

# VS-2000

## DIGITAL STUDIO WORKSTATION



Before using this unit, carefully read the sections entitled: "USING THE UNIT SAFELY" (Owner's Manual p. 2) and "IMPORTANT NOTES" (Owner's Manual p. 5). These sections provide important information concerning the proper operation of the unit. Additionally, in order to feel assured that you have gained a good grasp of every feature provided by your new unit, the Owner's Manual, and Appendices should be read in their entirety. These manuals should be saved and kept on hand as a convenient reference.

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# USING THE UNIT SAFELY

## INSTRUCTIONS FOR THE PREVENTION OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

### About ⚠ WARNING and ⚠ CAUTION Notices

<b>⚠ WARNING</b>	Used for instructions intended to alert the user to the risk of death or severe injury should the unit be used improperly.
<b>⚠ CAUTION</b>	Used for instructions intended to alert the user to the risk of injury or material damage should the unit be used improperly. * Material damage refers to damage or other adverse effects caused with respect to the home and all its furnishings, as well to domestic animals or pets.

### About the Symbols

	The ⚠ symbol alerts the user to important instructions or warnings. The specific meaning of the symbol is determined by the design contained within the triangle. In the case of the symbol at left, it is used for general cautions, warnings, or alerts to danger.
	The ⓧ symbol alerts the user to items that must never be carried out (are forbidden). The specific thing that must not be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the unit must never be disassembled.
	The ⓧ symbol alerts the user to things that must be carried out. The specific thing that must be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the power-cord plug must be unplugged from the outlet.

### ALWAYS OBSERVE THE FOLLOWING

#### ⚠ WARNING

- Before using this unit, make sure to read the instructions below, and the Owner's Manual.

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- Do not open or perform any internal modifications on the unit or its AC adaptor. (The only exception would be where this manual provides specific instructions which should be followed in order to put in place user-installable options; see Chapter 29.)

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- Do not attempt to repair the unit, or replace parts within it (except when this manual provides specific instructions directing you to do so). Refer all servicing to your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page.

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- Never use or store the unit in places that are:
  - Subject to temperature extremes (e.g., direct sunlight in an enclosed vehicle, near a heating duct, on top of heat-generating equipment); or are
  - Damp (e.g., baths, washrooms, on wet floors); or are
  - Humid; or are
  - Exposed to rain; or are
  - Dusty; or are
  - Subject to high levels of vibration.

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- Make sure you always have the unit placed so it is level and sure to remain stable. Never place it on stands that could wobble, or on inclined surfaces.

#### ⚠ WARNING

- Be sure to use only the AC adaptor supplied with the unit. Also, make sure the line voltage at the installation matches the input voltage specified on the AC adaptor's body. Other AC adaptors may use a different polarity, or be designed for a different voltage, so their use could result in damage, malfunction, or electric shock.

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- Use only the attached power-supply cord. Also, the supplied power cord must not be used with any other device.

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- Do not excessively twist or bend the power cord, nor place heavy objects on it. Doing so can damage the cord, producing severed elements and short circuits. Damaged cords are fire and shock hazards!

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- This unit, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level, or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should immediately stop using the unit, and consult an audiologist.

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- Do not allow any objects (e.g., flammable material, coins, pins); or liquids of any kind (water, soft drinks, etc.) to penetrate the unit.

**! WARNING**

- Immediately turn the power off, remove the AC adaptor from the outlet, and request servicing by your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page when:
  - The AC adaptor, the power-supply cord, or the plug has been damaged; or
  - If smoke or unusual odor occurs
  - Objects have fallen into, or liquid has been spilled onto the unit; or
  - The unit has been exposed to rain (or otherwise has become wet); or
  - The unit does not appear to operate normally or exhibits a marked change in performance.



- In households with small children, an adult should provide supervision until the child is capable of following all the rules essential for the safe operation of the unit.



- Protect the unit from strong impact. (Do not drop it!)



- Do not force the unit's power-supply cord to share an outlet with an unreasonable number of other devices. Be especially careful when using extension cords—the total power used by all devices you have connected to the extension cord's outlet must never exceed the power rating (watts/amperes) for the extension cord. Excessive loads can cause the insulation on the cord to heat up and eventually melt through.



- Before using the unit in a foreign country, consult with your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page.



- Keep lithium batteries out of reach of small children. If a child has accidentally swallowed a battery, see a doctor immediately.



- Lithium batteries must never be recharged, heated, taken apart, or thrown into a fire or water.



- Always turn the unit off and unplug the AC adaptor before attempting installation of the circuit board (model no. VS8F-2/VS8F-3; Chapter 29).



**! WARNING**

- DO NOT play a CD-ROM disc on a conventional audio CD player. The resulting sound may be of a level that could cause permanent hearing loss. Damage to speakers or other system components may result.



**⚠ CAUTION**

- The unit and the AC adaptor should be located so their location or position does not interfere with their proper ventilation. 

- Always grasp only the plug on the AC adaptor cord when plugging into, or unplugging from, an outlet or this unit. 

- At regular intervals, you should unplug the AC adaptor and clean it by using a dry cloth to wipe all dust and other accumulations away from its prongs. Also, disconnect the power plug from the power outlet whenever the unit is to remain unused for an extended period of time. Any accumulation of dust between the power plug and the power outlet can result in poor insulation and lead to fire. 

- Try to prevent cords and cables from becoming entangled. Also, all cords and cables should be placed so they are out of the reach of children. 

- Never climb on top of, nor place heavy objects on the unit. 

- Never handle the AC adaptor or its plugs with wet hands when plugging into, or unplugging from, an outlet or this unit. 

- Before moving the unit, disconnect the AC adaptor and all cords coming from external devices. 

- Before cleaning the unit, turn off the power and unplug the AC adaptor from the outlet (Chapter 4). 

- Whenever you suspect the possibility of lightning in your area, disconnect the AC adaptor from the outlet. 

- Use only the specified type (model no. CR3032) of lithium battery (Chapter 29). Be sure to insert it as directed (to ensure correct polarity). 

- Used lithium batteries must be disposed of in compliance with whatever regulations for their safe disposal that may be observed in the region in which you live. 

- Install only the specified circuit board(s) (model no. VS8F-2/VS8F-3). Remove only the specified screws (Chapter 29). 

**⚠ CAUTION**

- Should you remove screws, make sure to put them in a safe place out of children's reach, so there is no chance of them being swallowed accidentally. 

- Always turn the phantom power off when connecting any device other than condenser microphones that require phantom power. You risk causing damage if you mistakenly supply phantom power to dynamic microphones, audio playback devices, or other devices that don't require such power. Be sure to check the specifications of any microphone you intend to use by referring to the manual that came with it. 

(This instrument's phantom power: 48 V DC, 10 mA Max)

# Important Notes

In addition to the items listed under “USING THE UNIT SAFELY” on page 2, please read and observe the following:

## Power Supply

- Do not connect this unit to same electrical outlet that is being used by an electrical appliance that is controlled by an inverter (such as a refrigerator, washing machine, microwave oven, or air conditioner), or that contains a motor. Depending on the way in which the electrical appliance is used, power supply noise may cause this unit to malfunction or may produce audible noise. If it is not practical to use a separate electrical outlet, connect a power supply noise filter between this unit and the electrical outlet.
- The AC adaptor will begin to generate heat after long hours of consecutive use. This is normal, and is not a cause for concern.
- Before connecting this unit to other devices, turn off the power to all units. This will help prevent malfunctions and/or damage to speakers or other devices.

## Placement

- Using the unit near power amplifiers (or other equipment containing large power transformers) may induce hum. To alleviate the problem, change the orientation of this unit; or move it farther away from the source of interference.
- This device may interfere with radio and television reception. Do not use this device in the vicinity of such receivers.
- Noise may be produced if wireless communications devices, such as cell phones, are operated in the vicinity of this unit. Such noise could occur when receiving or initiating a call, or while conversing. Should you experience such problems, you should relocate such wireless devices so they are at a greater distance from this unit, or switch them off.
- Do not expose the unit to direct sunlight, place it near devices that radiate heat, leave it inside an enclosed vehicle, or otherwise subject it to temperature extremes. Excessive heat can deform or discolor the unit.
- When moved from one location to another where the temperature and/or humidity is very different, water droplets (condensation) may form inside the unit. Damage or malfunction may result if you attempt to use the unit in this condition. Therefore, before using the unit, you must allow it to stand for several hours, until the condensation has completely evaporated.

## Maintenance

- For everyday cleaning wipe the unit with a soft, dry cloth or one that has been slightly dampened with water. To remove stubborn dirt, use a cloth impregnated with a mild, non-abrasive detergent. Afterwards, be sure to wipe the unit thoroughly with a soft, dry cloth.
- Never use benzene, thinners, alcohol or solvents of any kind, to avoid the possibility of discoloration and/or deformation.

## Repairs and Data

- Please be aware that all data contained in the unit’s memory may be lost when the unit is sent for repairs. Important data should always be backed up on a storage device (e.g., CD-R/RW disc), or written down on paper (when possible). During repairs, due care is taken to avoid the loss of data. However, in certain cases (such as when circuitry related to memory itself is out of order), we regret that it may not be possible to restore the data, and Roland assumes no liability concerning such loss of data.

## Memory Backup

- This unit contains a battery which powers the unit’s memory circuits while the main power is off. When this battery becomes weak, the message shown below will appear in the display. Once you see this message, have the battery replaced with a fresh one as soon as possible to avoid the loss of all data in memory. To have the battery replaced, consult with your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the “Information” page.



## **Additional Precautions**

- Please be aware that the contents of memory can be irretrievably lost as a result of a malfunction, or the improper operation of the unit. To protect yourself against the risk of losing important data, we recommend that you periodically save a backup copy of important data you have stored in the unit's memory on a storage device (e.g., CD-R/RW disc).
- Unfortunately, it may be impossible to restore the contents of data that was stored on a storage device (e.g., CD-R/RW disc) once it has been lost. Roland Corporation assumes no liability concerning such loss of data.
- Use a reasonable amount of care when using the unit's buttons, sliders, or other controls; and when using its jacks and connectors. Rough handling can lead to malfunctions.
- Never strike or apply strong pressure to the display.
- When connecting / disconnecting all cables, grasp the connector itself—never pull on the cable. This way you will avoid causing shorts, or damage to the cable's internal elements.
- To avoid disturbing your neighbors, try to keep the unit's volume at reasonable levels. You may prefer to use headphones, so you do not need to be concerned about those around you (especially when it is late at night).
- When you need to transport the unit, package it in the box (including padding) that it came in, if possible. Otherwise, you will need to use equivalent packaging materials.
- Use a cable from Roland to make the connection. If using some other make of connection cable, please note the following precautions.
  - Some connection cables contain resistors. Do not use cables that incorporate resistors for connecting to this unit. The use of such cables can cause the sound level to be extremely low, or impossible to hear. For information on cable specifications, contact the manufacturer of the cable.

## **Handling Hard Disks**

### **Important Performance and Image Data**

- Once a hard disk fails to function normally, all data that has been stored on it could be destroyed.  
**All hard disks eventually wear out.** We recommend that you consider the hard disk not as a permanent storage site, but as a place to store data temporarily. We also recommend that you back up important performance that cannot be recorded again onto the external media (e.g., CD-R/RW disc).  
Note that Roland assumes no liability whatsoever, including monetary compensation, for the loss of any recorded content in the event of the malfunction of, or physical damage to the hard disk, or for any direct or incidental damages resulting from the loss of such data.

### **Precautions Regarding Setup and Use**

- Certain hard disk setup procedures and usage conditions may result in the corruption of recorded data, malfunctioning, or physical damage to the disk, so be sure to observe the following precautions.
  - Do not subject the hard disk to vibration or shock, especially while the unit is in operation.
  - Do not set up the unit in any location where it may be affected by vibration from external sources, or on any surface that is not stable and level.
  - If the device includes a cooling fan, ensure that the fan and the side panel air vents remain unobstructed.
  - Do not leave the unit in any environment subject to temperature extremes; for example, in a closed automobile in summer or outdoors during winter.
  - Do not use the unit in conditions of high temperature and humidity or in any location subject to rapid temperature changes.
  - Do not unplug the power cord or switch off any circuit breakers in the circuit to which the unit is connected while the power is turned on.
  - Do not move the unit while the power is turned on or immediately after turning off the power. When transporting the unit, first turn off the power and confirm that the display screen has gone off, disconnect the power plug, then wait at least two minutes before moving the device.

## Emergency Procedures

\* **The following procedures are to be used as emergency measures only, and are not recommended for normal operation.**

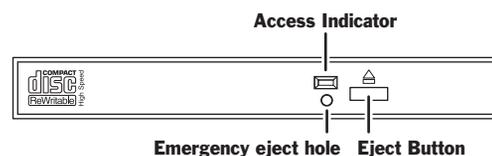
- If the device fails to respond to operational commands or does not complete operations, turn off the power. If the power does not shut off following normal shutdown procedures, disconnect the power plug.

If the unit does not operate normally when the power is turned on again, it may mean that the hard disk has been damaged. In such instances, consult your dealer or the nearest Roland Service Center. Note, however, that it may not be possible to recover any data from the hard disk once it has been lost.

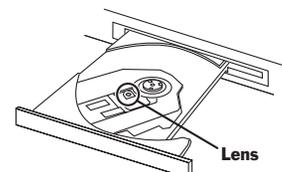
If your device features drive check capabilities, use the drive check function to regularly confirm that there are no problems, even when the device is operating normally.

For more detailed information on the shutdown and drive check procedures, refer to the Owner's Manual.

## Handling the CD-RW Drive



- Install the unit on a solid, level surface in an area free from vibration.
- Avoid using the unit immediately after it has been moved to a location with a level of humidity that is greatly different than its former location. Rapid changes in the environment can cause condensation to form inside the drive, which will adversely affect the operation of the drive and/or damage discs. When the unit has been moved, allow it to become accustomed to the new environment (allow a few hours) before operating it.
- It is strictly restricted to eject tray using emergency eject hall during VS-2000 is operating (while the DISK indicator of VS-2000 or access indicator of built-in CD-RW drive is lit).
- Remove any disc from the drive before powering up or down.
- When you carry VS-2000, remove the disc from the loading tray.
- To avoid the risk of malfunction and/or damage, insert only discs with  into the CD-RW drive. Never insert any other type of disc. Avoid getting paper clips, coins, or any other foreign objects inside the drive.
- Do not touch the lens.
- When the lens is dirty, clean the lens with a commercial lens blower.



## **Handling CD-ROM/CD-R/ CD-RW Discs**

### **⚠ WARNING**

- DO NOT play a CD-R/RW disc (CD-R/RW disc on which song data has been backed up) on a conventional audio CD player. The resulting sound may be of a level that could cause permanent hearing loss. Damage to speakers or other system components may result.
- Upon handling the discs, please observe the following.
  - Do not touch the recorded surface of the disc.
  - Do not use in dusty areas.
  - Do not leave the disc in direct sunlight or an enclosed vehicle.
- Avoid touching or scratching the shiny underside (encoded surface) of the disc. Damaged or dirty discs may not read/write properly. Keep your discs clean using a commercially available CD cleaner.
- Keep the disc in the case.
- Do not keep the disc in the CD-RW drive for a long time.
- Do not put a sticker on the label of the disc.
- Wipe the disc with a soft and dry cloth radially from inside to outside. Do not wipe along circumference.
- Do not use benzine, record cleaner spray or solvents of any kind.
- Do not bend the disc.

## **Copyright**

- Unauthorized recording, distribution, sale, lending, public performance, broadcasting, or the like, in whole or in part, of a work (musical composition, video, broadcast, public performance, or the like) whose copyright is held by a third party is prohibited by law.
- When exchanging audio signals through a digital connection with an external instrument, this unit can perform recording without being subject to the restrictions of the Serial Copy Management System (SCMS). This is because the unit is intended solely for musical production, and is designed not to be subject to restrictions as long as it is used to record works (such as your own compositions) that do not infringe on the copyrights of others. (SCMS is a feature that prohibits second-generation and later copying through a digital connection. It is built into MD recorders and other consumer digital-audio equipment as a copyright-protection feature.)
- Do not use this unit for purposes that could infringe on a copyright held by a third party. We assume no responsibility whatsoever with regard to any infringements of third-party copyrights arising through your use of this unit.

## **About the License Agreement**

- The VS-2000 and its CD-R/RW capability are designed to allow you to reproduce material to which you have copyright, or material which the copyright owner has granted you permission to copy. Accordingly, reproduction of Music CD or other copyrighted material without permission of the copyright owner avoiding technical prohibiting features of second-generation and later copying like SCMS or others constitutes copyright infringement and may incur penalties even in case such reproduction is for your own personal use and enjoyment (private use). Consult a copyright specialist or special publications for more detailed information on obtaining such permission from copyright holders.

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# 1—Welcome

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Congratulations on the purchase of your Roland VS-2000 Digital Studio Workstation. The VS-2000 will allow you to take your music—or any other kind of sound—from the first spark of inspiration to completed recording.

Although the VS-2000 is simple to operate, the sheer number of tools it provides do require some introduction and explanation. That's what the *VS-2000 Owner's Manual* is for. Of course, what you do with these tools is up to you and your imagination.

If you've purchased a VS8F-2 Effect Expansion Board or a VS8F-3 Plug-In Effect Expansion Board for your VS-2000, refer to Chapter 29, beginning on Page 389, for installation instructions. To learn how to install a VS20-VGA VGA/Mouse Expansion Board for adding mouse, ASCII keyboard and VGA capabilities to your VS-2000, see the installation instructions that ship with the VS20-VGA.

Your VS-2000 is an extremely reliable device. However, there's no guarantee against data loss due to improper use of the VS-2000 or unforeseen events. Roland Corporation assumes no liability concerning such loss of data.

## About this Manual

### How the *VS-2000 Owner's Manual* is Organized

The *VS-2000 Owner's Manual* explains the VS-2000's architecture, features, operations and settings. It also provides application suggestions and step-by-step procedures. To get the most from your VS-2000, we recommend reading the entire manual. The structure of the manual generally reflects the order in which a typical signal flows through the VS-2000, with extra explanations for beginners at the front.

If you'd like to get to work immediately, you may first want to:

- *set the VS-2000's internal clock and calendar*—The VS-2000 time-stamps each recording to make it easy for you to keep track of your work. See Page 67 for instructions.
- *connect a mouse, ASCII keyboard and VGA monitor*—If you've purchased a VS20-VGA (sold separately), a mouse, PS/2 keyboard and VGA monitor, see Page 66 for setup information.

Here's where you'll find instructions that explain how to perform some basic operations:

- *"Creating a New Project"*—Page 103
- *"Recording a New Track"*—Page 177
- *"Backing Up a Project"*—Page 110
- *"Inserting Effects on an Input or Track Channel"*—Page 215
- *"Setting Up an Internal Loop Effect"*—Page 211
- *"Mixing"*—Page 200

These procedures will get you up and running, but, of course, they're no substitute for actually reading the manual and really learning how the VS-2000's features work.

We highly recommend purchasing an optional VS20-VGA and connecting a VGA monitor to your VS-2000—it makes the VS-2000 even easier and more fun to use. With a VGA monitor, you can perform most VS-2000 operations onscreen using a mouse.

To make it easy for you to find the manual's many step-by-step procedures, we've assembled a "Step-By-Step Instruction Finder" that starts on Page 21. There's also a standard Table of Contents at the front of the book and an Index in back. Additional information can be found in "Supplemental Information," starting on Page 399.

In this manual, illustrations that show VS-2000 screens reflect their appearance at the time the manual was written. As the VS-2000's software is enhanced through operating system upgrades, the appearance of the VS-2000's screens may change.

## Names

Throughout the *VS-2000 Owner's Manual*, the names of buttons, knobs, faders, jacks—and settings that appear in the display—are shown exactly as they appear on the VS-2000 itself. As a result, names printed on the VS-2000 are shown in capital letters. For example, the button labeled "AUTOMIX" will appear in the manual as the AUTOMIX button, or simply AUTOMIX, as in "Press AUTOMIX." Settings on the display are shown in the same lower- and upper -case letters they use onscreen.

A few buttons serve several purposes and have multiple names. In such cases, we'll refer to the button by the name that reflects its current use. If we need to refer to a button's multiple labels all at once, we'll show the labels with a bullet between them, as with the CH EDIT•MASTER button.

The F 1-6 buttons beneath the display can do different things at different times. We'll show an F button's current function in parentheses after its name, as in "F1 (INPUT)."

The four arrow keys are a special case. Sometimes, we'll collectively refer to ◀, ▶, ▲ and ▼ as "cursor" buttons since they allow you to move, or "cursor," around in the VS-2000's display.



## Note, Tip, Glossary and Warning Icons

Throughout the *VS-2000 Owner's Manual*, you find the symbols shown below in the left-hand margins. Here's what these symbols mean.



*Notes* provide additional information about the topic described in the main text.



*Tips* offer interesting ways to use the feature under discussion. They'll also let you know why you should care about what's being said.



This symbol will be of special interest to beginners, because the word—or words—to its right can be found in the glossary that starts on Page 413.



Make sure you pay attention whenever you see the *Warning* symbol. Warnings provide important information that will help you avoid damage to your recordings, VS-2000, other equipment or even yourself.

## Other Documents in the VS-2000 Box

The *VS-2000 Appendices* provide additional detailed information not included in the *Owner's Manual*. For example, the VS-2000 will display an error message if you attempt to perform an operation that the VS-2000 doesn't allow—the *Appendices* contain a list of all error messages and an explanation of what each one means. You'll also find a Troubleshooting section that can help you figure out what to do if the VS-2000 behaves in an unexpected manner.

## Getting More Help

If you have questions that can't be answered by the *VS-2000 Owner's Manual*, Roland offers a number of informational resources.

### The Roland Internal Web site

Visit the Roland US Web site at: <http://www.Roland.com>.

### The Roland US Web site

Visit the Roland US Web site at: <http://www.RolandUS.com>. You'll find lots of information about the VS-2000 and a wealth of support materials. If you're new to recording or mixing, you'll especially enjoy the downloadable booklets for beginners.

### The Roland US Faxback System

If you can receive faxes, you can access our library of support documents 24 hours a day, seven days a week. Call 323-890-3780 for more information about using our faxback system.

### Roland US Product Support

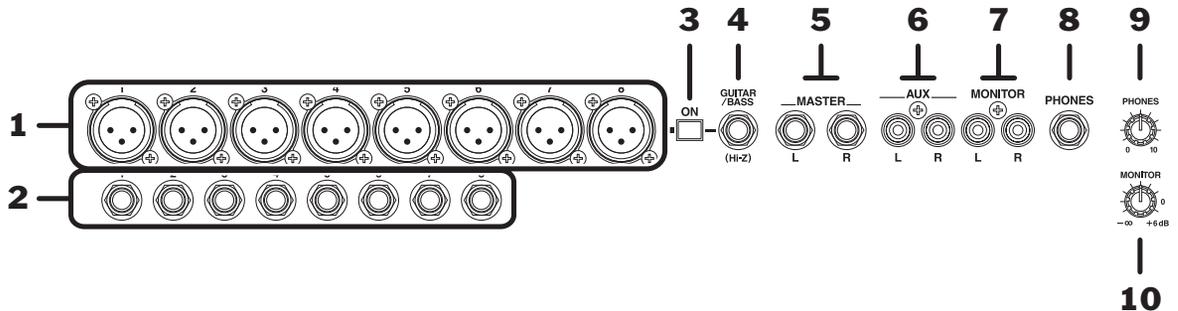
If you need help from a real, live person, call the Roland US Product Support team at 323-890-3740, Extension 3741.



## 2—Getting Around

### The Top Panel of the VS-2000

#### Analog Input Jacks



The analog input jacks allow you to bring analog audio into the VS-2000's 24-bit analog-to-digital (A/D) converters using balanced XLR connectors and balanced or unbalanced 1/4" connectors. We'll explain how to correctly set an analog input's level in "Setting Analog Input Levels" on Page 134.



Each XLR jack is paired with a 1/4" jack. There are therefore eight input jack pairs: Inputs 1-8. Inputs 1-8 are controlled by Input Channels 1-8, respectively (Page 52).



Don't use the same-numbered XLR and TRS input jack—each INPUT knob and channel controls both jacks, so you won't have independent control of the individual jacks' signals.



*Analog, 24-bit, balanced, XLR, unbalanced, TRS, dB*

#### 1—XLR Inputs 1-8

Each of the eight XLR input jacks accepts an input signal from a balanced XLR connector.



The VS-2000 can provide phantom power for a condenser-type mic connected to an XLR jack. See "To Turn an XLR Input Jack's Phantom Power On or Off" on Page 134.

#### 2—TRS Inputs 1-8

Connect a 1/4" phone-type TRS balanced or unbalanced audio connector to any of the eight TRS input jacks.

#### 3—GUITAR/BASS (Hi-Z) ON Switch

Press the GUITAR/BASS (Hi-Z) ON switch to turn on the GUITAR/BASS (Hi-Z) input jack, and to turn off TRS Input 8—when the switch is locked in its "in" position, the GUITAR/BASS (Hi-Z) input jack is activated.

### **4—GUITAR/BASS (Hi-Z) Jack**

If you'd like to plug an electric guitar or bass directly into the VS-2000, connect it to the GUITAR/BASS Hi-Z (for "high impedance") 1/4" phone-type jack for a loud, clean signal with a minimum of noise.



*High impedance*



You can use either the GUITAR/BASS (Hi-Z) input jack or TRS Input 8, but not both at the same time. The setting of the GUITAR/BASS (Hi-Z) ON switch determines which of these jacks is turned on.

### **5—MASTER L/R Output Jacks**

This pair of analog line-level 1/4" output jacks carries the stereo MASTER bus signal to an external device.

### **6—AUX L/R Output Jacks**

Signals sent to Aux busses 1 and 2 are sent out of the VS-2000's RCA-type L and R AUX output jacks, respectively. Each jack produces a line-level signal.

### **7—MONITOR L/R Output Jacks**

The VS-2000's stereo MONITOR bus is sent out of the VS-2000's RCA-type L and R AUX output jacks. Each jack produces a line-level signal. The master volume of the signal produced at these outputs is controlled by the MONITOR knob described below.

### **8—PHONES Jack**

Connect standard stereo headphones (purchased separately) to this jack to listen to the VS-2000. The jack has its own volume control (Page 75). You can select the signal to be sent to the PHONES jack, as described in Chapter 21.

### **9—PHONES Knob**

This knob controls how loudly the VS-2000's MONITOR output is heard through headphones connected to the PHONES jack. To learn how to set your headphone listening level, see "Adjusting Your Listening Level" on Page 75.

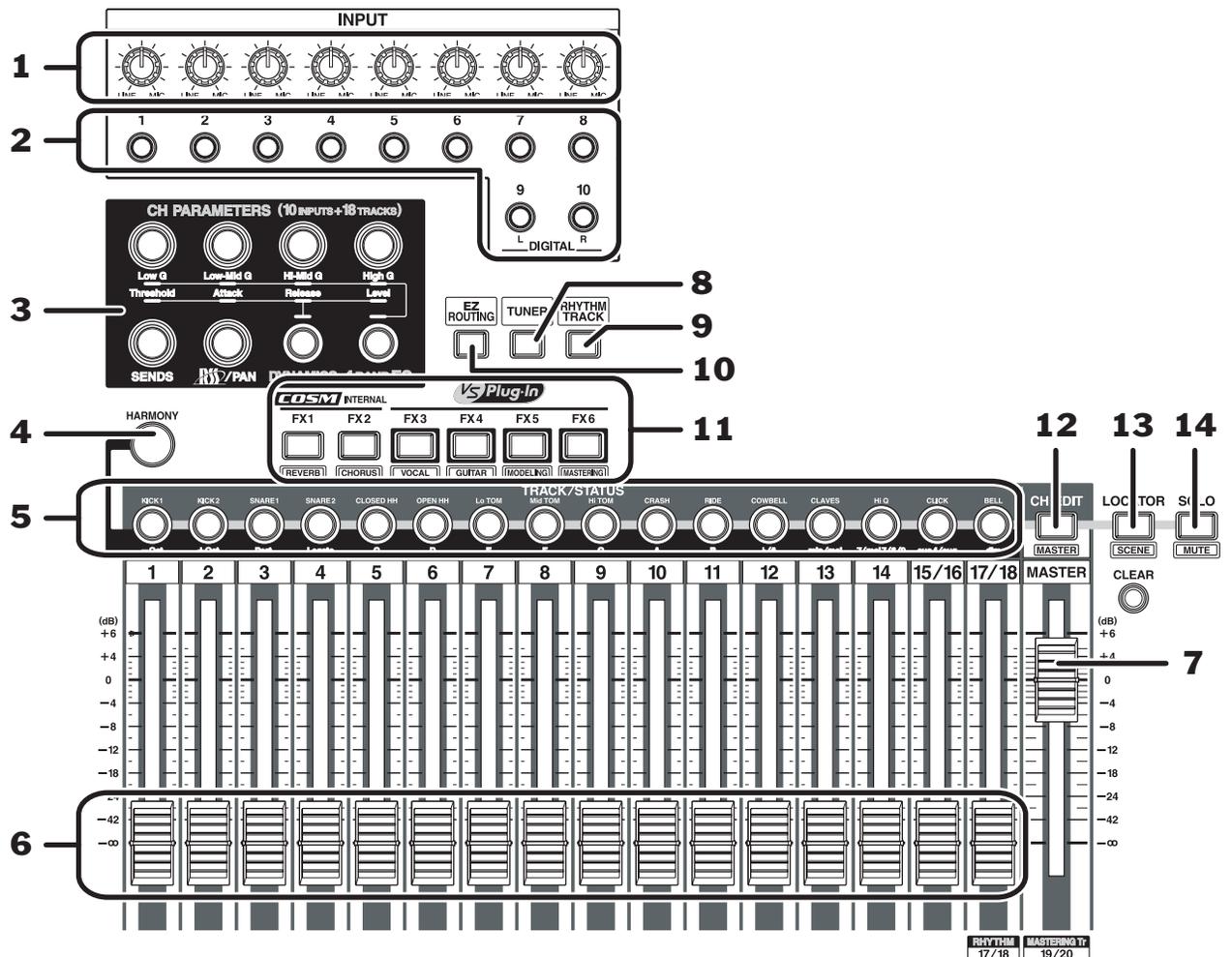
### **10—MONITOR Knob**

This knob controls the volume of the VS-2000's stereo MONITOR bus and outputs. It can also set the basic listening level of the PHONES jacks.



*Bus*

## Mixer Area



### 1—INPUT Knobs 1-8

You can adjust the sensitivity of an XLR or TRS input jack by turning its INPUT knob. Turn the knob all the way counter-clockwise for a line level or all the way clockwise for a mic level device.

When no input signal is connected or in use, turn each input jack's knob all the way counter-clockwise to avoid unwanted noise, and set its FADER parameter (Page 152) to  $-\infty$ .



*Mic level, line level, dBu*

### 2—INPUT Buttons 1-10

The VS-2000 has 10 input channels that control the signals coming into its 10 inputs:

- *Input Channels 1-8*—control signals coming into the analog XLR or 1/4" Inputs 1-8 (Page 33).
- *Input Channels 9 and 10*—control stereo signals received at the VS-2000's coaxial stereo digital input (Page 48).

To view an input channel's settings, press the corresponding INPUT button.

### 3—CH PARAMETERS Controls

The controls in the CH PARAMETERS section allow you to quickly adjust important settings in the currently selected input or track channel. When the channel's settings are displayed, the top four knobs control dynamics or EQ settings. To set the behavior of the knobs, press the DYNAMICS or 4 BAND EQ buttons.

<i>When:</i>	<i>DYNAMICS is lit:</i>	<i>4 BAND EQ is lit:</i>
Low G•Threshold	sets the volume threshold at which dynamics processing takes place.	sets the level, or "gain," of the Low EQ band.
Low-Mid G•Attack	sets the speed at which dynamics processing starts.	sets the gain of the Low-Mid EQ band.
Hi-Mid G•Release	sets the speed at which dynamics processing stops.	sets the gain of the Hi-Mid EQ band.
High G•Level	sets the level of the dynamics processor's signal.	sets the gain of the High EQ band.

The SENDS knob controls the amount of signal the channel sends to the selected Aux or FX bus, as described on Page 167.

The RSS/PAN knob can control the channel's stereo panning or the amount of its signal sent to the VS-2000's RSS Pan 3D effect (Page 225). When the channel is:

- *not being sent to the RSS Pan effect*—the knob controls the position of the channel's signal in the MASTER bus main mix.
- *being sent to the RSS Pan effect*—the knob controls the amount of signal going to the RSS effect.

### 4—HARMONY Button

Press the HARMONY button to view the HARMONY ASSIGN screen on which you can set up the VS-2000's automatic harmonization feature.

### 5—TRACK/STATUS Buttons 1-18

The TRACK/STATUS 1-18 buttons perform a variety of tasks on the VS-2000, according to the state of the CH EDIT, HARMONY, RHYTHM TRACK, LOCATOR•SCENE and SOLO•MUTE buttons. When:

- *CH EDIT, HARMONY, RHYTHM TRACK, LOCATOR•SCENE and SOLO•MUTE are not lit*—the TRACK/STATUS buttons set the behavior of the corresponding hard disk recorder track(s). See Page 176.
- *CH EDIT is lit*—press a TRACK/STATUS button to select the corresponding track channel and display its settings. See Page 147.
- *HARMONY is lit*—press a TRACK/STATUS button to select the desired harmonic mode or interval. See Page 325.
- *RHYTHM TRACK is lit*—you can create and edit patterns by performing the desired notes on the TRACK/STATUS buttons. See Page 305.
- *LOCATOR•SCENE is lit*—green, you can use the TRACK/STATUS buttons to store and recall locators (Page 182). When it's lit red, you can use the TRACK/STATUS buttons to store and recall scenes (Page 142).
- *SOLO•MUTE is lit*—green, the TRACK/STATUS buttons flash to allow you to solo individual tracks in SOLO mode (Page 142). When it's lit red, they flash to let you mute individual tracks in Mute mode (Page 141).

## 6—Track Channel Faders

Use each track channel strip fader to make adjustments to the corresponding track's output level. Fader 15/16 controls the level of Tracks 15 and 16 as a stereo pair. Fader 17/18 controls Tracks 17 and 18 together, or can control the level of the Rhythm Track (Page 305).



When you adjust the linked channel's output level (Page 150, Page 154), move odd-numbered channel's physical fader.

## 7—MASTER FADER

The position of the MASTER fader sets the level of the main stereo MASTER mix bus.



Since the MONITOR outputs and the PHONES jacks are typically set to listen to the MASTER mix bus, the position of the MASTER fader also affects your listening level.

## 8—EZ ROUTING Button

Press EZ ROUTING to set up, load and save signal routings in the VS-2000:

<i>To learn about</i>	<i>see:</i>
Routing input channels to tracks	Chapter 12
Recording tracks onto other tracks	Chapter 14
Routing FX return channels to tracks	Chapter 17
Activating and de-activating phantom power	Chapter 9
Setting up output signals	Chapter 21
Sending channels to the internal effects	Chapter 16
Saving and loading EZ Routing templates	Chapter 22
Clearing routings	Chapter 22
Initializing routings	Chapter 22



*Routing*

## 9—TUNER Button

Press TUNER to turn on the VS-2000's built-in chromatic tuner, described on Page 79.

## 10—RHYTHM TRACK Button

Press RHYTHM TRACK button to set up and turn on the VS-2000's built-in drum/percussion pattern generator, described on Page 305.

## 11—FX 1-6 Buttons

The FX 1-6 buttons allow you to set up and control the VS-2000's effects (AKA, "FX"). The VS-2000 can have up to six effect processors, called "FX 1-6."

- To select, set up and edit an effect—press its FX button.
- To control the output of an effect processor—press and hold down its FX button to display the corresponding FX return channel.

As shipped from the factory, Effects 1 and 2 are available. You can add up to four additional stereo effect processors by purchasing and installing two additional effects boards—each board adds two stereo effect processors. You can buy and install a:

- VS8F-2 Effect Expansion Board—to add more effects of the same kind that ship with the VS-2000.
- VS8F-3 Plug-In Effects Expansion Board—to use Roland and third-party plug-in effects.



For an explanation of the VS-2000's effects, see Chapter 5, starting on Page 87.



When selecting effect patches for Effects 1 or 2—or any processor that's using a VS8F-2 effect board—you can hold down SHIFT and press an FX button to jump to the type of effect labeled beneath the button.

### **12—CH EDIT Button**

Press the CH EDIT button so it lights, and then press a TRACK.STATUS button to display the corresponding track channel's settings.

### **13—LOCATOR•SCENE Button**

Press the LOCATOR•SCENE button so it's lit green to store and recall locators using the TRACK/STATUS buttons. To select a locator bank, hold down LOCATOR•SCENE when it's lit green and press any TRACK/STATUS button—the display asks you to select the desired locator bank.

To leave Locator mode, press LOCATOR•SCENE again to unlight the button. Hold down SHIFT and press the LOCATOR•SCENE button so it's lit red to store and recall scenes using the TRACK/STATUS buttons. To select a scene bank, hold down SHIFT and press LOCATOR•SCENE for two seconds—the display asks you to select the desired scene bank. To leave Scene mode, press LOCATOR•SCENE twice to unlight the button.



A locator remembers a particular now line position within a project—when you recall the locator, the now line instantly jumps back to that time position. Each project can contain up to 96 locators arranged in groups, or “banks,” of 16 locators each. Locators are discussed in detail in “Locators” on Page 182.

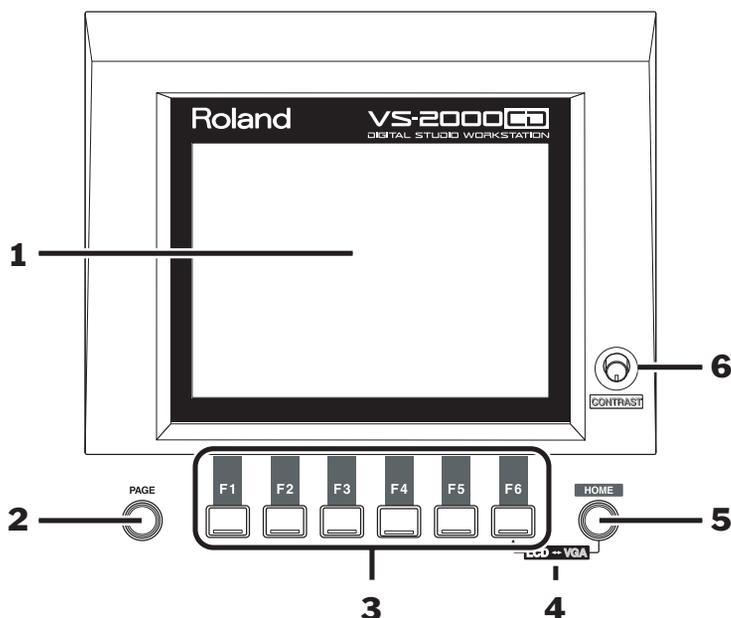


A scene stores your current mixer settings, allowing you to save different versions of your project for instant recall. Each project can contain up to 96 scenes in groups, or “banks,” of 16 scenes each. Scenes are discussed in detail in “Scenes” on Page 142.

### **14—SOLO•MUTE Button**

Press SOLO•MUTE so it's green to enter and exit Solo mode (Page 142). Hold down SHIFT and press SOLO•MUTE so it's red to enter and exit Mute mode (Page 141).

## Display Area



The LCD display and its buttons are central to everything you do on the VS-2000. The F buttons discussed in Chapter 4, on Page 68.

### 1—LCD Display

The LCD display is your window to the VS-2000's operations. In addition to providing you vital information, the display is central to all VS-2000 activity.



When you purchase and install a VS20-VGA VGA/Mouse Expansion Board and add an external VGA monitor to the VS-2000 for use as a main display, the VS-2000's built-in LCD provides supplemental information.

### 2—PAGE Button

Some activities on the VS-2000 require more than a single screenful of settings—each screenful is called a “page.” For such activities, you can repeatedly press the PAGE button to cycle through the available pages.

### 3—F Buttons 1-6

The F 1-6 buttons are “soft” buttons whose job changes depending on what you're doing. When an F button is active, its current function is shown on the display above the button. For more on how the F buttons work, see Page 68.

In addition, when you hold down SHIFT, the F buttons display a variety of menus and screens:

<i>Hold down SHIFT and press:</i>	<i>To display:</i>
F1	the PROJECT menu. When you press PROJECT, a menu appears in which you'll find an assortment of project-management tools and tools for working with your internal hard drive.
F2	the TRACK menu that contains the TRACK region and phrase editing sub-menus.
F3	the EFFECT menu to set up the VS-2000's internal effects. Chapter 5 discusses important underlying effects concepts. Chapter 16 provides the specifics on using the VS-2000's internal effects.
F4	the UTILITY menu, which offers a wide variety of settings that determine the behavior of the VS-2000. See Chapter 28, starting on Page 377.
F5	the wave display screen that allows you to view the currently selected track's audio as a detailed waveform rather than a simple rectangle.



*IDE drive, waveform*

### **4—LCD↔VGA**

When you've connected an external VGA monitor to the VS-2000, hold down F6 and press HOME to select your main display. See Page 381 for details.

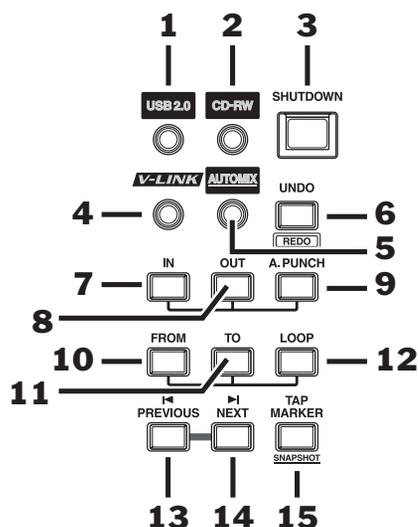
### **5—HOME Button**

Press the HOME button to return to the VS-2000's Home screen, described in detail in Chapter 8, beginning on Page 123. Hold SHIFT and press the button to change what appears in the playlist area of the Home screen (Page 128).

### **6—CONTRAST Knob**

The CONTRAST knob allows you to change the contrast of the VS-2000's display. Turn the knob until the display looks its best from your viewing angle.

## Control Area



### 1—USB 2.0 Button

The VS-2000 can communicate with a personal computer via USB. This communication allows you to transfer data between the VS-2000 and computer, as described on Page 81, and allows you to update the VS-2000's operating system software, as described in the documentation that accompanies the software. Press the USB 2.0 button to display the screen on which you can activate this connection.



The VS-2000 is connected to the computer using a standard USB cable, as described on Page 47.

### 2—CD-RW Button

Press this button to view the CD-RW/MASTERING menu from which you can perform CD-related operations, as well as audio file importing and exporting. Hold down SHIFT and press CD-RW to jump to the VS-2000's Mastering Room, where you can complete the master mix of a project and create an audio CD. See Chapter 27, starting on Page 355.



*Mastering, CD-R/RW drive*

### 3—SHUTDOWN Button

To preserve your work the VS-2000 must be turned off by pressing this button for two seconds, as described on Page 85.

### 4—V-LINK Button

Press the V-LINK button—so it lights—to configure the VS-2000 for use with a video editing or presentation system. When V-LINK is active, the VS-2000 and video equipment are synchronized for tightly integrated operation. For details regarding synchronization, see Chapter 23.



*MMC, MTC, slave*

### **5—AUTOMIX Button**

Press this button to turn Automix on (lit) or off (unlit). Hold down SHIFT and press AUTOMIX to view the AUTOMIX SETUP screen. See Chapter 26, starting on Page 341.

### **6—UNDO•REDO Button**

The VS-2000 allows you to reverse—or “undo”—up to 999 of your last recording or editing actions. Press the UNDO•REDO button to view the Undo dialog. After undoing any action, you can also “redo” it by pressing UNDO•REDO while holding down SHIFT—the Redo dialog appears.

### **7—IN Button**

Press the IN button to set the current position of the now line as the start of a region of data you want to edit. Hold down A.PUNCH and press IN to set the punch-in point during Auto Punch operations.

### **8—OUT Button**

Press the OUT button to set the current position of the now line as the end of a region of data you want to edit. Hold down A.PUNCH and press OUT to set the punch-out point during Auto Punch operations.

### **9—A. PUNCH Button**

Press this button to activate (lit) or de-activate (unlit) Auto Punch. See Page 190.

### **10—FROM Button**

Press FROM to select the current position of the now line as a time-reference point in a section of data to be moved or copied. When looping, press FROM while holding down LOOP when the now line’s at the location you want to use as the start of your loop.

### **11—TO Button**

Press TO to select the current position of the now line as a location at which you want the FROM point to be placed when data is moved or copied. When looping, press TO while holding down LOOP when the now line’s at the location you want to use as the end of your loop.



IN, FROM, OUT and TO work together, playing a part in a variety of editing operations. They’re discussed as a group in Chapter 18, on Page 236.

### **12—LOOP Button**

Press this button to turn looping on (lit) or off (unlit). See Page 178.

### **13— PREVIOUS Button**

Press PREVIOUS to move the now line to the beginning of the currently selected track phrase or to the end of the phrase immediately before it. Hold down SHIFT and press PREVIOUS to move the now line back in time to the nearest marker.



You can reverse the behavior of this button by resetting the UTILITY menu’s PREVIOUS/NEXT Sw parameter, described on Page 379.

### **14— NEXT Button**

Press NEXT to move the now line to the end of the currently selected track phrase or to the beginning of the phrase immediately after it. Hold down SHIFT and press NEXT to move the now line forward in time to the nearest marker.

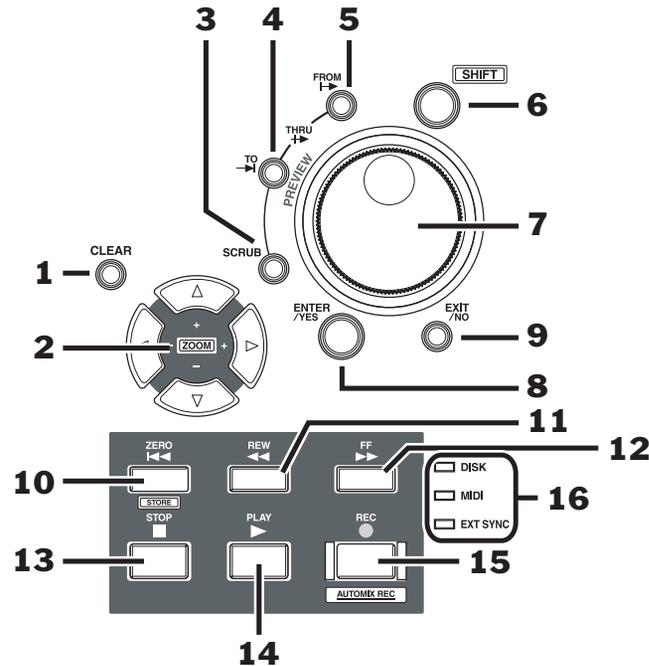


You can reverse the behavior of this button by resetting the UTILITY menu's PREVIOUS/NEXT Sw parameter, described on Page 379.

### **15—TAP MARKER•SNAPSHOT Button**

Press TAP MARKER•SNAPSHOT to create a marker at the current position of the now line—the marker is numbered automatically. When AUTOMIX (Page 341) is lit, press AUTOMIX and this button to create a snapshot of your current mixer settings that can be recalled as part of an automated mix. Automix and snapshots are discussed in Chapter 26. Hold down CD-RW and press TAP MARKER•SNAPSHOT to place a CD track marker at the now line's current location.

## Navigation Tools



This area contains frequently used controls that are part of many VS-2000 operations.

### 1—CLEAR Button

To delete a locator, marker or scene, hold down CLEAR and press the desired locator or scene (Page 142) TRACK/STATUS button. To clear an edit point, hold down SHIFT and CLEAR and press the desired IN, OUT, FROM or TO button. To delete an Auto Punch point, hold down A.PUNCH and CLEAR and press the desired IN or OUT button. To clear a loop point, hold down LOOP and CLEAR and press the desired FROM or TO button.

### 2—◀ ▶ ▲ ▼ (Cursor)/ZOOM Buttons

Press the ◀, ▶, ▲ or ▼ cursor buttons to move the selection cursor (Page 67) around the VS-2000's display. Also, hold down SHIFT and press the desired arrow button to zoom in and out on track data shown onscreen (Page 123):

- Press ▶ to increase the horizontal magnification.
- Press ◀ to decrease the horizontal magnification.
- Press ▲ to increase the vertical magnification.
- Press ▼ to decrease the vertical magnification.

### 3—SCRUB Button

When you need to precisely locate a moment in a track, press SCRUB to activate the Scrub feature. When SCRUB is lit, you can turn the Time/Value dial to move the now line and listen to a tiny piece of the track play over and over—this lets you zero in on just the moment you're looking for. This can be very helpful when editing. To turn off scrubbing, press SCRUB again so its light goes out. See Page 181 to learn more.

#### **4—PREVIEW TO Button**

Press PREVIEW TO to listen to the last few moments leading up to the current location of the now line—you can set how much you want to hear.

#### **5—PREVIEW FROM Button**

Press PREVIEW FROM to listen to what occurs just after the current location of the now line—you can set how much you want to hear.



PREVIEW TO and PREVIEW FROM work together, and are all described in detail in “Preview” on Page 180.



To audition the project just before and after the current position of the now line, press PREVIEW FROM and PREVIEW TO at the same time for the PREVIEW THRU feature.

#### **6—SHIFT Button**

Many of the VS-2000's buttons have a secondary function. When you hold SHIFT and press one of these buttons, the button performs the function shown in the label beneath the button. See Page 70 for more information on using the SHIFT button.

#### **7—Time/Value Dial**

- During project playback, you turn the dial to move forward or backward in time. See Page 131 for more information.
- Turn the Time/Value dial to adjust settings.

#### **8—ENTER/YES Button**

Press ENTER/YES in response to a yes/no question shown on the display, to execute a procedure, mark an item currently selected on the display or select data for editing.



The ENTER/YES button often flashes to underscore that you're being asked a question on the display or that further options are available for your current activity.

#### **9—EXIT/NO Button**

Press EXIT/NO in response to a question on the display, to cancel an operation, exit the current screen or un-mark an object currently selected on the display.



The EXIT/NO button often flashes to underscore that you're being asked a question on the display.

#### **10—ZERO•STORE Button**

Press ZERO•STORE to return to the beginning of the project (Time 00h00m00s00f00)—see Page 130. Hold down SHIFT and press ZERO•STORE to save the current state of your project to your hard drive.

#### **11—REW Button**

Press REW (for “Rewind”) to move back gradually through a project. Hold SHIFT and press REW to jump to the start, or “top,” of the audio recorded in the project.

### **12—FF Button**

Press FF (for “Fast Forward”) to move gradually forward through a project. Hold SHIFT and press PREVIEW FROM to jump to the end of the audio recorded in the project.

### **13—STOP Button**

Press STOP to halt playback at the now line’s current location—see Page 126.

### **14—PLAY Button**

Press PLAY to begin playback from the current location of the now line—see Page 126. To restart the VS-2000 during the Shutdown procedure (Page 85), hold down SHIFT and press PLAY.

### **15—REC•AUTOMIX REC Button**

Hold down REC•AUTOMIX REC and press PLAY to record audio (see Page 176). When the AUTOMIX button (Page 42) is lit, hold down REC•AUTOMIX and press PLAY to record mixer settings as realtime Automix data—see Chapter 26 (Page 341).



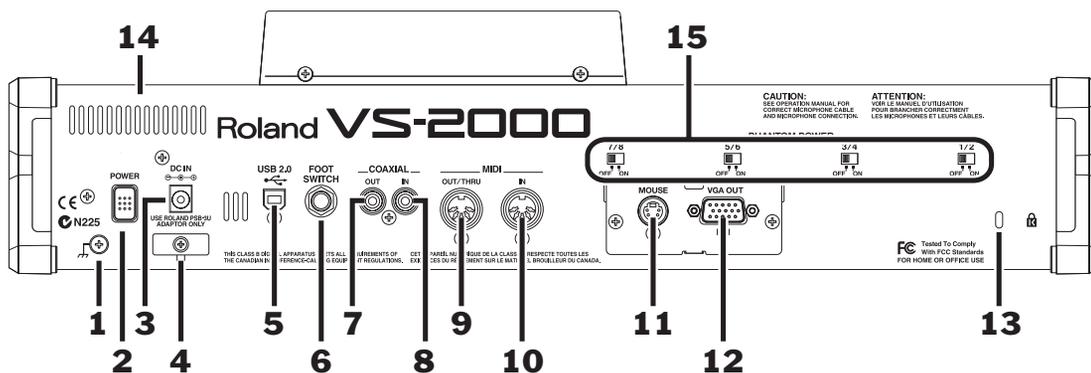
*Realtime*

### **16—DISK/MIDI/EXT SYNC Indicator**

Each of these indicators shows activity of a particular sort. When:

- *the DISK indicator lights*—the internal hard drive is being read or being written to.
- *the MIDI indicator lights*—the VS-2000 is receiving MIDI data from an external device.
- *the EXT SYNC indicator lights*—the VS-2000’s transport is ready to be synchronized to—and driven by—an external device.

## The Rear Panel of the VS-2000



### 1—Grounding Terminal

Connect a ground cable here if necessary.

### 2—POWER Switch

Use the POWER switch to turn the VS-2000 on. Use it to turn the VS-2000 off after performing a proper shutdown procedure.



Don't simply flip the POWER switch when you want to shut down the VS-2000—if you do this, data loss may occur. Make sure to use the proper shutdown procedure, described on Page 85.

### 3, 4—DC IN Jack, DC Cord Hook

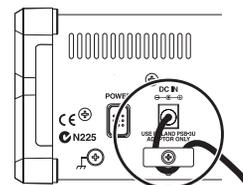
Connect the supplied AC power adaptor to this jack, and then connect the adaptor's AC plug to a grounded AC outlet.



Use only the supplied AC power adaptor to prevent damage to your VS-2000.



To prevent the inadvertent disruption of power to your unit should the plug be pulled out accidentally, and to avoid applying undue stress to the DC IN jack, anchor the power cord using the cord hook, as shown in this illustration.



### 5—USB 2.0 Jack

To connect the VS-2000 to a computer for the exchanging of files, connect the "A" end of a USB cable to this jack. Connect the "B" end to the computer's USB jack. See Page 81 to learn about activating and de-activating USB communications.



To help ensure successful USB communication, connect the VS-2000's USB 2.0 jack directly to a USB jack on your computer. The use of a USB hub is not recommended.

### **6—FOOT SWITCH Jack**

You can control a variety of VS-2000 functions using an optional foot switch—such as a Roland DP-2 or BOSS F5-SU—connected to this jack. See Page 378.

### **7,8—COAXIAL OUT and IN Digital Audio Connectors**

The VS-2000 can both receive and transmit IEC 60958-format digital audio via its coaxial digital IN and OUT connectors. Each connector carries a stereo digital audio signal. See Page 135 to learn how to successfully handle incoming digital audio.



You can configure the VS-2000 to record digital audio received from an external digital device connected to the COAXIAL IN jack—see Page 137.



The COAXIAL IN connector of VS-2000 is compatible with 2ch PCM audio only. If the VS-2000 receives audio signal in other formats (DTS, Dolby Surround etc.), it outputs such signals as noise.



The COAXIAL IN and OUT jacks carry *only* digital audio signals. The IN jack won't accept standard analog audio signals, and the OUT jack doesn't produce them.

### **9—MIDI OUT/THRU Jack**

By default, this jack functions as a MIDI output jack—connect it to the MIDI input of any device to which you wish to send MIDI data from the VS-2000 (see Chapter 23, Page 283). You can also set the MIDI OUT/THRU jack to function as a THRU jack that passes along any MIDI data the VS-2000 receives from an external device (Page 284).

### **10—MIDI IN Jack**

Connect the MIDI output of an external device to the MIDI IN jack when you want the VS-2000 to receive and respond to MIDI data transmitted from an external device. See Chapter 23, starting on Page 283.

### **11—MOUSE Jack**

When you've installed a VS20-VGA VGA/Mouse Expansion Board (sold separately), connect a PS/2 mouse (purchased separately) to the MOUSE jack. See Page 66.



PS/2

### **12—VGA OUT Jack**

When you've installed a VS20-VGA VGA/Mouse Expansion Board (sold separately), connect an external VGA CRT color video monitor—purchased separately—to this DB-15-type VGA output jack. You'll find setup details on Page 66 and learn about using the VGA on Page 381.

### **13—Security Slot**

You can lock the VS-2000 to a stationary object to protect against theft using commonly available security cables. If you have access to the World Wide Web, go to <http://www.kensington.com> for details.



### **14—Cooling Fan Exhaust Vent**

The VS-2000 contains a cooling fan that prevents it from overheating. The fan expels hot air through this exhaust vent.



Be sure never to block the cooling fan exhaust vent. If hot air from the VS-2000 chassis isn't allowed to escape through this vent, the VS-2000 may overheat and be damaged.

### **15—PHANTOM POWER 1/2, 3/4, 5/6, 7/8**

Each of the four PHANTOM POWER switches turns on or off the VS-2000's phantom power supply to an odd/even pair of XLR input jacks. To learn more about phantom power, see Page 134.



## 3—Introduction to the VS-2000

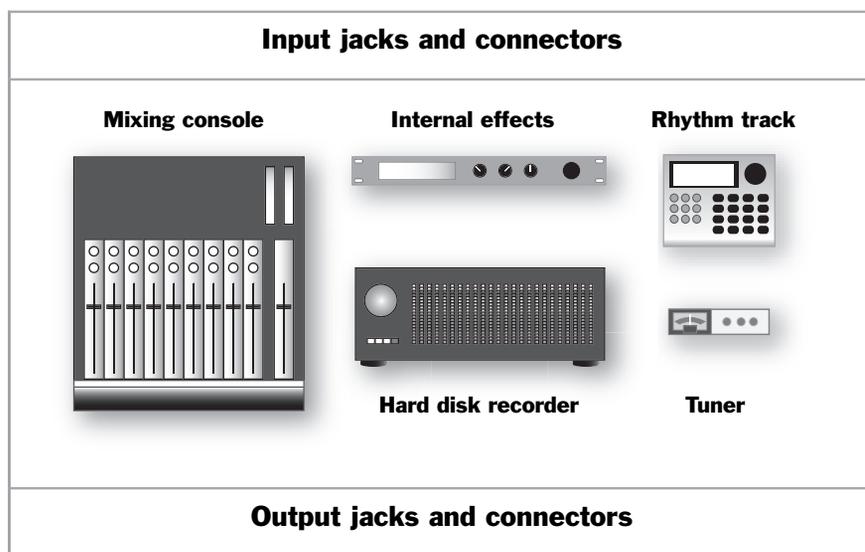
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To master the VS-2000, it's important to understand the components that make up this self-contained 20-track recording studio. That's what we'll do here. More specific descriptions of how to use these components can be found in later chapters as noted.

While advanced V-2000CD users may already understand much of what's discussed here, everyone should make sure to read "Projects" on Page 58. This section introduces the project, the basic structure in which all VS-2000 work takes place.

### What's Inside the VS-2000?

Every recording studio has the same mission: the capturing of sound and the conversion of that sound into a form—an audio CD, a film or video soundtrack, a broadcast—that people can hear. If you were to go into any conventional multitrack recording studio, you'd therefore see the same sort of tools. All of these tools can also be found inside your VS-2000. Here's what's hidden inside its case:



### Input Jacks and Connectors

Obviously, you've got to have a way to get sound into the VS-2000.

Analog and digital sounds travel through the cables that bring them to the VS-2000 as electrical signals, called "input signals." The VS-2000 provides jacks that recognize analog audio signals from microphones and from electric or electronic instruments. It also has digital connectors that accept digital audio signals from devices such as synthesizers or effect boxes with digital outputs, and from digital audio tape (DAT) decks and other kinds of digital recorders, including computer-based audio recorders. We'll discuss the VS-2000's analog input jacks and digital connectors in detail in Chapter 9, starting on Page 133.

## The Mixing Console

The VS-2000 contains a digital 40-channel mixing console.

### **What's a Digital Mixing Console?**

First, let's make sure we understand what a mixing console, or "mixer," is. A mixer is a device that lets you manipulate audio, and lets you combine multiple audio signals into a single sound, or a "mix." That mix can be in mono or stereo.

A *digital* mixer converts all audio signals into binary data—numbers—and performs all of its operations using complex mathematical equations. When you listen to the mixer—and any time audio comes out of its analog outputs—the sound is converted back into audible form. A digital mixer has several powerful advantages:

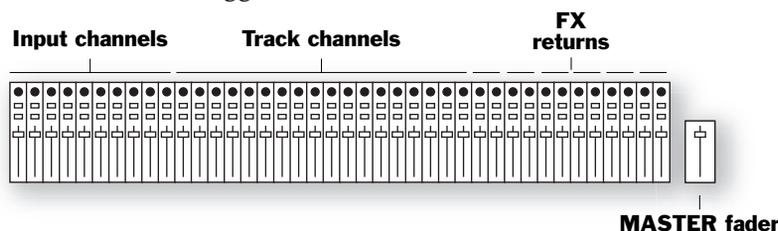
- Digital mixers produce extremely high-quality sound.
- They can memorize settings that can be restored with the touch of a button.
- They have a flexible internal structure—it's all just numbers under the hood, after all, not physical wires—so you can easily re-configure the mixer's internal connections in ways that aren't possible with a traditional analog mixer.

### **40 Channels?**

In the VS-2000, each audio signal has its own set of controls with which you can manage and shape its sound. This set of controls is called a "channel." The VS-2000's mixer has 40 channels, all of which are always active and available:

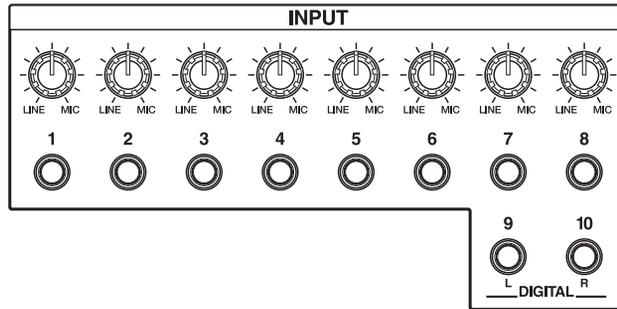
- *10 input channels*—control signals received by 8 of the VS-2000's analog input jacks and its stereo digital input connector. The 10 input channels are sometimes collectively referred to as the "input mixer."
- *18 track channels*—control the sound of recordings being played back by the VS-2000's hard disk recorder. They may be referred to as the "track mixer."
- *6 stereo FX return channels (or 12 mono channels)* control the sound produced by the VS-2000's internal effects.

If the 40 channels were laid out as they are in a conventional mixer console, the VS-2000 would be *much* bigger.

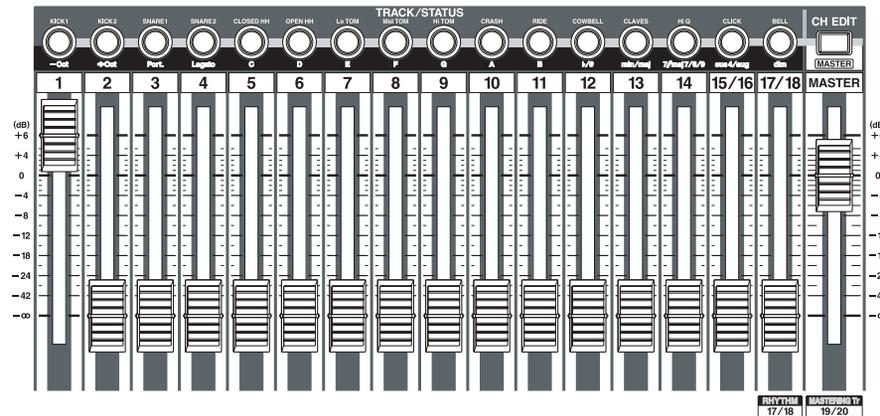


To make the VS-2000 compact portable, its channels have been placed in three space-efficient areas of the VS-2000's front panel.

The 10 input channels are found in the INPUT area. To view and adjust the settings for any of these channels, press its button.



The 18 track channels are controlled by the 16 physical faders on the VS-2000. Track Channels 1-14 have their own individual channel strips. Tracks 15 and 16 share a strip, as do Tracks 17 and 18. The strips' physical faders are helpful when making the precise level adjustments required in a mix, and when automating a mix.

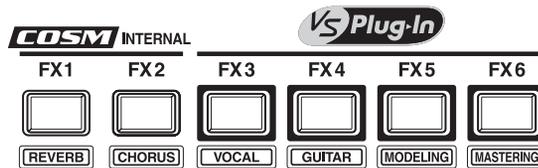


The strip shown at the far right here isn't actually one of the track channels—it controls the level of the MASTER mix.



Track Channel Fader 17/18 can control the VS-2000's built-in Rhythm Track feature instead of Tracks 17 and 18, as explained on Page 305.

To view and adjust the settings for any of the six stereo FX return channels, press the corresponding FX button for two seconds.



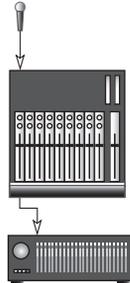
All of the VS-2000 channels are available and active all the time.

We'll discuss the operation of the mixer in detail in Chapter 10, starting on Page 139. Channel settings are described detail in Chapters 11 and 17.

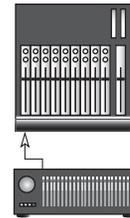
## ***The Main Roles of the VS-2000 Mixer***

Two of the most important jobs the mixer performs in the VS-2000 are this:

**It helps you make an input signal sound the way you want it to on its way to a track.**



**It helps you get the track to sound the way you want, both during recording and while it's being played back when you're mixing or bouncing.**



You'll also use the VS-2000's mixer to:

- mix input signals for your performers to listen to in headphones or stage monitors.
- send input signals to the VS-2000 internal effects.
- set the amount of internal effects processing you want to add to your input signals.
- control the level of input signals sent to external devices for effect processing, and the sound of what comes back into the VS-2000 from the external devices.
- listen to the hard disk recorder's tracks as you record so that you can hear what they're recording.
- send tracks to the internal effects.
- set the amount of internal effects processing you want to hear on your tracks.
- control the level of tracks sent to external devices for effect processing, and the sound of what comes back into the VS-2000 from the external devices.
- create a mix to send to a house public address (PA) system when you're using the VS-2000 for live recording in a club or concert hall.

What all of these jobs have in common is that all involve the same basic abilities in the mixer. The mixer lets you:

- control the level of all kinds of audio.
- set the audio's stereo positioning between your speakers.
- change the tonal characteristics of audio with equalization, or "EQ."
- apply dynamics processing to audio to change the way it gets louder or softer.



*Bouncing, equalization, EQ, dynamics processing*

## The Internal Effects

### **What Are the Internal Effects?**

The VS-2000 contains a set of internal effects processors. As shipped from the factory, there are two internal stereo effect processors onboard. You can install another two effect expansion boards for a total of six internal stereo effect processors—each board adds a pair of stereo effects. You can install any combination of Roland VS8F-2 Effect Expansion Boards or VS8F-3 Plug-In Effect Expansion Boards (purchased separately).



Each stereo effect processor can also be used as two separate mono effect processors.

### **What Are Effects?**

An effect is a type of audio processing that's added to a sound to enhance it. There are a variety of effects available in the VS-2000, including:

- *Reverbs*—A reverb adds an ambience to a sound, creating the impression that it exists in an actual physical space. Some people call reverb “echo,” though technically that word applies to something else, as we’ll see. A reverb can be short in duration—so that it sounds like an average-sized room in your home—or long, so that it sounds like big concert hall. It can also be set to any size in-between.
- *Delays*—A delay causes the original sound to repeat one or more times, often at levels that get quieter and quieter with each repeat. Long delays help re-create classic rock ‘n roll sounds. Any delay can also be useful for subtly suggesting an ambience. Another word for “delay” is “echo.”
- *Choruses, flangers and phasers*—All three effects add their own type of swirling texture to a sound, most often to instruments such as electric pianos and electric guitar or bass. They utilize subtle delays and/or pitch changes to do what they do.
- *Filters*—A filter removes part of the original sound. This group of effects includes EQs and things like wah-wah pedal simulations.
- *Compressors, limiters, gates*—These effects, collectively called “dynamics processors,” alter the volume of the original signal in one way or another. Compressors and limiters even out volume fluctuations, while a gate lowers the level of a signal—or shuts it off altogether—when it falls below a certain volume level.
- *Modeling*—Roland’s COSM™ (Composite Object Sound Modeling) process emulates various guitar amps, microphones and speakers with amazing realism.

The VS-2000 also offers effects that use several of these audio processes at once.

### **Harmony**

The VS-2000’s Harmony feature uses the VS-2000’s effect processors to generate harmonies from recorded performances.

### **How Does the VS-2000 Create Effects?**

Each of the VS-2000’s effects is created by subjecting an audio signal—remember, it’s just numbers while it’s inside the VS-2000—to a complex mathematical formula called an “algorithm.” The VS-2000 contains 36 algorithms. You’ll find a list of them in the *VS-2000 Appendices* booklet.

Each algorithm has its own collection of settings. You can save an algorithm’s settings in the VS-2000 memory as an “effect patch.” The VS-2000 ships from the factory with 250 pre-programmed patches, many of which offer more than one kind of effect. The

VS-2000 also provides 200 memory locations into which you can save your own effect patches. See the *VS-2000 Appendices* for a list of the factory effect patches.

Effects can be applied to an audio signal in either of two ways, as we'll discuss in Chapter 5, starting on Page 87.

#### ***What's the Difference Between a VS8F-2 and a VS8F-3?***

Though a VS8F-2 provides an additional pair of stereo effect processors that can produce the same effects that ship with the VS-2000. This can be helpful when two stereo processors just aren't enough for your creative needs.

The VS8F-3 allows you to take advantage of third-party plug-in effects, as well as some new and powerful Roland-produced algorithms. A plug-in is an effect program designed specifically for the production of a single, high-quality effect, and can be individually purchased according to your needs.

The ability to use plug-ins means that you can expand the VS-2000's effect processing power far beyond its already potent built-in effects or those offered on a VS8F-2. A wide range of plug-ins created by some of today's leading effect programmers are available for the VS8F-3 and the VS-2000. For a list of the plug-ins currently available for the VS8F-3, visit Roland's Web site at [www.RolandUS.com](http://www.RolandUS.com) or [www.Roland.com](http://www.Roland.com).

## **The Hard Disk Recorder**

The VS-2000's hard disk recorder is the simplest of its three major components to explain and understand—it's an audio recorder, acting a lot like a cassette recorder, VCR or any other traditional kind of recorder. Its basic controls will be familiar to you. Instead of recording on a cassette or VHS tape, however, the hard disk recorder records audio onto a computer hard disk drive (Page 93). This provides some important advantages over other kinds of recorders:

- Its sound quality is excellent.
- You can instantly jump to any location in a recording with no waiting while the machine fast-forwards or rewinds.
- You can easily manipulate recorded audio, copying it, pasting it, moving it, time-stretching it and much more.
- You can edit audio "non-destructively," with the ability to undo any edit you make.
- The VS-2000 can memorize multiple locations within a recording so that you can jump back and forth between sections in a heartbeat.

#### ***How Many Tracks Can It Record?***

The hard disk recorder can record up to 8 tracks at once, and play back up to 18 tracks at a time. That's really only the beginning of the story—each project on the VS-2000 can actually contain 320 "Virtual Tracks" from which you can pick and choose.



The words "track" and "Virtual Track" have special meanings in the VS-2000. We'll discuss them in Chapter 6.



The number of tracks you can record and play at once is determined by the selected recording mode, as you'll learn in Chapter 7.

We'll discuss how to use the hard disk recorder in Chapter 13, starting on Page 175.

## Rhythm Track

The VS-2000's Rhythm Track provides professional-sounding drum tracks that can provide the basis for your own music. It even has its own high-quality drum sounds built-in. We'll describe the Rhythm Track in detail in Chapter 24.

## Tuner

To make recording instruments such as guitars and bass even easier, the VS-2000 contains a handy built-in chromatic tuner, which is explained in Chapter 4.

## Output Jacks and Connectors

You can burn your own audio CDs directly from the VS-2000 using its built-in CD-RW drive. However, you might also want to get audio out of the VS-2000 to:

- send your MASTER mix to a pair of monitors so you can hear what you're doing.
- send input signals or tracks to an external effect processor.
- send tracks to a computer for further editing or other purposes.
- send signals to a headphone amplifier to give your performers a way to hear what's being recorded during a recording session.
- send signals to a stage monitors to let your performers hear what they're playing or singing when using the VS-2000 for live recording.

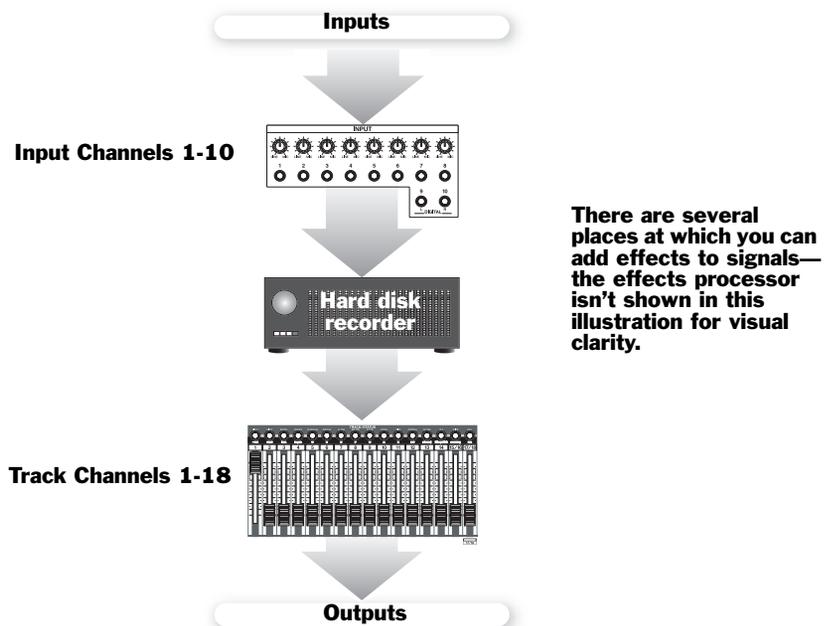
The VS-2000 provides analog output jacks and digital connectors for all of these situations. We'll discuss them in detail in Chapter 21, starting on Page 273.



*Burn*

## Signal Flow

Here's how audio signals typically flow in the VS-2000. You can see how the inputs, input channels, hard disk recorder, track channels and outputs work together:



## Projects

Everything you do in the VS-2000 takes place inside something called a “project.” As its name suggests, a project is a hard disk file that contains all of the information for a particular work or performance you’re creating. That work could be a song, a soundtrack, a broadcast, a jingle or anything else. It could even be the music for an entire CD, containing multiple songs, or a set of songs recorded live.



In some other V-Studios—such as the VS-1880, VS-1680, VS-890 and VSR-880—projects are called “songs.”

Projects provide an easy way to keep all the materials for a particular piece in one place, ready to go when you need them, including:

- everything you’ve recorded.
- your most recent mixer settings, as well as any alternate mixer setups you’ve saved.
- your effect settings.
- all locations you’ve saved for use in navigation, punching and looping.
- all Automix data.
- playback speed settings.
- all information relating to tempo and synchronization.
- project Rhythm Track data
- all project-related UTILITY menu settings.

The VS-2000 *always* has a project loaded, even if you’ve never created one yourself.

A project can be as large as space allows, as long as it doesn’t exceed the maximum number of allowable events (see below.) You can save up to 200 projects on your hard drive, space permitting. You can change from project to project by loading the project you want to work on as needed. You can also copy data between projects. Project operations are discussed in Chapter 7 on Page 99.

### About Events

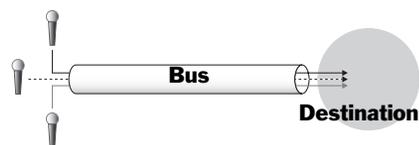
The smallest chunk of project data that the VS-2000 works with is called an “event,” a piece of information that the VS-2000 needs to do its job. For example, each recording you make uses up at least two events: one that tells the VS-2000 where on the hard drive the recording’s file starts, and one that tells it where it ends. Each project can contain roughly 30,000 events—when all of its events have been used up, the project is full, even if you have disk space left. You can trim the number of events in a project by “optimizing” it, as discussed in Chapter 7.

## Busses in the VS-2000

In order to get signals from one place to another within the VS-2000—and to provide a way to get them out of the VS-2000—the VS-2000 uses a set of “busses.” While we’ll describe the use of the VS-2000’s busses in various places throughout the *VS-2000 Owner’s Manual*, it’s important to first understand what a bus is.

### What’s a Bus?

A bus is a pathway down which one or more signals can travel to a common destination.



In older analog mixers, a bus was literally a single wire into which signals were fed—the wire was then connected to the desired destination’s input.

This simple mechanism is more significant than it may seem since it lets you send a group of signals to a track, into a mix, to an effect, to specific outputs and more. Much of the VS-2000’s bussing occurs behind the scenes—so you won’t always be dealing directly with it—but some of its busses play an important, visible role in its operations.

Although every bus is essentially the same thing—a pathway—busses are named for the type of signal they typically carry. The VS-2000 provides the following busses.

<i>Type of bus:</i>	<i>What it does:</i>
RECORD	Each of these eight busses carries signals to one of the hard disk recorder’s tracks.
MASTER	This stereo left/right pair of busses carries the VS-2000’s main stereo mix to any number of possible destinations.
MONITOR	This stereo left/right pair of busses carries signals to your listening device: monitor speakers or headphones
AUX	“AUX” is short for “Auxiliary Send.” The two AUX busses carry signals to outputs connected to external devices such as effect boxes or headphone amplifiers for your performers.
FX	“FX is short for “Effect.” The six FX busses carry signals to the VS-2000’s internal effects.

## About Direct Paths

There’s another type of pathway available in the VS-2000 called a Direct path, or “DIR” for short. Unlike a bus, a Direct path can only carry one signal at a time. Each of the eight Direct paths is handy for routing a single signal to an internal effect or to an output on its way to an external device. See “Direct Paths” on Page 207.

## Achieving Perfect Levels

In all digital recording, the best sound is achieved when a signal is at *just* below 0 dB in level so that the audio takes fullest advantage of the recording device’s available bit depth. You need to be careful, though: If the signal exceeds 0 dB, the signal will “clip.”



*Bit depth*

### What’s “Clipping?”

Clipping is the introduction of clicking and other noises when a signal’s too loud. There’s no really good way to get rid of these noises once they’ve been recorded. You may have some success importing the audio into a wave editor with de-clicking tools, but it’s best to avoid clipping in the first place.

## How Do I Get Good Levels?

The goal, therefore, is to capture as loud a signal as possible without exceeding 0 dB. Achieving a loud-but-not-too-loud signal is the challenge of digital recording. When your audio has a consistent, predictable dynamic range, it's not hard to accomplish. However, if your project swings wildly between loud and soft passages—or if you're recording musicians whose volume changes a lot—it can be more tricky.

### **Take Care During Recording**

When it comes to establishing great levels, the most critical stage is during the original recording process. The most difficult recording situations involve the recording of musicians whose levels fluctuate between one performance and another, or even within the same performance—it can be hard to capture a strong level if you can't be sure how loud the performance is going to get. Fortunately, the VS-2000 provides some peak-detection options that can help you anticipate potential level problems (Page 130). It also offers tools you can use to smooth out a signal.

If you're finding a performer's level just too erratic to manage, consider running the signal through an external compressor/limiter that can smooth out some of the volume fluctuations in the performance before it even gets to the VS-2000. Try to find an acceptable trade-off between making the signal manageable on one hand, and not removing expressive dynamics from the signal on the other.



*Compressor, limiter*



The level of a digital input signal is normally controlled at its source, the external digital device that produces it.

### **Watch the Meters**

The VS-2000 provides meters that let you view your signal levels at every stage in the project-creation process. The VS-2000's various meters are described in detail in Chapter 8, which starts on Page 123.

As you work on your project, pay close attention to your levels:

- Watch the input channel meters during recording—they set the levels of signals as they're recorded onto your tracks.
- Watch your FX bus levels if you're using them to send signals to the internal effects.
- Watch your AUX bus levels if you're using them to send signals to external devices.
- Watch your Direct path levels if you're using them to send signals to external devices or the internal effects.
- During mixing, watch:
  - *your track levels*—if they're too loud, bring them down and raise your MASTER fader setting.
  - *your MASTER bus levels*—this is the mix's overall level.
- Watch your output meters if you're sending signals to external devices.

## **The Importance of Backing Up**

It's a simple fact of life that even the most reliable computers and their hard drives can misbehave—everyone who owns a computer knows this. Outside events—such as power outages and spikes—can also cause problems to occur.

The VS-2000 is a highly specialized computer designed for recording, but it *is* a computer, and all of your data is stored on its hard drive. As such, it's subject to the same mishaps as any other computer. While your VS-2000 is very trustworthy, there can be no absolute guarantee that nothing will ever go wrong.

It's vitally important, therefore, that you do what every computer user must do: regularly back up your data. If an unexpected problem does occur, you can always re-load your backed-up data and carry on.

Your built-in CD-R/RW drive provides a perfect way to easily and quickly back up your data on inexpensive CD-R (“CD-Recordable”) or CD-RW (“CD-ReWritable”) disks that can hold large amounts of data. The VS-2000 provides extensive backup and recovery tools, as described in Chapter 7.

While backing up your data requires an investment of your time on a regular basis, there's no substitute for the peace of mind it provides, especially if something does go wrong. Backing up your project is the best way to ensure that all of your inspired moments and hard work remain completely safe and sound, no matter what happens.



# 4—Setting Up and Basic Operations

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## Things You'll Need

### Power

You'll need a standard AC power socket that supplies grounded AC power. If you're going to listen to the VS-2000 through speakers, you'll also need power for them and for their amplifier if it's a separate component.

### A Way to Listen to the VS-2000

You can listen to—or“monitor”—the VS-2000 through speakers or by connecting standard stereo headphones to the VS-2000's PHONES jack.

For speakers, we recommend Roland's DS-series Digital Reference Monitors (purchased separately). There are several reasons:

- They have ultra-flat frequency responses. It's critical that your speakers tell you the truth as you work so you know what your recordings really sound like. The DS-series tell the truth.
- The DS-series are powered monitors, meaning that they have their own built-in amplifiers that are perfectly matched to the speakers.
- They have coaxial digital inputs so that you can connect them to the VS-2000 digitally and avoid noise that may occur with analog wiring.
- They can take advantage of Roland's advanced COSM Speaker Modeling that lets you try out your work on a variety of virtual speaker models. The VS-2000's built-in speaker models eliminate the difficulty of making sure your recordings sound good on any speaker system.

### A Headphone Note

The VS-2000's PHONES jack is a 1/4" stereo phone-type jack, so you'll need to make sure that the headphones you use have a 1/4" stereo phone-type plug. If your headphones have some other type of plug, you'll need to purchase an adapter for them.

## Getting Ready

### *Turn Everything Off, Turn Everything Down*

In order to prevent any unpleasant surprises or damage to your monitoring equipment, you should turn off all of your equipment—the VS-2000, monitors, etc.—before making your connections. In addition, you should turn down all of the appropriate volume controls before powering up your system:

- If you're using a speaker amplifier, turn its gain control down all the way.
- On the VS-2000, turn down the MONITOR knob to the right of the display all the way. If you're going to connect headphones to the PHONES jack, turn down the PHONES knob all the way as well.

### **Install a VS20-VGA and Connect a PS/2 Mouse and ASCII Keyboard**

A mouse and ASCII keyboard can make operation of the VS-2000 even easier. When you install a VS20-VGA VGAMouse Expansion Board (purchased separately), the VS-2000 supports the use of a PS/2-type mouse and keyboard. (A PS/2 mouse and keyboard must be purchased separately.)

Many of the VS-2000's operations can be performed using a mouse instead of the VS-2000's top-panel controls, as described on Page 70. A mouse also allows you to operate the VS-2000 from the screen of a connected VGA monitor (purchased separately)—see Page 381. You can perform a wide range of operations—and navigate the VS-2000—using a connected ASCII keyboard (Page 72).

Connect the included mouse and keyboard to a PS/2“Y” connector—available at most computer supply stores—attached to the VS20-VGA's PS/2 MOUSE jack.



You may need to activate your ASCII keyboard. See the keyboard settings on Page 66



### **Install a VS20-VGA and Connect a VGA Monitor**

When you connect a color VGA monitor (purchased separately) to a VS20-VGA (purchased separately) installed in your VS-2000, the VS-2000 becomes even easier to use. By manipulating its controls onscreen using your mouse, everything becomes a simple matter of pointing and clicking. You can use the VGA as your main display and the VS-2000's internal LCD as a supplemental Info Display, or the other way around. See Page 381 to learn more.

You can use any standard VGA display that has a refresh rate from 60-75 Hz. Connect your monitor's DB-15-type VGA cable to the VS20-VGA's VGA OUT jack.

### **Connect Monitors or Headphones**

The connections you'll make depend on how you'll be listening to the VS-2000:

- If you're going to be listening to the VS-2000 through DS-series monitors, you can connect the VS-2000's COAXIAL OUT to the monitors' COAXIAL DIGITAL INPUT. Make sure the DS-90's or DS-50A's Digital Input Select Switch is set to COAXIAL, and that its Input Select Switch is set to DIGITAL INPUT. See your *DS-series Owner's Manual* for more information.



When using the COAXIAL OUT for monitoring, you'll need to configure the VS-2000 as described in “If You're Using DS-Series Monitors” on Page 75.

- If you're using other monitors, connect the VS-2000's MONITOR L and R jacks to the left and right inputs, respectively, of your speaker system.
- If you're using headphones, connect them to the PHONES jack.

### **Connect All Other Devices**

Connect any other devices to the appropriate VS-2000 jacks or connectors. If you're unsure which jack or connector to use, consult the device's documentation.

## Making Power Connections

Connect the AC plug on the supplied AC power cable to a grounded AC outlet, and the adaptor's DC plug to the VS-2000's DC IN jack—use *only* the supplied AC adaptor. Connect all other devices' power cables as recommended in their documentation.

## Powering Up

It's important that you power up the VS-2000 and any equipment to which it's attached in the following order to prevent damage to your equipment and to make sure the VS-2000 recognizes everything you've connected to it.



Once the connections have been completed (Page 66), turn on power to your various devices in the order specified. By turning on devices in the wrong order, you risk causing a malfunction and/or damage to speakers and other devices.



This unit is equipped with a protection circuit. A brief interval after power up is required before the unit will operate normally.

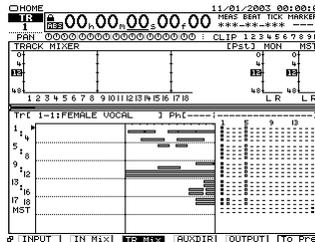


If you turn on the power immediately after turning the power off, the system may not boot up correctly. When you turn the power on, you should wait for 30 seconds or so after turning the power off.



In the following steps, allow each piece of equipment to finish its power-up sequence before proceeding to the next step.

1. Turn on everything connected to the VS-2000 except your monitors or monitoring system. This includes devices connected to the VS-2000 via analog connections or digitally and your VGA monitor.
2. Turn on the VS-2000 by pressing its rear-panel POWER switch to the On position. When the Home display—shown here—appears, the VS-2000 power-up sequence is complete.



This takes a few moments, as explained in the next section.

3. Turn on your monitor speakers or monitoring system.

## What Happens During the VS-2000's Power-Up

When you turn the VS-2000 on, it performs a few important tasks that help ensure its successful operation. It:

- performs some diagnostic routines to make sure everything's working properly.
- sets up the available effects.
- re-loads the project that was loaded at power-down. (When you turn on the VS-2000 for the first time, this is the "U Wanna Play Me" demo or "with Me" demo.) As a project loads, the faders move to their last-saved positions and the project's settings are restored.

## Configuring the VS-2000

### Setting Up the VGA Monitor, Mouse and Keyboard

Here's how to set up the mouse, keyboard and VGA monitor you can use when you've installed a VS20-VGA VGA/Mouse Expansion Board board (purchased separately):

1. Hold down SHIFT and press F4 under the display.
2. Press PAGE—if necessary—until "SYSTEM" appears above F1.
3. Press F1 (SYSTEM) beneath the display.
4. Press F3 (Param3) to display the VGA, mouse and keyboard settings.
5. Use the ◀, ▶, ▲ and ▼ buttons as necessary to select each setting—a setting's outline darkens when it's selected—and turn the Time/Value dial to choose the desired value.



If you don't have a VGA monitor, mouse or keyboard, skip over its parameters.

#### VGA Monitor Parameters

<i>Parameter:</i>	<i>What it sets:</i>	<i>Typical setting is:</i>
VGA OUT	Turns the VGA output on or off	On
REFRESH RATE	Sets the rate at which the monitor re-draws its image	Manufacturer's recommended setting
H. POSITION	Shifts the image left or right	0
V. POSITION	Shifts the image up or down	0
OPERATION TARGET	Designates the internal LCD or a connected VGA monitor as the main operation display	see Page 381



Consult your VGA monitor's documentation for its recommended refresh rate to avoid poor image quality and possible damage to the monitor.



The VGA parameters are described in greater detail on Page 381.

#### Mouse Parameters

<i>Parameter:</i>	<i>What it sets:</i>	<i>Typical setting is:</i>
PS/2 MOUSE	Turns the mouse on or off	On
POINTER SPEED	Sets how fast the mouse's cursor moves	3
MOUSE BUTTON SWAP Sw	Sets the right- or left-handedness of the mouse	(see Page 70)

#### ASCII Keyboard Parameters

<i>Parameter:</i>	<i>What it sets:</i>	<i>Typical setting is:</i>
PS/2 KEYBOARD	Turns the keyboard on or off	On
KEYBOARD TYPE	Selects the nationality of the ASCII keyboard you're using	101/104 (in USA); 106/109 (Japan)

## Setting the VS-2000's Clock

The VS-2000 time-stamps your recordings to make it easier for you to keep track of your work. Before it can do this, you'll need to set its clock.

1. Hold down SHIFT and press F4.
2. Press the PAGE button repeatedly—if necessary—until "DATE" appears above F6.
3. Press F6 (DATE). The DATE/TIME screen appears.
4. If the DATE parameter isn't selected, use the ◀, ▶, ▲ and ▼ buttons to select it.
5. If the month isn't already selected, press ◀ to select it.
6. Turn the Time/Value dial until the current month is displayed.
7. Press ▶ and turn the Time/Value dial to choose today's date.
8. Press ▶ and turn the Time/Value dial to choose the current year.
9. Press ▶ and turn the Time/Value dial to choose the desired DATE FORMAT setting. Dates can be shown on the display in any of the following styles:

<i>This value:</i>	<i>Displays dates as:</i>
mm/dd/yyyy	07/12/2001
dd/mm/yyyy	12/07/2001
yyyy/mm/dd	2001/07/12
MMM.dd'YY	Jul. 12,'01
dd MMM'YY	12 Jul'01

10. Press ▼ to select the TIME parameter.
11. Turn the Time/Value dial to select the current hour.



The VS-2000 uses 24-hour time: Midnight is Hour 00, 1 am is 01, and 1 pm is Hour 13.

12. Press ▶ and turn the Time/Value dial to select the minute, and then second.
13. Press F5 (SET) to confirm your changes.
14. Press F6 (EXIT) to leave the DATE/TIME screen and finish the procedure.

## A Few Fundamental Concepts

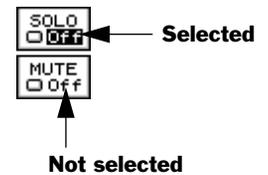
### Selection

Before you can change something in the VS-2000, you must first select it. In the case of physical controls, it's obvious: before you can move a fader, you've got to grab it with your fingers. This rule also applies to items shown on the VS-2000's display. When you select something on the display, you're telling the VS-2000 you want to do something to the thing you've selected. The two most common ways to make a selection are to use the cursor buttons or to click the desired item with your mouse. Once you've made a selection, you can make the desired change using the appropriate tool.

When you select one displayed item and then another, you're moving the "selection cursor."

The VS-2000 shows you what's currently selected. Often, the selected item becomes "highlighted"—its colors are inverted. Text, for example, becomes white with a dark background.

When you select a box in which you can enter data or choose a different value, the box's outline becomes darkened.



## Switches

Some settings in the VS-2000 are presented as switches. They're typically shown in either of two ways:

- *As a box*—when a switch is on, it's darkened. When it's off, it's not.
- *As checked items*—when a value is checked, it's on. If it's not, it's off.



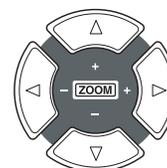
## Parameters and Values

Up until now in this manual, we've been using the word "setting" to describe something you can adjust. The correct term is actually "parameter," the word we'll use from here on (except in a few cases where "setting" is clearer). When you adjust a parameter, what you change is its "value." You can set a parameter with the cursor buttons—see below—and Time/Value dial, or by using your mouse (Page 70).

## Tools You'll Use All the Time

### The Cursor/ZOOM Buttons

Most of the time, you can navigate to the desired parameter on the display by pressing the ◀, ▶, ▲ and ▼ cursor/ZOOM buttons. When you press any of these buttons, you'll see the selection cursor move in the direction of the arrow button you've pressed.



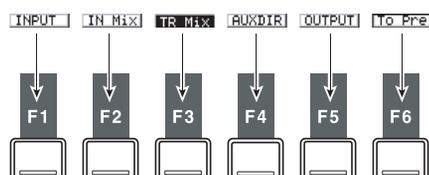
By holding down SHIFT and pressing the ◀, ▶, ▲ and ▼ buttons, you can zoom in or out on track displays. See Page 44.



If you've connected an ASCII keyboard to the VS-2000, you can often use its arrow keys instead of the ◀, ▶, ▲ or ▼ buttons.

### The F Buttons

In all of the VS-2000's operations, the LCD display provides information and visual feedback about what you're doing. Parameters, on/off switches and more appear on the display. Often, boxes appear at the bottom of the display—each of these boxes shows the current function of the F button directly beneath it.



If there's nothing on the display above an F button, it's currently inactive.



You can use the F1-F6 buttons on a connected ASCII keyboard instead of the F buttons beneath the VS-2000's display if you've installed and optional VS20-VGA board.

When the boxes at the bottom of the screen are small rectangles, the F buttons usually:

- display the parameters associated with an operation.
- execute an operation.
- act as on/off switches.
- move the selection cursor to a location on the display.
- exit the current screen.

Sometimes the boxes at the bottom of the screen are large and contain icons. When this is the case, press the corresponding F button to begin an operation or view a menu of related parameters. In all cases, the label on the display above the F button tells you what the button does.



The labels above the F buttons change when you hold down SHIFT to show the important screens you can display by pressing the corresponding F button.

<i>Press SHIFT and:</i>	<i>To display the:</i>
F1	Project menu
F2	Track menu
F3	Effect menu
F4	Utility menu
F5	Wave display (when pressed while the Home screen is visible)

## Pages



More parameters may be available than can fit on the display at once. In these cases, they're arranged over several "pages" on the display. You'll see the Page symbol in the lower left-hand corner of the display—the display may also show what look like folder tabs, presenting the available pages as tabbed layers.



Press the PAGE button repeatedly to display each of the available pages.



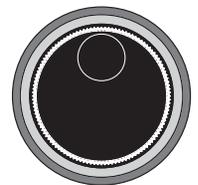
If you've connected an ASCII keyboard to the VS-2000, you can press its Tab key instead of the VS-2000's PAGE button.

### Param 1, 2, 3 Screens

In some VS-2000 menus, parameter pages are divided further into sub-pages called "Param1," "Param2," etc. You can select one of these sub-pages by pressing its F button.

## The Time/Value Dial

Once you've selected a parameter you want to edit, you can turn the large, black Time/Value dial to change the parameter's value.



