **OK** to insert your tracks, or click **Cancel** to cancel the operation.

Your new tracks appear below any pre-existing tracks, with new audio tracks appearing above new MIDI tracks.

> **Note:** *You can also choose the default output bus for new audio tracks by right-clicking a bus, and choosing* **Set as Default Bus** *from the pop-up menu.*

Configuring the display of tracks in the Track view

There are several commands in the Track view **View** menu and Track pane context menu that allow you to configure the appearance of your tracks in the Track view. You can use these commands to zoom in or out, show or hide any combination of tracks, and revert back to previous display settings. The following table lists each of these commands and provides an explanation of each.

Command	Description	Shortcut
Show and Fit Selection	This command hides all tracks which are not selected. The remaining tracks are adjusted in size vertically and horizontally to fit in the Track view, without scrolling if possible. All track selections are lost after this command is executed.	CTRL+ALT+H
Fit Tracks to Window	All currently displayed tracks are adjusted in size vertically to fit in the Track view, without scrolling if possible.	F
Fit Project to Window	This command resizes all tracks both vertically and horizontally to fit in the Tracks view.	SHIFT+F
Lock Height	This command maintains the track's height when you use a zoom or fit command. See "To lock or unlock the height of a track" on page 320.	n/a
Show Only Selected Tracks	This command hides all tracks which are not selected. The remaining tracks are adjusted in size vertically.	CTRL+SHIFT+H
Hide Selected Tracks	Hides all selected tracks.	CTRL+H
Show All Tracks	Shows all tracks in your project, including these hidden using the Track Manager.	SHIFT+H
Track Manager	Opens the **Track Manager** dialog box. For more information about the **Track Manager** dialog box, see "Track Manager dialog" on page 1764.	H
Undo View Change	This command restores the view to its previous state. There are up to 16 levels of undo.	ALT+Z
Redo View Change	This command restores the view to the state prior to the **Undo View Change** command.	ALT+SHIFT+Z

Table 46.

To lock or unlock the height of a track

1. Right-click an empty area in one of the desired track's controls to display the Track pane context menu.

2. Choose **Lock Height** from the menu.

When you lock the height of a track, its height does not change when you use a Zoom or Fit command. When a track's height is locked, you can still drag the track strip's lower border to adjust the track's height. After you drag the border, the altered track height becomes the track's locked height.

Copying tracks

When you copy one or more tracks using the Track view **Tracks > Clone Track(s)** command, you can choose any of the following options:

*   What to copy: events, properties, effects, sends
*   Repetitions: how many copies of each selected track
*   Starting track: where you want the first new track to appear

To copy tracks

1. Select the tracks that you want to copy.Click the Track view **Tracks** menu and choose **Clone Track(s)** to open the **Clone Track(s)** dialog box.

2. Check the **Clone Events**, **Clone Properties**, **Clone Effects**, and/or **Clone Sends** boxes to indicate which items you want to copy.

3. If you want copied events to become linked clips, check the **Link to Original Clips** check box.

4. Select the number of repetitions of each selected track that you want to create.

5. Select the track number where you want the first new track to appear. The other new tracks appear right after it.

6. Click **OK**.

SONAR copies the tracks and pastes the selected tracks, with the first new track appearing at the track number you selected. All tracks appear consecutively.

> **Note:** *When cloning an Instrument track, a new MIDI track is created and assigned to the same soft synth as the cloned instrument track.*

Erasing tracks

You can easily delete an entire track, including all of the track properties and all of its clips and events. Sometimes, you only want to erase, or **wipe**, the contents of a track, leaving the track properties as they are. If you delete or wipe a track by mistake, you can use **Edit > Undo** to restore the deleted material.

When you delete or wipe a track, the track information is not placed on the Clipboard. To remove material from a track and place it on the Clipboard, use the **Edit > Cut** command instead.

To delete tracks

1. Select the tracks you want to delete.

2. Click the Track view **Tracks** menu and choose **Delete Track(s)**.

SONAR deletes the selected tracks. You can also right-click individual tracks and choose **Delete Track** from the pop-up menu.

To wipe tracks

1. Select the tracks you want to wipe.

2. Click the Track view **Tracks** menu and choose **Wipe Track(s)**.

SONAR deletes all clips and events from the selected tracks, but leaves the track properties intact.

Working with track templates

You can create an unlimited number of track templates for quickly recalling your most often used track settings including the following:

- Track type (MIDI or Audio)
- Mute, Solo and Record state
- Hardware input
- Output destination
- Bus send settings
- Track parameters
- Track icons
- Effects and their settings
- Instrument and Bank/Patch
- Track name

To create a track template

1. Select the track or tracks you want to save as a preset.

2. Select **File > Export > Track Template** from the main menu.

   The **Save As** dialog box appears.

3. Enter a name for the template and click **Save**.

Track templates use the file extension .cwx.

To insert a track or tracks from a template

• Select **Insert > Track Template** to open the **Import Track Template** dialog box, then select the desired track template.

   Or

• Right-click in the Tracks pane and select **Insert From Track Template > [track template name]** or select **More Track Templates**.

This inserts tracks that are exactly like the template.

Track icons

Track icons allow you to quickly identify a track's contents by instrument. You can assign a new track icon, create your own track icons, and save an icon as part of a track template.

To show or hide track icons

• To show or hide Track Icons in all views, use the **Views > Icons > Show Icons** command.

• To show or hide Track Icons in a specific view, use the **Views > Icons > [name of desired view] > Show Icons** command.

   Or

• To hide a track icon, right-click a track icon in the desired view, and choose **Show Icons** from the pop-up menu. This option is not available in Track view headers.

To configure Track view icons

• To show standard track icons in the header of each track in the Track view, use the **Views > Icons > Track View > Show in Header** command.

• To show custom track icons in the header of each track in the Track view, use the **Views > Icons > Track View > Show Custom In Header** command.

• To show track icons on the left side of the track controls of each track in the Track view, use the **Views > Icons > Track View > Show In Strip** command.

To change the size of track icons

• Right-click a track icon in the desired view, and choose **Small Icons** or **Large Icons** from the pop-up menu.

   Or

- Select **Views > Icons > [name of desired view] > Small Icons** or **Large Icons** from the main menu.

To change a track icon

1. Right-click on the icon you want to change.

2. Select **Load Track Icon** from the menu that appears.

   The **Open** dialog box appears.

3. Select an icon and click **Open**.

> **Note:** *The right-click option is not available when you right-click a track icon in a track header in the Track view. However, you can load a new track icon into a track header by ALT-clicking the track icon to display the **Open** dialog box, and then choosing a new icon. You can ALT-click a track icon in any view to display the **Open** dialog box.*

To reset a track icon to its original icon

1. Right-click on the icon you want to reset.

2. Select **Reset Track Icon** from the menu that appears.

To create a track icon

1. Create or edit a graphics file in .bmp format, preferably 128 by 128 pixels.

   You can use any image as a track icon. You can use any size image, but for best results scale the image to 128 pixels square. Images must be in the .bmp format.

2. Save the image as a .bmp file in the Track Icons directory in your SONAR program folder.Track icon size(s) and transparency

You can configure the size of small and large icons in `Cakewalk.ini`. By default, small icons are 32x32 pixels and large icons are 48x48 pixels. Use the following INI variables to change the default size:

`[WinCake]`

`SmallIconHeight=32`

`LargeIconHeight=48`

If you want to create custom track icons, we recommend that you author them as 96x96 pixel 24-bit bitmaps (.BMP).

The top left pixel in the BMP determines the transparent color. If you prefer to not have transparent icons, add the following variable to `Cakewalk.ini`:

`[WinCake]`

`IconTopLeftPixelTransparent=0`

Configuring Track view controls

To configure track and bus control layouts

1. Click the Track Control button at the top of the Track pane and choose **Track Control Manager** to open the **Track Control Manager**.

2. In the **Preset** field, choose the control preset that you want to configure, or choose **<new>**, and type a name to create a new tab.

3. In each of the four Strip columns (Audio Strip, MIDI Strip, etc.), check all the controls you want to see for the current preset.

4. To select all available controls, click **Select All Controls**; to select the default controls, select **Restore Defaults** (this will delete any new presets you' have created).

5. To configure a different preset, select it in the **Preset** field.

6. Click **OK** to implement your changes, or **Cancel** to delete them.

For more information about the Track Control Manager dialog box, see "Track Control Manager" on page 1771.

To change the VU meter to horizontal or vertical display

- Click the Track view **Options** menu, point to **Meter Options** and choose **Horizontal Meters** or **Vertical Meters** on the submenu.

Arranging clips

The Track view provides many ways for you to rearrange, copy, and paste clips to arrange your music the way you want. The easiest is to select the clips or portions of clips you want to arrange and then drag and drop them wherever you want. You can drag and drop clips in the Track view even while playback is in progress. You can also arrange clips via the Clipboard using the **Edit > Cut**, **Edit > Copy**, and **Edit > Paste** commands, which work like those in almost all Windows programs.The **snap grid** enables you to move clips to or by an exact amount of time, such as a quarter note or whole measure. See "To change the snap options" on page 355.

See:

Displaying clips

Clips are displayed as rectangles in the Clips pane. Their position and length show you at a glance their starting times and lengths. You can control four aspects of their appearance:**Color.**   By default, each track's clips are drawn in a different color. The clip colors restart at the tenth track. You can customize the default colors of clips in **Edit > Preferences > Customization - Color**, or change the color of any individual clip in the Clip Inspector.

Note: *In audio clips, the waveform changes color, unless no clip contents are displayed. In MIDI clips, the clip background changes color.*

- **Name.** You can also assign each clip a descriptive name, which is displayed in the upper-left corner of the clip.
- **Contents.** At your option, clips can be displayed with a graphical representation of the events in the clip. The effect is slightly different for MIDI and audio information.
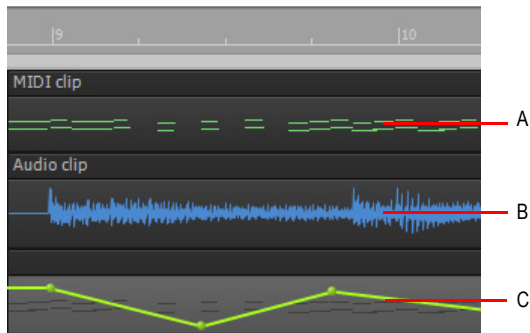
*A. A MIDI clip shows each event; by looking at the clips, you can "see" the notes that are being played **B.** An audio clip shows the actual waveform **C.** Controller or automation data are also displayed*

To inspect the clip contents more closely, use the zoom tools to increase the size in which clips are displayed. Note that displaying the contents of each clip makes your computer work a little harder. As a result, if your computer has an older, slower CPU you may want to turn off the display of clip contents.:

Figure 72. *Zoom controls*
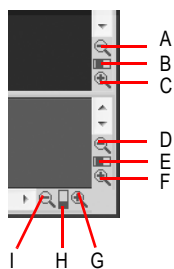
*A. Zoom Clips pane out vertically **B.** Vertical Zoom fader for Clips pane **C.** Zoom Clips pane in vertically*
*D. Zoom Bus pane out vertically **E.** Vertical Zoom fader for Bus pane **F.** Zoom Bus pane in vertically **G.** Zoom in horizontally **H.** Horizontal zoom fader **I.** Zoom out horizontally*

Arranging and editing
Arranging clips

Clip header indicators

Audio and MIDI clips show various information at the top of each clip. A standard clip shows only the clip name, while clips that have been modified in various ways show additional information.

Figure 73. *Clip header indicators*
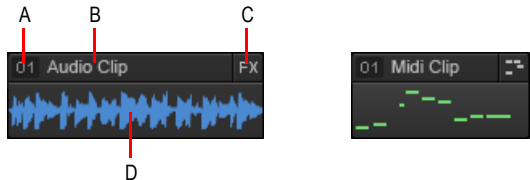
A. Clip group number B. Clip name C. Indicators (FX, AudioSnap, Follow Project Tempo, Stretch, V-Vocal, MIDI editor) D. Clip data (audio waveform or MIDI data)

> **Note:** *Clip headers automatically disappear if the track height is less than 36 pixels.*

The following table describes the various clip header indicators.

Audio clip	MIDI clip	Description
		The clip is a standard audio or MIDI clip.
		The clip is assigned to a clip group. The number identifies the group. For details, see "Clip groups" on page 345.
		The clip contains at least one clip effect. For details, see "To insert an effect on a clip" on page 870.
	n/a	The clip has AudioSnap enabled, which gives you flexible rhythmic and tempo control over audio transients. For details, see "AudioSnap (Producer and Studio only)" on page 589.

Table 47. *Clip header indicators*
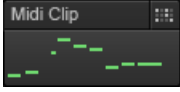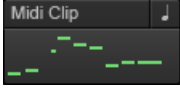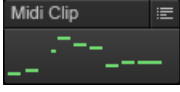
Audio clip	MIDI clip	Description
Audio Clip ▽	n/a	The clip is a V-Vocal clip, which lets you perform pitch correction on notes and phrases, edit formants, and add vibrato to monophonic sounds. For details, see "V-Vocal clips (Producer and Studio only)" on page 898.
Audio Clip 200%	n/a	The clip has been stretched from its original duration by the displayed percentage value. For details, see "Slip-stretching audio" on page 642.
Audio Clip ↔	n/a	The clip follows the global project tempo. For details, see "To sync an audio clip to the project tempo" on page 611 and "AudioSnap section" on page 550.
n/a	Midi Clip	Double-click the clip to open the Piano Roll view. For details, see "The Piano Roll view" on page 677.
n/a	Midi Clip	Double-click the clip to open the Step Sequencer view. For details, see "Step Sequencer view" on page 1803.
n/a	Midi Clip	Double-click the clip to open the Staff view. For details, see "The Staff view" on page 1072.
n/a	Midi Clip	Double-click the clip to open the Event List view. For details, see "The Event List view" on page 742.

Table 47. *Clip header indicators (Continued)*

To hide clip headers and maximize clip waveform display

To globally hide the clip headers, click the Track view **View** menu, point to **Display**, and select **Maximize Waveform Height**. When this options is enabled, the waveform display spans the full height of clips.

To zoom horizontally

Do *one* of the following:

• Click the horizontal zoom buttons to zoom in or out by a fixed percentage each time you click.

• Drag the horizontal zoom fader to zoom in or out by the amount you drag.

• Hold down the CTRL key and press the right arrow key (to zoom in) or the LEFT ARROW key (to zoom out).

- Point the mouse pointer at the top half of the Clips pane or Piano Roll view time ruler (the mouse pointer should look like this: ⊕), then drag up/down.

To zoom vertically

Do *one* of the following:

- Click the vertical zoom buttons to zoom in or out by a fixed percentage each time you click.
- Drag the vertical zoom fader to zoom in or out by the amount you drag.
- Hold down the CTRL key and press the UP ARROW key (to zoom out) or the DOWN ARROW key (to zoom in).
- Point the mouse pointer at the top half of the Clips pane or Piano Roll view time ruler (the mouse pointer should look like this: ⊕), then click with the right mouse button and drag up/down.

To zoom into a selected area

- Use the Zoom tool to drag-select an area of a clip or clips that you want to zoom to. To activate the Zoom tool, hold down the Z key. When you release the mouse, the area you selected expands to fill the Clips pane window.

Zoom command keyboard shortcuts:

To do this	Use this shortcut
Zoom in vertically	CTRL+DOWN ARROW
Zoom in horizontally	CTRL+RIGHT ARROW
Zoom out vertically	CTRL+UP ARROW
Zoom out horizontally	CTRL+LEFT ARROW
Undo Zoom	ALT+Z
Redo Zoom	ALT+SHIFT+Z
Turn On Zoom tool (use the Zoom tool to select the area to zoom to)	Hold down Z
Fit project to window	SHIFT+F
Fit tracks and buses to window	F
Full Screen mode	F11

Table 48.

To zoom using the mouse wheel (Fast Zoom)

• Hold down the ALT key and roll the mouse wheel forward to zoom in, backward to zoom out.

• Hold down ALT+SHIFT to intensify mouse wheel zoom effect.Hold down ALT+CTRL to adjust track scale (Track View Clips Pane only)

To select Fast Zoom options

1. Click the Track view **Options** menu and choose **Zoom Options**.

2. Select the intensity of the Zoom effect in **Zoom Factor** by using the spinners or manually entering a value.

3. Select the vertical and horizontal Zoom focus.

4. Check or uncheck **Simultaneous Vertical and Horizontal Zoom**.

   The default is for **Simultaneous Vertical and Horizontal Zoom** to be checked. If you uncheck it, **Fast Zoom** exhibits the following behaviors.

   • ALT+Mouse Wheel zooms vertically

   • ALT+SHIFT+Mouse Wheel zooms faster vertically

   • CTRL+ALT+Mouse Wheel zooms horizontally

   • CTRL+ALT+SHIFT+Mouse Wheel zooms faster vertically

5. Click **OK**.

To display clip names and contents

1. Click the Track view **Options** menu, point to **Display** and choose **Display Clip Names** to show clip names, or leave it unchecked to hide clip names.

2. Click the Track view **Options** menu, point to **Display** and choose **Display Clip Contents** to show clip contents, or leave it unchecked to hide clip content.

SONAR modifies the clips pane to show the information you want.

To change clip names

1. Select the clips you want to rename.

2. Open the Clip Inspector and show the **Properties** section.

Figure 74. *The Clip Inspector.*
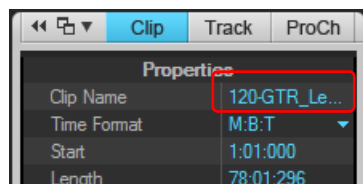
3. Click the Clip Name field, type a name for the selected clips, then press ENTER

SONAR renames the selected clips.

To change clip colors

1. Select the clips whose color you want to change.

2. Open the Clip Inspector and show the **Properties** section.

Figure 75. *The Clip Inspector.*
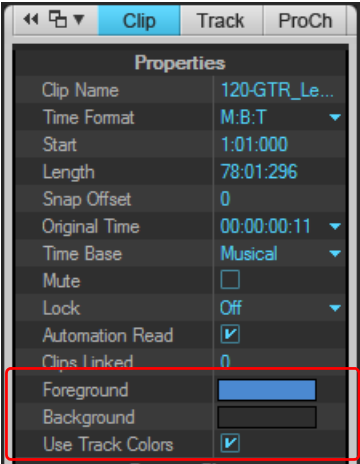
3. Choose a color as follows:

To do this	Do this
Use the default color	Select the **Use Track Colors** check box.
Use a custom color	Click the Foreground or Background field and pick a color.

Table 49.

SONAR changes the color of the selected clips.

Using the Navigator view

The Navigator view displays a large part of your project so you can see an overview of your song. The Navigator view is a floating version of the Navigator pane found at the top of the Track view.

To open the Navigator view, click the **Views** menu and choose **Navigator**, or press ALT+SHIFT+8.

Figure 76.   *The Navigator view.*
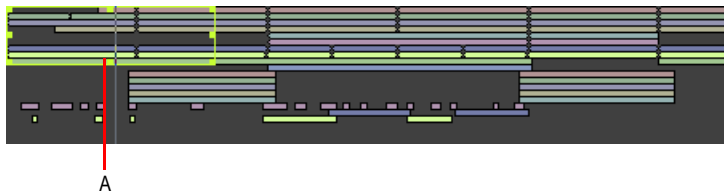
A. Track rectangle

Track rectangle

The Track Rectangle appears as a green rectangle within the Navigator view. The Track Rectangle indicates the section of your project which appears in the Clips pane of the Track view. You can move the Track Rectangle or change its size.

To move the track rectangle

1. Position your cursor inside the Track Rectangle until the icon changes to look like this: ⊕.
2. Click and drag the rectangle where you want and release.

To move the track rectangle when clicking

Right-click in the Navigator view and select the **Left Click Positions Rectangle** option.

To change the size of the track rectangle

1. Click one of the nodes on the rectangle border.
2. Drag to change the rectangle size.

To draw the track rectangle

Hold down the ALT key and drag.

To change the Now time in the Navigator view

1. Hold down the CTRL key.
2. Click where you want the Now Time to be.

To change the track height in the Navigator view

Right-click in the Navigator view and select one of the following options:

•   Track Height Short

- Track Height Medium
- Track Height Tall

To zoom the Navigator view

Right-click in the Navigator view and select one of the following options:

- Horz Zoom Level 1
- Horz Zoom Level 2
- Horz Zoom Level 3
- Horz Zoom Level 4
- Horz Zoom Level 5
- Horz Zoom to Project

Opening views by double-clicking clips

By default, double-clicking a MIDI clip in the Clips pane opens a Piano Roll view for that track, and double-clicking an Audio clip opens the Loop Construction view for that track.

To specify which view should open when you double-click a clip, click the Track view **Options** menu, point to **Click Behavior > Double-Click** and choose the desired view.

To open a view from a clip

1. Right-click in the Clips pane, and choose **View** from the pop-up menu.
2. Choose the type of view you want to work with from the submenu.

Selecting clips

Before you move, copy, edit, or delete clips you need to select them. There are several ways to select whole clips, as shown in the table:

To do this	Do this
Select a single clip	Click on the clip in the Clips pane.
Select several clips at once	With the right mouse button, drag in a rectangular pattern that touches each clip.
Select all the clips in a track	Click on the track number in the Track view.
Select a portion of one or more clips	Use the Smart tool or Select tool and drag across the bottom part of the clip(s). The Snap to Grid setting determines the size portion you can select.
Add clips to the selection	Hold the SHIFT key and either click on the clips or drag a rectangle around the clips.
Add or remove clips from the selection	Hold the CTRL key and either click on the clips or drag a rectangle around the clips.
Add or remove all clips in a track from the selection	Hold the CTRL key and click on the track number.

Table 50.

Using the Select tool

The Select tool [image] allows you to perform both time based selection and clip selection.

To enable the Select tool

• Do one of the following:

  • Click the Select tool [image] in the Control Bar.
  • Press F6.

To select by time or by clip

You can use either the Smart tool or Select tool to select by time or by clip.

When using the Smart tool or Select tool, a clip is divided into two vertical zones. The mouse pointer changes depending on which clip zone the pointer is over:

- **Smart tool:**
  - **Header.**   Click to select the clip.
  - **Top/Bottom.**   Drag to select by time.
  - **Top/Bottom.**   Click to select the clip.
  - **Top/Bottom.**   Drag with the right mouse button to lasso select.
- **Select tool:**
  - **Top/Bottom.**   Click to select the clip.
  - **Top/Bottom.**   Drag with the left mouse button to select by time. Drag with the right mouse button to lasso select.

The Smart tool and Select tool obey Snap to Grid.

To lasso select

Using the Smart tool [icon] or Select tool [icon], drag with the right mouse button.

Lasso selection works across tracks, and selects the data type that is specified in each track's Edit Filter.

Moving and copying clips

You can copy or move clips using drag-and-drop editing or the **Cut**, **Copy**, and **Paste** commands. If you copy or move clips into tracks that contain existing material, you need to let SONAR know how to combine the two.

You have these options:

Option	How it works
Blend Old and New	Events in the copied or moved clip are placed into a new clip that overlaps with the existing clip. This is the same effect as sound-on-sound recording.
Replace Old with New	Events in the copied or moved clip are placed into a new clip, and any overlapping events in the existing clip are erased. This is the same effect as overwrite recording.
Slide Over to Make Room	The existing clips are shifted in time to make room for the new clips, so they will not overlap. If you check the **Align to Measures** option, shifted clips are always aligned to measure boundaries; otherwise, the clips are placed end to end.

Table 51.

When you use the **Edit > Paste Special** command to add information to a track that contains existing material, there is one final option you can choose.

Option	What it means
Paste as New Clips	New clips are created containing the events on the Clipboard, exactly as described in the preceding table.
Paste into Existing Clips (MIDI clips only)	The events on the Clipboard are merged into any existing clips that occupy the same region of time. This means you will never end up with clips that overlap.

Table 52.

Note that if you copy or move clips to new, empty tracks, you don't have to worry about these settings. In this case, the track properties that go with the clips are automatically applied to the new track.When you use drag-and-drop editing:

• You can set the above options every time you perform an edit, or you can set them once and have the same settings carry over automatically. Check or uncheck the **Ask This Every Time** box in the **Drag and Drop Options** dialog box to indicate your preference. To open the **Drag and Drop Options** dialog box, click the Track view **Options** menu and choose **Drag and Drop Options**.

• If you drag to the edge of the Clips pane, it will scroll automatically in the direction you drag.

• If you change your mind while dragging clips, press the ESC key to cancel the operation.

SONAR also lets you move and copy clips between projects.

To move clips using drag and drop

1. Select the clips you want to move.

2. If you want to move the clips by an exact amount of time, enable the snap grid (see "To change the snap options" on page 355 and "Aim Assist line" on page 340).

3. Select the Smart tool ★ or Move tool ✛ in the Control Bar.

4. Position the mouse over one of the selected clips.

5. Press and hold down the left mouse button. A rectangle is displayed around the selected clips.

6. Drag the clips to their new location, and release the mouse button.

7. If necessary, choose the options you want from the **Drag and Drop Options** dialog box (go to **Edit > Preferences > Customization - Editing**, or right-click in the Clips pane and select **Drag & Drop Options** from the pop-up menu), and click **OK**.

Figure 77.   *The **Drag and Drop Options** dialog box*
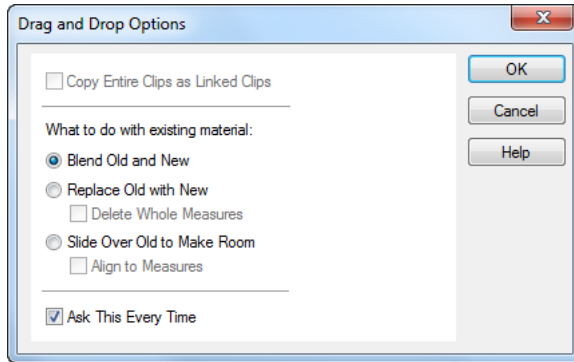
SONAR moves the clips to their new location.

> **Note:** *Moving an audio clip (other than a Groove clip) to a part of your project that has a different tempo changes the size of the clip.*

To move clips using cut and paste

1. Select the clips you want to move.

2. Choose **Edit > Cut Special** to display the **Cut** dialog box.

Figure 78.   *The **Cut** dialog box*
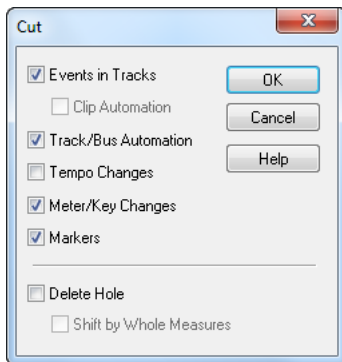
3. Choose the options you want and click **OK**. SONAR cuts the clips from the project and places them on the Clipboard.

4. Click in the Track pane to set the current track to be the one where clips should be pasted.

5. Set the Now time to be the time at which the clips should be pasted.

6. Choose **Edit > Paste Special** to display the **Paste** dialog box.

Figure 79. *The **Paste** dialog box*
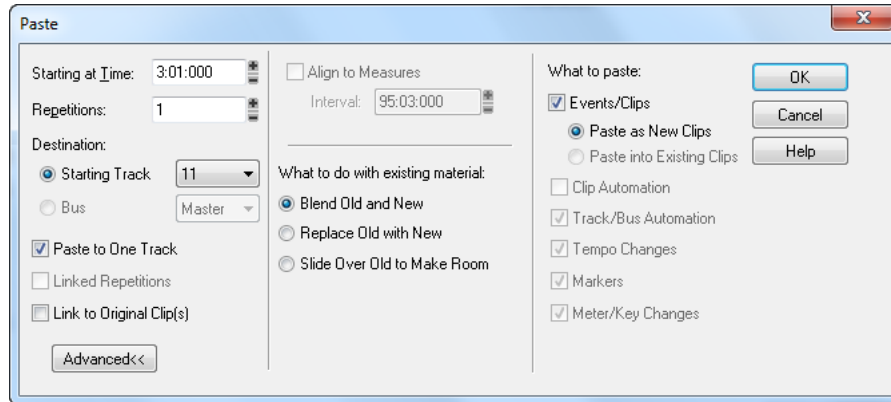
7. Choose the options you want and click **OK**.

SONAR places the clips in their new location.

To choose a specific start time and/or length for a clip

1. Select the clip you want to edit.

2. Open the Clip Inspector and select the **Properties** section.

3. In the **Time Format** field, choose the units you want to use for the new start time and/or length by clicking one of the radio buttons:

- **M:B:T.** Click this if you want the clip to begin and end on a specific measure, beat, or tick.
- **Samples.** Click this is you want the clip to begin and end on a specific sample.
- **H:M:S:F.** Click this is you want the clip to begin and end on a specific hour, minute, second, or frame. This is also known as SMPTE time, and lets you start the clip at an absolute-time-based (as opposed to musical-time-based) point in your project.**Seconds.** Click this is you want the clip to begin and end on a specific second.

4. In the **Start** and **Length** fields, enter a new start time and/or length, or use the spinners or keyboard to change values.

5. Choose a value in the **Time Base** field—choose one of the two options in this section to control what happens to the clip's start time when you change the tempo:

- **Musical (M:B:T).** If the clip is set to the Musical time base, the clip's M:B:T position stays constant, and its Absolute (SMPTE) position shifts.**Absolute (SMPTE).** If the clip is set to the Absolute (SMPTE) time base, its Absolute position stays constant, and its M:B:T position shifts.

> ℹ️ **Note:** *The length of a clip may also change when you change the tempo—audio clips maintain their absolute (SMPTE) length, while a MIDI clip will follow the value in the **Time Base** field. If a MIDI clip is set to use musical time, the clip maintains its M:B:T length. If a MIDI clip is set to use absolute time, the clip maintains its absolute length.*

SONAR adjusts the clip to the values you chose.

> **Note:** *The **Snap Offset** field is for audio clips only. The value of this field is the snap offset of the selected clip, in samples. When you set a snap offset value for a clip, and then drag the clip, the left edge of the clip does not snap to the current snap resolution--the clip snaps to a point on the clip that is the distance from the left edge of the clip to the snap offset value. For example, if you set the snap resolution to move to a measure, and the snap offset of a clip to 1500 samples, when you drag the clip, instead of the left edge of the clip moving to a measure line, the spot on the clip that's 1500 samples right of the beginning of the clip moves to the measure line.*

To copy clips using drag and drop

1. Select the clips you want to copy.
2. Enable the snap grid, if desired.
3. Select the Smart tool in the Control Bar/
4. Position the mouse over one of the selected clips.
5. Press and hold the CTRL key and click and hold the left mouse button. A rectangle is displayed around the selected clips.
6. Drag the clips to the new location, and release the mouse button.
7. If necessary, choose the options you want from the **Drag and Drop Options** dialog box, and click **OK**.

SONAR copies the clips to their new location.

To copy clips using copy and paste

1. Select the clips you want to copy.
2. Choose **Edit > Copy Special** to display the **Copy** dialog box.
3. Choose the options you want and click **OK**. SONAR copies the clips to the Clipboard.
4. Click in the Track pane to set the current track to be the one where clips should be pasted.
5. Set the Now time to be the time the clips should be pasted.
6. Choose **Edit > Paste Special** to display the **Paste** dialog box.
7. Choose the options you want and click **OK**.

SONAR copies the clips to their new location.

To delete clips

1. Select the clips you want to delete.
2. Do one of the following:
   - Choose **Edit > Delete**, which brings up a dialog box—choose options and click **OK**.
   - Press the DELETE key.

SONAR deletes the selected clips.

See:

"Splitting and combining clips" on page 365

"Working with partial clips" on page 352

"Working with linked clips" on page 363

"Aim Assist line" on page 340

Aim Assist line

Aim Assist is a vertical white line that shows the mouse pointer's horizontal position in the Clips pane and Piano Roll. The mouse pointer's time position is also shown in the time ruler.

Aim Assist is a helpful guide when editing in the Clips pane and Piano Roll, making it easy to align the mouse pointer with events on different tracks or markers in the time ruler.

Figure 80.   *The Aim Assist line is a helpful guide when editing in the Clips pane*
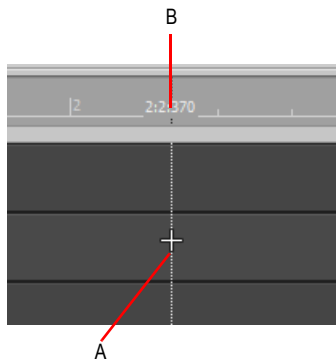
A. Vertical Aim Assist line B. Time position

When Snap to Grid is enabled, the Aim Assist line follows the current Snap to Grid settings rather than the mouse pointer position.

The following rules apply when selecting and moving a clip with the Smart tool, Edit tool, Select tool or Move tool:

Click the front/left portion of a clip. The Aim Assist line snaps to the start of the clip boundary and travels with the clip as it is dragged.

Click the rear/right portion of a clip. The Aim Assist line snaps to the end of the clip boundary and snap operates on the clip's end. The AimAssist line travels with the clip as it is dragged.

To enable/disable Aim Assist

• Do one of the following:

  • Click the **Edit** menu and choose **Aim Assist**.

  • Press X.

  The vertical Aim Assist line is shown or hidden.

Tip: *You can also toggle Aim Assist on/off with a key binding. For information about assigning key bindings, see "Key bindings" on page 1066.*

To customize the Aim Assist color

1. Go to **Edit > Preferences > Customization - Colors**.

2. In the **Color Category** list, select **Track View**.

3. In the **Screen Element** list, select **Aim Assist line**.

4. Specify the desired color and click **OK** to close the **Preferences** dialog box.

See:

"Splitting and combining clips" on page 365

"Working with partial clips" on page 352

"Working with linked clips" on page 363

Reverting clip(s) to original time stamp

All audio and MIDI clips in SONAR have a **Original Time** property, which stores the original SMPTE time stamp associated with a clip. The Original Time clip property is based on absolute time, not tempo. This allows you to freely re-arrange clips and later revert them back to their original time.

SONAR automatically assigns the **Original Time** property during import or immediately after record. When an audio clip containing a SMPTE time stamp is imported into SONAR (such as a Broadcast Wave file), the **Original Time** field is populated with this time stamp. When opening previous SONAR projects, existing clips will be populated with their current time.

Note: *The **Original Time** property can not be edited. If a clip is bounced to a new clip, the **Original Time** stamp will not propagate to the new clip.*

Figure 81. *The Clip Inspector.*
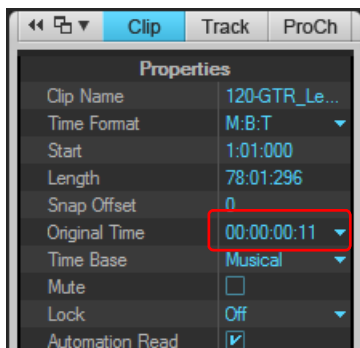
A. Original Time property; click to revert clip to the original time stamp

To revert clip(s) to original time stamp

To revert selected clips to their original SMPTE time stamp, do *one* of the following:

- Right-click a clip and choose **Revert Clip(s) to Original Time Stamp** from the context menu.
- In the Clip Inspector, select the **Properties** section, click the Original Time field and choose **Revert to original time stamp** on the pop-up menu.

Locking Clips

You can lock a clip so that it can't be accidentally modified or deleted. You can lock the clip's position and/or its data.

To lock or unlock a clip's position and/or data

• In the Clip Inspector, select the **Properties** section, click the Lock field and choose what clip attributes you want to lock:

   • **Position and Data.**   This choice locks position and data, and causes a lock icon to appear on the clip 🔒.

   • **Position Only.**   This choice locks position only, and causes a yellow lock icon with the clasp unlocked to appear on the clip 🔓.

   • **Data Only.**   This choice locks data only, and causes a blue lock icon with the clasp unlocked to appear on the clip 🔓.

Figure 82.   *The Clip Inspector.*
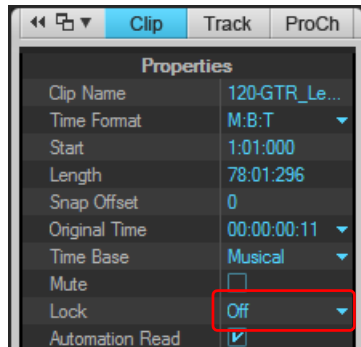
Or

1. Right-click a clip.

2. From the pop-up menu, choose one of the following commands:

   • **Clip Lock > Lock Position.**   In lock mode, this choice locks position only, and causes a yellow lock icon with the clasp unlocked to appear on the clip. If data is already locked, then both position and data become locked, and a "locked" lock icon appears on the clip. In unlock mode, if both position and data are locked, and you unlock position, then the blue "unlocked" lock icon appears on the clip, meaning that only data is locked.

- **Clip Lock > Lock Data.** In lock mode, this choice locks data only, and causes a blue lock icon with the clasp unlocked to appear on the clip. If position is already locked, then both position and data become locked, and a "locked" lock icon appears on the clip. In unlock mode, if both position and data are locked, and you unlock data, then the yellow "unlocked" lock icon appears on the clip, meaning that only position is locked.

Note: *If a clip's position is locked, and you change tempo, what happens to the clip's position depends on what option the Clip Properties **Time Base** field is set to: **Musical (M:B:T)**, or **Absolute (SMPTE)**. If the clip is set to the Musical time base, the clip's M:B:T position stays constant, and its Absolute position shifts. If the clip is set to the Absolute time base, its Absolute position does not move, but its M:B:T position shifts.*

Auto scroll lock in Clips pane

While editing, you can prevent the Clips pane from scrolling horizontally during playback. This allows you to focus on the edit location without worrying that the screen will eventually scroll away from the edit location.

When the **Left Click Locks Scroll** option is enabled (default behavior), the Clips pane will not scroll if you click any object in the Clips pane. When you are done with the edit and want the Clips pane to scroll again during playback, click in the background of the Clips pane to clear auto scroll lock.

To enable/disable auto scroll lock

Click the Track view **Options** menu, point to **Click Behavior** and choose **Left Click Locks Scroll** on the submenu.

Clip groups

SONAR lets you treat multiple clips as a single unit. By grouping clips, you can select and edit an entire group of clips by simply selecting or editing any group member. A group can contain both audio and MIDI clips from a single track or from multiple tracks.

Clip groups are very useful, for example, when editing multitrack drums and you want to synchronize edits on all clips from the same recording take.

You can instruct SONAR to automatically group clips after recording multiple tracks simultaneously, or you can add and remove clips from a group after the clips have been recorded.

Grouped clips are indicated by a group number before the clip name.

Figure 83. *Grouped clips*
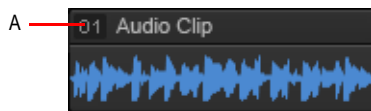
A. The group number is displayed next to the clip name

To group clips during multitrack recording

1. Go to **Edit > Preferences > Project - Record**, or right-click the Record button to access recording settings.

2. Under **Clip Groups**, select the **Group Clips Across Tracks** check box.

After recording is complete, all new clips are grouped together. When loop recording, each pass of the loop gets placed in its own group.

Two discrete steps are placed in the Undo history. The first step is the actual recording and the second step is for Create Clip Group. This allows you to undo the clip group, if desired, without losing the recording.

The following example shows two takes of a five track loop recording. The first clip group is selected.
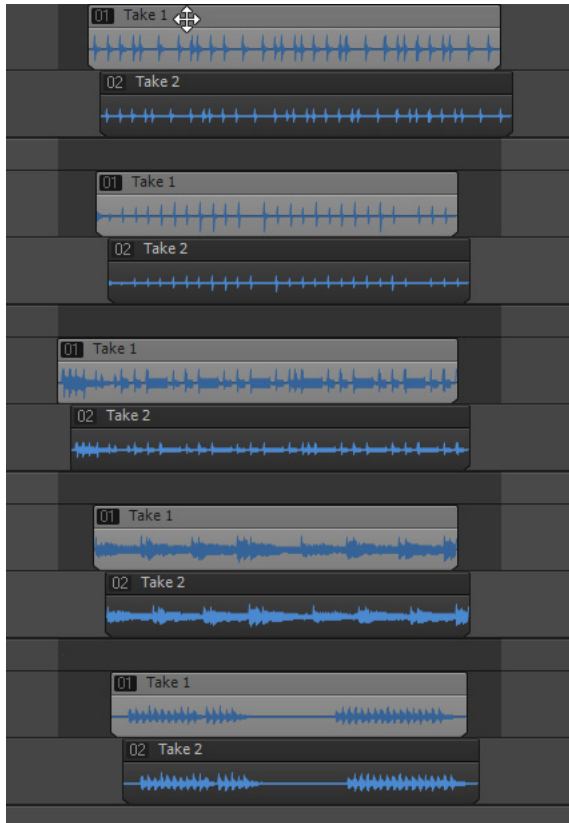
ℹ **Note:** *The **Group Clips Across Tracks** setting is stored with each project.*

To create a clip group

1. Select all the clips you want to group together.
2. Do *one* of the following:
   - Press [(square bracket).
   - Right-click any selected clip, point to **Add to Clip Group** and choose **New** from the pop-up menu.

   A new clip group is created and the group number is displayed next to each clip name.

   Note: *A clip may only belong to one clip group at a time. If any of the selected clips already belong to another clip group, they will be removed from the other group and placed in the new group.*

To add clips to an existing clip group

1. Click on any clip in the existing group.

   All clips in the group are selected.
2. Hold down the CTRL key and click the clips that you want to add to the group.
3. Right-click any selected clip, point to **Add to Clip Group** and choose the desired group from the pop-up menu.

   All selected clips are placed in a new clip group.

   Note: *A clip may only belong to one clip group at a time. If any of the selected clips already belong to another clip group, they will be removed from the other group and placed in the new group.*

To remove clips from a clip group

1. Select the clips you want to remove from the group.

   Tip: *To select only a single clip in a group, hold down the SHIFT key and click the clip that you want to remove from the group.*

2. Right-click any selected clip and choose **Remove from Clip Group** from the pop-up menu.

   The selected clips are no longer grouped.

To remove all clip groups

1. Do *one* of the following:
    - On the **Edit** menu, point to **Select** and choose **All**.
    - Press CTRL+A.

    All clips are selected.

2. Do *one* of the following:
    - Press SHIFT+[(square bracket).
    - Right-click any selected clip and choose **Remove from Clip Group** from the pop-up menu.

    The selected clips are no longer grouped.

Using editing tools on grouped clips

The Select, Mute and Split tools behave as follows when editing grouped clips:

- Select tool :
    - Clicking a clip in a group will also select all other clips in the same group.
    - Lasso-selecting will select clips that are touched by the lasso as well as other clips in the same group that intersect the lasso time range.

- Split tool :
    - Clicking an unselected clip will split that clip and all other clips in the same group that intersect the split time.
    - If a previous selection exists, clicking will split only the clips in the selection.
    - Selecting a range will split all clips in the group that intersect that range.

- Mute tool . The Mute tool has several modes of operation. The corresponding mode is indicated in square brackets.
    - [Mute Entire Clips mode] Clicking an unselected clip will mute that clip and all other clips in the same group.
    - [Mute Entire Clips mode] If a previous selection exists, clicking will mute only the clips in the selection.

- [Mute Entire Clips mode] Lasso-selecting will mute clips that are touched by the lasso as well as other clips in the same group that intersect the lasso time range.
- [Mute Time Ranges mode] Selecting a range will mute all clips in the group that intersect that time range.

Note: *Muting a time range is limited to one track or take lane at a time.*

- [Isolate mode] Isolate mode does not follow clip groups for clips that live in the same track.

SONAR can automatically create a new clip group when splitting clips in an existing clip group. To specify the split behavior, follow these steps:

1. Go to **Edit > Preferences > Customization - Editing**.
2. Under **Clips**, select the **When splitting clips in groups, create new groups** check box.

For more information about splitting clips, see "Splitting and combining clips" on page 365.

Copying and pasting grouped clips

When you copy and paste clips that belong to a clip group, you can specify if the pasted clips should be placed in a new clip group or continue to be grouped with the original clip group. By default, a new clip group is created. You can change the behavior by adding the following line to the [WinCake] section of the Cakewalk.ini file:

```
[WinCake]
CreateNewGroupsOnPaste=1
```

The values are as follows:

0 = The pasted clips will belong to the same clip group as the clips that were copied.

1 = A new clip group is created for the pasted clips. This is the default behavior.

To view and edit the Cakewalk.ini file, go to **Edit > Preferences > File - Initialization File**.

For more information about the Cakewalk.ini file, see "Initialization files" on page 1287.

Nudge

Nudging is moving a clip or a MIDI note by a small amount to the left or right or up and down. There are three customizable settings for the Nudge feature. You can also nudge clips (in the Track view) or notes (in the Piano Roll view) up or down, and you can use keyboard shortcuts (see).

See:

Nudge settings

To configure the three nudge settings, go to **Edit > Preferences > Customization - Nudge** or **Process > Nudge > Settings**.

To Nudge a Clip Left or Right

Use the following procedure to nudge a clip.

1. Select the clip you want to nudge.
2. Select **Process > Nudge Left(1-3)** from the menu to move the clip left or **Process > Nudge Right(1-3)** to move the clip right.

The amount the clip or note moves is determined by the settings in **Edit > Preferences > Customization - Nudge**.

To Nudge a Clip Up and Down

Use the following procedure to nudge a clip (in the Track view) or MIDI note (in the Piano Roll view) up or down.Select the clip or note you want to nudge.

3. Select **Process > Nudge > Up** to move the clip or note up or **Process > Nudge > Down** to move a clip or note down.

Clips move up or down one track at a time. Notes move up or down one pitch at a time.

To Change Nudge Settings

1. Select **Process > Nudge > Settings** to access nudge settings.
2. In one of the three Nudge groups, select one of the following:
   - **Musical Time.**   Select a note length setting.
   - **Absolute Time.**   Select one of the following absolute time options and a number in the first

field:

Absolute time setting	Description
Seconds	Whole seconds.
Milliseconds	Thousands of a second.
Frames	Number of frames. The default frame count is 30 frames per second. The number of frames varies depending on the setting in **Edit > Preferences > Project - Clock**.
Samples	A very small amount of time. For CD-quality audio there are 44,100 samples per second, so a value of 1 here would not move a clip by a perceptible amount.
Ticks	The number of ticks per quarter note varies depending on the setting in **Edit > Preferences > Project - Clock**. The default setting is **960**.

Table 53.

- **Follow Snap Settings.** Moves the clip or note by the current snap setting.

To Nudge a Clip Using Keyboard Shortcuts

1. Select the clip you want to nudge.
2. If necessary, turn on Num Lock (press the Num Lock key on your keyboard).
3. Press the appropriate Num Key.

Nudge	Shortcut
Left 1	NumPad 1
Right 1	NumPad 3
Left 2	NumPad 4
Right 2	NumPad 6
Left 3	NumPad 7
Right 3	NumPad 9
Up	NumPad 8
Down	NumPad 2

Table 54.

Working with partial clips

SONAR lets you select, copy, move, and delete portions of a project even if they do not match clip boundaries. There are two ways to do this:

• Directly select portions of one or more clips.

• Select a range of times and one or more tracks. SONAR automatically selects the portions of clips that are in both the selected time range and the selected tracks.You can then copy, move, or delete the material the same way you do with whole clips.When you select portions of a clip, SONAR may round off the start and end times of your selection based on the snap grid. For more information, see "Defining and using the Snap Grid" on page 354.

To select a portion of a clip

Select the Smart tool [★] or Select tool [↖] in the Control Bar and drag across the bottom half of a clip.

SONAR highlights the selected portion of the clip. You can edit this portion of the clip using all the normal editing commands.

To select a portion of several clips

Select the Smart tool [★] or Select tool [↖] in the Control Bar, then click in the bottom half of a clip and drag across several clips in adjacent tracks.

SONAR highlights the selected portions of all the clips. You can edit these portions of clips using all the normal editing commands.

To select partial clips using time ranges and tracks

1. Select a range of time in one of the following ways:
   • Drag the mouse in the Time Ruler.
   • Click between two markers to select the time between the markers.
   • Select a clip (SONAR selects the range of time covered by the clip).
   • Choose **Edit > Select > By Time**, enter the start and end time, and click **OK**.

2. Select one or more tracks by clicking, SHIFT-clicking, or CTRL-clicking on the track numbers in the Track view.

3. To adjust the start and end time of the selection, hold the SHIFT key while clicking on the Time Ruler.

The relevant portions of clips in the selected tracks are highlighted. You can edit these portions of clips using all the normal editing commands.

To clear the partial clip selection

You can clear the time-restricted selection in any of the following ways:

- Click in an empty area of the Clips pane to completely clear the selection.
- Choose **Edit > Select > None** or press CTRL+SHIFT+A to completely clear the selection.
- Click on a single clip in the Clips pane to clear the time selection and select the clip.

Markers and the snap grid

SONAR has a collection of features you can use to simplify and speed the work you do arranging your projects. Here are a few of the most important things you can do:

- Show gridlines on measure boundaries in the Track view.
- Define and use the snap grid to make drag-and-drop editing more accurate.
- Create markers to identify and work with key time points in your project.

See:

Showing gridlines

Displaying gridlines, or vertical rules, in the Clips pane of the Track view makes it easy to see at a glance how clips align with each other, how they align with measure boundaries, and when they start and end.

To show/hide vertical grid lines

1. Click the Track view **View** menu, point to **Display > Vertical Grid Lines** and select one of the following options:
   - **None.** No vertical grid lines are displayed
   - **Behind Clips.** Vertical grid lines are displayed, but clips will draw on top of them, so clip contents will not be obstructed.
   - **In Front of Clips.** Vertical grid lines are displayed and drawn on top of clips, always visible.

   SONAR displays the Track view as you requested.

Defining and using the Snap Grid

SONAR lets you define a snap grid that makes it easier to arrange clips, select time ranges, and control envelope shape drawing. To use the snap grid, enable the **Snap to Grid** button ⊞ in the Control Bar's Snap module (or press N) and set the grid resolution to an interval of musical time, such as a whole note, half note, or quarter note; a unit of absolute time: a number of frames, seconds or samples; an event; the start or end of a clip; a marker; or audio transients. The grid can use multiple resolutions at the same time, such as a whole note, and audio transients. When the **Snap to Grid** button is enabled, if you move or paste clips or markers, items will be snapped to the nearest point on the snap grid.

You can also use the snap grid to move clips **by** a certain interval, rather than snap them **to** the interval. Moving **by** an interval can be useful during drag-and-drop operations, if your data are not exactly aligned with measure or note boundaries. To set advanced Snap to Grid settings, go to **Edit > Preferences > Customization - Snap to Grid**.

Magnetic snap.   Cakewalk's snap grid has an option called magnetic snap. This means that when you're dragging the boundary of an object, you can move the boundary freely until the boundary gets within a certain number of ticks from the snap target. The closer the object gets to the snap target, the more strongly the object is pulled to the target. You can set the strength of magnetic snap to low, medium, high, or off. Note that if you are zoomed out a certain amount, the time boundary around the snap target will appear to be quite small, and you might think that the snap grid is not functioning. If this is the case, zoom in closer to enhance your editing experience. If you're dragging a whole clip, magnetic snap is not in effect.

To enable or disable the Snap Grid

Do one of the following:

- Click the **Snap to Grid** button ⊞ in the Control Bar's Snap module.
- Press N.

To change the snap options

1. In the Control Bar's Snap module, select one or more of the following resolution options:

    - **Time resolution.**   Snap to the selected musical or absolute time resolution. Click and hold the mouse button pressed to select a different duration from the pop-up menu. For absolute time resolutions (samples, frames, seconds), type the desired number of units. When **Smart Grid** is selected, the snap resolution is dynamically determined by the horizontal zoom level, and the M:B:T time rulers in the Clips pane and Piano Roll view are optimized to show relevant snap locations.

    ℹ **Note:** *To exit Smart Grid mode, clear the **Smart Grid** check mark. If you manually select a new resolution while **Smart Grid** is enabled, the new settings only apply until the focused view's zoom level changes.*

    - **Triplet** [3].   Reduces the duration of the selected Musical time resolution by 2/3 of its original duration. When **Triplet** is enabled, three note events fit in the space of two.

    - **Dotted** ▫.   Increase the duration of the selected Musical time resolution by half of its original value (150%).

    - **Snap To.**   Align data *to* the snap grid.

    - **Snap By.**   Move data *by* the grid resolution.

    - **Landmark Events** 🏔.   Snap to the selected landmarks, including markers, Now Time, clips, audio transients, MIDI notes, and automation envelope nodes. To select the desired landmarks, right-click the **Snap to Grid** button ⊞ to open the **Preferences** dialog, then

select the desired check boxes in the **Landmarks** section. SONAR will snap to landmarks on tracks/lanes that are currently visible in the Clips pane.

2. Go to **Edit > Preferences > Customization - Snap to Grid**.

3. If you want to change the magnetic snap strength, or turn off magnetic snap, adjust the **Snap Intensity** slider.

4. If you want to automatically snap edited audio clips to the nearest zero crossing of the waveform (the point at which there is no volume, to minimize the glitches that can happen when waveforms are spliced together) select the **Snap to Nearest Audio Zero Crossings** check box.

5. Click **OK** to close the dialog box.

All time selections and drag-and-drop editing operations use the new snap grid resolution(s).

To use a secondary Snap to Grid resolution

By default, SONAR uses the global Snap to Grid settings when snap is enabled. However, you can also specify a secondary Snap to Grid resolution that is in effect when holding down the N key.

To assign the secondary Snap to Grid settings, hold down the N key while selecting the desired snap settings in the Control Bar's Snap module.

To momentarily apply the secondary Snap to Grid resolution, hold down the N key while dragging or editing data that is snapping to the grid. When the N key is released, the main global snap settings are restored.

To swap the primary and secondary Snap to Grid settings, press CTRL+SHIFT+N.

Note: *To enable/disable Snap to Grid, press the N key quickly. To assign or use the secondary Snap to Grid resolution, keep the N key pressed.*

Tip: *You can configure the secondary Snap to Grid resolution to effectively bypass snapping when holding down the N key. To do so, hold down the N key while disabling the snap resolution and snap landmarks in the Control Bar's Snap module. Snapping will now be temporarily disabled while you hold down the N key.*

See also:

Snap offsets

Snap offsets allow you to set a point other than the beginning of a clip as the "snap" point used by the Snap to Grid. A snap offset is the number of samples from the beginning of the clip. Snap offsets affect all edits that obey the Snap to Grid setting. Once the snap offset is added, you can set the Timer Ruler to SMPTE or MBT time.

Note: *You cannot set a snap offset for a Groove clip.*

Creating a snap offset

Use the following to add a snap offset to a clip:

1. Locate the place in the clip where you want to put the snap offset, and set the Now Time to that location. Use the Scrub tool if necessary.

2. Right-click on the clip and select **Set Snap Offset to Now Time** from the menu that appears.

Edits to that clip, when the **Snap to Grid** button is depressed, now snap to the snap offset rather than the beginning of the clip.

Deleting a snap offset

1. Select the clip.

2. Open the Clip Inspector and select the **Properties** section.

3. Click the Snap Offset field and type **0**.

Creating and using markers

Markers are a way of associating a name with a time point in your project. You use markers to name sections of a project, to mark hit points in a film score, or simply to provide a shortcut for working with any time point in a project. Markers make it easy to:

- Jump to a specific time point in a project.

- Select a portion of a project.

- Enter a time in any dialog box, by pressing G and choosing the marker you want.

You can see and work with markers in four ways:

- They are displayed in the Time Ruler at the top of the Track, Staff, and Piano Roll view.

- The Markers module in the Control Bar lets you add markers and jump to specific marker locations.

- The Markers view displays all markers and lets you add, edit, and delete markers.

- You can press M while playback is in progress to add a marker on the fly.

The time associated with a marker can be expressed in musical time or as a locked SMPTE time. If a marker has a musical time (measures, beats, and ticks), the marker stays at that musical time regardless of changes in tempo. If a marker has a locked SMPTE time (hours, minutes, seconds, and frames), the marker stays at the same time even when the tempo is changed. Locked markers are useful for projects that require you to sync the music or sound with film scores or multimedia presentations. See "To add a marker" on page 359.

SONAR takes the current snap grid settings into account when you move or copy markers. For example, if the snap grid is set to even measure boundaries, any time you move or copy a marker, the marker will be snapped to the beginning of the nearest measure. You are allowed to have any number of markers at a single time point. To display the Markers view, choose **Views > Markers**. From the Markers view, you can use the **File > Print** and **File > Print Preview** commands to print a listing of markers.

Figure 84. *The Markers view*
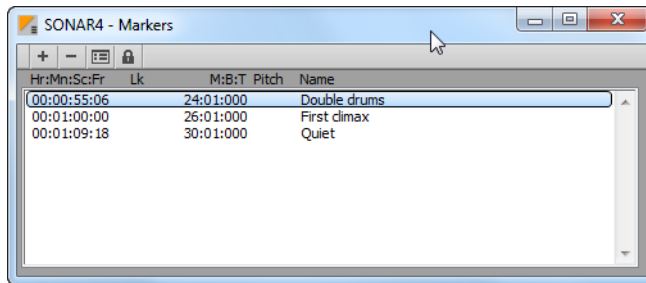
You can add markers while playback is stopped or while playback is in progress (on the fly). When you add a marker while playback is stopped, you can enter a name for the marker and either use the Now time or enter a different time. When you add a marker on the fly, the marker is named automatically and assigned the Now time. Using the Markers view, you can edit the names and times whenever you want.

To add a marker

1. Open the **Markers** dialog box in one of the following ways:

    - Click [icon] in the Control Bar's Markers module.
    - Press M.
    - Choose **Project > Insert Marker**.
    - Click + in the Markers view.
    - Hold down the CTRL key and click the marker section of the Time Ruler.
    - Right-click in the Time Ruler and select **Insert Marker**.

    SONAR displays the **Marker** dialog box.

Figure 85. *The **Marker** dialog*
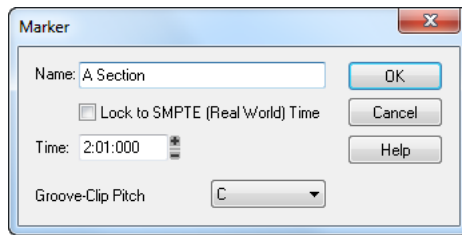
2. Enter a name for the marker in the **Name** box.
3. The time is set to the Now time. If you want, use the spinners to change the time or type in a new marker time.
4. Check the **Locked to SMPTE** box if you want to lock the marker to the SMPTE time.
5. Click **OK**.

SONAR adds the marker and displays it in the Time Ruler, the Markers view, and the Control Bar's Markers module.

To add a marker on the fly

- Click [icon] in the Control Bar's Markers module, or press M.

SONAR adds a marker at the Now time and displays it in the Time Ruler, the Markers view, and the Markers module.

To edit a marker

1. Either right-click on the marker in the Time Ruler, or choose a marker in the Markers view and click ▦. SONAR displays the **Marker** dialog box.

2. Change the marker name, time, or other settings as desired.

3. Click **OK**.

SONAR updates the marker in the Time Ruler and the Markers view.

To copy a marker

1. Press and hold the CTRL key.

2. Drag a marker in the Time Ruler of the Track view, Staff view, Tempo view, or Piano Roll view. SONAR displays the **Marker** dialog box.

3. Enter the desired marker settings and click **OK**.

SONAR copies the marker and displays it in the Time Ruler and the Markers view. You can also cut and paste markers directly from the Markers view.

To lock or unlock several markers

1. In the Markers view, select one or more markers. Use the CTRL and SHIFT keys if necessary to modify the selection.

2. Select or deselect 🔒.

SONAR updates the markers.

To move a marker

• Drag the marker in the Time Ruler.

SONAR updates the marker time and shows it at the new location.

To delete a marker

1. Press and hold the left mouse button while pointing to a marker in the Time Ruler.

2. Press DELETE, and release the mouse button.

SONAR deletes the marker. You can use **Edit > Undo** if you make a mistake.

To delete markers from the Markers view

1. In the Markers view, select one or more markers. Use the CTRL and SHIFT keys if necessary to modify the selection.

2. Click – or press DELETE.

SONAR deletes the selected markers. You can use **Undo** if you make a mistake.

To jump to a marker

There are many different ways to jump to a specific marker:

• Choose a marker from the drop-down list in the Control Bar's Markers module.

• Press G twice to display a list of markers, choose the marker you want, and click **OK**.

• Click on a marker in the Markers view to set the Now time to that marker.

• Click the **Next Marker** button ⬛ or **Previous Marker** button ⬛ in the Markers module.

• Press CTRL+SHIFT+PAGE DOWN to jump to the next marker, or press CTRL+SHIFT+PAGE UP to jump to the previous marker.

To select a time range using markers

You can select a range of times by clicking in the marker section of the Time Ruler:

• Click to the left of the first marker to select the time between the start of the project and the first marker.

• Click to the right of the last marker to select the time between the marker and the end of the project.

• Click between two markers to select the time between the markers.

• If looping is enabled, click to the right of the **Loop Start** marker to select the loop region

• If punch recording is enabled, click to the right of the **Punch In** marker to select the punch region

💡 **Tip:** *If you press TAB or right-click while holding down the left mouse button over the markers, you can toggle through which of the overlaid markers you'd like to move.*

For example, if the Now Time marker, a regular Marker, a Loop point, and a Punch point are all at measure 5, pressing Tab (while holding down the left mouse button) toggles through T (Now Time), M (regular), L (Loop), and P (Punch). If you want to change the regular marker, simply drag the mouse when M is displayed; if you want to adjust the position of the Loop point, tab through to L, and so on.

TAB to transients

You can use the TAB and SHIFT+TAB keys to jump to audio transients, and MIDI Note events. Tabbing is only possible when the transport is not rolling.

TAB to transients is selection-based, which means tabbing will go to the next/previous transient amongst all selected clips. If there is no selection, tabbing operates on the current track.

To move the Now time to the next transient

• Press TAB.

To move the Now time to the previous transient

• Press SHIFT+TAB.

TAB to transients landmarks

The following table shows how TAB to transients applies to different SONAR clip types.

Clip type	TAB target
Audio Groove clips.	Each slice.
"Stretch to tempo" clips (clips that are not groove clip looped but use groove clip for rendering).	Each slice.
Regular audio clips.	Each transient as detected by AudioSnap.
Slip stretched audio clips.	Each transient as detected by AudioSnap, scaled to the stretch amount so tabbing continues to line up perfectly.
MIDI clips.	Each Note event (MIDI Controller data is ignored). **Note:** If there are multiple Note events at the exact same tick position, only one of the notes will be tabbed to.
MIDI Groove clips.	Each Note event.
Step Sequencer clips.	Each step that contains a note.

Table 55. *TAB to transients landmarks*

TAB to transients in the Piano Roll view

In addition to the Track view inline Piano Roll, TAB to transients also works in the Piano Roll view. If multiple tracks are displayed in the Piano Roll view, tabbing only operates on the current track.

Working with linked clips

SONAR makes it easy to repeat a pattern over and over using a feature called **linked clips**. Linked clips always have the same contents, name, and display color. Any change you make to the internal contents of one of the clips, such as adding or editing notes or effects, automatically applies to all of them. Any number of clips may be linked with each other. To create linked clips, copy the clips and when pasting, check the **Linked Clips** option in the **Paste** dialog box or the **Drag and Drop Options** dialog box. Linked clips are displayed with a dotted border, so they are easy to spot. You can also identify linked clips from the Clip Inspector or by using the **Select All Siblings** command in the Clips pane context menu. You can easily unlink linked clips, and then edit them individually. You have two options when unlinking linked clips:

Option	How it works
New linked group	The clips you selected will still be linked to each other, but won't be linked to any clips that are not selected
Independent	Every selected clip will be completely independent

Table 56.

Once you have unlinked linked clips, you cannot re-link them except by using **Edit > Undo**.

If you attempt to copy only a portion of a linked clip, the copy will not be linked to the original. Copies of a clip can be linked to the original only when you select and copy the entire clip.

To make linked copies of a clip using drag and drop

1. Click the Track view **Options** menu and choose **Drag & Drop Options** to display the **Drag and Drop Options** dialog box.
2. Check the option labeled **Copy Entire Clips as Linked Clips**.
3. Click **OK**.
4. Select the clips you want to copy.
5. Position the mouse over one of the selected clips.
6. Press and hold down the CTRL key.
7. Press and hold down the left mouse button. A rectangle is displayed around the selected clips.
8. Drag the clips to their new location, and release the mouse button.
9. If necessary, confirm the options in the **Drag and Drop Options** dialog box, and click **OK**.

SONAR creates copies of the selected clips that are linked to the originals. Any change you make to one of the clips is applied to all linked clips, including the original clip.

To make linked copies of a clip using copy and paste

1. Select the clips you want to copy.
2. Choose **Edit > Copy Special** to display the **Copy** dialog box.
3. Choose options as desired and click **OK**. SONAR copies the clips to the Clipboard.
4. Click in the Track pane to set the current track to be the one where clips should be pasted.
5. Set the Now time to be the time at which the clips should be pasted.
6. Choose **Edit > Paste Special** to display the **Paste** dialog box.
7. In the **Paste** dialog box, choose one of two options:
   • **Linked Repetitions.** If you choose this option, only the new copies of the original clip are linked together. Edits you make to the new copies do not affect the original, and vice versa.
   • **Link to Original Clip(s).** If you choose this option, the new copies and the original clip are linked together. Edits you make to any of the linked clips, including the original, affect all other linked clips in the group.
8. Choose the other options you want and click **OK**.

SONAR creates copies of the selected clips that are linked in the way you chose.

To unlink linked clips

1. In the Clips pane, select the clips you want to unlink.
2. Right-click on any selected clip and choose **Unlink** from the pop-up menu. SONAR displays the **Unlink Clips** dialog box.
3. Choose the unlink option you want, and click **OK**.

SONAR unlinks the clips and updates the Clips pane accordingly. From now on, any changes you make to one of the clips are applied only to remaining linked clips, if any.

To select the clips that are linked to another clip

1. Select one or more clips in the Track view.
2. Right-click on any selected clip and choose **Select All Siblings** from the pop-up menu.

SONAR selects any clip that is linked to one of the currently selected clips.

Splitting and combining clips

SONAR provides several commands that are used to split and combine clips. Specifically, you can:Split a clip into several smaller clips

- Create a new clip from a selected portion of an existing clip
- Combine adjacent or overlapping clips into a single, longer clip

The following table summarizes the commands you can use.

To do this	Use this command	Notes
Split clips into parts	• Right-click the clip and choose **Split** on the context menu • Press S	Works on all selected clips. You can also press the **s** key to split all selected clips at the Now Time.
Combine several clips into one	Click the Track view **Clips** menu and choose **Bounce to Clip(s)**	If the selected clips are in separate tracks, one clip is created for each track. All clip automation is applied destructively to the new clip.

Table 57.

Note: *Combining a stereo and mono clip always produces a stereo clip.*

The **Split** command lets you split clips four different ways.

Option	How it works
Split at Time	Splits selected clips at a specific point in time. By default, the split occurs at the Now time, but you can choose any time you want.
Split Repeatedly	Splits selected clips at regular intervals, beginning at a specified time, with a specified duration. For example, you could split a long clip into 4-bar clips starting at measure 5.
Split at Markers	Splits selected clips at any marker location. This option is available only if your project has markers.
Split when Silent	Removes "silent" stretches of one measure or more from selected clips. The presence in a measure of any event—including those that make no sound, such as a patch change or lyric event—will cause that measure to be retained.

Table 58.

While the **Split** command works for both MIDI and audio clips, for audio clips, the **Split** command provides sample accurate editing and snap-to-zero capability.Note that the **Edit > Undo** and **Edit > Redo** commands work with all three of these editing commands.

SONAR allows you to specify what is selected after a clip is split into two parts:

- **Left portion (default).**   Only the left portion is selected.
- **Right portion.**   Only the right portion is selected.
- **Both portions.**   Both the left and right portions are selected.
- **None.**   Neither portion is selected.

To specify the default split behavior

1. Go to **Edit > Preferences > Customization - Editing**.
2. Under **Clips**, select the desired option in the **Selection after single split** list.

To split clips into smaller clips

1. Select the clips you want to split.
2. Right-click on any selected clip, and choose **Split** from the pop-up menu. SONAR shows the **Split** dialog box or press the S key to split the clip(s) at the Now Time.
3. Choose the Split option you want to use, and enter the settings you want to use.
4. Click **OK**.

    Or

1. Select the clips you want to split.
2. Set the Now Time to the time you want to split the clips.
3. Press the S key.

SONAR splits the selected clips according to your instructions.

To combine clips

1. Select the clips you want to combine (the clips must be on the same track).
2. Right-click on of the clips and select **Bounce to Clip(s)** from the pop-up menu.

SONAR combines the selected clips into a single, new clip.

Take lanes and comping takes

Take lanes provide an alternative method of viewing and editing overlapping clips on tracks. Overlapping clips can occur when you record multiple takes on the same track. Take lanes can be expanded or collapsed on each track. When expanded, Take lanes are indented below the parent track. Take lanes can be created, hidden, and removed, and each track can have an unlimited number of lanes.

Take lanes provide many benefits, including:

• Better visibility of clip data.

• Less screen clutter on track strips.

• Ability to quickly mute and solo individual takes.

• Better workflow for creating a final composite take out of many separate takes.

To show a track's Take lanes, click the track's **Expand/collapse Take lanes** button.

Figure 86. *Take lanes collapsed.*
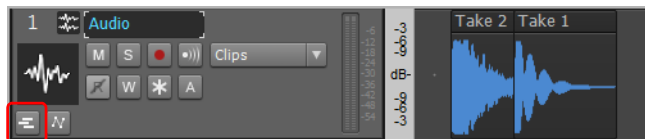
Figure 87. *Take lanes expanded.*
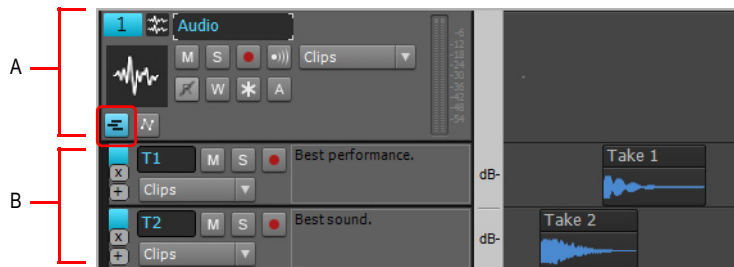
A. Parent track B. Take lanes

When you view clips in separate take lanes, it's easy to mute and solo them individually and eventually come up with a composite take, with only the best clips playing back.

When you use loop recording, you can store all your takes in the same track, and then use the Mute tool or to hear only the ones you want.

If you enable a track's **Expand/collapse Take Lanes** button, SONAR moves the track's clips to separate lanes whenever any of the following happens:

- You use loop recording in Sound on Sound mode, and choose to store takes in a single track.
- You record over some pre-existing data while in Sound on Sound mode.
- The track contains at least one overlapping clip.

See:

Take lane controls

Most of the controls in Take lanes are identical to the controls found in tracks.

Figure 88. *Take lane controls.*
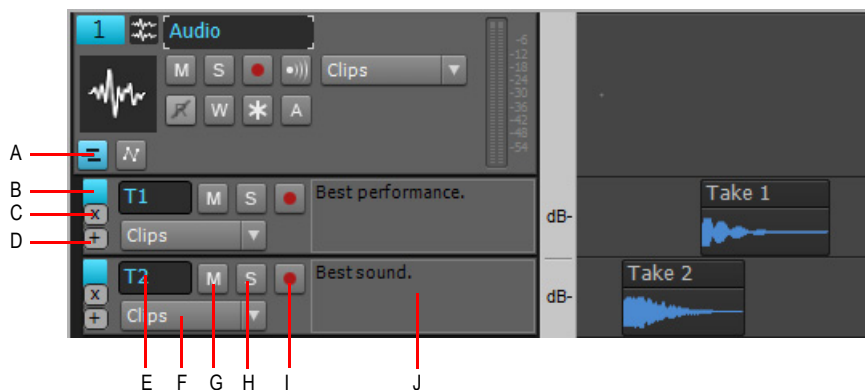
A. Expand/collapse Take lanes B. Select lane C. Remove lane D. Insert new lane E. Lane name F. Edit Filter G. Mute H. Solo I. Arm for recording J. Comments

The following controls are shown in each Take lane:

- **Remove lane** ⊠.   Remove lane and all data in the lane.
- **Insert new lane** ⊞.   Add a new empty lane below the clicked lane. Each track can have an unlimited number of lanes. New Take lanes are automatically named **T1**, **T2**, **T3**, etc.
- **Select.**   Click to select the lane and its parent track. Lanes support the same selection gestures as tracks.
- **Edit Filter.**   Use a track's Edit Filter control to specify the type of data you want to edit.
  - **Clips.**   The selected tool operates on clips.
  - **Audio Transients.**   The selected tool operates on audio transients (only available for audio

tracks).

- **Notes.**   The selected tool operates on MIDI Note events (only available for MIDI and Instrument tracks).

- **Clip Automation.**   The selected tool operates on clip automation envelopes. Select the desired automation parameter from the submenu. Created envelopes are displayed in bold text at the top of the menu.

- **Name.**   Take lanes are automatically named with a sequential take number. You can rename Take lanes, just like regular tracks.

- **Solo.**   Solo the Take lane and temporarily mute all other Take lanes within the same parent track.

- **Mute.**   Mute the Take lane.

- **Record Arm.**   Arms the Take lane for recording. New data will overwrite existing data, regardless of the global record mode.

- **Comments.**   Type a comment or description of the selected take.

Note: *When using Quick Groups on Take lanes, the Quick Group affects Take lanes with the same identical name in other selected tracks.*

See:

Using Take lanes

To expand/collapse a track's Take lanes

Click a track's **Expand/collapse Take Lanes** button ⬒.

Any existing clips are moved from the parent track to separate Take lanes.

💡 **Tip:** *To show/hide Take lanes in the current track, press SHIFT+T.*

Figure 89. *You can expand and collapse Take lanes on each track.*
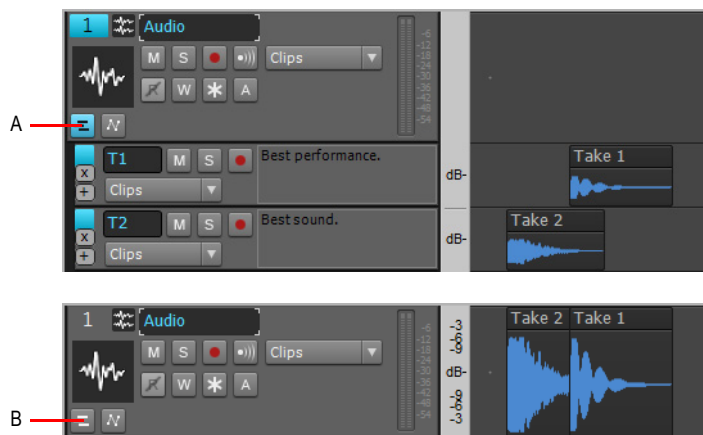
A. Take lanes expanded B. Take lanes collapsed

After Take lanes are expanded, you can move clips on top of each other without SONAR automatically creating new Take lanes.

ℹ️ **Note 1:** *If you want to move a clip to the exact same time placement in an adjacent lane, hold the SHIFT key down while you drag.*

ℹ️ **Note 2:** *If the Track view **Options > Auto Crossfade** option is enabled, SONAR adds a crossfade between any newly overlapped clips that are on the same Take lane.*

Take lanes and Automation lanes can be displayed simultaneously. Take lanes are always displayed immediately below the parent track, and Automation lanes are displayed below the Take lanes.

The **Expand/collapse Take Lanes** button has three states:

- **Collapsed, with no existing lanes.** The button is not highlighted .

- **Collapsed, with at least one existing lane.** The button has a soft blue glow .

- **Expanded.** The button is solid blue .

To insert a new Take lane

1. Click a track's **Expand/collapse Take Lanes** button.

2. Click the **Insert new lane** button in an existing Take lane.

   A new lane is created below the clicked lane. New Take lanes are automatically named **T1**, **T2**, **T3**, etc.

To remove a lane

Click the lane's **Remove lane** button . The lane is removed, and any existing clips are deleted.

To reorder lanes

Click any empty space in a lane and drag the lane up or down to the desired location.

To resize lanes

Move the mouse pointer over the gap below a lane until the cursor looks like this , then drag up or down to resize the lane to your liking.

When you resize a lane, all other Take lanes and Automation lanes in the same track automatically inherit the same height.

Figure 90. *Drag the splitter bar up/down to resize lanes.*
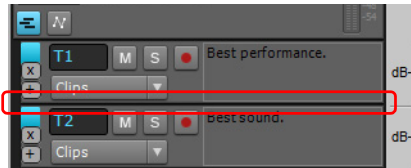
To mute or unmute a Take lane

Click the Take lane's **Mute** button [M].

To solo or unsolo a Take lane

Click the Take lane's **Solo** button [S].

You can only solo one Take lane at a time.

To arm a Take lane for recording

Click the Take lane's **Arm for Recording** button [●].

You can only arm one Take lane at a time.

Note: *If a track's Take lanes are expanded while recording into the parent track, the recorded data will be moved to a new Take lane after recording is stopped.*

To loop record multiple takes into separate Take lanes

1. Go to **Edit > Preferences > Project - Record**, or right-click the Record button to access recording settings.
2. Under the **Recording Mode** options, choose **Sound on Sound (Blend)**.
3. Under **Loop Recording**, choose **Store Takes in a Single Track**, and click **OK**.
4. Click the target track's **Expand/collapse Take Lanes** button [≡] so Take lanes are visible.
5. Click the parent track's **Arm for Recording** button. **Note:** It is important that you arm the parent track, not an existing Take lane.
6. Set your loop boundaries and start recording multiple passes through the looped area.
7. Stop recording.

To select a lane

Click the top left corner of the Take lane.

To select all Take lanes in a track, do one of the following:

- Double-click the top left corner in any Take lane.
- Click the parent track's track number.

To edit clip automation in a Take lane

1. Click a track's **Expand/collapse Take lanes** button ⊒.
2. Click the Take lane's Edit Filter, point to **Clip Automation**, and select the desired clip automation parameter. Created envelopes are displayed in bold text at the top of the menu.
3. Use the global tools to edit automation envelopes. For details see "Tools" on page 407.

To crop overlapping clips to eliminate overlap

1. In a multi-lane track, move either the Smart tool ⭐ or the Edit tool ✎ between two overlapping clips until the cursor turns into the overlap cropping tool.
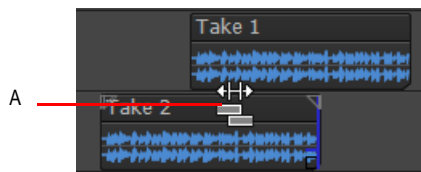
A. Overlap cropping tool

2. In the space between the clips, click the spot where you want the first clip to end and the second one to begin. SONAR crops both clips so that they no longer overlap.

See:

"Clip muting and isolating (clip soloing)" on page 375

To edit a specific Take lane control across multiple tracks

Quick Groups allow you to effortlessly adjust identical controls across the same Take lane in different tracks. For example, you can quickly mute all Take lanes named **T2**. You can Quick Group the Mute, Solo, Arm for Recording and Edit Filter controls. Quick Groups can either affect all tracks, or only *selected* tracks of the same type. You hold down the CTRL key to momentarily create a Quick Group.

Quick Groups operate on lanes with the same original name across different tracks, not in lanes on the same track. All Take lanes remember their original name, even if you rename the lanes. For example, all Take lanes originally named **T2** are grouped, even if some of them have been renamed.

Do *one* of the following:

• **To adjust the same control in all tracks.**   Hold down the CTRL key and adjust a control in a track that is *not* selected. SONAR automatically adjusts the same control in all other tracks.

• **To adjust the same control in selected tracks.**   Select the tracks you want to adjust, then hold down the CTRL key and adjust a control in any *selected* track. SONAR automatically adjusts the same control in all other selected tracks of the same type.

For example, to change the Edit Filter on all Take lanes originally named **T2**, select the tracks you want to include in the Quick Group, then hold down the CTRL key while you adjust the Edit Filter control on any selected lane named **T2**.

When you adjust controls in a Quick Group, each affected control displays a temporary group color.

For more information about Quick Groups, see "Quick Groups" on page 917.

See:

Clip muting and isolating (clip soloing)

Together with Take lanes, clip muting and isolating (clip soloing) make it easy to build a composite take from multiple takes.

The Mute tool ![M] lets you mute/unmute entire clips, or only regions within clips. Click a clip to mute/unmute the clip. Drag in the bottom half of the clip to mute a region, and drag in the top half to unmute a region. A clip that is completely muted displays the **Mute** icon ![icon] in its upper left corner.In addition, you can also play back only selected data if you want by pressing the SHIFT key and the SPACEBAR at the same time.

To mute a time range

1. Select the Mute tool ![M] in the Control Bar.

2. If you want to mute a precise amount of time, enable the **Snap to Grid** button ![grid] and set its menu to an appropriate value.

3. Drag across the bottom half of the clip.

SONAR mutes the area you dragged through and displays the muted waveform or MIDI data as a dotted line.
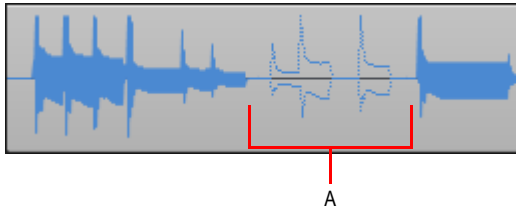
A. Muted area of clip

To unmute a time range

1. Select the Mute tool ![M] in the Control Bar.

2. Drag across the top half of the clip.

To mute or unmute an entire clip

1. Select the Mute tool $\boxed{\text{M}}$ in the Control Bar.

2. Click the clip.

When a clip is currently muted, SONAR displays the Mute icon in the upper left corner of the clip.
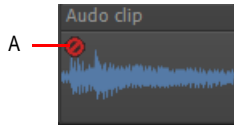
A. Mute icon
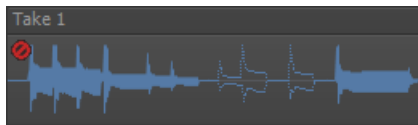
Toggling a clip's mute status

You can mute or unmute a clip without using the Mute tool if you want. Pressing K on your keyboard toggles the mute status of all selected clips. Any muted time ranges remain muted.

See:

Audition (selection playback)

To audition the current selection, press SHIFT+SPACEBAR. Only the selected data plays back.

Isolating (clip soloing)

Isolating works by muting all the clips in a track in the same time region except the ones that you want to hear. To make it simpler to work with overlapping clips in the same track, click the track's

Expand/collapse Take Lanes button $\boxed{\equiv}$ to show overlapping clips in separate lanes.

To isolate a region

1. Select the Mute tool [M] in the Control Bar.
2. Set the track's Edit Filter control to **Clips**.
3. Hold down the CTRL key and drag across the region you want to isolate.

To isolate a clip

1. Select the Mute tool [M] in the Control Bar.
2. Set the track's Edit Filter control to **Clips**.
3. Hold down the CTRL key and click the clip to isolate the entire clip/lane.

Track folders

A track folder contains tracks in the Track pane of the Track view. Track folders make larger projects much easier to manage—you can group different types of tracks in their own folder: vocals, soft synths, ReWire instruments, drums, etc.The main characteristics of a track folder are:

* You can edit all the tracks in the folder as if you were editing a single track—especially valuable for drum tracks. The track folder displays a composite clip in the Clips pane of all the clips in the folder. Selecting a time range in the composite clip selects data in all the enclosed tracks in the same time range; now you can edit all the tracks in the folder by editing the selected area of the composite clip.

* You can hide tracks in a folder, freeing up space on your screen.

* A folder can contain any type of track—you can put MIDI, audio, and synth tracks in the same folder.

* You can archive, mute, solo, arm, or input monitor all the tracks in a folder with one click—just click the **Archive**, **Mute**, **Solo**, **Arm**, or **Input Echo** button on the track folder.
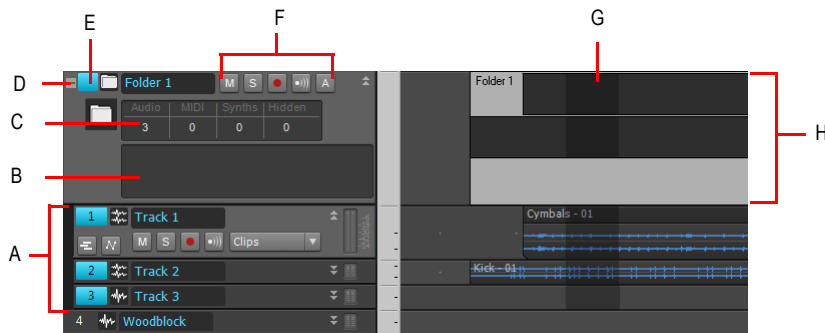
A. The tracks in a track folder are indented B. Description box C. Track folder info D. Open/Close folder
E. Track folder—click here to select all data in track folder F. Archive, Mute, Solo, Arm, and Input Echo buttons
G. Selected area of composite clip H. Composite clip

To create a track folder

* Right-click in the Track pane of the Track view, and choose **Insert Track Folder** from the pop-up menu.

    Or

- Use the **Insert > Track Folder** menu command.

    Or

- Right-click a track that's not in a track folder and select **Move to Folder > New Track Folder** from the pop-up menu.

A new track folder appears in the Track pane.

To add a track to a track folder

- In the Track view, move the mouse cursor just to the right of the track number of a pre-existing track until the cursor turns into a black, double-ended arrow, and then click and drag the track's titlebar onto the track folder. Release the mouse.

    Or

- Insert a track when a track within a track folder has focus.

    Or

- Right-click a track that's not in a track folder and select **Move to Folder > Track Folder "n"** from the pop-up menu.

    Or

- Select the tracks you want to add to the folder, right-click on the folder and select **Add Track(s) to Folder** from the menu that appears.

The added track appears in the track folder, and is indented a little to show that it's inside the track folder.

To remove a track from a track folder

- In the Track view, move the cursor just to the right of the track number of a track until the cursor turns into a black, double-ended arrow, and then click and drag the track's titlebar out of the Track Folder. Release the mouse.

    Or

- Right-click the track and select **Remove From Folder** from the pop-up menu.

To add multiple tracks to a track folder

1. Select the tracks you want to add.
2. Right-click a selected track and choose **Move to Folder > Track Folder "n"** from the pop-up menu.

To remove multiple tracks from a track folder

1. Select the tracks you want to remove.
2. Right-click a selected track and choose **Remove From Folder** from the pop-up menu.

To delete a track folder

1. In the Track view, right-click and select **Delete Track Folder** from the menu that appears.
2. SONAR asks you if you want to delete all the tracks in the folder along with the track folder—click **Yes** or **No**.

SONAR deletes the track folder. If you didn't choose to delete the tracks in the track folders, SONAR moves these tracks to the top level.

To open or close a track folder

• Click the folder icon that's just left of the track folder's name.

To select or deselect all the tracks in a track folder

• Click just to the left of the folder icon.

To rename a track folder

• Double-click the track folder's name, type a new name, and press ENTER.

To add a description to a track folder

• Double-click the **Description** box, type a description, and press ENTER.

To select all clips in a time range

• With the Smart tool or Select tool , drag across the bottom half of the composite clip.

Now you can edit, move, cut and paste all the selected clips by editing the selected part of the composite clip.

Adding effects in the Track view

You can add both MIDI and audio effects directly from the Track view. SONAR adds these effects in real-time, preserving your track's original data.

To add effects in the Track view

1. Right-click in the effects bin of the track you want to add effects to.
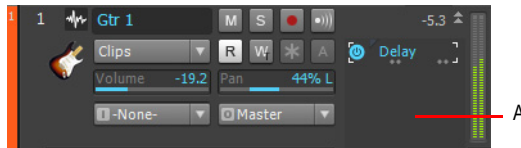
A. Right-click here to add an effect

An effects pop-up menu appears. SONAR displays MIDI effects if you are editing a MIDI track, and audio effects for an audio track.

2. Select an effect from the menu.

The name of the effect appears in the effects bin and the effect's property page appears. To delete the effect, right-click the effect name and choose **Delete** from the pop-up menu.

3. Set the effects parameters or choose a preset.

Play your track and listen to the effect(s).

> **Note:** *If you use the same effects for more than one track, it's more efficient to add the effects to an bus. See *

Changing tempos

Your project can incorporate all kinds of tempo changes, including step changes from one tempo to another, gradual increases (accelerandos) or decreases (ritardandos), and almost any other type of change you can imagine. The tempo changes you add to your project become part of the project and are saved with the project file.You can add tempo changes to your project in the following ways:

• Clicking the tempo display in the Control Bar's Transport module.

• Using the **Project > Insert Tempo Change** and **Project > Insert Series of Tempos** commands.

• By drawing tempo changes graphically in the Tempo view.

• Inserting tempo changes in the Tempo view's Tempo List pane.

The **Process > Fit to Time** and **Process > Fit Improvisation** commands can also be used to introduce tempo changes into your work file. For more information, see "Stretching and shrinking events" on page 714 and "Fit Improvisation" on page 726.

When you change the tempo of a project that contains audio, SONAR allows you to stretch or shrink audio clips when you have converted them to Groove clips and have enabled the Follow Project Pitch option in the Loop Construction view. Otherwise, the MIDI tracks will speed up or slow down while the audio tracks will play at the same speed. For more information about Groove clips, see "Working with Groove Clip audio" on page 659. Audio clips that are not Groove clips change in size when moved to a part of your project that has a different tempo.

Sometimes you don't want to adjust the speed of your audio. Here are some examples:

• If your project contains background music and a voice-over, you might want to change the tempo of the background music without altering the voice-over.

• If you're trying to modify the speed of some MIDI tracks to match a sampled drum groove, you want to leave the audio unchanged.

When you change the tempo of your project, clips having stretching enabled change tempo along with the project, while those that do not have stretching enabled do not. For more information about stretch-enabling clips, see "To set the tempo of a Groove Clip" on page 662.

Tempos set when the clock source is set to MIDI Sync do not have any effect, because SONAR follows the external tempo. For more information, see "Synchronizing your gear" on page 1153.

See:

"Using the Transport module" on page 383

"SONAR changes the current tempo to the desired value.Using the Tempo commands" on page 383

"Using the Tempo view" on page 386

"Automation time base" on page 1006

Using the Transport module

The Transport module displays the current tempo and lets you change the tempo as shown in the following figure.

Figure 91. *The Transport module.*

A

A. Click to enter a new tempo

When you enter a new tempo directly in the Transport module, you change the most recent tempo setting in the project.

To change the current tempo in the Tempo toolbar

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove Clip Looping** enabled.

2. Click the current tempo in the Transport module.

3. Type a new value and press ENTER, or use the spinners to change the tempo value.

SONAR changes the current tempo to the desired value.Using the Tempo commands

The **Project > Insert Tempo Change** and **Project > Insert Series of Tempos** commands can be used to change the existing tempo of a project or to introduce one or more tempo changes at various points in a project. You can enter tempo values directly, introduce smooth increase or decreases in tempo, or even use your mouse to tap out the tempo you want for some portion of a project.

To insert a tempo change

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove Clip Looping** enabled.

2. Choose **Project > Insert Tempo Change** to display the **Tempo** dialog box.

Figure 92. *The Tempo dialog*
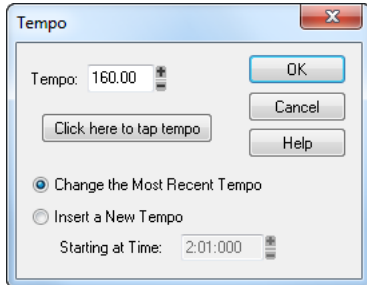
3. Check the **Insert a New Tempo** box.

4. Enter a new tempo in one of the following ways:

   - Type a value in the **Tempo** field.
   - Click the arrows to change the value.
   - Tap a new tempo in the space indicated in the dialog box.

5. Enter a starting time for the new tempo.

6. Click **OK**.

SONAR inserts a tempo change at the designated time.

To insert a series of tempos

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove clip Looping** enabled.

2. Choose **Project > Insert Series of Tempos** to display the **Insert Series of Tempos** dialog box.

Figure 93. *The Insert Series of Tempos dialog*
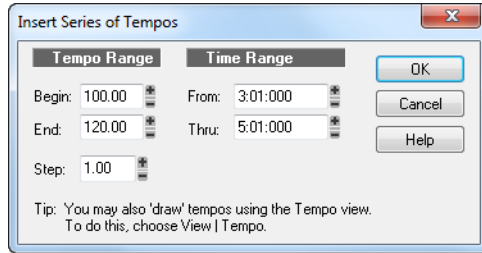
3. Enter a starting tempo, ending tempo, and step size.

4. Enter a starting and ending time for the series of tempo changes.

5. Click **OK**.

SONAR erases any existing tempo changes between the starting and ending time, and inserts a series of tempo changes that change smoothly between the starting and ending time. This command never inserts more than one tempo change on the same clock tick. Audio clips which you want to follow tempo changes can also be converted to Groove clips in the Loop Construction view.

To modify the most recent tempo change

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove Clip Looping** enabled.

2. Choose **Project > Insert Tempo Change** to display the **Tempo** dialog box.

3. Check the **Change the Most Recent Tempo** box.

4. Enter a new tempo in one of the following ways:
   - Type a value in the **Tempo** field.
   - Click the arrows to change the value.
   - Tap a new tempo in the space indicated in the dialog box.

5. Click **OK**.

SONAR changes the most recent tempo to the new value.

Using the Tempo view

The Tempo view provides both a graphic display of the tempo and a list of all tempo changes in your project. In the graphical display you can use your mouse to draw tempo changes directly onto the graph. In the tempo list, you can insert, edit, and delete individual tempo changes. To open the Tempo view, choose **Views > Tempo** or press ALT+SHIFT+5. Click the **Tempo List** button 🖽 to display or hide the tempo list.

Figure 94. *The Tempo view*
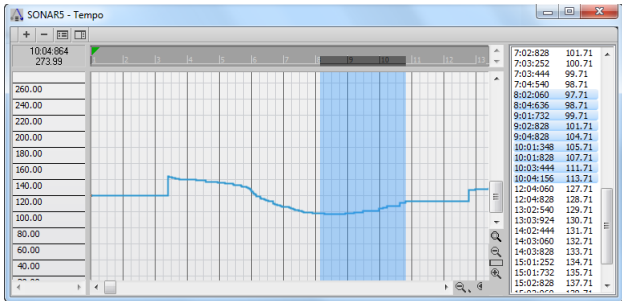
If an entire project has a single tempo, the graph shows a straight horizontal line, and a single tempo in the list.

The Control Bar contains several tools you can use to add or modify tempo changes:

Tool	Name	What it's for
▮	Select	Drag the Select tool in either the Tempo list or graphic display to select tempos to edit
▮	Freehand	Draw a custom curve indicating changes in tempo
▮	Line	Draw a straight line indicating a steady increase or decrease in tempo
▮	Erase	Eliminate tempo changes already in place for some portion of a project
▮	Snap grid	Controls how often you can insert tempo changes—for example, every measure, every eighth note, every 3 samples, etc.

Table 59.

If you make a mistake using any of these tools, you can use **Edit > Undo** to correct the error. When you use the Freehand tool, the speed with which you drag the mouse determines the density of tempo events. To insert a larger number of relatively small tempo changes, move the mouse slowly. To insert a smaller number of relatively large tempo changes, drag the mouse quickly.

Arranging and editing
Changing tempos

The Tempo List Pane has its own tools for editing tempo changes:

Tool	Name	What it's for
	Tempo List	Displaying a list of all tempo changes in the project.
+	Insert Tempo	Insert a new tempo change
–	Delete Tempo	Delete a tempo change
	Tempo Properties	Edit a tempo change

Table 60.

To insert a tempo change in the Tempo view

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove Clip Looping** enabled.

2. Select the Freehand tool or the Line tool in the Control Bar.

3. Click in the Tempo view at any desired time point and tempo level.

SONAR introduces a tempo change at the indicated point.

To steadily increase or decrease the tempo in the Tempo view

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove Clip Looping** enabled.

2. Select the Line tool in the Control Bar.

3. Drag a line in the graph from the starting time and tempo to the ending time and tempo.

SONAR introduces a linear series of tempo changes.

To draw a series of tempo changes in the Tempo view

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove Clip Looping** enabled.

2. Select the Freehand tool in the Control Bar.

3. Drag the cursor across the graph, adjusting the tempo level as you move left to right.

SONAR introduces a series of tempo changes.

To erase tempo changes in the Tempo view

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove Clip Looping** enabled.

2. Select the Erase tool in the Control Bar.

3. Drag the mouse over the graph to highlight the region you want to erase.

4. Release the mouse button.

SONAR deletes all tempo changes in the area you marked. The last tempo setting prior to the erased region is now in effect in that region.

To insert a tempo change in the Tempo list in the Tempo view

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove Clip Looping** enabled.

2. Click the **Tempo List** button to display or hide the tempo list.

3. Select any tempo change in the list.

4. Click **Insert Tempo** to open the **Tempo** dialog box.

5. Set the tempo, time, and other properties.

6. Click **OK**.

SONAR inserts the new tempo into the list.

To edit a tempo change in the Tempo view

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove Clip Looping** enabled.

2. Click the **Tempo List** button ⊞ to display or hide the tempo list.

3. In the tempo list, select the tempo change to be edited.

4. Click **Tempo Properties** ▦ or double-click the tempo change to open the **Tempo** dialog box.

5. Edit the tempo properties as desired.

6. Click **OK**.

To delete a tempo change from the Tempo list in the Tempo view

1. Enable **Groove Clip Looping** on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove > Clip Looping** from the pop-up menu. Each clip that has **Groove Clip Looping** enabled has beveled edges instead of sharp corners. The same command disables **Groove Clip Looping** on any selected clip that has **Groove Clip Looping** enabled.

2. Click the **Tempo List** button ⊞ to display or hide the tempo list.

3. In the **Tempo** list, select the tempo change to be deleted.

4. Click **Delete Tempo** – , or press DELETE.

SONAR deletes the selected tempo change. You cannot delete the first tempo in the list.

Undo, redo, and the undo history

SONAR provides very powerful **Undo** and **Redo** commands that let you move forward or backward through any portion of an editing session. Every project has its own independent undo history. This means you can return to any open project and use the **Undo** and **Redo** commands, even if you've spent the last hour working on a different project. The undo history of a project is lost when you close the project.

Remembering everything that is necessary to undo the changes you have made can use a lot of memory. If a change you are about to make requires too much memory and cannot be undone, you will be advised that the operation is too big to undo later and asked if you want to go ahead anyway. If you do choose to perform the operation, you will not be able to undo it. Therefore, you may want to save your project first.The **Edit > History** command displays a complete history of the commands and actions you can undo for the current project. The **Undo History** dialog box looks like this:

Figure 95. *The **Undo History** dialog*
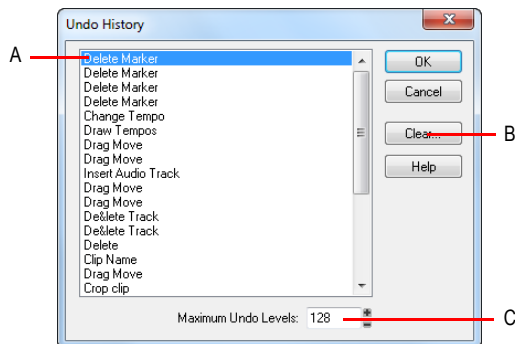
*A. Most recent change **B.** Click to clear the undo history **C.** Adjust the number of steps you can undo*

The **History** command is grayed out until you make a change to the current project that can be undone.

The History list is updated every time you make a change to a project. For example, if you insert a new note into a project using the Piano Roll view, that action is added to the History list. This entry remains on the list—even if you undo the change—so that you can redo the change later on. If you delete the note, this change is added to the **History** list.

You can click the **Clear** button in the **Undo History** dialog box to erase the undo history for the current project and free up some memory. If SONAR is low on memory, it may offer to erase the History list. To revert to an earlier version of a project, highlight the entry in the History list that represents the point to which you'd like to return, and click **OK**. SONAR performs the necessary undo or redo actions to take you to that point. Once you edit the project (for example, by inserting a note), the History list is truncated at that point. Then, as you do further work, the History list grows again. Any events occurring before the event you highlighted remain on the list.

By default, SONAR keeps a history of up to 128 editing actions for each open project. Once that limit is reached, each new action pushes out the oldest item from the History list. You can raise or lower that number in the **Undo History** dialog box.

Slip-editing (non-destructive editing)

Slip-editing allows you to non-destructively hide or reveal the beginning of a clip, the end of a clip, or both. The hidden material in a clip is not heard during playback. All hidden material remains intact and can be restored. All slip-editing movements correspond to the current snap to resolution. For more information about the snap to grid, see "Defining and using the Snap Grid" on page 354.
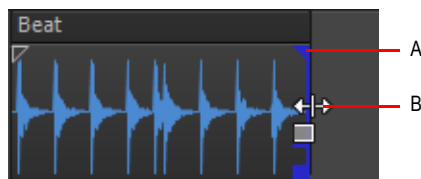
A. Clip handle B. Slip-edit cursor

⚠️ **Important:** *Like any clips, slip-edited clips can be combined with other clips using the Track view Clips > Bounce to Clip(s) command and slip-edited clips in a track can be mixed down to another track. When a slip-edited clip is combined with another clip or an effect is applied to a clip using the Process > Apply Effect > Audio Effects command, any slip-edited data (audio clips or MIDI events that are cropped from view) is overwritten.*

See also:

"Using slip-editing" on page 392

Using slip-editing

SONAR makes it easy to edit audio and MIDI clips by way of prominent clip handles that appear as your cursor comes close to the edges of clips. The clip handles are easy to see and are equipped with broad functionality for fade-ins, fade-outs, and crossfades, as well as non-destructive editing of the beginning and end of clips.

To slip-edit a clip

1. Set an appropriate snap resolution in the Control Bar's Snap module.

2. Select the Smart tool ⭐ or Edit tool ✎ in the Control Bar.

3. If you are slip editing an audio clip, open the Clip Inspector, select the **Groove Clip** section and make sure the **Looping** check box is unchecked.

4. Move the cursor over the beginning of the clip until the clip handle appears.
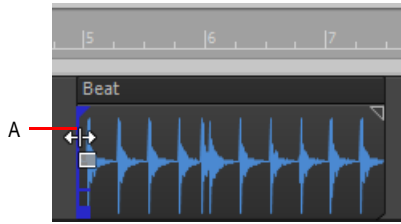
A. Clip handle

5. Click and drag the clip handle until the unwanted information has been removed.
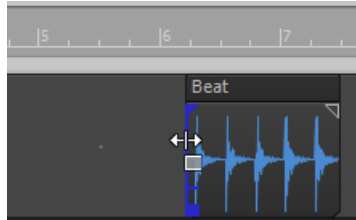
The hidden information in the slip-edited clips remains intact but is not heard during playback.

To move data without moving its clip

1. Do *one* of the following:

- Using the Smart tool [★], hold ALT+SHIFT move the pointer over the middle of the clip you want to edit.

- Using the Edit tool [🔧], hold ALT+SHIFT move the pointer over the top third of the clip you want to edit.

   The cursor changes to look like this [⟨⟩].
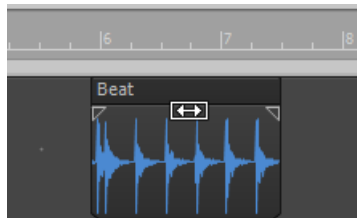
2. Click and drag the clip to the left or right as desired.

   As in the case of slip-editing, the hidden information in the clip remains intact but is not heard during playback.

To move data and the clip edge

1. Select the Smart tool ⊡★ or Edit tool ⊡ in the Control Bar.
2. Hold down ALT+SHIFT and move the cursor to the edge of the clip you want to edit.

    A clip handle appears at the edge of the clip you are editing.
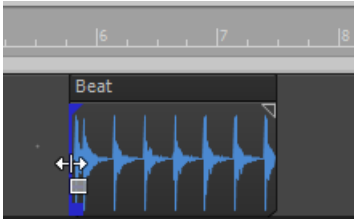
3. Click and drag the edge of the clip to the desired location.
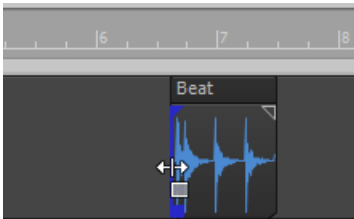
The hidden information in the clip remains intact but is not heard during playback.

To permanently delete slip-edited data

1. Select the clips that contain the slip-edited data you want to delete.
2. Select the Track view **Clips > Apply Trimming** command.

SONAR permanently deletes the slip-edited data from the clips you selected.

Slip-editing multiple clips

You can slip-edit multiple clips at the same time.

To slip-edit multiple clips at once

1. Make sure all clips are not loop-enabled.
2. Select the clips you want to slip-edit.
3. Move your cursor over the beginning or end range of the selected clips until the blue clip handle appears.
4. Drag the boundary to the desired location and release.

Fades and crossfades

Fades are a gradual increase or decrease in volume at the beginning (fade-in) or end (fade-out) of a clip. A crossfade is when one clip fades out while another fades in. There are two ways to create fades and crossfades in SONAR: offline (destructive) and real-time (non-destructive). To create fades and crossfades offline, see "Applying fades and crossfades offline" on page 794.

See:

"Using fades and crossfades in real-time" on page 395

Using fades and crossfades in real-time

You can create real-time fades and crossfades in the Track view's Clips pane. Real-time fades and crossfades do not change the data in the clip. SONAR reads the fade-in, fade-out, or crossfade in the clip and adjusts the gain accordingly. You can edit the crossfade's start time and end times. You can set the type of fade-in or fade-out you want to use as a default:

- **Linear.** A straight line, raising or lowering the volume at a steady rate.
- **Slow Curve.** A curved fade which starts to change the volume slowly at first and then rapidly increasing (fade-in) or decreasing (fade-out) the volume.
- **Fast Curve.** A curved fade which starts to change the volume quickly at first and then rapidly decreasing (fade-out) or increasing (fade-in) the volume.

To choose the fade type

Click the Track view **Options** menu, point to **Crossfade Type** and select the desired default Fade-In, Fade-Out and Crossfade curve types.

To create a real-time fade-in in a Clip

1. Select the Smart tool ⭐ or Edit tool 🔧 in the Control Bar.

2. In the Track view's Clips pane, move your mouse over the top part of the beginning of a clip until the cursor looks like this: ⬌△, and a red line appears at the edge of the clip.

   A filled red triangle appears at the top of the red line indicating the fade marker is ready to be dragged.
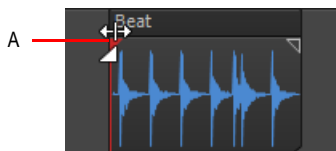
A. Filled red triangle

3. When your cursor changes and the filled red triangle appears, click and drag to the right until you reach your desired fade-in length.

As you drag your mouse, a fade-in appears on your clip, and the red line moves with the mouse to mark the end of the fade-in.
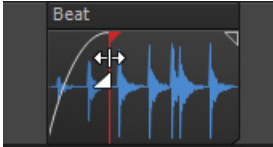
To edit a fade-in in a Clip

• To move the entire fade-in to a later point in the clip, drag above the blue horizontal line located a quarter of the way up the blue vertical line

*A. Cursor above horizontal blue line **B.** Horizontal blue line*

• To move only the starting point of the fade-in, drag below the horizontal blue line.

• To delete a fade-in from an audio clip, simply drag the triangular fade handle to the front edge of the clip.

The filled blue triangle at the top of the clip handle indicates that dragging the top edge of the clip handle will move the fade along with the crop. The filled blue rectangle at the bottom of the clip handle indicates that dragging the bottom of the clip handle will slip edit the edge, but leave the end of the fade-in where it is.

To create an automatic crossfade (real-time)

1. Click the Track view **Options** menu and choose **Auto Crossfade**.
2. Click the Track view **Options** menu, point to **Crossfade Type > Default Crossfade Curves** and select the desired default crossfade curve types.
3. Select and drag an audio clip so that it overlaps another audio clip. You should overlap the clips by the length you want the crossfade.
4. When you have the clip positioned where you want it, release the mouse button to drop the clip.

   The **Drag and Drop Options** dialog box appears.
5. In the **Drag and Drop Options** dialog box, check the **Blend Old With New** check box and click **OK**.
6. The two clips now overlap with a crossfade, looking something like this:
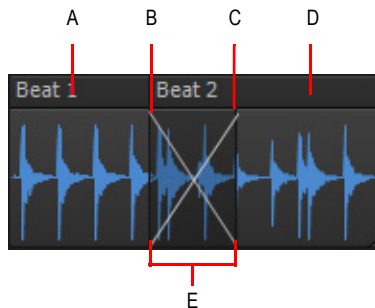
A. First clip B. Fade-out C. Fade-in D. Second clip E. Crossfade

You can edit fade-ins and fade-outs. You can change the start, end and position of a fade. The following procedures all demonstrate edits to a fade-in, but fade-outs work exactly the same.

To change an existing fade

1. Move your cursor over the beginning of a fade-out or the end of a fade-in, until your cursor looks like this: .
2. Right-click to and select the desired fade type from the menu that appears.

To change an existing crossfade

1. Move your cursor over the region where the crossfade is.
2. Right-click and select the desired crossfade from the menu that appears.

To edit or create fades from the Process menu

1. Select the clip or clips in which you want to create or edit fade-ins and/or fade-outs.
2. Select **Process > Fade Selected Clips**.
3. Click the Track view **Clips** menu and choose **Fade Clips** to open the **Fade Selected Clips** dialog box.
4. Adjust parameters according to the following table.

Parameter	Description
Fade In (mS)	Select the number of milliseconds you want the fade-in to last.
Fade Out (mS)	Select the number of milliseconds you want the fade-out to last.
Fade In Curve	Choose a fade-in type. Options are linear, slow or fast curve.
Fade Out Curve	Choose a fade-out type. Options are linear, slow or fast curve.
Alter Existing Times	Select this option if you want to change the existing fade lengths. You don't need to check this option if you're creating new fades.
Alter Existing Curves	Select this option if you want to change the existing fade types. You don't need to check this option if you're creating new fades.
Only Show if Pressing Shift	Select if you want to apply previous dialog box settings without opening the dialog box. Hold shift when selecting command to override this option.

Table 61.

5. Click **OK** to close the dialog box.

SONAR creates or edits the fade(s) according to the options you chose in the dialog box.

Enhanced editing with keyboard

SONAR supports advanced editing via the numeric keypad on standard QWERTY keyboards. You can perform the following operations:

- Navigate (see "Navigating with a keyboard" on page 402):
    - Scroll
    - Zoom
- Select (see "Selecting with a keyboard" on page 403):
    - Clip select
    - Time select
- Edit (see "Editing with a keyboard" on page 404):
    - Trim/crop
    - Fade

To enable/disable editing with a QWERTY keyboard

1. On your QWERTY keyboard, press the NumLock key to enable NumLock mode.

2. On the numeric keypad, press 0.

3. Select the desired mode:
   - **Zoom/Scroll mode.**   Press 1.
   - **Select mode.**   Press 3.
   - **Edit mode.**   Press 9.

   The keys on the numeric keypad are mapped as follows:

Figure 96.   *Numeric keypad (NumLock mode)*

Arranging and editing
Enhanced editing with keyboard
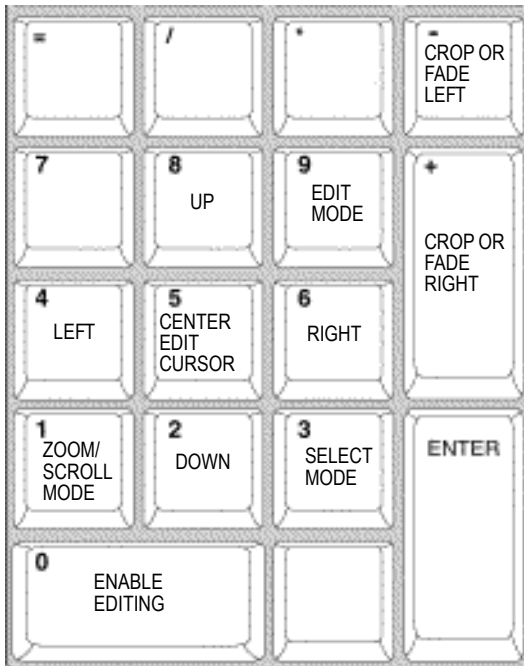
Key	Function
0	Enable/disable keyboard editing (when NumLock is enabled)
1	Enable Zoom/Scroll mode
2	Down
3	Enable Select mode
4	Left
5	Center edit cursor
6	Right
7	--
8	Up
9	Enable Edit mode
Volume knob (if keyboard has a rotary encoder)	Zoom/scroll/trim/crop depending on current mode
PLUS (+)	Crop or fade right in Edit mode
MINUS (-)	Crop or fade left in Edit mode

Table 62.

See:

Navigating with a keyboard

Scroll and Zoom are part of the same mode, which makes it fast to navigate around a project.

You can zoom both horizontally and vertically, in small or large steps.

You can scroll fast or slow in any direction, in small or large steps.

To zoom and scroll with a keyboard

1. On your QWERTY keyboard, press the NumLock key to enable NumLock mode.
2. On the numeric keypad, press 0 to enable keyboard editing.
3. On the numeric keypad, press 1 to enable Zoom/Scroll mode.

   The numeric keypad is mapped as follows:

Key	Function	CTRL+	ALT+	SHIFT+
0	Enable/disable keyboard editing (when NumLock is enabled)	--	--	--
1	Enable Zoom/Scroll mode	--	--	--
2	Scroll down in large steps	Zoom out vertically in large steps (based on selection)	--	--
3	Enable Select mode	--	--	--
4	Scroll left in large steps	Zoom in horizontally in large steps (based on selection)	--	--
5	Center edit cursor	--	--	--
6	Scroll right in large steps	Zoom out horizontally in large steps (based on selection)	--	--
8	Scroll up in large steps	Zoom in vertically in large steps (based on selection)	--	--

Table 63.

Key	Function	CTRL+	ALT+	SHIFT+
9	Enable Edit mode	--	--	--
Volume knob (if keyboard has a rotary encoder)	Scroll horizontally	Scroll vertically	Scroll in small steps	Zoom (based on selection)

Table 63.

The zooming behavior depends on the current Edit or Select mode:

• **Zoom around the selection.**   Will center and zoom on the mid-point of the selection.

• **Zoom around the edit cursor.**   Will center and zoom around the cursor.

The most appropriate zoom method is used automatically based on the following logic:

• The default zoom method is **Zoom around the selection**.

• If there is no selection, the next zoom method is **Zoom around the edit cursor**.

Selecting with a keyboard

In Select mode, you can select either clips or time.

To enable selecting with a keyboard

1. On your QWERTY keyboard, press the NumLock key to enable NumLock mode.

2. On the numeric keypad, press 0 to enable keyboard editing.

3. On the numeric keypad, press 3 to enable Select mode.

    The numeric keypad is mapped as follows:

Key	Function	CTRL+	ALT+
2	Move edit cursor down	Move to closest clip on next track	Select down
4	Move edit cursor left	Move to previous clip	Select left
5	Center edit cursor	--	--
6	Move edit cursor right	Move to next clip	Select right
8	Move edit cursor up	Move to closest clip on previous track	Select up

Table 64.

To move the edit cursor

- In Select mode, do one of the following:
    - **To move to the left.**   Press 4.
    - **To move to the right.**   Press 6.
    - **To move to the previous lane or track.**   Press 8.
    - **To move to the next lane or track.**   Press 2.
    - **To center the edit cursor.**   Press 5.
    - **To move to the previous clip.**   Press CTRL+4.
    - **To move to the next clip.**   Press CTRL+6.
    - **To move to the closest clip on the previous track.**   Press CTRL+8.
    - **To move to the closest clip on the next track.**   Press CTRL+2.

To select time with a keyboard

1. Move the Now Time to where you want to start the selection.
2. In Select mode, hold down ALT and move the edit cursor left/right/up/down to make a time selection.

To select clips with a keyboard

- In Select mode, do one of the following:
    - **To select and edit clip under the edit cursor.**   Press 9 to select clip and enable Edit mode.
    - **To extend the current selection.**   Hold down SHIFT+ALT and press 2, 4, 6 or 8.

Editing with a keyboard

Edit mode lets you fade and crop all selected clips. If no clips are selected when you enter Edit mode, SONAR will automatically select the clip that is under the edit cursor.

To enable clip editing with a keyboard

1. On your QWERTY keyboard, press the NumLock key to enable NumLock mode.
2. On the numeric keypad, press 0 to enable keyboard editing.
3. On the numeric keypad, press 9 to enable Edit mode.

   The numeric keypad is mapped as follows:

Function	Key
Select fade out for editing	2
Select left clip edge for cropping	4
Select right clip edge for cropping	6
Select fade in for editing	8
Fade or crop selected clips	Volume knob (if keyboard has a rotary encoder)
Crop or fade right in Edit mode	PLUS (+)
Crop or fade left in Edit mode	MINUS (-)

Table 65.

To fade clips with a keyboard

1. In Select mode, select the clips that you want to fade.
2. Press 9 to enable Edit mode.
3. Specify the clip property that you want to edit:
   - **Fade in.**   Press 8.
   - **Fade out.**   Press 2.
4. Do one of the following to adjust the selected fade:
   - Turn the rotary encoder.
   - Press PLUS (+) or MINUS (-).

Note: *Fades do not obey Snap to Grid.*

To crop clips with a keyboard

1. In Select mode, select the clips that you want to crop.
2. Press 9 to enable Edit mode.
3. Specify the clip edge that you want to crop:
   - **Left clip edge.** Press 4.
   - **Right clip edge.** Press 6.
4. Do one of the following to adjust the selected clip edge:
   - Turn the rotary encoder.
   - Press PLUS (+) or MINUS (-).

Note: *Crop obeys Snap to Grid.*

Tools

SONAR has several different global tools that allow you to edit content in your projects. The global tools live in the Tools module in the Control Bar, and allow you to edit content in the following views:

- Track view
- Piano Roll view
- Staff view
- Tempo view

The selected tool applies to whichever editing view has focus. There are several ways to select tools:

- From the Tools module in the Control Bar. For details, see "Using the Control Bar to select tools" on page 411.
- From the Tools HUD (Heads Up Display). For details, see "Using the Tools HUD to select tools" on page 413.
- By pressing the tool's keyboard shortcut. For details, see "Using keyboard shortcuts to select tools" on page 414.

Figure 97. *Global tools are accessed from the Tools module in the Control Bar.*

Each tool serves a specific purpose, and the most suitable tool depends on the editing task you want to accomplish. The default Smart tool can be used for most tasks, but there may be times when a specific tool is either required or makes the editing task easier. For instructions about common editing tasks, see "Using tools to perform common tasks" on page 473.

To use a tool in the Track view, first select the desired tool, then select the data type you want to edit (clips, track automation, clip automation, audio transients, or notes). You can specify the desired data type independently for each track. For details, see "Selecting the data type to edit" on page 416.

SONAR provides the following global tools.

Tool	Button	Shortcut	Description	How to use
"Smart tool" on page 422	★	F5	The Smart tool is the default tool in SONAR. The Smart tool is a multi-function tool that combines functions from several other tools. The function is determined by where you click.	Using the Smart tool on: • Audio clips • MIDI clips • PRV notes • Automation • AudioSnap transients
"Select tool" on page 429	▸	F6	The Select tool lets you select data. You can select a time range, or select entire clips, MIDI notes, envelope nodes and transients.	Using the Select tool on: • Audio clips • MIDI clips • PRV notes • Automation • AudioSnap transients
"Move tool" on page 433	✛	F7	The Move tool lets you move selected data. You can move entire clips, partial clips, MIDI notes, envelope nodes, transient markers and clip tempo map markers.	Using the Move tool on: • Audio clips • MIDI clips • PRV notes • Automation • AudioSnap transients
"Edit tool" on page 437	⬎	F8 (cycle through Edit tools)	The Edit tool lets you adjust data. You can slip-edit clips, adjust note start/end times, adjust fades, and raise/lower note velocity and automation envelopes.	Using the Edit tool on: • Audio clips • MIDI clips • PRV notes • Automation
"Timing tool" on page 442	⬌	F8 (cycle through all Edit tools)	The Timing tool lets you slip-stretch audio clips, drag-quantize MIDI notes, and stretch audio using transient markers.	Using the Timing tool on: • Audio clips • PRV notes • AudioSnap transients
"Split tool" on page 445	✂	F8 (cycle through all Edit tools)	The Split tool lets you split clips, cut clips, split MIDI notes, and split clips at transients.	Using the Split tool on: • Audio clips • MIDI clips • PRV notes • AudioSnap transients
"Freehand tool" on page 448	✎	F9 (cycle through all Draw tools)	The Freehand tool lets you draw MIDI notes and freehand automation envelopes. You can also create and promote transient markers.	Using the Freehand tool on: • PRV notes • Automation • AudioSnap transients

Table 66. *Tools*

Tool	Button	Shortcut	Description	How to use
"Line tool" on page 451		F9 (cycle through all Draw tools)	The Line tool lets you draw straight automation envelopes and "paint" MIDI notes.	Using the Line tool on: • PRV notes • Automation
"Sine tool" on page 454		F9 (cycle through all Draw tools)	The Sine Pattern tool lets you edit automation envelopes by drawing sine shapes.	"Using the Pattern tools on automation" on page 455
"Triangle tool" on page 454		F9 (cycle through all Draw tools)	The Triangle Pattern tool lets you edit automation envelopes by drawing triangle shapes.	"Using the Pattern tools on automation" on page 455
"Square tool" on page 454		F9 (cycle through all Draw tools)	The Square Pattern tool lets you edit automation envelopes by drawing square shapes.	"Using the Pattern tools on automation" on page 455
"Saw tool" on page 454		F9 (cycle through all Draw tools)	The Saw Pattern tool lets you edit automation envelopes by drawing sawtooth shapes.	"Using the Pattern tools on automation" on page 455
"Random tool" on page 454		F9 (cycle through all Draw tools)	The Random Pattern tool lets you edit automation envelopes by drawing random shapes.	"Using the Pattern tools on automation" on page 455
"Erase tool" on page 456		F10 (cycle through all Erase tools)	The Erase tool lets you delete clips, partial clips, MIDI notes, automation envelope nodes, and transient markers.	Using the Erase tool on: • Audio clips • MIDI clips • PRV notes • Automation • AudioSnap transients
"Mute tool" on page 460		F10 (cycle through all Erase tools)	The Mute tool lets you mute clips, mute partial clips, mute MIDI notes, and disable transient markers.	Using the Mute tool on: • Audio clips • MIDI clips • PRV notes • AudioSnap transients
"Scrub tool" on page 464	None	J	The Scrub tool lets you play all displayed tracks as you drag the mouse pointer forward or backward at the desired speed.	To scrub: • A single track • All displayed tracks
"Zoom tool" on page 465	None	Z	The Zoom tool lets you change the vertical and horizontal scale of a view. You can lasso select a specific area to zoom into.	"Using the Zoom tool" on page 465

Table 66.   *Tools (Continued)*

See:

Selecting tools

To select and use a tool

1. Do *one* of the following:

    • Click the desired tool in the Control Bar's Tools module. For details, see "Using the Control Bar to select tools" on page 411.

    • Press T on your computer keyboard to display the Tools HUD, then select the desired tool. For details, see "Using the Tools HUD to select tools" on page 413.

    • Press the tool's keyboard shortcut. A tool's keyboard shortcut is displayed in its tooltip. For details, see "Using keyboard shortcuts to select tools" on page 414.

    The selected tool is highlighted, and the mouse pointer changes to reflect the active tool. For details, see "Mouse cursors" on page 469.

2. Click the desired track's Edit Filter control and select the data type you want to edit:

    • Clips

    • Audio Transients (audio tracks only)

    • Notes (MIDI tracks only)

    • Track Automation (including ProChannel, Arpeggiator, plug-in parameters, and MIDI continuous controllers)

    • Clip Automation

Tip: *To set all similar tracks to the same Edit Filter setting, hold down the CTRL key when you change any track's Edit Filter setting. To set all selected tracks to the same Edit Filter setting, first select the tracks, then hold down CTRL when you change any track's Edit Filter setting.*

Figure 98. *Use the Edit Filter control to specify what type of data the global tools should operate on.*

A
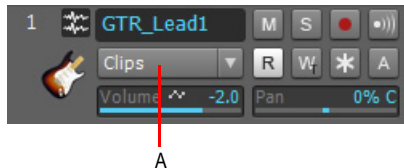
A. *Edit Filter*

For details, see "Selecting the data type to edit" on page 416.

For instructions about performing common tasks, see "Using tools to perform common tasks" on page 473.

Note: *Some tools can only be used on certain types of data. The mouse pointer indicates if the selected tool can be used at the current position. For details, see "Mouse cursors" on page 469.*

Using the Control Bar to select tools

Figure 99. *Global tools are accessed from the Tools module in the Control Bar.*

A. *Smart tool* ***B.*** *Select tool* ***C.*** *Move tool* ***D.*** *Edit tools (Edit/Timing/Split)* ***E.*** *Draw tools (Freehand/Line/Sine/ Triangle/Square/Saw/Random)* ***F.*** *Erase tools (Erase/Mute)* ***G.*** *Draw resolution*

To show/hide the Tools module

Right-click the Control Bar and select **Tools Module**.

For more information about the Tools module, see "Tools module" on page 498.

Accessing grouped tools

Related tools are grouped together in the Tools module. Several buttons in the Tools module display a small triangle in the bottom right corner. The triangle indicates that you can click and keep the mouse button pressed for a brief moment to access additional tools or options from a pop-up menu. You can also right-click the button and choose an option on the pop-up menu.

The following groups are available:

- **Edit tools:**
    - Edit tool
    - Timing tool
    - Split tool
- **Draw tools:**
    - Freehand tool
    - Line tool
    - Sine tool
    - Triangle tool
    - Square tool
    - Saw tool
    - Random tool
- **Erase tools:**
    - Erase tool
    - Mute tool

If the tool you are looking for isn't visible in the Tools module, chances are that another tool in the same group is selected. To access the hidden tool, click the group the tool belongs to, then select the tool from the pop-up menu. Figure Figure 101 on page 413 shows an expanded view of all tool groups.

Figure 100. *If a button displays a small triangle in the bottom right corner, click and keep the mouse button pressed to access additional tools or options.*
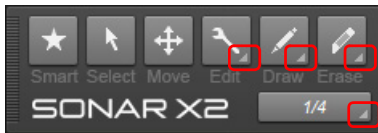
Figure 101. *Tools module expanded view.*
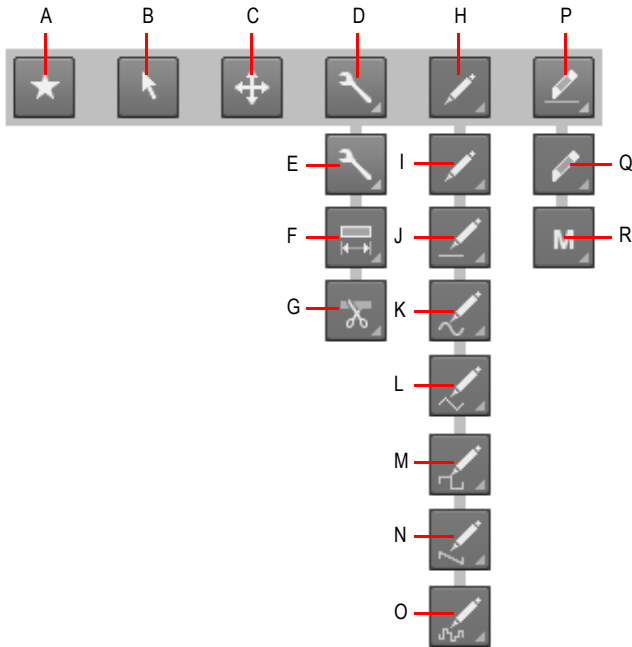
*A. Smart tool B. Select tool C. Move tool D. Edit tools E. Edit tool F. Timing tool G. Split tool H. Draw tools
I. Freehand tool J. Line Tool K. Sine Pattern tool L. Triangle Pattern tool M. Square Pattern tool N. Saw
Pattern tool O. Random Pattern tool P. Erase tools Q. Erase tool R. Mute tool*

Using the Tools HUD to select tools

Press the T to open the Tools HUD (Heads Up Display) at the current pointer position, then select
the desired tool.

Tip: *You can press the middle mouse button to open the Tools HUD. While the Tools HUD is open,
use the mouse wheel to open the **Edit Filter** menu.*

Figure 102. *Press T to show the Tools HUD.*

In the Track view, the Tools HUD also shows the Edit Filter control for whichever track is behind the
mouse pointer when the Tools HUD is opened.

Using keyboard shortcuts to select tools

Use the following keyboard shortcuts to select tools. Tools that belong to the same group share the same shortcut. Press a shortcut repeatedly to cycle through all tools in a group.

Tool	Button	Shortcut
Show Tools HUD	---	T
"Smart tool" on page 422	★	F5
"Select tool" on page 429	▶	F6
"Move tool" on page 433	✛	F7
Cycle through Edit tools (Edit/Timing/Split)	---	F8
"Edit tool" on page 437	✎	F8
"Timing tool" on page 442	⟷	F8
"Split tool" on page 445	✂	F8
Cycle through Draw tools (Freehand/Line/Sine/Triangle/Square/Saw/Random)	---	F9
"Freehand tool" on page 448	✎	F9
"Line tool" on page 451	✎	F9
"Sine tool" on page 454	✎	F9
"Triangle tool" on page 454	✎	F9
"Square tool" on page 454	✎	F9

Table 67. *Tool keyboard shortcuts*

Tool	Button	Shortcut
"Saw tool" on page 454		F9
"Random tool" on page 454		F9
Cycle through Erase tools (Erase/Mute)	---	F10
"Erase tool" on page 456		F10
"Mute tool" on page 460	M	F10
Snap on/off	---	N
"Scrub tool" on page 464	---	J (hold to use)
"Zoom tool" on page 465	---	Z (hold to use)

Table 67. *Tool keyboard shortcuts (Continued)*

To temporarily invoke a tool

While using a specific tool, you can temporarily invoke another tool by holding down the new tool's keyboard shortcut. Release the shortcut to switch back to the previously selected tool.

For example, if you are using the Move tool and need to select some notes, press and hold down the F6 key (shortcut for the Select tool), make a selection, then release the F6 key to return to the Move tool.

For a list of tool shortcuts, see "Using keyboard shortcuts to select tools" on page 414.

Hotspots and modifier keys

Clips, note events, envelopes and AudioSnap transients have different "hotspots". That is, a tool may do something different depending on where you click. As you move the mouse pointer, the current hotspot is shown as a shaded rectangle.

A modifier key, such as CTRL, ALT or SHIFT, may also be used in some cases to extend a tool's function.

See:

"Selecting the data type to edit" on page 416

Selecting the data type to edit

Use a track's Edit Filter control to specify the type of data you want to edit.

Figure 103. *Use the Edit Filter control to specify what type of data the global tools should operate on.*

A
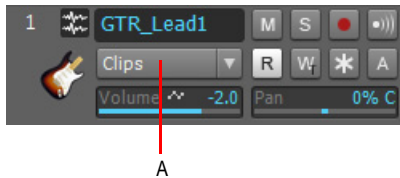
A. Edit Filter

The following data types can be selected:

- **Clips.** The selected tool operates on clips.
- **Audio Transients.** The selected tool operates on audio transients (only available for audio tracks).
- **Notes.** The selected tool operates on MIDI Note events (only available for MIDI and Instrument tracks).
- **Track Automation.** The selected tool operates on track automation envelopes, including ProChannel, Arpeggiator, plug-in parameters and MIDI continuous controllers (CCs). Select the desired automation parameter from the submenu. Color-coded squares and bold text are used to indicate existing envelopes.
- **Clip Automation.** The selected tool operates on clip automation envelopes. Select the desired automation parameter from the submenu. Color-coded squares and bold text are used to indicate existing envelopes.

To change the current Edit Filter setting

Do *one* of the following:

- Click the Edit Filter control and select the desired data type. The Edit Filter control is available in each track strip in the Track view and in the Tools HUD (see).
- Hold down the SHIFT key and click the clip or envelope you want to edit.
- Hold down the SHIFT key and click an automatable control (Volume, Pan, etc.) in a track strip.
- Hold down the SHIFT key and right-click to toggle between the two most recently selected data types.
- Click the middle mouse button to show the Tools HUD, then scroll the mouse wheel to cycle

through the available data types.

Tip: *To set all tracks to the same Edit Filter setting, hold down the CTRL key when you change any non-selected track's Edit Filter setting. To set all selected tracks to the same Edit Filter setting, hold down the CTRL when you change any selected track's Edit Filter setting.*

Tip: *You can quickly toggle between Track Volume and the last/previously shown data type on the current track. To do so, press the PLUS (+/=) key. This only works on the current parent track, not in Automation lanes.*

To toggle between the two most recent Edit Filter settings, hold down the SHIFT key and right-click in the Clips pane.

Data type ghosting

Although you can only edit one data type at a time, you can choose to always show clips and automation envelopes simultaneously. All but the selected data type will be shaded, or "ghosted". This allows you to see all data types in context while editing a specific data type.

You can also hold down the SHIFT key and click any ghosted object to switch a track's current Edit Filter setting. This is a quick way to toggle between editing clips and automation envelopes.Use the Edit Filter control to specify what type of data the global tools should operate on.
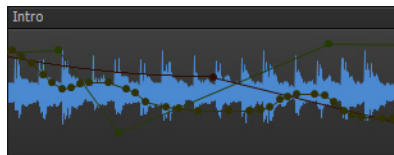
Clips
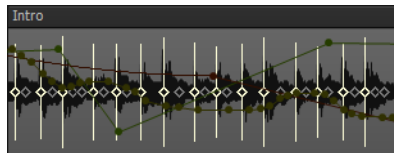
Audio Transients
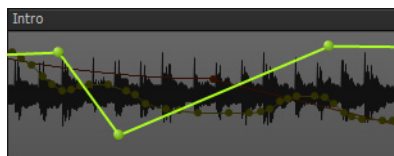
Track Automation and Clip Automation
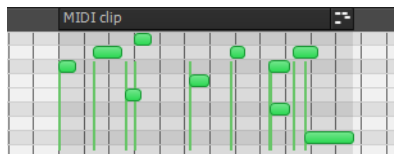
Notes

To enable/disable data type ghosting

Click the Track view **Options** menu, point to **Display** and choose **Display Ghosted Data** on the submenu.

To switch between editing clips and automation envelopes

Hold down the SHIFT key and click the clip or envelope you want to edit.

Editing audio clips

Editing MIDI clips

Editing notes in the Piano Roll

Editing automation envelopes

Editing AudioSnap transients

-
-

See:

Smart tool

The Smart tool is the default tool in SONAR. The Smart tool is a multi-function tool that combines functions from several other tools. The function is determined by where you click.

To select the Smart tool

Do *one* of the following:

- Click the Smart tool button ![button] in the Control Bar.
- Press T to display the Tools HUD, then select the Smart tool.
- Press F5.

Clip headers and the Smart tool

Clips are drawn with a header, which can be clicked with the Smart tool to select and move the clip. Clip headers automatically disappear if the track height is less than 36 pixels.

Figure 104. *Clip headers are visible when clips are higher than 36 pixels.*
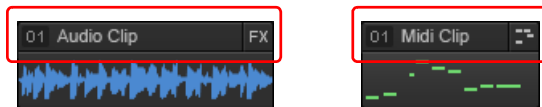
See also "To hide clip headers and maximize clip waveform display" on page 328.

Using the Smart tool on audio clips

Figure 105. *Smart tool hotspots on audio clips.*

Hotspot	Default action	+ALT	+CTRL	+ALT+SHIFT	Right-click
A	Adjust fade in				
B	Adjust fade out				
C	Crop clip start Note: If the clip contains a fade in, drag the top half to crop clip start and move the fade in, or or drag the bottom half to only crop the clip without moving the fade in.		Stretch clip	Crop clip start and also move clip data Note: If the clip contains a fade in, drag the top half to crop clip start and move the fade in, or or drag the bottom half to only crop the clip without moving the fade in.	
D	Crop clip end Note: If the clip contains a fade out, drag the top half to crop clip end and move the fade out, or or drag the bottom half to only crop the clip without moving the fade out.		Stretch clip	Crop clip end and also move clip data Note: If the clip contains a fade out, drag the top half to crop clip end and move the fade out, or or drag the bottom half to only crop the clip without moving the fade out.	
E	Select by time				Drag to lasso select

Table 68. *Using the Smart tool on audio clips*

Hotspot	Default action	+ALT	+CTRL	+ALT+SHIFT	Right-click
F	Click to select clip; drag to move clip or selection	Split clip		Move data within clip	
G	Click to set the Now time and clear the selection; drag to select by time Note: Click the clip header to select the clip, or drag the header to move the clip.	Split clip	Adjust clip gain	Move data within clip	Drag to lasso select

Table 68. *Using the Smart tool on audio clips (Continued)*

Using the Smart tool on MIDI clips

Figure 106. *Smart tool hotspots on MIDI clip.*
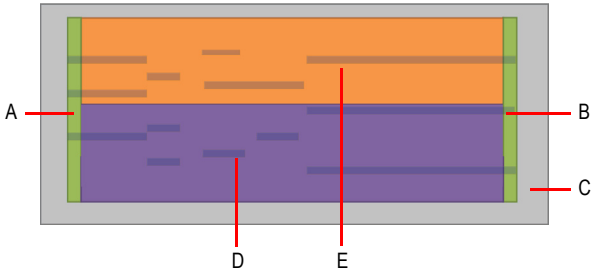
Hotspot	Default action	+ALT	+CTRL	+ALT+SHIFT	Right-click
A	Crop clip start			Crop clip start and also move clip data	
B	Crop clip end			Crop clip end and also move clip data	
C	Select by time				Drag to lasso select

Table 69. *Using the Smart tool on MIDI clips*

Hotspot	Default action	+ALT	+CTRL	+ALT+SHIFT	Right-click
D	Click to select clip; drag to move clip or selection	Split clip		Move data within clip	Drag to lasso select
E	Click to set the Now time and clear the selection; drag to select by time Note: Click the clip header to select the clip, or drag the header to move the clip.	Split clip	Adjust clip velocity	Move data within clip	Drag to lasso select

Table 69. *Using the Smart tool on MIDI clips (Continued)*

Using the Smart tool on PRV notes

Figure 107. *Smart tool hotspots on PRV notes.*
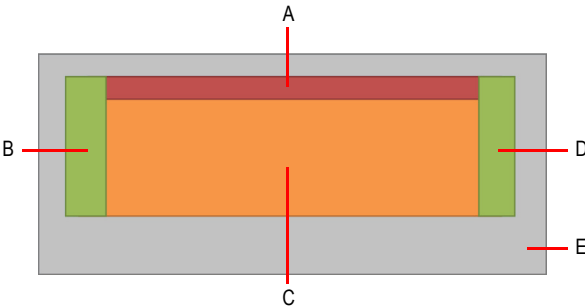
Hotspot	Default action	Double-click	Right-click	+ALT	+SHIFT	CTRL+Right-click	ALT+Right-click	CTRL+ALT+SHIFT+Right-click
A	Drag up/down to adjust note velocity							
B	Adjust note start							
C	Click to select note; drag to move note	Open Note Properties dialog	Erase note	Split note	Add note to selection	Toggle selection	Mute note	

Table 70. *Using the Smart tool on PRV notes*

Hotspot	Default action	Double-click	Right-click	+ALT	+SHIFT	CTRL+Right-click	ALT+Right-click	CTRL+ALT+SHIFT+Right-click
D	Adjust note end							
E	Insert a new note (before releasing mouse button, drag left/right to change duration, and up/down to change pitch)	Insert a new note	Click to unselect Drag to lasso select	Insert a new note with the selected duration	Change the Event Filter to Clips		Drag to perform the alternate mode of the selected Erase tool (either lasso Erase or Mute)	Draw notes line

Table 70. *Using the Smart tool on PRV notes (Continued)*

Using the Smart tool on automation

Figure 108. *Smart tool hotspots on automation.*
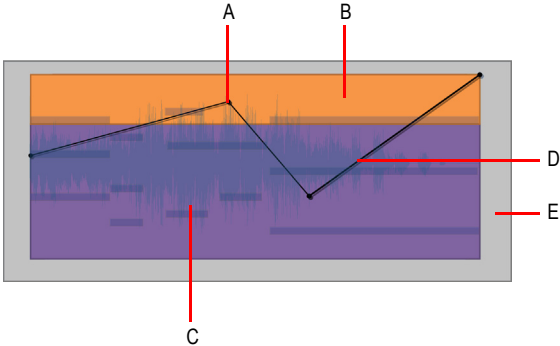
Hotspot	Default action	Double-click	+CTRL	+ALT	Right-click
A	Move node	Reset node			
B	Drag up/down to adjust selected nodes		Insert nodes at the selection points		

Table 71. *Using the Smart tool on automation*

Smart tool

Hotspot	Default action	Double-click	+CTRL	+ALT	Right-click
C	Drag left/right to select nodes				Drag to lasso select
D	Insert a node	Add new node			
E	Time select nodes			Click or drag to insert new events (Piano Roll Controller Pane only)	Drag to lasso select

Table 71. *Using the Smart tool on automation (Continued)*

Using the Smart tool on AudioSnap transients

Figure 109. *Smart tool hotspots on AudioSnap transients.*

Hotspot	Default action	Double-click	+ALT	+CTRL
A	Drag transient marker line to stretch selected transients (non-proportional stretch)	Select all adjacent transient markers in other tracks		Drag transient marker line to stretch selected transients proportionally
B	Drag transient marker handle (diamond) to move transient marker (non-stretch)			
C	Lasso select transients		Insert new transient marker	
D	Lasso select transients across clips and tracks			

Table 72. *Using the Smart tool on AudioSnap transients clips*

See also:

Select tool

The Select tool lets you select data. You can select a time range, or select entire clips, MIDI notes, envelope nodes and transients.

To select the Select tool

Do *one* of the following:

- Click the Select tool button ![button] in the Control Bar.
- Press T to display the Tools HUD, then select the Select tool.
- Press F6.

Using the Select tool on audio clips

Figure 110. *Select tool hotspots on audio clip.*
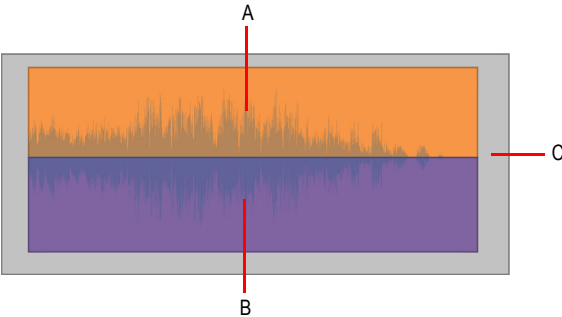
Hotspot	Default action	Right-click
A	Select by time	Drag to lasso select
B	Click to select clip	
B	Drag to select multiple clips	
C	Select by time	Drag to lasso select

Table 73. *Using the Select tool on audio clips*

Using the Select tool on MIDI clips

Figure 111. *Select tool hotspots on MIDI clip.*
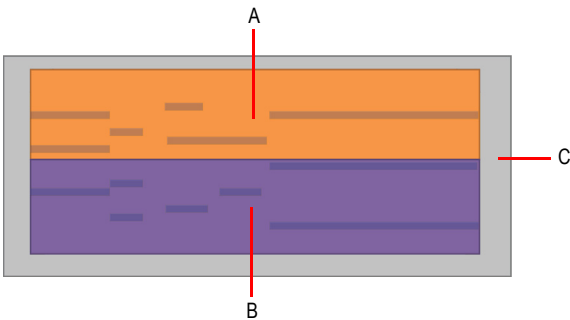
Hotspot	Default action	Right-click
A	Select by time	Drag to lasso select
B	Click to select clip	
B	Drag to select multiple clips	
C	Select by time	Drag to lasso select

Table 74. *Using the Select tool on MIDI clips*

Using the Select tool on PRV notes

Figure 112. *Select tool hotspots on PRV notes.*
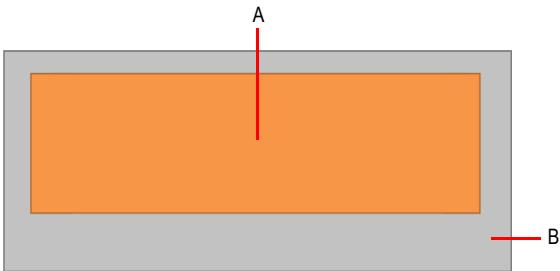
Hotspot	Default action
A	Click to select note
A	Drag to lasso select
B	Lasso select

Table 75. *Using the Select tool on PRV notes*

Using the Select tool on automation

Figure 113. *Select tool hotspots on automation.*
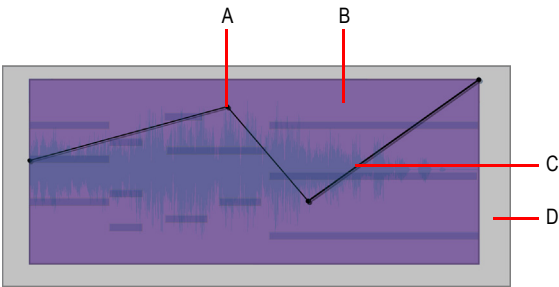
Hotspot	Default action	Double-click	+CTRL	+SHIFT	Right-click
A	Select node		Extend/toggle selection	Extend selection	Drag to lasso select
B	Time select nodes		Extend/toggle selection	Extend selection	Drag to lasso select nodes across tracks
C	Select segment				
D	Time select nodes				Drag to lasso select nodes across tracks

Table 76. *Using the Select tool on automation*

Using the Select tool on AudioSnap transients

Figure 114. *Select tool hotspots on AudioSnap transients.*
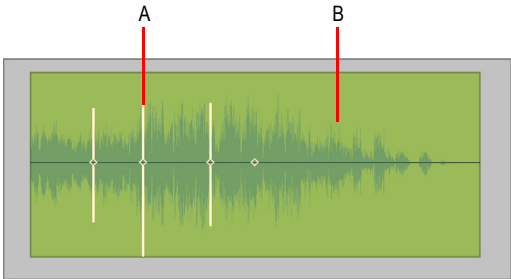
Hotspot	Default action	Double-click	+CTRL	+SHIFT
A	Select transient marker	Select adjacent transient markers in other tracks	Extend/toggle selection	Extend selection
B	Drag left/right to select transient markers			

Table 77. *Using the Select tool on AudioSnap transients*

See also:

Move tool

The Move tool lets you move selected data. You can move entire clips, partial clips, MIDI notes, envelope nodes, transient markers and clip tempo map markers.

To select the Move tool

Do *one* of the following:

- Click the Move tool button ⊕ in the Control Bar.
- Press T to display the Tools HUD, then select the Move tool.
- Press F7.

Using the Move tool on audio clips

Figure 115. *Move tool hotspots on audio clip.*
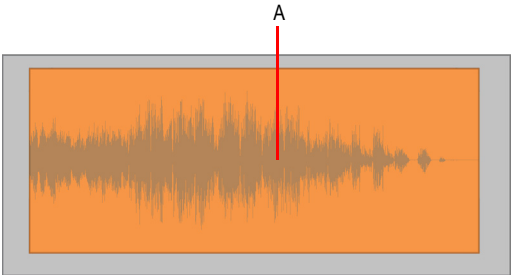
Hotspot	Default action	+ALT
A	Drag clip to move clip	
A	Drag selection to move selection	

Table 78. *Using the Move tool on audio clips*

Using the Move tool on MIDI clips

Figure 116. *Move tool hotspots on MIDI clip.*
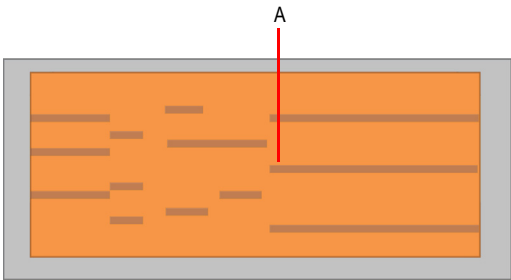
Hotspot	Default action	+ALT
A	Drag clip to move clip	
A	Drag selection to move selection	

Table 79. *Using the Move tool on MIDI clips*

Using the Move tool on PRV notes

Figure 117. *Move tool hotspots on PRV notes.*
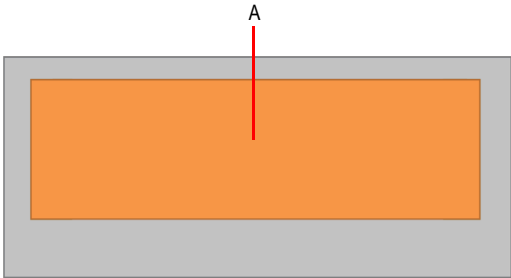
Hotspot	Default action	+SHIFT
A	Move note freely	Constrain movement vertically or horizontally

Table 80. *Using the Move tool on PRV notes*

Using the Move tool on automation

Figure 118. *Move tool hotspots on automation.*
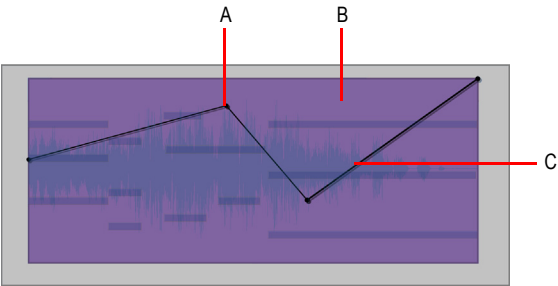
Hotspot	Default action	Double-click	+CTRL	+SHIFT
A	Move node	Reset node	Extend/toggle selection	Extend selection
B	Move selected segments/nodes			
C	Move segment	Add new node	Extend/toggle selection	Extend selection

Table 81. *Using the Move tool on automation*

Using the Move tool on AudioSnap transients
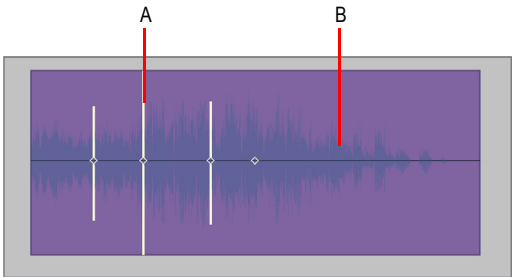
Hotspot	Default action	Double-click
A	If no selection exists, move clicked transient marker; if selection exists, move selected transient markers	Reset transient marker
B	Move selected transient markers	

Table 82. *Using the Move tool on AudioSnap transients*

See also:

Edit tool

The Edit tool lets you adjust data. You can slip-edit (trim/crop) clips, adjust note start/end times, adjust fades, and raise/lower note velocity and automation envelopes.

Note: *The Edit tool does not work on AudioSnap transients.*

To select the Edit tool

Do *one* of the following:

- Click the Edit tool button [icon] in the Control Bar.
- Press T to display the Tools HUD, then select the Edit tool.
- Press F8.

Note: *The F8 shortcut key cycles through all Edit tools (Edit/Timing/Split). If another Edit tool is selected, press F8 again until the Edit tool is selected.*

Using the Edit tool on audio clips

Figure 120. *Edit tool hotspots on audio clip.*
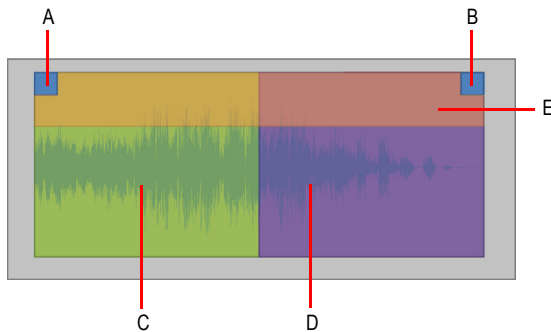
Hotspot	Default action	+CTRL	+ALT+SHIFT
A	Adjust fade in		
B	Adjust fade out		

Table 83. *Using the Edit tool on audio clips*

Hotspot	Default action	+CTRL	+ALT+SHIFT
C	Crop clip start Note: If the clip contains a fade in, drag the top 75% to crop clip start and move the fade in, or or drag the bottom 25% to only crop the clip without moving the fade in.	Stretch clip	Crop clip start and also move clip data
D	Crop clip end Note: If the clip contains a fade out, drag the top 75% to crop clip end and move the fade out, or or drag the bottom 25% to only crop the clip without moving the fade out.	Stretch clip	Crop clip end and also move clip data
E		Stretch clip	Move data within clip

Table 83. *Using the Edit tool on audio clips (Continued)*

Using the Edit tool on MIDI clips

Figure 121. *Edit tool hotspots on MIDI clip.*
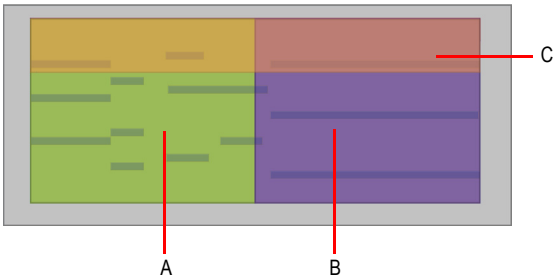
Hotspot	Default action	+ALT+SHIFT
A	Crop clip start Note: If the clip contains a fade in, drag the top 75% to crop clip start and move the fade in, or or drag the bottom 25% to only crop the clip without moving the fade in.	Crop clip start and also move clip data
B	Crop clip end Note: If the clip contains a fade out, drag the top 75% to crop clip end and move the fade out, or or drag the bottom 25% to only crop the clip without moving the fade out.	Crop clip end and also move clip data
C		Move data within clip

Table 84. *Using the Edit tool on MIDI clips*

Using the Edit tool on PRV notes

Figure 122. *Edit tool hotspots on PRV notes.*
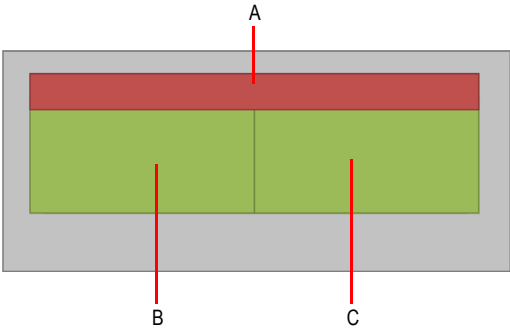
Hotspot	Default action
A	Drag up/down to adjust note velocity
B	Adjust note start
C	Adjust note end

Table 85. *Using the Edit tool on PRV notes*

Using the Edit tool on automation

Figure 123. *Edit tool hotspots on automation.*
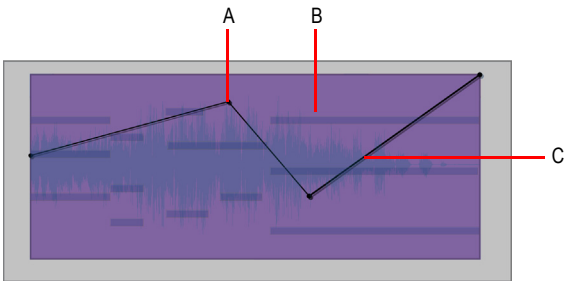
Hotspot	Default action	Double-click	+CTRL	+SHIFT
A	Drag to move node Click to select node	Reset node	Extend selection	Extend selection
B	Drag up/down to adjust selected nodes			
C	Drag to move line segment Double-click to add new node		Drag up/down to cycle through the line's available curve types (Fast, Current, Slow, Jump).	

Table 86. *Using the Edit tool on automation*

See also:

Timing tool

The Timing tool lets you slip-stretch audio clips, drag-quantize MIDI notes, and stretch audio using transient markers

ℹ️ **Note:** *The Timing tool does not work on MIDI clips or automation.*

To select the Timing tool

Do *one* of the following:

- Click the Timing tool button ⊟ in the Control Bar.
- Press T to display the Tools HUD, then select the Timing tool.
- Press F8.

ℹ️ **Note:** *The F8 shortcut key cycles through all Edit tools (Edit/Timing/Split). If another Edit tool is selected, press F8 again until the Timing tool is selected.*

Using the Timing tool on audio clips

Figure 124. *Timing tool hotspots on audio clip.*
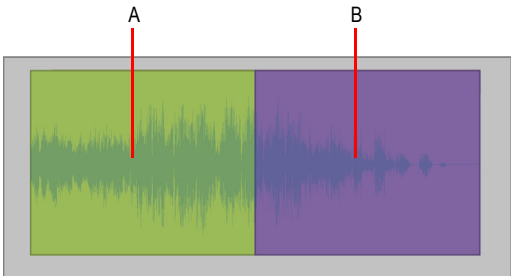
Hotspot	Default action
A	Stretch clip start
B	Stretch clip end

Table 87. *Using the Timing tool on audio clips*

Using the Timing tool on PRV notes

Figure 125. *Timing tool hotspots on PRV notes.*

A
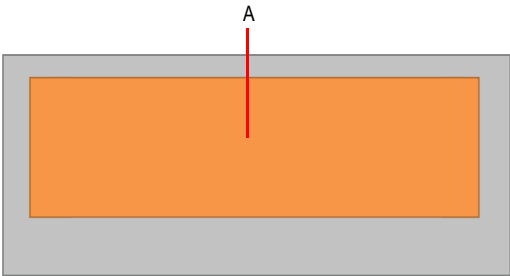
Hotspot	Default action
A	Drag up/down to drag quantize selected notes

Table 88. *Using the Timing tool on PRV notes*

Using the Timing tool on AudioSnap transients

Figure 126. *Timing tool hotspots on AudioSnap transients.*

A   B
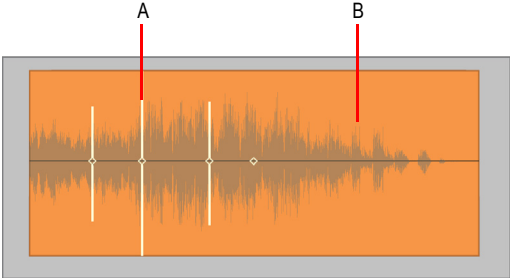
Hotspot	Default action	Double-click	+CTRL
A	Drag left/right to stretch audio at selected transients	Reset transient	Drag to stretch proportionally
B	Drag left/right to stretch audio at selected transients		

Table 89. *Using the Timing tool on AudioSnap transients*

See also:

Split tool

The Split tool lets you split clips, cut clips, split MIDI notes, and split clips at transients. By splitting clips, you can copy, move, and delete individual sections.

To select the Split tool

Do *one* of the following:

- Click the Split tool button ✂ in the Control Bar.
- Press T to display the Tools HUD, then select the Split tool.
- Press F8

> **Note:** *The F8 shortcut key cycles through all Edit tools (Edit/Timing/Split). If another Edit tool is selected, press F8 again until the Split tool is selected.*

Using the Split tool on audio clips

Figure 127. *Split tool hotspots on audio clip.*
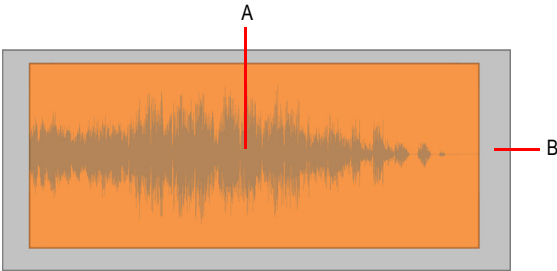
Hotspot	Default action
A	Click to split clip
A	Drag to split selection
B	Lasso to split at lasso edges

Table 90. *Using the Split tool on audio clips*

Using the Split tool on MIDI clips

Figure 128. *Split tool hotspots on MIDI clip.*
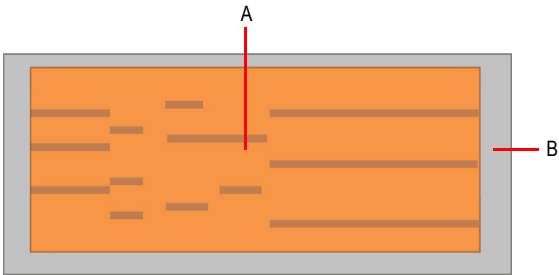
Hotspot	Default action
A	Click to split clip
A	Drag to split selection
B	Lasso to split at lasso edges

Table 91. *Using the Split tool on MIDI clips*

Using the Split tool on PRV notes

Figure 129. *Split tool hotspots on PRV notes.*
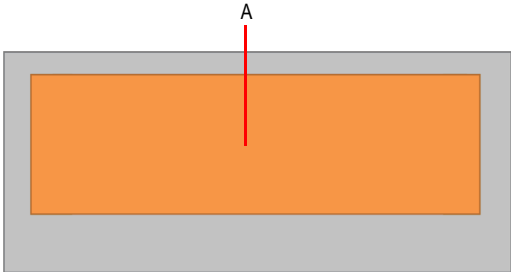
Hotspot	Default action
A	Split note

Table 92. *Using the Split tool on PRV notes*

Using the Split tool on AudioSnap transients

Figure 130. *Split tool hotspots on AudioSnap transients.*
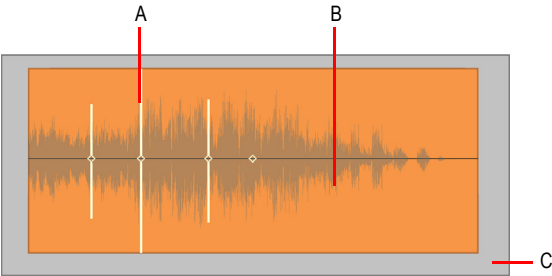
Hotspot	Default action
A	Split audio at transient marker
B	Drag over transient markers to split audio at transients
C	Lasso split at transient markers across clips and tracks

Table 93. *Using the Split tool on AudioSnap transients*

See also:

Freehand tool

The Freehand tool lets you draw MIDI notes and freehand automation envelopes. You can also create and promote transient markers.

Note: *The Freehand tool does not work on audio clips or MIDI clips.*

When using the Draw tools to draw note events, use the Value control to specify the duration (whole, half, etc.) of new note events. For details, see "Specifying note durations" on page 468.

Figure 131. *Use the Value control to specify the duration of new note events.*

A. Draw resolution (note value)

To select the Freehand tool

Do *one* of the following:

- Click the Freehand tool button ![icon] in the Control Bar.
- Press T to display the Tools HUD, then select the Freehand tool.
- Press F9.

Note: *The F9 shortcut key cycles through all Draw tools (Freehand/Line/Sine/Triangle/Square/ Saw/Random). If another Draw tool is selected, press F9 again until the Freehand tool is selected.*

Using the Freehand tool on PRV notes

Figure 132. *Freehand tool hotspots on PRV notes.*
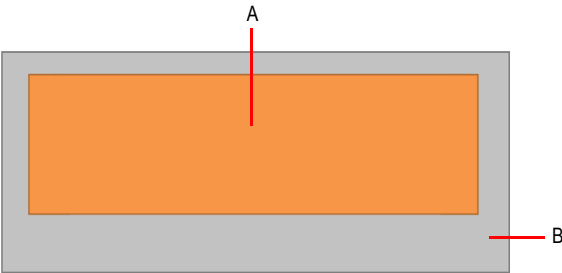
Hotspot	Default action	+CTRL	+ALT	+CTRL+SHIFT
A	Glue notes together	Modify velocity (only when velocity is not shown in the Controller pane)		Draw velocity linearly (only when velocity is not shown in the Controller pane)
B	Draw a new note		Insert a new note	

Table 94. *Using the Freehand tool on PRV notes*

Note 1: *To glue notes together, click one note, drag to another note of the same pitch, then release the mouse button.*

Note 2: *Use the Value control in the Tools module to specify the duration for new note events. You can also click an existing Note event to inherit its duration and apply it to new Note events. For details, see "Use note duration value from last touched note" on page 468.*

Using the Freehand tool on automation

Figure 133. *Freehand tool hotspots on automation.*
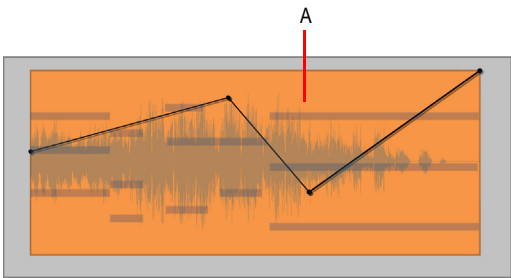
Hotspot	Default action	+SHIFT
A	Draw nodes/segments	Insert nodes at the Snap to Grid value without changing the value of the envelope segments (limited to the track the gesture is started on)

Table 95. *Using the Freehand tool on automation*

Using the Freehand tool on AudioSnap transients

Figure 134. *Freehand tool hotspots on AudioSnap transients.*
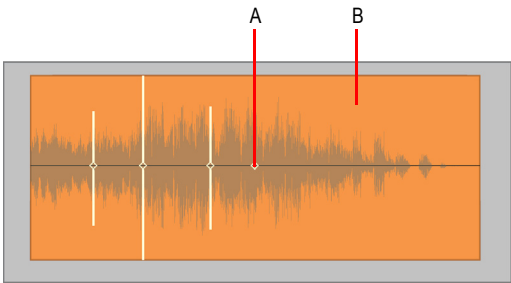
Hotspot	Default action
A	Promote transient marker
B	Insert transient marker

Table 96. *Using the Freehand tool on AudioSnap transients*

Freehand tool

See also:

Line tool

The Line tool lets you draw straight automation envelopes and "paint" MIDI notes at defined resolutions and intervals.

Note: *The Line tool does not work on audio clips, MIDI clips or AudioSnap transients.*

For additional draw settings, see "Specifying note durations" on page 468.

To select the Line tool

Do *one* of the following:

- Click the Line tool button in the Control Bar.
- Press T to display the Tools HUD, then select the Line tool.
- Press F9.

Note: *The F9 shortcut key cycles through all Draw tools (Freehand/Line/Sine/Triangle/Square/ Saw/Random). If another Draw tool is selected, press F9 again until the Line tool is selected.*

Using the Line tool on PRV notes

Figure 135. *Line tool hotspots on PRV notes.*

Hotspot	Default action	+CTRL	+CTRL+SHIFT
A	Drag to paint multiple notes.	Modify velocity (only when velocity is not shown in the Controller pane)	Draw velocity linearly (only when velocity is not shown in the Controller pane)

Table 97. *Using the Line tool on PRV notes*

Note: *Use the Value control to specify the duration of each note, and use the Snap resolution to specify the interval between each note.*

Using the Line tool on automation

Figure 136. *Line tool hotspots on automation.*
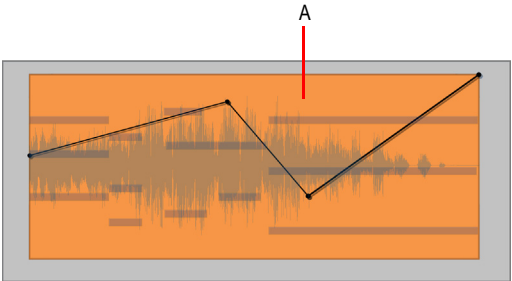
Hotspot	Default action	+SHIFT
A	Drag to add nodes at mousedown and mouseup points	Insert nodes at the Snap to Grid value without changing the value of the envelope segments (limited to the track the gesture is started on)

Table 98. *Using the Line tool on automation*

Note: *To draw a line, click anywhere to set the line start point, move the mouse, then release the mouse button to set the line end point.*

See also:

Pattern tools

The various pattern tools let you draw automation envelopes that have a specific shape.

For additional draw settings, see

To select a pattern tool

Do *one* of the following:

- Click the desired pattern tool button in the Control Bar.
- Press T to display the Tools HUD, then select the desired pattern tool.
- Press F9.

Note: *The F9 shortcut key cycles through all Draw tools (Freehand/Line/Sine/Triangle/Square/ Saw/Random). If another Draw tool is selected, press F9 again until the desired pattern tool is selected.*

Sine tool

The Sine Pattern tool lets you edit automation envelopes by drawing sine shapes.

Triangle tool

The Triangle Pattern tool lets you edit automation envelopes by drawing triangle shapes.

Square tool

The Square Pattern tool lets you edit automation envelopes by drawing square shapes.

Saw tool

The Saw Pattern tool lets you edit automation envelopes by drawing sawtooth shapes.

Random tool

The Random Pattern tool lets you edit automation envelopes by drawing random shapes.

Note: *The pattern tools do not work on audio clips, MIDI clips, PRV notes or AudioSnap transients.*

For information about drawing shapes, see

Using the Pattern tools on automation

Figure 137. *Pattern tool hotspots on automation.*
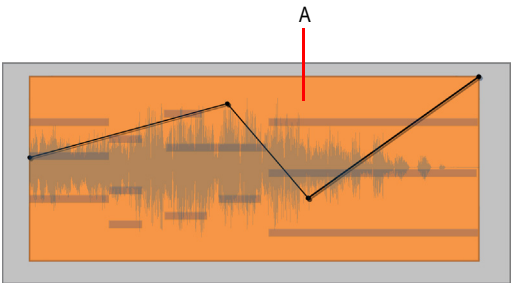
Hotspot	Default action	+SHIFT
A	Draw automation shapes	Insert nodes at the Snap to Grid value without changing the value of the envelope segments (limited to the track the gesture is started on)

Table 99. *Using Pattern tools on automation*

> **Note:** *To draw automation shapes, set the Snap to Grid resolution to the desired length of each pattern cycle, then perform the following steps in one gesture:*
>
> **1.** *Click to set the center position of the shape.*
> **2.** *Drag up/down to set the vertical range of the shape.*
> **3.** *Drag left/right to set the duration of the shape.*

See also:

Tools

Pattern tools

Erase tool

The Erase tool lets you delete clips, partial clips, MIDI notes, automation envelope nodes, and transient markers.

To select the Erase tool

Do *one* of the following:

- Click the Erase tool button ![erase tool button] in the Control Bar.
- Press T to display the Tools HUD, then select the Erase tool.
- Press F10.

> ℹ **Note:** *The F10 shortcut key cycles through all Erase tools (Erase/Mute). If another Erase tool is selected, press F10 again until the Erase tool is selected.*

Using the Erase tool on audio clips

Figure 138. *Erase tool hotspots on audio clip.*
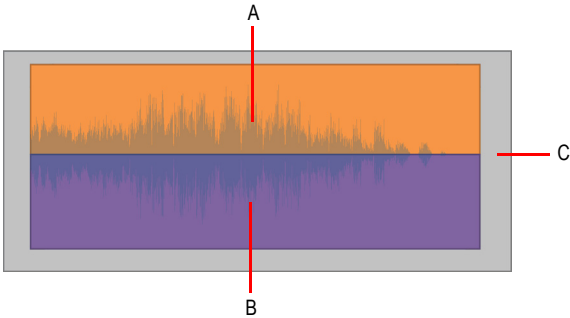
Hotspot	Default action	+ALT
A	Drag to delete a time selection	
B	Click clip to delete clip	
B	Click a selection to delete the selection	
C	Lasso to delete clips	Delete by time

Table 100. *Using the Erase tool on audio clips*

Using the Erase tool on MIDI clips

Figure 139. *Erase tool hotspots on MIDI clip.*
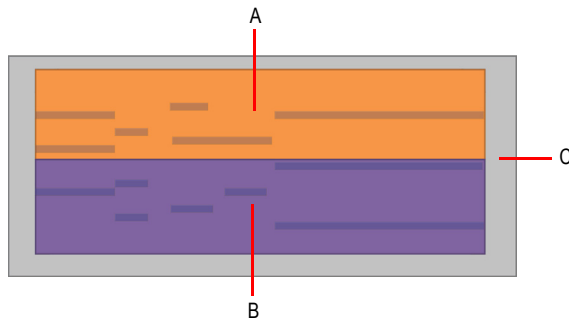
Hotspot	Default action	+ALT
A	Drag to delete a time selection	
B	Click clip to delete clip	
B	Click a selection to delete the selection	
C	Lasso to delete clips	Delete by time

Table 101. *Using the Erase tool on MIDI clips*

Using the Erase tool on PRV notes

Figure 140. *Erase tool hotspots on PRV notes.*
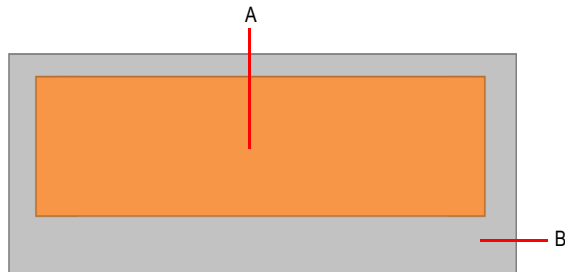
Hotspot	Default action
A	Click to delete note
A	Drag to delete multiple notes
B	Lasso delete notes

Table 102. *Using the Erase tool on PRV notes*

Using the Erase tool on automation

Figure 141. *Erase tool hotspots on automation.*
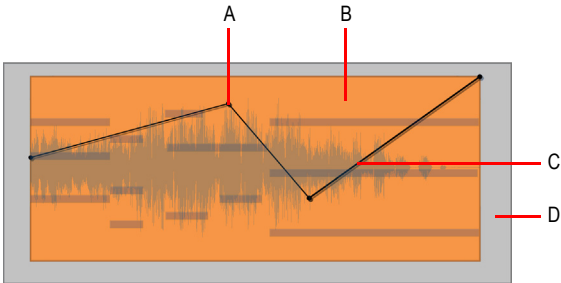
Hotspot	Default action
A	Delete node
B	Drag to lasso delete nodes across tracks
C	Delete envelope segment
D	Lasso delete nodes across tracks

Table 103. *Using the Erase tool on automation*

Erase tool

Using the Erase tool on AudioSnap transients

Figure 142. *Erase tool hotspots on AudioSnap transients.*
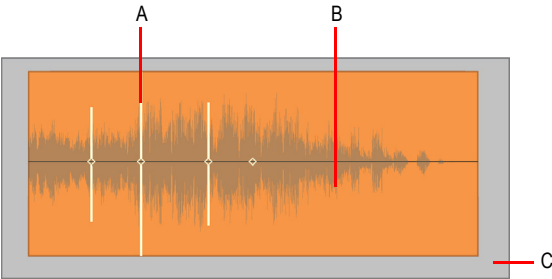
Hotspot	Default action
A	Delete clicked transient marker
B	Drag to delete multiple transient markers
C	Lasso delete transient markers across clips and tracks

Table 104. *Using the Erase tool on AudioSnap transients*

Note: *You can only erase user created transient markers.*

See also:

Mute tool

The Mute tool lets you mute clips, mute partial clips, mute MIDI notes, and disable transient markers. Mute events to prevent them from playing back.

ℹ️ **Note:** *The Mute tool does not work on automation.*

To select the Mute tool

Do *one* of the following:

- Click the Mute tool button ▣ in the Control Bar.
- Press T to display the Tools HUD, then select the Mute tool.
- Press F10.

ℹ️ **Note:** *The F10 shortcut key cycles through all Erase tools (Erase/Mute). If another Erase tool is selected, press F10 again until the Erase tool is selected.*

Using the Mute tool on audio clips

Figure 143. *Mute tool hotspots on audio clip.*
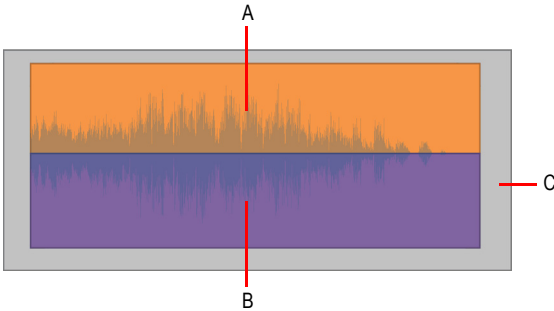
Hotspot	Default action	+ALT	+CTRL
A	Click to unmute clip		Click to isolate Take lane
A	Drag to unmute by time		Drag to isolate by time
B	Click to mute clip		Click to isolate Take lane

Table 105. *Using the Mute tool on audio clips*

Hotspot	Default action	+ALT	+CTRL
B	Drag to mute by time		Drag to isolate by time
C	Lasso to mute clips	Lasso to unmute clips	

Table 105. *Using the Mute tool on audio clips (Continued)*

Using the Mute tool on MIDI clips

Figure 144. *Mute tool hotspots on MIDI clip.*
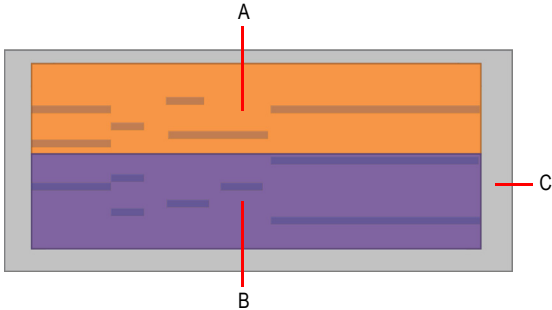
Hotspot	Default action	+ALT	+CTRL
A	Click to unmute clip		Click to isolate Take lane
A	Drag to unmute by time		Drag to isolate by time
B	Click to mute clip		Click to isolate Take lane
B	Drag to mute by time		Drag to isolate by time
C	Lasso to mute clips	Lasso to unmute clips	

Table 106. *Using the Mute tool on MIDI clips*

Using the Mute tool on PRV notes

On PRV notes, the Mute tool functions as a toggle. Click once to mute and click again to unmute.

Figure 145. *Mute tool hotspots on PRV notes.*
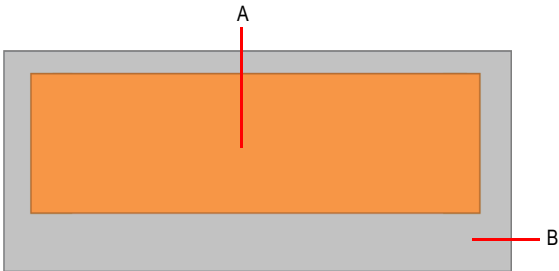
Hotspot	Default action
A	Click to mute/unmute
A	Drag to mute/unmute multiple notes
B	Lasso mute/unmute notes

Table 107. *Using the Mute tool on PRV notes*

Using the Mute tool on AudioSnap transients

Figure 146. *Mute tool hotspots on AudioSnap transients.*
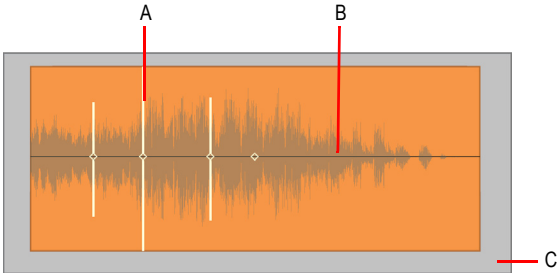
Hotspot	Default action
A	Disable transient marker

Table 108. *Using the Mute tool on AudioSnap transients*

Hotspot	Default action
B	Disable transient markers
C	Lasso disable transient markers across clips and tracks

Table 108. *Using the Mute tool on AudioSnap transients (Continued)*

See also:

Scrub tool

The Scrub tool lets you audition all displayed tracks as you drag the mouse cursor forward or backward at the desired speed. You can scrub a single track by dragging over the track, or all displayed tracks by dragging in the Time Ruler.

Note: *The Scrub tool does not work on automation.*

To scrub a single track

Hold down the J key to temporarily enable Scrub mode and drag over the track.

To scrub all displayed tracks

Hold down the J key to temporarily enable Scrub mode and drag in the Time Ruler.

Note: *The Scrub tool is invoked by pressing the J key. There is no Scrub tool button in the Control Bar or Tools HUD.*

See also:

Zoom tool

The Zoom tool lets you change the vertical and horizontal scale of a view. You can use lasso to select a specific area to zoom into.

Using the Zoom tool

Hold down the Z key to temporarily enable Zoom mode, then lasso to select the region you want to zoom into.

To revert to the previous zoom level, press ALT+Z.

Note: *The Zoom tool is invoked by pressing the Z key. There is no Zoom tool button in the Control Bar or Tools HUD.*

See also:

Snap to Grid settings

SONAR lets you define a snap grid that makes it easier to arrange clips, select time ranges, and control envelope shape drawing. To use the snap grid, enable the **Snap to Grid** button ⊞ in the Snap module and set the grid resolution to an interval of musical time, such as a whole note, half note, or quarter note; a unit of absolute time: a number of frames, seconds or samples; an event; the start or end of a clip; a marker; or audio transients. The grid can use multiple resolutions at the same time, such as a whole note, and audio transients. When the **Snap to Grid** button is enabled, if you move or paste clips or markers, items will be snapped to the nearest point on the snap grid.

Figure 147. *Snap to Grid settings are available in the Snap module in the Control Bar.*
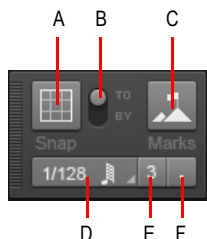
*A. Snap on/off **B.** Snap To / Snap By **C.** Snap to landmarks **D.** Snap resolution (musical time or absolute time) **E.** Triplet **F.** Dotted*

The Snap module contains the following settings:

- **Snap enable/disable** ⊞. Enable/disable snapping. When enabled, vertical grid lines that correspond to the snap resolution are displayed in the Track view.
- **Snap To.** Align data *to* the snap grid.
- **Snap By.** Move data *by* the grid resolution.
- **Time resolution.** Snap to the selected musical or absolute time resolution. Click and hold the mouse button pressed to select a different duration from the pop-up menu. For absolute time resolutions (samples, frames, seconds), type the desired number of units. When **Smart Grid** is selected, the snap resolution is dynamically determined by the horizontal zoom level. When **Smart Grid** is enabled, the M:B:T time rulers in the Clips pane and Piano Roll view are optimized to show relevant snap locations.
- **Triplet** 3. Reduces the duration of the selected Musical time resolution by 2/3 of its original duration. When Triplet is enabled, three note events fit in the space of two.
- **Dotted** .. Increase the duration of the selected Musical time resolution by half of its original value (150%).
- **Landmark Events** . Snap to the selected landmarks, including markers, Now Time, clips,

audio transients, MIDI notes, and automation envelope nodes. To select the desired landmarks, right-click the **Snap to Grid** button ▦ to open the **Preferences** dialog, then select the desired check boxes in the **Landmarks** section. SONAR will snap to landmarks on tracks/lanes that are currently visible in the Clips pane.

Additional Snap to Grid settings

To access additional snap settings, go to **Edit > Preferences > Customization - Snap to Grid** (or right-click the **Snap to Grid** button ▦).

The **Snap** section contains the following settings:

- **Snap Intensity.** Specify the magnetic strength when snapping, which determines how quickly moved events are pulled towards the snap grid.

- **Magnetic Test.** Drag the event to test the current Snap Intensity setting.

- **Snap to Nearest Audio Zero Crossings.** Automatically snap edited audio clips to the nearest zero crossing of the waveform (the point at which there is no volume) to minimize glitches that can happen when waveforms are spliced together.

- **Landmarks.** Snap to the selected landmarks when the **Events** button is enabled in the Control Bar's Snap module:

  - **Markers.** Snap to any marker.

  - **Now Time.** Snap to the current Now Time.

  - **Clips.** Snap to the start or end of any clip.

  - **Audio Transients.** Snap to transient markers in audio clips.

  - **MIDI Notes.** Snap to note events in MIDI clips.

  - **Automation Nodes.** Snap to automation envelope nodes.

See also:

"Defining and using the Snap Grid" on page 354

"Tools" on page 407

Specifying note durations

When using the Smart tool or Freehand tool to draw new note events, use the Value control in the Tools module to specify the note duration of new note events (whole, half, etc.).

Figure 148. *Use the Value control to specify the duration of new note events.*

A. Draw resolution (note value)

You can also use the following shortcuts to set the desired note duration.

Duration	Shortcut
Set whole note duration	CTRL+SHIFT+1
Set half note duration	CTRL+SHIFT+2
Set quarter note duration	CTRL+SHIFT+4
Set eight note duration	CTRL+SHIFT+8
Set sixteenth note duration	CTRL+SHIFT+6
Set thirty-second note duration	CTRL+SHIFT+3

Table 109. *Global note duration shortcuts*

Use note duration value from last touched note

When inserting new Note events, you can choose to always apply the note duration from the last touched Note event. To do so, select **Last Touched** in the Value control drop-down menu. Before inserting a new Note event, select an existing Note event that already uses the duration you want to apply to the new note, then insert the new note.

See also:

Tools
Specifying note durations

Mouse cursors

When using global tools, the mouse cursor indicates which operation will be performed when you click or drag. Valid operations depend on the selected tool, the Edit Filter setting, and where the pointer is positioned.

The following table describes each cursor.

Cursor	Description
	Select clip.
	Lasso select.
	Select by time.
	Move.
	Fade in.
	Fade out.
	Crop clip start.
	Crop clip start, but don't move fade in position.
	Crop clip start and move fade in position.
	Crop clip end.

Table 110. *Tool cursors*

Cursor	Description
	Crop clip end, but don't move fade out position.
	Crop clip end and move fade out position.
	Mute event.
	Mute by time.
	Unmute by time.
	Isolate Take lane (mute all other overlapping Take lanes in same track).
	Erase clip.
	Lasso erase.
	Erase by time.
	Split.
	Scrub.
	Move a single envelope node.
	Move multiple selected envelope nodes.

Table 110. *Tool cursors (Continued)*

Mouse cursors

Cursor	Description
	Move an envelope line segment.
	Adjust selected envelope region up/down.
	Draw.
	Draw line/pattern.
	Draw automation line.
	Draw automation sine pattern.
	Draw automation triangle pattern.
	Draw automation square pattern.
	Draw automation sawtooth pattern.
	Draw automation random pattern.
	Move selected automation.
	Lasso select automation.
	Split automation (add node).

Table 110.   *Tool cursors (Continued)*

Mouse cursors

Cursor	Description
	Erase automation.
	Insert transient marker.
	Lasso select transient markers.
	Stretch transient marker.
	Move transient marker.
	Erase transient marker.
	Disable transient marker.
	Split audio at transient marker.
	Glue MIDI note events together.
	Move MIDI note events.
	Adjust MIDI note velocity.
	Trim MIDI note event.
	Drag quantize selected MIDI note events.

Table 110.   *Tool cursors (Continued)*

Mouse cursors

Cursor	Description
	Move data within clip (ALT+SHIFT).
	Crop overlapping clips when showing Take lanes.

Table 110. *Tool cursors (Continued)*

See:

"Tools" on page 407

Using tools to perform common tasks

This section explains how to perform many common editing tasks.

See:

Working with audio clips

- "To fade in/out an audio clip" on page 475
- "To crop a clip's start/end" on page 475
- "To select audio clips" on page 476
- "To scrub an audio clip" on page 477
- "To mute/unmute a clip" on page 477
- "To move a clip" on page 478
- "To stretch an audio clip" on page 478
- "To erase a clip" on page 478
- "To split a clip" on page 479
- "To raise/lower a MIDI Clip Velocity envelope" on page 483

Working with MIDI clips

Working with MIDI notes

Working with automation envelopes

Using tools to perform common tasks

Working with AudioSnap transients

Working with audio clips

To fade in/out an audio clip

1. Set the track's Edit Filter control to **Clips**.
2. Do *one* of the following:

   - With the Smart tool ![icon], position the pointer in the top left (fade in) or top right (fade out) corner of the clip, then drag to adjust the fade duration.

   - With the Edit tool ![icon], position the pointer in the top left (fade in) or top right (fade out) corner of the clip, then drag to adjust the fade duration.

To crop a clip's start/end

1. Set the track's Edit Filter control to **Clips**.
2. Do *one* of the following:

   - With the Smart tool ![icon], position the pointer over the clip's start or end point, then drag to adjust the start/end position.

   - With the Edit tool ![icon], position the pointer over the clip's start or end point, then drag to adjust the start/end position.

💡 **Tip:** *When cropping clips, you can choose to also move clip fades proportionally, or retain the original fade position. To move the fade position, click the top three quarters of the clip edge when cropping. To retain the clip fade position, click the bottom quarter of the clip edge when cropping. You can also hold down the ALT key while cropping in order to move a clip fade.*

To move data and the clip edge

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   • With the Smart tool [icon], position the pointer over the clip's start or end point, then hold ALT+SHIFT and drag to adjust the start/end position.

   • With the Edit tool [icon], position the pointer over the clip's start or end point, then hold ALT+SHIFT and drag to adjust the start/end position.

To move data without moving its clip

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   • With the Smart tool [icon], position the pointer within the clip, then hold ALT+SHIFT and drag left/right to move the data within the clip boundaries.

   • With the Edit tool [icon], position the pointer within the clip, then hold ALT+SHIFT and drag left/right to move the data within the clip boundaries.

To select audio clips

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   • With the Smart tool [icon], position the pointer over the clip, then click to select the clip.

   • With the Smart tool [icon], position the pointer below the clip header, then drag to make a time selection.

   • With the Smart tool [icon], position the pointer outside any clips, then drag to make a time selection.

   • With the Smart tool [icon], drag with the right mouse button to lasso the clips you want to select. It is sufficient to simply touch the clips you want to select; there is no need to fully enclose the clips.

   • With the Select tool [icon], position the pointer outside any clips, then drag over the clips you want to select.

   • With the Select tool [icon], position the pointer over the clip, then click to select the clip.

Using tools to perform common tasks

- With the Select tool ![icon], position the pointer over the clip, then drag to make a time selection.

- With the Select tool ![icon], drag with the right mouse button to lasso the clips you want to select. It is sufficient to simply touch the clips you want to select; there is no need to fully enclose the clips.

Tip: *To modify a selection, hold down the CTRL key and click clips to toggle their selection state.*

To scrub an audio clip

1. Set the track's Edit Filter control to **Clips**.
2. Do *one* of the following:
   - To scrub a single track, hold down the J key and drag across the track.
   - To scrub all visible tracks, hold down the J key and drag in the time ruler.

To mute/unmute a clip

1. Set the track's Edit Filter control to **Clips**.
2. Do *one* of the following:

   - With the Mute tool ![M icon], drag across the bottom half of the clip to mute a time region, and drag across the top half to unmute a time region.

   - With the Mute tool ![M icon], click the bottom half of the clip to mute the entire clip, and click the top half of the clip to unmute the clip.

   - With the Mute tool ![M icon], position the pointer outside any clips and drag over the clips you want to mute/unmute.

To isolate a Take lane

1. Set the track's Edit Filter control to **Clips**.
2. Do *one* of the following:

- With the Mute tool ![M], hold down the CTRL key and drag across the region you want to isolate.

- With the Mute tool ![M], hold down the CTRL key and click the clip to isolate the entire clip/lane.

All other Take lanes in the same track are muted.

To move a clip

1. Set the track's Edit Filter control to **Clips**.
2. Do *one* of the following:

    - With the Smart tool ![★], position the pointer over the clip header, then drag the clip or selection to the desired location.

    - With the Move tool ![✛], drag the clip or selection to the desired location.

To stretch an audio clip

1. Set the track's Edit Filter control to **Clips**.
2. Do *one* of the following:

    - With the Smart tool ![★], hold down the CTRL key and position the pointer over the clip's first half and drag to stretch the beginning, or position the pointer over the clip's second half and drag to stretch the end.

    - With the Timing tool ![↔], position the pointer over the clip's first half and drag to stretch the beginning, or position the pointer over the clip's second half and drag to stretch the end.

    - With the Edit tool ![✎], hold down the CTRL key and position the pointer over the clip's first half and drag to stretch the beginning, or position the pointer over the clip's second half and drag to stretch the end.

    A clip icon in the top right corner of the clip indicates the clip is stretched and shows the stretch percentage.

To erase a clip

1. Set the track's Edit Filter control to **Clips**.
2. Do *one* of the following:

    - With the Erase tool ![✎], position the pointer over the top half of the clip, then drag to erase a time selection.

- With the Erase tool ![erase icon], position the pointer over the bottom half of the clip, then click to erase the entire clip.

- With the Erase tool ![erase icon], position the pointer outside any clips, then drag over the clips you want to erase. Hold down the ALT key and drag to erase by time.

To split a clip

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   - With the Smart tool ![smart tool icon], position the pointer where you want to split the clip, then hold down ALT and click (or lasso to split a region).

   - With the Split tool ![split tool icon], position the pointer where you want to split the clip, then click (or drag to split one or more clips at the mousedown and mouseup points).

To raise/lower an audio Clip Gain envelope

1. Set the track's Edit Filter control to **Clips**.

2. Select the Smart tool ![smart tool icon].

3. Position the mouse pointer over the top half of the clip until the pointer looks like this ![pointer icon], hold down the CTRL key and drag up/down.

💡 **Tip:** *For greater control over clip gain envelopes, set the Event Filter to **Clip Automation > Gain**.*

ℹ️ **Note:** *Clip envelopes can be adjusted in the parent track or in a Take lane.*

See:

Tools

Using tools to perform common tasks

Working with MIDI clips

To crop a clip's start/end

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   • With the Smart tool , position the pointer over the clip's start or end point, then drag to adjust the start/end position.

   • With the Edit tool , position the pointer over the clip's start or end point, then drag to adjust the start/end position.

To move data and the clip edge

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   • With the Smart tool , position the pointer over the clip's start or end point, then hold ALT+SHIFT and drag to adjust the start/end position.

   • With the Edit tool , position the pointer over the clip's start or end point, then hold ALT+SHIFT and drag to adjust the start/end position.

To move data without moving its clip

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   • With the Smart tool , position the pointer within the clip, then hold ALT+SHIFT and drag left/right to move the data within the clip boundaries.

   • With the Edit tool , position the pointer within the clip, then hold ALT+SHIFT and drag left/right to move the data within the clip boundaries.

To select MIDI clips

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   - With the Smart tool , position the pointer over the clip, then click to select the clip.

   - With the Smart tool , position the pointer below the clip header, then drag to make a time selection.

   - With the Smart tool , position the pointer outside any clips, then drag to make a time selection.

   - With the Smart tool , drag with the right mouse button to lasso the clips you want to select. It is sufficient to simply touch the clips you want to select; there is no need to fully enclose the clips.

   - With the Select tool , position the pointer over the bottom half of the clip, then click to select the clip.

   - With the Select tool , position the pointer over the top half of the clip, then drag to make a time selection.

   - With the Select tool , position the pointer outside any clips, then drag to make a time selection.

   - With the Select tool , drag with the right mouse button to lasso the clips you want to select. It is sufficient to simply touch the clips you want to select; there is no need to fully enclose the clips.

To scrub a MIDI clip

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:
   - To scrub a single track, hold down the J key and drag across the track.
   - To scrub all visible tracks, hold down the J key and drag in the time ruler.

To mute/unmute a clip

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   - With the Mute tool [M], drag across the bottom half of the clip to mute a time region, and drag across the top half to unmute a time region.

   - With the Mute tool [M], click the bottom half of the clip to mute the entire clip, and click the top half of the clip to unmute the clip.

   - With the Mute tool [M], position the pointer outside any clips and drag over the clips you want to mute/unmute.

To isolate a Take lane

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   - With the Mute tool [M], hold down the CTRL key and drag across the region you want to isolate.

   - With the Mute tool [M], hold down the CTRL key and click the clip to isolate the entire clip/ lane.

   All other Take lanes in the same track are muted.

To move a clip

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   - With the Smart tool [★], position the pointer over the clip header, then drag the clip or selection to the desired location.

   - With the Move tool [✛], drag the clip or selection to the desired location.

To erase a clip

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   - With the Erase tool [✏], position the pointer over the top half of the clip, then drag to erase a time selection.

- With the Erase tool [icon], position the pointer over the bottom half of the clip, then click to erase the entire clip.

- With the Erase tool [icon], position the pointer outside any clips, then drag over the clips you want to erase. Hold down the ALT key and drag to erase by time.

To split a clip

1. Set the track's Edit Filter control to **Clips**.

2. Do *one* of the following:

   - With the Smart tool [icon], position the pointer where you want to split the clip, then hold down ALT and click (or lasso to split a region).

   - With the Split tool [icon], position the pointer where you want to split the clip, then click (or drag to split one or more clips at the mousedown and mouseup points).

To raise/lower a MIDI Clip Velocity envelope

1. Set the track's Edit Filter control to **Clips**.

2. Select the Smart tool [icon].

3. Position the mouse pointer over the top half of the clip until the pointer looks like this [icon], hold down the CTRL key and drag up/down.

Tip: *For greater control over clip velocity envelopes, set the Event Filter to **Clip Automation > Velocity**.*

Note: *Clip envelopes can be adjusted in the parent track or in a Take lane.*

See:

Tools

Using tools to perform common tasks

Working with MIDI notes

To adjust a MIDI note's velocity

1. Set the track's Edit Filter control to **Notes**.
2. Do *one* of the following:

   • With the Smart tool ![icon], position the pointer near the top center of the note, then drag up/
     down.

   • With the Edit tool ![icon], position the pointer near the top center of the note, then drag up/down.

To adjust a MIDI note's start/end

1. Set the track's Edit Filter control to **Notes**.
2. Do *one* of the following:

   • With the Smart tool ![icon], position the pointer over the note's start or end point, then drag left/
     right to adjust the start/end position.

   • With the Edit tool ![icon], position the pointer over the note's start or end point, then drag left/
     right to adjust the start/end position.

To select MIDI notes

1. Set the track's Edit Filter control to **Notes**.
2. Do *one* of the following:

   • With the Smart tool ![icon], drag with the right mouse button over the notes you want to select.

   • With the Smart tool ![icon], position the pointer over the bottom half center of the note, then click
     to select the note.

   • With the Select tool ![icon], click the note.

   • With the Select tool ![icon], drag over the notes you want to select.

To scrub MIDI notes

1. Set the track's Edit Filter control to **Notes**.
2. Hold down the J key and drag across the notes.

To mute/unmute a MIDI note

1. Set the track's Edit Filter control to **Notes**.
2. Do *one* of the following:

   - With the Smart tool [image], hold down the ALT key and right-click the note.

   - With the Mute tool [image], click the note to mute/unmute a single note, or drag over notes to mute/unmute multiple notes.

To move a MIDI note

1. Set the track's Edit Filter control to **Notes**.
2. Do *one* of the following:

   - With the Smart tool [image], position the pointer over the bottom half center of the note, then drag the note to the desired location.

   - With the Move tool [image], drag the note or selection to the desired location.

[image] **Tip:** *When moving a note, hold down the SHIFT key to constrain vertical or horizontal movement, depending on the direction you first move.*

To draw a MIDI note

1. Set the track's Edit Filter control to **Notes**.
2. Do *one* of the following:

   - With the Smart tool [image], click where you want to insert a new note. Before releasing mouse button, drag left/right to change duration, and up/down to change pitch.

   - With the Freehand tool [image], click where you want to insert a new note.

[image] **Note:** *Use the Value control in the Tools module to specify the duration for new note events.*

To drag-quantize MIDI notes

1. Set the track's Edit Filter control to **Notes**.

2. Select the notes you want to quantize.

3. With the Timing tool [icon], position the pointer over a selected note and drag up/down to quantize all selected notes.

To glue MIDI notes together

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

    • With the Smart tool [icon], hold down ALT+CTRL and drag across two or more notes of the same pitch (click on the first note, drag to the second note and release the mouse button).

    • With the Freehand tool [icon], drag across two or more notes of the same pitch (click on the first note, drag to the second note and release the mouse button).

   All touched note events of the same pitch are merged into a single note event.

To paint MIDI notes

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

    • With the Smart tool [icon], hold down ALT+CTRL and drag to insert multiple notes. Use the Value control to specify the duration of each note, and use the Snap resolution to specify the interval between each note.

    • With the Line tool [icon], drag to insert multiple notes. Use the Value control to specify the duration of each note, and use the Snap resolution to specify the interval between each note.

To erase a MIDI note

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

    • With the Smart tool [icon], right-click a note to erase a single note, or keep the right mouse button pressed and drag over notes to erase multiple notes.

    • With the Erase tool [icon], click a note to erase a single note, or drag over notes to erase multiple notes.

Using tools to perform common tasks

To split a MIDI note

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

- With the Smart tool , position the pointer where you want to split the note, then hold down ALT and click (or lasso to split a region).

- With the Split tool , position the pointer where you want to split the note, then click (or lasso to split a region).

To open the Note Properties dialog

1. Set the track's Edit Filter control to **Notes**.

2. With the Smart tool , double-click the note.

See:

Working with automation envelopes

To select automation

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

- With the Smart tool or Select tool , drag left/right to make a time selection.

- With the Smart tool or Select tool , drag with the right mouse button to lasso select.

- With the Select tool , click the node. Hold CTRL or SHIFT to extend the selection.

- With the Edit tool , click the node.

To move automation

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

   - With the Move tool , position the pointer over the envelope segment you want to move, then drag the segment to the desired location.

   - With the Edit tool , position the pointer over the envelope segment you want to move, then drag the segment to the desired location.

To move envelope nodes

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

   - With the Smart tool , drag the node to the desired location.

   - With the Move tool , drag the node to the desired location.

   - With the Edit tool , drag the node to the desired location.

   When dragging an envelope node, the tooltip shows the current value and the delta value for the change.

To reset envelope nodes

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

   - With the Smart tool , double-click the node.

   - With the Move tool , double-click the node.

   - With the Edit tool , double-click the node.

To raise/lower selected envelope nodes

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

- With the Smart tool ![star icon], position the pointer near the top center of the track/clip, then drag up/down.

- With the Edit tool ![edit icon], position the pointer near the top center of the track/clip, then drag up/down.

To draw automation freehand

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. With the Freehand tool ![freehand icon], drag to insert envelope nodes and segments.

To draw a straight line

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. With the Line tool ![line icon], click to set the line start point, move the mouse, then release the mouse button to set the line end point.

To draw automation shapes

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Select the desired pattern tool: Sine Pattern tool ![sine icon], Triangle Pattern tool ![triangle icon], Square Pattern tool ![square icon], Saw Pattern tool ![saw icon], or Random Pattern tool ![random icon].

3. Set the Snap to Grid to the desired length of each cycle of the shape you want to draw. For example, if you want to draw sine curves, and you want each complete sine curve to last one beat, set the Snap to Grid to a value of Quarter. If the Snap to Grid is disabled, the default cycle is one measure.

4. Click and hold the mouse button in the Clips pane at the place where you want to draw the envelope shape. The place where you click also sets the vertical midpoint of the shape.

5. Drag up or down to set the vertical range of the envelope, then drag to the right or left to set the length of your edit. As you drag, the cursor's vertical distance from the midpoint (the point where you originally clicked) determines the amplitude of the shape. To create a series of identical shapes, hold the SHIFT key down while you drag. To gradually increase or decrease the amplitude, gradually move the pointer farther from or closer to the midpoint.

6. Release the mouse button when done. The shape you selected appears, repeating according to the Snap to Grid setting.

Tip:

- *To halve the cycle frequency (for example, if snap resolution = quarter note, make each cycle a half note), hold down the ALT key while you draw.*
- *To double the cycle frequency (for example, if snap resolution = quarter note, make each cycle an eighth note), hold down the CTRL key while you draw.*
- *To invert the phase of the pattern, drag the cursor below the zero-line/center (where you initially clicked to start the pattern).*

To erase automation

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

- With the Erase tool , click a node to erase a single node, or drag over nodes to erase multiple nodes.

- With the Erase tool , click an envelope segment to erase the nodes to the left and right of the segment.

- With the Erase tool , position the pointer outside the clip, then drag to lasso erase nodes across clips or tracks.

To add envelope nodes

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

- With the Smart tool , position the pointer over the envelope where you want to insert a new node, then click.

- With the Smart tool , hold down the CTRL key and drag to insert two nodes at the selection boundaries.

- With the Select tool , position the pointer over the envelope where you want to insert a new node, then double-click.

- With the Move tool , position the pointer over the envelope where you want to insert a new

node, then double-click.

- With the Edit tool , position the pointer over the envelope where you want to insert a new node, then click.

- With the Line tool , drag to add nodes at the mousedown and mouseup points. Hold down the SHIFT key and drag to add nodes at the Snap to Grid value.

- With the Freehand tool , hold down the SHIFT key and drag to add nodes at the Snap to Grid value.

- With any pattern draw tools (Sine tool , Triangle tool , Square tool , Saw tool , or Random tool), hold down the SHIFT key and drag to add nodes at the Snap to Grid value.

To draw MIDI continuous controller envelopes

1. Click the track's Edit Filter control, point to **Track Automation** and choose **MIDI** to open the **MIDI Envelope** dialog box.
2. Specify the desired MIDI envelope parameter settings (Type, Value, and Channel).
3. With the Freehand tool , drag to insert envelope nodes and segments.

See:

Working with AudioSnap transients

To select transient markers

1. Set the track's Edit Filter control to **Audio Transients**.

2. Do *one* of the following:

   • With the Smart tool ★, click the transient marker or drag left/right to make a time selection.

   • With the Smart tool ★, position the pointer outside the clip, then drag to lasso select transients across clips or tracks.

   • With the Smart tool ★, double-click a transient marker to select all adjacent transient markers in other tracks.

   • With the Select tool ▸, click the transient marker. Hold CTRL or SHIFT to extend the selection.

   • With the Select tool ▸, drag left/right to select multiple transient markers.

   • With the Select tool ▸, double-click a transient marker to select all adjacent transient markers in other tracks.

To move transient markers (without stretching audio)

1. Set the track's Edit Filter control to **Audio Transients**.

2. Do *one* of the following:

   • With the Smart tool ★, drag the transient marker handle (diamond) to the desired location.

   • With the Move tool ✛, drag the transient marker handle (diamond) to the desired location.

To stretch transients

1. Set the track's Edit Filter control to **Audio Transients**.

2. Do *one* of the following:

   • With the Smart tool ★, then drag the transient marker line to the desired location.

   • With the Timing tool ⬓, drag the transient marker line to the desired location. To stretch all selected transients proportionally, hold down the CTRL key while you drag any selected transient marker.

Using tools to perform common tasks

To promote transient markers

1. Set the track's Edit Filter control to **Audio Transients**.

2. With the Freehand tool , click the transient marker handle (diamond).

To disable transient markers

1. Set the track's Edit Filter control to **Audio Transients**.

2. With the Mute tool , click a transient marker handle (diamond) to disable a single transient marker, or drag across transient markers to disable multiple transient markers.

To erase transient markers

1. Set the track's Edit Filter control to **Audio Transients**.

2. With the Erase tool , click the transient marker to erase a single transient marker, or drag over transient markers to erase multiple transient markers.

Note: *You can only erase user created transient markers.*

To reset transients

1. Set the track's Edit Filter control to **Audio Transients**.

2. With the Move tool , double-click the transient marker.

To split an audio clip at transient markers

1. Set the track's Edit Filter control to **Audio Transients**.

2. With the Split tool , click the transient marker where you want to split the clip. Drag to split at multiple transient markers.

To add transient

1. Set the track's Edit Filter control to **Audio Transients**.

2. With the Freehand tool , click on a clip where you want to add a new transient marker.

See:

Using tools to perform common tasks

Control Bar overview

Much of your time in SONAR is spent recording and listening to your project as it develops. The Control Bar contains the most important tools and other pieces of information you will need to record, edit and play back your project.

The Control Bar consists of several modules that each contain various related controls. You can re-arrange and show/hide each individual module, which allows you to only show the functions you need most often. By default, the Control Bar is docked at the top of SONAR's screen, but can also be undocked or docked at the bottom.

Figure 149. *The Control Bar.*
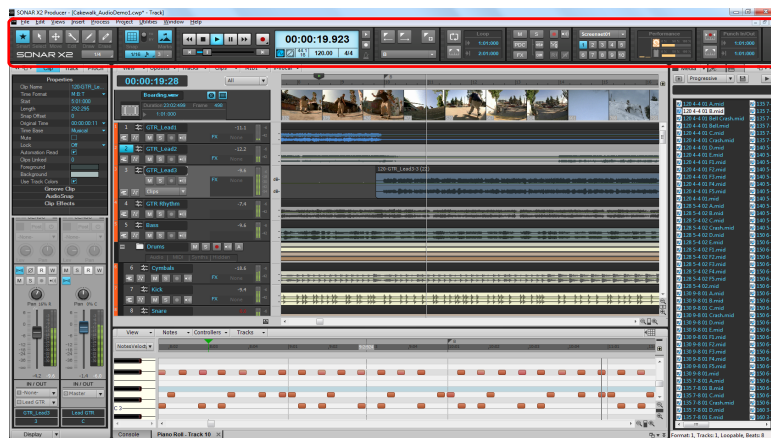
To show/hide the Control Bar

Do one of the following:

• On the **Views** menu, click **Control Bar**.

• Press C on your computer keyboard.

Control Bar modules

Figure 150. *Control Bar modules.*
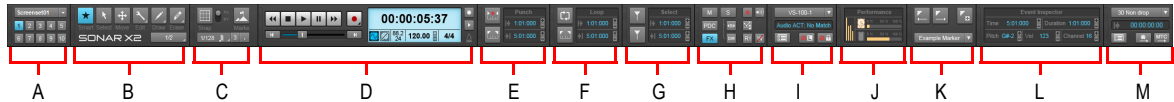
A. Screenset module B. Tools module C. Snap module D. Transport module E. Punch module F. Loop module
G. Select module H. Mix module I. ACT module J. Performance module K. Markers module L. Event
Inspector module M. Sync module

The Control Bar contains the following modules:

• **Tools module.**   The Tools module lets you select a global tool and draw resolution. For details, see "Tools module" on page 498.

• **Snap module.**   The Snap module lets you configure Snap to Grid settings. For details, see "Snap module" on page 502.

• **Transport module.**   The Transport section contains standard controls for Record, Return to Zero, Rewind, Stop, Play, and Fast Forward. For details, see "Transport module" on page 504.

• **Loop module.**   The Loop module lets you configure loop settings. For details, see "Loop module" on page 507.

• **Mix module.**   The Mix module lets you configure Mute, Solo, Arm for recording, effects bypass and automation playback/recording settings. For details, see "Mix module" on page 509.

• **ACT module.**   The ACT module lets you configure how control surfaces interact with effect and soft synth plug-ins. For details, see "ACT module" on page 511.

• **Screenset module.**   The Screenset module lets you save and recall screenset presets (window layouts). For details, see "Screenset module" on page 512.

• **Performance module.**   The Performance module lets you monitor CPU, disk and memory activity. For details, see "Performance module" on page 514.

• **Punch module.**   The Punch module lets you configure punch record settings. For details, see "Punch module" on page 516.

• **Select module.**   The Select module lets you configure selection settings. For details, see "Select module" on page 517.

• **Markers module.**   The Markers module lets you navigate by markers. For details, see "Markers module" on page 518.

• **Event Inspector module.**   The Event Inspector module lets you modify selected clips and

events. For details, see "Event Inspector module" on page 519.

- **Sync module.**   The Sync module lets you configure synchronization settings. For details, see "Sync Module" on page 520.

To show/hide modules

Do *one* of the following:

- **To show/hide a specific module.**   Right-click the Control Bar and select **<name> module**.
- **To hide a module.**   Right-click the module and select **Hide Module**.
- **To show all modules.**   Right-click the Control Bar and select **Show All**.

Note: *Depending on the video resolution, your computer monitor may not be wide enough to display all Control Bar modules simultaneously. When you show a new module, other visible modules get pushed to the right. If the right most module can not fit on screen, it will automatically be hidden. Hidden modules have a "Offscreen" suffix in the Control Bar context menu.*

To re-arrange modules

Drag a module's gripper to the desired location within the Control Bar.

Figure 151.   *Drag a module's gripper to move the module.*
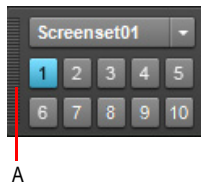
A. Gripper

To dock/undock the Control Bar

Right-click the Control Bar and select one of the following commands:

- **Dock Control Bar at Top.**   Select this option to dock the Control Bar above the Track view.
- **Dock Control Bar at Bottom.**   Select this option to dock the Control Bar below the Track view.
- **Undock Control Bar.**   Select this option to undock the Control Bar.

Tip: *You can click any blank area in the Control Bar and drag the Control Bar to the desired position.*

See:

Tools module

The Tools module contains various tools that allow you to edit content in your projects. The current tool applies to whichever editing view has focus.

Using menu buttons

Several buttons in the Tools module display a small triangle in the bottom right corner. The triangle indicates that you can click and keep the mouse button pressed for a brief moment to access additional tools or options. You can also right-click the button and choose an option on the pop-up menu.

Figure 152. *If a button displays a small triangle in the bottom right corner, click and keep the mouse button pressed to access additional tools or options.*

To show/hide the Tools module

Right-click the Control Bar and select **Tools Module**.

Figure 153. *Global tools are accessed from the Tools module in the Control Bar.*

A. Smart tool B. Select tool C. Move tool D. Edit tools (Edit/Timing/Split) E. Draw tools (Freehand/Line/Sine/ Triangle/Square/Saw/Random) F. Erase tools (Erase/Mute) G. Draw resolution

The Tools module contains the following controls:

• **Smart tool** ⬚.   The Smart tool is the default tool in SONAR. The Smart tool is a multi-function tool that combines functions from several other tools. For audio clips, automation and transients, the Smart Tool is a combination of the Edit, Select and Move tools. For MIDI notes, the Smart Tool is a combination of the Edit, Select, Move, Draw and Erase Tools. The function is determined by where you click. For details, see "Smart tool" on page 422.

• **Select tool** ⬚.   The Select tool lets you select data. You can select a time range, or select entire clips, MIDI notes, envelope nodes and transients. For details, see "Select tool" on page 429.

• **Move tool** ⬚.   The Move tool lets you move selected data. You can move entire clips, partial clips, MIDI notes, envelope nodes, transient markers and clip tempo map markers. For details, see "Move tool" on page 433.

• **Edit tool** ⬚.   The Edit tool lets you adjust data. You can slip-edit clips, adjust note start/end times, adjust fades, raise/lower clip volume envelope, and raise/lower note velocity and automation envelopes. For details, see "Edit tool" on page 437.

• **Timing tool** ⬚.   Select the Timing tool. The Timing tool lets you slip-stretch audio clips, drag-quantize MIDI notes, and stretch audio using transient markers. For details, see "Timing tool" on page 442.

- **Split tool** [icon]**.**   The Split tool lets you split clips, cut clips, split MIDI notes, split clips at transients, and add envelope nodes. For details, see "Split tool" on page 445.

- **Freehand tool** [icon]**.**   The Freehand tool lets you draw MIDI notes and freehand automation envelopes. You can also create and promote transient markers. For details, see "Freehand tool" on page 448.

- **Line Draw** [icon]**.**   The Line tool lets you draw straight automation envelopes and "paint" MIDI notes. For details, see "Line tool" on page 451.

- **Sine tool** [icon]**.**   The Sine Pattern tool lets you edit automation envelopes by drawing sine shapes. For details, see "Sine tool" on page 454.

- **Triangle tool** [icon]**.**   The Triangle Pattern tool lets you edit automation envelopes by drawing triangle shapes. For details, see "Triangle tool" on page 454.

- **Square tool** [icon]**.**   The Square Pattern tool lets you edit automation envelopes by drawing square shapes. For details, see "Square tool" on page 454.

- **Saw tool** [icon]**.**   The Saw Pattern tool lets you edit automation envelopes by drawing triangle shapes. For details, see "Saw tool" on page 454.

- **Random tool** [icon]**.**   The Random Pattern tool lets you edit automation envelopes by drawing random shapes. For details, see "Random tool" on page 454.

- **Erase tool** [icon]**.**   The Erase tool lets you delete clips, partial clips, MIDI notes, automation envelope nodes, and transient markers. For details, see "Erase tool" on page 456.

- **Mute tool** [icon]**.**   The Mute tool lets you mute clips, mute partial clips, mute MIDI notes, and disable transient markers. For details, see "Mute tool" on page 460.

- **Note value.**   The note duration that is used when drawing new Note events with the Smart tool or Freehand tool. Click the button and keep the mouse button pressed for a brief moment to access the note value menu. For details, see "Specifying note durations" on page 468.

[icon] **Tip:** *You can quickly access the various tools from the Tools HUD by pressing T on your computer keyboard.*

See:

"Tools" on page 407

"Nudge" on page 350

See also:

Snap module

SONAR lets you define a snap grid that makes it easier to arrange clips and note events, select time ranges, and control envelope shape drawing. To use the snap grid, enable the **Snap to Grid** button

⊞ in the Snap module and set the grid resolution to an interval of musical time, such as a whole note, half note, or quarter note; a unit of absolute time: a number of frames, seconds or samples; an event; the start or end of a clip; a marker; or audio transients. The grid can use multiple resolutions at the same time, such as a whole note, and audio transients. When the **Snap to Grid** button is enabled, if you move or paste clips or markers, items will be snapped to the nearest point on the snap grid.

Figure 154. *Snap to Grid settings are available in the Snap module in the Control Bar.*
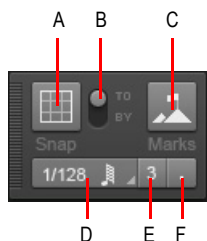
A. Snap on/off B. Snap To / Snap By C. Snap to landmarks D. Snap resolution (musical time or absolute time) E. Triplet F. Dotted

The Snap module contains the following settings:

- **Snap enable/disable** ⊞**.**   Enable/disable snapping. When enabled, vertical grid lines that correspond to the snap resolution are displayed in the Track view.

- **Time resolution.**   Snap to the selected musical or absolute time resolution. Click and hold the mouse button pressed to select a different duration from the pop-up menu. For absolute time resolutions (samples, frames, seconds), type the desired number of units. When **Smart Grid** is

  selected (the **Snap to Grid** button changes to 🔲), the snap resolution is dynamically determined by the horizontal zoom level, and the M:B:T time rulers in the Clips pane and Piano Roll view are optimized to show relevant snap locations.

  ℹ **Note 1:** *To exit Smart Grid mode, clear the **Smart Grid** check mark. If you manually select a new resolution while **Smart Grid** is enabled, the new settings only apply until the focused view's zoom level changes.*

  ℹ **Note 2:** *The Piano Roll view can use its own independent snap resolution. For details, see *

- **Triplet** ³**.**   Reduces the duration of the selected Musical time resolution by 2/3 of its original

duration. When Triplet is enabled, three note events fit in the space of two.

- **Dotted** . Increase the duration of the selected Musical time resolution by half of its original value (150%).
- **Snap To.** Align data *to* the snap grid.
- **Snap By.** Move data *by* the grid resolution.

- **Landmark Events** . Snap to the selected landmarks, including markers, Now Time, clips, audio transients, MIDI notes, and automation envelope nodes. To select the desired landmarks, right-click the **Snap to Grid** button to open the **Preferences** dialog, then select the desired check boxes in the **Landmarks** section. SONAR will snap to landmarks on tracks/lanes that are currently visible in the Clips pane.

Additional Snap to Grid settings

To access additional snap settings, go to **Edit > Preferences > Customization - Snap to Grid** (or right-click the **Snap to Grid** button).

The **Snap** section contains the following settings:

- **Snap Intensity.** Specify the magnetic strength when snapping, which determines how quickly moved events are pulled towards the snap grid.
- **Magnetic Test.** Drag the event to test the current Snap Intensity setting.
- **Snap to Nearest Audio Zero Crossings.** Automatically snap edited audio clips to the nearest zero crossing of the waveform (the point at which there is no volume) to minimize glitches that can happen when waveforms are spliced together.
- **Landmarks.** Snap to the selected landmarks when the **Events** button is enabled in the Control Bar's Snap module:
  - **Markers.** Snap to any marker.
  - **Now Time.** Snap to the current Now Time.
  - **Clips.** Snap to the start or end of any clip.
  - **Audio Transients.** Snap to transient markers in audio clips.
  - **MIDI Notes.** Snap to note events in MIDI clips.
  - **Automation Nodes.** Snap to automation envelope nodes.

See:

See also:

Transport module

The Transport module lets you control the transport and transport-related functions, such as Record
⬤, Return to Zero ⏮, Rewind ⏪, Stop ⏹, Play ▶, and Fast Forward ⏩.

To show/hide the Transport module

Right-click the Control Bar and select **Transport Module**.

Figure 155. *The Transport module.*
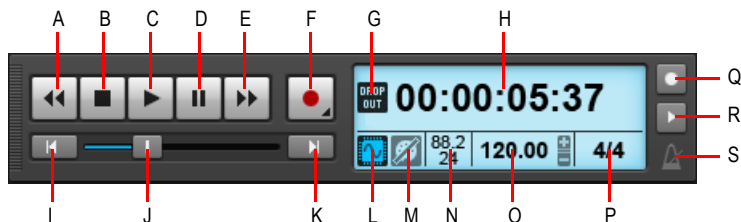
*A. Rewind B. Stop C. Play D. Pause E. Fast Forward F. Record G. Dropout indicator H. Current Now time
(this space is also used for progress bars and "Waiting for sync" messages) I. Return to zero (RTZ) J. Position
K. Jump to project end L. Audio Engine on/off M. Reset/Panic N. Sample rate and bit depth O. Tempo
P. Meter Q. Metronome during record R. Metronome during playback S. Click to open metronome settings*

The Transport module contains the following controls:

• **Rewind** ⏪. Gradually rewind the project.

• **Stop** ⏹. Stop playback.

- **Play** ▶. Start/stop playback.

- **Pause** ⏸. Pause/resume playback.

- **Fast Forward** ⏩. Gradually fast forward the project.

- **Record** ⏺. Start recording (requires at least one track to be armed for recording). Right-click to access global record options. Click and keep the mouse button pressed for a brief moment to enable step recording.

- **Step Record.** Open the Step Record window. For details, see "Step recording" on page 291.

- **RTZ** ⏮. Rewind to the start of the project.

- **Progress Bar** ⏸. Current position in the project. Drag to skip around in the project.

- **Go to End** ⏭. Skip to the end of the project.

- **Time Display.** The time display section shows useful information about the current project, including the Now time, sample rate and bit depth, tempo and meter. The following information is shown:

  - **Current Now Time.** The Now time shows your current location in the project. For details, see "The Now time and how to use it" on page 178. Click the time display to toggle between the following time formats:

    - **MBT.** Display time as Measure:Beat:Tick.

    - **HMSF.** Display time as Hour:Minute:Second:Frame. This format is also referred to as SMPTE time.

    - **Milliseconds.** Display time in milliseconds.

    - **Samples.** Display time in samples.

  - **Dropout Indicator** 🔲. Appears whenever your project requires more resources than your CPU, main memory, and disk can supply. For details, see "Dropouts and other audio problems" on page 1197.

  - **Audio Engine on/off** 〽. Enable/disable the audio engine. The **Audio Engine** button lights up if the audio engine stops running. To restart the audio engine, click the **Audio Engine** button.

  - **Reset / Panic (Reset MIDI and Audio)** 🖊. Reset any stuck MIDI notes. The **Reset** button flashes if a MIDI note is stuck.

  - **Sample Rate / Bit Depth.** The project's sample rate and recording bit depth.

  - **Current Tempo.** The current tempo at the Now time. Double-click to change the current tempo.

  - **Current Meter.** The number of beats per measure and the note value of each beat at the current Now time. Click to change the meter. For details, see "Setting the Meter and Key

Control Bar overview

The Time Display section also shows the following information:

• Horizontal progress bar when SONAR is performing certain operations.

• "Waiting for Sync" message when synchronizing SONAR to an external clock source. When synchronized to an external clock source, the Time Display shows both the current Now time and the SMPTE source time.

Figure 156. *The display shows the current Now time, a progress bar or "Waiting for sync" message.*
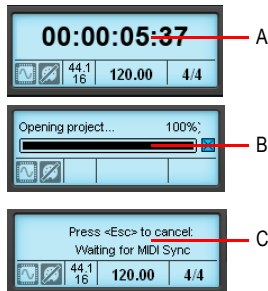
A. Now time B. Progress bar C. "Waiting for sync" message

• **Metronome Record on/off** [icon]. Enable/disable the metronome during recording. Right-click to access Metronome settings.

• **Metronome Playback on/off** [icon]. Enable/disable the metronome during playback. Right-click to access Metronome settings.

• **Metronome settings** [icon]. Click the metronome icon to open the metronome preferences.

See:

See also:

Loop module

The Loop module lets you control loop settings.

To show/hide the Loop module

Right-click the Control Bar and select **Loop Module**.

Figure 157. *The Loop module.*

A. Loop On/Off B. Set Loop Time to Select C. Loop Start Time D. Loop End Time

The Loop module contains the following controls:

- **Loop on/off** .   Enable/disable playback looping.

- **Set Loop Times to Selection** .   Set the Loop Start time to the start (From) time of the selection, and the Loop End time to the end (Thru) time of the selection.
- **Loop Start Time.**   The current Loop Start time. Click to modify.

- **Loop End Time.** The current Loop End time. Click to modify.

💡 **Tip:** *If a numeric time field has focus, you can press the G key to access a list of marker positions.*

See:

See also:

Mix module

The Mix module lets you configure various playback settings. You can quickly mute/unmute, solo/unsolo and arm/disarm all tracks. You can also configure automation settings and specify the solo behavior.

To show/hide the Mix module

Right-click the Control Bar and select **Mix Module**.

Figure 158. *The Mix module.*

A. Mute B. Solo C. Arm D. Input Echo E. Live Input PDC Override F. Bypass All Effects G. Exclusive Solo
H. Dim Solo I. Automation Read (playback) J. Automation Write (recording) K. Offset mode

The Mix module contains the following controls:

- **Mute / Unmute All Tracks** [M].   Click to mute/unmute all tracks. The button is lit if at least one track is muted.

- **Solo / Unsolo All Tracks** [S].   Click to solo/unsolo all tracks. The button is lit if at least one track is soloed.

  - **Dim Solo enable/disable** [DIM].   Enable/disable Dim Solo mode. Dim Solo is a mode in which non-soloed audio tracks/buses are still audible but at a reduced level. For details, see "Dim Solo mode" on page 200.

  - **Exclusive Solo enable/disable** [S].   Enable/disable Exclusive Solo mode. With Exclusive Solo mode, you can only solo one track and one bus at a time. For details, see "Exclusive Solo mode" on page 201.

- **Arm / Disarm All Tracks** [●].   Click to arm/disarm all tracks. The button is lit if at least one track is armed.

- **Input Echo On/Off All Tracks** [●)].   Enable/disable Input Monitoring on all tracks.

- **Bypass all Effects** [FX].   Bypass all effects globally. For details, see "Bypassing effects globally" on page 869.

- **Live Input PDC Override** [PDC].   Enable/disable delay compensation on live tracks, thereby removing the latency during playback and recording of such tracks. Because it's a toggle, you can quickly turn it on to complete your tracking at low latency, and turn it off when finished to hear the

track compensated as normal. For details, see "Live Input PDC override" on page 282.

- **Allow Automation Writing** .   Globally enable/disable the ability to write automation.

- **Global Automation Playback** .   Globally enable/disable all automation playback.

- **Offset mode** .   Enable/disable Offset mode. In Offset mode, you "offset" the current automation in a track using a parameter's controls. For details, see "Envelope mode and Offset mode" on page 1031.

See:

See also:

ACT module

Active Controller Technology (ACT) allows you to use a control surface or MIDI controller to control the plug-in effect or soft synth that has focus. SONAR communicates with control surfaces via special control surface plug-ins (see "External devices" on page 1211). The ACT module lets you configure ACT settings for a specific control surface plug-in.

To show/hide the ACT module

Right-click the Control Bar and select **ACT Module**.

Figure 159. *The ACT module.*

A. Controller/surface name B. Status display C. Open property page D. ACT Learn E. ACT Lock

The ACT module contains the following controls:

- **Controller / Surface Name.**   Select the control surface plug-in to control.

- **Controller / Surface Status Display.**   Status display for the selected control surface plug-in.

- **Open Control Surface Plug-in 🔲.**   Open the property page for the selected control surface plug-in.

- **ACT Learn 🔲.**   Enable/disable ACT Learn. ACT Learn allows you to assign a specific effect/ synth parameter to a specific hardware control on your control surface. For more information, see "To edit the default ACT mappings" on page 1235.

- **ACT Lock 🔲.**   Lock/unlock the current ACT context (the effect/synth that has focus). For more information, see "ACT" on page 1234.

See:
"ACT" on page 1234

See also:

Screenset module

A *screenset* is a snapshot of the current layout of various views and windows in a project, including which windows are open, their size, position, zoom level and whether they are docked or floating. You can create up to 10 screensets per project and freely switch between screensets at any time.

Screensets can be selected and edited from the Screenset module in the Control Bar, or with number keys 1-0 on your computer keyboard.

To show/hide the Screenset module

Right-click the Control Bar and select **Screenset Module**.

Figure 160. *The Screenset module.*

A. Screenset list B. Screenset buttons 1-10

The Screenset module in the Control Bar contains the following controls:

- **Screenset menu.**   The **Screenset** menu lets you select, revert, lock, rename, duplicate and import screensets. The name of the current screenset is shown in the menu. The menu contains the following commands:
  - **1 [screenset 1 name] - 0 [screenset 10 name].**   Select screenset 1 through 10.
  - **Revert Current Screenset.**   Revert the current screenset to its last saved state before the project was saved. See "To revert the current screenset to its last saved state" on page 1058.

- **Lock/Unlock Current Screenset.** Lock the current screenset to prevent any modifications. See "To prevent the current screenset from being modified" on page 1057.

- **Rename Current Screenset.** Rename the current screenset. See "To name or rename the current screenset" on page 1057.

- **Duplicate Current Screenset to.** Copy the current screenset to another screenset location (1 to 0). Select the target screenset location from the submenu. The selected target screenset becomes the current screenset. See "To duplicate the current screenset" on page 1057.

  - **1 [screenset 1 name] - 0 [screenset 10 name].** Duplicate the current screenset to screenset 1 through 10.

- **Import Screensets from <source file name>.cwp.** Import screensets from another open project. Any locked screensets in the current project are not overwritten. See "To import screensets from another project" on page 1057.

- **1-10 buttons** 1 - 10 . Select screensets 1 through 10. You can also press the 1-0 keys on the computer keyboard to select screensets 1 through 10. The active screenset button is highlighted.

See:

"Screensets" on page 1054

See also:

"Tools module" on page 498

"Snap module" on page 502

"Transport module" on page 504

"Loop module" on page 507

"Mix module" on page 509

"ACT module" on page 511

"Performance module" on page 514

"Punch module" on page 516

"Select module" on page 517

"Markers module" on page 518

"Event Inspector module" on page 519

"Sync Module" on page 520

Performance module

The Performance module lets you monitor your computer's performance, including CPU, disk and memory activity.

To show/hide the Performance module

Right-click the Control Bar and select **Performance Module**.

Figure 161. *The Performance module.*

A. CPU meters (one per core) B. Disk Activity indicator C. Disk Space meter D. Memory Usage meter

The Performance module contains the following controls:

• **CPU meters.** Displays the time it takes to process a buffer full of audio data as a percentage of the maximum time available to process that data and maintain uninterrupted playback. There is one CPU meter for each core in your computer, up to 32 cores. There is some tolerance built into the meter, so it is possible that it will exceed 100% at times (more so during recording than playback).

Note: *The width of the Performance module depends on the number of CPU cores available.*

32 cores

4 cores

• **Disk Activity indicator** . Measures how much of the available time SONAR is using to perform input/output functions on your hard disk. The size of your setup's I/O buffer size (listed under **File System** in **Edit > Preferences > Audio - Sync and Caching**) determines how much time is allowed to perform disk operations and maintain uninterrupted playback. When SONAR performs disk operations, the Disk Activity indicator changes color from yellow to red to indicate the time SONAR is taking to complete each cycle of disk input/output. A red icon indicates very high data activity.

• **Disk Space meter.** Shows the amount of available space on the drive where your wave data directory is located. The tooltip shows the actual remaining disk space on your audio disk.

• **Memory Usage (RAM) meter.** Shows the total memory (RAM) usage by your computer, not just

by SONAR.

Note: *If you experience a dropout or your CPU or Disk meters are reading high, there are steps you can take to improve your audio performance. For more information, see "Audio dropouts or crashes during playback" on page 1256.*

See:

"CPU meter/Disk meter/Dropout indicator" on page 1194

"Improving audio performance" on page 1181

"Getting the most out of your computer" on page 1189

"Reduce GUI updates to improve playback performance" on page 1196

"Improving recording performance" on page 1206

See also:

"Tools module" on page 498

"Snap module" on page 502

"Transport module" on page 504

"Loop module" on page 507

"Mix module" on page 509

"ACT module" on page 511

"Screenset module" on page 512

"Punch module" on page 516

"Select module" on page 517

"Markers module" on page 518

"Event Inspector module" on page 519

"Sync Module" on page 520

Punch module

The Punch module lets you control auto-punch settings.

To show/hide the Punch module

Right-click the Control Bar and select **Punch module**.

Figure 162. *The Punch module.*

A. Auto-Punch On/Off B. Set Punch Time to Select C. Punch In Time D. Punch Out Time

The Punch module contains the following controls:

- **Auto-Punch on/off** .   Enable/disable punch recording. Toggles punch recording on/off.

- **Set Punch Time to Selection** .   Set the Punch In time to the start (From) time of the selection, and the Punch Out time to the end (Thru) time of the selection.

- **Punch In Time.**   The current Punch In time. Click to modify.

- **Punch Out Time.**   The current Punch Out time. Click to modify.

> **Tip:** *If a numeric time field has focus, you can press G to access a list of marker positions.*

See:

See also:

Select module

The Select module lets you control the selection From and Thru times.

To show/hide the Select module

Right-click the Control Bar and select **Select module**.

Figure 163. *The Select module.*
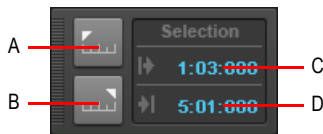
A. Set Select From = Now B. Set Select Thru = Now C. Select From Time D. Select Thru Time

The Select module contains the following controls:

- **Set Selection From = Now** . Specify the Now time as the time from which a selection extends.

- **Set Selection Thru = Now** . Specify the Now time as the time through which a selection extends.

- **Select From Time.** The current From time. Click to modify.

- **Select Thru Time.** The current Thru time. Click to modify.

Tip: *If a numeric time field has focus, you can press G to access a list of marker positions.*

See:

See also:

Markers module

The Markers module lets you navigate by markers and insert new markers.

To show/hide the Markers module

Right-click the Control Bar and select **Markers Module**.

Figure 164. *The Markers module.*
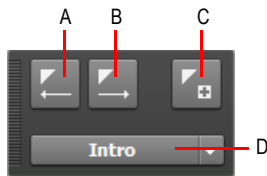
A. Jump to previous marker B. Jump to next marker C. Insert marker D. Current marker

The Markers module contains the following controls:

- **Previous Marker** . Jump to the previous marker.

- **Next Marker** . Jump to the next marker.

- **Insert Marker** . Insert a new marker.
- **Current Marker Display.** This list shows the current marker and lets you instantly jump to any marker in the project.

See:

See also:

Event Inspector module

The Event Inspector module lets you view and modify settings for selected clips and MIDI Note events. If you select multiple notes, the **Event Inspector** module displays the note value if all selected note values are the same. If the note values are different, the Event Inspector does not display anything.

To show/hide the Event Inspector module

Right-click the Control Bar and select **Event Inspector Module**.

Figure 165. *The Event Inspector module.*
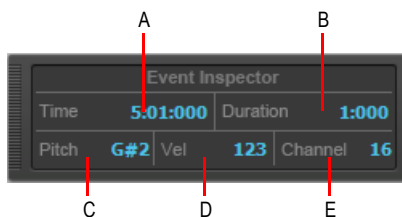
A. Time B. Duration C. Pitch D. Velocity E. Channel

The Event Inspector module contains the following controls:

- **Time.**   Start time of the selected event(s), specified as a valid M:B:T time value. Separate values with a colon or a space. For example, measure 2, Beat 3, Tick 720 would be written as 2:3:720.
- **Duration.**   Duration of the selected event(s), specified as a PPQ value. You can also specify a percentage of the current duration value. For example, to double the duration, type **200%** and press ENTER.
- **Pitch.**   Pitch of the selected event(s), specified as note names (C0 through G10) or note numbers (0 through 127). You can also use a modifier to raise or lower the value by a number of half-steps. To raise the pitch by 2 half-steps, type **+2** and press ENTER. To lower the pitch by 2 half-steps, type **-2** and press ENTER.
- **Vel.**   Velocity value of the selected event(s), specified as a value between 0 and 127. You can also use a modifier to raise or lower the current velocity value (+/- 0 through 127). You can also specify a percentage of the current velocity value. For example, to double the velocity, type **200%** and press ENTER.
- **Channel.**   MIDI channel assigned to the selected events, specified as a value between 1 through 16.

See also:

Sync Module

The Sync module lets you configure synchronization settings.

To show/hide the Sync module

Right-click the Control Bar and select **Sync Module**.

Figure 166. *The Sync module.*

A. SMPTE/MTC format B. Incoming timecode C. Sync type D. Transmit MIDI Sync E. Transmit MTC Sync

The Sync module contains the following controls:

- **SMPTE/MTC format.**   Select the time code format. The following frame rates are supported:

  - **23.976 frames per second (FPS).**   Typically used with H.264/MPEG-4 AVC video.

  - **24 frames per second (FPS).**   Used for theatrical film worldwide. Any film in North America or Japan uses this setting.

  - **25 FPS.**   Used for PAL/SECAM video and some film in countries that use 50 Hz wall electricity. This is the setting to use when synchronizing to any European video format.

  - **29.97 FPS Drop.**   NTSC broadcast and long format video in North America and Japan. This setting synchronizes the video perfectly with SONAR, but the sequencer position displayed in the Now Time and Big Time displays will gradually drift and become incorrect over long periods of time. The audio and MIDI synchronization to the external device will not be affected by this discrepancy.

  - **29.97 FPS Non Drop.**   NTSC non-broadcast and short length video in North America and Japan. Used for some music projects. This setting synchronizes the video perfectly with SONAR, but the sequencer position displayed in the Now Time and Big Time displays will gradually drift and become incorrect over long periods of time. The audio and MIDI synchronization to the external device will not be affected by this discrepancy.

  - **30 FPS Drop.**   Not a standard type of timecode, used rarely for speed correction and transfer problems in tape based systems.

  - **30 FPS Non Drop.**   Most music projects and some film in North America. This is the best choice for any music project and should be used unless the situation dictates otherwise.

- **Incoming timecode.**   Shows the current time of incoming time code when synchronizing to an external device.

- **Sync type.**   Select the sync type. The following sync types are supported:

  - **Internal Sync** 🏠.   Timing is determined by the clock on the computer motherboard.

  - **MIDI Sync** 🌐.   Timing is determined by the clock on an external MIDI device.

  - **SMPTE/MTC Sync** [SMPTE].   Timing is determined by a time code signal (in SMPTE or some other format) recorded on some external medium or generated and sent by SONAR.

  - **Audio Sync** 〰️.   Timing is determined by the clock on the computer's audio interface.

- **Transmit MIDI Sync** ⬛. Transmit MIDI Sync to external MIDI devices, such as drum machines, stand-alone MIDI hardware sequencers, and sequencers built into MIDI keyboards (only available when using the Internal or Audio clock). SONAR sends messages to all other devices to start and stop playback and to keep all the devices in sync. SONAR can send MIDI Sync on multiple MIDI output ports. For details, see "MIDI synchronization" on page 1158.

- **Transmit MTC Sync** ⬛. Transmit MIDI Time Code (MTC) to external devices that can receive MTC. SMPTE/MTC is a position and timing reference that indicates the current location in the project and how quickly the project should be playing. SMPTE/MTC time code labels the position in a project in hours, minutes, seconds, and frames. The speed of playback is indicated by a frame rate. SONAR can send MTC on multiple output ports simultaneously. For details, see "SMPTE/MIDI time code synchronization" on page 1162.

See:

See also:

Inspectors

When working on a project, you will frequently need to access track and clip parameters and mix controls. The Track Inspector and Properties Inspector provide easy access to relevant settings for the selected track(s) or clip(s).

Figure 167. *Use the Track Inspector and Properties Inspector to configure track and clip settings.*
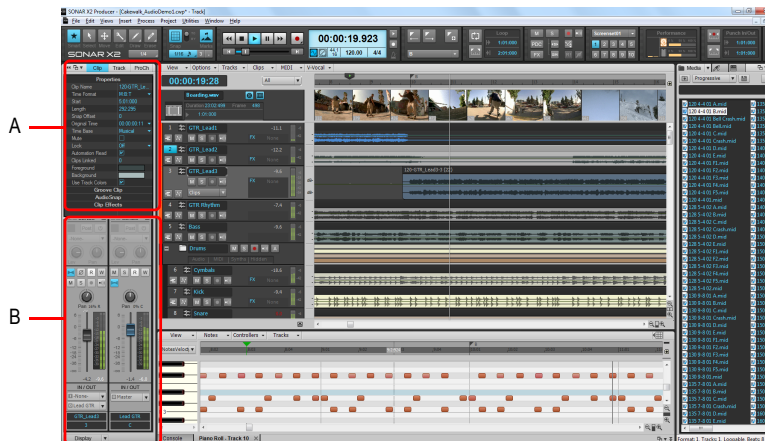
A. Properties Inspector B. Track Inspector

The Inspector pane appears to the left of the Track view, but can also be moved to the right side. There are three separate inspectors:

- **Track Inspector.** The Track Inspector shows mix settings for the *current* track, bus, or main, and is essentially identical to a channel strip in the Console view. Advanced MIDI settings are also available for MIDI tracks and Instrument tracks. For details, see "Track Inspector overview" on page 529.

- **Properties Inspector.** The Properties Inspector shows properties for the *selected* clip(s), track(s), or bus(es). For details, see "Properties Inspector overview" on page 544. The Properties Inspector has several modes:

- **Clip.**   The Clip Properties Inspector displays settings for the currently selected clip(s). For details, see "Properties Inspector - Clip Properties" on page 546.
- **Track.**   The Track Properties Inspector lets you type a track name, specify the automation write mode and time base, specify an audio track's AudioSnap render modes, specify the default clip colors, and enter a text description. For details, see "Properties Inspector - Track Properties" on page 553.
- **Bus.**   The Bus Properties Inspector lets you type a bus name, specify the automation write mode and time base, and enter a text description. For details, see "Properties Inspector - Bus Properties" on page 556.

Note: *Settings in the inspectors are non-destructive, and therefore do not destructively process data in any way. Feel free to experiment with different settings without worrying that changes are permanent.*

- **ProChannel (Producer only).**   ProChannel combines compression, equalization, and tube saturation modeling in one convenient processor. ProChannel is available on each audio track, Instrument track and bus. For details, see "ProChannel (Producer only)" on page 963.

Note: *Due to technical limitations of the VST plug-in format, it is not possible to show more than one instance of a ProChannel module. As a result, the same ProChannel instance can not be displayed in the Inspector and Console view at the same time. If you open ProChannel in the Inspector, the same ProChannel will close in the Console view, and vice versa.*

Figure 168. *The Track Inspector extends the full height of the Inspector pane, while the Properties Inspector is shown in the top half when visible.*

*A. Dock/undock Inspector **B.** Show/hide Clip Properties Inspector **C.** Show/hide Track Properties Inspector **D.** Show/hide ProChannel **E.** Display area for Properties Inspector **F.** Display area for Track Inspectors **G.** Show/hide/configure Track Inspector modules **H.** Section header bars (click to show controls) **I.** Show audio output or MIDI settings (Instrument tracks only)*

Inspectors

To show/hide the Inspector pane

Do *one* of the following:

- On the **Views** menu, click **Inspector**.
- Press I on your computer keyboard.
- Click the **Docking Options** button in the top right corner of the Inspector pane and select **Collapse**.

To expand/collapse the Inspector pane

When the Inspector is docked, do *one* of the following:

- Click the **Expand/Collapse** button at the top of the Inspector pane.
- Press I on your computer keyboard.

Figure 169. *Use the **Expand/collapse** button to expand/collapse the Inspector.*

Expanded   **Collapsed**
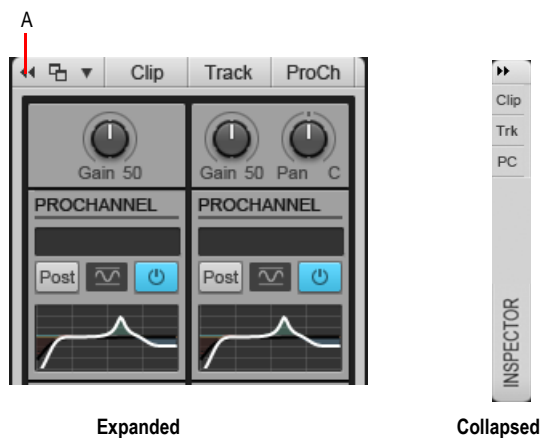
A. Expand/Collapse

To dock/undock the Inspector

Do *one* of the following:

- **To dock the Inspector on the right side.**   Click the **Docking Options** button and select **Dock Right**.

- **To dock the Inspector on the left side.**   Click the **Docking Options** button and select **Dock Left**.

- **To undock the Inspector.**   Click the **Docking Options** button and select **Undock**, or click to the left of the **Dock/Undock** button and drag the Inspector to the desired location.

> **Tip:** *You can click any blank space at the top of the Inspector pane and drag the Inspector to the desired position.*

Figure 170. *Use the **Dock/Undock** and **Docking Options** controls to change the position of the Inspector.*

*A. Dock/Undock **B.** Docking Options*

To enter values in inspectors

Do *one* of the following:

- Type a value in the text box and press ENTER.
- Drag the slider or use the mouse wheel.
- Select/clear the check box.
- Click the arrow buttons in the inspector to increase or decrease the value.
- Click the text box and then use the UP ARROW and DOWN ARROW keys to increase or decrease the value.
- Select a value from the drop-down menu associated with the text box.

Inspectors

To edit multiple tracks/clips simultaneously

You can use the Track Properties and Clip Properties inspectors to modify multiple selected tracks or clips simultaneously. The following rules apply when modifying multiple tracks/clips:

- If the selected tracks or clips share the same value for a parameter, that parameter will display normally.
- If the selected tracks or clips have different values for a parameter, that parameter will display as **(Multi)**.
- If the selected Tracks or Clips are of a different type and it would not be appropriate or possible to modify a parameter, that parameter will be unavailable.

See:

Track Inspector overview

The Track Inspector provides mixing controls for the currently selected audio track, MIDI track, Instrument track, bus or main. The Track Inspector is essentially identical to a channel strip in the Console view. Any changes you make in the Track Inspector are reflected in the corresponding Console view channel strip, and vice versa. The Track Inspector modules can be shown/hidden independently from the corresponding Console view modules.

The Track Inspector is divided in two. The left strip shows mix controls for the current track/bus/main. The right strip varies depending on the current track type, as shown in the following table.

Current track type	Left strip	Right strip
Audio	Selected audio track	Output of selected track or send
MIDI	Selected MIDI track	Arpeggiator, Input Quantize, Snap to Scale settings, MIDI chorus, MIDI reverb, Bank Select Method, Key+ and Time+ for selected MIDI track
Instrument	Selected Instrument track	**Audio** tab: Output of selected track or send **MIDI** tab: Arpeggiator, Input Quantize and Snap to Scale settings for selected Instrument track
Bus	Selected bus	Output of selected bus or send
Main	Selected main	Blank

Table 111. *Track inspector controls*

Showing both the current track and its output destination side-by-side makes it fast and easy to configure the desired audio routing.

Figure 171. *The content displayed in the Track Inspector depends on the current track type.*

Audio track	MIDI track and Instrument track (MIDI tab)	Instrument track (Audio tab)	Bus	Main
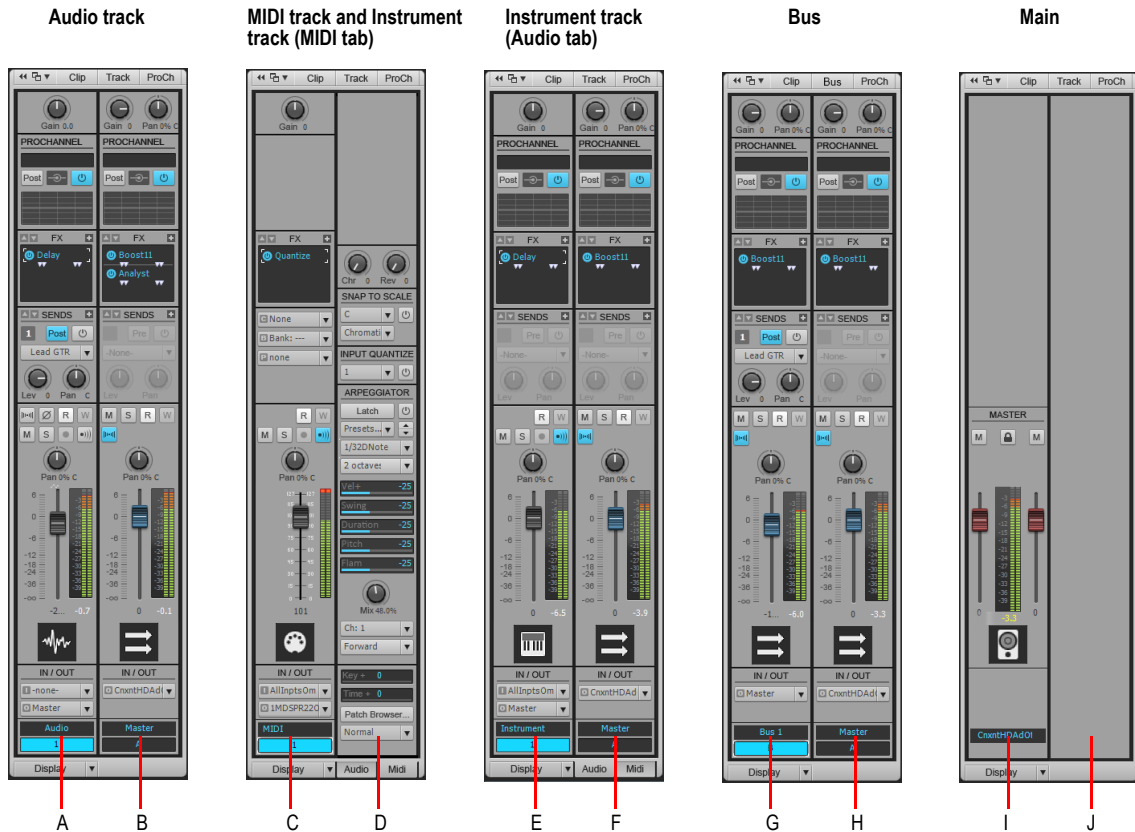
A. Current audio track B. Output of current audio track C. Current MIDI track or Instrument track D. Advanced MIDI settings for current MIDI track or Instrument track (MIDI tab) E. Current Instrument track F. Output of current Instrument track (Audio tab) G. Selected bus H. Output of selected bus I. Selected main J. The right strip is blank when showing mains

Note: *When the current track is an Instrument track, you can show either audio output controls or advanced MIDI settings in the right strip by selecting the **Audio** tab or **MIDI** tab at the bottom of the Track Inspector.*

Track Inspector overview

To show a track/bus/main in the Track Inspector

Do *one* of the following:

- Click the desired track, bus or main in the Track view or Console view.
- Click the Track Name control in the Track Inspector to select any available track, bus or main.

To lock the Track Inspector to a specific track or bus

Be default, the Track Inspector dynamically updates to show the current track. However, you can choose to always show a specific track or bus regardless of which track is current.

1. Click the track or bus you want to show in the Track Inspector.
2. Click the Track Name control in the Track Inspector and select **Lock the current track or bus** from the drop-down menu.

   To unlock the track or bus, select **Lock the current track or bus** from the menu again.

See:

Track Inspector controls

The controls in the Track Inspector vary depending on the current track type.

Control	Description	Audio track	MIDI track	Instrument track	Bus	Main
Clip	Show/hide the Clip Properties Inspector.	--	--	--	--	--
Track	Show/hide the Track Properties Inspector.	--	--	--	--	--
Dock/Undock	Dock/undock the Inspector pane.	--	--	--	--	--
Docking Options	The **Docking Options** menu lets you dock/undock/float/collapse the Inspector pane.	--	--	--	--	--
Gain	Pre-fader input gain for fine tuning a track's volume or input level to a bus.	x			x	
Velocity offset	The change in velocity (volume) that will be applied to notes in the track on playback; ranges from –127 to +127.		x	x		
Input pan	Sets the pan of the audio data sent to the bus.				x	
ProChannel (Producer only)	ProChannel is an extended channel strip that provides high-quality Compressor, Equalizer, and Tube saturation processing for each channel. See "ProChannel (Producer only)" on page 963.	x		x	x	
Effects bin	The patch point for a track's plug-ins or soft synths.	x	x	x	x	
Send Enable	Activates a send module, which sends a copy of the track signal to a bus.	x		x	x	
Send Level	Controls volume of audio data sent by the send module.	x		x	x	
Send Pan	Adjusts the send pan setting.	x		x	x	
Send Pre/Post switch	Pre (pre-fader) means that the Send signal goes to the bus prior to the track's volume fader; post means the Send signal goes to the bus after the volume fader.	x		x	x	
Send destination	Displays name of bus that the Send is sending data to.	x		x	x	
Channel	The MIDI channel through which the notes will be played.		x	x		
Bank	The set of patch names available for the track.		x	x		

Table 112. *Track Inspector controls*

Track Inspector overview

Control	Description	Audio track	MIDI track	Instrument track	Bus	Main
Patch	The instrument sound that will be used for playback.		x	x		
Phase Invert	A switch that inverts the phase of the track.	x				
Mono/Stereo	A switch that determines whether a track's signal enters an effect or chain of effects as mono or stereo, regardless of the nature of the track.	x			x	
Read Automation	Enable/disable automation playback.	x	x	x	x	
Write Automation	Enable/disable automation writing.	x	x	x	x	
Mute	When enabled, mutes the track.	x	x	x	x	x
Solo	When enabled, solos the track.	x	x	x	x	
Arm for recording	When enabled, arms the track for audio recording.	x	x	x		
Input echo	Turns input monitoring on or off.	x	x	x		
Waveform Preview	Display the waveform of the audio that's flowing through the bus.				x	
Pan	The stereo distribution of the output, ranging from 100% left (hard left) to 100% right (hard right); a value of "C" indicates sound that is centered left-to-right. On stereo tracks, pan acts as balance.	x	x	x	x	
Volume	The current volume level for the track, ranging from -INF (silent) to +6 dB (maximum volume). The recording and playback levels are displayed in the Playback and Record meters.	x	x	x	x	x
Meter	The recording and playback levels are displayed in the Playback and Record meters. For MIDI tracks, the meter shows MIDI activity and velocity.	x	x	x	x	x
Track icon	Track icons allow you to quickly identify a track's contents by instrument. You can assign a new track icon, create your own track icons, and save an icon as part of a track template.	x	x	x	x	x
Track number	A sequential track number used for reference.	x	x	x	x	

Table 112. *Track Inspector controls (Continued)*

Control	Description	Audio track	MIDI track	Instrument track	Bus	Main
Track name	A name that you assign the track for easy reference. Note that if you do not assign a name to a track, the default name is the track number. This track number will change if you change the order of your tracks. You can click the Track Name control to select any available track, bus or main to display in the Track Inspector.	x	x	x	x	x
Input	The input source for the track, used in recording.	x	x			
Output	The output bus through which the track is played.	x	x	x	x	
Link	Main out faders can be linked using the **Link** button 🔒. This allows you to adjust both the left and right channel at the same time.					x
Chorus	Adds MIDI chorus effect to the track.	x	x			
Reverb	Adds MIDI reverb effect to the track.	x	x			
Bank Select Method	The Bank Select Method used by your sound module to switch back and forth between banks of sounds. See "Assigning the Bank Select method" on page 1127.	x	x			
Patch Browser	Opens the "Patch Browser dialog" on page 1644 dialog box, which lets you search for patches by name.	x	x			
Key+	The number of half steps by which the notes in the track are transposed on playback (e.g., 12 to transpose up one octave)					
Time+	An offset applied to the start time of the events in the track.	x	x			
Arpeggiator	The Arpeggiator lets you play intricate patterns of notes that would otherwise be extremely difficult or impossible to play manually and at speeds and octave ranges that exist beyond the physical limitations of the player or keyboard range. See "Arpeggiator section" on page 541.	x	x			

Table 112. *Track Inspector controls (Continued)*

Track Inspector overview

Control	Description	Audio track	MIDI track	Instrument track	Bus	Main
Input quantize	Input quantizing allows you to automatically quantize MIDI input during recording. See "Input Quantize section" on page 540.		x	x		
Snap to scale	When Snap to Scale is enabled, any notes that you draw or move in the Piano Roll view stay within the selected scale. See "Snap to Scale section" on page 540.		x	x		
Display	The **Display** menu lets you show/hide modules in the Track Inspector.	x	x	x	x	x
Module Options	The **Module Options** menu lets you configure settings for various modules.	x	x	x	x	x
Audio tab	Show audio output controls in the right side strip.			x		
MIDI tab	Show advanced MIDI controls in the right side strip.			x		

Table 112. *Track Inspector controls (Continued)*

See also:

"Audio track controls" on page 536

"Bus controls" on page 537

"MIDI track and Instrument track controls" on page 538

"Main controls" on page 543

Audio track controls

Figure 172. *Track Inspector controls for audio tracks.*
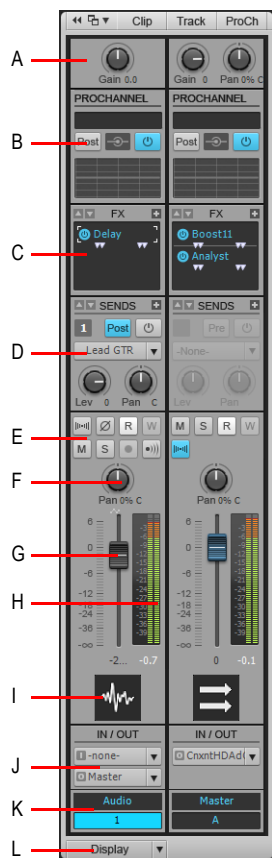
A. Input gain B. ProChannel (Producer only) C. Effects bin D. Sends E. Mute, Solo, Arm, Input Echo, Phase Invert, Stereo Interleave, Read Automation, Write Automation F. Pan G. Volume H. Meter I. Track icon J. Input and output K. Track name and number L. Display menu

See also:

Bus controls

Figure 173. *Track Inspector controls for buses.*
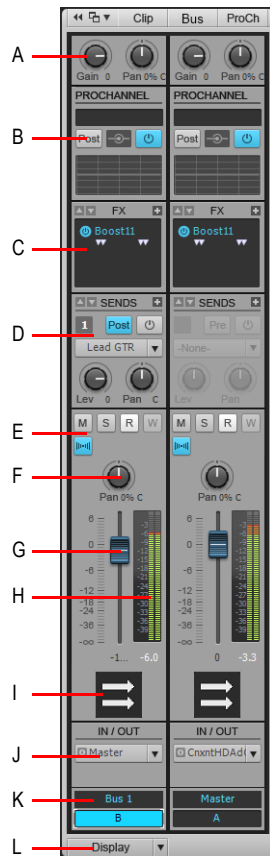
A. Input gain and pan B. ProChannel (Producer only) C. Effects bin D. Sends E. Mute, Solo, Waveform preview, Read Automation, Write Automation F. Pan G. Volume H. Meter I. Bus Icon J. Output K. Bus name L. Display menu

See also:

MIDI track and Instrument track controls

When the current track is a MIDI track, the left strip shows mix controls and the right strip shows Snap to Scale, Input Quantize, Arpeggiator and other advanced MIDI settings. Instrument tracks can show either audio or MIDI controls in the right strip, depending on whether the **Audio** or **MIDI** tab is selected.

Figure 174. *Track Inspector controls for MIDI tracks and Instrument tracks.*
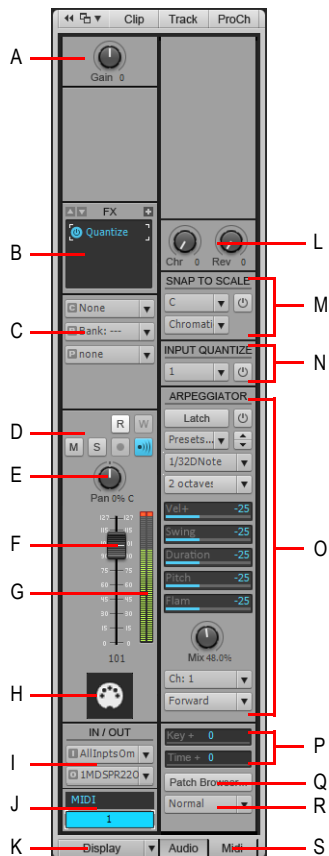
A. Velocity trim B. Effects bin C. Channel/Bank/Patch Quantize D. Mute, Solo, Arm, Input Echo, Read Automation, Write Automation E. Pan F. Volume G. Meter H. Track icon and number I. Input and output J. Track name K. Display menu L. Chorus and Reverb M. Snap to Scale N. Input Quantize O. Arpeggiator P. MIDI offset controls (Key+ and Time+) Q. Open Patch Browser R. Bank Select Method S. Audio and MIDI tabs (Instrument tracks only)

See also:

Figure 175. *Instrument tracks can show audio output or MIDI controls by selecting the **Audio** tab or **MIDI** tab.*

Audio tab   **MIDI tab**
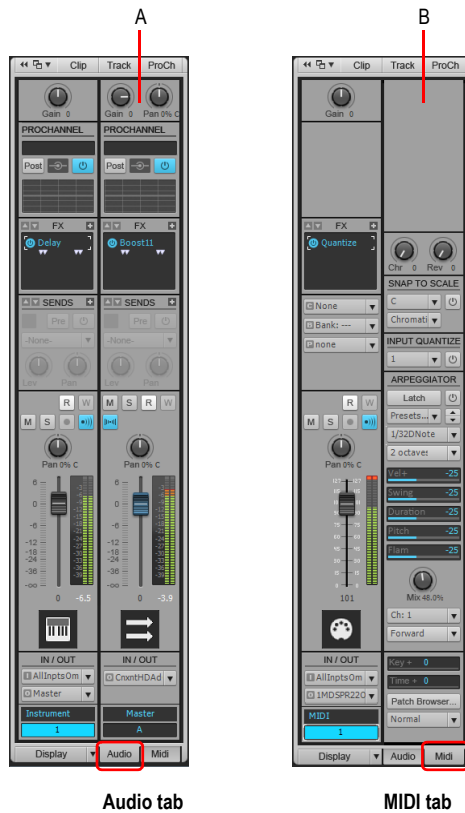
A. Audio output   B. MIDI controls

Advanced MIDI Controls section

- **Chorus.**   Adds MIDI chorus effect to the track.
- **Reverb.**   Adds MIDI reverb effect to the track.
- **Key+.**   The number of half steps by which the notes in the track are transposed on playback (e.g., 12 to transpose up one octave)
- **Time+.**   The number of "Ticks" on page 1920 that the track's playback timing is offset from the other tracks.
- **Patch Browser.**   Opens the "Patch Browser dialog" on page 1644 dialog box, which lets you search for patches by name.
- **Bank Select Method.**   Your synthesizer uses one of four bank select methods to switch back and forth between banks of sounds. To find the method used for your instrument, check the

instrument's User's Guide or the manufacturer's web site. The four methods are as follows:

- **Normal.** Use for instruments that respond to Controller 0 or Controller 32 bank select messages.

- **Controller 0 only.** Use for instruments that only respond to Controller 0 bank select messages.

- **Controller 32 only.** Use for instruments that only respond to Controller 32 bank select messages.

- **Patch 100...127.** Use for instruments that let you change banks by sending patch changes between 100 and 127.

For more information about Bank Select Methods, see "Assigning the Bank Select method" on page 1127.

Snap to Scale section

- **Snap to Scale On/Off.** Enables/disables Snap to Scale on the selected track.

- **Scale.** Displays current scale for Snap to Scale feature. The drop-down menu contains the following options:

  - **<scale categories>.** The pre-installed scales are organized into categories such as Diatonic, Pentatonic, Exotic, etc. Point to the desired category and select a scale from the submenu.

  - **Custom User Scales.** This submenu lists all custom scales you have created.

  - **Scale Manager.** Select **Scale Manager** to create new scales or edit existing scales. See "To create a scale" on page 731 and "To edit or delete a scale" on page 732.

- **Root Note.** Use this field to specify the root note of the selected scale.

- **Settings.** Use this field to specify how you want SONAR to handle non-scale notes in the Piano Roll view when Snap to Scale is enabled.

  - **Next, Higher Note.** SONAR moves any non-scale note that you move to the next higher note in the selected scale.

  - **Previous, Lower Note.** SONAR moves any non-scale note that you move to the previous, lower note in the selected scale.

  - **Nearest Note.** SONAR moves any non-scale note that you move to the note that is closest in pitch in the selected scale.

For more information about Snap to Scale, see "Snap to Scale" on page 730.

Input Quantize section

- **Input Quantize On/Off.** Enables/disables Input Quantize on the selected track.

- **Preset.** Save or select settings that you use often in the drop-down menu. To save a new group of settings, click the Preset list and choose **Quantize Settings** to open the **Input Quantize** dialog box, then type a name in the Preset field and click the **Save** button. To delete a group, select it and click the **Delete** button. The **Input Quantize** dialog box contains the following settings:

  - **Resolution.** Set the note resolution in either standard note duration or tick value. The

resolution determines the size note or time value that you want your MIDI data to conform to.

- **MIDI Event Start Times.**   Select this option to quantize MIDI event start times.

- **Note Durations.**   Select this option to quantize Note Event durations to the size of the **Resolution** value.

- **Only Quantize Notes.**   If selected, SONAR will not modify other events, such as controllers.

- **Strength.**   This value determines how closely SONAR moves the selected notes to the resolution value, or "grid". See "Strength" on page 720.

- **Swing.**   Use this value to make groups of even eight notes (or whatever note you want to enter in the **Resolution** field) "swing", instead of playing with exact eighth note rhythm. A value of **50** percent, or "50-50", produces equal durations for both notes—no swing. A larger value makes the first note longer, and vice versa. See "Swing" on page 720.

- **Window.**   This value determines whether SONAR quantizes notes that are far from the quantization points, or leaves them alone. A value of 100 percent quantizes every note. See "Window" on page 721.

- **Randomize.**   This value randomizes the three previous fields to introduce a more human feel to the rhythm. The value you enter is the maximum amount of difference from the entered values that the randomize feature can add.

For more information about Input Quantize, see "Input quantizing" on page 267.

Arpeggiator section

- **Arpeggiator On/Off.**   Enables/disables the Arpeggiator on the selected track. This control can be assigned to MIDI remote control and modified in real-time during project playback.

- **Preset.**   You can create and edit Arpeggiator presets; all user parameters are stored in the preset. Arpeggiator settings are included in track templates.

- **Rate.**   Adjusts the relative speed of the Arpeggiator sequence by changing all the note durations by a factor of the current tempo. This control can be assigned to MIDI remote control and modified in real-time during project playback.

- **Octave Range.**   Sets the number of octaves through which the arpeggio will play. A value of 1 means that a held chord will only arpeggiate the notes that are being held within the octave from which the notes are being transmitted. A value of 2 means a held chord will arpeggiate for two octaves. The held chord always represents the bass octave, meaning that the other octaves sound in a higher register.

  If you specify a range higher than the standard MIDI specifications, the Arpeggiator will repeat the pattern in the highest available octave as necessary.

  This control can be assigned to MIDI remote control and modified in real-time during project playback.

- **Latch.**   Latch keeps the arpeggio playing after you let go of the keys.

  This control can be assigned to MIDI remote control and modified in real-time during project playback.

- **Swing.**   Sets the amount of swing applied to the selected pattern. You can make a pattern of 8th,

16th, or 32nd notes play back as swing notes instead of straight notes. The amount of swing ranges from 0 (no swing) to 100% (maximum swing).

- **Velocity.** An offset control that scales the arpeggiated note's velocity to a percentage of the original note velocity.

- **Duration.** Controls whether the notes in the pattern are held to their full value, or are held for shorter or longer durations.

- **Pitch.** A transposition control in half-steps, up or down a maximum of 2 octaves.

   Flam. If a pattern contains flams, this menu controls how big a difference there is between the attack time of the flam and the note it is attached to.

- **Mix.** When 0, simultaneously held notes arpeggiate as single notes. At 50%, simultaneously held notes are heard as a chord in addition to the usual arpeggiated notes, both at equal levels. At 100%, only the held chord is audible.

   Control: Knob (0 – 100%); this control can be assigned to MIDI remote control and modified in real-time during project playback.**Channel.** MIDI input and output menu—the Arpeggiator only affects input data that's on the MIDI channels listed on this menu. The Arpeggiator always obeys the track's assigned output channel, plus any additional channels specified in the Arpeggiator's **Ch** menu.

- **Shape.** Choose a shape that specifies the direction in which currently held notes are to be sequenced. The following shapes are available:

   - Rhythm (implicit rhythm mode)
   - ForwardReverseForward Circle 1
   - Reverse Circle 1
   - Forward Circle 2
   - Reverse Circle 2
   - Inward
   - Outward
   - Inward CircleOutward Circle
   - As Played
   - As Played Circle
   - Random

   For more information about the Arpeggiator, see "Arpeggiator" on page 269.

Track Inspector overview

Main controls

Figure 176. *Track Inspector controls for mains*
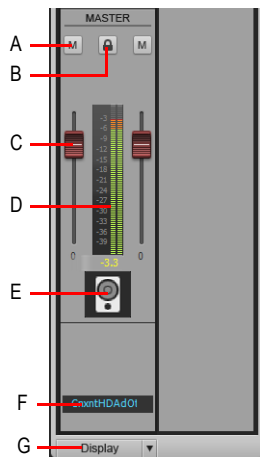
A. Mute B. Link channels C. Volume D. Meter E. Icon F. Mains name G. Display menu

See also:

To show/hide modules

Click the **Display** control at the bottom of the Track Inspector and select the modules you want to show/hide.

The following modules are available:

- **Input Gain.**   Show/hide Input Trim/Gain/Pan controls.
- **ProChannel (Producer only).**   Show/hide ProChannel controls, which includes Equalizer, Compressor and Tube Saturation.
- **FX Bin.**   Show/hide effect bins.
- **Sends/Bank/Patch.**   Show/hide Send controls for audio tracks and buses, or Bank/Patch/Channel controls for MIDI tracks and Instrument tracks.
- **MSR.**   Show/hide Mute, Solo, Arm for Recording, Input Echo, Phase Invert, Mono/Stereo, Read Automation, Write Automation and Wavefrom Preview controls.
- **Pan Control.**   Show/hide Pan controls.
- **Volume.**   Show/hide Volume controls and meters (and Link controls for mains).
- **Icon.**   Show/hide track icons.
- **In/Out.**   Show/hide Input and Output controls

Figure 177. *Use the **Display** menu to configure modules in the Track Inspector.*
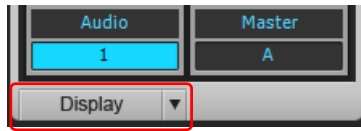
See:

Properties Inspector overview

The Properties Inspector shows properties for the selected clip(s) or track(s), depending on whether the **Clip** or **Track** button is pressed:

- **Clip.** The Clip Properties Inspector displays settings for the currently selected clip(s). For details, see "Properties Inspector - Clip Properties" on page 546.
- **Track.** The Track Properties Inspector lets you type a track name, specify the automation write mode and time base, specify an audio track's AudioSnap render modes, specify the default clip colors, and enter a text description for the selected track(s). For details, see "Properties Inspector - Track Properties" on page 553.
- **Bus.** The Bus Properties Inspector lets you type a bus name, specify the automation write mode and time base, and enter a text description. For details, see "Properties Inspector - Bus Properties" on page 556.

The Properties Inspector contains multiple sections that you can show/hide by clicking the section's header bar. By default, the Clip Properties Inspector and Track Properties Inspector are collapsed. Only one section can be visible at a time.

Figure 178. *The Track Inspector extends the full height of the Inspector pane, while the Properties Inspector is shown in the top half when visible.*

A. Dock/undock and expand/collapse Inspector B. Show/hide Clip Properties Inspector C. Show/hide Track/Bus Properties Inspector D. Show/hide ProChannel

See:

Properties Inspector - Clip Properties

The Clip Properties Inspector displays settings for the currently selected clip(s). The Clip Properties Inspector contains the following sections:

Figure 179. *The Clip Properties Inspector displays settings for the currently selected clip(s).*
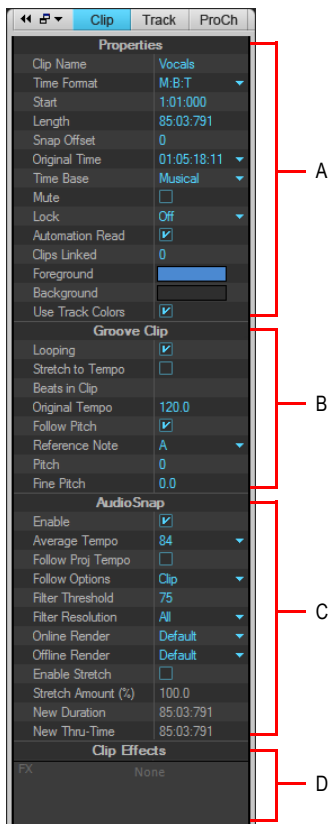
A. Clip Properties section B. Groove Clip Looping section C. AudioSnap section D. Clip Effects section

Note: *The preceding image shows all sections in the Clip Properties Inspector expanded for illustration purposes only. You can only show one section at a time.*

To show/hide the Clip Properties Inspector

Click the **Clip** button at the top of the Inspector pane, or press SHIFT+I.

Figure 180. *Click the **Clip** button to show/hide the Clip Properties Inspector.*
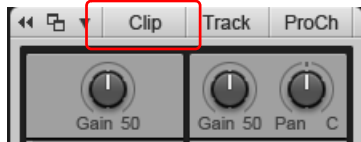
To show/hide a section in the Clip Properties Inspector

Click the section's header bar in the inspector.

The section expands and the previously-displayed section collapses.

Figure 181. *Click a section's header bar to expand the section and show its controls.*
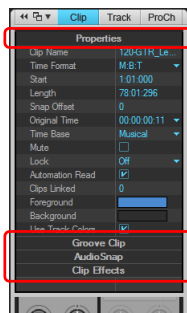
Properties section

- **Properties header bar.**   Click to show/hide the **Properties** section.
- **Clip Name.**   Use this field to assign a name to the selected clip. The name of a clip is used in the Track view and Event List view. You can assign any name to help you remember the contents of the clip.
- **Time Format.**   Use the list to specify in which format to display the selected clip's Start time and Length. The options are as follows:
  - **MBT.**   Display the clip's **Start** and **Length** properties in M:B:T (Measure: Beat:Tick) format.
  - **Samples.**   Display the clip's **Start** and **Length** properties in number of samples format.
  - **HMSF.**   Display the clip's **Start** and **Length** properties in H:M:S:F (Hour: Minute:Second:Frame) format.
  - **Seconds.**   Display the clip's **Start** and **Length** properties in number of seconds format.
- **Start.**   Use this field to move the selected clip forward or backward in the track by setting a new start time.
- **Length.**   This field displays the length of the selected clip.

- **Snap Offset (audio clips only).** The **Snap Offset** field is for audio clips only. Snap offsets allow you to set a point other than the beginning of a clip as the "snap" point used by the Snap to Grid. A snap offset is the number of samples from the beginning of the clip. Snap offsets affect all edits that obey the Snap to Grid setting. Clips without a snap offset always align at the very beginning of a clip. For more information, see "Snap offsets" on page 357.

> **Note:** *You cannot set a snap offset for a Groove clip.*

- **Original Time.** The Original Time property stores and shows the original SMPTE time stamp associated with the clip. This is the SMPTE time stamp at which the clip was recorded or imported into the project. The Original Time property can not be edited. See "To revert clip(s) to original time stamp" on page 342.
- **Time Base.** Choose one of the two options in this section to control what happens to a locked clip when you change the tempo:
  - **Musical (M:B:T).** If the clip is set to the Musical time base, the clip's M:B:T position stays constant, and its absolute position shifts.
  - **Absolute.** If the clip is set to the Absolute time base, its absolute position stays constant, and its M:B:T position shifts.
- **Mute.** Mutes the clip.
- **Lock.** Locks the clip's data and/or position. The Lock drop-down menu contains the following options:
  - **Position and Data.** Locks position and data, and adds a lock icon on the clip ⬚.
  - **Position Only.** Locks position only, and adds a yellow lock icon (with the clasp unlocked) on the clip ⬚.
  - **Data Only.** Locks data only, and adds a blue lock icon (with the clasp unlocked) on the clip ⬚.
- **Automation Read.** Allows the clip to respond to clip automation envelopes.

> **Note:** *Clip envelopes are only visible/editable when the parent track's Edit Filter control is set to* **Clip Automation***. For details, see "Selecting the data type to edit" on page 416.*

- **Clips Linked.** Shows how many clips are linked to the selected clip.
- **Foreground.** Specifies the waveform or note color of the selected clip.
- **Background.** Specifies the clip background color of the selected clip.
- **Use Track Colors.** Returns the selected clip's color to the default, as defined in **Edit > Preferences > Customization - Color**.

  For more information about clip properties, see "Editing clip properties" on page 782 and "Arranging clips" on page 325.

Properties Inspector overview

Groove Clip section

- **Groove Clip header bar.**　Click to show/hide the **Groove Clip** section.

- **Looping.**　Convert the selected clip to a Groove Clip. You can drag the right edge of a Groove Clip to create loop repetitions. Groove Clips can also obey pitch markers. For more information about Groove Clips, see "Working with Groove Clip audio" on page 659 and "MIDI Groove Clips" on page 668.

> **Note:** *If this control is not available, the selected clip is most likely an AudioSnap clip. A clip can not have Groove Clip looping and AudioSnap enabled at the same time.*

- **Stretch to Tempo (audio clips only).**　Stretch or shrink the selected clip to fit the project's tempo. SONAR uses the Beats in Clip and Original Tempo parameters are used to make the change.

- **Beats in Clips.**　The number of beats (quarter notes) in the clip.

- **Original Tempo (audio clips only).**　The tempo at which the clip was recorded.

- **Follow Pitch.**　Transposes the loop, if necessary, to the key of the project. A loop recorded in the key of A, used in a project in the key of C, will be transposed up three semitones if the **Follow Pitch** option is selected. You can also insert markers in the Time Ruler which change the project pitch. These markers, called pitch markers affect only Groove clips with **Follow Pitch** enabled.

- **Reference Note.**　Represents the key in which the loop was originally recorded. The Follow Pitch feature uses this information, when checked, to transpose the loop to match the project's default project pitch and pitch markers.

- **Pitch (semitones).**　Allows you to set the transposition of a clip independently from the project pitch. A positive number transposes the clip up by that number of semitones. A negative number transposes the clip down by that number of semitones. Remember, if **Follow Pitch** is enabled, the clip follows the project's pitch, so any transposition changes you make using this option are changes to the project pitch, not the clip pitch.

- **Fine Pitch (cents).**　Allows you to make tuning adjustments or to transpose the pitch of a clip up to 50 cents. There are 100 cents in one semitone. A **Fine Pitch** setting of **1** adjusts the pitch up one hundredth of a semitone. The **Fine Pitch** option can "fine tune" a slightly out of tune clip so that it is in pitch with the remaining clips in a project.

  For more information about Groove Clips, see "Working with loops and Groove Clips" on page 651.

Inspectors

Properties Inspector overview

AudioSnap section

- **AudioSnap header bar.** Click to show/hide the **AudioSnap** section.
- **Enable.** Enables or disables AudioSnap on selected audio clips.

> **Note:** *AudioSnap is automatically enabled on a clip if you stretch a transient marker on the clip.*

- **Average Tempo.** Shows the average tempo candidates: original, 0.5x and 2x. SONAR will do its best to detect the correct average tempo, but a clip can often have multiple potential tempos (60 BPM, 120 BPM, 240 BPM, etc.). If SONAR is unable to detect a tempo, **Average Tempo** will be set to **Original**, which is the project's tempo at the location the clip was recorded or imported. If you change the **Average Tempo** setting, all clip tempo changes are adjusted to scale.
- **Follow Project Tempo.** Forces the clip to follow the project's global tempo map.
- **Follow Options.** Specifies at which resolution the clip should follow tempo changes when **Follow Project Tempo** is selected. The options are as follows:
  - Beats
  - Measures
  - Clip (default)
  - Auto-Stretch

> **Note:** *The **Follow Project Tempo** option only works on clips that are configured to use musical time (the **Time Base** property is set to **Musical (M:B:T)** in the Clip Properties Inspector.*

- **Filter Threshold.** Disables AudioSnap transient markers based on their volume. This clears out unwanted markers to make editing easier. Higher values create a bigger volume threshold, which disables markers that are fall below that threshold.
- **Filter Resolution.** The selected **Filter Resolution** value lets you disable markers based on their time location. This clears out unwanted markers to make editing easier. Larger values create a bigger time window, based on musical time values, which preserves markers that are closest to the displayed musical time value, and disables others.
- **Online Render.** This choice determines what stretch algorithm is used during real-time playback. For more information about render modes, see "Algorithms and rendering" on page 646. The options are as follows:
  - **From Track.** This uses the algorithm listed in the **Online** field in **Edit > Preferences > Project - AudioSnap**.
  - **Groove clip.** This mode works faster than Percussion render mode, using less processing power.

Properties Inspector overview

- **Percussion.** This mode works better than the Groove Clip render mode on percussive material, especially if the stretching is by more than a few beats per minute.