When you're adjusting parameter values with the Time/Value dial, hold down SHIFT as you turn the dial to move through the available values by different-sized increments.



You can change your current time location in a project using the Time/Value dial (see Page 131).

## The ENTER/YES and EXIT/NO Buttons

Use the ENTER/YES or EXIT/NO buttons beneath the Time/Value the to execute or cancel the current operation, or to respond to a question posed on the display.



You can tell the ENTER/YES button from the EXIT/NO simply by touch—ENTER/YES is larger.

The ENTER/YES and EXIT NO buttons blink to signify that you can press the:

- ENTER/YES button to finish, or press EXIT/NO to cancel, the current operation.
- ENTER/YES to answer “yes” to a displayed question, or EXIT/NO to reply “no.”

The ENTER/YES button also blinks to indicate that you can press it to view additional options. EXIT/NO flashes at times to show you can press it to exit the current screen.



If you prefer, you can always use the Enter key on your keyboard instead of ENTER/YES, or the Esc key instead of EXIT/NO.

## The SHIFT Button



Many of the VS-2000’s buttons perform more than one job—these buttons often have an upper label and a lower label that’s printed inside an outline box. The un-boxed label shows the button’s primary function, the boxed label its secondary use.

To cause a button to perform its secondary job, hold down SHIFT and press the button before letting go SHIFT.



You can set the SHIFT button so that it toggles on and off with each touch to cut down on SHIFT-button presses. See “SHIFT LOCK” on Page 379.



For a complete list of SHIFT operations, see Page 399.

## Using a Mouse

When you’ve installed a VS20-VGA VGA/Mouse Expansion Board, the VS-2000 works with a two-button mouse, which can be set up for right-handed or left-handed users, according to the setting of the MOUSE BUTTON SWAP Sw System parameter in the VS-2000’s UTILITY menu. When the parameter’s turned:



- *off*—the mouse operates as a right-handed mouse. The left button clicks and the right button displays pop-up menus.
- *on*—the mouse operates as a left-handed mouse. The right button clicks and the left button displays pop-up menus.

When the *Owner’s Manual* says to “click” the mouse, right-handed users should click the left-hand button. When it says to “right-click,” they should click the right-hand button. If you’re a left-handed mouse user, you’ll need to mentally reverse these instructions—“click” the right-hand button and “right-click” the left-hand button.

**Mouse Cursors**

The cursor changes to show you what the mouse can do as you move it over different items on the display.

<i>This cursor:</i>	<i>Means that the mouse:</i>
	is moving between items on the display. On the Home screen, you can click on a track to select it.
	can click on the item beneath the cursor. If it's a switch, you can toggle through its values by repeatedly clicking. If it's an adjustable parameter, you'll see either of the next two cursors after you click.
	can raise or lower the parameter's value as you drag the mouse up or down, respectively.
	can raise or lower a parameter's value as you drag the mouse right or left, respectively.
	can drag the data beneath it during editing operations.
	is ready to move whatever's beneath the mouse to a new location.
	is ready to copy whatever's beneath the mouse by dragging; this appears when SHIFT is held down during track editing.
	is ready to trim the start of a phrase during track editing.
	is ready to trim the end of a phrase during track editing.



There are several additional cursors that appear momentarily during track editing, as described on Page 248.



When a parameter's values are presented in a list or in a box, you can simply click the desired value with your mouse without having to select the parameter first.

**Pop-Up Menus**

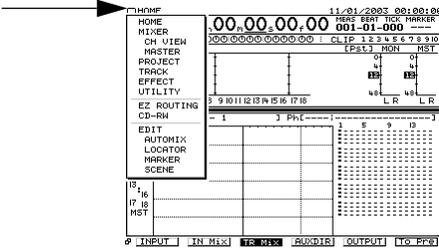
When a pop-up menu is available, you can select an item in the menu by dragging the mouse to it—so the item's highlighted—and then click the left mouse button to select it. The following two pop-up menus are available from a number of screens.



**Drag to the desired menu item and click.**

*Display Pop-Up Menu*

You can quickly jump to some of the VS-2000's most important screens by clicking on the small rectangle in the upper left-hand corner of many of the VS-2000's screens.



*Channel Pop-Up Menu*

If you're using a mouse, you can also select a new input, track or FX return channel from any screen on which the currently selected channel's number is displayed as shown here.

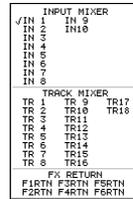
**IN**  
1  
Input channel
 

**TR**  
1  
Track channel
 

**FX1**  
RTN  
FX return channel

To select a new channel:

1. Click the channel number. The Channel Pop-Up menu appears.
2. Move the cursor to the desired channel and click.



## Using an ASCII Keyboard

After you've connect an ASCII keyboard to an optional VS20-VGA VGA/Mouse Expansion Board's PS/2 MOUSE jack, and activated it (Page 66), you can use the keyboard to perform the following actions.

### What You Can Do With an ASCII Keyboard

<i>You can use the keyboard's:</i>	<i>To:</i>
Letter and number keys	enter names for projects, tracks, scenes, locators, etc.
Space bar	start, stop and continue project playback
Arrow keys	move the cursor on the VS-2000's display
SHIFT+arrow keys	zoom in and out vertically and horizontally
Home	display the Home screen
F7	display the EZ Routing VIEW screen
SHIFT+F8	display Mastering Room screen
Ctrl+S	store the current project
Ctrl+Alt+Delete	shut down the VS-2000
<i>And the keyboard's:</i>	
<i>Acts as the VS-2000's:</i>	
F1-F6	F1-F6 buttons
Tab	the PAGE button
Enter	the ENTER/YES button or left mouse button
Esc	the EXIT/NO button
F9	the PROJECT MENU button
F10	the TRACK MENU button
F11	the EFFECT MENU button
F12	the UTILITY MENU button

## UNDO and REDO

### Undo

The Undo function allows you to reverse—or“undo”—track recording and editing operations. Each project remembers up to 999 of your most recent recording and editing actions and can restore the project to the state it was in before each action.



Each action is assigned a numbered “Undo level.” The lower the number of the level, the more recent the action. All undoable actions in a project appear in the Undo list along with the date and time of each action.



When you undo a recording or editing operation, everything you did after the operation originally took place is also undone.



Undo affects track recording and editing operations only—it doesn’t undo parameter value changes.

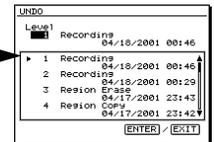


If a project contains data required for undoing actions you’re sure you’ll never need to undo, you can perform a project optimization to discard the unwanted data and reduce the size of the project and the space it takes up on your hard disk. See Page 105.

### Undoing a Track Recording or Editing Operation

1. Press UNDO•REDO.
2. Locate the desired action in the Undo list.
3. Turn the TIME VALUE dial to select the desired Undo level—the selected level has an arrow to its left.
4. Press ENTER/YES. The selected action—and all other recording and editing actions that took place after it—is undone.

The currently selected Undo level



After the Undo operation is complete, the UNDO•REDO button remains lit to indicate that you can cancel the Undo operation by performing a Redo.



You can set the UTILITY menu’s UNDO MESSAGE parameter so that when you press UNDO, the VS-2000 instantly reverses the last operation without displaying the Undo list—see Page 380.

### Redo

If you change your mind about an action—or series of actions—you’ve undone, you can perform a “Redo” while the UNDO•REDO button is lit. To do this, hold down SHIFT and press UNDO•REDO. When the Redo dialog appears, press ENTER/YES.



The ability to perform a Redo operation lasts only until you next save the project.

## Naming

You can assign names to a wide range of things in the VS-2000, such as:

- projects (Page 103)
- tracks (Page 272)
- takes (Page 262)
- phrases (Page 261)
- effect patches (Page 223)
- locators (Page 184)
- markers (Page 188)
- scenes (Page 142)
- routing templates (Page 281)

The pages in the previous list provide details about how to access each item’s naming screen. The procedure you’ll use is the same no matter what it is you’re naming, and all of the naming screens look alike, as in the following illustration.



The project-naming screen provides some additional elements, including information about the project, an icon selection box, and an area for project comments.

### Entering a New Name Using the VS-2000 Controls

1. Press ◀ to select the first character in the naming box if it isn’t already selected.
2. Turn the Time/Value dial to select the desired first character—a box appears around the currently selected character in the area below the naming box.
3. Press ▶ to select the next character.
4. Turn the Time/Value dial to select the second character in the new name.
5. Repeat Steps 3 and 4 until you’ve entered the entire new name.
6. When you’re done, press F5 (OK).

### Entering a New Name from a Keyboard

1. Press ◀ to select the first character in the naming box if it isn’t already selected.
2. Type the desired name.
3. Press F5 (OK).

### Naming Tools

The F buttons beneath the naming screen provide tools you may want to use as you create a name.

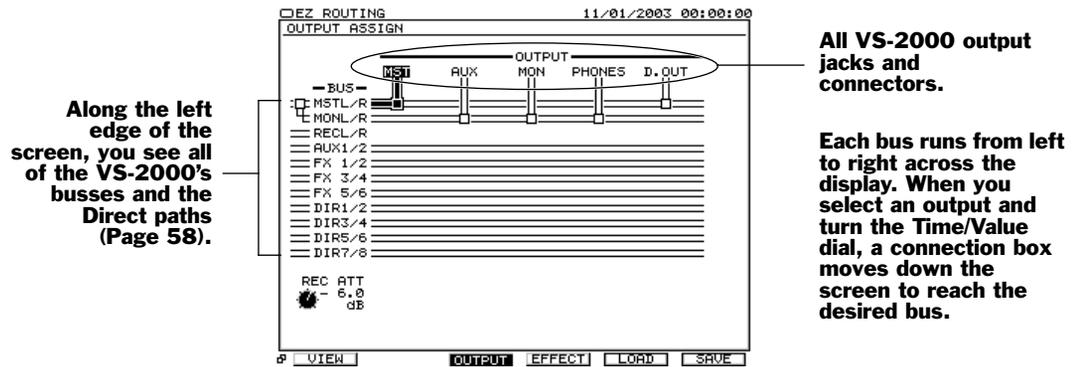
Press:	To:
F1 (HIST)	recall with each press one of the names you’ve entered since powering up.
F2 (BackSp)	delete the character to the left of the currently selected character.
F3 (DELETE)	erase the currently selected character and move all following characters to the left by one position.
F4 (INSERT)	add a blank space before the currently selected character, moving all following characters one position to the right.
F5 (OK)	assign the currently entered text to the item you’re naming.
F6 (CANCEL)	leave the naming screen without assigning a new name.

## If You're Using DS-Series Monitors

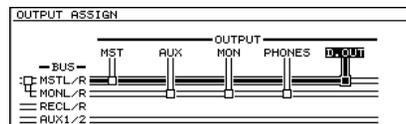
If you're using Roland DS-series Digital Reference Monitors, you'll need to route the MONITOR bus to the digital output to which you're connecting the monitors. (In the factory demo songs, this has already been taken care of.) When you create a new project, however, the MASTER stereo mix, not the stereo MONITOR bus, is routed to the COAXIAL OUT connector.)

### Setting Up for Roland's DS-Series Digital Monitors

1. Press EZ ROUTING.
2. Press F3 (OUTPUT). The OUTPUT ASSIGN screen appears. On this screen, you can change the signal routed to each output jack and connector.

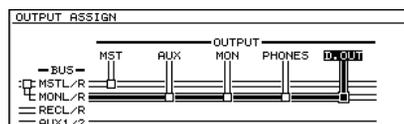


3. Press  $\blacktriangleright$  until D. OUT is selected in the top row as in this screenshot:



The thick black line—think of it as a virtual cable—shows that the MASTER mix (MASTL/R) is routed to the digital output (D.OUT).

4. Turn the Time/Value dial clockwise so that "cable" connects MONL/R to the D.OUT connector—"MONL/R" stands for "MONITOR Left/Right."



If you prefer, you can drag the output's connection box down to MONL/R using your mouse.

## Adjusting Your Listening Level

If you're listening to the VS-2000 through monitor speakers, the MONITOR knob to the left of the display sets your listening level. You'll generally want to keep this at the 0dB position (3 o'clock). Of course, you can always turn the MONITOR knob to raise or lower the listening level as needed—the 0dB position serves as a good starting point. Adjust your DS-series INPUT LEVEL or monitor-speaker amplifier level settings so that the VS-2000 is producing sound at a desirable level.



If you're using headphones, the setting of the MONITOR knob establishes the basic monitoring level, so set it to its 0dB position. To adjust your headphones' volume, turn the PHONES knob. Start with the knob turned all the way counter-clockwise, and slowly turn it clockwise to reach the desired listening level.



If you've connected a speaker system directly to the VS-2000 and would like separate control of your speakers and headphones, route the MASTER outputs to the PHONES jack on the EZ ROUTING OUTPUT ASSIGN screen (see Steps 1-3 in "If You're Using DS-Series Monitors" on Page 75). The MONITOR knob will control only the speakers, and the PHONES knob will control the headphone level.



In the factory demos, the MASTER bus is routed to the PHONES jack, so the PHONES knob independently controls the level produced by the headphone jack.

### Playing the Factory Demos

As shipped from the factory, your VS-2000 has a few demonstration songs—"demos"—stored as projects on its internal hard drive. When you power up the VS-2000, the "Promises" project is loaded into the VS-2000, all of its settings are restored, and its track channel faders move to their last-saved positions.



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No data for the music that is played will be output from the VS-2000's MIDI OUT/THRU jack.



To save changes you've made to a demo, make a copy of the demo (Page 106). The demos loaded at the factory are write-protected (Page 104) and therefore not editable.

### "U Wanna Play Me"

This section assumes you've just powered up the VS-2000 and the demo project "U Wanna Play Me" is loaded. If this isn't the case, load "U WANNA PLAY"—see "Loading a Project" on Page 101. (The track sheets included in the VS-2000 box contain demo details.)

"U Wanna Play Me" was written by Scott Tibbs and is © 2003 Roland Corporation.

### "With Me"

Your hard drive also contains another VS-2000 demo, "With Me," written by Nicole McKenna and Saul Zonana, and copyright © 2003 20/20 Music. To learn how to load it, see "Loading a Project" on Page 101.

## Bring Down the MASTER Fader

To make sure the demo isn't too loud, first bring the MASTER fader all the way down.

The MASTER fader controls the level of the MASTER mix bus that's routed to the MONITOR bus (see "What's a Bus?" on Page 58). Since the MONITOR bus is supplying audio to the MONITOR and PHONES jacks—and to the digital output connected to DS-series Digital Reference Monitors—moving the MASTER fader adjusts your listening level.

## Starting Playback of the Demo

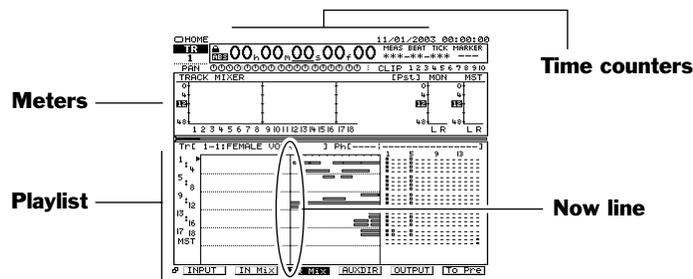
1. Press PLAY to begin playback.
2. Slowly bring up the MASTER fader to set the MASTER mix to a comfortable listening level.



If the demo finishes playing before you're done reading the following sections, press ZERO to restart it.

## A Quick Look at What's on the Display

1. Press HOME.
2. Press PAGE until "INPUT" appears on the display above F1. The display should look something like this:



3. If it doesn't, hold down SHIFT and press HOME repeatedly until it does. You can also change the magnification of the playlist by holding down SHIFT and pressing ◀, ▶, ▲ and/or ▼.

You're now looking at the Home screen. This screen is so important that an entire chapter—Chapter 8, starting on Page 123—is devoted to it. For now, we'll just point out a few items of interest. They're labeled in the illustration above.

- *Time counters*—The time counters show your current location in the project. You can move to a new location by dialing in a new time in the counters, as described on Page 131.
- *Meters*—The meters show you important level information during recording and playback. If TR Mix above F3 isn't highlighted, press F3 (TR Mix). The meters are now showing you the level of each of the project's tracks.
- *Playlist*—The playlist shows the data on all of the project's tracks. Each chunk of data you see is called a "phrase," and is shown as a rectangle. As the project plays, the data moves from right to left. (We'll explain tracks, phrases and more on Page 94.)
- *Now line*—The now line is a visual representation of the time location shown in the counters. It shows you where in the project you are right now. When data in the playlist crosses the now line, you hear it.

### **Stopping and Starting Playback**

- To stop listening to the demo before it ends, press STOP.
- To resume playback from the spot at which you stopped, press PLAY.
- To play the demo again from the top, press ZERO, and then PLAY.
- If you wish to, you can also use the REW (Rewind) and FF (Fast Forward) buttons to move to other locations in the project.

### **Navigating the Demo Using Locators**

You can store up to 96 specific time locations in each project as “locators.” By recalling a locator, you can instantly jump to its location in the project.

“U Wanna Play Me” contains 10 locators, all stored in Locator Bank 1—there are 6 locator banks, numbered 1-6.

Here’s where the locators in Bank 1 take you:

<i>Locator Number:</i>	<i>Takes you to:</i>
01	Chorus
02	Intro
03	Drum Entry 1
04	First Verse 1
05	Second Verse
06	Chorus 2
07	Break and Scratch 2
08	Third Verse
09	Chorus
10	“Oh, Baby” Break

You can recall locators when the project is playing or stopped—we’ll recall them when the project isn’t playing so you can see how they help you move through a project:

1. Press STOP to stop playback.
2. Press ZERO to return to the beginning—Time Zero—of the project.
3. If LOCATOR•SCENE isn’t lit green, press it so that it lights. Since Locator Bank 0 is already selected, we only need to select a locator bank.
4. Press TRACK/STATUS Button 1—the VS-2000 takes you to Locator 01, the first chorus.
5. Press TRACK/STATUS 5—you’re now at the start of Verse 2.

Locators are discussed in detail in “Locators” on Page 182.

### **Adjusting Track Levels**

The VS-2000’s 16 physical channel strips (Page 35) control the VS-2000’s track channels. See Chapter 10.

1. Slide the track channel strip faders up and down to hear how they change the levels of the tracks in “U Wanna Play Me.”

### **About Automix**

Automix allows the VS-2000 to memorize and play back mix-related settings, including any changes you make to those settings as the project plays. See Chapter 26 to learn about Automix.

## Recalling Scenes

The VS-2000 can memorize up to 96 mix setups as “scenes.” Scenes allow you to:

- store and recall multiple versions of a mix.
- store and recall different versions of a project with different V-Tracks (Page 97).

“U Wanna Play Me” contains a couple of scenes that show off the way scenes work.

1. Hold down SHIFT and press LOCATOR•SCENE so it lights red.  
Scenes—like locators—are stored in banks of 16 scenes each, numbered from 1-16. Since Scene Bank 1 is already selected, we only need to enter each desired scene’s second digit for the scenes in “U Wanna Play.”
2. Press TRACK/STATUS 2. Scene 02—containing a shortened intro—loads the settings it contains.
3. Play “U Wanna Play” to hear how it sounds with Scene 02.
4. Press STOP when you’re done and keep your eyes on the display.



You can recall scenes only while a project isn’t playing, so press STOP before attempting to recall a scene.

5. Press SCENE again, and then TRACK/STATUS 3 to recall Scene 03—this time a vocal starts the song. The display shows it uses different V-Tracks than Scene 02.
6. Press ZERO and then PLAY to listen to the way the song’s changed.

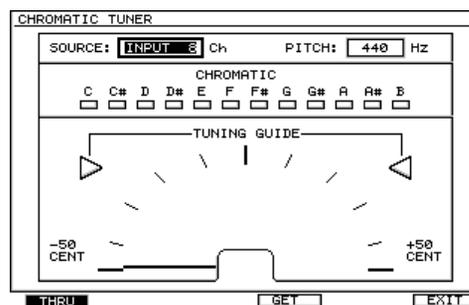
To learn about storing scenes, recalling them and more, see “Scenes” on Page 142.

## The VS-2000’s Built-It Tuner

The VS-2000 has its own chromatic tuner that you can use to make sure your instruments are precisely in tune before you start recording, and can even check the tuning of recorded tracks. The tuner works with any instrument connected to one of the VS-2000’s XLR or 1/4” input jacks, or with any recorded track.

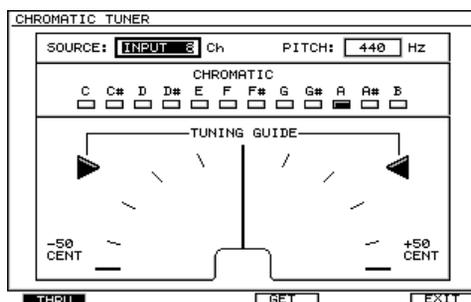
### Tuning an Instrument with the VS-2000 Tuner

1. Connect the instrument to the desired input
2. Press TUNER—the CHROMATIC TUNER display appears.



3. Cursor to the SOURCE parameter and select the input to which you’ve connected the instrument.
4. Set PITCH to the desired tuning reference. Concert pitch—A=440—is the default setting.
5. To hear the instrument you’re tuning, press F1 (THRU) so it’s turned on (darkened). When THRU is on, the tuner passes the selected input’s signal through to the corresponding input channel.

6. Play a note. The note that's closest in pitch to what you've played lights in the tuner's CHROMATIC display.  
When a note is exactly in tune, both large arrows light and the tuning indicator points straight upward.



7. If the played note needs tuning, retune the note on your instrument until both of the large arrows light and the tuning indicator points straight upward. If only the arrow on the left lights, the note is flat; if only the arrow on the right lights, it's sharp.

### ***Tuning to a Non-Standard Pitch***

The VS-2000's tuner allows you to tune instruments to a non-standard reference pitch, as long as that instrument is within a -23 cent-to-+23 cent range below or above concert pitch.

This might happen when you're using a piano, organ or some other instrument that can't be easily re-tuned on the spot. In such a case, the tuner can itself be tuned to the pitch of the instrument you can't retune. Here's how:

1. Connect the instrument to the desired input
2. Press TUNER—the CHROMATIC TUNER display appears.
3. Cursor to the SOURCE parameter and select the input to which you've connected the instrument.
4. Press F4 (Get).
5. Play a note—the tuner's indicator goes straight up and the tuner takes the note's tuning as its reference pitch, adjusting the PITCH value accordingly.
6. For each instrument you'd like to tune, follow the steps above in "Tuning an Instrument with the VS-2000 Tuner."
7. When you've finished tuning your instrument(s), set the PITCH parameter back to 440 to return to concert pitch.

### ***Tuning to Recorded Tracks***

You can also tune live instruments to already recorded tracks. Make sure to record a note you can use as a tuning reference. We recommend an "A" above Middle C for a few seconds before or after the actual music. It's best to record the note on an instrument that produces a clear pitch such as guitar, piano, organ or horn. A synthesizer that produces a complex timbre, for example, would not be a good choice. Follow the steps in "Tuning to a Non-Standard Pitch."

## Connecting the VS-2000 to a Computer Via USB

You can exchange various files with a computer connected to the VS-2000 via a USB connection. You can:

- *Move recordings from the VS-2000 to the computer*—VS-2000 recordings can be transferred to the computer and converted to WAV files or AIFF files for editing, processing, etc.
- *Move audio files to the VS-2000 from the computer*—WAV files or AIFF files can be converted to VS-format files on the computer and transferred to the VS-2000.



The VS-2000 box contains a CD-ROM on which you'll find Mac and PC software that allows you to convert VS-format files to WAV files or AIFF files and vice versa. See the documentation included with the software to learn how to convert files.



Realtime audio signals and MIDI messages cannot be handled via the VS-2000's USB connector.

Any USB-related process begins with the activation of USB storage in the VS-2000.

### Caution when using USB storage mode



#### **Important**

Unfortunately, it may be impossible to restore the contents of the data that was stored on a hard disk once it has been lost. Roland Corporation assumes no liability concerning such loss of data.

Further, Roland Corporation will accept no responsibility for improper function of VS-2000 caused by the incorrect operation.

Please read following instruction and "Cautions when establishing the USB connection" (Page 82) carefully before the USB connection with computers.

When you connect the VS-2000 to your computer using a USB cable, all folders and files on the VS-2000's hard disk will be displayed on the computer monitor, and you will be able to freely modify, delete, or add to these files via USB. In addition, you will be able to initialize the VS-2000's hard disk remotely using the computer.

Also, initializing or de-fragmentation of VS-2000's hard disk is possible remotely from the computer.

Note, however, that if files and folders are modified, deleted, or added using the computer, or if the hard disk is initialized, or if de-fragmentation is executed, the VS-2000 may no longer be able to function properly, and important data could be lost. It is crucial, therefore, that no operations other than contained application (VS-2000 Wave Converter) be carried out using USB.

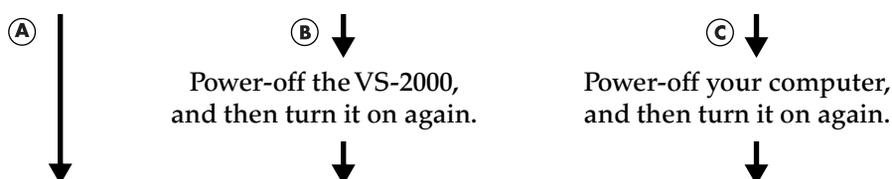
Do not perform the following actions when switching to USB mode or transmitting data. These operations may result in your computer not responding. Data on VS-2000's hard disk may also be corrupted.

- Do not:
- Disconnect the USB cable
  - Put the computer in suspended (standby) mode or hibernation, restart, or quit
  - Turn off the VS-2000's power

### **Cautions when establishing the USB connection**

- The VS-2000 and computer must be connected one-to-one. Do not make connections via a USB hub.
- With certain types of USB cable, the internal hard disk may not be detected correctly. If this occurs, try reconnecting the cable. The hard disk may be detected successfully if you use a cable of a different length. Cable compatible with USB 2.0 and length of 5m or less is recommended.
- Do not enter into USB storage mode when discs like audio CD etc. is loaded on internal CD-RW drive of VS-2000.
- In rare cases, it may happen that the internal CD-RW drive will be detected but the internal hard disk will not be detected when you connect the VS-2000 to your computer. If this occurs, re-connect using one of the following methods (A–C).

Break the connection as described in “Terminating the connection to your computer” (Page 84), and disconnect the USB cable.



Once again, make connections as described in “Establishing a connection to your computer” (Page 82).

- If you’re using Windows XP in an environment where network drives are assigned or you’ve used the Subst command to assign virtual drives, there may be cases in which not all of the VS-2000’s internal hard disk (partitions) will be detected.
- A certain amount of time may be required for the VS-2000’s internal hard disk to be detected.

### **Establishing a connection to your computer (Entering USB Storage mode)**

VS-2000 is compatible with USB 2.0. Connection with computer that has USB 2.0 port is recommended.



It is possible to connect computer with USB 1.\* port. However, the transfer speed will be slower.

#### ■ **Supported operating systems**

- Microsoft® Windows® Millennium Edition
- Microsoft® Windows® 2000 Professional
- Microsoft® Windows® XP
- Mac OS 10.2 or later

#### ■ **Driver**

The VS-2000 uses a standard DRIVER that is found on OS. The DRIVER will be installed automatically once connected with Computer via USB.

#### ■ **Required items**

USB cable

\* Cable compatible with USB 2.0 and length of 5m or less is recommended.

Here’s how to start up USB Storage mode so that your computer and the VS-2000 will be on-line (able to communicate with each other).



While USB Storage mode is active, all buttons and knobs except for F6 (EXIT) will be disabled.



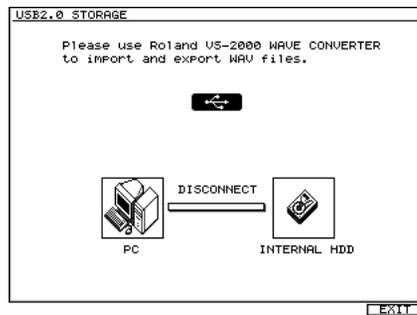
You cannot enter USB Storage mode while a project is being played or recorded.

1. With playback stopped, press USB 2.0. The following dialog appears:

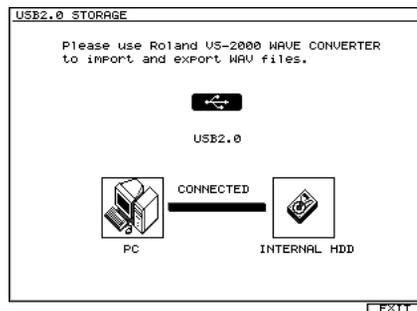


2. Press YES/ENTER—“Store Current?” appears on the display.
3. Press ENTER/YES to store the most recent changes to your project—including any mastering tracks you’ve just created—or press EXIT/NO to proceed without re-saving your project.
4. The USB 2.0 storage screen will appear, and USB Storage mode will start up (USB 2.0 button will light).

This indicates that the VS-2000 is now able to communicate with your computer.



5. Connect the VS-2000 to the computer as described on Page 47. Your computer and the VS-2000 will be on-line (i.e., in a state in which they can communicate with each other), and the on-screen indication will change from “DISCONNECT” to “CONNECTED.”



The standard driver provided by the operating system is used as the USB driver to connect the VS-2000 and computer.



In USB Storage mode, the VS-2000’s DISK indicator will not light even if the VS-2000 and computer are communicating. It will operate normally while the USB 2.0 Storage screen indicates “CONNECTED.”

### ■ The VS-2000 icon

When your computer detects the VS-2000's internal hard disk, a VS-2000 icon will appear.

#### Windows Me/2000/XP

One or more new drives will be added to "My Computer."

- Each partition will be displayed. Up to four (IDE:0–IDE:3) will be detected.
- The letter assigned as the drive name will depend on your computer system.

#### Mac OS 10.2 or later

The VS-2000 icon will appear on the desktop.

In Mac OS 10.xx, each partition will be displayed. Up to four (IDE:0–IDE:3) will be detected.

## Terminating the connection to your computer (Exiting USB Storage mode)

When the VS-2000 and your computer are on-line (i.e., in a state in which they can communicate with each other), you must not disconnect the USB cable or exit USB Storage mode; doing so may cause your system to malfunction or may cause files to be destroyed or damaged.

When you are ready to terminate the connection between the VS-2000 and your computer, you must use the following procedure.

1. Perform the following action on your computer.
  - Windows Me/2000/XP  
Use the Safely Remove Hardware icon shown in the taskbar to terminate the connection to the VS-2000.
  - Mac OS X (10.2 or later)  
Drag the VS-2000 icon on the desktop into the trash to terminate the connection to the VS-2000.

Your computer and the VS-2000 are now off-line; now you can safely terminate the USB connection.

2. Press F6 (EXIT). The following dialog appears:



3. Press ENTER/YES—The VS-2000 will exit USB Storage mode. The home screen will appear, and the VS-2000 will return to normal operation.
4. Disconnect the USB cable.

## Turning Off the VS-2000



It's important that you don't simply flip the VS-2000's POWER switch to turn it off—always use the procedure below to prevent damage to your data.



If you'd like to restart the VS-2000—perhaps while troubleshooting a problem—use the procedure below as well.

### Turning Off the VS-2000

1. Hold down SHUTDOWN for two seconds. The following dialog appears:



2. If you wish to turn off or restart the VS-2000, press ENTER/YES. If not, press EXIT/NO to cancel the operation. If you press ENTER/YES, a dialog like this one appears:



← The name of the currently loaded project.

← The project's sample rate and recording mode (Page 102).

3. If you've made changes to the currently loaded project you'd like to preserve, press ENTER/YES. If you haven't, press EXIT/NO.



If you're shutting down the VS-2000 when a factory demo song—or any other protected project—is loaded, you won't be prompted to store the current song.

In either case, the VS-2000 takes a few moments to prepare to shut down—and to save your project if you pressed ENTER/YES in Step 3. When the VS-2000 is ready to be powered off, the following message appears:



4. If you'd like to restart the VS-2000, hold down SHIFT and press the flashing PLAY button—the VS-2000 begins its power-up sequence. If you'd like to shut down the VS-2000, flip its rear-panel POWER switch to its Off position.



If you need to move the VS-2000 after shutting it down, wait 30 seconds or so to give its hard drive a chance to stop spinning in order to avoid damaging it.



# 5—Understanding Effects

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## Harnessing the VS-2000's Effects

The VS-2000 provides a range of creative possibilities when it comes to effects. How and where you apply them will have a big impact on the sound you achieve.

This chapter discusses important effect-related ideas, including:

- *effect routings*—How you get your signals in and out of an effect has a lot to do with the way they'll sound.
- *master effects*—You can add effects to your entire mix. This ability is especially important when you're creating a final master.
- *when and where to apply effects*—You can add effects as you record, during mixdown, or add them to your entire mix at once. We'll offer some tips that'll help you decide when and where to apply your effects.
- *native effects and plug-in effects*—You can use the VS-2000's built-in effects or special plug-in effects (purchased separately) sold by leading effect houses.
- *external effects*—You can send signals out of the VS-2000, into external effects-processing devices, and back, if you wish to.

### Dry and Wet

"Dry" and "wet" are two terms that are frequently used in any discussion of effects, providing a shorthand way to say whether or not a signal has had effects applied to it:

- *dry*—A dry signal is a signal to which you haven't applied an effect.
- *wet*—A wet signal is a signal to which you have applied an effect.



You can bring a signal into the VS-2000 that already uses an effect—from the effect processor built into a synthesizer, for example—but for our purposes, until you add a VS-2000 effect to the signal, we'll consider it dry.

### Effect Routings

There are two basic methods you can use to apply an effect to a signal.

*You can:*

*replace* the dry signal with a wet version of the signal so that only the wet version is heard.

*add* a wet version of the signal to the dry version so that both are heard.

*Term for an effect applied this way:*

insert effect

loop effect



Loop effects are sometimes called "send-and-return effects."

The method you'll choose depends on the type of effect you're applying to your signal—the patch list in the *VS-2000 Appendices* shows the suggested use for each effect patch. We'll describe how to set up insert and loop effects in Chapter 16 starting on Page 211. The following sections explain how the two methods work.

## Insert Effects

An insert effect detours a signal as it makes its way through the VS-2000. The signal is diverted into the effect, processed, and the effect's output—the wet version of the signal—takes the original signal's place and resumes its journey. The name "insert effect" refers to the idea that you've inserted the effect in the signal's path.



### When To Use Insert Effects

You'll typically want to insert the following types of effects:

- dynamics-based effects like compressors, limiters, gates and expanders
- distortion effects
- chorus, flanger and phaser effects
- guitar and vocal multi-effects
- Microphone, Amp and Speaker Modeling
- rotary speaker effects
- filter effects such as EQs and vocoders

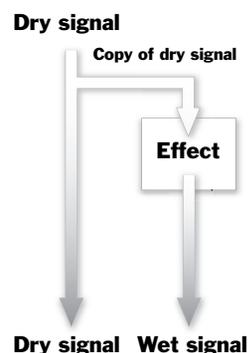


Insert effects act a lot like the small effects boxes and pedals through which guitarists, bassists and keyboardists run their instruments on their way to their amps. Any type of effect you might apply in this way is a good insert-effect candidate.

## Loop Effects

With a loop effect, you combine two different versions of the signal: the original dry signal and an effected, wet version. This is accomplished in two stages.

- You *send* a copy of the signal into the effect.
- You *return* the output of the effect—the wet version of the signal—to a mixer channel, and combine this channel's signal with the original signal.



### About the Terms "Send" and "Return"

"Send" and "return" are used in mixing as both verbs and nouns. This can be confusing to beginners, so let's be clear about what we mean.

	<i>When we use:</i>	<i>As a verb, it describes the act of:</i>	<i>As a noun, it refers to:</i>
Send		directing a signal into an effect, as in "Send Track Channel 1 into Effect 1."	the device we use to carry the copy into the effect, as in "Adjust the send." Also, the copy itself, as in "The send is too loud."
Return		routing the effect's output into a channel, as in, "Return Effect 1 to FX Return Channel 1."	the channel into which the effect's output is routed, as in "Adjust the return."

## FX Sends

In the VS-2000, each of the six FX send busses provides a pathway into one of the VS-2000's six internal effect processors. By default, FX 1 carries signals into Effect 1, FX 2 to Effect 2, and so on. When you want to send an input, track or even an FX return channel's signal to an internal effect, you send it to the corresponding FX bus—you can set how much of the signal you want to send to the effect by setting the FX send level on its CH EDIT screen (Page 139).

## Pre-Fader and Post-Fader Sends

The VS-2000 allows you to send a signal to an FX bus from either of two places as the signal makes its way through a channel. You can send it:

- *pre-fader*—to send the signal to the FX bus before the signal reaches its channel fader. The FX send level isn't affected by changes you make to the fader's position—it stays the same even if the level of the signal itself changes. This can be useful if you're sending a signal to an effect and want its effect level to remain constant as the level of the signal itself changes.
- *post-fader*—to send the signal to the FX bus after its fader. Changes you make to the signal's level using its fader affect the amount of the signal sent to the FX bus. As the fader goes up, the FX send level goes up, and vice versa. This can be especially useful when you're using the FX bus to add an effect to the signal—the relationship between the signal level and effect level stays the same as you change the signal's level. You'll usually want to use a post-fader send for effects.

Each FX bus can be configured to accept either pre-fader or post-fader signals from the input, track and FX return channels, as described on Page 206.

## When To Use Loop Effects

You'll use loop effects any time you want to add an effect to a signal so that both the signal and the effect are heard. The most frequent use of loop effects is with reverbs and delays, the two most frequently used effects there are.

## Master Effects

The VS-2000 allows you to apply an effect to your entire mix at once. You can do this by inserting the effect into the main MASTER mix's signal path. While you can do this at any time, this capability is particularly important when creating final stereo mastering tracks in preparation for burning an audio CD. The VS-2000's Mastering Tool Kit (MTK) effects are specially designed for this purpose and provide everything you need to add the final touches to your recordings.



*Mastering tracks*

## Native and Plug-In Effects

VS-2000 users can enjoy both:

- *native effects*—effects built-in to the VS-2000 and contained on additional installed VS8F-2 Effect Expansion Boards.
- *plug-in effects*—third party effects that can be installed on optional VS8F-3 Plug-In Effect Expansion Boards. Leading software producers have released versions of the

music industry's most popular effect plug-ins for use with the VS-2000. See Roland's Web site—[www.RolandUS.com](http://www.RolandUS.com) or [www.Roland.com](http://www.Roland.com)—or call Roland Product Support for the latest info on available plug-ins.

Native effects and plug-ins operate in the same manner in the VS-2000, so everything we've discussed so far in this chapter applies to both types of effect.

## External Effects

While the VS-2000 provides a wide range of effects, you may wish to send a signal out of the VS-2000 and into an external effect processor. You'll use the processor's effect as a loop effect, by:

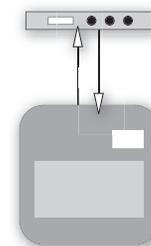
- sending the signal to an Aux bus or Direct path
- routing the Aux bus or Direct path to a VS-2000 output
- connecting the output to the input of the external device
- processing the signal inside the external device
- connecting the device's output to one of the VS-2000's inputs to return the wet signal to the VS-2000.

We'll describe this procedure in more detail on Page 213.



Even though an external effect is always a loop effect, you can simulate an insert effect by using only the external processor's return, and none of the original dry signal.

External effect processor



VS-2000

## Getting the Most From Your Effect Processors

It's important to be strategic about how you employ your effects so that you'll have the effects you need at each step along the way as you record and mix your project. Even engineers in the best-equipped studios in the world may find that they wish they had one more effect processor available from time to time. The simple truth is that while an effect processor's creating a particular effect, it's not available for any other use.

Here's an example. If you've got only the factory-installed effect processing in your VS-2000 and are already using Effect 1 and 2, you don't have any other internal effect processors available for a third effect. (This is why we recommend installing additional effect boards in your VS-2000.)

### ***Consider Recording Your Effects As You Go***

The solution is planning. Try to work out in advance the effects you'll need for all of the elements in your project. This will allow you to budget your effect-processing power.

One of the main tricks you can use to be sure you've got all the effects you need is to apply a signal's effect as you record the signal—the resulting track contains both the signal *and* its effect. This is called "printing" the effect. The benefit of recording your effects as you go is that it frees up the effect processor for later use.

This method isn't without risk, however: Once you've recorded an effect onto a track along with a signal, the effect can't be altered or removed. It can also be difficult to anticipate how a signal and its effect will sound when all other project elements have been recorded and are in place.

If you've got spare tracks, you can hedge your bets by recording the signal on one track, its effect on another, and then combining them later into a single track—or pair of tracks if you're using a stereo effect—once you're sure you like what you've got.

Even so, printing effects with your tracks can be a real lifesaver in a project that needs lots of effects.

Printing effects can also make a mix easier, since the printed effects will have already been dealt with, freeing you up to concentrate on other details during the often-complex mixing process.



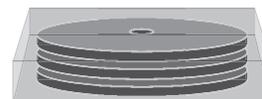
# 6—Understanding the Hard Disk Recorder

This chapter describes the fundamentals of hard disk recording in the VS-2000. If you're new to hard disk recording, you'll find all the basics here. We'll explain:

- what a hard disk drive is.
- how a VS-2000 hard drive organizes data.
- how a hard drive must be prepared for use by the VS-2000.
- how the VS-2000 records audio on a hard drive.
- how the VS-2000 plays back audio recorded on a hard drive.
- non-destructive, pointer-based editing.
- what a VS-2000 phrase is.
- what a VS-2000 V-Track is.
- what a VS-2000 track is.
- what a VS-2000 region is.

Even experienced users should read about VS-2000 tracks and their contents: takes, V-Tracks, phrases and regions. You'll need to understand what each of these is to fully master the VS-2000 editing capabilities. See Page 97.

## VS-2000 Hard Disk Drives



### What's a Hard Drive?

A hard drive is a hardware mechanism that contains one or more rigid platters—that's why it's called a "hard" drive—on which data is stored. A hard drive may also be referred to as a "disk drive." In the VS-2000, your hard drive stores all of your recordings and project settings. A hard drive is a great way to store and quickly retrieve data, and provides for some amazing features, as we'll see.

Your VS-2000 shipped from the Roland factory with a 40 GB (gigabyte) IDE hard drive installed. This provides lots of space for your projects.

### How a VS-2000 Hard Drive Organizes Data

A VS-2000 hard drive divides up its total disk space into sections called "partitions." Partitions help keep project data together on the hard drive. Each partition acts like a separate virtual drive—it even looks that way on the VS-2000's screens.

Your 40 GB VS-2000 internal hard drive was divided into four approximately 10 GB partitions at the factory. These partitions are labeled IDE:0, IDE:1, IDE:2 and IDE:3.



Internal hard drive



When we refer to a “drive” in the rest of the *VS-2000 Owner’s Manual*, we’ll be referring to a partition. This reflects that way the VS-2000’s software views partitions, and will make disk- and drive-related operations easier to explain and understand. (It’s also how partitions show up on your computer’s desktop when you use the VS-2000’s USB storage capabilities.) When we need to refer to an entire hard disk mechanism, we’ll call the mechanism a “hard drive.”

### Preparing a Hard Drive for Use

Before you can use a new internal hard drive with the VS-2000, it must be prepared for use. The hard drive must be erased, formatted and divided into partitions using the `FmtDrv` (for “Format Drive”) command described on Page 117.



The internal hard drive that came with your VS-2000 was formatted and partitioned before the demo songs were installed at the factory. It’s ready to be used as is.

### How Audio Is Recorded on a VS-2000 Hard Drive

Each time you record audio, it’s stored as a disk file comprised of digital data. This file is called a “take.” It includes your audio and a time-stamp of the date and time at which the recording took place. Until you perform a project optimization (Page 105), the VS-2000 holds on to all of the takes you’ve recorded in a project.

Even when you re-record a performance—“recording over” your first attempt—the original take remains on your hard drive and is still available to you should you want it. And when you edit a recording on the VS-2000, you don’t actually edit the take itself, thanks to non-destructive, pointer-based editing, which we’ll discuss shortly.

### How Recordings Are Played Back

#### Random Access

When your VS-2000 plays back your music from a hard drive, it uses something called “random access” playback. The phrase “random access” has its roots in computer programming, but what it means to you is this: The VS-2000 recorder can instantly play any audio in a project located anywhere on its hard drive.

Random access playback produces a couple of very important benefits:

- You never have to wait for the recorder to rewind or fast-forward to a location in a project. The VS-2000 gets where it needs to go in a heartbeat.
- The VS-2000 can employ pointer-based playback and editing.

#### What’s Pointer-Based Playback?

When you play a recording, the VS-2000 uses a set of “pointers” to identify the audio you want to play. Each pointer contains a piece of information about the audio. Among other things, pointers allow the VS-2000 to play parts of a take, rather than having to play the entire disk file from beginning to end. A simple set of pointers might include:

- the identity of the take that contains the desired audio.
- the time location within the take at which playback is to begin.
- the time location within the take at which playback is to end.

## Phrases

A set of pointers is called a “phrase.” Every time you make a new recording, the VS-2000 automatically creates a new phrase to play the new audio. Each phrase appears in the Home screen’s playlist (Page 126) as rectangle.



Each phrase is a rectangular box. This illustration shows a string of three phrases.

Phrases are also created in other ways:

- Any time you re-record a portion of a track—typically by punching (Page 188)—the new recording appears on the track as a phrase.
- You can create a new phrase that plays a currently unused take.



You can perform various editing operations on phrases, and edit regions of audio within phrases, as we’ll discuss later in this chapter, on Page 98.

## Virtual Tracks, or “V-Tracks”

As you record audio, punch in and out and edit it, you create a string of phrases positioned one after the other in the order in which they’ll play back. This string of phrases is called a “Virtual Track,” or “V-Track” for short.



From here on in the *VS-2000 Owner’s Manual*, we’ll refer to a string of phrases by its short name: “V-Track.”

Of course, if you’ve made a recording but haven’t done any punching or editing, the V-Track that plays it will consist of just the one phrase that plays the entire take.

# Non-Destructive, Pointer-Based Editing

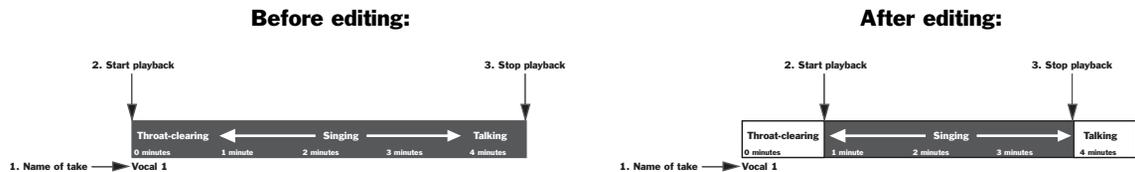
## Pointer-Based Editing

When you edit audio on the VS-2000, what you’re actually doing is editing a phrase, the set of pointers that instruct the VS-2000 how to play the audio. You’re not actually changing the take stored on your hard disk at all—you’re only editing its pointers. This type of editing is called “non-destructive editing” because it does no harm to the take itself. It doesn’t alter the take at all.



A few editing operations change audio by copying it and altering the copy—even so, the original take remains unaffected, and the pointers simply point to the copied audio.

This illustration shows how erasing unwanted audio from a recording affects its pointers. The dark portion of the take is the part that you hear during playback.



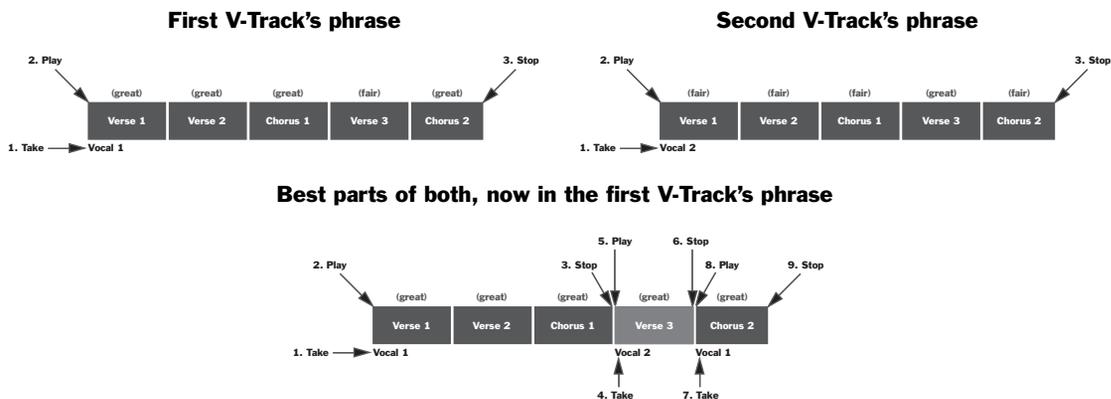
All you’ve really done is changed the positions of Pointers 1 and 2.



Though we're creating pointers and pointer names here for demonstration purposes, the VS-2000 takes care of all this in its internal programming language.

Because random access playback is so fast, the VS-2000 jumps from one location within the take to another so quickly it sounds as if it's playing one continuous recording.

The VS-2000 can also jump from one take to another during playback. In the illustration below, a phrase on one V-Track contains a great vocal performance except for the third verse. A phrase on a second V-Track has a great Verse 3. Here's what happens if you copy Verse 3 from the second V-Track to the first:



The VS-2000 creates and places all of its pointers behind the scenes—all you experience is that the first phrase now contains a completely great vocal performance.

You can also move or copy entire phrases to new locations on the same V-Track or from one V-Track to another—and much more—as described in Chapter 19.

### ***The Advantage of Non-Destructive Editing***

Non-destructive editing allows you to undo any edits you perform because all of your original hard disk recordings—your takes—remain safe and sound on your hard disk no matter how many edits you perform on the phrases that play them. It's only their pointers that have been edited.

This provides a tremendous amount of creative freedom. You can feel free to explore any creative editing possibility without worrying that you won't be able to get back to where you started.



If you're sure you no longer need your discarded data, you can clear it from your hard drive to gain disk space by performing a project optimization, described on Page 105.

# What Is a VS-2000 Track?

The VS-2000's 18 tracks resemble the tracks of a traditional multitrack recorder, so it feels familiar and comfortable to anyone who's used one. In fact, VS-2000 tracks are something a bit different, and they provide an incredible amount of recording power.

So, if...

- a recording is stored on your hard drive as a disk file called a "take," and
- the sets of pointers that tell the VS-2000 how to play a take are called "phrases," ...and...
- a group of phrases strung together for playback is called a "V-Track"

...then what's a track?

In the VS-2000, a track is a collection of 16 V-Tracks, any *one* of which can be selected at any given time. When a V-Track is selected, you can record on it or play it back.

A track's 16 V-Tracks can contain anything you want. They can play the same take (or takes) in different ways or they can each contain completely different things altogether.

**Related recordings on all of the track's V-Tracks**

1	Vocal Attempt 1
2	Vocal Attempt 2
3	Vocal Attempt 3
4	Vocal Attempt 4
5	Vocal Attempt 5
6	Vocal Attempt 6
7	Vocal Attempt 7
8	Vocal Attempt 8
9	Vocal Attempt 9
10	Vocal Attempt 10
11	Vocal Attempt 11
12	Vocal Attempt 12
13	Vocal Attempt 13
14	Vocal Attempt 14
15	Vocal Attempt 15
16	Vocal Attempt 16

**Assorted recordings on the track's V-Tracks**

1	Vocal Attempt 1
2	Tenor Sax
3	Lead Guitar #2
4	Lo Harmony
5	High Harmony
6	Vocal Attempt 2
7	Vocal Attempt 3
8	Lead Guitar (Ac.)
9	Piano Melody
10	XV5080
11	Vocal Attempt 11
12	JV1010
13	Harmonica Solo
14	Flute
15	Soprano Sax
16	Cbassinet

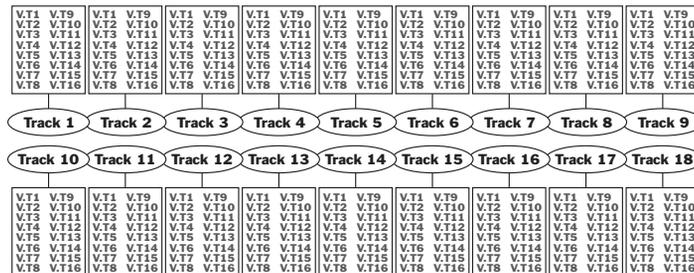
You can select which of its 16 V-Tracks each track will play at any given time. We'll describe how to do this on Page 149.



When you record or play a V-Track, the settings of the corresponding track channel determine what it sounds like. Track 1's currently selected V-Track is heard through Track Channel 1, Track 2's V-Track through Track Channel 2, and so on. Track channels are discussed in Chapters 10, 11 and 14.

## The Power of V-Tracks

Although the VS-2000 is an 18-track studio, in a very real sense it's way more than that. Since each of its 18 tracks can play any of 16 V-Tracks, a project can actually hold as many as 288 recordings from which you can choose 18 for playback at any given time.



As you can see, this gives you with a *huge* sonic palette to work with. You can even construct totally different versions of a project from its massive collection of V-Tracks.

## Track Editing Basics



During editing operations, the word “track” serves as a shorthand for the currently selected V-Track. When we say we’re editing a track, what we literally mean is that we’re editing the audio on the track’s currently selected V-Track.

The following sections provide just a brief introduction to the editing of tracks in the VS-2000. We’ll discuss it in detail beginning in Chapter 18, which starts on Page 235.

There are two basic ways you can edit the contents of a track:

- You can work with phrases (Page 95).
- You can work on a specific time “region” within a track.

### About Editing Phrases

Phrase editing is the quickest way to work with a track’s audio, since it works with pre-defined chunks of the track. You can perform a range of operations on a phrase—these are detailed in Chapter 19.

You may also find it handy to manually divide the phrases on a V-Track into new convenient, easy-to-work-with chunks. Though this can take a little time, it can save you a *lot* of time later on in the editing process:

- If you’re working on a song, and think you’ll be moving a track’s sections around, you can turn each section into a phrase. This’ll let you simply grab the desired phrase when it’s time to assemble the track.
- If you’re working with sound effects, you can turn each one into a separate phrase, making the positioning of your elements quick and easy.



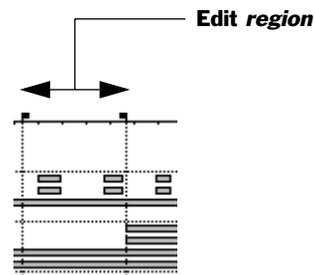
The phrase DIVIDE operation can automatically separate your audio into separate phrases, as described on Page 260.

### About Editing Regions

A region is a selected time range within a track. You define the region you want to edit by placing two “edit points”:

- IN—The position of the IN marker determines the beginning of the section you want to edit. This location is called the “IN point.”
- OUT—The position of the OUT marker determines the end of the section you want to edit. This location is called the “OUT point.”

The region is the portion of the track that occurs after the IN point and before the OUT point. It can contain data from one or more phrases, and can also contain silence.



Chapter 18 describes how to set IN and OUT points for track editing, as well as two other very important editing points, FROM and TO. See Page 236.

Chapter 20, beginning on Page 263, describes region editing operations.

# 7—Project and Drive Operations

This chapter describes the various project- and hard drive-related activities you can perform from the VS-2000's PROJECT menu screens. Most everything that has to do with an entire project can be found on this menu.



You can quickly save the latest changes you've made to the currently loaded project by holding down SHIFT and pressing ZERO•STORE. We recommend you do this often.

## Navigating the PROJECT Menu Screens

1. Hold down SHIFT and press F1 (PROJ).



2. The VS-2000 scans your hard drive and CD-RW drive. When it's done, the first PROJECT menu screen appears.

**Currently selected drive**

**The project that's currently loaded in the VS-2000's memory is shown in white type on a black background in the project list.**

**The project list occupies the top of every PROJECT menu screen.**

**Tabbed layers of F Buttons**

To perform a project- or hard drive-related operation, press the operation's F button, shown on a tabbed layer at the bottom of the screen.



**If you're looking for an operation whose F button is currently hidden, press PAGE repeatedly until its F button appears.**

## Working with the PROJECT LIST

You can scroll through the items in the project list by pressing ▼ or ▲.



As noted in "How a VS-2000 Hard Drive Organizes Data" on Page 93, each hard drive partition is called a "drive."

The project list shows all your available drives. Your internal drives are labeled as "IDE:(partition number)." As shipped from the factory, these partitions are IDE:0, IDE:1, IDE:2 and IDE:3. Your CD-R/RW drive is shown as "ATAPI."



If you encounter error messages when working with your CD-R/RW drive, check Page 368 or the *VS-2000 Appendices* to learn what the messages mean.

In the project list, you can also see all of the projects on the currently selected drive. The VS-2000 provides information about each project.

Write-protect status	Name	Sample rate	Recording mode	Size	Creation date and time	Type of project
□ [CU WANNA PLAY]		44.1k	M16	468MB	10/23/2003 11:16	(VS-2000)

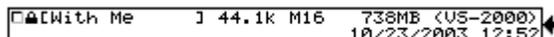


We'll discuss write-protection, project sample rates and recording modes later on in this chapter.

### Selecting an Item in the Project List

To select a project or drive shown in the project list:

1. Press  $\blacktriangledown$  or  $\blacktriangle$  or turn the Time/Value dial until the desired item is outlined.



When an item is outlined and has an arrow pointing to it from the right, it's selected.

### To Display the Projects on a Drive

1. Select the drive. When a drive is selected, the LIST button appears in the screen's lower-right-hand corner.
2. Press LIST—the VS-2000 displays a list of the projects on the drive.



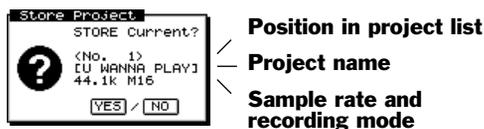
**PROJECT menu**  
**F6 (LIST)**



To view the contents of an audio CD, see “The CD Player Feature” on Page 368.

## About “Store Current?” Messages

During the course of most PROJECT menu operations, the VS-2000 asks you:



The VS-2000 displays this message when an operation needs to temporarily borrow the part of the VS-2000's memory that holds the currently loaded project—after the operation is complete, the VS-2000 re-loads the project from your hard drive. If you've made any changes to the project since you last stored it, press ENTER/YES in response to this message to ensure that those changes aren't lost.



If a project is write-protected (Page 104), this message doesn't appear, since the project is locked to prevent the making of any changes to it.

## Project Operations

### About F6 (MARK)

Before you can perform some of the project operations, you have to target the project on which you want to perform the operation. You do this by marking the project.



**PROJECT menu  
F6 (MARK)**

#### Marking a Project

1. Press  $\blacktriangledown$  or  $\blacktriangle$  or turn the Time/Value dial to select the project.
2. Press F6 (MARK) to place a checkmark to the left of the project's name, thus targeting it.



F6 (MARK) is available only when a project, not a drive, is selected.

### SELECT

Press SELECT to load the project that's currently highlighted in the project list. When it's loaded, it replaces the project that's currently stored in the VS-2000's onboard memory. You can play, record, edit and mix a project only while it's loaded into the VS-2000.



**PROJECT menu  
F1 (SELECT)**

The SELECT button doesn't look quite like any other VS-2000 menu button, and it acts differently, too. It's the only button that performs its action as soon as you press it. All of the other buttons merely display the corresponding operation's screens.



To load a project from another drive, select the drive and press F6 (LIST), as described in "To Display the Projects on a Drive" on Page 100.

#### Loading a Project

1. Hold down SHIFT and press F1 (PROJECT).
2. If "SELECT" isn't visible above F1, press PAGE until it is.
3. In the project list, select the project you want to load.
4. Press F1 (SELECT). The VS-2000 displays:



5. Press ENTER/YES to load the selected project, or EXIT/NO to cancel the operation. If you pressed ENTER/YES, the VS-2000 asks:



If the currently loaded project is write-protected (Page 104), the VS-2000 loads the new project without displaying this question.

6. Press ENTER/YES to store your latest changes to the currently loaded project before loading the new one, or EXIT/NO to skip re-saving it. The VS-2000 loads the selected project into its memory.

**NEW****Setting the Project Recording Mode**

When you create a project, you select the project's bit depth by setting the Recording Mode parameter. Once set, the project's recording mode cannot be changed later.



The *VS-2000 Owner's Manual* assumes that your projects use the 16-bit recording mode, except as noted.

Audio captured by a digital recorder such as the VS-2000 is translated into a series of number strings for storage on your hard drive. "Numbers" equals "digits"; hence "digital recording." On the VS-2000, each number string can be comprised of 16 digits, or 24. Each of these digits is called a "bit," so the technical way of saying this is that the VS-2000 can record with either a 16-bit or 24-bit "resolution" or "bit depth." The more bits a recorder uses, the more accurately the sonic details in the original sound are captured.

The VS-2000 defaults to recording at a 16-bit resolution—M16 mode—since this is the resolution used by audio CDs. For most VS-2000 users, this is the perfect bit depth: it matches CDs and allows the use of all 18 of the VS-2000's tracks. You can choose to record a project at 24 bits—M24 mode—if you don't need as many tracks and you're going to be transferring its audio to a DVD or other 24-bit medium.

<i>Recording mode:</i>	<i>Playback tracks:</i>	<i>Tracks you can record at once:</i>
M16 (16 bit)	18	8
M24 (24 bit)	12	8

Another advantage of 16-bit recording is that it gives you more recording time on a partition. This chart shows the number of minutes you'd get when recording a single track in a single partition. The available time depends on the selected sample rate.

<i>Recording mode:</i>	<i>Number of minutes in one partition:</i>
M16	2,152
M24	1,433

**About The VS-2000's Sample Rate**

All digital recorders record audio by creating a numerical representation of the audio at a particular moment in time—this numerical representation is called a "sample." By creating samples many thousands of times per second—and playing them back just as quickly—the illusion is created of a single stream of continuous audio. In fact, what you're hearing is really a series of separate samples. Since audio is constantly changing, the more samples a recording device makes per second, the greater its chances are of faithfully capturing and reproducing its sound.

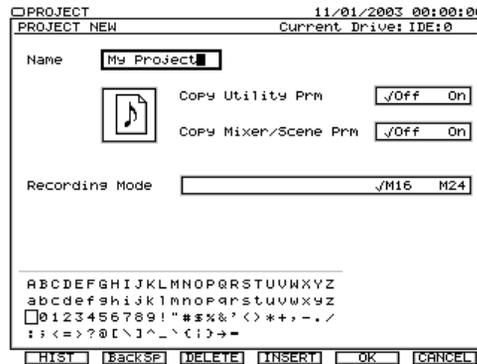
The number of times per second that a digital recorder samples audio is called its "sample rate." The VS-2000 records audio at a sample rate of 44,100 samples per second, or "44.1 kHz." This is also the sample rate used by all audio CDs.

## Creating a New Project

1. Hold down SHIFT and press F1 (PROJECT).
2. If “NEW” isn’t visible above F2, press PAGE until it is.
3. Press F2 (NEW)—the PROJECT NEW screen appears.



**PROJECT menu  
F2 (NEW)**



4. Set the Copy System Prm parameter to:
  - *Off*—to create a new project with default UTILITY menu parameter values (UTILITY menu parameters are described in Chapter 28).
  - *On*—to copy the current project-related UTILITY parameter values into the new project.
5. Set the Copy Mixer/Scene Prm parameter to:
  - *Off*—to create a new project with default mixer settings and no scenes.
  - *On*—to copy the mixer settings and scenes from the currently loaded project into the new project.



Since scenes remember effect patch edits, copying scenes lets you move effect settings from the current project into the new one you’re creating.

6. Select the desired recording mode (Page 102).
7. Name the new project.



You can re-name the project later on—and add a comment, if you like—using the project NAME operation (see Page 103).

8. Press F5 (OK). The VS-2000 displays:



9. To proceed, press ENTER/YES, or press EXIT/NO to cancel the operation. The VS-2000 asks if you want to store the current project before creating and loading the new one.
10. Press ENTER/YES to save any changes you’ve made to the currently loaded project, or press EXIT/NO to create and load the new project without saving the old one.

## NAME

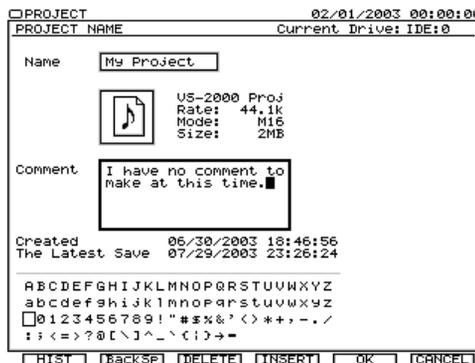
You can re-name the currently loaded project. On the PROJECT NAME screen, you can also enter a comment about the project and view assorted project information.

### Re-Naming a Project

1. Hold down SHIFT and press F1 (PROJECT).
2. If "NAME" isn't visible above F3, press PAGE until it is.
3. Press F3 (NAME)—the PROJECT NAME screen appears.



**PROJECT menu  
F3 (NAME)**



4. Enter the desired name as described in "Naming" on Page 74.

### Entering a Project Comment

1. On the PROJECT NAME screen, select the Comment box and enter the desired comment the same way you'd enter a name.

## PROTECT

You can lock a project on your hard drive to protect its data from being accidentally overwritten, and to prevent accidental erasure of the project. This is called "write-protecting" a project. You can also unlock a project using the same procedure.



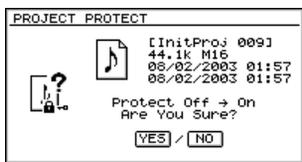
**PROJECT menu  
F4 (PROTEC)**

### Locking and Un-Locking a Project on Your Hard Drive

1. Hold down SHIFT and press F1 (PROJECT).
2. If "PROTEC" isn't visible above F4, press PAGE until it is.
3. Select the desired project.
4. Press F4 (PROTEC). Depending on whether the project is currently locked or not, the VS-2000 asks if you're sure you want to:

These symbols tell you if a project's:

- Locked**
- Unlocked**



...lock the project...

or



...unlock the project.

5. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.

## OPTIMIZE

As described in “UNDO and REDO” on Page 72, the VS-2000 retains all of your recorded data so that you can undo up to 999 of your most recent actions. A project can grow quite large with audio you don’t plan to use.

You can “optimize” a project, deleting from your hard drive all data not currently on a project V-Track. In some cases, this can lead to the recovery of large amounts of drive space. A lean project is also faster to back up, and requires less CD-R/RW disk space.

After you’ve optimized a project, you can no longer undo actions performed prior to the optimization procedure. Your Undo levels start over again back at Level 1 with the first action taken after the optimization.



You can’t use Undo to reverse an optimization procedure.



Optimization on the VS-2000 is not the same as optimization on a computer. On the VS-2000, optimization doesn’t defrag your drive (Page 116)—it deletes unwanted files.



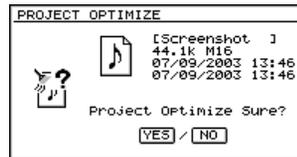
Optimize deletes only unused audio in the selected project. It doesn’t affect any audio on any of your V-Tracks, whether the V-Tracks are currently selected or not.

### Optimizing a Project

1. Load the project you want to optimize.
2. Hold down SHIFT and press F1 (PROJECT).
3. If “OPTIMZ” isn’t visible above F5, press PAGE until it is.
4. Select the desired project.
5. Press F6 (MARK) to place a checkmark to the left of the project’s name, targeting it for optimization.
6. Press F5 (OPTIMZ). The VS-2000 asks:

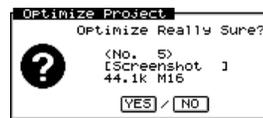


**PROJECT menu  
F5 (OPTIMZ)**



7. If you’re sure you want to proceed, press ENTER/YES, or press EXIT/NO to cancel optimization of the displayed project.

Since you’re about to permanently delete audio data, the VS-2000 asks again:



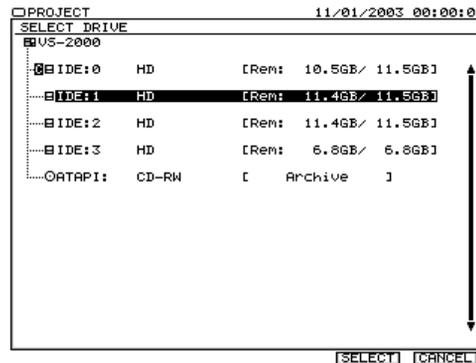
8. Press ENTER/YES to optimize the current project, or EXIT/NO to cancel.

## Destination Drive Selection

When you’re moving project data from one place to another—when you’re copying, backing up or exporting project data—you can select the desired destination drive before beginning the operation, as noted in the procedures described later in this chapter. In addition, you’ll see F4 (SelDrv) at the bottom of the operation’s main screen in case you change your mind later and want to select a new destination drive.

### Selecting a New Destination Drive

1. Press F4 (SelDrv) to display the SELECT DRIVE screen.



2. Use ▼ or ▲ or the Time/Value dial to highlight the desired drive.
3. Press F5 (OK) to select the drive and return to the project operation's screen.

## COPY

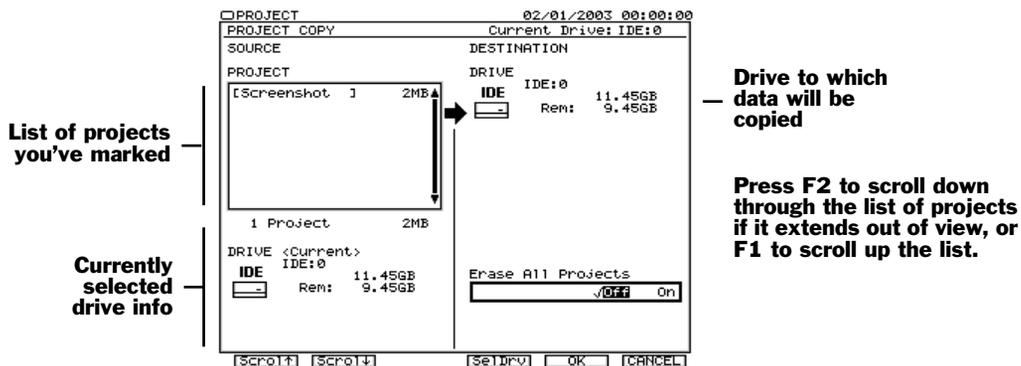
Use the PROJECT menu's COPY operation to make a copy of a project. You can store the copy in the project's current drive or in another one, providing the destination drive has enough free space. This can be handy when you want to have a safety copy of a project while you work on the original. It can also be useful if you need to create multiple versions of a project based on the same original work. Finally, it can be helpful if you're having problems backing up a project.

### Copying a Project

1. Hold down SHIFT and press F1 (PROJECT).
2. Select and mark the project(s) you want to copy.
3. If "COPY" isn't visible above F1, press PAGE until it is.
4. Mark the project(s) you want to copy.
5. Turn the Time/Value dial to select the drive to which you want to copy the marked project(s).
6. Press F1 (COPY)—the PROJECT COPY screen appears.



**PROJECT menu  
F1 (COPY)**



You can wipe the destination drive clean before copying your data to it.

7. Set Erase all Projects to:
  - *Off*—if you want to add what you're copying to the list of projects already on the destination drive.
  - *On*—if you want to clear the drive so it contains only what you're copying.

- Press F5 (OK)—the VS-2000 asks:



- Press ENTER/YES to proceed, or EXIT/NO to cancel the COPY operation. If you pressed ENTER/YES, the VS-2000 asks if you want to store any changes you've made to the currently loaded project before beginning the COPY process.
- Press ENTER/YES to save your most recent changes to the currently loaded project before copying the marked project(s), or EXIT/NO to simply begin copying.
- If Erase all Projects is on, the VS-2000 asks if you're sure you want to erase the destination drive first—press ENTER/YES to do so, or EXIT/NO to cancel copying.

## ERASE

You might want to erase a project from your hard drive to gain back free drive space, when you've copied it to another drive, or when you simply no longer want to project.



The project ERASE command permanently erases a project from your hard drive. This operation cannot be reversed using the VS-2000's Undo feature, so perform it with care.

### Erasing a Project

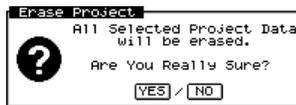
- Hold down SHIFT and press F1 (PROJECT).
- Select and mark the project—or projects—you want to erase.
- If "ERASE" isn't visible above F2, press PAGE until it is.
- Press F2 (ERASE)—the VS-2000 asks:



**PROJECT menu  
F2 (ERASE)**



- If you're sure you want to delete the marked project(s) from your hard drive, press ENTER/YES. If not, press EXIT/NO.
- Since ERASE is irreversible, the VS-2000 asks again:



- To erase the marked project(s), press ENTER/YES, or press EXIT/NO to cancel.

## SPLIT

SPLIT creates a new project from selected V-Tracks, removing them from the currently loaded project. The new project inherits the original project's settings, including markers, locators, Automix data, the tempo map and sync track, project-related UTILITY menu settings and its name, with a distinguishing last character added. The new project is stored on the same drive as the original project.

Project SPLIT can be handy if you've got a large project with lots of V-Tracks you're not using but don't want to erase. You can split out these V-Tracks to a new project, making the original project smaller and easier to back up.



SPLIT cannot be reversed using the VS-2000's Undo feature—V-Tracks removed from a project can returned to it only by using the region IMPORT feature. See Page 269.



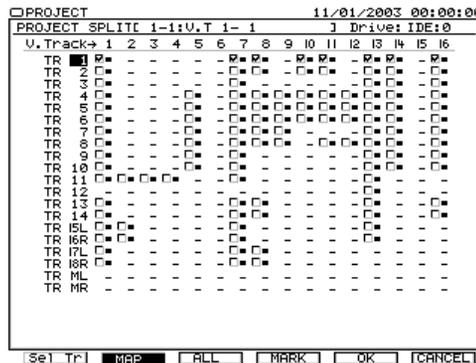
Project SPLIT uses very little additional space on your hard drive since it's essentially moving data from the original project to the new one, not creating new data.

### Splitting a Project

1. Load the project you want to split (Page 101).
2. Hold down SHIFT and press F1 (PROJECT).
3. If "SPLIT" isn't visible above F3, press PAGE until it is.
4. Press F3 (SPLIT)—the VS-2000 first SPLIT screen appears.



**PROJECT menu  
F3 (SPLIT)**



You can mark V-Tracks on SPLIT's V-Track MAP screen—shown above—or on its Select Track screen. You can mark as many V-Tracks as you want on either screen. In the map of the project's V-Tracks, any V-Track that contains data appears as a small black box with a checkbox to its left.

5. To select a V-Track, cursor to it and press F4 (MARK) to check its checkbox; to unselect it, press F4 (MARK) again. You can select and unselect all of the V-Tracks in the map at once by repeatedly pressing F3 (ALL).



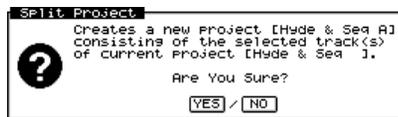
To quickly select or unselect one track's entire set of V-Tracks, cursor all the way to the left so that the track's name is highlighted and press F4 (MARK).

6. If you prefer to work on the Select Track screen, press F1 (SelTrk).
7. To select a V-Track for export on the Select Track screen, turn the Time/Value dial to highlight the V-Track and press F4 (MARK) to place a checkmark next it.



Hold down SHIFT as you turn the Time/Value dial to jump between same-numbered V-Tracks on different tracks.

8. When you've selected all of the desired V-Tracks, press F5 (OK). The VS-2000 asks:



9. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.
10. If you pressed ENTER/YES, the VS-2000 asks if you want to save recent changes to the currently loaded project before proceeding.
11. Press ENTER/YES to save the project's recent changes before performing the split, or EXIT/NO to skip directly to splitting the project.

## COMBINE

Project COMBINE—as its name suggests—allows you to append a project from your hard drive onto the end of the currently loaded project. You can use COMBINE to collect, one-by-one, individual projects into one large project. You might want to, for example, do this when assembling the songs for an album if each song has been recorded as a separate project—see “Multi-Project Compilation CDs” on Page 357.



Only projects that share the same recording mode can be combined. In case you combine projects, you need to select two different projects.

### How COMBINE Works

- The project that's added to the end of the currently loaded project is placed four seconds after the end of the current project's last audio.
- A new marker is automatically placed at the start of the newly appended material.
- The appended project's track and V-Track assignments are preserved in the new combined project.
- The appended project is no longer on your hard drive as a separate project since its data is now part of the new combined project.



Some aspects of appended project are not carried over into the currently loaded project, such as markers, locators, Automix data, the tempo map and sync track, and project-related UTILITY menu settings.

### Combining Two Projects

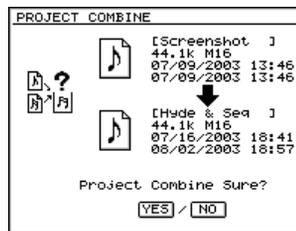


Since COMBINE alters both projects, we recommend you back both of them up before performing the COMBINE operation.

1. Load the project you want to use as the basis for the final project.
2. Hold down SHIFT and press F1 (PROJECT).
3. Select the project you want to add to the end of the loaded project.
4. If “COMBIN” isn't visible above F4, press PAGE until it is.
5. Press F4 (COMBIN)—the VS-2000 asks:



**PROJECT menu  
F4 (COMBIN)**



6. Press ENTER/YES to proceed with the combining of the two projects, or press EXIT/NO to cancel the operation.
7. If you pressed ENTER/YES, the VS-2000 asks again if you're really sure:



8. Press ENTER/YES to proceed, or EXIT/NO to cancel—the VS-2000 asks if you want to save any changes you've made to the currently loaded project before proceeding.
9. Press ENTER/YES to store the current project's changes, or press EXIT/NO to skip directly to the combining of the two projects.

## BACKUP

We strongly recommend that you back up your projects regularly. When you back up a project, you make a copy of it on a CD-R or CD-RW, and store the backup in a safe, separate place. Though your VS-2000 is an extremely reliable device, unexpected events—including power outages and worse—*can* occur during its operation. The only way to guarantee that your work remains safe is to back it up.

You can re-load a project backup at any time by performing a RECOVER operation—see Page 111.

### Backing Up a Project

1. Insert the desired CD-R or CD-RW into your CD-R/RW drive.



The BACKUP operation re-formats the destination media for backup use. The media, therefore, doesn't need to be formatted ahead of time.

2. Hold down SHIFT and press F1 (PROJ).
3. Mark the project(s) you want to back up.
4. If "BACKUP" isn't visible above F1, press PAGE until it is.
5. Press F1 (BACKUP)—the PROJECT BACKUP screen appears.



**PROJECT menu  
F1 (BACKUP)**

**List of projects you've marked** — points to the project list box.

**Currently selected drive info** — points to the drive information section.

**Drive to which data will be backed up** — points to the 'DRIVE' field showing 'CD-RW drive'.

**Press F2 to scroll down through the list of projects if it extends out of view, or F1 (Scroll) to scroll up through the list.** — points to the scroll buttons at the bottom of the screen.

6. Select whether or not you'd like the VS-2000 to verify the accuracy of your backup once it's been written on the CD. While this causes the backup to take a bit longer, we recommend turning Verify on to make absolutely sure your project data's been correctly backed up.
7. We recommend trying the MAX setting that uses your drive's fastest supported speed. If you experience any problems, try a lower speed.
8. Press F5 (OK).  
The VS-2000 asks if you want to save any recent changes to the currently loaded project before proceeding with the backup.
9. Press ENTER/YES to save your currently loaded project before proceeding with the backup, or EXIT/NO to skip straight to the backup.  
If you're using a CD-RW disc that already contains data, the VS-2000 asks if you want to erase the disk. For details on the messages that may appear, see Page 368.
10. Press ENTER/YES to erase the CD-RW, or EXIT/NO to cancel the backup.  
If a project is too large to fit on the medium you're using, the VS-2000 asks you for additional media as needed.



During a multi-CD backup, the VS-2000 asks for each disk twice: once to label the disk, and once to actually write data on the disk.

11. Insert the requested media and press ENTER/YES, or press EXIT/NO to abort the procedure.
12. If you're backing up multiple projects, the VS-2000 backs up each one in turn.



Project backup data cannot be played as is. To play the project, use project RECOVER to restore the project to your hard drive in playable form.

## RECOVER

To re-load VS-2000 project backup data, use the RECOVER operation. When you recover a project, the project is restored to your internal hard drive in its original state.



RECOVER is available only when the selected drive contains project backup data.

### Recovering Backup Data

1. Hold down SHIFT and press F1 (PROJECT).
2. Insert the CD containing the backup into your CD-R/RW drive.

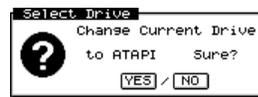


**PROJECT menu  
F2 (Recover)**



If the project is backed up on more than one disk, insert the first disk containing backup data.

3. Select the drive containing the project backup data.
4. Press F6 (LIST) to view the drive's contents. The VS-2000 displays:



**New drive's name**

5. Press ENTER/YES to continue, or EXIT/NO to cancel the drive change.
6. Mark the project(s) you want to recover.
7. Turn the Time/Value dial to select the drive to which you want to recover the marked backup data.
8. If "Recover" isn't visible above F2, press PAGE until it is.
9. Press F2 (Recover)—the PROJECT RECOVER screen appears.

**List of project backup data you've marked**

PROJECT		DESTINATION	
SOURCE	DRIVE	IDE	IDE:0
[InitProj 001] 2MB	IDE	IDE:0	11.45GB
[U Wanna Play] 598MB	Rem:		10.81GB
2 Projects 600MB			

DRIVE: CD-RW drive

CD Speed: [MAX]

Erase All Projects: [Off] On

Buttons: [Scroll+] [Scroll-] [SetDrv] [OK] [CANCEL]

**Drive to which data will be recovered**

**Press F2 to scroll down through the list of project backup data if it extends out of view, or F1 (Scrol) to scroll up through the list.**

10. Set Erase all Projects to:
  - *Off*—if you want to add the project(s) you're recovering to the list of projects already on the destination drive.
  - *On*—if you want to clear the drive so it contains only your recovered projects.
11. Set the desired CD drive speed. Try MAX. If you experience problems recovering the data, try a lower speed.
12. Press F5 (OK). The VS-2000 asks if you want to save the currently loaded project.
13. Press ENTER/YES to save the loaded project before the recovery operation, or press EXIT/NO to go straight to recovery.

The VS-2000 asks if you're sure you want to proceed with the recovery.

14. Press ENTER/YES to continue the recovery, or EXIT/NO to cancel.
15. If Erase All Projects is on, the VS-2000 asks if you're sure you want to erase the destination drive first—press ENTER/YES to do so, or EXIT/NO to cancel recovery.
16. If the backup is larger than a single disk, the VS-2000 asks for additional disks as needed. Insert each requested disk in your drive and press ENTER/YES to proceed.

## IMPORT

You can use project IMPORT to restore song backup and archive data from the:

- VS-880/880EX
- VS-890
- VSR-880
- VS-1680
- VS-1880/1824/1824CD
- VS-2400CD/2480/2480CD

When you import a song from an earlier V-Studio, the VS-2000 converts it into a VS-2000 project. You can recover backed-up song data from a CD. After the VS-2000 imports the song, it's loaded as the current project. If you're importing multiple songs, the last song the VS-2000 imports becomes the current project..



See "V-Studio Song/VS-2000 Project Compatibility" on Page 410 for details on how other V-Studios' songs are transformed into VS-2000 projects.



Tempo map is not importable.



You can't import songs from the VS-1680 or VS-1880 by installing their internal hard drives in the VS-2000. The VS-2000 utilizes a different type of drive format.



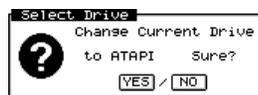
To import a VS-840 song, use the VS-840's Song Convert operation to convert it first into VS-880 format, and then import the song into the VS-2000. Only the song's audio and track assignments are imported—all other settings must be recreated manually.

### Importing a Song from an Earlier V-Studio

1. Insert the CD containing the backed-up song data into your CD-R/RW drive.
2. Hold down SHIFT and press F1.
3. Select the device containing the song data.
4. Press F6 (LIST). The VS-2000 displays:



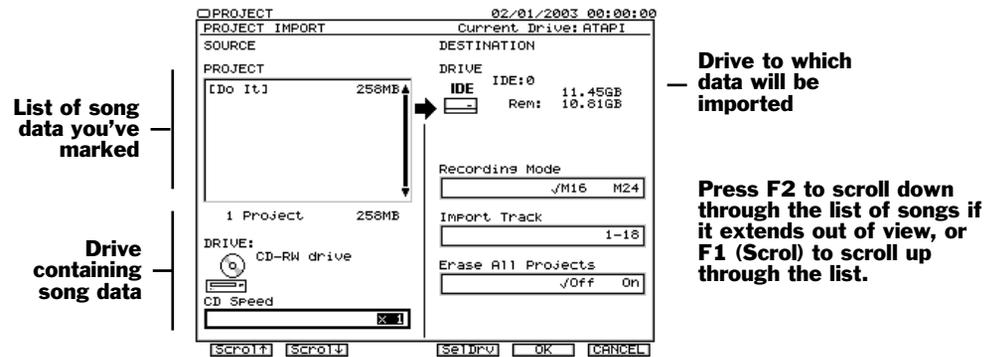
**PROJECT menu**  
**F3 (IMPORT)**



— **New drive's name**

5. Press ENTER/YES to change drives, or EXIT/NO to cancel the drive change.
6. Mark the song(s) you want to import.
7. Select the drive to which you want to import the song.
8. If "IMPORT" isn't visible above F3, press PAGE until it is.

9. Press F3 (IMPORT)—the PROJECT IMPORT screen appears.



10. Select the desired Recording Mode (Page 102) for the imported song.
11. If the song has more than 18 tracks, the Import Track parameter allows you to select the set of tracks you'd like to import.
12. Set Erase All Projects as desired. You can select:
  - *Off*—to add the imported song to projects already on the selected partition.
  - *On*—to wipe all other projects from the selected partition during importing.
13. Set CD Speed to the maximum setting. If the import fails, lower the speed.
14. Press F5 (OK) to import the marked songs—the VS-2000 asks if you're sure.
15. Press ENTER/YES to start importing, or EXIT/NO to cancel the operation. The VS-2000 imports the selected song data. Depending on the amount of data, and the amount of conversion required, this can take a while.

## EXPORT

You can export the current project from the VS-2000 so that it can be played on the:

- VS-880/880EX
- VS-890
- VSR-880
- VS-1680
- VS-1880/1824/1824CD
- VS-2400CD/2480/2480CD



The VS-2000 won't export a project directly to the VS-840's data format. You can export a project as VS-880 data, and use the VS-840's Song Convert feature to load the data.

### How Export Works

This section describes how the currently loaded VS-2000 project is translated for export to the various V-Studios. In all cases, when you export a VS-2000 project, the newly created song uses the project's sample rate and recording mode.



There is a limitation of playback track on other VS series products. It is necessary to copy or move tracks on VS where the sound data is exported.



The VS-2000's M16 recording mode is the same as the MAS mode in the VS-880, VS-880EX, VSR-880, VS-890, VS-1680 and VS-1880. The VS-2000's M16 recording mode is identical to the M16 mode in the VS-2400CD and VS-2480/2480CD.



Currently selected the tempo map will be exported.

You can export a project to CD-R/RW as a song archive for earlier V-Studios and as a backup for the VS-2400CD/2480/VS-2480CD.

### Exporting to a VS-880 or VS-880EX

- Eight project tracks are exported. You can select Tracks 1-8, 9-16 or 17-18.
- Only V-Tracks 1-8 are exported to VS-880 songs—to export data on V-Tracks 9-16, copy the data to V-Tracks 1-8. In VS-880EX songs, the VS-2000's V-Tracks 1-8 are exported to Bank A, and V-Tracks 9-16 to Bank B.
- Only the project's Locators 00-31 are exported.
- M24 Projects can't be exported as VS-880 or VS-880EX songs.

### Exporting to a VS-890 or VSR-880

- Eight project tracks are exported. You can select Tracks 1-8, 9-16 or 17-18.
- V-Tracks 1-8 are exported to Bank A, and V-Tracks 9-16 to Bank B.
- M24 projects can't be exported as VS-890 or VSR-880 songs.

### Exporting to a VS-1680

- 16 project tracks are exported. You can select Tracks 1-16 or 17-18.
- Only the project's Locators 00-63 are exported.
- Projects that use the M24 recording mode can't be exported as VS-1680 songs, nor can projects that contain CDR mastering tracks—see Page 356.

### Exporting to a VS-1880/1824/1824CD

- All 18 project tracks are exported.
- Only the project's Locators 00-63 are exported.
- Projects that use the M24 recording mode can't be exported as VS-1880 songs.

### Exporting to a VS-2400CD

- Rhythm Track and Harmony data is not included when a VS-2000 project is exported to a VS-2400CD project.

### Exporting to a VS-2480/2480CD

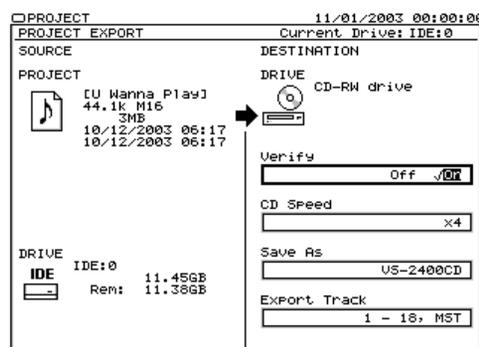
- Rhythm Track and Harmony data is not included when a VS-2000 project is exported to a VS-2480/2480CD project.
- RSS PAN settings and V-Link Automix data are discarded when a VS-2000 project is exported as a VS-2480/2480CD project.

## Exporting a VS-2000 Project

1. Load the desired project into the VS-2000.
2. Hold down SHIFT and press F1.
3. If "EXPORT" isn't visible above F4, press PAGE until it is.
4. Press F4 (EXPORT). The PROJECT EXPORT screen appears.



**PROJECT menu  
F4 (EXPORT)**



5. Set the Verify and CD Speed parameters:
  - Verify's setting determines whether or not the VS-2000 double-checks the accuracy of the data it writes on your CD. Turning Verify on is always the safest method, though it does cause the export to take a little longer.
  - CD Speed—sets the speed at which the exported data is written to the CD. Try the MAX setting to make the EXPORT process faster. If you experience problems, try a slower setting.
6. Set the Save As parameter to select the type of V-Studio data the VS-2000 exports.
7. Export Track determines which of the project's tracks are exported.
8. Press F5 (OK). The VS-2000 asks if you want to save any recent changes you've made to the current project before proceeding.
9. Press ENTER/YES to save any recent changes, or EXIT/NO to skip to exporting. If you're using a CD-RW disc that already contains data, the VS-2000 asks if you want to erase the disk. For details on the messages that may appear, see Page 368.
10. If a project is too large to fit on the medium you're using, the VS-2000 asks you for additional media as needed. Insert the requested media and press ENTER/YES, or press EXIT/NO to abort the procedure.



During a multi-CD export operation, the VS-2000 asks for each disk twice: once to label the disk, and once to actually write data on the disk.

## Drive Operations



A reminder: each disk drive partition appears in the VS-2000's project list as a separate drive. As we noted in Chapter 6, when we refer to a "drive," we mean a partition. When we refer to an entire hard drive mechanism, we call it a "hard drive." This distinction is *very* important to remember in the following sections.

Before proceeding with the PROJECT menu's hard drive- and drive-related operations, here's some information about keeping your hard drive operating at its best.

### Disk Maintenance

As with any piece of sophisticated electronic equipment, your hard drive requires a bit of maintenance from time to time in order to perform at its best.

When you shut down the VS-2000 correctly (Page 85)—instead of just switching it off—you're performing simple everyday maintenance, letting the VS-2000 properly conclude disk operations, storing your latest work safely on the currently selected drive before shutting down.

In addition, you'll want to make sure your hard drive doesn't begin to show signs of "fragmentation," which can slow down the VS-2000 and cause other problems.

### Fragmentation

#### ***What Is Fragmentation?***

When a hard drive has first been set up and has lots of free space, your VS-2000 can write each file's data in one single, continuous area of the hard drive. When the file is played back, the VS-2000 only has to look in one place to find all the necessary data.

When a hard drive has been in use for a while, however, the empty spaces for writing new data become smaller and smaller. This occurs for a few reasons:

- There's simply less free space.
- New data for each project may be written far away from the rest of the project data when you've got several projects taking up space on the hard drive.
- When you optimize a project (Page 105) to free up disk space, small chunks of unwanted data are discarded, leaving small areas of free space.

When the VS-2000 stores new files, it squeezes them into any bits of space it can find. As a result, the data winds up scattered all over the hard drive. When the data is stored in such little bits and pieces, the hard drive is said to be "fragmented."



**With fragmentation, little bits and pieces of a file are written all over the drive.**

When the VS-2000 plays back a file from a fragmented hard drive, it has to grab a little piece from here, another piece from there and so on. This is much harder than simply playing one continuous chunk from a single hard drive location, and it takes more time. This can slow things down unacceptably and lead to errors during playback, recording or backup.

Fragmentation is a naturally occurring process for a hard drive used with any computer or recording device. Hard drives that record audio are especially prone to fragmentation due to the stop-and-start nature of recording.

### ***How Can I Prevent Fragmentation?***

We strongly recommend you perform the following three-step procedure, in order, once a month to eliminate any fragmentation on your hard drive before it starts causing problems:

1. Back up all of the projects stored in the hard drive, as described on Page 110.
2. Perform a Format Drive operation (Page 117) with Physical Format turned on.
3. Recover your projects to the hard drive (Page 111).



When you format a hard drive, you erase all of the data on it, in all of its partitions. *Do not* format your hard drive until you've backed up every one of its projects—see "BACKUP" on Page 110.

### ***Is My Hard Drive Fragmented?***

Your hard drive may be fragmented if:

- you experience "Drive Busy!" messages.
- you hear pops and clicks when you play back a project.
- the VS-2000's transport begins to feel sluggish as you navigate a project.

### ***What Can Be Done About a Fragmented Hard Drive?***

You can de-fragment—or "defrag"—your hard drive using the same three steps we listed in "How Can I Prevent Fragmentation?"

If you have trouble backing up a project, it may be because it's just too fragmented. Perform the following actions, in order:

1. Optimize the project (Page 105).

2. After optimization, copy the project to another drive, preferably one that's less crowded with project data (Page 106).
3. Back up the copy and perform the steps in "How Can I Prevent Fragmentation?" on the previous page.



If you have trouble backing up the copied project, try lowering the CD speed.

## Format Drive

When you format a hard drive, you erase all of the information currently on it, and prepare it for use by the VS-2000. Formatting completely wipes clean all of the hard drive's partitions. You'd format a hard drive:

- after backing up all of its projects during your monthly hard drive maintenance, as described in "How Can I Prevent Fragmentation?" on Page 116.
- when you're de-fragging a hard drive after backing up all of the projects on it.



When a hard drive is formatted for use with the VS-2000, it can't be used by another device.

### **What Gets Formatted**

When you format a drive, all of its contents are erased. If the drive has multiple partitions—as your internal hard disk does—they're all wiped clean of data.

### **About Partition Sizes**



To learn about partitions, see "How a VS-2000 Hard Drive Organizes Data" on Page 93.

When you format a hard drive, you're asked to decide the size of its drives/partitions. The VS-2000 offers you four choices:

- 500MB
- 1GB
- 2GB
- 10GB



"MB" is short for megabytes, one million bytes.

We recommend you select a 10GB partition size when you format a hard drive for use with the VS-2000—a 10GB partition provides plenty of room for the VS-2000's 18-track projects. The other sizes are provided mainly for their familiarity to users of earlier V-Studios.

### **Formatting a Hard Drive**



Back up all data on the hard drive before formatting. Formatting erases all of the data on the hard drive, and the data cannot be recovered using Undo or any other method.



If you accidentally delete data, that data cannot be restored to its previous state. Roland Corporation assumes no liability concerning such loss of data.



The Format Drive operation is available only when a drive is selected.