Note: *The **Online** render mode is for preview purposes only during playback. The final audio quality will be greatly improved after the **Offline** render mode is applied during mixdown/export.*

- **Offline Render.** This drop-down menu lets you choose the algorithm that is used when you export or freeze stretched audio. The choices in the drop-down menu are as follows:
  - **From Track.** This uses the algorithm listed in the **Offline Rendering** field in **Edit > Preferences > Project - AudioSnap**.
  - **Radius Mix.** Better for clips containing polyphonic, stereo data.
  - **Radius Mix Advanced.** Similar to **Radius Mix**, but exposes a **Smoothing** slider that adjust how much detail to preserve.
  - **Radius Solo.** Better for clips containing monophonic, solo instruments.
  - **Radius Solo (Bass).** Better for clips containing solo bass instruments.
  - **Radius Solo (Vocal).** Better for clips containing solo vocals.
  - **Same as Online.** Uses the same choice as the **Online** field.
- **Enable Stretch.** Allows a clip to follow a project's tempo as it changes. It instructs SONAR to stretch or shrink the clip to fit the project's tempo. SONAR uses the Original BPM parameters to make the change.
- **Stretch Amount (%).** Specify by what percentage to stretch the clip.
- **New Duration.** Specify what duration to stretch the clip to.
- **New Thru-Time.** Specify the Thru Time to stretch the clip to.

  For more information about AudioSnap, see "AudioSnap (Producer and Studio only)" on page 589.

Clip Effects section

- **Clip Effects header bar.**   Click to show/hide the **Clip Effects** section. This sections lets you add real-time effects to the selected clip.
- **Effects bin.**   Right-click to insert a plug-in, or drag a plug-in from the Browser.

  For more information about clip effects, see "Effects on clips" on page 870 and "Adding effects in the Track view" on page 381.

See:

See also:

Properties Inspector - Track Properties

The Track Properties Inspector lets you type a name, enter a text description, specify the AudioSnap track render mode for audio tracks, and specify the default clip colors for the selected track(s).

Note: *If the active channel strip is a bus, the Track Properties tab label shows **Bus** instead of **Track**.*

Figure 182. The Track Properties Inspector lets you specify settings for the selected track(s).
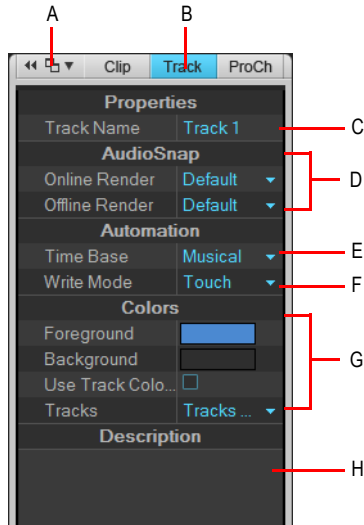
A. Dock/undock Inspector B. Show/hide Track Properties Inspector C. Track name D. AudioSnap track render modes E. Automation Time Base F. Automation Write Mode (Producer and Studio only) G. Default clip colors H. Text description

To show/hide the Track Properties Inspector

Click the **Track** button at the top of the Inspector pane, or press CTRL+SHIFT+I.

*Figure 183. Click the **Track** button to show/hide the Track Properties Inspector.*
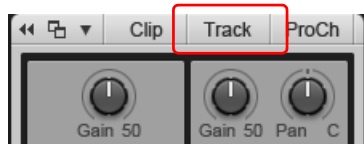
The Track Properties Inspector contains the following sections:

Properties section

- **Track Name.**   Assign a name to the selected track.

AudioSnap section (audio tracks only)

- **Online Render.**   Specify the algorithm to use during real-time playback. For more information about render modes, see "Algorithms and rendering" on page 646. The options are as follows:
  - **From Global.**   This uses the algorithm listed in the **Online** field in **Edit > Preferences > Project - AudioSnap**.
  - **Groove clip.**   Works faster than Percussion render mode, using less processing power.
  - **Percussion.**   Works better than the Groove Clip render mode on percussive material, especially if the stretching is by more than a few beats per minute.

Note: *The **Online** render mode is for preview purposes only during playback. The final audio quality will be greatly improved after the **Offline** render mode is applied during mixdown/export.*

- **Offline Render.**   This drop-down menu lets you choose the algorithm that is used when you export or freeze stretched audio. The choices in the drop-down menu are as follows:
  - **From Global.**   This uses the algorithm listed in the **Offline Rendering** field in **Edit > Preferences > Project - AudioSnap**.
  - **Radius Mix.**   Better for clips containing polyphonic, stereo data.
  - **Radius Mix Advanced.**   Similar to **Radius Mix**, but exposes a **Smoothing** slider that adjust how much detail to preserve.
  - **Radius Solo.**   Better for clips containing monophonic, solo instruments.
  - **Radius Solo (Bass).**   Better for clips containing solo bass instruments.
  - **Radius Solo (Vocal).**   Better for clips containing solo vocals.
  - **Same as Online.**   Uses the same choice as the **Online** field.

Automation section

- **Time Base.**   Choose one of the two options in this section to control what happens to automation when you change the tempo:
  - **Musical (M:B:T).**   If the track is set to the Musical time base, the automation's M:B:T position stays constant, and its absolute position shifts.
  - **Absolute.**   If the track is set to the Absolute time base, its absolute position stays constant, and its M:B:T position shifts.
- **Write Mode (Producer and Studio only).**   This drop-down menu lets you choose the automation write mode:
  - **Touch.**   Touch mode overwrites any existing automation data for the currently armed parameter only when the parameter is moved with the mouse or a MIDI controller. Automation writing stops when the parameter is released, and the parameter returns to any previously automated position.

Properties Inspector overview

- **Overwrite.** Overwrite mode overwrites any existing automation data for the currently armed parameter while the transport is rolling, even if you don't touch the parameter.
- **Latch.** Latch Mode is similar to Touch mode; new automation data overwrites existing automation data when you move a control. However, when you release the parameter, it will remain "latched" into its current position and continue to overwrite any existing automation data until playback stops.

Color section

- **Foreground.** Specify the default waveform or note color of the selected track.
- **Background.** Specify the default clip background color of the selected track.
- **Use Track Color.** Use the default track color, as defined in **Edit > Preferences > Customization - Color**.
- **Tracks.** When **Use Track Color** is selected, use the **Tracks** drop-down menu to specify which set of track colors to use (as defined in **Edit > Preferences > Customization - Color**). You can choose from ten different default color combinations.

Description section

- **Description.** Type a comment or description of the selected track.

See:

See also:

Properties Inspector - Bus Properties

The Bus Properties Inspector lets you type a name, specify the automation time base and write mode, and enter a text description for the bus(es).

Figure 184. *The Bus Properties Inspector lets you specify settings for the selected bus(es).*
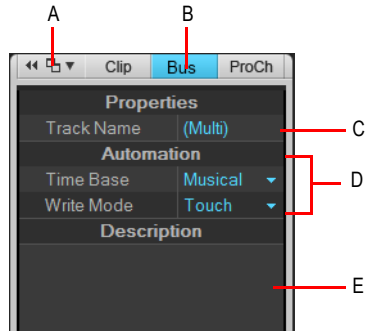
A. Dock/undock Inspector B. Show/hide Bus Properties Inspector C. Bus name D. Automation Time Base and write mode E. Text description

To show/hide the Bus Properties Inspector

Click a bus in the Track view, then click the **Bus** button at the top of the Inspector pane, or press CTRL+SHIFT+I.

Figure 185. *Click the **Bus** button to show/hide the Bus Properties Inspector.*

Note: *If the active channel strip is a track, the Track Properties tab label shows **Track** instead of **Bus**.*

The Bus Properties Inspector contains the following sections:

Properties section

• **Track Name.** Assign a name to the selected bus.

Automation section

• **Time Base.** Choose one of the two options in this section to control what happens to automation when you change the tempo:

Properties Inspector overview

- **Musical (M:B:T).** If the bus is set to the Musical time base, the automation's M:B:T position stays constant, and its absolute position shifts.
- **Absolute.** If the bus is set to the Absolute time base, its absolute position stays constant, and its M:B:T position shifts.

- **Write Mode (Producer and Studio only).** This drop-down menu lets you choose the automation write mode:
  - **Touch.** Touch mode overwrites any existing automation data for the currently armed parameter only when the parameter is moved with the mouse or a MIDI controller. Automation writing stops when the parameter is released, and the parameter returns to any previously automated position.
  - **Overwrite.** Overwrite mode overwrites any existing automation data for the currently armed parameter while the transport is rolling, even if you don't touch the parameter.
  - **Latch.** Latch Mode is similar to Touch mode; new automation data overwrites existing automation data when you move a control. However, when you release the parameter, it will remain "latched" into its current position and continue to overwrite any existing automation data until playback stops.

Description section

- **Description.** Type a comment or description of the selected bus.

See:

Properties Inspector overview

Browser

The Browser lets you find and import various types of content into your projects, including audio and MIDI files, track and project templates, track icons, Effects Chain presets, effect plug-ins and instruments. You can drag content and plug-ins directly into tracks. The Browser consists of three sections:

- **Media Browser.** Find audio, MIDI, video, projects, project templates, track templates, Effects Chain presets and track icons that you want to import into a project. For more information, see "Using the Media Browser" on page 563.

- **Plug-in Browser.** Organize plug-ins and drag effects to tracks and clips. You can access audio effects (DirectX and VST), MIDI effects (MFX), instruments (DXi and VSTi) and ReWire devices. For more information, see "Using the Plug-in Browser" on page 574.

- **Synth Rack Browser.** Manage all active instruments in a project. For more information, see "Using the Synth Rack Browser" on page 581.

Objects in the Browser can be added to your project in two ways:

- Drag the object to an appropriate location.
- Double-click the object in the Browser.

By default, the Browser is docked on the right side of the screen. More detailed information is shown in the Media Browser and Synth Rack Browser when the SONAR Browser is floating or docked at the bottom of the screen. For more information, see "Docking/undocking and resizing the Browser window" on page 561.

Figure 186. *The Browser lets you import content into a project and manage effects and instruments.*
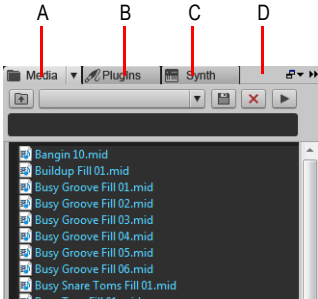
A. Media Browser *B.* Plug-in Browser *C.* Synth Rack Browser *D.* Header bar

To show audio/MIDI content

Click the **Browse Media** button 📁.

To show plug-ins

Click the **Browse Plug-ins** button 🖉.

To show the Synth Rack

Click the **Browse Synth Rack** button 🎹.

See:

Docking/undocking and resizing the Browser window

By default, the Browser is docked on the right side of the screen. You can undock the Browser, or dock it on the left side or at the bottom. You can also resize the width of the Browser.

More detailed information is shown in the Media Browser and Synth Rack Browser when the SONAR Browser is floating or docked at the bottom of the screen.

Figure 187. *Browser*

Docked   **Undocked**   **Collapsed**
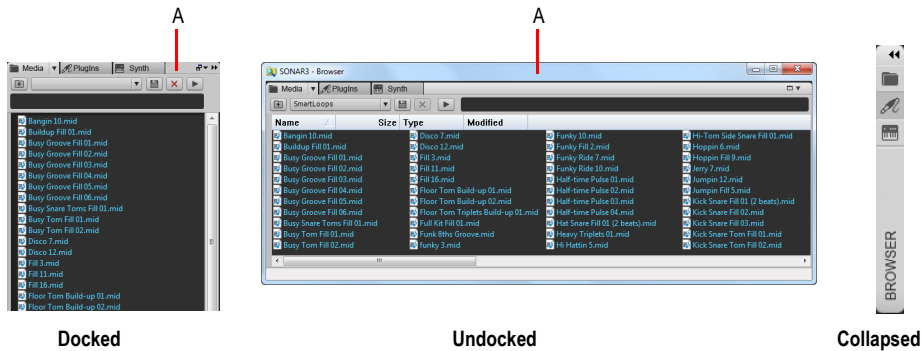
A. Header bar

Figure 188. *Use the docking controls to change the position of the Browser.*
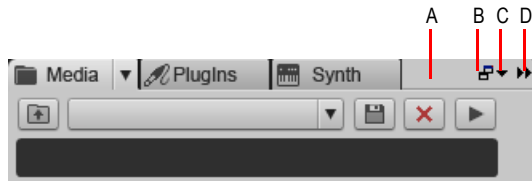
A. Click here to drag the Browser B. Dock/Undock C. Docking Options D. Expand/Collapse

To dock the Browser

When the Browser is undocked, do *one* of the following:

- Double-click the Browser header bar.
- Click the **Dock/Undock** button in the Browser.
- Click the **Docking Options** button, and select one of the following menu commands:
  - **Dock at Left.** Dock the Browser to the left of the Track view.
  - **Dock at Right.** Dock the Browser to the right of the Track view.
  - **Dock in MultiDock.** Dock the Browser in the MultiDock, which appears below the Track view by default.

To undock the Browser

When the Browser is docked, do *one* of the following:

- Double-click the Browser header bar.
- Click the Browser header and drag the Browser to the middle of the screen.
- Click the **Dock/Undock** button in the Browser.

More detailed information is shown in the Media Browser and Synth Rack Browser when the SONAR Browser is floating or docked at the bottom of the screen.

To float the Browser or move it to a different monitor

Click the **Docking Options** button, and select **Float**.

To move the Browser to the left side

Do *one* of the following:

- Click the **Docking Options** button, and select **Dock at Left**.
- Click the Browser header and drag the Browser to the left side of the screen.

To dock the Browser in the MultiDock

Do *one* of the following:

- Click the Browser header and drag the Browser to the MultiDock.
- Click the **Docking Options** button, and select **Dock in MultiDock**.

To expand/collapse the Browser

Click the **Expand/Collapse** button in the Browser.

To resize the width of the Browser

Drag the Browser's sidebar left/right.

To show the Browser

Select **Views > Browser**.

See:

Using the Media Browser

The Media Browser allows you to browse and import various file types that can be used in SONAR, including:

- Audio files (.wav, .mp3, .wma, .aif, etc.)
- MIDI files (.mid)
- Project5 patterns (.ptn)
- Step sequencer patterns (.ssp)
- REX loops (.rex)
- Video files (.avi, .mpg, .wmv, .asf, .mov)
- Track icons (.bmp)
- Track templates (.cwx)
- Project templates (.cwt, .tpl)
- Projects (.cwp, .cwb, .bun, .wrk)
- Effects Chain presets (.fxc)

You can preview audio and MIDI files before you import them into your project. If you preview a Groove clip, it plays back at the tempo and in the key of your current project. Audio files can be auditioned through any bus and MIDI files can be auditioned through any soft synth. You can preview audio from a video file, but not the video itself.

You can save presets for your favorite content folders, which allows you to instantly jump to specific folders on your hard disk.

Media Browser interface

Figure 189. *Media Browser*
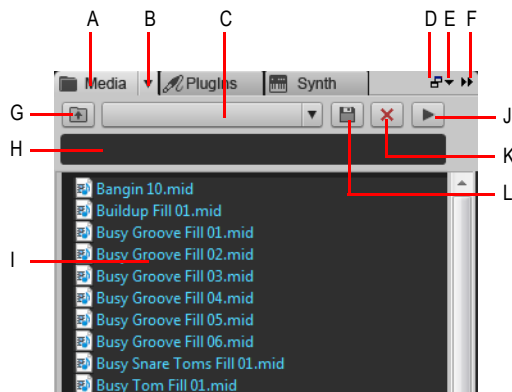
A. Show Media Browser B. Browser menu C. Content Location menu D. Dock/undock E. Docking options
F. Expand/collapse G. Move up one level to the parent directory H. Search filter I. File list J. Play/Stop
K. Delete content preset L. Save content preset

Figure 190. *Media Browser (undocked)*
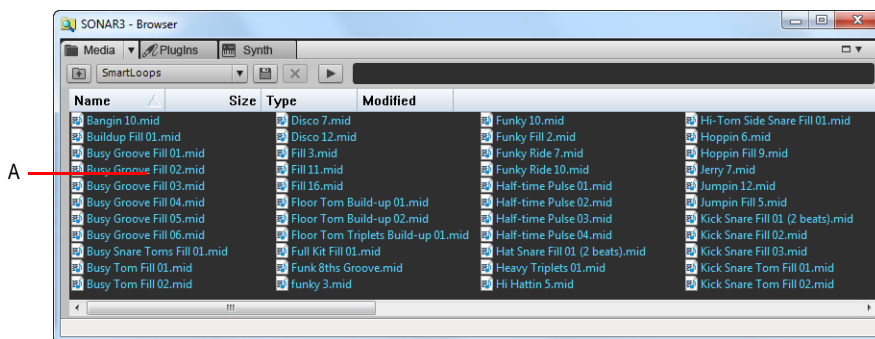
A. Folder pane

- **Show Media Browser** . Show the Media Browser.

- **Browser menu.** The **Browser** menu lets you choose how content files are displayed and specify options for previewing audio and MIDI files. The menu contains the following commands:

  - **Views.** The **Views** submenu lets you specify how files are displayed in the file list view. The options are as follows:

    - **Icons.** Icons view displays your files and folders as icons. The file name is displayed under the icon.

    - **List.** List view displays the contents of a folder as a list of file or folder names preceded by

Using the Media Browser

small icons.

- **Details.** When the Browser is undocked or docked at the bottom, Details view displays the file size, type and when the file was last modified.

- **Folders.** When the Browser is undocked or docked at the bottom, this option lets you show/hide the Folders pane.

- **Auto-Preview.** When **Auto Preview** is selected, you can automatically previews loops and files when you click on them in the Media Browser view. If the selected file is a Groove clip, it plays back in the project tempo and key.

- **Preview at Host Tempo.** When **Preview at Host Tempo** is selected, audio and MIDI groove clips follow the project's tempo at the current Now time.

- **Loop Preview.** Select **Loop Preview** to continuously loop the selected file(s) during preview.

- **Audio Preview Bus.** The **Audio Preview Bus** submenu lets you select the output device for previewing audio files.

- **Synth Preview Output.** The **Synth Preview Output** submenu lets you select the soft synth for previewing MIDI files.

- **Search filter.** The search filter allows you to only show content that includes a specific text string in the file name.

- **Content Location menu.** The **Content Location** menu allows you to quickly jump to favorite content locations on your hard disk. You can save and recall your own Content Location presets.

- **Save Content Location Preset** 💾**.** Save the current folder as a Content Location preset. By default, the folder name is used as the preset name, but you can type any desired name before you click the **Save Content Location Preset** button.

- **Delete Content Location Preset** ❌**.** Delete the selected Content Location preset.

- **Move Up One Level** ⬆**.** Open the folder one level above the active folder.

- **Play** ▶**.** Play the currently selected media file.

- **Content List pane.** The Content List pane shows all supported files in the active folder. Icons to the left of file names indicate the file type, including if it is a Groove Clip. When pointing to a file, the tooltip shows the full file name.

See:

Adding Browser objects to your project

To show audio/MIDI content

Click the **Browse Media** button 📁.

To import an audio or MIDI file

1. In the Browser, click the **Browse Media** button 📁.
2. Navigate to the folder that contains the file you want to import.
3. Do *one* of the following:
   - **To insert into an existing track as a new clip.**   Double-click the file to add it to the selected track at the current Now time, or drag the file to the desired location.

ℹ️   **Note:** *A new track is created if the file type is not compatible with the selected track.*

   - **To insert into a new track.**   Drag the file to en empty space in the Track view, below the last track.
   - **To replace the selected clip.**   Drag the file to the Clip Inspector.
   - **To insert into a cell in the Matrix view.**   Make sure the Matrix view is visible, then drag the file to the desired Matrix cell.

Valid destinations for audio files

You can drag audio files to the following locations:

- Audio track
- Audio clip
- MIDI track
- MIDI clip
- Audio clip inspector
- Empty Track view
- Empty Console view
- Instrument track

Using the Media Browser

Valid destinations for MIDI files

You can drag MIDI files to the following locations:

• Audio track

• Audio clip

• MIDI track

• MIDI clip

• MIDI clip inspector

• Empty Track view

• Empty Console view

• Instrument track

To export audio or MIDI clips

Drag the clip(s) to the desired location in the Media Browser.

> **Note:** *The Media Browser will appear automatically if you drag a clip over the Plug-in Browser or Synth Rack Browser.*

By default, audio clips are exported with the following settings:

• Format: Wave

• Bit depth: same as original clip.

• Sample rate: same as current project.

• Dithering: off

If you want to specify various options when exporting audio, you can use the **File > Export > Audio** command instead.

To import a track template

1. In the Browser, click the **Browse Media** button .

2. Navigate to the folder that contains the track template you want to import.

3. Do *one* of the following:

   • **To add tracks to the end.** Drag the track template to an empty space below the last track, or double-click the track template.

   • **To replace an existing track.** Drag the track template onto the track you want to replace.

> **Note:** *If the target track and dropped track template are different track types, the target track will be changed to match the track template.*

Valid destinations for track templates

You can drag track templates to the following locations:

- Audio track
- Audio clip
- MIDI track
- MIDI clip
- Audio track inspector
- MIDI track inspector
- Audio track effects bin
- MIDI Track effects bin
- Audio Console strip
- Audio Console effects bin
- MIDI Console strip
- MIDI Console effects bin
- Empty Track view
- Empty Console view
- Instrument track
- Instrument track inspector
- Instrument Console strip

To import a project template

1. In the Browser, click the **Browse Media** button .
2. Navigate to the folder that contains the project template you want to import.
3. Do *one* of the following:
    - **To add tracks at the end of the current project.**   Drag the project template to the Track view.
    - **To open the template as a new project.**   Double-click the project template.

To open or import a project file

1. In the Browser, click the **Browse Media** button .
2. Navigate to the folder that contains the project you want to import tracks from.

3. Do *one* of the following:

- **To open a project.** Double-click the desired cwp/cwb/wrk/bun file.
- **To import the project into existing tracks.** Drag the desired cwp/cwb/wrk/bun file into an existing track.
- **To import the project as new tracks.** Drag the desired cwp/cwb/wrk/bun file to an empty space in the Track view, below the last track.

To import a video file

1. In the Browser, click the **Browse Media** button ▣.
2. Navigate to the folder that contains the video file you want to import.
3. Do *one* of the following:

- Drag the video file to the Video Thumbnail pane or anywhere in the Track view.
- Double-click the video file.

To assign a track/bus icon

1. In the Browser, click the **Browse Media** button ▣.
2. Navigate to the folder that contains the icon you want to import.
3. Drag the icon to the desired track/bus in the Track view.

To preview audio content

1. In the Browser, click the **Browse Media** button ▣.
2. On the **Browser** menu, select **Auto-Preview**.
3. On the **Browser** menu, point to **Audio Preview Bus**, then select the bus you want to preview audio through.
4. Navigate to the folder that contains the audio content you want to preview, then click the file you want to preview.

ⓘ Note: *Auto-Preview is enabled by default. If you disable **Auto-Preview**, you must click the **Play** button each time you want to preview the selected audio file.*

💡 Tip: *To preview an audio file as a Groove Clip, hold down the ALT key and click the file. To preview all selected files as Groove Clips, hold down the ALT and click the **Play** button ▶.*

The **Play** button changes to a **Stop** button during preview.

To preview MIDI content

1. In the Browser, click the **Browse Media** button 📁.
2. On the **Browser** menu, select **Auto-Preview**.
3. On the **Browser** menu, point to **Synth Preview Output**, then select the soft synth you want to preview MIDI through.Navigate to the folder that contains the MIDI content you want to preview,

ℹ️ **Note:** *If there are no synths in the project, go to **Insert > Soft Synths** and insert the desired soft synth.*

then click the file you want to preview.

ℹ️ **Note 1:** *Auto-Preview is enabled by default. If you disable **Auto-Preview**, you must click the **Play** button each time you want to preview the selected audio file.*

ℹ️ **Note 2:** *MIDI Groove Clips loop indefinitely, but standard MIDI files play only once and do not repeat.*

The **Play** button changes to a **Stop** button during preview.

To rename media files in the Media Browser

1. In the Browser, click the **Browse Media** button 📁.
2. Do one of the following:
- Click the click the file you want to rename and press F2.
- Right-click the file you want to rename, and choose **Rename** on the pop-up menu.

To delete media files in the Media Browser

1. In the Browser, click the **Browse Media** button 📁.
2. Do *one* of the following:
   - Right-click the file you want to delete, and choose **Delete** on the pop-up menu.
   - Select the file you want to delete, and press the DELETE key.

To enable/disable Auto-Preview

1. In the Browser, click the **Browse Media** button .

2. On the **Browser** menu, click **Auto-Preview**.

See:

See also:

Using Content Location presets

The Media Browser allows you to save and recall presets to quickly access your favorite folders.

Any folder that you can navigate to in the Media Browser can be saved as a Content Location preset, which allows you to instantly return to a specific folder by simply selecting a preset from the **Content Location** list.

As you navigate in the Media Browser, the **Content Location** box automatically displays the current folder name or the first preset that matches the selected folder location.

To save a Content Location preset

1. In the Browser, click the **Browse Media** button .

2. Navigate to the folder that you would like to save as a preset.

   The selected folder name is displayed in the **Content Location** box.

3. If you want to specify a new friendly preset name, type the desired name in the **Content Location** box.

4. Click the **Save Content Location Preset** button .

   The selected folder name is displayed in the **Content Location** box.

To select a Content Location preset

1. In the Browser, click the **Browse Media** button 📁.
2. In the **Content Location** box, select the desired preset.

   The Media Browser automatically navigates to the appropriate folder location.

To delete a Content Location preset

1. In the Browser, click the **Browse Media** button 📁.
2. In the **Content Location** box, select the preset you want to delete.
3. Click the **Delete Content Location Preset** button ❌.

See:

Keyboard navigation

Standard key commands for navigating Windows Explorer also work in the SONAR Browser. The following table lists keys for navigating the SONAR Browser.

Action	Shortcut key
Navigate between files	UP/DOWN ARROW
Navigate between directories	LEFT/RIGHT ARROW
Move to parent directory	BACKSPACE
Move to the selected directory or open the selected file	ENTER
Move to the first file in a directory	HOME
Move to the last file in a directory	END
Open a shortcut menu for the selected item	SHIFT+F10
Expand everything under the current selection (folder pane only)	Numeric Keypad *
Expand the current selection (folder pane only)	Numeric Keypad +
Collapse the current selection (folder pane only)	Numeric Keypad -

Table 113.   *Shortcut keys for navigating the SONAR Browser*

See:

Using the Plug-in Browser

The Plug-in Browser lets you insert effects, instruments and ReWire devices into your projects. The following plug-in types are supported:

- DirectX and VST audio effects.
- MFX MIDI effects
- DXi and VSTi instruments
- ReWire devices

Plug-ins are displayed according to their organization in the selected Plug-in Layout. Custom plug-in layouts let you organize plug-ins any way you want: alphabetically, by vendor name, by effect type, etc.

Effects can be added to tracks, buses and clips. Instruments can be added to audio tracks, Instrument tracks and the Synth Rack.

Plug-in Browser interface

Figure 191. *Plug-in Browser*
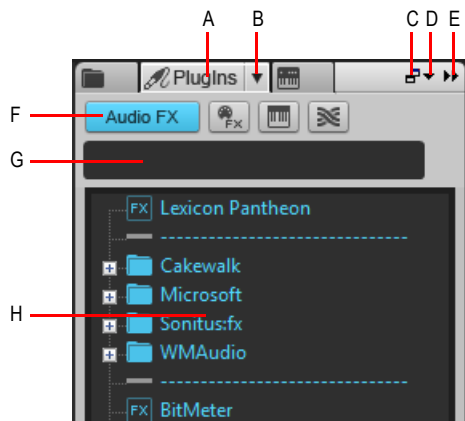
A. Show Plug-in Browser B. Plug-in Layout menu button C. Dock/undock D. Docking options E. Expand/collapse F. Plug-in Type buttons G. Search filter H. Plug-in list

- **Show Plug-in Browser** 🖋️ .   Show the Plug-in Browser.
- **Audio.**   Show available DX and VST audio effect plug-ins.
- **MIDI.**   Show available MFX MIDI effect plug-ins.
- **Synth.**   Show available DXi and VSTi soft synths.
- **ReWire.**   Show available ReWire devices.
- **Plug-in Layout menu.**   The **Plug-in Layout** menu lets you specify how plug-ins are organized.

The menu contains the following commands:

- **Manage Layouts.**   Opens Cakewalk Plug-in Manager, which lets you create, delete, and edit plug-in layouts. For more information about Cakewalk Plug-in Manager, see the Cakewalk Plug-in Manager online Help.
- **Default All Plug-ins.**   The default layout, which lists all plug-ins alphabetically.
- **Organized by Type.**   Select this layout to organize plug-ins by type (EQ, reverb, etc.).
- **<list of layouts>.**   The **Plug-in Layout** menu lists all layouts stored by Cakewalk Plug-in Manager. Select a layout to change the plug-in list.
- **Search filter.**   The search filter allows you to only show plug-in names that includes a specific text string.
- **Plug-in list.**   The Plug-Ins list is populated from the currently-selected layout from the **Plug-in Layout** menu and the plug-in type selected from the **Plug-in Type** menu.

See:

Adding effects and instruments to a project

To show a specific plug-in type

1. In the Browser, click the **PlugIn** button 🖋 to show the Plug-in Browser.
2. Click the button that corresponds to the plug-in type you want to show:

   - **Audio FX** [FX]
   - **MIDI FX** [Fx]
   - **Instruments** [▥]
   - **ReWire** [※]

To select a plug-in layout

Click the **PlugIn** menu button ✐ and select the desired layout. Click **Manage Layouts** if you want to modify an existing layout or create a new layout.

To insert an effect in a track or bus

1. In the Browser, click the **PlugIn** button ✐ to show the Plug-in Browser.
2. Click the button that corresponds to the plug-in type you want to show:
   - **Audio FX** [FX]
   - **MIDI FX** [Fx]
3. Do *one* of the following:
   - **To insert the effect in a specific location in the effects bin.** Drag the effect to the desired position in a track/bus effects bin.
   - **To insert the effect at the end of the effects bin.** Drag the effect to an empty track space in the Clips pane, or double-click the effect (only if the selected track type matches the effect type).

Valid destinations for audio effects

You can drag audio effects to the following locations:

- Audio track
- Audio clip
- Audio track inspector
- Audio clip inspector
- Audio track effects bin
- Audio Clip effects bin
- Audio Console strip
- Audio Console effects bin
- Instrument track
- Instrument track inspector
- Instrument track effects bin
- Instrument Console strip
- Instrument Console effects bin

Valid destinations for MIDI effects

You can drag MIDI effects to the following locations:

- MIDI track
- MIDI clip
- MIDI track inspector
- MIDI clip inspector
- MIDI Track effects bin
- MIDI Clip effects bin
- MIDI Console strip
- MIDI Console effects bin
- Instrument track
- Instrument track inspector
- Instrument track effects bin
- Instrument Console strip
- Instrument Console effects bin

To insert an effect into a clip's effects bin

1. In the Browser, click the **PlugIn** button 🖋 to show the Plug-in Browser.
2. Click the button that corresponds to the plug-in type you want to show:

   - **Audio FX** [FX]

   - **MIDI FX** [Fx]

3. Drag the desired effect to a clip in the Clips pane.

To insert an instrument

1. In the Browser, click the **PlugIn** button 🖋 to show the Plug-in Browser.

2. Click the **Instruments** button [🎹].

3. Do *one* of the following:

   - **To insert an instrument as a new Instrument track.** Drag the desired instrument to an empty space in the Track view or Clips pane, or double-click the instrument.

- **To insert an instrument as a track effect.** Drag the instrument to the desired track's effects bin, or drag the instrument to the desired track in the Clips pane.

Note: *When you drag an instrument to an audio track or MIDI track, the following happens automatically:*

- *If dropped on an audio track or inspector: add to Synth Rack, set audio track input and Synth automation accordingly.*
- *If dropped on a MIDI track or inspector: add to Synth Rack, set MIDI track output and Synth automation accordingly.*

Valid destinations for instruments

You can drag instruments to the following locations:

- Audio track
- MIDI track
- Audio track inspector
- MIDI track inspector
- Audio Console strip
- MIDI Console strip
- Empty Track view
- Empty Console view
- Instrument track
- Instrument track inspector
- Instrument Console strip

To insert a ReWire device

1. In the Browser, click the **PlugIn** button ✐ to show the Plug-in Browser.

2. Click the **ReWire** button ✕.

3. Drag the ReWire device to the Track view or Clips pane.

   The ReWire device is added to the Synth Rack and a new Instrument track is created.

To rename a plug-in

1. In the Browser, click the **PlugIn** button 🖊 to show the Plug-in Browser.
2. Select the plug-in, then click the plug-in name again and type a name.

    The plug-in is renamed and the plug-in layout is auto-saved.

    ℹ️ **Note:** *You can only rename plug-ins in a custom menu layout, not in the default menu layout.*

See:

Using FX Chain presets (.fxc)

You can save effect chains in SONAR, which can be used in any project. An FX Chain preset stores all the settings of a specific effects bin. This allows you to effortlessly duplicate favorite effect combinations and settings without having to manually insert one effect at a time. FX Chain presets are saved as .fxc files that can be imported from the Plug-in Browser.

To save an FX Chain preset

1. Do *one* of the following:

    *   To save an effects bin as an FX Chain preset, right-click any blank space in the effects bin and choose **Save as FX Chain Preset** on the pop-up menu. Specify a preset name and location in the **Save FX Chain Preset** dialog box. All plug-ins in the effects bin are consolidated into a single new FX Chain.

    *   To save an FX Chain container as a new FX Chain preset, right-click the FX Chain container in an effects bin and choose **Save as FX Chain Preset** on the pop-up menu. Specify a preset name and location in the **Save FX Chain Preset** dialog box.

- Click the **Browse Plug-ins** button ⟋ in the Browser, then drag the FX Chain container from the Track view to the Audio FX section in the Browser. The FX Chain is added to the FX Chain folder.

ℹ **Note:** *FX Chain presets are stored as FX Chain Preset files (*.fxc). For track and bus effects bins, the default name for the FX Chain preset is the track/bus name. For clip effects bins, the default name is the clip name.*

To load an FX Chain preset

Do *one* of the following:

- Right-click an effects bin and choose **Load FX Chain Preset** on the pop-up menu. Select the desired FX Chain Preset file (*.fxc) in the **Load FX Chain Preset** dialog box and click **Open**.
- From the **Plug-in** tab of the Browser, under **Audio**, expand the **FX Chain** branch and drag the preset to an effects bin.

ℹ **Note:** *You can automatically extract plug-ins when loading an FX Chain preset. To do so, hold down the SHIFT key while loading the preset. For more information about extracting plug-ins from an FX Chain container, see "To extract plug-ins from an FX Chain container" on page 888.*

⚠ **Caution:** *If you load a SONAR X2 project in an older version of SONAR, SONAR will report the FX Chain as a missing plug-in and the contents of the FX Chain will be unavailable. Resaving the project will permanently remove the FX Chain.*

To rename an FX Chain preset

1. In the Browser, click the **PlugIn** button ⟋ to show the Plug-in Browser.
2. Under **Audio**, expand the **FX Chain** branch.
3. Select the FX Chain, then click the FX Chain name again and type a name.

See:

"Effects chains" on page 882

"FX Chain module" on page 992

"Using the Media Browser" on page 563

"Using the Plug-in Browser" on page 574

"Using the Synth Rack Browser" on page 581

"Keyboard navigation" on page 573

"Browser" on page 559

Using the Synth Rack Browser

The Synth Rack view lets you view, insert, delete, and configure your soft synths. You can also mute, solo, and freeze any active instruments in your projects. Each time you insert a soft synth into your project, a new row appears in the Synth Rack view with the name of the soft synth and its current preset. You can select different presets directly from the Synth Rack.

When a synth is highlighted in the Synth Rack, the corresponding tracks in the Track View and Console View are also highlighted.

You can insert as many copies of the same soft synth as you like; each new copy appears in a new row and has the same name, but has a higher number after the name (ReWire soft synths can only have one copy open). The new higher-numbered name also appears on the menus of Instrument track inputs and MIDI track outputs.

When the Synth Rack is undocked, or docked at the bottom, additional controls become available. These include synth icons and control knobs to control and/or automate parameters.

Synth Rack interface

Figure 192. *Synth Rack Browser*
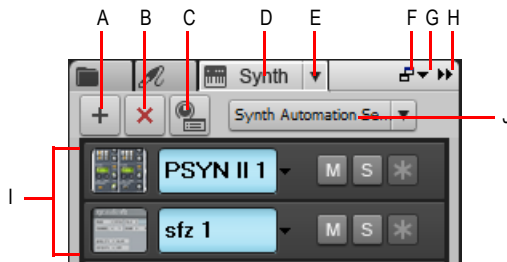
A. Insert Synth B. Delete Synth C. Insert Synth Options D. Show Synth Rack Browser E. Synth Settings menu
F. Dock/undock G. Docking options H. Expand/collapse I. Instrument list J. Synth Automation menu

Figure 193. *Synth control bar*
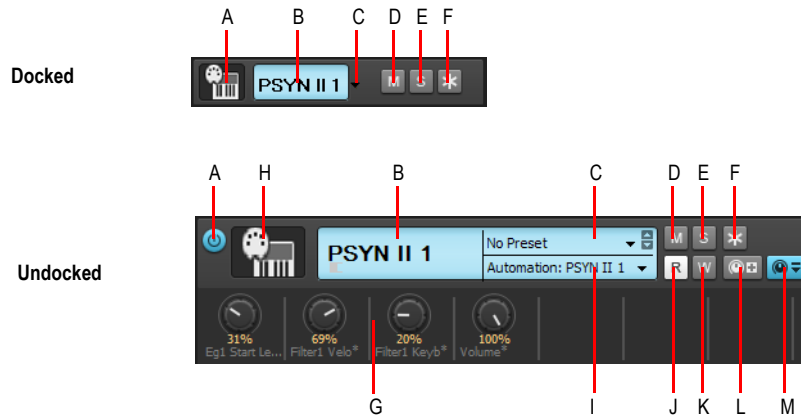
Docked

A   B   C   D E   F

Undocked

A   H   B   C   D   E   F

G   I   J K   L   M

A. Connect/disconnect (only when floating or docked at top or bottom) **B.** *Synth name* **C.** *Preset picker* **D.** *Mute*
E. Solo **F.** *Freeze/unfreeze* **G.** *Automated knobs* **H.** *Synth icon* **I.** *Automation track* **J.** *Automation Read*
K. *Automation Write* **L.** *Assign Controls* **M.** *Show/Hide Assigned Controls*

- **Show Synth Rack Browser** 🎹.   Show the Synth Rack Browser.

- **Synth Settings menu.**   The **Synth Settings** menu lets you insert, delete and freeze the selected soft synth, and specify other related options. The menu contains the following commands:

  - **Insert Synths > Plug-in Layouts > Manage Layouts.**   Opens Cakewalk Plug-in Manager, which lets you create, delete, and edit plug-in layouts.

  - **Insert Synths > Plug-in Layouts > <list of layouts>.**   The **Plug-in Layout** menu lists all layouts stored by Cakewalk Plug-in Manager. Select a layout to change the plug-in list.

  - **Insert Synths.**   This submenu lists all available soft synths. Click the desired soft synth to insert it in the current project and add an Instrument track. You can also preview MIDI files through any active soft synth in the Media Browser.

  - **Insert ReWire Devices.**   This submenu lists all available ReWire devices. Click the desired ReWire device to insert it in the current project and add an Instrument track. You can also preview MIDI files through any active ReWire device in the Media Browser.

  - **Insert Synth Options.**   Opens the **Insert Soft Synth Options** dialog box (see "Insert Soft Synth Options dialog" on page 1626), which lets you specify what happens when you insert a new soft synth.

  - **Synth Properties.**   Opens the user interface for the selected soft synth. You can also double-click an empty space in the synth's Synth Rack row to open the synths user interface.

  - **Replace Synth.**   This submenu lets you replace the selected synth with any other available synth.

- **Delete Synth.**   Deletes the selected soft synth or ReWire device from the current project.

Note 1: *Always close any ReWire applications in their own interfaces before deleting them from SONAR.*

Note 2: *Deleting a soft synth from the Synth Rack view does not delete the tracks associated with the soft synth, but does change the associated MIDI track's output to the next lower-numbered output.*

- **Enable MIDI Output.**   If the selected soft synth can create MIDI data from built-in arpeggiators or other components, select **Enable MIDI Output** if you want to record or redirect this new MIDI data.

- **Freeze Synth** ❄.   Freeze whichever soft synth currently has focus in the Synth Rack. Each synth also has its own **Freeze** and **Thaw** buttons at the end of its individual control strip in the Synth Rack. See "Freeze tracks and synths" on page 858 for more information. Right-click the **Freeze Synth** button to access various freeze options on a pop-up menu.

- **Unfreeze Synth.**   Unfreeze whichever soft synth currently has focus in the Synth Rack.

- **Quick Unfreeze Synth.**   Quick unfreeze whichever soft synth currently has focus in the Synth Rack.

- **Freeze Options.**   Open the **Freeze Options** dialog box, which lets you specify what happens when you freeze a synth.

- **Unload Synth on Disconnect.**   When this option is selected, you can freeze a soft synth or disconnect the synth in the Synth Rack view and free up the memory that the synth was using. With some synths this can be a lot of memory, especially with synths that use samples. Of course, if you remove the synth from your computer's memory, reconnecting or unfreezing the synth will take the same amount of time that it did when you originally loaded the synth.

- **Force MIDI Echo Through Current Track.**   Select this option to force incoming MIDI data to always echo through the current track, even if the current track's **Input Echo** button is in the Off position, and regardless of which synth has focus in the Synth Rack.

- **Insert Synth** ➕.   Insert a new soft synth.

- **Delete Synth** ✖.   Delete the selected soft synth.

- **Properties** ▤.   Open the selected soft synth's property page (only visible when the Browser is floating or docked in the MultiDock).

- **Insert Synth Options** 🔳.   Open the **Insert Soft Synth Options** dialog box, which lets you specify options for new soft synths.

- **Synth Automation menu.** The **Synth Automation** menu lets you specify on which track to display and record automation data for the selected soft synth.**<name of track synth was created with>.** By default, automation data is displayed and recorded on the track the soft synth was created with.

  - **Audio Tracks.** This submenu lets you choose any available track in the project to record and display the selected synth's automation data on.

- **Instrument list.** Each inserted instrument in a project appears in the Instrument list, and shows the following controls:

> **Note:** *Certain controls in the Instrument list are only available when the Synth Rack is undocked or docked at the bottom of the screen.*

  - **Connect/disconnect.** Disconnect a synth, mute all tracks associated with it, and free up memory and CPU cycles.

  - **Synth icon.** The synth icon provides a graphic representation of the soft synth. You can right-click the icon to manage the assigned icon. This control is only available when the Synth Rack is undocked or docked at the bottom.

  - **Synth name.** The default name of the soft synth. To rename the synth, double-click the name, type the desired name and press ENTER.

  - **Preset picker.** The preset picker lets you select any available preset for the soft synth. When the Synth Rack is undocked or docked on the bottom, you can also click the left/right arrows to step through the available presets.

  - **Automation.** The **Automation** list lets you specify on which track to display and record automation data for the soft synth. This list is identical to the **Synth Automation** menu at the top of the Synth Rack. This control is only available when the Synth Rack is undocked or docked at the bottom.

  - **Mute.** Mute/unmute the synth, and all tracks associated with this instance of the synth.

  - **Solo.** Solo/unsolo the synth, and all tracks associated with this instance of the synth.

  - **Freeze/unfreeze.** Freeze/unfreeze the soft synth.

  - **Thaw synth (Quick unfreeze / refreeze).** Quick unfreeze/refreeze the soft synth. This control is only available when the Synth Rack is undocked or docked at the bottom. You can also hold down the SHIFT key and click the **Freeze Synth** button to perform Quick unfreeze / refreeze.

  - **Read.** Enable/disable automation read for the soft synth. This control is only available when the Synth Rack is undocked or docked at the bottom.

- **Write.** Enable/disable automation write for the soft synth. This control is only available when the Synth Rack is undocked or docked at the bottom.
- **Assign Controls.** Lets you choose which parameters in the synth's interface to create control knobs for. This control is only available when the Synth Rack is undocked or docked at the bottom.
- **Show/Hide Assign Controls.** Show/hide any automated knobs you have created with the **Assign Controls** command. This control is only available when the Synth Rack is undocked or docked at the bottom.
- **Automated knobs.** These are knobs you create by using the **Assigned Controls** button. The knobs are displayed below the synth's control bar in the Synth Rack. Automated knobs are only available when the Synth Rack is undocked or docked at the bottom.

See:

Managing instruments in a project

To insert an instrument

1. In the Browser, click the **Browse Synth Rack** button 🎹 .
2. Click the **Synth Settings** button menu, point to **Insert Synths** and select the desired soft synth.

To remove an instrument

1. In the Browser, click the **Browse Synth Rack** button 🎹 .
2. In the Synth Rack, click the soft synth you want to remove.
3. Do *one* of the following:

   - Click the **Delete Synth** button ❌ .
   - Click the **Synth Settings** button menu, then click **Delete Synth**.

   A dialog box appears, asking you to confirm deletion of the instrument. You can also specify if SONAR should delete any associated tracks.

To open an instrument's property sheet

1. In the Browser, click the **Browse Synth Rack** button 🎹 .
2. Click on the desired synth in the Synth Rack to give it focus.
3. Click the **Synth Settings** button menu, then click **Synth Properties**.

💡 **Tip:** *You can also double-click an empty space in the synth's control bar to open its user interface.*

To mute/solo/freeze an instrument

1. In the Browser, click the **Browse Synth Rack** button 🎹 .
2. Click the desired synths **Mute**, **Solo**, or **Freeze** button.

To select an instrument preset

1. In the Browser, click the **Browse Synth Rack** button 🎹 .
2. Click the desired synth's preset picker.

To access assignable control knobs

1. Make sure the Browser is undocked or docked at the bottom of the screen.

2. In the Browser, click the **Browse Synth Rack** button 🎹 .

3. Click the desired synth's **Show/Hide Assigned Controls** button.
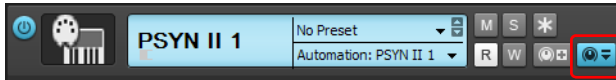
To replace an instrument

1. In the Browser, click the **Browse Synth Rack** button 🎹 .

2. Do *one* of the following:

- Select the synth you want to replace, click the **Browse Synth Rack** button 🎹 drop-down menu and choose **Replace Synth**.

- Click the **PlugIns** tab 🖊 followed by the **Synths** button 🎹 , then drag a synth onto an existing track (audio, MIDI or Instrument) that is connected to the synth.

- In the Track view, right-click a track (audio, MIDI or Instrument) that is connected to the synth, and choose **Replace Synth** on the pop-up menu.

SONAR automatically re-routes any Output and Input controls that were assigned to the old synth.

See:

Using the Synth Rack Browser

AudioSnap (Producer and Studio only)

SONAR's AudioSnap engine and tempo analysis features give you unprecedented rhythmic and tempo control over your audio. Employing sophisticated transient detection technology, the AudioSnap engine automatically analyzes all recorded and imported audio files for rhythmic content to determine where the beats are in the music.

AudioSnap is completely non-destructive, similar to Groove clips and V-Vocal clips. AudioSnap, V-Vocal, and Groove clips are mutually exclusive. Groove clip markers are typically placed at a zero-crossing point before a transient; AudioSnap transient markers are placed where musical changes occur, but may not be exactly at a zero crossing.

What is AudioSnap?

AudioSnap is not a single feature, but rather a collection of different tools that can be used for different tasks. The AudioSnap palette ties it all together in a task-oriented layout.

AudioSnap does several things, in a variety of ways:

• Stretches audio clips to fit project tempo or for quantizing.

• Changes project tempo to fit audio or MIDI clips.

• Copies audio rhythms for groove quantizing or doubling sounds.

Figure 194. *The AudioSnap palette*
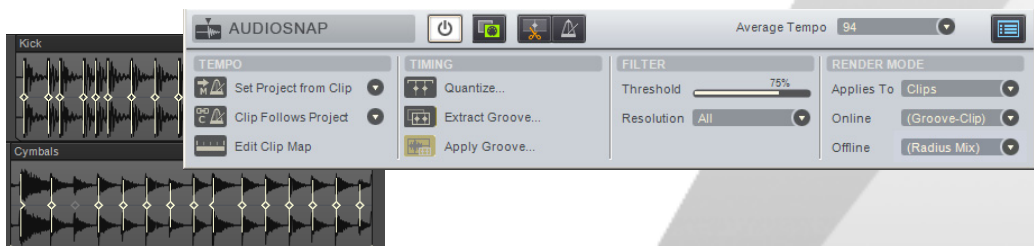
How does it work?

AudioSnap works by finding the *transients* in audio clips. Transients are the areas in an audio clip where the level increases suddenly. These make good locations to shrink, stretch, or split a clip, without changing its sound quality too drastically. SONAR contains a variety of high-quality stretching algorithms for different kinds of material. You can choose a lower-quality algorithm for real-time playback of your edits, and then choose a better algorithm for mixdown or bouncing to track (see "Algorithms and rendering" on page 646).

SONAR lets you define the default online and offline algorithms via the AudioSnap palette, and you can override the default algorithm(s) on a clip-by-clip basis.

Note: *The online algorithm is for preview purposes only during playback. The final audio quality will be greatly improved after the offline algorithm is applied during mixdown/export.*

The transients also make it possible for SONAR to calculate a clip's tempo map (see "Editing a clip's tempo map" on page 613).

Figure 195. *Audio clip.*
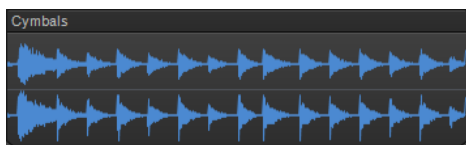
Figure 196. *Audio clip showing transient markers.*

AudioSnap finds transients automatically, but the transient markers don't always appear exactly where you might want them for the kind of editing you want to do. You can edit the markers by moving them to new locations, adding markers, filtering out markers, deleting markers, and promoting markers (protecting them from being filtered). For information about editing transient markers, see "Editing transient markers" on page 597.

Why would I use it?

Here are some common uses for AudioSnap:

- Aligning measure lines and tempo to audio or MIDI tracks that were recorded without a metronome (see "Synchronizing audio and the project tempo" on page 610).
- Fixing timing errors (see "Fixing timing problems in audio clips" on page 617).
- Synchronizing the rhythms of out-of-sync tracks (see "Making multiple clips/tracks groove together" on page 624).

- Doubling existing sounds with other sounds (see "Extracting MIDI timing information from audio" on page 633).
- Changing the tempo of existing projects (see "Changing a project's tempo" on page 616).
- Snapping both audio and MIDI edits to audio beats (see "Snapping edits to audio beats" on page 635).
- Fixing timing errors in multi-track recordings while maintaining phase relationships (see "Adjusting the timing of a multi-track performance while maintaining phase relationships" on page 619).

If you want to edit audio right away with AudioSnap, see "Synchronizing audio and the project tempo" on page 610 and "Fixing timing problems in audio clips" on page 617. If you want to learn more about all the AudioSnap tools and options, see the following links.

See:

"Using global tools on AudioSnap transient markers" on page 592

"Editing transient markers" on page 597

"Using the AudioSnap palette" on page 606

"Synchronizing audio and the project tempo" on page 610

"Fixing timing problems in audio clips" on page 617

"Extracting MIDI timing information from audio" on page 633

"General editing" on page 635

"Using the Pool" on page 643

"Algorithms and rendering" on page 646

Using global tools on AudioSnap transient markers

At the heart of AudioSnap are transient markers. SONAR automatically detects transients for all audio clips in your project.Although you can also edit transient markers with the Select tool, Move tool, Timing tool, Split tool, Freehand tool, Erase tool and Mute tool, this chapter focuses on the Smart tool since it is the easiest way to edit transient markers.

In order to edit audio transient markers, you must assign a track's Edit Filter to **Audio Transients** (see "Selecting the data type to edit" on page 416).

For more information about using different tools on AudioSnap transient markers, see:

"Using the Smart tool on AudioSnap transients" on page 427

"Using the Select tool on AudioSnap transients" on page 432

"Using the Move tool on AudioSnap transients" on page 436

"Using the Timing tool on AudioSnap transients" on page 443

"Using the Split tool on AudioSnap transients" on page 447

"Using the Freehand tool on AudioSnap transients" on page 450

"Using the Erase tool on AudioSnap transients" on page 459

"Using the Mute tool on AudioSnap transients" on page 462

To enable the Smart tool

1. Select the Smart tool ⭐ in the Control Bar.

2. Assign the desired track's Edit Filter control to **Audio Transients**.

   All audio clips show transient markers and the AudioSnap palette appears.

   ℹ️ **Note:** *Displaying transient markers does not mean that AudioSnap is enabled. AudioSnap is only active on a clip when at least one transient marker has been stretched.*

   If you select another data type in the Edit Filter, transient markers will no longer be visible and the AudioSnap palette closes.

The following table describes how the Smart tool behaves when interacting with transient markers and clips.

Action	On transient marker	On clip
Click	Selects the transient marker.	Selects the clip and opens the AudioSnap palette.
Right-click	Opens the transient marker context menu.	Opens the AudioSnap context menu.

Table 114. *Smart tool actions*

Action	On transient marker	On clip
Double-click	Selects transients from other tracks (from selected clips) that fall within a certain window of time of the transient the user is clicking on. If no clips are selected, only non-hidden tracks are affected.	--
Drag	Non-proportional stretch with selected transients. **Note:** You can drag a marker from either the head or the line of the marker. Drag the line to stretch a marker and drag the head to move a marker.	Lasso selects transient markers.
Hold down the CTRL key and drag	Proportionally stretches selected transients.	Lasso selects transients to add to the current selection.
Hold down the CTRL key and click	Adds transient marker to current selection.	--
Hold down the CTRL key and double-click	Like double-click, but adds transients to the current selection.	--
Hold down the CTRL and SHIFT keys and double-click	Like double-click, but extends the range of selected transients.	--
Hold down the ALT key and click	--	Inserts a new transient marker.

Table 114. *Smart tool actions*

Figure 197. *Smart tool hotspots on AudioSnap transients.*

Hotspot	Default action	Double-click	+ALT	+CTRL
A	Drag transient marker line to stretch selected transients (non-proportional stretch)	Select all adjacent transient markers in other tracks		Drag transient marker line to stretch selected transients proportionally
B	Drag transient marker handle (diamond) to move transient marker (non-stretch)			
C	Lasso select transients		Insert new transient marker	
D	Lasso select transients across clips and tracks			

Table 115. *Using the Smart tool on AudioSnap transients clips*

For more information about editing transient markers, see "Editing transient markers" on page 597.

Transient marker context menu

The transient marker context menu gives you quick access to commands related to time stretching and tempo mapping. The following menu commands are available when you right-click a transient marker:

• **Select markers.** Use this submenu to select transient markers that meet specific criteria.

• **Set project tempo from clip.** This command copies the clip's tempo map to the project's global tempo map. This allows the project's measure boundaries to align with the audio clip. Whenever the project's tempo map is generated from a clip, the clip's **Lock Position** property is enabled automatically.

• **Set clip tempo from project.** This command copies the project's tempo map to the clip's tempo map. This allows the project's measure boundaries to align with the audio clip.

• **Clips follow project tempo.** This command forces the clip to follow the project's global tempo map.

> **Note:** *The **Clips follow project tempo** command only works on clips that are configured to use musical time (the **Time Base** property is set to **Musical** in the Clip Inspector).*

• **Edit clip tempo map.** Each audio clip has an internal tempo map. This command exposes controls that allow you to edit a clip's tempo map. For details, see "Editing a clip's tempo map" on page 613.

• **Merge and Lock Markers.** This command combines all transient markers on all selected tracks, so that all selected tracks share identical transient markers. The clip positions are also

AudioSnap (Producer and Studio only)
Using global tools on AudioSnap transient markers

locked. This will ensure that phase relationships are maintained when quantizing or moving clips across multiple tracks. When using the Smart tool to drag transient markers, all transient markers at exactly the same point in time on selected clips move together as a group.

- **Save as Groove.**   This command opens the **Define Groove** dialog box, which lets you save the groove to a file. The groove can then be applied to other audio or MIDI clips.

- **Copy as MIDI.**   This command saves the selected audio as a MIDI clip, which you can paste from the Clipboard into a MIDI track. You select the MIDI note that the transients in the audio clip will be converted to in the **AudioSnap Options** dialog box, which opens when you click the **Options** button.

- **Quantize.**   This command opens the **Quantize** dialog box, which has options to quantize **AudioSnap Beats** and **Audio Clip Start Times**, and also to set automatic crossfade options.

- **Groove Quantize.**   This command opens the **Groove Quantize** dialog box, which has an option to quantize **AudioSnap Beats**, and controls to set automatic crossfade options.

- **Pool > Add MBT to pool.**   The Track view Time Ruler can be added to the Pool (see "Using the Pool" on page 643). This command adds the current Musical Time snap resolution to the pool, and also displays dotted pool lines in the Clips pane. This can be useful as either a basic visual guide, or for adding the Musical Time to an extracted groove, or to fill in any transients that may be "missing" in a syncopated or sparse section. In the Control Bar's Snap module, set the **Musical Time** value to the resolution you would like to add to the Pool.

- **Pool > Add clip to pool.**   This command adds or deletes the clip's transient markers from the Pool. The markers do not have to be visible to be added to the Pool. See "Using the Pool" on page 643 for more information.

- **Pool > Show pool lines.**   This command hides or shows the Pool lines.

- **Pool > Apply transient pool markers.**   This command insert new transient markers that correspond to the Pool markers.

- **Pool > Quantize to pool.**   This command quantizes the selected clips to the Pool.

- **Enable AudioSnap.**   This command enables or disables AudioSnap on selected audio clips.

AudioSnap section in the Clip Inspector

In addition to the AudioSnap palette, you can also edit a clip's AudioSnap settings in the Clip Inspector. For details, see "Properties Inspector - Clip Properties" on page 546.

Figure 198. *The AudioSnap section in the Clip Inspector*
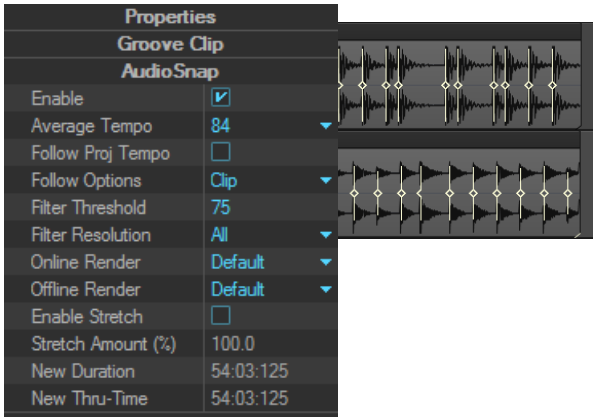
See:

Editing transient markers

Transient markers show where the transients of a clip are (areas where the level increases suddenly), and are used to edit the timing of audio clips.

AudioSnap finds transients automatically, but the transient markers don't always appear exactly where you might want them for the kind of editing you want to do.

Most AudioSnap commands edit transient markers automatically as a result of an editing operation, but sometimes you achieve the best results by editing the markers manually.

You can edit the markers by moving them to new locations, adding markers, filtering out markers, deleting markers, and promoting markers (protecting them from being filtered).

Figure 199. *Transient markers*

See:

To select a transient marker

1. Select the Smart tool ★ in the Control Bar.
2. Assign the track's Edit Filter control to **Audio Transients**.
3. Click the desired transient marker.

   The marker is highlighted.

To select/deselect all transient markers in a clip

1. Select the Smart tool ★ in the Control Bar.
2. Assign the track's Edit Filter control to **Audio Transients**.
3. Right-click a clip and choose **Select Markers > All** or **Select Markers > None** on the pop-up menu.

To select multiple adjacent transient markers

1. Select the Smart tool ★ in the Control Bar.
2. Assign the track's Edit Filter control to **Audio Transients**.
3. Do *one* of the following:
   - Draw a lasso around the desired transient markers.
   - Click the first marker in the range, hold down the SHIFT key, and click the last marker in the range.

   The markers are highlighted.

To select multiple discontiguous transient markers

1. Select the Smart tool ★ in the Control Bar.
2. Assign the track's Edit Filter control to **Audio Transients**.
3. Hold down the CTRL key and click the desired transient markers.

   The markers are highlighted.

To select the same transient in multiple clips

1. Select the clips that you want to edit.
2. Select the Smart tool ★ in the Control Bar.
3. Assign the track's Edit Filter control to **Audio Transients**.
4. Double-click a transient marker in any selected clip.

All transient markers near the same position (within a defined time window) in all selected clips are selected.

Note 1: *If no clips are selected, transient markers from all clips are eligible to become selected.*

Note 2: *To specify the size of the time window, click the **AudioSnap Options** button* 📧 *in the AudioSnap palette to open the **AudioSnap Options** dialog box, then specify the desired **Pool Transient Window** value.*

To extend a multi-track marker selection

When editing multi-track instruments, you may want to simultaneously adjust a range of transients across multiple tracks. In order to do so, you need to select the tracks and time region you want to edit.

1. Select the clips that you want to edit.
2. Select the Smart tool ⭐ in the Control Bar.
3. Assign the track's Edit Filter control to **Audio Transients**.
4. Double-click a transient marker in any selected clip.

   All transient markers near the same position (within a defined time window) in all selected clips are selected.
5. Hold down the CTRL key and double-click another transient marker in any selected clip.

   A range or transient markers are selected across all selected clips.

To select all similar transient markers in a clip

1. Select the Smart tool ⭐ in the Control Bar.
2. Assign the track's Edit Filter control to **Audio Transients**.
3. Right-click the desired clip and choose from the following options from the pop-up menu:
   - **Select Markers > Moved**
   - **Select Markers > Stretched**
   - **Select Markers > Disabled**
   - **Select Markers > Enabled**
   - **Select Markers > Promoted**
   - **Select Markers > User**

Selecting all markers of a certain type makes it easy to perform operations such as resetting only the stretched markers, or promoting only the disabled markers.

To move a transient marker (without stretching audio)

• Drag the marker handle (diamond).

Figure 200. *To move a transient marker, drag the marker head (diamond)*
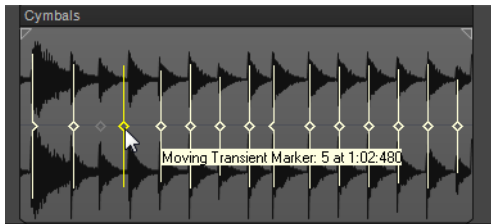
To drag a transient marker and stretch audio

• Drag the marker line.

Figure 201. *To stretch a transient, drag the marker line*
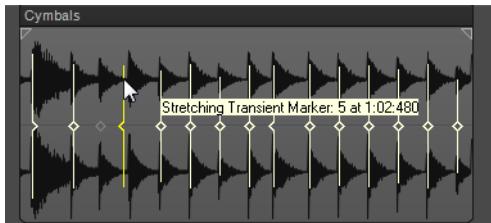
When you drag and drop the line of a marker, the marker moves to the place where you drop it, and the audio that is located between the dragged marker and the following marker stretches.

Note: *If you stretch a transient marker, AudioSnap is enabled on the clip.*

You can find additional marker editing commands on the transient marker context menu.

To stretch multiple transient markers in a clip

1. Select the desired transient markers.
2. Drag any of the selected transient markers.

To stretch multiple transient markers in a clip proportionally

1. Select the desired transient markers.
2. Hold down the CTRL key and drag any of the selected transient markers.

To reset transient markers

1. Select all transient markers you want to reset.

2. Right-click any selected transient marker and select **Reset** from the pop-up menu.

To disable a transient marker

• Right-click the marker you want to disable and select **Disable** from the pop-up menu.

To delete a transient marker

• Right-click the marker you want to reset and select **Delete Marker** from the pop-up menu.

> **Note:** *You can only delete user-created transient markers.*

To insert a new transient marker

1. Select the Smart tool ⭐ in the Control Bar.

2. Assign the track's Edit Filter control to **Audio Transients**.

3. Hold down the ALT key and click where you would like to insert a new transient marker.

A new transient marker is inserted.

or

1. Disable the **Snap to Grid** button ▦ (or press the N key) if the place you need the marker is not on a convenient snap location.

2. Select the clip or clips that need the marker.

3. Move the Now Time to the place where you want the marker.

4. Press CTRL+ALT+I.

The marker appears in the selected clip(s) and displays a hollow square to show that it is a manually created marker:

> **Note:** *You can also add markers at Pool lines with a single command. See "To add markers at Pool lines" on page 638.*

To copy transient markers from one track to another track

1. Select the Smart tool [★] in the Control Bar.

2. Assign the track's Edit Filter control to **Audio Transients**.

   The AudioSnap palette appears and all audio clips show transient markers.

3. Select the target clip (the clip that you want to copy markers to) and drag the **Threshold** slider in the AudioSnap palette until all transient markers are disabled.

4. Select both the source clip (the clip you want to copy markers from) and the target clip.

5. Right-click either of the selected clips and select **Merge and Lock Markers** from the pop-up menu.

   The transient markers on the source clip are copied to the target clip.

To enable/disable transient markers

It's sometimes necessary to disable some of the markers so you can extract a clearer groove, or snap or quantize data to only the more important markers. Disabling markers is a way to thin the data so that it creates a clearer time grid to work with. It also avoids stretching any transients that you don't want to stretch as a result of quantizing audio. Disabled markers are not deleted, but are ignored by all AudioSnap functions. Only the head of a disabled marker remains visible.

There are several ways to disable/enable the transient markers in a selected clip:

• **The Resolution drop-down list in the AudioSnap palette.** The selected **Resolution** value lets you disable markers based on their time location. This clears out unwanted markers to make editing easier. Larger values create a bigger time window, based on musical time values, which preserves markers that are closest to the displayed musical time value, and disables others.

> **Note:** *The **Resolution** setting will only work reliably if the audio clip's internal tempo map is accurate. For details, see "Editing a clip's tempo map" on page 613.*

• **The Threshold slider in the AudioSnap palette.** This slider works by disabling markers based on their **volume**. Dragging the slider to the right creates a larger volume threshold, so that transients that fall below the current volume threshold that the slider defines are disabled.

• **The transient marker context menu.** You can right-click a marker, and choose **Disable** from the pop-up menu.

• Press CTRL+ALT+D to disable or re-enable all selected markers.

> **Tip:** *If you want to protect a marker from being disabled by the **Sensitivity** slider or the **Threshold** slider, you can right-click the marker and enable the **Promote** option from the transient marker pop-up menu. You can also promote a disabled marker to ensure that it never becomes enabled by the **Sensitivity** slider.*

To navigate to the next/previous transient (TAB to transients)

- Do *one* of the following:
    - To move the Now Time to the next transient, press TAB.
    - To move the Now Time to the previous transient, press SHIFT+TAB.

Note: *TAB to transients is selection-based, which means tabbing will go to the next/previous transient amongst all selected clips. If there is no selection, tabbing operates on the current track.*

For more information, see "TAB to transients" on page 362.

Transient marker appearance

Each transient marker changes its appearance when it is selected, moved, new, disabled, or has certain other characteristics.

The following table lists the variations in appearance that a marker can display.

Marker appearance		Description
	Soft yellow hollow diamond shape	Standard active marker or promoted marker. A promoted marker is never disabled by the **Resolution** or **Threshold** controls in the AudioSnap palette.
	Solid diamond shape	User inserted marker.
	Bright yellow	Selected marker.
	Grey; only the head of the marker is visible	Disabled marker.
	Arrow	Stretched marker. Any given transient can only be stretched or shrunk to 25-400% of original length. A small arrow indicates in which direction the audio has been stretched. **Note**: An important difference between quantizing MIDI and audio is that two or more audio transients can never collapse on top of each other like MIDI notes can.

Table 116. *Transient marker shapes and colors*

Transient marker context menu

The transient marker context menu appears when you right-click a transient marker. The command you choose from this menu acts on the marker that you right-click, and most commands also act on any markers that are selected. The following table describes each command.

Command	Description
Reset	Moves a marker back to its original position. Shortcut for selected markers is CTRL+ALT+R.
Disable	The marker is ignored. Shortcut for selected markers is CTRL+ALT+D.
Promote	By "promoting" a marker, you can set emphasis on certain beats and prevent the marker from becoming disabled when you adjust the **Resolution** or **Threshold** controls. Shortcut for selected markers is CTRL+ALT+P.
Delete marker	Only available for manually added markers; the command is greyed-out if you right-click an automatically generated marker. Shortcut for selected markers is CTRL+ALT+BACKSPACE.
Snap (stretch) to nearest transient	Moves marker to nearest Pool marker. **Note:** You can also snap transient markers to the time ruler and other transient markers. For details, see "To add the Time ruler to the Pool" on page 644 and "Snapping edits to audio beats" on page 635.
Snap (stretch) backward	Moves marker backward to nearest Pool marker.
Snap (stretch) forward	Moves marker forward to nearest Pool marker.
Stretch to	Moves the marker to the project time that you enter in the **To Time** field, and stretches the audio that is between the previous and next markers.
Move to	Moves the marker to the project time that you enter in the **To Time** field.
Audition Beat	Auditions the clip up to the next marker. Default shortcut is CTRL+SHIFT+SPACEBAR.
Split Beat	Splits the beat at the marker.
AudioSnap Palette	Opens the AudioSnap palette. Shortcut is A to show (but not hide) the palette.

Table 117. *Transient marker context menu commands*

See:

"Using global tools on AudioSnap transient markers" on page 592

"Using the AudioSnap palette" on page 606

"Fixing timing problems in audio clips" on page 617

Editing transient markers

Enabling/disabling AudioSnap

You can enable/disable AudioSnap processing on a clip-by-clip basis. Transient markers are always available to be edited, but AudioSnap is not active on a clip unless at least one transient marker has been stretched.

By disabling AudioSnap on a clip that has stretched transient markers, you can compare how the clip sounds with and without AudioSnap processing. Disabling AudioSnap can also temporarily free up CPU processing power.

To enable or disable AudioSnap

1. Select the audio clips you want to enable/disable AudioSnap on.

2. Do one of the following:

   - Click the **Bypass** button [⏻] in the AudioSnap palette.

   - Click the **Enable** check box in the Clip Inspector's **AudioSnap** section.

   AudioSnap is enabled/disabled on the selected audio clips, and transient markers are shown/hidden.

   Note: *AudioSnap is automatically enabled on a clip if you stretch a transient marker on the clip.*

See:

Using the AudioSnap palette

The AudioSnap palette provides easy access to time stretching and tempo-related tools.

Except for the AudioSnap enable/disable command, the AudioSnap palette's controls apply to the currently selected audio clip or clips.

To show the AudioSnap palette

• Do *one* of the following:

  • On the **Views** menu, click **AudioSnap Palette**.

  • Press A.

or

1. Select the Smart tool ⭐ in the Control Bar.

2. Assign the track's Edit Filter control to **Audio Transients**.

3. Click an audio clip that you want to edit.

The AudioSnap palette contains the following controls.

Figure 202. *AudioSnap palette controls*
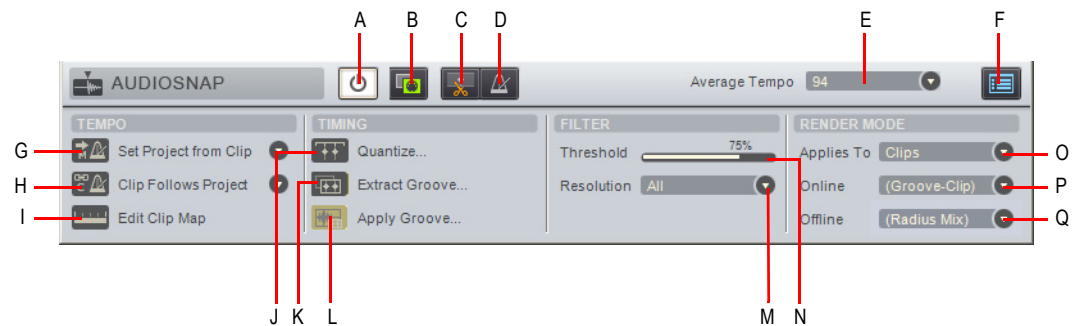
A. Bypass B. Copy as MIDI C. Split into clips by transient markers D. Toggle sample/musical based clip start time E. Average Tempo F. AudioSnap properties G. Set project tempo from clip H. Clip follows project tempo I. Edit clip tempo map J. Quantize K. Extract Groove L. Apply Groove M. Resolution N. Threshold O. Applies to P. Online render mode Q. Offline render mode

Toolbar section

• **Bypass** ⏻ .   This button enables or disables AudioSnap on selected audio clips.

• **Copy as MIDI** 📷 .   This button saves the selected audio as a MIDI clip, which you can paste from the Clipboard into a MIDI track. You select the MIDI note that the transients in the audio clip will be converted to in the **AudioSnap Options** dialog box, which opens when you click the **Options** button.

- **Split Beats into Clips** ![icon]. This button splits a clip at each transient marker into multiple clips.**Clip Timebase (Absolute or Musical)** ![icon] **/** ![icon]. There are two timebase settings for a clip in SONAR:

  - **Musical (default)** ![icon]. Musical Timebase means the clip start position will follow Musical Time (MIDI Tick).

  - **Absolute** ![icon]. Absolute Timebase means that the clip start time will follow Absolute Time (SMPTE).

- **Average Tempo.** This list shows the average tempo candidates: original, 0.5x and 2x. SONAR will do its best to detect the correct average tempo, but a clip can often have multiple potential tempos (60 BPM, 120 BPM, 240 BPM, etc.). If SONAR is unable to detect a tempo, **Average Tempo** will be set to **Original**, which is the project's tempo at the location the clip was recorded or imported. If you change the **Average Tempo** setting, all clip tempo changes are adjusted to scale.

  This list also contains the **Set Clip Tempo From Project** command, which copies the project's tempo map to the clip's tempo map. This allows the project's measure boundaries to align with the audio clip.

- **AudioSnap Options** ![icon]. This button opens the **AudioSnap Options** dialog box. This dialog box has its own Help topic, which appears when you click its **Help** button.

Tempo section

- **Set Project Tempo From Clip** ![icon]. This button copies the clip's tempo map to the project's global tempo map and automatically triggers the **Clip Follows Project Tempo** command. This allows the project's measure boundaries to align with the audio clip. The drop-down list lets you specify at which resolution the clip's tempo map should be copied to the project tempo. The options are as follows:
  - Beats
  - Measures (default)
  - Clip

- **Clip Follows Project Tempo** ![icon]. This button forces the clip to follow the project's global tempo map. The drop-down list lets you specify at which resolution the clip should follow tempo changes. The options are as follows:
  - Beats
  - Measures
  - Clip (default)

![info icon] **Note:** *The **Clips follow project tempo** command only works on clips that are configured to use musical time (the **Time Base** property is set to **Musical** in the Clip Inspector).*

- **Edit Clip Tempo Map** [icon]. Each audio clip has an internal tempo map. This button exposes controls that allow you to edit a clip's tempo map. For details, see "Editing a clip's tempo map" on page 613.

Timing section

- **Quantize** [icon]. This button opens the **Quantize** dialog box, which has options to quantize **AudioSnap Beats** and **Audio Clip Start Times**, and also to set automatic crossfade options.

- **Extract Groove** [icon]. This button adds the selected clip's transients to the Pool (see "Using the Pool" on page 643) and shows vertical Pool lines. To apply the pool (groove) to another clip, select the desired clip and click the **Apply Groove** button. To clear the Pool, click the **Extract Groove** button again.

[icon] **Note:** *If an existing Pool exists when you click the **Extract Groove** button, the existing Pool will first be cleared.*

- **Apply Groove** [icon]. This button applies the currently extracted groove (Pool) to the selected clips, clears the Pool and releases the **Extract Groove** button. See also "To quantize an audio clip to another audio clip (Quantize to Pool)" on page 627.

Filter section

- **Threshold.** This slider is available when a clip's transient markers are showing. The slider disables markers based on their volume. This clears out unwanted markers to make editing easier. Dragging the slider to the right creates a bigger volume threshold, which disables markers that are fall below that threshold. Works on selected clips.

- **Resolution.** This drop-down list is available when a clip's transient markers are showing. The selected **Resolution** value lets you disable markers based on their time location. This clears out unwanted markers to make editing easier. Larger values create a bigger time window, based on musical time values, which preserves markers that are closest to the displayed musical time value, and disables others. Works on selected clips.

Render mode section

- **Applies To.** This drop-down menu lets you choose whether any changes to the **Online** and **Offline** settings apply to clips, tracks, or the default settings. The choices in the drop-down menu are as follows:

  - **Clips.** When selected, the **Online** and **Offline** render mode settings apply to any selected clips. The **Online** and **Offline** lists display the current render modes for the selected clip. If you select multiple clips that have different render modes, the **Online** and **Offline** lists display **(Multi)**. If the selected clip has inherited render mode settings from the track or from the **Default Settings** settings, the **Online** and **Offline** lists display the inherited render mode in parenthesis.

  - **Tracks.** When selected, the **Online** and **Offline** render mode settings apply to all current and future clips in the selected tracks.

- **Default Settings.** When selected, the **Online** and **Offline** render mode settings apply to the **Default (track/global)** render mode.

- **Online.** This choice determines what stretch algorithm is used during real-time playback. The **Percussion** options works better than the **Groove Clip** option on percussive material, especially if the stretching is by more than a few beats per minute. For more information about render modes, see "Algorithms and rendering" on page 646.

Note: *The **Online** render mode is for preview purposes only during playback. The final audio quality will be greatly improved after the **Offline** render mode is applied during mixdown/export.*

- **Offline.** This drop-down menu lets you choose the algorithm that is used when you export or freeze stretched audio. The choices in the drop-down menu are as follows:

  - **Groove clip.** This choice works faster, using less processing power.
  - **iZotope Radius Mix.** This is better for clips containing polyphonic, stereo data.
  - **iZotope Radius Mix Advanced.** This choice is similar to **iZotope Radius Mix**, but exposes a **Smoothing** slider that adjust how much detail to preserve.
  - **iZotope Radius Solo.** This is better for clips containing monophonic, solo instruments.
  - **Percussion.** This is the best choice for percussion sounds.

AudioSnap palette auto load

```
AutoLoadAudioSnapPalette=<0 or 1>, default = 1
```

By default, the AudioSnap palette appears automatically whenever you enable AudioSnap on a clip. If you prefer to never auto-show the AudioSnap palette, you can change this behavior by adding a variable to the `Cakewalk.ini` file.

This variable should be set in the `[WinCake]` section. For example:

```
[WinCake]
```
```
AutoLoadAudioSnapPalette=0
```

See:

Synchronizing audio and the project tempo

There are many reasons why you may want to synchronize audio clips with the project tempo. The following list presents a few common examples.

AudioSnap provides two ways to quickly synchronize audio and the project tempo map:

- **Applying an audio clip's internal tempo map to the project's global tempo map.** Use this method if you want the project tempo to match an audio clip's tempo and have audio beats aligned with the project's time ruler.

  This is useful in the following scenarios:

  - If you recorded an audio track without using the metronome, and you want the project's measure and beat boundaries to align with the audio. For example, you may have recorded an audio track that you would like to use as the tempo reference when recording additional tracks.
  - If you want both audio and MIDI edits to snap to audio beats.
  - If you want to use the **Quantize** and **Groove Quantize** commands on audio clips, and have audio beats quantized correctly.
  - If you want to remix an existing song that has been imported into SONAR (from an audio CD or MP3 file, etc.). In order to add new drum loops and MIDI instruments that play in time with the original song, you need to create a tempo map from the original song.

  For details, see

- **Applying the project's tempo to a clip's tempo map.** Use this method if you want a clip to follow the project tempo.

  This is useful in the following scenarios:

  - If you want to synchronize new audio with existing audio.
  - If you want to tighten up a new audio track so it fits well with the timing and tempo of an existing track.
  - If you want to globally change the project's tempo after audio has been recorded.

  For details, see

How does it work?

Each audio clip has an internal tempo map, which makes it possible to synchronize the audio clip with the project's global tempo map (see "Editing a clip's tempo map" on page 613).

SONAR automatically creates a tempo map for each audio clip. In some cases, SONAR can detect the wrong tempo. For example, SONAR might detect a tempo of 120 BPM when the actual tempo is 240 BPM, or a beat may be mapped to the wrong transient. You can easily remap the tempo map, if necessary.

You should make sure a clip's internal tempo map is correct before using any of the tempo-related commands in the AudioSnap palette. For details, see "Editing a clip's tempo map" on page 613.

To sync the project tempo to an audio clip

1. Select the audio clip(s) that has the desired tempo map.
2. Press A to open the AudioSnap palette.
3. Click the **Set Project Tempo From Clip** button 🖈📐 on the AudioSnap palette.

   The clip tempo map is copied to the project tempo map so the tempo maps are identical.

   > **Note 1:** *The **Set Project Tempo From Clip** drop-down list lets you specify at which resolution the clip's tempo map should be copied to the project tempo. The options are as follows:*
   >
   > - *Beats*
   > - *Measures (default)*
   > - *Clip*

   > **Note 2:** *If multiple audio clips have their **Clip Timebase** property set to **Musical**, changing the project tempo will affect the relative positions of the audio clips. When using the **Set Project Tempo from Clip** command, SONAR will offer to convert the timebase to **Absolute**.*

   If you need to align the project tempo with freely played MIDI notes, see "To sync the project tempo to freely played MIDI" on page 728.

To sync an audio clip to the project tempo

1. Select the audio clip(s) that you want to follow the project tempo.
2. Press A to open the AudioSnap palette.
3. Click the **Clip Follows Project Tempo** button 📐 on the AudioSnap palette.

   The clip is synchronized to the project's tempo map.

   > **Note:** *If the audio clip does not play back at the expected tempo, the clip might not have an accurate internal tempo map. For details about editing a clip's tempo map, see "Editing a clip's tempo map" on page 613.*

To copy the project tempo to an audio clip's tempo map

1. Configure the project's tempo as desired (either specify the tempo manually, or extract the tempo from another audio clip by using the **Set Project Tempo from Clip** button ⬛ on the AudioSnap palette).

2. Select the audio clip(s) that you want to follow the project tempo.

3. Press A to open the AudioSnap palette.

4. Click the **Average Tempo** box on the AudioSnap palette and select **Set Clip Tempo From Project** on the drop-down menu.

   The global project tempo map is copied to the clip tempo map so the tempo maps are identical.

   ℹ️ **Note:** *AudioSnap will always attempt to find the tempo of any clip recorded or imported into SONAR. While several possible tempos are normally generated, in some cases AudioSnap may be unable to detect the correct tempo or may not detect a tempo at all. This can occur if the source material is highly compressed or does not contain transient markers on all actual beats.*

   If AudioSnap is unable to detect a tempo from the clip, new transient markers are inserted on each beat corresponding to the project's global tempo map.

   If AudioSnap detects possible tempos for the clip, existing transient markers (that appear within a defined window of the project's beats) are reassigned to nearby beat markers on the clip's tempo map.

See:

Editing a clip's tempo map

Each audio clip has an internal tempo map, which makes it possible to synchronize the audio clip with the project's global tempo map (see "Editing a clip's tempo map" on page 613).

SONAR automatically creates a tempo map for each audio clip. In some cases, SONAR can detect the wrong tempo. For example, SONAR might detect a tempo of 120 BPM when the actual tempo is 240 BPM, or a beat may be mapped to the wrong transient. You can easily remap the tempo map, if necessary.

SONAR provides a convenient graphical interface for editing a clip's tempo map.

You should make sure a clip's internal tempo map is correct before using any of the tempo-related commands in the AudioSnap palette.

The following figure shows what a SONAR-generate clip tempo map might look like.

Figure 203. *You can edit the internal tempo map of each audio clip*
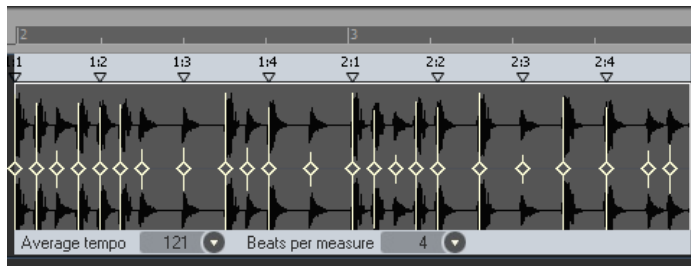
The following controls are available when editing a clip's tempo map:

- **Beat markers.**   Each detected beat has a corresponding beat marker. You can remap a beat marker by dragging the marker to any active transient marker. When a beat marker has been moved, it turns red and becomes "anchored" to the assigned transient marker. An "anchored" beat marker is a marker that has been edited as opposed to a beat that SONAR detected. To "un-anchor" a beat marker, double-click the marker.

- **Average Tempo.**   This list shows the average tempo candidates: original, 0.5x and 2x. SONAR will do its best to detect the correct average tempo, but a clip can often have multiple potential tempos (60 BPM, 120 BPM, 240 BPM, etc.). If SONAR is unable to detect a tempo, **Average Tempo** will be set to **Original**, which is the project's tempo at the location the clip was recorded or imported. If you change the **Average Tempo** setting, all clip tempo changes are adjusted to scale.

  This list also contains the **Set Clip Tempo From Project** command, which copies the project's tempo map to the clip's tempo map. This allows the project's measure boundaries to align with the audio clip.

- **Beats per measure.**   This list lets you specify the number of beats per measure. The value range is **2** to **14**, and the default value is **4**.

To edit a clip's tempo map

1. Select the clip or clips you want to edit.

2. Click the **Edit clip tempo map** button ▭▭ on the AudioSnap palette.

   A simple tempo map guide appears above the clip, indicating where SONAR has mapped the bars/beats of the clip.

3. If the **Average Tempo** list does not show the correct tempo, select the correct tempo.

4. If the **Beats per measure** box does not show the correct number of beats, specify the correct number of beats per measure.

5. Starting from the beginning of the clip, inspect the beat markers above the clip. If any beat marker is mapped to the wrong transient, drag the beat marker to the correct transient.

Figure 204. *Drag beat markers to edit the clip tempo map*
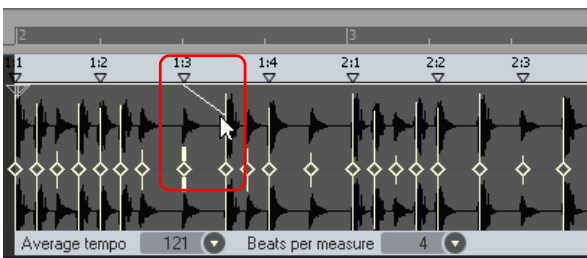
Note 1: *Beat markers can only be dragged to active transient markers. If you need to drag a beat marker to a position that doesn't have a corresponding transient marker, first insert a new transient marker at the desired position. For details, see "To insert a new transient marker" on page 601.*

*You can also use the **Merge and Lock Markers** command to merge transient markers from other tracks. This is useful, for example, if one track contains beats 1 and 3 and another track contains beats 2 and 4. For details, see "To copy transient markers from one track to another track" on page 602.*

Note 2: *If you hold down the CTRL key when you drag a beat marker to the left, the original beat marker and all subsequent beat markers will be renumbered accordingly.*

If you hold down the CTRL key when you drag a beat marker to the right, all subsequent beat markers will be moved by the same number of transient markers.

The clip's tempo map is recalculated and the dragged beat marker turns red to indicate it has been "anchored" to a new transient. An "anchored" beat marker is a marker that has been edited as opposed to a beat that SONAR detected. To "un-anchor" a beat marker, double-click the marker.

If a beat marker is dragged to a transient marker that is already assigned to a later beat marker, SONAR will automatically re-number all subsequent beat markers accordingly.

A beat marker cannot be dragged to an earlier transient marker if that transient is already assigned to a beat marker.

6. To hide the tempo map guide, click the **Edit clip tempo map** button ▦ on the AudioSnap palette again.

💡 **Tip:** *You can also enable/disable **Edit clip tempo map** from the transient marker context menu.*

To audition an audio clip when editing the clip tempo map

When you are editing a clip's tempo map, you may frequently need to audition the audio to make sure you are positioning the beat markers at the correct transients.

1. Right-click the clip tempo map (above the clip) where you want to audition the clip, and keep the right mouse button pressed.

SONAR creates a one-measure selection, starting from one measure before the position clicked. The selected time will gradually increase the longer you keep the mouse button pressed.

2. Release the right mouse button.

SONAR auditions the selection.

See:

Changing a project's tempo

Changing a whole project's tempo is simple with AudioSnap, if the tempo change is not drastic.

Before you change the global tempo of a project that contains audio, you must first make sure the audio clips are configured to follow tempo changes.

After you change the tempo, you may want to bounce some or all of the tracks to new tracks with the Radius algorithms to correct any unwanted change to each track's sound.

To change a project's tempo

1. Use the **File > Open** command to open the desired project.

2. Use the **Edit > Select > All** command.

3. Press A to open the AudioSnap palette.

4. Zoom in (or press F) to get a better look at your clips.

5. With all clips still selected, enable the **Clip Follows Project Tempo** button ⬚⬚ in the AudioSnap palette.

> **Note:** *The **Clips follow project tempo** command only works on clips that are configured to use musical time (the **Time Base** property is set to **Musical** in the Clip Inspector).*

   All the clips display the **Auto Stretch** icon ⬚, and will now conform to any new or future tempo changes.

6. In the Control Bar's Transport module, click the **Tempo** value 105.00 , type the desired tempo value, and press ENTER.

   All the tracks stretch to conform to the new tempo. Listen to the project as a whole, and also solo each track to hear how different the sound is after stretching.

See:

"Using global tools on AudioSnap transient markers" on page 592

"Editing transient markers" on page 597

"Using the AudioSnap palette" on page 606

"Synchronizing audio and the project tempo" on page 610

"Fixing timing problems in audio clips" on page 617

"Extracting MIDI timing information from audio" on page 633

"General editing" on page 635

"Using the Pool" on page 643

"Algorithms and rendering" on page 646

Fixing timing problems in audio clips

AudioSnap provides several ways to fix timing errors in audio clips:

- You can drag individual beats or groups of beats to new positions. This gives you complete control over where each transient ends up.

- You can quantize to a particular note resolution. This can be a very quick way to fix a clip, if your markers are fairly close to where you want them to end up.

- You can quantize to another clip's beats, making the clips share the same groove.

- You can slip-stretch the clip, to make it fit a larger or smaller block of time. This is a very quick way to adjust a clip that has good timing, but whose tempo may be a little different from the project you want to use it in.

- You can combine techniques: slip-stretch a clip to fit a new tempo, then quantize or drag any markers that are out of sync.

The following is a list of common timing problems and solutions:

- If the audio contains various timing problems, but you want to fix them manually instead of letting AudioSnap fix them automatically, see "Adjusting the timing of a solo performance" on page 618. This gives you complete control over every aspect of your audio, and allows you to manually drag audio beats around to perfect the timing.

- If you need to fix a multi-track performance, such as a multi-mic drum kit or a full band, and you need to maintain phase relationships between tracks, see "Adjusting the timing of a multi-track performance while maintaining phase relationships" on page 619.

- If you want to synchronize the timing of clips on different tracks, you can fix this with AudioSnap if the sync errors aren't huge. For details, see "Synchronizing the rhythms of out-of-sync tracks" on page 624.

- If you want to quantize audio to the project's time ruler, see "To quantize audio to the project's time ruler" on page 625.

- If you want to quickly tighten up a performance in a project that already has a fixed tempo or varying tempo map, see "Quantizing audio" on page 625. This is useful if you like the performance, but the timing is off in a few places.

- If you want to extract the groove from one clip and apply it to another clip, see "To Groove Quantize an audio clip" on page 626. You can extract a groove from both audio and MIDI clips.

- If you need to synchronize audio with the projects tempo map, see "Synchronizing audio and the project tempo" on page 610.

See:

"Adjusting the timing of a solo performance" on page 618

"Adjusting the timing of a multi-track performance while maintaining phase relationships" on page 619

Adjusting the timing of a solo performance

When adjusting the timing of a solo performance (for example, a single instrument recorded with a single microphone, or a pre-recorded drum loop, etc.), you can freely drag beats around without worrying about potential phase problems.

By manually adjusting beats, you have complete control over the timing of your audio.

To manually adjust the timing of a solo performance

1. Select the Smart tool ⭐ in the Control Bar.

2. Assign the track's Edit Filter control to **Audio Transients**.

   Audio clips display transient markers and the AudioSnap palette appears.

3. Drag the desired transient markers around to perfect the timing.

For more information about editing transient markers, see "Editing transient markers" on page 597.

See:

Adjusting the timing of a multi-track performance while maintaining phase relationships

Editing a multi-track instrument, such as a multi-microphone drum kit or a full band, requires a little more care than editing a solo performance.

When stretching or quantizing multi-track audio, it is critical to maintain the phase relationships of the original recording. This can only be achieved if the tracks are stretched at the same exact points in time across all tracks.

AudioSnap provides tools that make it easy to preserve the phase relationship across tracks when editing beats on individual tracks.

In the following example, you will learn how to use AudioSnap to edit a multi-track drum kit alongside a piano track. The drum kit was recorded with three microphones (kick, snare, and overhead), each routed to its own track.

To adjust the timing of a multi-track performance while maintaining phase relationships

The following figure shows the last three hits of a song. The top track is piano and the rest are drums: kick, snare and overhead.

Figure 205. *The drum hits are rushed and are not in sync with the Piano track*
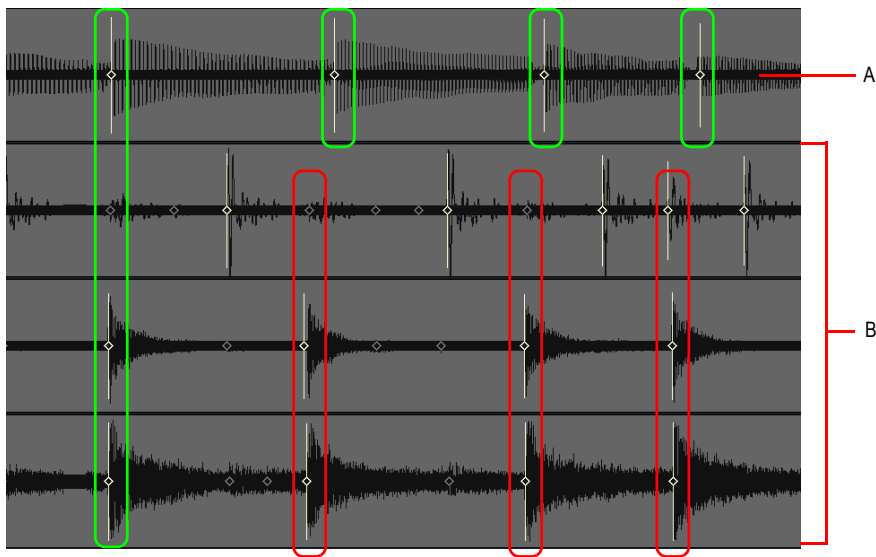
A. Piano track B. Drum tracks

As you can see, the drummer has rushed and is not in time with the piano. At the beginning of the measure, the drummer is in time with the piano. Over the course of the measure, the drummer is performing a fill and on the next three beats is way ahead of the piano player. You can see how the transient markers on the drum tracks are progressively earlier as the measure goes on (the drummer is rushing).

Our job is to align the drum hits with the piano hits so that the drum and piano tracks in time all the way through the measure.

1. Select the Smart tool [★] in the Control Bar.

2. Assign the track's Edit Filter control to **Audio Transients**.

    Audio clips display transient markers and the AudioSnap palette appears.

3. Select the three drum tracks and make splits right before and right after the area you want to edit. For details, see "To split clips into smaller clips" on page 366.

4. Select only the kick and snare clips.

5. On the AudioSnap palette, set **Resolution** to **1/16**.

6. Select only the drum overhead track.

7. On the AudioSnap palette, set **Threshold** to **100%** to ensure that there are no transients detected. This step is necessary because the overhead track contains audio from both the kick and the snare, and you want to make sure the kick, snare and overhead tracks are always synchronized when stretching beats.

8. Select all three drum tracks.

9. Right-click any selected clip and select **Merge and Lock Markers** on the pop-up menu.

    All three drum tracks now share the exact same transient markers, and each clip's position is locked.

> **Note:** *When you fix timing errors in multi-tracked drum parts, you typically need to adjust all the drum parts in exactly the same way, because drum parts often contain "bleed"—the sound of other drums in the track of the drum that you are trying to record. For example, if your snare mic also picks up some of the hi-hat sound, you can't move hi-hat clips around without also moving the snare clips in exactly the same way, otherwise the sound of the hi-hat in the hi-hat track will conflict with the sound of the hi-hat in the snare track.*
>
> *Any time you have a track that contains "bleed" from other audio tracks, such as drum overhead tracks or room ambiance tracks, you want to make sure the track has the same identical transient markers as the individual close-mic tracks. The first step is to disable all transient markers in the overhead/room track, then use the **Merge and Lock Markers** command to copy the transient markers from all individual close-mic tracks.*

Figure 206. *The **Merge and Lock Markers** command has copied the same transient markers to all three drum tracks.*
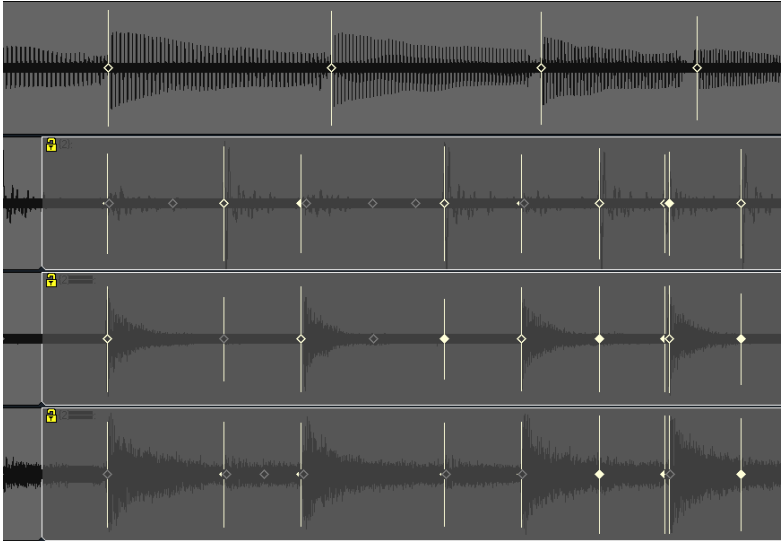
The drum tracks are now ready to be edited.

We want to keep the feel of the piano track, so our goal is align the drum tracks with the piano track, while preserving the phase relationship between the three drum tracks.

When editing multiple transients to adjust the timing of a performance, often times you need to speed up or slow down a section rather than just move an entire section later or earlier. In this example, the drummer was speeding up through the drum fill and then hits next downbeat too early. To fix this, you need to proportionally drag the drum transients so they are better aligned with the piano track.

10. Using the Smart tool, lasso select all transient markers from the first hit through the third hit, across all drum tracks.

11. Hold down the CTRL key and drag any selected drum transient marker until the third drum hit is aligned with the third piano hits.

    The selected transients are stretched proportionally. The first and last drum and piano hits are now aligned. The effect of this edit is that the drummer no longer rushes through the fill and he lands on the downbeat much closer with the piano.

Figure 207. *The drum and piano hits are aligned*
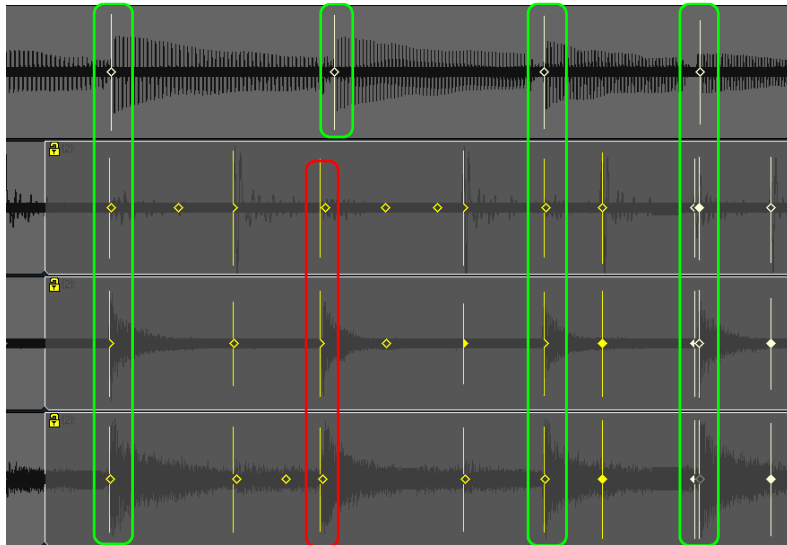
The second drum and piano hits are close but not perfect, so we need to fix this single beat.

12. Hold down the CTRL key and double-click any drum transient marker on the second hit.

All drum transient markers for the second hit are selected

13. Drag any selected transient markers until it aligns with the second piano hit.

All three drum and piano hits are now aligned properly, and the phase relationships between all drum tracks have been preserved.

Figure 208. *All three drum and piano hits are perfectly aligned*
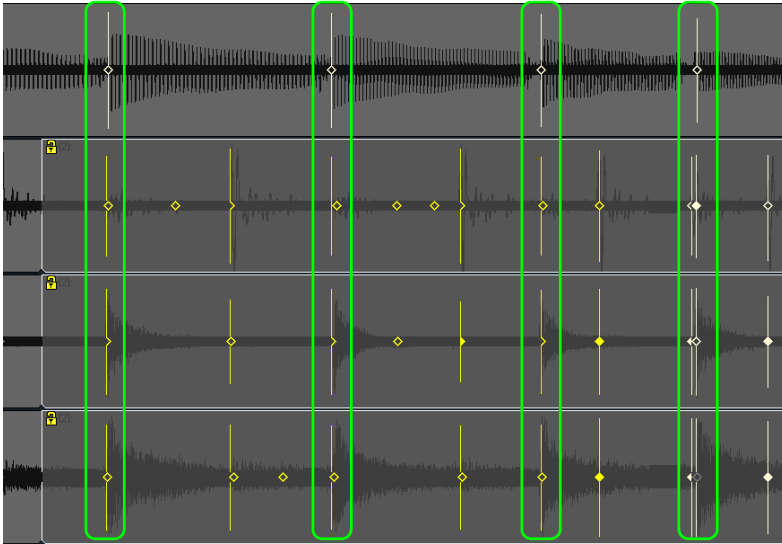
For information about maintaining phase relationships without stretching audio, see "To quantize multi-tracked drums without stretching audio" on page 628.

See:

Synchronizing the rhythms of out-of-sync tracks

A common problem arises when two or more clips aren't quite in sync with each other. You can fix this with AudioSnap if the sync errors aren't huge. The AudioSnap command that is most helpful in this situation is the **Quantize to Pool** command. The way it works is you decide which clip has the correct rhythm, you add that clip's transient markers to the Pool, and then you quantize the other clip's transient markers to the Pool. For details, see "To quantize an audio clip to another audio clip (Quantize to Pool)" on page 627.

💡 **Tip:** *You can also copy one clip's tempo to the project tempo, then configure other clips to follow the project tempo. For details, see "To sync the project tempo to an audio clip" on page 611 and "To sync an audio clip to the project tempo" on page 611.*

See:

"Adjusting the timing of a solo performance" on page 618

"Adjusting the timing of a multi-track performance while maintaining phase relationships" on page 619

"Making multiple clips/tracks groove together" on page 624

"Quantizing audio" on page 625

"To quantize audio to the project's time ruler" on page 625

"To Groove Quantize an audio clip" on page 626

"To quantize an audio clip to another audio clip (Quantize to Pool)" on page 627

Making multiple clips/tracks groove together

You can extract the groove from one audio clip and apply it to another audio clip. You can also apply a pre-existing groove file to all selected audio clips.

For details, see "To Groove Quantize an audio clip" on page 626.

See:

"Adjusting the timing of a solo performance" on page 618

"Adjusting the timing of a multi-track performance while maintaining phase relationships" on page 619

"Synchronizing the rhythms of out-of-sync tracks" on page 624

"Quantizing audio" on page 625

"To quantize audio to the project's time ruler" on page 625

"To Groove Quantize an audio clip" on page 626

"To quantize an audio clip to another audio clip (Quantize to Pool)" on page 627

Quantizing audio

Quantizing audio is a quick way to tighten up the feel of an audio track. AudioSnap provides several ways to quantize audio:

• You can quantize audio to the project's time ruler. This is useful for tightening up a performance in a project that already has a fixed tempo or varying tempo map. For details, see "To quantize audio to the project's time ruler" on page 625.

• You can copy the feel of one track and apply it to another track. There are four ways to accomplish this with AudioSnap:

  • Method 1: Extract MIDI timing from the source track, then use Groove Quantize on the target track. For details, see "To extract MIDI timing from an audio clip" on page 633 and "To Groove Quantize an audio clip" on page 626.

  • Method 2: Add the source track to the Pool, then quantize the target track to the pool. For details, see "To quantize an audio clip to another audio clip (Quantize to Pool)" on page 627 and "Using the Pool" on page 643.

  • Method 3: Use the **Extract Timing** button on the AudioSnap palette to extract the timing from selected clips, then use the **Apply Groove** button to apply the extracted groove to the selected clips. For details, see "To extract the groove from one clip and apply it to another clip" on page 626.

  • Method 4: You can manually match transient markers across multiple tracks by using the Smart tool. For details, see "To manually match transients across different tracks" on page 626.

To quantize audio to the project's time ruler

1. Select the audio clip you want to quantize.

2. Press A to open the AudioSnap palette.

3. Click the **Quantize** button ⊞ in the AudioSnap palette.

   The **Quantize** dialog box appears.

4. Make sure the **AudioSnap Beats** check box is selected.

5. Configure the Quantize options as desired, then click **OK**.

   SONAR quantizes the selected clips.

> ℹ **Note:** *You can only quantize to one rhythmic value at a time. If you don't want to quantize all beats in an audio clip (to ensure the **Quantize** command doesn't move them to a rhythmic placement where they don't belong), temporarily disable any transient markers you don't want to quantize. For details, see "To disable a transient marker" on page 601.*

To Groove Quantize an audio clip

The **Groove Quantize** command aligns transients with a groove that's on the Clipboard or a pre-existing groove file. If you want to copy the timing from another audio clip to the Clipboard, see "To extract MIDI timing from an audio clip" on page 633.

1. Select the audio clip you want to groove quantize.

2. Press A to open the AudioSnap palette.

3. On the **Process** menu, click **Groove Quantize**.

   The **Groove Quantize** dialog box appears.

4. In the **Groove File** field, select either **Clipboard** or the file that the groove pattern you want to use is saved in.

5. In the **Groove Pattern** field, select the groove pattern that you want to use.

6. Select the **Resolution** value that you want to quantize to.

7. Make sure the **AudioSnap Beats** check box is selected.

8. Click **OK**.

To extract the groove from one clip and apply it to another clip

1. Select the audio clip you want to extract the groove from.

2. Press A to open the AudioSnap palette.

3. Click the **Extract Timing** button.

   The clip's groove is extracted and vertical Pool lines are displayed to indicate the extracted transients.

4. Select the clip you want to apply the groove to.

5. Click the **Apply Groove** button.

   The groove is applied to the selected clip and the Pool is cleared.

To manually match transients across different tracks

1. Select the Smart tool [★] in the Control Bar.

2. Assign the track's Edit Filter control to **Audio Transients**.

   Audio clips show transient markers and the AudioSnap palette appears.

3. In the Control Bar's Snap module, select the **Landmark Events** button [image].

   ⓘ **Note 1:** *If events do not appear to snap to audio transients, go to **Edit > Preferences >***

   ***Customization - Snap to Grid** (or right-click the **Snap to Grid** button [image]) and make sure the*
   ***Audio Transients** check box is selected under **Landmarks**.*

Fixing timing problems in audio clips

Note 2: *When snapping audio transients, the following rules apply:*

- *If a Pool exists, audio transients snap to the Pool.*
- *If a Pool does not exists, audio transients snap to transients in the selected tracks.*
- *If there are no selected tracks, audio transients snap to transients in the selected clip.*

4. Select the audio tracks that you want to use as the rhythm guide.

5. Identify the transient markers you want move, then drag the transient markers until they snap to the nearest transient markers in the selected tracks.

To quantize an audio clip to another audio clip (Quantize to Pool)

A common problem arises when two or more clips aren't quite in sync with each other. You can fix this with AudioSnap if the sync errors aren't huge. The AudioSnap command that is most helpful in this situation is the **Quantize to Pool** command. The way it works is you decide which clip has the correct rhythm, you add that clip's transient markers to the Pool, and then you quantize the other clip's transient markers to the Pool.

1. Select the Smart tool ⭐ in the Control Bar.

2. Assign the track's Edit Filter control to **Audio Transients**.

   Audio clips show transient markers and the AudioSnap palette appears.

3. Select the audio clip that you want to use as the rhythm guide.

4. Disable any transient markers that you want to exclude from the Pool (see "To disable a transient marker" on page 601).

5. Right-click the selected clip and select **Pool > Add clip to pool** on the pop-up menu.

   The selected clip is added to the Pool, and its transient markers turn purple.

6. Select the audio clip that you want to quantize.

7. Right-click the selected clip and select **Pool > Quantize to pool** on the pop-up menu.

   The **Quantize to AudioSnap Pool** dialog box appears.

8. Configure the following settings as desired:

   - **Max Distance From Pool.** The value in this menu determines which notes are affected by the **Quantize to Pool** command. For example, if you choose **Quarter** in the menu, notes that are farther than a quarter note from a Pool line are not quantized.**Quantize Window.** This slider fine tunes the value in the **Max Distance From Pool** menu. A window of **100 percent** includes all markers that lie within the **Max Distance From Pool** value.**Quantize Strength.** This slider controls quantize strength, which determines how closely the selected notes move to the Pool markers.Click **OK**.

   The transients in the selected clips are quantized to the Pool.

See also:

"To extract the groove from one clip and apply it to another clip" on page 626

To quantize multi-tracked drums without stretching audio

When you fix timing errors in multi-tracked drum parts, you will frequently need to adjust all the drum parts in exactly the same way, because drum parts often contain "bleed"—the sound of other drums in the track of the drum that you are trying to record. For example, if your snare mic also picks up some of the hi-hat sound, you can't move hi-hat clips around without also moving the snare clips in exactly the same way, because if you don't, the sound of the hi-hat in the hi-hat track will conflict with the sound of the hi-hat in the snare track.

AudioSnap's **Add Transients to Pool** command and **Split Beats into Clips** command allow you to slice your drum tracks at identical locations, so you can then drag or quantize whole clips without stretching any audio. This method of aligning clips does not change the phase relationships between the clips, as long as you move all the clips identically.

Let's take a look at some multi-tracked drum parts, and see how to quantize them all in exactly the same way. The following project uses 10 mics, including room mics and overhead mics:
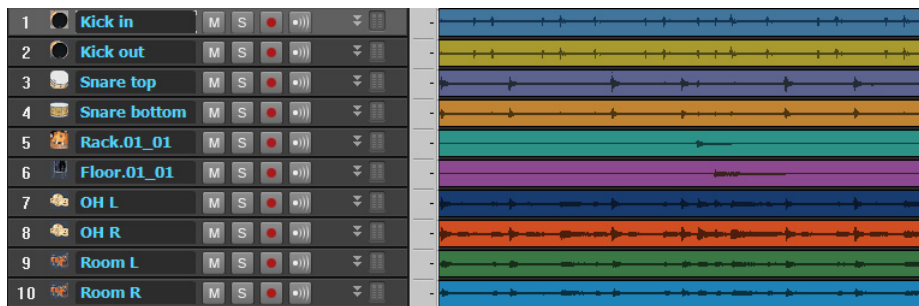
1. Select the Smart tool ⭐ in the Control Bar.
2. Assign the track's Edit Filter control to **Audio Transients**.

   Audio clips display transient markers and the AudioSnap palette appears.
3. If necessary, edit each drum track's transient markers so that there are no extraneous transients (use the **Threshold** slider, disable some transients, move others, etc.).
4. Disable all the transient markers in the overhead mic and room mic tracks.

   ℹ Note: *The room mics and overhead mics are much farther from the drums than the close mics, so the transients in their tracks occur a little later than the close mic tracks. Because you will eventually split each beat into a separate clip, you only want to use the transient markers from the close mic tracks to avoid cutting off any transients.*

5. Select all the drum tracks.
6. Right-click any selected drum track and select **Merge and Lock Markers** on the pop-up menu.
7. All transient markers on all selected tracks are copied to each drum track, so all drum tracks share identical transient markers. The clip positions are also locked.
8. On the **Edit** menu, point to **Clip Lock** and click **Lock Position**.

AudioSnap (Producer and Studio only)
Fixing timing problems in audio clips

The clip positions are no longer locked.

9. Select a drum track that has steady beats throughout the song.

💡 **Tip:** *If there is not a single drum track that has steady beats throughout the song, you can create a temporary guide track by bouncing all the drum tracks to a single track (select all the tracks, use the* ***Edit > Bounce to Tracks*** *command, select* ***Main Outputs*** *in the* ***Source Category*** *field in the* ***Bounce to Tracks*** *dialog box, and click* ***OK****).*

10. Click the **Set Project Tempo From Clip** button 🔲 to align measure lines with drum track and establish a tempo map.

    The project's measure boundaries line up with the transients in the drum tracks.

ℹ️ **Note:** *If the measure boundaries do not line up properly with the drum tracks, you may need to edit the guide track's tempo map. For details, see* "To edit a clip's tempo map" *on page 614.*
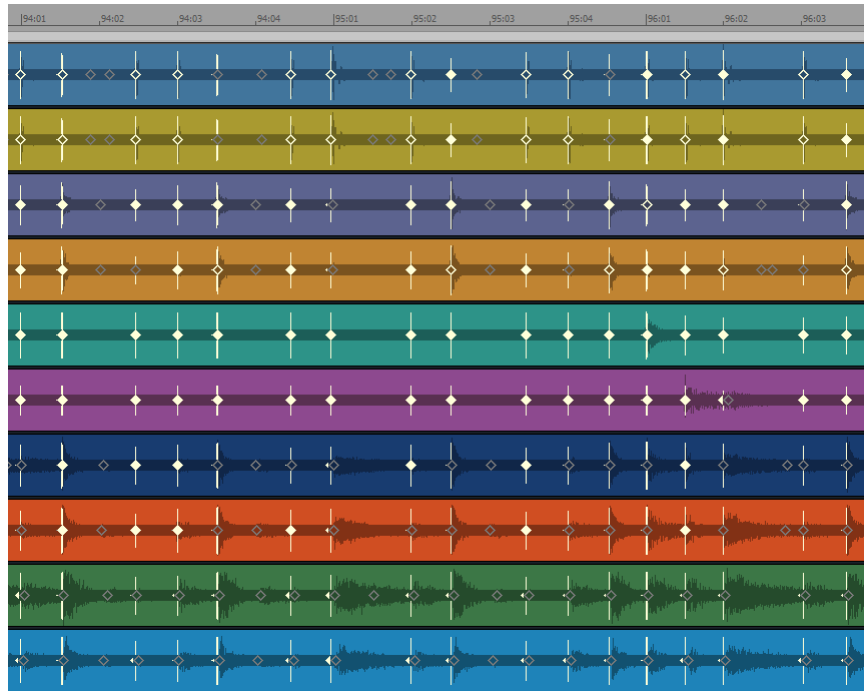
11. Select all the drum tracks.

12. Click the **Split Beats into Clips** button 🔲 on the AudioSnap palette.

    Each beat is split into a separate clip.
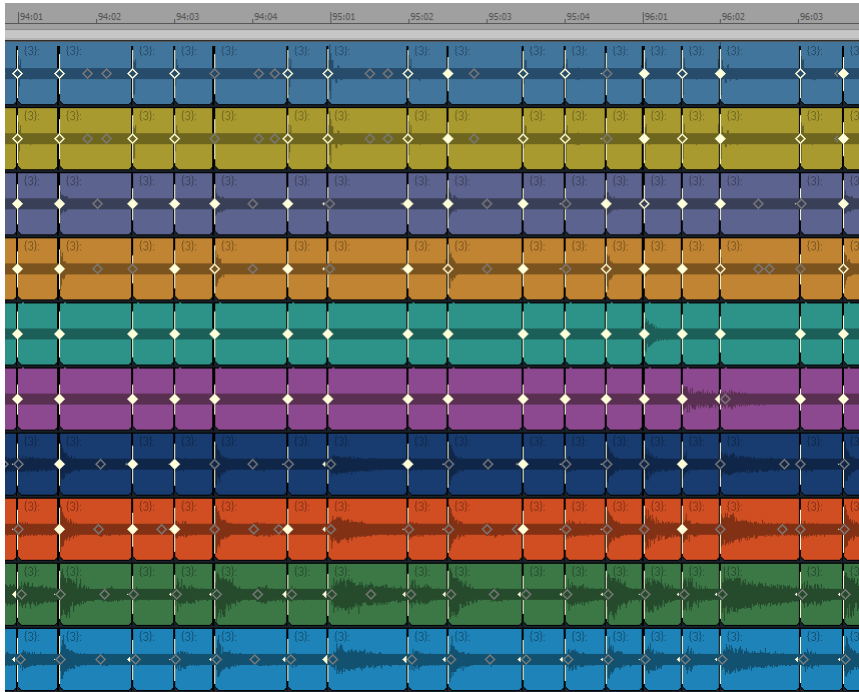
Now we can quantize all the clips at the same time. Let's quantize this example to eighth notes:

13. Select all the clips that you want to quantize.

14. Use the **Process > Quantize** command to open the **Quantize** dialog box.

15. In the **Duration** field, choose **Eighth** (for this example).

16. Configure the other settings as follows:

- Make sure the **AudioSnap Beats** check box is cleared.
- Make sure the **Audio Clip Start Times** is selected.

- Make sure the **Auto XFade Audio Clips** check box is selected, and the **XFade** and **Max Gap** values are set at their default values.

Fixing timing problems in audio clips

☑ Auto XFade Audio Clips
XFade:　20.000 ▲ ms
Max Gap: 80.000 ▲ ms
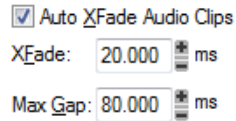
17. Click **OK** to close the **Quantize** dialog box.

After some processing time, the clip start times move to the eighth note boundaries:
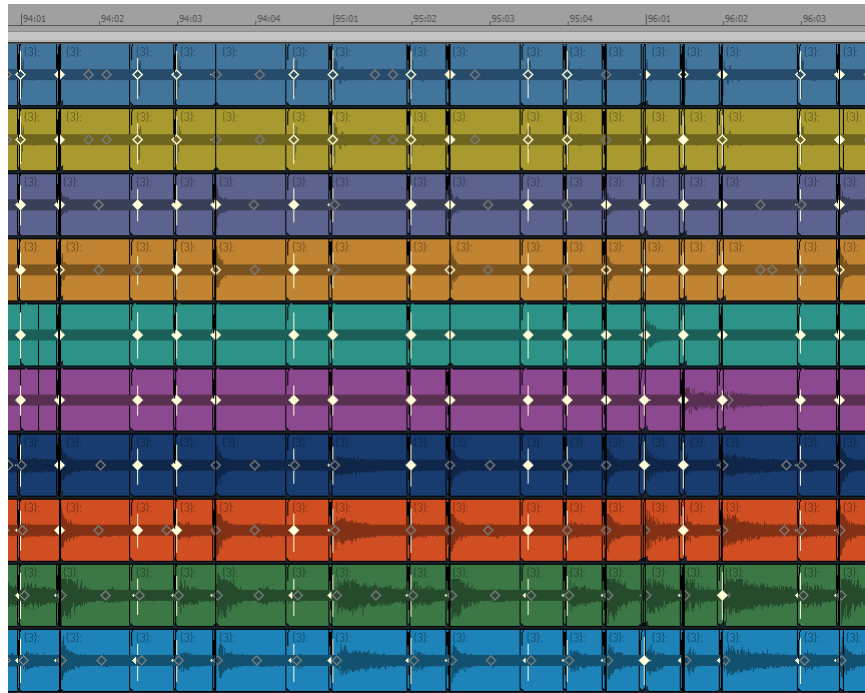
Some clips now overlap, and some clips have small gaps between them. Because the **Auto XFade Audio Clips** check box was enabled, and the **XFade** and **Max Gap** values were set at their default values, crossfades have been automatically added between clips, and any gaps that were smaller than the **Max Gap** value have been filled in. Let's zoom in to take a closer look:
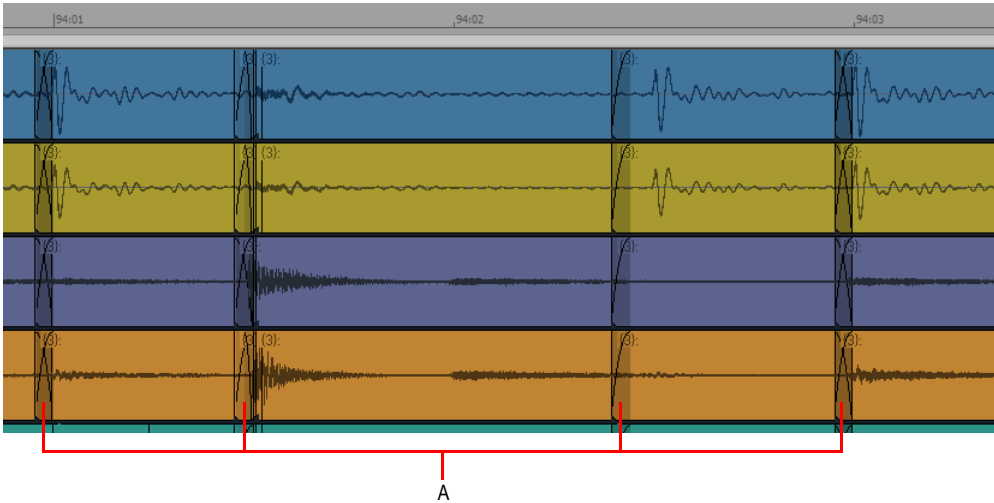
A. Crossfades

Now the clips line up with eighth note boundaries, no audio has been stretched, and phase relationships have been maintained.

For information about maintaining phase relationships when stretching audio, see "Adjusting the timing of a multi-track performance while maintaining phase relationships" on page 619.

See:

Extracting MIDI timing information from audio

Extracting MIDI timing information from audio allows you to:

- Double an audio rhythm with a MIDI instrument.
- Replace sounds in an audio clip (commonly used for drum replacement).
- Notate the rhythm of an audio clip.
- Align lyrics with an audio rhythm.

After you extract the timing information from an audio clip, the timing information is copied to the Clipboard as MIDI note events. You can paste the MIDI notes to a new MIDI track or use the Clipboard as a source for the **Groove Quantize** command.

To extract MIDI timing from an audio clip

1. Select the Smart tool ![icon] in the Control Bar.
2. Assign the track's Edit Filter control to **Audio Transients**.
3. Press A to open the AudioSnap palette.
4. Select the audio clip whose rhythm you want to extract.
5. Do any necessary quantizing, and disable any transient markers that you don't want to extract (see "Quantizing audio" on page 625 and "To disable a transient marker" on page 601).
6. With the clip still selected, click the **AudioSnap Options** button ![icon] in the AudioSnap palette to open the **AudioSnap Options** dialog box.
7. In the **Convert to MIDI Note** box, choose **C3**. This is the note most drum synths use for the bass drum. If your favorite synth uses a different note, choose it now.
8. Choose a **Note Velocities** option: either accept the extrapolated velocities in the audio clip (the **Vary With Pulse Level** option), or set a constant velocity for the notes in the **Set All To Same Value** field.
9. Click **OK** to close the **AudioSnap Options** dialog box.
10. Click the **Copy As MIDI** button ![icon].

    This adds the extracted groove to the Clipboard.

    SONAR copies the audio rhythm to the Clipboard as a MIDI clip, with the same pitch assigned to each note.

You can now paste the MIDI notes to a new MIDI track, use the Clipboard as a source for the **Groove Quantize** command, or save the extracted groove as a Groove Quantize file.

To paste the extracted MIDI timing to a MIDI track

1. Click the track number of a MIDI track to select it.

2. Move the Now Time to the measure where you want the data (we'll use measure 1).Press

💡 **Tip:** *If you want the MIDI notes to align perfectly with the audio data, press SHIFT+G to move the Now time to the beginning of the selected audio clip.*

CTRL+V to paste the data.

A new MIDI clip is inserted in the track

ℹ️ **Note:** *All the new MIDI notes have the same pitch, and the tails of the preceding notes reach all the way to the following notes, so you can't see the actual rhythm. You can easily shorten the duration of each note event in order to clearly see each note event. To do so, click **Process > Length** to open the **Length** dialog box. In the **Length** dialog box, disable the **Start Times** check box, enable the **Duration** check box, and type **50** in the **Percent** field. Click **OK** to close the dialog box. Assign the MIDI track's Edit Filter to **Notes** and you will be able to see the rhythm if you zoom in.*

To save the extracted MIDI timing as a Groove Quantize file

1. Select **Process >Groove Quantize** to open the **Groove Quantize** dialog box.

2. Click the **Define** button to open the **Define Groove** dialog box.

3. In the **File** field, choose a file to save the pattern in, or type a name to create a new file.

4. In the **Pattern** field, type a name for the pattern, and click **OK**.

The extracted MIDI groove is saved as a Groove Quantize file, and can be used at any time with the **Groove Quantize** command.

See:

General editing

If you want to snap edits in the Clips pane to transient markers, see "Snapping edits to audio beats" on page 635.

If you want to split each beat into a separate clip, see "Splitting beats into clips" on page 637.

If you want to stretch the duration of an audio clip, see "Slip-stretching audio" on page 642.

If you want to automatically create envelope nodes that are aligned with transient markers, see "Adding automation" on page 642.

Snapping edits to audio beats

The Snap module in the Control Bar has a **Snap to Audio Transients** button ◆ that allows you to snap edits in the Clips pane to transient markers in selected audio clips.

When snapping audio transients, the following rules apply:

- If a Pool exists, audio transients snap to the Pool.
- If a Pool does not exists, audio transients snap to transients in the selected tracks.
- If there are no selected tracks, audio transients snap to transients in the selected clip.

In the following example, you will learn how to snap MIDI notes to audio beats.

To snap to audio transients

1. Select the audio clips whose rhythm you want to snap to.

2. In the Control Bar's Snap module, select the **Landmark Events** button.

> **Note:** *If events do not appear to snap to audio transients, go to **Edit > Preferences > Customization - Snap to Grid** (or right-click the **Snap to Grid** button ▦) and make sure the **Audio Transients** check box is selected under **Landmarks**.*

3. Disable **Musical Time** and all other Snap to Grid options.

Figure 209. *The Snap module.*
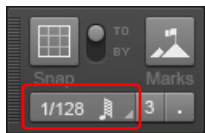
4. In this example, we're using the Inline Piano Roll view: to enable it, assign a MIDI track's Edit Filter to **Notes**. Zoom in enough to see where the edits need to be. Make sure the **Landmark Events** button is enabled in the Control Bar's Snap module.

ⓘ **Note:** *If events do not appear to snap to audio transients, go to **Edit > Preferences > Customization - Snap to Grid** (or right-click the **Snap to Grid** button) and make sure the **Audio Transients** check box is selected under **Landmarks**.*
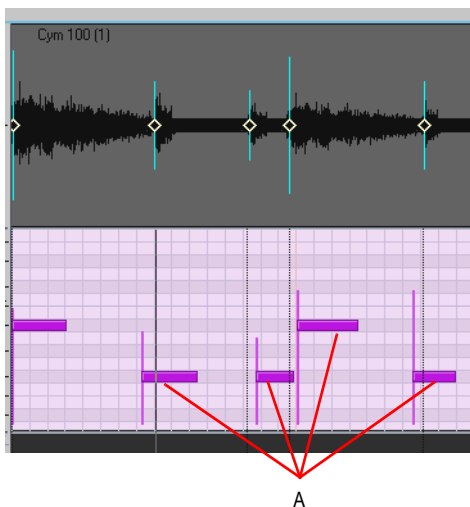
A. These notes don't line up with the audio beats

5. Drag the misaligned MIDI notes so they line up with the audio beats. As you're dragging notes, they will automatically snap to the nearest audio beat.
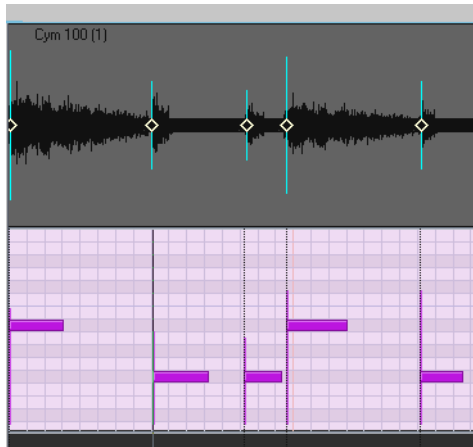
Splitting beats into clips

Clicking the **Split Beats Into Clips** button 🔧 on the AudioSnap palette splits a selected AudioSnap-enabled clip into new clips starting at every enabled transient marker. The main reason you might want to do this is to align a clip with a new tempo or quantize it, without stretching the audio. Once you split a clip at its transients, you can move the new clips by dragging or quantizing so that they are aligned the way you want them to be. The advantage is that moving clips instead of transient markers does not stretch any audio, so that the original sound quality is unchanged. The possible disadvantage is that you can create gaps between the new clips when you move them. However, the **Quantize**, **Groove Quantize**, and **Fade Selected Clips** dialogs all have an option to automatically fill in the gaps. This is the **Fill Gaps, XFade between Audio Clips** option in the **Fade Selected Clips** dialog box, and is the **Auto XFade Audio Clips** option in the **Quantize** and **Groove Quantize** dialogs. Filling the gaps is accomplished automatically by "rolling out" the first clip's right edge and the second clip's left edge to create a crossfade. This option will often be used when quantizing drum parts, which results in smooth-sounding audio without introducing phase problems.

> 🛈 **Note:** *When you align clips on multiple tracks, it is necessary to split and/or quantize all clips at the exact same position in order to avoid phase problems. In order to do so, it is necessary to establish a common, or master, transient pool that all tracks can reference. The **Merge and Lock Markers** command will use the transient pool as a reference, and insert identical transient markers on all selected clips. You can then use the **Split Beats Into Clips** button 🔧 to split clips at audio beats.*

To add markers at Pool lines

1. Select the Smart tool in the Control Bar.
2. Assign the track's Edit Filter control to **Audio Transients**.
3. Make sure that the Pool contains markers from at least one clip, or from the Time Ruler.
4. Select the clips that you want to add markers to.
5. Right-click a selected clip, and choose **Pool > Apply transient pool markers** on the pop-up menu.

Markers appear on the selected clips at Pool lines.

To split a clip at beats

1. Select the clip(s) that you want to split.
2. Press A to open the AudioSnap palette.
3. Click the **Split Beats into Clips** button .

   The clip's beats are split into separate clips.

To split a clip, quantize it, and fill in the gaps

1. The following picture shows a clip whose transient markers don't line up with the measure lines:
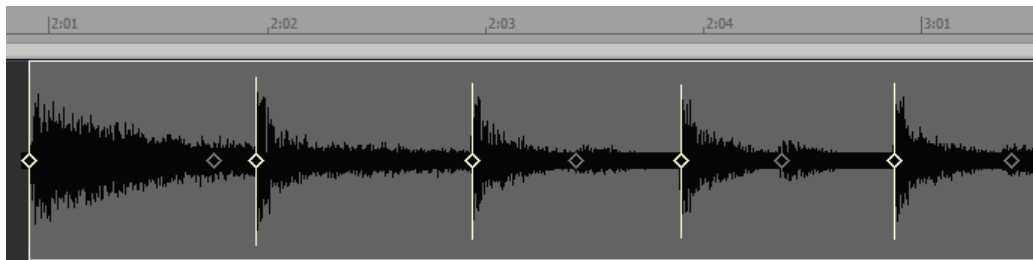
2. If we quantize it, the audio will stretch and we may or may not like the resulting sound. Let's try splitting it, and quantizing the clips instead of the transients: click the **Split Beats Into Clips** button on the AudioSnap palette.

The clip splits at the transients, and only the first new clip is still selected:
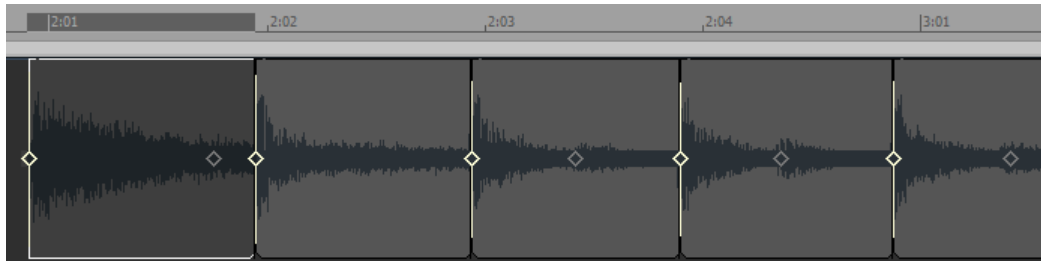
3. Let's quantize the clips: drag through the clips to select them.

4. Click the **Quantize** button in the AudioSnap palette.

The **Quantize** dialog box appears:
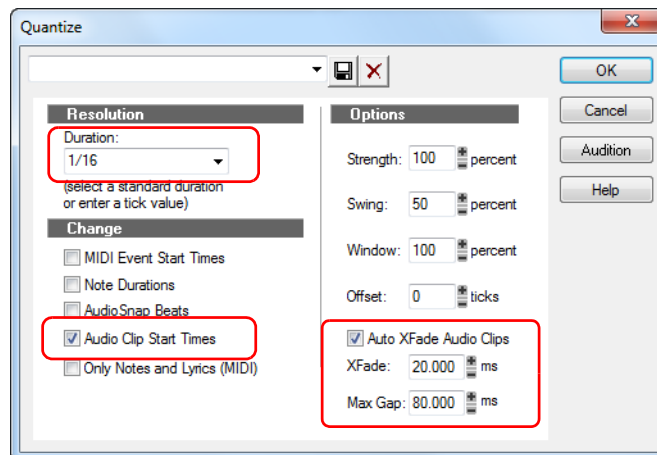
5. Make sure that **Audio Clip Start Times** is selected, and that (for this example) **Sixteenth** is selected in the **Duration** field. Leave the **Auto XFade Audio Clips** option unchecked for now, and click **OK**. Let's zoom in and look at the quantized clips:
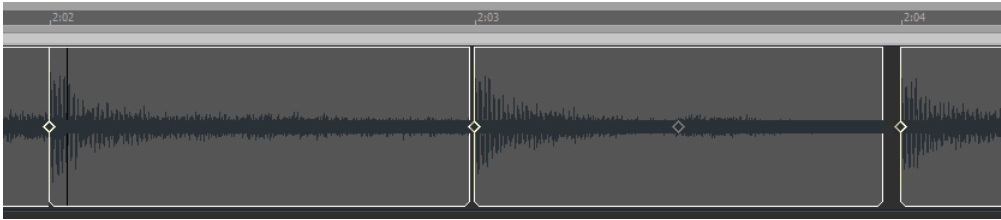
6. The start of each clip now lines up where we want it to, but there are gaps between some of the clips. Let's undo what we just did (press CTRL+Z), and quantize again. This time, however we will enable the **Auto XFade Audio Clips** option in the **Quantize** dialog box, and click **OK**:
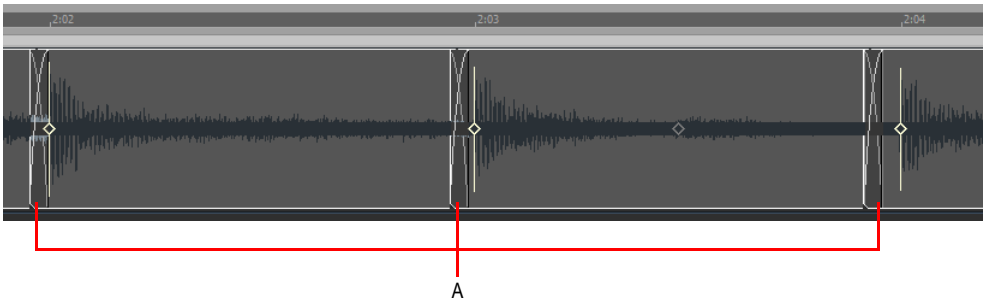
A. Crossfades

7. Where the gaps were between clips, we now see crossfades. The default length of the crossfade is 20 milliseconds, but you can change that by entering a number in the **XFade <number goes here> ms** field in the dialog box.

8. If you don't want wide gaps to be filled in, you can enter a number of up to 200 milliseconds in the **Max Gap** field. Any gap that is wider than the number in this field will not be filled in.

If we wanted to drag the clips to new locations instead of quantizing them, we could fix any resulting gaps by selecting the clips that have gaps, and use the Track view **Clips > Fade Clips** command.

The **Fade Selected Clips** dialog box has the **Fill Gaps, XFade between Audio Clips** radio button, the **XFade <number goes here> ms** field, and the **Max Gap** field.

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Figure 210. *The **Fade Selected Clips** dialog*
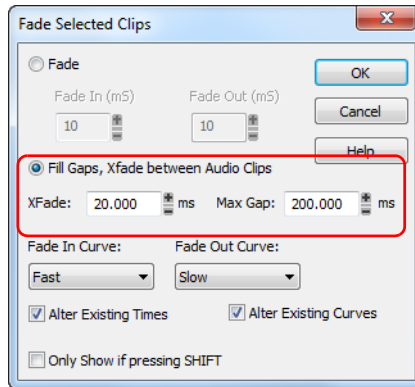
To fill in gaps with the Fade Selected Clips command

1. Select the clips that have gaps you want to fill.

2. Click the Track view **Clips** menu and choose **Fade Clips** to open the **Fade Selected Clips** dialog box.

3. Enable the **XFade between Audio Clips** radio button, and set any options you want in the **XFade <number goes here> ms** field, and **Max Gap** field.

4. Click **OK**.

See:

Slip-stretching audio

You can slip-stretch an audio clip in order to expand or compress its duration. Slip-stretching only works on regular audio clips, not Groove clips or REX loops.

To slip-stretch an audio clip

1. Select the Smart tool ⭐ in the Control Bar.
2. Hold down the CTRL key, move the mouse pointer over the end of the clip until the cursor changes into the slip-stretch icon 🔲, then drag the end of the clip to the desired position.

   The clip is stretched and displays the stretch amount in the clip header (percentage of original duration).
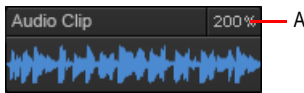
A. Stretch amount

See:

Adding automation

If you have an automation envelope on a track, AudioSnap can automatically add nodes to the envelope that align with a selected clip's transient markers. This makes it easy to add special processing at transient locations.

To add nodes at transients

1. Select the audio clip(s) that contain the transient markers you want to use as a guide.
2. Right-click an automation envelope on the clip, and choose **Add Nodes at Transient Markers** from the pop-up menu.

Now you can easily edit your envelope at transient locations.

See:

Using the Pool

The Pool is a collection of transient markers that can be extracted as a groove, and also function as snap locations. A transient marker that belongs to the pool is displayed in the Clips pane as a solid line within the parent track, and as a dotted line outside the parent track. Hovering the mouse over a dotted line will display a tooltip containing the parent track and position.

To show/hide pool lines

1. Select the Smart tool ⭐ in the Control Bar.
2. Assign the desired track's Edit Filter control to **Audio Transients**.
3. Right-click a clip and choose **Pool > Show pool lines** on the pop-up menu.

Figure 211. *Pool lines*
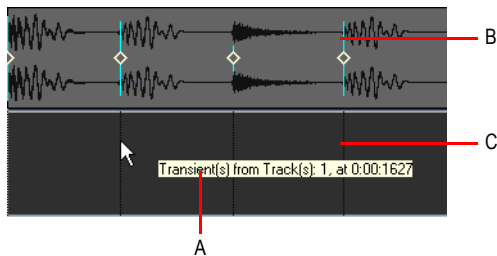
*A. Tooltip **B.** Solid line **C.** Dotted line*

The Track view Time Ruler can be added to the Pool (see "To add the Time ruler to the Pool" on page 644).

To add a clip's transients to the Pool

1. Select the an AudioSnap-enabled clip.
2. Right-click the clip and choose **Pool > Add Clip to Pool** on the pop-up menu.

To hide or show the Pool

1. Select the Smart tool [★] in the Control Bar.
2. Assign the track's Edit Filter control to **Audio Transients**.
3. Right-click a clip and choose **Pool > Show pool lines** on the pop-up menu.

To add the Time ruler to the Pool

1. In the Control Bar's Snap module, set the **Musical Time** value to the resolution you would like to add to the Pool.
2. Select the Smart tool [★] in the Control Bar.
3. Assign the track's Edit Filter control to **Audio Transients**.
4. Right-click in the Clips pane and select **Pool > Add MBT to pool** on the pop-up menu.

   The current Musical Time snap resolution to the pool, and also displays dotted pool lines in the Clips pane. This can be useful as either a basic visual guide, or for adding the Musical Time to an extracted groove, or to fill in any transients that may be "missing" in a syncopated or sparse section.

To add transient markers at Pool lines

1. Select the Smart tool [★] in the Control Bar.
2. Assign the track's Edit Filter control to **Audio Transients**.
3. Make sure that the Pool contains markers from at least one clip, or from the Time Ruler.
4. Select the clips that you want to add markers to.
5. Right-click a selected clip and choose **Pool > Apply transient pool markers** on the pop-up menu.

Markers appear on the selected clips at Pool lines. When aligning clips on multiple tracks, it is necessary to split and/or quantize all clips at the exact same position in order to avoid phase problems when quantizing audio. In order to do so, it is necessary to establish a common, or "master", transient reference pool which can be applied to all tracks. The **Apply transient pool markers** command will use the transient pool as a reference, and insert identical transient markers on all selected clips.

> **Note:** *Adding markers at Pool lines can add a lot of markers to a clip. If you later decide that you want to work with the clip's original markers, you can remove only the markers that you added by right-clicking the transient marker, and choosing Reset from the pop-up menu.*

Groove Quantize and Quantize to Pool

You can use two kinds of groove quantizing on audio clips: the **Groove Quantize** command aligns transients with a groove that's on the Clipboard, and the **Quantize to pool** command aligns transients with the Pool.

When you use the **Groove Quantize** command, you can align a clip with a pre-existing groove, or you can extract a groove from another clip.

For information about extracting a groove, see

For information about groove quantizing an audio clip, see

For information about quantizing to the Pool, see

See:

Algorithms and rendering

When you stretch an audio clip, AudioSnap uses a particular formula, or *algorithm*, to stretch the audio. The best algorithms take the most computing time and power to complete, so if AudioSnap always used the best available algorithms (the iZotope Radius algorithms), you would not be able to play back your clip in a reasonable amount of time to listen to the timing. That's why you can choose a quick algorithm for **"online"** rendering (real-time playback), and a different algorithm for **"offline"** or non-real-time rendering. Offline rendering in an AudioSnap context usually means bouncing to track, but it also refers to other offline processes such as freezing tracks and applying effects. When you do any of these mixdown operations such as bouncing, exporting, or freezing, audio clips use the offline rendering algorithm you have chosen for them.

Note: *The **Online** render mode is for preview purposes only during playback. The final audio quality will be greatly improved after the **Offline** render mode is applied during mixdown/export.*

Typical algorithm choices for an AudioSnap session work like this:

- Do your AudioSnap time stretching, error correction, etc., with a quick algorithm: choose either **Percussion** or **GrooveClip**.
- After your AudioSnap editing is finished, bounce to track with a better algorithm: choose one of the Radius choices, or for drum tracks, **Percussion** is usually the best choice.

Note: *You should avoid rendering AudioSnap clips more than once. Applying stretch algorithms multiple times in succession can degrade the audio quality (similar to transcoding an MP3 file).*

*Until your project is mixed and finalized, it is recommended that you use the Freeze function instead of **Bounce to Track(s)** or **Bounce to Clip(s)** if you need to temporarily off-load CPU processing power. For details, see "To freeze an AudioSnap-enabled clip" on page 648.*

The following table describes the available algorithms.

Algorithm	Description
GrooveClip	Good all-around algorithm to use while stretching audio
Percussion	Gives a better sound on percussion clips while stretching audio
iZotope Radius Mix	Best all-around choice when bouncing to track with audio clips that contain a mix of different sounds
iZotope Radius Mix Advanced	This choice is similar to **iZotope Radius Mix**, but exposes two parameters: • **Pitch coherence.** Pitch coherence preserves naturalness of timbre for pitched solo voices, such as human speech, saxophone or vocals. The default value for this control is 50%. Higher values of pitch coherence will increase phase accuracy but may sound more modulated. • **Phase coherence.** When processing stereo or surround audio, Phase coherence helps to preserve the phase relationships between channels. The default value for this control is 50%. Higher values of phase coherence will preserve the phase between multiple audio channels at the expense of slight distortion. The **Pitch coherence and Phase coherence** parameters can be adjusted in **Edit > Preferences > Project - AudioSnap**.
iZotope Radius Solo	Best choice when bouncing to track with audio clips of a solo instrument. Although a guitar is a "solo" instrument, if you play chords instead of single notes you may want to select "Radius Mix" instead. **Tip:** if a clip/track contains a mixture of polyphonic and monophonic parts, you may want to split the parts into separate clips and experiment with different algorithms for each clip.
iZotope Radius Solo (Bass)	Best choice when bouncing to track with audio clips of a bass instrument
iZotope Radius Solo (Vocal)	Best choice when bouncing to track with audio clips of a solo voice

Table 118.

To choose default algorithms

1. Press A to open the AudioSnap palette.
2. In the **Applies To** list, select **Default Settings**.
3. Under **Render Mode**, select the desired **Online** and **Offline** render modes.

Every AudioSnap-enabled clip that you stretch or bounce uses the settings you choose for default stretch algorithms, *except* clips that you choose individual settings for.

To choose render algorithms for an individual clip

1. Select the clip or clips you want to edit.
2. Press A to open the AudioSnap palette.

   The AudioSnap palette displays the current render mode of the selected clip. If you select multiple clips that have different render modes, the **Online** and **Offline** lists display **(Multi)**.
3. In the **Applies To** list, select **Clips**.
4. Under **Render Mode**, select the desired **Online** and **Offline** render modes.

To choose render algorithms for all current and future clips on a track

1. Select the track or tracks you want to edit.
2. Press A to open the AudioSnap palette.
3. In the **Applies To** list, select **Tracks**.
4. Under **Render Mode**, select the desired **Online** and **Offline** render modes.

   All current and future clips in the selected tracks will inherit the selected render modes.

To freeze an AudioSnap-enabled clip

1. Do one of the following to open the **Freeze Options** dialog:

   - In the Track view, right-click any track's **Freeze** button ✳.
   - Right-click an audio track, and select **Freeze > Freeze Options** from the pop-up menu.
2. Make sure the **Track FX** check box is cleared.
3. Click **OK** to close the **Freeze Options** dialog box.
4. Do one of the following:

   - In the Track view, click the desired track's **Freeze** button ✳.
   - Right-click the track and select **Freeze > Freeze Track** from the pop-up menu.

   SONAR bounces the audio in the track to a new audio clip or clips.

To bounce an AudioSnap-enabled clip

1. Select the clip you want to bounce.
2. Click the Track view **Tracks** menu and choose **Bounce to Track(s)** to open the **Bounce to Track(s)** dialog box.
3. In the **Destination** field, choose the track where you want your new audio clip to go.
4. In the **Source Category** field, choose **Tracks**.
5. Choose the **Channel Format** and **Dithering** options you want.
6. Enable all the options in the **Mix Enables** section.
7. Click **OK**.

See:

AudioSnap (Producer and Studio only)
Algorithms and rendering

Working with loops and Groove Clips

Loops are short digital audio clips which are often designed to be repeated over and over or "looped," although some loops, called one-shots, are intended to play just once. Groove clips, often used as loops, are digital audio clips that "know" their tempo and pitch information. Groove clips automatically respond to changes in a project's tempo and can have their root note pitch adjusted using pitch markers. In SONAR, you can import ACID™ loops, or digital audio clips and convert them to Groove clips. You can also record your own audio and create Groove clips. To download more Groove clips and loops, visit www.cakewalk.com.

Note: *Groove clips and ACIDized loops are loaded into RAM, and can take up a lot of memory. Copying them does not increase the amount of memory they take up, but loading the initial copy does.*

See:

The Loop Construction view

The Loop Construction view is where you create and edit Groove clips.

Figure 212. *The Loop Construction view*
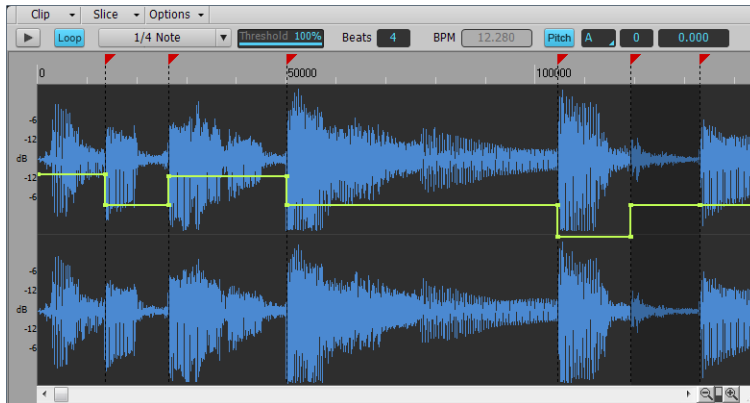
The **Loop Construction view** toolbar has tools for editing slicing markers and controls for previewing loops.

See:

"Loop Construction controls" on page 652

See also:

"Working with loops" on page 658

"Working with Groove Clip audio" on page 659

"Loop Construction view" on page 1872

Loop Construction controls

The following is a list of the controls in the Loop Construction view, followed by a description. For step-by-step instructions, see the links at the end of this section.

Clip menu

The **Clip** menu contains the following commands:

• **Save Loop.** Opens the **Save As** dialog box. In the **Save As** dialog box you can save the current loop (Groove clip) as a Riff Wave file, which are compatible with ACIDized loops. You can save Riff Wave files for use with another SONAR project or with ACID.

- **Loop On/Off.** Groove Clip enable/disable. When enabled, loop clips in the Track view by dragging the right side of a clip with your mouse. When disabled, you are able to slip-edit the clip.

- **Stretch On/Off.** Instructs SONAR to stretch or shrink the clip to fit the project's tempo. The **Beats in Clip** and **Original BPM** parameters are in the Clip Inspector and **Loop Properties** dialog box are used to make the change.

- **Loop Properties.** Opens the **Loop Properties** dialog box.

Note: *The settings in the **Loop Properties** dialog box are also available in the **Groove Clip** section in the Clip Inspector.*

Slice menu

The **Slice** menu contains the following commands:

- **Reset Markers.** Restores all automatically generated markers to the original position and enables all those that were disabled. Manually created markers remain as is.

- **Show/Hide Gain Envelope.** Toggles on or off the display of a gain envelope.

- **Show/Hide Pan Envelope.** Toggles on or off the display of a pan envelope.

- **Show/Hide Pitch Envelope.** Toggles on or off the display of a pitch envelope.

- **Next Slice.** Moves the slice selection to the next slice in the loop. You can also press the PAGE DOWN key.

- **Previous Slice.** Moves the slice selection to the previous slice in the loop. You can also press the PAGE UP key.

Options menu

The **Options** menu contains the following commands:

- **Auto Slice Preview On/Off.** Turns on slice auto preview.

- **Auto Slice Preview Loop On/Off.** This control is only available if the **Enable Slice Auto Preview** option is on. This option loops the slice auto preview.

- **Preview Bus.** Select the output through which you want to listen to the clip.

Controls

- **Preview** ▶. Plays the current loop repeatedly. Click again to stop preview.

- **Loop.** Click the **Loop** button to loop clips in the Track view by dragging the right side of a clip with your mouse. When **Loop** is not on, you are able to slip-edit the clip.

- **Resolution.** The slice **Resolution** control sets the resolution for the creation of markers, or the "slicing" of the looped clip. This control uses the following note durations:

  - No Slice
  - Whole Note
  - 1/2 Note

- 1/4 Note
- 1/8 Note
- 1/16 Note
- 1/32 Note

The automatic markers appear at the note resolutions according to the Resolution setting. At the eighth note setting, there are eight markers per measure.

This control works well for slicing audio that has more subtle changes in volume with few dramatic transients.

The markers in a loop clip preserve the timing of the audio at that moment. Too few or too many markers can cause unwanted "artifacts" when a loop clip is stretched.

- **Threshold.** The **Threshold** control senses transients in your audio clip and assigns a marker at the beginning and end of each one it finds. As you increase the number in this field, smaller transients are detected and the number of markers increases.
- **Beats.** The number of beats (quarter notes) in the clip.
- **BPM.** The tempo at which the clip was recorded.
- **Pitch.** The **Follow Project Pitch** option transposes the loop, if necessary, to the key of the project. A loop recorded in the key of A, used in a project in the key of C, would be transposed up three semitones if the **Follow Project Pitch** check box was checked.
- **Root Note.** The **Root Note** represents the key in which the loop was recorded. The **Follow Project Pitch** feature uses this information, when checked, to transpose the loop to match the project's key.
- **Coarse Pitch.** You can set the transposition of a clip, independent from the project pitch, using the **Coarse Pitch** field. A positive number transposes the clip up by that number of semitones. A negative number transposes the clip down by that number of semitones. Remember that, if the **Follow Project Pitch** option is checked, the clip follows the project's pitch, so any transposition changes you make using this option are changes to the project pitch, not the clip pitch.

   An example: The project key is C. The clip key is D. If the **Follow Project Pitch** option is checked, the clip is transposed down by two semitones. A value entered into the **Pitch (semitone)** field adjusts the pitch from C. If you enter "-1" the pitch would be transposed down by one additional semitone to B.

   Another example: The clip pitch is E. The desired clip pitch is D. If the **Follow Project Pitch** option is not checked, and a value of "2" is entered in the **Pitch (semitones)** field, the clip is transposed down two semitones to D from the original pitch of E.

- **Fine Pitch.** The **Pitch (fine)** field allows you to make tuning adjustments or to transpose the pitch of a clip up to 50 cents. There are 100 cents in one semitone. A Pitch (fine) setting of **1** adjusts the pitch up one hundredth of a semitone. The **Pitch (fine)** option can "fine tune" a slightly out of tune clip so that it is in pitch with the remaining clips in a project.

Slicing markers

There are two types of slicing markers in the Loop Construction view: automatic and manual. Automatic markers appear in red and are automatically generated by SONAR when you loop enable a clip. The one exception to this is if you import an ACIDized wave file into SONAR. ACIDized files always appear with manual slicing markers. Manual markers appear in purple. If you add a marker or move an automatic marker, it turns purple to show you that it has been edited. For information on editing slicing markers, see "To edit the slicing markers in a Groove Clip" on page 663.

Beat markers

Beat Markers mark where the beats fall in your clip. There are as many beat markers as there are beats in a clip.

Audio scaling

Audio scaling is the increase or decrease in the size (scale) of the waveform in clip. Audio scaling allows you to make detailed edits by zooming in on the parts of the waveform closest to the zero crossing (silence) while preserving the track size. By showing just the quietest parts of a clip, you can make very precise edits.

The Audio Scale Ruler is located on the far left of the Loop Construction view.

Figure 213. *Audio scale ruler*
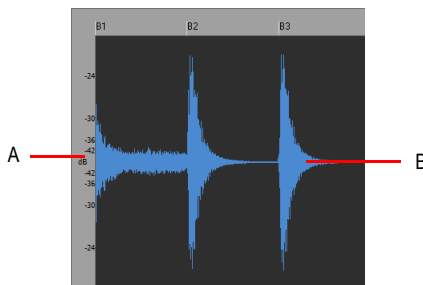
A. *Audio Scale Ruler* **B.** *Clip*

There are three right-click display options in the Audio Scale Ruler:

- **Percentage.**   Shows audio scaling by percentage. For example, if the highest percentage in the Audio Scale Ruler reads 2.0%, then only the parts of the waveform which are within 2% of the zero crossing appear in the clip.

- **dB.**   Shows audio scaling by dB. For example, if the highest dB in the Audio Scaling Ruler reads -36, then only the parts of the waveform which are 36 dB below 0 dB appear in the clip.

Working with loops and Groove Clips
The Loop Construction view

- **Zoom Factor.** Shows audio scaling by a factor. For example, if the Zoom Factor reads 10, then the waveform is zoomed in by a factor of 10.

See:

Using loops with the Browser

The Browser lets you find and import various types of content into your projects, including audio and MIDI loops. The Browser's Media tab makes it easy to find and import loops.

You can preview audio and MIDI files before you import them into your project. If you preview a Groove clip, it plays back at the tempo and in the key of your current project. Audio files can be auditioned through any bus and MIDI files can be auditioned through any soft synth.

Figure 214. *Media Browser*
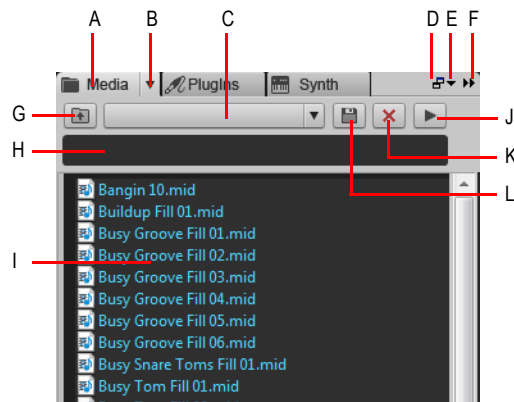
A. Show Media Browser **B.** Browser menu **C.** Content Location menu **D.** Dock/undock **E.** Docking options **F.** Expand/collapse **G.** Move up one level to the parent directory **H.** Search filter **I.** File list **J.** Play/Stop

To import an audio or MIDI file

1. In the Browser, click the **Browse Media** button 🖿 .
2. Navigate to the folder that contains the file you want to import.
3. Do *one* of the following:

- **To insert into an existing track as a new clip.** Double-click the file to add it to the selected track at the current Now time, or drag the file to the desired location.

Note: *A new track is created if the file type is not compatible with the selected track.*

- **To insert into a new track.** Drag the file to en empty space in the Track view, below the last track.
- **To replace the selected clip.** Drag the file to the Clip Inspector.
- **To insert into a cell in the Matrix view.** Make sure the Matrix view is visible, then drag the file to the desired Matrix cell.

To preview audio content

1. In the Browser, click the **Browse Media** button .
2. On the **Browser** menu, select **Auto-Preview**.
3. On the **Browser** menu, point to **Audio Preview Bus**, then select the bus you want to preview audio through.
4. Navigate to the folder that contains the audio content you want to preview, then click the file you want to preview.

Note: *Auto-Preview is enabled by default. If you disable **Auto-Preview**, you must click the **Play** button each time you want to preview the selected audio file.*

Tip: *To preview an audio file as a Groove Clip, hold down the ALT key and click the file. To preview all selected files as Groove Clips, hold down the ALT and click the **Play** button .*

The **Play** button changes to a **Stop** button during preview.

To preview MIDI content

1. In the Browser, click the **Browse Media** button .
2. On the **Browser** menu, select **Auto-Preview**.
3. On the **Browser** menu, point to **Synth Preview Output**, then select the soft synth you want to preview MIDI through.

Note: *If there are no synths in the project, go to **Insert > Soft Synths** and insert the desired soft synth.*

4. Navigate to the folder that contains the MIDI content you want to preview, then click the file you want to preview.

Note 1: *Auto-Preview is enabled by default. If you disable **Auto-Preview**, you must click the **Play** button each time you want to preview the selected audio file.*

Note 2: *MIDI Groove Clips loop indefinitely, but standard MIDI files play only once and do not repeat.*

The **Play** button changes to a **Stop** button during preview.

For more information about the Browser, see

See:

Working with loops

You can make any audio clip into a loop by selecting the **Looping** check box in the Clip Inspector's **Groove Clip** section. Once looping is enabled, you can drag out loops to create multiple repetitions. There are several other ways to enable looping:

To enable or disable a clip for looping

Select the clip you want to loop and do *one* of the following:

- In the Clip Inspector's **Groove Clip** section, select the **Looping** check box.
- Press CTRL+L.
- Right-click the clip and choose **Groove Clip Looping** on the pop-up menu.

To create repetitions of a loop

1. Set the Snap value if you want the loop to repeat at precise time boundaries.

2. Move the cursor over the end of the loop-enabled clip until the cursor looks like this.

3. When the cursor changes, click the end or beginning of the clip and drag it to the right (if you are dragging out from the end) or left (if you are dragging from the beginning).

The clip repeats itself until you stop dragging.

To create partial repetitions of a loop

1. Move the cursor over the end of the loop-enabled clip until the cursor looks like this ⬔.

2. When the cursor changes, click the end or beginning of the clip and drag it to the right (if you are dragging out from the end) or left (if you are dragging from the beginning).

If the **Snap to Grid** button ▦ is on, you can create a partial loop as small as the **Snap to Grid** setting allows. For example, if your **Snap to Grid** setting is set to quarter notes, you can create partial repetitions as small as a quarter of a measure.

See:

"Using loops with the Browser" on page 656

"Working with Groove Clip audio" on page 659

"MIDI Groove Clips" on page 668

"Importing Project5 patterns" on page 672

Working with Groove Clip audio

Groove clips are .wav files that behave similarly to Sony Media Software's ACIDized loops (SONAR also has MIDI Groove clips—see "MIDI Groove Clips" on page 668). Groove clips contain information about the audio content, including the original tempo, original reference pitch, number of beats in the loop, and audio transient information.

See:

"How Groove Clips work in SONAR" on page 659

"Using Groove Clips" on page 660

"Creating and editing Groove Clips" on page 661

"Using pitch markers in the Track view" on page 665

"Working with REX files" on page 666

How Groove Clips work in SONAR

Groove clips have information saved within them which allow them to adjust to changes in tempo and pitch. Groove clips can read a project's tempo and tempo changes, and can adjust their root note pitch when they read pitch markers. You can add pitch markers in the Track view's Time Ruler to transpose the Groove clip. As your project passes over a pitch marker, SONAR transposes your

Groove clips based on the clip's root note reference pitch. If you insert no pitch markers in your project, there are no pitch changes in your Groove clips. The default project pitch is C.

Note 1: *When working with Groove clips, it is important to know the difference between **key** and **pitch**. Your project's key signature has no effect on Groove clips. The pitch of your Follow Project Pitch-enabled Groove clips is dictated by pitch markers in the Time Ruler. If there are no pitch markers in your project, these Groove clips play at the pitch set in **Project > Set Default Groove Clip Pitch** (the default is C).*

Note 2: *Groove clips must be at least one beat in length. If you try to loop-enable a clip of a shorter duration you may experience distortion or artifacts.*

See also:

Using Groove Clips

Groove clips are easy to use because they automatically adjust to your project's pitch markers and tempo. You can import existing loops or create your own, using the Loop Construction view.

To import a Groove Clip into your project

1. Select a Track in the Track view.
2. Set the Now Time to the place you want the clip to begin.
3. Select **File > Import > Audio** from the menu.

   The **Open** dialog box appears.
4. Navigate to a directory that contains Groove clips and select one.
5. Click **Open**.

   Or

1. Open the Browser and click the **Media** button ▣.
2. Navigate to a directory that contains Groove clips.
3. Drag and drop a clip into the Track view, or double-click it to insert it at the Now Time.
4. The clip appears on the track and at the time in your project where you drop it, so if you want the clip on a new track, drop it after the last track in your project.

By default, Groove clips are loop-enabled and transposed to match the project's pitch.

Setting the default project pitch

Go to **Project > Set Default Groove Clip Pitch** and specify the default pitch.

Your project now uses the root note of your clips to transpose to the project pitch. Use Pitch markers at different points in your project to change the pitch. For more information about Pitch markers, see "Using pitch markers in the Track view" on page 665.

Creating and editing Groove Clips

Any audio clip can be converted to a Groove clip. Groove clips contain tempo, beat, and pitch information which SONAR uses to stretch and transpose the clips to match the project. Most Groove clips are loop-enabled, meaning that you can use the mouse to drag clip repetitions in the Track view. Groove clips can be either loop-enabled or not, although they usually are. When a Groove clip is loop-enabled, its edges appear beveled. It is sometimes desirable to create clips that follow the project's tempo and key, but are not intended to loop. The following is a list of the attributes contained in a Groove clip:

•   **Beats in clip.**   The number of quarter notes in a clip. A four measure clip in 4/4 time should have 16 beats. When you enable looping for a clip, SONAR calculates the number of beats in the clip using an algorithm. This calculation is very often accurate, but in some cases, for instance when the clip has a very slow or very fast tempo or if the clip has an unusual number of beats, then the number of beats in a clip may have to be edited manually in the **Beats in clip** field.

•   **Original tempo.**   The original tempo of the recording. SONAR uses the original tempo to adjust to your project's tempo. The original tempo must be specified for stretching clips.

Note: *When you loop-enable a clip, SONAR calculates the original tempo of the clip, and unless the clip's length is in exact beat or measure increments, the original tempo that SONAR calculates may vary from the recorded tempo. These fluctuations are usually quite small and do not affect the quality of the Groove clip you create.*

•   **Reference note.**   The original key of the recorded clip. SONAR uses the Reference note when it transposes Groove clips to match your project's pitch.

These attributes can be edited in the Loop Construction view. For more information about the Loop Construction view, see "Loop Construction view" on page 1872.

To set the number of beats in a Groove Clip

When you open a clip in the Loop Construction view, SONAR determines the number of beats in the clip. In some cases the beat value may not be correct. The beats in clip value can only be changed if the clip is loop enabled.

Do the following to change value in the **Beats** field.

•   Click the **Plus** or **Minus** button to the right of the **Beats** field until the correct value is displayed.

To change the Loop Construction view Time ruler display

You can display the Loop Construction view Time Ruler in measures or in samples. To toggle between the two modes, double-click the Time Ruler.

To set the tempo of a Groove Clip

When creating a new Groove clip, SONAR sets the clip's tempo to the current project tempo. To ensure proper stretching behavior you must set the value in the **BPM** field to the tempo at which you recorded the clip. The tempo value of a clip can only be changed if the clip is stretch-enabled.

Do the following to change the value in the **BPM** field.

- Click the **Plus** or **Minus** button to the right of the **BPM** field until the correct value is displayed. For more precise tempos you can double-click in the **BPM** field and enter a tempo.

To slice a Groove Clip

1. Double-click on a clip in the Clips pane.

    The clip appears in the Loop Construction view.

2. Slice the clip using one or all of the following methods:

To do this	Do this
Slice the clip on note divisions	Click the **Resolution** button and select the desired note resolution in the drop-down list. The available settings range from whole notes to 64th notes. Selecting quarter notes, for example, will create four markers per measure.
Slice the clip at transient peaks	Drag the **Threshold** slider to the desired value. The larger transients in the clip will be flanked by markers.
Slice the clip manually	Move your mouse to the space above the Time Ruler and double-click to add a marker. Click and drag the marker, if necessary, so it aligns with the beginning or end of a transient.

Table 119.

3. Play your project and adjust the slicing of your clip as necessary.

> **Note:** *You can use any or all of these methods to slice a clip. If you adjust both the **Resolution** and **Threshold** values, two markers may be placed right next to each other. If these markers are too close, the markers will automatically merge. Manual markers will not automatically merge.*

To transpose a Groove Clip to match your project's pitch

Follow this procedure to force the Groove clip to follow the project's default pitch.

1. Double-click the clip you want to transpose to the project's pitch.

The clip appears in the Loop Construction view.

2. Click the **Pitch** button.

To transpose a Groove Clip by semitones

Follow this procedure to transpose a Groove clip by any number of semitones.

1. Double-click the clip you want to transpose to the project's pitch.

The clip appears in the Loop Construction view.

2. If the **Pitch** button is enabled, click it to disable it.

3. In the **Coarse Pitch** field, enter the number of semitones you want to transpose the clip by. A negative number in the **Coarse Pitch** field transposes a clip down. A positive number in the **Coarse Pitch** field transposes the clip up.

To "fine tune" a Groove Clip

Follow this procedure to make slight pitch changes to a clip.

1. Double-click the clip you want to transpose to the project's pitch.

The clip appears in the Loop Construction view.

2. If the **Pitch** button is enabled, click it to disable it.

3. In the **Pitch (fine)** field, enter the number of cents you want to adjust the pitch. You can enter a number from -50 (transpose the pitch down by a quarter tone) to 50 (transpose the pitch up by a quarter tone).

To edit the slicing markers in a Groove Clip

The following table describes how to create and edit the slicing markers in the Loop Construction view.

To do this	Do this
Add a slicing marker	Move the mouse cursor to the Markers bar, at the beginning of a transient and double-click.
Delete a slicing marker	Select the Erase tool and click on a marker.
Move a slicing marker	Click and drag a marker
Reset slicing markers to original positions	Click the **Slice** menu and select **Reset Markers**.

Table 120.

For more information about slicing markers, see "Slicing markers" on page 655.

Editing slices

Each slice (space between the slicing markers) can be adjusted in the Loop Construction view. You can adjust the following slice attributes:

- Gain
- Pan
- Pitch

To preview a Groove Clip slice

1. Double-click on a clip to open the Loop Construction view.
2. Click the Loop Construction view **Options** menu and select **Auto Slice Preview On/Off**.
3. Click a slice to hear it.

To adjust a Groove Clip slice gain

1. In the Loop Construction view, select the slice on which you want to adjust the gain.
2. Click the **Slice** menu and select **Show/Hide Gain Envelope**.

   The Gain envelope is displayed.
3. Drag the Gain envelope up/down to adjust the selected slice's gain.

To adjust a Groove Clip slice pan

1. In the Loop Construction view, select the slice on which you want to adjust the pan.
2. Click the **Slice** menu and select **Show/Hide Pan Envelope**.

   The Pan envelope is displayed.
3. Drag the Pan envelope up/down to adjust the selected slice's pan.

To adjust a Groove Clip slice pitch (half steps)

1. In the Loop Construction view, select the slice on which you want to adjust the pitch.
2. Click the **Slice** menu and select **Show/Hide Pitch Envelope**.

   The Pitch envelope is displayed.
3. Drag the Pitch envelope up/down to adjust the selected slice's pitch by half steps (seminotes).

To adjust a Groove Clip slice pitch (cents)

1. In the Loop Construction view, select the slice on which you want to adjust the pitch.
2. Click the **Slice** menu and select **Show/Hide Pitch Envelope**.

   The Pitch envelope is displayed.
3. Hold down the SHIFT key and drag the Pitch envelope up/down to adjust the selected slice's pitch by cents.

Saving Groove Clips as Wave files/ACIDized Wave files

Once you have created a Groove clip in SONAR, you can save the clip as a Groove Clip/Wave file, compatible with ACIDized wave files.

To save a Groove Clip as a Riff Wave file/ACIDized Wave file

1. If you have not already done so, create a Groove clip. See "Creating and editing Groove Clips" on page 661.

2. In the Loop Construction view, click the **Clip** menu and select **Save Loop**.

   The **Save As** dialog box appears.

3. Use the toolbar in the **Save As** dialog box to navigate to the location where you want to save the file.

4. In the **File name** field, enter a name for the file.

5. Click the **Save** button.

To drag and drop a Groove Clip into another program

You can drag and drop clips from SONAR to another application or to a directory in Windows. When you drag a file from SONAR, the source file is copied and the copy is placed in the new directory or application.

See:

Using pitch markers in the Track view

Pitch markers change the pitch at which Groove clips sound. All Groove clips in SONAR that have the **Follow Project Pitch** option enabled adjust their pitch as they encounter pitch markers in SONAR. If there are no pitch markers, all Groove clips play at the default project pitch, unless the **Follow Project Pitch** parameter is disabled.
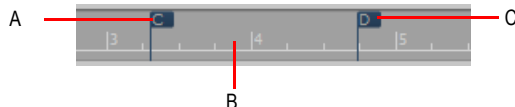
*A. Pitch marker: Groove clips with Follow Project Pitch enabled play with the Root Note transposed to C **B.** Time Ruler **C.** Pitch marker: Groove clips with Follow Project Pitch enabled play with the Root Note transposed to D*

To enable a clip's Follow Project Pitch option

1. Select the clip and open the Clip Inspector.
2. Select the Clip Inspector's Groove Clip section and make sure that the **Reference Note** field is correct. When your project reaches a pitch marker, SONAR transposes each groove clip that has the **Follow Project Pitch** option enabled by the difference between the clip's **Reference Note** and the current **Project Pitch**.

To change your project's default pitch

Go to **Project > Set Default Groove Clip Pitch** and specify the default pitch.

SONAR transposes each groove clip that has the **Follow Project Pitch** option enabled by the difference between the clip's **Reference Note** and the current **Project Pitch**. Your project's pitch changes wherever you insert a pitch marker. If you don't insert any pitch markers, your project stays at its default pitch.

To create a pitch marker

1. In the Track view, right-click in the Time Ruler.
2. Select **Create a Marker** from the menu that appears.
3. The **Marker** dialog box appears.
4. In the **Groove Clip Pitch** drop-down, select a pitch.
5. Click **OK**.

To move a pitch marker

• Click and drag a pitch marker to a new location on the Time Ruler.

See:

Working with REX files

SONAR supports two types of Groove Clips:

• ACIDized Groove Clip
• REX-based Groove Clip

Like ACIDized WAVE files, REX files are audio files that are designed to be looped and follow the project's tempo. The time stretching technology that REX files use is well suited for percussive sounds, such as drums.

You can import REX files into a SONAR project. Once imported, you can work with REX files just as if they were regular Groove Clips (see "Working with Groove Clip audio" on page 659).

Note: *REX-based Groove Clips can be edited in the Loop Construction view, but certain Loop Construction view tools only apply to ACIDized Groove Clips. The following Loop Construction view commands, settings and tools do not apply to REX files:*

- *Enable Looping*
- *Beats in Clip*
- *Enable Stretching*
- *Marker tools*
- *Slice Resolution*
- *Transient Detection*

To import a REX file

1. On the **File** menu, point to **Import** and click **Audio**.

   The **Import Audio** dialog box appears.

2. In the **Files of type** list, select **All Audio** or **REX (*.rex, *.rx2, *.rcy)**.

3. Find and select the REX file you want to import.

   If you want to preview the selected file, click **Play**. The file will play at the current project tempo.

4. Click **Open**.

   The REX file is imported into SONAR as a Groove Clip.

You can also drag REX files into SONAR, paste from the Clipboard, or import from the Media Browser view.

To disable looping of a REX-based Groove Clip

If you want to disable looping of REX based Groove Clips, use the Track view **Clips > Bounce to Clip(s)** command or click the track's **Freeze** button render the REX based Groove Clip to a standard audio clip.

For details, see "Bouncing to clips" on page 787 and "Freeze tracks and synths" on page 858.

To use pitch markers with REX-based Groove Clips

Unlike ACIDized audio loops, REX files do not store the original pitch (root note) value. If you want a pitched REX file to properly follow your project's pitch markers, you must manually specify the original root note for each REX clip. By default, SONAR assigns a root note value of G#.

Due to limitations of the REX file format, the root note value can not be saved back to the REX file, and must be manually specified each time you import a REX file into a SONAR project. If you want to permanently save the root note value with a REX loop, export the REX Groove clip as an ACIDized .wav file.

For details, see Root Note and "Saving Groove Clips as Wave files/ACIDized Wave files" on page 665.

See:

MIDI Groove Clips

MIDI Groove clips are MIDI clips that you can roll out like audio Groove clips, and you can also choose to have SONAR transpose MIDI Groove clips when your project reaches a pitch marker.

You can change any MIDI clip into a MIDI Groove clip (or back into a regular MIDI clip) by right-clicking the clip and choosing **Groove-Clip Looping** on the pop-up menu. A MIDI clip that has its Groove clip feature activated appears with *beveled edges* in the Clips pane.

Here are some other features of MIDI Groove clips:

- You can roll out copies in either direction (just like audio Groove clips). The Snap to Grid setting determines what beat boundaries (if any) you can roll to.
- You can edit individual repetitions without altering any other copies (*unlike* audio Groove clips).

Note: *If you then roll the edge of your MIDI Groove clip back over the area you edited, you will lose your edits.*

- All new repetitions are based on the first clip (just like audio Groove clips). However, if you split a repetition from its original source clip, the repetition becomes independent: if you copy this clip, SONAR treats it as an original clip.
- You can import MIDI Groove clips from the **Import MIDI** dialog box, the Media Browser view, and by dragging and dropping from the Windows Explorer.
- You can preview MIDI Groove clips in the **Import MIDI** dialog box.
- You can edit MIDI Groove clips wherever you can edit regular MIDI clips.

For step-by-step information, see the following procedures, and also "Exporting and importing MIDI Groove clips" on page 670.

See:

To enable or disable a MIDI clip's Groove Clip function

• Select the clip and press CTRL+L.

  Or

• Right-click the clip and choose **Groove Clip Looping** from the pop-up menu.

A MIDI clip that has its Groove clip feature activated appears with *beveled edges* in the Clips pane.

To create repetitions of a MIDI Groove Clip

1. Set the Snap value if you want the clip to repeat at precise time boundaries.

2. Move the cursor over the end or beginning of the clip until the cursor looks like this ⬚. When the cursor changes, click the end or beginning of the clip and drag it to the right (if you are dragging out from the end) or left (if you are dragging from the beginning).

The clip repeats itself until you stop dragging.

To transpose MIDI Groove Clip

1. Select the MIDI Groove clip.

2. Hold down the ALT key, and press the + or - key on your computer keyboard to raise or lower the clip's pitches a half-step at a time. You don't have to stop playback.

  Or

1. Select the MIDI Groove clip.

2. Open the Clip Inspector's Groove Clip section and adjust the **Pitch (semitones)** field. Choose the number of half-steps you want to transpose the clip by: choose negative numbers to transpose down, or positive numbers to transpose up.

Either method transposes the original clip and all repetitions. The original clip displays a positive or negative number in parentheses showing any transposition value you've added to the clip.

If you use pitch markers to transpose a clip, any transposition value you add to the clip by the above two methods changes the final pitch by whatever transposition value you've added.

To transpose a MIDI Groove Clip with pitch markers

Use the same method you use for audio Groove clips: see "Using pitch markers in the Track view" on page 665.

See also:

Exporting and importing MIDI Groove clips

You can not export MIDI Groove clips by saving your project as a Standard MIDI File—Standard MIDI Files do not contain MIDI Groove clip data, such as transposition value, etc. When you import MIDI Groove clips, you can preview them in the **Import MIDI** dialog box.

There are two methods for exporting MIDI Groove clips:

• Using the **File > Export > MIDI Groove Clip** command

• Dragging a MIDI Groove clip from SONAR to the Windows Explorer

There are three methods for importing MIDI Groove clips:

• Using the **File > Import > MIDI** command

• Using the Media Browser view

• Dragging a MIDI Groove clip from the Windows Explorer to a MIDI track in SONAR

For step-by-step information, see the following procedures:

To export MIDI Groove Clips with the File command

1. Highlight the MIDI Groove clip that you want to export.

2. Use the **File > Export > MIDI Groove Clip** command.

   The **Export MIDI** dialog box appears.

3. Navigate to a folder where you store MIDI Groove clips.

4. Type a name for the clip in the **File Name** field.

5. Click the **Save** button.

SONAR exports the MIDI Groove clip, which contains the information displayed in the Clip Inspector's **Groove Clip** section, except for the **Pitch (semitones)** field, which does not get exported.

To export a MIDI Groove Clip with drag and drop

• Drag the MIDI Groove clip that you want to export to the folder in the Windows Explorer where you want to keep it.

To import MIDI Groove Clips with the File command

1. Move the Now Time to the place where you want to import the clip.

2. Highlight the track you want to import the clip into.

3. Use the **File > Import > MIDI** command.

   The **Import MIDI** dialog box appears,

4. Navigate to a folder where you store MIDI Groove clips. Make sure that the **Files of Type** field is set to **MIDI File**.

5. Highlight the file you want to import—the **File Info** field displays the file's MIDI Groove clip data, if any.

6. If you want to preview (listen to) the highlighted file, click the **Play** button in the **Import MIDI** dialog box. When you decide to import the highlighted file, click the **Open** button.

To import MIDI Groove Clips from the Browser

1. Make sure that the Snap-to-Grid setting is appropriate for what you want to do.

2. If the Browser view is not open, use the **Views > Browser** command to display it, or press B.

3. Navigate to a folder where you store MIDI Groove clips.

4. Do either of the following:

   • Drag the file you want to the track and time where you want it.

   • Move the Now Time to the place where you want to import the file, highlight the track you want to import the file into, and double-click the file.

To import a MIDI Groove Clip with drag and drop

1. Make sure that the Snap-to-Grid setting is appropriate for what you want to do.

2. In the Windows Explorer, navigate to a folder where you store MIDI Groove clips.

3. Drag the MIDI Groove clip to the track and time where you want it to go.

See:

Importing Project5 patterns

Project5 is Cakewalk's pattern-based soft synth work station that has its own library (pattern bin) full of MIDI and audio patterns, stored on disk. If you have Project5 MIDI patterns on your hard disk, you can import them directly into SONAR.

To import a Project5 pattern

1. Move the Now Time to the place where you want to import the pattern.
2. Highlight the track you want to import the pattern into.
3. Use the **File > Import > MIDI** command.

   The **Import MIDI** dialog box appears,
4. Change the **Files of Type** field to **P5 Pattern**.
5. Navigate to a folder where you store Project5 MIDI patterns.
6. Highlight the file you want to import.
7. To import the highlighted file, click the **Open** button.

SONAR imports the pattern to the selected track at the Now Time.

> **Tip:** *You can preview Project5 patterns in the Browser.*

See:

"Using loops with the Browser" on page 656

"Working with loops" on page 658

"Working with Groove Clip audio" on page 659

"MIDI Groove Clips" on page 668

Editing MIDI events and continuous controllers (CC)

SONAR lets you edit the events in your projects in dozens of different ways. The Piano Roll view lets you add and edit notes, controllers, and automation data interactively, using a graphic display. SONAR's many editing commands can improve the quality of recorded performances, filter out certain types of events, and modify the tempos and dynamics of your projects. The Event List view lets you see and modify every detail of your project. Finally, you can apply a variety of effects and filters to enhance your MIDI data.

Note: *For a basic overview over MIDI data, please see*

To specify the default editing view for MIDI clips

SONAR provides several views you can use to edit MIDI data. You can specify which ediitng view should open by default when you double-click a MIDI clip. To do so, click the Track view **Options** menu, point to **Click Behavior > Double-Click > MIDI Clips**, and select the desired default editing view. The options are as follows:

- **-Nothing-.** Prevent any view from opening when you double-click a MIDI clip.
- **Event List View.** Open the Event List view when you double-click a MIDI clip.
- **Staff View.** Open the Staff view when you double-click a MIDI clip.
- **Piano Roll View.** Open the Piano Roll view when you double-click a MIDI clip.
- **Inline Piano Roll View.** Open the Inline Piano Roll view when you double-click a MIDI clip.

You can override the default editing view and assign a specific editing view to each MIDI clip. To do so, click the MIDI Editor indicator in the top right corner of the MIDI clip, then choose the desired editing view on the pop-up menu.

Figure 215. *Click the MIDI Editor indicator to assign a default ediitng view.*
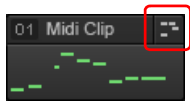
The following table describes the various MIDI clip header indicators.
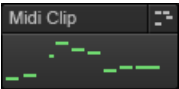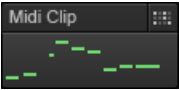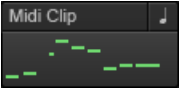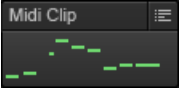
Indicator	Description
	Double-click the clip to open the Piano Roll view. For details, see "The Piano Roll view" on page 677.
	Double-click the clip to open the Step Sequencer view. For details, see "Step Sequencer view" on page 1803.
	Double-click the clip to open the Staff view. For details, see "The Staff view" on page 1072.
	Double-click the clip to open the Event List view. For details, see "The Event List view" on page 742.

Table 121. *MIDI clip editing view indicators*

SONAR has many additional commands and features for working with audio. For more information, see "Editing audio" on page 773.

See:

"Event Inspector" on page 675

"The Piano Roll view" on page 677

"The Inline Piano Roll view" on page 705

"Selecting and editing events" on page 709

"Changing the timing of a recording" on page 718

"Searching for events" on page 734

Event Inspector

The Event Inspector module is available in the Control Bar. The Event Inspector has the following:

• Time

• Pitch

• Velocity

• Duration

• Channel

Figure 216. *The Event Inspector module.*
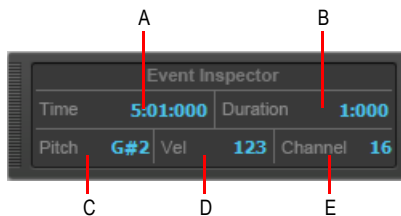
A. Time B. Duration C. Pitch D. Velocity E. Channel

To display a note's properties in the Event Inspector

• Select a note.

 If you select multiple notes, the Event Inspector displays the note value if all selected note values are the same. If the note values are different, the Event Inspector does not display anything.

To change a note's properties using the Event Inspector

1. Select a note.
2. In the appropriate Event Inspector field, change the value. See the following table for a description of valid value entries for each field in the Event Inspector.

Event Inspector Field	Valid Values
Time	Any valid M:B:T time value. Separate values with a colon or a space. For example, measure 2, Beat 3, Tick 720 would be written as 2:3:720.
Pitch	Note names (C0 through G10) and note numbers (0 through 127) are valid in this field. Also, you can use a modifier to raise or lower the value by a number of half-steps. To raise the pitch by 2 half-steps, type +2 and press enter. To lower the pitch by 2 half-steps, type -2 and press enter.
Velocity	A velocity value or modifier value are valid in this field. Valid velocity values are 0 through 127. Valid modifier values are +/- 0 through 127.
Duration	A PPQ value.
Channel	1 through 16.

Table 122.

The Piano Roll view

The Piano Roll view displays all notes and other events from one or more MIDI tracks in a grid format that looks much like a player piano roll. Notes are displayed as horizontal bars, and drum notes as diamonds. Pitch runs from bottom to top, with the left vertical margin indicating the pitches as piano keys or note names. Time is displayed running left to right with vertical measure and beat boundaries. The Piano Roll view makes it easy to add, edit, and delete notes from a track.

A single-track version of the Piano Roll view is available in each track in the Track view. This view is called the Inline Piano Roll view, and replaces the Clips pane in any track that you choose to display in Inline Piano Roll mode.

The Piano Roll view consists of the Note Map pane, the Drum Grid pane, the Notes pane, the Controller pane, the Track List pane and a menu across the top.

Figure 217. *The Piano Roll view*
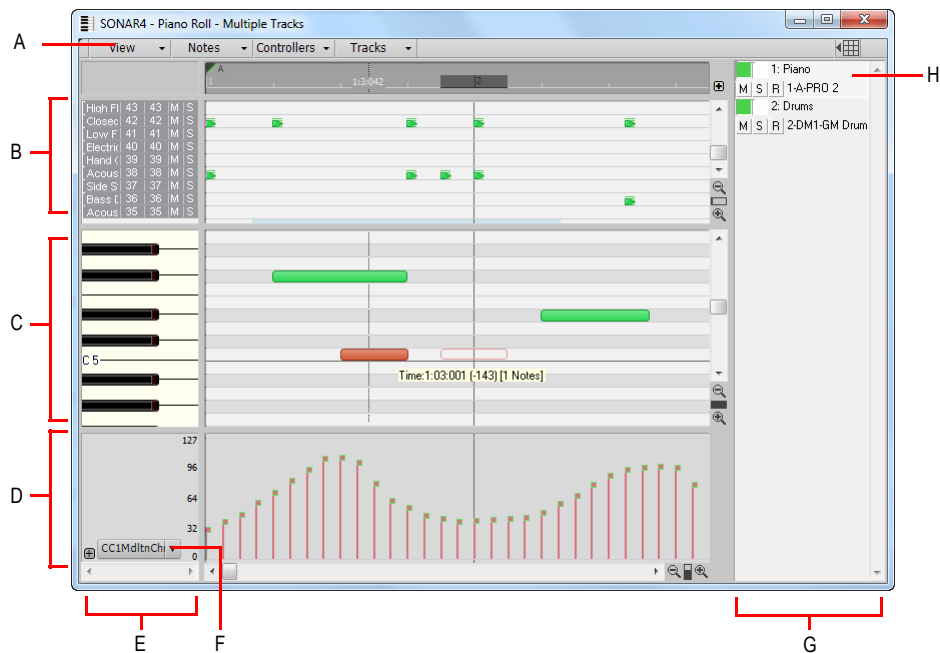
A. Menu B. Drum Grid pane C. Notes pane D. Controller pane E. Key/Pitch pane F. Edit Filter G. Track List pane H. Selected track

See:

Editing MIDI events and continuous controllers (CC)
The Piano Roll view

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Note Map pane

This pane displays your drum map settings. You can mute or solo individual pitches, and preview individual pitch sounds. For more information about the Note Map Pane, see "The Note Map pane" on page 769.

See also:

"Drum maps and the Drum Grid pane" on page 759

Drum Grid pane

In the Drum Grid pane you can add, delete, and edit notes and note properties in any MIDI track(s) assigned to a drum map. You can also edit controllers in this pane if you choose to hide the Controller pane.

For more information, see "The Drum Grid pane" on page 771, and "Adding and editing controllers in the Piano Roll" on page 695.

See also:

"Drum maps and the Drum Grid pane" on page 759

Notes pane

In this pane you can add, edit, and delete notes in any MIDI track(s) not assigned to a drum map. You can also edit controllers in this pane if you choose to hide the Controller pane.

Use the Edit Filter to select the MIDI event type you want to edit.

See also:

"Adding and editing notes in the Piano Roll" on page 684

Controller pane

This pane displays controller events, which you can edit. To show or hide the Controller pane, click the Piano Roll view **View** menu and choose **Show/Hide Controller Pane**. When the Controller pane is hidden, all controller events appear in the Notes pane.

See also:

"Adding and editing controllers in the Piano Roll" on page 695

Track List pane

The Track List pane is home to a list of all tracks currently displayed in the Piano Roll view. In this pane you can enable and disable editing of a track's data; mute, solo and arm a track; and show or hide the track's data in the Notes pane or Drum Grid pane. Track numbers, names and output ports appear in the Track List pane. To show or hide the Track List pane, click the Piano Roll view **View** menu and choose **Show/Hide Track Pane**.

If you see an error message saying that you have masked the active track, it means that the active

track is not visible at the moment. To unmask the track click the track's **Show/Hide Track** button in the Track List pane so that the button appears in color.

See also:

"Working with multiple tracks in the Piano Roll view" on page 680

Opening the view

There are several ways to open the Piano Roll view:

• In the Track view, select the track you want to see, then choose **Views > Piano Roll View** or press ALT+3

• In the Track view, right-click on a track and choose **Views > Piano Roll** from the pop-up menu

• Double-click on a MIDI clip in the Clips pane

• In a soft synth's property page, click the **Open View** button to open the default MIDI editing view.

Each selected track is displayed. To switch to different tracks, click the Piano Roll view **Tracks** menu and choose the track you want.

The Piano Roll view lets you edit notes and controllers during playback or recording, in real time. This means you can loop over a portion of your project and hear any change you make on the next loop. The Piano Roll view also shows notes on-screen as you record them.

See:

Working with multiple tracks in the Piano Roll view

You can view as many tracks as you want in the Piano Roll view. When you display several tracks at the same time in the Piano Roll view, you control which track(s) you can see and/or edit by using the buttons in the Track List pane. To show or hide the Track List pane, click the Piano Roll view **View** menu and choose **Show/Hide Track Pane**.

If you want to edit the data in a track, you must make the track you want to edit the current track. The name of the current track appears highlighted in the Track List pane. The following shows three tracks in the Track List pane:
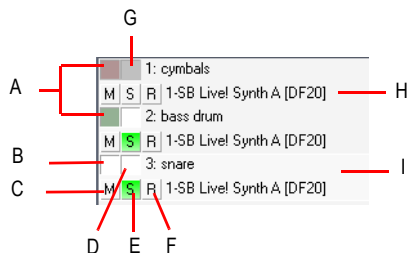
*A. Track's data shown in Notes pane **B.** Track's data hidden in Notes pane **C.** Mute **D.** Track enabled for track editing **E.** Solo **F.** Arm **G.** Track disabled for track editing **H.** Output **I.** Current track*

To make a track the current track in the Track List pane, click on the track. When a thin dotted line surrounds the track, it is the current track.

Tip: *Clicking a note will make the note's parent track the current track.*

The following is a list of ways to optimize the multiple track functionality in the Piano Roll view.

Selecting tracks to view

To assign tracks to the Track List pane, click the Piano Roll view **Tracks** menu and choose **Pick Tracks**. Click on a track name to select it. Hold down the CTRL key and click more track names to select additional tracks. To show the next or previous track, click the Piano Roll view **Tracks** menu and choose **Show Previous Track** or **Show Next Track**. Selecting **Show Previous Track(s)** moves the track or range of tracks down by one track number. Selecting **Show Next Track(s)** moves the track or range of tracks up by one track number. For example, if you have tracks 2, 3 and 7 displayed in the Track List pane and you select **Show Previous Track(s)**, the Track List pane displays tracks 1, 2, and 6.

Display

If the notes of two tracks overlap, the notes of the topmost track in the Track List pane appear over the notes of the other track. You can move a track up or down by in the Track List pane by clicking and holding on the track and moving the track to the desired position.

All tracks ending in the same digit (2, 12, 22, etc.) share the same color. The default colors can be changed using **Edit > Preferences > Customization - Colors**.

The Enable/Disable Track Editing button

The **Enable/Disable Track Editing** button 1: sets whether or not you can edit the notes of a track in the Piano Roll view. When the button appears white, editing is enabled and the track appears in color. When the button appears gray, editing is disabled and the track appears in gray.

Note: *The **Enable/Disable Track Editing** button only disables the Piano Roll view tools; other editing commands are still operational.*

The Show/Hide Track button

The **Show/Hide Track** button controls whether or not a track appears in the Notes pane. The button appears in color when toggled on, white when off.

The Invert Tracks button

If you use the **Show/Hide Track** button to hide any tracks in the Track List pane, you can show all these tracks and hide the ones that are currently displayed by selecting **Tracks > Invert Tracks**.

See:

Note names

You can change the instrument definition for the active track in the Piano Roll view. Right-click the piano keys in the Notes pane to open the **Note Names** dialog box where you can use note names that are defined as part of any instrument definition. For more information about instrument definitions, see "Instrument definitions" on page 1117.

To change the active track's instrument definition

1. Right-click the left side of the Notes pane (where the piano keys or note names are displayed) to display the **Note Names** dialog box.

Figure 218. *The **Note Names** dialog*
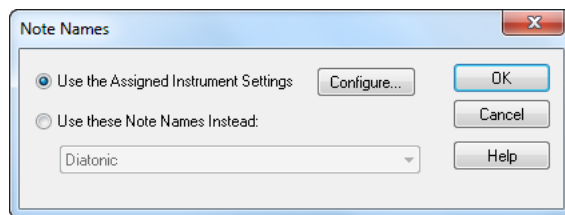
2. To use the note names from the assigned instrument (the default), click **Use the Assigned Instrument Settings**. Click **Configure** to change the instrument definitions.

3. To override the default setting, click **Use These Settings Instead**, and choose the note names and mode you want to work with.

4. Click **OK** when you are done

The Piano Roll view is updated with the settings you request.

Displaying notes and controllers (Piano Roll view only)

The menu across the top of the Piano Roll view lets you quickly hide or show any combination of the data in a MIDI track or in multiple MIDI tracks (see also "Displaying notes and controllers in the Inline Piano Roll view" on page 707).

To hide or show data in the Piano Roll view

1. If you want to display the data from multiple MIDI tracks, first choose and configure the tracks from which you want to display data (see "Working with multiple tracks in the Piano Roll view" on page 680).

2. Choose from the following menu options:

   • To hide or show notes for all displayed tracks, click the Piano Roll view **Notes** menu and choose **Show Notes**.

   • To hide or show the outline(s) of the clip(s) you're looking at, click the Piano Roll view **View** menu and choose **Show Clip Outlines**.

   • To hide or show a controller type for all displayed tracks, click the Edit Filter, then click the name of the controller.

   • To hide or show the edit handles on controllers, click the Piano Roll view **Controllers** menu and choose **Show Controller Handles**.

   • To hide or show the velocity columns on all tracks except the active track, click the Piano Roll view **Notes** menu and choose **Show Velocity on Active Track Only**.

   • To show all controllers in all displayed tracks, click the Piano Roll view **Controllers** menu and choose **Show All Controllers**.

3. After you choose an option, the menu closes.

See:

"Adding and editing notes in the Piano Roll" on page 684

"Adding and editing controllers in the Piano Roll" on page 695

Adding and editing notes in the Piano Roll

You add notes in the Piano Roll view or Inline Piano Roll view by first choosing a note duration in the Control Bar's Tools module and then dragging in the view with the Smart tool or Freehand tool at the pitch location and time location where you want the note to go. The pitch locations are marked by grey rows for the sharps or flats, and white rows for naturals. Octaves are labeled on the keyboard display on the left side of the Piano Roll view, and by the MIDI Scale in the Inline Piano Roll view. You can display different octaves by dragging the vertical scroll bar that's on the right side of the Piano Roll view, or by dragging the MIDI Scale in the Inline Piano Roll view. The time locations are marked by the measure numbers in the horizontal time ruler that's at the top of the view, and by the vertical grid lines that mark the beats in the measure. Use the Snap module in the Control Bar to specify how precisely you can place your notes in time.

You can edit notes by a variety of methods:

- Select notes, and then use editing commands from the **Edit** menu, the **Process** menu, or the Event Inspector.

- Move single or groups of selected notes with the Select tool.

- Edit the pitch, location, duration, start time, and velocity of individual or groups of selected notes with the Smart tool ⭐ or Freehand tool ✎.

- Delete notes with the Erase tool ✎, or by right-clicking with the Smart tool ⭐.

For step-by-step procedures, see the following topics:

Selecting notes

There are several ways to select notes in the Piano Roll view and Inline Piano Roll view:

- Click and drag in the Piano Roll view's Time Ruler to select notes (and other MIDI events) that start playing within the time range that you select.

- In the Inline Piano Roll view, click and drag in the Track view's Time Ruler to select notes (and other MIDI events) that start playing within the time range that you select. This selects data in the current track, or all selected tracks.

- With the Smart tool ⭐, click notes, or drag around them with the right mouse button.

- With the Select tool ⭤, click notes, or drag around them.

- In the Piano Roll view only (not the Inline Piano Roll view): click or drag the piano keys to the left

of the Notes pane or the drum map rows in Note Map pane to select all notes of the desired pitch(es).

• In the Inline Piano Roll view: SHIFT-click or SHIFT-drag the piano keys on the MIDI Scale to select all notes of the desired pitch(es).

To select notes with the Select tool

1. Select the Select tool ![Select tool icon] in the Control Bar.
2. Select notes as shown in the table:

To do this	Do this
Select a single note	Click on the note
Select several notes at once	Drag a rectangle around the notes you want to select
Add to the selection	Hold the SHIFT key while selecting notes
Toggle the selection	Hold the CTRL key while selecting notes
Select notes in a certain time range.	Set the desired Snap to Grid value in the Control Bar's Snap module, and drag in the Time Ruler.

Table 123.

Selected notes are highlighted (50% gray mask).

To select all notes of certain pitches (Piano Roll view only)

Click the piano keys on the left side of the Notes pane or the drum map rows in the Note Map pane as shown in the table:

To do this	Do this
Select all notes of a single pitch	Click on the piano key or drum map row
Select all notes of several pitches	Drag across the keys or drum map rows
Add to the selection	Hold the SHIFT key while clicking on a piano key or drum map row
Toggle the selection	Hold the CTRL key while clicking on a piano key or drum map row

Table 124.

To select all notes of certain pitches (Inline Piano Roll view only)

1. Zoom the MIDI Scale in far enough to see the keys clearly (left-click and drag on the MIDI Scale).
2. SHIFT-click a piano key to select all the notes of that pitch, or SHIFT-drag through multiple notes to select them.

CTRL-clicking to select multiple non-adjacent notes is not possible in the MIDI Scale.

See:

Editing notes with the global tools

You can edit notes in the Piano Roll view and the Inline Piano Roll view with the same methods. The Smart tool, Freehand tool and Select tool are useful for quick note editing. You can do the same edits with commands in the **Process** menu (**Length**, **Slide**, **Transpose**). If you want to edit multiple notes at the same time, first select them with the Select tool.

MIDI notes display their velocity value as a wide or narrow column. You can drag the column up or down to edit the note's velocity. Holding the Smart tool over the middle of the note in the upper third of the note displays a small velocity column on the Smart tool to show that the tool is in the target zone.
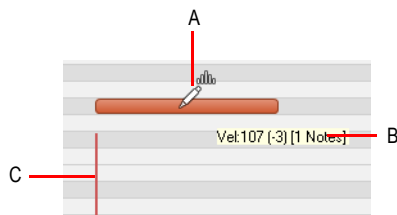
A. Smart tool in velocity-edit mode B. Tooltip showing cursor position C. Velocity column

Tooltips give you a constant readout of the cursor position, how much you've edited the selection, and how many notes you're editing.

In the following figure, the tooltip lists the current location of the cursor, how far the selection has moved from its original location (1252 ticks to the right), the current pitch level and MIDI note number of the cursor (E8 100), how far from the note's original pitch the cursor has moved (1 half-step higher), and how many notes are in the selection.

To adjust a MIDI note's velocity

1. Set the track's Edit Filter control to **Notes**.
2. Do *one* of the following:

    - With the Smart tool [★], position the pointer near the top center of the note, then drag up/down.

    - With the Edit tool [✎], position the pointer near the top center of the note, then drag up/down.

To adjust a MIDI note's start/end

1. Set the track's Edit Filter control to **Notes**.
2. Do *one* of the following:

    - With the Smart tool [★], position the pointer over the note's start or end point, then drag left/right to adjust the start/end position.

    - With the Edit tool [✎], position the pointer over the note's start or end point, then drag left/right to adjust the start/end position.

To select MIDI notes

1. Set the track's Edit Filter control to **Notes**.
2. Do *one* of the following:

    - With the Smart tool [★], position the pointer outside any notes, then click with the right mouse button and drag over the notes you want to select.

    - With the Smart tool [★], position the pointer over the bottom half center of the note, then click to select the note.

    - With the Select tool [↖], click the note.

    - With the Select tool [↖], position the pointer outside any notes, then drag over the notes you want to select.

    - With the Freehand tool [★], position the pointer outside any notes, hold down the ALT key and drag over the notes you want to select.

To scrub MIDI notes

1. Set the track's Edit Filter control to **Notes**.
2. Hold down the J key and drag across the notes.

To mute/unmute a MIDI note

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

    - With the Smart tool ★, hold down the ALT key and right-click the note.

    - With the Mute tool M, click the note to mute/unmute a single note, or drag over notes to mute/unmute multiple notes.
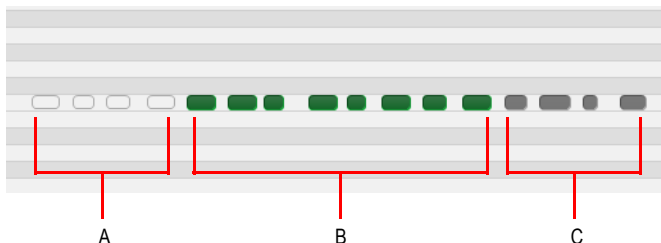
*A. Event-Muted (hollow; the note outline uses the Clip Mute color) **B.** Unmuted events (track color) **C.** Muted using the Mute tool on the clip (Clip Mute color)*

To move a MIDI note

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

    - With the Smart tool ★, position the pointer over the bottom half center of the note, then drag the note to the desired location.

    - With the Move tool ✛, drag the note or selection to the desired location.

💡 **Tip:** *When moving a note, hold down the SHIFT key to constrain vertical or horizontal movement, depending on the direction you first move.*

To draw a MIDI note

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

    - With the Smart tool ★, drag where you want to insert a new note.

- With the Freehand tool ![freehand icon], click where you want to insert a new note.

Note: *Use the Value control in the Tools module to specify the duration for new note events. You can also click an existing Note event to inherit its duration and apply it to new Note events. For details, see ["Use note duration value from last touched note"](#) on page 468.*

To drag-quantize MIDI notes

1. Set the track's Edit Filter control to **Notes**.

2. Select the notes you want to quantize.

3. With the Timing tool ![timing icon], position the pointer over a selected note and drag up/down to quantize all selected notes.

To glue MIDI notes together

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

- With the Smart tool ![smart icon], hold down ALT+CTRL and drag across two or more notes of the same pitch (click on the first note, drag to the second note and release the mouse button).

- With the Freehand tool ![freehand icon], drag across two or more notes of the same pitch (click on the first note, drag to the second note and release the mouse button).

All touched note events of the same pitch are merged into a single note event.

To paint MIDI notes

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

- With the Smart tool ![smart icon], hold down ALT+CTRL and drag to insert multiple notes. Use the Value control to specify the duration of each note, and use the Snap resolution to specify the interval between each note.

- With the Line tool ![line icon], drag to insert multiple notes. Use the Value control to specify the duration of each note, and use the Snap resolution to specify the interval between each note.

To erase a MIDI note

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

   - With the Smart tool ![star icon], right-click a note to erase a single note, or keep the right mouse button pressed and drag over notes to erase multiple notes.

   - With the Erase tool ![erase icon], click a note to erase a single note, or drag over notes to erase multiple notes.

To split a MIDI note

1. Set the track's Edit Filter control to **Notes**.

2. Do *one* of the following:

   - With the Smart tool ![star icon], position the pointer where you want to split the note, then hold down ALT and click (or lasso to split a region).

   - With the Split tool ![split icon], position the pointer where you want to split the note, then click (or lasso to split a region).

To open the Note Properties dialog

1. Set the track's Edit Filter control to **Notes**.

2. With the Smart tool ![star icon], double-click the note.

MIDI note velocity colorization

`PRVColorizeVelocity=<0 or 1>, default = 1`

MIDI note colors are tinted depending on their velocities. Notes will appear darker for higher velocities and lighter for lower velocities.

This feature may be enabled (1) or disabled (0) in the `[WinCake]` section of the `Cakewalk.ini` file. For example:

`[WinCake]`

`PRVColorizeVelocity=0`

Note event colors based on velocity

By default, note events in the Piano Roll are colorized based on velocity. Darker shades of the basic track color indicate higher velocities. Lighter shades of the basic track color indicate lower velocities.

This behavior can be bypassed by adding the following INI variable to the WinCake section of `Cakewalk.ini` (see "Cakewalk.ini" on page 1289):

`PRVColorizeVelocity=0`

Piano Roll lasso behavior

By default, lasso selecting the top of velocity lines in the Piano Roll's Note pane also automatically selects the corresponding note events. If you don't want velocity lines to affect note selection, you can change the behavior by adding a switch to the Windows registry.

⚠️ **Warning:** *Always back up the Windows registry before making any changes. Only edit the registry if you are comfortable doing so.*

1. Click the Start button and select **Run**.
2. Type **regedit** and click **OK** to open the Registry Editor.
3. Navigate to **HKEY_CURRENT_USER\Software\Cakewalk Music Software\SONAR Producer\X2**.
4. Add a new DWORD value called **AllowLassoVelInNotesPane** (click **Edit > New > DWORD Value**).
5. Double-click the new **AllowLassoVelInNotesPane** DWORD event to open the **Edit DWORD Value** dialog box, then change the value to **0** (0=OFF; 1=ON).
6. Click **OK** to close the **Edit DWORD Value** dialog box, then restart SONAR.

ℹ️ **Note:** *If you are showing velocity lines in the Piano Roll Controller pane, you can still lasso select velocity lines to select the corresponding note events. The above registry setting only affects the Note pane in the Piano Roll and inline Piano Roll.*

See:

Piano Roll view snap resolution

The Piano Roll view can use its own optional and independent Snap to Grid resolution, separate from the global Snap to Grid resolution. This allows you, for example, to use a specific resolution when working with clips in the Track view, and a different resolution when working with note events in the Piano Roll view.

ℹ️ **Note:** *The inline Piano Roll always obeys the global snap resolution.*

The Piano Roll view always obeys the global Snap to Grid on/off setting, even if you specify an independent snap resolution in the Piano Roll view. The Snap settings in the Piano Roll view only apply to the snap resolution, not whether Snap to Grid is on or off.

To enable/disable independent Piano Roll view Snap resolution

1. In the Piano Roll view, click the **Snap to Grid** button ◀⊞, which is located to the right of the menu bar.

    The **Snap to Grid** button is lit ▶⊞ and the following controls are exposed:
    -   Musical time snap value
    -   Snap to MIDI events
    -   Snap to markers

2. Select the desired snap settings.

    If you do not select any Piano Roll snap settings within 5 seconds, the snap controls will hide automatically until you click the **Snap to Grid** button ◀⊞ again. If the Piano Roll snap controls are hidden, the Piano Roll view automatically obeys the global snap resolution.

Figure 219. *Independent Piano Roll Snap resolution disabled (Piano Roll view obeys global snap settings)*
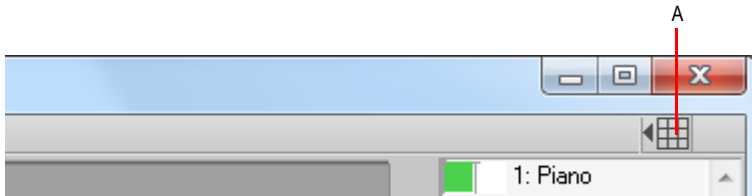
A. Enable/disable independent Snap to Grid resolution in the Piano Roll view

Figure 220. *Independent Piano Roll Snap resolution enabled*
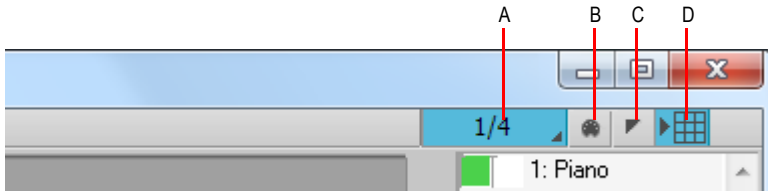
A. Piano Roll view Snap resolution (musical time) B. Snap to MIDI events C. Snap to markers D. Enable/ disable independent Snap resolution in the Piano Roll view

Show velocity on selected notes (optional)

SONAR has an option to show velocities for selected Note events. This option makes it easier to see and edit velocities when many Note events are present. It also makes it easier to change the velocity for individual Note events that are stacked (such as chords).

If there is no selection, velocities are shown for all Note events.
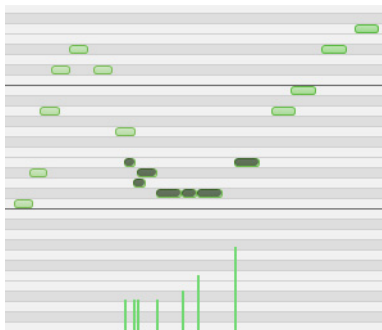
To only show velocity for selected note events

Click the Piano Roll view **Notes** menu and choose **Show Velocity on Selected Notes Only**.

The state of the **Show Velocity on Selected Notes** option is saved with the project, and the setting is separate for the Piano Roll view and inline Piano Roll.

See:

Selection sensitive velocity drawing

If *any* Note events are selected, velocity painting will only affect those selected Note events. If no Note events are selected, then velocity painting will affect all Note events.
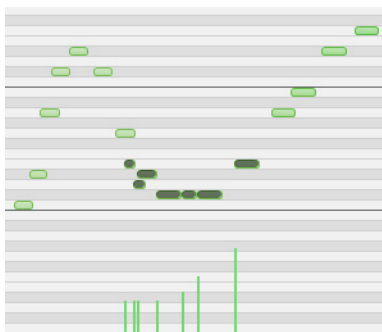
Example 1. *Painting velocity when some Note events are selected. Only those Note events are changed.*
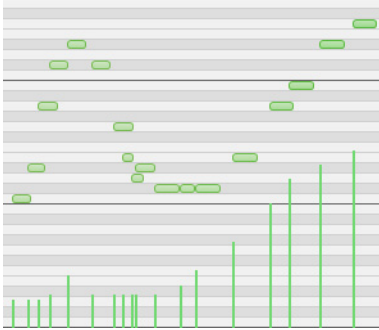
Example 2. *Painting velocity when no Note events are selected. All Note events are changed.*

See:

Hiding events in muted clips

By default, events in muted MIDI clips are shown in the Piano Roll view. SONAR provides an option to exclude muted clips from displaying in the Piano Roll view.

To show/hide events in muted clips

Click the Piano Roll view **View** menu and choose **Hide Muted Clips**.

See:

Adding and editing controllers in the Piano Roll

Controller events (MIDI continuous controllers, pitch wheel, NRPN's, and RPN's) appear in either the Notes pane or the Controller pane, depending on whether you choose to display the Controller pane or not. Each controller event has an edit handle at the top, which you can drag to edit, and a tail under the edit handle, which graphically demonstrates the controller event's current value. The tail changes colors to show whether you can edit a particular type of controller, and also turns dark to show that the controller event is selected. Controller events appear in different colors so you can differentiate them when you're displaying multiple controller events, possibly in multiple tracks.

Note: *Only the current track and current events appear in a solid color. All other tracks and events appear in de-saturated colors.*
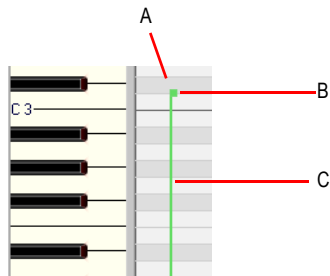
A. A single controller event B. Edit handle (also called Controller handle C. Controller tail

To show which events belong to which track, and which ones are the "current" events (the ones you can edit), and which events are selected, controller events use the following color patterns:

• **Controller tail.**   Uses the same color as the edit handle when the controller can be edited (in other words, when the controller is selected in the Piano Roll view Edit Filter). You can automatically enable a controller type for editing by clicking its edit handle with the Draw tool.

• **Selected.**   If a controller event is selected, both the edit handle and the tail darken in shade the way that selected notes do.

See:

Multiple automation controller lanes

The Controller pane in the multi-track Piano Roll view (not the inline Piano Roll) is split up into multiple lanes—one lane for each unique event type in the track.

You can freely create new lanes to display and edit MIDI data such as velocity, modulation, pitch bend and CCs (Continuous Controllers) and events can be moved and copied between lanes.

To show the Controller pane, click the Piano Roll view **View** menu and choose **Show/Hide Controller Pane**, or press ALT+C.
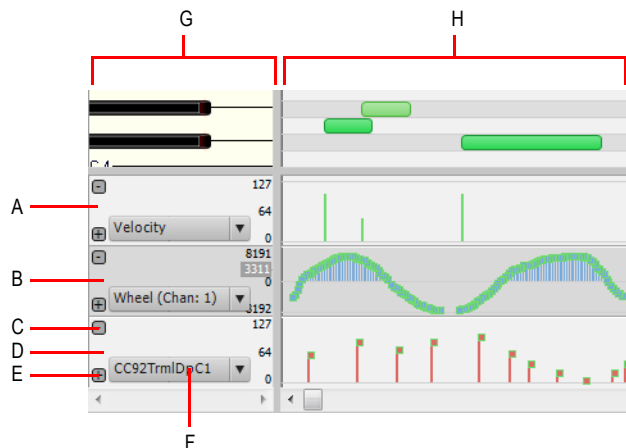
A. Velocity lane B. Wheel lane C. Remove lane D. CC92 lane E. Add new lane F. Edit Filter G. Scale pane H. Controller pane

See:

Editing MIDI events and continuous controllers (CC)
Adding and editing controllers in the Piano Roll

Working with MIDI data lanes

The Controller pane allows you to display and edit non-note MIDI data, such as velocity, modulation, pitch bend and continuous controllers (CCs), in multiple lanes at the bottom of the Piano Roll view.

When you open the Piano Roll view, SONAR will automatically create a separate MIDI data lane for each unique data type that is present in the selected track(s).

While the Track pane can show multiple event types simultaneously, each MIDI data lane displays only a single event type. MIDI data lanes allow you to easily show only the parameters you are interested in, without cluttering up the interface with numerous overlapping events.

MIDI data lanes cannot be reordered or resized. The height of all MIDI data lanes is determined by the height of the Controller pane.

See:

To create a new lane

1. Make sure the Controllers pane is shown at the bottom. If it is not displayed, click the Piano Roll view **View** menu and choose **Show/Hide Controller Pane**.

2. Click the **Plus** button ⊞ in the bottom left corner of any existing lane.

   A new lane is inserted below the lane that was clicked. SONAR will try to automatically assign the lane to any event type that exists in the track, provided the event type is not already assigned to another lane. Existing event types are assigned based on the following priority list:

   1. Velocity

   2. Continuous Controllers (same order as in the **MIDI Event Type** dialog box)

   3. Wheel

   4. Channel Aftertouch, starting from channel 1

   5. RPN

   6. NRPN

   If no event types exist in the track, the **MIDI Event Type** dialog box appears, which lets you specify the desired event type.

To delete a lane

To delete an existing lane, click the **Minus** button ⊟ in the top left corner of the lane.

The button is not available if there is only one lane open. To remove the last lane, simply hide the Controller pane (click the Piano Roll view **View** menu and choose **Show/Hide Controller Pane**).

> ℹ **Note:** *Deleting a lane does not delete any MIDI events from the track.*

To assign an Event Type to a lane

1. Click the lane's Edit Filter.
2. Select an existing event type in the pop-up menu, or select **New Value Type** to specify a new event type.

   The name of the current edit type is displayed in the lane.

See:

"Displaying notes and controllers (Piano Roll view only)" on page 683

To copy events between lanes

When you copy events from one lane to another lane, the MIDI data is transformed to match the edit type in the target lane.

1. Select the event types you want to copy to another lane. See "Selecting controllers" on page 701 for more information.
2. In the Scale pane, right-click the lane you want to copy the selected events to.

   The lane context menu appears.
3. Click **Copy selected events to this lane**.

   The selected events are copied to the destination track.

ⓘ **Note:** *It is impossible to copy selected events to a lane that has an edit type of Velocity; the type of event to transform to would be Note and the pitch could not be specified in this case. In this case, the **Copy selected events to this lane** menu command will be disabled and appear grayed out.*
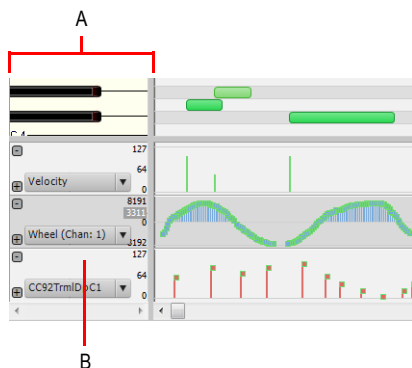
A. Scale pane B. Right-click the lane in the scale pane

Editing MIDI events and continuous controllers (CC)

Adding and editing controllers in the Piano Roll

To move events between lanes

When you move events from one lane to another lane, the MIDI data is transformed to match the edit type in the target lane.

1. Select the event types you want to move to another lane. See "Selecting controllers" on page 701 for more information.

2. In the Scale pane, right-click the lane you want to move the selected events to.

   The lane context menu appears.

3. Click **Move selected events to this lane**.

   The selected events are moved to the destination track.

   Note: *It is impossible to move selected events to a lane that has an edit type of Velocity; the type of event to transform to would be Note and the pitch could not be specified in this case. In this case, the* **Move selected events to this lane** *menu command will be disabled and appear grayed out.*

Adding controllers

When you add a new controller type to a track, the controller type is automatically chosen in the **Show/Hide MIDI Events** menu, so that you can see it. For help showing and hiding all the other MIDI data you may have in your track or tracks, see "Displaying notes and controllers in the Inline Piano Roll view" on page 707, "Displaying notes and controllers (Piano Roll view only)" on page 683, and "Working with multiple tracks in the Piano Roll view" on page 680.

To add controller data with the Freehand tool

1. Click the controller lane's Event Filter and choose **New Value Type** to open the **MIDI Event Type** dialog box.

2. Choose options from the following fields:

   • **Type.**   Choose the type of controller you want to add (for example, choose Control if you want to edit volume).

   • **Value.**   This field is greyed-out if you choose **Wheel** or **ChanAft** in the **Type** field. If you choose **Control**, **RPN**, or **NRPN** in the **Type** field, choose which Control, RPN, or NRPN you want to add. For example, to edit volume, choose **7-Volume** in this field if you chose **Control** in the **Type** field.

   • **Channel.**   Choose a MIDI channel for the controller if you want. If your track has a MIDI channel listed in the **Ch** field, all MIDI data in your track uses the listed MIDI channel.

3. Click **OK** to close the dialog box.

4. Select the Freehand tool [icon] in the Control Bar, and add your controller values by using one of the following methods:

- Depress the mouse at the point where you want your controller messages to start, and drag the Draw tool to draw the kind of curve you want your controller messages to follow. A tooltip appears when you depress the mouse, and constantly reports the controller name, channel, value, and location of the controller value that you are entering. Release the mouse where you want your curve to end.

Tip: *To draw a straight line, hold the SHIFT key down while you draw.*

- To add one controller event at a time, click each place that you want to add a controller value. A tooltip appears when you click, and reports the controller name, channel, value, and location of the controller value that you are entering.

The controller events you added appear as vertical lines, each with an edit handle at the top that you can drag. Each different type of controller event appears with a different color (see "Adding and editing controllers in the Piano Roll" on page 695 for more information).

When you use the Draw tool, the speed with which you drag the mouse determines the density of controller events. To insert a larger number of controller events with relatively small changes in value, move the mouse slowly. To insert a smaller number of controller events with relatively large changes in value, drag the mouse quickly.

To insert a series of controllers

1. Choose **Insert > Series of Controllers** to display the **Insert Series of Controllers** dialog box.
2. Choose the controller type from the **Insert** list.
3. Choose the controller number or type from the **Number** list.
4. Use the spinners or enter the desired MIDI channel.
5. Enter a starting and ending value in the **Begin** and **End** boxes.
6. Enter a starting and ending time in the **From** and **Thru** boxes.
7. Click **OK** when you are done.

SONAR inserts a series of controller events with values that change smoothly over time from the starting to the ending value indicated in the dialog box. This command never inserts more than one event on the same clock tick. If any controllers of the type you have selected already exist in the time region, SONAR deletes these before inserting the new ones.

See:

"Selecting controllers" on page 701

Selecting controllers

To perform many editing procedures on controllers, you first need to select the controller events you want to edit. A selected controller event turns dark when it is selected. You can select a single controller event, multiple controller events of the same type, or all controller events.

To select controller events of the same type

1. Click the Edit Filter and select the event type you want to show in the MIDI data lane.

2. Select the Select tool ![select tool] in the Control Bar, and select one or more controller events by using the following techniques:

   • Drag a rectangle around the edit handles of the controller events that you want to select.

   • SHIFT-click or SHIFT-drag to add other controllers to the selection.

   • CTRL-click to or CTRL-drag toggle the selection state of a controller.

   • Click and drag in the Time Ruler.

Select controllers within note duration

When editing MIDI data it is often necessary to align the timing of Controller events with that of Note events. For example, Sustain Pedal (CC64) events need to move along with the notes they are supposed to sustain, and Pitch Wheel events need to move along with the notes whose pitch they are supposed to modify.

When the **Select Controllers Along with Notes** option is enabled, selecting a Note event or a range of Note events will also automatically select any Controller events that exist within the time range of the Note event(s).

Note events can be selected by clicking the notes or by lasso-selecting the notes. For more information, see "Selecting notes" on page 684.

The following rules apply when multiple Note / Controller event types are selected:

• Dragging a Note event vertically will not affect the selected Controller event(s).

• Dragging a Note event in time (horizontally) will also drag the Controller event(s) along with it in time.

• Dragging Controller events vertically will not affect the selected Note event(s).

• Dragging Controller events in time will also drag Note events along with them in time.

• If multiple Controller types are selected, only the type you click on can be dragged vertically. The rest will only move in time (horizontally).

To enable/disable 'Select Controllers within Note Duration'

Click the Piano Roll view **Controllers** menu and choose **Select Controllers Along With Notes**.

> ℹ **Note:** *The state of the **Select Controllers Along With Notes** option is global and applies to both the Piano Roll view and inline Piano Roll.*

See:

Piano Roll Microscope mode

The Piano Roll Microscope mode makes it much easier to edit MIDI data without constantly needing to change zoom settings. This is especially useful in the inline Piano Roll where track heights are typically sized such that MIDI notes become very small.

When Microscope mode is enabled, a transparent rounded square centered on the mouse cursor shows a zoomed in region of the Piano Roll data underneath it:

Only the work area under the mouse is zoomed in while the rest of the data retains its normal size.

Here is an example of dense MIDI data that is difficult to edit at the current zoom level:
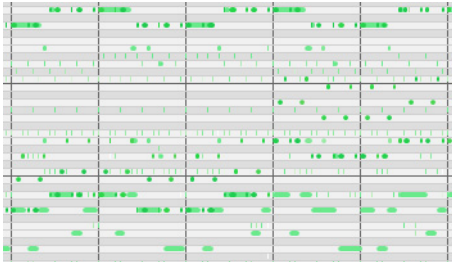
With Microscope mode turned on, the area under the mouse looks like this:
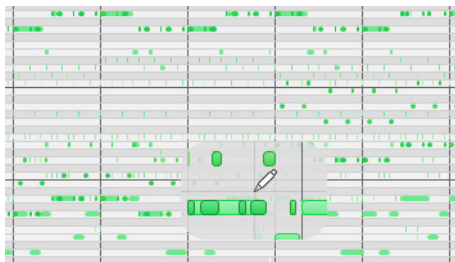
Microscope mode also works with Drum Maps:
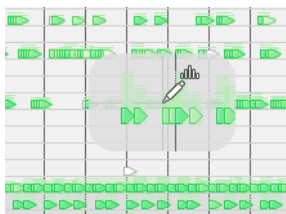
To enable/disable Microscope mode

To enable/disable Microscope mode, do *one* of the following:

• Click the Piano Roll view **View** menu and choose **MIDI Microscope**.

• Click the Track view **View** menu and choose **MIDI Microscope**.

• Go to **Edit > Preferences > Customization - Editing** and select the **Microscope** check box.

How Microscope mode works

Position.   The Microscope is always centered on the mouse position.

Size.   The size of the Microscope is configurable. The default diameter is 100 pixels. See "Configuring Microscope mode options" on page 704 for more information.

Transparency.   The Microscope maintains a certain level of transparency so that the real-sized data can always be seen.

Zoom Factor (vertical).   The amount of vertical zoom varies with the existing zoom level of the data. Generally, the note height under the microscope has a minimum height of 8 pixels and scales up from there depending on the existing zoom of the data. The microscope data will always be bigger than the original regardless of how far it is zoomed in.

Zoom Factor (horizontal/time).   The microscope will provide some horizontal magnification when the view zoom is such that notes become very narrow.

💡 **Tip:** *Use Fast Zoom in combination with Microscope mode if you want to quickly zoom around the current mouse position. See "To zoom using the mouse wheel (Fast Zoom)" on page 330 for more details.*

Configuring Microscope mode options

There are several settings that let you configure the size and zoom level of the microscope.

To Configure Microscope Mode Options

Go to **Edit > Preferences > Customization - Editing**.
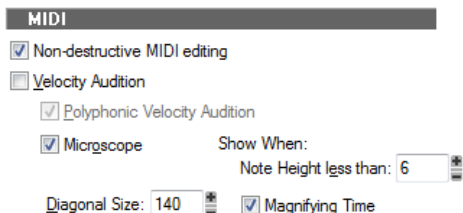
The following options are available:

Microscope.   Use this check box to enable/disable Microscope mode (enabled by default).

Diagonal Size.   Use this numeric entry box to specify the diameter size in pixels of the microscope. The valid range is 20-250 and the default value is 100.

Show When Note Height Less Than.   Microscope mode will only be enabled if the note heights (in pixels) are equal or less than this number. The valid range is 2-20 and the default value is 6.

Magnifying Time.   Use this check box to enable/disable horizontal magnification when the Piano Roll view zoom is such that notes become very narrow.

In addition to these options, there are some other parameters that can be configured by adding the following INI variables to the WinCake section of Cakewalk.ini (see "Cakewalk.ini" on page 1289):

Variable	Type	Default value	What it does
MicroscopeHZoomThreshold=<1..20>	Integer	8	By default, the Microscope mode begins horizontal magnification when a 32nd note is narrower than 8 pixels. This line lets you specify the horizontal zoom threshold (1-20 pixels).
MicroscopeHZoomMax=<2.0 - 8.0>	Integer	3.0	This line specifies the highest horizontal magnification that will result when using Microscope mode.

Table 125.

The Inline Piano Roll view

The Inline Piano Roll view lets you edit note and continuous controller events for a single track directly in the Track view. To show a track's Inline Piano Roll, click the track's Edit Filter control and choose **Notes**. If a track uses a Drum Map, the Inline Piano Roll view for that track displays the Drum Map's note names on the track's MIDI Scale (see "The MIDI scale" on page 706 for more information).

In this view, you can:

• Edit notes and controller events

• Edit multiple notes or events

• Display multiple controller types simultaneously

• Choose which MIDI events you want to display

• Use separate Snap to Grid settings in the Clips pane mode and Inline Piano Roll mode

You control the Inline Piano Roll view with the global tools in the Control Bar's Tools module.

See also:

"Displaying the Inline Piano Roll view" on page 705

"The MIDI scale" on page 706

"Displaying notes and controllers in the Inline Piano Roll view" on page 707

Drawing and editing notes and controllers in the Inline Piano Roll view is the same in the Piano Roll view, with a few exceptions (noted in the appropriate topics). The major difference is that you can display and edit multiple tracks in the Piano Roll view.

To draw and edit notes and controllers in the Inline Piano Roll view, see "Adding and editing notes in the Piano Roll" on page 684, and "Adding and editing controllers in the Piano Roll" on page 695.

Displaying the Inline Piano Roll view

Use the following methods to hide or show the Inline Piano Roll view.

To hide or show an individual track's Inline Piano Roll view

Do *one* of the following:

• Click the track's Edit Filter control and choose **Notes**.

• Double-click a MIDI clip in the Clips pane.

To hide or show all tracks' Inline Piano Roll views

Hold down the CTRL key and assign any track's Edit Filter control to **Notes**.

See also:

The MIDI scale

MIDI tracks have a control called the MIDI Scale. This control displays a vertical ruler labeled with MIDI values (in 7bit Values mode) or MIDI notes (in Notes mode), giving you a visual guide for editing notes and controllers. The MIDI Scale is also a vertical zoom control. If a track uses a Drum Map, the MIDI Scale for that track displays the Drum Map's note names on the track's MIDI Scale (in Notes mode).

Figure 221. *MIDI Scale in Notes mode*
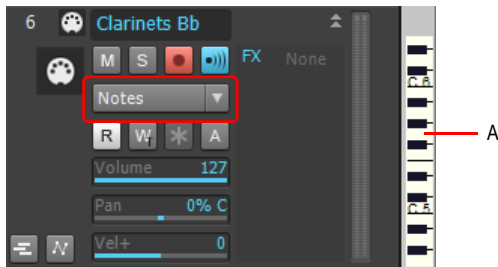
A. MIDI Scale

To zoom vertically with the MIDI scale

1. Put the MIDI Scale into notes mode by right-clicking the MIDI Scale and choosing **Notes** from the pop-up menu.

2. Hold the mouse over the MIDI Scale so that the cursor changes to a small vertical keyboard, and drag upward to zoom in. The Inline Piano Roll view zooms in.

> **Note:** *In Notes mode, if the track is zoomed-out too far, there is not enough room in the MIDI Scale to display the keyboard. To see the keyboard, you need to zoom in far enough to display the keyboard.*

3. To zoom out, drag downward on the keyboard display.

You can also zoom by using the Track view zoom controls.

Editing MIDI events and continuous controllers (CC)
The Inline Piano Roll view

To scroll vertically with the MIDI scale

• Right-click the MIDI Scale and drag up or down to scroll.

To fit a single track's content into its Inline Piano Roll view

• Right-click the MIDI Scale and choose **Fit Content** from the pop-up menu.

 Or

• CTRL-double-click the MIDI Scale.

To audition and select notes

• To audition and select a note, SHIFT-click the note's pitch in the MIDI Scale.

• To audition and select all notes within a certain range, SHIFT-drag through the notes' range of pitches in the MIDI Scale.

To change the MIDI scale's display mode

• Right-click the MIDI Scale to display the pop-up menu, and choose either **7bit Values** (this displays MIDI values), or **Notes** (this displays the keyboard).

See also:

Displaying notes and controllers in the Inline Piano Roll view

You can show or hide notes and controller events in the Inline Piano Roll independently for each track, and also independently from the Piano Roll view.

To hide or show data in individual tracks

1. Select the track(s) you want to configure.
2. Click the Track view **MIDI** menu and choose from the following menu options:
    • To hide or show notes, click **Show Notes**.
    • To hide or show a controller, point to **Show Controllers** and click the name of the controller (for example, click **CC: 1-Modulation (Chan: 2)**).
    • To show all controllers in the current track, point to **Show Controllers** and click **Show All Controllers**.
    • To show or hide all the outlines of any clips in the track, click **Show Clip Outlines**.
3. After you choose an option, the menu closes. You can repeat step 2 to choose more options.

Drawing and editing notes and controllers in the Inline Piano Roll view is the same in the Piano Roll view, with a few minor exceptions (noted in the appropriate topics). To draw and edit notes and controllers in the Inline Piano Roll view, see "Selecting notes" on page 684, "Editing notes with the global tools" on page 686, "Adding controllers" on page 699, and "Selecting controllers" on page 701.

You can zoom in to or out of individual MIDI Tracks by dragging the MIDI Scale up or down. See "The MIDI scale" on page 706 for more information.

To edit controller events in the Inline Piano Roll view

1. Click the MIDI track's Edit Filter control, point to **Notes** and choose **New Value Type** to open the **MIDI Event Type** dialog box.

2. Choose options from the following fields:

   - **Type.** Choose the type of controller you want to add (for example, choose Control if you want to edit volume).

   - **Value.** This field is greyed-out if you choose **Wheel** or **ChanAft** in the **Type** field. If you choose **Control**, **RPN**, or **NRPN** in the **Type** field, choose which Control, RPN, or NRPN you want to add. For example, to edit volume, choose **7-Volume** in this field if you chose **Control** in the **Type** field.

   - **Channel.** Choose a MIDI channel for the controller if you want. If your track has a MIDI channel listed in the **Ch** field, all MIDI data in your track uses the listed MIDI channel.

See also:

"Selecting notes" on page 684

"Adding and editing controllers in the Piano Roll" on page 695

"Adding and editing notes in the Piano Roll" on page 684

"Adding controllers" on page 699

"Selecting controllers" on page 701

Selecting and editing events

SONAR has many editing commands that you can use to modify the events that make up your project. Here are some of the things you can do:

• Transpose events, clips, tracks, or an entire project to a different key

• Shift events to an earlier or later time

• Stretch or shrink material to a different length

• Reverse the notes in a clip to create new arrangements

• Modify the note velocities

The following sections describe these editing commands and how to use them. SONAR also has some special commands you can use to modify or clean up a performance or to search for or select events that meet certain criteria.

See:

Copying and pasting MIDI data

You can copy and paste both notes and controller data in SONAR.

To copy and paste MIDI data with the Copy/Paste commands

1. Select the data you want to copy.

2. Use the **Edit > Copy** command, or press CTRL+C.

3. Use the **Edit > Paste Special** command, or press CTRL+ALT+V.

   The **Paste** dialog box appears.

4. Fill in options, and click **OK**. Click the **Help** button in the dialog box for an explanation of each option.

SONAR pastes the copied data to the desired location.

Transposing

The **Process > Transpose** command transposes the pitches of selected note events up or down by a fixed number of steps. It does so by changing the MIDI key numbers of note events. Simply enter the number of half-steps—a negative number to transpose down, a positive number to transpose up.

SONAR can also perform diatonic transposition, which shifts all the notes up and down the major scale of the current signature by the designated number of steps. For instance, if you specify an amount of **+1** and the key signature is **C-major**, a C becomes a D (up a whole step), an E becomes an F (up a half step), and so on. Diatonic transposition assures you that the transposed notes fit with the original key signature.

As an option, you can choose to transpose selected audio clips along with any selected MIDI clips. SONAR uses pitch-shifting (a plug in for changing audio pitch) to perform the transposition. You can transpose audio only a single octave in either direction (-12 to +12), and you cannot transpose audio when you are using diatonic transposition.

To transpose selected events

1. Select the tracks, clips, or events you want to transpose.

2. Choose **Process > Transpose** to display the **Transpose** dialog box

Figure 222. *The Transpose dialog box.*
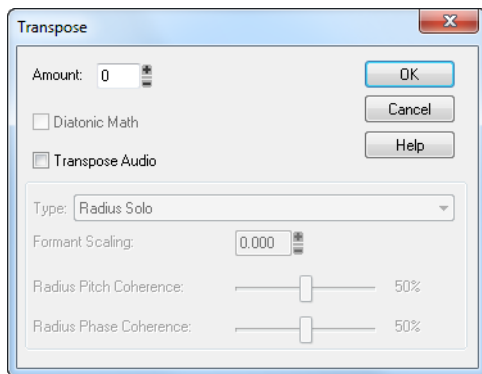
3. Use the spinners or enter the number of semi-tones to transpose.

   Or

   Use the + and - keys on your keypad to go up or down by one or [and] to go up or down by octaves.

4. Check Diatonic Math if you want to transpose along the major scale of the current key.

5. Choose **Transpose Audio** if you want to pitch-shift selected audio clips. If you check this check box. SONAR transposes any selected audio data up or down, but only by half-steps, not diatonically. When this check box is enabled, the following two options become available:

   • **Type.** Choose the type of audio data you're transposing. Choose options based on the source material: single voice or instrument versus a group of instruments (ensemble or

polyphonic), and how long you want to wait for processing to finish: better quality can take a long time if you're processing several tracks.

- **Formant scaling.** Possible values range from -2.000 to 2.000 octaves. Formants give a voice its characteristic sound. You can use the Formant Scaling value to offset the pitch transposition you're applying. For example, if you're transposing the pitch down, you can raise the formant to try and maintain the characteristics of the sound.

6. Click **OK** when you are done.

SONAR transposes the selected events.

Shifting events in time

The Track view lets you move entire clips forward or backward in time by using drag and drop editing or by changing the start time of selected clips. The **Process > Slide** command is slightly more flexible—you can use it to shift individual events and markers (or selected events and markers) either forward or backward in time. This has an effect that is similar to the Time+ parameter in the Track view. However, the **Process > Slide** command modifies the time stored with each event, while the Time+ parameter simply applies a temporary change during playback.

You can also use the **Process > Slide** command to move markers located within the selection. If you have selected any locked markers, SONAR will ask whether they should slide, too.

To shift events in time

1. Select the events and/or markers you want to shift.

2. Choose **Process > Slide** to display the **Slide** dialog box.

3. Check the types of event you want to slide (events and/or markers).

4. Enter the number of measures, ticks, seconds, frames or samples to slide. Enter a negative number to shift material earlier. Note that you cannot slide any event earlier than 1:01:000. For example, if the current selection starts at 2:01:000, you cannot slide events earlier by more than one measure.

5. Click **OK** when you are done.

SONAR shifts the selected events and/or markers. You can also use the **Process > Nudge** command to move events. See "Nudge" on page 350 for more information.

Inserting time or measures into a project

The **Project > Insert Time/Measures** command lets you insert any number of blank measures, ticks, seconds, or frames into a project. You can insert the blank measures (or other period of time) into all tracks or into one or more selected tracks. If you insert the blank time into the entire project, all events in each track—markers, meter and key settings, and tempo changes—are shifted automatically by default. If you insert the blank time into one or more selected tracks, only the events in those tracks are shifted by default. You can always choose which types of events should be shifted.

To insert a single blank measure into a project

1. Press CTRL+SHIFT+A or select **Edit > Select > None** to make sure that no track or time range is selected.
2. Set the Now time to the place where you want to insert the measure.
3. Choose **Project > Insert Time/Measures** to display the **Insert Time/Measures** dialog box.

Figure 223. *The Insert Time/Measures dialog box*
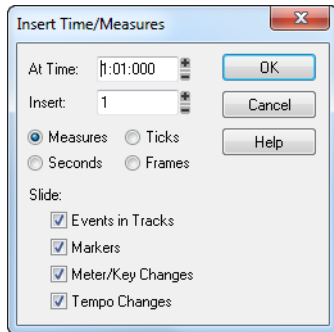
4. Verify that the settings are correct and click **OK**.

SONAR inserts a blank measure at the Now time.

To insert blank time or measures into a project

1. Select **Edit > Select > None** to make sure that no track or time range is selected.
2. Select the range of time you want to insert by dragging in the Time Ruler.
3. Choose **Project > Insert Time/Measures** to display the **Insert Time/Measures** dialog box.
4. If necessary, adjust the time at which blank space will be inserted.
5. If necessary, change the length of time to insert by entering a number and choosing the units you want from the list.
6. Choose the types of events that should be shifted automatically from the **Slide** list.
7. Click **OK** when you are done.

SONAR inserts the desired amount of blank time into the project.

To insert blank time or measures into selected tracks

1. Select the range of time you want to insert by dragging in the Time Ruler.
2. Select one or more tracks by CTRL-clicking on the track numbers.
3. Choose **Project > Insert Time/Measures** to display the **Insert Time/Measures** dialog box.
4. If necessary, adjust the time at which blank space will be inserted.

Selecting and editing events

5. If necessary, change the length of time to insert by entering a number and choosing the units you want from the list.

6. Choose the types of events that should be shifted automatically from the Slide list.

7. Click **OK** when you are done.

SONAR inserts the desired amount of blank time into the project.

Deleting measures or time from one or more tracks

There are two methods for deleting time or measures:

- If there is any audio or MIDI data in the area you want to delete, you can use the **Edit > Delete** command to delete the area that you select. Portions of MIDI clips may have no data in them: they have boundaries but no dark lines inside—if that's the case, use the following method.

- If there is no data in the area you want to delete, you can simply drag any clips that come after the empty area to their proper destinations. You can also use this method if there is data in the area you want to delete—you just have to choose whether you want to replace the data in the deleted area, blend it with the data you're moving, or slide it over to make room.

To delete time when there **is** audio or MIDI data in the area you want to delete:

1. In the Track view, select the track(s) you want to delete measures or time from by doing one of the following:
   - Select a single track by clicking the track number.
   - Select multiple tracks by CTRL-clicking the track numbers.

2. Set the Snap to Grid value to the unit of time you want to delete. For example, if you want to delete whole measures, set the Snap to Grid value to a whole measure.

3. In the Clips pane, select the measures or time you want to delete by dragging in the Time Ruler located just above the first track.

4. Select **Edit > Delete Special**.

   The **Delete** dialog box appears.

5. Click the following check boxes:
   - **Events in Tracks**
   - **Delete Hole.** If you want the data that comes after the hole to retain its same placement in a measure, check the **Shift by Whole Measures** option.

6. Click any of the other options you want to delete.

7. Click **OK**.

SONAR deletes the time or measures you selected.

To delete time when there **is no** audio or MIDI data in the area you want to delete (or if there is data, but you like to drag and drop):

1. Set the **Snap to Grid** value to the unit of time you want to delete. For example, if you want to delete whole measures, set the **Snap to Grid** value to a whole measure.

2. In the Track view, select the clips you want to move.

3. Drag one of the selected clips to its proper destination—the **Drag and Drop Options** dialog box appears.

4. Choose options and click **OK**.

All the selected clips move by the amount that you dragged the mouse.

Stretching and shrinking events

The **Process > Length** and **Process > Fit to Time** commands can be used to stretch or shrink a portion of a project. **Process > Length** lets you stretch or shrink the selection by a fixed percentage and makes the adjustment by altering the individual events. A value of 200 percent, for example, stretches the selection to twice its original length, while a value of 50 percent shrinks the selection to half its original length.

Process > Fit to Time stretches or shrinks the selection so that it ends at a specific time, expressed in either measure:beat:tick (MBT) or hours:minutes:seconds:frames (SMPTE) format. This command gives you a choice of modifying the events or modifying the underlying tempo. This is useful when you want a portion of a project to have an exact length. The start time of the selection does not change, but the end time is altered as necessary to fit the required time interval.

Both of these commands offer the option to stretch audio clips along with the MIDI information. Sometimes you don't want to adjust the speed of your audio.

Here are some examples:

- If your project contains background music and a voice-over, you might want to change the tempo of the background music without altering the voice-over

- If you're trying to modify the speed of some MIDI tracks to match a sampled drum groove, you want to leave the audio unchanged

- If your audio consists solely of sound effects, you most likely do not want to adjust them

Audio can be stretched or condensed up to a factor of 4 (e.g., it can be shrunk to as little as 25 percent of its original length, or expanded to as much as 400 percent of its original length).

You can also use the **Process > Length** command to alter only the start times or the durations of notes. For example, changing the durations of notes to 50 percent of their original length can create a staccato effect.

To stretch or shrink using percentages

1. Select the events you want to change.

2. Choose **Process > Length** to display the **Length** dialog box.

Figure 224. *The Length dialog*
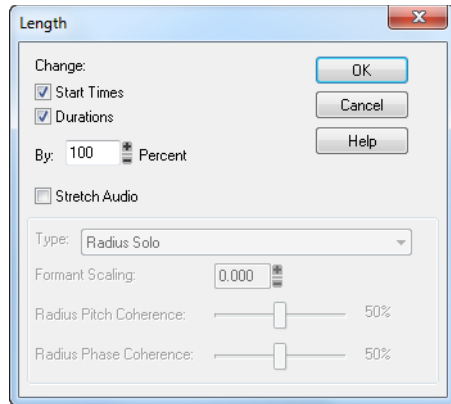
3. Choose to change the **Start Times** and/or **Durations** of selected notes by checking the boxes.

4. If you want to stretch selected audio clips, check the **Stretch Audio** box. When this check box is enabled, the following two options become available:

   • **Type.** Choose the type of audio data you're stretching. Choose options based on the source material: single voice or instrument versus a group of instruments (ensemble or polyphonic), and how long you want to wait for processing to finish: better quality can take a long time if you're processing several tracks.

   • **Formant scaling.** Possible values range from -2.000 to 2.000 octaves. Formants give a voice its characteristic sound. If you find that changing the length of your audio changes the timbre too much, you can raise or lower the formant to try and maintain the characteristics of the sound

5. Use the spinners or type in the desired percent change in length.

6. Click **OK** when you are done.

SONAR modifies the length of selected events.

To stretch or shrink to a specific length

1. Select the events you want to change.

2. Choose **Process > Fit to Time** to display the **Fit to Time** dialog box.

Figure 225. *The **Fit to Time** dialog*
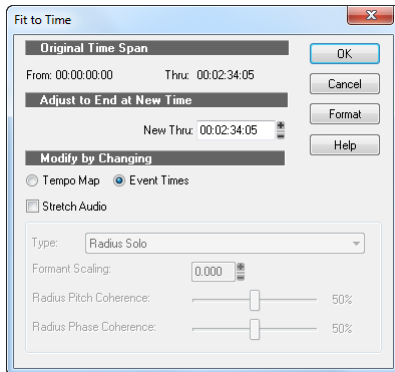
3. Enter the desired end time in the **New Thru** box. Click **Format** to switch between MBT and SMPTE format.

4. Choose one of the following:

   • **Tempo Map.**   Choose this option if you want the tempo to change but not the duration of notes and events. For example, if your clip contains quarter notes, and you want those notes to stay quarter notes even though the elapsed time of the clip changes, choose **Tempo Map**. SONAR alters the tempo but not the events in the track.

   • **Event Times.**   Choose this option if you want the tempo(s) to remain unchanged while note durations and event start times change.

Note: *This option is unavailable if your selected data includes any Groove clips.*

5. If you want to stretch selected audio clips, check the **Stretch Audio** box. The following options become available:

   • **Type** (disabled unless **Stretch Audio** is checked).   Choose options based on the source material: single voice or instrument versus a group of instruments (ensemble or polyphonic), and how long you want to wait for processing to finish: better quality can take a long time if you're processing several tracks.

   • **Formant Scaling** (disabled unless **Stretch Audio** is checked).   The possible values range from -2.000 to 2.000 octaves. Formants give a voice its characteristic sound. If you find that changing the length of your audio changes the timbre too much, you can raise or lower the formant to try and maintain the characteristics of the sound

6. Click **OK** when you are done.

SONAR modifies the length of selected events or changes the tempo map, as you requested.

High-resolution audio boosted by 6 dB when stretched using MPEX

When using a sample rate of 88.2 kHz or higher and performing any operation that uses MPEX time/pitch stretching, the stretched audio will be boosted by 6 dB.

Reversing notes in a clip

The **Process > Retrograde** command reverses the order of events in a selection. If one or more clips are selected, then the events within each clip are reversed. If several clips are selected from the same track, then the order of the clips is also reversed. You could use this command, for example, to take a scale or other long run of notes and reverse the order in which they are played. The **Process > Retrograde** command does not reverse the contents of audio clips. It only changes their start times. You can use the **Process > Audio > Reverse** command to reverse audio clips.

To reverse the sequence of notes or other events

1. Select the notes you want to reverse.

2. Choose **Process > Retrograde**.

SONAR reverses the order of the selected events.

Adding crescendos and decrescendos

The **Process > Scale Velocity** command lets you create crescendos and decrescendos on those instruments that respond to MIDI velocity. Most such instruments map changes in velocity to changes in note loudness. Many synthesizer patches alter the timbre of the sound as well, so that higher velocities produce brighter, as well as louder, sounds. Changes in velocity also affect the playback of audio clips.

This command lets you set a starting and ending velocity for the entire time range of the selection. SONAR scales the velocity of each event to create a smooth linear change in velocity. As an option, you can enter a starting and ending percentage; existing velocity values are modified by the designated percentage.

You can also edit note velocities in the Notes pane of the Piano Roll view, which lets you draw shapes other than straight line changes. For more information, see "Adding and editing notes in the Piano Roll" on page 684.

To scale velocities

1. Select the events whose velocity data you want to change.

2. Choose **Process > Scale Velocity** to display the **Scale Velocity** dialog box.

Figure 226. *The **Scale Velocity** dialog*
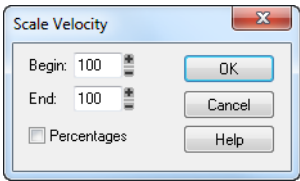
3. Enter the starting and ending velocity values.

4. Check the **Percentages** box if the values are percentages.

5. Click **OK** when you are done.

SONAR alters the velocity of selected events.

Changing the timing of a recording

When you record a performance, there may be problems you'd like to correct. For example, the note timing may not have been as accurate as you would like. Or, you may have recorded without using a metronome and strayed from the tempo in one direction or another.

SONAR has two types of commands that you can use to modify the timing of a clip.

The **Quantize** command alters the timing of the notes in your recording so that they fit a time grid. The grid can have fixed time intervals or intervals that are based on some existing note pattern.

The **Fit to Improvisation** command, on the other hand, sets up a series of tempos that fit the material you have recorded. Here's a summary of when to use each type of command:

Use this command	To do this
Quantize	Change the timing of the notes you've recorded to fit with the tempo of a project
Fit to Improvisation	Change the tempos of a project to fit with the performance you've recorded

Table 126.

These two types of commands are discussed in the following topics.

See:

Quantizing

Quantizing is one of the most important editing functions in SONAR. You use this feature to correct timing errors you make when recording from a MIDI instrument or to adjust the timing of audio clips.

Very few musicians are capable of performing in perfect time. As you play, you are likely to strike some notes slightly before or after the beat or to hold some notes slightly longer than you intended. The **Quantize** commands can help to correct these types of timing mistakes.

SONAR has two different quantize commands:

Command	How it works
Process > Quantize	Adjusts the start time and duration of selected notes so that they line up with a fixed size grid
Process > Groove Quantize	Lays a grid over an existing piece of music (the *groove pattern*), and then adjusts the start time, duration, and velocity of selected notes so that they line up with the grid

Table 127.

These commands have quite a few settings, making them very flexible and powerful. In addition, both of these commands let you create, save, and re-use presets. This means that once you find the settings you like, you can save them and then apply them to other projects in a consistent way.

Resolution

The **resolution** indicates the spacing of the grid. You can use any value from a whole note down to a thirty-second note triplet. You can also specify resolution in clock ticks. A rule of thumb is to select a resolution that matches the smallest note in the region you are quantizing. If you are quantizing a run of sixteenth notes, use a sixteenth note as the resolution. If you are quantizing a mix of sixteenth and eighth notes, you should still use a sixteenth note. At the default timebase of 480 PPQ, 480 clock ticks is equal to quarter-note resolution.

When you use **Groove Quantize**, SONAR creates a grid at the desired resolution on top of the notes in the groove. For example, if the groove contains only quarter notes but you choose sixteenth-note resolution, SONAR builds the grid by dividing the space between each quarter note into four equal sections. In places where the groove file contains no notes, SONAR builds a fixed grid of the desired resolution.

Offset

Normally, the resolution grid is aligned evenly with the start of measures and beats. As an option, you can shift the grid earlier or later by any desired number of clock ticks. If the resolution is a quarter note and you've set the offset to +3 ticks, then a note that is originally near 1:01:000 would be moved to 1:01:003—three ticks beyond the beat boundary.

Duration

As an option, SONAR can adjust the duration of note events so that each note ends one clock tick before the start of the nearest resolution-sized note. This ensures that the notes do not overlap, which can cause problems on some synthesizers. The adjustment may lengthen the duration of some notes and shorten the duration of others.

When you use **Groove Quantize**, the duration adjustment compares the note length to the duration of the sample note in the groove. If no duration information is available, SONAR uses the distance to the start of the groove event closest to the end of the note.

Velocity

The velocity adjustment, which is only available with the **Groove Quantize** command, adjusts the note velocity to the velocity of the corresponding notes in the groove.

Strength

The human ear is tuned to the slight "imperfections" we hear from most musicians. If you quantize a project so that all notes are perfectly in position, it may end up sounding mechanical or rigid. To avoid this, SONAR lets you adjust the **strength** of the adjustment. A strength of 100 percent indicates that all notes are moved so that they are in perfect time, while a strength of 50 percent means that all notes are moved half-way towards the desired position. This lets you "tighten up" the timing as much as you want, without going too far.

The **Groove Quantize** command also lets you control the strength of duration and velocity adjustments. As you work with this command, you will notice that the note start time has a greater effect than the duration on the rhythmic feel of the track. For this reason, changing the starting times (time strength close to 100 percent) has a more noticeable effect than changing durations (duration strength close to 100 percent). However, there are situations in which you might want to change both to avoid ending up with notes that overlap or with unwanted rests.

Swing

Many projects do not have notes positioned on a perfectly even time grid. For example, projects with a swing feel, though they may be written entirely in eighth notes, are often played more like eighth-note triplets, with the first note extended and the second one shortened. The **Swing** option lets you distort the timing grid so each pair of notes is spaced unevenly, giving the quantized material a swing feel.

A swing value of 50 percent (the default) means that the grid points are spaced evenly. A value of 66 percent means that the time between the first and second grid points is twice as long as the time between the second and third points. The following figure illustrates the effect of the swing setting on the timing grid:

Editing MIDI events and continuous controllers (CC)
Changing the timing of a recording

Swing = 50%

Swing = 66%

Swing = 33%
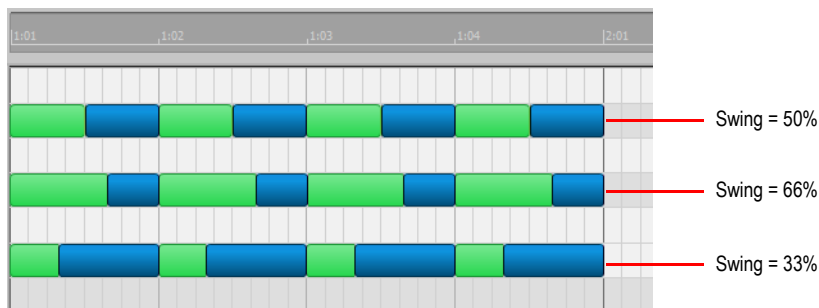
Window

When you quantize some portion of a project, you might not want to adjust notes that are very far from the grid. The **window**, or **sensitivity**, setting lets you choose how close to the resolution grid a note must be located for quantize to move it.

A window of 100 percent includes all notes and guarantees that all notes will be shifted to lie exactly on the grid. The window extends half the resolution distance before and after the quantization point. A window of 50 percent extends only a quarter of the way toward the adjacent quantization points.

When you use **Groove Quantize**, you can also perform adjustments on out-of-window events. There are four options:

Option	How it works
Do Not Change	Notes outside the window are not changed.
Quantize to Resolution	Notes outside the window are snapped to a regular grid of the specified resolution.
Move to Nearest	The window or sensitivity setting is ignored—all notes are moved toward the nearest reference event, regardless of how far off the grid they are located.
Scale Time	SONAR finds the two closest events before and after the event in question that are within the window sensitivity and adjusts any bracketed out-of-window events so that their relative timing is the same. This option can uniformly speed up, slow down, or shift out-of-window events.

Table 128.

Other settings

If you want, you can restrict the types of events that are affected by the **Quantize** commands to only notes, lyrics, and audio clips. If you choose this option, SONAR will not modify other events, like controllers.

To use the Quantize command

1. Select the material you want to quantize using any of the selection tools and commands.

2. Choose **Process > Quantize** to display the **Quantize** dialog box.

Figure 227. *The Quantize dialog*
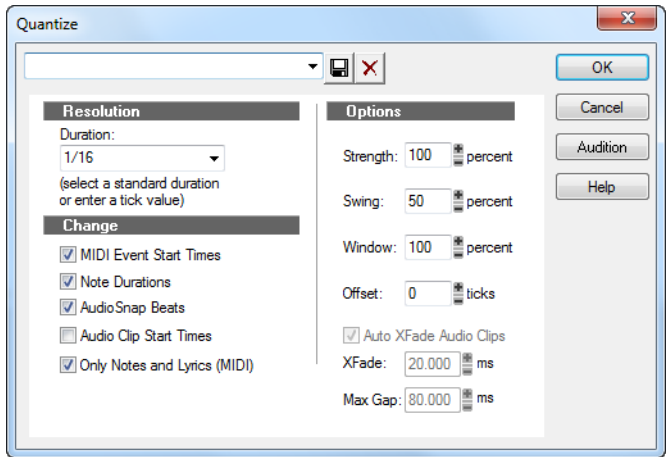
3. Choose one of your own presets from the list, or enter the settings you want according to the table:

Setting	What to do
Resolution	Choose a note size or enter the number of clock ticks
Change	Check the event types and characteristics you want to change
Options	Enter values for Strength, Swing, Window, and Offset

Table 129.

4. Click **Audition** if you want to hear how the quantization will sound; press **Stop** to stop auditioning the change.

5. Make adjustments as necessary.

6. Click **OK** when you are done.

SONAR quantizes the selected MIDI information and audio clips. You can use **Undo** to restore the material to its original state.

Editing MIDI events and continuous controllers (CC)
Changing the timing of a recording

To use the Groove Quantize command

1. Select the track or clip you want to quantize, using any of the selection tools and commands.
2. Choose **Process > Groove Quantize** to display the **Groove Quantize** dialog box.

Figure 228. *The Groove Quantize dialog*
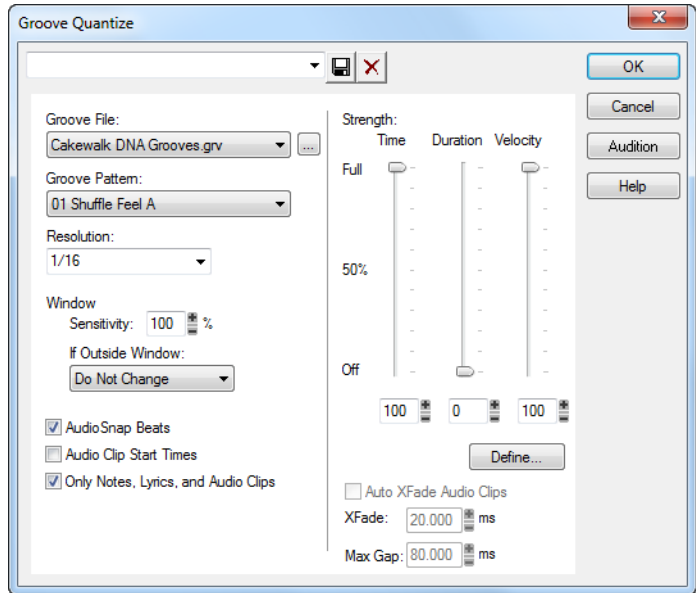
3. Choose a groove file from the **Groove File** field.
4. Choose a groove pattern from the **Groove Pattern** field.
5. Use the following fields to configure your pattern:

Setting	What to do
Resolution	Choose a note size or enter the number of clock ticks
Window Sensitivity	Enter the window sensitivity value (percentage)
If Outside Window	Choose what should happen to events outside the window
Only Notes, Lyrics and Audio	Check to prevent MIDI controller, aftertouch, and xRPN data from being adjusted
Stretch Audio	Check to stretch audio clips to adjust their duration
Strength	Use the sliders or enter values for Note strength, Duration strength, and Velocity strength

Table 130.

6. Click **Audition** if you want to hear how the quantization will sound; press Stop to stop auditioning the change.

7. Make adjustments as necessary.

8. Optionally, type a name in the **Preset** field (located at the top of the dialog box) and click the **Save** button to save your settings.

9. Click **OK** when you are done.

SONAR quantizes the selected MIDI information and audio clips. You can use **Undo** to restore the material to its original state. If you saved your settings, you can apply them to any pattern you want by selecting the pattern and choosing a preset from the **Preset** field. To delete a group of settings, select the group from the **Preset** field and click the **Delete** button.

Defining a groove

To use the groove quantize feature, you must create or choose a small snippet of music—the groove pattern—for SONAR to use as the timing and accent reference. You can use either of the following:

• A track, clip, or portion of a clip stored on the Clipboard

• A groove stored in a SONAR groove file

Any MIDI data that you place onto the Clipboard can be used as a groove pattern. With a carefully defined groove pattern, you can give an old project an entirely new feel. If you like the groove pattern you have created, you can save it to a groove file.

Groove files can store one or more groove patterns. SONAR supports two types of groove files:

• DNA™ grooves, which contain only timing information but are compatible with some other MIDI sequencer software products

• SONAR's native groove format, which stores timing, duration, and velocity information and can handle longer patterns and longer gaps between quantization points

You can add groove patterns to these files from the Clipboard, edit existing patterns, or delete patterns you do not want to keep. There is no limit to the number of groove patterns that can be stored in a single file. You can organize your grooves into several files or keep them all together in a single file. Groove files have an extension of .grv.

A groove pattern can be as short or long as you like. If the groove pattern is shorter than the material to be quantized, the pattern will be repeated as many times as necessary.

To define a new groove

1. Select the music that defines the groove using any of the selection tools and commands.

2. Choose **Edit > Copy** to place the music onto the Clipboard.

You can now use the **Groove Quantize** command with the Clipboard as the "Groove File."

To save a groove pattern

1. Select the music that defines the groove using any of the selection tools and commands.

2. Choose **Edit > Copy** to place the music onto the Clipboard.

3. Choose **Process > Groove Quantize** to display the **Groove Quantize** dialog box.

4. Choose the **Clipboard** as the groove "Groove File."

5. Click the **Define** button to display the **Define Groove** dialog box.

Figure 229. *The Define Groove dialog*
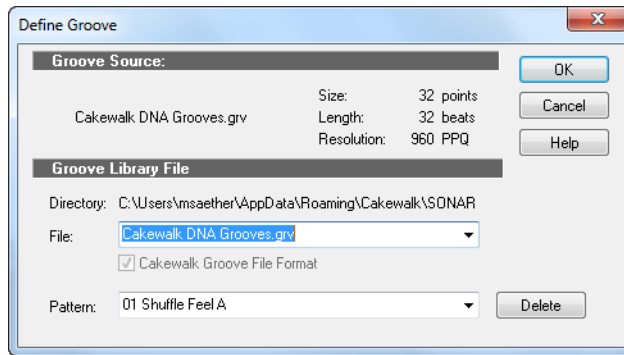
6. Select an existing groove file, or enter the name for a new groove file.

7. Enter a pattern name, or choose an existing pattern to replace.

8. Click **OK**.

9. If you are replacing a groove, verify that you want to delete the existing version.

10. Click **Close** when you are done to return to the **Groove Quantize** dialog box.

SONAR stores the groove in the file and chooses the new groove as the current groove source.

To copy an existing groove

1. Choose **Process > Groove Quantize** to display the **Groove Quantize** dialog box.

2. Choose the groove file and groove pattern you want to copy.

3. Click the **Define** button to display the **Define Groove** dialog box.

4. Select an existing groove file, or enter the name for a new groove file.

5. Enter a pattern name, or choose an existing pattern to replace.

6. Click **OK**.

7. If you are replacing a groove, verify that you want to delete the existing version.

8. Click **Close** when you are done to return to the **Groove Quantize** dialog box.

SONAR stores the groove on the Clipboard and chooses the new groove as the current groove source.

To delete a groove

1. Choose **Process > Groove Quantize** to display the **Groove Quantize** dialog box.

2. Click the **Define** button to display the **Define Groov**e dialog box.

3. Select the file containing the groove to delete.

Changing the timing of a recording

4. Select the pattern name of the groove.

5. Click the **Delete** button, and confirm that you want to delete the groove pattern.

6. Repeat steps 3 to 5 for each groove you want to delete.

7. Click **Close** when you are done to return to the **Groove Quantize** dialog box.

Groove Quantize tips

Here are some tips to help you with groove quantizing:

Aligning sloppy tracks with a good one.   Select the portion of the "good" track that you want to apply to the "sloppy" tracks and copy it to the Clipboard. Select the portion of the sloppy tracks you want to modify. Choose **Process > Groove Quantize**, choose the Clipboard as the groove source, and click **OK**.

Accenting beats in each measure.   Create a sample measure containing note events at the desired accent points. Give the notes on the accented beats a greater velocity and the others a lesser velocity. Select the measure, copy it to the Clipboard, and then choose **Process > Groove Quantize**. Set the velocity strength as high as necessary so that the notes get accented the way you want.

Stealing that feeling.   Suppose you have a dry piece that was composed and entered into SONAR with a rigid sense of timing (for example, using step recording). You've recorded a bass line that has exactly the off-beat rhythmic dynamic you want for the dry piece. You'd like to force your other tracks to share that feel. Copy the bass track to the Clipboard; from the **Groove Quantize** dialog box, select the Clipboard as the groove source; choose a resolution value roughly on the order of the duration of the bass notes and a window of 100 percent. SONAR aligns the melody note events with the nearest bass notes.

Synchronizing rhythm and solo tracks.   If you want to preserve the unique rhythm of each track but want to synchronize them together in time, try a larger resolution value and a smaller window. For example, suppose you have one track with a highly stylized drum beat and another track containing a jazz solo with some very nice runs in it. The drum beats fall primarily on quarter notes, but the solo consists of runs of fast notes that aren't quite sixteenth triplets. Copy the drum track to the Clipboard, and groove quantize using a quarter-note resolution and a window of perhaps 10 percent. SONAR aligns the solo notes near the quarter-note drum beats but maintains the feel of the solo during the fast runs of notes in between.

Correcting off-tempo tracks.   Suppose you have both rhythm and melody tracks recorded, but the melody was played erratically. First, copy the rhythm track to the Clipboard. Then use groove quantize with a whole-note resolution, a window of 25 percent or less, and with the **Scale Time** option selected. The **Groove Quantize** command will synchronize the melody track with the groove source at roughly measure boundaries, while maintaining the relative timing of the notes in each measure.

Fixing a bad verse.   Copy a good verse to the Clipboard. Then change the selected range to cover only the bad verse. Perform a groove quantize using the Clipboard contents as the groove source. The rhythms of the two verses then match.

Fit Improvisation

SONAR lets you record music from a MIDI controller without requiring that you use a fixed tempo. In fact, if you record without using a metronome, you are very likely to end up with a recording that does not fit onto a fixed tempo grid.

The **Process > Fit Improvisation** command lets you take a recording and create a tempo map (with measure and beat boundaries) that fits what you played. Your performance is not changed in any way, even though the note start times and durations are adjusted to fit the new tempo map. This is important if you later want to use any of SONAR's editing features that depend on a proper tempo map for best results.

To use this command, you must record a reference track containing a single clip that matches your original track or tracks but has only a single note on each beat boundary. You should make sure that the reference track has one event for every single beat, with no extra beats or missing beats. The first beat of the reference track should be at 1:01:000. You can use any editing command to adjust the reference track.

If you want, you can use other types of events as markers on the reference track, such as a sustain pedal. Remember, however, that MIDI sustain pedals generate one event when the pedal is pressed and another when it is released. So if you want to use the sustain pedal for the reference track, keep this in mind. Click down, up, down, up, for one, two, three, four.

Remember that the better the quality of your reference track, the better job the **Fit Improvisation** command can do. You want each of your reference track events to be as close as possible to the beat of the music. Note that some keyboards transmit aftertouch events when you record your reference track. These extra events will prevent **Process > Fit Improvisation** from working properly. Therefore, you should delete these events before using this command, or filter them out when recording the reference track (using **Edit > Preferences > MIDI - Playback and Recording**).

To fit tempos to an improvisation

1. Record the reference track.

2. Select the reference track.

3. If necessary, combine all clips in the reference track into a single clip using the Track view **Clips > Bounce to Clip(s)** command.

4. Choose **Process > Fit Improvisation**.

SONAR adds tempo changes as necessary to fit the tempo grid to the reference track. When you're done, you should mute the reference track, since the reference track events are not rescaled.

Note: *If the resulting tempo grid exceeds 250 beats per minute, you will see an error message. If this happens, you can shorten the start times of each event using the* ***Process > Length*** *command, decrease the tempo to compensate for the change, and then try again.*

You can also use the **Set/Measure Beat At Now** command to align a freely played MIDI performance with the Time Ruler.

To sync the project tempo to freely played MIDI

If you have recorded a MIDI track without a metronome, you may want to align the project's tempo map with the MIDI performance. The **Set/Measure Beat At Now** command allows you to create new bar lines to fit your project. This command does not stretch audio. It works by adjusting tempo so that measure lines line up with audio transients *or* MIDI data. The tempo will ramp up/down from the previous tempo change in order to arrive at the required tempo.

To use the **Set Measure/Beat At Now** command, you need to be able to identify where you want to put the downbeats of each measure, and possibly where you want to place some other beats of the measure, if the tempo varies a lot.

1. Display the MIDI clip that you want the measure/beats to align with in the Inline Piano Roll view: click the MIDI track's Edit Filter control and choose **Notes**. Zoom in enough to see the MIDI data clearly (you can also use the regular Piano Roll view).

   Tip: *To make it easier to visually align note events with the Time Ruler, drag the MIDI track to the top position so it appears right below the Time Ruler.*
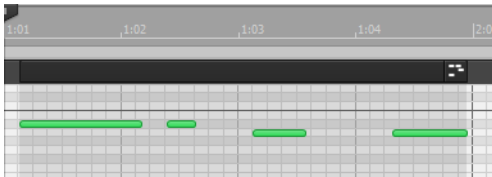
2. If you want other MIDI clips that exist in the project to retain their current M:B:T positions, select the clips, right-click one of them, and choose **Clip Lock > Lock Position** from the pop-up menu.

3. Turn off the **Snap to Grid** button ⊞, and use the Select tool ▸ to click the MIDI clip at the place where you want to set a measure or beat. The Now Time cursor moves to the place you clicked:
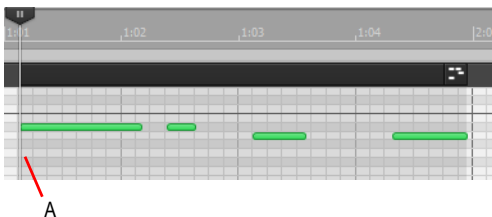
A. Now Time cursor

4. Choose **Project > Set Measure/Beat at Now** to open the **Measure Beat/Meter** dialog box.
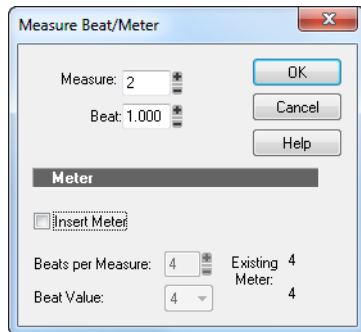
5. Enter the desired measure and beat values, and click **OK**.

Note: *SONAR attempts to guess the correct measure/beat, so you usually can just click **OK** to accept the default values.*

6. Move the Now Time to the next desired beat (click the start of the next note).

Tip: *Press TAB to jump to the next note, or SHIFT+TAB to jump to the previous note.*

7. Choose **Project > Set Measure/Beat at Now** to open the **Measure Beat/Meter** dialog box, enter the desired values, and click **OK**.
8. Repeat steps 6 and 7 until the Time Ruler is correctly aligned.

After you align the Time Ruler to your clip, you can smooth out the tempo changes in the Tempo view, and your clip will retain its M:B:T position.

Snap to Scale

When Snap to Scale is enabled, any notes that you draw in the Piano Roll view (or Inline Piano Roll view) stay within the selected scale. Also, any notes that you move with the Select tool stay within the selected scale. When Snap to Scale is enabled, both Piano Roll views display grey rows at the pitch levels that are not in the selected scale. Also, both the Select tool and the Draw tool display a tuning fork icon when you create or modify notes to show that Snap to Scale is enabled.

You can create custom scales, modify existing ones, and choose how SONAR handles non-scale notes.

To enable or disable Snap to Scale for a single track

• Open the Track Inspector

Figure 230. *Snap to Scale settings in the Track Inspector*
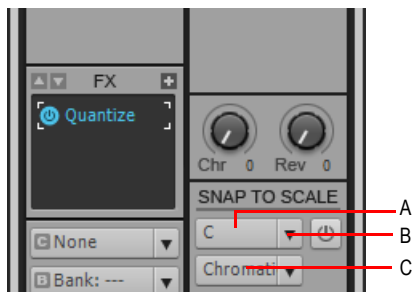
A. Root Note menu B. Scale Snap button C. Scale menu

Or

• In the Piano Roll view, in the Track List pane, right-click the track that you want to affect, and choose **Enable/Disable Snap to Scale** from the pop-up menu.

To momentarily bypass the Snap to Scale feature

• Hold down both mouse buttons while you edit.

To choose a root note for a single track

• Do either of the following:

  • In the Track Inspector, click the drop-down arrow in a track's **Root Note** control, and choose a root note from the menu that appears.

  • In the Piano Roll view, right-click a track's name in the Track List pane, and choose **Root Note > (name of root note)** from the pop-up menu.

To choose a scale for a single track

- Do either or the following:

  - In the Track Inspector, click the drop-down arrow in a track's **Scale** control, and choose a scale note from the menu that appears. The scale options in the menu contain both factory-supplied scales and ones that you create and/or edit.

  - In the Piano Roll view, right-click a track's name in the Track List pane, and choose **Scales > (kind of scale) > (name of scale)** from the pop-up menu.

To create a scale

1. Open the **Scale Manager** dialog by clicking the drop-down arrow in the **Scale** menu, and choosing **Scale Manager** from the menu that appears.

2. In the **Scale Family** field, click the scale family that you want your scale to appear under when your scale appears in the **Scale** menu.

3. Click the **Create New Scale** button ⚡.

   The Scale Manager displays a default name (New Scale "n") for the new scale, and automatically selects **C** as the root note of the scale.

   Note: *All scales in the **Scale Manager** dialog box use C as the root note.*

4. Edit the name of the new scale by clicking the default name (New Scale "n") where it appears at the very top of the **Scale** field, and then typing a new name for the scale.

5. Include or exclude individual notes for the scale by clicking either the keys in the keyboard display, or by clicking the scale degree buttons under the **Scale Degrees** field. Included notes appear as blue dots in the keyboard display, as depressed scale degree buttons, and as scale degrees in the **Scale Degrees** field.

Figure 231. *The **Scale Manager** dialog*

A. Keyboard display   B. Scale degree buttons
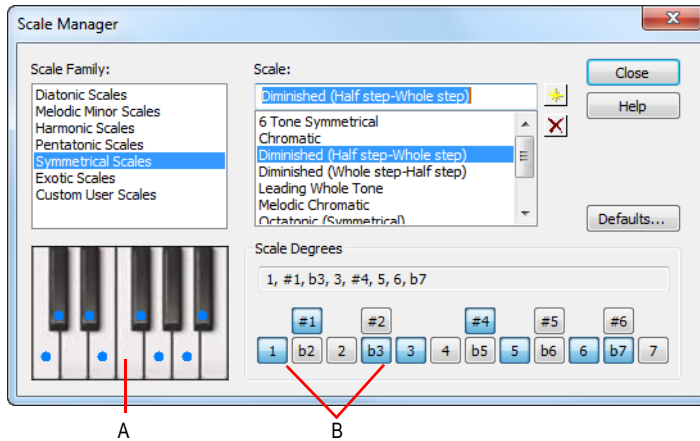
A. Keyboard display B. Scale degree buttons

6. When you're through choosing scale degrees, click the **Close** button to save your changes. If you want to delete your scale, just highlight it in the **Scale** field, and click the **Delete** button ⊠.

To edit or delete a scale

1. Open the **Scale Manager** dialog box (click the drop-down arrow in the **Scale** menu, and choose **Scale Manager** from the menu, or the right-click menu in the Track List pane of the Piano Roll view).

2. In the **Scale Family** field, click the scale family that the desired scale is filed under.

3. Select the desired scale by clicking the scale's name in the **Scale** field. If you want to delete the scale, click the **Delete** button ⊠.

4. Include or exclude individual notes for the scale by clicking either the keys in the keyboard display, or by clicking the scale degree buttons under the **Scale Degrees** field. Included notes appear as blue dots in the keyboard display, as depressed scale degree buttons, and as scale degrees in the **Scale Degrees** field.
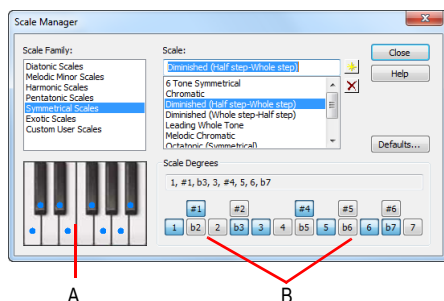
A. Keyboard display B. Scale degree buttons

5. When you're through choosing scale degrees, click the **Close** button to save your changes.

To restore a scale or scales to factory settings

1. Open the **Scale Manager** dialog box.

2. If you want to restore a particular scale to factory settings, select it in the **Scale** field, click the **Defaults** button, and in the **Scale Defaults** dialog box, select **Restore Current Scale (if factory)**, and click **OK**.

3. If you have deleted a factory-supplied scale and want to replace it with the original version, click the **Defaults** button, and in the **Scale Defaults** dialog box, select **Restore Any Missing Scales**, and click **OK**.

4. If you want to restore all factory-supplied scales to factory settings, click the **Defaults** button, and in the **Scale Defaults** dialog box, select **Restore All Factory Scales**, and click **OK**.

To choose how SONAR handles non-scale notes

1. Open the **Snap Settings** dialog by clicking the drop-down arrow in the **Scale** menu, and choosing **Snap Settings** from the menu that appears.

2. Choose one of the following options:

    • **Adjust to Next, Higher Note.**   If you choose this option, SONAR moves any non-scale note that you move to the next higher note in the selected scale.

    • **Adjust to Previous, Lower Note.**   If you choose this option, SONAR moves any non-scale note that you move to the previous, lower note in the selected scale.

    • **Adjust to Nearest Note.**   If you choose this option, SONAR moves any non-scale note that you move to the note that is closest in pitch in the selected scale.

Searching for events

The events in a project have many different parameters. For example, all MIDI notes have a channel, starting time, pitch, velocity, and duration. Controllers have a controller number and value. SONAR makes it simple to find, select, and modify events that have certain values for specific attributes.

Here are some of the things you can do and the commands that you would use to do them:

Action	Command
Select all the events in a project that have the specified attributes	Edit > Select > By Filter
Modify an existing selection to keep only those events that have the specified attributes	Edit > Select > By Filter
Replace all events that meet specified attributes with modified versions of the events	Process > Find/Change

Table 131.

These capabilities can help you find problem spots or errors in a project or make systematic changes to events that have particular attributes. All of these capabilities rely on the use of an **event filter**, which lets you choose the types of events you want to work with and the range of values in which you are interested.

See:

Event filters

When you select individual clips, or select portions of clips by dragging the Time Ruler, you automatically select all the events that fall within the designated time range. Sometimes you need finer control over which events are selected. For example, you might want to:

- Select the notes that are played in a certain octave, so you can copy them to another track
- Select and boost the velocity of notes that have a velocity below a certain threshold
- Find the first patch change event on a particular track
- Select and change the duration of all notes that occur on the third beat of any measure

The **Event Filter** dialog box looks like this:

Editing MIDI events and continuous controllers (CC)
Searching for events

Figure 232. *The **Event Filter - Search** dialog*
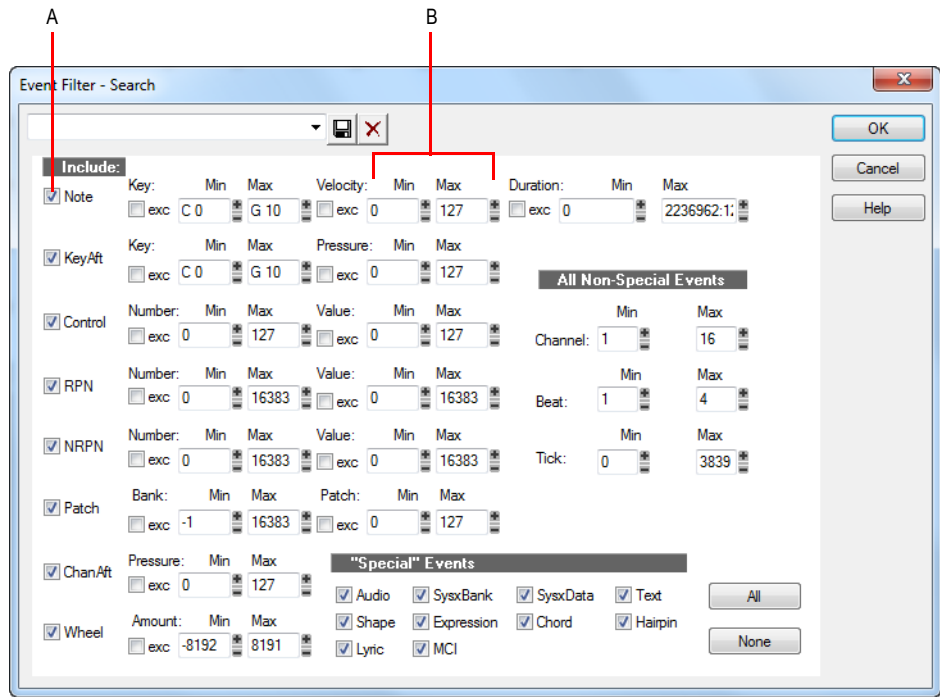
A. Check to include this type of event B. Enter the range of values for the events you want

Different types of events have different parameters, as shown in the table:

This event type	Has these parameters
Note	Pitch, velocity, and duration
Key Aftertouch	Pitch and pressure value
Controller	Controller number and value
RPN/NRPN	RPN/NRPN number and value
Patch Change	Bank and patch numbers
Channel Aftertouch	Pressure value
Pitch Wheel	Value

Table 132.

The event filter only accepts events that meet all the specified ranges. This means that a note event must fall within the pitch range, the velocity range, and the duration range in order to be included. The event filter can also be used to accept events that occur in a range of channel numbers, beats, and clock ticks.

You can choose either to *include* or *exclude* the events that meet the specified criteria. To exclude events within the designated range and select the ones outside the designated range, check the **exc** check box for that value range.

The event filter can also be used to identify several special event types: audio, System Exclusive events, Lyrics, MCI commands, envelope shades, and a few others. You do not enter a range of values for these special events; SONAR finds all events of the types you choose.

The **All** and **None** buttons help you set up the event filter the way you want:

Click this button	To do this
All	Set the event filter to include all events. You can then modify the value ranges to narrow down your search or uncheck the types of events you want to exclude.
None	Set the event filter to *not* include any events. Starting from a blank slate, you can check off the types of events you want to find or select and enter the desired ranges of values.

Table 133.

In any place in the event filter where you would normally enter a pitch string, you can also enter the pitch by pressing a key on your MIDI keyboard. Also, you can use the question mark in place of the octave number as a wild card. This lets the event filter accept a single note, regardless of the octave. For example, the pitch string C? will match a C in any octave.

Selecting events

The **Edit > Select > By Filter** command is used to refine a selection by applying an event filter to an initial selection. You can use this command any number of times to refine the selection even further. Before using this command, use any of the selection commands and tools to create an initial set of selected event. You can use the **Edit > Select > All** command to select all events in the current view.

The Track view cannot display individual selected events. As a result, the **Edit > Select > By Filter** command will not necessarily change the appearance of the Track view. SONAR applies the event filter rule, but the change is not visible. However, once you change the selection in any way (for example, by clicking on a track number or by clicking in the Time Ruler), the effects of the event filter are erased. If you want to use the filter, you must choose **Edit > Select > By Filter** again and click **OK** to use the same filter values.

> **Note:** *The shading of a clip in the Track view indicates how many of the events in the clip are selected. If the clip is shown in solid black, all events in the clip are selected. If a portion of a clip is shown in medium gray, all the events in that time range are selected. If the clip is shown in light gray, only some of the events in the shaded time range are selected.*

To select events using the Event Filter

1. First, select an initial set of tracks, clips, or events.

2. Choose **Edit > Select > By Filter** to display the **Event Filter** dialog box.

3. Set up the event filter to find the events you want.

4. Click **OK**.

SONAR searches the currently selected events and weeds out those that do not meet the requirements of the event filter.

Example: splitting left-hand and right-hand parts

Suppose you recorded a keyboard riff on Track 1 but want to split the left and right hands apart into separate tracks so you can edit them separately. Suppose that all the right-hand notes are above C4. Here's how to proceed:

1. Select all of Track 1 by clicking on the track number in the Track view.

2. Choose **Edit > Select > By Filter** to display the **Event Filter** dialog box.

3. Click the **None** button to clear the dialog box.

4. Check the **Note** check box, and enter a minimum value of **C4**. The maximum should already be set to **C9**.

5. Click **OK**. SONAR selects all the notes from C4 up.

6. Choose **Edit > Cut** to move the selected notes to the Clipboard.

7. Choose **Edit > Paste** and paste the events to a different track.

Process > Find/Change

The **Process > Find/Change** command is an extremely flexible way of manipulating the data parameters of events. It works something like the search-and-replace function in a word processor but with scaling rather than simple replacement.

This command uses two event filters. The first event filter lets you set up your search criteria. The second event filter is used to define the replacement value ranges. When an event satisfies the search criteria, its parameters are scaled between the search ranges and the replacement ranges. This permits transposition, inversion, key signature changes, and other operations to be accomplished with this one simple command.

In the second **Event Filter** dialog box, the check boxes and value ranges for beats and ticks are ignored. Only the replacement value ranges for the selected event types are used.

The **Process > Find/Change** command understands a wild card octave number in the second event filter to mean, "replace the original note with a different note in the original octave." Using octave wild cards for both the search and replacement event filters lets you, for instance, change all E-flats to E-naturals, preserving the octave of each note.

A few examples will illustrate some of the many uses of the **Process > Find/Change** command. These examples apply to the note event type, though the command can be used on any type of event.

Parameter	Search range	Replacement range	Effect
Pitch (key)	From C2 to C4	From C4 to C6	Transposes all notes in the search range up two octaves
Pitch	From E2 to E2	From Eb2 to Eb2	Converts all Es in octave 2 to Eb in the same octave
Pitch	From E? to E?	From Eb? to Eb?	Converts all Es in all octaves to Eb in the same octave
Pitch	From E? to E?	From E? to Eb5	Converts all Es to Eb in octave 5
Pitch	From C1 to C8	From C8 to C1	Inverts all the notes in the specified range
Velocity	From 0 to 127	From 80 to 127	Compresses the velocity values into a narrower range
Velocity	From 0 to 127	From 127 to 0	Inverts the velocity values (makes loud notes soft, and soft notes loud)
Duration	From 0:01:00 to 0:02:000	From 0:01:000 to 0:01:000	Converts all notes that are between a quarter note and half note in length, and makes them all quarter notes
Channel	From 1 to 1	From 2 to 2	Changes all events on MIDI channel 1 to MIDI channel 2
Channel	From 1 to 16	From 4 to 4	Reassigns all events to MIDI channel 4

Table 134.

Editing MIDI events and continuous controllers (CC)
Searching for events

Controllers, RPNs, NRPNs, and automation data

SONAR projects contain a lot more information than the notes and digital audio files that are at the heart of your work. Controllers, RPNs, and NRPNs (xRPNs, for short) are special types of events used by MIDI software and hardware to control the details of how MIDI music is played. Automation data are used to adjust volume, pan, and other parameters of MIDI and audio tracks on the fly while playback is in progress.

SONAR lets you enter or edit controller, xRPN, and automation data in several ways:

- Using envelopes in the Track view
- Using the Piano Roll view and Inline Piano Roll view
- Using the **Insert > Series of Controllers** command
- Editing controller events in the Event List view

Editing data in the Track view's Clips pane or the Piano Roll view gives you great flexibility. You can examine the controllers in graphical form and edit them even while recording or playback is in progress. This means you can loop over a portion of your project and hear any change you make on the next loop.

> **Note:** *MIDI envelopes you create in the Piano Roll view and MIDI envelopes you create in the Track view Clips pane are actually separate envelopes, even if they control the same parameter. Both kinds of envelopes are visible in the Clips pane, and should generally not be used to control the same parameter. You can convert Piano Roll view envelopes to Track view envelopes by selecting the time range and tracks that the Piano Roll envelopes occupy, and using the Track view **Clips > Convert MIDI Controllers to Envelopes** command.*

For more information about automation, see "Automation" on page 1001 and "Mixing" on page 829. For more information about the Event List view, see "The Event List view" on page 742.

See also:

"Adding and editing controllers in the Piano Roll" on page 695

Controllers

Controllers are the MIDI events such as volume, sustain pedal, and pan that you use to change the sound while you're playing. You can enter controller data from within SONAR, or record them from external devices such as MIDI keyboards.

Controllers let you control the detail and character of your music. Say you're playing a guitar sound on your synthesizer, but it sounds lifeless and dull. That's partly because a guitar player doesn't just play notes one after another—he often bends or slides on the strings to put emotion into his playing. You can use controllers in the same way, creating bends, volume swells, and other effects that make sounds more realistic and more fun to listen to.

Your computer can work the controllers on your electronic instrument by sending MIDI Controller messages. The MIDI specification allows for 128 different types of controllers, many of which are used for standard purposes. For example, controller 7 is normally used for volume events, and controller 10 is normally used for pan. Every controller can take on a value ranging from 0 to 127.

The Piano Roll contains several drop-down lists that let you choose the controller you want to see and edit. The contents of these lists depend on the output and channel settings and on the instrument assigned to that output and channel. Different instruments use controllers in different ways. See "Instrument definitions" on page 1117.

> **Note:** *SONAR has automatic searchback for all continuous controller data to ensure that the correct controller values are in effect regardless of where you start playback. Suppose you start playback halfway through a project. SONAR searches back from that point to find any earlier controller values that should still apply.*

RPNs and NRPNs

RPNs (Registered Parameter Numbers) and NRPNs (Non-Registered Parameter Numbers) are similar to controllers, except that both the parameter number and data value can be any number between 0 and 16,383.

When RPNs and NRPNs are transmitted via MIDI or stored in a standard MIDI file, they are converted into four separate controller messages. SONAR detects incoming xRPN messages from MIDI inputs or files and reassembles them into a single RPN or NRPN event. This provides the convenience of single RPN or NRPN events in SONAR plus compatibility with existing files, equipment, and software. The following table shows the controller numbers SONAR uses for RPN and NRPN events.

Message	Parameter number MSB Controller	Parameter number LSB Controller	Data value MSB Controller	Data value LSB Controller
RPN	101	100	6	38
NRPN	99	98	6	38

Table 135.

Automation data

The Track and Console views allow you to record automation data that define changes in volume, pan and many other parameters throughout a project.

The Track view allows you to create envelopes to adjust several parameters. For more about automation, see "Automation" on page 1001.

Velocity, Pitch Wheel, and Aftertouch

SONAR lets you display and edit several other types of data the same way you do controller data. These data include:

- MIDI pitch wheel or pitch-bend messages
- MIDI channel aftertouch (ChanAft) values
- MIDI key aftertouch (KeyAft) values

Remember that note velocity is an attribute of each note and not a completely separate event. You cannot add or remove velocity events in the Notes pane, but you can use the draw tool to adjust the velocity values for existing notes. You can also edit velocities with the **Process > Scale Velocity** command. For more information, see "Adding crescendos and decrescendos" on page 717. You can edit individual note velocities in the **Note Properties** dialog box, described in "Changing note properties" on page 1084.

The Event List view

The Event List view shows events in a list format. You can insert, delete, or modify any kind of event, including notes, pitch-wheel data, velocity, MIDI controllers, patch changes, Wave files, lyrics, text strings, MCI commands, System Exclusive meta-events, and more.

To open the Event List view, do *one* of the following:

- Select one or more tracks and choose **Views > Event List**
- Right-click a clip in the Clips pane and choose **Views > Event List** on the pop-up menu.
- Press ALT+8.

Figure 233. *The Event List view*
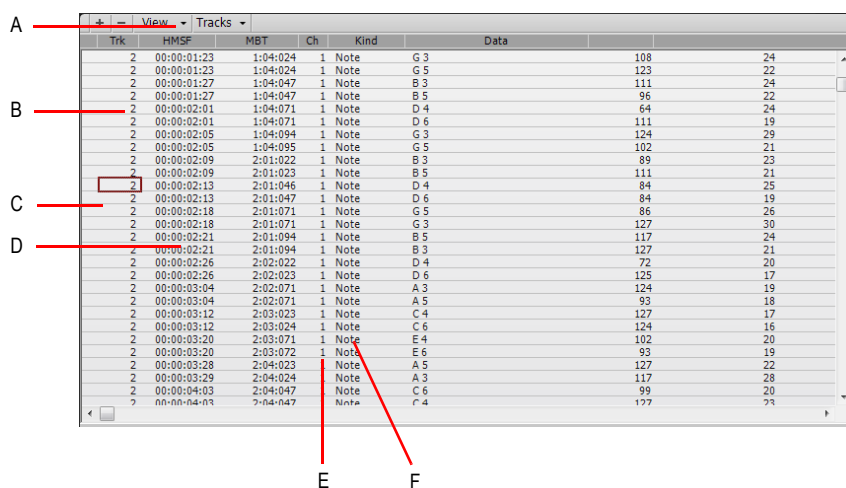
A. Menu **B.** *Track* **C.** *This event is selected* **D.** *Event time* **E.** *Event channel* **F.** *Event type*

The events in the selected tracks are listed one per line, from top to bottom. As you move the highlight through the event list, SONAR updates the Now marker (time display). During playback, the event list scrolls to display the events at the current time. The current event is centered in the Event List during playback, and the highlight is on the correct event when playback stops. Any time you change the Now time, the event list is updated and the highlight is moved to the event that will be played next.

When the Event List view includes more than one track, events are mixed together in chronological order. For example, if you select tracks 1 and 3 when you open the Event List view, you see a single list of intermingled events from tracks 1 and 3. You can have any number of Event List views, each containing any number of tracks, open at the same time. You can change the tracks shown in the Event List view by clicking **Tracks** menu and choosing the tracks you want.

Editing MIDI events and continuous controllers (CC)
The Event List view

See:

Event List buttons and overview

Each line of the Event List view shows a single event along with all of its parameters. There are many different types of events. All share the following parameters:

• The time of the event, displayed in SMPTE (hours:minutes:seconds:frames) format

• The time of the event, displayed in MBT (measures:beats:ticks) format

• The event type, or **kind** of event

The remaining parameters vary by event type. You can hide or show each kind of event via the Event List view **View** menu or by checking its check box in the **Event Manager** dialog box. Here is a summary listing of the parameters that apply to each type of event.

Short name	Type of event	Parameters
Note	MIDI note	Pitch (MIDI key number), velocity (0-127), duration (beats:ticks or simply ticks), MIDI channel (1-16)
KeyAft	MIDI key aftertouch	Pitch (MIDI key number), pressure amount (0-127), MIDI channel (1-16)
Control	MIDI controller change	Controller number (0-127), controller value (0-127), MIDI channel (1-16)
Patch	MIDI patch change	Bank select method, bank number, number or name of the patch, MIDI channel (1-16)
ChanAft	MIDI channel aftertouch	Pressure amount (0-127), MIDI channel (1-16)
Wheel	MIDI pitch wheel position	Wheel position (-8192 to 8191, where the center is 0)
RPN	Registered Parameter Number	Parameter number (0-16383), parameter value (0-16383), MIDI channel (1-16)
NRPN	Non-registered Parameter Number	Parameter number (0-16383), parameter value (0-16383), MIDI channel (1-16)
Sysx Bank	System Exclusive data bank	Sysx bank number (0-8191)
Sysx Data	System Exclusive data message	Sysx message up to 255 bytes long

Table 136.

Short name	Type of event	Parameters
Text	Text	Text
Lyric	Lyric	Text (a single word or syllable)
MCIcmd	Windows Media Control Interface (MCI) command	MCI command text
Wave Audio	Digital audio wave	Name, velocity (0-127), and number of samples
Shape Events	Automation graph segments made up of a solid line between two nodes	Change in values, kind of shape, and length in MBT format. **Note:** Shape events cannot be edited, only deleted.
Expression	Staff view expression marking	Text of expression mark
Hairpin	Staff view dynamics marking	Direction (crescendo or diminuendo) and duration
Chord	Staff view chord symbol	The name of the chord
Event List Manager	Opens **Event Manager** dialog box	Shows or hides various kinds of events
Insert Event +	Inserts a copy of highlighted event—double-click the event's **Kind** parameter to change it to the kind of event you want	Whatever the highlighted event's parameters are
Delete Event −	Deletes the highlighted event	Whatever the highlighted event's parameters are

Table 136.

Here are some notes about events and their parameters:

- The Channel parameter in the Track view can force an event to play on a different MIDI channel from the one shown in the event list.

- Pedal marks entered in the Staff view are displayed in the Event List view as controller events (64).

- Many keyboards do not support key aftertouch and channel aftertouch. Consult the *User's Guide* for your keyboard for more information.

- When you double-click the value of a patch event, SONAR displays the **Bank/Patch Change** dialog box. For more information about bank and patch changes, "To insert a bank/patch change" on page 221.

- See "System exclusive data" on page 1139, for more information about System Exclusive banks.
- See "Editing audio" on page 773, for more information about audio clips.

Selecting events in the Event List view

The following table describes how to select events in the Event List view.

To do this	Do this
Select a single event	Click on the event.
Select multiple, contiguous events	Select the first event, hold the SHIFT key down and click the last event.
Select multiple, contiguous events using the arrow keys	Hold down the CTRL and SHIFT keys while pressing the up or down arrows.
Select multiple, non-contiguous events	Select an event, hold the CTRL key while selecting additional events

Table 137.

Event List display filter

You can configure the Event List view to display different event types, as described in the following table.

To do this	Do this
Hide events of a certain type	Select the event type in the Event List view **View** menu, in the Event List view pop-up menu, or in the Event Manager. To display a type of event, deselect it.
Open the Event Manager	Click the Event List view **View** menu and choose **Event Manager**.
Show or hide slip-edited events	As a default, if you slip edit the boundaries of a clip, all events outside those boundaries are hidden in the Event List view. If you want to see these events, click the Event List view **Tracks** menu and choose **Show Cropped**. **Note:** You can not edit slip-edited material in the Event List view.

Table 138.

Editing events and event parameters

The Event List view lets you add, delete, or change events one by one. You can also print the list of events or audition the events one at a time to see how they sound.

You can change the parameters of any event by moving the rectangular highlight to the cell you want to change and doing one of the following:

• Type a new value and then press ENTER.

• Press the - and + keys on the numeric keypad to decrease or increase values by a small amount.

• Press the [and] keys to decrease or increase values by a larger amount.

• Click and hold the mouse button, and then drag the mouse up or down to change the value by a small amount.

• Click and hold both mouse buttons, and then drag the mouse up or down to change the value by a larger amount.

• Double-click a cell, and then enter or choose a new value.

If you change the time of an event, it may also change its position in the event list. The Event List view follows that event to its new location.

If you try to change the event type (kind of event), SONAR lets you choose the kind of event you want from a dialog box. When you change one kind of MIDI event into another kind of MIDI event, SONAR preserves the parameters as fully as possible.

Note: *Shape events cannot be edited, only deleted.*

To insert a new event

1. Move the highlight (use the mouse or arrow keys) to the point at which you want to insert an event.

2. Press INSERT, or click ➕ . SONAR makes a copy of the highlighted event.

3. Change the event to the kind of event you need by double-clicking the name of the event that's listed in the Kind column. The **Kind of Event** dialog box appears.

4. Choose what kind of event you want and click **OK**. SONAR changes the highlighted event to the kind you chose.

5. Edit the event time and other parameter values as required.

If the Event List is initially empty, pressing the INSERT key creates a default note event.

To delete an event

1. Move the highlight (use the mouse or arrow keys) to the event you want to delete.

2. Press DELETE, or click ➖ .

SONAR deletes the event.

To delete several events

1. Select the events you want to delete by clicking, dragging, or CTRL or SHIFT-clicking in the first column of the Event List view.

2. Choose **Edit > Cut**.

SONAR deletes the selected events.

To print the Event List

1. Choose **File > Print Preview** to display a preview of the printed event listing.

2. Click the **Zoom** button (or just click the page) to zoom in and out, and use the PAGE UP and PAGE DOWN to review the pages.

3. Click **Print** to print the event list, or click **Close** to close the Preview window without printing.

To play events step by step

1. Using the keyboard, hold the CTRL and SHIFT keys and press the SPACEBAR to play the currently highlighted event. If the event is a note event, it plays until you release the SPACEBAR.

2. When you release the SPACEBAR, the highlight moves to the next event.

3. Continue pressing the SPACEBAR to play events one by one.

4. To edit the last event you heard, release the SHIFT key.

The highlight moves back to the last event you heard, so you can make changes. You can also audition a single event using the mouse. CTRL-click on an event to play the event. If the event is a note or Wave event, it plays until you release the mouse button.

Additional event information

Note Events.   There are three values parameters for note events:

• A pitch, which represents the MIDI key number as a note and an octave.

• A velocity (0–127), which is how fast the key is struck. Some keyboards don't transmit or receive velocity messages.

• A duration, which is how long the note lasts. This amount is shown in beats:ticks format. (If the note lasts less then one beat, then only the number of ticks is shown.)

Note names may also represent percussion instruments, and lists of such note names are sometimes associated with a particular percussion patch. The note C3, for example, may really be "kick drum." If a patch is associated with a percussion note name list, the name of the percussion instrument appears in Event List view rather than a note and an octave from the piano keyboard.

SONAR uses the following notation to display flats and sharps in this and other views:

Character	Meaning
b	flat
#	sharp
"	double flat
x	double sharp

Table 139.

MCIcmd events

Media Control Interface (MCI) commands are special events that let you control other multimedia hardware and software (e.g., CD-ROM drives, laserdiscs, sound cards, animations, video) during playback. MCI commands are part of the multimedia extensions in Windows. MCIcmd events have one parameter—the command line text of the MCI command. Here are some examples:

This command	Does this
`PLAY C:\Train.wav`	Plays the Wave file `Train.wav`
`PLAY C:\Videos\Vacation.avi`	Plays the video file `Vacation.avi` from the VIDEOS folder
`SET CDAUDIO TIME FORMAT TMSF PLAY CDAUDIO 3`	Plays a specific track from the CD drive
`STOP CDAUDIO`	Stops the CD from playing

Table 140.

While MCI commands can be used to play Wave files, these files are played at their normal speed and are not necessarily synchronized with MIDI or other audio data. By contrast, Wave audio clips are played in lock-step synchronization with MIDI and other audio data.

For complete documentation of Windows MCI commands, search for MCI on the Microsoft World Wide Web site (www.microsoft.com).

MIDI effects (MIDI plug-ins)

SONAR provides the ability to use plug-in MIDI effects. Using plug-in effects is similar to using the MIDI processing commands off-line. The overall procedure is as follows:

• Select the MIDI data to be affected.

• Right-click the selected clip(s) and choose **Process Effect > MIDI Effects** on the pop-up menu.

• Set effect parameters (or select a preset if you've made one for this purpose).

• Click **Audition** to preview the music with the effect applied.

• Click **OK** to apply the effect to the selected MIDI data.

If you're not happy with the result, choose **Edit > Undo** before doing any additional work.

MIDI effects can be applied to whole or partial clips. For example, you can apply an echo to just one note.

MIDI effects can also be applied to MIDI tracks in real time (during playback) in the Track view, Track Inspector and Console views. Unlike any of the processing described so far, using effects in real time is non-destructive. This means that the MIDI data itself is not modified.

> **Note:** *Offline effects may cause your MIDI events to grow in size. For example, when you apply echo, the clip may need to grow to accommodate the tail end of the echo.*

SONAR includes the following MIDI plug-ins:

• Arpeggiator

• Chord Analyzer

• Echo/Delay

• Event Filter

• Quantize

• Transpose

• Velocity

See:

MIDI effects presets

The MIDI effects dialogs support the use of presets. For information about presets, see "Presets and property pages" on page 866.

Quantizing

Figure 234. *MFX Quantize*
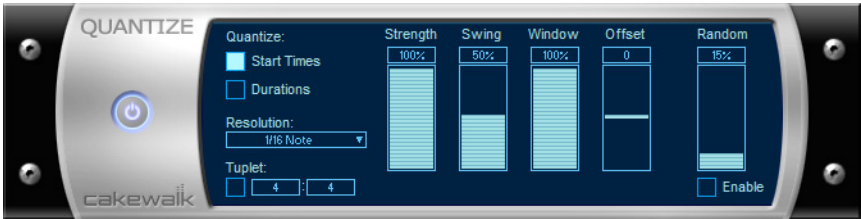
The **Quantize** command moves events to (or towards) an evenly-spaced timing grid.

The quantize effect parameters are as follows:

Parameter/Option	Meaning
Start Times	Quantize event start times.
Durations	Quantize event durations.
Resolution	The spacing of the grid used for quantization.
Tuplet	Specify the resolution as a tuplet note, for example 5 notes in the time of 4.
Strength (%)	The strength of the adjustments. 100% indicates perfect quantization; otherwise, the command moves the notes only part way towards the desired position.
Swing (%)	The distortion of timing used to produce a swing feel. A value of 50% indicates a straight rendition; negative and positive values produce distortion of the timing grid. For more information about swing, see "Swing" on page 720.
Window (%)	The sensitivity of quantization. A value of 100% causes all notes to be quantized. Lower values cause the effect not to quantize notes that are far from the timing grid.

Table 141.

Parameter/Option	Meaning
Offset (Ticks)	The offset of the quantization grid from the start of measure boundaries. A value of 0 indicates perfect alignment. Values less than 0 shift the grid points earlier; values greater than 0 shift the grid later.
Randomize	Causes a random time offset to be added to or subtracted from each new event time. You must also specify the maximum offset, as a percentage of the quantization resolution.

Table 141.

To quantize MIDI data

1. Select the data to be affected.
2. Right-click the selected clip(s) and choose **Process Effect > MIDI Effects > Cakewalk FX > Quantize** on the pop-up menu.
3. Set the quantization parameters, as described in the table above.
4. Click **OK**.

SONAR applies the specified quantization to the selected data.

Adding Echo/Delay

Figure 235. *MFX Echo/Delay*
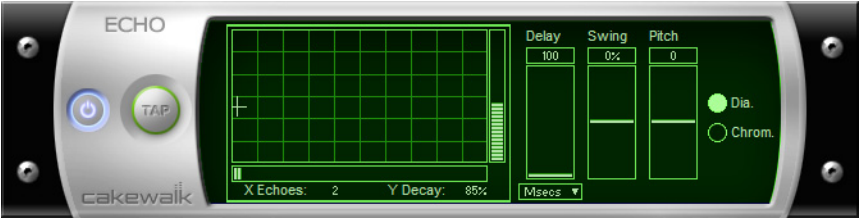
The **Echo Delay** command creates a series of repeating echoes of each note. The echo notes can decrease or increase in velocity, and can be transposed from the original by regular intervals.

The parameters used to specify the echo/delay effect are as follows:

Parameter/Option	Meaning
Decay (%)	The reduction in velocity with each echo. A value greater than 100% indicates an increase in velocity.
No. Echoes	The number of echo notes for each original note. If the velocity reaches 0 before the specified number of echoes, the effect generates no more echo notes.

Table 142.

Parameter/Option	Meaning
Delay	The delay between successive echo notes.
Delay Units	The units used to specify the delay. You may specify delay in ticks, in milliseconds, or as a note duration.
Tap	The delay you specify by tapping the control with the mouse.
Swing (%)	The distortion of timing used to produce a swing feel to the echo. A value of 0% indicates a straight rendition; negative and positive values produce distortion of the timing grid. For more information about swing, see "Swing" on page 720.
Pitch (Steps)	The number of steps to transpose each echo note from the previous. You can specify a Diatonic or Chromatic scale.

Table 142.

To apply Echo/Delay to MIDI data

1. Select the data to be affected.
2. Right-click the selected clip(s) and choose **Process Effect > MIDI Effects > Cakewalk FX > Echo/Delay** on the pop-up menu.
3. Set the echo/delay parameters, as described in the table above.
4. Click **OK**.

SONAR applies the specified echo effect to the selected data.

Filtering events

Figure 236. *MFX Event Filter*

The **Event Filter** command lets you remove events from the MIDI data, keeping or passing through only those events that you specify. The Event Filter effect works almost identically to the event filter

used by the **Edit > Select > By Filter** command. For more information, see "Event filters" on page 734.

To apply an event filter to MIDI data

1. Select the data to be affected.

2. Right-click the selected clip(s) and choose **Process Effect > MIDI Effects > Cakewalk FX > Event Filter** on the pop-up menu.

3. Set the event filter parameters.

4. Click **OK**.

SONAR applies the specified event filter to the selected data, removing all those events that do not meet the filter criteria.

Adding Arpeggio

Figure 237. *MFX Arpeggiator*

The **Arpeggiator** command applies an arpeggio to its input and plays it back in real time. You can make it arpeggiate with a swing feel, or straight and staccato or legato, vary its speed and direction, and specify its range.

The parameters used to specify the arpeggiator effect are as follows:

Parameter/Option	Meaning
Swing (%)	The distortion of timing used to produce a swing feel. A value of 0% indicates a straight rendition; negative and positive values produce distortion of the timing grid. For more information about swing, see "Swing" on page 720.
Rate	The delay between successive notes.
Units	The units used to specify the delay. You may specify delay in ticks, in milliseconds, or as a note duration.
Legato (%)	The smoothness of the notes of the arpeggio. 1 percent plays each notes and releases it instantly. 99 percent plays each note up to the start of the next note.

Table 143.

Parameter/Option	Meaning
Path	The direction of the arpeggio. Options are *Up, Up* (arpeggios go up), *Up, Down* (arpeggios go up, then down), *Down, Down* (arpeggios go down), *Down, Up* (arpeggios go down, then up).
Play thru	The disposition of the notes you play to specify the arpeggio. Checked plays the original notes. Unchecked filters out the original notes.
Specify output range	The range over which the arpeggio plays. Checked specifies that the arpeggiator repeats notes at each octave over the entire specified range. Unchecked specifies that the arpeggiator includes only the notes you actually play.
Lowest note	The MIDI number of the lowest note of the arpeggio. Numbers run from 0 to 127.
Span (Notes)	The number of half-steps in the range. Numbers run from 12 to 127.
Use chord control	The chord you specify. Checked specifies that the arpeggiator infers the chord from the notes played in the range. It identifies the chord in the Chord recognized box and uses it to play arpeggios for notes outside the range.
Lowest note	The MIDI number of the lowest note the arpeggiator uses for chord recognition (0 to 126).
Span (Notes)	The number of half-steps in the range. Numbers run from 1 to 127.
Chord recognized	The chord the Arpeggiator recognizes and plays.

Table 143.

To apply the Arpeggiator to MIDI data

1. Select the data to be affected.
2. Right-click the selected clip(s) and choose **Process Effect > MIDI Effects > Cakewalk FX > Arpeggiator** on the pop-up menu.
3. Set the arpeggiator parameters, as described in the table above.
4. Click **OK**.

SONAR applies the specified arpeggio effect to the selected data.

Analyzing chords

Figure 238. *MFX Chord Analyzer*
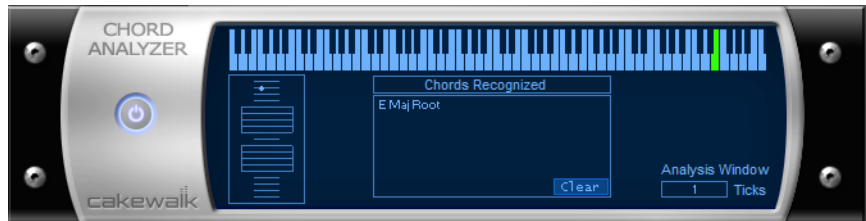
The **Chord Analyzer** command analyzes chords. You select the notes to be analyzed in one of SONAR's windows, then open the Chord analyzer and press the **Audition** button. The chord appears on the MIDI display and the staff, and its name with possible alternatives appears in the Chords recognized box.

You can play the notes on your MIDI input device and have the Chord Analyzer identify the chords in real time. You do not have to set to playback.

You can open the Chord Analyzer in the Track and Console views, press Playback and have the Chord Analyzer identify the chords in real time.

The Chord Analyzer has a single parameter:

Parameter/Option	Meaning
Analysis window	The frequency with which the Chord Analyzer samples the chord. Lower numbers (smaller intervals) are more accurate, but require more computation.

Table 144.

To analyze a chord

1. Select the notes to be analyzed.

2. Right-click the selected clip(s) and choose **Process Effect > MIDI Effects > Cakewalk FX > Chord Analyzer** on the pop-up menu.

3. Click the **Audition** key.

SONAR displays the chord and its name.

To clear the display, press the **Clear** button.

Note: *When analyzing chords you may see chords being displayed before you hear them. You can reduce the amount of time these chords appear ahead of playback. To do so, go to **Edit > Preferences > MIDI - Playback and Recording** and enter a lower value in the **Prepare Using "N" Milliseconds Buffer** option. Excessively low values may cause glitches during playback, so it is best to gradually reduce the value in this option until the desired result is achieved.*

Changing velocities with the Velocity effect

Figure 239. *MFX Velocity*
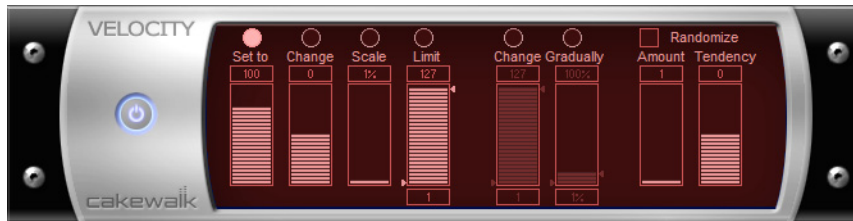
The **Velocity** effect lets you adjust velocities of MIDI notes. You can set velocity values, set scale values, add specific or random offsets, create smooth transitions, and limit the velocity range.

The velocity effect options are as follows:

Parameter/Option	Meaning
Set all velocities to X	Sets all velocities to the specified value.
Change velocities by X	Adds a specified increment to all velocities.
Scale velocities to X% of their current value	Multiplies all velocities by a constant factor.
Change gradually from X to Y	Creates a smooth velocity change across the selection.
Change gradually from X% to Y%	Scales velocities by a gradually changing factor.
Limit range from X to Y	Brings all velocities into the specified range.
Randomize by +/- X	Adds or subtracts a random offset from each velocity. You must also specify the maximum offset. You can select this option in addition to one of the previous options.
Tendency	The tendency of the random offset to be lower or higher, on a scale from -10 to 10.

Table 145.

To change note velocities

1. Select the data to be affected.

2. Right-click the selected clip(s) and choose **Process Effect > MIDI Effects > Cakewalk FX > Velocity** on the pop-up menu.

3. Select options as described in the table above.

4. Click **OK**.

SONAR changes note velocities according to the specified options.

Transposing MIDI notes with the Transpose MIDI effect

Figure 240. *MFX Transpose*
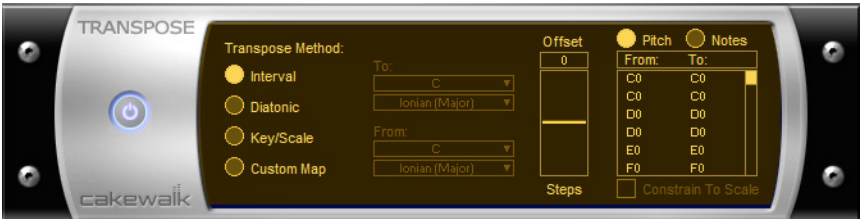
You can perform simple chromatic or diatonic transpositions, transpose from one key to another, or define your own custom transposition.

The transpose options are as follows:

Parameter/Option	Meaning
Interval	Specifies chromatic transposition. Transposes notes by the specified number of steps.
Diatonic	Specifies diatonic transposition. Transposes notes by the specified number of scale steps within the specified scale.
Key/Scale	Specifies transposition from one scale and key to another.
Custom Map	Specifies custom transposition as defined by the map.
Offset	For Interval transposition, the number of steps for the transposition. For Diatonic Transposition, the number of scale degrees for the transposition. For Key/Scale transposition, a number of octaves added to each note after transposition.
Key	For Diatonic transposition, the key in which the transposition is made.
From, To	For Key/Scale transposition, the starting and ending key and scale.
Transposition Map	A table of pitch mappings for the specified transposition. You can select to show the pitches as note names or as note numbers. For Diatonic and Key/Scale transpositions, pitches not in the starting (from) key are indented. To change a pitch mapping, click on a **From** pitch and select a **To** pitch with the pop-up slider. If you change a pitch mapping, the transposition type is automatically set to **Custom Map**.
Constrain to Scale	For Diatonic and Key/Scale transpositions, forces all non-scale notes to be transposed to the nearest appropriate scale tone.

Table 146.

To transpose MIDI data

1. Select the data to be affected.

2. Right-click the selected clip(s) and choose **Process Effect > MIDI Effects > Cakewalk FX > Transpose** on the pop-up menu.

3. Set the transposition options as described in the table above.

4. Click **OK**.

SONAR transposes the selected data according to the options you specified.

Drum maps and the Drum Grid pane

There are several panes in the Piano Roll view designed for use with MIDI drum tracks: the Note Map pane which lists the original pitch values and the mapped values for each note, and the Drum Grid pane which displays your drum tracks (any track assigned to a drum map) and where you can edit your drum tracks.

See:

The basics

Drum maps are virtual MIDI ports that you create and edit. Drum maps give you total control over all the MIDI drum sounds you have access to either in the form of software (soft synths) or hardware (external MIDI sound modules).

Drum maps in SONAR allow you to do the following:

- Re-map note events, for example, map a General MIDI drum kit to a non-General MIDI drum kit.
- Create a custom drum kit from several MIDI devices (soft synths, hardware synths) and play it from a single MIDI track if desired.
- Use the Drum Grid Editor to show only the drum sounds you want to see.
- Sort drum sounds to suit your needs.
- Mute and solo individual drum sounds

See:

Creating and editing a drum map

You can create a drum map by either modifying an existing drum map or by creating a new drum map.

See:

The Drum Map Manager

In the **Drum Map Manager** dialog box you can create and save drum maps for use with hardware or software synths and samplers. You can customize drum maps to select specific sounds on any of your available sound sources.

To open the Drum Map Manager dialog

You can open the Drum Map manager in one of the following ways:

- Go to **Edit > Preferences > MIDI - Drum Map Manager**.

  Or

- Click on the **Output** field of your MIDI drum track and select **Drum Map Manager**

Figure 241. *The Drum Map Manager section*
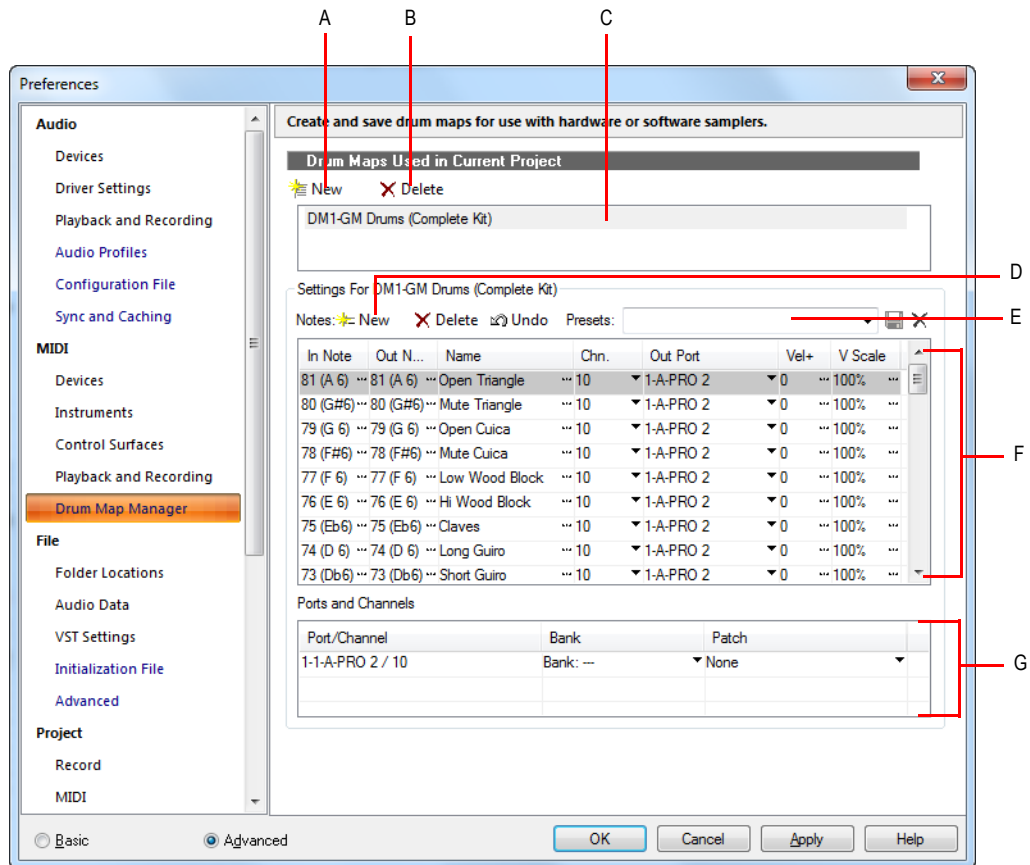
A. New Drum Map button B. Delete Drum Map button C. Current Drum Map D. Click to create a new row
E. Preset list F. Rows G. Port/Channel pairs

Drum maps used in current project

This field displays all the currently available drum maps. click the **New** button ✳ New to create a new drum map and **Delete** ✕ Delete to delete a drum map. Select a drum map to display the drum mappings in the Drum Map Manager. All drum maps in this field are saved with the current project.

Presets

Presets can be used to populate the fields in the Drum Map Manager. This field is also used to save new drum maps by entering a name in the field and clicking the **Save** button.

Settings

The **Settings** section is where you map the following for each **In Note** (source):

• **In Note.**   The source MIDI note value.

• **Out Note.**   The MIDI note value that plays on the destination sound source.

• **Name.**   The user-defined name for the row.

• **Chn.**   The channel on which the note is transmitted.

• **Out Port.**   The hardware output port or software virtual output port to which you are sending the note.

• **Vel+.**   Apply a velocity offset setting to an individual mapped pitch.

• **V Scale.**   The V Scale value sets a level of compression or expansion. A value below 100% is compression. A value above 100% is expansion. The Vel+ setting allows for gain make-up.

Ports and channels

This section lists each unique **Port** and **Channel** pairing. This allows you to make quick global changes that **Port** and **Channel** pairing's **Bank** and **Patch** settings.

See:

Working in the Drum Map Manager

The following table lists several ways of editing settings in the Drum Map Manager.

To do this	Do this
Audition a row	Select the row and press SHIFT+SPACEBAR
Sort rows	Drag and drop a row to a new location
Select multiple rows	Click a row, hold down the CTRL key while selecting additional rows

Table 147.

To do this	Do this
Change the Output Port for all rows with the same Channel/Port	Press CTRL+SHIFT while changing the port.
Undo an edit	Press the **Undo** button ✍ Undo

Table 147.

See:

The Map Properties dialog

The **Map Properties** dialog box lets you change all the settings for an individual mapped note in your drum map. The settings in the **Map Properties** dialog box are the same as a single row in the Drum Map Manager. If you want to edit more than one drum note pitch mapping, click the **Map Mgr** button to open the **Drum Map Manager** dialog box.

Figure 242. *The Map Properties dialog*
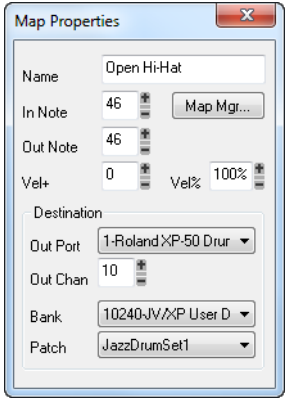
To open the Map Properties dialog

- Double-click on a row in the Note Map pane.

   Or

- Right-click on a row in the Note Map pane and select **Map Properties** from the menu that appears.

See:

Saving a drum map

Use the following procedure to save a new or modified drum map:

1. In the Drum Map Manager, enter a name for the new drum map in the **Preset** field.

2. Click the **Save** button ▦.

Drum map presets are saved and available for all projects. Drum maps are saved on a per-project basis.

Using drum maps

The following topics cover using drum-mapped tracks, including how to display drum tracks in the Drum Grid pane and how to edit note velocities.

See:

Assigning a MIDI track to a drum map

Use the following procedure to assign a MIDI track to a drum map:

To assign a MIDI track to a drum map

1. Display the Track view if it is minimized.
2. In the track you want to assign to a drum map, click the **Output** drop-down and select a drum map from the options in the menu that appears.

See:

Opening a drum map

Use the following procedure to open a drum map in the Drum pane:

To open a drum map

1. In the Track view, assign the drum map you want to open to a MIDI track. See
2. Select the MIDI track you just assigned the drum map to and select **Views > Piano Roll**.

To open all tracks assigned to a drum map

1. Select a single track assigned to the drum map.
2. Hold down CTRL+SHIFT while selecting **Views > Piano Roll**.

See:

"Assigning a MIDI track to a drum map" on page 765

"Displaying tracks in the Drum Grid pane" on page 766

"Velocity tails" on page 767

"Editing note velocities" on page 767

"To change the order of mapped notes in the Drum Map pane" on page 770

Displaying tracks in the Drum Grid pane

Use the following procedure to display a drum track or tracks in the Drum Grid pane.

To display tracks in the Drum Grid pane

1. Create a drum map if you have not already done so. See "Creating and editing a drum map" on page 760.
2. Change the focus to the Track view.
3. In the track(s) you want to view in the Drum Grid Editor, select a drum map from the **Output** drop-down menu.
4. Select the tracks you want to view in the Drum Grid Editor and select **Views > Piano Roll**.

The Piano Roll view appears with the selected track's data appearing in the Drum Grid Editor.

See:

"Assigning a MIDI track to a drum map" on page 765

"Opening a drum map" on page 765

"Velocity tails" on page 767

"Editing note velocities" on page 767

"To change the order of mapped notes in the Drum Map pane" on page 770

Velocity tails

In the Drum Grid pane, you have the option of showing the velocity of each note as a series of bars. The higher the bars, the higher the velocity value.

Figure 243. *Velocity tails can be shown or hidden*

A. *Notes with velocity showing* **B.** *Notes without velocity showing*

To display velocity tails in the Drum Grid pane

Click the Piano Roll view **Notes** menu and choose **Show Velocity Tails**.

See:

Editing note velocities

In the Drum Map Editor you can display note velocities as a series of horizontal bars behind the note. To show or hide velocity tails, click the Piano Roll view **Notes** menu and choose **Show Velocity Tails**.

To edit a note velocity in the Drum Grid pane

1. Select the Smart tool ⭐ in the Control Bar.
2. Assign the track's Edit Filter control to **Notes**.
3. Move your cursor over the velocity tail you want to edit until the cursor changes to look like this:

   ✏️
4. Click and drag the velocity tail. Drag it up to increase the velocity. Drag it down to decrease the velocity.

To edit multiple note velocities in the Drum Grid editor

When you edit multiple notes that have different initial velocities, the velocities are adjusted on a relative basis, so if you reduce a velocity by 50%, all other selected notes have their velocities reduced by the same percentage. For example: you select three notes. The first has a velocity of 100, the second a velocity of 50, and the third a velocity of 30. You click and drag the velocity of the first note down to 50. The second note's velocity changes from 50 to 25 and the third note's velocity changes from 30 to 15.

1. Select the Smart tool ⭐ in the Control Bar.
2. Assign the track's Edit Filter control to **Notes**.
3. Select the notes you want to change the velocity of.
4. Move your cursor over one of the selected notes.
5. Click and drag the velocity tail. Drag it up to increase the velocity. Drag it down to decrease the velocity.

See:

Previewing a mapped sound

Use the following procedure to hear the drum sound you have mapped a note to.

To preview a mapped sound

• In the Note Map pane, click on the name of the sound you want to hear.

See:

The Note Map pane

The Note Map pane displays the current drum map. In the Note Map pane each row represents a pitch. The Note In pitch is the recorded pitch. You map the recorded pitch to whatever pitch you want using the Note Out pitch setting. You can also change the name of the mapped note and mute or solo the mapped note.

Pedal Hi-Hat	44	44	M	S
High Floor Tom	43	43	M	S
Closed Hi-Hat	42	42	M	S
Low Floor Tom	41	41	M	S
Electric Snare	40	40	M	S
Hand Clap	39	37	M	S
Acoustic Snare	38	38	M	S
Side Stick	37	37	M	S
Bass Drum 1	36	36	M	S
Acoustic Bass Drum	35	35	M	S

See:

Changing mapped-note settings

You can change the following settings in the Note Map pane:

- Mapped-note name
- Note Out
- Mute
- Solo

To change the Name setting

The name of a mapped note in the Note Map pane is a user-assigned variable. Make it descriptive for easy reference. To change the Name setting, use the following procedure:

1. In the Note Map pane, double-click on the appropriate row.

The **Map Properties** dialog box appears.

2. In the **Map Properties** dialog box, enter a new name in the **Name** field and press the ENTER key.

To change the Note Out setting

The Note Out setting is the actual note you hear when the Note In value is played. To change the Note Out setting, use the following procedure:

1. In the Note Map pane, double-click on the appropriate row.

    The **Map Properties** dialog box appears.

2. In the **Map Properties** dialog box, enter a new value in the **Note Out** field and press the ENTER key, or use the **+/-** buttons to change the value and press the ENTER key.

To change multiple Note Out settings

1. Open the Drum Map Manager.

2. In the Drum Map Manager, select a contiguous range of rows by selecting the first in the range, and holding down the SHIFT key while selecting the last in the range.

    Or

    Select a non-contiguous range by selecting one row and holding down the CTRL key while selecting additional rows.

3. Hold down both the CTRL and SHIFT keys while selecting a new Output in the Output column.

To mute or solo a mapped note

The Mute and Solo controls in the Note Map pane allow you to mute or solo an individual mapped note. To mute or solo a mapped note, use the following procedure:

*   In the Note Map pane, click the **Mute** M or **Solo** S button in the appropriate row.

    Or

*   Right-click on the row you want to mute or solo and select **Mute** or **Solo** from the menu that appears.

To display the Note In and Note Out values by their pitch name

You have the option of showing the **Note In** and **Note Out** values by their pitch names. To do so, use the following procedure:

*   Right-click on any row in the Note Map pane and select the **Display Pitch Names** command from the menu that appears.

To change the order of mapped notes in the Drum Map pane

Use the following procedure to change the order of mapped notes in the Note Map pane.

1. Move your cursor over the row you want to move in the Note Map pane.

2. When your cursor changes to look like this ↕, click and drag the row to the place you want it to be and release the mouse button.

The Drum Grid pane

The Drum Grid pane is where you edit your drum tracks. The Drum Grid pane is the top pane in the Piano Roll view and opens automatically when you open a MIDI drum track.

The Drum Grid pane is for MIDI drum tracks what the Note pane is for other MIDI tracks. In the Drum Grid pane you can add, delete and edit notes and note properties. You can edit controllers in this pane if you hide the Controller pane. You can customize the number of grid lines in the Drum Grid pane and choose whether or not to show note velocity "tails."

See:

Grid lines

The Drum Grid pane is divided into a time grid. You can set the resolution of the grid lines from 1/4 note to 1/64 note, or to follow the current snap grid setting.

To turn on grid lines in the Drum Map pane

Click the Piano Roll view **View** menu and choose **Show Vertical Gridlines**.

To set the Drum Map pane grid line resolution

Click the Piano Roll view **View** menu, point to **Grid Resolution** and choose the desired resolution on the submenu.

See:

Drum maps and the Drum Grid pane
The Drum Grid pane

Editing audio

The Track view lets you edit and arrange audio clips. You can perform basic tasks such as cut, copy, paste, and move; apply simple audio processing such as gain change, fades, and equalization; and use sophisticated audio effects such as stereo chorus and reverb. The Track view lets you see your audio clips on a timeline, arranged by track, to help you visualize the organization of your project's audio data.

Most audio processing commands and audio effects can be used from the Event List view as well, by selecting one or more audio clips, then choosing the desired command from the **Process > Apply Effect** menu. Plug-in effects can also be applied to audio data non-destructively, in real time, from the Track view, Track Inspector and Console view effects bins. For more information, see "Mixing" on page 829.

See:

Digital audio fundamentals

Digital audio is a numeric representation of sound; it is sound stored as numbers. In order to understand what the numbers mean, you need to start with the basic principles of **acoustics**, the science of sound.

See:

Basic acoustics

Sound is produced when molecules in the air are disturbed by some type of motion produced by a vibrating object. This object, which might be a guitar string, human vocal cord, or a garbage can, is set into motion because energy is applied to it. The guitar string is struck by a pick or finger, while the garbage can is hit perhaps by a hammer, but the basic result is the same: they both begin to vibrate. The rate and amount of vibration is critical to our perception of the sound. If it is not fast enough or strong enough, we won't hear it. But if the vibration occurs at least twenty times a second and the molecules in the air are moved enough, then we will hear sound.

See:

Example—a guitar string

To understand the process better, let's take a closer look at a guitar string.

When a finger picks a guitar string, the entire string starts to move back and forth at a certain rate. This rate is called the **frequency** of the vibration. Because a single back and forth motion is called a **cycle**, we use a measure of frequency called **cycles per second**, or **cps**. This measure is also known as **Hertz**, abbreviated **Hz**. Often the frequency of vibration of an object is very fast, so we can also express the frequency in thousands of cycles per second, or **kilohertz** (abbreviated **kHz**)
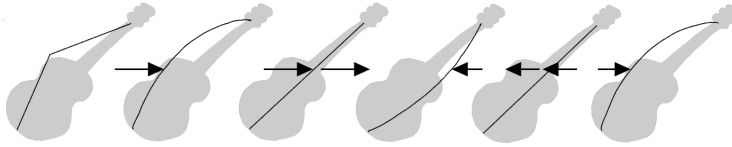
The actual distance the string moves is called its **displacement**. This is proportional to how hard the string is plucked. A greater displacement results in a louder sound.

The displacement of the string changes as the string vibrates, as shown here:
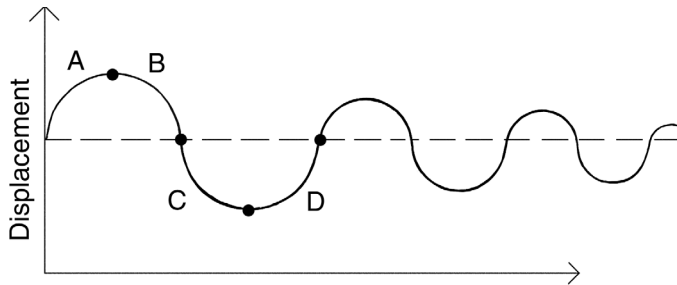
The segment marked "A" represents the string as it is pulled back by the pick; "B" shows it moving back towards its resting point, "C" represents the string moving through the resting point and onward to its outer limit; then "D" has it moving back towards the point of rest. This pattern repeats continuously until the friction of the molecules in the air gradually slows the string to a stop. As the string vibrates, it causes the molecules of air around it to vibrate as well. The vibrations are passed along through the air as **sound waves**. When the vibrations enter your ear, they make your eardrum vibrate, and you hear a sound. Likewise, if the vibrating air hits a microphone, it causes the microphone to vibrate and send out electrical signals.

In order for us humans to hear the sound, the frequency of the vibration must be at least 20 Hz. The highest frequency sound we can hear is theoretically 20 kHz, but, in reality, it's probably closer to 15 or 17 kHz. Other animals, and microphones, have different hearing ranges.

If the simple back-and-forth motion of the string was the only phenomenon involved in creating a sound, then all stringed instruments would probably sound much the same. We know this is not true, of course; the laws of physics are not quite so simple. In fact, the string vibrates not only at its entire length, but at one-half its length, one-third, one-fourth, one-fifth, and so on. These additional vibrations (**overtones**) occur at a rate faster than the rate of the original vibration (the **fundamental frequency**), but are usually weaker in strength. Our ear doesn't hear each frequency of vibration individually, however. If it if did, we would hear a multinote chord every time a single string were played. Rather, all these vibrations are added together to form a complex or composite sound that our ear perceives as a single tone.

Fundamental
frequency (1f)
100% amplitude

2x fundamental (2f)
50% amplitude

3x fundamental (3f)
33% amplitude

4x fundamental (4f)
25% amplitude

5x fundamental (5f)
20% amplitude
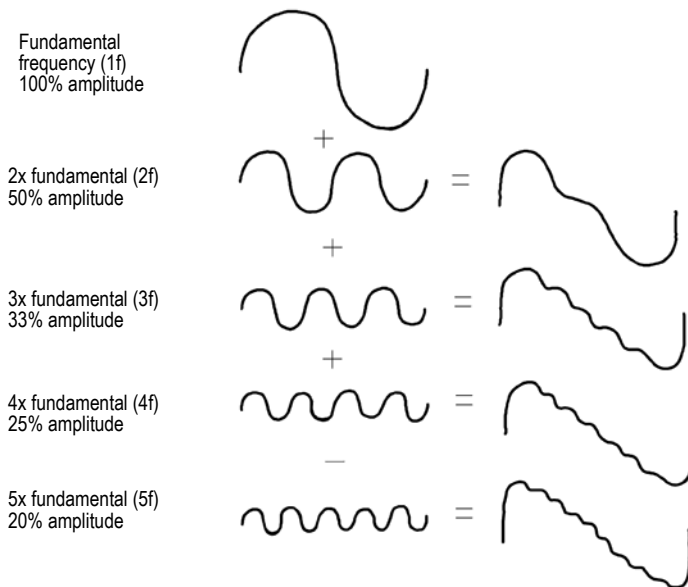
This composite waveform still doesn't account for the uniqueness of the sound of different instruments. For example, stringed instruments usually have a resonator. In the case of the guitar, the resonator is the big block of hollow wood to which the string is attached (the guitar body). This has a major impact on the sound we perceive when a guitar is played because it enhances or amplifies some of the vibrations produced by the string and diminishes or attenuates others. The ultimate effect of all the vibrations occurring simultaneously, being altered by the resonator, adds up to the sound we know as guitar.

See:

Digital audio fundamentals

Waveforms

A sound wave can be represented in many different ways: as a mathematical formula, as a series of numbers, or graphically as a **waveform**. A waveform displays the size, or **amplitude**, of the vibration as a function of time. For example, the waveform of the sound of the plucked guitar string might look like this:
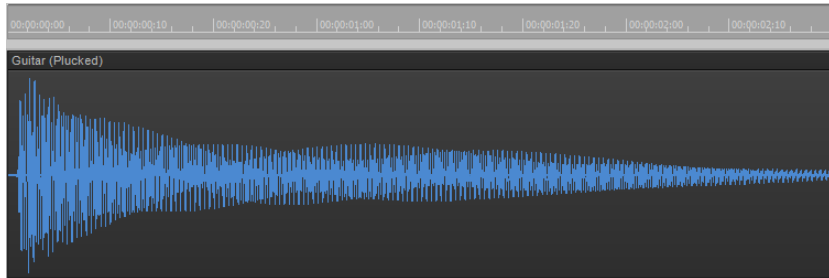
The waveform of a trumpet blast might look like this:
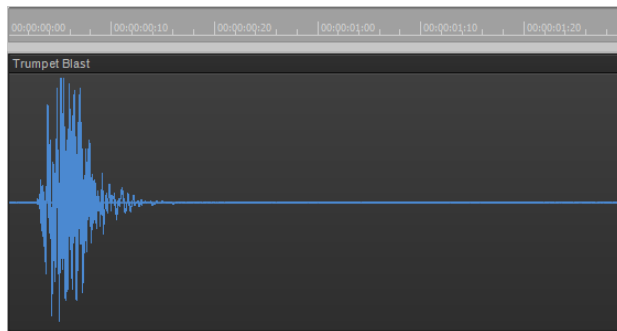
And the waveform of a spoken word might look like this:
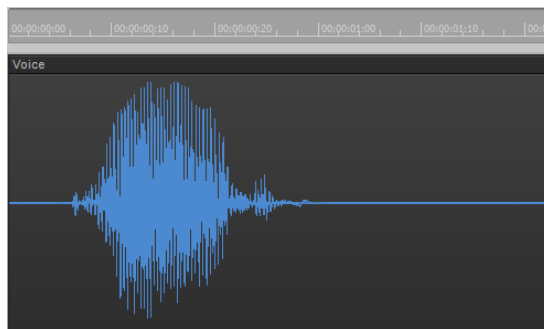
The three waveforms shown above are quite different from one another, both in appearance and sound. Each has its own characteristic shape, or envelope, and each has its own complex combination of frequency components, which can change across the duration of the sound.

The center line of a waveform is the zero line; it corresponds to the rest position (displacement of 0) of the original vibrating object. (A waveform for perfect silence would be a horizontal line at zero.) Back and forth motions of the vibrating object translate to upward (positive) and downward (negative) excursions of waveform amplitude. For example, a close-up of a portion of the guitar waveform might look like this:
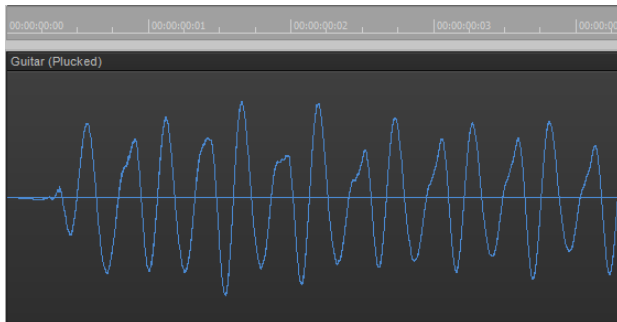
The waveform crosses the zero line twice during each complete vibration. These **zero-crossings** are important in digital audio processing; they are good places to cut waveforms apart and splice them together. If waveforms are cut or spliced at other locations, clicks and pops can occur. The maximum amplitude of the waveform in each vibration is also important: it determines the strength of the vibration, and thus the loudness of the sound.

See:

Recording a sound

To record digital audio, your computer monitors the electrical signal generated by a microphone (or some other electroacoustical device). Because the signal is caused by a sound, the signal strength varies in direct proportion to the sound's waveform. The computer measures and saves the strength of the electrical signal from the microphone, thus recording the waveform.

There are two important aspects of this measuring process. First is the **sampling rate**, the rate at which the computer saves measurements of the signal strength. It is a known fact of physics that you must measure, or **sample**, the signal at a rate at least twice that of the highest frequency you want to capture. For example, suppose you want to record a moderately high note on a violin—say the A whose fundamental frequency is 440 Hz and all overtones up to five times the fundamental. The highest frequency you want to capture is 2,200 Hz, so you need to measure the electrical signal from the microphone at least 4,400 times per second.

Since humans can hear frequencies well above 10 kHz, most sound cards and digital recording systems are capable of sampling at much higher rates than that. Typical sampling rates used by modern musicians and audio engineers are 22 kHz, 44.1 kHz, and 48 kHz. The 44.1 kHz rate is called **CD-quality**, since it is the rate used by audio compact discs.

The other important aspect of the measuring process is the **sampling resolution**. The sampling resolution determines how accurately the amplitude of each sample is measured. At present, the music industry has settled on a system that provides 65,536 different values to assign to the amplitude of a waveform at any given instant. Thus, each sample saved by your computer requires 2 bytes (16 bits) to store, since it takes 2 bytes to store a number from –32,768 to 32,767. The scaling of the electrical input signal level to amplitude value is determined by your audio hardware and by the position of your input level control.

What if the amplitude of the sampled signal gets too high, such that a 16-bit number is not large enough to represent it? What typically happens is that the signal is **clipped**, cut off at the maximum value.

Here is what a clipped waveform might look like:
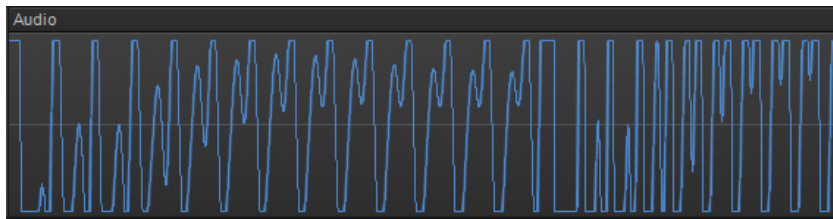
Clipping is not usually desirable and may have unpleasant audible effects. Sudden irregularities in the waveform of any type can cause clicks, pops, and distortion of the original sound.

See:

The decibel scale

In acoustics, the decibel (dB) scale is a scale for measuring the relative loudness of two sounds. For example, environmental noise is often measured as follows:

```
L = 20 log (p/p0)
```

where L is the sound pressure level (in dB), p is the sound pressure amplitude, and p0 is a reference amplitude of 20 micropascals (less than one billionth of atmospheric pressure). On this scale, a barely audible sound ($p = p0$) has a sound pressure level of 0 dB, normal conversation ($p = 1,000*p0$) is at a level of around 60 dB, and a jet engine at close range ($p = 1,000,000*p0$) is at a level of around 120 dB.

Similar decibel scales are used in other branches of science and engineering to measure electrical power levels and other signal levels, always with respect to some reference level.

In SONAR, decibels are used in several places:

- To indicate volume levels of audio tracks in the Track view, Track Inspector and Console view
- To indicate the effects of filters and equalizers

The reference level (0 dB) usually corresponds to the current loudness of the sound. A positive change in decibels makes the sound louder; a negative change makes the sound quieter.

See:

"Digital audio fundamentals" on page 774

Audio clips

If you have read "Digital audio fundamentals" on page 774, you should have a good idea of what is contained in a SONAR audio clip. An audio clip contains a long series of numbers, or samples, representing the fluctuating amplitude of a waveform. Audio clips are typically quite large, hundreds of kilobytes to many megabytes in size. By comparison, a MIDI event takes only a few bytes to store.

The Track view lets you see your audio waveforms in great detail; you can zoom in until you see the individual samples.

You should also now be aware of some things to watch out for when editing your audio data. First, if you cut audio clips apart or splice them together, you should do so at zero-crossings in the waveform (places where the amplitude is zero), in order to avoid sudden changes in amplitude that may cause clicks and pops. Second, you should beware of clipping. Clipping of the audio waveform can occur if you record a signal at too high a record level, or if you apply audio processing or effects that increase the waveform amplitude too much. If you accidentally cause the waveform to clip, you should undo the command and try again with different parameters.

Clipping can also occur in other situations, for example, if you try to play or mix several loud audio tracks together, the aggregate signal strength may at times exceed the clipping limit, and the output signal will be distorted. To correct the problem, you can create a volume envelope to reduce the level in loud audio clips or reduce the track volume in the Console or Track views.

See:

"Digital audio fundamentals" on page 774

Managing audio data

Because of the great size of audio data, SONAR uses an intelligent scheme for storing audio clips on disk to conserve disk space and minimize the time it takes to load and save data. Audio data is not stored directly in your project file, but rather in separate files in a special directory. For more information, see "Audio file management" on page 1171.

You can export your project in MP3, WMA, or Wave format. You can also convert your project's MIDI data to audio and export it to any of the above formats. For more information, see "Preparing audio for distribution" on page 926.

Digital audio fundamentals

See:

Basic audio editing

The Track view lets you perform basic editing tasks such as cut, copy, paste, delete, drag-and-drop, split, and bounce. You can drag fade-ins and fade-outs onto a clip using your mouse or you can set complex envelopes on both clips and tracks. You can use envelopes to change settings for gain (volume), pan, mute, bus send level and bus send pan. The Scrub tool lets you audition portions of audio by dragging the mouse.

Use the Select tool to make selections.

Here is a summary of the ways in which you can select audio clips:

To do this	Do this
Select a single clip	Click the bottom half of the clip
Select several clips at once	Drag a rectangle around them
Select part of a clip	Drag across the top half of the clip
Add clips to the selection	Press SHIFT and either click the clips or drag a rectangle around the clips
Add or remove clips from the selection	Press CTRL and either click the clips or drag a rectangle around the clips
Add or remove clips in a track from the selection	Press CTRL and click the track number
Select clips in a time range	Drag in the Time Ruler
Select clips between two markers	Click between the markers
Remove all selections	Click in an empty area outside of any clip

Table 148.

See:

Editing clip properties

Audio clips have several properties that you can change:

Property	Description
Name	The name of a clip is used in the Track view and Event List view. You can assign any name to help you remember the contents of the clip.
Start	The start determines when the sample is played.
Length	The length indicates the size of the clip.
Snap Offset	A value that represents the number of samples into the clip at which the clip snaps to.
Display Color	The clip's color in the Track view.

Table 149.

To change an audio clip's name

1. Select the audio clip.

2. In the Clip Inspector, type a new name in the **Name** box.

The new clip name appears in the upper left corner of the clip.

To change a clip's start

1. Select the audio clip.

2. In the Clip Inspector, enter a new starting time in the **Start** field.

The Track view displays the clip at the new starting time.

Moving, copying, pasting and deleting audio clips

Clips can be cut, copied, pasted, and deleted with **Edit** menu commands, or moved and copied with drag-and-drop techniques. For more information, see "Arranging and editing" on page 313.

Audio scaling

Audio scaling is the increase or decrease in the size (scale) of the waveform in a track or bus. Audio scaling allows you to make detailed edits by zooming in on the parts of the waveform closest to the zero crossing (silence) while preserving the track or bus size. By showing just the quietest parts of a clip, you can make very precise edits. You can also zoom out on the waveform.

You can change the audio scale using keyboard shortcuts or the Audio Scale Ruler.

The Audio Scale Ruler is located in the vertical splitter bar between the Clips pane and the Track pane.
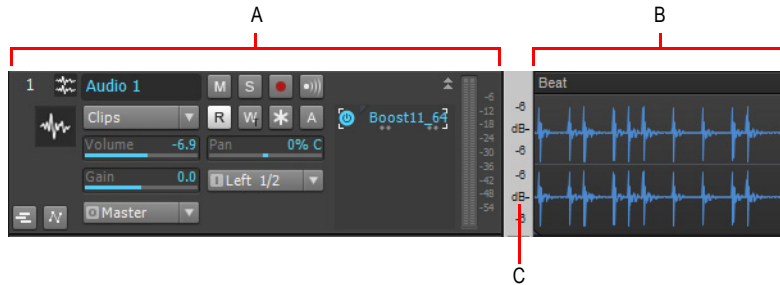
A. *Track pane* **B.** *Clips pane* **C.** *Audio Scale Ruler*

Note: *The Audio Scale Ruler does not appear on multi-layered tracks.*

There are three display options in the Audio Scale Ruler:

- **Percentage.** Shows audio scaling by percentage. For example, if the highest percentage in the Audio Scale Ruler reads 2.0%, then only the parts of the waveform which are within 2% of the zero crossing appear in the clip.

- **dB.** Shows audio scaling by dB. For example, if the highest dB in the Audio Scaling Ruler reads -36, then only the parts of the waveform which are 36 dB below 0 dB appear in the clip.

- **Zoom Factor.** Shows audio scaling by a factor. For example, if the Zoom Factor reads 10, then the waveform is zoomed in by a factor of 10.

Note: *The Audio Scale Ruler display reflects the type of audio clip directly beneath it. If it is a stereo waveform, the Audio Scale Ruler appears in stereo (one for each channel). If it is a mono clip it appears in mono. Also, the Audio Scale Ruler only displays numbers when it is above a certain height. If you cannot see the Audio Scale Ruler, increase the size of your track or bus.*

To change the Audio Scale Display option

1. Right-click on the Audio Scale Ruler in any track.

   A menu appears. The current display option is checked.

2. Select an option from the menu.

To scale all audio tracks together

To scale all audio tracks together, follow the instructions in the following table.

To do this	Do this
Increase the scale for all tracks	Press ALT+UP ARROW. Or Hold down the CTRL key and click the **Vertical Zoom In** button. When you hold down the CTRL key and position your cursor over the **Vertical Zoom In** button, your cursor looks like this:
Decrease the scale for all tracks	Press ALT+DOWN ARROW. Or Hold down the CTRL key and click the **Vertical Zoom Out** button. When you hold down the CTRL key and position your cursor over the **Vertical Zoom Out** button, your cursor looks like this:
Increase/Decrease the scale for all tracks using your mouse	Hold down the CTRL key, click the **Vertical Zoom** fader and drag the fader up or down. When you hold down the CTRL key and position your cursor over the **Vertical Zoom** fader, your cursor looks like this:
Increase to maximum scale	Hold down the CTRL and SHIFT keys and click the **Vertical Zoom In** button. When you hold down the SHIFT and CTRL keys and position your cursor over the **Vertical Zoom In** button, your cursor looks like this:
Decrease to minimum scale	Hold down the CTRL and SHIFT keys and click the **Vertical Zoom Out** button. When you hold down the SHIFT and CTRL keys and position your cursor over the **Vertical Zoom Out** button, your cursor looks like this:

Table 150.

To scale a single track or bus

To scale a single audio track, follow the instructions in the following table.

To do this	Do this
Increase/decrease the scale of individual stereo or mono tracks	There are several ways to increase or decrease the size of an individual track's or bus's waveform: • Press CTRL+ALT+UP/DOWN ARROW keys • Click and drag vertically in the track's Audio Scale Ruler. When you click and drag in the Audio Scale ruler of a track, your cursor looks like this: • Select the Zoom tool, hold the SHIFT key and drag around the clip you want to zoom in on.
Restore a track to minimum scale	Double-click in the track's Audio Scale Ruler.

Table 151.

To undo audio scaling

• Press ALT+Z.

To scale a single track or bus using the Audio Scale ruler

• In the track in which you want to change the audio scale, click in the Audio Scale Ruler and drag. Drag up to increase the audio scaling. Drag down to decrease the audio scaling.

To show or hide the Audio Scale ruler

Click the Track view **View** menu, point to **Display** and choose **Show Audio Scale**.

Splitting audio clips

You can split long audio clips into shorter ones. This lets you extract and rearrange individual sounds, adjust timing and alignment, and apply effects selectively. Audio clips can be split using the Split tool in the Control Bar or with the **Split** command.

To split clips with the Split tool

1. If necessary, zoom-in in the Track view and use the Scrub tool (hold down J) to determine where you want to make a split.
2. If you want the split to be made on a note or measure boundary, a marker, specify the desired snap settings in the Control Bar's Snap module.
3. Select the Split tool ✄ in the Control Bar.
4. Click once to make a single split, or to make two splits, click where you want the first split, drag within a clip and release to make a second split.

To split clips with the Split command

1. Select the clip you want to split.
2. Right-click the selected clip and select **Split** from the menu.

    The **Split Clips** dialog box appears.
3. In the **Split Clips** dialog box, select from the following options.

Option	Description
Split At Time	Specify the time at which you want to split the clip and the time format.
Split Repeatedly	Specify the first measure at which you want to split the clip in the **Starting At Measure** field and the intervals at which you want to split the clip in the **And Again Every** field.
Split At Each Marker	Creates a split in the clip at every marker.
Split When Silent For At Least	Creates a split after each period of silence which exceeds the number of measures specified.

Table 152.

SONAR splits the audio clip according to your specifications. Each new clip has the same name as the original clip.

> **Note:** *A shortcut to split a selected clip is to move the Now time to where you want to split it, and press S on your computer keyboard.*

Bouncing to clips

Individual audio clips in the same track can be combined into a single clip with the **Bounce to Clip(s)** command.

> **Note 1:** *Like any clips, slip-edited clips can be combined with other clips using the **Bounce to Clip(s)** command. When a slip-edited clip is combined with another clip, any slip-edited data (audio clips or MIDI events that are cropped from view) is overwritten.*

> **Note 2:** *You control the bit depth of all rendering operations (bouncing, freezing, applying effects) in **Edit > Preferences > File - Audio Data**, in the **Render Bit Depth** field. The default value of **32** is the best for most situations. See "Bit depths for rendering audio" on page 1187 for more information.*

To bounce to clips

1. Select the clips to be combined in the Track view.

2. Click the Track view **Clips** menu and choose **Bounce to Clip(s)**.

The clips are combined into a single clip. Empty space between clips is filled with silence in the new clip. All clip automation from the source clips is applied to the new clip.

Bouncing AudioSnap and stretched clips

SONAR includes a command to select all AudioSnap and stretched clips. The primary use of this command is to quickly select all stretched audio clips before you use the Track view **Clips > Bounce to Clip(s)** command.

There are two common reasons why you may want to bounce AudioSnap and stretched clips:

• To free up CPU resources during playback.

• In order to save a bundle (.cwb) file, which does not support AudioSnap data.

To select all AudioSnap and stretched clips

On the **Edit** menu, point to **Select** and click **All AudioSnap/SlipStretched**.

To bounce multiple audio clips to a new track

1. Select the clips to be combined in the Track view.
2. Click the Track view **Tracks** menu and choose **Bounce to Track(s)**.

    The **Bounce to Track(s)** dialog box appears.
3. Select the track you want to bounce to in the **Destination** field.
4. Select other options in the **Mixdown Audio**/**Bounce to Track(s)** dialog box and click **OK**.

The clips are combined into a single clip on the destination track. Empty space between clips is filled with silence in the new clip.

Scrubbing

You can use the Scrub tool to locate or audition a particular sound or passage as you drag the mouse. You can scrub a single audio track by dragging over that track or all tracks by dragging in the Time Ruler.

Note: *The Scrub tool is not affected by current Mute and Solo settings of a track.*

To audition audio with the Scrub tool

1. Hold down the J key to activate the Scrub tool.
2. Click and drag the pointer over an audio track.

Note: *To bypass the current volume and pan settings when scrubbing, hold down the ALT key. This will force scrubbing to play back at unity gain and centered.*

Tip: *To hear the clips in all audio tracks, drag with the Scrub tool in the horizontal ruler.*

Basic audio processing

Audio processing commands let you modify audio data according to some rule or algorithm. The rule can be as simple as reversing the audio data or boosting it by a certain factor, or as complex as performing a Fourier analysis and selectively amplifying or attenuating sounds at certain frequencies.

Audio processing commands can work on whole, partial and non-contiguous clips. For example, suppose you want to make certain words in a vocal passage softer. You can create a volume envelope and use it to lower the volume, non-destructively in just the section of the track containing those words. You could also use the **Process > Apply Effect > Gain** command to lower the volume destructively.

You should listen to the results of your work after each audio processing command. If you don't like what you hear, you can use **Edit > Undo** to restore your audio data to its previous state.

Many of the dialog boxes associated with SONAR's audio processing and effects commands have two important features: Audition and Presets.

The **Audition** button is used to audition the processed audio data. When you click **Audition**, SONAR processes the first few seconds of your data, then plays it repeatedly until you click **Stop**. This helps you to get an idea of whether the settings in the dialog box are producing the desired effect.

Presets are a way to store dialog box settings so that you can apply the exact same processing or effect again in the future. The following table tells you how to use presets in the effects dialog boxes.

To do this	Do this
Save the current settings as a preset	Enter a preset name and click the **Save** button 🖫
Use a preset	Select the preset from the drop-down list
Delete a preset	Select the preset, then click the **Delete** button ☒

Table 153.

Many audio processing and effects presets are supplied with SONAR.

See:

Using the Normalize and Gain commands

SONAR provides several commands to boost or cut the volume of audio data. The **Process > Apply Effect > Normalize** command, and the **Process > Apply Effect > Gain** commands are used to control the volume of selected audio data, in decibels. For more information about the decibel scale, see "The decibel scale" on page 779. The **Normalize** command "normalizes" the audio data: it boosts the volume until the maximum amplitude is reached somewhere in the data. By normalizing the data, you achieve the maximum possible volume without distortion or clipping. The **Gain** command lets you edit the volume, phase, and stereo interleave of selected audio data. You can also use this command to remove center material from a clip (good for removing vocals).

Like all the audio processing commands, these commands work by modifying the waveform data. You can achieve volume changes non-destructively using automation. For more information, see "Automation" on page 1001.

When increasing or decreasing the volume of audio clips, you should consider the following points:

- **Normalize** raises the noise floor; that is, while it increases the volume of the signal, it also boosts the noise it contains. (This is true when you raise the volume by other means, too.)

- Due to the nature and limitations of digital audio, the sum of all audio signals played together cannot exceed the waveform amplitude limit. Even though no individual clip is clipped, the combination may cause distortion.

If the selection contains any loud signals, **Normalize** may not seem to have any effect. This is because the volume increase is determined by the loudest audio in the selection. If an audio clip contains segments that are too quiet and others that are loud, you should probably split off the quiet segments into separate clips and then normalize those.

To normalize audio data

1. Select the audio data to be affected.

2. Choose **Process > Apply Effect > Normalize** from the menu.

   The **Normalize** dialog box appears.

3. Drag the **Normalize Level** slider to the approximate level you think is appropriate.

4. Click **OK** to process the selected audio.

Listen to the edited data. You can use the **Edit > Undo** command if you don't like the results, and then try a different setting in the **Normalize** dialog box.

To use the Gain command

1. Select the audio data you want to edit.

2. Choose **Process > Apply Effect > Gain** to open the **Gain** dialog box.

3. If you only want to change the overall volume of the selection, move the **New Left Channel-From Left** slider and the **New Right Channel-From Right** sliders by a similar amount. You can press the **Audition** button to try out your edits.

4. If you want to switch the two channels, reverse all four sliders from their present positions.

5. If you want to invert the left channel phase, click the **Invert left-channel phase** button button. If you want to invert the right-channel phase, click the **Invert right-channel phase** button in the **New Right Channel** section.

6. If you want to remove center material (usually where the vocal track is), set the N**ew Left Channel-From Left** slider and the **New Right Channel-From Right** slider to **100%**, and set the **New Left Channel-From Right** slider and the **New Right Channel-From Left** slider to **-100%** (negative 100%).

7. Press the **Audition** button if you want to audition your edits.

8. Click **OK** to process the selected audio.

Listen to the edited data in your mix. You can use the **Edit > Undo** command if you don't like the results, and then try different settings in the **Gain** dialog box.

Reversing audio data

By reversing audio data, you can make it play backwards. You may want to do this to obtain unusual sounds for special effects.

The **Reverse** command does not reverse the musical position of audio data. Use the **Process > Retrograde** command to invert the order of clips in time.

To reverse audio data

1. Select the audio data to be affected.

2. Choose **Process > Apply Effect > Reverse** from the menu.

SONAR reverses the selected audio data.

Advanced audio processing

SONAR provides a number of advanced audio processing commands for power users. Among these are commands to apply fades and crossfades.

See:

Removing silence

The **Remove Silence** command detects sections of audio that fall below a given loudness threshold, and replaces those sections with absolute silence. **Remove Silence** gives you the option of actually deleting the silent sections from the selected audio clips, splitting long audio clips into a greater number of shorter audio clips.

SONAR treats passages of absolute silence intelligently. It doesn't store stretches of silence on disk, and thereby conserves disk space. During a passage of absolute silence, SONAR sends no signal to the digital output port; this results in cleaner audio playback. **Remove Silence** is great for cleaning up your final audio mix, because it can mute all audio tracks in which the live performers were "laying out."

Using **Remove Silence** to split long audio clips into smaller ones opens a variety of creative possibilities.

The parameters in the **Remove Silence** dialog box are used to specify exactly what you mean by silence. More precisely, **Remove Silence** employs what is called a digital noise gate. The gate is a type of filter, it passes data through, or stops it from passing through, according to certain criteria. Parameters in the dialog box specify the conditions under which the gate is opened and under which it closes again.

The digital noise gate parameters are described in the following table.

Parameter	Meaning
Open Level (dB)	The loudness threshold for opening the noise gate. The gate officially opens when loudness rises above this level, although it can open earlier because of the **Attack Time**.
Close Level (dB)	The loudness threshold for closing the noise gate. The gate officially closes when loudness falls below this level, although it can stay open later because of the **Release Time**.

Table 154.

Parameter	Meaning
Attack Time (ms)	The value in this field is the interval of time after the volume reaches the **Open Level** for the gate to fully open. Opening the gate gradually produces a fade-in effect instead of an instant on-off sound.
Hold Time (ms)	The minimum time for the gate to stay open. **Hold Time** is useful when you've set high open and close levels, for example, when your source signal is very loud. Noise gates set this way tend to react to repeated percussive passages (such as drum rolls) by repeatedly opening and closing; this can sound unpleasant. By setting a hold time, you can ensure that the gate stays open long enough during percussive passages.
Release Time (ms)	The amount of time after the **Close Level** is reached that the gate actually closes. This lets the tail end of sounds pass through without being clipped.
Look Ahead (ms)	The value in this field causes the gate to open slightly before the sound reaches the **Open Level** so you don't lose the sound's attack.

Table 154.

To remove silence

1. Select the audio data to be affected.

2. Choose **Process > Apply Effect > Remove Silence** to open the **Remove Silence** dialog box.

Figure 244. *The Remove Silence dialog*
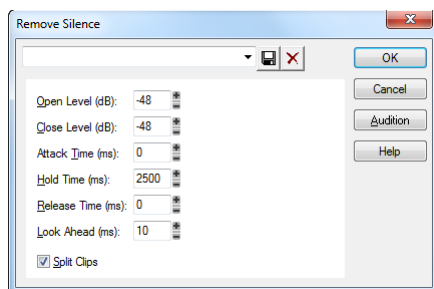
3. Set the digital noise gate parameters as described in the table above.

4. Check the **Split Clips** box to delete the silent sections of audio.

5. Click **OK** to remove silence from the selected data.

SONAR processes the audio as directed.

Removing DC offset

Some models of audio hardware produce a DC offset while recording, which is caused by electrical mismatches between the audio hardware and the input device or instrument. Although imperceptible, DC offset may cause problems in further stages of sound processing.

Note: *An easy way to spot DC offset is to zoom in to a silent section of your sound file. If the silent waveform matches the centerline in the waveform display, your file does not contain DC offset.*

To remove DC offset from existing audio

1. Select the audio data and choose **Process > Apply Effect > Remove DC Offset**. This launches the **Remove DC Offset** dialog box.
2. Choose from the following options, and click **OK**:
   - **DC Offset Threshold (dB).**   You can set a minimum dB threshold. If the analyzed DC offset is below this value, no removal takes place.
   - **Analyze Left Channel (dB) and Right Channel (dB).**   This field displays the DC offset separately for the left and right channels. Press the **Audition** button to update the display.
   - **Compute DC Offset from first 5 seconds only.**   To speed processing, select the Compute DC offset from first 5 seconds only check box. Only the first five seconds of a sound file will be analyzed when measuring the DC offset. The only time that five seconds is not sufficient is if a long fade-in or mute has been applied at the beginning of the file.

To remove DC offset during recording

1. Go to **Process > Apply Effect > Remove DC Offset** to open the **Remove DC Offset** dialog box.
2. In the **DC Offset Threshold (dB)** field, set a minimum dB threshold, and click **OK** to close the dialog box. If the analyzed DC offset is below this value, no removal takes place.
3. Go to **Edit > Preferences > Audio - Playback and Recording**, select the **Remove DC Offset During Recording** check box, and click **OK**.

This option filters out DC Offset according to the threshold value that you set in the **Remove DC Offset** dialog box.

Applying fades and crossfades offline

SONAR provides several commands for applying gradual volume changes to audio data. The first command, **Fade/Envelope**, lets you fade-in or fade-out, and lets you choose an envelope, a curve that governs the rate of the fade. The starting envelope can be linear (straight line), exponential, or inverse exponential. You can change the shape of the envelope before applying the fade.

The envelope in the **Fade/Envelope** dialog box is made of one or more connected line segments (the linear curves are a single segment, the exponential curves consist of nine segments each).

Although the endpoints of the curve are fixed, you can move the intermediate points, and create new intermediate points, to change the shape of the curve.

To do this	Do this
Move a point	Click and drag it to a new location
Insert a new point	Click on the line between existing points
Remove a point	Drag it onto the next point
Restart from the original curve	Click **Reset**

Table 155.

The second command, **Crossfade**, lets you create a smooth transition from one audio clip to another, by fading two overlapping audio clips simultaneously (one fades out, the other fades in). As with **Fade/Envelope**, you can choose from three different starting curves and change the shape of the curve.

To apply a fade to audio data

1. Select the audio data to be affected.
2. Choose **Process > Apply Effect > Fade/Envelope** to open the **Fade/Envelope** dialog box.
3. Select an envelope from the drop-down list.

Figure 245. *The **Fade/Envelope** dialog*
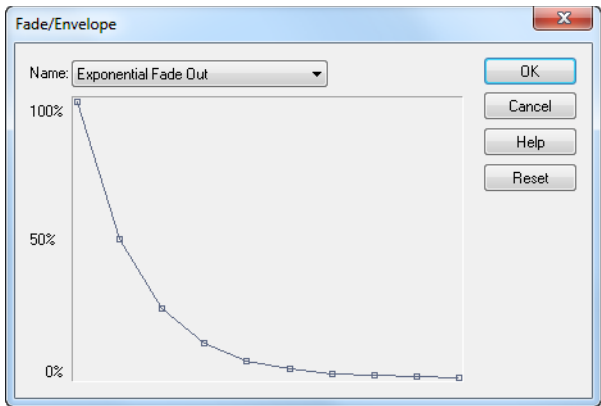
4. If desired, manipulate the curve as described in the table above.
5. Click **OK**.

SONAR applies the fade to the selected audio data.

To crossfade two overlapping clips

1. Select two overlapping audio clips. They need not be on the same track, but they must overlap in time for the command to have any effect.

2. Choose **Process > Apply Effect > Crossfade** to open the **Crossfade** dialog box.

3. Select an envelope from the drop-down list.

Figure 246. *The **Crossfade** dialog*
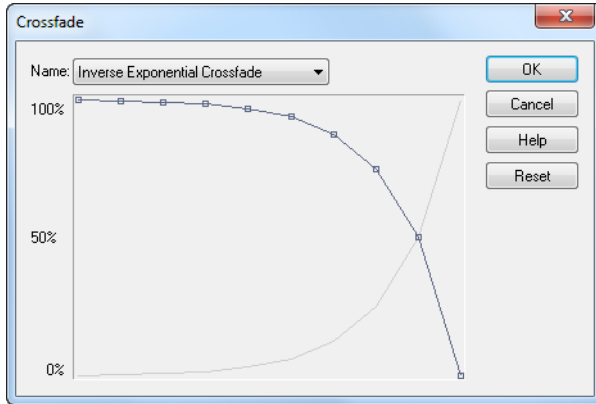
4. If desired, manipulate the curve as described in the table above. You can manipulate only the curve pertaining to the first of the two overlapping clips; the second curve is automatically adjusted so that the two curves constantly add up to 100%.

5. Click **OK**.

SONAR applies the two fades to the selected data.

See "Slip-editing (non-destructive editing)" on page 392 for information on non-destructive editing.

Advanced audio processing

Audio effects (audio plug-ins)

SONAR provides the ability to use plug-in audio effects. Some audio plug-in effects are supplied with SONAR. Others can be purchased from third-party software manufacturers, and appear automatically in SONAR's menus once they are installed on your system. If you need help when using a plug-in, press the F1 key on your computer keyboard to open the plug-in's help file. Please note that third-party plug-ins may not have a help file.

For a list of all included plug-ins, see "Included plug-ins" on page 1341.

> **Note:** *SONAR X2 Producer and Studio can use unlimited plug-ins. SONAR X2 Essential can use up to 64 plug-in effects and 16 software instruments.*

Using plug-in effects is similar to using the audio processing commands off-line. The overall procedure is as follows:

- In the Track view, Track Inspector or Console view, right-click the effects bin and select an effect from the pop-up menu.
- Set effect parameters (or select a preset).
- Listen to the track and adjust parameters based on what you hear.

You can add audio effects, like MIDI effects, to audio tracks in real time (during playback) in the Console and Track views. Unlike some of the audio processing discussed so far, using effects in real time is non-destructive. This means that the audio clip data itself is not modified, and no new audio files are created. For more information about real-time effects, see "Mixing" on page 829.

> **Note:** *Off-line effects may cause your audio clips to grow in length. For example, when you apply reverb, your clip may need to lengthen to accommodate the sound of the reverberation. The additional sound that an effect produces from a clip is called an effects tail.*

See:

Real-time audio effects processing

From the Console and Track views you can destructively apply audio effects for one or more tracks. When you are pleased with the audio effects you have patched into a track, you can apply the effects to the track. Destructively applying effects to a track saves resources, allowing you to include additional tracks and/or effects.

To apply audio effects

Add one or more audio effects to one or more tracks in either the Track view or the Console view, and then:

1. In the Track view, select the tracks you want to be affected.
2. Select **Process > Apply Effect > Audio Effects** from the menu.
3. If desired, select the option to delete the effects after applying them.
4. Click **OK**.

If you do not delete the effects from each track after applying them, they remain active.

Note: *Applying effects can be undone, but the effects are not then re-patched in the effects bin.*

See also:

"Destructive audio effects processing" on page 798

Destructive audio effects processing

You can also directly apply an audio effect to an audio clip. Right-click the clip and select an effect from the **Process Effect** menu. Set the effect parameters, and click **OK** to start processing.

See also:

"Real-time audio effects processing" on page 797

Software instruments

SONAR's Synth Rack (the **Synth** tab in the Browser) makes inserting a soft synth or ReWire instrument a one-step process, and makes viewing and configuring these instruments simple. In the Synth Rack you can insert and delete synths, create control knobs to control and/or automate parameters, scroll through patches and presets, mute, solo, freeze, and choose what track to display automation data on. You can easily control all of your soft synths from one view.

SONAR also supports *multi-port* synths, which allow you to use different synth tracks and effects for each patch or group of patches in a multi-timbral, multi-port synth.

SONAR seamlessly integrates VST synths. The VST Configuration Wizard runs automatically on startup, registering all your VST plug-ins. See "VST configuration" on page 895 for more information.

For more information, see:

Synth Rack

To open the Synth Rack, open the Browser and click the **Synth** button 🎹. The Synth Rack lets you view, insert, delete, and configure your soft synths. You can also mute, solo, and freeze any or all of them from this view. Each time you insert a soft synth into your project, a new row appears in the Synth Rack with the name of the soft synth and its current preset. You can select different presets from the view. You can insert as many copies of the same soft synth as you like; each new copy appears in a new row and has the same name, but has a higher number after the name (ReWire soft synths can only have one copy open). The new higher-numbered name also appears on the menus of synth track inputs and MIDI track outputs.

Figure 247. *Synth Rack Browser*
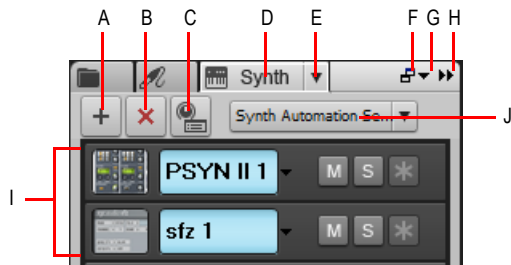
*A. Insert Synth B. Delete Synth C. Insert Synth Options D. Show Synth Rack Browser E. Synth Settings menu
F. Dock/undock G. Docking options H. Expand/collapse I. Instrument list J. Synth Automation menu*

Figure 248. *One Row in the Synth Rack*
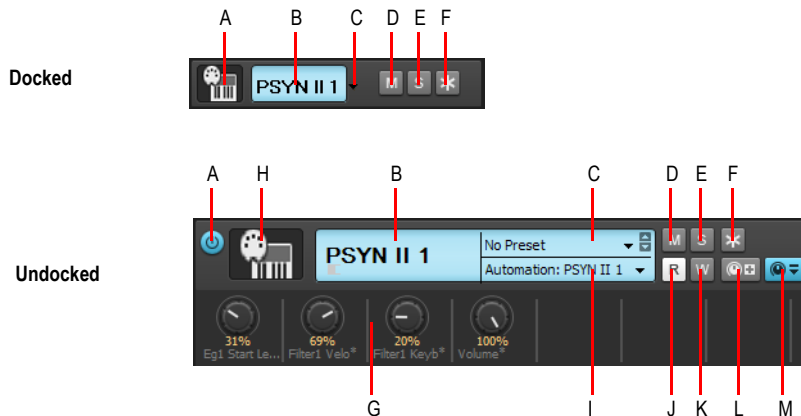
*A. Connect/disconnect (only when floating or docked at top or bottom) B. Synth name C. Preset picker D. Mute
E. Solo F. Freeze/unfreeze G. Automated knobs H. Synth icon I. Automation track J. Automation Read
K. Automation Write L. Assign Controls M. Show/Hide Assigned Controls*

For more information about the Synth Rack, see "Using the Synth Rack Browser" on page 581.

For step by step instructions, see:

Synth tracks

Using a soft synth introduces a third kind of track to your project alongside audio and MIDI tracks. A **synth track** functions much like an audio track, but with a few differences:

- A synth track's input is always a synth or a ReWire device, which means you cannot record audio or enable input monitoring from another source on that track.

- A synth track can display a waveform preview of its output. When you enable this display function by clicking the ▐▬ button on the track strip, the amplitude of a synth track's audio signal is graphed in real time as a waveform.

- Synth tracks are distinguished by the synth icon to the right of the track number.
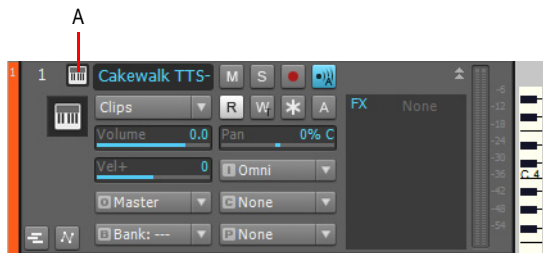
A. Synth icon

For step by step instructions, see:

"Inserting soft synths" on page 802

"Waveform preview for buses and synth tracks" on page 857

"ReWire instruments" on page 821

"Freeze tracks and synths" on page 858

See also:

"Using instrument tracks" on page 806

Inserting soft synths

> **Note:** *SONAR X2 Producer and Studio can use unlimited plug-ins. SONAR X2 Essential can use up to 64 plug-in effects and 16 software instruments.*

In order to play a soft synth from a MIDI controller or with recorded MIDI data, you need to have at least one synth track that lists the soft synth in its **Input** field, and at least one MIDI track that lists the soft synth in its **Output** field. The data from the MIDI track feeds the synth track and plays the soft synth. If you're playing the soft synth with a MIDI controller, the MIDI track that's feeding the synth track must have the focus (lighter color). You can also patch the soft synth into an audio track's effects bin instead of a synth track's **Input** field.

To add a soft synth to the audio and synth tracks' **Input** menus (drop-downs) and the MIDI tracks' **Output** menus, you have to insert each soft synth that you want to use into each project. There are two basic ways to insert soft synths in SONAR:

1. You can insert soft synths from the Browser's **Synth** tab or with the **Insert > Soft Synths** command. If you use this method, you can choose to have SONAR create the necessary synth and MIDI tracks, and patch them together correctly. If you want to use multiple synth tracks to take advantage of SONAR's support for the multi-output soft synth format, you need to create and patch additional MIDI tracks manually to feed the additional synth tracks.

2. You can insert soft synths into effects bins of individual audio tracks. If you use this method, you need to set a MIDI track's **Output** field to the name of the soft synth you inserted. Then you can record MIDI data in the MIDI track to play the soft synth with.

The procedure for inserting multi-output and single-output soft synths is basically the same. There are just more tracks possibly involved when you insert a multi-output soft synth.

You can insert more than one copy (also called an *instance*) of the same soft synth. Each new copy has the same name as the previous copy except for having a higher number after the name. Every copy appears in a separate row in the drop-down menus of synth and audio track inputs and MIDI track outputs.

To insert a soft synth from the Synth Rack or menu

1. If you want to use the Synth Rack, open the Browser and click the **Synth** button 🎹 , then click the **Insert** button ➕ to display the pop-up menu of installed soft synths.

2. If you want to use the menu command, use the **Insert > Soft Synths** command to display the pop-up menu of installed soft synths.

3. In the pop-up menu, click the name of the soft synth you want to insert.

   The **Insert Soft Synth Options** dialog box appears, unless you've previously unchecked the **Ask This Every Time** check box that's in the dialog box. If you have, SONAR inserts the soft synth according to the preferences you set the last time you used the **Insert Soft Synth Options** dialog box. If you need to open the **Insert Soft Synth Options** dialog box when it's hidden, click the **Insert Soft Synth Options** button 🖼 in the Synth Rack.

4. Choose options from the **Insert Soft Synth Options** dialog box according to the following:

   • If you want to create a MIDI track that uses the soft synth as an output, check the Create These Tracks: MIDI Source check box.

   • If you want to create a single synth track that acts as an output for Output 1 of the soft synth, check the Create These Tracks: First Synth Audio Output check box.

- If you want to create separate synth tracks for each of the soft synth's outputs, check the Create These Tracks: All Synth Audio Outputs check box.

- If you want to use existing MIDI and audio tracks to play the soft synth, uncheck all of the Create These Tracks options. SONAR adds the soft synth to the audio track input and MIDI track **Output** menus. You need to set an existing MIDI track's **Output** field to the soft synth, and set an existing audio track's **Input** field to the soft synth (the audio track will then become a synth track).

- If you want to open the soft synth's interface from this dialog box, check the **Open These Windows: Synth Property Page** check box.

- If you opened this dialog box from the **Insert** menu and want to open the Synth Rack view, check the **Open These Windows: Synth Rack View** check box.

- If the synth you're inserting can create or send MIDI data, and you want to record or redirect this MIDI data, enable the Enable MIDI Output check box.

- Any automation data you create for this synth is displayed by default on the Synth track for this synth. If you want to display this data on a different track, choose the track in the **Display Automation On** menu.

- If you create some new knobs on the Synth Rack to control certain parameters on a particular synth, you can display the same knobs every time you insert that synth by enabling the Recall Assignable Controls check box.

- If you want to open this dialog box every time you use the **Insert > Soft Synths** command, or click the **Insert** button in the Synth Rack view and choose a synth from the pop-up menu, check the **Ask This Every Time** option. If you always insert soft synths in the same way, you can uncheck this option so you don't have to deal with the dialog box each time. To open the dialog box when the option is unchecked, click the **Insert Soft Synth Options** button ![icon] in the Synth Rack.

5. Click **OK** to close the dialog box and insert the synth.

SONAR adds the soft synth to the audio track **Input** and MIDI track **Output** menus, and creates any new tracks that you requested. The new tracks already have the correct inputs and outputs patched. Now you can record MIDI data in the soft synth MIDI tracks, and/or play the soft synth from a MIDI keyboard or controller. See "Playing a soft synth" on page 810.

To insert a soft synth in an effects bin

1. In either the Track view, Track Inspector or Console view, right-click the effects bin of an unused audio track or bus.

ⓘ **Note:** *If you patch a soft synth into a bus that has no audio track assigned to it, the soft synth does not sound. Always use a bus that has at least one audio track sending data to it.*

The plug-in menu appears.

2. Under **Soft Synths**, choose the name of a soft synth.

Two things happen: the soft synth's interface appears, and the soft synth's name appears in the track's or bus's effects bin, with a **Bypass** button next to the name.

3. Set the soft synth's parameters (choose sounds, effects, etc.), and drag its interface out of the way.

4. Click the **Output** field of a MIDI track to display the **Output** menu.

5. Select the name of the soft synth that you patched into the audio track or bus.

6. If the soft synth is multi-timbral, choose a MIDI channel for the MIDI track.

7. Also in the MIDI track, select a bank and patch.

Now you can record some MIDI data into the MIDI track to play the soft synth with. See "To play a soft synth with recorded MIDI data" on page 811.

You can also play the soft synth in real-time from a MIDI controller. See "To play a soft synth from a MIDI controller" on page 811.

See also:

Using instrument tracks

SONAR has a track type called *instrument track*, which makes it very simple to work with soft synths. An instrument track is essentially two tracks—a MIDI track and an audio track, both associated with the same soft synth—contained in a single track strip. An instrument track allows you to control the MIDI data that is sent to a soft synth and the audio signal that is returned from the soft synth.

To create an instrument track

In order to create an instrument track, you must first insert a new soft synth.

1. Do *one* of the following to insert a new soft synth:

    • On the **Insert** menu, point to **Soft Synths** and select the desired soft synth.

    • In the Synth Rack, click the **Insert Soft Synth and ReWire devices** button ⊞ and select the desired soft synth from the pop-up menu.

    The **Insert Soft Synth Options** dialog box appears.

Figure 249. *The **Insert Soft Synth Options** dialog*
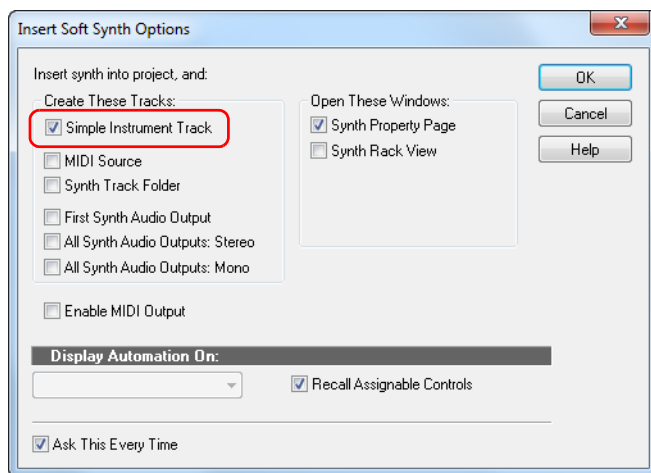
2. Select the **Instrument Track** check box, then click **OK** to close the **Insert Soft Synth Options** dialog box.

    A new instrument track is inserted.

    Instrument tracks have a unique track icon ▥. The track name defaults to the soft synth name.

Figure 250. *Instrument track strip*
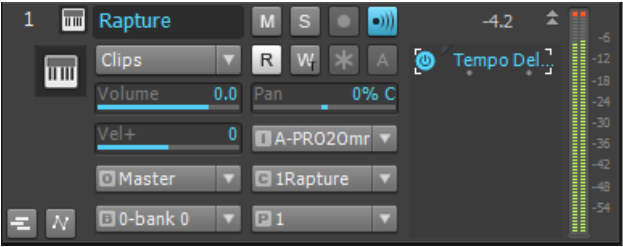
Instrument track controls

Because an instrument track is a hybrid between an audio and a MIDI track, an instrument track strip contains both audio and MIDI controls.

The instrument track strip exposes MIDI input and audio output controls. Internally, the MIDI output is assigned to the soft synth's MIDI input, and the audio input is assigned to the soft synth's main output.

The following table shows all controls that are availalbe on an instrument track, and indicates if a control applies to audio or MIDI data.

Control type	Audio	MIDI
Mute	X	
Solo	X	
Arm		X
Input Monitor	X	
Automation Read/Write	X	
Inline Piano Roll		X
Volume	X	
Pan	X	
Trim		X
Input Quantize		X
Input	(Internally assigned to synth output)	X
Output	X	(Internally assigned to synth input)

Table 156.

Control type	Audio	MIDI
MIDI Channel		X
Bank		X
Patch		X
Time+		X
Pitch+		X
Sends	X	
Snap to scale		X
Effects bin	X	
Meter	X	
Track scale	(When track is frozen)	X

Table 156.

Editing in the Clips pane

By default, MIDI clips are displayed and can be edited in the Clips pane. MIDI track and clip envelopes are not available.

If an instrument track is frozen, audio clips are displayed and can be edited in the Clips pane. Audio track and clip envelopes are also available.

> **Note:** *The inline Piano Roll is not available on a frozen instrument track.*

Exporting and bouncing

When exporting or bouncing an instrument track, both MIDI and audio data are taken into account. The result is the same as if the track is frozen.

Converting an audio and MIDI track to a single instrument track

If an existing audio track and MIDI track are assigned to the same soft synth, you can convert the two tracks to a single instrument track.

1. Select the audio and MIDI tracks that you want to combine into a single instrument track.

2. Right-click one of the selected track strips and select **Make Instrument Track** from the pop-up menu.

    The audio and MIDI tracks and combined into an instrument track.

Splitting an instrument track to separate audio and MIDI tracks

You can split an instrument track into separate audio and MIDI tracks. The audio and MIDI tracks will remain assigned to the same soft synth.

• Click the Track view **Tracks** menu and choose **Split Instrument Track**.

   The instrument track is converted to separate audio and MIDI tracks, both assigned to the soft synth.

Opening a soft synth's property page

There are several different methods to open a soft synth's property page (interface):

• When you insert the soft synth from the **Insert** menu or Browser, select the **Open These Windows: Synth Property Page** check box in the **Insert soft synth Synth Options** dialog box.

• Double-click the name of the soft synth in either a MIDI track's **Output** field or a synth track's **Input** field.

• Double-click the track icon of a MIDI track or the Synth track that the synth uses. **This works even when a track is minimized**:

• Double-click the row in the Synth Rack that displays the soft synth.

• Double-click the name of the soft synth in an effects bin.

A. Double-click here B. Or here C. Minimized tracks

Synth Rack icons

Each Synth Rack strip displays a synth icon so that you can easily tell one synth from another when the rack contains multiple synths.

Icons have the same image format and file location as track icons, and use the same commands to show or hide the icons. Synth Rack Icons are enabled in SONAR by default, and the default icon for each synth is `track_icon_dxi_large.bmp`. The Synth Rack only displays large format icons, fixed at 48x48 pixels.

Use the following procedures to manage your synth icons:

To do this	Do this
To hide Synth Rack icons	Right-click an icon in the Synth Rack and choose **Show Synth Icons** from the pop-up menu. Or Use the **Views > Icons > Synth Rack > Show Large Icons** command.
To show Synth Rack icons	Use the **Views > Icons > Synth Rack > Show Large Icons** command.
To load a particular synth icon	Right-click the icon in the Synth Rack that you want to change, and select **Load Synth Icon** from the pop-up menu.
To reset a particular synth icon to its original icon	Right-click the icon in the Synth Rack that you want to reset, and select **Reset Synth Icon** from the pop-up menu.
To open a synth's property page	Double-click the synth's icon in the Synth Rack.

Table 157.

Playing a soft synth

There are several ways to play a soft synth:

- You can record MIDI data and use the soft synth as a playback device.

> **Note:** *WDM or ASIO drivers do not improve performance when you play back recorded MIDI data—the improvement comes only when you play a soft synth in real time from an external MIDI controller or keyboard.*

- You can play the soft synth in real time from a MIDI controller or keyboard. To avoid excessive latency, your sound card must be using a WDM or ASIO driver. Also, you must set mixing latency to the lowest achievable level (probably less than 10 msec.), which you do by adjusting the Buffer Size slider in **Edit > Preferences > Audio - Driver Settings**.

- Some soft synths that use the DXi 2 format can send MIDI data, sometimes including MIDI notes, from their interfaces to SONAR. For example, some soft synths have MIDI keyboards built into their interfaces that you can click to send note on/off messages.

   See "Recording a soft synth's MIDI output" on page 820 for more information.

To play a soft synth with recorded MIDI data

1. Insert a soft synth into the project.

2. In the MIDI track that sends its output to the soft synth, choose a MIDI channel.

3. Open the soft synth's interface (see "Opening a soft synth's property page" on page 809).

4. Set the soft synth's parameters (choose sounds, effects, etc.), and drag its interface out of the way (the soft synth's interface does not have to be open for the soft synth to sound).

5. If you want to save your soft synth settings, type a name in the **Presets** field, and click the **Disk** icon that's next to the **Presets** field.

6. Record some MIDI data into the MIDI track.

When you play back the recorded MIDI data, you should hear the soft synth through your sound card's outputs. If you don't, make sure your data is in the right range; a bank, patch, and channel are selected; your monitor speakers or headphones are turned up; and that none of the relevant tracks are muted.

You can add effects to each of the synth tracks. You can also add MIDI effects to your soft synth MIDI tracks.

To play a soft synth from a MIDI controller

1. Make sure your controller is set to local off.

2. Make sure that the **Audio Engine** button in the Control Bar's Transport module is enabled.

3. Insert a soft synth into your project (see "Inserting soft synths" on page 802, if necessary).

Note: *If you patch a soft synth into a bus that has no audio track assigned to it, the soft synth does not sound. Always use a bus that has at least one audio track sending data to it.*

4. In the MIDI track that sends its output to the soft synth, choose a MIDI channel.

5. Open the soft synth's interface (see "Opening a soft synth's property page" on page 809).

Note: *You can also open a soft synth's interface by double-clicking its name where it appears in a MIDI track's **Output** menu or a synth track's **Input** menu.*

6. Set the soft synth's parameters (choose sounds, effects, etc.), and drag its interface out of the way.

7. If you want to save your soft synth settings, type a name in the **Presets** field, and click the **Disk** icon that's next to the **Presets** field.

8. Make sure that the MIDI track has the focus (its titlebar is lighter), and play your MIDI controller.

When you play your MIDI controller you should hear the soft synth through your sound card's outputs. If you don't, make sure you're playing in the right range; a bank, patch, and channel are selected; your monitor speakers or headphones are turned up; your controller is attached to your MIDI interface; and that none of the relevant tracks are muted.

To remove a soft synth from a track or bus

• If your soft synth is patched into the effects bin of an audio track or bus, right-click the name of the soft synth, and choose **Delete** from the pop-up menu.

   OR

• In the synth track that uses the soft synth as an input, choose another input for the track. If you don't select another soft synth as an input, the synth track becomes a regular audio track.

To remove a soft synth from a project

• If your soft synth is patched into the effects bin of an audio track or bus, right-click the name of the soft synth, and choose **Delete** from the pop-up menu.

• If your soft synth is patched into the **Input** field of a synth track, go to the Synth Rack, click the name of the soft synth to select it, and then click the **Delete** button. SONAR deletes the soft synth strip from the Synth Rack and sets the inputs and MIDI outputs of all affected tracks to the next lower-numbered option. SONAR does not delete the affected tracks.

Note: *If you're using a ReWire instrument and not a soft synth, always close the ReWire instrument's interface before you delete the instrument from SONAR, or before you close SONAR.*

See:

Software instruments
Playing a soft synth

Muting and soloing soft synth tracks

SONAR automatically places any synth and MIDI tracks that use soft synths into a group that makes muting and soloing the tracks easy:

- To mute or solo a MIDI track that is patched to a synth track, simply mute or solo the MIDI track—SONAR automatically mutes or solos the correct synth track. If another MIDI track uses the synth track as an output, SONAR leaves the synth track unmuted.

- To mute or solo all the MIDI tracks that are patched to a specific soft synth, simply mute or solo the synth track that the MIDI tracks are patched into.—SONAR automatically mutes or solos all the correct MIDI tracks.

    Or

- Click the **M** or **S** buttons (mute and solo, respectively) next to the soft synth's name in the Synth Rack view. This mutes or solos all the tracks associated with this instance of the soft synth.

- Click the **Solo** button S on the soft synth's property page. The **Solo** button functions the exact same way as the **Solo** button on the source track/bus.

You can use the **Mute** and **Solo** buttons in the Track view, Synth Rack, or Console view.

Rename synths in the Synth Rack view

It is possible to rename synth in the Synth Rack view. This is especially useful if you use many instances of a particular synth and you need to distinguish each instance.

To rename a synth

Double click the **Name** field of the synth you want to rename.

Multi-port soft synths

A multi-port soft synth allows you the option of using a different synth track for every output that the soft synth has. This allows you to use different plug-in effects for each sound (or in some cases, group of sounds) that a soft synth produces. For example, if a soft synth can produce 16 sounds at the same time, and has 4 outputs, you can send any of the 16 sounds out through any of 4 different outputs, giving you a choice of 4 different plug-in configurations for that soft synth. You would use 4 different synth tracks: one for each output. If a soft synth can produce 8 sounds at the same time, and has 8 outputs, you could use 8 synth tracks and 8 plug-in configurations. If you need more plug-in configurations or just more sounds, you can insert more copies of the same soft synth, using new synth tracks for all of the new copy's outputs. You can also send all the MIDI tracks out the same output and synth track if you don't need separate plug-ins for each sound, or just want to use the soft synth's internal effects.

The **Insert Soft Synth Options** dialog box gives you the option of automatically creating a separate synth track for each audio output that the soft synth has, or creating just one synth track for Output 1 of that particular soft synth. Each new copy (also called an *instance*) of a soft synth is considered to be a separate instrument, and appears in a separate row in the Synth Rack, with a number after its name representing which copy it is.

For step by step instructions, see:

Software instruments
Multi-port soft synths

Converting your soft synth tracks to audio

Once your project sounds the way you want it to, it's extremely easy to convert your soft synth MIDI tracks to either new audio tracks, or Wave, MP3, or other exported files.

You can also do a temporary conversion, called freezing. See "Freeze tracks and synths" on page 858 for more information.

To convert your soft synth tracks to new audio tracks

1. Mute all tracks that you don't want to convert.

2. Click the Track view **Tracks** menu and choose **Bounce to Track(s)**.

   The **Bounce to Track(s)** dialog box appears.

3. In the **Destination** field, choose a new or pre-existing track to put the new audio data on.

4. If you've saved presets from previous bounce operations, you can choose a preset from the **Preset** field.

5. In the **Source Category** field, choose **Tracks**.

6. In the **Channel Format** field, choose **mono** if you want a mono track, **stereo** if you want a stereo track, and **split mono** if you want to create separate mono tracks.

7. In the **Source/Buses** field, choose the output bus(es) that the soft synth tracks are using (usually the main outputs).

8. In the **Mix Enables** field, make sure all choices are selected.

9. Click **OK**.

SONAR creates new audio tracks from the outputs you selected. When you're through converting, don't forget to mute your MIDI tracks so you won't hear them and the new audio track(s) at the same time.

> **Note:** *You control the bit depth of all rendering operations (bouncing, freezing, applying effects) in **Edit > Preferences > File - Audio Data**, in the **Render Bit Depth** field. The default value of 32 is the best for most situations. See "Bit depths for rendering audio" on page 1187 for more information.*

To export your soft synth tracks as Wave, MP3, or other type files

1. Mute all tracks that you don't want to export; make sure you don't mute the synth track or the audio track that the soft synth is patched into, or the MIDI track(s) that you are using as a source.

2. Use the **File > Export > Audio** command.

   The **Export Audio** dialog box appears.

3. In the **Look in** field, choose the location where you want the new, exported file to be.

4. Type a file name in the **File name** field.

5. Choose the type of file, the format, and the bit depth of the new file you're creating—for MP3 use 16 bits.

6. In the **Mix Enables** field, make sure all choices are selected.

7. Click **OK**.

SONAR creates a new audio file of the type you specified. Find the file in the folder you specified, and double-click it to listen to it.

See:

Software instruments
Converting your soft synth tracks to audio

Using the Assignable Controls feature

You can create knobs on the Synth Rack to control any of a synth's automatable parameters (each knob learns what parameter to control when you create the knob). This makes it easy to adjust the controls that you use most often on a particular synth, and also lets you record automation from the Synth Rack. After you create some control knobs, the next time you insert the same synth, you can choose to display the same control knobs that you used previously.

You can also group control knobs on the Synth Rack, and use Remote Control to move the knobs.

To create control knobs on the Synth Rack

1. Undock the Browser or dock it in the MultiDock. Assignable controls can not be shown when the Browser is docked at the left or right side.

2. In the synth's strip of controls in the Synth Rack, click the **Assign Controls** button to enable it.

3. While the **Assign Controls** button is enabled, click on each control in the synth's property page that you want to create a knob for.

4. When you're finished clicking on controls, click the **Assign Controls** button to disable it.

The Synth Rack displays knobs for the controls you selected, with the each knob's name displayed below each knob. Now you can adjust some of the synth's parameters by moving the appropriate knob in the Synth Rack.

Figure 251. *Assignable synth controls.*
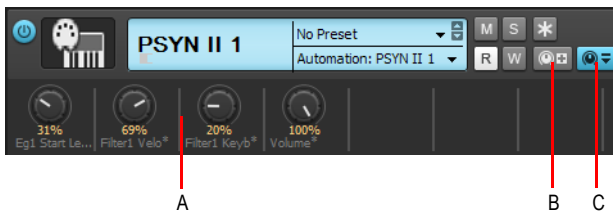
A. Automated knobs B. Assign Controls C. Show/Hide Assigned Controls

To hide or show control knobs on the Synth Rack

• In the Synth Rack, click the **Show/Hide Assigned Controls** button.

The Synth Rack displays knobs for the controls you selected, with the each knob's name displayed below each knob. Now you can adjust some of the synth's parameters by moving the appropriate knob in the Synth Rack.

See also:

Automating controls from the Synth Rack

Note: *Your synth's manufacturer determines which controls (if any) you can automate. If your synth does not expose its controls to SONAR, you can not automate the synth.*

Once you create some control knobs on the Synth Rack, you can record automation from them. Use the same procedure you would use to record automation of any other SONAR knob or widget. See "Recording individual fader or knob movements" on page 1009 and "Displaying Synth Rack automation" on page 818 for more information

You can also draw and edit synth automation in the Clips pane. See "Drawing soft synth automation in the Clips pane" on page 819 for more information.

See also:

Displaying Synth Rack automation

You can choose what track you want a synth's automation to appear in for editing. Use the **Automation Track** menu in each strip of controls in the Synth Rack to choose what track you want to display the synth's automation on. You can display the automation from several different synths on the same track, or put a synth's automation on a track that is completely unrelated to the synth if you want.

See "Synth Rack" on page 800 for a picture of the Synth Rack and all its components.

See also:

Remote control of the Synth Rack

Once you create some control knobs on the Synth Rack, you can assign knobs or sliders on your MIDI controller to control the Synth Rack knobs.

See "Using remote control" on page 919 for more information.

Drawing soft synth automation in the Clips pane

Some synths have controls that you can automate by drawing envelopes in the Track view.

To automate a soft synth's controls in the Clips pane

In the Synth Rack, the **Automation Track** menu in a particular synth's control strip displays the track that this synth's automation appears in. Click this track's Edit Filter control and choose the desired synth parameter on the pop-up menu.

SONAR draws an envelope for the parameter that you chose. You can edit the envelope to make the parameter behave as you want it to.

See also:

Soft synth MIDI output support

Some soft synths produce MIDI output as well as audio output. You can now record the MIDI output of both VST and DirectX instruments that have this feature.

Recording a soft synth's MIDI output

SONAR allows you to record the MIDI output of a synth onto another MIDI track in your project. This can be convenient if your synth creates arpeggios, drum patterns, or other MIDI data that you want to edit as a MIDI clip.

To enable MIDI outputs on a synth

- When inserting a synth from the **Insert** menu or the Synth Rack, check the **Enable MIDI Output** check box in the **Insert Soft Synth Options** dialog box.

The soft synth will now appear as an **Input** option on all MIDI tracks just like any hardware inputs.

To hear a soft synth's MIDI output through another track

1. Verify that **Enable MIDI Output** is enabled for the synth whose MIDI output you want to hear through another track.
2. On a new MIDI track in your project, set the **Input** to the synth whose MIDI output you want to hear.
3. Set the **Output** of that track to another synth or MIDI output used in your project and enable **Input Echo**.
4. Play some MIDI data through the synth whose MIDI **Output** has been enabled.

The MIDI data sent from that synth will be echoed through the **Output** of the new MIDI track.

To record a soft synth's MIDI output to a track

1. Verify that **Enable MIDI Output** is enabled for the synth whose MIDI output you want to record.
2. On a new MIDI track in your project, set the Input to the synth whose MIDI output you want to record and arm the track.
3. Click the **Record** button to start recording.
4. If you're recording live MIDI input through the synth, place track focus on the synth's MIDI track and begin playing your MIDI controller. If you're recording pre-existing MIDI data through the synth, record through the duration of the pre-existing clips.

The MIDI Output of the synth will be recorded to the new MIDI track. You can then edit the MIDI data and route it to a different MIDI output as you see fit.

> **Note:** *Be careful to avoid creating a MIDI feedback loop. To prevent this, make sure the Input of a soft synth's MIDI track is not set to the same synth's Output.*

ReWire

SONAR can send MIDI events to any object in a ReWire client application on as many MIDI channels as the client application makes available.

See:

ReWire instruments

ReWire is a technology for transferring audio data between software applications in real time—the software equivalent of a multi-channel audio cable. ReWire is built on the following cornerstones:

- Real-time audio streaming between applications
- Sample accurate synchronization
- Common transport functionality

SONAR supports the ReWire 2.0 format, but with some differences. SONAR interacts with ReWire applications in the following ways:

- You can insert one instance of a ReWire application into each SONAR project.
- You can use as many MIDI channels and devices in each ReWire application as that application makes available.
- You can insert ReWire devices into SONAR projects from the Synth Rack or **Insert** menu, and you can tell SONAR to create the necessary synth tracks and one MIDI track at that time. You can also tell SONAR to open the ReWire application's property page, because, unlike synths, ReWire applications must have their property pages (interfaces) open in order to function.
- SONAR's tempo, transport, and loop points are linked to the ReWire application. Activating or changing any of these settings in the ReWire application(s) changes the same setting in SONAR, and vice versa. If you have several applications open and you make a change in one of them, it may be necessary to put the focus on the other application(s) to update their interfaces.
- You cannot send patch or bank changes from SONAR to the ReWire application. All other track property controls in SONAR control the ReWire device, except the pan controls on MIDI tracks. The pan controls on SONAR's synth tracks control the ReWire device's panning.
- You can mix down or bounce ReWire tracks in SONAR the same way you mix down or bounce synth tracks.

- You can use SONAR's automation functions on both synth and MIDI tracks that the ReWire application uses.
- Muting or soloing a synth track that a ReWire device uses automatically mutes or solos the MIDI track that feeds that synth track. Muting or soloing a MIDI track that a ReWire device uses will mute or solo the corresponding synth track only if there is only one MIDI track feeding that synth track.
- You must always close your ReWire application(s) before you close SONAR. Some ReWire applications prevent SONAR from closing properly if the ReWire applications are still open.

For step-by-step procedures, see:

"Inserting a ReWire instrument" on page 822

"To use separate synth tracks for each ReWire device" on page 823

"Automating ReWire instruments" on page 825

"Mixing down ReWire instruments" on page 824

"ReWire troubleshooting guide" on page 825

Inserting a ReWire instrument

After you install your ReWire applications and reboot your computer, the names of the ReWire applications appear in SONAR's **Insert** menu under ReWire Devices, and also in the Synth Rack's **Insert** button pop-up menu.

> **Note:** *ReWire supports both 32-bit and 64-bit programs, but it is not possible to mix the two environments. A 32-bit program and a 64-bit program cannot communicate via ReWire. Make sure you load the correct version of your ReWire device, depending on whether you are using the 32-bit or 64-bit version of SONAR.*

To insert a ReWire instrument

1. Open a SONAR project. Do not launch your ReWire application.

2. In the Synth Rack, click the **Insert** button, and click **ReWire Devices** to display the submenu of installed ReWire devices.

   OR

   Use the **Insert > ReWire Devices** command to display the submenu of installed ReWire devices.

3. Click the name of the ReWire device you want to insert.

   The **Insert Soft Synth Options** dialog box appears.

4. Choose options from the **Insert Soft Synth Options** dialog box according to the following:

   - If you want to create a MIDI track that uses the ReWire Instrument as an output, check the Create These Tracks: MIDI Source check box.

   - If you want to create a single synth track that acts as an output for Output 1 of the ReWire Instrument, check the Create These Tracks: First Synth Audio Output check box.

- If you want to create separate synth tracks for each of the ReWire Instrument's outputs, check the Create These Tracks: All Synth Audio Outputs check box.

- If you want to use existing MIDI and audio tracks to play the ReWire Instrument, uncheck all of the Create These Tracks options. SONAR adds the ReWire Instrument to the audio track **Input** and MIDI track **Output** menus. You need to set an existing audio track's **Input** field to the ReWire Instrument, and set an existing MIDI track's **Output** field to the ReWire Instrument. The existing audio track will then become a synth track.

- If you want to open the ReWire Instrument's interface from this dialog box, check the **Open These Windows: Synth Property Page** check box (**always check this option**: ReWire Instruments do not sound unless their property pages are open).

- If you opened this dialog box from the **Insert** menu and want to open the Synth Rack, select the **Open These Windows: Synth Rack View** check box.

- If you want to open this dialog box every time you use the **Insert > ReWire Instrument** command, or click the **Insert** button in the Synth Rack and choose a ReWire instrument from the pop-up menu, check the **Ask This Every Time** option. If you always insert ReWire Instruments in the same way, you can uncheck this option so you don't have to deal with the dialog box each time. To open the dialog box when the option is unchecked, click the **Insert Soft Synth Options** button 🔳 in the Synth Rack.

5. Click **OK** to close the dialog box.

   SONAR adds your ReWire devices to the audio and synth track **Input** menus and the MIDI track **Output** and **Channel** menus, creates any tracks you requested, adds the ReWire instrument to the Synth Rack, and opens the ReWire application's interface.

6. In the MIDI track whose output is the ReWire synth track, click the drop-down arrow in the **Channel** field to display the names of the available ReWire devices in your ReWire instrument.

7. Click the name of the device you want to use.

8. Make sure that the synth track you want to hear the ReWire instrument through has the appropriate ReWire channel listed in its **Input** field.

Now you can record MIDI data in the MIDI track and hear it through the synth track. If you want to use different synth tracks for each ReWire device, see the following procedure.

> **Note:** *Always close your ReWire applications before closing a SONAR project.*

To use separate synth tracks for each ReWire device

1. Open SONAR**,** insert a ReWire instrument, and choose the **All Synth Audio Outputs** option in the **Create These Tracks** field of the **Insert Soft Synth Options** dialog box. Make sure you choose to open the Synth window, and click **OK**.

   SONAR inserts the ReWire instrument and creates multiple synth tracks.

2. In your ReWire application, assign the devices you want to use to the outputs or channels you want to use. For example, in Propellerheads Reason, you use the back panel of the mixer to drag cables from a device to the output channel you want to use for that instrument.

3. In SONAR, set the **Output** field of a MIDI track to the name of your ReWire application, and set the **Channel** field to the name of the ReWire device you want to play with this track.

4. Record some MIDI data in the track and play it. Find the synth track whose **Input** field lists the output channel you patched your device into—the playback meter lights up as you play the MIDI track that plays your device.

Now you can use separate effects for each of your ReWire devices.

Note: *Always close your ReWire applications before closing a SONAR project.*

See also:

Routing MIDI data to ReWire instruments

Some ReWire applications can create large numbers of instruments. You can send a track's MIDI data to any of these instruments by selecting the specific instrument in the **MIDI channel** menu of the relevant track.

To send MIDI data to a specific ReWire instrument

1. In the SONAR MIDI track that contains the recorded MIDI data you want to send, make sure that the **Output** menu is set to the correct ReWire device.

2. Then use the **Ch** menu in the same track to choose the instrument you want to send to. This also works if you just want to use this track to play your MIDI controller through a particular instrument in the ReWire application.

Mixing down ReWire instruments

To either mix down or bounce ReWire instruments to new audio tracks, use the same procedures as for synths.

See also:

Automating ReWire instruments

You can automate audio and MIDI tracks that are patched to ReWire instruments the same ways you can automate any of SONAR's audio and MIDI tracks.

See also:

ReWire troubleshooting guide

The following lists some common issues when you use ReWire with SONAR:

- **SONAR Won't Close Properly.** Always close your ReWire applications before closing SONAR or a SONAR project.
- **Rebirth Won't Play After I Open Its Property Page.** Make sure that the Loop switch in Rebirth is enabled.
- **My ReWire Project Plays at a Different Tempo when Opened from SONAR.** When you open a ReWire project from SONAR, the ReWire project assumes SONAR's default tempo, which is 100. Change SONAR's tempo to match your ReWire project.
- **My MIDI Controller Works in SONAR or my ReWire Application, but not Both.** Choose different MIDI In ports for both SONAR and your ReWire application. Do this in SONAR by using the **Edit > Preferences > MIDI - Devices** command, and highlighting the MIDI In port you want to use in SONAR. If you only have one MIDI In port on your MIDI interface or sound card, enable that input in either SONAR or your ReWire application, and disable that input in the other application.
- **I Get a MIDI Input Error Message When I Open a ReWire Application.** If you only have one MIDI Input port on your MIDI interface, you probably have that one reserved for SONAR, leaving none for your ReWire application. If you would rather use your MIDI controller in the ReWire application instead of SONAR, you can deselect your MIDI input port in **Edit > Preferences > MIDI - Devices**, and then select that MIDI **Input** from whatever menu your ReWire application has for that purpose. If you have multiple inputs on your MIDI interface, simply select different ones for SONAR and your ReWire application.

ReWire and fast forwarding in SONAR

When there is a ReWire application loaded into a SONAR project, the SONAR **Fast Forward** button/command only works if there is a clip at the end of the SONAR project or if **Stop at Project End** is not checked.

ReWire tracks silent when using metronome record count-in

When using a metronome count-in and recording, any ReWire tracks will be silent at the start of recording. The silence period will equal the count-in duration. To fix this issue, disable metronome count-in (go to **Edit > Preferences > Project - Metronome** and set **Record Count-in** to **0**).

See:

Stand-alone synths

Some soft synths can be run independently of SONAR and do not need to be inserted to the Synth Rack or an effects bin to use. After you install this kind of synth and restart your computer, the name of the synth's MIDI driver appears in SONAR's **MIDI Devices** dialog box under **Outputs**.

See:

Playing a stand-alone synth

SONAR plays this kind of synth by seeing it as additional MIDI outputs in both the **MIDI Devices** dialog box and in MIDI tracks' **Output** fields.

To play a stand-alone synth

1. Go to **Edit > Preferences > MIDI - Devices**.
2. In the **Outputs** field, make sure the name of your stand-alone synth's MIDI driver is highlighted, and click **OK**.
3. Click the **Output** field of an unused MIDI track to display the **Output** menu.
4. Select the name of the stand-alone synth's MIDI driver.
5. If your stand-alone synth is multi-timbral, change the track's MIDI channel to the same one that the synth uses for the sound you want to hear.
6. Select a bank and patch on your stand-alone synth, if you haven't already.

7. Record some MIDI data in the MIDI track, or play any MIDI controller that's an input for the MIDI track.

When you play your MIDI controller or play back the recorded MIDI data, you should hear the stand-alone synth through your sound card's outputs. If you don't, make sure you're playing in the right range and that your monitor speakers or headphones are turned up, and that none of the relevant tracks are muted.

See:

Recording a stand-alone synth

There are several ways to record a stand-alone synth:

• You can use the synth's wave capture function, if it has one. See your synth's documentation for a procedure. Make a note of where the resulting captured Wave file is stored, and then you can import the file into SONAR by using the **File > Import > Audio** command.

• You can connect your sound card's outputs to your sound card's inputs, either internally or externally, depending on your sound card's design. After you do this, you need to arm an audio track in SONAR and select one of your sound card's wave drivers as an input. Start recording, and make sure the MIDI track that is routed to the synth is playing back.

• You can use your sound card's **wave capture** or **what-you-hear** option, if it has one. See the following procedure.

To record a stand-alone synth with your sound card's Wave Capture function

1. Pick a destination audio track and set the **Input** field to **Stereo**.

   Note: If you have more than one sound card installed, select the one that your stand-alone synth uses as an output.

2. Arm the destination track.

3. Mute or archive any tracks that you don't want to record to the destination track.

4. If SONAR's metronome is set to use any software synth to produce a click, disable the recording metronome. To do so, click the **Record Metronome** button in the Control Bar's Transport module, or go to **Edit > Preferences > Project - Metronome** and clear the **Recording** check box.

5. Open your sound card's mixer device. This is normally done by double-clicking the speaker icon on the Windows taskbar, or by choosing **Start > Control Panel > Hardware and Sound > Volume Control** in Windows 7..

Note: *Some sound cards, such as the SoundBlaster Live, have their own proprietary mixer. If yours has one, please use it instead.*

6. Click **Adjust Volume For Recording**, and make sure all boxes below are checked.

7. Click **OK**, and locate the slider marked **MIDI**, **Synth**, **Mixed Input**, or **What You Hear**. Check the **Select** box at the bottom, then close the window.

8. In SONAR, click the **Record** button.

    SONAR records all the MIDI tracks that are assigned to the stand-alone synth as a stereo audio track.

After you finish recording, mute the MIDI tracks that you just recorded so you don't hear them and the new audio track at the same time.

Mixing

SONAR lets you mix your projects with tremendous control and flexibility. The extensive bussing controls, support for DX and VST plug-ins, built-in EQ's, automation, remote control, metering, grouping, and freeze features let you design your own style of mixing, with your own workflow. (Automation is covered in a separate chapter.)

After you finish mixing a project, you can export the project in a variety of audio file formats to create a CD master or to publish your work on the Internet. You can choose to include all real-time effects and control movements in the mixed-down tracks that you export (see "Preparing audio for distribution" on page 926 for more information).

See:

See also:

Preparing to mix

The Console view, Track view and Track Inspector contain all the controls you need to mix your project. To open the Console view, choose **Views > Console** or press ALT+2. To open the Inspector, choose **Views > Inspector** or press I. The Track view is always open.

Note: *You can control all sliders and knobs in the Console and Track Views by hovering over them with the mouse and manipulating the mouse wheel.*

Figure 252. *The Console view*

A. Console view menu B. ProChannel (Producer only) C. Pane splitter bars D. Track channel strips E. Bus channel strips F. Main channel strips

The Console view contains the following main elements:

- **Menu.**   Use the menu to configure channel strips. You can filter the display of specific channel strip types and modules within channel strips. For details, see "Console view menu" on page 1857 and "To show/hide specific tracks, buses and mains" on page 1860.

- **Track, Bus and Mains panes.**   The Console view has three separate panes: the left most pane contains track channel strips, the middle pane contains bus channel strips, and the right pane

contains main channel strips. You can drag the pane splitter bars to resize the panes.

- **Channel strips.** Each track, bus and main in the project is represented by its own vertical channel strip. Use the channel strip controls to mix and process tracks, buses and mains. For details, see "Channel strips" on page 1839.
- **Modules.** Controls in channel strips are grouped into modules that can be shown or hidden. For details, see "Modules" on page 1851.

The Console view can show the following channel strip types:

- **Audio track.** Use to control tracks that contain digital audio data, which is routed to your hardware audio interface. For details, see "Audio track controls" on page 1845.
- **MIDI track.** Use to control tracks that contain MIDI data. MIDI tracks can control external MIDI devices or software instruments. For details, see "MIDI track controls" on page 1846.
- **Instrument track.** Use to control software instruments. For details, see "Instrument track controls" on page 1847.
- **Bus.** Use to create submixes, headphone mixes, and effects sends. SONAR supports both stereo buses and surround buses. For details, see "Bus controls" on page 1848.
- **Main.** Use to control the physical audio outputs of your audio interface. A main channel strip contains both a left and right output and two volume controls. For details, see "Main controls" on page 1849.

You can adjust Console view controls in the following ways:

- Click on the center of the knob and drag the mouse up or down to adjust the knob
- Click and drag a fader up or down
- Double-click the center of the knob to return it to its snap-to position

Volume and pan faders also have snap-to positions; double-click a fader's knob to return the fader to its snap-to value.

The controls and effects patch points all have tool tips associated with them. To see a description of a particular control or effect, simply rest the cursor over the item for a few seconds.

For information on using the controls in the Track view, see "Changing track settings" on page 205.

Volume, pan, bus send level and bus send pan also have snap-to positions; double-click the control to return it to its snap-to value.

The controls and effects patch points all have tool tips associated with them. To see a description of a particular control or effect, simply rest the cursor over the item for a few seconds.

See:

"Configuring the Console and Track views" on page 833

Configuring the Console and Track views

The Console and Track view can be reconfigured in a variety of ways. You can:

• Choose the tracks that you want to see

• Adjust the display of audio meters and clip indicators

• Change the number of buses

• Set control snap-to positions

• Insert new tracks

• Name tracks and buses

Note: *The Console view has additional controls to configure its appearance. See "Console view" on page 1836 for more information.*

Meters are helpful in determining the relative volumes of your audio tracks and in detecting and preventing overload. By default, the Console view displays output level meters in main out modules at all times, and displays record level meters in individual tracks whenever they are armed and have an audio input. The display of meters, however, can place a considerable load on your computer. Showing only the peak indicators, or hiding the meters entirely, can reduce the load on your computer. This may increase the number of audio tracks and real-time effects you can play back at one time.

In the Track view, there are several ways to configure which tracks are displayed.

To hide selected tracks

1. Select the tracks you want to hide.

2. Press CTRL+H.

To display only selected tracks

1. Select the tracks you want to display.

2. Press CTRL+SHIFT+H.

To show all tracks

Press SHIFT+H.

To choose the tracks that are displayed using the Track Manager

1. Click the Track view **Tracks** menu and choose **Track Manager** to open the **Track Manager** dialog box.

2. In the list, check those tracks you would like displayed in the view in which you are working, and uncheck the rest. You can use SHIFT-click, CTRL-click, or the quick select buttons to select multiple modules; press the SPACEBAR to check or uncheck all the selected modules at once. Please note that the track display selections you make in the Track view do not affect those in the Console view and vice versa.

3. Click **OK**.

To hide a bus or track

• Right-click on the module and choose **Hide Track** or **Hide Bus**.

To show or hide meters in the Track view

• Click the Track view **Options** menu, point to **Meter Options** and select one of the following options:

• **Track Record Meters.**   Displays record meters for any armed track.

• **Track Playback Meters.**   Displays playback meters.

• **Bus Meters.**   Displays meters in buses.

For more information about metering options, see "Changing the meters' display" on page 851.

To change a meter's range

• Right-click on the meter and choose a new range.

To add a bus

1. Right-click in the Bus pane (to add a bus at the end of the current buses) or over an existing bus (to add a bus before it).

2. Select **Insert Stereo Bus** or **Insert Surround Bus** from the menu that appears.

A bus appears in the Bus pane.

To delete a bus

1. Right-click in the Bus pane over an existing bus.

2. Select **Delete Bus** from the menu that appears.

The bus is deleted from the Bus pane.

> **Note:** *If you have any track or bus routed through the bus you delete, the signal will be rerouted to the deleted bus's output.*

To create a bus send in a track

1. Right-click in an empty part of the Track pane (Track view) or a track module (Console view).
2. Select **Insert Send** for a list of buses available.
3. Select a bus from the list.

To set the snap-to position of a knob or fader

1. Set the control to the desired position.
2. Right-click on the control and choose **Value > Set Snap-To=Current**.

From now on, the control returns to this position when double-clicked.

To insert a new track

1. Right-click in the Console view or on the header of a track in the Track view.
2. Choose **Insert Audio Track** or **Insert MIDI Track**.

SONAR adds a new track to the project.

To rename a track or bus

1. In the Console view, click on the module name. In the Track view double-click on the Track name.
2. Type a new name.
3. Press ENTER.

If you rename a track, the new name is copied to the Track view. If no name has been assigned to a track, the Console view and Track view display the track's number.

To link left/right faders in a Console view module

1. In the module whose faders you want to link, adjust the volume of each fader to the appropriate level.
2. Click the **Link** button 🔒.

Mixing MIDI

SONAR gives you many tools to control your MIDI mix. When your MIDI tracks sound the way you want them to, there are several ways to convert them to audio (see "Converting MIDI to audio" on page 837).

See:

"Mixing a MIDI track" on page 836

"Converting MIDI to audio" on page 837

Mixing a MIDI track

All MIDI track controls are available in the Track Inspector. A subset of all MIDI track controls are available in the Console view and Track view.

You can control the mixing and playback of a MIDI track as follows:

To do this	Do this
Add a real-time MIDI effect to the track	Right-click in the effects bin and select an effect from the list (for more information, see "Using real-time effects" on page 862)
Remove an effect	Select the effect and press DELETE or right-click and select **Delete**.
Select the output	Click the **Output** control and choose one from the list
Select the channel	Click the **Channel** button and choose one from the list
Select the bank	Click the **Bank** button and choose one from the list
Select the patch	Click the **Patch** button and choose one from the list
Set the Chorus level	Adjust the **Chorus** slider (Track Inspector only)
Set the Reverb level	Adjust the **Reverb** slider (Track Inspector only)
Mute the track	Click the **Mute** button
Solo the track	Click the **Solo** button
Arm the track for recording	Click the **Arm** button
Set the Pan level	Adjust the **Pan** fader

Table 158.

To do this	Do this
Set the Volume level	Adjust the **Volume** fader
Select the input	Click the **Input** button and choose one from the list

Table 158.

The Volume fader displays the level from a scale of 0 (minimum) to 127 (maximum). The Pan knob displays the pan value on a scale that ranges from 100% Left to 100% Right with center represented by a C.

Converting MIDI to audio

The following options cover three basic MIDI setups:

- If your MIDI tracks play back through a soft synth, use either the **File > Export > Audio** or the Track view **Tracks > Bounce to Track(s)** commands (see the procedures in "To export your soft synth tracks as Wave, MP3, or other type files" on page 816, and "To convert your soft synth tracks to new audio tracks" on page 815).

- If your MIDI tracks play back through your sound card's synthesizer, see "To convert a sound card's synth tracks to a stereo audio track" on page 837.

- If your MIDI tracks play back through external MIDI modules, simply connect their analog outputs to the inputs on your sound card, and record to new audio tracks.

To convert a sound card's synth tracks to a stereo audio track

1. Pick a destination audio track and set the **Input** field to **Stereo-(name of your sound card)**.

> **Note:** *If you have more than one sound card installed, select the one that your synth uses as an output.*

2. Arm the destination track.

3. Mute or archive any tracks that you don't want to record to the destination track.

4. If SONAR's metronome is set to use any software synth to produce a click, disable the recording metronome. To do so, click the **Record Metronome** button in the Control Bar's Transport module, or go to **Edit > Preferences > Project - Metronome** and clear the **Recording** check box.

5. Open your sound card's mixer device.

   - Windows 7: Click the Windows **Start** button and go to **Control Panel > Hardware and Sound > Volume Control**.

6. Open the sound card's recording control window (the command is probably **Options > Properties > Adjust Volume For Recording**) and make sure all check boxes below **Adjust Volume For Recording** are selected.

7. Click **OK**, and locate the slider marked **MIDI**, **Synth**, **Mixed Input**, or **What You Hear**. Check the **Select** box at the bottom, then close the window.

8. In SONAR, click the **Record** button.

SONAR records all the MIDI tracks that are assigned to the sound card synth as a stereo audio track.

After you finish recording, mute the MIDI tracks that you just recorded so you don't hear them and the new audio track at the same time.

Signa l flow

Clip

Audio clip

Clip mute

V-Vocal region

Clip fades

Clip envelopes/Clip Mute regions

Clip effects bin

Input

Hardware input   Soft Synth input

Input meter (record)

Track

Gain   0.0   Input Gain

Phase/Interleave

ProChannel

Effects bin

Playback Meter (pre fader/pre effects bin)

Pre fader sends are affected by **M**-**S** buttons unless you change the LinkPFSendMute Aud.ini option.

(M S)

Send

Send level

Send pan

Surround or Stereo Bus   Hardware out

Volume fader   Volume   0

Stereo pan or Surround pan   Pan   0% C

Playback Meter (post fader)   M S

Post fader send

Stereo bus

Input Gain   0   Input Gain

Pre fader send   Input Pan   0% C   Input pan

OutptVlm   0   Output Volume

Output P...   0% C   Output Pan

Post fader send   M S   Playback meter (post fader)

Surround bus

Input Gain   Input Gain   0

Pre fader send

Output Volume   OutptVlm   0

M S   Playback meter (post fader)

Post fader send

Hardware Outputs

You control the mixing and playback of an audio track as follows:

To do this	Do this
Add a real-time audio effect to the track	Right-click in the effects bin and select an effect from the list (for more information, see "Using real-time effects" on page 862").
Remove an effect	Select the effect and press DELETE or right-click and select **Delete.**
Send audio data from the track to a bus	Insert a send in the track controls by right-clicking in the track controls and selecting **Insert > Send > [name of bus you want the data to go to]**. Click the **FX** tab at the bottom of the Track pane, and then click the track's **Bus Enable** button so that it turns green, and set the **Bus Send Level** and **Bus Send Pan** (for more information, see "Stereo buses" on page 842").
Mute the track	Click the **Mute** button.
Solo the track	Click the **Solo** button.
Arm the track for recording	Click the **Arm** button.
Set the Pan level	Adjust the **Pan** control.
Set the Send Pan to be the same as the bus that the send feeds into	Right-click the **Send Pan** control and choose **Follow Track Pan** from the pop-up menu. This setting is only active when the send has the same interleave as the bus that the send feeds into, and is set to **Post Fader**. If enabled, the **Send Pan** control no longer affects the output.
Set the Volume level	Adjust the **Volume** fader.
Select the output	Click the drop-down arrow in the **Output** field and choose one from the list.
Select the input	Click the drop-down arrow in the **Input** field and choose one from the list.

Table 159.

SONAR displays volume in dB (decibels). When adjusting the volume or bus send level controls, a value of 0 dB indicates full signal strength; positive values, up to 6 dB, indicate a signal gain; negative values indicate an attenuated signal. When adjusting the Pan control, the value is displayed on a scale that ranges from 100%L (hard left) 100%R (hard right).

See also:

"Sidechaining signal flow" on page 841

"External Insert signal flow" on page 878

Sidechaining signal flow
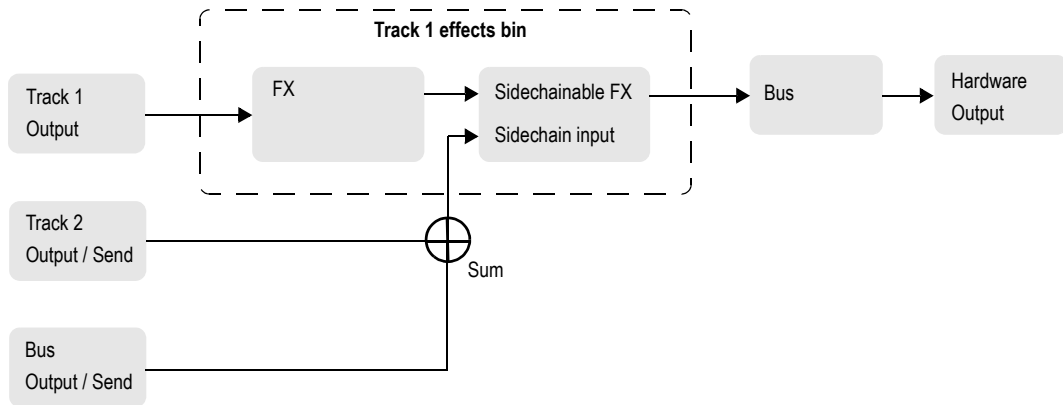
See also:

"Sidechaining" on page 872

"Signa l flow" on page 839

"External Insert signal flow" on page 878

Routing and mixing digital audio

Any audio track can be tapped, before or after the track volume control, and sent to one or more buses. A bus can tap any number of audio tracks. Each track's data passes through the track's send level knob on its way to the bus. This is shown in the following figure.
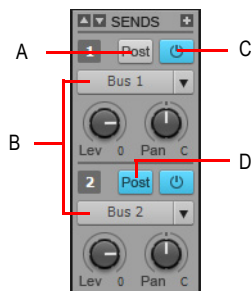
*A. Pre-fader: output level to Bus 1 is not affected by the track's volume fader **B.** This track is routed to Bus 1 and Bus 2 **C.** Send enable button: must be lit to send track data to bus **D.** Post-fader: track's volume fader controls output level to Bus 2*

The audio in each bus is processed by the input gain and pan controls (main output buses don't have these controls), then processed by any real-time effects you have patched, sent through the bus output level and pan controls, and then sent to the designated main out, in stereo. You can also insert a send control on a bus, and send the bus signal to another bus, or route the output of a bus to another bus.

At each main out, all audio data from audio tracks and buses that were routed to that main are mixed together. Finally, the data passes through each main's master volume fader.

See:

Stereo buses

Buses are useful for mixing together different audio tracks (in stereo) and applying effects to the mix. You can mix the tracks at different volume levels by adjusting each track's bus send level. Buses output to either other buses or to a main out.

You control the bus as follows:

To do this	Do this
Send audio data from an audio track to the bus	In an audio track, press the **Bus Send Enable** button corresponding to the bus, or choose the bus as an output for the track. If the track doesn't have a Send module, you can insert one by right-clicking the track and choosing **Insert > Send > [name of bus you want the data to go to]**.
Send audio data from a bus to another bus	If the bus doesn't have a Send module, you can insert one by right-clicking the bus and choosing **Insert > Send > [name of bus you want the data to go to]**. Then click the **Bus Send Enable** button so that it's lit, and adjust the **Bus Send Level** and **Bus Send Pan**.
Set the level of the audio data sent to the bus	In an audio track, set the **Bus Send Level** corresponding to the bus, or volume fader if the output is to the bus
Set the pan of the audio data sent to the bus	Adjust the **Bus Send Pan** knob
Set the input level to the bus	Adjust the **Input gain** on the bus itself
Set the input panning to the bus	Adjust the **Input pan** on the bus itself
Display the waveform of the audio that's flowing through the bus	Enable the bus' **Waveform Preview** button

Table 160.

To do this	Do this
Add a real-time audio effect to the bus	Right-click in the effects bin and select an effect from the list (for more information, see "Using real-time effects" on page 862)
Remove an effect	Select the effect and press DELETE, or right-click and choose **Delete**
Set the output level	Adjust the **Output volume**
Set the output panning	Adjust the **Pan** setting
Set the Send Pan to be the same as the bus that the bus feeds into	Right-click the **Send Pan** control and choose **Follow Bus Pan** from the pop-up menu. This setting is only active when the send has the same interleave as the bus it feeds into, and is set to **Post Fader**. If enabled, the **Send Pan** control no longer affects the output.
Select the output	Click the **Output** button and choose one from the list

Table 160.

For more information about using buses and sends, see www.cakewalk.com/Tips/MixMast/AuxBus.aspx.

Surround buses (SONAR Producer and Studio only)

Surround buses are useful for mixing and adding effects to create a surround mix.

To patch a track through a bus

1. Open the Console view (**Views > Console View**) or the Track Inspector (**Views > Inspector**).

2. If you want to add effects to the bus, right-click in the effects bin of a bus (if it is not in use already) and choose an effect from the effects pop-up menu. (If you are working in the Track view, you may first need to display the Bus pane by clicking the **Show/Hide Bus Pane** button located at the bottom of the Track view.)

   The name of the effect you have chosen appears in the bus effects bin.

3. Set the effect's parameters and close it.

4. Repeat steps 2 and 3 for any additional effects you want to use.

5. In the Console view or Track Inspector, select the channel strip that you want to patch through the bus, then do the following:

   • Drag the **Bus Send Level** control for the bus to the approximate level you want.

   • Drag the **Bus Send Pan** to the approximate setting you want.

   • Click the **Bus Enable** button for the appropriate bus.

6. Repeat step 5 for all the tracks you want to patch through the bus.

7. In the bus, adjust the **Input Gain** and **Output Volume** controls to the approximate level you want.

8. In the bus, drag the **Input Pan** and **Output Pan** controls to the approximate positions you want.

9. Play your tracks and adjust the **Send Level** controls, the **Pan** controls, etc.

To mute or solo a bus

Each bus has a **Mute** button and a **Solo** button. These controls act like the **Mute** and **Solo** buttons in a track, but they affect all the signal routed through the bus.

1. Open the Track view, Track Inspector or Console view.

2. Click the **Mute** or **Solo button** in the bus you want to mute or solo.

Bus selection

As with tracks, buses can be selected in both the Track View and the Console View. The current selection can contain a mixture of tracks and buses.

Bus selection is useful if you want to cut/copy/paste automation data in a bus, or delete multiple buses.

Track selection controls are labeled with track numbers, while bus selection controls are labeled with letters (A-Z, AA-AZ, etc.).

Figure 253. *Bus selection control*

A. Bus letter

To do this	Do this
Select a bus	Click the bus letter in the Track view or Console view. The bus is selected, and all other buses—except the current bus—are deselected. When a bus is selected, both the bus letter and all the data in the bus appear highlighted.
Select several adjacent buses	Click the bus letter for the first bus in the group, drag the mouse to the last bus letter in the group, and release the mouse button.
Select/deselect all buses	Double-click a bus letter.
Add or remove a single bus from the selection	Hold the SHIFT key and click the bus letter to add it to the selection; hold the CTRL key and click the bus letter to toggle its selection status.
Select all tracks and/or buses that are assigned to a bus.	Hold down the ALT key and click the bus letter.

Table 161.

Select tracks/buses that are assigned to a specific bus

You can quickly select all tracks and buses that are routed to a specific bus (via outputs or sends). To do so, hold down the ALT key and click the bus' Select control in the Track view or Console view.

To display the audio waveform of a bus

• Enable the bus' **Waveform Preview** button . This displays the waveform of the audio that is flowing through the bus.

Main outs

Each enabled hardware channel has a main out channel strip in the Console view. Main outs are the final destination for all of your audio in SONAR. Main outs accept input from both tracks and buses.

Main outs contain both a left channel and a right channel Volume fader, which allows you to adjust the level of each channel independently. You can link the two faders to move them as a group.

Figure 254. *Track Inspector controls for mains*
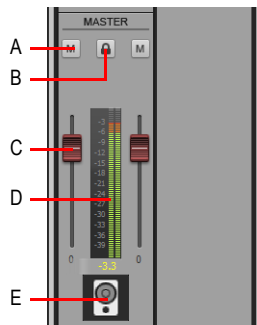
A. Mute B. Link channels C. Volume D. Meter E. Icon

Insert Send Assistant

The Insert Send Assistant makes it fast and easy to create headphone mixes, effect buses and insert sends to new or existing buses.

To open the Insert Send Assistant

- Right-click on a track or bus and select **Insert Send > Insert Send Assistant** from the pop-up menu.

    The **Insert Send Assistant** dialog box opens.

Figure 255. *The **Insert Send Assistant** dialog*
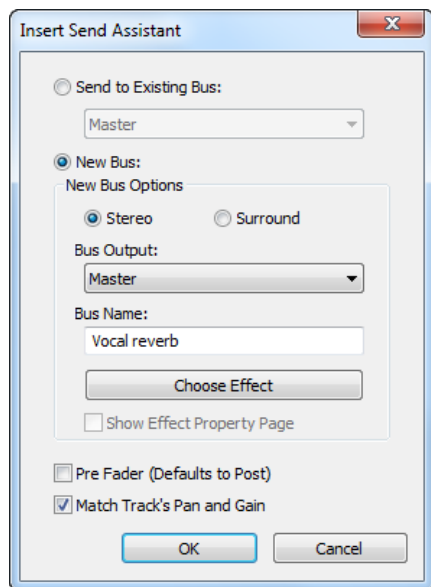
The **Insert Send Assistant** dialog box has the following options:

Send to Existing Bus. This option lets you assign a new send to an existing bus in the current project. Select the desired bus from the drop-down list.

The **New Bus Options** section is unavailable when **Send to Existing Bus** is selected.

New Bus. This option lets you assign a new send to a new stereo or surround bus. When selected, you can use the **New Bus Options** section to specify stereo or surround, the bus name and other settings (see "New bus options" on page 847).

> **Note:** *Surround buses are only supported in SONAR Producer and Studio.*

Pre Fader.   When **Pre Fader** is selected, the send signal is *before* the channel volume fader. As a result, the send level going to the bus does not change when the channel fader changes. **Pre Fader** is preferred when you want to create separate mixes, such as unique headphone mixes for different performers. By default, the send signal is post fader and comes *after* the channel volume fader. As a result, the send level going to the bus changes when the channel fader changes. Use post fader if you want to create an effect bus. Doing so allows you to maintain a consistent balance between the "wet" and "dry" signals as you adjust the channel fader.

Match Track's Gain and Pan.   When **Match Track's Pan and Gain** is selected, the newly created send will have Gain and Pan settings that match those of the strip's Main Gain and Pan. As a result, the headphone mix matches the main mix, and from there you can adjust the headphone mix as desired.

> **Note:** *The **Match Track's Pan and Gain** setting does not affect sends that are assigned to surround buses.*

New bus options

When you select **New Bus**, the following settings can be configured:

Stereo.   This option lets you assign a new send to a new stereo bus.

Surround.   This option lets you assign a new send to a new surround bus.

Bus Output.   Specify the desired output for the new bus. The drop-down list shows all available output destinations.

Bus Name.   Specify the desired name for the new bus. This name will be shown in the Track view and Console view.

Choose Effect.   Click the button to choose the desired effect plug-in to insert on the new bus. When an effect has been selected, the plug-in name is displayed on the button face.

Show Effect Property Page.   When **Show Effect Property Page** is selected, the chosen effect plug-in's user interface (UI) appears when you click **OK** to close the **Insert Send Assistant** dialog box.

To insert a send to an existing bus

1. Right-click on a track or bus and select **Insert Send > Insert Send Assistant** from the pop-up menu.

   The **Insert Send Assistant** dialog box opens.

2. Click **Send to Existing Bus** and select the desired bus from the drop-down list.

3. Click **OK** to close the **Insert Send Assistant** dialog box.

   A new send is inserted and assigned to the specified bus.

To insert a send to a new stereo bus

1. Right-click on a track or bus and select **Insert Send > Insert Send Assistant** from the pop-up menu.

   The **Insert Send Assistant** dialog box opens.

2. Under **New Bus Options**, select **Stereo** and specify any other desired options (see "New bus options" on page 847).

3. Click **OK** to close the **Insert Send Assistant** dialog box.

   A new send is inserted and assigned to the new bus.

To insert a send to a new surround bus

1. Right-click on a track or bus and select **Insert Send > Insert Send Assistant** from the pop-up menu.

   The **Insert Send Assistant** dialog box opens.

2. Under **New Bus Options**, select **Surround** and specify any other desired options (see "New bus options" on page 847).

3. Click **OK** to close the **Insert Send Assistant** dialog box.

   A new send is inserted and assigned to the new surround bus.

To insert a send to a new effect bus

1. Right-click on a track or bus and select **Insert Send > Insert Send Assistant** from the pop-up menu.

   The **Insert Send Assistant** dialog box opens.

2. Under **New Bus Options**, select **Stereo** or **Surround**.

3. Click **Choose Effect** and choose the desired effect plug-in.

   The chosen effect plug-in name is display on the button face.

4. Make sure **Pre Fader** is not selected.

5. [Optional] If you want to see the effects UI, select the **Show Effects Property Page** check box.

6. Specify the desired output in the **Bus Output** list.

7. Click **OK** to close the **Insert Send Assistant** dialog box.

   A new send is inserted and assigned to the new bus. The new bus contains the chosen effect plug-in.

To insert a send on multiple tracks simultaneously

1. Select all the tracks that you want to insert a send on.

2. Right-click any selected track and select **Insert Send > Insert Send Assistant** from the pop-up menu.

   The **Insert Send Assistant** dialog box opens.

3. Under **New Bus Options**, select **Stereo** or **Surround** and specify any other desired options (see "New bus options" on page 847).

4. Click **OK** to close the **Insert Send Assistant** dialog box.

   A new send is inserted on all selected tracks and assigned to the new bus.

See:

"Audio track parameters" on page 205

Metering

The Console view, Track views and Track Inspector all have meters to measure playback level, record level, bus output level, and main output level. You can configure the meters differently in each view, if you want.

The responsiveness of your record meters (which also measure input monitoring) is dependent upon the latency setting in **Edit > Preferences > Audio - Driver Settings** and the settings **Edit > Preferences > Customization - Audio Meters**. With higher latency settings the meters may appear sluggish.

There are three basic things you should know about meters:

• What the meters measure

• How to show or hide different kinds of meters

• How to choose display options for each kind of meter

> **Note:** *Metering uses significant amounts of your computer's processing power, especially RMS metering. If you need to free up resources, turning off metering where you don't absolutely need it helps. Using peak metering on tracks and peak plus RMS metering on the main out is a good option. To **disable all metering**, turn off metering in **both** the Track view and Console view.*

See:

"What the meters measure" on page 850

"Hiding and showing meters" on page 850

"Changing the meters' display" on page 851

What the meters measure

The following table summarizes what each kind of meter measures.

Kind of meter	What it measures
Record	The level of the instrument listed as an input for the track you are monitoring—the track must be armed to enable the meter
Playback	A playback meter measures the playback level of any pre-existing data in the track you are monitoring, either before or after the track faders, depending on what display options you choose
Main outs	The level of the signal output by each main out.
Buses	The level of the output signal the bus is sending back from the effects.

Table 162.

See also:

Hiding and showing meters

The display of meters in the Track view, Track Inspector and Console view can be configured independently of each other.

To show/hide meters in the Track view

Click the Track view **Options** menu, point to **Meter Options** and select **Track Record Meters**, Track **Playback Meters** or **Bus Meters**.

To show/hide meters in the Track Inspector

Click the **Display** button at the bottom of the Track Inspector and choose **Volume**. Meters and Volume faders belong to the same Inspector module.

To show/hide meters in the Console view

Click the Console view **Modules** menu and choose **Volume**. Meters and Volume faders belong to the same Console view module.

Note: *If you want to conserve the maximum amount of your CPU's resources, turn off all metering in the Track view, Track Inspector and Console view.*

To show or hide individual meters on tracks or buses

• Right-click the track or bus to display the pop-up menu, and check or uncheck the appropriate show meter option.

See also:

Changing the meters' display

You control the range and kind of units that the various meters display in the Track view, Track Inspector and Console view. The meters in each view can be configured independently.

You also have the option of using segmented or non-segmented meters, and you can customize the color of non-segmented meters.

To configure Track view meters

Click the Track view **Options** menu, point to **Meter Options** and select the desired settings on the submenu.

To configure Track Inspector meters

Click the **Display** button at the bottom of the Track Inspector, point to **Module Options > Meters** and select the desired settings on the submenu.

To configure Console view meters

Click the Console view **Options** menu, point to **Meters** and select the desired settings on the submenu.

The following meter settings are available:

Menu option	What it does
Horizontal Meters (Track view only)	Choose this option to display the Track view meters horizontally instead of vertically.
Vertical Meters (Track view only)	Choose this option to display the Track view meters vertically instead of horizontally.
Show Numeric Peak Values (Track view only)	Choose this option to display peak values in each track header next to the **Input Echo** button (see also "Peak markers" on page 856)
Show Track Peak Markers (Track view only)	See "Peak markers" on page 856)

Table 163.

Menu option	What it does
Show Bus Peak Markers (Track view only)	See "Peak markers" on page 856)
Reset All Meters	If a track clips, its meter shows a red clipping indicator. Click this button to reset the clipping indicator to its non-clipping state.
Peak	Choosing this option causes the meter to display the highest amplitude in the signal that occurs in a complete cycle of a frequency.
RMS	Choosing this option causes the meter to display more of an average of the amplitudes that occur in a complete cycle of a frequency. RMS, or Root-Mean-Square, is a little over seventy percent of peak level.
Peak + RMS	Choosing this option causes the meter to display both the RMS and peak levels. The RMS level is displayed by the solid bar on the left side of the meter, and the peak level is displayed as a small line that follows the RMS level just to the right of it.
Pre Fader/Post Fader (This option is for playback and bus meters only)	Choose Pre Fader or Post Fader to measure the playback level either before or after the track's or bus' volume fader.
Pre Fader/Post FX (This option is for the buses only)	Choose Pre Fader/Post FX to measure the bus volume before the fader, but after any real-time effects.
-12 dB....-90 dB	Choosing one of these numbers sets the scale of the meter to a certain range of dB. For example, choosing -90 dB sets the range of measurement of that meter to 90 dB. **Note:** You can also change the scale of a meter by right-clicking the meter to display a pop-up menu and choosing a new dB range.
Show Labels (Track view only)	Clicking this option hides or shows the dB markings on the meter. Hiding the markings shrinks the meter significantly, saving space.
Hold Peaks	Choosing this option causes the meter to display a small vertical line (the peak marker) that shows the peak level and then decays until a new peak is reached.
Lock Peaks	Choosing this option causes the meter to lock the peak marker at the highest level, until a higher level occurs.

Table 163.

Enabling mono on a bus/main will affect upstream meters

If you make a bus or main out mono by toggling its Mono/Stereo switch, any "upstream" meters—that is, meters on any tracks or buses that are assigned to the mono bus/main out—from the bus/main out will also display as mono.

Note: *This only affects the meter display, not any audio that is bounced or exported.*

See also:

To show vertical or horizontal meters in the Track view

• Click the Track view **Options** menu, point to **Meter Options** and select **Horizontal Meters** or **Vertical Meters**.

To customize meter colors

1. Go to **Edit > Preferences > Customization - Colors**.
2. In the **Color Category** list, select **Meters**.
3. Choose **VU LO Level, VU HI Level**, or **VU Tick Marks**, and select the desired color.

Note: *Custom meter colors are only available when using non-segmented meters.*

Segmented and non-segmented meters

You can display meters as segmented (the default) or non-segmented meters.
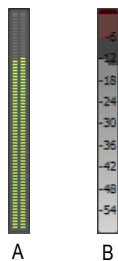
A. Segmented meter B. Non-segmented meter

To display segmented or non-segmented meters

1. Go to **Edit > Preferences > Customization - Audio Meters**.
2. Under **Segmented Meters**, select **Track view** or **Console view** to show segmented meters, or clear the check boxes to show non-segmented meters.

For more information, see "Customization - Colors" on page 1707.

Changing the meters' performance

There are two major factors that determine the performance of meters in SONAR. One is audio latency which you can adjust, within the limits of your audio hardware drivers, in **Edit > Preferences > Audio - Driver Settings** . The second is the settings in **Edit > Preferences > Customization - Audio Meters**.

SONAR has configurable meter ballistics that allow you to adjust the rise and fall times of both the RMS and Peak Meters. Out of the box, SONAR ships with industry-standard settings that mimic meter ballistics for common hardware consoles.

To adjust the meter performance, go to **Edit > Preferences > Customization - Audio Meters** and follow these guidelines:

To do this	Do this
Increase or decrease meter refresh rates	Adjust the **Refresh rate** field. Valid values are from 25 to 250 milliseconds.
Change the decay rate (the amount of time the meter display stays at its peak)	Adjust the **Decay Rate** value. Valid values are from 1 to 150 milliseconds.
Increase or decrease the amount of time the meter displays a peak value	Adjust the **Hold Time** value. Valid values are from 0 to 5000 milliseconds.
Adjust rise and fall times	Adjust the **Rise** or **Fall** settings for **RMS** or **Peak**. Valid **Rise** values are from 0 to 1000 milliseconds. Valid **Fall** values are from 0 to 2500 milliseconds.

Table 164.

Here are the default values for the various settings:

- Refresh Rate = 40 msec
- Peak Hold – Decay Rate = 50 msec
- Peak Hold – Hold Time = 750 msec
- RMS Rise = 300 msec
- RMS Fall = 300 msec
- Peak Rise = 0 msec

- Peak Fall = 1000 msec

See also:

MIDI activity indicators

Each MIDI track displays a MIDI playback meter in the Track view, Track Inspector and Console view. The MIDI meter consists of two sections:

- **MIDI Activity Indicator.**   The MIDI Activity Indicator lights up whenever a MIDI event is encountered in the track.
- **MIDI Velocity Meter.**   The MIDI Velocity Meter shows the greatest current note velocity encountered during playback.
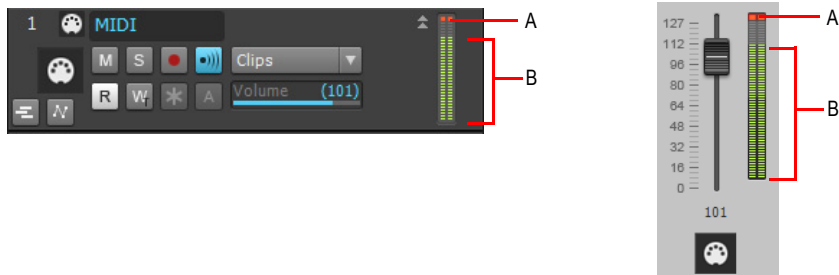
A. MIDI Activity Indicator B. MIDI Velocity Meter

Audio and MIDI meters can be either vertical or horizontal in the Track view. For more information, see

Peak markers

Buses and audio tracks have a feature called Peak Markers. A Peak Marker in each audio track or bus moves along in the Clips pane just behind the Now Time cursor displaying the highest peak found during playback. Peak Markers appear in two different colors: one color if the peak is below 0 dB, and a different color if the peak is above 0dB. By default, peaks below 0dB will be green, and peaks above 0dB will be red. Colors for both Peak Markers and their text fields are configurable in **Edit > Preferences > Customization - Colors**.
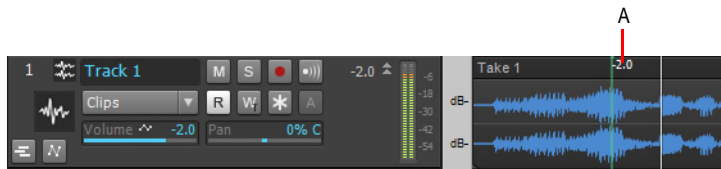
A. *Peak marker*

To hide or show peak markers globally

- Click the Track view **Options** menu, point to **Meter Options** and select **Show Track Peak Markers** or **Show Bus Peak Markers**.

To hide or show peak markers on an individual track or bus

- Right-click the track or bus, and choose **Show Peak Marker** from the pop-up menu.

To jump to a peak marker

- Right-click the numeric peak display in the track/bus header strip, and choose **Go To Peak** from the context menu (see the following figure). Doing so will center the peak location and Now time in the Clips pane. This is useful because a Peak Marker may be offscreen.
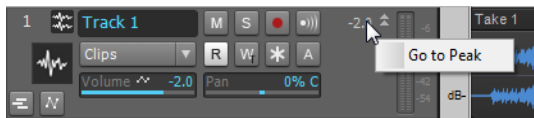
To hide or show the Numeric Peak display

- Click the Track view **Options** menu, point to **Meter Options** and select **Show Numeric Peak Values**.

To clear peak markers from a track

- Double-click the meter.

Waveform preview for buses and synth tracks

You can choose to display a waveform for the audio output of a bus or synth track. When you enable the display function, the amplitude of a bus' or synth track's audio signal is graphed in real time as a waveform. The waveform turns red wherever clipping is occurring. Waveform preview allows you to visualize a mix and verify levels over the duration of a project, easily detecting peaks and other level problems that may require attention. You can choose to display Peak Markers if you want to (see "Peak markers" on page 856 for more information). If you change the volume of the audio signal and replay the project, the waveform changes to reflect the new bus or synth track volume.

Each bus or synth track has a **Waveform Preview** button ![button], which allows you to enable/disable waveforms display on an individual basis. By default, each button is turned off.

You can change the color of the waveform preview by choosing a color for **Waveform Preview** in **Edit > Preferences > Customization - Colors**.

To enable/disable waveform preview on a bus or synth track

- For buses, find the desired bus in the Bus pane of the Track view, and click the bus' **Waveform Preview** button ![button].

- For synth tracks, find the desired synth track in the Track view, and click the track's **Waveform Preview** button ![button].
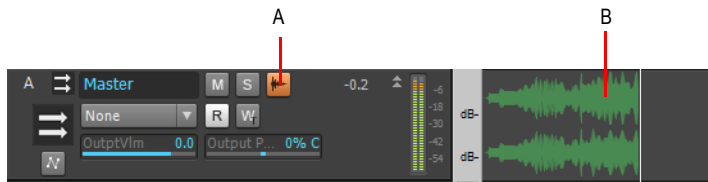
A. *Waveform Preview button in Track view* **B.** *Waveform Preview*

Freeze tracks and synths

The Freeze feature allows you to temporarily bounce your track, including soft synths and effects, to reduce the amount of CPU power needed. The Freeze feature also works for synths patched in the Synth Rack.

The following are the available commands for track freezing:

• **Freeze Track.** Bounces the audio in the track to a new audio clip or clips, applies any effects, and disables the effects bin.

• **Unfreeze Track.** Discards the bounced audio, restores the original audio to the way it was before the last **Freeze** or **Quick Freeze** command, and enables the effects bin.

• **Quick Unfreeze Track.** Hides and mutes the bounced audio, restores the original audio to the way it was before the last freeze or quick freeze command, and enables the effects bin. Bounced audio is retained, however, and toggling between **Quick Freeze** and **Quick Unfreeze** should be instantaneous.

• **Quick Freeze Track.** Only available after a **Quick Unfreeze**, the **Quick Freeze** function redisplays and unmutes the bounced audio instantaneously and disables the effects bin.

The following are the available commands for synth freezing:

• **Freeze Synth.** Audio from a soft synth is bounced and placed on the synth's track. Output from the synth is disabled, as is the effects bin on the synth track.

• **Unfreeze Synth.** Discards bounced audio, enables the synth and track effects bin. Bounced audio is discarded, and will be re-bounced if you choose **Freeze** again.

• **Quick Unfreeze Synth.** Hides and mutes the bounced audio, enables the synth and track effects bin. Bounced audio is retained, and toggling between **Quick Freeze** and **Quick Unfreeze** should be instantaneous.

• **Quick Freeze Synth.** Only available after a **Quick Unfreeze**, the **Quick Freeze** function redisplays and unmutes the bounced audio instantaneously, disables the synth, and any effects on the synth track.

Note 1: *An **Unfreeze** or **Quick Unfreeze** command restores the audio on a track to the way it was before the last **Freeze** or **Quick Freeze** command. Any editing you do to a frozen track is discarded when you **Unfreeze** or **Quick Unfreeze** the track.*

Note 2: *You control the bit depth of all rendering operations (bouncing, freezing, applying effects) in **Edit > Preferences > File - Audio Data**, in the **Render Bit Depth** field. The default value of **32** is the best for most situations. See "Bit depths for rendering audio" on page 1187 for more information.*

To Freeze a track

Do one of the following:

• In the Track view, click the track's **Freeze** button ✳.

• Right-click on a track and select **Freeze > Freeze Track** from the menu that appears.

SONAR bounces the audio in the track to a new audio clip or clips, applies any effects, and disables the effects bin.

To Unfreeze a track

Do one of the following:

• In the Track view, click the track's **Freeze** button ✳.

• Right-click on a track and select **Freeze > Unfreeze Track** from the menu that appears.

SONAR discards the bounced audio, restores the original audio, and enables the effects bin. Audio will be re-bounced if **Freeze** is chosen again.

To do a Quick Unfreeze of a track

Do one of the following:

• Hold down the SHIFT key and click the track's **Freeze** button ✳.

• Right-click on a frozen track and select **Freeze > Quick Unfreeze Track** from the menu that appears.

SONAR hides and mutes the bounced audio, restores the original audio, and enables the effects bin. Bounced audio is retained, however, and toggling between **Quick Freeze** and **Quick Unfreeze** should be instantaneous.

To Quick Freeze a track

Do one of the following:

• Click the track's **Freeze** button ✳.

• Right-click on a track that you did a **Quick Unfreeze** on and select **Freeze > Quick Freeze Track** from the menu that appears.

Only available after a **Quick Unfreeze**, the **Quick Freeze** function redisplays and unmutes the bounced audio instantaneously

To Freeze a soft synth

Do one of the following:

- In the Track view, click any associated track's **Freeze** button ✳.
- Right-click a synth track or a synth's MIDI track, and choose **Freeze > Freeze Synth** from the menu that appears.
- In the Synth Rack (**Synth** tab in the Browser), click the **Freeze/Unfreeze** button ✳.

SONAR bounces the synth's audio data to the synth track. SONAR disables the synth's output, and disables the effects bin on the synth track.

> **Note 1:** *If a soft synth has been inserted to an audio track's effects bin, the **Freeze/Unfreeze** button is not present in the Synth Rack for that synth. To freeze that synth, right-click the track or the synth's MIDI track and choose **Freeze > Freeze Synth** from the menu that appears.*

> **Note 2:** *A MIDI track can only be frozen if it is routed to a software instrument.*

To Unfreeze a synth

Do one of the following:

- In the Track view, click any associated track's **Freeze** button ✳.
- Right-click a synth MIDI or audio track, and choose **Freeze > Unfreeze Synth** from the menu that appears.
- In the Synth Rack, click the **Freeze/Unfreeze** button ✳, and choose **Freeze > Unfreeze Synth** from the menu that appears.

SONAR discards bounced audio, enables the synth and the synth audio track's effects bin. SONAR will be re-bounce the audio if you choose Freeze again.

To do a Quick Unfreeze of a synth

Do one of the following:

- Hold down the SHIFT key and click any associated track's **Freeze** button ✳.
- Right-click a frozen synth MIDI or audio track, and choose **Freeze > Quick Unfreeze Synth** from the menu that appears.
- In the Synth Rack, click the **Freeze/Unfreeze** button ✳, and choose **Freeze > Quick Unfreeze Synth** from the menu that appears.

SONAR hides and mutes the bounced audio, enables the synth and track effects bin. Bounced audio is retained, and toggling between **Quick Freeze** and **Quick Unfreeze** should be instantaneous.

To Quick Freeze a synth

Do one of the following:

• Click any associated track's **Freeze** button ✳.

• Right-click a quick unfrozen synth track or synth MIDI track, and choose **Freeze > Quick Freeze Synth** from the menu that appears.

• In the Synth Rack, click the **Freeze/Unfreeze** button ✳, and choose **Freeze > Quick Freeze Synth** from the menu that appears.

Only available after a **Quick Unfreeze**, the **Quick Freeze** command redisplays and unmutes the bounced audio instantaneously, disables the synth, and any effects on the synth track.

To set Freeze options

Do one of the following to open the **Freeze Options** dialog:

• In the Track view, right-click any track's **Freeze** button ✳.

• Right-click an audio or synth track, and choose **Freeze > Freeze Options** from the menu that appears.

• In the Synth Rack, click the **Freeze/Unfreeze** button ✳, and choose **Freeze Options** from the menu that appears.

  Choose options in the **Freeze Options** dialog box. For help choosing options, click the **Help** button in the dialog box.

💡 **Tip:** *All **Freeze** commands are also available in the **Track** menu.*

💡 **Tip:** *To show or hide the **Archive** and **Freeze** buttons in the Track view, open the Track Control Manager and specify the visibility of the Track State group. For details, see "Track Control Manager" on page 1771.*

Using real-time effects

You can use plug-in effects non-destructively, in real time (to apply effects offline, see "Applying audio effects" on page 913), from the Track view, Track Inspector and Console view. You can also hear your plug-in effects in real time on any live instruments you are recording—just make sure Input Monitoring is enabled (see "Input monitoring" on page 278). You can also insert effects directly on clips (see "Effects on clips" on page 870).

For example, suppose you want to add a reverb effect to an audio track containing a recorded violin solo. You could do it in two different ways:

- **Destructive.** The digital audio data itself is modified. Although this may be exactly what you want, it does limit your options. If you want to modify the effect parameters slightly or to remove the effect and try a different effect, you must use the **Undo** command, or revert to a saved copy of the original data.

- **Non-destructive (real-time).** The digital audio data in your track is not changed but simply altered on the fly during playback. This means you can experiment with effects parameters, bypass effects, or remove them entirely at any time. Since most effects require complex numeric calculations, real-time effects processing puts a heavy load on your computer's CPU. If you use too many effects, the CPU will not be able to keep up and playback will sound choppy and disconnected.

You can also apply real-time audio effects to a submix in a bus. For example, rather than patching separate reverb effects in each of several guitar tracks, you can mix the guitar tracks together in a bus and apply a single reverb effect to the submix. This makes much more efficient use of CPU time. Patching effects on a bus also opens up new creative possibilities.

There are several reasons why you might want to apply effects offline (destructively):

- If you want to apply more effects than your CPU can handle, applying some of the effects offline will reduce CPU usage during playback.

- If you want to apply effects to an individual audio clip, rather than the whole track, it is simpler to do so using offline effects.

The **File > Export > Audio** command, allows you to apply real-time effects when you export, so you do not need to apply your effects destructively or use the Track view **Tracks > Bounce to Track(s)** command to prepare the tracks beforehand. For information about exporting audio, see "Preparing audio for distribution" on page 926.

All plug-in effects and soft synths have a Preset window you can use to save and recall your favorite settings for those plug-ins.

See:

"Effects parameters" on page 863

"How to use real-time effects" on page 863

"Applying audio effects" on page 913

Effects parameters

Each effect in an effects patch point has its own independent set of parameter values. For example, you can apply a short reverb in one track and a long reverb in another track. The dialog boxes for real-time effects contain the same parameters as the offline effects, though there are a few differences:

- You can adjust the parameters while playback is in progress, so there is no need for an **Audition** button.
- For audio effects, because mixing is handled through the Track view or Console view, there is no Mixing tab.
- You do not need to click **OK** for the effect to be applied.

Refer to the sections "MIDI effects (MIDI plug-ins)" on page 749 and "Audio effects (audio plug-ins)" on page 797 for descriptions of the effects and their parameters.

How to use real-time effects

You can patch effects into tracks and buses in the Track view, Track Inspector and Console view. After you patch one or more effects into an effects bin, you can reorder the effects, delete them, or add new ones.
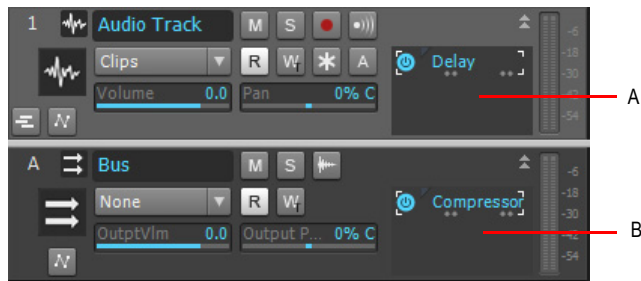
A. An effects bin in a track in the Track view B. An effects bin in a bus in the Track view

A. *An effects bin in a track in the Console view* **B.** *An effects bin in a bus in the Console view*

Here's how to insert and configure effects:

To do this	Do this
Add a real-time effect to a MIDI track, audio track, synth track or bus.	Right-click in the effects bin of the track or bus you want to add the effect to, and select an effect from the pop-up menu.
Change the order in which effects are used.	Drag an effect up or down in the effects bin.
Edit an effect's parameters.	Double-click on the effect to open the effect's dialog box.
Move an effect to a different bin.	Drag the effect to another effects bin.
Copy an effect to a different bin.	Hold down the CTRL key and drag the effect to another effects bin.
Replace an effect.	Right-click an existing effect to insert a new effect, or hold down the ALT key an drag an effect on top of an existing effect. SONAR will attemp to remap matching parameter names.
Delete an effect.	Right-click the name of the effect, and choose **Delete** from the pop-up menu.
Send all keystrokes to a plug-in that has focus.	Enable the **Keystroke** button ⌨ in the plug-in's property page.
Use a preset.	See "Presets and property pages" on page 866 for more information.

Table 165.

When you place an effect in an effects bin, an abbreviated name is used to describe the effect. Sometimes the limited space makes it impossible to identify the effect. If this occurs, simply rest the cursor over the effect for a second or two, and a tooltip will pop up to display the full name of the effect.

Effects in effects bins display "ticks" that tell you whether the effect is outputting a mono, stereo, or surround signal:

A. Mono indicator

A. Stereo indicator

A. Surround indicator (in 5.1 mode)

If you're using the double-precision audio engine, plug-ins that can send and receive 64-bit data display doubled ticks.
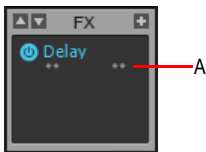
A. Stereo indicator in 64-bit mode

See also:

"Using the per-track EQ (Studio and Essential only)" on page 911.

Look-ahead processing at high latencies

Some plug-ins, such as the Sonitus:fx Multiband and other dynamics processors, use a look-ahead buffer mechanism, which results in a short delay being introduced to the output signal when the plug-in is used in real-time. SONAR's automatic delay compensation (ADC) takes care of any delays, but you may experience some anomalies when using such a plug-in to process the output of a DXi-especially if SONAR is configured to use a high mixing latency. The symptoms include audio that appears to drop out, and/or missed notes (from the MIDI track that is assigned to the DXi). Again, this is more prone to occur with higher latency settings.

This may happen if SONAR doesn't pump ahead enough MIDI data to compensate for ADC. To fix this problem, go to **Edit > Preferences > MIDI - Playback and Recording** and increase the **Prepare Using [n] Millisecond Buffers** value.

Presets and property pages

Presets are a way to store property page settings so that you can recall the exact same group of settings again in the future. Effects and soft synths use presets, and so do some other functions you'll find in certain dialogs.

You manage presets with the **Presets** section that appears at the top of a plug-in property page, and the buttons next to the **Presets** box.
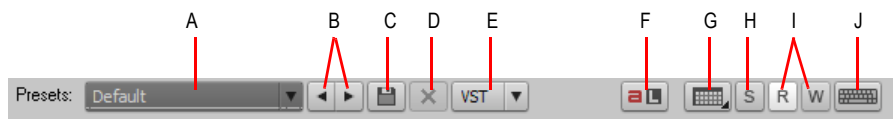
A. Presets menu displays the name of the current preset B. Previous/Next Preset buttons C. Save Preset button D. Delete Preset button E. The VST button preset controls appear only on VST plug-ins F. ACT Learn button G. Open view H. Solo button I. Automation read and write buttons J. Send all keystrokes to this plug-in button

The **Presets** menu displays presets in the following order:

- **Most Recently Used presets.**   These appear at the top of the **Presets** menu, up to 8 in number, and followed by a horizontal line to separate this section from the next section of the menu.

- **VST factory presets.**   Any VST factory presets appear below the **Most Recently Used** section, and are also followed by a horizontal separator line.

- **Cakewalk and user presets.**   These appear at the bottom of the **Presets** menu.

The following table tells you how to use presets.

To do this	Do this
Load a preset	Do either of the following: • Click the drop-down arrow on the right side of the **Presets** menu, and click the name of the preset in the drop-down menu. • Click the left or right side of the **Prev/Next** button to load the previous or next preset in the menu. You can click the button repeatedly to step through the menu.
Save the current settings as a preset	If you're using: • **A VST factory preset.** These can not be deleted or overwritten (the **Delete** button appears greyed-out). If you want to change one of these, double-click the name, enter a new name, and click the **Save** button. **Note**: VST presets can be stored by saving a .fxp file (see the following instructions). • **A Cakewalk or user preset.** Either save these under a new name: double-click the name, enter a new name, and click the **Save** button, or just click the **Save** button to overwrite the preset with current values.
Delete a preset	VST factory presets can not be deleted. If you're not using a VST factory preset, simply display the preset name in the Presets window, and then click the **Delete** button.
Load or save a .fxp file	Use the **Load Preset** or **Save Preset** commands, respectively, in the **VST** button drop-down menu
Load or save a .fxb file	Use the **Load Bank** or **Save Bank** commands, respectively, in the **VST** button drop-down menu

Table 166.

The Presets window also has a feature called Preset Dirty Flags. A Preset Dirty Flag is an asterisk that appears next to the name of the preset. The asterisk tells you that you changed and saved this particular preset in another project, and the settings in the current project are different from the saved version. If you re-save the preset in the current project with the current settings, the asterisk disappears, but will reappear in the other project, showing you that the displayed settings in that project are different from the last saved version of the preset. If you want to get rid of the asterisk in all projects, save the preset in each project with the exact same settings.

Plug-in property pages have a couple of other controls not related to presets:

- **Open View button.** This button lets you open a MIDI editing view for a soft synth's corresponding MIDI track. Click the small down arrow to specify the default editing view from the menu. The following views are available:

  - Step Sequencer (default)

  - Piano Roll View

  - Staff View

  - Event List

- **Automation read and write buttons.** These buttons enable or disable automation playback and recording for the plug-in's parameters. See "Automation" on page 1001 for more information.

- **Keystrokes button.** Enabling this button sends all keystrokes to a particular instance of a plug-in when the plug-in's property page has focus.

To solo track/bus from plug-in window

When tweaking an effect, it is often desirable to only hear the audio that is passing through the effect.

A **Solo** button S is available on all plug-in property pages, which allows you to quickly solo the track or bus that the effect is inserted on while adjusting the plug-in. The **Solo** button functions the exact same way as the **Solo** button on the source track/bus.

Figure 256. *A **Solo** button is available on each plug-in property page*

A. Solo button

> **Note:** *If you solo a software instrument in the Synth Rack, the **Solo** button will also affect all associated MIDI and audio tracks.*

See:

"Soloing tracks" on page 198

"Muting and soloing soft synth tracks" on page 813

"Audio effects (audio plug-ins)" on page 797

Bypassing effects globally

SONAR allows you to globally bypass all audio effects in a project. You can also choose to only bypass effects of a specific category (track, bus or clip).

With global effects bypass, you can:

- Quickly compare (A/B) a dry versus a wet mix.
- Temporarily bypass all inline plug-in delay compensation (PDC) effects in order to avoid delay compensation induced latency while tracking virtual instruments or input monitored tracks.
- Temporarily reduce CPU consumption.

SONAR also has the ability to bypass effects at a per-effect level (effects bypass) as well as at an effects bin level (bin bypass). Any existing effects and bin bypass states are preserved when you globally bypass and unbypass effects.

You can selectively unbypass individual effects while in this global bypass state, whick makes it easy to quickly audition a single effect within a mix.

Note: *You can only globally bypass audio effects, not MIDI effects.*

To globally bypass all effects in a project

- Do one of the following:

    - In the Control Bar's Mix module, click the **Bypass all Effects** button [FX].
    - Press E.

    All effects bins in the active project are temporarily bypassed. To restore the bins to their original state, click the **Bypass all Effects** button [FX] again.

Note: *The **Bypass all Effects** option is only a temporary toggle, and is not saved with the project.*

Figure 257. *The Mix module.*

To globally bypass all track, bus or clip effects

1. Determine which type of effects you want to bypass (track, bus or clip), and make sure at least one corresponding effects bin is visible.

2. Right-click the effects bin and select **Bypass Bins Of This Type** from the pop-up menu.

All effects bins of the same type as the source effects bin are globally bypassed. To restore the bins to their original state, simply toggle the state of the **Bypass Bins Of This Type** option.

Effects on clips

You can insert real-time effects on clips, in both MIDI and audio tracks. Each clip that you insert an effect on displays its own effects bin, that you can use to manage the effects on that clip.

The characteristics of clip-based effects are:

*   Splitting a clip copies the effect(s) onto both clips.

*   You can copy or move clip-based effects from one clip to another, and to or from the effects bin on a track.

*   A clip's effects bin also appears in the Clip Inspector.

*   Audio effects can be automated by using clip envelopes.

*   The Track view **Clips > Bounce to Clip(s)** command follows clip boundaries—effects tails are cut off, unless you slip-edit the end of the clip to leave space.

*   Freezing a track or synth will also freeze the per-clip effects bins.

To insert an effect on a clip

Do *one* of the following:

*   Right-click the clip, choose **Open Clip Effects Bin** on the pop-up menu, then right-click the clip effects bin and choose the desired effect.

*   From the Browser, drag an effect onto the clip.

*   Open the Clip Inspector and show the **Clip Effects** section. Right-click the effects bin to select an effect, or drag an effect from the Browser.

The FX icon appears on the clip(s) after you insert the effect.
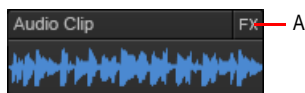
A. FX icon

To open or close the effects bin on a clip

• To open a clip's effects bin, click the **FX** icon, or right-click the **FX** icon and select **Open Clip Effects Bin** from the pop-up menu.

• To close a clip's effects bin, click the **X** icon that's in the upper left corner of the clip's effects bin, or click anywhere outside of the effects bin.

To delete, bypass, move, copy, or re-order a clip effect

• To delete an effect, right-click the effect name and choose **Delete** from the pop-up menu.

• To bypass or un-bypass all the effects on a clip, right-click in the clips's effects bin and choose **Bypass Bin** from the pop-up menu.

• To enable or disable an individual effect, click the effect's **on/off** switch.

• To move an effect to another effects bin (on a track or a clip), drag the name of the effect to the other effects bin.

• To copy an effect to another effects bin (on a track or a clip), hold the CTRL key down, and then drag the name of the effect to the other effects bin.

• To change the order of an effect in an effects bin, drag the name of the effect up or down to the desired place in the effects chain.

To apply inserted clip effects

1. If you want to apply the inserted effects on more than one clip, select them.

2. If you want to leave room at the end of any clips for effects tails, slip-edit the ends of the clips to leave some empty space.

3. Click the Track view **Clips** menu and choose **Bounce to Clip(s)**.

After the progress bar disappears, the bounced clips appear with new waveforms to reflect the effects processing. The inserted clip effects are removed from the bounced clips automatically.

Canceling changes made to real-time plug-ins

`EnablePluginCancelButton=<0 or 1>, default = 0`

In SONAR 4.0.2 and earlier, opening the property page of a VST plug-in during playback could result in a slight disruption in playback.

The cause for this problem has its roots in the little **Cancel** button that sits in the top right corner of the plug-in's property page. The purpose of this button is to allow the user to cancel out of any changes they might have made to the plug-in, restoring back to whatever state the plug-in was in before they opened the GUI window. To make this work, SONAR would need to take an initial snapshot of the plug-in's state, and some plug-ins with large amounts of preset data could cause an audio hiccup if the data was captured for the **Cancel** button.

To address this issue, SONAR 4.0.3 (and later) does not take a snapshot of the plug-in's state by default, and the **Cancel** button is not available. There is a new `Cakewalk.ini` variable to bring back the **Cancel** button if desired, but be aware that this may also result in hiccups when opening VST plug-ins during playback.

This variable should be set in the `[WinCake]` section. For example:

`[WinCake]`

`EnablePluginCancelButton=1`

Sidechaining

SONAR supports multi-input plug-ins, which are typically sidechain plug-ins that have two inputs: a primary input and a sidechain input.

When SONAR detects such a plug-in in an effects bin, a virtual output port is created for each extra input exposed by the plug-in. Audio track, Bus and Send outputs can be routed to sidechain inputs.

Sidechaining is typically used with compressors to limit one signal depending on the signal level of another. Common applications are to reduce the level of a bass guitar when there is a kick drum, or to reduce the level of music whenever a speaker talks (often used for background music in radio- and television programs). There are of course many more applications that are not mentioned here.

SONAR includes the following plug-ins that support sidechaining:

- Sonitus Compressor
- Sonitus Gate
- Vintage Channel VC-64 (Producer only)

In addition, ProChannel (Producer only) supports sidechaining when using the PC4K S-Type Bus Compressor mode. For details, see "ProChannel (Producer only)" on page 963.

Limiting the number of plug-in sidechain inputs

By default, a multi-channel VST plug-in always exposes the maximum number of input channels it supports.

You can limit the number of sidechain inputs that SONAR displays for any given VST plug-in. This is useful if you don't need to use all the input channels and you want to limit the number of audio input channels that are displayed in SONAR.

To limit the number of sidechain inputs

1. On the **Utilities** menu, click **Cakewalk Plug-in Manager** to open the Cakewalk Plug-in Manager.

2. In the **Plug-in Categories** list, select **VST Audio Effects (VST)**.

3. In the **Registered Plug-ins** list, select the desired plug-in.

4. Under **VST Configuration**, click **Plug-in Properties** to open the **VST Plug-in Properties** dialog box.

5. In the **Max used inputs** box, specify the max number of inputs you want to use for the plug-in.

> **Note:** *The default value is the maximum number of mono input channels as exposed by the plug-in. The valid range is from 2 to the maximum number of channels exposed by the plug-in. With a value of 2, SONAR will not display any sidechain inputs for the plug-in. With a value of 4, SONAR will display 1 stereo sidechain input, etc.*

Sidechaining signal flow
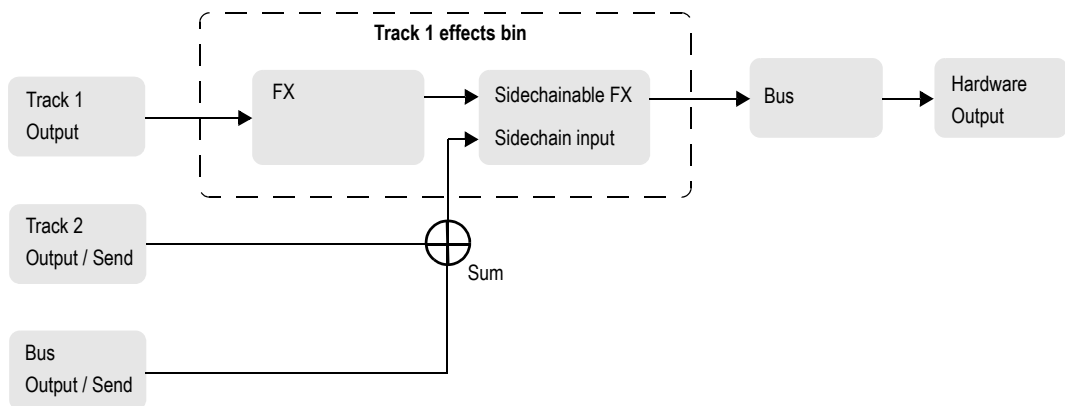
See also:

To assign a track/bus/send output to a sidechain input

1. Insert the sidechain-capable plug-in in a track or bus effects bin (see "Adding effects" on page 222).

   The sidechain input is exposed in the list of available output destinations in all Track/Bus/Send Output controls (except for outputs that would result in a feedback loop).

2. Assign the desired audio track, bus or Send output to the plug-in's sidechain input. For more information, see "Assigning Inputs & Outputs" on page 216.

   Note: *All sources that are sent to a sidechain input will be mixed down prior to being sent to the sidechain.*

Sidechain plug-ins in clip effects bins and surround bus effects bins:

Sidechain inputs are not exposed by plug-ins that are inserted in clip effects bins and surround bus effects bins. You can insert any multi-input plug-in into a clip effects bin or surround bus effects bin, but the sidechain inputs on these plug-ins will not be active. The plug-in will function as a normal plug-in and only receive input on its primary input.

See:

"Real-time bounce" on page 923

"Sidechainable Vintage Channel VC-64 plug-in (Producer only)" on page 875

"Signa I flow" on page 839

"Limiting the number of plug-in sidechain inputs" on page 873

Bouncing audio with sidechain plug-ins

In order to render a sidechain input as part of a mix when bouncing audio, you must select *all* tracks that contribute to the sidechain input.

See:

"Bouncing/freezing with sidechain plug-ins" on page 924

"Bouncing audio with sidechain plug-ins" on page 874

"Bouncing tracks" on page 921

"Bouncing to clips" on page 787

Freeze and sidechain inputs

Freeze does not consider sidechain inputs because Freeze only works on a single audio track at a time. To mix down sidechain inputs, use standard bounce with all sidechain sources selected in the mix.

See:

Sidechainable Vintage Channel VC-64 plug-in (Producer only)

The Vintage Channel VC-64 plug-in supports sidechaining (see "Sidechaining" on page 872). When an instance of Vintage Channel VC-64 is inserted in a project, you can assign audio track, bus and send outputs to its sidechain input.

Each Compressor and EQ can be configured to listen to the sidechain input. The sidechain signal is always applied to the last input(s) of the VC-64.

Sidechain controls

The VC-64 has three buttons that affect sidechaining:

Key (for each compressor).   Enabling sidechaining on one of the compressors will send the sidechain input(s) to the level detector of that compressor. This function compresses the signal based on the sidechain level rather than the primary input level.

Listen.   Enable to listen to the compressor's sidechain signal instead of the ordinary output.

Key (for each EQ).   Enabling sidechaining on one of the equalizers will replace its normal input (according to its routing) with the sidechain signal.

> **Note 1:** *When you enable **Key** on one of the compressors, the internal compressor sidechain (detector chain) is fed from the external sidechain inputs. When you enable **Listen** you will hear what's on the compressor's sidechain regardless if this comes from the external sidechain inputs or not. If you want to hear the external sidechain you must enable both **Key** and **Listen** on one of the compressors.*

> **Note 2:** *If **Listen** is enabled on both compressors only the sidechain of Compressor 2 will be heard.*

Figure 258. *Vintage Channel VC-64*
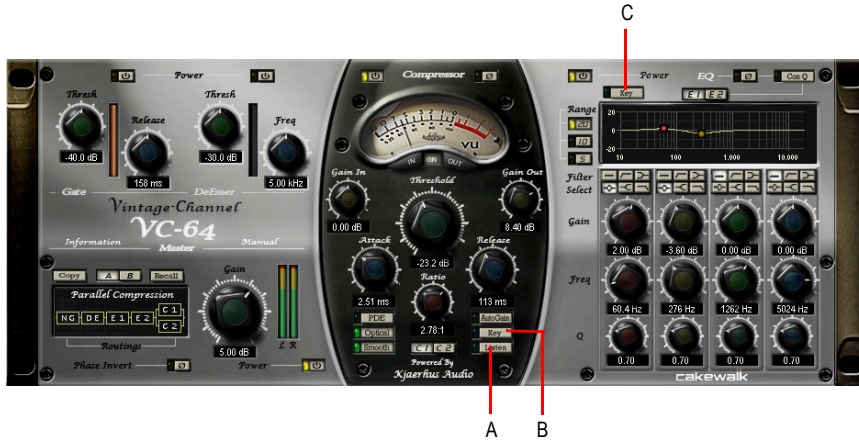
A. Sidechain Listen B. Enable/disable sidechaining for the current Compressor C. Enable/disable sidechaining for the current EQ

For more information, see the Vintage Channel VC-64 online Help.

External Insert plug-in (Producer and Studio only)

The purpose of the External Insert plug-in is to route audio to and from existing I/O ports in SONAR, allowing an external audio device to be effectively patched into any effects bin. This allows you to seamlessly incorporate your favorite outboard gear in a SONAR project.

The External Insert plug-in is able to measure and automatically compensate for the round-trip delay through your audio hardware (the time it takes for the audio to exit you computer, be processed by your external audio hardware and finally returned to the computer).

External Insert interface

The left-hand side contains the hardware/external Send controls and the right-hand side contains the hardware/external Return controls.

Send Stereo Mode buttons:

• **L (Left).**   This toggle enables/disables the left channel send output (enabled by default).

• **R (Right).**   This toggle enables/disables the right channel send output (enabled by default).

• **Mono.**   This toggle sums the stereo signal to make it dual-mono so the send output has the same audio on the left and right channels.

Send Level.   This is a +/- 24dB trim to the level that is passed to the external send. This parameter is automatable.

Send VU Meter.   This meter shows the signal level being delivered to the external send. Since this is feeding a sound card output, it is important to avoid clipping at this stage.

Send Port Picker.   This control lets you choose an audio output that currently has nothing routed to it. This is the port that you should connect to the input(s) of your external gear. All output ports that are already used in the project are excluded (except for master buses that have other instances of the External Insert plug-in routed to them).

Note: *Output ports that are used by the External Insert plug-in are excluded from all track and bus Output controls.*

Return Phase Control.   This control flips the phase of the signal being returned to the external return input. This parameter is automatable.

Return Level.   This is a +/- 24dB trim to the level that is passed from the external send. This parameter is automatable.

Return VU Meter.   This meter shows the signal level entering the external return.

Return Port Picker.   This control lets you choose any available hardware input. This is the port you that you should connect to the output(s) of your external gear. All input ports that are already used in the project are excluded

Note: *Input ports that are used by the External Insert plug-in are excluded from all track and bus Input controls.*

Delay Measurement.   This control shows the last measured round-trip delay through your audio hardware. Click the control to initiate a new measurement.

Manual Delay Offset.   The center control displays and resets the manual delay offset. The buttons to the left decrease the manual offset by 1 ⌐ - ⌐ or 10 ⌐ -- ⌐ samples. The buttons to the right increase the manual offset by 1 ⌐ + ⌐ or 10 ⌐ ++ ⌐ samples. All delay buttons are disabled during playback.

Note 1: *Time-based effects such as reverb and delay can artificially increase the latency measurement. Before manually measuring the delay, you may want to bypass the external gear (if Bypass is supported by your external gear).*

Note 2: *The delay is automatically re-measured if the **Buffer Size** setting is changed in **Edit > Preferences > Audio - Driver Settings** or if ports are changed.*

External Insert plug-in (Producer and Studio only)

Figure 259. *External Insert*
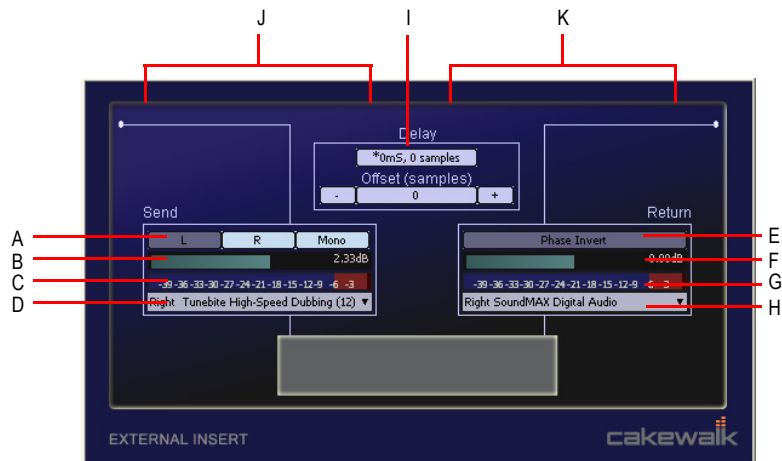
A. Send Stereo Mode (Left, Right, Mono) B. Send Level C. Send VU Meter D. Send Port E. Return Phase
F. Return Level G. Return VU Meter H. Return Port I. Delay Measurement J. Send section K. Return section

Figure 260. *External Insert signal flow*

External Insert plug-in (Producer and Studio only)
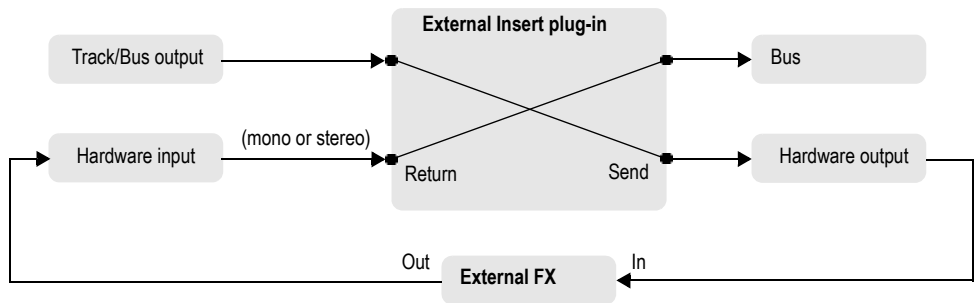
Automatable parameters

The External Insert plug-in exposes the following automatable parameters:

• Send Gain

• Return Gain

• Phase Invert

• Left Mute

• Right Mute

• Mono

See:

"Automating effects" on page 1036

To use an external effect in a SONAR project

1. Make sure your external gear is connected to your audio interface and turned on.

The external gear's audio input must be connected to one of your audio interface's output ports and the external gear's audio output must be connected to one of your audio interface's input ports.

2. Right-click an effects bin and select **External Insert** from the pop-up menu.

The External Insert property page appears.

3. Click the **Send Port** control and choose the audio port that is connected to your external gear's audio input.

4. Click the **Return Port** control and choose the audio port that is connected to your external gear's audio output.

5. Click the **Delay Measurement** control to measure the round-trip delay through your audio hardware.

The round-trip time for the signal to return is measured and displayed on the button. This is the delay that will be compensated for in SONAR to keep the track in sync with the rest of the project. For information about testing the delay measurement, see "Testing the delay measurement" on page 880 and "When to measure the delay" on page 881.

Note: *Time-based effects such as reverb and delay can artificially increase the latency measurement. Before manually measuring the delay, you may want to bypass the external gear (if Bypass is supported by your external gear).*

6. Play back the project and adjust the Send and Return levels to obtain the desired mix. You may also need to adjust levels on your external gear.

💡 **Tip:** *The **Send** and **Return** levels, **Phase** and **I/O port** settings can be saved as a preset. If you frequently use a specific external effect, save the settings as a preset that can be quickly recalled in other projects.*

ⓘ **Note:** *If you bounce audio in a project that uses the External Insert plug-in, the bounce operation must be performed in real-time. For more information, see*

Testing the delay measurement

The External Insert plug-in's delay measurement is normally sample accurate. However, for some hardware configurations, it is possible that a manual adjustment of up to several samples may be required in order to be exactly sample-accurate. If you want to test the accuracy of the delay measurement for your hardware, follow these steps:

1. Create an audio track and record or import some audio.

2. Use the Track view **Tracks > Clone Track(s)** command do clone the track (including the audio) to a new track.

3. Insert the External Insert plug-in on one of the tracks.

4. Assign the **Send** and **Return** to any available input and output on your audio hardware.

5. Patch an audio cable directly between the assigned input and output on your audio hardware.

6. Press **Play** in SONAR.

   You should hear both tracks out of time with each other.

7. Carefully match the levels of the two tracks.

💡 **Tip:** *While adjusting levels, refer to the numeric peak indicators on the track strip. It is important for this test that the levels match as closely as possible.*

8. In the Track Inspector or Console view, click the **Phase** button ⌀ on one of the tracks to invert the phase.

9. In the External Insert plug-in, click the **Delay Measurement** control to measure the round-trip delay through your audio hardware.

   The round-trip time for the signal to return is measured and displayed on the button.

10. Press **Play** in SONAR again.

    You should hear the track play significantly quieter and thinner sounding.

11. To confirm if the delay is measured as accurately as possible, adjust the manual offset by one sample in either direction. Press Play after each adjustment and note if the sound gets louder or quieter.

External Insert plug-in (Producer and Studio only)

In almost all cases, the sound will be quietest with no manual offset. In some rare circumstances, you may have hardware that requires an offset of a sample or two. If this is the case, you will want to always add that offset when you use the External Insert plug-in.

If your hardware requires a manual offset, you will only need to adjust the offset once for any particular sound card.

Tip: *The manual offset can be saved in a preset for the External Insert plug-in.*

When to measure the delay

Several things can change the delay of the External Insert, including:

• Changing audio ports.

• Changing audio driver model.

• Changing audio device.

• Changing SONAR's buffer size.

When the current delay setting becomes invalid, an asterisk (*) is displayed next to the delay value. If you notice the asterisk, it means something has changed in your system and it's time to measure the delay again.

Loading a project that uses the External Insert plug-in

When you load a project with the External Insert plug-in (or select a preset in the External Insert interface), SONAR checks to see if the exact same ports are assigned as when the project was saved. SONAR's port assignments can change if you load the project on a different hardware configuration or change driver models. If there is any discrepancy between the port assignments that were saved and the ports that are used in the current configuration, the ports are set to "None". Doing so avoids accidentally loading projects and having audio routed in an unexpected way.

Bouncing or freezing audio that uses the External Insert plug-in

The External Insert is a simple way to use real outboard effects as if they are inside SONAR. However there are several good reasons why you should consider bouncing or freezing the audio that passes through the External Insert in order to capture the result of the external hardware processing:

• If the outboard effect's settings are changed between sessions, your project will sound different.

• If you change SONAR's buffer sizes often, you will need to re-measure the delay on all instances of the External Insert each time.

• If you collaborate with other SONAR users, it will be impossible for other users to get the same sound as you unless they have the exact same outboard gear with exactly the same settings.

• You may want to use that outboard gear for something else - either in an External Insert on another track, or for any other use in your studio.

• There is no way to use the same piece of outboard gear on different projects with different settings.

If you bounce or freeze audio in a project that uses the External Insert plug-in, the bounce operation must be performed in real-time.

When bouncing audio data, SONAR will automatically detect the presence of any External Insert plug-ins (see "External Insert plug-in (Producer and Studio only)" on page 876) in tracks or buses, and disallow the bounce operation if the **Fast Bounce** mix option is enabled.

If you need to bounce or freeze audio in a project that contains any External Insert plug-ins, you have two choices:

• Disable *Fast Bounce* in the mixdown settings.

• Bypass all active External Insert plug-in's before bouncing.

If you need to make a change later, you can always unfreeze the audio, change settings, then freeze again.

See:

Effects chains

> **Note:** *This feature is not available in SONAR X2 LE.*

SONAR lets you save and load audio effect plug-in chain presets called FX Chain. An FX Chain can be nested within effects bins, renamed, moved between tracks, buses and clip effects bins or saved to disk as FX Chain presets.

Figure 261. *An FX Chain is a container that can include multiple audio plug-ins.*
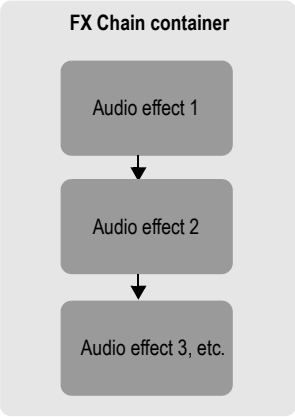
Figure 262. *FX Chain.*

A. FX Chain container in effects bin B. FX Chain property page

See:

Using FX Chain presets

FX Chain presets can be used in track, clip and bus effects bins. One or many FX Chain containers can reside in a single effects bin, but you can not nest an FX Chain container inside other FX Chain containers.

Figure 263. *To create a new FX Chain, drag an FX Chain preset from the Browser's Audio tab to an audio track or audio clip effects bin.*
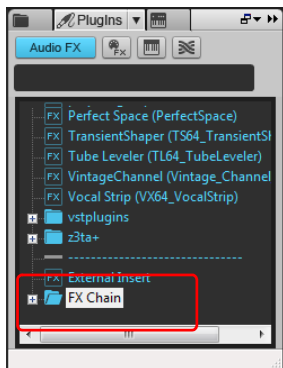
Figure 264. *Double-click an FX Chain container to open the FX Chain property page.*

A. FX Chain container in effects bin B. FX Chain property page

To create a new FX Chain container

1. Right-click an effects bin and select **FX Chain** on the pop-up menu.

   A new FX Chain container is inserted and its property page appears.

2. Insert the desired plug-ins in the FX Chain container by doing *one* of the following:
   - Right-click the open FX Chain container and select the desired plug-ins from the pop-up menu.
   - Drag audio plug-ins from the Browser's **Plug-in** tab to an FX Chain to append to it. As you drag a plug-in over the container, it will open automatically, allowing you to drop in the plug-in at the desired position.

   Note: *An FX Chain can only be created for audio effects (not for MIDI effects or software instruments).*

To edit an FX Chain property page

1. Double-click the FX Chain container in an effects bin to open the FX Chain property page.

2. Do *one* of the following:
   - To add a new plug-in, right-click the FX Chain property page and select a plug-in from the pop-up menu. You can also drag plug-ins from the Browser.
   - To re-order plug-ins, drag the plug-ins to the desired position.
   - To edit an individual plug-in within an FX Chain property page, double-click the plug-in to open its property page.
   - To bypass an individual plug-in, click the small button to the left of the plug-in name.
   - To delete a plug-in, right-click the plug-in and select **Delete** on the pop-up menu.

Figure 265. *FX Chain.*

A. FX Chain container in effects bin B. FX Chain property page C. Right-click to add a new plug-in

FX Chain property page controls

Figure 266. *FX Chain controls.*
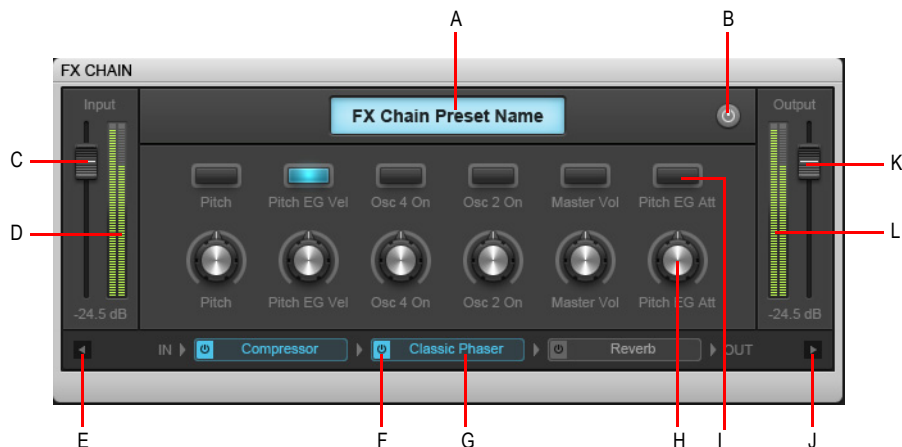
A. Effects Chain name (double-click to edit) B. Bypass Effects Chain C. Input level D. Input meter E. Scroll plug-in list left F. Click button to bypass/un-bypass plug-in G. List of effects in chain (double-click to open plug-in; drag to reorder) H. Assignable rotary (right-click to assign) I. Assignable button (right-click to assign) J. Scroll plug-in list right K. Output level L. Output meter

The FX Chain property page contains the following controls:

- **FX Chain preset name.**   The name of the current FX Chain preset. Double-click to rename.
- **Global bypass.**   Bypass all plug-ins in the FX Chain.
- **Input level.**   Input level before the FX Chain. This parameter is automatable.
- **Input level meter.**   Measures the pre-FX Chain level.
- **Assignable rotaries.**   Up to 6 assignable rotaries allow you to control automatable plug-in parameters without having to open a plug-in's property page. For details, see "Using assignable controls" on page 889.
- **Assignable buttons.**   Up to 6 assignable buttons allow you to control automatable plug-in parameters without having to open a plug-in's property page. For details, see "Using assignable controls" on page 889.
- **Output level.**   Output level after the FX Chain, before next effect or FX Chain. This parameter is automatable.
- **Output level meter.**   Measures the post-FX Chain level.
- **List of plug-ins in FX Chain.**   List of all plug-ins that are inluded in the current FX Chain preset. The signal flows from left to right. Drag to reorder plug-ins, and right-click to add/remove plug-ins. You can bypass individual plug-ins by clicking the small bypass toggle to the left of the plug-in name.

To rename an FX Chain container

1. Right-click the FX Chain container in an effects bin and choose **Rename** on the pop-up menu.

2. Type a new name and press ENTER.

To save an FX Chain preset

Do *one* of the following:

• To save an effects bin as an FX Chain preset, right-click any blank space in the effects bin and choose **Save as FX Chain Preset** on the pop-up menu. Specify a preset name and location in the **Save FX Chain Preset** dialog box. All plug-ins in the effects bin are consolidated into a single new FX Chain.

• To save an FX Chain container as a new FX Chain preset, right-click the FX Chain container in an effects bin and choose **Save as FX Chain Preset** on the pop-up menu. Specify a preset name and location in the **Save FX Chain Preset** dialog box.

• Click the **Browse Plug-ins** button ✐ in the Browser, then drag the FX Chain container from the Track view to the Audio FX section in the Browser. The FX Chain is added to the FX Chain folder.

> **Note:** *FX Chain presets are stored as FX Chain Preset files (*.fxc). For track and bus effects bins, the default name for the FX Chain preset is the track/bus name. For clip effects bins, the default name is the clip name.*

To load an FX Chain preset

Do *one* of the following:

• Right-click an effects bin and choose **Load FX Chain Preset** on the pop-up menu. Select the desired FX Chain Preset file (*.fxc) in the **Load FX Chain Preset** dialog box and click **Open**.

• From the **Plug-in** tab of the Browser, under **Audio**, expand the **FX Chain** branch and drag the preset to an effects bin.

> **Note:** *You can automatically extract plug-ins when loading an FX Chain preset. To do so, hold down the SHIFT key while loading the preset. For more information about extracting plug-ins from an FX Chain container, see *

> **Caution:** *If you load a SONAR X2 project in an older version of SONAR, SONAR will report the FX Chain as a missing plug-in and the contents of the FX Chain will be unavailable. Resaving the project will permanently remove the FX Chain.*

To delete an FX Chain container

Do *one* of the following:

• To delete an entire FX Chain container, select the FX Chain container in the effects bin and press the DELETE key.

• To delete an entire FX Chain container, right-click the FX Chain container in an effects bin and choose **Delete** on the pop-up menu.

• To delete an individual plug-in within the FX Chain, double-click the FX Chain container to open the FX Chain bin, then select the plug-in and press the DELETE key.

To convert an effects bin to an FX Chain container

Right-click the effects bin and choose **Convert Bin to FX Chain** on the pop-up menu.

All plug-ins in the effects bin are consolidated into a single new FX Chain.

To extract plug-ins from an FX Chain container

Right click the FX Chain and choose **Extract FX Chain Plugins** on the pop-up menu.

All plug-ins in the FX Chain are merged into the effects bin and the FX Chain is deleted.

Note: *You can automatically extract plug-ins when loading an FX Chain preset. To do so, hold down the SHIFT key while loading the preset.*

To replace effects bin contents with an FX Chain preset

Hold down the ALT key while you drag an FX Chain preset to an effects bin. The effects bin is cleared and replaced with the FX Chain container.

To replace the effects bin content and automatically extract the plug-ins from the FX Chain preset, hold down ALT+SHIFT while you drag an FX Chain preset to an effects bin.

To move plug-ins between FX Chain containers

1. Open the FX Chain container that contains the plug-in you want to move to another FX Chain container.

2. Hold down the SHIFT key and drag the plug-in to the target FX Chain container. If closed, the target FX Chain container will open automatically when you point to it during the drag operation.

   You can drag individual plug-ins and effects chains between track and clip effects bins.

Tip: *To copy plug-ins instead of moving them, hold down the CTRL key while you drag the plug-in to another effects bin.*

To automate FX Chain plug-ins

Effects in an FX Chain can be automated just like other effects in an effects bin. Parameter names for plug-ins that reside within an FX Chain container are listed in submenu's prefixed by the associated FX Chain name.

You can also use ACT to control the FX Chain's input level, output level and assignable knobs and buttons. For details, see "ACT" on page 1234.

For information about automating effects, see "Automating effects" on page 1036.

To rename an FX Chain preset

1. In the Browser, click the **PlugIn** button ✐ to show the Plug-in Browser.
2. Under **Audio**, expand the **FX Chain** branch.
3. Select the FX Chain, then click the FX Chain name again and type a name.

See:

"Effects chains" on page 882

"Using assignable controls" on page 889

"Customizing the FX Chain UI (Producer and Studio only)" on page 893

"Audio effects (audio plug-ins)" on page 797

Using assignable controls

Assignable knobs and buttons can control automatable plug-in parameters in the FX Chain. An FX Chain preset can store up to six assignable knobs and six assignable buttons.

Figure 267. *Assignable knobs and buttons.*

To add/remove an assignable knob or button (Producer only)

Right-click the FX Chain property page and choose one of the following commands on the pop-up menu:

- **Add knob.** Add a new assignable knob, up to a total of 6 knobs.
- **Add button.** Add a new assignable button, up to a total of 6 knobs.
- **Remove control.** Remove the assignable control.
- **Learn knob/button.** The FX Chain is put into a learning mode and will 'listen' to controls touched on the plug-ins in the FX Chain. When you select **Learn knob/button** again, the touched controls are assigned and displayed in the FX Chain property page. Learn mode is automatically ended if the limit of 6 buttons or knobs is reached, or when the limit of 4 parameters for a knob or button is reached.

> **Note:** *If you right-click an existing knob/button, that knob/button is reset and re-learned, otherwise a new knob or button is created (up to a maximum of 6 buttons or knobs).*

To customize an assignable control (Producer only)

Right-click a knob or button in the FX Chain property page and choose **Edit control** on the pop-up menu to open the **Control Properties** dialog box.

Figure 268. *Assignable control properties.*

A. Name B. Position C. Destination D. Start value E. End value

The **Control Properties** dialog box contains the following settings:

• **Name.**   The name of the assignable control, shown as the label.

• **Position.**   The "slot" position of the control, from left to right.

• **Destination.**   Choose up to four automatable plug-in parameters to control with the assignable knob or button.

• **Start.**   The start value for the destination parameter, specified as a percentage (0.00% to 100.00%).

• **End.**   The end value for the destination parameter, specified as a percentage (0.00% to 100.00%). You can also set Start and End values automatically. For details, see "To set parameter value range automatically" on page 891.

To set parameter value range manually

1. Right-click a knob or button in the FX Chain property page and choose **Edit control** on the pop-up menu to open the **Control Properties** dialog box.

2. Specify the **Start** and **End** values.

💡 **Tip:** *You can invert ranges to have two parameters move in opposite directions.*

To set parameter value range automatically

1. Open a plug-in's property page and set the desired Start position for each parameter.

2. Right-click a knob or button in the FX Chain property page, point to **Ranges** on the pop-up menu and choose one of the following commands:

   • **All Parameters- Set Start.**   Set the Start value of all parameters assigned to the FX Chain knob or button. The values are determined by the current position of each plug-in's property page settings.

   • **All Parameters- Set End.**   Set the End value of all parameters assigned to the FX Chain knob or button. The values are determined by the current position of each plug-in's property page settings.

   • **<Plug-in name - Parameter name>- Set Start.**   Set the Start value of a specific parameter assigned to the FX Chain knob or button.

   • **<Plug-in name - Parameter name>- Set End.**   Set the End value of a specific parameter assigned to the FX Chain knob or button.

To set the default parameter value

1. Adjust a knob or button in the FX Chain property page to the desired default position.

2. Right-click the knob or button and choose **Set Default Value** on the pop-up menu.

When you double-click the knob or button, it returns to its default value.

> **Note:** *If multiple parameters are assigned to the knob or button, the default value will be 0.5.*

To map an assignable knob or button to a plug-in parameter (Producer only)

1. Right-click an assignable knob or button in the FX Chain property page and choose **Edit control** on the pop-up menu to open the **Control Properties** dialog box.
2. Specify an automatable plug-in parameter in the **Destination** list. You can specify up to four parameters for each knob and button.

Figure 269. *Specify up to four automatable plug-in parameters for each assignable control.*
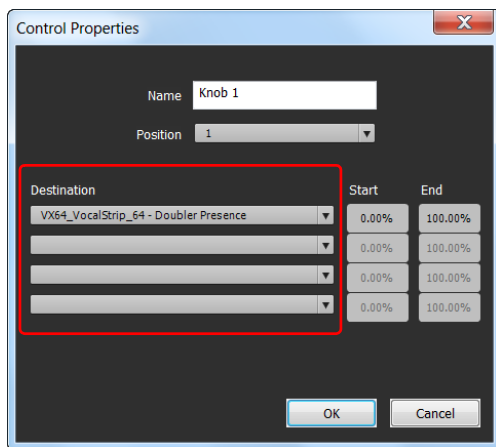
> **Note:** *You can also "learn" plug-in parameters by simply touching controls in plug-in property pages. To do so, right-click in the FX Chain property page and select **Learn Knobs** or **Learn Buttons** on the pop-up menu. Touch the plug-in parameters you want to assign, then select **Learn Knobs** or **Learn Buttons** again to exit learn mode.*

See:

Customizing the FX Chain UI (Producer and Studio only)

You can change the colors and graphics that are displayed in each FX Chain. To do so, right-click the FX Chain property page and click **Customize UI** on the pop-up menu to open the **Settings** dialog box.

Figure 270. *Use the Settings dialog box to customize the appearance of the FX Chain property page.*
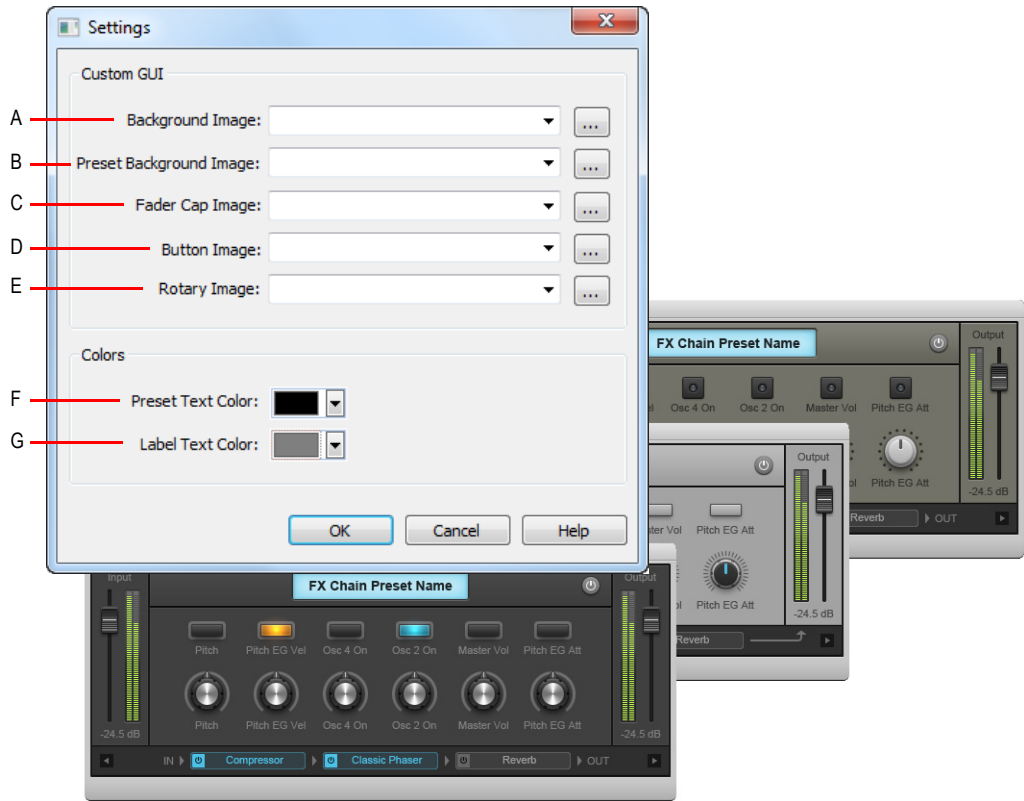
A. Background image B. Preset background image C. Fader cap image D. Button image E. Rotary image F. Preset text color G. Label text color

Figure 271. *FX Chain UI.*
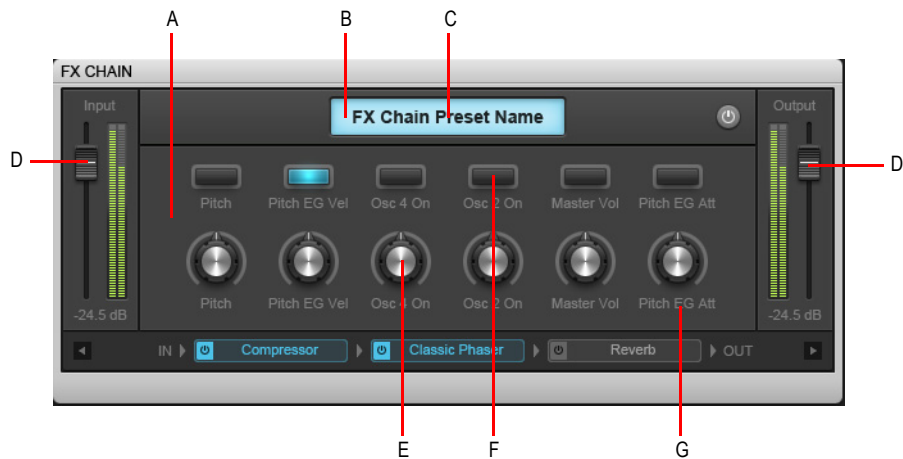
A. Background image B. Display image C. Preset text color D. Fader cap image E. Rotary image F. Button image G. Label text color

For details about the options in the **Settings** dialog, see "Settings dialog" on page 1781.

See:

"Effects chains" on page 882

"Using FX Chain presets" on page 884

"Using assignable controls" on page 889

"Audio effects (audio plug-ins)" on page 797

Organizing plug-ins

Once you have more than a few plug-in effects and/or soft synths installed on your computer, you might want to organize the way they appear in the various plug-in and synth menus that you use. The Cakewalk Plug-in Manager is a powerful tool to organize your plug-in menus. Open the Plug-in Manager by using the **Utilities > Cakewalk Plug-in Manager** command, and display the Plug-in Manager's help file by pressing F1.

Even if you don't use the Plug-in Manager, SONAR now automatically organizes all DX and VST plug-ins into a default plug-in menu layout called **Default – All Plug-ins**. If you select the **Plug-in Layouts > Manage Layouts** option from a plug-in menu, the Plug-in Manager opens and automatically populates the **Plug-in Layout** area with the **Default Layout**, which produces a solid starting point for customizing layouts.

VST plug-ins are organized in menus according to the file folder structure in which they reside on your hard disk.

VST configuration

SONAR automatically scans your VST folders for new plug-ins on startup, registering any unscanned VST plug-ins so that they become available in SONAR's plug-in menus. You can turn off automatic scanning in **Edit > Preferences > File - VST Settings** by clearing the **Scan For VST Plug-ins On Startup** check box.

There are two places you can configure your VST plug-ins manually: go to **Edit > Preferences > File - VST Settings** or use the Cakewalk Plug-in Manager (**Utilities > Cakewalk Plug-in Manager**). You can use **Edit > Preferences > File - VST Settings** to set general VST options, such as choosing which folders to scan, but not specific options on individual plug-ins. Use the Cakewalk Plug-in Manager to set options on individual plug-ins (use the **Utilities > Cakewalk Plug-in Manager** command to open the Plug-in Manager). The following procedures explain how to use the settings in **Edit > Preferences > File - VST Settings**. The Cakewalk Plug-in Manager has its own help.

To configure global VST settings

• Go to **Edit > Preferences > File - VST Settings**.

To add a folder to scan

1. Go to **Edit > Preferences > File - VST Settings**.

2. Under **VST Scan Folder(s)**, click the **Add** button to open the **Browser for Folder** dialog box.

3. Choose the folder you want to add, and click **OK**.

4. Repeat steps 1 and 2 to add any additional folders you might want to scan.

The new folders appear in the **VST Scan Folder(s)** list, along with any folders that were already in the list.

To remove a folder from the VST Scan Folder(s) list

1. Go to **Edit > Preferences > File - VST Settings**.

2. Under **VST Scan Folder(s)**, select the folder you want to remove, then click the **Remove** button.

To set options for all plug-ins in a folder

1. Go to **Edit > Preferences > File - VST Settings**.

2. Under **VST Scan Folder(s)**, select the folder you want to set options for, then click the **Folder Defaults** button.

3. In the dialog box that appears, choose from the following options (options that control properties for individual plug-ins are greyed-out: use the Cakewalk Plug-in Manager to set those options):

   • **Enable as plug-in.**   Enable this option if you want to use the plug-ins in this folder as audio effects.

   • **Configure as tempo-based effect.**   If the effects in this folder are supposed to respond to tempo information (for example, a tempo-synced delay), and they are not responding, make sure this box is checked.

   • **Force stereo operation.**   If you need to use mono plug-ins in situations that requires stereo, you can enable this option to run the plug-ins in stereo mode. This option simply creates two identical output streams from the plug-ins where only one existed.

   • **Do not intercept NRPNs.**   SONAR uses NRPNs to run automation of your VST plug-ins. However, some instruments have their own implementation of this process, so checking this box passes the NRPNs directly to the instrument, allowing it to manage its own automation.

   • **Max used inputs.**   This option controls the number of sidechain inputs that are exposed by SONAR for the plug-in. The default value is the maximum number of input channels that are exposed by the plug-in. If the value is set to 2, SONAR will not display any sidechainable inputs; if set to 4, SONAR will display 1 sidechainable input, etc.

   • **Load using jBridge wrapper.**   This check box is only enabled on systems where jBridge is installed. jBridge allows you to use 32-bit VST effects and instruments when using the x64 version of SONAR, as well as use 64-bit plug-ins when using the x86 version of SONAR. jBridge can also bridge 32-bit plug-ins in the x86 version of SONAR, allowing your computer to overcome the memory limitations of a single 32bit process.

   • **Enable delay compensation.**   Usually, you will leave this check box the way you found it. SONAR contains a delay compensator, which turns on and off automatically for each individual plug-in (only a few plug-ins need it). If your plug-in needs extra time to process the audio data, the plug-in sends a message to SONAR, so it can synchronize playback time to the delayed output from the plug-in.

   • **Serialize Host Access.**   When **Serialize Host Access** is selected, communications with the plug-in are serialized as far as possible. The default behavior is OFF, which allows asynchronous calls to the plug-in.

   When **Serialize Host Access** is disabled, SONAR's audio engine runs more efficiently and allows the UI thread to interact independently with the plug-in GUI without impacting the audio engine.

The only reason to enable **Serialize Host Access** would be for a plug-in that has thread safety problems leading to crashes or glitches when changing plug-in presets.

- **Enable mono processing.**   When enabled, this option replicates the audio signal from the first channel to the left and right channel, effectively forcing the output of VST to be mono.

- **Translate Bank/Program Changes.**   When enabled, this option translates MIDI program change messages into VST preset changes. This is only used for plug-ins that do not support MIDI program change messages.

- **Always suspend on stop.**   When enabled the VST plug-in state will be set to suspended when the transport is stopped in SONAR. The default behavior is to keep VST's always in a resumed state. Enabling this option will prevent effects tails from being heard when the transport is stopped.

- **Always suspend on play.**   When **Always suspend on Play** is selected, the plug-in will reset when playback starts. Select this option for any VST instruments that have problems with stuck notes when stopping the transport. The **Always suspend on Play** property is also useful for effects that generate a tail, such as delays and reverbs. The effect is that you will hear the tails when the transport stops, but not when the transport rolls again. **Always Suspend on Play** is disabled by default.

4. Click **OK** to close the dialog box.

To turn Automatic Scanning on or off

1. Go to **Edit > Preferences > File - VST Settings**.
2. Under **VST Scan Options**, select the **Scan For VST Plug-ins On Startup** check box. The next time you launch SONAR, your VST folders will either be scanned or not, depending on the option you chose.

To re-scan failed plug-ins

1. Go to **Edit > Preferences > File - VST Settings**.
2. Under **VST Scan Options**, select the **Re-scan Failed Plug-ins** check box. The next time you scan, any plug-ins that did not scan correctly during previous scans will be re-scanned.

To re-scan existing plug-ins

1. Go to **Edit > Preferences > File - VST Settings**.
2. Under **VST Scan Options**, select the **Re-scan Existing Plug-ins** check box. The next time you scan, any plug-ins that have already been scanned will be re-scanned, and any new folder default options you have chosen will be implemented.

To run a scan

1. Go to **Edit > Preferences > File - VST Settings**.
2. Under **VST Scan**, click the **Scan VST Folders** button.

To set all VST plug-ins to folder defaults

1. Go to **Edit > Preferences > File - VST Settings**.

2. Under **VST Scan**, click the **Reset All VST Plug-ins** button. The next time you scan, SONAR will set all plug-ins in your **VST Scan** folders to your folder default settings.

To set options for individual VST plug-ins

1. On the **Utilities** menu, click **Cakewalk Plug-in Manager** to open the Cakewalk Plug-in Manager.

2. In the **Plug-in Categories** list, select **VST Audio Effects** or **VST Instruments**.

3. In the **Registered Plug-ins** list, select the desired plug-in.

4. Under **VST Configuration**, click **Plug-in Properties** to open the **VST Plug-In Properties** dialog box.

5. Select the desired options, then click **OK** to close the **VST Plug-In Properties** dialog box.

> **Note:** *For any of the VST properties to take effect, the plug-in must be re-instantiated. The simplest way to do that is to delete the plug-in from the effects bin or Synth Rack, then press CTRL+Z to undo.*

For more information about adjusting VST plug-in settings, see the Cakewalk Plug-in Manager online Help.

V-Vocal clips (Producer and Studio only)

V-Vocal is a vocal processor that integrates Roland's VariPhrase technology into SONAR. Designed for monophonic sounds, especially vocals, V-Vocal does pitch correction on notes and phrases, edits formants, adds vibrato if you want, and can also correct timing.

Access V-Vocal by selecting audio data, and then inserting an instance of V-Vocal. This creates a monophonic V-Vocal clip, which means that the selected audio data is copied to create the V-Vocal clip, while the original audio data is muted and left unchanged.

The following procedures explain how to manage V-Vocal clips. For information about using V-Vocal, see

To create a V-Vocal clip

1. Select the audio data you want to use.

2. Use the Track view **V-Vocal > Create V-Vocal Clip** command, or right-click the clip and choose **V-Vocal > Create V-Vocal Clip** from the Clips pane pop-up menu.

SONAR copies the selected audio data, inserts an instance of V-Vocal on the copied data, and displays the new V-Vocal clip (the copied audio data that contains an instance of V-Vocal) where the selected audio data was, and opens the V-Vocal interface. The V-Vocal icon appears on the V-Vocal clip. The original audio data is muted. No track data is moved or otherwise modified by creating a V-Vocal clip. You can drag the V-Vocal clip away from the original audio data if you want.

To open a V-Vocal interface

• If the V-Vocal interface of the clip you want to edit is not open, right-click the V-Vocal clip and choose **V-Vocal > V-Vocal Editor** from the Clips pane pop-up menu. You can also double-click the V-Vocal clip or press SHIFT+V.

To move, edit, or copy a V-Vocal clip

• Use standard editing commands (nudge, drag-and-drop, slip-edit, etc.) to move, edit, or copy the clip. When you move a V-Vocal clip, the original audio clip is revealed underneath it. You can unmute the original clip by using the Mute tool. You can also or create your own key binding to launch the V-Vocal editor.

Note: *Offline processing commands such as **Process > Apply Effect > Normalize** and **Process > Apply Effect > Gain** do not work on a V-Vocal clip.*

To bypass or unbypass a single V-Vocal clip

• Right-click the V-Vocal clip and choose **V-Vocal > Bypass/Unbypass** from the Clips pane pop-up menu.

When you bypass a V-Vocal clip, you hear the original audio data that makes up the V-Vocal clip without hearing any V-Vocal processing. When **Bypass** is enabled, the **Bypass** button in the V-Vocal interface appears red.

To bypass or unbypass all V-Vocal clips in a track

• Right-click a V-Vocal clip and choose **V-Vocal > Bypass All V-Vocal Clips** from the Clips pane pop-up menu.

To delete a V-Vocal clip

• Select a V-Vocal clip (the green clip with the V-Vocal icon, not the original audio clip) and use the **Edit > Delete** command, or press DELETE on your keyboard.

Note: *V-Vocal commands can also be accessed by clicking the **V** icon in the V-Vocal clip* .

Using V-Vocal (Producer and Studio only)

V-Vocal is a vocal processor that does pitch correction on notes and phrases, corrects timing, edits formants and dynamics, and can add vibrato.

The following topics describe using the V-Vocal interface to process audio data. For information about inserting and managing V-Vocal in SONAR, see "V-Vocal clips (Producer and Studio only)" on page 898.

Here's a description of the interface:

Figure 272. *V-Vocal*
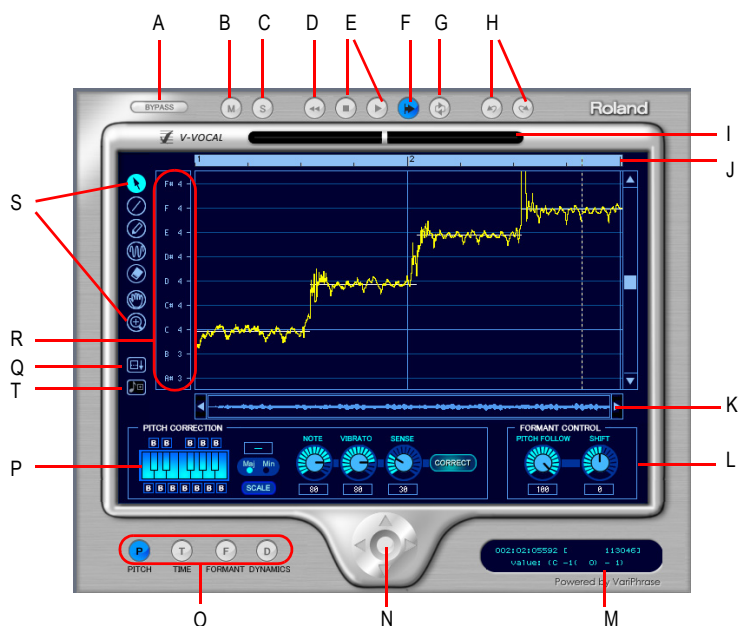
A. Bypass B. Mute C. Solo D. Rewind E. Play/Stop F. AutoScroll G. LoopMode H. Undo/Redo I. Cent indicator J. Timeline K. Scroll L. Formant control M. Information view N. Zoom O. Edit mode P. Pitch correction Q. Spread editing area R. Select pitch correction key S. Tools T. Pitch to MIDI

Description of interface components

- **Edit mode.** Select the parameter you want to edit: pitch, time, formant, or dynamics.

- **Zoom.** Continuous horizontal or vertical zooming by dragging the center vertically or horizontally. If you drag the center while pressing the SHIFT key, you can restrict the zoom direction to horizontal or vertical. Zoom in or out incrementally by clicking any of the four arrows. Double-clicking the center shows the overall clip.

- **AutoScroll.** The editing display scrolls when you turn on **AutoScroll**.

- **Formant control.**   The **Pitch Follow** knob increases or decreases the formant according to pitch. The **Shift** knob increases or decreases the formant for the entire phrase.
- Pitch Correction
    - **Keyboard and Scale buttons.**   Assign the target notes with the **Keyboard** button; each key has a **Bypass** button (B) located under or over the key. The **Scale** button lets you assign the target notes by scale: click the **Scale** button, click **Maj** or **Min**, and click a note on the **Keyboard** button to choose the root of the scale.
    - **Note button.**   Use this button to set the rate of pitch correction. This function can adjust the pitch to the selected notes' grids by increasing or decreasing the pitch of the selected region.
    - **Vibrato.**   Set the depth of the vibrato. If you choose 100%, vibrato depth is set to zero.
    - **Sense.**   This is a sensitivity control for pitch correction for unstable pitch areas such as portamento. Pitch correction gets stronger if you increase the value.
- **Cent indicator.**   This indicator shows the pitch correction amount by cents in realtime (+/- 100 cents).
- **Timeline.**   This gives a graphical display of the playback time in beats.
- **Select pitch correction key.**   Set the target notes for the pitch correction. Each time you click a note, the note's color is changed to red, grey, or blue in turn. Meaning of each color is as follows:
    - Blue: selected
    - Gray: not selected
    - Red: Bypassed
- **Arrow tool** **.**   For selecting the editing region, and for increasing or decreasing the pitch of the selected region.
- **Line tool** **.**   For drawing Pitch, Formant, and Dynamics with straight lines.
- **Pen tool** **.**   For drawing Pitch, Formant, and Dynamics freehand.
- **Vibrato/LFO tool** **.**   For adding and editing Vibrato or LFO at the selected region.
- **Eraser** **.**   For resetting the selected region to its initial value.
- **Hand tool** **.**   For scrolling the display. If you drag in the editing area while pressing the CTRL key, you can zoom.
- **Rectangle zoom** **.**   For selecting an area to zoom in to. Drag a border around the area you want to zoom to. Overall area is displayed by double clicking.

See:

Mixing
Using V-Vocal (Producer and Studio only)

Playing back V-Vocal clips

You can play back V-Vocal clips by clicking the buttons at the top of the V-Vocal interface. Besides playing the V-Vocal clip, you can mute it, solo it, loop it, and rewind it. Clicking in the time ruler at the top of the graph moves the playback time.

To play a V-Vocal clip

- To play a V-Vocal clip, click the **Play** button in the V-Vocal interface, or press the SPACEBAR.
- To stop playback, press the SPACEBAR, or click the **Stop** button.
- To mute the track that the V-Vocal clip is in, click the **M** button in the V-Vocal interface.
- To Solo the track that the V-Vocal clip is in, click the **S** button in the V-Vocal interface.
- To rewind the V-Vocal clip, click the **Rewind** button in the V-Vocal interface.
- To loop the V-Vocal clip, click the **Loop Mode** button in the V-Vocal interface.
- To set the playback time for the V-Vocal clip, click in the timeline that's at the top of the graph.

See:

Pitch editing

Pitch editing requires that the **Pitch** button in the **Edit Mode** section is enabled. Here's a description of the interface in pitch editing mode:
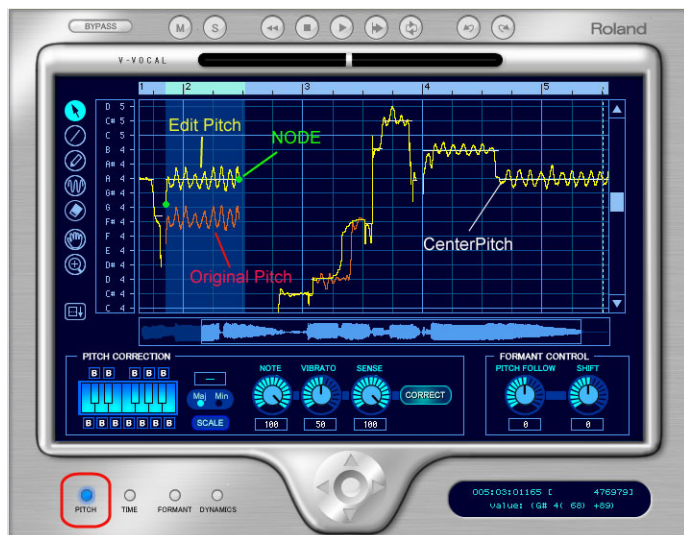
- The yellow line is the edited Pitch curve and this line is the actual sounding pitch.

- The red line is the original Pitch curve and this line cannot be edited.
- The green dot is a Node. Nodes are automatically assigned to the start and end of the edited region. You can select the specific region between the nodes if you click the yellow line between the nodes.
- The white horizontal line is called Center Pitch. Center Pitch is used as a baseline for increasing or decreasing vibrato or for pitch correction.

To change the pitch of a selected region

1. Use the Arrow tool to select the part of the yellow line that you want to transpose (make sure that the **Pitch** button in the **Edit Mode** section is enabled).

   The selected region turns blue to show that it is selected.

2. Drag the yellow line up or down.

   Nodes appear automatically when you shift pitch.

Tips:

- CTRL-dragging snaps the pitch to the pitch correction grid. SHIFT dragging moves the pitch by 100 cent increments.
- You can also edit pitch by dragging a node up or down.
- You can undo each edit you do by pressing CTRL+Z. You can use this command repeatedly to undo multiple edits.

About pitch correction

The key for making manipulated sound more natural is using the parameters in the **Pitch Correction** section: **Note**, **Vibrato** and **Sense**. Functions for each parameter are as follows:

- **Note.**   Controls the ratio of pitch shifting to the nearest scale note. With a value of 100, each section is completely shifting to the nearest scale note.
- **Vibrato.**   As the value increases, the vibrato depth gets narrower. At a value of 100, Vibrato is completely eliminated.
- **Sense.**   As the value increases, the range of affecting pitch correction gets wider.

If you set all of above parameters to a value of 100, you will get a "robot voice"-type sound.

Current default values are:

- Note: 100
- Vibrato: 50
- Sense: 100

This setup is a bit too artificial. If you want to make the sound more natural, we suggest the following setup:

- Note: 70-100; be careful of intonation.
- Vibrato: 0-20; try 0, if you'd like to keep the original.
- Sense: 20-30; adjust to fit the data.

The above suggestion is just one example. Different types of audio might require different settings.

In addition, try adjusting the **Pitch Follow** parameter in the **Formant Control** section as follows:

- Set the value close to 100 if you'd like to do subtle pitch correction.
- Set close to 0 if you'd like drastic rephrasing.

To draw freehand pitch changes

1. Click the Pen tool.
2. Draw a shape on the graph.

To draw straight line pitch changes

1. Click the Line tool.
2. Draw a line on the graph.

To correct pitch

1. Select the region you want to correct by using the Arrow tool.
2. Select the notes that you want the selected region to become by clicking notes on the **Keyboard** button. The selected notes should be light blue. The deselected notes are dark blue. When you click the **Correct** button, the selected area conforms to the light blue notes on the keyboard. You can also click the note names in the **Select Pitch Correction** field to select notes. Note that light blue note names are selected, grey note names are not selected, and red note names are bypassed.

> **Note:** *To display different octaves, drag the vertical scroll bar that is at the right side of the graph up or down.*

3. Set the amount of pitch correction you want by adjusting the Note knob. 100 cents is equal to a half-step. Between 70 and 100 is a good place to start.
4. If the selected region has any unstable pitch areas such as portamento, you can adjust the Sense knob, which adjusts pitch correction sensitivity. Pitch correction gets stronger if you increase the value. 30 is a good starting point. If the selection has vibrato, try 0 to 30.
5. Click the **Correct** button. The pitch in the selected region moves to the target pitches (the light blue notes on the keyboard).

To conform pitches to a Scale

1. Use the Arrow tool to select the region where you want to correct pitches.
2. Click the **Scale** button so that it is enabled (light blue).
3. Click a **Maj** or **Min** button to select a major or minor scale, respectively.
4. Click a note on the **Keyboard** button to select the root note of the scale.

    The notes of the scale you selected turn light blue on the **Keyboard** button.
5. Click the **Correct** button.

The selected area conforms to the light blue notes on the keyboard.

Using V-Vocal (Producer and Studio only)

To restore original pitch

• Use the Eraser tool to drag over a region. The region you drag over returns to original pitch.

To add vibrato

1. Click the Vibrato/LFO tool.
2. Move the cursor to the place where you want the vibrato to start.

    The cursor displays a vibrato icon when it is ready to add new vibrato: .
3. Drag to the right for the length of the vibrato segment that you want to add.

To edit vibrato

1. Move the Vibrato/LFO tool over the vibrato segment that you want to edit.

    The cursor displays a double-arrow icon when it is ready to edit vibrato: .
2. Drag the vibrato segment vertically to edit amplitude, or horizontally to edit frequency.

> **Tip:**
>
> • *Holding the CTRL key down while you drag restricts vibrato editing to amplitude only.*
> • *Holding the SHIFT key down while you drag restricts vibrato editing to frequency only.*

To fade-in vibrato

1. Move the Vibrato/LFO tool over the beginning of a vibrato segment.

    The cursor displays a fade-in icon when it is ready to add a fade-in: .
2. Drag the vibrato segment to the right for the length of the fade-in that you want to add.

See:

Editing time

To edit timing with V-Vocal, the **Time** button in the **Edit Mode** section must be enabled.

To edit time

1. Make sure the **Time** button is enabled.
2. Move the Arrow tool near the vertical center of the graph until the cursor changes to the double arrow, and click at each point where you want to preserve the original timing. A vertical green line appears at each point that you click.

3. Now add new green lines between the existing ones.

4. Drag the new lines to the left or right to compress or expand each region.

Tips:

• Hold down the CTRL key while you move lines to move all the following lines by an equal amount.

• To erase lines, drag a region with the eraser. Timing reverts to its original condition in the areas where you erase lines.

See:

Editing formants

A rough definition of formants is that they are vowel sounds. To edit formants with V-Vocal, the **Formant** button in the **Edit Mode** section must be enabled.

Here's a picture of the V-Vocal interface in formant mode:
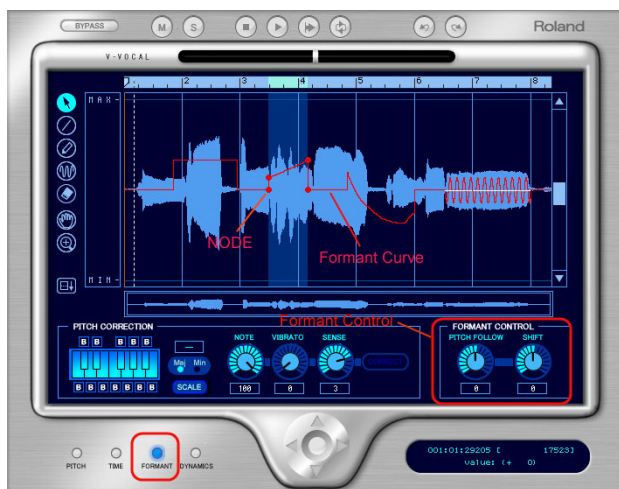
The red line in the graph is the formant line. The red dots on the line are nodes.

To shift the formant of a region

1. Use the Arrow tool to select the region you want to shift.

2. Drag the red line in the region up or down.

When you drag the red line, nodes are automatically created at the start and end of the selected region. You can drag the nodes to create different shapes.

Tips:

• Double-clicking the red line in a selected region adds nodes to the place where you click, and also

to the start and end of the selected region.

- You can do freehand editing with the Pen tool.
- You can add an LFO to a selected region by dragging the red line up or down with the Vibrato tool. Dragging left or right modifies the LFO frequency.
- You can reset segments of the red line by dragging with the Eraser.
- You can increase or decrease the formant for the entire phrase by adjusting the **Shift** knob.

To link the Formant line to the Pitch line

- To increase or decrease the formant relative to pitch, adjust the **Pitch Follow** knob. You can view pitch at the same time as formants by right-clicking the graph, and choosing **Views > Pitch** from the context menu.

See:

"Editing dynamics" on page 907

Editing dynamics

The basic procedures for editing dynamics with V-Vocal are the same as for formant editing, except that dynamics are represented by a yellow line, and you must have the **Dynamics** button enabled in the **Edit Mode** section.

See:

"Context menu" on page 907

Context menu

If you right-click the graph, the V-Vocal context menu appears.

The menu has the following commands:

- **Undo.**   Use this command to undo your last editing action. You can use this command repeatedly to undo a series of editing actions, starting with the latest.
- **Redo.**   Use this command to redo an editing action that was just cancelled by an Undo command.
- **Select All.**   Use this command to select the whole phrase. You can deselect a selection by clicking away from the waveform.
- **View.**   Use this command and the options in its submenu to hide or show the phrase's waveform (**Wave** option on submenu), the pitch display (**Pitch**), the formant line (**Formant**), and the dynamics line (**Dynamics**).
- **Group Node.**   Deletes nodes in the selected region.
- **Pitch Detect Mode.**   Method for redetecting center pitch (the white horizontal line) of LFO or

Vibrato. After you select the region you want to redetect, choose from these options the following submenus.

- **Standard 1.** Generally, you do not need to select this option, because it is used to detect pitch as soon as you create a V-Vocal clip. If you decide to use another method, but change your mind and want to use this method, you can select this method to recreate the original data.

- **Standard 2.** This is a general pitch detection setting that often performs better on styles with deeper vibratos.

- **Deep Vibrato.** Special purpose pitch detection method for phrases that contain very deep vibratos; this detection method tends to create longer center pitches, but may detect multiple notes as a single note.

- **Precision.** Special purpose pitch detection method for very high resolution pitch detection of phrases; this detection method will create more accurate center pitches for styles containing fast variations of pitch. This method, however, may divide a single vibrato section into multiple pitches.

- **LFO Pen Type.** Select the type of the waves of vibrato added by the Vibrato tool.

See:

V-Vocal pitch-to-MIDI

V-Vocal is able to convert pitch to MIDI. V-Vocal data can be dragged from V-Vocal and dropped onto a MIDI track in SONAR's Clips pane.

Pitch to MIDI settings

To open the **Pitch to MIDI Settings** dialog box, right-click in the V-Vocal Edit pane and select **Pitch to MIDI Settings** from the pop-up menu.

There are two parameters that affect the generated MIDI data.

Pitch Bend Range. This setting is used to specify the pitch bend range to use when converting fine pitch changes to MIDI. The Pitch Bend Range value is specified in semitones and the range is 1-24. The default value is 2 semitones.

Time Resolution (ticks). This setting is used to specify the tick interval between pitch bend events. The choices are 20, 40, 60, 80, 100 and 120, and the default value is 20 ticks.

Use Pitch Bend. This setting specifies whether or not the converted MIDI data will include Pitch Wheel events.

To convert pitch-to-MIDI

Click the **Pitch to MIDI** button 🎵 and drag onto a MIDI track in SONAR's Clips pane.

A MIDI representation of the post-correction V-Vocal audio data is copied to the MIDI track.

Keyboard shortcuts

The following table lists the V-Vocal keyboard shortcuts.

Command	Shortcut
Arrow tool	S
Line tool	L, or hold down SHIFT while using the Pen tool
Pen tool	D
Vibrato/LFO tool	V
Erase tool	E
Hand tool	H
Zoom tool	Z
Undo zoom	U
Redo zoom	SHIFT+U
Zoom vertically	CTRL+UP/DOWN ARROW keys
Zoom horizontally	CTRL+LEFT/RIGHT ARROW keys
Fit entire region into display	SHIFT+F
Fit content vertically	F
Pitch edit mode	1
Time edit mode	2
Formant edit mode	3
Dynamics edit mode	4
Cycle through all modes	SHIFT+LEFT/RIGHT ARROW keys
Play/Stop	SPACEBAR
Rewind	W
Bypass	B
AutoScroll	A
Loop on/off	\
Undo	CTRL+Z

Table 167.

Command	Shortcut
Redo	CTRL+SHIFT+Z
Cancel drag gesture	ESC
Select All	CTRL+A
Select None	CTRL+SHIFT+A
Return selection to default settings	DELETE
Solo track	/
Show/hide waveform in Pitch edit mode	SHIFT+W
Go to/Center cursor	G
Scroll up/down	UP/DOWN ARROW keys; PAGE UP/PAGE DOWN
Scroll left/right	LEFT/RIGHT ARROW keys

Table 167.

Mixing
Using V-Vocal (Producer and Studio only)

Using the per-track EQ (Studio and Essential only)

SONAR has a 4-band EQ patched into each audio track by default. You can adjust these EQ's in the Console view and the Track Inspector. You can show or hide the EQ plot, and open the EQ interface to access all EQ controls.

The EQ Plot module lets you adjust the per-track equalization curve. To access additional equalizer controls, double-click the EQ plot.

Figure 273. *EQ Plot module.*
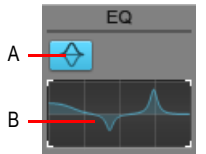
A. EQ on/off B. EQ plot

Figure 274. *Double-click the EQ plot to open the Sonitus fx: EQ interface*
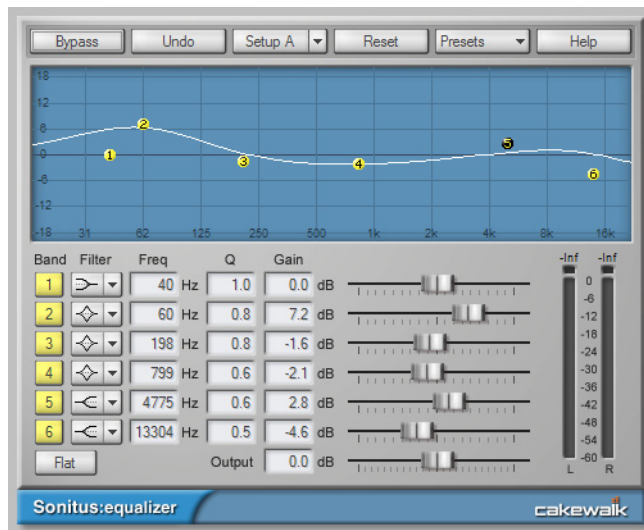
> **Note:** *In SONAR Producer, the per-track EQ is part of ProChannel. For details, see "ProChannel (Producer only)" on page 963 and "QuadCurve Equalizer module" on page 981.*

Here's how to use it:

To show or hide the EQ in all audio tracks

• In the Console view, click the Modules menu and choose **EQ Plot**.

• In the Track Inspector, click the **Display** button and choose **EQ Plot**.

To enable or disable the EQ in a track or bus

• Double-click the EQ plot to open the EQ interface, then enable/disable the desired bands.

To configure the EQ

• Double-click the track's EQ plot to open the Sonitus fx: EQ property page. Please see the Sonitus fx: EQ online Help for detailed information.

To change the plot resolution

• Right-click the EQ plot and choose the desired plot resolution on the pop-up menu.

To copy EQ settings

SONAR lets you easily copy EQ settings from one track/bus (source) to another track/bus (target) when using the integrated per-channel EQ in the Console View or Track Inspector.

To do so, hold down the CTRL, click the source EQ plot and drag to the target EQ plot, then release the mouse button and CTRL key.

The EQ settings are copied from the source track/bus to the target track/bus. The target EQ will automatically be enabled if it was not already enabled.

This command is undoable, so you can quickly and easily revert to a track/bus' previous EQ settings.

Note: *You can only copy settings from an EQ that is enabled.*
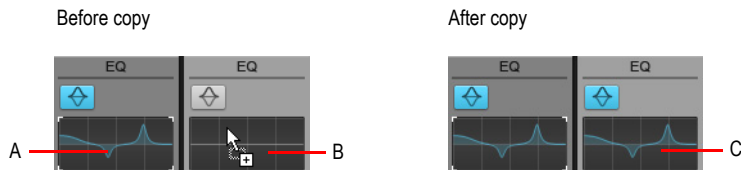
A. Hold down the CTRL key and left-click in the source EQ plot B. While still holding down the CTRL key and left mouse button, drag the mouse cursor to the target EQ plot and release the mouse button C. The source EQ plot is copied to the target EQ plot

Applying audio effects

You can destructively apply audio effects for one or more tracks. When you are pleased with the audio effects you have patched into a track, you can apply the effects to the track. Applying effects to a track saves resources, allowing you to include additional tracks and/or effects

> **Note:** *When applied effects are undone, they are not re-patched in the effects bin(s).*

To apply multiple audio effects offline

1. Add one or more audio effects to one or more tracks in either the Track view, Track Inspector or the Console view.
2. In the Track view, select the tracks or clips you want to be affected.
3. Select **Process > Apply Effect > Audio Effects**.

   The **Apply Audio Effects** dialog box appears.
4. If desired, select the option to delete the effects after applying them.
5. Click **OK**.

If you do not delete the effects after applying them, they remain active.

CPU usage of audio effects

The number of real-time audio effects that your computer can handle depends on the number of audio tracks in your project, the number and type of effects you want to use, and the type and speed of your CPU. Certain effects are more CPU-intensive than others, and enabling certain settings (such as using equalization within the Stereo Reverb) increases CPU usage for those effects.

Applying MIDI effects

You can destructively apply the MIDI effects in a track's patch point. This makes it easy for you to experiment with MIDI effects before you commit to them on a more permanent basis.

To apply MIDI effects destructively

1. In the Track view, select the tracks or clips to be affected.
2. Select **Process > Apply Effect > MIDI Effects**.
3. If desired, select the option to delete the effects after applying them.
4. Click **OK**.

If you don't delete effects after applying them, they continue to be active during playback, even though they have already been applied.

Using control groups

SONAR lets you link faders, knobs, or buttons in the Track view, Track Inspector and Console view into **groups**. Groups are collections of controls whose movements are linked together. For example:

- Two **Volume** faders or controls can be grouped so that when you increase or decrease the volume of one track, the volume of the other track changes in exactly the same way.

- Four **Mute** buttons can be grouped so that when you click on the **Mute** button to mute track 1, tracks 1 and 2 are muted and tracks 3 and 4 are un-muted.

The Console view and Track view identify controls, knobs and faders that are grouped using a colored group indicator that is displayed on the controls in each group. The controls in group A are displayed with a red indicator, the controls in group B with a green indicator, and so on. Controls, faders and knobs can be grouped together.

When you group buttons together, the way they work is based on their position when you create the group:

- Buttons that are in the same position when grouped will turn on and off together at all times.

- Buttons that are in opposite positions when grouped will always remain in opposite positions.

When you group buttons with knobs or faders, the button turns on/off when the knob or fader reaches its halfway point.

You have several additional options. There are three general types of groups: absolute, relative, and custom. Here's how they work.

Absolute

The range of motion in all controls in the group is identical. When you move one control in the group, all other controls in the group move the same amount in the same direction. The controls do not necessarily need to start at the same level.

Relative

The range of motion for controls in the group is not the same. All controls in the group have the same value at one point—the lowest level for send, return, and volume levels, and zero for pan controls.

Custom

Sometimes you want to define a more complex relationship between the controls in a group. For example:

- You want two controls to operate in reverse—when one fader drops, the other increases (cross fade).

- You want two volume faders grouped so that they are locked together at maximum level, but drop at different rates.

- You want two faders to be locked together with the same range of motion, but a third fader grouped with them to have a different range of motion.

Custom groups let you set the range of motion for each control in the group by entering a starting and ending value. As any one control in the group is moved from its starting position to its ending position, the other controls in the group exercise their full range of motion.

When you have defined a custom group, you can adjust the starting and ending position of each control using the **Group Settings** dialog box or using pop-up menus on the controls in the group.

Note: *By default, the relative gain between grouped controls that affect gain is preserved. If you prefer the relative position of the controls to be preserved regardless of the relative gain, there is a check box in the **Group Properties** dialog box that will toggle between these two behaviors.*

To add a control to a group

1. Right-click on the control.
2. Choose a group from the **Group** submenu.

SONAR adds the control to the group. Controls, knobs and faders are highlighted with the group's color indicator.

Tip: *You can quickly group identical controls in multiple tracks. To do so, select the desired tracks, then assign a control to a group. SONAR automatically assigns the same control in all other selected tracks to the same group.*

To remove a control from its group

1. Right-click on the control.
2. Choose **Remove From Group** from the menu.

SONAR removes the control from the group and displays the control with the neutral color indicator.

To remove all controls from a group

• Right-click a control in the group, and choose **Clear Group** from the pop-up menu.

To override a control's grouping

• Hold down the CTRL key while moving the control.

The control remains part of the group and functions as such once the CTRL key is lifted.

To set the group type to Relative or Absolute

1. Right-click on any control in the group and choose **Group Manager** to display the **Group Manager** dialog box.

Figure 275. *The Group Manager dialog*
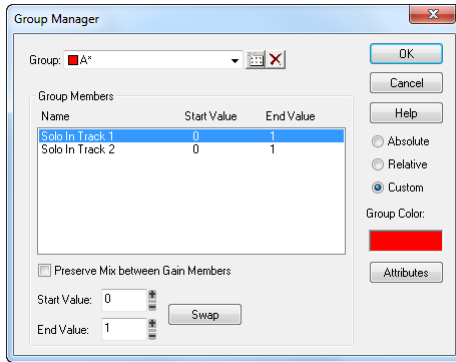
2. Choose **Absolute** or **Relative** as the group type and click **OK**.

SONAR uses the type to determine the range of motion for the group's controls.

To create a custom group

1. Right-click on any control in the group and choose **Group Manager** to display the **Group Manager** dialog box.

2. Choose **Custom** as the group type. The starting and ending values for each control are displayed.

3. To change the starting or ending value for a control, click on the control in the list and enter new values in the **Start** and **End** box.

4. To swap the starting and ending value, click the **Swap** button.

5. Click **Close** when you are done.

SONAR uses the type to determine the range of motion for the group's controls.

To adjust the Start Value of a control

1. Set the control to the desired starting value.

2. Right-click on the control.

3. Choose **Value > Set Start = Current**.

SONAR sets the start value of the control.

The **Set Start = Current** and **Set End = Current** commands set the range of motion that a grouped control moves through as the other members of the group move through their starting and ending values. You don't have to designate a group as a custom group to create a custom group—just group some controls and set their starting and ending values.

To adjust the End Value of a control

1. Set the control to the desired ending value.

2. Right click on the control.

3. Choose **Value > Set End = Current**.

SONAR sets the end value of the control.

The **Set Start = Current** and **Set End = Current** commands set the range of motion that a grouped control moves through as the other members of the group move through their starting and ending values. You don't have to designate a group as a custom group to create a custom group—just group some controls and set their starting and ending values.

See also:

Quick Groups

Quick Groups allow you to effortlessly adjust identical controls across multiple tracks or buses. A Quick Group can either affect all tracks, or only *selected* tracks of the same type. You hold down the CTRL key to momentarily create a Quick Group.

The following rules apply when using Quick Groups:

• Quick Groups only affect tracks of the same type (Audio or MIDI).

• For instrument tracks, the relevant controls is treated as belonging to an Audio or MIDI track.

• Quick Groups do not work between tracks and buses.

• Quick Groups apply a relative adjustment to each control.

• If you adjust a control in a selected track, only *selected* tracks of the same type are affected.

• If you adjust a control in a non-selected track, *all* tracks are affected.

To use a Quick Group

Do *one* of the following:

• **To adjust the same control in all tracks.**   Hold down the CTRL key and adjust a control in a track that is *not* selected. SONAR automatically adjusts the same control in all other tracks.

• **To adjust the same control in selected tracks.**   Select the tracks you want to adjust, then hold down the CTRL key and adjust a control in any *selected* track. SONAR automatically adjusts the same control in all other selected tracks of the same type.

When you adjust controls in a Quick Group, each affected control displays a temporary group color.

The following controls can be adjusted via a Quick Group:

• Mute

• Solo

• Arm for Recording

• Input Monitor/Echo

• Automation Read

• Automation Write

- Input
- Output
- Trim/Vel+
- Pan
- Phase Invert
- Mono/Stereo Interleave
- Volume
- FX insert
- Send insert
- Send controls
- Send destination
- Clear peak meter
- Input pan
- Channel
- Bank
- Patch
- Expand/collapse Take lanes
- Expand/collapse Automation lanes
- Meter scale
- ProChannel:
    - Expand/collapse
    - Pre/Post
    - Bypass
    - Insert module
    - Remove module
    - Replace module
    - Collapse all modules in a track

See:

Using remote control

This section explains how to assign knobs or sliders on a MIDI controller to control specific parameters on specific tracks. If you have a control surface with groups of faders such as a Tascam US-428 or CM Labs MotorMix, see "External devices" on page 1211.

SONAR's Remote Control function lets you use a MIDI device to remotely control knobs, buttons, and sliders in the Track and Console views. For example, you can:

- Use a key on your keyboard to temporarily mute a track
- Work the send level in a bus with your pitch bend wheel
- Set the main volume levels with NRPN messages
- Prevent SONAR from sending any controller messages to your MIDI device.
- Record automation from an external controller

If you set up remote control for a grouped control, the remote control works all controls in the group.

The type of MIDI message used to work a control is selected in the **Remote Control** dialog box. The options are as follows:

Message option	Message effect on buttons	Message effect on sliders and knobs
None	No remote control	No remote control
Note On	The button state is toggled	The slider/knob is alternately maximized and minimized
Note On/Off	The button state is toggled when Note On is received, and toggled again when Note Off is received	The slider/knob is maximized when Note On is received, and minimized when Note Off is received
Controller	n/a	The slider/knob value is set to the controller value
Wheel	n/a	The slider/knob value is set to the wheel value, with the values mapped from their original range of –8,192 to 8,191 to a range of 0 to 127
RPN	n/a	The slider/knob value is set to the RPN value, with the values mapped from their original range of 0 to 16,383 to a range of 0 to 127
NRPN	n/a	The slider/knob value is set to the NRPN value, with the values mapped from their original range of 0 to 16,383 to a range of 0 to 127

Table 168.

To set up remote control for a knob, button, or fader

1. Right-click on the control and choose **Remote Control** from the pop-up menu.
2. Choose the remote control type, as described in the table above.
3. Set the note or controller number if applicable.
4. Set the **MIDI Channel** field to the channel that your controller sends out.
5. Click **OK**.

You can now work the control from your MIDI device. If you click the **Automation Write** button on the track strip of the track you are recording on, you can record your external controller's knob or fader movements.

To disable remote control

• Right-click on the control and choose **Disable Remote Control** from the pop-up menu.

To prevent SONAR from sending controller data to your MIDI device

• Right-click each knob or fader in SONAR that is sending unwanted controller data to your MIDI device and choose **Disable Control** from the pop-up menu.

See:

Using the Learn option

The **Learn** option in the **Remote Control** dialog box allows you to bind a parameter in SONAR to a knob or fader on your controller.

To Bind a Control Using the Learn Option

1. Right-click on the parameter you want to arm in either the Track view or Console view and select **Remote Control** from the pop-up menu.
2. Move a knob or fader on your controller.
3. Click the **Learn** button in the **Remote Control** dialog box and click **OK**.

The control in SONAR is now bound to the knob or fader on your controller.

Bouncing tracks

The Track view **Tracks > Bounce to Track(s)** command lets you combine one or more audio tracks into a submix. A submix can be a mono track, a stereo track or several mono tracks that contain the mixture of the original tracks, preserving the volume, pan, and effects for each track. If you're bouncing tracks that are routed to a surround bus (SONAR Producer only), you can bounce them to as many mono tracks as you have surround channels, by choosing the **Split Mono** option in the **Channel Format** field of the **Bounce to Tracks** dialog box, and also choosing a surround bus in the **Source Category** field. After their creation, the submix tracks are just like any other tracks—you can edit them, add effects, copy them to another project, etc. The original, unmixed audio tracks are not deleted, so you can archive them and recover them later, or continue using them as before.

> **Note:** *You control the bit depth of all rendering operations (bouncing, freezing, applying effects) in **Edit > Preferences > File - Audio Data**, in the **Render Bit Depth** field. The default value of **32** is the best for most situations. See "Bit depths for rendering audio" on page 1187 for more information.*

The Track view **Tracks > Bounce to Track(s)** command operates completely offline, meaning you can mix down tracks that may be too complex for your machine to actually play in real time.