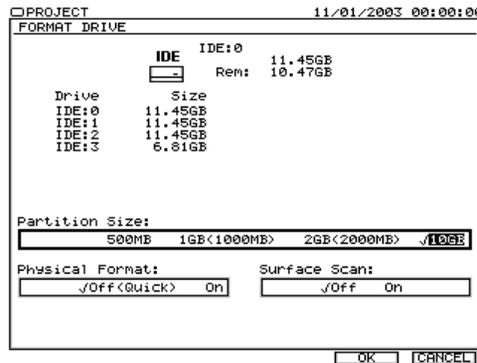
When you select a drive for formatting, you're really selecting its entire hard drive, all of whose partitions are erased during formatting.

1. Hold down SHIFT and press F1 (PROJECT).
2. Select a drive belonging to the hard drive you want to format.
3. If "FmtDrv" isn't visible above F2, press PAGE until it is.
4. Press F2 (FmtDrv)—the FORMAT DRIVE screen appears.



**PROJECT menu  
F2 (FmtDrv)**

**Information  
about the  
drive you've  
selected.**



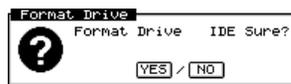
5. Select the desired partition size. We recommend 10GB.
6. Set Physical Format to:
  - *Off (Quick)*—for faster formatting if you're re-formatting a VS-2000 hard drive just to clear it quickly.
  - *On*—if the hard drive is being formatted for the VS-2000 for the first time or during your monthly maintenance. If you have time—Physical Format extends the formatting process considerably (40 minutes or more)—use Physical Format to absolutely eliminate any lingering data corruption.
7. Set Surface Scan to:
  - *Off*—to skip a check of the hard drive platters' surfaces during formatting.
  - *On*—so that it checks the surfaces of the hard drive's platters by performing an automatic read/write test after formatting. This can take a while (30 minutes or more), but it's a good thing to do periodically.
8. Press F5 (OK). The VS-2000 asks if you're sure you want to format the hard drive:

**Selected drive**



9. Press ENTER/YES to proceed with the formatting, or EXIT/NO to cancel. If you pressed ENTER/YES, the VS-2000 double-checks to make sure you want to proceed, since you're about to erase everything that's on the selected hard drive.

**Selected drive**



10. Press ENTER/YES to proceed with formatting, or EXIT/NO to cancel the operation. If you pressed ENTER/YES, the VS-2000 asks if you want to save any recent changes to the currently loaded project.
11. Press ENTER/YES to save the project, or EXIT/NO to proceed without doing so. Depending on your Physical Format and Surface Scan settings, formatting can take anywhere from a few moments to several hours.



*Do not* interrupt the formatting operation before it's finished.

## Clear Partition

You can erase, or “initialize,” the contents of a single drive—a partition—to make room for new projects. The PROJECT menu’s Clear Partition operation performs this task.



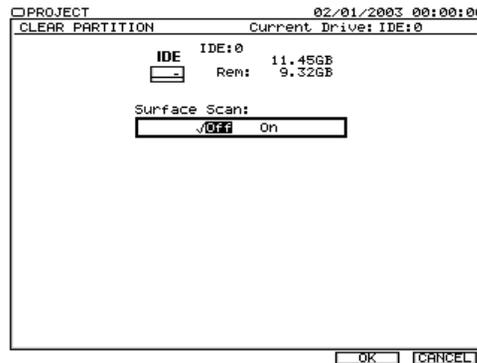
Clearing a drive has no effect on fragmentation. Only backing up your projects and re-formatting a hard drive can de-frag it.

### Clearing a Drive/Partition

1. Hold down SHIFT and press F1 (PROJECT).
2. Select the drive you wish to clear.
3. If “ClrPrt” isn’t visible above F3, press PAGE until it is.
4. Press F3 (ClrPrt)—the appears.

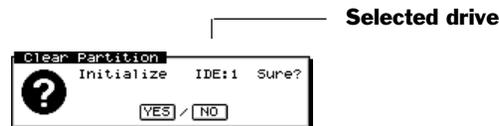


**PROJECT menu  
F3 (ClrPrt)**



**Information  
about the  
selected drive/  
partition**

5. Set Surface Scan to:
  - *Off*—to skip a check of the platter surface in the partition’s area of the hard drive during initialization.
  - *On*—so that it checks the platter surface by performing an automatic read/write test after initialization. This can take a while, but it’s a good thing to do periodically.
6. Press F5 (OK). The VS-2000 asks if you’re sure you want to clear selected drive:



7. Press ENTER/YES to clear the drive, or EXIT/NO to cancel.
 

If you pressed ENTER/YES, the VS-2000 double-checks to make sure you want to proceed, since you’re about to wipe everything on the selected drive/partition.
8. If you want to proceed, press ENTER/YES. To cancel the operation, press EXIT/NO.
9. If you pressed ENTER/YES, the VS-2000 asks if you want to save any recent changes to the currently loaded project.
10. Press ENTER/YES to save the project before clearing the drive, or EXIT/NO to proceed without doing so.

## Drive Check

If you're experiencing problems loading a project, copying it or backing it up, you can run a Drive Check operation to determine if the problem is with your data—if not, you may have a connection problem or a hardware malfunction. Drive Check examines the directory that keeps track of where your files are, and seeks out potential problems with your data. When it's done, it displays a report of its findings.

```

DRIVE CHECK Result
--No Err--
Cluster Info.      Result List
Total:             349481      System          OK
Defect:            0          Project List     OK
Used:              29443      001: [ini] Proj 001] OK
Free:              320037      Other Files     OK
X-Link Err:       0
Loose Area:       0
IllegalDIR:       0
Read Error:       0
    
```

[ENTER]

**Drive Check found no problems with this drive.**

### Understanding the Drive Check Report

The most important part of the Drive Check Report is the line at its top left that either says “No Err”—as in the illustration above—or “(x) Err,” where “x” equals the number of errors found. If Drive Check does find errors, it lists them in the report—turn the Time/Value dial to view them. Items marked with “OK” have no problems.

Here's what some of the terms in the report mean:

- *Cluster*—the smallest chunk of disk data the VS-2000 reads and writes.
- *Cross link (X-Link)*—a case in which audio from one project is mistakenly referenced by another. This may cause one project's audio to be heard during playback of another.
- *Loose Area*—a chunk of orphaned audio data not associated with any project.
- *Directories*—the list of each drive's files and where they're located on the disk. If a directory becomes confused or damaged, you may see “IllegalDIR” error messages.

<i>This:</i>	<i>Refers to:</i>
Total	Total number of clusters
Defect	Number of damaged or unusable clusters
Used	Number of clusters in use
Free	Number of clusters not yet used
X-Link Err	Number of cross links
Loose Area	Number of orphaned clusters
Illegal Dir	Number of directories with incorrect information
Read Error	Number of data-reading problems during the check

### About Drive Check's Repair Capabilities

If Disk Check finds a problem it can attempt to fix it for you by deleting the data that's causing the trouble you're experiencing. Often—once the damaged data is removed—the problems that led you to Drive Check disappear.

After Drive Check resolves a problem, we recommend backing up all of your data, re-formatting the drive and recovering the backed-up data to ensure that no lingering problems remain.



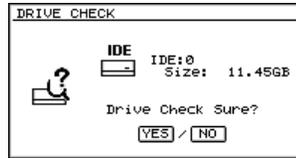
When you begin a Drive Check repair, the VS-2000 warns you that you'll lose data. The fact is that the data you'll lose is no longer any good anyway, as evidenced by the fact that you've been experiencing problems and that Drive Check has targeted the data for deletion.

### Running Drive Check

1. Hold down SHIFT and press F1 (PROJECT).
2. Select the drive you want to check.
3. If "DrvChk" isn't visible over F1, press PAGE until it is.
4. Press F1 (DrvChk). The VS-2000 asks:



**PROJECT menu**  
**F1 (DrvChk)**



— Selected drive

5. Press ENTER/YES to check the selected drive, or EXIT/NO to cancel. The VS-2000 asks if you want to save any recent changes to the current project.
6. Press ENTER/YES to save the project, or EXIT/NO to proceed to the Drive Check. The Drive Check can take a while, depending on the size of your drive.



You can cancel the Drive Check at any time by pressing EXIT/NO. Do not interrupt Drive Check by turning off the VS-2000's power.

When the check is complete, the VS-2000 displays a report of the results.

7. If errors have been found, press ENTER/YES to have Drive Check attempt to remove the cause of the problem from your drive, or press EXIT/NO to cancel Drive Check.



If you're concerned about the risks of proceeding and would like some guidance, give our Product Support team a call at 323-890-3740, x3741 from 8:30am to 5pm PST, Monday-Friday.

The VS-2000 warns you: "You'll Lose Data," but, as noted above, any data Drive Check wants to remove is probably unusable anyway.

8. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation. When Drive Check has finished its repair, it displays what it's done. Projects that've been partially altered are indicated by "Alt," and projects that have been completely deleted are shown as "Del."



# 8—The Home Screen

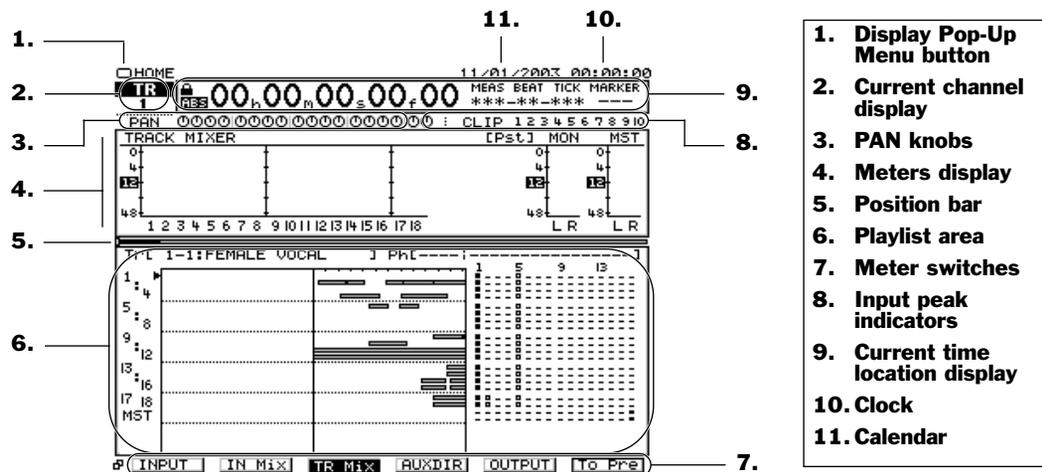
The Home screen is central to VS-2000 operations. It's one screen every VS-2000 user needs to master:

- It's the first screen you see when you power up the VS-2000.
- It provides you a comprehensive overview of the current project.
- It serves as your home base, no matter what you're doing on the VS-2000.

We call it the "Home" screen because it provides a great place to return to if you get confused navigating the VS-2000's many displays. Should this ever happen, press HOME to return to the familiar Home screen and regain your bearings.

## Elements of the Home Screen

You can change the appearance of the Home screen to suit the way you work, and for certain specific operations—we'll discuss the possibilities later in this chapter. When you first turn on the VS-2000, the Home screen contains the following elements:



Numbers 1-3 and 8-11 in the above illustration appear on a variety of VS-2000 screens. The descriptions in the following pages explain how they work.



"MST" at the bottom of the playlist stands for "mastering tracks." We'll explain mastering tracks in "About Mastering Tracks" on Page 356.

### Display Pop-Up Menu Button

Click the small rectangle in the upper left corner of the Home screen to view the Display Pop-Up menu, described on Page 71.



## Current Channel Display

**IN**  
1 or... **TR**  
1 or... **FX1**  
RTN

The current channel display shows you the name of the input, track or FX return channel that's most recently been selected for editing ("Channel Selection" on Page 139).



There's *always* an input, track, Aux master or FX return channel selected in the VS-2000, even if you've just powered up and haven't manually selected one. After power-up, Track Channel 1 is selected.



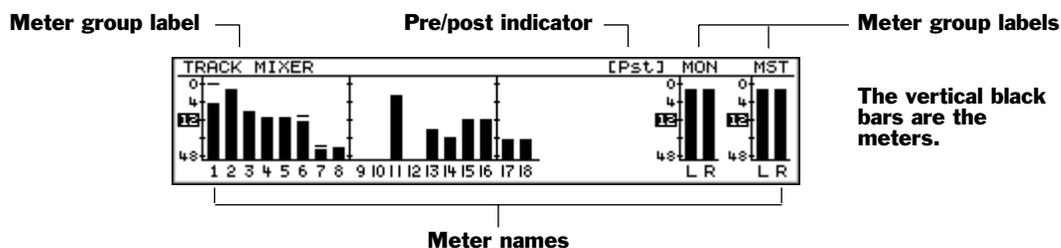
As described on Page 71, you can click on a channel's name in the current channel display to access the Channel Pop-Up menu.

## PAN Knobs

PAN ○○○○|○○○○|○○○○|○○○○|○○

The PAN knobs show the PAN settings in the MASTER mix for the track channels. You can drag any of these virtual knobs left or right to shift the corresponding channel's signal leftward or rightward, respectively.

## Meters Display



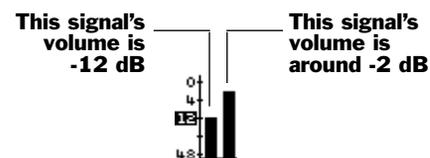
The meters display shows the levels of your signals. The meter switches at the bottom of the display select the signals to be displayed—they're described on Page 128. In the illustration above, F3 (TR Mix), for "Track Mixer," has been pressed and is currently highlighted at the bottom of the display (not shown).

The meters display often shows the meters for more than one set of signals at a time, as in the illustration above. Each group of meters is labeled—the label appears just above the meters. The numbers at the bottom of the meters display identify each meter's signal. In this illustration, the meters to the left are showing the levels of the 18 tracks. The meters to the right show the levels of the stereo MONITOR and MASTER busses.

The meters display can be replaced by the fader/pan display, described on Page 131. If the meters display isn't visible, press PAGE on the VS-2000 until the meter switches appear, and then select the desired meters' display view (Page 128).

## How the VS-2000 Meters Show Signals

Levels are shown on the VS-2000's display in a row of vertically oriented meters. Each meter's signal is shown as a thick black bar that grows taller as its signal gets louder. The 48, 12, 4 and 0 markings to the left of the meters show you how loud the signal is in dBs— -48 dB, -12 dB, -4 dB and 0 dB—as the black bar varies in height.



## How Loud Is Too Loud?

In general, you want each signal to be as loud as possible without exceeding 0 dB. 0 dB is the loudest a digital signal can get without causing clipping—see Page 59.

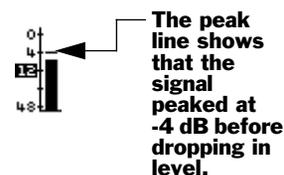
Each signal should be in the -12 dB to 0 dB range when you're setting:

- a signal's input level
- Aux bus or FX bus levels
- Direct path levels
- a track's recording level
- the overall level of a mix
- output levels



When you're mixing, the playback level of individual tracks is determined by how they sound in the mix, not by metered levels. Fortunately, if you've set each track's recording level properly, it'll be impossible to set its playback level so that it exceeds 0 dB.

To help you keep track of how loud your signals get, a peak line representing each signal's loudest level remains for a few moments in its meter after the signal's level goes back down. This lets you look from meter to meter without worrying that you've missed a too-loud signal peak.



You can set the peak lines so they "stick" at their loudest levels until you release them, to make sure you don't miss anything important—see "PEAK HOLD Sw" on Page 383.

## Pre- and Post-Fader Level Metering

You can meter the level of most any signal:

- when it's traveled through its entire channel except its final fader level control. This is called "pre-fader," or "pre" for short.
- after its level has been adjusted by its fader. This is called "post-fader," or "post."



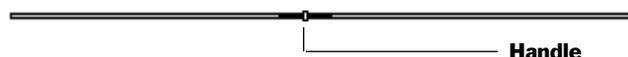
You can't meter input signals pre- or post-fader because they haven't yet traveled through an input channel. You *can* meter an input channel's signal this way, however.

The meters display's pre/post indicator shows you whether you're viewing pre-fader or post-fader signals, as shown in the illustration on Page 124. The meter switches (Page 128) include a switch that lets you select a pre- or post-fader view.



In general, you'll want to view signal levels post-fader. However, it can be helpful to view pre-fader levels when you're experiencing a problem and need to track down the precise spot in the signal's signal flow at which the problem is occurring.

## Position Bar

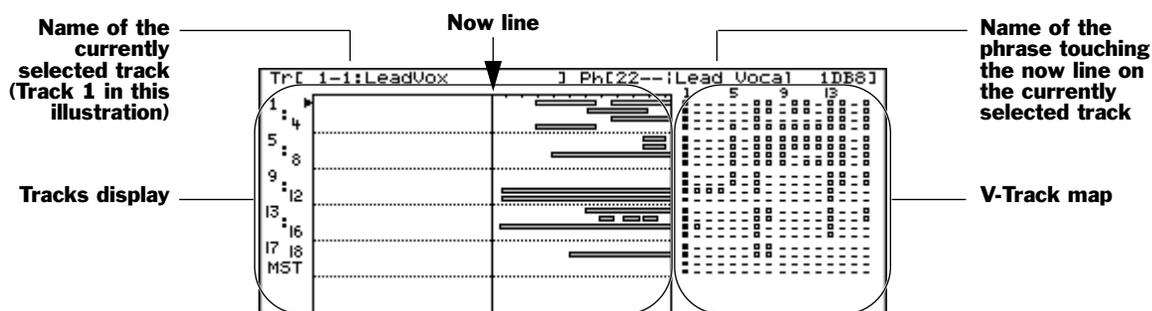


The position bar has a handle you can grab with your mouse and drag:

- rightward to move to a later time in the project.
- leftward to move to an earlier time.

The position bar's handle shows where you are in the project. The black area to either side of the handle shows the portion of the project currently displayed in the playlist.

## The Playlist



The project playlist shows you what's on a project's tracks, and is therefore central to all track editing operations. It shows you a left-to-right list of all of the phrases to be played back in a project. As a project plays, the displayed phrases move from right to left, with each phrase playing as it crosses the now line.

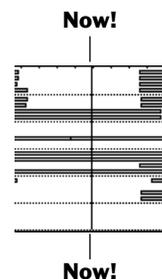


The name of the currently selected track is shown above the tracks display, and the name of the phrase on the track that's touching the now line is shown next to it.

### Now line

The now line shows your current position in a project. It's a graphic representation of the time shown in the current time location display (Page 130). The now line shows what part of the project is playing *now*. Some people call the now line the "now line."

The now line also plays a part in track phrase editing (Chapter 19). When a phrase is touching the now line, it can be selected for editing.

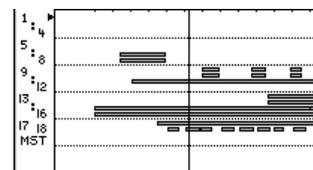


### Tracks Display

The tracks display shows two things:

- the tracks in the current project
- the phrases on the tracks

Each track in the tracks display is a list of the phrases presented from left to right in the order in which they'll play.



When you zoom out, some track numbers are shown as dots in order to fit them all on the display.

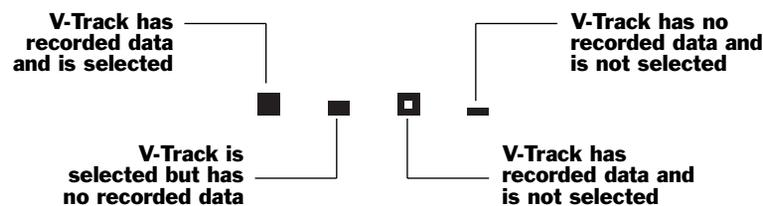
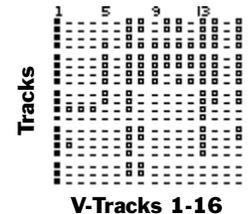
If this sounds similar to a V-Track (Page 95), you're right. Each track in the tracks display shows the string of phrases that comprise its currently selected V-Track. In fact, to put it more plainly: What you see on each track in the tracks display is its currently selected V-Track, laid out from left to right.



You can zoom in and out on the tracks display, and even expand its overall size. See "Zooming In and Out on the Playlist" and "Expanded Playlist Views" on Page 128.

### V-Track Map

The V-Track map shows you the project's V-Tracks (Page 95) arranged in a grid of horizontal rows corresponding to the project's tracks. Each of the 16 V-Tracks in a row is represented by a symbol that tells you if the V-Track contains data and if it's currently selected or not.



During track editing, the V-Track map shows the V-Tracks involved in the current editing operation—see Page 251.

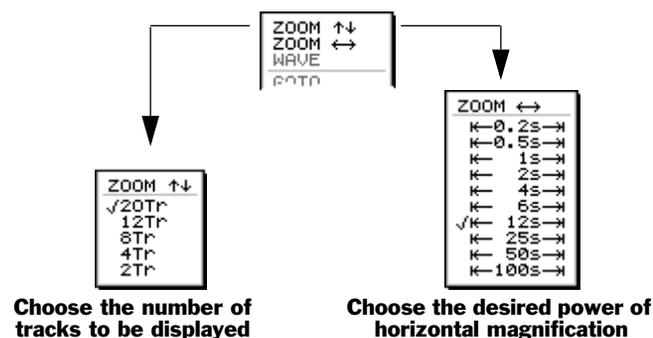
You can select a V-Track for recording and/or playback by clicking it with your mouse—a dialog appears to confirm that you've selected a new V-Track. You can also select a new V-Track for a track using its CH EDIT V.Trk parameter (Page 149).

### Zooming In and Out on the Playlist

You can hold down SHIFT and press ◀, ▶, ▲ or ▼ to change the magnification of the playlist's tracks. Press:

- **SHIFT + ◀**—to squeeze the tracks so that more project time fits into view.
- **SHIFT + ▶**—to spread out the tracks so that you can see track data more clearly.
- **SHIFT + ▲**—to make the tracks taller, with fewer tracks fitting on the display.
- **SHIFT + ▼**—to fit more tracks onto the display.

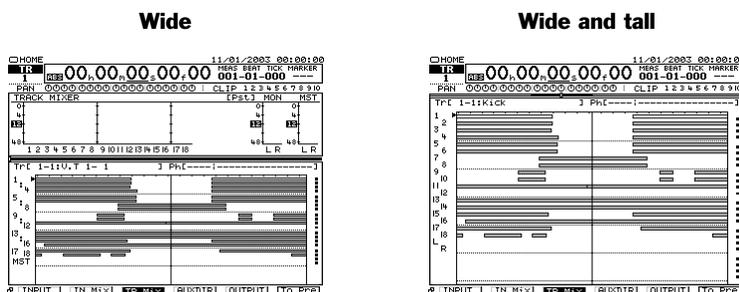
You can also right-click on the playlist to open the Edit Pop-Up menu, which provides a pair of zooming options. Scroll to the type of zooming you want to set and click.



In either dialog, you can select the desired magnification by scrolling to it and clicking.

### Expanded Playlist Views

You can hold down SHIFT and press HOME to more radically change the way the playlist is displayed. Each time you press HOME, the screen cycles through two additional playlist views and back to its original appearance:



- *Wide view*—the tracks fill the entire width of the Home screen.
- *Wide and tall view*—the tracks expand in height as well, reaching up to the position bar. The meters or fader/pan display and V-Track map are hidden.

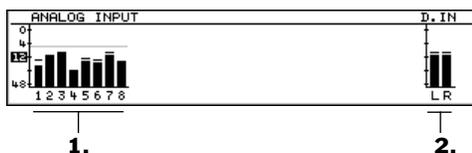


You can further zoom in and out in the wide and wide and tall playlist views using the techniques described in “Zooming In and Out on the Playlist” on Page 127.

### Meter Switches

The meter switches determine the signals to be shown in the meters display. Select:

- *F1 (INPUT)*—to show the level of signals coming into the input jacks from the analog and digital input jacks and connectors.



1. Analog Inputs 1-8
2. Digital Inputs 9 and 10

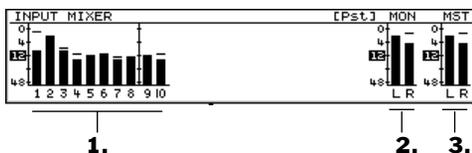


The light gray line across the analog input meters shows the current setting of the input peak indicators (Page 130).



An input jack’s signal can be metered only once it’s been routed to an input channel.

- *F2 (IN Mix)*—to show the level of input channel signals before or after their faders, and to show the MONITOR and MASTER bus levels.

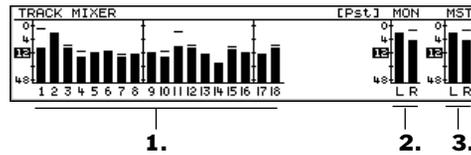


1. Input Channels 1-10
2. Stereo MONITOR bus
3. Stereo MASTER bus



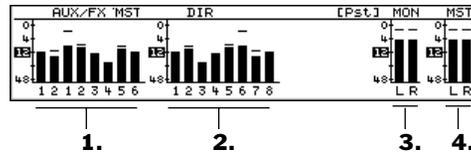
When you’re recording a track, the level setting of the input channel that’s routed to the track sets the track’s recording level.

- *F3 (TR Mix)*—to show the playback levels of the tracks and the MONITOR and MASTER bus levels.



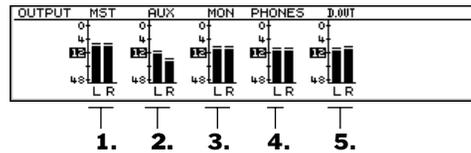
1. Track Channels 1-18
2. Stereo MONITOR bus
3. Stereo MASTER bus

- *F4 (AUXDIR)*—to show the master levels of the eight Aux send busses, eight Direct paths and the MONITOR and MASTER bus levels.



1. Aux 1, 2; and FX Busses 1-6
2. Direct Paths 1-8
3. Stereo MONITOR bus
4. Stereo MASTER bus

- *F5 (OUTPUT)*—to show the levels of signals at the VS-2000 analog and digital output jacks and connectors.



1. Stereo MASTER bus
2. Stereo Aux Output B
3. Stereo MONITOR bus
4. Stereo PHONES Outputs
5. Stereo Digital Outputs

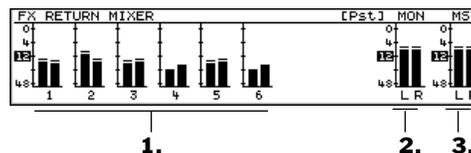
- *F6 (To Pre/To Pst)*—This switch allows you to select pre or post metering (Page 125) when viewing the IN Mix, TR Mix and AUXDIR meter views. (The switch is grayed-out when you've selected the INPUT or OUTPUT meter views.) When the pre/post indicator (Page 124) shows "Pre," you can press F6 (To Pst) to set the metering to post-fader. When the indicator shows "Pst," you can press F6 (To Pre) to switch to pre-fader metering.



Pre- and post-fader AUXDIR metering shows Aux, FX and direct bus signals before or after the Aux/FX bus and Direct path master level controls—see Page 205 and Page 209.

### The FX Return Channel Meters

You can meter the levels of the four stereo FX return channels by pressing PAGE until "FX RTN" appears above F5. Press F5 (FX RTN) to display the FX return channel meters.



1. FX Return Channels 1-6
2. Stereo MONITOR bus
3. Stereo MASTER bus

## Input Peak Indicators

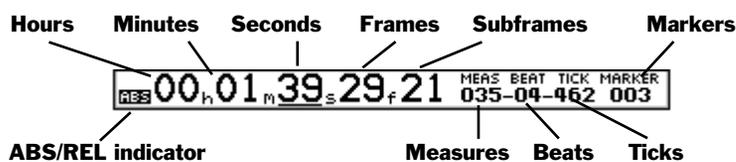
The input peak indicators help you set the level of signals coming into the VS-2000's analog input jacks. The 10 numbered indicators correspond to the eight analog input jacks and two digital inputs.

1 2 3 4 5 6 7 8 9 10

In this illustration,  
Input Channel 4's  
signal is too loud.

When you're adjusting an INPUT knob (Page 35) to set the input level for a signal coming into an analog input jack, a dark box appears around its input peak indicator if the signal exceeds a pre-determined level—the INPUT PEAK LEVEL parameter (Page 378) sets the input peak indicators to light when a signal reaches -6 dB, -3 dB or 0 dB. A light gray line appears in the INPUT meters display view (Page 128) to show the input peak indicators' current volume threshold setting.

## Current Time Location Display



At the top of many of the VS-2000's screens is the current time location display, which consists of three project time counters. Each shows you the now line's current location in the project using its own form of time measurement:

<i>This counter:</i>	<i>Shows the current time:</i>
Time code	as hours, minutes, seconds, frames and subframes
Measures and beats	as measures, beats and ticks (there are 480 ticks in each beat)
Markers	by showing the last marker that passed across the now line



If you're recording MIDI instruments from a sequencer synced to the VS-2000, the measures and beats counter can make it easy to perform very precise track edits on the VS-2000. Be sure to set the project's time signature and tempo to match that of the sequencer before recording. See "Working with a Tempo Map" on Page 296.



*Frame, subframe, tick*

The ABS/REL indicator tells you whether the displayed time is:

- *absolute time (ABS)*—based on the real project start time.
- *relative time (REL)*—shifted during synchronization of the VS-2000 to an external device. See "Shifting the Project Start Time" on Page 300.

## Changing Your Current Location in a Project

You can change your location using the current time location display, moving through the project by any of its time increments.

<i>To use the:</i>	<i>Do this:</i>
Time/Value dial	<ol style="list-style-type: none"> <li>Use ◀, or ▶ to underline the desired unit of time measurement.</li> <li>Turn the Time/Value dial clockwise or counter-clockwise to move forward or back in the project. Hold SHIFT as you turn the dial to move by larger chunks of time.</li> </ol>
mouse	<ol style="list-style-type: none"> <li>Click on the desired unit of time measurement and drag up or down to move forward or back in the project.</li> </ol>



You can move through a project by 1/100ths of a frame by selecting the time code counter's subframe value and holding down SHIFT as you turn the Time/Value dial.

## Clock, Calendar

The clock shows the current time and the calendar shows today's date.

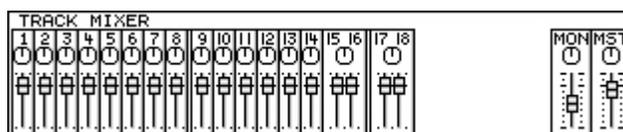


In order for the calendar and clock to accurately show the current date and time, you must set the VS-2000's system clock. See Page 67.



You can replace the calendar and clock with a readout that shows you how much free space remains on the selected drive. See "DATE/REMAIN Sw" on Page 380.

## Using the Fader/Pan Display



You can replace the meters display (Page 124) on the Home screen with the fader/pan display if you wish. The fader/pan display presents a small channel strip representing each channel of the type selected with the F/P Switches. Each onscreen channel strip contains a fader and pan knob that you can set using your mouse.

## The F/P Switches

The F/P switches activate the fader/pan display and select the set of channels you'd like to view. To display the F/P switches, press PAGE until "IN F/P" appears above F2.

<i>Press:</i>	<i>To show channel strips for:</i>
IN F/P	the 10 input channels, the MONITOR bus and the MASTER bus.
TR F/P	the 18 track channels, the MONITOR bus and the MASTER bus.
AUXF/P	the two Aux busses, six FX send busses, eight Direct paths, six FX return channels, the MONITOR bus and the MASTER bus.



F5 (FX RTN) shows the meters for the six FX return channels, as described on Page 129.

## **About The ID Buttons**

When you've pressed PAGE until ID PL, ID IN, ID TR, ID Mlt and ID ChV appear above the F buttons, you can use the buttons to select what's shown on the Info Display when an optional external VGA monitor is connected and designated as the main display.

# 9—Working with Input Signals

This chapter describes how to get signals into the VS-2000's analog and digital input jacks and connector, and thus to their corresponding input channels. We'll also discuss setting analog input levels.

## Analog Input Signals

### Making Analog Connections



Before connecting instruments, microphones or other external sound sources to the VS-2000's analog input jacks, bring the MASTER fader all the way down to prevent damage to your speakers, headphones or other equipment as you make the connection. After the connection's been made, bring the MASTER fader back to its 0 marking.

When connecting an instrument, mic or other sound-producing device to the VS-2000, connect one end of the device's cable into the device, and the plug on its other end into the appropriate VS-2000 jack.



If you're using an AKG C3000B, Roland DR-20, Shure SM-57 or SM-10, or Lavalier mic, consider using the VS-2000's Microphone Modeling to simulate the sound of an expensive studio mic—see Page 224.

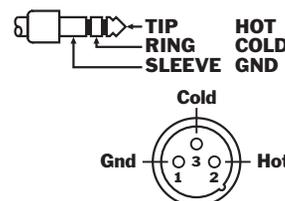
The VS-2000's INPUT knobs allow it to accommodate a wide range of input levels, from mic level to line level.



If a cable's plug doesn't exactly fit the input jack, *don't force it*. Make sure you've selected the correct VS-2000 jack. If the jack seems too small or large, it's most likely the wrong jack. See Chapter 2 for detailed information on the VS-2000's input jacks. You may need to purchase an adaptor to use the cable with the VS-2000. If you're sure you've properly matched plug to jack and still have a problem with the connection, consult the vendor from whom you purchased the plug or cable.

### About XLR/TRS Connectors

This instrument is equipped with balanced (XLR/TRS) type input jacks. Wiring diagrams for these jacks are shown in this illustration. Make connections after first checking the wiring diagrams of other equipment you intend to connect.



### Avoiding Feedback

If you're listening to the VS-2000 through speakers, and you're using microphones, feedback—unpleasant high-pitched squealing—can occur. To avoid feedback:

- make sure that your mics are pointed away from the speakers to avoid feedback.
- try to move the mics and speakers further apart.
- turn down the speakers' volume.

To prevent hazard or damage, ensure that only microphone cables and microphones conforming to IEC-268-15A are connected.



French language  
for Canadian Safety Standard

Afin d'éviter tout risque ou dommage, ne brancher que des câbles de microphone et des microphones conformes à la norme IEC-268-15A.

## Phantom Power

Each of the VS-2000's eight XLR jacks can supply +48 V phantom power to a connected condenser microphone that doesn't have its own internal power source.



*Always turn the phantom power off when connecting any device other than condenser microphones that require phantom power. You risk causing damage if you mistakenly supply phantom power to dynamic microphones, audio playback devices, or other devices that don't require such power. Be sure to check the specifications of any microphone you intend to use by referring to the manual that came with it. (This instrument's phantom power: 48 V DC, 10 mA Max)*



*Phantom power is supplied to the VS-2000's XLR jacks in odd/even pairs, so if you only need phantom power on one jack, make sure not to connect another mic to its odd/even partner.*

### To Turn an XLR Input Jack's Phantom Power On or Off



Bring the input channel's fader all the way down before turning the jack's phantom power on or off.

1. On the back panel of the VS-2000, locate the four PHANTOM POWER switches.



Each PHANTOM POWER switch turns the phantom power on or off for one odd/even pair of XLR jacks.

2. Set the appropriate switch to turn the desired jack pair's phantom power on or off.



Read the manual for your microphone, and turn on phantom power only if you're using a condenser microphone that requires it. Phantom power can damage other mics.



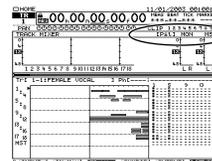
To avoid damage to a connected mic or instrument, make sure the corresponding XLR jack's phantom power is turned off when you're using one of the 1/4" TRS jacks.

## Setting Analog Input Levels

Once you've connected a signal to an analog input jack, you'll need to set its level.

### To Set an Analog Input Level

1. If you're connecting an electric guitar or bass to the GUITAR/BASS (Hi-Z) jack, be sure to lock in the GUITAR/BASS (Hi-Z) ON switch (Page 33).
2. Press HOME on the VS-2000.
3. Send some signal into the input jack.  
The eight input peak indicators (Page 130)—the first 1-8 set of numbers in the top right part of the screen—represent the eight analog input jacks.
4. Turn up the jack's INPUT knob until its peak indicator lights on the display.



Input peak indicators

1 2 3 4 5 6 7 8 9 10

In this illustration, Input Jack 2's input peak indicator has lit.

5. Turn the INPUT knob counter-clockwise slightly until the indicator doesn't flash.



You can set the level at which the input peak indicators turn on (Page 378).

## Digital Input Signals

### Digital Connections

The VS-2000 can accept digital audio from an external digital device through its COAXIAL IN jack. To learn about this jack, see Page 48.



The Digital IN connector of VS-2000 is compatible with 2ch PCM audio only. If the VS-2000 receives audio signal in other formats (DTS, Dolby Surround etc.), it outputs such a signal as noise.

### Digital Considerations

This section discusses a couple of issues you should consider to help ensure that your digital audio is successfully captured by the VS-2000.

#### **Sample Rates**

The VS-2000 operates at a sampling rate of 44.1 kHz. As a result, it will successfully receive only external digital audio that uses that sample rate.



*Sample rate*

If your source material is at a different sample rate, consider converting the external audio's sample rate to 44.1 kHz before bringing it into the VS-2000. There are various devices and utilities that you can use for this purpose.

#### **Bit Depth**

The VS-2000 records audio using 24 bits or 16 bits, according to the project's recording mode (Page 102).

If an external digital audio device uses a bit depth that's higher than your project's, dither the device's output down to the project's recording resolution before bringing the audio into the VS-2000. If the device uses the same or a lower bit depth, the VS-2000 will record the audio as is, at the project's selected bit depth.

The VS-2000 can also dither its digital output to match a lower bit depth used by an external digital device receiving audio from the VS-2000—see Page 382.

### The Master Clock

In order for two digital audio devices to communicate successfully, they have to both use the same timing reference, or "master clock." If they don't, the digital audio they exchange is likely to wind up at the wrong pitch, or to have clicks and pops within it. The master clock timing reference can be produced by the device producing the digital audio. The timing information, called "word clock," is sent alongside the digital audio signal from the source device—the "master"—to the receiving device, called the "slave."

#### **Who Should Supply the Master Clock?**

There are two basic conditions in which you'll be bringing digital audio signals into the VS-2000's digital inputs, and each has its own master clock considerations:

- when its hard disk recorder *isn't* being synchronized to an external device
- when its hard disk recorder *is* being synchronized to an external device

When the VS-2000's hard disk recorder *isn't* being synchronized to an external device, and is receiving digital audio from a single external device, use the external device as the source of the master clock. Set MASTER CLOCK to DIGITAL IN (see below).

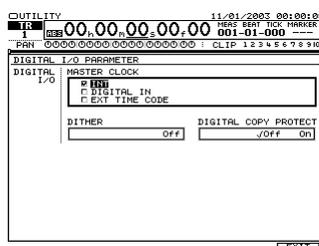
When the VS-2000's transport *is* being synchronized to an external device, and is receiving digital audio from the same device to which the VS-2000 is being synchronized, use the device to which the VS-2000 is being synchronized and from which the digital audio is coming as the master clock source. Set the VS-2000's MASTER CLOCK parameter to EXT TIME CODE (see below).

### Designating the Master Clock for Digital Audio Input

When you're receiving digital input signals from a connected digital, either device can serve as the master—be sure to set up the other as a slave.

However, in order for the VS-2000 to successfully receive digital audio from other external digital audio devices, the VS-2000 should usually be slaved to an external master clock. Here's how to set up a successful master/slave digital audio relationship:

1. Hold down SHIFT and press F4.
2. Press PAGE until "DIGITL" appears above F2.
3. Press F2 (DIGITL) to view the DIGITAL I/O parameters.



4. Press ▲, if necessary, to select the MASTER CLOCK parameter.
5. Turn the Time/Value dial to select the desired master word clock source.

<i>When you select:</i>	<i>The master clock comes from:</i>
INT	the VS-2000.
DIGITAL IN	the device connected to the COAXIAL IN jack (Page 48).
EXT TIME CODE	the device connected to the MIDI IN jack.



If "MASTER CLOCK" is set to "DIGITAL IN," noise may be heard from the VS-2000's audio output when you unplug the coaxial cable or power off your digital audio device. Please turn down the VS-2000's volume before doing things such as unplugging the coaxial cable.

### Completing the Master/Slave Setup

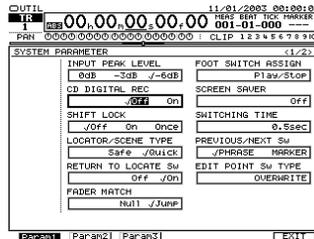
Make sure that the device designated as the master clock source uses its internal clock as its timing reference. If the VS-2000 is the master, set its MASTER CLOCK to INT.

To learn how to configure each external digital device, consult its documentation.

## Recording Digital Input Signals

Before you can record signals received by the VS-2000's digital COAXIAL IN jack, you have to enable digital recording on the VS-2000. Here's how:

1. Hold down SHIFT and press F4.
2. Press PAGE until "SYSTEM" appears above F1.
3. Press F1 (SYSTEM).



**If this screen isn't visible after you press F1 (SYSTEM), press F1 (Param1) to display it.**

4. Press **◀**, **▶**, **▲** and/or **▼** to highlight the CD DIGITAL REC parameter if necessary.
5. Turn the Time/Value dial to select On.  
The "Concerning Copyright" statement appears as a reminder of the laws governing the digital copying of copyrighted materials. It also presents Roland's position on the SCMS digital recording copy-protection protocol.
6. After reading the statement, press ENTER/YES, or press EXIT/NO to suspend activation of digital recording.  
If you pressed ENTER/YES in Step 6, the VS-2000 licensing agreement appears.
7. If you agree to the displayed terms, press ENTER/YES. If not, press EXIT/NO to leave digital recording disabled.



Since the CD DIGITAL REC parameter is a system parameter, it doesn't need to be reset unless you initialize your VS-2000's system settings (Page 385).



# 10—Using the Digital Mixer

In this chapter, we'll discuss how to perform basic operations on the mixer. For an introduction to the VS-2000's built-in digital mixer, see Chapter 3.

## Channel Selection

As described on Page 52, all of the VS-2000's 40 mixer channels are active and available at all times. Each of these sets of channels has its own area on the VS-2000.

- 10 input channels • 18 track channels • 6 stereo FX return channels

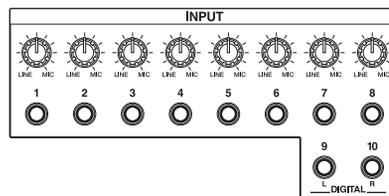
When you want to adjust a channel's parameters, you must first select the channel. When you select the channel, its CH EDIT parameters are displayed—"CH EDIT" is short for "Channel Edit."



In addition to the instructions provided below, you can also use a connected mouse to select any channel from the Channel Pop-Up menu, described on Page 71.

### Selecting an Input Channel for Editing

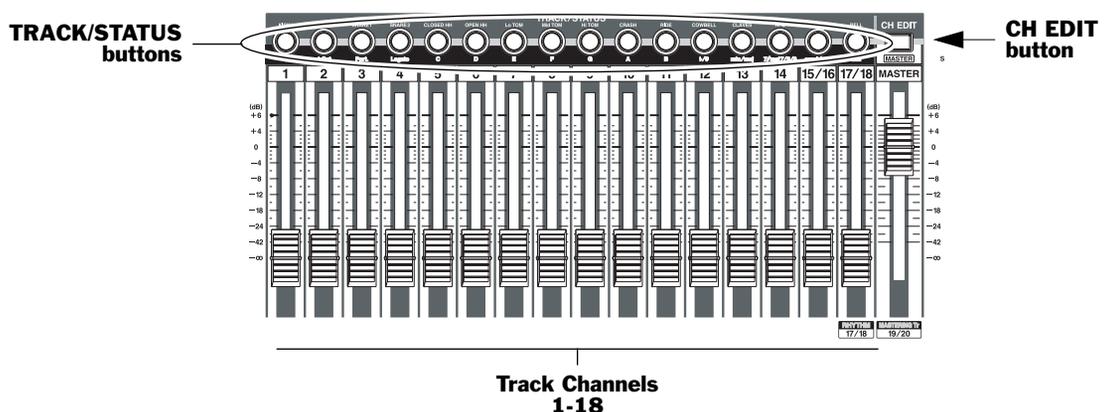
To select any of the input channels and display its CH EDIT parameters (Page 147), press its round button in the INPUT area.



### Selecting a Track Channel for Editing

To select any of the track channels and display its CH EDIT parameters (Page 147):

1. Press the CH EDIT button so it lights.
2. Press the desired track channel's TRACK/STATUS button.

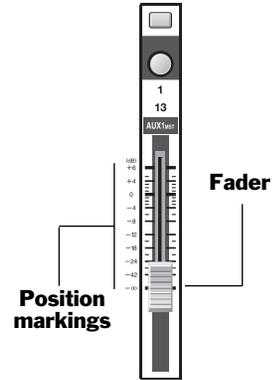


### About the Track Channel Faders

Each track channel strip provides a fader whose primary job is the control of the channel’s signal level. Faders are especially helpful when adjusting, or “riding,” signal levels during a mix.

The faders have markings printed to their left that show the relative position of each fader in dBs. To the left of the channel strips area, numbers are printed alongside these markings.

When a fader is at its 0dB position, it’s neither adding to or subtracting from the level of its recorded track. This position is referred to as “unity gain,” since the signal’s level leaving the fader is the same as it is coming into the fader.



When you load a project, the VS-2000 offers you a choice of how the faders take control of the track channels’ stored levels. See “FADER MATCH” on Page 380.

The VS-2000 provides a shortcut for setting a track channel’s fader to its unity gain position. This procedure also places the channel’s signal to the center stereo position.

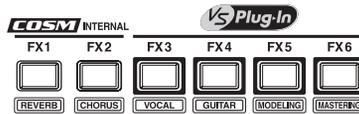


### To Reset a Channel’s Fader and Pan

1. While holding down CLEAR, press the desired channel’s INPUT, FX or TRACK/STATUS button.  
If the track channels for editing, press CH EDIT so it lights so it lights.

### Selecting an FX Return Channel for Editing

Each of the six possible onboard stereo effect processors—FX1-FX6—has its own FX button. To select an FX return channels and display its CH EDIT parameters (Page 227), hold down its FX button for two seconds.



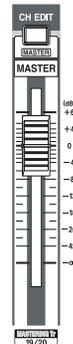
You can also use a connected mouse to select any channel from the Channel Pop-Up menu, described on Page 71.

### The MASTER Fader

The MASTER fader—located at the far right of the channel strip area—controls the overall level of the main stereo MASTER mix.

#### While Recording

During recording, you’ll typically listen to the MASTER mix, so moving the MASTER fader affects how loud the overall mix sounds. It’s a good idea to set it to 0db in this context, and then use the MONITOR or PHONES knobs to actually set the listening level.



When you’re recording, the setting of the MASTER fader has no effect on the level of signal recorded on your tracks—it adjusts the level of the mix you’re listening to.

### While Mixing

Since the MASTER fader controls the level of the MASTER mix, its setting controls the overall level of your final mix. You can fade out a mix using the MASTER fader.



Automix can memorize a fadeout you perform using the MASTER fader.

The VS-2000's level meters tell you how loud or soft your overall mix level is. To learn about metering in the VS-2000, see "Meters Display" on Page 124.



Start your mix by setting the MASTER fader to 0db, and adjust your channels' levels to achieve the proper overall level. Once you're close to finishing your mix, you can move the MASTER fader to fine-tune the overall level.

## Muting and Soloing Channel Signals

There may be times when you'd like to temporarily silence, or "mute," individual channels in order to hear your other signals more clearly. Likewise, you may want to isolate, or "solo," individual channels so that you can listen to them without hearing other channels' signals. While you can always turn track channels on or off by pressing their TRACK/STATUS buttons, the VS-2000 provides two ways for you to more easily mute and un-mute or solo and un-solo input, track and FX return channels:

- You can turn on a channel's CH EDIT MUTE or SOLO switch (Chapters 11 and 17).
- To quickly control the muting or soloing of multiple input, track or FX return channels, you can use Mute mode and Solo mode, respectively.



If a channel is both muted and soloed at the same time, the channel's signal is muted.

### Mute Mode

Mute mode lets you mute or un-mute multiple input, track and FX return channels quickly and easily. After muting the desired channels, you can leave Mute mode and leave the channels muted. You can return to Mute mode at any time to un-mute the silenced channels, or you can turn off their CH EDIT MUTE switches.



Automix can record and play back the muting and un-muting of channels.

#### Muting Channels in Mute Mode

1. Hold down SHIFT and press SOLO•MUTE so it lights red. The INPUT, FX and TRACK/STATUS buttons flash. When a channel's button flashes in Mute mode, its signal isn't muted.



In Mute mode, the TRACK/STATUS buttons flash red.

2. Press the desired channel's INPUT, FX or TRACK/STATUS button—it lights solidly to show the channel is muted, and its signal silenced. You can mute as many channels as you wish.
3. To un-mute a channel, press its button again—the button flashes to show that the channel's no longer muted.
4. To exit Mute mode, press MUTE again.



You can quickly un-mute all currently muted channels. While holding down SHIFT and CLEAR, press SOLO•MUTE.

## Solo Mode

In Solo mode, you can quickly isolate individual channels—temporarily silencing all other channels—so that you can hear them more clearly. After you’ve soloed the desired channels, you can exit Solo mode and turn to other tasks with the selected channels remaining soloed. You can return to Solo mode at any time to un-solo the channels or turn off their CH EDIT SOLO switches.

### Soloing Channels in Solo Mode

1. Press SOLO•MUTE so it lights green.  
The INPUT buttons, FX buttons and TRACK/STATUS buttons flash. When a channel’s button is flashing in Mute mode, its signal is not soloed.



In Mute mode, the TRACK/STATUS buttons flash green.

2. Press the desired channel’s INPUT, FX or TRACK/SELECT button—it lights solidly to show the channel is now soloed, and all other channels are temporarily silenced. You can solo as many channels as you like.
3. To un-solo a channel, press its button again—the button flashes to show that the channel’s no longer soloed.
4. To exit Solo mode, hold down SOLO again.



To un-solo all currently soloed channels, hold down CLEAR and press SOLO•MUTE.

## Scenes

The VS-2000 allows you to save a wide range of current mixer settings as a “scene.” Each project can contain up to 96 scenes. A scene contains all of your current:

- channel fader positions
- channel parameter settings
- MASTER level settings
- signal routings
- effect settings

When you save your settings as a scene, you “store” the scene. When you re-install its settings, you “recall” the scene. You can recall a scene at any time a project isn’t playing. You can name each scene to help you remember what it contains, and protect individual channels from having their settings changed when a scene is recalled.



When changing scenes, you may hear a click. This is normal and does not indicate a malfunction.



Scenes don’t store your listening levels. Before recalling a scene, make sure that your MONITOR and PHONES knobs are set to levels that won’t result in any nasty surprises. Use these knobs to adjust your listening level after recalling the scene.

Since so much time in any studio is spent setting up and adjusting your settings, scenes are incredibly convenient, allowing you to try out and save alternate versions of a setup or mix. In addition, since a scene includes the V. Track CH EDIT parameter that determines the audio each track is to play, you can actually create and store different versions of a project, containing different elements—vocal and instrumental performances, different solos, and so on—that can be recalled instantly.

Scenes are stored in sets called “scene banks,” with each bank containing 16 scenes, numbered from 1 to 16. You can also name each scene to help you identify it.

## Basic Scene Operations

You can quickly and easily store and recall scenes using LOCATOR•SCENE button.



Scenes can be stored and recalled only when a project isn't currently playing.



You can also store and recall scenes from the UTILITY menu (Page 144).



You can use the Scene feature's Safe mode, and perform scene operations more carefully and slowly from a list in the SCENE window. See Page 145.



### Storing a Scene

1. Hold down SHIFT and press LOCATOR•SCENE so it lights red. Each scene is stored in a numbered location from 1 to 16, corresponding to the 16 TRACK/STATUS buttons. When a scene has been stored in a location, the corresponding TRACK/STATUS button lights in Scene mode.
2. Press any TRACK/STATUS button to store the scene in the corresponding location. If you'd like to store the scene in a different scene bank, follow the instructions in "Changing Scene Banks" and press its button in the selected bank.
3. If a location already contains a scene, and you'd like to store a new scene in its place, you'll have to clear the older scene first. See "Clearing a Scene" on Page 143.



### Recalling a Scene

1. Hold down SHIFT and press LOCATOR•SCENE if it's not already lit red.
2. If the current scene bank contains the scene you want, press the scene's lit TRACK/STATUS button. To recall a scene from a different bank, follow the instructions in "Changing Scene Banks" and then press the scene's button in the desired bank.

### Changing Scene Banks

1. Hold down SHIFT and press LOCATOR•SCENE if it's not already lit red. If any scenes are stored in the currently selected scene bank, their TRACK/STATUS buttons light.
2. While holding down SHIFT, hold down LOCATOR•SCENE for two seconds—the SCENE BANK SELECT window pops open.
3. Turn the Time Value dial to select the desired scene bank and press ENTER/YES.

### Clearing a Scene

1. Hold down SHIFT and press LOCATOR•SCENE if it's not already lit red. If you'd like to clear a scene from a different bank, see the instructions in "Changing Scene Banks" before proceeding.
2. While holding down CLEAR, press the desired scene's TRACK/STATUS button. The scene is cleared from that location, and the button's light turns off.

### Leaving Scene Mode

To leave Scene more manually, press LOCATOR•SCENE so its light turns off.

After you store or recall a scene, the VS-2000 returns the TRACK/STATUS buttons to their normal job of controlling hard disk recorder tracks (Page 176)—this is intended to

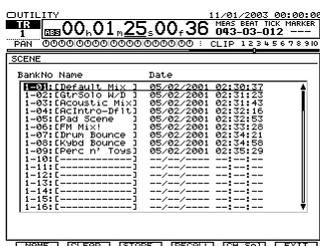
help you get right back to recording. You can change this behavior if you wish so that Scene mode remains active—and LOCATOR•SCENE button remains lit red—until you manually leave it.

1. Hold down SHIFT and press F4.
2. If you don't see "SYSTEM" above F1, press PAGE until it you do.
3. Press F1 (SYSTEM).
4. If F1 (Param1) isn't highlighted, press F1 (Param1).
5. You can set the RETURN TO Tr STATUS Sw parameter to:
  - *On*—to automatically re-activate the TRACK/STATUS buttons after you store or recall a scene.
  - *Off*—so that you must press LOCATOR•SCENE to leave Scene mode.
6. Press F6 (EXIT) to confirm your changes.

## Editing Scenes

You can edit scenes on the UTILITY menu's SCENE screen. You can name them, clear them, store and recall them, and select the channels whose settings are to be recalled.

1. Hold down SHIFT and press F4.
2. Press PAGE repeatedly until "SCENE" appears above F4.
3. Press F4 (SCENE).



The VS-2000 time-stamps each scene when it's created, as shown on this screen.

4. Press ▲ or ▼ or turn the Time/Value dial to select the desired scene. You can:
  - Press F1 (NAME) to rename (Page 74) the selected scene.
  - Press F2 (CLEAR) to delete the selected scene.
  - Press F3 (STORE) to store your current settings as the selected scene.

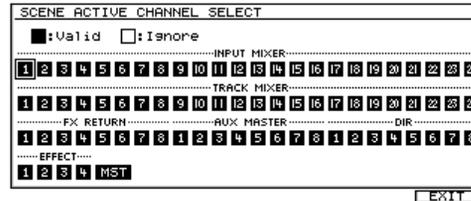


Save a new scene by selecting a blank location in the list and pressing F3 (STORE).

- Press F4 (RECALL) to recall the selected scene.
  - Press F5 (Ch Sel) to protect channels when scenes are recalled—see Page 145.
5. Press F6 (EXIT) when you're done to confirm your changes.

### Protecting a Channel's Settings When a Scene is Recalled

1. Hold down SHIFT and press F4.
2. Press PAGE repeatedly until "SCENE" appears over F4.
3. Press F4 (SCENE).
4. Press F5 (CH Sel). The channel-selection box appears.



Each channel is represented by a box. When the box is black, its settings will be changed when a scene is recalled. When it's white, they won't.

5. Press  $\leftarrow$ ,  $\rightarrow$ ,  $\uparrow$  and/or  $\downarrow$  to select a channel you want to protect. (In the above illustration, Input Channel 1 is selected, as shown by the outline around its box.)
6. Turn the Time/Value dial so the channel's box turns white to show it's protected.
7. Repeat Steps 5 and 6 for any channels you want to protect/ignore.
8. Press F6 (EXIT) when you're done.

### Scenes in Safe Mode

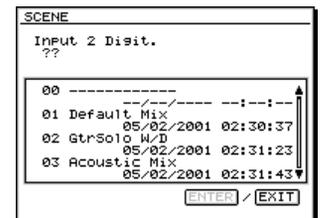
Scenes are so fast and easy to recall that it's possible to grab the wrong one, especially when recalling a scene by its number, not its name. Safe mode provides a SCENE window that shows each scene's number *and* name. You can also store and clear scenes in Safe mode. Though a slower way to work, it helps ensure you've got the right scene.

#### Turning on Scene Safe Mode

1. Hold down SHIFT and press F4.
2. If "SYSTEM" doesn't appear above F1, press PAGE until it does.
3. Press F1 (SYSTEM).
4. The LOCATOR/SCENE TYPE parameter turns Safe mode on or off—see Page 379. Its default value is Quick. To turn on Safe mode, select Safe.

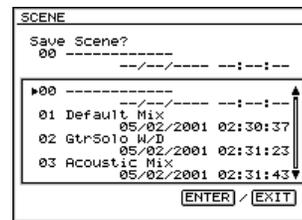
#### Recalling a Scene in Safe Mode

1. Hold down SHIFT and press LOCATOR•SCENE—the SCENE window opens.
2. Turn the Time/Value dial to scroll through the list until the desired scene is visible.
3. Enter the scene's two-digit number on the keypad—an arrow appears to the left of the scene in the list, and "Load Scene?" appears in the window.
4. Press ENTER/YES to recall the selected scene and close the window, or just press EXIT/NO twice to leave the window without recalling a scene.



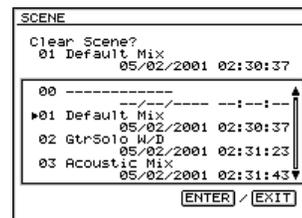
### Storing a Scene in Safe Mode

1. Hold down SHIFT and press LOCATOR•SCENE—the SCENE window appears.
2. Turn the Time/Value dial to scroll through the list until the desired unused scene memory location is visible.
3. Enter the memory location's two-digit number on the numeric keypad—an arrow appears to the left of the scene in the list and "Save Scene?" appears in the window.
4. Press ENTER/YES to store your current mixer settings in the selected scene memory location and close the window, or just press EXIT/NO twice to leave the window without saving the scene.



### Clearing a Scene in Safe Mode

1. Press SCENE—the SCENE window appears.
2. Turn the Time/Value dial to scroll through the list until the desired scene is visible.
3. Enter the scene's two-digit number on the numeric keypad—an arrow appears to the left of the scene in the list.
4. Press CLEAR—"Clear Scene?" appears.
5. Press ENTER/YES to clear the selected scene and close the window, or just press EXIT/NO three times to leave the window without clearing the scene.



## Resetting Mixer Parameters

You can quickly reset most mixer parameters to their default values should you wish to start over with a "clean slate." To do this:

1. Hold down SHIFT and press F4.
2. Press PAGE until "PrmIni" appears above F1.
3. Press F1 (PrmIni).
4. Turn the Time/Value dial to select MIXER.
5. Press F5 (OK)—a confirmation screen appears.
6. If you're sure you want to proceed, press ENTER/YES. To cancel the operation, press EXIT/NO.



The reset procedure does not initialize all of the mixer's settings. For example, it doesn't delete your scenes, or reset the LOCATOR/SCENE TYPE parameter described on Page 145.

# 11—Input and Track Channel Tools

Input channel and track channels offer almost exactly the same parameters with which you can shape their signals. This chapter describes these “CH EDIT”—short for “Channel Edit”—parameters. They have their own chapter since they’re the main tools you use to make your input signals and tracks sound the way you want.



Input channel CH EDIT settings affect how a signal will be recorded. Track channel CH EDIT changes affect only how the hard disk recorder plays a track, and are therefore less permanent. If you’re not sure about a change you’re thinking of making to a signal you’re about to record, make the changes in its track channel.

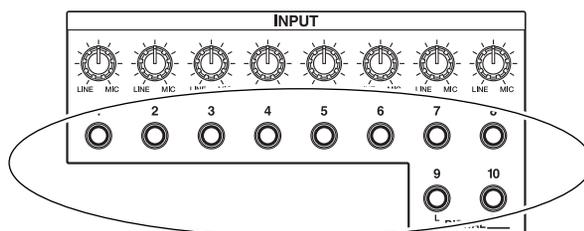


FX return channels have their own CH EDIT parameters. However, they’re a little bit different than the CH EDIT parameters discussed here—you can learn about them in Chapter 17.

## Viewing a CH EDIT Screen

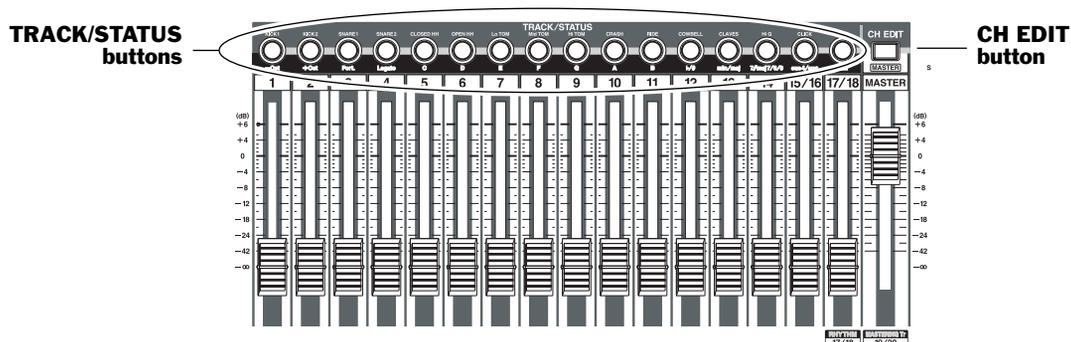
### Displaying an Input Channel’s CH EDIT Screen

1. Press the desired channel’s button in the INPUT area.



### Displaying a Track Channel’s CH EDIT Screen

1. Press CH EDIT so it lights, if it isn’t already lit.
2. Press the desired track channel’s TRACK/STATUS button.



### Changing CH EDIT Screens

1. To view a specific CH EDIT screen whose F button is currently:
  - *visible*—press the screen’s F button.
  - *hidden*—press PAGE, and then press the screen’s F button.

## Introduction to the CH EDIT Screens

There are five CH EDIT parameter screens for input channels and six for track channels.

*Input channel CH EDIT screens:*

VIEW	DYN
EQ	FX Ins
RSSPan	

*Track channel CH EDIT screens:*

VIEW	ASSIGN
DYN	EQ
FX Ins	RSSPan

Screens that are common to both input and track channels are identical in both places.

### How the CH EDIT Screens Are Organized

All of the CH EDIT screens have three sections. The top and bottom sections are always available as you move from CH EDIT screen to CH EDIT screen. When you select a new CH EDIT screen, it's the contents of the middle area that change. This chapter devotes a section to each CH EDIT screen, or—more precisely—what you'll find in the middle section of each screen.

#### The Top of the CH EDIT Screens

The top of each CH EDIT screen contains elements also found on the Home screen:

The diagram shows the top section of an input channel CH EDIT screen. It includes a 'MIXER' button, a channel name 'IN 1', a 'PAN' knob, a 'RES' display, time units 'h', 'm', 's', 'f', a 'MEAS BEAT TICK MARKER' display, a 'CLIP' indicator, and a 'CLIP' meter. A legend on the right lists the numbered callouts:

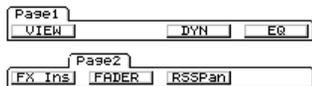
1. Display Pop-Up Menu button
2. Current channel display
3. PAN knob display
4. Position bar
5. View label
6. Clock
7. Calendar
8. Current time location display
9. Input peak indicators

This illustration shows the top section of an input channel. In a track channel, the input peak indicators are replaced by the selected track's name.

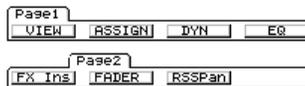
For a detailed description of what's at the top of a CH EDIT screen, see Chapter 8.

#### The Bottom of the CH EDIT Screens

At the bottom of the CH EDIT screens you'll find an F button for each CH EDIT screen. The buttons are organized into a pair of tabbed layers. Press the PAGE button to toggle between the two layers.



The input channel tabs



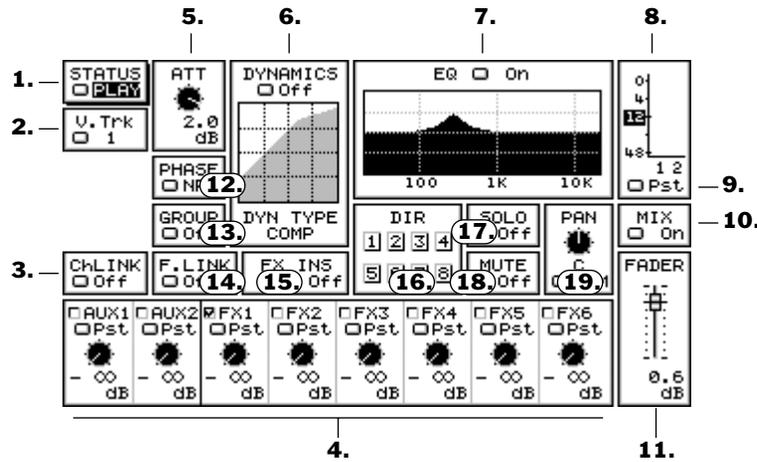
The track channel tabs



The remaining F buttons activate CH EDIT tools available on various CH EDIT screens. We'll describe the role of F5 on the VIEW, DYN and EQ screens in the following sections. F6 turns on the parameter view, described on Page 164.

## The CH EDIT Screens

### The CH EDIT VIEW Screen



This illustration shows a track channel CH EDIT VIEW screen. 1 and 2 are present only in track channels—with input channels, that area of the screen is empty.

To learn about the CH EDIT VIEW screen's CpyPRM button, see Page 166.



You can toggle back and forth between the CH EDIT VIEW screen and the last screen you were on by repeatedly the channel's INPUT button or TRACK/STATUS button.



You can hold down SHIFT as you turn the Time/Value dial to move through parameter values in fine increments on the CH EDIT VIEW screen.

#### 1. STATUS (track channel only)



The STATUS parameter mirrors the behavior of the TRACK/STATUS buttons (Page 176). Changing a track's recording or playback status in either place changes it in both. You can set the parameter to:

- **PLAY**—The track channel's TRACK/STATUS button lights green and any data recorded on the track plays back when you press the PLAY button (Page 175).
- **REC**—The TRACK/STATUS button flashes red to show that the track is now armed for recording. To learn how record, see "Recording a New Track" on Page 177.
- **MUTE**—The TRACK/STATUS light turns off and the track is silenced.

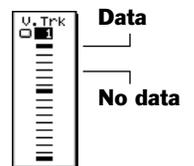
#### 2. V.Trk (track channel only)



The V.Trk selector allows you to select one of the track's 16 V-Tracks for recording and/or playback. To learn about V-Tracks, see Page 95.

You can use this parameter to select the desired V-Track in either of two ways. In both cases, you start by selecting the V.Trk parameter. Then, you can:

- turn the Time/Value dial to select the desired V-Track.
- press the flashing ENTER/YES button to view the V. Trk Pop-Up window that graphically displays all 16 of the track's V-Tracks. Each V-Track appears as a line. If the line is thin, there's no recorded data on the V-Track—if it's thick, there is. Turn the Time/Value dial to select the desired V-Track and press ENTER/YES.



You can also select a track channel's V-Track with a connected mouse using the Home screen's V-Track map. See Page 127.

### 3. ChLink



When CHLink (“Channel Link”) is turned on, the current channel becomes linked to the channel next to it. If the current channel is:

- *odd-numbered*—it’s linked to the even-numbered channel to its right.
- *even-numbered*—it’s linked to the odd-numbered channel to its left.

When channels are linked, you can change a CH EDIT parameter’s value in both channels at once by changing it in either of the linked channels. This can be especially helpful when two channels control the left and right sides of a stereo signal.

When you link input or track channels, each resulting pair of inputs or tracks acts as a single stereo object during routing, with a single input and output connection point.



You can quickly link channels by pressing the even-numbered channel’s INPUT or TRACK/STATUS button while holding down the button for its odd-numbered partner.



When two channels are linked, their PAN and FADER parameters change in appearance and behave differently. See Page 155 and Page 152, respectively, for more.



When you link two channels, their FADER parameter is set to 0dB or to their most recent linked level value. When you unlink channels, they’re reset to 0dB.

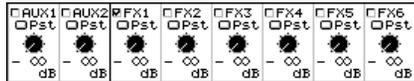


When channels are linked, you can individually adjust their FADER and PAN settings on the PRM.V—“parameter view”—screen (Page 164). You can press ENTER/YES when the FADER parameter’s selected to jump to its parameter view.



The F.LINK parameter (Page 154) links only the channels’ FADER parameters if you want to retain individual control of their other parameters.

### 4. AUX and FX Send Controls



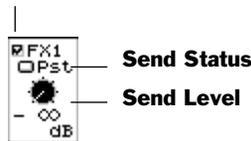
- *The AUX Send Controls 1 and 2*—allow you to send a copy of the channel’s signal to Aux Bus 1 and/or 2. These two bussed are connected to the AUX 1 and 2 output jacks, respectively.
- *The FX Send Controls 1-6*—allow you to send a copy of a channel’s signal to any the six possible effect processors, FX 1-6.



To learn more about the FX and Aux sends, see Chapter 15.

Each of the FX and Aux send busses has its own set of three controls.

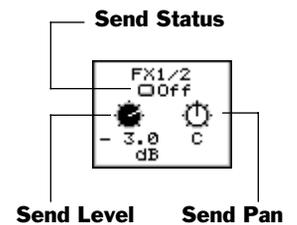
#### SENDS Knob switch



- *The SENDS Knob switch*—When this parameter is checkmarked, it designates the send to be controlled by the CH PARAMETERS SENDS knob (Page 167). The VS-2000 remembers the setting for each channel, so whenever you select a channel, the SENDS knob takes over control of the desired FX or AUX send.

- The *Send Status parameter*—turns the channel’s send to the FX or Aux bus on or off. You can select:
  - *Off*—so that no signal is sent to the FX or Aux bus from the channel.
  - *Pre or Pst (depending on the FX or Aux bus’s current configuration)*—to turn on the send to the FX or Aux bus from the channel. See below for more details.
- The *Send Level parameter* sets the amount of the channel’s signal to be sent to the FX or Aux bus. The range is from  $-\infty$  to 6 dB.

If the FX or Aux bus is configured as one of a linked pair of busses, its Send Level control changes in appearance and behavior. It sets the amount of the channel’s signal to be sent to both linked busses. The Send Pan knob that appears controls the signal’s position in the stereo image created by the two linked FX or Aux busses.



You can control an FX or AUX bus send level directly from the VS-2000’s front panel using the SENDS knob—see Page 167.

#### About FX and AUX Send Configuration

In the VS-2000, each FX and Aux bus can accept pre-fader signals from all input and track channels *or* post-fader signals from the input and track channels—not a mix of both. An FX or Aux bus can also be linked with its odd/even partner to form a single stereo send. You can configure an FX or Aux bus on the MASTER EDIT VIEW screen (Page 206) or from the CH EDIT VIEW screen as described on Page 206.



To learn about pre- and post-fader FX and AUX sends, see “Pre-Fader and Post-Fader Sends” on Page 89. For more on linking busses, see “Stereo FX and Aux Busses” on Page 204.

### 5. ATT

The ATT (“Attenuation”) parameter allows you to adjust the level of the signal coming into the channel. If the signal is clipping or sounds distorted, you can lower the ATT value by as much as -42.0 dB. If the signal is too soft, you can raise it by up to 6.0 dB.

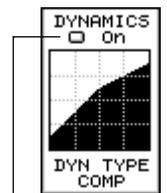


The ATT parameter can be particularly handy when you’re working with a digital input signal, since its input level is set by the device producing it. You can adjust its input channel’s ATT value to place the signal at a proper level (Page 60).

When you’re working with analog input signals, you won’t usually need to change the ATT setting if you’ve properly set your input levels (Page 134). The same is true if you’ve recorded your tracks correctly, as described on Page 60.

### 6. DYNAMICS

The DYNAMICS section provides an on/off switch that lets you turn the channel’s dynamics tools on or off from the VIEW screen, and graphically shows you the current dynamics settings. The channel’s dynamics parameters are found on its DYN screen (Page 156).



Dynamics on/off switch



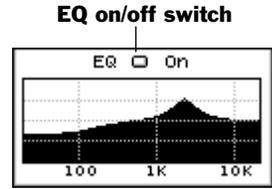
When the DYNAMICS on/off switch is selected, press the flashing ENTER/YES button to jump directly to the DYN screen.



You can control a channel’s dynamics tools directly from the VS-2000 using the CH PARAMETERS controls—see Page 167.

### 7. EQ

In the VIEW screen's EQ section, you can see the channel's current EQ settings presented in graphic form, and can turn all of the channel's EQ bands on or off with a single switch. Set the channel's EQ parameters on its EQ screen (Page 160).



When the EQ on/off switch is selected, press the flashing ENTER/YES button to jump directly to the EQ screen.

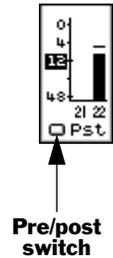


You can control a channel's EQ tools directly from the VS-2000 using the CH PARAMETERS controls—see Page 167.

### 8. Channel Output Meter

#### 9. Channel Output Meter Pre/Post Switch

The channel output meter shows the level of the channel's signal as it leaves the channel. With an input channel, this is particularly important since it shows the level at which the signal is being sent to a track and recorded—in essence, it's the recording level (see Page 177). When you're creating a mix, the meter can help you visually keep track of a channel's level.



The channel output meter pre/post switch allows you to set the channel output meter so it shows the channel signal's pre-fader level or post-fader level—it can be set to Pre ("Pre-fader") or Pst ("Post-fader"). Most of the time, leave it to set to Pst to show the channel's final output level. The Pre setting is useful if you're using a pre-fader Aux or FX bus (Page 151), or Direct path (Page 154), and want to view the level of the channel's signal before it's sent. Also, if you want to verify that a track has been successfully recorded, set its track channel meter to Pre—this lets you see the recorded signal level.

### 10. MIX

When MIX is turned on, the channel's signal is sent into the VS-2000's MASTER mix. When it's turned off, it's not. When you're mixing, each track channel's MIX parameter must be turned on to hear its signal in the mix.



As shipped from the factory, all of the VS-2000's input and track channels are sent into the MASTER mix. You may want to remove the input channels from the mix during recording so that you're not bothered by unwanted input channel signals as you play back your recorded tracks. See Page 173.

### 11. FADER

The FADER parameter sets the output level from the channel. On track channels, changing this parameter is the same thing as moving the channel's physical fader.



When a channel is linked with its odd/even partner (Page 150, Page 154), the appearance of the FADER parameter changes to a stereo fader to show that adjusting the parameter's value changes the level for both linked channels.



You can quickly jump to this parameter by pressing F2 (FADER)—see Page 166.



You can see the channel's output level in the channel output meter (Page 152).



If a channel is linked (Page 150), you can individually adjust its FADER value by pressing ENTER/YES when FADER is selected—a pop-up window with a common stereo fader and individual faders appears. Press ENTER/YES again when you're done setting FADER values in the pop-up window.

## 12. PHASE



Conflicting air-pressure changes produced by two sound waves can result in the two sounds canceling each other out momentarily—the sounds can disappear altogether. More typically, a “swirling” effect will be heard. This happens most frequently in situations with multiple mics placed close together, as when a drum kit is being recorded. To fix this, change the PHASE switch value from Nrm (“Normal”) to Inv (for “Invert”) to reverse the timing, or “phase,” of one or more of the signals until their sound waves agree and the problem is resolved.

## 13. GROUP



The VS-2000 provides 12 fader groups, each of which lets you to simultaneously control the level of a group of input, track and/or FX return channels while maintaining the volume differences between them. This can be extremely helpful if you're happy with the way a group of signals work together, but you need to make all of them louder or softer. Rather than having to individually adjust each channel's FADER level, you can assign them to a fader group and change only a single FADER value to raise or lower their levels as one unit, preserving the delicate balance you've established between them.

*To Assign Channels to a Fader Group:*

1. Set the individual channels' levels as desired.
2. Display the CH EDIT VIEW screen for the first channel you want to add to the group.
3. Set GROUP to the number of the fader group you want to use, from 1 to 12.
4. Repeat Steps 2-4 for the other channels you want to include in the group, using the same number in Step 3 for each of the channels.

Once the channels have been grouped, you can change any of their FADER values to simultaneously raise or lower the levels of all of the group's channels. To remove a channel from a group, set its GROUP parameter to OFF.



You can control the level of the track-channel fader groups using the track channel strip faders—see Page 140. If you've connected a VGA to your VS-2000, you can also assign channels to groups on the fader groups' multi-channel view page.



You can change the level of a track channel in a fader group without affecting the group's other channels by holding down CLEAR and moving its fader to the desired position. When you release the CLEAR button, the channel is returned to fader group control.

### 14. F.LINK



The F.LINK (for “Fader Link”) on/off switch lets you link the FADER parameter values of odd/even channel pairs. If the current channel is:

- *odd-numbered*—its FADER value is linked with that of the even-numbered channel to its right.
- *even-numbered*—its FADER value is linked with that of the odd-numbered channel to its left.

When two channels’ FADER values are linked, you can move either fader to control the output level of both channels simultaneously. This can be handy when you want to simultaneously adjust the levels of two related channels.



When you link two channels’ FADER values, the VS-2000 sets them both to 0dB, or to their last linked setting. When you un-link the values, they’re reset to 0dB.



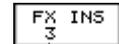
When two channels are linked, their FADER parameter changes in appearance and behaves differently. See Page 152.



The F.LINK parameter differs from the ChLink parameter in that it only links the channels’ FADER parameters. All of their other parameters remain independent of each other.

### 15. FX INS

Press ENTER/YES to jump to the FX Ins screen to insert an effect on the channel, or to remove an insert effect. See Page 215.



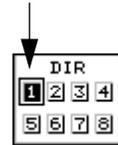
In this illustration, Effect 3 is inserted in the channel.

The FX INS display shows the number of any effect that’s been inserted into the channel’s signal flow (Page 88), or “Off” if there are no effects inserted in the channel.

### 16. DIR 1-8

Use the DIR 1-8 boxes to assign the channel to any of the eight Direct paths (Page 207) pre- or post-fader (Page 209).

DIR Bus 1 is selected and highlighted here.



To assign a channel’s signal to a Direct path from a CH EDIT VIEW screen:

1. Select the desired Direct path box.
2. Turn the Time/Value dial so that its number is highlighted.

Only one channel’s signal can be routed to a Direct path at a time, it replacing the channel previously routed to the path. For a list of the channels currently routed to the Direct paths, press ENTER/YES. Press EXIT/NO to close the list.

### 17. SOLO



Turn SOLO on to quickly isolate the channel by turning off any other channels whose SOLO switch is not turned on. To solo multiple channels, you’ll find it quicker to use Solo Mode (Page 142).



When a channel is soloed in Solo Mode, its SOLO switch is automatically turned on.

## 18. MUTE



Use a channel's MUTE switch to quickly silence the channel's signal. To quickly mute more than one channel, use Mute mode (Page 141).



When a channel is muted in Mute Mode, its MUTE switch is automatically turned on.

## 19. PAN (RSS)



The PAN knob sets the channel's stereo position in the MASTER mix and when you're performing a stereo bounce (Page 193). PAN can be set from L63—all the way to the left—to R63—all the way to the right.

When the channel's parameters are linked with another channel via the ChLink parameter, the appearance of the PAN parameter changes to show the stereo image created by the two linked channels. Adjusting the PAN parameter's value shifts their entire stereo image left or right while maintaining the positions of the two channels relative to each other.



Use the PAN parameter only when the channel's signal is being sent to a stereo destination, such as the MASTER mix, a pair of tracks or a pair of outputs.

The PAN/RSS button also allows you to assign the channel to the VS-2000's RSS Pan effect. To do this, cursor to "NRM" and turn the Time/Value dial to select RSS. If RSS Pan is not yet enabled, the VS-2000 will ask if you'd like to go to the screen on which it can be turned on. Press ENTER/YES to do so, or CANCEL/NO cancel the operation.



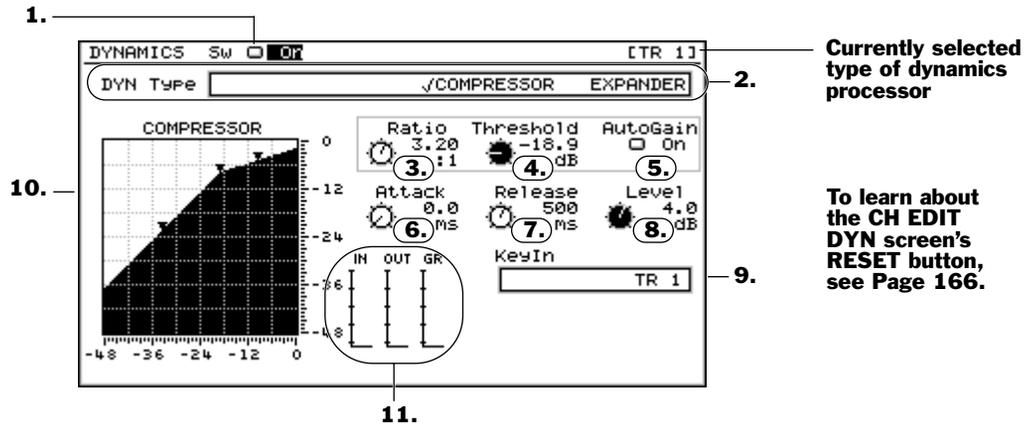
When RSS Pan is already enabled, "NRM" is shown in black. If the effect is not yet turned on, "NRM" appears gray.

When the channel is assigned to RSS Pan, the parameter changes in appearance, and controls the amount of the channel's signal being sent to the effect.



You can control a channel's panning or RSS Pan send directly from the VS-2000 using the CH PARAMETERS controls—see Page 167.

## The DYN Screen



Each VS-2000 input and track channel has its own dynamics processor that can act as a compressor or expander for the channel's signal.

### What is Dynamics Processing?

A dynamics processor—as its name suggests—shapes a signal by responding to changes in its level. It can help you control extreme fluctuations in volume or exaggerate them by reducing portions of the signal's level, or “gain.”

### The Basic Mechanics of Dynamics Processing

All dynamics processors respond to the same fundamental information:

- A threshold level setting tells the processor to start working when the channel's signal is at a particular level.
- An attack setting tells the processor how quickly it should respond when the signal hits the threshold level.
- A ratio setting tells the processor how much to change the signal's level.
- A release setting tells the processor when to stop changing the signal's level.

The VS-2000 offers you the choice of a compressor or expander on the DYN screen.

### What's a Compressor?

A compressor is a device that reduces the difference between the loudest part of a recording and the softest—what it compresses is the signal's dynamic range. This can smooth out volume peaks and can make the signal more manageable.



Compression can also add its own sound to a signal, making it seem tighter and more professional, since compressors are used so widely on commercial recordings.

When a signal's level exceeds the threshold setting, the compressor lowers the signal's gain—the ratio setting determines by just how much. The attack time sets how quickly the compressor starts reducing the signal's level after it crosses the threshold, and the release time determines how long the compressor keeps working before letting the signal return to its un-processed level.

## What's an Expander?

The DYN screen expander is a downward-type expander that exaggerates the differences between a signal's loudest parts and its softest parts—it widens, or “expands,” the signal's dynamic range. You can use an expander to make unwanted background noise quieter. An expander can also make a signal's original dynamic changes more exciting by making them more pronounced.



An expander can be handy when it's used as a gating mechanism that makes unwanted background noise quieter than it is in the original signal.

The expander works by bringing down the level of any signal that falls below the threshold level setting, making the signal even quieter. The ratio setting determines how much gain reduction will be applied. The speed at which expansion begins is set by the attack time, and the release time sets how long expansion lasts before the signal's allowed to rise back up to its un-processed level.

### 1. Dynamics Sw

DYNAMICS SW  ON

The Dynamics switch—also visible on the CH EDIT VIEW screen—turns the channel's dynamics processor on or off.

### 2. DYN Type

DYN Type  COMPRESSOR  EXPANDER

Select the desired type of dynamics processor by setting the DYN Type switch. Choose:

- COMPRESSOR
- EXPANDER

### 3. Ratio

Ratio 2.00 :1

The ratio setting determines the strength of the dynamics processing to be applied to signals as they cross the threshold level (Page 158).

<i>For a:</i>	<i>The Ratio parameter sets how much gain reduction will be applied when:</i>
compressor	the signal's level exceeds the threshold level setting.
expander	the signal's level falls below the threshold level setting.

You can set Ratio from 1.00:1 to ∞:1. The Ratio setting tells you how much a signal's level is to be changed by describing how much gain control the processor would apply to keep a signal 1 dB from the threshold. With a 4.00:1 compressor ratio, for example, every time a signal exceeds the threshold by 4 db, the compressor reduces the signal level so that it's only 1 dB above the threshold. An 8.00:1 compressor ratio therefore requires twice as much gain reduction to keep the signal down to the same 1 dB.

The logic of the Ratio setting can be simply stated as: The higher the number to the left of the colon, the more the dynamics processor reduces the level of the channel's signal as it moves beyond the threshold level setting.



When a compressor's ratio is set to a 10:1 value or higher, the compressor acts as a “limiter” because it effectively blocks signals from becoming too loud.

As you look for the right compression ratio, start out with a lower value and gradually increase the Ratio setting until you like what you hear. If the sound of the processor turning on and off is too obvious—this is called “pumping”—lower the Ratio setting.

### 4. Threshold



The Threshold value sets the signal level at which the dynamics processor starts applying gain reduction to the signal. It can be set from -24 dB to 0 dB.

For a:	<i>The Threshold parameter determines the signal level:</i>
compressor	above which the compressor begins to apply gain reduction.
expander	below which the compressor begins to apply gain reduction.

The Threshold value in essence sets how much of the signal will be processed:

- *When you're using a compressor*—setting Threshold to lower values means that more of the signal will be above the threshold and qualify for gain reduction.
- *When you're using an expander*—setting Threshold to higher values means that more of the signal will be below the threshold and qualify for gain reduction.

### Threshold and Ratio Settings for a Compressor

While all DYN parameters interact, Threshold and Ratio work together as the two most important parameters. Here are some guidelines when you're using a compressor:

- For a signal that has just a few level peaks you want to tame, try a 4:1 Ratio value with a high Threshold setting so that only the loudest levels are compressed.
- To compress a singer, start with a 2:1 ratio—and a low Threshold value—and gradually raise the Ratio value to taste.
- To smooth out a bass or tighten a snare, try a middle/low threshold and a 4:1 ratio.
- To add sustain to a lead guitar, try a ratio of 8:1 with a low threshold.

Once you've got Threshold and Ratio set, the other DYN settings come into play.

### 5. AutoGain



AutoGain automatically boosts signals whose levels have been lowered by dynamics processing so that they peak at -6 dB below 0 dB.



AutoGain sets the signal to a maximum of -6 dB in order to leave a bit of headroom for fast transient volume peaks that occur before the dynamics processor has a chance to respond.

### 6. Attack



The Attack parameter—which can be set from 0.0 ms (milliseconds) to 800.0 ms—sets the speed at which gain reduction begins when a signal:

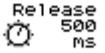
- goes above the threshold when you're using a compressor.
- falls below the threshold level when you're using an expander.

If you want to make sure your dynamics processor catches even the fastest peaks or drops in the signal, make the attack fast by setting Attack to a low value. If you're more concerned with applying gain reduction to signals that stay above or below the threshold for longer periods of time—with compression or expansion, respectively—set Attack to a higher, longer value.



Adjust the setting of the Attack parameter to help soften the audible pumping that can occur with a high Ratio value.

## 7. Release

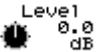


The Release parameter sets how long gain reduction will be applied, and can be set from 0 to 8000 ms. When your signal has a lot of quick changes in level, set Release to a high enough value that you don't hear the dynamics processor switching on and off constantly. If you're only interested in managing a few isolated level changes in a signal, try a shorter, lower value.



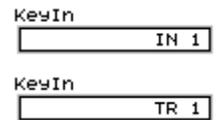
Adjust the setting of the Release parameter to help soften the audible pumping that can occur with a high Ratio value.

## 8. Level



Dynamics processing often affects the overall level of a signal. Use the Level parameter to re-adjust the signal's level as it leaves the dynamics processor.

## 9. KeyIn



The KeyIn parameter lets you select a different audio source as a trigger for your dynamics processor—the dynamics processor will respond to level changes in the KeyIn signal, and apply those changes to the current channel's signal.

- *For input channels*—you can select any input channel's signal.
- *For track channels*—you can select any track channel's signal.



To de-activate the KeyIn feature, set the KeyIn parameter to the current channel.

If the channel is linked, you can select a separate KeyIn signal for both linked channels.

The KeyIn feature can be helpful when the current channel's signal level fluctuations aren't making the dynamics processor react the way you want. If there's another signal with stronger dynamic changes that match the timing of those in the channel's signal, you can use that other signal to drive the channel's dynamics processor.

If the signal you're working with is too steady in level to adequately trigger its dynamics processor, you can create a copy of the channel's signal to use just as a KeyIn signal source—don't send the copied signal to the main mix or a track. Add exaggerated EQ (Page 160) to the copy so that its level changes are more dramatic and can better trigger your dynamics processor. If you're working with an input channel signal, you can make your KeyIn copy by assigning the input jack or connector you're using to an additional input channel. If you're working with a track channel signal, you can record a dummy track with exaggerated EQ for KeyIn use.



You can use KeyIn to set up "ducking," in which one channel's signal level is automatically lowered in response to the presence of a signal in another channel. If you're doing spot production, for example, use your voice-over as the KeyIn source for your music bed—when the voice-over starts, the bed's level is automatically lowered.

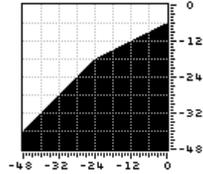


You can also create interesting special effects by using a KeyIn signal whose dynamic changes don't match those in the channel's signal. This lets you impose a new, totally different set of dynamic changes on the channel's signal. For example, a KeyIn percussion sound can make the channel's signal level go up and down in rhythm.



### 10. Graphic Dynamics Display

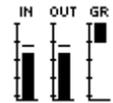
The graphic dynamics display shows how the dynamics processor is shaping the level of the channel’s signal. The numbers at the bottom of the graph represent the signal’s original level, while the levels on the right show the current effect of the dynamics processor.



Here’s a simple way to understand the graphic display. Locate your Threshold setting along the lower edge of the display. If you’re using a compressor, you can see how the compressor shapes your signal’s level to the right of the threshold. An expander’s effect is shown to the left of the threshold. With an expander/compressor, both sides of the threshold show the processor’s effect.

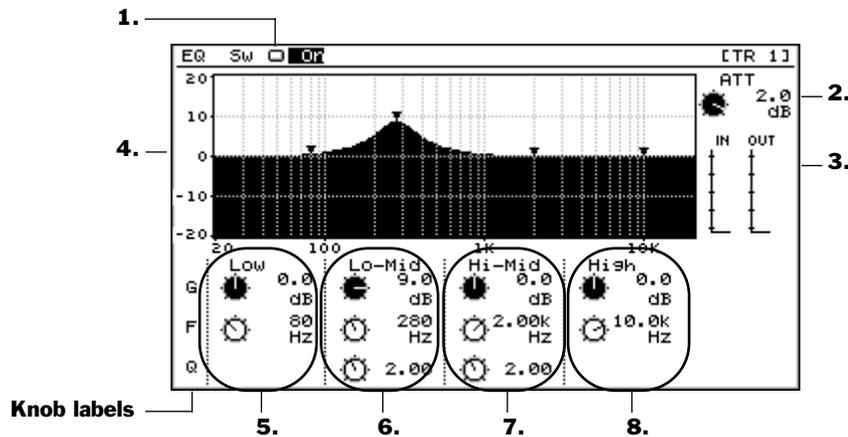
### 11. IN/OUT/GR Meters

The DYN screen provides three meters that let you see what the channel’s dynamics processor is doing to its signal at any given moment. The:



- *IN meter*—shows the signal’s original level coming into the dynamics processor.
- *OUT meter*—shows the signal’s level coming out of the dynamics processor.
- *GR (Gain Reduction) meter*—shows the amount of gain reduction being applied.

### The EQ Screen



To learn about the CH EDIT EQ screen’s RESET button, see Page 166.

Each VS-2000 input and track channel has its own EQ.

### What Is EQ?

A sound wave is a repeating change in air pressure that your ear perceives as a sound. The sound wave moves between its least amount of air pressure and its greatest many, many times per second, and *very* quickly. The number of times it repeats this cycle each second is called its “frequency.” Frequencies are measured in single cycles (called “Hertz” or “Hz”), or in thousands of cycles (“kilohertz” or “kHz”). A low-frequency sound wave repeats its cycle fewer times per second than a high-frequency sound wave does. This is important because a sound wave’s frequency determines its pitch.

In fact, every sound you hear is made up of a mix of sound waves that occur so close together in time that the ear perceives them as one single sound. Each of these sound waves is occurring at its own frequency, of course. This means that every sound you hear is comprised of sound waves at a variety of pitches and at different volumes, all working together to create a single complex sound. The low-frequency sound waves make up its bass, while the high-frequency sound waves make up its treble range.

EQ, or “equalization,” allows you to raise or lower the volume of specific sound waves within a sound, identifying the sound waves by their frequencies. By raising or lowering the volume of specific frequencies within a sound, you can change its character, making it brighter or warmer, harsher or sweeter. You can lower the volume of any frequencies you don’t like in a sound, or make other frequencies louder.

A device that performs equalization is called an “equalizer,” or simply “EQ” for short. Some equalizers divide up a signal into specific frequency ranges, or “bands,” with a set of controls assigned to each band. A low band EQ adjusts the levels of bass frequencies, while a high band EQ operates on the treble content in a signal.

### The Basic Mechanics of an Equalizer

All EQs use the same basic devices to do what they do. They all contain a:

- *frequency selector*—that allows you to select the desired frequency range by selecting the frequency at its center, sometimes called the “center frequency.”
- *gain control*—that lets you turn the selected frequencies up or down in volume.

“Parametric” EQs also offer a Q, or bandwidth, control. This control lets you set the width of the affected range of frequencies below and above the center frequency.



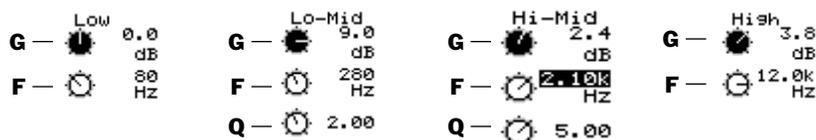
You can find a frequency by turning up the EQ’s gain and sweeping through the frequency values until you hear what you want. If you’re using a parametric EQ, lower the Q. Once you’ve found the frequency, set the gain and Q as desired.



Here’s an EQ tip: Set the gain control so that the sound changes the way you want it to, and then back off a little. This simple trick can really improve your EQ.

### The EQ Screen Frequency-Based Tools

The EQ screen provides a set of tools with which you can alter the frequency content of the channel’s signal: a filter and four bands of equalization.



G=gain control; F=frequency selector

*This tool:*

*Offers these controls:*

Low Band EQ	gain control and frequency selector
Lo-Mid Band EQ	gain control, frequency selector, Q control
Hi-Mid Band EQ	gain control, frequency selector and Q control
High Band EQ	gain control and frequency selector

The channel signal flows through the EQ screen from top to bottom in the chart above, or left-to-right onscreen.