Here are some reasons to use **Bounce to Track(s)**:

- Your mix is so complex that real-time playback is impossible. **Bounce to Track(s)** produces the correct mix, and store the result in a new track or tracks.
- You require more CPU time for your real-time effects. With **Bounce to Track(s)**, you can premix some of your tracks with real-time effects applied, saving CPU time during playback.

If you mix down to tracks that already have data, the new events are placed in the track, but do not overwrite existing material.

To mix down (bounce) audio tracks

1. Set all volume, pan, effects, and automation settings just as you want them.
2. Select the tracks or clips you want to mix down.
3. If you are using effects on the tracks and want to mix the effects down at this time, select the whole length of the longest track or clip plus an extra measure for the reverb or effects "tail."
4. Click the Track view **Tracks** menu and choose **Bounce to Track(s)** to open the **Bounce to Track(s)** dialog box.

Figure 276. *The **Bounce to Track(s)** dialog*
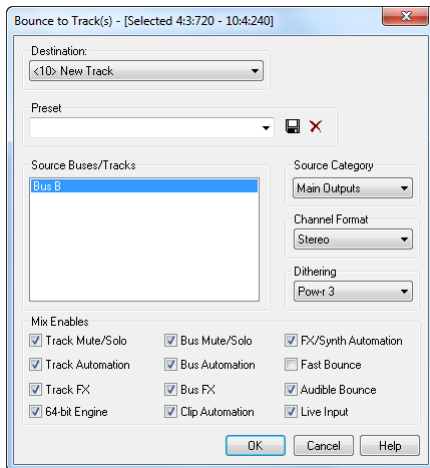
5. Select the first destination track for the mixdown.

6. If you've saved a preset configuration for the **Bounce to Tracks(s)** dialog box, select it now in the Preset window.

7. In the **Source Category** field, select the source you want to use for your bounced track(s) from the following options:

   - **Tracks.** Choosing this option creates new separate tracks for each track you highlight in the **Source Buses/Tracks** field. Each track you highlight will produce a new mono track, stereo track, or two new mono tracks (the **Split Mono** option), depending on what you choose in the **Channel Format** field.

   - **Buses.** Choosing this option creates new separate tracks for each bus you highlight in the **Source Buses/Tracks** field. Each bus you highlight will produce a new mono track, stereo track, or two to eight new mono tracks (the **Split Mono** option), depending on whether the bus is a stereo or surround bus, and depending on what you choose in the **Channel Format** field.

   - **Main Outputs.** Choosing this option creates new separate tracks for each main output you highlight in the **Source Buses/Tracks** field. Each main output you highlight will produce a new mono track, stereo track, or two to eight new mono tracks (the **Split Mono** option), depending on whether the output is a stereo output or the Surround Main, and depending on what you choose in the **Channel Format** field.

   - **Entire Mix.** Choosing this option bounces your entire mix down to a new mono track, stereo track, or two to eight new mono tracks (the **Split Mono** option), depending on whether the output is a stereo output or the Surround Main, and depending on what you choose in the **Channel Format** field.

8. Select a channel format: the kind of track(s) you want to create with your bounce.

9. Select source buses or tracks.

10. Select the kind of dithering you want for your bounce, or select None.

- In the **Mix Enables** field, choose the elements you want to include in the mixdown. If you want to exclude muted tracks and/or include only soloed tracks, make sure **Track Mute/Solo** is checked. Make sure **Fast Bounce** is checked, otherwise the bounce process will take as long as it takes to play your selected track data in real time. Usually, you also want to check **64-bit Mix Engine**. This option lets you turn on the 64-bit mix engine temporarily while you bounce your tracks. This produces a higher-quality bounce without taxing your CPU during the rest of your session.

> **Note 1:** *If you have patched a synth into a track or bus, make sure you check **Track FX** to include synths that are patched into tracks, and check **Bus FX** to include synths that are patched into buses.*

> **Note 2:** *If you don't check **Track Automation**, any initial volume and pan settings in an exported track are ignored and the track's audio data will be exported at the level that exists in the track, with pan set to center. If you don't check **Clip Automation**, any trim settings are ignored during export.*

11. If you want to save your settings as a preset, type a name for them in the **Preset** box, and then click the floppy disk icon that's next to the **Preset** box.

12. Click **OK**.

SONAR mixes the audio data and a new track or tracks appear in your project.

Real-time bounce

When Fast Bounce is enabled

When **Fast Bounce** is enabled, the bounce operation is performed by streaming audio as fast as possible through all mixers and buses in the project. During a fast bounce operation, all hardware outputs are temporarily disabled and the bounce is performed silently.

> **Note:** *There is no sonic degradation by performing a fast bounce since it uses the same operation that is performed during normal playback.*

There are a few limitations to the **Fast Bounce** operation:

- You cannot perform a fast bounce if the audio contains any External Insert plug-ins. Since the External Insert plug-in is typically used to receive audio from external hardware, SONAR's audio output must be sent to the external hardware in real-time. SONAR will display an error message if you attempt to bounce audio that is routed to the External Insert plug-in.
- Certain software instruments, such as samplers, cannot process audio faster than real-time and will produce glitches when operated in fast bounce mode.
- Some hardware-based DSP effects have trouble with fast bounce.

When Fast Bounce is disabled

When **Fast Bounce** is disabled, the bounce is performed in real-time by actually playing back the project audibly in similar fashion to standard playback. In real-time bounce mode, all audio hardware inputs and outputs are active in order to allow I/O to external hardware inserts.

If you manually stop playback during the bounce operation, SONAR will prompt you if you want to keep or cancel the bounce.

Audible bounce

When **Fast Bounce** is disabled, the real-time bounce operation can be performed either silently or audibly.

The following dialogs have a new **Audible Bounce** option:

- "Bounce to Track(s) dialog" on page 1576
- "Export Audio dialog" on page 1597
- Export Video mix options
- "Apply Audio Effects dialog" on page 1569
- "Freeze Options dialog" on page 1611

When **Audible Bounce** is unchecked, no audio output will be heard during the bounce process. When in real-time bounce mode (**Fast Bounce** unchecked) and **Audible Bounce** is enabled, you can hear the output of the mixdown.

Note: *Depending on the gain stages used in the project and the mixdown options selected–such as bouncing with source category assigned to Tracks, or with mute/solo or automation disabled in the bounce settings or while freezing tracks–the output may be louder or softer than during normal playback. Please be sure to turn down the master output level before using real-time audible bounce under these scenarios to avoid the possibility of speaker damage.*

To allow live input during bounce

1. Click the Track view **Tracks** menu and choose **Bounce to Track(s)** to open the **Bounce to Track(s)** dialog box.
2. Under **Mix Enables**, clear the **Fast Bounce** check box and select the **Live Input** check box.

Improve real-time bounce performance

When performing a real-time bounce operation, you can use the **Pause** button as a toggle to temporarily reduce the frequency of GUI updates. This maximizes CPU resources for the audio engine and can be useful while playing projects that consume a lot of CPU, to help avoid dropouts.

For more information, see "The Now time is not smooth during playback or scrolls out of view" on page 1266.

Bouncing/freezing with sidechain plug-ins

Sidechain inputs are not automatically included when you bounce a selection. If you want to bounce the output of a single track that contains a sidechain plug-in, the easiest solution is to also select *all*

tracks that contribute to the plug-in's sidechain input, and do a bounce with Fast Bounce disabled and the Source Category set to "Tracks".

Note: *Freezing a track with sidechain inputs will not include the sidechain input. If you need to free up CPU on a track that includes a sidechain, use the bounce command with all sidechain sources explicitly selected in the mix.*

See:

"Sidechaining" on page 872

"External Insert plug-in (Producer and Studio only)" on page 876

"Bouncing tracks" on page 921

"Bouncing to clips" on page 787

Preparing to create an Audio CD

You can create an audio CD from any wave file or files (extension .wav) of up to either 74 or 80 minutes (depending on the recordable CD media you have). If your projects are audio only, you can simply mix down to a stereo wave file. If your projects contain MIDI, you must first convert the MIDI tracks to audio tracks. Once you have all the stereo wave files you want to include on your CD, you are ready to burn a CD. Use the **Utilities > Burn Audio CD** command to burn your tracks to an audio CD.

For step-by-step procedures:

"To export audio to Wave file format" on page 927

"Converting MIDI to audio" on page 837

To burn audio tracks to an audio CD

1. Make sure the tracks you want to burn to CD have been saved as 16-bit, 44,100 Hz, stereo Wave (.wav) files.

2. Insert a blank CD-R disc in the destination drive.

3. Choose **Utilities > Burn Audio CD** to open the **Audio CD Burner** dialog box.

4. Select a destination CD writing drive using the Target Drive drop-down list.

5. Click **Add Track** to locate and import the audio Wave files you want to burn to CD.

6. Place the tracks in the desired order by using the **Move Up** and **Move Down** buttons.

7. Click **Burn CD**.

SONAR verifies, performs a layout of the tracks and writes the current track list to CD medium in the selected drive. After the disk is completed, the disk is ejected from the drive.

Preparing audio for distribution

The **File > Export Audio** command exports your project as a new file or files that you can burn to a CD, or distribute via the Web or email. In addition, SONAR Producer allows you to export surround-encoded files (see "Exporting surround mixes" on page 962). The following export formats are supported:

Format	Definition
Wave (surround files in Wave format are supported by SONAR Producer only)	The standard digital audio format used under Windows for burning CDs, with a file extension of .wav.
Sony Wave64	The Sony Wave64 file format is similar to the RIFF format, but is a true 64-bit file format designed to overcome the size limitations of the RIFF format.
Windows Media Advanced Streaming Format (includes Windows Media Pro; surround files are supported by SONAR Producer only)	Compressed digital audio for streaming over the Internet, with the file extension .wma.
MP3	Highly compressed digital audio designed for quick downloads via the Internet, with the file extension .mp3. The MP3 encoder that comes with SONAR is a trial version which will time-out. The full version is available for download at www.cakewalk.com.
Apple AIFF	Audio Interchange File Format, co-developed by Apple Inc., is most commonly used on Apple Macintosh computer systems. The file extension is .aif.
NeXT/Sun	Au is the standard audio file format used by Sun, Unix and Java. The audio in au files can be 8-bit or 16-bit PCM or compressed with the µLaw, alaw or G729 codecs. The file extension is .au.
FLAC	FLAC stands for Free Lossless Audio Codec, which is somewhat similar to MP3, but lossless. Audio in a FLAC file is compressed without any loss in quality.The file extension is .flac.
Sound Designer II	Sound Designer II is the native format of DigiDesign's Sound Designer pro audio software and is also used natively by Macromedia DECK II and many applications. SD2 files be mono or interleaved stereo and the file extension is .sd2.
Core Audio Format	Core Audio Format is a new 64-bit audio format supported natively in Mac OS X, and is also used by QuickTime 7. Audio in Core Audio Format files can be uncompressed PCM or compressed (such as AAC). The file extension is .caf.

Table 169.

Format	Definition
RAW	Rarely used, a RAW file can contain audio in any codec but is usually used with PCM audio data.
OMF	The Open Media Format, created by AVID Technology, is designed to port a project to other applications or platforms. OMF files preserve tracks, clip positions, slip edits and some other project attributes depending on which application is writing or reading the OMF file.

Table 169.

If your audio hardware is configured for stereo playback, Wave files are created in stereo; if your audio hardware is configured for monophonic playback, the Wave file is created in mono.

Cakewalk External Encoder Config utility

SONAR supports external command-line encoders, such as LAME, Ogg Vorbis, Monkey's Audio, etc. If an external command-line encoder is installed on your machine, the 'Cakewalk External Encoder Config' utility allows you to add the encoder to SONAR's list of available file formats when exporting audio (**File > Export > Audio**).

To use the utility, start SONAR and go to **Utilities > Cakewalk Ext Encoder Config**, then specify the proper settings or the encoder you want to use.

> **Note:** *The SONAR DVD includes several pre-defined profiles for various encoders. These profiles can be found in the* \Utilities\External Encoder Profiles *folder. You can use these profiles as a starting point when creating your own profiles. Simply double-click the appropriate .reg file to add the information to the Windows registry, then use the 'Cakewalk External Encoder Config' utility to specify the correct install path of the encoder.*

To export audio to Wave file format

1. Set all volume, pan, effects, and automation settings just as you want them.
2. If you only want to mix down parts of tracks, select those clips now. If you don't select anything, everything's selected.
3. If you are using effects on the tracks and want to mix the effects down at this time, select the whole length of the longest track or clip plus extra time for the reverb or effects "tail."
4. Choose **File > Export > Audio** to open the **Export Audio** dialog box.
5. Select a destination folder using the **Look In** field.
6. Enter a file name.
7. Choose one of the following from the **Files of type** drop-down list:
    *   **Wave.**   Choose this if you want to export a standard wave file, or if you're exporting a surround project in wave format.
    *   **Broadcast Wave (time-stamped).**   Choose this if you want to create a Broadcast Wave file (see Broadcast Wave).

8. In the **Source Category** field, select one of the following options:
   - **Tracks.**   Choosing this option creates a separate file for each track that you select in the **Source Buses/Tracks** field.
   - **Buses.**   Choosing this option creates a separate file for each bus that you select in the **Source Buses/Tracks** field.
   - **Main Outputs.**   Choosing this option creates a separate file for each main output that you select in the **Source Buses/Tracks** field.
   - **Entire Mix.**   Choosing this option creates one file for your entire mix, unless you're exporting a surround mix with **Split Mono** selected in the **Channel Format** field.
9. In the **Source Buses/Tracks** field, choose the buses or tracks you want to use as a source to create your mix. If you chose **Tracks in the Source Category** field, only tracks will show up as choices in this field.
10. In the **Channel Format** field, select one of the following options:
   - **Stereo.**   All exported tracks and clips are mixed down to a stereo file or files.
   - **Mono.**   All exported tracks and clips are mixed down to a mono file or files.
   - **Split Mono.**   All exported tracks and clips are mixed down to separate mono files.
   - **Multichannel.**   All exported tracks are mixed down to a multichannel wave file or files.
11. Choose the sample rate that you want your exported file to be.
12. Select the bit depth that you want the exported file to use. If your source file is 16 and you export to 24, you get more precision for any audio effects in the mix (and a larger file). If your source file is 24 and you export to 16, you lose some sound definition, but you get some of it back if the **Dithering** option is on in the **Edit > Preferences > Audio - Playback and Recording** dialog box (see "Dithering" on page 936 for more information).
13. In the **Mix Enables** field, choose the elements you want to include in the mixdown. If you want to exclude muted tracks and/or include only soloed tracks, make sure **Track Mute/Solo** is checked.

> **Note 1:** *If you have patched a synth into a track or bus, make sure you check Track FX to include synths that are patched into tracks, and check Bus Returns to include synths that are patched into buses.*

> **Note 2:** *If you don't check Track Automation. any initial volume and pan settings in an exported track are ignored and the track's audio data will be exported at the level that exists in the track, with pan set to center. If you don't check Clip Automation, any trim settings are ignored during export. If you don't check Master Automation, any volume and balance settings at the main outs are ignored.*

14. If you want to save the settings you created in the **Export Audio** dialog box, type a name for them in the Preset window and then click the floppy disk icon that's next to the window.
15. Click **Export**.

The audio is exported to the Wave file or files.

If you chose Broadcast Wave as the export format, the following information is stored in the file(s):

- **Description.** A brief description of the contents of the Broadcast wave. Limited to 256 characters.
- **Originator.** The author of the Broadcast wave. This information is taken from the **Author** field in the "File Info dialog" on page 1608.
- **Originator Reference.** A unique reference identifier created by SONAR.
- **Origination Date.** The date the file was created.
- **Origination Time.** The time the file was created.
- **Time Reference.** The SMPTE time stamp for the beginning of broadcast wave.

To export a project in Windows Media format

1. Set all volume, pan, effects, and automation settings just as you want them.
2. If you only want to mix down parts of tracks, select those clips now.
3. If you are using effects on the tracks and want to mix the effects down at this time, select the whole length of the longest track or clip plus extra time for the reverb or effects "tail."
4. Choose **File > Export > Audio** to open the **Export Audio** dialog box.
5. Select a destination folder using the **Look In** field.
6. Enter a file name.
7. Choose **Windows Media Advanced Streaming Format** from the **Files of type** drop-down list.
8. In the **Source Category** field, select one of the following options:
   - **Tracks.** Choosing this option creates a separate file for each track that you select in the **Source Buses/Tracks** field.
   - **Buses.** Choosing this option creates a separate file for each bus that you select in the **Source Buses/Tracks** field.
   - **Main Outputs.** Choosing this option creates a separate file for each main output that you select in the **Source Buses/Tracks** field.
   - **Entire Mix.** Choosing this option creates one file for your entire mix, unless you're exporting a surround mix with **Split Mono** selected in the **Channel Format** field.
9. In the **Source Buses/Tracks** field, choose the buses or tracks you want to use as a source to create your mix. If you chose **Tracks** in the **Source Category** field, only tracks will show up as choices in this field.
10. In the **Channel Format** field, select one of the following options:
    - **Stereo.** All exported tracks and clips are mixed down to a stereo file or files.
    - **Mono.** All exported tracks and clips are mixed down to a mono file or files.
    - **Split Mono.** All exported tracks and clips are mixed down to separate mono files.
    - **Multichannel.** All exported tracks are mixed down to a multichannel WMA file or files.
11. Choose the sample rate that you want your exported file to be.

12. Select the bit depth that you want the exported file to use. If your source file is 16 and you export to 24, you get more precision for any audio effects in the mix (and a larger file). If your source file is 24 and you export to 16, you lose some sound definition, but you get some of it back if the **Dithering** option is on in the **Edit > Preferences > Audio - Playback and Recording** dialog box (see "Dithering" on page 936 for more information).

13. In the **Mix Enables** field, choose the elements you want to include in the mixdown. If you want to exclude muted tracks and/or include only soloed tracks, make sure **Track Mute/Solo** is checked.

> **Note 1:** *If you have patched a synth into a track or bus, make sure you check Track FX to include synths that are patched into tracks, and check Bus Returns to include synths that are patched into buses.*

> **Note 2:** *If you don't check Track Automation. any initial volume and pan settings in an exported track are ignored and the track's audio data will be exported at the level that exists in the track, with pan set to center. If you don't check Clip Automation, any trim settings are ignored during export. If you don't check Master Automation, any volume and balance settings at the main outs are ignored.*

14. If you want to save the settings you created in the **Export Audio** dialog box, type a name for them in the Preset window and then click the floppy disk icon that's next to the window.

15. Click **Export**.

The **Windows Media Format Encode Options** dialog box appears.

16. Select options and click **OK**.

The audio is compacted and exported to a file or files with the extension .wma.

To export a project in MP3 format

1. Set all volume, pan, effects, and automation settings just as you want them.

2. If you only want to mix down parts of tracks, select those clips now.

3. If you are using effects on the tracks and want to mix the effects down at this time, select the whole length of the longest track or clip plus an extra measure for the reverb or effects "tail."

4. Choose **File > Export > Audio** to open the **Export Audio** dialog box.

5. Select a destination folder using the **Look In** field.

6. Enter a file name.

7. Choose **MP3** from the **Files of type** drop-down list.

8. In the **Source Category** field, select one of the following options:

- **Tracks.** Choosing this option creates a separate file for each track that you select in the **Source Buses/Tracks** field.

- **Buses.** Choosing this option creates a separate file for each bus that you select in the **Source Buses/Tracks** field.

- **Main Outputs.** Choosing this option creates a separate file for each main output that you

select in the **Source Buses/Tracks** field.

- **Entire Mix.**   Choosing this option creates one file for your entire mix.

9. In the **Source Buses/Tracks** field, choose the buses or tracks you want to use as a source to create your mix. If you chose **Tracks** in the **Source Category** field, only tracks will show up as choices in this field.

10. In the **Channel Format** field, select one of the following options:

- **Stereo.**   All exported tracks and clips are mixed down to a stereo file or files.

- **Mono.**   All exported tracks and clips are mixed down to a mono file or files.

- **Split Mono.**   All exported tracks and clips are mixed down to separate mono files.

11. Choose the sample rate that you want your exported file to be.

12. In the **Bit Depth** field, select 16. If your source file is 24 and you export to 16, you lose some sound definition, but you get some of it back if the **Dithering** option is on in the **Edit > Preferences > Audio - Playback and Recording** dialog box (see "Dithering" on page 936 for more information).

13. In the **Mix Enables** field, choose the elements you want to include in the mixdown. If you want to exclude muted tracks and/or include only soloed tracks, make sure Track Mute/Solo is checked.

Note 1: *If you have patched a synth into a track or bus, make sure you check Track FX to include synths that are patched into tracks, and check Bus Returns to include synths that are patched into buses.*

Note 2: *If you don't check Track Automation. any initial volume and pan settings in an exported track are ignored and the track's audio data will be exported at the level that exists in the track, with pan set to center. If you don't check Clip Automation, any trim settings are ignored during export. If you don't check Master Automation, any volume and balance settings at the main outs are ignored.*

14. If you want to save the settings you created in the **Export Audio** dialog box, type a name for them in the Preset window and then click the floppy disk icon that's next to the window.

15. Click **Export**.

The **Cakewalk MP3 Encoder** dialog box appears.

16. Choose options and click **OK**.

The audio is compacted and exported to a file or files with the extension .mp3.

See also:

"Cakewalk Publisher" on page 938

Exporting tracks with no selection

If the source category is Tracks when you bounce or export audio with no selection in, each wave file will be exactly the same duration as the original source track.
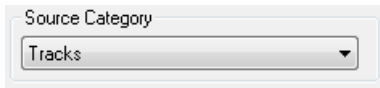
Encoding options

After clicking the **Export** button, an additional dialog box will appear showing **Extra Encoding Options**. These options typically determine the bit depth, endian-ness (the byte ordering in memory used to represent the data), and an encoding type within the major file format.

Figure 277. *The **Extra Encoding Options** dialog*

Here is the master list of subformats supported in SONAR:

AIFF (Apple/SGI) (extension "aiff")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- Unsigned 8 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law
- IMA ADPCM
- GSM 6.10
- 12 bit DWVW
- 16 bit DWVW
- 24 bit DWVW

AIFF (Apple/SGI) (extension "aif")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- Unsigned 8 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law
- IMA ADPCM
- GSM 6.10
- 12 bit DWVW
- 16 bit DWVW
- 24 bit DWVW

AU (Sun/NeXT) (extension "au")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law
- 32kbs G721 ADPCM
- 24kbs G723 ADPCM

CAF (Apple Core Audio File) (extension "caf")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- 32 bit float
- 64 bit float

- U-Law
- A-Law

FLAC (FLAC Lossless Audio Codec) (extension "flac")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM

RAW (Headerless audio file) (extension "raw")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- Unsigned 8 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law

SD2 (Sound Designer II) (extension "sd2")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM

W64 (Sony Wave-64) (extension "w64")

- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- Unsigned 8 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law
- IMA ADPCM
- Microsoft ADPCM
- GSM 6.10

Preparing audio for distribution

WAV (Microsoft) (extension "wav")

• Signed 16 bit PCM

• Signed 24 bit PCM

• Signed 32 bit PCM

• Unsigned 8 bit PCM

• 32 bit float

• 64 bit float

• U-Law

• A-Law

• IMA ADPCM

• Microsoft ADPCM

• GSM 6.10

• 32kbs G721 ADPCM

Exporting OMF files

OMF (Open Media Format) files are designed for cross-platform compatibility. For more information about the OMF format, see "Importing OMF projects" on page 304.

If you plan to export a SONAR project to another program that can read OMF files, it pays to consider three things before you start your SONAR project:

• Sample rate and audio bit depth of the target system

• Number of tracks the target system can handle

• SONAR and most other audio programs do not include video in the OMF file

To export a project as an OMF file

1. Select **File > Export > OMF**.

   The **Export OMF** dialog box appears.

2. Enter a **File Name** (maximum 64 characters—SONAR limits name length for ISO CDR compatibility), and in the **Save As Type** field, choose **OMF Version 1** or **2**. Most applications expect Version 2, but check with your engineer.

3. Audio Packaging: usually you should choose **Embed Audio Within OMF**, which includes the audio data in the OMF file. But you should check with your engineer.

4. **Split Stereo Tracks Into Dual Mono.**   See what your engineer wants. If exporting a 24-bit project to a Pro Tools system, enable **Split Stereo Tracks Into Dual Mono**, as some Pro Tools systems do not support 24-bit interleaved stereo files.

5. **Include Archived Tracks.**   You can choose to include archived tracks in your exported file.

6. **Mix Each Groove Clip As A Separate Clip.**   If you have several Groove Clips in a track SONAR exports them as one clip unless you check this option. If you check this option, SONAR

has to do a separate export operation for each Groove Clip in the track, which is very time-consuming. If you only have one Groove Clip in a track, and you have rolled out numerous repetitions of the clip, SONAR exports a single clip that is the length of the original clip and all the repetitions, which is not a time-consuming operation.

7. **Audio Format.** Ask your engineer what format the studio uses, Windows (RIFF Wave) or Mac (AIFC).

8. Click the **Save** button.

9. SONAR exports the project as an OMF file. In the **Save as Type** field, select the OMF version you want to save the project as. Version 1 is compatible with older applications. See your target application's documentation for information on which version it supports.

Note: *OMF files save the following:*

- Tracks
- Clip positions
- Slip edits
- Fades and crossfades (as destructive edits)
- The following information is discarded:
- Volume
- Pan
- Automation
- Effects

Dithering

Dithering. Whenever an audio signal is converted from a higher-bit resolution to a lower resolution, it is necessary to apply dither to avoid introducing undesirable quantization noise or harmonic distortion into the signal. The purpose of dither is to reduce the resulting distortion by adding low-level random noise or "dither" to the audio signal. Different mathematical calculations are used to generate dither, each method has advantages and disadvantages depending on the particular operation. SONAR features the Pow-r dithering process, short for Psycho-acoustically Optimized Wordlength Reduction, which can produce lower-bit files that sound indistinguishable from higher-bit source files. When this option is turned on, SONAR uses dithering when you export a higher-bit file at a lower resolution, or lower the bit depth of a project's audio files by using the **Utilities > Change Audio Format** command, or when you "render" audio (bounce, freeze, or apply effects).

SONAR Producer offers five kinds of dithering:

- **Rectangular.** Essentially white noise, no noise shaping. Advantages: least CPU-intensive, lowest signal-to-noise ratio, preferable to shaped dither when successive dithering can occur (e.g. bouncing, freezing). Disadvantages: suffers from intermodulation distortion, higher perceived loudness than Pow-r dither.

- **Triangular.** Higher level than rectangular, no noise shaping. Advantages: low CPU-intensive dither, superior to Rectangular as it does not suffer from modulation noise effects. Preferable to shaped (Pow-r) dither when successive dithering can occur (e.g. bouncing, freezing). Disadvantages: higher perceived loudness than Pow-r dither.

- **Pow-r 1.** Noise-shaped dither. Advantages: less CPU-intensive than Pow-r types 2 and 3, lower perceived loudness than Rectangular or Triangular. Disadvantages: less noise shaping than Pow-r types 2 and 3, not recommended for operations where dither will be applied successively (e.g. bounce and freeze).

- **Pow-r 2.** Noise-shaped dither. Advantages: lowest perceived loudness, highest quality settings, recommended for audio export. Disadvantages: highest CPU-intensive settings, not recommended for operations where dither will be applied successively (e.g. bounce and freeze).

- **Pow-r 3.** Same as Pow-r 2 except most CPU-intensive and transparent of all choices.

To choose dithering options

1. Go to **Edit > Preferences > Audio - Playback and Recording**.

2. Click the **Dithering** list and choose the kind of dithering you want to use.

3. Click **OK**.

Burning audio CDs

SONAR has integrated Audio CD burning, which allows you to write your audio tracks to an audio CD that can be played in any standard CD player.

The **Utilities > Burn Audio CD** command lets you burn your tracks to an audio CD that you can play in any standard CD player.

For more information about the **Utilities > Burn Audio CD** command, see "Audio CD Burner dialog" on page 1570 and the Cakewalk Publisher online Help.

Cakewalk Publisher

You can use Publisher to create a customized streaming music player with a playlist of your music, upload the player to your personal or band's web site, and embed it in any other web site. You can also update your playlist with album art, links (URLs), and artist, track, & album information.

Publisher works by connecting to your web host's FTP account (usually provided when you sign up with a web hosting company and create a web site) and uploading files to a location of your choosing. Once these files are successfully transferred to your web site, Publisher generates a simple HTML tag that you can paste into any other web site to embed and display your audio player. For those familiar with it, the process is similar to selecting images that are originally hosted on one web site and displaying them on a different web site.

Figure 278. *Cakewalk Publisher*

To start Cakewalk Publisher

There are three ways to start Cakewalk Publisher:

• Click **Utilities > Cakewalk Publisher**.

• When exporting audio as an MP3 file, enable the **Add to Cakewalk Publisher** check box in the **Export Audio** dialog box.

• Click **Start > Programs > Cakewalk > Publisher > Cakewalk Publisher**.

For more information about Cakewalk Publisher, see the Cakewalk Publisher online Help and

Surround Mixing (Producer and Studio only)

SONAR fully supports surround mixing (SONAR Essential can open surround projects created in Producer and Studio, converting them to stereo). SONAR can create finished surround mixes in all popular surround formats, including Windows Media 9 Pro. You can use a joystick to control surround panning if you want.

Note: *It's always advisable to know the required sampling rate and audio driver bit depth for the target medium that your surround project will be used in. That way you can work in the correct format from the start, without having to convert later. You can set these parameters in **Edit > Preferences > Audio - Driver Settings**.*

To get a complete understanding of SONAR's surround functions, start with the "Surround basics" on page 940.

See:

Surround basics

Surround sound is a common name for various techniques for positioning audio in reference to the listener. Whereas regular stereo is limited to left/right positioning, within a relatively narrow field, surround sound opens possibilities of positioning an audio source anywhere around the listener. Surround sound comes in many formats. The differences between the formats are in three areas:

• **The number of speakers.**   This varies from 3.2 all the way to 8.1.

• **The angles of the speakers.**

• **The intended final coding format.**   This depends on the media the audio will be "stored" on: film, broadcast video or DVD, for example.

The most common format is 5.1, which consists of five full-range channels and a low-frequency effects (LFE) channel (the ".1" in 5.1 is the LFE or sub channel). The five full-range channels are reproduced by left, right, and center speakers positioned in front of the listener (L, R, and C for short), and left and right surround speakers positioned behind the listener (Ls and Rs for short). The LFE channel can be routed to the main speakers or to a subwoofer that can be positioned almost anywhere.

The center channel is typically used to lock dialog box or sounds to a video screen. The LFE channel is generally routed to a subwoofer to enhance low audio frequencies for effects such as explosions or crashes. Audio in this channel is limited to a range of approximately 25 Hz to 120 Hz.

See:

Surround Mixing (Producer and Studio only)
Surround basics

Configuring SONAR for surround mixing

This section covers setting up SONAR for surround sound.

See:

Using surround format templates

A Surround Format template specifies the number of speakers and the order in which the speakers are arranged.

There are several different surround formats, including LCRS, 5.1, 6.1, and 7.1, with 5.1 being most common. The number after the decimal point refers to the number of Low Frequency Effect (LFE) speakers. However, there are even different flavors of 5.1. The different flavors specify in which order the speakers are arranged, and the speaker angles. For example:

Surround Format	Speaker Order
5.1 SMPTE/ITU	L, R, C, LFE, Ls, Rs
5.1 Music Alternative	L, R, Ls, Rs, C, LFE
5.1 Film Alternative	L, C, R, Ls, Rs, LFE

Table 170.

The speaker positions, moving clockwise from center, are identified as:

Label	Speaker
C	Center (directly in front of listener)
Rc	Right of Center
R	Right (standard Stereo placement)
Sr	Side right—directly to the right of the listener
Rs	Right Surround
Cs	Surround (rear center)
Ls	Left Surround
Sl	Side Left—directly to the left of the listener
L	Left (standard Stereo placement)
Lc	Left of center
LFE	Low Frequency Effect speaker(s)—placed according to room acoustics

Table 171.

To mix in surround sound in SONAR, you must insert at least one surround bus.

A project can include multiple surround buses, but all surround buses in a project use the same surround format (5.1, 7.1, etc.).

The project's surround format is based on one of the following Surround Format templates:

- 2.0
- 2.1
- LCR
- LRC+LFE
- LRS
- LFS+LFE
- Matrix UHJ
- QUAD
- 4.1 (SMPTE/ITU)
- Quad+LFE
- PanAmbio 4.1
- LCRS

- Surround (SMPTE/ITU)
- Surround Media
- LCRS+LFE
- 5.1 (Standard 3/2)
- 5.1 (Film/Alternative)
- 5.1 (Music/Alternative)
- 5.1 (SMPTE/ITU)
- 6.0 (Hexagon)
- 6.0 (Film/Alternative)
- 6.0 (Music/Alternative)
- 6.1 (Film/Alternative)
- 6.1 (Music/Alternative)
- 6.1 (SMPTE/ITU)
- 7.0 (Heptagon)
- 7.0 (Film/Alternative)
- 7.0 (Music/Alternative)
- 7.1 (Film/Alternative)
- 7.1 (Music/Alternative)
- 7.1 (SMPTE/ITU)
- 8.0 (Octagon)
- 8.0 (Film/Alternative)
- 8.0 (Music/Alternative)
- 8.1 (Film/Alternative)
- 8.1 (Music/Alternative)
- 8.1 (SMPTE/ITU)

5.1 (SMPTE/ITU) is the default template.

The Surround Format templates are hard-coded, and cannot be deleted. However, you can freely assign any enabled audio output port to any surround channel, and save the configuration as a preset.

Surround settings are per project. Surround speaker assignments default to unique audio output channels when you choose a new template.

To configure surround settings, go to **Edit > Preferences > Project - Surround**.

See:

Choosing a surround format

Go to **Edit > Preferences > Project - Surround** to select a surround format. Choosing a surround format sets the number of speakers your project is using, and lets you choose a specific sound card output for each speaker. Here you can also choose parameters for bass management, and for downmixing, which means converting a surround mix into a stereo mix.

The group of sound card outputs that you choose in **Edit > Preferences > Project - Surround** make up the "Surround Main." The **Surround Main** becomes a choice on the **Outputs** menus of tracks and buses as soon as you insert a surround bus into your project. You won't see a "Surround Main" output module in the output modules section of the Console view, because it's just a term for the group of sound card outputs you choose for surround mixing. The pan control on any track or bus that outputs to the "Surround Main" controls which hardware outputs receive the signal that the track or bus sends to the "Surround Main."

SONAR saves the surround settings you choose in **Edit > Preferences > Project - Surround** with your project, including your downmixing parameters. If you have some particular settings you might use again, you can save a group of settings as a preset (except for downmixing parameters—you can change these, but they aren't saved in presets). To save a group of settings as a preset, type a name in the **Presets** field and then click the **Disk** icon that's to the right of the field. When you want to use this preset in a project, just choose it from the **Presets** drop-down menu.

To choose a surround format and set sound sard outputs

1. Go to **Edit > Preferences > Project - Surround**.

2. Select a format from the **Surround Format** drop-down.

   The diagram to the right of the **Surround Format** menu changes to illustrate the speaker placement of the format that you chose.

3. In the Output column, assign each channel to a sound card output.

   Note: *Consumer-grade sound cards, such as Audigy or SoundBlaster, typically reserve output 4 for the LFE channel. Check your sound card manual for details.*

4. Click **OK**.

   Note: *Take a moment to make sure your speakers are correctly hooked up to the corresponding outputs before you attempt any playback. See the diagram in **Edit > Preferences > Project - Surround** for the speaker setup. If you are not sure what the abbreviations for the speaker names are, see "Surround basics" on page 940.*

See:

"Surround buses" on page 945

Surround buses

You have to have at least one surround bus in your project to use surround sound. A surround bus differs from a stereo bus in that it simply has more channels. For example, if a project is set to 7.1, then the bus has 8 channels: 7 directional channels and one LFE channel.

To insert a surround bus

1. In the Bus Pane of the Track view or the Console view, right-click to display a pop-up menu of bus options.

2. Select **Insert Surround Bus** from the pop-up menu.

Or

• Use the **Insert > Surround Bus** menu command.

See:

Routing in surround

Tracks can send output to a surround bus, the Surround Main, or a hardware output. If a track is routed to a surround bus or the Surround Main, it has surround meters and a surround panner. You can route any track or bus to another bus, the Surround Main or a hardware out. However, you are prevented from creating a signal loop by routing the signal back into a bus that is already in the signal flow. The following table lists how each of these routing options affects the signal.

Signal Flow	Result
Track to stereo bus	No change
Mono track to surround bus	Mono signal is routed to both Left and Right channels of surround format. You can change the routing to other surround channels by using the surround panner on the track.
Stereo track to surround bus	Stereo left channel is routed to Left channel of surround format; stereo right channel is routed to Right channel of surround format. You can change the routing to other surround channels by using the surround panner on the track.
Track to hardware output	No change
Stereo bus to stereo bus	No change

Table 172.

Signal Flow	Result
Stereo bus to surround bus or the Surround Main	Stereo left channel is routed to Left channel of surround format; stereo right channel is routed to Right channel of surround format. You can change the routing to other surround channels by using the surround panner on the stereo bus.
Stereo bus to hardware output	No change
Surround bus to stereo bus	Surround channels are downmixed to stereo
Surround bus to surround bus or the Surround Main	No change

Table 172.

To assign a track to a surround bus or surround main

• Click in the track's **Output** field and select a surround bus, the **Surround Main**, or **New Surround Bus** as an output.

See:

Downmixing

Downmixing is a way of previewing your surround project in stereo only. There are various cases where surround is not available and it may be that someone plays your project in stereo only. A radio broadcast is a good example. Downmixing is a valuable tool for determining if your project will sound good in stereo. However, you can export your project in stereo, and SONAR uses your downmix settings to create your exported file.

The following table lists the downmixing settings in **Edit > Preferences > Project - Surround** and gives a brief description of what the setting does. You can also manually enter other values besides these preset ones.

Downmixing Setting	Options
Center Downmix Level (dB)	These options determine how much of the center is mixed to the left and right. • **-3 dB.** Maintains the same level of center channel sound when you listen in a typically reverberant room • **-4.5 dB.** A compromise level between -3dB and -6 dB • **-6 dB.** Maintains the same level of center channel sound when you listen to direct sound without typical room reverberations • **-INF.** Eliminates all of the Center channel signal
Surround Downmix Level (dB)	The amount of Left Surround and Right Surround mixed into the Left and Right channels respectively. • **-3 dB.** Maintains the same level of surround • **-6 dB.** Reduces the level of surround so that it doesn't compete with center channel sound such as dialog • **-INF.** Eliminates all of the Surround channel signal
LFE Level (dB)	The amount of the LFE channel mixed into the Left and Right channels respectively. • **-12 (or type in a value).** Lets you choose the level of LFE in the stereo mix • **-INF.** Eliminates all LFE

Table 173.

To downmix a project

1. If you do not have a stereo bus in your project, create one by right-clicking in the Bus pane in the Track view or Console view and selecting **Insert Stereo Bus** from the menu that appears.

2. Go to **Edit > Preferences > Project - Surround**, select a center downmix level and a surround downmix level, and click **OK**.

3. In each of the surround buses, assign the output to a stereo bus.

4. Listen to your project through the stereo bus, and make any final adjustments to the stereo mix by changing the values in **Edit > Preferences > Project - Surround**.

5. If you want to export your stereo mix, use the **File > Export > Audio** command. This command obeys your downmix settings.

See:

Panning in surround

Unlike stereo panning which sends sound to left and right speakers, surround panning means sending sound to multiple speakers at points along a circle.

When a track/bus/send is assigned to a surround bus, the Pan control turns into a multi-dimensional surround panner. The surround panner comes in four sizes:

- **Micro.** This is found in the Track view.
- **Small.** This is found on sends.
- **Medium.** This is the surround panner which is displayed in the Track Inspector and Console view.
- **Large.** This is a large surround panner (see "Controlling surround panning" on page 949 for a picture) which has additional controls, and appears when you right-click a surround panner and choose **Open Surround Panner** from the pop-up menu, or double-click outside the surround panner circle, or press ENTER when the panner has focus.

A. Micro surround panner in Track view B. Six channel output meter

Figure 279. *Console view surround panner*

A. Medium surround panner in Console view

The small and large panners are always synchronized; the large panner simply provides increased resolution when you adjust the surround pan position.

ℹ️ **Note 1:** *Surround panning is not available for tracks/sends that are routed to non-surround buses.*

Note 2: *If the track/bus/send is reassigned to a stereo bus, any surround automation will be orphaned, but will automatically reconnect if the track/bus/send is later assigned back to a surround bus.*

See:

Controlling surround panning

Here are pictures of the large surround panner and medium surround panner:

Figure 280. *Large Surround Panner*
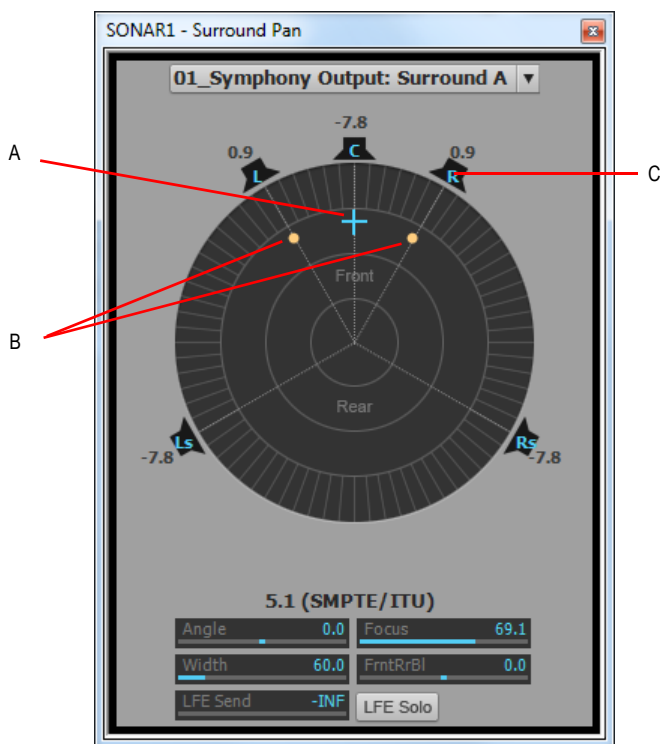
A. Angle and focus marker B. Width markers C. Right speaker icon

Figure 281. *Medium Surround Panner*

The large surround panner has some sliders at the bottom that the medium surround panner doesn't have, except for the LFE Send slider, which the medium panner has. Except for the sliders, the large and medium surround panners have the following controls:

- **Angle and Focus marker.**   A small sphere that you can drag in any direction to both control and display the following two parameters:

    - **Angle.**   This is the perceived angle of the sound source as it differs from the position directly in front of the listener. The scale is 0 to 180 degrees on the listener's right, and 0 to -180 degrees on the listener's left. 0 means the sound is coming from directly in front of the listener, and plus or minus 180 degrees means that the sound is coming from directly behind the listener.

    - **Focus.**   This is the perceived distance of the sound source from the center of the circle on a scale of 0 to 100, 0 meaning the center of the circle, and 100 meaning the perimeter.

- **Width markers.**   These are two smaller spheres equidistant from the Angle and Focus marker. Their distance from each other and from the front of the circle shows the Width value (see definition below). You can also drag the Width markers to control Angle and Focus.

- **Speaker icons/squares.**   Each surround channel is represented by a speaker icon in the large panner, and a white square in the small panner. The large panner also has a corresponding volume level in dB directly in front of each icon. The position of each speaker icon shows you each speaker's position in the surround mix. Clicking a speaker icon or square *mutes* the corresponding channel, causing the icon or square to become grey. Double-clicking the icon *solos* its channel, turning the icon green.

- **Angle slider (large panner only).**   This slider both displays and controls the angle value.

- **Focus slider (large panner only).**   This slider both displays and controls the focus value.

- **Width slider (large panner only).**   This slider both displays and controls the width value. *Width* is a measure of how wide an area the sound seems to be coming from on a scale of 0 to 360 degrees. At 0 and 360 degrees, the sound seems to all come from a single speaker. At 180 degrees the sound seems to come from directly opposite sides. The default angle matches the project's left and right channel angle. For example, in 5.1 SMPTE/ITU surround, the default width is 60 degrees.

- **Front/Rear Balance slider (large panner only).**   Abbreviated as **FrntRrBl**, this slider adjusts the front and rear balance. Drag it to the left to reduce the level from the front speakers, or drag it to the right to reduce rear level.

- **LFE slider.**   This slider both displays and controls the level of sound sent to the LFE channel.

- **LFE Only button (large panner only).**   This button mutes all channels except the LFE channel.

To open the large surround panner

- Right-click the small surround panner or the pan control in a track, and choose **Open Surround Panner** from the pop-up menu.

  Or

- Select a track and choose **Views > Surround Panner**, or press ALT+SHIFT+9.

  Or

- Double-click outside the **Surround Panner** circle.

  Or

- Press ENTER when the panner has focus.

To change the angle

- In either the large or small surround panner, drag the **Angle** and **Focus** marker to the left or right.

  Or

- In the large surround panner, drag the **Angle** slider.

To change the focus

- In either the large or small surround panner, drag the **Angle** and **Focus** marker toward or away from the center.

  Or

- In the large surround panner, drag the **Focus** slider.

To mute a surround speaker

- In the large surround panner, click a speaker icon to mute its output. The speaker icon turns grey when the speaker is muted.

  Or

- In the small surround panner, click a white square to mute a speaker's output. The square turns grey when the speaker is muted.

To solo a surround speaker

- In the large surround panner, double-click a speaker icon to solo its output. The speaker icon turns green when the speaker is soloed.

  Or

- In the small surround panner, double-click a white square to solo a speaker's output. The square turns green when the speaker is soloed.

To change the width

- In the large surround panner, drag the **Width** slider.

To change the front/rear balance

- In the large surround panner, drag the FrntRrBl slider left to reduce front level, or right to reduce rear level.

To change the LFE send level

- In either the large or small surround panner, drag the LFE slider.

ℹ **Note:** *Double-clicking any surround panner control will reset the control to its default value, which for the **LFE** control is **-INF**.*

To solo or unsolo the LFE channel

- In the large surround panner, click the **LFE Solo** button.

To isolate a signal in one speaker

- In the large surround panner, drag the **Width** slider to **0**, the **Focus** slider to **100**, and then drag the **Angle** slider until the sphere icon is directly in front of the correct speaker.

  Or
- Press the desired Numeric Keypad key that represents the speaker position (7=L, 8=C, 9=R, see "Keyboard shortcuts" on page 953).

To group panner controls

- In the large surround panner, right-click each slider that you want to add to the group, and choose **Group-"n"** from the pop-up menu.

Now you can move a single slider, and all sliders in that same group move synchronously.

ℹ **Note:** *If you group sliders that are in the same surround panner, you can no longer move the markers that represent those sliders' values. You can only move a grouped marker by moving its associated slider.*

Surround Mixing (Producer and Studio only)
         Panning in surround

Keyboard shortcuts

The following shortcuts allow you to control a surround panner from the keyboard:

Shortcut	Function
ALT+drag	Constrains to angle
ALT+SHIFT+drag	Constrains to angle at 100% focus
CTRL+SHIFT+drag	Constrains to focus only
SHIFT+click	Sets panner point to the point that you click (large and medium panners only)
SHIFT+drag controls (Angle, Width, etc.)	Fine resolution
Up/Down cursor keys	Move to next/previous widget in surround panner
Left/Right cursor keys	Move to next/previous panner in same track
CTRL+up/down	Move to surround panner in another track
CTRL+NumPad 0-9	Speaker mutes
NumPad 0-9	Jump to speaker angle at 100% focus

Table 174.

NumPad assignments:

- 0 = n/a
- 1 = Ls
- 2 = Cs
- 3 = Rs
- 4 = Sl
- 5 = centers the panner
- 6 = Sr
- 7 = L
- 8 = C
- 9 = R
- / = Lc
- * = Rc

See also:

Automating surround panning

You can arm or disarm for automation all the controls in a surround panner by clicking any control in the surround panner (except **LFE Solo**), and choosing **Write Enable** from the pop-up menu.

Potential 'pops' when using surround automation (SONAR Producer only)

If you record **Angle** surround pan automation, please note that a pop may occur as the angle parameter jumps from 0 degrees to 180 degrees. This may occur if the jump is not instantaneous, and can be easily solved by zooming in the envelope automation and moving the top and bottom nodes so they are aligned in time.

> **Tip:** *Enable Snap to make it easier to align the envelope nodes.*

See:
"Surround metering" on page 955

Joystick support

SONAR allows you to use a joystick to control surround panning. A force-feedback joystick such as the Microsoft® SideWinder® Force Feedback 2 joystick can add a tactile element to mixing sessions, and add button control to some SONAR transport and/or menu commands with the extra buttons on the joystick module.

The joystick will grab the current pan position/sphere anytime you pull the trigger button (the "firing" button under your index finger). When recording automation, you write new automation every time you pull the trigger button.

Various joystick buttons can be used to:

• Control SONAR's transport
• Switch focus to adjacent tracks/sends
• Solo/unsolo current channel
• Open/close the large surround panner window

To connect the joystick to SONAR

1. Go to **Edit > Preferences > MIDI - Control Surfaces**.

2. Click the **Add** button , and choose **Joystick Panner** in the **Controller/Surface** field of the **Controller/Surface Settings** dialog; click **OK**.

3. Click **OK** to close the **Preferences** dialog box.

4. In the Control Bar's ACT module, select **Joystick Panner** in the drop-down menu, then click the **Controller/Surface Properties** button 🔳.

5. In the **Joystick Panner** dialog box, select button **1** in the **Buttons** field, and then select **Engage Pan Mode** in the **Button Actions** field.

6. Now select Button **2**, and select **Engage Pan Nav Mode** in the **Button Actions** field.

7. Select any other buttons your joystick has (one at a time), and connect them to any transport or menu commands you want in the **Button Actions** field; close the **Joystick Panner** dialog box.

Now when you hold down button **1** (the "trigger button"), the joystick controls the surround panner on the current track or send. When the pan/sphere is in the desired position, let button **1** up to hold the position. When you hold down button **2**, move the joystick vertically to change the current track, and horizontally to change to a different send control. The Control Bar's ACT module displays the names of the current track and send. Use any other buttons you configured to control other SONAR functions.

You can save your button assignments as a preset by typing a name for the current group of settings in the Presets window in the **Joystick Panner** dialog box, and then clicking the floppy disk icon that's next to the **Presets** field. Whenever you want to load a preset, just select it in the Presets window.

Surround metering

Meters in tracks routed to surround buses or the Surround Main, and meters in surround buses work the same as stereo meters (see "Metering" on page 849), however, surround meters display more channels. For example, a project in 5.1 would have a six-channel meter.

Figure 282. *Multi-channel meter*
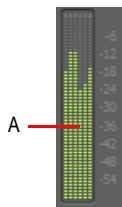
A. Six-channel meter

Each pair of hardware outputs still uses a stereo meter, but you will see the meters on several pairs of outputs displaying levels, depending on how many surround channels your project uses.

See:

"Bass management" on page 956

Bass management

A bass management system takes all the frequencies below a certain frequency (normally 80Hz) from the main channels, and the signal from the LFE channel, and mixes them together into the speaker that is best equipped to handle them. This is usually a subwoofer, but sometimes the left and right front speakers are used if a subwoofer isn't available. The reason why this is done is to make use of the subwoofer for more than the occasional low frequency effect, since the subwoofer is there anyway, and to lower the effective response of the system to about 25 Hz.

When you encode to Dolby Digital, the LFE channel gets a +10dB gain on playback from Dolby's decoder. This gives you the option of delivering some really powerful deep bass during playback, like in that earthquake sound effect in your recording. Consider also that this +10 dB of low bass can be added to any low bass that came out of the other 5 channels from redirection, so you realistically can deliver a sound from the subwoofer that is more than +20dB above the sound from any other speaker.

What this means during mixing is that you would have to turn the analog gain to your subwoofer up 10 dB relative to the other 5 speakers, so that you hear the sound as it will be played back in home theater systems that use bass management, and you will get your levels set right in the mix.

SONAR's bass management system allows you to monitor how a surround project will sound with bass management, so you don't have to change the gain to your subwoofer during mixing. SONAR's bass management system only applies to monitoring, and is ignored when you export your file.

To monitor with bass management

1. If necessary, open the project you want to use bass management with.
2. Go to **Edit > Preferences > Project - Surround**.
3. Check the **Monitor with Bass Management** option.
4. Select an option in the **Low Pass Cutoff (Hz)** drop-down, and click **OK**.

See:

Surround effects

SONAR lets you use your existing stereo or mono effects as surround effects. SONAR does this through the SurroundBridge, which automatically sets up your existing mono & stereo plug-ins so you can patch them into surround buses (buses, **not tracks**).

See:

The SurroundBridge

The SurroundBridge automatically loads enough instances of a plug-in to handle all your surround channels. For example, if you patch a *stereo* effect into a surround bus that uses 5.1 SMPTE/ITU panning, the SurroundBridge automatically assigns the Left and Right channels of the bus to instance 1 of the plug-in, assigns the Left Surround and Right Surround channels to instance 2, the Center channel to instance 3, and the LFE channel to instance 4. If you patch a mono effect into a surround bus, the SurroundBridge assigns each channel to a single instance of the mono effect, which would create six instances of the effect on a 5.1 surround bus. You can view and edit these assignments on the **SurroundBridge** tab that's in the property page of every effect that's patched into a surround bus. For example, if you want a certain effect on the Left Surround channel of a surround bus, but not on the Right Surround channel, you can assign these two channels to different instances of the effect you're patching by choosing options on the **SurroundBridge** tab of the effect's property page.

The SurroundBridge also links the automatable parameters of each instance so that when you change a parameter in one instance, you automatically change the same parameter in all the other instances. You can unlink parameters individually, or per-instance (see "How to patch and configure surround effects" on page 958).

See:

Effect property pages

A single property page controls all instances of an effect that is patched into a surround bus. The effect's property page displays a different tab for each instance of the effect. By default, when you change an automatable parameter on one tab of the property page, that change is duplicated on all the tabs of the property page. However, you can "unlink" individual parameters from the other tabs by clicking the **Unlink Controls** button in the effect property page, and while the button is enabled (red), move the parameter you want to unlink, and then click the **Unlink Controls** button again to disable it. Now you can change that parameter on one tab without changing the same parameter on the other tabs. You can also link or unlink all of an instance's parameters by using the controls on the **SurroundBridge** tab.

See:

Effect presets

You can use existing (non-surround) effects presets when you patch an effect to a surround bus— selecting a non-surround preset sets all of a plug-in's instances to the settings of the preset; selecting a surround preset sets each instance's parameters individually, according to the information stored in the preset.

See:

How to patch and configure surround effects

For step-by-step instructions, see the following procedures.

To patch an effect into a surround bus

• Right-click the effects bin of a surround bus and choose a mono or stereo effect from the pop-up menu.

The SurroundBridge patches multiple instances of the effect you chose into the bus's effects bin (however, only one effect appears in the bin), with default assignments of surround channels to plug-in instances.

> **Note:** *Mono plug-ins may not work properly when inserted in a Surround bus effect bin. A common symptom is a Runtime error message.*

To change channel assignments for a patched effect

1. If the effect's property page is not open, display it by double-clicking the name of the effect in the surround bus's effects bin.

2. On the **SurroundBridge** tab of the effect's property page, use the drop-down menus in the Left Input and Right Input columns to assign individual surround channels to instances of the effect.

Your assignments take effect immediately, and the names of the tabs in the property page change to reflect the new assignments.

To unlink individual effect parameters from other effect instances

1. In the property page of an effect that's patched into a surround bus, click the **Unlink Controls** button so that it turns red.

2. Make some adjustments to the automatable parameters you want to unlink (non-automatable parameters are not linked together). You can select parameters on any tab. SONAR will automatically capture which controls you change and unlink them from the corresponding controls for the other surround channels.

3. When you're finished adjusting parameters, click the **Unlink Controls** button again so that it's not red.

Now you can adjust the parameters you adjusted, without automatically adjusting the same parameters that are on other tabs of the effect's property page. As long as the **Unlink Controls** button is not red, all other controls will remain linked.

A list of the parameters that you unlinked appears in the **Unlinked Controls** field on the **SurroundBridge** tab, with the instance number listed in the **Plug-in #** column of the **Unlinked Controls** field.

If you unlinked some but not all of an instance's parameters, the instance's check box in the **Controls Linked to Group** column appears **grey**, with a check.

To view a list of the automatable parameters in a particular effect, uncheck one of the **Controls Linked to Group** check boxes on the **SurroundBridge** tab, and read the list in the **Unlinked Controls** field.

To relink individual effect parameters to other effect instances

1. In the **Unlinked Controls** field on the **SurroundBridge** tab, select the parameters you want to relink—if the parameters you want to select are adjacent, you can SHIFT-click the first and last ones in the group. If they're not adjacent, you can CTRL-click them individually.

2. Click the **Relink Controls** button.

The parameters you relinked are removed from the list.

To unlink all of an instance's parameters from other instances

1. In the property page of an effect that's patched into a surround bus, click the **SurroundBridge** tab.

2. Find the instance you want to unlink in the **Plug-in #** column, and uncheck its **Controls Linked to Group** check box.

The parameters you unlinked appear in the **Unlinked Controls** field, with the instance number listed in the **Plug-in #** column of the **Unlinked Controls** field.

> **Note:** *To relink all of an instance's parameters, recheck its **Controls Linked to Group** check box.*

To disable an instance

*   On the **SurroundBridge** tab of the effect's property page, uncheck the **Enable** check box of the plug-in you want to disable. The instance's tab becomes greyed-out when you do this. You can re-enable the instance by rechecking the check box.

The **Enable** check box is a separate bypass system from the **Bypass** button that is on the instance's individual property tab. Disabling an instance by using the **Enable** check box lightens the CPU load by taking the instance out of the processing path. The **Bypass** button on the instance's property tab does not change color when you click the **Enable** check box, because it is a separate system. The **Bypass** button is automatable in some plug-ins.

To save a preset

1. Set the effect's parameters the way you want them.

2. In the **Presets** field of the effect's property page, type a name for the preset, and click the floppy disk icon that's just right of the **Presets** field.

Saving a preset of an effect that's patched into a surround bus creates a surround preset, which includes channel assignments and parameter linkage settings.

Importing surround mixes

SONAR imports multi-channel (surround) files as a group of mono files. If the files contain information that labels the speaker location of each channel in the file, SONAR copies these labels to the clips in your audio tracks, but does not pan the tracks according to these labels. This is because you may not have your SONAR project set to the same multi-channel format as the imported project.

You can import the following types of multi-channel files:

- Multi-channel PCM wave files (.wav)
- Dolby AC3 encoded files. (.ac3)—these are encoded for Dolby surround. You will need to install an AC3 decoder filter such as this one: http://ac3filter.sourceforge.net in order to be able to decode these files in SONAR.

⚠️ **Important:** *After installing the above AC3 codec, go to Control Panel and launch the "AC3 Filter" control panel applet. From there you can set up the default speaker output for this filter to 5.1 channels. Until you do this it will only stream in stereo. Also check the sample rate of the imported file. It's recommended that you set your project sample rate to whatever the file uses before importing. Otherwise the import process will go through a time consuming resampling pass for each channel.*

- Windows Media Pro

To import a surround multi-channel file

1. Use the **File > Import > Audio** command to open the **Import Audio** dialog box.
2. Select a file of a supported file type.
3. Check **Import As Mono Tracks**.
4. Click **Open**.

SONAR imports each channel to a separate mono track.

💡 **Tip:** *You can also rip the soundtrack from a video file by opening the video file directly from the Import Audio dialog box.*

See:

"Exporting surround mixes" on page 962

Exporting surround mixes

You can export your surround mixes as multi-channel PCM wave files, or as Windows Media Pro files.

To export a surround multi-channel file

1. Use the **File > Export > Audio** command to open the **Export Audio** dialog box.

2. Type a name for your file.

3. In the **Files of Type** field, choose one of the following:

    • If you want to create a multi-channel wave file, choose **RIFF Wave**.

    • If you want to create a multi-channel Windows Media file, choose **Windows Media Advanced Streaming Format**.

4. In the **Source Category** field, choose **Buses**, **Main Outputs**, or **Entire Mix**.

5. Choose the bus or buses in the **Source Buses/Tracks** field that you want to export your mix from.

6. Choose **Multichannel** in the **Channel Format** field.

7. Choose any other options you want such as **Sample Rate** and **Bit Depth**.

8. If you want to save the settings you created in the **Export Audio** dialog box, type a name for them in the Preset window and then click the floppy disk icon that's next to the window.

9. Click **Export**.

SONAR exports your project in the file format you selected.

Standard AVI audio codecs do not support multichannel audio

None of the standard AVI audio codecs support multichannel audio. When exporting multichannel audio to an AVI video file, do not select an audio codec (no compression), or use a codec that is known to support multichannel audio.

ProChannel (Producer only)

ProChannel features a collection of audio processing modules that can be dynamically added, removed, and reordered per audio track, Instrument track and bus in the Inspector and Console view. Combining compression, equalization, and tube saturation modeling in one convenient processor, ProChannel is designed to make it fast and easy to enhance any track or bus.

Figure 283. *ProChannel provides compressor, equalizer and tube saturation processing for each channel.*

SONAR X2 includes the following ProChannel modules:

- **Compressor.** The Compressor modules let you limit the dynamic range and balance the overall level. Compression makes the loud parts of the signal quieter, resulting in a more even level.

SONAR includes two different compressor modules:

- **PC76 U-Type Channel Compressor.** This is the default mode when using ProChannel on a track. This mode is meticulously modelled after one of the most renowned and famous solid-state (F.E.T.) compressors that is used in professional studios and recordings. Known to bring out the brightness and presence of a sound. Commonly used on vocal tracks, but also recommended for stereo drum buses and guitar tracks. For details, see "PC76 U-Type Channel Compressor module" on page 977.

Note: *The PC76 U-Type Channel Compressor is faithfully modelled after the hardware circuitry of a classic compressor that does not support sidechaining. Consequently, the PC76 U-Type Channel Compressor does not support sidechaining either. If you need to use sidechaining, use the PC4K S-Type Bus Compressor mode.*

- **PC4K S-Type Bus Compressor.** This is the default mode when using ProChannel on a bus. This mode is based on the legendary center console stereo bus compressor in one of the world's most successful analog studio production mixing consoles. Known to add punch and drive to a mix. Also recommended for instruments like piano and drums. This mode supports sidechaining. For details, see "PC4K S-Type Bus Compressor module" on page 979.

- **QuadCurve Equalizer.** The QuadCurve Equalizer module allows you to fine tune the frequency spectrum of your music or sound. You have control over six individual bands, which allows you to attenuate or boost specific frequency ranges and shape the overall characteristics of the audio signal. Equalization may also be applied creatively, to add presence or enhance certain frequencies, to remove noise, hum or low-end rumble, for special effects or numerous other purposes. For more information, see "QuadCurve Equalizer module" on page 981.

- **Tube Saturation.** Digital audio recordings can sometimes sound sterile and lifeless. The Tube Saturation module employs advanced analog vacuum-tube circuit modeling, which allows you to apply ultra-high-quality analog warmth and saturation to individual tracks and full mixes. Under the hood are dynamic, virtual vacuum-tubes that mimic the "animated" nature of their real, analog counterpart as they respond to different audio input. The result is the coveted warm, lively and realistic analog sound of classic vacuum-tube processors and amplifiers. For details, see "Tube Saturation module" on page 987.

- **PC4K S-Type Expander/Gate.** PC4K S-Type Expander/Gate is based on the legendary channel strip gate in one the world's most successful analog studio production mixing consoles.

- **Softube Saturation Knob.** The Softube Saturation Knob module borrows from Softube's famous German FET distortion and compression circuitry modeling, and provides smooth, one-knob, frequency saturation operation for adding just the right amount of tube warmth to any track.

- **Console Emulator.** The Console Emulator module emulates the sound of three classic recording consoles in SONAR's mixer. For details, see "Console Emulator module" on page 988.

- **FX Chain.** The FX Chain module lets you save and load audio effect plug-in chain presets called FX Chain. The FX Chain module can be used as an effects bin that can be inserted between other ProChannel modules. For details, see "FX Chain module" on page 992.

- **BREVERB SONAR ProChannel.** The BREVERB SONAR ProChannel module by Overloud provides world-class studio reverb. Dozens of professional presets are included. SONAR

includes both VST and ProChannel versions of BREVERB SONAR. For details, click the Help button in the BREVERB SONAR VST version.

Additional modules will be available in the future from Cakewalk and third party vendors. For help with external ProChannel modules, select a module and press F1 to open its online Help.

To show/hide ProChannel

To show/hide ProChannel in the Console view, click the **Modules** menu, then click **ProChannel**.

To show/hide ProChannel in the Inspector, click the **ProCh** button at the top of the Inspector, or press CTRL+I.

Note: *Due to technical limitations of the VST plug-in format, it is not possible to show more than one instance of a ProChannel module. As a result, the same ProChannel instance can not be displayed in the Inspector and Console view at the same time. If you open ProChannel in the Inspector, the same ProChannel will close in the Console view, and vice versa.*

To expand/collapse ProChannel in the Console view

Click the **Expand/Collapse** button ▶ in the Inspector or Console view.

To close all instances of ProChannel, hold down the CTRL key and click any **Expand/Collapse** button ▶.

Note: *When expanding ProChannel in the Console view, ProChannel extends to the right of the channel strip.*

See:

See also:

Using ProChannel

To enable/disable a module

In the expanded ProChannel, click the module's enable/disable button ⏻.

ℹ️ **Note:** *The more ProChannel modules you enable, the more CPU resources are required from your computer.*

To insert a module

Do *one* of the following:

- Click the **Insert Module** button ➕ in the Inspector and choose a module on the pop-up menu.
- Right-click a module header or blank space in ProChannel and select **Insert Module** on the pop-up menu.

Figure 284. *Click the Insert Module button to insert a new module.*

Inspector

ℹ️ **Note:** *You can insert multiple instances of external ProChannel modules. However, you can not insert multiple instances of the internal ProChannel modules, including QuadCurve Equalizer, Tube Saturation, PC76 U-Type compressor, and PC4K S-Type bus compressor.*

To remove a module

Right-click the module header and select **Remove Module** on the pop-up menu.

To replace a module

Right-click a module header or blank space in ProChannel and select **Replace Module** on the pop-up menu.

To reorder a module

The signal flows from top to bottom. Click a module's gripper and drag the module up/down to the desired position.

Figure 285. *Drag a module's gripper up/down to reorder the signal chain.*

To select a module

Click a module to make it the active module. The active module is shaded slightly. You can use ACT to control parameters in the active module, and all context menu commands operate on the active module when right-clicking an empty space in ProChannel.

To specify the default ProChannel configuration

1. Insert and arrange the ProChannel modules in the desired order.
2. Do *one* of the following:
   - **To specify the default configuration for tracks.**   Right-click any empty space in a track's ProChannel and select **Set Modules as Default for Tracks** on the pop-up menu.
   - **To specify the default configuration for tracks.**   Right-click any empty space in a bus' ProChannel and select **Set Modules as Default for Buses** on the pop-up menu.

To route ProChannel pre-effects bin or post-effects bin

By default, the ProChannel signal is routed prior to the channel's effects bin (pre). To route ProChannel after the effects bin (post), right-click any empty space in ProChannel and select **Post-FX bin** on the pop-up menu.

To interact with the QuadCurve Equalizer graph

The QuadCurve Equalizer graph is divided into four sections, which correspond to the Low, Low-Mid, Mid-High and High bands. When you move the mouse pointer over the graph, the current band is highlighted.

Note: *The High Pass filter and Low Pass filter can not be edited from the graph.*

To adjust a band's gain, drag up/down.

To adjust a band's frequency, drag left/right.

To adjust a band's Q, hold down the ALT key and drag up/down.

To adjust parameters with finer precision, hold down the SHIFT key while dragging.

To enable/disable a band, click the band's region in the graph.

To change the plot resolution globally, right-click any QuadCurve Equalizer graph in the Console view and choose the desired resolution on the pop-up menu. The resolutions are as follows:

- Auto (graph scales dynamically)
- 6 dB
- 12 dB
- 18 dB

Figure 286. *QuadCurve Equalizer graph.*
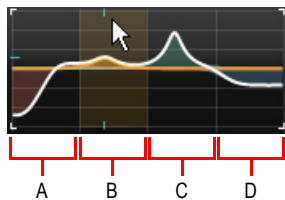
A. Low band B. Low-Mid band C. Mid-High band D. High band

To sidechain the ProChannel compressor

1. Add the PC4K S-Type Bus Compressor module.

2. Under **Side Chain**, click the **On/Off** toggle.

Figure 287. *Add the PC4K S-Type Bus Compressor module in order to use sidechaining.*

See also:

To use presets

Do *one* of the following:

• To load an existing preset, click the **Load Preset** button ▣ and navigate to the desired preset file.

• To save a new preset or overwrite the current preset, click the **Save Preset** button ▣, type a name, then click **Save**.

> **Note:** *To see the **Load Preset** and **Save Preset** buttons in the Inspector and collapsed Console view strips, hover the mouse over the Preset control.*

Figure 288. *Use presets to save and recall favorite settings.*
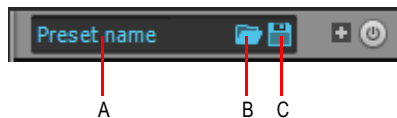
A. Current preset B. Load Preset C. Save Preset

To lock ProChannel in the Inspector pane

By default, the Track Inspector dynamically updates to show the current track. However, you can choose to always show a specific instance of ProChannel regardless of which track is current.

1. Click the track or bus you want to show in the Track Inspector.

2. Click the **ProCh** button at the top of the Inspector.

   ProChannel is displayed in the Inspector pane.

3. Click the Track Name control at the bottom of the Inspector and select **Lock the current track or bus** from the drop-down menu.

   To unlock the track or bus, select **Lock the current track or bus** from the menu again.

Keyboard navigation

When ProChannel has focus, you can use the following keys to navigate around ProChannel:

Key	Action
PAGE UP	Scroll up
PAGE DOWN	Scroll down
HOME	Go to top
END	Go to bottom

Table 175. *ProChannel keyboard shortcuts*

ProChannel compatibility with SONAR X2 Studio and Essential

ProChannel is only included with SONAR X2 Producer. If a project was created in Producer and loaded into Studio or Essential, the project might sound different because ProChannel is not available. However, if you resave the project in Studio or Essential, all ProChannel settings will be persisted and available if you later load the project into Producer again.

Loading legacy projects

If you load a pre-SONAR X2 project that uses the per-channel Sonitus:fx EQ, the ProChannel QuadCurve Equalizer module will be disabled.

If you want to keep and edit the Sonitus:fx EQ, double-click the small Equalizer graph in the collapsed ProChannel.

To replace the Sonitus:fx EQ with the ProChannel QuadCurve Equalizer, do *one* of the following:

- Press CTRL and click the Equalizer enable/disable button ⏻.

- Enable the Equalizer module. SONAR prompts if you want to switch from the Sonitus:fx EQ to the ProChannel QuadCurve Equalizer.

Loading X2 projects in SONAR X1c or earlier

• SONAR X1c and earlier only support a single compressor module per channel. If you are using multiple compressor modules on a channel in a SONAR X2 project, SONAR X1c (or earlier) will only load one of the compressors.

• SONAR X1c and earlier always shows the Compressor, Equalizer and Tube Saturation modules on all channels. If you load a SONAR X2 project that doesn't use all the default modules, SONAR X1c will automatically recreate the missing modules.

• If you load a SONAR X2 project that has ProChannel Global Bypass enabled, you will not be able to unbypass that ProChannel instance in SONAR X1c.

See:

See also:

ProChannel modules and controls

ProChannel can be displayed either collapsed or expanded in the Inspector and Console view. When collapsed, only a subset of all available controls are visible.

Note: *When expanding ProChannel in the Inspector, ProChannel fills the entire width of the Inspector. When expanding ProChannel in the Console view, ProChannel extends to the right of the channel strip.*

Figure 289. *ProChannel can be displayed collapsed or expanded in the Inspector and Console view.*

Collapsed   **Expanded**   **Inspector**
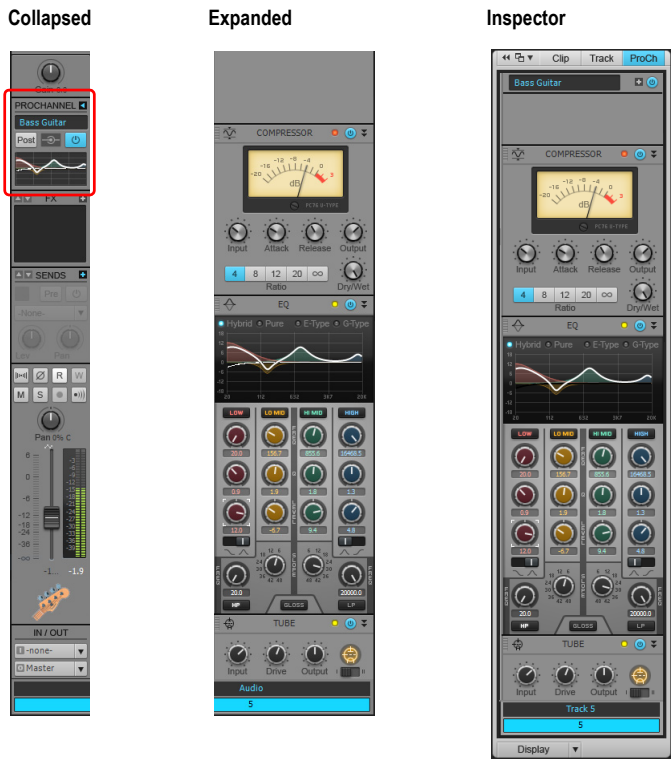
ProChannel controls (collapsed)

Figure 290. *ProChannel (collapsed)*
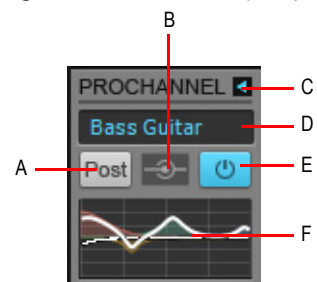
A. Pre/Post B. Global input meter C. Expand/collapse ProChannel D. Preset E. Global On/Off F. QuadCurve Equalizer graph

By default, ProChannel is collapsed and only shows a subset of all available controls. When collapsed, ProChannel shows the following controls:

- **Expand/Collapse .** Expands/collapses the ProChannel module.

- **Preset.** Shows selected preset name. Hover the mouse over the Preset control to access **Load Preset** and **Save Preset** controls. For details, see "Presets" on page 975.

- **Pre/Post Post.** Specifies if the ProChannel signal is routed prior to the channel's effects bin (pre) or after the effects bin (post).

- **Global input meter.** Activity indicator that shows if any module is processing audio.

- **Global enable/disable.** When enabled, the audio signal flows through ProChannel. When disabled, ProChannel is bypassed.

- **QuadCurve Equalizer graph.** Shows the equalization curve.

ProChannel controls (expanded)

Figure 291. *ProChannel (expanded).*

A. Selected track B. Selected track's expanded ProChannel C. Presets D. Compressor E. Equalizer F. Tube saturation

When expanded, ProChannel exposes the following controls:

- **Collapse** ⏸. Collapses the ProChannel module.
- **Preset.** Shows selected preset name. For details, see "Presets" on page 975.
- **Insert Module (Inspector only).** Lets you insert a new module from a pop-up menu. See also "To replace a module" on page 967.
- **Gripper.** Drag up/down to reorder the module.
- **Icon.** Each module category has its own unique icon. For details, see "Module categories" on page 976.
- **Name.** Module name.
- **Clipping LED.** Shows if the input signal to the module is clipping. If there is any distortion in the ProChannel signal chain, the clipping LEDs let you identify where the clipping occurs.
- **Enable/disable.** Enable/disable the module.
- **Minimize/Restore.** Collapse and restore the module height. Hold down the CTRL key and click to collapse/restore the same module on all selected tracks. Hold down the ALT key and click to collapse/restore all modules in a track.

Figure 292. *Module header controls.*
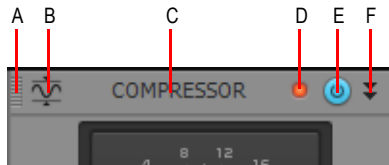
A. Gripper B. Icon C. Name D. Clipping LED E. Bypass F. Minimize/Restore

Presets

ProChannel includes several presets to get you started. However, because all audio material is different, the real power and fun is to experiment with the controls to come up with settings that suit the audio material you are working with.

ProChannel presets are saved to disk as *.pcp files. By default, presets are stored in the `<SONAR program folder>\ProChannel presets` folder. To change to the default preset folder, go to **Edit > Preferences > File - Folder Locations**.

Figure 293. *Use presets to save and recall favorite settings.*
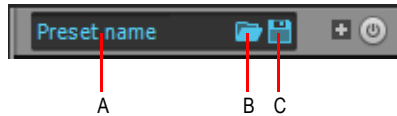
A. Current preset B. Load Preset C. Save Preset

• **Preset list.** Shows selected preset name. Choose any existing preset from the list.

• **Preset.** Shows selected preset name.

• **Load Preset** . Opens the **Open** dialog box to the default preset directory. Choose a preset and click **Load** to load the preset.

• **Save Preset** . Opens the **Save As** dialog box to the default preset directory. Type a name and click **Save** to save the current ProChannel settings as a new preset. To overwrite an existing preset, type the same name as the existing preset.

Note 1: *To see the **Load Preset** and **Save Preset** buttons in the Inspector and collapsed Console view strips, hover the mouse over the Preset control.*

Note 2: *If a preset is referring to a plug-in that is missing, only the module header is loaded and the module is collapsed. When expanded, the module will be empty to indicate the plug-in is missing.*

See also:

Module categories

Modules are arranged by category in the **Insert Module** pop-up menu, and each module displays its category icon. The following categories are available:

Category	Module icon	Type of processor
Frequency		EQ, pitch shift, etc.
Dynamics		Compressor, gate, expander, etc.
Simulation		Tape saturation, etc.
Distortion		Distortion, drive, etc.
Time		Delay, reverb, etc.
Modulation		Chorus, flanger, phaser, vibrato, tremolo, etc.
Imaging		Stereo spread, etc.
Analysis		Spectrum analyzer, etc.

Table 176. *ProChannel module categories*

Note: *The number of available categories depends on the modules you have installed. By default, SONAR X2 includes Equalizer, Compressor, Gate and Tube Saturation modules, and therefore shows the Frequency, Dynamics and Simulation categories.*

See:

PC76 U-Type Channel Compressor module

Figure 294. *PC76 U-Type Channel Compressor.*
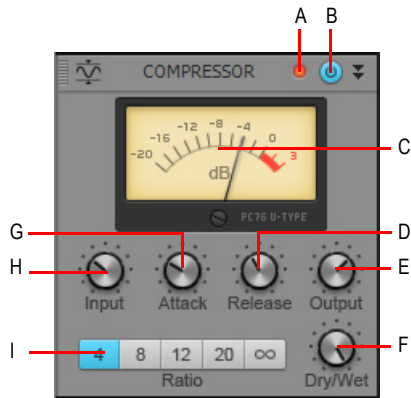
A. *Clipping LED* **B.** *Compressor enable/disable* **C.** *VU meter* **D.** *Release* **E.** *Output level* **F.** *Dry/Wet level*
G. *Attack* **H.** *Input level* **I.** *Ratio*

This is the default compressor module when using ProChannel on a track. This module is meticulously modelled after one of the most renowned and famous solid-state (F.E.T.) compressors that is used in professional studios and recordings. Known to bring out the brightness and presence of a sound. Commonly used on vocal tracks, but also recommended for stereo drum buses and guitar tracks.

> **Note:** *The PC76 U-Type Channel Compressor is faithfully modelled after the hardware circuitry of a classic compressor that does not support sidechaining. Consequently, the PC76 U-Type Channel Compressor does not support sidechaining either. If you need to use sidechaining, use the PC4K S-Type Bus Compressor mode.*

The PC76 U-Type Channel Compressor module contains the following controls:

- **Clipping LED.** Shows if the input signal to the Compressor module is clipping. If there is any distortion in the ProChannel signal chain, the clipping LEDs let you identify where the clipping occurs.

- **Compressor enable/disable** ⏻**.** Enables/disables the PC76 U-Type Channel Compressor module.

- **VU meter.** Shows the amount of gain reduction.

- **Input.** Determines the relative threshold and total amount of gain reduction. The valid range is -20 dB to +40 dB, and the default value is -0.2 dB.

> **Tip:** *The PC76 U-Type Channel Compressor does not have a dedicated threshold control, but instead has a fixed threshold level and uses the **Input** control to determine the relative threshold as well as the total amount of gain reduction. To set a specific amount of compression, first turn the **Input** and **Output** controls all the way down, adjust the **Attack** control in order to engage gain reduction, then finally adjust the **Input** control until the desired amount of gain reduction is achieved.*

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- **Attack.** Adjusts the time it takes the compressor to respond to the input signal after the threshold level has been reached. A fast attack setting means that compression will be more or less instant. Using a slower attack setting results in the compression being gradually increased, allowing for more variations in the signal than the fast setting. Attack should be adjusted according to the nature of the audio material. The valid range is 0.0 to 1.2 milliseconds, and the default value is 0.4 milliseconds.

- **Release.** Adjusts the time the compressor takes to go back to an inactive state after the input level has fallen below the threshold value. Short release times will make the compression more flexible and able to adapt to the input signal, but can cause fast changes in gain that may sound displeasing to the ears. Longer release times produce a signal with a more even level and less of a "pumping" effect, but make it harder to maximize the overall compression because changes in the input level cannot be compensated for quickly enough to make the output volume totally consistent. The valid range is 50.0 milliseconds to 1200 milliseconds, and the default value is 510 milliseconds.

- **Output.** Applies a final gain adjustment to the post-compression audio signal. The valid range is -40.0 dB to +20.0 dB, and the default value is -0.4 dB.

> **Note:** *The **Output** control essentially functions as a makeup gain control. Use the **Input** control to set the desired amount of limiting, then use the **Output** control to set the desired output level.*

- **Ratio.** Controls the amount of compression (gain reduction) that will be applied to the signal after the input audio level exceeds the threshold level. Ratio denotes the difference in dB between input level and output level, i.e. how much the signal above the threshold level will be compressed. For example, a ratio of 4:1 means that when the input level increases by 4dB, the output level of the signal above threshold will only increase by 1dB. The following ratios are available:
  - **4.** Use when general dynamic range compression is desired.
  - **8.** Use when general dynamic range compression is desired.
  - **12.** Use when peak-limiting is desired.
  - **20.** Use when peak-limiting is desired.
  - **Nuke.** Same effect as if all other ratio buttons are enabled simultaneously. The result is extreme compression, which is often used for drum recordings.

- **Dry/Wet.** Adjust the balance between the unprocessed (dry) and processed (wet) audio signal. The valid range is 0 to 100% and the default value is 100%.

See:

PC4K S-Type Bus Compressor module

Figure 295. *PC4K S-Type Bus Compressor.*
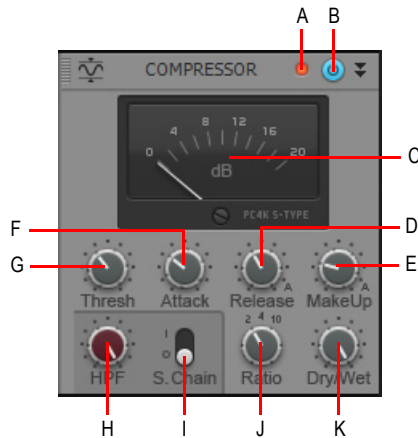
A. Clipping LED B. Compressor enable/disable C. VU meter D. Release E. Make-up gain F. Attack
G. Threshold H. Sidechain High Pass filter I. Sidechain enable/disable J. Ratio K. Dry/Wet level

This is the default compressor module when using ProChannel on a bus. This module is based on the legendary center console stereo bus compressor in one of the world's most successful analog studio production mixing consoles. Known to add punch and drive to a mix. Also recommended for instruments like piano and drums. This mode supports sidechaining.

The PC4K S-Type Bus Compressor module contains the following controls:

- **Clipping LED.**   Shows if the input signal to the Compressor module is clipping. If there is any distortion in the ProChannel signal chain, the clipping LEDs let you identify where the clipping occurs.

- **Compressor enable/disable** ⏻**.**   Enables/disables the PC4K S-Type Bus Compressor module.

- **VU meter.**   Shows the amount of gain reduction.

- **Thresh.**   Sets the level at which compression occurs. If the input signal level is below the threshold, no compression takes place. If the threshold level is reached, compression (i.e. automatic gain reduction) occurs, reducing the gain of the input signal according to the Ratio, Attack and Release settings. The valid range is -30 dB to +20 dB, and the default value is -10 dB.

- **Attack.** Adjusts the time it takes the compressor to respond to the input signal after the threshold level has been reached. A fast attack setting means that compression will be more or less instant. Using a slower attack setting results in the compression being gradually increased, allowing for more variations in the signal than the fast setting. Attack should be adjusted according to the nature of the audio material. The valid range is 0.1 to 30 milliseconds, and the default value is 0.8 milliseconds.

- **Release.** Adjusts the time the compressor takes to go back to an inactive state after the input level has fallen below the threshold value. Short release times will make the compression more flexible and able to adapt to the input signal, but can cause fast changes in gain that may sound displeasing to the ears. Longer release times produce a signal with a more even level and less distortion, but make it harder to maximize the overall compression because changes in the input level cannot be compensated for quickly enough to make the output volume totally consistent. The valid range is 0.1 to 1.2 seconds and Auto. and the default value is 0.5 seconds. If Auto is selected, the release time is dependent on the duration of the signal peak.

- **Make Up.** Compensates, or "makes up" for automatic gain reduction. Make-up gain refers to the process of re-balancing the subjective level of the compressed audio against the uncompressed audio. In other words, make-up gain reduces the difference in level between the loudest and quietest sounds of the processed audio. As the compressor turns down the peak levels of the audio that exceeds the threshold level, you may want to turn up the level of the entire compressor to balance the mix. For example, if you increase the gain so that the peak levels are the same as before compression, the quieter sections of the audio will also be increased by the same amount, effectively keeping the peaks levels as they were before compression while increasing the level of the quieter audio. The valid range is -10 dB to +30 dB and Auto, and the default value is 0 dB. If Auto is selected, the Make Up gain is automatically calculated based on the Ratio and Threshold settings.

- **Ratio.** Controls the amount of compression (gain reduction) that will be applied to the signal after the input audio level exceeds the threshold level. Ratio denotes the difference in dB between input level and output level, i.e. how much the signal above the threshold level will be compressed. For example, a ratio of 4:1 means that when the input level increases by 4dB, the output level of the signal above threshold will only increase by 1dB. The following ratios are available:

  - **2.** Use when general dynamic range compression is desired.

  - **4.** Use when general dynamic range compression is desired.

  - **10.** Use when peak-limiting is desired.

- **Sidechain.** Sidechaining is typically used with compressors to limit one signal depending on the signal level of another. Common applications are to reduce the level of a bass guitar when there is a kick drum, or to reduce the level of music whenever a speaker talks (often used for background music in radio- and television programs). Audio track, Bus and Send outputs can be routed to sidechain inputs. The Sidechain sections contains the following controls:

  - **On/Off.** Enables/disables the compressor's sidechain input as an audio output destination in all Track/Bus/Send Output controls.

  - **High Pass.** Applies a High Pass filter to the sidechain input. The valid range is OFF to 2 kHz.

- **Dry/Wet.**   Adjusts the balance between the unprocessed (dry) and processed (wet) audio signal. The range is 0 to 100% and the default value is 100%.

See also:

See:

QuadCurve Equalizer module

The QuadCurve Equalizer module allows you to fine tune the frequency spectrum of your tracks.

The QuadCurve Equalizer module can be displayed in either full size or compact size. The compact module hides the Frequency, Q and Level controls for the Low, Low-Mid, Mid-High and High bands. You may want to show the compact size if ProChannel is too tall to show all its controls in the Inspector or Console view.

- **To show/hide compact mode in the Inspector.**   Click the **Display** button at the bottom of the Inspector, point to **Module Options > ProChannel** and choose **Compact EQ Module**.
- **To show/hide compact mode in the Console view.**   Click the Console view **Options** menu, point to **ProChannel** and choose **Compact EQ Module**.

To adjust knobs with finer resolution, hold down the SHIFT key while adjusting a knob.

To type parameter values, double-click the value edit box below a parameter.

Figure 296. *QuadCurve Equalizer module.*
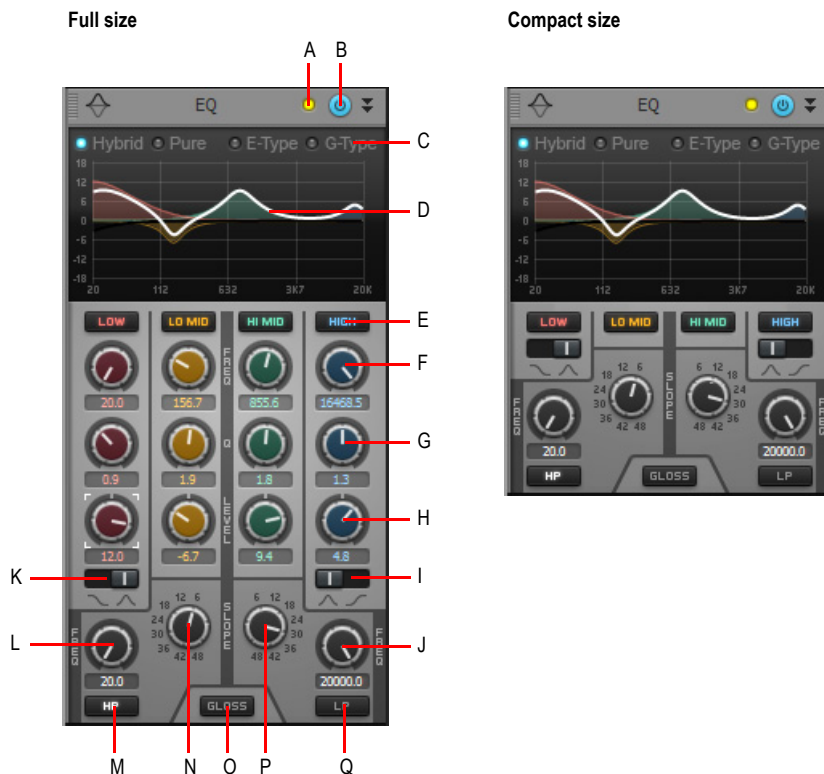
A. Clipping LED *B.* QuadCurve Equalizer enable/disable *C.* Style (Hybrid, Pure, E-Type or G-Type)   *D.* Graph
E. Band enable/disable (Low, Low-Mid, Mid-High, High) *F.* Frequency *G.* Q *H.* Level *I.* High band filter type
J. Low Pass filter frequency *K.* Low band filter type *L.* High Pass filter frequency *M.* High Pass filter enable/
disable *N.* High Pass filter slope (Q) *O.* Gloss enable/disable *P.* Low Pass filter slope (Q) *Q.* Low Pass filter
enable/disable

Figure 297. *The equalizer has six bands.*

A. Low band (red) B. Low-Mid band (yellow) C. Mid-High band (green) D. High band (blue) E. High Pass filter (black) F. Low Pass filter (black)

The QuadCurve Equalizer module contains the following controls:

• **Clipping LED.**   Shows if the input signal to the QuadCurve Equalizer module is clipping. If there is any distortion in the ProChannel signal chain, the clipping LEDs let you identify where the clipping occurs.

• **QuadCurve Equalizer enable/disable** ⏻.   Enables/disables the QuadCurve Equalizer module.

• **Style.**   Specifies the equalizer algorithm. Choose between transparent equalization (**Pure**) or equalization for character (**Hybrid, E-Type** and **G-Type**). Each style provides a different

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interaction between Q and Level settings. The styles are as follows:
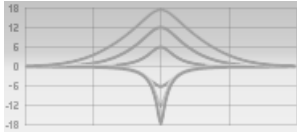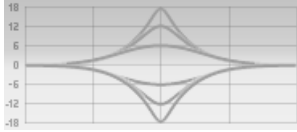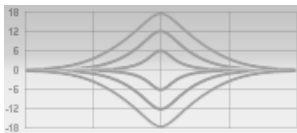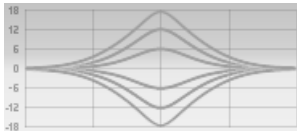
Style	Description	Recommended for	Curve
Hybrid	Provides an unsymmetrical curve that is very versatile. The curve is similar to E-Type when boosting frequencies, but has constant Q response in when cutting frequencies. Suitable for gentle fill EQ when boosting, while also accurately modifying troublesome resonance frequencies when cutting.	• Resonance control for drums and percussion instruments • Problem solving and surgical correction of frequencies.	
Pure	Provides a clean transparent mastering style equalizer with a soft and gentle curve.	• Overall EQ • Buses • Mastering • Whenever you need to apply subtle changes over a wide spectrum.	
E-Type	Provides a curve that mimics a vintage hardware equalizer. In this mode, the Q response is constant at all Level settings. This allows you to have a narrow Q at low gain settings, which is especially useful for drums. This mode is less suitable for overall EQ or subtle corrections, because you also need to adjust the Q setting to maintain its effect when adjusting the gain. This is a very clinical and flexible EQ because it has separate control over Q and Level.	• Drums • Precision and problem solving • Whenever you need relatively high Q at low gain settings	
G-Type	Provides a curve that mimics a modern hardware equalizer. In this mode, the Q response is dynamic, meaning the Q is reduced as you increase the Level, and the effective bandwidth is increased for low gain settings. This is a musical EQ with a gentle Q curve.	• Overall EQ • Subtle adjustments to instruments and vocals • Broad and musical tonal balancing	

Table 177. *EQ types*

- **Graph.**   Shows the equalization curve. Each band is identified by a unique color, and the sum of all bands is displayed as a white line. Adjust the equalizer by manipulating the graph. For details, see "To interact with the QuadCurve Equalizer graph" on page 968.

  - To adjust a band's gain, drag up/down.

  - To adjust a band's frequency, drag left/right.

  - To adjust a band's Q, hold down the ALT key and drag up/down.

- To adjust parameters with finer precision, hold down the SHIFT key while dragging.

- To enable/disable a band, click the band's region in the graph.

- To change the plot resolution globally, right-click any small QuadCurve Equalizer graph in the Console view and choose the desired resolution on the pop-up menu. The resolutions are as follows:

  - Auto (graph scales dynamically)

  - 6 dB

  - 12 dB

  - 18 dB

- **Band enable/disable.**   Enables/disables the Low `LOW`, Low-Mid `LO MID`, Mid-High `HI MID` and High `HIGH` bands. Enabling a band allows it to be processed with equalization. The knobs and graph curves are color-coded per band:

  - Low = Red

  - Low-Mid = Yellow

  - Mid-High = Green

  - High = Blue

- **Frequency.**   Sets the center frequency for the selected band (Low, Low-Mid, Mid-High and High). The valid frequency range for each band is as follows:

Band	Frequency range	Default center frequency
Low	20.0 - 20000.0 Hz	79.6 Hz
Low-Mid	20.0 - 20000.0 Hz	317 Hz
Mid-High	20.0 - 20000.0 Hz	1261.9 Hz
High	20.0 - 20000.0 Hz	5023.8 Hz

Table 178.   *Default center frequency for each band*

- **Q.**   Sets the width of the selected band (Low, Low-Mid, Mid-High and High), which determines the amount of surrounding frequencies that will be affected when adjusting the band. A low Q value gives a high bandwidth for the filter band, resulting in a smooth shaping of the sound and little audible 'coloration'. Filtering will however be less accurate, since a wide frequency range around the center frequency will be affected. A high Q value reduces the bandwidth, improving filter accuracy but also creating sharp dips or peaks in the frequency spectrum. The width of the Q is expressed in terms of octaves. The valid range is 0.1 to 16.0 and the default value is 1.3.

- **Level.**   Boosts or attenuates the selected band (Low, Low-Mid, Mid-High and High).The valid range is -18.0 dB to +18.0 dB and the default value is 0 dB. The Level control interacts with the Q parameter, depending in the selected EQ type (Hybrid, Pure, E-Type or G-Type).

- **Low band filter type.**   Toggles the Low band between Bell and Low Shelf mode. In Bell mode,

the Low band boosts or attenuates a range of frequencies around a central point in a bell shape. In Low Shelf mode, the Low band boosts or attenuates the set frequency and all frequencies below it.

- **High band filter type.**   Toggles the High band between Bell and High Shelf mode. In Bell mode, the High band boosts or attenuates a range of frequencies around a central point in a bell shape. In High Shelf mode, the High band boosts or attenuates the set frequency and all frequencies above it.

- **Low Pass filter enable/disable** `LP`**.**   Enables the Low Pass filter, which attenuates high frequencies above the Low Pass frequency while allowing other frequencies to pass unfiltered.

- **Slope (Low Pass).**   Specifies the ratio of how the Low Pass filter attenuates frequencies above the Low Pass frequency. Slop is expressed in decibels per octave. The range is from 6 dB to 48 dB in 6 dB increments.

- **LP.**   Specifies the cut-off frequency for the Low Pass filter.

- **High Pass filter enable/disable** `HP`**.**   Enables the High Pass filter, which attenuates low frequencies below the High Pass frequency while allowing other frequencies to pass unfiltered.

- **Slope (High Pass).**   Specifies the ratio of how the High Pass filter attenuates frequencies below the High Pass frequency. Slop is expressed in decibels per octave. The range is from 6 dB to 48 dB in 6 dB increments.

- **HP.**   Specifies the cut-off frequency for the High Pass filter.

- **Gloss** `GLOSS`**.**   Adds a smooth breath and presence to the high end without any harshness using a unique gloss filter.

See also:

See:

ProChannel (Producer only)

Tube Saturation module
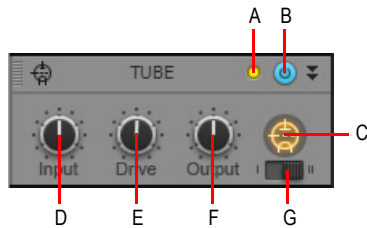
A. Clipping LED B. Tube saturation enable/disable C. Activity indicator D. Input gain E. Drive (level) F. Output gain G. Saturation type

The Tube Saturation module contains the following controls:

- **Saturation type.**   Select the desired type of tube saturation:

  - **Type 1.**   Type 1 provides pure tube emulation.

  - **Type 2.**   Type 2 is a dual-tube emulation. The second tube applies a special crossover filter in the high end and doesn't process high frequencies. This ensures that sibilant sounds are not distorted or sound metallic. The result is a gentler tube saturation in the higher frequencies.

- **Clipping LED.**   Shows if the input signal to the Tube Saturation module is clipping. If there is any distortion in the ProChannel signal chain, the clipping LEDs let you identify where the clipping occurs.

- **Tube Saturation enable/disable** .   Enables/disables the Tube Saturation module.

- **Input gain.**   Applies a gain adjustment to the pre-processed audio signal.

- **Drive.**   Adjust how much of the pre-processed input signal enters into saturation. The valid range is 0% (no saturation) to 100% (very saturated) and the default setting is 0%.

- **Output gain.**   Applies a final gain adjustment to the post-processed audio signal.

- **Tube Saturation** .   Shows any tube saturation activity. The icon glows when the input signal is being processed.

See:

Console Emulator module

Figure 299. *Console Emulator module.*
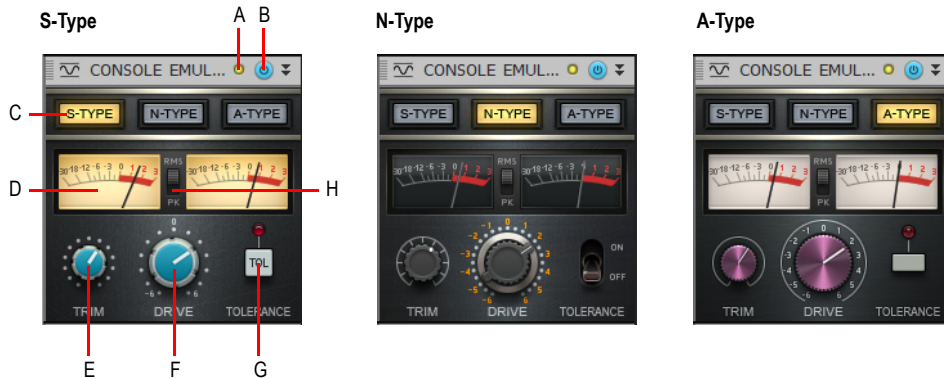
A. Clipping LED B. Console Emulator enable/disable C. Emulation mode D. Output VU meters (left and right channels) E. Trim (not available in bus module) F. Drive G. Tolerance H. RMS/Peak meter toggle

When recording to analog tape, the mixing console is the centerpiece of the studio. The audio signal is affected as it passes through the circuitry of the console. Each console employs a different design and components, which adds to the sonic imprint of each console. There are various elements that define the sound of each console.

Digital audio is often accused of lacking "character". Although mixing entirely inside a computer (often referred to as "mixing in the box") has many benefits, it can sometimes lack the character of using an analog mixing console.

The Console Emulator module emulates the sonic characteristics of three classic mixing consoles. This has nothing to do with EQ and compression, but rather mimics the subtle non-linear distortion and noise that occurs when passing an audio signal through a mixing console's analog circuit.

The Console Emulator module is based on the following principles:

• Input transformer emulation, which introduces hysteresis and frequency dependent saturation.

• Frequency response shaping of the channel.

• Bias drift of the active stages.

• Component tolerance simulation by slightly changing the filter's values in the different channels.

• Saturation of the mix bus.

• Crosstalk on stereo buses.

Just like an analog console, the overall sound character is the sum of all the separate processing stages. Depending on the console type and settings, some of the benefits you may experience include:

• A wider sound stage.

• Increased sense of sense of spatial cohesion.

• More depth and definition.

• A bit more warmth and aggression.

• Easier to balance levels across tracks.

Controls

There are two versions of the Console Emulator module:

• **Console Emulator Channel.**   This version is designed for individual tracks.

• **Console Emulator Bus.**   This version is designed for buses. It contains the same controls as the Channel version, except it does not have a Trim control.

Figure 300. *Console Emulator Channel and Bus modules.*

Console Emulator Channel   Console Emulator Bus
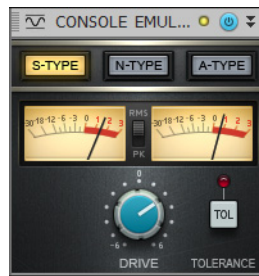
The Console Emulator module contains the following controls:

• **Mode.**   Selects the desired console emulation mode. For each mode, the Console Emulator module closely resembles the hardware it is modeled after.

   • **S-Type.**   Emulates a clean and transparent British console that is popular among mixing engineers in rock and pop genres. This console has potentially been used on more platinum selling albums than all other consoles combined.

   • **N-Type.**   Emulates a British console that is used in legendary recording studios, including Abbey Road, The Village, Ocean Way, and Skywalker Sound. This console is warm and has a rich low end.

   • **A-Type.**   Emulates a revolutionary British console, of which only 13 consoles were ever built. This console was made famous at Trident Studios and Cherokee Studios. This console has a brighter top and less lows than the N-Type console. Some consider this best sounding console of all time.

• **Clipping LED.**   Shows if the input signal to the Console Emulator module is clipping. If there is

any distortion in the ProChannel signal chain, the clipping LEDs let you identify where the clipping occurs.

- **Console Emulator enable/disable** ⏻.   Enables/disables the Console Emulator module.

- **Output VU meters.**   These meters are calibrated to function responsively, just like real-world meters. These meters fully support proper gain-staging needed for professional mixing situations and let the user make a better judgment of the volume needed for a particular track.

- **RMS/Peak.**   The VU meters can be switched to show RMS or Peak levels. Choose **RMS** to display more of an average of the amplitudes that occur in a complete cycle of a frequency. RMS, or Root-Mean-Square, is a little over seventy percent of peak level. Choose **Peak** to display the highest amplitude in the signal that occurs in a complete cycle of a frequency.

- **Trim.**   Adjusts the input gain. The valid range is 0% to 100% and the default setting is 0%. This control is only available in the Console Emulator Channel module, not in the Console Emulator Bus module.

- **Drive.**   Adjusts how much of the pre-processed input signal enters into saturation. For example, in an analog hardware mixer, if you put all the channel faders at +3dB, the summing circuits will saturate more than if the channels faders are set to 0dB. With this parameter, you can control the amount of summing saturation. The valid range is -6.0 dB to +6.0 dB and the default setting is 0 dB.

> 🛈 **Note:** *The Drive parameter faithfully emulates the behavior of a fader on a real hardware console when the Drive value is between -6 dB and +2 dB. The Drive range is extended and goes beyond its hardware counterpart, allowing creative processing when the value is between +2 dB and +6 dB.*

- **Tolerance.**   Simulates the component tolerances of the bus circuits. Even if all the channels in a mixer are in theory equal each other as they are composed by the same electrical components, in practice these components can be slightly different among the channels. For example, a 2Kohm resistor could be 1.98Kohm on channel 1, 2.03Kohm on channel 2 and 1.99Kohm on channel 3, and so on. By enabling the Tolerance switch, the Console Emulator module will sound slightly different on different channels. These differences are saved into the song state, so it can be recalled when you reload the session.

How to use the Console Emulator

To get the full benefit of console emulation, you typically want to add the Console Emulator module to all audio tracks and buses across your project.

The audible results may appear subtle when first using the Console Emulator module. In fact, you may not hear any difference at all at first. This is especially true if you insert the Console Emulator module after you have already mixed a song.

The effect is subtle when listening to individual tracks or buses. Keep in mind that the effect is accumulative, so the effect will become more noticeable as you add Console Emulator to multiple tracks.

The trick is to insert the Console Emulator module before you start mixing. All your mixing decisions will then be made based on having the Console Emulator module in the signal chain. When you are done mixing, you can globally enable/disable the Console Emulator module to A/B the results, and you will likely hear a noticeable difference.

Guidelines:

- You will typically want to insert the Console Emulator module as the first module, and make sure ProChannel has **Post FX Bin** disabled. However, you can also experiment with placing the Console Emulator module at the end and enable **Post FX Bin**, so all your effects and processed sound are affected.

- Add the Console Emulator module to all audio tracks and buses across your project, and use Quick Groups to easily control multiple instances simultaneously. To do so, select all tracks, then hold down the CTRL key while you insert or modify the Console Emulator module.

- Leave the Console Emulator module active throughout the mixing process, "working" the mix through the plug-in.

💡 **Tip:** *Add the Console Emulator module to the default ProChannel layout. This way, the Console Emulator module is always available on all tracks. Use the same console mode on all tracks and buses.*

See:

FX Chain module

The FX Chain module allows you to use FX Chains (see "Effects chains" on page 882) and individual audio effects within the ProChannel signal flow. The FX Chain module can be used as an effects bin that can be inserted between other ProChannel modules.

An FX Chain is a container that can include multiple audio plug-ins. Assignable knobs and buttons can control automatable plug-in parameters in the FX Chain. An FX Chain preset can store up to six assignable knobs and six assignable buttons.

Figure 301. *FX Chain module.*
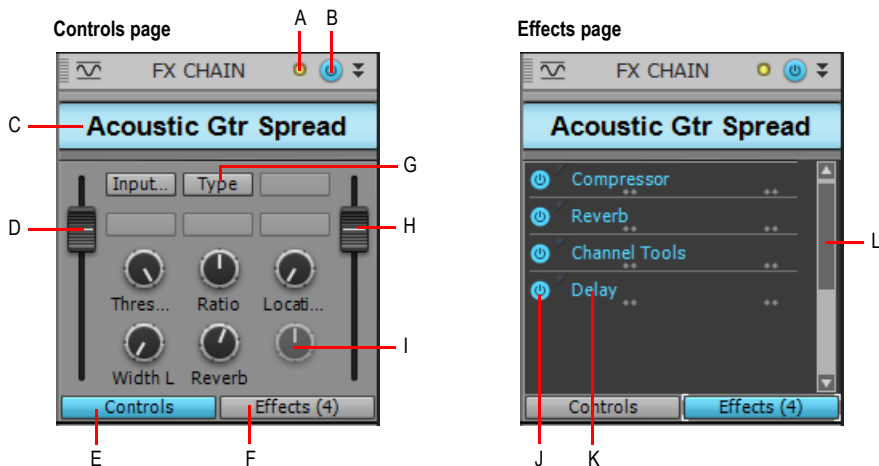
A. Clipping LED B. FX Chain enable/disable C. FX Chain name (double-click to edit) D. Input level E. Show Controls page F. Show Effects page G. Assignable button (right-click to assign) H. Output level I. Assignable rotary (right-click to assign) J. Click button to bypass/un-bypass plug-in K. List of effects in chain (double-click to open plug-in; drag to reorder) L. Scroll bar

The FX Chain module contains the following controls:

- **FX Chain preset name.** The name of the current FX Chain preset. Double-click to rename.

- **Controls page.** The Controls page shows the automatable effect parameters that are assigned to the FX Chain knobs and buttons:

  - **Input level.** Input level before the FX Chain. This parameter is automatable.

  - **Assignable rotaries.** Up to 6 assignable rotaries allow you to control automatable plug-in parameters without having to open a plug-in's property page. For details, see "Using assignable controls" on page 889.

  - **Assignable buttons.** Up to 6 assignable buttons allow you to control automatable plug-in parameters without having to open a plug-in's property page. For details, see "Using assignable controls" on page 889.

  - **Output level.** Output level after the FX Chain. This parameter is automatable.

- **Effects page.** The Effects page shows a list of all plug-ins that are included in the current FX Chain preset. The signal flows from top to bottom. Drag to reorder plug-ins, and right-click to add/remove plug-ins. You can bypass individual plug-ins by clicking the small bypass toggle to the left of the plug-in name.

Note: *Unlike the FX Chain plug-in (see "Effects chains" on page 882), all buttons and knobs in the ProChannel FX Chain module are always visible when showing the Controls page. Buttons and knobs that are not assigned to an automatable effect parameter are disabled.*

Tip: *Knob and button labels are sometimes truncated. Move the mouse pointer over the control to see the full label in a Tooltip.*

To add a new FX Chain module

Do *one* of the following:

- Click the **Insert Module** button in the Inspector and choose **FX Chain** on the pop-up menu. An empty FX Chain module appears with the Effects page visible.
- Right-click a module header or blank space in ProChannel and select **Insert Module > FX Chain** on the pop-up menu. An empty FX Chain module appears with the Effects page visible.
- Drag an audio effect from the Browser to ProChannel. An empty FX Chain module appears with the Effects page visible, and the audio effect's property page appears.
- Drag an FX Chain preset from the Browser to ProChannel.

To load an FX Chain preset

Do *one* of the following:

- On the Effects page, right-click the effects bin and choose **Load FX Chain Preset** on the pop-up menu. Select the desired FX Chain Preset file (*.fxc) in the **Load FX Chain Preset** dialog box and click **Open**.
- From the **Plug-in** tab of the Browser, under **Audio**, expand the **FX Chain** branch and drag the preset to ProChannel.
- Right-click the preset name field and choose **Load FX Chain Preset** on the pop-up menu.

Figure 302. *To create a new FX Chain, drag an FX Chain preset from the Browser's Audio tab to an audio track or audio clip effects bin.*
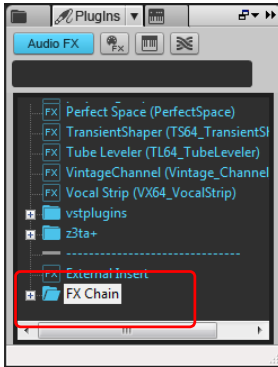
To add an effect to the current FX Chain

Do *one* of the following:

- On the Effects page, right-click the effects bin, point to **Audio FX** and choose the desired audio effect on the pop-up menu.
- From the **Plug-in** tab of the Browser, under **Audio FX**, drag the desired effect the FX Chain module's Effects page.

To remove an effect

Right-click the effect name on the Effects page and choose **Delete** on the pop-up menu.

To re-order plug-ins

On the Effects page, drag the effects up/down to the desired position.

To bypass an individual plug-in

On the Effects page, click the small button to the left of the plug-in name.

To rename the FX Chain

Double-click the preset name field, then type the desired name and press ENTER.

To save an FX Chain preset

Do *one* of the following:

- Right-click the preset name field and choose **Save FX Chain Preset** on the pop-up menu.
- Right-click the effects bin on the Effects page and choose **Save FX Chain Preset** on the pop-up menu.

To edit a knob or button

Right-click the control and choose **Edit Control** on the pop-up menu.

To enable a knob or button for automation writing

Right-click the control and choose **Write Enable Automation** on the pop-up menu.

To enable a knob or button for automation playback

Right-click the control and choose **Read Enable Control** on the pop-up menu.

To reset a knob or button to its default value

Double-click the control.

To open an effect's property page

Double-click the effect name on the Effects page.

To automate FX Chain plug-ins

Effects in an FX Chain can be automated just like other effects in an effects bin. Parameter names for plug-ins that reside within an FX Chain container are listed in submenu's prefixed by the associated FX Chain name.

You can also use ACT to control the FX Chain's input level, output level and assignable knobs and buttons. For details, see "ACT" on page 1234.

For information about automating effects, see "Automating effects" on page 1036.

To customize an assignable control

Right-click a knob or button in the FX Chain module and choose **Edit control** on the pop-up menu to open the **Control Properties** dialog box.

Figure 303. *Assignable control properties.*

A. Name B. Position C. Destination D. Start value E. End value

The **Control Properties** dialog box contains the following settings:

- **Name.**   The name of the assignable control, shown as the label.
- **Position.**   The "slot" position of the control, from left to right.
- **Destination.**   Choose up to four automatable plug-in parameters to control with the assignable knob or button.
- **Start.**   The start value for the destination parameter, specified as a percentage (0.00% to 100.00%).
- **End.**   The end value for the destination parameter, specified as a percentage (0.00% to 100.00%). You can also set Start and End values automatically. For details, see "To set parameter value range automatically" on page 996.

To clear an assignable knob or button

Right-click a knob or button in the FX Chain module and choose **Remove control** on the pop-up menu to open the **Control Properties** dialog box. The assigned parameter(s) is removed from the control, but the control remains visible.

To set parameter value range manually

1. Right-click a knob or button in the FX Chain module and choose **Edit control** on the pop-up menu to open the **Control Properties** dialog box.
2. Specify the **Start** and **End** values.

💡 **Tip:** *You can invert ranges to have two parameters move in opposite directions.*

To set parameter value range automatically

1. Open a plug-in's property page and set the desired Start position for each parameter.
2. Right-click a knob or button in the FX Chain module, point to **Ranges** on the pop-up menu and choose one of the following commands:
   - **All Parameters- Set Start.**   Set the Start value of all parameters assigned to the FX Chain knob or button. The values are determined by the current position of each plug-in's property page settings.
   - **All Parameters- Set End.**   Set the End value of all parameters assigned to the FX Chain knob or button. The values are determined by the current position of each plug-in's property page settings.
   - **<Plug-in name - Parameter name>- Set Start.**   Set the Start value of a specific parameter assigned to the FX Chain knob or button.
   - **<Plug-in name - Parameter name>- Set End.**   Set the End value of a specific parameter assigned to the FX Chain knob or button.

To set the default parameter value

1. Adjust a knob or button in the FX Chain module to the desired default position.

2. Right-click the knob or button and choose **Set Default Value** on the pop-up menu.

When you double-click the knob or button, it returns to its default value.

Note: *If multiple parameters are assigned to the knob or button, the default value will be 0.5.*

To map an assignable knob or button to a plug-in parameter

1. Right-click an assignable knob or button in the FX Chain module's Controls page and choose **Edit control** on the pop-up menu to open the **Control Properties** dialog box.

2. Specify an automatable plug-in parameter in the **Destination** list. You can specify up to four parameters for each knob and button.

Figure 304. *Specify up to four automatable plug-in parameters for each assignable control.*
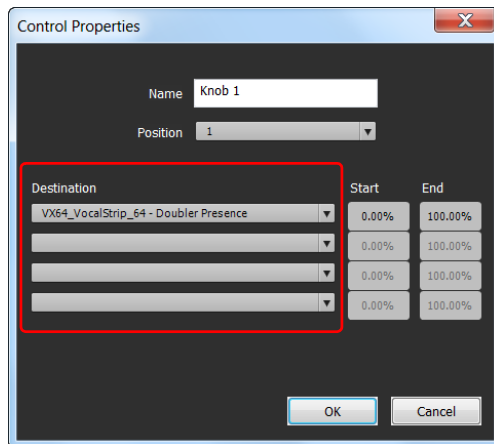
Note: *You can also "learn" plug-in parameters by simply touching controls in plug-in property pages. To do so, right-click in the FX Chain module's Controls page and select **Learn Knobs** or **Learn Buttons** on the pop-up menu. Touch the plug-in parameters you want to assign, then select **Learn Knobs** or **Learn Buttons** again to exit learn mode.*

Customizing the FX Chain UI

You can change the colors and graphics that are displayed in each FX Chain. To do so, right-click the FX Chain module and click **Customize UI** on the pop-up menu to open the **Settings** dialog box.

Figure 305. *Use the Settings dialog box to customize the appearance of the FX Chain module.*
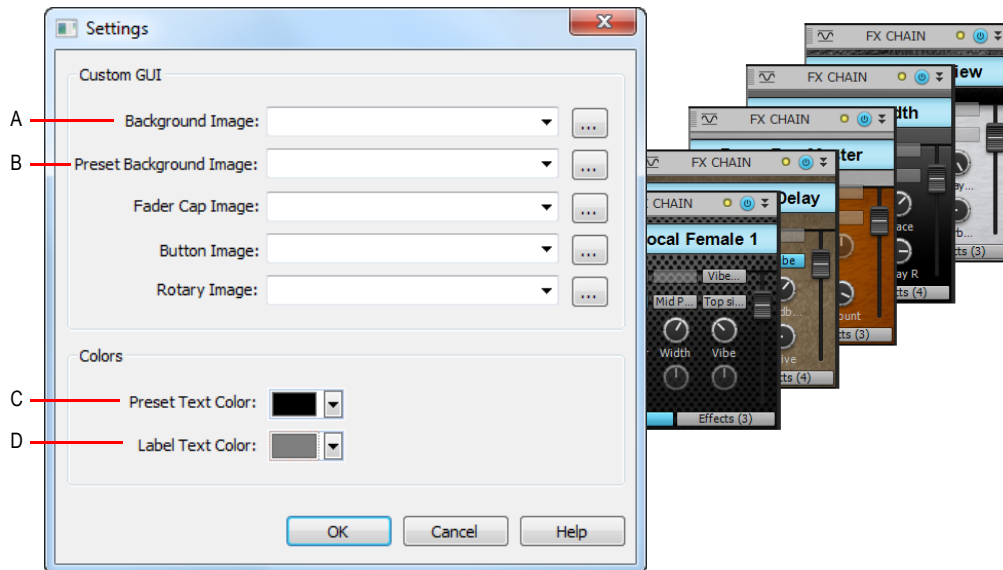
A. Background image B. Preset background image C. Preset text color D. Label text color

The **Settings** dialog box contains the following settings:

• **Background Image.**   The main background image in the FX Chain Controls page.

• **Preset Background Image.**   The image behind the preset name.

• **Preset Text Color.**   Color of preset name.

• **Label Text Color.**   Color of button and knob text labels.

Figure 306. *FX Chain UI.*

A. Preset Background Image B. Preset Text Color C. Label Text Color D. Background Image

> **Note:** *The Fader Cap, Button Image, and Rotary Image settings can not be customized from the FX Chain module. To customize all images, create the FX Chain preset in a track's effects bin (see* "Effects chains" *on page 882 and* "Customizing the FX Chain UI (Producer and Studio only)" *on page 893), then load the FX Chain preset into ProChannel.*

See also:

See:

Automation

SONAR has a very sophisticated automation system that lets you record fader moves and parameter changes with a mouse or control surface during playback in real time, or edit automation graphically offline.

Automation means to record the movement of a fader, knob, or other control so that the next time you play your project, that control moves automatically. This allows you to dynamically change parameters over the course of a project's timeline. SONAR allows you to graphically automate much more than just volume and pan controls—you can automate individual controls, faders, and knobs that control the main outs, individual tracks, buses, individual effects' parameters (including some plug-in synths), and even individual clips. Easy to use read and write controls are featured on each automatable component of SONAR.

You can also group several controls together and automate them all by recording only a single control's movements. You can draw freehand and geometric automation curves with the Freehand tool and Pattern tools. All automatable controls are in the Console view and the Track view (including the Clips pane), however, you can also graphically automate MIDI controllers from the Piano Roll view in addition to the Console and Track views. You can enable or disable all automation by clicking the **Global Automation Playback** button R! in the Control Bar's Mix module. You can also enable or disable automation by track or by parameter using the **Automation Read** button R on track strips, buses, effects bins and soft synths. This is a handy way to turn off automation for a particular section of parameters while mixing.

Below are some examples of when you may want to use automation:

- If you want a track to slowly fade in or out, automate the tracks Volume control.
- If a particular plug-in is only required during a specific section in a song, automate the plug-in's Bypass parameter during the parts of the track where the plug-in is not required.
- If you want a certain sound to pan across speakers at given points during a song, "record" the panning movements.

See:

Quick automation guide

The following table summarizes Console and Track view automation.

What you can automate	Parameters you can automate	How you can automate them
Individual tracks	Gain, pan, mute, bus send gain, bus send balance, MIDI controllers, MIDI chorus and reverb, pitch wheel, channel aftertouch, RPN and NRPN.	Draw envelopes in the Clips pane, record the fader movements, or take a snapshot.
Buses	Input gain and pan, output gain and pan.	Draw envelopes in the Clips pane, record the fader movements, or take a snapshot.
Individual effects	Varies with the effect.	Draw envelopes in the Clips pane, record the fader movements, or take a snapshot.
Soft Synth controls	Varies with the synth.	See "Drawing soft synth automation in the Clips pane" on page 819 and "Automating controls from the Synth Rack" on page 818.
Groups of faders or other controls	Whatever the faders or other controls in the group control.	Record fader movements.
Individual clips	Gain and pan for audio clips, velocity for MIDI clips.	Draw envelopes in the Clips pane.

Table 179.

In addition, SONAR allows you to copy and paste envelopes between tracks. The *only* controls that you *can't automate* are the **Arm**, **Solo**, **Pre/Post**, **Interleave** (Mono/Stereo selector), **Bus Enable**, and **Phase** buttons, and the **Trim** fader.

For step-by-step instructions, see:

Automation methods

There are several ways to automate controls in the Track view, Track Inspector and Console view:

- **Recording the movements of individual faders, knobs, or controls.** Record parameter changes in real-time with a mouse or control surface. This method includes any knob, slider, or control except the **Solo**, **Arm**, **Phase**, **Interleave**, **Vol Trim**, **Bus Enable**, **Pre/Post** buttons, **Bank**, **Patch**, **Channel**, **Key+**, **Time+**, **Input** and **Output**.
- **Drawing envelopes in the Clips pane for audio and/or MIDI data.** Draw automation envelopes with the global tools. An envelope is a graph of the change in level of a particular parameter over time. For details, see "Creating and editing automation envelopes" on page 1019.
- **Recording automation data from an external controller.**
- **Snapshots.** Take an instantaneous snapshot of the current parameter settings. For details, see "Snapshots" on page 1035.

A common workflow is to first record automation in real-time, then use the global edit tools to graphically fine-tune the automation envelope.

For step-by-step instructions, see:

Automation write modes (Producer and Studio only)

There are three modes available when writing automation: **Overwrite**, **Touch**, and **Latch**. The following table describes each mode.

Mode	Icon	Description	Parameters affected
Overwrite		Overwrite mode overwrites any existing automation data for the currently armed parameter while the transport is rolling, even if you don't touch the parameter. Any previous automation is erased. This mode is useful if you want to set some parameters to their desired write positions before you press Play.	Only the parameter currently shown in the track's Edit Filter.
Touch		Touch mode overwrites any existing automation data for the currently armed parameter only when the parameter is moved with the mouse or a MIDI controller. Automation writing stops when the parameter is released, and the parameter returns to any previously automated position. This mode is useful if you want to update a previous write pass, appending new automation data only where desired. When using a touch-sensitive MIDI controller, new automation data will only overwrite existing automation data when you physically touch a control.	All automation data on the track.
Latch		Latch Mode is similar to Touch mode; new automation data overwrites existing automation data when you move a control. However, when you release the parameter, it will remain "latched" into its current position and continue to overwrite any existing automation data until playback stops. This mode is useful if you want to start writing automation only after a parameter is moved. This mode is particularly useful for automating pan controls and plug-in parameters when using a non-touch sensitive control surface (because it does not revert to its previous position when you release a control).	All automation data on the track.

Table 180.   *Automation write modes*

Note 1: *When writing automation from control surfaces, SONAR uses whichever automation write mode is set on the track.*

Note 2: *All automation write modes obey the Auto Punch region. For details, see*

To specify a track's automation write mode

Select the track. Click the **Track** button at the top of the Inspector pane, or press CTRL+SHIFT+I. In the Track Inspector's **Automation** section, click **Write Mode** and select **Overwrite**, **Touch**, or **Latch**. For details, see

Tip: *You can use a Quick Group to assign multiple selected tracks to the same automation write mode. For details see*

See:

Automation time base

You can specify what happens to existing automation envelopes when you change the project's tempo. Automation can be locked to absolute time or musical time. You specify the automation time base in the Track Properties Inspector's **Automation** section. The two **Time Base** options are as follows:

- **Musical (M:B:T).** If the track is set to the Musical time base, the automation's M:B:T position stays constant, and its Absolute position shifts.

- **Absolute.** If the track is set to the Absolute time base, its Absolute position stays constant, and its M:B:T position shifts.

To specify a track's automation time base

1. Click the track or bus you want to show in the Track Inspector.

2. Click the **Track** button at the top of the Inspector pane, or press CTRL+SHIFT+I.

3. In the Track Properties Inspector's **Automation** section, click the **Time Base** item and select **Musical (M:B:T)** or **Absolute**.

See:

Automation Read and Automation Write buttons

SONAR has buttons to enable/disable automation playback (the **Automation Read** buttons R) and automation writing (the **Automation Write** buttons W) on the following modules:

- Tracks
- Buses
- Plug-in property pages
- Clip effects property pages (**Automation Read** button only)

In addition, SONAR has right-click commands to enable/disable automation playback and writing for individual parameters. The **Automation Read/Write** buttons enable or disable automation playback and recording respectively on all the parameters on an individual track, bus, or plug-in at once. The **Automation Read/Write** commands enable or disable automation playback and writing respectively on individual parameters of tracks, buses, or plug-ins.

The **Automation Read** button enables playback of automation envelopes for all automatable parameters in the track, bus, or plug-in that the button is on, and is a handy way to temporarily turn off envelopes for a particular track or bus while mixing.

The **Automation Write** button [W] enables all automatable parameters on a specific audio track, bus, or plug-in to be recorded.

The **Automation Read** and the **Automation Write** buttons are located by default next to the **Mute**/**Solo**/**Arm** buttons on track and bus strips in the Track View, on the console strip in the Console View, and below the **Mute** and **Solo** buttons in the Synth Rack. They are also available in Cakewalk Soft Synth and Cakewalk effects plug-ins. **Automation Read** and **Automation Write** buttons have three states; enabled, disabled, and dim. Enabled buttons indicate that all associated parameters are read/write enabled. A dim button indicates that some parameters in the track strip or plug-in are read or write enabled, while others are not. During automation writing, you will see the automation preview envelope being drawn in real time alongside the normal waveform or MIDI preview.
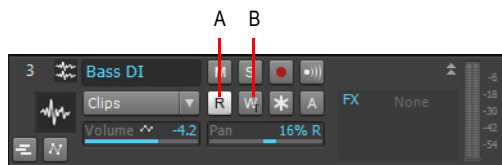
A. Automation Read button B. Automation Write button

Enabling individual parameters

You can read-enable or write-enable individual parameters on tracks and buses by right-clicking them and choosing **Automation Read Enable** or **Automation Write Enable** from the pop-up menu.

If you right-click an effect in an effect bin, the **Read Enable Parameter** and **Write Enable Parameter** menu choices open dialogs that allow you to select which parameters you want to enable.

See "Recording individual fader or knob movements" on page 1009 for more information.

See also:

Recording individual fader or knob movements

Recording automation for knobs and faders works in the Track view, the Console view, and Synth Rack. You can record automation during both playback and recording operations.

To record individual fader or knob movements

1. Do one of the following:

   - To write-enable an individual track or bus control, right-click the fader or control you want to automate and choose **Automation Write Enable** from the pop-up menu.

   - To write-enable individual plug-in parameters, right-click the name of the plug-in in the effects bin, and choose **Write Enable Parameter** from the pop-up menu. This opens a dialog box that allows you to choose which parameters to write-enable.

   - To write-enable individual synth parameters, right-click the synth's **Automation Write** button in the Synth Rack, and choose **Write Enable Parameter** from the pop-up menu. This opens a dialog box that allows you to choose which parameters to write-enable.

   - To write-enable all parameters in an audio track, bus, synth, or effect, enable the **Automation Write** button ⬚W on the track, bus, Synth Rack strip, or plug-in property page you are recording automation for. Enabling the **Automation Write** button on a track or bus also write-enables all parameters of any effects on the track or bus.

2. Start playback or recording.

3. Move the armed parameter control(s).

4. Stop playback or recording.

After you record the automation data, SONAR draws a graph of it (an envelope) in the Clips pane, which you can edit with the mouse by adding and dragging nodes (see the rest of this chapter). Once you record automation data in a track, the widget that you automated displays an indicator to show that automation has been applied. You can also group controls, so that automating one control automates all the controls in the group.

See also:

Automation lanes

Automation lanes are an alternative method of viewing automation envelopes on tracks and buses. Automation envelopes can be displayed in the parent track, or in indented lanes below the parent track.

Figure 307. *Automation lanes.*
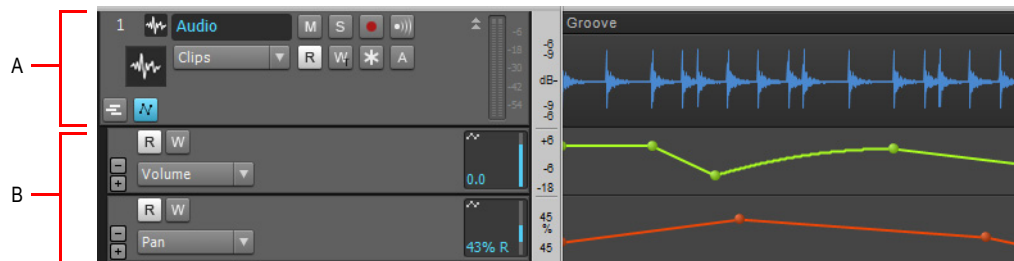
A. Parent track *B.* Automation lanes

While the parent track can show multiple clips and automation envelopes simultaneously, each Automation lane displays only a single automation envelope. Automation lanes allow you to easily show only the parameters you are interested in, without cluttering up the interface with numerous automation envelopes.

Automation lanes can be expanded or collapsed. When expanded, Automation lanes are indented below the parent track/bus. Automation lanes can be created, hidden, and removed. Each track/bus can have an unlimited number of lanes.

Automation lanes provide many benefits, including:

• Better visibility of automation data.

• Less screen clutter on track strips.

• Choose to only show the data you're interested in.

• Easier to work with individual automation envelopes.

• Easy to copy and paste specific automation data.

• Ability to quickly bypass individual automation parameters.

• Slider to control automation parameters.

To show a track's Automation lanes, click the track's **Expand/collapse Automation lanes** button
[N].

Use an Automation lane's Edit Filter control to specify the automation parameter you want to edit.

The selected global tool operates on track automation envelopes that are assigned to lanes, including ProChannel, Arpeggiator, plug-in parameters and MIDI continuous controllers (CCs).

Figure 308. *You can expand and collapse Automation lanes for each track and bus.*

A. Automation lanes expanded B. Automation lanes collapsed

    🛈 **Note:** *Clip automation is performed in Take lanes, not Automation lanes. For details, see "Take lanes and comping takes" on page 367.*

See:

See also:

Automation lane controls

Most of the controls in Automation lanes are identical to the controls found in tracks.

Figure 309. *Automation lane controls.*
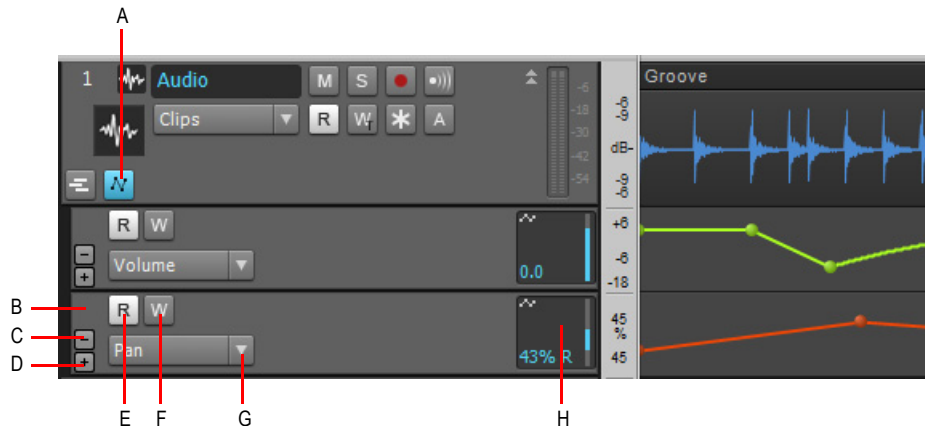
*A. Expand/collapse Automation lanes **B.** Select lane **C.** Remove lane **D.** Insert new lane **E.** Read Automation enable/disable **F.** Write Automation enable/disable **G.** Edit Filter **H.** Parameter slider*

The following controls are shown in each Automation lane:

- **Remove lane** ⊟.   Remove lane, but keep any existing automation envelopes.

- **Insert new lane** ⊞.   Add a new Automation lane below the clicked lane. Each track can have an unlimited number of lanes. An automatable parameter is automatically assigned to the new Automation lane based on the following order:

  Audio and Instrument tracks:

  1. Existing automation (priorities are same as 2-6)

  2. Track volume

  3. Track pan

  4. Track mute

  5. ProChannel modules from top to bottom; first parameter to last

  6. FX automation, first effect in bin to last, first parameter to last

  MIDI tracks:

  1. Existing automation (priorities are same as 2-8)

  2. Volume

  3. Pan

  4. Automated Mute

5. Expression

6. Chorus

7. Reverb

8. Arpeggiator; first parameter to last

9. MIDI envelope selection dialog

An automatable parameter can be visible in an Automation lane, or in the parent track, but not in both locations simultaneously. If you choose to display an envelope in an Automation lane, that envelope will no longer be shown in the parent track, and vice versa. To open all existing automation envelopes in separate Automation lanes, hold down the ALT key when you click the PLUS button.

- **Select.** Click to select the lane and its parent track. Lanes support the same selection gestures as tracks.

- **Edit Filter.** Specify which automatable track parameter to show in the Automation lane. Parameters that are already displayed in other Automation lanes are shown in the menu, but disabled. Note: Clip envelopes are accessed in the parent track or on individual Take lanes.

- **Read Automation.** Enable/disable automation playback on the lane.

- **Write Automation.** Enable/disable automation writing on the lane. The automation write mode is specified in the parent track. The **Write Automation** button indicates the selected write mode.

- **Slider.** Use the slider to control the assigned parameter when writing automation. The slider position represents the current value of the envelope.

See:

See also:

Using Automation lanes

To show/hide a track's Automation lanes

Click a track's **Expand/collapse Automation lanes** button .

The **Expand/collapse Automation lanes** button is a toggle and only shows automation parameters that have previously been assigned to lanes. Any other existing automation parameters are displayed in the parent track.

If no Automation lanes have been previously created, a new Automation lane is created and assigned to a parameter based on the following priority list:

Audio and Instrument tracks:

1. Existing automation (priorities are same as 2-6)
2. Track volume
3. Track pan
4. Track mute
5. ProChannel modules from top to bottom; first parameter to last
6. FX automation, first effect in bin to last, first parameter to last

MIDI tracks:

1. Existing automation (priorities are same as 2-8)
2. Volume
3. Pan
4. Automated Mute
5. Expression
6. Chorus
7. Reverb
8. Arpeggiator; first parameter to last
9. MIDI envelope selection dialog

Tip: *To show/hide Automation lanes in the current track, press SHIFT+A.*

Automation
Automation lanes

The **Expand/collapse Automation Lanes** button has three states:

- **Collapsed, with no existing lanes.** The button is not highlighted [icon].

- **Collapsed, with at least one existing lane.** The button has a soft blue glow [icon].

- **Expanded.** The button is solid blue [icon].

To insert a new Automation lane

1. Click a track's **Expand/collapse Automation lanes** [icon] button.
2. Do *one* of the following:

   - Click the **Insert new lane** button [icon].
   - Press SHIFT+PLUS (+).

   A new Automation lane is created and assigned to a parameter based on the following priority list:

   Audio and Instrument tracks:

   1. Existing automation (priorities are same as 2-6)
   2. Track volume
   3. Track pan
   4. Track mute
   5. ProChannel modules from top to bottom; first parameter to last
   6. FX automation, first effect in bin to last, first parameter to last

   MIDI tracks:

   1. Existing automation (priorities are same as 2-8)
   2. Volume
   3. Pan
   4. Automated Mute
   5. Expression
   6. Chorus
   7. Reverb
   8. Arpeggiator; first parameter to last
   9. MIDI envelope selection dialog

To assign a parameter to an Automation lane

Do *one* of the following:

• Click the Automation lane's Edit Filter, point to **Automation**, and select the desired track automation parameter. Created envelopes are displayed in bold text at the top of the menu, and automation parameters that are assigned to other Automation lanes are dimmed.

• Hold down the SHIFT key and select a track parameter in the parent track's Edit Filter.

> **Tip:** *To open the same parameter in a new Automation lane for all selected tracks, hold down CTRL+SHIFT and select a track parameter in any selected parent track's Edit Filter*

To display all created automation envelopes in separate lanes

1. Click a track's **Expand/collapse Automation lanes** ⬛ button.

2. Hold down the SHIFT key and click the **Insert new lane** button ⊞ in an Automation lane.

   All existing automation envelopes are displayed in separate Automation lanes.

To remove a lane

Click the lane's **Remove lane** button ⬛. The lane is removed, and any existing automation envelope is moved up to the parent track.

> **Note:** *If an automation parameter is already assigned to an Automation lane and you select the same automation parameter in the parent track's Edit Filter, the automation parameter is moved to the parent track and the Automation lane is removed.*

To reorder lanes

Click any empty space in a lane and drag the lane up or down to the desired location.

Figure 310. *Click any empty space and drag up/down to reorder lanes.*
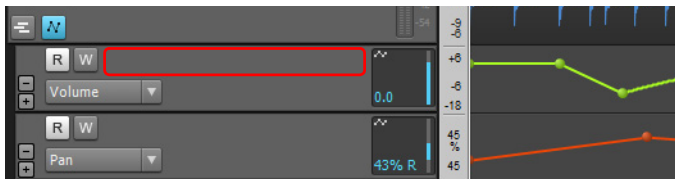
To resize lanes

Move the mouse pointer over the gap below a lane until the cursor looks like this ⬍, then drag up or down to resize the lane to your liking.

When you resize a lane, all other lanes in the same track/bus automatically inherit the same height.

Figure 311. *Drag the splitter bar up/down to resize lanes.*
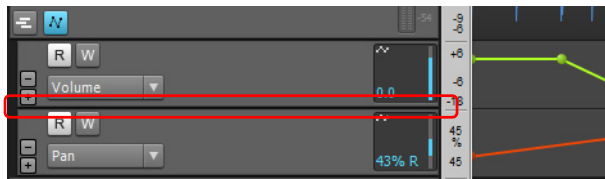
To edit track automation in a lane

1. Click a track's **Expand/collapse Automation lanes** ⬩ button.
2. Click the Automation lane's Edit Filter, point to **Automation**, and select the desired track automation parameter. Created envelopes are displayed in bold text at the top of the menu.
3. Use the global tools to edit automation envelopes. For details see "Tools" on page 407.

To edit clip automation in a lane

1. Click a track's **Expand/collapse Take lanes** button ⬩.
2. Click the Take lane's Edit Filter, point to **Clip Automation**, and select the desired clip automation parameter. Created envelopes are displayed in bold text at the top of the menu.
3. Use the global tools to edit automation envelopes. For details see "Tools" on page 407.

See:

"Automation lanes" on page 1010

"Automation lane controls" on page 1013

See also:

"Automation" on page 1001

"Quick automation guide" on page 1003

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Creating and editing automation envelopes

You can create automation envelopes for tracks, buses, clips and plug-ins. Drawing an envelope overwrites any preexisting envelope for the same parameter that occurs at the same time in the same track or bus.

To edit automation envelopes, first select the automation parameter from a track's Edit Filter control (see "Selecting the data type to edit" on page 416), and use the global tools in the Control Bar's Tools module (see "Tools" on page 407) to edit the envelope.

If a time selection spans multiple tracks, the global envelope editing tools affect all selected tracks.

Figure 312. *Edit Filter control.*
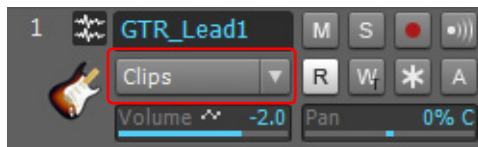
To control track automation, click a track's Edit Filter control, point to **Track Automation** and choose the desired track parameter on the submenu menu. To control clip automation, point to **Clip Automation** and choose the desired clip parameter on the submenu. The Edit FIlter menu uses bold text to indicate already created envelopes. For more information about using the Edit Filter, see "Selecting the data type to edit" on page 416.

Tip: *You can quickly toggle between Track Volume and the last/previously shown data type on the current track. To do so, press the PLUS (+/=) key. This only works on the current parent track, not in Automation lanes.*

To toggle between the two most recent Edit Filter settings, hold down the SHIFT key and right-click in the Clips pane.

See:

See also:

Creating and editing automation envelopes

To insert a new automation envelope

In the Track view, click the track's Edit Filter control and select the desired parameter on the pop-up menu.

The envelope appears in the Clips pane as a straight, dotted line in the envelope's individual color, with a node (very small circle) at the beginning. When you move the cursor over the envelope, a vertical, double-ended arrow appears under it with the name and current value of the envelope in a box next to the cursor. The envelope's vertical position reflects the current value of the parameter you are editing.

Note: *The dotted line in an envelope shows two things:*

- *There is no automation data at the time in a track where the dotted line is.*
- *The value of the last piece of automation data that exists before the dotted line is represented by the vertical level of the dotted line.*

You can move an automated control while your project plays, and if you move it during a time where that control has a dotted line in its envelope, the control will stay where you move it. As soon as the Now time reaches a node or solid line, the control snaps to the value of the node or solid line.
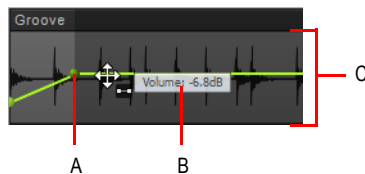
A. Node B. Envelope name and current value C. Envelope value range

To select automation

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

   - With the Smart tool [icon] or Select tool [icon], drag left/right to make a time selection.

   - With the Smart tool [icon] or Select tool [icon], drag with the right mouse button to lasso select.

   - With the Select tool [icon], click the node. Hold CTRL or SHIFT to extend the selection.

   - With the Edit tool [icon], click the node.

To move automation

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

   - With the Move tool ⊕, position the pointer over the envelope segment you want to move, then drag the segment to the desired location.

   - With the Edit tool ✎, position the pointer over the envelope segment you want to move, then drag the segment to the desired location.

To add envelope nodes

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

   - With the Smart tool ★, position the pointer over the envelope where you want to insert a new node, then click.

   - With the Smart tool ★, hold down the CTRL key and drag to insert two nodes at the selection boundaries.

   - With the Select tool ▸, position the pointer over the envelope where you want to insert a new node, then double-click.

   - With the Move tool ⊕, position the pointer over the envelope where you want to insert a new node, then double-click.

   - With the Edit tool ✎, position the pointer over the envelope where you want to insert a new node, then click.

   - With the Line tool ✎, drag to add nodes at the mousedown and mouseup points. Hold down the SHIFT key and drag to add nodes at the Snap to Grid value.

   - With the Freehand tool ✎, hold down the SHIFT key and drag to add nodes at the Snap to Grid value.

   - With any pattern draw tools (Sine tool ✎, Triangle tool ✎, Square tool ✎, Saw tool ✎, or Random tool ✎), hold down the SHIFT key and drag to add nodes at the Snap to Grid value.

Creating and editing automation envelopes

To move envelope nodes

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

   • With the Smart tool [image], drag the node to the desired location.

   • With the Move tool [image], drag the node to the desired location.

   • With the Edit tool [image], drag the node to the desired location.

   When dragging an envelope node, the tooltip shows the current value and the delta value for the change.

To snap nodes vertically

While moving nodes up or down, hold down the CTRL key to snap vertically to the previous node or two previous flat line segments. As the dragged node is snapped, the vertical snap target is highlighted. The global Snap to Grid settings are also active while the CTRL key is pressed.

Figure 313. *The vertical snap target is highlighted.*
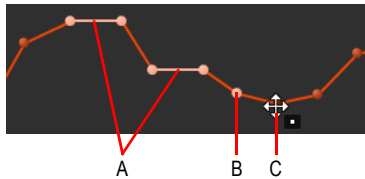
A. Snap target (previous two flat line segments) *B. Snap target (previous node)* *C. Node that is being moved*

To reset envelope nodes

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

   • With the Smart tool [image], double-click the node.

   • With the Move tool [image], double-click the node.

   • With the Edit tool [image], double-click the node.

   Note: *You can also move the cursor over the node until it a cross appears under it, right-click the node, and choose **Reset Node** on the pop-up menu.*

To reset an envelope to the current value

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Move the Now time to where the envelope's value is to your liking.

3. Right-click the envelope and choose **Clear All** on the pop-up menu.

SONAR resets the envelope to the current value.

To raise/lower selected envelope nodes

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

   • With the Smart tool ![icon], position the pointer near the top center of the track/clip, then drag up/down.

   • With the Edit tool ![icon], position the pointer near the top center of the track/clip, then drag up/down.

To raise/lower an envelope across a time range

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Drag in the time ruler to select the duration of the envelope that you want to raise/lower.

3. Do *one* of the following:

   • With the Smart tool ![icon], position the pointer within the selection near the top center of the track/clip until the mouse pointer looks like this ![icon], then drag up/down.

   • With the Move tool ![icon], position the pointer within the selection, then drag up/down.

To raise/lower an audio Clip Gain envelope

1. Set the track's Edit Filter control to **Clips**.

2. Select the Smart tool ![icon].

3. Position the mouse pointer over the top half of the clip until the pointer looks like this [icon], hold down the CTRL key and drag up/down.

> 💡 **Tip:** *For greater control over clip gain envelopes, set the Event Filter to **Clip Automation > Gain**.*

> ℹ️ **Note:** *Clip envelopes can be adjusted in the parent track or in a Take lane.*

To draw automation freehand

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. With the Freehand tool [icon], drag to insert envelope nodes and segments.

To draw a straight line

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. With the Line tool [icon], click to set the line start point, move the mouse, then release the mouse button to set the line end point.

To change an envelope segment's shape

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Move the cursor over the segment of the envelope that lies between the two nodes until the double-ended arrow appears, then right-click the envelope and choose one of the following shapes on the pop-up menu:

   • **Jump.**   This choice causes the envelope to make a ninety degree jump where the envelope reaches the second node. SONAR displays jumps with a dotted line, meaning that there is automation data at the nodes where the dotted line begins and ends, but not where the line itself is.

   • **Linear.**   This choice draws a straight line between the two nodes.

   • **Fast Curve.**   This choice draws a curve between the two nodes that changes value rapidly at first, but more slowly toward the end of the curve.

- **Slow Curve.** This choice draws a curve between the two nodes that changes value slowly at first, but more rapidly toward the end of the curve.

Tip: *You can also change an envelope segment's shape with the Edit tool* . *To do so, select the envelope segment you want to change, then hold down the CTRL key and drag the selected envelope segment up/down.*

To draw automation patterns

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Select the desired pattern tool: Sine Pattern tool , Triangle Pattern tool , Square Pattern tool , Saw Pattern tool , or Random Pattern tool .

3. Set the Snap to Grid to the desired length of each cycle of the shape you want to draw. For example, if you want to draw sine curves, and you want each complete sine curve to last one beat, set the Snap to Grid to a value of Quarter. If the Snap to Grid is disabled, the default cycle is one measure.

4. Click and hold the mouse button in the Clips pane at the place where you want to draw the envelope shape. The place where you click also sets the vertical midpoint of the shape.

5. Drag up or down to set the vertical range of the envelope, then drag to the right or left to set the length of your edit. As you drag, the cursor's vertical distance from the midpoint (the point where you originally clicked) determines the amplitude of the shape. To create a series of identical shapes, hold the SHIFT key down while you drag. To gradually increase or decrease the amplitude, gradually move the pointer farther from or closer to the midpoint.

6. Release the mouse button when done. The shape you selected appears, repeating according to the Snap to Grid setting.

Tip:

- *To halve the cycle frequency (for example, if snap resolution = quarter note, make each cycle a half note), hold down the ALT key while you draw.*
- *To double the cycle frequency (for example, if snap resolution = quarter note, make each cycle an eighth note), hold down the CTRL key while you draw.*
- *To invert the phase of the pattern, drag the cursor below the zero-line/center (where you initially clicked to start the pattern).*

Creating and editing automation envelopes

To draw MIDI continuous controller envelopes

1. Click the track's Edit Filter control, point to **Track Automation** and choose **MIDI** to open the **MIDI Envelope** dialog box.

2. Specify the desired MIDI envelope parameter settings:
   - In the **Type** field, choose what kind of MIDI event you want to control with your envelope.
   - In the **Value** field, choose the name of the controller you want to edit.
   - In the **Channel** field, choose the MIDI channel that you want the envelope to send data on.
   - Click **OK** to close the **MIDI Envelope** dialog,

   SONAR creates the envelope you chose.

3. With the Freehand tool , drag to insert envelope nodes and segments.

   Note: *MIDI envelopes you create in the Piano Roll Notes pane and MIDI envelopes you create in the Track view Clips pane are actually separate envelopes, even if they control the same parameter. Both kinds of envelopes are visible in the Clips pane, and should generally not be used to control the same parameter. You can convert Piano Roll view envelopes to Track view envelopes by selecting the time range and tracks that the Piano Roll envelopes occupy, then use the Track view **Clips > Convert MIDI Controllers To Envelopes** command.*

To erase automation

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Do *one* of the following:

   - With the Erase tool , click a node to erase a single node, or drag over nodes to erase multiple nodes.

   - With the Erase tool , click an envelope segment to erase the nodes to the left and right of the segment.

   - With the Erase tool , position the pointer outside the clip, then drag to lasso erase nodes across clips or tracks.

To delete a single envelope

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).

2. Move the cursor over the envelope until a vertical, double-ended arrow appears under it, and right-click the envelope.

   The **Envelope Editing** menu appears.

3. Choose **Delete Envelope** from the menu.

SONAR deletes the envelope.

To delete several or all envelopes

1. Select the data that contains the envelopes you want to delete—you can select parts of tracks, one or more whole tracks, or all tracks.

2. Do *one* of the following:

- Use the **Edit > Delete Special** command to open the **Delete** dialog box.
- Press CTRL+ALT+X or use the **Edit > Cut Special** command to open the **Cut** dialog box.

3. Select **Track/Bus Automation** if it's listed.

4. Select **Clip Automation** if it's listed.

5. Click **OK**.

SONAR deletes any track and clip envelopes that are in the data you selected.

To copy an envelope

1. In the Track view or the Clips pane, select the track or clip that has the envelope you want to copy. If you want to copy all the automation data in the track, select the whole track.

2. Press CTRL+ALT+C or use the **Edit > Copy Special** command.

The **Copy** dialog box appears.

3. Choose **Clip Automation** and/or **Track/Bus Automation**.

Note 1: *The basic **Edit > Copy** (CTRL+C) and **Edit > Paste** (CTRL+V) commands only apply to the data type that is selected in the track's Edit Filter. The **Edit > Copy Special** (CTRL+ALT+C) and **Edit > Paste Special** (CTRL+ALT+V) commands open a dialog that lets you specify which elements to copy/paste.*

Note 2: *If the **Track/Bus Automation** field is greyed-out, you must re-select a part of the clip that contains either a node or a solid line (shape). A dotted line by itself is not an envelope and can not be copied.*

4. Choose any other kinds of data you want to copy—if you only want to copy the automation data, choose only **Track/Bus Automation** and/or **Clip Automation**.

5. Click **OK**.

SONAR copies the data you selected to the Clipboard.

Creating and editing automation envelopes

To paste an envelope

1. Select the track(s) and location (Now Time) you want to paste the data to.
2. Press CTRL+ALT+V or use the **Edit > Paste Special** command.

   The **Paste** dialog box appears.
3. Choose a track and location to paste to, if you haven't already.
4. Click **OK**.

SONAR pastes the automation data and any other types of data you chose in the

 box into the track and location you selected.

You can reassign an envelope to control a different parameter from the one it originally controlled. For example, you can reassign a volume envelope to control pan.

To reassign an envelope

1. Set the track's Edit Filter control to the desired automation parameter (**Track Automation** or **Clip Automation**).
2. Move the cursor over the envelope until the cursor changes to a double-ended arrow, and right-click the envelope.

   The **Envelope Editing** menu appears.
3. Choose **Assign Envelope >** (**name of the parameter you want the envelope to control**).

The envelope changes color to reflect its new parameter assignment.

Automation editing mouse cursors

The mouse pointer provides helpful information when editing automation envelopes. The mouse pointer informs you if you are moving a single node, multiple nodes, a line segment, or a time selection. The following table shows the various mouse cursors.

Mouse cursor	Description
	Move a single envelope node
	Move multiple selected envelope nodes
	Move an envelope line segment
	Adjust selected envelope region up/down

Table 181. *Automation mouse cursors*

For a list of all global tool mouse cursors, see

See:

Automating track and bus mute

The **Mute** buttons in the Track view, Track Inspector and Console view work in two ways:

- You can record or draw automation for each **Mute** button, and the automation data controls the buttons.
- You can click a **Mute** button while playback is in progress and manually override any automation data for that button.

A track's **Mute** button can display the muted or unmuted status of either the automation envelope or of manual muting. To toggle between showing a track's manual mute status or automated mute status, right-click the track's **Mute** button and choose **Switch to Automated Mute** or **Switch to Manual Mute** on the pop-up menu. When the command is disabled, the track's **Mute** button shows whether you have depressed the **Mute** button manually or not (the *manual mute status*). When the command is enabled, the **Mute** button displays a fader next to the M: .

To draw a Mute envelope

1. Click the track's Edit Filter control, point to **Track Automation** and choose **Automated Mute** on the submenu.

   An envelope appears at the bottom of the track.

2. Add nodes to the envelope and edit it so that the envelope is more than 50% of its maximum height wherever you want the track muted.

To record a Mute button's movement

1. Right-click the **Mute** button you want to automate and choose **Switch to Automated Mute** from the pop-up menu.

2. Make sure the **Mute** button or its whole track is write-enabled.

3. Start playback or recording, and click the **Mute** button on and off where appropriate.

4. Click the **Stop** button press the SPACEBAR when the track has been muted in the appropriate places.

SONAR draws an automated mute envelope in the track you recorded on. Before you listen to your track, make sure the **Global Automation Playback** button is enabled in the Control Bar's Mix module.

See:

Envelope mode and Offset mode

There are two modes which control how your volume faders, pan faders, bus send faders, and bus send pan faders behave during playback. The two modes are **Envelope mode** and **Offset mode**.

Envelope mode.   In envelope mode, volume and pan faders follow the project's automation and do not respond to changes you make in real-time.

Offset mode.   In Offset mode, you "offset" the current automation in a track using a parameter's controls. For example, if a pan envelope is set to hard left (100% left) and you adjust the pan in offset

mode to 100% right, then the pan parameter is now set to hard right. Setting the pan in offset mode to 50% right would set the pan to the center.

Note: *Any position that you set a fader to in Offset mode remains in effect when you switch back to Envelope mode. For example, if you set a volume fader to -INF while in Offset mode, switch to Envelope mode and drag the fader to its maximum level, you will not hear anything.*

To enable/disable Offset mode

Do *one* of the following:

• Click the **Offset mode** button ⊠ in the Control Bar's Mix module.

• Press O.

In Offset mode, all controls that can be offset appear with a plus sign. For example Vol+.

The following audio controls support both Envelope and Offset modes:

Control	Envelope Mode Range	Offset Mode Range
Volume	-Infinity to +6dB, default is 0dB	-Infinity to +6dB, default is 0dB
Pan	100% L to 100% R, default is C	100% L to 100% R, default is C
Bus Send Level	-Infinity to +6dB, default is 0 dB	-Infinity to +6dB, default is 0dB
Bus Send Pan	100% L to 100% R, default is C	100% L to 100% R, default is C
Bus Return Level	-Infinity to +6dB, default is 0dB	-Infinity to +6dB, default is 0dB
Bus Return Balance	100% L to 100% R, default is C	100% L to 100% R, default is C
Main Out Volume	-Infinity to +6dB, default is 0dB	-Infinity to +6dB, default is 0dB
Main Out Balance	100% L to 100% R, default is C	100% L to 100% R, default is C

Table 182.

Creating and editing automation envelopes

The following MIDI controls support both Envelope and Offset modes:

Control	Envelope Mode Range	Offset Mode Range
Volume	0 to 127, default is 101	0 to 127, default is 101
Pan	100% L to 100% R, default is C	100% L to 100% R, default is C
Chorus	0 to 127, default is 0	-127 to 127, default is 100
Reverb	0 to 127, default is 0	-127 to 127, default is 100

Table 183.

To open non-SONAR envelope display on a percentage scale

You can globally configure the placement of 0 dB for your envelopes in the Clips pane. The default placement in the Clips pane of 0 dB is roughly 1/3 from the top of the clip. You can change the position of 0 dB in all envelopes to the middle of the clip.

There are several advantages when using the **Envelope Display on a Percentage Scale** option:

• It makes it easier to tell if there have been any changes.

• There is a finer resolution around 0 dB.

Note: *In Envelope mode, newly created volume clips appear at the same dB value as the current Vol setting. For example, if the Vol setting is +3 dB, a newly created volume envelope appears above the middle of the clip.*

To display envelopes on a percentage scale

• Go to **Edit > Preferences > Customization - Display** and select the **Display Envelopes on Percentage Scale** check box.

See:

Converting MIDI controllers to envelopes

MIDI controllers you edit in the Piano Roll view and MIDI envelopes you create in the Track view Clips pane are actually separate data, even if they control the same parameter. Both kinds of envelopes are visible in the Clips pane, and should generally not be used to control the same parameter. You can convert Piano Roll view envelopes to Track view envelopes by selecting the time range and tracks that the Piano Roll envelopes occupy, and using Track view **Clips > Convert MIDI Controllers To Envelopes** command.

To convert MIDI controllers to envelopes

1. In the Clips pane, select the time range and track(s) that contain the controller data you want to convert.

2. In the Track view menu, select **Clips > Convert MIDI Controllers to Envelopes**.

   The **Convert MIDI To Shapes** dialog box appears.

3. In the **Type** field, select the type of controller you want to convert.

4. In the **Value** field, select the controller number of the controller you want to convert. For example, if you're converting a volume envelope to a shape, select **7**.

5. In the **Channel** field, select the channel of the controller you want to convert, and click **OK**.

SONAR converts the Piano Roll view controller envelope you selected to a Track view shape that controls the same parameter.

> **Note:** *If two clips overlap, the **Clips > Convert MIDI Controllers to Envelopes** command converts the controller envelopes in both clips, in whatever parts of the clips lie in the selected time range.*

See:

Snapshots

A snapshot is a setting or group of settings that SONAR's controls snap to when your project reaches a certain Now Time. You set all the controls to the values you want, and then create a snapshot of these settings at a particular Now Time. This approach is useful, for example, when your project contains a variety of distinct sections and you want to make a sudden change in one or more settings between the sections.

To create a snapshot of a track or bus parameter

1. Move the parameter control to where you want it.

2. Move the Now Time to the location where you want to create the snapshot.

3. Right-click the control and choose **Automation Snapshot** in the pop-up menu. You don't have to write-enable the track or bus module.

   An indicator will appear on the control to show that automation has been added, and a node will be added to the control's envelope on the track.

4. Make sure the appropriate **Automation Read** button is enabled, play your project and listen to the results. You can undo the snapshot by using the **Undo** command, or by taking another snapshot at the same Now Time.

Successive snapshots do not update envelope node values

When taking multiple automation snapshots at the same Now time, new envelope nodes are created instead of updating any existing envelope nodes. To address this issue, undo the previous automation snapshot before performing a new snapshot.

See:

Automating effects

SONAR allows you to automate plug-ins, giving you real-time control over dozens of effects parameters.

See also:

> **Note:** *When using automatable effects, the CPU meter may fluctuate rapidly within a few percentage points. This is normal behavior.*

Automating individual effects parameters

You can automate the parameters of some of SONAR's effects by drawing envelopes, or recording fader movements, or creating snapshots. You enable all automatable parameters in an effect when you enable the **Automation Write** button in an effect property page.

To record fader movements, see "Recording individual fader or knob movements" on page 1009.

To draw envelopes for an individual effect's parameters

1. Patch an automatable effect into the track or bus where you want to use it, and close the effect's dialog box when it appears.
2. Right-click in the Clips pane in the track (or bus) where you patched the effect.

   The Clips pane or Bus pane pop-up menu appears.

3. If you opened the Clips pane pop-up menu, choose **Envelopes > Create Track Envelope > (name of the effect you patched)**. If you opened the Bus pane pop-up menu, choose **Create Bus Envelope > (name of the effect you patched)**.

   The effect's envelope dialog box appears, listing all the parameters you can automate in the **Envelope Exists** list.

4. Check all the parameters you want to create envelopes for; as you check each envelope choice, you can choose a color for the envelope by clicking the **Choose Color** button that's in the lower right corner of the dialog box.

Note: *You can change a plug-in envelope's color whenever you want by highlighting its name in the effect's envelope dialog box and clicking the **Choose Color** button.*

5. Click **OK**.

All the envelopes that you checked appear in the track or bus you were working in. You can edit them just like any other envelopes.

See also:

Recording automation data from an external controller

You can record automation data from an external controller or a MIDI keyboard.

To record automation data from an external controller

1. In either the Track view or Console view, right-click the control or knob that you want to control externally, and choose **Remote Control** from the pop-up menu.

   The **Remote Control** dialog box appears.

2. If your controller sends standard MIDI messages, RPN's, or NRPN's, choose a controller (such as Wheel) with which to control your knob or control (see "Remote Control dialog" on page 1745 for more information). Also choose the MIDI channel your controller will be sending the automation data on (it doesn't have to be the same channel that the knob or control's track plays back on), and click **OK**.

3. If your controller works by sending Sysx information instead, choose options in the **Sysx** fields (see "Remote Control dialog" on page 1745 for more information), and click **OK**.

4. In either the Track or Console view, write enable the knob or control for automation that you just configured for remote control.

5. Start playback or recording, and move the slider or wheel that you selected on your external controller.

6. When you finish recording the automation, click the **Stop** button or press the SPACEBAR.

Listen to your project and either re-record the automation, or disable each armed control by clicking the **Allow Automation Writing** button in the Control Bar's Mix module. You can disable remote control by right-clicking the relevant knob or fader and choosing **Disable Remote Control** from the pop-up menu.

> **Tip:** *When recording automation from a non touch-sensitive control surface, it is recommended that you use Latch or Overwrite mode.*

> **Note:** *When writing automation from a control surface, SONAR uses whichever automation write mode is set on the track.*

See also:

Recording automation data from an external controller

Window management

SONAR offers a lot of flexibility in the way you can arrange windows on your screen. This allows you to adjust the viewing and editing space to suit your own needs. The following options are just some of the ways you can arrange windows:

- Dock the Control Bar, Inspector and Browser to one of SONAR's edges. For details, see "Docking windows" on page 1042.

- Dock windows in the MultiDock. You can have as many views open in tabbed format as you want. Instead of placing each view in its own window, you can group views by docking them in the MultiDock. For details, see "MultiDock" on page 1046.

- Float views and move them outside of the confines of SONAR. This is particularly useful if you take advantage of SONAR's dual monitor support. For details, see "Floating views and using dual video monitors" on page 1051.

- Open multiple instances of the same view type. For details, see "Locking views" on page 1052.

- Save window layouts as screenset presets and freely switch between screensets at any time. For details, see "Screensets" on page 1054.

- Tile projects and windows. For details, see "Tiling windows" on page 1053.

- Instantly make the current view or plug-in transparent so you can easily access other windows that may be hidden behind the current window. The X-Ray Windows feature eliminates the need to constantly minimize, move, or close windows in order to work in other windows. For details, see "X-Ray" on page 1059.

- Drag window frames to resize windows.

- Zoom in/out. For details, see "Zoom controls" on page 86.

- View SONAR in full screen mode. To do so, click the **Window** menu and choose **Full Screen**, or press F11.

See:

"Docking windows" on page 1042

"MultiDock" on page 1046

"Floating views and using dual video monitors" on page 1051

See also:

Docking windows

By docking windows, you can keep frequently-used windows open but out of the way while working on a project. You can dock windows and panes in two different areas in SONAR:

- **Top/bottom/left/right edge.**   The Control Bar, Inspector and Browser can be docked along SONAR's edges.
- **MultiDock.**   Most editing views and the Browser can be docked in the MultiDock. By default, the MultiDock appears below the Track view. For details see "MultiDock" on page 1046.

The SONAR interface consists of five primary UI elements, each with its own default location. The following list shows the types of windows that can be docked in each location, and the default for each location.

- **Top edge:**
  - Control Bar (default)
- **Bottom edge:**
  - Control Bar
  - MultiDock (default)

Note 1: *The MultiDock is a container that can host one or more other views. The MultiDock appears automatically when you dock a view at the bottom of the Track view. For details, see "MultiDock" on page 1046.*

Note 2: *The Control Bar and MultiDock can both be docked at the bottom at the same time. In this case, the MultiDock appears above the Control Bar.*

- **Right edge:**
  - Browser (default)
  - Inspector

- **Left edge:**
  - Inspector (default)
  - Browser

Figure 314. *You can dock most windows and panes at the top, bottom, left and right of SONAR's interface.*
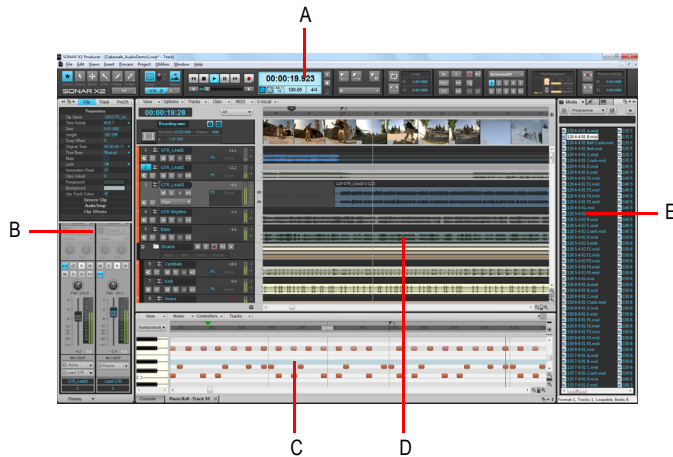
A. Control Bar B. Track and Clip Inspectors C. MultiDock (Piano Roll view shown) D. Track view E. Browser

When dragging the Control Bar, Inspector, Browser, MultiDock and other views towards any edge, a colored rectangle indicates a valid drop location.

Figure 315. *A colored rectangle indicates a valid drop location.*

To dock/undock the Control Bar

Right-click the Control Bar and select one of the following commands:

• **Dock Control Bar at Top.**   Select this option to dock the Control Bar above the Track view.

• **Dock Control Bar at Bottom.**   Select this option to dock the Control Bar below the Track view.

• **Undock Control Bar.**   Select this option to undock the Control Bar.

Tip: *You can click any blank area in the Control Bar and drag the Control Bar to the desired position.*

To dock/undock the Inspector

To dock, do *one* of the following:

• Click the **Docking Options** button and select **Dock at Right** or **Dock at Left**.

• Click any blank space at the top of the Inspector pane and drag the Inspector to the desired position.

To undock, do do *one* of the following:

• Click the **Docking Options** button and select **Undock**,.

• Click to the left of the **Dock/Undock** button 🔲 and drag the Inspector to the desired location.

• Click any blank space at the top of the Inspector pane and drag the Inspector to the desired position.

Note: *The Inspector can not be docked in the MultiDock.*

Figure 316. *Use the docking controls to change the position of the Inspector.*
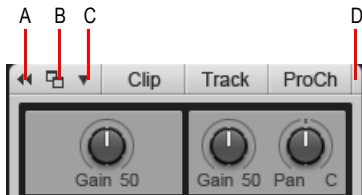
A. *Expand/Collapse* **B.** *Dock/Undock* **C.** *Docking Options* **D.** *Click here to drag the Inspector*

To dock/undock the Browser

To dock, do *one* of the following:

- Click the **Docking Options** button and select **Dock at Right**, **Dock at Left** or **Dock in MultiDock**.
- Click any blank space at the top of the Browser and drag the Browser to the desired position.

To undock, do *one* of the following:

- Click the **Dock/Undock** button 🔲.
- Click the **Docking Options** button and select **Undock**.
- Click any blank space at the top of the Browser and drag the Browser to the desired position.

Figure 317. *Use the docking controls to change the position of the Browser.*

A. Click here to drag the Browser B. Dock/Undock C. Docking Options D. Expand/Collapse

More detailed information is shown in the Media Browser and Synth Rack Browser when the Browser is floating or docked in the MultiDock.

See:

See also:

MultiDock

The MultiDock is a container that can host one or more views. The MultiDock allows you to have frequently-used windows open in a centralized location, without obscuring the Track view. Instead of placing each view in its own window, you can group views by docking them in the MultiDock. In the MultiDock, each docked window is in its own tab with its own close button.

The MultiDock appears automatically when you dock a view below the Track view. By default, new editing views are arranged on tabbed panes in the MultiDock.

Figure 318. *You can dock multiple windows in the MultiDock.*
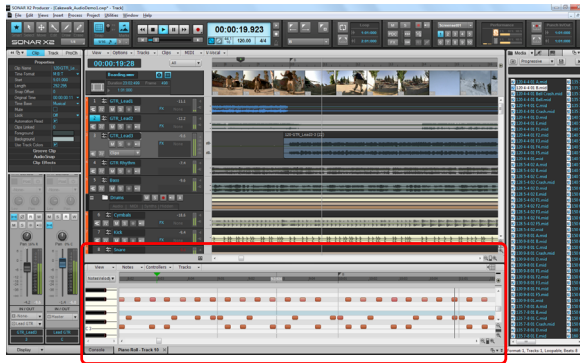
Figure 319. *The MultiDock.*
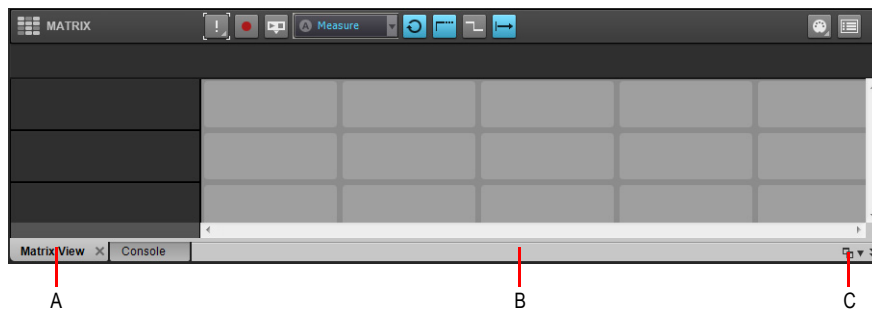
A. Each docked window has its own tab B. Click to the right of the tabs and drag the MultiDock away from the bottom of the screen in order to undock the MultiDock C. Dock/undock and expand/collapse the MultiDock

The MultiDock is only visible when at least one view is docked there. By default, the MultiDock is displayed at the bottom of the screen, below the Track view, but you can also float the MultiDock and even position it on a second video monitor. You can also maximize the MultiDock to do detailed work in a docked window, or drag the splitter bar at the top of the MultiDock to enlarge the tabbed view area.

When you drag a window towards the bottom of the Track view, a colored rectangle indicates that the window will be docked in the MultiDock when you release the mouse button.

Figure 320. *When you drag a window onto the MultiDock, a colored rectangle indicates that it is a valid drop location.*
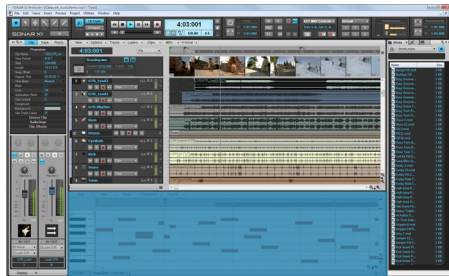
To dock a window

Do *one* of the following:

• Drag the window to the MultiDock.

• Click the view's **Docking Options** menu, and choose **Dock in MultiDock**.

• Click the upper left corner of a window, and choose **Dock in MultiDock** from the pop-up menu.

Figure 321. *To dock a window in the MultiDock, click the window's icon menu in the top left corner and select Dock in MultiDock.*
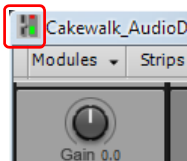
To undock a window

Do *one* of the following:

- Drag the window's tab out of the MultiDock.
- Click the view's **Docking Options** menu, and choose **Undock**.
- Right-click the window's tab, and choose **Undock** from the pop-up menu.

> **Note:** *When you undock a window, the window will be float enabled. If you do not want to float the window, click the window's icon menu in the top left corner and choose **Disable Floating**.*

To close a window in the MultiDock

Do *one* of the following:

- Click the tab's X button.
- Right-click the window's tab, and choose **Close** from the pop-up menu.

  If you close the last remaining tab, the MultiDock closes automatically.

Figure 322. *To close a window, click the tab's X button.*
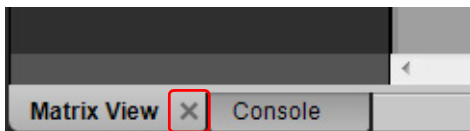
To navigate between docked windows

Do *one* of the following:

- Click the desired tab.
- Hold down the SHIFT and CTRL keys and press the LEFT ARROW or RIGHT ARROW key.

To resize the MultiDock

Drag the splitter bar up/down.

Figure 323. *To resize the MultiDock vertically, drag the splitter bar up/down.*
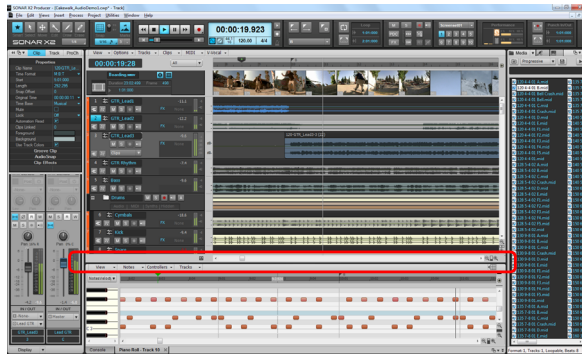
To expand a docked window

To expand a docked window so it fills the Track view, double-click the window's tab or press SHIFT+D.

To restore the view to it's original docked size, double-click the tab again.

To expand/collapse the MultiDock

Click the Expand/Collapse button ⬇ in the bottom right corner.

Figure 324. *MultiDock docking controls.*
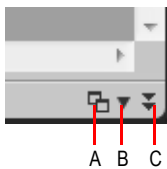
A. Dock/undock   B. Docking options   C. Expand/collapse

To dock/undock the MultiDock

To dock, do *one* of the following:

- Click the **Dock/Undock** button ⊡.
- Click the **Docking Options** menu and choose **Dock at Top** or **Dock at Bottom**.
- Drag the MultiDock to the top or bottom of the screen.

The MultiDock can be docked in four different positions, depending on where you release the mouse button. By default, the Inspector and Browser extend the full height of the screen. However, you can choose to extend the MultiDock all the way to the left and/or right edge.

To undock, do *one* of the following:

- Click the **Dock/Undock** button ⊡.
- Click the **Docking Options** menu and choose **Undock**.
- Click to the right of the tabs and drag the MultiDock away from the bottom of the screen.
- Right-click the window's tab, and choose **Undock** from the pop-up menu.

To maximize/restore the MultiDock (when undocked)

Double-click the MultiDock title bar.

See also:

Floating views and using dual video monitors

When a view is float enabled, you can move it outside of the confines of SONAR. This is particularly useful if you take advantage of SONAR's dual monitor support, which allows you to float most of your views to a second monitor and increase the number of views that you can have open at one time.

Important: *Dual monitor support requires that you have a supported video card. Follow your hardware manufacturer's instructions for using dual monitors.*

You can float views in SONAR without having a second monitor. Floating a view allows you to move it out of SONAR, over the Control Bar and menus, for example, giving you added flexibility when using SONAR with other applications. All views except the Track view can be floated.

Note: *If you are using a dual monitor system and experience sluggish performance when selecting and dragging clips in the Clips pane, confirm that both monitors are set to the same Color Quality bit depth.*

By default, new views are docked in the MultiDock. Any view can be undocked from the MultiDock and moved anywhere on the desktop. To float a docked view, simply drag the view's tab out of the MultiDock.

To float a view

1. Open the view you want to float.

2. Click the view's icon located in the upper left corner of the view and choose **Enable Floating**.
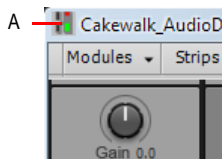
A. Piano Roll view icon

3. Move the view wherever you want.

See also:

"Window management" on page 1041

"Docking windows" on page 1042

"MultiDock" on page 1046

"Floating views and using dual video monitors" on page 1051

Locking views

By default SONAR allows only one instance of each view, but you can lock the contents of most views, preserving the current view by forcing a new instance of the view to appear if necessary. Locking views is the only way you can have multiple instances of the same view open. Only the Track and Console views cannot be locked.

To lock/unlock a view

Do *one* of the following:

• Click the upper left corner of a window, and choose **Lock Contents** from the pop-up menu.

If the view is docked in the MultiDock, right-click the view's tab and choose **Lock Contents**.

Tip: *A view can be locked automatically by pressing the CTRL key when opening the view.*

See also:

Tiling windows

If you want to view more than one project or window at a time, you can tile the windows.

To tile windows

1. If the window you want to tile is docked in the MultiDock, drag the tab out of the MultiDock to undock the window.

2. Disable floating for any windows you want to tile (click the icon located in the upper left corner of the window and select **Disable Floating**).

3. Do *one* of the following:

    *   Choose **Window > Cascade**.
    *   Choose **Window > Tile in Rows**.
    *   Choose **Window > Tile in Columns**.

See:

"Window management" on page 1041

"Docking windows" on page 1042

"MultiDock" on page 1046

"Floating views and using dual video monitors" on page 1051

"Locking views" on page 1052

"Screensets" on page 1054

"X-Ray" on page 1059

"View reference" on page 1789

Screensets

A *screenset* is a snapshot of the current layout of various views and windows in a project, including which windows are open, their size, position, zoom level and whether they are docked or floating. You can create up to 10 screensets per project and freely switch between screensets at any time.

Figure 325. *Screensets allow you to instantly switch between different window layouts.*

Screenset 1

Screenset 2
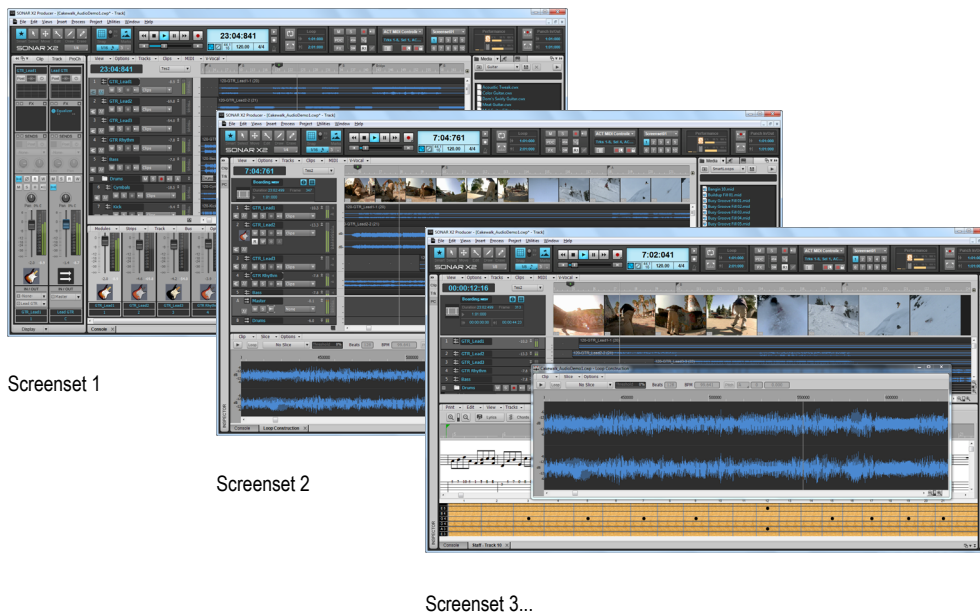
Screenset 3...

One of the 10 available screensets is always active. There is no need to explicitly save screensets; SONAR does that automatically for you, allowing you to focus on your work. The current window layout is always stored as the current screenset. SONAR automatically saves the current screenset when you save the project or switch to another screenset. This allows screensets to seamlessly integrate into any workflow. You can also lock screensets in order to prevent any further changes.

When you open a project, SONAR automatically restores the project's last used screenset.

Screensets make it very efficient to arrange views and windows in SONAR. For example, you may prefer to use a particular window layout while recording, a different layout when working with loops, and a different layout while mixing, etc. By creating custom screensets, you can quickly change the window layout depending on the current workflow. When you select a screenset, SONAR automatically restores the window layout that is stored in the screenset, so there is no need to manually close or open windows.

Screensets can be selected and edited from the Screenset module in the Control Bar, or with number keys 1-0 on your computer keyboard.

Screensets are saved per project, and you can import screensets from other projects. Screensets can be updated, renamed, duplicated and locked to prevent further changes.

By default, SONAR has 10 custom window layouts assigned to screensets 1-10, but you can update and rename the default screensets to suit your own work style.

See:

Using Screensets

Screenset controls

You use the Screenset module in the Control Bar to manage screensets. The Screenset module contains a menu and 10 buttons to select screensets. The name of the current screenset is shown in the Screensets menu, and its corresponding button is highlighted.

Figure 326. *The Screenset module in the Control Bar lets you select and edit custom screensets.*

A. Screensets menu and name of current screenset B. Screenset buttons 1-10

The Screenset module in the Control Bar contains the following controls:

- **Screenset menu.**   The **Screenset** menu lets you select, revert, lock, rename, duplicate and import screensets. The name of the current screenset is shown in the menu. The menu contains the following commands:

  - **1 [screenset 1 name] - 0 [screenset 10 name].**   Select screenset 1 through 10.

  - **Revert Current Screenset.**   Revert the current screenset to its last saved state before the project was saved. See "To revert the current screenset to its last saved state" on page 1058.

- **Lock/Unlock Current Screenset.** Lock the current screenset to prevent any modifications. See "To prevent the current screenset from being modified" on page 1057.

- **Rename Current Screenset.** Rename the current screenset. See "To name or rename the current screenset" on page 1057.

- **Duplicate Current Screenset to.** Copy the current screenset to another screenset location (1 to 0). Select the target screenset location from the submenu. The selected target screenset becomes the current screenset. See "To duplicate the current screenset" on page 1057.

  - **1 [screenset 1 name] - 0 [screenset 10 name].** Duplicate the current screenset to screenset 1 through 10.

- **Import Screensets from <source file name>.cwp.** Import screensets from another open project. Any locked screensets in the current project are not overwritten. See "To import screensets from another project" on page 1057.

Note: *The **Screenset** menu is also available in the main **View** menu.*

- **1-10 buttons ⊞ - ⊞.** Select screensets 1 through 10. You can also press the 1-0 keys on the computer keyboard to select screensets 1 through 10. The active screenset button is highlighted.

To show/hide the Screenset module

Right-click the Control Bar and select **Screenset module**.

To select a screenset

Do *one* of the following:

- Select a screenset from the **Screenset** menu in the Control Bar.

- Click one of the Screenset buttons (1-10) in the Control Bar.

- Press number keys 1-0 on the computer keyboard. These keys correspond to the 10 available screensets.

- On the **Views** menu, point to **Screensets** and select the desired screenset.

To create or update a screenset

1. Select the screenset location you want to update (1 through 0).

2. Make sure the screenset is not locked (see "To prevent the current screenset from being modified" on page 1057).

3. Arrange the views and windows the way you want, including zoom settings, etc.

4. Do *one* of the following:

   - **To save only the current screenset.** Choose a different screenset (using numerical keys, quick access buttons, or menu). The current screenset is saved and the newly-selected screenset is loaded.

   - **To save all screensets.** Choose **File > Save** to save the project.

To name or rename the current screenset

1. Make sure the Screenset module is visible in the Control Bar.
2. Click the **Screenset** menu and select **Rename Current Screenset**.

   The **Rename Screenset** dialog box opens.
3. Type a new name and click **OK**.

Note: *You can not rename a locked screenset.*

To prevent the current screenset from being modified

1. Make sure the Screenset module is visible in the Control Bar.
2. Click the **Screenset** menu and select **Lock/Unlock Current Screenset**.

   A padlock icon appears next to the screenset name in the **Screenset** menu to indicate that the screenset is locked. To unlock the screenset, select the **Lock/Unlock Current Screenset** command again.

To import screensets from another project

1. Make sure the Screenset module is visible in the Control Bar.
2. Open the target project that you want to import screensets into.
3. While the target project is open, also open the source project you want to import screensets from.
4. Select the target project to give it focus.
5. Click the **Screenset** menu and select **Import Screensets from <source file name>.cwp**.

   SONAR imports screensets from the source project and overwrites the corresponding screensets in the target project. Screensets that are locked in the target project will not be overwritten.

Note: *If more than two projects are open, SONAR only shows the first one that contains screensets as a valid source. The **Import Screensets** command is unavailable if the source project doesn't contain any valid screensets or if only one project is open.*

To duplicate the current screenset

SONAR can store up to 10 screensets per project. You can copy the current screenset to any other preset location in the same project. To do so:

1. Make sure the Screenset module is visible in the Control Bar.
2. Do *one* of the following:
   - On the **Screenset** menu, point to **Duplicate Current Screenset to**, then select the desired screenset location (**1** through **0**).

- Hold down the CTRL key and press the number key that corresponds to the target screenset location (1 through 0).

The current screenset is copied to the specified location, and the selected location becomes the current screenset.

Note: *You can not copy a screenset to a locked screenset location.*

To revert the current screenset to its last saved state

When you switch to another screenset, SONAR automatically saves any changes to the current screenset (unless the screenset is locked). If you have made changes to the current screenset that you don't want to save, you can easily revert to the last saved state of the screenset. To do so, perform the following steps before saving the project or selecting another screenset:

1. Make sure the Screenset module is visible in the Control Bar.
2. On the **Screensets** menu, select **Revert Current Screenset**.

   The current screenset reverts to its last state before the project was saved.

See:

See also:

X-Ray

The X-Ray Windows feature eliminates the need to constantly minimize, move, or close windows in order to work in other windows. It works by decreasing the opacity of the current window enough so that you can see and work with the window that's behind the current window. You activate the feature by pressing SHIFT+X when the mouse cursor is over a window you want to x-ray. You can choose to X-Ray whichever window is underneath the mouse cursor, or automatically X-Ray all FX/synth property pages in one step.

Note: *The mouse cursor does not need to be over any plug-in property pages.*

The X-Ray Windows feature works on the following windows:

- Piano Roll view (when float-enabled)
- Plug-in effects and synths
- Controller/Surface plug-ins

To select key bindings for X-Ray windows

1. Use the **Edit > Preferences** command to open the **Preferences** dialog box, then select **Keyboard Shortcuts**.

2. If you want to use currently unassigned keys or key combinations, scroll through the options in the **Key** window until the **Assigned to** field that is just under the window reads **Unassigned**. It's a good idea to find two unassigned options that are next to each other or easy to remember.

Note: *For best results with X-Ray Windows, avoid using ALT key combinations.*

3. Once you have decided on two keys or key combinations that you want to use, select **Global Bindings** in the **Area** field, and scroll to the bottom of the list of commands that are in the window below that field.

4. In the **Key** window, highlight the key or key combination that you want to use for the X-Ray command, then highlight **X-Ray** in the function column of the list of commands, then click the **Bind** button to bind them together.

5. Now highlight the key or key combination that you want to use for the **X-Ray All FX/Synths** command, then highlight **X-Ray All FX/Synths** in the function column of the list of commands, then click the **Bind** button to bind them together.

6. Click **OK** to close the dialog box.

To use X-Ray windows

1. Use the **Edit > Preferences** command to open the **Preferences** dialog box, click **Customization - Display** and make sure the **Enable X-Ray** check box is selected.

2. Make sure that the view windows you want to X-Ray are in the Floating-enabled state. To check this, click the view or fx icon that's in the upper left corner of a window, and select **Enable Floating** from the drop-down menu. If **Disable Floating** is in the menu, then the **Floating** option is already enabled.

Note: *All FX/Synth/Control surface property pages are float-enabled by default.*

3. To X-Ray or un-X-Ray a single window, move the mouse cursor over the window, and press SHIFT+X for the X-Ray command. The window does not need to be the highlighted window.

4. To X-Ray or un-X-Ray all plug-in windows at once, press the key binding for the **X-Ray All FX/Synths** command.

Note: *If a window has focus, and the window's **Give All Keystrokes To Plug-in** button* 🖮 *is enabled, X-Ray keyboard commands won't work.*

To Adjust X-Ray Windows Options

1. Use the **Edit > Preferences** command to open the **Preferences** dialog box, then click **Customization - Display**.

2. On the General tab, you can adjust these options:

   • **Enable X-Ray.**   Enable or disable this check box to turn the X-Ray Windows feature on or off.

   • **Opacity.**   Adjust this value by typing in a value, or by clicking and holding the **+** or **-** button to adjust the final opacity percentage value that an X-Rayed window reaches.

   • **Fade Out Time.**   Adjust this value by typing in a value, or by clicking and holding the **+** or **-** button to adjust the amount of time that an X-Rayed window takes to reach its final opacity percentage value.

   • **Fade In Time.**   Adjust this value by clicking and holding the **+** or **-** button to adjust the amount of time that an X-Rayed window takes to restore its original opacity.

3. Click **OK** to close the dialog box and accept your changes.

To exclude a plug-in from X-Ray capability

Very few plug-ins use DirectDraw to create their windows. These windows appear jittery when x-rayed.

To exclude a plug-in from X-Ray capability, follow these steps:

1. Use the **Utilities > Cakewalk Plug- in Manager** command to open the Cakewalk Plug-in Manager.

2. In the **Plug-in Categories** window, select the plug-in category to exclude.

3. In the **Registered Plug-ins** window, select the plug-in to exclude.

4. If the plug-in is a DirectX effect or an MFX, write down (or select and copy) the CLSID value that's in the **CLSID** field at the bottom of the dialog box.

If VST or VSTi, write down the VST ID value that's in the **VST ID** field at the bottom of the dialog box.

5. Close the **Plug-in Manager** dialog box.

6. Open the `Xrayexclude.ini` file that's in your SONAR program folder (use Notepad).

7. At the end of the file, find the `[EffectProps View]` section.

   You will see entries such as the following:

```
; Waves SSL EQ Stereo

XRayExclude11=1397510483

XRayExclude12={E451379E-F7E1-4E82-98D9-BEB87AC45E90}
```

8. Exclude your plug-in by creating a blank line below the last entry in the `[EffectProps View]` section, and then typing:

```
;[name of your plug-in, but without brackets]
```

XRayExclude[type the next available number in XRayExclude list, but without brackets]=[VST ID number, with no brackets, or CLSID number, with curly brackets at start and finish]

   For example, if the last entry in the `[EffectProps View]` section was:

```
; Waves SSL EQ Stereo

XRayExclude11=1397510483

XRayExclude12={E451379E-F7E1-4E82-98D9-BEB87AC45E90}
```

   If you want to exclude the Cakewalk FxDelay from the X-Ray Windows feature, after creating a blank line, type:

```
; Cakewalk FxDelay

XRayExclude13={985DAF67-589F-4B8D-8BBC-D7AD651B9022}
```

   If there was also a VST version of the Cakewalk FxDelay, you would add another line:

```
XRayExclude14=[some VST ID number, with no brackets]
```

9. Save and close the `Xrayexclude.ini` file, and restart SONAR to implement your changes.

See also:

| Window management
X-Ray

Templates and key bindings

A *template* is a special file that is used as a pattern to create similar project files. You might create a template file that defines a particular musical ensemble (say, a string quartet) or a particular studio configuration (MIDI instruments, audio outputs, and so on). Templates make it fast and easy to create and configure new projects.

A *key binding* lets you associate SONAR commands with keys on your MIDI or computer keyboard. This makes it easy for you to access specific features more quickly and efficiently. You can even assign saved layouts to key bindings for quick access.

See:

Templates

Template files make it easy to create new projects with certain predefined settings. To create a template file, create a new project file and arrange the project settings the way you want, then save the project as a template file. Template files have a file extension of .cwt. When you create a new project, you can use the template as the basis for the new project. SONAR looks for template files in a particular folder on your hard disk. By default, this folder is the program folder. To change the template directory, go to **Edit > Preferences > File - Folder Locations**.

Every time you start SONAR, a new, empty project is displayed. If you want, you can determine the settings for this default project by creating and saving a special template file, called `Normal.cwt`. If you create or update the `Normal.cwt` file, SONAR will display this template automatically when the program is started.

As a rule, any parameter that is saved in a project file is also saved in a template file. Following are some useful parameters that are saved in template files:

- Track configuration and track parameters
- Timebase
- Sysx banks
- File information and comments
- Tempo settings
- Meter and key settings
- Clock and synchronization information
- MIDI data
- MIDI In/Out/Thru settings
- MIDI metronome settings
- Selection start and end times
- Record mode and punch-in times
- Drum maps
- Audio data
- Automation

The following parameters are saved globally and are not stored in template or project files:

- Initialization file parameters
- Big Time font settings
- MIDI device settings
- Instrument definitions
- Autosave options
- Key bindings
- Color settings

To create a template

1. Create a new file using the **File > New** command.
2. Add tracks.
3. Set one or more parameters to be the way you want.
4. Choose **File > Save As** to display the **Save As** dialog box.
5. Choose **Template** from the **Save as Type** list.
6. Enter a template file name and click **Save**.

SONAR saves the template file.

To create a new project from a template

1. Choose **File > New** to display the **New Project File** dialog box. The list contains the names of all existing templates.
2. Choose a template from the list.
3. Click **OK**.

SONAR creates the new project and displays it in the Track view.

See also:

Template example: three MIDI instruments

Suppose that your system has only a single MIDI output but you own three different synthesizers:

- One synthesizer set to receive on channels 1 through 8
- A general MIDI synthesizer module set to receive data on all 16 channels
- A drum machine set to receive on MIDI channel 10

Here's how you can use a template to make it easy to create new projects that are already configured for the instruments you own.

To create the example template file

1. Choose **File > New** to create a new project file.
2. Insert 16 MIDI tracks.
3. In the **Ch** drop-down menu of track 10, enter **10**. The drum machine responds to channel 10. For consistency, the drums can be placed on track 10.

4. The second synthesizer responds to channels 1 through 8. These can be placed on tracks 1 through 8. For each track, enter the corresponding channel number using the **Ch** drop-down menu for each track. You should now have tracks 1 through 8 set to channels 1 through 8.

5. The third synthesizer can respond to 16 MIDI channels, but the only channels left are 9 and 11 through 16. Enter these numbers in the corresponding tracks. You will need to mute the unused channels on the third synthesizer (1 through 8 and 10) so they won't play. These are assigned to the drum machine and the second synthesizer.

6. Name each track and set any track parameters, such as starting patch, volumes, panning, reverb, chorus, and transposition.

7. If you like, configure other parameters needed in your projects, such as auto-send Sysx banks, tempo settings, window positions, and comments.

8. Choose **File > Save**, and save the file as a template named **my3synths**.

Now, each time you want to start working on a new project, you can simply load your template and start recording.

See also:

"Templates" on page 1064

Key bindings

Key bindings let you associate SONAR commands with keys on both your MIDI keyboard and your computer keyboard. This makes it easy for you to access specific features more quickly and efficiently.

In addition, SONAR supports:

- Importing key bindings from other popular sequencer programs (see "Importing key bindings" on page 1069)
- Exporting key bindings from SONAR (see "Exporting key bindings" on page 1069)
- Use of any single key as a key binding (number keys on the number pad are separate keys from the other number keys)
- Changing the key bindings for commands that were previously hardwired, including hotkey commands in the various views

> **Note:** *The SPACEBAR is "globally" bound to the **Play/stop** button, so that when you have a plug-in window open, you can still start and stop playback with the SPACEBAR.*

Any one or two of the CTRL, ALT, and SHIFT keys can be used in combination with other keys. Preset key combinations appear in bold, with the command that they're currently assigned to listed at the bottom of the **Preferences** dialog box (**Edit > Preferences > Customization - Keyboard Shortcuts**).

Rather than tie up all the notes on your MIDI keyboard with key bindings, SONAR lets you define a key binding shift key on your MIDI keyboard that indicates when you want to use a key binding. For example, you could designate the lowest note on your MIDI keyboard as the key binding shift key, and then assign different notes to specific commands (for example, C4 to **Process > Quantize**, C5 to **Process > Groove Quantize**, and so on). If you press the C4 key by itself, the note plays normally. If you press the C4 key in combination with the lowest key on your keyboard (the key binding shift key), then it's just as if you had chosen the **Process > Quantize** command from the menu.

You can choose one of two options to define the key binding shift key:

• MIDI key (typically, the very lowest or highest key on your MIDI keyboard)

• Controller event (typically, one of the pedals)

If you use a MIDI key as the key binding shift key, then you lose the ability to play that note by itself. When you play the note, SONAR assumes you are about to choose one of the key bindings you have created and ignores the note. If this is ever a problem, you can disable MIDI key bindings without canceling the key assignments and then re-enable the MIDI key bindings later on.

You can use a key binding to execute a command only when that command is possible. For example, the **File > Save** command is disabled when no projects are open. If you have assigned the CTRL+F2 key combination to the **File > Save** command, it won't do anything when no projects are open.

You can use MIDI key bindings and computer keyboard key bindings at the same time.

To create a key binding using the computer keyboard

1. Go to **Edit > Preferences > Keyboard Shortcuts** (make sure the **Advanced** option is selected at the bottom of the **Preferences** dialog box).

2. Check **Computer** in the **Type of Keys** list.

3. To quickly scroll to the key or key combination you want, click the **Locate Key** button, and then press the key or keys you want to use.

4. Highlight the key combination you want to use in the Key list. Keys on the number pad appear as Num "n." If a key or combination is already bound to a global command by default, the name of the key appears in bold text, and the command it is bound to appears at the bottom of the **Key Bindings** dialog box under **Assigned to**. Binding a key or combination to a command and clicking **OK** overwrites any default binding for that key or combination.

5. In the **Area** menu, select the context in which you want to use the key binding.

6. Highlight the command you want to assign from the **Function** list.

7. Click **Bind** to bind the key combination to the command.

    SONAR places an asterisk next to the key(s) that you chose, and draws a line from the highlighted key(s) to the command that the key(s) will trigger. Any keys that are assigned to commands have asterisks next to them. Any commands that have keys assigned to them list the keys in the **Computer** column and/or the **MIDI** column.

8. Repeat steps 3 through 7 for all the keys you want to bind.

9. If you want to save these key bindings for other sessions, make sure that the **Save Changes for Next Session** check box is checked.

10. Click **OK** when you are done.

SONAR assigns the key(s) you chose.

To create a key binding using a MIDI keyboard

1. Go to **Edit > Preferences > Keyboard Shortcuts**.

2. Check **MIDI** in the **Type of Keys** list.

3. Check the **Enable** box to make sure MIDI key bindings are enabled.

4. If you haven't already done so, create a key binding shift key by doing one of the following:

   • Check **Key** under **MIDI Shift Options**, and enter the name of the key you want to use.

   • Check **Controller** under **MIDI Shift Options**, and choose the controller you want from the list.

5. Highlight the key you want to bind from the **Key** list (if you click inside the **Key** list to put the focus on it, you can then play a note on your MIDI keyboard, and the note automatically becomes highlighted in the **Key** list).

6. Select the command you want to bind from the **Function** list.

7. Click the **Bind** button.

   SONAR places an asterisk next to the Key that you chose, and draws a line from the highlighted key to the command that it's bound to. Any keys that are assigned to commands have asterisks next to them. Any commands that have keys assigned to them list the keys in the **Computer** column and/or the **MIDI** column.

8. Repeat steps 5 through 7 for all the keys you want to bind.

9. If you want to save these key bindings for other sessions, make sure that the **Save Changes for Next Session** check box is checked.

10. Click **OK** when you are done.

SONAR assigns the key(s) you chose.

To **disable** MIDI key bindings, uncheck the **Enable** box in the **Key Bindings** dialog box.

To search for key bindings

1. Go to **Edit > Preferences > Customization - Keyboard Shortcuts**.

2. In the **Search** box, type the text you want to search for.

The key binding list is filtered to show only functions that contain the text you specified in the **Search** box.

See also:

Templates and key bindings
Key bindings

Importing key bindings

SONAR can use key bindings from other sequencer applications. Clicking the **Import** button in the **Key Bindings** dialog box allows you to choose a new set of key bindings. After you import new key bindings, you can edit and save them the way you do with the default key bindings.

To import key bindings

1. Go to **Edit > Preferences > Keyboard Shortcuts**.
2. Click the **Import** button to open the Import **Key Bindings** dialog box.
3. Navigate to the SONAR program folder (you don't have to store them there).
4. Choose a key bindings file from the choices in the program folder. Key bindings files use the file extension .kbn.
5. Click **Open**.

SONAR loads the key bindings you chose.

See also:

Exporting key bindings

Clicking the **Export** button in the **Key Bindings** dialog box allows you to export the current set of key bindings, so that they are available when you want to switch key bindings.

To export key bindings

1. Go to **Edit > Preferences > Keyboard Shortcuts**.
2. Click the **Export** button to open the **Export Key Bindings** dialog box.
3. Navigate to the folder where you want to save the key bindings.
4. Type a name for the key bindings.
5. Click **Save**.

SONAR saves the key bindings, and adds the file extension .kbn to the filename.

See also:

Notation and lyrics

This section describes three SONAR views that are used to edit the music notation and lyrics of your project.

- SONAR's Staff view lets you work with your composition in a standard musical staff, guitar tablature and a virtual guitar fretboard. You can add, move, and delete notes with your mouse or with your computer keyboard. You can add chord names, guitar chord grids, expression marks, hairpin symbols, pedal marks, and lyrics. And you can print professional-quality notation of a complete arrangement or individual parts, with up to 24 staves per page.

- The Meter/Key view lets you view, insert, and edit meter and key changes at any measure boundary in the project.

- The Lyrics view lets you edit a track's lyrics, and can be used to cue you with the lyrics during playback or recording.

See:

The Staff view

The Staff view is composed of a Staff pane and a Fretboard.

When you first open the Staff view, you may see only the Staff and not the Fretboard. Resize the Staff view by dragging its edges until you can see everything easily. When you save your file, whatever size the Staff view is will be the way it appears the next time you open the file.

The Staff pane displays MIDI note events as musical notation. For some musicians, this may be the most familiar and comfortable view in which to work. The Staff pane provides many features that make it easy for you to compose, edit, and print music.

For guitar players who are new to musical notation, the Fretboard represents the notes in the Staff pane as they would appear on a six-string guitar neck in standard tuning. The number of strings and the tuning are configurable. All notes that appear in the Staff pane at the Now time are shown in the Fretboard. If you enter notes in the Staff at the Now time, they appear on the Fretboard. Likewise, you can enter notes into the Staff at the Now time by clicking the guitar strings on the fretboard. Notes and chords shown in the Fretboard can be easily edited by dragging them up and down the guitar strings.

Figure 327. *The Staff view*
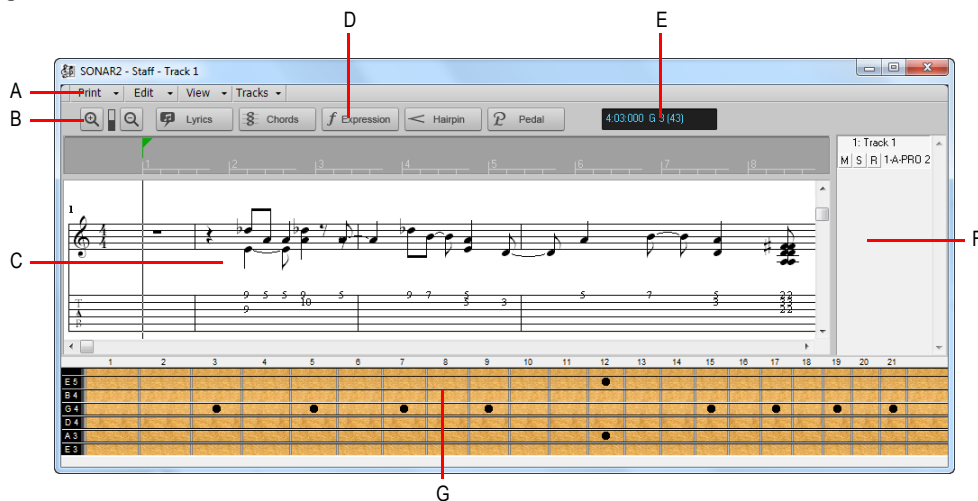
A. Staff view menu B. Zoom in/out C. Staff pane D. Editing tools E. Time and pitch locator F. Track list pane
G. Fretboard pane

See:

Opening the Staff view

There are several ways to open the Staff view:

- In the Track view, select the MIDI tracks you want to see, then choose **Views > Staff View**, or press ALT+7.
- Right-click on a track in the Clips pane and choose **Views > Staff View** on the pop-up menu.

You can always change the tracks that are displayed: in the Staff view, click the **Track** menu, choose **Pick Tracks** and select the tracks you want. You can display one or more tracks.

The Staff view lets you edit, delete, copy, and move notes during playback or recording, in real time. This means you can loop over a portion of your project and hear any change you make on the next loop. You can freeze the Staff view from automatic scrolling during playback by pressing the SCROLL LOCK key.

The Staff view includes zoom tools that let you change the vertical and horizontal scale of the view.

Displaying tracks

The Staff view also has a Track List pane that allows you to set a track's Mute/Solo/Arm status and to change track focus.

To view the Track List pane:

- Click the Staff view **Track** menu and choose **Show/Hide Track Pane**.

To set track focus:

- In the Track List pane, click the track name.

To mute, solo, or arm a track:

- In the Track List pane, click a track's **M**, **S**, or **R** buttons, respectively.

> **Note:** *You can right-click in the Track List pane to access Snap to Scale commands. For more information about this feature, see "Snap to Scale" on page 730.*

Staff pane layout

The Staff pane can display up to 24 staves of standard and percussion notation. When you open the Staff pane, SONAR automatically picks a clef for each track—bass or treble—by looking at the range of pitches in the track. If a track has notes that fall into both clefs, or no notes at all, SONAR automatically splits the track into two staves, treble and bass. You can change the assignment of clefs with the **Staff View Layout** dialog box.

When you split a track into treble and bass staves, you must select a split point. Notes at or above the split are placed into a treble staff, notes below the split are placed into a bass staff.

A wide variety of editing options for notes, layout, and MIDI effects are available from the Staff pane right-click menu.

Percussion settings are discussed in the section "Setting up a percussion track" on page 1103.

The Staff pane right-click menu

The Staff pane right-click menu offers the following editing options:

Menu command	Result
MIDI Effects	Opens the **MIDI Effects** submenu. See "MIDI effects (MIDI plug-ins)" on page 749 for more information.
Layout	Opens the **Staff View Layout** dialog box.
Regenerate Tablature	Opens the **Regenerate Tablature** dialog box. "Regenerate TAB" on page 1099 for more information.
Export to ASCII TAB	Saves the track in TAB format with the extension .TXT.
Quantize	Opens the **Quantize** dialog box. See "Quantizing" on page 750 for more information.
Groove Quantize	Opens the **Groove Quantize** dialog box. See "Quantizing" on page 750 for more information.
Transpose	Opens the **Transpose** dialog box. See "Transposing" on page 710 for more information.
Slide	Opens the **Slide** dialog box.
Find/Change	Opens the **Event Filter Search** dialog box. See "Process > Find/Change" on page 737 for more information.
Length	Opens the **Length** dialog box. See "Stretching and shrinking events" on page 714 for more information.
Scale Velocity	Opens the **Scale Velocity** dialog box. See "Adding crescendos and decrescendos" on page 717 for more information.
Retrograde	Reverses the order of selected events and clips.
Deglitch	Opens the **Deglitch** dialog box. See "Deglitch dialog" on page 1085 for more information.
Fit to Time	Opens the **Fit to time** dialog box. See "Stretching and shrinking events" on page 714 for more information.
Fit Improvisation	"Fit Improvisation" on page 726.

Table 184.

To change the Staff pane layout

1. Click the Staff view **Edit** menu and choose **Layout** to open the **Staff View Layout** dialog box.

2. Select a track from the list (if the track you want to edit is not in the list, click the **Tracks** menu and choose **Pick Tracks**, then select the desired track). The **Clef** option shows the track's clef.

3. Select a new clef from the list.

4. If you select Treble/Bass, select a Split point.

5. If you select one of the Percussion options, click **Percussion Settings** to set up the appearance of percussion notes.

6. Repeat steps 2-5 for other tracks.

7. Click **Close** when you are done.

SONAR displays tracks using the new staff settings.

💡 **Tip:** *If a piano part's left-hand and right-hand parts overlap, a split point will not correctly separate the two parts into treble and bass staves. You may prefer to put the two parts into two separate tracks.*

The Fretboard

The Fretboard shows you the notes located at the Now time in the Staff pane, laid out on a virtual guitar fretboard. For example, if the Staff pane shows you this:

The Fretboard pane shows you this:

The Fretboard stays in sync with the Now Time during playback and recording, and stays in sync with the scrub time during scrubbing. The color of each note on the Fretboard is the same as the color of the corresponding clip in the Track view. (See "Arranging clips" on page 325 for information about setting clip properties.)

To show/hide the Fretboard pane, click the Staff view **View** menu and choose **Show/Hide Fret View**.

See:

Fretboard pop-up menu

When you right-click the Fretboard in the Staff view, the **Fretboard** pop-up menu appears, giving you choices for note editing, Staff view layout, and Fretboard appearance.

Menu command	Result
Layout	Opens the **Staff View Layout** dialog box.
Select Fretboard Track	Controls which of the displayed tracks receive the notes you enter on the Fretboard.
Export to ASCII TAB	Saves the track in ASCII TAB format with the extension .txt.
Mirror Fretboard	Inverts Fretboard so highest-sounding string appears at the bottom.
Rosewood Hi	Fretboard appears in rosewood with high screen resolution.
Rosewood Lo	Fretboard appears in rosewood with low screen resolution.
Ebony Hi	Fretboard appears in ebony with high screen resolution.
Ebony Lo	Fretboard appears in ebony with low screen resolution.
Maple Hi	Fretboard appears in maple with high screen resolution.
Maple Lo	Fretboard appears in maple with low screen resolution.

Table 185.

To change the Staff view layout

1. Click the Staff view **Edit** menu and choose **Layout** to open the **Staff View Layout** dialog box.

Figure 328. *The Staff View Layout dialog*
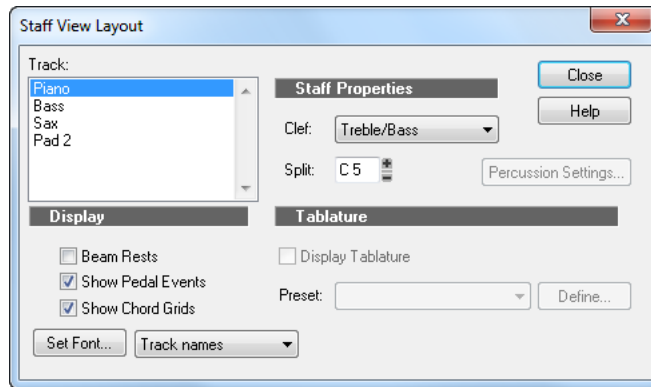
2. Select a track from the list (if the track you want to edit is not in the list, click the **Tracks** menu and choose **Pick Tracks**, then select the desired track). The **Clef** option shows the track's clef.

3. Select a new clef from the list.

4. If you select **Treble/Bass**, select a **Split** point. C5 represents middle C.

5. If you select one of the **Percussion** options, click **Percussion Settings** to set up the appearance of percussion notes.

6. Repeat steps 2-5 for other tracks.

7. Click **Close** when you are done.

   SONAR displays tracks using the new staff settings.

Basic musical editing

The global tools let you edit a project by manipulating the elements of standard music notation. Using these tools, you can create and edit notes, chord symbols (guitar fretboards), pedal marks, expression marks, hairpins, and lyrics.

When drawing events in the Staff view, the staff is shaded to indicate where the current event type can be drawn. Events can only be drawn where the background is white.

Figure 329. *The selected event type can only be drawn where the background is white.*

 Notes

 Lyrics

 Chords

 Expression markings

 Hairpins

 Pedal markings

See:

Inserting notes on the staff

You can add notes to your composition with simple point-and-click techniques. To help with your composing, SONAR gives you audio feedback as you place each note.

You can insert notes anywhere in the Staff pane, but inserting them at the Now time gives you control over the exact time you want to insert to. The SHIFT+RIGHT/LEFT ARROW command moves the Now Time forward or backward by the amount of the note duration you choose. To specify a note duration for new notes, use the Duration control in the Control Bar's Tools module. The CTRL+RIGHT ARROW/CTRL+LEFT ARROW commands pages you through the track, sounding each note as the cursor passes over it. You can also page through the track by choosing the **Edit > Play Previous** and **Edit > Play Next** commands in the Staff view menu.

Note: *You cannot insert notes whose durations are less than the value in the **Display Resolution** field, which accessed via the **View > Display Resolution** command in the Staff view menu.*

You may want to pick a different snap-to grid value for a particular note. For example, if you want to insert a half note in the last quarter note position in a measure (in order to get two tied quarter notes), you must set the snap resolution to a quarter note. SONAR will automatically convert the half note to two tied quarter notes. The same method can be used to insert a syncopated note, such as a quarter note at an eighth note position.

You may also want to disable the **View > Fill Durations** and **View > Trim Durations** options before you enter notes on the staff. This will allow you to see the true durations of all the notes you enter. These options are discussed in "Changing the way notes are displayed" on page 1086.

To insert a note on the staff

1. Disable the **View > Fill Durations** and **View > Trim Durations** options in the Staff view menu, if desired (this is usually the best way when you're entering notes).

2. Click the Staff view **View** menu and choose **Display Resolution**, then choose a resolution that's as small or slightly smaller than the smallest note you plan to enter.

3. Select the Draw Freehand tool in the Control Bar.

4. Select a note duration in the Control Bar's Tools module. You cannot insert a note that's shorter in length than the note in the **Display Resolution** field.

> **Tip:** *You can click an existing Note event to inherit its duration and apply it to new Note events. For details, see*

5. Move the Now time to the location where you want the new note by pressing SHIFT+RIGHT ARROW or SHIFT+LEFT ARROW. Notice the vertical line that marks the Now time in the Staff pane. The line moves by the duration of the note you selected to enter.

6. Click the cursor on the vertical line at the pitch that you want.

7. To add a sharp or flat, select the Smart tool in the Control Bar, double-click the note to open the **Note Properties** dialog box—in the **Pitch** field, use the **+** or **-** buttons to raise or lower the pitch, and click **OK**. You can type enharmonic spellings into the **Pitch** field, such as C#5, E"4. and Fx6. The double quotation mark produces a double flat, and the x produces a double sharp.

SONAR places the new note in the staff. If desired, drag the note horizontally or vertically to a new time or pitch.

Inserting notes with the Fretboard

You can also enter notes onto the staff from the fretboard using the mouse. You always enter notes into the staff at the Now time.

To insert notes on the Fretboard with the mouse

1. Click in the Time Ruler to set the Now time.

2. Select the Draw Freehand tool in the Control Bar.

3. Select a note duration, and a modifier (dot or triplet) if desired.

4. Click on the guitar strings in the fretboard to enter notes. You can enter up to six simultaneous notes (one per string).

5. Advance the Now Time by the current note duration using the right arrow key while holding down the shift key. This allows you to quickly enter a series of notes.

Selecting notes

Use the Select tool in the Control Bar to make selections. Selection methods in the Staff view are similar to those in other views. Here is a summary:

To do this	Do this
Select a note or other symbol	Click it
Select several symbols at once	Click and drag a rectangle around them
Add symbols to the selection	Press SHIFT and either click on the symbols or drag a rectangle around the events
Add or remove symbols from the selection	Press CTRL and either click on the symbols or drag a rectangle around the events
Select symbols in a time range	Click and drag in the Time Ruler
Select symbols between two markers	Click between the markers
Remove all selections	Click in an empty area

Table 186.

    Note: *Tied notes must be selected together, since the series is really just a single MIDI note. To select tied notes, you must click or drag a rectangle around the first note of the series.*

For more information about selecting notes, see "Smart tool" on page 422 and "Select tool" on page 429.

Moving, copying, and deleting notes on the staff

Selections can be cut, copied, pasted, and deleted with **Edit** menu commands. The techniques are similar to those used in other views. Selections can also be dragged and dropped to copy or move them. To keep track of your current position while dragging, you can keep an eye on the time and pitch locator in the upper-right corner of the Staff view.

Notes can be dragged horizontally, to a new time, or vertically, to a new pitch or staff. When you drag a note up or down to a new pitch, the note normally snaps to the notes in the current key signature (diatonic scale). This makes it easy to drag notes quickly among pitches that are in the current key.

If you need to transpose more than a few notes, use the **Process > Transpose** command. For more information, see "Transposing" on page 710.

To move a single note in the Staff view

1. Select the Select tool or Draw tool in the Control Bar.
2. Click the note to be moved.
3. Drag the note to a new time, pitch, or staff.

SONAR moves the note to the new location.

To move several notes in the Staff view

1. Select the Select tool in the Control Bar.
2. Select the notes to be moved.
3. Click one of the selected notes.
4. Drag the notes to a new time, pitch, or staff.

SONAR moves the notes to the new location.

To copy one or more notes in the Staff view

1. Select the Select tool in the Control Bar.
2. Select the notes to be copied.
3. Press and hold the CTRL key.
4. Drag the notes to a new time, pitch, or staff.

SONAR inserts copies of the notes at the new location.

To erase notes with the Erase tool

1. Select the Erase tool in the Control Bar.
2. Click any notehead to erase the note.
3. To erase several notes, click and drag with the Erase tool.

Any notes whose notehead is touched by the eraser will be deleted.

Moving notes from within the Fretboard

You can drag notes displayed in the fretboard horizontally along each string to change their pitch. They always change in the chromatic scale. You can not drag notes from one string to another.

To change the pitch of a single note in the Fretboard

1. Click in the Time Ruler to set the Now time to the time of the note you want to change.
2. Select the Select tool or Draw tool in the Control Bar.
3. Drag the note along the string to a new fret.

SONAR moves the note to the new pitch.

To change the pitch of a chord in the Fretboard

1. Click in the Time Ruler to set the Now time to the time of the chord you want to change.
2. Select the Select tool in the Control Bar.
3. While pressing SHIFT, click each of the notes you would like to change.
4. While continuing to press SHIFT, drag the notes along the strings.

SONAR moves the notes you selected to the new pitches.

Tip: *You can also move the Now time pointer to the exact note by using the **Step Play** buttons.*

Auditioning

Sometimes it is useful to listen to your music slowly, note-by-note, rather than at full speed. For example, you may need to locate a bad note, or you may be trying to learn the correct fingering for a difficult passage.

The Staff view has two features that let you audition your composition at reduced speed: Scrub and Step Play. The Scrub tool lets you drag a vertical bar over the staff, playing the notes as it goes. You can scrub backward or forward at any speed. Step Play lets you step through the project note by note, in either direction.

To audition with the Scrub tool

1. Hold down the J key to activate the Scrub tool.
2. Drag the mouse horizontally through the Staff pane to play the notes.

SONAR plays any notes the scrub line passes over.

To play notes with Step Play

1. Set the Now time by clicking in the Time Ruler.
2. Step through the music as follows:

To do this	Do this
Step forward	Choose **Edit > Play Next** or press CTRL+RIGHT ARROW
Step backward	Choose **Edit > Play Previous** or press CTRL+LEFT ARROW

Table 187.

Changing note properties

The Staff view lets you edit all the MIDI parameters for a note, including those not normally portrayed by standard musical notation. Note properties are as follows:

Property	Meaning
Time	The starting time of the note
Pitch	The note's pitch
Velocity	The note's velocity (0 to 127)
Duration	The note's duration, in ticks or in beats and ticks
Channel	The MIDI channel on which the note is played
Fret	The fret at which the note is played on the neck
String	The string on which the note is played

Table 188.

To edit a note's properties

1. Select the Smart tool in the Control Bar and double-click the note to open the **Note Properties** dialog box.

Figure 330. *The **Note Properties** dialog*
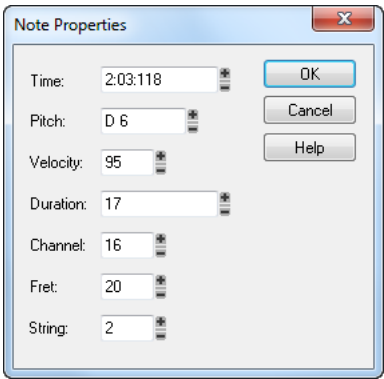
2. Edit the note's properties, as described in the table.

3. Click **OK**.

SONAR changes the note's parameters and redraws the note if necessary.

Deglitch dialog

When recording MIDI guitar, even the best players occasionally play unintended notes. The Deglitch feature allows you to filter out the softest, shortest, and highest notes in the file.

There are three filters in the **Deglitch** dialog:

Pitch

With the Pitch filter you can set the maximum pitch allowed in the track. If a MIDI event has a higher pitch than the maximum you set, it is removed.

Velocity

With the Velocity filter you can set a minimum velocity allowed in the track. If a MIDI event has a lower velocity than the one you set, it is removed.

Duration

With the Duration filter you can set a minimum note duration for the track in either ticks or milliseconds. If a MIDI event has a shorter duration than the one you set, it is removed.

To use the Deglitch filter

1. Select a track or a section of track.

2. Select **Process > Deglitch** from the menu.

   The **Deglitch** dialog box appears.

3. Check each of the filters you want to use.

4. Enter the parameters (maximum or minimum values) you want for each of the filters you are using.

5. Click **OK**.

If you are not happy with the result, select **Edit > Undo** to restore the original MIDI track.

Working with triplets

The Staff view places certain limitations on the use of triplets. The limitations are:

- Triplets must occur in full sets of three.
- All three steps in a triplet must be notes (no rests) of the same basic duration.
- There can be no ties in or out of, or within the triplet.

In most cases, the Staff view can recognize triplets in MIDI data. However, the slight timing inaccuracies inherent in live performances can complicate the detection of triplets. If working from performance data, you may find it useful to quantize the notes closer to exact triplet positions using the **Process > Quantize** command. See "Quantizing" on page 750 for details.

To enter a triplet

1. Enable Snap to Grid in the Control Bar's Snap module.

2. Select the Draw tool in the Control Bar.

3. Select a triplet note duration in the Tools module.

4. Enter the first note at the desired location in the staff.

   SONAR inserts all three triplet notes at the same pitch. You can then drag the second and third notes to their correct pitch locations.

Beaming of rests

The Staff view supports beaming of rests, a practice that is popular with rhythmically complex music. Beam lengths are extended to include rests that are integral parts of the beamed group of notes. Short stems, called stemlets, extend from the beam toward the rest. This makes the rhythms easier to read, because the beat boundaries are made clear.

To enable beaming of rests

1. Click the Staff view **Edit** menu and choose **Layout** to open the **Staff View Layout** dialog box.

2. Select the **Beam Rests** option.

3. Click **OK**.

   Thereafter, the Staff view beams rests as though they were notes.

Changing the way notes are displayed

Unlike musical notation programs, SONAR uses the MIDI events themselves as the permanent representation of the music; thus, the Staff view is only an interpretation of a MIDI performance.

MIDI notes do not always correspond exactly to notes on a staff. Whereas a staff defines precise grid-like starting times and durations for notes, a MIDI note can start at any arbitrary time during the project, and last for any length of time. If you record a performance from a MIDI keyboard, for example, you'll find that some notes may start slightly before the beat, and some a little after, and that the notes end a little late or a little early. Although these slight imperfections are what gives a performance its "human" quality, you don't necessarily want to see all these imperfections notated with excruciating precision.

The Staff view has two options you can select to affect the way MIDI notes are displayed on the staff:

Option	Purpose
Fill Durations	Visually rounds up note durations to the next beat or the next note, whichever comes first.
Trim Durations	Visually rounds down note durations if they extend a little way past the start of the next note.

Table 189.

Here's what the Staff view looks like with and without these options:

Figure 331. *Fill and Trim off*

Figure 332. *Fill and Trim on*

On the other hand, if you are entering notes into the Staff view with the mouse, **Fill Durations** and **Trim Durations** may produce confusing results. For example, with **Fill Durations**, an inserted eighth note in 4/4 time would look like a quarter note until you insert another eighth note immediately following it. It is recommended that you turn off the **Fill Durations** and **Trim Durations** options when entering notes; these options are more appropriate for looking at notes you recorded via a performance.

Using enharmonic spellings

Any musical note can be referred to by several different names. For example, C#3 and Db3 identify the same pitch, as do G#4 and Ab4. The most appropriate name depends upon the current key signature, but can also depend on musical context.

SONAR uses a set of rules to automatically add accidentals (sharps, flats and naturals) to notes based on the current key signature. These rules cover the most common musical situations and usually lead to pleasing results. However, there is no guaranteed right way to resolve accidentals. Doing so ultimately requires knowledge regarding what key or scale is being evoked—knowledge that only the composer possesses. For example, if a modulation is being prepared, then the new key signature has not yet been completely established, and the harmony has already begun to shift. In fact, there may not even be a scale in a diatonic sense: chromatic scales, for instance, are supposed to sharp on the way up and flat on the way down. Because no set of rules will suffice for all situations, the composer needs the ability to override any default choice.

Notes in SONAR normally do not have a forced enharmonic spelling. This means that they will automatically change to match the default for a new key signature. If you specify spelling that matches the default choice, SONAR will drop any forced spelling and switch back to default behavior. Otherwise, the forced spelling is remembered for that note, and will not change to follow the key signature. If you change the pitch of a note by some other means (for instance, by dragging it up or down), it will lose any forced spelling, because it very likely no longer applies to the new pitch. Enharmonic spelling overrides for each note are saved in the project file.

When you type a note's enharmonic spelling, use the following table as a guide.

Accidental	Character	Example	Displays as
Flat	b	Cb5	
Sharp	#	C#5	
Double flat	"	C"5	
Double sharp	x	Cx5	

Table 190.

To change a note's enharmonic spelling

1. Select the Smart tool in the Control Bar and double-click the note to open the **Note Properties** dialog box.

2. In the **Pitch** textbox, type a new spelling for the note.

3. Click **OK**.

SONAR displays the note with the new enharmonic spelling.

You can change enharmonic spellings in other views, such as the Event List view, by similarly typing a new spelling wherever the note pitch is displayed as a text string.

You can also use the **Process > Find/Change** command to change enharmonic spellings—for example, to change multiple occurrences of Eb5 to D#5, or even all Ebs to D#s. See "Process > Find/Change" on page 737 for more information.

MIDI Channels and the Fretboard

You can display notes on the fretboard based on the note event's MIDI channel. (Do not confuse this with the Track MIDI channel.) A single track can hold events on many different MIDI channels. See "Assigning a MIDI channel (Chn)" on page 225 for more information. Displaying notes using this method is 100% accurate because each string is represented by an individual MIDI channel. For example, String 1 = MIDI channel 11, String 2 = MIDI channel 12, etc.

To display notes on the Fretboard using their MIDI channels

1. Set your MIDI guitar to transmit on 6 consecutive channels. This is often referred to as "MONO" mode. Refer to your MIDI Guitar device documentation for more information.

2. Select and Arm a track.

3. If you want the data from all 6 strings to be recorded to a single track, set the **Input** to **OMNI**. If you want each string on a separate track, you need to set up each individual track to record on the corresponding MIDI channel. The **GT-30 Guitar Synthesizer** template is designed to do this, so you may want to open that from the **Quick Start** menu or from the **File** menu. To use the **File** menu method, choose **File > Open** and choose Cakewalk Template from the **Files of type** field. Then choose the **Roland GT-30 Guitar Synthesizer** template.

4. Open the Staff view.

5. Click the Staff view **Edit** menu and choose **Layout** to open the **Staff View Layout** dialog box.

6. Click **Define**.

7. In the **Method** field, click **MIDI Channel**.

8. In the **1st Channel** field, set SONAR to transmit on the same series of MIDI channels that you chose in step 1. Select **1** for 1-6, **2** for 2-7, etc.

   MIDI guitar devices can transmit in MONO using a different series of MIDI channels, but SONAR needs to be listening to the same channels in order to properly display the MIDI guitar input.

9. Click **Close**.

10. Click **OK**.

SONAR displays notes on the Fretboard based on their MIDI channels.

If you are planning to record or input notes from a MIDI guitar synth or MIDI converter, you need to set this up on the instrument. In the case of the Roland GT-30, for example, you set it to send on MIDI Channel 11, MONO. This sends out each corresponding string on channels 11-16.

Chords and marks

The Staff view lets you add and edit chord symbols, dynamic markings, hairpin symbols, and pedal events. Like notes, these symbols are placed in the score with the Draw Freehand tool. They can be selected, cut, copied, pasted, deleted, and dragged and dropped. With the exception of pedal marks, though, these symbols have no audible effect; they serve only to enhance and clarify the printed score.

See:

Adding chord symbols

The Staff view lets you enter chord symbols above the staff. You can enter both ordinary chord names and guitar chord symbols, which display both the chord name and fingering. SONAR has a large number of predefined chords from which you can choose. You can also define and save your own chords.

If a track is split into treble/bass staves, chords are allowed only above the upper (treble) staff.

SONAR stores its library of chords in the file Chords.liw. The chords in the library are sorted into groups. You can add and remove chords from the library, create new groups (i.e., for alternative guitar tunings), and add chords from a different library file.

You edit chords in the **Chord Properties** dialog box. Chord properties are shown in the following table.
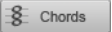
Property	Meaning
Time	The time of the chord, in measure, beat, and tick (MBT) format
Name	The name of the chord
Group	The chord group

Table 191.

The **Chord Properties** dialog box also lets you draw guitar chord grids and manage the chord library.

You can suppress the display of all guitar chord diagrams by deselecting the **Show Chord Grids** option in the **Staff view's Layout** dialog box. With this option disabled, only chord text appears.

To add a chord symbol

1. Select the Draw Freehand tool in the Control Bar.

2. Click the **Chords** button $\boxed{\text{🎼 Chords}}$ in the Staff view.

3. Position the pointer above the staff (the pointer changes to a pencil when you are in a legal position).

4. Click to place a chord symbol.

SONAR inserts a copy of the most recently added chord (by default, C). You can then edit the symbol to display the chord you want.

To move a chord symbol

1. Select the Draw Freehand tool in the Control Bar.

2. Drag the chord symbol to a new location.

To edit a chord symbol

1. Right-click the symbol to open the **Chord Properties** dialog box.

2. Edit information about the chord according to the table:

To do this	Do this
Move a chord in time	Change the Time property.
Give the chord a new name	Select a chord from the drop-down list, or type a new name. Use # for sharp and b for flat.
Add descriptive text to the chord name	Type the text in square brackets after the chord name. The text does not appear in the Staff view.
See a different set of chords	Select a group from the list. This option only applies if you have created a custom chord library.

Table 192.

3. If desired, select a group from the list and/or create a guitar chord grid.

Figure 333. *The Chord Properties dialog*
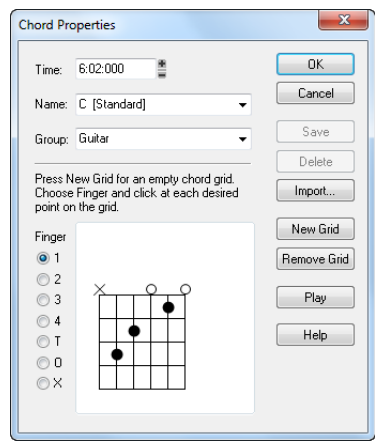
4. Click **OK**.

The Staff view displays the chord with the new properties, moving it to a new time if necessary.

To add a guitar chord grid

1. Right-click the chord symbol to open the **Chord Properties** dialog box.

2. Follow the instructions in the table:

To do this	Do this
Display a blank chord grid	Click **New Grid**
Place a dot on the grid	Select the finger number (1-4, or T for Thumb), then click the grid at the appropriate string and fret location
Assign an open string	Select O, then click on the string
Assign a muted string	Select X, then click on the string
Change the finger assigned to a dot	Click the dot repeatedly to cycle through the fingers
Insert a fret designation	Click to the right of the grid and enter the number of the index finger fret in the **Chord Fret Number** dialog box
Play the chord (Audition)	Click **Play**
Remove the chord grid	Click **Remove Grid**

Table 193.

3. Click **OK**.

The Staff view displays the chord with the new guitar chord grid.

To manage the chord library

1. Right-click the chord symbol to open the **Chord Properties** dialog box.

2. Follow the instructions in the table:

To do this	Do this
Add a chord to the library	Select a group, enter a name in the **Name** box, enter a guitar grid (if desired), and click **Save**.
Delete a chord from the current group	Select the chord from the list and click **Delete**.
Add a new group	Type a name for the group in the **Group** textbox and click **Save**.
Delete a group	Select a group from the list and click **Delete**.
Merge chords from an external chord library	Click the **Import** button and select a file. Chord libraries have the extension .liw.

Table 194.

3. Click **OK**.

SONAR saves the chord library with the changes you made.

Adding expression marks

Expression marks tell a performer how to interpret the notes and durations on the page. They provide a necessary supplement to simple notation, in which notes have only pitch and duration, but no hint of how loudly, softly, or smoothly, they are to be played. Dynamic marks—from *ppp* (pianissimo) for "very, very softly" through *fff* (fortissimo) for "very, very forcefully"—allow notation to convey volume instructions. Expression marks are also needed to specify other aspects of performance, such as whether a passage is to be played legato or staccato. Finally, expression marks can be used to convey to the performer the composer's suggestions or requirements as to how a passage should be interpreted. In such cases the language used can leave much to the imagination, as in *with majesty* or *abrasively*.

Expression marks do not change the underlying MIDI data. They only provide information to the reader on how a piece should be performed.

If the track is split into treble/bass staves, expression marks are allowed only below the treble staff.

When entering an expression mark, you can leave a dangling hyphen at the end of an expression mark to insert automatic spaced hyphens until the next expression mark. For example:

cresc.   -   -   -   ff

It is often desirable to terminate such a series of hyphens with a blank expression mark. For example:

accel.   -   -   -

Expression text is italicized in the Staff view. Standard dynamic markings also appear bold.

To add an expression mark

1. Select the Draw Freehand tool in the Control Bar.

2. Click the **Expression** button f Expression in the Staff view.

3. Position the pointer below the lowest note in the staff. (The pointer changes to a pencil when you are in a legal position.)

4. Click to open an insertion box.

5. Type the expression mark text. Press ESC to abort the operation.

6. Press ENTER, or press TAB or SHIFT+TAB to move to the next or previous mark, respectively.

SONAR inserts the new expression mark below the staff.

To edit an expression mark

1. Right-click the expression mark to open the **Expression Text Properties** dialog box.

Figure 334. *The Expression Text Properties dialog*
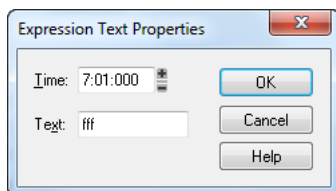
2. Edit the time and text of the expression mark as desired.

3. Click **OK**.

The Staff view displays the expression mark with the new text, including moving it to a new time if necessary. You can also use the Draw tool and click on an expression mark directly to change its text.
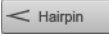
Adding hairpin symbols

Some musical phrases vary dynamically, increasing or decreasing in loudness for dramatic effect. SONAR lets you insert traditional crescendo and diminuendo hairpin symbols that convey this information to a performer, as shown here:
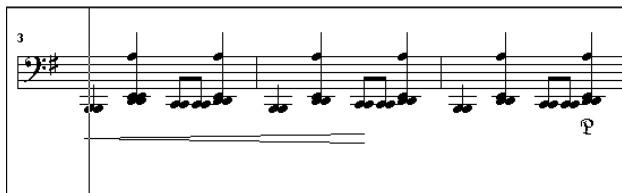
If the track is split into treble/bass staves, hairpin symbols are allowed only below the treble staff.

To add a hairpin symbol

1. Select the Draw Freehand tool in the Control Bar.

2. Click the **Hairpin** button `< Hairpin` in the Staff view.

3. Position the pointer below the staff (the pointer changes to a pencil when you are in a legal position).

4. Click to place a hairpin symbol.

SONAR inserts a copy of the most recently added hairpin symbol, which you can edit as desired.

To edit a hairpin symbol

1. Right-click on the hairpin symbol you want to edit.

   The **Hairpin Properties** dialog box appears.

2. Change any of the following parameters:

   • **Time.** The beginning time of the hairpin symbol

   • **Crescendo or Diminuendo.**

   • **Duration.** Enter the number of beats followed by a colon (for example 4: for one measure in 4/4 time) or a PPQ number value.

Adding pedal marks

Pedal marks traditionally indicate where the sustain pedal of a piano is to be pressed and for how long. With SONAR, you can achieve the same effect by inserting a pair of symbols indicating when the sustain pedal controller is to be turned on (down) and when it is to be turned off (up). Unlike chord symbols, expression marks, and hairpin symbols, each pedal symbol corresponds to a MIDI event. The other symbols are purely ornamental, intended to provide a composer with a way to communicate suggestions or requirements to performers.

Pedal event parameters are as follows:

Parameters	Meaning
Time	The time of the event, in measures, beats, and ticks (MBT).
Channel	The MIDI channel on which the event will be sent.
Value	The event value. A value of 127 depresses the pedal, a value of 0 raises it. (Some advanced synthesizers support values between 0 and 127 for "partial pedaling.")

Table 195.

If the track is split into treble/bass staves, pedal marks are allowed only below the bass staff.

You can suppress the display of all pedal marks by deselecting the **Show Pedal Events** option in the **Staff view's Layout** dialog box.

To add a pedal mark

1. Select the Draw Freehand tool in the Control Bar.

2. Click the **Pedal** button $\mathcal{P}$ Pedal   in the Staff view.

3. Position the pointer below the staff (the pointer changes to a pencil when you are in a legal position).

4. Click to place a pedal mark.

SONAR inserts a pair of pedal symbols (a pedal down and a pedal up). You can click and drag either symbol to a new time.

To edit a pedal event

1. Right-click the pedal symbol (pedal down or pedal up) to open the **Pedal Event Parameters** dialog box.

Figure 335. *The Pedal Proerties dialog box.*
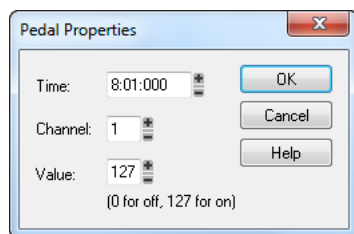
2. Edit the pedal event parameters, as described in the table above.

3. Click **OK**.

SONAR changes the pedal event parameters, including moving the symbol to a new time if necessary.

Tablature

The Staff view can display guitar or bass MIDI tracks as tablature. You can generate and edit tablature or enter notes on either the fretboard or on the tablature staff to create a new track. You can export tablature to an ASCII file for printing or distribution on the Web.

See:

Tablature settings

Both the **Staff View Layout** dialog box and the **Tablature Settings** dialog box create tablature settings for a whole track at a time. To modify tablature for selected parts of a track, select part of a track and use the **Edit > Regenerate TAB** command.

In the **Staff View Layout** dialog box you can choose a preset style of tablature by choosing from the **Preset** pop-up menu, or you can define your own style by clicking the **Define** button in the **Staff View Layout** dialog box to open the **Tablature Settings** dialog box.

To define a tablature style

1. Click the Staff view **Edit** menu and choose **Layout** to open the **Staff View Layout** dialog box, then click the name of the track you want to define tablature for.

2. Click the **Define** button (lower right corner).

   The **Tablature Settings** dialog box appears.

3. Click the **Tablature** tab and choose a tablature method from the **Method** drop-down list. There are three methods to determine how the TAB is displayed:

   • **Floating.** Which allows the notes to spread over the entire fretboard

   • **Fixed.** This specifies where on the neck these notes should be played. When **Fixed** is selected the **Finger span** and **Lowest fret** fields are used together to define the "box" where the notes are displayed. The **Finger span** parameter determines how many consecutive frets will be used to display the note. For example, if **Finger span** is set to **4**, then SONAR will attempt to place all the notes within those 4 frets. The **Lowest Fret** then determines where on the fretboard the notes will be displayed within the **Finger span**. The red box in the fretboard

display changes to reflect the settings in these two parameters.

- **MIDI Channel.** This uses the event's MIDI channel to determine which string the note should be displayed on. When **MIDI Channel** is selected, the user chooses which series of MIDI Channels should be considered. This is useful for MIDI guitarists that record parts in MONO mode, where each string transmits on a different MIDI channel. (Values: 1 - 11). Selecting **1** in the **1st Channel field** will cause it to use MIDI channels 1 - 6, selecting **2**, 2 - 7, and so on.)

Note: *Select the Skip Channel 10 option if you are using a Yamaha G50 or other device which reserves channel 10.*

4. Type a number into the **Number of Frets** field. This determines how many frets the guitar has that the tab is based on.

5. In the **String Tuning** fields, choose the instrument from the drop-down list and number of strings from the **Number of Strings** field.

   The open string pitches for the instrument you choose automatically appear in the **String Number** fields below the drop-down list.

6. Customize any of the open string pitches by using the **+** or **-** buttons on the **String Number** fields.

7. Save your settings by typing a name into the **Preset** field at the top of the dialog box and clicking the disk icon next to it. You can remove presets from the list by clicking the **X** button next to the disk icon.

The next time you want to use these settings for a track, choose your Preset in the **Staff View Layout** dialog box from the **Presets** drop-down list.

Changing Fretboard texture and orientation

You can change fretboard texture and orientation (high string on top or bottom of neck) in the **Staff View Layout** dialog box, or by right-clicking the Fretboard.

To change the Fretboard texture and orientation

1. Click the Staff view **Edit** menu and choose **Layout** to open the **Staff View Layout** dialog box.

2. Click the **Define** button (lower right corner).

   The **Tablature Settings** dialog box appears.

3. Click the **Fretboard** tab.

4. In the **Texture** field, choose a texture from the drop-down list.

5. If you want to reverse the standard string orientation, in the **Orientation** field click **Low String on Top (Mirror)**.

6. Click **OK**.

The Fretboard changes to reflect your choices.

Quick TAB

SONAR quickly creates a tablature based on standard fingering patterns. After you try the quick version, you can customize the tablature to your liking.

To create a quick TAB

1. Open a file that contains a MIDI guitar track.

2. In the Track view, select the track number of the track you want to display tablature for.

3. Select **Views > Staff View**.

   The Staff view appears, displaying a fretboard and the notation of your MIDI track. To see everything, you may need to resize the Staff view by dragging the top border upward a few inches.

4. Click the Staff view **Edit** menu and choose **Quick TAB**.

   A tablature grid appears, displaying the fret numbers for all the notes in the track.

5. From the **File** menu, choose **Save**. Saving your file saves TAB settings for each track you generated TABs for.

Press the SPACEBAR to play your file. Notice that the Fretboard displays the name of each note above the string and fret you would play it on as the note plays.

Regenerate TAB

The **Regenerate TAB** command works on selected regions in a track to modify the fingering according to the method you choose. The TAB display by default uses the **Floating** algorithm which allows the notes to spread over the entire fretboard. By choosing the **Fixed** algorithm instead, you can designate a specific finger span and lowest fret which causes the TAB of a selected region to be displayed within this range. This usually creates a more compact fingering system.

The **Regenerate TAB** command gives you a third choice for displaying tablature MIDI channel. This uses the event's MIDI channel to determine which string the note should be displayed on. When **MIDI Channel** is selected, the user chooses which series of MIDI Channels should be considered. This is useful for MIDI guitarists that record parts in MONO mode, where each string transmits on a different MIDI channel.

To regenerate TAB

1. Select the Select tool in the Control Bar and drag a rectangle around the notes or TAB numbers you want to change.

2. Click the Staff view **Edit** menu and choose **Regenerate TAB** to open the **Regenerate Tablature** dialog box.

3. Select **Fixed** from the **Method** field and fill in values for **Finger Span** (usually 4), **Lowest Fret**, and **Number of Frets** (usually 21).

4. Click **OK**.

SONAR regenerates a TAB based on your specifications. If notes are out of the range you specified, SONAR displays them as close to that range as possible.

Entering notes from the TAB staff

You can enter notes or chords directly from the TAB staff.

To enter notes from the TAB staff

1. Open the Staff View.
2. Click the Staff view **Edit** menu and choose **Quick TAB**.
3. Press CTRL+HOME to move the Now Time to the start of the project.
4. Select the desired note duration in the Control Bar's Tools module.
5. Select the Draw Freehand tool in the Control Bar.
6. Enter a note by clicking a line in the TAB staff.
7. Without letting go of the mouse, click and drag the cursor up to set the fret number.

Tip: *You can move ahead in the track by pressing SHIFT+RIGHT ARROW, and move back in the track using SHIFT+LEFT ARROW. The Now Time moves by the amount of the note duration you choose in the Control Bar's Tools module.*

Single note editing from the TAB staff

SONAR enables you to edit single notes from the TAB staff in several ways:

- With the Freehand tool selected, drag fret numbers up or down. When you reach the desired fret number, release the mouse.
- With the Freehand tool selected, move a note to a different string by holding down the ALT key while you drag the fret number to a different line. If the note you are moving won't play on the string you are dragging it to, you won't be able to move it.
- Right-click the fret you want to edit. A list of fret numbers appears. Select the one you want, and the fret you right-clicked changes to the fret number you selected.

Editing chords or groups of notes from the TAB Staff

To edit chords or groups of notes in the TAB staff, first select which notes you want to edit, and then drag them to new pitches or strings.

To edit chords or groups of notes from the TAB staff

1. Select the Select tool in the Control Bar.
2. In the TAB staff, drag a rectangle around the chord or group of notes you want to edit, and release the mouse.
3. Drag the fret numbers you selected up or down by the amount you want.
4. You can drag the notes to different strings by holding down the ALT key while you drag. If the notes you are moving won't play on the strings you are dragging them to, you won't be able to move them.

To export to an ASCII TAB file

1. Select the track you want to export.
2. Open the Staff view.
3. Click the Staff view **Print** menu and choose **Export to ASCII TAB**.

    The **Save As** dialog box appears.
4. Enter a file name in the **File name** field.
5. Click **OK**.

SONAR saves the track with the file extension .txt.

Editing notes and chords from the Fretboard

You can transpose single notes or chords from the Fretboard.

To transpose single notes

1. Move the Now Time to the note you want to edit by pressing SHIFT+RIGHT/LEFT ARROW. You may need to change the note duration in the Control Bar's Tools module.
2. Use the Select tool to drag the note left or right on the fretboard.

To transpose chords

1. Move the Now Time to display the chord you want to transpose.
2. Hold down the SHIFT key and select all the notes in the chord.
3. Hold down the SHIFT key and drag the chord to a new position, then release the mouse.

Entering notes from the Fretboard

If you prefer to work with the Fretboard instead of a musical staff, SONAR makes it easy to enter notes from the Fretboard. You can enter single notes or chords by clicking the string and fret of the note you want to enter at the Now Time position.

1. Display the track you want to add notes to in the Staff view.
2. Select the Draw Freehand tool in the Control Bar.

    Now the cursor appears as a pencil when you move it over the Staff or Fretboard.
3. Move the Now Time to where you want to start entering notes by pressing SHIFT+RIGHT ARROW or SHIFT+LEFT ARROW. Each press of the arrow moves the Now Time by the amount of the note duration you choose in the Control Bar's Tools module.
4. Enter a note by clicking the string and fret where you would play the note.

    The note appears on the Fretboard, in the Staff, and in the TAB if you have generated one (to generate a Quick TAB, click the Staff view **Edit** menu and choose **Quick TAB**).
5. If you are entering a chord, continue clicking notes at the same Now Time. To move ahead, press SHIFT+RIGHT ARROW and click a new note duration in the Control Bar's Tools module, if desired.

You can delete a note right after you enter it by pressing CTRL+Z, or at any time by selecting the Erase tool in the Control Bar and clicking the note in the notation or TAB staffs.

SONAR gives you several options to play and hear the notes in your track:

• Scrubbing enables you to click each note in the Fretboard and hear it play. Hold down the J key to activate the Scrub tool, then click the note.

• Scrub strumming enables you to "strum" chords by dragging the Scrub tool through a chord. With the Scrub tool activated, drag through a chord on the Fretboard from below it or above it and back and forth.

• CTRL+RIGHT ARROW/CTRL+LEFT ARROW moves the cursor through the track, playing each note as it reaches it.

Working with percussion

The Staff view can display percussion tracks on a five-line percussion staff or on a single percussion line. The staff usually displays notes for a drum set or multiple percussion instruments; the line is used to display notes for a single instrument (although it need not be so).

SONAR lets you control the appearance of percussion staffs in considerable detail. You can display percussion notes using several different types of noteheads and articulation symbols, and you can map any percussion sound to any position on the percussion staff (in a percussion track, each MIDI note value designates a different percussion instrument; mapping lets you display any instrument in any position on the staff, regardless of the underlying MIDI note value). You can save your settings as a preset, and use them again on other tracks and in other projects. SONAR supplies a standard preset based on the General MIDI percussion standard and popularly accepted percussion staff positions and noteheads.

See:

Setting up a percussion track

Before you use the percussion capabilities of the Staff view, your percussion track should be set up correctly. This will allow you to hear the proper sounds when placing notes and during playback, and will allow you to see the correct percussion instrument names rather than generic note names in the Piano Roll view, Event List view, and **Percussion Notation** dialog box.

To set up a percussion track

1. Select the track so it appears in the Track Inspector.
2. In the Track Inspector, assign the Output and Channel for your percussion instrument. For example, if the output is assigned to a sound card that supports General MIDI, use channel 10.
3. Go to **Edit > Preferences > MIDI - Instruments**.
4. Make sure that the output/channel combination used by your track is assigned to a percussion instrument definition. For example, channel 10 of a General MIDI output should be assigned to the **General MIDI Drums** instrument definition.
5. Click **OK** in both dialog boxes.

SONAR shows the new track output and channel in the Track view, and will use the proper percussion instrument names in the Piano Roll view, Event List view, and **Percussion Notation** dialog box.

For more information about instrument definitions, see "Instrument definitions" on page 1117.

Setting up a percussion staff or line

The first time you display a percussion track in the Staff view, SONAR picks a default percussion clef for the track. Tracks with only one note value are assigned the Percussion Line clef. Tracks with multiple note values are assigned the Percussion Staff clef.

If you want to change a Percussion Staff to a Percussion Line or vice versa, or if you want to change another type of staff to a percussion staff, you can do so in the **Staff View Layout** dialog box. If you change a track's clef to a non-percussion clef, the percussion notation settings will be lost.

The lowest and highest lines on the Percussion clef are E5 and F6, respectively. The Percussion Line represents E5.

By default, percussion staves are given SONAR's default note bindings and notehead assignments. If you want to use your own notation, or if you want to set up the appearance of a percussion line, you need to use the **Percussion Notation Key** dialog box. In this dialog box, the percussion sounds and staff positions that are bound have an asterisk near their names. When you select a bound percussion sound, a line joins the sound to its staff position. Each percussion sound can be bound only to a single position, but each position may be bound to several sounds. You can use different notehead types and articulation symbols to visually distinguish the sounds.

To assign a percussion staff or line to a track

1. Click the Staff view **Edit** menu and choose **Layout** to open the **Staff View Layout** dialog box.
2. Select your percussion track from the list.
3. Select **Percussion Staff** or **Percussion Line** from the **Clef** drop-down list.
4. Click **Percussion Settings** to set up the appearance of percussion notes (see "To set up a track's percussion notation key" on page 1104).
5. Click **Close**.

SONAR changes the track's clef to the selected percussion clef.

To set up a track's percussion notation key

1. Click the Staff view **Edit** menu and choose **Layout** to open the **Staff View Layout** dialog box.
2. Select your percussion track from the list.
3. Click **Percussion Settings** to open the **Percussion Notation Key** dialog box.
4. Set up the percussion notation key according to the following table.

To do this	Do this
Map (bind) a percussion sound to a line or space on the staff	Select the sound (or corresponding MIDI note) in the MIDI Note list, select the intended position in the percussion staff in the Display As list, then click **Bind**.
Set the notehead and articulation mark for a percussion sound	Select the sound in the **MIDI Note** list, then select a **Notehead Type** and **Articulation Symbol**. (Only bound sounds can be assigned a notehead type and articulation symbol other than the default.)
Control how unbound percussion sounds display	In the **Display As** list, click the pitch that you want all unbound notes to display as. Then select a **Notehead Type** and **Articulation Symbol**, then click the **Default note** button to apply your changes.
Remove a binding	Select the percussion sound in the **MIDI Note** list, then click **Unbind**. Unbound notes are displayed in the default position.
Load a preset	Select the preset from the **Preset** list.
Save your settings as a preset	Click the **Save** button 🔳 and enter a preset name.
Clear all bindings	Click **Zap All**.
Select notes in the note lists with a MIDI keyboard	Click in the **MIDI Note** or **Display As** list, then strike a key on your keyboard.

Table 196.

5. Click **OK** to close the **Percussion Notation Key** dialog box.

6. Click **Close** to close the **Staff View Layout** dialog box.

The Staff view shows the percussion clef with the note bindings and noteheads you assigned.

Ghost strokes

In percussion notation, parentheses around a note mean that it is a ghost stroke, played very lightly and barely heard. SONAR supports ghost strokes by displaying parentheses around any percussion note event with velocity less than 32 (a fixed, arbitrary threshold). If necessary, you can adjust the Vel+ parameter of the track and the velocities of the individual notes to effectively move this threshold without changing the way the note sounds.

The following figure shows two tracks displaying ghost strokes.
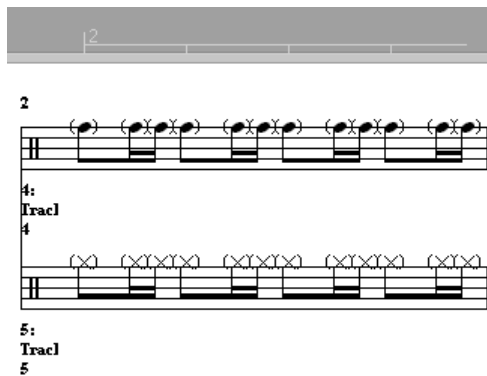
Printing

The Staff view provides printing support of standard musical notation in nine staff sizes. The Staff view prints general project information from the **File Info** dialog box (see "Labeling your projects" on page 309) at the beginning of the score, including the song's title (or file name), subtitle (dedication), playing instructions, author/composer, and copyright. In addition, SONAR identifies the tracks by number and name, and numbers each measure and each page.

SONAR lets you select a size for your printed score. Engravers have nine standardized sizes of the five-line staff. The vertical distance between the lines of each staff is called its rastral size, or measurement. Each rastral size has a number and is used by publishers for a specific genre of musical composition.

Number	Trade names	Genre usage
0	Commercial or Public	Wire-bound manuscript
1	Giant or English	Elementary band and orchestra books; instruction booklets
2 or 3	Regular, Common, or Ordinary	Sheet music for concertos and classics
4	Peter	Folios, works for organ, etc.
5	Large middle	Band/wind ensemble music; sheet music
6	Small middle	Chorals; condensed sheet music
7	Cadenza	Pocket editions; cues in piano parts; military marches
8	Pearl	Thematic advertisement; ossia

Table 197.

To print a score

1. Make sure the Staff view is the current window.
2. Choose **File > Print Preview**.
3. If you want, click **Zoom**, or click in the music, to zoom the view in and out.
4. Click the **Configure** button to select a rastral size.
5. When zoomed out, you can press PAGE UP and PAGE DOWN to navigate between pages.
6. Click **Print**.

SONAR displays the **Windows Print** dialog box, from which you can set up your printer and print the score.

Alternatively, you can choose **File > Print** and skip the print preview window.

Can't print if Staff view is floating

It is not possible to print the Staff view if the Staff view is float-enabled. If necessary, temporarily disable floating if you need to print from the Staff view.

Export to MusicXML (Producer only)

SONAR lets you export notation to the MusicXML format, which can be used in other notation programs such as Finale and Sibelius. MusicXML serves as a functional standard for saving notation data in a better way than MIDI.

> **Note:** *SONAR can export MusicXML files, but can not import MusicXML files. To import scores into SONAR, first export them to a standard MIDI file, then import the MIDI file into SONAR.*

SONAR's Staff view includes a layer of visual quantization to allow complex MIDI data to be displayed as standard notation. This includes the **Display Resolution**, **Fill Durations** and **Trim Durations** settings. When exporting to MusicXML, the notation is exported exactly the way it is displayed in the Staff View after visual quantization is applied, which could differ from what is stored as MIDI data.

To export to a MusicXML file

1. Select the track you want to export.
2. Open the Staff view.
3. Click the Staff view **Print** menu and choose **Export to MusicXML**.

   The **Save As** dialog box appears.
4. Enter a file name in the **File name** field.
5. Click **OK**.

For more information about MusicXML, visit www.recordare.com/musicxml.

See:

"Notation and lyrics" on page 1071

"The Staff view" on page 1072

The Meter/Key view

The Meter/Key view lets you enter meter and key changes at measure boundaries. Meter and key changes affect all tracks.

See:

What Is meter?

The meter—also known as the time signature—describes how to divide time into rhythmic pulses. When you set the meter, you are specifying the number of beats per measure and the note value of each beat. Common meters include:

- 2/4 (two beats per measure, quarter note gets a beat)
- 4/4 (four beats per measure, quarter note gets a beat)
- 3/4 (three beats per measure, quarter note gets a beat)
- 6/8 (six beats per measure, eighth note gets a beat)

The top number of a meter is the number of beats per measure, and can be from 1 through 99. The bottom number of a meter is the value of each beat; you can pick from a list of values ranging from a whole note to a thirty-second note.

The meter affects several things in SONAR:

- Metronome accents
- How measure, beat, and tick (MBT) times are calculated and displayed
- How the Staff view is drawn

While SONAR in general allows meters to have up to 99 beats per measure, the Staff view cannot display such measures. You will receive an error message if you try to use the Staff view with meters exceeding its limit.

Internally, SONAR stores times as "raw" ticks or clock pulses. The **timebase**—the number of pulses per quarter note (PPQ)—is adjustable, from 48 to 960 PPQ. If you are using a timebase of 120 PPQ and the project file is in 4/4 time, then a whole measure equals 480 ticks. See "Setting the MIDI timing resolution" on page 259 for more information about the timebase.

Usually the easiest approach to working with meter changes is to set all of them up before doing any recording. Use the Meter/Key view or the **Project > Insert Meter/Key Change** command to add meter changes at the desired measures.

What Is key?

In musical terms, a key is a system of related notes based on the tonic (the base pitch) of a major or minor scale. A key signature is a group of sharps or flats placed immediately to the right of the clef sign. The key signature tells a performer that certain notes are to be systematically raised or lowered.

There are fifteen different key signatures—seven with sharps, seven with flats, and one without either. The fifteen key signatures correspond to fifteen different major scales, and to fifteen different minor scales (for example, the key signature for C major is the same as for A minor).

The key signature affects several things in SONAR:

- The key signature controls how SONAR displays notes. In the Event List view and some dialog boxes, SONAR converts the MIDI pitch number to labels like Db (D-flat in the key of C).
- The Staff view uses the key signature to display notation correctly.
- How the notes are transposed when the **Diatonic** option is enabled.

The key signature affects only how SONAR displays pitches for you. Changing the key signature does not affect the MIDI key number (pitch) stored with each note. To actually transpose pitches, use the Transpose command or edit notes individually by using the Piano Roll, Event List, or Staff views.

Note: *Groove clips are not affected by changes to your project's key. Groove clips follow the default project pitch value, specified in Project > Set Default Groove Clip Pitch, and Pitch markers in the Time Ruler. For more information, see "Using pitch markers in the Track view" on page 665.*

Frequently you use only one key signature for an entire project, but SONAR supports multiple key signatures and multiple meter changes in a project. The default key is C. You can change these defaults by creating your own default template file. For more information, see "Templates" on page 1064.

Opening the Meter/Key view

To open the Meter/Key view, choose **Views > Meter/Key**.

The Meter/Key view displays a list of meter/key changes in the project. There is always an entry for measure 1, because there must always be a meter and key signature for the project. The default meter is 4/4 and the default key is C. You can change these defaults by creating your own default template file. For more information, see "Templates" on page 1064.

Each meter/key change has the following properties:

Property	Meaning
At Measure	The measure where the meter/key change takes place.
Beats per Measure	The number of beats per measure, the upper number in the time signature.
Beat Value	The note length of a beat, the lower number in the time signature. 2 corresponds to a half note, 4 to a quarter note, 8 to an eighth note, etc.
Key Signature	The key signature.

Table 198.

Adding and editing meter/key changes

The Meter/Key view displays a list of all the meter/key changes in the project. You can add, delete, or edit meter/key changes by clicking the buttons at the top of the view. You can also insert meter/key changes into the project with the **Project > Insert Meter/Key Change** command.

To add a meter/key change

1. Open the Meter/Key view.

2. Click **Add +**, or choose **Project > Insert Meter/Key**, to open the **Meter/Key Signature** dialog box.

Figure 336. *The **Meter/Key Signature** dialog*
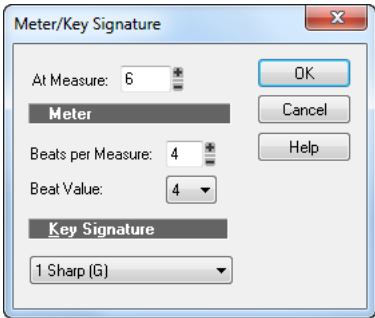
3. Enter information about the new meter/key change.

4. Click **OK**.

SONAR inserts the meter/key change into the project. The meter/key change will appear in the Staff view at the appropriate measure.

To delete a meter/key change

1. Select the meter/key change to be deleted from the list.

2. Select additional meter/key changes by using SHIFT-click and CTRL-click.

3. Click **Delete** – .

SONAR removes the meter/key change from the project. You cannot delete the first meter/key change from measure 1 of a project.

To move a meter/key change

1. Select the meter/key change to be moved.

2. Click **Add** + .

3. Edit the Measure parameter to the meter/key change's new measure.

4. Click **OK**.

5. Select the original meter/key change again.

6. Click **Delete** – .

SONAR removes the original meter/key change and inserts a copy of it at the new measure.

To edit a meter/key change

1. Select the meter/key change to be edited.

2. Click **Change** ▦ to open the **Meter/Key Signature** dialog box.

3. Edit the meter/key change properties.

4. Click **OK**.

SONAR changes the properties of the meter/key change.

Music notation for non-concert-key instruments

For historical reasons, certain musical instruments are traditionally notated in a transposed key rather than the actual key. For example, a normal (Bb) trumpet part is written in the key one whole step higher than the actual concert key, and an Eb alto sax part is written a major sixth higher. Musicians have traditionally learned to read and refer to the notes they play using the proper transposition interval for their instrument.

SONAR supports these non-concert instrumental keys through use of the Key+ control in the Track Inspector. Simply enter or record the notes into the instrument's track transposed as the musician would expect them, and then set the proper transposition interval in the Key+ control to make it play in the correct key. For example, a Bb trumpet track should have all its notes a whole note higher than concert pitch, and should have Key+ set to -2 to transpose it two chromatic steps back down. Remember, not all trumpets are Bb instruments!

To notate a Bb trumpet part

1. Record or enter the notes using the pitches that the musician who will be reading the part needs to see. For example, if the non-transposing instruments are playing in the key of C, a Bb trumpet player needs to see the notes a whole step higher—the key of D. The instrument itself sounds a whole step lower than concert pitch, so when a Bb trumpet plays in the key of D, it sounds in the key of C.

   Now that the pitches appear the way that the trumpet player needs to see them, the problem is that when you play your project, the MIDI notes in the trumpet track sound a whole step too high.

2. In the Track Inspector, force SONAR to play the trumpet track a whole step lower by entering **-2** (negative 2) in the **Key+** field and pressing ENTER.

Now the trumpet part in the Staff view appears in the key of D—SONAR automatically adds two sharps to the trumpet track's key signature—but the track sounds in the key of C because you entered **-2** in the **Key+** field (you may need to close the Staff view and reopen it to see the new key signature). The Staff view automatically transposes the key signature for each track according to the track's Key+ value. Multiple tracks appear and can be printed as an orchestral score, with the proper different key signatures for each track.

Note that this Key+ information is saved in SONAR .cwp files, but not in standard MIDI files. If you save a file as a MIDI file, the Key+ transposition will be applied to each note event, so that the file will sound the same, but the Key+ information will be lost. If you're reading in a MIDI file, you can easily set up the non-concert instrument tracks and then save the file as a normal project file. First set the Key+ offset to reflect the non-concert instrument's key signature. Then, use Transpose to compensate for the Key+ offset.

Working with lyrics

SONAR lets you create, edit, and display lyrics, the words and syllables associated with notes in a track. Lyrics can be the words to a song, the text of a vocal passage, a narration to be read along with the music, cues of some type, or text totally unrelated to the music. Each word or syllable in the lyrics must be associated with a note in a MIDI track. Each MIDI track can have its own lyrics.

Although lyrics can logically be associated with digital audio data, you cannot actually place lyrics in an audio track. If you want to create lyrics for an audio track, you must create an auxiliary MIDI track to hold the lyrics.

You can enter and edit lyrics in several ways:

- Using the Lyrics mode in the Staff view
- Using the Lyrics view
- Inserting lyric events in the Event List view

The Staff view is usually the preferred location for entering lyrics, since you can see the notes with which the lyrics are associated. The Lyrics view can also be used for entering or editing lyrics, but its main strength is that it can display lyrics in a larger, more readable format. You might use the Lyrics view to display song lyrics during recording and playback, so performers can see the words and sing

along. You can make the font size in the Lyrics view as large as desired, so that the lyrics can be read at a distance from the monitor. During playback, the current line in the lyrics is enclosed in a box and the current word is highlighted.

Lyric events are similar to text events. Like any other event, they occur at a particular time. They contain text, just like general-purpose text events, but generally they contain only a single word (or syllable of a word). As events, Lyrics can be edited in the Event List view (see "The Event List view" on page 742).

See:

"Adding and editing lyrics in the Staff view" on page 1113

"Opening the Lyrics view" on page 1114

"Adding and editing lyrics in the Lyrics view" on page 1114

Adding and editing lyrics in the Staff view

The Staff view displays lyrics below their associated track. If the track is split into treble/bass staves, lyrics are aligned with notes in both staves, but are displayed below the treble staff.

When a lyric word or syllable spans multiple notes, a trailing underline or series of regularly spaced hyphens is automatically drawn, following conventional lyric notation practice.

To add lyrics to a track

1. Select the Draw Freehand tool in the Control Bar.

2. Click the **Lyrics** button 🎹 Lyrics in the Staff view.

3. Position the pointer below the staff, under the first note to be assigned lyrics. (The pointer changes to a pencil when you are in a legal position.)

4. Click to open an insertion box.

5. Follow the instructions in the table:

To do this	Do this
Enter a word or syllable	Type it in the insertion box
End the word or syllable and move to the next note	Type a space, tab, or hyphen
Skip over a note	Type a space or hyphen
Move back to the previous note	Press SHIFT+TAB

Table 199.

6. Press Enter when you are done.

SONAR displays the new lyrics below the staff.

To edit lyrics

1. Select the Draw Freehand tool in the Control Bar.
2. Click the word you want to change.
3. Edit the word as desired.
4. Press ENTER.

SONAR replaces the old word with the new one.

Opening the Lyrics view

There are three ways to open the Lyrics view:

- In the Track view, select the track whose lyrics you want to see, then choose **Views > Lyrics**
- Right-click a clip in the Clips pane and choose **Views > Lyrics** from the menu
- Press ALT+SHIFT+1

To select the track whose lyrics you want to see, click the Lyrics view **Tracks** menu and choose **Pick Track**s, then select the desired track and click **OK**.

To select a font for the display, click the Lyrics view **Font** menu and choose one of the following commands:

- **Font A.** Selects the first font. By default, this is a small font useful for editing.
- **Font B.** Selects the second font. By default, this is a larger font useful for reading lyrics at a distance.
- **Fonts.** Opens a dialog box where you can select a font. The selected font is then assigned as Font A or B (depending on which is currently selected).

Adding and editing lyrics in the Lyrics view

Lyrics appear in the Lyrics view as a stream of syllables, each one associated with a note in the track. In this context, a **syllable** is any continuous string of characters, without a hyphen. For example, "love," "desire," and "infatuation" are all syllables; each one would be associated with a single note. If you want to break a word into multiple syllables, you must hyphenate the word. For example, "de-sire" would map onto two notes, since it is now two syllables long.

When you enter the lyrics, you can mark the syllables the way you want, or you can simply type the text in normally and use automatic hyphenation to break the text into syllables. This means that you can add lyrics to a project by copying and pasting them from another application (such as a word processor), and then hyphenate them automatically.

To extend a single syllable over more than one note, you can use extra hyphens, separated by spaces. For example, in "Oh-say can you see…", the "Oh" is extended over two notes. If a track contains no lyrics yet, the display will show only a series of hyphens (one for each note in the track).

If you enter more syllables than there are notes in the track, SONAR assigns the extra lyrics times at quarter note intervals.

To enter lyrics in the Lyrics view

1. Click in the upper left corner of the view to position the cursor at the start of the text.

2. Follow the instructions in the table:

To do this	Do this
Enter a word or syllable	Type it
End a word or syllable and move to the next note	Type a space or hyphen
Break a line for easier viewing	Press ENTER

Table 200.

To edit lyrics in the Lyrics view

Editing in the Lyrics view follows standard Windows conventions for cursor movement, selection, cut (CTRL+X), copy (CTRL+C), paste (CTRL+V), and delete (DELETE). When you pause, SONAR will update all Lyric events in the track.

To hyphenate the lyrics

1. If you want, select a portion of the lyric text. If you do not select any text, all the lyrics will be hyphenated.

2. Click the Lyrics view **Font** menu and choose **Hyphenate**.

SONAR hyphenates the lyrics.

Instrument definitions

Instrument definitions are a powerful feature of SONAR that makes it easier for you to find the banks, patches, and controllers of your MIDI instruments. An instrument definition is a file that contains the names of the banks, patches, note names, bank select method, and controllers of an instrument. Instrument definitions for many popular MIDI instruments are included with SONAR or are available on the Cakewalk web site (www.cakewalk.com). If an instrument definition is not available for your instrument, and you are familiar with MIDI and how it works, you can use SONAR to create your own instrument definition.

Most MIDI instruments available today are General MIDI (GM) compatible, which means that they come with the standard set of sounds or patches defined by the GM standard. SONAR initially assumes that your MIDI instruments are GM compatible. The names of patches and controllers that you initially see displayed throughout SONAR are drawn from the GM specification.

At the same time, many MIDI instruments provide additional sounds and controllers beyond those required by the GM standard. In addition, some older MIDI instruments are not GM compatible. If you are using one of these instruments with SONAR, you can use instrument definitions to make sure that the names of banks, patches, and controllers that you see in SONAR are the same ones you see on the display screens of your MIDI keyboards and modules.

See:

Assigning instruments

SONAR lets you assign a MIDI instrument definition to each available MIDI output and channel. The assignments you make determine the MIDI bank names, patch names, note names, and controller names that you see during your SONAR session.

Suppose that you have a Roland GS-compatible synthesizer attached to MIDI output 1. By assigning all 16 channels of MIDI output 1 to the Roland GS instrument definition, you ensure that the bank, patch, note, and controller name lists you see displayed in SONAR are the same ones that you see on the display screen of your synthesizer.

Often, you want to assign a different instrument to channel 10, which is usually used for percussion. For example, you might assign the Roland GS instrument definition to channels 1 through 9 and 11 through 16, but you would most likely want to assign the Roland GS Drumsets instrument definition to channel 10. That way, any SONAR tracks you assign to channel 10 on that output use the names of drum sets for patch names, and drum notation in the Piano Roll view. If you have several MIDI outputs, with a different MIDI module attached to each one, you would normally assign a different instrument definition to each MIDI output.

For convenience, you can assign a block of channels to one instrument and then change the assignment of one or more of those channels without changing the others. For example, you can highlight all 16 channels of the first MIDI output and assign them to the Roland GS instrument definition. Then, you can highlight channel 10 of that same MIDI output and assign it to the Roland GS Drumset instrument definition. Channels 1 through 9 and 11 through 16 on the first MIDI output will stay assigned to Roland GS.

If you only have one MIDI output, but have several MIDI modules attached to it, you can assign a few channels to each module. For example, you might have a Roland synth receiving on MIDI channels 1 through 9, a Roland drum machine receiving on channel 10, and a basic GM-compatible synth receiving on channels 11 through 16. In this case, you'd use three different instrument definitions for your one and only MIDI output.

To assign instrument definitions to MIDI outputs and channels

1. Go to **Edit > Preferences > MIDI - Instruments**.

Figure 337. *The Instruments section*
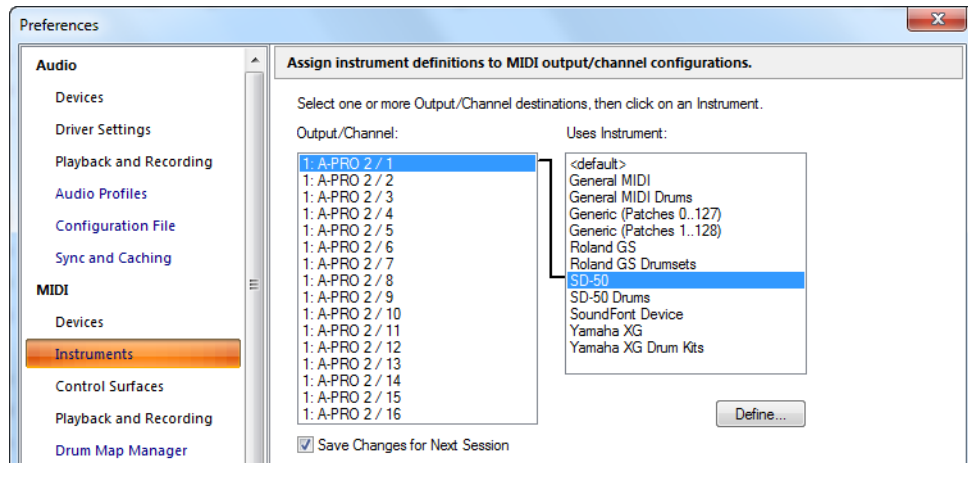
2. Select one or more MIDI outputs and channels from the **Output/Channel** list (use SHIFT-click and CTRL-click to select multiple outputs and channels). You can also drag through a bunch of channels to select them. For example, if you want to assign the first 16 MIDI channels on output 1 to a certain MIDI module, drag through the first 16 items in the **Output/Channel** list to select them.

3. Choose the instrument definition to which the selected outputs and channels should be assigned from the Uses Instrument list. A black line connects the two lists. If your MIDI module's name doesn't appear in the list and you don't want to use General MIDI bank and patch names for it, see "Importing instrument definitions" on page 1121.

4. To save these changes permanently, check the **Save Changes for Next Session** box.

5. Click **OK** to apply your changes.

From now on, the bank, patch, controller, and note names from the assigned instrument definition are used throughout SONAR on any track that uses one of the output/channel combinations you selected in the **Output/Channel** list.

To clear instrument assignments

1. Go to **Edit > Preferences > MIDI - Instruments**.

2. Select the MIDI outputs and channels whose assignments you want to remove from the **Output/Channel** list.

3. Choose **<default>** from the **Uses Instrument** list. A black line connects the two lists.

4. Click **OK** when you are done.

You don't really clear instrument assignments—you reassign them to use the default (General MIDI) instrument definition. After you reassign the output/channel combinations, the default (GM) bank, patch, controller, and note names are used throughout SONAR on any track that uses one of the output/channel combinations you reassigned in the **Output/Channel** list.

See also:

Importing instrument definitions

When you install SONAR, a few common instrument definitions are already set up for you and ready to use. SONAR also includes several hundred additional instrument definitions that you can import.

These instrument definitions are stored in text files in your SONAR folder, organized largely by manufacturer. For example, all the instrument definitions for Roland gear are stored in the `Roland.ins` file; all the instrument definitions for Yamaha gear are stored in the `Yamaha.ins` file. The `Misc.ins` file contains miscellaneous instrument definitions.

If SONAR does not include an instrument definition for your MIDI instrument, you can find additional and updated instrument definitions on the **Downloads** section of the Cakewalk Web site (www.cakewalk.com). Simply download the files to your SONAR folder, unzip if necessary, and import the instrument definitions as described in "To import instrument definitions" on page 1121.

When you import an instrument definition, it is added to the master instrument definition file `Master.ins`. The contents of this file determines the list of instruments that appear in the **Assign Instruments** dialog box.

To import instrument definitions

1. Go to **Edit > Preferences > MIDI - Instruments**.
2. Click **Define** to display the **Define Instruments and Names** dialog box.
3. Click **Import** to display the **Import Instrument Definitions** dialog box.
4. Choose the file that contains instrument definitions for your manufacturer, and click **Open**. SONAR displays a list of all the instrument definitions in the file.
5. Choose one or more instruments from the list, and click **OK**.
6. Click **Close** to close the **Define Instruments and Names** dialog box.

The instrument definitions you imported should now appear in the **Uses Instrument** list in the **Assign Instruments** dialog box.

See also:

Creating instrument definitions

SONAR lets you create and edit instrument definitions. To create an instrument definition, you must answer these types of questions:

- What are the names of the patches in each bank?
- Which note names should be used for each patch?
- What are the names of the MIDI Controllers for this instrument?
- Which RPN and NRPNs are available on the instrument?
- Which Bank Select method does the instrument use?

To collect this information, you need the MIDI documentation for your instrument.

Here's a general outline of the steps you must follow to create an instrument definition:

- Create a new instrument in the **Instrument** tree.
- Create any new name lists in the **Names** tree that are required for the instrument.
- Drag name lists and possibly a bank select method to the new instrument from the **Names** tree.
- Close the **Define Instruments and Names** dialog box.

For detailed instructions, see

You define instruments in the **Define Instruments and Names** dialog box, shown in the following figure.

Figure 338. *The Define Instruments and Names dialog*

A   B
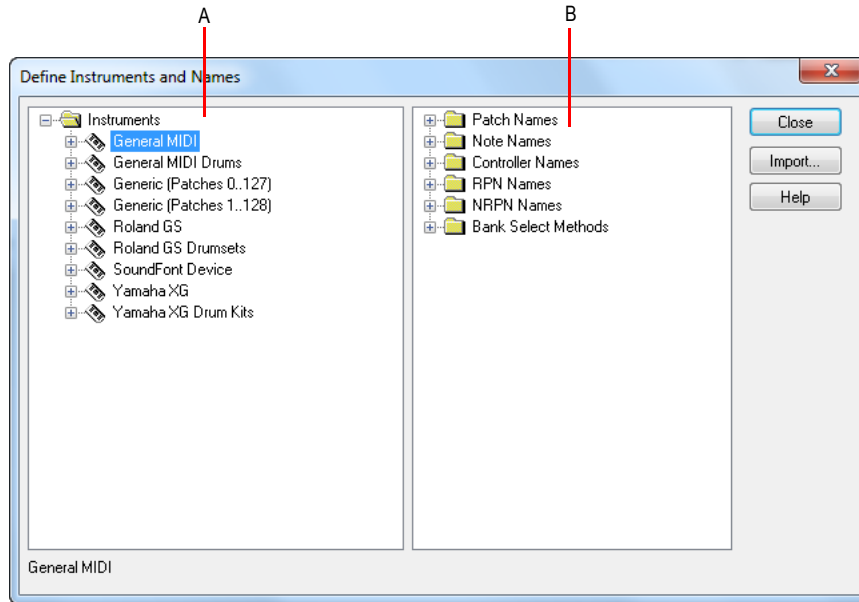
A. The Instruments tree B. The Names tree

The **Define Instruments and Names** dialog box contains two trees:

- The **Instruments** tree in the left half of the dialog box lists all defined instruments and their characteristics
- The **Names** tree in the right half of the dialog box shows all the resources you use to define an instrument

You expand or collapse the folders and lists in each tree by clicking on the **+** or **-** key shown to the left of each item. You can also right-click on an item and choose **Expand** or **Collapse** from the menu, or double-click on an item to expand or collapse it.

To define an instrument, you drag resources from the **Names** tree to the name of an instrument on the **Instruments** tree. Each resource is color-coded—you can only drag a Names list to an **Instrument** tree branch of the same color. For example, you can only drag a list from the **Patch Names** folder in the **Names** tree to a **Patch Names for Banks** folder in the **Instruments** tree.

There are six components to an instrument definition:

- Method for bank selection
- Patch names, such as Piano and Bass
- Note names, which are most frequently used to name drum notes, such as kick or snare
- Controller names, like volume and pan
- Names for Registered Parameter Numbers (RPNs)

Creating instrument definitions

• Names for Non-Registered Parameter Numbers (NRPNs)

The instrument definitions organize all names (patches, notes, controllers, RPNs, and NRPNs) into lists. You may be able to define a new instrument using existing name lists. For example, two models of synthesizers made by a particular manufacturer may have identical patch name lists but use different NRPNs. In this case, you can use the same patch name lists for both instruments, but you would need to use a different NRPN list (or perhaps create a new NRPN list) for the second synth.

If you want your changes to be remembered the next time you run SONAR, make sure the **Save Changes For Next Session** option in the **Assign Instruments** dialog box is checked before clicking **OK**. Otherwise, to make only temporary changes, be sure to remove the check from that option.

To create a new instrument

1. In the **Define Instruments and Names** dialog box, right-click the word **Instruments** at the top of the **Instrument** tree, and choose **Add Instrument** from the pop-up menu.
2. Type a name for the new instrument and press ENTER.

The new instrument is provided with default settings for all of its characteristics.

See also:

To rename an instrument

1. In the **Define Instruments and Names** dialog box, right-click an Instrument name in the **Instrument** tree and choose **Edit** from the pop-up menu.
2. Type the new name and press ENTER.

To delete an instrument

1. In the **Define Instruments and Names** dialog box, right-click an Instrument name in the **Instrument** tree and choose **Delete** from the menu.
2. Confirm that you want to delete the instrument.

To save an instrument definition

1. Click **Close** to close the **Define Instruments and Names** dialog box.
2. Click **OK**.

SONAR saves the instrument definition in the `Master.ins` file.

To export an instrument definition

1. In the **Define Instruments and Names** dialog box, right-click an Instrument name in the **Instrument** tree and choose **Export** from the menu to display the **Export Instrument Definition** dialog box.

2. If you don't want to save the file in the folder that's listed in the **Save In** field, navigate to the folder in which you do want to save the file.

3. Enter a file name and click **Save**.

SONAR saves the file, with the filename extension .ins.

> **Note:** *Exporting instrument definitions allows you to share them with other SONAR users.*

To reload instrument definitions

Users of MIDI librarian programs need the ability to update SONAR's instrument definitions in real-time, without having to close and restart SONAR.

When the **Reset (Panic)** button is pressed, SONAR closes and reopens the instrument manager to reload settings from Master.ins and Instrmap.ini.

Any changes made to patch names or other instrument definitions are reflected immediately.

See also:

Creating and editing patch name and other lists

You can create and edit the various lists in the **Names** tree that make up each instrument definition. Patch name, note name, and controller name lists can contain up to 128 entries, numbered 0 through 127. RPN and NRPN name lists can contain up to 16,384 entries, numbered 0 through 16,383.

To create and edit name lists

•   To create, edit, or work with name lists, go to the **Names** tree of the **Define Instruments and**

Names dialog box, and follow the directions in the following table.

To do this	Do this
Create a new name list	Duplicate an existing Patch Names or other list by doing one of the following: expand the folder that contains the name list, highlight the name list and press the Ins (Insert) key; highlight the folder and press SHIFT+INSERT; or right-click any folder or name list and choose **Add Names List** from the menu. Then type a name for the list and press ENTER.
Delete a name list	Highlight the names list and press the DELETE key; or right-click on the name list and choose **Delete** from the menu. You will see a warning if the list is used by any instrument definition. If you delete the list anyway, the instrument definition will change automatically.
Add the next item in a name list	Highlight a name and press the Ins key, or right-click on a name and choose **Add Name** from the menu. Then enter the name.
Add a name anywhere in a list	Highlight the name of a list and press SHIFT+INSERT, or right-click on the name of a list and choose **Add Name** from the menu. Then enter the name.
Delete names from a list	Highlight the Names List or Name, and press DELETE. You can also right-click, then choose **Delete**.
Edit a name in a list	Highlight the name or name list and press F2, or right-click and choose **Edit** from the menu. Then enter the new name.

Table 201.

See also:

Instrument definitions
Creating instrument definitions

Copying name lists

You can easily create new lists that are similar to other lists. For example, suppose you want to create a new patch name list called **NewList** that is almost identical to the General MIDI patch list, but with one or two small changes. Here's how you proceed:

• Create a new patch name list in the **Patch Names** folder of the **Names** tree called, for example, **NewList**.

• Drag the new list onto the **General MIDI** list in the **Names** tree. You will be asked if you want to base **NewList** on the **General MIDI** list.

• Click **OK**. **NewList** will now be listed under the **General MIDI** branch. Any patch names that exist in the **General MIDI** list apply to **NewList**, too.

• Add new patch names to **NewList**. These names will override those in the list on which **NewList** is based.

If you change your mind about **NewList** and want to make it a stand-alone, separate list, simply drag it to the **Patch Names** root folder.

See also:

Assigning the Bank Select method

Your synthesizer uses one of four bank select methods to switch back and forth between banks of sounds. To find the method used for your instrument, check the instrument's *User's Guide* or the manufacturer's web site. The four methods are as follows:

Method	Used for
Normal	Instruments that respond to Controller 0 or Controller 32 bank select messages
Controller 0 only	Instruments that only respond to Controller 0 bank select messages
Controller 32 only	Instruments that only respond to Controller 32 bank select messages
Patch 100...127	Instruments that let you change banks by sending patch changes between 100 and 127

Table 202.

The bank select method you choose affects the bank numbers that you assign to each patch list, as described in the following section. Here's how you compute the bank numbers:

Bank select method	To compute the bank number
Normal	Take the value of Controller 0, multiply it by 128, and add the value of Controller 32 to derive the bank number. **Note**: A synthesizer manufacturer may refer to Controller 0 as the MSB (Most Significant Byte) and to Controller 32 as the LSB (Least Significant Byte).
Controller 0 only	The value of Controller 0 is the bank number.
Controller 32 only	The value of Controller 32 is the bank number.
Patch 100...127	Take the patch number and subtract 100 to derive the bank number.

Table 203.

Here is an example of the Normal bank select method. According to the documentation for the Roland JV-1080 synthesizer, the PR-A Bank has a Controller 0 value of 81 and a Controller 32 value of 0. You compute the bank number that you enter in the instrument definition as follows: (81 x 128) + 0 = 10,368.

To change the Bank Select method

1. Highlight and expand the instrument in the **Instrument** tree.
2. Expand the **Bank Select Method** branch in the **Names** tree.
3. Drag the desired bank select method from the **Names** tree to the **Instrument** tree.

See also:

Assigning patch names

A MIDI instrument can have up to 16,384 banks of 128 patches each. Patches can have names, like "Piano" for patch number 0, "Bass" for patch number 1, and so on. Normally, each bank contains a different set of patches, so each bank needs a separate patch name list. Most synthesizers start with a patch number of 0.

You can assign a patch name list to each bank. You can also assign a default patch name list to the instrument, which is used for all banks for which you haven't assigned a specific list. The previous section describes how to compute the bank numbers to which each patch name list is assigned.

Each bank can also be assigned a special Drum flag, which indicates that all patches in that bank contain drum sounds. If you set this flag, the Piano Roll view will display drum notes as diamonds, and the Staff view will use percussion notation.

To see the assignment of patch name lists to banks

1. Expand the instrument definition by clicking the + sign next to the instrument name.

2. Expand the Patch Names for Banks folder by clicking the + sign. The list expands to show the bank numbers and the patch name list that is assigned to each bank.
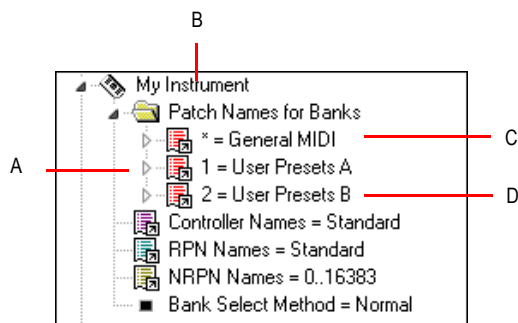
A. There are three defined banks *B. Instrument name* *C. The * indicates that this patch list is the default*
D. This is the name of a patch name list

To add a bank or change the patch names for a bank

1. Drag a patch name list from the **Names** tree to the **Patch Names for Banks** folder of the instrument you're editing in the **Instrument** tree.

2. Enter a bank number, or enter **-1** to indicate that this list of patch names should be used as the default.

SONAR displays the updated banks and patch name lists. If necessary, SONAR adds a new bank to the instrument definition.

To remove a bank or patch name list

1. In the **Instrument** tree in the **Patch Names for Banks** folder of the instrument you're editing, highlight the bank and patch names list.

2. Press the DELETE key, or right-click on the bank name and choose **Delete** from the pop-up menu.

To set or clear the Drum flag

• Right-click on the bank in the **Instrument** tree, and choose **Drums** from the pop-up menu.

See also:

Assigning note names

Each patch may have a list of up to 128 names for notes. Usually, note names are labels for percussion instruments. For example, the pitch C3 may really be "Kick Drum," and D3 may be "Snare." Because a drum machine may provide different drum kits for each patch, SONAR lets you specify a different list of note names for each patch. The Piano Roll and Event List views show you these note names.

You can assign a note name list to each patch. You can also assign a default note name list to the instrument, which is used for all patches for which you haven't assigned a specific note name list.

Each patch can also be assigned a special Drum flag, which indicates that this patch contains drum sounds. If you set this flag, the Piano Roll view will display drum notes as diamonds, and the Staff view will use percussion notation.

There are several standard note name lists provided with SONAR:

Note name list	Contents
0...127	The numbers 0 through 127
Diatonic	The default MIDI note names (like C4, E5, and so on)
General MIDI Drums	The default instrument names for the General MIDI drum patch

Table 204.

To see the assignment of note name lists to patches

1. Expand the instrument definition by clicking the + sign next to the instrument name.

2. Expand the **Patch Names for Banks** folder by clicking the + sign.

3. Continue expanding the tree by clicking the + sign, until the tree is fully expanded.
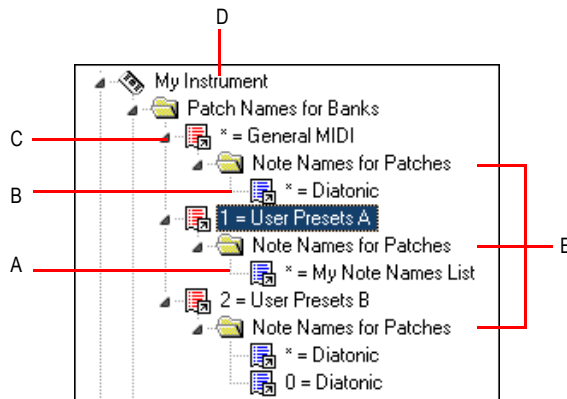
*A. This is the name of a note name list B. The * indicates that this note name list is the default C. Bank
D. Instrument name E. Note name lists are defined for three different patches*

To change the note names for a patch

1. Drag a note name list from the **Names** tree onto the **Note Names for Patches** folder of the instrument and bank you're editing in the **Instruments** tree.

2. Enter the patch number that should use these note names, or enter **-1** to indicate that this list of note names should be used as the default.

SONAR displays the updated patch and note name lists. If necessary, SONAR adds a new patch to the instrument definition.

To remove a note name list

1. In the **Instrument** tree in the **Note Names for Patches** folder of the instrument you're editing, highlight the name of the note names list (for example, "diatonic").

2. Press the DELETE key, or right-click on the note name list and choose **Delete** from the pop-up menu.

To set or clear the Drum flag

• Right-click on the patch in the **Instrument** tree, and choose **Drums** from the menu.

See also:

Assigning controller, RPN, and NRPN names

SONAR lets each instrument have its own lists of controller names, RPN names, and NRPN names. There is always exactly one list of each type per instrument.

To see the controller, RPN, and NRPN name lists

• Expand the instrument definition by clicking the PLUS (+) sign next to the instrument name.
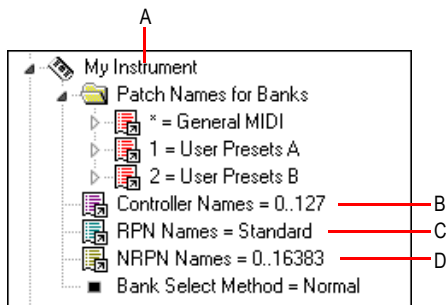
A. Instrument name B. Controller name list C. RPN name list D. NRPN name list

To change the controller, RPN, or NRPN name list

1. In the **Names** tree, expand the branch containing the Controller name lists, RPN name lists, or NRPN name lists.

2. Drag the desired name list from the Names tree onto the corresponding branch of the **Instrument** tree.

SONAR displays the updated Controller, RPN, or NRPN name lists.

See also:

SONAR flags in instrument definitions

SONAR has several flags that you can use in instrument definition files for use with specific instrument definitions.

UsesNotesAsControllers=n

Some MIDI devices, certain mixers for example, use MIDI Note events instead of Continuous Controller events for automation. It is often desirable to treat the Note events as Controller events in order for them to obey the "Zero Controllers When Play Stops" and "Patch/Controller Searchback Before Play Starts" settings.

You can enter this variable in any instrument definition by using a text editor, such as Windows Notepad. The variable should be entered directly below an instrument definition. For example:

[Mackie OTTO-1604]

UsesNotesAsControllers=1

Control=Mackie OTTO-1604

Patch[*]=Mackie OTTO-1604

Key[*,*]=Mackie OTTO-1604

NoControllerReset=n

Any port/channel using an instrument definition that has a NoControllerReset flag set to 1 does not receive a "zero controller" message upon stop. You can enter this variable in any instrument definition by using a text editor, such as Windows Notepad. The variable should be entered directly below an instrument definition. For example:

[Yamaha Promix 01 Control Chan]

NoControllerReset=1

Control=Yamaha Promix 01 Control Chan

Patch[*]=Yamaha Pro Mix 01

This parameter should be used when it is undesirable to zero/reset controllers when playback stop, such as when using an external effects processor that uses MIDI controllers for real-time parameter control, or when using a digital mixer as a MIDI control surface (and not using the generic control surface plug-in).

Instrument definition tutorial

The following tutorial takes you through the process of setting up an instrument definition for a Roland keyboard so that the bank and patch names, including any self-created sounds, read the same in SONAR as they do on the display screen of your keyboard instrument.

Why use instrument definitions?

The main reason to import or create an instrument definition is so you can use patch names that are specific to the MIDI module you're using, instead of using generic General MIDI patch names. It's much easier to find a particular sound on a MIDI module when the actual names of the patches in the current bank of sounds pop up on a list, instead of just the numbers 0 to 127, or General MIDI names like Trumpet. Of course, if you're only using General MIDI modules, General MIDI patch names might be all you need. You can also rename each MIDI output with the name of the MIDI module it's connected to. For example, it might be more meaningful to name a MIDI output Roland Sound Canvas instead of MOTU MIDI Express 5. That way, you won't have to remember that you connected the Sound Canvas to the MOTU MIDI Express output number 5—the name **Sound Canvas** shows up as an option in the **Output** field of each MIDI track in SONAR's Track view. Also if you have an effects processor or module that's hard to get to in your studio, you may find it convenient to control it from SONAR.

What can they do and not do?

Instrument definitions don't increase the number of sounds or the capabilities of your modules, they just make it easier to find and remember the sounds and/or MIDI controllers you want to use, if they're not all generic General MIDI items. After you define an instrument, SONAR displays the names that you choose for the sounds in each of that instrument's banks, rather than displaying the same 128 General MIDI names over and over for each bank of sounds.

Where do instrument definitions come from?

The patch names and other characteristics of each particular MIDI module are supplied by the manufacturer, and are contained in an instrument definition file, which is a text file written in a format SONAR can read. Many of these files come with SONAR, and many more are available at Cakewalk's Web site, and also at www.lilchips.com. Instrument definition files have the extension .ins and can contain a definition for only one instrument, or definitions for several instruments. For example, the file `Roland.ins` contains definitions for many Roland modules. The file `Misc.ins` contains miscellaneous definitions that might include your instrument if you don't see a specific file for it. You can find these files in your SONAR folder. The file `Master.ins` contains all the

instrument definitions currently loaded into SONAR, and determines the list of instruments that appears in the **Assign Instruments** dialog box.

Start of tutorial

Let's say you have a Roland XP-10 and you want SONAR to display all of its patch names from all of its banks, including any self-created sounds you add to it.

Let's start by importing the names of the built-in banks and patches that the XP-10 has.

To import a Roland instrument definition

1. Go to **Edit > Preferences > MIDI - Instruments**.

2. Click **Define** to display the **Define Instruments and Names** dialog box.

3. Click **Import** to display the **Import Instrument Definitions** dialog box.

4. Choose the file that contains instrument definitions for your manufacturer, which in this case is the `Roland.ins` file, and click **Open**. SONAR displays a list of all the instrument definitions in the file.

5. Scroll down the list, select **Roland XP-10**, and click **OK**.

6. Click **Close** to close the **Define Instruments and Names** dialog box.

The instrument definition you imported should now appear in the **Uses Instrument** list in the **Assign Instruments** dialog box.

When you import an instrument definition, it is added to the master instrument definition file `Master.ins`. The contents of this file determines the list of instruments that appear in the **Assign Instruments** dialog box.

Now let's assign the XP-10 definition to some channels on a MIDI output:

To assign the Roland XP-10 bank and patch names to a MIDI output

1. Go to **Edit > Preferences > MIDI - Instruments**.

2. Let's assign all 16 MIDI channels on output 1 to use the XP-10 bank and patch names:
   - Drag through the first 16 items in the **Port/Channel** list to select them.
   - From the **Uses Instrument** list, click **Roland XP-10**. A black line connects the two lists.

3. To save these changes permanently, enable the **Save Changes for Next Session** option.

4. Click **OK** to apply your changes.

From now on, any track that uses any of channels 1 to 16 on output 1 displays bank and patch names from the XP-10.

To check this, assign a MIDI track in a project to Ch 1, assign the **Output** field to **1-Roland XP-10**, and then examine the drop-down lists in the **Bank** and **Patch** fields of the track. You should see bank and patch names that are specific to the Roland XP-10.

Let's check some of our bank and patch lists to see if they match up with what we see on the screen of the XP-10. On the XP-10, let's look at the **Vari 1** bank: if we look at tone (tone means the same as patch) **#005** in the **Vari 1** bank on the XP-10, we see that it is called **Detuned EP1**. If we change the bank on a MIDI track to **128-Roland XP-10 Var #01**, and look at the menu of patches in the **Pch** field, we see that there is no name listed for patch **#004** (Roland numbers its patches from 1 to 128; SONAR numbers patches from 0 to 127, so patch **#004** in SONAR is the same patch number as patch **#005** on the Roland). Let's look at some of the other Roland XP-10 patch name lists in the right window of the **Define Instruments and Names** dialog box to see if another one has the right patch names in it, and rename it **Var #01**.

To substitute and rename a patch list

1. Go to **Edit > Preferences > MIDI - Instruments** and click the **Define** button to open the **Define Instruments and Names** dialog box.

2. In the **Names Tree** window on the right, click the + sign on the **Patches** folder to expand the tree of patch name lists.

3. Scroll down to the **Roland XP-10 Var #08** list and click its + sign to expand it.

4. Compare the names on the **Var #08** list with the patch names of the **Vari 1** instruments on the Roland's display screen. You'll see they are the same.

5. Let's substitute the **Var #08** list for the **Var #01** list that SONAR currently lists as the XP-10's second bank, which has a bank change number of 128:

   1. In the **Instruments** tree in the left window, click the **Roland XP-10** entry to expand it, and then expand the **Patch Names for Banks** list that's directly under it.

   2. Expand the **Patch Names** tree in the right window and find the **Roland XP-10 Var #01** list (if there is one) and right-click it to display the pop-up menu.

   3. Choose **Edit** from the pop-up menu, and change the name from **Roland XP-10 Var #01** to **Roland XP-10 Var #011**.

   4. In the same tree find the **Roland XP-10 Var #08** list and change the name from **Roland XP-10 Var #08** to **Roland XP-10 Var #01**.

   5. Drag the newly renamed list from the **Patch Names** tree in the right window to the **Patch Names for Banks** tree in the left window.

   6. In the **Bank Number** dialog box, enter **128**, and click **OK**.

6. Click the **Close** button to close the **Define Instruments and Names** dialog box and click **OK** to close the **Assign Instruments and Names** dialog box.

Examine the new bank and patch data in a track that uses **1-Roland XP-10** as an output. In the **Bnk** field, select **128 Roland XP-10 Var #01**, then look at the drop-down list of patches in the **Pch** field. The list should now have the same names that the Roland keyboard uses for its **Vari 1** bank.

The Roland XP-10, like most MIDI keyboards, allows you to create your own sounds and store them in one or more User banks. You can create patch name lists in SONAR that are the same as the names you gave to each of your own sounds.

Checking bank numbers

You can calculate bank numbers by using the methods described in "Assigning the Bank Select method" on page 1127, but you might find it easier to use the following method:

To check the bank numbers

1. Set up a MIDI track to record from your MIDI keyboard or module.

2. Click the **Record** button to start recording, and change banks on your keyboard.

3. Stop recording, and open the Event List view.

4. The bank change you recorded is displayed in the Event List view in this way: in the **Data** column you'll see what kind of bank change method your keyboard uses (probably Normal), and in the column to the right of that data is the number of the bank you changed to.

When we changed the Roland XP-10 to the User 1 bank, we recorded a bank number of 8192.

To create a patch name list for your own sounds

1. You could create a new list by copying and renaming an existing list (right-click a list and choose **New Patch Name List** from the pop-up menu), but since the instrument definition we imported for the XP-10 includes a list called **Roland XP-10 User Tone 1**, let's just edit that one: in the **Names** Tree window on the right, right-click the **Roland XP-10 User Tone 1** list and choose **Add Patch Name** from the pop-up menu.

   A new patch field appears, with the text `0=0` inside.

2. Replace the first number in the **Patch** field with the number of a patch you stored in **User Bank 1** on the Roland.

3. Replace the second number in the **Patch** field with the name you made up for the patch you just gave a number to, and press ENTER.

4. Assign names to as many patch numbers as you want—the numbers between 0 and 127 that you don't assign any names to show up in the Track view **Patch** menu just as patch numbers with no other names.

5. When you finish assigning names, drag your edited patch list to the Roland XP-10 **Patch Names for Banks** tree in the left window.

6. Enter **8192** as the bank number, which we know is the correct bank number from the previous procedure.

7. Click the **Close** button to close the **Define Instruments and Names** dialog box and click **OK** to close the **Assign Instruments and Names** dialog box.

Now you can select the **8192-Roland XP-10 User Tone 1** bank in the **Bank** field of a MIDI track, and then examine the patch list in the **Patch** menu: you should see the patch list that you just created.

System exclusive data

SONAR's System Exclusive (Sysx) librarian provides you with 8192 banks in which to hold MIDI System Exclusive messages. A **bank** is a storage area plus some associated parameters such as a destination output and an optional description. Each bank can hold any number of messages; the amount of data it can hold is limited only by available memory. The banks are saved in the SONAR project file. Each bank can also be saved as a .syx file.

Figure 339. *The Sysx view*
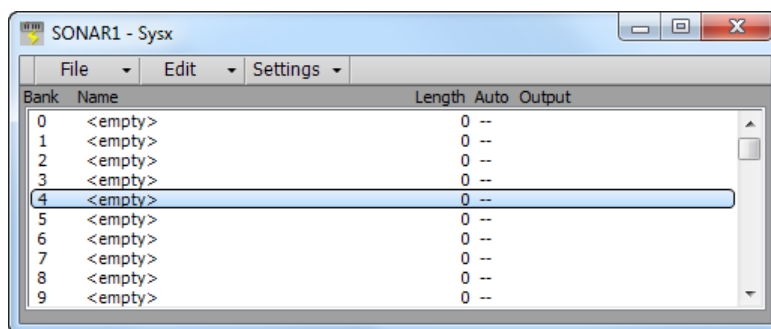
See:

What is System Exclusive?

System Exclusive data is MIDI's way of letting each synthesizer manufacturer transmit private data about its products. A System Exclusive message has a manufacturer ID; the rest of the message is completely proprietary and varies for each manufacturer, even for each of its products. SONAR does not understand what this data means; it simply can hold onto it for you. You can take snapshots of your equipment's configuration and store them in SONAR's System Exclusive banks for transmitting back to the equipment. You may want to do this simply to back up your equipment's patches and/or settings, much like backing up your computer's hard drive in case something goes wrong. Or you may configure your equipment differently for each project's requirements, which is why storing System Exclusive banks with each SONAR project file can be useful. Of course, for merely backing up your equipment, you can have a project containing only System Exclusive data and no notes.

See:

Sysx events

SONAR provides two distinct kinds of Sysx events: **Sysx Bank** and **Sysx Data**.

- **Sysx Bank:** You can use Sysx Bank events to transmit one of the project's 8192 banks of System Exclusive data. These banks can be recorded, viewed, and edited in the Sysx view, and each bank can contain one or more very large System Exclusive messages. Sysx Banks may also be marked Auto, so that they are sent when the file is loaded rather than during the start of playback.

- **Sysx Data:** You can also use Sysx Data events, which can each contain a single System Exclusive message up to 255 bytes long. You can view the message bytes in the Event List view.

Sysx Data events can be recorded in real time. See "Real-time recording of System Exclusive messages" on page 1149 for more information.

See:

Using the System Exclusive view

The System Exclusive view has a list box for a maximum of 256 Sysx banks, plus a toolbar of buttons. Most of the buttons affect whatever bank you have selected in the list. Certain buttons will be disabled if the selected bank is empty. To open the System Exclusive view, click the **Views** menu and choose **Sysx**, or press ALT+SHIFT+7.

SONAR stores Sysx messages as either Sysx banks or Sysx data. The main difference is in the number of bytes in the message, and also that Sysx data is only visible in the Event List view as SysxData events. A Sysx data message can have up to 255 bytes in it. You can send Sysx data to an instrument without interrupting playback (depending on the speed of your computer and the number of bytes in the message), however, sending a Sysx bank stops playback until all of the Sysx bank is transmitted. Sysx banks are usually sent to your instrument when you load your work file. SONAR asks you each time you load a project file if you want to send any existing Sysx banks the file contains that are marked for auto-sending. To mark or unmark the selected bank for auto-sending, click the **Settings** menu and choose **Auto Send on/off**.

For more information, see:

Sending Sysx banks at startup

You can tell SONAR to send certain Sysx banks to your instrument(s) each time you open the project file that the banks are in.

To send Sysx banks at startup

1. In the Sysx view, select a bank that you want to send to an instrument when you open the current project.

   SONAR highlights the bank you select.

2. Click the Sysx view **Settings** menu and choose **Auto Send on/off**.

   A checkmark appears next to the bank name in the **Auto** column to show that the bank is marked for auto-sending.

3. While the bank is still highlighted, click the **Settings** menu and choose **Output** to open the **Sysx Bank Output** dialog box.

4. Enter the number of the output you want to send this bank out through, and click **OK**.

   The output number you entered appears next to the selected bank in the **Output** column.

5. Repeat steps 1-4 for each bank you want to send, and save your project.

The next time you open a project, SONAR asks you if you want to send any Sysx banks in the project that are marked for auto-sending. If you click **OK**, SONAR sends the bank(s).

If you want SONAR to send auto-send banks every time you open a project without asking you, uncheck the check box in the **Auto-Send Sysx** dialog box that says **Ask this question every time**. If you decide later that you want to be asked, go to **Edit > Preferences > File - Advanced** and select the **Ask Before Sending System Exclusive (When Opening Projects)** check box.

Importing, creating, and dumping Sysx banks

There are several ways to get a sysx bank into SONAR:

- You can import (load) an external .syx file.
- You can edit an empty bank to create a new bank from scratch.
- You can dump a bank into SONAR from the synthesizer itself.

To import a Sysx bank into a project

1. In the Sysx view, select an empty bank to import the new bank into (unless you want to add to or overwrite an existing bank).

2. Click the Sysx view **File** menu and choose **Open**.

   The **Open** dialog box appears.

3. If necessary, navigate to the folder that contains your .syx files, select the one you want to import, and click **Open**.

The file appears as a new bank in the row you selected in the Sysx view. If you want SONAR to send this bank every time you open this project, make sure the bank is selected (highlighted), then click the Sysx view **Settings** menu and choose **Auto Send on/off**. A checkmark appears in the **Auto** column next to all auto-send-enabled banks.

To create a Sysx bank

1. In the Sysx view, select an empty bank, then click the **Edit** menu and choose **Edit Data** (or double-click the empty bank).

   The **Edit System Exclusive Bytes** dialog box appears.

2. Type your message(s). Each message you add to the window must begin with **F0** and end with **F7** (that's F zero and F seven). See your instrument's manual for the messages you can create.

3. When you finish typing the message(s), click **OK** to close the dialog box.

After you close the editing window, your new bank appears in the Sysx view. Use the buttons in the toolbar to name it, give it an output number, and mark it for auto-sending, if you want. Save your project when you're finished.

To dump a Sysx bank into SONAR

1. Go to **Edit > Preferences > MIDI - Playback and Recording** and make sure the **System Exclusive** check box is selected. If it isn't, SONAR won't receive System Exclusive messages.

2. In the Sysx view, select an empty bank to dump the new bank into (unless you want to add to or overwrite an existing bank).

3. Click the Sysx view **File** menu and choose **Receive**.

   The **Receive System Exclusive** dialog box appears, which contains a list of Dump Request Macros (DRMs). Each DRM has a name that describes the synthesizer the DRM controls and the type of data that the DRM asks the synthesizer to send.

4. Do one of the following:

   • If the name of your instrument and the kind of data you want to store in SONAR appears in the list, select your choice and click **OK**.

   • If your instrument and the type of data you want to record are not in the list, select You start dump on instrument, click **OK**, and press whatever button on your synthesizer that starts a Sysx bank dump. The **You start dump on instrument** option is not really a Dump Request Macro. It tells SONAR that you will initiate a dump (or multiple dumps) from the front panel of the synthesizer.

5. The DRM may prompt you for additional information, which you should supply.

   • **Patch number:** DRMs that are written to request an individual patch or configuration give you this prompt, so you can specify the one you want to have dumped.
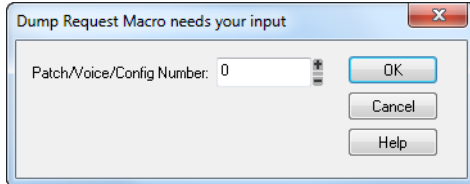
   • **Channel/unit number:** Most synthesizers have a Sysx channel or unit number. This covers the situation in which you own two of the exact same synthesizer, and want to do Sysx with each independently. Your synthesizer manual should describe the factory-set number.

Importing, creating, and dumping Sysx banks
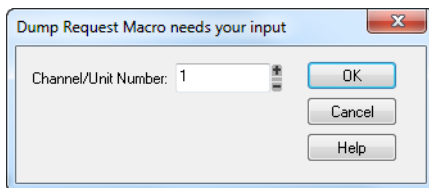
When your instrument starts sending the bank, the Sysx Receive window counts the bytes as SONAR receives them. If the count stays at zero for more than a couple of seconds, something is wrong. The synthesizer may not be hooked up to the MIDI interface in both directions, or you may have answered a DRM prompt incorrectly. Click **Cancel**. If any data were received, you will see the number of bytes in the bank list.

6. Once the bytes received count stops increasing, you can click **Done** to tell SONAR to stop receiving. However, if your synthesizer also displays a message when the instrument is finished sending a bank, wait until that message says the transmission is finished before you click **Done**.

The currently selected bank now holds the received Sysx data. At this point, you may want to give the bank a descriptive name by selecting it and clicking **Edit > Name**.

See also:

"Editing Sysx banks" on page 1146

"Sysx view menu" on page 1146

Note: *The SONAR librarian may not support synthesizers that require handshaking dump protocols. Some of these synthesizers have a backup protocol where they will do a normal dump if they don't get a handshake. Others do not.*

More about Dump Request Macros

DRMs are defined in your `DRM.ini` file in the `[Dump Request Macros]` section. You may add your own DRMs or modify the ones that we have provided. Use the Windows Notepad to edit the file. Comments in the `DRM.ini` file itself describe how to write DRMs. The specific Sysx messages can be found in the instrument manual, or they can be obtained by contacting the manufacturer. Remember that a DRM must start with **F0** and end with **F7**.

Sometimes you will find that the byte size is different when you use a DRM, as opposed to initiating the dump from the instrument. It is possible the instrument is dumping some additional information when you initiate the dump from the instrument, but you should be able to use either method without any problems.

When you use the Sysx view **File > Receive** command, you may pick from a list of Dump Request Macros. These are short System Exclusive messages sent to a synthesizer to make it dump (send back) System Exclusive data. DRMs are defined in your `Cakewalk.ini` file in the `[Dump Request Macros]` section. You may add your own DRMs or modify the ones that we have provided. Use the Windows Notepad to edit the file.

Please note that many of the DRMs included with SONAR have been donated by customers who are using the particular equipment. In some cases, we have not been able to test those DRMs because we do not have access to that equipment. We redistribute such DRMs on an as-is basis. Additional user-supplied DRMs may be available on the Cakewalk Web site (www.cakewalk.com).

Editing Sysx banks

Editing a Sysx bank is very similar to creating one.

To edit a Sysx bank

1. In the Sysx view, select the bank you want to edit, and click **Edit > Edit Data** (or double-click the selected bank).

    The **Edit System Exclusive Bytes** dialog box appears.

2. Edit your message(s). Each message in the window must begin with **F0** and end with **F7** (that's F zero and F seven). See your instrument's manual for the messages you can create.

3. When you finish editing the message(s), click **OK** to close the window.

Save your project when you're finished.

See also:

Sysx view menu

The Sysx view menu contains the following commands.

File menu

- **Open.** Load a .syx file into the selected Sysx bank.
- **Send.** Transmit the current bank's System Exclusive message. If nothing seems to happen, make sure you have correctly set the output. This command is disabled if the current bank is empty.
- **Send All.** Transmit all non-empty Sysx banks.
- **Receive.** Dump data from a synthesizer into the selected Sysx bank. If the bank contains data, SONAR asks you whether you want the new data to overwrite the existing data or be appended to it.

    When receiving dumps, remember to connect both the MIDI In and Out ports of the synthesizer to the MIDI interface. Also, make sure that your instruments are set up to receive and/or transmit Sysx. Synthesizers that you normally use only to play sounds—for example, sound modules that don't have keyboards—don't need to be hooked up in both directions except for receiving dumps, so it is easy to forget this. (If you will only be *sending* Sysx messages to the device, the normal one-direction hookup is sufficient.).

- **Save.** Save the selected Sysx bank as a .syx file. This is a good way to copy a Sysx bank between two SONAR project files. Save the bank into a file, load the other SONAR project file,

then load the bank again. This is also a good way to copy one bank to another in the *same* project file.

• **Clear.**   Delete the selected Sysx bank.

Edit menu

• **Edit Data.**   Although SONAR**'**s Sysx features are designed mainly to store System Exclusive data for you, you can edit the bytes of shorter messages in hex format (many of the more popular synthesizers have special patch-editing programs available that let you edit data using sliders and other tools rather than raw hex data).

When you select a bank and choose the **Edit Data** command, SONAR converts the binary data into a text representation and pops up the **Edit System Exclusive Bytes** dialog box, in which you can edit the text. If you make changes and click **OK** to keep them, SONAR tries to convert the text back into binary format. You'll get an error message if the text does not begin with an F0 and end with an F7, which are the System Exclusive begin and end bytes.

SONAR may not be able to convert the data to text format. The text representation requires three to four times more memory than the data itself, and the **Edit System Exclusive Bytes** dialog box can contain roughly as much text as *Notepad*.

• **Name.**   Enter a descriptive name for the selected Sysx bank. Names are saved only in .cwp and .cwb files.

Settings menu

• **Auto Send on/off.**   Automatically transmit the selected bank every time SONAR loads the project file. You might use this option for banks that contain System Exclusive messages that load a set of sounds for a synthesizer at or before the start of a project.

Before transmitting, SONAR asks your permission. This is a safety feature for loading a file you have received from someone else; if it happens to contain data for your synthesizer(s), you might lose your patches and configuration information. However, if you don't want to be asked, go to **Edit > Preferences > File - Advanced** and clear the **Ask Before Sending System Exclusive (When Opening Projects)** check box.

• **Output.**   Specify the MIDI output port to transmit the selected Sysx bank on.

To export a Sysx bank to another project

1. In the Sysx view, select the bank you want to export.
2. Click the Sysx view **File** menu and choose **Save** to open the **Save As** dialog box.
3. Navigate to the folder in which you want to store the file.
4. Enter a file name and click **OK**.

   SONAR saves the file in the location you specified, with the extension .syx.
5. Open the project to which you want to import the bank and select an empty bank in the Sysx view (unless you want to add the file to an existing bank).
6. Click the Sysx view **File** menu and choose **Open** to open the **Open** dialog box.
7. Navigate to the desired folder, select the .syx file you want to import, and click **Open**.

SONAR loads the selected bank into the current project.

System exclusive data   1147
Sysx view menu

Transmitting banks during playback

SONAR has a special meta-event, Sysx Bank, that lets you play a System Exclusive bank at a specified time in your project. You can use a Sysx meta-event to send any of the 8192 available Sysx banks at any time in a sequence. To do this, you have to insert a new event in the Event List using the INSERT key on the computer keyboard. Next you have to double-click **Event Kind** and change it to **System Exclusive**. In the **Values** column, select the bank (0-8191) that you want to send.

MIDI is a serial data transmission, meaning it can do only one thing at a time. If you try to upload a huge sampler dump during a fast drum solo, playback will noticeably lurch. MIDI must complete the System Exclusive message before it can resume playback. The Sysx meta-event is appropriate only for very short System Exclusive messages. The exact length depends on various factors, such as the speed of your computer but as a rule of thumb, 100 bytes is a likely maximum, and even that may often be too large.

You don't need to use Sysx meta-events for sending System Exclusive information at the beginning of your project. Instead, use the **Auto** option for System Exclusive banks. Banks that are marked Auto are transmitted automatically by SONAR when it loads the project file they are stored in. Use the Sysx meta-event only when you need to send a Sysx Bank during the middle of the project.

See:

Real-time recording of System Exclusive messages

You can record short System Exclusive messages in real time. These will end up in the track as the new Sysx Data types of events, which can hold System Exclusive messages up to 255 bytes long. Before you record any Sysx messages, go to **Edit > Preferences > MIDI - Playback and Recording** and make sure the **System Exclusive** check box is selected.

To record Sysx messages in real-time

1. Arm a MIDI track for recording—use a track that's uses the output you want to send the Sysx data out through.

2. Press the **Record** button or press R to start recording.

3. Move the button or fader on your MIDI instrument that sends Sysx data.

4. Stop recording.

SONAR records your instrument's Sysx data as a Sysx Data event. Open up the Event List view for the track you recorded on to view the data. When you play back the MIDI track that the Sysx Data event is on, make sure that the **Output** field of the track is set to the output that the MIDI instrument you want to send Sysx data to is on.

See also:

Sysx echo

You can configure SONAR to echo received System Exclusive messages to output devices.

To echo Sysx messages

1. Go to **Edit > Preferences > MIDI - Playback and Recording** and select the **Echo System Exclusive** check box.

2. Select the MIDI ports you want to echo System Exclusive messages on.

3. Click **OK**.

See:

Sysx .ini file settings

The `TTSseq.ini` initialization file contains settings that govern the sending and receiving of System Exclusive information. If you are experiencing difficulties using Sysx, you will probably be able to correct the problem by adjusting these settings.

The options described below occur in the `[Options]` section of the `TTSseq.ini` file. You can edit this file using the Windows Notepad. Every time you add or change one or more lines in `TTSseq.ini`, you must restart SONAR in order for the change to take effect.

SysxSendDelayMsecs=n

This setting causes SONAR to delay *n* milliseconds if it encounters an F7 in a System Exclusive bank, but only if the line `SysxDelayAfterF7=n` is not zero. The line SysxDelayAfterF7=*n* enables a delay between Sysx messages, while the line `SysxSendDelayMsecs=n` sets the size of the delay.

n = 60 Default value (in milliseconds)

SysxDelayAfterF7=n

This setting causes SONAR to delay Sysx transmission for a certain amount of time if it encounters an F7 in a System Exclusive bank. This gives some instruments the required amount of "breathing" time necessary to process the Sysx transmission. The default delay is 1/18 of a second, but can be changed by also adding the `SysxSendDelayMsecs=n` line, where *n* is the number of milliseconds that the delay lasts.

The possible values of *n* in the line `SysxDelayAfterF7=n` are 0 and 1. Their significance is as follows:

n = 0 No delay

n = 1 Delay between each Sysx message

SysxSendPacketSize=n

System Exclusive bytes are transmitted in packets, with a 1/18-second default delay between each packet. Setting this value to a smaller number will help slower synthesizers avoid overflowing their internal buffers. This line sets the number of bytes between each Sysx transmit delay.

n = 1024 Default value (in bytes)

See:

Troubleshooting

SONAR is not receiving Sysx messages

- Make sure all your devices are connected correctly.
- Make sure you have the right MIDI Input selected in **Edit > Preferences > MIDI - Devices**.
- Make sure that your instrument is set up to transmit System Exclusive data.

Sysx bank names don't show when I open a file

Sysx bank names are only saved in .cwp and .cwb files (not in .mid files).

SONAR doesn't include a DRM for my instrument

If there is no Dump Request Macro (DRM) for your instrument, you should select You start dump on instrument, then initiate the Sysx dump from the instrument. Once the bytes received count stops increasing, click **Done** to tell SONAR to stop receiving. The currently selected bank now holds the received Sysx data. You can rename the bank if you want by selecting the bank and clicking **Edit > Name**.

You can also add a DRM for any unlisted instrument. For more information about how to do this, read the section "More about Dump Request Macros" on page 1145 earlier in this chapter.

Synthesizers reporting MIDI data errors

Some synthesizers will report data errors when you try to send Sysx information to them. This usually happens when SONAR sends data at a rate too fast for the synthesizer to keep up. You can use the SysxSendPacketSize=number setting in TTSseq.ini to make SONAR transmit Sysx data more slowly, as described in "Sysx .ini file settings" on page 1150.

Try setting the number to 64. If that does not solve the problem, try successively smaller values. If 64 works, you may try larger values until it stops working; go back to the largest value that worked and you will have the fastest transmission rate that the problematic synthesizer can keep up with.

My equipment is not receiving Sysx from SONAR

Make sure the instrument is set up to receive System Exclusive messages. In the Sysx View, make sure the right output is selected. Verify that the Sysx message originally transmitted from the same kind of instrument. An instrument will not recognize Sysx messages from a different make or model of instrument.

Finally, try adjusting the parameters in the TTSseq.ini file, as described "Sysx .ini file settings" on page 1150.

Timing requirements when receiving Sysx

Some MIDI devices have special timing requirements when receiving System Exclusive transmissions. If your equipment has problems receiving System Exclusive data from SONAR, you might need to introduce some small delays to allow the equipment to digest the information it is receiving.

The line in `TTSseq.ini` that reads `SysxDelayAfterF7=n` enables SONAR to introduce a delay between each Sysx message so that the instrument has some time to respond to the message. Setting *n* to be 1 enables the delay. The line SysxSendDelayMsecs=*n* lets you control how many milliseconds the delay is, where *n* is the number of milliseconds that the delay lasts.

Roland equipment

Some Roland equipment—notably, the GR-1 and GR-50 Guitar Synthesizers—have problems receiving Sysx packets in fast succession. You must use the setting SysxDelayAfterF7 = 1 with these devices.

Ensoniq instruments

Successfully sending Sysx messages to most Ensoniq instruments requires that you add the following three lines to the `[Options]` section of `TTSseq.ini`:

`SysxDelayAfterF7=1` Enables delay

`SysxSendDelayMsecs=200` Sets delay time to 200 milliseconds

`SysxSendPacketSize=65535` Increases packet size to 64k

See:

Synchronizing your gear

Your computer is often used with other equipment: sound cards, MIDI equipment, and digital tape decks or other digital recording tools. All these devices can have their own built-in clocks or timing mechanisms.

When several pieces of equipment are used together, it's important that they operate in synchronization. For this to happen, all the equipment must rely on the same source of clock or timing information. SONAR lets you use many different types of synchronization so that you can get your work done quickly and efficiently.

See:

"Synchronization overview" on page 1154

"Choosing clock sources: SONAR as master" on page 1157

"MIDI synchronization" on page 1158

"SMPTE/MIDI time code synchronization" on page 1162

"MIDI Machine Control (MMC)" on page 1168

Synchronization overview

SONAR supports several different types of synchronization, which rely on a variety of different clock sources:

Clock source	Timing is determined by
Internal	The clock on the computer motherboard
Audio	The clock on the computer's sound card
MIDI Sync	The clock on an external MIDI device
SMPTE/MIDI Time Code (MTC)	A time code signal (in SMPTE or some other format) recorded on some external medium or generated and sent by SONAR

Table 205.

When you use either the internal or audio clock, SONAR can control other MIDI devices using MIDI Sync. In this case, SONAR is the "master" device and the other MIDI devices are the "slaves."

When MIDI Sync is the clock source, SONAR operates either in response to incoming MIDI messages or as the sender. In this case, SONAR can be either the master or the slave. Note that audio playback is not supported when using MIDI Sync with SONAR as the slave.

When SMPTE/MIDI Time Code (SMPTE/MTC) is the source of timing information, SONAR operates in response to incoming MTC messages. These messages could be generated by:

• An external MIDI device that is capable of generating MIDI Time Code (like the Roland VS880)

• A MIDI interface that is converting other time code signals (like SMPTE, EBU, or film time code) into MIDI Time Code

When you use some of these synchronization options, some SONAR commands work differently. This section describes each of the synchronization options, how and why each is useful, and the effect each option has on other features and commands.

The Sync module in the Control Bar lets you change back and forth quickly between the different clock settings.

Figure 340. *The Sync module.*

A. SMPTE/MTC format B. Incoming timecode C. Sync type D. Transmit MIDI Sync E. Transmit MTC Sync

The Sync module contains the following controls:

• **SMPTE/MTC format.** Select the time code format. The following frame rates are supported:

  • **23.976 frames per second (FPS).** Typically used with H.264/MPEG-4 AVC video.

  • **24 frames per second (FPS).** Used for theatrical film worldwide. Any film in North America or Japan uses this setting.

  • **25 FPS.** Used for PAL/SECAM video and some film in countries that use 50 Hz wall electricity. This is the setting to use when synchronizing to any European video format.

  • **29.97 FPS Drop.** NTSC broadcast and long format video in North America and Japan. This setting synchronizes the video perfectly with SONAR, but the sequencer position displayed in the Now Time and Big Time displays will gradually drift and become incorrect over long periods of time. The audio and MIDI synchronization to the external device will not be affected by this discrepancy.

  • **29.97 FPS Non Drop.** NTSC non-broadcast and short length video in North America and Japan. Used for some music projects. This setting synchronizes the video perfectly with SONAR, but the sequencer position displayed in the Now Time and Big Time displays will gradually drift and become incorrect over long periods of time. The audio and MIDI synchronization to the external device will not be affected by this discrepancy.

  • **30 FPS Drop.** Not a standard type of timecode, used rarely for speed correction and transfer problems in tape based systems.

  • **30 FPS Non Drop.** Most music projects and some film in North America. This is the best choice for any music project and should be used unless the situation dictates otherwise.

- **Incoming timecode.** Shows the current time of incoming time code when synchronizing to an external device.
- **Sync type.** Select the sync type; right-click to show synchronization settings. The following sync types are supported:
  - **Internal Sync.** Timing is determined by the clock on the computer motherboard.
  - **MIDI Sync.** Timing is determined by the clock on an external MIDI device.
  - SMPTE/MTC Sync. Timing is determined by a time code signal (in SMPTE or some other format) recorded on some external medium or generated and sent by SONAR.
  - **Audio Sync.** Timing is determined by the clock on the computer's audio interface.
- **Transmit MIDI Sync 🔘.** Transmit MIDI Sync to external MIDI devices, such as drum machines, stand-alone MIDI hardware sequencers, and sequencers built into MIDI keyboards (only available when using the Internal or Audio clock). SONAR sends messages to all other devices to start and stop playback and to keep all the devices in sync. SONAR can send MIDI Sync on multiple MIDI output ports. For details, see "MIDI synchronization" on page 1158.
- **Transmit MTC Sync ᴹᵀᶜ.** Transmit MIDI Time Code (MTC) to external devices that can receive MTC. SMPTE/MTC is a position and timing reference that indicates the current location in the project and how quickly the project should be playing. SMPTE/MTC time code labels the position in a project in hours, minutes, seconds, and frames. The speed of playback is indicated by a frame rate. SONAR can send MTC on multiple output ports simultaneously. For details, see "SMPTE/MIDI time code synchronization" on page 1162.

You can also choose the sync mode as follows:

1. Go to **Edit > Preferences > Project - Clock**.
2. Under **Source**, select the desired clock source.
3. Click **OK**.

The clock source and the type of synchronization that is used are options that are stored as part of your project files. For example, one of your projects might be set up to use the internal clock; a second might use the Audio clock and MIDI Sync with SONAR as the master timing source; and another might use SMPTE/MTC Sync as the clock source.

Many technical support requests concern synchronization problems, which are among the hardest to diagnose and duplicate over the phone. If you experience problems, before you call, perform as much experimentation and gather as much information as possible about what does and doesn't work. The more prepared you are, the more we can help.

Choosing clock sources: SONAR as master

When SONAR is used alone, or with an external device that does not have its own clock or timing signal, you use one of two clock sources: Internal or Audio.

When the clock source is set to Internal, SONAR uses the clock built into the computer or the computer's MIDI interface as its timing source. If your projects contain only MIDI (no audio), this is the most efficient method of playback.

If your projects contain MIDI and audio, or only audio, you should set the clock source to Audio. This lets the sound card clock determine the correct speed for audio playback and automatically synchronizes MIDI playback to match the audio. For more information, see "System configuration" on page 1182.

When either of these clock sources is used, you can also configure SONAR to drive other MIDI devices using MIDI Synchronization. For more information, see "MIDI synchronization" on page 1158. If you need to send MIDI Time Code (MTC), SONAR will send this data regardless of the clock setting.

To use the Internal clock source

Do *one* of the following:

- Go to **Edit > Preferences > Project - Clock** and select **Internal**.
- In the Control Bar's Sync module, click the **Sync Type** button and choose **Internal Sync** on the pop-up menu.

Figure 341. *The Sync module.*
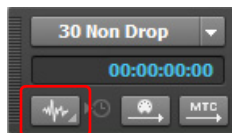
A. SMPTE/MTC format **B.** Incoming timecode **C.** Sync type

To use the Audio clock source

Do *one* of the following:

- Go to **Edit > Preferences > Project - Clock** and select **Audio**.
- In the Control Bar's Sync module, click the **Sync Type** button and choose **Audio Sync** on the pop-up menu.

MIDI synchronization

MIDI Synchronization, or **MIDI Sync**, is usually used to synchronize SONAR with drum machines, stand-alone MIDI hardware sequencers, and sequencers built into MIDI keyboards. SONAR can slave to MIDI Sync, and can send MIDI Sync on multiple output ports.

When MIDI devices are synched, the master device sends messages to all other devices to start and stop playback and to keep all the devices in sync. To change the tempo of a project, you adjust the tempo on the master device. The playback tempo on all slave devices is then set automatically.

The following MIDI messages are sent by the master device to support MIDI Sync:

Message	How it is used
Start	This message tells slave devices to start playing from the beginning of the currently loaded sequence.
Stop	This message tells slave devices to stop playback.
Continue	This message tells slave devices to continue playing from the current location in the currently loaded sequence.
Song Position Pointer (SPP)	This message tells slave devices to change the current location to the designated point in the project. SONAR normally issues an SPP message immediately prior to any Start or Continue message.
Clock	The master sends clock messages to each slave device at the rate of 24 per quarter note. The slave devices use these messages to establish the tempo and stay in sync.

Table 206.

When you start playback on the master MIDI device, for example, it sends a Start message to all slave devices, announcing that playback has started. If the slave devices are set up correctly, they receive the message and start playing back with the master device. When SONAR is set up as the master device, you can enable or disable these messages.

See:

SONAR as the slave

When SONAR is slaved to an external MIDI device, the following changes occur:

- When you click the **Play** or **Record** button, a message (Waiting for MIDI Sync) is displayed in the status bar. When you start your external device, SONAR will follow.
- If you change the tempo using an external device, the SMPTE time code display in SONAR will be incorrect.
- SONAR will not transmit MIDI Start, Continue, Stop, and Clock messages.
- Digital audio will play back, but not necessarily in sync.

To use MIDI Sync with SONAR as the slave

1. Configure the external MIDI device you want to use as the master device to transmit MIDI Sync.
2. Configure external slave devices to receive MIDI Sync.
3. Go to **Edit > Preferences > MIDI Devices**.
4. Make sure that your MIDI interface is highlighted in the Inputs list, and click **OK**.
5. Click the **Transmit MIDI Sync** button in the Sync module to use the MIDI Sync clock source.

From now on, SONAR starts playback and recording only after the appropriate message is received from the master device.

SONAR as the master

There are several options, found in **Edit > Preferences > Project - MIDI**, which you can use when SONAR is the MIDI Sync master device:

Option	What it's for
Transmit MIDI Start/Continue/Stop/Clock	Choosing this option causes SONAR to tell the slave when to start, when to continue, when to stop, and what timing data to go by (SONAR's).
Use Start, Never Continue (greyed out unless above option is checked)	If you are using an external drum machine to repeat a drum pattern or loop, you might always want playback on the drum machine to start at the beginning of the loop. When this option is chosen, SONAR sends a Start message to all slave devices when playback is started, even if you are in the middle of a project. (Normally, SONAR would send a Continue message if playback starts from the middle of a project.)
Transmit MIDI Song Position Pointer (SPP)	When this options is checked, SONAR sends an SPP message before starting or continuing playback. If you are using a drum machine as described previously, you might want to disable this option.
Locate Delay for SPP Recipient	Some older MIDI devices take a small amount of time to respond to SPP messages. This option causes SONAR to delay briefly after sending an SPP message, to give the slave device time to respond. The delay is in 1/18ths of a second. Enter 1 for a 1/18th second delay, 2 for 2/18ths of a second, or 18 for a full second delay.
MIDI Sync Output Ports	Choose the outputs that your slave devices are connected to.

Table 207.

To use MIDI Sync with SONAR as the master

1. Configure your external MIDI devices to receive MIDI Sync.
2. Go to **Edit > Preferences > Project - MIDI**.
3. Check the **Transmit MIDI Start/Continue/Stop/Clock** box.
4. For most applications, check the **Transmit MIDI Song Position Pointer** box.
5. If you are using a drum machine to play patterns or loops, check the **Use Start, Never Continue** option and disable the **Transmit MIDI Song Position Pointer** option.
6. In the **MIDI Sync Output Ports** field, check off the output ports that you want to send the sync signal out of.
7. Click **OK**.

From now on, the transport controls in SONAR control playback on the external MIDI devices.

Using MIDI Sync with drum machines

The most flexible way to use a MIDI drum machine is to record the notes it generates into SONAR, then use that machine as a MIDI playback device. This lets you edit, cut, paste, and copy your drum parts like any other clip. You can use MIDI Sync to record the notes from the drum machine into SONAR as follows:

1. Use the drum machine's pattern-composing facilities to compose your drum part.

2. Configure the drum machine to be a slave device that receives MIDI Sync messages.

3. Configure SONAR to send MIDI Stop/Start/Continue/SPP messages.

4. Record the drum part from SONAR. The drum machine starts automatically when recording begins and stops automatically when you press Stop.

5. Switch the drum machine out of MIDI Sync mode so that it acts simply as a sound-producing module.

Troubleshooting MIDI Sync

If you experience problems with MIDI Sync when SONAR is the master device, verify that your external devices are configured correctly to respond to MIDI Sync. Most devices have a **Clock** option that should be set to **External** or **MIDI**.

If SONAR does not respond to MIDI Sync as a slave device, verify that your external devices are configured correctly to transmit MIDI Sync. Remember that only one external device can be used as the master clock source.

SMPTE/MIDI time code synchronization

SMPTE/MIDI Time Code Sync (SMPTE/MTC) is another method of synchronization that lets SONAR act as a master or slave to external devices. SONAR can send or receive SMPTE/MTC messages to or from external devices that can generate or receive MTC. SONAR can send MTC on multiple output ports simultaneously.

SMPTE/MTC is a position and timing reference that indicates the current location in the project and how quickly the project should be playing. Time code labels the position in a project in hours, minutes, seconds, and frames. The speed of playback is indicated by a **frame rate**.

Time code is recorded onto tape using a device called a time code generator. The process of recording a time code signal onto a track is called **striping**. Normally, the start of a tape stripe has a particular time, expressed in hours, minutes, seconds, and frames. For example, the tape stripe might start at 00:00:00:00, 01:00:00:00, or any other time. The material recorded on the tape usually starts anywhere from 10 seconds to several minutes after the start of the time code. Sometimes, the tape stripe starts at a time like 00:59:50:00, and the material starts 10 seconds later, at 01:00:00:00.

When you create a new SONAR project, by default the project is configured so that the beginning of bar 1 is synchronized with a time code of 00:00:00:00. If the starting point of the material on your tape or external project is not 0, you need to enter an offset to tell SONAR the time code that corresponds to the start of the project.

To enter an offset

1. Go to **Edit > Preferences > Project - Clock**.
2. Specify the desired offset in the **SMPTE/MTC Offset** field. To enter an offset of 15 seconds, type **0**,**0**,**15** and hit ENTER. The **SMPTE/MTC Offset** value should now be **00:00:15:00** or 15 seconds.

Frame rates

Seven time code frame rates are supported in SONAR, which are normally used for the following types of applications:

External Timecodes	Cakewalk Setting	Description
23.976 frames per second	23.976 FPS	Typically used with H.264/MPEG-4 AVC video.
24 frames per second	24 FPS	Used for theatrical film worldwide. Any film in North America or Japan uses this setting.
25 frames per second (EBU timecode)	25 FPS	Used for PAL/SECAM video, video and some film in countries that use 50 Hz wall electricity. This is the setting to use when synchronizing to any European video format.
29.97 frames per second non drop-frame	29.97 FPS NDF	NTSC non-broadcast and short length video in North America and Japan. Some music projects. This setting synchronizes the video perfectly with SONAR, but the sequencer position displayed in the Now Time and Big Time displays will gradually drift and become incorrect over long periods of time. The audio and MIDI synchronization to the external device will not be affected by this discrepancy.
29.97 frames per second drop-frame	29.97 FPS DF	NTSC broadcast and long format video in North America and Japan. This setting synchronizes the video perfectly with SONAR, but the sequencer position displayed in the Now Time and Big Time displays will gradually drift and become incorrect over long periods of time. The audio and MIDI synchronization to the external device will not be affected by this discrepancy.
30 frames per second non drop-frame	30 FPS NDF	Most music projects and some film in North America. This is the best choice for any music project and should be used unless the situation dictates otherwise.
30 frames per second drop-frame	30 FPS DF	Not a standard type of timecode, used rarely for speed correction and transfer problems in tape based systems.

Table 208.

For more information about frame rate time formats, see the documentation for your time code hardware.

Refer to the documentation for your MIDI interface or external MIDI device for additional information about SMPTE/MTC.

To use SONAR as the master MTC generator

1. Configure the clocks on each external device that you want to synchronize to receive SMPTE/MTC. Make sure they're connected to MIDI outputs from your computer or MIDI interface.

2. In the Control Bar's Sync module, click the **Sync Type** button and choose **Internal Sync** or **Audio Sync** on the pop-up menu.

3. Go to **Edit > Preferences > Project - MIDI**.

4. Select the **Transmit MTC** check box (you can also click the **Transmit MTC Sync** button [MTC] in the Sync module).

5. In the **Frame Rate** field (it's just below the **Transmit MTC** check box), choose the frame rate that your project uses (see "Frame rates" on page 1163, if necessary).

6. In the **MTC Output Ports** field, check off the outputs that you want to send MTC on (the outputs your external devices are connected to).

7. Click **OK**.

SONAR saves your sync and MTC output port settings with your project. However, output ports are saved by their number only, not their name. Their number is determined by the order in which they appear in **Edit > Preferences > MIDI - Devices**. If you change the order of devices in this dialog box, the MTC output ports in your project will retain the same numbers, but those numbers will now refer to different outputs. Also, if you reduce the number of highlighted outputs in **Edit > Preferences > MIDI - Devices**, and the MTC ports you chose have higher numbers than what are currently highlighted in **Edit > Preferences > MIDI - Devices**, SONAR does not substitute new port numbers.

To configure SONAR to sync to SMPTE/MTC

1. In the Control Bar's Sync module, click the **Sync Type** button and choose **SMPTE Sync** on the pop-up menu.

2. Go to **Edit > Preferences > Audio - Sync and Caching**.

3. Select one of the following options:

   • **Ask first, then switch to clock source and start.** This option prompts SONAR to alert you when it detects a SMPTE/MTC signal, asks if you want to sync to the incoming signal, and if you respond that you do, switches the clock source and starts to receive the signal.

   • **Always switch the clock source and start.** SONAR automatically switches to the clock source of the incoming signal and begins to receive the signal.

   • **Do not switch clock source, but start if in SMPTE/MTC mode.** This option automatically syncs to the incoming signal if SONAR is in SMPTE/MTC mode.

   Note: *The final option, Never switch clock source, never start, should never be used if you are attempting to sync to an external clock source.*

4. Click the **Project - Clock** page (**Edit > Preferences > Project - Clock**).

5. Choose the frame rate and time offset that are appropriate for your source material.

6. Click the **MIDI - Devices** page (**Edit > Preferences > MIDI - Devices**).

7. Make sure that your MIDI interface is highlighted in the Inputs list. If your interface also has a Sync driver, highlight that as well, then click **OK**.

When SONAR is the slave, here's how things work:

- SONAR monitors for a SMPTE/MTC signal. You are able to perform other action in SONAR while waiting for the signal.

- Start playback on the external device. It takes about two seconds for SONAR to lock from the time it receives time code input.

- If the time code is earlier than the start of the project (based on the time code offset), another message (Chasing…) is displayed in the status bar. When the time code reaches the start of the project, SONAR starts to play in sync.

- If the time code is at or after the start of the project, SONAR starts playback as soon as it locks to the time code.

- When the external device stops (or when the time code ends), SONAR will stop.

> **Note:** *If you want SONAR to switch its clock source to SMPTE/MTC automatically when SONAR receives a SMPTE/MTC signal, go to* **Edit > Preferences > Audio - Sync and Caching** *and select the* **Always switch clock source to start** *option.*

See:

Playing digital audio under SMPTE/MTC sync

SONAR gives you two choices for controlling audio playback when using time SMPTE/MTC Sync:

Option	How it works
Trigger and freewheel	Audio event playback is started (or triggered) at the exact time code, but then the audio plays at its own internal rate (or freewheels). When audio freewheels, it can gradually drift from the time code due to variations in the time code signal.
Full chase lock	The speed of audio event playback is continually adjusted to stay in sync with the time code. If the external clock drifts or changes rate, SONAR adjusts the audio playback speed to stay in sync. This adjustment may introduce slight pitch changes, but those changes will be negligible if the external clock is reasonably steady.

Table 209.

Some digital sound cards (such as the Frontier Design Wavecenter or the Antex Studio Card) have external clock inputs. If you are using one of these cards, and an external clock source like a digital tape deck is the master timing source for the project, choose the **Trigger and Freewheel** option. The clock input on the audio card guarantees that there is no drift between the time code and audio playback.

To set the audio playback option

1. Go to **Edit > Preferences > Audio - Sync and Caching**.

2. Under **Synchronization**, select either **Trigger & Freewheel** or **Full Chase Lock**.

3. Click **OK**.

   Audio playback under time code sync is handled according to the setting you chose.

SMPTE/MTC sync and full chase lock

When using SMPTE/MTC Sync with full chase lock, the first time you play any audio the pitch may fluctuate wildly for up to 30 seconds. Also, you may occasionally note the pitch of the audio sounding consistently high or low pitch.

A simple analogy makes this behavior easy to understand: Synchronizing audio to SMPTE/MTC is a lot like trying to get even and stay neck-and-neck with another car on the freeway. If the car is ahead of you, you need to drive faster to catch up to it. If it's behind you, you have to slow until the car catches up to you. Once the two cars are neck-and-neck, you can simply keep going at the same speed, unless the other car changes its speed. If the other car speeds or slows, you must speed or slow too.

The first time you play audio under SMPTE/MTC Sync, the audio clock has to get even with the external clock. This could mean racing ahead, which raises the pitch of the audio, or stepping on the brakes, which lowers the pitch of the audio. These fluctuations continue until SONAR matches its playback speed to the external clock, which usually takes no more than 30 seconds. The stable playback speed, by the way, may be slightly faster or slower than the normal audio playback speed, resulting in a slight change in the pitch of the audio. Here's the best way to address this problem:

• Start each new SONAR session by playing some audio under SMPTE/MTC Sync.

• Let the audio play for 30 seconds or until all audio pitch fluctuations stop.

Once this procedure is complete, SONAR knows the difference in rates between the external time code and the audio clock on your sound card. For the rest of the session, SONAR will start playback closely in sync, without any drastic pitch changes.

If the external timing source were 100 percent stable, the audio would stay in sync with the external clock. Unfortunately, no timing source is perfect. Therefore, every once in a while after playback has started, SONAR may need to vary the playback speed by a tiny amount to stay even with the time code. If the time code signal is unstable (as might be the case from an analog source), these variations can cause noticeable changes in audio pitch, which can in turn cause audible audio distortion.

Troubleshooting SMPTE/MTC sync

The most common problems with SMPTE/MTC Sync, and ways to correct or avoid them, are shown in the following table.

Problem	What to do
The tape is striped incorrectly	Check the tape stripe using your time code generator and, if necessary, restripe the tape.
The MIDI interface isn't producing MIDI Time Code	Use utility programs that come with your MIDI interface to make sure that the time code stripe is being received (sometimes you must enable a **Time Code Sync** option). Check the MIDI interface settings to make sure that MIDI Time Code is being generated.
The frame rate is set incorrectly	The frame rate on the stripe must match the frame rate you set in SONAR.
The offset is set incorrectly	The offset you enter in SONAR must match the start time of recorded material on the tape.
SONAR is not configured correctly	Verify and/or repeat the steps in "To configure SONAR to sync to SMPTE/MTC" on page 1164.
Audio playback drifts out of sync with the tape	Enable the **Full Chase Lock** option, which keeps audio from freewheeling.
SONAR continues playing for up to one full second after the time code stops	Some time code readers tolerate dropouts of up to one second, without affecting playback. When you stop the tape deck, it takes a full second for the reader to realize that this isn't merely a dropout and to signal the end of the time code to SONAR. This does not indicate any problem with time code sync.

Table 210.

No MTC sync within 1 minute of midnight roll-over

SONAR will not sync to MTC within one minute of roll-over (1 minute before midnight; 23:59:00:00 - 23:59:59:xx). To address this, use a SMPTE offset that doesn't require you to trigger the midnight roll-over.

MIDI Machine Control (MMC)

MIDI Machine Control (MMC) is a protocol that controls an MMC-equipped remote device via MIDI. SONAR lets you use MMC to start and stop playback and recording on remote MIDI devices such as tape decks, video recorders, and even other software packages. If you have several MMC-controllable devices in your studio, assign each a unique Unit ID so that MMC commands can be addressed to a particular device.

MMC is very powerful when used with MIDI Time Code sync. For example, suppose you have an MMC-equipped digital tape deck that generates time code and want to use the tape deck as the timing master for a project. You can set up your equipment and software so that the transport controls in SONAR send MMC messages to the tape deck, which in turn starts and stops playback in SONAR via SMPTE/MTC Sync. In this configuration, SONAR's transport buttons (**Play**, **Record**, and **Stop**) are simply remote control substitutes for the buttons on your tape deck. In this type of configuration, you must choose one MMC-controllable device as the time code master.

When MMC is enabled, press Play to start playback on all connected MMC devices, and press Stop to stop all connected devices. If you press Record while playback is underway, all connected MMC devices (e.g., tape decks) begin recording on any armed tracks. If you stop recording (without stopping playback), SONAR instruct the tape decks to punch out. You must arm and disarm tracks on the tape deck; you cannot do this from SONAR.

If you have established punch-in/out points in **Edit > Preferences > Project - Record**, SONAR will attempt to preprogram the punch-in and punch-out times. However, your equipment must recognize the MMC event command for this feature to work. (Consult the owner's manual or contact the equipment manufacturer for more information.) If your equipment behaves erratically with automated punch-in, don't attempt to use it when those pieces of equipment are connected.

SONAR instructs MMC devices to locate the current project position only when playback or recording is started. This prevents excessive wear on the motors and tape heads of the devices.

To configure MIDI Machine Control (MMC)

1. Go to **Edit > Preferences > Project - Clock**.
2. Under **Source**, select **SMPTE/MTC**.
3. Click the **Project - MIDI** page (**Edit > Preferences > Project - MIDI**).
4. Select the **Transmit MMC** check box.
5. Enter the ID of the master timing device in the **Time Code Master's Unit ID** box.
6. Click **OK**.

MMC is now enabled.

To disable MIDI Machine Control (MMC)

1. Go to **Edit > Preferences > Project - MIDI**.
2. Make sure the **Transmit MMC** box is not checked, and click **OK**.

MMC is disabled.

Synchronizing your gear
MIDI Machine Control (MMC)

Audio file management

Project files in SONAR do not contain the digital audio itself. A SONAR project file (.cwp) references the audio contained in the project, so care must be taken when backing up your digital audio projects. This section covers file management, including backing up your projects.

See:

The Project Files dialog

SONAR projects, extension .cwp, contain all your project information with the exception of your digital audio data. This data is stored in a separate folder or folders. You can opt to save the audio data for all of your projects in a single audio folder, or create multiple folders.

The **Project Files** dialog box lists all of your project's audio files and their location. This dialog box is a valuable tool for managing your audio files. Access the dialog by opening a project and choosing **Project > Audio Files**.

Figure 342. *The **Project Files** dialog*
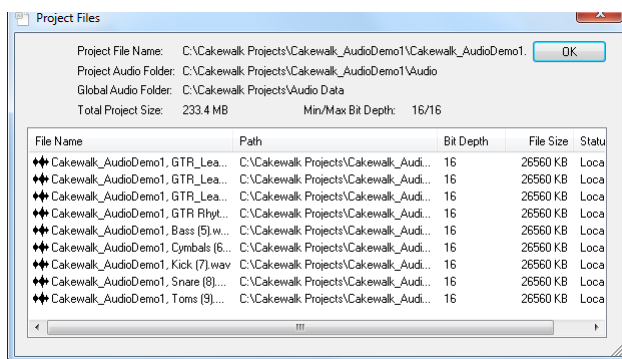
How to use the Project Files dialog

The **Project Files** dialog box has important information, including:

- Exactly which folders all of your audio files are saved in—know at a glance if you can backup your project by copying the audio folder and the .cwp file or if you need to do a Save As to round up files not in your project's audio folder.

- The filenames for each audio file your project is referencing

- The combined size the audio data in your project—important if you are going to backup your project

- The bit depth of every audio file in your project, including a display o the lowest and highest in the **Min/Max Bit Depth** field

- The location status of each audio file, which could be any of the following:

  - **Global.**   This means that the file is stored in the Global Audio Data directory. The Global Audio Data directory can be changed in **Edit > Preferences > File - Audio Data**.

  - **Local.**   This means that the file is stored in the local wave data directory, a per-project data directory which is a subdirectory in the directory where the project file is stored.

  - **External.**   This means that the file is stored in a directory other than the Global Audio Data directory or in a Local audio data directory.

  - **Missing.**   This means that the file is not to be found.

Project files and bundle Files

SONAR project files contain various project settings, any MIDI data, and references which "point" to audio clip data. The audio data (and video data) itself is not saved in a project file. To save audio as well, save your project as a Bundle file (extension .cwb). Bundle files contain everything that a project file contains in addition to the digital audio. Bundle files are useful for backing up projects and for burning onto removable media, like a blank CD or DVD.

The following are descriptions of both file types:

File Type	Description	When to Use
.cwp	Contains MIDI data, project settings, and pointers to audio data in your Data directory. Project files contain no audio data, so they are small. Backing up a Project file does not back up the associated audio data.	Project files are good for routine projects. You can use Project files and back them up as Bundle files at various steps during a projects development.
.cwb	Contains all project data, including all audio data. Bundle files are large.	Bundle files are useful for backing up projects or for transporting a project to another computer (to bring it to a friend's house, for example).

Table 211.

See "64-bit CWB files" on page 258.

To create a bundle file

1. Choose **File > Save As** to display the **Save As** dialog box.

2. Choose Bundle from the **Save as Type** list.

3. Enter a file name and click **OK**.

SONAR compacts all the audio and merges it with the remaining project data in a bundle file.

To unpack a bundle file

1. Choose **File > Open** to display the Open dialog box.

2. Choose a file with a .cwb extension.

3. Click **Open**.

   If you have the **Use Per-project Audio Folders** option enabled in **Edit > Preferences > File - Audio Data**, the **Unpack Bundle** dialog box appears. If this option is not enabled, the bundle file opens and all audio data is stored in the Global Audio Folder.

4. If you want to store the project in its own folder do the following in the **Unpack Bundle** dialog:

   • Enter a project filename in the **Project Name** field.

   • Use the **Browse** button to the right of the **Location** field to select a destination folder for the

project, or to create a new folder, enter a new folder pathname in the **Location** field.

- Use the **Browse** button to the right of the **Audio Path** field to select a destination folder for the project's audio data, or to create a new folder, enter a new folder pathname in the **Audio Path** field.

OR

If you want to store the project in the Cakewalk Projects folder, and its audio in the Global Audio Folder, uncheck the **Store Project Audio in its Own Folder** option.

5. Click **OK**.

Audio folders

By default, SONAR stores audio data separately from the rest of your projects, as wave files placed into a special folder called the **Global Audio Folder**, the location of which is listed in the **Global Audio Folder** field in **Edit > Preferences > File - Audio Data**. You can also create audio folders on a per-project basis.

Note: *Previous versions of Cakewalk used a folder called the WaveData folder, located in the product directory.*

See:

"Global audio folders" on page 1174

"Per-project audio folders" on page 1175

"Imported audio files" on page 1176

Global audio folders

You can change the location of the Global Audio Folder. This may be necessary if, for example, your hard disk is full and you want to move all audio data storage to a different hard disk. We strongly recommend that you do not change the location of the Global Audio Folder unless absolutely necessary.

If your original Global Audio Folder contains any audio files with the extension .wav, you must manually move these files to the new Global Audio Folder using the Windows Explorer, or open the project and use the **Missing Audio** dialog box to find and move the missing files.

To change the global audio folder

1. Go to **Edit > Preferences > File - Audio Data**.
2. Enter the pathname of the new Global Audio Folder in the **Global Audio Folder** field, or click the **Browse** button that's at the right end of the **Global Audio Folder** field to browse to the new directory.

3. Click **OK** when you are done.

4. Use the Windows Explorer or some other program to move all audio files from the old Global Audio Folder to the new Global Audio Folder.

All new audio files will be stored in the new Global Audio Folder, unless you decide to use per-project audio.

> **Tip:** *It is safer, but more time-consuming, to first save the all projects as bundle files, change the Global Audio Folder, then open the bundle files. This ensures that all of the audio data is properly moved to the new Data directory.*

Per-project audio folders

You have the option of using a single audio data folder or using different audio data folders for each project. By default SONAR stores audio data in per-project audio folders, but you can use the Global Audio Folder if you want. If you want to change the default behavior, use the following procedure:

To enable or disable the per-project audio folder option

1. Go to **Edit > Preferences > File - Audio Data**.

2. In the **Per-Project Audio** section, check or uncheck the **Use Per-Project Audio Folders** option.

3. Click **OK** to apply the change.

If you enable the per-project audio folder option, the **New Project File** allows you to choose the directory where you want to store the new project and a subdirectory where you want to store the project's audio data.

To create a new project using per-project audio

1. Select **File > New**.

    The **New Project File** dialog box appears.

2. Enter a filename in the **Name** field

    The **Location** and **Audio Path** directories are automatically updated in the following format:

    *   `C:\default directory\<project name>`. The default directory for new projects is assigned in **Edit > Preferences > File - Folder Locations**. *<project name>* is the project's per-project folder name.

    *   `C:\default directory\<project name>\Audio`. The default directory for new projects is assigned in **Edit > Preferences > File - Folder Locations**. *<project name>* is the project's per-project folder name, and Audio is the subfolder where your audio data will be stored.

3. If you want, rename the **Location** and/or **Audio Path** directories.

4. Click **OK**.

To save an existing project using per-project audio

You may have older files that are not using per-project audio folders. If you want to save these files using a per-project audio folder, use the following procedure:

1. Make sure the **User Per-Project Audio Folders** option is selected in **Edit > Preferences > File - Audio Data**.

2. Open the project whose audio you want to store using per-project audio.

3. Select **File > Save As**.

   The **Save As dialog box appears**.

4. If you want, change the name of your project.

5. In the **Project Path** field, enter the new directory where you want to save the project, or use the **Browse** button to the right of the field to navigate to an existing directory.

6. Check the **Copy all audio with project** option.

7. Click **Save**.

8. SONAR copies the project to the directory specified in the **Project Path** field and stores all the project's audio in the directory specified in the **Audio Path** field.

> **Note:** *After you use the above procedure, you have two versions of the same project.*

Imported audio files

By default, SONAR will make a copy of any audio data imported using the **File > Import > Audio** command and place the imported audio into the project's audio folder. You can configure SONAR to simply reference audio from its current location if, for example, you want to import large quantities of audio data into a project and don't want to consume time and disk space by making copies of the files. Copies are always made if the imported audio does not match the current project's sampling rate (and if you edit any of the imported audio data). Automatic handling of imported files is enabled by default. Do not disable this option unless you are prepared to manage the audio files individually. Creating backups of your projects is very easy if all your audio is stored in a single, per-project directory.

To change handling of imported files

Use the following procedure to allow or disallow file sharing between projects:

1. Go to **Edit > Preferences > File - Audio Data**.

2. Check the **Always Copy Imported Audio Files** option to create copies of all imported audio clips as a default.

   Or

Uncheck the **Always Copy Imported Audio Files** option to reference imported audio from its current location.

ℹ **Note:** *You can override this setting when importing audio by checking or unchecking the* ***Copy Audio to Project Folder*** *option in the* ***Import Audio*** *dialog box.*

3. Click **OK** when you are done.

Imported files will be handled based on the settings you have chosen.

See:

Backing up projects with digital audio

There are several ways to back up your projects in SONAR. You can use per-project audio folders to keep all a project's audio in its own folder, use the Consolidate Project Audio command to create a backup copy of all your project's audio, or you can save a project as a bundle file (.cwb).

The following table lists several backup methods.

Backup Method	Advantages
Per-project Audio Folders If you are using per-project audio folders you can create a copy of the project folder and its audio subfolder.	This method is an exact copy of your project, preserving all clips and pathname information.
Consolidate Project Audio If your project references audio from multiple folders, for example you have a library of loops that you share between several projects, you can gather all the audio for your project into a single folder using the **Consolidate Project Audio** command. The **Consolidate Project Audio** command copies every audio file your project references into a backup folder beneath the projects audio data folder. Creating a copy of all your project's audio may take a lot of disk space.	Allows you to create a complete backup of all project audio even if the audio is in multiple locations. Creates a new folder which you can move or delete without fear of losing the original audio files.
Bundle Files A **bundle file** is a single file that contains all the information—except video—used in a project. A bundle file includes everything that is stored in a normal project file, plus all the digital audio that is used in the project.	Creates a single file for ease of portability.

Table 212.

To backup projects using per-project audio folders

Use this procedure to create a backup of a project that has its own project folder.

1. Open the project you want to backup.

2. Select **Project > Audio Files**.

    The **Project Files** dialog box appears.

3. In the **Project Files** dialog box, check the **Path** column to make sure that every audio file is stored in the project's audio folder. If any files are stored in folders other than the project's audio folder, you should use the **Consolidate Project Audio** command to move all audio to the project's audio folder.

4. Close the **Project Files** dialog box once you have confirmed that all audio files are in the project's audio folder.

5. Close the project.

6. Using Windows Explorer, copy the project folder and its contents, including the project's audio folder, to its backup location (CD-R, CD-RW, DVD-R, DVD-RW, Zip or Jaz drive, another hard drive, network drive, etc.).

You have now created a copy of your project. It is a good idea to open the project once you have backed it up to confirm that all audio loads properly.

To create a backup using the Consolidate Project Audio command

Use this procedure to backup a project that has multiple audio folders:

1. Open the project you want to backup.

2. Select **Utilities > Consolidate Project Audio**.

3. A message box appears listing the destination folder for your audio backup.

4. Click **OK** to confirm.

5. Using Windows Explorer, copy the project, the backup folder and all its contents, including the project's audio folder, to its backup location (CD-R, CD-RW, DVD-R, DVD-RW, Zip or Jaz drive, another hard drive, network drive, etc.).

    Note: *The Consolidate Project Audio command only copies the audio in your project, so make sure you copy the project (.cwp) along with the backup folder.*

6. Once you have copied the backup folder you can delete it to free up disk space.

Deleting unused audio files

The **Utilities > Clean Audio Folder** command is used to delete digital audio files in an audio folder if they are no longer used by any of your projects. You should use this command from time to time to free up disk space.

This command searches your entire system for project files, and then compiles a list of all the audio files in a specified folder that are not in use by any of these projects. You can then choose to delete these audio files. Make sure that all of your important project (.cwp) files are stored on your local hard disk(s) before using this command. If your project files are stored elsewhere (removable media, etc.), then you risk accidentally deleting important audio files that are associated with your projects.

If you are using another utility program that protects you from accidentally deleting important files (such as Norton Protect), you may need to disable that program. Otherwise, the next time you use the **Utilities > Clean Audio Folder** command you may once again find these not-quite-deleted files.

To delete unused audio files

1. Make sure all project files that contain audio are immediately accessible on a hard disk.

2. Choose **Utilities > Clean Audio Folder** to display the **Clean Audio Folder** dialog box.

3. Click the **Browse** button to the right of the **Audio Path** field and navigate to the folder you want to search for unused audio files.

4. If you want to search all subfolders of the folder you chose in the **Audio Path** field, click the **Recursive** option.

5. Click the **Find** button. SONAR searches the selected directory for audio files that appear to be unused by any existing projects, and displays the names of these files in the list.

   SONAR searches the entire system for project files. Audio files in the folder or folders you decide to search which do not belong to any of the projects on your system appear in the **Clean Audio Folder** dialog box. If any corrupted or unreadable project files exist on your system, the **Unreadable Files** dialog box appears. It is very important that you restore any unreadable files from a backup before continuing, otherwise you risk data loss.

6. Follow the instructions in the table:

To do this	Do this
Listen to a file	Highlight the file name in the list and click **Play**
Delete a file	Highlight the file name in the list and click **Delete**
Delete all files	Click **Delete All**, and click **Yes** to confirm

Table 213.

7. Click **Close** when you are done.

Improving audio performance

Digital audio presents several challenges: it is large, using enormous amounts of disk space, especially at higher sampling rates and bit-depths, and it is CPU-intensive. Added to this mix is the wide variety of audio hardware available today. This section covers some common problems with recording and playback and how to configure your computer and audio hardware for optimum performance.

See:

System configuration

This section covers optimizing your system configuration to work with SONAR.

See:

The Wave Profiler

The Wave Profiler is a utility that analyzes the sound cards in your computer and determines the best DMA (Direct Memory Access) settings for communicating with SONAR. These DMA settings are displayed in samples, at the sample rates and bit depths your sound card supports. The Wave Profiler also sets a value in milliseconds for the Buffer Slider, which controls mixing latency. The Wave Profiler is unnecessary if you are using an ASIO driver.

The DMA settings are used to ensure that a project that contains both MIDI and digital audio plays back in tight synchronization. If SONAR is not configured properly with your audio device's DMA settings, MIDI and digital audio material may not play back correctly.

Note to users of previous Cakewalk products: The DMA settings in versions of Cakewalk prior to SONAR 1.0 were displayed in bytes rather than samples. Using your previous DMA settings in SONAR will not work. Try the settings that wave profiler displays, and if you are not satisfied, only then attempt to optimize your settings.

The Wave Profiler utility runs automatically the first time you run SONAR. The wave profiler determines the best DMA settings for the supported bit depths and sample rates of your sound card.

> **Note:** *It is possible to load a 48 kHz project when you are using a sound card that does not support 48 kHz. SONAR does not warn you when you do this. Your project may crash, or it may appear to record audio when your project is not actually recording.*

All of your audio settings are listed in the **Preferences** dialog box, which you open with the **Edit > Preferences** command. The following list summarizes all the settings that the Wave Profiler sets. You can override all of them except what audio drivers are listed in the Drivers tab:

- Input and output drivers
- DMA buffer sizes (in samples)
- Mixing latency

If you experience MIDI and audio synchronization problems during playback, before contacting technical support, run the Wave Profiler and try the default settings.

To manually run the Wave Profiler

1. Go to **Edit > Preferences > Audio - Driver Settings**.

2. Click **Wave Profiler**.

The Wave Profiler examines each of your sound cards in turn, makes default settings in the **Preferences** dialog box, and displays the name of each sound card and the sample rates that each card supports.

Enabling and disabling audio devices

Your computer may have several installed devices like FAX modems and software synthesizers that Windows recognizes as sound cards containing audio drivers. You do not want to use these devices for audio input or output. If they are listed as audio drivers in the **Preferences** dialog box, you need to disable them.

To enable or disable an audio device

1. Go to **Edit > Preferences > Audio - Devices**.

2. In the **Input Drivers** and **Output Drivers** fields, do one or both of the following:

   • To enable an audio device, click the name of the device so that it is highlighted.

   • To disable an audio device, click the name of the device so that it is not highlighted.

3. Click **OK**.

Disabling a device in **Edit > Preferences > Audio - Devices** usually prevents conflicts with other audio devices. Occasionally you may need to disable a device in the Windows Control Panel.

SONAR also allows you to choose the sound card whose clock should be used to control recording and playback timing (if you only have one sound card, SONAR automatically uses it). Every sound card's clock crystal is slightly different, which causes minor differences in the actual playback rate on each card. These differences may lead to slight synchronization problems if you use one card for recording and a different one for playback. Generally, you should choose your highest quality sound card for both recording and playback timing. Note that while some multichannel sound cards have multiple drivers, most sound cards have only a single audio driver.

To select playback and record timing masters

1. Go to **Edit > Preferences > Audio - Driver Settings**.

2. In the **Playback Timing Master** and **Record Timing Master** fields, select which sound cards you want to control playback and record timing, respectively.

3. Click **OK**.

While you must choose a playback timing master, you can route audio output through any number of devices at once. For example, suppose your computer has both a high-end audio card and a basic built-in sound card. You should choose the high-end sound card as the record and playback timing master. However, using the buses in the Console or Track views, you could create a headphone or monitor mix and route it through the built-in sound card.

Sampling rates

SONAR supports all common sampling rates. Only one sampling rate is allowed per project. It's usually better not to change the sampling rate of a project, because this involves exporting your tracks one at a time, and then importing them at the new sampling rate. During this process you lose clip boundaries, envelopes, and other separate data that is mixed into the exported tracks.

To set the sampling rate for new projects

1. Go to **Edit > Preferences > Audio - Driver Settings** and change the **Sampling Rate** field to the desired number. You can choose from the available options, or enter any number that your hardware supports.

2. Click **OK**.

To change the sampling rate of a project

1. Select an audio track and use the **File > Export Audio** command to open the **Export Audio** dialog box.

2. Select the options you want, and click **Export** to export the track.

3. Repeat steps 1 and 2 for all the audio tracks you want to convert.

4. After you have exported all the tracks you want to convert, go to **Edit > Preferences > Audio - Driver Settings** and change the **Sampling Rate** field to the desired number.

5. Use the **File > New** command to open a new project.

6. Use the **File > Import > Audio** command to open the **Import Audio** dialog box.

7. Select the audio files you just exported (hold down the CTRL key while you click each one), and click **Open** to import the files.

SONAR imports the selected files at the new sampling rate.

To import audio that has a different sampling rate

• Use the **File > Import > Audio** command to import the audio file(s) (this converts them to the project sampling rate).

Bit depths and float resolution

SONAR supports all common bit depths, including 64. SONAR's 32-bit mixing provides full floating-point resolution for extended dynamic range, and precise audio processing. For maximum dynamic range and precision, you can also choose 64-bit mixing (go to **Edit > Preferences > Audio - Driver Settings** and select the **64-bit Double Precision Engine** check box). SONAR can import, export, play back, and render 64-bit float files.

A SONAR project can contain files of different bit depths. You can specify different bit depths for playing back, recording, importing, exporting, and rendering audio (bouncing, freezing, applying effects). To play back or record at a specific bit depth, your sound card must support that bit depth.

Notes about 64-bit files:

- 64-bit files can now be imported at their native 64-bit depth.
- At playback time 64-bit files are streamed at full 64-bit resolution when the Double Precision engine is turned on.
- At playback time 64-bit files are converted to 32-bit when the Double Precision engine is turned off.
- **64-bit** is a choice in the **File Import** dialog box.
- **64-bit** is a choice in the **Edit > Preferences > File - Audio Data** file bit depth fields.
- Bounce-to-track now renders at 64-bit if the render bit depth is set to **64**.
- You can save and load .cwb files containing any combination of 16/24/32/64 and stereo/mono wave files.

To find the bit depth of clips in a project

Do *one* of the following:

- Right-click a clip, choose **Associated Audio Files** on the pop-up menu, and examine the **Bit Depth** column.
- Go to **Project > Audio Files** command to open the **Project Files** dialog box, and examine the **Bit Depth** column.

The following topics show you how and why to choose bit depths for various operations.

See:

Bit depths for playback

Most sound cards can play audio at 16-bit or 24-bit resolution, with a few sound cards supporting 18-bit and 20-bit resolution. When your project contains files with different bit depths SONAR plays them at the bit depth that your sound card is currently set to. Because SONAR can play projects that contain files of different bit depths, you don't have to convert 16-bit files to 24 bits to play them with other 24-bit files, saving significant storage space. If you're playing 64-bit, 32-bit, or 24-bit files at 16 bits, you can turn dithering on in **Edit > Preferences > Audio - Playback and Recording** to compensate for the truncated data.

When you first install SONAR, the Wave Profiler profiles your sound card at all the bit depths that the sound card supports, so when you change the playback bit depth, you don't need to run the Wave Profiler again (you do need to relaunch SONAR).

Here's how to change the playback bit depth for a project:

To change playback bit depth

1. Go to **Edit > Preferences > Audio - Playback and Recording** and choose the bit depth you want to use in the **Audio Driver Bit Depth** field.

2. Click **OK**.

> **Note:**
>
> - *If you choose to play back at greater than 16 bits, you may need to pick a bit format for your data in* **Edit > Preferences > Audio - Audio Profiles** *in the* **Stream > 16 Bit Data As** *field. You may need to consult your sound card's documentation to find the optimum setting.*
> - *Some audio devices, especially USB devices that use WDM drivers, can not operate in 24-bit mode unless a variable in SONAR's* Aud.ini *file is set to 1. The variable is Use24BitExtensible=<0 or 1>, which goes in the* [name of your audio device ('n' in, 'n' out)] *section of the* Aud.ini *file.*
> - *SONAR 4 does not play back projects that contain files with different bit depths (SONAR 5 and later), so if you want to open a multiple bit depth project in SONAR 4, see the following procedure or a conversion procedure.*

To rewrite audio files at different bit depths

1. Use the **Utilities > Change Audio Format** command to open the **Change Audio Format** dialog box.

2. Choose a new bit depth in the **New Bit Depth** field.

3. If you're changing to 16 bits, you can check or uncheck the **Apply Dither** check box. Dithering means to add a certain audio signal to 16 bit audio to make it sound more like it did as a higher-bit signal.

4. Click **OK**.

SONAR rewrites the audio tracks in your project at the new bit depth.

Bit depths for recording

You can choose the bit depth of newly-recorded files in SONAR, and you can change this value at any time. The Transport module in the Control Bar shows the project sampling rate and the current record bit depth setting.

The choices for the recording bit depth setting are 16, 24, 32, and 64. At present, no devices can record at 32-bit or 64-bit resolution, so you don't need to choose these options yet. 24-bit files give greater dynamic range than 16-bit files, so 24 is a good choice for music that gets very soft, as well as loud. 16-bit recording is efficient for many recording projects, especially louder projects.

To choose a recording bit depth

1. Go to **Edit > Preferences > File - Audio Data**.

2. Under **File Bit Depths**, change the **Record Bit Depth** field to the desired number.

3. Click **OK**.

Bit depths for importing audio

You can choose the bit depth of imported files in SONAR, and you can also import files at their current bit depth. You can import files at bit depths as high as 64. Because SONAR can play projects that contain files of different bit depths, you don't have to convert 16-bit files to 24 bits to play them with other 24-bit files, saving significant storage space.

> **Note:** *If you are playing back 32-bit or 64-bit audio at high sample rates (and high latency sizes), the disk I/O buffer size in **Edit > Preferences > Audio - Sync and Caching** may need to be increased to handle this extra disk streaming throughput. A too small disk I/O buffer size can result in dropouts or clicks during audio playback of such content. If so try a higher I/O buffer size like 256 or 512.*

See "Bit depths and float resolution" on page 1184 for more information about 64-bit files.

To choose an importing bit depth

1. Go to **Edit > Preferences > File - Audio Data**.
2. Under **File Bit Depths**, change the **Import Bit Depth** field to the desired number. You can choose the **Original** option to import the files at their current bit depth.
3. Click **OK**.

This process changes the default import bit depth, which appears in the **Import Audio** dialog box. You can override this value for one import process at a time by changing the value in the **Import Audio** dialog box.

See also "SONAR project file compatibility notes" on page 1188.

Bit depths for exporting audio

You can choose the bit depth of exported files from SONAR. Unless you are burning a CD or DVD, or are concerned about storage space, you can export files at 32 bits (or even 64) to preserve the precision of any audio processing that was done to the files.

To choose an exporting bit depth

1. Use the **File > Export > Audio** command to open the **Export Audio** dialog box.
2. In the **Bit Depth** field, select the desired number.
3. Choose other options and click **OK**.

Bit depths for rendering audio

You can choose the bit depth that SONAR uses for such operations as bouncing tracks, freezing tracks, and applying effects (these processes are referred to as rendering). This bit depth is set at 32 by default, which allows large level changes without clipping, and with greater dynamic range, especially in soft parts of your music. You can also render at 64 bits for greatest precision.

To choose a rendering bit depth

1. Go to **Edit > Preferences > File - Audio Data**.
2. Under **File Bit Depths**, change the **Render Bit Depth** field to the desired number.
3. Click **OK**.

Preparing higher-quality audio for CD burning

If your project uses a different sampling rate from 44,100, or contains files that are not 16-bit, use this procedure to prepare your project for CD-burning:

To prepare higher-quality audio for CD burning

1. Use the **File > Export > Audio** command to open the **Export Audio** dialog box. Choose **RIFF Wave** in the **Files of Type** field, **Export to Stereo File(s)** in the **Format** field, and **16** in the **Bit Depth** field.
2. After exporting the audio, close SONAR and open up your sound card control panel (for M-Audio cards, usually the Delta Control Panel, for Echo Audio, usually the Echo Console, for MOTU it's the 324 console, etc.) Once the control panel is open, change the setting for your sampling rate to 44.1 kHz.
3. Next launch SONAR, go to **Edit > Preferences > Audio - Driver Settings** and change the **Audio Driver Bit Depth** to **16**. Change **Default Settings for New Projects** to **44100 Hz** for the **Sampling Rate**.
4. After making these adjustments, click the **Wave Profiler** button. In some instances, with certain audio hardware configurations you may be prompted with an audio driver error dialog box during this process. This is nothing to be concerned about. You will have to exit SONAR, re-launch, verify the settings you made in the **Preferences** dialog box, and click the **Wave Profiler** button again. When you can successfully run the Wave Profiler without an audio driver error, proceed to the next step.
5. Create a new project (**File > New** command). The **Normal** option is fine for this.
6. Import the mixed down audio by using the **File > Import Audio** command.
7. Confirm the bit depth and sample rate of the imported audio by using the **File > Info** command, and clicking **File Stats**. The **File Stats** dialog box lists the correct sample rate and bit depth.
8. Final step: use the **File > Export > Audio** command. Be sure to select **16** for the **Bit Depth** and uncheck all **Mix Enables**.

Now you can burn your exported audio file to CD, using Pyro Audio Creator, or other software.

SONAR project file compatibility notes

Cakewalk Bundle (.cwb) files containing double precision 64-bit floating point files will not open in SONAR 5 or earlier versions.

Project files saved in SONAR X2 will not open in SONAR 4 if they reference or include any of the following types of data or information:

- 32 bit audio clips.
- Audio clips that are not all of the same bit depth.

SONAR X2 project files may contain new features that will be missing if opened in SONAR 4, including:

- Clip effects and clip automation:
  - Effects are removed.
  - Automation envelopes are orphaned.
- Groups:
  - SONAR X2 groups are preserved but will not be completely functional in SONAR 4.
  - Controls may be removed from groups.
  - Groups can't be added to or changed.
  - Group names will be truncated.
  - SONAR 4 may add extra groups to the project.

Re-saving a SONAR X2 project file in SONAR 4 may permanently remove the project data described above.

Improving performance with digital audio

When a project contains many tracks of digital audio or when many real-time effects are in use, your computer may have difficulty keeping up during playback. When this occurs, you'll hear portions of the audio drop out, stutter, or pop. Or maybe your project responds slowly to real-time effects and volume changes. In an extreme case audio playback may stop altogether. If you experience a dropout, a dialog box appears with suggestions for fixing the problem. This section covers performance issues specific to digital audio, including how to get the more tracks of audio, more real-time effects, lower latency and how to fix audio dropouts.

For more information, see:

Getting the most out of your computer

The maximum number of audio tracks you can expect to play on your computer depends on the audio sample rate, the speed of your hard disk, and the speed of your computer's CPU.

The effect of your CPU on audio track throughput is much more difficult to quantify. Throughput is affected by the type of chip, clock speed, the number and type of real-time effects in use, cache size and settings, and many other factors.

There are a variety of things you can do to increase the number of audio tracks and effects you can play on your computer, as outlined in the following table.

Approach	How it works
Avoid compressed disks	If you use DoubleSpace, Stacker, or some other disk compression system, it will slow down playback of audio tremendously. Configure your system so that the Data directory is on a hard disk that is not compressed.
Exit other programs	The more programs you have open, the more CPU cycles you are taking away from your project. Exit any programs unnecessary to the task at hand.
Refrain from other activity during playback	If you open and close windows or do lots of editing while playback is in progress, you may steal CPU cycles that would otherwise be used for playback.
Apply some audio effects offline	If you are happy with your real-time effects, consider using the **Process > Apply Effect > Audio Effects** command to apply those effects offline. Then remove those effects from real-time use and free up lots of CPU power.
Archive unused audio tracks	Audio tracks that are muted continue to place a load on your processor. To lessen the burden and free up cycles to handle more audio, archive all unused audio tracks. See "To archive or unarchive tracks" on page 198 for more information.
Mix down or freeze your audio/synth tracks	If your project contains many different audio/synth tracks or many real-time effects, you can use the Track view **Tracks > Bounce to Track(s)** command or click a track's **Freeze Track** button to reduce all of this content to an audio track or tracks with no active effects.
Change **I/O Buffer Size** on the **Advanced** tab of the **Audio Option**s dialog box	The default setting is 64 KB. Yours may work better with 128, 32, or 16. If those values don't help, try 256, 512, or move on to another remedy.
Defragment your hard disk	If your hard disk is fragmented, playback of audio will be slower. Use the Disk Defragmenter to correct the situation.
Turn off dithering in the **Edit > Preferences > Audio - Playback and Recording** dialog box (choose **None** in the **Dithering** field).	Dithering subtly improves your mix, but most people can't hear it. Turn it back on for mastering.

Table 214.

Approach	How it works
Enable read and write caching	By default, SONAR bypasses all disk caching, which typically results in better performance with audio data. If your computer has an older IDE disk controller, or a disk controller that does not use DMA transfers, enabling caching may improve SONAR's audio performance. **Note**: Changes to these settings only take effect when you restart SONAR. Go to **Edit > Preferences > Audio - Sync and Caching** to change the **Enable Read Caching** and **Enable Write Caching** settings.
Disable the Display Clip Contents options	Drawing the contents of audio clips in the Clips pane uses some CPU cycles. If you are using a slow machine, you may want to disable this feature. To do so, click the Track view **View** menu, point to **Display** and choose **Display Clip Contents**.

Table 214.

Digital audio files and storage

Digital audio requires a large amount of disk storage. The following table shows the disk space requirements in megabytes for a single minute of digital audio in mono and stereo at various sampling rates.

Sampling rate	16 bit	24 bit
11 kHz Mono	1.3 MB per minute	1.9 MB per minute
11 kHz Stereo	2.5 MB per minute	3.8 MB per minute
22 kHz Mono	2.8 MB per minute	3.8 MB per minute
22 kHz Stereo	5.0 MB per minute	7.6 MB per minute
44.1 kHz Mono	5.0 MB per minute	7.6 MB per minute
44.1 kHz Stereo	10.1 MB per minute	15.1 MB per minute
48 kHz Mono	5.5 MB per minute	7.6 MB per minute
48 kHz Stereo	11.0 MB per minute	16.5 MB per minute
96 kHz Mono	11.2 MB per minute	16.5 MB per minute
96 kHz Stereo	22.0 MB per minute	33.0 MB per minute

Table 215.

For more information, see "Dropouts and other audio problems" on page 1197.

See:

"Mixing latency" on page 1192

Mixing latency

SONAR has a Buffer Size slider in **Edit > Preferences > Audio - Driver Settings** to set mixing latency. Mixing latency is the amount of time SONAR allocates to prepare a buffer full of audio data for playback. Lower latency settings add processing time because of the need to refill the smaller data buffers more often. You may need to use the slider to **increase** mixing latency under the following conditions:

- You use lots of real-time effects, and you hear dropouts. Check the CPU meter for high readings; try increasing the latency.
- Your sound card does not function well at lower latency. Some sound cards just do not function well at lower latency settings. Even though SONAR's CPU meter and Dropout indicator report no problems, if you hear dropouts try increasing the mixing latency.

Sound cards differ in the precision of their timing, what size audio buffers they require, and other characteristics. SONAR has a utility called the Wave Profiler that can usually automatically detect the type of sound card that you have installed and configure its settings for best performance. If your sound card is a well-known model, you can usually use SONAR without having to change many audio settings. However, if you experience synchronization problems between MIDI and digital audio, like to use different sample rates and bit depths, or want to experiment with mixing latency, you need to do some optimization yourself.

See:

ASIO drivers

SONAR supports ASIO drivers. You are limited to a single sound card when using an ASIO driver.

To use an ASIO driver

Use the following procedure to enable SONAR for use with an ASIO driver.

1. Go to **Edit > Preferences > Audio - Playback and Recording**.
2. Click the **Driver Mode** list and select **ASIO**.

   SONAR re-profiles your audio hardware.

ASIO sample position

`UseHardwareSamplePosition=<0, 1>, default = 0`

This variable applies to ASIO mode only and controls whether SONAR internally compute the sample position based on buffer switch calls or uses the ASIOGetSamplePosition reported value to retrieve the driver reported value.

Some drivers change the reported sample position based on how long a buffer switch took to complete and this can cause problems since SONAR expects the reported position to be in sync with the number of buffers actually streamed.

This `Aud.ini` variable defaults to 0.

Minimize driver state changes

SONAR has an option to not reset audio devices each time playback or recording starts. This option minimizes device state transitions in response to transport operations. When enabled, SONAR attempts to keep the device in a running state as far as possible.

To configure the MinimizeDriverStateChanges option

1. Go to **Edit > Preferences > Audio - Configuration File**.

2. Under **Configuration Settings**, click **Edit Config File**.

   The `Aud.ini` file opens in the default Windows text editor.

3. In `Aud.ini`, locate the entry called `MinimizeDriverStateChanges` and set it to the desired value. For example:

   `MinimizeDriverStateChanges=1`

   Valid values are as follows:

   • 0 = off.

   • 1 = On for ASIO only (default).

   • 2 = On for WDM only.

   • 3 = On for both ASIO and WDM.

4. Save `Aud.ini` and close the Windows text editor.

5. Click **Reload Config Settings** to reload the current audio configuration settings from `Aud.ini`.

   Note: *The* `MinimizeDriverStateChanges` *variable only applies when using ASIO or WDM driver modes, not when using the MME driver mode.*

Queue buffers

SONAR allows you to set the number of queue buffers in **Edit > Preferences > Audio - Driver Settings**. A higher number of queue buffers will take longer to fill, and therefore cause an increase in latency. A lower number of queue buffers decreases latency, but may cause "dropouts." The

default setting is 2. For more information, see "Mixing latency" on page 1192, and "Dropouts and other audio problems" on page 1197.

CPU meter/Disk meter/Dropout indicator

SONAR has several tools to help you identify and correct audio problems, including the CPU meter and Disk meter in the Control Bar's Performance module, and the Dropout indicator in the Transport module.

Figure 343. *The Transport module.*

The Dropout Indicator ![DROP OUT] appears whenever your project requires more resources than your CPU, main memory, and disk can supply. For details, see "Dropouts and other audio problems" on page 1197.

Figure 344. *The Performance module.*

A. CPU meters (one per core) B. Disk Activity indicator C. Disk Space meter D. Memory Usage meter

The Performance module contains the following controls:

• **CPU meters.**   Displays the time it takes to process a buffer full of audio data as a percentage of the maximum time available to process that data and maintain uninterrupted playback. There is one CPU meter for each core in your computer, up to 32 cores. There is some tolerance built into the meter, so it is possible that it will exceed 100% at times (more so during recording than playback).

ⓘ   **Note:** *The width of the Performance module depends on the number of CPU cores available.*

32 cores

4 cores

- **Disk Activity indicator** 🖫.   Measures how much of the available time SONAR is using to perform input/output functions on your hard disk. The size of your setup's I/O buffer size (listed under **File System** in **Edit > Preferences > Audio - Sync and Caching**) determines how much time is allowed to perform disk operations and maintain uninterrupted playback. When SONAR performs disk operations, the Disk Activity indicator changes color from yellow to red to indicate the time SONAR is taking to complete each cycle of disk input/output. A red icon indicates very high data activity.

- **Disk Space meter.**   Shows the amount of available space on the drive where your wave data directory is located. The tooltip shows the actual remaining disk space on your audio disk.

- **Memory Usage (RAM) meter.**   Shows the total memory (RAM) usage by your computer, not just by SONAR.

> ℹ️ **Note:** *If you experience a dropout or your CPU or Disk meters are reading high, there are steps you can take to improve your audio performance. For more information, see* "Audio dropouts or crashes during playback" *on page 1256.*

See also:

"Multiprocessor load balancing" on page 1195

Multiprocessor load balancing

SONAR's audio engine has enhanced multicore performance and load balancing.

The CPU meter in the Control Bar's Performance module shows the time it takes to process a buffer full of audio data as a percentage of the maximum time available to process that data and maintain uninterrupted playback. There is one CPU meter for each core in your computer, up to 32 cores.

Figure 345. *The Performance module.*
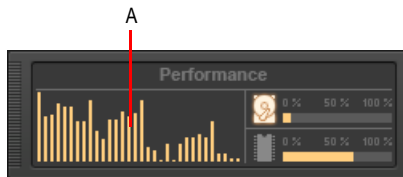
A. CPU meters (one per core)

See also:

"CPU meter/Disk meter/Dropout indicator" on page 1194

Reduce GUI updates to improve playback performance

SONAR has a CPU conservation mode that reduces the number of GUI updates with no effect on actual playback quality and rendering. This maximizes CPU resources for the audio engine and can be useful while playing projects that consume a lot of CPU, to help avoid dropouts.

Like the **Scroll Lock** key, the **Pause** key now works as a special GUI throttle toggle key. When the **Pause** key is pressed, SONAR runs in a CPU conservation mode by reducing the frequency of GUI updates. For example, VU meter updates, Now position pointer and progress updates will appear to update less frequently.

During CPU conservation mode, the UI is only updated once per second.

This mode can also be helpful to conserve CPU while doing a real-time bounce (see "Real-time bounce" on page 923).

24-bit tips

Here are a few tips for playing back and/or recording at 24-bits:

- Try to play back at 24-bits even if your sound card only operates at 20- or 18-bits:

  Having established the default settings for new files, you must also specify at what playback bit-depth you want your sound card to use. In **Edit > Preferences > Audio - Driver Settings** , set the **Audio Driver Bit Depth** to the desired value. Even if your sound card's highest bit-depth is only 18- or 20-bits, you should try selecting an **Audio Driver Bit Depth** of **24** first. If you receive an error message when doing so, try selecting **20**. If this also produces an error message, try selecting **18**. In other words, if you want SONAR to operate your sound card at any bit-depth greater than 16-bits, try selecting the highest value possible in the **Audio Driver Bit Depth** setting, and work downward from there if you have to.

  (If your sound card's maximum bit-depth is 20-bits and you specify an **Audio Driver Bit Depth** of **24** as advised above, audio data will still be sampled by your sound card in 20-bit samples, but each sample will automatically be padded with extra 0's to produce a 24-bit sample, which will be stored at full 24-bit resolution in your project file.

- Some 24-bit cards require you to configure the order in which data is streamed:

  If necessary, go to **Edit > Preferences > Audio - Driver Settings** and select one of the following options in the **Stream > 16-bit data as** list:

  - 3 bytes
  - 4 bytes, right justified
  - 4 bytes, left justified
  - 32-bit PCM, right justified
  - 32-bit PCM, left justfied

  These settings affect how 24-bit audio samples are transferred from the sound card into the SONAR software, and affect the efficiency of the transfer. You'll get the best performance from this card when working at 24-bits if you use the correct setting for your sound card. If you're not sure whether your particular sound card requires these settings, consult the documentation that

came with your sound card. You should also check the web page www.cakewalk.com/Support/Docs/sound cardTips.html to see if any information is available there regarding configuration of your particular sound card in Cakewalk. When in doubt, leave these settings disabled.

(These settings are only relevant when working with sound cards at >16 bits-per-sample. You can ignore them when operating at normal 16-bit depth.)

• Using 24-bit depth and/or high sampling rate can be costly:

While using 24-bit audio can improve the sound quality of your recordings, there are some important drawbacks to keep in mind. Projects stored at 24-bit depth will require 50% more disk space than those stored at 16-bits; if you have a large number of audio tracks (and keep in mind that stereo tracks require twice as much data as mono tracks!), your audio project file can grow very large and use up lots of disk space. Also note that recording, playing, and processing 24-bit data utilizes more CPU resources than working with 16-bit data. This means that for a given computer configuration, you will be able to record/play/process a smaller number of total simultaneous tracks, and use a smaller number of simultaneous real-time effects, in a 24-bit project than you would be able to in a 16-bit project. This is also true when working at higher sampling rates (i.e., a 24-bit/96khz project requires substantially more computing resources than a corresponding 16-bit/44.1khz project). Depending on the size of your project and the configuration of your computer (CPU, RAM, disk), you may need to reconsider whether working at the higher bit-depth/sampling rate is justified or even possible.

Some plug-ins do not function well at a 96 kHz sampling rate.

Using an audio bit depth of 24 can enhance the performance of some plug-ins, but raising the sampling rate to 96 kHz does not offer much improvement, and can cause some plug-ins to add unintended artifacts to the sound. Using a 24-bit, 44.1 kHz setup for your audio provides plenty of enhanced performance for plug-ins that can take advantage of it, without risking the problems that 96 kHz audio causes with some plug-ins.

It's also worth noting that not all audio projects benefit equally from the use of higher bit-depth/sampling rates. Most professional sound engineers will tell you that 24-bit, higher-sampling-rate audio is most beneficial when working with music that focuses on natural acoustic instruments and/or vocals recorded with very high-quality microphones. The benefits of 24-bit/high-sampling-rate recording are less audible when working with highly synthetic or highly compressed program material, often found in contemporary popular music. You must make your own judgement about whether the benefits of higher-capacity audio justify the extra demands it places on your computer.

Note: *Red Book Audio CDs are still 16-bit (44.1 sampling rate), so if your goal is to burn a CD, you will have to mix down to 16-bit.*

Dropouts and other audio problems

If your SONAR application suddenly stops producing audio while in the midst of recording or playback, you've very likely experienced a "dropout." Sometimes instead of a dropout, you may experience a "stutter" during playback (a small section of audio repeats itself once or twice before normal playback resumes). Or, you may occasionally experience a "glitch" or "pop" during audio playback (a brief interruption or clicking noise is heard, but audio playback then continues normally

from that point). It is possible to experience a dropout while working exclusively with MIDI (i.e., no audio data in the project), but this is a different matter and is not covered here.

All of these audio problems are the result of audio information not being sent to or received from your sound card fast enough or reliably enough. During recording, the sound card sends incoming audio data to the sound card driver, which in turn sends audio data to SONAR to store on hard disk. When playing back, SONAR reads audio data from the hard disk and feeds it to the sound card driver, which in turn passes it to the sound card for audible output. If these activities can't be completed fast enough, or if the communication between SONAR and the sound card driver is broken in some way, recording and/or playback will be disturbed.

Causes and cures

The exact cause of your audio problem will vary depending on the configuration of your computer and/or the content of the project file you're working with. The majority of audio problems are caused by one of the factors listed here. Read each of the following topics, in the order shown, and follow the recommendations provided:

"The CPU is being interrupted by "background" activities having nothing to do with audio" on page 1198

"Cakewalk doesn't properly "recognize" your sound card" on page 1199

"The "I/O Buffer Size" may not be well matched to your hard disk" on page 1199

"Mixing latency may be set too low" on page 1200

"Your hard disk may be excessively fragmented" on page 1200

"Your project file may be excessively fragmented" on page 1200

"Your sound card's driver may be obsolete" on page 1201

"There may be a conflict with your video card or other multimedia streaming card" on page 1201

"Your sound card may have a conflict with another device in your computer" on page 1203

"Your project may simply be too "complex" for your computer" on page 1204

"Upgrade your computer hardware: more RAM, a faster CPU, and a faster disk drive" on page 1204

The CPU is being interrupted by "background" activities having nothing to do with audio

Turn off these other activities, so your CPU can process audio without interruption:

- Turn off the **Microsoft Office FastFind** option if present on your system.

- Don't use any scheduled background tasks (e.g., tasks which are part of the Windows Plus package, or which you have scheduled yourself using the Windows Task Scheduler utility).

- Discontinue use of any networking or communications applications on your computer. For example, don't run email programs (like Microsoft Outlook), Web browsers, or AOL client software while you are running SONAR. These programs send and receive chunks of information over a modem or a network connection; when one of these data chunks is sent or received, your CPU may be unexpectedly interrupted from SONAR audio processing to deal with the modem or network data. That interruption can disrupt the smooth processing of audio data, causing a

dropout or glitch. If possible, you should disconnect your computer from a local area network, and/or disconnect from any dial-up telecommunications while recording or playing back audio in SONAR.

- Turn off your screen saver (if present).

- Turn off the **Auto-Notification** option for your CD-ROM drive. If it is turned on, the insertion of a CD-ROM can interrupt audio processing.

  To disable it, open the System applet in the Control panel, click on the **Device Manager** tab, expand the CD-ROM list entry, double-click on the listed CD-ROM device, click on the **Settings** tab, and uncheck the **Auto Insert Notification** check box.

- Disable any kind of virus scanning program that might be running in the background. To find out what programs are currently running, press the CTRL-ALT-DELETE keys simultaneously to display the Windows Task Manager; if you see an anti-Virus program shown on the list of currently running tasks, select that program and click **End Task**.

- If SONAR's Auto Save feature is enabled, disable it.

- Remove all programs from the Windows Start Up folder (\Windows\Start Menu\Programs\Start Up).

Cakewalk doesn't properly "recognize" your sound card

Re-run the SONAR Wave Profiler, which will attempt to analyze your sound card and establish proper settings for it:

- Go to **Edit > Preferences > Audio - Driver Settings** and click the **Wave Profiler** button.

- If Wave Profiler offers you the chance to use "default settings" for your sound card, accept the defaults, close the **Preferences** dialog box, and check audio playback/recording.

- If problem(s) continue, re-run the Wave Profiler, but this time do not accept any default settings.

- If you decline to use default settings (or if Wave Profiler can't find any for your sound card), Wave Profiler will analyze your sound card's capabilities by running some tests and automatically establish appropriate settings based on the test results.

- If your sound card is listed at www.cakewalk.com/Support/Docs/sound cardtips.html, read and follow any special card-specific operating instructions listed there.

- Re-test audio recording/playback. If problem(s) persist, go to the Next Step.

The "I/O Buffer Size" may not be well matched to your hard disk

SONAR may be reading and writing audio data to/from your hard disk in chunks that are either too large or too small for your particular hard disk's characteristics.

Go to **Edit > Preferences > Audio - Sync and Caching** and try different values for **Playback I/O Buffer Size** and **Record I/O Buffer Size** until you find values that works well for your particular hard disk:

- The default value is **64**. Try reducing this value, to **32**, then **16**. After each change, close the dialog box (click **OK**) and re-test your project's recording/playback behavior.

- If problem(s) persist, try increasing this value, to **128**, then **256**, then **512**. Again, close the dialog box and re-try your project after each change.

- If you have an older, slower computer or an older, slower hard disk, you should try increasing the buffer size; decreasing is not advised on slower hardware. However, increasing this setting uses more of your computer's RAM. If you have a smaller amount of RAM in your computer, increasing the buffer size may not help.

If problem(s) persist, restore this value to its default and continue with the next step.

Mixing latency may be set too low

SONAR tries to send and receive audio data to/from your sound card with very a minimal delay (so that any real-time adjustments you make to a track's volume, pan, or other settings will take effect rapidly). If the latency setting is set too low, the sound card driver may not be able to keep up with the SONAR, and audio will be disrupted.

Try higher latency settings:

- Go to **Edit > Preferences > Audio - Driver Settings** . Move the **Mixing Latency Buffer Size** slider control to the right in small increments until you see the value to the right of the slider increase; close the dialog box (click **OK**) and re-test your project after each increment.
- If problem(s) continue, move the slider control back to its original position, and try increasing the number in the **Buffers in Playback Queue** textbox. (This value starts out at **4**; try increasing it to **5**, **6**, **7**, or **8**). Close the dialog box (click **OK**) and re-test your project after each such change.
- The total effective latency is displayed below the slider; it is determined by multiplying the per-buffer latency time (in msec) by the number of buffers in the playback queue.

Your hard disk may be excessively fragmented

Audio data can be processed most efficiently if it is arranged in consecutive physical locations on your hard drive. Over time, the chunks become distributed at various discontiguous locations on your disk, which makes it more time consuming for SONAR to access the chunks. This extra access time can interfere with smooth audio recording and/or playback.

Try defragmenting the hard disk:

- Make sure SONAR, and the Wave data directory are not installed on a compressed hard disk.
- Defragment your hard disk. If you have more than one hard disk in your computer, identify the disk which contains the SONAR Data directory (this is where your projects' audio clips are stored.) To defragment the hard disk, exit SONAR first. Then, select **Start > Programs > System Tools > Accessories > Disk Defragmenter**. We recommend that you backup your hard disk before defragmenting it.

Your project file may be excessively fragmented

Audio data can be processed most efficiently if it is arranged in consecutive physical locations on your hard drive. During normal SONAR usage, a project's audio data can become fragmented into chunks stored at discontiguous locations on your disk. Accessing these discontiguous chunks can consume extra processing time, which can lead to dropouts.

Try defragmenting your project file:

1. Open the project file that has audio problems.

2. Save it as a Cakewalk Bundle (.cwb) file by selecting **Save As** from the **File** menu and selecting **Cakewalk Bundle** from the **Save As Type** drop-down list and clicking the **Save** button.

3. Close the project.

4. Open the Cakewalk Bundle you just closed

Saving then re-opening the bundle file automatically defragments the audio data used by the project, reducing the chances of a dropout or other audio problem.

When you are ready to save the file again, you may want to save it as a normal (.cwp) file. Saving and opening .cwp files takes less time than saving and opening bundle files.

Your sound card's driver may be obsolete

Obtain and install a new sound card driver (if available):

• Consult your sound card manufacturer's web site (or contact their Customer Service department) to check for the availability of a later driver version. If one exists, obtain it and install it on your computer according to their instructions. With the new driver installed, restart the computer, then delete the file `cw9auddx.ini` from your SONAR folder. Launch SONAR and let it re-profile your audio hardware. When it's done, re-test your audio recording/playback.

• If problem(s) persist, continue with the next step.

There may be a conflict with your video card or other multimedia streaming card

Some video drivers contain bugs which can interfere with SONAR's operation. Or, the driver may be "stealing" excessive CPU time away from SONAR (some video card vendors, in an attempt to make their cards operate faster, supply drivers that tie up the computer's bus for relatively long intervals (so-called "PCI bus contention"). This can interrupt the smooth flow of audio data between SONAR and the sound card's driver.)

Try to remove the video card conflict as follows:

• Try turning off "hardware acceleration" on your video card (if available). This may cause more sluggish screen drawing, but may improve the flow of audio data to your sound card, thereby reducing the possibility of dropouts.

  To disable the hardware acceleration on your graphics card: Launch Control panel (**Start > Settings > Control panel**). Double-click the **Display** icon. Select the **Settings** tab. Click on the **Advanced Properties** button. Select the **Performance** tab. Move the slider for **Hardware Acceleration** one notch at a time toward 'none' and re-test your recording/playback after each such adjustment. If problem(s) persist, leave the slider at 'none' and proceed with the next step.

• Try Using the Windows driver for your specific sound card (instead of the manufacturer's driver).

• Try using the standard VGA/SVGA drivers provided with Windows (instead of the drivers provided by the manufacturer).

• Check your video card manufacturer's web site for a later driver version. If a newer driver is available, download it and install it on your computer following the manufacturer's instructions.

  • If you have an STB Velocity 128 card, and your graphics card was configured and shipped with a new computer, you may want to check the computer vendor's Web site (instead of

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Improving audio performance

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STB's site) to see if they offer a driver update for the STB card. Computer vendors often will customize drivers to their specific needs and you should use their driver updates.

- Try reducing the number of colors used by your video card. 16-, 24-, or 32-bit true color display settings can severely hamper real-time audio performance on some computers; using fewer colors allows your computer to spend more of its processing time on audio and MIDI.

  You can adjust color depth by right-clicking on your Windows desktop, clicking **Properties**, clicking on the **Settings** tab, and selecting a suitable entry in the **Colors** list. Also, try reducing the display resolution. Re-test your audio playback/recording with these changes.

- If you have one of the following specific video cards, applying the following card-specific .ini file settings can reduce PCI bus contention problems. Be sure to check out www.cakewalk.com/Support/Docs/VideocardTips.html for more information about these and other popular video cards:

  - If you have a Hercules Dynamite 128 card:

    Open the `System.ini` file in Notepad (or any text editor). In the section called `[Hercules]`, check to ensure that this line is present:

    `Optimization=1`

    (The default is 0; if necessary, edit the value to 1 and save the file. Restart Windows.

  - If you have a Matrox Millenium card:

    Open the `System.ini` file in Notepad (or any text editor). In the section called `[mga.drv]`, add the following line:

    `Pcichipset=1`

    Edit the file as necessary, and save the file. Restart Windows.

    If you have an early Matrox video card, Disable Use PowerGDI acceleration:

    (**Start > Settings > Control panel > Display > MGA Settings > Advanced > Performance**)

    If you have a later Matrox video card, enable Use Bus Mastering and Disable use Automatic PCI Busd Retries:

    (**Start > Settings > Control panel > Display > Settings > PowerDesk button**)

  - If you have a card based on the S3 chipset (S3, Inc. provides graphics chips for other manufacturers; consult your card manufacturer's Web site to see if that card is S3-based):

    Open the `System.ini` file in Notepad (or any text editor). In the section called `[display]`, make sure the following line is present:

    `BusThrottle=1`

    Edit as necessary, and save the file. Restart Windows.

- If problem(s) persist, continue with the next step.

Your sound card may have a conflict with another device in your computer

Try resolving this device conflict as follows:

*   Ensure that your sound card is not sharing IRQs with any other device. Although some sound cards claim that they work properly on a shared IRQ, this is usually not the case and it is advisable to avoid such sharing. To do this, right click on **My Computer** and select **Properties** from the pop-up menu. In the **System Properties** dialog box, click on the **Device Manager** tab, then double-click on the Computer icon at the top of the list. This allows you to look at all the devices on your system and which IRQs they are using. Scroll through the list until you see your sound card. Check the IRQ setting to the left of the icon. If there are other devices (such as a video card) that are assigned to the same IRQ, you should try moving your sound card to a different slot in your computer. Note that entries which say something like "IRQ Holder for PCI Steering" do not indicate conflicting devices, and can be ignored.

*   Go to **Edit > Preferences > Audio - Devices** and make sure that only your sound card's input and output drivers are highlighted in both menus. (If you have more than one sound card installed in your system, try using only a single sound card and deselecting the other(s). If you can get audio to record/playback properly on a single sound card, but you encounter problems using two sound cards simultaneously, there may be a conflict between the two sound cards. Contact Cakewalk Technical Support for assistance in this event.)

*   If problem(s) continue, another multimedia audio device on your system (like a built-in sound card or voicemodem) could be interfering with your sound card's functionality. To see if this is the cause of your problem(s), you'll have to temporarily disable these other devices. Note that this may cause other programs which rely on these other devices to no longer work correctly.

    To disable these other device(s), in Windows go to the Control Panel, and double-click the Multimedia icon. Click the **Advanced** tab, and click the plus sign next to **Audio Devices**. Double-click any audio devices listed there that AREN'T the sound card, and choose **Do Not Use Audio Features on This Device**. Click **OK**, and repeat this step for any non-sound card device, including voicemodems, 'virtual audio devices' or 'game-compatible devices'. Once the sound card is the only device left, click **OK**, and restart the computer. After restarting, delete the file cw9auddx.ini from your Cakewalk folder. Once you've deleted those files, launch Cakewalk, and let it profile your audio hardware. When it's done, try playing your audio again.

*   If problem(s) continue, try deselecting any MIDI devices which you might be using. In SONAR, go to **Edit > Preferences > MIDI - Devices** and deselect every MIDI device in both **Inputs** and **Outputs**, then when SONAR asks, select **Continue with no MIDI input** and **Continue with no MIDI output**, and try re-test your audio recording/playback.

*   If problem(s) persist, reselect your audio and MIDI devices, and continue with the next step.

Your project may simply be too "complex" for your computer

Your computer may not have enough processing power to deal with all of the tracks, clips, and real-time effects used in your project. You can upgrade your computer hardware (see) or you can simplify your project's content so it demands less processing power.

If possible, try reducing the complexity of your project in any of the following ways:

• Reduce the number of real-time effects used in your project. Instead of generating the effects in real-time (nondestructively) during playback, consider applying the effects offline (destructively), before beginning playback.

• Reduce the number of distinct tracks being played back simultaneously. Consider "sub-mixing" several of your audio tracks into one track (using the Track view **Tracks > Bounce to Track(s)** command), and then archiving the individual tracks which were combined in the sub-mix. (Archived tracks don't use up any CPU resources during playback, leaving more CPU resources available to properly play the non-archived tracks.)

• Where possible, record audio using a mono source, rather than a stereo source. Mono clips require less processing power than stereo clips.

• Avoid using overlapping audio clips. Where possible, combine/blend overlapping clips into a single clip, which uses less processing power.

• Thin the amount of MIDI controller data and the number of SysEx messages in your tracks.

• If you can't reduce your project's complexity, or if problems persist even after the complexity has been reduced, proceed to the next step.

Upgrade your computer hardware: more RAM, a faster CPU, and a faster disk drive

If your project makes extensive use of real-time effects (plug-ins), you should consider upgrading to a faster CPU. If your primary concern is playing or recording a large number of tracks, a faster CPU will help, but you may find that adding more RAM, a faster hard disk, and/or an improved hard disk controller may help even more.

The following are some tips on upgrading your hardware:

Audio problems are often caused by a hard disk which is transferring data too slowly. The disk could simply be physically incapable of reading and writing data fast enough, or the disk controller could be causing too much CPU time to be consumed when transferring audio data to/from the disk.

Consider upgrading your equipment as follows:

• Ensure that your hard drive controller is NOT configured to operate in "compatibility mode" which can greatly slow data transfer to/from your hard disk and make it almost impossible to record/play audio in Cakewalk reliably. To do this, go to the Control Panel and double-click on the System icon. Click the **Performance** tab. At the top of the **Performance** screen read the entries across from **File Systems** and **Virtual Memory**. They both need to say **32-bit**. If they mention **MS-DOS Compatibility Mode**, then your computer has a serious problem, beyond the scope of what a Cakewalk technician can fix. Your computer is processing the audio data very slowly and Cakewalk will not work properly until the **MS-DOS Compatibility Mode** problem is eliminated.

Help is available on the Microsoft Technical Support Web page at www.microsoft.com/Support. Click on the **Support Online** link and search for the phrase **Troubleshooting MS-DOS Compatibility Mode on Hard Disks**. This problem can arise when installing a new hard disk in your computer; if Windows cannot find a suitable driver for the disk, it installs a generic driver and operates in Compatibility Mode.

- If you're using a hard disk controller that employs "programmed I/O", upgrade to a disk controller that uses "bus mastering" instead. (This is sometimes also known as an UltraDMA IDE Controller). The former technique relies on the CPU to transfer the data to/from the hard disk, stealing cycles which the CPU could be sending audio data to/from the sound card. With the latter technique, the hard disk controller itself is primarily responsible for transferring the data to/from the hard disk, relieving the CPU of much of that burden.

- Install a faster hard disk. If you're using an IDE- or E-IDE-type hard drive, try to find one which has a lower disk access time (e.g., less than 9msec). Use the Win Tune test application available at www.winmag.com, this diagnostic tool measures your hard drive's uncached transfer rate.

Optimized picture cache redrawing

There are several options in the .ini files to speed up picture cache redrawing The biggest improvement will be seen on machines with multiple processors. Parallel processing can yield a significant boost in performance.

There is also an option in the **Associated Audio Files** dialog box to selectively redraw waveforms for individual clips that may have a corrupt waveform display (see "To redraw waveforms" on page 1206).

.INI file picture cache options

3 new INI file variables that are used by picture cache generation and display:

- In `Aud.ini`:

In the `[Aud]` section:

`EnablePicCacheThreads=1` (default)

This option creates extra background worker threads for the generation of wave pictures when you load a project. One worker thread is automatically created per CPU/core. Setting `EnablePicCacheThreads=0` reverts back to only using a single thread for picture computation.

If you are running a system with multiple CPU's or cores setting this to 1 can greatly speed up the computation of pictures.

Notes:

-These threads are only active while the picture is being computed.

-This option is only applicable on multiprocessor/multicore systems.

Also in the `[Aud]` section:

`ComputePicturesWhilePlaying=1` (default)

This option allows waveform pictures to be computed in the background while audio playback is in progress. Most modern computers should be able to handle this load with no problems. Note that work is only done while new pictures are actually being computed—once the pictures are finished rendering there is no overhead.

- In `Cakewalk.ini`:

  In the `[WinCake]` section:

  `ProgressiveWavePictures=1` [default]

  This option enables progressive display of waveform pictures. When enabled you will see pictures being displayed in the clips view dynamically as they are being computed. The waveforms will update in the background when the application is idle. If the `ComputePicturesWhilePlaying` flag is set to **1**, waveforms will continue being displayed progressively even while audio playback is in progress. This can save time waiting for a complete picture to be finished before you can see it.

To redraw waveforms

1. Select the clips that you want to redraw.
2. Right-click a selected clip, and choose **Associated Audio Files** on the pop-up menu to open the **Associated Audio Files** dialog box.
3. Click the **Recompute Picture(s)** button. A dialog box appears, asking if you want to recompute the pictures on the selected clips.
4. Click **OK**.

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`EnableCacheWriteThru=<0 or 1>, default = 1`

This `Aud.ini` variable enables disk write thru caching, on by default. When write thru caching is on, data recorded to wave files is written to the hard disk immediately, circumventing the hardware disk cache. Having write thru caching off can be more efficient for disk I/O but can result in data loss if your system crashes.

MIDI Prepare Buffer Size and automation

If your project contains several track/clip automation envelopes, setting your MIDI playback buffer size too low (in **Edit > Preferences > MIDI - Playback and Recording**) can cause audio to crackle if your audio latency is also set very low. This problem will be somewhat worse if you enable multiprocessing in the audio engine. To minimize or eliminate these crackles, please be sure to keep your MIDI playback buffers at or above the default setting of 250 msec.

Using audio devices in Windows 7

SONAR introduces several enhancements for communicating with audio devices in Windows 7, including:

- Support for WASAPI, which is the new standard for audio in Windows 7 and future Windows operating systems.
- MMCSS task profile support.
- Optimized WaveRT streaming.

See:

WASAPI support

SONAR provides support for WASAPI (Windows Audio Session API), which is the new standard for audio in Windows 7 and future Windows operating systems.

The primary advantages of WASAPI are:

- Better compatibility with consumer audio devices:
  - Supports a wide variety of audio devices, including newer WaveRT devices and legacy Windows audio devices.
  - Lets you use consumer audio devices that don't have ASIO drivers or drivers that don't work well under WDM.
- Provides low latency access to audio devices.

Using WASAPI in Windows 7

WASAPI has four different modes of operation. SONAR supports WASAPI *Exclusive* mode using event signaling, because this mode is best suited for audio programs.

In order to use WASAPI in SONAR, your audio device must have WDM drivers that Windows can successfully communicate with, and the audio device must be enabled to work in Exclusive mode.

Exclusive mode is the default in Windows 7 and can be configured from your audio device's taskbar or **Properties** dialog box in Device Manager. Consult your audio device's manual if you need further information.

Exclusive mode requires exclusive access to the audio device. Another program will not be able to use the audio device simultaneously with SONAR.

💡 **Tip:** *If you select* **Share Drivers With Other Programs** *in* **Edit > Preferences > Audio - Playback and Recording**, *SONAR will relinquish control of the audio device when the program loses Windows focus.*

To enable WASAPI mode in SONAR

1. Go to **Edit > Preferences > Audio - Playback and Recording**.
2. In the **Driver Mode** list, select **WASAPI**.
3. Select the **Audio - Devices** page tab (**Edit > Preferences > Audio - Devices**).
4. In the **Input Drivers** and **Output Drivers** lists, select the desired input and output ports.
5. Click **OK** to close the **Preferences** dialog box.

See also:

MMCSS task profile support

The Multimedia Class Scheduler Service (MMCSS) provides Windows multimedia programs, including SONAR, with prioritized access to CPU resources for time-sensitive processing.

By default, SONAR uses the MMCSS task profile named *Pro Audio*. If desired, you can instruct SONAR to use a custom MMCSS task profile.

To use a custom MMCSS task profile in SONAR

1. Determine the name of the MMCSS task profile that you want to use. MMCSS task profiles are listed in the Windows registry under **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Multimedia\SystemProfile\Tasks**. Ensure that the registry entry exists for the profile you want to use.

2. If you have added any new profiles, reboot your computer to allow the MMCSS service to see the new profiles.

3. In SONAR, go to **Edit > Preferences > Audio - Configuration File**.

4. Under **Configuration Settings**, click **Edit Config File**.

   The `Aud.ini` file opens in the default Windows text editor.

5. In `Aud.ini`, locate the entry called `MMCSSTaskKey` and set it to the desired profile name. For example:

   `MMCSSTaskKey=Pro Audio`

6. Save `Aud.ini` and close the Windows text editor.

7. Click **Reload Config Settings** to reload the current audio configuration settings from `Aud.ini`.

   SONAR will now use the new task profile for MMCSS.

WaveRT updates

SONAR supports WaveRT in two ways:

WDM driver mode.   WaveRT event mode access is available in SONAR when you are using WDM as a driver mode and a WaveRT capable audio device is detected. A [WaveRT] suffix is added to the driver name in this case.

WASAPI driver mode.   Event mode WaveRT drivers are automatically listed and available in WASAPI mode.

External devices

SONAR can be controlled by a wide range of MIDI controllers and external MIDI devices. SONAR also contains two generic controller/surface plug-ins (the ACT MIDI Controller plug-in, and the Cakewalk Generic Surface Plug-in), which allow you to use almost any MIDI controller or controller/surface with SONAR. You can also control certain external devices from SONAR by using StudioWare or OPT (Open Plug-in Technology) panels.

SONAR allows you to control soft synths as well as effect plug-ins. Active Controller Technology (**ACT**) allows you to control any plug-in that has focus, using the same widget mappings for each instance of the same plug-in. You can also choose to lock a particular controller/surface to a particular instance of a plug-in.

Note: *Some older plug-ins do not support ACT.*

To keep track of your mappings, SONAR displays different-colored markers on each track and/or bus to show you which controller/surface is currently controlling that particular module. These visual markers on tracks and buses are called the **WAI display** (Where Am I).

SONAR includes preset mappings for popular controllers/surfaces and MIDI controllers such as the Roland A-PRO series. If SONAR does not currently include preset mappings for your controller/surface, you can create mappings by using the built-in ACT MIDI Controller Plug-in or Cakewalk Generic Surface Plug-in.

See:

Roland A-PRO controllers

SONAR has a custom controller/surface plug-in that allows a Roland A-PRO controller to control SONAR track, bus, and plug-in parameters (both effects and synths). This includes support for ACT (Active Controller Technology), which lets you use your controller to adjust plug-in parameters on whatever plug-in currently has focus.

Figure 346. *The A-PRO control surface plug-in enables full control of all SONAR tracks, buses, plug-ins and other parameters from your A-PRO MIDI keyboard controller.*
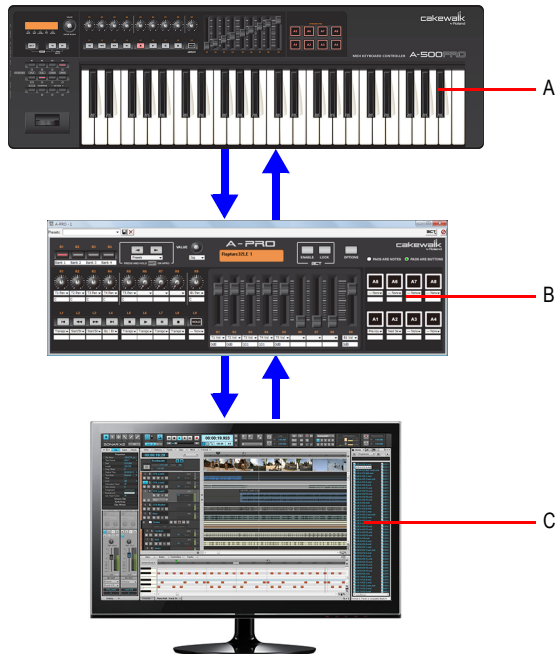
A. A-PRO MIDI keyboard controller B. Control surface plug-in C. SONAR

Using your Roland A-PRO to control SONAR is as easy as:

1. Enabling the Roland MIDI drivers in SONAR.
2. Choosing the correct Roland In Port in **Edit > Preferences > MIDI - Control Surfaces**.
3. Loading the correct memory preset in your Roland A-PRO.

Please refer to the A-PRO owner's manual for detailed instructions on how to configure and connect the A-PRO MIDI keyboard controller to your computer.

Once you have made the necessary connections, you will need to configure your Cakewalk host program to recognize the A-PRO MIDI keyboard controller.

To enable the Roland A-PRO MIDI drivers

1. Follow your A-PRO MIDI keyboard controller's instructions for physically connecting the surface to your computer.

2. Go to **Edit > Preferences > MIDI - Devices**.

3. Select **A-PRO 2** in both the **Inputs** and **Outputs** lists.

4. Click **OK**.

To connect a Roland A-PRO to SONAR

1. Follow your A-PRO MIDI keyboard controller's instructions for physically connecting the surface to your computer.

2. Go to **Edit > Preferences > MIDI - Control Surfaces**.

3. Click the **Add Controller/Surface** button , which opens the **Controller/Surface Settings** dialog box.

4. In the **Controller/Surface** field of the **Controller/Surface Settings** dialog box, select **A-PRO**.

5. Assign both **Input Port** and **Output Port** to **A-PRO 2**.

> **Note:** *Port 2 is the Controls Port, which is the port used by the A-PRO controls (rotaries, sliders, buttons and pads).*

6. Click **OK** to close the **Controller/Surface Settings** dialog box.

7. In the **Preferences** dialog box (**MIDI - Control Surfaces** page), make sure that the **WAI Display** check boxes and the **ACT Indicators** check boxes are enabled, and click **OK**.

8. Make sure the ACT button on your A-PRO MIDI keyboard controller is pressed.

Figure 347. *ACT button*

When pressed, the ACT button launches the A-PRO control surface property page and allows your A-PRO MIDI keyboard controller to communicate with SONAR.

> **Important:** *The ACT button should always be enabled when you want to control SONAR.*

When you open a project, the A-PRO MIDI keyboard controller responds and reflects the layout of the loaded project.

Now that your Roland A-PRO is connected, you can see which tracks and/or buses are being controlled by it by looking at the colored markings (the **WAI** display; see "The WAI display" on page 1232 for more information) in SONAR's interface. Open the A-PRO property page by double-clicking the WAI display or by choosing **A-PRO** from the **Utilities** menu.

Once the Roland A-PRO property page is open, press F1 on your computer keyboard to open the Help file for the property page.

See:

"The WAI display" on page 1232

"ACT" on page 1234

Setting up control surfaces

If you are not using a Roland A-PRO controller, use the following procedures to connect or disconnect your controller/surface:

To enable MIDI Input and Output drivers

1. Go to **Edit > Preferences > MIDI - Devices**.

2. In the **Inputs** list, make sure that the MIDI Input driver or drivers that your controller/surface uses are selected.

3. If you have a bi-directional controller/surface (one that both sends and receives data in order to control a software application), also make sure that the MIDI Output driver or drivers that the controller/surface uses are enabled in the Outputs pane on the right side of the dialog box.

4. Click **OK**.

To connect a controller/surface to SONAR

1. Follow your controller/surface's instructions for physically connecting your controller/surface to your computer (you may need to close SONAR first).

2. In SONAR, go to **Edit > Preferences > MIDI - Control Surfaces**.

3. Click the **Add Controller/Surface** button ⭐, which opens the **Controller/Surface Settings** dialog box.

4. In the **Controller/Surface** field of the **Controller/Surface Settings** dialog box, find the name of your controller/surface, and select it. However, if you want to use Active Controller Technology, or if your controller/surface is not listed, select either the **Cakewalk Generic Surface** or the **ACT MIDI Controller**.

ⓘ   **Note:** *The Cakewalk Generic Surface plug-in is not bi-directional.*

5. In the **Input Port** and **Output Port** fields, select which MIDI input and output ports the controller/surface uses.

ℹ **Note 1:** *You may need to read the documentation for your controller/surface to find out which MIDI input driver your controller/surface uses to control software applications. If your controller/surface includes a MIDI keyboard, your controller/surface might use one MIDI input driver for the controller/surface functions, and a different MIDI input driver to send MIDI notes and pitch bend data to the application (the piano keyboard functions).*

ℹ **Note 2:** *Control surfaces retain their current MIDI port assignments even if you add or remove MIDI devices.*

   If any assigned MIDI port is missing when you load a project, SONAR will let you remap each missing port to an available port. For more information, see "Changing MIDI Output devices" on page 67.

6. Click **OK** to close the **Controller/Surface Settings** dialog box.

7. In the **Preferences** dialog box, make sure that both the **ACT** and **WAI** check boxes are enabled, and click **Close**.

⚠ **Important:** *If your controller/surface needs to be in a certain mode, or have a certain memory preset loaded in order to control a software application, put your controller/surface in the proper mode or load the required memory preset now.*

Now that your controller/surface is connected, you can see which tracks and/or buses are being controlled by it by looking at the colored markings (the **WAI** display; see "The WAI display" on page 1232 for more information) in SONAR's interface.

If you selected the ACT MIDI Controller plug-in or the Cakewalk Generic Surface plug-in for your controller/surface, you can load a default set of mappings by opening the property page for either plug-in, and selecting the name of your controller/surface from the Presets window in the property page.

Synchronizing channel strips between SONAR and control surfaces

SONAR allows control surfaces to display all channel strips in a project, or only the channel strips that are visible in the Track view or Console view.

1. Go to **Edit > Preferences > MIDI - Control Surfaces**.

2. Under **Control Strips Visible in**, click one of the following:
   • **Track View.**   The controller/surface matches the channel strips that are visible in the Track view.
   • **Console View.**   The controller/surface matches the channel strips that are visible in the Console view.
   • **All Strips.**   The controller/surface shows all channel strips in the project.

The controller/surface immediately refreshes and displays the specified channel strips.

Figure 348. *The Control Surfaces section.*
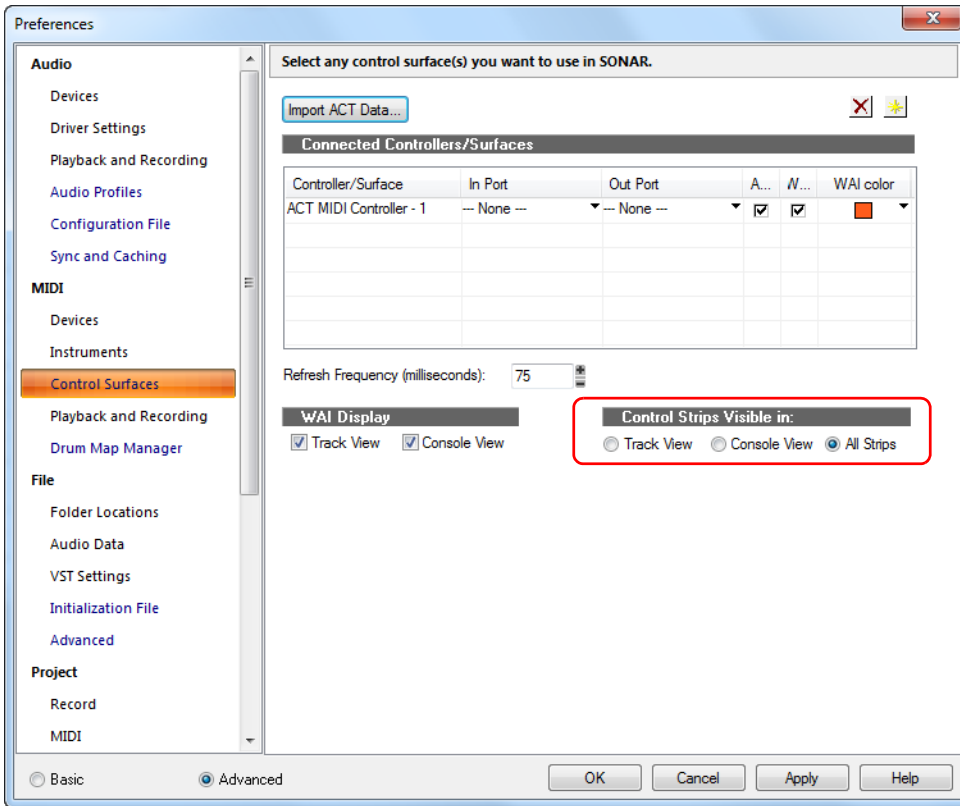
See also:

To disconnect a controller/surface from SONAR

1. Go to **Edit > Preferences > MIDI - Control Surfaces**.

2. In the **Controller/Surface** column, click the name of the controller/surface that you want to disconnect.

3. Click the **Delete** button ![X], which deletes the name of the controller/surface that you selected.

4. Click **Close**.

External devices
Setting up control surfaces

Control surface refresh rate

Control surfaces are refreshed by posting a windows message every 75 milliseconds.

```
CtrlSurfaceRefreshMS=<50 - 5000> (default=75)
```

You may want to increase the value of this `Cakewalk.ini` variable if you are experiencing sluggish UI responsiveness when using a control surface and playing back high CPU projects.

Also, if you are using a control surface that is not bi-directional, the surface does not need to be refreshed at all and you can safely increase the value.

This variable should be set in the `[Wincake]` section. For example:

```
[Wincake]
CtrlSurfaceRefreshMS=75
```

See:

ACT MIDI Controller plug-in

The ACT MIDI Controller plug-in can be configured to support any generic MIDI controller (controller/surface), such as the JL Cooper FaderMaster, Peavey PC-1600, and Kenton Control Freak. Generic controllers/surfaces typically have 8-16 strips of faders/knobs/buttons, are non-motorized, and can often be configured to transmit any MIDI message (continuous controllers, NRPNs, Sysx, etc.). The ACT MIDI Controller supports ACT.

After you have connected your controller/surface, and selected the ACT MIDI Controller plug-in in **Edit > Preferences > MIDI - Control Surfaces** (see "Setting up control surfaces" on page 1214 if necessary), open the ACT MIDI Controller property page, and select a preset for your controller/surface (load the default mappings).

To open the ACT MIDI Controller property page

1. In the Control Bar's ACT module, make sure that **ACT MIDI Controller** appears in the drop-down menu. If you can't find it in the drop-down menu, you need to add it in **Edit > Preferences > MIDI - Control Surfaces** (see "Setting up control surfaces" on page 1214 if necessary).

2. Click the **Open Control Surface Plug-in** button in the ACT module. You can also double-click the WAI display of the ACT MIDI Controller plug-in.

> **Note:** *To change the bank of tracks that the controller/surface controls, use the buttons on the controller/surface itself (or drag the WAI display). Use the drop-down menu in the ACT module to choose what controller/surface the ACT module displays information for. Click the **Open Control Surface Plug-in** button to display the property page (interface) of the currently displayed controller/surface.*

Figure 349. *The ACT module.*
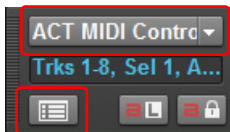
See also:

"To use ACT with the ACT MIDI Controller plug-in" on page 1234

"Using the ACT MIDI Controller property page" on page 1218

Using the ACT MIDI Controller property page

The ACT MIDI Controller property page gives you a wide range of options to control track, bus, and plug-in parameters.

You can press F1 when the property page is open to get a description of all the fields and controls.

To load default mappings

• In the **Presets** list, select the name of your controller/surface. If your controller/surface does not have a preset, select the **Default** preset, and see "Assigning controls on your controller/surface to cells in the ACT MIDI property page" on page 1219.

⚠️ **Important:** *After you load the preset for your controller/surface, look at the **Comments** field on the **Options** tab of the ACT MIDI Controller property page. The **Comments** field will usually list the factory memory preset that your controller/surface must be using to use the ACT MIDI Controller plug-in. Make sure that you have loaded the correct memory preset in your controller/surface's memory.*

To edit default mappings

• On the **Options** tab, in the **Rotaries**, **Sliders**, or **Buttons** fields, choose the **Bank** of parameter mappings that you want to edit, then select a new parameter for that Bank. For example, if in the **Rotaries** field, you select **Bank 4**, and the parameter field next to the **Bank** field now reads **Send 2 Pan**, you could select **Send 2 Vol** instead. If you then click the **Controllers** tab, and select **Bank 4** in the **Bank** menu that's in the rotaries row, the rotary knobs will now control **Send 2 Volume** on all the tracks currently under control. If you have at least 2 sends in each track, the **Rotary** fields on the **Controllers** tab will now display the name and current level of each **Send 2** in the controlled tracks.

You can restore the default parameter assignments by clicking the **Defaults** button.

If you want to choose a different knob or other control to control a specific cell in the property page (the MIDI Learn function), see "Assigning controls on your controller/surface to cells in the ACT MIDI property page" on page 1219.

See:

"ACT presets" on page 1219

ACT presets

After you have carefully configured the ACT MIDI Controller property page to work with your controller/surface, you will likely want to save the configuration as a preset.

To save a preset

• Type a name in the **Presets** window, then click the **Save** (floppy disk) button.

See:

"Assigning controls on your controller/surface to cells in the ACT MIDI property page" on page 1219

Assigning controls on your controller/surface to cells in the ACT

MIDI property page

Each cell or field on the **Controllers** tab of the ACT MIDI Controller property page lists the SONAR or plug-in parameter that is currently controlled by that cell. However, if your controller/surface does not have a preset, no knobs or sliders on your controller/surface will be assigned to that cell, or the knobs may be assigned in a pattern that you don't prefer.

If your controller/surface does not have a preset, or if you want to change the knobs and sliders that control specific cells in the ACT MIDI Controller property page, use the MIDI Learn function to assign knobs and sliders to cells:

To assign controls on your controller/surface to cells in the ACT MIDI Controller property page

1. Click the cell on the **Controllers** tab of the ACT MIDI Controller property page that you want to control with a specific knob or control on your controller/surface. You can assign knobs to cells that do not currently list any SONAR or plug-in parameter.

   The cell displays the MIDI Learn message.

2. Move the control on your controller/surface that you want to use to control that cell. This assigns the control to the cell.

3. You can edit the cell label by clicking the label and entering a new name in the **Edit Label** dialog box. This way you can immediately see which knobs or sliders on your controller/surface are controlling which cell in the ACT MIDI Controller property page.

4. Repeat steps 1-3 for all the cells you want to control. Remember, you can assign controls to cells that do not currently list any SONAR or plug-in parameters.

5. When you are finished assigning controls to cells, save your work as a preset: choose a preset or type a new name in the **Presets** box, and click the **Save** button (floppy disk icon) that's next to the Presets window.

See also:

Cakewalk Generic Surface plug-in

The Cakewalk Generic Surface Plug-in supports both ACT and WAI. See "The WAI display" on page 1232, and "ACT" on page 1234 for more information.

After you have connected your controller/surface (including loading the correct memory preset in your controller/surface's memory), and selected the **Cakewalk Generic Surface** plug-in in **Edit > Preferences > MIDI - Control Surfaces** (see "Setting up control surfaces" on page 1214 if necessary), open the Cakewalk Generic Surface property page.

To open the Cakewalk Generic Surface property page

1. In the Control Bar's ACT module, make sure that **Cakewalk Generic Surface** appears in the drop-down menu. If **Cakewalk Generic Surface** is not available in the drop-down menu, see "Setting up control surfaces" on page 1214.

2. Click the **Open Control Surface Plug-in** button 🖿 in the ACT module. You can also double-click the WAI display of the Cakewalk Generic Surface plug-in.

See:

"Loading Cakewalk Generic Surface presets" on page 1221

Loading Cakewalk Generic Surface presets

SONAR contains preset mappings for most controllers/surfaces. Before creating a set of mappings from scratch, load one of the preset mappings for your controller/surface and see if you like it. Even if the preset doesn't meet all of your needs, it is usually a good base for creating your own presets.

🛈 **Note:** *To use ACT with the Cakewalk Generic Surface property page, you need to first assign the knobs and controls on your controller/surface to radio buttons **1-9** and **A-G** in the **ACT Controls** section of the property page, and save these assignments as a new preset. See "To Use ACT with the Cakewalk Generic Surface" on page 1223.*

To load a preset

1. At the top of the Cakewalk Generic Surface property page, in the **Presets** field, click the drop-down arrow that is at the right edge of the **Presets** box to display the menu of built-in presets.

2. Find the name of your controller/surface. There may be several versions of presets for your controller/surface, if your controller/surface has multiple presets.

3. Click one of the versions. If there are no versions for your controller/surface, see "Assigning faders and knobs to control SONAR parameters" on page 1222.

Try out the available presets for your controller/surface. If you want to edit one of them, first save it under a new name: type a new name for it in the Presets window, and then click the **Save** button 🖫 that's next to the **Presets** box.

See:

Assigning faders and knobs to control SONAR parameters

The Cakewalk Generic Surface property page has separate sections that control track parameters (the **Track Parameters** section), plug-in parameters (the **ACT Controls** section), and global parameters (the **Global Parameters** section).

To configure track parameters

1. In the Cakewalk Generic Surface property page, in the **Use ACT** or **Strip Params** fields, make sure that either the **ACT Enable** check box is disabled, or that the **Both** check box is enabled. If the **Both** check box is enabled, your controller/surface is controlling both track and plug-in parameters.

2. In the **Configure Strip Number** field, use the drop-down menu to choose which track strip in the current bank of tracks you want to configure (the number of tracks in the current bank is listed in the **Number of Track Strips** field).

3. If you want to change how many tracks are in a single bank, enter a new number in the **Number of Track Strips** field.

4. Click the radio button of the **Parameter** that you want to configure (choose from Parameters 1-16).

5. Use the drop-down menu next to the parameter you clicked to choose exactly what parameter you want to configure.

6. Move the control on your controller/surface that you want to use to control this parameter.

7. Click the **Learn** button in the dialog box. The MIDI message that the control you moved sent out appears in the MIDI Message for the **Current SONAR Parameter** section.

8. You can edit how SONAR interprets this particular message if you want. See "MIDI Message Interpretation" on page 1229 for more information.

9. Repeat steps 4-8 if you want to configure more parameters for this track strip, or choose a new track strip in the **Configure Strip Number** field, and then repeat steps 4-8

When you've finished your edits, either type a name for this group of settings in the **Presets** window and click the **Save** button 🔲 (recommended), or just click the **Save** button to overwrite the current preset. You can then reload this collection of track settings any time you want to by choosing the name of the preset that you saved in the **Presets** window.

To Use ACT with the Cakewalk Generic Surface

1. Make sure you have completed the following preliminary steps:
   - Successfully connected your controller/surface to SONAR (if necessary, see "Setting up control surfaces" on page 1214).
   - Opened the Cakewalk Generic Surface property page (if necessary, see "To open the Cakewalk Generic Surface property page" on page 1221).

2. In the **ACT Controls** section of the Cakewalk Generic Surface property page are radio buttons **1-9** and **A-G**. These buttons control plug-in parameters in the active effect or synth plug-in. You first need to assign a knob or control on your controller/surface to each one of these radio buttons. Do this by clicking a radio button, moving a knob or control on your controller/surface, and then clicking the **Learn** button in the Cakewalk Generic Surface property page. You can check what MIDI message you've assigned to each button by clicking a button and then reading the value in the MIDI Message for **Current SONAR Parameter** section. If the **None** radio button is highlighted after you click an **ACT Controls** radio button, you have not assigned a control to that **ACT Controls** radio button. When you finish, save your assignments as a preset.

3. Next, in the Cakewalk Generic Surface property page, in the **Use ACT** or **Strip Params** fields, make sure that either the **ACT Enable** check box is enabled, or that the **Both** check box is enabled. If the **Both** check box is enabled, your controller/surface is controlling both track parameters and plug-in parameters.

4. In SONAR, put the focus on the plug-in effect or synth -that you want to configure: either click its property page, or click its name in an effects bin.

   The name of the plug-in appears in the **Context** field in the Cakewalk Generic Surface property page.

5. Enable the **ACT Learn Mode** button in the Control Bar's ACT module.

6. In the property page of the plug-in that you want to control, click the parameters that you want to control.

7. Move the sliders/knobs on your controller/surface that you want to use to control the parameters with, in the same order that you clicked the parameters (you can reverse steps 6 and 7).

8. Disable the **ACT Learn Mode** button in the Control Bar's ACT module.

9. A dialog box appears, asking if you want to keep your assignments. Click **Yes** or **No**.

As soon as you disable the **ACT Learn Mode** button, any plug-in mappings that you keep are saved globally, and will be the same in every project for a particular plug-in. Now your controller/surface can control whatever soft synth or effect currently has focus. If you want to control only a single instance of a plug-in, regardless of which plug-in has focus, enable the Lock Context check box. For more information about ACT, see "ACT" on page 1234.

You can save Track parameter mappings and knob/radio button mappings in the Presets window that is at the top of the Cakewalk Generic Surface property page.

Assigning Forward and Rewind buttons

The **Forward** and **Rewind** assignments are special cases in the Cakewalk Generic Surface property page. When you click select either of these parameters, notice that **Literally/Toggle** field becomes greyed-out, and the **On/Off** fields become available. This is because the **Forward** and **Rewind** commands both require two different MIDI messages to function: one MIDI message to turn the operation on, and a different message to turn the operation off. This kind of operation is best assigned to a button that sends out one MIDI message when you hold or push it down, and a different MIDI message when you let the button up. The property page can usually fill in the **On** field and the **Off** field correctly if you push the desired button a few times and then click the **Learn** button. But it helps if you know exactly what MIDI messages the desired button sends out. That way, you can fill in the correct trigger values in the **On** and **Off** fields if the displayed values are incorrect.

Conserving knobs and buttons

There are a few tricks you can use if you're running out of buttons, or if your controller/surface only has a couple of buttons on each strip, and you want to control more parameters on each track:

- **Assign a two-way knob or button to control two different parameters.** If a knob sends out one MIDI message when it's turned to the right and a different MIDI message when it's turned to the left, you could use it to control 2 toggle-type parameters, such as **Solo** and **Arm**. For example, if a knob sends out **NRPN # 5000** with a data value of **1** when you turn it to the right and a data value of **16383** when you turn it to the left, you could use a **Trigger Value** of **1** to turn the **Arm** button on and off, and a **Trigger Value** of **16383** to turn the **Solo** button on and off. That way, each time you turn the knob to the right, the **Arm** button turns on or off. Each time you turn the knob left, the **Solo** button turns on or off.

- **Assign a two-way knob to control a continuous parameter.** If your fader is assigned to control **Volume**, you can use a two-way knob to control **Pan** or some other continuous parameter such as **Send 1 Level**. For example, if a knob sends out **NRPN # 5000** with a data value of **1** when you turn it to the right and a data value of **16383** when you turn it to the left, you could use a value of **1** in the **Increment/Decrement Plus +** field, and a value of **16383** in the **Increment/ Decrement Minus -** field. That way, each time you turn the knob to the right, the **Pan** parameter (or whatever parameter you want) increases by 1. Each time you turn the knob to the left, the parameter decreases by 1. The parameter continues to increase if you keep turning the knob to the right, and decreases similarly if you keep turning the knob to the left.

- **Use multiple strips to control one track at a time.** Assign as many knobs and faders as you want to control lots of parameters on only one track (leave the **Configure Strip Number** field set to **1** while you're assigning faders and knobs). Then assign a couple of buttons to **Move 1 Left** and **Move 1 Right**, so you can shift your controller/surface one track at a time.

See also:

Controlling different tracks or groups of tracks

The Cakewalk Generic Surface plug-in can control anywhere from 1-32 tracks simultaneously, as specified by whatever number you fill in the **Number of Track Strips** field in the Cakewalk Generic Surface property page. There is always at least one track being controlled, referred to as the **Base Track**. The **Number of Track Strips** value refers to the base track plus 'n' number of additional tracks. The Control Bar's ACT module automatically updates to display the range of tracks (1-8, 2-9, 9-16, etc.) that your control surface currently controls.

If multiple controller/surfaces are enabled, the Control Bar's ACT module lets you select which controller/surface to display track information for.

The currently controlled tracks are displayed in the ACT module. It is important to understand that the ACT module is for display purposes only—it gets information from the Cakewalk Generic Surface plug-in (or any other active controller/surface plug-in), but the ACT module cannot update, or send information to the Cakewalk Generic Surface plug-in. Changing which tracks are controlled must be done with the **Move 1 Left**, **Move 1 Right**, **Move Bank Left**, or **Move Bank Right** parameters, or by clicking the **BaseTrack** buttons that are at the top of the Cakewalk Generic Surface property page.

Note: *If you don't have any buttons left over to assign to the **Move 1** or **Move Bank** parameters, you can click the right or left buttons in the **BaseTrack** section of the Cakewalk Generic Surface property page to move the **Base Track** to the right or left by one track. The buttons are located so that you can resize the property page to just show the buttons and the **Presets** field.*

To control the next track or bank of tracks

1. In the Cakewalk Generic Surface property page under **Global Parameters**, select **Move 1 Right** to control the next higher-numbered track, or **Move Bank Right** to control the next higher-numbered bank of tracks.

2. Move (twice) the button or knob that you want to use to shift the controller/surface to the next higher-numbered track or bank (for example, from track 1 to track 2, or from tracks 1-8 to tracks 9-16).

3. Click the **Learn** button.

   The property page reads the type of MIDI message and displays the characteristics in the appropriate fields.

4. Press the TAB key to accept the data.

5. Move the button or knob again and watch the display in the Control Bar's ACT module to see if the current tracks shift by the appropriate number.

Repeat this procedure, but use a different knob, and select **Move 1 Left** or **Move Bank Left** so that you can move the current track or bank to a lower-numbered one.

See also:

External devices
Cakewalk Generic Surface plug-in

The Cakewalk Generic Surface property page

The Cakewalk Generic Surface property page appears when you click the **Open Control Surface Plug-in** button [icon] in the ACT module while **Cakewalk Generic Surface** appears in the drop-down menu. The Cakewalk Generic Control controller/surface plug-in must be enabled first, however (see "Setting up control surfaces" on page 1214, if necessary).

The property page contains the following sections:

BaseTrack

This section contains 2 buttons on either side of a number field. You can click the buttons to move the **Base Track** to a higher-numbered track (right button) or lower-numbered track (left button). The **Base Track** is the first track in the bank of tracks that your controller/surface is currently controlling. You define how many tracks are in a bank by entering a number in the **Number of Track Strips** field. The number can be from 1 to 32, inclusive. The property page is designed so that you can minimize it (by dragging the border) to show only the **BaseTrack** buttons and **Preset** window, so you can click the buttons while you're working. The buttons are an alternative way to change the **Base Track** if you haven't assigned any buttons on your controller/surface to do that. The **Move 1** and **Move Bank** fields are what you use to assign those functions.

Track Parameters

This section lists the particular track strip you are assigning controls for, the number of strips that make up a bank of tracks, and the various track parameters you can control with the faders and knobs on your controller/surface. You can assign the following different track parameters (they are listed in the drop-down menu next to each **Parameter "n"** field):

- Volume
- Pan
- Mute
- Solo
- Record Arm
- Write Enable
- Phase
- Send "n" Level ("n"=1-16; depending on number of active buses; Send 1 Level=Reverb for MIDI tracks, Send 2 Level=Chorus for MIDI tracks)
- Send "n" Pan ("n"=1-16)
- Send "n" Enable ("n"=1-16)
- Send "n" Pre/Post ("n"=1-6)

Cakewalk Generic Surface plug-in

Use ACT or Strip Params

This section lets you decide whether your controller/surface is controlling track parameters, plug-in parameters, or both.

Note: *It's possible to use the same control on your controller/surface to control both a track parameter and a plug-in parameter. It's not usually a good idea to control both at the same time.*

This section has the following controls:

- **ACT Enable radio button.** Lets you assign a control on your controller/surface to enable or disable the **ACT Enable** check box. Radio buttons are used with Learn mode.
- **ACT Enable check box.** When this check box is enabled (and not greyed-out), your controller/surface controls plug-in parameters only.
- **Both check box.** When this check box is enabled, your controller/surface controls both track and plug-in parameters. When neither the **Both** check box nor the **ACT Enable** check box are enabled, your controller/surface controls track parameters only. In Both mode, you typically allocate some physical controls to control Track parameters, while other physical controls are allocated to control plug-in parameters.

ACT Controls

This section let's you assign buttons and knobs to control plug-ins. This section has the following controls:

- **Lock Context radio button.** Lets you assign a control on your controller/surface to enable or disable the **Lock Context** check box.
- **Lock Context check box.** When this check box is enabled, your controller/surface controls only the particular instance of the particular plug-in that had focus when you enabled this check box.
- **Context field.** Displays the name of the plug-in that currently has focus, unless the **Lock Context** check box is enabled.
- **Physical Control Type.** This field lets you tell SONAR what kind of control you are using for the selected parameter. For example, if the parameter you're controlling is an On/Off type of parameter, like a power button, it would be a good idea to use a button or switch on your controller instead of a slider.
- **Radio buttons 1-9 and A-G.** Each of these 16 radio buttons lets you map up to 16 plug-in parameters to controls on your controller/surface. The name of each of the 16 plug-in parameters that are currently being controlled are listed in order next to each radio button. To use these buttons, you must first assign a control on your controller/surface to each one of these buttons. See "To Use ACT with the Cakewalk Generic Surface" on page 1223.

MIDI Message for the Current SONAR Parameter

This section is where you can choose a specific kind of MIDI message to control whatever parameter is selected in the **Track Parameters**, **ACT Controls** (including the **ACT Enable** check box), or **Global Parameters** sections. Most of the time you don't need to choose, because the **Learn** button fills in the fields automatically.

Choose from the following options:

- **None.**   Click this button to disable control of the selected parameter.
- **Learn.**   If you don't know the exact MIDI message that a fader/knob/button transmits, you can simply move the fader/knob/button a couple of times, and then click **Learn** to automatically fill in the correct MIDI message.
- **Controller.**   With this button enabled and a Controller number entered in the **Number** field, SONAR moves the selected parameter whenever it receives this specific controller message from your controller/surface on the specified channel.
- **Channel.**   The MIDI channel the controller/surface uses for the MIDI Message that is controlling the current parameter.
- **NRPN.**   With this button enabled and a NRPN number entered in the **Number** field, SONAR moves the selected parameter whenever it receives this specific NRPN message from your controller/surface on the specified channel.
- **Trigger Value.**   For triggered actions (mute, solo, play, stop, etc.), specify the Controller, NRPN or RPN value that will trigger the current parameter.
- **RPN.**   With this button enabled and a RPN number entered in the **Number** field, SONAR moves the selected parameter whenever it receives this specific RPN message from your controller/ surface on the specified channel.
- **Note.**   You can use a Note On message to trigger a parameter or action. The **Number** field next to the radio button displays the note number, and the **Trigger Value** field displays the velocity the note must use to trigger the desired parameter. If you use a MIDI keyboard for this field, you can enter zero in the **Trigger Value** field, and the property page will then use the Note Off signal as a trigger, instead of the Note On.
- **Wheel.**   You can use a pitch wheel to trigger a parameter. In this case, the **Trigger Value** field uses a range of numbers from 0 to 16383. Continuous parameters such as Pan or Volume are the best choices for a pitch wheel (except for the fact that the wheel usually returns to its original position when you let go of it), but you can use a wheel to control toggle-type parameters by entering 0 or 16383 in the **Trigger Value** field. That way, you'll trigger the desired parameter when the wheel reaches its maximum or minimum position.
- **Sysx Single Byte.**   Selecting this option tells SONAR that the significant data (the variable, or parameter value) in the incoming Sysx message is in the form of a single byte. The **Sysx Single Byte** option has the following structure: **F0 ? VV ? F7**. The pre string should be **F0 ?**, where you must include the **F0** byte, and the post string should be **? F7**, where you must include the **F7** byte.
- **Sysx High Byte First.**   Selecting this option tells SONAR that the significant data in the incoming Sysx message is in the form of two bytes, with the high byte first. The **Sysx High Byte First** option has the following structure: **F0 ? HI LO ? F7**.

Cakewalk Generic Surface plug-in

- **Sysx Low Byte First.**   Selecting this option tells SONAR that the significant data in the incoming Sysx message is in the form of two bytes, with the low byte first. The **Sysx Low Byte First** option has the following structure: **F0 ? LO HI ? F7**.

- **Starts With.**   Fill in the string that your controller/surface sends in Sysx messages that precedes the significant data.

- **Ends With.**   Fill in the string that your controller/surface sends in Sysx messages that follows the significant data.

- **Sysx Trigger.**   Triggered targets (play, mute, solo, etc.) are enacted by using a Sysx trigger, where the user simply types the entire Sysx message **F0 ?? F7** that will trigger the action.

- **Trigger Message.**   The exact Sysx message, in the form of **F0 ? ? F7**, for the **Sysx Trigger** option.

> **Note:** *The **Sysx Single Byte, Sysx High Byte First**, and **Sysx Low Byte First** options assume that the Sysx message will be interpreted as a value to control continuous parameters such as Volume, extracted from somewhere in the middle of the message. That is why those three options are unavailable for "triggered" targets, like play, record, mute, solo, move 1 left, move 1 right, etc.*

MIDI Message Interpretation

A special interpretation of a MIDI message is commonly used in the following two cases:

- **Literally/Toggle.**   The property page interprets almost all MIDI messages as either literal values or toggle-type values, so most of the time this button is checked. A fader usually sends out a stream of different messages that are different for each position of the fader. The values of these messages are used "literally" to make timely changes in a continuous parameter such as Volume. The other common interpretation of a MIDI message is that it is meant to "toggle" a control such as a **Mute** button on and off. The property page interprets almost all MIDI messages as one of these two types of message.

- **Increment/Decrement.**   This option is valuable if you want to use a button or knob that can only send two different values to control a continuous parameter, such as Pan or Volume (see "Conserving knobs and buttons" on page 1224).

  - **Plus+.**   The value that causes the desired parameter to increase by 1.

  - **Minus-.**   The value that causes the desired parameter to decrease by 1.

- **On/Off.**   This option is currently only used with the **Forward >>** and **Rewind <<** shuttle actions. You should only assign buttons to these functions if each button sends a different MIDI message when it is released from the message it sends when it is pushed. The **On** field displays the value the button sends when you push it, and the **Off** field displays the value the button sends when you release it.

Global Parameters

This section let's you assign buttons and knobs to control SONAR's transport. The parameters you can control are:

- **Play**
- **Stop**
- **Forward >>**
- **Rewind <<**
- **Record**
- **Write Automation**
- **Jog <- (previous measure)**
- **Jog -> (next measure)**
- **Move 1 Left.** This parameter changes the currently-controlled track to the next lower-numbered track.
- **Move Bank Left.** This parameter changes the currently-controlled bank of tracks to the next lower-numbered bank of tracks.
- **Move 1 Right.** This parameter changes the currently-controlled track to the next higher-numbered track.
- **Move Bank Right.** This parameter changes the currently-controlled bank of tracks to the next higher-numbered bank of tracks.

Presets

After you have carefully configured the Cakewalk Generic Surface property page to work with your control surface, you will likely want to save the configuration as a preset.

To save a preset

- Type a name in the Preset box, then click the **Save** (floppy disk) button.

Euphonix EuCon control surface support

SONAR supports the Euphonix EuCon protocol, which allows SONAR to be controlled by Euphonix surfaces such as the MC and CM408 series.

To enable EuCon support in SONAR

1. Follow your Euphonix surface's instructions for physically connecting the Euphonix surface to your computer and configure the Euphonix software.

2. In SONAR, go to **Edit > Preferences > MIDI - Control Surfaces**.

3. Click the **Add Controller/Surface** button , which opens the **Controller/Surface Settings** dialog box.

4. In the **Controller/Surface** field of the **Controller/Surface Settings** dialog box, select **EuCon Controller**.

5. Click **OK** to close the **Controller/Surface Settings** dialog box.

 Note: *It is not necessary to select any input or output ports.*

6. In the **Preferences** dialog box (**MIDI - Control Surfaces** page), make sure that the **WAI Display** check boxes and the **ACT Indicators** check boxes are enabled, and click **OK**.

For more information about using the EuCon Controller surface, see the separate EuCon Controller online Help (open the EuCon Controller plug-in and press F1).

See also:

The WAI display

The WAI display (short for Where Am I) is a group of colored markers to show you which tracks and/ or buses are currently being controlled by which controller/surface. Each controller/surface uses different colored markers.

In the following picture controller/surface 1 (blue markers) is controlling tracks 2-5, and controller/ surface 2 (red markers) is controlling tracks 7-14. You can **drag the markers** to different groups of tracks to change which tracks each controller/surface is controlling. You can also double-click the WAI markers to open the property page of that particular controller/surface.

Figure 350. *WAI display*
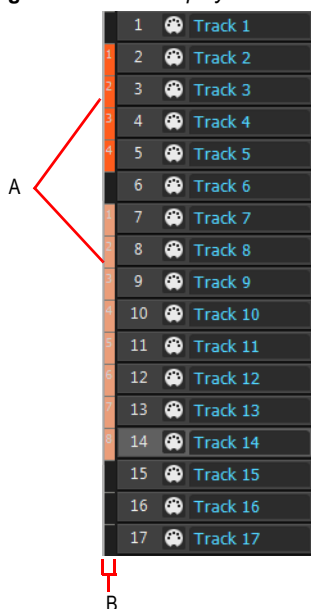
A. WAI markers B. WAI strip

If multiple controller/surfaces overlap, the narrowest strip range appears on top of the widest strip range.
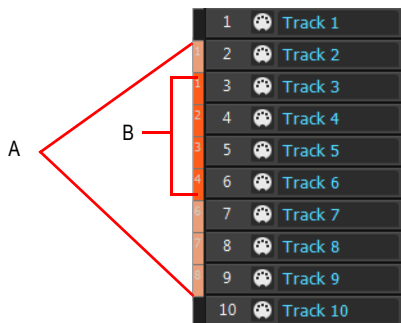
A. Red markers B. Blue markers

The following table describes how you can use WAI markers.

To do this	Do this
Change the group of tracks or buses that a controller/surface controls	Drag the WAI markers from one group of tracks to another group, or from one group of buses to another group. Or Right-click in the WAI strip, and choose **Move > [name of controller/surface] > here** from the pop-up menu.
Open the property page of a controller/surface	Double-click the WAI markers for that controller/surface.
Show or hide the WAI markers in the Track view and/or Console view	Go to **Edit > Preferences > MIDI - Control Surfaces** and select or clear the **Track view** and/or **Console view** check boxes in the **WAI Display** section.
Show or hide the WAI markers for a specific controller/surface	Go to **Edit > Preferences > MIDI - Control Surfaces** and select or clear the check box in the **WAI** column just to the right of the name of the controller/surface.
Change the color of the WAI markers for a specific controller/surface	Go to **Edit > Preferences > MIDI - Control Surfaces** and select a color in the **WAI color** column just to the right of the name of the controller/surface.

Table 216.

See:

ACT

Active Controller Technology (ACT) allows you to control whatever plug-in effect or soft synth currently has focus. The controller/surface mappings for a particular plug-in work the same on each instance of that plug-in, whenever that instance has focus. You can change the focus to a particular plug-in by clicking either the plug-in's interface, or its name in an effects bin.

SONAR has built-in mappings for all relatively recent SONAR plug-ins, however some older plug-ins such as the TTS-1 do not support ACT.

Note: *If you're not using a Roland A-PRO controller, using ACT at this date means using either the ACT MIDI Controller Plug-in, or the Cakewalk Generic Surface Plug-in. The ACT MIDI Controller Plug-in has presets for most popular controller/surfaces that include built-in links between the knobs and controls on a given controller/surface and the cells on the Controllers tab of the ACT MIDI Controller property page. If you're not using one of the factory presets (or there isn't one for your controller/surface) OR if you're using the Cakewalk Generic Surface Plug-in, you need to establish some links between the knobs and controls on your controller/ surface, and either the cells in the ACT MIDI Controller property page or the radio buttons in the Cakewalk Generic Surface Plug-in property page. To do either of these, see "Assigning controls on your controller/surface to cells in the ACT MIDI property page" on page 1219, or "To Use ACT with the Cakewalk Generic Surface" on page 1223.*

To use ACT with the ACT MIDI Controller plug-in

1. Make sure you have completed the following preliminary steps:

   • Successfully connected your controller/surface to SONAR (if necessary, see "Setting up control surfaces" on page 1214)

   • Opened the ACT MIDI Controller property page (if necessary, see "To open the ACT MIDI Controller property page" on page 1218)

   • Selected a preset from the ACT MIDI Controller property page **Presets** menu, either a factory preset for your controller/surface, or a self-created preset (if there is no preset, see "Assigning controls on your controller/surface to cells in the ACT MIDI property page" on page 1219).

2. Enable ACT in the ACT MIDI Controller property page by enabling the Active Controller Technology Enable check box. The ACT MIDI Controller can enable this check box from the controller/surface itself.

3. Put the focus on the plug-in that you want to control.

   The name of the plug-in appears in the **Active Controller Technology** field of your controller/ surface's property page, and the current mappings appear above the **Knob** and **Slider** fields in the controller/surface property page.

4. Adjust the plug-in's parameters by moving the controls on your controller/surface (if you're using a self-created preset for the first time, you may have to create your own ACT Mappings before you can do this step—see the following procedure).

5. If you want to control only this instance of the plug-in with your controller/surface, enable the **Lock** check box in the ACT MIDI Controller property page, or enable the **ACT Lock** button in the Control Bar's ACT module.

6. If you are not locking the controller/surface to a single instance of a plug-in, put the focus on another plug-in, if desired, and adjust its parameters.

To edit the default ACT mappings

1. Enable ACT in the ACT MIDI Controller property page by enabling the **Active Controller Technology Enable** check box.

2. Enable the **ACT Learn Mode** button in the Control Bar's ACT module.

3. Open the property page of the plug-in that you want to control.

4. Click the parameters in the property page that you want to control.

5. Move the sliders/knobs on your controller/surface that you want to use to control the parameters with, in the same order that you clicked the parameters (you can reverse steps 4 and 5).

6. Disable the **ACT Learn Mode** button in the Control Bar's ACT module.

7. A dialog box asks if you want to keep your assignments. Click **Yes** or **No**.

Any assignments you keep are saved automatically as soon as you disable the **Learn** button. These assignments are global, so they are the same for every project.

8. In the property page of the plug-in that you want to control, click the parameters that you want to control.

9. Move the sliders/knobs on your controller/surface that you want to use to control the parameters with, in the same order that you clicked the parameters (you can reverse steps 6 and 7).

Importing ACT data

You can use ACT with any automatable plug-in. You can create your own mappings by using the ACT Learn button, but because ACT Learn mappings are stored in XML files, you can also import XML data that contains predefined parameter mappings for certain plug-ins. These predefined parameter mappings provide generic "best guess" assignments between the controls on your surface, and the parameters in the plug-in, which gives you a starting point that you can customize by using the ACT Learn process.

The import feature makes it easy for users to share data, and will also allow you to download incremental updates when new plug-in mappings become available.

If you import ACT data for a certain plug-in, and you have already mapped some of the parameters in that plug-in, for each already-mapped plug-in, a dialog box asks you if you want to overwrite that plug-in's mapping. This lets you protect any parameter mappings that you've already done.

To see if any new ACT XML files are currently available, check the support pages at www.cakewalk.com.

To import ACT data

1. Go to **Edit > Preferences > MIDI - Control Surfaces**.
2. Click the **Import ACT Data** button to open the **Import** dialog box.
3. Navigate to an XML file that contains ACT Learn data, select the file, and click **Open**.

If duplicate plug-in entries are encountered during import, SONAR will ask if you want to overwrite the existing plug-in settings. The options are: **Yes**, **Yes All**, **No**, **No All**. Select one of the answers.

SONAR imports the ACT data you requested.

OPT panels

OPT stands for Open Plug-in Technology. If you have a Yamaha sound module that uses OPT panels, you can open the panels directly from SONAR, edit your sounds, and save them as presets.

To open an OPT panel

1. Make sure your Yamaha module is connected to your computer and turned on.
2. Use the **Views > OPT Panel** command to display the submenu of installed OPT panels, and click the name of the OPT panel you want to display.

   The OPT panel appears.
3. If you want to edit a preset you've previously created, choose the preset from the Presets window; otherwise type a name for your new preset in the Presets window.
4. Edit your sound (each OPT panel has its own help file).
5. Click the floppy disk icon that's next to the **Presets** box to save your edited sound.

Working with StudioWare

StudioWare panels are software interfaces to external MIDI devices such as samplers, keyboards, automatable mixers, and effects units. These interfaces allow you to manipulate the controls on any external MIDI device from graphical controls on your screen. The changes you make to these controls can even be recorded and then played back as part of your project.

SONAR includes a wide variety of StudioWare panels for popular MIDI devices, with new panels constantly under development here at Cakewalk, by equipment manufacturers, and by SONAR users. Check the Cakewalk web site (www.cakewalk.com) from time to time for new and updated StudioWare panels.

StudioWare panels

SONAR comes with a variety of StudioWare panels. Some are designed to control a specific external MIDI device, while others are useful with a variety of devices. Here is a listing of some of the panels that are included with SONAR:

Panel name	What it's for
Line 6 POD	Provides control for the Line 6 POD 2.0/Pro amp modeler.
Line 6 POD	Provides control for the Line 6 Bass POD amp modeler.
Fender Cyber Twin	Provides control for the Fender Cyber Twin amp modeler.
ART SQX20	Provides control for the ART SGX 2000 Express guitar preamp/processor
AWE	Controls the wavetable synthesizer on SoundBlaster AWE sound cards
EMU Orbit	Provides basic control of the EMU's Orbit synthesizer
General MIDI	Provides parameters and control for any General MIDI compatible synthesizer
Mackie OTTO 1604	Fader and Mute control designed for the Mackie 1604 mixer
MMC	MIDI Machine Control panel, providing track arming and transport control for any device that responds to MMC commands
Novation Bass Station BS1	Panel for controlling the settings of the Novation BassStation
Novation Bass Station Rack BSR1	Panel for controlling the settings of the Novation BassStation rack version
Novation DrumStationRack DRM-1	Panel for controlling the settings of the Novation DrumStation
Novation Super Bass Station Rack	Panel for controlling the settings of the Novation SuperBassStation rack version
Roland GS	Control panel providing parameter manipulation for any GS-compatible synth
Roland VS-880	Provides parameter and transport control for the Roland VS-880 digital audio workstation
Tascam RC-808	Control Interface modeled after the Tascam RC-808 remote control unit, used with the DA-38, DA-88, and DA-98 multitrack recorders
Yamaha ProMix 01	Provides parameter control for the Yamaha ProMix digital mixer
Yamaha 03D	Provides parameter control for the Yamaha 03D digital mixer
Roland UA-100	Provides parameter control for the Roland UA-100 audio canvas

Table 217.

To open a StudioWare panel

1. Choose **File > Open** to display the **Open File** dialog box.

2. Choose **StudioWare** from the **Files of Type** list.

3. Choose a StudioWare file and click **Open**.

SONAR opens and displays the StudioWare panel.

Using StudioWare panels

Every StudioWare panel is made up of a collection of controls and other information displays. The controls are software representations of the knobs, buttons, and sliders on an external MIDI device. By moving the controls on the screen, you adjust the controls on the external MIDI device. If you want, you can also configure the StudioWare panel so that moving the controls on the external device adjusts the controls on your computer screen. Some StudioWare panels contain controls that perform other functions within SONAR, such as changing track parameters or running CAL programs.

Because StudioWare panels can be used to control many different types of devices, and because each and every panel can be tailored for a specific application and hardware environment, it is impossible to explain here all the different ways to use a particular panel. Instead, this section tells you how to use the different types of controls and how to record the changes you make to each control as part of your project.

There are three types of controls in most StudioWare panels: buttons, knobs, and sliders. In addition, panels may contain LED indicators, level meters, text, and bitmap images. The appearance of controls and other displays may vary greatly from panel to panel. They may be of very different sizes, and they may be designed with custom styles, bitmaps, and colors. In addition, sliders and meters may be laid out either horizontally or vertically.

MMC

General MIDI
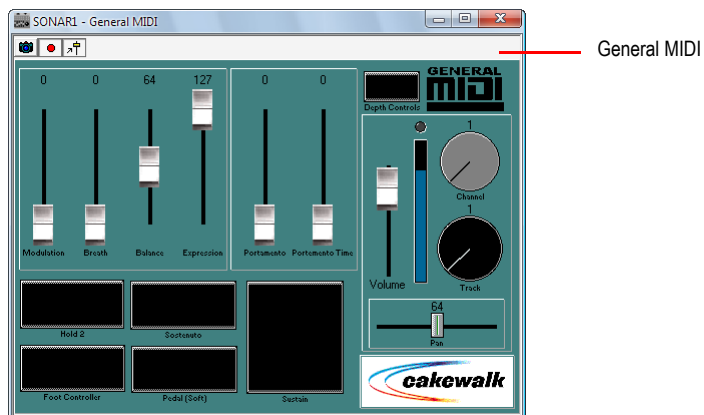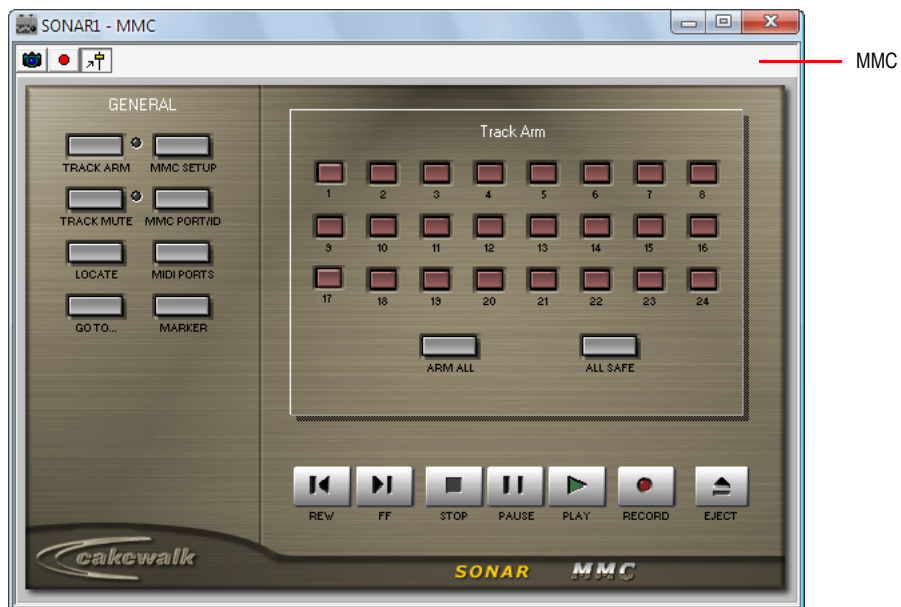
There are a variety of ways to adjust the values of buttons, sliders, and knobs:

To change this	Do this
The status of a button	Click on the button
The value of a slider	Click on the desired slider position to move the slider to that position, or drag the slider to the desired position
The value of a knob	Click along the outer edge of the knob to move the knob to that position, or drag the outer edge of the knob in a circular motion to set the desired position

Table 218.

To change the value of a knob or slider using the keyboard, you must first select the control:

- To select a control that has a numeric value display or label, click on the value or the label.
- To select a control without a numeric value display, click on the control, being careful to click at the current control position. If you do not click at the current control position, the control will change values as a result of the mouse click.

To adjust a knob or slider using the keyboard:

- Press the - and + keys to decrease or increase the value of the selected control by the smallest amount
- Press the [and] keys to decrease or increase the value of the selected control by steps of 10

Grouping controls

SONAR lets you create groups of StudioWare controls. When several controls are in a single group, you can move a single control and have the remaining controls in the group adjust automatically. This is useful for many different mixing and crossfade applications.

When you create a group of controls, each control in the group has a starting and an ending value. Here's how these values are used:

- When you move any control in the group to its starting value, all controls in the group are set to their starting value
- When you move any control in the group to its ending value, all controls in the group are set to their ending value
- When you position any control in the group somewhere between its starting and ending value, all controls in the group are set to the same relative position between their starting and ending value

The initial range for each control is set based on the position of the controls at the time you group them.

You can adjust the range for any individual control, even if it is part of a group, simply by holding the SHIFT key while you move the control. When you adjust an individual control by holding the SHIFT key, its maximum or minimum is adjusted, depending on whether the entire group is closer to its minimum or maximum value.

To create a group of controls

1. Select any control by clicking on it with the mouse.
2. Hold down the CTRL key and click on one or more additional controls.

SONAR creates a group from the selected controls.

To remove controls from a group

Hold down the CTRL key and click on any control in the group.

SONAR removes the control from the group.

To adjust a single control in a group

Hold down the SHIFT key and drag the control to a new value.

The range for the control is adjusted so that its current position corresponds with the current position of other controls in the group.

Example: to set two faders for a crossfade

1. Move the two faders to their midpoint.
2. Click on the first fader, and then CTRL-click on the second to create a group.
3. Move both faders to their highest position.
4. SHIFT-drag the second fader to its lowest position.
5. Drag the first fader to its lowest position.
6. SHIFT-drag the second fader to its highest position.

These two controls are now grouped so that they move in opposite directions.

The minimum and maximum values of the faders look like this:

Fader	Starting value	Ending value
#1	0	127
#2	127	0

Table 219.

To set faders that are always the same distance apart, set the ranges something like this:

Fader	Starting value	Ending value
#1	0	63
#2	64	127

Table 220.

To set faders to move over different ranges of values, set them something like this:

Fader	Starting value	Ending value
#1	0	127
#2	0	100

Table 221.

Recording control movements

You can move the controls in a StudioWare panel while playing back a project to adjust the levels or other MIDI activity that the panel is designed to accommodate. In addition, you can record changes that you make to the controls in a panel so that these changes become a part of your project. Recording changes so that they play back automatically is known as **automation**.

There are two general approaches to recording control movements, as indicated in the following table.

Approach	How it works
Snapshot	You set all the controls to the values you want, and then create a snapshot of these settings at a particular Now time. When you play back the project later, all the controls will snap back to these settings when you reach the appropriate Now time.
Real-time recording	You move controls in any way you like, recording the series of changes you make so they become part of your project. When you play back the project later, the controls move exactly as you recorded them.

Table 222.

The first approach is useful, for example, when your project contains a variety of distinct sections and you want to make a sudden change in one or more settings between the sections.

The latter approach is most useful when you want to create smooth transitions from one section to another. For example, you could slowly add modulation to a MIDI piano or move the faders on a digital mixing console. Once you record these changes, they will play back along with your project automatically.

StudioWare lets you record and re-record automation data as many times as necessary. When you record new movements for a control, any old events for that control are replaced by the newer ones. Movements of other controls are unaffected. You can re-record moves again and again until you've got the movement exactly the way you want it. You can also edit automation data using the Notes pane in the Piano Roll view.

There are three tools in the **StudioWare** toolbar that are used to control recording and automation:

Icon	Tool	What it's for
	Update	Makes the controls in the panel update automatically during playback or when MIDI data is received by the panel
	Snapshot	Records a snapshot of the current position of all controls
	Record	Activates real-time recording of all control movements

Table 223.

Most StudioWare panels are designed to both send and receive MIDI data. This means two things:

- If you move the controls on your external MIDI device, the StudioWare panel will be notified of the changes
- When you play back a project containing automation data, the StudioWare panel is notified of the automation changes

The **Update** button in the **StudioWare** toolbar indicates whether these changes are played back visually on the StudioWare panel. Press this button to make sure that automation parameters and changes made on the external MIDI device are displayed in the StudioWare panel. Turn this option off if you do not want to see these changes.

If you are recording a snapshot while playback is in progress, you should probably disable Update. Otherwise, some of the controls may move as a result of previously recorded automation events, even while you are trying to position them correctly.

When you are recording real-time control movements, you probably want Update enabled, so that the controls will show the events that have already been recorded.

If you record automation data on a track that contains linked clips, SONAR automatically unlinks the clips so that the automation data do not apply to other instances of the linked clip. As an example, suppose you have four repetitions of a particular riff, stored in four linked clips that play in sequence. When you record a fade-out over these four clips, SONAR automatically splits the clips into four independent clips, each with automation data representing some portion of the fade.

If you record a snapshot of control positions on a track that contains linked clips, the clips remain linked, and the snapshot applies to all copies of the linked clip.

If you are not happy with the automation data you recorded, you can always use the **Edit > Undo** command to remove it.

The automation data you record using a StudioWare panel can be displayed and edited using either the Notes pane in the Piano Roll view or the Event List view. For more information about the Controller pane, see "Controllers, RPNs, NRPNs, and automation data" on page 739. For more information about the Event List view, see "The Event List view" on page 742.

To record a snapshot while playback is stopped

1. Set the Now time to the point in the project where you want the settings to take effect.
2. Move the controls to the settings you desire.
3. Click ![camera icon].

SONAR records a snapshot of the current control settings.

If the Now time is the very beginning of the project, then the snapshot will change the track parameters to match the controls in the panel instead of recording automation events.

To record a snapshot while playback is in progress

1. Make sure the ![button icon] button in the **StudioWare** toolbar is not pressed so that Update is disabled.
2. Change the Now time to a few bars or seconds before the time you want to take the snapshot.
3. Start playback.
4. When you have reached the appropriate time, click on the **Snapshot** button.

SONAR records a snapshot of the current control settings.

To record control changes in real-time

1. Make sure the ![button icon] button in the **StudioWare** toolbar is pressed so that **Update** is enabled.
2. Make sure the ![record icon] button in the **StudioWare** toolbar is pressed so that **Recording** is enabled.
3. Set the Now time to a few bars or seconds before the time at which you want to record control movements.
4. Click ![play icon] or press SPACEBAR to start playback.

   ![info icon] **Note:** *Do not press the **Record** button in the Control Bar's Transport module!*

5. Adjust the controls as you want while playback is in progress. Each time you adjust a control, the Record tool ![record icon] is activated.
6. When you are done, click ![stop icon] or press the SPACEBAR to stop playback.
7. Click the ![record icon] button in the **StudioWare** toolbar to turn off real-time recording.

SONAR records the control changes that you entered while playback was in progress.

Control settings

The controls in a StudioWare panel are designed to send and receive various types of MIDI information. This information can be transmitted to two possible destinations:

• A specific track in your project

• A MIDI output

When you want to record the movements of controls within a panel, you must make sure that MIDI data from the control are directed to a MIDI track.

StudioWare Panel drawing speed

Some StudioWare panels use bitmap graphics to enhance their appearance. These graphics can slow down the speed with which a panel is displayed on some slower PCs. You can turn off these bitmap graphics by adding this line to the [WinCake] section of the Cakewalk.ini file, as follows.

```
PanelsShowWidgetBitmaps=0
```

To turn bitmap graphics on again, change the entry to:

```
PanelsShowWidgetBitmaps=1
```

For more information about the Cakewalk.ini file, see "Initialization files" on page 1287.

Using CAL

Cakewalk Application Language (CAL) is an event-processing language that you use to extend SONAR with custom editing commands.

See:

Running CAL programs

To interrupt a CAL program while it is running, press the ESC (Escape) key. Press **OK** to confirm that you want to interrupt the CAL program. As a rule, you shouldn't interrupt a CAL program in this way unless you suspect it is stuck in an infinite loop.

To open a CAL program

1. Select the MIDI data you want to edit.

2. Choose **Process > Run CAL**.

   The **Open** dialog box appears.

3. Navigate to the folder that contains the CAL program you want to run.

4. Choose the file you want to open and click **Open**.

The CAL program you chose runs and modifies the selected MIDI data.

Sample CAL files

The following is a description of the sample CAL programs that come with SONAR. You can use these programs as is or modify them to suit your own needs.

See:

SPLIT NOTE TO TRACKS.cal

This program splits individual notes to separate tracks. It is useful if you have one drum track but want to split each drum to a separate track (for more flexible editing).

SPLIT CHANNEL TO TRACKS.cal

This program splits a track by channel into 16 new tracks. This can be useful for Type 0 MIDI files, which may have data recorded on many channels but only one track.

To use the program

1. Select only one track.
2. Set the From and Thru markers for any part of the track (you don't have to split the whole track).
3. Run the `Split Channel to Tracks.cal` program.

   SONAR displays a dialog box.
4. Select the first track for the 16 split-channel tracks (preferably, the first of 16 blank tracks).
5. Click **OK**.

RANDOM TIME.cal

This program randomizes event starting times. It asks you for a number of ticks. The program then changes each event time by an amount that is randomly between plus or minus one-half the number of ticks that you supply.

For example, if you type the number 4, each event time will have -2, -1, 0, 1, or 2 added to it.

THIN CONTROLLER DATA.cal

This thins continuous Controller data. It prompts you for two numbers.

- The number of the Controller that you want to thin. For example, MIDI assigns the Volume controller to number 7.
- A thinning factor. For example, if you specify the number 3, the program deletes every third Controller event of the kind you've specified.

This program never deletes Controllers with the values 0, 64, or 127, because the goal is to thin the data without destroying the fundamental shape of it.

THIN CHANNEL AFTERTOUCH.cal

This works almost exactly like the previous program, but it thins channel aftertouch (ChanAft) events. It asks you for the thinning factor.

THIN PITCH WHEEL.cal

This works almost exactly like the previous two programs, but it thins pitch-wheel events. It asks you for the thinning factor.

This program never deletes wheel events with these special values:
-8192, 0, and 8191.

MAJOR CHORD.cal, MINOR CHORD.cal

These two CAL programs and the three other chord-building CAL programs that come with SONAR build chords using existing events in the track(s) as chord roots.

For instance, if you select a single note as the region and run `Major_chord.cal`, two notes are added above the original note. The resulting chord is a major triad.

Normally, you'll use these programs on a region containing a single note. You can, however, apply these to tracks containing many notes. Each original note will become the root of a chord.

Troubleshooting

If you're having a problem with SONAR, don't panic. This chapter lists some common problems and how to solve them.

If you don't find an answer here, there are two other important places to look for help:

- Check the ReadMe file that came with your software. It contains additional information that wasn't available when this online Help was written. To view the Readme file, select **Help > View README.RTF**.
- Visit our support Web site at www.cakewalk.com/Support, where you will find answers to frequently asked questions, tech support documents, program patches and updates, and more.

Frequently asked questions

See also:

Installation Error: DeleteFile Failed; code 5 Access Denied

If you are using Windows 7 and your user account has limited privileges, you may see the following error message when installing SONAR: "DeleteFile failed; code 5 access denied".

To resolve the issue, restart your computer, and log in with another administrative user account, then install SONAR.

If you are already logged in as the Administrator, you will need to run the SONAR installer manually as Admin:

1. Insert the SONAR DVD installation disc in your DVD drive.

   Note: *If you are using a downloaded version of the installer, skip to step 4.*

   If the Auto-run screen appears, close it.

2. Go to Computer, right-click on your DVD/CD-ROM drive and click **Open**.

3. Navigate to `\Install\SONAR_Setup.exe`.

4. Right-click `SONAR_Setup.exe`. and click **Properties** to open the **Properties** dialog box.

5. Click the **Advanced** button to open the **Advanced Attributes** dialog box.

6. Select the **Run as Administrator** check box, then click **OK** to close the **Advanced Attributes** dialog box.

If the preceding steps do not resolve the issue and there is no other user account to log into, please create a new user account with administrative rights. It is possible the permissions for the current user account are corrupt, and creating a new user account should correct the problem. For information about creating a new user account, please see http://technet.microsoft.com/en-us/library/cc505882.aspx.

Make sure no other programs are running when you install SONAR, such as virus scanners. To prevent any programs from loading when you start Windows, follow these steps:

1. Choose **Start > Run** to open the **Run** dialog box.

2. Type **MSCONFIG**, then click **OK** to open the **System Configuration Utility** dialog box.

3. Click the **Startup** tab.

4. Clear all selected check boxes, then click **OK**.

   Note: *You can always re-select any cleared check boxes at a later time. If you are using any real-time monitoring programs, such as Spy Doctor or Zone Alarm, please disable them from within each respective program.*

5. Restart the computer.

6. Reinstall SONAR.

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Setting up an internal audio card

Some internal audio cards need to have a cable connected to their audio input in order for the drivers to work properly. If this applies to your internal audio card and you don't have access to a microphone with an 1/8 inch cable, then you can use any 1/8 inch connection to force the audio card into displaying the drivers correctly.

If the drivers are not available in SONAR, try plugging a simple pair of headphones into the mic or line input before starting SONAR.

If you are experiencing problems with playback, try the following steps:

1. Go to **Edit > Preferences > Audio - Playback and Recording**.
2. In the **Driver Mode** list, select **MME (32-Bit)**.
3. Select the **Share Drivers With Other Programs** check box.
4. Select the **Always Open All Devices** check box.
5. Click **Audio - Sync and Caching**.
6. In the **Playback I/O Buffer Size (KB)** list, select **512**.
7. In the **Record I/O Buffer Size (KB)** list, select **512**.
8. Click **Apply**.
9. Click **Audio - Devices**.
10. Select all Input and Output drivers for your sound card, except any Inputs named "Stereo Mix" or "What you Hear".
11. Click **Audio - Driver Settings**.
12. Assign **Playback Timing Master** and **Record Timing Master** to the first listed device or the device in which your speakers are plugged into.
13. Set **Buffers in Playback Queue** to **2**.
14. Drag the **Buffer Size** slider to the middle.
15. In the **Sampling Rate** list, select **44100**.
16. Click **OK** and restart SONAR.
17. Play a project. If audio is distorted, go to **Edit > Preferences > Audio - Driver Settings**, change **Buffers in Playback Queue** to **4,** then click **OK** and restart SONAR.

More "Frequently asked questions" on page 1251.

Configuring an audio interface

Before configuring your audio interface, make sure you have installed the latest drivers (can normally be obtained from the manufacturer's Web site).

If you are using a USB Interface, ensure that it is plugged directly to the computer and not into a USB hub or external hard drive.

You can find setup guides for many popular audio devices at www.cakewalk.com/support/hardwaresetup. If your device is not listed or if you do not have access to the Internet, follow these steps to configure your hardware in SONAR:

1. Make sure your audio interface is connected and receiving power before you start SONAR.

2. Go to **Edit > Preferences > Audio - Playback and Recording**.

3. In the **Driver Mode** list, select **ASIO**.

4. Click **Audio - Sync and Caching**.

5. In the **Playback I/O Buffer Size (KB)** list, select **512**.

6. In the **Record I/O Buffer Size (KB)** list, select **512**.

7. Click **Apply**.

8. Click **Audio - Devices**.

9. Select all Input and Output drivers for your audio interface, then click **Apply**.

10. Click **Audio - Driver Settings**.

11. Assign **Playback Timing Master** and **Record Timing Master** to the first ASIO, then click **OK** and restart SONAR.

12. Play a project that contains audio.

    If playback doesn't play smoothly, continue to step 12.

13. Go to **Edit > Preferences > Audio - Driver Settings**.

14. Click the **ASIO Panel** button.

    The ASIO Panel opens, with settings specific to your audio interface.

15. Locate a buffer or latency control and set it in the middle position.

16. Restart SONAR and play a project that contains audio.

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Audio dropouts or crashes during playback

Symptom: After several seconds of playback, the audio begins to cut out, although the transport appears to keep rolling.

Solutions:

- Go to **Edit > Preferences > Audio - Driver Settings** and increase the value of the **Buffer Size** slider, or adjust the hardware buffer size in the ASIO Panel.
- Go to **Edit > Preferences > Audio - Sync and Caching** and increase the **Playback I/O Buffer Size (KB)** and **Record I/O Buffer Size (KB)** values. Try settings of **512**, **1024**, or **2048** KB.
- There may be a plug-in that is causing the project to crash. Try opening the project in Safe Mode:
    1. Go to **File > Open** and select the project that crashes, but do not open it yet.
    2. Hold down the SHIFT key and click **Open**.

    The **File Open - Safe Mode** dialog box appears, prompting you to load the plug-ins that are used in the project.

    3. Click **No** for any plug-in that has been recently installed or added to the project. You can also remove any non-Cakewalk plug-ins to ensure the project will load properly.

More

My MP3 encoder stopped working

SONAR includes a 30 day trial of the MP3 encoder. Cakewalk does not own the license to the MP3 format and because not all users require the MP3 format, Cakewalk does not force you to pay for the license. If you need to export your projects as MP3 files, you can purchase the encoder directly from www.store.cakewalk.com.

> **Note:** *If you purchase the MP3 encoder, you can continue to use it with future Cakewalk products.*

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When I play a file I don't hear anything (MIDI project)

Symptom: When you attempt to play back a project (.cwp) or a MIDI file (.mid), the playback meters move and the timeline scrolls, but there is no sound from the speakers or headphones.

Solution: The project only contains MIDI data and needs to be routed to a software synth (**Insert > Soft Synths**), a hardware synthesizer, or the Microsoft GS Wavetable Synth.

For more information about playing MIDI data in SONAR, please see "Tutorial 4 – Playing and recording software instruments" on page 125.

More "Frequently asked questions" on page 1251.

I can't record from my MIDI device

Symptom: When you play notes on your MIDI instrument while recording on a MIDI track, nothing is recorded.

Solutions:

- You may have no MIDI input device selected. Go to **Edit > Preferences > MIDI - Devices** and select the correct input and output devices.
- Your MIDI cables may be connected incorrectly. Check to make sure that the MIDI output of your keyboard is connected to the input port on your MIDI interface.
- Your may need to update the drivers for your MIDI interface. Please visit the device manufacturer's Web site and download and install any updated software patches or drivers.
- You have not configured SONAR to record MIDI data. Make sure that you have performed the following steps:
  - Select the correct MIDI input for the track you are recording to.
  - Arm the track for recording.
  - Press SONAR's **Record** button (not the **Play** button).
- The correct instrument definition for your MIDI device may not have been imported and configured correctly. To import an instrument definition, follow these steps:
  1. Go to **Edit > Preferences > MIDI - Instruments**.
  2. Click **Define** to open the **Define Instruments and Names** dialog box.
  3. Click **Import** to open the **Import Instrument Definitions** dialog box.

4. Navigate to the desired instrument definition file (.ins) and click **Open**.

Note: *By default, instrument definition files are stored in SONAR's Sample Content folder.*

5. Select one or more instrument definitions from the I**mport Instrument Definitions** dialog box and click **OK**.

6. Click **Close** to return to the **Assign Instruments** dialog box.

You can now assign your new instruments definition(s) to the proper port and channel assignments.

Note: *You may need to route channel 10 specifically to a Drum Instrument definition file. If none is available, route all channels to the single definition.*

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I can't record any audio

Symptom: The **Record** button is lit and the transport is moving, but nothing is being recorded.

Solutions:

- You may not have selected the correct recording device. Go to **Edit > Preferences > Audio - Driver Settings** and make sure **Record Timing Master** is set to the input you are using. Make sure **Playback Timing Master** is set to the same device that your speakers or headphones are plugged into.

- You have not set up SONAR to record audio. Make sure that you have performed the following steps:

  - Select the correct audio input for the track you are recording to.

  - Arm the track for recording.

  - Press SONAR's **Record** button (not the **Play** button).

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I hear an echo when I record

If you have input monitoring enabled, when you play an instrument that is plugged into your sound card, you hear the direct signal that goes straight through your sound card, and then an instant later you hear the sound that is processed by SONAR, including any plug-in effects you may be using.

You can eliminate the echo in either of two ways:

• Mute the direct signal so you only hear the sound that is processed by SONAR. If you choose this method, you may hear too much of a lag between the time you play your instrument and the time you hear it, depending on the latency of your system (using WDM audio drivers is a great way to achieve lower latency).

To mute your sound card's direct sound:

1. Open the Windows Volume Control window:

   • Windows 7: Click the Windows **Start** button and go to **Control Panel > Hardware and Sound > Volume Control**.

   The Volume Control window appears.

2. In the Play Control window of the mixer, check the Mute check box in the Line-In column, or in the column of whatever jack your instrument is plugged into, and close the mixer window.

• Disable input monitoring so you only hear the raw signal that's coming through your sound card. If you choose this method, you won't hear any plug-in effects you may be using.

To disable input monitoring:

• On the track where you want to disable input monitoring, click the track's **Input Echo** button so that it is in the Off position:

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Dropouts happen at high bit-depths or high sample rates

If you are hearing consistent dropouts/clicks in your audio and if your project contains high bit depth (32/64 bit) or high sample rate audio (88.2K or higher), it may be indicative of a too small I/O buffer size. If so try a higher I/O buffer size like 256 or 512. If audio problems persist, reset to 128 and try a different remedy.

Go to **Edit > Preferences > Audio - Sync and Caching**, and set **Playback I/O Buffer Size (KB)** and **Record I/O Buffer Size (KB)** to **256**, **512** or **1024**.

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Patching an effect into SONAR causes a dropout

You may have simply reached the maximum number of tracks and effects your CPU can handle. If this is the case, there are several things you can try:

- Freeze tracks and synths that you presently don't need to edit. For details, see "Freeze tracks and synths" on page 858.
- Use the **Bounce to clips** command to mix down clips that contain a lot of edits (clip effects, automation, AudioSnap, etc). Doing so will decrease the amount of data your system has to process simultaneously. For details, see "Bouncing to clips" on page 787.
- If you are using V-Vocal, a lot of processing power may be required from your system. For best performance, it is recommended that you use a clip as small as possible to apply the V-Vocal effect, then use the **Bounce to Clips** command to mix down any final V-Vocal clips that don't require any more editing.
- Open the C:\Cakewalk Projects\Picture Cache folder and delete its contents (do not delete the folder itself). Doing so will free up disk space so SONAR may perform more efficiently.

However, if SONAR's CPU meter does not appear to be maxed out, or other plug-ins seem to work, you may need to address the problem by editing a line in the Aud.ini file. You can edit the Aud.ini file from within SONAR.

1. Go to **Edit > Preferences > Audio - Configuration File**.
2. In the **Properties** list, scroll down to the property named **ExtraPluginBufs**.

   The default value of the ExtraPluginBufs variable is 0.
3. Change the value of **ExtraPluginBufs** to **1**.
4. Click **OK** to close the **Preferences** dialog box, then try to insert the effect that caused the dropout.

If you still experience a dropout, change the value of **ExtraPluginBufs** to **2**. Continue to double the value of this variable until you reach **128** (**4**, **8**, **16**, **32**, etc.). If a value of **128** does not fix the problem, it is time to try something else. For more information about potential dropout causes, see "Dropouts and other audio problems" on page 1197.

More "Frequently asked questions" on page 1251.

I can't open my project / File Recovery mode

SONAR 5 introduced a special diagnostic mode called Safe Mode to fix problems with project files that would not open. Safe mode is activated when you open a file while the **SHIFT key** is pressed.

In certain rare circumstances, on attempting to open a project file you may see the following error message:

"This file you are trying to open is not compatible with this version of SONAR".

This message indicates that SONAR detected errors in the project file and was unable to open it. This normally indicates that your project file has data corruption.

Data corruption on a DAW can occur due to various reasons, a few of which include:

- Your hard drive might suffer data loss.
- Windows delayed writes might fail leading to data corruption.
- Many hard disks have a "write through cache" buffer for efficiency. Occasionally this write through buffer might not get flushed due to a driver error or system crash. In such cases data might not be flushed to your hard driver causing corrupt files (SONAR requests Windows to flush this buffer after a file save operation).
- A plug-in can corrupt SONAR's memory space causing invalid data to be written to disk when the project is saved.
- During a file save the system can crash. In such situations, you will have a truncated file on disk.

You save a "recovery file" through SONAR's crash exception dialog box. When a crash occurs in SONAR, you are presented with this dialog box allowing you to **attempt** to save a recovery file. While this works most of the time, occasionally SONAR may be in a compromised state due to memory corruption. Under these circumstances, saving a file might cause a crash or the file might contain invalid data.

In general, the best insurance against the data corruption scenarios above is to follow standard safe computing practices to guard against data loss (keep regular backups, use autosave with versioning, etc.). However, occasionally you may be faced with a situation where you do not have a backup copy of a critical project that now fails to open.

SONAR's File Recovery Mode offers a means to help recover data from damaged project files.

To use File Recovery mode

Do *one* of the following:

- If you are opening a file from the **Most Recently Used files** list in the **File** menu, hold down the SHIFT key while selecting file name.
- If you are opening the file from the **Open** dialog box, select the file in the dialog box and hold down the SHIFT key while clicking the **OK** button.

What does File Recovery mode do?

File Recovery Mode applies the following behavior when opening a project file:

- Opens only the Track view, skipping all other opened views in the project including effects windows, Console View etc.
- Prompts you to open the plug-ins saved with your project. Each plug-in gets a prompt, so you can open some and not open others.

⚠️ **Important:** *If you choose to not open a plug-in, that plug-in is stripped out of the project, so resaving the file will cause a loss of any project specific settings for that plug-in.*

- Ignores various strict error checks that would normally prevent a file from loading.
- Detects corrupt data and skips over "chunks" that are found to be invalid. E.g., if a track/event is detected to contain invalid data, SONAR will attempt to skip over that track/event and proceed to load the next track/event.

In many cases, File Recovery Mode may be able to open damaged projects with minimal data loss. However, the level of success depends on the nature and extent of the data corruption, so the results are not predictable. As a result of this, after opening a damaged project in File Recovery Mode, you must carefully observe whether your settings have been retained or if the project exhibits other problems. If you notice problems you should copy and paste the critical data from the recovered file into a brand new empty project to start clean.

⚠️ **Important:** *Since File Recovery Mode ignores many critical error checks while loading a file, depending on the nature of the data corruption in the file, it is possible that opening a file with File Recovery Mode might cause SONAR to crash or become unresponsive. Please ensure that you save all your current work and close all open projects **before** attempting to open a file with File Recovery Mode.*

After loading a file with File Recovery Mode, it is recommended that you resave the file—preferably with a new name—and then shut down and restart SONAR before proceeding.

More

No sound from my software instrument/synth

Symptom: I have inserted a soft synth but when I play notes on my MIDI keyboard I don't hear anything.

Solutions:

• Make sure that the Instrument track, MIDI track, or audio track are not muted.

• Make sure the MIDI notes are in the right range for the synth's patch.

• Make sure that SONAR's audio engine is engaged. The **Audio Engine** button in the Control Bar (Transport module) is lit when the audio engine is engaged.

• Unless you are using a dedicated Instrument track for the soft synth, make sure the current MIDI track's Output control is assigned to the soft synth.

• Make sure that the **Input Echo** button on the current MIDI track is set to **Input Echo: Auto Thru** or **Input Echo: On**.

• If you MIDI controller contains an on-board sound module, make sure it's Local Control function is set to OFF.

More

SONAR doesn't recognize new plug-ins

SONAR supports both VST and DirectX effect and instrument plug-ins. You will first need to determine which of these two types of plug-ins you have. Most third-party plug-ins are VST.

For VST Plug-ins

When you install a new VST plug-in, be mindful of the folder where it is installed. Common default locations include:

`C:\Program Files\Cakewalk\VstPlugins` (recommended location)

`C:\Program Files\Steinberg\VstPlugins`

`C:\Program Files\VstPlugins`

VST plug-ins appear in SONAR via the integrated VST scanner. If you have installed VST plug-ins to a common location, like the folders listed earlier, you may not need to take any additional steps. If the new plug still does not appear, you will need to point SONAR's VST scanner to the exact directory where your new VST plug-in is installed.

To do so:

1. Go to **Edit > Preferences > File - VST Settings**.

2. Under **VST Scan Folder(s)**, click the **Add** button and browse to the folder where the new plug-in is installed.

> **Note:** *VST scanner looks for dll files. So for example, the file* `PerfectSpace.dll` *is found under* `C:\Program Files\Cakewalk\VstPlugins`. *You will probably notice that this directory has already been added by default and thus Perfect Space appears automatically.*

3. When you have selected the folder that contains your new plug-in's dll file, click **OK**.

4. Click **Scan VST Folders**.

5. Click **OK** to close the **Preferences** dialog box.

   Your new VST plug-in should now appear in SONAR's plug-in menus.

For DirectX Plug-ins

Normally, no additional setup is required for DirectX plug-ins. DirectX plug-ins install globally into Windows and are seen by any DirectX host program, such as SONAR. If your new DirectX plug-in is not appearing in SONAR, first check to make sure it is installed properly. If you are confident it is installed properly, then the plug-in may be excluded from your plug-in lists. To check:

1. Go to **Utilities > Cakewalk Plug-in Manager** to open Cakewalk Plug-in Manager.

2. Click **Show Excluded** in the lower left corner.

3. In the **Plug-in Categories** list, select **DirectX Audio Effects (DX)** (for audio effects) or **DirectX Instruments (DXi)** (for soft synths).

4. Verify if the plug-in appears in the **Registered Plug-ins** list. If so, the plug-in is excluded.

5. To enable any excluded plug-in, select the plug-in in the **Registered Plug-ins** list, then click **Enable Plug-in**.

My waveforms are gone, but I still hear audio; it says Busy in the corner of the clip

If your audio clips are labeled "Busy", the waveform display has not finished drawing yet, or may be corrupt. To force SONAR to redraw waveforms in the current project, perform the following steps:

1. Go to **Edit > Select > All** to select all clips.

2. On the Track view **Clips** menu, select **Recompute Picture Cache**.

If you still have trouble with waveform redrawing, please see "Optimized picture cache redrawing" on page 1205.

My waveforms are gone, but I still hear audio; it says Busy in the corner of the

I get an error message when I change a project to 24-bit audio

Some audio devices, especially USB devices that use WDM drivers, can not operate in 24-bit mode unless a variable in SONAR's `Aud.ini` file is set to 1. The variable is Use24BitExtensible=<0 or 1>, which goes in the `[name of your audio device ('n' in, 'n' out)]` section.

To access the `Aud.ini` file from within SONAR, go to **Edit > Preferences > Audio - Configuration File** and click **Edit Config File**. After you update and save the `Aud.ini` file, click **Reload Config Settings**.

For more information, see "AUD.INI" on page 1301.

More "Frequently asked questions" on page 1251.

Bouncing tracks takes a long time

By default, SONAR uses a buffer for bouncing tracks that is the same size as the (Mixing Latency) **Buffer Size** value that you set in **Edit > Preferences > Audio - Driver Settings**. But with some projects, especially ones that use certain soft synths, the bounce buffer needs to have its own value.

To change the BounceBufSizeMsec value

1. Go to **Edit > Preferences > Audio - Configuration File**.

2. In the **Properties** list, change the **BounceBufSizeMsec** value to **100**, or a value between 0 and 350 so that the bounce buffer will use a more efficient size for bouncing, which has different requirements from normal playback latency.

ⓘ **Note:** *At a value of **0**, the bounce buffer is the same size as the (Mixing Latency) **Buffer Size** value that you set in **Edit > Preferences > Audio - Driver Settings**.*

For more information, see "AUD.INI" on page 1301.

More "Frequently asked questions" on page 1251.

The Now time is not smooth during playback or scrolls out of view

If the Now Time does not update smoothly during playback, press the PAUSE (or BREAK) key on your keyboard to make sure you didn't inadvertently put SONAR in CPU conservation mode. If the PAUSE key has been pressed, SONAR displays the letter P in the status bar.

If the Now Marker scrolls out of view or off of the screen, press the SCROLL LOCK button on your keyboard so that SONAR follows the Now Marker.

Plug-in windows flicker or don't display properly

X-Ray is not compatible with plug-ins that use DirectDraw to create their windows, such as many recent plug-ins by Waves. If a plug-in is not compatible with X-Ray, the plug-in's window will either flicker or not display properly. If you have any plug-ins that are affected by this, you can exclude the plug-in(s) from X-Ray by following these instructions:

1. Open the Cakewalk Plug-in Manager (**Utilities > Cakewalk Plug-in Manager**).

2. In the **Plug-in Categories** list, select the category that the plug-in you want to exclude is in.

3. In the **Registered Plug-ins** list, select the plug-in that you want to exclude.

4. If the plug-in is a DirectX effect, write down (or select and copy) the CLSID value that's in the CLSID field at the bottom of the dialog box.

5. If the plug-in is a VST or VSTi, write down the VST ID value that's in the **VST ID** field at the bottom of the dialog box.

6. Close the **Cakewalk Plug-in Manager** dialog box.

7. Use Notepad to open the `XRayExclude.ini` file that's in your SONAR program folder (`C:\Documents and Settings\<username>\Application Data\Cakewalk\SONAR <your version>` .

8. At the end of the file, find the `[EffectProps View]` section.

9. Exclude your plug-in by creating a blank line below the last entry in the `[EffectProps View]` section, and then typing:

   `;[name of your plug-in, but without brackets]`

   `XRayExclude[type the next available number in XRayExclude list, but without brackets]=[VST ID number, with no brackets, or CLSID number, with curly braces at start and finish]`

   For example, if the last entry in the `[EffectProps View]` section was:

   `; Waves SSL EQ Stereo`

```
XRayExclude11=1397510483
```
```
XRayExclude12={E451379E-F7E1-4E82-98D9-BEB87AC45E90}
```
If you want to exclude the Cakewalk FxDelay from the X-Ray Windows feature, after creating a blank line, type:
```
; Cakewalk FxDelay
```
```
XRayExclude13={985DAF67-589F-4B8D-8BBC-D7AD651B9022}
```
If there is also a VST version of the Cakewalk FxDelay, add another line:
```
XRayExclude14=[some VST ID number, with no brackets]
```
10. Save and close the `XRayExclude.ini` file, and restart SONAR to implement your changes.

More "Frequently asked questions" on page 1251.

I get a Burn Error or No Drive is Detected error when burning a CD directly from SONAR

1. Start SONAR and open the project you are attempting to burn to a CD.

2. Go to **Edit > Select All** to select the entire project.

3. Go to **File > Export Audio** to open the **Export Audio** dialog box.

4. Set **Sample Rate** to **44100**.

5. Set **Bit Depth** to **16**.

6. Type a name in the **File name** field.

7. Select the **Add to Audio CD Track List** check box.

8. Click **Export**.

9. Go to **Utilities > Burn Audio CD**.

If you receive burning errors or your CD-R/W drive isn't recognized under **Target Drive**, try the following

- Make sure the **Burn Speed** setting in Audio Creator matches the CD-R/W or DVD-R/W settings in Windows. To do so:

   a) Go to My Computer, right-click on the CD/DVD-R/W drive and click **Properties**.

   b) Click the **Recording** tab and select the correct **Burning Speed** setting.

   c) Make sure the **Enable Recording on this Drive** check box is select.

   d) Repeat steps 1 - 9.

More "Frequently asked questions" on page 1251.

Known issues

The following topics cover known issues in SONAR.

Session Drummer 3 performance (Producer only)

Session Drummer 3 contains some programs that are approaching 1 GB in size. Users with only 1 GB of memory may experience performance issues.

See:

Session Drummer 2 issues (Studio only)

MIDI drag and drop from Desktop captured by SONAR

Dragging a MIDI file from the Desktop into Session Drummer 2 will cause a new MIDI project to be created in SONAR.

To add a MIDI pattern to Session Drummer 2, you may use its built-in MIDI Pattern Browser, or you may drag and drop a MIDI clip from SONAR.

Session Drummer 2 may lose sync with SONAR during seeking

If the global **Set Now Time with Full Reset** option (click the Track view **Options** menu and choose **Set Now Time with Full Reset**) is disabled, Session Drummer 2 may lose sync with SONAR if Session Drummer 2 is auto-playing a pattern while you seek in the SONAR time ruler.

If you are affected by this issue, the solution is to enable **Set Now Time with Full Reset**.

RPN events stop Session Drummer 2 audio output

If a MIDI track that is routed to Session Drummer 2 is transmitting RPN events, Session Drummer 2 will no longer output audio.

To fix this, open the Session Drummer 2 property page, click the **VST Preset Options** button next to the preset controls, then select **Plug-in Properties**. Finally, enable **Do not intercept NRPNs** and click **OK**.

See:

HLP files cannot be opened in Windows 7

Windows 7 does not ship with the Windows Help (WinHlp32.exe) help program, which is required in order to open 32-bit help content files that have the .HLP file extension. This affects HLP files for a few legacy plug-ins that are included with SONAR. We will update SONAR's online Help in the future to address this. In the meantime, please see the following Microsoft Knowledge Base article for information about a solution: http://support.microsoft.com/kb/917607.

See:

TTS-1 DXi does not support 88.2 kHz sample rate

The Cakewalk TTS-1 soft synth supports 44.1 kHz, 48 kHz, and 96 kHz sample rates, but not 88.2 kHz. The audio engine will not engage if SONAR is configured to use a sample rate of 88.2 kHz while TTS-1 is loaded and connected.

See:

Plug-in delay compensation re-sync

Some plug-ins such as iZotope Ozone 4 and various UAD plug-ins, change their internal delay (PDC) dynamically when certain parameters are modified, presets are changed or internal plug-in routing is changed. When a plug-in changes its internal delay, SONAR X2 will detect this and re-sync all tracks in the project to this new delay value. While this is done you may hear a momentary interruption in playing audio. This is normal and required in order to keep tracks in sync and delay compensated.

See:

SONAR x64

SONAR 5 was the first DAW application to provide a 64-bit audio engine in a 64-bit binary application. Both a 32-bit and a 64-bit version of SONAR are included on the SONAR DVD.

The following features are not supported in SONAR x64 at this time:

- ReWire support for 32-bit clients like Project 5 v2, Reason, and Fruity Loops.

- 32-bit DirectX plug-ins.

- DreamStation DXi2.

- MPEX time/pitch stretching. A 64-bit library is not available for the MPEX time/pitch stretching algorithm, so this feature is not supported in SONAR x64. Use iZotope Radius or SONAR's internal time/pitch stretching instead.

- Apple has yet to release QuickTime for Windows x64, so QuickTime import/export is not yet supported.

Note: *MPG 1 movie files can be imported.*

See:

Backwards compatibility

SONAR X2 can load projects from any previous versions of SONAR, but projects that are saved in SONAR X2 cannot be re-opened in SONAR 1.x or SONAR 2.x. In case you need to open a pre-SONAR X2 project in an earlier version of SONAR, it is recommended that you always create a backup copy of the original project before you re-save the project in SONAR X2.

Project files saved in SONAR X2 will not open in SONAR 4 or earlier if they reference or include any of the following types of data or information:

• 32-bit and 64-bit audio clips, including clips and tracks that have been frozen or rendered as 32-bit or 64-bit data.

• Audio clips that are not all of the same bit depth.

Project files saved in SONAR X2 will not open in SONAR 5 if they reference 64-bit audio clips.

Project files saved in SONAR X2 that contain multiple automation envelopes per track may appear like automation data is missing when opened in an earlier version of SONAR. To see all automation data for a track right-click on it and choose **Envelopes > Show Track Envelopes** and then select each envelope that you would like to show.

SONAR X2 project files may contain new features that will be missing if opened in SONAR 5 and earlier, including:

• ACT current context.

• All AudioSnap data.

• Automation Read Enable States.

• Clip lock properties.

• **Preserve mix between gang members** setting.

• Synth Rack Assignable Controls.

• Synth Rack Automation.

SONAR X2 project files may contain new features that will be missing if opened in SONAR 4, including:

• Clip effects and clip automation:

  • Effects are removed.

  • Automation envelopes are orphaned.

- Groups:
  - SONAR 7 groups are preserved but will not be completely functional in SONAR 4.
  - Controls may be removed from groups.
  - Groups can't be added to or changed.
  - Group names will be truncated.
  - SONAR 4 may add extra groups to the project.

Re-saving a SONAR X2 project file in an older version may permanently remove the project data described above.

Template files saved from SONAR X2 will not load in earlier versions of SONAR. This is because of changes made to SONAR's view persistence code in SONAR X2.

See:

Windows 7

In WASAPI mode if you set the audio latency lower than 4 milliseconds, you will get an error message that the audio device does not support the current format. This is a known bug in the shipping version of Windows 7 and has been reported to Microsoft.

See:

Hardware setup

This appendix contains additional details on configuring your equipment for use with SONAR.

See:

Connect your MIDI equipment

If you are using a MIDI interface (such as an MPU-401 or Sound Blaster MIDI option) with an external MIDI keyboard, you need to connect the equipment using MIDI cables.

It is possible to connect your equipment in some rather complex ways that may cause problems. If you call for technical support with a problem concerning equipment that doesn't seem to be responding, we'll probably suggest that you reconnect things in one of the ways listed here before we explore the problem further. Also be sure to check the "Troubleshooting" on page 1251 chapter before calling us.

There are two methods that fit many circumstances. The one you choose depends on whether your keyboard has:

- All three types of MIDI jacks: In, Out, and Thru
- Only two types of MIDI jacks: In and Out

If you have only one keyboard, read "If your keyboard doesn't have a MIDI Thru jack" on page 1276 (regardless of whether you have MIDI Thru or not).

If your keyboard has a MIDI Thru jack

If your keyboard has three MIDI jacks—In, Out, and Thru—then use the following diagram.
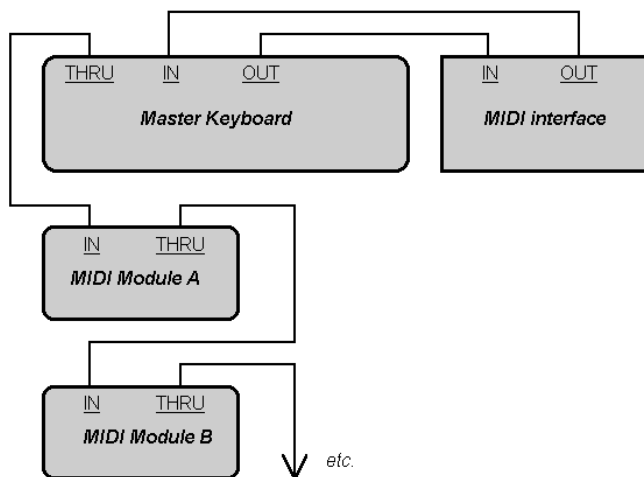
If you are using a 15-pin joystick adapter cable that splits into two MIDI cables:

• Connect the 15-pin jack to your computer's joystick port.

• Connect the In cable to your instrument's MIDI Out jack.

• Connect the Out cable to your instrument's MIDI In jack.

Here's a checklist:

Connect this	To this
Master keyboard Out	MIDI interface In
MIDI interface Out	Master keyboard In
Master keyboard Thru	Another MIDI module's In
That MIDI module's Thru	Yet another MIDI module's In

Table 224.

Continue the sequence, repeating the last connection for each of your sound modules.

Each MIDI device should be set to a unique MIDI channel or range of channels to avoid note-doubling. Refer to the manuals for your MIDI devices for information on how to set their MIDI channels.

Your MIDI interface may have a Thru jack as well as In and Out jacks. If your master keyboard lacks MIDI Thru, you can add more MIDI modules to your setup by connecting the MIDI interface's Thru to the first module's In. You can then chain subsequent modules onto the first module, as described earlier.

If your keyboard doesn't have a MIDI Thru jack

If your keyboard has only two MIDI jacks—In and Out—or if you have only one keyboard, use the following diagrams instead:
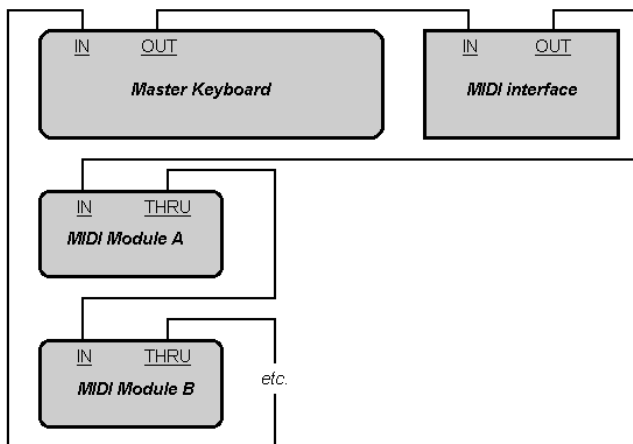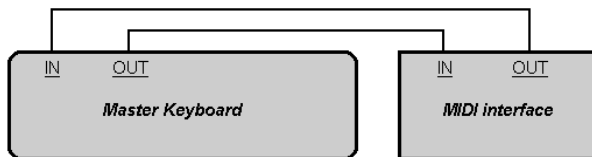
Each MIDI device should be set to a unique MIDI channel or range of channels to avoid note-doubling. Refer to the manuals for your MIDI devices for information on how to set their MIDI channels.

If your master keyboard now seems to double notes (they sound thicker), or if you can play only one half as many at once, first make sure that no MIDI channel is being used by more than one of your MIDI devices.

Set up to record digital audio

In general, the inputs of sound cards take 1/8 inch stereo mini-jacks. Sound cards usually have two inputs—one for line level inputs and the other for microphones (at mic level). The line level input is stereo; the mic input could be either stereo or mono. If your final output does not terminate in a 1/8 inch jack (and it probably doesn't), you will need an adapter to plug it into your sound card.

Most sound cards use the Windows Volume Control to adjust the master input and output volumes and to control which recording inputs are active. If you don't hear audio tracks, or if you can't easily control the audio volume in SONAR, go to **Control Panel > Hardware and Sound > Volume Control** (Windows 7) and check the settings there. See your sound card's documentation for more.

Electric guitar direct-In

You can connect an electric guitar directly to your sound card using a 1/4 inch mono to 1/8 inch stereo adapter. The following diagram shows this setup:

To sound card microphone input (mono)

1/4 inch instrument cable

1/4 inch to 1/8 inch adapter
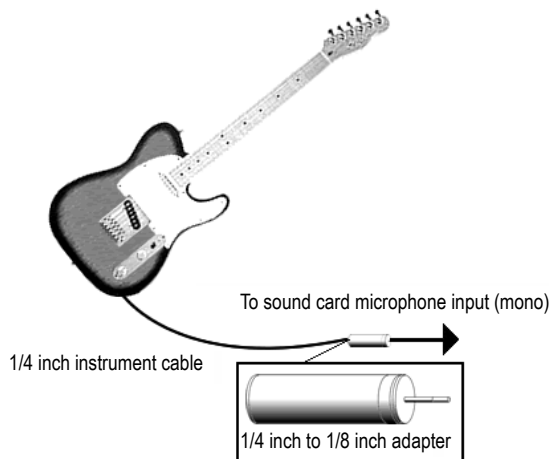
The 1/8 inch jack should be plugged into the sound card's mic input, although plugging into the line input may also work.

Electric guitar through effects rack

You can also plug an electric guitar into an effects rack, then send the output of the rack to the sound card's input, as shown in the following diagram:

Rack effects units

Rack FX

Rack FX

Rack FX

Rack FX

To sound card line input (stereo)

L

R

RCA to 1/8 inch adapter (stereo)

1/4 inch instrument cable

1/4 inch to RCA adapter (x2)
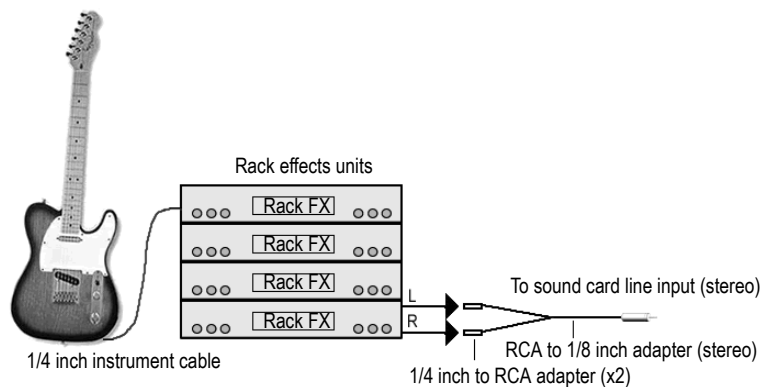
This diagram assumes that the output of the rack is at line level. If it is at pro level instead (+4 dB), and your card does not accept a +4 db input, you will need to attenuate (lower) the F/X rack's signal. To do this, use a mixer between the rack's output and the Y-adapter. If the rack has only a mono output, a 1/4 inch mono to 1/8 inch stereo adapter should be used instead of a Y-adapter.

If you want to connect a guitar amplifier's direct output to the sound card, you should base your setup on this example.

Microphone direct-In

Microphones can be plugged into the sound card's mic input. Some inexpensive microphones are made especially for use with sound cards and come equipped with 1/8 inch jacks. However, better quality microphones take better quality cables, which do not terminate in 1/8 inch jacks. The following diagram illustrates how to connect a microphone that terminates in a 1/4 inch jack:
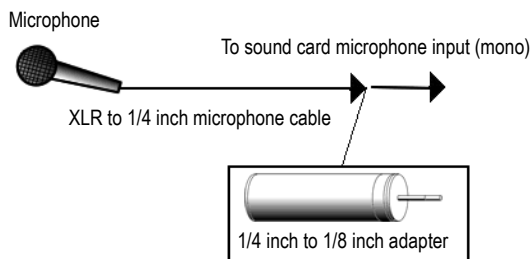
Microphone

To sound card microphone input (mono)

XLR to 1/4 inch microphone cable

1/4 inch to 1/8 inch adapter

Home Stereo, CD player, radio tuner, preamp output

The output of a stereo component can be connected to the sound card's line in, using a dual RCA to 1/8 inch stereo mini Y-adapter. Many portable cassette players come with this kind of adapter, or even with a single cable with all the necessary jacks. In the following diagram, a stereo component is connected to the Y-adapter using standard RCA cables:

STEREO

RCA / left

RCA / right

ADAPTER

1/8 inch stereo

sound card

line in

Disk

Y-adapter:

2x RCA to 1/8 inch stereo
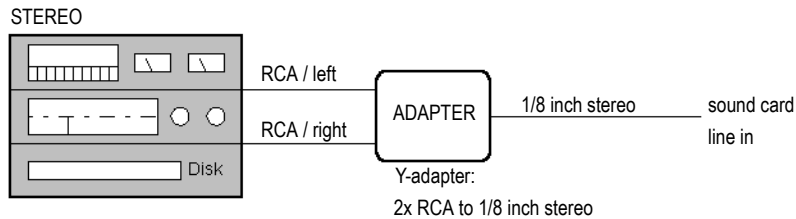
Internal CD player

If you are using your computer's internal CD player, and it does not have its audio outs connected internally to the sound card, run a cable from the CD player's Headphone jack to the card's Line In jack. If there is no Headphone jack, you'll need to use an external CD player.

Mixer

You can connect a mixer to the sound card with a setup of the following kind:

From sound card line output tto inputs #1 & 2

From Aux Bus #1 & 2 to sound card line input

Stereo Amplifier

Main mixer outs to power amp

1/4 inch instrument cable to input #3
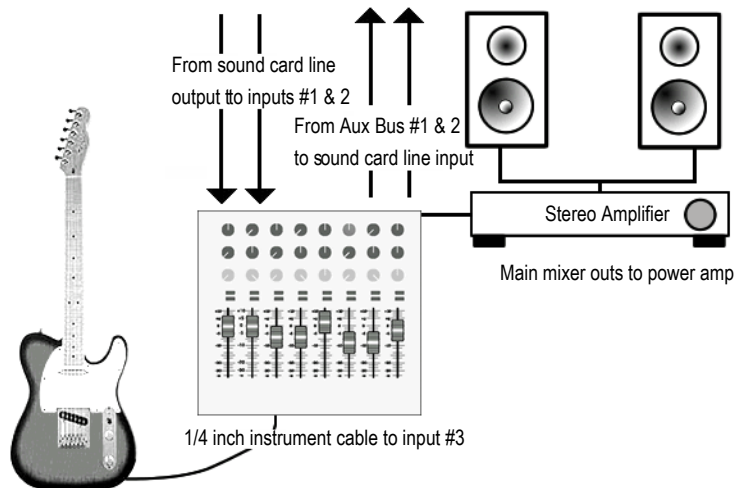
Note: *If your mixer has buses, use them! This helps to avoid feedback.*

MIDI files

The Standard MIDI file format is a file interchange format defined by the MIDI Manufacturers Association (MMA). The purpose of the format is to allow for the exchange of MIDI data between different programs. Any program that can read and write MIDI files has a common language with which to talk to other MIDI software. The compact size of MIDI music files makes them particularly useful for delivering music online.

SONAR can open standard MIDI files, and can save your projects in standard MIDI file formats. Note that only the MIDI portion of your projects is saved in a standard MIDI file. If your projects contain digital audio, the audio portion of the project will be lost when you save it to a standard MIDI file.

Note: *If you load a standard MIDI file into SONAR, SONAR strips out any initial volume and pan settings and sets the volume and pan controls for any affected tracks to those values. Initial volume and pan settings in a standard MIDI file are those that occur within the first measure. Any affected volume and pan controls will show the initial values that SONAR loaded from the standard MIDI file. Any volume and pan controls that are not affected, in other words that don't have initial values stored in the file, will show their current values in parentheses. These controls are disabled until you move one of them and therefore give it a value, at which point the control becomes enabled and the parentheses disappear. If you save a file as a standard MIDI file, SONAR saves the values of all enabled controls as initial values. However, as a project plays, SONAR's controls do not display MIDI controller values that change throughout the track— SONAR's controls only display automation values, i.e. shapes. If you want SONAR's controls to display MIDI controller values throughout the project, use the Track view **Clips > Convert MIDI Controllers to Envelopes** command.*

SONAR supports two different MIDI file formats, MIDI Format 0 and MIDI Format 1. Format 0 MIDI files contain a single track, with all events stored in that track. Format 1 MIDI files can store up to 7256 tracks, just like SONAR project files. When you load a MIDI Format 0 file, SONAR splits it into 16 separate tracks, based on the MIDI channels assigned to each event. When you save a project to a MIDI Format 0 file, SONAR collapses MIDI information from all of its tracks into one single track.

SONAR also lets you save and load files in the RIFF MIDI file format. This is a standard Resource Interchange File Format specification that encapsulates a Standard MIDI File of either format 0 or format 1. These files typically have an extension of *.rmi*.

A disadvantage of MIDI files is that the way the file sounds on playback varies based upon the sound reproduction hardware you are using. The same project sounds very different on two different synthesizers or two different sound cards. Another problem is that the Standard MIDI File specification leaves some details open to interpretation by software and hardware manufacturers.

To save a project as a Standard MIDI file or RIFF MIDI file

1. Choose **File > Save As** to display the **Save As** dialog box.
2. Choose the desired format from the **Save as Type** list.
3. Enter a file name and click **Save**.

See:

Timebases

MIDI files can be expressed in any of a number of timebases (ppq resolutions). It is likely that most MIDI files you will encounter use a common timebase, such as 96 or 120. Although SONAR supports many timebases, it is possible that a MIDI file may use a timebase that SONAR does not support. In that case, the times will be converted into whatever timebase is currently the default.

Supported MIDI file meta-events

MIDI files can contain meta-events. The types of meta-events that SONAR supports are listed in the following table.

MIDI File Meta-event	How it is represented in SONAR
Meter and key signature	Meter/key signature map entry
Tempo	Tempo change
General text	Track name
General text in the conductor track of a Format 1 file	Markers view markers
Track name	Track name
Port number (format 1)	Port assignments are maintained. Only available when the Write Cable Meta Events to MIDI Files (Output Select)

Table 225.

Features not supported by MIDI files

While the MIDI file format is very flexible and extensive, it cannot store the following parameters that are part of a standard project file: key offset, velocity offset, time offset, and forced channel.

When you save a project to a MIDI file, most of these parameters are applied to the individual events. For instance, if you have assigned track 1 to channel 10 in the Track view, SONAR will write the MIDI file so that every event on track 1 has a channel number of 10. When you subsequently load the MIDI file all of those Track view parameters will have vanished. But the music will sound the same, because SONAR has made these changes to the events themselves.

Other MIDI file handling notes

Here are a few specific points about how SONAR works with MIDI files:

- SONAR places Lyric events found in Format 0 MIDI files into Track 4, in accordance with conventions used by karaoke players.
- SONAR inserts any Text or Lyric events found at time 0 in a track into the **Comments** field in the **File Info** dialog box, unless the Text or Lyric event is preceded by a Note event.
- SONAR automatically enables the **Zero Controllers when Play Stops** option (available in **Edit > Preferences > Project - MIDI**) whenever a MIDI file is loaded.
- If a general MIDI file contains a copyright notice, the File Info window will be displayed automatically when the file is opened.

Special handling of GM, GS, and XG MIDI files

General MIDI compatibility of a song file is indicated by the presence of a special System Exclusive message at the beginning of the song. When SONAR finds a GM, GS or XG reset message, it assumes that you would like to work within the GM Score Production guidelines. This causes SONAR to use special timing for program change information when writing MIDI Files, and allows it to search more aggressively for track parameters when reading MIDI files. The result is that it is easier than ever to create and use General MIDI song files with SONAR.

SONAR does not enforce or even verify compliance with the GM guidelines for your music data. But SONAR does comply with them when generating events that represent track parameters. If necessary, SONAR will insert blank setup measures at the start of your song. This makes space for certain events to be inserted at the correct times at the start of each track: bank changes, patch changes, volume, and pan. This means that you can use SONAR's track parameters for these settings when composing songs: When you save your work as a MIDI File, SONAR will place these events in the track at the specific clock ticks recommended by the guidelines.

You can tell SONAR to follow the GM guidelines by loading the "Turn GM System On" Sysx bank in the Sysx View (*gmsystem.syx* in your Cakewalk directory), and then either inserting a sysx event at time 1:1:0 or using the Auto setting for that bank.

When loading a GM file, each track's bank, patch, volume and pan parameters are lifted from the data stream and placed in SONAR's Track view for you to see and edit onscreen. The GM mode ensures that all patches, banks and controllers are placed at specified times throughout a setup measure when you save a MIDI file. This ensures that all setup information can be digested by your synthesizer before it starts playback. If you don't have a setup measure in your project, SONAR will insert one for you.

If there is no GM, GS, or XG reset System Exclusive message present at the start of your project, SONAR will not operate in this GM mode.

If you have problems playing MIDI files

A MIDI file can cause playback problems if all of the following are true:

*   The MIDI file is a GM-compatible Standard MIDI Format 1
*   All patches, banks and/or controllers are stored in one track
*   All related note events are stored in a different track

When SONAR loads such a file, it may try to optimize the program changes, causing incorrect selection of synthesizer voices during playback (the GM, GS, and XG specifications all recommend the use of Standard MIDI Format 0 for distribution of music data, which would make this problem irrelevant). If you encounter this problem, simply re-select your instruments and re-save the file.

If you plan to publish your songs

If you plan to publish your own songs, we encourage you to follow the General MIDI authoring guidelines. These guidelines are quite detailed about the exact layout of many types of song data, and a complete discussion of them can be found on the World Wide Web at www.midi.org. However, SONAR can help you to conform with the GM guidelines if you follow these practices:

• Always save your master copy of any work in progress in SONAR project (.cwp) file format. When you are ready to publish your work, use the **File > Save As** command to create a Standard MIDI Format 0 file.

• All of the major publishing guidelines recommend that you use Standard MIDI File Format 0 instead of Format 1. Some sequencers cannot read the more complex Format 1 files, particularly sequencers embedded in some types of hardware such as karaoke players.

• Load the "Turn GM System On" system exclusive bank (*gmsystem.syx* in your Cakewalk directory) in the Sysx view, and set the bank to Auto Send. This message will not only re-initialize a General MIDI compatible sound module to a known state, but will also tell SONAR to generate GM setup measures for your program changes when you save the project in Standard MIDI Format. See "Variables in the [Options] section" on page 1298 for information on disabling setup measure.

• For best results, you should always place program changes and other MIDI messages in the same tracks as the notes they affect. This keeps the data for each track together as a single unit, and avoids problems that might occur when SONAR cannot easily correlate the program changes with the note events.

Initialization files

Many Windows applications, as well as Windows itself, use files to store information about your preferences and configuration. Often applications store values to these files when you make selections in the program using menus or dialog boxes. However, you can also change these files directly. In some cases, there is no way to change the settings in the application, and changing the file directly is the only way.

See:

Initialization files

This appendix documents three initialization files, which are stored in the SONAR program folder (by default, C:\Program Files\Cakewalk\SONAR X2.

- `Cakewalk.ini`
- `TTSseq.ini`
- `Aud.ini`

To view and edit the `Cakewalk.ini` file, choose **Edit > Preferences > File - Initialization File**. To view and edit the `Audi.ini` file, choose **Edit > Preferences > Audio - Configuration File**. You can use Windows Notepad to open and alter any of the three files. There are several other .ini files in the SONAR folder, but you should not attempt to edit or modify these files in any way. Changes to these other files could cause SONAR to stop operating properly.

Before making any changes to any of the .ini files, you should make a backup copy in case you make a mistake. After you have made your changes, save the file and close Notepad. SONAR reads the settings in these files only when it first starts up. Therefore, if you change any settings while SONAR is running, you should exit and restart SONAR in order for the changes to take effect.

See:

Initialization file format

Initialization files all follow a common format. They are divided into sections whose names appear in the file in brackets, like this:

```
[Section Name]
```

Within each section, variables are of the form:

```
<variable name>=<value>
```

For example, the `DrawPlayingAudio` variable belongs in the `[Wincake]` section in `Cakewalk.ini`, and determines whether the audio waveform is redrawn or not when the display is scrolling during playback. If the value is 0 (FALSE), then the waveforms are not redrawn. If the value is 1 (TRUE), then waveforms are redrawn. To redraw waveforms when scrolling during playback, the entry in the file looks like this:

```
[Wincake]
DrawPlayingAudio=1
```

The variable names contain no spaces. They are not case sensitive.

See:

Cakewalk.ini

Many of the items in `Cakewalk.ini` are set using SONAR menus and dialog boxes. However, some items can be changed only by using the **Edit > Preferences > File - Initialization File** command or by directly editing this file using the Windows Notepad.

`Cakewalk.ini` is divided into different sections. Unless otherwise noted, all entries should appear in the section that starts with the line:

```
[Wincake]
```

For example, if you want to add the line PanicStrength=1 to `Cakewalk.ini`, you should put it on the line under [Wincake], like this:

```
[Wincake]
PanicStrength=1
```

The following section lists the different variables you can change in `Cakewalk.ini`.

Variable	Type	Default value	What it does
JogPosTimer=<milliseconds> (default=120) PauseOnJog=<0 or 1> (default=0; off)			There are two variables that control the behavior of using a control surface jog wheel to change SONAR's Now time: JogPosTimer is the period of the now time throttle. When a jog message comes in, SONAR sets the transport time immediately but will not set the transport time again for this length of time. During the time, SONAR just remembers the latest jog time received. PauseOnJog is the main switch. 1 does a pause and invokes the throttle timer. 0 just sends the now time with no pause and no throttle timer. If 0, the setting of JogPauseTimer is "don't care." For example: `[Wincake]` `JogPosTimer=120` `PauseOnJog=0`
WavePreviewSampleFrequency=<1-10>	Integer	1	By default, waveform previews take a meter sample for each meter frame. The default interval between meter frames is 40 milliseconds. The `WavePreviewSampleFrequency` `Cakewalk.ini` variable lets you specify how frequently samples are taken. The value can be an integer between 1 and 10, and represents the number of frames to sample. It goes in the `[Wincake]` section of `Cakewalk.ini`. For example: `WavePreviewSampleFrequency=1` With the default value (1), every meter frame gets written to the history file. With higher values (2-10), frames will be skipped, causing fewer history frames to be written to the history file. Higher values may be desirable if the waveform previews are affecting playback performance.

Table 226.

Variable	Type	Default value	What it does
WavePreviewInputBuffers=< 1-4>)	Integer	4	This variable allows control of the number of Waveform preview input buffers. The input buffers allow more efficient access to the recorded meter history on disk, and greatly speeds up performance access to previews while zooming and scrolling the clips view when waveform preview is active. You can control the actual number of history page buffers with this variable. This value is an integer and the minimum value is 1 and the default is 4 buffers. 2-4 buffers should be sufficient for most usage scenarios. Each buffer consumes approx 32K per preview track. Lower values consume less memory but may cause more disk access when scrolling or zooming large projects when preview is active.
DrawPlayingAudio= < 0 or 1>	Boolean	0 (disable)	This line controls whether the audio waveform is redrawn or not when the display is scrolling during playback. By setting the value to 1, you can force the Track view to always redisplay audio data, even during playback. This is recommended only for very fast machines.
ForegroundForSMPTE=<0 or 1>	Boolean	1 (enable)	This line specifies whether or not SONAR should jump to the foreground (focus) once it locks to SMPTE.
HyphenDir=<drive:path name>	Path	<installation directory>\ttshyph.dll	This determines the location of the Hyphenator extension .dll used by SONAR, and is written during installation. This should never need to be changed.
MaxPanelUndoSteps= <num>	Integer	128	Each StudioWare view remembers a certain maximum number of (Design mode) operations before discarding old ones. This line lets you control the maximum depth of each Panel undo history. Be aware that the larger the number you specify, the more memory must be dedicated to storing the information required to undo commands.
PanelsShowWidgetBitmaps= <0 or 1>	Boolean	1 (enable)	This line controls whether SONAR hides (n=0) or shows (n=1) all widget bitmaps while in Use mode (except those in Image widgets).

Table 226.

Variable	Type	Default value	What it does
PanicStrength=<0 or 1>	Boolean	0 (controller 123 only)	The **Panic/Reset** button stops playback and turns off any stuck notes. There are two ways a MIDI note can be turned off: By a note-off message (n=1) or by MIDI controller number 123 (all notes off). By default, Panic uses controller 123 only (n=0).
StaffViewChanSeparateVoices=<0 or 1>	Boolean	1 (enable)	This line specifies whether or not SONAR should treat channels assigned to each note as separate voices. This is useful if you want to force note stems up or down for different voices.
TVWidgetsStickInHeader=<0 or 1>	Boolean	0	By default, Track view controls (widgets) will only appear in the track header bar if the track is minimized and there is enough room to display at least one control. When TRUE (value=1) widgets stay in the header bar regardless of the height of a track. **Note**: the following controls will never appear in the track header bar: Send widgets, meters, and vertical effects bin.
VelocitySolidWidth=<1..4>	Integer	1	By default, note velocity tails are displayed as 1 pixel wide solid vertical lines in the Piano Roll view. To make the velocity tails wider (2-4 pixels wide), add the following line to `Cakewalk.ini` in the `[WinCake]` section: `VelocitySolidWidth=<pixel size; 1-4>` For example: `VelocitySolidWidth=2`
VelocityAutoshrinkWidth= <0 or 1>	Boolean	0	If you set this to 1, solid velocity tails will become narrower by one pixel if the vertical zoom is such that notes are less than 5 pixels high. For example, with: `[Wincake]` `VelocitySolidWidth=2` `VelocityAutoshrinkWidth=1` you get bigger velocity tails (ala SONAR 4) when the notes are big enough to edit, but really thin velocities tails when the notes are too small to edit.

Table 226.

Variable	Type	Default value	What it does
VelocityAsBargraph= <0 or 1>	Boolean	0	By default, note velocity tails are displayed as thin vertical lines in the Piano Roll view, and the color is the same as note events. If "Notes/ Velocity" is not the current edit type, this color will be slightly lightened. To override this and use bar graph indicators for velocity tails, add the following line to the `[WinCake]` section: `VelocityAsBargraph=1`
VelocityBargraphFullWidth=< 0 or 1>	Boolean	0	When displaying velocity tails as bar graphs (see above), you can specify whether the velocity tails should be fixed at 3 pixels wide (default), or extend the full width of the note event. To display full-width velocity tails, add the following line to the `[WinCake]` section: `VelocityBargraphFullWidth=1`
PRVUseForegroundColor=< 0 or 1>	Boolean	1	The Piano Roll view and Inline Piano Roll note event colors are based on the track color. By default, note events use a track's foreground (data) color instead of the background (clip) color. To override this and use background colors instead, add the following line to the `[WinCake]` section: `PRVUseForegroundColor=0`
PRVColorizeVelocity= <0 or 1>	Boolean	1	By default, note events in the Piano Roll are colorized based on velocity. Darker colors indicate higher velocityes. To override this and use the static track color instead, add the following line to the `[WinCake]` section: `PRVColorizeVelocity=0`
MicroscopeHZoomThreshold =<1..20>	Integer	8	By default, the Microscope mode begins horizontal magnification when a 32nd note is narrower than 8 pixels. This line lets you specify the horizontal zoom threshold (1-20 pixels).
MicroscopeHZoomMax= <2.0 - 8.0>	Integer	3.0	This line specifies the highest horizontal magnification that will result when using Microscope mode.

Table 226.

Variable	Type	Default value	What it does
ShowClipShadow= <0 or 1>	Boolean	0	By default, a drop shadow is not displayed on clips in the Track view. To always display a drop shadow on clips, add this to the `[Wincake]` section: `ShowClipShadow=1`
PauseDuringSave= <0 or 1> f	Boolean	0	By default, when saving a project file during playback, SONAR saves the file asynchronously while playback continues. While this is not a problem with most projects, complex projects under high CPU load conditions (particularly while running under low latency) may take longer to save than if the transport was not playing. Setting `PauseDuringSave` to a value of 1 in the `[Wincake]` section changes the default behavior and pauses playback temporarily for the duration of the file save. This allows the file save to proceed as fast as possible before playback resumes.
StaffViewPreScanMeasures = <num>	Integer	16 (measures)	This line specifies how far back (in measures) SONAR should search for long elements in order to display them in the Staff view. If a long element does not start within the specified time, then it will not be displayed in the Staff view (although it will print).
ToolTempFileDir=<drive:path name>	Path	<Windows TEMP directory>	This line specifies where to store temporary .wav files when launching a third party wave editor from the **Utilities** menu.
ProgressiveWavePictures=< 0 or 1> f	Boolean	1	This option enables progressive display of waveform pictures. When enabled you will see pictures being displayed in the clips view dynamically as they are being computed. The waveforms will update in the background when the application is idle. If the `ComputePicturesWhilePlaying` flag is set to 1, waveforms will continue being displayed progressively even while audio playback is in progress. This can save time waiting for a complete picture to be finished before you can see it.

Table 226.

Initialization file format

Variable	Type	Default value	What it does
CtrlSurfaceRefreshMS= <50 - 5000>	Integer	75	You may want to increase the value of this `Cakewalk.ini` variable if you are experiencing sluggish UI responsiveness when using a control surface and playing back high CPU projects. Also, if you are using a control surface that is not bi-directional, the surface does not need to be refreshed at all and you can safely increase the value.
AutoLoadAudioSnapPalette= <0 or 1>	Boolean	1	By default, the AudioSnap palette appears automatically whenever you enable AudioSnap on a clip. If you prefer to never auto-show the AudioSnap palette, you can change this behavior by setting the value to 0.
DrawToolbarGradient= <0 or 1	Boolean	1	Global and view toolbars are drawn with a background gradient. If you prefer a flat background, set the value to 0.
TVControlHeight= <number of pixels>	Integer	17	Specifies the height of controls in the Track view. The value shouldn't be changed more than 1 or 2 from the default value, or you may experience unexpected results.
TVControlWidth= <number of pixels>	Integer	41	Specifies the width of controls in the Track view.
TVControlSpacingX= <number of pixels>	Integer	3	Specifies the horizontal space, in pixels, between controls in the Track view.
TVControlSpacingY= <number of pixels>	Integer	3	Specifies the vertical space, in pixels, between controls in the Track view.
TVSpacingXInCluster =<number of pixels>	Integer	2	Specifies the horizontal space between each button in a "cluster". The default value is 2 pixels. The following controls are grouped into clusters: • Mute, Solo, Arm for Recording (MSR) • Automation Read, Automation Write • Phase, Interleave (mono/stereo)
TVBoldStripNames= <0 or 1>	Boolean	1	Specifies whether track/bus names use bold (value=1) or regular (value=0) font style in the Track view.
TVLargeStripNames= <0 or 1>	Boolean	1	Specifies the size of track/bus names in the Track view. The default size is large (value=1).

Table 226.

Variable	Type	Default value	What it does
TransparentClipNames= <0 or 1>	Boolean	0	SONAR can write Clip Names with an alpha channel such that the waveform behind the clip name can be seen. To enable this effect, set the value to 1.
SmallIconHeight	Integer	32	This variable specifies the small track icon size. By default, small icons are 32x32 pixels.
LargeIconHeight	Integer	48	This variable specifies the large track icon size. By default, large icons are 48x48 pixels.
IconTopLeftPixelTransparent	Boolean	1	By default, track icons support transparency. The top left pixel in the BMP determines the transparent color. If you prefer to not have transparent icons, set the variable value to 0. **Note:** When transparency is enabled, the global color entry (**Edit > Preferences > Customization - Colors**) called "Track View Icons Background" determines the background color ("Console Strips Icons background" does the same for the Console view and Track Inspector).
CPUMeterMode= <0 - 2>	Integer	0	This variable specifies how the CPU meter appears in the status bar on multiprocessor systems. The values are as follows: 0 = The peak thread load is displayed as the bar and a yellow indicator shows the average of all audio threads. This the default mode. 1 = The average audio thread load is displayed as the bar and a yellow indicator shows the peak thread. 2 = A bar is shown for each audio thread. This is the same display as previous versions of SONAR.
CreateNewGroupsOnPaste= <0 or 1>	Boolean	1	When you copy and paste clips that belong to a clip group, this variable specifies if the pasted clips should be placed in a new clip group or continue to be grouped with the original clip group. By default, a new clip group is created. The values are as follows: 0 = The pasted clips will belong to the same clip group as the clips that were copied. 1 = A new clip group is created for the pasted clips. This is the default behavior.

Table 226.

Variable	Type	Default value	What it does
EnablePluginCancelButton=<0 or 1>	Boolean	0	In SONAR 4.0.2 and earlier, opening the property page of a VST plug-in during playback could result in a slight disruption in playback. The cause for this problem has its roots in the little **Cancel** button that sits in the top right corner of the plug-in's property page. The purpose of this button is to allow the user to cancel out of any changes they might have made to the plug-in, restoring back to whatever state the plug-in was in before they opened the GUI window. To make this work, SONAR would need to take an initial snapshot of the plug-in's state, and some plug-ins with large amounts of preset data could cause an audio hiccup if the data was captured for the **Cancel** button. To address this issue, SONAR 4.0.3 (and later) does not take a snapshot of the plug-in's state by default, and the **Cancel** button is not available.
NoFontSmoothing=<0 or 1>	Boolean	0	Set the value to 1 to disable font smoothing in SONAR. You must restart SONAR in order for the change to take effect.

Table 226.

TTSSEQ.INI

The TTSseq.ini file can only be changed using Windows Notepad.

Variables in the [Options] section

Variable	Type	Default value	What it does
ChaseDelay=<num>	Integer	20 (2 seconds)	This line specifies the sync chase delay in 1/10 seconds. During SMPTE/MTC sync, when the position is determined, playback begins at a later time to allow for setup. This line specifies the delay amount. If this value is too long, you always have to wait after starting playback before SONAR locks. If this value is too short—especially on slower computers—then it will try to play before it's ready, which will cause a spurt of notes to catch up when it actually starts, the effort of which could also cause sync to give up if the CPU is really overtaxed.
FlywheelAmount=<num>	Integer	5 (½ second)	This line specifies the SMPTE flywheel time in 1/10 seconds. This is the maximum dropout time length SONAR will allow before aborting sync.
MfxLookAhead=<ticks>	Integer	960*4	Defines how much extra MIDI data is sent to MFX plug-ins, so that they have extra room to quantize events into the future. Lower values mean MFX plug-ins can work more "just in time." Example: `MfxLookAhead=480`.
SendResetsToSoftSynths= <0 or 1>	Boolean	0	This variable controls (globally) whether SONAR sends MIDI controller resets to DXi's. This variable should be set in the `[OPTIONS]` section. Legal values are: 0 (default): Resets are not sent to DXi's 1: SONAR will send MIDI controller resets to DXi's. This is what SONAR already does for hardware synths. For example: If you are freezing synth tracks that have MIDI controller messages, setting this variable to TRUE (1) will ensure that synths will have their MIDI controllers reset before a freeze operation.
GeneralMidiSMFs=<0 or 1>	Boolean	1 (enable)	This line controls whether or not SONAR creates a General MIDI setup measure when loading Standard MIDI Files.
LyricTrack=<num>	Integer	3 (track 4)	This line specifies which track is to contain lyrics from Type 0 Standard MIDI files. A zero means track 1, a 1 means track 2, and so on.

Table 227.

Variable	Type	Default value	What it does
MMCDelayMsecs=<num>	Integer	100	This setting specifies the minimum amount of time that must elapse between any two MMC commands. Some MMC gear, including the Fostex MTC-1 and the Tascam SY-88, can get confused unless there is at least a 10-millisecond delay after every MMC command. This can cause intermittent problems on fast machines. SONAR corrects this problem with the `MMCDelayMsecs=<n>` line. The default value is 100 milliseconds, although some experimentation may be required to find the proper value for your system.
MMCPort=<num>	Integer	-1 (all)	By default, SONAR will transit MMC commands on all MIDI outputs. In some situations it is necessary to limit the number of outputs MMC is transmitting on. This line specifies which output MMC is to be transmitted on. The value is 0 based, so a value of 0 means output 1, and a value of 1 means output 2, etc.
MMCPreRoll=<num>	Integer	20 (2 seconds)	This line specifies the MMC pre-locate amount in 1/10 seconds. By default, SONAR waits for two seconds after it starts receiving time code before beginning to playback or record. You can add this line to change the two-second delay. If this setting does not exist, the value of the ChaseDelay setting is used. If the `ChaseDelay` setting does not exist either, then the default for MMCPreRoll is 20.
MMCUseEvent=<0 or 1>	Boolean	1 (enable)	If all MMC features work except for Auto Punch record mode, your equipment probably doesn't support the MMC Event command (consult with the manufacturer if you aren't sure). You can overcome this limitation by adding this line.
SendLocalOff=<0 or 1>	Boolean	1 (enable)	This line determines whether or not SONAR should send a Local Control OFF message during startup.
SendLocalOn=<0 or 1>	Boolean	0 (disable)	This line determines whether or not SONAR should send a Local Control ON message at exit.

Table 227.

Variable	Type	Default value	What it does
IgnoreMidiInTimeStamps= <0 or 1>	Boolean	0 (disable)	This line determines whether or not SONAR ignores any MIDI time stamping that a MIDI driver does. If you're experiencing increasing delays between the time you play a MIDI note on a controller and the time you hear SONAR echo it, setting this line to 1 may help. Also, if you find that SONAR is recording MIDI data at a different time from when the data was played, setting this line to 1 may help. If the MIDI driver is using a different clock from SONAR, the time discrepancy increases the longer that the MIDI driver is open, so you need to tell SONAR to ignore the timestamp that the MIDI driver adds to the data (set the value to 1).
SyncAllowRateTweak=< 0 or 1>	Boolean	1 (enable)	When synching to SMPTE, SONAR normally attempts to track the rate of the incoming sync signal, in order to survive dropouts better when the SMPTE source speed is slightly off. Setting this to 0 defeats this. If you have a slower computer and dense work to play, defeating this can result in a small efficiency improvement and also prevent rate-tracking timing inaccuracies when the computer is so busy that it's late processing incoming sync messages.
SysxDelayAfterF7=<0 or 1>	Boolean	1 (enable)	This setting causes SONARSONAR to delay Sysx transmission for a certain amount of time if it encounters an F7 in a Sysx bank. This gives some instruments a required amount of delay time that is necessary to process the Sysx transmission. The default delay is 1/18 of a second, but can be changed by also adding the `SysxSendDelayMsecs=<n>` line. The possible values are 0 and 1. Their significance is as follows: 0: no delay 1: delay between each Sysx string (F0 … F7)
SysxSendDelayMsecs= <num>	Integer	60	This setting causes SONAR to delay a specified number of milliseconds if it encounters an F7 in a Sysx bank.

Table 227.

Initialization file format

Variable	Type	Default value	What it does
SysxSendPacketSize= <num>	Integer	1024	This line specifies the number of bytes between Sysx transmit delays. Sysx bytes are transmitted in packets, with a 1/18 second delay between each packet. Setting this value smaller will help slower MIDI devices (synthesizers, etc.) avoid overflowing their internal buffers.
UseCableMetaEvents= <0 or 1>	Boolean	1 (enable)	This line specifies whether or not SONAR should use nonstandard "Cable" meta-events for storing Sysx bank output number into Standard MIDI files (by default, n=1).

Table 227.

Variables in the [MIDI Input Devices] section

Variable	Type	Default value	What it does
MaxInPort=<num>	Integer	15 (16 outputs)	This variable determines the maximum number of MIDI inputs. The value is 0 based, so a value of 15 means that the limit is 16 outputs.

Table 228.

Variables in the [MIDI Output Devices] section

Variable	Type	Default value	What it does
MaxOutPort<num>	Integer	15 (16 outputs)	This variable determines the maximum number of MIDI outputs. The value is 0 based, so a value of 15 means that the limit is 16 outputs.

Table 229.

AUD.INI

To edit `Aud.ini`, do the following:

1. Go to **Edit > Preferences > Audio - Configuration File**.

2. Under **Configuration Settings**, click **Edit Config File**.

   The `Aud.ini` file opens in the default Windows text editor.

3. Edit `Aud.ini` as desired.

4. Save `Aud.ini` and close the Windows text editor.

5. Click **Reload Config Settings** to reload the current audio configuration settings from `Aud.ini`.

Variables in AUD.ini

Variable	Type	Default Value	What it does

MeterFrameSizeMS=
<10-200>
	Integer	40	Meters in SONAR show peak (or RMS) values at a given instant in time. The actual peak value displayed by a meter is the highest peak recorded in an interval of time referred to as a "Meter Frame." The default size for a meter frame is 40 milliseconds, which is an accuracy of 25 FPS. The `MeterFrameSizeMS` variable allows you to change the size of this interval. It goes in the `[Wave]` section. For example:
			`[Wave]`
			`MeterFramSizeMS=40`
			Setting this value to a lower value will make the meters record peak info for smaller time slices. However this can also increase the metering CPU and memory cost.
			Note: although SONAR doesn't enforce a fixed value range, the recommended range should be between 10 and 200 milliseconds.

PicCacheMB=<size in MB>	Integer	20	This variable specifies the maximum size of the picture cache. The picture cache is located in the directory specified by the `PictureDir=<path>` variable (defaults to `<Cakewalk Folder>\Picture Cache`).
PictureDir=<drive:path name>	Path	<Cakewalk directory>\Picture Cache	This line specifies where to store the picture cache.
ComputePicturesWhilePlaying=< 1 or 0>	Boolean	1	This option allows waveform pictures to be computed in the background while audio playback is in progress. Most modern computers should be able to handle this load with no problems. Note that work is only done while new pictures are actually being computed—once the pictures are finished rendering there is no overhead.
EnablePicCacheThreads= <1 or 0>	Boolean	1	This option creates extra background worker threads for the generation of wave pictures when you load a project. One worker thread is automatically created per CPU/core. Setting `EnablePicCacheThreads=0` reverts back to only using a single thread for picture computation. If you are running a system with multiple CPU's or cores setting this to 1 can greatly speed up the computation of pictures.

Table 230.

Initialization file format

Variable	Type	Default Value	What it does
FlushWriteBeforeRead= <1 or 0>	Boolean	0	The default setting causes SONAR to perform disk reads (for audio playback) before attempting any disk writes (for audio recording). Overriding this value by setting it to 1 causes SONAR to attempt disk writes first. This yields the best results when you are attempting to record a large number of tracks at high latency.
FlushMultiple=<0 or 1>	Boolean	1	This variable determines how SONAR performs writes to disk in cases where multiple inputs are being recorded simultaneously. The default setting causes SONAR to write all the data for all inputs all at once, and then wait for the entire set of writes to complete. Overriding this value by setting it to 0 causes SONAR to perform each input's write separately, and wait for each individual write to complete before proceeding to the next one.
ExtraPluginBufs= <0 to no upper limit>	integer	0	It instructs SONAR to set aside extra audio data buffers, to accommodate plug-ins which do large amount of internal buffering and therefore "keep" data buffers to themselves. Recommended maximum setting of 64 or 128.
Use24BitExtensible=<0 or 1>	Boolean	0	This line goes in the section of the Aud.ini file under [*name of your sound card* ('n' in , 'n' out)]. If you get an error message when you try to change the audio driver bit depth to 24, try setting this line to 1. Most USB audio devices that use WDM drivers need this line set to 1.

Table 230.

Variable	Type	Default Value	What it does
GapDezipperUsec=<0-1000>	Integer	500	The audio engine will now render a smooth fade in whenever audio playback is interrupted and there is a abrupt transition in gain. The purpose of doing this is to dezipper (smooth out) the gain transition due to the discontinuity. For example, if you click on the time ruler to jump to a new time location during playback, the engine will smoothly render the transition to the new gain level as a fade in. This smoothing also takes place whenever playback gapping occurs. You can control the fade in time via the GapDezipperUsec variable, which is expressed in microseconds per dB and controls the speed of the fade in to the new gain value. (default = 500 microseconds. i.e. the fade will take 500 microseconds per change in dB at the transition point). You may increase or shorten the time of the fade by increasing or decreasing this value. The normal legal value range for this variable is 0 to 1000 microseconds. This variable should be set in the [Wave] section. A value of zero turns off dezippering on gapping completely.
MixDezipperUsec=<0-1000>	Integer	50	This variable is similar to GapDezipperUsec except that it controls how the mixer itself renders abrupt gain transitions due to envelopes in the project. This variable is expressed in microseconds per dB and controls the speed of the fade in to the new gain value (default = 50 microseconds). The normal legal value range for this variable is 0 to 1000 microseconds. This variable should be set in the [Wave] section. **Important:** Changing the value of this variable will affect how envelopes are rendered by the mixer and may cause your mixes to sound slightly different. Setting MixDezipperUsec too low can cause clicks while rendering abrupt gain changes due to envelopes.
AllowOfflineRenderMixThreads= <0 or 1>	Boolean	1	A value of 1 (default) allows multiprocessing during fast bounce when multiprocessing is enabled in SONAR. Set to 0 to temporarily disable multi-threaded mixing mixing during a fast bounce operation.
LinkPFSendMute=<0 or 1>	Boolean	0	If this is set TRUE, pre fader sends on both tracks and buses are automatically muted when the track/bus is muted. Also if another track is soloed the pre fader sends on other tracks will be muted. This basically conforms to pre SONAR 4 behavior.

Table 230.

Variable	Type	Default Value	What it does
DefaultEqPosition=<0 or 1>	Boolean	0	The integrated channel EQ is pre effects bin by default, but you can change the position of any channel EQ by right-clicking the EQ plot and choosing the desired position from the context menu. The DefaultEqPosition Aud.ini variable lets you specify the default EQ position for all new tracks/buses. This variable lives in the [Aud] section of Aud.ini, and legal values are: 0 (pre FX) or 1 (post FX).
BounceBufSizeMsec= <0 to 350>	Integer	0	This is a line in the Wave section of the Aud.ini file that sets the buffer size for bouncing tracks. At a value of 0, the bounce buffer is the same size as the Mixing Latency value that you set in **Edit > Preferences > Audio - Driver Settings**. If you find that bouncing tracks, especially with certain soft synths, takes a very long time, you can set this value to 100, or some value between 0 and 350 so that the bounce buffer will use a more efficient size for bouncing, which has different requirements from normal playback latency. **Note**: on larger projects, setting this variable to a large value can cause out-of-memory errors.
DropoutMsec=<num>	Integer	250	Under high system load conditions, the SONAR audio pump mechanism may become starved. When this condition is detected, SONAR drops out. The DropoutMsec variable allows you to configure the tolerance time in milliseconds. This variable applies to all driver modes. Setting DropoutMsec to a positive value > 0 specifies the actual time in milliseconds to tolerate before dropping out due to starvation. Setting DropoutMsec to a negative value < 0 means we use a multiple of the audio buffer size as the tolerance. i.e. -2 means we use twice the audio buffer size. Note that setting this value too low (e.g. 0) can result in more frequent dropouts in the program. If you notice too many dropouts, try raising it in buffer multiples or by explicitly specifying a millisecond value.
SuspendPluginsOnBounce=<0 or 1>	Boolean	1	This is a line in the [Wave] section of the Aud.ini file that controls whether VST plug-ins are suspended and resumed prior to starting a bounce operation. When set to 1 (default), VST plug-ins are suspended and resumed both before and after the bounce process. This flushes any residual buffers that might be present from plugins that have internal latency.

Table 230.