### 1. EQ Sw

EQ Sw  On

The EQ Sw (“EQ Switch”) parameter turns the CH EDIT EQ on and off.

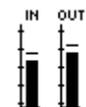
### 2. ATT

ATT 2.0 dB

The EQ screen provides easy access to the ATT parameter that also appears on the CH EDITVIEW screen. See Page 151.

### 3. EQ Meters

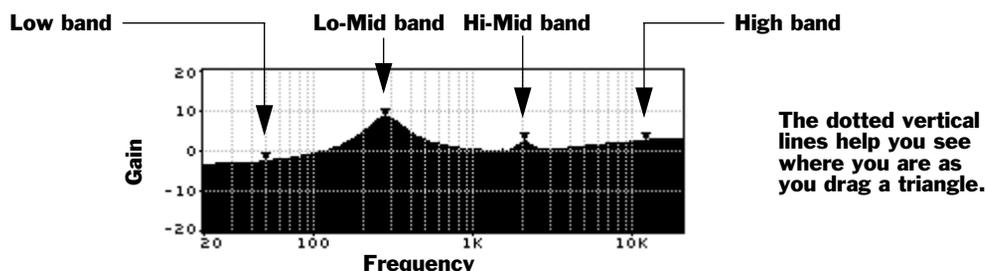
There are two meters on the EQ screen:



- The IN meter shows you the level of the signal as it enters the EQ screen.
- The OUT meter shows you the signal’s level as it leaves the EQ screen.

### 4. Interactive EQ Display

The interactive EQ display shows you the settings of the four EQs. Each equalizer is represented by a triangle.



You can change a band’s gain and frequency values on the interactive EQ display with your mouse by dragging its triangle:

- left or right to lower or raise, respectively, change its frequency.
- down or up to lower or raise, respectively, its gain.

### 5. Low Band EQ

Low 3.7 dB  
50 Hz

The Low EQ band operates on all frequencies below the selected frequency. It has a:

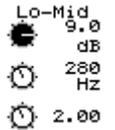
- *frequency selector*—that sets the center frequency, from 20 Hz to 1.00 kHz.
- *gain control*—that raises or lowers the level of the selected frequency range. It can be set anywhere from -15.0 dB to 15 dB.

The low band EQ is a shelving-type EQ that affects the level of all frequencies below the selected frequency, as well as a narrow range of frequencies slightly above it. As such, it requires no Q setting.

## 6. Lo-Mid Band EQ

The Lo-Mid EQ band is a parametric EQ that contains a:

- *frequency selector*—that sets the center frequency, from 20 Hz to 20.0 kHz.
- *gain control*—that raises or lowers the level of the selected frequency range. It can be set anywhere from -15.0 dB to 15 dB.
- *Q*—that sets the width of the affect range of frequencies, from .36 to 16.0.

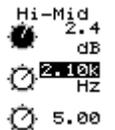


Although this EQ is called the “Lo-Mid” band, its wide range of frequency values means that you can use it to adjust the level of any frequencies in a signal, low *or* high.

## 7. Hi-Mid Band EQ

The Hi-Mid EQ band is a parametric EQ that contains a:

- *frequency selector*—that sets the center frequency, from 20 Hz to 20.0 kHz.
- *gain control*—that raises or lowers the level of the selected frequency range. It can be set anywhere from -15.0 dB to 15 dB.
- *Q*—that sets the width of the affect range of frequencies, from .36 to 16.0.

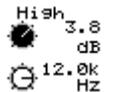


Although this EQ is called the “Hi-Mid” band, its wide range of frequency values means that you can use it to adjust the level of any frequencies in a signal, high *or* low.

## 8. High Band EQ

The high band EQ operates on all frequencies above the selected frequency. It has a:

- *frequency selector*—that sets the center frequency, from 1.00 kHz to 20.0 kHz.
- *gain control*—that raises or lowers the level of the selected frequency range. It can be set anywhere from -15.0 dB to 15 dB.



The high EQ band is a shelving-type EQ that affects the level of all frequencies above the selected frequency, as well as a narrow range of frequencies slightly beneath it. As such, it requires no *Q* setting.

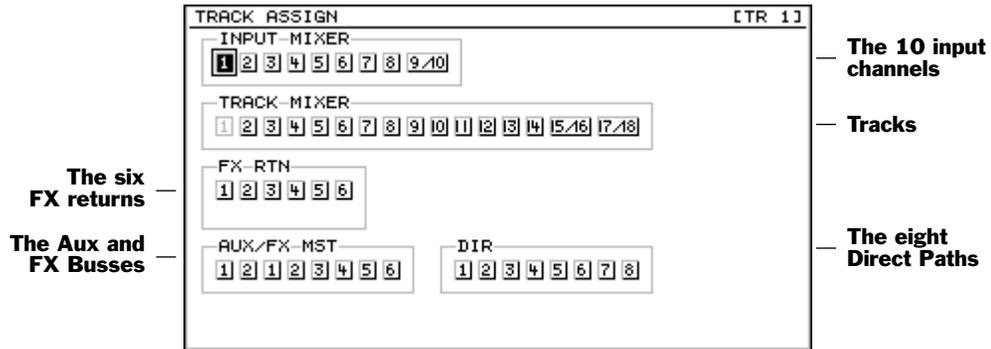
## The FX Ins Screen

The FX Ins (“Effect Insert”) screen is discussed in Chapter 16—see Page 215.

## The RSSPan Screen

The RSSPan screen is described in Chapter 16, on Page 225.

## The CH EDIT ASSIGN Screen



On a track channel’s ASSIGN screen, you can route input channel, FX return, Aux/FX bus and Direct path signals or other tracks to the current channel’s track for recording. The screen acts like the EZ ROUTING screens (Page 278), but without virtual “wires.”

To route a signal to the current channel’s track:

- use the cursor buttons to select the desired signal source and turn the TIMEVALUE dial clockwise—the selected signal source highlights to show that it’s routed to the current channel’s track. To disconnect the source, turn the Time/Value dial counter-clockwise.
- click the desired signal source with your mouse—the selected signal source highlights to show that it’s routed to the current channel’s track. To disconnect the source, click it again.

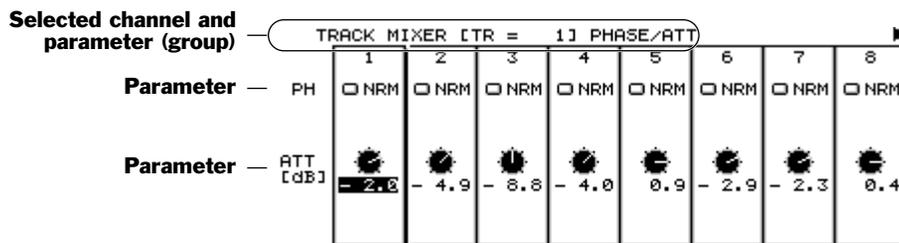


You can route as many signals to the current channel’s track as you like.



If you select a stereo source—linked input channels, tracks or Aux/FX busses—both linked signals will be combined and routed into the current channel’s track. If the current channel’s linked to another channel, the left side of the source signal will go to the odd-numbered track and the right side to the even-numbered track.

## Parameter View



The CH EDIT PRM.V (for “Parameter View”) feature allows you to view a selected CH EDIT parameter in multiple channels at the same time. You can also adjust the parameter in any of the displayed channels. This can save you time when you need to adjust the same parameter in a group of channels.

To activate the Parameter View, press F6 (PRM.V) from any CH EDIT screen except a tracks channel’s ASSIGN screen. Also, on a track channel’s CH EDIT VIEW screen, F6 (PRM.V) is unavailable when the STATUS parameter is selected—choose another parameter to activate F6 (PRM.V).





To return to the normal CH EDIT display, press F6 (CH.V).

At the bottom of the Parameter View screen is a set of four tabbed layers that contain an F button for each of the viewable parameters or parameter groups for the current channel. Press the desired F button. To reveal an F button that's currently hidden, tap PAGE until the tabbed layer it's on appears. There are also F buttons for the DYN and EQ screens that show all their parameters at once, as described below.

At the left side of the screen, you'll see the displayed parameter's name. If a group of related parameters is in view, each is labeled at the left side of the screen.

The Parameter View screen can't always show all of the channels' settings for a parameter at the same time. When all of the channels won't fit onscreen at once, you'll see an arrow pointing to the right at the right-hand side of the screen. You can press **▶** or click the arrow with your mouse to view the remaining channels, or **◀** to go back.

In some cases, you'll see up and down arrows at the left edge of the screen. In general, these mean that there's more to see above and/or below the current view—you can press **▼** or **▲**, or click either arrow with your mouse. What happens when you click one of the arrows depends on what's being viewed.

<i>When the PRM.V screen shows:</i>	<i>Use the up and/or down arrows to view:</i>
DYN parameters	the DYN screen's expander and compressor parameters. See Page 156. At the top of the PRM.V section of the display, you'll see the name of the currently displayed set of dynamics parameters. When the dynamics processor is set to compressor, all expander-related parameters are hidden, and vice versa.
EQ parameters	all of the EQ screen's parameters. See Page 160.

<i>When the PRM.V screen shows:</i>	<i>Use the up and/or down arrows to view:</i>
FXIns parameters	the effect insert settings—and patch name—for each of the available effects, one at a time. See Page 214. At the top of the PRM.V section of the display, you'll see the name of the currently displayed effect.
AUX/FX parameters	the Aux and FX send settings for the two Aux busses and six FX busses, one at a time. See Page 150. At the top of the PRM.V section of the display, you'll see the name of the currently displayed send.



If you edit a parameter while in Parameter View, its channel automatically becomes the currently selected channel.



Hold down SHIFT and press **▲** or **▼** to view the previous or next parameter's Parameter View screen, respectively.



Hold down SHIFT and press **▲** or **▼** to view the currently settings' Parameter View screen for the previous or next channel, respectively.

## Assorted CH EDIT Tools

### The CH EDIT VIEW CpyPRM Button

**[CpyPRM]**

You can copy another input or track channel’s parameter values to the current channel from the current channel’s CH EDIT VIEW screen. To do this:

1. Press F5 (CpyPRM)—the COPY MIXER PARAMETER dialog opens.



2. Set the SOURCE Ch parameter to the channel whose parameters you’d like to copy. You can select any input or track channel.
3. The COPY TARGET select the parameters you want to copy to the current channel.

Select:	To copy:
ALL	all of the source channel’s parameter settings to the current channel.
DYNAMICS	all of the source channel’s DYN screen parameter settings to the current channel.
EQ	all of the source channel’s EQ screen parameter settings to the current channel.
LEVEL	the source channel’s FADER and Aux send levels to the current channel.



The CpyPRM feature doesn’t copy the following track-channel-only parameters—STATUS, V.Trk, PlyMod.

### The DYN and EQ Screen RESET Buttons

**[RESET]**

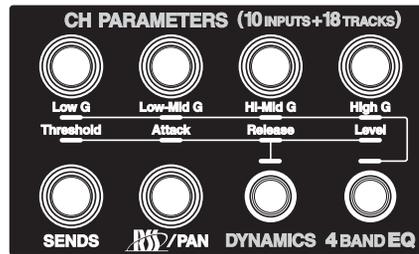
To start with a clean slate as you set up a channel’s dynamics processing or EQ, reset all of the CH EDIT DYN and EQ parameters by pressing F5 (RESET).

### The FADER Button

**[FADER]**

To quickly change on channel’s level while on a CH EDIT screen, press PAGE to display the second tabbed layer and then press F2 (FADER)—the cursor jumps to the channel’s FADER parameter.

## CH PARAMETERS Controls



The CH PARAMETERS area of the VS-2000's front panel provides a fast way to adjust important settings for the currently selected channel while the channel's CH EDIT parameters are being displayed. Using the CH PARAMETERS controls, you can adjust:

- four of the channel's DYN parameters (Page 158).
- the channel's EQ gain parameters (Page 162).
- the amount of the channel's signal going to the currently designated Aux or FX bus (Page 150).
- the panning of the channel's signal in the stereo MASTER mix, or the amount of the channel's signal going to the RSS Pan effect if it's assigned to RSS Pan (Page 155).



The upper four CH PARAMETERS knobs can control the channel's dynamics processor or EQ, but not at the same moment. Their behavior is determined by the DYNAMICS and 4 BAND EQ button. Press either button to assign the knobs to the desired job.

### Using the CH PARAMETERS Knobs

1. Display the desired channel's CH EDIT parameters.
2. To adjust the channel's:
  - *DYN parameters*—press DYNAMICS so it lights and use the top four CH PARAMETERS knobs as THRESHOLD, ATTACK, RELEASE and LEVEL knobs.
  - *EQ parameters*—press 4 BAND EQ so it lights and use the top four CH PARAMETERS knobs as LOW G, LO-MID G, HI-MID G and HIGH G knobs. If you turn the knobs while you are holding 4 BAND EQ down, you can change value of frequency.
  - *Designated Aux or FX send*—turn the SENDS knob as desired.
  - *RSS Pan amount or stereo panning*—turn the RSS/PAN knob as desired. If the channel's sending signal to the RSS Pan effect, the knob controls the amount of its signal being sent to the effect. If the channel's not going to the RSS Pan effect, the knob adjusts the channel's signal in the stereo MASTER mix.



When you press the CH PARAMETERS DYNAMICS and 4 BAND EQ buttons, the VS-2000 jumps to the selected channel's CH EDITVIEW screen for your convenience.



# 12—Working with Input Channels

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## Introduction to Input Channel Routing

This chapter discusses what to do with an input channel's signal once you've got it sounding the way you want. If you'd like to learn about:

- using the VS-2000's digital mixer, see Chapter 10.
- shaping each input channel's signal, see Chapter 11.

You can send an input channel's signal to:

- *a track in the VS-2000's hard disk recorder*—the most common destination for an input channel's signal in the VS-2000. You can route as many signals to the same track as you want. Once the signal's been routed to a track, it can be recorded on the track.
- *the MASTER mix*—You'll want to route an input channel's signal into the MASTER mix before you're ready to send it to a track for recording. You'll also want to route input channel signals into the MASTER mix when you're combining live audio input signals with recorded tracks in your final mix. This would be the case when you're running a MIDI sequencer alongside your recorded VS-2000 tracks.
- *a Direct path*—on which it can be carried to an internal effect or an output on its way to an external device such as an external multitrack recorder.
- *an Aux bus*—You can send an input channel's signal to an Aux bus on which it can travel through an output to an external device such as a headphone amplifier or an external effect processor.
- *an FX bus*—You can send an input channel's signal to an FX bus on which it can travel to one of the VS-2000's internal effects.

In the following sections, we'll discuss how to route input signals to the first three of these destinations. Chapter 15 discusses how to send signals to the Aux and FX busses.

## Routing Linked Stereo Input Channels

When you're bringing stereo audio into the VS-2000, you can link the input channel that's controlling the left side of the stereo image with the input channel that's controlling the right side by turning on the CH EDIT ChLink parameter (see Page 150).

When input channels are linked, they act as single object for routing purposes. On routing screens that show virtual wires, one wire connects both input channels to the desired destination. You can connect a linked pair of input channels to a single track or to pair of tracks whose track channels are linked (Page 150)—linked track channels share a single connection point. If you connect the linked input channels to:

- *a single track*—both input channels' signals are combined onto the selected track.
- *a linked pair of tracks*—the left input channel's signal goes to the odd-numbered track, and the right input channel's signal goes to the even-numbered track.



In the same way a linked pair of input channels acts as a single stereo object during routing, a linked pair of tracks acts as a single stereo destination.

## Routing an Input Channel Signal to a Track



When you've routed a signal to a track for recording, the signal can be recorded on the track's currently selected V-Track. To learn more about V-Tracks, see Page 95.

You can route an input signal to a track in any of three ways in the VS-2000:

- You can use the fast and easy Quick Routing mode, described below.
- You can route the signal to the track on the EZ ROUTING VIEW screen (Page 172).
- You can also route a signal to a track right from within its input channel using the CH EDIT ASSIGN screen, as described on Page 164.



While the following sections describe routing single input channels and tracks, linked input channels and tracks behave just like their unlinked counterparts during routing.



You can save any routing you create as an EZ Routing template. See Chapter 22 to learn about EZ Routing templates.

### ***When an Input Channel is Routed to a Track***

When the track is record-enabled or recording—so its TRACK/STATUS buttons is flashing red or lit solidly red—the VS-2000 automatically removes the input channel's signal from the MASTER bus. This prevents your hearing the signal through the input channel and the track's channel at the same time. When you record, you'll hear only the track channel so you know what the track is "hearing" and thus what it'll record.

As soon as the track is set to play back or turned off—so its TRACK/STATUS button is green or unlit, respectively—the VS-2000 returns the input channel's signal to the MASTER bus. If you don't want to hear the input signal, and don't want to unplug its source or lose its fader setting, you can remove it from the mix manually—see Page 172.

## Quick-Routing Input Channels to Tracks

Quick Routing begins with the selection of the desired destination track—once you've selected the track, you route the desired signal to it. In Quick Routing mode, the TRACK/STATUS buttons first select a destination track. Then, the INPUT buttons select the source input channel signal(s) you want to send to the track.

- The TRACK/STATUS button for the currently selected track channel solidly lights to show that its track is the destination track.
- The INPUT button for any channel routed to the selected track lights solidly.

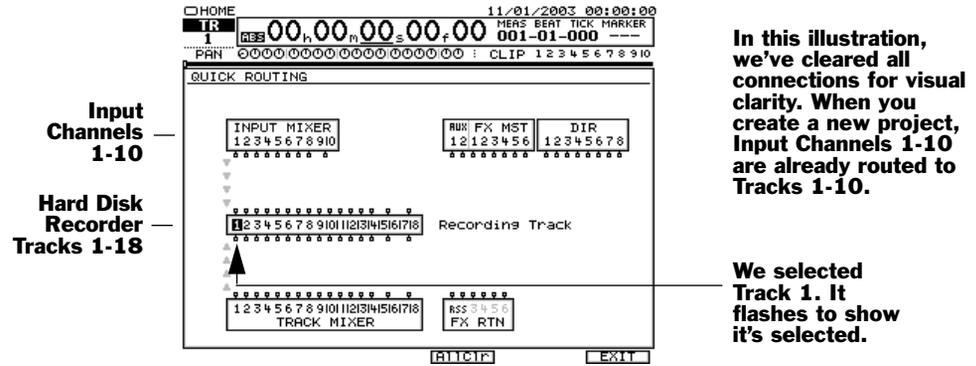
All other INPUT and FX and TRACK/STATUS buttons flash. Route each desired input channel to the track by pressing the input channel's SELECT button.



You can also route other tracks, Aux busses and FX return channels to tracks using Quick Routing, as described later.

### To Quick-Route an Input Signal to a Track

1. Make sure the CH EDIT button isn't lit—if it is, press the button to un-light it.
2. Hold down the desired track channel's TRACK/STATUS button for a second or so until the QUICK ROUTING screen appears.

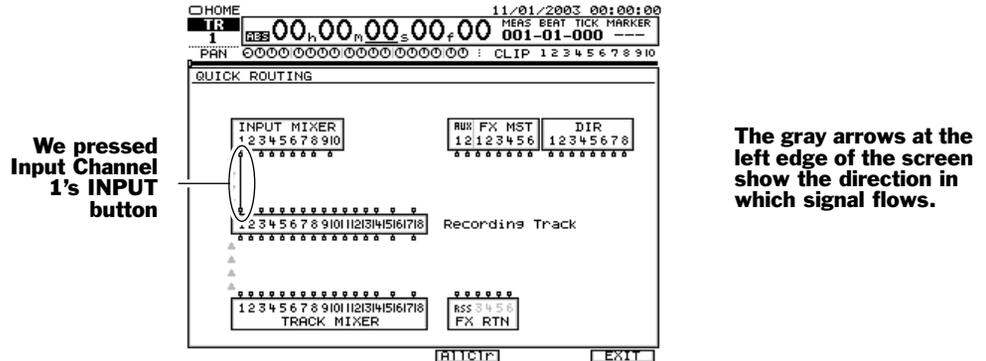


The TRACK/STATUS button you held down in Step 2 lights solidly to show the current destination track. If any input channels are already routed to the track, their SELECT buttons also light solidly.



To quickly clear all track routings, hold down the solidly-lit TRACK/STATUS button and press CLEAR, or simply press F4 (AllClr).

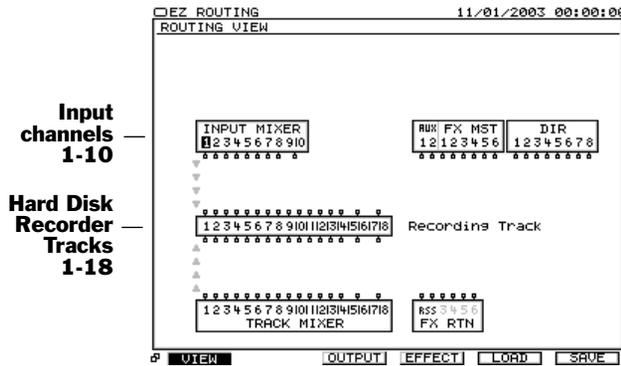
3. Press the desired input channel's INPUT button—a virtual wire appears on the screen to show the connection you've made.



4. If you want to break the connection press the INPUT button again.
5. To route another signal to the track, repeat Step 3, if necessary, and Step 4.
6. To select another destination track, press the desired track's TRACK/STATUS button—it lights solidly to show that it's now the Quick Routing destination track.
7. Repeat Steps 3 and 4 to select the input channel signal you want to send to the track.
8. When you've finished, press F6 (EXIT) to confirm your routing and leave Quick Routing mode.

## Input Signal Routing on the EZ ROUTING VIEW Screen

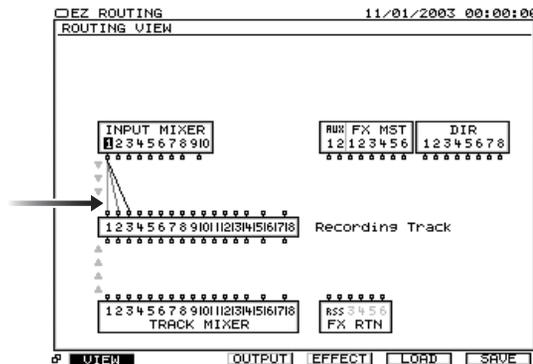
1. Press EZ ROUTING.



In this illustration, we've cleared all track connections for visual clarity. When you create a new project, Input Channels 1-10 are already routed to Tracks 1-10.

The gray arrows at the left edge of the screen show the direction in which signal flows.

2. If the ROUTING VIEW screen doesn't appear, and you see "VIEW" above F1, press F1 (VIEW)—if you don't see "VIEW" above F1, press PAGE and then F1 (VIEW). The INPUT MIXER block provides connections for the outputs of the 10 input channels at the bottom of the block.
3. Use **←**, **→**, **▲** and/or **▼** to select the desired input channel's output along the lower edge of the INPUT MIXER block. We've selected Input Channel 1's output in the illustration above.
4. Turn the Time/Value dial clockwise—as you turn it, a wire appears that connects the input channel to one track after another in the RECORDING TRACKS block.



5. Turn the dial in either direction to select the desired destination track.
6. To break the connection between an input channel and a track, repeat Steps 3 and 4, and turn the Time/Value dial counter-clockwise until no connections exist.

## Input Channel Signals and the Main Mix

### Removing Input Channel Signals from the Main Mix

When you create a new project, the VS-2000's input channels are routed into the MASTER mix to help ensure that you can easily hear their signals even before you route them to tracks. Once you *have* routed them to tracks, and recorded their signals, it can be a good idea to remove them from the main mix. When you play back your

project, you'll be able to hear your tracks without also hearing unwanted audio coming through your input channels.



If you have live mics connected to inputs, you may experience feedback from monitor speaker or headphone signals leaking into the mics. Taking the input channels out of the main mix is a good way to avoid this problem.

The idea is to remove the input channel's signal from the MASTER mix. This method spares you from having to disconnect the input signal's source from the VS-2000 or lowering its input channel fader in case you'll want to send it back into the mix later on.

### ***Removing Input Signals from the MASTER Mix***

1. Press the desired input channel's INPUT button—the input channel's CH EDIT VIEW screen appears.
2. Turn MIX (Page 152) off.
3. Repeat Steps 1 and 2 for any other input channels whose signals you've already recorded.

### **Adding an Input Channel's Signal to the Main Mix**

If you need to add an input channel back into the mix after having de-activated its send to the MASTER bus, it here's how.

### ***Sending an Input Channel's Signal into the Main Mix***

1. Press the channel's INPUT button.
2. Turn the channel's MIX parameter on (Page 152).

### **Routing an Input Channel Signal to a Direct Path**

To route an input channel's signal into the MASTER mix:

1. Press the channel's INPUT button.
2. Turn on the desired Direct path's on/off switch (Page 154).



To learn about more about Direct paths, see Chapter 15.



# 13—Operating the Hard Disk Recorder

This chapter discusses the mechanics of using the VS-2000's hard disk recorder—basically, it's all about recording and playing back a project. We'll describe the recorder's tools for navigating a project and for playing it back in a variety of ways.



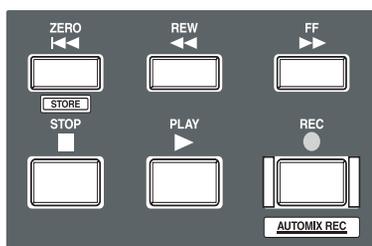
If you're not clear on what the hard disk recorder is and what it does, see "The Hard Disk Recorder" on Page 56. To learn the fundamentals of how it records and plays back audio—and how its built-in hard disk works—see Chapter 6, starting on Page 93.



You can reverse any recording action using the VS-2000's Undo and Redo features, described on Page 72.

## The Transport Buttons

### The Main Transport Buttons



The most basic tools you have for recording and playing a project—and running the hard disk recorder—are the transport buttons.

Press:	To:
PLAY	begin playback from the now line's current position in the project.
STOP	halt playback at the now line's current position.
REC	begin recording any armed tracks, as described on Page 177.
ZERO	return to Time 00h00m00s00f00, the very beginning of the project.
REW	move back in time through the project
FF	move forward in time through the project

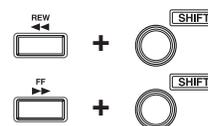


The buttons perform other tasks when SHIFT is held down. See "SHIFT Operations" on Page 399.

### Special Transport Buttons

In addition to the main transport buttons, you can jump to the:

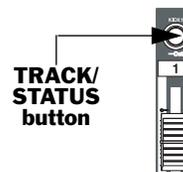
- *the beginning, or "top," of the project's audio*—by holding down SHIFT and pressing REW.
- *the end of the project's recorded audio*—by holding down SHIFT and pressing FF.



## The TRACK/STATUS Buttons

Each TRACK/STATUS button sets the behavior of its corresponding track.

On the VS-2000, the TRACK/STATUS buttons perform a host of tasks. In this chapter, we'll discuss their primary use. In order for the TRACK/STATUS buttons to behave as described in this chapter, the CH EDIT, LOCATOR•SCENE and SOLO•MUTE lights must be unlit, and the VS-2000's Rhythm Track and Harmony features must not be currently using the TRACK/STATUS buttons.



### How the TRACK/STATUS Buttons Work

Each time you press a TRACK/STATUS button, you change the current operating mode of the corresponding track. (We'll mention some shortcuts for doing this later on.) The TRACK/STATUS button's color shows you the track's current state:

<i>If the button is:</i>	<i>The track:</i>
Not lit	is turned off. No recording or playback will occur.
Green	is set to play back what's recorded on the track.
Flashing red	is ready, or "armed," for recording. What you hear depends on the RECORD MONITOR parameter's setting (Page 189).
Flashing red and amber	is armed for recording with the source signal being heard when RECORD MONITOR is set to Auto (Page 189).
Solidly lit red	the track is in the process of recording.

## Recording

This section describes recording a single mono track. If you'd like to record stereo audio across a pair of tracks, link their track channels (Page 150) and use the same procedure.

### Before Recording a Track

#### **Select a V-Track**

When you record a track, you're recording audio on the track's currently selected V-Track—to learn what a V-Track is, see Page 94. You can select a V-Track on the Home screen's V-Track map (Page 127) or by setting the corresponding track channel's CH EDIT V.Trk parameter (Page 149). In either case, you'll need to select the desired V-Track before recording.

#### **Set Up Your Routing**

Before you can record a signal, you've got to get it to the track. To learn how to route the input channel's signal to the track or pair of tracks, see Page 170.

## ***Set Up Your Monitoring and Shape the Signal to Taste***

During recording, you'll typically monitor the MASTER mix. Make sure the MASTER fader is set as desired and set the track's channel fader to 0 so you can hear the track.

If you're sure you want to make permanent changes to the signal's sound before recording, use the input channel's CH EDIT tools (Chapter 11) to do so. Otherwise, shape its sound using its track channel CH EDIT parameters. Set the input channel's fader—and FADER parameter, therefore—to the desired recording level. For tips on recording levels, see "How Do I Get Good Levels?" on Page 60.

## **Recording a New Track**

1. Press ZERO to return to the beginning of the project.
2. Hold down REC and press the track's TRACK/STATUS button. It flashes red to show that the track is armed and ready to be recorded.
3. Press REC—it, too, flashes to show that you're about to record.
4. Press PLAY—recording starts. REC and the TRACK/STATUS button light solid red.
5. To halt recording the track, press STOP.
6. If you want to record the track again, repeat Steps 1-5.
7. To play back the track, press ZERO and then PLAY.



If the RECORD MONITOR PlayRec parameter (Page 189) is set to Source, hold down STOP and press the TRACK/STATUS button before pressing ZERO and PLAY.



If you've finished recording a track, make sure that its TRACK/SELECT button is green or unlit before moving on to ensure that you don't accidentally record over the track.



You can re-record any part of an already recorded track by punching—see Page 188.

## **Playback**

### **Basic Playback Procedure**

#### ***Playing Back Recorded Tracks***

1. Make sure that the TRACK/STATUS button for any track you want to play back is lit green.



Here's a shortcut for setting a TRACK/STATUS button to green for playback. Hold down STOP and press the desired TRACK/STATUS button.

2. Bring up the track channel faders for any track you want to hear to the desired position—or to 0, if you're not sure—and make sure the MASTER fader is set to 0.
3. Set your listening level as described on Page 75.
4. Press ZERO to return to the very beginning of the project, or hold down SHIFT and press REW to go to the beginning of the project's recorded audio.
5. Press PLAY to begin playback.
6. Press STOP to halt playback.

You can begin playback from anywhere in the project by placing the now line at the desired location and hitting PLAY.

## Moving Through a Project

You can place the now line in a variety of ways, including:

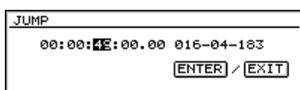
- using the current time location display (Page 130)
- locators (Page 182)
- markers (Page 186)
- the position bar (Page 126) found on many of the VS-2000 screens
- the Jump feature—see below.

## Using Jump

The VS-2000's Jump feature allows you to quickly move the now line to any location in the project:



1. Hold down SHIFT and press PAGE—a dialog appears showing you the location to which you can jump.



2. Use the cursor buttons and the Time/Value dial to select the desired destination.
3. Press ENTER/YES to move the now line to the selected location.

## Looped Playback

You can loop a section of a project so that it plays over and over. This can be handy when a section needs rehearsal, or when you're punching a section over and over as a performance is perfected (see Page 190.)



To use the Loop feature, you must first tell the VS-2000 where you want the looped section of the project to begin and where you want it to end by setting loop FROM and TO points, respectively. You can do this in a variety of ways.

### **Setting Loop Points When a Project Isn't Playing**

1. Move the now line to the beginning of the section to be looped.
2. Hold down LOOP, press FROM and release both buttons.
3. Move the now line to the desired loop end location.
4. Hold down LOOP, press TO and release both buttons.
5. If you need to re-set either point, move the now line to the desired location, hold down LOOP and press the FROM or TO button as necessary.

### **Setting Loop Points While a Project Is Playing**

For this entire process, hold down the LOOP button until instructed otherwise.

1. Start playback shortly before the location at which you want the loop to start.
2. Hold down LOOP.
3. Without releasing LOOP, press TAP at the start of the section you want to loop.
4. Continue holding down LOOP and press TAP at the end of the section.
5. Release LOOP.

### Clearing Loop Points

1. Hold down LOOP and CLEAR and press the FROM or TO button to clear the current LOOP FROM or TO point, respectively.

### Setting Loop Points Using Locators

You can learn about locators on Page 182. The following steps presume you've already placed locators at the beginning and end of the section you want to loop.

1. Press LOCATOR•SCENE—so it's lit—and select the locator bank containing the locators you've placed at the start and end of the section you want to loop.
2. Recall the locator positioned at the start of the section.
3. Hold down LOOP and press FROM.
4. Recall the locator positioned at the end of the section.
5. Hold down LOOP and press TO.

### Setting Loop Points Using Markers

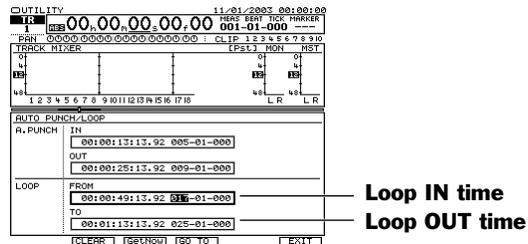
Markers are described on Page 186. Before setting your Loop FROM and TO points, place markers at the beginning and end of the section to be looped.

1. Move to the marker located at the start of the section.
2. Hold down LOOP and press FROM.
3. Move to the marker located at the end of the section.
4. Hold down LOOP and press TO.

### Editing Loop FROM and TO Points Manually

You can edit, clear and place Loop Punch FROM and TO points on the AUTO PUNCH/ LOOP screen in the UTILITY MENU.

1. Hold down SHIFT and press LOOP—the AUTO PUNCH/LOOP screen appears.



You can do a few things with your Auto Punch IN and OUT points on this screen:

- You can use the cursor buttons and Time/Value dial, or a connected mouse, to change either point's location by time code or measures and beats.
  - You can select FROM or TO on the screen and press F2 (CLEAR) to erase its current time assignment.
  - You can grab the now line's current position as a new FROM or TO point. Select FROM or TO on the screen and click F3 (GetNow).
  - You can move the now line to an FROM or TO location by selecting FROM or TO on the screen and clicking F4 (GO TO).
2. Press EXIT when you're done to confirm your changes.

## Activating Looped Playback

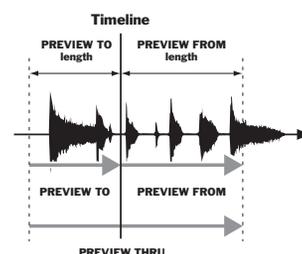
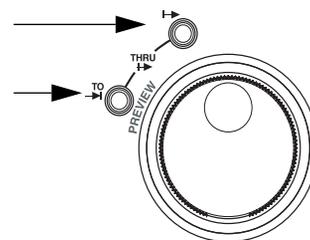
1. Move the now line to a location shortly before the section you'll be looping.
2. Press LOOP so it's lit.
3. Press PLAY—when the VS-2000 reaches the LOOP TO point, it starts over again at the LOOP FROM point, playing the looped section over and over again.
4. Press STOP to halt playback.
5. To turn looping off, press LOOP so it's not lit.

## Preview

The VS-2000's Preview feature plays a few moments of the project just before and/or after the now line's current position. This can be handy when you're trying to find the precise time at which a recorded event occurs when you're placing locators (Page 182) or markers (Page 186). You can set the preview length as described on the next page.

There are three PREVIEW functions. Press:

- *PREVIEW TO*—to play a few moments of the project leading up to the now line's current position.
- *PREVIEW FROM*—to play a few moments of the project starting at the current position of the now line.
- *PREVIEW TO and PREVIEW FROM*—to play a few moments before the now line through to a few moments after it. This is called "PREVIEW THRU."



## Pinpointing an Event with the PREVIEW Buttons

1. Position the now line in the general area of the event you want to pinpoint, noting its position in the current time location display.
2. Press PREVIEW TO to see if the preview reaches the event or plays right through it.
3. If PREVIEW TO doesn't reach the event, move the now line forward in time slightly. If it plays through the event, move the now line back a little.
4. Press PREVIEW TO again.
5. Repeat Steps 2-4 until the preview ends just at the beginning of the event.
6. Note the now line's current position and press PREVIEW FROM.
7. Make sure that none of the event is being chopped off at the front, and that as soon as you hit PREVIEW FROM, you hear the event.
8. Adjust the now line's position as necessary, checking it with PREVIEW FROM.
9. When you have the now line positioned at the moment at which the event occurs, place a locator or a marker so that you can easily return to the event as you need to.

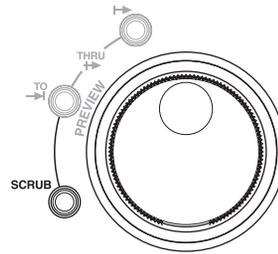


In the above instructions, we used both PREVIEW TO and FROM. You may not always need to use both to find the location you're looking for.

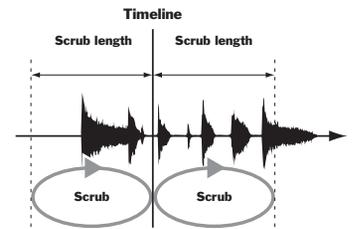
## Setting the PREVIEW TO and FROM Times

1. Hold down SHIFT and press F4.
2. If "PlyRec" isn't displayed above F4, press PAGE until it is.
3. Press F4 (PlyRec).
4. Press F2 (Param2).
5. Set PREVIEW TO LENGTH and PREVIEW FROM LENGTH to the desired times, in tenths of a second, from 1.0 sec to 10.0 sec.
6. Press F6 (EXIT) to confirm your changes.

## Scrub



When you want to find an audio event with absolutely microscopic precision—such as when you’re editing tracks—use the Scrub feature. Scrub plays a tiny piece of the project quickly over and over so that by moving the now line in small increments, you can find exactly what it is you’re looking for. You can listen just before or just after the now line, and can change the duration of the audio you hear during scrubbing.



### ***Finding an Event with Microscopic Precision Using Scrub***



If you’re looking for an event in a single track, you may find it useful to switch to the wave display’s microscopic view (Page 239) when you’re searching for exact locations using the Scrub feature. It’ll let you see what you’re hearing.

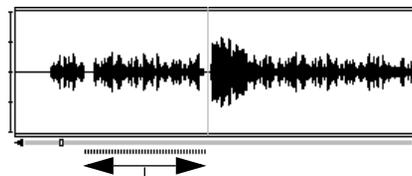
1. Press STOP if the project’s playing.
2. Press HOME.
3. Move the now line to the general location of the event you want to locate.
4. Select the track containing the event you seek.
5. Hold SHIFT and press F5 to view the track’s audio in a magnified view.
6. Press PLAY and visually locate the event you’re looking for.
7. Turn the Time/Value knob to move the now line back to just in front of the event.
8. Press SCRUB—you hear the VS-2000 play a short chunk of audio over and over.



Scrub typically plays such a short fragment of audio that you won’t see the now line moving in the wave display as it works.

9. Press PREVIEW TO.

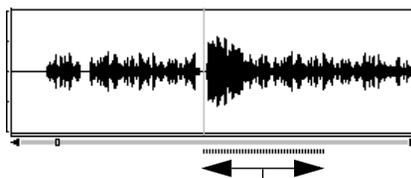
The VS-2000 previews the audio just before the now line, and sets Scrub so that it plays a tiny chunk of audio leading up to the now line.



**The gray bar beneath the waveform shows you what SCRUB TO plays**

10. In the current time location display, underline the subframe time value so you can move the now line in tiny time increments.
11. Turn the Time/Value dial slowly to pinpoint the now line position just before the event.
12. Press PREVIEW FROM.

After the VS-2000 previews the audio starting at the now line it sets Scrub to play from the event and on.



The gray bar beneath the waveform shows you what **SCRUB FROM** plays

13. Turn the Time/Value dial to set the now line so it's the very start of the event.
14. Press **SCRUB** again to turn it off.
15. Place a locator (Page 182) or marker (Page 186) at the now line's position—you can use the locator or marker to move to this spot during track editing.

### Setting Scrub Times

1. Hold down **SHIFT** and press **F4**.
2. If "PlyRec" isn't displayed above **F4**, press **PAGE** until it is.
3. Press **F4** (PlyRec).
4. Press **F2** (Param2).
5. Set **SCRUB LENGTH** to the desired time, from 25 ms (milliseconds) to 100 ms.
6. Press **F6** (**EXIT**) to confirm your changes.

## Locators

The VS-2000 can memorize up to 96 locations in a project, allowing you to jump to any one of them instantly. This makes it easy to quickly get from place to place without having to slow down to hunt for the desired location. Each place you want the VS-2000 to remember is stored in its memory as a "locator." To jump to that place, recall the locator and the now line instantly moves to its position in the project.

Locators are stored in six locator banks, numbered from 1-6. Each bank can contain up to 16 locators, numbered 1-16. You can also name each locator to help remind you where in the project it'll take you—see "Editing Locators" on Page 184.



It's best to use locators to store the locations of sections of your project, as opposed to the locations of individual audio events. Since locators are so easy to recall, they're great for getting around. For places you want to bookmark but don't plan to visit often, use markers (Page 186)—you can have up to 1,000 markers in project.

### Basic Locator Operations

The following operations take place when the **LOCATOR** indicator is lit green to signify you're in Locator mode.



You can use the Locator feature's Safe mode to perform locator operations more carefully from list in a **LOCATOR** window. See Page 184.

## Storing a Locator



You can store locator's while a project's playing or when it's stopped.

1. Press LOCATOR•SCENE if it's not already lit green.  
Each locator bank contains 16 memory slots, numbered from 1-16, in which a locator can be stored. These memory slots correspond to the 16 TRACK/STATUS buttons. When a locator's been stored in a slot, its TRACK/STATUS button lights when you're in Locator mode and its locator bank is selected.
2. Press any TRACK/STATUS button to store the locator in the corresponding memory slot. If you'd like to store the locator in a different locator bank, see "Changing Locator Banks" and press the desired TRACK/STATUS button in the selected bank.
3. If a memory slot already contains a locator, and you want to store a new locator there, you'll have to first clear the older locator. See "Clearing a Locator" below.

## Recalling a Locator

1. Press LOCATOR•SCENE if it's not already lit green.
2. If the currently selected locator bank contains the locator you want, press the locator's lit TRACK/STATUS button. To recall a locator from another bank, follow the instructions in "Changing Locator Banks" and press its TRACK/STATUS button in the selected bank.



After the locator is recalled, the VS-2000 remains Locator mode. You can change this behavior if you wish—see "Remaining In Locator Mode" on Page 184.

## Changing Locator Banks

1. Press LOCATOR•SCENE if it's not already lit green. If any locators are stored in the currently selected locator bank, their TRACK/STATUS buttons light.
2. Hold down LOCATOR•SCENE for two seconds—the LOCATOR BANK SELECT window appears.
3. Turn Time/Value dial to select the desired locator bank.
4. Press ENTER/YES to change locator banks.

## Clearing a Locator

1. Press LOCATOR•SCENE if it's not already lit green. If you'd like to clear a locator from a different bank, see the instructions in "Changing Locator Banks" first.
2. While holding down CLEAR, press the desired locator's TRACK/STATUS button. The locator is cleared from that memory slot, and the button's light turns off.



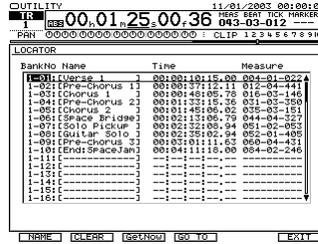
After the locator is recalled, the VS-2000 leaves Locator mode. You can change this behavior if you wish—see "Remaining In Locator Mode" on Page 184.

## Other Locator Operations

### Editing Locators

You can edit locators on the UTILITY menu's LOCATE screen. You can name them, clear them, create them, change their positions and jump to them from this screen.

1. Hold down SHIFT and press F4.
2. Press PAGE repeatedly until "LOCATE" appears over F3.
3. Press F3 (LOCATE).



4. Press ▲ or ▼ or turn the Time/Value dial to select the desired locator. You can:
  - press F1 (NAME) to rename (Page 74) the selected locator.
  - press F2 (CLEAR) to delete the selected locator.
  - press F3 (GetNow) to reset the locator to the now line's current position.



You can store a new locator at the now line's current position by scrolling to an unused locator line and pressing F3 (GetNow).

- Press F4 (GO TO) to move the now line to the selected locator's position.
5. Press F6 (EXIT) when you're done to confirm your changes.

## Remaining In Locator Mode

You can set the VS-2000 so that it remains in Scene mode after recalling and storing scenes, or so it automatically returns to Locator mode after either action.

1. Hold down SHIFT and press F4.
2. If you don't see "SYSTEM" above F1, press PAGE until you do.
3. Press F1 (SYSTEM).
4. If F1 (Param1) isn't highlighted, press F1 (Param1).
5. You can set the Rtn TO Tr STATUS Sw parameter to:
  - *On*—to automatically leave Locator mode after you store, recall or clear a locator, returning the TRACK/STATUS buttons to their usual job.
  - *Off*—to remain in Locator mode after storing, recalling or clearing a locator.
6. Press F6 (EXIT) to confirm your changes.

## Locators in Safe Mode

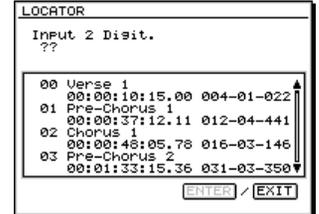
If you prefer to work with locators a bit more slowly and carefully, you can use Safe mode. Safe mode allows you to work with locators in a LOCATOR window that shows each locator's number and name. You can also store and clear locators in Safe mode. While this is a slower way to work, it provides greater certainty that you've got the right locator.

### Turning on Locator Safe Mode

1. Hold down SHIFT and press F4.
2. If "SYSTEM" doesn't appear above F1, press PAGE until it does.
3. Press F1 (SYSTEM).
4. The LOCATOR/SCENE TYPE parameter turns Safe mode on or off—see Page 379. Its default value is Quick. To turn on Safe mode, select Safe.

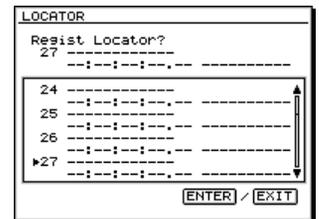
### Recalling a Locator in Safe Mode

1. Press LOCATOR•SCENE so it lights green—the LOCATOR window opens.
2. Turn the Time/Value dial to highlight the desired locator.
3. Press ENTER/YES to recall the selected locator and close the window, or just press ENTER/NO twice to leave the window without recalling a locator.



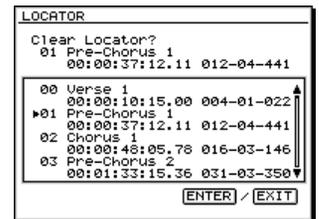
### Storing a Locator in Safe Mode

1. Position the now line at the desired location on the project.
2. Press LOCATOR•SCENE so it lights green—the LOCATOR window appears.
3. Turn the Time/Value dial to select the desired unused locator slot.
4. Press ENTER/YES to store the now line's current position as a new locator and close the window, or just press EXIT/NO twice to leave the window without registering the locator.



### Clearing a Locator in Safe Mode

1. Press LOCATOR•SCENE so it lights green—the LOCATOR window appears.
2. Turn the Time/Value dial to select the desired locator.
3. Press CLEAR—"Clear Locator?" appears.
4. Press ENTER/YES to clear the selected locator and close the window, or just press EXIT/NO three times to leave the window without clearing the locator.



## Markers

You can bookmark up to 1,000 locations in a project using markers. Markers are a great way to keep track of key moments in a project. You can use them to tag edit points you've located using the Preview (Page 180) or Scrub (Page 181) features. You can also use them to re-order the sections of a project using the Region Arrange feature. Markers can be named and manually edited.

You can see the last marker the now line passed in the current time location display. If there are no markers in the project, the marker area of the display (Page 130) shows “—.” If the now line hasn't yet reached the first of the project's makers, you see “\*\*\*.”



We recommend using markers to tag the locations of individual project events, and using locators (Page 182) to memorize where your project's sections are since you can recall locators more quickly than markers. And with 1,000 markers, you won't use them all up as quickly as the 100 locators in a project.



When you create an audio CD on the VS-2000 (Chapter 27), you'll place special CD track markers to identify the selections on the CD.

### Placing a Marker

You can place a marker when the project is stopped or when it's playing.



There must be at least 0.1 seconds of time between any two markers.

#### To Place a Marker

1. Press TAP to place a marker at the now line's current location. The marker appears as a downward-pointing arrow above the home screen's playlist in the location at which you hit TAP.



We've placed three markers, as shown by the arrows above the playlist.

#### How Marker Numbers are Assigned

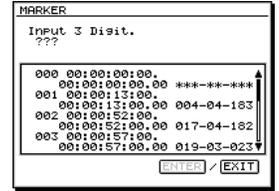
When a marker is placed, it's assigned a number—this number serves as the marker's name unless you manually edit it (Page 188). A marker's number reflects its position in a chronological list of all of the markers in a project. If new markers are placed in the project, any markers that follow them are renumbered to reflect their new, later position in the marker list.

## Moving the Now Line to a Marker

### Using the Locate to Marker Window

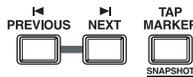
You can jump to any marker's position in the project at any time.

1. Hold down SHIFT and press F6—the Locate to Marker window appears.
2. Turn the Time/Value dial to place an arrow to the left of the desired marker—ENTER/YES turns on.
3. Press ENTER/YES to jump to the marker's location.
4. Press EXIT/NO to close the window.



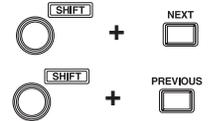
You can also clear a marker from the Clear Marker window, as described on Page 187.

### Using PREVIOUS and NEXT



You can jump from one marker to the next, or back using the PREVIOUS and NEXT buttons:

- Hold down SHIFT and press NEXT—to jump to the next marker in the project after the now line's current position.
- Hold down SHIFT and press PREVIOUS—to jump to the last marker in the project before the now line's current position.



You can change the behavior of the PREVIOUS and NEXT buttons so you don't have to hold SHIFT. As shipped from the factory, they're set to move from phrase to phrase on the selected track (Page 240). To change the buttons' behavior, switch the PREVIOUS/NEXT Sw Utility menu parameter (Page 379) to MARKER.

## Clearing Markers



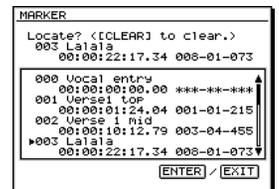
In addition to the two methods listed here, you can clear a marker in the UTILITY menu's Marker screen, described in "Editing Markers" on Page 188.

### Clearing a Marker Using PREVIOUS and NEXT

1. Move to the marker you want to clear using PREVIOUS or NEXT (see above).
2. Hold down CLEAR and press TAP.

### Clearing a Marker in the Clear Marker Window

1. Hold down SHIFT and press F6—the Locate to Marker window appears.
2. Turn the Time/Value dial to place an arrow to the left of the desired marker.
3. Press CLEAR—the Clear Marker window appears.
4. Turn the Time/Value dial to select another marker if you want to.
5. Press ENTER/YES to clear the selected marker.
6. Press EXIT/NO to leave the Clear Marker window.
7. Press EXIT/NO to close the Locate to Marker window.



### Clearing All Markers at Once



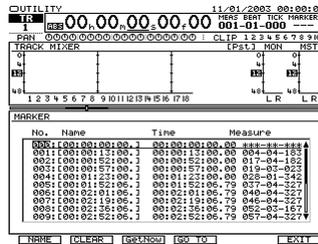
When you clear all markers, every marker in the project is deleted, including all CD track markers.

1. Hold down SHIFT and CLEAR and press TAP. The VS-2000 asks if you're sure you want to delete all of the project's markers.
2. Press ENTER/YES to clear all of the project's markers, or EXIT/NO to cancel the operation.

### Editing Markers

The UTILITY menu's Marker screen provides tools for naming, clearing, resetting or jumping to any marker.

1. Hold down SHIFT and press F4.
2. Press PAGE until "MARKER" appears above F2.
3. Press F2 (MARKER).



4. Press ▲ or ▼ or turn the Time/Value dial to select a marker to edit. You can:
  - Press F1 (NAME) to rename (Page 74) the selected marker.
  - Press F2 (CLEAR) to delete the selected marker.
  - Press F3 (GetNow) to reset the marker to the now line's current position.
  - Press F4 (GO TO) to move the now line to the selected marker's position.
5. Press F6 (EXIT) when you're done to confirm your changes.

### Punching

You can re-record any section of an already-recorded track using a process called "punching." The process actually has three stages, each with its own name:

- When you start the re-recording, you "punch in."
- The re-recording act itself is called the "punch."
- When you end the re-recording, you're "punching out."

On the VS-2000, you can punch manually, or you can pre-set the places in the project where you'll punch in and out using the Auto Punch feature. Auto-punching is great for hands-free punching when you're recording yourself.

The VS-2000 punches in and out quite quickly, so you can punch even very small pieces of a track if you're fast enough. If you're not, use Auto Punch.

## Monitoring During Punching

When you're punching on a track somewhere other than at the very start of the project, you'll typically begin playback just before the section you want to re-record. This lets you get oriented before recording actually starts. However, you may want to hear either of two things on the track as you wait for the punch. Would you (or your performers) prefer to hear the already recorded track or the live input signal?

- If you listen to what's already on the track, you'll be able to hear where you are, but you won't really be able to warm up or rehearse because you won't hear yourself.
- If you choose instead to listen to the live input signal, you won't be able to hear the recording, and may not know exactly where to come in for the punch.

You can hear either the already recorded audio *or* the live input signal, which is called the "source signal" in this context.

- When the project is stopped—so it's neither recording or playing back—you'll hear the source signal.
- The RECORD MONITOR parameter on the UTILITY PlayRec screen (Page 383) determines what you'll hear before, during and after a punch. If it's set to:
  - *Auto*—you'll hear the recorded track before the punch and the source signal as you record. After you punch-out, you'll hear the recorded track.
  - *Source*—you'll hear the source signal before, during and after the punch.

## Before You Punch

When you're re-recording a portion of a track you've just recorded, you don't have to do anything to prepare your signal for punching. If you're punching on a track recorded at an earlier time, do your best to match the original recording's sound and level.

Decide how you want to monitor the punch as described above, listening before the punch to the already-recorded audio or to your source signal.

## Punching In and Out Manually

If you want to punch something quickly without stopping to set up an auto-punch—and you've got a hand free—you can punch in and out using the transport buttons.

1. Hold down REC and press the track's TRACK/STATUS button so that it's flashing red to arm the track for recording.
2. Move to a location in the project shortly before the spot where you want to punch in—pick a place that lets you get your bearings before the punch-in occurs.
3. Press PLAY.
4. When you reach the place at which you want recording to start, press REC—recording begins and the REC button lights solid red.
5. To punch out, press REC again when you reach the point at which you want recording to end.

## Auto-Punching

The VS-2000's Auto Punch feature automatically punches in and out at specified locations in the project. When you use Auto Punch:



- You don't have to bother with manually punching in and out and can concentrate on what's being recorded
- If you're recording yourself, you can punch hands-free.
- If you'll be needing to do the same punch over and over until the recorded performance is just right, Auto Punch ensures that each attempt will occur at precisely the same location as the last.



You can use Auto Punch together with looped playback (Page 178) to automatically record multiple takes of the same section as a performance is perfected. Set the loop so that it starts a measure or two before the punch, and ends a measure or two after it so that the section plays over and over in a musically sensible way. Make sure LOOP and A.PUNCH are lit during punching. You can retrieve past takes recorded with this method using the Take Manager and New Phrase features, described in Chapter 19.

An auto-punch begins with the placement of Auto Punch IN and OUT points that tell the VS-2000 where you want to punch in and where you want to punch out. There are a few ways different ways you can set these—use whichever method you prefer.



You can manually edit the Auto Punch IN and OUT point locations to make their placement more precise. See Page 191.

### **Setting Auto Punch Points When a Project Isn't Playing**

1. Move the now line to the desired punch-in location.
2. Hold down A.PUNCH and press IN.
3. Move the now line to the desired punch-out location.
4. Hold down A.PUNCH and press OUT.
5. If you need to re-set either point, move the now line to the desired location, hold down A.PUNCH and press the IN or OUT button. You can repeat this as many times as necessary.

### **Setting Auto Punch Points While a Project Is Playing**

1. Start playback shortly before the location at which you want the punch to begin.
2. Hold down A.PUNCH.
3. Without releasing A.PUNCH, press TAP at the desired punch-in point.
4. Continue holding A.PUNCH and press TAP at the desired punch-out location.
5. Release A.PUNCH.

### **Clearing Auto Punch Points**

1. Hold down A.PUNCH.
2. Without releasing A.PUNCH, hold down CLEAR and press IN or OUT.
3. Release A.PUNCH.

### Setting Auto Punch Points Using Locators

You can learn about locators on Page 182. The following steps presume you’ve already placed locators at the desired punch-in and -out locations.

1. Press LOCATOR•SCENE—so it’s lit green—and, if necessary, select the locator bank containing the locators you want to use as punch-in and punch-out points.
2. Recall the locator positioned at the start of the section you want to punch.
3. Hold down A.PUNCH and press IN.
4. Recall the locator positioned at the end of the section you want to punch.
5. Hold down A.PUNCH and press OUT.

### Setting Auto Punch Points Using Markers

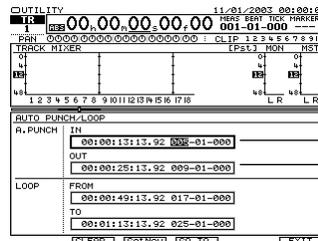
Markers are described on Page 186. Before setting your Auto Punch In and OUT points, place markers at the desired punch-in and -out locations.

1. Move to the marker located at the desired punch-in location.
2. Hold down A.PUNCH and press IN.
3. Move to the marker positioned at the end of the section you want to punch.
4. Hold down A.PUNCH and press OUT.

### Editing Auto Punch IN and OUT Points Manually

You can edit, clear and place Auto Punch IN and OUT points on the AUTO PUNCH/ LOOP screen in the UTILITY MENU.

1. Hold down SHIFT and press A.PUNCH to view the AUTO PUNCH/ LOOP screen.



Auto Punch IN time  
Auto Punch OUT time

You can do a few things with your Auto Punch IN and OUT points on this screen:

- You can use the cursor buttons and Time/Value dial, or a connected mouse, to change either point’s location by time code or measures and beats.
  - You can select IN or OUT on the screen and press F2 (CLEAR) to erase its current time assignment.
  - You can grab the now line’s current position as a new IN or OUT point. Select IN or OUT on the screen and click F3 (GetNow).
  - You can move the now line to an IN or OUT location by selecting IN or OUT on the screen and clicking F4 (GO TO).
2. Press EXIT when you’re done to confirm your changes.

### ***Performing an Auto Punch***

1. Set your Auto Punch IN and OUT points as described above.
2. Press A.PUNCH so it's lit.
3. Move to a convenient location in the project before the location you want to punch.
4. Press the track's TRACK/STATUS button so it flashes red.
5. Press REC so it flashes red.
6. Press PLAY.  
When the now line reaches the punch-in point recording automatically begins and the TRACK/STATUS and REC buttons light solidly red. When the now line gets to the punch-out point, recording automatically stops and the TRACK/STATUS and REC buttons resume flashing.
7. To turn Auto Punch off, press A.PUNCH so it's not lit.

# 14—Working with Track Channels

The VS-2000's track channels control the sound of its hard disk recorder's tracks. When you're recording a track, you listen to its source signal through the corresponding track channel to ensure you're hearing what the hard disk recorder is capturing. When you play back a track, you play it through its track channel.

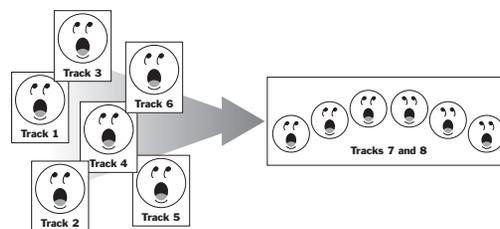
To learn how to:

- select a V-Track for playback, see Page 127 and Page 149.
- shape a track's sound, see Chapter 11, starting on Page 147.
- add effects to the track's sound, see Page 211.

In this chapter, we'll discuss a few things you might want to do with recorded tracks. We'll discuss bouncing. We'll explain how to route a track channel to a Direct path. We'll also provide some guidance on how to prepare your recorded tracks for a final mix.

## Bouncing

"Bouncing" is the process of submixing one or more already recorded tracks and recording that submix onto a new track or a new pair of tracks. There are many reasons to bounce:



- You bounce when you record your final mix onto your mastering tracks (Page 356).
- You might want to combine a group of related tracks—such as a large set of individually recorded background vocals, or a couple of instruments whose textures you're combining—so that you can work with them as a single object when you create the final mix.
- You can make your available effects processing power go farther by bouncing tracks with their intended effects. Once the tracks and effects have been bounced, you'll be free to use the effect processors for other jobs in the final mix.
- You might want to create a different-sounding version of a track.
- You can compile the best parts of multiple tracks into a single great one by bouncing their best pieces together.



When you bounce, you copy the bounced tracks, so the original tracks remain safe and sound unless you manually erase them. You can return to the original tracks if you need to do the bounce again or to do some editing or re-recording of the original material.



Though we refer to "bouncing *tracks*" for simplicity's sake, what you're really doing when you bounce is bouncing V-Tracks.



While the following sections describe performing a single bounce, you can use the same methods to perform multiple, separate bounces simultaneously to save time.

## The Mechanics of Bouncing

For most of the things you do with tracks in the VS-2000, you can think of a track in the hard disk recorder and its corresponding track channel as pretty much the same thing—the track plays through its track channel, which provides the parameters that determine how the track will play and sound.

In bouncing, however, it's important to remember the difference between the two so you remain clear about what you're doing. When you bounce, here's what happens:

- The hard disk recorder plays one or more tracks through their track channels. We'll call these the "source track channels."
- You send the output of the source track channels to a new track, or pair of linked tracks, on the hard disk recorder we'll call the "destination track or linked tracks."
- You monitor the destination track or linked tracks through their own track channels during recording and playback—each of these is a "destination track channel."
- You record the bounce onto the destination track or linked tracks.

## Mono and Stereo Bouncing

You can bounce anything you've recorded, including single mono tracks or linked tracks that contain stereo recordings. You can also bounce in mono or stereo:

- *To perform a mono bounce*—bounce to a single, unlinked track.
- *To perform a stereo bounce*—bounce to a pair of linked tracks (Page 150).



If your tracks are stereo but you bounce in mono, the stereo audio on the original tracks is combined into mono during the bounce.

Think about your final mix to decide if you should bounce in mono or stereo:

- If you're combining multiple single-track instruments that'll be positioned in the same place in the final stereo mix, bounce them in mono.
- If you're bouncing stereo instruments that'll be positioned together in the mix, bounce in stereo to retain their stereo imaging.
- If you want the bounced tracks to be heard in different left/right locations in the final mix, bounce in stereo and position them as desired in the bounce.
- If you're bouncing a single-track instrument to add a mono effect, bounce in mono.
- If you're bouncing one or more single-track instruments to add a stereo effect, bounce in stereo.
- If you're compiling bits and pieces of a mono performance, bounce in mono; if it's a stereo performance—of a pianist or a horn section, for example—bounce in stereo.

## First Things

In order to ensure success, perform the bounce in the following order:

1. If you want to perform a stereo bounce, link the pair of tracks you'll be bouncing to.
2. Route the source track channels to the destination track or linked tracks.
3. Set up your monitoring so that you're listening to the destination track channel(s).
4. Create a submix of the source track channels. If you want to add effects, route them to the destination track or linked tracks (see Chapter 16).
5. Perform the bounce.

## Link the Destination Tracks For a Stereo Bounce

To link the adjacent odd/even tracks on which you'll be recording a stereo bounce:

1. Press CH EDIT so it lights.
2. While holding down the odd-numbered track channel's TRACK/STATUS button, press the even-number track channel's TRACK/STATUS button.

## Routing Tracks for a Bounce

To set up track bouncing, you can use any of three methods:

- You can use Quick Routing—see below. (For Quick Routing basics, see Page 170.)
- You can use the EZ ROUTING VIEW screen, described on Page 196.
- You can also use a destination track's ASSIGN screen, described on Page 164.

Each pair of stereo linked track channels or hard disk recorder tracks appears as a single stereo object with a single virtual connection wire during routing. Therefore, when the following sections describe the bouncing of mono source track channels to mono destination tracks, the steps apply equally to linked source track channels and linked destination tracks—they act just like their unlinked counterparts when you're setting up routing.



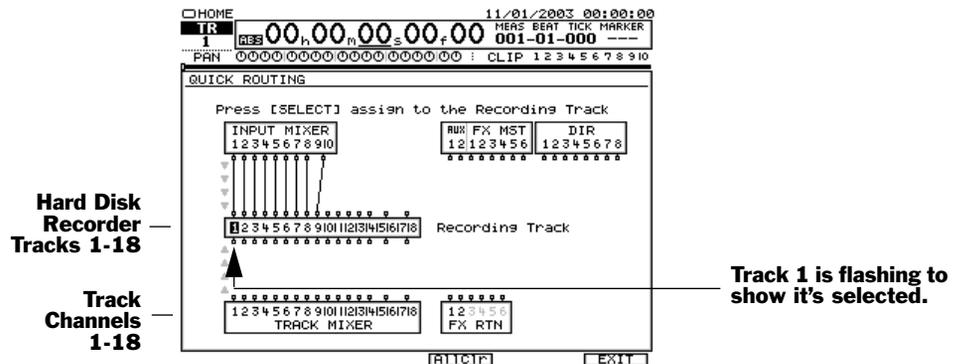
You can also include input channels, Aux busses, FX busses, Direct paths and FX return channels in a bounce. When you bounce tracks and live input signals, it's called a "live bounce."



You can save any routing you create as an EZ Routing template. See Chapter 22 to learn about EZ Routing templates.

### Quick-Routing a Bounce

1. Hold down the destination track channel's TRACK/STATUS button for a second or so until the QUICK ROUTING screen appears. (If you're bouncing in stereo, hold down either TRACK/STATUS button belonging to the destination linked tracks.)



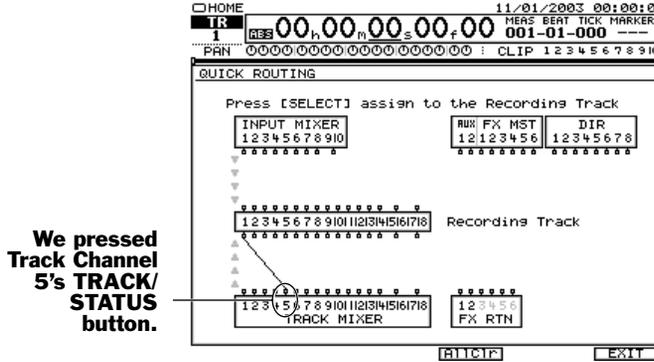
The TRACK/STATUS button you pressed in Step 1 lights solidly to show the current destination track (or linked tracks).

2. Press CH EDIT so it lights. All of the TRACK/STATUS buttons turn red except for the one belonging to the destination track you selected in Step 1. When the TRACK/STATUS buttons are red, their tracks may be selected as source tracks. If any tracks are already routed to the destination track, their TRACK/STATUS buttons light solidly—all other tracks' TRACK/STATUS buttons flash.



To quickly clear all of the QUICK ROUTING screen's connections, press F4 (AllClr).

3. Press the desired source track channel's TRACK/STATUS button—a virtual wire appears on the screen to show the connection you've made.

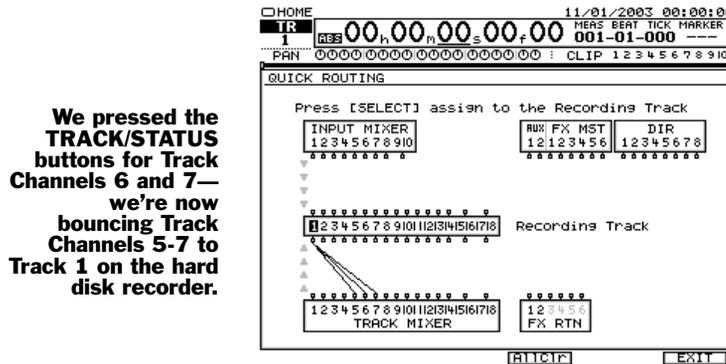


We pressed Track Channel 5's TRACK/STATUS button.

The gray arrows at the left edge of the screen show the direction in which signal flows. When you're bouncing tracks, signal flows up from the track channels to the hard disk recorder tracks.

If you want to break the connection, press SELECT again.

4. Repeat Step 3 for any other tracks you want to bounce.



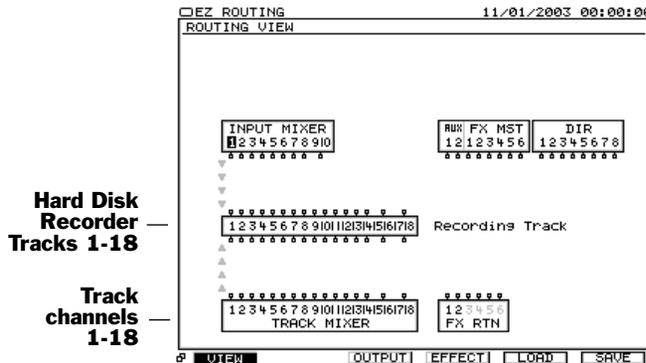
We pressed the TRACK/STATUS buttons for Track Channels 5-7—we're now bouncing Track Channels 5-7 to Track 1 on the hard disk recorder.

The gray arrows at the left edge of the screen show the direction in which signal flows. When you're bouncing tracks, signal flows up from the track channels to the hard disk recorder tracks.

5. When you're done, press F6 (EXIT) to confirm the routing and leave Quick Routing.

### Setting Up EZ Routing for a Bounce

1. Press EZ ROUTING.

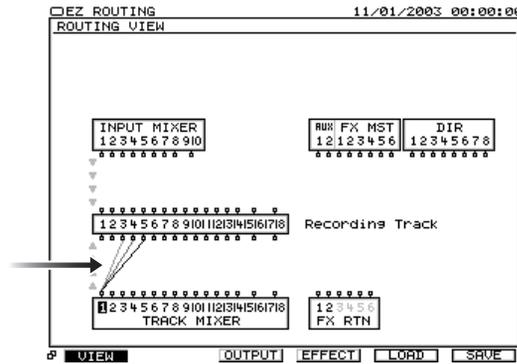


Hard Disk Recorder Tracks 1-18  
Track channels 1-18

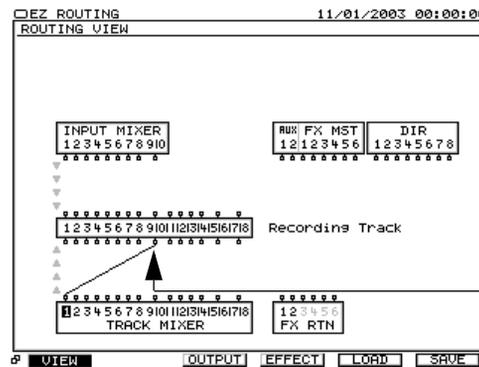
The gray arrows at the left edge of the screen show the direction in which signal flows. When you're bouncing tracks, signal flows up from the track channels to the hard disk recorder tracks.

2. If the ROUTING VIEW screen doesn't appear, and you see "VIEW" above F1, press F1 (VIEW). If you don't see "VIEW" above F1, press PAGE and then F1 (VIEW).
3. Use ←, →, ▲ and/or ▼ to select a source track channel's output along the upper edge of the TRACK MIXER block.

- Turn the Time/Value dial clockwise—as you turn it, a wire appears that connects the track channel to one track after another in the Recording Track block.



- Turn the dial in either direction to select the desired destination track.

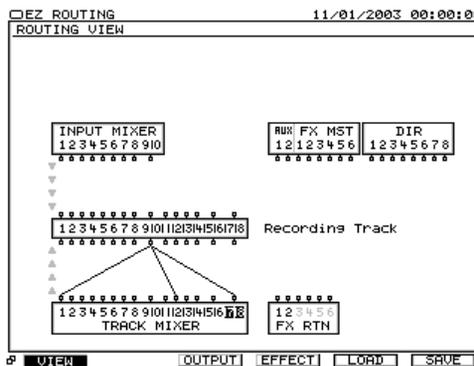


- To break the connection between a track channel and a track, repeat Steps 3 and 4, and turn the Time/Value dial counter-clockwise until no connection exists.



To clear all track-to-track connections, press PAGE until "ClrTrA" appears above F4, and then press F4 (ClrTrA).

- Repeat Steps 3-5 to route other track channels' outputs to the destination track.



**We've connected a combination of mono and stereo source track channels to our stereo destination linked tracks.**  
**Source Tracks 1 and 12 are mono track channels, and Track Channels 17 and 18 are linked in stereo.**

## Listening as You Bounce

When you bounce tracks, it's important to know what you're hearing:

- You don't want to listen directly to the source track channels.
- You *only* want to listen to your destination track channel(s).

By listening only to the destination track channel(s), you can be confident that what you hear is what you'll get in the final recorded bounce. The VS-2000 helps you monitor a bounce properly by removing the source track channels from the MASTER mix when you arm your destination track or linked tracks for recording.



It's a good idea to bounce while listening to all of the project's other track channels. This'll give you a better idea hear how the bounce will sound in the final mix.

### **Listening to the Destination Track Channels**

Make sure that:

- the CH EDIT MIX parameter for any destination track channel is turned on.
- any destination track channel fader is set to its 0 position. You can adjust the fader's position to make the bounce fit into your mix if you need to.

### **Set Up the Destination Tracks**

Arm the destination track or linked tracks for recording in order to listen to the source track channels through the destination track channel(s) as you mix the bounce.

*Record-enable the destination track(s):*

1. Hold down REC and press the destination track's TRACK/STATUS button so that it flashes red. With linked tracks, press either one's TRACK/STATUS button.

*Set RECORD MONITOR so you can hear the bounce as you rehearse its mix:*

1. Hold down SHIFT and press F4.
2. If "PlyRec" doesn't appear above F4, press PAGE until it does.
3. Press F4 (PlyRec).
4. Set RECORD MONITOR to Source so you can hear what you'll be bouncing as you play the project. (With this parameter set to Auto, you won't hear the bounce as the project's playing until you actually record the bounce.)



You may want to re-set RECORD MONITOR to Auto when you're done bouncing. To learn more about the what RECORD MONITOR parameter does, see Page 189.

## Mixing the Bounce

Make sure you've set the TRACK/STATUS button for each source track so that it's green, and that you've selected the V-Tracks that contain the audio you want to bounce (Page 149). Likewise, select the V-Track(s) on which you want to record the bounce in the destination track or track pair.

Since you'll be listening to each destination track through its track channel, it's important that you set each destination track channel so that it doesn't color the sound of the bounce. If it does, you may be fooled into making EQ mistakes or other errors as you mix together the tracks you're bouncing. Turn off all EQ, dynamics processing and FX sends in each destination track channel.

Rehearse the bounce by playing the project a few times, blending together the track channels you're bouncing. Use each source track channel's CH EDIT screens to make any desired changes to its sound. Adjust its EQ or dynamics processing values as needed. If you're bouncing in stereo, pan the source tracks as you want them to be placed in the final mix. Make any changes you want to make while you still have individual control of each track channel's signal—once they're combined in the bounce, they're all locked together. Add any effect you want to use by routing the effect processor's output to the destination tracks, and by sending the desired tracks to the effect using their track channel CH EDIT FX send controls (Page 150).



You can use Automix when you bounce. This is handy if you need to make a lot changes to your source track channel settings during the course of the bounce. See Chapter 26.

### **Setting the Overall Bounce Level**

As you blend your source track channels in the bounce, make sure their combined level is suitable for recording. You can do this by keeping your eye on the level meter for the destination track or linked track. You'll find this meter on the Home screen:

1. Press HOME.
2. If necessary, press PAGE until "TR Mix" appears above F3.
3. Press F3 (TR Mix).

## **Performing the Bounce**

Once you've complete the procedures described in the previous section, you're ready to actually perform the bounce. Since your destination track or linked tracks are already armed for recording, all you have to do is:

1. Press ZERO to return to the beginning of the project. If you're only bouncing a section of the project, navigate to a location shortly before that section.
2. Press REC.
3. Press PLAY—the bounce is recorded on the destination track or linked tracks.
4. When the bounce is finished, press STOP.
5. Hold down STOP and press the TRACK/STATUS button for the destination track or either TRACK/STATUS button for linked destination tracks. The TRACK/STATUS button(s) for the destination track or linked tracks turns green.
6. Turn off the TRACK/STATUS buttons for the tracks you've bounced so you don't hear them along with the destination track or linked tracks as you listen back.
7. Play back the bounce to make sure it's satisfactory.
8. If you need to perform the bounce again, hold down REC and press the destination track's TRACK/STATUS button so that it flashes red. With linked tracks, press either one's TRACK/STATUS button. This re-arms the track(s) for recording.
9. Repeat Steps 1-6.



You can punch in and out during bouncing just as you can during any other recording. Punching's described on Page 188.



Don't erase you're original source tracks—that way, you'll be able to redo the bounce at a later time if you need to.

## Sending a Track Channel's Signal to a Direct Path

You can send a single track channel's signal to an output using a direct path—this might be useful for a percussionist who only wants to hear a single guide instrument, for example. By using a Direct path, you save your two Aux busses for other jobs. To learn more about Direct paths, see Chapter 15.

### Routing a Track to a Direct Path

1. Press CH EDIT so it lights.
2. Press the desired track channel's TRACK/STATUS button.
3. Turn on the desired Direct path's on/off switch (Page 154).



To learn about routing a Direct path to a VS-2000 output, see Chapter 15.

## Mixing

The most important place to send a track channel's signal is, of course, to the MASTER mix bus when you create your final mix. While a complete discussion of how to mix is far beyond the scope of the *VS-2000 Owner's Manual*, here's a very brief overview of the process to get you started, since track channel signals—the sound of your recorded tracks—are the main ingredient of most VS-2000 mixes.

Any discussion of mixing has to mention a mix's other elements: effects and any live input signals you're using. Discussions of these topics can be found in other chapters.

### The Mechanics of Mixing

A final mix is nothing more—or less—than the combining of all of the project's audio into a single stereo audio signal. That includes your recorded tracks, effects you add to those recordings and any live input signals (such as MIDI instruments) required to complete the project's sound.



If you've connected your VS-2000 to a pair of Roland DS-series Digital Reference Monitors, you can try out your mix on a variety of different virtual speakers to make sure your project sounds great wherever it's played—see "Speaker Modeling" on Page 224.

To create the final mix, send all project elements to the stereo MASTER bus.

- *Recorded tracks*—are sent to the MASTER mix from their track channels. If you've inserted effects on any track channels, they go along for the ride as well.
- *Loop effects*—are sent to the MASTER mix from the FX return channels.
- *Live input signals*—are sent to the main mix from the input channels.

Make sure that the CH EDIT MIX parameter (Page 152) for any desired track, FX or input channel is turned on if you want its signal to be sent to the MASTER bus.

Since you listen to the MASTER bus during most VS-2000 operations, you're really already mixing as you balance the levels of your track channels just to make things sound good as you work. The final mix may only mean a refinement of what you've been listening to all along.



Since track channel EQ and dynamics processing affect only the playback of your tracks—and don't alter their actual recordings—why not experiment with the tracks' sound throughout the recording process? This can give you a great head-start on the final mix.

During the final mix, you'll want to:

- use the track channels' CH EDIT parameters to make each of the project's tracks sound exactly the way you want as you hear them in context with the project's other tracks, effects and so on. Adjust EQ settings, levels, panning and dynamics processing until you're satisfied.
- insert any effects into individual track channels as desired.
- send signals from your track channels to any desired internal loop effects (Page 211), and return the outputs of the effects to the MASTER bus.
- If you're incorporating any live signals, use their input channel CH EDIT parameters to refine their sound. Apply effects to them as needed.



Take advantage of the VS-2000's easy-to-use Automix feature. Automix captures changes you make to your tracks' settings as you mix, and plays them back at your command. This lets you build your mix, element-by-element, getting one thing just right, and then another, taking your time as you craft the perfect mix. To learn about Automix, see Chapter 26, starting on Page 341.

Once you've got everything fed into the MASTER bus, and sounding the way you want, the mix can be:

- recorded—bounced—down to a pair of mastering tracks for burning onto an audio CD (see Chapter 27).
- sent to any pair of the VS-2000's analog or digital outputs for recording onto an external analog or digital device, respectively.



# 15—FX and Aux Busses and Direct Paths

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The VS-2000 has three types of important pathways. Each has its own use:

- *An FX bus*—carries signals to one of the VS-2000’s internal FX processors.
- *An Aux bus*—can carry signals to an AUX output.
- *A Direct path*—carries a single signal to a selected destination.

The six FX busses, two Aux busses and the eight Direct paths share a chapter in the *VS-2000 Owner’s Manual* because they’re all pathways that carry signals to particular destinations. In addition, FX busses and Aux busses are identical except for where they usually carry signals. In this chapter we’ll explain all three, and then offer some guidance on how to use them.

It’s likely you’ll use FX busses most often, since the VS-2000’s internal effects are so important in working on the VS-2000. Here’s an overview of the features each of these pathways offers.

<i>Feature:</i>	<i>FX bus:</i>	<i>Aux bus:</i>	<i>Direct path:</i>
Carries multiple signals	Yes	Yes	No
Receives signal from pre-or post-fader	Yes	Yes	Yes
Has individual send level controls	Yes	Yes	No
Can be linked in stereo	Yes	Yes	No
Master level control	Yes	Yes	Yes
Front-panel knob control	Yes	Yes	No

## Aux and FX Busses

### FX and Aux Bus Overview

We’ll discuss the Aux and FX busses together since they work exactly the same way. The difference between them lies in how they’re typically used.

Here’s what FX busses and Aux busses have in common:

- They can both carry multiple signals at a time.
- Each input, track and FX return channel has its own FX send and Aux send controls that allow you set how much of the channel’s signal goes to either type of bus.
- You can send signals to an FX bus or an Aux bus pre- or post-fader.
- You can link odd/even FX busses or Aux busses to create a stereo pair of busses, and pan signals across the resulting stereo field as the signals are carried to their desired stereo destination.
- Each FX and Aux bus has its own parameter for setting its overall, or “master,” level.

## When Would You Use an FX Bus?

You'd use an FX bus to send an input, track or even FX return channel's signal to the desired internal effects processor. You can do this during recording and mixing. The important thing to remember is that, when you're using loop effects (Page 88), each FX bus is the pathway that a signal has to travel to reach the desired internal effect processor. FX Sends 1-6 carry signals to FX Processors 1-6, respectively.

## When Would You Use an Aux Bus?

An Aux bus can carry signals to an external effect for outboard processing, or to a headphone amplifier for your performers (see "Creating a Headphone Mix Using an Aux Bus" on Page 207).

## Sending a Signal to an FX or Aux Bus

Each input, track and FX return channel has a set of CH EDIT FX send and AUX send controls with which you can send a copy of the channel's signal to any of the six FX busses or two Aux busses. These controls, and how to use them, are described on Page 150 and Page 230.



You can quickly adjust the currently selected channel's FX or Aux send using the front-panel CH PARAMETERS SENDS knob. See Page 167.



You can configure any Aux bus or FX bus to receive channel signals from before or after a channel's fader level control. See Page 206.

## Stereo FX and Aux Busses

You can link odd/even pairs of FX or Aux busses so that each pair acts as a single stereo object. You can send a channel's signal to a pair of linked FX or Aux busses and use a panning control to place the signal's position within their stereo field.

Linked FX busses are handy when you're sending signals to an internal effect that has discreet left and right signal paths (see the *VS-2000 Appendices* for the structures of its internal effects.) This is also a great tool when you're using two Aux busses to create a stereo headphone mix for performers—when the busses are linked, you'll have full control of the stereo imaging in their mix (Page 206).

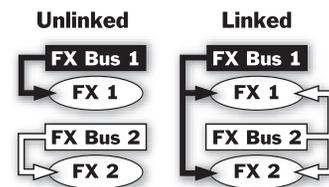
With linking, an FX or Aux bus is linked to the bus next to it. If the bus is:

- *odd-numbered*—it's linked to the even-numbered FX or Aux bus to its right.
- *even-numbered*—it's linked to the odd-numbered FX or Aux bus to its left.

Each FX or Aux bus's configuration determines whether or not it's linked to its odd/even partner. See "Configuring an FX or Aux Bus" on Page 206.

Each FX bus is always connected to its like-numbered effect processor. When a pair of FX busses are linked, both busses carry signals to both of their processors:

- *The odd-numbered FX bus*—sends signals to the left side of the two processors.
- *The even-numbered FX bus*—sends signals to the right side of the two processors.





You can link an odd or even FX bus pair from either bus’s effect processor by setting the processor’s FXLnk parameter. See Page 229.

## FX and Aux Bus Levels

As with any other signal, you need to make sure that the FX bus’s level or the Aux bus’s isn’t too quiet or loud. Rather than having to return to the individual channels’ FX or AUX send controls to solve a problem, you can simply adjust the bus’s master level fader, as described below. The VS-2000’s meters display allows you to keep an eye on your overall FX and Aux bus levels—Direct path levels appear on the same display.

### Metering FX and Aux Bus and Direct Path Levels

1. Press HOME.
2. If “AUXDIR” isn’t visible above F4, press PAGE until it is.
3. Press F4 (AUXDIR)—meters for the eight Aux/FX busses appear at the left of the meters display. Just to their right are meters for the eight Direct paths.



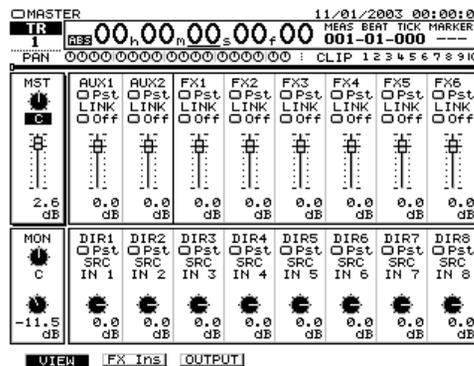
Chapter 8 discusses how the Home screen’s meters work.



For guidelines on Aux or FX bus levels, see “How Do I Get Good Levels?” on Page 60.

### Adjusting an FX or Aux Bus’s Master Level

1. Hold down SHIFT and press CH EDIT•MASTER—the MASTER EDIT screen appears.



Each FX and Aux bus has a master level parameter at the bottom of its strip.



2. Select and adjust the desired bus’ master level parameter to set its overall level.

## Configuring an FX or Aux Bus

An FX or Aux bus’s configuration determines its behavior. You can set the bus so that:

- it receives each channel’s signal before its fader (“pre-fader”) or after its fader (“post-fader”). To learn about pre- and post-fader FX/Aux sends, see Page 89.
- it’s linked to its odd/even partner. See Page 204.

You can configure an FX or Aux bus on:

- its *MASTER EDIT* screen—allowing you to set up all of your Aux or FX busses at once.
- a *CH EDIT VIEW* screen—letting you quickly configure the FX or Aux bus as you set up a channel’s other parameters.

### Configuring an FX or Aux Bus from the MASTER EDIT Screen

1. Hold down SHIFT and press CH EDIT•MASTER.

These strips control the AUX busses

These strips control the FX busses

SHIFT + CH EDIT MASTER

2. Set the bus’s Pre/Pst switch to the desired value.
3. To link the bus to its odd/even partner, turn its LINK switch on.



You can adjust the bus’s master level by moving the onscreen fader underneath its Pre/Pst and LINK switch, as described on Page 205.

Pre-Pst switch

LINK switch

### Configuring an FX or Aux Bus from a CH EDIT VIEW Screen

1. Navigate to the desired input, track or FX return channel’s CH EDIT screen (Page 147 and Page 227).
2. Cursor to the desired send’s Send Status parameter or click it with your mouse. ENTER/YES starts to flash to show that further options are available.
3. Press ENTER/YES—the following dialog box appears.

FX1 SETTING

POSITION: Pre  Pst

BUS LINK:  Off On

ENTER / EXIT

4. Select Pre or Pst for the POSITION parameter, as desired.
5. Turn BUS LINK on or off as desired.



When FX or Aux busses are linked, their controls on the CH EDIT screen change—see Page 151 for details.

## Creating a Headphone Mix Using an Aux Bus

Probably the most common use of an Aux bus is to use the bus to carry input and/or track channel signals to performers' headphones so they can hear what's going on during recording. You can send performers' live input signals along with already recorded tracks to any headphone mix you create.

Since you have two Aux busses in the VS-2000, you can create two separate mono, or one stereo, headphone mixes for your performers.

### To Set Up an Aux Bus Headphone Mix



The following steps describe how to create a stereo headphone mix. If you want to create a mono mix, skip Steps 1 and 8.

1. Link the odd/even pair of Aux busses you plan to use, as described on Page 206.
2. Set either bus's Pre/Pst switch to Pre—the settings for both Aux busses change. You'll want to use a pre-fader send so that you can adjust your individual channel faders as you record without your performers being distracted by changes you make. Their pre-fader levels will remain constant as you adjust your faders' positions.
3. Route the linked Aux busses to the VS-2000 AUX outputs.
4. Connect the VS-2000's AUX outputs to the stereo inputs of your external headphone amplifier—Chapter 21 describes output routing.
5. Display the CH EDIT screen for the first input or track channel you want to include in the headphone mix (Page 147).
6. Turn on the channel's send to the Aux bus by setting its switch to Pre. (See Page 150)
7. Set the amount of signal you want to send to the headphone mix by adjusting the send level to the linked Aux busses you're using.
8. Adjust the stereo placement of the channel's signal in the headphone mix.
9. Repeat Steps 5-8 for any other input or track channel signals you want to send to the headphone mix.
10. Hold down SHIFT and press CH EDIT•MASTER.
11. Adjust the Aux bus's master level parameter to set the headphone mix's overall volume as desired (Page 205).



You can also use effects in the headphone mix. See "Adding Effects to a Headphone Mix" on Page 234.

## Direct Paths

Here's what the eight Direct paths can do:

- They can carry a single signal.
- Each input, track and FX return channel has its own Direct path assignment switch that lets you send its signal to any Direct path.
- You can send channel signals to a Direct path pre- or post-fader.
- Each Direct path has a final level control.

## When Would You Use a Direct Path?

Wherever you might use an Aux bus to carry a single signal somewhere, you can just as easily use a Direct path—this'll save your Aux busses for other tasks. You can route a Direct path to an output jack (Chapter 21) on its way to an external device such as an external digital recorder, effect processor or computer. You can send the VS-2000's metronome output as a click track to a drummer's headphone amp using a Direct path.

### **External Insert-Like Effects**

While you can't directly insert an external effect into an input, track or FX return channel, you can use a Direct path to accomplish much the same result:

1. Configure a Direct path so that it accepts the channel's signal post-fader (Page 209).
2. Route the Direct path to a digital output—see Chapter 21 for details.
3. Connect the input of the external processor—or a computer with an effect plug-in—to the digital output to which you've routed the Direct out.
4. Assign the desired input, track or FX return channel to the Direct path (Page 154).
5. Turn off the channel's CH EDIT MIX parameter to remove it from the main mix.
6. Return the external processor's—or computer's—output to one of the VS-2000's digital inputs. (See Chapter 9.)
7. Select the digital input as the VS-2000's master clock (Page 136).
8. Send the input channel's signal into the MASTER mix or to a track (Chapter 12).

## Sending a Signal to a Direct Path

Send an input or track channel's signal to a Direct path from the channel's CH EDIT VIEW screen—see Page 154. Page 229 describes sending an effect to a Direct path.



When you send an FX return channel's stereo signal to a Direct path, its left and right sides are mixed together in the mono Direct path.



When you send a channel's signal to a Direct path, it's done using a simple on/off switch. There's no separate send level control for sending the signal to a Direct path.

## Direct Path Levels

While each Direct path's level is nominally a carbon copy of the input, track or FX return channel signal it carries, you can adjust the final level of a Direct path on its MASTER EDIT configuration screen, as described in "Configuring a Direct Path" on Page 209. This can be helpful if you're sending a channel's signal somewhere else in addition to the Direct path, or to multiple Direct paths.

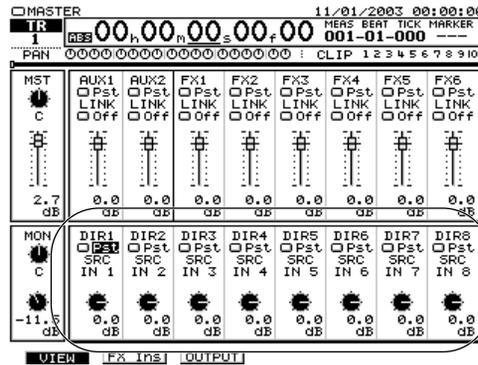
### **Metering Direct Path Levels**

You can see each Direct path's level on in the AUXDIR meters on the VS-2000's home page. See Page 205 to learn how to view these meters.

## Configuring a Direct Path

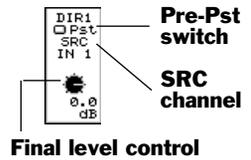
Each Direct path can receive signals from an input, track or FX return channel before or after—pre or post—the channel’s fader level control. Generally, you’ll want to use the post-fader send, though the pre-fader send can be handy when you’re using a Direct path for adding an insert-like external effect to a channel’s signal (Page 208).

1. Hold down SHIFT and press CH EDIT•MASTER.



Eight master control strips for the eight Direct paths

2. Set the Direct path’s Pre/Pst switch to the desired value.
3. Adjust the final level parameter at the bottom of its control strip.



The SRC readout shows the input or track channel signal currently assigned to the Direct path.



# 16—Using Effects

In this chapter, we'll describe how to use the VS-2000's effect processing power. We'll detail how to:

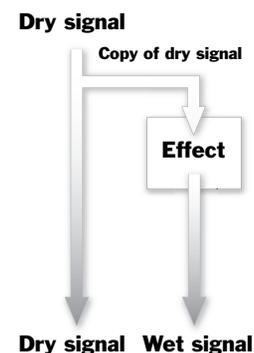
- set up a loop effect.
- insert an effect on an input or track channel, or the MASTER bus.
- add effects to a headphone mix.
- select effects.
- edit effects.
- save effects.

For the basics on the VS-2000's effects and why they're useful, see Chapters 3 and 5.

## Using Loop Effects

When you want to add reverb or a delay to your input, track or FX return signals, use a loop effect. Loop effects add effect processing to a signal—they don't replace it—so that you end up with a combination of the original dry signal and the effect.

The following sections explain how to set up an internal and external loop effect. Whether you're recording a loop effect on tracks or adding them during a mix, the process is the same—the only difference is where you send the effect's output signal when you're done, as described in Chapter 17, "Working with FX Return Channels."



## Setting Up an Internal Loop Effect

### *Play Now, Learn Later*

If you've just created a new project and would like to quickly start experimenting with loop effects—and learn about their mechanics later on—you can. When you create a new project that doesn't copy the settings of the currently loaded project (Page 102), the VS-2000 routes FX Busses 1-6 to FX 1-6, respectively. Therefore:

1. Display the desired channel's CH EDIT screen.

To learn how to display the CH EDIT screen for an input or FX channel, see Page 147.

2. Use one of the channel's FX send controls (Page 150) to send some of the channel's signal to the same-numbered effect. Use the FX 1 send controls to send the signal to FX 1, for example. Try a send level of 0.0 dB as a start.
3. Press and hold down the FX 1 button to display the CH EDIT parameters for FX Return Channel 1.
4. Adjust the effect's level in the MASTER mix by setting the FX return's FADER value (Page 230).
5. Select the desired effect—see "Selecting Effect Patches" on Page 219.
6. Repeat Steps 1 and 2 for any other input or track channels you want to send into the effect.



### ***The Mechanics of a Loop Effect***

There are five steps to setting up an internal loop effect:

1. Choose one of the internal effect processors as the one you'll use.
2. Configure the FX bus as desired.
3. Send signals to the FX bus and, as a result, to the effect.
4. Return the output of the effect to the desired destination.
5. Select and edit—if necessary—the desired effect patch.

Select the desired patch—and edit it, if necessary—as a last step since you won't be able to hear it, and what you're doing, until the previous steps have been performed.

### ***Choose an Effect Processor***

As shipped from the factory, the VS-2000 has two stereo effect processors, Effect 1 and Effect 2. With an optional VS8F-2 and/or VS-8F-3 installed, Effects 3 through 6 become available. Some algorithms work only with certain processors—see Page 220 for more information.

### ***Configure the FX Bus***

You'll need to decide whether you want to send signals from your input, track or FX return channels to the FX bus before or after the channel faders. Unless you're planning an unusual effect whose level stays constant as the dry signal level changes, configure the FX bus so that it's set to Pst.

You can link odd/even FX busses to create a stereo send into an effect. Check out the algorithm diagram in the *VS-2000 Appendices* for the effect you want to use to see if accepts stereo input signals. If it doesn't, use a single unlinked FX bus. Most VS-2000 effects use a mono input signal.

Page 206 describes how to configure an FX bus.

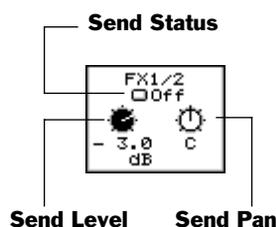
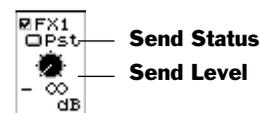
### ***Send Signals to the Effect***

You can send an input, track or FX return channel's signal to an FX bus using its CH EDIT Aux send controls.

Each input, track and FX return channel provides six sets of CH EDIT FX send controls with which you can send the channel's signal to any of the FX busses. The six FX control modules send the channel's signal to FX Busses 1-6, and therefore, to FX 1-6, respectively.

To send a channel's signal to an effect, adjust the FX send controls for the FX bus you're using:

1. Display the desired channel's CH EDIT VIEW screen.
2. Turn on the FX send control's send status switch by setting it to the available Pre or Pst value.
3. Set its send level as desired—use 0.0 dB as a starting value.
4. If you're using linked FX busses, adjust the FX send panning control to place the channel's signal in the effect's stereo field.



### ***Return the Output of the Effect***

The output of each of the six internal effects has its own channel in the VS-2000's digital mixer. These are the six FX return channels, which are the subject of Chapter 17, starting on Page 227. Their FADER parameters set their levels, and each has its own CH EDIT parameters with which you can control the sound and destination for the corresponding effect processor.



In a new default project, the six FX return channels are routed into the MASTER mix.

### ***Select an Effect Patch and Edit It if Necessary***

We'll explain how to do both of these things in "Selecting Effect Patches" on Page 219 and "Editing Effect Patches" on Page 221.

## **Setting Up an External Loop Effect**

You can use an Aux bus or Direct path to send a signal to an external effect processor. Although the effect is produced by an external device, the usual loop effect send-and-return logic still applies. In fact, a few of the steps are exactly the same:

1. Route an Aux or Direct path to the desired analog output jack or digital output connector—see Page 274 to learn how to assign Aux or Direct paths to outputs.
2. Configure the Aux or Direct path as we've already described on Page 206.
3. Send signals to the Aux bus or Direct path, and, therefore, to the external effect. You can also learn how to do this on Page 212.
4. Return the effect processor's output or outputs to one or two of the VS-2000's analog or digital inputs. Chapter 9 describes working with input signals.
5. Send the input channels' signals to the desired destination as described in Chapter 12.

## Inserting an Effect

### About Insert Effects

#### *Where They're Used*

Insert effects can be inserted on individual input and track channels. They can also be inserted on the MASTER bus when you want to run your entire mix through an effect, such as when you're mastering a project's final mix.

It's important to budget your insert effect processing power as you work because an insert effect can only work with one or two signals at a time:

- When you insert an effect on an input or track channel, you can dedicate the whole processor to the channel's signal, or only its left or right side, leaving the other side free for use by another channel.
- If an effect processor is inserted on the MASTER bus, it's unavailable for other use since the MASTER bus's stereo signal always occupies both sides of the processor.



Since each insert effect is injected directly into the channel's signal flow, no FX bus is required for bringing the channel's signal into the effect.

#### *Insert Effect Chains*



If you'd like to use more than one insert effect on a signal, you can chain multiple effects together to create an insert effect chain. With an insert effect chain, a signal flows from one processor to another before resuming its normal signal flow. This can be a great way to immediately take the signal through a series of sonic changes.

You can chain as many effects together in an insert effect chain as you have available processors. The order of the effects is always the same: Effect 1 first, then Effect 2 and so on. If you use non-consecutive effects in a chain—such as Effect 1 and then Effect 4—the signal still flows through them according to the effect processors' numerical order.

### Input and Track Channel Insert Effects

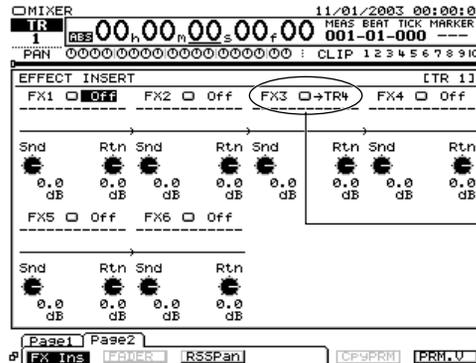
#### *Where Effects are Inserted*

When you insert an effect on an input or track channel, the channel's signal is diverted into the effect just after its dynamics processor. This means that you can perform dynamics processing on a signal before its insert effect, allowing you to shape its volume contour before insert effect processing is applied. The signal exits the insert effect and resumes its normal signal flow through the channel just before the CH EDIT ATT parameter and the channel EQ so you can EQ the effected signal if you wish to.



### Inserting Effects on an Input or Track Channel

1. Display the desired channel's CH EDIT VIEW screen.
2. Select the FX INS parameter—the ENTER/YES button begins to flash.
3. Press ENTER/YES, or press PAGE and then F1 (FX Ins), to display the EFFECT INSERT screen.



Effect 3 is already inserted on Track Channel 4

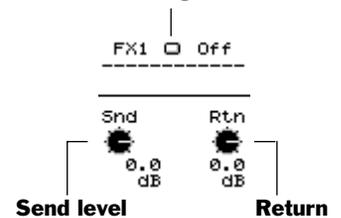


If a processor is tied up elsewhere, you'll see an arrow pointing to the input or track channel it's inserted on, as with Effect 3 above. To change this assignment, press the channel's button on which it's inserted to access its EFFECT INSERT screen.

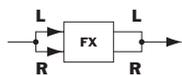
Each processor has its own set of insert controls. You can select any available effect processor—depending on the patch you want to use (Page 220)—and insert it on the current input or track channel.

Each of the effect processors is a stereo processor with left and right sides. You can insert both sides of an effect, one or the other, or both sides one-after-another, as explained below.

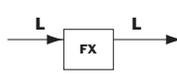
Insert assign switch



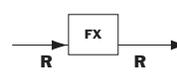
4. Select an effect's insert assign switch and turn the Time/Value dial to select the desired insert routing. You can select OFF, so that the effect isn't inserted on the channel, or you can select:



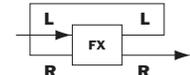
**Ins**—the channel's signal is processed by both sides of the stereo effect.



**InsL**—the channel's signal is processed by the effect's left side only.

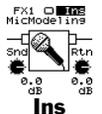


**InsR**—the channel's signal is processed by the effect's right side only.



**InsS**—the channel's signal is processed first by the effect's left side, and then by its right side.

When you select an insert routing, a symbol representing the processor's currently selected effect patch appears to show you the effect you've inserted. Lines in and out of the symbol show the selected signal flow in and out of the inserted effect.



5. You can adjust the level of the signal going into the insert effect using the effect's Snd control. You can also adjust the Rtn level of the signal as it leaves the effect. With a single insert effect, you'll typically adjust these settings only if there's a problem with the sound of the effect.

6. If you're constructing an insert effect chain, repeat Steps 5 and 6 for each desired insert effect.



The Snd and Rtn levels become more important when you're using more than one insert effect, since multiple insert effects do more to affect the signal's level. If any effect in the chain sounds distorted, lower the effect's Snd level or the Rtn level of the preceding effect. The Rtn setting for the very last insert effect in the chain sets the final volume of the signal as it resumes its normal signal flow through the channel.

7. Once you've set up your insert effects, select the desired effect patch for each—see "Selecting Effect Patches" on Page 219.

### ***Insert Routing Tips***

Here are some tips to help you choose the most suitable of the four possible insert routings—Ins, InsL, InsR and InsS—for your input or track channel signal. In general, the type of routing you should select depends on the effect patch you'll be using. Specifically, it depends on how the patch's algorithm treats its left and right sides. Refer to the algorithm diagrams in the *VS-2000 Appendices* to see how each algorithm works.

#### *The Ins Routing*

Many of the VS-2000's effect algorithms combine their left and right inputs into a single signal for processing. The Ins routing is therefore an excellent candidate for effect patches based on these algorithms. You can insert the left and right side of these effects on different channels, but since both sides will end up being processed as single sound, there's not much point in doing so.

#### *The InsL and InsR Routings*

When an effect patch's algorithm processes its left and right sides independently, you can treat the processor as if it's two mono processors rather than a single stereo processor. You can insert each side of the processor on different channels using the InsL or InsR insert routing. A number of the VS-2000's algorithms are designed for this kind of use.

#### *The InsS Routing*

The InsS routing sends the channel's signal into and out of the left side of an effect, and then into the right side. When you use this routing with an effect patch whose algorithm treats the left and right sides independently, you essentially double the effect's power. For example, if you use InsS with an effect that uses the Parametric Equalizer ("PEQ") algorithm, the signal goes through its four-band EQ on the left, and then the four-band EQ on its right, turning the algorithm into an eight-band equalizer.

## MASTER Bus Insert Effects

### Where Effects are Inserted

MASTER bus insert effects are inserted onto the MASTER bus just before its final level control—the MASTER fader. Use an insert effect on the MASTER bus if an entire mix needs a particular type of processing.

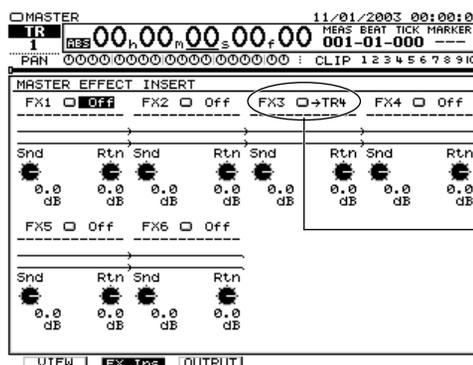
When you master your final mix in preparation for burning an audio CD or for transfer to a computer or other external digital audio device, you can apply an insert effect to the whole mix from within the VS-2000's Mastering Room. The VS-2000 offers a large collection of Mastering Tool Kit ("MTK") effect patches designed for just this purpose: to apply the finishing touches to a great mix.



If your VS-2000 is connected to Roland DS-series monitors (Page 75), you can insert a Speaker Modeling effect patch on the MASTER bus—see Page 224 for details.

### Inserting Effects on the MASTER Bus

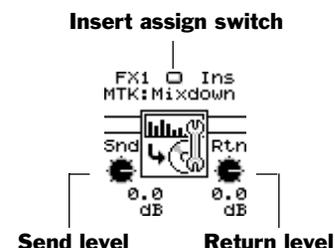
1. Hold down SHIFT and press CH EDIT•MASTER.
2. Press F2 (FXIns)—the MASTER EFFECT INSERT appears.



Effect 3 is already inserted on Track Channel 4

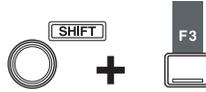
The MASTER EFFECT INSERT screen operates in much the same way as the input and track channels' EFFECT INSERT screen, though it's a bit simpler: only one insert routing is needed for each effect since a MASTER bus insert effect always uses both sides of its processor.

3. Select the desired effect's insert assign switch and select:
  - *OFF*—so that the effect is not inserted on the MASTER bus.
  - *Ins*—to insert the effect on the MASTER bus.
4. As necessary, use the insert effect's Snd and Rtn controls to adjust the level of the signal coming into the insert effect or out of it, respectively.
5. Repeat Steps 3 and 4 for any other effects you want to insert on the MASTER bus.
6. Once you've set up your insert effects, select the desired effect patch for each—see "Selecting Effect Patches" on Page 219.



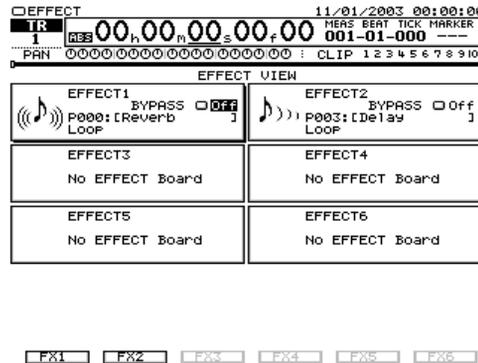
## Selecting, Editing and Saving Effect Patches

You'll find the screens on which you select, edit and save effect patches in the EFFECT menu. To view the EFFECT menu, hold down SHIFT and press F3 (EFFECT).



### The EFFECT VIEW Screen

When you press the EFFECT MENU button, the EFFECTVIEW screen appears. This screen shows you a menu of your effect processors, and provides basic information about each, as well as a BYPASS switch.



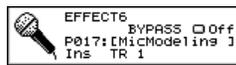
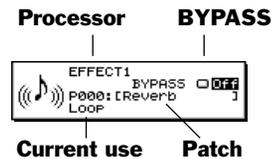
**This VS-2000 has only the factory effects installed, so Effects 3-6 are unavailable.**

There's a box on the screen for each of the eight possible internal effects—if you haven't installed the optional VS8F-2 or VS8F-3 board required for an effect, you'll see "No EFFECT Board" in its box, as is the case with Effects 3-6 in the illustration above.

### Information in the Effect Boxes

Each effect's box on the EFFECTVIEW screen shows:

- the name of the effect processor
- the name of its currently selected effect patch, along with a symbol representing the algorithm on which it's based.
- whether the effect is currently available as a loop effect or is currently in use as an insert effect—if it is, you can see where's it's inserted, as show below.



**This processor is currently inserted on Track Channel 1.**

### About the BYPASS Switch

The BYPASS switch on the EFFECTVIEW screen also appears as F5 (BYPASS) on other effect screens. It behaves the same way everywhere.

When a processor's Bypass feature is turned on, any signals sent to the processor go around it instead of through it, so the signals are not processed. In essence, the effect is turned off. Therefore, if BYPASS is:

- *Off*—the effect processor is on.
- *On*—the effect processor is off.

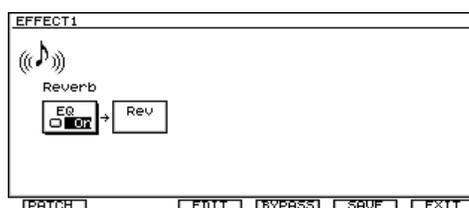
When a processor is bypassed, it remains that way until you reset its BYPASS switch.

### Setting Up an Effect Processor

At the bottom of the EFFECTVIEW screen is an F button for each of the eight effect processors.



## The Algorithm View Screen



The Algorithm View screen is each internal and VS8F-2-based effect processor's home page. It shows you a diagram of the algorithm on which the effect's currently selected patch is based. It also acts as the gateway to the screens on which you select, edit and save effect patches.



For information on using VS8F-3 effects, consult the VS8F-3's documentation as well as the documentation accompanying your third-party plug-ins.

On the Algorithm View screen, press:

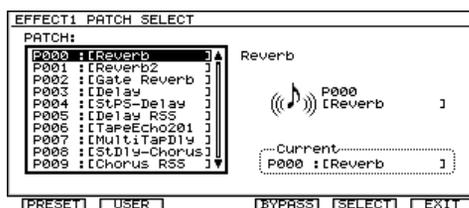
- *F1 (PATCH)*—to select an effect patch for the processor
- *F2 (EDIT)*—to edit the selected patch's parameters.
- *F4 (SAVE)*—to save the patch's current settings as a new effect patch.
- *F5 (BYPASS)*—to bypass the processor (see Page 218).
- *F6 (EXIT)*—to return to the EFFECTVIEW screen.

## Selecting Effect Patches



To learn about using VS8F-3 effects, consult the VS8F-3's documentation as well as the documentation accompanying your third-party plug-ins.

When you press F1 (PATCH) on the Algorithm View screen for an internal or VS8F-2-based effect processor, its PATCH SELECT screen appears.



## **Preset and User Effect Patches**

The VS-2000's memory contains 250 "preset" patches designed to meet a wide range of effect-processing needs. The preset patches can't be erased or modified—though you can use them as the basis for your own patches—so they're always there for you to use.

You can also store 200 of your own "user" patches in the VS-2000's memory. You can create these patches starting with the onboard effect algorithms—see "Starting from Scratch" below—or customize preset patches for your own use and save them as your own new user patches. Your collection of user patches is available in any project.



As shipped from the factory, the VS-2000's user patches are copies of the first 200 VS8F-2 preset patches. Since they're only copies, you can replace them with your own user patches without fearing that you're losing anything.

### **Starting from Scratch**

The 36 effect algorithms (Page 55) built into the VS-2000 and found on each VS8F-2 card are the foundation on which effect patches are built. To build your own effect patch from scratch, begin with one of the first 36 preset patches: P000-P035. These patches use each algorithm's default settings.

Each plug-in effect on a VS8F-3 card also has its own presets you can use, and that can serve as the basis for your own effect patches.

### **Effect Patch Prefixes, Numbers and Names**

Each effect patch is named using a specific set of naming conventions that provides information about the patch. Each patch has a:

- *prefix*—that tells you if it's a preset patch or a user patch. If the patch's name starts with a "P," it's a preset patch. If it starts with "U," it's a user patch.
- *number*—that shows you the patch's position in the patch list.
- *name*—that describes the patch. If the patch isn't a default patch (see above), its name is preceded by an abbreviation that tells you the algorithm it's based on. A default patch's name is the name of its algorithm.

### **Match the Patch to the Processor**

Due to the processing requirements of some of the effect algorithms, not all patches can be used by all of the processors.



Consult the documentation that accompanied your VS8F-3 and its plug-ins to learn about their processing requirements.

Built-in and VS8F-2 effect patches based on the following algorithms can't be selected for the even-numbered effect processors, Effect 2, 4 and 6:

- Reverb
- Gate Reverb
- Vocoder2 (19)
- Voice Transformer
- Mastering Tool Kit



In the patch list for the even-numbered processors, any patches based on these algorithms are grayed-out and unselectable.

Since the following VS8F-2 algorithms require two effect processors, they can only be selected for odd-numbered processors—Effect 1, 3 or 5—and the selected processor’s even-numbered partner—Effect 2, 4 or 6, respectively—becomes unavailable for other use:

- Vocoder2 (19)
- Voice Transformer
- Mastering Tool Kit

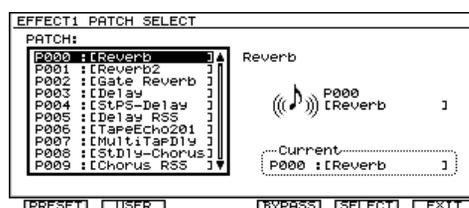


If an odd-numbered processor uses a patch based on one of these algorithms, the EFFECT VIEW box and F button for its even-numbered partner is grayed-out.

## Selecting an Effect Patch

To navigate to an effect’s PATCH SELECT screen if you’re not already there:

1. Hold down SHIFT and press F3.
2. Press the processor’s F button to display its Algorithm View screen.
3. Press F1 (PATCH).



To select an effect patch on the PATCH SELECT screen:

1. Press F1 (PRESET) to jump to the first preset effect patch in the patch list, or press F2 (USER) to jump to the first user patch.
2. Turn the Time/Value dial to select the desired patch. You can use the dial to scroll through all of the preset and user patches if you want to.
3. Press F5 (SELECT) to load the selected effect patch.



The *VS-2000 Appendices* contains an effect patch list that tells you whether a built-in or VS8F-2 patch is designed for use as a loop or insert effect. The list also tells you if the patch has stereo inputs—so it treats its left and right sides independently—or if its input is mono.



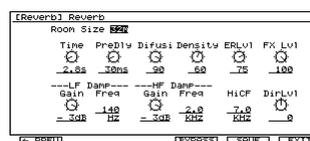
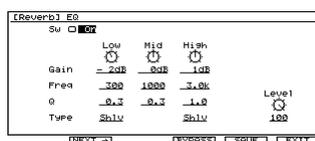
The BYPASS switch is explained on Page 218. Press F6 (EXIT) to return to the processor’s Algorithm View screen.

## Editing Effect Patches



To learn about using VS8F-3 effects, consult the VS8F-3’s documentation as well as the documentation accompanying your third-party plug-ins.

Press F3 (EDIT) on an internal or VS8F-2-based effect processor’s Algorithm View screen to view the first editing screen for the selected effect patch. In the illustration below, you can see the two editing screens for the first effect patch, P000 Reverb.



Each algorithm provides a set of parameters with which you can change the effect processing it produces. To learn about each algorithm's parameters, see the *VS-2000 Appendices*. When you edit a patch, you edit the values for the algorithm—or algorithms—on which the patch is based.

It's not uncommon for a patch to have more parameters than will fit on one screen. When this is the case, you can navigate between the patch's screens by pressing F2 (NEXT) to move to the next editing screen, or F1 (PREV) to move back.



All changes you make to a patch can be heard as soon as the next signal is sent into the effect processor.

### ***Editing an Effect Patch***

To navigate to an effect's first editing screen if you're not already there:

1. Hold down SHIFT and press F3.
2. Press the processor's F button to display its Algorithm View screen.
3. Press F3 (EDIT).

To edit an effect patch on any of its editing screens:

1. Select a parameter you want to edit.
2. Set its value as desired.

### ***Effect and Direct Level Settings***

Many effect patches offer FX Lvl ("effect level") and DirLvl ("direct level") parameters. These two parameters are of special importance since they set the balance between wet and dry signals. FX Lvl sets the level of the processed signal, while DirLvl sets the level of the original signal. Both parameters have a range from -100 to 100, with 0 silencing the effected or original signal, respectively.

If a patch is designed for use as a loop effect, it'll be added to the dry input or track channel signal in the MASTER mix or on tracks. Therefore, FX Lvl is typically set to 100, the maximum volume, and DirLvl is set to 0.

With an insert effect, on the other hand, the effect's output replaces the original signal, so the FX Lvl and DirLvl values are more similar. While great care has been taken to pre-program the right FX Lvl/DirLvl balance for each patch, you may wish to adjust these settings for your project.

### ***Preserving Patch Edits***

There are two ways you can preserve an effect patch edit. You can:

- Save your current mixer settings—including your effect settings—as a scene, as described in "Scenes" on Page 142.
- Save your effect patch edits as a new user patch, as described in the next section.

## Saving Effect Patches



To learn about using VS8F-3 effects, consult the VS8F-3's documentation as well as the documentation accompanying your third-party plug-ins.

From the Algorithm View screen of an internal or VS8F-2-based effect processor—or any of its edit screens—you can press F5 (SAVE) to store the patch's current parameter values as your own user effect patch (see "Preset and User Effect Patches" on Page 220).

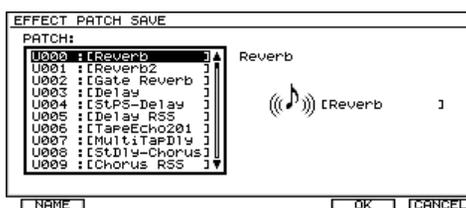
When you press F5 (SAVE), the EFFECT PATCH SAVE screen appears, and the list of 200 user patches is presented. You can replace any of the current user patches with your new effect patch.



Until you begin saving your own patches, all of the user effect patches are merely copies of the first 200 preset patches, so feel free to replace any of them—you won't be losing anything you don't already have as a preset patch.

### Saving an Effect Patch

1. Hold down SHIFT and press F3.
2. Press the processor's F button to display its Algorithm View screen.
3. Press F3 (EDIT).
4. Edit the patch as desired.
5. Press F5 (SAVE) to view the EFFECT PATCH SAVE screen.



To save an effect patch on the EFFECT PATCH SAVE screen:

1. Turn the Time/Value dial to select one of the 200 user effect patch memory locations. The patch currently residing the selected location will be replaced with the new patch you're saving.
2. If you'd like to cancel the patch-saving operation, press F6 (CANCEL).
3. Press F5 (OK) to store your current patch settings as a new user patch in the selected user memory location.
4. Press F1 (NAME) and name the new patch—to learn about naming, see Page 74.
5. Press F5 (OK) when you're done.

## Speaker Modeling

If you're using Roland's DS-series Digital Reference Monitors, you can take advantage of the VS-2000's Speaker Modeling feature. Speaker Modeling allows your DS-series to simulate the sound of a wide range of speakers, including popular studio monitors and consumer stereo speakers. Since the trickiest part of mixing is making sure your audio sounds good no matter where it's heard, Speaker Modeling great because it lets you to try out your mix on a variety of virtual systems.

### Using Speaker Modeling

1. Insert a built-in or VS8F-2 effect on the MASTER bus as described on Page 217.
2. Hold down SHIFT and press F3.
3. Press the F button for the effect you selected in Step 1.
4. Press F1 (PATCH).
5. The Speaker Modeling effects patches are P220-P-230. Each patch is an emulation of a different kind of speaker—the patch's icon shows you the speaker it's based on.



See the *VS-2000 Appendices* for a list of the Speaker Modeling patches.

6. Press F (SELECT) to choose the desired model.

## Microphone Modeling

The microphone modeling effects built into the VS-2000 and found on a VS8F-2 card can make audio captured by an inexpensive mic sound like it's been captured by one of the world's best studio mics.

In order to create a realistic microphone model, the VS-2000 needs to know the sonic characteristics of the mic you're really using. The VS-2000's Microphone Modeling effect patches are designed to work with several different mics:

- Roland DR-20
- SM-10 (headset mic)
- AKG C3000B
- Lavalier (necklace) mic
- Shure SM-57

If you have one of these mics, you can insert an effect on your mic's input channel and select the desired Microphone Modeling effect patch to transform the sound of your microphone.

### Using Microphone Modeling

1. Insert the desired built-in or VS8F-2 microphone modeling effect on your mic's input channel as described on Page 215.
2. Hold down SHIFT and press F3.
3. Press the F button for the effect you selected in Step 1.
4. Press F1 (PATCH).
5. The Microphone Modeling effects patches are P110-P-138. Select a patch based on the kind of mic you're using.



See the *VS-2000 Appendices* for a list of the built-in and VS8F-2 Microphone Modeling patches.

6. Press F (SELECT) to choose the desired model.

## RSS PAN



The VS-2000's RSS Pan effect adds a rich three-dimensionality to stereo audio signals, offering intelligent control of the size and even the placement of the sound in the listening space.

Up to four channels' signals can be sent to the RSS Pan effect.

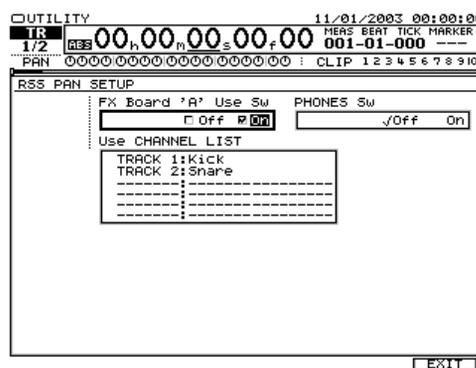
RSS Pan can be used only with unlinked channels.

The RSS Pan effect requires the use of one of the VS-2000's effect boards. When the board is allocated to RSSPan, it can't be used for other effects or the analyzer.



### To Configure the RSS Pan Feature:

1. Hold down SHIFT and press F4.
2. Press PAGE repeatedly until "RSSPan" appears above F2.
3. Press F2 (RSSPan)—the RSS PAN SETUP screen appears:



4. Cursor to the Use EFFECT Board parameter and turn the Time/Value dial to select the effect board you'd like to use for producing the RSS Pan effect. You can select Off—for no RSS Pan—or VS8F-2 A or B.

You can use the B effect board only if your VS-2000 has two VS8F-2s installed.

5. Press ENTER/YES to confirm your selection.
6. If you'd like to hear RSS Pan in your PHONES jack, turn the PHONES Sw on.
7. To select the first channel to which you'd like to apply RSS Panning, cursor down to the top line in the USE CHANNEL LIST box and turn the Time/Value dial to select the desired input or track channel.
8. To send additional channels' signals to the RSS Pan effect, cursor to the other lines in the Use CHANNEL LIST box and turn the Time/Value dial to select the desired channel or channels.

You can also assign channels to the RSS Pan effect directly from their CH EDIT screens, as described on Page 155.

To record a signal with RSS Pan applied, route the RSS effect to the desired pair of tracks on the EZ Routing ROUTING VIEW screen. When RSS Pan is turned on "RSS" replaces "1" and "2" in the FX RTN block onscreen.





You can use Automix's Gradation feature to smoothly move between different RSS Pan positions. Automix provides a special RSS PAN Grad. MODE parameter that allows you to move between RSS Pan positions in front of you—when the parameter's set to Clockwise—or behind you—when it's set to Counterclockwise, providing that the desired direction of movement wouldn't push the signal beyond the lowest or highest possible RSS Pan values.

# 17—Working with FX Return Channels

The VS-2000 has six FX return channels, one for each of its six effect processors that are available when you've installed optional VS8F-2 and/or VS8F-3 effect boards. The FX return channels control the stereo outputs of Effects 1-6, respectively, when they're set up as loop effects.



When an effect is inserted on an input or track channel, or the MASTER bus, it requires no FX return channel. Therefore, if this is the case, the effect's FX return channel is deactivated.



When the VS-2000 is shipped from the factory, Effects 1 and 2 are available. You can install optional VS8F-2 or VS8F-3 effect boards to add another pair of stereo effects, up to a total of six stereo effects.

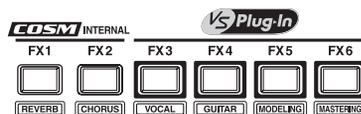
## ***What Does an FX Return Channel Do?***

Each FX return channel provides a set of controls for the stereo signal produced by its corresponding effect processor, Effect 1-6. An FX return channel has a FADER parameters with which you can set the level of the stereo effect. It also provides a set of CH EDIT tools that let you manage the effect and send it to the MASTER mix, print the effect to hard disk recorder tracks, or to Aux or Direct paths.

## **FX Return CH EDIT Tools**

### ***Displaying an FX Return Channel's CH EDIT Screen***

1. Press the FX processor's button.

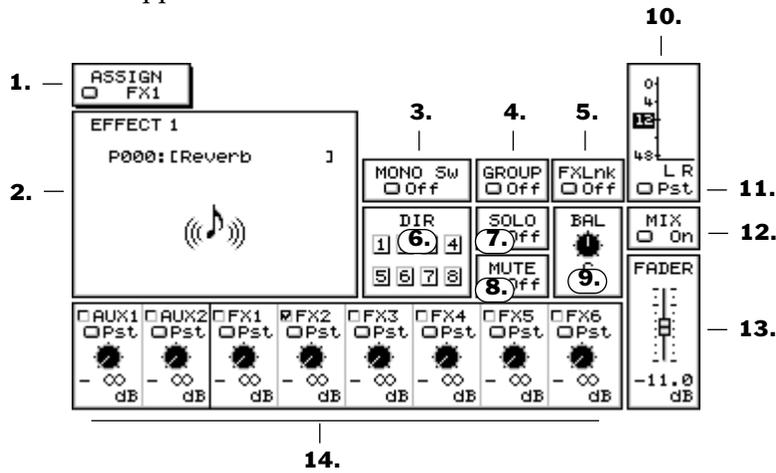


Each FX return channel has three FX return CH EDIT screens. It has a:

- main CH EDIT screen (see Page 228)
- RSSPan screen (Page 225)
- Parameter View screen (Page 231)

## The Main FX Return CH EDIT Screen

1. Press and hold the desired FX return channel's FX button—its main CH EDIT VIEW screen appears.



### 1. ASSIGN

The ASSIGN selector shows the FX bus that carries signals to the FX return channel's effect processor. This is also shown on the EZ ROUTING EFFECT screen described on Page 279.



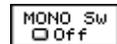
### 2. EFFECT Algorithm Display

The EFFECT algorithm display shows the algorithm on which the effect's currently selected patch is based. When the display is selected, the ENTER/YES button flashes—press the ENTER/YES button to jump to the effect's Algorithm View screen (Page 219).



### 3. MONO Sw

The MONO Sw ("Mono Switch") allows you to collapse the left and right sides of the stereo effect into a mono signal. To restore the effect to stereo, turn Mono Sw off.



When the effect's output is mono, you can use its BAL (Page 229) parameter to pan the effect to the desired location.

### 4. GROUP

You can assign the effect's output to any of the VS-2000's 12 fader groups that allow you to control the levels of multiple input, track and/or FX return channels. The parameter operates in exactly the same way as the input and track channel GROUP parameter—see Page 153.



## 5. FXLnk

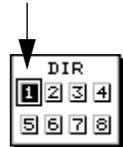


Turn on the FXLnk (for “FX Bus Link”) parameter to link the effect’s FX send bus to its odd/even partner. When sending signals to an effect with stereo inputs, this allows you to send signals individually to the effect’s left and right inputs (Page 204).

## 6. DIR 1-8

Using the DIR 1-8 parameters, you can route the effect to an output after sending it to any of the eight Direct paths (Page 207). You can use a pre- or post-fader Direct path, as explained on Page 209. Chapter 21 describes working with the VS-2000 outputs.

DIR Bus 1 is selected and highlighted here.



To send an effect to a Direct path from its FX return channel:

1. Select the desired DIR parameter box.
2. Turn the Time/Value dial so that the desired Direct path becomes highlighted.

Only one channel’s signal can be routed to a Direct path at a time. When you assign a channel to a Direct path, it replaces the channel that had previously been routed to the bus. For a list of the channels currently routed to the Direct paths, press ENTER/YES. Press EXIT/NO to close the list.

## 7. SOLO



Turn SOLO on to quickly isolate the effect by turning off any other channels whose SOLO switched is not turned on. When you want to solo multiple signals, use Solo Mode (Page 142)—it’s faster.



When an effect is soloed in Solo Mode, its SOLO switch is automatically turned on.

## 8. MUTE



Use the MUTE switch to quickly silence the effect’s output. To mute more than one channel, you’ll probably find it easier to use Mute mode (Page 141).



When an effect is muted in Mute Mode, its MUTE switch is automatically turned on.

## 9. BAL



The BAL (“Balance”) control sets the stereo placement of the effect when it’s sent to a stereo destination such as the MASTER mix or a pair of linked tracks. The BAL parameter shifts the effect’s entire stereo image leftward or rightward while maintaining the positions of its left and right sides in relation to each other. The parameter can be set from L63 to R63.

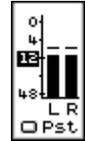


When Mono Sw is turned on, BAL acts as a simple pan control of the effect’s mono signal.

### 10. Effect Output Meter

### 11. Effect Output Meter Pre/Pst Switch

The Effect output meter shows the effect's output level as it's sent to the selected destination. The meter can show pre- or post-fader levels. Most of the time, you'll want to view post-fader levels to see the effect's true output level. If you're sending the effect pre-fader to one or two Aux or FX busses (Page 230) or Direct paths (Page 229), you may want to view its pre-fader level to see what you're sending.



### 12. MIX

When MIX is turned on, the effect is sent to the MASTER bus. When it's off, it's not. To add the effect to a mix, make sure MIX is turned on.



Listen to an effect as you record a track—without recording the effect—by sending the track channel's signal to the effect, setting MIX to On and making sure the effect isn't routed to the track (Page 232). You'll hear the effect in the MASTER mix as you record.

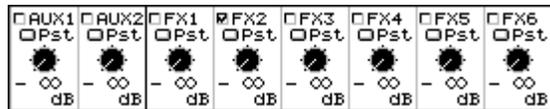
### 13. FADER

The FADER parameter's value sets the output level of the effect.



### 14. AUX and FX Send Controls

Each FX return channel has a set of two Aux send controls and six FX send controls with which you can send the effect to any Aux or FX bus or pair of linked Aux or FX busses.



You can use these controls to send the effect to:

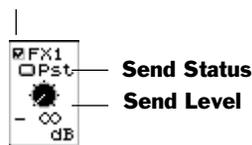
- *headphone mixes*—You can send the effect to an Aux bus routed to an output that's connected to a performer's headphone amplifier input. This procedure is described in detail in "Adding Effects to a Headphone Mix" on Page 234.
- *another effect*—You can create a chain of effects in the VS-2000 by sending one effect's output to an FX bus routed into another effect's input. If you want, you can repeat the process by sending the second effect to a third and so on.
- *external devices*—Send the effect to Aux busses routed to outputs connected to an external device.



Though the VS-2000 doesn't prevent you from doing so, sending an effect's output to the FX bus routed to its own input can produce unpredictable results.

Each of the Aux and FX send busses has its own set of three controls.

#### SENDS Knob switch

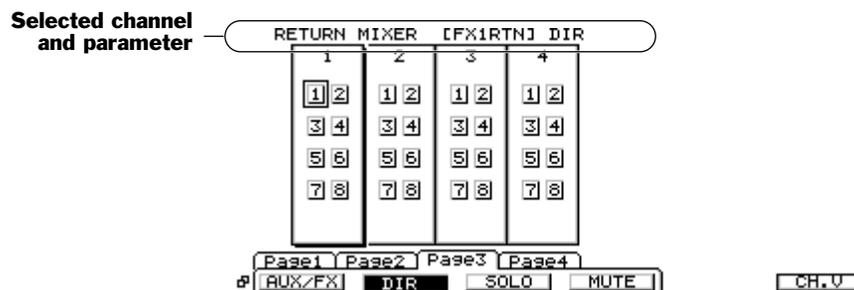


- *The SENDS Knob switch*—When this parameter is checkmarked, it designates the send to be controlled by the CH PARAMETERS SENDS knob (Page 167). The VS-2000 remembers the setting for each channel, so whenever you select a channel, the SENDS knob takes over control of the desired AUX or FX send.
- *The Send Status parameter*—turns the channel’s send to the FX or Aux bus on or off. You can select:
  - *Off*—so that no signal is sent to the Aux or FX bus from the channel.
  - *Pre or Pst (depending on the Aux or FX bus’s current configuration)*—to turn on the send to the Aux or FX bus from the channel.
- The Send Level parameter sets the amount of the channel’s signal to be sent to the FX or Aux bus. The range is from  $-\infty$  to 6 dB.



Each Aux and FX bus can receive signals pre- or post-fader, and can be linked to its odd/even partner. When you select an AUX/FX send control’s send status parameter, ENTER/YES flashes—press ENTER/YES to configure the Aux or FX bus as described on Page 206.

## The FX Return Parameter View Screen



The FX return channels’ Parameter View feature lets you view, and adjust the value of, the currently selected parameter for all of the FX return channels at once.



To activate Parameter View, press F6 (PRM.V) from an FX return channel’s main CH EDIT screen. F6 (PRM.V) is available only when the currently selected parameter can be displayed in Parameter View.



To return to the main FX return CH EDIT screen, press F6 (CH.V).



If you edit a parameter while in Parameter View, its channel automatically becomes the currently selected channel.

At the bottom of the Parameter View screen are four tabbed layers on which you’ll find an F button for each of the parameters that can be shown using Parameter View. To reveal a parameter on a layer that’s hidden, press PAGE until the layer appears.

### The Aux and FX Send Controls in Parameter View

The Parameter View screen can’t fit all FX return channel Aux and FX send controls onscreen at the same time. You can press  $\blacktriangledown$  or  $\blacktriangle$ , or click either arrow with your mouse, to scroll through the send control parameters for each of the two Aux and six FX busses. At the top of the PRM.V section of the display, you’ll see the name of the currently displayed bus.

## Routing Effects to Tracks

You can route an FX return channel’s stereo output to a pair of linked tracks or to a single track in order to record the effect, alone or mixed with any signal(s) it’s processing. The FX return channel’s FADER parameter sets the effect’s recording level.



You can add an effect to tracks you’re bouncing by routing its FX return channel’s output to your bounce destination track or track pair—see Page 195.

An FX return channel’s stereo output is routed as a single connection, with a single “wire” you can connected to a pair of linked tracks. If you route an FX return channel to a single track, it’s recorded as a mono signal containing both its left and right sides.



In the following sections, we explain how to route an FX return channel’s stereo output to a pair of tracks. Use the same steps to route an effect in mono to a single track.

### Quick Routing an FX Return Channel

1. Make sure the CH EDIT button isn’t lit—if it is, press the button to un-light it.
2. Hold down either destination track channel’s TRACK/STATUS button for a second or so until the QUICK ROUTING screen appears.

**Hard Disk Recorder Tracks 1-18**

**We pressed the TRACK/STATUS button for linked Track 17. Tracks 17 and 18 are flashing to show they’re selected as our destination.**

**FX Return Channels 1-6 (No optional effect boards are installed, so FX 3-6 are grayed-out.)**

The TRACK/STATUS button you pressed in Step 1 lights solidly to show the linked tracks you’ve chosen as the stereo destination for your effect. If any input channels or FX processors are already routed to the tracks, their buttons also light solidly.



To quickly clear all of the QUICK ROUTING screen’s connections, press F4 (AllClr).

3. To route FX 1 to Tracks 17 and 18, press the FX Return Channel 1’s FX 1 button—a virtual wire appears on the screen to show the connection you’ve made.

**The gray arrows at the left edge of the screen show the direction in which signal flows. When you’re recording effects onto tracks, signal flows up from the FX return channels to the hard disk recorder tracks.**

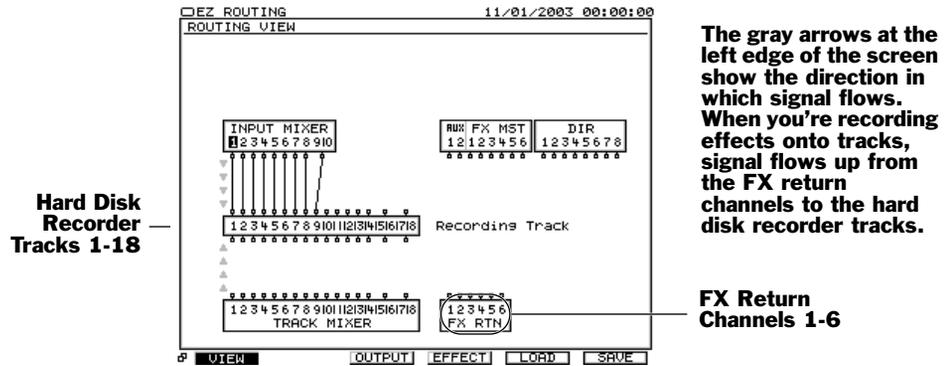
**We pressed FX Processor 1’s FX 1 button.**

4. If you want to break the connection, press FX 1 again.

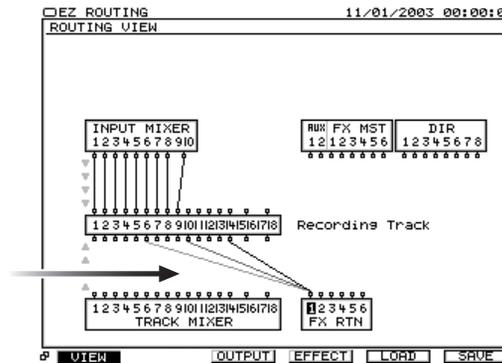
- When you're done, press F6 (EXIT) to exit Quick Routing.

## FX Return Routing on the EZ Routing VIEW Screen

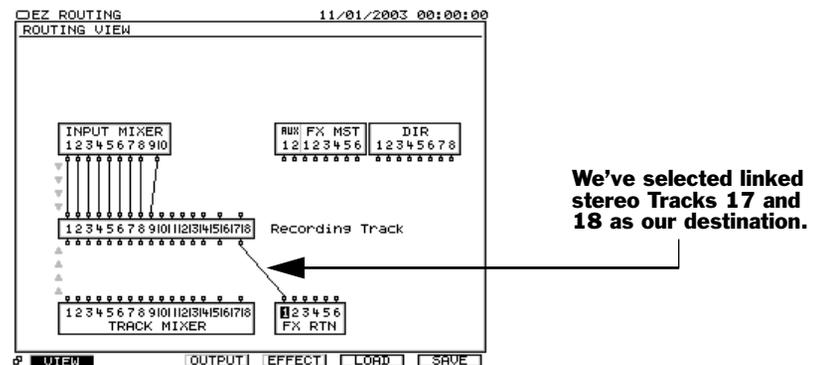
- Press EZ ROUTING.



- If the ROUTING VIEW screen doesn't appear, and you see "VIEW" above F1, press F1 (VIEW). If you don't see "VIEW" above F1, press PAGE and then F1 (VIEW).
- Use **←**, **→**, **▲** and/or **▼** to select the FX return channel's output along the upper edge of the FX RTN block. We've selected FX Return Channel 1's output in the illustration below.
- Turn the Time/Value dial clockwise—a wire appears that connects the FX return channel to one track after another in the Recording Track block.



- Turn the dial to select the desired pair of destination linked tracks.



- To break the connection, repeat Steps 3 and 4, and turn the Time/Value dial counter-clockwise until no connection exists.

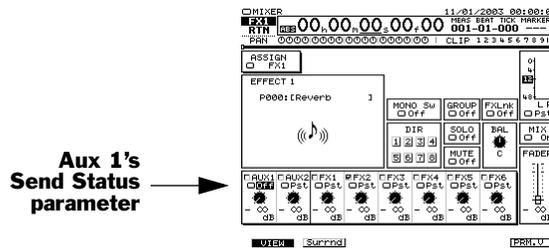


To clear all FX effect-to-track connections, press PAGE until “ClrTrA” appears above F4, and then press F4 (ClrTrA).

## Adding Effects to a Headphone Mix

When you’ve created a headphone mix using an Aux bus, it’s easy to add an effect to any of its signals. Send each channel’s signal to the effect as desired. The following steps describe how to route the effect to the Aux bus:

- press and hold down the FX 1-6 button for the FX return channel belonging to the effect you want to send to the headphone mix. The FX return channel CH EDIT parameters appear.
- Set the Send Status parameter for the Aux bus you’re using for your headphone mix to its available Pre or Post value, depending on the Aux bus’s configuration (Page 206).



- Set the amount of the effect to be sent to the headphone mix.



For the effect to sound its best, use a linked pair of Aux busses for a stereo headphone feed. In Steps 4 and 5 above, you’ll be setting up both linked Aux busses simultaneously—use the linked Aux busses’ balance control to position the stereo effect as desired in the mix.



You can also set the send level using the VS-2000’s CH PARAMETERS SENDS knob—see “CH PARAMETERS Controls” on Page 167.

# 18—Editing Tracks

This chapter provides an introduction to the editing of audio data on VS-2000 tracks. The first part of the chapter explains important editing concepts. The second part explains how to use the various available editing methods.

Chapter 6 explains how audio data is recorded on the VS-2000, and provides explanations for some important terms: take, phrase, V-Track and track. See Page 94.



Remember that when you're editing a track, what you're really editing is its currently selected V-Track.

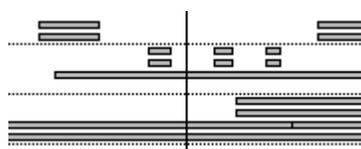
## Editing Concepts and Overview

### Phrases and Regions

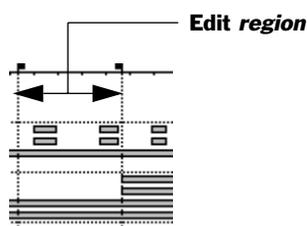
In editing a track, you can work:

- pre-defined chunks of audio called "phrases." You can work with one phrase at a time on each track, or you can work with phrases on multiple tracks at the same time. Chapter 19 discusses the things you can do with phrases.

**Each rectangle in the Home screen's playlist is a *phrase***



- a specified time "region" in one or more tracks. Region editing operations are described in detail in Chapter 20.



To master the powerful editing features of the VS-2000, it's important to understand exactly what a phrase is. See "What's Pointer-Based Playback?" on Page 94 if you haven't already read it.



If you want to edit multiple phrases on a track at the same time, you can define a region that includes the phrases.



Earlier V-Studios referred to regions as "tracks." Some of the VS-2000's editing features also use this word instead of "region."

## Edit Points

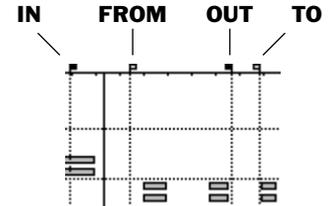
The VS-2000 provides a set of special markers just for editing—these markers are called “edit points.” The IN and OUT edit points define regions of data. The FROM and TO edit points help you position phrases and regions you’re moving or copying.



Use the VS-2000’s Scrub feature for the most precise positioning of the now line when you’re placing edit points. Scrub is described on Page 181.

### Edit Point Flags

In the playlist, each edit point is shown as a dotted line with a flag at its top. Each point has its own flag.



The FROM point is set to the same location as the IN point by default—you won’t see its flag when it’s behind the IN flag. You can manually move the FROM point to a different location, as described in this chapter.



### IN and OUT

In region editing, the process begins with selecting the portion of the project you want to edit. You define this time range by placing the IN and OUT edit points:

<i>This edit point:</i>	<i>Sets:</i>
IN	the beginning of the section of data you want to work with.
OUT	the end of the section of data you want to work with.

You should never place your OUT edit point at an earlier location in the project than your IN edit point.



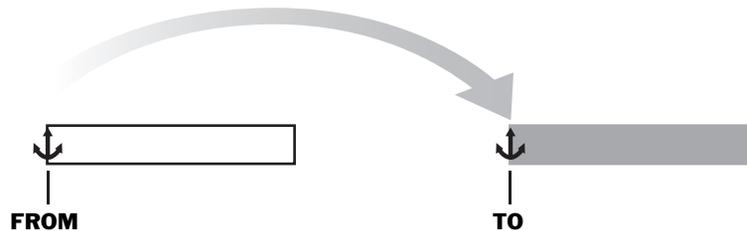
### FROM and TO

Whenever you move or copy a phrase or region, you begin by designating a specific reference point within the phrase or region—a “time anchor,” if you will. (The VS-2000 does this for you automatically, as described below.) This anchor can be the beginning of the phrase or region, or it can be an event somewhere in the middle of it.

When you select a location to which you want to move or copy a phrase or region, what you’re really doing is selecting a location to which you want to move or copy its anchor.

<i>This edit point:</i>	<i>Sets:</i>
FROM	the time anchor within a phrase or region.
TO	the location to which you want to move or copy the time anchor.

Most often when you move or copy a phrase or region, you’ll want to place the front of the moved or copied data at the desired time destination.



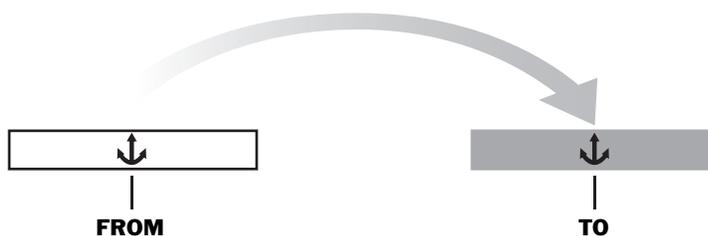
Therefore, as a convenience:

- when you select a phrase, the VS-2000 automatically places the FROM point at the beginning of the phrase. If you select multiple phrases, FROM is placed at the front of the first phrase you select.
- when you place an IN point to define the beginning of a region, the VS-2000 automatically sets FROM to the same location. If you select multiple regions, FROM is placed at the front of the first region you select.



You can manually reset FROM to any location you desire using the methods described later in this chapter.

If you set FROM at an event within a phrase or region, you can use the event's target location as a way to position the entire phrase or region.



For example, when:

- *you're copying a one-measure drum loop and can't find the exact start of the downbeat*—Place FROM at an easily identified, loud, repeated event, such as a snare drum hit on the second beat. Place TO at the second beat of the destination measure. When you copy the loop, the snare—along with the rest of the loop—lands in the pocket.
- *you're moving a music cue with a passage that has to occur at a specific time*—Place FROM at the beginning of the passage. Place TO where you want the passage to start. Move the entire cue and the passage lands in exactly the right place.



FROM and TO also make it easy to accurately position sound effects you've recorded or imported.

## Using the IN, OUT, FROM and TO Buttons

You can set your IN, OUT, FROM and TO edit points using the VS-2000's IN, OUT, FROM and TO buttons. You can also jump immediately to any of these edit points by pressing its button.

### **Placing Edit Points Using the IN, OUT, FROM and TO Buttons**

To set edit points for the first time in a project using the VS-2000's buttons:

1. Position the timeline at the desired location.
2. Press the desired IN, OUT, FROM or TO button.
3. To clear an edit point, hold down the CLEAR button. Then press the desired IN, OUT, FROM or TO button.

Once you've set a project's IN, OUT, FROM and TO points, their buttons can be configured so that pressing an edit point's button:

- moves the timeline to its position.
- resets the edit point to the current position of the timeline.

### Configuring the Behavior of the IN, OUT, FROM and TO Buttons

1. Hold down SHIFT and press F4.
2. If "SYSTEM" doesn't appear over F1, press PAGE until it does.
3. Press F1 (SYSTEM).
4. The EDIT POINT Sw TYPE parameter sets the behavior of the IN, OUT, FROM and TO buttons for resetting your IN, OUT, FROM or TO edit points. You can choose:
  - *Same as LOCATOR*—so that pressing an edit point's button moves the timeline to the edit point's location in the project.
  - *OVERWRITE*—so that pressing an edit point's button resets the edit point to the current position of the timeline.
5. Press F6 (EXIT) to confirm your changes and to leave the SYSTEM Param1 screen.



If EDIT POINT Sw TYPE is set to OVERWRITE, you can still move the timeline to an edit point—hold down SHIFT and press the desired IN, OUT, FROM or TO button.

## Performing Edits

### The Appearance of Selected Tracks, Phrases and Regions

Depending on the method you use to select a phrase or region in the playlist—we'll describe these methods later in this chapter—the process can have two steps:

1. Select the track on which the desired phrase or region resides.
2. Select the phrase or region.

When a track, phrase or region is selected, its appearance changes. When a track is selected, a triangle appears to its left and the track turns white.



When a phrase or region is selected, it's outline becomes dotted.

**Selected phrases**



**Selected regions**



**When audio is selected, it has a dotted outline. If its track is also selected, it's white. If not, it's black.**



If you select audio on one of a pair of linked tracks, the audio on the other linked track is also selected.

## Where Editing Takes Place

You'll edit tracks on the VS-2000's Home screen—see Chapter 8—or on the wave display, described below. Each screen offers a different view of a project's audio.

### The Wave Display

The wave display is a companion to the Home screen's playlist and can be opened whenever the Home screen is visible.



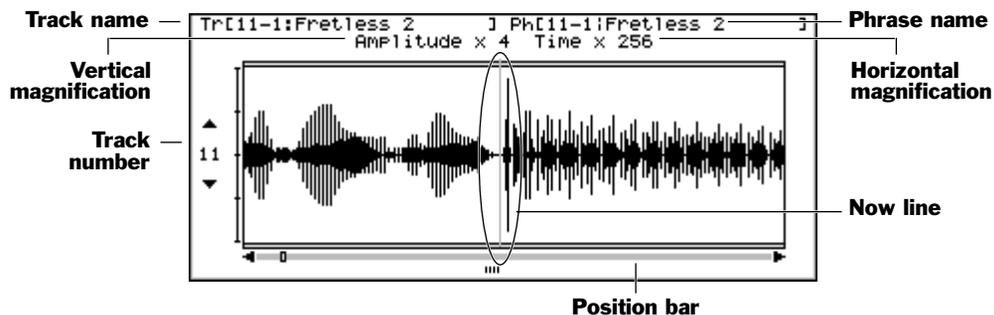
Press STOP before opening or closing the wave display.

To open and close the wave display:

1. Press HOME.
2. Hold down SHIFT and press F5 (WAVE)—the wave display fills the bottom of the screen, with the upper part of the Home screen and its F buttons still visible.
3. To close the wave display, hold down SHIFT and press F5 (WAVE) again—the lower portion of the Home screen reappears.



The wave display provides a highly magnified view of a track's audio in which you can often literally see the audio event you're looking for. The waveform in the display is the track's audio interpreted in graph form. The graph's vertical axis represents volume, or "amplitude." Its horizontal axis represents project time.



Here's how to get around on the wave display.

To:	Do this:
view the desired track	Use the ▼ and ▲ buttons.
zoom in or out vertically	Hold down SHIFT and press ▲ or ▼, respectively
zoom in or out horizontally	Hold down SHIFT and press ► or ◀, respectively



The track that's currently selected for editing remains selected as you scroll through—and view—different tracks in the wave display. You can see the name of the currently selected track in the top left corner of the display, a portion of the Home screen that's still visible. The wave display itself tells you which track you're viewing there.



By combining different vertical and horizontal zoom settings, you can view the selected track's audio with almost any degree of detail. You can also hold down SHIFT and press HOME to toggle on and off a full-screen view of the wave display.

You can move through the project while you're on the wave display using the current time location display (Page 130)—which is still visible above the wave display—the transport buttons, position bar, Jump feature, locators or markers.



The wave display has its own position bar located beneath the displayed waveform. You can drag its handle with your mouse to move through the project. You can also click on the arrow at its left end to move slowly backward through the project—in steps of about 16 samples—or on the arrow at its right to move slowly forward.

### Choosing the Right Editing Screen

Use the screen that best suits the job at hand:

- If you need to see the project's other tracks, or to see an entire project section at once, edit in the Home screen's playlist (Page 126). The Home screen is best suited to making larger edits: moving audio around in a project, or from track to track and so on. You'll find a variety of views and magnifications, as described on Page 127.



On the Home screen, you can jump from the start to the end of a selected track's phrases, one after another, by pressing PHRASE NEXT when the PREVIOUS/Next Sw (Page 379) is set to PHRASE. Press PHRASE PREVIOUS to move in the opposite direction.

- Use the wave display when you need an up-close, detailed view of a track's audio. It's the best choice when precision is critical and when you're performing edits on tiny bits of audio. The wave display's especially handy when you're using Scrub (Page 181) to pinpoint audio events.

You can switch back and forth between the Home and wave display screens—and use different views and magnifications—as you edit.

### Selecting Phrase or Region Editing

1. Hold down SHIFT and press F2.
2. Select the desired type of editing by pressing F6. When:
  - *F6 is set to Ph→Reg*—phrase editing is currently selected, as shown by the onscreen symbol. You can press F6 (Ph→Reg) to switch to region editing.
  - *F6 is set to Reg→Ph*—region editing is currently selected, as shown by the onscreen symbol. You can press F6 (Reg→Ph) to switch to phrase editing.



If you're working on a connected VGA, you can click the PHRASE/REGION/AUTOMIX button at the right above the playlist on the Home screen to select the desired type of editing.

## Editing Methods

The VS-2000 lets you edit a project's phrase and regions two different ways:

- an optional mouse
- TRACK menu

You can use either of these methods exclusively, or any combination of them. You can perform many of the same phrase or region editing operations regardless of the method you decide to use, though each method presents your options a bit differently.

When you purchase and install a VS20-VGA board (Page 29), you can connect a PS/2 mouse to your VS-2000—see Page 66. A mouse provides fast access to seven of the most common phrase editing operations and region operations, and makes “drag-and-drop” editing possible. The TRACK menu offers additional editing operations as well.

### What Each Editing Method Offers

#### A Mouse

Mouse editing provides a fast, tactile editing experience. When you edit with a mouse, you can select phrases or regions by clicking and dragging. You can move them by simply dragging them to the desired locations, or copy them as you drag—a set of placement cursors help you position moved or copied phrases and regions where you wish them to go.



When you want to perform other editing related operations, a right-click of the mouse on the playlist opens the Edit Pop-Up menu—when you select an operation from the pop-up, an edit message appears (see below) in which you can use your mouse to set up the details of the edit and then execute it.

#### The TRACK Menu

The TRACK menu offers parameter-based editing. When you select an edit operation from the TRACK menu, use the VS-2000's controls to select the desired phrases or regions, set the relevant parameters and then execute the operation. This form of editing allows you to edit slowly and carefully. The TRACK menu also provides access to some editing operations that aren't available using the mouse.

To display the TRACK menu, press:



## Edit Messages

When you edit using a mouse, the VS-2000 displays edit messages that help you refine and then confirm your edit. The displayed parameters are also found in the TRACK menu operation.

PHRASE MOVE	
FROM	00:00:00:00 001-01-000
TO	00:00:14:07.45 008-01-238
Quantize	√Off On
[ENTER]/[EXIT]	

All phrase editing operations—and thus the parameters you see in the edit messages and in the TRACK menu—are explained in Chapter 19. All of the region editing operations are described in Chapter 20.

You can edit displayed parameters with a mouse or the cursor buttons and Time/Value dial. An edit isn't final until you press ENTER/YES. To cancel an edit, press EXIT/NO.

You can turn edit messages off to speed up the editing process if you wish by resetting the UTILITY menu's EDIT MESSAGE parameter (Page 380). If you're using a mouse, you can turn the messages on and off in the Edit Pop-Up menu, described on Page 242.

## Editing with an Optional Mouse

### The Edit Pop-Up Menu

The mouse works in conjunction with the Edit Pop-Up menu during phrase and region editing. You can set edit points from the menu—see Page 243—and perform quite a few other editing-related actions as described below.



In this illustration, the IN point is selected.

To view and use the Edit Pop-Up menu:

1. Right-click the mouse anywhere on the Home screen playlist or in the wave display—the Edit Pop-Up menu appears.
2. Scroll to the desired menu item. If the required edit points for an item in the menu haven't been set, the item is grayed-out.
3. Click the left mouse button.



To close the Edit Pop-Up menu without selecting an item, click on the playlist.

To:	Right-click and:
Zoom in or out	select ZOOM ↑↓ or ZOOM ↔. In either case, a dialog appears in which you can select the desired magnification.
View the wave display from the Home screen	select WAVE.
View the Home screen from the wave display	select PLIST.
Move the now line to the position line's location	select GOTO.
Set IN, OUT, FROM and TO	see Page 243.
Activate the VS-2000's Scrub feature (Page 181)	select SCRUB and click to checkmark it.
Use Scrub to preview audio	select SCRUB TO to hear the audio just before the position line, SCRUB THRU to listen to audio just before and after the position line, or SCRUB FROM to listen to a small chunk of audio starting at the position line.
Select a track	Sel Trk selects the track on which you've right-clicked if no IN and OUT points have been set. (You can also select a track with your mouse by clicking on it. See Page 243).
Select a region	Sel Trk selects the region of data between the IN and OUT points on the track you've right-clicked if IN and OUT points have been set. (You can also select a region by dragging across it. See Page 245).
Select a phrase	Sel Phr selects the phrase you've right-clicked. (You can also select a phrase by clicking on it (Page 244) or from the SELECT PHRASE Pop-Up menu (Page 244).
To:	Right-click and:

Perform seven of the most common phrase or region editing operations (Page 248)	select the desired operation from the menu. You can select only those operations for which the required edit points have been set.
Switch from region to phrase editing and back	select PHRASE or REGION, as desired.
UNDO	select the desired Undo level from the Undo list (Page 73).
REDO	reverse the last Undo operation.
Activate snapping to a measures or beats grid	select GRID. Choose the desired grid from the dialog that appears to activate the grid.
Edit Msg	turn on (checked) or off edit messages that are displayed when you edit audio with your mouse. Edit messages are explained on Page 241.

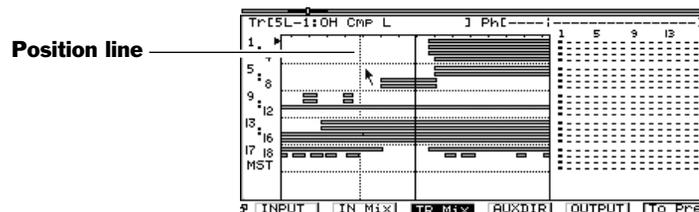
If you hold down CLEAR or SHIFT, additional options appear in the pop-up.

<i>To:</i>	<i>First:</i>	<i>Then right-click and:</i>
Clear region edit points	Press and hold CLEAR	select the desired edit point.
Move the now line	Press and hold SHIFT	select the desired edit point or choose GOTO to move to the current location of the position line.

### **Placing Edit Points with Your Mouse**

To place an edit point with your mouse:

1. Click the mouse at the desired time location in the project. A dotted vertical line appears. This is called the “position line.”



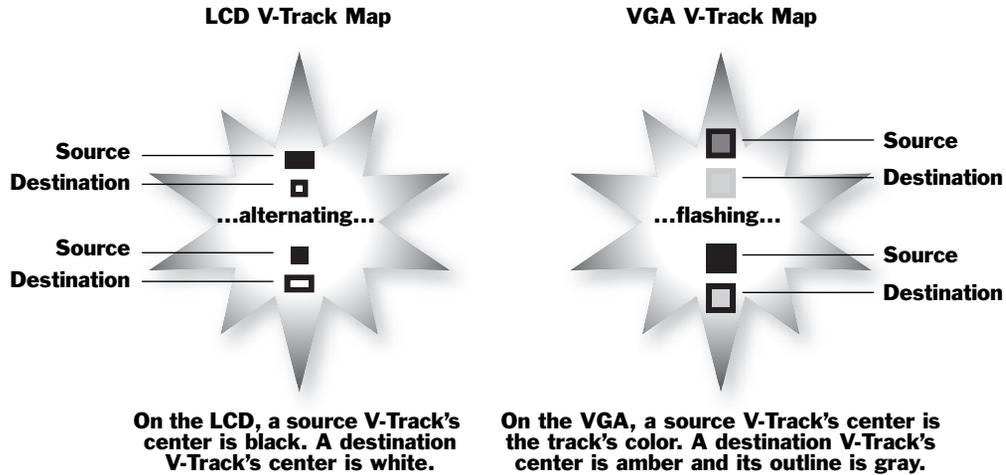
2. Click the right mouse button on the track playlist. The Edit Pop-Up menu appears and offers a variety of options.
3. Drag to the name of the desired edit point so that it's highlighted in the pop-up menu.
4. Click the left mouse button—the selected edit point is set. You can see its flag (Page 236) at the top of the position line above the playlist.

### **Selecting a Track with Your Mouse**

To select a track with your mouse, click the track in the playlist, or click the track's number to the left of the playlist.

### Selecting Destination V-Tracks with Your Mouse

When you're editing with your mouse, you can use the mouse and the LCD or connected VGA V-Track maps to quickly select destination V-Tracks for audio you're moving or copying. The V-Track maps show you the V-Tracks that act as the source of audio being moved or copied, as well as the currently selected destination V-Tracks.



To change a new destination track's V-Track, click the desired V-Track with your mouse.



To learn how to change destination tracks—as opposed to V-Tracks— see Page 243.

### Selecting Phrases By Clicking or Dragging Your Mouse

When phrase editing is selected (Page 240), you can select a phrase using the mouse by clicking on the desired phrase or dragging across it. In addition, you can drag vertically or diagonally across multiple tracks to select one phrase on each, or you can hold down SHIFT and click the phrase on each track you'd like to select. To unselect all selected phrases, click in an empty area of the playlist. To unselect one of a group of selected phrases, hold down SHIFT and click the phrase again.



When you drag with your mouse to select a phrase, make sure you start dragging on the playlist after the beginning of the project, Time 00h00m00s00f00.

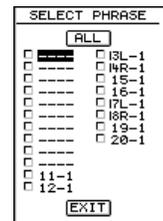


If you click or drag across a phrase on a linked track, the phrase on the other linked track is also selected if there are phrases on both tracks at the location where the cursor first touches the phrase.

### Selecting Phrases from the SELECT PHRASE Pop-Up Menu

To select one or more phrases using the SELECT PHRASE Pop-Up:

1. Select phrase editing in the TRACK menu (Page 240).
2. Turn the Time/Value dial to move the now line over the phrase(s).
3. Right-click any track number to the left of the playlist.
4. In the SELECT PHRASE Pop-Up menu, you can see which tracks contain a phrase at the now line's current position. Click each desired track to select its phrase. Click a track again to unselect its phrase.



Click ALL to checkmark all of the tracks, or click it again to un-check all of the tracks.

5. Click EXIT when you're done—the phrases you've selected are ready to be edited.



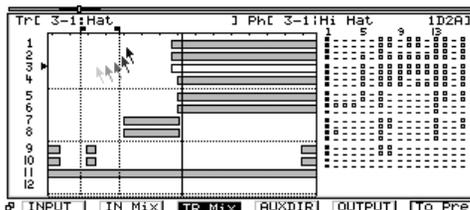
If you select a phrase on one of a pair of linked tracks, the phrase on the other linked track is also selected if it's touching the now line.

### Selecting Regions by Dragging Your Mouse



When you drag with your mouse to select regions, make sure you start dragging on the playlist after the beginning of the project, Time 00h00m00s00f00.

1. Select region editing in the TRACK menu (Page 240).
2. Click and hold the left mouse button at the desired IN point, making sure to click after the start of the project.
3. Drag rightward across the display and release the button at the desired OUT point.



4. To re-do the operation, repeat Steps 2 and 3.



You can also drag from right to left, setting the OUT and then the IN and FROM points.



As you drag, any data that you drag across is also selected. To unselect any of this data, cursor to its track and press ENTER/YES.



The FROM point is placed at the start of the earliest data you select. You can move the FROM position manually using any method described late in this chapter.

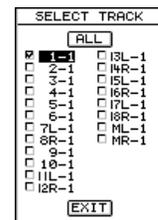


If you select an audio region on one of a pair of linked tracks, the region on the other linked track is also selected.

### Selecting Regions From the SELECT TRACK Pop-Up Menu

To select one or more regions using the SELECT TRACK pop-up:

1. Select region editing in the TRACK menu (Page 240).
2. Make sure your IN and OUT points are set as desired.
3. Right click on any track number to the left of the playlist—the SELECT TRACK Pop-Up menu appears.
4. Click each track that contains a region you want to select, or click the track again to unselect its region.



Click ALL to checkmark all of the tracks, or click it again to un-check all of the tracks.

5. Click EXIT when you're done—all audio that falls between the IN and OUT points on the selected tracks is now ready to be edited.



If you select a region on one of a pair of linked tracks, the region on the other linked track is also selected.

### **Moving Data by Dragging with Your Mouse**

1. Activate phrase or region editing as desired (Page 240).
2. Select the desired phrase(s) or region(s).  
The FROM point is automatically placed at the front of the earliest data you select. Reset the FROM point to another location if you want to.
3. Move your mouse cursor over the desired data. The cursor changes to an opened hand to show that you can grab the data. 
4. Click on the desired data and hold the mouse button down—the cursor changes to a closed hand to show the data is ready to be dragged.   
The TO point is automatically reset to the current position of the FROM point—you'll be setting a new TO location as you drag.
5. Drag the data to the desired location.  
You see the TO flag move as you drag, as well as a light gray copy of the data to show you where you're dragging it. Watch the closed hand for the appearance of any desired position cursors described on Page 248.
6. If edit messages—see “Edit Messages” on Page 241—are:
  - *turned off*—the data is moved to the new location, and you're done.
  - *turned on*—you can set the operation's parameters as desired and press ENTER/YES to proceed, or EXIT/NO to cancel the operation.



To learn how to snap dragged audio to a measures or beats, see “Snapping to Grid” on Page 247.

### **Copying Data by Dragging with Your Mouse**

1. Activate phrase or region editing as desired (Page 240).
2. Select the desired phrase(s) or region(s).  
The FROM point is automatically placed at the front of the earliest data you select. Reset the FROM point to another location if you want to.
3. Move your mouse cursor over the desired data. The cursor changes to an opened hand to show that you can grab the data. 
4. Click on the desired data and hold the mouse button down—the cursor changes to a closed hand to show the data is ready to be dragged.   
The TO point is automatically reset to the current position of the FROM point—you'll be setting a new TO location as you drag.
5. Hold down SHIFT—a plus sign appears in the closed-hand cursor icon. 
6. While continuing to hold SHIFT, drag the data to the desired location.  
You see the TO flag move as you drag, as well as a light gray copy of the data to show you where you're dragging it. Watch the closed hand for the appearance of any desired position cursors.
7. Release the mouse button and then release SHIFT.
8. If edit messages—see “Edit Messages” on Page 241—are:
  - *turned off*—the data is moved to the new location, and you're done.
  - *turned on*—you can set the operation's parameters as desired and press ENTER/YES to proceed, or EXIT/NO to cancel the operation.

### **Using the Mouse To Trim the Front or Back of a Phrase**

You can easily and quickly trim the front or back of a track phrase using your mouse—this serves the same purpose as the TRIM IN and TRIM OUT phrase editing operations (Page 257), though it's much faster. By simply dragging the phrase edge you want to trim, you can change where a phrase begins or ends.

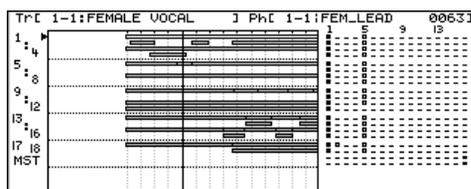
1. Press HOME and use the ◀, ▶, ▲ and/or ▼ buttons to set the display's magnification as desired.
2. To prepare to trim:
  - *the front of a phrase*—hold the mouse cursor over the phrase's leading edge until the trim in cursor appears. ←[+ — Trim in
  - *the back of a phrase*—hold the mouse cursor over the phrase's trailing edge until the trim out cursor appears. [+]→ — Trim out
3. To trim:
  - *the front of the phrase*—click and drag to the right.
  - *the back of the phrase*—click and drag to the left.
4. Release the mouse button to execute the trim.



You can drag a phrase's edge as far as the beginning or end of the take on which the phrase is based, and no further.

### Snapping to Grid

When you've set up a tempo map (Page 296) for your project, you can turn on the Home screen's Track Edit Grid feature.

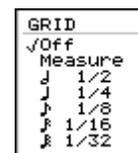


This illustration shows measure gridlines.

When the grid is active, the front edge of a phrase or region you're dragging "snaps" to the nearest gridline as you drag. You can have a gridline for every measure or beat. To place the audio at the gridline, release the mouse button after the snap. If you're dragging a group of phrase or regions, the first one you select snaps to the grid, and the others retain their positions relative to that first phrase or region.

To turn on the Track Edit Grid feature:

1. Right-click on the Home screen's playlist.
2. Select GRID from the Edit Pop-Up menu—the Grid Options window opens.
3. Select the desired grid setting. You can select:
  - *Off*—so the grid is turned off.
  - *Measure*—for a gridline at the start of every measure.
  - *Beat*—for a gridline for every beat in the project.
  - *1/2, 1/4, 1/8, 1/16, 1/32*—for a gridline at each selected beat division.
 If you select any value other than Off, the grid appears immediately in the playlist.



If you can't see the grid, hold down SHIFT and press ◀ or ▶ to zoom in or out until the gridlines appear.

You can snap any edit point to a gridline by setting the UTILITY menu's SYSTEM GRID MODE parameter (Page 380) as desired. To:

- *snap only TO edit points to gridlines*—set GRID MODE to Only TO.
- *snap all edit points to gridlines*—set GRID MODE to ALL EDIT POINT.



You can temporarily disable the grid feature by holding down CLEAR on the VS-2000 as you drag edit points or audio.

### Position Cursors

As you drag phrases or regions in the playlist to move or copy them, watch the closed-hand cursor. It changes to help you place the moved or copied data precisely by showing you when the moving TO point (Page 236) is touching certain key locations:

When the closed hand turns to:	The TO point is precisely placed at:
	the original position of the front edge of the selected data if you haven't dragged up or down.
	the original position of the back edge of the selected data if you haven't dragged up or down.
	the IN point.
	the OUT point.
	the original FROM location.
	the now line.



The position cursors are very precise, so watch the closed hand carefully. A position cursor lights only when the FROM point is precisely at one of the above locations. This, in fact, is what makes the position cursors so useful.



If the position cursors are appearing and disappearing too quickly for you to react, hold down SHIFT and press  to zoom in on the playlist's time axis.



If you're moving audio and would prefer not to see the position cursors, hold down CLEAR as you drag. (The cursors are always visible when you're drag-copying audio.)



When you're editing phrases, you can place the IN and OUT points—otherwise unused in phrase editing—at locations where you think you may want to place dragged audio. Watch for the position cursors to show you when the TO point touches them.

### Performing an Edit Operation From the Edit Pop-Up Menu

To perform seven of the most commonly used editing operations on selected phrases or regions from the Edit Pop-Up menu:

1. Select the desired operation from the Edit Pop-Up menu (Page 242). ENTER/YES flashes. If the desired operation is grayed out, make sure you've selected a phrase or region, and that all of the operation's required edit points are set.
2. Press ENTER/YES. If edit messages—see "Edit Messages" on Page 241—are:
  - *turned off*—the selected operation is performed, and you're done.
  - *turned on*—you can set the operation's parameters as desired and press ENTER/YES to proceed, or EXIT/NO to cancel the operation.



## Editing from the TRACK Menu

You can perform any phrase or region editing operation from the TRACK menu. To display the TRACK menu:

1. Hold down SHIFT and press F2 (TRACK).



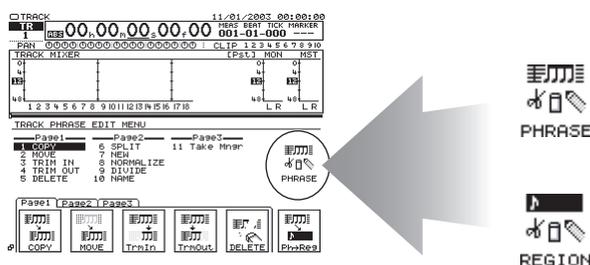
The parameters unique to each phrase or region editing operation are described in Chapters 19 and 20, respectively.

### How the TRACK Menu Is Organized

The TRACK menu presents all phrase and region editing operations in two sub-menus:

- The TRACK PHRASE EDIT MENU
- The TRACK REGION EDIT MENU

The large PHRASE and REGION symbols that appear at the right side of the screen tell you at a glance which menu is currently displayed.



If you're viewing:

Switch to the:

By pressing:

TRACK PHRASE EDIT MENU

TRACK REGION EDIT MENU

F6 (Ph→Reg)

TRACK REGION EDIT MENU

TRACK PHRASE EDIT MENU

F6 (Reg→Ph)



You can also select the desired menu by pressing PHRASE•REGION•AUTOMIX on your connected VGA monitor until it turns green for phrase editing or red for region editing.

### The Appearance of TRACK Menu Screens

TRACK menu screens, as shown above, don't fill the entire display—parts of the Home screen remain visible to make editing easier. You can move around a project using the current time location display (Page 130). The playlist is visible in most edit screens. The meters display—or the fader/pan displays—may also remain in view.



When the playlist is visible during editing, you can hold down SHIFT and press F5 to replace the playlist with the wave display.

### Sources and Destinations in the TRACK Menu

When you're moving or copying phrases and regions, or if you're swapping regions on different tracks in the TRACK menu, designate the:

- *source track*—the track you're moving or copying audio from.
- *destination V-Track*—the track to which you're moving or copying the audio.

### Performing an Edit Operation from the TRACK Menu

1. Hold down SHIFT and press F2.
2. If the desired edit menu isn't displayed:
  - press F6 (Ph→Reg) to switch to the TRACK REGION EDIT MENU screen.
  - press F6 (Reg→Ph) to switch to the TRACK PHRASE EDIT MENU screen.
3. Begin the desired edit operation by:
  - *clicking its F button*—Each menu's available operations are arranged on a set of tabbed layers. If the desired operation's F button isn't visible, press PAGE until it appears, and then press its F button.
  - *selecting it from the displayed menu*—Use the cursor buttons to select the desired operation and press ENTER/YES.

The operation's main screen appears. The TRACK/STATUS buttons—and the SELECT buttons in some operations—flash. See Page 251 to learn about quick-selecting tracks, phrases and regions.



An operation may have more than one screen. For details on all of the phrase editing operations, see Chapter 19. Chapter 20 explains all of the region editing operations.

### Placing Edit Points on a TRACK Menu Operation Screen

Each edit operation's main screen allows you to place the edit points the operation requires. They're presented as parameters. When you first begin an edit operation, the parameters show the time location of any edit point that's already been placed. You can set an edit point by:

IN	00:00:08:00.00	003-03-023
OUT	00:00:24:00.00	008-03-022
FROM	00:00:09:00.00	003-03-023
TO	00:00:43:00.00	014-04-182

- selecting its parameter and entering the desired location using the cursor buttons and Time/Value dial (or your mouse).
- selecting the edit point's parameter and moving the now line to the desired location. To lock in the new location, unselect the parameter by selecting some other parameter on the screen.
- using the current time location display to move the now line to the desired location, selecting the edit point's parameter and pressing F2 (GetNow).



You can move the now line to any already set edit point by selecting the edit point's parameter box and pressing F3 (GO TO).

### About Selection in the TRACK Menu

The TRACK menu offers two ways to select tracks, phrases and regions. You can use the:

- *Quick-Selection feature*—that lets you quickly select the tracks you want to edit.
- *onscreen selection tools*—that provide more information about your selection, and let you select destination V-Tracks when you're copying, moving or exchanging audio.

When you're moving, copying or exchanging audio, you need to select source and destination tracks. In other edit operations, you need only select the phrase(s) or region(s) upon which you want to perform the operation.

## Quick-Selecting from the TRACK Menu



You can use Quick Selection for all phrase and region operations except the phrase Take Manager, and the region IMPORT and ARRANGE edit operations.

When you select and begin an editing operation that requires the selection of phrases or regions, the TRACK/STATUS buttons start to flash. You use these buttons to quick-select the tracks that contain the desired phrases or regions. When you select the track:

- any phrase on the track that's touching the now line is selected. If there's no phrase touching the now line, the track will not let itself be selected. Move the now line so it touches the desired phrase, and then select it.
- any region of audio on the track between the IN and OUT points is selected—see “Placing Edit Points on a TRACK Menu Operation Screen” on Page 250. If there's no audio on the track between the IN and OUT points, the track cannot be selected.



If you quick-select a phrase or region on one of a pair of linked tracks, the phrase or region on the other linked track is also quick-selected.

In Quick Selection, TRACK/STATUS buttons select source and destination tracks. When the CH EDIT button is:

- *unlit*—you're selecting source tracks.
- *lit*—you're selecting destination tracks.

*To quick-select source tracks and destination tracks when moving, copying or exchanging audio:*

1. If necessary, press CH EDIT so it's unlit to view source tracks.
2. Press the TRACK/STATUS button of a source track—it lights solidly in red to show that the audio comes from that track.
3. Press CH EDIT so it's lit to view potential destination tracks. By default, the same track is selected as the destination track. Its TRACK/STATUS button solidly lights to show this.
4. If you want to select a different destination track, press its TRACK/STATUS button so it lights solidly amber.
5. To include another set of source and destination tracks, press CH EDIT so it's unlit, and then the new source track's TRACK/STATUS button.



Each time you select a new source track, subsequent destination track selections apply to that source—you can't go back and select a different destination track for a source you selected earlier.

6. Press CH EDIT so it lights and the new destination track's TRACK/STATUS button.
7. To remove a set of source and destination tracks, press the source track's TRACK/STATUS button—the source and destination tracks' SELECT and TRACK/STATUS buttons once again flash to show they're no longer selected.



If you'd like to change an earlier set of source/destination tracks, press the source track's TRACK/STATUS button, and then set it up again the way you want it.

The V-Track map on the display shows you the V-Tracks that are currently selected for editing. Any V-Track with a wide, flashing black box is a source. Any V-Track with a wide, flashing white box is a destination.



Quick Selection always select the destination track's currently active V-Track. To select a different destination V-Track, use the onscreen selection tools.

To quick-select phrase and regions for all other quick-selectable edit operations:

1. Turn CH EDIT off.
2. Press the desired track's TRACK/STATUS button—it lights solid red to show it's targeted for editing.
3. Repeat Steps 1 and 2 for any other tracks you want to include.
4. To unselect a track, press its TRACK/STATUS button again—it flashes green to show it's no longer selected.



The V-Track map on the display shows you which V-Tracks are currently selected for editing. Any V-Track with a flashing, wide white box is selected for editing.



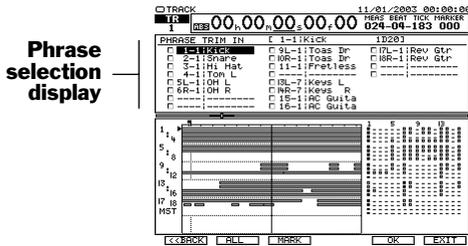
After you've selected the desired phrase(s) or region(s), set up the rest of the edit operation on the display.

### Selection Using the TRACK Menu's Onscreen Selection Tools

For most of the TRACK menu's editing operations, when you want to select a phrase or region using the TRACK menu onscreen selection tools, you press:

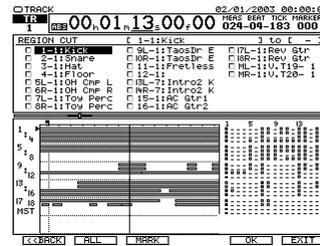
- F1 (SelPhr)—to select a phrase
- F1 (SelTrk)—to select a region

When you press F1 (SelPhr) or F1 (SelTrk), the phrase or region selection display appears in the upper part of the screen—just beneath the current time location display—while the playlist is visible in the lower part of the screen.



Phrase selection display

You can select tracks that have a phrase touching the now line.



Region selection display

You can select any track—whether it contains audio in the defined region or not—since regions can contain silence.



When you're performing phrase deletion, normalization or naming, or region exchanging or naming, there's no need to press F1—the desired selection display appears on the edit operation's main screen.



There are no phrase or region selection displays for creating a new phrase, importing a region from another project or re-arranging the order of regions in a project.



If you select a phrase or region on one of a pair of linked tracks, the phrase—if it's touching the now line—or region on the other linked track is also selected.

To select a phrase or region using the TRACK menu's onscreen tools:

1. Use the cursor buttons to select the track containing the desired phrase or region.
2. Press F3 (MARK) to select the track's phrase or region—a checkmark appears to the track's left to show it's selected. 



When you're selecting phrases, only tracks containing a phrase that's touching the now line can be marked. You can mark additional phrases on the other tracks by cursoring up to the current time location display and turning the Time/Value dial to move the now line to the desired phrases. You can then mark their tracks.

3. To unselect a track, press F3 (MARK) again—the checkmark is removed. If the editing operation involves moving or copying audio between tracks, you see an arrow to the right of the track you've selected. This arrow points to a destination V-Track. 



On many editing screens, you can see each track's name. On selection screens that allow you to choose V-Tracks, only track numbers are shown to make room.

4. Turn the Time/Value dial to select the desired destination V-Track.



Be careful not to select the same V-Track as a destination for more than one source.



You can use the onscreen tools together with the Quick Selection feature to jump from one track's currently selected V-Track to another track's currently selected V-Track without having to turn the Time/Value dial to get there. While the source track is highlighted onscreen, you can press any track's TRACK/STATUS button to make the onscreen V-Track value jump to that track's currently selected V-Track.

5. Repeat Steps 1-4 for any phrase or region you wish to select.
6. Press F1 (<<BACK) to return to the edit operation's main screen, or F6 (EXIT) to return to the TRACK PHRASE EDIT MENU or the TRACK REGION EDIT MENU.



You can select or unselect all of the displayed phrase or regions at once by pressing F2 (ALL). If any phrase or regions are selected, they become unselected. If none are selected, they all become selected. If they're all selected, they all become unselected. Press F2 (ALL) repeatedly to toggle selection on and off for all phrases or regions.



# 19—Phrase Editing Operations

This chapter describes the phrase-based editing operations you can perform in the VS-2000. Most of the operations can be performed using an optional mouse (Page 66) or the edit commands presented in the TRACK menu—some can be performed only from the menu. We'll list the way(s) each operation can be performed.

Chapter 18, "Editing Tracks," explains:

- important editing concepts you need to know—see Page 235.
- all about the FROM and TO edit points—see Page 236.
- how to edit using a mouse—see Page 242.
- how to edit from the TRACK menu—see Page 249.



You can find step-by-step editing instructions in the Step-by-Step Instruction Finder that starts on Page 21.



If you've recorded mastering tracks (Page 356) in CDR mode, their phrases can't be used on other project V-Tracks. Likewise, non-CDR phrases can't be used on CDR-recorded mastering tracks. If you attempt either action, the VS-2000 displays "Found Illegal Track Pair!" Press ENTER/YES. You can easily spot CDR-recorded tracks—see Page 357.

## COPY

### **Use: Mouse, TRACK menu**

Phrase COPY makes a copy of each selected phrase and pastes the copy at the desired location. You can copy a phrase to a new time location and/or to another track. You can copy it to a currently selected V-Track, or to a V-Track that isn't currently selected.



**TRACK menu  
F1 (COPY)**



The TRACK menu's phrase COPY operation lets you copy phrases to V-Tracks that aren't currently selected.

### **Why You'd Use Phrase COPY**

You can use COPY to build a track from a short musical segment such as a drum pattern. By pasting the pattern end-to-end the desired number of times, you can create a seamless drum loop. COPY also allows you re-use performances that occur multiple times in a project—perfectly performed chorus background vocals, for example. You can also create a safety copy of a phrase on a spare V-Track before editing the original.

### **Edit Points**

- *FROM*—sets the location of the phrase's time anchor.
- *TO*—sets the time location at which you want to paste the time anchor.

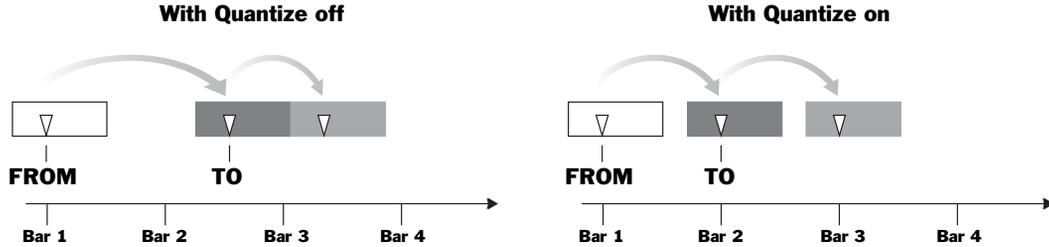
### **Times**

This sets the number of copies to be pasted, one after another, at the TO point.

### Quantize

When Times is set to a number other than 1, Quantize lets you paste the copied phrases precisely on the first beat of the tempo map’s measures. You can set Quantize to:

- *Off*—so that copies are pasted according to the Overlap setting described below.
- *On*—so that the TO point for the first copy is shifted to the first beat of the measure in which TO is currently placed. Each subsequent copy is pasted the same number of measures away from the FROM point, at the first beat of the measure.



This allows you to keep pasted copies in time no matter what the tempo of the audio in the project is, even if it speeds up or slows down.

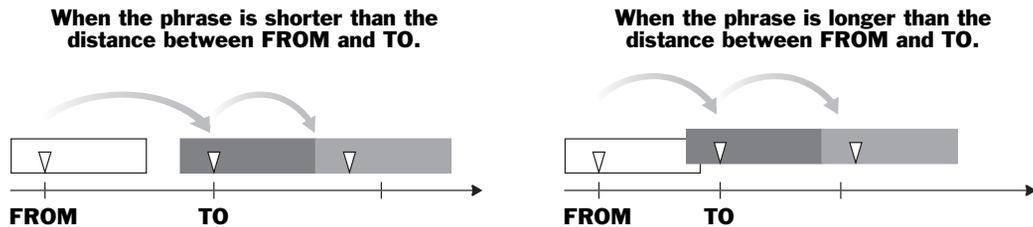


To take advantage of the Quantize feature, you’ll need to established a tempo map for your project. See Page 296.

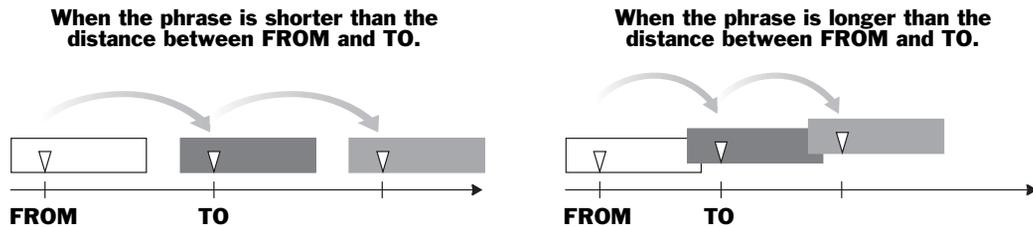
### Overlap

When the Times parameter is set to a number other than 1, the Overlap parameter sets the timing relationship between pasted copies. When Overlap is:

- *Off*—the front of each copied phrase is pasted to the end of the preceding copy. The copied phrases’ timing can grow more and more incorrect with each copy.



- *On*—each copy is pasted at the same time distance from the start of the previous copy as the distance between FROM and TO. If the length of the phrase is different than the distance between FROM and TO, Overlap keeps the pasted copies in time.



## MOVE

### **Use: Mouse, TRACK menu**

Phrase MOVE lets you place a selected phrase at a new time location and/or on another track. You can move it to a currently selected V-Track, or to a V-Track that isn't currently selected.



**TRACK menu  
F2 (MOVE)**



The TRACK menu's phrase MOVE operation lets you move phrases to V-Tracks that aren't currently selected.

### **Why You'd Use Phrase MOVE**

If there's a timing error in a performance, MOVE can shift it into correct musical time. You can also move a performance from one spot in a project to a more useful location—for example, if a guitarist plays a great lick at the end of your fadeout, you can move the lick into the project's intro, or into the solo section in the middle of the project.

### **Edit Points**

- *FROM*—sets the location of the phrase's time anchor.
- *TO*—sets the time location to which you want to move the time anchor.

### **Quantize**

Quantize lets you move a phrase exactly to the first beat of a measure when you've set up a tempo map for your project (see Page 296). Set it to:

- *Off*—so that the phrase is moved to the TO location.
- *On*—so that the phrase is moved to the first beat of the measure in which TO is currently placed.



Quantizing works when you're moving a phrase much the way it works when you're copying multiple phrases, as illustrated on Page 256.

## TRIM IN

### **Use: Mouse, TRACK menu**

TRIM IN allows you to adjust the location at which a selected phrase begins without changing the timing of its audio content.



**TRACK menu  
F3 (TrmIn)**

### **Why You'd Use Phrase TRIM IN**

You can use TRIM IN to make a phrase start exactly where its audio begins by cleaning off unwanted silence or noise from its beginning. This can make it easier to move or copy the phrase. Use TRIM IN to clean up the front of your mastering tracks (Page 362).

### **Edit Points**

- *TO*—sets the desired beginning of the phrase. Any part of the phrase that occurs before the TO point is trimmed from the phrase.



You can also trim the front of a phrase using your mouse—see Page 246.

## TRIM OUT

### **Use: Mouse, TRACK menu**

TRIM OUT allows you to adjust the location at which a selected phrase ends without changing the timing of its audio content.



**TRACK menu  
F4 (TrmOut)**

### **Why You'd Use Phrase TRIM OUT**

Use TRIM OUT to remove unwanted audio from the end of a phrase. You can also use TRIM OUT to get rid of unwanted studio noise and conversation after the audio you want to keep. Use TRIM OUT to clean up the ends of your mastering tracks (Page 362).



You can use TRIM OUT when you need to trim a rhythm pattern to exactly the right length to help ensure that it loops properly.

### **Edit Points**

- **TO**—sets the desired end of the phrase. Any part of the phrase that occurs after the TO point is trimmed from the phrase.



You can also trim the front of a phrase using a mouse—see Page 246.

## DELETE

### **Use: Mouse, TRACK menu**

Use the phrase DELETE command to remove a phrase from a project.