Variable	Type	Default Value	What it does
ShowMultiChannelInputs = <0 or 1>	Boolean	1	This is a line in the Wave section of the `Aud.ini` file that specifies whether SONAR uses multichannel audio devices as multiple stereo pairs or just a single stereo pair.
ShowMultiChannelOutputs= <0 or 1>	Boolean	1	This is a line in the Wave section of the `Aud.ini` file that specifies whether SONAR uses multichannel audio devices as multiple stereo pairs or just a single stereo pair.
MinimizeDriverStateChanges =<0 or 1>	Boolean	1	This is a line in the Wave section of the `Aud.ini` file that controls whether or not audio devices are reset in response to transport changes (play/stop). Valid values are as follows: 0 = off. 1 = On for ASIO only (default). 2 = On for WDM only. 3 = On for both ASIO and WDM.
MMCSSTaskKey= <task name>	Name	Pro Audio	By default, SONAR uses the MMCSS task profile named **Pro Audio**. If desired, you can instruct SONAR to use a custom MMCSS task profile.
ManageASIOThreadPriority= <0 or 1>	Integer	1	This determines whether SONAR manages the ASIO thread priority when necessary. This defaults to 1.
EnableCacheWriteThru= <0 or 1>	Boolean	1	This variable enables disk write thru caching. When write thru caching is on, data recorded to wave files is written to the hard disk immediately, circumventing the hardware disk cache. Having write thru caching off can be more efficient for disk I/O but can result in data loss if your system crashes.
RealtimePreroll=<0 or 1>	Boolean	0	This variable specifies whether preroll buffers are pumped as fast as possible or in real-time. Prerolling in realtime may improve buffering and CPU load when using hardware DSP solutions such as the Universal Audio UAD-1 or Focusrite Liquid Mix.
WaveInBuffers=<2 - 8>	Integer	8	When using the External Insert plug-in alongside the original dry signal in WDM mode, you might notice a flanging or flamming effect. To minimize this effect, we recommend that you set the `WaveInBuffers` `Aud.ini` variable to 2. **Note:** Setting the value to 2 might have an adverse effect with certain audio hardware, causing recording to drop out. If this occurs, reset the value to 8 and try using ASIO drivers if your hardware has ASIO support.

Table 230.

Variable	Type	Default Value	What it does
ThreadSchedulingModel= <0 - 2>	Integer	1	This variable goes in the `[Wave]` section and controls the interaction of the main audio thread and worker threads on multiprocessor systems when the **Use Multiprocessing Engine** option is enabled. Depending on the system, a particular model may result in less glitching and better overall performance. The values are as follows: 0 = Same as previous versions of SONAR. 1 = (default) Better thread balance. Model is more efficient and can provide cycles for other tasks. 2 = Additional worker thread is created. This may result in improvement with Quad processor systems or higher. Not recommended for Dual processor systems.
UseHardwareSamplePosition=< 0, 1>	Boolean	0	This variable applies to ASIO mode only and controls whether SONAR internally compute the sample position based on buffer switch calls or uses the ASIOGetSamplePosition reported value to retrieve the driver reported value. Some drivers change the reported sample position based on how long a buffer switch took to complete and this can cause problems since SONAR expects the reported position to be in sync with the number of buffers actually streamed.
PanLawCompatMode=<0 or 1>	Boolean	0	When using a non-default pan law with floating point or 24-bit audio, SONAR would previously apply the pan law twice; once at the clip level and once more at the track level. In SONAR 8.5.2 and later, pan laws are only applied once at the track level and only for mono tracks. Any clip pan envelopes will continue to work, but behave strictly as a balance control. If you have existing projects that use a non-default pan law (i.e. other than **0dB center sin/cos taper**), the mix might sound louder in SONAR X2. When the value is 0 (default), non-default pan laws are not applied at the clip level. Clip pan envelopes always use the (0dB center sin/cos taper) law. When the value is 1, pan laws are applied at the clip level. It is not recommended that you use this value unless you need to retain backwards compatibility with pre-SONAR X2 projects that use a non-default pan law.

Table 230.

New features in SONAR X2

SONAR X2 has many new features (some features are in SONAR Producer and Studio only). The following is a list and description of each new feature:

Skylight

Figure 351. *Skylight.*

A. *Control Bar* *B.* *Inspector* *C.* *Track view* *D.* *Browser* *E.* *MultiDock*

Take Lanes

Take lanes provide an alternative method of viewing and editing overlapping clips on tracks. Overlapping clips can occur when you record multiple takes on the same track. Take lanes can be expanded or collapsed on each track. When expanded, Take lanes are indented below the parent track. Take lanes can be created, hidden, and removed, and each track can have an unlimited number of lanes.

Take lanes provide many benefits, including:

- Better visibility of clip data.

- Less screen clutter on track strips.

- Ability to quickly mute and solo individual takes.

- Better workflow for creating a final composite take out of many separate takes.

To show a track's Take lanes, click the track's **Expand/collapse Take lanes** button .

Figure 352. *Take lanes collapsed.*
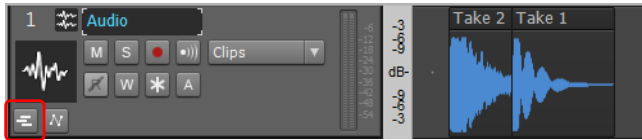
Figure 353. *Take lanes expanded.*
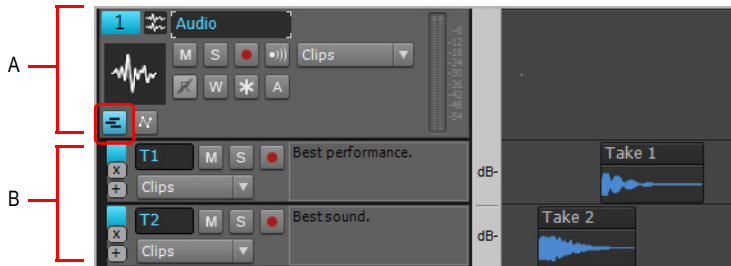
A. Parent track B. Take lanes

For details, see "Take lanes and comping takes" on page 367.

Automation Lanes

Automation lanes are an alternative method of viewing automation envelopes on tracks and buses. Automation envelopes can be displayed in the parent track, or in indented lanes below the parent track.

Figure 354. *Automation lanes.*
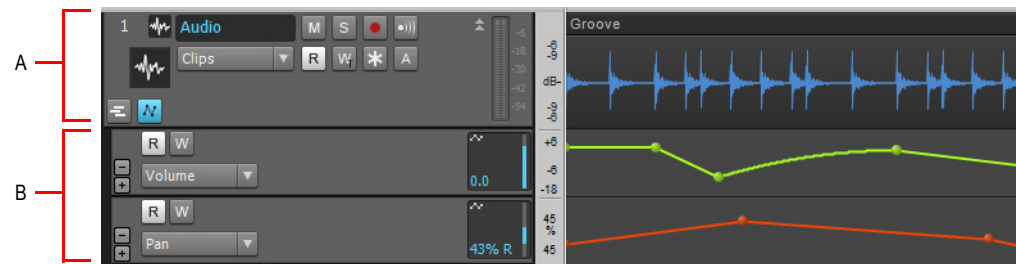
A. Parent track B. Automation lanes

Automation lanes provide many benefits, including:

• Better visibility of automation data.

• Less screen clutter on track strips.

• Choose to only show the data you're interested in.

- Easier to work with individual automation envelopes.
- Easy to copy and paste specific automation data.
- Ability to quickly bypass individual automation parameters.
- Slider to control automation parameters.

To show a track's Automation lanes, click the track's **Expand/collapse Automation lanes** button ⬚.

For details, see "Automation lanes" on page 1010.

Track view enhancements

- Take Lanes for improved editing of overlapping clips, and Automation Lanes for improved editing of individual automation envelopes. For details, see "Take lanes and comping takes" on page 367 and "Automation lanes" on page 1010.
- New clip UI with intuitive header indicators. See "Clip header indicators" on page 327.
- All new audio clips and MIDI clips have the same default colors.
- Auto Track Zoom to automatically zoom the current track. For details, see "Auto Zoom the current track" on page 87.
- Enhanced time ruler zoom and scrolling. For details, see "Zooming and scrolling in the time ruler" on page 88.
- Track names are no longer bold, in order to fit text better.
- Selected clips have a more distinctive color.
- Audio data can no longer be placed on a MIDI track, and MIDI data can no longer be placed on an audio track.
- Different background color for odd and even tracks/buses in the Clips pane.
- Smooth envelope drawing.
- Created envelopes are listed in bold text at the top of the Edit Filter menu.
- **Automation Write** buttons indicate the automation mode (Touch, Overwrite, or Latch). For details, see "Automation write modes (Producer and Studio only)" on page 1005.
- Smoother and more visible Now Time playback line that extends the full height of the Track view.
- Assign a default MIDI editing view to each MIDI clip. For details, see "To specify the default editing view for MIDI clips" on page 673.
- Now Time marker indicators that shows playback state. For details, see "The Now time marker" on page 180.

Figure 355. *The Now Time marker indicates the playback state*
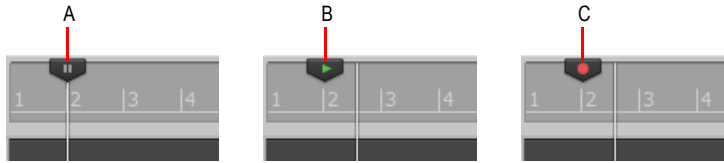
A. Paused B. Playback C. Recording

Piano Roll enhancements

- Controller lanes.
- Edit Filter UI is similar to the Track view Edit Filter.
- Horizontal and vertical Aim Assist line. Enabled via the global Aim Assist option in the Track view.
- Drag duration when inserting notes via the Smart Tool.
- Controller pane size is remembered when you close and reopen the Piano Roll view.
- Updated time ruler similar to the Track view time ruler.
- Lasso select scrolls the Piano Roll view when you reach the window boundary.
- The inline Piano Roll shows clip headers when editing note events. Click a header to select all events that live in the clip, or drag the header to move all events in the clip.

For details, see "The Piano Roll view" on page 677.

Inspector enhancements

- Bus Properties Inspector (available when a bus has focus).
- Track Properties Inspector and Bus Properties Inspector have an Automation section, with controls to specify the automation write mode and time base.
- New Arpeggiator UI with horizontal sliders, which allows parameter values to display better.
- Modular ProChannel.
- Keyboard shortcuts to show/hide Track Properties Inspector, Clip Properties Inspector and ProChannel. For details, see "Basic shortcuts" on page 1454.

For details, see "Inspectors" on page 523.

Browser enhancements

- **Replace synth** command to replace a synth with any other available synth. Swap instruments and try new sounds in one simple step, while keeping all other routing and track data fully in-tact. For details, see "To replace an instrument" on page 587.
- Option to delete associated tracks when deleting synths. For details, see "To remove an instrument" on page 586.
- Drag FX Chains and clips to/from the Browser. For details, see "To save an FX Chain preset" on page 579 and "To load an FX Chain preset" on page 580.

- Rename media files, plug-ins and FX Chains. For details, see "To rename media files in the Media Browser" on page 570, "To rename a plug-in" on page 579 and "To rename an FX Chain preset" on page 580.

- Delete media files directly from the Browser. For details, see "To delete media files in the Media Browser" on page 570.

- Multi-folder search filter.

- Send MIDI data to external MIDI output when previewing MIDI data.

- Browser preview stays synchronized with the Matrix.

- Clicking a synth in the Synth Rack makes the corresponding instrument track active.

For details, see "Browser" on page 559.

Control Bar enhancements

- Control Bar modules are centered.

- Tools module updates:
  - Trim tool has been renamed to Edit tool.

- Snap to Grid module updates:
  - **Smart Grid** option. Snap to dynamic grid based on horizontal zoom level.
  - Note duration values show a graphic representation of the selected note value.
  - Triplet and dotted note duration buttons.
  - **Snap To** and **Snap By** are now a single toggle.
  - Streamlined **Landmarks** button. Right-click the **Landmarks** button to enable/disable individual landmarks.
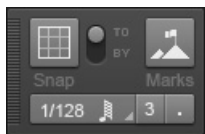
- Transport module updates:
  - Access metronome settings by clicking the metronome icon.

- Screenset module updates:
  - The active screenset is highlighted.
  - There are 10 screenset buttons.

- Mix module updates:
  - Offset mode button.

For details, see

Full Screen mode

You can expand SONAR's interface by using the new Full Screen mode. To do so, click the **Window** menu and choose **Full Screen**, or press F11.

Other user interface and usability enhancements

- Easier to use default plug-in layouts.
- Open the Step Sequencer, Piano Roll view, Staff view, or Event List view directly from a soft synth's property page. For details, see
- MIDI Input controls set to **None** correctly display **None** instead of **Omni**.
- Tooltips are flicker-free.
- Support for mono input/output.
- Screensets remember the active tab in the MultiDock.
- Deleting a bus is undoable.
- Many new intuitive mouse pointer cursors.
- Dozens of other UI enhancements.

See:

Perform

Matrix enhancements

- Updated UI.
- Improved playback for rock-solid sync for both MIDI and audio cells.
- Improved MIDI routing. MIDI rows can be routed through tracks and apply processing such as MIDI FX, Arpeggiator, volume, pan, etc. Output tracks to MIDI hardware devices or soft synths, or route MIDI rows directly to synths.
- Per-cell trigger resolution. Each cell can be set to a custom trigger resolution. Instead of A/B trigger resolutions, there is a global resolution and a per-cell resolution.
- The active track is highlighted and can be selected from the Matrix.
- MIDI Learn empty cells.
- MIDI Learn learns Port, Channel and Note.

For details, see "Matrix view" on page 1876.

Arpeggiator enhancements

- New Arpeggiator UI with horizontal sliders, which allows parameter values to display better.
- Improved Arpeggiator real-time performance.

For details, see "Arpeggiator" on page 269.

Overloud TH2 Producer amp simulator (Producer only)

Figure 356. *TH2 Producer*

TH2 Producer by Overloud provides realistic guitar amp models from clean to crushing distortion.

This special edition includes 10 amplifier models, 10 cabinet models, 10 stomp box effects models, 3 microphone models, delay and reverb master effects and dozens of presets. Easily build or modify your own signal path.

For more information, see the *TH2 Producer* online Help.

Overloud TH2 SONAR amp simulator (Studio only)

Figure 357. *TH2 SONAR*

TH2 SONAR by Overloud provides realistic guitar amp models from clean to crushing distortion.

This special edition includes 10 amplifier models, 10 cabinet models, 3 microphone models, and dozens of presets. Easily build or modify your own signal path.

For more information, see the *TH2 SONAR* online Help.

Rapture (Producer only)

Combining power, elegance, control, and unbeatable sounds, *Rapture* is one of the most exciting synthesizers available. Capable of producing rich, hypnotic, and rhythmic basses, leads, and pads, *Rapture* is perfect for performing and designing the modern synthesized sounds igniting today's pop, dance, and electronic music. Rapture is a wavetable synthesizer with advanced sound manipulation capabilities, well suited for electronica-related music styles. A comprehensive Modulation Matrix provides expressive control and a unique Step Generator provides an intuitive interface for the creation of rhythmic parameter changes.

For more information, see the *Rapture* online Help.

See:

Record

Recording enhancements

- Use Take lanes to easily manage overlapping clips when recording multiple takes on the same track. For details, see "Take lanes and comping takes" on page 367.
- Loop record to separate Take lanes.
- When recording to a track that contains existing data, specify whether or not you want to hear the previously recorded material. For details, see "To hear previously recorded material on track while recording" on page 276.

Metronome enhancements

- Access metronome settings by clicking the metronome icon in the Control Bar.
- Support for subdivisions.
- Metronome can be enabled and disabled during playback and recording.

For details, see "Setting the Metronome and Tempo settings" on page 253 and "Project - Metronome" on page 1696.

See:

Edit

Tools enhancements

- Improved Smart tool and Edit tool with added functionality (Note: the Trim tool has been renamed to the Edit tool).
- Clips are drawn with a header, which can be clicked with the Smart tool to select and move the clip.
- Select envelope curve types (Fast, Current, Slow, Jump) with the Edit tool. For details, see "To change an envelope segment's shape" on page 1025.
- Draw envelope lines at mousedown and mouseup points with the Line Draw tool.
- All tools support multi-track editing.
- Many refinements to the various global tools.
- Many new intuitive mouse pointer cursors.

For details, see "Tools" on page 407.

Snap to Grid enhancements

- New **Smart Grid** snap resolution. When **Smart Grid** is selected, the snap resolution is dynamically determined by the horizontal zoom level, and the M:B:T time rulers in the Clips pane and Piano Roll view are optimized to show relevant snap locations.
- Quickly toggle between primary and secondary snap settings (snap override).
- Enable/disable snapping with the N key.
- Right-click the **Snap to Grid** button ⊞ in the Control Bar to access snap settings.
- UI to test the magnetic snap strength in the **Preferences** dialog.
- Enhanced Snap module in the Control Bar:
  - Note duration values show a graphic representation of the selected note value.
  - Triplet and dotted note duration buttons.
  - **Snap To** and **Snap By** are now a single toggle.
  - Streamlined **Landmarks** button. Right-click the **Landmarks** button to enable/disable individual landmarks.

Figure 358. *Snap module in the Control Bar.*
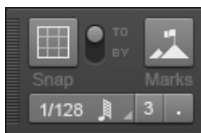
For details, see "Defining and using the Snap Grid" on page 354 and "Snap module" on page 502.

Zooming enhancements

- More zoom levels and overall smoother zooming.
- Auto zoom the current track for faster workflow . For details, see "Auto Zoom the current track" on page 87.
- Enhanced zooming in the time ruler. Point the mouse pointer at the top half of the Clips pane or

  Piano Roll view time ruler until the mouse pointer looks like [icon], then drag up/down to zoom

  horizontally, or drag up/down with the right mouse button to zoom vertically. For details, see "Zooming and scrolling in the time ruler" on page 88.
- Zoom undo/redo also applies to screensets.
- Zoom undo/redo now properly restores the visible Clips Pane range.
- Double-click the top half of the time ruler to invoke the **Fit Project To Window** command.
- Undo/redo zoom by using the left and right mouse buttons. To undo zoom (same as ALT+Z), press and hold down the right mouse button, then click the left mouse button. To redo zoom (same as ALT+SHIFT+Z), press and hold down the left mouse button, then click the right mouse button.

For details, see "Zoom controls" on page 86 and "Zooming and scrolling in the time ruler" on page 88.

Scrolling enhancements

- Overall smoother scrolling.
- Scroll ProChannel vertically.
- Lasso selecting in the Piano Roll view and inline Piano Roll now scrolls the view when you reach the window boundary.
- Enhanced scrolling in the time ruler. For details, see "Zooming and scrolling in the time ruler" on page 88.

Selection enhancements

- Improved selection of tracks and data. Solid and consistent selection look and gestures across all views.
- Drag with the right mouse button to lasso select.
- When you reach a window boundary while selecting, the window scrolls.
- The **Select All** command (and CTRL+A shortcut) only selects data that is editable in the view that has focus.
- Hold down the SHIFT key and click in the time ruler or Clips pane to extend the current selection. If there is no existing selection, the selection extends from the Now Time.

Grouping enhancements

- The **Group > New** and **Group > Save** commands have been consolidated into a single **Group > New** command. For details, see "Using control groups" on page 914.

- Clip groups:
  - *Selection group* has been renamed to *Clip group*.
  - New keyboard shortcuts for working with clip groups. For details, see "Clip shortcuts" on page 1464.
  - For details, see "Clip groups" on page 345.
- Quick Group support for:
  - Create/Delete/Reassign sends in the Track view and Console view.
  - Insert/Remove/Replace ProChannel modules (Producer only).
  - Up/down scrolling in Send clusters in the Console view and Inspector.
  - Minimize a ProChannel module across all selected tracks (Producer only).
  - Minimize all ProChannel modules in a single track (Producer only).
  - Pre/Post toggle in ProChannel (Producer only).
  - Bypass ProChannel (Producer only).
  - Scrolling in ProChannel with mouse wheel (Producer only).
  - Expand/collapse lanes.
  - Assign parameters to Automation lanes.
  - For details, see "Quick Groups" on page 917.

Key binding enhancements

- Search function for Key Bindings. For details, see "To search for key bindings" on page 1068.
- "On Stop, rewind to now marker" can be toggled on/off by pressing CTRL+W.
- Additional commands exposed as key bindings, including:
  - Snap to Measure.
  - Metronome on/off.

See:

Mix

Automation enhancements

- Display and edit automation envelopes in discrete Automation lanes. For details, see "Automation Lanes" on page 1312.

- Refined automation write modes, including Touch, Overwrite, and Latch (Producer and Studio only). For details, see "Automation write modes (Producer and Studio only)" on page 1005.

- Automation recording obeys the Auto Punch region.

- Specify if track automation should be locked to Absolute or Musical time. For details, see "Automation time base" on page 1006.

- Arm parameters for automation writing during playback.

- Optional vertical snap when dragging envelope nodes. For details, see "To snap nodes vertically" on page 1023.

- Smoother automation envelope drawing.

- Offset mode on/off toggle in the Control Bar's Mix module.

- The mouse hit zone for nodes has been expanded to make it easier to grab nodes.

- The Edit Filter and Automation menus use bold text to indicate created envelopes. Created envelopes are also moved to the top of menus.

- Faster and more powerful editing with the global tools:

  - Select and edit envelopes across multiple tracks. For example, raise/lower track volume envelopes across a group of tracks.

  - When dragging envelope nodes, the tooltip shows the current value plus the delta value for the change.

  - Audio scale ruler in the Track view shows appropriate scale format when editing Volume and Pan automation.

  - Intuitive mouse cursors when editing automation.

  - Change curve types, draw lines, adjust clip volume. For details, see "Tools" on page 407 and "Working with automation envelopes" on page 487.

For details, see "Automation" on page 1001.

R-MIX SONAR (Producer only)

Figure 359. *R-MIX SONAR.*
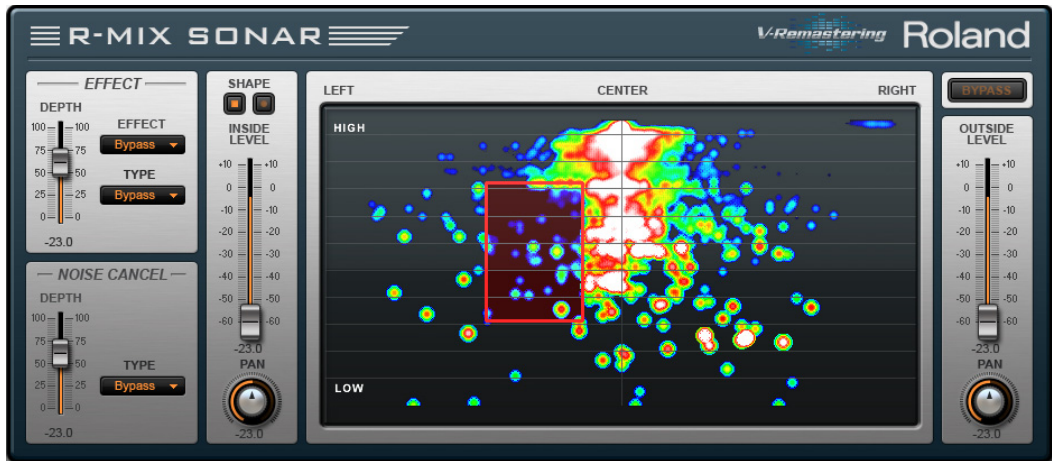
R-MIX SONAR allows you to visually manipulate an audio mix. Powered by Roland's V-Remastering technology, R-MIX SONAR lets you see the components of a stereo mix as color-coded clouds of energy and harmonic matter as the song plays.

Visualizing the sound allows you to use not only your ears but also your eyes to understand the layout and placement of the instruments. You can select any components of the mix, and freely edit them. By moving and adjusting the frame provided by R-MIX SONAR Edition, you can mute or extract specific regions of the visualized sound, in this way altering the volume balance in very precise ways. You can change and automate panning positions and levels to individual instruments within a stereo mix, for example, and add effects to each element as desired.

Highlights:

- VST plug-in that can be inserted on a track, clip, and bus FX bin.
- Simple interface with only one intuitive screen to navigate.
- Controls are designed according to natural workflow so you can work effortlessly.
- View the elements of a stereo mix as color-coded clouds of energy and frequency matter onscreen.
- Freely select, manipulate and automate any element within a stereo mix.

The following are some ideas for how you can use R-MIX SONAR:

- Create "minus-one" type karaoke files from existing songs by lowering the level of a pre-recorded vocal or any other instrument you select within a mix.
- Remove a vocal from an already-mixed song and re-record an alternate vocal.
- Create your own remixes and mash-ups by using two pairs of stereo tracks within R-MIX SONAR.
- Automate the level and panning of individual instruments in a stereo mix.

- Transcribe and learn parts by isolating any desired instrument within a mix.
- Solo an individual part and analyze it for study; slow down a fast guitar solo, for example, and learn how to play it.
- Mute or extract specific regions of the visualized sound.
- Add effects only to any specific part of a mix, such as vocals.
- Clean up old recordings and master stereo mixes by adjusting individual instrument levels and applying noise reduction and effects.

For more information about using R-MIX, see the R-MIX SONAR online Help.

ProChannel enhancements (Producer only)

- ProChannel is now modular and modules can be dynamically added, removed, and reordered. For details, see "ProChannel (Producer only)" on page 963.
- Routing can be adjusted by moving modules via simple drag and drop. Signal flow is easily visualized and flows from top to bottom, just like a hardware mixer.
- ProChannel modules can be expanded and collapsed individually, preserving valuable screen real-estate.
- Scroll ProChannel vertically to easily access all modules. The Console view conveniently remains in place while scrolling ProChannel.
- Insert multiple instances of ProChannel modules on the same track or bus.

> **Note:** *You can insert multiple instances of external ProChannel modules. However, you can not insert multiple instances of the internal ProChannel modules, including QuadCurve Equalizer, Tube Saturation, PC76 U-Type compressor, and PC4K S-Type bus compressor.*

ProChannel Console Emulator module (Producer only)

The Console Emulator module emulates the sound of three classic recording consoles in SONAR's mixer.

For details, see "Console Emulator module" on page 988.

ProChannel FX Chain module (Producer only)

The FX Chain module lets you save and load audio effect plug-in chain presets called FX Chain. The FX Chain module can be used as an effects bin that can be inserted between other ProChannel modules.

For details, see "FX Chain module" on page 992.

ProChannel QuadCurve Equalizer module (Producer only)

The QuadCurve EQ has many enhancements:

- New Hybrid type.
- The EQ graph shows Frequency and Gain scales, bands are color-coded, and has nodes you can drag to adjust the EQ.
- Value edit box below each parameter.

For details, see "QuadCurve Equalizer module" on page 981.

ProChannel PC4K S-Type Expander/Gate module (Producer only)

PC4K S-Type Expander/Gate is based on the legendary channel strip gate in one the world's most successful analog studio production mixing consoles.

For more information, see the PC4K S-Type Expander/Gate online Help.

ProChannel Softube Saturation Knob module (Producer only)

The Softube Saturation Knob module borrows from Softube's famous German FET distortion and compression circuitry modeling, and provides smooth, one-knob, frequency saturation operation for adding just the right amount of tube warmth to any track.

Overloud BREVERB SONAR (Producer only)

Figure 360. *BREVERB SONAR VST version*

Figure 361. *BREVERB ProChannel module*

BREVERB SONAR by Overloud provides world-class studio reverb. Dozens of professional presets are included, covering a wide range of applications from mixing to post-production. SONAR includes both VST and ProChannel versions of BREVERB SONAR. For details, click the Help button in the BREVERB SONAR VST version.

FX Chains 2.0

• Redesigned and streamlined FX Chain container and pre/post meters.

• Create FX Chains with modulation matrix, customizable interface and user-definable skins. (Producer and Studio only)

• Control up to four different parameters with each assignable knob and button. For details, see "To customize an assignable control (Producer only)" on page 890.

• Learn functionality for assignable knobs and buttons. For details, see "To add/remove an assignable knob or button (Producer only)" on page 890.

• Specify range for assignable knobs. For details, see "To set parameter value range manually" on page 891 and "To set parameter value range automatically" on page 891.

• Drag and drop FX Chains from the Browser, between tracks, or to individual clips.

• Includes Producer line of FX Chains (Producer only)

• Includes Studio line of FX Chains (Producer and Studio only)

• Includes Essential line of FX Chains (Essential only)

For details, see "Effects chains" on page 882.

See:

"New features in SONAR X2" on page 1309

"Skylight" on page 1311

"Perform" on page 1317

Master

Improved LP-64 EQ (Producer only)

Smooth performance and no glitching when adjusting parameters during playback.

Improved LP-64 Multiband Compressor (Producer only)

Smooth performance and no glitching when adjusting parameters during playback.

See:

Deliver

MusicXML export

Export notation data as MusicXML for use in other notation programs. MusicXML is the universal digital sheet music interchange and distribution format. For details, see "Export to MusicXML (Producer only)" on page 1107.

SoundCloud export

SoundCloud is an online music sharing service that allows you to upload and share your music with others online. SONAR has integrated support for uploading audio to the SoundCloud service.

SoundCloud offers many ways to share your sounds online, including:

• Host your sounds on SoundCloud.com.

• Share your sounds on many of the most popular social networking Web sites, including Facebook and Twitter, making it easy to promote your music.

• Download public or private audio files from other SoundCloud users. This is a great way to collaborate with others.

• Allow anyone, or only specific people, to access and comment on your sounds.

For details, see "Sharing your songs on SoundCloud" on page 927.

See:

Misc. enhancements

Online product documentation

By default, SONAR opens the online HTML Help in your default Web browser. The latest documentation is always available from the Cakewalk Web site. Online help offers many benefits, including:

• Portability (e.g. Mobile phones)

• Searchability (e.g. Google)

• Google Translate support

If you do not have an Internet connection, SONAR will instead launch an offline version of the online Help.

If you prefer to always use offline Help, go to **Preferences > File > Advanced**, and select **Always Use Offline Help**.

To download the latest offline help file, go to **Help > Download Latest Help File**.

Other enhancements

• Gapless operation when moving loop points, inserting effects, and inserting and replacing synths.

• Optimized MIDI input timing results in improved Arpeggiator timing and real-time soft synth playing.

• Browser preview stays synchronized with the Matrix.

• SONAR X2 Essential is available as a 64-bit program.

• Chinese version of X2 program and User Guide PDF (online Help is English).

• Improved VS-700 control surface support. For details, see the VS-700 online Help.

• Support for ReWire 64. For details, see "ReWire" on page 821.

> **Note:** *ReWire supports both 32-bit and 64-bit programs, but it is not possible to mix the two environments. A 32-bit program and a 64-bit program cannot communicate via ReWire. Make sure you load the correct version of your ReWire device, depending on whether you are using the 32-bit or 64-bit version of SONAR.*

• Dozens of additional performance, audio engine, and UI improvements.

See:

Comparison

The following table highlights the key differences between SONAR X2 Producer, SONAR X2 Studio, and SONAR X2 Essential.

Product Comparison	SONAR X2 Essential	SONAR X2 Studio	SONAR X2 Producer
General			
Max number of audio tracks	64	Unlimited	Unlimited
Max number of MIDI tracks	Unlimited	Unlimited	Unlimited
Max Bit Depth / Sample Rate	64-bit float / 384kHz	64-bit float / 384kHz	64-bit float / 384kHz
Max number of effects / instruments	64 / 32	Unlimited	Unlimited
Max simultaneous buses	16	Unlimited	Unlimited
Max audio effects sends (per track/bus)	5	Unlimited	Unlimited
Internal mixing engine	64-bit	64-bit	64-bit
Windows x64 Support	Native x64	Native x64	Native x64
Step Sequencer 2.0	x	x	x
Video import/export	x	x	x
GPU Acceleration	x	x	x
Matrix view	x	x	x
Arpeggiator	x	x	x
FX Chains	x	x	x

Table 231. *SONAR X2 comparison*

Product Comparison	SONAR X2 Essential	SONAR X2 Studio	SONAR X2 Producer
FX Chain UI customizing		x	x
External Insert		x	x
AudioSnap 2.0		x	x
V-Vocal 1.5		x	x
Surround Sound		x	x
SoundCloud export	x	x	x
MusicXML export	x	x	x
Automation record modes		x	x
R-MIX SONAR			x
ProChannel			x
Audio plug-in effects			
Alias Factor	x	x	x
Analyst	x	x	x
Bit Meter	x	x	x
Boost 11 Peak Limiter	x	x	x
Classic Phaser	x	x	x
Compressor/Gate	x	x	x
CW - Delay (Mono)	x	x	x
CW- EQ (Mono)	x	x	x
CW- Reverb (Mono)	x	x	x
DSP-FX Chorus (32-bit Only)	x	x	x
DSP-FX Delay (32-bit Only)	x	x	x
DSP-FX EQ (32-bit Only)	x	x	x
DSP-FX Flange (32-bit Only)	x	x	x
DSP-FX StudioVerb (32-bit Only)	x	x	x
FX1 Dynamics Processor	x	x	x

Table 231. *SONAR X2 comparison (Continued)*

Product Comparison	SONAR X2 Essential	SONAR X2 Studio	SONAR X2 Producer
FX2 AmpSim	x	x	x
FX2 TapeSim	x	x	x
HF Exciter	x	x	x
Modfilter	x	x	x
Multivoice Chorus/Flanger	x	x	x
Parametric EQ	x	x	x
Para-Q	x	x	x
Pitch	x	x	x
Reverb	x	x	x
SpectraFX	x	x	x
Stereo Delay (32-bit Only)	x	x	x
Stereo Reverb	x	x	x
Tempo Delay	x	x	x
Sonitus fx: EQ	x	x	x
Sonitus fx: Reverb	x	x	x
Sonitus fx: Compressor		x	x
Sonitus fx: Delay		x	x
Sonitus fx: Gate		x	x
Sonitus fx: Modulator		x	x
Sonitus fx: Multiband		x	x
Sonitus fx: Surround		x	x
Sonitus fx: Surround Compressor		x	x
Sonitus fx: Wah Wah		x	x
Sonitus fx:Phase		x	x
Channel Tools		x	x
TH2 SONAR	x	x	

Table 231.   *SONAR X2 comparison (Continued)*

Product Comparison	SONAR X2 Essential	SONAR X2 Studio	SONAR X2 Producer
TH2 Producer			x
BREVERB SONAR			x
LP-64 EQ			x
LP-64 Multiband			x
Perfect Space (32-bit Only)			x
PX-64 Percussion Strip			x
TL-64 Tube Leveler			x
TS-64 Transient Shaper			x
Vintage Channel			x
VX-64 Vocal Strip			x
MIDI plug-in effects			
MFX Arpeggiator	x	x	x
MFX Change Velocity	x	x	x
MFX Chord Analyzer	x	x	x
MFX Echo/Delay	x	x	x
MFX Event Filter	x	x	x
MFX Quantize	x	x	x
MFX Transpose	x	x	x
Instruments			
Cakewalk Sound Center	x	x	x
Cakewalk TTS-1	x	x	x
Dimension	LE	LE	Pro
Dreamstation DXi (32-bit Only)	x	x	x
DropZone	x	x	x
Square I	x	x	x
Studio Instruments Suite	x	x	x

Table 231. *SONAR X2 comparison (Continued)*

Product Comparison	SONAR X2 Essential	SONAR X2 Studio	SONAR X2 Producer
Cyclone		x	x
Pentagon I		x	x
PSYN II		x	x
Rapture LE		x	
Rapture			x
Roland Groove Synth	x	x	x
RXP REX Player		x	x
SFZ Sound Font Player		x	x
Z3ta+		x	x
Session Drummer 3			x
True Pianos Amber (x86, x64)			x
Expansion Packs for Dimension Pro			
Digital Sound Factory V2 Classic Keys			x
Hollywood Edge FX			x
Dimension Pro Expansion Pack 1			x
Dimension Pro Expansion Pack 2			x
Classic Sounds for Dimension Pro			x
Audio Loops, MIDI Clips & Projects			
500 MB REX Loopmasters			x
500 MB REX/WAV Sample Magic			x
210 MB WAV XMIX			x
MIDI Groove Clips			x
Tutorial Projects			x
Artist demo projects			x

Table 231. *SONAR X2 comparison (Continued)*

See:

| Comparison

Included plug-ins

The following is a list of audio, MIDI and instrument plug-ins that are included with SONAR.

For detailed informaiton about a specific plug-in, see the plug-in's online Help.

Amp, tape & tube simulation

Dynamics processing

Channel strips, stereo & panning

Delays & modulation

EQ

Mastering

Reverbs

Signal analysis

Specialty effects

MIDI effects

Instruments

See:

Audio effects

2-band EQ

Figure 362. *2-band EQ*
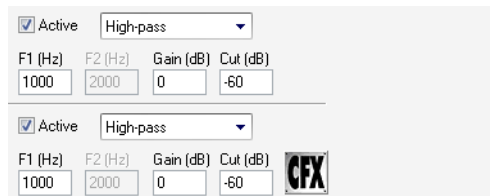
The 2-Band EQ lets you choose the frequencies affected by equalization, and then choose how much to cut or boost each frequency.

For more information, see the *2-band EQ* online Help.

Alias Factor

Figure 363. *Alias Factor*

Alias Factor combines bit crushing and low pass filtering in a unique way, allowing you to decimate your audio to create tones as varied as vintage samplers, cell phones, or old video games. Decimator effects are nothing new, but *Alias Factor* generates this effect using a special technique that generates aliasing without the unwanted harsh effects provided by other options, offering sounds that are grainy in a "smooth" and organic way. *Alias Factor* also allows for further creation of attention grabbing new timbres by linking a low pass resonant filter to the decimator for a new means of tweaking your sound.

For more information, see the *Alias Factor* online Help.

Analyst

Figure 364. *Analyst*
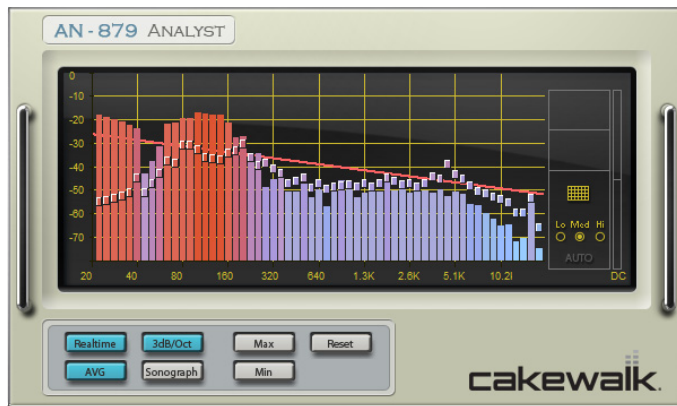
Analyst is a spectrum analyzer, and can also generate automation envelopes.

You can operate Analyst in either one of two modes:

• **Spectrum mode.** Vertical axis represents dB, horizontal axis represents frequency (as pictured above).

• **Sonograph mode.** This mode displays a color-coded historical representation of the audio. Level is indicated by color; vertical axis represents frequency. Horizontal axis represents time, with NOW being at the right edge, and the history going toward the left.

For more information, see the *Analyst* online Help.

BitMeter

Figure 365. *BitMeter*

See the benefits of SONAR's 64-bit audio engine in action with the Bit Meter VST plug-in: . A valuable tool for monitoring the digital activity of your audio stream. View output word length, dynamic range, signal peaks, and more to analyze the quality of your digital signal.

Boost 11 Peak Limiter

Figure 366. *Boost 11 Peak Limiter*

The *Boost 11 Peak Limiter* is a transparent peak limiting and volume maximizing plug-in for mixing and mastering purposes; it is designed to reduce peak levels without coloring the sound. Boost 11 uses a "look-ahead" limiter algorithm to prevent output clipping and PDR (Program Dependent Release) to minimize pumping (audible fluctuations of the volume) and maximize the loudness. "Look-ahead" means the limiter analyzes the audio input ahead of time by delaying the output for approximately 1.5ms. Boost 11 supports sampling rates up to 192 kHz, mono and stereo operation, and double precision processing.

Boost 11's features include:

• Look-ahead peak detection prevents clipping

• Program Dependent Release minimizes pumping

• Dynamic waveform displays of input vs. output

• Stereo peak and RMS input/output meters

• Operation at sampling rates up to 192 kHz

• 64-bit double precision signal path

• VST Automation

For more information, see the *Boost 11 Peak Limiter* online Help.

BREVERB SONAR (Producer only)

Figure 367. *BREVERB SONAR*

BREVERB SONAR by Overloud provides world-class studio reverb. Dozens of professional presets are included, covering a wide range of applications from mixing to post-production. SONAR includes both VST and ProChannel versions of BREVERB SONAR. For details, click the Help button in the BREVERB SONAR VST version.

Channel Tools

Figure 368. *Channel Tools*

The *Channel Tools* plug-in provides easy and powerful channel processing for gain, Mid-Side decoding, delay and stereo panning. *Channel Tools* is ideal for enhancing and adjusting stereo separation for stereo tracks and full mixes.

With *Channel Tools* you can:

• Use intuitive controls to easily place the left and right channels individually anywhere in the stereo

space.

- Automatically decode Mid-Side channel recordings.
- Enhance the spatial characteristics of your mixes.
- Adjust for phase problems due to microphone placement.
- Swap the left and right channels.
- Invert the polarity (phase) of each channel.
- Fine-tune the timing of recordings by delaying the left and/or right channel by a specific number of samples or milliseconds.

For more information, see the *Channel Tools* online Help.

Chorus

Figure 369. *Chorus*
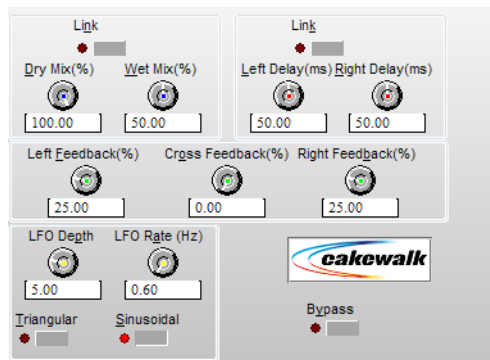
Chorusing "fattens" the audio to make one instrument sound like many. When many people sing together, for example, each of their voices is slightly out of tune and off the beat. Therefore, detuning and delaying the signal makes many instruments sound richer, including guitars, vocals, and strings.

For more information, see the *Chorus* online Help.

Chorus (mono)

Figure 370. *Chorus (mono)*
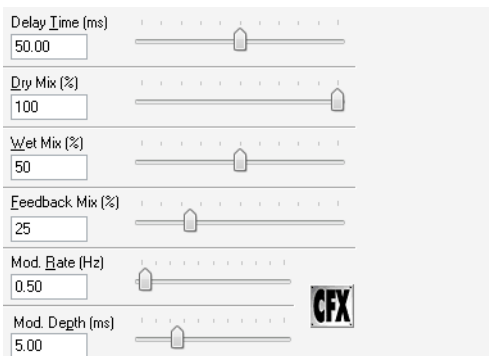
For more information, see the *Chorus (mono)* online Help.

Classic Phaser

Figure 371. *Classic Phaser*

This is a classic phaser effect that uses a modulating notch filter with a feedback loop. The "Quadra" mode provides extra wide imaging and animation.

For more information, see the *Classic Phaser* online Help.

Compressor/Gate

Figure 372. *Stereo Compressor/Gate*

Stereo Compressor/Gate combines a compressor and a gate into a single effect, so you can increase the overall dynamic level of an audio signal, without distorting the loud parts, and without excessively boosting low-level noise. You can manually trigger the gate via MIDI, which makes it simple to produce stuttering effects.

For more information, see the *Stereo Compressor/Gate* online Help.

Delay

Figure 373. *Delay*
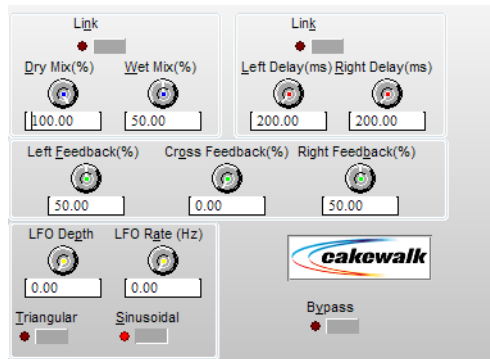
FX Delay (Stereo) creates a series of repeating signals from the original signal. You vary the amount of this delay or echo by changing the Delay Time and the Feedback Mix. Use the modulation parameters to detune the processed signal.

For more information, see the *Delay* online Help.

Delay/Echo (mono)

Figure 374. *Delay/Echo (mono)*
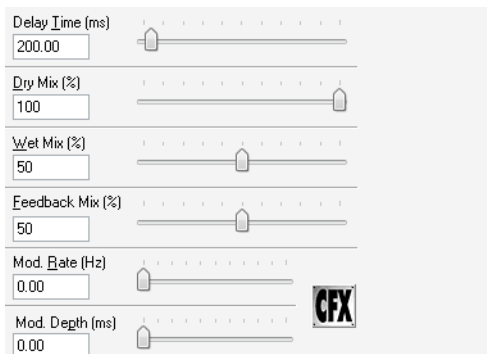
Delay/Echo creates a series of repeating signals from the original signal. You vary the amount of this delay or echo by changing the Delay Time and the Feedback Mix. This effect is available both as a destructive, offline effect, and as a realtime effect in both the Track and Console windows.

For more information, see the *Delay/Echo (mono)* online Help.

DSP-FX Chorus (32-bit Only)

Figure 375. *DSP-FX Chorus*
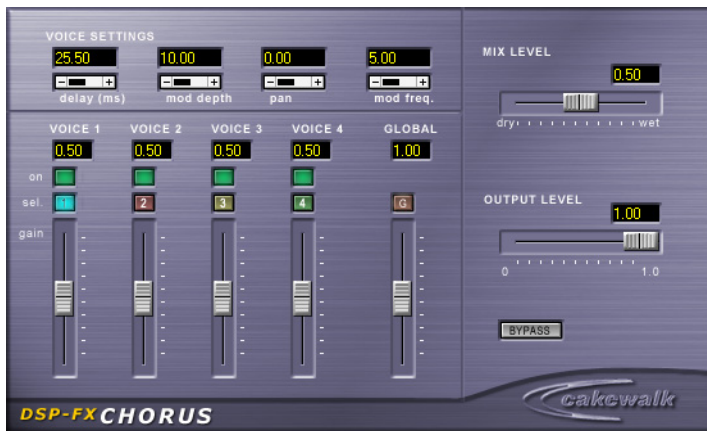
The FxChorus gives you a wide variety of ways to fatten up your recordings, providing both sound and intonation variables from small and large groups of singers or instruments. You can set each of the four voices independently, giving you the power of four different chorus processors at the same time.

For more information, see the *DSP-FX Chorus* online Help.

DSP-FX Delay (32-bit Only)

Figure 376. *DSP-FX Delay*
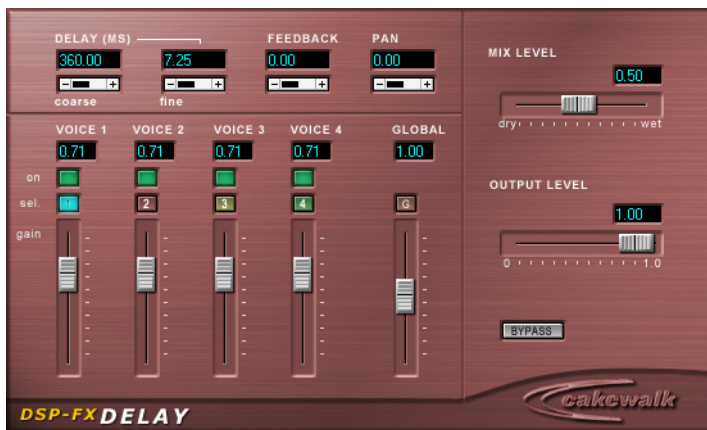
FxDelay creates a series of repeating signals from the original signal. You can create a single echo on the original signal, or a series of echoes.

For more information, see the *DSP-FX Delay* online Help.

DSP-FX EQ (32-bit Only)

Figure 377. *DSP-FX EQ*
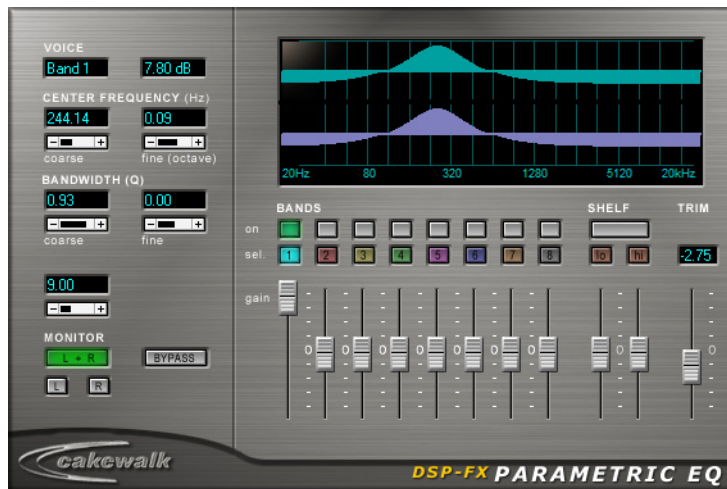
FxEq is an extremely flexible EQ. It is highly customizable, offering 8 user-defined bands.

For more information, see the *DSP-FX EQ* online Help.

DSP-FX Flange (32-bit Only)

Figure 378. *DSP-FX Flange*
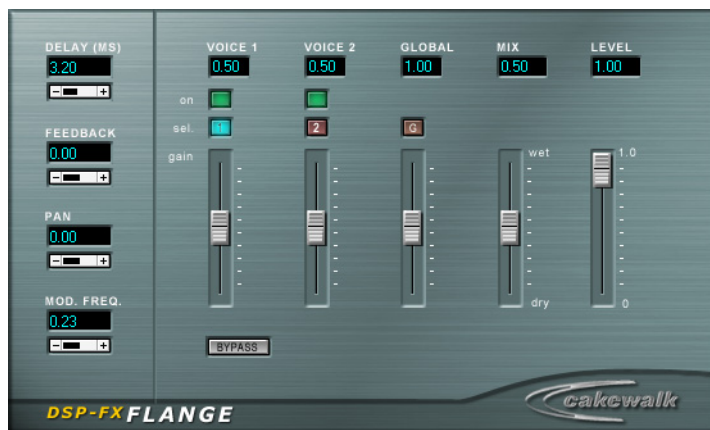
The FxFlange is the first digital flanger to accurately model tape-based analog flanging, right down to the engineer's thumb applying pressure on one of the tape reels. Since its two voices are completely independent, the FxFlange can produce more complex effects than a standard stereo flanger—it's like having two separate flangers in the same unit. The FxFlange is very effective for

both flanging individual instrument tracks or for flanging multiple tracks or the entire mix for a dramatic swirling sound.

For more information, see the *DSP-FX Flange* online Help.

DSP-FX Studioverb (32-bit Only)

Figure 379. *DSP-FX Studioverb*

The FXReverb provides very dense and warm reverberation with 32-bit floating point implementation. This eliminates the digital grunge and harshness that occurs even in the best studio reverberation systems, which are implemented using less advanced fixed point processing. The FXReverb provides extremely high efficiency, typically using half of the CPU load of other premium reverb plug-ins.

For more information, see the *DSP-FX Studioverb* online Help.

Flanger

Figure 380. *Flanger*
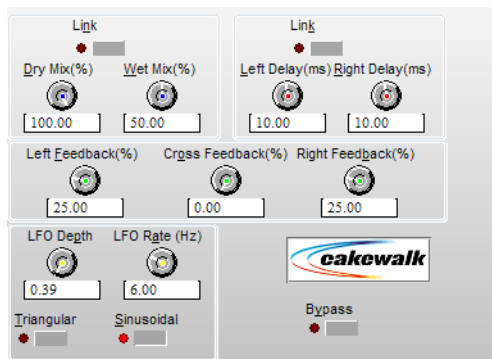
Flanging consists of two signals, one delayed slightly so that the signals are out of phase. This creates a spacey, ethereal sound.

For more information, see the *Flanger* online Help.

Flanger (mono)

Figure 381. *Flanger (mono)*
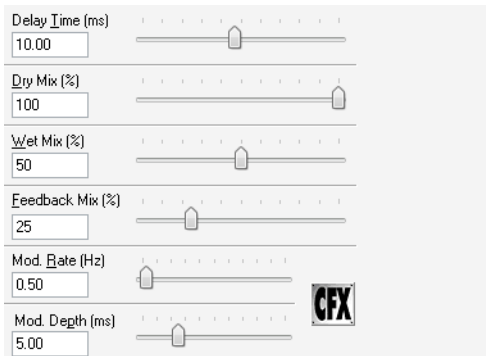
Flanging consists of two signals, one delayed slightly so that the signals are out of phase. This creates a spacey, ethereal sound.

For more information, see the *Flanger (mono)* online Help.

FX Compressor/Gate

Figure 382. *FX Compressor/Gate*
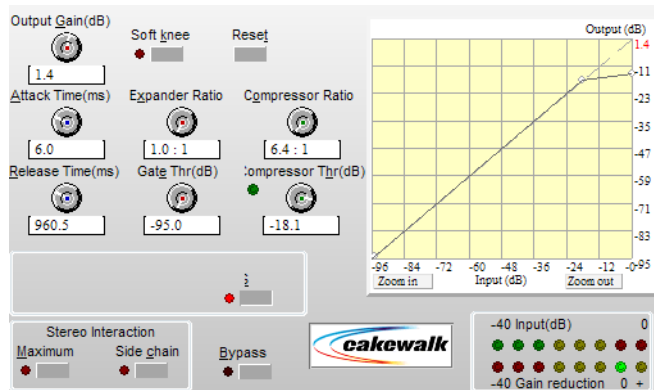
A compressor takes the loudest parts of an input signal and reduces their volume. There are a variety of reasons why you might want to use a compressor:

• Compressors enable you to increase the overall signal level of a mix, without causing the distortion that would result from exceeding the maximum allowable peak level. Increasing the average signal level makes a recording sound louder, with an apparent increase in "punch."

• If you plan to reproduce your audio using a medium with limited dynamic range, such as magnetic tape, the increase in the average signal level that you achieve with a compressor helps prevent important audio material from being lost in the background noise.

• Compression can even out unwanted volume changes to achieve a smoother and fuller sound.

For example, if a vocalist moves closer in and further away from a microphone while making a recording, the recorded volume levels may be uneven. A compressor can smooth out theses variations.

- During mixdown, you can use a compressor to adjust the dynamic range of individual tracks. This is one way to balance the tracks, and can even reduce the need to use a lot of equalization.

- Compressors can be used to increase an instrument's sustain, by using a release time longer than the instruments decay.

- With extreme compressor settings, you can produce new interesting sounds from familiar sounds.

For more information, see the *FX Compressor/Gate* online Help.

FX Dynamics Processor

Figure 383. *FX Dynamics Processor*
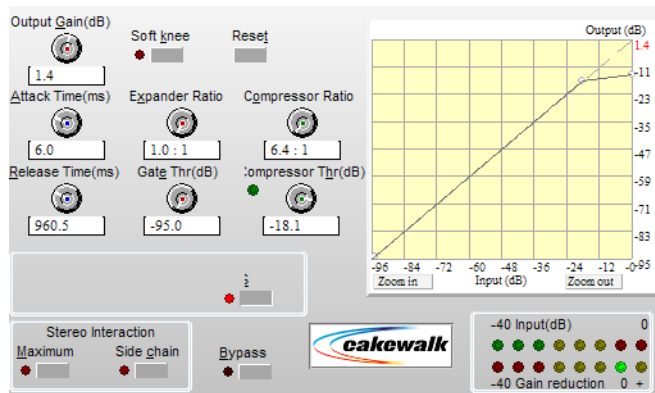
Dynamics processors are a class of audio effects that modify the dynamic range of an audio signal. The dynamic range of an audio signal is a measure of the level of variation between the loudest and softest parts of the signal.

For more information, see the *FX Dynamics Processor* online Help.

FX Expander/Gate

Figure 384. *FX Expander/Gate*
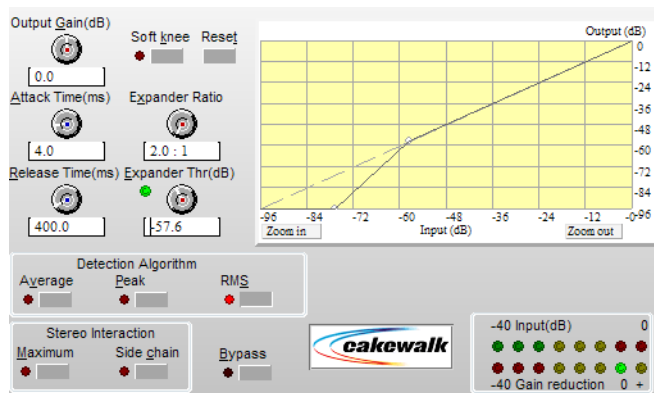
The stereo expander expands the dynamic range of the portion of an audio signal which falls below a given threshold.

For more information, see the *FX Expander/Gate* online Help.

FX Limiter

Figure 385. *FX Limiter*
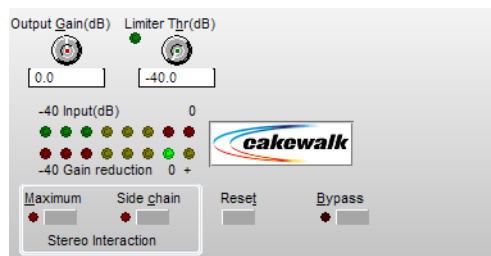
The purpose of the limiter is to prevent the audio signal from exceeding a threshold value. A limiter may be seen as an extreme case of compressing

For more information, see the *FX Limiter* online Help.

FX2 AmpSim

Figure 386. *FX2 AmpSim*
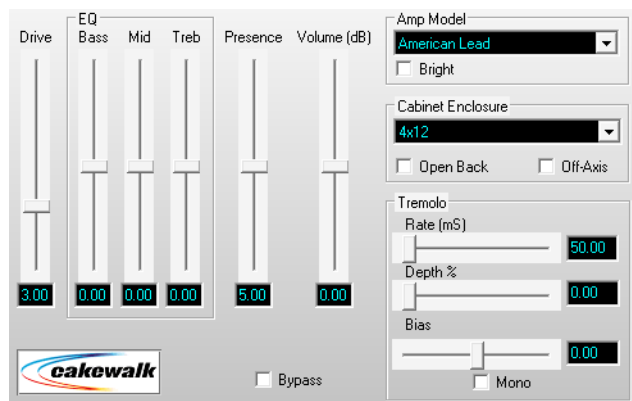
The AmpSim plug-in allows you to simulate processing your audio through a guitar amplifier and/or speaker cabinet, providing authentic distortion and speaker modeling characteristics.

For more information, see the *FX2 AmpSim* online Help.

FX2 TapeSim

Figure 387. *FX2 TapeSim*
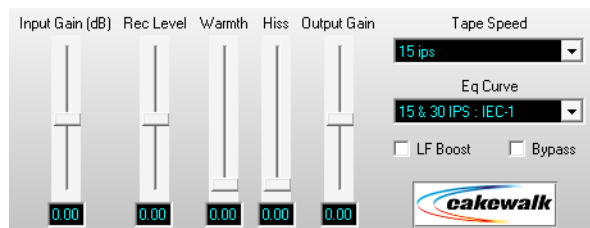
The TapeSim plug-in simulates processing your audio through an analog tape recorder, emulating the coloration effects that are inherent in magnetic recording, including natural tape overload compression, saturation and hiss (noise).

For more information, see the *FX2 TapeSim* online Help.

HF Exciter

Figure 388. *HF Exciter*

HF Exciter lets you enhance the higher end of the frequency spectrum. This produces the psycho-acoustic affect that the signal is brighter and clearer. This is done by adding harmonic content that is not present in the original signal.

For more information, see the *HF Exciter* online Help.

LP-64 EQ (Producer only)

Figure 389. *LP-64 EQ*

Unlike traditional equalizers, LP-64 EQ provides highly accurate control of tonal balance while maintaining a linear-phase shift at all frequencies, regardless of the gain settings. Phase-shifting in typical equalizers means that audio material is shifted in time in a frequency-dependent way. Alignment of low and high frequencies may have changed with respect to one another and to the original audio material. In other words, the sound is literally "pulled apart" in time, often resulting in loss of sonic clarity and crispness. With LP-64 EQ linear-phase processing, the integrity of your audio is maintained for all frequencies, at all times—no unintended coloration, cancellations, comb filtering, or muddy transients. When a host application, such as SONAR, compensates for the plug-in's overall latency, the resulting linear-phase output is referred to as "zero-phase".

LP-64 EQ is well suited for critical mastering projects.

For more information, see the *LP-64 EQ* online Help.

LP-64 Multiband (Producer only)

Figure 390. *LP-64 Multiband Compressor*

The LP-64 Multiband Compressor consists of five high-quality compressors, each operating on a single adjustable frequency band.

Unlike typical limiters, the filters that split up the frequency bands in the LP-64 Multiband Compressor plug-in are of the Linear Phase variety. This allows you to split up the spectrum into bands and then sum them back together with no phase errors or colorations.

Most typical limiters color the sound even if they are doing nothing, because the splitting/re-combining of the bands is done with IIR (Infinite impulse response) filters with phase shift.

For more information, see the *LP-64 Multiband* online Help.

Modfilter

Figure 391. *Mod Filter*

Mod Filter produces a dynamic filtering effect, in that the actual filter can respond to incoming signal or follow the cycle of a tempo-synchronized LFO. The filter itself is a low-pass filter type, which filters out higher frequencies.

For more information, see the *Mod Filter* online Help.

Multivoice Chorus/Flanger

Figure 392. *Multivoice Chorus/Flanger*

Chorus/Flanger lets you add depth and thickness to the signal. The EQ section in the feedback path allows you to create some truly unique sounds.

For more information, see the *Multivoice Chorus/Flanger* online Help.

Parametric EQ

Figure 393. *Parametric EQ*
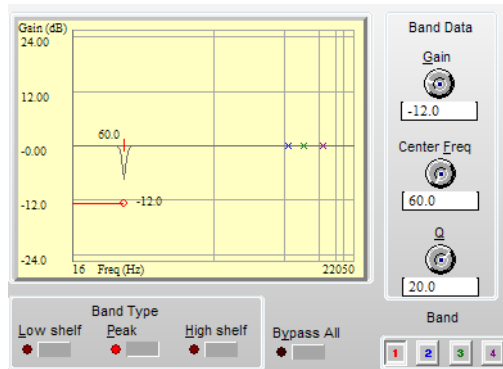
The FX EQ (Stereo) is a parametric equalizer consisting of four bands which you can control using both the interactive graph and controls adjacent to it. To select a band either click near it on the graph or click one of the four buttons in the Band field at the bottom of the dialog box.

For more information, see the *Parametric EQ* online Help.

Para-Q

Figure 394. *Para-Q*

Para-Q is a two-band true parametric EQ that can be used to boost or attenuate generally high or low bands of the signal. It consumes very little processing power, which allows you to use it on many tracks simultaneously.

For more information, see the *Para-Q* online Help.

Perfect Space (32-bit Only) (Producer only)

Figure 395. *Perfect Space convolution reverb*

The *Perfect Space* convolution reverb is a stereo convolution processor. The process of convolution allows you to apply the acoustic characteristics of any space (or sound) to any input signal. Perfect Space can work with a latency as low as 64 samples (1.5 ms at 44.1kHz), making it possible to use it during tracking.

The process of convolution allows you to apply the acoustic characteristics of any space to any input signal. These acoustic characteristics are captured within audio files called **impulse responses**.

An impulse response can specifically represent a certain location, from a famous cathedral to a locker room shower. Impulse responses (IRs) are created by recording the reverberations within these spaces after playing special tone sweeps or firing a starter pistol. These wideband "impulse" sounds typically span the entire audible frequency range, so the recorded "response" includes a complete representation of how the space reacts to all frequencies. Use IRs of this type to change your project's performance location without moving an inch.

Convolution is not limited to emulating pre-existing spaces, though. In fact, you can use absolutely *any* sound (drums, claps, screams, towel snaps, etc.) to manipulate your source audio. With creative convolving, you can achieve very interesting filter, reverb and delay effects.

In the context of using Perfect Space, an impulse response is a standard mono, stereo or multi-channel uncompressed .WAV or .AIFF file of any bit-depth.

In addition to using the impulse responses included with SONAR and files from your own libraries, you can find many impulse responses for free on the Internet at Web sites like www.noisevault.com.

For more information, see the *Perfect Space* online Help.

Pitch Shifter

Figure 396. *Pitch Shifter*
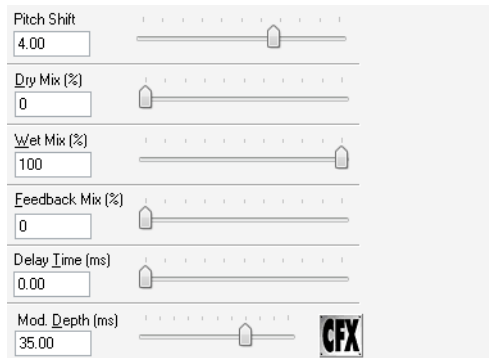
The Cakewalk FX Pitch Shifter raises or lowers the pitch of an audio signal, while leaving the duration of the audio event unchanged. This is a fast pitch shifter that uses minimal computation time.

For more information, see the *Pitch Shifter* online Help.

ProChannel (Producer only)

ProChannel is an extended channel strip that provides high-quality compressor, equalizer, and tube saturation processing for each audio track, Instrument track and bus.

ProChannel appears as a module in the Track Inspector and Console view.

Figure 397. *ProChannel*

For more information, see

PX-64 Percussion Strip (Producer only)

Figure 398. *PX-64 Percussion Strip*

PX-64 Percussion Strip is a multi-functional plug-in that combines a series of effects specifically optimized and streamlined for drum and percussion processing. Combining transient shaping, compression, expansion, equalization, delay and tube saturation in one convenient plug-in, *PX-64 Percussion Strip* is designed to make it fast and easy to enhance any drum or percussion track.

For more information, see the *PX-64 Percussion Strip* online Help.

Reverb

Figure 399. *Reverb*
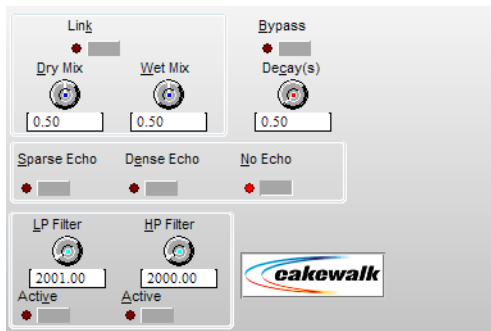
Reverberation, or reverb, adds many small echoes to a signal to create spaciousness.

For more information, see the *Reverb* online Help.

Reverb (mono)

Figure 400. *Reverb (mono)*
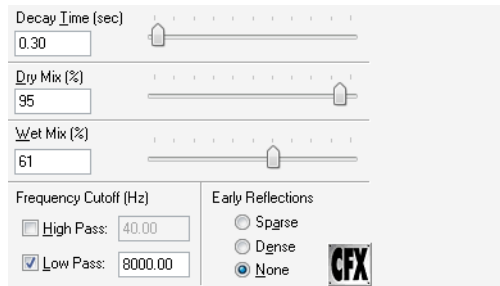
Reverberation, or reverb, adds many small echoes to a signal to create spaciousness.

For more information, see the *Reverb (mono)* online Help.

Sonitus fx: Compressor

Figure 401. *Sonitus fx: Compressor*
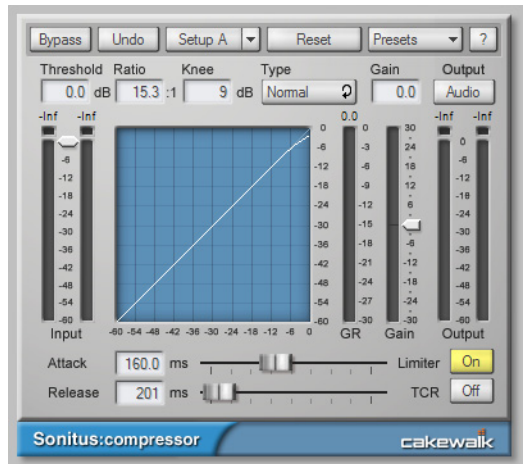
fx:compressor is a variable-knee compressor with built-in peak limiting. The purpose of a compressor is to limit the dynamic range of music or sound. Compression will make the loud parts of the signal more quiet, resulting in a more or less even level.

For more information, see the *Sonitus fx: Compressor* online Help.

Sonitus fx: Surround Compressor

Figure 402. *Sonitus fx: Surround Compressor*
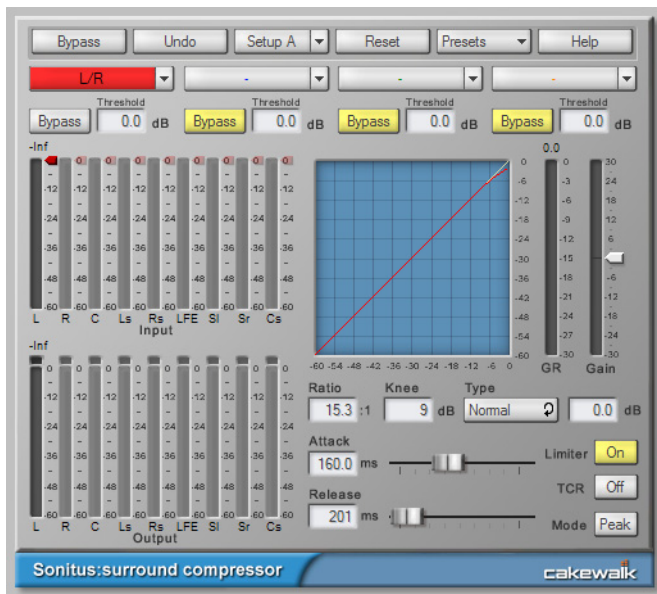
The Sonitus Surround Compressor is an enhanced, surround-capable version of the Sonitus:fx Compressor plug-in. The Surround Compressor is comprised of four stereo compressors. After you patch the compressor into a surround bus, you can direct any combination of the bus's input channels to any of the four compressors, sending any combination of stereo channel pairs, the center channel, and the LFE to the compressor(s) you choose. By default, all channels feed into compressor 1, and you can then redirect channels to the other three if you want.

For more information, see the *Sonitus fx: Surround Compressor* online Help.

Sonitus fx: Delay

Figure 403. *Sonitus fx: Delay*
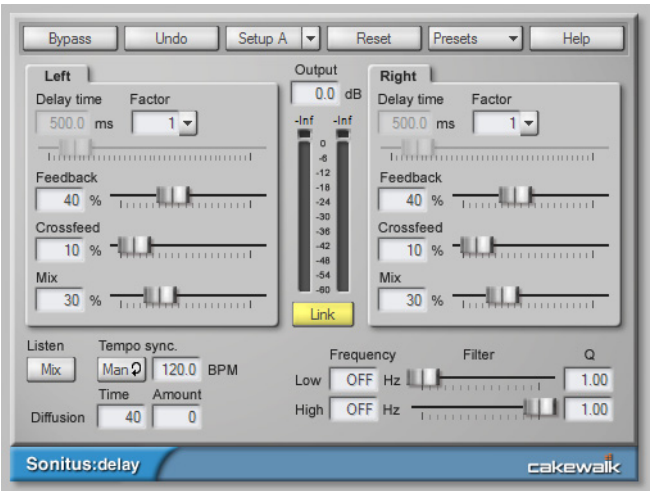
fx:delay is an advanced stereo delay with tempo sync.

For more information, see the *Sonitus fx: Delay* online Help.

Sonitus fx: EQ

Figure 404. *Sonitus fx: EQ*
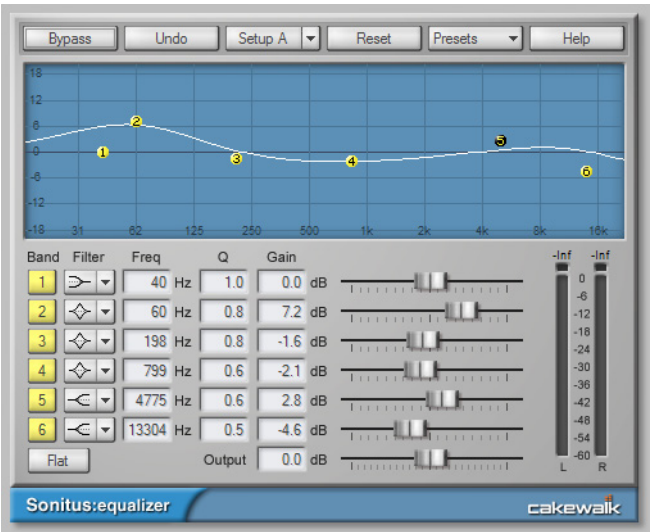
fx:equalizer is a 6-band parametric equalizer with selectable filter types for each band and frequency response graph. Equalizers are instrumental in fine tuning the frequency spectrum in all kinds of

music and sound. They let you use different filtering techniques to attenuate, cut or boost a specific frequency or a range of frequencies, allowing you the shape the overall characteristics of the audio signal.

For more information, see the *Sonitus fx: EQ* online Help.

Sonitus fx: Gate

Figure 405. *Sonitus fx: Gate*
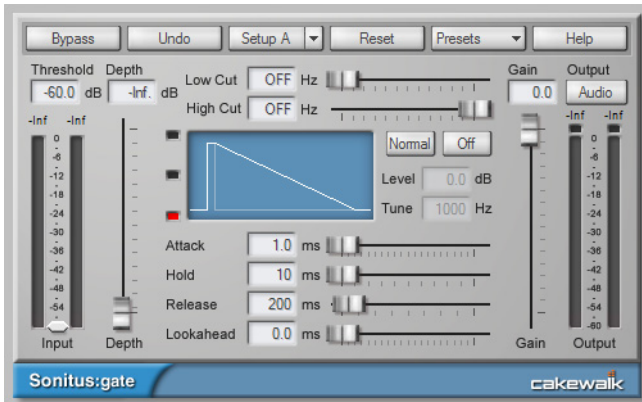
fx:gate is a dynamic gate with side-chain filtering and lookahead. The fx:gate plug-in has wide variety of uses. It can funcion as a noise gate, which quite simply gates (or blocks) signals whose amplitude lies below a certain threshold, and lets other signals through. This is useful for eliminating background noises, such as hiss or hum, during periods of silence in a recording or performance.

In addition, it also features a tuneable peak Punch mode that makes it possible to add transient punch to frequencies lacking in individual drum sounds, adding greater definition and presence to the gated signal. Using the variable high pass and low pass side chain filters enables you to perform "frequency conscious" gating. The gate can also be switched from Gating to Ducking mode for removal of clicks and pops.

For more information, see the *Sonitus fx: Gate* online Help.

Sonitus fx: Modulator

Figure 406. *Sonitus fx: Modulator*
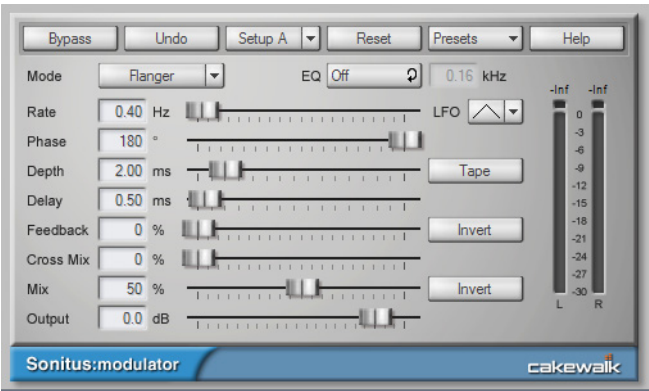
fx:modulator combines six time-varying modulation effects into one integrated plug-in.

For more information, see the *Sonitus fx: Modulator* online Help.

Sonitus fx: Multiband

Figure 407. *Sonitus fx: Multiband*
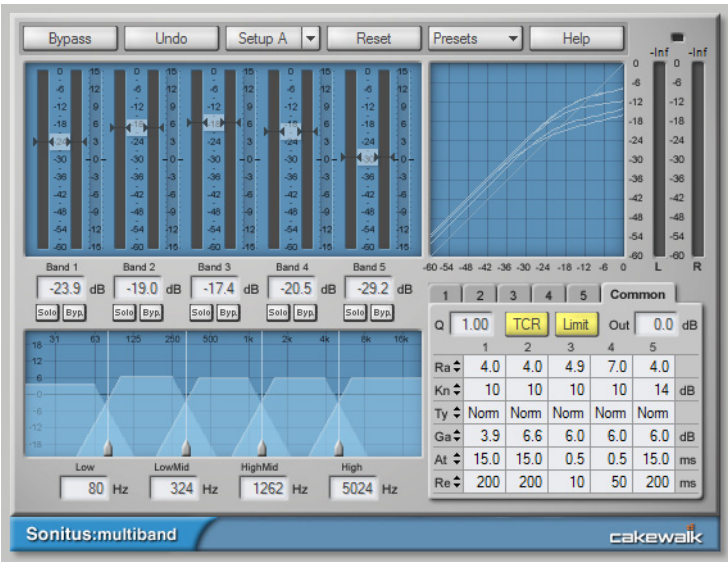
fx:multiband is a 5 band variable knee compressor with both normal and vintage compression modes and output limiter.

Using a multiband compressor has many advantages over using a traditional ("single band") compressor when it is used on audio signals containing complex harmonic material like a complete music mix.

*   "Pumping" is virtually eliminated. "Pumping" is a phenomenon that is noticed when music with a heavy bass beat is run through a standard compressor; the mids and highs seem to vary in amplitude or "pump" to the beat. Multiband compressors don't pump because the bass frequencies are processed in a different compressor from that used to process the mid- and high range frequencies.

*   The signal is equalized as it is compressed, so that differences in equalization between different sources are less noticeable.

*   Multiband compressors supress or enhance the dynamic properties of specific frequency ranges. Based on this, they can also be used for tasks like de-essing, pop removal, adjusting vocal and/or instrument punch and breath (attack and release curves) within a mix.

For more information, see the *Sonitus fx: Multiband* online Help.

Sonitus fx:Phase

Figure 408. *Sonitus fx: Phase*
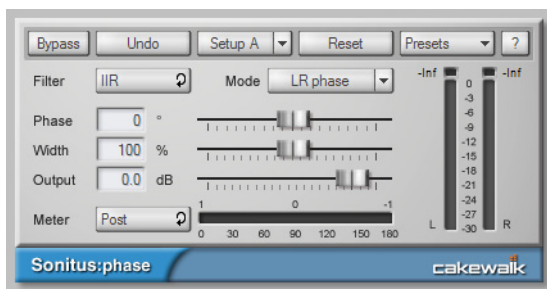
fx:phase lets you arbitrarily adjust the phase of a sound.

> **Note:** *fx:phase is a phase shifter or phase delay - it is not a phaser, which is an entirely different type of effect. A phaser creates modulation effects by adjusting the center frequency of cascaded allpass filters, whereas fx:phase is used for applying a constant phase shift at all frequencies.*

For more information, see the *Sonitus fx:Phase* online Help.

Sonitus fx: Reverb

Figure 409. *Sonitus fx: Reverb*
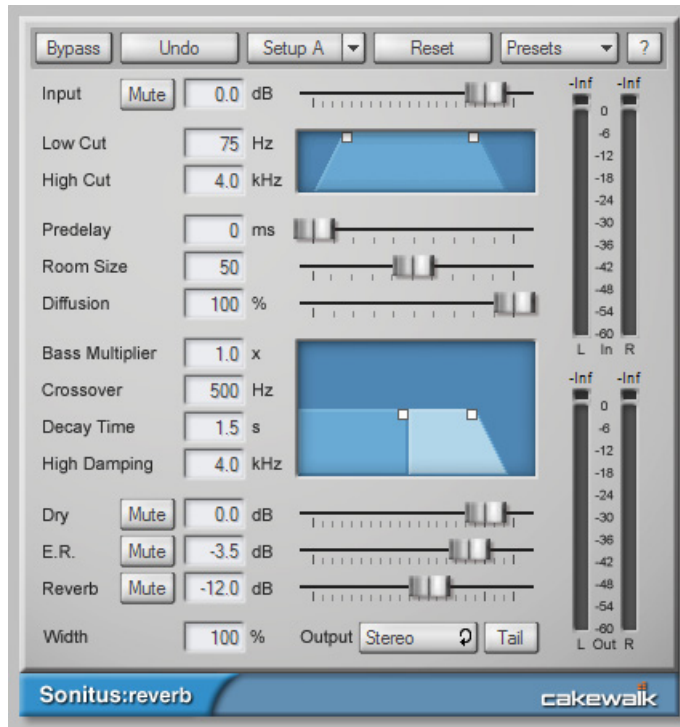
Reverb or reverberation is the effect of resounding echos in a room or other enclosed acoustic environment. Reverb can be seen as a series of echos so dense that they can't be told apart from each other. fx:reverb emulates the phenomenon of sound being reflected off walls in a virtual room, and allows you to add reverb that resembles the character, decay and frequency response of various environments.

For more information, see the *Sonitus fx: Reverb* online Help.

Sonitus fx: Surround

Figure 410. *Sonitus fx: Surround*
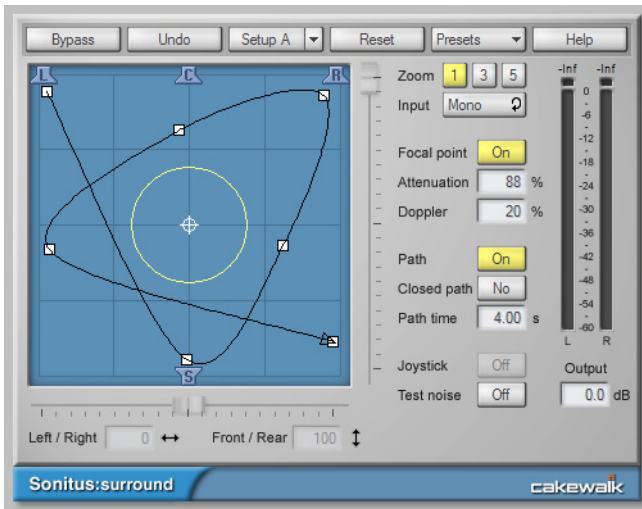
fx:surround is a surround sound panner with built-in doppler and attenuation rendering for distance and velocity effects, joystick control and graphical path editing.

For more information, see the *Sonitus fx: Surround* online Help.

Sonitus fx: WahWah

Figure 411. *Sonitus fx: WahWah*
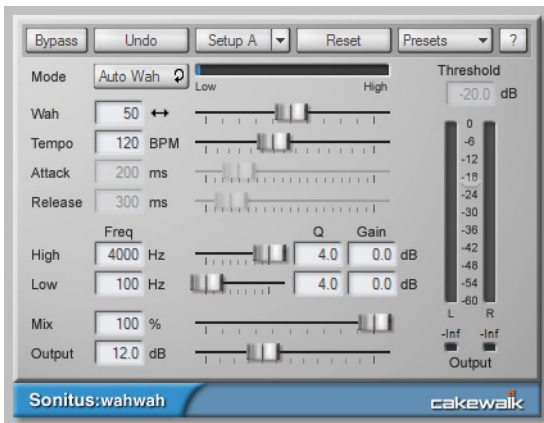
fx:wahwah is a guitar effect emulator. A classic guitar effect, the wahwah stomp box became an instant hit when it was introduced in 1966. The Vox wahwah was the first, and was soon followed by a multitude of similar designs. It was dubbed wahwah because of its unique vocal-like sound.

fx:wahwah is a digital adaptation of the analog designs, and is modeled after real-life wahwah stomp boxes like the Morley Pro Series Distortion Wah, Jim Dunlop Crybaby Model GCB-95 and Model JH-1 (Jimi Hendrix).

For more information, see the *Sonitus fx: Wah Wah* online Help.

SpectraFX

Figure 412. *SpectraFX*

The SpectraFX lets you modulate (change the settings of) a wide variety of powerful effects in real time, using a mouse, joystick, or the SpectraFX's LFO (Low Frequency Oscilator) feature. You can create filter sweeps, distortion, flanging, and lots of other effects that change as quickly or slowly as you want, in time to the music or not, as you choose. The LFO feature synchronizes itself to your project's tempo, letting you choose any number of beats or measures before it repeats.

For more information, see the *SpectraFX* online Help.

StudioVerb 2

Figure 413. *StudioVerb2*

Studioverb2 provides very dense and warm reverberation with 32-bit floating point implementation. This eliminates the digital grunge and harshness that occurs even in the best studio reverberation systems, which are implemented using less advanced fixed point processing. The Studioverb2 provides extremely high efficiency, typically using half of the CPU load of other premium reverb plug-ins.

For more information, see the *StudioVerb 2* online Help.

Tempo Delay

Figure 414. *Tempo Delay*

Stereo Delay produces a tempo-synchronized echo on whichever channel it is patched to. The three-band EQ section in the feedback path allows you to create some truly unique sounds.

For more information, see the *Tempo Delay* online Help.

TH2 Producer amp simulator (Producer only)

Figure 415. *TH2 Producer*

TH2 Producer by Overloud provides realistic guitar amp models from clean to crusing distortion.

This special edition includes 10 amplifier models, 10 cabinet models, 10 stomp box effects models, 3 microphone models, delay and reverb master effects and dozens of presets. Easily build or modify your own signal path.

For more information, see the *TH2 Producer* online Help.

TH2 SONAR amp simulator (Studio and Essential only)

Figure 416. *TH2 SONAR*

TH2 SONAR by Overloud provides realistic guitar amp models from clean to crusing distortion.

This special edition includes 10 amplifier models, 10 cabinet models, 3 microphone models, and dozens of presets. Easily build or modify your own signal path.

For more information, see the *TH2 SONAR* online Help.

TL-64 Tube Leveler (Producer and Studio only)

Figure 417. *TL-64 Tube Leveler*

The *TL-64 Tube Leveler* plug-in is a preamp/processor that employs advanced analog vacuum-tube circuit modeling, which allows you to apply ultra-high-quality analog warmth and saturation to tracks and mixes.

TL-64 Tube Leveler provides complete models of entire vacuum-tube circuits. Under the hood are dynamic, virtual vacuum-tubes that mimic the "animated" nature of their real, analog counterpart as they respond to different input audio. The result is the coveted warm, lively and realistic analog sound of classic vacuum-tube processors and amplifiers.

Digital audio recordings can sometimes sound sterile and lifeless. Use *TL-64 Tube Leveler* to add just the right amount of warm tube saturation to individual tracks or full mixes.

For more information, see the *TL-64 Tube Leveler* online Help.

TS-64 Transient Shaper (Producer and Studio only)

Figure 418. *TS-64 Transient Shaper*

The *TS-64 Transient Shaper* plug-in provides powerful control over the dynamics of audio tracks and mixes.

In a musical context, the term *transient* refers to a sudden increase in sound output that occurs for a short period of time. For example, the attack portion of a drum hit is a transient.

Unlike a typical compressor, *TS-64 Transient Shaper* lets you shape the audio signal's attack phase *independently* of the decay/sustain phase.

TS-64 Transient Shaper is primarily designed for drums and percussion, but can also be useful on other percussive sounds, such as guitar and electric piano.

TS-64 Transient Shaper features include:

• Powerful envelope/transient-detection.

• Linear-phase filtering.

• Gain-shaping.

• Shape the transients independently of the tail or ambience.

• Automatable parameters.

• Smooth, zipperless output.

For more information, see the *TS-64 Transient Shaper* online Help.

VC-64 Vintage Channel (Producer only)

Figure 419. *VC-64 Vintage Channel*

Taking full advantage of SONAR's internal 64-bit double precision processing, *VC-64 Vintage Channel* offers the classic sound of sought-after analog channel strips and dynamics processors.

For more information, see the *VC-64 Vintage Channel* online Help.

VX-64 Vocal Strip (Producer only)

Figure 420. *VX-64 Vocal Strip*

VX-64 Vocal Strip is a multi-functional plug-in that combines a series of effects specifically optimized and streamlined for vocal processing. Combining compression, expansion, equalization, deessing, doubling, delay and tube saturation in one convenient plug-in, *VX-64 Vocal Strip* is designed to make it fast an easy to enhance any vocal track.

VX-64 Vocal Strip features include:

• 5 professional quality effect modules, each with its own bypass toggle.

• All modules are specifically tuned for vocal processing.

• Advanced tube saturation modeling available on input, output and EQ modules.

• Deesser with switchable center frequency and threshold.

• Configurable effect chain routing.

• Smooth, zipperless automatable parameters.

• Library of presets.

For more information, see the *VX-64 Vocal Strip* online Help.

See:

MIDI effects

MFX Arpeggiator

Figure 421. *MFX Arpeggiator*

The **Arpeggiator** command applies an arpeggio to its input and plays it back in real time. You can make it arpeggiate with a swing feel, or straight and staccato or legato, vary its speed and direction, and specify its range.

MFX Change Velocity

Figure 422. *MFX Velocity*

The **Velocity** effect lets you adjust velocities of MIDI notes. You can set velocity values, set scale values, add specific or random offsets, create smooth transitions, and limit the velocity range.

MFX Chord Analyzer

Figure 423. *MFX Chord Analyzer*
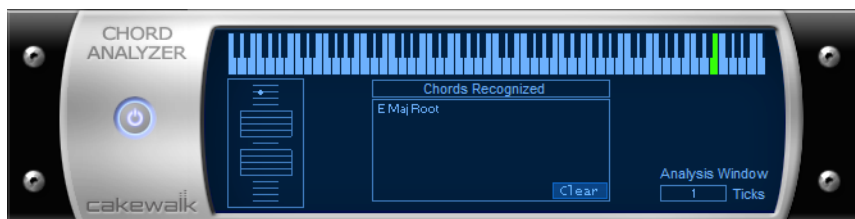
The **Chord Analyzer** command analyzes chords. You select the notes to be analyzed in one of SONAR's windows, then open the Chord analyzer and press the **Audition** button. The chord

appears on the MIDI display and the staff, and its name with possible alternatives appears in the Chords recognized box.

You can play the notes on your MIDI input device and have the Chord Analyzer identify the chords in real time. You do not have to set to playback.

You can open the Chord Analyzer in the Track and Console views, press Playback and have the Chord Analyzer identify the chords in real time.

MFX Echo/Delay

Figure 424. *MFX Echo/Delay*
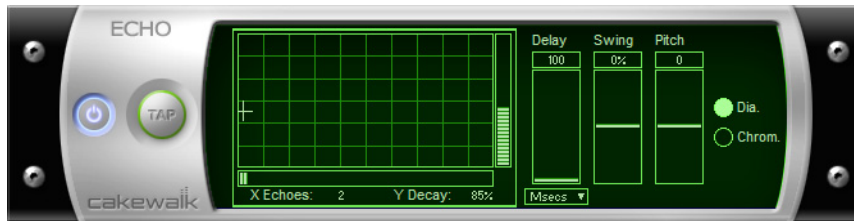
The **Echo Delay** command creates a series of repeating echoes of each note. The echo notes can decrease or increase in velocity, and can be transposed from the original by regular intervals.

MFX Event Filter

Figure 425. *MFX Event Filter*

The **Event Filter** command lets you remove events from the MIDI data, keeping or passing through only those events that you specify. The Event Filter effect works almost identically to the event filter used by the **Edit > Select > By Filter** command. For more information, see "Event filters" on page 734.

MFX Quantize

Figure 426. *MFX Quantize*
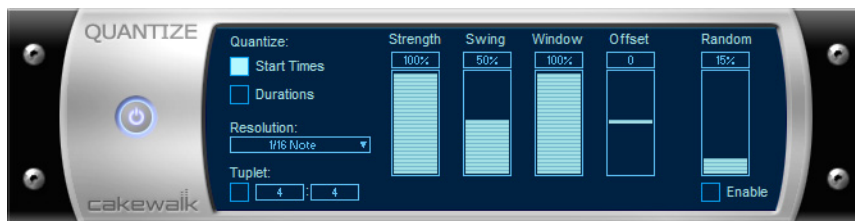
The **Quantize** command moves events to (or towards) an evenly-spaced timing grid. The Quantize effect is similar to the **Process > MIDI Effects > Cakewalk FX > Quantize** command. For more information, see "Other settings" on page 721.

MFX Transpose

Figure 427. *MFX Transpose*
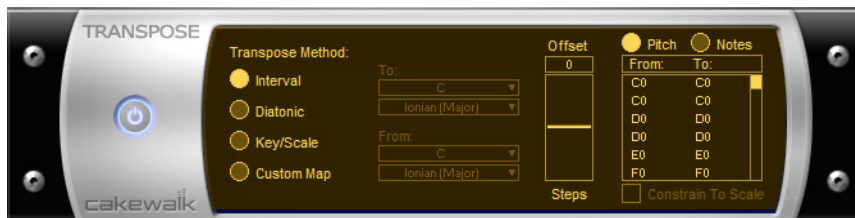
The **Process > MIDI Effects > Cakewalk FX > Transpose** command is a flexible transposition feature. You can perform simple chromatic or diatonic transpositions, transpose from one key to another, or define your own custom transposition.

See:

"Audio effects" on page 1345

"Instruments" on page 1381

Instruments

Cakewalk Sound Center

Figure 428. *Cakewalk Sound Center*

Cakewalk Sound Center is a simple and intuitive playback synth that lets you quickly find, preview and play sound programs. You can browse programs by categories and subcategories, and even search for patches by name. Finding the right sounds for your songs has never been easier. You can also rate your favorite programs and sort programs by rating.

For more information, see the *Cakewalk Sound Center* online Help.

Cakewalk TTS-1

Figure 429. *Cakewalk TTS-1*

Cakewalk TTS-1 is a GM2 (General MIDI 2) compatible, multi-timbral, multi-output, software synthesizer featuring a newly developed software synthesis engine, with 256 sounds and 9 drum sets built in.

For more information, see the *Cakewalk TTS-1* online Help.

Cyclone

Figure 430. *Cyclone*

The Cyclone DXi is a 16-part phrase sampler with beat-matching and extensive loop editing capabilities. With Cyclone you can trigger different loops of different tempos and Cyclone will automatically play them back at the same tempo, in sync with little or no signal degradation. Cyclone is similar to a software-based sampler in that you can trigger the pads from the mouse, a MIDI keyboard, or from MIDI data in a track; the difference is that is works with entire loops or phrases, similar to Dr. Rex, the AKAI MPC 4000 or many other Groove-station-like hardware products. Cyclone takes Phrase sampler a step further because it lets you edit individual loop slices or make other changes on the slice level.

For more information, see the *Cyclone* online Help.

Dimension LE Synth with Garritan Pocket Orchestra (Studio only)

Figure 431. *Dimension LE*

This special version of the Dimension Pro synth features over 400 sound programs, ranging from real bass, organ and electric piano samples to cutting-edge synth sounds and rhythmic grooves. It also includes the special edition of the Garritan Pocket Orchestra, which has been programmed specifically for Dimension LE and features orchestral instrument libraries of unrivaled quality that include strings, brass, woodwinds, keyboards, and percussion sounds.

Dimension LE is powered by Cakewalk's Expression Engine providing several types of synthesis capabilities including multi-sample rendering, wavetable synthesis, waveguide synthesis as well as REX playback and manipulation.

For more information, see the *Dimension LE* online Help.

Dimension Pro (Producer only)

Figure 432. *Dimension Pro*

At Dimension's core is a powerful sample-playback engine paired with advanced synthesis capabilities. It draws on a comprehensive library of sounds covering every aspect of contemporary music. Dimension is also expandable, meaning more sounds can be added to the instrument via expansion packs, or user multisamples based on standard PCM wave files.

Besides sample-playback, Dimension is capable of Wavetable synthesis, and Physical Modeling (Waveguide) synthesis. These two synthesis methods allow a broad sound palette, ranging from synthesized analog sounds, to plucked instruments, to precise reproductions of acoustic instruments.

For more information, see the *Dimension Pro* online Help.

DreamStation DXi2 (32-bit only)

Figure 433. *DreamStation DXi2*

DreamStation DXi2 is a fully automatable polyphonic analog synthesizer.

DreamStation DXi2's features include:

- Subtractive synthesis combined with FM synthesis.
- 3 oscillators, multimode self oscillating IIR filter, VCA, LFO, user EG for each voice.
- Available waveforms: sine, triangle, sawtooth, pulse, square, noise.
- Available filter types: 12dB/Octave Lowpass, Highpass, Bandpass, 24dB/Octave Lowpass and Formant.
- A maximum of 16 voices polyphony.
- Linear frequency modulation, Hard synchronization, Ring modulation, Distortion.

For more information, see the *DreamStation DXi2* online Help.

DropZone

Figure 434. *DropZone*

There's no easier way to add your own style to a track. Just drag and drop a sample into *DropZone*, and make it part of your beat. It is the ideal synth for creating remixes or for building the perfect hook for your song. *DropZone* includes real instrument sounds, drums, vocals, REX-format loops and more.

For more information, see the *DropZone* online Help.

Pentagon I (Producer and Studio only)

Figure 435. *Pentagon I*

Pentagon I Performance Oriented Synthesizer

For more information, see the *Pentagon I* online Help.

PSYN II (Producer and Studio only)

Figure 436. *PSYN II*

PSYN is a very powerful virtual analog synthesizer, which recreates sounds of old analog and vintage synthesizers.

Four oscillators with up to four waveforms each plus noise, a sub oscillator, several modulation capabilities, two filters, five envelope generators, three low frequency oscillators and a very flexible modulation array are the resources PSYN offers, combined with full automation and a powerful MIDI Learn mode.

For more information, see the *PSYN II* online Help.

Rapture (Producer only)

Figure 437. *Rapture*

Combining power, elegance, control, and unbeatable sounds, *Rapture* is one of the most exciting synthesizers available. Capable of producing rich, hypnotic, and rhythmic basses, leads, and pads,

Rapture is perfect for performing and designing the modern synthesized sounds igniting today's pop, dance, and electronic music. Rapture is a wavetable synthesizer with advanced sound manipulation capabilities, well suited for electronica-related music styles. A comprehensive Modulation Matrix provides expressive control and a unique Step Generator provides an intuitive interface for the creation of rhythmic parameter changes.

For more information, see the *Rapture* online Help.

Rapture LE (Studio only)

Figure 438. *Rapture LE*

Combining power, elegance, control, and unbeatable sounds, *Rapture* is one of the most exciting synthesizers available. Capable of producing rich, hypnotic, and rhythmic basses, leads, and pads, *Rapture* is perfect for performing and designing the modern synthesized sounds igniting today's pop, dance, and electronic music.

For more information, see the *Rapture LE* online Help.

Roland GrooveSynth

Figure 439. *Roland GrooveSynth*

Roland GrooveSynth provides genuine Roland groove box and synth sounds.

For more information, see the *Roland GrooveSynth* online Help.

RXP REX Player (Producer and Studio only)

Figure 440. *RXP*
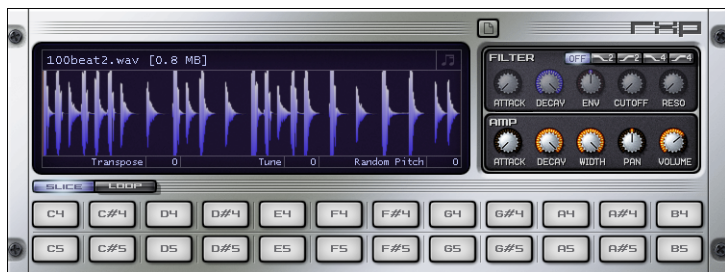
RXP DXi is a virtual instrument that plays REX files. The REX file format stipulates that audio slices play back individually, usually via MIDI. This allows arbitrary playback of slices and conformation of loops to the host tempo map.

For more information, see the *RXP* online Help.

Session Drummer 3 (Producer only)

Figure 441. *Session Drummer 3*

Session Drummer 3 is a professional drum sampler and pattern player. It features Cakewalk's patented *Expression Engine* technology, an anti-aliased, real-time sound production system for multisample audio playback. *Session Drummer 3* accurately replicates the sound of its real-world counterpart and features a highly-detailed user interface as well as simple but powerful controls. You can load single samples (Wave or AIFF files), or multisamples (SFZ files) which already contain key mapping and velocity switching assignments. You can load samples in any bit depth and sample rate, in mono or stereo, in looped or unlooped format. Wave and AIFF files can be loaded directly, or as a sample inside an SFZ definition file.

Samples can be of any bit depth (8 to 32-bit), any sample rate, and either mono or stereo. Each sample in a multisample can be a standard PCM Windows Wave file (.wav), an Apple audio format (.aiff) or a compressed file in the standard, high-quality, open and royalty-free ogg-vorbis format (.ogg).

Alternatively, it is possible to open multisample definition files (.sfz) or individual samples by dragging them to an instrument pad.

Session Drummer 3 features include:

• MIDI pattern playback.

• Multi-velocity acoustic and electronic drum kits.

• A comprehensive collection of presets and MIDI-based loop files, providing you with a creative jump-start.

• An animated user interface (UI).

• Controls for volume, pan and tuning of each drum kit piece.

For more information, see the *Session Drummer 3* online Help.

sfz Sound Font Player

Figure 442. *sfz Sound Font player*
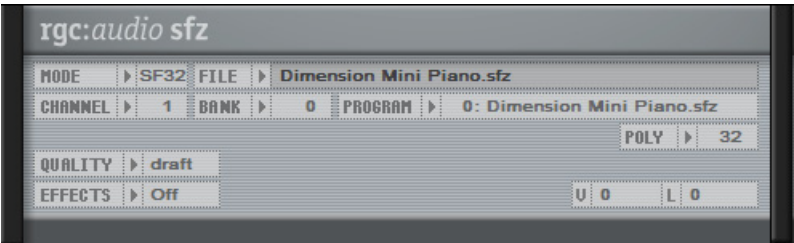
sfz is a high-quality multitimbral SoundFont player. sfz can play SoundFont (.sf2), wave (.wav) and ogg-vorbis compressed (.ogg) files.

For more information, see the *sfz* online Help.

Square I

Figure 443. *Square I*
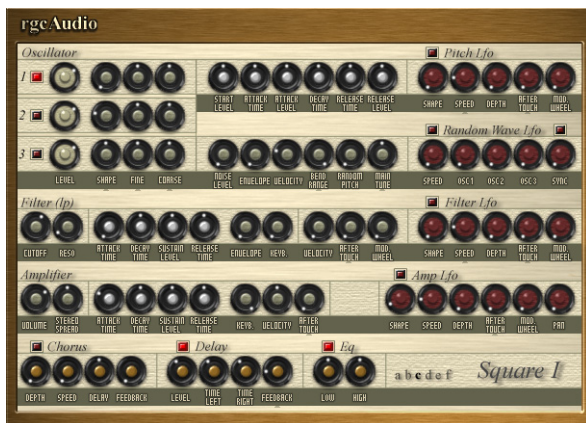
The warmness and classic sound of the vintage analog synthesizers, combined with the fidelity and precision of a VST instrument.

For more information, see the *Square I* online Help.

Studio Instruments Bass Guitar

Figure 444. *Studio Instruments Bass Guitar*

Bass Guitar accurately replicates the sound of a classic electric bass guitar sound and features a highly-detailed user interface as well as simple but powerful controls. It uses Cakewalk's patented and acclaimed Expression Engine technology, an anti-aliased, real-time sound production system for multi-sample audio playback.

For more information, see the *Studio Instruments Bass Guitar* online Help.

Studio Instruments Drum Kit

Figure 445. *Studio Instruments Drum Kit*

Drum Kit accurately replicates the sound of its real-world counterpart and features a highly-detailed user interface as well as simple but powerful controls. It uses Cakewalk's patented and acclaimed Expression Engine technology, an anti-aliased, real-time sound production system for multi-sample audio playback.

For more information, see the *Studio Instruments Drum Kit* online Help.

Studio Instruments Electric Piano

Figure 446. *Studio Instruments Electric Piano*

Electric Piano accurately recreates the classic Fender Rhodes electric piano sound and features a highly-detailed user interface as well as simple but powerful controls. It uses Cakewalk's patented and acclaimed Expression Engine technology, an anti-aliased, real-time sound production system for multi-sample audio playback.

For more information, see the *Studio Instruments Electric Piano* online Help.

Studio Instruments String Section

Figure 447. *Studio Instruments String Section*

String Section offers three types of classical string instruments—Violins, Cellos and Basses—and features a highly-detailed user interface as well as simple but powerful controls. It uses Cakewalk's

patented and acclaimed Expression Engine technology, an anti-aliased, real-time sound production system for multi-sample audio playback.

For more information, see the *Studio Instruments String Section* online Help.

True Pianos (x86, x64) (Producer only)

Figure 448. *TruePianos VST*

One of four modules that currently ship with the full version of 4Front Technologies' *TruePianos VSTi*, the *TruePianos Amber Module* provides world-class, playable piano sounds through its combination sampling, modeling, and synthesis sound design. *TruePianos* sounds and feels great, just like a real acoustic piano, with all the important characteristics: sympathetic resonance, inter-string harmonics, repedalling and more.

• Designed to blend transparently with the musician's hands through its unique capabilities of matching to the players own playing style (and characteristics of his/her MIDI keyboard) with the help of intuitive controls.

• Optimized for real-time performance, with low CPU usage even at 96khz host sampling rates and advanced polyphony levels.

For more information, see the *TruePianos VST* online Help.

Z3ta+ (Producer only)

Figure 449. *Z3TA+*
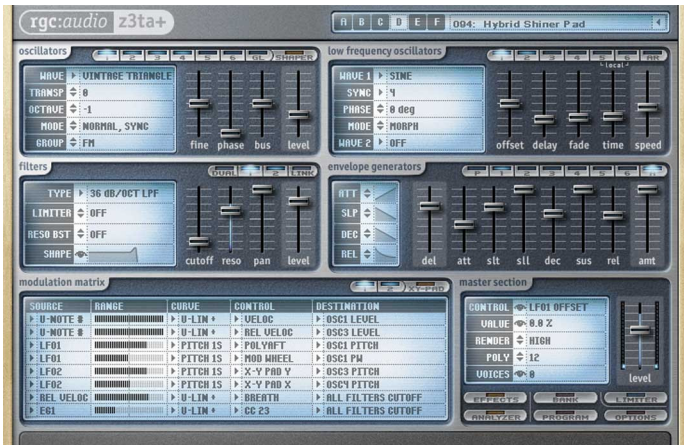
Z3TA+ is an award-winning analog-style synthesizer with incredible sound shaping capabilities. The exclusive bandlimited Waveshaping technology makes Z3TA+ one the best and most respected synths in the industry.

Whether you're looking for lush, warm pads, slowly evolving atmospheres, searing leads or sparkling FM sounds, Z3TA+ delivers the goods, and includes hundreds of professional presets.

For more information, see the *Z3TA+* online Help.

See:

"Audio effects" on page 1345

"MIDI effects" on page 1378

Cyclone

The following figure illustrates the Cyclone DXi views and controls.

Figure 450. *Cyclone*
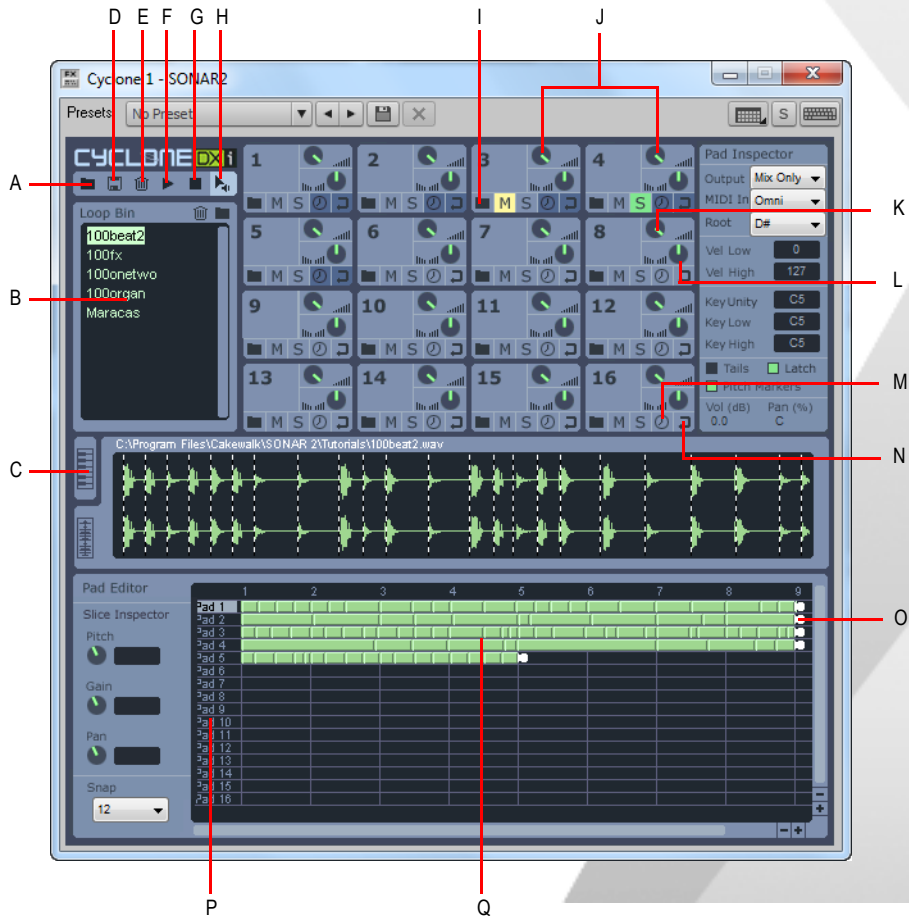
A. Import Sound Bank B. Loops C. Key Map view tab D. Export Sound Bank E. Trash button F. Play button
G. Stop button H. Auto Preview button I. Pad J. Pad Group K. Volume knob L. Pan knob M. Sync button
N. Loop button O. Track handles P. Selected pad Q. Tracks

See:

Cyclone toolbar

The following graphic shows each of Cyclone's toolbar buttons:
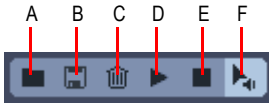
A. Import Sound Bank B. Export Sound Bank C. Trash D. Auto Preview E. Stop F. Preview

The following table describes each of Cyclone's buttons.

Button	Description
Import Sound Bank	Opens the **Open** dialog box so you can load an existing Sound Bank.
Export Sound Bank	Opens the **Save As** dialog box to save the current settings as a Sound Bank (.cyc).
Trash	Clears the contents of the project.
Preview	Plays the selected pads or slices.
Stop	Stops playback.
Auto Preview	When **Auto Preview** is on, you can preview the sound of a slice by clicking a slice in the Loop view or an event by clicking an event in the Pad Editor. Also, you can click and drag a slice over events in the Pad Editor, releasing the mouse button when you hear the event you want to replace.

Table 232.

Pad groups

The following graphic shows a close-up of a Cyclone pad group:
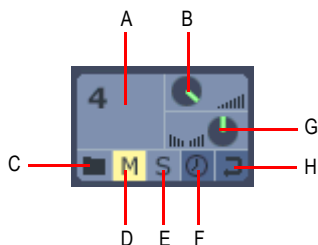
A. Pad B. Volume C. Load D. Mute E. Solo F. Sync G. Pan H. Loop

A Pad Group in Cyclone has the following controls:

Control	Description
Pad	The trigger for playing a loop.
Volume knob	Adjusts the volume of the Pad Group. The volume value is displayed in the Pad Inspector.
Pan knob	Adjusts the pan of the Pad Group. The pan value is displayed in the Pad Inspector.
File Load button	Opens the **Open** dialog box where you can navigate to the directory or directories where you store your files.
Mute button	Mutes the playback of the Pad Group.
Solo button	When selected, only that Pad Group plays.
Sync button	Synchronizes the playback of the Pad Group to SONAR. When selected, the Pad Group follows SONAR's tempo and pitch.
Loop button	When selected, the playback of the Pad Group repeats continuously.

Table 233.

Pad inspector

The Pad Inspector has additional pad group controls:
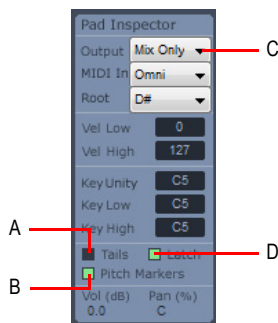
A. Click to enable tails for current track B. Click to force Cyclone to follow SONAR's Pitch markers C. Select an audio output D. Click to toggle on/off Latch mode

In the Pad Inspector there are the following controls:

Control	Description
Output	You can select from one of 16 audio outputs or use the Mix Only setting to use the Master out.
MIDI In	You can set which MIDI channel the pad group responds to. Each pad group could have a unique MIDI Input channel.
Pad Root	This setting is read from the file when it is imported. The first loop sets the Pad Root value for each additional loop.
Velocity—Low	The minimum velocity value that triggers the pad group.
Velocity—High	The maximum velocity value that triggers the pad group.
Key Map—Unity	The MIDI note value at which the loop plays at the Pad Root pitch. This value is assigned to a loop when it is imported. You can change the Unity value in the Pad Inspector or in the Key Map view.
Key Map—Low	The lowest MIDI note value that triggers the pad group. Both the Low and High not values transpose the pitch of the loop if they are different from the Unity note value. The transposition is relative to the Unity note. The played pitch of the loop is not same as the MIDI note that triggers it unless the Unity note and the Pad Root note are the same.
Key Map—High	The highest MIDI note value that triggers the pad group.

Table 234.

Control	Description
Tails	The tails feature extends the "tail" or decay of a slice which may otherwise have ended prematurely, drowned out by the next slice. This is particularly useful when you substitute a longer slice with a shorter one leaving room for a tail to sound.
Latch	The **Latch** option gives you a second mode for triggering pads. In Latch mode, a Groove Clip plays continuously when triggered until it is triggered again. With Latch mode disabled, a pad only plays as long as the key or mouse button is held and stops when you release. If you want to set all pads to the same Latch state, hold down the SHIFT key while setting the Latch for any one pad.
Pitch Markers	This option forces Cyclone to follow SONAR's Pitch markers. When a Pitch marker is encountered, the loop is transposed by the same number of semi-tones as the pitch change in SONAR.

Table 234.

Loop bin

The Loop bin, located right below the **Cyclone** toolbar, is where you can place loops you want to use in Cyclone. From the Loop bin you can drag and drop loops onto a Pad or into the Pad Editor.
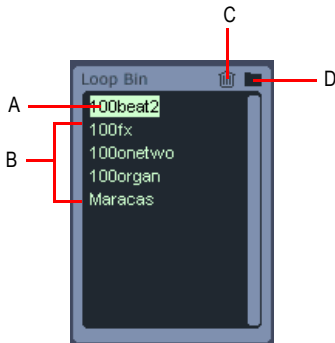
A. Current Loop B. Loops C. Click to delete selected loop D. Click to load a loop

Loop view and Key Map view

The Loop view displays the content of the loop you have selected in the Loop bin. If the loop is an ACIDized loop, the loop's transient markers separate the file's slices. From the Loop view, you can drag a slice onto an event in the Pad Editor.

Figure 451. *Loop view*
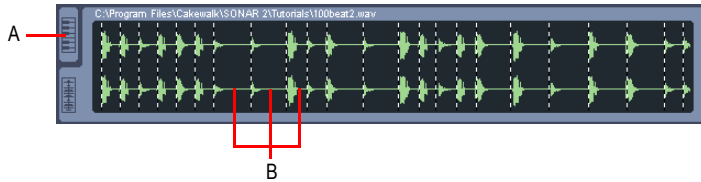
A. Click to open the Key Map view B. Slices

The Key Map view shares the same space in Cyclone as the Loop view. You toggle between the two views by clicking on one of the tabs to the left of whichever view is displayed. The keyboard in the Key Map view shows the Unity note (in orange) and the range of notes that trigger the pad group (in blue). Drag the Unity note to change its value. Drag the white triangles to extend the range of MIDI note values that trigger the pad group.

Figure 452. *Key Map view*
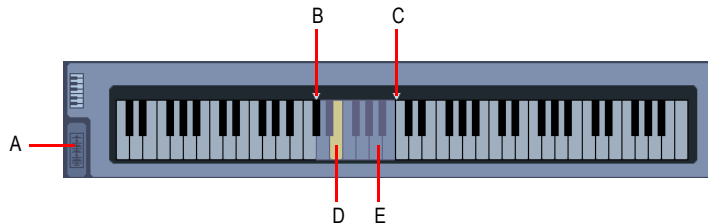
A. Current Loop B. Key Map Low C. Key Map High D. Unity note; plays loop at the Pad Root pitch E. Key Map range appears in blue

Pad editor

The Pad Editor displays up to 16 "tracks," one for each pad in Cyclone. Each track has the same number as the pad it represents. Each track is made up of events. An event represents a slice of a ACIDized loop, or in the case of standard wave files, it represents the entire file. Each track in the Pad Editor can be made up of slices from any number of different files. Each track in the Pad Editor terminates with a Track Handle. A Track Handle marks the point at which the track loops back to the beginning. You can move Track Handles using the mouse to any point in the Pad Editor, shortening or lengthening the length of the track.

Slice inspector

The Slice Inspector has pitch, gain and pan offset controls. You can change the pitch of the slices in a loop to change the melody of the loop. If you want to edit multiple slices at the same time, select multiple slices by SHIFT-selecting them and adjust the controls you want.

Using Cyclone

Cyclone is a multi-output synth, and you launch it the same way you launch other synth's: by inserting it into a SONAR project. There are two basic ways to insert synths in SONAR:

- You can insert synths from the Synth Rack view or with the **Insert > Soft Synths** command. If you use this method, you can choose to have SONAR create the necessary audio and MIDI tracks, and patch them together correctly. If you want to use multiple audio tracks to take advantage of SONAR's multi-output support, you need to create and patch additional MIDI tracks manually to feed the additional audio tracks.

- You can insert synths into effects bins of individual audio tracks. If you use this method, you need to set a MIDI track's **Output** field to the name of the synth you inserted. Then you can record MIDI data in the MIDI track to play the synth with. This method does not allow you to use multiple outputs.

For step by step instructions, see "Inserting soft synths" on page 802, "Multi-port soft synths" on page 814, and "Converting your soft synth tracks to audio" on page 815.

See:

"Inserting soft synths" on page 802

"Using the Synth Rack Browser" on page 581

"Multi-port soft synths" on page 814

"Playing a soft synth" on page 810

"Converting your soft synth tracks to audio" on page 815

"Muting and soloing soft synth tracks" on page 813

"To remove a soft synth from a track or bus" on page 812

Note: *This documentation refers to any audio data that you can import into Cyclone as **loops**, referring to ACIDized loops and standard Wave files.*

To load loops into Cyclone

- Click the folder icon that's on the Loop bin to display the **Open** dialog box. Select a loop and click **Open**. Cyclone loads the loop into the Loop bin.

    OR

- Click a folder icon that's on a particular Pad that you want to load a loop into. When the **Open** dialog box appears, select a loop and click **Open**. Cyclone loads the loop into both the Pad where you clicked the folder icon and the Loop bin.

    OR

• Drag a loop into Cyclone from SONAR's Clips pane or Media Browser view.

> **Note:** *ACIDized and Riff Wave files imported into Cyclone can not be more than 64 beats long. Regular wave files are limited to 30 seconds. Cyclone does not support 8-bit files.*

To audition loops

• Select a loop in the Loop bin, and then click Cyclone's **Play** button.

To play loops

1. Assign a loop to a pad or pads (see "To assign a loop to a pad" on page 1402).
2. Select the pad or pads you want to play by clicking on them.
3. Click the **Preview** button to play the selected pads.

   If the **Loop** button for that pad is depressed the loop plays indefinitely; you can stop it by clicking the Pad again.

   If the **Loop** button is not depressed, the loop stops when it reaches the end of its original length. You can stop it before then by clicking the Pad.

You can also trigger the Pads with a MIDI controller, or with recorded MIDI data.

To play a loop in Latch mode

1. Assign a loop to a Pad (see "To assign a loop to a pad" on page 1402).
2. In the Pad Editor, select the track you want to loop in Latch mode.
3. In the Pad Inspector, click the **Latch** control to enable it. The **Latch** control indicator appears green when enabled.
4. Click the mouse on the pad to start the loop playing.
5. Click the mouse on the pad again to stop playing.

The loop stops playing as soon as you release the mouse button.

To assign a loop to a pad

• Drag a loop from the Loop bin to a Pad.

   OR

• Click a folder icon that's on a particular Pad that you want to load a loop into. When the **Open** dialog box appears, select a loop and click **Open**. Cyclone loads the loop into both the Pad where you clicked the folder icon and the Loop bin.

   OR

• Drag a loop onto a Pad from SONAR's Clips pane or Media Browser view.

You can assign one loop per Pad.

To synchronize a loop to SONAR's tempo

• Click the **Sync** button that's on the Pad that the loop is assigned to. The **Sync** button lights up when it's engaged.

To set a Loop to Follow SONAR pitch markers

1. In the Pad Editor, select the track you want to follow pitch markers.
2. In the Pad Inspector, click the **Pitch Markers** control. The **Pitch Markers** control appears green when enabled.

To assign MIDI keys to a pad

1. Click the Pad that you want to trigger.
2. Click the **Keyboard** button in the Loop view to display the Key Map view.

   The blue keys between the **Pitch Range** markers show what MIDI keys trigger the Pad. The yellow key is the **Root Note**, which triggers the loop at its original pitch.
3. Drag the edge of the **Pitch Range** (the blue keys within the white triangle markers) to change the range of notes that trigger the loop. If the loop's pitch changing function is turned on, each MIDI key in the trigger range transposes the loop by the trigger note's distance from the Root Note.
4. Drag the yellow key to change the **Root Note**. The **Root Note** does not have to be in the trigger range.
5. In the **MIDI Chn** field, choose the MIDI channel that the MIDI notes will use to trigger this pad with.

You can assign the same key ranges to all the Pads if you want. You can assign different velocity ranges to each pad, also.

To assign a velocity range to a pad

1. Click the Pad that you want to assign a velocity range to.
2. Click the **Keyboard** button in the Loop view to display the Key Map view.
3. In the **Velocity Low** field, fill in the lowest velocity that you want to trigger the Pad with.
4. In the **Velocity High** field, fill in the highest velocity that you want to trigger the Pad with.

Now the Pad only plays its loop when the Pad receives a MIDI note within its velocity range.

To play a pad with recorded MIDI data

1. Record some MIDI data into a SONAR MIDI track.

2. In the MIDI track's **Output** field, choose **Cyclone**. Cyclone must have been already inserted into the project in order for it to appear as a choice in the **Output** field.

3. In the MIDI track's **Ch** field, choose the number of the Cyclone Pad that you want to trigger with this MIDI track.

See:

Controlling individual pads—volume, pan, mute, solo, sync, looping, and content

Each Pad has the following controls:

*   **Volume knob.**   Turn to adjust.

*   **Pan knob.**   Turn to adjust.

*   **Folder icon.**   Click this to import a loop to an individual Pad.

*   **Mute button.**   Click this to mute or unmute the loop that's assigned to an individual Pad.

*   **Solo button.**   Click this to solo or un-solo the loop that's assigned to an individual Pad.

*   **Sync button.**   Click this to synchronize (or unsynchronize) the Pad's loop to SONAR's pitch and tempo.

*   **Loop button.**   Click this to cause or prevent the Pad's loop from repeating indefinitely between its track length markers that are in the Pad Editor.

To export a sound bank

1. Click the **Export Sound Bank** button in the **Cyclone** toolbar.

    The **Save As** dialog box appears.

2. Navigate to the directory where you want to save the Sound Bank.

3. Enter a name for the Sound Bank.

4. Click **OK**.

Cyclone saves your Sound Bank. All wave files assigned to pads are saved. You can choose that Sound Bank in any Cyclone project SONAR automatically saves your current Cyclone settings, so you do not need to save a Sound Bank unless you want to use these settings in a different project.

To import a sound bank

1. Click the **Import Sound Bank** button on the **Cyclone** toolbar.

   The **Open** dialog box appears.

2. Navigate to the directory where you saved your Sound Bank, select it and click **OK**.

Cyclone loads the loops and associated settings that make up the Sound Bank you loaded.

To clear the contents of a project

• Click the Trash icon in the **Cyclone** toolbar.

   Cyclone deletes all loops from your project.

Mixing down Cyclone

You mix down a Cyclone session the same ways you mix down any synth.

For step-by-step instructions, see

Loop editing

Clicking a loop in the Loop bin displays that loop in the Loop view. The Loop view displays the selected loop as a series of slices that separate the transients in the loop. When the **Auto-preview** button is depressed, you can click each of the slices to hear it. If the loop is assigned to a Pad, the slices also appear in the Pad Editor as a series of *events*, which you can also click to hear. Clicking an event in the Pad Editor also highlights the corresponding slice in the Loop view.

You can drag slices from the Loop view to any position in any track in the Pad Editor in order to add data to a Pad, or replace an already-existing event If you can drag a slice along a series of events in the Pad Editor, if the **Auto-preview** button is depressed, each event sounds as you drag across it, enabling you to hear events before you decide to replace them.

To add or replace parts of a loop

1. In the Loop bin, click the loop that you want to use as source material.

2. Make sure that the **Auto-preview** button is on.

3. Drag the slice that you want to use from the Loop view to the slice or empty space in the Pad Editor that you want to place the slice.

4. If you dragged to an area that's to the right of the Track Length marker, drag the marker to the right until it's to the right of the new slice.

To change the length of a track

• Drag the Track Length marker to the right or left to lengthen or shorten the track, respectively. You can include empty space in your track. If you depress the **Loop** button for that Pad (track), the track loops continuously between the beginning of the track and the Track Length marker.

To set the number of divisions for a slice

You can set the number of divisions in each slice. This controls how exact the placement of your slices is within the Pad Editor. Each division represents a place where a slice can "snap to" or begin.

1. In the Pad Editor, click the down arrow next to the **Snap** field.

2. From the drop-down menu that appears, select one of the following:

    • None
    • 1/beat
    • 2/beat
    • 3/beat
    • 4/beat
    • 8/beat
    • 12/beat
    • 16/beat

    The number of divisions per beat in Cyclone is set.

Keyboard shortcuts in Cyclone

The following table lists the keyboard shortcuts in Cyclone and explains what they do.

Keyboard Shortcut	Description
SHIFT select	Hold the SHIFT key to select multiple slices in the Pad Editor.
SHIFT drag	Hold the SHIFT key while dragging to maintain a slice's time.
CTRL drag	Hold the CTRL key while dragging to copy a slice.
SHIFT CTRL drag	Hold the SHIFT and CTRL keys simultaneously while dragging to copy the slice and maintain the slice's time.
Left and Right arrows	Turn on Auto Preview, select a slice in the Loop view or Pad Editor, and use the left and right arrow keys to listen to individual beats.

Table 235.

Undo and redo

You can undo any edit you make in Cyclone. If you decide, after you have used Undo, that you want the edit after all, you can Redo the edit. The number of edits you can Undo and Redo in Cyclone is unlimited.

To undo an edit

Do *one* of the following:

• Click the **Edit** menu and choose **Undo**.

• Press CTRL+Z.

To redo an edit

Do *one* of the following:

• Click the **Edit** menu and choose **Redo**.

• Press SHIFT+CTRL+Z.

Menu reference

Use the **Contents** or **Search** tabs to find the menu command topic you are looking for.

File > New

The **File > New** command opens the "New Project File dialog" on page 1639 box where you choose a template for a new file. See "New Project File dialog" on page 1639 for more information.

See also:

"You can create your own template files and use them as the basis for other new projects. For more information, see "Templates" on page 1064." on page 251

File > Open

The **File > Open** command opens the **Open** dialog box. Use the **Open** dialog box to open an existing project. See "Open dialog" on page 1641 for more information.

File > Revert

The **File > Revert** command opens the **Revert** dialog box, which allows you to load an earlier version of the current file. To use the Revert feature, file versioning must be enabled in **Edit > Preferences > File - Advanced**.

File > Close

The **File > Close** command closes the current project. If multiple projects are open, the project with focus is closed.

File > Save

The **File > Save** command saves the current project. If multiple projects are open, the project with the focus is saved.

For more information, see

File > Save As

The **File > Save As** command opens the **Save As** dialog box where you can save a project with the name, directory, and format you specify. The formats available are:

- **Normal.** Also known as a Project file (extension .cwp)
- **Bundle.** Contains all the audio and MIDI data (extension .cwb)
- **Template.** Save project settings so you can use them with new projects (extension .cwt)
- **MIDI Format 0.** Standard MIDI File that has all channels merged into one track.
- **MIDI Format 1.** Standard MIDI File that keeps each channel on a separate track.
- **Riff MIDI Format 0.** Riff MIDI File of Format 0.
- **Riff MIDI Format 1.** Riff MIDI File of Format 1.

See also:

File > Import > Audio

The **File > Import > Audio** command lets you import "Digital audio" on page 1911 information stored in wave file format into any track (or, for stereo, two tracks) of a project.

The **File > Import > Audio** command supports the following digital audio file types:

• Wave (extension .wav)

• MPEG (extensions .mpeg, .mpg, .mp2, and .mp3)

• Windows Media files (extension .wma)

• Apple AIFF (extensions .aif and .aiff)

• MS Streaming Format (extension .ams)

• Audio files (extensions .au and .snd)

The sampling rate for a project is set based on your default sampling rate. If the sampling rate from the wave file does not match the sampling rate in your project, then it will be converted to the current project's sampling rate.

See:

"Importing audio CD Tracks" on page 303

File > Import > Audio CD

The **File > Import > Audio CD** command lets you import tracks from audio CD's into any track of a project. Any number of CD tracks can be imported. For each track selected, a new Audio track is created in the project.

The **File > Import > Audio CD** command supports CD Audio Track files (extension .cda).

Audio tracks on a CD always have a bit depth of 16, but you can choose to import the tracks at a higher bit depth if desired.

See:

"Importing audio CD Tracks" on page 303

File > Import > Video

SONAR's **File > Import > Video** command lets you include an AVI, MPEG, or QuickTime video in your project. This video is shown in real time as your project plays. The Video view displays the current time (as in the Big Time view) and the video itself. The display in the Video view is synchronized with the Now time, giving you convenient random access to the video stream. This makes it easy to align music and digitized sound to the video.

See:

"Video playback, import, and export" on page 236

File > Import > MIDI

The **File > Import > MIDI** command opens the **Import MIDI** dialog box. You must first select a MIDI track to make the command available. This dialog box lets you import MIDI files and Project5 patterns.

For more information, see "Exporting and importing MIDI Groove clips" on page 670.

File > Export > Audio

The **File > Export > Audio** command lets you save and export your projects as MP3 files and other types of formats.

For more information about the **File > Export > Audio** command, see "Preparing audio for distribution" on page 926.

See also:

"Routing and mixing digital audio" on page 841

File > Export > Video

Use the **File > Export > Video** command to combine the audio data and any video data in your SONAR project into an .avi file, Windows Media Video file, or QuickTime file. The audio in your project is mixed down automatically and saved with the video in the new file.

Note: *It is presently only possible to export QuickTime videos on a 32-bit system. This is a limitation of QuickTime, not SONAR*

For more information about video files, see "Video playback, import, and export" on page 236 and "Preparing audio for distribution" on page 926.

File > Export > MIDI Groove Clip

The **File > Export > MIDI Groove Clip** command opens the **Export MIDI Groove Clip** dialog box. You must first select a MIDI Groove Clip to make the command available.

For more information, see "Exporting and importing MIDI Groove clips" on page 670.

File > Export > OMF

SONAR's **File > Export > OMF** command opens the **Export OMF** dialog box.

File > Export > Track Template

This command opens the **Export Track Template** dialog box. Use this command to save a track template using the currently selected track as a template. For more information about track presets, see "Working with track templates" on page 321.

File > Print

The **File > Print** command opens your system's "Print dialog" on page 1737 box.

File > Print Preview

The **File > Print Preview** command opens the SONAR Print window, where you can view your document before you print it.

File > Print Setup

The **File > Print Setup** command opens your system's **Print Setup** dialog box.

File > Send

The **File > Send** command opens a blank email message and attaches the current project.

Note: *If you send a project file (extension .cwp) and your project contains audio data, the audio data is not attached along with the project file. If you want to send a project that contains both MIDI and audio data, use the bundle file format (extension .cwb). For more information, see "Saving your work" on page 307.*

File > Recent File

The recent file list at the bottom of the **File** menu lets you choose any file you have opened recently. Choosing a file in the list opens it immediately.

File > Exit

The **File > Exit** command closes SONAR. If you have made any changes since the last time you saved any of the open projects, SONAR prompts you to save the changes.

Edit > Undo

The **Edit > Undo** command reverses your last action. Successive **Undoes** cancel preceding actions in reverse order. To redo the action, see "Edit > Redo" on page 1415.

Edit > Redo

The **Edit > Redo** command cancels a just-previous **Undo** command.

Edit > History

The **Edit > History** command opens the "Undo History dialog" on page 1766, which displays a history of your editing actions. You can set how many editing actions you want the **Undo History** dialog box to store by changing the number in the **Maximum Undo Steps** field. The default value is **128**.

See:

"Undo, redo, and the undo history" on page 390

Edit > Select > All

The **Edit > Select > All** command selects everything in all open views. Any action affects all selected objects.

See:

"Selecting and editing events" on page 709

Edit > Select > None

The **Edit > Select > None** command cancels all selections, with the result that nothing is selected.
See:

"Selecting and editing events" on page 709

Edit > Select > All AudioSnap/Stretched Clips

The **Edit > Select > All AudioSnap/Stretched Clips** command selects all AudioSnap and stretched audio clips.

See:

"AudioSnap (Producer and Studio only)" on page 589

"Selecting clips" on page 334

Edit > Select > By Filter

The **Edit > Select > By Filter** command lets you change a selection to keep only events with the criteria you specify.

For more information, see "Searching for events" on page 734.

See also:

"Selecting and editing events" on page 709

"Event Filter Select Some/Search/Replace dialog" on page 1594

Edit > Select > By Time

The **Edit > Select > By Time** command lets you specify times from which and through which SONAR selects.

To select partial clips by time, see "To select partial clips using time ranges and tracks" on page 352.

See also:

"Select By Time dialog" on page 1753

Edit > Select > From = Now

The **Edit > Select > From = Now** command lets you specify the "Now time" on page 1916 as the time from which a selection extends.

The From and Thru times you select appear in the Control Bar's Select module in the **From** and **Thru** fields. If you select a whole measure, the Thru time is the start of the next measure, which actually makes it a "to" time and not a "through" time.

Edit > Select > Thru = Now

The **Edit > Select > Thru = Now** command lets you specify the Now time as the time through which a selection extends.

The From and Thru times you select appear in the Control Bar's Select module in the **From** and **Thru** fields. If you select a whole measure, the Thru time is the start of the next measure, which actually makes it a "to" time and not a "through" time.

Edit > Select > From = Start

The **Edit > Select > From = Start** command lets you specify the start of a piece as the time from which a selection extends.

The From and Thru times you select appear in the Control Bar's Select module in the **From** and **Thru** fields. If you select a whole measure, the Thru time is the start of the next measure, which actually makes it a "to" time and not a "through" time.

Edit > Select > Thru = End

The **Edit > Select > Thru = End** command lets you specify the end of a piece as the time through which a selection extends.

The From and Thru times you select appear in the Control Bar's Select module in the **From** and **Thru** fields. If you select a whole measure, the Thru time is the start of the next measure, which actually makes it a "to" time and not a "through" time.

Edit > Select > Select Track Envelopes with Clips

When you enable this option, selecting a clip will also select any overlapping track envelopes.

Edit > Aim Assist

Use this command to show or hide the Aim Assist line, which is a vertical line that shows the mouse pointer's horizontal position in the Clips pane, and vertical and horizontal position in the Piano Roll.

See:

"Aim Assist line" on page 340

Edit > Cut

The **Edit > Cut** command lets you remove from the project and put on the Clipboard any selected objects.

If you want to specify what to cut, use the **Edit > Cut Special** command instead to open the "Cut dialog" on page 1587.

You can paste the contents of the Clipboard elsewhere.

See "Edit > Paste" on page 1419.

See also:

"Moving and copying clips" on page 335

"Erasing tracks" on page 321

Edit > Cut Special

The **Edit > Cut Special** command lets you remove from the project and put on the Clipboard any selected objects. You can specify the kinds of objects to cut in the "Cut dialog" on page 1587.

You can paste the contents of the Clipboard elsewhere.

See "Edit > Paste" on page 1419.

See also:

"Moving and copying clips" on page 335

"Erasing tracks" on page 321

Edit > Copy

The **Edit > Copy** command lets you put on the Clipboard any selected objects.

If you want to specify what to copy, use the **Edit > Copy Special** command instead to open the "Copy dialog" on page 1585.

You can paste the contents of the Clipboard elsewhere. See "Edit > Paste" on page 1419.

To remove rather than copy objects, see "Edit > Cut" on page 1418.

To make copies of linked clips, see "Splitting and combining clips" on page 365.

See also:

"Moving and copying clips" on page 335

"Working with partial clips" on page 352

"Importing MIDI files" on page 306

Edit > Copy Special

The **Edit > Copy Special** command lets you put on the Clipboard any selected objects. You can specify the kinds of objects to copy in the "Copy dialog" on page 1585.

You can paste the contents of the Clipboard elsewhere. See "Edit > Paste" on page 1419.

To remove rather than copy objects, see "Edit > Cut" on page 1418.

To make copies of linked clips, see "Splitting and combining clips" on page 365.

See also:

"Moving and copying clips" on page 335

"Working with partial clips" on page 352

"Importing MIDI files" on page 306

Edit > Paste

The **Edit > Paste** command lets you put the contents of the Clipboard into any appropriate place in your project.

If you want to specify what, where, and how to paste, use the **Edit > Paste Special** command instead to open the "Paste dialog" on page 1642.

To put data on the Clipboard, see "Edit > Cut" on page 1418 or "Edit > Copy" on page 1418.

See also:

"Moving and copying clips" on page 335

"Importing material from another SONAR project" on page 303

"Importing MIDI files" on page 306

Edit > Paste Special

The **Edit > Paste Special** command lets you put the contents of the Clipboard into any appropriate place in your project. You can specify what, where, and how to paste in the "Paste dialog" on page 1642.

To put data on the Clipboard, see "Edit > Cut" on page 1418 or "Edit > Copy" on page 1418.

See also:

"Moving and copying clips" on page 335

"Importing material from another SONAR project" on page 303

"Importing MIDI files" on page 306

Edit > Delete

The **Edit > Delete** command removes selected objects from the project. It doesn't put them on the Clipboard, so they can not be subsequently pasted.

If you want to specify what to delete, use the **Edit > Delete Special** command instead to open the "Delete dialog" on page 1591.

For more information, see "To delete clips" on page 340.

See also:

"Moving and copying clips" on page 335

"Working with partial clips" on page 352

"Deleting measures or time from one or more tracks" on page 713

Edit > Delete Special

The **Edit > Delete Special** command removes selected objects from the project. It doesn't put them on the Clipboard, so they can not be subsequently pasted. You can specify the kinds of objects to remove in the "Delete dialog" on page 1591.

For more information, see "To delete clips" on page 340.

See also:

"Moving and copying clips" on page 335

"Working with partial clips" on page 352

"Deleting measures or time from one or more tracks" on page 713

Edit > Preferences

The **Edit > Preferences** command opens the **Preferences** dialog box, which lets you configure various settings in SONAR.

See:

"Preferences dialog" on page 1647

Groove Clip Looping

The **Groove Clip Looping** command enables a selected audio clip's looping capabilities. When you enable these capabilities, you can make unlimited copies of the clip by dragging its start or end points to the left or right, respectively. When a clip's looping capabilities are enabled, the clip's corners are beveled instead of sharp. If the clip's looping capabilities are already enabled, the same command turns them off.

For more information, see "Working with loops and Groove Clips" on page 651.

Clip Mute/Unmute

This command mutes or unmutes all selected clips.

Split

The **Split** command opens the "Split Clips dialog" on page 1757, which allows you to split a selected clip into smaller clips.

Split Clip(s) at AudioSnap Pool

The **Split Clip(s) at AudioSnap Pool** command splits selected clips at AudioSnap pool lines.

Clip Lock > Lock Position

Using the **Clip Lock > Lock Position** command locks or unlocks a clip's position.

For more information, see "Locking Clips" on page 343.

Clip Lock > Lock Data

Using the **Clip Lock > Lock Data** command locks or unlocks a clip's data.

For more information, see "Locking Clips" on page 343.

Views > Control Bar

The **Views > Control Bar** command shows/hides the Control Bar.

See also:
"Control Bar overview" on page 495

Views > Track View

The **Views > Track View** command displays the Track view.

See also:
"Track view" on page 1790

Views > Browser

Select **Views > Browser** to open the Browser view.

You can preview and import files using the Browser view, without having to leave your work environment. For more information, see "Browser" on page 1876.

See also:
"Browser" on page 559

Views > Inspector

Select **Views > Inspector** to open the Inspector pane.

The Track Inspector and Properties Inspector provide easy access to relevant settings for the selected track(s) or clip(s).

See also:
"Inspectors" on page 523

Views > Console View

To open the Console view, use the **Views > Console View** command.

The Console view contains all the controls you need to mix your project. For more information about the Console view, see "Console view" on page 1836.

See also:

"Preparing to mix" on page 831

Views > Piano Roll View

Open the Piano Roll view with the **Views > Piano Roll View** command. The Piano Roll view displays all MIDI notes and events from one or more tracks in a grid format that looks much like a player piano roll. Notes are displayed as horizontal bars, and drum notes as diamonds. Pitch runs from bottom to top, with the left vertical margin indicating the pitches as piano keys or note names. Time is displayed running left to right with vertical measure and beat boundaries. The Piano Roll view makes it easy to add, edit, and delete notes and controller data from a track.

See also:

"The Piano Roll view" on page 677

Views > Step Sequencer

Open the Step Sequencer by using the **Views > Step Sequencer** command or by double-clicking on a Step Sequencer clip.

If an existing Step Sequencer clip is selected, the **Views > Step Sequencer** command will open the selected Step Sequencer clip. If no Step Sequencer slip is selected, the **Views > Step Sequencer** command will create a new Step Sequencer clip.

The **Views > Step Sequencer** command is disabled if multiple Step Sequencer clips are selected.

See:

"Step Sequencer view" on page 1803

Views > Matrix View

Select **Views > Matrix View** to open the Matrix view.

The Matrix view lets you trigger individual or multiple audio and MIDI patterns, either with a computer keyboard, mouse or via MIDI remote control. For more information, see "Matrix view" on page 1876.

Views > Staff

Open the Staff view by using the **Views > Staff View** command. The Staff view contains the Staff pane and the Fretboard. The Staff pane displays MIDI note events as musical notation, and the Fretboard displays MIDI notes as markers on a guitar fretboard. The Staff view provides many features that make it possible for you to compose, edit, and print music.

For more information, see "The Staff view" on page 1072.

Views > AudioSnap Palette

The **Views > AudioSnap Palette** command opens the AudioSnap Palette, which allows you to set AudioSnap options.

For more information, see "AudioSnap (Producer and Studio only)" on page 589.

Views > Loop Construction

Open the Loop Construction view by selecting **Views > Loop Construction** from the menu. The Loop Construction view allows you to create Groove clips and enable looping of clips.

See "Loop Construction view" on page 1872 for more information.

See also:

"Using Groove Clips" on page 660

"Creating and editing Groove Clips" on page 661

Views > Event List

Open the Event List view with the **Views > Event List** command. The Event List view shows events in a list format. You can insert, delete, or modify any kind of event, including notes, pitch-wheel data, velocity, MIDI controllers, patch changes, wave files, lyrics, text strings, MCI commands, System Exclusive meta-events, and more.

See:

"The Event List view" on page 742

Views > Lyrics

Open the Lyrics view by using the **Views > Lyrics** command. The Lyric view lets you edit a track's lyrics. You can use it to cue yourself or your group with the lyrics during playback and recording. For more information about the Lyrics view, see "Lyrics view" on page 1835.

See also:

"Working with lyrics" on page 1112

Views > Video

Open the Video view by using the **Views > Video** command. The Video view lets you load digitized video files and play them back with your project. For more information about the Video view, see "Video view" on page 1868.

Views > Big Time

Open the Big Time view by using the **Views > Big Time** command. The Big Time view lets you see the "Now time" on page 1916 from a distance while recording. For more information about the Big Time view, see "Big Time view" on page 1872.

See also:

"Displaying the Now time in large print" on page 182

Views > Markers

Open the Markers view with the **Views > Markers** command. The Markers view lets you add, move, rename, or delete "Marker" on page 1915 (labels) for places in your song. The markers make it easier to move from one point to another. For more information about the Markers view, see "Markers view" on page 1871.

See "Creating and using markers" on page 357.

Views > Tempo

Open the Tempo view by using the **Views > Tempo** command. The Tempo view provides a graphic display of the tempo. In the Tempo view you can use your mouse to draw tempo changes directly onto the graph. For more information about the Tempo view, see "Tempo view" on page 1869.

See "Using the Transport module" on page 383.

Views > Meter/Key

Open the Meter/Key view by using the **Views > Meter Key** command. The Meter/Key view lets you set and change the meter and key signature for any project or part of a project, over all its tracks. For more information about the Meter/Key view, see "Meter/Key view" on page 1871.

See "The Meter/Key view" on page 1108.

Views > Sysx

Open the Sysx view by using the **Views > Sysx** command. The "Sysx" on page 1919 view gives you 256 "Bank" on page 1910s to hold MIDI System Exclusive messages. For more information about the SYSX view, see "SYSX view" on page 1871.

See "Using the System Exclusive view" on page 1141.

Views > Navigator

Open the Navigator view by using the **Views > Navigator** command. The Navigator view gives you an overview of your entire project.

Views > Surround Panner

Open the Surround Panner by using the **Views > Surround Panner** command. The Surround Panner allows you to control the output levels for each of your outputs. For more information, see "Panning in surround" on page 948.

Views > Icons > Show Icons

This global command hides or shows icons in all applicable views.

Views > Icons > Track View > Show Icons

This command hides or shows icons in the Track view, if the global command to show icons is not enabled.

Views > Icons > Track View > Large Icons

This command displays icons in the Track view in large format.

Views > Icons > Track View > Small Icons

This command displays icons in the Track view in small format.

Views > Icons > Track View > Show in Header

This command hides or shows icons in the Track view in the headers of each track.

Views > Icons > Track View > Show Custom in Header

This command hides or shows custom icons in the Track view headers instead of the default icons.

Views > Icons > Track View > Show in Strip

This command hides or shows icons in the track strips of the Track view.

Views > Icons > Track Inspector > Show Icons

This command hides or shows icons in the Track Inspector.

Views > Icons > Track Inspector > Show Large Icons

This command displays icons in the Track Inspector in large format.

Views > Icons > Track Inspector > Show Small Icons

This command displays icons in the Track Inspector in small format.

Views > Icons > Console > Show Icons

This command hides or shows icons in the Console view.

Views > Icons > Console > Show Large Icons

This command displays icons in the Console view in large format.

Views > Icons > Console > Show Small Icons

This command displays icons in the Console view in small format.

Views > Icons > Synth Rack > Show Large Icons

This command hides or shows icons in the Synth Rack in large format.

Views > Screensets > Screenset 1

Select screenset 1.

See also:
"Screensets" on page 1054

Views > Screensets > Screenset 2

Select screenset 2.

See also:
"Screensets" on page 1054

Views > Screensets > Screenset 3

Select screenset 3.

See also:
"Screensets" on page 1054

Views > Screensets > Screenset 4

Select screenset 4.

See also:
"Screensets" on page 1054

Views > Screensets > Screenset 5

Select screenset 5.

See also:

Views > Screensets > Screenset 6

Select screenset 6.

See also:

Views > Screensets > Screenset 7

Select screenset 7.

See also:

Views > Screensets > Screenset 8

Select screenset 8.

See also:

Views > Screensets > Screenset 9

Select screenset 9.

See also:

Views > Screensets > Screenset 10

Select screenset 10.

See also:

"Screensets" on page 1054

Views > Screensets > Revert Current Screenset

Revert the current screenset to its last saved state before the project was saved. See "To revert the current screenset to its last saved state" on page 1058.

See also:

"Screensets" on page 1054

Views > Screensets > Lock/Unlock Current Screenset

Lock the current screenset to prevent any modifications. See "To prevent the current screenset from being modified" on page 1057.

See also:

"Screensets" on page 1054

Views > Screensets > Rename Current Screenset

Rename the current screenset. See "To name or rename the current screenset" on page 1057.

See also:

"Screensets" on page 1054

Views > Screensets > Duplicate Current Screenset to > Screenset 1

Duplicate the current screenset to screenset 1.

See also:
"Screensets" on page 1054

Views > Screensets > Duplicate Current Screenset to > Screenset 2

Duplicate the current screenset to screenset 2.

See also:
"Screensets" on page 1054

Views > Screensets > Duplicate Current Screenset to > Screenset 3

Duplicate the current screenset to screenset 3.

See also:
"Screensets" on page 1054

Views > Screensets > Duplicate Current Screenset to > Screenset 4

Duplicate the current screenset to screenset 4.

See also:
"Screensets" on page 1054

Views > Screensets > Duplicate Current Screenset to > Screenset 5

Duplicate the current screenset to screenset 5.

See also:
"Screensets" on page 1054

Views > Screensets > Duplicate Current Screenset to > Screenset 6

Duplicate the current screenset to screenset 6.

See also:
"Screensets" on page 1054

Views > Screensets > Duplicate Current Screenset to > Screenset 7

Duplicate the current screenset to screenset 7.

See also:
"Screensets" on page 1054

Views > Screensets > Duplicate Current Screenset to > Screenset 8

Duplicate the current screenset to screenset 8.

See also:
"Screensets" on page 1054

Views > Screensets > Duplicate Current Screenset to > Screenset 9

Duplicate the current screenset to screenset 9.

See also:
"Screensets" on page 1054

Views > Screensets > Duplicate Current Screenset to > Screenset 10

Duplicate the current screenset to screenset 10.

See also:
"Screensets" on page 1054

Views > Screensets > Import Screensets

Import screensets from another open project. Any locked screensets in the current project are not overwritten. See "To import screensets from another project" on page 1057.

See also:
"Screensets" on page 1054

Insert > Audio Track

The **Insert > Audio Track** command, which you can also find by right-clicking a track title bar in the Track view, inserts an audio track above the track on which you right-click.

Insert > MIDI Track

The **Insert > MIDI Track** command, which you can also find by right-clicking a track title bar in the Track view, inserts a MIDI track above the track on which you right-click.

Insert > Soft Synth

The **Insert > Soft Synth** command displays a submenu of all installed soft synths. Clicking the name of one of the synths either displays the **Insert Synth Options** dialog box, or inserts a synth into your project if you unchecked the dialog's **Ask This Every Time** option previously.

See:

"Inserting soft synths" on page 802

Insert > Soft Synth > Plug-in Layouts > Manage Layouts

The **Insert > Soft Synth > Plug-in Layouts > Manage Layouts** command opens the Cakewalk Plug-in Manager. The **Plug-in Manager** dialog box has its own help file, which appears when you click its **Help** button.

Insert > ReWire Device

The **Insert > ReWire Device** command displays a submenu of all installed ReWire soft synths. Clicking the name of one of the soft synths either displays the Insert **Synth Options** dialog box, or inserts s soft synth into your project if you unchecked the dialog's **Ask This Every Time** option previously.

See:

"ReWire instruments" on page 821

Insert > Multiple Tracks

The **Insert > Multiple Tracks** command allows you to insert multiple audio and/or MIDI tracks, and set some track properties for the inserted tracks.

Insert > Track Folder

The **Insert > Track Folder** command, which you can also find by right-clicking a track title bar in the Track view, inserts a track folder above the track on which you right-click.

For more information, see "Track folders" on page 378.

Insert > Track Template

The **Insert > Track Template** command opens the **Import Track Templates** dialog box. For more information about track templates, see "Working with track templates" on page 321.

Insert > Stereo Bus

The **Insert > Stereo Bus** command, which you can also find by right-clicking an empty area of the Bus pane in the Track view or Console view, inserts a stereo bus into the empty space of the Bus pane.

Insert > Surround Bus

The **Insert > Surround Bus** command, which you can also find by right-clicking an empty area of the Bus pane in the Track view or Console view, inserts a surround bus into the empty space of the Bus pane.

For more information, see "Surround buses" on page 945.

Insert > Bank/Patch Change

Use the **Insert > Bank/Patch** command to insert a patch change and/or a bank change.

See:

"To insert a bank/patch change" on page 221

"Choosing the instrument sound (bank and patch)" on page 220

Insert > Series of Controllers

Select **Insert > Series of Controllers** from the menu to open the "Insert Series of Controllers dialog" on page 1625.

This command lets you change controller event values smoothly over a specified time range.

See "Adding and editing controllers in the Piano Roll" on page 695.

Process > Apply Effect > Audio Effects

The **Process > Apply Effect > Audio Effects** command (which is greyed-out if you're not currently using any audio effects) opens the **Apply Audio Effects** dialog box. Applying an audio effect means that the audio data that you apply the effect to is permanently altered to sound like it would if it was flowing through an effects processor in real time. Applying an effect saves a lot of your processor's power for other tasks that must be done in real time.

Clicking **OK** in this dialog box applies any audio effects that are patched into track inserts. but does not apply effects that are patched into a bus. You can also check the **Delete the effects from the track inserts** check box to remove the real-time effects from the track inserts after you apply them, so the audio data does not receive a double dose of the same effects.

See:

Process > Apply Effect > MIDI Effects

The **Process > Apply Effect > MIDI Effects** command opens the **Apply MIDI Effects** dialog box, which allows you to apply any MIDI effects that are patched into a track to all **selected** data in that track. Applying a MIDI effect means that the MIDI data that you apply the effect to is permanently altered to sound like it would if it was flowing through an effects processor in real time. You can leave the **Delete the effects from the track inserts** check box checked to remove the real-time MIDI effects from the track inserts after you apply them, so the track data does not receive a double dose of the same effects.

See:

Process > Apply Effect > Remove Silence

The **Process > Apply Effect > Remove Silence** command detects sections of audio that fall below a given loudness threshold, and replaces those sections with absolute silence.

See also:

Process > Apply Effect > Extract Timing

Use the **Process > Apply Effect > Extract Timing** command to extract the timing from selected clips. The clip's groove is extracted and vertical Pool lines are displayed to indicate the extracted transients.

See also:

"To extract the groove from one clip and apply it to another clip" on page 626

Process > Apply Effect > Gain

The **Process > Apply Effect > Gain** command can adjust stereo channels independently, switch channels, invert the phase of one or both channels, and produce any amount of possible gain or cut values.

See "Using the Normalize and Gain commands" on page 790 for more information.

See also:

"Basic audio processing" on page 789

Process > Apply Effect > Normalize

The **Process > Apply Effect > Normalize** command lets you increase the volume of the selected clips or tracks to the maximum level possible before clipping.

For more information, see "To normalize audio data" on page 790.

See also:

"Basic audio processing" on page 789

Process > Apply Effect > Remove DC Offset

The **Process > Apply Effect > Remove DC Offset** command lets you remove artifacts from audio files caused by DC offset.

For more information, see "Removing DC offset" on page 794.

Process > Apply Effect > Fade/Envelope

The **Process > Apply Effect > Fade/Envelope** command lets you specify accurately the shape of a fade for a selection, clip, or track. You can specify one of the following curves, which the "Fade/Envelope dialog" on page 1606 displays for you:

• Exponential Fade In

• Exponential Fade Out

• Inverse Exponential Fade In

• Inverse Exponential Fade Out

• Linear Fade In

• Linear Fade Out

Alternately you can manipulate any curve in the dialog box to look exactly as you want.

See also:

"To apply a fade to audio data" on page 795

Process > Apply Effect > Crossfade

The **Process > Apply Effect > Crossfade** command lets you specify accurately the shape of a "Crossfade" on page 1911 for two overlapping audio clips. You can specify one of the following curves, which the "Crossfade dialog" on page 1586 displays for you:

• Exponential Crossfade

• Inverse Exponential Crossfade

• Linear Crossfade

Alternately you can manipulate any curve in the dialog box to look exactly as you want.

For more information, see "To crossfade two overlapping clips" on page 796.

See also:

"Fades and crossfades" on page 395

Process > Apply Effect > Reverse

The **Process > Apply Effect > Reverse** command reverses audio data, making it play backwards. You may want to do this to obtain unusual sounds for special effects.

See also:

"Reversing audio data" on page 791

Process > Quantize

The **Process > Quantize** command opens the "Quantize dialog" on page 1740.

This command adjusts the start time and duration of selected notes so that they line up with a fixed size grid. In the **Quantize** dialog box, you can adjust the resolution of the grid (note size) and specify which track properties you want to allow the command to change.

For step by step instructions:

"To use the Quantize command" on page 722

"To use the Groove Quantize command" on page 723

"To define a new groove" on page 724

"To save a groove pattern" on page 724

"To copy an existing groove" on page 725

"To delete a groove" on page 725

"Groove Quantize tips" on page 726

See also:

"Changing the timing of a recording" on page 718

Process > Apply Effect > Reverse

Process > Groove Quantize

The **Process > Groove Quantize** command opens the "Groove Quantize dialog" on page 1615.

This command adjusts the start time and duration of selected notes using a music piece as a pattern. In the **Quantize** dialog box, you assign the groove pattern you want to use (extension .GRV), adjust the resolution of the grid (note size) and specify which track properties you want to allow the command to change.

See also:

"Groove Quantize tips" on page 726

"Changing the timing of a recording" on page 718

Process > Transpose

The **Process > Transpose** command transposes the pitches of note events up or down by a fixed number of half-steps. It does so by changing the MIDI key numbers of note events and by pitch-shifting audio clips. Simply enter the number of half-steps in the **Amount** field of the **Transpose** dialog box--a negative number to transpose down, a positive number to transpose up.

SONAR can also perform diatonic transposition, which shifts all the notes up and down the major scale of the current signature by the designated number of steps. For instance, if you specify an amount of +1 and the key signature is C-major, a C becomes a D (up a whole step), an E becomes an F (up a half step), and so on. Diatonic transposition assures you that the transposed notes fit with the original key signature.

As an option, you can choose to transpose selected audio clips along with any selected MIDI clips. SONAR uses pitch-shifting to perform the transposition. You can transpose audio only a single octave in either direction (-12 to +12), and you cannot transpose audio when you are using diatonic transposition.

See also:

"Transposing MIDI notes with the Transpose MIDI effect" on page 757

Process > Slide

The **Process > Slide** command opens the "Slide dialog" on page 1754. You can move a selected track and/or its markers by a set amount of measures, ticks, seconds or frames. Positive numbers move the track to the right (forward) and negative numbers move the track to the left (backward).

See also:

"Shifting events in time" on page 711

Process > Nudge > Left 1

The **Process > Nudge > Left 1** command moves a selected clip to the left by any of three increments that you set in the Nudge 1 section in **Edit > Preferences > Customization - Nudge**. You can assign a hotkey shortcut for this command.

For more information, see "Nudge" on page 350.

Process > Nudge > Right 1

The **Process > Nudge > Right 1** command moves a selected clip to the right by any of three increments that you set in the Nudge 1 section in **Edit > Preferences > Customization - Nudge**. You can assign a hotkey shortcut for this command.

For more information, see "Nudge" on page 350.

Process > Nudge > Left 2

The **Process > Nudge > Left 2** command moves a selected clip to the left by any of three increments that you set in the Nudge 2 section in **Edit > Preferences > Customization - Nudge**. You can assign a hotkey shortcut for this command.

For more information, see "Nudge" on page 350.

Process > Nudge > Right 2

The **Process > Nudge > Right 2** command moves a selected clip to the right by any of three increments that you set in the Nudge 2section in **Edit > Preferences > Customization - Nudge**. You can assign a hotkey shortcut for this command.

For more information, see "Nudge" on page 350.

Process > Nudge > Left 3

The **Process > Nudge > Left 3** command moves a selected clip to the left by any of three increments that you set in the Nudge 3 section in **Edit > Preferences > Customization - Nudge**. You can assign a hotkey shortcut for this command.

For more information, see "Nudge" on page 350.

Process > Nudge > Right 3

The **Process > Nudge > Right 3** command moves a selected clip to the right by any of three increments that you set in the Nudge 3 section in **Edit > Preferences > Customization - Nudge**. You can assign a hotkey shortcut for this command.

For more information, see "Nudge" on page 350.

Process > Nudge > Up

The **Process > Nudge > Up** command moves a selected clip up a track at a time in the Track view or a note up a pitch at a time in the Piano Roll view.

For more information, see "Nudge" on page 350.

Process > Nudge > Down

The **Process > Nudge > Down** command moves a selected clip down a track at a time in the Track view or a note down a pitch at a time in the Piano Roll view.

For more information, see "Nudge" on page 350.

Process > Nudge > Settings

This command opens **Edit > Preferences > Customization - Nudge** where you can customize the three Nudge settings.

For more information, see "Nudge" on page 350.

Process > Find/Change

The **Process > Find/Change** command is an extremely flexible way of manipulating the data parameters of events. It works something like the search-and-replace function in a word processor but with scaling rather than simple replacement.

See:

"Searching for events" on page 734

Process > Length

The **Process > Length** command can be used to stretch or shrink a portion of a project. **Process > Length** lets you stretch or shrink the selection by a fixed percentage and makes the adjustment by altering the individual events. A value of 200 percent, for example, stretches the selection to twice its original length, while a value of 50 percent shrinks the selection to half its original length.

This command offers the option to stretch audio clips along with the MIDI information. Sometimes you don't want to adjust the speed of your audio. Audio can be stretched or condensed up to a factor of 4 (e.g., it can be shrunk to as little as 25 percent of its original length, or expanded to as much as 400 percent of its original length).

See also:

"Stretching and shrinking events" on page 714

Process > Scale Velocity

The **Process > Scale Velocity** command lets you create crescendos (volume swells) and decrescendos on those instruments that respond to MIDI velocity. Most such instruments map changes in velocity to changes in note loudness. Many synthesizer patches alter the timbre of the sound as well, so that higher velocities produce brighter, as well as louder, sounds. Changes in velocity also affect the playback of audio clips.

This command lets you set a starting and ending velocity for the entire time range of the selection. SONAR scales the velocity of each event to create a smooth linear change in velocity. As an option, you can enter a starting and ending percentage; existing velocity values are modified by the designated percentage.

You can also edit note velocities in the Notes pane of the Piano Roll view, which lets you draw shapes other than straight line changes. For more information, see "Adding and editing controllers in the Piano Roll" on page 695.

Process > Retrograde

The **Process > Retrograde** command reverses the order of events in a selection. If one or more clips are selected, then the events within each clip are reversed. If several clips are selected from the same track, then the order of the clips is also reversed. You could use this command, for example, to take a scale or other long run of notes and reverse the order in which they are played. The **Process > Retrograde** command does not reverse the contents of audio clips. It only changes their start times. You can use the **Process > Apply Effect > Reverse** command to reverse audio clips.

See also:

"Reversing notes in a clip" on page 717

Process > Deglitch

The **Process > Deglitch** command opens the "Deglitch dialog" on page 1590.

See also:

"To use the Deglitch filter" on page 1085

Process > Fit to Time

Process > Fit to Time stretches or shrinks the selection so that it ends at a specific time, expressed in either measure:beat:tick (MBT) or hours:minutes:seconds:frames (SMPTE) format. This command gives you a choice of modifying the events or modifying the underlying tempo. This is useful when you want to alter a portion of a project to have an exact length. The start time of the selection does not change, but the end time is altered as necessary to fit the required time interval.

Audio can be stretched or condensed up to a factor of 4 (e.g., it can be shrunk to as little as 25 percent of its original length, or expanded to as much as 400 percent of its original length).

For more information, see "To stretch or shrink to a specific length" on page 716.

"Stretching and shrinking events" on page 714.

Process > Fit Improvisation

SONAR lets you record music from a MIDI controller without requiring that you use a fixed tempo. But if you record without using a metronome, you are very likely to end up with a recording that does not fit onto a fixed tempo grid.

The **Process > Fit Improvisation** command lets you take a recording and create a tempo map (with measure and beat boundaries) that fits what you played. Your performance is not changed in any way, even thought the note start times and durations are adjusted to fit the new tempo map.

To use this command, you must record a "reference track" containing a single clip that matches your original track or tracks, but has only a single note on each beat boundary. You should make sure that the reference track has one event for every single beat, with no extra beats or missing beats. The first beat of the reference track should be at 1:01:000. You can use any editing command to adjust the reference track.

See also;

"To fit tempos to an improvisation" on page 727

Process > Run CAL

The **Process > Run CAL** command enables you to run CAL programs. Cakewalk Application Language (CAL) is an event-processing language that you use to extend SONAR with custom editing commands.

You can write your own CAL program and use or edit CAL programs that other people have written. CAL files are stored on disk in files with an extension of .cal.

See Also:

"Running CAL programs" on page 1248

Project > Info

The **Project > Info** command opens the **File Info** dialog box where you can enter information about your project, including author, title and copyright. For more information, see "File Info dialog" on page 1608.

Project > Audio Files

The **Project > Audio Files** command opens the **Project Files** dialog box. For information, see "Project Files dialog" on page 1739.

Project > Insert Meter/Key Change

Use the **Project > Insert Meter/Key Change** command to insert a meter change and/or a key change.

See "Adding and editing meter/key changes" on page 1110.

Project > Insert Tempo Change

The **Project > Insert Tempo Change** command opens the "Tempo dialog" on page 1763.

For more information, see "Changing tempos" on page 382.

See:

"To insert a tempo change" on page 384.

"Changing tempos" on page 382

Project > Insert Series of Tempos

The **Project > Insert Series of Tempos** command lets you change "Tempo" on page 1920 smoothly over a specified time range by inserting a series of tempo changes.

See "To insert a series of tempos" on page 384.

Project > Insert Time/Measures

Use the **Project > Insert Time/Measures** command to insert blank measures at a specified location.

See "Inserting time or measures into a project" on page 711.

Project > Insert Marker

Use the **Project > Insert Marker** command to insert a marker at a specified location.

See:

"To add a marker" on page 359

Project > Set Default Groove Clip Pitch

The **Project > Set Default Groove Clip Pitch** submenu lets you specify the default pitch that Groove Clips should follow when the clip's **Follow Project Pitch** option is enabled.

Groove clips do not follow your project's key. Groove Clips follow the project pitch that is specified in the **Default Groove Clip Pitch** dialog box, in addition to any pitch markers in the Time Ruler.

SONAR transposes each Groove Clip that has the **Follow Project Pitch** option enabled by the difference between the clip's **Reference Note** and the current **Project Pitch**. Your project's pitch changes wherever you insert a pitch marker. If there are no pitch markers in your project, Groove Clips play at the pitch set in the **Set Default Groove Clip Pitch** submenu (the default is C).

See also:

"Using pitch markers in the Track view" on page 665.

Project > Set Timecode at Now

The **Project > Set Timecode at Now** command opens the **Set Timecode at Now Time** dialog box, which allows you to move the SMPTE time 00:00:00:00 to the current Now time. If you enter a value in the dialog box, the SMPTE value that you enter is set to the current Now time.

Project > Set Measure/Beat at Now

The **Project > Set Measure/Beat at Now** command opens the **Measure Beat/Meter** dialog box, which allows you to shift the Time Ruler so that the beat of the measure that you choose in the dialog box appears at the Now Time.

See:

"To sync the project tempo to freely played MIDI" on page 728

"Measure Beat/Meter" on page 1633

Utilities > Consolidate Project Audio

The **Utilities > Consolidate Project Audio** command copies all the audio used by the current project into a subfolder of the project's audio folder. Use this command to create a backup of your project's audio.

For more information:

"Backing up projects with digital audio" on page 1177

Utilities > Clean Audio Folder

Use the **Utilities > Clean Audio Folder** command to delete digital audio files from an audio data directory that are no longer used by any of your projects. You should use this command from time to time to free up disk space.

> ⚠️ **Important:** *Make sure that all of your important project (.cwp and .wrk) files are stored in your local hard disk(s) before using this command. If your project files are stored elsewhere, such as a floppy drive, removable drive, or network drive, you risk accidentally deleting important audio files that are associated with your projects.*

> ℹ️ **Note:** *The Cakewalk Audio Finder (CWAFTool) is a more advanced utility for finding and removing unused projects and audio files. This utility can be installed from the **AutoRun** menu of the SONAR CD. If you have an older version of SONAR you can download the SONAR Audio Finder from the SONAR Web site at www.cakewalk.com.*

For more information about the **Utilities > Clean Audio Folder** command, see "To delete unused audio files" on page 1179.

Utilities > Change Audio Format

Use the **Utilities > Change Audio Format** command if you want to rewrite the audio in a project to a different bit depth. Your sound card must be capable of playing the project at the new bit depth.

For more information about the **Utilities > Change Audio Format** command, see "Change Audio Format dialog" on page 1579.

Utilities > Cakewalk Publisher

Use the **Utilities > Cakewalk Publisher** command to present and share your music online.

Using Publisher, you can create a customized streaming music player with a playlist of your music, upload it to your personal or band's Web site, and embed it in any other Web site. You can also update your playlist with album art, links (URLs), and artist, track, & album information.

Publisher works by connecting to your web host's FTP account (usually provided when you sign up with a webhosting company and create a Web site) and uploading files to a location of your choosing. Once these files are successfully transferred to your Web site, Publisher generates a simple HTML tag that you can paste into any other Web site to embed and display your audio player. For those familiar with it, the process is similar to displaying images hosted on one site in another.

Figure 453. *Cakewalk Publisher*

For more information about the **Utilities > Cakewalk Publisher** command, see the Cakewalk Publisher online Help.

Utilities > Share with SoundCloud

The **Utilities > Share with SoundCloud** command opens the Cakewalk SoundCloud interface, which lets you share your music with others online.

See:

"Sharing your songs on SoundCloud" on page 927

Utilities > Burn Audio CD

The **Utilities > Burn Audio CD** command lets you burn your tracks to an audio CD that you can play in any standard CD player.

For more information about the **Utilities > Burn Audio CD** command, see "Audio CD Burner dialog" on page 1570 and the Cakewalk Publisher online Help.

Utilities > CWAF Tool

The **Utilities > CWAF Tool** command opens the Cakewalk Audio Finder Tool, which lets you locate audio files that are used in your SONAR projects.

For more information about Cakewalk Audio Finder Tool, see the Cakewalk Audio Finder Tool online Help.

Utilities > External Encoder Configuration Utility

The **Utilities > External Encoder Configuration Utility** command opens the Cakewalk Encoder Configuration Utility, which lets you configure external audio encoders so that you can use them seamlessly in SONAR's **Export Audio** dialog box.

For more information about Cakewalk Encoder Configuration Utility, see the Encoder Configuration Utility online Help.

Utilities > Cakewalk Plug-in Manager

The **Utilities > Cakewalk Plug-in Manager** command opens the Cakewalk Plug-in Manager, which lets you control how plug-ins behave and how they appear in SONAR's plug-in lists and menus.

For more information about Cakewalk Plug-in Manager, see the Cakewalk Plug-in Manager, online Help.

Time Ruler Format > M:B:T

The **Time Ruler Format > M:B:T** command, which is also available from the Clips pane pop-up menu, changes the unit of measurement in the time ruler to "MBT" on page 1915 units.

Time Ruler Format > H:M:S:F

The **Time Ruler Format > H:M:S:F**: command, which is also available from the Clips pane pop-up menu, changes the unit of measurement in the time ruler to "H:M:S:F" on page 1913 units.

Time Ruler Format > Samples

The **Time Ruler Format > Samples** command, which is also available from the Clips pane pop-up menu, changes the unit of measurement in the time ruler to samples.

Time Ruler Format > Milliseconds

The **Time Ruler Format > Milliseconds** command, which is also available from the Clips pane pop-up menu, changes the unit of measurement in the time ruler to milliseconds.

Window > Full Screen

The **Window > Full Screen** command lets you view SONAR in full screen mode.

Window > Cascade

The **Window > Cascade** command lets you arrange multiple opened windows in an overlapped fashion.

Window > Tile in Rows

The **Window > Tile in Rows** command arranges multiple opened windows from top to bottom down the screen.

Window > Tile in Columns

The **Window > Tile in Columns** command arranges multiple opened windows from side to side across the screen.

Window > Arrange Icons

Use the **Window > Arrange Icons** command to arrange the icons for minimized windows at the bottom of the main window.

Help > Keyboard Shortcuts

Note: *A **plus sign** (**+**) indicates that both keys must be held down at the same time. For example, CTRL+F6.*

Basic shortcuts

Command	Shortcut
Show Track view	ALT+1
Show/hide Control Bar	C
Show/hide Inspector	I
Show/hide Clip Properties Inspector	SHIFT+I
Show/hide Track Properties Inspector	CTRL+SHIFT+I
Show/hide ProChannel	CTRL+I
Show/hide Browser	B
Expand/collapse MultiDock	D
Maximize/restore MultiDock	SHIFT+D
Close current floating window	CTRL+F4
Show Tools HUD	T
Show AudioSnap Palette	A
Zoom in horizontally	CTRL+RIGHT ARROW
Zoom out horizontally	CTRL+LEFT ARROW
Full Screen mode on/off	F11
X-Ray on/off	SHIFT+X
X-Ray all effect/synth plug-ins	CTRL+SHIFT+X
Preferences	P
Cut	CTRL+X
Cut Special	CTRL+ALT+X
Copy	CTRL+C
Copy Special	CTRL+ALT+C
Paste	CTRL+V
Paste Special	CTRL+ALT+V

Table 236. *Basic keyboard shortcuts*

Menu command shortcuts

Command	Shortcut
Online Help	F1
File > New	CTRL+N
File > Open	CTRL+O
File > Save	CTRL+S
File > Print	CTRL+P
Edit > Undo	CTRL+Z
Edit > Redo	CTRL+SHIFT+Z
Edit > Select > All	CTRL+A
Edit > Select > None	CTRL+SHIFT+A
Edit > Cut	CTRL+X
Edit > Cut Special	CTRL+ALT+X
Edit > Copy	CTRL+C or CTRL+INSERT
Edit > Copy Special	CTRL+ALT+C
Edit > Paste	CTRL+V or SHIFT+INSERT
Edit > Paste Special	CTRL+ALT+V
Project > Insert Marker	M
View Undo (zoom)	ALT+Z
View Redo (zoom)	ALT+SHIFT+Z

Table 237.   *Menu command keyboard shortcuts*

View shortcuts

Command	Shortcut
Control Bar	C
Inspector	I
Browser	B
Track view	ALT+1
Console view	ALT+2
Piano Roll view	ALT+3
Step Sequencer	ALT+4
Matrix view	ALT+5
Staff view	ALT+6
Loop Construction view	ALT+7
Event List view	ALT+8
Lyrics view	ALT+SHIFT+1
Video view	ALT+SHIFT+2
Big Time view	ALT+SHIFT+3
Markers view	ALT+SHIFT+4
Tempo view	ALT+SHIFT+5
Meter/Key view	ALT+SHIFT+6
Sysx view	ALT+SHIFT+7
Navigator view	ALT+SHIFT+8
Surround Panner	ALT+SHIFT+9

Table 238. *View keyboard shortcuts*

Track view shortcuts

Command	Shortcut
Show Track view	ALT+1
Insert new track	INSERT
Show/hide Bus pane	SHIFT+B
Show/hide Video Thumbnail pane	V
Show/hide Navigator pane	ALT+N
Show/hide Aim Assist line	X
Resize all tracks vertically to fit in window	F
Resize and zoom tracks to see entire project	SHIFT+F
Show and fit selection	CTRL+ALT+H
Fit content	CTRL+F
Manage track visibility	H
Show only selected tracks	CTRL+SHIFT+H
Hide selected tracks	CTRL+H
Show all tracks	SHIFT+H
Open/Close current Track Folder	ALT+SHIFT+H
Expand/Collapse Take lanes for current track	SHIFT+T
Expand/Collapse Automation lanes for current track	SHIFT+A
Insert new Automation lane in current track	SHIFT+PLUS (+)
Enable/disable Auto Zoom	SHIFT+Z
Zoom in horizontally	CTRL+RIGHT ARROW
Zoom out horizontally	CTRL+LEFT ARROW
Zoom all tracks in vertically	CTRL+DOWN ARROW
Zoom all tracks out vertically	CTRL+UP ARROW
Zoom out on all audio waveforms	ALT+DOWN ARROW

Table 239.   *Track view keyboard shortcuts*

Command	Shortcut
Zoom in on current track's audio waveforms	CTRL+ALT+UP ARROW
Zoom out on current track's audio waveforms	CTRL+ALT+DOWN ARROW
Zoom current track in vertically	CTRL+SHIFT+DOWN ARROW
Zoom current track out vertically	CTRL+SHIFT+UP ARROW
Zoom in on all audio waveforms and MIDI notes	ALT+UP ARROW
Increase current track height	CTRL+SHIFT+DOWN ARROW
Decrease current track height	CTRL+SHIFT+UP ARROW
Scale audio waveform in all audio tracks and MIDI notes in all MIDI tracks	ALT+UP/DOWN ARROW
Scale audio waveform in current audio track or scale MIDI notes in current MIDI track	CTRL+ALT+UP/DOWN ARROW
Put focus in Track pane	SHIFT+UP ARROW
Put focus in Bus pane	SHIFT+DOWN ARROW
Solo/unsolo current track	ALT+S
Select current track	COMMA (,)
Open Patch Browser for current MIDI track	SEMICOLON (;)
Close project	CTRL+F4
Toggle current track's Edit Filter between Track Volume and last/previous data type	PLUS (+/=)
Cut Special	CTRL+ALT+X
Copy Special	CTRL+ALT+C
Select and audition previous Take lane	SHIFT+COMMA (,)
Select and audition next Take lane	SHIFT+PERIOD (.)

Table 239.   *Track view keyboard shortcuts*

Help > Keyboard Shortcuts

Transport shortcuts

Command	Shortcut
Record	R
Step Record on/off	SHIFT+R
RTZ	W
Play/Stop	SPACEBAR
Stop with Now marker	CTRL+SPACEBAR
Toggle 'On stop, rewind to Now marker' on/off	CTRL+W
Audition selection	SHIFT+SPACEBAR
Go to time	G
Go to selection start (From time)	SHIFT+G
Go to next marker	CTRL+SHIFT+PAGE DOWN
Go to previous marker	CTRL+SHIFT+PAGE UP
Record metronome on/off	F3
Playback metronome on/off	CTRL+F3
Open Metronome settings	SHIFT+F3
Loop on/off	L
Set Measure/Beat at Now time	SHIFT+M

Table 240.   *Transport keyboard shortcuts*

Record shortcuts

Command	Shortcut
Record	R
Step Record on/off	SHIFT+R
Arm all tracks for recording	CTRL+R
Toggle Track Arm for selected track	ALT+R
Record metronome on/off	F3

Table 241. *Record keyboard shortcuts*

Tools shortcuts

Command	Shortcut
Show Tools HUD	T
Smart tool	F5
Select tool	F6
Move tool	F7
Cycle through Edit tools (Edit/Timing/Split)	F8
Cycle through Draw tools (Freehand/Line/Sine/Triangle/Square/Saw/Random)	F9
Cycle through Erase tools (Erase/Mute)	F10
Snap to Grid on/off	N
Assign or use secondary Snap to Grid resolution while dragging data	Keep the N key pressed
Zoom tool	Z
Scrub tool	J
Split selected clips at Now time	S
Set whole note duration	CTRL+SHIFT+1

Table 242. *Tools keyboard shortcuts*

Command	Shortcut
Set half note duration	CTRL+SHIFT+2
Set quarter note duration	CTRL+SHIFT+4
Set eight note duration	CTRL+SHIFT+8
Set sixteenth note duration	CTRL+SHIFT+6
Set thirty-second note duration	CTRL+SHIFT+3

Table 242. *Tools keyboard shortcuts*

Edit Filter shortcuts

Command	Shortcut
Select a specific control	Hold down the SHIFT key and click the control
Toggle between the last two data types	Hold down the SHIFT key and right-click
Show the Tools HUD	T or click the middle mouse button
Envelope Offset mode	O

Table 243. *Edit Filter keyboard shortcuts*

Snap to Grid shortcuts

Command	Shortcut
Snap to Grid on/off	N
Open Snap to Grid settings	SHIFT+N
Assign or use secondary Snap to Grid resolution while dragging data	Keep the N key pressed
Swap the primary and secondary Snap to Grid settings	CTRL+SHIFT+N

Table 244. *Snap to Grid keyboard shortcuts*

Nudge shortcuts

Command	Shortcut
Nudge Left 1	Numeric Keypad 1
Nudge Down	Numeric Keypad 2
Nudge Right 1	Numeric Keypad 3
Nudge Left 2	Numeric Keypad 4
Nudge Settings	Numeric Keypad 5
Nudge Right 2	Numeric Keypad 6
Nudge Left 3	Numeric Keypad 7
Nudge Right 3	Numeric Keypad 8

Table 245. *Nudge keyboard shortcuts*

Screenset shortcuts

Command	Shortcut
Screenset 1	1
Screenset 2	2
Screenset 3	3
Screenset 4	4
Screenset 5	5
Screenset 6	6
Screenset 7	7
Screenset 8	8
Screenset 9	9
Screenset 10	0
Copy current Screenset to Screenset 1	CTRL+1
Copy current Screenset to Screenset 2	CTRL+2

Table 246. *Screenset keyboard shortcuts*

Command	Shortcut
Copy current Screenset to Screenset 3	CTRL+3
Copy current Screenset to Screenset 4	CTRL+4
Copy current Screenset to Screenset 5	CTRL+5
Copy current Screenset to Screenset 6	CTRL+6
Copy current Screenset to Screenset 7	CTRL+7
Copy current Screenset to Screenset 8	CTRL+8
Copy current Screenset to Screenset 9	CTRL+9
Copy current Screenset to Screenset 10	CTRL+0

Table 246. *Screenset keyboard shortcuts*

Marker shortcuts

Command	Shortcut
Insert marker	M
Next marker	CTRL+SHIFT+PAGE DOWN
Previous marker	CTRL+SHIFT+PAGE UP
Open Markers view	ALT+SHIFT+4

Table 247. *Marker keyboard shortcuts*

Loop shortcuts

Command	Shortcut
Loop on/off	L
Set loop points to selection	SHIFT+L
Groove Clip looping enable/disable	CTRL+L
Open Loop Construction view	ALT+7

Table 248. *Loop keyboard shortcuts*

Clip shortcuts

Command	Shortcut
Mute clip	K
Groove Clip looping enable/disable	CTRL+L
Open Associated Audio Files dialog	SHIFT+K
Lock Clip Position and Data	CTRL+K
Open clip effects bin	ALT+K
Add selected clips to new clip group	[
Remove selected clips from clip group	SHIFT+[

Table 249. *Clip keyboard shortcuts*

Track State shortcuts

Command	Shortcut
Toggle Track Mute for selected track	ALT+M
Toggle Track Solo for selected track	ALT+S
Toggle Track Arm for selected track	ALT+R

Table 250. *Track State keyboard shortcuts*

Automation shortcuts

Command	Shortcut
Global Write Automation off	F12
Global Read Automation on/off	CTRL+F12
Envelope Offset mode on/off	O
Insert new Automation lane in current track	SHIFT+PLUS (+)

Table 251. *Automation keyboard shortcuts*

Quantize shortcuts

Command	Shortcut
Open Quantize dialog	Q
Open Input Quantize settings	SHIFT+Q
Input Quantize on/off	CTRL+Q

Table 252. *Quantize keyboard shortcuts*

V-Vocal shortcuts

Command	Shortcut
Open V-Vocal Editor	SHIFT+V
Create V-Vocal clip	SHIFT+V
Note: All V-Vocal shortcuts in the Editor itself are listed in the V-Vocal help file.	

Table 253. *V-Vocal keyboard shortcuts*

Step Sequencer shortcuts

Command	Shortcut
Open the Step Sequencer	ALT+4
Insert a new row above the selected row	INSERT
Delete the active row	DELETE
Move focus to the previous control	LEFT ARROW
Move focus to the next control	RIGHT ARROW
When there are multiple strips, move focus to the same control on the previous row	UP ARROW
When there are multiple strips, move focus to the same control on the next row	DOWN ARROW
When focus is on a control in the steps pane, move focus to the strips pane	CTRL+LEFT ARROW

Table 254. *Step Sequencer keyboard shortcuts*

Command	Shortcut
When focus is on a control in the strips pane, move focus to the steps pane	CTRL+RIGHT ARROW
When focus is either on the steps or strips pane, move focus to the toolbar	CTRL+UP ARROW
When focus is on the toolbar, move focus to the strips pane	CTRL+DOWN ARROW
When focus is on steps, toggle step or tie on/off; for buttons, turn on/off	ENTER
When focus is on a step, allow velocity adjustment	SHIFT+ENTER
For spinner controls, increase/decrease value; fine adjust for knobs	+ / - (plus and minus)
Coarse adjust for knobs	[/] (square brackets)
Toggle the **Audition** (Play) button for the view	CTRL+SHIFT+SPACEBAR
When focus is on the steps pane, move focus to the next enabled note on the same row	TAB
When focus is on the steps pane, move focus to the previous enabled note on the same row	SHIFT+TAB
Shift the active row's steps by 1 step and wrap first step to the end	ALT+LEFT ARROW
Shift the active row's steps by 1 step and wrap the last step to the beginning	ALT+RIGHT ARROW

Table 254.   *Step Sequencer keyboard shortcuts*

Surround Panner (large) shortcuts

Command	Shortcut
Constrains to angle	ALT+drag
Constrains to angle at 100% focus	ALT+SHIFT+drag
Constrains to focus only	CTRL+SHIFT+drag
Sets panner point to the point that you click (large and medium panners only)	SHIFT+click
Fine resolution	SHIFT+drag controls (Angle, Width, etc.)
Moves to next/previous widget in surround panner	UP/DOWN ARROW keys
Moves to next/previous panner in same track	LEFT/RIGHT ARRROW keys
Moves to surround panner in another track	CTRL+UP/DOWN ARROW keys

Table 255.   *Surround panner keyboard shortcuts*

Command	Shortcut
Speaker mutes	CTRL+NumPad 0-9
Jumps to speaker angle at 100% focus	NumPad 0-9
n/a	NumPad 0
Ls	NumPad 1
Cs	NumPad 2
Rs	NumPad 3
Sl	NumPad 4
n/a	NumPad 5
Sr	NumPad 6
L	NumPad 7
C	NumPad 8
R	NumPad 9
Lc	/
Rc	*

Table 255. *Surround panner keyboard shortcuts*

Help > SONAR Online > Support

The **Help > SONAR Online > Support** command opens your web browser to the SONAR Support Web page.

Help > SONAR Online > User's Forum

The **Help > SONAR Online > User's Forum** command opens your web browser to the Cakewalk User's Forum Web page.

Help > SONAR Online > Videos

The **Help > SONAR Online > Videos** command opens your web browser to the Cakewalk Videos Web page.

Help > Audio > Configuring your audio interface

The **Help > Audio > Configuring your audio interface** command opens your web browser to the Audio Interface Setup Guide page on the Cakewalk Web site.

Help > Troubleshooting > Problems with registration

The **Help > Troubleshooting > Problems with registration** command opens your web browser to the Product Registration FAQ page on the Cakewalk Web site.

Help > Troubleshooting > Frequently asked questions

The **Help > Troubleshooting > Frequently asked questions** command opens your web browser to the Frequently Asked Questions page on the Cakewalk Web site.

Help > Download Latest Help File

Opens the SONAR Support Page in your default web browser, where you can download the latest online Help file (SONAR.CHM).

Help > View ReadMe

The **Help > View ReadMe** command tells you all about the current version of SONAR.

Help > Quick Start

The **Help > Quick Start** command gives you access to a number of ways to get started.

For more information about the **Help > Quick Start** command, see

Help > Usage Logger

The **Help > Usage Logger** command opens the **Usage Logging** dialog box, which lets you log useful information that may assist Cakewalk Technical Support in troubleshooting potential problems with your system when using SONAR.

For more information about the **Help > Usage Logger** command, see "Usage Logging dialog" on page 1777.

Help > Register Online

The **Help > Register Online** command opens Cakewalk's online form so you can register your new product.

Help > Time Trial Activator

The **Help > Time Trial Activator** command opens the **Time Trial Activator** dialog box. If you have an evaluation version of SONAR and need to extend the evaluation period, this dialog box allows you to enter the activation code that a Cakewalk representative can give you.

Help > About SONAR

The **Help > SONAR** command displays copyright, version number of the product, and your licensing information.

Delete Track

This command, which you find by right-clicking a track name or number in the Track view, removes the track on which you right-click.

Group

This command, which you find by right-clicking a fader, button, or knob in the Track or Console views, lets you "Group" on page 1913 faders, knobs, or buttons so they work together in ways you specify.

For more information about grouping controls, see "Using control groups" on page 914.

Remove From Group

This command, which you find by right-clicking a fader, button, or knob in the Track or Console views, lets you remove a control or button from its group.

For more information about grouping controls, see "Using control groups" on page 914.

Set Start = Current

This command, which you find by right-clicking a fader, button, or knob in the Track or Console views, lets you adjust the start value of a control. This command, together with the **Set End = Current** command, only functions when you use custom grouping. These two commands set the range that a grouped control moves through when the members of its group move through their starting and ending values. This makes it easy to group controls so that they move in similar or opposite motion and at similar or different rates of speed.

For more information about grouping controls, see "To adjust the Start Value of a control" on page 916, and "Using control groups" on page 914.

Set End = Current

This command, which you find by right-clicking a fader, button, or knob in the Track or Console views, lets you adjust the end value of a control. This command, together with the **Set Start = Current** command, only functions when you use custom grouping. These two commands set the range that a grouped control moves through when the members of its group move through their starting and ending values. This makes it easy to group controls so that they move in similar or opposite motion and at similar or different rates of speed.

For more information about grouping controls, see "To adjust the End Value of a control" on page 916, and "Using control groups" on page 914.

Insert Audio Track

This command, which you find by right-clicking in the Console view in the grey area to the right of the final module, or in the Track pane context menu in the Track view, adds a new "Digital audio" on page 1911 track.

For more information about configuring tracks, see "Configuring the Console and Track views" on page 833.

Insert MIDI Track

This command, which you find by right-clicking in the Console view in the grey area to the right of the final module, adds a MIDI track to the console.

For more information about adding tracks, see "Changing track settings" on page 205.

Hide Module

This command allows you to hide track and bus modules in the Console view. You find the command by right-clicking in the Console view in three different areas:

- For track modules, right-click in the grey area above a track's **Phase** button.

- For buses, right-click in the grey area between the **Send** and **Return** knobs.

To redisplay modules, see "To choose the tracks that are displayed using the Track Manager" on page 834, and "Configuring the Console and Track views" on page 833.

Set Snap-to = Current

This command, which you find by right-clicking a fader or knob in the Console or Track views, sets the snap-to position of that fader or knob to its current value. When you double-click a fader or knob, it jumps to its snap-to position.

For more information about the Console view, see "Preparing to mix" on page 831.

90 dB Range

This command, which you find by right-clicking any audio meter in the Track view or Console view, changes the range that the meter measures to 90 dB.

For more information about meters, see "Metering" on page 849.

78 dB Range

This command, which you find by right-clicking any audio meter in the Track view or Console view, changes the range that the meter measures to 78dB.

For more information about meters, see "Metering" on page 849.

60 dB Range

This command, which you find by right-clicking any audio meter in the Track view or Console view, changes the range that the meter measures to 60 dB.

For more information about meters, see "Metering" on page 849.

42 dB Range

This command, which you find by right-clicking any audio meter in the Track view or Console view, changes the range that the meter measures to 42 dB.

For more information about meters, see "Metering" on page 849.

24 dB Range

This command, which you find by right-clicking any audio meter in the Track view or Console view, changes the range that the meter measures to 24 dB.

For more information about meters, see "Metering" on page 849.

12 dB Range

This command, which you find by right-clicking any audio meter in the Track view or Console view, changes the range that the meter measures to 12 dB.

For more information about meters, see "Metering" on page 849.

Set As Current Track

This command, which you find by right-clicking the grey area of a MIDI or audio track in the Console view, changes the track you clicked to the current track. This makes that track the object of any track editing commands you give, such as **Mute**, **Solo**, **Delete**, etc.

For more information about the Console view, see "Preparing to mix" on page 831.

Delete

This command, which you find by right-clicking the name of an effect in the Console view, deletes that effect from its patch point.

For more information about effects, see "Audio effects (audio plug-ins)" on page 797 and "MIDI effects (MIDI plug-ins)" on page 749.

Set Loop Points

This command, which you find by right-clicking in the "Time ruler" on page 1920, sets the Loop From time to the start time of the selection, and the Loop Thru time to the end time of the selection.

For more information about looping, see "Looping" on page 189.

Select Loop Region

This command, which you find by right-clicking in the "Time ruler" on page 1920, sets the selection start and end times to the Loop From and Loop Thru times.

For more information about looping, see "Looping" on page 189.

Set Punch Points

This command, which you find by right-clicking in the "Time ruler" on page 1920, sets the Punch In time to the start time of the selection, and the Punch Out time to the end time of the selection.

For more information about punch recording, see "Punch recording" on page 288.

Punch On/Off

This command, which you find by right-clicking in the "Time ruler" on page 1920, enables or disables Auto Punch.

For more information about punch recording, see "Punch recording" on page 288.

Loop On/Off

Click to enable/disable playback looping.

Set Punch Points

Sets the borders of a selected area as punch points.

Select Punch Region

This command, which you find by right-clicking in the "Time ruler" on page 1920, sets the selection start and end times to the **Punch In** and **Punch Out** times.

For more information about punch recording, see "Punch recording" on page 288.

Jump

This command causes an automation envelope to make a 90 degree "jump" when it reaches the next node.

See:

"Creating and editing automation envelopes" on page 1019

Linear

This command draws a straight line between two nodes.

See:

"Creating and editing automation envelopes" on page 1019

Fast Curve

This command creates a curve between nodes which changes rapidly at first, and slower as it nears the second node.

See:

"Creating and editing automation envelopes" on page 1019

Slow Curve

This command creates a curve between two nodes which changes slowly at first, then rapidly as it nears the second node.

See:

"Creating and editing automation envelopes" on page 1019

Drag and Drop Options

The **Drag and Drop Options** command opens the "Customization - Editing (Advanced)" on page 1728 section in the **Preferences** dialog box.

Associated Audio Files

This command opens the **Associated Audio Files** dialog box. For more information, see "Associated Audio Files dialog" on page 1581.

Mirror Fretboard

This command displays the Staff view's fretboard with low strings at the top and high strings at the bottom.

Rosewood Hi

This command changes the fretboard to appear as if made of rosewood with high resolution.

Rosewood Lo

This command changes the fretboard to appear as if made of rosewood in low resolution.

Ebony Hi

This command changes the fretboard to appear as if made of ebony in high resolution.

Ebony Lo

This command changes the fretboard to appear as if made of ebony in low resolution.

Maple Hi

This command changes the fretboard to appear as if made of maple in high resolution.

Maple Lo

This command changes the fretboard to appear as if made of maple in low resolution.

Animate

This command, which you find by right-clicking in the Video view, enables or disables video playback. Disabling video playback frees your computer to process more audio data, if your project has too much data to process efficiently.

For more information about video, see "Video playback, import, and export" on page 236.

Insert

This command, which you find by right-clicking in the Video view, inserts a video file into a project.

See also:

"Video playback, import, and export" on page 236

Delete

This command, which you find by right-clicking in the Video view, deletes a video file from a project.

For more information about deleting video files, see "To delete the video from the project" on page 238.

See also:

"Video playback, import, and export" on page 236

Original Size

This command, which you find by right-clicking in the Video view, displays the video in its original size.

For more information about video, see "Video playback, import, and export" on page 236.

Stretch to Window

This command, which you find by right-clicking in the Video view, stretches the video to fill the Video view.

For more information about video, see "Video playback, import, and export" on page 236.

Preserve Aspect Ratio

This command, which you find by right-clicking in the Video view, stretches the video as much as possible while preserving the original aspect ratio.

For more information about video, see "Video playback, import, and export" on page 236.

Integral Stretch

This command, which you find by right-clicking in the Video view, stretches the video as much as possible, but only enlarges it by whole-number multiples.

For more information about video, see "Video playback, import, and export" on page 236.

Full Screen

This command, which you find by right-clicking in the Video view, stretches the video to fill the screen.

For more information about video, see "Video playback, import, and export" on page 236.

Time Display Format > M:B:T

This command, which you find by right-clicking in the Video view, changes the video view's time display to "MBT" on page 1915 (measure:beat:tick).

For more information about video, see "Video playback, import, and export" on page 236.

Time Display Format > SMPTE

This command, which you find by right-clicking in the Video view, changes the video view's time display to "SMPTE" on page 1919.

For more information about video, see "Video playback, import, and export" on page 236.

Time Display Format > Frames

This command, which you find by right-clicking in the Video view, changes the video view's time display to frame.

For more information about video, see "Video playback, import, and export" on page 236.

Time Display Format > None

This command, which you find by right-clicking in the Video view, hides the video view's time display.

For more information about video, see "Video playback, import, and export" on page 236.

Time Display Format > Font

This command, which you find by right-clicking in the Video view, lets you choose the font for the video view's time display.

For more information about video, see "Video playback, import, and export" on page 236.

Background Color > Black

This command, which you find by right-clicking in the Video view, changes the background color of the Video view to black.

For more information about video, see "Video playback, import, and export" on page 236.

Background Color > White

This command, which you find by right-clicking in the Video view, changes the background color of the Video view to white.

For more information about video, see "Video playback, import, and export" on page 236.

Video Properties

This command, which you find by right-clicking in the Video view, opens the "Video Properties dialog" on page 1770, where you can set the trim-in and trim-out times, and read the video file's statistics.

Add Node

This command, which you find by right-clicking an envelope in the Track view, adds a node to the envelope that you clicked.

For more information about envelopes, see "Automation" on page 1001.

Reset Node

This command returns a node to its default value. For example a pan node would return to 0% C.

Delete Node

This command deletes the node over which you have right-clicked.

Lock Contents

This command forces SONAR to open a new instance of the current view (the view you are locking) rather than using the current view. This allows you to keep multiple copies of the same view open at one time.

See:

"Locking views" on page 89

Enable Floating

This command allows you to "float" a view (move it beyond the boundaries of SONAR. This is especially useful when using dual monitors.

See:

"Floating views" on page 89

Zoom tool

This command enables the Zoom tool feature.

For more information about the Zoom tool feature, see "Displaying clips" on page 325.

For more information about displaying tracks, see "Configuring the Console and Track views" on page 833.

Previous Zoom

This command returns the Track view to the previous zoom level.

For more information about displaying tracks, see "Configuring the Console and Track views" on page 833.

Show All Tracks

This command shows all tracks in the current project.

For more information about displaying tracks, see "Configuring the Console and Track views" on page 833.

Record Meters

When selected with a check mark, record meters are displayed. When unchecked, record meters are not displayed.

Playback Meters

When selected with a check mark, playback meters are displayed. When unchecked, playback meters are not displayed.

Output Bus Meters

When selected with a check mark, output bus meters are displayed. When unchecked, output bus meters are not displayed.

Record Meter Options > Peak

Available in the **Playback Meter Options**, **Record Meter Options**, and **Mains Meter Options** submenus, this command sets the meter to **Peak**.

For more information about Peak meter display, see "Metering" on page 849.

Record Meter Options > RMS

Available in the **Playback Meter Options**, **Record Meter Options**, and **Mains Meter Options** submenus, this command sets the meter to **RMS**.

For more information about RMS meter display, see "Metering" on page 849.

Record Meter Options > Peak + RMS

Available in the **Playback Meter Options**, **Record Meter Options**, and **Mains Meter Options** submenus, this command sets the meter to **Peak + RMS**.

For more information about Peak + RMS meter display, see "Metering" on page 849.

Record Meter Options > Show Labels

This command toggles on/off the meter labels.

Record Meter Options > Hold Peaks

This command causes a meter to hold the most recent peak for a short time. The peak volume level recorded by the meter is marked by a small white line which remains for a moment if lock peaks is not checked or until the end of playback or recording if Lock Peaks is checked.

Record Meter Options > Lock Peaks

This command when checked and the Hold Peaks is also checked causes the peak to be locked at its highest point on the meter until the end of playback or recording.

Playback Meter Options > Peak

Available in the **Playback Meter Options**, **Record Meter Options**, and **Mains Meter Options** submenus, this command sets the meter to show peaks.

For more information about Peak meter display, see "Metering" on page 849.

Playback Meter Options > RMS

Available in the **Playback Meter Options**, **Record Meter Options**, and **Mains Meter Options** submenus, this command sets the meter to **RMS**.

For more information about RMS meter display, see "Metering" on page 849.

Playback Meter Options > Peak + RMS

Available in the **Playback Meter Options**, **Record Meter Options**, and **Mains Meter Options** submenus, this command sets the meter to **Peak + RMS**.

For more information about Peak + RMS meter display, see "Metering" on page 849.

Playback Meter Options > Show Labels

This command toggles on/off the meter labels.

Playback Meter Options > Hold Peaks

This command causes a meter to hold the most recent peak for a short time. The peak volume level recorded by the meter is marked by a small white line which remains for a moment if lock peaks is not checked or until the end of playback or recording if **Lock Peaks** is checked.

Playback Meter Options > Lock Peaks

This command when checked and the Hold Peaks is also checked causes the peak to be locked at its highest point on the meter until the end of playback or recording.

Output Bus Meter Options > Peak

Available in the **Playback Meter Options**, **Record Meter Options**, and **Mains Meter Options** submenus, this command sets the meter to show peaks.

For more information about Peak meter display, see "Metering" on page 849.

Output Bus Meter Options > RMS

Available in the **Playback Meter Options**, **Record Meter Options**, and **Mains Meter Options** submenus, this command sets the meter to **RMS**.

For more information about RMS meter display, see "Metering" on page 849.

Output Bus Meter Options > Peak + RMS

Available in the **Playback Meter Options**, **Record Meter Options**, and **Mains Meter Options** submenus, this command sets the meter to **Peak + RMS**.

For more information about Peak + RMS meter display, see "Metering" on page 849.

Output Bus Meter Options > Show Labels

This command toggles on/off the meter labels.

Output Bus Meter Options > Hold Peaks

This command causes a meter to hold the most recent peak for a short time. The peak volume level recorded by the meter is marked by a small white line which remains for a moment if lock peaks is not checked or until the end of playback or recording if Lock Peaks is checked.

Output Bus Meter Options > Lock Peaks

This command when checked and the Hold Peaks is also checked causes the peak to be locked at its highest point on the meter until the end of playback or recording.

Playback Meter Options > Pre Fader

This command sets the meter to measure the volume level in the signal path prior to entering the fader.

Output Bus Meter Options > Pre Fader

This command sets the meter to measure the volume level in the signal path prior to entering the fader.

Playback Meter Options > Post Fader

This command sets the meter to measure the volume level in the signal path after exiting the fader.

Output Bus Meter Options > Post Fader

This command sets the meter to measure the volume level in the signal path after exiting the fader.

Output Bus Meter Options > Pre Fader Post FX

This command sets the meter to measure the volume level in the signal path after the effects bin and prior to the fader.

Percentage

This command sets the Audio Scaling ruler to display the percentage of the waveform being shown.

dB

This command sets the Audio Scaling ruler to display the dB level of the waveform being shown.

Zoom Factor

This command sets the Audio Scaling ruler to display the zoom factor (a multiple of the default zoom level, i.e. a zoom factor of 10 shows the waveform at 10 times the detail) of the waveform being shown.

Show and Fit Selection

This command zooms vertically and horizontally in the Track view to fit just the selected clips.

Show only Selected Tracks

Hides all tracks which are not selected.

Hide Selected Tracks

Hides all selected tracks.

Show All Tracks and Buses

Shows all tracks and buses in your project.

Undo View Change

Reverts the following parameters to their previous state:

- Individual track sizes
- Height factors
- Scaling

There are 16 levels of undo for this command.

Redo View Change

Negates the last Undo View Change command.

Create Track Envelopes Using Linear Shapes

This command, when checked, causes newly inserted envelopes to have a node at both the beginning and end of the track. If unchecked, an envelope appears as a dotted line with no active nodes.

Snap to Grid

Click this button to turn **Snap to Grid** on or off.

See:

Select tool

Use this to select data.

Erase tool

Use this to erase data.

Draw tool

Use this to draw data or events.

Open Clip Effects Bin

This command opens the clip effects bin.

See:

"Effects on clips" on page 870

Insert New Track(s) or Bus(es)

Click this button to choose from a variety of insertion options. You can insert a single audio or MIDI track, multiple tracks, a track folder, a track template, or a single stereo or surround (SONAR Producer only) bus.

Split tool

This button activates the Split tool, which allows you to split a clip into separate clips. You can click on a clip once to create a single split, or click and drag over a section of a clip to create two splits. The Split tool follows the current Snap to Grid settings. The Split tool allows you to edit multiple clips simultaneously, including clips in clip groups.

See:

"Splitting and combining clips" on page 365

Mute tool

This button activates the Mute tool, which allows you to mute an umute individual clips. Set options for this tool by clicking the small down arrow to the right of the button. The Mute tool allows you to edit multiple clips simultaneously, including clips in clip groups.

See:

"Clip muting and isolating (clip soloing)" on page 375

Exclusive Solo

This button enables Exclusive Solo mode. When you solo a track or bus in Exclusive Solo mode, all other soloed tracks or buses are automatically unsoloed.

See:

"Exclusive Solo mode" on page 201

Add Clip to Pool

This command adds or deletes the clip's transient markers from the Pool. The markers do not have to be visible to be added to the Pool. See "Using the Pool" on page 643 for more information.

See:

"Using the Pool" on page 643

"AudioSnap (Producer and Studio only)" on page 589

Show Pool Lines

This command hides or shows the Pool lines.

See:

"Using the Pool" on page 643

"AudioSnap (Producer and Studio only)" on page 589

Add MBT to Pool

This command adds the time ruler to the Pool.

Tip: *In the Control Bar's Snap module, set the **Musical Time** value to the resolution you would like to add to the Pool.*

See:

"Using the Pool" on page 643

"AudioSnap (Producer and Studio only)" on page 589

Quantize to Pool

This command opens the **Quantize to AudioSnap Pool** dialog box, which lets you quantize audio beats to the Pool.

See:

"To quantize an audio clip to another audio clip (Quantize to Pool)" on page 627

"AudioSnap (Producer and Studio only)" on page 589

Quantize to Pool

[Track view] View > Navigator Show/Hide

Use this command to show or hide the Navigator pane in the Track view. The keyboard shortcut for hiding or showing the Navigator pane is ALT+N.

See:

"Using the Navigator view" on page 332

[Track view] View > Video Thumbnail Show/Hide

This command toggles on or off the display of the Video Thumbnails track. The Video Thumbnails track can be displayed even if there is no video in your project. You can also show or hide the this track by pressing V on your keyboard.

See:

"Video playback, import, and export" on page 236

[Track view] View > Auto Zoom

This command enables/disables Auto Zoom, which allows you to automatically enlarge the track that has focus. All other tracks are minimized. When a new track is focused, it swaps heights with the previously focused track.

See:

"Auto Zoom the current track" on page 87

[Track view] View > Display > Display Ghosted Data

Use this command to show or hide all data types, regardless of which data type is selected in a track's Edit Filter control.

All but the selected data type will be shaded, or "ghosted". This allows you to see all data types in context while editing a specific data type.

[Track view] View > Display > Display Track Separators

Enabling this option causes SONAR to display a horizontal line in the Clips pane between each track.

[Track view] View > Display > Display Clip Names

If you name any of your clips, enabling this option causes SONAR to display the names.

[Track view] View > Display > Display Clip Contents

Enabling this option causes SONAR to display a graphical depiction of the audio or MIDI data that the track contains, including automation data.

[Track view] View > Display > Show Audio Scale

Check this option to display the Audio Scale Ruler in the splitter bar between the Clips pane and the Track pane.

[Track view] View > Display > Maximize Waveform Height

Enabling this option causes SONAR to hide clip headers, which allows waveforms and MIDI data to span the full height of clips.

[Track view] View > Display > Vertical Grid Lines > None

Enabling this option causes SONAR to not display vertical grid lines in the Clips pane.

[Track view] View > Display > Vertical Grid Lines > Behind Clips

Enabling this option causes SONAR to display vertical lines in the Clips pane that are one measure apart. Vertical grid lines are displayed, but clips will draw on top of them, so clip contents will not be obstructed.

[Track view] View > Display > Vertical Grid Lines > In Front of Clips

Enabling this option causes SONAR to display vertical lines in the Clips pane that are one measure apart. Vertical grid lines are displayed and drawn on top of clips, always visible.

[Track view] View > Fit Tracks and Buses to Window

This command adjusts the vertical track heights to fit all tracks in your project in the Track view.

[Track view] View > Fit Project to Window

This command fits your entire project, or as many tracks as possible, into the Track view.

*Tip: You can also double-click the top half of the Clips Pane time ruler to perform the **Fit Project to Window** command.*

View > Fit MIDI Content

Fit all displayed MIDI content into the visible area of the Piano Roll view.

View > MIDI Microscope

This command activates Piano Roll Microscope mode. When Microscope mode is enabled, a transparent rounded square centered on the mouse cursor shows a zoomed in region of the Piano Roll data underneath it.

See:

"Piano Roll Microscope mode" on page 702

[Track view] View > View Undo

This command returns the Track view to the previous zoom level (undo zoom).

For more information about displaying tracks, see "Configuring the Console and Track views" on page 833.

[Track view] View > View Redo

This command negates the last Undo View Change command (redo zoom).

For more information about displaying tracks, see "Configuring the Console and Track views" on page 833.

[Track view] Options > Auto crossfade

Use this command to enable or disable automatic crossfades.

See:

"Fades and crossfades" on page 395

[Track view] Options > Crossfade Type

Specify default fade in, fade out and crossfade curve types.

[Track view] Options > Crossfade Type > Default

Fade-In Curve > Linear

This command sets as a default a linear, or steady fade-in curve when dragging the beginning of a clip.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Fade-In Curve > Slow Curve

This command sets as a default a slow fade-in curve when dragging the beginning of a clip.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Fade-In Curve > Fast Curve

This command sets as a default a fast fade-in curve when dragging the beginning of a clip.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Fade-Out Curve > Linear

This command sets as a default a linear, or steady fade-out curve when dragging the end of a clip.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Fade-Out Curve > Slow Curve

This command sets as a default a slow fade-out curve when dragging the end of a clip.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default

Fade-Out Curve > Fast Curve

This command sets as a default a fast fade-out curve when dragging the end of a clip.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Crossfade Curves > Linear Out - Linear In

This command sets as default a crossfade in which the first clip fades out at a steady rate and the second clip fades in at a steady rate.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Crossfade Curves > Fast Out - Fast In

This command sets as default a crossfade in which the first clip fades out fast and the second clip fades in fast.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Crossfade Curves > Slow Out - Slow In

This command sets as default a crossfade in which the first clip fades out slowly and the second clip fades in slowly.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Crossfade Curves > Fast Out - Slow In

This command sets as default a crossfade in which the first clip fades out fast and the second clip fades in slowly.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Crossfade Curves > Slow Out - Fast In

This command sets as default a crossfade in which the first clip fades out slowly and the second clip fades in fast.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Crossfade Curves > Linear Out - Fast In

This command sets as default a crossfade in which the first clip fades out at a steady rate and the second clip fades in fast.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Crossfade Curves > Linear Out - Slow In

This command sets as default a crossfade in which the first clip fades out at a steady rate and the second clip fades in slowly.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Crossfade Curves > Fast Out - Linear In

This command sets as default a crossfade in which the first clip fades out fast and the second clip fades in at a steady rate.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Crossfade Type > Default Crossfade Curves > Slow Out - Linear In

This command sets as default a crossfade in which the first clip fades out slowly and the second clip fades in at a steady rate.

For more information about crossfades, see "Fades and crossfades" on page 395.

[Track view] Options > Click Behavior > Left Click Sets Now

Enabling this option allows you to set the Now Time by left-clicking a location in the Clips pane.

[Track view] Options > Click Behavior > Right Click Sets Now

Enabling this option allows you to set the Now Time by right-clicking a location in the Clips pane.

[Track view] Options > Click Behavior > Left Click Locks Scroll

Enabling this option prevents the Clips pane from scrolling horizontally during playback while you edit data. This allows you to focus on the edit location without worrying that the screen will eventually scroll away from the edit location. When you are done with the edit and want the Clips pane to scroll again during playback, click in the background of the Clips pane to clear auto scroll lock.

[Track view] Options > Click Behavior > Double-Click > MIDI Clips > -Nothing-

Enabling this option prevents any view from opening when you double-click a MIDI clip.

[Track view] Options > Click Behavior > Double-Click > MIDI Clips > Event List View

Enabling this option causes the Event List view to open when you double-click a MIDI clip.

[Track view] Options > Click Behavior > Double-Click > MIDI Clips > Staff View

Enabling this option causes the Staff view to open when you double-click a MIDI clip.

[Track view] Options > Click Behavior > Double-Click > MIDI Clips > Piano Roll View

Enabling this option causes the Piano Roll view to open when you double-click a MIDI clip.

[Track view] Options > Click Behavior > Double-Click > MIDI Clips > Inline Piano Roll View

Enabling this option causes the Inline Piano Roll view to open when you double-click a MIDI clip.

[Track view] Options > Click Behavior > Double-Click > Audio Clips > -Nothing-

Enabling this option prevents any view from opening when you double-click an audio clip.

[Track view] Options > Click Behavior > Double-Click > Audio Clips > Loop Construction View

Enabling this option causes the Loop Construction view to open when you double-click an audio clip.

[Track view] Options > Meter Options > Track Record Meters

Show or hide track record meters.

[Track view] Options > Meter Options > Track Playback Meters

Show or hide track playback meters.

[Track view] Options > Meter Options > Bus Meters

Show or hide bus meters.

[Track view] Options > Meter Options > Horizontal Meters

Show horizontal meters in the Track view.

[Track view] Options > Meter Options > Vertical Meters

Show vertical meters in the Track view.

[Track view] Options > Meter Options > Show Numeric Peak Values

Show or hide peak values in each track's header.

[Track view] Options > Meter Options > Show Track Peak Markers

Show or hide peak markers for tracks.

For details, see "Peak markers" on page 856.

[Track view] Options > Meter Options > Show Bus Peak Markers

Show or hide peak markers for buses.

For details, see "Peak markers" on page 856.

[Track view] Options > Meter Options > Reset All Meters

Reset all meters and clear any clipping indicators.

[Track view] Options > Meter Options > Record Meter Options > Peak

This command sets the meter to **Peak**.

For more information about Peak meter display, see "Metering" on page 849.

[Track view] Options > Meter Options > Record Meter Options > RMS

This command sets the meter to **RMS**.

For more information about RMS meter display, see "Metering" on page 849.

[Track view] Options > Meter Options > Record Meter Options > Peak + RMS

This command sets the meter to **Peak + RMS**.

For more information about Peak + RMS meter display, see "Metering" on page 849.

[Track view] Options > Meter Options > Record Meter Options > -12 dB

This command changes the range that record meters measure to 12 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Record

Meter Options > -24 dB

This command changes the range that record meters measure to 24 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Record Meter Options > -42 dB

This command changes the range that record meters measure to 42 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Record Meter Options > -60 dB

This command changes the range that record meters measure to 60 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Record Meter Options > -78 dB

This command changes the range that record meters measure to 78 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Record Meter Options > -90 dB

This command changes the range that record meters measure to 90 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Record Meter Options > Show Labels

This command toggles on/off labels on record meters.

[Track view] Options > Meter Options > Record Meter Options > Hold Peaks

This command causes a meter to hold the most recent peak for a short time. The peak volume level recorded by the meter is marked by a small white line which remains for a moment if lock peaks is not checked or until the end of playback or recording if Lock Peaks is checked.

[Track view] Options > Meter Options > Record Meter Options > Lock Peaks

This command when checked and the Hold Peaks is also checked causes the peak to be locked at its highest point on the meter until the end of recording.

[Track view] Options > Meter Options > Track Meter Options > Peak

This command sets the meter to **Peak**.

For more information about Peak meter display, see "Metering" on page 849.

[Track view] Options > Meter Options > Track Meter Options > RMS

This command sets the meter to **RMS**.

For more information about RMS meter display, see "Metering" on page 849.

[Track view] Options > Meter Options > Track Meter Options > Peak + RMS

This command sets the meter to **Peak + RMS**.

For more information about Peak + RMS meter display, see "Metering" on page 849.

[Track view] Options > Meter Options > Track Meter

Options > Pre Fader

This command sets the meter to measure the volume level in the signal path prior to entering the fader.

[Track view] Options > Meter Options > Track Meter Options > Post Fader

This command sets the meter to measure the volume level in the signal path after exiting the fader.

[Track view] Options > Meter Options > Track Meter Options > -12 dB

This command changes the range that track playback meters measure to 12 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Track Meter Options > -24 dB

This command changes the range that track playback meters measure to 24 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Track Meter Options > -42 dB

This command changes the range that track playback meters measure to 42 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Track Meter Options > -60 dB

This command changes the range that track playback meters measure to 60 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Track Meter Options > -78 dB

This command changes the range that track playback meters measure to 78 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Track Meter Options > -90 dB

This command changes the range that track playback meters measure to 90 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Track Meter Options > Show Labels

This command toggles on/off labels on track playback meters.

[Track view] Options > Meter Options > Track Meter Options > Hold Peaks

This command causes a meter to hold the most recent peak for a short time. The peak volume level recorded by the meter is marked by a small white line which remains for a moment if lock peaks is not checked or until the end of playback or recording if Lock Peaks is checked.

[Track view] Options > Meter Options > Track Meter Options > Lock Peaks

This command when checked and the Hold Peaks is also checked causes the peak to be locked at its highest point on the meter until the end of playback.

[Track view] Options > Meter Options > Bus Meter

Options > Peak

This command sets the meter to **Peak**.

For more information about Peak meter display, see "Metering" on page 849.

[Track view] Options > Meter Options > Bus Meter Options > RMS

This command sets the meter to **RMS**.

For more information about RMS meter display, see "Metering" on page 849.

[Track view] Options > Meter Options > Bus Meter Options > Peak + RMS

This command sets the meter to **Peak + RMS**.

For more information about Peak + RMS meter display, see "Metering" on page 849.

[Track view] Options > Meter Options > Bus Meter Options > Pre Fader

This command sets the meter to measure the volume level in the signal path prior to entering the fader.

[Track view] Options > Meter Options > Bus Meter Options > Post Fader

This command sets the meter to measure the volume level in the signal path after exiting the fader.

[Track view] Options > Meter Options > Bus Meter Options > Pre Fader Post FX

This command sets the meter to measure the volume level in the signal path after the effects bin and prior to the fader.

[Track view] Options > Meter Options > Bus Meter Options > -12 dB

This command changes the range that bus meters measure to 12 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Bus Meter Options > -24 dB

This command changes the range that bus meters measure to 24 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Bus Meter Options > -42 dB

This command changes the range that bus meters measure to 42 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Bus Meter Options > -60 dB

This command changes the range that bus meters measure to 60 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Bus Meter Options > -78 dB

This command changes the range that bus meters measure to 78 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Bus Meter

Options > -90 dB

This command changes the range that bus meters measure to 90 dB.

For more information about meters, see "Metering" on page 849.

[Track view] Options > Meter Options > Bus Meter Options > Show Labels

This command toggles on/off labels on bus meters.

[Track view] Options > Meter Options > Bus Meter Options > Hold Peaks

This command causes a meter to hold the most recent peak for a short time. The peak volume level recorded by the meter is marked by a small white line which remains for a moment if lock peaks is not checked or until the end of playback or recording if Lock Peaks is checked.

[Track view] Options > Meter Options > Bus Meter Options > Lock Peaks

This command when checked and the Hold Peaks is also checked causes the peak to be locked at its highest point on the meter until the end of playback or recording.

[Track view] Options > Drag and Drop Options

The **Drag and Drop Options** command opens the **Drag and Drop Options** dialog box.

[Track view] Options > Zoom Options

The **Zoom Options** command opens the **Zoom Options** dialog box.

This command shows options for changing the mouse's zoom behavior. For more information about Fast Zoom, see "To zoom using the mouse wheel (Fast Zoom)" on page 330.

[Track view] Options > On Stop, Rewind to Now Marker

When this check box is enabled, the Now Time jumps back to the Now Time Marker whenever playback stops.

You can also toggle this option on/off by pressing CTRL+W.

[Track view] Options > Set Now Time With Full Restart

When this option is checked, when you change the Now Time during playback, the Transport comes to a full stop, and then restarts playback. This stops the sound for a brief moment, but makes synchronization (especially with video) more robust.

[Track view] Options > Stop at Project End

When this option is checked, playback will automatically stop after the last event in the project is reached. When this option is unchecked, playback will continue beyond the end of the project and playback can also be started in an empty project.

Make Instrument Track

If an existing audio track and MIDI track are assigned to the same software instrument, you can convert the two tracks into a single instrument track (only available for MIDI tracks).

Split Instrument Track

Split an instrument track into separate audio and MIDI tracks. The audio and MIDI tracks will remain assigned to the same software instrument (only available for Instrument tracks).

[Track view] Tracks > Bounce to Track(s)

This command lets you combine one or more audio tracks into a submix.

For more information about the **Bounce to Track(s)** command, see "Bouncing tracks" on page 921.

[Track view] Tracks > Clone Track(s)

This command copies one or more tracks. You can choose to include events, properties, sends, and/ or effects in the copied track(s). You can specify a destination.

For more information about the **Clone Track(s)** command, see "Copying tracks" on page 320.

Delete Track(s)

This command deletes one or more tracks entirely, including all its track properties and all its clips and events. SONAR does not put deleted information on the Clipboard for later copying.

For more information about the **Delete Track(s)** command, see "Erasing tracks" on page 321.

[Track view] Tracks > Wipe Track(s)

The **Tracks > Wipe Track(s)** command deletes track contents but leaves track properties intact. SONAR does not put wiped information on the Clipboard for later copying.

For more information about the **Wipe Track(s)** command, see "Erasing tracks" on page 321.

[Track view] Tracks > Copy Track Name(s) to Clip Name(s)

This command copies track names to clips in corresponding tracks.

[Track view] Tracks > Hide Track(s)

This command hides all selected tracks. To display them again, select **Tracks > Track Manager** or press H on your keyboard to open the **Track Manager** dialog box.

Track Manager

This command opens the **Track Manager** dialog box.

For more information about the **Track Manager** dialog box, see "Track Manager dialog" on page 1764.

For more information about displaying tracks, see "Configuring the Console and Track views" on page 833.

[Track view] Tracks > Sort Tracks

The **Sort Tracks** command lets you arrange tracks in order according to any of several criteria.

For more information about rearranging tracks, see "To sort the tracks" on page 317, "To drag a track to a new position" on page 316, and "To insert a single track" on page 318.

[Track view] Tracks > Selected Track Input Series

The **Selected Track Input Series** command opens the **Assign Series of Inputs** dialog box.

Use this command to assign a series of consecutive mono input ports to the selected audio tracks.

For details, see "To assign different audio input ports to multiple tracks" on page 218 and "Assign Series of Inputs dialog" on page 1570.

[Track view] Tracks > Selected Track Inputs

The **Selected Track Inputs** command opens the **Track Inputs** dialog box.

Use this command to assign the same input port to the selected tracks.

For details, see "To assign the same audio input port to multiple tracks" on page 217 and "Track Inputs dialog" on page 1764.

[Track view] Tracks > Selected Track Outputs

The **Selected Track Outputs** command opens the **Track Outputs** dialog box.

Use this command to assign the same output port to the selected tracks.

For details, see "To assign the same audio output port to multiple tracks" on page 218 and "Track Outputs dialog" on page 1765.

[Track view] Clips > Apply Trimming

This command lets you permanently delete any data from a selected clip that is hidden by a slip editing edit.

For step-by-step instructions, see "To permanently delete slip-edited data" on page 394.

[Track view] Clips > Bounce to Clip(s)

This command lets you combine selected audio clips into a single clip.

Note: *Like any clips, slip-edited clips can be combined with other clips using the Bounce to Clip(s) command. When a slip-edited clip is combined with another clip, any slip-edited data (audio or MIDI events that are cropped from view) is overwritten.*

For more information, see "Splitting and combining clips" on page 365, and "Bouncing to clips" on page 787.

See also:

"Splitting and combining clips" on page 365

"Bouncing to clips" on page 787

[Track view] Clips > Convert to Mono

This command lets you convert any selected stereo audio clip(s) to mono.

[Track view] Clips > Fade clips

This command opens the **Fade Selected Clips** dialog box, which allows you to create or edit fades on selected clips.

For more information, see "Fades and crossfades" on page 395.

[Track view] Clips > Add to Clip Group > New

This command places all selected clips in a new clip group.

Note: *A clip may only belong to one clip group at a time. If any of the selected clips already belong to another clip group, they will be removed from the other group and placed in the new group.*

See:

"Clip groups" on page 345:

[Track view] Clips > Remove from Clip Group

This command removes all selected clips from any clip group they may belong to.

💡 **Tip:** *To select only a single clip in a group, hold down the SHIFT key and click the clip that you want to remove from the group.*

See:
"Clip groups" on page 345:

[Track view] Clips > Revert Original Time Stamp

This command moves all selected clips back to their original SMPTE time position.

[Track view] Clips > Set Snap Offset to Now Time

This command sets the snap offset at the Now Time. A snap offset is a value, in samples, at which the Snap Grid uses to align the clip. Clips without a snap offset always align at the very beginning of a clip. For more information, see "Snap offsets" on page 357.

[Track view] Clips > Select All Siblings

This command selects all clips that are linked to the selected clip.

[Track view] Clips > Unlink

This command opens the "Unlink Clips dialog" on page 1767.

[Track view] Clips > Unlink Step Sequencer Clips

This command unlinks the selected step sequencer clips, allowing each clip to be edited separately from each other.

See:

"To unlink copied Step Sequencer clips" on page 1831

[Track view] Clips > Convert MIDI Clip(s) to Step Sequencer

This command lets you convert any selected MIDI clip to a step sequencer clip.

See:

"To convert a MIDI clip(s) to a Step Sequencer clip(s)" on page 1830

[Track view] Clips > Convert MIDI Controllers to Envelopes

This command opens the "Convert MIDI To Shapes dialog" on page 1584. This command lets you convert a controller envelope created in the Piano Roll view to a Track view envelope.

> **Note:** *If two clips overlap, the command converts the controller envelopes in both clips, in whatever parts of the clips lie in the selected time range.*

For step-by-step instructions, see "Converting MIDI controllers to envelopes" on page 1034.

Show Notes

Show or hide Note events in the Piano Roll view.

Show Velocity

Show or hide velocity tails in the Piano Roll view.

Show/Hide Velocity Tails

Show or hide the velocity tails on MIDI notes in all tracks that are using Drum Maps.

Show Velocity on Selected Notes Only

This option lets you show velocities for selected Note events only. This makes it easier to see and edit velocities when many Note events are present. It also makes it easier to change the velocity for individual Note events that are stacked (such as chords).

Show All Controllers

Show all controllers in all displayed tracks.

[Track view] MIDI > Select Controllers Along With Notes

When **Select Controllers Along with Notes** is enabled, selecting a Note event or a range of Note events will also automatically select any Controller events that exist within the time range of the Note event(s).

See:

Show Controller Handles

Show or hide edit handles on controller events.

Show Clip Outlines

Show or hide the outline(s) of the clip(s) you're looking at in the Piano Roll view.

Hide Muted Clips

By default, events in muted MIDI clips are shown in the Piano Roll view. SONAR provides an option to exclude muted clips from displaying in the Piano Roll view.

[Track view] V-Vocal > Create V-Vocal Clip

This command creates a V-Vocal clip on top of selected audio data.

For more information about V-Vocal clips, see "V-Vocal clips (Producer and Studio only)" on page 898.

[Track view] V-Vocal > Remove V-Vocal

This command removes the V-Vocal processor from the V-Vocal clip.

For more information about V-Vocal clips, see "V-Vocal clips (Producer and Studio only)" on page 898.

[Track view] V-Vocal > V-Vocal Editor

This command opens the V-Vocal interface.

V-Vocal is a vocal processor that corrects pitch, formants, timing, and can add vibrato.

For more information about V-Vocal clips, see "V-Vocal clips (Producer and Studio only)" on page 898.

[Track view] V-Vocal > Bypass/Unbypass

This command bypasses or unbypasses all selected V-Vocal clips.

For more information about V-Vocal clips, see "V-Vocal clips (Producer and Studio only)" on page 898.

[Track view] V-Vocal > Bypass all V-Vocal Clips

This command bypasses or unbypasses all V-Vocal clips in the project.

For more information about V-Vocal clips, see "V-Vocal clips (Producer and Studio only)" on page 898.

Save as groove

This command opens the **Define Groove** dialog box, which lets you save the groove to a file. The groove can then be applied to other audio or MIDI clips.

See:

"To Groove Quantize an audio clip" on page 626

"AudioSnap (Producer and Studio only)" on page 589

Copy as MIDI

This command copies the selected audio clip's beats to the Clipboard as MIDI notes, which you can paste into a MIDI track. You select the MIDI note that the transients in the audio clip will be converted to in the **AudioSnap Options** dialog box, which opens when you click the **Options** button in the AudioSnap palette.

See:

"To extract MIDI timing from an audio clip" on page 633

"AudioSnap (Producer and Studio only)" on page 589

Set project tempo from clip

This command copies the clip's tempo map to the project's global tempo map. This allows the project's measure boundaries to align with the audio clip. Whenever the project's tempo map is generated from a clip, the clip's **Lock Position** property is enabled automatically.

See:

"Synchronizing audio and the project tempo" on page 610

"AudioSnap (Producer and Studio only)" on page 589

Clip follows project tempo

This command forces the selected audio clips to follow the project's global tempo map.

See:

"Synchronizing audio and the project tempo" on page 610

"AudioSnap (Producer and Studio only)" on page 589

Edit clip tempo map

This command shows/hides controls that allow you to edit a clip's tempo map.

See:

"Editing a clip's tempo map" on page 613

"AudioSnap (Producer and Studio only)" on page 589

Show/Hide Track Pane

Use this command to show or hide the Track pane.

[Piano Roll] View > Show/Hide Controller Pane

Use this command to show or hide the Controller pane in the Piano Roll view.

[Piano Roll] View > Show/Hide Drum Pane

Use this command to show or hide the Drum pane in the Piano Roll view.

[Piano Roll] View > Show Vertical Gridlines

Use this command to show or hide vertical grid lines in the Piano Roll view.

[Piano Roll] View > Grid Resolution > Quarter

The **Quarter** option creates grid lines in the Drum Grid pane at quarter note intervals.

[Piano Roll] View > Grid Resolution > Quarter Triplet

The **Quarter Triplet** option creates grid lines in the Drum Grid pane at quarter note triplet intervals (three lines per half note).

[Piano Roll] View > Grid Resolution > Eight

The **Eighth** option creates grid lines in the Drum Grid pane at eighth note intervals.

[Piano Roll] View > Grid Resolution > Eight Triplet

The **Eighth Triplet** option creates grid lines in the Drum Grid pane at eighth note triplet intervals (three lines per quarter note).

[Piano Roll] View > Grid Resolution > Sixteenth

The **Sixteenth** option creates grid lines in the Drum Grid pane at sixteenth note intervals.

[Piano Roll] View > Grid Resolution > Sixteenth Triplet

The **Sixteenth Triplet** option creates grid lines in the Drum Grid pane at sixteenth note triplet intervals (three lines per eighth note).

[Piano Roll] View > Grid Resolution > 32nd

The **32nd** option creates grid lines in the Drum Grid pane at 32nd note intervals.

[Piano Roll] View > Grid Resolution > 32nd Triplet

The **32nd Triplet** option creates grid lines in the Drum Grid pane at 16th note triplet intervals (three lines per 32nd note).

[Piano Roll] View > Grid Resolution > 64th

The **64th** option creates grid lines in the Drum Grid pane at 64th note intervals.

[Piano Roll] View > Grid Resolution > Follow snap settings

The **Follow Snap settings** option sets the grid lines to match the current Snap to Grid setting.

Pick Tracks

This command opens the **Pick Tracks** dialog box, which lets you choose the tracks to display.

Show Next Track(s)

This command displays the next track or group of tracks.

Show Previous Track(s)

This command displays the previous track or group of tracks.

Show All Tracks

Show all tracks that are open in the current view.

Hide All Tracks

Hide all tracks that are open in the current view.

Invert Tracks

Invert the visibility state of all tracks that are open in the current view.

[Staff view] Print > Export to ASCII Tab

This command opens the "Save As dialog" on page 1749, where you can set the name and location for an ASCII text file of a track's tablature.

[Staff view] Print > Export to MusicXML

This command opens the "Save As dialog" on page 1749, where you can export the displayed notation as MusicXML. For details, see "Export to MusicXML (Producer only)" on page 1107.

See:

"Export to MusicXML (Producer only)" on page 1107

[Staff view] Edit > Layout

Opens the **Staff View Layout** dialog box.

[Staff view] Edit > Quick TAB

SONAR quickly creates a tablature based on standard fingering patterns. After you try the quick version, you can customize the tablature to your liking.

For details, see "Quick TAB" on page 1099.

[Staff view] Edit > Regenerate TAB

The **Regenerate TAB** command generates a new TAB staff in the Staff pane.

For details, see "Regenerate TAB" on page 1099.

[Staff view] Edit > Play Previous

Clicking this button plays the previous note from the Now time.

[Staff view] Edit > Play Next

Clicking this button plays the next note from the Now time.

[Staff view] View > Show/Hide Fret Pane

Show or hide the guitar fretboard display.

[Staff view] View > Display Resolution > 1/4

This option sets quarter notes as the smallest note duration that will display in the Staff view. Any note events that are smaller than a quarter note will automatically display as a quarter note.

[Staff view] View > Display Resolution > 1/8

This option sets eighth notes as the smallest note duration that will display in the Staff view. Any note events that are smaller than an eighth note will automatically display as an eighth note.

[Staff view] View > Display Resolution > 1/16

This option sets sixteenth notes as the smallest note duration that will display in the Staff view. Any note events that are smaller than a sixteenth note will automatically display as a sixteenth note.

[Staff view] View > Display Resolution > 1/32

This option sets 32nd notes as the smallest note duration that will display in the Staff view. Any note events that are smaller than a 32nd note will automatically display as a 32nd note.

[Staff view] View > Fill Durations

Visually rounds up notes to the next note or beat, whichever comes first—useful for displaying recorded MIDI notes, but not for entering notes with the Draw tool.

[Staff view] Edit > Trim Durations

Visually rounds down note durations if they extend a little past the start of the next note—useful for displaying recorded MIDI notes, but not for entering notes with the Draw tool.

[Console view] Strips > Tracks

Show/hide tracks.

[Console view] Strips > Buses

Show/hide buses.

[Console view] Strips > Mains

Show/hide mains.

[Console view] Strips > Audio

Show/hide audio tracks.

[Console view] Strips > MIDI

Show/hide MIDI tracks.

[Console view] Strips > Instrument

Show/hide Instrument tracks.

[Console view] Strips > Muted

Show/hide muted tracks.

[Console view] Strips > Archived

Show/hide archived tracks.

[Console view] Strips > Frozen

Show/hide frozen tracks.

[Console view] Strips > Widen All Strips

Show wide channel strips.

[Console view] Strips > Narrow All Strips

Show narrow channel strips.

[Event List view] View > Event Manager

To open the "Event Manager dialog" on page 1596:

• Right-click in the Event List view and choose **Event Manager** from the pop-up menu.
  OR

• Click the Event List view **View** menu and choose **Event Manager**.

In the Event Manager you select which types of event to display in the Event List view. Check the events you want to see in the Events List view.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Notes

This option shows or hides all note events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Key Aftertouch

This option shows or hides all key aftertouch events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Controller

This option shows or hides all controller events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Patch Change

This option shows or hides all patch change events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Channel Aftertouch

This option shows or hides all channel aftertouch events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Pitch Wheel

This option shows or hides all pitch wheel events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > RPN

This option shows or hides all RPN events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > NRPN

This option shows or hides all NRPN events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Sysx Bank

This option shows or hides all Sysx banks.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Sysx Data

This option shows or hides all Sysx data.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Text

This option shows or hides all text events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Lyrics

This option shows or hides all lyric events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > MCI

This option shows or hides all MCI commands.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Audio

This option shows or hides all audio clips.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Shape

This option shows or hides all automation shapes.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Expression

This option shows or hides all expression events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Hairpin

This option shows or hides all hairpin events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] View > Chords

This option shows or hides all chord events.

For more information about the Event List view, see "Event List view" on page 1832.

[Event List view] Tracks > Show cropped

This option allows you to show or hide events that are outside of slip-edited clip boundaries.

[Lyrics view] Fonts > Font A

Selects the first font. By default, this is a small font useful for editing.

[Lyrics view] Fonts > Font B

Selects the second font. By default, this is a larger font useful for reading lyrics at a distance.

[Lyrics view] Fonts > Fonts

Opens the **Font** dialog box where you can select a font. The selected font is then assigned as Font A or B (depending on which is currently selected).

[Lyrics view] Fonts > Hyphenate

Hyphenates the selected text in the Lyrics view. If you do not select any text, all the lyrics will be hyphenated.

[Lyrics view] Tracks > Pick Track

This command opens the **Pick Track** dialog box, which lets you choose which track to display in the Lyrics view.

[Sysx view] File > Open

Load a .syx file into the selected Sysx bank.

[Sysx view] File > Send

Transmit the current bank's System Exclusive message. If nothing seems to happen, make sure you have correctly set the output. This command is disabled if the current bank is empty.

[Sysx view] File > Send All

Transmit all non-empty Sysx banks.

[Sysx view] File > Receive

Dump data from a synthesizer into the selected Sysx bank. If the bank contains data, SONAR asks you whether you want the new data to overwrite the existing data or be appended to it.

When receiving dumps, remember to connect both the MIDI In and Out ports of the synthesizer to the MIDI interface. Also, make sure that your instruments are set up to receive and/or transmit Sysx. Synthesizers that you normally use only to play sounds—for example, sound modules that don't have keyboards—don't need to be hooked up in both directions except for receiving dumps, so it is easy to forget this. (If you will only be *sending* Sysx messages to the device, the normal one-direction hookup is sufficient.).

[Sysx view] File > Save

Save the selected Sysx bank as a .syx file. This is a good way to copy a Sysx bank between two SONAR project files. Save the bank into a file, load the other SONAR project file, then load the bank again. This is also a good way to copy one bank to another in the *same* project file.

[Sysx view] File > Clear

Delete the selected Sysx bank.

[Sysx view] Edit > Edit Data

Although SONAR's Sysx features are designed mainly to store System Exclusive data for you, you can edit the bytes of shorter messages in hex format (many of the more popular synthesizers have special patch-editing programs available that let you edit data using sliders and other tools rather than raw hex data).

When you select a bank and choose the **Edit Data** command, SONAR converts the binary data into a text representation and pops up the **Edit System Exclusive Bytes** dialog box, in which you can edit the text. If you make changes and click **OK** to keep them, SONAR tries to convert the text back into binary format. You'll get an error message if the text does not begin with an F0 and end with an F7, which are the System Exclusive begin and end bytes.

SONAR may not be able to convert the data to text format. The text representation requires three to four times more memory than the data itself, and the **Edit System Exclusive Bytes** dialog box can contain roughly as much text as *Notepad*.

[Sysx view] Edit > Name

Enter a descriptive name for the selected Sysx bank. Names are saved only in .cwp and .cwb files.

[Sysx view] Settings > Auto Send on/off

Automatically transmit the selected bank every time SONAR loads the project file. You might use this option for banks that contain System Exclusive messages that load a set of sounds for a synthesizer at or before the start of a project.

Before transmitting, SONAR asks your permission. This is a safety feature for loading a file you have received from someone else; if it happens to contain data for your synthesizer(s), you might lose your patches and configuration information. However, if you don't want to be asked, go to **Edit > Preferences > File - Advanced** and clear the **Ask Before Sending System Exclusive (When Opening Projects)** check box.

[Sysx view] Settings > Output

Specify the MIDI output port to transmit the selected Sysx bank on.

Left Click Positions Rectangle

When **Left Click Positions Rectangle** is selected, clicking in the Navigator view re-positions the track rectangle.

See:

"Using the Navigator view" on page 332

Horz Zoom Level 1

The **Horz Zoom Level 1** command selects horizontal zoom level 1 in the Navigator view.

See:

"Using the Navigator view" on page 332

Horz Zoom Level 2

The **Horz Zoom Level 2** command selects horizontal zoom level 2 in the Navigator view.

See:

"Using the Navigator view" on page 332

Horz Zoom Level 3

The **Horz Zoom Level 3** command selects horizontal zoom level 3 in the Navigator view.

See:

"Using the Navigator view" on page 332

Horz Zoom Level 4

The **Horz Zoom Level 4** command selects horizontal zoom level 4 in the Navigator view.

See:
"Using the Navigator view" on page 332

Horz Zoom Level 5

The **Horz Zoom Level 5** command selects horizontal zoom level 5 in the Navigator view.

See:
"Using the Navigator view" on page 332

Horz Zoom to Project

The **Horz Zoom to Project** command shows the entire project in the Navigator view.

See:
"Using the Navigator view" on page 332

Track Height Short

The **Track Height Short** command makes track heights appear short in the Navigator view.

See:
"Using the Navigator view" on page 332

Track Height Medium

The **Track Height Short** command makes track heights appear medium size in the Navigator view.

See:

"Using the Navigator view" on page 332

Track Height Tall

The **Track Height Short** command makes track heights appear tall in the Navigator view.

See:

"Using the Navigator view" on page 332

Insert Module

The **Insert Module** command inserts a new module in the channel's ProChannel.

See:

"To insert a module" on page 966

Remove Module

The **Remove Module** command removes the selected ProChannel module.

See:

"To remove a module" on page 967

Replace Module

The **Replace Module** command lets you replace the selected ProChannel module with another module.

See:

Post-FX bin

The **Post-FX Bin** toggle switches the ProChannel's signal from prior to the channel's effects bin or after the channel's effects bin.

See:

Set Modules as Default for Tracks

The **Set Modules as Default for Tracks** command stores the current ProChannel configuration as the default for new tracks.

See:

Set Modules as Default for Buses

The **Set Modules as Default for Buses** command stores the current ProChannel configuration as the default for new buses.

See:

Add knob

The **Add knob** command adds a new assignable knob in the FX Chain's property page.

See:

"To add/remove an assignable knob or button (Producer only)" on page 890

Add button

The **Add button** command adds a new assignable button in the FX Chain's property page.

See:

"To add/remove an assignable knob or button (Producer only)" on page 890

Edit control

The **Edit control** command opens the **Control Properties** dialog box, which lets you configure the selected control.

See:

"To customize an assignable control (Producer only)" on page 890

"To map an assignable knob or button to a plug-in parameter (Producer only)" on page 892

Remove control

The **Remove control** command removes the selected assignable control.

See:

"To add/remove an assignable knob or button (Producer only)" on page 890

Write Enable Automation

The **Write Enable Automation** command toggles the automation write state for the FX Chain knob or button.

See:

Set Default Value

The **Set Default Value** command sets the default value for the FX Chain knob or button. When you double-click the knob or button, it returns to its default value.

See:

All Parameters - Set Start

The **All Parameters - Set Start** command sets the Start value for all plug-in parameters assigned to the FX Chain knob or button. The values are determined by the current position of each plug-in's property page settings.

See:

All Parameters - Set End

The **All Parameters - Set End** command sets the End value for all plug-in parameters assigned to the FX Chain knob or button. The values are determined by the current position of each plug-in's property page settings.

See:

Learn Knobs

The **Learn Knobs** command puts the FX Chain into a learning mode and will 'listen' to controls touched on the plug-ins in the FX Chain. When you select **Learn Knobs** again, the touched controls are assigned and displayed in the FX Chain property page. Learn mode is automatically ended if the limit of 6 knobs is reached.

See:

"To add/remove an assignable knob or button (Producer only)" on page 890

"To map an assignable knob or button to a plug-in parameter (Producer only)" on page 892

Learn Buttons

The **Learn Buttons** command puts the FX Chain into a learning mode and will 'listen' to controls touched on the plug-ins in the FX Chain. When you select **Learn Buttons** again, the touched controls are assigned and displayed in the FX Chain property page. Learn mode is automatically ended if the limit of 6 buttons is reached.

See:

"To add/remove an assignable knob or button (Producer only)" on page 890

"To map an assignable knob or button to a plug-in parameter (Producer only)" on page 892

Customize UI

The **Customize UI** command opens the **Settings** dialog box, which lets you configure the appearance of the FX Chain property page.

See:

"Customizing the FX Chain UI (Producer and Studio only)" on page 893

Customize UI

Beginner's guide to Cakewalk software

If you have little or no experience using music software to play and record music, this guide is for you. This guide explains the terms and concepts you need to know to use music software. You can get much more help in every Cakewalk program by using the **Help** menu, or by pressing F1 when you have any view or dialog box open. All Cakewalk programs have very basic tutorials in the online Help that cover recording and playback. To view these tutorials, open the **Help** menu, click **Help Topics**, and look for topics called **Getting Started** or **Tutorials**.

Note: *The graphics in this document are from different varieties of Cakewalk software, including older versions.*

The basic way that you use a computer to record and play sound is this: your computer has a circuit board in it called a *sound card*, which converts the sound from an electric instrument or microphone into a long string of numbers, which a computer stores and then converts back into sound when you want to play the recording. Almost every computer comes with a sound card which is good enough to make very good, but not fully professional-level recordings.

The sound card has inputs and outputs on it, which you can see by looking at the back of your computer.
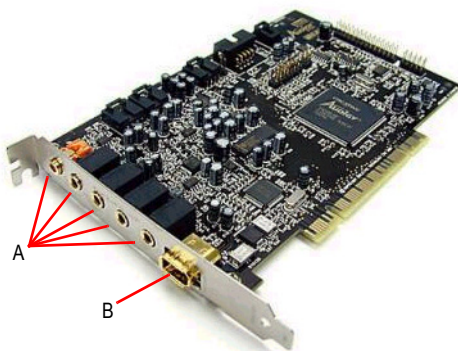
A. Inputs and outputs B. Joystick port

To record, for example, an electric guitar into the computer, you plug one end of your guitar cable into your guitar, and plug the other end into the Line input of your sound card. Then you would click the **Record** button in your Cakewalk software, start playing your instrument, and then click the **Stop** button (or press the SPACEBAR). The Line input has a little icon next to it, which is very hard to recognize, so it usually helps to look at the documentation that came with your sound card or computer. A guitar cable has a plug on it that is 1/4 inch wide (diameter), and the Line input on low-priced sound cards is 1/8 inch wide. You need to connect your guitar cable to a 1/8 inch adapter in order to plug it into most sound cards. These adapters are inexpensive and are available at most electronics supply stores.

1/4 inch to 1/8 inch adapter

If you want to record an acoustic instrument or vocal, you would use a microphone. You connect the microphone's cable to the adapter and plug the adapter into the Mic input of the sound card. You can get a better sound, however, by plugging the microphone cable into a preamp, or a mixer with a preamp, and plugging the outputs of the mixer or preamp into the Line input of the sound card, instead of the Mic input. You would then need an adapter to connect the two outputs (left and right) of the mixer or preamp to the 1/8 inch Line input. Ask the store where you buy your preamp or mixer what kind of adapter you need to connect to a sound card that has 1/8 inch inputs.

Professional-quality sound cards do not use 1/8 inch inputs, so you do not need one of these adapters to use a professional-grade sound card.

To play back the music, you need to connect powered speakers or headphones to the output of the sound card, which on new computers is usually painted green. Then you click the **Rewind** button (or press **w**) in your Cakewalk software, and then click the **Play** button (or press the SPACEBAR) to play back what you recorded.

Music software uses two different formats to play and record sound—"MIDI" on page 1541 and "Audio" on page 1549. Knowing the differences between the two formats is essential for using most music software. However, some Cakewalk programs, such as Guitar Tracks Pro, do not use MIDI.

For more information, see:

MIDI

Besides introducing MIDI in this section, we'll explain the following MIDI topics:

Short for Musical Instrument Digital Interface, MIDI is a system that lets an electronic instrument or computer control other instruments. MIDI is largely a set of commands, called MIDI messages, that cause an electronic instrument to play specific sounds at specific times, and also to play those sounds in the style that you dictate. A MIDI instrument functions very much like a player piano, only instead of using a roll of paper with holes punched in it, a MIDI instrument needs a software program or other MIDI instrument to turn its notes on and off. When you record MIDI, you don't record the sound of the instrument you're recording—you record the commands that play that instrument in the way you want it to be played. For example, when you press a key on a MIDI keyboard while your Cakewalk software is recording, the software just records the fact that a certain note was pressed and then released—the software doesn't record the actual sound of the note. When you play back the recording, the software takes control of your MIDI instrument and turns the note on and then off at the same time in the song that you did. MIDI notes can be read and displayed by a music notation program. Digital audio, the sound format used by CDs, Wave files, and MP3s, can not. After you record your MIDI data you can use Cakewalk to convert the MIDI data into digital audio so that you can create CDs, MP3s, or Windows Media files.

MIDI has advantages and disadvantages when compared to digital audio. MIDI files are much smaller than audio files, since MIDI data is only made up of the commands to play instruments, instead of the actual sound of the instruments themselves. You can usually copy one or more MIDI files onto a floppy disk. You can easily email MIDI files. You can save a MIDI file in a format called a Standard MIDI File, and then open it and use it in many different programs. You can record MIDI music as slowly as you want, and then change the tempo in your software to play it back at any tempo you want. Audio files, however, can only play back at approximately the same tempo they were recorded at without drastically altering the sound quality. It's easy to edit and transpose MIDI files, since they are so small and you're just editing commands, not actual sound. MIDI files can be printed out as standard musical notation or lead sheets. It can be harder to make MIDI music sound as natural as audio. If you don't record MIDI music in real time, it can sound mechanical. Some MIDI instruments, especially some of the acoustic-sounding instruments such as brass, strings, and guitars that you find on the built-in synthesizers of low-priced sound cards, sound artificial. However, percussive sounds usually sound quite good on MIDI instruments, and are much easier to record than a real drum set. You can also play back MIDI data through any number of hardware or software samplers that use recordings (samples) of any instrument you can imagine as sound sources.

For more information, see:

MIDI channels, interfaces, inputs, and outputs

Most MIDI instruments can play at least 16 different sounds at the same time—instruments that can play more than one sound at a time are called **multi-timbral** (pronounced multi-*tambral*). In order to control which sounds respond to which commands, MIDI messages are marked with a channel number from 1 to 16. That way a MIDI sound module, such as a drum machine, can tell which messages are meant for which of the sounds it is capable of playing. Each instrument has a limit to the number of notes it can play at one time, counting all the notes it is playing on all the sounds it is using combined. That number is usually between 32 and 128, and is called **polyphony**.

You need some way to get MIDI messages into and out of your computer, so a MIDI system needs a piece of hardware called a **MIDI interface**, which can be a stand-alone module connected to your computer's parallel, serial, or USB port; an internal module installed in a slot inside your computer; or can be part of your sound card (the sound cards that come with most computers frequently use the joystick port as an input and output for MIDI data). Your computer sends MIDI messages to your MIDI interface, which then sends them on to your MIDI instruments. That's how MIDI software plays MIDI instruments. A MIDI interface contains inputs and outputs, labeled **MIDI IN** and **MIDI OUT**, which you connect MIDI cables to so you can send MIDI messages to and from MIDI instruments. MIDI instruments can be stand-alone synthesizers or can be built into your sound card. Most inexpensive sound cards have internal synthesizers that can make at least 128 different sounds (if you're using a synthesizer that's built into your sound card, you don't have to connect that to the sound card, since the connections are internal to the sound card).

Figure 454. *Joystick connector—use this if your MIDI interface is the joystick port on your sound card.*
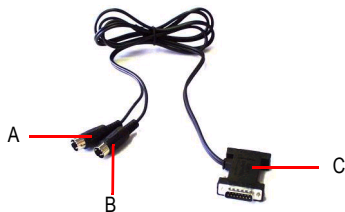
A. Insert this MIIDI IN plug into the MIDI OUT port on your MIDI instrument B. Insert this MIIDI OUT plug into the MIDI IN port on your MIDI instrument C. Insert this plug into the joystick port on your sound card

Figure 455. *Standard MIDI cable—use this if your MIDI interface has standard 5-pin input and output ports*
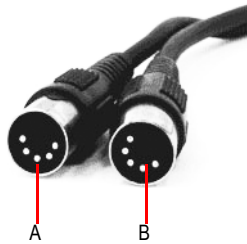
A. Connect one end to an OUT on your MIDI interface B. Connect the other end to an IN on your MIDI instrument

MIDI instruments have inputs and outputs labeled MIDI IN and MIDI OUT. You connect a MIDI cable from one of your MIDI interface's MIDI OUTs to a MIDI IN on an instrument. You also connect a MIDI cable from the MIDI OUT on one of your MIDI instruments to the MIDI IN on your MIDI interface. The instrument that you connect to the MIDI IN of your interface is called a **controller**, and typically has a piano-style keyboard for sending note on/off messages, pitch and modulation wheels, and perhaps some sliders on it for sending other MIDI messages to the interface. You can also get MIDI converter modules that turn guitars, drums, and other instruments into controllers. You can use a controller to record yourself playing in real time. When you play your controller, the MIDI messages go to the interface, then into your computer, and then back to the interface and to a specific MIDI instrument that's connected to the interface. You choose what instrument the messages come back to by using the software. This process of a computer sending back out the MIDI messages that it just received is called **echoing**. By using echoing, you can play one MIDI instrument, but cause other MIDI instruments to play. Your controller usually has a setting on it called **Local On/Off**. When your controller is connected to your interface, you need to set the Local On/Off setting to Local Off. That's because if your software is set to send MIDI messages back to your controller, when you play a note on your controller, it is sent to the computer, and then back to the controller again through its MIDI IN, causing it to play **two notes every time you play one note** on it. When your controller is set to Local Off, it won't play a note on the controller when you press a key, but only when the Note On message comes back from the computer, which happens instantaneously. Remember to set it back to Local On if you're going to use the controller separate from the computer.

MIDI instruments have a third port called a **MIDI THRU** port. This port passes through MIDI messages without changing them in any way. You can chain MIDI instruments together by connecting the MIDI THRU port on one MIDI instrument to the MIDI IN port on another instrument, with several instruments chained together that way. If you had a MIDI interface that had 8 outputs, and you chained 3 instruments together on each of those outputs by using the MIDI THRU ports, you would be able to play 24 instruments at one time.

For more information, see:

MIDI drivers

Your MIDI interface needs a driver to function. A driver is a small software program that controls input and output for a peripheral device. To use a MIDI interface in SONAR, you need to make sure that your interface's driver is installed, and that you have told SONAR to use it. That way, SONAR knows to use the driver and to list all of your interface's inputs and outputs in the proper menus. If your MIDI interface is part of your sound card, you probably installed its driver when you installed the sound card. You can check this in SONAR in **Edit > Preferences > MIDI - Devices**. In the **Outputs** list, see if the name of your MIDI interface is listed. It should be called something like **SB Live MIDI Out**. Make sure it is highlighted. In the Inputs list, you should see something like SB Live MIDI In. Make sure this is highlighted and click **OK**. If you don't see the name of your interface listed, you need to install its driver from the CD, floppy disk, or Web site that your interface's documentation recommends.

After you have installed the driver and restarted your computer, you need to **tell SONAR to use this** particular driver. Go to **Edit > Preferences > MIDI - Devices**. In the **Outputs** list, make sure that the name of your interface's driver is highlighted. If it isn't, click it to highlight it. If your interface has more than one output, make sure you highlight the names of all the outputs. The **order of the outputs** in the list determines what output numbers SONAR gives to each output. So even if an output on your interface has a label that says 1 or A, if it is not first in the list in the **Outputs** list, it will not be labeled 1 in SONAR. You can change the order in the list by temporarily deselecting all the outputs except the one you want to move to the top, and then clicking the **Move Selected Devices To Top** button that's at the bottom of the dialog box. Then make sure you reselect the other outputs you want to use.

For more information, see:

MIDI files, projects, tracks, and clips

In Cakewalk programs, the file that you use to store usually a single song's data is called a **project**. This is the file you use to record, play back, and edit your song. The file extension for a project is .wrk in older Cakewalk programs and .cwp in newer ones. Projects that use only the MIDI format (no digital audio) can be saved in a format called a **Standard MIDI File**, and can then be played back in any program or machine that plays MIDI files. These files have the extension .mid.

The MIDI messages within a project are usually separated into smaller containers called **tracks**, and even smaller containers called **clips**, which are sections of a track. You usually use tracks to separate the MIDI messages that are intended to play one kind of sound from the MIDI messages that play other sounds. You usually assign each track to its own MIDI channel. A typical MIDI project might have separate tracks for drums, bass, and piano. In this example, you might assign the bass track to Channel 2, and the piano track to Channel 5. Then you would set your MIDI sound module to play a bass sound on Channel 2, and a piano sound on Channel 5. Instead of manually setting your MIDI modules to play these sounds, you can send Program Change messages to tell your sound module what sounds to play on what channels (see "Controlling which sounds you hear" on page 1547). You usually assign drum tracks to Channel 10. Because you stored the MIDI messages that are assigned to each sound on separate tracks, you can then control and edit the stored MIDI messages that go to one sound without changing the messages that are sent to other sounds.

Figure 456. *Track view*
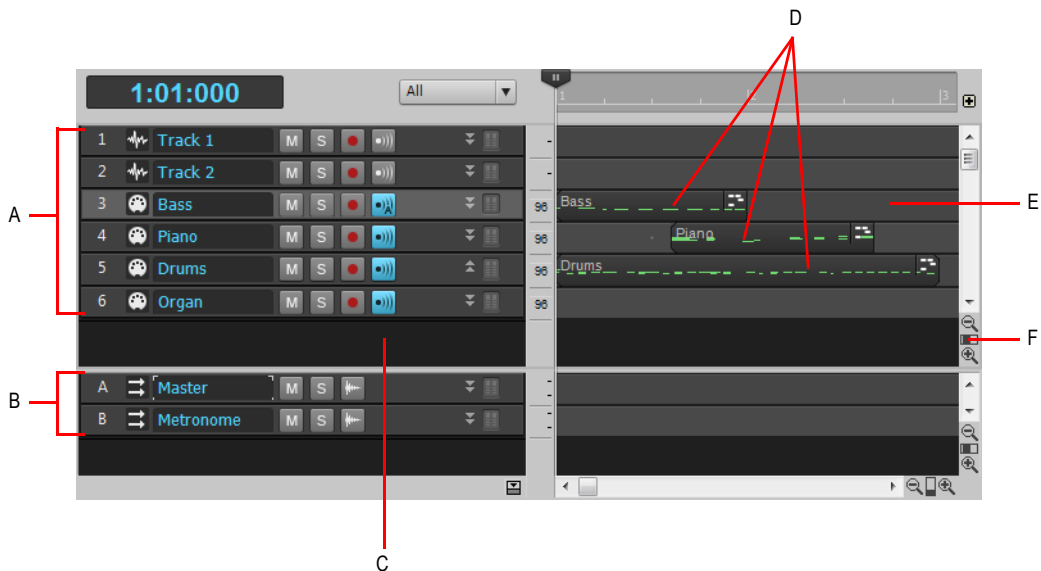
A. Tracks 1 through 6 B. Buses C. Track pane D. MIDI messages recorded in Tracks 3,4, and 5 E. Clips pane F. Vertical Zoom fader—drag to change track height

Notice that when you record any data into a track, that SONAR displays a visual representation of the track's data in the Clips pane. In the above picture, Tracks 1, 2, and 6 are still empty, while

Tracks 3, 4, and 5 contain recorded data. Also notice that Track 3 is a different color from the other tracks, meaning that it has the **focus**, and will make the bass sound when you play your MIDI keyboard (controller). If you click one of the other MIDI tracks to change the focus, the sound that's selected for that track will sound when you play your controller.

Figure 457. *Track 3 zoomed in to expose track property fields*
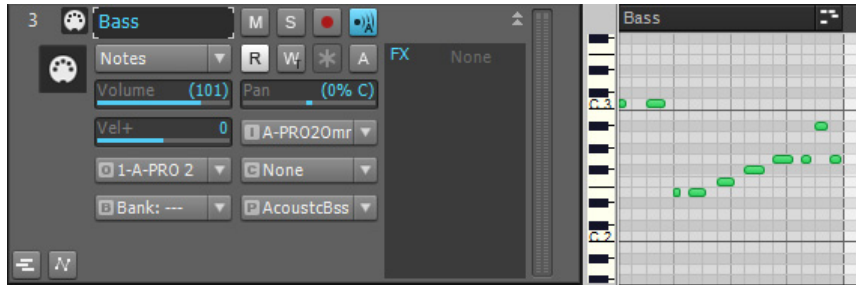
In the above picture, we zoomed in far enough by dragging the Vertical Zoom fader (see previous picture) to expose the track property fields for each track. Use these to **choose what MIDI channel** each track is sending its messages out on, what sound (patch) the track is sending the messages to, how loud the overall track volume is, what MIDI instrument you're sending the track's data to, and several other property choices. Notice that the track's number and its MIDI channel are not the same. **Track numbers and MIDI channels have nothing to do with each other**, although you may want to keep them the same in a small project to make remembering them easier. We could have sent Track 3's MIDI messages out on any channel we wanted, just by selecting a different number in the **Ch** field. Notice the MIDI cable logo just in front of the track name; the audio track above it has a different logo to identify it as an audio track. The audio track has different track property fields from the MIDI track (notice there's no **Ch** field).

For more information, see:

Controlling which sounds you hear

Because each MIDI instrument can probably play many different sounds at the same time, you need a way to tell each instrument which tracks are meant for which sounds. You do this by assigning a MIDI channel to each track, and by assigning a specific sound, called a **patch** or **program**, to each track.

Because there are only 16 MIDI channels, and each instrument can probably play 16 different sounds at the same time, you need a way to **create more MIDI channels** to make sure that instruments play only the notes that are specifically meant for them. The way a MIDI program gets around this limitation is by **assigning an output number** to each group of 16 MIDI channels. For example, if your MIDI interface has 8 outputs, you might set your first 16 tracks to use output 1, the next 16 tracks to use output 2, and so on. The MIDI messages on the first 16 tracks would only be sent out through the cable that comes out of the first output port, the messages from the next 16 tracks would only come out of output 2, and so on. So if your MIDI interface has 8 outputs, you effectively have 128 MIDI channels to work with. Of course, the way you choose what output you want to send a track's data out of is determined by what instrument is connected to that output. So, even if you only had a keyboard track and a drum track in your project, and your favorite keyboard instrument was connected to output 1 of your MIDI interface and your drum machine was connected to output 2, you would assign the keyboard track to use output 1 and the drum track to use output 2.

In the following figure, notice that the two tracks both use Channel 2. But these are not the same channel! The tracks are assigned to different outputs, so the MIDI messages in these two tracks will be sent to different instruments. The bass track will send its data out on Channel 2 of Output 2. The piano track will send its data out on Channel 2 of Output 1.
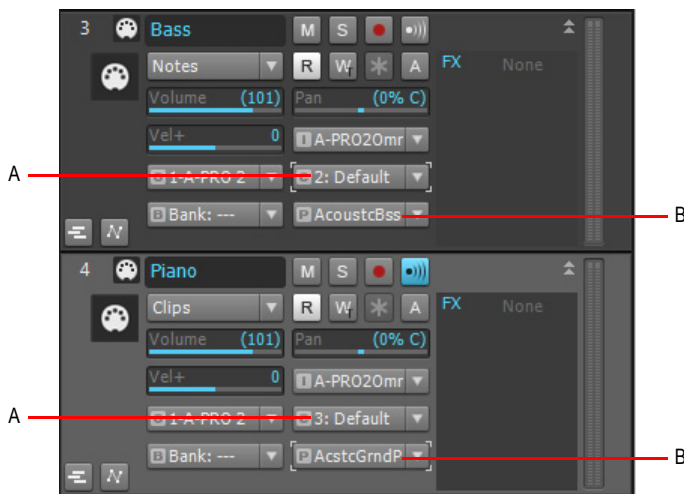
A. MIDI channel B. Output

If your interface only has one output, and you chain several instruments to that output by using the MIDI THRU ports on the instruments, you can use the individual instruments' own control panels to choose what MIDI channels they will respond to. That way, **an instrument can ignore** any notes or other messages that are meant for a different instrument on the chain. This setting is usually called **MIDI Receive**, and might be abbreviated on an instrument's control panel as MIDI RX.

Since most projects have several tracks in them, and each track is usually assigned to a different sound, how do you **control what sound you hear when you press a key** on your MIDI controller? In Cakewalk programs, one of your tracks is always highlighted, because it has the focus. Whatever track you click grabs the focus, and the sound that's selected for that track will sound when you play your keyboard.

For more information, see:

Audio

The audio format works by converting any sound that's recorded into a long series of numbers, storing and usually editing the numbers, and then converting the numbers back into sound.

When you record sound using this format, the microphone you use causes the voltage in its cable to change rapidly as the mic's diaphragm vibrates. These rapid changes in voltage are measured and recorded by an **analog-to-digital converter**, and these measurements make up what we call digital audio. To convert digital audio back into sound, a **digital-to-analog converter** uses the stored numbers to cause the voltage in a cable to change rapidly, and this voltage then moves the diaphragm in a loudspeaker in a similar way to the way that the microphone's diaphragm moved originally (unless the numbers have been edited to produce a more desirable sound). These converters, commonly referred to as A to D or A/D, and D to A or D/A, are part of your computer's sound card. Better sound cards usually keep their converters in a separate box that's not in the computer itself, because the computer's fan and disk drives add noise to the sound card's signal.

Digital audio works like cartoon animation. In a cartoon, a series of still photographs is displayed rapidly in sequence to make it look as if the objects in the photographs are moving. When digital audio is converted back into sound, the voltage is changed at regular intervals to simulate continuous sound. To make high-quality sound, the original voltage during recording has to be measured, or "sampled," at rapid enough intervals to fool your ears into hearing continuous sound. Audio CDs use a sampling rate of 44,100 per second. To store and edit so many numbers places a big load on most PCs, much bigger than the processing of MIDI data causes.

For more information, see:

Audio playback in SONAR

To use digital audio in SONAR, you first have to make sure that your sound card and its driver are properly installed. For information about sound card and driver installation, see your sound card's documentation, and also "Audio hardware (sound cards) and drivers" on page 1564.

After you've successfully tested your sound card and driver, you should play back one of the sample files that came with your Cakewalk software.

To play back a sample file, use the **File > Open** command, navigate to a folder that has bundle files in it (they have the extension .bun or .cwb), select a bundle file, and click **Open**. After the file loads, make sure that your speakers are turned on, and play the file by pressing the SPACEBAR. You also can stop the file's playback by pressing the SPACEBAR again. You should hear something. You can rewind the file by pressing W, or by clicking the **Rewind** button 🔙 in the Control Bar.

If you don't hear anything, here are several steps to take:

Playback troubleshooting table

Possible problem	What to do
The volume setting is turned down on your software mixer, or wave playback is muted.	If your sound card only has one stereo output, your sound card probably responds to the Windows Mixer. If your sound card has more than one stereo output, it might not respond to the Windows Mixer—launch your sound card's own mixer software if it has it, and make sure all volume settings are turned up and nothing is muted. To open the Windows Mixer—double-click the **Speaker** icon that's on your Windows taskbar 🔊 to open the **Play Control** dialog box. If you don't see the Speaker icon on your taskbar, you can open the Windows Mixer by using the **Control Panel > Hardware and Sound > Volume Control** (Windows 7) command. Make sure that both the Wave Direct Sound slider and the Play Control slider are turned up, and that none of the **Mute** or **Mute All** check boxes at the bottom of the dialog box are checked.
Your speakers aren't connected properly, or the volume is turned down.	Make sure your speakers are on and the volume is turned up.
Your sound card isn't hooked up correctly.	Run the Microsoft Sound Recorder (**Start > Programs > Accessories > Entertainment > Sound Recorder**). Open any wave file and see if it plays sound correctly through your speakers. If not, check your sound card documentation to make sure it is properly installed and configured.

Table 256.

Possible problem	What to do
Your tracks' initial volume settings are too low, or the tracks are muted.	See "Track-by-track playback" on page 1554.
Your audio tracks are assigned to the wrong playback device.	Check the playback device assignment for an audio track by clicking the track's **Output** button or **Out** field. If the name of your sound card (the one you have connected to an amp and speakers) is not selected on the pop-up menu, select it. If it's not listed, go to **Edit > Preferences > Audio - Devices** and make sure the name of your sound card is selected in the **Output Drivers** list. Next, go to **Edit > Preferences > Audio - Driver Settings** and make sure the sound card is selected in the **Playback Timing Master** list. If you don't see anything resembling the name of your sound card, anywhere, see the next step.
SONAR doesn't recognize your sound card.	Go to **Edit > Preferences > Audio - Driver Settings** and click the **Wave Profiler** button to test your audio hardware. Then try playing the file again. **Note:** It is not necessary to run the Wave Profiler for a sound card using an ASIO driver.

Table 256.

For more information, see:

Tracks

A track is represented by a horizontal strip in the Track view that has a name and number on the left side (each track is also represented by a vertical module in the Console view). A track is a container you usually use to keep the sound from each instrument separate from the others—you usually keep the sound from each instrument on a separate track.

In the following picture, you can see the visual results of recording the first 3 notes of "Three Blind Mice" as audio in Track 1, and as MIDI in Track 2.
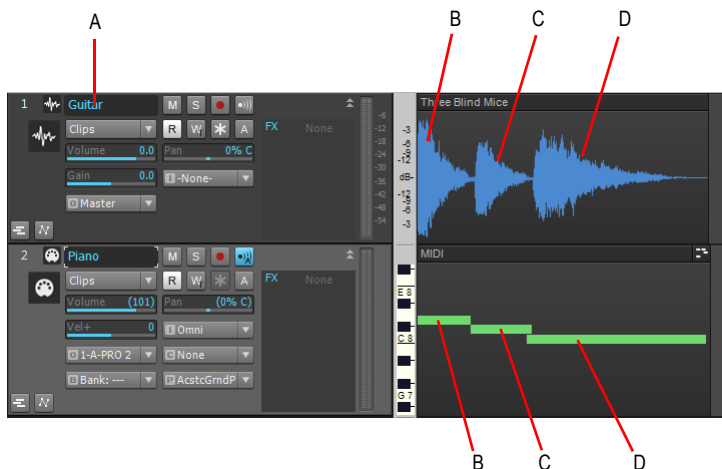
A. Name of Track 1 B. Three C. Blind C. Mice

Notice that the graph (or *picture*, SONAR stores these picture files in the Picture Cache folder in the Cakewalk Projects folder) of the audio data follows the natural decay in loudness of a sound after each note is struck. This is as expected since the pictures represent the actual sound that is recorded. The MIDI track's graph is much simpler, since it only represents commands to turn a certain note on for a certain time period, then turn another note on, etc. We zoomed in on these two tracks far enough to expose all the track property fields, such as Volume, Pan, Input, Output, etc. Notice the different logos left of the track names that distinguish audio tracks from MIDI tracks. Notice the data in the audio track's **Out** field: A. This is the name of the output driver that this particular sound card uses. If your sound card only has one pair of outputs (or one stereo output), you don't have to change anything in the **Out** field. SONAR fills it in automatically as soon as SONAR finishes running the Wave Profiler. If your sound card has more than one pair of outputs, or you have more than one sound card installed and enabled on your computer, you can use this field to choose what pair of outputs you want to hear a specific track played back through.

Note: *It is not necessary to run the Wave Profiler for a sound card using an ASIO driver.*

For more information, see:

Clips

A clip is a portion of the audio or MIDI data in a track that is bounded by a vertical line on each end of the clip. You can click a clip to select it—a selected clip becomes highlighted. After you select a clip, you can copy it, drag it to a new location, delete it, or use any command in the **Edit** menu to alter it. A clip can be any size. A clip that is an exact number of beats or measures and is suitable for repetition, such as a drum pattern, is frequently called a *loop*. Clips are also sometimes called *events*. A track can have no clips (no data at all), one clip (all the track's data is in one clip), or many clips. Having lots of clips in a track increases processing time for your computer.

In the following picture, the Split tool was used to separate the audio in Track 1 into three clips. You can activate the Split tool by pressing F8 on your keyboard, at which time the cursor turns into a small scissors icon. After you activate the Split tool, you can click the track data at the points where you want to split it into clips.
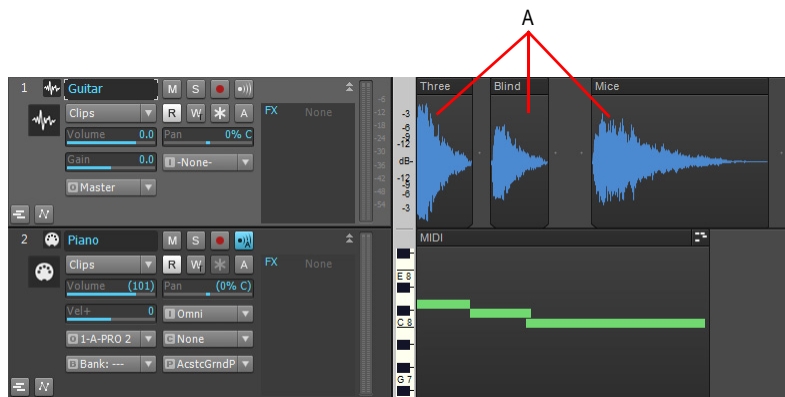
A. Clips

You can rearrange the sound in both audio and MIDI tracks by dragging and/or copying clips. The precision of the clips' movement is governed by the **Snap to Grid** button ⊞, which you can configure in the Control Bar's Snap module. Additional snap settings are available in **Edit > Preferences > Customization - Snap to Grid**. In the following picture, the clips in Track 1 have been moved around to reverse their order, so instead of the first three notes of Three Blind Mice, we now have Mice Blind Three.
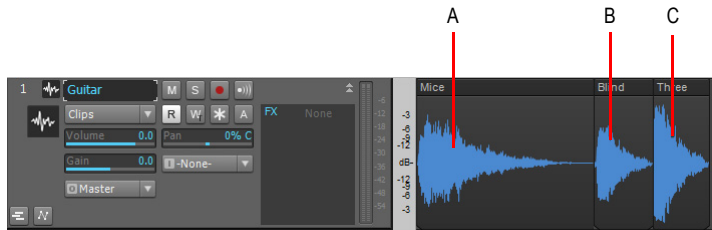
A. Mice B. Blind C. Three

For more information, see:

Track-by-track playback

You can change a track's volume by dragging its volume fader (see the following figure). You can silence a track by clicking its **Mute** button M (any button you click lights up when it's enabled). You can also silence all other tracks besides one if you click a track's **Solo** button S. You can click either of these buttons while a project is playing, and you can mute or solo as many tracks as you want. You can also silence a track by *archiving* it, but you have to stop playback to archive or un-archive a track. To archive or un-archive a track, click the track's **Archive** button A. Archiving a track removes its data from your computer's memory (RAM), freeing up more memory for other tracks that you may be working on.
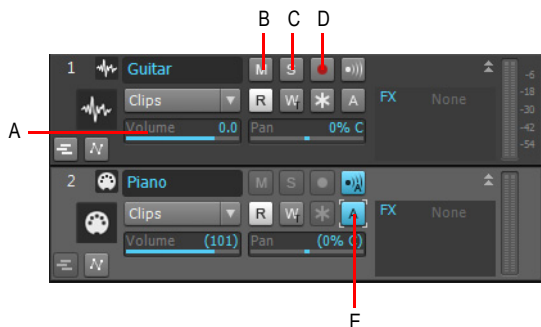
A. Track volume fader—drag left or right to change B. Mute button C. Solo button D. Arm button E. Archived track

The following table summarizes muting, soloing, and archiving.

Track status	What it means
Normal	The track plays unless one or more of your other tracks is soloed.
Muted	The track is not played, but you can turn it on while playback is in progress.
Archived	The track is not played, and you must stop playback to re-enable it. Archived tracks do not tax your CPU during playback so they can be used to store alternate takes.
Soloed	Only those tracks that are designated as solo tracks are played; all others are muted.

Table 257.

If a track is both muted and soloed, it does not play. Mute has precedence.

For more information, see:

Audio recording

If your sound card and driver are properly installed, recording audio data is mostly a matter of accomplishing two tasks:

• Connecting an instrument, home stereo, or microphone to an input on your sound card

• Choosing that same input in SONAR, your sound card's software, and/or Windows

For more information, see:

Connecting an instrument, home stereo, or microphone to your sound card

You need a cable with the correct plug on the end of it to connect an instrument or mic to your sound card. Low-priced sound cards usually have 1/8 inch analog jacks (inputs) marked Mic and Line, and might have a digital input marked S/PDIF. The Line input is the correct one for most electronic instruments such as electric guitars. The Mic input is calibrated to accept the input from microphones (however, you can usually get a better recorded sound by plugging a mic into a preamp or mixer with preamp, and plugging the preamp or mixer into the Line input). The S/PDIF input is the one to use for digital audio sources such as samplers and some CD players. Guitar cables usually have a 1/4 inch plug on the end, so to connect an electric guitar to a 1/8 inch jack, you need a 1/4 inch-to-1/8 inch adapter, which is readily available at electronics supply stores. If you're not sure what kind of inputs your sound card has, you can actually measure their width (diameter).

If you have a more professional-grade sound card, the input jacks will probably be 1/4 inch, and you might also have some XLR inputs for low-impedance microphones, and S/PDIF and possibly AES/EBU connections for digital input and output. If your microphone cable has an XLR plug on the end of it (an XLR plug has 3 pins sticking out of it), and your sound card only has 1/4 inch input jacks, you need to put an XLR-to-1/4 inch adapter on the end of your microphone cable.

The following table summarizes the possible sound card inputs, types of cables required, and the inputs to plug into.

Type of sound card inputs	Cables and adapters needed	Inputs to plug into
1/8 inch Mic and Line	For most electric instruments: 1/4 inch balanced cable connected to 1/4 inch-to-1/8 inch adapter. For mics that have an XLR plug on their cable: XLR-to-1/4 inch adapter connected to 1/4 inch-to-1/8 inch adapter.	Plug instruments into the Line input; plug microphones into the Mic input. Alternatively, plug mics into preamps, and plug preamps into Line inputs.
1/4 inch Left and Right	No adapter required for normal electric instrument cable. For mics that have an XLR plug on their cable: XLR-to-1/4 inch adapter.	Plug both instruments and mics into the Left or Right input of a pair of inputs. If your instrument has stereo pickups and a stereo cable, you can plug the cable into both the Left and Right inputs.
1/4 inch Left and Right, XLR Left and Right	No adapters required	Plug instruments into the 1/4 inch Left, Right, or both inputs. Plug a mic into the XLR Left or XLR Right input.
S/PDIF (Sony/Phillips Digital Interface)	No adapters required. Use a a 75 ohm coaxial video cable, or special S/PDIF cable. Do not use standard stereo component cables.	Connect your digital source (probably a sampler or CD player with digital outputs) to your sound card's S/PDIF input using a 75 ohm coaxial video cable, or special S/PDIF cable. See "To record through the S/PDIF input" on page 1563.

Table 258.

Electric guitar direct-in

You can connect an electric guitar directly to your sound card using a 1/4 inch mono to 1/8 inch stereo adapter. The following diagram shows this setup:

Figure 458. *Electric guitar direct in*
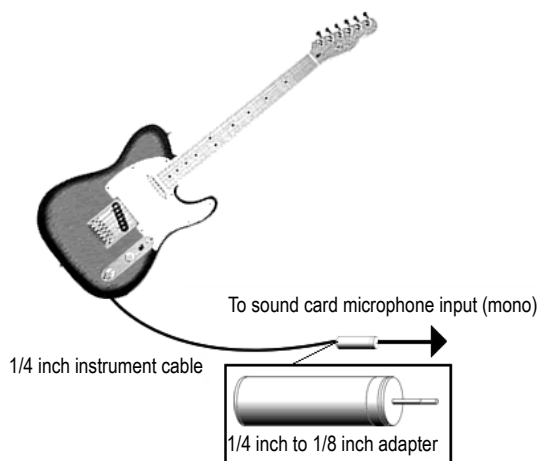
The 1/8 inch plug should be plugged into the sound card's Line input, although plugging into the Mic input will also work. If you use the Line input, make sure you have selected **Line-In** on the **Windows Record Control** dialog box (Windows Mixer). If you use the Mic input, select **Microphone**. To open the Windows Mixer—double-click the **Speaker** icon that's on your Windows taskbar 🔊 to open the **Play Control** dialog box. In the **Play Control** dialog box, use the **Options > Properties** command, select **Recording** (under **Adjust volume for**), make sure **Line-In** and **Microphone** are checked, and click **OK**. In the **Record Control** dialog box, click the **Select** check box in either the **Line-In** or **Microphone** column, make sure the sliders are in the upper half of their range, and click **OK**. If you don't see the Speaker icon on your taskbar, you can open the Windows Mixer by using the **Control Panel > Hardware and Sound > Volume Control** (Windows 7) command.