**TRACK menu  
F5 (DELETE)**



Remember: When you delete a phrase from a project, you're not erasing its audio from your hard drive unless you optimize the project (Page 105). If you haven't optimized the project, you can get the audio back at any time using Undo or by creating a new phrase (Page 259) from the take on which the phrase was based.

### **Why You'd Use Phrase DELETE**

Phrase DELETE allows you to get rid of unwanted phrases so you don't have to bother silencing them when you mix, and so they don't clutter up your playlist.

## SPLIT

### **Use: Mouse, TRACK menu**

You can split a currently selected phrase into two phrases using the phrase SPLIT command.



**TRACK menu  
F1 (SPLIT)**

### **Why You'd Use Phrase SPLIT**

Phrase SPLIT lets you break up longer phrases into two separate pieces to turn musical ideas, sound effects or anything else into individual objects. This makes it easier to move each element, copy it, or subject it to any other editing operation.



If you plan to be moving a lot of audio around in a project, taking the time to split your elements into separate phrases can make editing much easier in the long run. DIVIDE can break up a long phrase into multiple components automatically—see Page 260.

### **Edit Points**

TO—sets the point at which a selected phrase is split.



Here's an easy way to set the SPLIT TO point: move the now line to the desired location and press F2 (GetNow).

## **NEW**

### **Use: Mouse, TRACK menu**

You can create a new phrase from any of the project's takes stored on your hard drive—to learn about takes, see Page 94.



**TRACK menu**  
**F2 (NEW)**

### **Why You'd Use Phrase NEW**

Phrase NEW lets you retrieve a project recording that you've discarded. This recording can be a phrase you've deleted, or a performance that you originally thought you didn't want to use. If you've deleted a portion of a phrase that you want to restore—and can't remember its Undo level—you can go back to the take on which the phrase is based, and make a whole new phrase you can re-edit.

### **Edit Points**

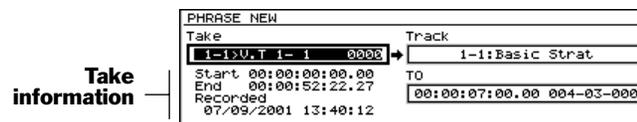
- TO—sets the time location at which the start of the new phrase is placed.



If you'd like the new phrase to be created at the same location in the project at which the take was originally recorded, press F4 (Orignl).

### **Take**

Highlight the Take parameter and turn the Time/Value dial to scroll through all of the project's available takes to select the one you want. Beneath the Take parameter you can see information about the selected take, including the location in the project where recording began and ended, and when the take was recorded.



Press F1 (TAKE) to jump to the Take Manager (Page 262). In the Take Manager, you can preview takes. To leave the Take Manager and resume editing, press F1 (<<BACK).



If you've already optimized the project, unused takes recorded before optimization will have been erased from the hard drive.



If you attempt to use a CDR-recorded take on a track other than the project's mastering tracks (Page 356)—or vice versa—the VS-2000 displays "Found Illegal Track Pair!" Press ENTER/YES to continue, and select a non-CDR take. You can identify a CDR-recorded take by the asterisk in its number, as shown on Page 357.

### Track

Turn the Time/Value dial to select any V-Track in the project as the V-Track on which the new phrase is to be created.



You can quick-select any currently active V-Track as a destination for the new phrase by selecting its track—press the track’s TRACK/STATUS button so it lights solidly.

## NORMALIZE

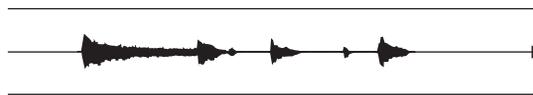
**Use: TRACK menu**

Normalization raises the level of a phrase to its optimal volume.



**TRACK menu  
F3 (Normlz)**

Before normalization



After normalization



The main NORMALIZE screen provides a phrase selection display in which you can mark the phrase you want to normalize. If the phrase you want isn’t available, move the now line so that it touches the phrase.

### Why You’d Use Phrase NORMALIZE

Phrase NORMALIZE allows you to increase the level of a phrase that was recorded at too low a volume to give you more signal to work with during bouncing and/or mixing.

While NORMALIZE can help a weak recording level, it’s not a perfect substitute for recording the signal properly in the first place since it raises the volume of background noise along with the desired audio content in the phrase.



## DIVIDE

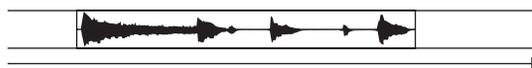
**Use: TRACK menu**

Phrase DIVIDE analyzes the level of the signal in the phrase and automatically divides it into smaller phrases wherever the signal level falls below a specified volume.

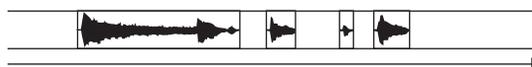


**TRACK menu  
F4 (DIVIDE)**

Phrase DIVIDE analyzes the levels in the original phrase...



...and divides the phrase up into smaller phrases.



### **Why You'd Use Phrase *DIVIDE***

Phrase *DIVIDE* breaks up a longer phrase into smaller phrases so that you can more easily work with the elements of a recording on an individual basis. It seeks to achieve the same result as phrase *SPLIT* (Page 258), but it does so automatically, and by working with an entire phrase in a single editing operation.

### ***IN* Threshold**

The *IN* Threshold sets the level at which a new phrase begins. As the VS-2000 searches for its next phrase, it considers a level higher than the *IN* Threshold parameter's value to signify the start of a new phrase. *IN* Threshold can be set from -84 dB to -6 dB.

### ***In* Margin**

The VS-2000 adds the amount of time selected by the *IN* Margin parameter to the front of a newly created phrase to ensure that the phrase doesn't start too abruptly in the middle of a signal on its way up to the *IN* Threshold level.

### ***OUT* Threshold**

*OUT* Threshold sets the level at which a phrase ends. When a phrase's signal falls below the level set by the *OUT* Threshold parameter, the VS-2000 considers the current phrase to be complete, and starts searching for the next phrase. *OUT* Threshold can be set from -84 dB to -6 dB.

### ***OUT* Margin**

The VS-2000 adds the amount of time selected by the *OUT* Margin parameter to the end of a newly created phrase to ensure that its audio isn't cut off prematurely as its signal drops down in level below the *OUT* Threshold.

## **NAME**

### ***Use: TRACK menu***

You can name any phrase. The main *NAME* screen provides a phrase selection display in which you can select the desired phrase. If the phrase you want isn't available in the display, move the now line so that it touches the phrase and press F1 (*NAME*). To learn about the VS-2000's naming tools, see "Naming" on Page 74.



**TRACK menu**  
**F5 (NAME)**

### **Why You'd Use Phrase *NAME***

When you name a phrase, it becomes easier to identify in the playlist and when you're selecting phrases during editing.

# Take Mngr

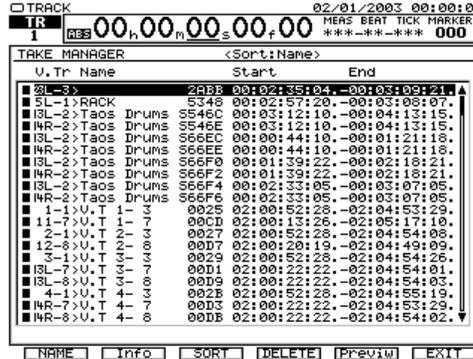
## Use: TRACK menu

The Take Mngr (“Take Manager”) shows you all of the project’s takes currently on your hard drive.



**TRACK menu  
F1 (TAKE)**

**A black box to the left of a take means that it's used by a phrase in the project.**



**The numbers and letters to the right of a take's name are its hexadecimal file identification.**



If you're not sure what a take is, see Page 94.

You can do a variety of things with the takes you see in the Take Manager screen—use the ▼ and ▲ buttons or the Time/Value dial to scroll through the list. Press:

- **F1 (NAME)**—to rename the selected take in order to make it easier to identify. For more on naming, see Page 74.
- **F2 (INFO)**—to toggle the information shown for the takes. The Take Manager can show each take's size and session information, or its start and end time.
- **F3 (SORT)**—to switch among the list's available sorting orders. You can select:
  - *Hist*—to sort the list by recording date and time.
  - *V.Tr*—to sort the list in V-Track order.
  - *Name*—to sort the list alphabetically by name.
- **F4 (DELETE)**—to delete the currently selected take.



When you delete a take, it's permanently erased from your hard drive. Use this feature cautiously. It cannot be undone.

- **F5 (Preview)**—to listen to the selected take. Press EXIT/NO to halt playback.
- **F6 (EXIT)**—to return to the TRACK PHRASE EDIT MENU.

## 20—Region Editing Operations

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This chapter explains the editing operations you can perform on project regions. Since region editing operations work on a chunk of time within a track, you can think of them as track editing operations—some of them do, in fact, affect an entire track.

You can perform most region operations using an optional mouse (Page 66) or the edit commands presented in the TRACK menu. Some are available only in the TRACK menu. We'll list how each operation can be performed in its description.

Chapter 18, "Editing Tracks," explains:

- important editing concepts you need to know—see Page 235.
- all about the FROM and TO edit points—see Page 236.
- how to edit using a mouse—see Page 242.
- how to edit from the TRACK menu—see Page 249.



You can find step-by-step editing instructions in the Step-by-Step Instruction Finder that starts on Page 21.

### **About Tracks Recorded with the CDR Recording Mode**



If you've recorded mastering tracks (Page 356) using CDR mode, their audio can't be used on other project V-Tracks. Likewise, non-CDR audio can't be used on CDR-recorded mastering tracks. If you attempt either action, the VS-2000 displays "Found Illegal Track Pair!" and the operation will not proceed. Press ENTER/YES to resume editing. You can easily spot CDR-recorded tracks by their appearance—see Page 357.

## COPY

### **Use: Mouse, TRACK menu**

With region COPY, you can copy an audio region in a selected track and paste the copy at a new location. You can copy a region to a new time location and/or to another track. You can copy it to a currently selected V-Track, or to a V-Track that isn't currently selected.



**TRACK menu  
F1 (COPY)**



The TRACK menu's region COPY operation lets you copy phrases to V-Tracks that aren't currently selected.

### **Why You'd Use Region COPY**

You can use COPY to build a track from a short musical segment such as a rhythm pattern. By pasting the pattern end-to-end the desired number of times, you can create a seamless drum loop. COPY also allows you re-use performances that occur multiple times in a project, such as perfectly performed chorus background vocals. You can also create a safety copy of a track's audio on a spare V-Track before editing the original.

### Edit Points

- *IN*—sets the beginning of the audio region to be copied.
- *OUT*—sets the end of the audio region to be copied.
- *FROM*—sets the location of the region’s time anchor.
- *TO*—sets the time location at which you want to paste the time anchor.



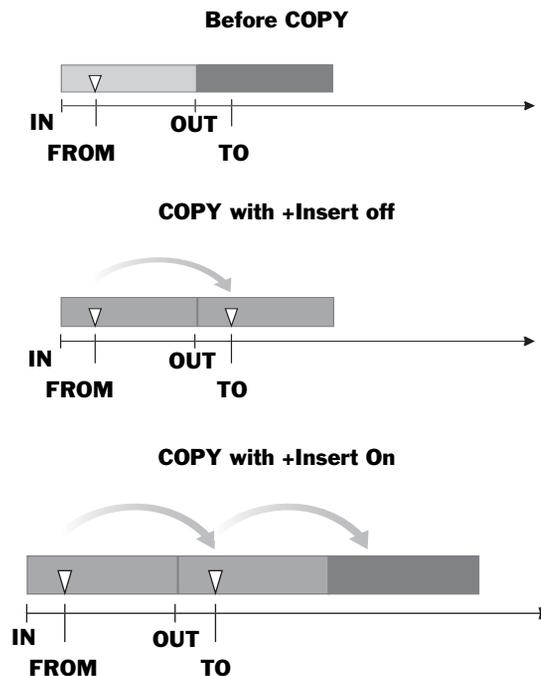
Be sure to set the distance between *IN* and *OUT* to a length of time greater than .5 seconds. Regions smaller than that will be copied, but won’t properly play back.

### Times

This parameter sets the number of copies to be pasted, one after another, at the *TO* point.

### +Insert

The +Insert parameter lets you choose whether you want the copied region to be pasted over any audio already at the *TO* location, or inserted before it.



Set it to:

- *Off*—so that the copied audio is pasted over any audio already present at the destination location.
- *On*—so that the copied audio is inserted at the *TO* point, moving all subsequent audio on the track to the end of the pasted copy, or copies.

## MOVE

### **Use: Mouse, TRACK menu**

The region MOVE edit operation moves the selected audio to a new location. You can move a region to a new time location and/or to another track. You can move it to a currently selected V-Track, or to a V-Track that isn't currently selected.



**TRACK menu  
F2 (MOVE)**



The TRACK menu's region MOVE operation lets you move phrases to V-Tracks that aren't currently selected.

### **Why You'd Use Region MOVE**

Region MOVE is a great way to move a segment of audio to a more useful location in a project.

### **Edit Points**

- *IN*—sets the beginning of the audio region to be moved.
- *OUT*—sets the end of the audio region to be moved.
- *FROM*—sets the location of the region's time anchor.
- *TO*—sets the time location to which you want to move the time anchor.



Be sure to set the distance between IN and OUT to a length of time greater than .5 seconds. Regions smaller than that will be moved, but won't properly play back.

### **+Insert**

The +Insert parameter for region MOVE works the same way as region COPY's +Insert parameter—see Page 264. Set it to:

- *Off*—so that the region you're moving replaces any audio already present at the destination location.
- *On*—so that the region you're moving is inserted at the TO point, moving all subsequent audio on the track to the end of the moved region.

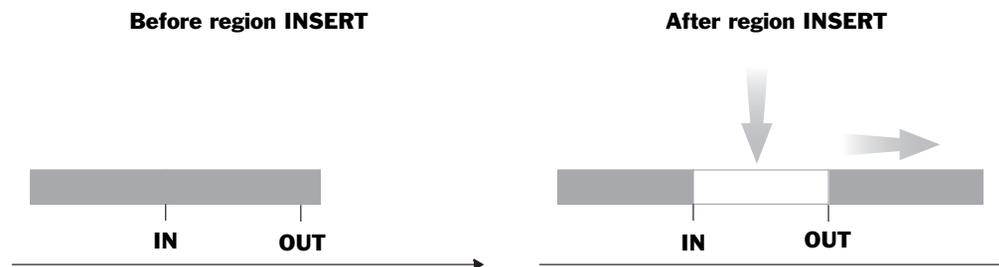
## INSERT

### **Use: Mouse, TRACK menu**

The INSERT edit operation adds silent, blank space between the designated IN and OUT points. Audio that had previously been there—and all of the audio that comes after it—is slid back to the OUT point, thus lengthening the track due to the added blank space.



**TRACK menu  
F3 (INSERT)**



## Why You'd Use Region INSERT

You'd use region INSERT if you wanted to shift audio to a later time in the project, leaving empty sonic space before it.



You can use INSERT to add a pause between sections of a musical piece by inserting the same amount of blank time into all of the project's tracks.

### Edit Points

- *IN*—sets beginning of the blank space you're inserting.
- *OUT*—sets the end of the blank space you're inserting.



Make sure there's no audio within .5 seconds before the IN point and .5 seconds after the OUT point to ensure a smooth transition.

### AllVTr

Turn AllVTr on if you want to insert the blank space into all of the V-Tracks belonging to a selected track—this will keep all of the V-Tracks aligned if you're separating entire sections of a project by inserting blank space.

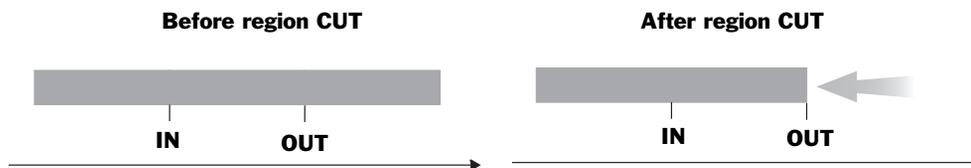
## CUT

### Use: Mouse, TRACK menu

Region CUT removes a specified chunk out of the selected track, moving everything that comes after the chunk forward in time so that there's no gap where the audio's been removed.



**TRACK menu**  
**F4 (CUT)**



### Why You'd Use Region CUT

You can use region CUT when you want to get rid of a portion of a performance, replacing it with what comes after. For example, if you've recorded a soloist playing over a fadeout, and the first eight bars of the fadeout aren't as good as the rest—you can cut the unwanted eight bars and move the best part of the performance forward. Chop out an entire unwanted section of a project by using CUT on all of its tracks.



Thanks to the VS-2000's non-destructive editing, audio you cut is still safe and sound on your hard drive if you want it back, until you optimize the project. You can use Undo to retrieve it, or create a new phrase from its original take (see Page 259).

### Edit Points

- *IN*—sets the beginning of the audio segment you're cutting out of the track.
- *OUT*—sets the end of the audio segment you're cutting out of the track.



Make sure there's no audio within .5 seconds before the IN point and .5 seconds after the OUT point to ensure a smooth transition.

## AllVTr

Turn AllVTr on if you want to remove the chunk of time from all of the V-Tracks belonging to a selected track.

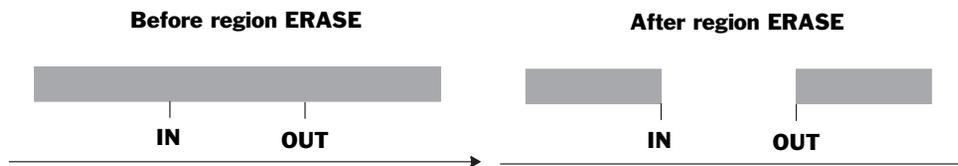
## ERASE

### Use: Mouse, TRACK menu

Erase removes a specified region from a selected track, leaving all of its other audio where it is.



**TRACK menu**  
**F5 (ERASE)**



### Why You'd Use Region ERASE

Region ERASE is a really good way to get rid of unwanted audio—wrong notes, noises, throat-clearing, unwanted chatter and so on—on a track without affecting the rest of its audio.



Thanks to the VS-2000's non-destructive editing, anything you erase is still on your hard drive if you want it back, until you optimize the project. Use Undo to retrieve it, or create a new phrase from its original take (see Page 259).

### Edit Points

- *IN*—sets the beginning of the audio segment you're erasing.
- *OUT*—sets the end of the audio segment you're erasing.



Make sure there's no audio within .5 seconds before the IN point and .5 seconds after the OUT point to ensure a smooth transition.

## AllVTr

Turn AllVTr on if you want to remove the audio from all of the V-Tracks belonging to a selected track. You'll want to do this if each V-Track contains a different performance attempt, and they all contain the same mistake.

## COMP/EXP.

### Use: Mouse, TRACK menu

The region COMP/EXP. ("Compression/Expansion") operation allows you to time-stretch or time-shrink a region, with or without changing the region's pitch.



**TRACK menu**  
**F1 (CmpExp)**



Time compression and expansion cannot be used on tracks recorded using the CDR recording mode.



Since the COMP/EXP. operation makes a new copy of any region it's processing, it can be performed only when there's sufficient free space on your hard drive.

Once you've defined the desired region, the location of the TO point determines whether the region's audio will be stretched out or shrunk. If the TO point is:

- *before the OUT point*—the region's audio is made shorter in duration.
- *after the OUT point*—the region is made longer in duration.



### Why You'd Want to Use Region COMP/EXP.

You can use COMP/EXP. to make audio fit a groove in a dance track. You can also use it to make a region meet the time constraints of a TV or radio commercial or a soundtrack.



You can stretch a region to fill a blank space in the playlist by placing TO at the beginning of the next audio. Likewise, if a region's too large to fit in an available gap, place TO where the region overlaps the audio following it to shrink it to the right size.

### Edit Points

- *IN*—sets the beginning of the region to be stretched or shrunk.
- *OUT*—sets the end of the region to be stretched or shrunk.



The length of time between the IN and OUT points must be greater than .5 seconds.

- *TO*—sets the amount of time compression or expansion to be applied, according to its position before (compression) or after (expansion) the OUT point.



You can compress the region's length to as little as 75% or expand by as much as 125%. Be aware that the more extreme the amount of compression or expansion, the more the region's audio quality may degrade.

### TYPE

The VS-2000 offers three different time compression/expansion algorithms. Select the one that most closely describes the region's audio:

- A: Vocal, Narration
- B: Slow-tempo Songs
- Fast-tempo Songs

### Pitch

When Pitch is set to:

- *Variable*—the region's pitch is raised or lowered by the same amount that its length is compressed or expanded, respectively.
- *Fixed*—the region's pitch stays the same regardless of the change to its length.

### Amp

The time compression/expansion process can change a region's level, and if its level becomes too high, distortion results. The Amp parameter lets you set the region's post-processing loudness. We recommend trying a setting of 60% to start. If the processed region is too quiet, perform an Undo and try again with a higher percentage. You can set this parameter to the following level percentages: 50, 60, 70, 80, 90, 100.

# IMPORT

## *Use: Mouse, TRACK menu*

You can import a track from another project recorded using the same sampling rate and recording mode as the current project.

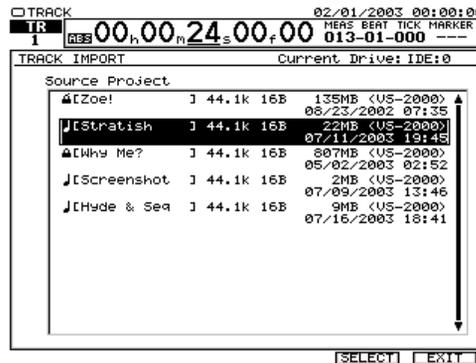


**TRACK menu  
F2 (IMPORT)**



You can import CDR-mode disk-image audio (Page 356) into any project, regardless of its sampling rate to unused V-Tracks belonging to the mastering tracks. CDR-recorded audio is always stereo, so it's imported to both tracks—when you select a destination track, its odd/even partner is also selected.

When you select IMPORT, the VS-2000 scans the selected drive and presents you a list of all projects that contain importable audio.



Select the desired project and press F5 (OK). On the screen that appears, you can select the track you want to import, and the track in the current project on which you want to place the imported audio.



During importing, if there's already audio on the track, the VS-2000 asks if you want to append the imported audio to its end or replace what's there. If you choose to append the audio, it's placed two seconds after the audio already on the track.

To return to the main IMPORT screen, press F1 (<<BACK).

## **Why You'd Use Region IMPORT**

IMPORT lets you share favorite recordings between projects, or create new projects based on previously recorded source materials.

### **SOURCE**

Turn the Time/Value dial to select the track you want to import.

### **DESTINATION**

Turn the Time/Value dial to select the track in the current project on which you want to place the imported audio.

## EXCHANGE

### **Use: TRACK menu**

Region EXCHANGE allows you to swap audio regions between source and destination tracks.



**TRACK menu  
F3 (Exchnge)**

### **Why You'd Use Region EXCHANGE**

Region EXCHANGE lets you re-organize a project's tracks to make them easier to work with. Also, you can use EXCHANGE to re-order tracks to facilitate channel linking.

### **How to Use Region EXCHANGE**

On the EXCHANGE main screen, select the desired source track—specifically, the data on its active V-Track—and the desired destination V-Track using the methods described in Chapter 18.



Make sure not to use the same destination V-Track(s) for more than one source track or linked pair of source tracks.

## ARRANGE

### **Use: TRACK menu**

Region ARRANGE lets you move regions around within a project to re-arrange the order of its sections. When you re-arrange a project's sections, you create a new playlist.



**TRACK menu  
F4 (Arrnge)**

ARRANGE identifies each section of a project by the marker placed at the start of the section and the marker at the end of the section. If one section runs right into the next, you don't need to place a separate marker at the end of the first section—the VS-2000 can use the marker at the start of the next section as the end marker for the first section. Place the markers you need before editing—see Page 186 to learn about markers.



Since region ARRANGE lets you restructure a project without creating any new audio files on your hard drive, it doesn't appreciably increase the size of the project, no matter how long a new playlist you create.

### **Why You'd Use Region ARRANGE**

Region ARRANGE lets you try out different structures for your project. If you're recording a song, you can move its pieces around until you're satisfied with the way it flows. If a project contains multiple pieces or songs, you can re-arrange their order.



You can undo a new project arrangement you'd decided you don't like.

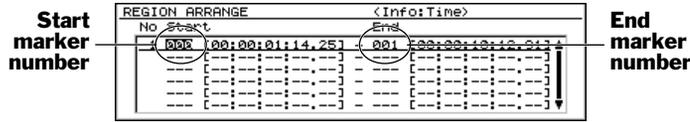
### **Edit Points**

- *TO*—sets the start of the newly created playlist.

### Creating a New Playlist

On the region ARRANGE main screen:

1. Press F1 (CREATE) to create the first segment of the new playlist.
2. Cursor to the segment's Start marker number.

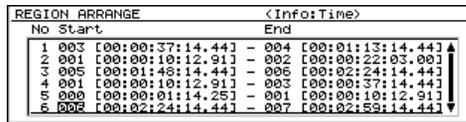


3. Turn the Time/Value dial to select the marker at the start of the desired section.
4. Cursor to the segment's End marker number.
5. Turn the Time/Value dial to select the marker at the end of the section.
6. Press F1 (CREATE) to create the next playlist segment.  
The VS-2000 creates a new segment with the same settings as the segment before it. Since you can't set a Start marker number to be higher than an End marker's number, set the new segment's End marker number first.



If you ever find you can't raise a segment's Start marker number, check the segment's End marker number to make sure that it's set higher than the desired Start marker.

7. Cursor to the segment's End marker number.
8. Turn the Time/Value dial to select the marker at the end of the section you want to use in the second segment.
9. Cursor to the segment's Start marker number.
10. Turn the Time/Value dial to select the marker at the start of the section.
11. Repeat Steps 6-11 for all of the desired remaining playlist segments.



12. If you need to change the settings for any segment, cursor to the desired settings and change them.

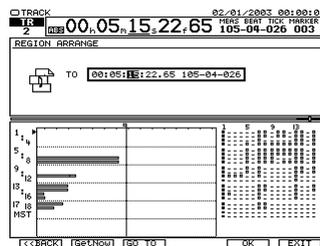
You can press:

- F2 (AllClr)—to clear all of the segments from the playlist.
- F3 (DELETE)—to clear the currently selected segment.
- F4 (Insert)—to add a new segment above the currently select segment.

### Placing and Activating a New Playlist

Once you've created the new playlist, you must place it at the desired location in the project in order to activate it. To do this:

1. Press F5 (NEXT)—the ARRANGE TO screen appears.



The TO location is the place in the project where the playlist is to start.



If you select a TO location that's before or somewhere in the middle of the project's currently active playlist, the new playlist is placed on top of the older one, taking the place of the older playlist wherever they overlap. If you position the new playlist after the currently active playlist, a new marker is automatically placed at the start of the new playlist to make it easy to navigate to.

2. Set TO to the desired project location. You can:
  - dial in the desired location using the Time/Value dial.
  - move the now line to the desired location using the current time location display at the top of the screen, and then press F2 (GetNow).



To move the now line to the current TO location, press F3 (GO TO).

3. Press F5 (OK) to activate and place the playlist in the project, F1 (<<BACK) to return to the main ARRANGE screen, or F6 (EXIT) to cancel the ARRANGE operation.

## NAME

### ***Use: TRACK menu***

The VS-2000 allows you to name any of the tracks in a project. The main NAME screen provides a track selection display where you can select the track you want to name. To learn about the VS-2000's naming tools, see "Naming" on Page 74.



**TRACK menu  
F5 (NAME)**

### ***Why You'd Use Region NAME***

Naming a track allows you to easily identify it on a connected optional VGA display and when you're selecting tracks during editing.

# 21—Working with the VS-2000 Outputs

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The VS-2000 offers a range of analog output jacks and digital connectors from which you can send its audio signals to external devices. This chapter discusses how to route signals to them and how they can be used.

## The VS-2000 Outputs

### Output Pairs

The VS-2000's analog and digital outputs are managed as left/right or odd/even output pairs when you're routing signals to them. These pairs can't be altered.

### Analog Output Jacks

The VS-2000 has six analog output jacks that you can connect to external devices when you want to send audio signals out of the VS-2000. You can use the jacks for the jobs suggested by their names or for any other purpose in which you need to get a VS-2000 audio signal to an external device that has analog inputs.

When you're routing signals to them, the six mono analog output jacks are divided into three sets of stereo jack pairs:

- *MASTER L/R*—By default, these 1/4" outputs send the VS-2000's stereo MASTER bus signal to an external device such as a two-track recording device.
- *AUX L/R*—These RCA-type outputs typically send the VS-2000's Aux 1 and 2 busses bus signal to external devices such as a headphone amps or external effects with analog inputs.
- *MONITOR L/R*—These RCA-type outputs can send the VS-2000's stereo MONITOR bus signal to external devices such as powered speakers or to a stereo speaker amplifier.

By default, the MONITOR bus' signal is routed to the stereo 1/4" PHONES jack. We've just described the default behavior of these jacks. You can actually route a variety of signals to them if you wish, as described on Page 274.

### Digital Output Connectors

The VS-2000 has a coaxial digital output (Page 48).



If you execute a project- or drive-related operation (e.g., switch the project or drive) on the VS-2000 while the VS-2000 is digitally connected to another digital audio device, noise may be heard from the audio output of the connected digital audio device. Please turn down the volume of your digital audio device before executing a project- or drive-related operation.



If you've connected a VS-2000 digital output to a device that's using a lower bit rate, you can dither the VS-2000's output down to that bit depth—see Page 382.



You can activate digital copy-protection to prevent the making of digital copies of audio you've recorded on a connected external DAT or MiniDisc recorder—see Page 382.



For a detailed discussion of master clock considerations when sending digital audio from device to device, see Page 135.

## Output Signal Routing

You can route bus signals or track signals to the VS-2000's analog and digital outputs. We'll discuss these two topics separately.

### Bus Routing

The VS-2000's output jacks and connectors can transmit MASTER, MONITOR, Aux and Direct path signals from the VS-2000's outputs to external devices. With the exception of the MASTER and MONITOR analog outputs, you can route any pair of busses—or a stereo bus—to any pair of output jacks or connectors.

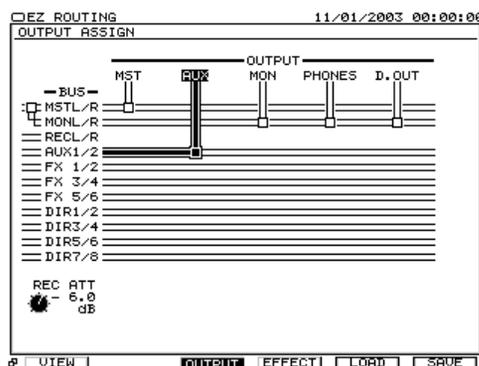
- The MASTER analog jacks always carry the stereo MASTER bus signal.
- The MONITOR analog jacks always carry the stereo MONITOR bus signals—you can, however, send the signals from any pair of busses into the stereo MONITOR bus feeding the MONITOR jacks.



Though busses are routed to outputs in pairs, you can send completely different signals on each bus pair's odd/even busses. If you're using Aux busses, the busses can be linked in stereo (Page 206) or not, as desired.

### Routing a Pair of Busses to a Pair of Outputs

1. Press EZ ROUTING.
2. If "OUTPUT" isn't above F3, press PAGE repeatedly until it is.
3. Press F3 (OUTPUT)—the OUTPUT ASSIGN screen appears.



In this illustration, we've selected the Aux analog jacks.

Aux Busses 1 and 2 are routed to the Aux jacks, as shown by the thick black connection line.

Each bus runs from left to right across the display. When you select an output and turn the Time/Value dial, a connection box moves down the screen to reach the desired bus.

The output jack and connector pairs run along the top of the screen, and the bus pairs run up and down its left edge.

4. Use ◀ or ▶ to select the desired pair of output jacks or digital connectors.
5. Turn the Time/Value dial to choose the desired pair of busses to be routed to the selected output pair—as you turn the dial, the connection box moves up and down the display, showing you what's routed to the selected pair of outputs.



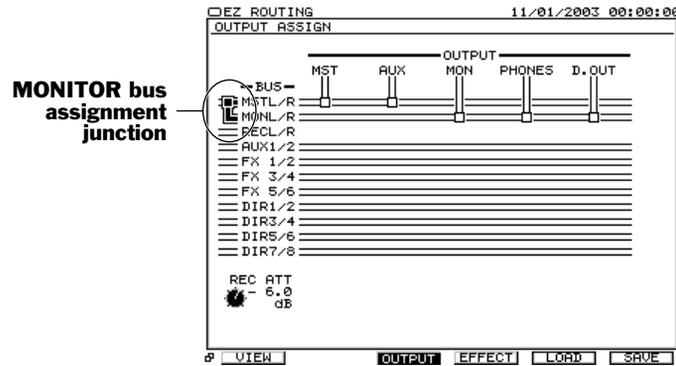
If you prefer, you can route busses to outputs by dragging an output pair's connection box down to the desired bus pair with your mouse.



The coaxial and optical digital outputs are always active, and carry the same signal.

## Routing a Pair of Busses to the Stereo MONITOR Bus

1. Press EZ ROUTING.
2. If “OUTPUT” isn’t above F3, press PAGE repeatedly until it is.
3. Press F3 (OUTPUT)—the OUTPUT ASSIGN screen appears.



In this illustration, we’ve selected the **MONITOR** bus assignment junction, and the stereo **MASTER** bus is selected as the signal being sent to the stereo **MONITOR** bus.

The assignment of a pair of busses—or a stereo bus—to the stereo **MONITOR** bus is shown by the **MONITOR** bus assignment junction at the left of the output routing area on the **OUTPUT ASSIGN** screen as shown above.

4. Press ◀ to highlight the **MONITOR** bus assignment junction.
5. Turn the Time/Value dial to choose the pair of busses to be sent to the stereo **MONITOR** bus—as you turn the dial, the connection moves up and down through the busses on the left side of the display, showing what’s being sent to the bus.

### Monitoring the Recording Busses Directly

To listen to the recording busses (Page 59) directly without sending them through their track channels, assign **REC L/R** to the **MONITOR** bus. When you do this:

- All eight recording busses are combined into a single stereo signal for monitoring.
- You can adjust this stereo signal’s level using the **REC ATT** parameter.



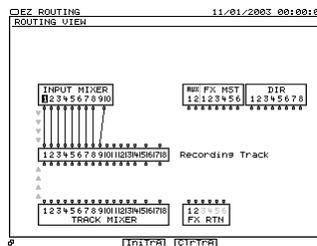
# 22—EZ Routing

The EZ ROUTING screens are where you go to set up the connections that allow signals to travel within the VS-2000. This chapter provides an overview of the EZ ROUTING screens we've been discussing all along, and describes the VS-2000's helpful EZ Routing tools.

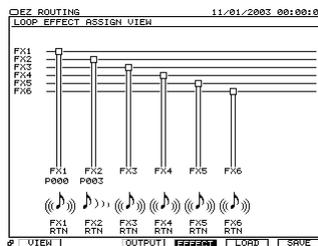
## The EZ ROUTING Screens

There are three EZ ROUTING screens on which routing is performed:

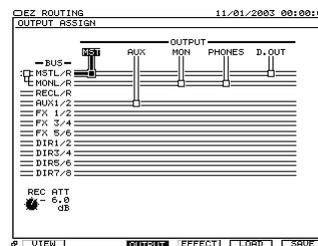
### EZ ROUTING VIEW



### LOOP EFFECT ASSIGN



### OUTPUT ASSIGN



## Navigating the EZ ROUTING Screens

To view the EZ ROUTING screens, press EZ ROUTING.

The EZ ROUTING screens have two pages that are identical except for the F buttons displayed at the bottom of the screen. Press PAGE to toggle between these two sets of F buttons. One page has a set of F buttons for each EZ ROUTING screen:

- F1 (VIEW) • F3 (OUTPUT) • F4 (EFFECT)

Press a screen's F button to view the screen.

The other page provides tools for resetting input and hard disk recorder track routings:

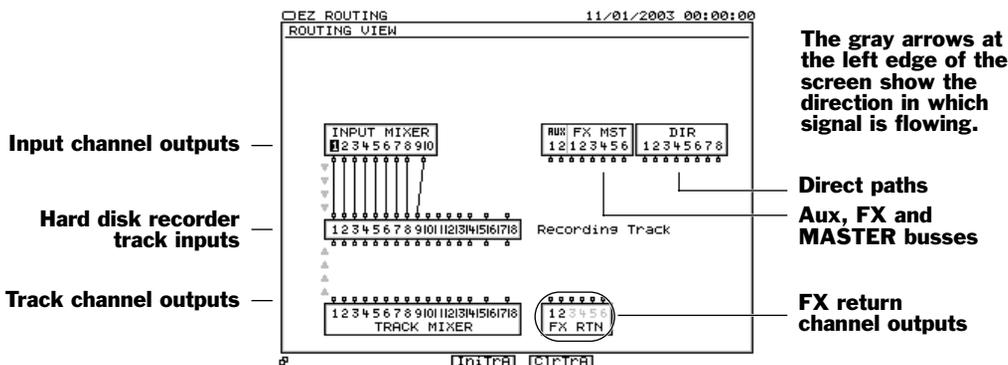
- F3 (IniTrA) • F4 (ClrTrA)

We'll discuss these on Page 280.

## EZ ROUTING VIEW Screen

The EZ ROUTING VIEW screen shows—and allows you to interconnect—all of your:

- input channels
- MASTER bus
- FX return channels
- FX busses
- Direct paths
- hard disk recorder tracks
- Aux busses
- track channels



### Making Connections on the EZ ROUTING VIEW Screen

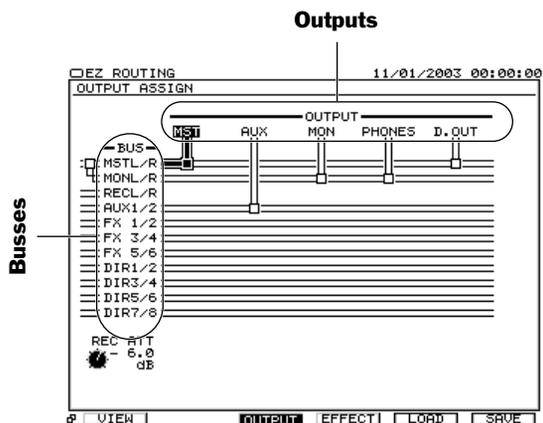
- Use **◀**, **▶**, **▲** or **▼** to select the desired input or output connection. You can select:
  - input channel outputs
  - MASTER bus outputs
  - Track channel outputs
  - FX and Aux bus outputs
  - Direct path outputs
  - FX return channel outputs
- Turn the Time/Value dial to create the desired connection.

We've already described various EZ ROUTING VIEW connections in detail in other parts of the *VS-2000 Owner's Manual*.

<i>To learn how to route:</i>	<i>See:</i>
input channels to tracks for recording	Page 172
track channels to tracks for bouncing	Page 196
FX return channels to tracks for recording and bouncing	Page 233

## The EZ ROUTING OUTPUT ASSIGN Screen

On the EZ ROUTING OUTPUT ASSIGN screen, you can route any of the VS-2000's busses to output jacks or connectors.



On this screen, you can adjust your listening level using the REC ATT parameter (Page 275) when you're listening to the eight recording busses instead of the MASTER mix.

### **Making Connections on the EZ ROUTING OUTPUT ASSIGN Screen**



For the purposes of routing, busses are treated as odd/even pairs that can include two mono busses or one stereo bus. Outputs are divided into odd/even, left/right pairs as well. These pairs cannot be altered.

1. Use ◀ or ▶ to select the desired pair of outputs.
2. Turn the Time/Value dial to create the desired connection.

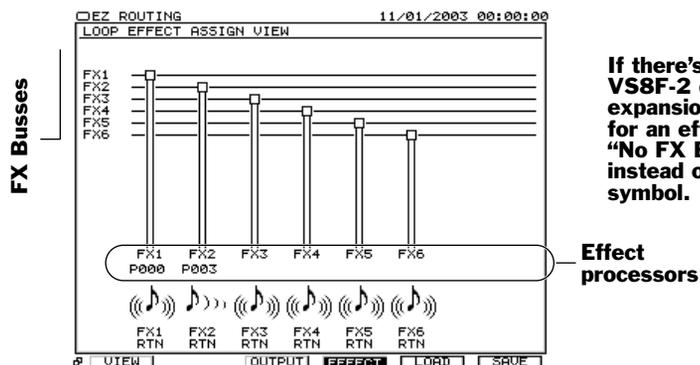


If you cursor all the way to the left, you'll select the MONITOR bus assignment junction. Turn the Time/Value dial to select the pair of busses—or stereo bus—you'd like to send into the stereo MONITOR bus.

Output routing is described in detail in Chapter 21. In addition, on Page 75, you'll find a detailed set of steps for setting up digital monitoring through a pair of Roland DS-series Digital Reference Monitors.

## **The EZ ROUTING LOOP EFFECT ASSIGN Screen**

The EZ ROUTING LOOP EFFECT ASSIGN screen displays the FX bus that carries signals to each of the VS-2000's internal effect processors. You can also see a symbol for each processor's currently selected effect patch.



If an FX bus is linked to its odd/even partner (Page 204), "L" and "R" are attached to the end of their names.

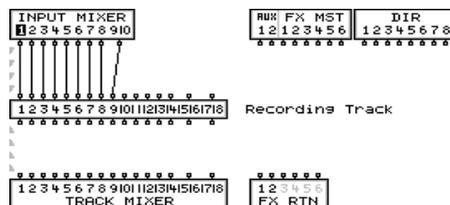
## EZ Routing Tools

**INITRA CLRTRA**

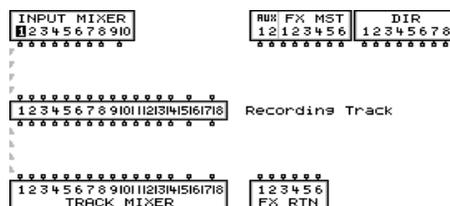
The EZ Routing tools that appear at the bottom of the EZ ROUTING VIEW, OUTPUT and EFFECT screens allow you to clear and initialize the routing of any signals to the hard disk recorder tracks.

When the hard disk recorder track connections are:

- initialized**—Input Channels 1-10 are routed to Tracks 1-10.



- cleared**—no input channels, Aux busses, Direct paths, track channels or FX return channels are routed to tracks.



To:	Press:
initialize all routings to hard disk recorder tracks	F3 (IniTrA)
clear all routings to hard disk recorder tracks	F4 (ClrTrA)

## Saving and Loading EZ Routing Templates

As you use your VS-2000, you'll spend lots of time creating routing setups for the various situations in which you'll be recording and mixing. You can save a routing setup—along with a host of other parameters—as an EZ Routing template that you can use in any project. When you recall a template, all of the routings and parameter values it contains are instantly restored, saving you lots of setup time. You can save up to 20 EZ Routing templates.



While some of the parameters saved in an EZ Routing template are also stored in scenes, a scene belongs to a particular project, while an EZ Routing template is always available.



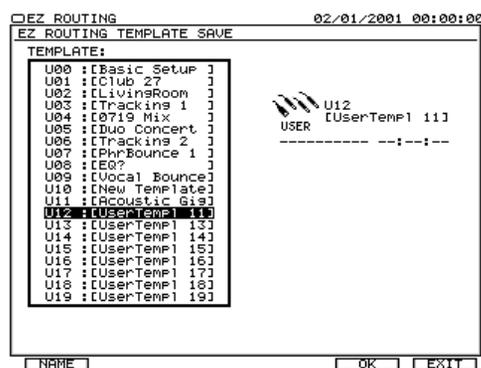
The VS-2000 ships with seven always-available EZ Routing templates for recording, bouncing and mixdown. You can find a list of the connections and parameters each of these templates installs on Page 400.

## The Type of Settings a Template Contains

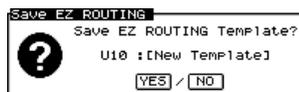
An EZ Routing template remembers everything that pertains to routing and configuration-related parameters—including input channel, track channel and Aux bus linking, V-Track selection and the current settings of the hard disk recorder's TRACK/STATUS buttons.

## Saving an EZ Routing Template

1. Set up your VS-2000 as desired.
2. Press EZ ROUTING.
3. If "SAVE" isn't visible above F6, press PAGE until it is.
4. Press F6 (SAVE)—the EZ ROUTING TEMPLATE SAVE screen appears.



5. Turn the Time/Value dial to select the desired user template memory location.
6. Press F1 (NAME) to name the template you're saving. See Page 74 to learn about naming. If you'd don't want to name the new template, skip this step.
7. When you're ready to finish saving the template, press F5 (OK), or press F6 (EXIT) to cancel the operation.



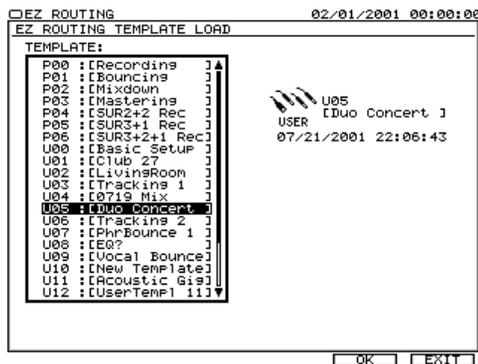
8. Press ENTER/YES to save the template, or EXIT/NO to cancel the operation.

## Loading an EZ Routing Template

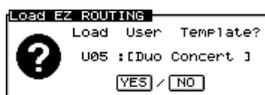


Before loading an EZ Routing template, it's a good idea to turn your listening level down all the way in case the template's new connections and settings cause feedback, result in unwanted noises or cause other problems.

1. Press EZ ROUTING.
2. If "LOAD" isn't visible above F5, press PAGE until it is.
3. Press F5 (LOAD)—the EZ ROUTING TEMPLATE LOAD screen appears.



4. Turn the Time/Value dial to select the template you want to load.
5. Press F5 (OK). The VS-2000 asks if you're sure you want to proceed.



6. Press ENTER/YES to load the template, or EXIT/NO to cancel the operation. If you press ENTER/YES, the template—and all of the routings and configuration settings it contains—loads.

# 23—MIDI and Synchronization

This chapter discusses the VS-2000's MIDI capabilities. The VS-2000 can:

- be operated remotely from an external MIDI device.
- transmit its internal settings via MIDI to an external MIDI storage device.

We'll discuss the related topic of synchronization in the chapter's second half, explaining how to successfully sync the VS-2000 with external devices such as MIDI sequencers, video editing systems and other analog and digital recorders.

## MIDI Operations



If you're new to MIDI, see "About MIDI" in the *VS-2000 Appendices*. Advanced MIDI users can find complete documentation of the VS-2000's MIDI features—including a MIDI implementation chart—in the *VS-2000 Appendices*.

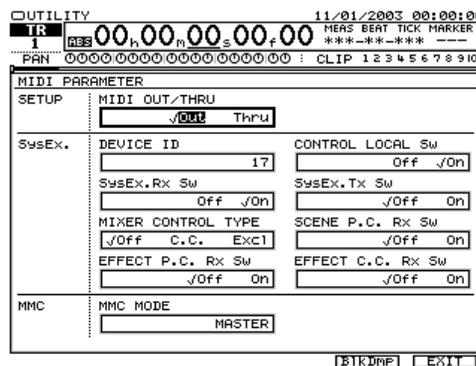
The VS-2000 boasts a wide range of MIDI features that enhance its interaction with other MIDI devices in your system. We'll begin by discussing the basics of how MIDI works in the VS-2000.

## VS-2000 MIDI Basics

### The MIDI PARAMETER Screen

You'll find all of the VS-2000's basic MIDI parameters on the UTILITY menu's MIDI PARAMETER screen. To get there:

1. Hold down SHIFT and press F4 (UTIL).
2. If "MIDI" isn't visible above F5, press PAGE until it is.
3. Press F5 (MIDI)—the MIDI PARAMETER screen appears.



4. Select the desired MIDI parameter and adjust its value.

## **MIDI OUT or THRU?**

The VS-2000's MIDI OUT/THRU parameter sets the behavior of the MIDI OUT/THRU jack on the VS-2000's rear panel. It can be set to:

- *Out*—so that MIDI data produced by the VS-2000 is transmitted to connected external MIDI devices. This is the typical setting.
- *Thru*—so that MIDI data received by the VS-2000 passes through and exits the VS-2000 unchanged. Use this setting only if you've arranged multiple MIDI devices in a daisy-chain and won't be sending any data from the VS-2000 itself.

For all of the operations described in this chapter in which you're transmitting any kind of MIDI data from the VS-2000, set this parameter to OUT.



In the following sections, we describe connecting the VS-2000 to a single external MIDI device. If you're using a MIDI patchbay, consult its documentation to learn how to route the VS-2000's MIDI OUT data to a desired MIDI device, and how to route a desired MIDI device's data to the VS-2000's MIDI IN jack.

## **Turning Fader Control On or Off**

The setting of the MIDI PARAMETER screen's CONTROL LOCAL Sw determines whether or not the 16 channel strip faders and the master fader are active. You may want to disable the faders when you're controlling the VS-2000 remotely—see Page 285—or if you want to protect your level settings from being accidentally changed. Set the parameter to:

- *Off*—so that channel strip fader movements have no effect on the levels of the track channels.
- *On*—so that the faders set the levels of the track channels. This is the default setting, since most often, you'll be controlling the VS-2000's levels locally, not via MIDI.

## **A Note About SysEx ID Numbers**

If you're using multiple VS-2000s, it's important to assign each VS-2000 its own System Exclusive, or "SysEx," ID number. Since VS-2000 SysEx messages (Page 285) can be understood—and acted upon—by any VS-2000, only this ID number embedded in the SysEx data lets the VS-2000 know if it's supposed to act on a SysEx message it receives.



In order to respond to a SysEx message, the VS-2000's ID number must be the same as the ID number embedded in the message—if it's set to another ID, the VS-2000 ignores the SysEx data. If you change the VS-2000's ID, make note of its previous setting so that you'll still be able to receive any SysEx data created with the older ID.

If you're working with a single VS-2000, there's no need to reset the MIDI PARAMETER screen's DEVICE ID parameter. With multiple VS-2000s, set each one to a different ID number—you can select any ID number from 1-32. ID 17 is the default.

## Remote MIDI Control of the VS-2000

The VS-2000 can be controlled from an external MIDI device. Three types of MIDI messages can be used for this purpose. You can use:

- *System Exclusive (“SysEx”) messages*—that can control most VS-2000 functions.
- *Program Change and Bank Select messages*— to select scenes and effect patches.
- *Control Change messages*—that adjust important input channel, track channel, FX return channel, Aux and FX bus, Direct path, MASTER bus and MONITOR bus parameters. You also can adjust effect and other parameters using NRPNs.



The various types of MIDI messages are described in the *VS-2000 Appendices*. In the *Appendices*, System Exclusive messages are called “Exclusive” messages.



When sending and receiving SysEx or Control Change messages that control the VS-2000, take care to avoid MIDI loops. In a MIDI loop, the same MIDI messages are sent and received by the connected devices over and over, spiraling into nonsensical settings in either or both devices. In many sequencers, a Thru feature passes MIDI data back to the device from which it came—this feature should be turned off when working with VS-2000 SysEx and Control Change messages.



NRPN

### **Remote Control of the VS-2000 with SysEx Messages**

You can control the VS-2000 using SysEx messages in either of two ways.

#### *Create SysEx Messages Manually*

You can manually program the SysEx messages in an external MIDI device for transmission to the VS-2000. This method requires an in-depth understanding of MIDI programming—see the *VS-2000 Appendices* for details.

#### *Capture and Return SysEx Messages*

Every VS-2000 button-press, knob turn, fader move and so on can generate a SysEx message that you can transmit from the VS-2000’s MIDI OUT/THRU connector. This data can be captured by an external MIDI recording device and transmitted back to the VS-2000. When you’re using the VS-2000 with a sequencer—as described later in this chapter—the sequencer can record *any* actions you perform on the VS-2000, going beyond even the extensive automation capabilities of the VS-2000’s Automix feature. When the sequencer plays back, your moves are faithfully reproduced.



You can also store VS-2000 settings in an external MIDI device using the VS-2000’s SysEx bulk dump capabilities—see Page 288.

#### *To transmit SysEx data from the VS-2000:*

1. Using a MIDI cable, connect the VS-2000’s MIDI OUT/THRU jack to the MIDI IN jack of the device in which you want to capture the VS-2000’s SysEx data.
1. Navigate to the MIDI parameter screen (Page 283).
2. Set MIDI OUT/THRU to Out.
3. Turn on the SysEx Tx Sw (“SysEx Transmit Switch”)—this determines whether or not SysEx data is transmitted from the VS-2000 as you operate its controls.
4. MIXER CONTROL TYPE sets the type of messages generated by the VS-2000’s controls. Set it to Excl so that the VS-2000 generates SysEx messages.

Every move you make on the VS-2000 produces a SysEx message that's transmitted from the MIDI OUT/THRU jack to the external MIDI device.



You can record the SysEx data on a track in a sequencer you're synchronizing with the VS-2000, as discussed later in this chapter.

*To receive SysEx Data from an external MIDI device:*

1. Using a MIDI cable, connect the VS-2000 MIDI IN jack to the MIDI OUT jack of the device from which you want to receive SysEx data.
2. Navigate to the MIDI parameter screen (Page 283).
3. Turn on SysEx. Rx Sw so that the VS-2000 responds to received SysEx data.

### **Changing Scenes via MIDI**

You can send the VS-2000 Program Change values on MIDI Channel 16 to recall scenes in the current project. Program Change Numbers 00-95 recall Scenes 01-96.

The VS-2000 can't switch scenes while its hard disk recorder is playing back. When it receives a Program Change on MIDI Channel 16 during playback, playback pauses, the requested scene is recalled, and playback then resumes.

Received Program Changes on MIDI Channel 16 are ignored during recording.

### **Changing Effect Patches via MIDI**

You can remotely select effect patches by sending the VS-2000 the appropriate Bank Select and Program Change messages on the effect's MIDI channel. Effects 1-6 respond to messages received on MIDI Channels 1-6, respectively.

<i>Bank MSB (C.C. 0):</i>	<i>Bank LSB (C.C. 32):</i>	<i>Program Change Numbers:</i>	<i>Selects Patches:</i>
0	0	0-99	Preset 000-099
0	1	0-99	Preset 100-199
0	2	0-49	Preset 200-249
0	3	0-99	User 000-099
0	4	0-99	User 100-199



You can change effect patches using program changes sent to the VS-2000 when the hard disk recorder is playing, recording or stopped.

### **Remote Control of the VS-2000 with Control Change Messages**

You can set a variety of VS-2000 parameters from a remote MIDI device by sending the VS-2000 Control Change messages. These include:

- input, track, FX return channel parameters
- MASTER and MONITOR bus parameters
- Aux and Direct path parameters
- effect parameters

You can also send the VS-2000 Control Change messages to set its hard disk recorder's TRACK/STATUS buttons.

Certain important parameters have their own Control Change numbers. You can set one of these parameters by simply sending the VS-2000 the desired value for the parameter's Control Change number. For a list of the MIDI channels used by the input, track, FX return channels and Master Edit area—as well as charts of Control Change numbers and the parameters they set—see “MIDI Channels and Control Change Maps” on Page 405.

Other parameters—such as effect parameters—can be adjusted using NRPNs, a special category of Control Change messages. For details on using NRPNs for editing effects and other parameters, see the MIDI Implementation section of the *VS-2000 Appendices*.

When you adjust these parameters on the VS-2000 itself, the VS-2000 can transmit Control Change values that can be recorded in an external MIDI device and then sent back to the VS-2000 as desired.

*To enable Control Change transmission on the VS-2000:*

1. Using a MIDI cable, connect the VS-2000's MIDI OUT/THRU jack to the external device's MIDI IN jack.
2. Navigate to the MIDI parameter screen (Page 283).
3. Set MIDI OUT/THRU to Out.
4. Set MIXER CONTROL TYPE to C.C. (“Control Change”).

*To enable Control Change reception on the VS-2000:*

1. Using a MIDI cable, connect the VS-2000's MIDI IN jack to the external device's MIDI OUT jack.
2. Navigate to the MIDI parameter screen (Page 283).
3. Set MIXER CONTROL TYPE to C.C. (“Control Change”).
4. If you want to edit effects using NRPNs, turn on the EFFECT C.C. Rx Sw (“EFFECT Control Change Receive Switch”) parameter.

## Remote MIDI Storage of VS-2000 Settings

You can transmit scenes, EZ Routing templates and user effect patches from the VS-2000 as SysEx bulk dump data that can be stored in an external MIDI storage device—or a sequencer—and loaded back into the VS-2000 at a later time. The VS-2000's bulk dump operations are performed on its MIDI BULK DUMP screen.



Bulk-dumping scene, EZ Routing or effect patch data doesn't remove it from the VS-2000's memory. It merely allows you to store a copy of the data externally.



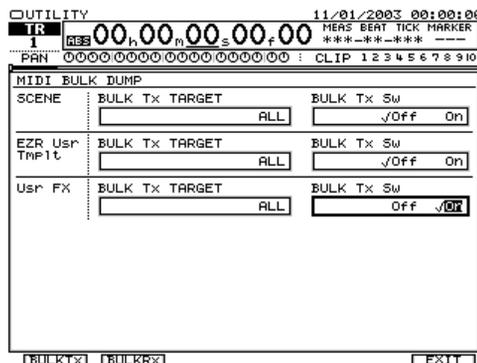
In order to transmit MIDI bulk dump data, the SysEx. Tx Sw parameter on the MIDI PARAMETER screen (Page 283) must be turned on. To receive bulk dump data, the SysEx. Rx Sw parameter on the same screen must also be turned on.



To ensure the successful re-loading of bulk dump data, read “A Note About SysEx ID Numbers” on Page 284.

## Sending SysEx Bulk Dump Data

- Using a MIDI cable, connect the VS-2000's MIDI OUT/THRU jack to the device to which you want to transmit the SysEx bulk dump.
- Navigate to the MIDI PARAMETER screen ((Page 283).
- Set MIDI OUT/THRU to Out.
- Press F5 (BlkDmp)—the MIDI BULK DUMP screen appears.



When you bulk-dump data from the VS-2000, all data selected for transmission on this screen is included in the dump. Therefore, you'll need to select what you want to transmit in the dump. The screen is divided into three parts: SCENE, EZR User Tmpl ("EZ Routing User Templates") and User FX ("User Effect Patches"). Each section has a BULK Tx ("Bulk Transmit") Sw on/off parameter, and a BULK Tx TARGET ("Bulk Transmission Target") parameter.

- To include scene data in the dump, turn on the SCENE section's BULK Tx Sw.
- Set the SCENE section's BULK Tx TARGET parameter to:
  - ALL—to include all of the current project's scenes in the dump.
  - (Scene XX)—to select a single scene to dump.
- If you want to include EZ Routing user template data in the dump, turn on the EZR User Tmpl section's BULK Tx Sw and select a single EZ Routing template or ALL templates for its BULK Tx TARGET parameter.
- To include one or all of your user effect patches, turn on the User FX section's BULK Tx Sw parameter and set its BULK Tx TARGET to ALL or a selected user effect patch.
- When you've configured the contents of the bulk dump, press F1 (BULKTx) for "Bulk Transmit."

The VS-2000 asks if you're sure you want to transmit the bulk dump.



- Press ENTER/YES to transmit the SysEx bulk dump, or EXIT/NO to cancel the operation.

A progress bar appears on the screen as the dump occurs. When the dump is complete, the VS-2000 displays "Done!"

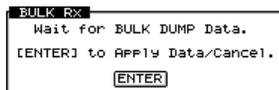
## Receiving SysEx Bulk Dump Data



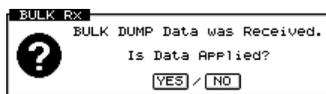
When you reload a scene, EZ Routing template or user effect patch, it's restored to its original memory location in the VS-2000, replacing anything that's currently stored there. Before receiving bulk dump data, make sure the memory locations you'll be loading data into don't contain anything you want to keep—if they do, re-save their current contents to new memory locations before proceeding.

1. Using a MIDI cable, connect the VS-2000's MIDI IN jack to the MIDI OUT of the device from which you want to transmit the SysEx bulk dump.
2. Navigate to the MIDI PARAMETER screen (Page 283).
3. Press F5 (BlkDmp)—the MIDI BULK DUMP screen appears.
4. Press F2 (BULKRx) for "Bulk Receive."

The VS-2000 tells you it's awaiting the bulk dump data.



5. If you wish to cancel the operation at this point, press ENTER/YES.
  6. When the data has been received, press ENTER/YES.
- The VS-2000 asks if you wish to restore the data to its original scene, EZ Routing template and/or user effect patch memory locations.



7. Press ENTER/YES to restore the data, or EXIT/NO to cancel the operation.

## MIDI Metronome

In addition to its full-featured Rhythm Track, the VS-2000 provides an internal metronome that allows you to create several types of simple reference rhythms during recording and playback—see Page 384. The metronome can also send its MIDI notes to an external MIDI sound module or keyboard, allowing you to use the module's sounds for your reference rhythm.

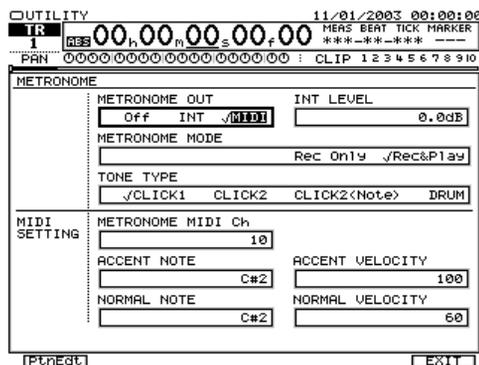
### Setting Up a MIDI Metronome



Prepare the external MIDI device that'll be producing your metronome sounds by configuring it to receive data on a MIDI channel of your choice, and by selecting a rhythm kit-type sound that plays a different percussion sound on each note.

1. Using a MIDI cable, connect the VS-2000's MIDI OUT/THRU jack to the MIDI IN jack of the device whose sounds you want to use as a metronome.
2. Navigate to the MIDI parameter screen (Page 283).
3. Set MIDI OUT/THRU to Out.
4. Press F6 (EXIT).
5. Press RHYTHM TRACK.

- Press F4 (Metro)—the METRONOME screen appears.



- Set METRONOME OUT to MIDI.
- Set METRONOME MIDI Ch to the MIDI channel on which the external MIDI device is set to receive data.  
The metronome can play two types of notes. It can play:
  - accent notes*—that signify the start of each measure to help you keep track of where you are.
  - normal notes*—that play on each measures' other beats. This note typically has a lower pitch than the accent note.
- Select the desired accent note on your external MIDI device by setting ACCENT NOTE to its MIDI note number.
- Select the desired normal note by selecting its MIDI note number for the NORMAL NOTE parameter.  
It's customary for the accent note to be somewhat louder than the normal notes—this loudness is determined by the note's MIDI velocity value.
- Once you've had a chance to hear your MIDI metronome, you may want to adjust the ACCENT VELOCITY and NORMAL VELOCITY parameters to set a pleasing volume balance between the two types of notes.

## Synchronization

### Why Sync the VS-2000?

The ability to synchronize the VS-2000—specifically, its hard disk recorder—with other devices can be useful in a variety of situations.

#### **Working with a MIDI Sequencer**

You can sync the VS-2000 to any kind of sequencer—a standalone hardware sequencer, a computer sequencing program or the sequencer in a beat box. Live stage productions with sequencer-driven lighting cues can also be synchronized to house sounds generated by the VS-2000.

In music, synchronizing the VS-2000 with a sequencer allows you to record MIDI instruments as audio on the VS-2000's tracks. It also lets you create a finished musical work without *ever* recording your MIDI instruments as VS-2000 tracks, perfecting your sequenced tracks as you listen to them alongside your recorded VS-2000 tracks. The sequencer can play its MIDI instruments live through the VS-2000's input channels during the final mixdown.

As described earlier in this chapter, you can record all of your VS-2000 actions into a sequencer as SysEx data, and have the sequencer play them back during a project. A sequencer can also adjust VS-2000 parameters in realtime using Control Change messages (Page 286) as a project plays or during recording.

#### **Working with a Video or Film Editing System**

Since you can synchronize the VS-2000 to any system that uses MTC or SMPTE synchronization (described later in this chapter), The VS-2000 can be a great asset in video or film soundtrack, commercial spot production or post-production work.

Synchronization lets you place the musical scores, narration or sound effects you've recorded on the VS-2000 perfectly to picture, thanks to the VS-2000's accurate frame/subframe synchronization precision.



The VS-2000's V-Link feature allows you to easily synchronize the VS-2000 with video editing and presentation devices. See Page 301.

### Basic Synchronization Concepts

#### **Master/Slave**

When two devices are synchronized with each other, one device is always designated as the "master" and the other the "slave," as we mentioned back in Chapter 9 in the discussion of digital audio's master clocking. In synchronization, the:

- *master*—generates the timing reference that both devices use.
- *slave*—operates using the master's timing reference.

The VS-2000 can operate as master and/or slave, depending on the situation, as described in the following sections.

## **What Do We Mean By “Timing Reference?”**

A timing reference is a kind of message continuously transmitted from master to slave to keep the devices synchronized. The VS-2000 works with two types of timing references when synchronizing its hard disk recorder with another device.

### *SMPTE/MTC*

The film and video industries use a steady stream of timing data called “SMPTE time code” to keep devices tightly synchronized with each other as they play. A form of SMPTE called “MIDI Time Code,” or “MTC” can be transmitted and received through MIDI cables along with other MIDI data. Both SMPTE and MTC provide very accurate synchronization. The time code area of the VS-2000’s current time location display (Page 130) shows MTC/SMPTE hours, minutes, seconds frames and subframes.

The VS-2000 can be synchronized to any device that generates MTC. Most sequencers support MTC, for example—not as many support SMPTE. The VS-2000 itself generates MTC.

### *MIDI Beat Clock*

MIDI beat clock—or “MIDI Clock” for short—is a pulse embedded in a stream of MIDI data that can be used for synchronizing MIDI devices. MIDI clock synchronization isn’t as accurate as MTC-based synchronization. It does have one important use, however. MIDI clock, along with MIDI Song Position Pointer (“SPP”) messages, passes along tempo and time signature information that can be used by the VS-2000 in the creation of sync tracks and tempo maps, which we’ll discuss in a moment.

The VS-2000 can record received MIDI clock information as a sync track that lets it act as a master to slave devices that understand MIDI clocks and Song Position Pointer. While the VS-2000 can generate MIDI clocks to slave devices that use this form of sync, the VS-2000 itself can’t be synchronized to MIDI clocks, since it’s not an accurate enough form of synchronization for the VS-2000’s precise operations.



### *Song Position Pointer*

## **About MTC Frame Rates**

When you use MTC for synchronizing the VS-2000 with an external device, make sure that the two devices are set to operate at the same MTC/SMPTE speed, or “frame rate.” The “frame” refers to how many frames of film or video occur in each second.

MTC/SMPTE can run at a few different frame rates, depending on the devices being synchronized and the materials they’re producing. It can run at:

- 30 *fps* (“frames per second”)—This speed is used by most MIDI sequencers and audio devices. Black and white video also runs at this speed.
- 29.97N (“non-drop”) *fps*—This is the speed at which United States’ NTSC format color video runs in non-time-critical situations, such as offline production work.
- 29.97D (“drop”) *fps*—This is the speed at which United States’ NTSC format live color video runs during broadcasts and other time-critical situations.
- 25 *fps*—This is the speed at which European SECAM or PAL film, video and audio equipment operates.
- 24 *fps*—Film, cell animation and certain audio devices run at this speed.

*What are Non-Drop and Drop Frame Rates?*

When a time counter display tries to show the frames passing by at the 29.97 fps color video frame rate, it has a problem: The counter can't show exactly 29.97 counter numbers per second. It can either show 29 per second or 30, but there's no way to display only a fraction of a counter number—a number's either shown or it isn't.

A technique called the "drop frame" was devised by the video industry to deal with this. With a frame rate called "29.97 drop," the first two frames in every minute are discarded except for the first minute and every tenth minute. This keeps the time code and a counter roughly together. In fact, they're always a little bit off from each other, but each time the frames are dropped, the time code leaps ahead to catch up to the counter temporarily. This form of time code isn't completely continuous—since it has to keep skipping over frames to catch up—but it's useful in situations where the counter, and the clock on the wall, has to match the time code as closely as possible. It's therefore the most commonly used time code in the live broadcasting of color video.

29.97 non-drop time code is its continuous cousin. It doesn't drop any frames and is the preferred frame rate when the counter's accuracy doesn't matter so much. Continuous time code is theoretically smoother than time code that jumps around skipping frames.

*Which Frame Rate Should You Use*

If you're syncing and there's no video or film involved, use the 30 fps frame rate unless one of your devices doesn't support it. This frame rate's continuous and has the finest possible resolution, being the fastest speed available. If you're syncing the VS-2000 to an external device that has to use another frame rate—for example, a video editing system—simply set the VS-2000 to the frame rate the external device uses. We'll describe setting the VS-2000's FRAME RATE parameter in the following sections.

**MMC**

MMC, short for "MIDI Machine Control," is a set of MIDI messages that controls the transport buttons—PLAY, STOP, etc.—of an MMC-supporting device. MMC also contains information that tells each device the current location of its transport. In the VS-2000, this would be the position of its now line. MMC's not a form of sync—it's about button-presses: When you press the PLAY button on a master MMC device, an MMC slave device acts as if its PLAY button has been pressed as well. The VS-2000 can act as an MMC master or slave.



In order for MMC to work, the master device's SysEx transmission must be enabled—in the VS-2000, this is the SysEx Tx Sw parameter on the MIDI PARAMETER screen (Page 283). The slave device's SysEx reception must also be turned on. For the VS-2000, this is the SysEx Rx Sw parameter, also on the MIDI PARAMETER screen.

**Synchronization with Tempo Changes**

It's not uncommon for a piece of music to use more than a single tempo or time signature. Since MTC/SMPTE speeds are unaffected by tempo or time signature, MTC/SMPTE time code doesn't contain tempo or time signature information. If you want a sequencer you're syncing to the VS-2000 to speed up or slow down—or change time signatures—in order to follow what's recorded in a project, you can synchronize the two devices using MIDI clock and Song Position Pointers (Page 292).

The VS-2000 can transmit this form of synchronization as a:

- *sync track*—a single, uneditable stream of MIDI clock/SPP synchronization data. The VS-2000 can record a sync track comprised of captured MIDI clock and Song Position Pointer data received from an external MIDI device. This lets an external sequencer “teach” the VS-2000 a song’s tempo and time signature changes. The data can then be sent back to the sequencer, slaving it to the VS-2000. You can also construct a sync track for a new or already recorded project using markers. In addition, the VS-2000 can use information you provide about an already recorded project to create a new sync track. See Page 295.
- *tempo map*—an editable stream of MIDI clock/SPP synchronization data. Each VS-2000 project has its own a tempo map in which you can view and edit a project’s tempo and time signature changes. You can build a tempo map for a new or already recorded project on the VS-2000 manually or by using markers, or convert an existing sync track into a tempo map. For details, see Page 296.

The primary difference between a sync track and a tempo map in synchronization operations is that a tempo map lets you see and edit tempo and time signature changes.



A project’s tempo map also provides the basis for the Home screen’s track editing grid.



To synchronize an external MIDI device to the VS-2000 using a sync track or tempo map, the device must recognize MIDI clock and Song Position Pointer messages.



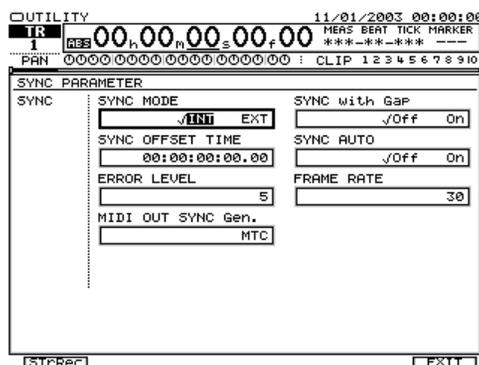
The VS-2000 has an area of memory set aside for a sync track—it isn’t recorded on a project track and doesn’t take up any recording tracks.



It’s important to understand that a sync track or a tempo map has no effect on the speed at which a project plays back—this speed is determined by the project’s sampling rate, or by received MTC/SMPTE time code. A sync track and tempo map merely transmit tempo and time signature information that describes what’s going on in a project to a MIDI device synchronized to the VS-2000.

### The SYNC PARAMETER Screen

1. To set up synchronization, hold down SHIFT and press F4 (UTIL).
2. If “SYNC” isn’t visible above F6, press PAGE until it is.
3. Press F6 (SYNC)—the SYNC PARAMETER screen appears.



**The SYNC AUTO parameter is actually available only when external sync is turned on—this illustration has been altered for instructional purposes.**

4. Select the desired sync parameter and adjust its value.



Some synchronization operations also involve parameters on the MIDI PARAMETER screen (Page 283).

## Working with a Sync Track

### Recording a Sync Track from an External Device



Prepare the external device that's supplying the sync track data by setting it to transmit MIDI clocks.

1. Using a MIDI cable, connect the VS-2000's MIDI IN jack to the MIDI OUT of the device from which you want to transmit the MIDI clocks.
2. Navigate to the SYNC screen (Page 294).
3. Press F1 (STrRec) for "SyncTrack Record"—the VS-2000 tells you it's awaiting data.



As the VS-2000 receives the incoming sync track data, its display shows what's being captured.

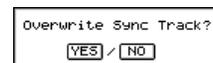


If you want to interrupt and cancel the operation, press EXIT/NO. When the incoming data's been recorded, the VS-2000 displays "Done!"



The VS-2000's now line doesn't move during sync track recording, nor do the project tracks play.

4. If you need to re-record the sync track, repeat Steps 1-3, and when the VS-2000 asks if you want to overwrite the previously recorded sync track data, press ENTER/YES to proceed or EXIT/NO to cancel.



### Generating a Sync Track from Markers

When a project contains music and uses a single time signature, you can create a sync track from markers placed on every beat in the project. To learn about placing markers, see Page 186. Once you've placed your markers, perform the following steps.

1. Hold down SHIFT and press TAP MARKER—the TEMPO MAP screen appears.
2. Press F1 (TM Cnv) to display the TEMPO MAP CONVERT window.
3. Set CONVERT TYPE to Tap → SyncTrk.
4. Set BEAT to the desired time signature.
5. Set TAP BEAT to the number of markers in each measure.
6. Press ENTER/YES to convert the markers into a sync track, or EXIT/NO to cancel the operation.

### Creating a Sync Track Automatically

When a project contains music and has a completely steady tempo and no time signature or tempo changes, the VS-2000 can create a sync track from the project's start and end times, its time signature and the number of measures it contains.



You'll need to note the following before proceeding: the precise start and end times of the project's audio, the number of measures in the project, and its time signature.

1. Hold down SHIFT and press TAP MARKER—the TEMPO MAP screen appears.
2. Press F1 (TM Cnv) to display the TEMPO MAP CONVERT window.
3. Set to CONVERT TYPE to Time → SyncTrk.
4. Set the START TIME parameter to the time at which the project’s audio starts.
5. Set the END TIME parameter underneath it to the time at which the project ends.
6. Enter the number of measures and the project’s time signature.
7. Press ENTER/YES to create the new sync track, or EXIT/NO to cancel the operation.

## Working with a Tempo Map

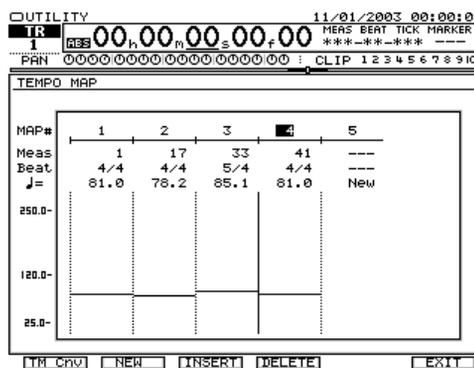
### The Tempo Map Screen



When you store a current project, the current tempo map is saved along with it.

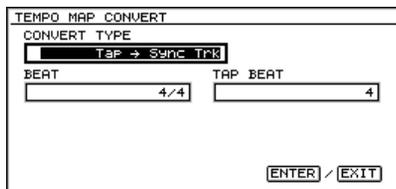
All editing of a project’s tempo map takes place on the TEMPO MAP screen. You can also view a project’s tempo and time signature details on this screen when you’ve generated a tempo map from a sync track or markers.

1. Hold down SHIFT and press TAP—the TEMPO MAP screen appears.



### The TEMPO MAP CONVERT Window

When you press F1 (TM CNV)—for “Tempo Map convert”—on the TEMPO map screen, the TEMPO MAP CONVERT window appears.



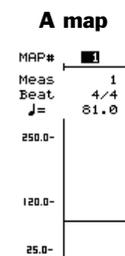
In this illustration, the parameters for the operation that converts markers into a sync track are displayed.

On this screen—as we saw earlier in “Working with a Sync Track”—you can perform a variety of sync track and tempo map conversion operations. When you set CONVERT TYPE to the desired operation, the operation’s parameters are displayed.

## The Elements of a Tempo Map

In a tempo map, each tempo or time signature change in a project is represented by a group of parameters collectively called a “map.” The maps are numbered starting with “1” in the order in which they occur in the project. A map contains the following parameters:

- *Meas* (“Measure”)—the measure at which the map’s settings take effect.
- *Beat*—the time signature at the start of the selected measure.
- $\text{♩} =$ —the tempo, in BPM (“Beats Per Minute”), at the start of the selected measure.



At the bottom of each map is a graphic display of its tempo relative to the entire possible range of tempos, from 25 BPM to 250 BPM.



Map 1 shows the project’s initial tempo and time signature and can’t be deleted.

## Shaping a Tempo Map By Hand

If you’ve only got a few tempo or time signature changes in a project, you can manually create an entire project tempo map on the TEMPO MAP screen (Page 296) by placing a map at every tempo or time signature change:

- Begin by editing the first map’s parameters to reflect the project’s starting tempo and time signature—there’s usually no need to change Map 1’s Meas parameter since it represents the project’s starting tempo and time signature.
- Create additional maps at all of the locations in the project at which a tempo or time signature change occurs.
- Edit the maps’ values as desired.



You’ll need to determine the desired BPM tempo values for your project to construct an accurate tempo map, or to edit the tempos in an existing one.

You can also edit the individual maps in an already-created tempo map.

To:	Do this:
create a new map	Press F2 (NEW)
select a map	Cursor to its number or any of its parameters. When a map is selected, the line at its left edge darkens.
insert a new map after the currently selected map	Press F3 (INSERT)
Erase the currently selected map	Press F4 (DELETE)

To edit an existing map:

1. Cursor to the map’s Meas parameter to move the map to a new location, and select the desired number of the measure at which you want to place the map.
2. Press  $\blacktriangledown$  and set the Beat parameter to the desired time signature.
3. Press  $\blacktriangledown$  and select the desired tempo for the map.



You can’t move a map to the same measure as the previous map, or to an earlier measure.



Hold down SHIFT as you turn the Time/Value dial to move through BPM values in whole-BPM-number steps.



A project's audio rarely starts at Time 00h00m00s00f00, and when the tempo map starts, so will a sequencer slaved to the VS-2000. You can use the SYNC OFFSET TIME parameter on the SYNC PARAMETER screen (Page 294) to delay the start of the tempo map. Move the now line to the beginning of the project's audio, note the now line's time code location in the current time location display, and copy the time into the SYNC OFFSET TIME parameter's box.

### ***Creating a Tempo Map from Markers***

When a project contains music and has a single time signature, you can create a tempo map from markers you've placed on every beat. To learn about placing markers, see Page 186.

1. Hold down SHIFT and press TAP MARKER—the TEMPO MAP screen appears.
2. Press F1 (TM Cnv) to display the TEMPO MAP CONVERT window.
3. Set to CONVERT TYPE to Tap → Tempo Map.
4. Set BEAT to the desired time signature.
5. Set TAP BEAT to the number of markers in each measure.
6. Press ENTER/YES to convert the markers into a tempo map, or EXIT/NO to cancel.

### ***Converting a Sync Track to a Tempo Map***

When you've recorded a detailed sync track—one that contains tempo changes and uses a single time signature—from an external device, you can convert it into a project tempo map.

1. Hold down SHIFT and press TAP MARKER—the TEMPO MAP screen appears.
2. Press F1 (TM Cnv) to display the TEMPO MAP CONVERT window.
3. Set to CONVERT TYPE to Sync Trk → Tempo Map.
4. Set SYNC TRACK BEAT to the project's time signature.
5. Press ENTER/YES to convert the sync track into a tempo map, or EXIT/NO to cancel the operation.

## **Syncing an External Device to the VS-2000**

The VS-2000 can generate MTC or MIDI clocks that allow you to synchronize another device to the VS-2000, with the VS-2000 as master and the external device as slave.

MIDI clocks or MTC are carried to an external device through a MIDI cable.



The following describes synchronizing a single device to the VS-2000. If you have a way of distributing VS-2000-generated sync—a MIDI patchbay can do this—you can slave multiple devices to the VS-2000 as long as they're all capable of responding to the selected form of synchronization.

### Setting Up the VS-2000 as the Sync Master

1. Navigate to the MIDI PARAMETER screen (Page 283).
2. Set MIDI OUT/THRU to Out.
3. If the device you're syncing to the VS-2000 supports MMC (Page 293), turn on the SysEx Tx Sw parameter and set MMC MODE to MASTER.
4. Press F6 (EXIT) and the F6 (SYNC) to display the SYNC PARAMETER screen.
5. Set SYNC MODE to INT, for "Internal" so that the VS-2000 uses its own timing.
6. If you'll be using MTC, select a FRAME RATE value—see Page 292 for guidance.
7. If you'll be using MTC, and the material in the slave device doesn't begin at 00h00m00s00f00, enter its start time as the Sync OFFSET TIME parameter's value—when the VS-2000's project plays from the top, the slave plays from this location.
8. Select the type of sync you want the VS-2000 to generate. If you're syncing to:
  - a MIDI device that recognizes MTC—set MIDI OUT SYNC Gen. to MTC.
  - a MIDI device that recognizes MIDI clocks—set MIDI OUT SYNC Gen. to MIDIClk ("MIDI Clock") if you want to synchronize the external device to a project tempo map. To synchronize the device to a sync track, select SyncTr.
9. Complete the setup by configuring the slave device so that it's set to:
  - use an external timing source.
  - receive the type of sync you're sending it from the VS-2000.
  - receive MMC if the device recognizes MMC.
  - receive SysEx data if the device recognizes MMC.



Consult the slave device's documentation for synchronization setup details.

### Starting Synchronized Playback with the VS-2000 as Master

1. Set the slave device—as detailed in its documentation—so that it's awaiting sync.
2. Press the VS-2000's PLAY button.
3. To halt synchronized playback, press STOP on the VS-2000.

## Syncing the VS-2000 to an External Device

The VS-2000 can be synced to a master device that generates MTC. The VS-2000 can receive MTC through its MIDI IN jack.

### Setting Up the VS-2000 as a Sync Slave

1. Navigate to the MIDI PARAMETER screen (Page 283).
2. If the master device transmits MMC (Page 293), turn on the VS-2000's SysEx Rx Sw parameter, and set the MMC MODE parameter to SLAVE.
3. Press F6 (EXIT) and then F6 (SYNC) to display the SYNC PARAMETER screen.
4. Set SYNC MODE to EXT, for "External" so that the VS-2000 uses the master device's timing to operate.

The SYNC with GAP parameter determines how the VS-2000 responds to small gaps, or "dropouts," that often occur in time code for a variety of reasons. Set it to:

- *Off*—if you want the VS-2000 to stop if there's any gap in the time code.
  - *On*—if you want the VS-2000 to continue playing, or "freewheel," at the last synchronized speed until time code is again received.
5. Set FRAME RATE to the master device's frame rate.
  6. If you've turned on external sync in Step 5, set SYNC AUTO to:
    - *Off*—so that the VS-2000 uses its own FRAME RATE setting.
    - *On*—so that the VS-2000 automatically resets its frame rate to that of the master device.

7. Set Sync ERROR LEVEL to adjust the VS-2000's tolerance of dropouts in the time code. Lower values make the VS-2000 less tolerant of time code problems, causing it to cancel synchronization by stopping the VS-2000's hard disk recorder. Higher values make the VS-2000 more patient with problems in the time code, giving it more time to recover before canceling synchronization.



The best setting for the both the SYNC with GAP and Sync ERROR LEVEL parameters is a personal judgement call. When SYNC with GAP is turned off and SYNC ERROR LEVEL is set to a lower value, you can be sure that your sync is rock-solid when synchronization is successful. On the other hand, it's more likely that synchronization will fail. If you turn SYNC with GAP on and use a higher Sync ERROR LEVEL value, it's more likely that synchronization will succeed, but it may not be as tight. You may need to experiment with various settings to find the one that's most satisfactory.

8. Complete the setup by configuring the master device so that it's set to:
  - send MTC to the VS-2000's MIDI IN jack.
  - the same frame rate as the VS-2000.
  - generate MMC.
  - transmit SysEx data.



Consult the master device's documentation for synchronization setup details.



If the time code produced by the master device starts before 00h00m00s00f00—that is, it's a negative value—the project playback on the VS-2000 pauses at 23h.59m.59s.29f.99. Be sure not to record any audio in the project at this time location.

### ***Starting Synchronized Playback with the VS-2000 as Slave***

1. Press PLAY on the VS-2000—its indicator flashes green to indicate that it's awaiting external time code.



Sync-related parameters can't be adjusted while the PLAY indicator is flashing.

2. Start playback on the master device—the VS-2000 follows suit. If you've shifted the project start time, the VS-2000 now line jumps to the desired location.
3. To halt playback, stop playback on the master. If you've shifted the project start time, the VS-2000 now line jumps to its actual MTC/SMPTE time code location.

### ***Shifting the Project Start Time***

It's not uncommon to be syncing a VS-2000 project to material on a master device that doesn't begin at 00h00m00s00f00 MTC/SMPTE time. You might be syncing the project to a song somewhere in the middle of a digital tape, for example. When you begin playback, the VS-2000's now line shoots ahead to the same time location—the beginning of the material on the master starts in the middle of the VS-2000's project.

If you've already recorded at the beginning of your project, it won't play along with the master's material. If you haven't yet recorded on the VS-2000, any audio you record during synchronization will begin somewhere within the project. When you want to do unsynchronized work, you'll need to navigate to the middle of the project to begin playback each time instead of just being able to hit the ZERO button.

You can shift, or "offset," the project's start time to solve this problem so that whenever the master starts over, your project begins at the top.

To offset the project start time:

1. Hold down SHIFT and press F4.
2. If “Disp” isn’t visible above F3, press PAGE until it is.
3. Press F3 (Disp).

The DISPLAY OFFSET TIME parameter shifts the project’s start time. To find the value you want, subtract the desired project start time—this is typically 00h00m00s00f00—from the master’s start time. Enter this amount as the DISPLAY OFFSET TIME.

$$\frac{\text{Master start time} - \text{desired project start time}}{\text{DISPLAY OFFSET TIME}}$$



This formula is especially helpful if your project’s audio starts somewhere other than zero. Use the location at which the audio begins as your desired start time. If you get a negative result, add 24.00.00.00.00 to the master’s start time and do the math again.

4. Set the TIME DISPLAY FORMAT parameter to REL, for “Relative Time,” so that the current time location display shows the project’s shifted start time instead of ABS (absolute) MTC/SMPTE time during playback.

## Synchronizing the VS-2000 and Video Equipment

### What is V-LINK

V-LINK ( **V-LINK™** ) is a function that allows music and images to be performed together. By using MIDI to connect two or more V-LINK compatible devices, you can easily enjoy performing a wide range of visual effects that are linked to the expressive elements of a music performance.



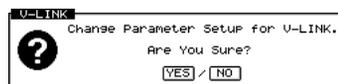
For example, by using the VS-2000 in conjunction with the Edirol DV-7PR’s “Presenter,” you can do the following things.

- You can make the necessary Edirol DV-7PR settings from the VS-2000.
- You can use the VS-2000’s faders to control video playback.
- You can use the VS-2000’s Automix feature for the synchronized rolling of video and sound on the Edirol DV-7PR.

### Switching V-LINK Mode On

Before you turn on V-LINK mode, start up your V-LINK compatible video device. Then:

1. Press the VS-2000’s V-LINK button.  
The VS-2000 asks you to confirm V-LINK startup.



2. Press ENTER/YES—V-LINK mode is turned on and the V-LINK button lights. (If you press EXIT/NO, the operation is cancelled.)

When V-LINK mode is turned on, the following parameters are automatically set in preparation for V-LINK mode operation.

1. SYNC Parameters
  - *SYNC AUTO*—is set to On. \*1
2. MIDI Parameters
  - *MIDI OUT/THRU*—is set to Out.
  - *SysEx. Tx Sw*—is set to On.
  - *SysEx. Rx Sw*—is set to On.
3. FADER Assign Parameters:
  - Determined by the setting of the parameters on the UTILITY V-LINK screens. See Page 386.
4. AUTOMIX is also turned on.\*2
  - Automix can control a variety of V-LINK parameters, as listed in the “Automix Parameter List” on Page 408.

\*1 The setting of this item changes only if the Sync Parameter screen SYNC MODE is set to “EXT.”

\*2 The setting of this item changes only if the Sync Parameter screen SYNC MODE is set to “INT.”

### **Switching V-LINK Mode Off**

1. Press the VS-2000’s V-LINK button.  
V-LINK will go dark, and V-LINK mode will be turned off.

### **Connecting the VS-2000 and the DV-7PR**

When you use the VS-2000 together with the Edirol DV-7PR’s “Presenter,” you can:

- make the necessary Edirol DV-7PR settings from the VS-2000.
- use the VS-2000’s faders to control video playback.
- use the VS-2000’s Automix feature for the synchronized rolling of video and sound on the Edirol DV-7PR.

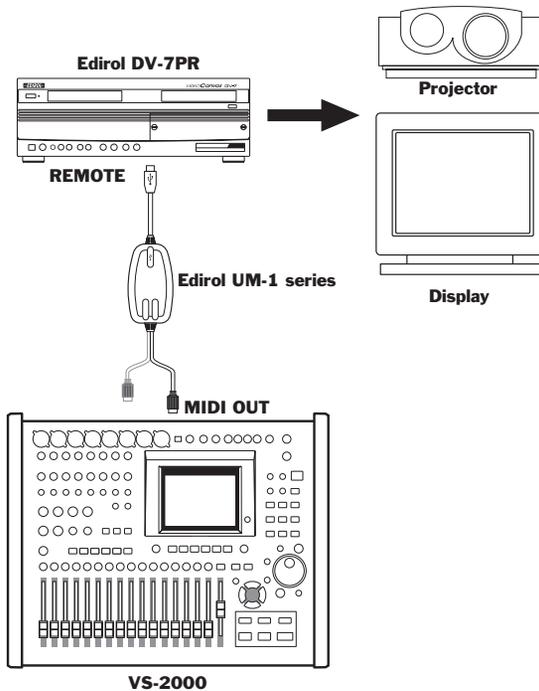


The V-LINK function is compatible with DV-7PR’s “Presenter” version 1.5 or later.

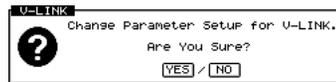
1. Make sure that the power of all devices is turned off, and make the connections shown on the next page.



Before connecting the VS-2000 to other devices, turn off the power to all of the devices. This will help prevent malfunctions and/or damage to speakers or other devices.



2. Turn on the power of each device.
3. Start up the Edirol DV-7PR "Presenter."
4. Hold down SHIFT and press F4.
5. If "SYNC" isn't visible above F6, press PAGE until it is.
6. Press F6 (SYNC)—the SYNC PARAMETER screen appears.
7. Set SYNC MODE to INT.
8. Press the VS-2000's V-LINK button—the VS-2000 asks for confirmation.



9. Press ENTER/YES.  
V-LINK mode is turned on, and the V-LINK button lights.

The Edirol DV-7PR can now be operated from the VS-2000.



When operating the Edirol DV-7PR, the "Select a Clip Bank" operation listed in the V-LINK Function Chart corresponds to switching the palette.



Hold down CLEAR and press V-LINK to initialize the parameters of the connected video device. For details on the initialized value of each video device parameter, refer to the owner's manual for your video device.



For details on the MIDI messages transmitted in V-LINK mode, refer to "MIDI Implementation" ("VS-2000 Appendices").

## Exchanging Digital Audio Data During Synchronization

You can exchange digital audio between the VS-2000 and its sync partner. You might, for example, want to move audio tracks from one V-Studio to another. To learn about digital connections, see Page 48. To learn about clocking digital audio, see Page 135.

### ***When the VS-2000 is the Master***

Set the VS-2000's MASTER CLOCK parameter (Page 135) to INT to send digital audio to the slave device with the VS-2000 controlling the audio's timing.

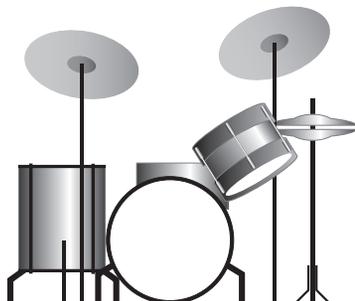
### ***When the VS-2000 is the Slave***

You can receive digital audio from the master device by setting the VS-2000's MASTER CLOCK to DIGITAL IN. The received digital audio's clocking is computed from, and controlled by, the master device's time code.

You can also send digital audio from the VS-2000 to the master device by setting the VS-2000's MASTER CLOCK parameter to INT—with this setting, the VS-2000 generates its own master clock based on the time code received from the master device.

# 24—Using the Rhythm Track

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The VS-2000 contains a high-quality rhythm generator for you to use as a timing reference or as the rhythmic foundation of your own arrangements. This chapter describes how to use the VS-2000's Rhythm Track feature.

## Rhythm Track Basics

### About Track 17/18

In the VS-2000's hard disk recorder, the linked stereo Tracks 17/18 can act as:

- a pair of normal linked audio tracks.
- the stereo Rhythm Track.

When the Rhythm Track is turned on, it takes over Tracks 17/18, and any audio recorded on the tracks does not play back as long as Rhythm Track is on. The audio isn't deleted; it's just silenced when Track 17/18 are otherwise occupied.



When the Rhythm Track is on and you're viewing other screens, the RHYTHM TRACK button flashes to let you know that Tracks 17/18 are being used by the Rhythm Track.

All of the CH EDIT parameters for Track Channels 17/18 apply to the Rhythm Track playing through Track 17/18. Therefore, Fader 17/18 acts as a master volume control for the Rhythm Track. You can also use CH EDIT dynamics processing, EQ and so on, and send the Rhythm Track to effects just as you would a standard hard disk recorder track. See Chapter 11 to learn about the CH EDIT parameters.

### About Rhythm Track Sounds and Drum Kits

The VS-2000 contains a collection of realistic drum samples in the form of PCM waveforms. These samples are arranged into nine "drum kits:"

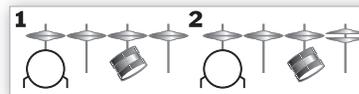
- STANDARD1
- HEAVY
- HOUSE
- STANDARD2
- JAZZ
- REGGAE
- ROOM
- HIP-HOP
- 808

Each kit has its own distinctive personality, and you can select any of these kits for use in a project.

## About Rhythm Patterns

The Rhythm Track's rhythm patterns are one-to-eight-measure drum phrases. 295 preset rhythm patterns are built into the VS-2000. You can edit these preset patterns and save them as your own new patterns, or create entirely new patterns. You can store your own patterns as:

A two-bar rhythm pattern



- *user patterns*—User patterns are stored in hard drive partitions, not within a particular project. This allows you to use the patterns in any project stored in the same partition. You can store up to 999 user patterns.
- *project patterns*—You can also store up to 999 project patterns within a project. These patterns are available only to the project in which they're saved.



Since a user pattern isn't stored within a project, it's not backed up when you back up a project that uses the pattern. To learn how to back up a user pattern, see "Rhythm Track Backup and Recovery" on Page 322.

## About Rhythm Arranges

When you use the Rhythm Track in a project, you do so by selecting a "Rhythm Arrange," short for "Rhythm Arrangement." A rhythm arrange is a chain of patterns with the right rhythm pattern for each section of your project: introduction, verse, chorus, bridge and so on.



A rhythm arrange runs at the tempo of your project, working hand-in-hand with the tempo map. You can even change the tempo of each pattern in the chain, if you wish to, by using the project's tempo map.



You can use a rhythm arrange to add drums to any project, even after other tracks have been recorded, by creating a tempo map that reflects the project's tempo changes.

The VS-2000 contains 49 preset rhythm arranges. As with patterns you can modify these and store them as new rhythm arranges or create your own from scratch. You can store your rhythm arranges as:

- *user rhythm arranges*—User rhythm arranges are stored in hard drive partitions, not within a project. This allows you to use them in any project stored in the same partition. You can store up to 10 user rhythm arranges.
- *project rhythm arranges*—You can also store up to 10 project rhythm arranges within a project. These patterns are available only to the project in which they're saved.



Since a user rhythm arrange isn't stored within a project, it's not backed up when you back up a project that uses it. See "Rhythm Track Backup and Recovery" on Page 322.

## The Rhythm Track and the Tempo Map

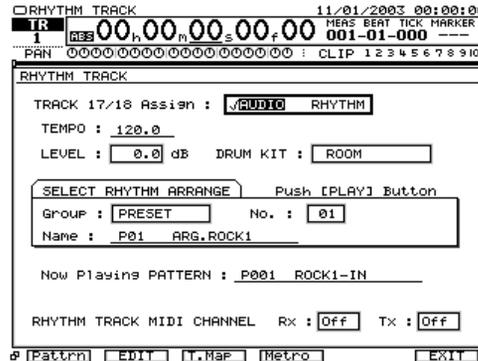
The Rhythm Track plays back at the tempo defined by the project's tempo map (Page 296). If the tempo map speeds up or slows down as the project plays, so does the Rhythm Track.



When you store a current project, the current tempo map is saved along with it.

## Playing a Rhythm Track

1. Press RHYTHM TRACK to display the RHYTHM TRACK screen.



2. To turn on the Rhythm Track feature, set TRACK 17/18 ASSIGN to RHYTHM—TRACK/STATUS Button 17/18 lights green.



The Rhythm Track works with the project tempo map (Page 306), speeding up or slowing down accordingly. To jump to the Tempo Map screen, press F3 (T.Map).

3. Current tempo set on tempo map will be displayed at “TEMPO.”
4. Set LEVEL as desired. Try a setting of 0.0 as start, and make fine adjustments with Fader 17/18.
5. Select the desired drum kit by dialing it in as the DRUM KIT parameter’s value. You can select:
  - STANDARD1      • STANDARD2      • ROOM
  - HEAVY            • JAZZ                • HIP-HOP
  - HOUSE            • REGGAE            • 808
6. Select the desired type of rhythm arrange by setting the Group parameter to:
  - PRESET            • USER                • PROJECT
7. Select the No. parameter and dial in the desired rhythm arrange from within the selected group—the name of the rhythm arrange appears in the Name area.
8. Press F6 (EXIT).
9. Press CH EDIT so it lights. if it isn’t already lit.
10. Hold down CLEAR and press TRACK/STATUS Button 17/18 to set Track Channel 17/18’s level to 0.0 so you can hear the Rhythm Track.
11. Press ZERO to return to the top of the project.
12. Press PLAY to hear the Rhythm Track.
13. To watch the RHYTHM TRACK display—this step is optional—press RHYTHM TRACK to return to the RHYTHM TRACK screen. As the project plays, the name of the currently playing pattern appears in the Now Playing PATTERN area.



The Rhythm Track can play sounds in an external MIDI module if you wish. See “Playing External Rhythm Track Sounds” on Page 321.



To work on a rhythm pattern, as described on Page 313, press F1 (Pptrn). To work on a rhythm arrange, as described on Page 309, press F2 (Edit)

## The Rhythm Track Metronome

Use the VS-2000's metronome when you want only a very simple rhythmic reference as a starting point for recording or playback. You can play the metronome internally using Rhythm Track sounds, or send the metronome out to performers' headphones mixes as a guide.

### Navigating to the Metronome

1. Press RHYTHM TRACK.
2. Press F4 (Metro) to display the METRONOME screen.

METRONOME	
METRONOME OUT	INT LEVEL
<input checked="" type="checkbox"/> Off INT MIDI	0.0dB
METRONOME MODE	
<input checked="" type="checkbox"/> Rec Only <input type="checkbox"/> Rec&Play	
TONE TYPE	
<input checked="" type="checkbox"/> CLICK1 <input type="checkbox"/> CLICK2 <input type="checkbox"/> CLICK2(Note)	
MIDI SETTING	METRONOME MIDI Ch
	10
	ACCENT NOTE
	C#2
	ACCENT VELOCITY
	100
	NORMAL NOTE
	C#2
	NORMAL VELOCITY
	60
	EXIT

### METRONOME OUT

METRONOME OUT turns on the metronome and configures it for internal use or for MIDI use. You can set the parameter to Off, INT ("Internal") or MIDI.

### INT LEVEL

When the metronome is being used internally, this parameter sets its volume, from  $-\infty$  to 6.0dB. the default setting is 0.0dB.

### METRONOME MODE

You can set when the metronome plays. Set METRONOME MODE to:

- *Rec Only*—to play only when you're recording project tracks.
- *Rec&Play*—to play both during recording and playback of project tracks.

### TONE TYPE

The metronome can play a variety of built-in sounds, as determined by the TONE TYPE parameter. Set it to:

- *CLICK1*—to play a pair of electronic ticks.
- *CLICK2*—to play a clave-like sound.
- *CLICK2(Note)*—to play a bass-drum like tone that derives its pitches from the metronome's ACCENT NOTE and NORMAL NOTE MIDI SETTINGS (Page 289).



The metronome can also generate MIDI notes that play percussion sounds produced by an external MIDI device (Page 289).

## Selecting, Editing and Creating a Rhythm Arrange

### Selecting a Rhythm Arrange

To select a rhythm arrange:

1. Press RHYTHM TRACK to display the RHYTHM TRACK screen.
2. Cursor to the SELECT RHYTHM ARRANGE area and set Group to the type of rhythm arrange you wish to use: preset, user or project.
3. Select No. (to the right of Group) and turn the Time/Value dial to select the desired rhythm arrange. The select rhythm arrange's name appears just below the Group and No. parameters.



When you've turned on the Rhythm Track and are playing project, you can revisit this screen to see the name of the currently playing pattern in the Now Playing PATTERN area.

### Creating or Editing a Rhythm Arrange

Creating and editing a rhythm arrange are really the same process, since you always start with the currently selected rhythm arrange

#### *Temporary Rhythm Arrange Memory*

When you modify a rhythm arrange, it's automatically copied into a special area of temporary memory within the VS-2000. Any changes to make to the rhythm arrange are made to this copy. Its name changes to "TEMP" to show this. When you're satisfied with your work, save the rhythm arrange in the user or project Rhythm Track memory.



Once you begin editing an existing rhythm arrange, the VS-2000 holds it in a special temporary memory area—the display shows "TEMP" at the front of the rhythm arrange's name. To avoid losing your work, save the rhythm arrange to user or project memory before selecting a different rhythm arrange or turning off the VS-2000. See "Saving a Rhythm Arrange" on Page 311.

1. Press RHYTHM TRACK to display the RHYTHM TRACK screen.
2. To create a new rhythm arrange from scratch, select USER 1—Empty Arrange. Otherwise, select the rhythm arrange you wish to edit.
3. Press F2 (EDIT) to display the RHYTHM ARRANGE EDIT screen.

RHYTHM ARRANGE EDIT  
CURRENT RHYTHM ARRANGE : TEMP ARG. ROCK1

RHYTHM PATTERN

GROUP : PRESET No. : 001  
Name : ROCK1-IN 4/4 1Meas  
LENGTH : 001

ARRANGE EDIT

001 MEASURE

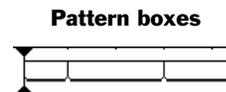
ASSIGN INSERT ERASE CUT SAVE EXIT

RHYTHM PATTERN area

ARRANGE EDIT area

4. If you're creating a new rhythm arrange, press ▼ to highlight MEASURE in the ARRANGE EDIT area and turn the Time/Value dial to Measure 1. If you're editing a rhythm arrange, select a measure whose rhythm pattern you wish to change.
5. Press ▲ to highlight the Group parameter and select the type of pattern you wish to use at Measure 1.

6. Select the specific pattern you want to use by setting the No. value. The selected rhythm pattern's name appears beneath the Group and No. parameters. To the right of its name is the pattern's nominal length. You can use an entire pattern, part of it, or extend its length by setting the LENGTH parameter. If you set LENGTH to a longer duration than the pattern's nominal size, the pattern is repeated to extend to the selected length.
7. Adjust the LENGTH value as desired—as you do so, you see the pattern's size change in the ARRANGE EDIT area to reflect the LENGTH value.
8. Set MEASURE to the next project section to set up, and repeat Steps 5-7.



Here's a quick formula that tells you the next measure to be programmed when you're creating a new pattern from the top. Add the MEASURE value to the LENGTH value—the total is the next measure you need to work on.



When you're programming a rhythm arrange, you can increase the MEASURE value using the FF button, or decrease it by pressing the REW button.

9. Repeat Step 8 until you've finished creating or editing the rhythm arrange.
10. Save your work before selecting a new rhythm arrange or turning off the VS-2000. See "Saving a Rhythm Arrange" on Page 311.

## Rhythm Arrange Tools

### ***Removing a Pattern from a Rhythm Arrange***

To remove a pattern you don't want, select the measure at which it starts, and then press:

- **F3 (ERASE)**—When you press F3 (ERASE), the current pattern is removed, and the measures it occupied remain in place. Select a different pattern, or patterns, for these measures or leave them silent.
- **F4 (CUT)**—When you press F4 (CUT) the current pattern is removed, and all of the following patterns move up in time so there's no empty space.

### ***Adding a Pattern to a Rhythm Arrange***

To add a pattern somewhere in the middle of an already existing rhythm arrange, select the measure at which you want the pattern to start and press F2 (INSERT). A blank, one-measure space is added. Select the rhythm pattern you want to add and set its length as desired.

### ***Quick-Entering Rhythm Arrange Patterns***

When you want a rhythm arrange to use a specific set of patterns over and over, you can quickly construct it by "playing in" the patterns using the TRACK/STATUS buttons. Here's how:

1. Press RHYTHM TRACK to display the RHYTHM TRACK screen.
2. To create a new rhythm arrange from scratch, select USER 1—Empty Arrange. Otherwise, select the rhythm arrange you wish to edit.
3. Press F2 (EDIT) to display the RHYTHM ARRANGE EDIT screen.

- Press F1 (Assign), for “Switch Assign”—the RHYTHM ARRANGE EDIT BUTTON ASSIGN screen opens.

RHYTHM ARRANGE EDIT BUTTON ASSIGN						
CURRENT RHYTHM ARRANGE : TEMP ARG. ROCK1						
Tr:STATUS	Gr	No.	Len	BEAT	Meas	PATTERN NAME
1	P	001	001	4/4	1	ROCK1-IN
2	P	002	002	4/4	2	ROCK1-U1
3	P	003	002	4/4	2	ROCK1-F1
4	P	004	002	4/4	2	ROCK1-U2
5	P	005	002	4/4	2	ROCK1-F2
6	P	004	002	4/4	2	ROCK1-U2
7	P	006	004	4/4	4	ROCK1-END
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	-	-	-	-	-	-
13	-	-	-	-	-	-
14	-	-	-	-	-	-
15/16	-	-	-	-	-	-
17/18	-	-	-	-	-	-

EXIT

- For each TRACK/STATUS button shown in the left-hand column, select a pattern and the length of measures for which you want it to play.



If you want a pattern to play at one length in part of the project and at a different length in another, assign the pattern to two different TRACK/STATUS buttons, with each button playing the pattern at the desired length.

- When you're done, press F6 (EXIT) to return to the RHYTHM ARRANGE EDIT screen.
- Set MEASURE to the first measure at which you want to enter a pattern.
- When you are creating Rhythm Arrange pressing TRACK/STATUS button, the current position specified at “MEASURE” moves for length specified at “Len” in RHYTHM ARRANGE BUTTON ASSIGN screen.
- Press the desired pattern's TRACK/STATUS button.
- If there is a rhythm pattern at current position and you are attempting to add new rhythm pattern at current position, the existing Rhythm Pattern will slide for the length of newly added Rhythm Pattern. The current position will move for the length of newly added Rhythm Pattern accordingly.
- Repeat Steps 7 and 9 to complete the rhythm arrange.

## Saving a Rhythm Arrange

To preserve a rhythm arrange you've created or edited, you must save it. Here's how:

- When you're ready to save a rhythm arrange, navigate to the RHYTHM ARRANGE EDIT screen if you're not already there (Page 315).
- Press F5 (SAVE)—the RHYTHM ARRANGE SAVE screen appears.

RHYTHM ARRANGE SAVE		
CURRENT RHYTHM ARRANGE : TEMP EMPTY ARRANG		
Save to	▼	
GROUP :	USER	No. : 01
Name :	U01 EMPTY ARRANG	
NAME	OK	EXIT

- Select the type of rhythm arrange you want to save by setting the Group parameter: USER or PROJECT. (See Page 306 if you're not clear on the difference between these two groups.)

4. Choose a specific memory location within the selected group as the place your rhythm arrange is to be stored. The rhythm arrange currently residing in that location is displayed beneath the Group and No. parameters.
5. If you want to name the rhythm arrange, press F1 (NAME) and do so—see “Naming” on Page 74 for details. After naming the rhythm arrange, press F6 (EXIT) to return to the RHYTHM ARRANGE SAVE screen.
6. Press F5 (OK)—the VS-2000 asks you to confirm your decision to save the rhythm arrange in the selected location.
7. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.

## Rhythm Arrange Copying

You can copy a rhythm arrange to another memory location. This allows you to:

- create a safety copy of a rhythm arrange with which you want to experiment.
- copy a user rhythm arrange into a specific project.
- copy a project rhythm arrange in user memory so you can use it with other projects.

### Copying a Rhythm Arrange

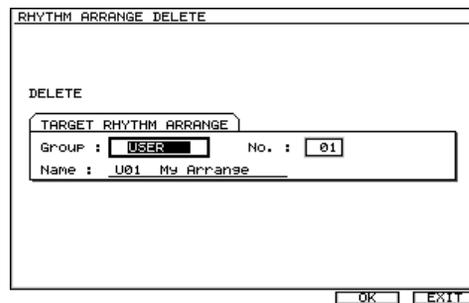
1. Press RHYTHM TRACK to display the RHYTHM TRACK screen.
2. If “COPY” isn’t visible above F1, press the PAGE button so it is.
3. Press F1 (COPY)—the RHYTHM ARRANGE COPY screen appears.

4. In the SOURCE RHYTHM ARRANGE area, select the desired rhythm arrange group, and then the individual rhythm arrange you wish to copy.
5. In the DESTINATION RHYTHM ARRANGE area, select desired rhythm arrange group, and then specific memory location in which you want to store the rhythm arrange copy. The name of the rhythm arrange currently residing in the selected location is displayed beneath the Group and No. parameters.
6. Press F5 (OK)—the VS-2000 asks if you’re sure. Proceeding with the operation will replace any rhythm arrange currently residing in the selected destination location.
7. To finish copying the rhythm arrange, press ENTER/YES.

## Deleting a Rhythm Arrange

You can delete a user or project rhythm arrange to save disk space, as follows:

1. Press RHYTHM TRACK to display the RHYTHM TRACK screen.
2. If “DELETE” isn’t visible above F2, press the PAGE button so it is.
3. Press F2 (DELETE)—the RHYTHM ARRANGE DELETE screen appears.



4. In the TARGET RHYTHM ARRANGE area, select the desired rhythm arrange group, and then the individual rhythm arrange you wish to erase. The selected rhythm arrange’s name appears below the Group and No. parameters.
5. Press F5 (OK)—the VS-2000 asks if you’re sure. Proceeding with the operation will permanently delete the selected rhythm arrange.
6. To finish deleting the rhythm arrange, press ENTER/YES.

## Working with Rhythm Patterns

### About the RHYTHM PATTERN SETUP Screen

All rhythm pattern recording and editing work starts on the RHYTHM PATTERN SETUP screen when you select a pattern.



You can listen to the selected pattern on the pattern setup screen, pattern recording screens or micro edit screen

#### ***Temporary Pattern Memory***

The pattern you choose is automatically copied into a special area of temporary memory within the VS-2000. Any changes to make to the pattern—including recording new data or editing the pattern—are applied to this temporary copy, and its name changes so it starts with “TEMP” to reflect this. When you’re satisfied with your work, you can save the pattern in the user or project Rhythm Track memory.



If you wish to preserve a pattern you’re working on, save it to user or project memory before selecting another pattern or powering down the VS-2000. When you select another pattern or turn off the VS-2000, the pattern held in temporary memory—and therefore your work—is replaced or cleared, respectively. See “Saving a Rhythm Pattern” on Page 319.

### Working on the RHYTHM PATTERN SETUP Screen

1. Navigate to the RHYTHM TRACK screen (Page 307).
2. Press F1 (Pattrn) to display the RHYTHM PATTERN SETUP screen.

RHYTHM PATTERN SETUP

SELECT RHYTHM PATTERN

GROUP : PRESET No. : 008

Name : P008 ROCK2-U1

BEAT : 4/4 MEASURE : 2

SWING : J AMOUNT : 50 %

STOP PLAY REALT STP/ED Save EXIT

3. To select the rhythm pattern you wish to use as the basis for recording or editing, set the Group parameter to the desired pattern type—PRESET, USER or PROJECT—and then set No. to the desired individual pattern within the selected group. The Name area beneath these two parameters show the currently selected pattern's name.
4. Set BEAT to the desired time signature. Notes in the pattern are moved to fit the new time signature.
5. Set the pattern's length by setting the MEASURE parameter.
6. You can add a "swing" feel to the pattern. Select the type of swing by setting the desired rhythm value for the SWING parameter, and set its strength by adjusting the AMOUNT parameter value (50% equals no swing).



When a pattern is set to swing, its notes are slightly delayed as part of the swing effect, even though they haven't actually been moved. When you edit a pattern with swing, its note positions therefore don't correspond absolutely to where they're heard.

## Copying a Pattern

You may wish to copy a user pattern into a project, or a project pattern into the user memory so you can use the pattern in other projects. Here's how:

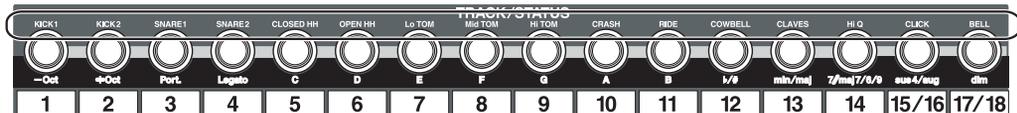
1. Navigate to the RHYTHM PATTERN SETUP screen.
2. If "PtnCpy" isn't visible above F1, press the PAGE button so it is.
3. Press F1 (PtnCpy)—the RHYTHM PATTERN COPY screen appears.

4. In the SOURCE RHYTHM PATTERN area, select the desired pattern group, and then the individual pattern you wish to copy.
5. In the DESTINATION RHYTHM PATTERN area, select desired pattern group, and then specific memory location in which you want to store the pattern copy. The name of the rhythm pattern currently residing in the selected location is displayed beneath the Group and No. parameters.
6. Press F5 (OK)—the VS-2000 asks if you're sure. Proceeding with the operation will replace any pattern currently residing in the selected destination location.
7. To finish copying the pattern, press ENTER/YES.

## Creating or Editing a Rhythm Pattern

The process of creating or editing a rhythm pattern is the same, since you're always starting with a pre-existing pattern (Micro-editing is something else—see "Rhythm Pattern Micro Editing" on Page 319).

You can play the desired notes using the TRACK/STATUS buttons. Each button is labeled with the drum sound it produces.



You can use a connected MIDI controller instead if you prefer, as described in "Entering Rhythm Pattern Notes Via MIDI" on Page 321.

### **Recording a Rhythm Pattern in Realtime**

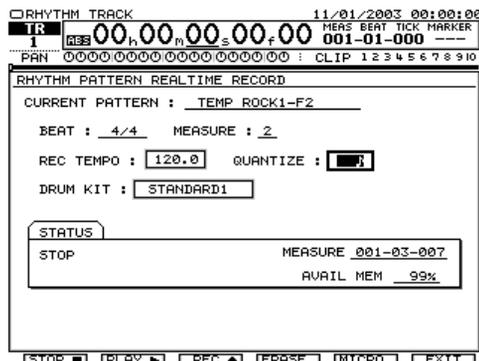
Perhaps the most enjoyable way to create a rhythm pattern is to simply perform it using the TRACK/STATUS buttons.



During realtime recording, transport functions are handled by the F buttons, as labelled. The hard disk recorder's transport buttons (Page 44) are not used.

To create a new rhythm pattern in realtime:

1. Navigate to the RHYTHM PATTERN SETUP screen.
2. Press F3 (Realt)—the RHYTHM PATTERN REALTIME RECORD screen appears.



3. Set REC TEMPO to the tempo at which you'd like to record. This tempo is for recording only—the pattern itself contains no tempo setting.
4. If you'd like to auto-correct the timing of your performance, set QUANTIZE to the desired quantization beat. Every note you record will be moved to the nearest occurrence of that beat. Otherwise, set QUANTIZE to Off.
5. Select the drum kit you wish to hear as you record by selecting it as the DRUM KIT value. This selection is for recording purposes only.
6. Press F3 (REC - 7. When you're ready start recording, press F2 (PLAY - 8. When you're done recording, press F1 (STOP 

You can refine the pattern further by editing it, as described in "Rhythm Pattern Micro Editing" on Page 319.

### **Realtime Recording Details**

#### *TRACK/STATUS Note Velocities/Volume*

The KICK1 and KICK2 buttons play the same sound, as do SNARE1 and SNARE2. The difference is that:

- KICK1 and SNARE1 play with a velocity value of 127.
- KICK2 and SNARE2 play at a velocity value of 75, so KICK2 and SNARE2 are lower in volume.

If you play the pair of kicks at the same time, or the two snares, two copies of the sound play in unison.



Notes recorded via MIDI are captured at their played velocity.

*MIDI Output*

When a pattern is playing sounds in an external MIDI sound module, KICK1 and KICK2, and SNARE1 and SNARE2, each produce their own different MIDI notes.

*TRACK/STATUS Hi-Q Button*

The TRACK/STATUS Hi-Q button’s sound is available only with the HOUSE and 808 drum kits.

**To Remove a Recorded Note in Realtime**

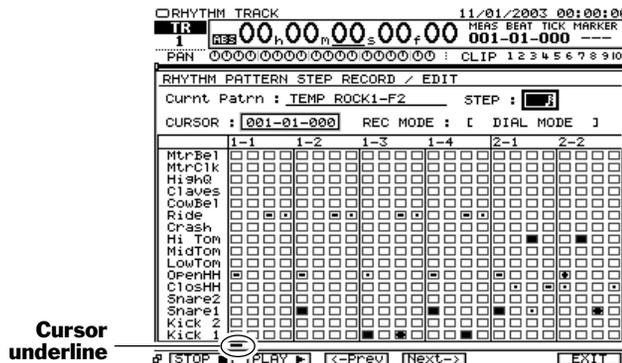
1. Press F4 (ERASE) during playback or recording so F1 (ERASE) darkens.
2. Press and hold down the unwanted note’s TRACK/STATUS button at the location at which the note was recorded to erase it.
3. To leave ERASE mode, press F4 (ERASE) again.

**Creating a Pattern in Step Time**

When you create a pattern using the step method, you enter the desired notes in a grid that presents you all of the notes in the pattern visually. This form of rhythm creation allows you to easily visualize what you’re doing, and is a somewhat more methodical approach than realtime recording.

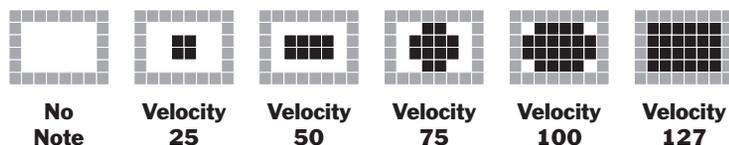
To create a new pattern in step time:

1. Navigate to the RHYTHM PATTERN SETUP screen.
2. Press F4 (Stp/Ed)—the RHYTHM PATTERN STEP RECORD/EDIT screen appears.



The notes in the pattern you selected to work with on the RHYTHM PATTERN SETUP screen (Page 313) appear in a grid of boxes that read from left to right. Here’s what it all means:

- The first measure’s beats appear in the column at the left, followed by the next measure’s, and so on. The number of measure columns you see depends on the length of the pattern and the number of beats there are in each measure.
- Every Rhythm Track drum sound has its own horizontal row showing all of the beats on which it can play. Each beat is represented by a gray, square box—when a note plays on a beat, a symbol appears in its box. The symbols in the beat boxes represent different note velocities. A note’s velocity determines how loudly it sounds.



3. Set the STEP parameter to determine the number of beats—and gray boxes—in each measure. You can select quarter note, quarter-note triplet, eighth note, eighth-note triplet, sixteenth note, sixteenth-note triplet, thirty-second note, thirty-second-note triplet, or off for free time.  
The display changes to accommodate the number of beats selected as the STEP value. Along the top of the box grid, you can see measure and beat numbers to help you keep track of where you are in the pattern.
4. Beneath the box grid, an underline cursor appears beneath the currently selected beat. Set the CURSOR parameter to the desired beat. The underline cursor moves according to your selection.



To quickly move back to the pattern's first beat, press the ZERO transport button.

To move from step to step forward through the pattern, press F4 (Next→). To move back by steps, press F3 (<Prev).



You can jump the position in case the current position is inside the box grid.

- Hold down SHIFT and press ▲ —the current position jumps to the top (MtrBel) of Current selected beat.
  - Hold down SHIFT and press ▼ — the current position jumps to the bottom (Kick1) of Current selected beat.
5. There are two recording modes in step recording. If "RecMod" doesn't appear above F1, press the PAGE button once. Then press F1 (RecMod) to set REC MODE to:
    - *DIAL MODE*—In Dial mode, move the cursor to the desired beat and press ▼ until you've highlighted the desired instrument's box. Turn the Time/Value dial to choose the desired velocity value, if any, for the currently selected beat. You can also turn off an existing note using the same method.



When you've added a new note, you can quickly toggle the selected velocity off and back on for a preview of the note by pressing ENTER/YES twice.

- *BUTTON MODE*—In Button mode, you can play the desired TRACK/STATUS button to add its note at the current cursor location—the notes is entered at a velocity of 127, except for KICK2 and SNARE2, which have a velocity of 75. To remove an already existing note, cursor to its location and press its TRACK/STATUS button to toggle it off.



In Button mode, you quickly erase all occurrences of a particular drum note in the pattern. Press F2 (ERASE)—REC MODE shows "ERASE." Press the TRACK/STATUS button of the note you wish to delete. The VS-2000 asks you to confirm your choice. Press ENTER/YES to proceed. Press F2 (ERASE) to leave Erase mode when you're done.



In Button mode, you can use the Time/Value dial to move the cursor more quickly through the pattern.

6. When you've added the desired note, repeat Steps 4 and 5 to add any other notes you want to add, or to remove notes you don't want in the pattern.
7. To listen to your work, press PAGE so that "PLAY ▶" appears above F2. Press F2 (PLAY ▶) to listen to the pattern and F1 (STOP ■) to halt playback.
8. Press F6 (EXIT) to leave step recording.



You can finish perfecting your pattern by editing it, as described in "Rhythm Pattern Micro Editing" on Page 319.

## Saving a Rhythm Pattern

To preserve a rhythm pattern you've created or edited, you must save it as follows:

1. When you're ready to save a rhythm arrange, press F6 (EXIT) to return to the RHYTHM PATTERN SETUP screen if you're not already there.
2. Press F5 (SAVE)—the RHYTHM PATTERN SAVE screen appears.

3. Select the type of rhythm pattern you want to save by setting the Group parameter: USER or PROJECT. (See Page 306 if you're not clear on the difference between these two groups.)
4. Choose a specific memory location within the selected group as the place your rhythm pattern is to be stored. The pattern currently residing in that location is displayed beneath the Group and No. parameters.
5. If you want to name the pattern, press F1 (NAME)—see “Naming” on Page 74 for details. After naming the pattern, press F6 (EXIT) to leave the Naming screen.
6. Press F5 (OK)—the VS-2000 asks you to confirm your decision to save the rhythm pattern in the selected location.
7. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.

## Rhythm Pattern Micro Editing

If you'd like to edit a preset rhythm pattern or one you've recorded in detail, you can do so using the Rhythm Track's Micro-Edit feature.



As with other changes you make to a rhythm pattern, any micro-editing you do is held in temporary memory within the VS-2000. To preserve your edits, be sure to save the pattern (Page 319) before selecting another pattern or turning off the VS-2000.

### Micro-Editing a Rhythm Pattern

1. From either the RHYTHM PATTERN REALTIME RECORD screen or the RHYTHM PATTERN STEP RECORD/EDIT screen, press F5 (MICRO) to display the RHYTHM PATTERN MICRO EDIT screen.

Position	NOTE	Vel	GATE
1-01-000	F#2 CiosHH	78	00-010
1-02-000	F#2 CiosHH	78	00-010
1-03-000	D 2 Share1	104	00-010
1-03-000	F#2 CiosHH	78	00-010
1-03-048	C 2 Kick 1	101	00-010
1-04-000	D 2 Share1	110	00-010
1-04-000	F#2 CiosHH	78	00-010
1-04-048	C 2 Kick 1	75	00-010
1-04-072	C 2 Kick 1	79	00-010

Each of the pattern's notes is displayed as an event in the list you see onscreen, one after another, in the order in which they play in the pattern.

2. To edit a note in the list, select its event using the ▼ or ▲ button—when an event's selected, it's highlighted.
3. Press ENTER/YES to highlight the aspect of the event you wish to change. Turn the Time/Value dial to change the selected event's:
  - *Position*—The note's location in the pattern. You can edit its bar, beat and/or tick value.
  - *NOTE*—You can change the note being played by the selected event.
  - *Vel*—You can set the note's velocity, which controls its volume.



You can't remove a note from a pattern by setting its velocity to 0. See Step 4 to learn how to properly remove a note.

- *GATE*—You can set the duration of the note so that it's shorter by adjusting its beat or tick value. The default GATE time is 0-010, for 0 beats, 10 ticks.



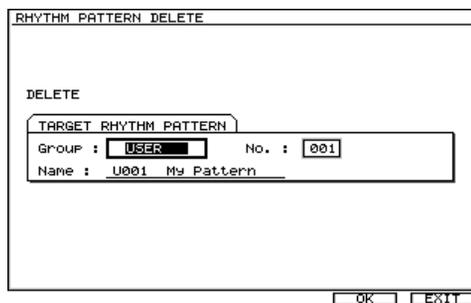
Setting GATE to a longer time value than the actual length of a drum sound has no effect on the sound.

4. To delete an event and its note altogether, select the note, or any of its parameters, and press F4 (DELETE).
5. To add another note, select an event that's playing as close as possible to the new note you want to add, and then press F3 (INSERT). A copy of the selected event is entered—adjust the event's settings to position it, select the desired sound, and so on.
6. To exit micro-editing, press F6 (EXIT).

## Deleting a Pattern

To delete a user or project pattern you no longer want:

1. Navigate to the RHYTHM PATTERN SETUP screen.
2. If "PtnDel" isn't visible above F2, press the PAGE button so it is.
3. Press F2 (PtnDel)—the RHYTHM PATTERN DELETE screen appears.



4. In the TARGET RHYTHM PATTERN area, select the desired pattern group, and then the individual pattern you wish to erase. The selected rhythm pattern's name appears below the Group and No. parameters.
5. Press F5 (OK)—the VS-2000 asks if you're sure. Proceeding with the operation will permanently delete the selected pattern.
6. To finish deleting the pattern, press ENTER/YES.

## The Rhythm Track and MIDI

### Playing External Rhythm Track Sounds

The Rhythm Track can play drum sounds on an external MIDI device. To do this:

1. With both devices turned off, connect the MIDI out of your VS-2000 to the MIDI IN jack of your MIDI device.
2. Turn on both devices.
3. Press RHYTHM TRACK.
4. Set RHYTHM TRACK MIDI CHANNEL TX (“RX” is short for “receive”) to the MIDI channel on which your MIDI keyboard is set to receive.

Each Rhythm Track note sends a MIDI note numbers as follows:

<i>Rhythm Track Sound:</i>	<i>MIDI Note:</i>	<i>Rhythm Track Sound:</i>	<i>MIDI Note:</i>
KICK1	B1	Hi TOM	D3
KICK2	C2	CRASH	C#3
SNARE1	D2	RIDE	D#3
SNARE2	E2	COWBELL	G#3
CLOSED HH	F#2	CLAVES	D#5
OPEN HH	A#2	HI Q	D#1
Lo TOM	F2	CLICK	A1
Mid TOM	A2	BELL	A#1

5. Set up your MIDI device to play in response to the above received MIDI notes.
6. Turn on the Rhythm Track, as described in Page 307, and play the project.

### Entering Rhythm Pattern Notes Via MIDI

When recording a pattern in realtime (Page 315), you can play the desired notes from a MIDI keyboard controller instead of on the TRACK/STATUS buttons. To set this up:

1. With both devices turned off, connect the MIDI out of your MIDI keyboard controller to the VS-2000’s MIDI IN jack using a MIDI cable.
2. Turn on both devices.
3. Press RHYTHM TRACK.
4. Set RHYTHM TRACK MIDI CHANNEL RX (“RX” is short for “receive”) to the MIDI channel on which your MIDI keyboard is transmitting.

The TRACK/STATUS buttons are played by the following keys on a MIDI keyboard.

<i>TRACK/STATUS Button:</i>	<i>MIDI Note:</i>	<i>TRACK/STATUS Button:</i>	<i>MIDI Note:</i>
KICK1	B1	Hi TOM	D3
KICK2	C2	CRASH	C#3
SNARE1	D2	RIDE	D#3
SNARE2	E2	COWBELL	G#3
CLOSED HH	F#2	CLAVES	D#5
OPEN HH	A#2	HI Q	D#1
Lo TOM	F2	CLICK	A1
Mid TOM	A2	BELL	A#1

## Muting the Rhythm Track

There are three ways to mute the Rhythm Track:

1. Bring Fader 17/18 all the way down.
2. Mute Track Channel 17/18. See “Mute Mode” on Page 141 to learn about muting.
3. Exit Rhythm Track mode and press CH EDIT to turn it off if it’s currently lit. Press TRACK/STATUS 17/18 to un-light it.



Since the Rhythm Track plays through Track Channel 17/18, you can also solo the Rhythm Track if you wish. See “Solo Mode” on Page 142 to learn about soloing.

## Rhythm Track Backup and Recovery

While a project rhythm arrange or rhythm pattern is stored within a project, it’s backed up during a project backup (Page 110). A user rhythm arrange or rhythm pattern, on the other hand, belongs to the hard disk partition on which it resides—it’s not backed up with a project that’s using it. User rhythm arranges and patterns have their own Backup and Recovery operations. You back up an entire partition’s rhythm arranges and rhythm patterns at the same time in a single process.

### ***Backing Up a User Rhythm Arrange or Rhythm Pattern***

1. Hold down SHIFT and press F1—the PROJECT LIST appears.
2. Select the partition whose user Rhythm Track data you want to back up if it’s not already selected, and press F6 (LIST).
3. Press RHYTHM TRACK.
4. If “BACKUP” is not visible above F4, press the PAGE button so it is.
5. Press F4 (BACKUP)—the RHYTHM TRACK USER BACKUP screen appears.
6. Insert the requested media and press ENTER/YES, or press EXIT/NO to abort the procedure. If you’re using a CD-RW disc that already contains data, the VS-2000 asks if you want to erase the disk. For details on the messages that may appear, see Page 368.
7. Press ENTER/YES to erase the CD-RW, or EXIT/NO to cancel the backup.
8. Select whether or not you’d like the VS-2000 to verify the accuracy of your backup once it’s been written on the CD. While this causes the backup to take a bit longer, we recommend turning Verify on to make absolutely sure your project data’s been correctly backed up.
9. We recommend trying the MAX setting that uses your drive’s fastest supported speed. If you experience any problems, try a lower speed.
10. Press F5 (OK) to complete the backup. When backup is finished, the VS-2000 displays the RHYTHM TRACK screen.

### ***Recovering a User Rhythm Arrange or Rhythm Pattern***

1. Hold down SHIFT and press F1—the PROJECT LIST appears.
2. Select the partition into which you want to recover your backed-up Rhythm Track data if it’s not already selected, and press F6 (LIST).
3. Press RHYTHM TRACK.
4. If “Recovr” is not visible above F5, press the PAGE button so it is.
5. Press F4 (BACKUP)—the VS-2000 asks if you want to save the currently loaded project.

6. If you wish to save the current state of your project, press ENTER/YES. Otherwise, press EXIT/NO.
7. When the VS-2000 pops open its CD-RW drive and asks you to insert the Rhythm Track user backup CD you wish to recover, insert the disk in the drive, close the drive, and press ENTER/YES—the RHYTHM TRACK USER BACKUP screen appears.
8. Use the cursor buttons to highlight the data you wish to recover, and press F1 (MARK) to checkmark it.
9. Set CD Speed as desired. We recommend trying the maximum CD speed; if you have any problems, lower the speed and try again.
10. Press F5 (OK)—the VS-2000 asks you to confirm the you want to proceed.



Rhythm track data you recover replaces any user rhythm arranges or rhythm patterns currently stored in the selected partition, so be careful not to replace data you wish to preserve.

11. Press ENTER/YES to complete the recovery, or EXIT/NO to cancel the operation. When recovery is finished, the VS-2000 displays the RHYTHM TRACK screen.

## Turning Off the Rhythm Track

1. Press RHYTHM TRACK.
2. Set TRACK 17/18 Assign to Audio.
3. Press F6 (EXIT).



# 25—Harmony

The VS-2000's built-in Harmony feature can generate up to six harmony voices from a single recorded vocal performance. This chapter describes how to create vocal harmonies using the Harmony feature.

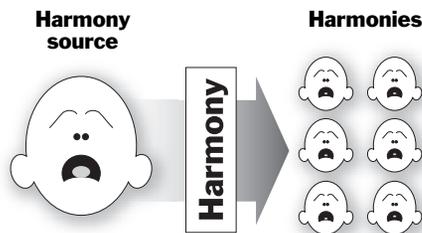


While the Harmony feature can be used on any recorded sound, it's optimized for use on a single human voice.

## Harmony Basics

### The Harmony Source

Harmony is applied to a single recorded hard disk recorder track at a time. In the following sections, we refer to this track as the Harmony source. Once you've created the desired harmonies, you can let Harmony continue to play them, or record them on their own hard disk recorder tracks.



Once you've recorded harmonies for a track, you can use the Harmony feature again on one or more additional tracks if you wish.

### The Harmony Module

The Harmony module is a set of controls that determine the vocal and performance qualities of the voices in the Harmony group you're creating.



The Harmony module's settings don't set the actual pitch of your harmonies—they simply determine the "personality" of the voices that Harmony creates. You arrange the actual harmonization yourself, as we'll explain later in this chapter.

There are two groups of Harmony module settings:

- "Common parameters" in the Harmony module set the behavior of the Harmony group as a whole.
- In addition, each Harmony voice is called a "part" and has its own individual settings, called "part parameters." This allows the voices in your harmonies to sound as distinctive as they would if you were hearing a group of real-world human singers.

## Harmony Patches

You can save Harmony module settings as a Harmony “patch.” The VS-2000 ships with 50 preset Harmony patches for you to use. You can edit these patches—or create your own from scratch—and save them as your own user patches. You can store as many as 50 user Harmony patches.



You can change Harmony module settings as your project plays and capture the settings from any given moment as a patch. See “Harmony Snapshots” on Page 339.

## Harmonization

The notes that Harmony’s voices actually “sing” are determined in either of two ways. You can:

- *enter the desired notes using the TRACK/STATUS buttons*—Beneath each TRACK/STATUS button is a label that shows the button’s job when Harmony is turned on. We’ll describe the use of the TRACK/STATUS buttons on Page 332.
- *play the desired notes on a connected MIDI controller*—When you’ve connected a MIDI keyboard or other pitched MIDI controller, you can easily play the desired harmonies into the VS-2000. You can also manipulate the Harmony voices using MIDI continuous controller messages. Using a MIDI controller for Harmony is described on Page 336.

## The Harmony Sequencer

The VS-2000 contains a Harmony sequencer in which you can record all of the desired Harmony notes for a hard disk recorder track as well as any changes you wish to make to Harmony module settings as your project plays. The sequencer captures and plays back all of this information as MIDI data.



If you’re unclear about what MIDI is and how it works, see “About MIDI?” in the VS-2000 Appendices.

The Harmony sequencer provides a separate sequencer track for each recorded hard disk recorder track you want to harmonize, running run alongside the hard disk recorder track—a Harmony sequencer track therefore takes up no hard disk recorder space whatsoever.

You can record a Harmony sequencer track by performing it on the TRACK/STATUS buttons or a connected MIDI controller, or by programming in the desired data manually. Once recorded, the track’s data can be manipulated edited as desired.

## Harmony and Effects

### FX Processor Use

The Harmony feature utilizes the power of the two built-in FX processors and any additional VS8F-2 effect expansion boards you’ve installed. Each pair of processors can produce two harmony notes. Therefore, with:

- *the built-in effects*—you can create two harmonies.
- *one additional VS8F-2*—you can create four harmonies.
- *two additional VS8F-2s*—you can create six harmonies.



### Selecting the Harmony Source and Processors

1. Select the recorded track you want to harmonize by selecting it as the HARMONY SOURCE value.
2. Press ▼ to move to the USE EFFECT Board area. In this area, you select the effect boards you wish to assign to Harmony. You can choose the internal effects—Board A—and any optional VS8F-2 effect boards you’ve installed.

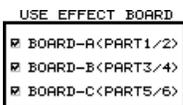


At the left of each effect board’s name, the VS-2000 shows you the Harmony parts the board supplies to Harmony.

The internal processors—FX 1 and 2—are the foundation of the Harmony feature. Turn the Time/Value dial so that check

BOARD-A<PART1/2>

3. Turn the Time/Value dial some more to activate any other effect board you wish to use.



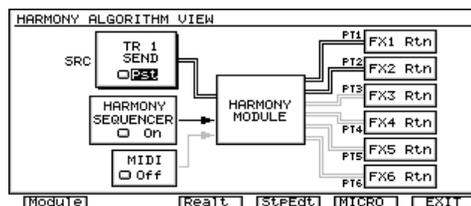
In this illustration, the internal effects and two optional VS8F-2 boards are assigned to Harmony.



As long as at least one pair of processors is assigned to Harmony, the feature remains turned on. When you want to turn Harmony off, make sure no board remains assigned to the feature.

### HARMONY ALGORITHM Screen

1. On the HARMONY ASSIGN screen (Page 327), press F1 (EDIT) to display the HARMONY ALGORITHM screen.



On this screen, you can configure the Harmony source and turn the Harmony sequencer and MIDI control on and off.

### Selecting Pre or Post Harmonies

Set the SRC Pre/Post switch to determine whether or not the signal from the selected source track is sent to the Harmony feature:



- *Pre*—so that the recorded track’s signal is sent to the Harmony feature before it passes through its track channel fader. This allows you to adjust the level of the track itself without affecting the level of the track’s harmonies. This setting is useful when you want the harmonies to remain at a constant level as the source track’s level moves up and/or down.
- *Post*—so that the recorded track’s signal goes to Harmony after the track’s track channel fader. When SRC is set to Post, any change you make to the track channel’s level also changes the Harmony volume. This can be handy when you want a vocal and its harmonies to go up and down in volume together.

## Turning on the Harmony Sequencer

To activate the Harmony sequencer (Page 326), set HARMONY SEQUENCER to On. Once you've done this, you can select realtime or step sequencing for capturing the desired Harmony notes. See "Recording in the Harmony Sequencer" on Page 337.



## Enabling MIDI Control

If you'd like to select Harmony notes from a connected MIDI controller—such as a MIDI keyboard controller—set MIDI to the channel on which your MIDI controller is transmitting MIDI data. If you don't want to use a MIDI controller, set MIDI to Off.



"Using a MIDI Controller" on Page 336 explains how to use a MIDI controller with Harmony.

## Harmony Patch Loading

### Loading Harmony Patches

1. Navigate to the HARMONY ALGORITHM screen (Page 328).
2. Press F1 (Module.)
3. Press F4 (PATCH) to display the HARMONY MODULE PATCH SELECT screen.

On the HARMONY MODULE PATCH SELECT screen, you can load Harmony patches using the same technique you'd use to load any effect patch. See "Selecting Effect Patches" on Page 219 to learn how to load effect patches.

## Customizing the Harmony Module

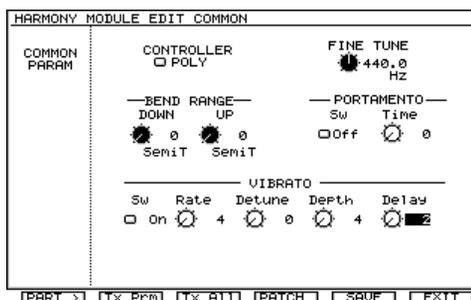
The Harmony module contains two pages of editable parameters with which you can customize your harmonies' sound and behavior. The:

- *HARMONY MODULE EDIT COMMON screen*—presents the common parameters that affect all of the harmonies.
- *HARMONY MODULE EDIT PART screen*—presents each part's individual parameters.

### Displaying the Harmony Module Parameters

1. Navigate to the HARMONY ALGORITHM screen (Page 328).
2. Press F1 (Module.)
3. To move between part and common parameters, press F1 (> PART) or F1 (< COMM).

## Harmony Module Common Parameters



Each of these parameters affects all of the generated harmonies:

### CONTROLLER

This parameter determines whether Harmony operates in:

- *Poly* (for “polyphonic”) mode—where it produces multiple notes at a time for chordal harmonies.
- *Solo mode*—where only a single note is produced at a time. When Harmony is in Solo mode, portamento (see below) can be used.



When the Harmony Module is set to Solo mode, all parts play the same note.

### FINE TUNE

Harmony normally produces notes at concert pitch. If your source track wasn’t recorded at concert pitch, you can adjust the Harmony pitch to match the source’s pitch.

### BEND RANGE

You can set the manner in which the harmonies respond to MIDI Pitch Bend messages received from a MIDI controller:

- *DOWN*—sets the maximum amount of downward pitch bending.
- *UP*—sets the maximum amount of upward pitch bending.

### PORTAMENTO

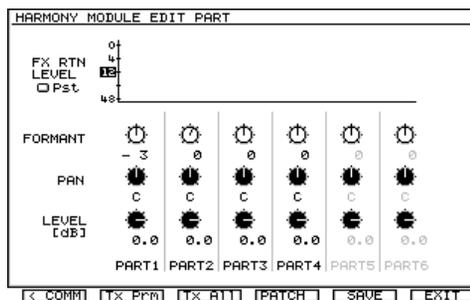
When the pitch of one note glides into the pitch of the next, it’s called “portamento.” When Harmony is in Solo mode, you can turn on portamento by setting the PORTAMENTO Sw to On, or by hitting TRACK/STATUS 3•Port. The PORTAMENTO Time parameter sets the speed at which one note’s pitch glides into the next note’s.

### VIBRATO

You can add a natural—or supernatural, if you wish—fluctuation to the harmonies’ pitch to simulate human vocal vibrato. To use vibrato, turn on the VIBRATO Sw parameter. Then, set:

- *Rate*—to set the speed of the vibrato.
- *Detune*—to set the pitch width of the vibrato.
- *Depth*—to set the strength of the vibrato.
- *Delay*—to program a natural-sounding pause between when a harmony note starts and when the vibrato begins.

## Harmony Module Part-Specific Parameters



Part parameters are available for as many parts as your allocated effect boards allow. In this illustration, the internal effects and one VS8F-2 are assigned to Harmony. Parts 5 and 6 are unavailable.

Each part has its own set of three parameters:

- **FORMANT**—controls the frequency content of the part's harmony. You can change the timbre of a harmony, or even the apparent gender of its singer, by adjusting its formant.
- **PAN**—sets the position of the part's harmony in the FX Return channel, or in the stereo image recorded on two hard disk recorder tracks.
- **LEVEL**—sets the part's volume relative to the other parts.



To set the final level of the harmonies as a group, adjust their FX return channel levels.



The HARMONY MODULE EDIT PART screen also provides an FX RTN LEVEL meter that shows the Harmony level. To view the basic Harmony level, set the meter to Pre. To view its level as affected by the LEVEL settings on each screen, set the meter to Pst.

## Harmony Patch Storage

### Saving Harmony Patches

From either HARMONY MODULE screen (Page 329), press F5 (SAVE) to store your current Harmony module settings as a patch. The procedure for saving a Harmony patch is identical to the procedure used for saving effect patches. To learn how to save effect patches, see "Saving Effect Patches" on Page 223.

## Entering Harmony Notes

You can select, or enter, the desired Harmony notes using the VS-2000's TRACK/STATUS buttons or a connected MIDI controller such as a MIDI keyboard. When you select a note on the TRACK/STATUS buttons or a MIDI keyboard, Harmony produces a copy of the source track's note at the selected pitch. The harmony therefore always matches the phrasing of the source track in time.

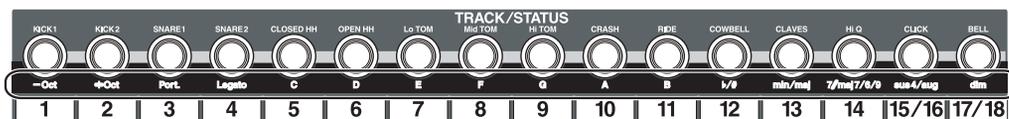
### Single Note and Chord Entry

Enter single note harmonies or entire chords, according to the setting of the Harmony sequencer's INPUT MODE NOTE/Chrd parameter (Page 337). When it's set to:

- **NOTE**—you can enter individual harmony lines using the TRACK/STATUS buttons described in, or a MIDI keyboard controller.
- **Chrd**—you can enter full chords using the TRACK/STATUS buttons described in, or a MIDI keyboard controller.

## Using the TRACK/STATUS Buttons

When Harmony is turned on, you can use the TRACK/STATUS buttons to enter the desired Harmony notes. Beneath each buttons is a label that shows the button's role in Harmony creation. The behavior of the buttons depends on the setting of the INPUT MODE parameter (Page 337), which can be set to NOTE or Chrd mode.



### The TRACK/STATUS Buttons in NOTE Mode

TRACK/STATUS button #:	Harmony Name:	What it Does:
1 and 2	-Oct. and + Oct.	These two buttons work together. When they're both unlit, the TRACK/STATUS buttons select notes in the octave above Middle C. To change octaves, press either button to turn it on, shifting the pitch in the direction of the lit button. To return to the original octave, press the unlit button so both buttons are unlit.
3	Port.	This button turns portamento on (lit) or off (unlit) by changing the value of the PORTAMENTO parameter—see Page 330.
4	Legato	When Legato is lit, the last-entered harmony continues sounding until another harmony note is entered.
5	C	When both Oct buttons are lit, press C to create a note at Middle C, or C4 in MIDI terms. Otherwise, the button plays a C in the selected octave.
6	D	When both Oct buttons are lit, press D to create a D harmony note above Middle C, or D4. Otherwise, the button plays a D in the selected octave.
7	E	When both Oct buttons are lit, press E to create an E harmony note above Middle C, or E4. Otherwise, the button plays an E in the selected octave.
8	F	When both Oct buttons are lit, press F to create an F harmony note above Middle C, or F4. Otherwise, the button plays an F in the selected octave.

### The TRACK/STATUS Buttons in NOTE Mode, con't.

TRACK/STATUS button #:	Harmony Name:	What it Does:
9	G	When both Oct buttons are lit, press G to create a G harmony note above Middle C, or G4. Otherwise, the button plays a G in the selected octave.
10	A	When both Oct buttons are lit, press A to create an A harmony note above Middle C, or A4. Otherwise, the button plays an A in the selected octave.
11	B	When both Oct buttons are lit, press B to create a B harmony note above Middle C, or B4. Otherwise, the button plays a B in the selected octave.
12	b/#	<ul style="list-style-type: none"> <li>• Press b/# once—it lights red and changes the TRACK/STATUS buttons so they play Cb-Bb.</li> <li>• Press b/# twice—it lights green and changes the TRACK/STATUS buttons so they play C#-B#.</li> </ul>
13-17/18	min/maj; 7/maj7/6/9 sus4/aug; dim	The buttons do nothing in NOTE mode.

### The TRACK/STATUS Buttons in Chrd Mode

When Harmony creates a chord, it roots it on the TRACK/STATUS button note you press after selecting the desired chord form with TRACK/STATUS Buttons 13-17/18.



You must install at least one optional VS8F-2 effect board to create Harmony chords, and you must assign that board to Harmony (Page 328).

TRACK/STATUS button #:	Harmony Name:	What it Does:
1 and 2	-Oct. and + Oct.	These two buttons work together. When they're both unlit, the TRACK/STATUS buttons select chords in the octave above Middle C. To change octaves, press either button to turn it on, shifting the pitch in the direction of the lit button. To return to the original octave, press the unlit button so both buttons are unlit.
3	Port.	This button turns portamento on (lit) or off (unlit) by changing the value of the PORTAMENTO parameter—see Page 330.

### The TRACK/STATUS Buttons in Chrd Mode, con't.

TRACK/STATUS button #:	Harmony Name:	What it Does:
4	Legato	When Legato is lit, the last-entered chord continues sounding until another chord is entered.
5	C	When both Oct buttons are lit, press C to create chord rooted on Middle C. Otherwise, the button plays a C chord in the selected octave.
6	D	When both Oct buttons are lit, press D to create a chord rooted on the D just above Middle C. Otherwise, the button plays a D chord in the selected octave.
7	E	When both Oct buttons are lit, press E to create a chord rooted on the E just above Middle C. Otherwise, the button plays an E chord in the selected octave.
8	F	When both Oct buttons are lit, press F to create a chord rooted on the F just above Middle C. Otherwise, the button plays an F chord in the selected octave.
9	G	When both Oct buttons are lit, press G to create a chord rooted on the G just above Middle C. Otherwise, the button plays a G chord in the selected octave.
10	A	When both Oct buttons are lit, press A to create a chord rooted on the A just above Middle C. Otherwise, the button plays an A chord in the selected octave.
11	B	When both Oct buttons are lit, press B to create a chord rooted on the B just above Middle C. Otherwise, the button plays a B chord in the selected octave.
12	b/#	<ul style="list-style-type: none"> <li>• Press <i>b/# once</i>—it lights red and changes the TRACK/STATUS buttons so they play C<sub>b</sub>-B<sub>b</sub>-rooted chords.</li> <li>• Press <i>b/# twice</i>—it lights green and changes the TRACK/STATUS buttons so they play C<sub>#</sub>-B<sub>#</sub>-rooted chords.</li> </ul>

### The TRACK/STATUS Buttons in Chrd Mode, con't.

TRACK/STATUS button #:	Harmony Name:	What it Does:
13	min/maj	<p>When Chrd is turned on, min/maj lights. To create:</p> <ul style="list-style-type: none"> <li>• <i>major chords</i>—press min/maj so it lights red, and then select the desired chord by pressing the 7/maj7/6/9 button.</li> <li>• <i>minor chords</i>—press min/maj so it lights green, and then select the desired chord by pressing the 7/maj7/6/9 button.</li> </ul> <p><i>Note: When you press sus4/aug or dim, min/maj turns off.</i></p>
14	7/maj7/6/9	<p>7/maj7/6/9 works in conjunction with the min/maj and sus4/aug buttons. When min/maj is lit, press 7/maj7/6/9 repeatedly to select the desired major or minor chord, depending on the current state of the min/maj button. When 7/maj7/6/9 is:</p> <ul style="list-style-type: none"> <li>• <i>off</i>—a plain major or minor chord is created.</li> <li>• <i>red</i>—a dominant seventh is added to the triad.</li> <li>• <i>flashing red</i>—a major seventh is added to the triad.</li> <li>• <i>green</i>—a sixth is added to the triad.</li> <li>• <i>amber</i>—a dominant ninth is added to the triad.</li> </ul> <p>When sus4/aug is lit, press 7/maj7/6/9 to add or remove a dominant 7th to the sus4 or augmented chord. If 7/maj7/6/9 is:</p> <ul style="list-style-type: none"> <li>• <i>off</i>—a plain suspended 4th or augmented chord is created.</li> <li>• <i>red</i>—a dominant seventh chord is added to the suspended 4th or augmented chord.</li> </ul>
15/16	sus4/aug	<p>Press sus4/aug to create a suspended 4th or augmented chord. When the button is:</p> <ul style="list-style-type: none"> <li>• <i>red</i>—a suspended 4th chord is created.</li> <li>• <i>green</i>—an augmented chord is created.</li> </ul>
17/18	dim	<p>Press dim so it lights to create a diminished chord.</p>



If you prefer to choose from among the available Harmony chords using the Time/Value dial, you can simply select the desired chord by setting the INPUT MODE chord value (Page 337)—the TRACK/STATUS buttons light to reflect the dialed-in choice.

## Using a MIDI Controller

To use a MIDI keyboard for Harmony note entry, connect the MIDI OUT of the controller to the VS-2000's MIDI IN Jack (Page 48) using a MIDI cable. Set Harmony to receive MIDI on the channel the controller is using for MIDI transmission as described on Page 329.

When you want Harmony to produce a particular note, simply play the desired note on the MIDI controller. To play the currently selected chord type, play its root note on the MIDI keyboard. You can also send the VS-2000 MIDI continuous controller messages when using Harmony—please see the MIDI implementation section of the *VS-2000 Appendices*.

## Part(y) of the First Part

Each of the notes you enter is assigned a part identity based on the order in which the notes were played. The:

- *first note you play*—is designated as Part 1.
- *second note you play*—is designated as Part 2, and so on.

Therefore, if your Harmony patch assigns different attributes to different parts, make sure to always play them in the desired order so that the right note gets the right attributes.



You can capture your notes in the Harmony sequencer, and quantize them and then move them slightly in time so that the notes play through the desired parts.

## Moving In and Out of Harmony Mode

When you're in Harmony mode, the track channel faders operate normally. You may, however, wish to turn the playback of other recorded tracks on or off as you work out your harmonies. To return the TRACK/STATUS buttons to their normal operation—so that you can turn tracks on or off—press HOME. The HARMONY button flashes and you can use the TRACK/STATUS buttons as you normally do. To re-assign them to Harmony operation, press HARMONY so it lights solidly.

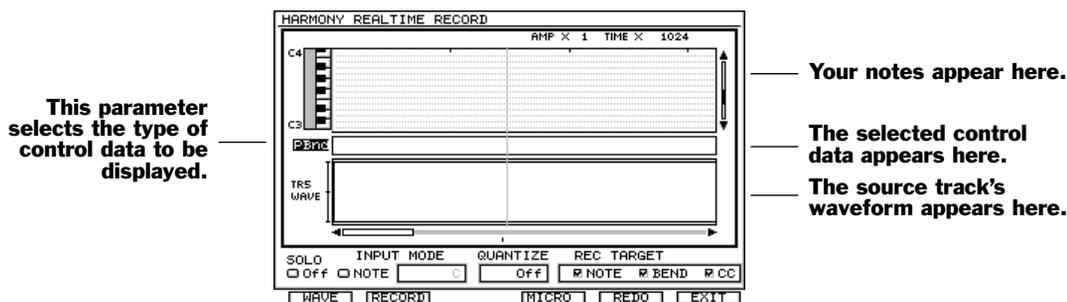
## Recording in the Harmony Sequencer

Once you've turned on the Harmony sequencer (Page 326), you can record in:

- *realtime*—by performing the desired Harmony notes in realtime on the TRACK/STATUS buttons or a connected MIDI controller as the project plays.
- *step time*—by entering the notes and other control data in the Harmony sequencer when the project isn't playing.

### Sequencing Harmonies in Realtime

1. On the HARMONY ALGORITHMVIEW screen, press F3 (Realt)—the HARMONY REALTIME RECORD screen appears.



2. Before sequencing, set the parameters at the bottom of the screen as desired:
  - **SOLO**—When Solo is on, only the source track and Harmony notes are heard. When it's off, all VS-2000 channels play normally.
  - **INPUT MODE**—Select:
    - **NOTE**—to input Harmony notes of your own devising.
    - **Chrd**—to input pre-constructed Harmony chords. To the right of Chrd, you can dial in the desired chord as an alternative to using the TRACK/STATUS buttons if you wish.
  - **QUANTIZE**—When QUANTIZE is on, all Harmony notes are moved to the nearest selected rhythm value. You can select Off, for no quantizing, 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/2T (for “Triplet”), 1/4T, 1/8T, 1/16T, 1/2D (for “Dotted”), 1/4D, 1/8D, 1/16D, 1/32D notes.
  - **REC TARGET**—You can set the Harmony sequencer to record the desired combination of notes, MIDI Pitch Bend messages and/or MIDI continuous controller messages. Highlight each type of data to be recorded and press ENTER/YES to checkmark it.
3. To view the source track as a waveform to help you see what's coming up, press F1 (WAVE) so it darkens. To speed up the VS-2000's responsiveness by turning off the waveform display, press F1 (WAVE) again.
4. To begin recording, move the now line to the desired project location, press F2 (RECORD), and perform the desired Harmony notes.
5. To playback your Harmony sequence, return the now line to the location you selected in Step 4, and press PLAY.



To undo your last sequencing action, press F5 (UNDO). To change your mind, press F5 (REDO).



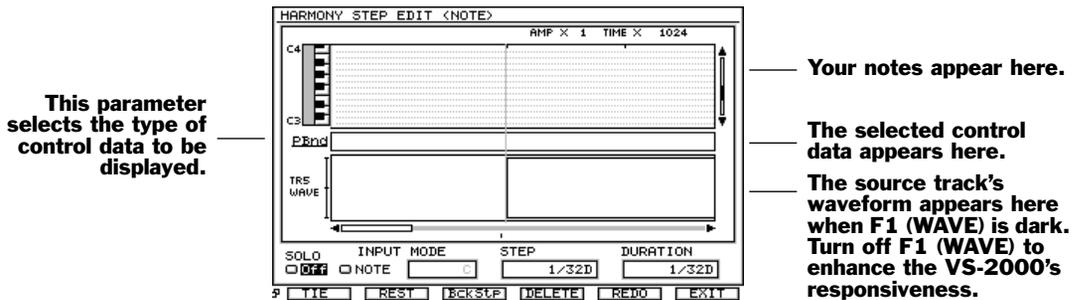
You can edit your sequence as described in “Editing a Harmony Sequence” on Page 339.

## Sequencing Harmonies in Step Time



Since it works with measures and beats, step editing works best when your project has been recorded using a tempo map, or when you've added one. See "Working with a Tempo Map" on Page 296.

1. On the HARMONY ALGORITHM VIEW screen, press F4 (StpEdt)—the HARMONY STEP EDIT (NOTE) screen appears.



On this screen, you can enter Harmony notes, one-by-one.

2. Set SOLO as desired. You can choose:
  - *Off*—all channels play normally.
  - *On*—only the harmonies and source track are heard.
3. Set INPUT MODE as desired. You can choose:
  - *NOTE*—to enter single notes at the selected step.
  - *Chrd*—to enter chords at the selected step.
4. Set STEP to the amount by which you want the now line to move forward after you enter the first note or chord. You can select 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/2T (for "Triplet"), 1/4T, 1/8T, 1/16T, 1/2D (for "dotted"), 1/4D, 1/8D, 1/16D, 1/32D notes.
5. Set DURATION to the desired length of the first note or chord. You can select Step, so that the note is the same length as the STEP value, or 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/2T (for "Triplet"), 1/4T, 1/8T, 1/16T, 1/2D (for "dotted"), 1/4D, 1/8D, 1/16D, 1/32D notes.
6. Play the desired note or chord on the appropriate TRACK/STATUS button or MIDI keyboard controller key—the now line moves forward by the amount specified in Step 4.
7. Reset STEP and DURATION for the next note or chord you wish to enter.
8. Play the next note or chord.
9. Repeat Steps 7 and 8 until the entire harmony has been entered.

### Other Step Time Tools

- Press F1 (TIE) so the now line moves to the next step, lengthening the most nearby note so that it reaches the new position of the now line.
- To insert a rest between notes, set STEP to the desired value and hit F2 (REST).
- Press F3 (BckStp) to move the now line back by the STEP amount and shorten the nearest note so that it ends at the now line's new position.
- To delete a note or chord at the now line's current location, press F4 (DELETE).



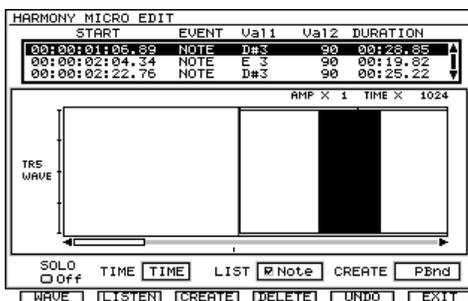
To undo your last entry, press F5 (UNDO). To change your mind, press F5 (REDO).



You can edit your sequence as described in "Editing a Harmony Sequence" on Page 339.

## Editing a Harmony Sequence

1. On the HARMONY ALGORITHM VIEW screen, press F5 (MICRO)—the HARMONY MICRO EDIT screen appears.



Event list

The selected data appears here, along with the source track's waveform when WAVE is turned on. For enhanced responsiveness, leave WAVE turned off.

- On this screen, you can edit your Harmony sequence in detail.
2. At the bottom of the screen, set TIME to display the project location in:
    - *TIME*—so Harmony events are identified by their clock-time location in the project.
    - *MBT*—so Harmony events are identified by their “Measure, Beat and Tick” location.
  3. Set LIST to display the type of Harmony data you’d like to see. You can select Note, PBend (for “Pitch Bend”), VbSw (for “Vibrato Switch”), VbRt (for “Vibrato Rate”), VbDt (for “Vibrato Detune”), VbDp (for “Vibrato Depth”), VbDl (for “Vibrato Delay”), PtSw (for “Part Switch”), PtTm (for “Part Time”), Frm1-6 (for “Formant 1-6”) and/or All. To display an item select it and press ENTER/YES to checkmark it.
  4. To display the source track’s waveform, press F1 (WAVE) so its darkened.
  5. Set Solo to:
    - *Off*—all channels play normally.
    - *On*—only the harmonies and source track are heard.
  6. To edit an already sequenced note, turn the TIME/VALUE dial to highlight it in the event list at the top of the screen and press ENTER/YES.
  7. Press ◀ or ▶ to highlight the setting you wish to change, and turn the Time/Value dial to select the desired value.



For a note in the list, Val1 is the note number and Val2 its velocity, or the force with which the note plays.

8. To preview the selected event, press F2 (LISTEN).
9. To add a new event, set the CREATE parameter to the type of event you’d like to add, and then press F3 (CREATE). Edit the new event as desired.
10. To erase the selected event, press F4 (DELETE).
11. To reverse your last edit, press F5 (UNDO). To change your mind, press F5 (REDO).

## Harmony Snapshots

You can easily take “Harmony snapshots” of important current Harmony module settings at the now line’s current location. When the project plays, the settings are applied, changing the Harmony sound at that location in the project. You can capture the following current settings individually:

- Portamento switch and time
- Vibrato switch, rate, detune, depth and delay
- Formant settings 1-6

### ***Capturing a Harmony Snapshot***

*Record a Single Harmony Module's Parameter's Value*

1. Move the now line to the desired location on either Harmony sequencer screen.
2. Press F6 (EXIT) and then F1 (Module).
3. Navigate to and select the desired common or part parameter that appears in the list on Page 339.
4. Press F2 (TX Prm), for "Transmit Parameter."

*Record All Harmony Module Parameters At Once*

1. Move the now line to the desired location on either Harmony sequencer screen.
2. Press F6 (EXIT) and then F1 (Module).
3. Press F3 (TX All), for "Transmit All Parameters."

## **Recording Harmonies on Hard Disk Recorder Tracks**

The final level and routing for each Harmony part is controlled by its same-numbered FX return channel, as explained in "FX Return Channels" on Page 327.

To record a harmony part on a hard disk recorder track, route its FX return channel to the track as described in "Routing Effects to Tracks" on Page 232. Set the FX return channel's level as desired to set the part's level.

## **Turning the Harmony Feature Off**

1. Press HARMONY.
2. Select the USE EFFECT BOARD parameter and turn the Time/Value dial counter-clockwise to un-assign off each activate effect board.
3. Press HOME.

# 26—Automix

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This chapter describes how to perform automated mixing on the VS-2000 using its Automix feature. Automix allows you to create and perfect automated mixes.

## The Benefits of Automix

### ***Automated Mixdown***

Mixing is a challenging art, a delicate balance of attention to detail and artistic vision. It's both a creative and clerical activity in which your project is turned into a final work that can be heard by other people. It's the time when everything you've been meaning to tend to, and every enhancement you've been planning, has to be addressed. As such, there's a lot to get right. Mixing is really the project's final, ultimate performance.

Automix allows you to build up your mix, element by element, by recording each adjustment and perfectly playing it back. This lets you take your time, enjoying the process of crafting your project's final sound. Since Automix remembers what you do, you can work on a mix over a period of time—at the start of each mixing session, your project mix is exactly as you left it and ready to be worked on some more.

When you think you may be done with a mix, and are listening to it on different systems and playing it for friends and associates, Automix removes the worry that if you find something wrong in the mix you'll have to start all over. With Automix, you can fix any individual problems while preserving the rest of the mix.

### ***Automated Recording***

While most people use Automix during mixdown, you can also use it during recording, since you can automate input channel parameters. If you're recording something repeatable that requires changes during the course of the project—perhaps you're recording synchronized sequencer tracks—you can automate those moves and play them back as you're recording your tracks.

## How Automix Works

### ***How is Automix Recorded?***

Automix captures and remembers changes made to a parameter's value over the course of a project, and remembers where each change occurs. What Automix records is Automix data, not audio data, and it's saved with the project. Automix records on its own tracks in its own area of the VS-2000's memory. It doesn't use any of your project's tracks. This means two important things:

- Using Automix doesn't reduce the number of available tracks in a project.
- Automix data is independent of audio data—you can alter either one without affecting the other.



Because Automix data and audio data are separate, when you move audio to a new location, you'll have to also remember to move the corresponding Automix data.

## How Do Automix Tracks Work?

For every input, track, FX bus, Aux bus and FX return channel there's a dedicated Automix track. When Automix mode is active, a channel's Automix track can capture or play back changes you make to its parameters. There are also Automix tracks for the MASTER bus, the Direct paths and for Effects 1-4.

## Which Parameters Can be Automated?

Automix works with a wide array of input, track and FX return CH EDIT parameters, as well as key MASTER EDIT, FX and Aux bus and Direct path parameters. For a list of the parameter values you can automate, see "Automix Parameter List" on Page 408.



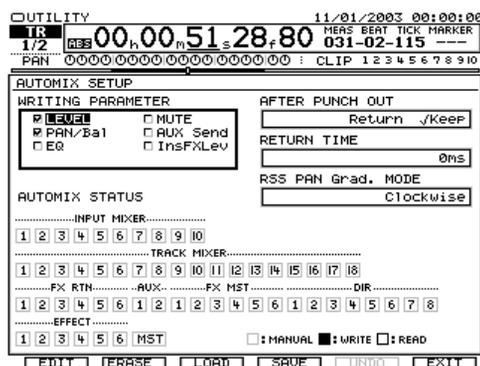
You can also automate most VS-2000 actions with MIDI SysEx messages (Page 285). Automix is easier to work with since it doesn't require an in-depth knowledge of MIDI.

Automix also memorizes and plays back effect patch changes. When you select a new patch as the project plays—see Page 219—the new selection is captured by Automix.

## The AUTOMIX Screen

### Navigating to the Automix Screen

1. While holding down SHIFT, press AUTOMIX—the AUTOMIX screen appears.



To learn about the RSS PAN Grad. MODE parameter, see Page 225.



We'll describe the AFTER PUNCH OUT and RETURN TIME parameters in our discussion of punching Automix data on Page 345. We'll describe F1 (EDIT) in "Editing Automix Data" on Page 347.

### The WRITING PARAMETER Area

The WRITING PARAMETER area of the AUTOMIX screen shows various parameter groups. When a parameter group is checkmarked, changes made to its parameters are captured when you record Automix data, both in realtime (Page 345) and in Automix snapshots (Page 346). Check only the parameters you want to automate to streamline your Automix data and minimize visual clutter in the AUTOMIX EDIT screen.

To toggle a WRITING PARAMETER group's checkmark on or off, turn the Time/Value dial to select the desired group and press ENTER/YES.

- LEVEL
- PAN/Bal ("Pan/Balance")
- EQ
- MUTE
- AUXSend
- InsFXLev ("Insert FX Level")

## The AUTOMIX STATUS Area

In the AUTOMIX STATUS area, select each Automix track and turn the Time/Value dial to set it as desired. The appearance of each Automix track's box shows you its current status.

An Automix track can be set to:

- *Manual*—so the corresponding input, track, Aux master or FX return channel, MASTER fader or Direct path doesn't use Automix. Its parameters are set manually.
- *Write*—so that the Automix track records changes made to the corresponding input, track, Aux bus or FX return channel, MASTER fader or Direct path.
- *Read*—so that the Automix track plays back its recorded Automix data.

The Automix track is set to:



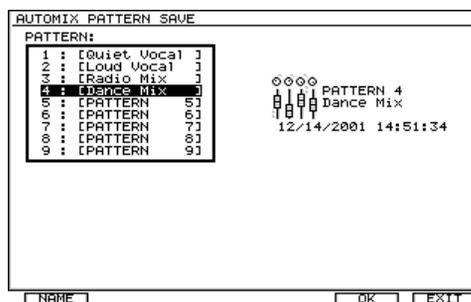
## Saving and Loading Multiple Automixes

Each project can store up to nine separate, alternate Automixes, any one of which can be loaded at any time. With multiple Automixes available, you can:

- develop the perfect automated mixdown through multiple versions with the ability to return to an earlier version at any time by simply re-loading it.
- try out several Automix approaches to a project and pick the one you like best.
- Automix the same project in different ways for different uses.

To save an Automix:

1. Press F4 (SAVE)—the AUTOMIX PATTERN SAVE screen appears. It shows the nine memory locations into which Automixes (or Automix “patterns”) can be saved.



2. Highlight the memory location into which you want to save the current Automix.

If you select a location that already contains an Automix, the Automix you're saving replaces the one that's already stored there.

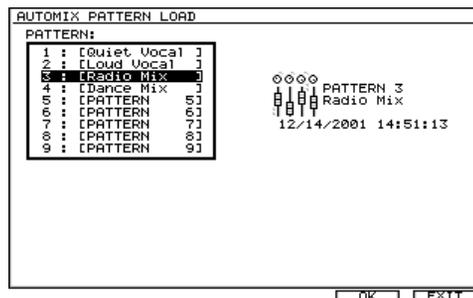
3. Press F5 (OK)—the VS-2000 asks “Save Automix Pattern?”
4. Press ENTER/YES to proceed or EXIT/NO to cancel the save.

To name a saved Automix, highlight it and press F1 (NAME). To learn how to use the VS-2000 naming tools, see “Naming” on Page 74.



To load an Automix:

1. Press F3 (LOAD)—the Automix loading screen appears.



2. Highlight the Automix you want to load.
3. Press F5 (OK)—the VS-2000 asks “Load Automix Pattern?”



When you load an Automix, it replaces the currently loaded Automix. If you don't want to lose your current Automix, make sure to save it before loading a different one.

4. Press ENTER/YES to proceed or EXIT/NO to cancel the loading.

### The F2 (ERASE) Button

To erase all of the currently loaded Automix data at once, press F2 (ERASE).



When you erase Automix data, you erase only the currently loaded Automix data. Any Automix you've saved remains intact and can still be loaded.

## Activating Automix Mode

1. Stop project playback.
2. Press AUTOMIX—it lights solidly to show Automix mode is active.
3. To turn Automix mode off, press AUTOMIX again—its light turns off.



## Recording Automix Data

You can record Automix data two ways:

- *Realtime Automix*—Realtime Automix records changes you make to parameter values as the project plays. This method captures every subtle change you make, and is the best method to use when you're making constant adjustments to your parameter values over the course of a project. You can also punch in new parameter value changes in realtime.
- *Snapshot Automix*—Snapshot Automix, as its name suggests, captures your mix settings at a particular moment. Whenever the now line travels back to that moment when Automix is turned on, the snapshot's settings are instantly recalled. Snapshots are great for sudden changes to a mix—at the beginning of a solo, for example, when a guitarist's level has to be made louder. You can smooth the transition to a snapshot's settings using Automix GRADATION (Page 352).

You can use the two approaches for different parts of the same mix if you like.



In order to automate a parameter's value, its parameter group must be checkmarked in the AUTOMIX screen's WRITING PARAMETER area—see Page 342.



If you're working on a project that you'll turn into an audio CD, you'll eventually cut unwanted extra space off the front of the project. You can do this by trimming your mastering tracks. However, if you plan to trim the project before recording your mastering tracks, consider doing it before recording your Automix data so you don't have to move the corresponding Automix data after cleaning up the front of the audio.

## Realtime Automix Recording

1. Press AUTOMIX to turn Automix mode on if AUTOMIX isn't already solidly lit.
2. Hold down SHIFT and press AUTOMIX to view the AUTOMIX screen.
3. Set each Automix track you want to record to Write.
4. Press ZERO to rewind to the top of the project or move the now line to the location at which you want to begin recording Automix data.
5. While holding down AUTOMIX, press AUTOMIX REC—the AUTOMIX button flashes to show that Automix data can now be recorded.
6. Press PLAY and perform your mix. To automate:
  - *track channel level changes*—move the faders as desired.
  - *input channel level changes*—press each desired input channel's INPUT button to display its CH EDIT VIEW screen and adjust its FADER parameter as desired.
  - *FX return channel level changes*—hold down each desired FX return channel's FX button to display its CH EDIT VIEW screen and adjust its FADER parameter as desired.

The changes you make are recorded onto the Write-enabled Automix tracks.

7. Press STOP when you're done—Automix recording is automatically turned off.
8. When you're done, hold down SHIFT, press AUTOMIX, and then set each automated track to Read mode.
9. Press ZERO or move the now line to the location at which you started mixing.
10. Press PLAY to hear your automation.
11. To re-do your automation—or to record new Automix data—repeat Steps 2-9.

## Realtime Punching of Automix Data

You can re-record sections of your automated mix by punching in new Automix data on any Automix tracks that are set to Write mode.

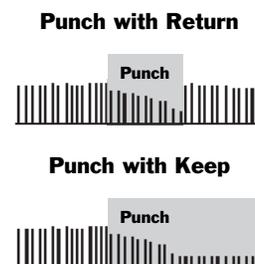


If you want to redo a section of automation at the very beginning of the project, use the recording procedure described on Page 345 and press STOP where you want the newly recorded automation to end.

### Merging New and Old Automix Data

When you insert new Automix data by punching in on an Automix track, the AFTER PUNCH OUT parameter on the AUTOMIX screen lets you determine what happens to parameter values after you punch out. When you set it to:

- *Return*—parameters return to their previously recorded values after the punch-out.
- *Keep*—parameter values at the end of the punch-out remain in effect for the rest of the project, or until you perform another punch-in later in the project.





Set AFTER PUNCH OUT to Return when you want to insert some Automix changes without affecting the rest of your automation data. Set it to Keep when you want the punch-in to change parameter values for the remainder of the project.

When you set AFTER PUNCH OUT to Return, the RETURN TIME parameter helps smooth the transition between the punch's final parameter values and those already recorded after the punch ends. You can set RETURN TIME to a value between 0ms and 1000ms—lower settings make transitions more abrupt.



If you decide at a later time that a punch-out transition is too noticeable, you can use the GRADATION Automix editing operation to smooth it out.

Automix offers two different ways to punch—you can use either method. The idea is to choose the method that requires the fewest button-presses for what you're doing:

- *AUTOMIX STATUS Button Punching*—Turn on Automix recording and toggle the desired Automix track(s) in and out of Write mode as the project plays.
- *AUTOMIX Button Punching*—Set the desired Automix tracks to Write mode, and toggle Automix recording on and off as the project plays.

## Snapshot Recording of Parameter Values

A snapshot registers the position of the now line and captures the current parameter values on all Automix tracks that are Write-enabled. When you play back the project with Automix turned on—and the Automix tracks set to play back—the parameter values stored in the snapshot are recalled when the now line reaches the location at which the snapshot was taken.



### ***Taking a Snapshot***

1. Move the now line to the location at which you want to take a snapshot.
2. If Automix isn't already turned on, press AUTOMIX so that it lights solidly.
3. Hold down SHIFT and press AUTOMIX.
4. Set any Automix track whose settings you want to capture to Write mode.
5. While holding down AUTOMIX, press AUTOMIX REC—AUTOMIX starts flashing to signify that it's ready to take the snapshot.
6. While holding down AUTOMIX, press TAP MARKER•SNAPSHOT—the current parameter values for the Write-enabled tracks are captured in the snapshot.
7. Hold down AUTOMIX and press REC so that AUTOMIX lights solidly to show it's no longer ready to record.
8. Hold down SHIFT and press AUTOMIX.
9. Set the Automix tracks from Step 4 to Read mode.

## Playing Back Automix Data

To play back Automix data:

1. If AUTOMIX isn't lit solidly, press it so that it is to show that Automix mode is on. If it's flashing, hold down AUTOMIX and press REC so that AUTOMIX lights solidly.
2. Hold SHIFT and press AUTOMIX.
3. Set each track you've automated to Read mode.
4. Play the project.

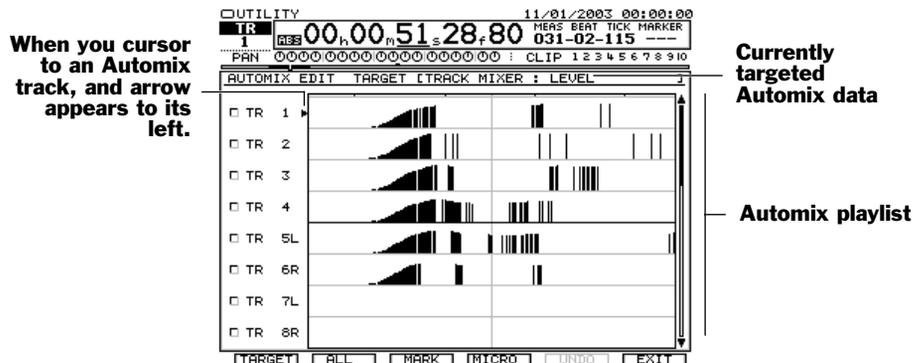
## Editing Automix Data

### Automix Editing Concepts

#### The AUTOMIX EDIT Screen

Automix editing takes place on the AUTOMIX EDIT screen. To get there:

1. While holding down SHIFT, press AUTOMIX.
2. Press F1 (EDIT)—the AUTOMIX EDIT screen appears.



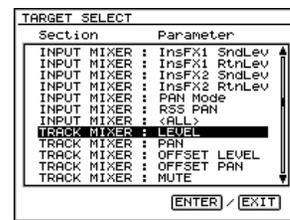
The AUTOMIX EDIT screen presents a playlist that shows the currently targeted Automix data—we'll explain targeting on the next page. Familiar Home screen tools appear at the top of the screen (Chapter 8). Edit-related F buttons are visible beneath the playlist. You can zoom in and out as desired.

#### Targeting Automix Data

Automix can record and play back more data than can possibly fit onscreen at once. Targeting allows you to select the Automix data and tracks you want to see and edit.

1. On the AUTOMIX EDIT screen, press F1 (TARGET)—the TARGET SELECT window appears.
2. Turn the TIME VALUE dial to highlight the desired target data.

When you select a target, you choose both the desired Automix track and the parameter whose Automix data you want to edit.



3. Press ENTER/YES to select the new target data, or EXIT/NO to return to the AUTOMIX EDIT screen without changing the targeted Automix data.
4. If you pressed ENTER/YES in Step 3, the newly targeted Automix tracks and data appear in the playlist.

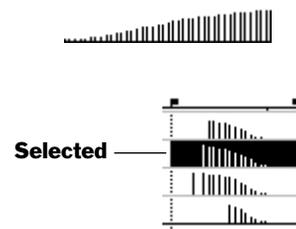


## What Automix Data Looks Like

Every time you change a targeted parameter's value during Automix recording, the change is captured as an "Automix event." Each event appears as a vertical black line on the AUTOMIX EDIT screen's playlist—the higher the line, the higher the parameter value.

When Automix events are selected for editing on the AUTOMIX EDIT screen, they appear in reverse: an event is white, and its background is dark.

This illustration shows a level parameter's fade-in.



## How Does Automix Editing Work?

Automix editing is very much like the region editing you perform on project audio tracks. You define a region by setting IN and OUT edit points, and you copy and move regions using FROM and TO. See Chapter 18 if you need to refresh your memory on the way region editing works.

### F2 (ALL) and F3 (MARK)

As with audio region editing, to select the events on an Automix track that fall between the IN and OUT points, you must select the track. You can cursor to an Automix track and press ENTER/YES or F3 (MARK) to select it for editing—this places a checkmark to its left. To simultaneously toggle the selection of all of the displayed Automix tracks on or off, press F2 (ALL).

### Automix Undo

Automix offers a single level of Undo for both Automix recording and editing. You can undo the most recent editing action until you perform another action. You can reverse the most recent Undo by performing a Redo until a new Automix recording or editing action is performed.

To undo the most recent Automix action, navigate to the AUTOMIX EDIT screen and press F5 (UNDO). To reverse the Undo, press F5 (REDO).

## Automix Editing Methods

You can perform any Automix editing operation using a connected mouse or the VS-2000's buttons. Both operate much the same as they do in track editing.



Before editing Automix data, you must target the desired Automix tracks and the type of Automix data with which you want to work, as described on Page 347.

### Automix Editing with a Mouse

Select and edit Automix data using the usual region editing methods. You can:

- set edit points using the position line (Page 243).
- define an Automix region by dragging (Page 245).
- drag selected Automix data to move or copy it (Page 246).
- perform various operations using the Automix Pop-Up menu.

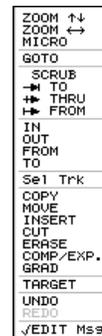
To learn more about editing with a mouse, see “Editing with an Optional Mouse” on Page 242.



The SELECT TRACK Pop-Up menu used in audio region editing is not available for Automix editing.

In addition to many of the same items found in the Edit Pop-Up menu (Page 242), you’ll find the following in the Automix Pop-Up menu:

- *MICRO*—opens the AUTOMIX MICRO EDIT window.
- *COMP/EXP. (Compress/Expand)*—allows you to lower or raise the value of selected automated parameter values. See Page 351.
- *GRAD (Gradation)*—helps smooth transitions between automated parameter values. See Page 352.
- *TARGET*—opens a dialog in which you can select the kind of Automix data you want to edit.



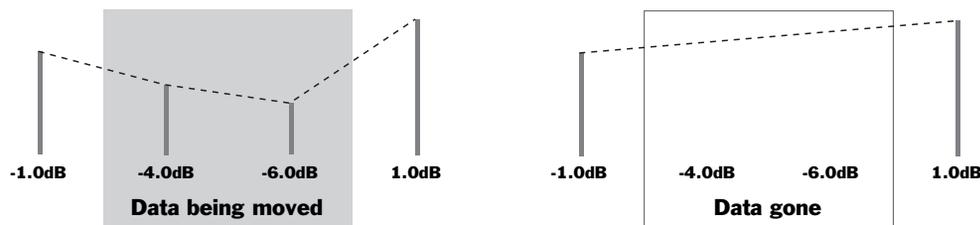
Hold down CLEAR and right-click to view options for deleting edit points, or hold down SHIFT to GO TO the desired edit point.

## Automix Editing Operations

Since all Automix edit operations affect regions of Automix data, they all use the IN and OUT edit points. We’ll note how FROM and TO are used where applicable.

### About Moving and Deleting Automix Data

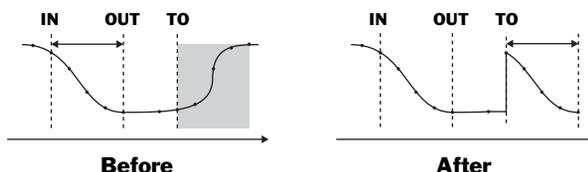
When you move or delete Automix data, the location from which you move or delete the data no longer contains its changes. What this means is that the value set by the final Automix event before the now-missing data stays in effect until the now line reaches the next event, after the missing data’s original location.



This illustration shows how a Level parameter’s values might change when Automix data is moved—the dotted line shows the resulting signal level.

### COPY

You can copy Automix data from one part of a project to another, or from one Automix track to another. This allows you to re-use any chunk of automation at multiple locations in a project. This can be especially handy when the same section of audio—such as a chorus—appears more than once. When you perfect the automation for the section, you can re-use it each time it occurs in the project.



FROM is set to the same location as IN.

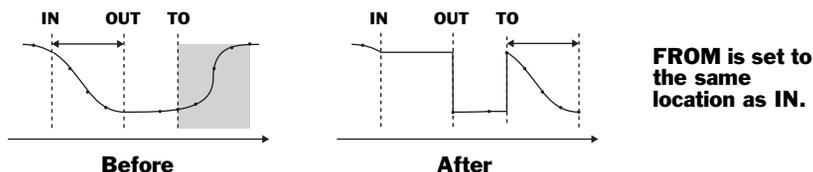
<i>Edit point:</i>	<i>What it does:</i>
FROM	sets the location of the Automix data region's time anchor
TO	sets the destination location for the time anchor



When you copy Automix data to a new location, it replaces any Automix data already present in the destination location.

## MOVE

Automix MOVE allows you to move already-recorded Automix data to a new location on the same Automix track or to another Automix track. You'd most often use MOVE when you've changed the position of track audio and need to move its automation to the same location.



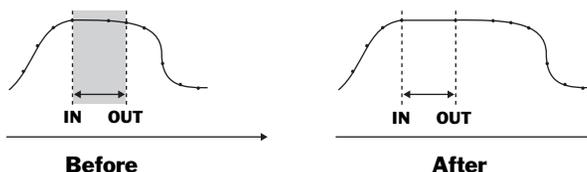
<i>Edit point:</i>	<i>What it does:</i>
FROM	sets the location of the Automix data region's time anchor
TO	sets the destination location for the time anchor



When you move Automix data to a new location, it replaces any Automix data already present in the destination location.

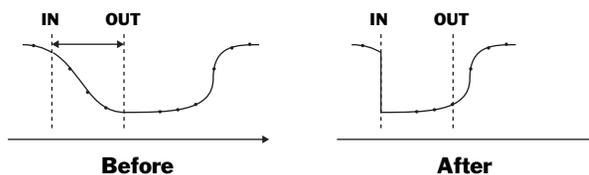
## INSERT

Insert adds an area of blank space at the IN location equal to the length of the selected Automix region—all data at the IN point and onward is moved so that it starts at the end of the inserted blank space. When you've inserted empty space in an audio track, you'll want to insert space in the accompanying Automix track as well so that your Automix events line up properly with their corresponding audio data.



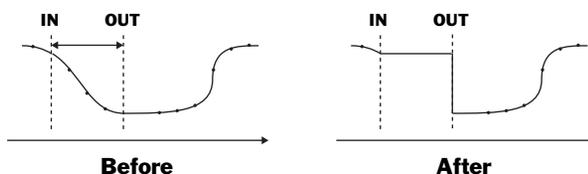
## CUT

CUT deletes the Automix events between the IN and OUT points and moves the remaining data forward so that it starts at the IN point. You might cut Automix data when it occurs just a bit later than you want it to, or when you need to re-align it with audio you've moved forward in the project.



## ERASE

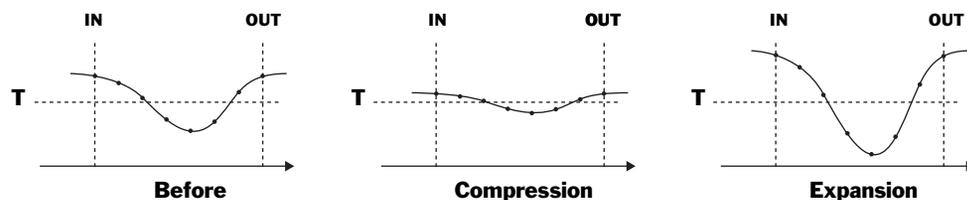
Automix ERASE cleans out Automix events between the IN and OUT points. This can be useful when you've recorded parameter value changes you decide you don't want, preferring to let an earlier parameter value remain in place until the OUT point.



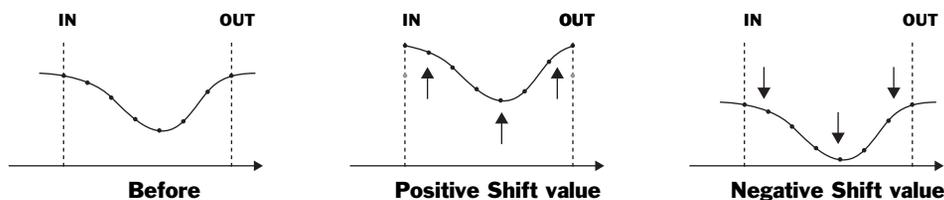
## COMP/EXP.

The Automix COMP/EXP. ("COMPRESS/EXPAND") edit operations allow you to lower or raise parameter values in the selected region. COMP/EXP. actually contains three separate operations:

- *Compression and Expansion*—change parameter values according to their distance from a specified threshold value ("T" stands for "Threshold" in the illustrations below). Use compression to make value changes in the selected Automix data region less extreme while retaining their basic character. Expansion makes the difference between your highest and lowest values more extreme.



- *Shift*—subtracts or adds a single specified amount to all parameter values in the selected region. You'd use Shift to simply raise or lower the selected values by the same amount.



### Parameter Value Percentages

The COMP/EXP. edit operations identify a parameter's values based on where they sit within the entire 100% range of the parameter's possible values. This allows you to identify the desired threshold value for compression/expansion, and helps you know how much shift to apply to an Automix region's parameter values, regardless of the kind of automated parameter you're working with.

### Compression and Expansion

Compression and expansion decrease or increase, respectively, the distance between the region's parameter values and a threshold parameter value. You can select as your threshold any of the parameter's possible values, from 0 for its lowest value, to 50 for its middle value, to 100 for its maximum value. Set Expand to the amount by which you

want to multiply the distance between the region’s values and the threshold value. You can use:

- *Compression*—Expand settings less than 1.0 bring parameter values closer to the threshold value.
- *Expansion*—Expand settings greater than 1.0 increase the distance between parameters values and the threshold value.



Parameter values exactly equal to the threshold value are not changed by Compression and Expansion.



An Expand value of exactly 1.0 causes no change in the selected parameters’ values.

*Shift*

Shift allows you to raise or lower all parameter values in the selected region by a percentage of the parameter’s entire range of values. You can set Shift anywhere from -50—which reduces the parameters’ values by 50% of the parameter’s entire range—to 50, which increases them by 50%.



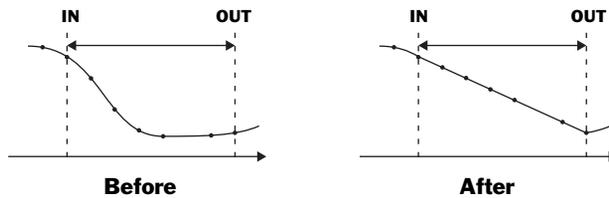
You can shift a value only within its parameter’s stated range. Once a parameter has reached its minimum or maximum value, Shift has no further affect on its value.