Electric guitar through effects rack

You can also plug an electric guitar into an effects rack, then send the output of the rack to the sound card's input, as shown in the following diagram:

Figure 459. *Electric guitar through effects rack*
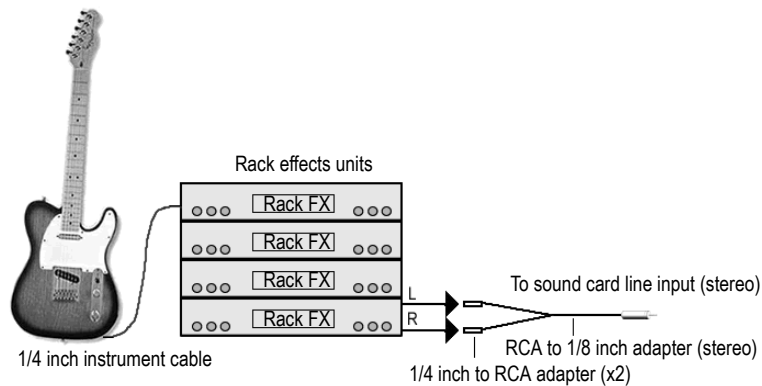
This diagram assumes that the output of the rack is at line level (consult your rack's documentation). If it is at pro level instead (+4 dB), and your sound card does not accept a +4 db input, you will need to attenuate (lower) the F/X rack's signal. To do this, use a mixer between the rack's output and the Y-adapter. If the rack has only a mono output, a 1/4 inch mono to 1/8 inch stereo adapter should be used instead of a Y-adapter.

If you want to connect a guitar amplifier's direct output to the sound card, you should base your setup on this example.

Microphone direct-in

Microphones can be plugged into the sound card's Mic input. Some inexpensive microphones are made especially for use with sound cards and come equipped with 1/8 inch plugs. However, better quality microphones take better quality cables, which do not terminate in 1/8 inch plugs. The following figure illustrates how to connect a microphone that terminates in a 1/4 inch plug to a 1/8 inch input:

Figure 460. *Microphone direct in*
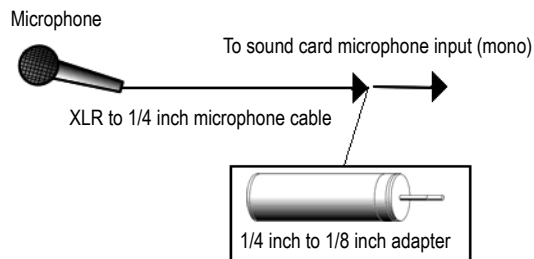
Home stereo, CD player, radio tuner, preamp output

The output of a stereo component can be connected to the sound card's Line input, using a dual RCA to 1/8 inch stereo mini Y-adapter. Many portable cassette players come with this kind of adapter, or even with a single cable with all the necessary plugs. In the following diagram, a stereo component is connected to the Y-adapter using standard RCA cables:

Figure 461. *Home stereo, CD player, radio tuner, preamp output*
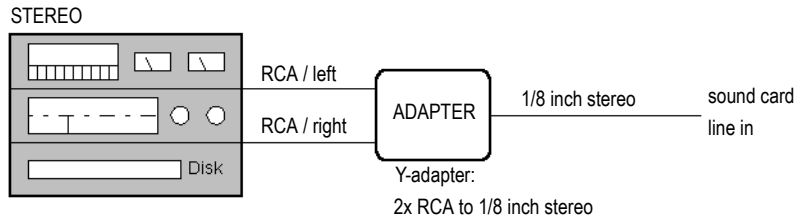
Internal CD player

If you are using your computer's internal CD player, and it does not have its audio output cable connected internally to the sound card, run a cable from the CD player's Headphone jack to the card's Line input. If there is no Headphone jack, you'll need to use an external CD player.

Mixer

You can connect a mixer to the sound card with a setup of the following kind:

Figure 462. *Mixer*
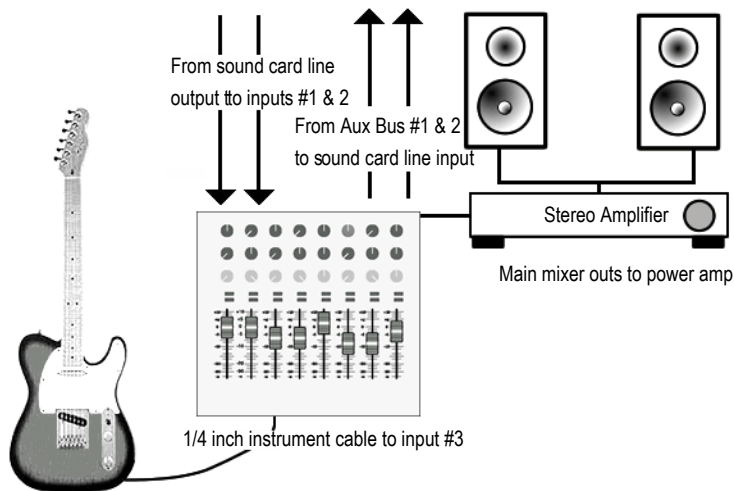
Let's trace the signal flow in the above picture:

1. Your pre-recorded tracks flow out of the sound card's outputs into mixer inputs #1 and 2.

2. Both the pre-recorded tracks and the live guitar's sound flow into the main mixer outs, where you can hear them (monitor them) through the stereo amplifier and speakers.

3. If you turn up the bus send #1 on the guitar input (mixer input #3), the guitar sound flows into a sound card line input out of bus #1. You could turn up the bus send #2 control on the guitar input if you wanted to use that instead, since both buses #1 and #2 are patched into the sound card's line input. You could also use both bus sends at the same time to double the guitar's mono signal if you wanted (not the usual way to record).

4. Since you're already hearing the guitar through the main outputs, you probably don't want to hear its signal again coming back through the sound card's outputs, so mute the sound card's line-in on its Play Control page of its mixer software (not its Record Control page—you want to record the line-in, but not play it back).

5. If you plug other instruments into other inputs, you can send them into your sound card's line input by turning up bus send #1 and/or #2 on each of the mixer's channels.

6. If the guitar in the above picture had a stereo pickup and stereo cable, you could plug the left plug on the cable into input #3 and turn up bus send #1, and plug the right plug into input #4, and turn up bus send #2 on that input. You would then be sending a stereo signal from the guitar through buses #1 and #2 to the sound card's line input.

7. In the above setup, do not turn up the bus sends on inputs #1 or #2 (where the sound card's line outputs connect to the mixer)—this creates a feedback loop, feeding the sound card's outputs back into its inputs through the buses.

For more information, see:

"Choosing inputs" on page 1561

"Audio recording" on page 1556

"Audio hardware (sound cards) and drivers" on page 1564

"MIDI" on page 1541

Choosing inputs

After you've connected your instrument or other sound source to your sound card, you need to tell your sound card's software, SONAR, and possibly the Windows Mixer which input you're recording through. If you're recording through the S/PDIF input, the procedure is a little different (see "To record through the S/PDIF input" on page 1563).

If your sound card only has one pair of inputs (one stereo Line input, usually, or Line and Mic inputs that can't be used simultaneously), then your sound card probably responds to the Windows Mixer.

Use the following procedure to record a track using the Windows Mixer.

To record with SONAR and the Windows Mixer

1. Open the Windows Mixer—double-click the **Speaker** icon that's on your Windows taskbar 🔊 to open the **Play Control** dialog box. If you don't see the Speaker icon on your taskbar, you can open the Windows Mixer by using the following command:

   • Windows 7: **Start > Control Panel > Hardware and Sound > Volume Control**

2. In the **Play Control** dialog box, use the **Options > Properties** command, and select **Recording** (under **Adjust Volume For**).

3. Under **Adjust Volume For**, make sure **Line-In** and **Microphone** are checked, and click **OK**.

   The **Record Control** dialog box appears.

4. If you're recording through the Line input, click the **Select** check box that's at the bottom of the **Line-In** column, and make sure that the volume slider in that column is in the upper half of its range (if you're recording through the Mic input, do the same actions in the **Microphone** column). Minimize the Windows Mixer window.

5. In SONAR's Track view, use the **In** field in a track you want to record in to select the input you're using—select either the **Left** input of your sound card to record in mono or the **Stereo** input to record in stereo.

6. Arm the track for recording (click its **R** button so that it's red), and play your instrument. You should see the Record Meter at the bottom of the track's property fields light up. If the meter doesn't move, see the table immediately following this procedure.

7. Adjust your instrument's volume, and/or the volume slider in the **Record Control** dialog box so that the level in the Record meter almost reaches the red zone when you play your loudest notes.

8. Record some sound by pressing **r** to start recording, and pressing the SPACEBAR when you're finished. You can rewind by pressing **w**.

After you stop recording, you should see a picture of your audio data in the Clips pane of the track you're recording in. Don't forget to disarm the track and save your project if you want to keep what you recorded.

If you don't see any movement in the track's record meter when you play your instrument, try some of the following:

Possible problem	Solution
You have chosen a Right input of your sound card as an input, but your instrument is plugged into a Left input.	Click the armed track's **Input** button and choose the opposite input from the currently selected one. If that doesn't help, try selecting the Stereo input.
Your instrument is plugged into a different-numbered input from the one you selected as an input.	Try choosing different-numbered Inputs until the meter starts to move.

Table 259.

Possible problem	Solution
Your instrument is not turned up or its cable is bad.	Turn up the instrument and try different cables.
You're using an adapter that doesn't quite fit the sound card input.	Try moving the adapter in or out slightly, and make sure the cable is plugged all the way into it.

Table 259.

If your sound card has multiple inputs and has its own mixer software, you probably don't need to select inputs in the Windows Mixer. To record through the analog inputs on your sound card, you probably only need to set your sound card's clock to internal, and in SONAR's Track view, choose the correct number of the inputs you're connected to in the **In** field of the track you're recording.

To record through the digital input (S/PDIF), see the following procedure.

To record through the S/PDIF input

1. Connect the instrument or CD player you want to record from to your sound card's S/PDIF input using a 75 ohm coaxial video cable or special S/PDIF cable. You may need to turn off the power on your computer, sound card, and sound source first. See your sound card's documentation.

2. Use your sound card's mixer software to set its clock to external or S/PDIF.

3. Leave SONAR's clock setting at the default choice, which is Audio. You can choose clock settings in **Edit > Preferences > Project - Clock** or in the Control Bar's Sync module.

4. Arm a track, test the input level and adjust input volume, and record your track.

5. When you're finished recording, set your sound card's clock back to internal, and listen to your recording.

There's one more type of audio connection you may find on occasion called AES/EBU, which stands for Audio Engineering Society/European Broadcasting Union, and is the highest bandwidth digital audio connection. An AES/EBU connection can use cables longer than 33 feet, which is the limit for S/PDIF cables. If your sound source has an AES/EBU connection, you can use your sound card's S/PDIF jacks to send data to and from the AES/EBU jacks by purchasing an inexpensive converter, such as the Hosa CDL-313 (www.hosatech.com).

For more information, see:

Audio hardware (sound cards) and drivers

There are many different brands of sound cards on the market today. This section aims to help you get the best out of yours.

See:

Consumer and professional

There are many sound cards to choose from. Nearly every computer comes with one. Some are nationally known brands and others are proprietary sound cards that are made specifically for a single manufacturer. These sound cards are called "consumer" cards. They are designed to handle the general multimedia tasks most computer users have, like playing CDs or MP3s, using your computer as a telephone, or playing computer games. Most consumer sound cards fit the bill nicely for the average computer user. They can play and record both audio and MIDI, but there are certain limitations which are relevant for Cakewalk users. The following list covers the characteristics of most consumer sound cards. This list is very general and does not necessarily reflect every sound card that comes bundled with a computer.

Consumer grade sound card characteristics:

- **Number of inputs and outputs.** Consumer cards nearly always have two inputs, mic and line in, and one output. Usually, these inputs and outputs are stereo, meaning there is a left and right channel.

- **Type of inputs and outputs.** Consumer cards almost always have eighth inch jacks, requiring an adaptor to use with standard quarter inch cables (guitar cables, patch cables, etc.).

- **Simultaneous recording and playback.** Some older consumer sound cards aren't capable of simultaneous recording and playback. These cards are called half-duplex. Cards that are capable of simultaneous recording a playback are called full-duplex.

- **16-bit, 44100 resolution.** Consumer cards are only capable of 16-bit audio and a sampling rate of 44.1 KHz. While these settings are at CD quality, Cakewalk software is capable of 32-bit audio at a sampling rate of up to 192 KHz.

- **Internal.** Consumer sound cards are installed in PCI slots (or ISA for older sound cards) on your computer's motherboard. While professional sound cards are also frequently installed in PCI slots, some provide a "breakout box" which houses the analog to digital (A to D) and digital to analog (D to A) converters, keeping them away from the internal noise a computer generates (fans, hard drives, etc.).

Professional sound card characteristics:

- **Multiple inputs and outputs.** Many professional sound cards have multiple inputs and/or outputs. Some have analog and digital inputs or outputs for use with ADATs and digital mixers.

- **Type of inputs and outputs.** Professional sound cards use quarter inch (mono or TRS), XLR or

RCA inputs rather than the eighth inch jacks found on consumer grade sound cards. Some cards also have digital inputs and/or outputs like S/PDIF and ADAT.

• **Higher bit-depths and sampling rates.** Most newer professional sound cards allow you to record at 20, 22 or 24-bit, and at a sampling rate of up to 96 KHz.

• **Onboard DSP.** Some sound cards have effects processors for things like reverb and delay built into the sound card. These can take a big load off of your computer.

• **High quality A to D and D to A converters (Analog to Digital and Digital to Analog).** The quality of your recordings ultimately depends on the quality of sound that you initially record. Professional sound cards have higher-quality components that convert the sound into and back out of the digital format.

See:

How do I know if I have a hardware conflict?

If you have a hardware conflict, you may see the following:

• one or more devices not working properly

• one or more devices not showing up in Device Manager

• your system crashing every time you use the device(s)

See:

Installation and drivers

When you install a sound card, you are installing both the hardware and software called a driver. The sound card driver is what allows your operating system and your sound card to communicate. This section is aimed at preventing problems when installing both your sound card and its driver.

Installing a sound card

Follow your sound card's documentation for installing the sound card in your computer. If you are installing a PCI card, or any hardware that requires you to open the cover of your computer, be careful to discharge any static electricity you are carrying by touching the metal casing of your computer before handling the sound card itself. Static electricity can damage a sound card's circuitry.

Installing a driver on Windows 98 and Windows Me

You sound card should come with software, too. Some manufacturers provide a driver setup program that takes you through the driver installation. Always use the manufacturer's software installation program if one is provided. If one is not provided, follow this procedure:

1. Click the **Start** button and select **Settings > Control Panel**.

2. In the Control Panel, double-click on **Add New Hardware**.

3. In the **Add New Hardware** wizard, click the **Next** button.

4. Select **No** when the **Add New Hardware** wizard asks you "Do you want Windows to search for your new hardware?"

5. From the list of Hardware types, select **Sound, Video and Game Controllers**, and click the **Next** button.

6. Select **Have Disk**.

7. If the driver is on a CD-ROM or a diskette, place it in the appropriate drive.

8. In the **Open** dialog box, use the **Browse** button to navigate to where the driver is located and select it.

9. Click **OK**.

10. Click **Finish**.

11. In the **Driver Set Up** dialog box, select the hardware settings that match what the multimedia device is physically set to, and click **OK**.

12. Click **Yes** to restart your computer.

WDM and MME

In most situations, the newer WDM (Windows Driver Model) sound card drivers that most sound card vendors are creating are a much better choice than the older MME (Multi-Media Extensions) drivers. If your sound card vendor has a WDM driver, it's usually a good idea use it. The following table compares their characteristics.

WDM	MME
Lower latency	Usually higher latency
Not every sound card vendor has produced a WDM driver.	MME drivers are widely available. **Note:** If you use two or more sound cards at the same time, and not all of them have WDM drivers, you must force the WDM drivers to function as MME drivers. Go to **Edit > Preferences > Audio - Playback and Recording** and select **MME** in the **Driver Mode** list.

Table 260.

IRQs

An IRQ (Interrupt Request) is an assigned location where the CPU expects to be interrupted by a device when it has completed a task. There are 16 IRQs on a computer. Usually, three or four are taken by the system, leaving 12 or 13 for other devices, like printers, USB devices, hard disks, floppy disk drives, keyboard and sound card. Some of these devices can share an IRQ with other devices, but for the most part this is not a good thing, and for a sound card which can use a lot of CPU power, it can be a real problem. IRQ conflicts can cause your system to freeze or fail to boot up properly, or the system may fail to recognize your sound card. Sometimes the problem only reveals itself when you attempt to use the device that is sharing an IRQ.

IRQ conflicts

Newer motherboards often use something called ACPI (Advanced Configuration and Power Interface) which controls IRQ settings, in effect overriding the motherboard IRQ settings. ACPI, just like Plug and Play, can sometimes lead to shared IRQs and problems with your sound card.

Checking for ACPI on Your System:

1. Look at your IRQ settings.

2. Look for an entry that says **ACPI**.

Resolving IRQ conflicts on a Non-ACPI system

The easiest way to resolve a conflict may be to remove the piece of hardware that is conflicting with your sound card. Of course, this is not always possible, but if you have a modem, network card, or some other hardware device that you do not use, removing it (and its driver) may free up an IRQ for your sound card.

Sometimes you can change a sound card's IRQ setting by physically moving the card to another PCI/ISA slot, or by moving several hardware devices to new slots. To do this, uninstall the hardware you want to move, along with its driver, put the hardware devices in their new slots and reinstall their drivers. Once you have completed this, check the IRQ settings again.

If moving or removing hardware did not help, you may be able to use the system BIOS to change an IRQ setting. To see if your BIOS allows you to make changes to your systems IRQ settings, consult your motherboard's documentation.

Resolving IRQ conflicts on an ACPI system

If you are experiencing an IRQ conflict on an ACPI system, you may want to turn off ACPI. This varies depending on your OS, BIOS and motherboard. Consult your computer manufacturer's documentation or technical support for instructions on how to do this.

SONAR and audio hardware

The following tips will help you get the most out of your sound card and Cakewalk software:

- **Use SONAR's Wave Profiler anytime your install a new sound card.** Wave Profiler determines the correct settings for your sound card.

- **Read the documentation for your sound card.** You can save yourself a lot of time by learning about your hardware before you try to use it. Many sound cards have their own control panels which allow you to customize the card's settings.

For more information, see:

Dialog box reference

Use the **Contents** tab, **Index** or **Search** tab to find the dialog box you are looking for.

About SONAR dialog

When you use the **Help > About SONAR** command, the Cakewalk logo appears, with the version number of your Cakewalk product listed below it.

Apply Audio Effects dialog

This dialog box gives you several options when applying audio effects:

Delete the effects from the track effects bin. This option lets you either keep your effects patched in the selected track(s) after the effects have been applied, or delete the effect from the track(s).

Fast bounce. This option is normally enabled but should be disabled if the track you are bouncing contains the External Insert plug-in (see "External Insert plug-in (Producer and Studio only)" on page 876). If you bounce audio that uses the External Insert plug-in, the bounce operation must be performed in real-time.

Audible bounce. The **Audible bounce** option is only available when in real-time bounce mode (when *Fast bounce* is unchecked). When Audible bounce is unchecked, no audio output will be heard during the bounce process. When in real-time bounce mode (Fast bounce unchecked) and Audible bounce is enabled, you can hear the output of the mixdown.

> **Note:** *Depending on the gainstages used in the project and the mixdown options selected–such as bouncing with source category assigned to Tracks, or with mute/solo or automation disabled in the bounce settings or while freezing tracks–the output may be louder or softer than during normal playback. Please be sure to turn down the master output level before using real-time audible bounce under these scenarios to avoid the possibility of speaker damage.*

Apply MIDI Effects dialog

When you select **Process > Apply Effect > MIDI Effects**, the **Apply MIDI Effects** dialog box appears. This dialog box lets you select options for applying MIDI effects to selected MIDI data. You can choose to delete the effect from the patch point after it is applied, so that it will not be reapplied on playback.

See also:

"Applying MIDI effects" on page 913

Assign Series of Inputs dialog

The **Selected Track Input Series** command in the Track view **Input** control drop-down menu opens the **Assign Series of Inputs** dialog box.

Use this command to assign a series of consecutive mono input ports to the selected audio tracks.

The **First Input to Assign** combo box lets you specify the audio input port that should be assigned to the first selected track. If a left or right input is selected, then mono inputs will be assigned. If a stereo input is selected, then stereo inputs will be assigned.

Figure 463. *The Assign Series of Inputs dialog*

See:
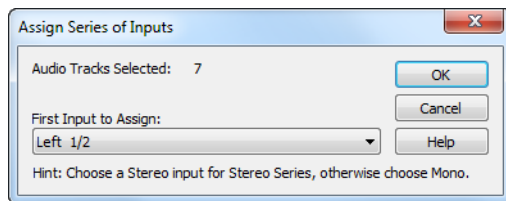
"To assign different audio input ports to multiple tracks" on page 218

Audio CD Burner dialog

The **Utilities > Burn Audio CD** command opens the **Audio CD Burner** dialog box. Use this command to burn your tracks to an audio CD. Tracks must meet the following criteria:

- All audio tracks must be stereo Wave files (extension .wav).
- Sample rate must be 44,100 Hz.

- Bit depth must be 16.

The **Audio CD Burner** dialog box has the following controls:

- **Track List.** The main area of the window is the track list. The tracks comprise the sounds that will be written (burned) to an audio CD. Each track is contained on its own line.
- **Add Track.** Browse to your local file system and add a new track to the list. All Audio Tracks must be stereo .wav files with a sample rate of 44,100 Hz, and a bit depth of 16. New tracks will go at the end of the list but can be moved anywhere. After a track is added, its size is added to the **Space Used** field, and subtracted from the **Space Available** field.
- **Move Up / Down.** Move the selected item(s) up or down in the track list order.
- **Delete Track.** Remove a track from the list.
- **Target Drive.** The Target Drive specifies the CD writing device to be used. The program scans your system to locate all available CD writing devices. Click on the arrow next to the drive letter to refresh the Target Drive. This process will verify if a blank CD has been placed in the drive. Once the blank CD has been verified, the available CD capacity is listed below the Track List.
- **Burn CD.** Verifies, performs a layout of the tracks and writes the current track list to CD medium in the selected drive. After the disk is completed, the disk is ejected from the drive.
- **Test Burn.** Verifies, performs a layout of the tracks and simulates burning the current track list to CD.
- **Cancel Burn.** This button appears when either **Burn CD** or **Test Burn** has been selected. It causes the current operation to be aborted.

Figure 464. *The **Audio CD Burner** dialog*
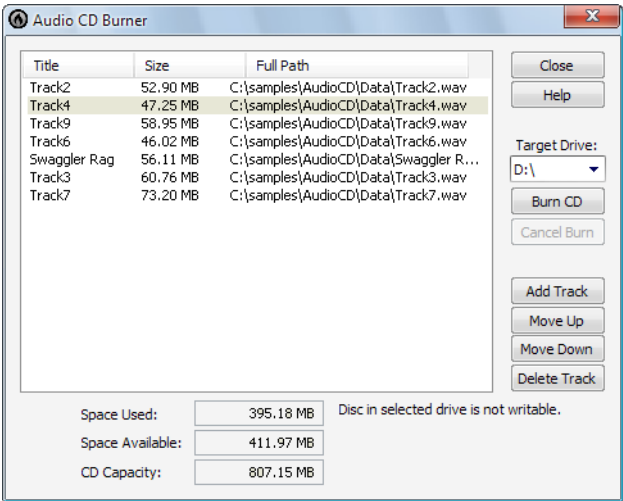
Audio Mixdown Options dialog

Clicking the **Mixdown Options** button in the **Export Video** dialog box opens the **Audio Mixdown Options** dialog box. This dialog box lets you control the characteristics of the audio file you export when you export a video from SONAR.

This dialog box has the following fields:

- **Preset.** You can name and save a preset which includes the source bus and all mix enable selections.

- **Channel Format.** Choose **Mono**, **Stereo**, or **Multichannel**.

- **Sample Rate.** Choose the sample rate that you want your exported audio to use.

- **Bit Depth.** Choose the bit depth that you want your exported audio to use.

- **Dithering.** Choose between five available types of dithering.

- **Source Bus(es).** Choose the bus or sound card driver you want to use to export your audio file.

- **Mix Enables.** Choose all the different audio components you want to include in your exported audio file. You usually include everything. If you include either **Track FX** or **Bus FX**, it's a good idea to add an extra measure to the end of your project to contain any reverb tails that your effects produce. Checking **Fast Bounce** causes the audio export process to go as fast as possible, as opposed to exporting in real-time. The **Audible bounce** option is only available when in real-time bounce mode (when *Fast Bounce* is unchecked). When Audible bounce is unchecked, no audio output will be heard during the bounce process. When in real-time bounce mode (Fast Bounce unchecked) and Audible bounce is enabled, you can hear the output of the mixdown.

> **Note:** *Depending on the gainstages used in the project and the mixdown options selected–such as bouncing with source category assigned to Tracks, or with mute/solo or automation disabled in the bounce settings or while freezing tracks–the output may be louder or softer than during normal playback. Please be sure to turn down the master output level before using real-time audible bounce under these scenarios to avoid the possibility of speaker damage.*

Automation Read/Write Parameters

This dialog box appears when you right-click the name of a plug-in in an effects bin and choose **Read Enable Parameter** or **Write Enable Parameter** from the pop-up menu.

This dialog box has the following fields:

Parameter Read Enabled

Parameter "n" check box. The enabled check boxes in this list show what parameters of the plug-in are automation read-enabled. You can check or uncheck each of these check boxes.

Parameter Write Enabled

Parameter "n" check box.   The enabled check boxes in this list show what parameters of the plug-in are automation write-enabled. You can check or uncheck each of these check boxes.

Enable All

Click this button to enable all check boxes.

Disable All

Click this button to disable all check boxes.

Auto-Send Sysx dialog

The **Auto-Send Sysx** dialog box appears when you open a project that contains Sysx data. The dialog box lets you choose whether to send the System Exclusive data to your MIDI instrument at that time. If you don't want to, click **Cancel**. You can send the data later, if you choose to, by using the Sysx view.

See also:

AVI Encoder Options dialog

Clicking the **Encoding Options** button in the **Video** dialog box opens the **AVI Encoder Options** dialog box. This dialog box lists the AVI video and audio codecs (compression-decompression programs) that are currently installed on your computer. The **AVI Encoder Options** dialog box has the following fields:

Video Codec

Choose a compression format, but note the following:

- Not all compression codecs listed may necessarily be compatible while re-compressing video through "Export to AVI". If an incompatible compression codec is selected an error message may be displayed during the export.
- If No Compression is selected, the video retains its original compression.
- The following video compression codecs have been found to be compatible. Different codecs provide varying degrees of compression performance.
  - MJPEG Compressor
  - DV Video Encoder
  - Indeo Video 5.04

- • Intel I.263
- • Cinepak Codec by Radius
- • Microsoft Video 1
- • Microsoft RLE
- • These codecs have been found not to work:
  - • H.261
  - • H.263
  - • Intel 4:2:0 Video V2.50
  - • MSScreen 9 encoder
  - • MSScreen encoder
  - • WMVideo Encoder DMO
  - • WM9Video Encoder DMO

Audio Codec

> **Note:** *If you're exporting an AVI file to either a 24-bit audio format or to a multi-channel (surround sound) format, set the Audio Codec to* **No Compression**.

The following audio compression codecs have been found to be compatible (you may see different codecs installed on your system):

- • CCITT - A Law
- • CCITT - U Law
- • DSP Group TrueSpeech
- • PCM (this is the standard uncompressed format for wav files)
- • GSM 6.10
- • IMA ADPCM

Keyframe Rate

This field is greyed-out if you choose the **Default Codec** in the **Video** field.

> **Note:** *If you intend to do a lot of seeking around or looping and editing while a video file is loaded, make sure that your video file has sufficient keyframes. Since each frame has to be computed from the last keyframe encountered, if you have very few keyframes in the video, performance may be slow. To change the number of keyframes, you may recompress the file using* **File > Export > Video** *and specify more frequent keyframes. Choose a suitable video compressor such as "Indeo Video 5.04" and change the KeyFrame Rate parameter to a number between 1-5. A value of 1 makes every frame a keyframe, and higher numbers insert a keyframe after that many frames.*

Data Rate

This field is greyed-out if you choose the **Default Codec** in the **Video** field. If you are compressing a file to be played over the Internet, use a data rate that doesn't exceed the capacity of the media players you expect will be used to play your file.

Quality

Lower quality values provide faster transmission and vice versa.

Change AVI settings

Checking this box causes another dialog box to appear after you click the **Save** button. This is the **Properties** dialog box that allows you finer control over the configuration of the AVI file you are creating. The available parameters are **Microsoft Direct Show** settings.

Bank Name dialog

When you select a bank in the Sysx view and click the **Name** button, the **Bank Name** dialog box appears. This dialog box lets you specify the name of the bank you selected. A bank must contain some Sysx data before you can name it.

See also:

"Using the System Exclusive view" on page 1141

Bank Output dialog

When you select a bank in the Sysx view and click the **Output** button, the **Bank Output** dialog box appears. This dialog box lets you specify which MIDI output you want the bank transmitted to. This is useful when you have MIDI playback modules connected to several different ports of your MIDI interface and you want to control which module receives a particular Sysx message.

See also:

"Using the System Exclusive view" on page 1141

Bank/Patch Change dialog

Select **Insert > Bank/Patch Change** to open the **Bank Patch Change** dialog box.

The output and channel of the selected track appear in the upper left corner.

Bank Select Method:

Choose from one of the following MIDI standard protocols:

• Normal

- Controller 0
- Controller 32
- Patch 100...127

For more information see "Assigning the Bank Select method" on page 1127.

Bank:

Select the Bank you want to use.

Patch:

Select the Patch you want to use.

If you want to use the "Patch Browser dialog" on page 1644, click the **Patch Browser** icon.

See also:

"To insert a bank/patch change" on page 221

"Choosing the instrument sound (bank and patch)" on page 220

Bounce to Track(s) dialog

Click the Track view **Tracks** menu and choose **Bounce to Track(s)** to open the **Bounce to Track(s)** dialog box.

This command lets you process the effects and/or automation together with the audio data in tracks to create one or several new tracks in order to lighten the load on your computer. Once you've bounced the tracks, you can archive or delete the source tracks to free up your computer's resources.

Note 1: *If you **select** any data in your project, only that data is included when you choose to bounce tracks. Alternatively, you can **mute** tracks you don't want to include in the mixdown, and then check **Track Mute/Solo** in the **Mix Enables** field so that SONAR uses that information as a guide when picking what tracks to include in the bounce. If a project is using any effects that add a "tail" to the end of an audio track, such as reverb or delay, then you should make sure that you select extra time in the time ruler (duration needed to hear the tail) at the end of the current selection before using the **Tracks > Bounce to Track(s)** command. This ensures that the "tail" is included in the audio mixdown.*

Note 2: *You control the bit depth of all rendering operations (bouncing, freezing, applying effects) in **Edit > Preferences > File - Audio Data** in the **Render Bit Depth** field. The default value for render bit depth is **32**. **64** can be selected to preserve the greater mixing and rendering precision that the 64 bit double precision mix engine provides. Values of **16** and **24** can also be selected. See "Bit depths for rendering audio" on page 1187 for more information.*

The dialog box has the following fields:

Destination

Assign the track to which you want to mixdown. If you are creating more than one track of audio, the destination track must be the first of consecutive blank or unwanted tracks.

Preset

You can create a preset out of your bounce settings, in case you use the same settings regularly. When the dialog box is set the way you want it, type a name in the **Preset** box and click the floppy disk icon that's next to it to save the preset.

Source Category

Select one of the following options:

- **Tracks.** Creates a new track or tracks (the **Split Mono** option in the **Channel Format** field) for each track that you select in the **Source Buses/Tracks** field.
- **Buses.** Creates a new track or tracks (the **Split Mono** option in the **Channel Format** field) for each bus that you select in the **Source Buses/Tracks** field.
- **Main Outputs.** Creates a new track or tracks (the **Split Mono** option in the **Channel Format** field) for each Main Output that you select in the **Source Buses/Tracks** field.
- **Entire Mix.** Creates a new track or tracks (the **Split Mono** option in the **Channel Format** field) from your entire mix.

Source Bus(es)/Track(s)

Choose the buses or tracks you want to use as a source to create your tracks. If you chose Tracks in the **Source Category** field, only tracks will show up as choices in this field.

Channel Format

Select from one of the following options:

- **Mono.** Creates a separate mono track for each track or bus selected in the **Source Buses/ Tracks** field.
- **Stereo.** Creates a separate stereo track for each track or bus selected in the **Source Buses/ Tracks** field.
- **Split Mono.** Creates separate mono tracks for each track or bus selected in the **Source Buses/ Tracks** field. If the selected track or bus is stereo, the selected track or bus will produce two new tracks. If the selected bus is a surround bus, the selected bus produces as many mono tracks as the bus has channels.

Dithering

Select from five available dithering types.

- Rectangular
- Triangular
- Pow-r 1

- Pow-r 2
- Pow-r 3

For more information, see "Dithering" on page 936.

Mix Enables

As default, each of the Mix Enables options is checked, meaning that your mixdown will sound the same as playback. You can check or uncheck each of the following settings to include or exclude them from the mix:

- **Track Mute/Solo.** If you check this option, tracks that are currently muted are not mixed down. Also with this option checked, if any tracks are soloed, only those tracks are included in the mixdown.

- **Bus Mute/Solo.** If you check this option, buses that are currently muted are not mixed down. Also with this option, if any buses are soloed, only the buses soloed are included in the mixdown.

- **Track Automation.** If you don't check this option, any volume and pan automation, **including initial volume and pan settings**, is ignored when creating the new track(s). The amplitude of the raw data in the tracks is used, and the pan is C, or centered.

- **Clip Automation.** If you don't check this option, any clip automation, **including any trim settings**, is ignored when creating the new track(s).

- **Bus Automation**

- **FX Automation**

- **Track FX.** If you don't check this option, any effects patched into various tracks' patch points, **including any plug-in synthesizers patched into track fx patch points**, are ignored when creating the new track(s).

- **Bus FX.** If you don't check this option, any effects patched into buses, **including any plug-in synthesizers patched into buses**, are ignored when creating the new track(s).

- **Fast Bounce.** When checked, SONAR bounces to tracks as fast as your computer will allow. If unchecked, bouncing to tracks happens in real time. Uncheck this option if you are using a synth that only works in real time. This option is checked by default.

- **Audible Bounce.** The **Audible Bounce** option is only available when in real-time bounce mode (when *Fast Bounce* is unchecked). When **Audible Bounce** is unchecked, no audio output will be heard during the bounce process. When in real-time bounce mode (Fast Bounce unchecked) and Audible Bounce is enabled, you can hear the output of the mixdown.

> **Note:** *Depending on the gainstages used in the project and the mixdown options selected–such as bouncing with source category assigned to Tracks, or with mute/solo or automation disabled in the bounce settings or while freezing tracks–the output may be louder or softer than during normal playback. Please be sure to turn down the master output level before using real-time audible bounce under these scenarios to avoid the possibility of speaker damage.*

- **64-bit Engine.** This option lets you turn on the 64-bit mix engine temporarily while you bounce your tracks. This produces a higher-quality bounce without taxing your CPU during the rest of your session.

For more information, see:

Change Audio Format dialog

Use the **Utilities > Change Audio Format** command if you want to rewrite the audio in a project to a different bit depth. Your sound card must be capable of playing the project at the new bit depth.

The **Change Audio Format** dialog box has the following fields:

New Bit Depth

Choose **16**, **24**, **32**, or **64**, depending on what audio format you want for this project.

Dither

This choice is available when you are converting to a lower bit-depth. Dithering means to add a certain audio signal to lower-bit audio to make it sound more like it did as a higher-bit signal.

For more information, see "Bit depths and float resolution" on page 1184; "Improving audio performance" on page 1181; and "Dithering" on page 936.

Chord Fret Number dialog

When you right-click a chord symbol in the Staff view, the **Chord Properties** dialog box appears. If there is a grid in the dialog box and you click to the right of it, the **Chord Fret Number** dialog box appears. This dialog box lets you enter a fret number to label the fret where the index finger goes (Finger 1). Create your grid and finger positions first, then label the index finger fret.

See also:

Chord Properties dialog

In the Staff view, right-click a guitar chord or chord symbol to open the **Chord Properties** dialog box. This dialog box lets you edit the guitar chord.

See also:

Choose Track Type dialog

Using the INSERT key in the Track view inserts a new track of the same type as the current track, unless you use it in an empty project that has no tracks yet. In that case, the **Choose Track Type** dialog box appears, offering you the choice to insert either an audio or MIDI track.

See also:

"Arranging and editing" on page 313

Clean Audio Folder dialog

The **Utilities > Clean Audio Folder** command opens the **Clean Audio Folder** dialog box. Use this command to delete digital audio files from an audio data folder that are no longer used by any of your projects. You should use this command from time to time to free up disk space.

Important: *Make sure that all of your important project (.cwp and .wrk) files are stored in your local hard disk(s) before using this command. If your project files are stored elsewhere, such as a floppy drive, removable drive, or network drive, you risk accidentally deleting important audio files that are associated with your projects.*

Note: *The Cakewalk Audio Finder (CWAFTool) is a more advanced utility for finding and removing unused projects and audio files. This utility can be installed from the **AutoRun** menu of the SONAR DVD. If you have an older version of Cakewalk, you can download the Cakewalk Audio Finder from the Cakewalk web site.*

Under Windows, deleted files are normally placed in the Recycle Bin. As a result, you should empty the Recycle Bin after using the **Clean Audio Folder** command, or the unused files will still physically remain on your hard disk.

If you are using another utility program that protects you from accidentally deleting important files (such as Norton Protect), you may need to disable that program. Otherwise, the next time you use the **Clean Audio Folder** command you may once again find these not-quite deleted files.

The **Clean Audio Folder** dialog box has the following fields:

Audio Path

Specify the directory in which you want to search for audio files.

Recurse

When checked, SONAR searches for audio files in all folders within the Audio Path directory.

File window

The file window lists all the unused audio files that SONAR finds.

Find button

Click this button to find all unused audio files and list them in the file window.

Play button

Click this button to play the audio file that is highlighted in the file window.

Delete button

Click this button to delete the audio file that is highlighted in the file window.

Delete All button

Click this button to delete all the audio files that are listed in the file window.

For more information, see:

Associated Audio Files dialog

The **Associated Audio Files** dialog box shows which audio file(s) is associated with a clip. The dialog box provides the following information:

- The audio file(s) that make up the selected clip.
- The path name(s) the files are stored under.
- The bit depth of the clip.

Recompute Picture(s)

Click **Recompute Picture(s)** to redraw waveforms for individual clips that may have a corrupt waveform display.

Clone Track(s) dialog

The Track view **Tracks > Clone Track(s)** command opens the **Clone** dialog box. Use this command to copy a track or tracks to a new track or tracks. The **Clone** dialog box has the following fields:

Selected Tracks

This field lists the tracks that are currently selected.

Clone Tracks

- **Clone Events.** Check this check box if you want to copy the MIDI and audio clips in the selected

track(s).

- • **Link to Original Clip(s).** Check this check box if you want the clips in the new track(s) to become linked clips with the identical clips in the original track(s).
- **Clone Properties.** Check this check box if you want to copy the properties of the highlighted track(s), such as the name, output, channel, etc.
- **Clone Effects.** Check this check box if you want the new track(s) to use the same real-time effects that are patched into the original track.
- **Clone Sends.** Check this check box if you want the new track(s) to use the same sends that are patched into the original track(s).
- **Repetitions.** The number of tracks you want to create from the selected track(s).
- **Starting Track.** The track at which your cloned track(s) appear. Existing tracks are moved down to make room, not overwritten.

See also:

Complete Registration dialog

Click **Register** to go to the Cakewalk web site to register your copy of SONAR. All Cakewalk software must be registered within 30 days of installation.

Note: *You must have an active internet connection to view this page and register online.*

To register anytime, log onto *www.cakewalk.com/register*, or call 888-CAKEWALK (U.S.) or +1 617-423-9004 (outside of the U.S.) between 9 AM and 8 PM Eastern Standard Time.

You will need the product serial number, your name, and a valid email address in order to register. Once you have submitted this information, we will email you a registration code that will allow you to keep using the software forever and give you access to technical support.

Once you receive your registration code either by phone or email, enter it in the field named **Registration Code** and then click **Complete**.

Note: *Your Serial Number will already be entered in the Serial Number field.*

If you are logged in with Administrative privileges, you will be prompted to raise privileges to Administrator to complete product registration. If you are logged in with an account that does not have Administrator privileges, please contact your network administrator or refer to your operating system help.

Register Later allows you to close this dialogue and continue to load SONAR.

> **Note:** *All Cakewalk software must be registered within 30 days of installation. After 30 days you must register your copy of SONAR in order to continue using it.*

For more information about registration, please go to www.cakewalk.com/register/FAQ/.

Controller/Surface Settings dialog

The **Controller/Surface Settings** dialog box opens when you click the **Add** button in **Edit > Preferences > MIDI - Control Surfaces**. The **Controller/Surface Settings** dialog box also opens when you select a control surface from the **Connected Controllers/Surfaces** list in the **Controllers/Surfaces** dialog box, and then click the **Property Page** button that's in the **Controllers/ Surfaces** dialog box.

The **Controller/Surface Settings** dialog box has the following fields:

• **Control Surface.** Use this field to select the control surface that you want to add to the **Connected Controllers/Surfaces** list (this option is greyed-out if you open the dialog box with the **Property Page** button).

• **Input Port.** Use this field to select the MIDI port that the control surface will use to send MIDI control data to SONAR.

• **Output Port.** Use this field to select the MIDI port that the control surface will use to receive MIDI control data from SONAR.

For more information, see:

"MIDI - Control Surfaces" on page 1670

"External devices" on page 1211

Convert MIDI To Shapes dialog

Use the Track view **Clips > Convert MIDI Controllers to Envelopes** command to open the **Convert MIDI To Shapes** dialog box. This command lets you convert a controller envelope created in the Piano Roll view to a Track view envelope, or *shape*.

Note: *If two clips overlap, the command converts the controller envelopes in both clips, in whatever parts of the clips lie in the selected time range.*

See:

"Creating and editing automation envelopes" on page 1019

Convert MIDI Clip(s) To Step Sequencer dialog

The Track view **Clips > Convert MIDI Clip(s) to Step Sequencer** command opens the **Convert MIDI Clip(s) to Step Sequencer** dialog box. This command lets you convert any selected MIDI clip to a step sequencer clip. There are two available options:

- **Resolution.** The resolution value should correspond to the shortest note value that you expect. For example, if you specify Sixteenth notes, you will get four steps per beat. The choices are:
  - Quarter (1 step per beat)
  - Eighth (2 steps per beat)
  - Eighth Triplet (3 steps per beat)
  - Sixteenth (4 steps per beat)
  - Sixteenth Triplet (6 steps per beat)
  - 32nd (8 steps per beat)
  - 32nd Triplet (12 steps per beat)
- **Preserve original timing (using time offsets).** Select this option if you want the Step Sequencer to preserve the original timing of the note events instead of quantizing them to the nearest step.

See:

"To convert a MIDI clip(s) to a Step Sequencer clip(s)" on page 1830

Copy dialog

The **Edit > Copy Special** command opens the **Copy** dialog box, which lets you put on the Clipboard any selected objects. You can paste the contents of the Clipboard elsewhere. See "Paste dialog" on page 1642.

To remove rather than copy objects, see "Cut dialog" on page 1587.

To make copies of linked clips, see "Splitting and combining clips" on page 365.

The **Copy** dialog box has the following fields:

Events in Tracks

If you check this check box, SONAR copies all "Event" on page 1912s in the selected object.

Clip Automation

If you check this check box, SONAR copies all clip automation in the selection.

Track/Bus Automation

If you check this check box, SONAR copies all Track and Bus automation from the selection.

Tempo Changes

If you check this check box, SONAR copies all tempo changes in the selected object.

Meter/Key Changes

If you check this check box, SONAR copies all meter and key changes in the selected object.

Markers

If you check this check box, SONAR copies all markers in the selected object.

See also:

"Moving and copying clips" on page 335

"Working with partial clips" on page 352

"Importing material from another SONAR project" on page 303

"Importing MIDI files" on page 306

Create Fx Envelopes dialog

If you have already patched an automatable effect into a track, you can right-click in the Clips pane and choose **Envelopes > Create > (name of the effect you patched)** to open a dialog box containing a list of the effect's automatable parameters. You can create or delete an envelope for each parameter by checking or unchecking its check box.

If you patched the effect into a bus, you can open the same dialog box by clicking in the Bus pane and choosing **Create > (name of the effect you patched)**.

The dialog box has the following fields:

Envelope Exists list

This is a list of all the automatable parameters for this effect—the ones with checkmarks already have envelopes. You can create new envelopes by checking more check boxes, or delete existing ones by unchecking check boxes.

Choose Color button

Click this button to choose colors for any envelopes whose names are highlighted and checked in the list. When you highlight the name of a checked envelope in the **Envelope Exists** list, the current color of that envelope appears above the **Choose Color** button; click the **Choose Color** button and choose a new color for the highlighted envelope. If you want the same color for several different envelopes, you can highlight as many names at one time as you want by dragging through them, SHIFT-clicking them, or CTRL-clicking them.

For more information, see:

"Automating effects" on page 1036

Crossfade dialog

The **Process > Apply Effect > Crossfade** command lets you specify accurately the shape of a crossfade for a selection, clip, or track. This is a *destructive edit*—it permanently alters the data that you apply it to. To apply a nondestructive volume change to selected data, see "Creating and editing automation envelopes" on page 1019.

The **Process > Apply Effect > Fade/Envelope** command opens the **Crossfade** dialog box, which has the following fields:

Name

This field contains a drop-down menu of different graphical shapes for the crossfade volume. The options are:

- **Exponential Crossfade.** This option causes the selected audio to change volume rapidly at first, but much slower toward the end of the crossfade.

- **Inverse Exponential Crossfade.** This option causes the selected audio to change volume slowly at first, but much faster toward the end of the crossfade.
- **Linear Crossfade.** This option causes the selected audio to change volume at a constant rate throughout the crossfade.

Crossfade graph

The crossfade graph illustrates any type of crossfade you choose in the **Name** field, but you can also drag points on the graph to create any shape you want.

Reset button

Click this button to reset the crossfade graph to the shape that is selected in the **Name** field.

For step by step directions, see "Fades and crossfades" on page 395.

Controller/Surface Settings dialog

The **Ctrl Surface Settings** dialog box appears when you click the **Property Page** button in **Edit > Preferences > MIDI - Control Surfaces**. This dialog box allows you to choose inputs and outputs for the selected control surface.

The **Controller/Surface** Settings dialog box has the following fields:

- **Control Surface.** This field lists the control surface you are choosing inputs and outputs for.
- **Input Port.** Click the name of the input port you want to use.
- **Output Port.** Click the name of the output port you want to use.

For more information, see:

"External devices" on page 1211

Cut dialog

The **Edit > Cut Special** command opens the **Cut** dialog box, which lets you remove from the project and put on the Clipboard any selected objects. You can paste the contents of the Clipboard elsewhere. See "Paste dialog" on page 1642.

The **Cut** dialog box has the following fields:

Events in Tracks

If you check this check box, SONAR removes every "Event" on page 1912 in the selected object.

Clip Automation

If you check this check box, SONAR removes all clip automation in the selection.

Track/Bus Automation

If you check this check box, SONAR removes all Track and Bus automation from the selection.

Tempo Changes

If you check this check box, SONAR removes all tempo changes in the selected object.

Meter/Key Changes

If you check this check box, SONAR removes all meter and key changes in the selected object.

Markers

If you check this check box, SONAR removes all markers in the selected object.

Delete Hole

If you check this check box, SONAR removes the space in the track where the object was. SONAR moves all objects after the deleted object forward in time by the length of the deleted object. Checking the **Shift By Whole Measures** option causes SONAR to move the following clips forward, but only as far as the nearest whole measure.

For more information, see "Moving and copying clips" on page 335.

See also:

"Erasing tracks" on page 321

Define Groove dialog

When you use the **Process > Groove Quantize** command, the **Groove Quantize** dialog box appears, which contains the **Define** button. Clicking the **Define** button opens the **Define Groove** dialog box. which you use to save new groove patterns.

The **Define Groove** dialog box has the following fields:

Groove Source

This field lists the file that contains the currently loaded groove, along with the attributes.

Groove Library File

- **File.**   Use this field to select or type a filename, so you can save the current groove in a certain file.
- **Pattern.**   Use this field to select or type a pattern name, so you can save the current groove with a name you choose. If you try to save to a pre-existing pattern name, SONAR asks if you want to overwrite (erase) that pattern.

Delete button

Click this button if you want to delete the groove pattern that is listed in the **Pattern** field.

See also:

Define Instruments and Names dialog

Use the **Edit > Preferences > MIDI - Instruments** command, then click the **Define** button to open the **Define Instruments and Names** dialog box.

The **Define Instruments and Names** dialog box contains two trees:

The Instruments Tree

The Instruments tree occupies the left side of the dialog box and lists all defined instruments and their characteristics

The Names Tree

The Names tree shows all the resources you use to define an instrument.

To define an instrument, you drag resources from the Names tree to the appropriate branches on the Instruments tree. Each resource is color-coded—for example, you can only drag a Names list to an Instrument tree branch of the same color.

See also:

Deglitch dialog

The **Process > Deglitch** command opens the **Deglitch** dialog box. When recording MIDI guitar, even the best players occasionally play unintended notes. The Deglitch feature allows you to filter out many of these unintended notes.

There are three filters in the **Deglitch** dialog:

Pitch

With the Pitch filter you can set the maximum pitch allowed in the track. If a MIDI event has a higher pitch than the maximum you set, it is removed.

Velocity

With the Velocity filter you can set a minimum velocity allowed in the track. If a MIDI event has a lower velocity than the one you set, it is removed.

Duration

With the Duration filter you can set a minimum note duration for the track in either ticks or milliseconds. If a MIDI event has a shorter duration than the one you set, it is removed.

For step by step instructions, see

Delay dialog

Using the **File > Open** command to open a Play List opens the Play List view, which has a **Delay** button.

Clicking the **Delay** button opens the **Delay** dialog box, which lets you specify a different kind of delay before the start of each song.

The **Delay** dialog box has these fields:

No Delay

Click this option to cause the song to start immediately following the previous song.

Wait for Key Press

Click this option to cause the song to start only after you press a key on your computer.

Wait for "N" Seconds

Click this option to cause the song to start only after a period of seconds, the number of which you fill in this field.

Delete dialog

The **Edit > Delete Special** command opens the **Delete** dialog box, which allows you to remove selected objects from the project. It doesn't put them on the Clipboard, so they can not be subsequently pasted. You can specify the following objects to remove:

Events in Tracks

Removes all events in the selected clip(s).

Clip Automation

Removes any clip envelopes in the selected clip(s).

Track/Bus Automation

Removes any track or bus automation from the selected clip(s).

Tempo Changes

Removes all tempo changes in the selected clip(s).

Meter/Key Changes

Removes all meter and key changes in the selected clip(s).

Markers

Removes all markers in the selected clip(s).

You have the following options in the **Delete** dialog:

Delete Hole

If selected, the **Delete Hole** option removes the space in the track where the clip(s) had been. All clips after the deleted clip(s) are moved forward in time by the length of the deleted clip(s). Checking the **Shift by Whole Measures** option causes SONAR to move the following clips forward, but only as far as the nearest whole measure.

For more information, see "To delete clips" on page 340.

Delete dialog (with multiple selection)

If you have both a track and an effect selected, the **Delete** dialog box appears with the following options:

Current Selection

Check this box if you want to delete the current track or clip selection.

Current Effect

Check this box if you want to delete the selected effect.

Drag and Drop Options dialog

If you right-click in the Clips pane and choose **Drag and Drop Options** from the pop-up menu, the **Drag and Drop** dialog box appears, which you use to control how clips behave when you drag them.

The **Drag and Drop** dialog box has the following fields:

Copy Entire Clips as Linked Clips

Choosing this option means that when you copy an entire clip and paste it, the new clip is a linked clip with the clip that you copied it from.

What to do with existing material

The fields in this section deal with the situation that occurs when you try to drag some data to a place in a track that already has some data.

- **Blend Old and New.**   Choosing this option tells SONAR to mix the new data with the old, with the following option:
- **Replace Old with New.**   Choosing this option tells SONAR to delete the old data, with the following option:
  - **Delete Whole Measures.**   Choosing this option tells SONAR to delete the old data up to the next measure line, regardless of whether the new data fills the space up to the next measure.
- **Slide Over Old to Make Room.**   Choosing this option tells SONAR to slide the old data either forward or backward in the track to make room for the new data. with the following option:
  - **Align to Measures.**   Choosing this option tells SONAR to slide the old data up to the next measure line, regardless of whether the new data fills the space up to the next measure.

Ask This Every Time

Choosing this option causes the **Drag and Drop Options** dialog box to open every time you drag some data.

See also:

"Moving and copying clips" on page 335

"Splitting and combining clips" on page 365

Dump Request Macro needs your input—Channel/Unit Number

When you click the **Receive** button in the Sysx view, and choose to receive sysx data from a synthesizer your system has trouble identifying, the **Dump Request Macro needs your input** dialog box appears. This dialog box, which appears if the system needs more information and you have two or more of the same synthesizer, lets you specify which channel or unit number you want dumped.

See also:

"Using the System Exclusive view" on page 1141

Dump Request Macro needs your input--Patch/Voice/Config Number

When you click the **Receive** button in the Sysx view, and choose to receive sysx data from a synthesizer your system has trouble identifying, the **Dump Request Macro needs your input** dialog box appears. This dialog box, which appears if the system needs more information, lets you specify which patch, voice, or config number you want dumped.

See also:

"Using the System Exclusive view" on page 1141

Edit Node dialog

Open the **Edit Node** dialog by right-clicking on a node and selecting **Properties** from the menu that appears.

Level

The node's value (% left or right pan, for example). Change the level by using the + or - keys to the left of the **Level** field or by clicking and dragging up or down.

Time

The node's time location in the track.

Select from the following time measurement options:

• M:B:T

• Samples

• H:M:S:F

- Seconds

    Then change the value in the **Time** field as desired. Change the level by using the + or - keys to the left of the **Level** field or by clicking and dragging up or down.

Edit System Exclusive Bytes dialog

When you select a bank in the Sysx view and click the **Edit** button, the **Edit System Exclusive Bytes** dialog box appears. This dialog box lets you edit your bytes in hex.

See also:

"Using the System Exclusive view" on page 1141

Event Filter dialog

If you want information about the **Event Filter - Search** dialog box, see "Event Filter Select Some/ Search/Replace dialog" on page 1594.

See Also:

"Searching for events" on page 734

"Event filters" on page 734

"Selecting events" on page 736

Event Filter Select Some/Search/Replace dialog

- **Edit > Select > By Filter** opens the **Event Filter-Select Some** dialog box. Use this command to **select** events of a specific nature that you specify in the dialog box. You can then edit all the events with any editing command.

- **Process > Find/Change** opens the **Event Filter-Search** dialog box, which opens the **Event Filter-Replace** dialog box when you click **OK**. Use this command to *select and replace* events of a specific nature with events of a different nature that you specify in the **Event Filter-Replace** dialog box.

The **Event Filter** dialog box contains these fields:

The Save Presets Drop-down List

After you choose all your selection criteria, type a name for them in the text box and click the disk icon to save them. You can reuse each set of selection criteria by choosing the appropriate name from the drop-down list. Use the **X** button next to the disk icon to remove selected items from the list.

Include

Click the **Include** check box for each row of data types you want to include in your selection.

Note

Click the **Note** check box to search for notes of a specific type. You can specify pitch, velocity and duration data to narrow your search. Click any of the **exc** check boxes to **exclude** data from your search. For example, if you click the exc check box under Key, you can exclude notes within the pitch range specified in the **Min** and **Max** fields.

KeyAft

Click **KeyAft** to include key aftertouch data in your selection. Choose the ranges of keys and pressure values you want to include (or exclude, by checking either of the **exc** check boxes).

Control

Click the **Control** check box to include any or all of the standard controllers. Set ranges for which controllers and values you want to include or exclude.

RPN

Click **RPN** to include registered parameter controllers in your selection. Consult your sound module's documentation to see what RPN's it responds to.

NRPN

Click **NRPN** to include non-registered parameter controllers in your selection. Consult your sound module's documentation to see what NRPN's it responds to.

Patch

Click **Patch** to include bank and patch data in your selection. You can set a range of banks and/or patches to include or exclude.

ChanAft

Click **ChanAft** to include channel aftertouch (aftertouch that applies to a whole MIDI channel, not just individual keys) in your selection. Set a range of pressure values to include or exclude.

Wheel

Click **Wheel** to include pitch wheel data in your selection. Set a range of values to include or exclude.

All Non-Special Events

Set ranges in these fields to limit your selection to specific MIDI channels, beats, or ticks.

"Special Events"

Click any of the check boxes in these fields to include instances of the following kinds of data in your selection (no ranges can be set for these events):

• **Audio.** Include audio data in your selection.

- **Shape.** Include shapes in your selection.
- **Text.** Include text boxes in the event list in your selection.
- **Expression.** Include expression marks in your selection.
- **SysxBank.** Include system exclusive bank events.
- **Lyric.** Include lyrics in your selection.
- **Chord.** Include chord symbols in your selection.
- **SysxData.** Include system exclusive data events.
- **MCI.** Include Media Control Interface commands
- **Hairpin.** Include crescendo or decrescendo marks in your selection.

All

Clicking the **All** button places a checkmark into all check boxes in the dialog box.

None

Clicking the **None** button clears the checkmark from all check boxes in the dialog box.

See Also:

Event Manager dialog

You can open the **Event Manage**r dialog box in two ways:

- Right-click in the Event List view and choose **Event Manager** from the pop-up menu.
- Click the **Event Manager** button in the Event List view.

Use the **Event Manager** dialog box to select which types of events to display in the Event List view. The **Event Manager** dialog box has the following fields:

MIDI

Check the different kinds of MIDI events you want to display.

Special

Check the different kinds of special events you want to display.

Notation

Check the different kinds of notation events you want to display.

All/None buttons

Click an **All/None** button under the column of event types that you want to display all of or none of. Clicking the button toggles the display between each extreme.

See also:

Export Audio dialog

Select **File > Export > Audio** to open the **Export Audio** dialog box. This command lets you export your projects as Wave, MP3 files, and other types of formats.

> **Note:** *If you **select** any data in your project, only that data is included when you choose to export audio. Alternatively, you can **mute** tracks or buses you don't want to include in the mixdown, and then check **Track Mute/Solo** or **Bus Mute/Solo** in the **Mix Enables** field so that SONAR uses that information as a guide when picking what data to include in the exported file. If a project is using any effects that add a "tail" to the end of an audio track, such as reverb or delay, then you should make sure that you select extra time in the time ruler at the end of the current selection before using the **File > Export Audio** command. This ensures that the "tail" is included in the audio mixdown.*

The dialog box has the following fields:

Look in

Shows the folder to which you are exporting your audio. Browse your available drives to choose a different directory.

Below the **Look in** field is a list of the selected folder's contents.

File name

Enter a name for the file you are creating.

Files of type

Select from one of the following export formats:

- **Wave.**   The standard digital audio format used under Windows and for CD's, with a file extension of .wav.
- **Broadcast Wave (time-stamped).**   A wave file with the following embedded information:
  - **Description.**   A brief description of the contents of the Broadcast wave. Limited to 256 characters.

- **Originator.** The author of the Broadcast wave. This information is taken from the **Author** field in the "File Info dialog" on page 1608.

- **Originator Reference.** A unique reference identifier created by SONAR.

- **Origination Date.** The date the file was created.

- **Origination Time.** The time the file was created.

- **Time Reference.** The SMPTE time stamp for the beginning of broadcast wave.

- **Windows Media Advanced Streaming Format.** The Microsoft Corporation's compressed audio format, with the file extension of .wma. If you choose **Windows Media Advanced Streaming Format** you will be prompted for more information about the file by the **Microsoft Audio Encode Options** dialog box.

- **MP3.** The mpeg-3 format, with the file extension .mp3.

- **SoundCloud – CD Quality.** Share a CD quality version of your song on SoundCloud. This format will result in a larger file size and may take longer to upload.

- **SoundCloud – FLAC.** Share a FLAC version of your song on SoundCloud. FLAC is a royalty free high quality lossless audio compression codec. Files compressed with FLAC can be 30-50% smaller than the original wav file and unlike MP3 there is no loss of audio quality. Use this preset if you want to have a share a higher quality version of your song, but also want to have a shorter upload time to SoundCloud. Your song will be saved as a FLAC (.flac) file.

- **SoundCloud – MP3.** Share an MP3 version of your song on SoundCloud. Your song will be saved as an MP3 (.mp3) file. MP3 files are the smallest and fastest files to upload to SoundCloud, however they will not be as high quality as Wave or FLAC files.

- **Various surround formats.** If you have installed any 3rd-party surround encoders, you will see them listed here.

Preset

You can create a preset for a mixdown. A preset contains all the settings within the **Bounce Settings** fields and also includes the **File Type**.

Source Category

Select one of the following options:

- **Tracks.** This option creates a separate file or group of files (the **Split Mono** option in the **Channel Format** field) for each track that you select in the **Source Buses/Tracks** field.

- **Buses.** This option creates a separate file or group of files (the **Split Mono** option in the **Channel Format** field) for each bus that you select in the **Source Buses/Tracks** field.

- **Main Outputs.** This option creates a separate file or group of files (the **Split Mono** option in the **Channel Format** field) for each main out that you select in the **Source Buses/Tracks** field.

- **Entire Mix.** This option creates a file or group of files (the **Split Mono** option in the **Channel Format** field) for your entire mix.

Channel Format

Select from one of the following options:

- **Mono.**   All exported tracks are mixed down to a mono file or separate mono files, depending on how many tracks or buses you select in the **Source Buses/Tracks** field.
- **Stereo.**   All exported tracks are mixed down to a stereo file or separate stereo files, depending on how many tracks or buses you select in the **Source Buses/Tracks** field
- **Split Mono.**   All exported tracks are mixed down to a group of mono files, or separate groups of mono files, depending on how many tracks or buses you select in the **Source Buses/Tracks** field.
- **Multichannel.**   All exported tracks in a Surround project are mixed down to a multichannel file containing the number of channels listed in **Edit > Preferences > Project - Surround**.

Source Buses/Tracks

- Select the tracks or buses that supply the audio data you want to export If you chose **Tracks** in the **Source Category** field, only tracks will show up as choices in this field.

Sample Rate

Set the sample rate for the file. CD audio uses 44100 kHz.

Bit Depth

Set the bit depth for the file. CD audio uses 16 bit. If you don't have Dithering turned on, this is a good time to turn it on.

Dithering

Whenever an audio signal is converted from a higher-bit resolution to a lower resolution, it is necessary to apply dither to avoid introducing undesirable quantization noise or harmonic distortion into the signal. You can select from five available dithering types.

- Rectangular
- Triangular
- Pow-r 1
- Pow-r 2
- Pow-r 3

For more information see "Dithering" on page 936.

Mix Enables

As default, each of the Mix Enables options is checked, meaning that your mixdown will sound the same as playback. You can check or uncheck each of the following items to include or exclude them from your mix:

- **Track Mute/Solo.**   If you check this option, tracks that are currently muted are not mixed down. Also with this option checked, if any tracks are soloed, only those tracks are included in the mixdown.
- **Bus Mute/Solo.**   If you check this option, buses that are currently muted are not mixed down. Also with this option checked, if any buses are soloed, only those bus outputs are included in the mixdown.
- **Track Automation.**   If you don't check this option, any volume and pan automation, **including initial volume and pan settings**, is ignored when creating the new file(s). The amplitude of the raw data in the tracks is used, and the pan is C, or centered.
- **Clip Automation.**   If you don't check this option, any clip automation, **including any trim settings**, is ignored when creating the new file(s).
- **Bus Automation**
- **FX Automation**
- **Track FX.**   If you don't check this option, any effects patched into various tracks' patch points, **including any plug-in synthesizers patched into track fx patch points**, are ignored when creating the new file(s).
- **Bus FX.**   If you don't check this option any effects in buses are ignored when creating the audio file.
- **Fast Bounce.**   When checked SONAR exports audio as fast as your computer allows. If unchecked, SONAR exports audio in realtime. Uncheck this option if you are using a synth that works only in realtime. This option is checked by default.
- **Audible bounce.**   The **Audible bounce** option is only available when in real-time bounce mode (when *Fast Bounce* is unchecked). When Audible bounce is unchecked, no audio output will be heard during the bounce process. When in real-time bounce mode (Fast Bounce unchecked) and Audible bounce is enabled, you can hear the output of the mixdown.

> **Note:** *Depending on the gainstages used in the project and the mixdown options selected–such as bouncing with source category assigned to Tracks, or with mute/solo or automation disabled in the bounce settings or while freezing tracks–the output may be louder or softer than during normal playback. Please be sure to turn down the master output level before using real-time audible bounce under these scenarios to avoid the possibility of speaker damage.*

- **64-bit Engine.**   If you don't usually run SONAR in 64-bit mode in order to save CPU, you can turn 64-bit mode on when you export audio by enabling this check box. Remember to turn it off after you export your audio, if you don't want to use it during tracking or mixing.

Add to Audio CD Track List

Check the **Add to Audio CD Track List** option when you export audio as a 16-bit, 44,100 Hz stereo Wave file (.wav). The **Audio CD Burner** dialog box appears with the Wave file pre-loaded in the **Track** list.

Add to Cakewalk Publisher

Check the **Add to Cakewalk Publisher** option when you export audio as an MP3 file. Publisher launches automatically and the MP3 file is pre-loaded.

For more information, see:

Dump Request Macro needs your input—Channel/ Unit Number

When you click the Receive button in the Sysx view, and choose to receive sysx data from a synthesizer your system has trouble identifying, the Dump Request Macro needs your input dialog box appears. This dialog box, which appears if the system needs more information and you have two or more of the same synthesizer, lets you specify which channel or unit number you want dumped.

Dump Request Macro needs your input--Patch/ Voice/Config Number

When you click the Receive button in the Sysx view, and choose to receive sysx data from a synthesizer your system has trouble identifying, the Dump Request Macro needs your input dialog box appears. This dialog box, which appears if the system needs more information, lets you specify which patch, voice, or config number you want dumped.

Duration dialog

When you use the **Transport-Step Record** command, the Step Record dialog box appears, which contains two Other buttons. Clicking the one on the Duration side of the dialog box opens the Duration dialog box. In the Duration field, enter the actual duration of the note you want to enter in ticks.

See also:

Edit Node dialog

Open the Edit Node dialog by right-clicking on a node and selecting **Properties** from the menu that appears.

Level

The node's value (% left or right pan, for example). Change the level by using the + or - keys to the left of the Level field or by clicking and dragging up or down.

Time

The node's time location in the track.

Select from the following time measurement options:

- M:B:T
- Samples
- H:M:S:F
- Seconds

    Then change the value in the Time field as desired. Change the level by using the + or - keys to the left of the Level field or by clicking and dragging up or down.

Edit System Exclusive Bytes dialog

When you select a bank in the Sysx view and click the Edit button, the Edit System Exclusive Bytes dialog box appears. This dialog box lets you edit your bytes in hex.

Event Manager dialog

You can open the Event Manager dialog box in two ways:

- Right-click in the Event List view and choose Event Manager from the pop-up menu.
- Click the Event Manager button in the Event List view

Use the Event Manager dialog box to select which types of events to display in the Event List view. The Event Manager dialog box has the following fields:

MIDI

Check the different kinds of MIDI events you want to display.

Special

Check the different kinds of special events you want to display.

Notation

Check the different kinds of notation events you want to display.

All/None buttons

Click an All/None button under the column of event types that you want to display all of or none of. Clicking the button toggles the display between each extreme.

See also:

Export Color Set dialog

The **Export Color Set** dialog box appears when you click the **Export Colors** button in **Edit > Preferences > Customization - Colors**.

This dialog box has the following fields:

Save in

Select the directory in which you want SONAR to store the file that you want to export.

file and folder window

This large window under the **Save in** field lists the files and folders that are inside the current folder.

File name

Type or select the filename you want to open.

Save as type

Select the type of file you want to open.

Export Current Color Set

Enable this check box if you want to export the current color arrangement as a color set file (.clr).

Export Color Preset

Enable this check box if you want to export all the presets in the **Presets** menu as a color set file (.clr).

Export MIDI Groove Clip dialog

The **File > Export > MIDI Groove Clip** command opens the **Export MIDI Groove Clip** dialog box. You must first select a MIDI Groove clip before the command becomes available.

The **Export MIDI Groove Clip** dialog box has the following fields:

Save In

Use this field to navigate to the folder where you want to store the MIDI Groove clip.

File Name

Type a name in this field for the file you're saving (exporting).

Save as Type

The only option in this field is **MIDI Groove Clip (.mid)**.

File Info

For your exported MIDI clip, this field lists the MIDI Groove clip characteristics that the clip contains, such as **Beats in Clip**, **Follow Project Pitch**, and **Reference Note**.

For more information, see

Export OMF dialog

Select **File > Export > OMF** to open the **Export OMF** dialog box.

This command lets you save and export your projects OMF files. The dialog box has the following fields:

Save in

Shows the folder to which you are exporting your project. Browse your available drives to choose a different directory.

Below the **Save in** field is a list of the selected folder's contents.

File name

Enter a name for the file you are creating.

File of type

Select from one of the following OMF file formats:

- **OMF version 1.** Compatible with older applications.
- **OMF version 2.** Compatible with newer applications.

Audio Packaging

- **Embed Audio Within OMF.** Saves all audio in the OMF file.
- **Reference Audio Externally.** Saves all audio in a subdirectory of the directory where you save the OMF file.

Audio Format

- **Write RIFF Wave.** Export audio as WAV files.
- **Write AIFC.** Export audio as AIF files.

Split Stereo Tracks to Dual Mono

Check this option to save stereo tracks as a pair of mono tracks.

Include Archived Tracks

Check this option to export tracks in the project that are currently archived.

Mix Each Groove Clip as a Separate Clip

Check this option to save each Groove clip as a separate clip. This option may increase the length of time it takes to export the project as an OMF file if there are many Groove clips in the project.

Expression Text Properties dialog

In the Staff view, when you right-click on a text expression, such as a *ff* marking, the **Expression Text Properties** dialog box appears.

This dialog box lets you edit the text and location of your expression text.

See also:

Export Track Template

The **File > Export > Track Template** and **Save As Track Template** commands open the **Export Track Preset** dialog box. You must first select a track before the command becomes available.

The **Export Track Template** dialog box has the following fields:

Save In

Use this field to navigate to the folder where you want to store the track template.

File Name

Type a name in this field for the template you want to save (export).

Save as Type

The only option in this field is **Track Template Files (.cwx)**.

Fade/Envelope dialog

The **Process > Apply Effect > Fade/Envelope** command lets you specify accurately the shape of a fade for a selection, clip, or track. This is a *destructive edit*—it permanent alters the data that you apply it to. To apply a nondestructive volume change to selected data, see "Creating and editing automation envelopes" on page 1019.

The **Process > Apply Effect > Fade/Envelope** command opens the **Fade/Envelope** dialog box, which has the following fields:

Name.   Use this field to choose the kind of fade you want to apply to the selected data, from the following choices:

- Exponential Fade In
- Exponential Fade Out
- Inverse Exponential Fade In
- Inverse Exponential Fade Out
- Linear Fade In
- Linear Fade Out

Fade graph.   This graph shows a visual representation of the type of fade you choose in the **Name** field. The graph changes as you drag the line or curve in different directions.

Reset button.   Click this button to restore the graph to the shape of the fade that's listed in the Name field.

For step by step directions, see "Fades and crossfades" on page 395.

Fade Selected Clips dialog

The Track view **Clips > Fade Clips** command opens the **Fade Selected Clips** dialog box where you can create or edit one or more clip fades.

The **Fade Selected Clips** dialog box has the following options:

Fade

Select **Fade** if you want to create a fade-in and fade-out on the selected clips.

Fade In

The number of milliseconds the fade-in lasts.

Fade Out

The number of milliseconds the fade-out lasts.

Fill Gaps, XFade between Audio Clips

Select the **Fill Gaps, XFade between Audio Clips** check box if you want to automatically fill in the gaps and create an automatic crossfade between selected audio clips. Filling the gaps is accomplished automatically by "rolling out" the first clip's right edge and the second clip's left edge to create a crossfade.

XFade

The duration of the automatic crossfade.

Max Gap

This value specifies the widest gap that will be filled with an automatic crossfade.

Fade-in Curve

Choose a fade-in type. Options are linear, slow or fast curve.

Fade-out Curve

Choose a fade-out type. Options are linear, slow or fast curve.

Alter Existing Times

Select this option if you want to change the existing fade lengths. You don't have to enable this if you're creating a new fade.

Alter Existing Curves

Select this option if you want to change the existing fade types. You don't have to enable this if you're creating a new fade.

Only Show if Pressing Shift

Select if you want to apply previous dialog box settings without opening the dialog box. Hold shift when selecting command to override.

File Info dialog

The **Project > Info** command opens the **File Info** dialog box. In the **File Info** dialog box, you can document the following information for your project:

Title

Your song's title.

Subtitle

Your song's subtitle.

Instructions

Specific instructions about for playing your song.

Author

The author of the song.

Copyright

Applicable copyright information.

Keywords

Put keywords describing the song here for future reference.

Project Description Text Box

Project description or other information.

See also:

File Statistics dialog

The **File Statistics** dialog box displays the following information about the contents of the project file:

Statistic	What it means
Created	The date the project was first saved.
Editing time	The total time you've had the project open, from the time it was created to the last time it was saved. This does not include time spent editing the project since you last saved it. If you want to update this value, save the project.
Revision	Each time you save a file that has been changed, this number is incremented. If you open a project, make no changes, then save it, the revision number is not changed.
Events	The total number of events in the project.
Sample rate	The sample rate for digital audio.
Bit depth	The bit depth of digital audio.
Pan Law	The project's current pan law setting.
File version	The SONAR version number.

Table 261.

File Options dialog

The **Options** button in the **Save As** dialog box opens the **File Options** dialog box.

Check the **Mark for Microsoft Media Player** check box if you plan to use your MIDI files for use with the Microsoft Media Player.

Find Missing Audio dialog

Use the **Find Missing Audio** dialog box to find missing audio in your project. The following is a brief description of the options you have in this dialog:

Open. Click this button once you have searched for and found the missing audio file.

Skip. Click this button to move to the next missing file. When you skip and audio file your project opens without that piece of missing audio.

Skip All.   Click this button to skip all missing audio files. When you skip all missing audio files, you project opens without those pieces of missing audio.

Search.   Click this button to begin a search of all available hard drives for your missing audio file.

After locating the file Options.   You can choose to either move an audio file to the project's audio data folder, copy an audio file to the project's audio data folder, or leave an audio file in its current folder.

Fit to Time dialog

The **Process > Fit to Time** command opens the **Fit to Time** dialog box, which you can use to stretch or shrink a selection so that it ends at a specific time, expressed in either measure:beat:tick (MBT) or hours:minutes:seconds:frames (SMPTE) format. This command gives you a choice of modifying the events or modifying the underlying tempo. This is useful when you want to alter a portion of a project to have an exact length. The start time of the selection does not change, but the end time is altered as necessary to fit the required time interval.

Audio can be stretched or condensed up to a factor of 4 (e.g., it can be shrunk to as little as 25 percent of its original length, or expanded to as much as 400 percent of its original length).

The **Fit to Time** dialog box has the following fields:

Original Time Span

This field lists the beginning location of the selection (the **From** value), and the ending location of the selection (the **Thru** value). You can toggle between MBT format and SMPTE format by clicking the **Format** button.

Adjust to End at New Time

Enter a value into the **New Thru** field of the new location where you want the selection to end.

Modify by Changing

Choose how you want to change the selection to change its duration. Usually, you change the Tempo Map; this method preserves the note durations and bar lines of your project. Choose from these options:

- **Tempo Map.**   Choose this option to change only the tempo(s) of the selection, leaving note durations and their relationships to bar lines unchanged.
- **Event Times.**   Choose this option to change the starting and ending times of all events in the selection, leaving the tempo(s) unchanged. This option is not available if any selected data contains a Groove clip.
- **Stretch Audio.**   Choose this option to cause any audio data in the selection to stretch or shrink to fit the new end time. This option has no effect on Groove clips.
  - **Type (disabled unless Stretch Audio is checked).**   (this is a SONAR Producer feature only) choose options based on the source material: single voice or instrument versus a group of instruments (ensemble or polyphonic), and how long you want to wait for processing to

finish: better quality can take a long time if you're processing several tracks.

- **Formant Scaling (disabled unless Stretch Audio is checked).** (this is a SONAR Producer feature only) possible values range from -2.000 to 2.000 octaves. Formants give a voice its characteristic sound. If you find that changing the length of your audio changes the timbre too much, you can raise or lower the formant to try and maintain the characteristics of the sound.

Format button

Click the **Format** button to toggle between display in "MBT" on page 1915 time and "SMPTE" on page 1919 time formats.

See also:

"To stretch or shrink to a specific length" on page 716

"Stretching and shrinking events" on page 714

"Working with Groove Clip audio" on page 659

Freeze Options dialog

The **Freeze Options** dialog box has the following options:

Fast Bounce

When checked, SONAR bounces to tracks as fast as your computer will allow. If unchecked, bouncing to tracks happens in real time. Uncheck this option if you are using a synth that only works in real time. This option is checked by default.

Hide MIDI Tracks

Check this box if you want the MIDI tracks associated with your synth to be hidden when the synth is frozen.

Single Bounce Per Track

Check this if you want to create a single clip for all the bounced audio. If you don't check this, each separate clip on a track creates a separate clip when you freeze the track.

Remove Silence

If you checked the previous option, you can check this box and adjust settings in the **Remove Silence** dialog box to remove silence in a frozen track. Checking this option will create separate clips from a single clip that has areas of silence in it.

Freeze Tail Duration n seconds

This value allows for a reverb or delay tail (the reverberations or signal delay that continue once the source has stopped). Set this value at a high enough value to allow for any delay or reverb or other effect that you may have patched into a track.

Audible bounce

When **Fast bounce** is disabled, the real-time bounce operation can be performed either silently or audibly. To hear the bounce operation while freezing a track, select the **Audible bounce** check box.

Track FX

When selected (default behavior), the track effects bin is rendered into the frozen clip, **Freeze Tail Duration** is applied, and the track effects bin is bypassed.

If the Track FX option is not selected, the track effects bin is not rendered into the frozen clip, which is useful when freezing AudioSnap clips in order to conserve CPU resources.

> **Tip:** *You can right-click any track's **Freeze** button in the Track view to open the **Freeze Options** dialog box.*

Gain dialog

The **Process > Apply Effect > Gain** command opens the **Gain** dialog box.

This dialog box lets you precisely control the gain, phase, and stereo interleave of selected audio data. This dialog box has the following controls:

- **New Left Channel-From Left slider.**   Drag the From Left slider to determine the amount of the original left channel that will be mixed to the new file (range = -INF to 18.0dB).

> **Note:** *Each group consisting of a slider, a % edit box, and a dB edit box are connected; adjusting one affects the others.*

- **New Left Channel-From Right slider.**   Drag the From Right slider to determine the amount of the original right channel that will be mixed to the new file (range = -INF to 18.0dB).
- **Invert left channel phase.**   Enable the **Invert left-channel phase** button if you want to reverse the phase of the new left-channel mix.
- **New Right Channel-From Left slider.**   Drag the **From Left** slider to determine the amount of the original left channel that will be mixed to the new file (range = -INF to 18.0dB).
- **New Right Channel-From Right slider.**   Drag the **From Right** slider to determine the amount of the original right channel that will be mixed to the new file (range = -INF to 18.0dB).
- **Invert right channel phase.**   Enable the **Invert right-channel phase** button if you want to reverse the phase of the new right-channel mix.
- **Audition button.**   click this button to audition a few seconds of your new settings.

- **Preset window.** use this window and the **Save** and **Delete** buttons that are next to it to save and manage any **Gain** presets you decide to store.

Go dialog

Press G to open the **Go** dialog box, which allows you to jump to a new Now Time. Additionally, the **Go** dialog box opens when you right-click a transient marker on a track with AudioSnap enabled and choose **Move to** or **Stretch to**.

The **Go** dialog box has only the following field:

To Time

In this field, fill in the time you want to move to according to the following table. You can click the spin controls (**Plus**-**Minus** buttons) to move forward or backward one tick at a time. When you click **OK**, the Now time becomes the time in the **To Time** field.

When you enter a time in MBT format, the beat and tick value are optional. You can use a colon, period, space, or vertical bar to separate the parts of the Now time.

You enter	The Now time is set to
2	2:00:000
2 1	2:01:000
4 2 0	4:02:000
9:1	9:01:000
5.1.30	5:01:030

Table 262.

If you click in the time ruler while the snap grid is enabled, the Now time snaps to the nearest point in the grid. By setting the grid size to a whole note or quarter note you can easily set the Now time to a measure or beat boundary.

You can also use the buttons and the scroll bar in the Control Bar's Transport module to adjust the time.

See also:

"The Now time and how to use it" on page 178

Groove Quantize dialog

The **Process > Groove Quantize** command opens the **Groove Quantize** dialog box. Groove Quantizing is a way to edit a track so that its rhythmic feeling and, optionally, controller data are similar to some other piece of music. The other piece of music forms a groove pattern that you store in a groove file, which has an extension of .GRV.

The **Groove Quantize** dialog box has the following fields:

Presets

Use this field to save or apply a group of settings, which include all the fields in the **Groove Quantize** dialog box except **Groove File** and **Groove Pattern**. Clicking the disk icon saves the current group of settings under the name you type into the presets window. Choosing a setting from the window's drop-down list applies it to the dialog box. Clicking the **X** icon deletes the current preset from the list.

Groove File

Use this field to choose what groove file you want to choose a groove pattern from. Groove files have the extension .GRV.

Groove Pattern

Use this field to choose the pattern you want to apply to the selected data.

Resolution

Set the note resolution. The smaller the note value, the more precise the quantization. See

Window

This field determines what SONAR does to notes that are far from the quantization points. See "Window" on page 721. The **Window** fields include the following:

- **Sensitivity.** This value determines how far from the quantization grid SONAR looks to find notes to quantize. A value of 100 percent quantizes every note. See "Window" on page 721.
- **If Outside Window.** This field offers the following choices:
  - **Do not change.** Choosing this option means that SONAR leaves notes alone that lie outside the window.
  - **Quantize to Resolution.** Choosing this option means that SONAR quantizes out-of-window notes according to the resolution value instead of the groove pattern.
  - **Move to Nearest.** Choosing this option means that SONAR moves out-of-window notes to the nearest groove event.
  - **Scale Time.** Choosing this option means that SONAR moves out-of-window notes so that they are equally spaced.

AudioSnap Beats

Check this box if you want AudioSnap transients to be quantized.

Only Notes, Lyrics and Audio

Check this box to prevent MIDI controller, aftertouch, and xRPN data from changing.

Strength

The values in the Strength section determine how closely SONAR changes the selected notes to match the groove's values.

The Strength section has these fields:

- **Time.** Drag the slider in this field to set how closely SONAR moves the start time of the selected notes to the groove's start times.
- **Duration.** Drag the slider in this field to set how closely SONAR moves the durations of the selected notes to the groove's durations.
- **Velocity.** Drag the slider in this field to set how closely SONAR moves the velocities of the selected notes to the groove's velocities.

Define button

Click this button to define a new groove pattern. See "Defining a groove" on page 724.

Auto XFade Audio Clips

When quantizing audio, empty space can occur between clips. Select the **Auto XFade Audio Clips** check box if you want to automatically fill in the gaps and create an automatic crossfade between selected audio clips. Filling the gaps is accomplished automatically by "rolling out" the first clip's right edge and the second clip's left edge to create a crossfade.

Groove Quantize dialog

The following options can be specified:

- **XFade.**   This value determines the duration of the crossfade.
- **Max Gap.**   This value specifies the widest gap that will be filled with an automatic crossfade.

See also:

Group Attributes dialog

When you right-click a control in the Track view or the Console view that belongs to a Quick Group, and choose **Save** from the pop-up menu, the **Group Attributes** dialog box appears. The **Group Attributes** dialog box has the following fields:

Group Name

You can enter a name for the group in this field.

Choose Color button

Clicking this button opens the **Color** dialog box, which allows you to choose or customize the group color.

Group Manager dialog

When you right-click a control in the Track view or the Console view and choose **Group Manager** from the pop-up menu, the **Group Manager** dialog box appears. The name of the group that the control you right-clicked belongs to appears in the **Group** field.

This dialog box lets you specify the relations of controls in a group, and edit the name and color of the group that is listed in the **Group** field.

The dialog box has the following fields:

Group

The name of the group that the control you right-clicked belongs to appears in the **Group** field, but you can choose another group from the drop-down menu, and edit its properties in the other fields.

Create New Group button

This button is just to the right of the **Group** field, and opens the **Group Attributes** dialog box. You can enter the name of the new group you want to create, and edit its properties in the rest of the **Group Manager** dialog box.

Delete Group button

Just to the right of the **Create New Group** button is the **Delete Group** button ✕. Clicking this button deletes the group that appears in the **Group** field.

Name column

This column is not active unless the group is a custom group. The **Name** column lists all the controls in the group of the control you right-clicked.

Start Value column

This column is not active unless the group is a custom group. The Start Value column lists the beginning values of all the controls in the selected group.

End Value column

This column is not active unless the group is a custom group. The End Value column lists the ending values of all the controls in the selected group.

Preserve Mix Between Gain Members

When this check box is enabled, any gain controls that are grouped will maintain the dB differential between them when they are moved. Otherwise, only the visual differential between them is maintained.

Start Value number field

This field is not active unless the group is a custom group. Edit the **Start Value** of the control that is highlighted in the **Name** column by typing a new number into the **Start Value** number field.

End Value number field

This field is not active unless the group is a custom group. Edit the **End Value** of the control that is highlighted in the Name column by typing a new number into the **End Value** number field.

Swap button

Click the **Swap** button to exchange the **Start Value** with the **End Value** for the control that is highlighted in the **Name** column.

Absolute button

Click this radio button to cause the grouped controls to move in the same direction at the same speed. See "Absolute" on page 914.

Relative button

Click this radio button to cause the grouped controls to move in the same direction but not at the same speed. See "Relative" on page 914.

Custom button

Click this radio button to custom-design the way the grouped controls move. See "Custom" on page 914.

Group Manager dialog

Group Color

This field displays the color of the group that's displayed in the **Group** field.

Attributes button

This button allows you to edit the name and color of any permanent group that's displayed in the **Group** field.

See also:

Hairpin Properties dialog

In the Staff view, right-click on a hairpin (crescendo or decrescendo) to open the **Hairpin Properties** dialog box.

Use these fields to edit the hairpin that you right-clicked:

- **Time.** Type the location you want the hairpin to move to.
- **< Crescendo.** Click this option to change the hairpin to a crescendo.
- **> Diminuendo.** Click this option to change the hairpin to a decrescendo.
- **Duration.** Type the length you want the hairpin to last.

See also:

Import Audio dialog

The **File > Import Audio** command opens the **Import Audio** dialog box. Use this command to import any of the following kinds of audio into your project:

- Wave (extension .wav)
- Sony Wave64 (extension .w64)
- Apple AIFF (extensions .aif and .aiff)
- Apple Core Audio File (extension .caf)
- MPEG (extensions .mpeg, .mpg, .mp2, and .mp3)
- Windows Media (extensions .asf, .wm, .wma, .wmv)
- Next/Sun (extensions .au, .snd)
- FLAC (extension .flac)

- Sound Designer II (extension .sd2)
- ReCycle (extensions .rcy, .rex, .rx2)
- All Files

The sampling rate for a project is set based on your default sampling rate. If the sampling rate from the wave file does not match the sampling rate in your project, then it will be converted to the current project's sampling rate.

The **Import Audio** dialog box has the following controls:

- **Look In field.**   Use this field to navigate to the folder that contains the audio file you want to import.
- **File name window.**   Just below the **Look In** field, this window displays the contents of the folder that's listed in the **Look In** field. In this window, you can click the name of the file you want to import to select it. You can select more than one file by holding down the CTRL key while you click.
- **File Name field.**   This field displays the name of the audio file that you have selected to import.
- **Files of Type field.**   Use this field to choose what kind of file you want to display in the **File name** window.
- **Bit Depth.**   This field lets you choose what bit depth you want the imported audio to be converted to. If you don't want any conversion, choose the **Original** option, which is the default. This option imports audio at whatever bit depth the imported audio is currently using.
- **Copy Audio to Project Folder check box.**   If you check this option, SONAR makes a new copy of the imported audio file in the project's folder.
- **Import as Mono Tracks check box.**   If you check this option, SONAR imports stereo audio files to two separate tracks, instead of one stereo track.
- **Preview Bus.**   This list lets you specify the desired output bus when previewing a file with the **Play** button.
- **Play button.**   Click this button to play audio files that are selected.
- **Format tag, Attributes, File Length.**   When you select a file to import in the **Import Audio** dialog box, these fields display the kind of audio file you have selected, the sample rate, bit depth, mono/stereo status, number of samples, and length in seconds of the selected file. If you select multiple files, the displayed data describes the last file that you select.

For more information, see:

Import Audio dialog

Import Audio CD Tracks dialog

The **File > Import > Audio CD** command opens the **Import Audio CD Tracks** dialog box. Use this command to import an audio CD track (extension .cda) into your project.

The **Import Audio CD Tracks** dialog box has the following controls:

- **Track List.** The main area of the window is the track list. Each track represents an audio track located on the CD. The tracks are automatically named and numbered in order. Any number of CD Tracks can be selected for importing.

- **Source Drive.** The **Source Drive** specifies the CD device containing the tracks to import. The program attempts to locate all CD devices available. Click the arrow next to the drive letter to refresh the **Source Drive**. This process will verify if an Audio CD has been inserted into the drive. Once the Audio CD has been verified, the available track list will appear in the window after a few moments.

- **Import Bit Depth.** Audio Tracks on a CD always have a bit depth of 16, but you can choose to import the tracks at a higher bit depth if desired.

- **Play.** When a single track is selected, it can be auditioned by pressing the **Play** button. Once playback begins the button is renamed to **Stop**, so that the audition can be manually terminated.

- **OK.** Imports the selected tracks. For each track selected, an Audio track is created in the project.

- **Cancel.** Closes the dialog box without performing any action.

Figure 465. *The **Import Audio CD Tracks** dialog*
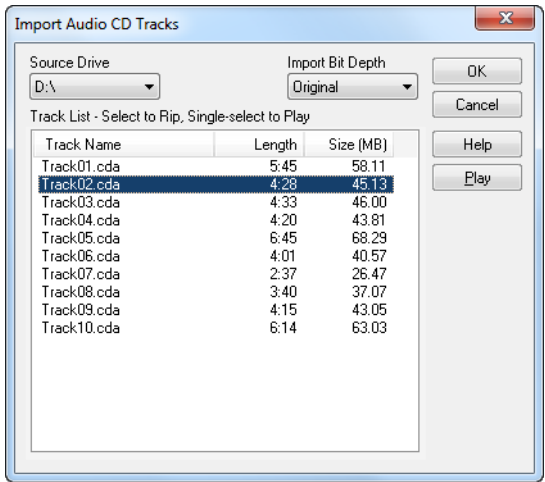
For more information, see:

Import Audio CD Tracks dialog

Import Color Set dialog

The **Import Color Set** dialog box appears when you click the **Import Colors** button in **Edit > Preferences > Customization - Colors**.

This dialog box has the following fields:

Look in

Select the directory in which SONAR stores the file that you want to open.

File and folder window

This large window under the **Look in** field lists the files and folders that are inside the current folder.

File name

Type or select the filename you want to open.

Files of type

Select the type of file you want to open.

Import Instrument Definitions dialog

To open the **Import Instruments Definition** dialog box, go to **Edit > Preferences > MIDI - Instruments**, click the **Define** button to open the **Define Instruments and Names** dialog box, then click the **Import** button. The **Import Instruments Definitions** dialog box contains the following fields:

Look in

Use this field to navigate to the folder that contains the instrument definitions you want to import,

File name

You can type the name of the file that you want to import, or click the file name in the window that's just above the **File name** field. Instrument Definition files have the extension .ins.

Files of type

The only choice in this field is Instrument Files (*. ins).

See also:

Import MIDI dialog

The **File > Import > MIDI** command opens the **Import MIDI** dialog box. Use this dialog box to import MIDI files or Project5 patterns.

The **Import MIDI** dialog box has the following fields:

Look In

Use this field to navigate to the folder that contains the MIDI file or Project5 pattern that you want to import.

File Name

This field lists the name of the file you've selected to import.

Files of Type

Use this field to choose whether you want to display MIDI files or Project5 patterns.

File Info

For a selected MIDI file, this field lists the type of MIDI file, the number of tracks, and any MIDI Groove clip characteristics that the file contains, such as **Follow Project Pitch**, **Number of Beats**, etc. For Project5 patterns, this field does not display information.

Play

The **Play** button allows you to audition the selected MIDI file.

Import Video File dialog

SONAR's **Import Video File** dialog box lets you include an AVI, MPEG, or QuickTime video in your project. This video is shown in real time as your project plays.

The Video view displays the current time (as in the Big Time view) and the video itself. The display in the Video view is synchronized with the Now time, giving you convenient random access to the video stream. This makes it easy to align music and digitized sound to the video.

If the Video view is the active window, you can now use keyboard shortcuts to advance by a frame or a frame increment. The +/-, and left/right arrow keys move forward/backwards by a single frame. If the control key is pressed, then the frame increment value is used (the default is 5 frames) Alternatively you can use the [and] keys to seek by the frame increment. See Changing the Frame Increment.

Commands in the Video view's pop-up menu let you set the time display format, the size and stretch options for the video display, the video start and trim times, and other options. Your project's video and digital audio data can be saved together in a new AVI file with **File > Export Video** command. For more information, see Preparing Audio for Distribution.

Note: *The project's video file is saved in the project by reference only; the actual video data remains in the original file.*

Use these options in the **Video File** dialog box:

Option	What it means
Look in	Use this field to find the folder that contains the video file you want to insert.
File name	Use this field to find the video file you want to insert. Clicking the name of the file in the window above this field causes it to appear in the **File name** field.
Files of Type	Use this field to select what type of video files to display. **Note:** If your system has a basic Windows installation with DirectShow installed, you may not be able to insert QuickTime video files. You may need to install the latest video Codecs from Microsoft's web site in order to import different video formats. The problem can be solved by going to Microsoft's web site (www.microsoft.com) and downloading and installing the latest version of Media Player.
Show File Info	If you check this option, SONAR displays the video file's format tag, audio sample rate, and length in both audio samples and time.
Import Audio Stream	If you check this option, SONAR imports the video file's audio file along with the video. Select a blank track before you do this.
Import Mono Tracks	If you check this option, SONAR imports the video file's audio file into two separate tracks, instead of one stereo track.
Open	After you decide what options you want, clicking the **Open** button imports the video and, optionally, the accompanying audio into your project.

Table 263.

For more information, see:

Import Video File dialog

Insert Pitch Change dialog

Right-clicking in the time ruler and choosing **Insert Pitch Change** from the pop-up menu opens the **Insert Pitch Change** dialog box.

This command changes the pitch of a Groove clip at the Now time at which you insert the command.

For more information, see:

"Creating and editing Groove Clips" on page 661

"Using pitch markers in the Track view" on page 665

Insert Series of Controllers dialog

Select **Insert > Series of Controllers** to open the **Insert Series of Controllers** dialog box.

This command lets you change controller event values smoothly over a specified time range.

Choose from the following options:

Insert

this field let you choose what kind of data to insert:

- **Pitch Wheel**
- **Controller**
- **"RPN"** on page 1918
- **"NRPN"** on page 1916
- **Number.**   This field is not available if you click the **Pitch Wheel** check box above. If you clicked the **Controller** check box, choose a value from the drop-down list. If you checked **RPN** or **NRPN**, consult the manual of your sound module to see what values it will accept.

Value Range

Enter a **Begin** value and an **End** value for your controller data.

Time Range

Enter **From** and **Thru** values to create a time boundary for your new controller data.

See Also:

"Adding and editing controllers in the Piano Roll" on page 695

Insert Series of Tempos dialog

This command lets you change tempo smoothly over a specified time range by inserting a series of tempo changes.

Tempo Range

- Begin–enter the tempo you want to start the tempo range at.
- End– enter the tempo you want to end the tempo range at.
- Step–enter a value in beats and clock ticks for how often you want SONAR to insert a tempo change into your tempo range.

Time Range

- From–enter the time location in your project where you want the tempo range to start.
- Thru– enter the time location in your project where you want the tempo range to end.

See Also:

Insert Soft Synth Options dialog

This dialog box appears when you use the **Insert > Soft Synths > (name of the synth you want to insert)** command, the **Insert > ReWire Device > (name of the ReWire device you want to insert)** command, or click the **Insert** button in the Synth Rack view and choose a synth from the pop-up menu.

This dialog box inserts the soft synth whose name you clicked into your project. Inserting it means that the synth's name is added to the synth and audio tracks' **Input** menus and the MIDI tracks' **Output** and **Channel** menus. Besides inserting the synth, the dialog box has some options:

Create These Tracks:

- **Simple Instrument Track.** If you select this option, the synth's MIDI input and main audio output appear in a single track strip.
- **MIDI Source.** If you select this option, a new MIDI track appears that lists the particular soft synth you chose in the MIDI track's **Output** field. You still need to choose values in the MIDI track's **Patch** and possibly **Channel** menus.
- **Synth Track Folder.** If you select this option, new synth tracks and associated MIDI tracks appear in a track folder. Each new instance of a synth gets its own folder.
- **First Synth Audio Output.** If you select this option, a new synth track appears that uses the synth's first audio output as an audio input.

- **All Synth Audio Outputs: Stereo.**   If you select this option, one new stereo synth track appears for each stereo audio output that the synth you chose has. Each of the new tracks uses a different one of the synth's outputs as an audio input.
- **All Synth Audio Outputs: Mono.**   If you select this option, two new mono synth tracks (one Left and one Right) appear for each stereo audio output that the synth you chose has. Each pair of new synth tracks uses a different one of the synth's outputs as an audio input.

Open These Windows:

- **Synth Property Page.**   If you choose this option, the interface (property page) of the synth you're inserting appears when you insert it.
- **Synth Rack view.**   If you choose this option, the Synth Rack view appears each time you insert another synth (or another instance of a synth you've already inserted).

Enable MIDI Output

Some synths can create MIDI data from built-in arpeggiators or other components. If you want to record or redirect this new MIDI data, enable this check box.

Display Automation On:

- **{Automation track drop-down menu}.**   By default, the automation data for a synth appears on the synth track associated with that synth. Use this menu to choose any other track to display the data on, including tracks that are already displaying other synth's automation data.
- **Recall Assignable Controls.**   If you create some knobs in the Synth Rack to control certain parameters on a particular synth, you can display the same knobs every time you insert an instance of that synth by enabling this check box.

Ask This Every Time

If you check this option, this dialog box appears every time you use the **Insert > Soft Synths > (name of the synth you want to insert)** command, the **Insert > ReWire Device > (name of the synth you want to insert)** command, or click the **Insert** button in the Synth Rack view and choose a synth from the pop-up menu. If you always insert soft synths in the same way, you can uncheck this option so you don't have to deal with the dialog box each time. To open the dialog box when the option is unchecked, click the **Insert Soft Synth Options** button in the **Synth Rack** view toolbar.

For step-by-step instructions, see:

Insert Soft Synth Options dialog

Insert Time/Measures dialog

Select **Project > Insert Time/Measures** to open the **Insert Time Measures** dialog box.

This dialog box lets you insert the amount of time you specify at the point you indicate in the music. You can specify what events to slide over to make room for the new amount of time.

At Time:

The time at which you want to insert time, seconds, ticks or frames.

Insert:

Set the number of one of the following to insert at the At Time:

- Measures
- Seconds
- Ticks
- Frames

Slide:

Select whether you want to slide (move down the track by exactly the amount of time you are adding) any of the following:

- Events in Tracks
- Markers
- Meter/Key Changes
- Tempo Changes

See also:

Insert Tracks dialog

Using the **Insert > Multiple Tracks** command opens the **Insert Tracks** dialog box, which allows you to insert multiple audio and/or MIDI tracks, and set some track properties.

This dialog box has the following fields:

Audio

- **Track Count.**   Set the number of audio tracks you want to insert.
- **Main Destination.**   Set the main output that you want the new audio tracks to use.
- **Set as Default Bus.**   If you check this box, all new audio tracks that you insert will use the main

output that is listed in the **Main Destination** field.

- **Send.** If you choose an option besides **None** in this field, each new audio track that you insert will contain a Send module whose output is the bus that you choose in this field.

MIDI

- **Track Count.** Set the number of MIDI tracks you want to insert.
- **Port.** Set the output port that you want the new MIDI tracks to use.
- **Channel.** Set the output channel that you want the new MIDI tracks to use.

Find/Change and Event Filter dialog

The **Process > Find/Change** command is a search-and-replace command that uses **two dialog boxes**. The command itself opens the **Event Filter-Search dialog box**. In this dialog box, you fill in the kinds of events you want SONAR to find and select. When you **click OK**, the **Event Filter-Replace dialog box** appears. In this dialog box, you fill in the kind of events you want to replace the selected events with.

To see some examples of how to fill in the dialog boxes, see "Process > Find/Change" on page 737.

For an explanation of all the fields in the **Event Filter** dialog box, see "Event Filter Select Some/Search/Replace dialog" on page 1594.

Kind of Event dialog

In the Event List view, double-clicking the name of any event that's listed in the **Kind** column opens the **Kind of Event** dialog box.

After you double-click the name of an event, you can change that event into another kind of event by choosing the new kind of event in the **Kind of Event** dialog box.

See also:

"Event List view" on page 1832

Length dialog

The **Process > Length** command, which opens the **Length** dialog box, can be used to stretch or shrink MIDI and/or audio clips, and/or to move their start times. **Process > Length** lets you stretch or shrink the selection by a fixed percentage and makes the adjustment by altering the individual events. A value of 200 percent, for example, stretches the selection to twice its original length, while a value of 50 percent shrinks the selection to half its original length.

This command offers the option to stretch audio clips along with the MIDI information. Sometimes you don't want to adjust the speed of your audio. Audio can be stretched or condensed up to a factor of 4 (e.g., it can be shrunk to as little as 25 percent of its original length, or expanded to as much as 400 percent of its original length).

You can also use the **Process > Length** command to alter only the start times or the durations of notes. For example, changing the durations of notes to 50 percent of their original length can create a staccato effect.

The **Length** dialog box has the following fields:

Change

Use the fields in this section to tell SONAR what to change, including:

- **Start Times.** Choose this option if you want the start times of the selected events to shift by a percentage of their distance from the beginning of the selection. For example, if a note starts on beat 3 of a selection and you enter a value of 50 percent, SONAR shifts the start of the note one beat to the left, or half of 2 beats.

- **Durations.** Choose this option if you want the durations of the selected events to shrink by a percentage.

By "N" Percent

Fill in the percentage number that you want the selected events to change by, which can be positive or negative.

Stretch Audio

Choose this option if you want duration of any selected audio to change.

Type (disabled unless Stretch Audio is checked)

This is a SONAR Producer feature only. Choose options based on the source material: single voice or instrument versus a group of instruments (ensemble or polyphonic), and how long you want to wait for processing to finish: better quality can take a long time if you're processing several tracks.

Formant Scaling (disabled unless Stretch Audio is checked)

This is a SONAR Producer feature only. Possible values range from -2.000 to 2.000 octaves. Formants give a voice its characteristic sound. If you find that changing the length of your audio changes the timbre too much, you can raise or lower the formant to try and maintain the characteristics of the sound.

See also:

Length dialog

Load Pattern dialog

To open the **Load Pattern** dialog box, do *one* of the following:

- Right-click in the **Step Sequencer** toolbar and select **Load Pattern** from the pop-up menu.
- Open the Step Sequencer and press press CTRL+ALT+L.

Use the **Load Pattern** dialog box to load an existing step sequencer pattern into a project.

Look in

Select the directory in which SONAR stores the pattern that you want to load.

File name

Type or select the filename of the pattern that you want to load.

Files of type

The **Load Pattern** dialog box can only load the Step Sequencer Patterns file type, which has the extension .ssp.

Lyric Properties dialog

In the Staff view, when you right-click on a word or syllable in the lyrics, the **Lyric Properties** dialog box opens. Use this dialog box to change a syllable's timing or text.

See also:

Map Properties dialog

The **Map Properties** dialog box lets you change all the settings for an individual mapped note in your drum map.

You can edit the following settings in the **Map Properties** dialog:

Name

A descriptive, user-assigned name for the current drum sound.

In Note

The recorded pitch as it appears in the Event List view. The range is from C0 to G10 or 0 to 127. Raise or lower values one half-step at a time using the +/- keys or by an octave at a time by using the open and close bracket keys ([and]).

Out Note

The specific note to which the In Note is mapped. The range is from C0 to G10 or 0 to 127. Raise or lower values one half-step at a time using the +/- keys or by an octave at a time by using the open and close braked keys ([and]).

Vel+

Sets a velocity offset to a mapped drum note. Values range from -127 through 127. Use the +/- keys to increase or decrease the value.

Vel%

Multiplies the velocity of the note by the percentage you enter. Values range from 10 to 200.

Map Manager button

Opens the **Map Manager** dialog box.

Out Port

The output port to which the Out Note is sent. You can assign a note to any port selected in the **MIDI Devices** dialog box. Also, any soft synths in your project show up as an option. You can use the +/- keys to scroll up or down in the **Output Port** list.

Out Chan

Sets the channel in which the mapped drum note plays. You can choose to follow the track's channel setting or set the note to a specific channel (1 through 16).

Bank

The bank number on which the mapped note is transmitted.

Patch

Sets the Patch name that the mapped drum note is transmitted to.

Marker dialog

Use the **Project > Insert Marker** command to open the **Marker** dialog box.

This dialog box lets you add a "Marker" on page 1915 where you specify in the music.

Name:

Enter the name you want to give the marker.

Lock to SMPTE time

Check this if you want to use SMPTE time code.

Time:

Enter the time at which you want to place the marker.

Groove Clip Pitch

If you want the marker to change the project pitch, select the pitch you want from the **Groove Clip Pitch** drop-down menu.

See also:

"Creating and using markers" on page 357

Markers dialog

This dialog box lets you choose any marker. Closing the box and the associated **Go** dialog box moves the Now time to the specified marker.

See also:

"Creating and using markers" on page 357

Measure Beat/Meter

You can insert meter changes anywhere in the timeline. The **Measure Beat/Meter** dialog box allows you to select the point on the Time Ruler where the meter change will occur. Using the spinners or manual entry, select the point at which you want to insert the meter change. Select the meter you want to change to by checking the **Insert Meter** check box, and entering the time signature you want.

See:

"To sync the project tempo to freely played MIDI" on page 728

Meter/Key Signature dialog

Select **Project > Insert Meter/Key Change** to open the **Meter/Key Signature** dialog box.

This dialog box lets you set the meter and key signature of a project or any part of a project.

At Measure:

Select the measure you from where you want the changes to take effect.

Beats per Measure:

Select the number of beats per measure.

Beat Value:

Select the value of each beat (i.e. 1 = whole note, 2 = half note, etc.)

Key Signature:

Select the key signature.

For step by step instructions, see "Setting the Meter and Key signatures" on page 252.

Microsoft Media Format Encode Options dialog

You can create settings and a description for your Windows Media Advanced Streaming Format file in the **Microsoft Audio Encode Options** dialog box.

Note: *To create a surround encoded file you must export surround encoded buses.*

Title:

Enter the title of the file.

Author:

Enter the name of the author responsible for creating the file.

Rating:

This field only relates to exporting video, which you can't do from this dialog box.

Copyright:

Enter any copyright information for the file.

Description:

Enter a note about the file.

Codec

Select a codec from the drop-down list.

Format

Select a format from the drop-down list. A higer the kbps setting the higher the quality of the file.

For more information, see:

"Routing and mixing digital audio" on page 841

MIDI Envelope dialog

When you click a MIDI track's Edit Filter control and choose **Track Automation > MIDI** in the drop-down menu, the **MIDI Envelope** dialog box appears.

The **MIDI Envelope** dialog box has the following fields:

- **Type.**   Use this field to choose what kind of MIDI event you want to control with your envelope.
- **Value.**   Use this field to choose the name of the controller you want to edit.
- **Channel.**   Use this field to choose the MIDI channel that you want the envelope to send data on.

For more information, see:

MIDI Event Type dialog

The **MIDI Event Type** dialog box opens when you do one of the following:

- Click a MIDI track's Edit Filter control and choose **Notes > New Value Type** in the drop-down menu.
- Click the Piano Roll view Edit menu and choose **New Value Type**.

The **MIDI Event Type** dialog box has the following fields:

- **Type.**   Use this field to choose what kind of MIDI event you want to create.
- **Value.**   Use this field to choose the name of the controller you want to create.
- **Channel.**   Use this field to choose the MIDI channel that you want the event to send data on.

For more information, see:

MIDI Input Presets dialog

The **MIDI Input Presets** dialog box appears when you use click the drop-down arrow on a track's MIDI **Input** field and select **Manage Presets** from the drop-down menu.

Use the **MIDI Input Presets** dialog box to create and edit MIDI Input Presets, which are collections of specific MIDI input channels and/or MIDI input ports that you want to assign to one or more tracks.

The **MIDI Input Presets** dialog box has the following fields:

Preset Window

The first window in the dialog box lists the currently selected preset for the active track. When you want to create a new preset, type a name for it in this field when you've finished choosing channels and ports, and click the **Save** button (disk icon).

Input Port

The list of available MIDI input ports is listed vertically in this field.

1-16 Check boxes

These check boxes allow you to choose what MIDI channels you want this particular track to respond to on the port listed in the **Input Port** field.

All Omni

This button turns all of the **1-16** check boxes on or off with one click.

Omni

These buttons turn the **1-16** check boxes for each of the **Input Ports** on or off with one click.

Save/Delete Buttons

The two buttons to the right of the **Preset** box are the disk icon, which saves the current settings under the name in the **Presets** box, and the **X** button, which deletes the current preset.

Migrate Cakewalk Preferences dialog

This dialog box lets you transfer a variety of configuration preferences from earlier Cakewalk installations.

The first time you run SONAR, it asks if you want it to search for an older version of Cakewalk and transfer (or "migrate") the preferences you established in that version to Cakewalk. SONAR searches all hard disks in your system for older versions, and if you have more than one older version of Cakewalk installed, SONAR presents a list of them, in the dialog box.

Missing Plug-ins dialog

This dialog box appears if you open a project that references plug-ins that are not installed on your machine. **If you save the project after you have opened it with missing plug-ins, all references to missing plug-ins are lost**. To retain the missing plug-ins in your project, exit SONAR without saving, reinstall the missing plug-ins and then re-open the project.

MP3 Export Options dialog

The following is a description of the options in the **MP3 Export Options** dialog:

Bit Rate

Choose a bit rate from the drop-down list. A higher bit rate creates larger, higher quality files. The Bit Rate allows you to select the trade-off between the size and the sound quality of the compressed file. Compressing to higher bit rates will provide better sound quality, but will also create larger files.

Bit rate is specified in bits per second. As a rule of thumb, bit rates of 120,000 bits per second or higher offer near CD quality sound. Lower bit rates can be used, with a corresponding decrease in quality. If you are preparing your project for distribution on the web, lower bit rates will create smaller files, and therefore faster downloading time.

The maximum bit rate that you can select depends on the sampling rate of the project. The encoder supports bit rates up to 320000 bit per second, providing extremely high quality compression. Selection of 320000 bits per second or lower requires that your project was created using at least a 32 kHz sampling rate. If your project was created using a lower sampling rate, your selection of bit rates will also be limited.

Stereo Mode

Select one of the following from the drop-down list:

- **Joint Stereo.**   In Joint Stereo mode, the encoder optimizes the stereo encoding by comparing the two stereo channels. If similar information is found in the left and right channels, the encoder uses the similar information to minimize the data it stores in the MP3 file. While this encoding technique may result in better compression, it may result in a loss of stereo quality. An additional option when using Joint Stereo compression is the selection of **Intensity Stereo**. Selection of **Intensity Stereo** instructs the encoder to further optimize the encoding by minimizing the data encoded for higher frequency sounds. This can also improve the compression of the MP3 file, however in some cases the optimization of high frequency sounds may result in a loss of sound quality.

- **Mono.**   Create a Mono file

- **Stereo.**   By selecting Stereo mode, the encoder will create a Stereo MP3 file from a stereo project by treating the left and right channels as completely independent signals. Unlike Joint Stereo encoding, stereo encoding will not try to take advantage of similar information in left and right channels. As a result, Stereo Mode will completely preserve stereo separation without trying to reduce the data.

- **Mid/Side Stereo.**   Preserves most of the stereo effect of a file but at lower bandwidth. Not too useful at bit rates above 128 kbs.

Enable High Pass Filter/Low Pass Filter

These filters decrease your file size by eliminating frequencies that people don't usually hear anyway

MP3 Export Options dialog

Variable Bit Rate Encoding

Instead of producing a constant bit rate throughout the file, the **Variable Bit Rate** option optimizes the bit rate in different parts of the file to use a higher bit rate where it will make a difference, and a lower one where it won't. This option generally produces a better quality file than constant bit rate encoding, but doesn't produce the predictable file size you might need for downloadable files.

Quality Slider

MP3 encoding uses several techniques for analyzing sound and creating MP3 files. The slider provides the user with the ability to specify how much time the encoder should spend analyzing the file.

When the slider is positioned to the far left, the encoder will spend more time analyzing and compressing the file. This will result in the highest quality MP3 file, but it will take longest amount of time to compress it.

To reduce the time required to encode a project, you can position the slider further to the right. This will compress files quickly by reducing the time spent analyzing the project. The trade-off for compressing quickly, or optimizing for speed, is that the resulting MP3 file may have a lower sound quality.

Encode ID3 Info

Check this box to include ID3 information with your MP3 file. The following fields are where you enter ID3 information that is stored in your MP3 file and displayed in most applications that play MP3 files.

• **Track.** The track number.
• **Title.** The Song title.
• **Artist.** The performer.
• **Album.** The album or collection of songs that the song comes from.
• **Year.** The year the song was made.
• **Genre.** Select from a list of genres.
• **Comment.** Track notes.

Rename Screenset dialog

Click **Views > Screensets > Rename Current Screenset** to open the **Rename Screenset** dialog box, which allows you to rename the current screenset.

See also:

Rename Screenset dialog

New Project File dialog

Open the **New Project File** dialog by selecting **File > New** from the menu.

In the **New Project File** dialog box you choose the name of your project, where the project's data is stored and which template you want to use to create the file.

Name

Enter a file name for your project. This option is only available if you have **Use Per-Project Audio Folders** selected in **Edit > Preferences > File - Audio Data**.

Location

Select a folder in which your project file is saved. This option is only available if you have **Use Per-Project Audio Folders** selected in **Edit > Preferences > File - Audio Data**.

Audio Path

Select a folder in which your project's audio data is stored. This option is only available if you have **Use Per-Project Audio Folders** selected in **Edit > Preferences > File - Audio Data**.

Template

Select the template you want to use for your new project. Select a template from the list and click **OK** to create a new project.

See also:

No MIDI Inputs—SONAR dialog

The **No MIDI Inputs - SONAR** dialog box appears the first time you run SONAR, if no MIDI input devices are selected in **Edit > Preferences > MIDI - Devices**, or when another program is using your system's MIDI inputs. This dialog box lets you choose, or decide not to choose, an input.

For more information, see

No MIDI Outputs—SONAR dialog

The **No MIDI Outputs - SONAR** dialog box appears the first time you run SONAR, if no MIDI output devices are selected in **Edit > Preferences > MIDI - Devices**, or when another program is using your system's MIDI outputs. This dialog box lets you choose, or decide not to choose, an output.

For more information, see

Normalize dialog

The **Normalize** dialog box appears when you use the **Process > Apply Effect > Normalize** command. This dialog box has the following controls:

- **Presets window.**   Use this window and the **Save** and **Delete** buttons that are next to it to save and manage any normalization presets that you decide to keep.
- **Normalize Level slider.**   Drag this slider up or down to control the volume of a selection so that the highest sample level reaches the level of the slider.
- **Percentage field.**   This field is linked to the **Normalize Level** slider. This field displays the percentage of possible normalization, from 0 to 100%.
- **dB field.**   Like the **Percentage** field, this field is linked to the **Normalize Level** slider. Typing values into this field moves the slider, just as moving the slider changes the values in this field. The dB values range from -INF (silent) to 0 dB (loudest level).

Note: *When you normalize stereo data, normalization is computed on the loudest sample value found in either channel and the same gain is applied to both.*

Note Names dialog

The **Note Names** dialog box appears when you right-click the piano keyboard that's located on the left side of the Piano Roll view. This dialog box lets you specify whether to use the settings assigned in the **Assign Instruments** dialog box or different settings you specify, or drum mode.

Clicking the **Configure** button opens the **Assign Instruments** dialog box.

See also:

Note Properties dialog

In the Staff view or Piano Roll view, when you right-click on a note, the **Note Properties** dialog box appears.

This dialog box lets you edit the note's time, pitch, velocity, and other MIDI properties.

See also:

"Selecting notes" on page 684

Online Registration dialog

The **Online Registration** dialog box appears when you start SONAR. You have three options in this dialog:

- **Register Now.**   This option opens your default Internet browser on Cakewalk's registration page.
- **Please Remind Me Later.**   This options closes the dialog box. The dialog box appears again, periodically, to prompt you to register.
- **Don't Ask Me Again.**   This option closes the dialog box permanently.

Open dialog

The **File > Open** command opens the **Open** dialog box. Use the **Open** dialog box to open an existing project.

Look in

Select the directory in which SONAR stores the file that you want to open.

File name

Type or select the filename you want to open.

Files of type

Select the type of file you want to open.

Go to Folder

Go to one of the predefined SONAR folders. See "File - Folder Locations" on page 1676.

See also:

"File type" on page 307

Open Groove File dialog

The **Open Groove File** dialog box appears when you click the **Open** button that's at the right end of the **Groove File** field in the **Groove Quantize** dialog box.

The **Open Groove File** dialog box has the following fields:

* **Look In.** This field lists the name of the folder whose contents are displayed in the window below it. Use this field to navigate to a folder that contains the groove file you need.

* **File Name.** This field lists the name of the currently selected file from the folder that's listed in the **Look In** field.

* **Groove File Directory.** The **Set Default** button allows you to choose a default directory for storing groove files. The **Go To Default** button closes the **Open Groove File** dialog box—when you reopen it, it opens to the default directory.

See also:

Paste dialog

The **Edit > Paste Special** command opens the **Paste** dialog box, which lets you put the contents of the Clipboard into any appropriate place in your project. To put data on the Clipboard, see

The **Paste** dialog box has the following fields:

Starting at Time

Fill in the where you want the beginning of the pasted data to go.

Destination

Select either a track or bus where you want the selection pasted.

Repetitions

Fill in how many copies of the pasted data you want to paste into the track end to end.

Starting at Track

Fill in the number of the track where you want SONAR to begin pasting the data.

Paste to One Track

This option is greyed out unless you copy data from more than one track at a time. Checking this check box causes SONAR to paste multiple tracks' data into a single track.

Linked Repetitions

Checking the **Link Repetitions** check box causes all the new clips to be linked clips with the clip you copied.

Link to Original Clip(s)

Checking the Link to Original Clip(s) check box creates a linked clip.

Advanced button

Clicking this button expands the **Paste** dialog box to include the following fields:

Align to Measures

This option is greyed out unless you choose at least two repetitions in the **Repetitions** field. Choosing this option tells SONAR to slide the old data up to the next measure line, regardless of whether the new data fills the space up to the next measure.

Filling in the **Interval** value field with a certain number of measures causes SONAR to paste each repetition of the new data at the interval in this field. Usually, you choose an interval at least as long as the object you copied.

What to do with existing material

The fields in this section deal with the situation that occurs when you try to paste some data to a place in a track that already has some data.

- **Blend Old and New.**   Choosing this option tells SONAR to mix the new data with the old, with the following options:
- **Replace Old with New.**   Choosing this option tells SONAR to delete the old data.
- **Slide Over Old to Make Room.**   Choosing this option tells SONAR to slide the old data either forward or backward in the track to make room for the new data, with the following option:

What to Paste

The fields in this section tell SONAR what elements of the copied data to paste into the track, including:

- **Events/Clips.**   Check this option if you want SONAR to paste MIDI events or audio data from the copied data, with these two options:
  - **Paste as New Clips.**   Check this option if you want the new data to become separate, discrete. clips.
  - **Paste into Existing Clips.**   Check this option if you want to include the new data inside any clips that already exist in the area you want to paste into.
- **Clip Automation.**   If you have clip envelopes in the selection you are pasting, you can check this option to paste it to its new location.

- **Track/Bus Automation.**   If you have track or bus envelopes in the selection you are pasting, you can check this option to paste it to its new location.
- **Tempo Changes.**   If you check this check box, SONAR pastes all tempo changes from the copied data.
- **Meter/Key Changes.**   If you check this check box, SONAR pastes all meter and key changes from the copied data.
- **Markers.**   If you check this check box, SONAR pastes all markers from the copied data.

See also:

Patch Browser dialog

The **Patch Browser** dialog box opens when you click the **Patch Browser** button in the Track Inspector. The **Patch Browser** button is also available from the **Insert > Bank/Patch Change** dialog box.

The **Patch Browser** dialog box has the following fields:

Show Patches Containing the Text

Use this field to search for patches by filling in pieces of the patch name. You can select previous search patterns from the drop-down list. Pressing the DELETE key redisplays the whole list, but doesn't actually delete the search text.

Name column

This column lists all the patch names of all the Instruments you have assigned to MIDI outputs. Clicking the heading of the **Name** column sorts the list in alphabetical order.

Bank column

This column lists the bank of the patch that's next to it in the Name column.

Patch column

This column lists the patch number of each patch in the Name column. **Sorting the lists**—You can sort your patch names by **name**, **bank**, or **patch number** simply by clicking the appropriate column heading in the **Patch Browser** dialog box.

See Also:

Pedal Properties dialog

In the Staff view, when you right-click on a pedal mark, the **Pedal Properties** dialog box appears. Use these fields to edit the sustain pedal mark that you clicked:

Time

Use this field to change the location of your pedal mark.

Channel

Use this field to set the MIDI channel of your pedal mark.

Value

Enter 0 to turn off the pedal (no sustain), or 127 to turn on the pedal (sustain).

See also:

Percent Done dialog

SONAR has done the indicated percent of the task you requested. Be patient.

Percussion Notation Key dialog

The **Staff View Layout** dialog box contains the **Percussion Settings** button, which opens the **Percussion Notation Key** dialog box. The **Percussion Settings** button is not available unless the track that is highlighted in the **Staff View** dialog box uses a percussion clef.

Use the following fields to configure your percussion settings:

Preset

Use the **Preset** field to apply, save, or delete a set of percussion settings.

MIDI Note

Use this field to select the MIDI pitches in your track that you want to appear as different pitches (to make the notes fit onto the staff neatly). You can set MIDI notes that would normally appear with several or lots of ledger lines to appear somewhere in the staff.

Display As

Use this field to select the notes that you want to appear on the staff when particular MIDI pitches play.

Default

This tiny window displays the *default note*—the note that all unbound MIDI notes display as.

Recommended for window

When you click a note in the **MIDI Note** field, the **Recommended for window** displays some standard display pitches for that MIDI note.

Notehead Type

When you click a note in the **MIDI Note** field, you can select a type of notehead for it, For example, cymbals usually use an X for a notehead. The **Notehead Circled** field allows you to add a circle around any MIDI note's notehead.

Articulation Symbol

This field allows you to add an articulation symbol to every instance of the selected pitch. For instance, hi-hat patterns often have a + over the closed hi-hat note and a circle over the open note.

Bind button

Click this button to connect a selected MIDI note to a selected note in the **Display As** field.

Unbind button

Click this button to disconnect a selected MIDI note from a selected note in the **Display As** field.

Default note button

Click this button to apply and save any changes you make to the default note, including display pitch, notehead type, and articulation symbol.

See also:

Percussion Notation Key dialog

Pick Track(s) dialog

Choosing the **Pick Tracks** command in the Piano Roll, Event List, Staff, or Lyrics views opens the **Pick Tracks** dialog box, which allows you to choose which tracks' data you want to display in any of the above views. To choose tracks to display, simply highlight the names of the ones you want to display. You can select non-adjacent track names by CTRL-clicking, and you can select adjacent track names by SHIFT-clicking or dragging.

Preferences dialog

The **Edit > Preferences** command opens the **Preferences** dialog box.

You can specify various options and preferences in the **Preferences** dialog box. Some options are global while others are per project.

Settings and options are organized into the following sections:

- **Audio.** Audio preferences are organized into the following categories:
  - "Audio - Devices" on page 1650
  - "Audio - Driver Settings" on page 1652
  - "Audio - Playback and Recording" on page 1656
  - "Audio - Audio Profiles (Advanced)" on page 1659
  - "Audio - Configuration File (Advanced)" on page 1661
  - "Audio - Sync and Caching (Advanced)" on page 1663
- **MIDI.** MIDI preferences are organized into the following categories:
  - "MIDI - Devices" on page 1666
  - "MIDI - Instruments" on page 1668
 - "MIDI - Control Surfaces" on page 1670
  - "MIDI - Playback and Recording" on page 1673
  - "MIDI - Drum Map Manager (Advanced)" on page 1675
- **File.** File preferences are organized into the following categories:
  - "File - Folder Locations" on page 1676
  - "File - Audio Data" on page 1681
  - "File - VST Settings" on page 1683
  - "File - Initialization File (Advanced)" on page 1686
  - "File - Advanced (Advanced)" on page 1688
- **Project.** Project preferences are organized into the following categories:
  - "Project - Record" on page 1690

- **Customization.** Customizable preferences are organized into the following categories:

Each section is organized into different *basic* and *advanced* subcategories. To only see basic preferences, click the **Basic** button. To see all available options, including advanced options, click the **Advanced** button.

To only show Basic sections

Click the **Basic** button.

To show all sections

Click the **Advanced** button.

See:

Preferences dialog

Audio - Devices

Figure 466. *The (audio) Devices section*

The **Devices** section displays a two-column list of available audio drivers. You can click the corresponding check box to enable/disable a driver. Select the drivers you want to make available for recording and playback. You can change the driver name by clicking the name in the first column and typing in your preferred name, or friendly name, for the driver.

The **Devices** section contains the following settings:

- **Input Drivers.** Input drivers are used for recording.
- **Output Drivers.** Output drivers are used for playback.
- **Use Friendly Names to Represent Audio Drivers.** If you enable this check box, the **Input** and **Output** menus in audio tracks and buses will use whatever friendly names you've created for your **Input** and **Output** drivers. Friendly driver names are global, not per-project.

Preferences dialog

- **Show Mono Outputs.**   Select this option if you want to assign audio track and bus outputs to individual (mono) hardware outputs in addition to stereo pairs. This is very useful, for example, if you record in SONAR but want to use an external mixing console to mix. When enabled, mono hardware outputs are available in all locations that display audio output ports, with the exception of the Media Browser view, Loop Construction view and **Import Audio** dialog box. Each available audio port exposes Left, Right and Stereo channels.

Note: *The **Show Mono Outputs** option only affects the display of mono hardware outputs in SONAR; it does not affect current output port assignments on tracks and buses. Existing mono output assignments are retained even if you disable the **Show Mono Outputs** option.*

For more information, see:

"Improving audio performance" on page 1181

See also:

"Preferences dialog" on page 1647

"Audio - Driver Settings" on page 1652

"Audio - Playback and Recording" on page 1656

"Audio - Audio Profiles (Advanced)" on page 1659

"Audio - Configuration File (Advanced)" on page 1661

"Audio - Sync and Caching (Advanced)" on page 1663

Preferences dialog

Audio - Driver Settings

Figure 467. *The Driver Settings section*
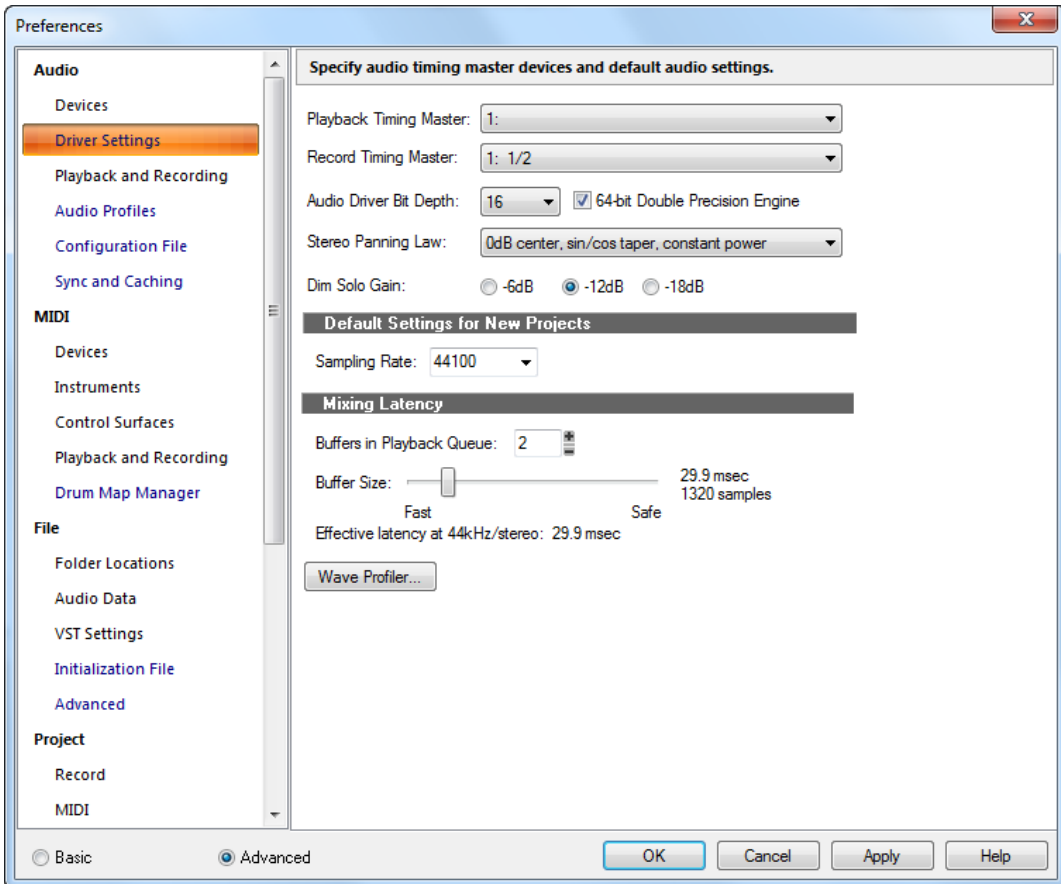
The **Driver Settings** section lets you specify the audio timing master devices, default sampling rate and other audio settings.

The **Driver Settings** section contains the following settings:

• **Playback Timing Master.** If you're using multiple wave drivers for playback, this list lets you specify which audio device should control the playback timing.

Note: *If you have two wave drivers, but all audio tracks are playing on only one wave driver, then that driver will be the timing master no matter what you choose.*

• **Record Timing Master.**   If you're using multiple wave drivers for playback, this list lets you specify which audio device should control the recording timing.

> **Note:** *Every sound card's clock crystal is slightly different, which causes minor differences in the actual playback rate on each card. These differences may lead to slight synchronization problems if you use one card for recording and a different one for playback. Multiple wave drivers on the same card will not have sync problems.*

Audio Driver Bit Depth.   Determines the number of bits per sample used for communicating with the audio hardware for playback. Your audio hardware must be capable of supporting the setting you supply here. In SONAR, choose between 16, 18, 20, 22 and 24. In most cases, even if your hardware is "advertised" as being 18 or 20 bit, you will want to set this value to 24 for optimum performance. SONAR 16-bit only.

> **Note:** *Using an audio driver bit depth that is greater than 16 means you also need to choose a preferred setting in the **Stream >16 Bit Data As** field in **Edit > Preferences > Audio - Audio Profiles**.*

64-bit Double Precision Engine.   Enabling this check box chooses 64-bit (double-precision) mixing in SONAR throughout the entire signal path. This includes dithering and plug-ins. SONAR will send and receive 64-bit data to and from all plug-ins that accept 64-bit data. If a plug-in requires 32-bit data, SONAR will send and receive 32-bit data.

Stereo Panning Law. Use this menu to choose a panning law for the current project and new projects. The current project's panning law is also displayed in the File Stats window, which appears when you open the **File Info** dialog box (**Project > Info** command), and click the **File Stats** button. Determines the mathematical formula used to control panning. The choices are:

• **(Default) 0 dB center, sin/cos taper, constant power.**   This choice causes a 3 dB boost in a signal that's panned hard left or right, and no dip in output level in either channel when the signal is center panned.

• **-3dB center, sin/cos taper, constant power.**   This choice causes no boost in a signal that's panned hard left or right, and 3dB dip in output level in either channel when the signal is center panned.

• **0dB center, square-root taper, constant power.**   This choice causes a 3 dB boost in a signal that's panned hard left or right, and no dip in output level in either channel when the signal is center panned.

• **-3dB center, square root taper, constant power.**   This choice causes no boost in a signal that's panned hard left or right, and 3dB dip in output level in either channel when the signal is center panned.

• **-6dB center, linear taper.**   This choice causes no boost in a signal that's panned hard left or right, and 6dB dip in output level in either channel when the signal is center panned.

• **0 dB center, balance control.**   This choice causes no boost in a signal that's panned hard left or right, and no dip in output level in either channel when the signal is center panned.

For more information about panning laws, see "Configuring panning laws" on page 223.

Preferences dialog

- **Dim Solo Gain.**   Dim Solo is a mode in which non-soloed audio tracks/buses are still audible but at a reduced level. The default gain reduction is -6dB, but can also be configured for -12dB and -18dB. For more information about Dim Solo, see "Dim Solo mode" on page 200.

Default Settings for New Projects

- **Sampling Rate.**   The **Sampling Rate** list allows you to enter or select an audio sampling rate for a new project. After audio has been added to the project—either by recording audio or by using the **File > Import > Audio** command—you can no longer change the sampling rate for that project. Therefore, you should choose the sampling rate immediately after choosing **File > New** to start a new song.

  You can choose one of the following sampling rates: 11025 Hz, 22050 Hz, 44100 Hz, 48000 Hz, 88200, 96000, 176400 and 192000 Hz. The default used by SONAR is 44100 Hz, the same rate as audio CDs. However, you may choose a higher rate and later mixdown to 44100.

  You can also enter any hardware supported value in the **Sampling Rate** field. Consult your hardware documentation for supported sampling rates.

Mixing Latency (MME and WDM drivers only)

- **Buffers in Playback Queue.**   This value determines the buffer characteristics for transfers to and from the audio drivers. Lowering this value improves audio "Latency" on page 1914, though making it too low makes your system more susceptible to stuttering or dropouts.
- **Buffer Size Slider.**   This control lets you set mixing latency manually, overriding the value set by the Wave Device Profiler. Lower numbers increase the risk of audio problems. WDM sound card drivers offer lower latency than the older MME type.

Wave Profiler (MME and WDM drivers only)

Wave Profiler attempts to detect the make and model of your sound card, which determine the card's DMA (Direct Memory Access) settings. Once Wave Profiler identifies the card, it displays the results and asks whether you want to use the default settings for that card or to override them:

If Wave Profiler has identified your card correctly, you may accept the default settings. Otherwise, Wave Profiler will run a series of tests to attempt to determine the correct DMA settings. Usually this process is successful; however, if it is not, you will need to enter the correct settings in **Edit > Preferences > Audio - Audio Profiles**.

To determine the correct settings, consult your sound card documentation. Our web site, at www.cakewalk.com, contains the latest DMA settings for commonly used sound cards.

The Wave Profiler utility runs automatically the first time you run SONAR. You need not run it again unless you install a new sound card or an updated driver for your current sound card.

Wave Profiler will not analyze the card at the 48 kHz sampling rate. It assumes that 48 kHz settings are the same as 44 kHz settings. If your sound card doesn't sync to 48 kHz, you may need to enter the settings manually.

Preferences dialog

ASIO Panel (ASIO drivers only)

This button opens a dialog box where you can set the buffer size for your ASIO driver and change the driver configuration. See your sound card's documentation for more information.

For more information, see:

See also:

Preferences dialog

Audio - Playback and Recording

Figure 468. *The (audio) Playback and Recording section*
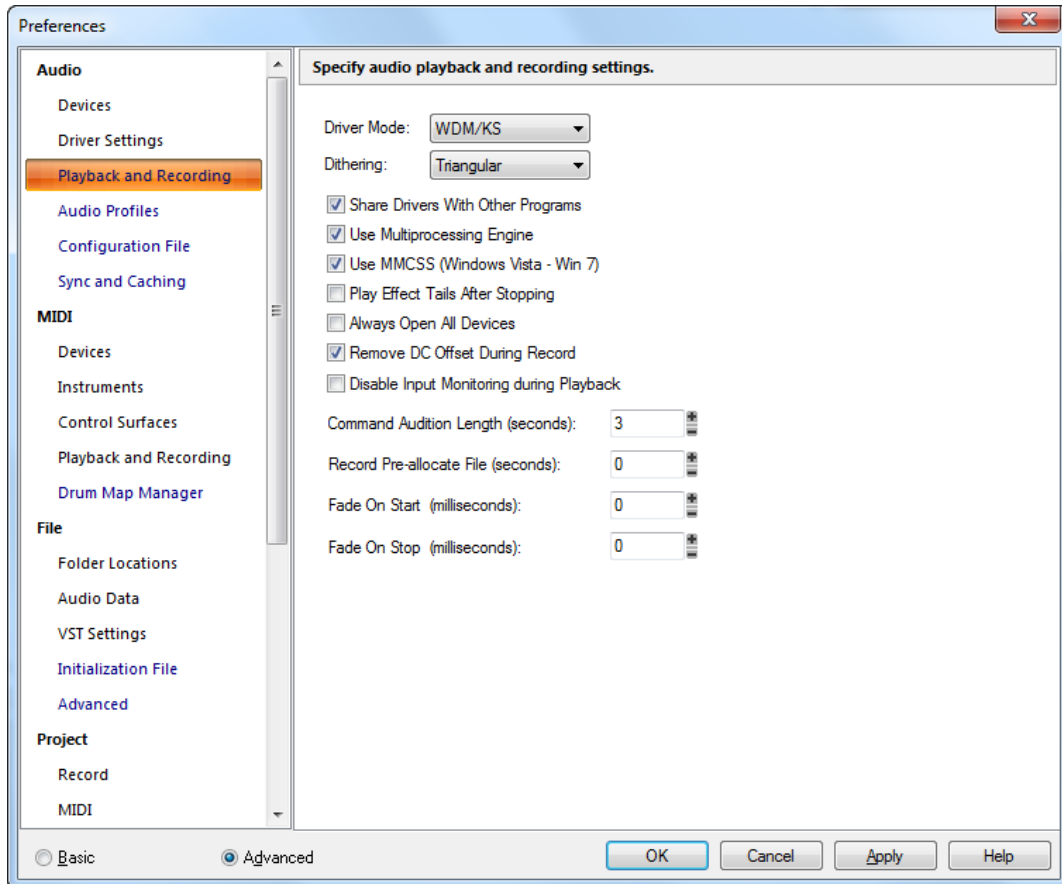
The **Playback and Recording** section lets you specify various settings that affect playback and recording.

The **Playback and Recording** section contains the following settings:

- **Driver Mode.**   Select from **WASAPI**, **WDM/KS**, **ASIO** or **MME**. Consult your hardware documentation to determine which driver your hardware uses. WDM/KS drivers are the latest available and typically have very low latency. MME is an older driver type and has higher latencies. ASIO drivers also offer lower latency. Your hardware may have all three driver options. If so, you should try WDM first.

- **Dithering.**   Whenever an audio signal is converted from a higher-bit resolution to a lower resolution, it is necessary to apply dither to avoid introducing undesirable quantization noise or harmonic distortion into the signal. The purpose of dither is to reduce the resulting distortion by

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Preferences dialog

adding low-level random noise or "dither" to the audio signal. Different mathematical calculations are used to generate dither, each method has advantages and disadvantages depending on the particular operation. SONAR features the *Pow-r* dithering process, short for **P**sycho-acoustically **O**ptimized **W**ordlength **R**eduction, which can produce lower-bit files that sound indistinguishable from higher-bit source files. When this option is turned on, SONAR uses dithering when you export a higher-bit file at a lower resolution, or lower the bit depth of a project's audio files by using the **Utilities > Change Audio Format** command, or when you "render" audio (bounce, freeze, or apply effects).

This option is turned on whenever the **Dithering** field has a value other than **None**. You can choose bit depths for recording, importing, and rendering (bouncing, freezing, and applying effects) in **Edit > Preferences > File - Audio Data**, and for exporting in the **Export Audio** dialog box (**File > Export > Audio** command). SONAR offers five kinds of dithering:

- **Rectangular.** Essentially white noise, no noise shaping. Advantages: least CPU-intensive, lowest signal-to-noise ratio, preferable to shaped dither when successive dithering can occur (e.g. bouncing, freezing). Disadvantages: suffers from intermodulation distortion, higher perceived loudness than Pow-r dither.

- **Triangular.** Higher level than rectangular, no noise shaping. Advantages: low CPU-intensive dither, superior to Rectangular as it does not suffer from modulation noise effects. Preferable to shaped (Pow-r) dither when successive dithering can occur (e.g. bouncing, freezing). Disadvantages: higher perceived loudness than Pow-r dither.

- **Pow-r 1.** Noise-shaped dither. Advantages: less CPU-intensive than Pow-r types 2 and 3, lower perceived loudness than Rectangular or Triangular. Disadvantages: less noise shaping than Pow-r types 2 and 3, not recommended for operations where dither will be applied successively (e.g. bounce and freeze).

- **Pow-r 2.** Noise-shaped dither. Advantages: lowest perceived loudness, highest quality settings, recommended for audio export. Disadvantages: highest CPU-intensive settings, not recommended for operations where dither will be applied successively (e.g. bounce and freeze).

- **Pow-r 3.** Same as Pow-r 2 except most CPU-intensive and transparent of all choices.

- **Share Drivers With Other Programs.** This option allows other software to access device drivers. When this option is checked, other software can access device drivers when SONAR is not the focus of Windows.

- **Use Multiprocessing Engine.** This option is grayed out unless you have a multiprocessor computer. If you have a multiprocessor computer, check this option if you want SONAR to use both processors at all times. If you do not check this option, SONAR still uses the second processor for some tasks.

- **Use MMCSS.** This option gives real-time applications such as SONAR higher priority for resource scheduling (thread scheduling) under Windows 7 (leave it checked).

- **Play Effect Tails After Stopping.** When checked, this option causes any effect with a "tail" (reverb, delay, etc.) to finish playing when playback is stopped.

- **Always Open All Devices.** With this option checked, SONAR opens all enabled stereo pairs of audio outputs as soon as you press play or turn on the audio engine. Any pairs that don't have

Preferences dialog

any tracks feeding them stream silence, but are still ready for use. So if you then change a track's output assignment on the fly SONAR doesn't have to reopen a device, which can cause gaps in playback.

- **Remove DC Offset During Record.** With this option enabled, SONAR filters out any DC Offset disturbances that may be present during recording. See "Removing DC offset" on page 794 for more information.

- **Disable Input Monitoring During Playback.** This option is off by default. When enabled, input monitoring will be disabled on all tracks during playback but not during recording.

- **Command Audition Length (seconds).** When you apply an edit or effect to an audio clip, SONAR lets you audition that edit for "N" seconds: the value you fill into this field.

- **Record Pre-allocate File (seconds).** When this option is set to a value greater than zero, SONAR will pre allocate the file to be recorded to the size specified (in seconds). This means that the file will not be resized while recording until it reaches the allocated size. The setting has the potential to reduce disk activity while recording and allows for more possible tracks. The valid range is 0–14400 seconds and the default value is 0. A reasonable setting would be 10 minutes (600 seconds) to 30 minutes (1800 seconds).

- **Fade On Start (milliseconds).** When this option is set to a value greater than zero, starting playback will cause a gradual fade in of the audio for the specified duration. The valid range is 0–100000 and the default value is 0.

- **Fade On Stop (milliseconds).** When this option is set to a value greater than zero, stopping playback will cause a gradual fade out of the audio for the specified duration. The valid range is 0–100000 and the default value is 0.

See also:

Preferences dialog

Audio - Audio Profiles (Advanced)

Figure 469. *The Audio Profiles section*
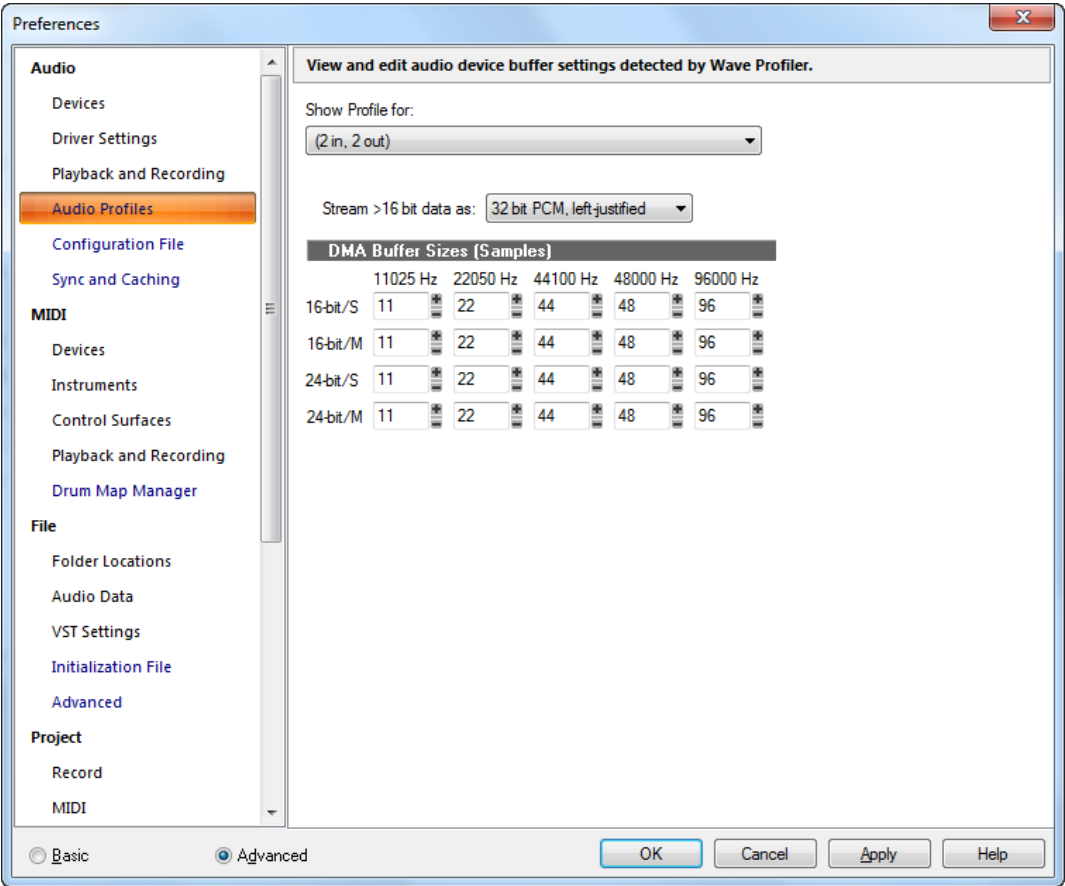
The **Audio Profiles** section shows the sound card buffer settings that the Wave Profiler has come up with.

Note: *The **Audio Profiles** section is only available when in MME or WDM/KS driver mode.*

- **Show Profile for.** This list shows the name of the sound card driver that the displayed settings are for.
- **Stream >16 bit data as.** Sound cards that handle audio formats greater than 16 bits have a preferred format for the data, the variations of which you can see by clicking the drop-down arrow in this field. Consult your sound card's documentation to choose the optimum setting.

Preferences dialog

DMA Buffer Sizes

These fields list the buffer characteristics for each sound card that the Wave Device profiler has come up with. In general, it is better not to change these settings without consulting SONAR technical support.

For more information, see "Improving audio performance" on page 1181.

See also:

Preferences dialog

Audio - Configuration File (Advanced)

Figure 470. *The Configuration File section*
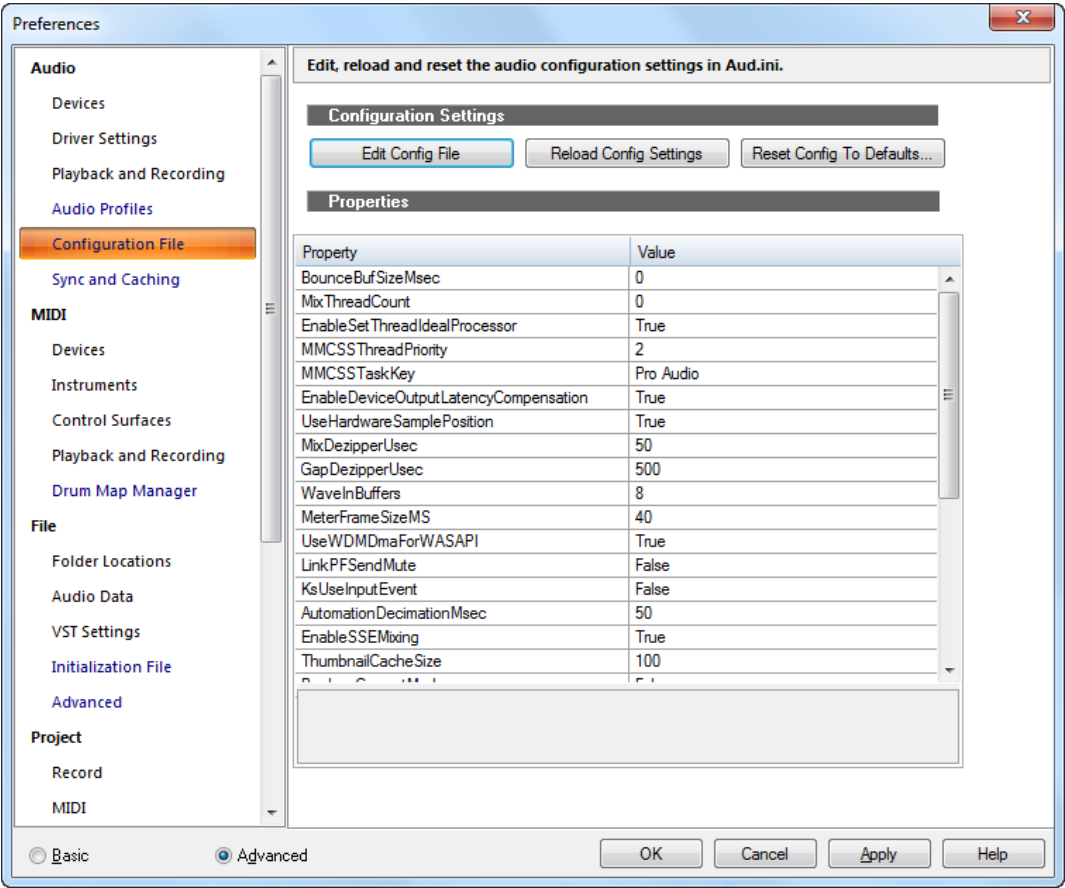
Configuration Settings

SONAR's audio configuration settings are stored in a file named `Aud.ini`. SONAR provides a convenient way to edit, reload and reset the audio configuration settings.

The **Configuration File** section contains the following options:

- **Edit Config File.** Click to open `Aud.ini` in the default Windows text editor. Make any necessary changes in `Aud.ini`, then save and close `Aud.ini`. You must click **Reload Config Settings** to apply any external changes to `Aud.ini`.

⚠️ **Warning:** *You should only change items in* `Aud.ini` *that are documented in the online Help or if you are instructed to by Cakewalk tech support. Undesirable changes to* `Aud.ini` *can result in loss of performance or malfunction of SONAR.*

- **Reload Config Settings.** Click to reload the current audio configuration settings from `Aud.ini`.
- **Reset Config To Defaults.** Click to reset the audio configuration settings to SONAR's default settings. The existing `Aud.ini` file is saved in case you want to restore it later.

Properties

The **Properties** list shows various configuration settings you can change, if necessary. When you select a property, a brief description of the property is shown below the list. You will typically only need to make any changes if you are instructed to do so by Cakewalk Technical Support.

See also:

See also:

Preferences dialog

Audio - Sync and Caching (Advanced)

Figure 471. *The Sync and Caching section*
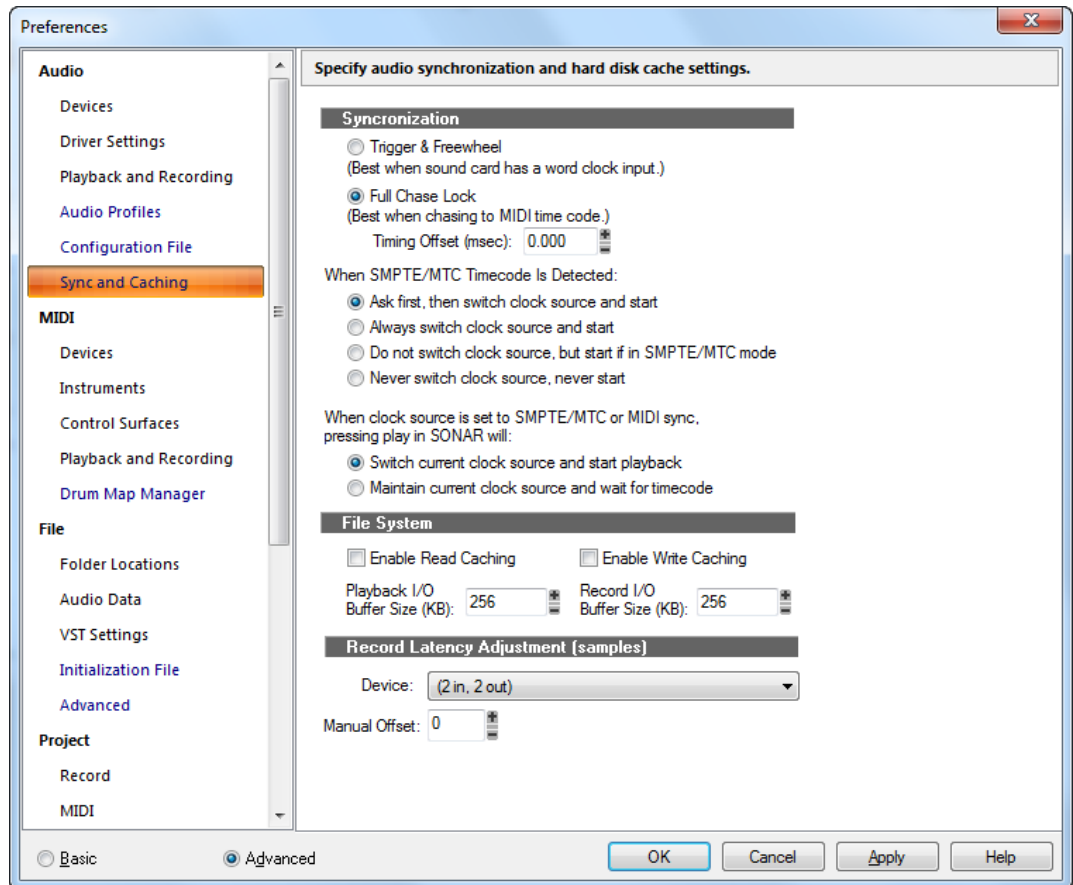
The **Sync and Caching** section lets you specify audio synchronization and hard disk cache settings.

The **Sync and Caching** section contains the following settings:

Preferences dialog

Synchronization

SONAR gives you two choices for synchronizing your audio tracks to SMPTE or MIDI Time Code:

• **Trigger and Freewheel.** With this option audio playback starts (or triggers) at the exact timecode, but then the audio plays at its own internal rate. The audio can gradually drift away from SMPTE time due to variations in the timecode signal.

• **Full Chase Lock.** With this option the speed of audio playback is continuously adjusted to stay with the timecode.

  • **Timing Offset (msec).** With this option, used for making very fine adjustments to the audio/MIDI synchronization of your project, you can offset the audio in your project by a number of milliseconds. A positive value delays audio by that amount. A negative value delays MIDI by that amount.

• **When SMPTE/MTC timecode is detected.** This option tells SONAR what to do when it detects SMPTE/MTC timecode. Choose from the following:

  • **Ask first, then switch to clock source and start.** This option prompts SONAR to alert you when it detects a SMPTE/MTC signal, asks if you want to sync to the incoming signal, and if you respond that you do, switches the clock source and starts to receive the signal.

  • **Always switch the clock source and start.** SONAR automatically switches to the clock source of the incoming signal and begins to receive the signal.

  • **Do not switch clock source, but start if in SMPTE/MTC mode.** This option automatically syncs to the incoming signal if SONAR is in SMPTE/MTC mode.

  • **Never switch clock source, never start.** SONAR does nothing when incoming SMPTE/MTC timecode is detected.

Note: *The final option, **Never switch clock source, never start**, should never be used if you are attempting to sync to an external clock source.*

• **When clock source is set to SMPTE/MTC or MIDI Sync, pressing play in SONAR will.** This option tells SONAR what to do when you press play in SMPTE/MTC or MIDI Sync mode:

  • **Switch current clock source and start playback.** Switch the clock to **Audio** (from **SMPTE** or **Sync**), and start playback. This cancels SMPTE (or Sync) mode.

  • **Maintain current clock source and wait for timecode.** Do not switch the clock (Stay in SMPTE or Sync mode), but wait for SMPTE or Sync. The playback button remains depressed.

Preferences dialog

File System

- **Enable Read Caching and Enable Write Caching.**   Choosing either of these options lets SONAR use the Windows disk cache while reading or writing audio data. SONAR will usually perform best with all caching disabled, which is the default setting. If your computer has an older IDE disk controller, or a disk controller that does not use DMA transfers, enabling caching may improve SONAR's audio performance.

Note: *Changes to these settings only take effect when you restart SONAR.*

- **I/O Buffer Size.**   This value determines the buffer characteristics for transfers to and from the disk. Changing this value does not affect audio latency, but will affect the disk throughput for audio tracks. The default setting is 128. A higher value causes more audio to be buffered from the disk ahead of the playback cursor. If you are hearing consistent dropouts/clicks in your audio and if your project contains high bit depth (32/64 bit) or high sample rate audio (88.2K or higher), it may be indicative of a too small I/O buffer size. If so, try a higher I/O buffer size like 256 or 512. If audio problems persist, reset to 128 and try a different remedy.

  Also, if you are playing a large file, and using maximum latency, a too-small I/O buffer size may cause dropouts or crashes. Try increasing the buffer size by blocks of 128.

Record Latency Adjustment (samples)

If you loop an audio output back into an audio input, and re-record a track this way, the audio doesn't line up. For some sound cards, it is off quite significantly. This record latency adjustment is a compensation for that delay.

You can do an approximate measurement of the delay by turning on samples as the resolution unit in the Time Ruler, and comparing the original track with the re-recorded track. Then you can enter a value in the **Manual Offset** field to compensate.

If you use ASIO mode, enter **0** in the **Manual Offset** field and leave the **Reported Input Latency** check box checked (this check box only appears in ASIO mode). This will line up audio in most cases. If you think you can tweak it closer, use the **Manual Offset** field.

In ASIO mode, the current active ASIO device (remember ASIO can only have one active at a time) reports its "Input Latency." You can't edit this value. This supposedly accounts for buffer size, A/D Conversion latency, etc. The check box allows you to use this reported value. It is checked by default. In any case, the amount entered into the **Manual Offset** field will be combined (added to) the reported value if you have it checked.

For more information, see:

See also:

Preferences dialog

MIDI - Devices

Figure 472. *The (MIDI) Devices section*
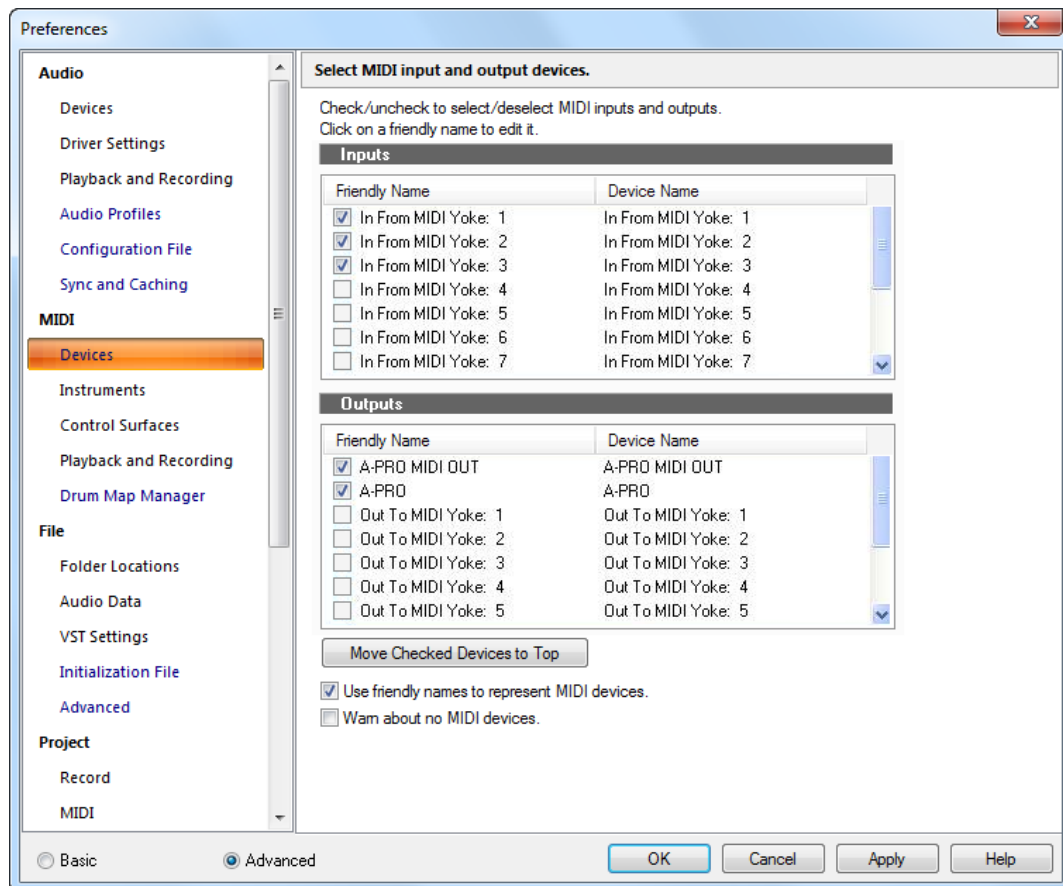
The **Devices** section lets you choose the MIDI inputs and outputs you want to use. The selection in the **Output** menu for a track determines which piece of hardware will be used to produce the sound stored in your project. The list of enabled input devices determines which input MIDI devices can successfully send MIDI data into your Cakewalk application.

You can make up your own friendly names for the MIDI input and output devices listed in this dialog box. The friendly name for a MIDI device is the name you will see in MIDI track **Input** and **Output** menus, if you enable the **Use Friendly Names To Represent MIDI Devices** check box at the bottom of this dialog box. To make up a friendly name, double-click the name of a device in the **Friendly Name** column, type a new name, and press ENTER.

The **Devices** section contains the following settings:

Inputs

Select devices from the list (you may have only one). SONAR accepts input from these devices for recording MIDI data.

Outputs

Select devices from the list. If your computer or MIDI interface has several MIDI outputs, you choose the ones you want to use and put them in a particular order. From then on, MIDI output 1 refers to the first selected MIDI output, MIDI output 2 to the second selected MIDI output, and so on. The output number is based solely on the order in which the selected outputs appear in the **Outputs** list. As a result, the output numbers used in SONAR may not match the output numbers that appear on your external multiport MIDI interface.

Move Checked Devices to Top button

Click this button to move a checked device farther up in the list, directly behind any other checked devices. If you want a particular device to become MIDI output 1, deselect all other devices, select the device you want to be number 1, and click the **Move Checked Devices to Top** button.

Use Friendly Names to Represent MIDI Devices

Enable this check box if you want the **Input** and **Output** menus of MIDI tracks to display the friendly name of a MIDI device, instead of its original name.

Warn About No MIDI Devices

Enable this check box if you want your Cakewalk application to warn you if no MIDI devices are enabled.

See Also:

See also:

Preferences dialog

MIDI - Instruments

Figure 473. *The Instruments section*
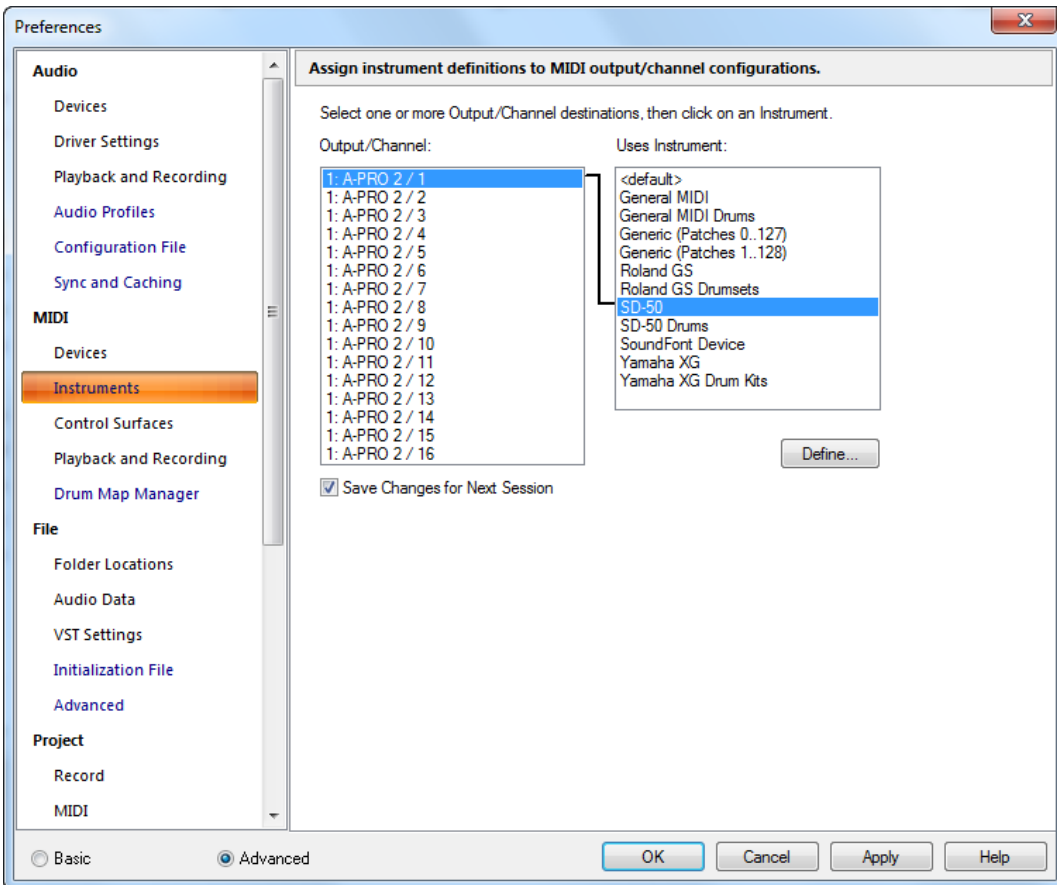
The **Instruments** section lets you choose one or more output/channel configurations and assign an instrument to it or them.

SONAR lets you assign a MIDI instrument definition to each available MIDI output and channel. The assignments you make determine the MIDI bank names, patch names, note names, and controller names that you see during your SONAR session.

Suppose that you have a Roland GS compatible synthesizer attached to MIDI output 1. By assigning all 16 channels of MIDI output 1 to the Roland GS instrument definition, you ensure that the bank, patch, note and controller name lists you see displayed in SONAR are the ones that match your synthesizer.

Often, you want to assign a different instrument to channel 10, which is usually used for percussion. For example, you might assign the Roland GS instrument definition to channels 1 through 9 and 11

through 16, but you would most likely want to assign the Roland GS Drumsets instrument definition to channel 10. If you have several MIDI outputs, with a different instrument attached to each one, you would normally assign a different instrument to each MIDI output.

For convenience, you can assign a block of channels to one instrument, and then change the assignment of one or more of those channels without changing the others. For example, you can highlight all 16 channels of the first MIDI output and assign them to the Roland GS instrument definition. Then, you can highlight channel 10 of the first MIDI output and assign it to the Roland GS Drumset instrument definition. Channels 1 through 9 and 11 through 16 on the first MIDI output will stay assigned to Roland GS.

You might also want to split channels to different instruments if you have several instruments attached to a single MIDI output. For example, you might have a Roland synth receiving on MIDI channels 1-9, a Roland drum machine receiving on channel 10, and a basic GM-compatible synth receiving on channels 11 through 16. In this case, you'd use three different instrument definitions for your one and only MIDI output.

The **Instruments** section contains the following settings:

Output/Channel

This field lists all your MIDI outputs and all the channels for each output. Highlight the output/channel combination you want to assign an instrument definition to. You can select several output/channel combinations at the same time (for example, all 16 channels of a output) by CTRL-clicking or SHIFT-clicking.

Uses Instrument

This field lists all the instrument definitions that are currently stored by SONAR. Selecting one binds it to any output/channel combinations that are selected in the **Output/Channel** field.

Save Changes for Next Session

Click this check box if you want to reuse any new combinations you made the next time you open SONAR.

Define button

Clicking this button opens the **Define Instruments and Names** dialog box, which allows you to define your own MIDI instruments, if they are not MIDI standard.

For step by step instructions, see:

See also:

Preferences dialog

MIDI - Control Surfaces

Figure 474. *The Control Surfaces section*
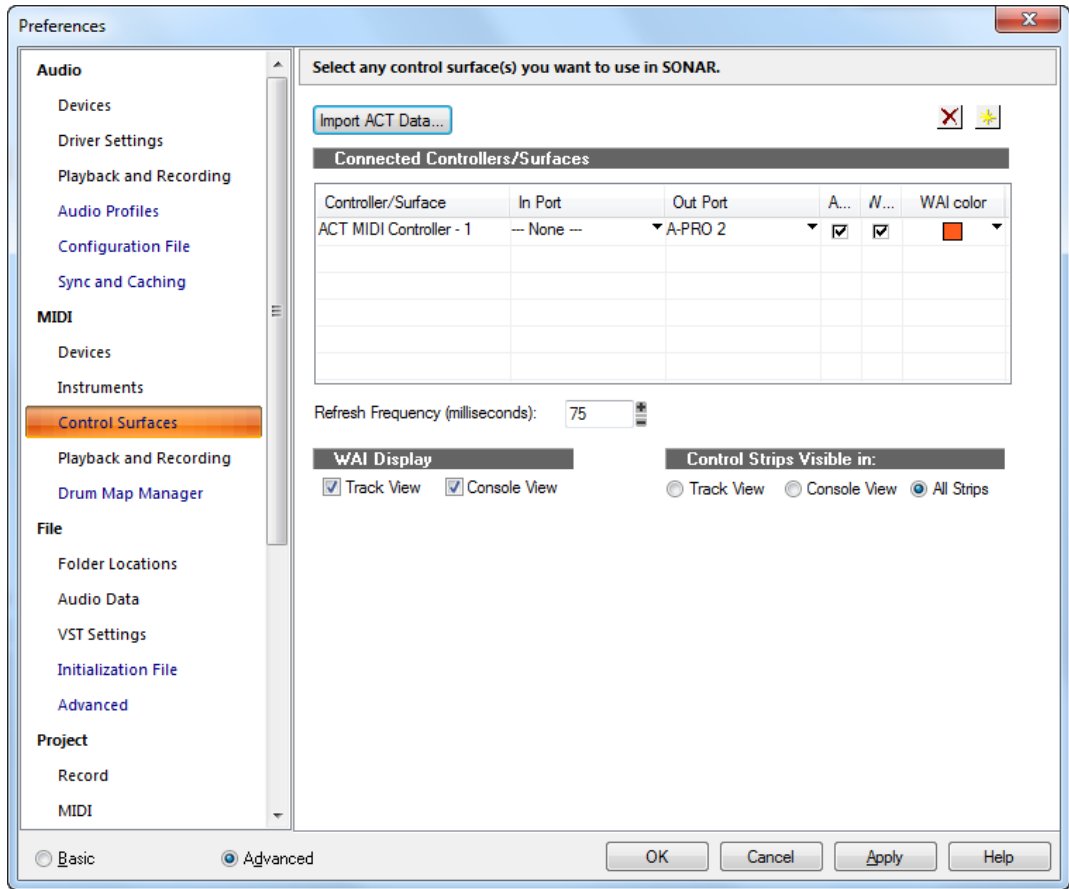
The **Control Surfaces** section allows you to enable as many control surfaces as you want to control with SONAR, and configure the control surfaces' interfaces. You can also configure the WAI display (Where Am I display) and ACT indicators.

The **Control Surfaces** section contains the following fields and buttons:

Import ACT Data

You can use ACT with any automatable plug-in. You can create your own mappings by using the **ACT Learn** button, but because ACT Learn mappings are stored in XML files, you can also import XML data that contains predefined parameter mappings for certain plug-ins. These predefined parameter mappings provide generic "best guess" assignments between the controls on your surface, and the parameters in the plug-in, which gives you a starting point that you can customize by using the ACT Learn process.

The import feature makes it easy for users to share data, and will also allow you to download incremental updates when new plug-in mappings become available.

If you import ACT data for a certain plug-in, and you have already mapped some of the parameters in that plug-in, for each already-mapped plug-in, a dialog box asks you if you want to overwrite that plug-in's mapping. This lets you protect any parameter mappings that you've already done.

To see if any new ACT XML files are currently available, check the support pages at www.cakewalk.com.

See:

Add Button ✦

Clicking this button opens the "Controller/Surface Settings dialog" on page 1583, which lets you to add another control surface to the list.

Delete Button ✖

Clicking this button deletes and disables a selected control surface from the list. You can re-enable it by clicking the **Add** button and selecting it from the drop-down menu.

Connected Controllers/Surfaces List

This is a list of all the control surfaces that are currently active and enabled in your project. The list has the following columns:

- **Controller/Surface column.**   This column lists the names of all the control surfaces that are currently active and enabled in your project.

- **In Port and Out Port columns.**   These columns list MIDI input and MIDI output drivers that each control surface uses to communicate with SONAR. You can click the drop-down arrow next to the name of each one to select a different driver.

- **ACT column.**   This column contains a check box for each enabled control surface that allows you to use ACT with each controller/surface. The property page for each controller/surface also has a check box to enable ACT, and this check box must also be enabled in order to use ACT.

- **WAI column.**   This column contains a check box for each enabled control surface that allows you to show or hide the WAI markers for each individual surface.

- **WAI color column.**   This column contains a drop-down menu for each enabled control surface that allows you to change the color of the WAI markers for each individual surface.

Preferences dialog

Refresh Frequency (milliseconds)

If you are experiencing sluggish UI responsiveness when using a control surface and playing back high CPU projects, you may want to reduce the control surface refresh frequency (increase the number of milliseconds). The valid range is 50-5000 milliseconds and the default value is 75.

Also, if you are using a control surface that is not bi-directional, the surface does not need to be refreshed at all and you can safely increase the value.

Note: *This is the same setting as the CtrlSurfaceRefreshMS variable in Cakewalk.ini.*

WAI Display

These check boxes show or hide the WAI markers in the Track view and/or the Console view.

For more information, see:

Control Strips Visible in

SONAR allows control surfaces to display all channel strips in a project, or only the channel strips that are visible in the Track view or Console view. The options are as follows:

- **Track View.** The controller/surface matches the channel strips that are visible in the Track view.
- **Console View.** The controller/surface matches the channel strips that are visible in the Console view.
- **All Strips.** The controller/surface shows all channel strips in the project.

See also:

Preferences dialog

MIDI - Playback and Recording

Figure 475. *The (MIDI) Playback and Recording section*
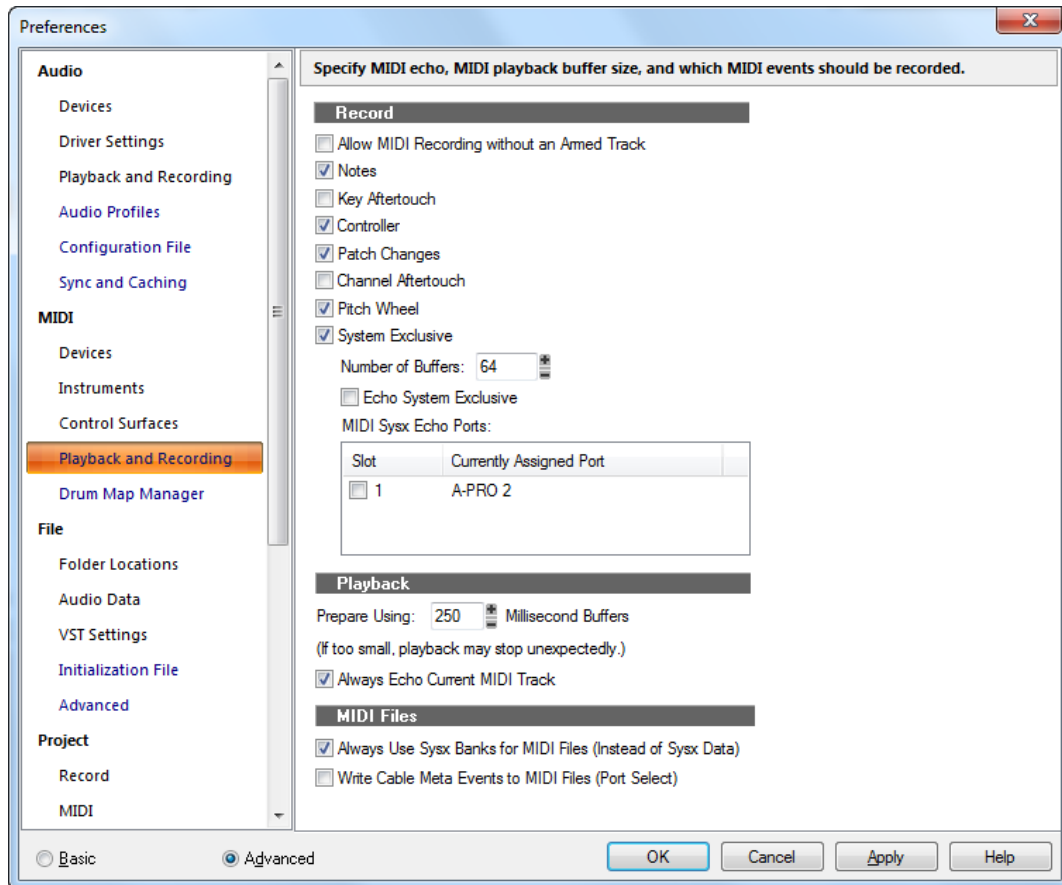
The **Playback and Recording** (MIDI) section lets you specify MIDI echo settings, MIDI playback buffer size, and which MIDI events should be recorded.

The **Playback and Recording** section contains the following settings:

Record

Use the fields in this section to choose what MIDI events you want to record. Choose any or all of these options:

- **Allow MIDI Recording without an Armed Track.**   By default, SONAR requires you to arm a track before recording.
- **Notes.**   Select this check box if you want to record Note events.

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- **Key Aftertouch.**   Select this check box if you want to record Key Aftertouch events.
- **Controller events.**   Select this check box if you want to record Controller events.
- **Patch Changes.**   Select this check box if you want to record Patch Change events.
- **Channel Aftertouch.**   Select this check box if you want to record Channel Aftertouch events.
- **Pitch Wheel.**   Select this check box if you want to record Pitch Wheel events.
- **System Exclusive.**   Select this check box if you want to record Sysx data.
    - **Number of Buffers.**   Choose how many MIDI buffers you want SONAR to use. The default value of 64 works well most of the time. If you experience frequent MIDI overflow from using MIDI plug-ins or lots of Sysx data, try a larger number, such as 128.
    - **Echo System Exclusive.**   Choose this if you want to echo Sysx data to the MIDI ports shown in the **MIDI Sysx Echo Ports** list.
    - **MIDI Sysx Echo Ports.**   This list lets you specify which MIDI ports to echo Sysx data on.

Playback

- **Prepare Using N Millisecond Buffers.**   This option lets you specify how far in advance SONAR prepares MIDI data during playback. The default is 250 milliseconds.

    If playback stops prematurely, you may try larger values (although you should also check the buffer options in **Edit > Preferences > Audio - Sync and Caching**).

    If you are using MIDI effects, you may want to try smaller values—for example, 100 milliseconds. Doing so means that, if you change a property for a MIDI effect, there will be less delay before you hear the new value take effect.

    For more information, see:

    "MIDI track parameters" on page 209

    "Recording music from a MIDI instrument" on page 266
- **Always Echo Current MIDI Track.**   This option is on by default, and means that incoming MIDI data will always be echoed through the current track, even if the track's **Input Echo** button is in the Off position.

MIDI Files

- **Always use Sysx Banks for MIDI Files (Instead of Sysx Data).**   If you check this option, SONAR puts any sysx data contained in imported MIDI files into sysx banks instead of a stream of sysxdata events (except for auto-send data, which is sent before playback). These banks show up in the Event list as bank events. If you don't check this option, imported sysx data remains as sysx data events if it is up to 255 bytes, and is put into banks if it is 256 or more bytes.
- **Write Cable Meta Events to MIDI Files (Port Select).**   If you select this option, SONAR can change the default output that a following (upcoming) sysx bank is sent to. The output select number is also inserted into the front of each track of a format 1 MIDI file to specify the output number.

Preferences dialog

See also:

MIDI - Drum Map Manager (Advanced)

Figure 476. *The Drum Map Manager section*
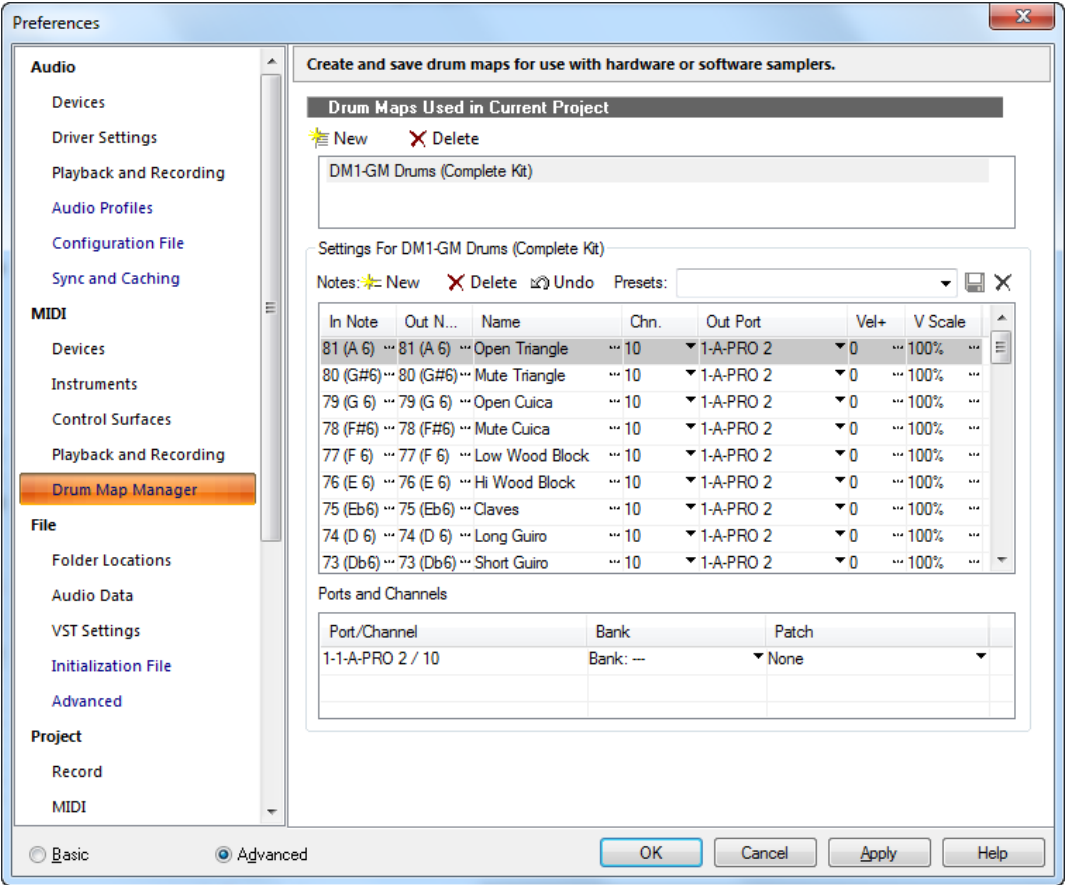
The **Drum Map Manager** section lets you create and save drum maps for use with hardware or software samplers. You can customize drum maps to select specific sounds on any of your samplers.

Preferences dialog

The **Drum Map Manager** section contains the following settings:

Drum Maps Used in Current Project

This field displays all the currently available drum maps. click the **New** button to create a new drum map and **Delete** to delete a drum map. Select a drum map to display the drum mappings in the Drum Map Manager. All drum maps in this field are saved with the current project.

Presets

Presets can be used to populate the fields in the Drum Map Manager. This field is also used to save new drum maps by entering a name in the field and clicking the **Save** button.

Source/Destination

The Source/Destination section is where you map the following for each In Note (source):

- **In Note.** The source MIDI note value.
- **Out Note.**   The MIDI note value that plays on the destination sampler.
- **Name.**   The user-defined name for the row.
- **Channel.**   The channel on which the note is transmitted. There is an option to follow the track's Channel setting.
- **Out Port.**   The hardware output port or software virtual output port to which you are sending the note.
- **Vel+.**   Apply a velocity offset setting to an individual mapped pitch.
- **V Scale.**   The V Scale value sets a level of compression or expansion. A value below 100% is compression. A value above 100% is expansion.

Port/Channel Pairs

This section lists each unique Port and Channel pairing. This allows you to make quick global changes that Port and Channel pairing's bank and patch settings.

For more information, see "Creating and editing a drum map" on page 760.

See also:

"Preferences dialog" on page 1647

"MIDI - Devices" on page 1666

"MIDI - Instruments" on page 1668

"MIDI - Control Surfaces" on page 1670

"MIDI - Playback and Recording" on page 1673

File - Folder Locations

Preferences dialog

Figure 477. *The Folder Locations section*
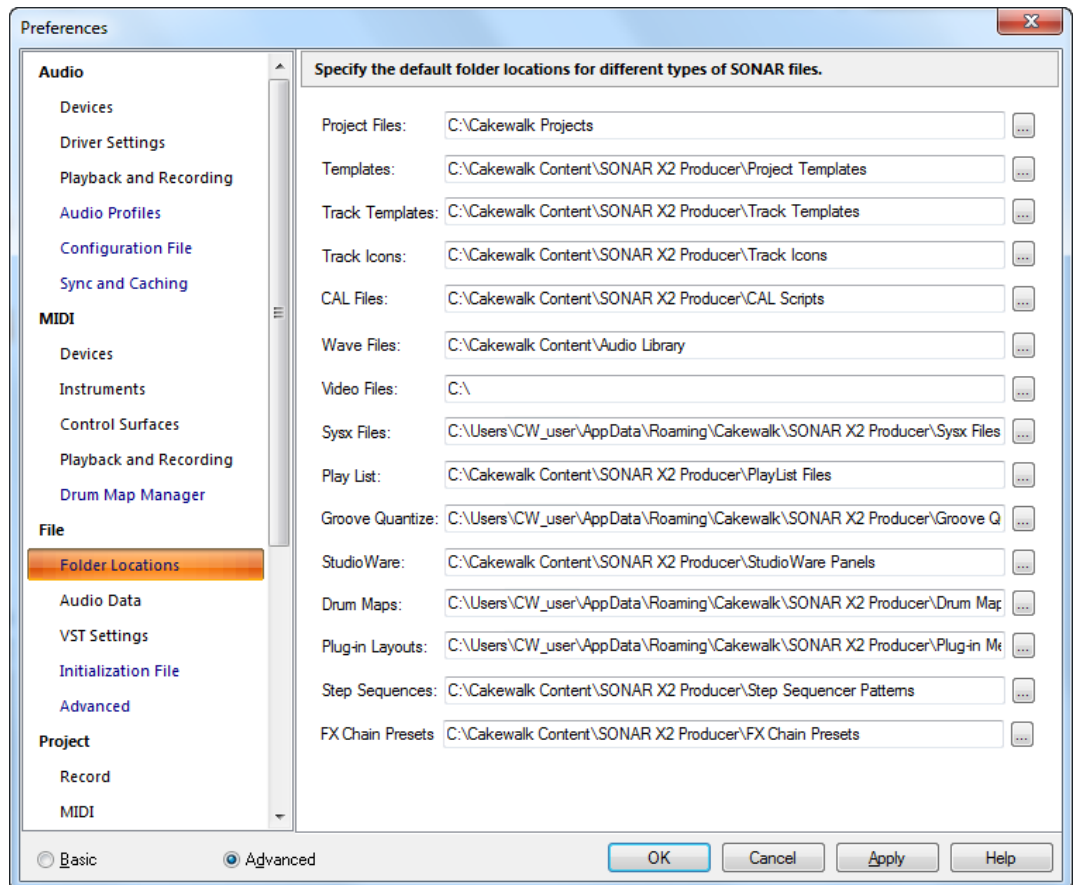
The **Folder Locations** section lets you specify default folders for different kinds of SONAR files. The default locations for all of these file types usually work well. However, if you find that this folder gets cluttered, changing the locations of the file types won't hurt anything, as long as you remember where you put things.

> **Note:** *The only folder location you have to be careful with is the **Global Audio** folder (listed in **Edit > Preferences > File - Audio Data**), which SONAR creates in the C:\Cakewalk Projects folder. SONAR stores all audio data that is associated with project files in this folder. If you move this folder, SONAR can not find the audio data for projects you have already recorded. To tell SONAR where you moved the folder, fill in the location in the **Global Audio Folder** field in **Edit > Preferences > File - Audio Data**.*

Preferences dialog

You can change the folder for a file type by typing a new path name in the particular file type's edit box, or by clicking the **Browse** button and navigating to the folder that you want to store that file type in. You can set different locations for the following file types:

Project Files (.cwp, .mid, .cwb)

.cwp and .cwb files are your standard SONAR project files. The default directory for your project files is `\Cakewalk Projects`, located in the root directory. .mid files are Standard MIDI Files and can be put anywhere you like.

Templates (.cwt)

These files store your favorite setups for window arrangement and instrument combinations. The default directory for template files is `C:\Cakewalk Content\SONAR X2 <Producer, Studio or Essential>\Project Templates`.

Track Templates

These files store your most commonly used track settings, including track type (MIDI or audio), effects and their settings, hardware input, bus send settings, and a variety of other track-related parameters. The default directory is `C:\Cakewalk Content\SONAR X2 <Producer, Studio or Essential>\Track Templates`.

Track Icons

These files store standard or customized icons. The default directory is `C:\Cakewalk Content\SONAR X2 <Producer, Studio or Essential>\Track Icons`.

CAL Files

These are small programs written in Cakewalk Application Language, that perform specialized MIDI editing. The default directory is `C:\Cakewalk Content\SONAR X2 <Producer, Studio or Essential>\CAL Scripts`.

Wave Files

These files are the standard Windows audio files that you can import into and export out of SONAR. They have the file extension .wav. The default directory for wave files is the `\Sample Content` folder located in:

Windows 7:

`C:\ProgramData\Cakewalk\SONAR X2 <Producer, Studio or Essential>`

Video Files

You can import .avi, ,mpg, and QuickTime video files into SONAR. The default directory for video files is the `\Sample Content` folder located in:

Windows 7:

`C:\ProgramData\Cakewalk\SONAR X2 <Producer, Studio or Essential>`

Preferences dialog

Sysx Files (.SYX)

When you create and save a .syx file. The default directory for sysx files is the `\Sample Content` folder located in:

Windows 7:

`C:\ProgramData\Cakewalk\SONAR X2 <Producer, Studio or Essential>`

Play List (.SET)

The default directory for play list files is `C:\Cakewalk Content\SONAR X2 <Producer, Studio or Essential>\PlayList Files`.

Groove Quantize (.GRV)

When you create and save a .grv file. The default directory for groove quantize files is the `\Sample Content` folder located in:

Windows 7:

`C:\ProgramData\Cakewalk\SONAR X2 <Producer, Studio or Essential>`

StudioWare

The default directory for StudioWare files is `C:\Cakewalk Content\SONAR X2 <Producer, Studio or Essential>\StudioWare Panels`.

Drum Maps

You can create drum maps to redirect any number of MIDI drum tracks to internal (software) and external (hardware) synthesizers or samplers. The default directory for drum map files is the `\Drum Maps` folder located in:

Windows 7:

`C:\ProgramData\Cakewalk\SONAR X2 <Producer, Studio or Essential>`

For more information about drum maps, see

Plug-in Layouts

You can create menu layouts for your plug-ins by using the Plug-in Manager (**Utilities > SONAR Plug-in Manager** command). The default directory for plug-in menu layouts is the `\Plug-in Menu Layouts` folder located in:

Windows 7:

`C:\ProgramData\Cakewalk\SONAR X2 <Producer, Studio or Essential>`

Step Sequences

When you create and save a .ssp file. You can save and load step sequencer patterns in the Step Sequencer.

The default directory for step sequencer patterns is `C:\Cakewalk Content\SONAR X2 <Producer, Studio or Essential>\Step Sequencer Patterns`.

Preferences dialog

FX Chain Presets

When you create and save a .fxc file. You can save and load FX Chain preset file in any effects bin.

The default directory for FX Chain presets is `C:\Cakewalk Content\SONAR X2 <Producer, Studio or Essential>\FX Chain Presets`.

See also:

"Preferences dialog" on page 1647

"File - Audio Data" on page 1681

"File - VST Settings" on page 1683

"File - Initialization File (Advanced)" on page 1686

"File - Advanced (Advanced)" on page 1688

File - Audio Data

Figure 478. *The Audio Data section*
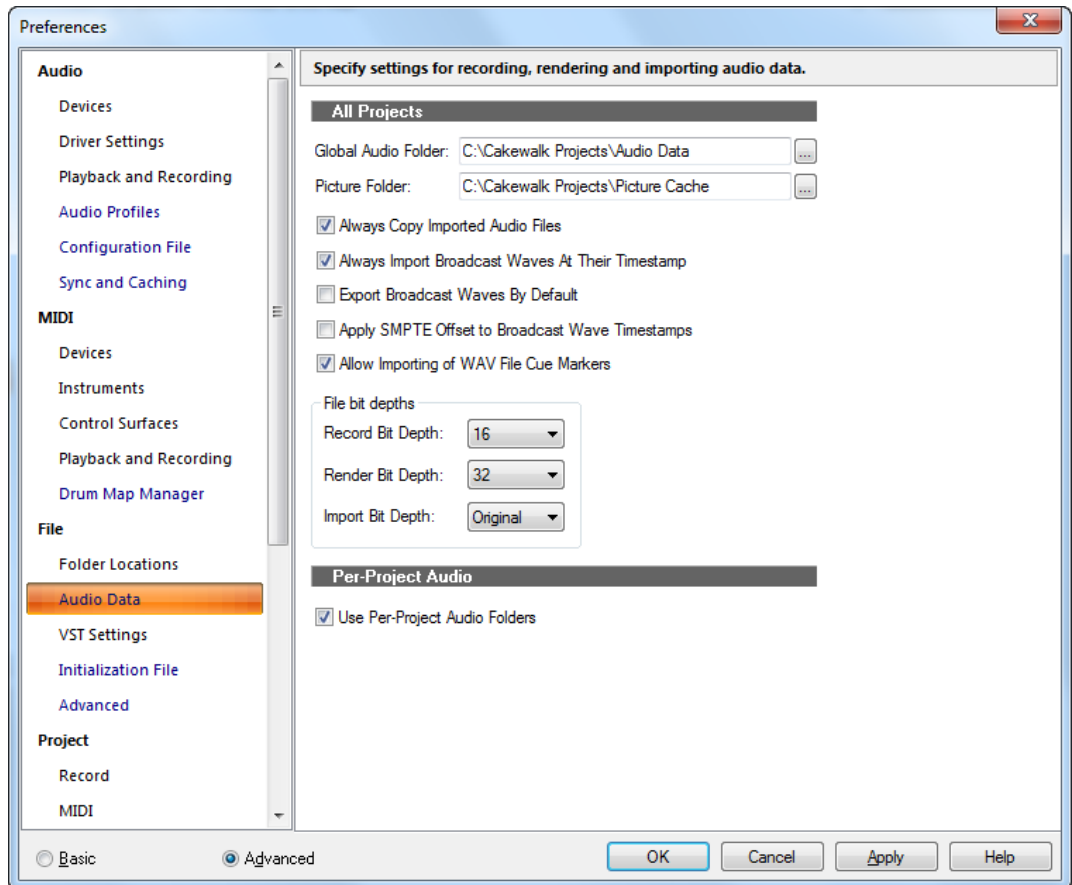
The **Audio Data** section lets you specify settings for recording, rendering and importing audio data.

The **Audio Data** section contains the following settings:

All Projects

- **Global Audio Folder.** The Global Audio Folder is where audio files are stored for all projects when per-project audio is not turned on. It is also used to store audio for older, non-per-project audio projects, as well as a temporary folder for unpacked bundle files and to store audio for as yet unnamed projects.

- **Picture Folder.** This folder contains the waveform images for all audio files in all your projects.

- **Always copy imported audio files.** When checked this option forces SONAR to always copy all imported audio files to your audio data directory. If you want to keep all your audio files in one

Preferences dialog

location, always keep this option checked.

- **Always Import Broadcast Waves at Their Timestamp.**   Forces SONAR to ignore the Now Time when importing Broadcast Wave files. When this option is checked, Broadcast Waves begin at their SMPTE timestamp in your project.

- **Export Broadcast Waves By Default.**   Check this option if you want the **Broadcast Waves** option to appear by default in the **Export Audio** dialog box.

- **Apply SMPTE Offset to Broadcast Wave Timestamps.**   Check this option if you want to add the **SMPTE/MTC Offset** value (listed in **Edit > Preferences > Project - Clock**) to the timestamps of the Wave files that you export from SONAR.

- **Allow importing of WAV File Cue Markers.**   Check this option if you want SONAR to import cue markers that may exist in wave files.

  Many field recorders, such as the Edirol R-4, can add cue markers to the wave files that they record. If you import these wave files into SONAR, the markers appear as standard SONAR markers on the Time Ruler.

  Marker names are based on the imported file name, and are numbered sequentially, with a limit of 16 characters <file name…> 1, <file name…> 2, etc.

File Bit Depths

- **Record Bit Depth.**   Use this field to choose the bit depth that recorded audio data will use. You can change this at any time.

- **Render Bit Depth.**   Use this field to choose the bit depth that audio processing (freezing, bouncing, applying effects) will use. The default value of 32 allows virtually lossless processing.

- **Import Bit Depth.**   Use this field to choose the bit depth that imported audio will use. The default choice of Original keeps the imported audio at its current bit depth.

Per-Project Audio

- **Use Per-Project Audio Folders.**   This option is on by default, and allows you to use a different audio data folder for each project.

See also:

File - VST Settings

Figure 479. *The VST Settings section*
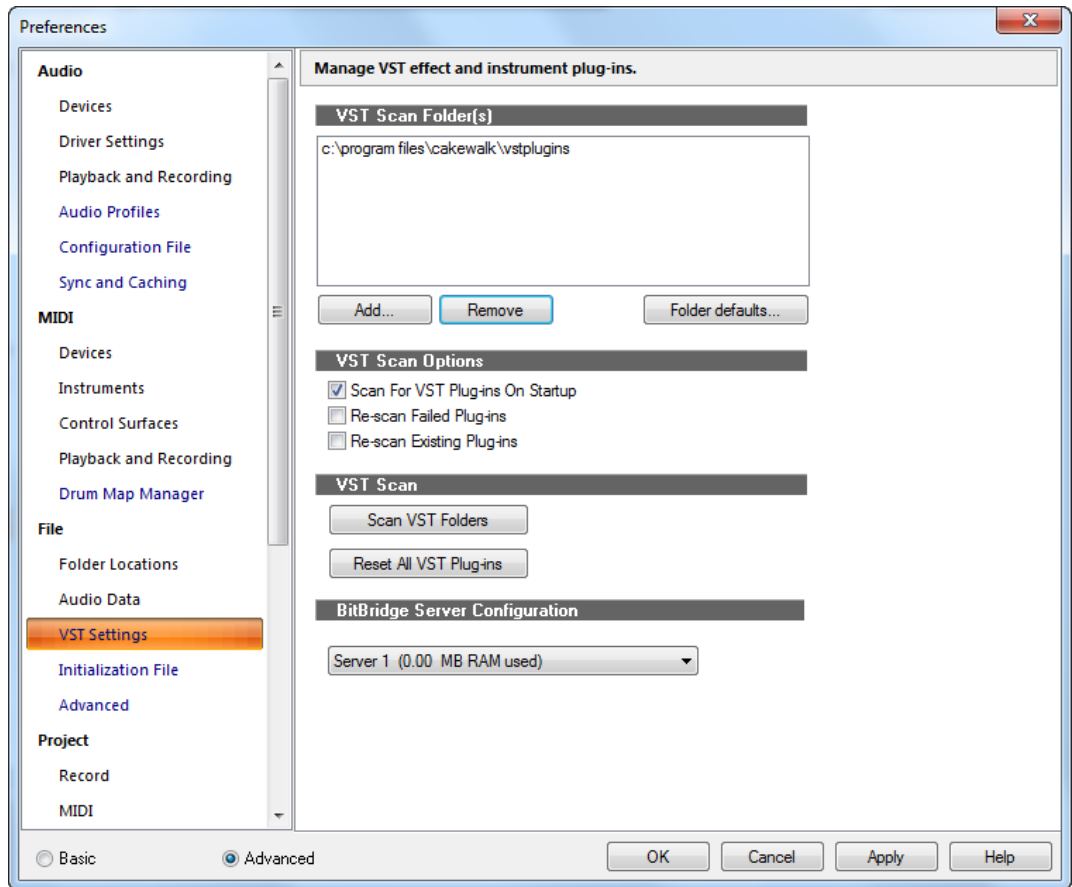
The **VST Settings** section lets you manage VST effect and instrument plug-ins.

The **VST Settings** section contains the following settings:

VST Scan Folders

This window lists the folders that are scanned for VST plug-ins. "Scanning" a VST plug-in means adapting the plug-in's file format so that the plug-in works in SONAR.

Preferences dialog

To add folders, remove folders, or set defaults for the listed folders, use the following buttons:

- **Add.**   This button opens the **Browse for Folder** dialog box, which allows you to select a new folder to be scanned.
- **Remove.**   To remove a folder from the to-be-scanned list, first select the folder, and then click the **Remove** button.
- **Folder defaults.**   Click this button to open a dialog box of folder options. These settings will set options for all the VST plug-ins in all the folders listed in the **VST Scan Folders** list. For more information, see

VST Scan Options

This group of commands controls the following options:

- **Scan for VST Plug-ins On Startup.**   If this option is checked, the folders listed in the VST Scan Folders window are searched for new plug-ins whenever you start SONAR. Any previously unscanned plug-ins are then scanned. Checking this option causes SONAR to search for unregistered VST plug-ins on startup. If you prefer to run the VST Configuration Wizard manually, you can disable this option.
- **Re-scan Failed Plug-ins.**   Checking this option causes any plug-in(s) that didn't scan correctly to be rescanned during the next scan.
- **Re-scan existing plug-ins.**   Checking this option causes plug-in(s) that did scan correctly to be rescanned during the next scan. This is a way to implement any changes you've made to the Folder defaults settings.

VST Scan

The commands in this section control the following options:

- **Scan VST Folders.**   Click this button to immediately scan the folders listed in the **VST Scan Folder(s)** list.
- **Reset All VST Plug-ins.**   Click this button to remove all scanning records and settings from all your VST plug-ins. Use this button if you want to completely start over.

BitBridge Server Configuration

Note: *BitBridge server configuration is only available in SONAR Producer.*

Cakewalk's BitBridge technology allows you to use 32-bit VST effects and instruments when using the x64 version of SONAR.

Preferences dialog

32-bit VST effects and instruments are loaded into "servers", and each server can address up to 4GB of RAM. BitBridge supports up to 32 independent plug-in servers, and each server can address up to 4GB of RAM, allowing access to a massive 128GB of RAM. This allows SONAR x64 to address all available RAM in your computer.

By default, SONAR manages memory automatically, and will allocate and allow access to all available RAM dynamically as plug-in's are used. This is done by dynamically creating new BitBridge servers only when necessary, up to a maximum of the available RAM.

Server loading is either automatic or customizable, giving you full control over which server to load plug-ins into. To enable automatic server loading, select **Automatic (Based on available RAM)**. To manually manage BitBridge servers, select the server that you want plug-ins to be loaded into.

After a specific server is selected, all plug-ins subsequently loaded will be loaded into that specific server, bypassing SONAR's automatic memory management. This also applies when you load a project that contains VST plug-ins.

Tip: *To more optimally use your available memory, assign memory hungry VST's to their own private BitBridge server. The actual memory consumed by a server instance is shown in the server list, allowing you choose which server you may want to load into.*

Custom server assignments are saved with the project file.

Note: *Server management is common for all loaded projects. If you have multiple projects open simultaneously, you can potentially overflow the 4GB capacity of a server if the projects reference the same server. Under this condition, a plug-in may fail to load. If this occurs, close the current project before opening another project.*

See also:

Preferences dialog

File - Initialization File (Advanced)

Figure 480. *The Initialization File section*
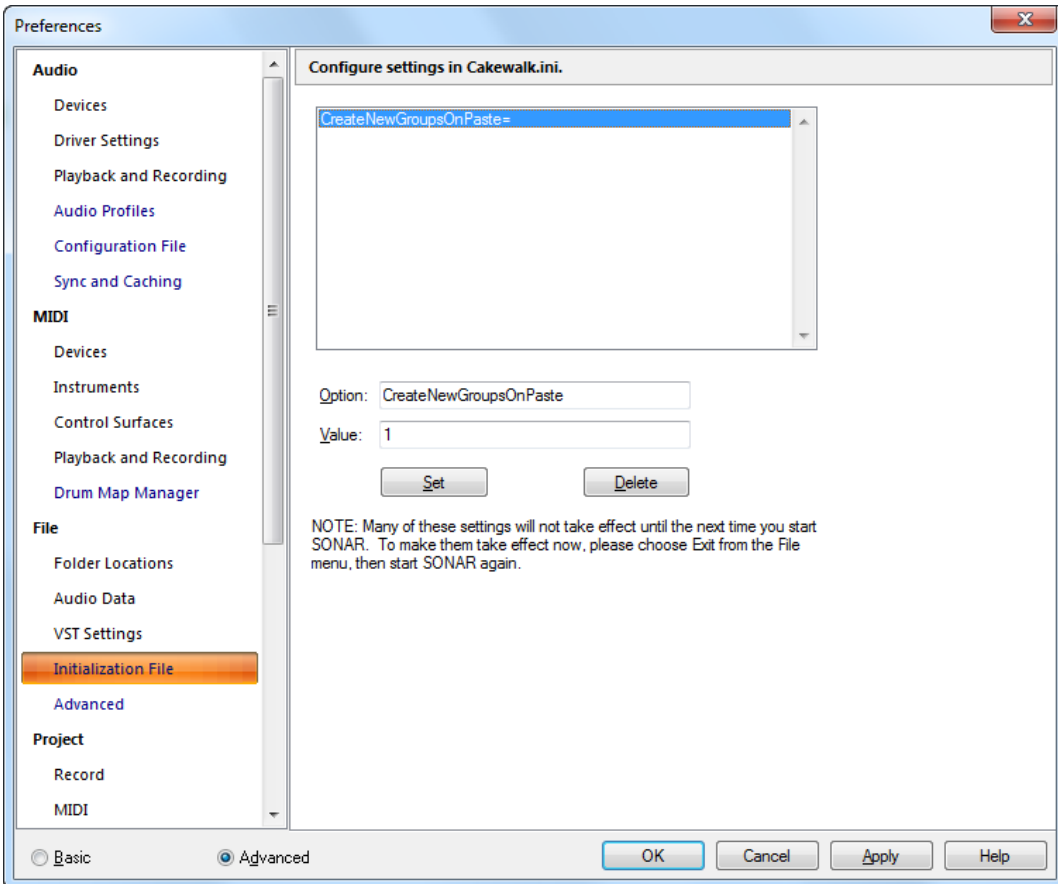
The **Initialization File** section lets you view and edit the `Cakewalk.ini` file, which allows you to store information about your preferences and configuration.

Note: *There are two other initialization files stored in the SONAR program folder:*

* *TTSseq.ini*
* *Aud.ini*

You can edit these files with a text editor, such as Windows Notepad. For more information, see *"Initialization files" on page 1288 and "Configuration Settings" on page 1661.*

Warning: *There are several other .ini files in the SONAR folder, but you should not attempt to edit or modify these files in any way. Changes to these other files could cause SONAR to stop operating properly.*

Before making any changes to any of the .ini files, you should make a backup copy in case you make a mistake. After you have made your changes, save the file and close Notepad. SONAR reads the settings in these files only when it first starts up. Therefore, if you change any settings while SONAR is running, you should exit and restart SONAR in order for the changes to take effect.

The **Initialization File** section contains the following fields:

Variable list

This list shows variables that are already assigned to values. Next to the variables, after the equal sign, are the values that each variable is currently assigned to.

Option

Type the variable into this field that you want to set a value for, for example, `DrawPlayingAudio`. Spelling is critical, but case doesn't matter.

Value

Type the number or value that you want to assign to the variable that is in the **Option** field.

Set button

Click this button to finish assigning the number in the **Value** field to the variable in the **Option** field.

Delete button

Click this button to delete the variable assignment that's highlighted in the Variable list.

See also:

See also:

Preferences dialog

File - Advanced (Advanced)

Figure 481. *The Advanced (File) section*
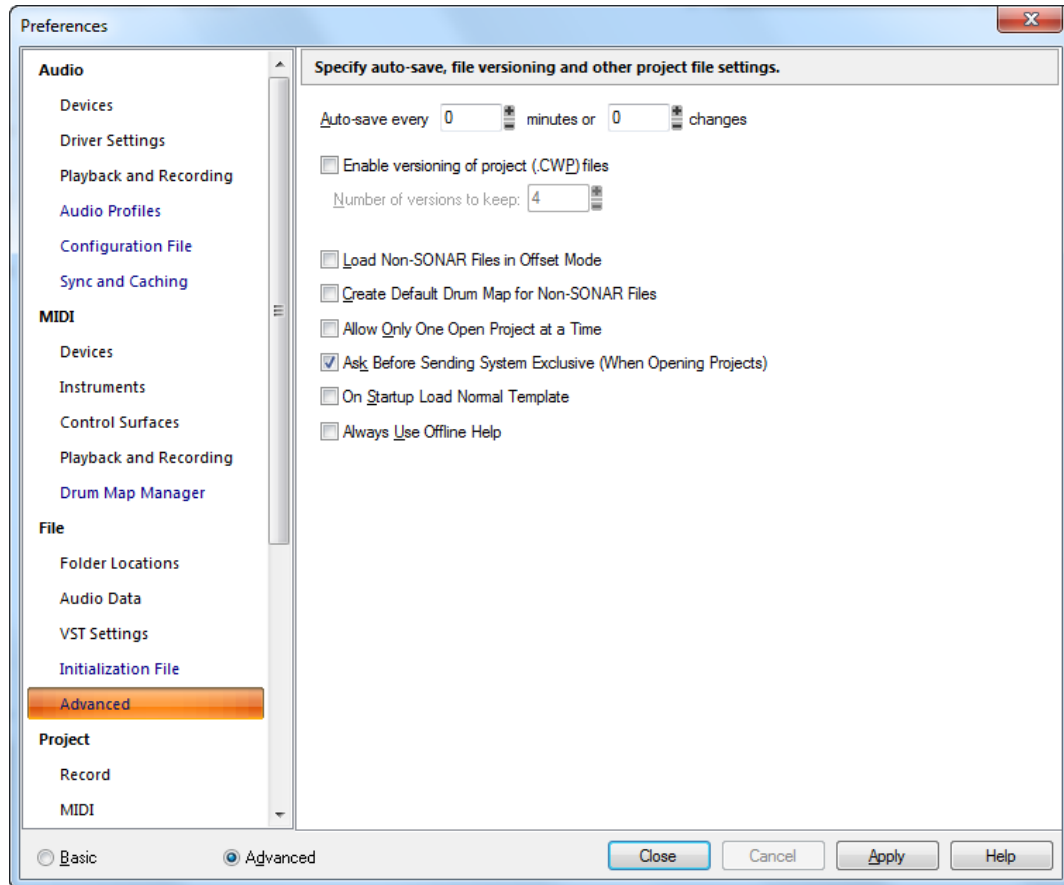
The **Advanced** section lets you specify auto-save, file versioning and other project file settings.

The **Advanced** section contains the following settings:

- **Auto-save Every "N" Minutes or "N" Changes.**   Choose how many minutes or edits between automatic saves.

- **Enable Versioning of Project (.cwp) Files.**   Checking this check box causes SONAR to save

successive versions of a project with the date the project was saved in the file name. The most recent version has no date in the name.

- **Number of versions to keep.** If you enable the versioning option, you can use this field to choose how many versions to keep. When the maximum number of files is reached, the oldest file is deleted.

• **Load Non-SONAR Files in Offset Mode.** This option causes .smf, .mid, .rmi, .wrk and .cwb/bun files to open in Offset mode (see "Envelope mode and Offset mode" on page 1031).

For more information about Offset mode, see "Envelope mode and Offset mode" on page 1031.

• **Create Default Drum Map for Non-SONAR Files.** This option ensures that when you load a Standard MIDI File, you won't have to create a drum map from scratch—SONAR creates a basic one for you.

• **Allow Only One Open Project at a Time.** If you check this check box, when you open a new project SONAR will close any project that is already open and ask if you want to save any changes.

• **Ask before Sending System Exclusive (When Opening Projects).** If you check this option and then open a project that contains sysx data, SONAR asks you before sending the sysx data.

• **On Startup Load Normal Template.** This option lets you leave the **Use Per-Project Audio Folders** option checked, but doesn't ask you to choose an audio folder every time you open a new project. While you record audio into the new project, the audio data is stored in the global audio folder until you save the file, at which point you can choose to create a PPA folder, or retain the audio in the Global audio folder.

• **Always Use Offline Help.** This option tells SONAR to always use the installed version of the Help (SONAR.chm). When this options is disabled, SONAR will load the latest online HTML help in your default web browser.

See also:

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Project - Record

Figure 482. *The Record section*
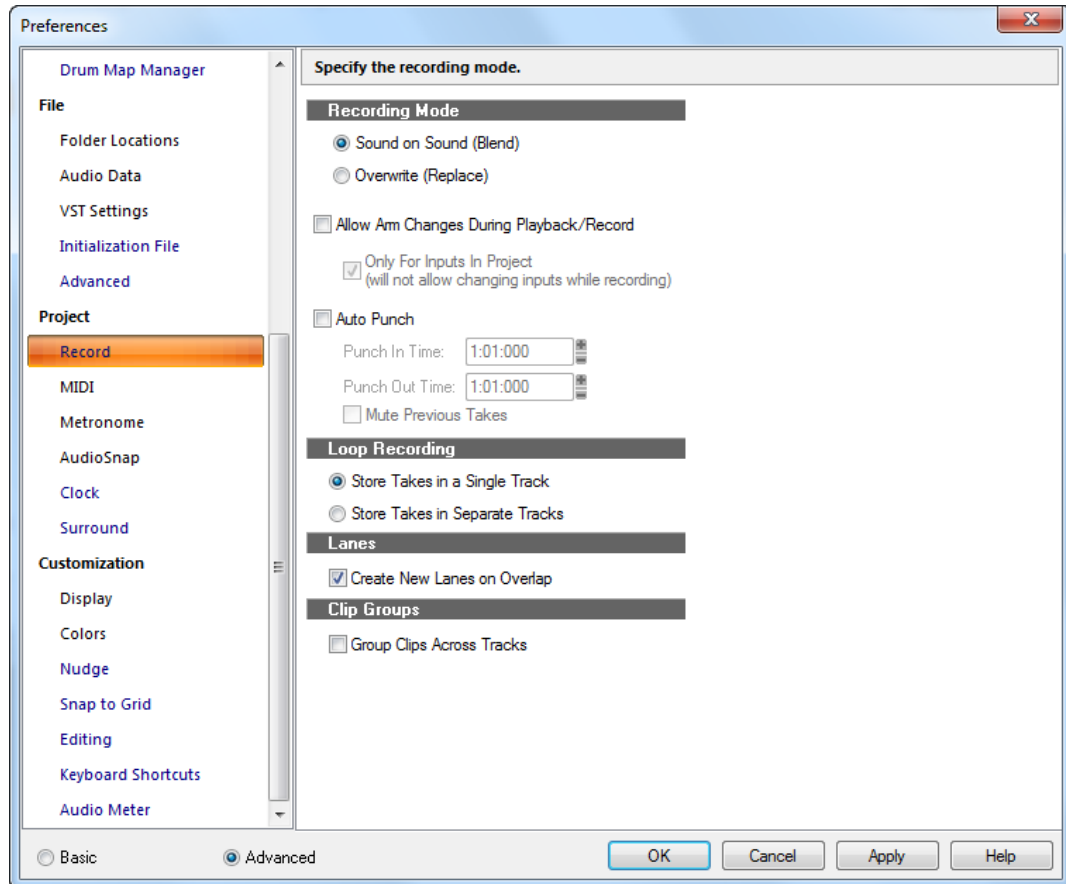
The **Record** section lets you specify how SONAR records clips into tracks that already contain other clips. If you use loop recording, you can also specify whether to record takes in sequential tracks or stacked in a single track.

Note: *SONAR saves the recording options you choose with each project, so you can save a different recording mode with each of your projects.*

The **Record** section contains the following settings:

Recording Mode

Choose one of the following options:

- **Sound on Sound (Blend).**   Choose this option to add sound to any pre-existing sound in the track.

- **Overwrite (Replace).**   Choose this option to overwrite any pre-existing sound in the part of the track you are recording into.

- **Allow Arm Changes During Playback/Record.**   Select this option if you want to arm and disarm tracks during playback and recording. This allows you to record to different tracks while the transport is rolling, without first having to stop playback in order to arm a track for recording.

Note: *The **Allow Arm Changes During Playback/Record** option is disabled by default. When enabled, SONAR must keep all hardware input ports open so that it can dynamically arm tracks on the fly. With some drivers in WDM mode, this can add significant overhead if there are many input devices enabled in **Edit > Preferences > Audio - Devices**. This may lead to more frequent drop outs. When using this option in WDM mode, it is recommended that you disable all unused input drivers to minimize this overhead. Disabling unused inputs is not required when using ASIO mode.*

- **Only For Inputs In Project.**   When **Allow Arm Changes During Playback/Record** is enabled, SONAR must keep all hardware input ports open so that it can dynamically arm tracks on the fly. With some drivers in WDM mode, this can add significant overhead if there are many input devices enabled in **Edit > Preferences > Audio - Devices**. The **Only For Inputs In Project** option instructs SONAR to only open hardware input ports that are currently active in the project (i.e. assigned to a track).

Note: *If this option is enabled, you will not be able to change inputs while recording.*

- **Auto Punch.**   Choose this option to punch record, and then set the following options:
  - **Punch In Time.**   Enter the time where you want the new recording activity to begin.
  - **Punch Out Time.**   Enter the time where you want the new recording activity to end.
  - **Mute Previous Takes.**   Uncheck this option in Sound on Sound (Blend) mode if you want to hear previous takes during Auto Punch.

Note: *The **Mute Previous Takes** option has no effect during loop recording.*

- **Hear previously recorded material on track.**   Select this option if you want to hear previously recorded material on a track while recording.

Preferences dialog

Loop Recording

Choose one of the following loop recording options:

- **Store Takes in a Single Track.** Choosing this option causes SONAR to merge every new take with the previous takes, unless you choose Overwrite mode, which mutes each take except the newest one.

- **Store Takes in Separate Tracks.** Choosing this option causes SONAR to place each new take in the next available track. This method can quickly overwhelm your computer if you are recording audio data.

Lanes

- **Create New Lane On Overlap.** If you have the **Expand/collapse Take Lanes** button ⊟ on a track enabled, and you record one clip so that it overlaps another clip, the clips appear in different take lanes when this option is enabled.

Clip Groups

- **Group Clips Across Tracks.** Choosing this option causes SONAR to place all new clips in a group after recording is complete. When loop recording, each pass of the loop gets placed in its own group. For more information, see "Clip groups" on page 345.

See Also:

See also:

Preferences dialog

Project - MIDI

Figure 483. *The MIDI section*
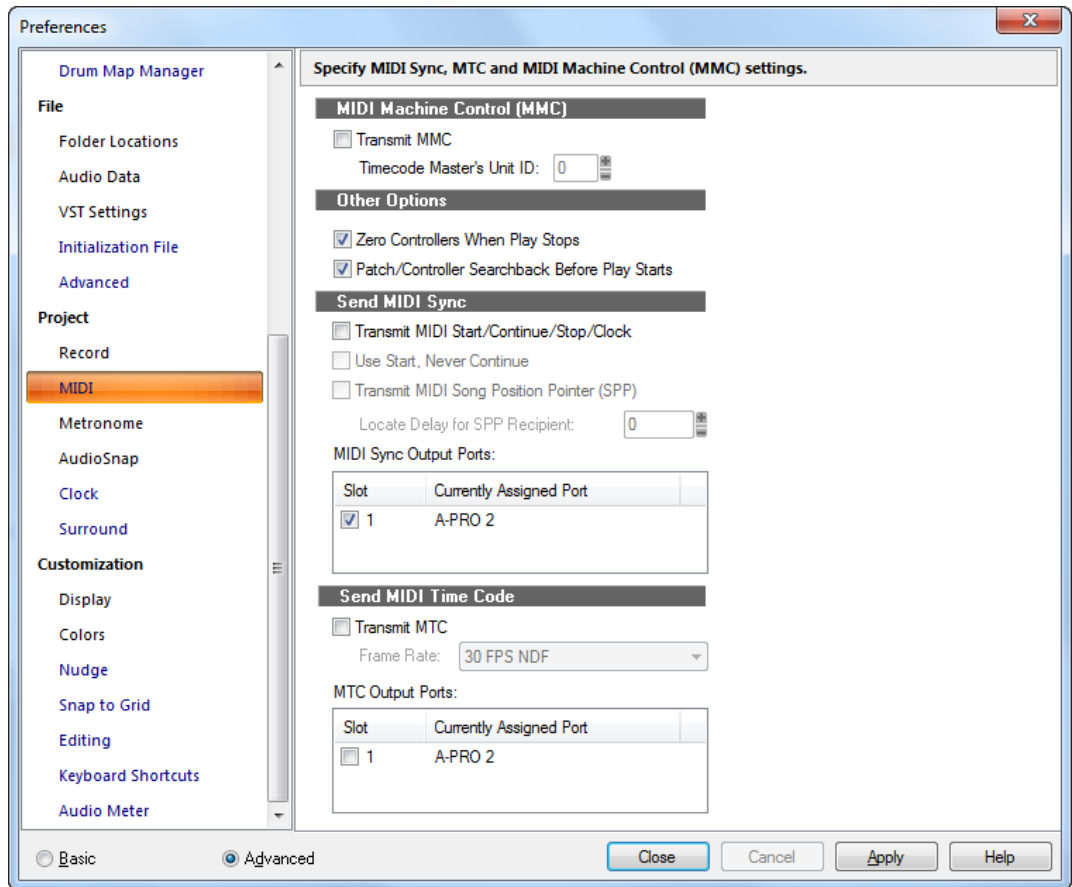
The **MIDI** section lets you specify MIDI Sync and MIDI Machine Control (MMC) settings.

The **MIDI** section contains the following settings:

MIDI Machine Control (MMC)

This section allows you to control MMC devices from SONAR, and has the following options;

- **Transmit MMC.** Choosing this option causes SONAR to send standard MMC commands such as start, stop, rewind, etc., to any MMC devices that are connected to your computer.
  - **Timecode Master's Unit ID.** If you have several MMC devices connected to your computer, for example three ADAT machines, one of them will be the timing master, and SONAR and the other MMC devices will slave to its timing. Fill in the ID number of the master MMC device, so that SONAR's MMC commands go to the right device.

Other Options

- **Zero Controllers When Play Stops.** If you choose this option, SONAR sets the controller values of the pitch wheel, the sustain pedal, and the modulation wheel on all 16 MIDI channels to zero. It also sends a "zero all continuous controllers" MIDI message which turns off other continuous controllers on newer synthesizers. If you experience frequent stuck notes when playback stops, try checking this option.
- **Patch/Controller Searchback Before Play Starts.** If you choose this option, SONAR finds and sends the most recent patch changes, wheel events, and pedal events before starting playback. This way, all settings are correct even if you start playback at an arbitrary point in the project.

See also:

Send MIDI Sync

When SONAR is the timing master in a master/slave synchronized setup, use this section to set MIDI Sync options:

- **Transmit MIDI Start/Continue/Stop/Clock.** Choosing this option causes SONAR to tell the slave when to start, when to continue, when to stop, and what timing data to go by (SONAR's).
- **Use Start, Never Continue (greyed-out unless you check the previous option).** Choosing this option causes SONAR to only transmit MIDI Start messages every time it restarts, even in the middle of a song. If you have a drum machine slaved to SONAR, and the drum machine is playing looped patterns, you probably want it to start at the beginning of its loop whenever SONAR restarts, even if SONAR restarts from the middle of a song.
- **Transmit MIDI Song Position Pointer (SPP).** Choosing this option causes SONAR to send an SPP message before starting or continuing playback. If you are using a drum machine as described above, you might want to disable this option.
  - **Locate Delay for SPP Recipient.** Some older MIDI devices take a small amount of time to respond to SPP messages. This option causes SONAR to delay briefly after sending an SPP message, in order to give the slave device time to respond. The delay is in 1/18ths of a second. Enter 1 for a 1/18th second delay, 2 for 2/18ths of a second, or 18 for a full second delay.
- **MIDI Sync Output Ports.** Choose the outputs that your slave devices are connected to.

Preferences dialog

Send MIDI Time Code

When SONAR is the timing master in a master/slave synchronized setup, use these options to send and configure MIDI Time Code (MTC):

- **Transmit MTC.** Check this box if you want SONAR to transmit MTC. You can also turn this option on or off at the **Sync** toolbar.

- **Frame Rate.** Use this drop-down menu to choose the frame rate for your project (see "Frame rates" on page 1163, if necessary).

- **MTC Output Ports.** Check off the output ports that you want SONAR to send MTC out of.

See also:

"MIDI synchronization" on page 1158.

"Synchronizing your gear" on page 1153

See also:

"Preferences dialog" on page 1647

"Project - Record" on page 1690

"Project - Metronome" on page 1696

"Project - AudioSnap" on page 1698

"Project - Clock (Advanced)" on page 1700

"Project - Surround (Advanced)" on page 1702

Preferences dialog

Project - Metronome

Figure 484. *The Metronome section*
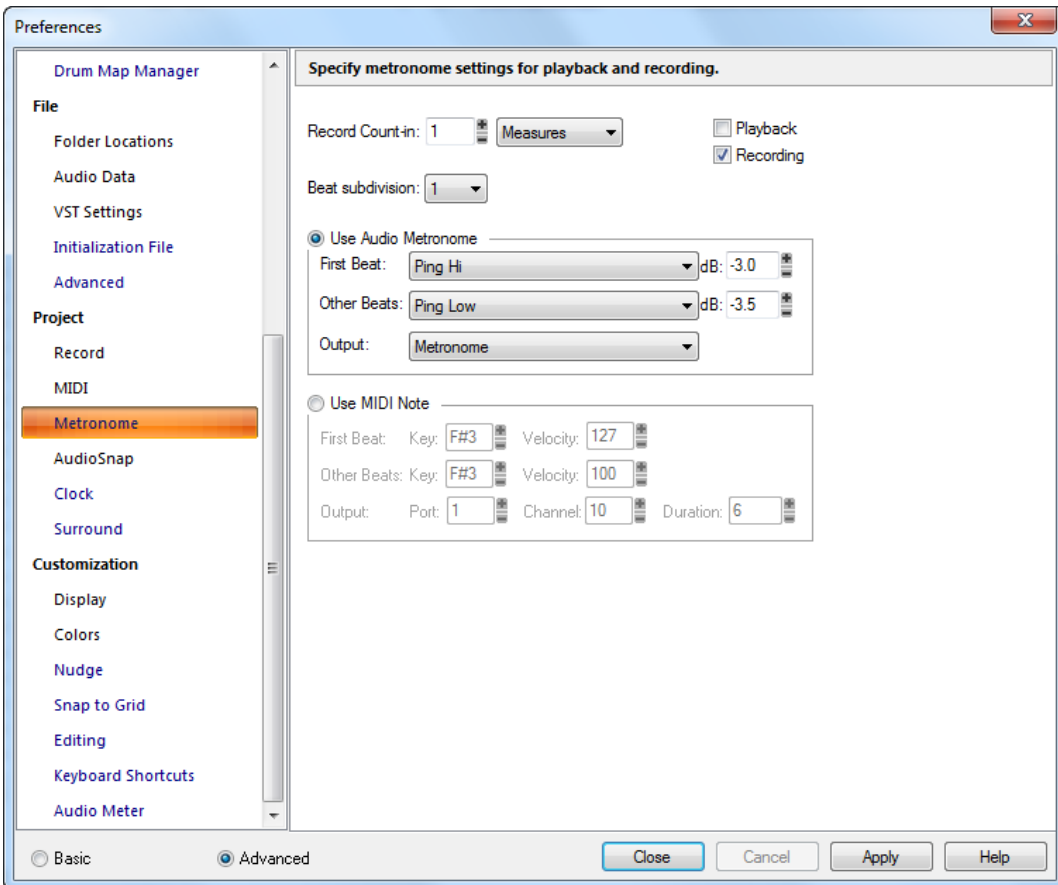
The **Metronome** section lets you specify metronome settings for playback and recording.

The **Metronome** section contains the following settings:

General

- **Record count In.** Specifies the number of count-in measures or beats.
  - **Measures.** Choosing this option sets the **Count-In** units to measures.
  - **Beats.** Choosing this option sets the **Count-In** units to beats.

Note: *The Record count-in always applies if there is a specified value, even if **Playback** and **Record** are not selected.*

Preferences dialog

- **Playback.** Choosing this option cause the metronome to sound during playback.
- **Recording.** Choosing this option cause the metronome to sound during recording.
- **Beat subdivision.** Select the desired subdivision value in the **Beat subdivision** list. The selected value is the subdivision for non-accented audible clicks.

Audio Metronome

- **Use Audio Metronome.** Choosing this option causes the metronome to use audio.
- **First Beat.** Select an audio sound for the first beat.
- **Other Beats.** Select an audio sound for other beats.
- **dB.** Set the dB level for the corresponding beat.
- **Output.** Set the output you want to use for the audio metronome.

MIDI Metronome

- **Use MIDI Note.** Choosing this option causes the metronome to sound by playing a MIDI note.
- **First Beat.** Choose a **Key** (a note) and a **Velocity** for the first metronome attack in the measure.
- **Other Beats.** Choose a **Key** (a note) and a **Velocity** for the other metronome attacks in the measure.
- **Port.** Choose the port that the MIDI note plays through.
- **Channel.** Choose the MIDI channel your metronome plays on.
- **Duration.** Choose how many "Ticks" on page 1920 you want the metronome sound to last.

For more information, see:

"To change your Metronome settings" on page 255

See also:

Preferences dialog

Project - AudioSnap

Figure 485. *The AudioSnap section*
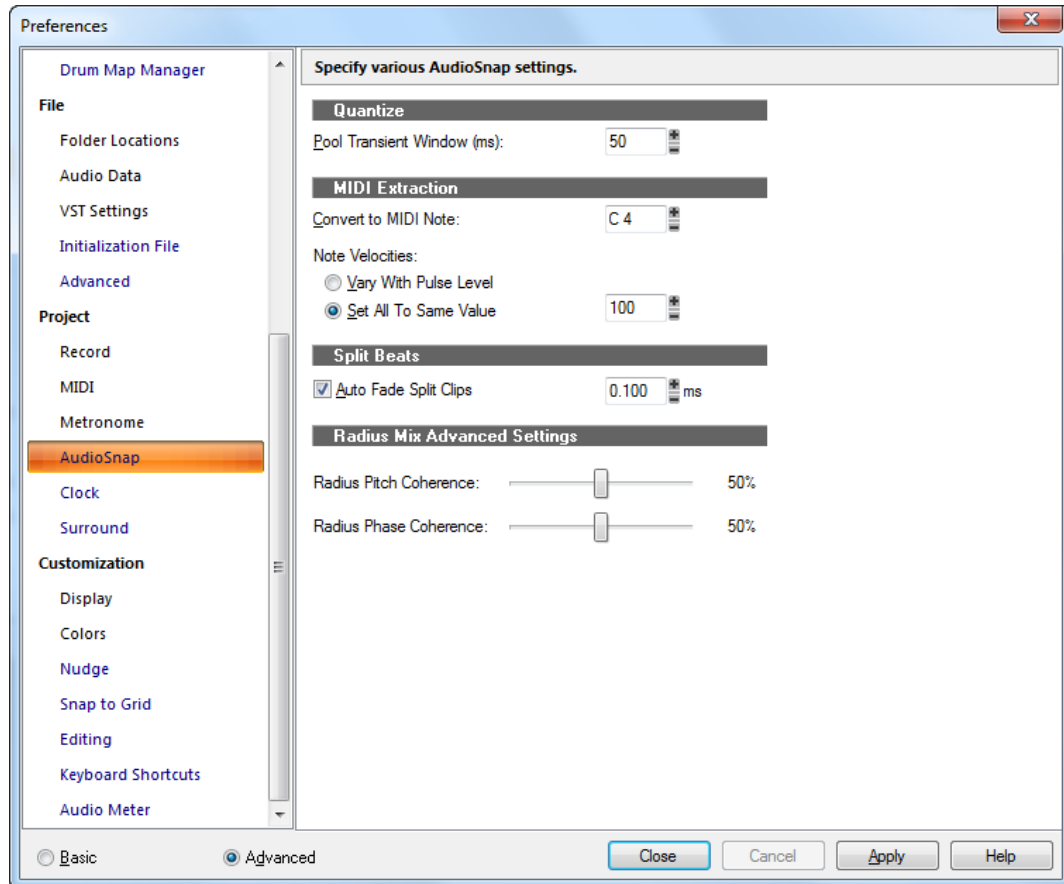
The **AudioSnap** section lets you specify various AudioSnap settings.

The **AudioSnap** section contains the following settings:

Quantize

- **Pool Transient Window (ms).**   When you double-click a marker, not only does the marker become selected, but all markers to the right of the marker become selected if they are located less than this field's value away from the original marker.

Preferences dialog

MIDI Extraction

- **Convert to MIDI Note.**   This field lets you choose what MIDI note all the transients in the clip will be converted to.

- **Note Velocities:**

  - **Vary with Pulse Level.**   This option causes the velocities of the notes in the MIDI clip to vary with the level of the transients in the audio clip.

  - **Set All to Same Value.**   This field lets you enter a velocity that all the MIDI notes in the clip will use.

Split Beats

- **Auto Fade Split Clips.**   Enabling this check box causes a cross fade to be added to all split clips, using a fade length in milliseconds that you set in the ms field in this section.

Radius Mix Advanced Settings

- **Radius Pitch coherence.**   Pitch coherence preserves naturalness of timbre for pitched solo voices, such as human speech, saxophone or vocals. The default value for this control is 50%. Higher values of pitch coherence will increase phase accuracy but may sound more modulated.

- **Radius Phase coherence.**   When processing stereo or surround audio, Phase coherence helps to preserve the phase relationships between channels. The default value for this control is 50%. Higher values of phase coherence will preserve the phase between multiple audio channels at the expense of slight distortion.

See also:

Preferences dialog

Project - Clock (Advanced)

Figure 486. *The Clock section*

The **Clock** section lets you specify synchronization settings and the number of subdivisions of the beat (parts per quarter note).

The **Clock** section has the following sections:

Source

This section lets you choose what device SONAR uses as a timing source, and has the following options:

- **Internal.**   Choose this option to use the clock on the computer's motherboard.
- **MIDI Sync.**   Choose this option to sync SONAR to an external MIDI device.
- **SMPTE/MTC.**   Choose this option to sync SONAR to an external device that generates either SMPTE time code or MIDI time code.
- **Audio.**   Choose this option to use the clock on the computer's sound card.

Ticks per quarter-note

This section lets you choose the number of subdivisions of the beat (parts per quarter note), from fifteen choices.

Timecode format

This section lets you choose a SMPTE frame rate from among seven choices.

- **SMPTE/MTC Offset.**   This section allows you to start SONAR playing after it starts receiving time code by an amount you choose in this field of the dialog box. Choose an amount in hours/minutes/seconds/frames format.

For more information, see:

See also:

Preferences dialog

Project - Surround (Advanced)

Figure 487. *The Surround section*
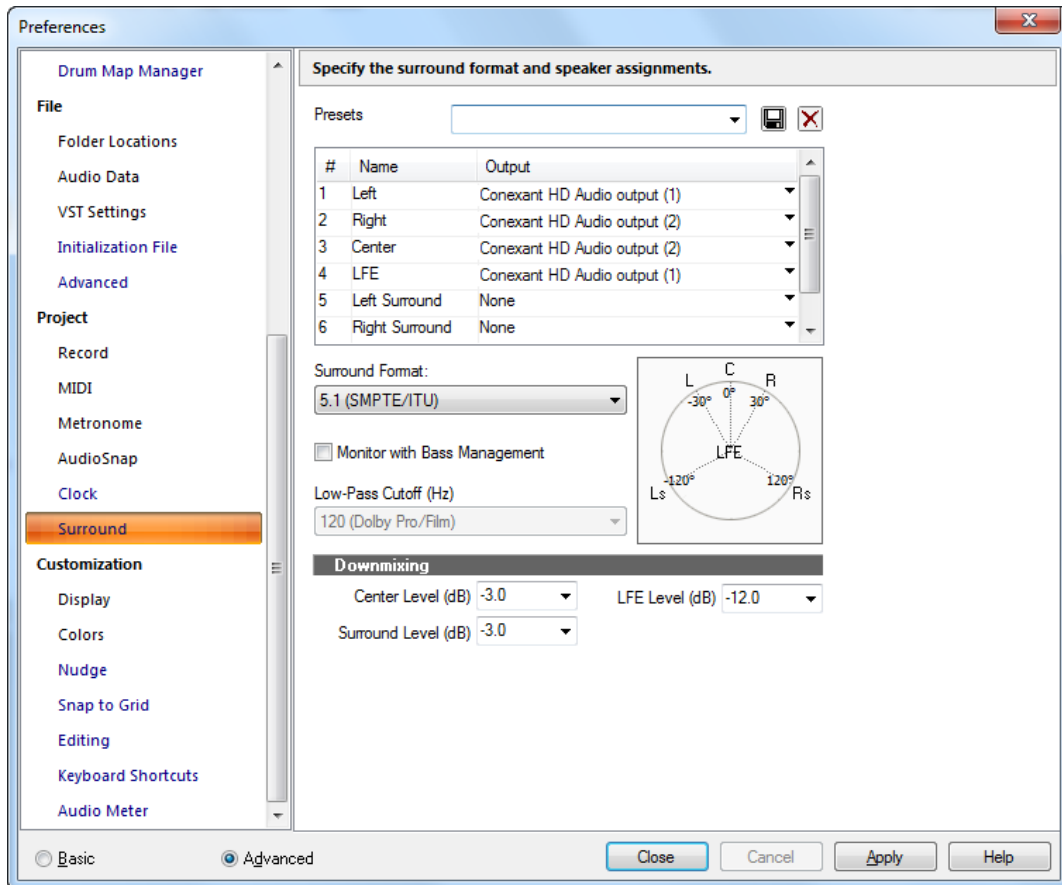
The **Surround** section lets you specify the surround format, speaker assignments, bass management and downmixing settings.

The **Surround** section contains the following settings:

Presets

You can save your current settings as a preset. This allows you to easily move between different surround configurations.

Output Assignments field

Set a hardware output for each channel.

Surround Format drop-down

Select a surround format from the drop-down:

- 2.1
- LCR
- LRC+LFE
- LRS
- LRS+LFE
- Matrix UHJ
- QUAD
- 4.1 (SMPTE/ITU)
- Quad+LFE
- PanAmbio 4.1
- LCRS
- Surround (SMPTE/ITU)
- Surround Media
- LCRS+LFE
- 5.1 (Standard 3/2)
- 5.1 (Film/Alternative)
- 5.1 (Music/Alternative)
- 5.1 (SMPTE/ITU)
- 6.0 (Hexagon)
- 6.0 (Film/Alternative)
- 6.0 (Music/Alternative)
- 6.1 (Film/Alternative)
- 6.1 (Music/Alternative)
- 6.1 (SMPTE/ITU)
- 7.0 (Heptagon)
- 7.0 (Film/Alternative)
- 7.0 (Music/Alternative)

Preferences dialog

- 7.1 (Film/Alternative)
- 7.1 (Music/Alternative)
- 7.1 (SMPTE/ITU)
- 8.0 (Octagon)
- 8.0 (Film/Alternative)
- 8.0 (Music/Alternative)
- 8.1 (Film/Alternative)
- 8.1 (Music/Alternative)
- 8.1 (SMPTE/ITU)

5.1 (SMPTE/ITU) should be the default template.

Monitor with Bass Management

When enabled, a combox lets you specify one of the following cutoff frequencies:

- 80 (Dolby consumer/DVD) (default)
- 116 (DTS)
- 120 (Dolby pro/film)
- 180

Low-pass Cutoff

All signals below the cutoff frequency are directed from the main channels to the LFE channel output.

Downmixing

- **Center Level.**   Center channel content is distributed equally into left and right channels of a 2-channel downmix with one of a choice of three levels. Each level is how much of center is mixed into both left and right. The alternatives are:
  - **-3 dB.**   This is the right amount to distribute into two acoustic sources to reach the same sound power level, thus keeping the far-field level (in the reverberant listening field, as is typical at home) equal. This is the amount by which a standard sin-cos panner redistributes a center panned image into left and right, for instance.
  - **-4.5 dB.**   Since -3 dB and -6 dB represent the extreme limits (of power addition on the one hand, or of phase-dependent vector addition on the other), an intermediate, compromise value was seen as valuable, since the correct answer has to be -4.5 dB +/- 1.5 dB.
  - **-6 dB.**   This covers the case where listening is dominated by direct sound. Thus, the two source signals add up by 6dB rather than by 3 dB, because they add as vectors, as voltages do, rather than as power does.

Preferences dialog

- **Surround Level.** Surround Downmix Level is the amount of Left Surround to mix into Left, and Right Surround to Right, when mixing down from any surround-equipped format to 2 channel. The available options are:
  - **-3 dB.** The amount by which mono surround information, from many movie mixes before discrete 5.1 was available, mixes down to maintain the same level as the original.
  - **-6 dB.** An amount that makes the mixdown of surround content not so prominent, based on the fact that most surround content is not as important as a lot of front content. This helps to avoid competition with dialog box, for instance, by heavy surround tracks in a mixdown situation.
  - **-INF.** Necessary for cases where the surround levels are so high that they compete with the front channels too much in mixdown situations.
- **LFE Level.** Choose -INF or -12 dB.

For more information, see "Surround Mixing (Producer and Studio only)" on page 939.

See also:

Preferences dialog

Customization - Display

Figure 488. *The Display section*
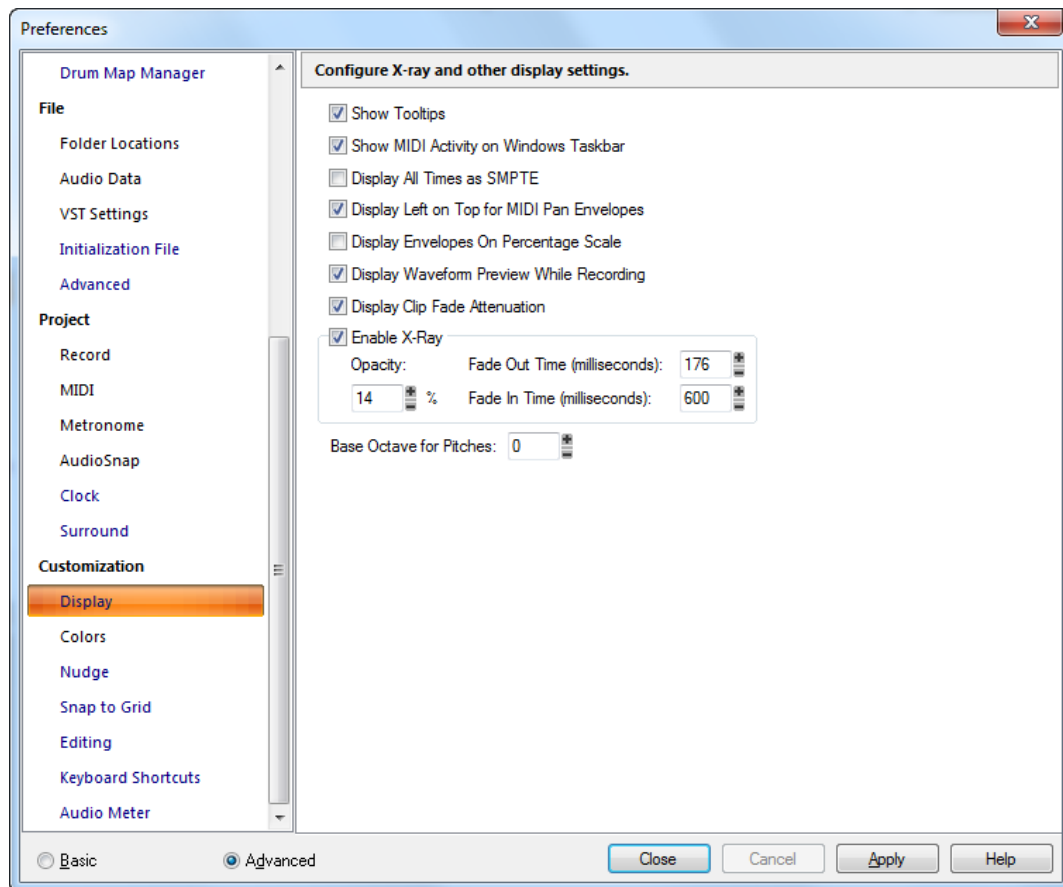
The **Display** section lets you configure X-ray and other display settings.

The **Display** section contains the following settings:

- **Show Tooltips.**   Checking this option causes SONAR to show tooltips. Tooltips are small text names or explanations that appear when you hold the mouse over a tool.

- **Show MIDI Activity on Windows Taskbar.**   Check this option to display the MIDI Input/Output Activity icon on the Windows taskbar.

- **Display All Times as SMPTE.**   This option, when checked, forces all time displays to appear in SMPTE time regardless of the setting you have in the Time Ruler.

- **Display Left on Top for MIDI Pan Envelopes.**   When checked, left is at the top of a clip for MIDI pan envelopes.

Preferences dialog

- **Display Envelopes on a Percentage Scale.** This option, when checked, causes new envelopes to be placed in the clip based on a range where 0 dB is in the middle of the clip. If the current volume is other than 0 dB, a new envelope is created at that location. For example a new envelope created at 6 dB would appear at the very top of the clip where a new envelope created at -20 dB would appear near the bottom of the clip.
- **Display Waveform Preview While Recording.** This option (on by default), when checked, causes SONAR to draw a preview waveform of any audio data that you record while you are recording it. If you turn this option off, SONAR creates a red swath in the Clips pane in the area you are recording, while you are recording.
- **Display Clip Fade Attenuation.** This option causes waveforms to respond to clip fades.
- **Enable X-Ray.** Enable this check box to turn on the X-Ray Windows feature, which allows you to see through plug-in windows and certain view windows to work in the window behind the current window. You use the X-Ray Windows feature by pressing a hotkey while the mouse is over an X-Rayable window.

  In addition to choosing hotkeys (**Edit > Preferences > Keyboard Shortcuts**), you can set these X-Ray Windows options:
  - **Opacity.** Choose how transparent you want the X-Rayed window to become when it is X-Rayed.
  - **Fade Out Time (Milliseconds).** Choose how fast you want the X-Rayed window to reach its maximum transparency.
  - **Fade In Time (Milliseconds).** Choose how fast you want the X-Rayed window to restore its normal state.
- **Base Octave for Pitches.** There is no industry standard for numbering octaves. By default, SONAR calls MIDI note 0 (the lowest possible note) C0. The Yamaha FB-01, for example, shows MIDI note 0 as C-2 (C negative 2). To match SONAR to that standard, set **Base Octave** to **–2**.

See also:

Customization - Colors

Figure 489. *The Colors section*
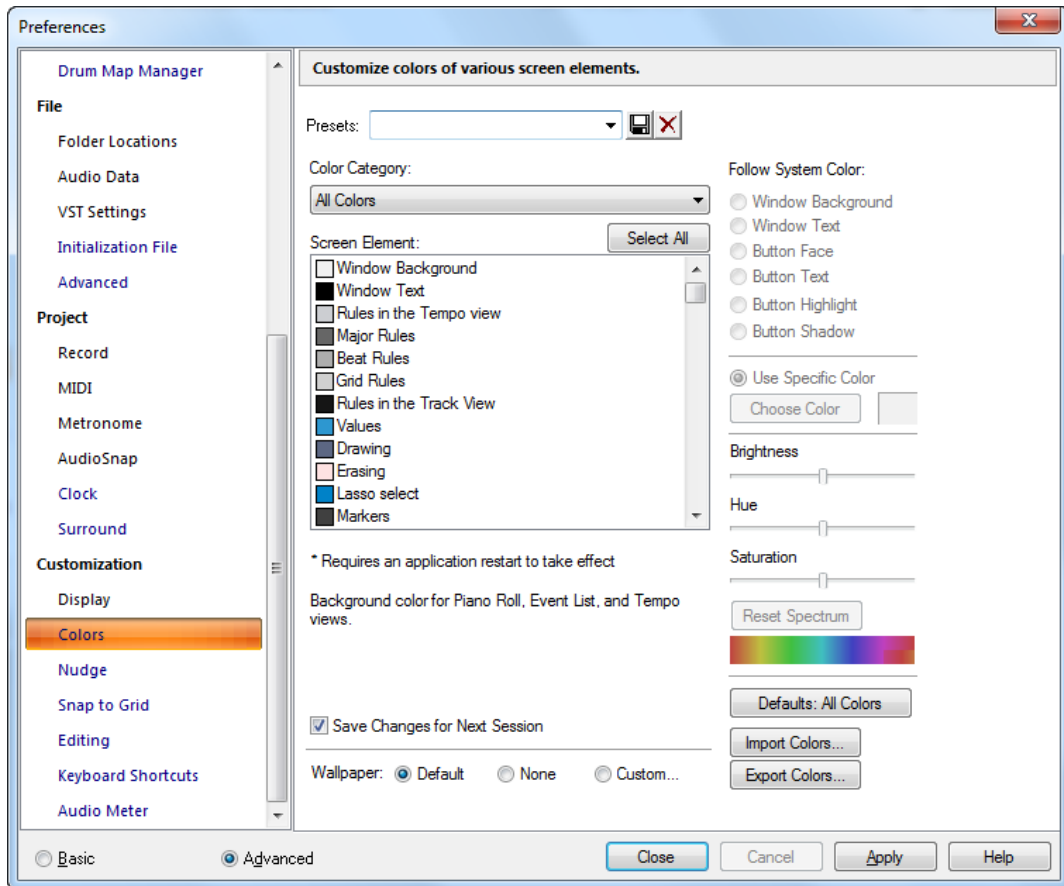
The **Colors** section lets you customize colors of various screen elements.

The **Colors** section contains the following settings:

Presets

You can create lots of different color schemes and save each one as a preset. After you create a color scheme that you like, type a name for it in the Presets window, and then click the floppy disk icon to save the preset. When you want to load the preset, just select it in the Presets window. To delete a preset, select it and then click the **Delete** button ⊠.

The **Colors** section has the following fields:

Color Category

This list shows different areas where color can be adjusted. Choosing one of these categories helps filter out screen elements you may not want to deal with at the moment. The categories also provide a convenient way to adjust brightness, hue, and saturation of a related collection of screen elements without hunting through a long list.

Screen Element

This list shows all the items in SONAR you can set the color of. Highlight the one you want to change. You can change multiple Elements simultaneously by CTRL-clicking or CTRL-dragging. Click **Select All** to select all screen elements in the current color category.

Follow System Color

This field lets you choose the same color for a highlighted item in the **Screen Element** list that Microsoft Windows uses for certain screen elements. For example, because Windows usually uses black for button text, if you highlight Window Background in the **Screen Element** list and then click **Button Text** in the **Follow System Color** field, all the window backgrounds in SONAR turn black (or whatever color you have set up for button text in your Windows preferences).

Note: *If you set any other screen element to the same color as Window background, you'll make that screen element invisible!*

Use Specific Color

Choosing this option instead of the **Follow System Color** option allows you to pick a specific color for the highlighted item in the **Screen Element** list. Click the **Choose Color** button to open the **Color** dialog box, click the color you want, and click **OK**. The highlighted item in the Screen Element list changes to the color you chose.

Brightness Slider

This control increases or decreases the luminance of the selected color, making it either more bright or more dull in appearance.

Hue Slider

This control determines the color type, such as red, green or blue.

Saturation Slider

This control increases or decreases the vibrancy of the selected color. A lower saturation value will input more "grayness" to the color, making it appear more faded.

Reset Button

Pressing the **Reset** button resets the **Brightness**, **Hue**, and **Saturation** sliders to default values.

Preferences dialog

Save Changes for Next Session

Check this check box if you want SONAR to use any new color assignments the next time you open SONAR.

Wallpaper

The options in this field allow you to set the color and design of SONAR's background area. The options are:

- **Default.** Choosing this option causes SONAR to use its original color and design for the background.
- **None.** Choosing this option causes SONAR to use a flat, grey color for the background.
- **Custom.** Choosing this option opens the **Wallpaper Bitmap** dialog box, which allows you to choose a graphics file (bitmap) to use as the background.

Defaults button

Clicking this button restores all of SONAR's color settings to their original values.

Import Colors button

This button opens the **Import Color Set** dialog box, which allows you to import a color arrangement, or a group of presets.

Export Colors button

This button opens the **Export Color Set** dialog box, which allows you to export a color arrangement, or a group of presets.

The following table identifies each of the screen elements in SONAR.

Screen element	Explanation
Window text	Text color
Rules in the Tempo view	Vertical lines in the Tempo view used to mark time intervals
Major Rules	Major lines used to mark larger intervals of time
Beat Rules	Color of the Beat rule lines
Grid Rules	Color of the Grid rule lines
Rules in the Track View	Vertical lines in the Track view used to mark measure intervals
Values	Color of selected events and tempo changes in the Tempo view

Table 264. *Screen elements*

Preferences dialog

Screen element	Explanation
Drawing	Colors used to show your drawing in the Piano Roll and Tempo views
Erasing	Color used to show your erasing in the Tempo views
Lasso select	Color of lasso select highlight
Markers	Color of markers in time rulers
Pitch Markers	Color of pitch markers in the Time Ruler
Loop Markers	Color of loop point markers
Punch Record Markers	Color of punch recording markers
Now Time Marker	Color of the Now Time Marker in the Track view
Track View Time Ruler Digits	Color of the Time Ruler markings
Time Ruler Tick Marks	Color of the Time Ruler beat and measure lines
AudioSnap Pool Lines	The color of the vertical lines in the Track view that show transient locations
Musical Snap Pool Lines	The color of the vertical lines in the Track view that show Snap to Grid locations (when **Add MBT to Pool** is enabled)
Musical Snap Pool Markers	The color of the markers in the Track view time ruler that show Snap to Grid locations (when **Add MBT to Pool** is enabled)
Clip Fades	Color for the fade line and fade shading
Clip Zero Amplitude Lines	Color for the line that marks a silent volume level for a clip
Snap Offset Markers	Color of the Snap offset markers
Clip Gain Envelope	Color of the Gain envelopes in clips
Clip Pan Envelope	Color of the Pan envelopes in clips
Clip Velocity Envelope	Color of velocity envelopes in clips
Selected Clip	Color of clips that are currently selected
Muted MIDI Clip Data	Color of the MIDI data in a muted area of a clip. Also used for the outline of event muted notes in the Piano Roll.
Folder Clip Background	Color of an area of a folder clip where there is no data

Table 264.   *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
Folder Clip Text	Color of text label on a folder clip
Folder Line	Color of the line on the left side of the Track pane connecting a track folder to the tracks that are contained in the folder
Record Preview Clip Background	The background color in the Clips pane of an armed track
Recording Waveform Previews	Color of the waveform in a clip during preview while recording
Bus Waveform Preview	Color of the waveform that a bus's or synth track's output generates
Waveform Preview (>= 0dB)	Color of the waveform in a clip during preview while recording if the amplitude is greater than or equal to 0dB
Input Quantize Record Preview Background	The background color in the Clips pane of an armed MIDI track when Input Quantize is enabled
Frozen Track Background	The background color of a frozen track in the Clips pane
V-Vocal Clip Background	The color of a V-Vocal clip.
Header	The color of clip headers.
Header (selected)	The color of selected clip headers.
Clip Background	The background color of clips.
Clip Background (selected)	The background color of selected clips.
Default Waveform	Waveform color of audio clips.
Default Notes	Note color of MIDI clips.
Audio Tracks 1, 11, 21...Foreground	Foreground color of all audio tracks that end in the number "1" (1, 11, 21, etc.)
Audio Tracks 1, 11, 21...Background	Background color of all audio tracks that end in the number "1" (1, 11, 21, etc.)
Audio Tracks 2, 12, 22...Foreground	Foreground color of all audio tracks that end in the number "2" (2, 12, 22, etc.)
Audio Tracks 2, 12, 22...Background	Background color of all audio tracks that end in the number "2" (2, 12, 22, etc.)
Audio Tracks 3, 13, 23...Foreground	Foreground color of all audio tracks that end in the number "3" (3, 13, 23, etc.)

Table 264. *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
Audio Tracks 3, 13, 23...Background	Background color of all audio tracks that end in the number "3" (3, 13, 23, etc.)
Audio Tracks 4, 14, 24...Foreground	Foreground color of all audio tracks that end in the number "4" (4, 14, 24, etc.)
Audio Tracks 4, 14, 24...Background	Background color of all audio tracks that end in the number "4" (4, 14, 24, etc.)
Audio Tracks 5, 15, 25...Foreground	Foreground color of all audio tracks that end in the number "5" (5, 15, 25, etc.)
Audio Tracks 5, 15, 25...Background	Background color of all audio tracks that end in the number "5" (5, 15, 25, etc.)
Audio Tracks 6, 16, 26...Foreground	Foreground color of all audio tracks that end in the number "6" (6, 16, 26, etc.)
Audio Tracks 6, 16, 26...Background	Background color of all audio tracks that end in the number "6" (6, 16, 26, etc.)
Audio Tracks 7, 17, 27...Foreground	Foreground color of all audio tracks that end in the number "7" (7, 17, 27, etc.)
Audio Tracks 7, 17, 27...Background	Background color of all audio tracks that end in the number "7" (7, 17, 27, etc.)
Audio Tracks 8, 18, 28...Foreground	Foreground color of all audio tracks that end in the number "8" (8, 18, 28, etc.)
Audio Tracks 8, 18, 28...Background	Background color of all audio tracks that end in the number "8" (8, 18, 28, etc.)
Audio Tracks 9, 19, 29...Foreground	Foreground color of all audio tracks that end in the number "9" (9, 19, 29, etc.)
Audio Tracks 9, 19, 29...Background	Background color of all audio tracks that end in the number "9" (9, 19, 29, etc.)
Audio Tracks 10, 20, 30...Foreground	Foreground color of all audio tracks that end in the number "0" (10, 20, 30, etc.)
Audio Tracks 10, 20, 30...Background	Background color of all audio tracks that end in the number "0" (10, 20, 30, etc.)
MIDI Tracks 1, 11, 21...Foreground	Foreground color of all MIDI tracks that end in the number "1" (1, 11, 21, etc.)
MIDI Tracks 1, 11, 21...Background	Background color of all MIDI tracks that end in the number "1" (1, 11, 21, etc.)

Table 264. *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
MIDI Tracks 2, 12, 22...Foreground	Foreground color of all MIDI tracks that end in the number "2" (2, 12, 22, etc.)
MIDI Tracks 2, 12, 22...Background	Background color of all MIDI tracks that end in the number "2" (2, 12, 22, etc.)
MIDI Tracks 3, 13, 23...Foreground	Foreground color of all MIDI tracks that end in the number "3" (3, 13, 23, etc.)
MIDI Tracks 3, 13, 23...Background	Background color of all MIDI tracks that end in the number "3" (3, 13, 23, etc.)
MIDI Tracks 4, 14, 24...Foreground	Foreground color of all MIDI tracks that end in the number "4" (4, 14, 24, etc.)
MIDI Tracks 4, 14, 24...Background	Background color of all MIDI tracks that end in the number "4" (4, 14, 24, etc.)
MIDI Tracks 5, 15, 25...Foreground	Foreground color of all MIDI tracks that end in the number "5" (5, 15, 25, etc.)
MIDI Tracks 5, 15, 25...Background	Background color of all MIDI tracks that end in the number "5" (5, 15, 25, etc.)
MIDI Tracks 6, 16, 26...Foreground.	Foreground color of all MIDI tracks that end in the number "6" (6, 16, 26, etc.)
MIDI Tracks 6, 16, 26...Background	Background color of all MIDI tracks that end in the number "6" (6, 16, 26, etc.)
MIDI Tracks 7, 17, 27...Foreground	Foreground color of all MIDI tracks that end in the number "7" (7, 17, 27, etc.)
MIDI Tracks 7, 17, 27...Background	Background color of all MIDI tracks that end in the number "7" (7, 17, 27, etc.)
MIDI Tracks 8, 18, 28...Foreground	Foreground color of all MIDI tracks that end in the number "8" (8, 18, 28, etc.)
MIDI Tracks 8, 18, 28...Background	Background color of all MIDI tracks that end in the number "8" (8, 18, 28, etc.)
MIDI Tracks 9, 19, 29...Foreground	Foreground color of all MIDI tracks that end in the number "9" (9, 19, 29, etc.)
MIDI Tracks 9, 19, 29...Background	Background color of all MIDI tracks that end in the number "9" (9, 19, 29, etc.)
MIDI Tracks 10, 20, 30...Foreground	Foreground color of all MIDI tracks that end in the number "0" (10, 20, 30, etc.)

Table 264. *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
MIDI Tracks 10, 20, 30...Background	Background color of all MIDI tracks that end in the number "0" (10, 20, 30, etc.)
Track View Active Outline	Color of the border around the active pane in the Track view: if the Bus pane is active, it displays this color; if the Track pane is active, it displays this color.
Clips Pane Ellipse	Color of dots which appear where there are no clips in the Clips pane
Active Track	Sets the color of the track that has the focus
Selected Track	Sets the color of any selected tracks
Strip Selection	Sets the color of any selected strip selector
Track View Control Icon	Sets the color of the icons that label the various controls in a track
Partially selected Track Folder	Color just to the left of the folder icon that indicates whether all the tracks in the folder are selected, or just some of them
Partially selected strips in Track Folder	Color on the upper left corner of the folder icon that indicates whether all the strips in the folder are selected, or just some of them
Track View Track Header Peak Text	Color of the text on the right end of a track's title bar that displays the peak level that the track's audio meter measures
Track View Header Warning Text	Color of the text described above when the track's level is in danger of clipping
Peak Marker (< 0 dB)	The color of the Peak Marker when amplitude peaks are less than 0dB
Peak Marker (>= 0 dB)	The color of the Peak Marker when amplitude peaks are greater than or equal to 0dB
Peak Marker Text	The color of the text on the Peak Marker
Vertical Measure Lines	The color of vertical measure lines in the Clips pane
Vertical Beat Lines	The color of vertical beat lines in the Clips pane
View Background (odd)	The Clips pane background color for odd-numbered tracks/buses

Table 264. *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
View Background (even)	The Clips pane background color for even-numbered tracks/buses
AudioSnap Marker	Color of active AudioSnap transient markers
Disabled AudioSnap Marker	Color of disabled AudioSnap transient markers
Selected AudioSnap Marker	Color of selected AudioSnap transient markers
Maximum stretched AudioSnap Marker	Color of maximum stretched AudioSnap transient markers
AudioSnap Pool Memeber Marker	Color of AudioSnap transient markers that belong to the Pool
Aim Assist line	Color of vertical line that follows the mouse pointer position when Aim Assist is enabled in the Track view
Track View Header Track Number	Color of the track number in the track header
Track View Audio Track Name Background	Color of background of audio track names in Track view
Track View Audio Track Name Text	Color of text of audio track names in Track view
Track View MIDI Track Name Background	Color of background of MIDI track names in Track view
Track View MIDI Track Name Text	Color of text of MIDI track names in Track view
Track View Synth Track Name Background	Color of background of Synth track names in Track view
Track View Synth Track Name Text	Color of text of Synth track names in Track view
Track View Instrument Track Name Background	Color of background of Instrument track names in Track view
Track View Instrument Track Name Text	Color of text of Instrument track names in Track view
Track View Bus Name Background	Color of background of Bus names in Track view
Track View Bus Name Text	Color of text of Bus names in Track view
Track View Track Folder Name Background	Color of the background for track folders in the folder name field
Track View Track Folder Name Text	Color of the text for track folders in the folder name field
Track View Strip Background	Background color outside the control fields in a track
Track View Control Background	Background color inside the control fields in a track
Track View Control Text and Values	Color of the text in Track view controls
Track View Disabled Control Text	Color of disabled controls in a track

Table 264.   *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
Track View Control Outline	Color of the control outlines
Track View Control Borders	Color of Track view control's borders
Track View Current Control Outline	Color of current Track view control outlines
Track View Strip Under	Color of empty space in the Track pane
First controller/surface color choice	Highlight color of any SONAR controls being controlled by the first control surface listed in **Edit >Preferences > MIDI - Control Surfaces**.
Second controller/surface color choice	Highlight color of any SONAR controls being controlled by the second control surface listed in **Edit >Preferences > MIDI - Control Surfaces**.
Third controller/surface color choice	Highlight color of any SONAR controls being controlled by the third control surface listed in **Edit >Preferences > MIDI - Control Surfaces**.
Fourth controller/surface color choice	Highlight color of any SONAR controls being controlled by the fourth control surface listed in **Edit >Preferences > MIDI - Control Surfaces**.
Font for controller/surface channel number display	Color of text in control surface channel display
Track View Trim Control	Sets the color of the background in the trim control field
Track View Bus Input Pan Control	Sets the color of this parameter's automation envelope
Quick Group	Sets the color that appears on controls that are part of a Quick Group
Track View Track Icons Background	Color of space surrounding Track Icons in Track view
Track View Volume Control / Envelope	Sets the color of this parameter's automation envelope
Track View Pan Control / Envelope	Sets the color of this parameter's automation envelope
Track View MIDI Chorus Control / Envelope	Sets the color of this parameter's automation envelope
Track View MIDI Reverb Control / Envelope	Sets the color of this parameter's automation envelope
Track View Mute Envelope	Sets the color of this parameter's automation envelope
Surround Focus Envelope	Color of automation envelope for surround focus
Surround LFE Send Control/Envelope	Color of automation envelope for LFE send control
Surround Width Envelope	Color of automation envelope for surround width

Table 264. *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
Front/Rear Balance Envelope	Color of automation envelope for surround front/rear balance
Track View Bus Send Level 1, 9 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Level 2, 10 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Level 3, 11 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send 4, 12 Level Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Level 5, 13 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Level 6, 14 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Level 7, 15 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Level 8, 16 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Pan 1, 9 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Pan 2, 10 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Pan 3, 11 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Pan 4, 12 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Pan 5, 13 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Pan 6, 14 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Pan 7, 15 Control / Envelope	Sets the color of this parameter's automation envelope
Track View Bus Send Pan 8, 16 Control / Envelope	Sets the color of this parameter's automation envelope

Table 264. *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
Bus Send Angle 1, 9 Envelope	Sets the color of this parameter's automation envelope
Bus Send Angle 2, 10 Envelope	Sets the color of this parameter's automation envelope
Bus Send Angle 3, 11 Envelope	Sets the color of this parameter's automation envelope
Bus Send Angle 4, 12 Envelope	Sets the color of this parameter's automation envelope
Bus Send Angle 5, 13 Envelope	Sets the color of this parameter's automation envelope
Bus Send Angle 6, 14 Envelope	Sets the color of this parameter's automation envelope
Bus Send Angle 7, 15 Envelope	Sets the color of this parameter's automation envelope
Bus Send Angle 8, 16 Envelope	Sets the color of this parameter's automation envelope
Bus Send Focus1, 9 Envelope	Sets the color of this parameter's automation envelope
Bus Send Focus 2, 10 Envelope	Sets the color of this parameter's automation envelope
Bus Send Focus 3, 11 Envelope	Sets the color of this parameter's automation envelope
Bus Send Focus 4, 12 Envelope	Sets the color of this parameter's automation envelope
Bus Send Focus 5, 13 Envelope	Sets the color of this parameter's automation envelope
Bus Send Focus 6, 14 Envelope	Sets the color of this parameter's automation envelope
Bus Send Focus 7, 15 Envelope	Sets the color of this parameter's automation envelope
Bus Send Focus 8, 16 Envelope	Sets the color of this parameter's automation envelope
Bus Send LFE 1, 9 Envelope	Sets the color of this parameter's automation envelope
Bus Send LFE 2, 10 Envelope	Sets the color of this parameter's automation envelope
Bus Send LFE 3, 11 Envelope	Sets the color of this parameter's automation envelope
Bus Send LFE 4, 12 Envelope	Sets the color of this parameter's automation envelope
Bus Send LFE 5, 13 Envelope	Sets the color of this parameter's automation envelope
Bus Send LFE 6, 14 Envelope	Sets the color of this parameter's automation envelope
Bus Send LFE 7, 15 Envelope	Sets the color of this parameter's automation envelope
Bus Send LFE 8, 16 Envelope	Sets the color of this parameter's automation envelope
Bus Send Width 1, 9 Envelope	Sets the color of this parameter's automation envelope
Bus Send Width 2, 10 Envelope	Sets the color of this parameter's automation envelope

Table 264. *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
Bus Send Width 3, 11 Envelope	Sets the color of this parameter's automation envelope
Bus Send Width 4, 12 Envelope	Sets the color of this parameter's automation envelope
Bus Send Width 5, 13 Envelope	Sets the color of this parameter's automation envelope
Bus Send Width 6, 14 Envelope	Sets the color of this parameter's automation envelope
Bus Send Width 7, 15 Envelope	Sets the color of this parameter's automation envelope
Bus Send Width 8, 16 Envelope	Sets the color of this parameter's automation envelope
Bus Send Front/Rear Balance 1, 9 Envelope	Sets the color of this parameter's automation envelope
Bus Send Front/Rear Balance 2, 10 Envelope	Sets the color of this parameter's automation envelope
Bus Send Front/Rear Balance 3, 11 Envelope	Sets the color of this parameter's automation envelope
Bus Send Front/Rear Balance 4, 12 Envelope	Sets the color of this parameter's automation envelope
Bus Send Front/Rear Balance 5, 13 Envelope	Sets the color of this parameter's automation envelope
Bus Send Front/Rear Balance 6, 14 Envelope	Sets the color of this parameter's automation envelope
Bus Send Front/Rear Balance 7, 15 Envelope	Sets the color of this parameter's automation envelope
Bus Send Front/Rear Balance 8, 16 Envelope	Sets the color of this parameter's automation envelope
Event List Note Events	Color of note events in the Event List view
Event List KeyAft Events	Color of key aftertouch events in the Event List view
Event List Control Events	Color of controller events in the Event List view
Event List Patch Events	Color of patch events in the Event List view
Event List ChanAft Events	Color of channel aftertouch events in the Event List view
Event List Wheel Events	Color of pitch wheel events in the Event List view
Event List Sysx Events	Color of System Exclusive events in the Event List view
Event List Special Events	Color of other, special events in the Event List view
Note that is on	Color of currently playing notes
Events	Color of selected events in the Piano Roll view
Navigator Background	Color of background in Navigator pane and view
Navigator Track Rectangle	Color of the Navigator pane triangle that shows what the part of the Clips pane is currently displayed

Table 264.   *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
PRV Drag Contents	The color that a MIDI event becomes while you're dragging the event
Snap to Scale Excluded Rows	Color of pitch rows in Piano Roll view (or Inline PRV) that become unavailable when Snap to Scale is enabled.
Continuous Event 1	The color of the first type of continuous event entered into the Piano Roll or Inline Piano Roll view
Continuous Event 2	The color of the second type of continuous event entered into the Piano Roll or Inline Piano Roll view
Continuous Event 3	The color of the third type of continuous event entered into the Piano Roll or Inline Piano Roll view
Continuous Event 4	The color of the fourth type of continuous event entered into the Piano Roll or Inline Piano Roll view
Continuous Event 5	The color of the fifth type of continuous event entered into the Piano Roll or Inline Piano Roll view
Continuous Event 6	The color of the sixth type of continuous event entered into the Piano Roll or Inline Piano Roll view
Continuous Event 7	The color of the seventh type of continuous event entered into the Piano Roll or Inline Piano Roll view
Continuous Event 8	The color of the eighth type of continuous event entered into the Piano Roll or Inline Piano Roll view
VU Lo level	Sets the color of the lower portion of a non-segmented meter.
VU Hi level	Sets the color of the higher portion of a non-segmented meter.
VU Tick Marks	Sets the color of the numbers and calibration lines of a non-segmented meter.
Console Segmented VU Tick Marks	Color of tick marks in segmented meters in the Console view
Enable/Disable Toggles	Sets the color of the enable/disable check box on effects and other objects that have an on/off switch
Track Inspector FX Bin	Color of background in Track Inspector's FX bin
Console FX Bin Text	Color of text in Console View's FX bin
Console View Control Text and Values	Color of text on Console View's controls

Table 264.   *Screen elements (Continued)*

Preferences dialog

Screen element	Explanation
Console View Slider	Color of Console view fields controlled by sliders
Console View Slider Background	Color of border area of Console view fields controlled by sliders
Console View Strip Background	Color of empty space in Console view
Console Audio Track Name Background	Color of background of audio track names in Console view
Console Audio Track Name Text	Color of text of audio track names in Console view
Console MIDI Track Name Background	Color of background of MIDI track names in Console view
Console MIDI Track Name Text	Color of text of MIDI track names in Console view
Console Synth Track Name Background	Color of background of Synth track names in Console view
Console Synth Track Name Text	Color of text of Synth track names in Console view
Console Instrument Track Name Background	Color of background of Instrument track names in Console view
Console Instrument Track Name Text	Color of text of Instrument track names in Console view
Console Bus Name Background	Color of background of Bus names in Console view
Console Bus Name Text	Color of text of Bus names in Console view
Console Main Name Background	Color of background of Main Output names in Console view
Console Main Output Name Text	Color of text of Main Output names in Console view
Console View Strip Label Text	Color of meter peak values in the Console view
Console EQ Plot Grid	Color of grid lines in per-channel EQ plot in Console view
Console EQ Plot Graph	Color of EQ curve in Console view's per-channel EQ plot
Synth Rack Text	Color of text in the Synth Rack
Dialog Box Banner Text	Color of the headings that separate different parts of a dialog box page
Dialog Box Banner Background	Color of the background behind a dialog banner heading
Track Inspector Background	Color of background in the Track Inspector
Track View Header Time Display	Color of time display above track strips in the Track view
Ghosted clip background	Color of clips when editing automation envelopes.

Table 264. *Screen elements (Continued)*

Preferences dialog

For more information, see:

See also:

Preferences dialog

Customization - Nudge

Figure 490. *The Nudge section*
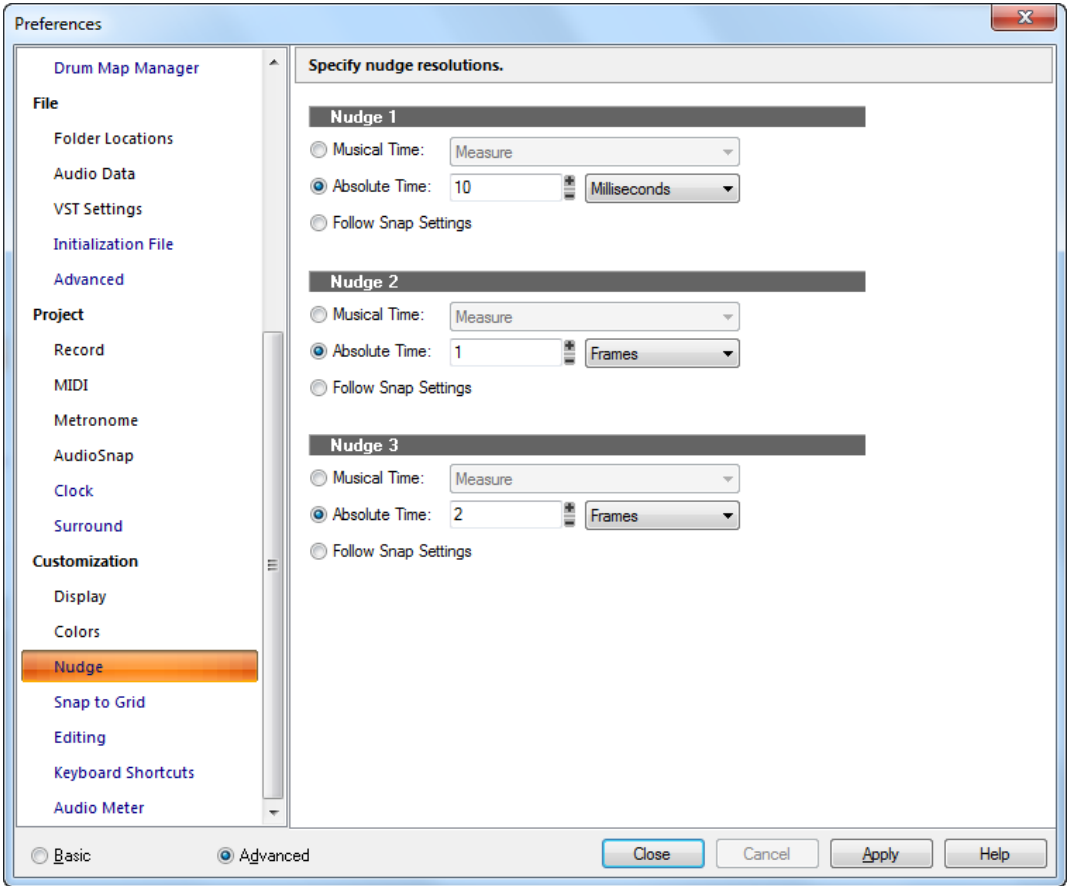
The **Nudge** section lets you specify three different nudge resolutions.

The **Nudge** section contains the following settings:

• **Musical Time.**   Select a note length setting.

• **Absolute Time.**   Select one of the following absolute time options and a number in the first field:

Absolute time setting	Description
Seconds	Whole seconds.
Milliseconds	Thousands of a second.

Table 265.

Preferences dialog

Absolute time setting	Description
Frames	Number of frames. There are 30 frames per second.
Samples	A very small amount of time. For CD-quality audio there are 44,100 samples per second, so a value of 1 here would not move a clip by a perceptible amount.
Ticks	The number of ticks per quarter note varies depending on the setting in **Edit > Preferences > Project - Clock**. The default setting is 960.

Table 265.

• **Follow Snap Settings.** Moves the clip or note by the current snap setting.

For more information, see

See also:

Preferences dialog

Customization - Snap to Grid

Figure 491. *The Snap to Grid section*
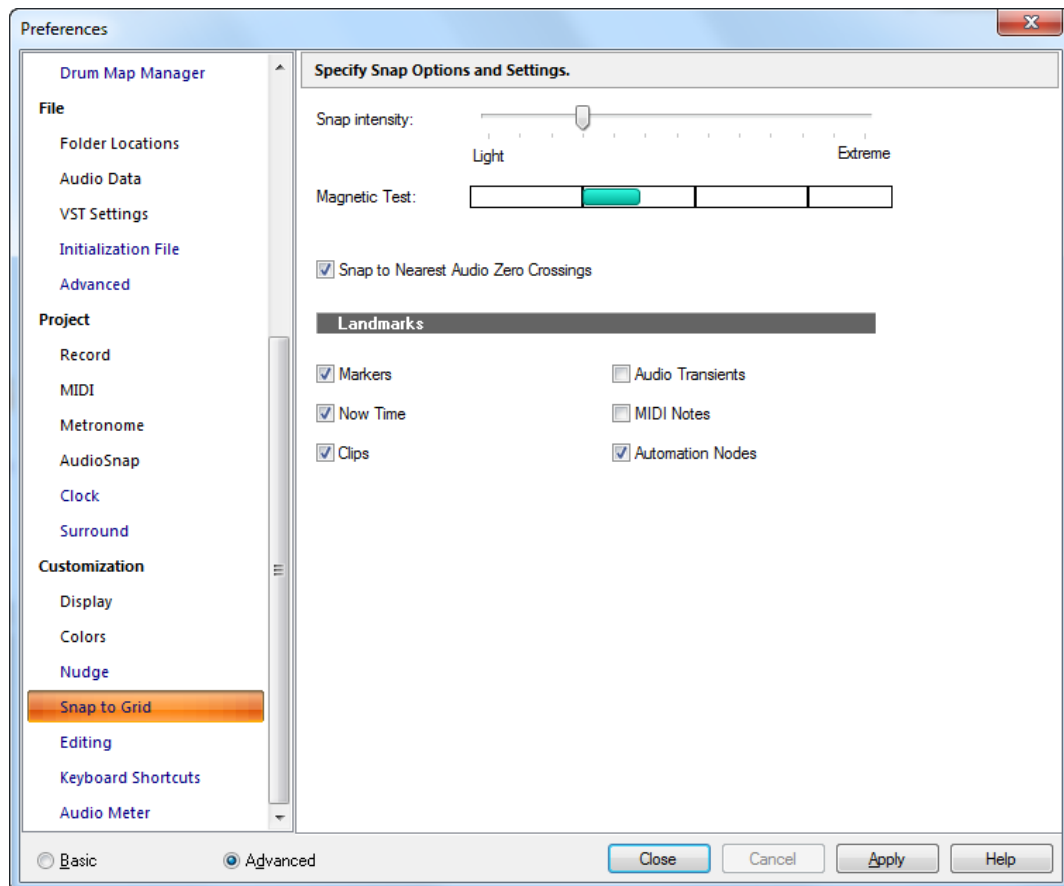
The **Snap to Grid** section lets you specify global snap settings.

The **Snap to Grid** section contains the following settings:

- **Snap Intensity.** Specify the magnetic strength when snapping, which determines how quickly moved events are pulled towards the snap grid.

- **Magnetic Test.** Drag the event to test the current Snap Intensity setting.

- **Snap to Nearest Audio Zero Crossings.** Automatically snap edited audio clips to the nearest zero crossing of the waveform (the point at which there is no volume) to minimize glitches that can happen when waveforms are spliced together.

- **Landmarks.** Snap to the selected landmarks when the **Events** button is enabled in the Control Bar's Snap module:

Preferences dialog

- **Markers.**   Snap to any marker.
- **Now Time.**   Snap to the current Now Time.
- **Clips.**   Snap to the start or end of any clip.
- **Audio Transients.**   Snap to transient markers in audio clips.
- **MIDI Notes.**   Snap to note events in MIDI clips.
- **Automation Nodes.**   Snap to automation envelope nodes.

See also:

Customization - Editing (Advanced)

Figure 492. *The Editing section*
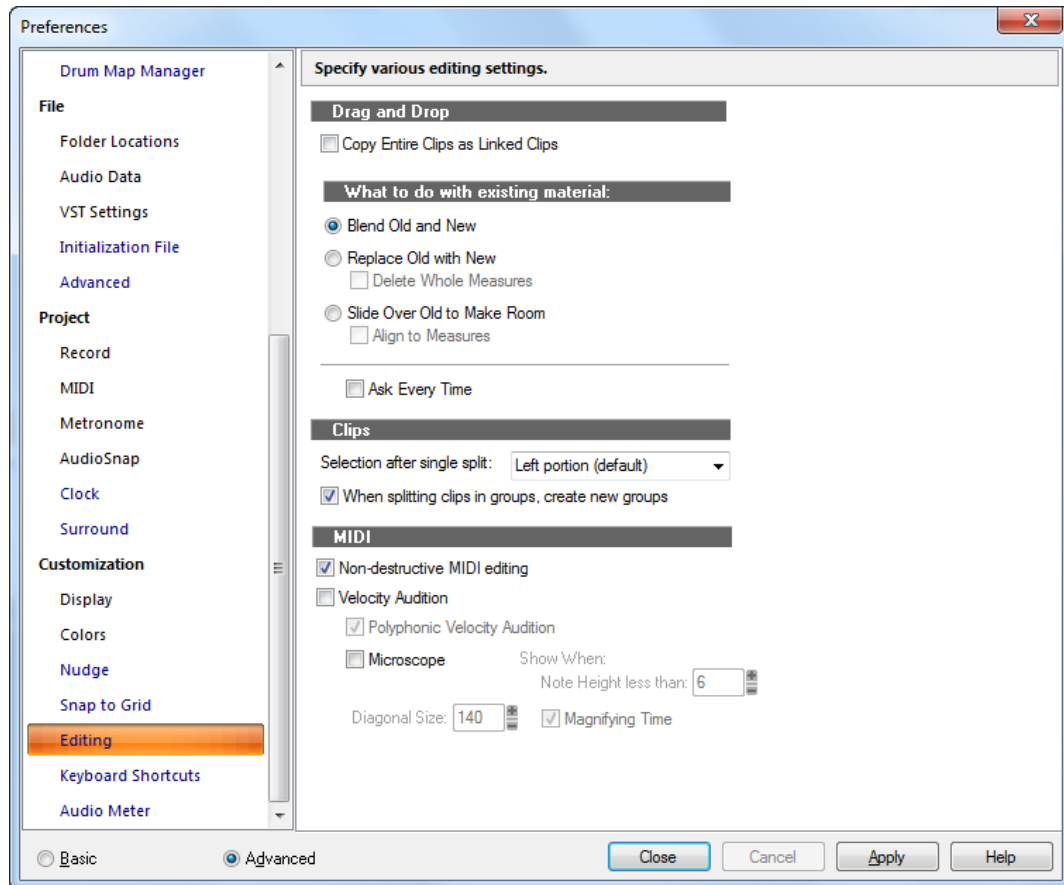
The **Editing** section lets you specify drag & drop behavior, auto-crossfade settings, MIDI editing options and Microscope settings.

The **Editing** section contains the following settings:

Drag and Drop

Choose from the following drag and drop options:

• **Copy Entire Clips as Linked Clips.** When you copy an entire clip, choosing this option causes the new clip and the clip that you copied it from to be "Linked clips" on page 1914.

Preferences dialog

What to do with existing material

The fields in this section deal with the situation that occurs when you try to drag some data to a place in a track that already has some data.

- **Blend Old and New.**   Choosing this option tells SONAR to mix the new data with the old, with the following option:

- **Replace Old with New.**   Choosing this option tells SONAR to delete the old data, with the following option:

  - **Delete Whole Measures.**   Choosing this option tells SONAR to delete the old data up to the next measure line, regardless of whether the new data fills the space up to the next measure.

- **Slide Over Old to Make Room.**   Choosing this option tells SONAR to slide the old data either forward or backward in the track to make room for the new data. with the following option:

  - **Align to Measures.**   Choosing this option tells SONAR to slide the old data up to the next measure line, regardless of whether the new data fills the space up to the next measure.

- **Ask This Every Time.**   Choosing this option causes the **Editing** section to appear every time you drag some data.

Clips

Choose from these clip editing options:

- **Crossfade Audio clips upon overlap.**   Choosing this option tells SONAR to automatically smooth out any volume differences between overlapping audio clips, nondestructively. If you choose this option to drag clips, and then disable it to drag some other clips, the clips with the crossfades retain their crossfades.

- **Crossfade Styles.**   Click this button to specify the default fade and crossfade settings. The options are as follows:

  - **Default Fade-In Curve > Linear.**   This command sets as a default a linear, or steady fade-in curve when dragging the beginning of a clip.

  - **Default Fade-In Curve > Fast Curve.**   This command sets as a default a fast fade-in curve when dragging the beginning of a clip.

  - **Default Fade-In Curve > Slow Curve.**   This command sets as a default a slow fade-in curve when dragging the beginning of a clip.

  - **Default Fade-Out Curve > Linear.**   This command sets as a default a linear, or steady fade-out curve when dragging the end of a clip.

  - **Default Fade-Out Curve > Fast Curve.**   This command sets as a default a fast fade-out curve when dragging the end of a clip.

  - **Default Fade-Out Curve > Slow Curve.**   This command sets as a default a slow fade-out curve when dragging the end of a clip.

  - **Default Crossfade Curves > Linear Out - Linear In.**   This command sets as default a crossfade in which the first clip fades out at a steady rate and the second clip fades in at a steady rate.

  - **Default Crossfade Curves > Fast Out - Fast In.**   This command sets as default a crossfade

in which the first clip fades out fast and the second clip fades in fast.

- **Default Crossfade Curves > Slow Out - Slow In.** This command sets as default a crossfade in which the first clip fades out slowly and the second clip fades in slowly.

- **Default Crossfade Curves > Fast Out - Slow In.** This command sets as default a crossfade in which the first clip fades out fast and the second clip fades in slowly.

- **Default Crossfade Curves > Slow Out - Fast In.** This command sets as default a crossfade in which the first clip fades out slowly and the second clip fades in fast.

- **Default Crossfade Curves > Linear Out - Fast In.** This command sets as default a crossfade in which the first clip fades out at a steady rate and the second clip fades in fast.

- **Default Crossfade Curves > Linear Out - Slow In.** This command sets as default a crossfade in which the first clip fades out at a steady rate and the second clip fades in slowly.

- **Default Crossfade Curves > Fast Out - Linear In.** This command sets as default a crossfade in which the first clip fades out fast and the second clip fades in at a steady rate.

- **Default Crossfade Curves > Slow Out - Linear In.** This command sets as default a crossfade in which the first clip fades out slowly and the second clip fades in at a steady rate.

For more information about crossfades, see

- **Selection after single split.** This list lets you specify what is selected after a clip is split into two parts:

  - **Left portion (default).** Only the left portion is selected.

  - **Right portion.** Only the right portion is selected.

  - **Both portions.** Both the left and right portions are selected.

  - **None.** Neither portion is selected.

- **When splitting clips in groups, create new groups.** Choosing this option tells SONAR to create a new clip group when splitting clips in an existing clip group.

MIDI

- **Non-Destructive MIDI Editing.** Select this option to make all MIDI editing non-destructive. When toggled on, this option forces deleted data to be retained even though it is not visible.

- **Velocity Audition.** Select this option if you want to hear the changes in velocity as you make them.

  - **Polyphonic Velocity Audition.** Select this option if you want to hear all selected notes as you drag them through different pitch levels.

- **Microscope.** Use this check box to enable/disable Microscope mode in the Piano Roll view and inline Piano Roll (enabled by default).

  - **Diagonal Size.** Use this numeric entry box to specify the diameter size in pixels of the microscope. The valid range is 20-250 and the default value is 100.

  - **Show When Note Height Less Than.** Microscope mode will only be enabled if the note heights (in pixels) are equal or less than this number. The valid range is 2-20 and the default value is 6.

Preferences dialog

- **Magnifying Time.** Use this check box to enable/disable horizontal magnification when the Piano Roll view zoom is such that notes become very narrow.

In addition to these options, there are some other parameters that can be configured by adding the following INI variables to the WinCake section of `Cakewalk.ini` (see "Cakewalk.ini" on page 1289):

Variable	Type	Default value	What it does
MicroscopeHZoomThreshold=<1..20>	Integer	8	By default, the Microscope mode begins horizontal magnification when a 32nd note is narrower than 8 pixels. This line lets you specify the horizontal zoom threshold (1-20 pixels).
MicroscopeHZoomMax=<2.0 - 8.0>	Integer	3.0	This line specifies the highest horizontal magnification that will result when using Microscope mode.

Table 266.

See also:

Preferences dialog

Customization - Keyboard Shortcuts (Advanced)

Figure 493. *The Keyboard Shortcuts section*
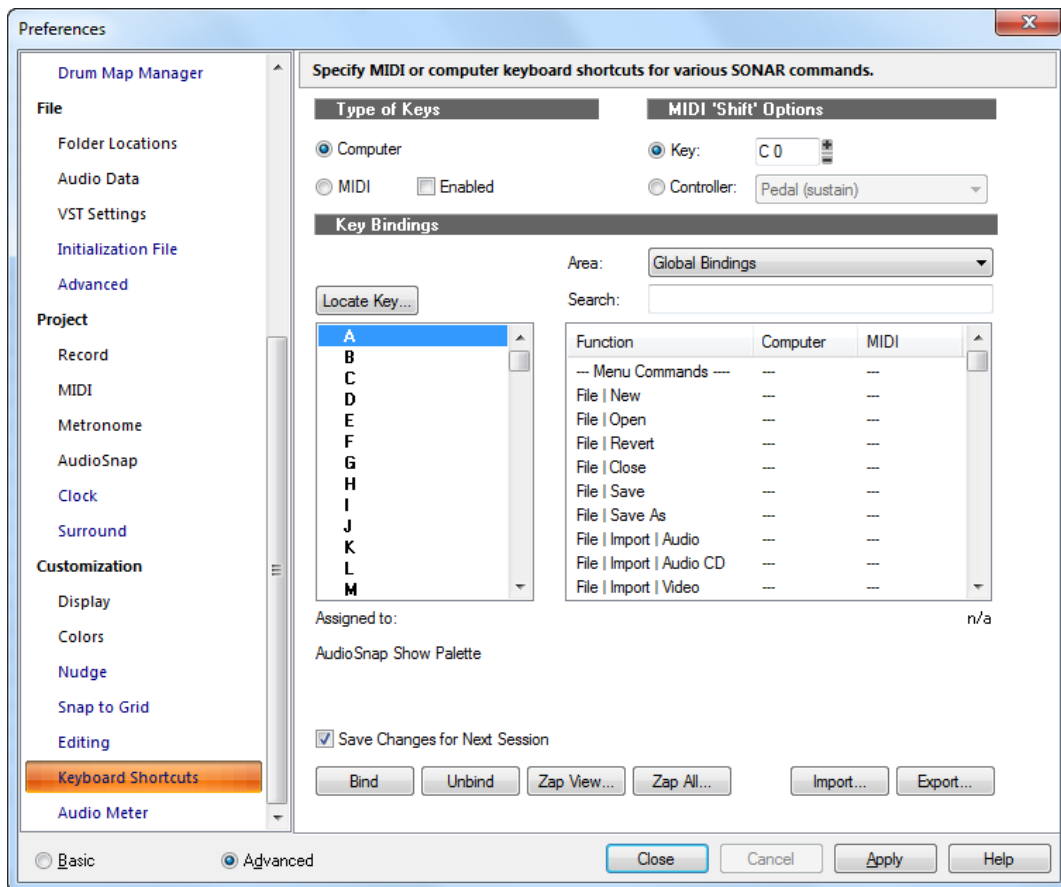
Key bindings let you associate SONAR commands with keys on your MIDI or computer keyboard. This makes it easy for you to access specific features more quickly and efficiently.

The **Keyboard Shortcuts** section lets you specify which keys and key combinations to use for specific SONAR commands.

The **Keyboard Shortcuts** section contains the following settings:

Type of Keys

Use these options to choose what kind of keys will trigger selected SONAR commands:

• **Computer.**   Links computer keyboard commands to specific SONAR commands.

• **MIDI.**   Links MIDI keyboard commands to specific SONAR commands. The **Enabled** check box

must be checked for MIDI keys to function.

MIDI 'Shift' Options

You can designate a MIDI Key or Controller (usually a pedal) to act as a key binding shift key. That way you can require that the key binding shift key be depressed before any command is triggered, so you only lose one note or pedal from its regular function.

Use these options to choose what acts as the key binding shift key:

- **Key.**   Clicking this option makes a key on your MIDI keyboard act as a key binding shift key. Choose which key by clicking the **+** or **-** buttons in the window that's just to the right of the **Key** button.
- **Controller.**   Clicking this option makes a controller on your MIDI keyboard act as a key binding shift key. Choose which controller (usually the sustain pedal) by choosing one from the drop-down list that's just to the right of the **Controller** button.

Key Bindings

The **Key Bindings** field has three lists, a button, and a line of text in it:

- **Key.**   Use this window to highlight a key that you want to bind to a command in the **Function** list. If a key or combination is already bound to a global command by default, the name of the key appears in **bold** text, and the command it is bound to appears at the bottom of the dialog box under **Assigned to**. Binding a key or combination to a command and clicking **OK** overwrites any default binding for that key or combination.
- **Function.**   Use this window to choose a command to bind to a highlighted key in the **Key** list.
- **Area.**   Use this window to choose in what context you want the key binding to work.
- **Search.**   The search filter allows you to only show key binding functions that includes a specific text string in the name.
- **Locate Key.**   Clicking this button allows you to quickly scroll the **Key** list to the key or keys that you press on your computer keyboard.
- **Assigned to.**   When you highlight an item in the **Key** list, this text line that's below the **Key** list shows any command that the item is currently bound to.

Save Changes for Next Session

Check this check box to save any changes.

Bind button

Click this button to bind a highlighted key to a highlighted function.

Unbind

Click this button to unbind a highlighted key from a highlighted function.

Zap Window

Click this button to remove all key bindings from whatever view is currently listed in the **Area** list.

Preferences dialog

Zap All

Click this button to remove all key bindings.

Import

Click this button to import a different set of key bindings that you've created or that are identical to some other sequencer application's.

Export

Click this button to export your currently-loaded set of key bindings so that you can reload them if you want.

See Also:

See also:

Customization - Audio Meter (Advanced)

Figure 494. *The Audio Meter section*
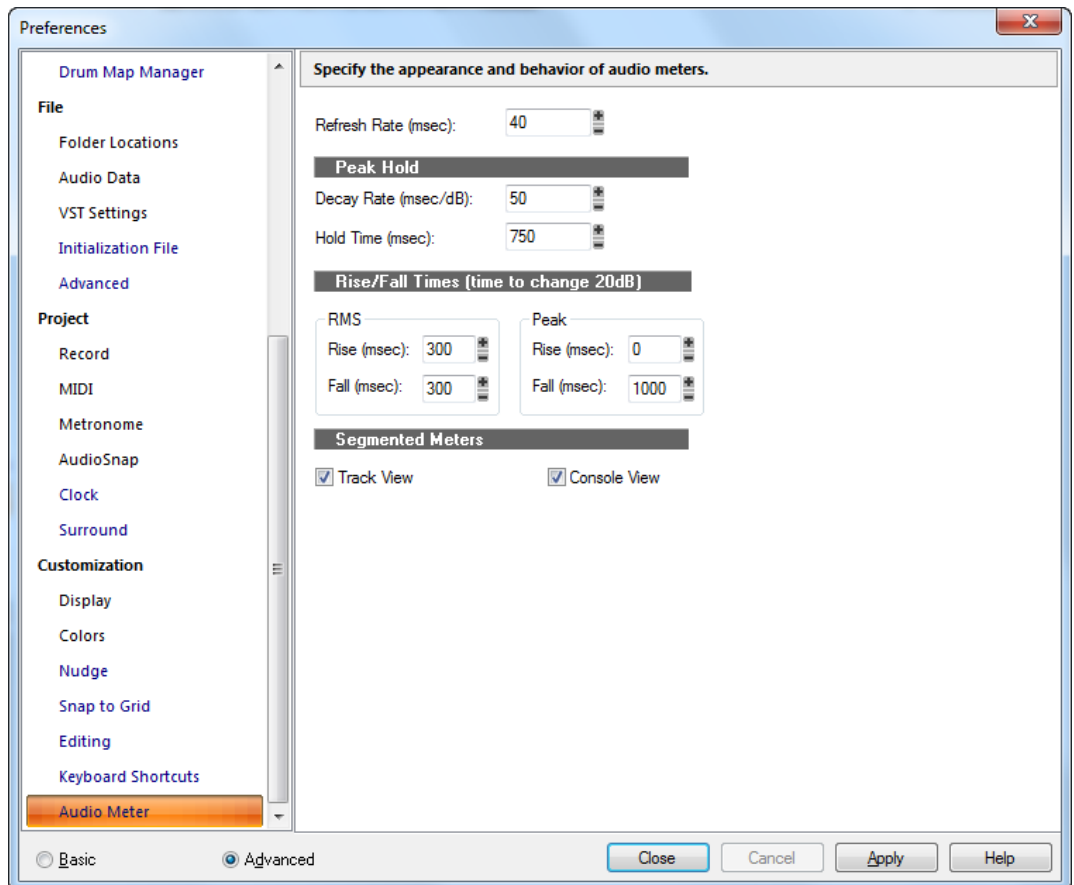
SONAR's meters are extremely adjustable. The **Audio Meter** section lets you specify the appearance and behavior of audio meters. These settings control meter ballistics globally for all types of meters in SONAR.

The **Audio Meter** section contains the following settings:

Refresh Rate (msec)

This field determines how often the meters are updated. Valid values range from 25 msec (forty times per second) to 250 msec (four times per second).

Preferences dialog

Peak Hold

- **Decay Rate (msec/dB).** When **Hold Peaks** is enabled (see "Changing the meters' display" on page 851), this setting describes how fast the peaks fall after the established Hold Time.

- **Hold Time (msecec).** When **Hold Peaks** is enabled (see "Changing the meters' display" on page 851), this setting describes for how long peaks will sit still before dropping

Rise/Fall Times (times to change 20dB)

- RMS
  - **Rise (msecec).** The time it takes for an RMS meter to register a 20dB rise in signal.
  - **Fall (msecec).** The time it takes for an RMS meter to register a 20dB fall in signal.
- Peak
  - **Rise (msecec).** The time it takes for a Peak meter to register a 20dB rise in signal.
  - **Fall (msecec).** The time it takes for a Peak meter to register a 20dB fall in signal.

Here are the default values for the various settings:

- Refresh Rate = 40 msec
- Peak Hold – Decay Rate = 50 msec
- Peak Hold – Hold Time = 750 msec
- RMS Rise = 300 msec
- RMS Fall = 300 msec
- Peak Rise = 0 msec
- Peak Fall = 1000 msec

Segmented Meters

The **Track View** and **Console View** check boxes let you display the meters in segmented fashion in the respective views.

For more information, see "Metering" on page 849.

See also:

Preferences dialog

Print dialog

The **Print** dialog box specifies the parameters of your print job, including the printer destination, the number of copies and properties.

The following is a description of the **Print** dialog:

Printer

This is the active printer and printer connection. Choose the **Setup** option to change the printer and printer connection.

Print Range

Specify the pages you want to print:

All

Prints the entire document.

Pages

Prints the range of pages you specify in the From and To boxes.

Copies

Specify the number of copies you want to print for the above page range.

Collate

Prints copies in page number order, instead of separated multiple copies of each page.

Properties button

Opens a dialog box that lets you specify whatever your printer allows.

Print Preview dialog

The **Print Preview** dialog box lets you see what the Staff view, Event List view, or Lyrics view will look like when printed.

Print

The **Print** button in the **Print Preview** dialog box opens your system's **Print** dialog box. For more information, see

Configure

For the Staff view, the **Configure** button in the **Print Preview** dialog box lets you choose from a number of standard staff sizes. You can see which fits your needs best.

Print dialog

Next Page

The **Next Page** button displays the next page of the print preview.

Prev Page

The **Prev Page** button displays the previous page of the print preview.

Two Page/One Page

The **Two Page** button displays two pages at a time in the print preview. When you display two pages, the **One Page** button appears. The **One Page** button

Zoom In

The **Zoom In** button zooms the page display in the **Print Preview** dialog box. If two pages are displayed, zooming may reduce the preview to just one page.

Zoom Out

The **Zoom Out** button zooms out the page display in the **Print Preview** dialog box.

Close

The **Close** button closes the **Print Preview** dialog box.

Print Setup dialog

The **Print Setup** dialog box specifies the parameters of your print job, including the printer destination, the number of copies and properties.

The following is a description of the Print Setup dialog:

Printer

This is the active printer and printer connection. Choose the **Setup** option to change the printer and printer connection.

Print Range

Specify the pages you want to print:

All

Prints the entire document.

Pages

Prints the range of pages you specify in the **From** and **To** boxes.

Copies

Specify the number of copies you want to print for the above page range.

Collate

Prints copies in page number order, instead of separated multiple copies of each page.

Properties button

Opens a dialog box that lets you specify whatever your printer allows.

Project Files dialog

Open the **Project Files** dialog by selecting **Project Audio Files** from the **File** menu.

The **Project Files** dialog box provides the following information:

Project File Name

File name and location of the project file.

Project Audio Folder

The directory in which the project's audio files are stored. This is the same as the next field, unless you're using per-project audio folders.

Global Audio Folder

The default directory in which project audio files are stored.

Total Project Size

The combined size of the project's audio data.

Min/Max Bit Depth

The lowest and highest bit depths of the audio files in the project.

File Name

File name(s) of the individual wave file(s) your project file references.

Path

The directory in which each file is stored.

Bit Depth

The bit depth of each wave file.

File Size

The size of each wave file.

Status

The following status entries are possible in the **Status** column of the **Project Files** dialog:

- **Global.**   The file is stored in the Global Audio Data directory. The Global Audio Data directory can be changed in **Edit > Preferences > File - Audio Data**.
- **Local.**   The file is stored in the local wave data directory, a per-project data directory which is a subdirectory in the directory where the project file is stored.
- **External.**   The file is stored in a directory other than the Global Audio Data directory or in a Local audio data directory.
- **Missing.**   The file is not to be found.

Sorting Files

You can quickly sort files by clicking on the column headers, for instance, to see all **Missing** audio files, click on the **Status** column header and the missing files appear at the top of the column.

For more information, see:

Quantize dialog

When you use the **Process > Quantize** command, the **Quantize** dialog box appears. Quantize has two different forms.

- **Process > Quantize.**   This is the standard quantizing command that adjusts the start time and duration of selected notes so that they line up with a fixed size grid.
- **Process > Groove Quantize.**   This command extracts a grid or "groove" from an existing piece of music (the "groove pattern"), and then applies it to another piece of music to produce a similar rhythmic feel.

Use the following fields in the **Quantize** dialog box to control standard quantizing:

Preset menu

Save or select settings that you use often in the drop-down menu. To save a new group of settings, type a name into the menu, and click the **Save** button. To delete a group, select it and click the **Delete** button.

Resolution

Set the note resolution. The smaller the note value, the more precise the quantization. See

Change

- **MIDI Event Start Times.**   Select this option if you want the start times of the MIDI events in the selected data to move.
- **Note Durations.**   Select this option if you want the length of notes to be edited to fit into the size you chose in the **Resolution** field.
- **AudioSnap Beats.**   Select this option if you want AudioSnap transients to move.

- **Audio Clip Start Times.** Select this option if you want the beginnings of audio clips to move.
- **Only Notes, Lyrics, and Audio.** If you select this option, SONAR will not modify other events, like controllers.

Options:

- **Strength.** This value determines how closely SONAR moves the selected notes to the resolution value, or "grid." See "Strength" on page 720.
- **Swing.** Use this value to make groups of even eighth notes (or whatever note you want to enter in the **Resolution** field) "swing," instead of playing with exact eighth note rhythm. A value of **50** percent, or "50-50," produces equal durations for both notes—no swing. A larger value makes the first note longer, and vice versa. See "Swing" on page 720.
- **Window.** This value determines whether SONAR quantizes notes that are far from the quantization points, or leaves them alone. A value of 100 percent quantizes every note. See "Window" on page 721.
- **Offset.** This value moves the quantization grid forward or backward in the track, away from the beat boundaries. See "Offset" on page 719.
- **Auto XFade Audio Clips.** This option becomes available if you enable the **Audio Clip Start Times** check box. If you enable this option, and the process of quantizing audio clips results in overlapping clips or gaps between clips, a crossfade is automatically added to the overlapping or empty area. You specify the length of the crossfade in **XFade** field. The **Max Gap** value specifies the widest gap that will be filled with an automatic crossfade.

Audition button

Click this button to hear your edit before you actually apply it to the selected data.

For step by step instructions:

"To use the Quantize command" on page 722

"Defining a groove" on page 724

"To save a groove pattern" on page 724

"To copy an existing groove" on page 725

"To delete a groove" on page 725

"Groove Quantize tips" on page 726

See also:

"Changing the timing of a recording" on page 718

Quantize dialog

Fast Zoom Options

The Fast Zoom feature allows you to use your mouse wheel to control Zoom functions.

Zoom Factor

Set the intensity of the zoom. Horizontal and vertical zoom intensity can be adjusted independent of one another using the spinners or by manual entry.

Zoom In

Select whether the Zoom in action is centered at the cursor or the Now Time in horizontal Zoom, and select whether the Zoom in action is centered at the cursor or the Active Track in vertical Zoom.

Zoom Out

Select whether the Zoom out action is centered at the cursor or the Now Time in horizontal Zoom, and select whether the Zoom out action is centered at the cursor or the Active Track in vertical Zoom.

Simultaneous Horizontal and Vertican Zoom

Check the check box to make horizontal and vertical zoom simultaneous.

See also:

"To zoom using the mouse wheel (Fast Zoom)" on page 330

Reassign Envelopes dialog

When you use the **Envelope Editing** menu's **Assign Envelope** command on an automatable effect's envelope, the **Reassign Envelopes** dialog box appears.

Click the parameter in the list of parameters that you want to reassign the envelope to, and click **OK**. SONAR changes the envelope to control the parameter you clicked.

See:

"Creating and editing automation envelopes" on page 1019

Receive System Exclusive dialog

In the Sysx view, clicking the **Receive Bank** button opens the **Receive System Exclusive** dialog box. Use this dialog box to tell a synthesizer to start sending system exclusive data—clicking the **OK** button in this dialog box opens the **Sysx Receive** dialog box and starts the transmission of Sysx data.

This dialog box displays how many bytes have been received. When the number stops increasing, click **Done**.

See also:

Regenerate Tablature dialog

Click the Staff view **Edit** menu and choose **Regenerate TAB** to open the **Regenerate Tablature** dialog box.

The Regenerate TAB command works on selected regions in a track to modify the fingering according to the method you choose. The TAB display by default uses the 'floating' algorithm which analyzes all events in a track and attempts to optimize tablature with reference to open position. By choosing the "fixed" algorithm instead, you can designate a specific finger span and lowest fret which causes the TAB of a selected region to be displayed within this range. This usually creates a more compact fingering system.

The **Regenerate Tablature** dialog box has the following fields:

Track

This window displays the names of all selected tracks. Highlight the one you want to regenerate TAB for.

Method

Choose what TAB style you want SONAR to use, from these options:

- **Fixed.**   This style specifies where on the neck these notes should be played. When Fixed is selected the Finger span and **Lowest fret** fields are used together to define the "box" where the notes are displayed. The **Finger span** parameter determines how many consecutive frets will be used to display the note. For example, if Finger span is set to 4, then SONAR will attempt to place all the notes within those 4 frets. The Lowest Fret then determines where on the fretboard will the notes be displayed within the Finger span. The red box in the fretboard display above the parameters changes to reflect the settings in these two parameters.
- **Floating.**   This style analyzes all events in a track and attempts to optimize tablature with reference to open position

- **MIDI Channel.**   This style uses the event's MIDI channel to determine which string the note should be displayed on. When MIDI Channel is selected, the user chooses which series of MIDI Channels SONAR receives on. This is useful for MIDI guitarists who record parts in MONO mode, where each string transmits on a different MIDI channel. (Values: 1 - 11). Selecting "1" will cause it to use MIDI channels 1 - 6, selecting 2, 2 - 7, and so on.

Finger Span

The value in this field determines the finger or fret span the new TAB covers. Usually, you set this value to 4.

Lowest Fret

The value in this field determines the lowest fret the TAB can use for the selected notes.

1st Channel

The value in this field determines the first MIDI channel of six consecutive channels that SONAR assigns notes to, depending on which strings you play the notes on.

Number of Frets

This value is determined in the **Staff View Layout** dialog box, and governs how many frets SONAR's Fretboard can display.

Skip Channel 10 (G50)

This check box is greyed out unless you choose MIDI Channel in the **Method** field. If you use a MIDI converter like the G50, Channel 10 is reserved for percussion instruments, so if you use a MIDI guitar to transmit on six consecutive MIDI channels, check this check box to avoid using Channel 10 for your guitar.

See Also:

Regenerate Tablature dialog

Remote Control dialog

When you right-click a control in the Console or Track views and choose **Remote Control** from the pop-up menu, the **Remote Control** dialog box appears. This dialog box lets you use a MIDI device as a remote control for knobs, buttons, and sliders in SONAR, and has the following fields:

Channel Messages

The buttons in this section control command that are specific to individual MIDI channels. The options are:

- **Note On.** With this button enabled, the selected control's value alternates between its minimum and maximum values every time you play the note that's listed in the **Note On** field. If the selected control is a button, it toggles between on and off position.

- **Note On/Off.** With this button enabled, the selected control's value is maximized when the note that's listed in this field is depressed, and minimized when the note is released. If the selected control is a button, it toggles between on and off position.

- **Controller.** With this button enabled and a Controller number entered in the **Number** field, SONAR "listens" for a controller message that your MIDI controller is sending, and the selected control moves up or down as the controller message's value gets larger or smaller. For example, if your MIDI controller can send MIDI volume data from one of its faders or controls, and you set a fader in SONAR to respond to Controller #7, the selected fader in SONAR will move up or down as the value of Controller #7 that your MIDI controller sends rises or falls.

- **Wheel.** With this button enabled, the selected control moves as the pitch wheel on your MIDI controller moves.

- **RPN.** If your MIDI controller can send RPN data, enabling this button causes the selected control to move as the RPN data that your MIDI controller changes.

- **NRPN.** If your MIDI controller can send NRPN data, enabling this button causes the selected control to move as the NRPN data that your MIDI controller changes.

- **MIDI Channel.** Use this field to tell SONAR which MIDI channel the controller data comes in on.

Learn button

If you don't know what controller number a slider or knob on your MIDI controller sends, just click the **Learn** button and then move the knob in question. SONAR reads the incoming MIDI data and automatically configures the **Remote Control** settings so that the controller you moved now controls the SONAR control that you are configuring.

Sysx

You can use this option to control SONAR's Console from an external controller that sends sysx, such as the Tascam 428, or any device that sends sysx data. You can set the selected control in SONAR to respond to sysx data by using these fields:

- **Single Byte.** Checking this option tells SONAR that the significant data (the variable, or parameter value) in the incoming sysx message is in the form of a single byte.

- **High byte first.**   Checking this option tells SONAR that the significant data in the incoming sysx message is in the form of two bytes, with the high byte first.
- **Low byte first.**   Checking this option tells SONAR that the significant data in the incoming sysx message is in the form of two bytes, with the low byte first.
- **Starts with.**   Fill in the string that your device sends in sysx messages that precedes the significant data.
- **Ends with.**   Fill in the string that your device sends in sysx messages that follows the significant data.

Note: *If you set up remote control for a grouped control, the remote control works all controls in the group.*

For step by step instructions:

See also:

Remove DC Offset dialog

The **Process > Apply Effect > Remove DC Offset** command opens the **Remove DC Options** dialog box, which allows you to remove audio artifacts cause by electrical mismatches between recording hardware and input instruments or devices. This dialog box has the following fields:

- **DC Offset Threshold (dB).**   You can set a minimum dB threshold. If the analyzed DC offset is below this value, no removal takes place.
- **Analyze Left Channel (dB) and Right Channel (dB).**   This field displays the DC offset separately for the left and right channels. Press the **Audition** button to update the display.
- **Compute DC Offset from first 5 seconds only.**   To speed processing, select the Compute DC offset from first 5 seconds only check box. Only the first five seconds of a sound file will be analyzed when measuring the DC offset. The only time that five seconds is not sufficient is if a long fade-in or mute has been applied at the beginning of the file.

Remove Silence dialog

When you use the **Process > Apply Effect > Remove Silence** command, or click the **Gate Settings** button in the **Freeze Options** dialog box, the **Remove Silence** dialog box appears. This command creates absolute silence during silent passages, eliminating extraneous noise.

The **Remove Silence** dialog box has the following fields:

Remove DC Offset dialog

Preset field (only appears with Process Audio command)

Use this field to choose and enter presets. Click the **Save** button to save any group of new settings after you enter a name in the **Preset** field. Click the **Delete** button to delete any selected group from the **Preset** field.

Open Level (db)

The value in this field is how loud the sound must get (the loudness threshold) before SONAR stops silencing the sound. The gate "officially" opens when loudness rises above this level, although it can open earlier because of the **Attack Time** (see Attack Time).

Close Level (db)

The value in this field is how soft the sound must get (the softness threshold) before SONAR starts silencing the sound. The gate "officially" closes when loudness falls below this level, although it can stay open later because of the Release Time (see Release Time).

Attack Time (ms)

The value in this field is the interval of time after the volume reaches the **Open Level** for the gate to fully open. Opening the gate gradually produces a fade-in effect instead of an instant on-off sound.

Hold Time (ms)

The value in this field is the minimum time for the gate to stay open. **Hold Time** is useful when you've set high open and close levels—for example, when your source signal is very loud. Noise gates set this way tend to react to repeated percussive passages (such as drum rolls) by repeatedly opening and closing; this can sound unpleasant. By setting a hold time, you can ensure that the gate stays open long enough during percussive passages.

Look Ahead (ms)

The value in this field causes the gate to open slightly before the sound reaches the **Open Level** so you don't lose the sound's attack.

Release Time (ms)

The value in this field is the interval of time after the volume reaches the **Close Level** before the gate actually closes. This lets the tail end of sounds pass through without being clipped.

Split Clips

Check the **Split Clips** box to delete the silent sections of audio.

Audition button (only appears with Process Audio command)

Click this button to hear the results of your effect on the first three seconds of the selected audio.

For more information, see:

Remove Silence dialog

Retain Cakewalk Preferences dialog

If you choose to retain or *migrate* your preferences from a previous version of Cakewalk, the SONAR installer finds the existing `Cakewalk.ini` files on your system. The list of `Cakewalk.ini` files appears in the **Retain Cakewalk Preferences** dialog box. You may choose one from this list. The preferences and settings stored in the older version's `Cakewalk.ini` and `TTSseq.ini` files are then transferred to the identically named configuration files for Cakewalk. Cakewalk migrates certain preferences to the Windows Registry rather than to the `Cakewalk.ini` file.

When you migrate your preferences, SONAR will:

1. Locate the Data directory (WaveData folder) used by your previous Cakewalk installations and direct SONAR to use that folder for its audio storage and retrieval as well.

Note: *Migrating Preferences will leave the Data directory in its current location - it does not move your audio recordings to a new location. It simply points SONAR to the audio you have saved during previous recording sessions. This means that your previously recorded songs that contain audio tracks should continue to open and playback as expected. It will also write new audio data to this same location. You are free to manually change your Data directory at a later time in SONAR's Options, Audio, Advanced tab. Advanced users may want to manually adjust this Data directory location.*

2. Automatically import any custom Instrument Definitions you used in your previous Cakewalk version.

3. Automatically import other custom settings you have made in various Cakewalk menus and INI files.

Revert dialog

The **File > Revert** command opens the **Revert** dialog box, which lets you open an earlier version of the current project. Click the version of the file that you want to open. If you then save the earlier version, it becomes than latest version. To use the Revert feature, file versioning must be enabled in **Edit > Preferences > File - Advanced**.

Safe Mode dialog

Opening a file in safe mode opens the safe mode dialog box, which asks you, one plug-in at a time, which of the file's plug-ins to open each. If you think one of the plug-ins is preventing the file from opening, choose not to load that plug-in. You can also try loading only one plug-in, closing the file, and then loading 2 plug-ins the next time you open the file, etc., until you isolate the bad plug-in.

See also

Save As dialog

The **File > Save As** command opens the **Save As** dialog box, which lets you save a project with the name, directory, and format you specify. The **Save As** dialog box can also be used to save Groove clips as Riff Wave files from the Loop Construction view. Use the following fields to control your options:

Save in

Select the directory in which you want to store the file.

File name

Type or select the filename you want to open.

Save as type

Select the type of file you want to save your project as. If you are saving a project, you have the following options:

- **Normal.** Saving as type Normal saves your MIDI data, all project settings, and references to your audio data, with the extension .cwp. SONAR saves no audio data in a .cwp file, only references to where the data is on the hard disk. Saving your project as a bundle file saves all your project data in one place, including a new copy of your audio data; this method uses a lot more disk space than saving as a .cwp file.

- **Template.** Template file with the extension .cwt. Use Template files to save commonly used project settings for quickly setting up a new project.

- **Cakewalk Bundle.** Bundle file with the extension .cwb. Bundle files contain everything that a Normal file type contains with the addition of all your project's audio. Bundle files are great for backing up projects, and are also useful for moving SONAR projects from one computer to another.

- **MIDI Format 0.** Save in this format to create a Standard MIDI File that has all channels merged into one track.

- **MIDI Format 1.** Save in this format to create a Standard MIDI File that keeps each channel on a separate track.

- **Riff MIDI Format 0.** Save in this format if you need a Riff MIDI File of Format 0.

- **Riff MIDI Format 1.** Save in this format if you need a Riff MIDI File of Format 1.

Riff Wave files. If you are saving in the Loop Construction view, you can save the wave file as a Groove Clip/Wave file or a regular Wave file, depending on whether you enabled looping on the clip that you're saving. Groove Clip/Wave files are ACID-compatible files which can be used in SONAR or any application that supports ACIDized files.

Go to Folder (Project saves only)

The Go to folder drop-down lets you quickly go to the default save location for different types of projects.

Copy all audio with project (Project saves only)

When selected, this check box creates a copy of every audio file your project references, regardless of where they are located, and stores them in a folder called Audio Data. The Audio Data folder is created in the folder where you save your project. For example, if you save your project to the following folder:

> C:\My Project

Your project's audio is saved in the following folder:

> C:\My Project\Audio Data

If you want to give the Audio Data folder a different name, you can do so using the **Audio path** option. See "Audio path (Project saves only)" on page 1750.

Create one file per clip (Project saves only)

This option is only available if the **Copy all audio with project** option is selected. When selected, the **Create one file per clip** option forces SONAR to create a new wave file for each unique clip. To conserve disk space, SONAR does not duplicate audio referenced by multiple copies of a clip, unless you have selected the **Export Broadcast Waves By Default** check box in **Edit > Preferences > File - Audio Data**.

Audio path (Project saves only)

If you want to customize the name of the folder in which you store your audio files, specify it in this field. You can use the **Browse** button to specify where the folder is saved.

See also:

"Saving your work" on page 307

Save Pattern dialog

To open the **Save Pattern** dialog box, do *one* of the following:

- Right-click in the **Step Sequencer** toolbar and select **Save Pattern** from the pop-up menu.
- Open the Step Sequencer and press press CTRL+ALT+S.

The **Save Pattern** dialog box lets you save a step sequencer pattern as a separate file. Use the following fields to control your options:

Save in

Select the directory in which you want to store the file.

File name

Type or select the filename you want to open.

Save as type

A step sequencer pattern is always saved as a Step Sequencer Patterns file type, which has the extension .ssp.

Scale Defaults dialog

In the Track Inspector, click the Scale control in the Snap to Scale section and choose **Scale Manager** to open the **Scale Manager** dialog box, then click the **Defaults** button to open the **Scale Defaults** dialog box.

This dialog box has the following fields:

- **Restore Current Scale (if factory).**   This option restores a single, selected file to its factory settings.

- **Restore Any Missing Scales.**   If you have deleted a factory-supplied scale and want to replace it with the original version, choose this option.

- **Restore All Factory Scales.**   If you want to restore all factory-supplied scales to factory settings, click this option.

Scale Manager dialog

In the Track Inspector, click the Scale control in the Snap to Scale section and choose **Scale Manager** to open the **Scale Manager** dialog box, which lets you create and edit scales to use with the Snap to Scale feature.

This dialog box has the following fields and controls:

- **Scale Family.**   This field lists all of the families of scales that in which an individual scale might be stored.

- **Scale.**   This field lists the scales that are stored in the selected Scale Family.

- **Keyboard display.**   This keyboard display shows the notes that are in the selected scale by displaying a blue dot over each note in the selected scale. You can include or exclude a note clicking keys in the keyboard display.

- **Scale Degrees.**   This field lists the different scale degrees that are in the selected scale.

- **Scale Degree buttons.**   These buttons below the **Scale Degree** field show what scale degrees are in the selected scale. Each depressed button shows that the button's namesake is in the selected field.

- **Defaults.**   This button opens a dialog box that offers to restore factory-supplied scales to their default values.

- **New button.** Click this button to create a new scale. When you click this button, the Scale Manager displays a default name (New Scale "n") for the new scale, and automatically selects C as the root note of the scale.

  Note: *All scales in the Scale Manager dialog box use C as the root note.*

- **Delete button.** Click this button to delete any scale that is highlighted in the **Scale** field.

Scale Velocity dialog

The **Process > Scale Velocity** command opens the **Scale Velocity** dialog box, which lets you edit MIDI clips to create crescendos (volume swells) and decrescendos on those instruments that respond to MIDI velocity. Most MIDI instruments map changes in velocity to changes in note loudness. Many synthesizer patches alter the timbre of the sound as well, so that higher velocities produce brighter, as well as louder, sounds.

This command lets you set a starting and ending velocity for the entire time range of the selection. SONAR scales the velocity of each event to create a smooth linear change in velocity. As an option, you can enter a starting and ending percentage; SONAR modifies existing velocity values by the designated percentage.

You can also edit note velocities in the Notes pane of the Piano Roll view, which lets you draw shapes other than straight line changes. For more information, see "Adding and editing controllers in the Piano Roll" on page 695.

The **Scale Velocity** dialog box has the following fields:

Begin

Enter a velocity value between 0 and 127 for the first event of the selection, unless you want to use percentages. If you use percentages, enter a number between 0 and the approximate percentage that would create a velocity of 127, when multiplied by the existing velocity of the first event. SONAR rounds off any values you create above 127 to 127.

End

Enter a velocity value between 0 and 127 for the last event of the selection, unless you want to use percentages. If you use percentages, enter a number between 0 and the approximate percentage that would create a velocity of 127, when multiplied by the existing velocity of the last event. SONAR rounds off any values you create above 127 to 127.

Percentages

Check this check box if you want to modify existing velocities by a percentage.

See also:

"To scale velocities" on page 717.

Search for Missing Audio dialog

Open the **Search for Missing Audio** dialog by clicking the **Search** button in the **Find Missing Audio** dialog box.

The **Search for Missing Audio** dialog box searches your entire computer for a file that has the same name as the missing file in your project. If the file is found, select it and click **OK**. If multiple copies of the same file name are found, you may select only one. If no files are found, manually search your Recycle Bin. If you find the missing file in the Recycle Bin, right-click on it and select **Restore** to return the file to your project's audio data directory.

Select By Time dialog

The **Edit > Select > By Time** command opens the **Select by Time** dialog box.

Choose the starting and ending times for the time selection you want to make by entering numbers into the following fields:

- **From.** Enter the number of the measure, beat, and tick of the location where you want the selection to start.

Note: *You can enter a whole number with no punctuation if your selection boundary is the beginning of a measure. You can separate measure, beat, and tick numbers with spaces, periods, or colons.*

- **Thru.** Enter the number of the measure, beat, and tick of the location where you want the selection to end.

The From and Thru times you select appear in the **Select** toolbar in the **From** and **Thru** fields. If you select a whole measure, the Thru time is the start of the next measure, which actually makes it a "to" time and not a "through" time.

For more information, see:

Set Default Velocities for Steps dialog

Open the **Set Default Velocities for Steps** dialog by right-clicking to the right of any row in the Step Sequencer and selecting **Set Default Velocities for Steps** from the pop-up menu.

From the **Set Default Velocities for Steps** dialog box you select the default velocity value that is assigned to new notes that are enabled in the Step Sequencer. The setting is global, which means it applies to all step sequencer clips and projects.

Select Fretboard Track dialog

Open the **Pick Fretboard Track** dialog box by right-clicking in the Fretboard pane and selecting **Select Track** from the **Fretboard** pop-up menu.

From the **Pick Fretboard Track** dialog box you select the track you want to see displayed in the fretboard pane if multiple tracks are displayed in the Staff pane.

To select a track, click the track in the **Pick Fretboard Track** dialog box and click **OK**.

See Also:

Set Timecode at Now Time

The **Project > Set Timecode at Now** command opens the **Set Timecode at Now Time** dialog box, which allows you to move the SMPTE time 00:00:00:00 to the current Now time. If you enter a value in the dialog box, the SMPTE value that you enter is set to the current Now time.

Slide dialog

The **Process > Slide** command opens the **Slide** dialog box, which allows you to move track data forward or backward in the track.

The **Slide** dialog box has the following fields:

Slide

Choose what kinds of track data you want to move:

- **Events in Tracks.** Events include notes and controller data but not markers.
- **Markers.** If you select any locked markers, SONAR asks whether you want to slide them too.

By

Enter a number in the **By** field to control how many units your selected data moves. Negative numbers move the data to earlier positions in the track, but data can not move earlier than beat 1 of the first measure. Choose from the following units:

- **Measures.** If you choose Measures, the selected data moves by a number of whole measures.
- **Ticks.** If you choose Ticks, the selected data moves by a number of ticks, which are portions of a beat.

- **Seconds.**   If you choose Seconds, the selected data moves by a number of whole seconds.
- **Frames.**   If you choose Frames, the selected data moves by a number of frames, which are the smallest units of SMPTE time.

See also:

"Shifting events in time" on page 711

SONAR Quick Start dialog

The SONAR **Quick Start** dialog box appears when you launch SONAR (unless you disable this option, see "Show this at Startup check box" on page 1755). It allows you to open any of a long list of templates, and open recent projects and introductory help topics. You can open this dialog box whenever you want by using the **Help > Quick Start** command.

The SONAR **Quick Start** dialog box has the following fields:

Open a Project button

Clicking this button is the same as using the **File > Open** command. The **Open** dialog box appears, displaying the contents of your SONAR project folder. Select the project you want to open, and click **OK**.

Open a Recent Project button and drop-down menu

Click the arrow at the end of the drop-down menu to display a list of projects you opened recently. Choose the one you want to open, and click the button (it has a folder icon on it) to open it.

Create a New Project button

Clicking this button opens the **New Project File** dialog box, which displays a list of templates for new projects. Select the one you want to open, and click **OK**.

Online Videos and more

Click this link to view our tutorial videos online. An active Internet connection is needed in order to access this content.

Getting Started button

Clicking this button opens the "Getting started" on page 3 help topic, which contains links that open tutorials and introductory help topics.

Show this at Startup check box

If you uncheck this check box, the SONAR **Quick Start** dialog box appears only when you use the **Help > Quick Start** command.

For more information, see:

"Creating a new project file" on page 250

Sort Tracks dialog

The Track view **Tracks > Sort Tracks** command opens the **Sort Tracks** dialog box. This command lets you arrange tracks in order according to any of several criteria. You can sort in ascending or descending order.

There are several ways you can change the order of tracks in the Track view:

- Drag a track to a new position in the Track view (see "To drag a track to a new position" on page 316).
- Insert new, blank tracks between existing tracks (see "To insert a single track" on page 318).
- Use the **Tracks > Sort Tracks** command to rearrange the tracks in order based on the track name, status, or other setting.

The **Sort Tracks** dialog box has the following fields:

Sort by

This field lets you choose what characteristic of the tracks you want to use to sort them by. Choose from these options:

- **Name.**   Choosing this option causes SONAR to sort the tracks in alphabetical order, either A to Z, or Z to A, depending on whether you choose **Ascending** or **Descending** in the **Order** field.
- **Muted.**   Choosing this option causes SONAR to put the muted tracks either first or last, depending on whether you choose **Ascending** or **Descending** in the **Order** field.
- **Archived.**   Choosing this option causes SONAR to put the archived tracks either first or last, depending on whether you choose **Ascending** or **Descending** in the **Order** field.
- **Selected.**   Choosing this option causes SONAR to put the selected tracks either first or last, depending on whether you choose **Ascending** or **Descending** in the **Order** field.
- **Size.**   Choosing this option causes SONAR to put the biggest tracks (tracks that contain the most events) either first or last, depending on whether you choose **Ascending** or **Descending** in the **Order** field.
- **Output.**   Choosing this option causes SONAR sort the tracks by output.
- **Channel.**   Choosing this option causes SONAR to sort the tracks by their MIDI channels, in either **Ascending** or **Descending** order.

Order

This field determines whether SONAR sorts the tracks by putting the tracks with higher numbered characteristics at the top or bottom of the Track window.

See:

"To sort the tracks" on page 317

See also:

"To drag a track to a new position" on page 316

"To insert a single track" on page 318

Split Clips dialog

When you right-click one or more selected clips and choose **Split** from the pop-up menu, the **Split Clips** dialog box appears. Use this command to split one or more clips into smaller clips.

The **Split Clips** dialog box has the following fields:

Split At Time

Choosing this option splits the clip(s) at the location you fill in. By default, this filed lists the Now time, but you can choose any time you want.

> **Time Format.** If you choose Split At Time, you can also select a time format for the **Split At Time** field from the four choices.

Split At Selection

Choosing this option splits the clip(s) at the boundaries of the selected area. If you're splitting a MIDI clip, the split will not split any notes, so the split may not happen exactly where your selection boundary is.

Split Repeatedly/Starting at Measure/And Again Every "N" Measures

Choosing this option creates split boundaries in the selected clip(s) starting at the location you choose in the **Starting at Measure** field, and again at every interval of measures that you choose in the **And Again Every "N" Measures** field.

Split at Each Marker Time

Choosing this option creates split boundaries in the selected clip(s) at each marker time.

Split When Silent For At Least "N" Measures

Choosing this option separates the selected clip(s) and removes empty space whenever the clips contain empty space that lasts a certain number of measures, the number of which you specify in the **"N"** field.

Use Nondestructive Cropping When Splitting MIDI Clips

If you check this option, SONAR hides any MIDI data (such as note durations) that overlap the clip boundary, without deleting any data. If you slip edit the new clip to expand the original boundary, SONAR uncovers the original data. If you don't check this option, SONAR deletes overlapping data when you split clips.

Note that the Undo and Redo commands work with all of these editing commands.

See also:

"Splitting and combining clips" on page 365

For step by step instructions:

Staff View Layout dialog

The **Staff View Layout** dialog box appears when you click the Staff view **Edit** menu and choose **Layout**, or choose **Layout** from either the Staff pane or Fretboard right-click menus.

Use these fields in the **Staff View Layout** dialog box to control staff layout options:

Track

This field lists the tracks that the Staff view currently displays. Highlight the name of the track that you want to set display options for.

Display

The **Display** fields in the **Staff Layout View** dialog box enable you to choose a variety of display options for the Staff view:

- Whether you want rests to be beamed together with the notes that occur on the same beat (**Beam Rests** check box).
- Whether the staff view will display sustain pedal events (**Show Pedal Events** check box).
- Whether you want chord grids displayed above chord symbols (**Show Chord Grids** check box).
- What fonts you want for any text, track names, or numbers in the Staff view (**Set Font** pop-up menu).

Staff properties (clef, split point)

In the Staff properties section of the **Staff View Layout** dialog box, you can select the type of clef you want to display in the Staff view. If you select **Treble/Bass** the **Split** option becomes active, allowing you to set the boundary note between the treble and bass clefs

Tablature settings

The **Staff View Layout** dialog box creates tablature settings for a whole track at a time. To modify tablature for selected parts of a track, select part of a track and use the **Regenerate TAB** command.

In the **Staff View Layout** dialog box you can choose a preset style of tablature by choosing from the **Preset** pop-up menu, or you can define your own style by clicking the **Define** button in the **Staff View Layout** dialog box to open the **Tablature Settings** dialog box.

See also:

Staff View Layout dialog

Staff View Print Configure dialog

When you use the **File > Print Preview** command, the Print Preview window appears. In the Print Preview window is the **Configure** button. Click the **Configure** button to open the **Staff View Print Configure** dialog box, which has the **Rastral Size** field that you control rastral size with.

Rastral size is the vertical distance between the lines of each staff. Each rastral size has a number and is used by publishers for a specific genre of musical composition

To change the rastral size, pick a new rastral size from the drop-down menu and click **OK**.

For more information, see:

Step Record dialog

Press SHIFT+R to open the **Step Record** dialog box. Step recording lets you specify step size and note duration so you can record difficult passages a step at a time. **Step Record always uses the Sound on Sound (blend) record mode**, regardless of the current record mode.

The **Step Record** dialog box has an extra set of controls called Advanced mode that only appear when you click the **Adv.** button. The **Step Record** dialog box has the following fields:

Step Size

- Click a note head to choose a step size for the next note or rest you want to enter.
- Click the dotted or double-dotted buttons to add a dot or double-dot to any step size.
- Click **N** to create a custom step size.
- Click the **Tuplet** check box, and enter values in the two adjacent number fields to create a tuplet step size

Duration

The duration value controls how much of a note's step size the note actually lasts.

- Click **Follow Step Size** to keep the duration values the same as the step size.
- If you don't check **Follow Step Size**, fill in a value in the **% of note value** field to set duration.
- If you don't check **Follow Step Size**, you can randomize the duration by the value you enter in the **Randomize By field** (Advanced mode only).

Destination Track

Choose the track that you want to add the note data to.

Note Properties (Advanced Mode Only)

If you don't check the Use Input check box for a particular note property, you can specify any or all of a note's **pitch**, **velocity**, and **channel** characteristics.

Navigation

- **Auto Advance.**   If this option is checked, the insertion point moves ahead automatically when you release a note.
- **Link to Now Time (Advanced mode only).**   If this option is checked, the insertion point duplicates the Now Time.
- **Delete on Back Step.**   If this option is checked, a note or notes are deleted when you click the **Step Backward** button.
- **Offset (Advanced mode only).**   You can enter a value in this field to enter notes at a constant distance away from the insertion point. You can enter a positive (after the insertion point) or negative value (before the insertion point).

Insertion Point Field

This field lists the current insertion point in MBT format.

Scroll Bar

The scroll bar provides a visual representation of the insertion point's location. Drag the scroll bar to move the insertion point forward or backward.

Step/Beat/Measure Back/Forward Buttons

Click these buttons to move the insertion point one step, beat, or measure respectively back or forward. The **Beat** and **Measure** buttons appear in Advanced mode only.

Adv./Basic Button

Click the **Adv.** button to display the advanced options. Click the **Basic** button to display only the basic options.

Activate Step Record

Click this button to turn step recording on or off.

Pattern

See "Step pattern recording" on page 298.

See Also:

Step Size dialog

The **Step Record** dialog box contains two **Other** buttons. Clicking the one on the **Step Size** side of the dialog box opens the **Step Size** dialog box. In the **Step Size** field, enter the size of the note you want to enter in "Ticks" on page 1920.

See also:

"Step recording" on page 291

SurroundBridge Plug-in Linker

The SoundBridge Plugin Linker allows you to use stereo plug-ins in a surround bus that has more than two channels. The Plugin Linker creates multiple instances of the plug-in.

Unlink Controls

You can unlink a parameter in an instance of a plug-in by clicking the **Unlink Controls** button so that it turns red, making some adjustments to the parameters that you want to unlink, and then clicking the **Unlink Controls** button again so that it's not red.

Presets

Existing plug-in presets are available in the SoundBridge Plugin Linker. When you select a stereo preset, the settings apply to each instance of the plug-in. If you save a surround preset, it saves the settings in each instance as well as the channel configuration. Surround presets are only compatible with the current configuration.

Plug-in Instance Configuration

The Plug-in Instance Configuration has the following elements:

Plug-in #.   The plug-in number (tabs from left to right).

Left Output.   The surround output for the left channel of the plug-in instance. If there is only one output for an instance, the Center channel for example, it appears in the Left output column.

Right Output.   The surround output for the right channel of the plug-in instance.

Controls Linked to Group.   Use this group to unlink an entire instance by unchecking this option for that instance.

Enable.   Acts as a bypass for that instance.

Unlinked Parameters

This field lists all the parameters that are unlinked.

For more information about the SoundBridge Plugin Linker, see "The SurroundBridge" on page 957.

Sysx Bank Name

This dialog box lets you specify the name of the bank you want.

Tablature Settings dialog

In the **Staff View Layout** dialog box you can choose a preset style of tablature by choosing from the **Preset** pop-up menu, or you can define your own style by clicking the **Define** button in the **Staff View Layout** dialog box to open the **Tablature Settings** dialog box.

Use the following fields in the **Tablature Settings** dialog box to configure TAB for a selected track:

Preset

Save your settings by typing a name into the **Preset** field at the top of the dialog box and clicking the disk icon next to it. You can remove presets from the list by clicking the **X** button next to the disk icon.

The next time you want to use these settings for a track, choose your Preset in the **Staff View Layout** dialog box from the **Presets** drop-down list.

Tablature

The Tablature tab has these fields:

- **Method.** Choose a tablature method from the **Method** drop-down list. There are three methods to determine how the TAB is displayed:
  - **Floating.** Analyzes all events in a track and attempts to optimize tablature with reference to open position
  - **Fixed.** This specifies where on the neck these notes should be played. When Fixed is selected, the **Finger span** and **Lowest fret** fields are used together to define the "box" where the notes are displayed. The Finger span parameter determines how many consecutive frets will be used to display the note. For example, if Finger span is set to 4, then SONAR will attempt to place all the notes within those 4 frets. The Lowest Fret then determines where on the fretboard will the notes be displayed within the Finger span. The red box in the fretboard display above the parameters changes to reflect the settings in these two parameters.
  - **MIDI Channel.** This uses the event's MIDI channel to determine which string the note should be displayed on. This is useful for MIDI guitarists who record parts in MONO mode, where each string transmits on a different MIDI channel. When MIDI Channel is selected, the user chooses which series of MIDI Channels SONAR receives on by typing a number into the **1st Channel** field (use values between 1 - 11). Selecting **1** will cause it to use MIDI channels 1 - 6, selecting 2, 2 - 7, and so on. Checking the **Skip Channel 10 (G50)** check box tells SONAR that your guitar is not transmitting on channel l0, so SONAR has to use other channels to display your data.
  - **Number of Frets.** The number in this field determines how many frets the instrument has that you want to generate a TAB for.

- **String Tuning.** Choose the instrument from the drop-down list and number of strings from the **Number of Strings** field.

  The open string pitches for the instrument you choose automatically appear in the string number fields at the bottom of the dialog box.

  Customize any of the open string pitches by using the **+** or **-** buttons on the **String Number** fields.

Fretboard

The Fretboard tab has these fields:

- **Texture.** Choose a texture from the drop-down list.
- **Orientation.** If you want to reverse the standard string orientation, click **Low String on Top (Mirror)**.

Both the **Staff View Layout** dialog box and the **Tablature Settings** dialog box create tablature settings for a whole track at a time. To modify tablature for selected parts of a track, select part of a track and use the **"Regenerate TAB"** on page 1099 command.

See Also:

"The Fretboard" on page 1075

"Quick TAB" on page 1099

"Staff pane layout" on page 1073

"The Staff view" on page 1072

"Basic musical editing" on page 1078

"Chords and marks" on page 1090

"Tablature" on page 1097

Tempo dialog

The **Project > Insert Tempo Change** command opens the **Tempo** dialog box. In the **Tempo** dialog box you can set a new "Tempo" on page 1920 at a specified point.

Use the following fields to insert a tempo change:

Tempo. Type a new tempo or use the **Click here to tap tempo button** to tap out a tempo. The **Tempo** field changes as the tapped tempo varies.

Change the Most Recent Tempo. Applies the tempo changes in the **Tempo** field to the most recent tempo.

Insert a New Tempo Starting at Time. This option applies the tempo from the **Tempo** field to a specific starting time

See also:

"SONAR changes the current tempo to the desired value.Using the Tempo commands" on page 383

"Changing tempos" on page 382

Tempo dialog

Track Inputs dialog

The **Select Track Inputs** command opens the **Track Inputs** dialog box. This command lets you specify inputs for all of your project's tracks for recording and MIDI echoing purposes. Use these fields in the dialog box to choose inputs for your tracks:

Track Column

Use the **Track** column to choose which track or tracks you want to choose an input for. Click the name of a track to select it or CTRL-click to select several at once. The **Input** control lists the currently assigned inputs for each track.

Source Column

This column lists the currently selected input sources for each track. You can change inputs by selecting one or more tracks (don't mix audio and MIDI tracks), and clicking either the **Audio Inputs** menu or the **MIDI Inputs** button to select inputs.

Audio Inputs drop-down menu

You can choose an input for one or more audio tracks by selecting them from the **Track** column, and then selecting the input you want from the **Audio Inputs** drop-down menu.

MIDI Inputs button

You can choose an input for one or more MIDI tracks by selecting them from the **Track** column, and then selecting the input you want by clicking the **MIDI Inputs** button.

When you finish choosing inputs for all your tracks, click **OK** to close the dialog box and change the inputs you specified.

See also:

"Choosing an input" on page 261

"Changing track settings" on page 205

Track Manager dialog

Do *one* of the following to open the Track Manager dialog:

• Click the Track view **Tracks** menu and choose **Track Manager**.

• Click the Console view **Strips** menu and choose **Track Manager**.

• Press H.

Use this dialog box to hide or display the various track modules and buses in the view that you opened it from.

The **Track Manager** dialog box has the following fields and buttons:

- **Display window.**   This window lists all the track and bus modules. A checkmark next to a module means it is visible.
- **Toggle buttons.**   These buttons select all of the type of module that is listed on the button. You can check or uncheck all selected modules by clicking one of the selected modules.

See also:

Track Outputs dialog

The **Select Track Outputs** command opens the **Track Outputs** dialog box, which you use to assign a highlighted track to a MIDI or audio output.

The **Track Output** dialog box has only the following fields:

MIDI Outputs

Choose the MIDI output that you want this track's data to be sent to. The **MIDI Outputs** field is grayed out if the selected track is an audio track.

Audio Outputs

Choose the audio output that you want this track's data to be sent to. The **Audio Outputs** field is grayed out if the selected track is a MIDI track.

See also:

Transpose dialog

The **Process > Transpose** command opens the **Transpose** dialog box, which allows you to transpose the pitches of MIDI and audio clips up or down by a fixed number of half-steps. It does so by changing the MIDI key numbers of note events and by pitch-shifting audio clips. Simply enter the number of half-steps in the **Amount** field of the **Transpose** dialog box; a negative number to transpose down, a positive number to transpose up. See "To transpose selected events" on page 710.

SONAR can also perform diatonic transposition, which shifts all the notes up and down the major scale of the current signature by the designated number of steps. For instance, if you specify an amount of +1 and the key signature is C-major, a C becomes a D (up a whole step), an E becomes an F (up a half step), and so on. Diatonic transposition assures you that the transposed notes fit with the original key signature.

As an option, you can choose to transpose selected audio clips along with any selected MIDI clips. SONAR uses pitch-shifting to perform the transposition. You can transpose audio only a single octave in either direction (-12 to +12), and you cannot transpose audio when you are using diatonic transposition.

The **Transpose** dialog box contains the following fields:

Amount

The number in this field tells SONAR how many half-steps, up or down (depending on whether you enter a positive or negative number), to transpose the selected data, unless you check the **Diatonic Math** check box. If you select the **Diatonic Math** check box, the number in this field tells SONAR how many scale steps to transpose the selected data.

Diatonic Math

If you check this check box. SONAR transposes the selected data up or down, but only within the current key signature.

Transpose Audio

If you check this check box. SONAR transposes any selected audio data up or down, but only by half-steps, not diatonically.

- **Type.** Choose the type of audio data you're transposing (this is a SONAR Producer feature only).
- **Formant scaling.** (this is a SONAR Producer feature only) possible values range from -2.000 to 2.000 octaves. Formants give a voice its characteristic sound. You can use the Formant Scaling value to offset the pitch transposition you're applying. For example, if you're transposing the pitch down, you can raise the formant to try and maintain the characteristics of the sound.

See also:

Undo History dialog

The **Edit > History** command opens the **Undo History** dialog box, which displays a history of your editing actions (the command is greyed-out if you made no edits). You can set how many editing actions you want the **Undo History** dialog box to store by changing the number in the **Maximum Undo Steps** field. The default value is **128**.

Use the **Undo History** dialog box to jump to a previous time in the history of the project. Then you can continue from that point, causing all the edits you did after that action to disappear.

The **Undo History** dialog box has the following fields:

History list

The **History** list displays a list of all the editing actions you did to this project, up to the number of actions in the **Maximum Undo Steps** field.

To revert to an earlier version of a project, highlight the entry in the History list that represents the point to which you'd like to return, and click **OK**. SONAR performs the necessary undo or redo actions to take you to that point. Once you make any new edits, SONAR clears the History list of all the edits you made after the edit you jumped back to. Then, as you do further work, the History list grows again. Any edits that happened after the edit you jumped back to remain on the list.

Clear button

You can click the **Clear** button in the **Undo History** dialog box to erase the undo history for the current project and free up some memory. If SONAR is low on memory, it may offer to erase the **History** list.

Maximum Undo Levels

This field lists the number of previous edits that SONAR stores. The default value is 128. You can enter a smaller number to reduce the memory required.

See also:

"Undo, redo, and the undo history" on page 390

Unlink Clips dialog

When you right-click a selected group of two or more linked clips and choose **Unlink** from the pop-up menu, the **Unlink Clips** dialog box appears.

This command lets you specify when unlinking selected linked clips whether to form a new, different linked group or to make the clips completely independent.

See also:

"Splitting and combining clips" on page 365

"Moving and copying clips" on page 335

Unpack Bundle dialog

The **Unpack Bundle** dialog box allows you specify the folder where you want to store the unpacked project and the folder where you want to store the project's audio data. This dialog box only appears if you have the **Use per-project audio folders** option selected in **Edit > Preferences > File - Audio Data**.

Project Name

Enter a file name for your project. The default name is the same as the bundle filename but with the .cwp extension.

Location

Select a folder in which your project file is saved.

Audio Path

Select a folder in which your project's audio data is stored.

Store Project Audio in its own Folder

Check this option to use per-project audio. If you uncheck this option, the project audio is stored in the default audio data folder.

Create One File per Clip

Check this option to create a separate wave file for each clip in your project. If you uncheck this option, all audio is stored in two wave files, a mono file with all the project's mono audio, and a stereo file with all the projects stereo audio.

Unpack OMF dialog

The **Unpack OMF** dialog box appears when you open an OMF file.

Note: *When you import an OMF that uses embedded media, SONAR can determine the bit depth and sample rate of the embedded media, and it will set those fields as the default values for OMF import. If the OMF is using externally linked media, SONAR will not be able to determine the sample rate of the media and will default to a 44,100 sample rate. In this case it is desirable to know the sample rate of the original material so the import OMF settings can be set to avoid resampling the media, if resampling is not desired.*

Select from the following unpack options:

Sample Rate

This field displays the sample rate that the imported audio uses if you're using embedded media; if you're using externally linked media, this field defaults to **44,100**. You can change the sample rate by choosing one of the sample rates listed in the drop-down menu.

Bit Depth

This field displays the bit depth that the imported audio uses if you're using embedded media; if you're using externally linked media, this field defaults to the **Original** menu option in the drop-down menu, which leaves the bit depth of the imported audio in its original depth. You can change the bit depth during import by choosing one of the listed options.

Initial Tempo

Set the initial tempo of the file.

Store Project Audio in its own Folder

If you want to use a unique folder for this project's audio data, check this option and fill out the **Project Name**, **Location** and **Audio Path** fields. If you deselect this option, the project is saved with the same file name to the default directory using the default audio directory. The file's new extension is .cwp.

Project Name

The Project filename. This field is only active if you have checked the **Store Project Audio in its own Folder** option.

Location

The directory where you want to save the project. This field is only active if you have checked the **Store Project Audio in its own Folder** option.

Audio Path

The audio directory where you want to store the audio for the project. This field is only active if you have checked the **Store Project Audio in its own Folder** option.

Unreadable Files dialog

This dialog box may appear when using the **Clean Audio Folder** command. This dialog box lists any files on your system which have a Cakewalk file extension (.cwp, .cwt, .wrk, and .tpl), but cannot be read by SONAR. These files may be corrupt or they may not be SONAR files at all, if for instance you have another application on your system which saves files with the same extension.

⚠ **Important:** *If any of your projects appears in this dialog box, do not proceed to delete any audio in the **Clean Audio Folder** dialog box without first restoring these projects from a backup source such as a Bundle file (.cwb). If SONAR cannot read a project file, any audio associated with it will be listed in the **Clean Audio Folder** dialog box.*

Video Export dialog

SONAR can combine an inserted video file with the audio tracks you record in a project to form a new AVI, Windows Media Video, or QuickTime file. You can also save to an external FireWire device. Choosing the **File > Export > Video** command opens the **Video Export** dialog box, which offers the following options:

• **Save in.** Choose the folder you want to store your new video file in.

• **File name.** Fill in a name for your new file.

- **Save As Type.** Choose Video for Windows (AVI), Windows Media Video, or QuickTime. If you have an external FireWire device connected, you can choose AVC Compliant Device, or whatever your device is named. See "Exporting a project to a FireWire DV device" on page 246 for more information.
- Video Export Settings:
  - **Encoding Options button.** Clicking this button opens an encoding options dialog box for the kind of file you chose in the **Save As Type** field.
  - **Audio Mixdown Options button.** Clicking this button opens the **Audio Mixdown Options** dialog box, which allows you to choose mono, stereo, or multichannel export; what sound card driver you're using to export; and all the audio components from your project that you want to include in the exported mix.

Video Properties dialog

Right-clicking a video in the Video view and choosing **Video Properties** from the pop-up menu opens the **Video Properties** dialog box. This dialog box has three tabs—the **Video Settings tab**, the **Info tab**, and the **Render Quality tab**.

Video Settings tab

The Video Settings tab lets you set playback time options, and has the following fields:

- **Clip.** This field lists the name of the currently-loaded video file.
- **Start Time.** If you don't want the video to start playing until some later time in the audio project, fill in the time that you do want the video to start. For example, if you want the beginning of your video to start playing at measure 3 of your audio project, enter **3** in the **Start Time** field.
- **Trim-in Time.** If you don't want your video to start playing right at the beginning of the video file, enter the time in the video file (in "SMPTE" on page 1919 format) where you want the video to start playing. For example, if your video has 10 seconds of blank video at the front of the file, you can enter **00:00:10:00** into the **Trim-in Time** field, and SONAR skips the first 10 seconds of the video file and starts playing your video file at the 10 second mark in the video.
- **Trim-out Time.** If you have blank or unwanted video at the end of your video file, enter the time (in SMPTE format) where you want to stop playing the video.

Info tab

The Info tab displays various attributes of the inserted video, and also contains the **More** button, which displays a more extensive set of attributes.

Render Quality tab

The Render Quality tab lets you control how your video looks in SONAR. It doesn't affect the video that you eventually export, although you can experiment with different settings to get an idea of how your video looks at different sizes and with different frame rates.

The Render Quality tab has the following controls:

- **Preview check box.**   Check this check box to cause the video in SONAR to display at a slightly lower quality: "preview" quality. This can cause slightly smoother playback.

- **Frame Rate (FPS).**   Use this field to change the frame rate. Lower frame rates free some of your computer's resources for playing back music and other tasks.

- **Video Size, X and Y.**   The **X** field sets the video's width, in pixels; the **Y** field sets height.

- **Restore Defaults.**   Click this button to set the three previous fields (including **Preview**) back to their default values.

See also:

"Video playback, import, and export" on page 236

Track Control Manager

The **Track Control Manager** dialog box appears when you click the Track Control list above the track strips and choose **Track Control Manager** on the drop-down menu.

Use the following fields to control which track or bus controls appear when you select a preset from the Track Control list in the Track pane:

Preset

Use this field to choose the preset that you want to configure, for all kinds of track and bus strips. You can also create a new preset by choosing the **<new>** option in the drop-down menu, and typing a name for the new preset.

Audio Strip

In this column, check off each control that you want to see for the preset that you chose in the **Preset** field for all audio tracks.

MIDI Strip

In this column, check off each control that you want to see for the preset that you chose in the **Preset** field for all MIDI tracks.

Bus Strip

In this column, check off each control that you want to see for the preset that you chose in the **Preset** field for all buses.

Surround Bus Strip

In this column, check off each control that you want to see for the preset that you chose in the **Preset** field for all surround buses.

Delete

Click this button to delete the tab that you chose in the **Preset** field.

New

Click this button to create a new preset with all check boxes enabled. You can name the new preset in the **preset** field.

Restore Defaults

Click this button to restore all controls to factory defaults. This will delete any new presets you have created.

Select All Controls

Click this button to select all the check boxes in the **Strip** columns.

Windows Media Format Encode Options dialog

You can create settings and a description for your Windows Media Advanced Streaming Format file in the **Microsoft Audio Encode Options** dialog box.

Note: *To create a surround encoded file you must export surround encoded buses.*

Title:

Enter the title of the file.

Author:

Enter the name of the author responsible for creating the file.

Rating:

This field only relates to exporting video, which you can't do from this dialog box.

Copyright:

Enter any copyright information for the file.

Description:

Enter a note about the file.

Variable Bit Rate

VBR encoding makes the quality of the encoded audio more consistent, but can make the resulting file size less predictable.

Codec

Select a codec from the drop-down list.

Format

Select a format from the drop-down list. The higher the kbps setting, the higher the quality of the file.

For more information, see:

WMV Encoder Options dialog

Clicking the **Encoding Options** button in the **Video Export** dialog box after you've selected **Windows Media Video** in the **Save As Type** field opens the **WMV Encoder Options** dialog box.

This dialog box has the following fields:

- **Profile.**   This field has a list of common WMV video file formats. Selecting a profile tells the WMV encoder what quality of file to produce.

- **Profile info.**   This field briefly explains the kind of video and audio file that the profile you selected will produce.

- **Title/Author/Rating/Copyright/Description.**   Filling in these fields will fill in the information your file will generate when you open the file's **Properties** dialog box from Windows Media Player.

- **Multipass.**   If you're creating a Variable Bit Rate (VBS) video, the file quality will improve some if you tell the encoder to go through your source material twice (make two passes at it).

Windows Media Video (WMV) profiles

SONAR includes several profiles for exporting WMV files. You can author your own WMV profiles if you want to use specific settings. To do so, you need to download and install the Windows Media Profile Editor, which is included with the Windows Media Encoder 9 Series.

Download from here:

www.microsoft.com/windows/windowsmedia/download

In **Select Download** choose **Windows Media Encoder**.

In **Select Version** choose **9 Series**.

The setup program will install the Windows Media Profile Editor utility.

If you author your own profiles (.prx files), they must be placed in the `\Documents and Settings\All Users\Application Data\Cakewalk\SONAR X2 Producer\WMV Profiles` directory in order to be available in SONAR.

> **Note:** *If you use SONAR Studio or Essential, substitute "Producer" with "Studio" or "Essential".*

WMV Encoder Options dialog

Insert Send Assistant dialog

When you right-click an audio track or bus and choose **Insert Send > Insert Send Assistant** from the pop-up menu, the **Insert Send Assistant** dialog box appears. This dialog box lets you create effect buses and insert sends to new or existing buses.

The **Insert Send Assistant** dialog box has the following options:

Send to Existing Bus.   This option lets you assign a new send to an existing bus in the current project. Select the desired bus from the drop-down list.

The **Options** section is unavailable when **Send to Existing Bus** is selected.

New Stereo Bus.   This option lets you assign a new send to a new bus. When selected, you can use the **Options** section to specify the bus name and other settings (see "New stereo/surround bus options" on page 1774).

New Surround Bus.   This option lets you assign a new send to a new surround bus. When selected, you can use the **Options** section to specify the surround bus name and other settings (see "New stereo/surround bus options" on page 1774).

New stereo/surround bus options

When you select **New Stereo Bus** or **New Surround Bus**, the following settings can be configured in the **Options** section:

Bus Name.   Specify the desired name for the new bus. This name will be shown in the Track view and Console view.

Patch Effect.   Select the **Patch Effect** check box if you want to create an effect bus. When selected, click **Choose Effect** to choose the desired effect plug-in that will be patched in the new bus.

Choose Effect.   This button is only available when **Patch Effect** is selected. Click the button to choose the desired effect plug-in to insert on the new bus. When an effect has been selected, the plug-in name is displayed on the button face.

Post Fader (best for effects).   When **Post Fader** is selected, the send signal is taken from *after* the channel volume fader. As a result, the send level going to the bus changes when the channel fader changes. Select **Post Fader** if you want to create an effect bus. Doing so allows you to maintain a consistent balance between the "wet" and "dry" signals as you adjust the channel fader.

Pre Fader.   When **Pre Fader** is selected, the send signal is taken from *before* the channel volume fader. As a result, the send level going to the bus does not change when the channel fader changes. **Pre Fader** is preferred when you want to create separate mixes, such as unique headphone mixes for different performers.

Show Effects.   This option is only available when **Patch Effect** is selected. When **Show Effects** is selected, the chosen effect plug-in's user interface (UI) appears when you click **OK** to close the **Insert Send Assistant** dialog box.

Bus Output.   Specify the desired output for the new bus. The drop-down list shows all available output destinations.

See:

Missing MIDI Ports dialog

If any assigned MIDI output devices are missing when you load a project, which is likely to happen if you transfer projects between different computers, the **Missing MIDI Ports** dialog box appears.

The **Missing MIDI Ports** dialog box lets you remap missing output ports to available output ports.

Note: *If you do not remap a missing device, the track's Output control will display **MISSING: <name of missing device>**. If the missing device becomes available in the future, the track will automatically be assigned to the correct device.*

Silent Buses Detected dialog

When you load a project, SONAR checks to see if the exact same output ports are assigned as when the project was saved. SONAR's port assignments can change if you load the project on a different hardware configuration or change driver models. If there is any discrepancy between the port assignments that were saved and the ports that are used in the current configuration, the ports are set to "None" and the **Silent Buses Detected** dialog box displays all track and bus outputs from the current project that have been assigned to a silent output.

The **Silent Buses Detected** dialog box also appears if any track or bus output is assigned to "None" as a result of changing the audio configuration.

Rename Cell dialog

When you right-click a cell in the Matrix view and choose **Rename Cell** from the pop-up menu, the **Rename Cell** dialog box appears. This dialog box lets you rename the cell.

See:

Adjust Velocity Multiplier dialog

When you right-click an audio track or bus and choose **Adjust Velocity Multiplier** from the pop-up menu, the **Adjust Velocity Multiplier** dialog box appears. This dialog box lets you set a level of velocity compression or expansion for all notes in a Step Sequencer row.

A **Velocity Multiplier** value below 1.00 is compression. A value above 1.00 is expansion.

See:

Matrix Options dialog

When you click the **Options** button in the Matrix view, **Matrix Options** dialog box appears. The following options are available:

- **Empty cells stop active cells when triggered.** This option determines how playing cells are affected when triggering an empty cell in the same row. If **Empty cells stop active cells when triggered** is disabled (default), triggering an empty cell has no effect on other cells. If **Empty cells stop active cells when triggered** is selected, triggering an empty cell in a row will force the row to stop playing. Likewise, triggering a column that contains empty cells will force the corresponding row to stop playing. This option is disabled by default.

- **AutoScroll to Column when Triggered by MIDI.** This option allows the Matrix view to automatically scroll a column into view if one of the column's cells are triggered by MIDI.

- **Import all audio as GrooveClips.** This option forces all audio to be imported as Groove Clips.

See:

Rename Cell dialog

Quantize to AudioSnap Pool dialog

When you click the **Quantize to pool** command on the Transient tool pop-up menu, the **Quantize to AudioSnap Pool** dialog box appears. This dialog box lets you configure various settings that affect how audio beats are quantized to the Pool. The options are as follows:

- **Max Distance From Pool.** The value in this menu determines which notes are affected by the **Quantize to Pool** command. For example, if you choose **Quarter** in the menu, notes that are farther than a quarter note from a Pool line are not quantized.
- **Quantize Window.** This slider fine tunes the value in the **Max Distance From Pool** menu. A window of **100 percent** includes all markers that lie within the **Max Distance From Pool** value.
- **Quantize Strength.** This slider controls quantize strength, which determines how closely the selected notes move to the Pool markers.

See:

Choose File Type dialog

The **Choose File Type** dialog box appears when you right-click an empty row in the Matrix view and select **Import File** from the context menu. This dialog box lets you specify whether to import an audio or MIDI file into a cell. The options are as follows:

- **Audio File.** Click **Audio File** if you want to import an audio file.
- **MIDI File.** Click **MIDI File** if you want to import a MIDI file.

See:

Usage Logging dialog

The **Usage Logging** dialog box appears when you select **Help > Usage Logger**. This dialog box lets you log useful information that may assist Cakewalk Technical Support in troubleshooting potential problems with your system when using SONAR.

The **Usage Logging** dialog box has the following fields:

- **Start Log.**
- **Close.**

- **Comment.**

- **Include SONAR .INI Files.**

- **Include Current SONAR Project File.**

- **Attachments.**   Click **Browse** to find and attach any helpful files to the log (screenshots, etc.).

- **Package Files.**   Package all the specified files into a single archive that you can send to Cakewalk Technical Support. The file is saved to your Desktop.

Loop Properties dialog—Audio Stretching

You have two different (and independent) ways to stretch clips: by using either Groove clips or AudioSnap. Groove Clip markers are typically placed at a zero-crossing point before a transient; AudioSnap markers are placed directly on a transient. The AudioSnap feature can extract tempo from a clip. Groove Clip stretching is preferred for more extreme stretching. There are numerous other differences between the two features (see "Working with Groove Clip audio" on page 659, and "AudioSnap (Producer and Studio only)" on page 589).

The **Audio Stretching** tab has a section of options for Groove Clips, and a separate section for AudioSnap, described as follows:

Groove Clips

Both MIDI and audio clips can be set to act as groove clips. The options you see in this dialog box for audio clips are different from the options for MIDI clips.

The Groove Clips section of the Audio Stretching tab has the following options:

- **Enable Looping.**   Checking the Enable Looping check box allows you to loop clips in the Track view by dragging the right side of a clip with your mouse. When Enable Looping is not checked, you are able to slip edit the clip. For more information about slip editing, see "Applying fades and crossfades offline" on page 794.

- **Stretch to Project Tempo [audio clips only].**   The Stretch to Project Tempo check box instructs SONAR to stretch or shrink the clip to fit the project's tempo. SONAR uses the Beats in Clip and Original Tempo parameters are used to make the change.

- **Beats in Clip.**   The number of beats (quarter notes) in the clip.

- **Original Tempo [audio clips only].**   The tempo at which the clip was recorded.

- **Follow Project Pitch.**   The **Follow Project Pitch** option transposes the loop, if necessary, to the key of the project. A loop recorded in the key of A, used in a project in the key of C, would be transposed up three semitones if the **Follow Project Pitch** check box was checked.

- **Reference Note.**   The Reference Note represents the key in which the loop was recorded. The Follow Project Pitch feature uses this information, when checked, to transpose the loop to match the project's key.

- **Pitch (semitones).**   You can set the transposition of a clip, independent from the project pitch, using the **Pitch (semitones)** field. A positive number transposes the clip up by that number of semitones. A negative number transposes the clip down by that number of semitones. Remember

that, if the **Follow Project Pitch** option is checked, the clip follows the project's pitch, so any transposition changes you make using this option are changes to the project pitch, not the clip pitch.

An example: The project key is C. The clip key is D. If the **Follow Project Pitch** option is checked, the clip is transposed down by two semitones. A value entered into the **Pitch (semitone)** field adjusts the pitch from C. If you enter **-1** the pitch would be transposed down by one additional semitone to B.

Another example: The clip pitch is E. The desired clip pitch is D. If the **Follow Project Pitch** option is not checked, and a value of **-2** is entered in the **Pitch (semitones)** field, the clip is transposed down two semitones to D from the original pitch of E.

- **Fine Pitch (cents) [audio clips only].** The **Fine Pitch (cents)** field allows you to make tuning adjustments or to transpose the pitch of a clip up to 50 cents. There are 100 cents in one semitone. A **Fine Pitch** setting of **1** adjusts the pitch up one hundredth of a semitone. The **Fine Pitch** option can "fine tune" a slightly out of tune clip so that it is in pitch with the remaining clips in a project.

For more information, see:

"Working with loops" on page 658

"Working with Groove Clip audio" on page 659

"Creating and editing Groove Clips" on page 661

AudioSnap

The AudioSnap section of the **Audio Stretching** tab has the following options:

- **Enable AudioSnap.** Enabling this check box enables the clip's AudioSnap feature, which makes the following options available:
  - **Show Transients.** Enabling this check box displays the clip's transients.
  - **Add Transients to Pool.** Enabling this check box displays vertical grid lines at the beginning of each of the clip's transients, extending vertically across the Clips pane.
  - **Auto Stretch (Follow Tempo).** Enabling this check box causes the clip to automatically follow any project tempo changes.
- **Enable Time Stretching.** This check box is unavailable if the **Auto Stretch (Follow Tempo)** check box is enabled, but is available whether or not the clip is AudioSnap-enabled. You can use this check box and related fields to stretch the clip by either a percentage amount , or to a new **Duration**, or to a new **Thru Time**. If you set one field, and Tab out of the field, the other 2 fields update automatically.
  - **Stretch Amount (%).** Choose by what percentage you want to stretch the clip.
  - **New Duration.** Choose what duration you want to stretch the clip to.
  - **New Thru Time.** Choose by Thru Time you want to stretch the clip to.

Loop Properties dialog—Audio Stretching

- **Online Algorithm.** Choose the algorithm you want to use to stretch the clip:

Algorithm	Description
Default	This means the algorithm that is listed in the **Online** field of the **AudioSnap Options** dialog box.
Groove clip	This choice works faster, using less processing power.
Percussion	This is the best choice for percussive sounds.

Table 267.

- **Offline Algorithm.** Choose the algorithm you want to use to stretch the clip:

Algorithm	Description
Default	This means the algorithm that is listed in the **Offline Rendering** field of the **AudioSnap Options** dialog box.
Same as Online	Uses the same choice as the **Online** field.
iZotope Radius Mix	This is better for clips containing polyphonic, stereo data.
iZotope Radius Solo	This is better for clips containing monophonic, solo instruments.
iZotope Radius Solo (Bass)	This is better for clips containing solo bass instruments.
iZotope Radius Solo (Vocal)	This is better for clips containing solo vocals

Table 268.

For more information, see "AudioSnap (Producer and Studio only)" on page 589.

Loop Properties dialog—Audio Files

The Audio Files tab of the **Clip Properties** dialog box lists:

- The audio file(s) that make up the selected clip
- The pathname(s) the files are stored under
- The bit depth of the clip

Recompute Picture(s)

Click **Recompute Picture(s)** to redraw waveforms for individual clips that may have a corrupt waveform display.

Control Properties dialog

The **Control Properties** dialog box appears when you right-click an assignable knob or button in an FX Chain property page and select **Edit control** on the pop-up menu. This dialog box lets you configure assignable knobs and buttons.

The **Control Properties** dialog box contains the following settings:

- **Name.** The name of the assignable control, shown as the label
- **Position.** The "slot" position of the control, from left to right.
- **Destination.** Choose up to four automatable plug-in parameters to control with the assignable knob or button.
- **Start.** The start value for the destination parameter, specified as a percentage (0.00% to 100.00%).
- **End.** The end value for the destination parameter, specified as a percentage (0.00% to 100.00%). You can also set Start and End values automatically. For details, see "To set parameter value range automatically" on page 891.

See:

"To customize an assignable control (Producer only)" on page 890

Settings dialog

The **Settings** dialog box appears when you right-click an FX Chain property page and select **Customize UI** on the pop-up menu. This dialog box lets you change the colors and graphics that are displayed in each FX Chain.

The **Settings** dialog box contains the following settings:

Custom GUI section

- **Background image.** The main background image in the FX Chain property page.
- **Preset background image.** The image behind the preset name.
- **Fader cap image.** Fader thumb for Input Level and Output Level faders.
- **Button image.** Assignable button images.
- **Rotary image.** Assignable knob images.

Colors section

- **Preset text color.** Color of preset name.
- **Label text color.** Color of button and knob text labels.

See:

"Customizing the FX Chain UI (Producer and Studio only)" on page 893

Fault Reporter dialog

The **Fault Reporter** dialog box appears if there is a problem and SONAR needs to close unexpectedly. If this happens, you have the option of sending a crash report directly to Cakewalk so we can better investigate the source of the problem.

Rename Effect dialog

The **Rename Effect** dialog box appears when you right-click an FX Chain and select **Rename** on the pop-up menu.

The **Rename Effect** dialog box lets you rename the FX Chain.

See:

Extra Encoding Options dialog

The **Extra Encoding Options** dialog appears after clicking the **Export** button in the **Export Audio** dialog. The options typically determine the bit depth, endian-ness (the byte ordering in memory used to represent the data), and an encoding type within the major file format.

Here is the master list of subformats supported in SONAR:

AIFF (Apple/SGI) (extension "aiff")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- Unsigned 8 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law
- IMA ADPCM
- GSM 6.10
- 12 bit DWVW

- 16 bit DWVW
- 24 bit DWVW

AIFF (Apple/SGI) (extension "aif")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- Unsigned 8 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law
- IMA ADPCM
- GSM 6.10
- 12 bit DWVW
- 16 bit DWVW
- 24 bit DWVW

AU (Sun/NeXT) (extension "au")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law
- 32kbs G721 ADPCM
- 24kbs G723 ADPCM

CAF (Apple Core Audio File) (extension "caf")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM

Extra Encoding Options dialog

- 32 bit float
- 64 bit float
- U-Law
- A-Law

FLAC (FLAC Lossless Audio Codec) (extension "flac")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM

RAW (Headerless audio file) (extension "raw")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- Unsigned 8 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law

SD2 (Sound Designer II) (extension "sd2")

- Signed 8 bit PCM
- Signed 16 bit PCM
- Signed 24 bit PCM

W64 (Sony Wave-64) (extension "w64")

- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- Unsigned 8 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law
- IMA ADPCM
- Microsoft ADPCM

Extra Encoding Options dialog

- GSM 6.10

WAV (Microsoft) (extension "wav")

- Signed 16 bit PCM
- Signed 24 bit PCM
- Signed 32 bit PCM
- Unsigned 8 bit PCM
- 32 bit float
- 64 bit float
- U-Law
- A-Law
- IMA ADPCM
- Microsoft ADPCM
- GSM 6.10
- 32kbs G721 ADPCM

See:

"Preparing audio for distribution" on page 926

Extra Encoding Options dialog

Input Quantize dialog

The **Input Quantize** dialog box appears after selecting **Quantize Settings** in the Input Quantize section in the Inspector.

The **Input Quantize** dialog box contains the following settings:

- **Resolution.** Set the note resolution in either standard note duration or tick value. The resolution determines the size note or time value that you want your MIDI data to conform to.
- **MIDI Event Start Times.** Select this option to quantize MIDI event start times.
- **Note Durations.** Select this option to quantize Note Event durations to the size of the **Resolution** value.
- **Only Quantize Notes.** If selected, SONAR will not modify other events, such as controllers.
- **Strength.** This value determines how closely SONAR moves the selected notes to the resolution value, or "grid". See "Strength" on page 720.
- **Swing.** Use this value to make groups of even eight notes (or whatever note you want to enter in the **Resolution** field) "swing", instead of playing with exact eighth note rhythm. A value of **50** percent, or "50-50", produces equal durations for both notes—no swing. A larger value makes the first note longer, and vice versa. See "Swing" on page 720.
- **Window.** This value determines whether SONAR quantizes notes that are far from the quantization points, or leaves them alone. A value of 100 percent quantizes every note. See "Window" on page 721.
- **Randomize.** This value randomizes the three previous fields to introduce a more human feel to the rhythm. The value you enter is the maximum amount of difference from the entered values that the randomize feature can add.

For more information about Input Quantize, see "Input quantizing" on page 267.

Snap Scale Settings dialog

The **Snap Scale Settings** dialog box appears after selecting **Snap Settings** in the Snap to Scale section in the Inspector.

The **Snap Scale Settings** dialog box contains the following settings:

- **Adjust to Next, Higher Note.** If you choose this option, SONAR moves any non-scale note that you move to the next higher note in the selected scale.
- **Adjust to Previous, Lower Note.** If you choose this option, SONAR moves any non-scale note that you move to the previous, lower note in the selected scale.
- **Adjust to Nearest Note.** If you choose this option, SONAR moves any non-scale note that you move to the note that is closest in pitch in the selected scale.

For more information about Snap to Scale, see "Snap to Scale" on page 730.

Snap Scale Settings dialog

Snap Scale Settings dialog

View reference

See also:

Track view

The **Track view** is always visible. It is the main window that you use to create, display, and work with a project. When you open a project file, the Track view is displayed for the project. Closing the Track view closes the project.

The Track view is divided into several sections: toolbars (at the top), the **Navigator pane**, the **Video Thumbnails pane**, the **Track pane,** the **Clips pane,** and the **Bus pane**. You can change the size of the panes by dragging the vertical or horizontal splitter bars that separate them.

Figure 495. *The Track view*
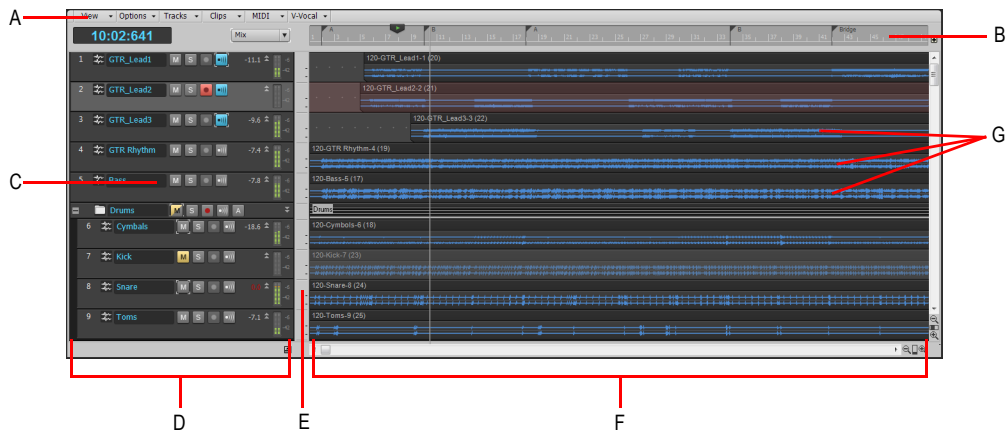
A. Track view menu B. Time ruler C. Track strips D. Track pane E. Splitter bar F. Clips pane G. Clips

You can automate most of the controls in the Track view by recording fader movements, drawing envelopes, and creating snapshots.

In addition, all of the current track's controls, plus a few that are only available in the Console view, are contained in the **Track Inspector**, which is an expanded version of the current track's controls located on the far left side of the Track view. You can hide or show the Track Inspector by pressing I on your keyboard.

Track view menu

Figure 496. *Track view menus*
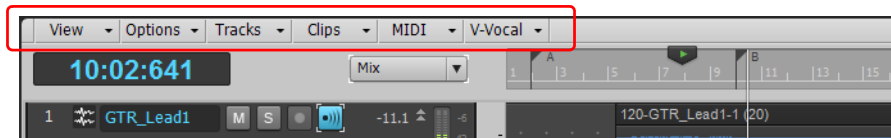
View menu

The **View** menu contains the following commands:

- **Navigator Show/Hide.** Show or hide the Navigator pane.
- **Video Thumbnail Track Show/Hide.** Show or hide the Video Thumbnails track. The Video Thumbnails track can be displayed even if there is no video in your project.
- **Fit Tracks and Buses to Window.** Adjust the vertical track heights to fit all tracks in your project in the Track view.
- **Fit Project to Window.** Fit the entire project, or as many tracks as possible, into the Track view.
- **Fit MIDI Content.** Fit all displayed MIDI content into the visible area of the Inline Piano Roll view.
- **MIDI Microscope.** Activate Piano Roll Microscope mode. When Microscope mode is enabled, a transparent rounded square centered on the mouse cursor shows a zoomed in region of the Piano Roll data underneath it.
- **View Undo.** Returns the Track view to the previous zoom level (undo zoom).
- **View Redo.** Negate the last View Undo command (redo zoom).

Options menu

The **Options** menu contains the following commands:

- **Auto crossfade.** Enable or disable automatic crossfades.
- **Crossfade Type.** Specify default fade in, fade out and crossfade curve types.
- **Display.** Use the submenu to select the desired display option:
  - **Display Ghosted Data.** Show or hide all data types, regardless of which data type is selected in a track's Edit Filter control. All but the selected data type will be shaded, or "ghosted". This allows you to see all data types in context while editing a specific data type.
  - **Display Track Separators.** Show or hide a horizontal line between each track in the Clips pane.
  - **Display Clip Names.** Show or hide clip names.
  - **Display Clip Contents.** Show or hide a graphical depiction of the audio or MIDI data that the track contains, including automation data.
  - **Show Audio Scale.** Show or hide the Audio Scale Ruler in the splitter bar between the Clips pane and the Track pane.
  - **Maximize Waveform Height.** Show or hide clip headers. When this option is enabled, waveforms and MIDI data span the full height of clips.
  - **Vertical Grid Lines.** Show or hide vertical grid lines in the Clips pane that are one measure apart. Use the submenu to specify how the vertical lines should display.
    - **None.** Vertical grid lines are not displayed.
    - **Behind Clips.** Vertical grid lines are displayed, but clips will draw on top of them, so clip contents will not be obstructed.

- I**n Front of Clips.** Vertical grid lines are displayed and drawn on top of clips, always visible.
- **Click Behavior.** Use the submenu to specify the behavior when clicking in the Clips pane:
  - **Left Click Sets Now.** Set the Now Time by left-clicking a location in the Clips pane.
  - **Right Click Sets Now.** Set the Now Time by right-clicking a location in the Clips pane.
  - **Left Click Locks Scroll.** Prevent the Clips pane from scrolling horizontally during playback while you edit data. This allows you to focus on the edit location without worrying that the screen will eventually scroll away from the edit location. When you are done with the edit and want the Clips pane to scroll again during playback, click in the background of the Clips pane to clear auto scroll lock.
  - **Double-Click.** Use the submenu to specify what happens when you double-click a clip:
    - **MIDI Clips > -Nothing-.** Prevent any view from opening when you double-click a MIDI clip.
    - **MIDI Clips > Event List View.** Open the Event List view when you double-click a MIDI clip.
    - **MIDI Clips > Staff View.** Open the Staff view when you double-click a MIDI clip.
    - **MIDI Clips > Piano Roll View.** Open the Piano Roll view when you double-click a MIDI clip.
    - **MIDI Clips > Inline Piano Roll View.** Open the Inline Piano Roll view when you double-click a MIDI clip.
    - **Audio Clips > -Nothing-.** Prevent any view from opening when you double-click an audio clip.
    - **Audio Clips > Loop Construction View.** Open the Loop Construction view when you double-click an audio clip.
- **Meter options.** Use the submenu to specify options for track playback meters, track record meters and bus meters.
- **Drag and Drop Options.** Open the **Drag and Drop Options** dialog box, which lets you control how clips behave when you drag them.
- **Zoom Options.** Open the **Zoom Options** dialog box, which lets you specify the mouse zoom behavior.
- **Select Track Envelopes With Selected Clips.** Selecting a clip will also select any overlapping track envelopes.
- **On Stop, Rewind to Now Marker.** The Now Time jumps back to the Now Time Marker whenever playback stops.
- **Set Now Time With Full Restart.** When you change the Now Time during playback, the Transport comes to a full stop, and then restarts playback. This stops the sound for a brief moment, but makes synchronization (especially with video) more robust.
- **Stop at Project End.** Playback will automatically stop after the last event in the project is reached. When this option is disabled, playback will continue beyond the end of the project and playback can also be started in an empty project.

Tracks menu

The **Tracks** menu contains the following commands:

- **Make Instrument Track.** If an existing audio track and MIDI track are assigned to the same software instrument, this command converts the two tracks into a single instrument track (only available for MIDI tracks).

- **Split Instrument Track.** Split an instrument track into separate audio and MIDI tracks. The audio and MIDI tracks will remain assigned to the same software instrument (only available for Instrument tracks).

- **Bounce to Track(s).** Combine one or more audio tracks into a submix.

- **Clone Track(s).** Copy the selected track(s). You can choose to include events, properties, sends, and/or effects in the copied track(s), and specify a destination.

- **Delete Track(s).** Delete the selected track(s), including all its track properties and all its clips and events. SONAR does not put deleted information on the Clipboard for later copying.

- **Wipe Track(s).** Delete track contents but leave track properties intact. SONAR does not put wiped information on the Clipboard for later copying.

- **Copy Track Name(s) to Clip Name(s).** Copy track names to clips in corresponding tracks.

- **Hide Track(s).** Hide all selected tracks. To display them again, select **Tracks > Track Manager** or press H on your keyboard to open the **Track Manager** dialog box.

- **Show All Tracks.** Show all tracks in the project.

- **Track Manager.** Open the **Track Manager** dialog box.

- **Sort Tracks.** Open the **Sort Tracks** dialog box, which lets you sort tracks by specific criteria.

Clips menu

The **Clips** menu contains the following commands:

- **Apply Trimming.** Permanently delete any data from a selected clip that is hidden by a slip editing edit.

- **Bounce to Clip(s).** Combine selected audio clips into a single clip.

- **Convert to Mono.** Convert any selected stereo audio clip(s) to mono.

- **Fade clips.** Open the **Fade Selected Clips** dialog box, which allows you to create or edit fades on selected clips.

- **Add to Clip Group > New.** Place all selected clips in a new clip group.

- **Add to Clip Group > <list of created groups>.** Place all selected clips in an existing clip group.

- **Remove from Clip Group.** Remove all selected clips from any clip groups they may belong to.

- **Revert to Original Time Stamp.** Move all selected clips back to their original SMPTE time position.

- **Set Snap Offset to Now Time.** Set the snap offset at the Now Time. A snap offset is a value, in samples, at which the Snap Grid uses to align the clip. Clips without a snap offset always align at

the very beginning of a clip.

- **Select All Siblings.**   Select all clips that are linked to the selected clip.
- **Unlink.**   Open the
- **Unlink Step Sequencer Clips.**   Unlink the selected step sequencer clips, allowing each clip to be edited separately from each other.
- **Convert MIDI Clip(s) to Step Sequencer.**   Convert any selected MIDI clip to a step sequencer clip.
- **Convert MIDI Controllers to Envelopes.**   Open the which lets you convert MIDI controllers into automation envelopes.

MIDI menu

The **MIDI** menu contains the following commands:

- **Show Notes.**   Show or hide Note events in the Inline Piano Roll view.
- **Show Velocity.**   Show or hide velocity tails in the Inline Piano Roll view.
- **Show/Hide Velocity Tails.**   Show or hide the velocity tails on MIDI notes in all tracks that are using Drum Maps.
- **Show Velocity on Selected Notes.**   Show velocities for selected Note events only. This makes it easier to see and edit velocities when many Note events are present. It also makes it easier to change the velocity for individual Note events that are stacked (such as chords).
- **Show Controllers.**   Use the submenu to select which controller events you want to show.
  - **Show All Controllers.**   Show all controllers in all displayed tracks.
  - **<list of available controllers>.**   All existing controller types are listed.
- **Select Controllers Along With Notes.**   When enabled, selecting a Note event or a range of Note events will also automatically select any Controller events that exist within the time range of the Note event(s).
- **Show Controller Handles.**   Show or hide edit handles on controller events.
- **Show Clip Outlines.**   Show or hide clip outlines in the Inline Piano Roll view.
- **Hide Muted Clips.**   Show or hide events that live in muted clips when working in the Inline Piano Roll view.

V-Vocal menu

The **V-Vocal** menu contains the following commands:

- **Create V-Vocal Clip.**   Create a V-Vocal clip on top of selected audio data.
- **Remove V-Vocal.**   Remove the V-Vocal processor from the selected V-Vocal clip.
- **V-Vocal Editor.**   Open the V-Vocal Editor interface.
- **Bypass/Unbypass.**   Bypass or unbypass all selected V-Vocal clips.
- **Bypass all V-Vocal Clips.**   Bypass or unbypass all V-Vocal clips in the project.

Track pane

The Track pane lets you see and change the settings for each track. Selected tracks always appear in a different color. The controls for an individual track are grouped together to form that track's *track strip*.

To change the current track, move the highlight using the mouse or the keyboard as follows:

Key	What it does
UP ARROW and DOWN ARROW	Moves the selection to the adjacent track. If a control is selected, the selection moves to the same control in the adjacent track, or the next track of the same type if the control only applies to a specific track type (for example, the Patch control only applies to MIDI tracks)
LEFT ARROW and RIGHT ARROW	Moves to the previous or next control in the Track pane. The RIGHT ARROW key moves the selected control right until reaching the end of a line, and at the end of the line the selection moves to the left-most control of the line below. The LEFT ARROW key moves the selected control to the left until it reaches the beginning of a line, and then moves to the end of the line above.
PAGE DOWN	Displays the next page of tracks
PAGE UP	Displays the previous page of tracks
HOME	Moves the highlight to the first track in the project
END	Moves the highlight to the last track in the project

Table 269.

The Track pane contains meters for recording, playback, and bus levels. You can hide or show any or all of these meters, and choose many different options for the units and format of the data the meters display. See "Metering" on page 849.

Clips pane

The Clips pane shows the clips in your project on a timeline that helps you visualize how your project is organized. Clips contain markings that indicate their contents. The Clips pane lets you select, move, and copy clips from place to place to change the arrangement of music and sound in your project.

The Track view makes it easy to select tracks, clips, and ranges of time in a project. These are the most common selection methods:

To	Do this
Select tracks	Click on the track number (the right side of the track number; the upper left corner of the track number is for grouping tracks), or drag over several track numbers
Select clips	Click on the clip, or drag a rectangle around several clips
Select time ranges	Drag in the time ruler, or click between two markers

As with most other Windows programs, you can also use the SHIFT-click and CTRL-click combinations when selecting tracks and clips. Holding the SHIFT key while you click adds tracks or clips to the current selection. Holding the CTRL key while you click lets you toggle the selection status of tracks or clips.

See:

"Automation" on page 1001

Bus pane

The Bus pane contains all of your project's buses. You display the Bus pane by clicking the **Show/Hide Buses** button ▣, which is located at the bottom of the Track view.

You use the buses in the Bus pane to patch in effects, control output volume and pan, and group tracks into subgroups.

See:

"Main outs" on page 845

"To patch a track through a bus" on page 843

Track/Bus Inspector

The Track/Bus Inspector makes it easy to adjust the current track's (or bus's) controls, because it's a greatly expanded version of the current track's controls that is located on the left side of the Track pane.

For more information about the Inspector, see "Inspectors" on page 523.

The Navigator pane

The Navigator pane, located just above the Track pane, displays the whole length of your project so you can always see an overview of your song, and where the Now time is. The Navigator pane displays all of your project's tracks. To show or hide the Navigator pane, click the Track view **View** menu and choose **Navigator Show/Hide** or press ALT+N. You can drag the splitter bar between the Navigator pane and the Track pane to change its height.

The Navigator pane has a green rectangle in it that is an outline of what the Clips pane is currently displaying. If you drag the center of the rectangle around in the pane, it scrolls the Clips pane to the same view. You can drag any of the nodes on the rectangle to zoom the Clips pane in or out. If you click in the Navigator pane, the left border of the rectangle jumps to the spot you clicked, and scrolls the Clips pane to that spot also. If you hold down the CTRL key while you click, the Now time jumps to that spot.

Figure 497. *The Navigator pane*
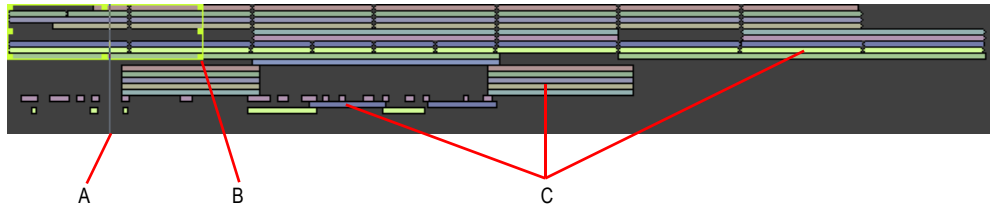
A. Now Time **B.** *Drag node to zoom* **C.** *Clips*

You can do the following with the Navigator pane:

• Scroll the display of the Clips pane (drag the green rectangle, or click in the Navigator pane)

• Zoom in and out in the Clips pane (drag a node on the green rectangle)

• Change the Now time using the Navigator pane (CTRL-click in the Navigator pane)

SONAR and screen readers for vision impaired users

SONAR has a special Accessibility Mode which can be helpful for vision impaired users when working with screen readers (Window-Eyes, JAWS, etc.). The Accessibility Mode is enabled by adding a key to the Windows Registry (WARNING: only do this if you are comfortable with editing the Windows registry; you may want to back up the registry first), and allows screen readers to receive various information from SONAR that may otherwise not be displayed on the screen (names, values, etc.).

The key is:

HKEY_CURRENT_USER\Software\Cakewalk Music Software\SONAR Producer\X2

Note: *If you use SONAR Studio or Essential, substitute "Producer" with "Studio" or "Essential".*

The Value is:

AccessibilityMode

It is a DWORD. Value can be 0, 1, 2 or 3:

0 - no accessibility (default)

1 - put the access string in the Track view's caption

2 - put the access string in the CWACCESS window

3 - put the access string in the CWACCESS window and make this window visible

SONAR empty view

To start working on a new or pre-existing project, choose **File > New** (to start a new project) or **File > Open** (to open a project).

See:

"You can create your own template files and use them as the basis for other new projects. For more information, see "Templates" on page 1064." on page 251

Piano Roll view

You can open the Piano Roll view by any of these methods:

- Select the track you want to edit and use the **Views > Piano Roll View** command or press ALT+3.
- Double-click a MIDI clip in the Clips pane (you can change this option with the Track view **Options > Click Behavior > Double-Click > MIDI Clips** command).

The Piano Roll view displays all MIDI notes and events from one or more tracks in either the Drum Grid pane or the Notes pane. The Notes pane is a grid format that looks much like a player piano roll. The Drum Grid pane is also laid out in a grid, but the sound of these drum notes are determined by the settings in the Drum Map pane. In both the Drum Grid pane and the Notes pane, notes are displayed as horizontal bars.

In the Notes pane, pitch runs from bottom to top, with the left vertical margin indicating the pitches as piano keys or note names. Time is displayed running left to right with vertical measure and beat boundaries.

In the Drum Grid pane, the drum sounds are mapped according to the current drum map in the Note Map pane. Like the Notes pane, time is displayed running left to right with vertical measure and beat boundaries.

The Piano Roll view makes it easy to add, edit, and delete MIDI events from a track.

The Piano Roll view consists of the "Notes pane" on page 1802, "Note Map pane" on page 1800, "Drum Grid pane" on page 1801, the "Controller pane" on page 679, and the "Track List pane" on page 1802.

For more information, see:

"Opening the view" on page 680

"Displaying notes and controllers (Piano Roll view only)" on page 683

"Adding and editing notes in the Piano Roll" on page 684

"Piano Roll view snap resolution" on page 691

"Adding and editing controllers in the Piano Roll" on page 695

Piano Roll view menu

View menu

The **View** menu contains the following commands:

- **Show/Hide Track Pane.**   Show or hide the Track pane.
- **Show/Hide Controller Pane.**   Show or hide the Controller pane.
- **Show/Hide Drum Pane.**   Show or hide the Drum pane.
- **Fit MIDI Content.**   Fit all displayed MIDI content into the visible area of the Piano Roll view.
- **MIDI Microscope.**   Activate Piano Roll Microscope mode. When Microscope mode is enabled, a transparent rounded square centered on the mouse cursor shows a zoomed in region of the Piano Roll data underneath it.
- **Show Clip Outlines.**   Show or hide clip outlines in the Piano Roll view.
- **Hide Muted Clips.**   Show or hide events that live in muted clips when working in the Piano Roll view.
- **Show vertical gridlines.**   Show or hide vertical grid lines in the Piano Roll view.
- **Grid resolution.**   Use the submenu to specify the vertical grid resolution:

Notes menu

The **Notes** menu contains the following commands:

- **Show Notes.**   Show or hide Note events in the Piano Roll view.
- **Show Durations.**   Show note durations for drum notes in the Drum pane.
- **Show Velocity.**   Show or hide velocity tails in the Piano Roll view.
- **Show/Hide Velocity Tails.**   Show or hide the velocity tails on MIDI notes in all tracks that are using Drum Maps.
- **Show Velocity on Selected Notes only.**   Show velocities for selected Note events only. This makes it easier to see and edit velocities when many Note events are present. It also makes it easier to change the velocity for individual Note events that are stacked (such as chords).
- **Show Velocity on Active Track only.**   When showing multiple tracks in the Piano Roll view, only show velocity for note events in the active track.

Controllers menu

The **Controllers** menu contains the following commands:

- **Select Controllers Along with Notes.**   When enabled, selecting a Note event or a range of Note events will also automatically select any Controller events that exist within the time range of the Note event(s).
- **Show Controller Handles.**   Show or hide edit handles on controller events.
- **Show All Controllers.**   Show all controllers in all displayed tracks.

Tracks menu

The **Tracks** menu contains the following commands:

- **Pick Tracks.**   Open the **Pick Tracks** dialog box, which lets you choose the tracks to display.
- **Show Next track.**   Display the next track or group of tracks.
- **Show Previous Track.**   Display the previous track or group of tracks.
- **Show All Tracks.**   Show all tracks that are open in the Piano Roll view.
- **Hide All Tracks.**   Hide all tracks that are open in the Piano Roll view.
- **Invert Tracks.**   Invert the visibility state of all tracks that are open in the Piano Roll view.

See also:

Note Map pane

The Note Map pane is where you map notes to specific drum sounds. The Note Map pane has the following columns:

- **Name.**   A user-assigned name for the note. The Name can be edited by clicking on it and entering a new name.
- **In Note.**   The recorded or original pitch of the note. The format can be either C0 through G10 or 0 through 127. There can be up to 128 entries in this column and each must be unique.

- **Out Note.** The Out Note column specifies the mapped pitch. The format can be either C0 through G10 or 0 through 127. There can be up to 128 entries in this column and each must be unique.
- **Mute.** Mutes the note.
- **Solo.** Solos the note.

See also:

Drum Grid pane

In this pane you can add, edit, and delete drum notes in a track or tracks. You can edit controllers in this pane if you hide the Controller pane. Only MIDI tracks that are assigned to a drum map appear in the Drum Grid pane.

See:

See also:

Notes pane

In this pane you can add, edit, and delete notes for a track or tracks. You can also edit controllers in this pane if you choose to hide the Controller pane.

See also:

See also:

Controller pane

This pane displays controller events, which you can edit. To show or hide the Controller pane, click the Piano Roll view **View** menu and choose **Show/Hide Controller Pane**, or press ALT+C.

See:

See also:

Track List pane

To show or hide the Track List pane, click the Piano Roll view **View** menu and choose **Show/Hide Track Pane**. The Track List pane is home to a list of all tracks currently displayed in the Piano Roll view. The track numbers and names appear in the Track List pane. Click the button again to hide the Track List pane.

For more information, see "The Piano Roll view" on page 677.

See:

"Working with multiple tracks in the Piano Roll view" on page 680

See also:

"Piano Roll view" on page 1798

"Piano Roll view menu" on page 1799

"Note Map pane" on page 1800

"Drum Grid pane" on page 1801

"Notes pane" on page 1802

"Controller pane" on page 1802

Step Sequencer view

The Step Sequencer makes it easy to compose patterns using a grid, where each cell (step) represents a note. You create patterns by clicking the cells in the grid to turn notes on or off, or by using step recording.

Many step sequencers use a Piano Roll grid-style interface. SONAR already has a very powerful Piano Roll view with similar MIDI editing functionality, so the purpose of the Step Sequencer is to provide a very different method for working with patterns.

The Step Sequencer is ideally suited for drum programming.

See:

"Step sequencer interface" on page 1804

"Working with rows" on page 1815

"Working with steps" on page 1817

"Working with Controller events" on page 1824

"Working with patterns" on page 1827

"Working with Step Sequencer clips" on page 1830

"Keyboard shortcuts" on page 1813

"Using the Step Sequencer with drum maps" on page 1829

Step sequencer interface

The Step Sequencer interface consists of five sections:

- **Menu.** Use the menu to load, save and clear patterns and specify various editing options. For details, see "Step Sequencer view menu" on page 1805.

- **Toolbar.** The toolbar contains transport controls and lets you specify the pattern length and behavior when inputting new notes. For details, see "Toolbar" on page 1806.

- **Rows.** Each row represents a unique pitch, and has its own independent group of controls. You can insert, delete and reorder rows. For details, see "Rows" on page 1808 and "Working with rows" on page 1815.

- **Notes pane.** The Notes pane is where you turn notes on and off to create a pattern. For details, see "Notes pane" on page 1811 and "Working with steps" on page 1817.

- **Controllers pane.** The Controllers pane is where you can create modulation events, such as Controller, Pitch Wheel, Channel Aftertouch, RPN and NRPN. For details, see "Controllers pane" on page 1812 and "Working with Controller events" on page 1824.

Figure 498. *Step sequencer interface*
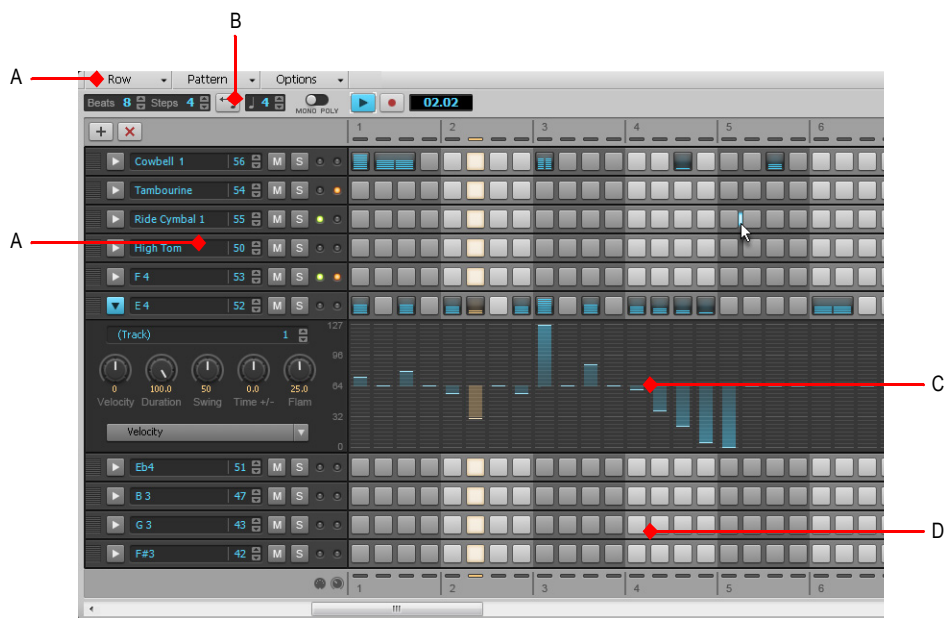
A. Menu A. Rows B. Toolbar C. Controllers pane (controls on the left side) D. Notes pane

See:

Step Sequencer view menu

Row menu

The **Row** menu contains the following commands:

- **Insert Row.**   Click to insert a new row. For details, see "To insert a row" on page 1815.
- **Delete Row.**   Click to delete a row. For details, see "To delete a row" on page 1816.
- **Rename Row.**   This command lets you rename a row.
- **Cut Row Steps.**   Click to cut a row's steps. The cut steps are placed on the Clipboard and can be pasted into another row. For details, see "To cut/copy/paste all notes in a row" on page 1819.
- **Copy Row Steps.**   Click to copy a row's steps. The copied steps are placed on the Clipboard and can be pasted into another row. For details, see "To cut/copy/paste all notes in a row" on page 1819.
- **Paste Row Steps.**   Click to paste the Clipboard contents to a row. For details, see "To cut/copy/paste all notes in a row" on page 1819.
- **Shift Steps Backward.**   Click to move all notes in a row to the left by one step. For details, see "To shift all notes in a row to the left or right" on page 1820.
- **Shift Steps Forward.**   Click to move all notes in a row to the right by one step. For details, see "To shift all notes in a row to the left or right" on page 1820.
- **Adjust Velocity Multiplier.**   This command lets you specify a level of compression or expansion for a pitch. The value range is 0.10 - 2.00 and the default value is 1.00 (no compression or expansion). A value below 1.00 is compression and a value above 1.00 is expansion. For details, see "To compress or expand all note velocities in a row" on page 1822.
- **Fill Every > 2-6.**   This command lets you automatically insert notes every, 2, 3, 4, 5, or 6 steps. For details, see "To automatically enable notes every "n" steps" on page 1819.

Pattern menu

The **Pattern** menu contains the following commands:

- **Load Pattern.**   Click to load a Pattern file (.spp) into the Step Sequencer.
- **Save Pattern As.**   Click to save the current pattern as a Pattern file (.spp).
- **Clear Pattern.**   Click to clear all steps in the current pattern.

Options menu

The **Options** menu contains the following commands:

- **Use fixed/default pattern velocity for step record.** This option lets you specify whether step recording should use the recorded velocity or a fixed velocity value for new notes. For information about setting a fixed velocity, see "To specify the default velocity value for new notes" on page 1821.

- **Preserve pattern for step sizes.** This option lets you specify how existing notes are affected when changing **Steps per Beat** value in the toolbar. When **Preserve Pattern for Step Size** is enabled, the original pattern is preserved whenever possible as you add or remove beats. Doing so ensures that notes retain their original position within each beat. When disabled, additional steps will instead be appended at the end of each beat.

- **Trigger note on click.** Enable this option is you want to automatically audition a note when clicking on a step.

- **Set default velocity for steps.** Lets you specify the default velocity value that is assigned to new notes that are enabled in the Step Sequencer. The setting is global, which means it applies to all step sequencer clips and projects. The default velocity value is 100.

See:

Toolbar

Figure 499. *Step sequencer toolbar*
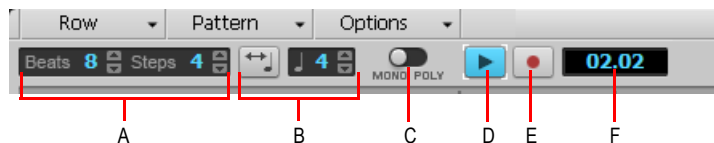
A. Pattern Length (beats per measure and steps per beat) B. Fit to Quarters C. Entry mode (monophonic or polyphonic) D. Play E. Step Record F. Position indicator

The **Step Sequencer** toolbar consists of the following controls:

- **Pattern Length.** The pattern length is determined by the following settings:

  - **Beats per Measure.** This setting specifies the number of beats per measure. The value range is 1-64 and the default value is 4 beats. Changes are undoable.

  - **Steps per Beat.** This setting specifies the number of steps per beat. The value range is 1-16

and the default value is 4 steps. Changes are undoable.

Note: *When changing the number of steps per beat, you can configure how existing notes are affected. By default, SONAR will preserve the original pattern whenever possible as you add or remove beats. Doing so ensures that notes retain their original position within each beat. If you prefer, you can instruct SONAR to instead append additional steps at the end of each beat. To toggle the behavior, click the* **Options** *menu and select* **Preserve Pattern for Step Sizes** *on the drop-down menu (enabled by default).*

• **Fit to Quarters.** **Fit to Quarters** will force the pattern duration to fit the specified number of quarter notes.

Note: *When you adjust the* **Fit to Quarters** *value, the clip duration may change depending on whether or not the clip has been rolled out to expose additional pattern iterations:*

• *If the clip has a single pattern iteration.* *When you change the* **Fit to Quarters** *value (number of quarter notes), the clip duration will continue to equal the length of one pattern iteration. That is, the clip will not be rolled out.*
• *If the clip has multiple pattern iterations.* *When you change the* **Fit to Quarters** *value (number of quarter notes), the new clip duration will either equal the old clip duration or the length of the new pattern, whichever is greater.*

• **Entry Mode Toggle.** This button toggles between Monophonic mode and Polyphonic mode, which affects the behavior when entering new notes. In Monophonic mode, only one note (row) may be assigned for each step. Monophonic mode is useful for sequencing melodic lines. When you click in a column to enter a new note, any existing notes in the same column will be removed automatically in Monophonic mode. In Polyphonic mode, you can enter multiple notes in the same column.

• **Step Record.** The **Step Record** button toggles step recording on/off. See "To step record notes from a MIDI device" on page 1823.

• **Play.** The **Play** button is used to start/stop the Step Sequencer when SONAR's main transport is idle.

• **Position Indicator.** The Position indicator shows the current measure and beat position in the step sequencer.

See:

Rows

*A. Drag to reorder rows B. Select row (and show Controllers pane) C. Note name (click to audition pitch)
D. Note number E. Mute F. Solo G. Incoming MIDI activity indicator H. Shared MIDI channel indicator I. Output
J. Step Editor parameter (Event Type picker) K. Velocity L. Duration M. Swing N. Time offset O. Flam
P. Output channel*

Each row represents a specific pitch. Similar to the Drum Editor in the Piano Roll view (in some ways, you can think of a row as a different way of looking at the Drum Map Manager in "MIDI - Drum Map Manager (Advanced)" on page 1675), the controls for each row are located at the left side of the row.

You can insert, delete and reorder rows. The current row is outlined to indicate which row has focus.

To expose all controls, click a row's **Select** button. Each row has the following controls:

• **Select.**   Use this button to expose advanced parameters and select the row or rows you want to edit in the Controllers pane. If multiple rows are selected, the Controllers pane is displayed below the top-most selected row. The Controllers pane is hidden if no rows are selected. See "To select rows" on page 1816, "To edit controller events on a single row" on page 1825 and "To edit controller events on multiple rows simultaneously" on page 1826.

• **Note Name.**   This control shows the name of the note to which the row is mapped. Click the note name to audition the pitch. To rename the note, right-click the row and select **Rename Note** from the pop-up menu.

• **Note Number.**   Use this control to specify the row's input note.

- **Mute.** This button mutes the row/note/pitch.
- **Solo.** This button solos the row/note/pitch.
- **Incoming MIDI activity indicator.** This indicator lights up if the row is receiving MIDI input.
- **Shared MIDI channel indicator.** This indicator lights up if a selected row shares the same MIDI channel as any other row. This is a convenient reminder that any controller events you insert in the row will also affect all other rows that share the same MIDI channel.
- **Output.** Use this control to assign all selected rows to any available software instrument or drum map. You can also access the **Map Properties** dialog box from the drop-down menu. By default, each row is assigned to the track's output. If you assign different rows to different outputs, the step sequencer will automatically assign the rows to a new drum map (see "Using the Step Sequencer with drum maps" on page 1829).
- **Channel.** Use this control to specify the output channel for all selected rows.
- **Velocity.** Use this control to apply a velocity offset to a pitch. The value range is -127 to +127 and the default value is 0.
- **Duration.** The Duration knob controls how long each note is held. The value range is 0 to 100% and the default value is 100% (hold each note for its full duration).
- **Swing.** The Swing knob controls the amount of swing that is applied to the sequence. The value range is 0 to 100% and the default value is 50% (no swing).

The default swing value of 50% means that the beats are spaced evenly. A value of 66% means that the time between the first and second beats is twice as long as the time between the second and third beats.

- **Time offset.** This knob lets you apply a time offset to all steps in a row. This is very useful for fine-tuning the rhythm of a pattern. The value range is -50% to 50% and the default value is 50% (no swing).
- **Flam.** This knob lets you adjust the timing of any flammed notes. A flam is a quiet "grace" note that is added to the beginning of a louder "primary" note, resulting in a fuller sounding note when played almost simultaneously. The value range is -50% to 50%. With a value of 50%, the flam is hit exactly in the middle of the step. See "To add/remove a flam" on page 1822.

View reference
Step Sequencer view

Row context menu

You can right-click any row to access the following commands:

- **Insert Row.**   Click to insert a new row. For details, see "To insert a row" on page 1815.
- **Delete Row.**   Click to delete a row. For details, see "To delete a row" on page 1816.
- **Cut Row Steps.**   Click to cut a row's steps. The cut steps are placed on the Clipboard and can be pasted into another row. For details, see "To cut/copy/paste all notes in a row" on page 1819.
- **Copy Row Steps.**   Click to copy a row's steps. The copied steps are placed on the Clipboard and can be pasted into another row. For details, see "To cut/copy/paste all notes in a row" on page 1819.
- **Paste Row Steps.**   Click to paste the Clipboard contents to a row. For details, see "To cut/copy/paste all notes in a row" on page 1819.
- **Shift Steps Forward.**   Click to move all notes in a row to the right by one step. For details, see "To shift all notes in a row to the left or right" on page 1820.
- **Shift Steps Backward.**   Click to move all notes in a row to the left by one step. For details, see "To shift all notes in a row to the left or right" on page 1820.
- **Velocity Multiplier.**   This command lets you specify a level of compression or expansion for a pitch. The value range is 0.10 - 2.00 and the default value is 1.00 (no compression or expansion). A value below 1.00 is compression and a value above 1.00 is expansion. For details, see "To compress or expand all note velocities in a row" on page 1822.
- **Rename Row.**   This command lets you rename a row.
- **Fill Every > 2-6.**   This command lets you automatically insert notes every, 2, 3, 4, 5, or 6 steps. For details, see "To automatically enable notes every "n" steps" on page 1819.

See:

Notes pane

The Notes pane consists of the following controls:

Rows. Each row represents a specific pitch. Similar to the Drum Editor in the Piano Roll view (in some ways, you can think of a row as a different way of looking at the Drum Map Manager in "MIDI - Drum Map Manager (Advanced)" on page 1675), the controls for each row are located at the left side of the row and has the following controls:

- **Note Cells (steps).**   Notes are enabled by clicking in a cell and disabled by right-clicking. Active steps are highlighted during playback. For more information about editing steps, see "Working with steps" on page 1817.

- **Beat Counter.**   The Beat Counter is displayed above the step grid and each "light" in the counter represents a step. Each beat is displayed in an alternate color and the current step is highlighted during playback.

- **Scroll Bars.**   Horizontal and vertical scroll bars make it easy to navigate around a sequence that contains many rows or steps.

See:

Controllers pane

The Controllers pane in the Step Sequencer is similar to the Controllers pane in the Piano Roll view and allows you to include Controller, Pitch Wheel, Channel Aftertouch, RPN and NRPN events in your sequences. You can also edit velocity values in the Controllers pane.

To display the Controllers pane, click a row's **Select** button. Any edits performed in the Controllers pane apply to all selected rows.

For more information about working with controller events, see "Working with Controller events" on page 1824 and "Adding and editing controllers in the Piano Roll" on page 695.

*A. Click a row's **Select** button to show the Controllers pane below the row B. Select the controller type you want to edit in the Controllers pane C. Note cells D. Controllers pane*

See:

Keyboard shortcuts

You can use the keyboard to navigate around the Step Sequencer interface and adjust settings. A focus rectangle indicates the step/control that is selected.

Action	Key
Open the Step Sequencer View	ALT+4
Insert a new row above the selected row	INSERT
Delete the active row	DELETE
Move focus to the previous control	LEFT ARROW
Move focus to the next control	RIGHT ARROW
When there are multiple strips, move focus to the same control on the previous row	UP ARROW
When there are multiple strips, move focus to the same control on the next row	DOWN ARROW
When focus is on a control in the steps pane, move focus to the strips pane	CTRL+LEFT ARROW
When focus is on a control in the strips pane, move focus to the steps pane	CTRL+RIGHT ARROW
When focus is either on the steps or strips pane, move focus to the toolbar	CTRL+UP ARROW
When focus is on the toolbar, move focus to the strips pane	CTRL+DOWN ARROW
When focus is on steps, toggle step or tie on/off; for buttons, turn on/off	ENTER
When focus is on a step, allow velocity adjustment	SHIFT+ENTER
For spinner controls, increase/decrease value; fine adjust for knobs	+ / - (PLUS and MINUS)
Coarse adjust for knobs	[/] (square brackets)
Toggles the **Audition** (Play) button for the view	CTRL+SHIFT+SPACEBAR
When focus is on the steps pane, move focus to the next enabled note on the same row	TAB
When focus is on the steps pane, move focus to the previous enabled note on the same row	SHIFT+TAB
Shift the active row's steps by 1 step and wrap first step to the end	ALT+LEFT ARROW
Shift the active row's steps by 1 step and wrap the last step to the beginning	ALT+RIGHT ARROW
Load a pattern	CTRL+ALT+L

Table 270.

Action	Key
Save the current pattern	CTRL+ALT+S
Enable/disable MIDI step recording	ALT+R
Go to previous step when step recording	COMMA (,)
Go to next step when step recording	PERIOD (.)

Table 270.

ⓘ **Note:** *You can also use a mouse wheel to adjust the value of the control that has focus. When adjusting note velocities, hold down the SHIFT key for fine control.*

If a knob has focus, you can press ENTER or F2 and type the desired value in an edit box.

See:

Using the Step Sequencer

To open the Step Sequencer

1. Do *one* of the following:
   - **To edit an existing pattern.** Select the Step Sequencer clip that you want to edit in the Step Sequencer.
   - **To create a new pattern.** Click the MIDI track in which you want to create the new pattern. The track then becomes the active track. Make sure that no MIDI clips are selected.
2. Do *one* of the following:
   - Select **Views > Step Sequencer**.
   - Press ALT+4.

The Step Sequencer window appears.

Note 1: *You can also open an existing pattern in the Step Sequencer by double-clicking an existing Step Sequencer clip.*

Note 2: *The **Views > Step Sequencer** command is disabled if multiple Step Sequencer clips are selected.*

See:

Working with rows

To insert a row

Do *one* of the following:

- Click the **Insert Row** button ⊞ .
- Press the INSERT key.
- Right-click a row and select **Insert Row** from the pop-up menu.

To delete a row

- Right-click a row and select **Delete Row** from the pop-up menu.

Or

1. Click the row you want to delete (so it has focus).
2. Do *one* of the following:
   - Click the **Delete Row** button ❌ .
   - Press the DELETE key.

> ℹ️ **Note:** *By default, the Step Sequencer opens with 12 rows. If you delete any rows in a pattern that contains no note events—or the track is not assigned to a drum map—the Step Sequencer will revert to 12 rows the next time it is opened.*

To reorder a row

1. Click the drag handle for the row that you want to reorder and keep the mouse button pressed.
2. Drag the mouse up or down to reorder the row.

   The row is outlined in order to show its current position. The yellow outline indicates the row that will be dragged and the red outline indicates where it will go when you release the mouse button.

3. Release the mouse button when the row has been moved to the desired position.

A. Click the row's handle and drag up/down to reorder a row

To select rows

Do one of the following:

- To select a single row, click the row's **Select** button.
- To select all rows, press CTRL+A (make sure the Step Sequencer view has focus).
- To select a range of rows, do one of the following:
  - Click the first row's **Select** button, then hold down the SHIFT key and click the last row's **Select** button.
  - Click the first row's **Select** button and drag up/down to select adjacent rows.

- To select discontiguous rows or to toggle a row's select state, hold down the CTRL key while you click the desired row's **Select** button.

  The Controllers pane is displayed below the selected row. If multiple rows are selected, the Controllers pane is displayed below the top-most selected row. If no rows are selected, the Controllers pane is hidden.

  Editing in the Controllers pane affects all selected rows.

ⓘ **Note:** *The **Shared MIDI Channel** indicator lights up if a selected row shares the same MIDI channel as any other row. This is a convenient reminder that any controller events you edit in the row will also affect all other rows that share the same MIDI channel.*

To rename a row

1. Do *one* of the following:
   - Right-click a row and select **Rename Row** from the pop-up menu.
   - Click the row's name to give it focus, then press ENTER or F2.
2. Type a new name and press ENTER.

See:

Working with steps

*A. Disabled step **B.** Enabled step (double-click to create a flam) **C.** Current step (yellow) **D.** Merged steps
E. Flammed step*

To enable a note

Do *one* of the following:

- **To enable a single note.**   Click on the note that you want to enable.
- **To enable multiple notes of the same pitch.**   Click on the first note that you want to enable and drag across all other notes you want to enable. By default, dragging is constrained to a single row. If you want to freely drag across different rows, hold down the ALT key while dragging.

The note is enabled.

SONAR creates a new Step Sequencer clip when you enable the first note in an empty pattern.
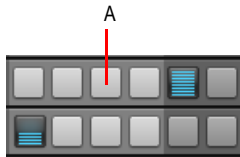
A. Click an empty step to enable the note

> **Tip:** *If you want to hear the note when you click on a step, see "To audition a note when clicking on a step" on page 1818.*

To audition a note when clicking on a step

To enable note audition when you click on an empty step:

Click the Step Sequencer view **Options** menu and select **Trigger Note on Click**.

The **Trigger Note on Click** option is disabled by default.

To automatically enable notes every "n" steps

You can quickly enable notes every 2, 3, 4, 5 or 6 steps:

1. Click on the step where you want the first note to be enabled. If a step is not selected, the first step in the row will be used.

2. Do *one* of the following:

   • Right-click the row you would like to enable the notes on, point to **Fill Every**, then select **2**, **3**, **4**, **5**, or **6**, depending on the desired interval.

   • Press CTRL+2, CTRL+3, CTRL+4, CTRL+5, CTRL+6, depending on the desired interval.

   Notes are enabled at the specified intervals.

> **Note:** *If the **Entry Mode** is **Polyphonic**, enabled notes will be merged with any existing notes in the row. If the **Entry Mode** is **Monophonic**, existing notes in the row will be cleared.*

To disable a note

Do *one* of the following:

• **To disable a single note.** Right-click on the note that you want to disable.

• **To disable multiple notes of the same pitch.** Right-click on the first note that you want to disable and drag across all other notes that you want to disable. By default, dragging is constrained to a single row. If you want to freely drag across different rows, hold down the ALT key while dragging.

The note is disabled.
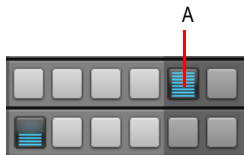
A. Right-click a note to disable the step

To cut/copy/paste all notes in a row

You can cut or copy all notes from a row and paste the notes to any other row:

1. Right-click to the right of the row that contains the notes you want to cut/copy and select **Cut Row Steps** or **Copy Row Steps** from the pop-up menu.

   The events are placed on the Clipboard.

2. Right-click to the right of the row where you would like to paste the notes and select **Paste Row Steps** from the pop-up menu.

   The note events are pasted to the new row and any existing events in the row are removed.

To shift all notes in a row to the left or right

You can easily move all notes in a row to the left or right by one step:

1. Right-click to the right of the row that contains the notes you want to move.

   A pop-up menu appears.

2. Select **Shift Steps Forward** or **Shift Steps Backward** from the pop-up menu.

Or

1. Click a row to give it focus.

2. Press ALT+LEFT ARROW or ALT+RIGHT ARROW.

   All notes in the row are moved by one step.

To shift all notes in a column up or down by one row

You can easily move all notes in a column up or down by one row:

1. Click any existing note in the column you want to move up or down. (so the note has focus).

2. Press ALT+DOWN ARROW or ALT+UP ARROW.

   All notes in the same column are moved down or up by one row.

To clear all steps

To clear all steps in the pattern, click the Step Sequencer view **Pattern** menu and select **Clear Pattern**.

To merge/unmerge notes

Do *one* of the following:

- **Merge adjacent notes.**   Hold down the CTRL key, click the first note you want to merge and keep the mouse button pressed, then drag across all other notes you want to merge.

- **Unmerge adjacent notes.**   Hold down the CTRL key, right-click the first note you want to unmerge and keep the mouse button pressed, then drag across all other notes you want to unmerge.

A. Unmerged note B. Merged notes

To edit a note's velocity

A note's velocity is shown inside the note cell (step).

To edit a note's velocity value, do *one* of the following:

• Click a row's **Select** button to show the Controllers pane, select **Velocity** in the **Step Editor** list, then draw velocity changes in the Controllers pane.

• Hold down the SHIFT key and drag the note up/down.

• Hold down the CTRL key, double-click a note and enter the desired velocity value.

• Click a note to give it focus and use a mouse wheel to adjust the velocity value. Hold down the SHIFT key for fine control.

You can also edit the velocities of multiple notes in one operation:

1. Hold down the SHIFT key and click a step to enter Velocity Editing mode.

    Two horizontal lines are displayed to indicate the range that you can move the mouse to adjust velocities.

2. Drag the mouse up or down across other rows to change the velocities of the steps in that row. Only steps in the same row may be edited.

    Velocity values are updated in real-time as you move the mouse within the row.

3. To commit the new velocity values, move the mouse pointer outside the row or release the mouse button.

> **Note:** *If you would like to audition velocity changes while editing velocities, make sure the* **Trigger Note on Click** *option is enabled (see "To audition a note when clicking on a step" on page 1818).*

For more information about working with controller events and velocities, see "Adding and editing controllers in the Piano Roll" on page 695.

To specify the default velocity value for new notes

By default, all new note events have a fixed velocity value of 100. To change the default velocity value for new notes:

1. Click the Step Sequencer view **Options** menu and select **Set default velocity for steps**.

    The **Set Default Velocity for Steps** dialog box appears.

2. Specify the desired velocity value and click **OK**.

> **Note:** *The default velocity setting is global and only affects new notes.*

To compress or expand all note velocities in a row

1. Right-click a row and select **Adjust Velocity Multiplier** from the pop-up menu.

    The **Adjust Velocity Multiplier** dialog box appears.

2. Do one of the following:

    *   To compress the note velocities, specify a value below 1.00.
    *   To expand the note velocities, specify a value above 1.00.

To add/remove a flam

*   Double-click the desired step.

    Flammed steps are drawn with a dividing marker halfway through the step.

    To adjust a row's flam timing, click the row's **Select** button to show the Controllers pane, then adjust the **Flam** knob as desired.
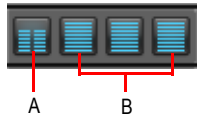
A. *Flammed step* **B.** *Normal steps*

To add slide (portamento) to notes

To create a smooth slide between two pitches, you must insert controller events in the Controllers pane. For details, see "To create a smooth slide (portamento) between pitches" on page 1826.

To specify the likelihood that a note will play (randomize)

You can specify the probability of whether an enabled note will play or not. By default, all enabled notes have a **Probability** value of 100%, which means the notes always play. To reduce the likelihood that a note will play, decrease the **Probability** value.

1. Click a row's **Select** button.

    The Controllers pane appears below the row.

2. Click the **Step Editor** control and select **Probability** from the drop-down menu.

3. Draw events in the Controller pane to specify the desired **Probability** value for each note. The **Probability** value specifies the likelihood that a note will play. The value range is 1 (seldom) to 100 (always).

To step record notes from a MIDI device

In addition to entering note events with the mouse, you can also use a MIDI input device to enter notes.

1. To enable MIDI step recording, do *one* of the following:

   - Click the **Record** button ⬤ in the Step Sequencer.

   - Right-click the **Play** button ▶ in the Step Sequencer.

   - Make sure the Step Sequencer window has focus and press CTRL+R.

   The **Step Record** button displays a red circle ⬤ to indicate that MIDI Step Recording mode is enabled and the Position Indicator indicates the current position with a red light ▬ ▬ ▬ ▬.

2. On your MIDI input device, play the note(s) that you would like to assign to the current step (as indicated by the red light in the Position Indicator).

   The Step Sequencer will listen for any and all notes that are pressed until a note is released, at which time the notes that were pressed will be turned on and the Step Sequencer will automatically advance to the next step. The following rules apply when step recording:

   - If the pitch that is pressed is already mapped to a row in the Step Sequencer, then the note is turned on.

   - If the pitch that is pressed is not mapped to a row in the Step Sequencer, then the step is skipped.

   - Undo (CTRL+Z) will undo the most recent step entry and move the current position back by one step.

3. To disable step recording, right-click the **Play** button again or press CTRL+R.

   The **Play** button changes back to its normal state ▶.

Specifying Velocity for Step Recording

You can specify whether step recording should use the recorded velocity or a fixed velocity value for new notes. To toggle between the two behaviors, right-click on the **Step Sequencer** toolbar and select **Use Fixed/Default Velocity for Step Recording** from the pop-up menu.

For more information about configuring the default velocity value, see "To specify the default velocity value for new notes" on page 1821.

Step Record Shortcuts

Action	Key
Enable/disable MIDI step recording	CTRL+R
Move the current step backward by one step	COMMA (,)
Move the current step forward by one step	PERIOD (.)
Undo the most recent step entry and move the current position backward by one step	CTRL+Z

Table 271.

Tip: *To insert a rest, simply move the step forward or backward without pressing a key on your MIDI controller.*

See:

Working with Controller events

You use the Controllers pane to include modulation events, such as Controller, Pitch Wheel, Channel Aftertouch, RPN and NRPN events, in your patterns. Modulation events are independent for each row.

Note: *Modulation events on one row may also affect other rows that share the same output port and channel pair. **Velocity** and **Time Offset** parameters are always independent for each row, regardless of port/channel assignments.*

To edit controller events on a single row

1. Click a row's **Select** button.

   The Controllers pane appears below the row. The Controllers pane contains a series of columns that correspond to the steps in the selected row.

   ⓘ **Note:** *The **Shared MIDI Channel** indicator lights up if a selected row shares the same MIDI channel as any other row. This is a convenient reminder that any controller events you edit in the row will also affect all other rows that share the same MIDI channel.*

2. Click the **Step Editor** control and select a parameter name from the drop-down menu.

   If the desired parameter is not listed, select **New Value Type** to open the **MIDI Event Type** dialog box and specify the following options:

   • **Type.** Choose the type of controller you want to add (for example, choose Control if you want to edit volume).

   • **Value.** This field is unavailable if you choose **Wheel** or **ChanAft** in the **Type** field. If you choose **Control**, **RPN**, or **NRPN** in the **Type** field, choose which Control, RPN, or NRPN you want to add. For example, to edit volume, choose **7-Volume** in this field if you chose **Control** in the **Type** field.

   • **Channel.** Choose a MIDI channel for the controller event.

3. Do one of the following:

   • **To draw a single controller event.** Click in the Controllers pane.

   • **To draw a series of controller events.** Drag in the Controllers pane.

   • **To draw a straight line.** Hold down the SHIFT key and drag in the Controllers pane.

   • **To erase controller events.** Right-click an existing controller event.

*A. Click a row's **Select** button to show the Controllers pane below the row **B.** Select the controller type you want to edit in the Controllers pane **C.** Draw events in the Controllers pane*

To edit controller events on multiple rows simultaneously

1. Select all the rows you want to edit. For details, see "To select rows" on page 1816.

   The Controllers pane appears below the top-most selected row.

2. Click the **Step Editor** control and select a parameter name from the drop-down menu.

   If the desired parameter is not listed, select **New Value Type** to open the **MIDI Event Type** dialog box and specify the following options:

   - **Type.** Choose the type of controller you want to add (for example, choose Control if you want to edit volume).

   - **Value.** This field is unavailable if you choose **Wheel** or **ChanAft** in the **Type** field. If you choose **Control**, **RPN**, or **NRPN** in the **Type** field, choose which Control, RPN, or NRPN you want to add. For example, to edit volume, choose **7-Volume** in this field if you chose **Control** in the **Type** field.

   - **Channel.** Choose a MIDI channel for the controller event.

3. Do one of the following:

   - **To draw a single controller event.** Click in the Controllers pane.

   - **To draw a series of controller events.** Drag in the Controllers pane.

   - **To draw a straight line.** Hold down the CTRL key and drag in the Controllers pane.

   - **To adjust all existing events.** Hold down the SHIFT key and drag in the Controllers pane.

   - **To erase controller events.** Right-click an existing controller event.

   The edits are applied to all selected rows.

To create a smooth slide (portamento) between pitches

1. Click a row's **Select** button.

   The Controllers pane appears below the row.

2. Click the **Step Editor** control and select **Slide/Portamento** from the drop-down menu.

3. Draw events in the Controller pane where you want to create a slide. The **Slide/Portamento** value specifies the time it takes for the next note to reach its pitch. The value range is 0 (off) to 127 (longest).

See:

Working with patterns

To create a brand new pattern

1. Click the MIDI track in which you want to create the new pattern. The MIDI track then becomes the active track. Make sure that no MIDI clips are selected.

2. Select **Views > Step Sequencer**.

The Step Sequencer window appears and SONAR creates a new Step Sequencer clip in the active track.

By default, each row is assigned to the track's output.

> **Note:** *You can also create a new Step Sequencer clip by clicking the **Step Sequencer** button on a software instrument's property page. Doing so creates a new Step Sequencer clip on the first MIDI track or on the Instrument track that corresponds to the software instrument, and the Step Sequencer view opens.*

To convert a MIDI clip to a Step Sequencer pattern

You can convert any existing MIDI clip into a step sequencer pattern. For details, see "To convert a MIDI clip(s) to a Step Sequencer clip(s)" on page 1830.

To edit an existing pattern

Do *one* of the following:

• Select the Step Sequencer clip that you want to edit in the Step Sequencer and select **Views > Step Sequencer**.

• Double-click the Step Sequencer clip.

The Step Sequencer window appears.

> **Note:** *A step sequencer clip can only be edited in the Step Sequencer view and not in any other MIDI editing views.*

To save a pattern

Do *one* of the following:

- Click the Step Sequencer view **Pattern** menu and select **Save Pattern As**.
- Right-click in the **Step Sequencer** toolbar and select **Save Pattern** from the pop-up menu.
- Press CTRL+ALT+S.

To specify the default folder for patterns:

1. On the **Edit** menu, click **Preferences** and then click **File - Folder Locations**.
2. Specify the folder location for Step Sequences.

To load a pattern

Do *one* of the following:

- Click the Step Sequencer view **Pattern** menu and select **Load Pattern**.
- Right-click in the **Step Sequencer** toolbar and select **Load Pattern** from the pop-up menu.
- Press CTRL+ALT+L.
- Drag a pattern from the Media Browser view and drop it in the Notes pane.

You can press CTRL+Z to undo the loaded pattern.

When you load a new pattern, the current pattern is cleared and replaced by the new pattern.

To specify the default folder for patterns:

1. On the **Edit** menu, click **Preferences** and then click **File - Folder Locations**.
2. Specify the folder location for Step Sequences.

Note: *If other clips are linked to the current Step Sequencer clip, all linked sibling clips will be updated with the loaded pattern.*

To preview a pattern

You can preview step sequencer patterns (.ssp) in the Media Browser. For details, see "To preview MIDI content" on page 570.

To step record a pattern

See "To step record notes from a MIDI device" on page 1823.

See:

Using the Step Sequencer with drum maps

By default, all rows in a Step Sequencer clip are assigned to the track's output port, which could be a hardware MIDI port, a software instrument, or a drum map.

If you re-assign rows to different output ports, the Step Sequencer will automatically assign the rows to a new drum map.

The following diagram illustrates how the Drum Editor in the Piano Roll view, the Step Sequencer and the **Drum Map Properties** dialog box are all interconnected when using a drum map.
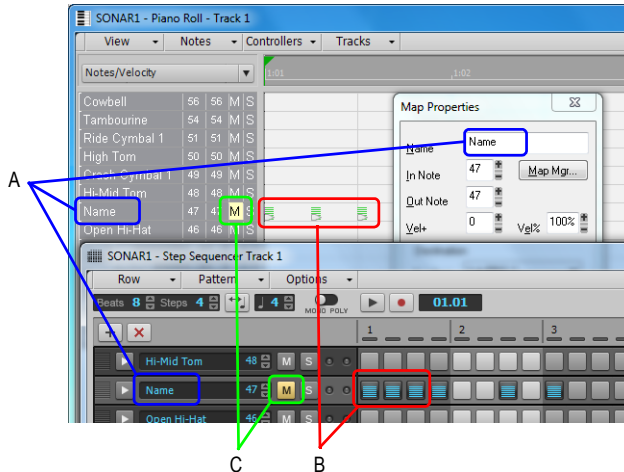
A. Note Name B. Notes C. Mute, Solo, Velocity and Velocity Multiplier are separate for the drum map and step sequencer

A change made in the **Drum Map Manager** dialog box will affect the Step Sequencer and vice versa.

> **Note:** *Mute, Solo, Velocity and Velocity Multiplier are separate for the drum map and step sequencer.*

To edit the drum map properties of a note

1. Click a row's **Select** button to show all controls for the selected row.
2. Click the **Output** control and select **Open Drum Map Manager** from the drop-down menu.

    The **Map Properties** dialog box appears.
3. Configure the drum map properties as desired. For more information, see "The Map Properties dialog" on page 763.

Clicking on another row in the Step Sequencer window will update the Map Properties to display information for the new row.

See:

Working with Step Sequencer clips

When you create a sequence in the Step Sequencer, SONAR creates a new Step Sequencer clip.

A Step Sequencer clip shows the first iteration of the sequence/pattern and all Step Sequencer clips can be identified by a small Step Sequencer clip icon ⊞ in the top right corner of the clip. Step sequencer clips are somewhat similar to MIDI Groove clips; you can drag the left and right edges of a Step Sequencer clip to show additional iterations of the sequence pattern.

To convert a MIDI clip(s) to a Step Sequencer clip(s)

You can convert any existing MIDI clip into a step sequencer clip:

1. Select the MIDI clip(s) you want to convert to a step sequencer clip(s).

2. Right-click the selected clip and choose **Convert MIDI Clip(s) to Step Sequencer** from the Clips pane context menu (hover the mouse over the bottom of the context menu in order to show any "hidden" commands).

   The **Convert MIDI Clip(s) to Step Sequencer** dialog box appears.

3. If you want the Step Sequencer to preserve the original timing of the note events instead of quantizing them to the nearest step, select **Preserve original timing (using step offsets)**. The notes will be adjusted to fit the steps, and per-step timing offsets will be created so that the result has the same note times as the original MIDI clip. Any human feel in the part will be preserved.

   If **Preserve original timing (using step offsets)** is not selected, the resulting clip will essentially be a quantized version of the original clip. The start of the clips will be the same and the first notes will be the same. The only thing that will possibly be different is the length of the clip (due to quantizing) and the notes in it may be moved slightly so they fit into the steps.

4. Specify the desired resolution value and click **OK**.

Note: *The resolution value should correspond to the shortest note value that you expect. For example, if you specify Sixteenth notes, you will get four steps per beat. The choices are:*

- *Quarter (1 step per beat)*
- *Eighth (2 steps per beat)*
- *Eighth Triplet (3 steps per beat)*
- *Sixteenth (4 steps per beat)*
- *Sixteenth Triplet (6 steps per beat)*
- *32nd (8 steps per beat)*
- *32nd Triplet (12 steps per beat)*

If a MIDI Groove clip contains any variations between different iterations, each unique iteration will be converted to a separate Step Sequencer clip.

To unlink copied Step Sequencer clips

When you copy step sequencer clips, all copies are linked to each other. This means that any further edits to any of the clips will be automatically reflected in all other linked sibling clips.

If you want to edit one instance of a step sequencer clip without affecting any other clips, you must first unlink the clip you want to edit:

1. Right-click the step sequencer clip in the Clips pane to show the Clips pane context menu.
2. Select **Unlink Step Sequencer Clips** from the context menu (point the mouse over the bottom of the context menu in order to show any "hidden" commands).

The clip is now unlinked from the other clips.

Tip: *If you frequently need to unlink step sequencer clips, assign the* **Unlink Step Sequencer Clips** *to a key binding (see* "Key bindings" *on page 1066).*

See:

Event List view

Open the Event List view by:

- Selecting one or more tracks and choosing **Views > Event List**.
- Right-clicking a track in the Clips pane and choosing **Views > Event List**.
- Pressing ALT+8.

The Events List view hides or displays all the events in a project in a list. To filter which events are shown in the Event List view, click Event List view View menu and select the desired event types. You can insert, delete, or change any kind of event, with the exception of Shape events which can only be deleted. Events are displayed in a list format. You can insert, delete, or modify any kind of event, including notes, pitch wheel data, velocity, MIDI controllers, patch changes, wave files, lyrics, text strings, MCI commands, System Exclusive meta-events, and more.

Figure 501. *The Event List view*
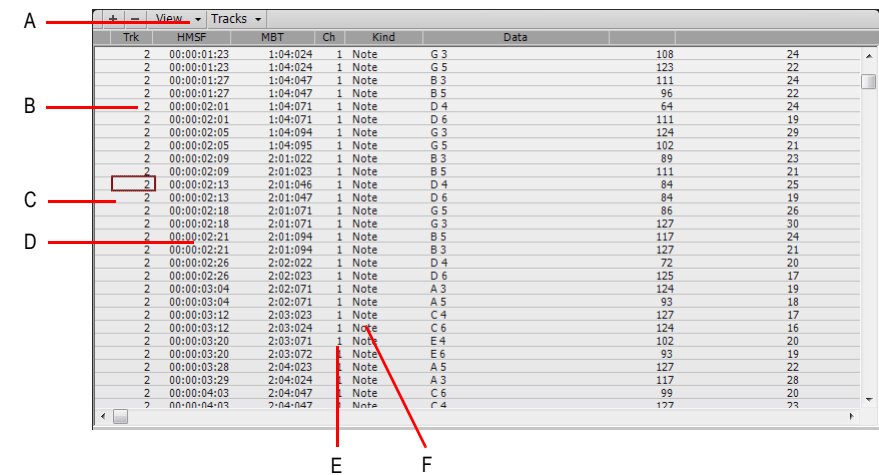
A. Menu   B. Track C. This event is selected D. Event time E. Event channel F. Event type

See:

Staff view

Open the Staff view by any of these methods:

• Use the **Views > Staff View** command.

• Select **Staff** from the Clips pane right-click pop-up menu.

• Press ALT+6.

The Staff view displays MIDI note events as musical notation. For some musicians, this may be the most familiar and comfortable view in which to work. The Staff view provides many features that make it possible for you to compose, edit, and print music.

The Staff view menu and toolbar buttons contain all the commands and options you need to enter and edit notes, and control the display of your notation.

The Staff view is composed of a Staff pane and a Fretboard. When you first open the Staff view, you may see only the Staff pane and not the Fretboard. Resize the Staff view by dragging its edges until you can see everything easily. When you save your file, whatever size the Staff view is will be the way it appears the next time you open the file.

The **Staff pane** displays MIDI note events as musical notation. For some musicians, this may be the most familiar and comfortable view in which to work. The Staff pane provides many features that make it easy for you to compose, edit, and print music. You can choose from a wide variety of clefs to display your music (see "To change the Staff pane layout" on page 1074).

For guitar players who are new to musical notation, the **Fretboard** represents the notes in the Staff pane as they would appear on a guitar or bass fretboard. All notes that appear in the Staff pane at the Now Time are shown in the Fretboard. Page through your track by pressing CTRL+RIGHT ARROW and watch the note names in the Fretboard appear. If you enter notes in the staff at the Now Time, they appear on the fretboard. Likewise, you can enter notes into the staff at the Now Time by clicking the guitar strings on the fretboard. Notes and chords shown in the fretboard can be easily edited by dragging them up and down the guitar strings.

Staff view menu

Print menu

• **Print.** Open the "Print dialog" on page 1737 box, which let's you print notation.

• **Print Preview.** Open the SONAR Print window, where you can view your document before you print it.

• **Export to ASCII Tab.** Open the "Save As dialog" on page 1749, where you can set the name and location for an ASCII text file of a track's tablature.

• **Export to MusicXML.** Open the "Save As dialog" on page 1749, where you can export the displayed notation as MusicXML. For details, see "Export to MusicXML (Producer only)" on page 1107.

Edit menu

The **Edit** menu contains the following commands:

- **Layout.**   Open the **Staff View Layout** dialog box.
- **Quick TAB.**   Create tablature based on standard fingering patterns. After you try the quick version, you can customize the tablature to your liking.
- **Regenerate TAB.**   Generate a new TAB staff in the Staff pane.
- **Play Previous.**   Play the previous note from the Now time.
- **Play Next.**   Play the next note from the Now time.

View menu

The **View** menu contains the following commands:

- **Show/Hide Track Pane.**   Show or hide the Track pane.
- **Show/Hide Fret View.**   Show or hide the guitar fretboard display.
- **Display Resolution.**   Use the submenu to specify the smallest note duration that will display in the Staff view.
- **Fill Durations.**   Visually round up notes to the next note or beat, whichever comes first—useful for displaying recorded MIDI notes, but not for entering notes with the Draw tool
- **Trim Durations.**   Visually round down note durations if they extend a little past the start of the next note—useful for displaying recorded MIDI notes, but not for entering notes with the Draw tool.

Tracks Menu

The **Tracks** menu contains the following commands:

- **Pick Tracks.**   Open the **Pick Tracks** dialog box, which lets you choose the tracks to display.
- **Show Next Track(s).**   Display the next track or group of tracks.
- **Show Previous Track(s).**   Display the previous track or group of tracks.

Toolbar

The Staff view toolbar contains the following buttons:

- **Zoom in/out.**   Zoom in/out horizontally and vertically.
- **Lyrics.**   Use the Draw tool to insert Lyric events.
- **Chords.**   Use the Draw tool to insert Chord events. After you enter a chord, right-click it to edit it.
- **Expression.**   Use the Draw tool to insert Expression events. Click below a staff to create a text box, type some dynamics, and press ENTER.
- **Hairpin.**   Use the Draw tool to insert Hairpin events (crescendo or decrescendo markings).

- **Pedal.**   Use the Draw tool to insert Pedal events. Click below a staff to enter a pedal down marker and a pedal up marker. You can drag both markers to reposition them.
- **Cursor position.**   This field shows the cursor's current position in both project time and pitch level. The pitch level is listed in both letter and number formats.

For more information, see:

Lyrics view

Open the Lyrics view by any of these methods:

- Using the **Views > Lyrics** command, or press ALT+SHIFT+1.
- Using the **Lyrics** command from the Clips pane right-click menu

The Lyric view lets you edit a track's lyrics. You can use it to cue yourself or your group with the lyrics during playback and recording.

For more information, see:

Console view

The Console view contains all the controls you need to mix your project. Tracks, buses and mains appear as vertical channel strips, similar to a hardware mixing console.

By default, the Console view is docked in the MultiDock, below the Track view. This allows you to simultaneously arrange in the Track view and mix in the Console view.

Figure 502. *The Console view*
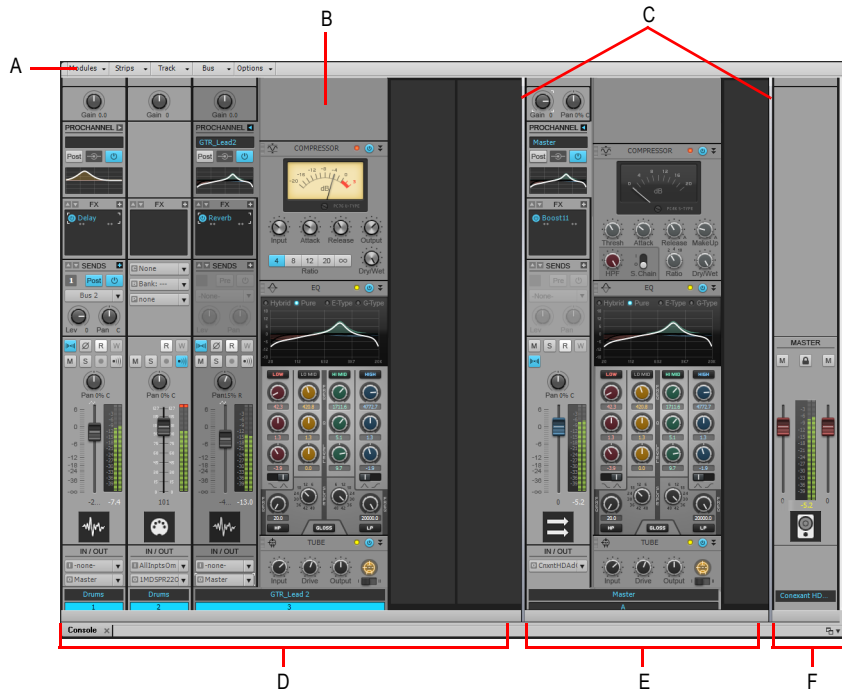
A. Console view menu B. ProChannel (Producer only) C. Pane splitter bars D. Track channel strips E. Bus channel strips F. Main channel strips

To open the Console view

Do *one* of the following:

• On the **Views** menu, choose **Console View**.

• Press ALT+2.

See:

The Console view interface

The Console view contains the following main elements:

- **Menu.**   Use the menu to configure channel strips. You can filter the display of specific channel strip types and modules within channel strips. For details, see "Console view menu" on page 1857 and "To show/hide specific tracks, buses and mains" on page 1860.

- **Track, Bus and Mains panes.**   The Console view has three separate panes: the left most pane contains track channel strips, the middle pane contains bus channel strips, and the right pane contains main channel strips. You can drag the pane splitter bars to resize the panes.

- **Channel strips.**   Each track, bus and main in the project is represented by its own vertical channel strip. Use the channel strip controls to mix and process tracks, buses and mains. For details, see "Channel strips" on page 1839.

- **Modules.**   Controls in channel strips are grouped into modules that can be shown or hidden. For details, see "Modules" on page 1851.

Figure 503. *The Console view*

A. Console view menu B. ProChannel (Producer only) C. Pane splitter bars D. Track channel strips E. Bus channel strips F. Main channel strips

See:

Channel strips

The Console view can show the following channel strip types:

- **Audio track.** Use to control tracks that contain digital audio data, which is routed to your hardware audio interface. For details, see "Audio track controls" on page 1845.

- **MIDI track.** Use to control tracks that contain MIDI data. MIDI tracks can control external MIDI devices or software instruments. For details, see "MIDI track controls" on page 1846.

- **Instrument track.** Use to control software instruments. For details, see "Instrument track controls" on page 1847.

- **Bus.** Use to create submixes, headphone mixes, and effects sends. SONAR supports both stereo buses and surround buses. For details, see "Bus controls" on page 1848.

- **Main.** Use to control the physical audio outputs of your audio interface. A main channel strip contains both a left and right output and two volume controls. For details, see "Main controls" on page 1849.

Figure 504. *The controls displayed in a channel strip vary according to the channel strip type.*
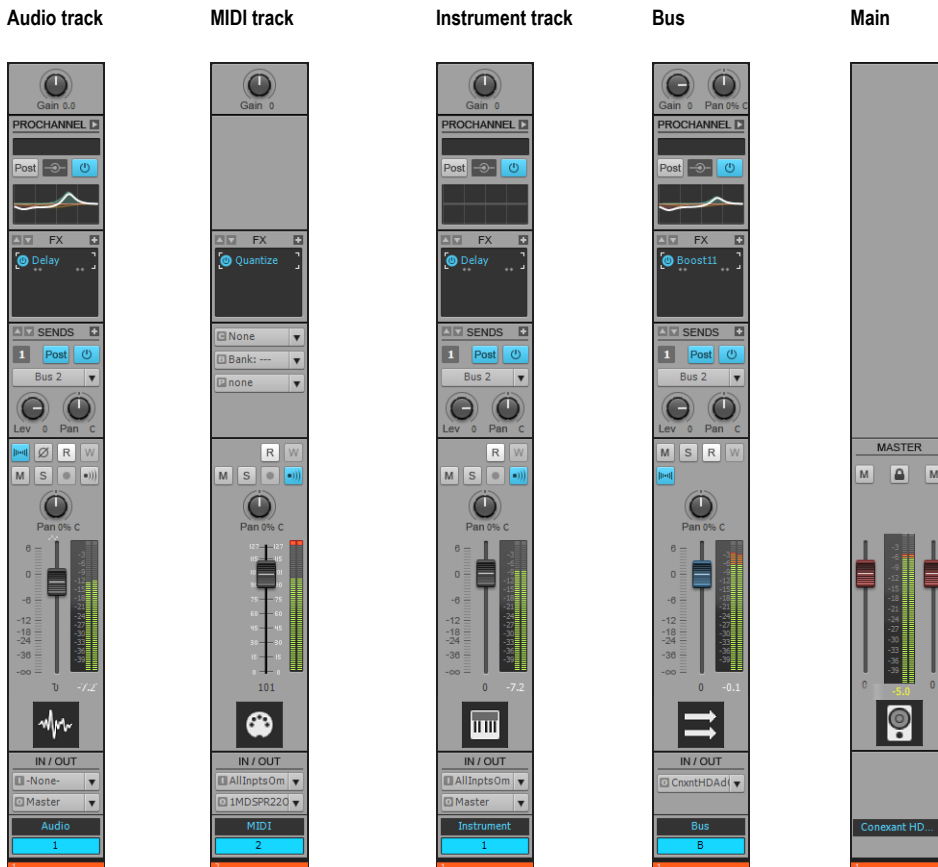
To show/hide a channel strip type

Click the **Strips** menu in the Console view and choose the desired channel strip type.

Figure 505. *Console view Strips menu.*
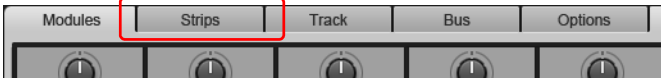
Channel strip controls

The controls displayed in a channel strip vary according to the channel strip type. Channel strip controls are grouped into various modules that can be shown or hidden. The following modules and controls are available.

Module	Control	Description	Audio track	MIDI track	Instrument track	Bus	Main
Input / Trim	Gain	Pre-fader input gain for fine tuning a track's volume or input level to a bus.	x			x	
	Velocity offset	The change in velocity (volume) that will be applied to notes in the track on playback; ranges from –127 to +127.		x	x		
	Input pan	Sets the pan of the audio data sent to the bus. **Note:** The Input Pan control is not visible in narrow channel strips.				x	
ProChannel (Producer only)	ProChannel (Producer only)	ProChannel is an extended channel strip that provides high-quality Compressor, Equalizer, and Tube saturation processing for each channel. See "ProChannel (Producer only)" on page 963. **Note:** The ProChannel EQ plot is not visible in narrow channel strips.	x		x	x	
EQ Plot (Studio and Essential only)	Equalizer graph	Adjust the curve of the per-track equalizer. For details, see "Using the per-track EQ (Studio and Essential only)" on page 911.	x		x	x	
FX Bin	Effects bin	The patch point for a track's plug-ins or soft synths.	x	x	x	x	

Table 272. *Console view channel strip controls*

Module	Control	Description	Audio track	MIDI track	Instrument track	Bus	Main
Sends / Bank / Patch	Send Enable	Activates a send module, which sends a copy of the track signal to a bus.	x		x	x	
	Send Level	Controls volume of audio data sent by the send module.	x		x	x	
	Send Pan	Adjusts the send pan setting. **Note:** The Send Pan control is not visible in narrow channel strips.	x		x	x	
	Send Pre/Post switch	Sends the signal to the bus prior to the track's volume fader; post means the Send signal goes to the bus after the volume fader.	x		x	x	
	Send destination	Displays name of bus that the Send is sending data to.	x		x	x	
	Channel	Specifies the MIDI channel through which the notes will be played.		x	x		
	Bank	Specifies the set of patch names available for the track.		x	x		
	Patch	Specifies the instrument sound that will be used for playback.		x	x		

Table 272. *Console view channel strip controls (Continued)*

Module	Control	Description	Audio track	MIDI track	Instrument track	Bus	Main
MSR	Phase Invert	A switch that inverts the phase of the track. **Note:** The Phase Invert control is not visible in narrow channel strips.	x				
	Mono/Stereo	A switch that determines whether a track's signal enters an effect or chain of effects as mono or stereo, regardless of the nature of the track. **Note:** The Mono/Stereo control is not visible in narrow channel strips.	x			x	
	Read Automation	Enable/disable automation playback. **Note:** The Read Automation control is not visible in narrow channel strips.	x	x	x	x	
	Write Automation	Enable/disable automation writing. **Note:** The Write Automation control is not visible in narrow channel strips.	x	x	x	x	
	Mute	Mute/unmute the channel strip.	x	x	x	x	x
	Solo	Solo/unsolo the channel strip.	x	x	x	x	
	Arm for recording	Arm the channel strip for recording.	x	x	x		
	Input echo	Turns input monitoring on or off (MIDI Thru for MIDI tracks)	x	x	x		
Pan Control	Pan	The stereo distribution of the output, ranging from 100% left (hard left) to 100% right (hard right); a value of "C" indicates sound that is centered left-to-right. On stereo tracks, pan acts as balance. For surround panners, the signal is sent to multiple speakers at points along a circle.	x	x	x	x	

Table 272. *Console view channel strip controls (Continued)*

Module	Control	Description	Audio track	MIDI track	Instrument track	Bus	Main
Volume	Volume	The current volume level for the track, ranging from -INF (silent) to +6 dB (maximum volume). The recording and playback levels are displayed in the Playback and Record meters.	x	x	x	x	x
	Link	Main out faders can be linked using the **Link** button 🔒. This allows you to adjust both the left and right channel at the same time.					x
	Meter	The recording and playback levels are displayed in the Playback and Record meters. For MIDI tracks, the meter shows MIDI activity and velocity.	x	x	x	x	x
	Meter peak value	The peak meter value updates during playback to show the highest peak level reached.	x	x	x	x	x
Icon	Track icon	Track icons allow you to quickly identify a track's contents by instrument. You can assign a new track icon, create your own track icons, and save an icon as part of a track template.	x	x	x	x	x
In / Out	Input	The input source for the track, used in recording.	x	x	x		
	Output	The output bus through which the track is played.	x	x	x	x	
---	Track number	A sequential track number used for reference.	x	x	x	x	

Table 272. *Console view channel strip controls (Continued)*

Module	Control	Description	Audio track	MIDI track	Instrument track	Bus	Main
---	Track name	A name that you assign the track for easy reference. Note that if you do not assign a name to a track, the default name is the track number. This track number will change if you change the order of your tracks. You can click the Track Name control to select any available track, bus or main to display in the Track Inspector.	x	x	x	x	x
---	WAI	The colored WAI bar shows which tracks and/or buses are currently being controlled by a controller/surface. Each controller/surface uses a different color. For details, see "The WAI display" on page 1232.	x	x	x	x	

Table 272. *Console view channel strip controls (Continued)*

Audio track controls

Figure 506. *Audio track controls in the Console view.*
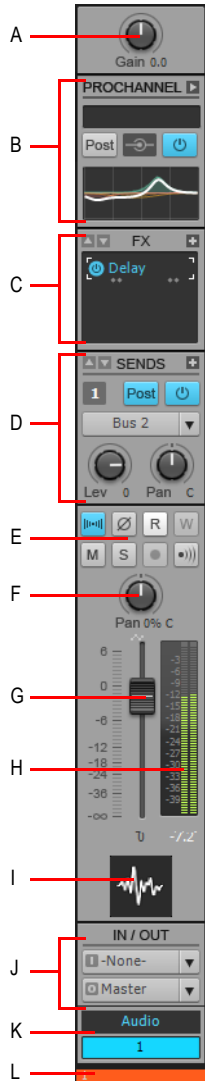
A. Input gain B. ProChannel (Producer only) C. Effects bin D. Sends E. Mute, Solo, Arm, Input Echo, Phase Invert, Stereo Interleave, Read Automation, Write Automation F. Pan G. Volume H. Meter I. Track icon J. Input and output K. Track name and number L. WAI display

MIDI track controls

Figure 507. *MIDI track controls in the Console view.*
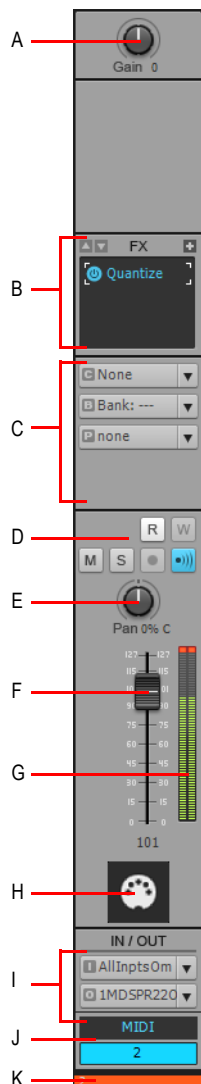
A. Velocity trim B. Effects bin C. Channel/Bank/Patch D. Mute, Solo, Arm, Input Echo, Read Automation, Write Automation E. Pan F. Volume G. Meter H. Track icon I. Input and output J. Track name and number K. WAI display

Instrument track controls

Figure 508. *Instrument track controls in the Console view.*
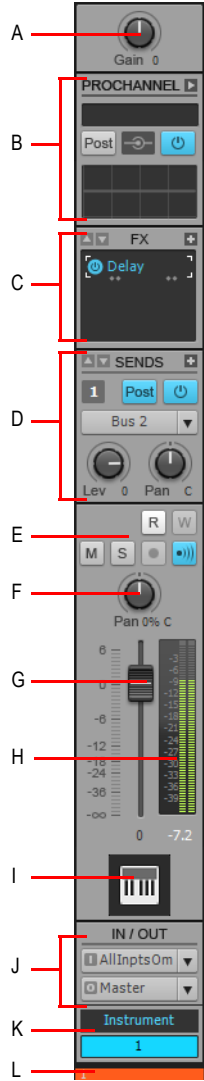
A. Input gain B. ProChannel (Producer only) C. Effects bin D. Sends E. Mute, Solo, Arm, Input Echo, Read Automation, Write Automation F. Pan G. Volume H. Meter I. Track icon J. Input and output K. Track name and number L. WAI display

Bus controls

Figure 509. *Bus controls in the Console view.*
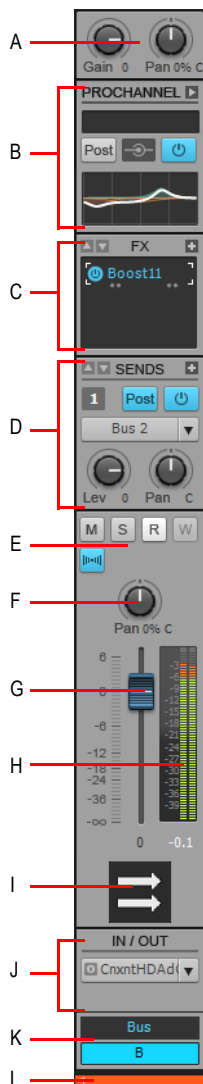
A. Input gain and pan B. ProChannel (Producer only) C. Effects bin D. Sends E. Mute, Solo, Read Automation, Write Automation F. Pan G. Volume H. Meter I. Bus Icon J. Output K. Bus name and letter L. WAI display

Main controls

Figure 510. *Main controls in the Console view.*
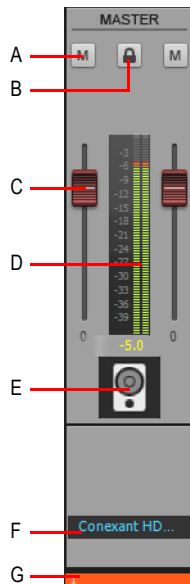
A. Mute B. Link channels C. Volume D. Meter E. Icon F. Mains name G. WAI display

Status indicators

The Console view shows if a control is grouped with one or more other controls, armed for automation, and if automation exists for the control.

Grouped control indicator

Small color-coded squares are displayed when knobs, faders, or buttons are grouped.

Figure 511. *Grouped control indicator.*
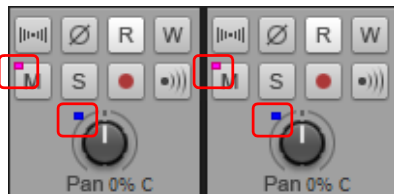
For details, see "To group controls" on page 1867.

Armed for automation indicator

A red rectangle outlines any controls that are armed for automation writing. You can write enable the entire channel strip, or individual controls.

Figure 512. *Armed for automation indicator.*
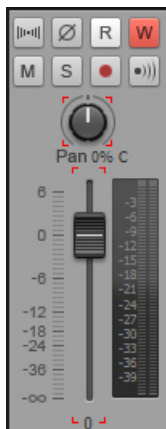
For details, see "To arm a channel strip for automation writing" on page 1864.

Automation present indicator

A small automation icon appears next to any controls that have existing automation data.

Figure 513. *Automation present indicator.*

See:

"Modules" on page 1851

"Console view menu" on page 1857

"Audio track controls" on page 1845

"MIDI track controls" on page 1846

"Instrument track controls" on page 1847

"Bus controls" on page 1848

Modules

Channel strip controls are grouped into various modules that can be shown/hidden. The following modules are available:

To show/hide a module

Click the **Modules** menu in the Console view and choose the desired module.

Figure 514. *Console view **Modules** menu.*
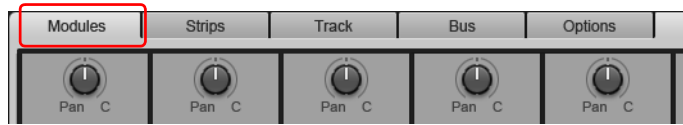
Input Gain module

The Input Gain module lets you adjust the pre-volume input gain and pan (buses only).

Figure 515. *Input Gain module.*
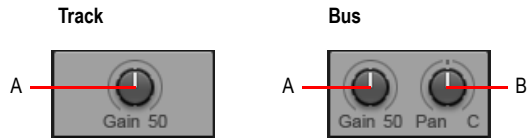
A. Input gain/trim B. Input pan

For information about using input gain, see "Adjusting volume trim" on page 225.

ProChannel module (Producer only)

The ProChannel module lets you apply compression, equalization, and tube saturation modeling to each audio track, Instrument track and bus.

Figure 516. *ProChannel module (Producer only).*
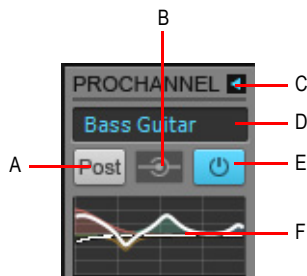
A. Pre/Post B. Global input meter C. Expand/collapse ProChannel D. Preset E. Global On/Off F. Equalizer graph

For information about ProChannel, see "ProChannel (Producer only)" on page 963.

EQ Plot module (Studio and Essential only)

The EQ Plot module lets you adjust the per-track equalization curve. To access additional equalizer controls, double-click the EQ plot.

Figure 517. *EQ Plot module (Studio and Essential only).*

A. EQ on/off B. EQ plot

For information about using the per-track Sonitus EQ in SONAR X2 Studio or Essential, see "Using the per-track EQ (Studio and Essential only)" on page 911.

FX Bin module

The FX Bin module let's you insert real-time plug-in effects in tracks and buses.

Figure 518. *FX Bin module.*
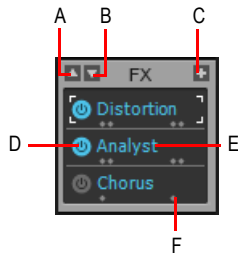
A. Scroll up B. Scroll down C. Insert plug-in D. Enable/disable plug-in E. Plug-in name F. Effect output interleave indicator (mono, stereo or surround) .

For information about using real-time effects, see "Using real-time effects" on page 862.

Sends / Bank / Patch module

The Sends / Bank / Patch module provides different controls for audio tracks, buses and MIDI tracks.

For audio tracks, you can create effects sends, submixes, headphone mixes, etc.

For MIDI tracks you can choose the bank, patch and channel, which determine the instrument sound that will be used for playback.

Figure 519. *Sends / Bank / Patch module.*

Audio track/Bus   MIDI track
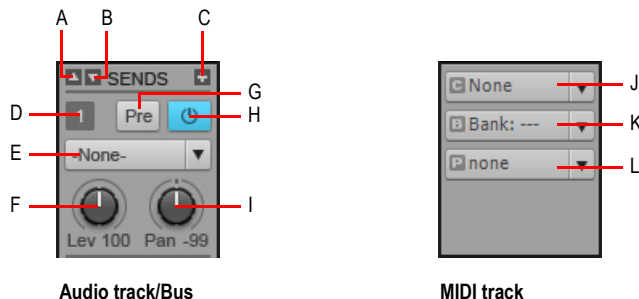
A. Scroll up B. Scroll down C. Insert Send D. Send number E. Send destination F. Send level G. Pre/post toggle H. Send enable/disable I. Send pan J. Bank K. Patch L. Channel

For information about using sends and MIDI Bank, Patch and Channel settings, see "Routing and mixing digital audio" on page 841 and "Choosing the instrument sound (bank and patch)" on page 220.

MSR module

The MSR module lets you set various track states, including mute, solo and arm for recording.

Figure 520. *MSR module.*
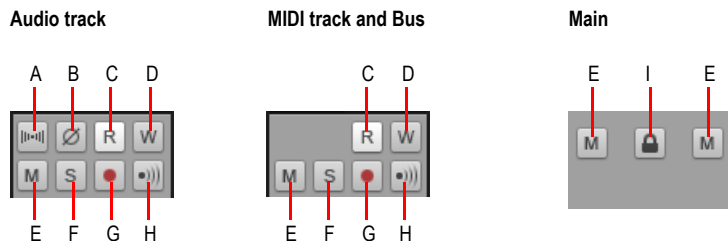
A. Mono/Stereo B. Phase Invert C. Read Automation D. Write Automation E. Mute F. Solo G. Arm for recording H. Input Echo I. Link left and right channel faders (mains only)

For information about track states, see "Track-by-track playback" on page 195.

Pan Control module

The Pan module lets you adjust the channel strip's pan setting.

Figure 521. *Pan Control module.*

A. Stereo Pan control B. Surround Panner (Producer and Studio only)

For information about panning, see "Adjusting volume and pan" on page 223 and "Panning in surround" on page 948.

Volume module

The Volume module lets you adjust the channel strip's playback or monitoring level. The meter lets you monitor the channel strip's playback or recording level. The peak meter value updates during playback to show the highest peak level reached.

Figure 522. *Volume module (also showing MSR and Pan Control modules).*
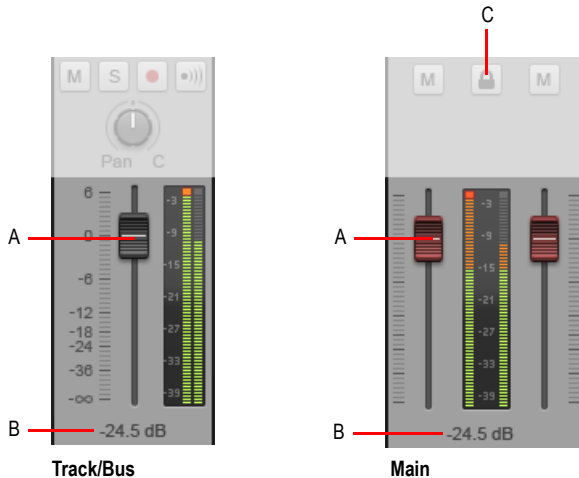
Track/Bus   Main

A. Volume fader B. Peak value C. Link faders (Mains only)

For easy identification, track fader thumbs are black, bus fader thumbs are blue, and mains fader thumbs are red.

Note: *Main out faders can be linked using the Link button 🔒. This allows you to adjust both the left and right channel at the same time.*

For information about setting levels, see "Adjusting volume and pan" on page 223.

For information about using meters, see "Metering" on page 849.

Icon module

The Icons module lets you assign a graphic icon to the channel strip. This makes it easy to identify tracks and buses visually.

Figure 523. *Icon module.*

A. Track/bus icon

For information about using track icons, see "Track icons" on page 322.

In / Out module

The In / Out module lets you assign an input and output to the channel strip. The Input device is used for recording and the Output device is used for playback.

Figure 524. *In / Out module.*
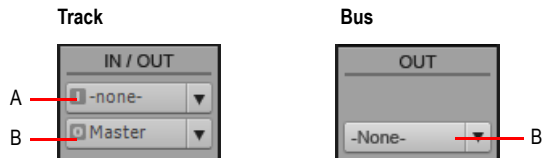
A. Input B. Output

For information about assigning inputs and outputs, see "Assigning Inputs & Outputs" on page 216.

See:

"Channel strips" on page 1839

"Console view menu" on page 1857

"The Console view interface" on page 1837

"Customizing the Console view" on page 1859

"Using the Console view" on page 1862

"Console view" on page 1836

Console view menu

The menu across the top of the Console view lets you configure the appearance and behavior of the Console view.

Figure 525. *Console view menu.*

Modules menu

The **Modules** menu contains the following commands:

- **Input Gain.**   Show/hide Input Gain and Trim controls.
- **ProChannel.**   Show/hide ProChannel (Producer only)
- **EQ Plot.**   Show/hide the EQ plot (Studio and Essential only)
- **FX Bin.**   Show/hide effects bins.
- **Sends / Bank / Patch.**   Show/hide Send, Bank and Patch controls.
- **MSR.**   Show/hide Mute, Solo and Arm for Recording controls.
- **Pan Control.**   Show/hide Pan controls.
- **Volume.**   Show/hide Volume controls and meters.
- **Icon.**   Show/hide track/bus icons.
- **In / Out.**   Show/hide Input and Output controls.

Strips menu

The **Strips** menu contains the following commands:

- **Tracks.**   Show/hide tracks.
- **Buses.**   Show/hide buses.
- **Mains.**   Show/hide mains.
- **Audio.**   Show/hide audio tracks.
- **MIDI.**   Show/hide MIDI tracks.
- **Instrument.**   Show/hide Instrument tracks.
- **Muted.**   Show/hide muted tracks.
- **Archived.**   Show/hide archived tracks.
- **Frozen.**   Show/hide frozen tracks.

- **Track Manager.**   Open the Track Manager dialog box.
- **Widen All Strips.**   Show wide channel strips.
- **Narrow All Strips.**   Show narrow channel strips.

Track menu

The **Track** menu contains the following commands:

- **Insert Audio Track.**   Insert a new audio track.
- **Insert MIDI Track.**   Insert a new MIDI track.
- **Insert Track from Template.**   Insert new tracks from a track template.
- **Make Instrument Track.**   If an existing audio track and MIDI track are assigned to the same software instrument, you can convert the two tracks into a single instrument track (only available for MIDI tracks).
- **Split Instrument Track.**   Split an instrument track into separate audio and MIDI tracks. The audio and MIDI tracks will remain assigned to the same software instrument (only available for Instrument tracks).
- **Delete Track.**   Delete the selected track.

Bus menu

The **Bus** menu contains the following commands:

- **Insert Stereo Bus.**   Insert a new stereo bus.
- **Insert Surround Bus.**   Insert a new surround bus.

Options menu

The **Options** menu contains the following commands:

- **Sends.**   Use the submenu to specify if Send modules should show two sends or four sends. The options are as follows:
  - **Send Display: 1.**   Show one send in the Send module.
  - **Send Display: 2.**   Show two sends in the Send module.
- **EQ Plot Resolution.**   Use the submenu to specify the equalizer plot resolution. The resolutions are as follows:
  - Automatic (graph scales dynamically)
  - 6 dB
  - 12 dB
  - 18 dB
- **ProChannel > Compact EQ module.**   Show/hide the Frequency, Q and Level controls for the Low, Low-Mid, Mid-High and High bands.
- **FX > Show Assignable Controls.**   Show or hide 4 controls for the selected plug-in effect (if the effect has assignable controls). To display a different control, right-click one of the displayed controls and choose **Reassign Control** on the pop-up menu.

- **Meters.** Use the submenu to specify various options for track, bus and mains meters. The submenu contains the following options:
  - **Track Record Meters.** Show/hide track record meters.
  - **Track Playback Meters.** Show/hide track playback meters.
  - **Bus Meters.** Show/hide bus meters.
  - **Mains Meters.** Show/hide mains meters.
  - **Reset All Meters.** Clear any clipping indicators from all meters.
  - **Record Meter Options.** Meter mode (Peak, RMS, or Peak+RMS), meter range (-12 dB to -90 dB), Show Labels, Hold Peaks, and Lock Peaks.
  - **Track Meter Options.** Meter mode (Peak, RMS, or Peak+RMS), meter location (pre fader or post fader), meter range (-12 dB to -90 dB), Show Labels, Hold Peaks, and Lock Peaks.
  - **Bus Meter Options.** Meter mode (Peak, RMS, or Peak+RMS), meter location (pre fader, post fader, or pre fader post effects), meter range (-12 dB to -90 dB), Show Labels, Hold Peaks, and Lock Peaks.
  - **Mains Meter Options.** Meter mode (Peak, RMS, or Peak+RMS), meter range (-12 dB to -90 dB), Hold Peaks, and Lock Peaks.

Note: *Additional audio meter options are available in **Edit > Preferences > Customization - Audio Meters**.*

See:

Customizing the Console view

There are various ways you can customize the Console view to suit your needs and to save screen space, including:

- Show/hide specific channel strip types, such as audio tracks, MIDI tracks, Instrument tracks, buses and mains (see).
- Show/hide specific tracks, buses and mains (see).
- Show/hide muted, archived or frozen channel strips (see).
- Show/hide modules, such as volume faders, meters, input and output controls, etc. (see).

- Show wide or narrow channel strips (see).
- Resize the Track, Bus and Mains panes (see).

To show/hide specific channel strip types

Click the **Strips** menu in the Console view and choose the desired channel strips.

To show/hide specific tracks, buses and mains

Do *one* of the following:

- Click the **Strips** menu, choose **Track Manager** to open the **Track Manager** dialog box, then select the tracks you want to show.
- Right-click a channel strip and choose **Hide Track** or **Hide Bus** on the pop-up menu.

To show/hide muted, archived or frozen channel strips

Click the **Strips** menu in the Console view and choose **Muted**, **Archived** or **Frozen**.

To show/hide modules

Click the **Modules** menu in the Console view and choose the desired module.

Figure 526. *Console view **Modules** menu.*

To set the width of channel strips

Channel strips can be either wide or narrow. By showing narrow channel strips, you can show more tracks, buses and mains simultaneously in the Console view.

To set all channel strips to wide mode, click the **Strips** menu and choose **Widen All Strips**.

To set all channel strips to narrow mode, click the **Strips** menu and choose **Narrow All Strips**.

To toggle an individual channel strip between wide and narrow mode, right-click the channel strip and choose **Narrow Strip** on the pop-up menu.

In Narrow mode, the following channel strip controls are hidden.

Module	Hidden controls in narrow channel strips
Input Gain	Input Pan
ProChannel	Global input meter

Table 273. *HIdden channel strip controls in Narrow mode*

Module	Hidden controls in narrow channel strips
Sends/Bank/Patch	Send Pan
MSR	Phase Invert, Mono/Stereo Interleave, Read Automation and Write Automation
Volume	dB scale

Table 273. *HIdden channel strip controls in Narrow mode (Continued)*

Figure 527. *You can show all or individual channel strips in Narrow mode in order to see more channel strips simultaneously.*

To resize the Track, Bus and Mains panes

Drag the vertical splitter bars to the left or right. The splitter bars snap to channel strip boundaries.

Figure 528. *Drag the vertical splitter bars to resize the Track, Bus and Mains panes.*
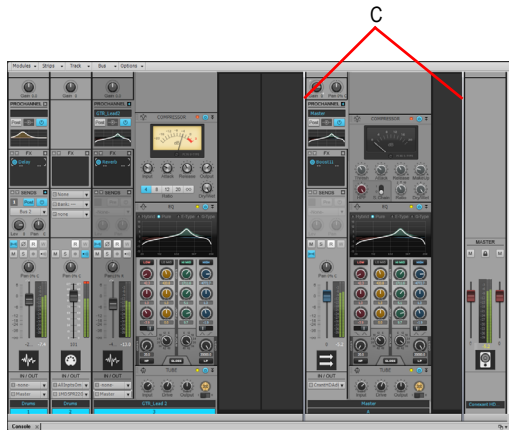
A. Pane splitter bars

See:

Using the Console view

To insert a new track

Right-click a track channel strip and choose **Insert Audio Track** or **Insert MIDI Track** on the pop-up menu.

To insert a new bus

Right-click a bus channel strip and choose **Insert Stereo Bus** or **Insert Surround Bus** on the pop-up menu.

To delete a track or bus

Right-click the track or bus and choose **Delete Track** or **Delete Bus** on the pop-up menu.

To rename a channel strip

Double-click the Name control at the bottom of the channel strip and type a new name.

Navigating within the Console view

To select the next or previous channel strip, press the LEFT ARROW or RIGHT ARROW key.

To jump to the first or last channel strip in the current pane (Track, Bus or Mains pane), press the PAGE UP and PAGE DOWN keys.

To scroll to the next or previous channel strip, click the scroll arrow buttons in the scrollbar.
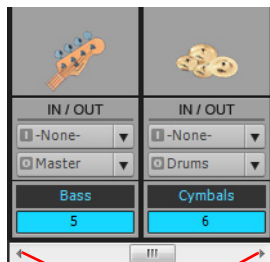
A. Click to scroll one strip at a time

Adjusting channel strip parameters

To adjust Console view controls

The Console view contains buttons, sliders, and knobs. Faders and knobs can be adjusted in several ways:

- Click the center of a knob and drag up or down.
- Point to a control and scroll the mouse wheel.
- Double-click the center of a knob and type the desired value.
- Double-click the value display below a volume fader and type the desired value.
- Double-click the bottom of a knob to reset it to its snap-to position.
- To adjust the same control in all channel strips, hold down the CTRL key and adjust a control.
- To adjust the same control in all selected channel strips of the same type, hold down CTRL+SHIFT and adjust a control in any selected channel strip.

Tip: *To adjust faders and knobs with greater precision, hold down the SHIFT key while adjusting the control.*

Snap-to positions

Faders and knobs have snap-to positions. To set the snap-to position, move a control to the desired snap-to position, right-click the control, and choose **Value > Set Snap To = Current**.

To arm a channel strip for automation writing

Click the channel strip's Write Automation button.

To disable automation writing for the channel strip, click the Write Automation button again.

Tip: *To disable automation writing for all write-enabled channel strips, click the **Clear all automation write enables** button* *in the Control Bar's Mix module. For details, see* *"Mix module" on page 509.*

To arm a single control for automation writing

Right-click the control and choose **Automation Write Enable** on the pop-up menu.

To disable automation writing for the control, choose **Automation Write Enable** on the menu again.

Read Automation and Write Automation states

Read Automation and **Write Automation** buttons are fully colored when they affect the entire channel strip. If only a subset of the channel strip's controls are affected, the **Read Automation** button and **Write Automation** buttons are only partially colored.

Figure 529. *The Read Automation and Write Automation buttons indicate if the entire channel strip is affected, or only a subset of its controls.*

All controls   **Individual controls**

To insert a plug-in effect

Do *one* of the following:

• Click the Insert FX button in the FX Bin module and choose a plug-in on the pop-up menu.

• Right-click the effects bin and choose a plug-in on the pop-up menu.

To show which channel strips are controlled by a control surface

1. Go to **Edit > Preferences > MIDI - Control Surfaces**.

2. Select your control surface in the **Connected Controllers/Surfaces** list.

3. Under **WAI Display**, select the **Console View** check box.

   The Console view shows a color-coded bar at the bottom of any channel strips that are controlled by your control surface. If you are using multiple control surfaces, you can assign a custom color to each control surface. For details, see "The WAI display" on page 1232.

To show/hide a module

Click the **Modules** menu in the Console view and choose the desired module.

Figure 530. *Console view Modules menu.*
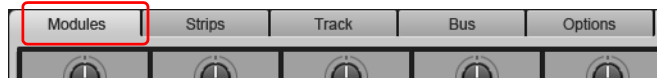
To show/hide individual channel strips

1. Click the **Strips** menu in the Console view and choose **Track Manager** to open the **Track Manager** dialog box.

2. Select the channel strips you want to see, then click **OK**.

To show/hide a channel strip type

Click the **Strips** menu in the Console view and choose the desired channel strip type.

Figure 531. *Console view **Strips** menu.*
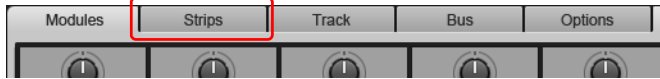
To show wide or narrow channel strips

To set all channel strips to wide mode, click the **Strips** menu and choose **Widen All Strips**.

To set all channel strips to narrow mode, click the **Strips** menu and choose **Narrow All Strips**.

To toggle an individual channel strip between wide and narrow mode, right-click the channel strip and choose **Narrow Strip** on the pop-up menu.

To specify meter options

Click the **Options** menu, point to **Meters**, then set the desired options.

To change a meter's range

Right-click the meter and choose a range.

To reset meter clip indicators

To reset a single clip indicator, click the clip indicator.

To reset all clip indicators, click the **Options** menu, point to **Meters** and choose **Reset All Meters**.

To dock the Console view in the MultiDock

Do *one* of the following:

• Drag the Console view to the MultiDock.

• Click the **Docking Options** button and choose **Dock in MultiDock**.

For more information about the MultiDock, see "MultiDock" on page 1046.

To undock the Console view

Do *one* of the following:

• Click the **Docking Options** button and choose **Undock**.

• Right-click the Console view tab and choose **Undock**.

To synchronize the Track view and Console view

By default, the Track view and Console view show the same sets of tracks and buses. However, you can choose to show different sets of tracks and buses. To do so:

1. Click the **Strips** menu in the Console view and choose **Track Manager** to open the **Track Manager** dialog box.

2. Clear the **Keep track/console visibility states in sync** check box and click **OK**.

To group controls

Right-click the control you want to assign to a group, point to **Group**, then select the desired group on the submenu.

Repeat the steps for each control you want to assign to the same group. You can adjust all grouped controls by adjusting any group member.

To temporarily override a group

To adjust a grouped control without affecting any other controls in the same group, hold down the CTRL key while you adjust the control.

To link left and right faders in a Main channel strip

1. In the Main channel strip whose faders you want to link, adjust the volume of each fader to the appropriate level.

2. Click the **Link** button ![Link button] .

See also:

Video view

Open the Video view by using the **Views > Video** command or by pressing ALT+SHIFT+2. In addition to the Video view, there is also a Video Thumbnails pane in the Track view (see "Using the Video Thumbnails pane" on page 242). The **File > Import > Video** command lets you include an AVI, MPEG, or QuickTime video in your project. This video is shown in the Video view in real time as your project plays. The Video view displays the current time (as in the Big Time view) and the video itself. The display in the Video view is synchronized with the Now time, giving you convenient random access to the video stream. This makes it easy to align music and digitized sound to the video.

If the Video view is the active window, you can now use keyboard shortcuts to advance by a frame or a frame increment. The +/-, and left/right arrow keys move forward/backwards by a single frame. If the control key is pressed, then the frame increment value is used (default = 5 frames) Alternatively you can use the [and] keys to seek by the frame increment.

Commands in the Video view's pop-up menu let you set the time display format, the size and stretch options for the video display, the video start and trim times, and other options. Your project's video and digital audio data can be saved together in a new AVI file by using the **File > Export > Video** command. For more information, see "Preparing audio for distribution" on page 926.

Note: *The project's video file is saved in the project by reference only; the actual video data remains in the original file.*

Use these options in the **Video File** dialog box:

Look in.   Use this field to find the folder that contains the video file you want to insert.

File name.   Use this field to find the video file you want to insert. Clicking the name of the file in the window above this field causes it to appear in the **File name** field.

Files of Type.   Use this field to select what type of video files to display.

Note: *In order to import and view QuickTime files, you will need to have installed the Quicktime DirectShow filters included with the installer, and you also need to download and install QuickTime from www.apple.com/quicktime.*

Show File Info.   If you check this option, Cakewalk displays the video file's format tag, audio sample rate, and length in both audio samples and time.

Import Audio Stream.   If you check this option, Cakewalk imports the video file's audio file along with the video. Select a blank track before you do this.

Stereo Split.   If you check this option, Cakewalk imports the video file's audio file into two separate tracks, instead of one stereo track.

Open.   After you decide what options you want, clicking the **Open** button imports the video and, optionally, the accompanying audio into your project.

For step by step instructions:

See Also:

Tempo view

Open the Tempo view by using the **Views > Tempo** command, or by pressing ALT+SHIFT+5.

The Tempo view shows the tempo of your project. You can use the mouse to draw tempo changes directly onto the graph.

The Tempo view provides both a graphic display of the tempo and a list of all tempo changes in your project. In the graphical display you can use your mouse to draw tempo changes directly onto the graph. In the tempo list, you can insert, edit, and delete individual tempo changes. Click the **Tempo List** button to display or hide the **Tempo** list.

If an entire project has a single tempo, the Tempo view shows a straight horizontal line, and a single tempo in the list.

If you want audio clips to stretch with any tempo changes you introduce, you need to enable Groove clip looping on any audio clips that you want to follow the tempo changes. Do this by selecting one or more clips, right-clicking a selected clip, and choosing **Groove Clip Looping** from the pop-up menu. Each clip that has Groove clip looping enabled has beveled edges instead of sharp corners. The same command disables Groove clip looping on any selected clip that has Groove clip looping enabled.

Use the global tools to add or modify tempo changes:

Tool	Name	What It's for
	Select	Drag the Select tool in either the graphic display or the tempo list to select tempos for editing.
	Freehand	Draw a custom curve indicating changes in tempo.

Table 274.

Tool	Name	What It's for
✏️	Line	Draw a straight line indicating a steady increase or decrease in tempo.
✏️	Erase	Eliminate tempo changes already in place for some portion of a project.
▦	Snap grid	When the **Snap to Grid** button is depressed, any new tempo changes will only be entered as often as the duration value in the Control Bar's Snap module.

Table 274.

If you make a mistake using any of these tools, you can use **Undo** to correct the error. When you use the Draw tool, the speed with which you drag the mouse determines the density of tempo events. To insert a larger number of relatively small tempo changes, move the mouse slowly. To insert a smaller number of relatively large tempo changes, drag the mouse quickly.

The tempo list has its own tools for editing tempo changes:

Tool	Name	What It's for
▥	Tempo List	Displaying a list of all tempo changes in the project.
+	Insert	Inserting a new tempo change
−	Delete	Deleting a tempo change
▤	Tempo Properties	Editing a tempo change

Table 275.

For more information, see "Using the Tempo view" on page 386. For step by step instructions:

Meter/Key view

Open the Meter/Key view by using the **Views > Meter/Key** command, or by pressing ALT+SHIFT+6.

The Meter/Key view lets you enter meter and key changes on measure boundaries. Meter and key changes affect all tracks.

The Meter/Key view lets you set and change the meter and key signature for any project or part of a project, over all its tracks.

For more information, see "The Meter/Key view" on page 1108.

See also:

"What Is meter?" on page 1108

"To add a meter/key change" on page 1110

"To delete a meter/key change" on page 1111

"To move a meter/key change" on page 1111

"To edit a meter/key change" on page 1111

Markers view

Open the Markers view with the **Views > Markers** command, or by pressing ALT+SHIFT+4. The Markers view lets you add, move, rename, or delete "Marker" on page 1915 (labels) for places in your song. The markers make it easier to move from one point to another.

See "Creating and using markers" on page 357.

SYSX view

Open the Sysx view by using the **Views > Sysx** command, or by pressing ALT+SHIFT+7. System Exclusive messages (Sysx) are commands that are unique to each brand or model of sound module. Consult the manual of each particular machine to find out what Sysx commands it responds to. The "Sysx" on page 1919 view gives you 256 Sysx banks to hold System Exclusive messages.

See "Using the System Exclusive view" on page 1141.

Big Time view

Open the Big Time view by using the **Views > Big Time** command, or by pressing ALT+SHIFT+3. The Big Time view lets you see the "Now time" on page 1916 from a distance while recording. Clicking the time display changes the units of time that the time display uses—the choices are MBT time and SMPTE.

Loop Construction view

Figure 532. *The Loop Construction view*
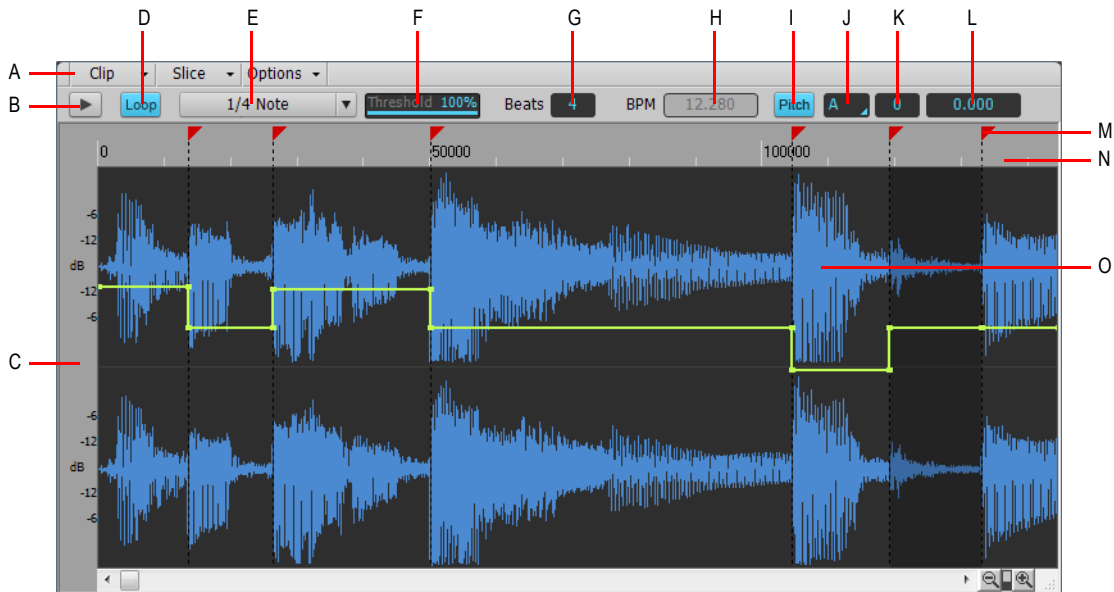
A. Menu *B.* Preview loop *C.* Audio scale (drag to zoom vertically) *D.* Loop on/off *E.* Resolution *F.* Threshold
G. Beats *H.* BPM (original tempo) *I.* Show/hide Pitch envelope *J.* Root note *K.* Coarse Pitch *L.* Fine Pitch
M. Slice markers *N.* Ruler (samples or beats) *O.* Groove clip

The following is a list of the controls in the Loop Construction view, followed by a description. For step-by-step instructions, see the links at the end of this section.

Clip menu

The **Clip** menu contains the following commands:

• **Save Loop.**   Opens the **Save As** dialog box. In the **Save As** dialog box you can save the current loop (Groove clip) as a Riff Wave file, which are compatible with ACIDized loops. You can save Riff Wave files for use with another SONAR project or with ACID.

- **Loop On/Off.**　Groove Clip enable/disable. When enabled, loop clips in the Track view by dragging the right side of a clip with your mouse. When disabled, you are able to slip-edit the clip.

- **Stretch On/Off.**　Instructs SONAR to stretch or shrink the clip to fit the project's tempo. The **Beats in Clip** and **Original BPM** parameters are in the Clip Inspector and **Loop Properties** dialog box are used to make the change.

- **Loop Properties.**　Opens the **Loop Properties** dialog box.

Note: *The settings in the **Loop Properties** dialog box are also available in the **Groove Clip** section in the Clip Inspector.*

Slice menu

The **Slice** menu contains the following commands:

- **Reset Markers.**　Restores all automatically generated markers to the original position and enables all those that were disabled. Manually created markers remain as is.

- **Show/Hide Gain Envelope.**　Toggles on or off the display of a gain envelope.

- **Show/Hide Pan Envelope.**　Toggles on or off the display of a pan envelope.

- **Show/Hide Pitch Envelope.**　Toggles on or off the display of a pitch envelope.

- **Next Slice.**　Moves the slice selection to the next slice in the loop. You can also press the PAGE DOWN key.

- **Previous Slice.**　Moves the slice selection to the previous slice in the loop. You can also press the PAGE UP key.

Options menu

The **Options** menu contains the following commands:

- **Auto Slice Preview On/Off.**　Turns on slice auto preview.

- **Auto Slice Preview Loop On/Off.**　This control is only available if the **Enable Slice Auto Preview** option is on. This option loops the slice auto preview.

- **Preview Bus.**　Select the output through which you want to listen to the clip.

Controls

- **Preview** ▶ .　Plays the current loop repeatedly. Click again to stop preview.

- **Loop.**　Click the **Loop** button to loop clips in the Track view by dragging the right side of a clip with your mouse. When **Loop** is not on, you are able to slip-edit the clip.

- **Resolution.**　The slice **Resolution** control sets the resolution for the creation of markers, or the "slicing" of the looped clip. This control uses the following note durations:

  - No Slice
  - Whole Note
  - 1/2 Note

- 1/4 Note
- 1/8 Note
- 1/16 Note
- 1/32 Note

The automatic markers appear at the note resolutions according to the Resolution setting. At the eighth note setting, there are eight markers per measure.

This control works well for slicing audio that has more subtle changes in volume with few dramatic transients.

The markers in a loop clip preserve the timing of the audio at that moment. Too few or too many markers can cause unwanted "artifacts" when a loop clip is stretched.

- **Threshold.**   The **Threshold** control senses transients in your audio clip and assigns a marker at the beginning and end of each one it finds. As you increase the number in this field, smaller transients are detected and the number of markers increases.
- **Beats.**   The number of beats (quarter notes) in the clip.
- **BMP.**   The tempo at which the clip was recorded.
- **Pitch.**   The **Follow Project Pitch** option transposes the loop, if necessary, to the key of the project. A loop recorded in the key of A, used in a project in the key of C, would be transposed up three semitones if the **Follow Project Pitch** check box was checked.
- **Root Note.**   The **Root Note** represents the key in which the loop was recorded. The **Follow Project Pitch** feature uses this information, when checked, to transpose the loop to match the project's key.
- **Coarse Pitch.**   You can set the transposition of a clip, independent from the project pitch, using the **Coarse Pitch** field. A positive number transposes the clip up by that number of semitones. A negative number transposes the clip down by that number of semitones. Remember that, if the **Follow Project Pitch** option is checked, the clip follows the project's pitch, so any transposition changes you make using this option are changes to the project pitch, not the clip pitch.

  An example: The project key is C. The clip key is D. If the **Follow Project Pitch** option is checked, the clip is transposed down by two semitones. A value entered into the **Pitch (semitone)** field adjusts the pitch from C. If you enter "-1" the pitch would be transposed down by one additional semitone to B.

  Another example: The clip pitch is E. The desired clip pitch is D. If the **Follow Project Pitch** option is not checked, and a value of "2" is entered in the **Pitch (semitones)** field, the clip is transposed down two semitones to D from the original pitch of E.

- **Fine Pitch.**   The **Pitch (fine)** field allows you to make tuning adjustments or to transpose the pitch of a clip up to 50 cents. There are 100 cents in one semitone. A Pitch (fine) setting of **1** adjusts the pitch up one hundredth of a semitone. The **Pitch (fine)** option can "fine tune" a slightly out of tune clip so that it is in pitch with the remaining clips in a project.

Slicing markers

There are two types of slicing markers in the Loop Construction view: automatic and manual. Automatic markers appear in red and are automatically generated by SONAR when you loop enable a clip. The one exception to this is if you import an ACIDized wave file into SONAR. ACIDized files always appear with manual slicing markers. Manual markers appear in purple. If you add a marker or move an automatic marker, it turns purple to show you that it has been edited. For information on editing slicing markers, see "To edit the slicing markers in a Groove Clip" on page 663.

Beat markers

Beat Markers mark where the beats fall in your clip. There are as many beat markers as there are beats in a clip.

Audio scaling

Audio scaling is the increase or decrease in the size (scale) of the waveform in clip. Audio scaling allows you to make detailed edits by zooming in on the parts of the waveform closest to the zero crossing (silence) while preserving the track size. By showing just the quietest parts of a clip, you can make very precise edits.

The Audio Scale Ruler is located on the far left of the Loop Construction view.

Figure 533. *Audio scale ruler*
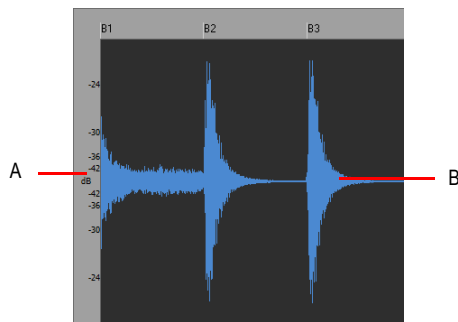
A. Audio Scale Ruler B. Clip

There are three right-click display options in the Audio Scale Ruler:

- **Percentage.** Shows audio scaling by percentage. For example, if the highest percentage in the Audio Scale Ruler reads 2.0%, then only the parts of the waveform which are within 2% of the zero crossing appear in the clip.

- **dB.** Shows audio scaling by dB. For example, if the highest dB in the Audio Scaling Ruler reads -36, then only the parts of the waveform which are 36 dB below 0 dB appear in the clip.

- **Zoom Factor.** Shows audio scaling by a factor. For example, if the Zoom Factor reads 10, then the waveform is zoomed in by a factor of 10.

For more information, see:

Browser

The Browser lets you find and import various types of content into your projects, including audio and MIDI files, track and project templates, track icons, Effects Chain presets, effect plug-ins and instruments. You can drag content and plug-ins directly into tracks.

Figure 534. *The Browser lets you import content into a project and manage effects and instruments.*
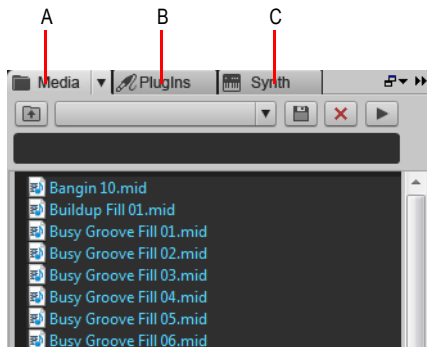
A. Media Browser B. Plug-in Browser C. Synth Rack Browser

Matrix view

The Matrix view lets you trigger individual or multiple audio and MIDI patterns, either with a computer keyboard, mouse or via MIDI remote control. The Matrix view consists of a grid, with unlimited rows and columns. You can drag audio, MIDI Groove Clips, Step Sequencer patterns and Project5 patterns to cells in the grid, and each row can be routed to any track in your project. You can record the Matrix performance to the Clips pane.

The Matrix view can be used as a stand-alone pattern trigger, or it can be synchronized with your project during playback.

There are many uses for the Matrix view, including:

• Experiment with different arrangements or combinations of loops, then record the performance into the Clips pane.

• Trigger any combination of loops in real-time

Figure 535. *The Matrix view*

See:

Matrix view user interface

Figure 536. *The Matrix view*
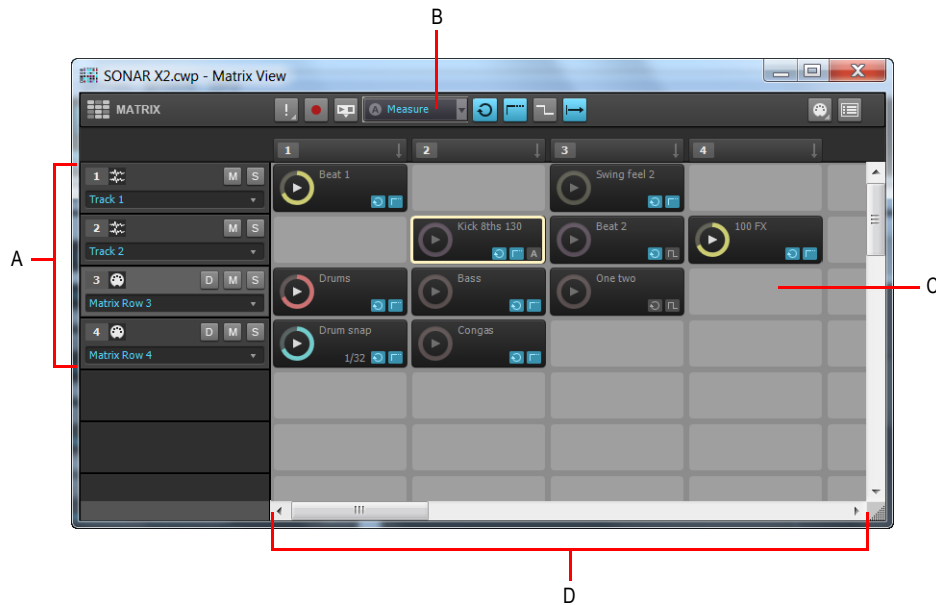
A. Rows B. Toolbar C. Cells D. Columns

The Matrix view consists of four sections:

- **Toolbar.**   The toolbar contains controls that let you specify how patterns are triggered. For details, see "Toolbar" on page 1879.
- **Rows.**   Each row is assigned to a track and can play one pattern at a time. A row can be routed to any track in your project. For details, see "Rows" on page 1881.
- **Columns.**   Each column contains one cell for each row. An entire column can be triggered at once. For details, see "Columns" on page 1883.
- **Cells.**   A cell is simply a pattern holder. You can drag one pattern into each cell, or leave the cell empty. Only one cell per row can be triggered at a time. For details, see "Cells" on page 1884.
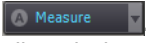
Toolbar

Figure 537. *Matrix view toolbar*
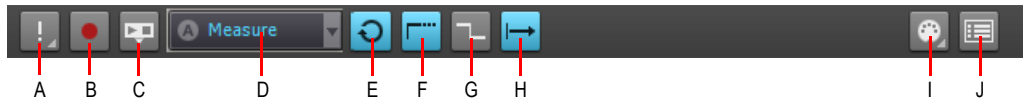
A. Stop All Cells B. Capture Matrix Performance (arm Matrix for recording) C. Follow Transport D. Global Trigger Resolution E. Global Loop Mode F. Global Latch Mode G. Retrigger Mode H. Cell Start I. Cell MIDI Trigger J. Options

The **Matrix view** toolbar contains the following controls:

- **Stop All Cells** ⏹ **.**   When the **Stop All Cells** button is enabled, all playing cells stop. The small arrow next to the **Stop All Cells** button lets you access a drop-down menu with the following commands:

  - **Clear All Cells.**   This command lets you clear the content from all cells.

  - **Clear All MIDI Learn**.   This command lets you clear MIDI Learn assignments from all cells.

- **Capture Matrix Performance** ⏺ **.**   When the **Capture Matrix Performance** button is enabled, you can record the current Matrix performance into the Clips pane during playback. Rows are recorded to their assigned output tracks. For details, see "To record a performance into the Clips pane" on page 1898. You can also perform a Quick Capture of a single pattern. For details, see "To render a single pattern to the Clips pane (Quick Capture)" on page 1899.

- **Follow Transport** ▱ **.**   This toggle lets you specify if the Matrix view should follow SONAR's main transport (Play/Stop) commands. When **Follow Transport** is enabled, patterns will only play when SONAR's transport is rolling. When **Follow Transport** is disabled, you can play the Matrix while SONAR's transport is idle (if you start SONAR's transport in this mode, cells that are already playing will immediately update their positions to synchronize with SONAR's transport). For details, see "To synchronize the Matrix with SONAR's transport" on page 1891.

- **Trigger Resolution** ▱ Measure **.**   This menu lets you specify the time lag between when you trigger a column or cell, and when it starts/stops playing. The options are as follows:

  - **Immediate.**   Playback starts immediately.

  - **Next Measure.**   Playback starts on the next measure boundary. This is the default setting.

  - **Next Beat.**   Playback starts on the next beat.

  - **Next 1/8 Note.**   Playback starts on the next 8th note.

  - **Next 1/16 Note.**   Playback starts on the next 16th note.

  - **Next 1/32 Note.**   Playback starts on the next 32th note.

  - **Next 1/64 Note.**   Playback starts on the next 64th note.

- **Global Loop Mode** ⟳ / →**.**   This toggle lets you specify if a triggered cell should repeat indefinitely, or stop when it reaches the end. When **Loop** is enabled ⟳, a triggered cell loops indefinitely. When **Global Loop Mode** is disabled →, a triggered cell plays once then stops. This option is enabled by default.

- **Global Latch Mode** ⌐ / ⌐⌐**.**   This toggle lets you specify if a triggered cell should stop or keep playing after you release the mouse button or MIDI key. When **Global Latch Mode** is enabled ⌐, a triggered cell will continue to play after you release the mouse button or MIDI key. When **Global Latch Mode** is disabled ⌐⌐, a triggered cell will stop playing when you release the mouse button or MIDI key.

> ⓘ **Note:** *Together, the **Global Latch Mode** and **Global Loop Mode** toggles give you flexible control over how cells are triggered.*
>
> - **To play a cell continuously when triggered.**   Enable **Global Loop Mode**; enable **Global Latch Mode**
> - **To play a cell once through when triggered.**   Disable **Global Loop Mode**; enable **Global Latch Mode**
> - **To play a cell continuously as long as the mouse/note is held.**   Enable **Global Loop Mode**; Disable **Global Latch Mode**
> - **To play a cell as long as the mouse/note is held, but stop at end.**   Disable **Global Loop Mode**; disable **Global Latch Mode**

- **Retrigger Mode** ⟵ / ⌐⌐**.**   This toggle lets you specify if a cell should stop or retrigger from the beginning if triggered during playback. When **Retrigger Mode** is enabled ⟵, triggering a playing cell will restart the cell from its beginning. When **Retrigger Mode** is disabled ⌐⌐, triggering a playing cell will stop the cell from playing.

- **Cell Start** ⊢→ / ⋯→**.**   This toggle lets you specify globally if a pattern should start from the beginning of the pattern, or if playback may start in the middle of a pattern in order to synchronize with the project's Now time. The two modes are as follows:

  - **Always from Beginning** ⊢→**.**   When you trigger a cell, the pattern will start playing from the beginning of the pattern, after the amount of time listed in the **Trigger Resolution** menu.

  - **Offset to Now Time** ⋯→**.**   When you trigger a cell, the pattern will start playing in sync with the Now time after the amount of time listed in the **Trigger Resolution** menu. It's as if the cell's pattern is repeated throughout the song and you unmute the pattern at a certain point. This is the default setting.

- **Cell MIDI Trigger** ⊙**.**   This toggle lets you enable/disable MIDI control over the Matrix view. Click the small arrow next to the **Cell MIDI Trigger** button to specify which MIDI channel the Matrix view should respond to (select **Omni** for all channels).

- **Options** 📋**.**   Click the **Options** button to open the **Matrix Options** dialog box. The following options are available:
    - **Empty cells stop active cells when triggered.**   This option determines how playing cells are affected when triggering an empty cell in the same row. If **Empty cells stop active cells when triggered** is disabled (default), triggering an empty cell has no effect on other cells. If **Empty cells stop active cells when triggered** is selected, triggering an empty cell in a row will force the row to stop playing. Likewise, triggering a column that contains empty cells will force the corresponding row to stop playing. This option is disabled by default.
    - **AutoScroll to Column when Triggered by MIDI.**   This option allows the Matrix view to automatically scroll a column into view if one of the column's cells are triggered by MIDI.
    - **Import all audio as GrooveClips.**   This option forces all audio to be imported as Groove Clips.

See:

Rows

Figure 538. *Matrix view row*

A. Row number B. Data type icon (audio or MIDI) C. Direct Mode (MIDI rows only) D. Mute/unmute row
E. Solo/unsolo row F. Assigned track G. Click the arrow to re-assign the row to a different track

A row is a horizontal collection of cells that is routed to a specific track in your project. Only one cell per row may be triggered at a time.

💡 **Tip:** *To play multiple patterns through the same track simultaneously, assign multiple rows to the same track.*

A row contains the following controls:

- **Row number** `1`. Sequential number to identify each row.

- **Data type icon** [icon] / [icon]. The icon indicates if the row contains audio data [icon] or MIDI data [icon]. Rows that are assigned to audio tracks can only contain cells with audio data. Likewise, rows that are routed to MIDI or Instrument tracks can only contain cells with MIDI data. The Audio or MIDI identity of a row is established when the first pattern is dragged into the row.

- **Direct Mode (MIDI rows only)** `D`. By default, a MIDI row is routed through the assigned MIDI track, and all track processing is applied, including MIDI FX, Arpeggiator, volume, etc. To bypass all track processing and send a row directly to the soft synth or hardware output that is assigned to the target track, click the row's Direct Mode button `D`.

- **Mute** `M`. Mute/unmute the row.

- **Solo** `S`. Solo/unsolo the row.

- **Assigned track.** Each row displays the name of the track it is routed to. All cells in the row are routed through the assigned track. Click the small arrow to reassign the row to another track.

The Matrix view supports unlimited rows. Rows are created automatically when you drag patterns into the Matrix view. Each row displays the name of the track it is routed to. Whenever a new row is created in the Matrix view, a corresponding track is also inserted in the project. New rows are named **Matrix row "n"**.

All rows that are assigned to the project's active track are highlighted. The active tracks is synchronized with the Track view and Console view, and you can set the active track by clicking a row in the Matrix view. In the following image, track 2 is the active track, so all rows that are assigned to track 2 are highlighted.

Figure 539. *Rows assigned to the active track are highlighted*
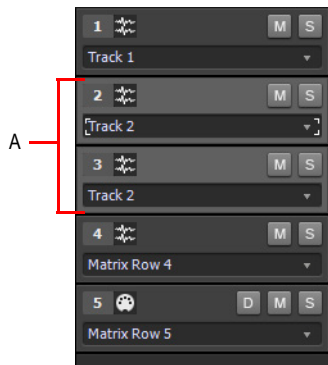
A. Rows 2-3 are highlighted since they are assigned to the active track

See:

Columns

Figure 540. *Matrix view columns*
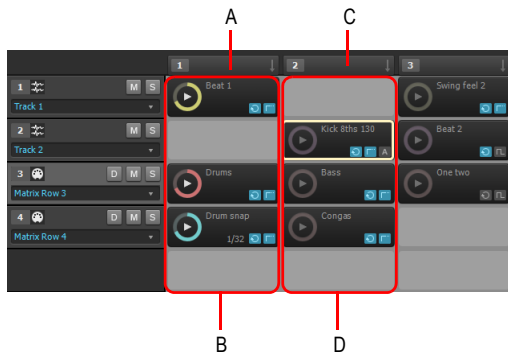
A. Column 1 trigger B. Column 1 C. Column 2 trigger D. Column 2

A column is a vertical collection of cells, with one cell per row.

Above each column is a Column Trigger, which lets you simultaneously trigger all cells in a column. Just like cells, the Column Trigger can be triggered with a mouse or via MIDI remote control. If you trigger a column, all other cells in the Matrix will be turned off, since only one cell per row may be triggered.

The Matrix view supports unlimited columns. A column is created automatically when at least one cell in the column contains a pattern.

Tip: *If you frequently need to trigger multiple patterns simultaneously, arrange the patterns into columns, then use the Column Triggers above the columns to trigger the patterns.*

You can right-click a Column Trigger to access the following commands:

• **Rename Column.**   Use this command to assign a custom name to a column header. By default, a column does not display any name. For details, see "To rename a column header" on page 1896.

• **Insert Column.**   Use this command to insert a new blank column. For details, see "To insert a new empty column" on page 1895.

• **Duplicate Column.**   Use this command to duplicate an entire column. For details, see "To duplicate an existing column" on page 1896.

- **MIDI Learn.** Use this command to assign a MIDI event to a Column Trigger, which allows you to trigger all cells in the column via MIDI remote control. The **MIDI Learn** command shows an orange outline around the Column Trigger if it is already in MIDI Learn mode, and shows a small MIDI icon if there is already a MIDI event assigned to the Column Trigger.

- **Clear MIDI Learn.** Use this command to remove any MIDI assignment from the Column Trigger. The column will no longer be triggered via MIDI remote control.

See:

Cells

Figure 541. *Matrix view cells*
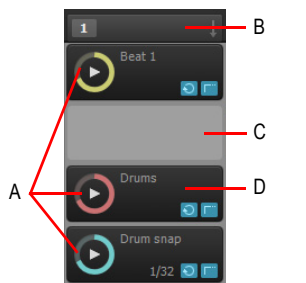
A. Filled cells (contain patterns) **B.** *Column trigger (click to play all cells in a column)* **C.** *Empty cell* **D.** *Playing cell with progress indicator*

The Matrix view is a grid of unlimited cells arranged into rows and columns.

A cell is simply a pattern holder. You can drag one pattern into each cell, or leave the cell empty. By default, a cell displays the name of the assigned pattern, but the cell can be renamed.

You can trigger cells by clicking with a mouse or via MIDI remote control. Only one cell per row can be triggered at a time. Patterns repeat themselves until you stop playback or until another pattern in the same row starts to play.

A cell blinks when it is triggered but not yet playing. In this state, the cell has been queued for playback, and will play as soon as the current **Trigger Resolution** is reached.

During playback, a cell displays a "play" icon and a circular progress indicator to show the position of the loop as it is playing.

A filled cell contains the following controls:

Figure 542. *Matrix view cell*

A. MIDI Learn indicator *B.* Trigger area *C.* Cell name *D.* Progress indicator *E.* Loop mode *F.* Latch mode
G. Trigger mode (blank if **Follow Global** is enabled)

- **Cell name.**   The name of the cell. By default, a cell displays the name of the assigned pattern, but the cell can be renamed. For details, see

- **Progress indicator.**   During playback, a cell displays a circular progress indicator to show the position of the loop as it is playing.

- **MIDI Learn indicator.**   The MIDI Learn indicator shows if the cell has been assigned to MIDI remote control.

- **Trigger area.**   Click the Trigger area to trigger the cell according to the global **Trigger Resolution** and **Cell Start** settings.

> **Note:** *When triggered with a mouse, a cell is triggered when the mouse button is pressed, not when the mouse button is released.*

- **Loop mode.**   Each cell has a **Loop Mode** button, which lets you override the **Global Loop Mode** setting. By default, each cell inherits the **Global Loop Mode** setting. When a cell's **Loop Mode** toggle is enabled, the cell will no longer follow the **Global Loop Mode** setting. For details, see

> **Note:** *After a cell's **Loop Mode** button has been engaged, the cell will no longer continue to follow the **Global Loop Mode** setting, even if you disable the cell's **Loop Mode** button. To restore the link to the **Global Loop Mode** setting, hold down the CTRL key and click the cell's **Loop Mode** button.*

- **Latch mode.**   Each cell has a **Latch Mode** button, which lets you override the **Global Latch Mode** setting. By default, each cell inherits the **Global Latch Mode** setting. When a cell's **Latch Mode** toggle is enabled, the cell will no longer follow the **Global Latch Mode** setting. For details, see

> **Note:** *After a cell's **Latch Mode** button has been engaged, the cell will no longer continue to follow the **Global Latch Mode** setting, even if you disable the cell's **Latch Mode** button. To restore the link to the **Global Latch Mode** setting, hold down the CTRL key and click the cell's **Latch Mode** button.*

- **Trigger Resolution.** By default, a cell follows the **Global Trigger Resolution**, as specified in the Matrix view toolbar. You can also assign a custom trigger resolution to each cell, instead of following the global trigger resolution. For details, see "To use a per-cell trigger resolution" on page 1892.

Figure 543. *Per-cell trigger resolution*
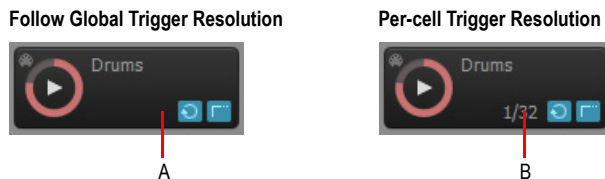
A. Follow Global Trigger Resolution (no resolution is displayed) **B.** *Per-cell Trigger Resolution (assigned resolution is displayed)*

You can right-click a cell to access the following commands:

- **Import File.** Use this command to import a file into a cell.
- **Rename Cell.** Use this command if you want to rename the cell.
- **Clear Cell.** Use this command to remove any pattern and MIDI assignment from the cell.
- **One-Shot Trigger.** Use this command to configure a cell as a one-shot sample. A one-shot cell plays one repetition from beginning to end and ignores any loop and latch settings.
- **MIDI Learn.** Use this command to assign a MIDI event to a cell, which allows you to trigger the cell via MIDI remote control. The **MIDI Learn** command shows an orange outline around the cell if it is already in MIDI Learn mode, and shows a small MIDI icon if there is already a MIDI event assigned to the cell. You can use the **MIDI Learn** command on both active and empty cells.
- **Clear MIDI Learn.** Use this command to remove any MIDI assignment from the cell. The cell will no longer be triggered via MIDI remote control.
- **Trigger Resolution.** Assign the desired trigger resolution to the cell. A cell can either follow the default Global Trigger Resolution setting, or a per-cell trigger resolution. The following settings are available:
  - Follow Global (default)
  - Immediate
  - Measure
  - Beat
  - 1/4
  - 1/8
  - 1/16
  - 1/32
  - 1/64

In addition to a mouse, you can use the computer keyboard to navigate between cells:

- Use the ARROW keys to move focus to another cell that contains data.
- Press ENTER to trigger the cell that has focus.
- Press DELETE to clear the cell that has focus.

See:

See also:

Using the Matrix view

To open the Matrix view

- Do *one* of the following:
  - Select **Views > Matrix view**.
  - Press ALT+5.

To assign a pattern to a cell

You can drag audio, MIDI Groove Clips, Step Sequencer patterns and Project5 patterns from the Media Browser view or from the Clips pane into the Matrix view. Do *one* of the following:

- **To assign a pattern to a cell in an existing row.** Do one of the following:
  - Drag a pattern to the desired cell in an existing row.
  - Right-click a cell and select **Import File** on the context menu.
- **To assign a pattern to a cell in an empty row.** If you drag a pattern to an empty row, you can specify if the new row should be assigned to an existing track or to a new corresponding track:
  - **To create a new row and assign it to the most recently created or assigned track.** Drag a pattern to the desired cell in an empty row.
  - **To create a new row and corresponding track.** Hold down the ALT key and drag a pattern to the desired cell in an empty row.

  Any new rows and tracks that are created by the Matrix are named "Matrix Row n".

  When dragging a clip from the Clips pane, the cell will automatically inherit the clip name and color. If the clip has no name, the cell will be named "Audio" or "MIDI".

Note 1: *Rows that are assigned to audio tracks can only contain cells with audio data. Likewise, rows that are routed to MIDI or Instrument tracks can only contain cells with MIDI data. The Audio or MIDI identity of a row is established when the first pattern is dragged into the row.*

Note 2: *When you drag a clip from the Clips pane and drop it in the Matrix view, the Matrix view will use the entire raw clip data, even if the clip is cropped. If you want the Matrix view to only use the uncropped part of the clip, first use the Track view **Clips > Bounce to Clip(s)** command to create a new clip. If you want the clip to loop smoothly, you may also want to convert the new clip to a Groove clip and edit it in the Loop Construction view before you drag it into the Matrix view.*

Tip: *If you want to always import audio as Groove Clips, click the **Options** button to open the **Matrix Options** dialog box, then click the **Import all audio as GrooveClips** check box.*

To assign multiple patterns to subsequent rows

1. Select multiple patterns in the Media Browser view or the Clips pane.
2. Drag the selected patterns to the desired target cell.

   The first pattern is assigned to the target cell, and any additional patterns are assigned to subsequent rows below the target cell.

To assign multiple patterns to subsequent columns

1. Select multiple patterns in the Media Browser view or the Clips pane.

2. Hold down the SHIFT key and drag the selected patterns to the desired target cell.

   The first pattern is assigned to the target cell, and any additional patterns are assigned to subsequent columns the right of the target cell.

To remove a pattern from a cell

- Do *one* of the following:
  - Click the cell then press the DELETE key.
  - Right-click the cell and select **Clear Cell** from the pop-up menu.
  - Drag the pattern to a different cell.

To remove all patterns

- Click the arrow next to the **Stop All Cells** button ![Stop All Cells button] in the **Matrix view** toolbar and select **Clear All Cells** from the drop-down menu.

To specify how soon a pattern should start playing after being triggered

When you trigger a cell or column, playback starts after the amount of time that is selected in the

Cell Trigger Time ![Measure menu] menu in the **Matrix view** toolbar.

- Click the **Trigger Resolution** menu and select one of the available options:
  - **Immediate.** Playback starts immediately.
  - **Next Measure.** Playback starts on the next measure boundary.
  - **Next Beat.** Playback starts on the next beat.
  - **Next 1/8.** Playback starts on the next 8th note.
  - **Next 1/16.** Playback starts on the next 16th note.
  - **Next 1/32 Note.** Playback starts on the next 32th note.
  - **Next 1/64 Note.** Playback starts on the next 64th note.

  After a cell has been triggered, the cell blinks until the **Trigger Resolution** is reached, at which time playback starts.

To start a pattern from its beginning

- Make sure the **Cell Start** toggle is in Always from Beginning mode ![toggle] before you trigger the pattern.

💡 **Tip:** *To trigger a cell using the opposite mode of the current **Cell Start** setting, hold down the ALT key when you trigger the cell.*

To configure a cell as "one-shot"

- Right-click the cell and select **One-Shot Trigger** on the context menu.

  The **Loop Mode** and **Latch Mode** buttons in the cell are hidden. When **One-Shot Trigger** mode is enabled, loop and latch settings are ignored, and the cell only plays one repetition from beginning to end.

  To disable **One-Shot Trigger** mode, right-click the cell and select **One-Shot Trigger** on the context menu.

To synchronize a pattern with the project's Now time

- Make sure the **Cell Start** toggle is in Offset to Now Time mode ⟶ before you trigger the pattern.

  Tip: *To trigger a cell using the opposite mode of the current **Cell Start** setting, hold down the ALT key when you trigger the cell.*

  When you trigger a cell in Offset to Now Time mode, the pattern will start playing in sync with the Now time after the amount of time listed in the **Trigger Resolution** menu. It's as if the cell's pattern is repeated throughout the song and you unmute the pattern at a certain point.

To synchronize the Matrix with SONAR's transport

- Make sure the **Follow Transport** button ⊞ is enabled.

  Patterns will now only play when SONAR's transport is rolling.

To trigger a cell

- Do *one* of the following:
  - Click the desired cell.
  - Use the ARROW keys on your computer keyboard to navigate to the desired cell, then press ENTER.
  - If the cell has been assigned to a MIDI event, press the appropriate key, pad or button on your MIDI controller. For details, see "To trigger a cell or column via MIDI remote control" on page 1894.
  - After the cell has been triggered, the cell blinks until the **Trigger Resolution** is reached, at which time playback starts.

  The global **Cell Start** toggle determines if the pattern will play from the beginning of the pattern

  or synchronize to the project's Now time. In Always from Beginning mode ⟼, patterns always

  start from the beginning. In Offset to Now Time mode ⟶, patterns synchronize to the project's Now time.

  Tip: *To trigger a cell using the opposite mode of the current **Cell Start** setting, hold down the ALT key when you trigger the cell.*

During playback, the cell displays a "play" icon and a circular progress indicator to show the position of the loop as it is playing. Patterns repeat themselves until you stop playback or until another pattern in the same row starts to play (non-looped content play as one-shots, meaning the patterns play only once).

> **Note 1:** *Only one cell per row can be triggered at a time. You can trigger multiple cells simultaneously as long as they are located in different rows.*

> **Note 2:** *Together, the **Global Latch Mode** and **Global Loop Mode** toggles give you flexible control over how cells are triggered.*
>
> * **To play a cell continuously when triggered.**   Enable **Global Loop Mode**; enable **Global Latch Mode**
> * **To play a cell once through when triggered.**   Disable **Global Loop Mode**; enable **Global Latch Mode**
> * **To play a cell continuously as long as the mouse/note is held.**   Enable **Global Loop Mode**; Disable **Global Latch Mode**
> * **To play a cell as long as the mouse/note is held, but stop at end.**   Disable **Global Loop Mode**; disable **Global Latch Mode**

See also:

To use a per-cell trigger resolution

By default, a cell follows the **Global Trigger Resolution**, as specified in the Matrix view toolbar. You can also assign a custom trigger resolution to each cell, instead of following the global trigger resolution.

To assign a per-cell trigger resolution:

1. Right-click the cell, point to **Trigger Resolution** on the pop-up menu, and select one of the following options:

   * Follow Global (default)

   * Immediate

   * Measure

   * Beat

   * 1/4

   * 1/8

   * 1/16

   * 1/32

   * 1/64

2. Do *one* of the following:

    • Click the desired cell's trigger area.

    • Use the ARROW keys on your computer keyboard to navigate to the desired cell, then press ENTER.

    • If the cell has been assigned to a MIDI event, press the appropriate key, pad or button on your MIDI controller. For details, see "To trigger a cell or column via MIDI remote control" on page 1894.

    • After the cell has been triggered, the cell blinks until the cell's assigned trigger resolution is reached, at which time playback starts.

Figure 544. *Cell trigger resolution*
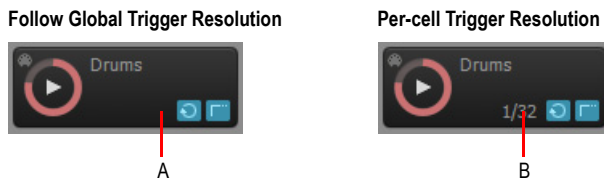
Follow Global Trigger Resolution   **Per-cell Trigger Resolution**

A   B

*A. Follow Global Trigger Resolution (no resolution is displayed) **B.** Per-cell Trigger Resolution (assigned resolution is displayed)*

See also:

"To trigger a cell" on page 1891

To trigger all cells in a column simultaneously

• Click the Column Trigger at the top of the column.

    All the patterns in the column start playing and any other playing cells are turned off.

    The shorter patterns in a column repeat until the longest pattern finishes.

A. Click the Column Trigger to trigger all cells in the column

See also:

To trigger a cell or column via MIDI remote control

You can trigger a cell or column via MIDI remote control, but you must first specify the MIDI message that should trigger the cell or column.

1. Right-click the cell or Column Trigger that you would like to trigger via MIDI remote control, and select **MIDI Learn** from the pop-up menu.

   The cell has an orange outline. The next MIDI event the Matrix receives will be assigned to all cells that are in MIDI Learn mode.

   Note: *If the **Cell MIDI Trigger** button* *in the **Matrix view** toolbar is disabled, it will automatically be enabled when a cell is in MIDI Learn mode.*

2. Press the desired key, pad or button on your MIDI controller.

   The incoming MIDI message is assigned to all cells that are in MIDI Learn mode.

   Tip: *You can put multiple cells on different rows into MIDI Learn mode, and all cells will be triggered by the same MIDI event.*

The MIDI message is assigned to a specific cell in the grid, not to any particular pattern or loop. You can even use MIDI Learn on empty cells.

After a cell has been assigned to a MIDI message, you can press the corresponding key, pad or button on your MIDI controller to trigger the cell.

1. Make sure the **Cell MIDI Trigger** button in the **Matrix view** toolbar is enabled.

2. Press the desired key, pad or button on your MIDI controller.

   All cells that are assigned to the incoming MIDI message will be triggered.

   Note: *You can also use a MIDI modifier key to trigger a cell using the opposite mode of the current **Cell Start**, **Global Loop Mode**, **Global Latch Mode**, or **Retrigger Mode** settings. To MIDI learn the MIDI modifier functions, Right-click the desired global mode button in the Matrix toolbar, choose **MIDI Learn**, then press the desired modifier note on your MIDI controller.*

   To use a modifier in a performance, press the appropriate modifier key on your MIDI controller, as learned using the steps outlined above. This action will invert the corresponding mode behavior for the very next cell that is triggered. Once a cell has been triggered, the modifier key is cleared and Matrix cell triggering will resume based on mode settings in the Matrix.

To disable MIDI remote control

- Make sure the **Cell MIDI Trigger** button in the **Matrix view** toolbar is disabled.

To clear MIDI event assignments

- Do *one* of the following:

- **To clear MIDI assignments for a single cell.** Right-click the desired cell and select **Clear MIDI Learn** on the pop-up menu.
- **To clear MIDI assignments for a single Column Trigger.** Right-click the desired cell and select **Clear MIDI Learn** on the pop-up menu.
- **To clear MIDI assignments for all cells and Column Triggers.** Click the arrow next to the **Stop All Cells** button [!] in the **Matrix view** toolbar and select **Clear All MIDI Learn** from the drop-down menu.

To retrigger a playing cell

1. Make sure the **Retrigger Mode** toggle in the **Matrix View** toolbar is enabled.

2. Do *one* of the following:
- Click the desired playing cell.
- Use the ARROW keys on your computer keyboard to navigate to the desired playing cell, then press ENTER.
- If the cell has been assigned to a MIDI event, press the appropriate key, pad or button on your MIDI controller. For details, see "To trigger a cell or column via MIDI remote control" on page 1894.

The playing cell restarts from its beginning.

To pause or resume playback of all playing cells

1. Make sure the **Follow Transport** button [ ] is enabled.

2. Press the SPACEBAR key.

To stop playing one or more cells

- Do *one* of the following:
  - Click the playing cell.
  - Click an empty cell in a row to stop that row.
  - If the cell is assigned to a MIDI event, press the corresponding key, pad or button on your MIDI controller (see "To trigger a cell or column via MIDI remote control" on page 1894).

To stop playing a column

- Do *one* of the following:
  - Click the Column Trigger above the column.
  - If the column is assigned to a MIDI event, press the corresponding key, pad or button on your MIDI controller (see "To trigger a cell or column via MIDI remote control" on page 1894).

To insert a new empty column

- Right-click a column header and select **Insert Column** on the context menu.

A new empty column is inserted to the left of the clicked column.

To duplicate an existing column

- Right-click a column header and select **Duplicate Column** on the context menu.

  A copy of the clicked column is created.

To rename a column header

1. Right-click a column header and select **Rename Column** on the context menu.

   The **Rename Column** dialog box appears.

2. Type the desired name and click **OK**.

   The name is displayed in the column header.

To stop playing all cells

- Click the **Stop All Cells** button ⚠ in the **Matrix view** toolbar.

To use independent Latch mode per cell

- Click the cell's **Latch Mode** button.

  The cell now uses its own independent Latch mode and no longer follows the **Global Latch Mode** setting.

ⓘ **Note:** *After a cell's **Latch Mode** button has been engaged, the cell will no longer continue to follow the **Global Latch Mode** setting, even if you disable the cell's **Latch Mode** button. To restore the link to the **Global Latch Mode** setting, hold down the CTRL key and click the cell's **Latch Mode** button.*

To use independent Loop mode per cell

- Click the cell's **Loop Mode** button.

The cell now uses its own independent Latch mode and no longer follows the **Global Loop Mode** setting.

ⓘ **Note:** *After a cell's **Loop Mode** button has been engaged, the cell will no longer continue to follow the **Global Loop Mode** setting, even if you disable the cell's **Loop Mode** button. To restore the link to the **Global Loop Mode** setting, hold down the CTRL key and click the cell's **Loop Mode** button.*

To mute/unmute a row

• Click the row's **Mute** button M .

A

Track 1
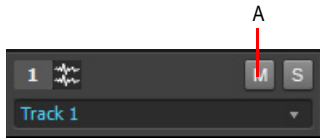
*A. Click the row's **Mute** button to mute/unmute a row*

To solo/unsolo a row

• Click the row's **Solo** button S .

A
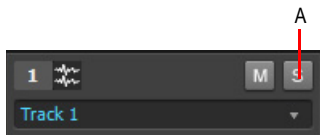
Track 1

*A. Click the row's **Solo** button to solo/unsolo a row*

To route a MIDI row directly to a soft synth or hardware output

• Click the row's **Direct Mode** button D . Doing so will bypass the assigned track's MIDI
processing, such as MIDI FX, Arpeggiator, volume, etc., and send the row directly to the assigned
soft synth or hardware output.

A

Matrix Row 4
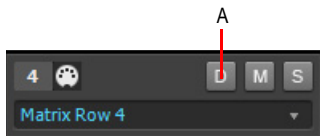
*A. Click the row's **Direct Mode** button to bypass all MIDI track processing*

To reassign a row to a different track

• Click the arrow next to the track name and select a track from the drop-down menu.

Rows that contain audio patterns can be assigned to any available audio track, and rows that contain MIDI patterns can be assigned to MIDI tracks.
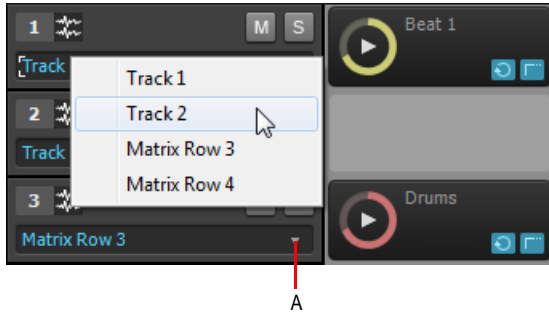
A. Click arrow to reassign a row to a different track

To rename a cell

1. Right-click a cell and select **Rename Cell** from the pop-up menu.

   The **Rename Cell** dialog box appears.

2. Type a new name and click **OK**.

To move a pattern to another cell

• Drag a pattern to an empty cell.

To copy a pattern to another cell

• Hold down the CTRL key and drag the pattern to another cell.

To record a performance into the Clips pane

You can capture (record) the output of the Matrix on the same tracks that rows are assigned to. When capturing data from the Matrix, any existing clips in the target tracks are unaffected.

1. Specify the desired triggering time lag in the **Trigger Resolution** [Measure] drop-down menu.

2. Click the **Capture Matrix Performance** [●] button to enable it.

3. Move the project's Now time to where you want to start recording.

4. Trigger the cells you would like to record.

ⓘ **Note:** *You can turn cells on and off while SONAR is capturing the performance.*

5. Press **Play** in SONAR to start playback.

As cells are triggered in the Matrix view, the Clips pane displays corresponding preview clips.

If SONAR's transport is looping, captured Matrix performance data will overwrite itself.

6. When you want to stop recording, press **Stop** in SONAR or press the SPACEBAR key.

SONAR records the output of all unmuted rows to their respective target tracks. The new clips inherit their colors from the triggered cells.

Audio patterns record as audio clip in the Clips pane, and MIDI patterns record as MIDI clips. If you want to undo the recording, press CTRL+Z.

Note: *In addition to capturing an entire performance, you can also perform a Quick Capture of a single pattern. For details, see "To render a single pattern to the Clips pane (Quick Capture)" on page 1899.*

See also:

"To render a single pattern to the Clips pane (Quick Capture)" on page 1899

To render a single pattern to the Clips pane (Quick Capture)

You can perform a Quick Capture of a single cell to render the pattern to the Clips pane.

• Hold down the CTRL and ALT keys and click the cell.

One repetition of the pattern is rendered on the row's target track at the current Now time.

See:

"Matrix view" on page 1876

Matrix view shortcuts

Shortcut	Focus in cell	Focus in header
ENTER	Trigger cell	Trigger header
HOME	Go to first occupied cell on the current row.	Go to first column trigger
END	Go to last occupied cell on the current row.	Go to last column trigger
CTRL+DOWN ARROW	---	Move focus to the cells at the same column on the last focused row if possible, otherwise tries to find nearest row
CTRL +UP ARROW	Move focus to the column buttons at the same column.	---
LEFT ARROW	Go to previous occupied cell on row	Go to previous column trigger
RIGHT ARROW	Go to next occupied cell on row	Go to next column trigger
DELETE	Delete contents of cell	---

Table 276. *Matrix view keyboard shortcuts*

See:

"Matrix view" on page 1876

Navigator view

Open the Navigator view by using the **Views > Navigator** command, or by pressing ALT+SHIFT+8.

The Navigator view displays a large part of your project so you can see an overview of your song. The Navigator view is a floating version of the Navigator pane found at the top of the Track view.

Track Rectangle

The Track Rectangle appears as a green rectangle within the Navigator view. The Track Rectangle indicates the section of your project which appears in the Clips pane of the Track view. You can move the Track Rectangle or change its size.

For more information, see "Using the Navigator view" on page 332.

Play List view

Open the Play List view by using the **File > New** command to open the **New Project** dialog box, and choosing Play List set from the list of files (it's near the top of the list). This view lets you set up a series of songs to play sequentially.

The Play List view lets you create, edit, and save a **play list** (or **set**) of up to 128 SONAR projects. Once you've created the list, you can play back the entire sequence automatically. You can even program the list to pause between songs for a fixed amount of time or to wait for a keystroke before proceeding.

The Play List view looks like this:
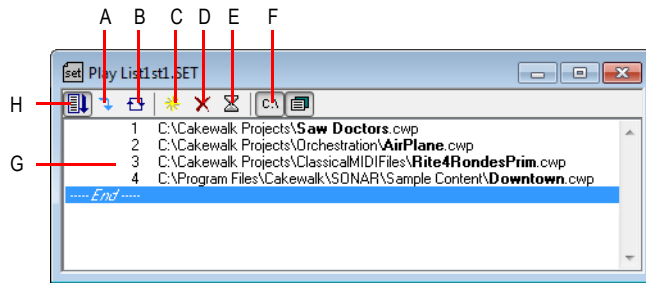
A. Switch to the next song B. Repeat the list C. Add a song D. Drop a song E. Set a delay F. Display full path
G. List of songs H. Enable the play list

Play lists can be saved for future use. Play list files have the extension .set.

See "To create and edit a play list" on page 234 and "To play files from the Play List view" on page 235.

See also:

"Playing files in Batch mode" on page 233

Surround panner

The large surround panner has the following controls:

- **Angle and Focus marker.** A small sphere that you can drag in any direction to both control and display the following two parameters:

  - **Angle.** This is the perceived angle of the sound source as it differs from the position directly in front of the listener. The scale is 0 to 180 degrees on the listener's right, and 0 to -180 degrees on the listener's left. 0 means the sound is coming from directly in front of the listener, and plus or minus 180 degrees means that the sound is coming from directly behind the listener.

  - **Focus.** This is the perceived distance of the sound source from the center of the circle on a scale of 0 to 100, 0 meaning the center of the circle, and 100 meaning the perimeter.

- **Width markers.** These are two smaller spheres equidistant from the Angle and Focus marker. Their distance from each other and from the front of the circle shows the Width value (see definition below). You can also drag the Width markers to control Angle and Focus.

- **Speaker icons/squares.** Each surround channel is represented by a speaker icon in the large panner, and a white square in the small panner. The large panner also has a corresponding volume level in dB directly in front of each icon. The position of each speaker icon shows you each speaker's position in the surround mix. Clicking a speaker icon or square **mutes** the corresponding channel, causing the icon or square to become grey.

- **Angle slider.** This slider both displays and controls the angle value.

- **Focus slider.** This slider both displays and controls the focus value.

- **Width slider.** This slider both displays and controls the width value. *Width* is a measure of how wide an area the sound seems to be coming from on a scale of 0 to 360 degrees. At 0 and 360 degrees, the sound seems to all come from a single speaker. At 180 degrees the sound seems to come from directly opposite sides. The default angle matches the project's left and right channel angle. For example, in 5.1 SMPTE/ITU surround, the default width is 60 degrees.

- **Front/Rear Balance slider (large panner only).** Abbreviated as FrntRrBl, this slider adjusts the front and rear balance. Drag it to the left to reduce the level from the front speakers, or drag it to the right to reduce rear level.

- **LFE slider.** This slider both displays and controls the level of sound sent to the LFE channel.

- **LFE Only button (large panner only).** This button mutes all channels except the LFE channel.

Figure 545. *Large Surround Panner*
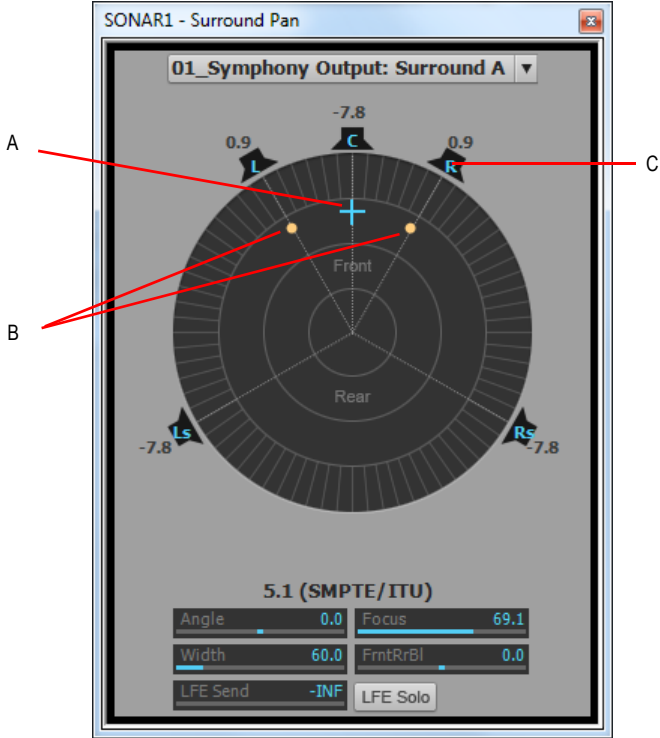
A. Angle and focus marker B. Width markers C. Right speaker icon

For more information about surround mixing, see "Surround Mixing (Producer and Studio only)" on page 939.

View reference
Surround panner

Glossary

Aftertouch
MIDI property controlling how much pressure is applied after sending a Note On message. See "Channel aftertouch (ChanAft)" on page 1910 and "Key aftertouch (KeyAft)" on page 1914.

AIFF
Short for Audio Interchange File Format, the audio file format on the Macintosh platform. Files in this format have the extension .aif or .aiff.

Archive
Silence and suppress the processing of a track. Archived tracks are not loaded into RAM, so they can't be unmuted in real time. Use the archive command to reduce the demand on your CPU. See "Mute" on page 1916.

Arm
Enable a track for recording.

See "Choosing an input" on page 261.

Audio clip
A visual reference to a portion of, or an entire, recorded audio file. This is represented graphically as a wave form which can be edited and manipulated in a variety of manners.

Audio track
An audio track is a reference point for playing and recording a single digital audio file stored on your computer's hard drive. The inputs of the audio track are where you would like to record a signal from and the outputs are where you would like to send this signal to monitor.

Audition
Preview audio effects before applying them to a track.

See "Basic audio processing" on page 789.

Automation

Ability to change controllable parameters over the length of a track. This is achieved by referencing "snapshots" or "nodes" assigned to specific parameter values in relation to their position on the timeline and is achieved with envelopes.

See "Quick automation guide" on page 1003.

Bank

A means of categorizing sounds. A "bank" can store up to 128 "patches".

Bit depth

The amount of data allocated to reproducing a sound wave of digital audio file. Closely related to the dynamic range of the audio file. 1-bit typically represents 6dB of dynamic range when converting an analog signal to a digital signal. Thus, the greater the bit depth, the greater the dynamic range.

Broadcast wave

A wave file with the following embedded information: description, originator, origination date, origination time, and SMPTE time reference.

Bundle file

A single file that incorporates all project information and audio data. Bundle files are useful for creating backups of your work or for moving projects from on computer to another.

Cakewalk Application Language (CAL)

An event-processing language that extends Cakewalk with custom editing commands. Useful for applying quantization, humanization, or other instant changes to MIDI events.

See "Running CAL programs" on page 1248.

Channel

Path through which MIDI transmits information. MIDI devices typically send data over 1 of 16 channels, or over all channels simultaneously (Omni).

Channel aftertouch (ChanAft)

MIDI property regulating the pressure applied to all the notes of the instrument on the specified channel.

Chord

Three or more notes played simultaneously. Typically represented by a single letter representing its root, numbers representing additional notes, and symbols representing its quality. On the guitar chord grid, the notes are shown on the neck of a guitar.

See "Adding chord symbols" on page 1090.

Chord symbol

The c among the expression marks on the staff view. Put one above the notes where you want to define a guitar chord grid.

See "Chords and marks" on page 1090.

Clip
A reference to a portion or entire audio or MIDI file stored on your computer. Clips can be edited, moved, linked, copied etc. as a means of creating your project.

Clone
A command that allows you to copy a track along with its properties. You can choose to copy the clips or events or both. You can choose the destination track for the copy.

Controllers
Pedals, knobs, and wheels on your electronic instrument that you can use to change the sound while you're playing.

See

Controls
Sliders, faders, knobs, and buttons on the console or your on-line equivalent of

See

Crescendo
A passage of music during which the volume gradually increases.

Crossfade
One clip fading in while another fades out. You can create destructive or non-destructive crossfades. For more information, see

dB
The abbreviation for Decibel.

See

Decibel
A logarithmic unit used to measure loudness; abbreviated dB.

See

Decrescendo
Also referred to as a diminuendo, is a passage of music during which the volume gradually decreases.

Digital audio
Music or sound recorded digitally, as on a compact disk as opposed to an analog signal recorded to tape.

DMA
Direct Memory Access. DMA settings determine how your computer's sound card communicates with Cakewalk.

See

DRM (Dump Request Macro)
Utility for getting synthesizer data into a bank.

Duration
In SONAR's **Step Record** dialog box, duration means the actual length of time that a note sounds, as opposed to the notated value of the note, which could be different. If you check the **Follow Step Size** option in the dialog box, the notated value and the duration are the same.

Echo
Enables real-time monitoring of the associated track's inputs through the outputs of your sound device.

Effects (audio effects)
Systematic changes you can make to parts or all of the music, like reverb, chorus, and delay.

See "Audio effects (audio plug-ins)" on page 797 and "Using real-time effects" on page 862.

Envelopes
Reflects the changes in value for a specified parameter (volume, for example) over a period of time. Also refers to the graph of the change—same as vector.

See "Automation" on page 1001.

Event
Note, MIDI action, or audio clip.

Expression
Chord symbol, text of any sort (like *ff* or *con amore*), hairpin, or pedal marks.

Expression marks
Dynamic markings and other musical instructions (like decrescendo, con amore, etc.) in the Staff view.

See "Adding expression marks" on page 1093.

Fade
Gradual increase or decrease in volume.

See "Fades and crossfades" on page 395 and "Automation" on page 1001.

Fade-in
A gradual increase in volume from absolute silence.

See "Fades and crossfades" on page 395 and "Automation" on page 1001.

Fade-out
A gradual decrease in volume toward absolute silence.

See "Fades and crossfades" on page 395 and "Automation" on page 1001.

Frame
One of the many single photographic images in a motion picture or video. It is the smallest unit used for SMPTE synchronization.

See "SMPTE/MIDI time code synchronization" on page 1162.

Frame rate
Indicates the number of frames displayed per second.

From time
The beginning of a selection. Set it in the Control Bar's Select module.

See "Now time" on page 1916.

Full-duplex
The ability to stream data in two directions simultaneously. Sound cards that support full-duplex allow for simultaneous recording and playback of audio.

See "Recording audio" on page 275.

Groove clip
Audio clip that contains pitch and tempo information that allows SONAR to automatically adjust the pitch and tempo of the clip to that of the project you insert it into.

Groove pattern
Piece of music used as a template for the groove quantize command.

See "To use the Groove Quantize command" on page 723.

Groove quantize
Lets you lay a grid over your groove pattern, then adjust time, duration, and velocity of selected notes so they line up with the grid.

See "To use the Groove Quantize command" on page 723.

Group
An entity consisting of multiple controls or buttons and specifying relationships between or among them.

Guitar chord grid
Displays chord symbols as well as the fingerings on the fret board of a guitar above the Staff View.

See "Chords and marks" on page 1090

H:M:S:F
Short for Hours, Minutes, Seconds, and Frames, which is the time format used for "SMPTE" on page 1919 time.

Hairpin symbol
Crescendo or decrescendo mark.

See "Chords and marks" on page 1090

Input

The selection for which channel of a device you want to receive signal from.

See "Choosing an input" on page 261.

Input monitoring

Hearing real-time playback of a track's input as it is being sent to, or recorded, in SONAR. You can enable input monitoring with a track's **Input Echo** button.

Inspector menu (same as context menu)

Menu appropriate for a particular location or item. Display a context menu by right-clicking on the location or item.

Instrument definitions

A file that contains information necessary to communicate settings about banks, patches, controllers, and other features of an instrument.

See "Creating instrument definitions" on page 1122.

Key aftertouch (KeyAft)

MIDI property regulating the pressure applied to an individual note.

Key offset

The number of half-steps by which to transpose the track. A value of 12 raises the notes an octave. You can transpose all note in a track on playback by setting this value (Key+) in the Track Inspector.

Key signature

Key of the piece, how many sharps or flats it has, and how the music displays in the various views.

Latency

Often referred to as "buffer size" is a measurement of the time it takes, in samples, for audio to travel from its source, through a sound card's drivers and converters, into SONAR, and back through the sound card to your speakers.

Linked clips

Clips so specified that any change made to one applies to all.

See "Splitting and combining clips" on page 365.

Live mode

Temporary condition of a project with all automation turned off. You can toggle back and forth between live mode and regular mode by clicking the **Global Automation Playback** button in the Control Bar's Mix module.

Locked (SMPTE) time

Locks a marker to a specified time from the start of the music. Not affected by changes in tempo or time signature.

See "Creating and using markers" on page 357.

Looping
Repetition of a part of the whole piece of music.

Loops
Small pieces of audio data, suitable for being repeated back to back, such as a single drum beat or measure.

Lyrics
Words to go along with music.

See "Working with lyrics" on page 1112.

Marker
Flag marking a specific time in the music.

MBT
Short for Measure, Beat and Tick number which is the time format used for beats.

9:04:0060 is the 60th tick of the fourth beat of the ninth measure.

MCI command (Media Control Interface command)
Special event in the Event List view that lets you control other multimedia hardware and software.

Meter
The meter, or time signature, divides time into rhythmic pulses. Specifies the number of beats per measure and the note value of each beat.

See "Setting the Meter and Key signatures" on page 252.

Metronome
A feature that plays a regularly recurring audible beat which aids in accurate performances. Can be observed in playback or recording. The rate is set by the tempo of the project.

See "Tempo" on page 1920.

MIDI
Musical Instrument Digital Interface. The means by which computers communicate with most sound cards, keyboards, and other electronic instruments.

Note: *MIDI data does not contain any audio data.*

Mixdown
Combination of two or more audio tracks into a stereo submix. See "Routing and mixing digital audio" on page 841.

MMC (MIDI Machine Control)
A protocol that controls an MMC-equipped remote device through MIDI.

See the online Help topic "MIDI Machine Control (MMC)" on page 1168.

MME

Multi Media Extensions—the name of Windows' built-in audio and multmedia software that was originally developed for Windows 3.0, and is still used by many sound card drivers. WDM drivers offer much better performance.

MTC Sync

MIDI Time Code sync. Messages are received in SMPTE/MTC format from an external MIDI device and generate MTC.

See "SMPTE" on page 1919.

Mute

Silences a track to not be heard during playback or recording.

Normal template

A default project template which includes a predetermined amount of tracks and/or buses.

Now time

The current time in a project or where you are in the music. This is Represented by a vertical line which travels throughout the timeline.

See "The Now time and how to use it" on page 178

NRPN

Non-Registered Parameter Numbers.

See "Controllers, RPNs, NRPNs, and automation data" on page 739.

Offline

Not in real time. When you apply an effect to a track offline, you permanently alter the data in that track; then you play the track to hear the effect. When you add an effect to a track in real time, you start the track playing, and you add the effect while the track plays. The data in the track does not change, but the sound of it coming through the effect does.

Offset

Shift (time, key, velocity) by a specified number of units. For example, you could offset the start of a track by two measures.

Overload

Loss of audio information caused by the audio level exceeding 0 db.

Pan

Degree to which a sound or piece of music comes from the left or right speaker. This control is commonly used to adjust the level of a signal in different channels. In a stereo mix, the level is adjusted between the left and the right speakers.

Patch

Particular sound in an electronic device. Patches are stored in banks, in groups of 128.

Pedal mark
Expression mark indicating when the player should hold down the pedal and release it.

Phase
Frequency dependent time delay. All frequencies experience phase, but as a whole this is not noticeable as they are affected uniformly. If frequencies fall out of phase, however, they interfere with each other constructively or destructively. This can be measured by calculating the period length, as well as amplitude and magnitude values of a recorded wave form. If two frequencies fall 180 degrees out of phase, they will enduce destructive interference and thus completely cancel each other out.

Pitch bend
Controller that changes the pitch of a MIDI note.

Pitch marker
A marker in the Time Ruler which transposes the root note pitch of all groove clips and ACIDized loops in a project.

Pitch wheel
Controller that changes the pitch of a MIDI note.

Port
Computer connector for sending or receiving data.

PPQ
Abbreviation for Parts per Quarter Note. MIDI sequencers divide each beat into fractions of a beat (called ticks) for timing and editing purposes. You can place events in precise timing locations, up to the sequencer's current PPQ. PPQ is adjustable on most sequencers, up to about 960 PPQ. PPQ values of 96, 120. and 480 are common.

Project pitch
Also known as the default project pitch. The project pitch is the pitch that all groove clips and ACIDized loops in your project follow if there are no pitch markers in the project. You can set the project pitch with the **Project > Set Default Groove Clip Pitch** command.

Property
Any attribute or value belonging to an object. Often you can see these by right-clicking on the object. Track and clip properties can be set in the Inspector.

Quantize
Correct human imperfection in start and duration of selected notes so they line up with a specified time grid.

Quantize resolution
Used to set how precise (in notes or ticks) you want applying quantization to be.

Quantize strength

Measure of how close you want quantized notes to be in relation to the quantize resolution.

See

Record

To capture audio to a digital audio file or store incoming MIDI data in a MIDI track.

RIFF wave

The standard digital audio format used under Windows and for CD's, with a file extension of .wav.

RMS

Short for Root Mean Square. A method of measuring an average of the amplitudes that occur in a complete cycle of a frequency. RMS is a little over seventy per cent of peak level.

RPN

Registered Parameter Numbers.

See

Ruler

Bar showing evenly-spaced measure intervals. It appears in the Track, Staff, and Piano Roll views.

Sampling rate

The number of samples per second a digital audio file is recorded at. A higher sampling rate typically increases the fidelity recordings, as it helps to avoid phase shifting and aliasing artifacts. A higher sampling rate will yield larger audio files and more hard drive space used.

Screenset

A snapshot of the current layout of various views and windows in a project, including which windows are open, their size, position, zoom level and whether they are docked or floating. You can create up to 10 screensets per project and freely switch between screensets at any time.

See

Scrub

A tool used for previewing audio. The Scrub tool allows you to playback audio faster or slower as a useful auditioning tool.

Sensitivity (window)

Distance from a timing grid a note has to be to be unaffected, or affected less, by quantizing.

Shape

An automation envelope created in the Track view or Console view.

Size

The number of events in a track, listed in the Size column of the Tracks window. This number changes every time you add or delete events to or from that track.

Slip editing

Non-destructive editing process that allows the start and/or end time of an audio or MIDI clip to be trimmed by simply dragging the front or back end of the clip.

SMPTE

Society of Motion Picture and Television Engineers. SMPTE format measures time in hours, minutes, seconds, and frames.

Snapshot

Collection of automation settings that become active at a specific time. When the Now Time reaches that time, all of those particular settings take effect.

Solo

Silences all tracks except for those that are soloed during playback and recording. Multiple tracks can be soloed at once.

Split point

In the Staff view, the point at which you split a track into treble and bass staves. Notes at or above the split point go into the treble staff, those below into the bass staff.

Staff

A set of horizontal lines developed for music notation.

Striping

Recording an analog time code signal onto a track.

Submix

A grouping of specific tracks with similar qualities and/or effects (such as a submix of guitars or vocals). Creating submixes, by sending groups of tracks to a group specific buses for example, allows for quick adjustments when it comes to mixing, such as muting or applying reverb to all the vocals.

See

Swing

Systematic uneven spacing of notes on a timing grid, to give music a swing feel.

Sysx

Short for System Exclusive, refers to MIDI messages that only a specific device can use and understand. Cakewalk's System Exclusive library, which can store, record, and display for viewing or editing 256 banks, each holding any number of patches.

See

Sysx bank

A Sysx bank is a storage area plus some associated parameters such as a destination output and an optional description. Each bank can hold any number of messages; the amount of data it can

hold is limited only by available memory. The banks are saved in the Cakewalk song file. Each bank can also be saved as a .syx file in the format used by the public domain MIDIEX utility.

Take

A single pass of recording a part or a song. Multiple "takes" are often used in the studio as a means of editing the best of each take for the final production.

Template

A file which stores specific project layouts, such as numbers of tracks and/or plug-in assignments, but does not store any audio or MIDI data. Useful for creating new projects which might require a similar layout.

See "Templates and key bindings" on page 1063.

Tempo

The speed at which the project or selection of music is played at. Measured in rhythmic beats per minute.

See "Metronome" on page 1915.

Thru time

Time up to which the music is to be played back or recorded. Set it in the Control Bar's Select module.

Ticks

Subdivisions of quarter notes. MIDI projects often use a resolution of 480 parts per quarter note ("PPQ" on page 1917); each part is also called a tick.

Time

In Cakewalk, Now time, from time, or thru time. When an event takes place in the music.

Time offset

Adjustment of all track events by a specified amount of time.

See "Adjusting the time alignment of a MIDI track (Time+)" on page 227.

Time ruler

Bar showing evenly-spaced intervals. It appears in the Track, Staff, and Piano Roll views. You can use the Time Ruler to change the Now Time, make a time selection, and insert markers. For more about the Time Ruler, see "The Time ruler" on page 184.

Timebase

Same as "PPQ" on page 1917. Timing resolution, measured in pulses (ticks) per quarter note. Determines how finely you can specify notes.

See "Setting the MIDI timing resolution" on page 259.

TPQ

Same as timebase or PPQ. Short for Ticks Per Quarter note.

Track

Cakewalk's representation of one or more lines of music with shared properties, for example, music played by one instrument.

Transients

Peaks of loudness in an audio clip. Used to determine where the beats lie in audio clips.

Vector

The graph of the change of a parameter's value. In audio programs, some parameters can be changed by drawing vectors; means the same as drawing "Envelopes" on page 1912.

Velocity

A measurement taken when recording MIDI note events of how fast a key is struck. A MIDI notes velocity will dictate how loud the note will sound during playback.

Volume

Loudness of a sound or piece of music.

WASAPI

WASAPI (short for Windows Audio Session Application Programming Interface) is a new driver model available in SONAR that allows it to communicate with the new audio features in Windows 7.

WDM

Windows Driver Model—low-latency audio driver that bypasses the operating system's audio streaming software so that the driver can communicate directly with the sound card and the audio application.

Widget

A graphical element of a StudioWare panel (such as a knob or slider) that controls a parameter on a MIDI instrument or runs a CAL program.

Wipe

Deletes a track's clips and events, but leaves its properties. You can undo a wipe, but not paste it.

xRPN

RPN and NRPN.

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