You can use Compression/Expansion and Shift together. The selected Automix data is compressed or expanded first, and then the Shift value is subtracted from or added to the resulting values.

**GRADATION**

GRADATION smooths out Automix data in order to help make transitions between varying values sound more natural. It does this by forcing the selected Automix data to conform to a shape, or “gradation curve,” you select.

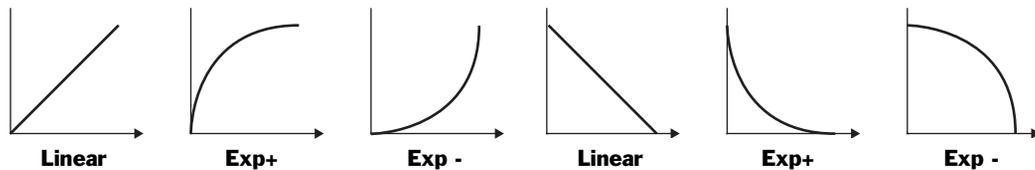


Set Gradation Curve to the desired shape. You can select:

- *Linear*—for a flat ascending or descending shape to the selected data.
- *Exp+*—for an upward convex exponential curve to the selected data.
- *Exp-*—for a downward convex exponential curve to the selected data.

**With ascending parameter values**

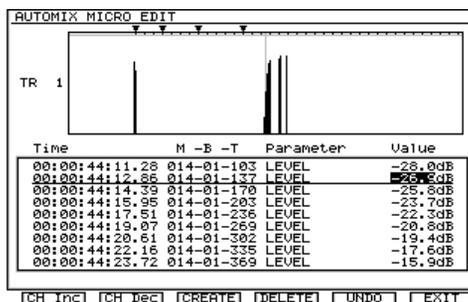
**With descending parameter values**



The RSS PAN Grad. MODE parameter allows you to move between RSS Pan positions in front of you or behind you—see “RSS PAN” on Page 225.

## Micro-Editing Automix Data

On the AUTOMIX EDIT screen, press F4 (MICRO) to display the AUTOMIX MICRO EDIT screen.



To leave the AUTOMIX MICRO EDIT screen, press F6 (EXIT).

On the AUTOMIX MICRO EDIT screen, you can individually edit the location and value of any Automix event. You can also delete any events you no longer want, and create new ones if you so choose.

### Micro-Editing Automix Data

- To view the desired Automix track's data, press F1 (Tr Inc) or F2 (Tr Dec) to move higher or lower, respectively, through the currently targeted Automix tracks. The current track's name and data is shown above the list of its Automix events.
- Press ▲ or ▼ to select the desired event in the list, and:
  - To change an Automix event's location—Use ◀ and ▶ to select the desired unit of time measurement. You can select time code or measures/beats/ticks. Turn the TIME VALUE dial to select the desired start location.
  - To change an Automix event's value—Use ◀ and ▶ to highlight the event's value and turn the TIME VALUE dial to select the desired value.



You can see the changes you make in the data window above the phrase list.

### Deleting an Automix Event

- Press ▲ or ▼ to select the event in the list.
- Press F4 (DELETE) to erase the selected Automix event.

### Creating a New Automix Event

- Press ▲ or ▼ to select an Automix event of the type you want to create.



If you can find an event at the desired location that's the same type of Automix event as the one you want to create, select it to save time.

- Press F3 (CREATE) to place a copy of the currently selected Automix event at the selected event's location.
- Edit the new Automix event's location and value as desired.



If you create a new event on an Automix track with no other events, the VS-2000 creates a Level event.

### Undoing an Automix Micro-Edit

- Press F5 (UNDO). Until you record more Automix data or perform a new Automix edit, you can press F5 (REDO) to reverse the undo.

## Automix and V-Link

V-Linking lets the VS-2000 work seamlessly with video editing and presentation devices—see Page 301. The VS-2000's Automix feature allows you to program a series of video clips that a presentation device is to play.

You can insert V-Link Automix events into a project on the Automix MICRO EDIT screen described on the previous page. You can enter a variety of V-Link Automix events at the desired project times. See “Automix Parameter List” on Page 408 for more information.



To micro-edit a V-Link event, select it as an Automix editing target, as described on Page 347.

# 27—Mastering and CD-R/RW Operations

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## Mastering

Mastering is the process of turning your mix into a final, polished stereo recording, suitable for writing, or “burning,” onto an audio CD for your private use or for mass-duplication. The VS-2000’s Mastering Room and Mastering Tool Kit provide all the mastering tools you need.



Even if you just want to make a mix that you’ll record onto a cassette for friends, the VS-2000’s mastering tools can help you make the project sound its best.



You can also digitally transfer your mastered project to an external device—such as a DAT deck or computer—for storage, for further editing or for additional processing.

## Mixing for Mastering



Take a few moments to check your project’s tracks for noises—coughing, hum or unwanted notes—before you mix. Use your track editing tools (Chapter 18) to get rid of anything bothersome that you might forget to mix around.

While the VS-2000 allows you to mix while you’re mastering, we recommend that you perfect your mix before entering the Mastering Room. This way, you’ll be able to more easily take advantage of the VS-2000’s extensive suite of mixing tools. First and foremost are your track channel CH EDIT tools (Chapter 11) that let you shape each signal using dynamics processing and multi-band EQ. Handy tools such as fader grouping allow you to manage related groups of tracks with ease.

We also encourage you to use Automix (Chapter 26), which can transform the entire act of mixing. With Automix, you don’t need to rehearse and rehearse tricky mix moves—just capture them once with Automix and you’re done. The fact that you can record Automix data for a track at a time means that you can pay attention to mix details in a way that’s just not otherwise possible.

## Important Mastering Concepts

### ***What Kind of Audio Can Be Burned on a CD***

Only audio from a project that uses a 44.1k sampling rate can be written onto an audio CD. Both of the VS-2000’s recording modes use a 44.1 kHz sampling rate.

CD audio is recorded at a bit depth of 16 bits. If you’ve recorded a project at 24 bits, the VS-2000 dithers its audio down internally to the required 16 bits during mastering—if you’re using the CDR recording mode (Page 356)—or during CD burning.



*Dither*

### ***What's Recorded on an Audio CD***

It's important to understand that an audio CD contains just that: audio. None of your project settings are themselves written to an audio CD, only the audio that those settings produce. It's therefore critical that your final mix sound *exactly* as you want it to—with all of the desired tracks, effects, live elements and so on—since that's what the audio CD will contain.

An audio CD can hold up to about 74 minutes worth of audio.

### ***What is the Mastering Room?***

An audio CD contains just two tracks of audio: a left and a right track. Your project must therefore be mixed down to just two V-Tracks that can be burned onto a CD. On the VS-2000, these two V-Tracks are called your "mastering tracks." The Mastering Room is where you create mastering tracks.

The Mastering Room has two operating modes. When it's set to:

- *Record*—You can listen to the signals from all of your input, track, Aux master and FX return channels as parts of the mix you record onto your mastering tracks.
- *Play*—You can play back your recorded mastering tracks. Input, track, Aux master and FX return channel signals are silenced since their audio can now be heard in the final mix recorded on the mastering tracks.

### ***About Mastering Tracks***

The mastering tracks that contain your final mix are always a pair of V-Tracks. To record on these tracks—and to hear them back—you must be in the Mastering Room.

You can select any pair of same-numbered V-Tracks from mastering tracks. We'll describe how to select the desired V-Tracks on Page 360.

### ***CD Disk Images***

All commercially produced audio CDs conform to a set of standards called the "Red Book" standards. The VS-2000 produces Red Book audio CDs.

Before the VS-2000 can burn audio onto a CD, it converts the audio into a Red Book-compliant form of data called a "disk image file," and stores the file on your internal hard drive. It's this stereo file that actually gets written onto the CD. A disk image file can be as large as 700MB depending on how much audio you're packing onto a CD.



The disk image file can be stored only on the VS-2000's internal hard drive.



The VS-2000 can use any free space on your hard drive for creating a CD disk image—the free space doesn't have to be in the currently selected drive partition.

There are two times during the mastering process at which you can create a disk image file. You can:

- *record your mastering tracks using the CDR recording mode*—This records your mastering tracks as a disk-image file. When you save the project, the file is saved with it. If you want to create additional audio CDs at a later time, when you load the project, the disk image file loads as well, ready for burning.
- *create a temporary disk image on the fly as you burn a CD*—The VS-2000 can create a temporary disk image file as you burn an audio CD if your mastering tracks weren't recorded using CDR mode. This takes a bit longer and, as soon as you're done burning CDs, the temporary disk image is discarded. If you want to burn more CDs at a later date, the VS-2000 has to create another temporary disk image.

### **Multi-Project Compilation CDs**

Many VS-2000 users treat each song—or other type of audio creation—as a separate project. When you want to create a CD from multiple projects, you've got to bring all of the audio from those projects together onto a single pair of mastering tracks. There are a few ways to do this.

#### *Imported Mastering Tracks*

One method is to mix and master each project separately using the CDR recording mode, and then use Region IMPORT (Page 269) to import all of their mastering tracks into a single compilation project's own mastering tracks. You can then do either of two things. You can:

- *edit them into the desired order*—Each imported set of mastering tracks appears as a pair of phrases in the playlist. It's a simple matter to move them into the desired positions with the desired spacing between each pair of phrases. By investing some editing time, you can create an edited set of CDR-recorded tracks that can be burned immediately onto an audio CD.
- *master them one-by-one*—You can place the imported mastering tracks on any V-Tracks you want, and then build a final full-length mastering track selection-by-selection (see "Building Mastering Tracks Selection-by-Selection" on Page 360). This method requires less editing time, but means that you have to re-master all of your elements in order to combine them.

#### *Imported CD Tracks*

As you perfect each mix, you can burn it onto a work CD. When you've got a satisfactory version of each mix, you can use the VS-2000's CD Capture feature (Page 374) to import each song—one after another in the desired order—into a single compilation project. Since you may develop multiple work CDs over the course of creating and mixing an album, this method provides a handy way to bring together your favorite mixes from different CDs. Once your mixes are imported and positioned as desired, you can create new album-length mastering tracks for burning onto a final CD.



Since the VS-2000's CD Capture feature imports audio entirely in the digital domain, your imported audio should be exactly the same as what you hear on the audio CD from which it comes.

### *Using Project COMBINE*

You can also use the Project COMBINE operation (Page 109) to combine all of the projects into a single compilation project. If you're doing a full-length CD, this project will be very large, and require lots of disk space. As with the first approach, you can edit each selection into position on the same pair of tracks—with 18 tracks to move, this can be a lot of work. A better idea is to leave them where they are and build your final mastering tracks one selection at a time.



To use PROJECT COMBINE, all of the projects must use the same recording mode.



Unless all of the projects were recorded in CDR mode, you'll need to create CDR-mode mastering tracks whether you edit your selections into the desired order or not.

### *Use an External Recorder*

You can also record each project's mix on an external digital recorder and then re-record each one into a single CDR-mode compilation project on the VS-2000. You can then re-order your selections on a single pair of CD-ready tracks, or build your mastering tracks selection-by-selection.

## **Understanding CD Track Markers**

When you play an audio CD, you can jump from song to song by entering the desired song's number. Each song, or individual selection, on a CD is technically called a "track." A CD can contain up to 99 tracks.



Don't be confused by the use of the word "track" here—a CD track is different from a track on the VS-2000. On the VS-2000, a track contains a single mono signal. On a CD, a track is a stereo audio selection or song.

A CD player identifies each of its tracks by the numbered CD track marker placed at the front of the track. When you create an audio CD, the VS-2000 automatically places the first CD track marker at the start of the mastering tracks, at Time 00h00m00s00f00. As the VS-2000 encounters each CD track marker in a project you're burning on a CD, it sends a command to the CD burner to move to its next-numbered track.



It's not possible to write a CD with track numbers in anything but normal numerical order, nor is it possible to skip track numbers.

When you're recording mastering tracks selection-by-selection, the Mastering Room can automatically write a CD track marker at the beginning of each new selection you record after the first one—see "Building Mastering Tracks Selection-by-Selection" on Page 360.

Once you've performed any editing you need to do on your finished mastering tracks, the final stage of mastering before you actually burn an audio CD is the placing of your remaining CD track markers in the desired positions. We'll describe how to do this on Page 364.

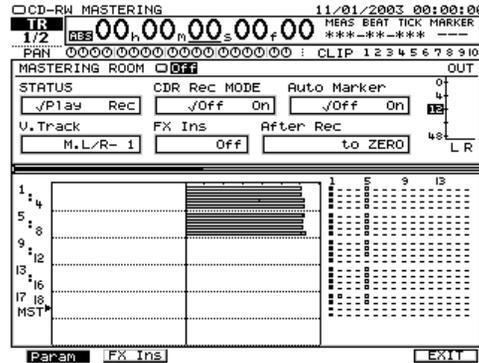


According to audio CD standards, CD track markers must be at least four seconds apart from each other. For this reason, every numbered track on a CD must be at least four seconds long. If you try to set CD track markers too close together, the VS-2000 displays "Can't Set Marker."

## Working in the VS-2000 Mastering Room

### Navigating to the Mastering Room

1. While holding down SHIFT, press CD-RW. The MASTERING ROOM screen appears.



Mastering room parameters

Project playlist

Navigation buttons

### Turning On the Mastering Room

To turn on the Mastering Room:

1. Set the MASTERING ROOM on/off switch to On.
2. To de-activate the Mastering Room, set its switch to Off.



When the Mastering Room is turned on, the CD-RW button flashes.

### Selecting the Mastering Room Operating Mode

The Mastering Room's operating mode is determined by the setting of its STATUS parameter. You can select:

- *Play*—to play back already recorded mastering tracks.
- *Record*—to record new mastering tracks.

### Selecting the Mastering Tracks' Recording Mode

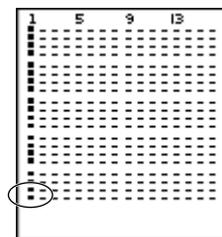
When the CDR Rec Mode parameter is turned on, your mastering tracks are recorded as disk image files that can be immediately burned to an audio CD (Page 356). When it's turned off, the mastering tracks are recorded using the project's recording mode.

Typically, you'll want to set CDR Rec Mode to On.

## Selecting the Mastering V-Tracks

Turn the Time/Value dial to select the V-Tracks on which you want to record your mastering tracks. You can select any same-numbered pair of tracks belonging to mastering tracks (Page 356).

The currently selected mastering tracks appear as diamonds in the V-Track map shown in the Mastering Room and elsewhere.



## Building Mastering Tracks Selection-by-Selection

When you're creating an audio CD with multiple audio selections—such as an album of songs or a collection of jingles or soundtrack cues—you can record its mastering tracks one selection at a time.



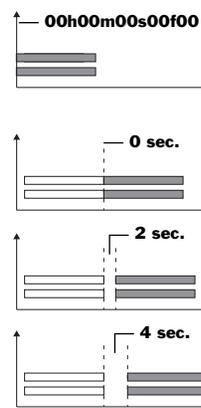
“Multi-Project Compilation CDs” on Page 357 discusses the various ways in which you can assemble an audio CD from multiple projects.

### Positioning Mastered Selections

After mastering the first selection, master the next selection, and so on, placing each new selection behind the previous one on the mastering tracks. The resulting mastering tracks contain a string of phrases, with each phrase playing the audio for one of the selections. You can edit these phrases later to refine their spacing, trim unwanted audio or change the selections' order (Page 362).

The Mastering Room's After Rec parameter places each new selection. Its values are:

- to ZERO—records the new mastered audio at Time 00h00m00s00f00, the beginning of the CD. Use this setting when you're creating a single-selection CD, or when you're recording the first selection in a multi-selection CD.
- to Last Phrs:0s—places the new mastered audio at the end of the audio already recorded on the mastering tracks, with no space between them.
- to Last Phrs:2s—places the new mastered audio at the end of the audio already recorded on the mastering tracks, with a two-second space between them.
- to Last Phrs:4s—places the new mastered audio at the end of the audio already recorded on the mastering tracks, with a four-second space between them.
- Stay HERE—records the new mastered audio in the same location in the project as its source data. Use this setting if you've created a compilation project, have moved its selections so that they play one after another, and are mastering each selection individually in order to be able to individually concentrate on each selection's mix.



### Placing Markers Automatically

When you add a new selection to already mastered audio, the Mastering Room's Auto Marker feature can place a CD track marker at the new selection's beginning to save you time later on. (The CD marker at the very start of the mastering tracks is added automatically during CD burning.) To turn on this feature, set Auto Marker to On.



Auto Marker places a CD track marker only at the beginning of a new selection—it doesn't place markers after pauses in the audio within the selection.



Use Auto Marker only if you're sure your mastering tracks will require no editing after they've been recorded—otherwise, you'll have to delete and re-place the CD track markers after moving your audio.



To make your CD track markers line up numerically with your selections, place two standard markers as dummy markers in the first selection, as described on Page 364.

### **Using the Mastering Tool Kit**

In the Mastering Room, you can insert any of the VS-2000's Mastering Tool Kit (MTK) effects onto the MASTER bus to add the final touch of processing to your mix.

The MTK effect patches cover a wide variety of mastering situations, and are all fully editable so that you can customize them for your particular needs. Each MTK effect is a powerful stereo effect that requires the resources of two effect processors.

You can chain together as many MTK effects as your effect processing power allows, though a single MTK effect is likely to be all you'll need. If you chain MTK effects, the MASTER bus signals flows through them one after another in numerical order, as with a single-channel insert chain (Page 214).

To insert a Mastering Tool Kit effect:

1. In the Mastering Room, select the FX Ins ("Effect Insert") parameter—the ENTER/YES button begins to flash.
2. Press F2 (FX Ins) or ENTER/YES to display the MASTER EFFECT INSERT screen. (We described in "Inserting Effects on the MASTER Bus" on Page 217.)
3. Select an available odd-numbered effect's insert assign switch—an MTK effect will also require the processing power of the effect's even-numbered partner.
4. Set the switch to Ins to insert the effect on the MASTER bus. If you wish to return to the Mastering Room, you can press F1 (Param) or F6 (EXIT).
5. Press the flashing ENTER/YES button to display the effect's Algorithm View screen from which you can select the desired MTK effect patch or edit the effect's currently selected patch (Page 219).



Technically, you can insert any effect patch on the MASTER bus, but we recommend using one of the MTK effect patches for mastering—that's what they're designed for.

6. To return to the Mastering Room, hold down SHIFT and press CD-RW.



Since the powerful MTK requires two effect processors, we recommend installing additional Roland effect boards to make sure you have all the effect processing you need during mixing and the creation of mastering tracks.



If your VS-2000 has limited effect processing power, consider recording your tracks with effects so that you can take advantage of the MTK during mastering. See "Getting the Most From Your Effect Processors" on Page 90.



In addition to being able to edit an MTK effect as desired, you can also adjust the MASTER EFFECT INSERT screen's Send and Return parameters to adjust the level of the MASTER bus's signal going into, and coming out of, the MTK effect.

### **Recording Mastering Tracks**

1. On the Mastering Room screen, set MASTERING ROOM to On.
2. Set STATUS to Record.
3. Set your other Mastering Room parameters as desired.
4. Press ZERO or move the now line to the beginning of the mix you want to record onto your mastering tracks.
5. Hold down REC and press PLAY.
6. When the mix has finished playing, press STOP.
7. To hear your mastering tracks, set STATUS to Play.
8. Press PLAY.
9. If you'd like to re-do the mastering tracks, Repeat Steps 2-8

### **Editing Mastering Tracks**

You can edit mastering tracks to trim unwanted space from before and after the audio, between sections, and to remove unwanted audio or outtakes. To do this, turn on the Mastering Room and set it to Play so you can hear what you're editing.

If you've:

- *created a single-piece mastering track*—its data appears as a single pair of phrases in the project's playlist.
- *constructed a mastering track from individual selections one-by-one*—each selection appears as a pair of phrases in the playlist.

Use phrase editing to trim any extra space from the very beginning of the mastering track. During the actual burning of your audio CD, the VS-2000 places the first CD track marker at the beginning of the mastering track—trimming its front ensures that the CD track marker lines up with the first audio you want to hear, not silence, a countoff or other unwanted sounds.



We recommend leaving about 15 frames of time before the audio actually begins so that your CD plays correctly even on slower CD players.

If the mastering track contains multiple selections, make sure that they're in the right order and the spaces between them are as you want them. Perform any phrase edits you need to in order to make the entire mastering track flow as desired.

Once you've completed the editing of your mastering tracks, you can move on to the final preparatory step: adding CD track markers.

### **Placing CD Track Markers**

"Understanding CD Track Markers" on Page 358 describes the purpose of CD track markers. This section describes the mechanics of placing them in your mastering tracks.

Though they have a very different purpose, you can work with CD track markers in much the same way you work with the VS-2000's project markers (Page 186).

## What CD Track Markers Look Like

Once placed, CD track markers appear above the playlist as downward-pointing triangles, just like normal markers. In the current time location display's Markers counter, each CD track marker has a "C" to its right.



CD track markers appear in the Locate to Marker window along with the project's other markers (Page 187). You can identify a CD track marker in this window by its location.

## About CD Track Marker Numbering

Each marker in a project—including each CD track marker—is identified by its number, as described on Page 186. As you add each new marker, it assumes its place in the project's marker list, and all subsequent markers' numbers go up by one.

If your project contains no other markers, here's how they'll be numbered when you're creating an audio CD with four selections—we'll use four songs in our example:

<i>Location:</i>	<i>CD Track Marker is numbered as:</i>	<i>CD Track:</i>
Beginning of Song #1	none needed—placed automatically	1
Beginning of Song #2	000c	2
Beginning of Song #3	001c	3
Beginning of Song #4	002c	4

Obviously, this can be confusing—starting with the second selection, the CD track number's marker is lower than the CD track's by two. If your project contains other markers, numbering can become *really* baffling.

You'll find the process of placing CD track markers much simpler if the numbers of the CD track markers you place correspond to the numbering of the CD's audio selections. There are a couple of things you can do to make this happen.

### *Delete all of the project's other markers*

See Page 188 to learn how to delete all project markers—this causes your marker numbering to start over. If you don't want to lose your markers, make a second copy of the project (Page 106). Remove the markers—and burn your CD—from the copy.

### *Place a pair of dummy markers in the first selection*

Since your CD burner ignores the VS-2000's normal project markers, you can place two "dummy" markers somewhere in the middle of the first selection—it doesn't matter where, as long as they're at least four seconds after the start of the selection and at least four seconds before its end. These two markers push the remaining CD track marker numbers back into line with the CD's track numbers. To use our example again:

<i>Location:</i>	<i>CD Track Marker is numbered as:</i>	<i>CD Track:</i>
Beginning of Song #1	none needed—placed automatically	1
Middle of Song #1	(Normal Marker #000)	<i>(ignored by CD-R/RW)</i>
Middle of Song #1	(Normal Marker #001)	<i>(ignored by CD-R/RW)</i>
Beginning of Song #2	002c	2
Beginning of Song #3	003c	3
Beginning of Song #4	004c	4

## Placing CD Track Markers

1. Press HOME to view the Home screen.
2. Position the now line at the beginning of the second selection on your mastering tracks. (Remember, the first selection's CD track marker is set automatically).



Use the VS-2000's Scrub feature (Page 181) to place the now line as precisely as you can, about 15 frames before the start of the selection's audio. The placement of the CD track marker determines what happens when a listener selects the track on a CD player, so make sure you've set the CD track marker where you want it.

3. While holding down CD-RW, press TAP to place the CD track marker.
4. Repeat Steps 1 and 2 for any other CD track markers you want to place in your mastering tracks.

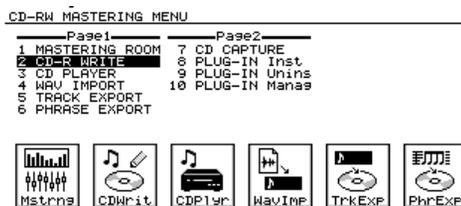


When you're done, you can jump from marker to marker to check their positions using the PREVIOUS and NEXT buttons—see "Using PREVIOUS and NEXT" on Page 187. If you need to clear and re-place a CD track marker, use PREVIOUS or NEXT to move the now line to the marker, hold down CLEAR and press TAP.

## CD-R/RW Operations

All CD-R/RW operations described in the following sections start on the CD-RW MASTERING MENU screen. To get there:

1. Press CD-RW—the CD-RW MASTERING MENU screen appears.



One of the most important CD-R/RW operations is the PROJECT menu's BACKUP operation, described in Chapter 7, on Page 110.



If you encounter error messages while using your CD-R/RW drive, see Page 368 or the VS-2000 Appendices for explanations of the VS-2000's error messages.

## Creating an Audio CD

### Track at Once or Disk at Once?

The VS-2000 allows you to select the way you want to write an audio CD:

- *adding tracks to a CD one at a time*—This can be a great way to compile a CD of work mixes to listen to. As you create each new mix, burn it onto your work CD. This method of creating a CD is called "Track at Once" or "TAO" for short. You can create Track at Once CDs only with CD-R disks.

- *writing all of the tracks in a single CD-burning process*—When you’ve created mastering tracks that contain all of a CD’s selections positioned as you want them, you can burn the entire “Disk at Once,” as this method’s called, or “DAO” for short.



If you plan to mass-duplicate your CD when it’s done, check with the duplication service you’re going to use—some duplicators accept only DAO-created CDs.

### Finalizing

Before a CD can be played on an ordinary CD player, certain important information must be written onto the CD, including track numbers and a Table of Contents, or “TOC.” This last step in the CD-creation process is called “finalizing.” Until then, the CD can be played only on your VS-2000 or another Roland V-Studio with a CD-R/RW drive—see “The CD Player Feature” on Page 368.

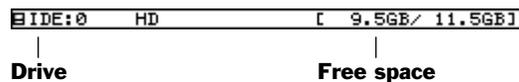
Once a CD-R’s been finalized, no more audio can be added to it—you can erase a CD-RW and start over. You can finalize a CD during the CD creation process. To finalize a CD without adding audio, use the procedure on Page 364, setting Finalize to OnlyFin.

### Making Sure You Have Enough Space

Before burning an audio CD, you’ll want to make sure your audio is going to fit on the blank CD-R or CD-RW. In addition, if your mastering tracks were created using any recording mode other than CDR mode, the VS-2000 will need the same amount of free space on your hard drive to create the necessary disk image file (Page 356) during the CD-burning process.

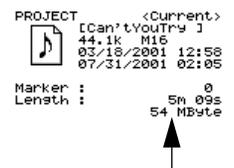
Before starting the CD-burning process, figure out how much free space is available on your internal hard drive:

1. Hold down SHIFT and press F1—the VS-2000 scans your connected drives and displays information about each drive.  
The VS-2000 can use any free space on your internal hard drive for the creation of a disk image, not just the currently selected drive, or partition.
2. Add up all of the free space left on your IDE drives. This is the amount of free space you have available.



Once you’ve started burning the CD, the CD-R WRITE screen provides the information you need to calculate the amount of room you need:

1. On the CD-R WRITE screens, locate the length of your project in minutes and seconds.
2. Multiply the minutes by 60, and add the result to the seconds to arrive at the length of the project in seconds.
3. Apply the following formula:



$$\begin{array}{ccccccccc}
 44,100 & \times & 2 & \times & 16 & \times & \text{seconds} & \times & 1/8 \\
 \uparrow & & \uparrow & & \uparrow & & \uparrow & & \uparrow \\
 \text{Sample rate} & & \text{Tracks} & & \text{Bits} & & \text{Project length} & & \text{Bits to bytes}
 \end{array}$$

The result is roughly the amount of space you'll need on the CD and on your internal hard drive. Compare this to the amount of free space on the CD as shown in the lower right corner of the CD-R WRITE screen, and to the amount of free hard drive space you have available.

```
Disc :      Blank Disc
Track:  0      0 MByte
Free :      787 MByte
```

### Burning an Audio CD



The following describes how to burn mastering tracks onto an audio CD. In fact, you can burn any two VS-2000 tracks onto an audio CD.



You can create an audio CD using either CD-R or CD-RW disks. Note, however, that not all CD players can play CD-RW disks, nor will all mass-duplicators accept them. We recommend using CD-R disks only when you're creating final CDs for other people or for mass duplication.



If your mastering tracks were created in a recording mode other than CDR, press PROJECT and add up the remaining free space on your IDE drives as described above before proceeding—you'll need to know this information as you burn your CD.

1. Insert a blank CD-R or CD-RW disk into your CD-RW drive.
2. Press CD-RW.
3. Press F2 (CDWrit)—"Store Current?" appears on the display.
4. Press ENTER/YES to store the most recent changes to your project—including any mastering tracks you've just created—or press EXIT/NO to proceed without re-saving your project.



F2 (CDWrit)

After you press the desired button, the VS-2000 performs a few setup operations—this takes a few moments. When the VS-2000 has finished setting itself up for CD burning, the CD-R WRITE screen appears.

CD-RW MASTERING
02/01/2003 00:00:00

CD-R WRITE
Current Drive: IDE:0

SOURCE	DESTINATION
L-Ch SOURCE TRACK ML-1:U.T19- 1	DRIVE ATAPI CD-RW
R-Ch SOURCE TRACK MR-1:U.T20- 1	

PROJECT [Surreal] <Current>

44.1k M16

03/18/2003 12:58

07/31/2003 02:05

Marker : 0

Length : 54 09s  
54 MByte

FINALIZE  
Off  On OnlyFin.

WRITE METHOD  
Track at Once

SPEED  
x 4 < 706KBps >

Disc : Blank Disc

Track: 0 0 MByte

Free : 846 MByte

OK CANCEL

Project info

Drive info

Disk info

If you've got a CD-RW disc in your burner, the VS-2000 displays a reminder that that many CD players can't play an audio CD-RW:

*CD-RW (ReWritable)!!  
Can't be Played back  
with Audio Player.  
Are You Sure?*

5. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.
6. If you're re-using a CD-RW disk that you want to erase, see Page 368.
7. Make sure you have enough room on the CD for your audio, calculating the space you'll need as described in "Making Sure You Have Enough Space" on Page 365.
8. If your mastering tracks were recorded using a recording mode other than CDR, verify that you have enough free space on your internal hard drive to create a disk image file—again, see Page 365.



If you lack the required space on the CD—or on your hard drive, as in Step 8—press F6 (CANCEL). If the CD is blank and still won't hold your audio, you'll need to trim the audio so that it fits. If the CD has other selections on it already, consider starting a new CD. If you need to make a disk image and don't have enough room on your hard drive, you'll need to clear some space on the drive before proceeding.

9. Select the mastering tracks—or other pair of tracks—you want to burn on the CD. You can select these in either of two ways. To select your tracks:
  - *at the same time*—select the L-Ch SOURCE TRACK parameter and turn the Time/Value dial to select the same-numbered V-Tracks on any odd/even pair of project tracks.
  - *individually*—select a pair of V-Tracks using the L-Ch SOURCE TRACK parameter, and then use the R-Ch SOURCE TRACK parameter to select a different right-side V-Track.
10. Select the desired WRITING METHOD: Track at Once or Disk at Once (see Page 364).

**You can easily spot a V-Track recorded in CDR mode—it has an asterisk in its number instead of a hyphen.**

**CDR-recorded V-Tracks**

```
ML*1:U.T19- 1
MR*1:U.T20- 1
```



**Standard V-Tracks**

```
ML-1:U.T19- 1
MR-1:U.T20- 1
```



If you select Track at Once, make sure to use a CD-R disk. You can't write a Track at Once CD-RW disk.

11. Set Finalize (Page 365) as desired. You can set it to:
  - *Off*—Use this setting when you're burning audio on a Track at Once CD, and you'll be adding more audio later.
  - *On*—Use this setting when you're burning a Disk at Once CD, or when you're adding the last selection to a Track at Once CD.
  - *OnlyFin.* ("Only Finalize")—Use this setting when you've decided you're done adding selections to a TAO CD, but haven't yet finalized the CD.
12. Select the speed at which the burner is to write the CD. You can select any of the available speeds—you'll only be offered choices supported by your burner.



Try using the highest available speed to make the burning operation as brief as possible. If you have trouble burning the CD, try a lower speed.

13. Press F5 (OK) to begin burning the CD.  
The VS-2000 asks if you're sure you want to burn the disk with your current settings, and if you've remembered to place the CD's track markers:

*Audio CD-R Write Sure?  
(selected writing method)  
CD Track No. OK?*

14. If you wish to proceed, press ENTER/YES. To cancel the operation, press EXIT/NO.
15. The VS-2000 displays a message about copyrighted material. When you've read the message, press ENTER/YES, or press EXIT/NO to cancel the operation.
16. A screen appears that discusses licensing terms. If you agree to these terms, press ENTER/YES to proceed. Otherwise, press EXIT/NO to cancel the operation.  
If you press ENTER/YES, the VS-2000 proceeds to burn the CD.  
When it's finished, the VS-2000 asks if you'd like to burn another CD of the same audio material. If you do, insert a new CD in your burner and press ENTER/YES, or press EXIT/NO to complete your CD-burning session.
17. If you press EXIT/NO, the VS-2000 displays "Done!"

## Erasing a CD-RW Disk

- If you attempt to write to a CD-RW that already contains data, the VS-2000 displays:  
*Finalized Disc! or Not Blank CD!*
- Press ENTER/YES to proceed. The VS-2000 then displays:  
*CD-RW (ReWritable)!!  
Erase?  
All Data on the CD-RW  
will be Erased.  
Are You Sure?*
- Press ENTER/YES to erase the current contents of the CD-RW disk. The erasing procedure takes a few moments.
- Once the disk's been erased, the VS-2000 shows the same message as in Step 5 on Page 366. Press ENTER/YES to proceed or EXIT/NO to cancel.
- Finally, the VS-2000 asks if you're sure you want to proceed, as in Step 13 above. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.

## If You Encounter Error Messages During CD Burning

The one error messages you're most likely to see during CD burning are the following:

- *Please Insert CD-R Disc!*—If you see this message, there's no CD-R or CD-RW disk in the burner, the burner's tray isn't closed, or the burner's not ready for use.

The *VS-2000 Appendices* contain explanations of additional error messages.

## The CD Player Feature

You can use your CD-R/RW drive as a CD player that can play CDs that haven't yet been finalized. It can also play any finalized CD, as well as commercial CD releases.

When you're using the CD Player feature, you can listen through the VS-2000's MASTER and MONITOR outputs, as well as the PHONES jacks. The CD Player feature is for listening only—you can't route audio from the CD to tracks for recording, or to additional VS-2000 output jacks or connectors.



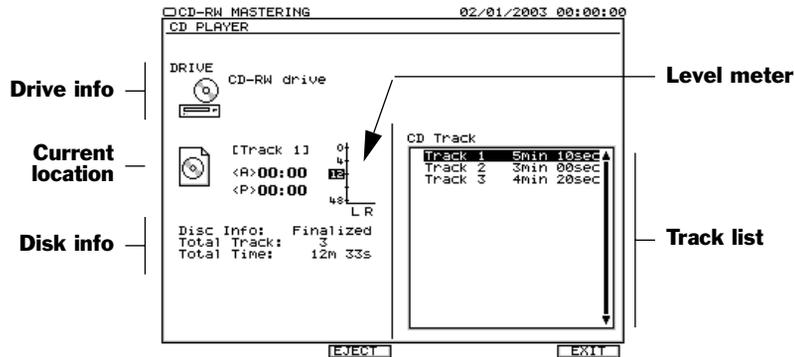
When you're listening to a CD that hasn't yet been finalized, you won't be able to hear approximately the final .5 seconds of each track.

### Playing an Audio CD

1. Press CD-RW.
2. Press F3 (CDPlyr)—the CD PLAYER screen appears.



F3 (CDPlyr)



3. Insert the desired CD into the drive.

To:	Press:
Play the CD from your current location	PLAY
Halt playback at the current position	STOP
Rewind to the top of the CD	ZERO
Jump to the start of the next track	NEXT
Jump to the beginning of the previous track	PREVIOUS
Eject the CD	F3 (EJECT)
Turn off the CD Player feature	F6 (EXIT)

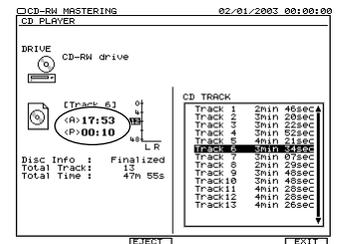


When the CD's not playing, you can use the VS-2000's REW or FF buttons to change your current location on the CD.

### About the CD Player Time Display

To help you locate audio for CD Capture (Page 374), the CD Player shows the current playback time in two ways:

- <A> ("Absolute" time)—shows the amount of time since the start of the CD.
- <P> ("Program" time)—shows the time since the start of the current track.



### WAV File Importing

The VS-2000's WAV Import feature allows you to load linear-format (PCM) WAV audio files from a data CD. There are many recordings and samples that use Microsoft's WAV format available on commercial CDs and on the Internet. When you import a WAV file, you can place it on any track in the current project.



Both Windows and MacOS computers can read WAV files.

## Converting WAV Files

The VS-2000 converts WAV files to the current project's recording mode when it imports them. When a WAV file is at the same sample rate as the project, this conversion can be quite quick. On the other hand, if it's not, the conversion can take a while. You can choose to perform a Normal conversion—for the best audio quality—or a Quick conversion if you're in a hurry.



If the WAV file is not at a 44.1 kHz sample rate, the file's sound may change when it's imported into the VS-2000.

## ISO 9660 CDs

The WAVE Import feature recognizes only ISO 9660-format CDs. If you're preparing a data CD of WAV files on a computer, make sure the CD uses the ISO 9660 format. Both PCs and Mac can create CDs in this format with the proper CD-burning software.

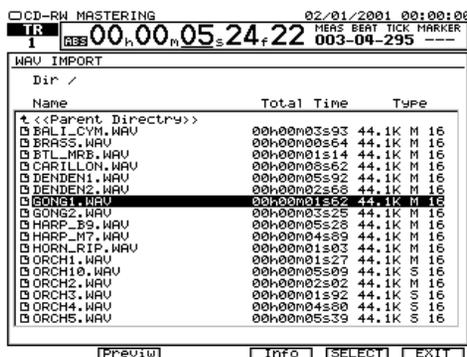
## The WAV IMPORT Screen

All WAV Import operations take place on the WAV IMPORT screen:

1. Insert the CD containing the WAV files into your CD-R/RW drive.
2. Press CD-RW.
3. Press F4 (WavImp)—the WAV IMPORT screen appears.



**F4 (WavImp)**



This screen presents you a list of all of the WAV files and folders in the CD's currently selected directory. You can select any item in the list by using ▼ and ▲ or the Time/Value dial to highlight it.

Each file directory on the CD appears in the displayed list as a folder. To open a folder, select it and press F5 (ChgDir) for "Change Directory." When you're inside a folder, an upward arrow points you back to the folder's parent directory. To move up and back out of the folder, highlight "<<Parent Directory>>" and press F5 (ChgDir) again.

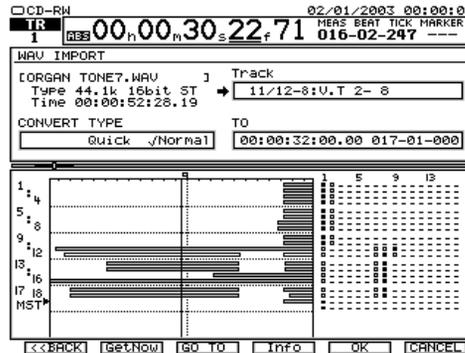
The list provides information about each of its WAV files. The Type column shows the file's sample rate, whether it's mono or stereo, and its bit depth. Press F4 (Info) to toggle the contents of the middle column on the display. This column can show you each file's:

- *Size*—in hours, minutes, seconds and frames.
- *Last Update*—the date on which the file was last modified.

To hear a preview of a WAV file, select it and press F2 (Previw) for "Preview."

## Importing a WAV File

1. Insert a CD containing WAV files into your CD-R/RW drive.
2. Press CD-RW.
3. Press F4 (WavImp).
4. Highlight the WAV file you want to import.
5. Press F5 (SELECT)—the WAV Import Destination screen appears.



As on the WAV IMPORT screen, you can press F4 (Info) to toggle the display of the selected file's size or its last modification date.

To return to the WAV IMPORT screen, press F1 <<BACK). To abort the procedure, press F6 (CANCEL).

6. To select a destination V-Track, or V-Tracks if you're importing a stereo WAV file:
  - select the TRACK parameter and turn the Time/Value dial to select any desired destination V-Track for the imported audio.
  - press the desired destination track's flashing TRACK/STATUS button to select its currently selected V-Track—the TRACK/STATUS button lights solidly.



If you're importing a stereo WAV file, when you select a destination V-Track, you select a pair of V-Tracks on odd/even tracks.

You can import the WAV file to any time location in the project—TO sets the location at which the beginning of the imported audio is placed. You can move the now line to the current TO location by pressing F3 (GO TO).

7. Set TO by:
  - *entering it manually*—Use the cursor buttons and the Time/Value dial to manually enter the desired TO location.
  - *moving the now line*—Cursor up to the current time location display and move the now line to the desired location in the project. Once there, press F2 (GetNow) to enter the now line's current location as the TO point.



There's nothing to prevent you from importing a WAV file onto a track—and at a time location—where there's already data. Be sure to select your destination V-Tracks and time location carefully—the imported data will replace whatever's there.

8. Select the desired type of file conversion, as described in "Converting WAV Files" on Page 370.
9. Press F5 (OK) to import the WAV file to the selected V-Track and time location.
10. When the VS-2000 displays "Done!" press F1 (<<BACK) to return to the WAV IMPORT screen.
11. Press F6 (EXIT) to leave the WAV IMPORT screen and listen to the imported audio.

## Exporting Tracks and Phrases as WAV Files

If you want to move audio from a project to an external device—such as a computer or sampler—that reads WAV files, you can export any track or phrase as a WAV file. The exported audio is written onto a data CD.



Since most audio programs can read WAV files, you can process exported VS-2000 audio using virtually any audio processing or editing software. Afterwards—and after saving the result as a WAV file—you can re-import the audio back into the VS-2000.

When you want to export an entire track, use the Track Export feature. To export portions of a track, use the VS-2000's phrase editing tools to fashion the audio into a phrase, and use the Phrase Export feature.



The VS-2000 exports each pair of linked tracks as a stereo WAV file.

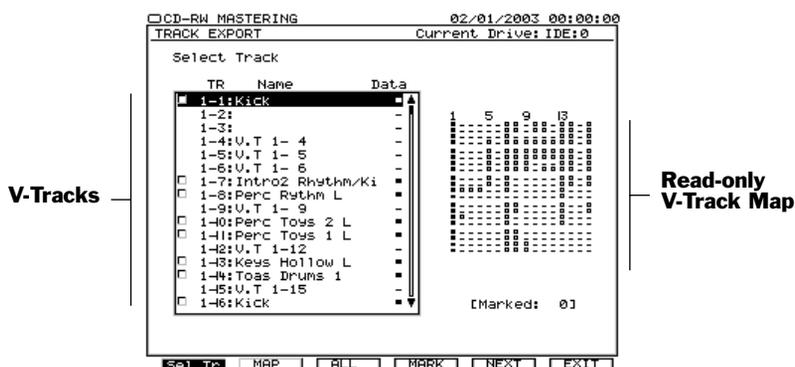
The procedures for exporting tracks and phrase start a bit differently, but end on the the same CD-burning screen.

### Exporting Tracks as WAV Files

1. Insert a blank CD-R or CD/RW into your CD burner.
2. On the CD-RW MASTERING MENU screen (Page 364), press F5 (TrkExp) for “Track Export”—the TRACK EXPORT Select Track screen appears.



F5 (TrkExp)



On this screen, you see a list of all of the project's V-Tracks. To the right is a V-Track map that shows you which V-Tracks contain data. When you export a track as a WAV file, you're really exporting a V-Track—see Chapter 6 for an explanation of the relationship between tracks and V-Tracks.

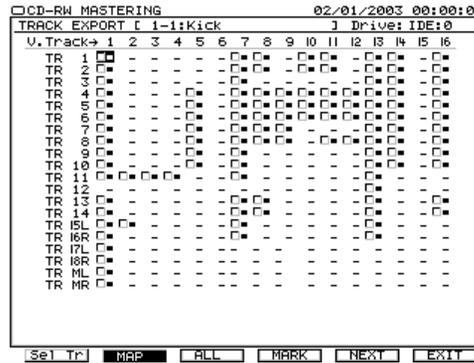
You can select the V-Tracks you want to export on TRACK EXPORT's Select Track screen or on its V-Track Map screen, described on the next page. You can mark as many V-Tracks for export as you want on either screen.

3. To select a V-Track for export on the Select Track screen, turn the Time/Value dial to highlight the V-Track and press F4 (MARK) to place a checkmark next it. You can toggle on or off the selection status of all V-Tracks that contain data by pressing F3 (ALL)—this can be handy if you want to export all of your tracks as WAV files.



Turning the Time/Value dial takes you through each of the project's V-Tracks. Hold down SHIFT as you turn to jump between same-numbered V-Tracks on different tracks.

- To select a V-Track on the V-Track Map screen, press F2 (MAP)—the TRACK EXPORT V-Track Map screen appears.



Each V-Track with audio appears as a small black square with a checkbox to its left.

- To select a V-Track for export, cursor to the V-Track and press F4 (MARK) to check its checkbox. As on the Select Track screen, you can select and unselect all of the V-Tracks at once by pressing F3 (ALL).



To quickly select or unselect all of a track's V-Tracks, cursor all the way to the left so that the track's name is highlighted and press F4 (MARK).

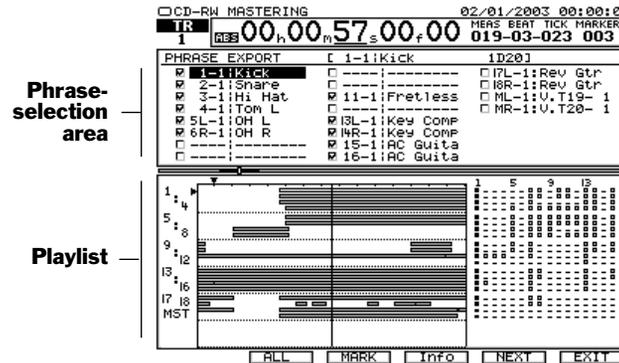
- When you've selected all of the V-Tracks you want to export, press F5 (NEXT) to go to the WAV Export CD burning screen, described on Page 374.

### Exporting Phrases as WAV Files

- Insert a blank CD-R or CD/RW into your CD burner.
- On the CD-RW MASTERING MENU screen (Page 364), press F6 (PhrExp) for "Phrase Export"—the PHRASE EXPORT screen appears.



F6 (PhrExp)



On this screen, you can select the phrases you want to export as WAV files. Every phrase that's currently touching the now line appears at the top of the screen in the phrase-selection area. If a phrase you want to export isn't available for selection, turn the Time/Value dial so that the now line touches the phrase.



Repeatedly press F4 (INFO) to display any of three types of information about the displayed phrases: their names, dates of creation, and sizes.

3. Select a phrase for export by cursoring to it using **▲** and **▼** and pressing **F3** (MARK) to checkmark it.

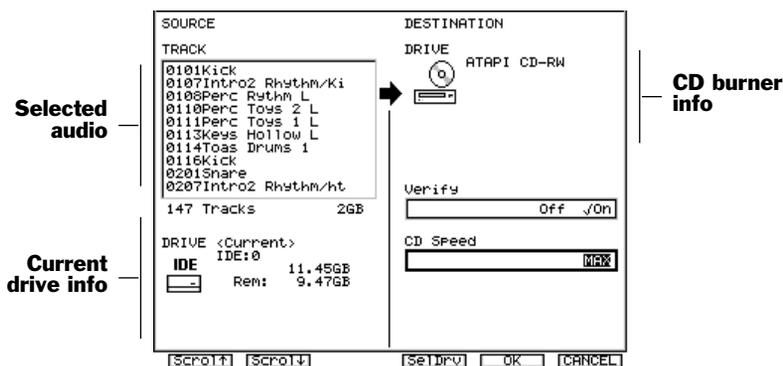


You can repeatedly press **F2** (ALL) to select or unselect all of the currently available phrases at once.

4. When you've selected all of the phrases you want to export as WAV files, press **F5** (NEXT) to view the WAV Export CD burning screen, described below.

### Burning Exported WAV Files to CD

1. When you've pressed **F5** (NEXT) on a TRACK EXPORT or PHRASE EXPORT screen, the WAV Export CD burning screen appears. This screen is identical for exporting tracks and phrases, except for its displayed title.



You can see the title of the screen and the currently selected hard drive above the area shown in this illustration.

2. A list of the selected tracks or phrases is displayed at the left of the screen—you can scroll up or down through this list to see what you're exporting by pressing **F1** (Scrol↑) or **F2** (Scrol↓).
3. Set Verify as desired. You can set it to:
  - *Off*—to finish the CD-burning process faster.
  - *On*—to make sure the CD has no data errors.
4. Select the desired drive speed. We recommend trying the MAX setting that uses your burner's fastest speed. If you have any trouble burning the CD, try again with a lower speed.
5. When you've returned to the screen shown above, press **F5** (OK) to export your tracks or phrases as WAV files to the CD. The process may take a little while, depending on the amount of audio data you're exporting.

## CD Capture

The VS-2000 can capture audio directly from an audio CD into a project. You can capture an entire audio selection from a CD or a portion of a selection.



**F1 (CDCapt)**

Each track from a CD is captured by the VS-2000 in approximately 20-30% of the track's playing time.

## To Capture Audio from an Audio CD

1. Insert the desired CD into your CD burner.
2. On the CD-RW MASTERING MENU screen (Page 364), press PAGE until “CDCapt” appears above F1.
3. Press F1 (CDCapt).  
The CD CAPTURE screen appears, and the VS-2000 scans the audio CD. When it’s finished, the CD TRACK list shows all of the stereo CD tracks on the CD.

CD-RW MASTERING 01/20/2003 00:00:00

CD CAPTURE

DRIVE ATAPI CD-RW

L-Ch DESTINATION TRACK  
1-1:U.T 1-1

R-Ch DESTINATION TRACK  
2-1:U.T 2-1

CAPTURE TO  
to ZERO

CD TRACK CAPTURE OFFSET  
Start of Track

CD TRACK CAPTURE LENGTH  
Whole 1 Track

CD TRACK

Track 1	4min 31sec
Track 2	2min 17sec
Track 3	4min 27sec
Track 4	2min 55sec
Track 5	3min 10sec
Track 6	2min 42sec
Track 7	4min 29sec
Track 8	3min 34sec
Track 9	3min 57sec
Track 10	1min 57sec
Track 11	1min 36sec
Track 12	3min 14sec
Track 13	2min 34sec
Track 14	3min 19sec
Track 15	3min 36sec

Disc Info : Finalized  
Total Track : 20  
Total Time : 65m 23s

Buttons: NOW CLEAR EJECT OK CANCEL

This CD TRACK list shows all of the tracks on the CD. You can scroll up or down through the list to view any CD tracks that aren't currently visible.



To eject the CD in the drive, press F3 (EJECT).

4. In the CD TRACK list, press the PREVIOUS or NEXT button or ▼ and ▲ to highlight the CD track you want to capture. Press the PLAY button to audition the selected track if you wish.



To reset the following parameters to their default values, press F2 (CLEAR).

5. Set L-Ch DESTINATION TRACK to select the project track and V-Track on which you want to capture the stereo CD track's left side. As a convenience, the VS-2000 automatically selects the same V-Track on the next-highest track as the destination for its right side.



If you want to burn a new audio CD from the captured audio, select a matching pair of empty V-Tracks on a mastering tracks as your destination—the VS-2000 can capture the audio directly into CDR mode as described on the next page.

6. If you'd like to select a different right-side destination, set R-Ch DESTINATION TRACK as desired.



If the destination selected in Step 5 already contains CDR-recorded audio, this parameter cannot be manually set.

7. The CAPTURE TO parameter allows you to place the captured audio at the desired time location on the destination V-Tracks. You can place the captured audio:
  - to Zero—at project time location 00h00m00s00f.
  - to Last Phrs:0S—at the end of the last phrase on the destination V-Tracks.
  - to Last Phrs:2S—two seconds after the last phrase on the destination V-Tracks.
  - to Last Phrs:4S—four seconds after the last phrase on the destination V-Tracks.
8. Set CD TRACK CAPTURE OFFSET to the time at which you want to begin capturing audio from the selected CD track. If you want to start at the beginning of the CD track, select Start of Track. Otherwise, dial in the distance from the start of the track at which you want the capture to begin.



You can use the VS-2000 CD Player's time display to identify the time location of any audio you want to grab. See Page 369.



You can set the CD TRACK CAPTURE OFFSET on the fly as you listen to the selected CD track. Press PLAY to begin playback, and press F1 (NOW) when you reach the moment at which you want to start the capture.

9. The CD TRACK CAPTURE LENGTH parameter sets the amount of audio to be captured from the CD track after the selected CD TRACK CAPTURE OFFSET time. To capture the remainder of the CD track's audio, set the parameter to Whole 1 Track. Otherwise, set it as desired.
10. Press F5 (OK).
11. Read the displayed message regarding copyright, and then press ENTER/YES to proceed.  
If you selected empty matching V-Tracks on mastering tracks in Steps 7 and 8, the VS-2000 can capture the CD audio as CDR-mode mastering tracks that you can burn directly to a new audio CD. If you selected another pair of destination tracks, skip to Step 13.
12. When the VS-2000 displays "Capture to Mastering Tr. In CDR Mode?" press ENTER/YES if you want to capture the audio in CDR mode, or EXIT/NO to capture it using the project's normal recording mode.
13. Read the displayed message about licensing, and press ENTER/YES to proceed.  
The capture process begins and the display shows "CD Capture..."
14. To exit CD CAPTURE, press F6 (EXIT).

### ***To Pause or Cancel an Ongoing CD Capture Operation***

You can pause or cancel a CD Capture operation while it's taking place:

1. Press EXIT/NO—"Abort?" is displayed.
2. Press ENTER/YES to cancel the operation, or EXIT/NO to resume it.

## **Installing VS8F-3 Plug-Ins**

Please see the documentation in the VS8F-3 Plug-In Effects Expansion Board box.

## **Removing VS8F-3 Plug-Ins**

Please see the documentation in the VS8F-3 Plug-In Effects Expansion Board box.

## **Backing Up VS8F-3 Plug-Ins**

Please see the documentation in the VS8F-3 Plug-In Effects Expansion Board box.

# 28—Utility Menu Parameters

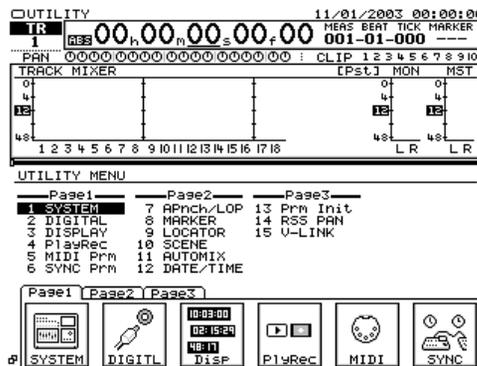
The UTILITY MENU contains a wide array of parameters. Some of its screens present parameters that set the general behavior of the VS-2000—or its behavior when a particular project is loaded—while others offer detailed control of specific VS-2000 features. This chapter describes what you’ll find in the UTILITY menu.

We’ve already explained many of the UTILITY menu’s screens and parameters in earlier chapters—as we go through the UTILITY menu screens, we’ll refer you to relevant descriptions elsewhere in the *VS-2000 Owner’s Manual*. They’re noted here for completeness.

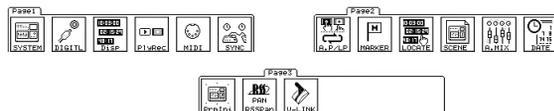
## The Main UTILITY Menu Screen

To view the UTILITY menu:

1. Hold down SHIFT and press F4 (UTIL).



You can display any of the UTILITY menu’s screens by cursoring to it in the UTILITY menu and pressing ENTER/YES, or by pressing its F button shown on one of tabbed layers as the bottom of the screen.



**If you’re looking for a screen whose F button is currently hidden, press PAGE repeatedly until its F button appears.**

The SYSTEM, PLAY/REC and V-LINK buttons each lead to sets of related screenfuls of parameters—these sub-screens are called “Param1”, “Param2” and, in the case of the SYSTEM screenset, “Param3.” To navigate between these screens, press F1 (Param1), F2 (Param2) or F3(Param3) as desired.

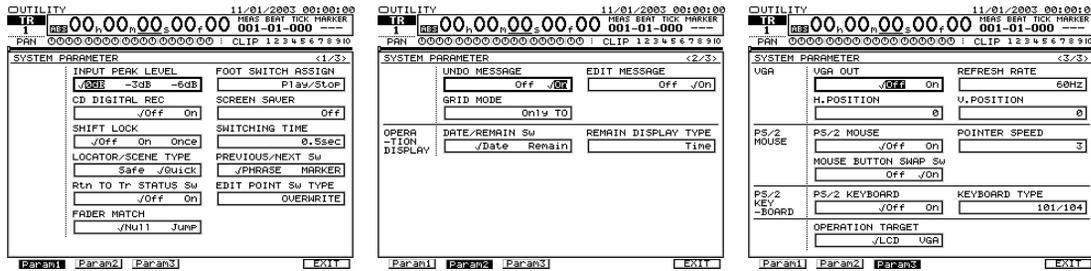
Many of the other UTILITY menu items also have sub-screens of their own, as explained in their descriptions.

On some UTILITY menu screens, parameters are arranged in labeled groups. In the following descriptions, we’ll organize parameters according to these groupings.

# SYSTEM



UTILITY menu  
F1 (SYSTEM)



## INPUT PEAK LEVEL

The INPUT PEAK LEVEL parameter sets the level at which the input peak indicators on the Home screen and elsewhere light, as described on Page 130. You can set the input peak indicators to light when a signal coming into an input channel reaches -6dB, -3dB or 0dB—a light gray line across the input meters display (Page 128) shows the current INPUT PEAK LEVEL value.

## FOOT SWITCH ASSIGN

An optional foot switch—such as a Roland DP-2 or BOSS FS-5U—connected to the VS-2000's rear panel FOOT SWITCH jack can perform a variety of functions. This parameter determines what a connected foot switch does. You can set the parameter to:

- *Play/Stop*—so you can start and stop project playback with the foot switch.
- *Record*—so you can toggle in and out of Record mode with each press of the foot switch, allowing for hands-free punching.
- *TapMarker*—so the foot switch acts like the TAP button: A press of the foot switch places a marker at the now line's current position.
- *Next*—so the foot switch acts like the NEXT button, moving the now line to the next phrase or marker, according to the setting of the PREVIOUS/NEXT Sw parameter (see Page 379).
- *Previous*—so the foot switch acts like the PREVIOUS button, moving the now line to the previous phrase or marker, according to the setting of the PREVIOUS/NEXT Sw parameter (see Page 379).
- *GPI*—so the foot switch responds to received Play/Stop instructions from a connected General Purpose Interface.



GPI

## CD DIGITAL REC

This switch enables or disables recording from digital audio sources such as CD players. See for “Recording Digital Input Signals” on Page 137.

## SCREEN SAVER

When you've connected a color VGA monitor to your VS-2000, the VS-2000 offers a built-in screen saver that turns on after a specified amount of time. The attractive, animated screen saver provides a measure of privacy by hiding the current VGA screen when you're not using it.

You can set the screen saver to:

- *Off*—so it never switches on.
- *1-30min*—to specify the period of inactivity after which the screen saver automatically turns on.

### **SHIFT LOCK**

When SHIFT is held down, many of the VS-2000's buttons perform their secondary function, typically—but not always—printed beneath the button in an outline box. If you're pressing the SHIFT button frequently, you can lock the SHIFT button on, or arm it for its next use. Set SHIFT LOCK to:

- *Off*—so the SHIFT button behaves normally, needing to be held down when you press the button whose behavior it changes.
- *On*—so that each press of the SHIFT button toggles it on or off. When it's on, each button you press that has a secondary function performs that function.
- *Once*—so that you can press SHIFT to arm it for its next use. Once you've pressed the next button that has a secondary function, SHIFT turns off.

### **SWITCHING TIME**

This parameter sets the length of time a button must be held down before it performs its secondary function, allowing you to press such a button quickly when SHIFT is locked on (see above) without triggering the secondary function. You can select values between 0.3 and 2.0 sec (seconds).

### **PREVIOUS/NEXT SW**

The PREVIOUS/NEXT Sw parameter, discussed on Page 187, sets the behavior of the PREVIOUS and NEXT buttons. You can set it to:

- *PHRASE*—so that pressing PREVIOUS or NEXT moves the now line to the previous or next edge, respectively, of a phrase.
- *MARKER*—so that pressing PREVIOUS or NEXT moves the now line to the previous or next marker, respectively.

### **LOCATOR/SCENE TYPE**

The LOCATOR/SCENE TYPE parameters activates or de-activates the Safe mode for selecting locators and scenes, as described on Page 184 and Page 145, respectively.

### **Rtn TO Tr STATUS Sw**

You can set the VS-2000 so that the TRACK/STATUS buttons default to the control of hard disk recorder tracks—automatically exiting Locator or Scene mode after a locator or scene, respectively, is selected—as described on Page 143 and on Page 184.

### **EDIT POINT Sw TYPE**

Edit Point Sw Type sets the behavior of the IN, OUT, FROM and TO buttons. See “Configuring the Behavior of the IN, OUT, FROM and TO Buttons” on Page 238.

### **FADER MATCH**

When you load a stored project, there's no relation between the position of the 16 physical faders and the stored FADER parameter levels for their corresponding track channels. The VS-2000 allows you to set the method by which the faders and their corresponding FADER parameters are brought into agreement. When the FADER MATCH parameter is set to:

- *Null*—the physical fader takes over control of the FADER parameter's value once you move the physical fader up or down so that its position corresponds to or passes by the current FADER setting.
- *Jump*—the FADER parameter value jumps to the setting reflected by the physical fader's position as soon as you move the physical fader.

### **UNDO MESSAGE**

This parameter turns the displaying of the Undo list (Page 72) on or off. If you press UNDO when the parameter's set to:

- *Off*—the last action is reversed immediately. This setting lets you undo the most recent action in the fastest way possible.
- *On*—the Undo list appears, allowing to select the desired Undo level.

### **EDIT MESSAGE**

When you edit on the VS-2000, you can view messages that allow you to adjust parameters relating to the edit—see “Edit Messages” on Page 241.



You can turn this parameter on and off in the Edit and Automix Edit Pop-Up menus.

### **GRID MODE**

The setting of the GRID MODE parameter determines how audio regions and phrases snap to their editing grid. To learn about the grid, see “Snapping to Grid” on Page 247.

## **OPERATION DISPLAY**

### **DATE/REMAIN Sw**

You can replace the clock in the upper right-hand corner of the VS-2000's LCD display with a readout of how much free space remains on the currently selected drive. When you set DATE/REMAIN Sw to:

- *Date*—the VS-2000's calendar/clock is displayed.
- *Remain*—the amount of free space left on the current drive is shown.

### **REMAIN DISPLAY TYPE**

When the display is showing the remaining space on the currently selected drive—see DATE/REMAIN Sw above—REMAIN DISPLAY TYPE sets the manner in which that information's presented:

- *Time*—shows the remaining recording time based on the current sample rate and recording mode.
- *CapaMB*—shows the remaining free space in megabytes (MB).
- *Capa%*—shows the free space remaining as a percentage of the original space.
- *Event*—shows the remaining number of free project events.

## VGA

The following parameters let you set up the VS-2000's output to a connected VGA monitor—we've already described them briefly on Page 66, but here's some additional detail. If you're not using an external monitor, these settings have no effect.



The use of an external VGA monitor requires the purchase and installation of a VS20-VGA VGA/Mouse Expansion Board, sold separately.

### VGA OUT

The VGA OUT switch turns the VS-2000's feed to a connected monitor on or off.

### REFRESH RATE

Every monitor constantly re-draws, or "refreshes," its image. The faster the monitor can do this, the less likely you are to notice. When a monitor refreshes too slowly, you can see a flicker that can be wearing. Set the parameter to 60Hz, 66Hz, 70Hz or 75Hz.



Consult your VGA monitor's documentation to learn its recommended refresh rate. If you select a value the monitor doesn't support, image quality may be poor, and damage to the monitor may result.

### H.POSITION

Adjust the H.POSITION ("Horizontal Position") parameter to shift the image on your VGA monitor to the left (negative values) or right (positive values). You can move as far as -5 to the left or +5 to the right.

### V.POSITION

Adjust the V.POSITION parameter to shift the image on your VGA monitor downward (negative values) or upward (positive values) by as much as -11 down or +11 up.

### OPERATION TARGET

OPERATION TARGET sets either the VS-2000's internal LCD or a connected VGA monitor as the main operational display. The main display responds to the VS-2000's top-panel controls, mouse and optional keyboard, and all messages appear there.



You can quickly toggle this parameter by holding down HOME and pressing F6(LCD↔VGA).

When you reset the OPERATION TARGET, the previous main display confirms the change.

**The internal LCD shows:**

OPERATION TARGET was changed to VGA.

**The external VGA shows:**

OPERATION TARGET was changed to LCD.

## PS/2 MOUSE, PS/2 KEYBOARD

For a description of the VS-2000's mouse settings, see Page 66. For a description of the VS-2000's ACSII keyboard settings, see Page 66.



The use of a mouse and/or keyboard requires the purchase and installation of a VS20-VGA VGA/Mouse Expansion Board, sold separately. To use a mouse *and* keyboard, an PS/2"Y" cable is also required.

## Digital



UTILITY menu  
F2 (DIGITL)

```

UTILITY                               11/01/2003 00:00:00
TR 1  ABS 00.00.00.00.00.00 MEAS BEAT TICK MARKER
                                001-01-000
PAN 000000000000000000000000 : CLIP 1 2 3 4 5 6 7 8 9 10

DIGITAL I/O PARAMETER
DIGITAL I/O  MASTER CLOCK
               DIGITAL IN
               EXT TIME CODE

DITHER              DIGITAL COPY PROTECT
Off                 √Off On
  
```

### MASTER CLOCK

To learn about setting the MASTER CLOCK parameter, see “Designating the Master Clock for Digital Audio Input” on Page 136.

### DITHER

If you’re sending audio to a connected external digital recorder that records at a lower bit depth than the VS-2000 (Page 135), you can dither the VS-2000’s output signal so that it sounds its best at the bit depth the external device is using. Dithering adds an inaudible veil of noise to the signal in order to mask audio artifacts that are introduced when bits are discarded as audio travels from a higher bit-rate device to a lower one. To set DITHER, select the bit depth of the external digital device.

Turn off DITHER until it’s needed since it affects all audio transmitted from the VS-2000’s digital outputs, including the audio sent to your connected Roland DS-series Digital Reference Monitors.



### DIGITAL COPY PROTECT

The VS-2000 allows you to use SCMS (“Serial Copy Management system”) to prevent additional copies from being made of digital audio you’ve recorded from the VS-2000’s coaxial or optical digital outputs onto a DAT tape or MiniDisc. To prevent copying, turn the DIGITAL COPY PROTECT parameter on before sending the digital audio to the DAT or MiniDisc recorder.

## Display



UTILITY menu  
F3 (Disp)

```

UTILITY                               11/01/2003 00:00:00
TR 1  ABS 00.00.00.00.00.00 MEAS BEAT TICK MARKER
                                001-01-000
PAN 000000000000000000000000 : CLIP 1 2 3 4 5 6 7 8 9 10

DISPLAY PARAMETER
DISPLAY  DISPLAY OFFSET TIME  TIME DISPLAY FORMAT
              00:00:00:00  √ABS REL

PEAK HOLD Sw
              √Off On
  
```

## DISPLAY OFFSET TIME

This parameter is explained in “Shifting the Project Start Time” on Page 300.

## TIME DISPLAY FORMAT

This parameter is explained in “Shifting the Project Start Time” on Page 300.

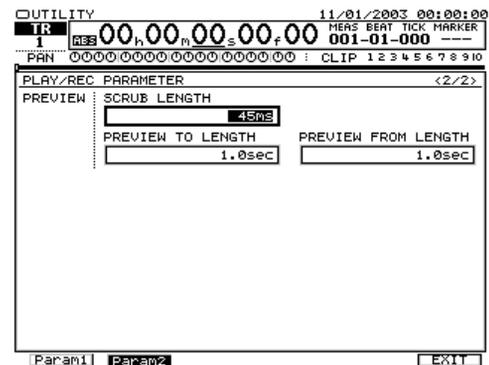
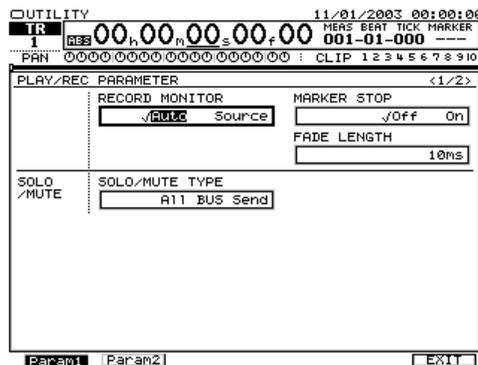
## PEAK HOLD Sw

You can set the VS-2000's level meters so that their peak lines “stick” at their highest positions, remaining there until you press HOME to release them. This allows you to look away from the display without worrying that you'll miss problematic level peaks. To make the peak lines stick, set PEAK HOLD Sw to On. To return them to their normal behavior, turn the parameter off.

# PLAYREC



UTILITY menu  
F4 (PlyRec)



## RECORD MONITOR

RECORD MONITOR is explained in “Monitoring During Punching” on Page 189.

## MARKER STOP

MARKER STOP lets you set the hard disk recorder so it automatically stops when the now line reaches the next marker. This can be handy when you want to stop playback at the end of a section you're working on: place a marker at the desired location and turn on this parameter. When MARKER STOP is off, the recorder behaves normally.

## FADE LENGTH

You can set the length of the crossfade that smooths transitions when you record, punch in and out, and edit. You can select 2ms, 10ms, 20ms, 30ms, 40ms or 50ms. The default setting is 10ms.

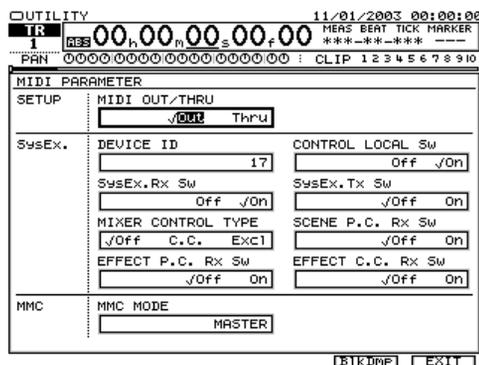
## SCRUB LENGTH

This parameter is explained in “Setting Scrub Times” on Page 182.

## PREVIEW TO LENGTH and PREVIEW FROM LENGTH

See “Setting the PREVIEW TO and FROM Times” on Page 180.

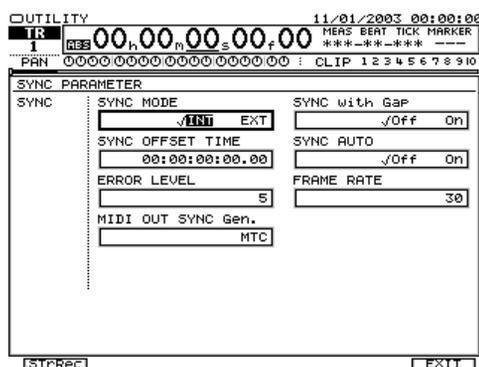
## MIDI



UTILITY menu  
F5 (MIDI)

The VS-2000's MIDI parameters and operations are described in Chapter 23, starting on Page 283. See the *VS-2000 Owner's Manual* index for page numbers of references.

## SYNC



UTILITY menu  
F6 (SYNC)

Synchronization parameters and operations are described starting on Page 291. See the *VS-2000 Owner's Manual* index for page numbers of specific parameter references.

## AUTO PUNCH/LOOP

The AUTOPUNCH/LOOP screen provides parameters for setting Auto Punch and Loop start and stop times. To learn about using its parameters for:

- *Auto Punch*—see “Editing Auto Punch IN and OUT Points Manually” on Page 191.
- *Loop*—see “Editing Loop FROM and TO Points Manually” on Page 179.



UTILITY menu  
F1 (A.P/LP)

## MARKER

Learn how to use the UTILITY menu's MARKER screen in “Editing Markers” on Page 188.



UTILITY menu  
F2 (MARKER)

## LOCATE

The LOCATE screen is described in “Editing Locators” on Page 184.



**UTILITY menu  
F3 (LOCATE)**

## SCENE

To learn how to use the SCENE screen, see “Editing Scenes” on Page 144.



**UTILITY menu  
F4 (SCENE)**

## AUTOMIX

See “The AUTOMIX Screen” on Page 342 to learn about using the AUTOMIX screen.



**UTILITY menu  
F5 (A.MIX)**

## DATE/TIME

To learn how to set the VS-2000’s calendar and clock that time-stamp your recordings, see “Setting the VS-2000’s Clock” on Page 67.

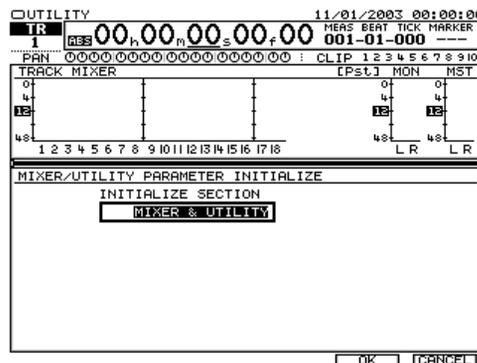


**UTILITY menu  
F6 (DATE)**

## Parameter Initialization



**UTILITY menu  
F1 (PrmIni)**



Use the MIXER/UTILITY PARAMETER INITIALIZE screen to reset many of the VS-2000’s mixer and/or UTILITY menu parameters to their default factory settings. You may want to do this to start over with a clean slate, or if your VS-2000 is behaving oddly, and you suspect that some unknown parameter value may be the cause.

This screen doesn’t initialize all mixer and/or UTILITY menu settings. Your basic project settings remain, including your current IDE drive selection. Scenes, the tempo map and sync track, LOCATOR/SCENE TYPE, SHIFT LOCK and NUMERICS TYPE parameters are among the settings that aren’t initialized.



## Resetting Mixer and UTILITY Parameters

1. Press UTILITY.
2. Press PAGE until “PrmIni” appears above F1.
3. Press F1 (PrmIni).

4. Turn the Time/Value dial to select:
  - *MIXER & UTILITY*—to initialize both the mixer and UTILITY parameters.
  - *MIXER*—to initialize only the mixer parameters.
  - *UTILITY*—to initialize only the UTILITY parameters.
5. Press F5 (OK)—a confirmation screen appears.
6. If you're sure you want to proceed, press ENTER/YES. To cancel the operation, press EXIT/NO.



If this procedure doesn't cure your VS-2000's odd behavior, call your nearest Roland Service Center or authorized Roland distributor in your country. See "Information" on Page 442.

## RSS PAN SETUP



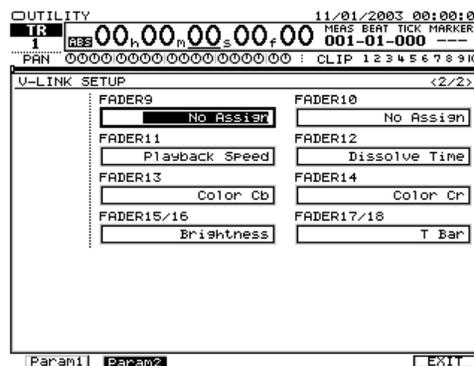
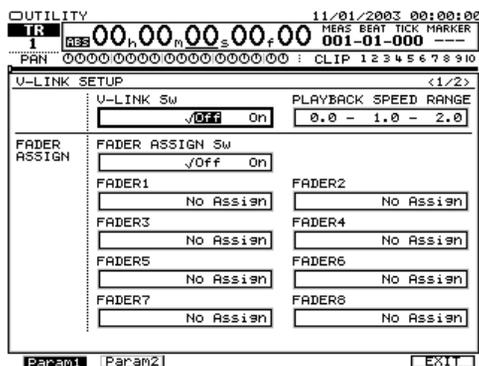
The VS-2000's RSS Pan effect algorithm allows you to add depth to your recordings. See "RSS PAN" on Page 225 to learn more about using the RSS Pan feature.

UTILITY menu  
F2 (RSSPan)

## V-LINK



UTILITY menu  
F3 (V-LINK)



### V-LINK Sw

The V-LINK Sw parameter turns V-LINK on or off. This parameter mirrors the current state of the V-LINK button—setting the parameter or pressing the button does the same thing.

### PLAYBACK SPEED RANGE

This parameter allows you set the range over which the video device's speed changes when using a VS-2000 fader to control playback speed, as described below. Select positive values for faster playback or negative values for slower playback.

### FADER ASSIGN Sw

To activate fader control of you video device from the VS-2000 when using V-LINK, set FADER ASSIGN Sw to On. The faders can control a range of behaviors, as described below.

**FADER 1-17/18**

A variety of settings on a V-LINK-connected video device can be controlled using the VS-2000's faders when V-LINK is active and FADER ASSIGN Sw (see above) is turned on. To assign a fader to the control of a setting, select the corresponding FADER parameters and dial in:

- *No Assign*—to de-activate the fader for V-LINK control.
- *Playback Speed*—to adjust the video playback speed. The amount of change depends on the setting of the PLAYBACK SPEED RANGE parameter (see above).
- *Dissolve Time*—to specify the time over which a dissolve (overlap) will occur when switching between clips.
- *Color Cb*—to adjust the blue hues.
- *Color Cr*—to adjust the red hues.
- *Brightness*—to adjust the brightness of the image.
- *T Bar*—to gradually switch video clips using the fader.



# 29—Expanding the VS-2000

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## Installing a VS8F-2/VS8F-3 Effect Expansion Board

The VS-2000 has two onboard stereo effects processors. You can add more effects by adding VS8F-2 or VS8F-3 expansion boards (both sold separately). A total of two boards (VS8F-2 or VS8F-3) can be installed.

### ***VS8F-2 (sold separately)***

Each VS8F-2 board provides two effects. If you install two VS8F-2 boards, you will be able to use a maximum of six stereo effects (EFFECT 1 through EFFECT 6). The effects provided by the VS8F-2 are the same as the effects of the built-in effects processors.

### ***VS8F-3 (sold separately)***

Installing a VS8F-3 lets you use external plug-in effects. In order to use the VS8F-3, you will need to install system software that supports plug-in effects. Refer to the VS8F-3 owner's manual for details.

### ***Installation Precautions***



Install only the specified circuit board(s), Model No. VS8F-2/VS8F-3. Remove only the specified screws.

- To avoid damaging internal components as a result of static electricity, please carefully observe the following precautions whenever you handle a VS8F-2/VS8F-3.
  - Before you touch the board, always first touch a metal object—such as a water pipe—so you're sure any static electricity you may have been carrying is discharged before you touch the VS8F-2/VS8F-3.
  - When handling the board, grasp it only by its edges. Avoid touching any of its electronic components or connectors.
  - Save the bag in which the VS8F-2/VS8F-3 was shipped, and put the board back into the bag should you need to store or transport the board.
- Use the correct Phillips screwdriver—a Number 2 screwdriver—for the size of the VS-2000's screws. The head of the screw may become stripped if you use the wrong screwdriver.
- To remove a screw, turn the screwdriver counter-clockwise. To tighten a screw, turn the screwdriver clockwise.



- When installing a VS8F-2/VS8F-3 effect expansion board, remove only the specified screws.
- Be careful that the screws you remove do not drop into the interior of the VS-2000.
- Re-attach the VS-2000's bottom cover after the installation—do not leave its internal components exposed.
- Do not touch any printed circuit pathways or connection terminals.
- Be careful not to cut your hand on the edge of the installation bay.

- Never use excessive force when installing a VS8F-2/VS8F-3. If it doesn't fit properly on the first attempt, remove the board, re-position it and try again.
- When the VS8F-2/VS8F-3 installation is complete, double-check your work before replacing the VS-2000's bottom cover.



Before turning the VS-2000 upside-down to install a VS8F-2/VS8F-3, obtain some newspapers or magazines and place them under the four corners of the VS-2000—or at both ends—to prevent damage to the buttons and controls. Position the VS-2000 carefully to avoid scratching or damaging it.

### Installation Procedure

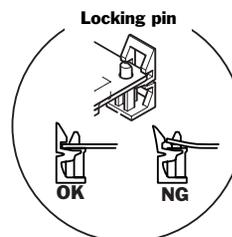
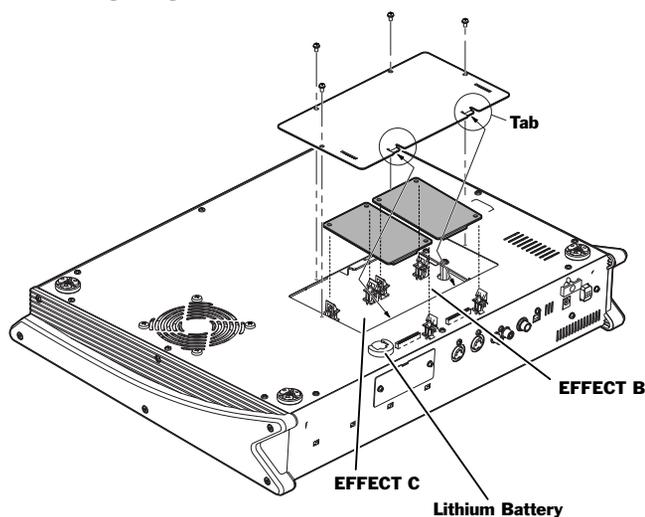


Always turn the unit off and unplug the power cord before attempting installation of the circuit board (VS8F-2/VS8F-3, Page 85).



During installation of a VS8F-2/VS8F-3 be careful not to touch the VS-2000's battery.

1. Before installing the VS8F-2/VS8F-3, turn off the power of the VS-2000 (Page 85) and all connected devices, and disconnect all cables from the VS-2000.
2. Turn the VS-2000 over onto its back, and remove only the screws shown in the following diagram.

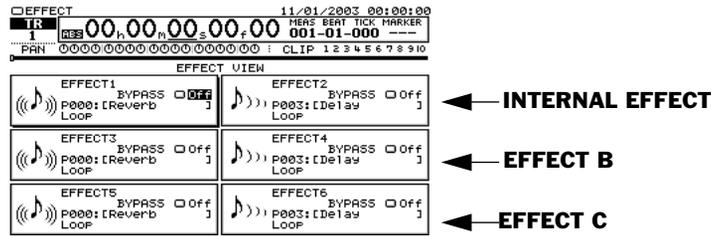


**When turning the unit upside-down, take care to avoid dropping it or allowing it to fall over.**

**Should you remove ground terminal screw and bottom cover screws, make sure to put them in a safe place out of children's reach, so there is no chance of them being swallowed accidentally.**

3. Inside the VS-2000, there are two connectors and 6 plastic pins for the VS8F-2/VS8F-3. Insert the connectors of the VS8F-2/VS8F-3 into the internal connectors, and simultaneously insert the plastic pins into the holes of the VS8F-2/VS8F-3 to fasten the unit in place.
  - Order of installation:  
When performing VS8F-2/VS8F-3 installations, install in the EFFECT B section first, then the EFFECT C section.
  - If you install one VS8F-2 and one VS8F-3:  
You must install the VS8F-3 in the EFFECT B section
4. Use the screws that you removed in Step 2 to re-fasten the bottom cover.
5. Connect the cables that you disconnected earlier.
6. Turn on the power, as described on Page 65.

7. After powering up the VS-2000, hold down SHIFT and press F3 (EFFECT).

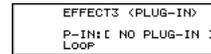


8. Verify that the VS8F-2/VS8F-3 are installed correctly. If they are installed correctly, the effects corresponding to the EFFECT B/C section(s) will be displayed as follows.

- VS8F-2: An effect icon will be displayed.



- VS8F-3: The screen will indicate <PLUG-IN>



\* The VS8F-3 will not be recognized unless system software that supports plug-in effects has been installed. Refer to the VS8F-3 owner's manual for details.

If the effect produced by an installed VS8F-2/VS8F-3 is missing—and the screen shows “No EFFECT Board” instead—the VS-2000 is not correctly recognizing the VS8F-2/VS8F-3. Re-install the VS8F-2/VS8F-3.

## Installation de la carte d'extension d'effets (French language for Canadian Safety Standard)

Deux processeurs d'effet stéréophonique sont intégrés au VS-2000. Il est possible d'ajouter d'autres effets en ajoutant une carte d'expansion VS8F-2 ou VS8F-3 (vendues séparément). Il est possible d'installer un total deux cartes d'expansion VS8F-2 ou VS8F-3.

### ***VS8F-2 (vendue séparément)***

Chaque carte VS8F-2 produit deux effets. Si deux cartes VS8F-2 sont installées, il est possible d'utiliser un maximum de six effets stéréophoniques (EFFET1 à EFFET6). Les effets produits par la carte VS8F-2 sont identiques aux effets des processeurs intégrés.

### ***VS8F-3 (vendue séparément)***

Si une carte VS8F-3 est installée, il est possible d'utiliser des effets d'un module d'extension. Pour utiliser la carte VS8F-3, il est nécessaire d'installer un logiciel de système qui prend en charge les effets du module d'extension. Voir le guide d'utilisation de la carte VS8F-3 pour les détails.

### ***Précautions lors de l'installation de la carte d'extension d'effets***



N'installez que les cartes de circuits imprimés spécifiées (VS8F-2/VS8F-3). Enlevez seulement les vis indiquées.

- Veuillez suivre attentivement les instructions suivantes quand vous manipulez la carte afin d'éviter tout risque d'endommagement des pièces internes par l'électricité statique.
  - Toujours toucher un objet métallique relié à la terre (comme un tuyau par exemple) avant de manipuler la carte pour vous décharger de l'électricité statique que vous auriez pu accumuler.
  - Lorsque vous manipulez la carte, la tenir par les côtés. Évitez de toucher aux composants ou aux connecteurs.
  - Conservez le sachet d'origine dans lequel était la carte lors de l'envoi et remettez la carte dedans si vous devez la ranger ou la transporter.
- Utiliser un tournevis cruciforme correspondant à la taille de la vis (un tournevis numéro 2). En cas d'utilisation d'un tournevis inapproprié, la tête de la vis pourrait être endommagée.
- Pour enlever les vis, tourner le tournevis dans le sens contraire des aiguilles d'une montre. Pour resserrer, tourner dans le sens des aiguilles d'une montre.



- Veillez à ne pas laisser tomber de vis dans le châssis du VS-2000.
- Ne pas laisser le panneau de protection avant détaché. S'assurer de l'avoir rattacher après avoir installé le disque dur.

- Ne pas toucher aux circuits imprimés ou aux connecteurs.
- Veillez à ne pas vous couper les doigts sur le bord de l'ouverture d'installation.
- Ne jamais forcer lors de l'installation de la carte de circuits imprimés. Si la carte s'ajuste mal au premier essai, enlevez la carte et recommencez l'installation.
- Quand l'installation de la carte de circuits imprimés est terminée, revérifiez si tout est bien installé.
- Toujours éteindre et débrancher l'appareil avant de commencer l'installation de la carte.



Avant de tourner le VS-2000 sens dessus-dessous, déposez des journaux ou des magazines sous les quatre coins ou aux deux extrémités pour éviter d'endommager les boutons et contrôles. Assurez-vous aussi de placer l'appareil de façon à ce que les boutons et contrôles ne soient pas endommagés.

### Procédure d'installation

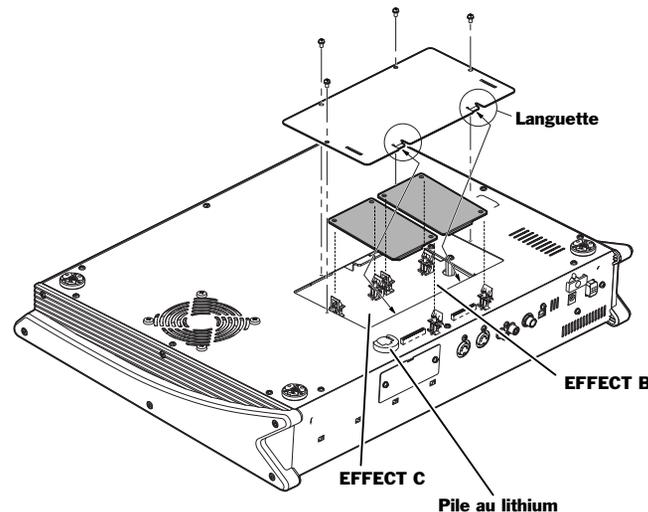


Toujours éteindre et débrancher l'appareil avant de commencer l'installation de la carte. (VS8F-2/VS8F-3; Page 85).



Pendant l'installation d'une carte VS8F-2/VS8F-3, prenez soin de ne pas toucher la pile du VS-2000.

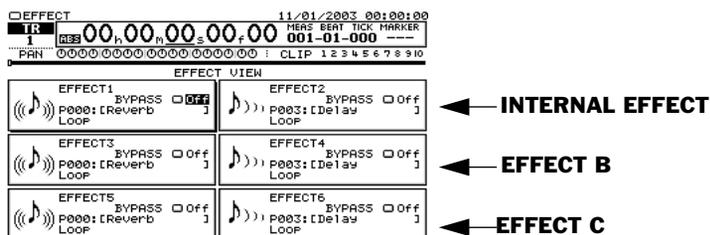
1. Avant d'installer la carte VS8F-2/VS8F-3, mettez hors tension le VS-2000 (Page 85) et tous les périphériques connectés, et débranchez tous les câbles du VS-2000.
2. Tournez le VS-2000 sens dessus-dessous et retirez uniquement les vis indiquées dans le schéma ci-dessous.



Lorsque vous tournez l'appareil sens dessus-dessous, veillez à ne pas l'échapper et à éviter qu'il tombe ou se renverse.

3. À l'intérieur du VS-2000, il existe deux connecteurs et 6 goupilles en plastique pour la carte VS8F-2/VS8F-3. Glissez les connecteurs de la carte VS8F-2/VS8F-3 dans les connecteurs internes et insérez simultanément les goupilles en plastique dans les trous de la carte pour la retenir en place.
  - Ordre d'installation :  
Lors de l'installation du VS8F-2/VS8F-3, suivre la séquence section EFFECT B → section EFFECT C.
  - Pour installer une carte VS8F-2 et une carte VS8F-3 :  
Il faut installer la carte VS8F-3 dans la section EFFECT B
4. Utilisez les vis retirées à l'étape 2 pour remettre le couvercle inférieur en place.
5. Rebranchez les câbles que vous avez débranchés.
6. Mettez l'appareil sous tension (Page 65).

- Après avoir redémarré le VS-2000, tenez la touche Maj enfoncée et appuyez sur la touche F3 (EFFECT).

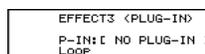


- Vérifier que les cartes VS8F-2 ou VS8F-3 sont installées correctement. Si les cartes sont installées correctement, les effets correspondant aux sections EFFECT B/C s'affichent comme suit.

- VS8F-2 : Un icône d'effets s'affiche.



- VS8F-3 : L'écran affiche <PLUG-IN> (MODULE D'EXTENSION)

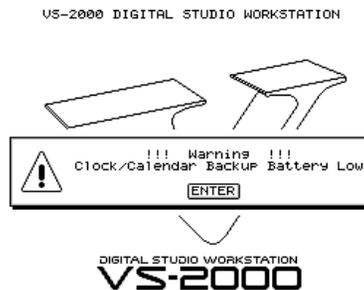


\* La carte VS8F-3 ne sera pas reconnue si un logiciel système qui prend en charge les effets du module d'extension n'a pas été installé. Voir le guide d'utilisation de la carte VS8F-3 pour les détails.

Si l'installation de la carte VS8F-2/VS8F-3 ne produit aucun effet et que l'écran affiche « No EFFECT Board », cela signifie que le VS-2000 ne reconnaît pas la carte VS8F-2/VS8F-3. Réinstallez alors la carte VS8F-2/VS8F-3.

## Replacing the VS-2000's Battery

The VS-2000 contains a lithium battery that powers its time-keeping features, and also provides the power for the area of the VS-2000's memory that stores certain parameter values. When the battery weakens, the VS-2000's time-keeping features may not operate correctly, and it may not properly remember various settings upon power-up. If the battery needs to be replaced, the VS-2000 shows the following message when you power up:



Use only the specified type (model no. CR2032) of lithium battery. Be sure to insert it as directed (to ensure correct polarity).



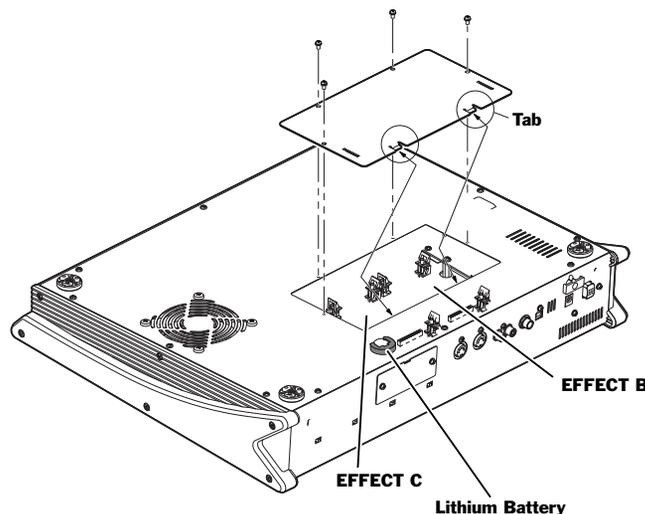
Before turning the VS-2000 upside-down to install a new battery, obtain some newspapers or magazines and place them under the four corners of the VS-2000, or at both ends, to prevent damage to the buttons and controls. Position the VS-2000 carefully to avoid scratching or damaging it.



When installing a new battery, follow the precautions listed on Page 389.

### Installation Procedure

1. Power down the VS-2000 (Page 85), saving any recent changes you've made to the currently loaded project.
2. Turn off all connected devices, and disconnect all cables from VS-2000.
3. Turn the VS-2000 over onto its back, and remove only the screws shown in the following illustration.



**Should you remove battery and screws, make sure to put them in a safe place out of children's reach, so there is no chance of them being swallowed accidentally.**

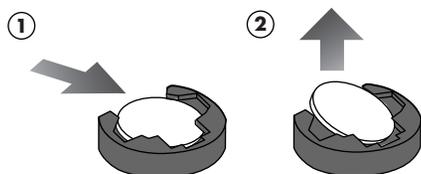
4. The battery should now be visible, as shown here.

- Replace the old battery with a new one.



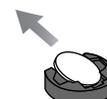
The VS-2000 uses a lithium CR2032 battery that you can purchase at most electronics stores.

■ Removal

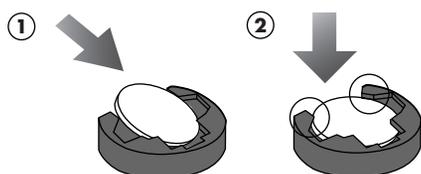


- While pressing the lithium battery inward in the direction of the arrow...
- Use your finger to tilt the battery upward and slide it out.

If you suddenly release your finger after pressing the lithium battery inward, the battery may fly out in the direction shown by the arrow (see illustration at right). Release your finger gradually, being careful not to allow the battery to fall inside the unit.



■ Installation



- While holding the lithium battery at an angle, insert it in the direction shown by the arrow.
- Press the battery down until it is retained by the tabs.

- Use the screws that you removed in Step 3 to re-fasten the VS-2000's bottom cover. This completes the process of exchanging the lithium battery.
- Connect the cables that you disconnected earlier.
- Turn on the power, as described in "Powering Up" on Page 65.
- Confirm that the message saying the lithium battery is depleted no longer appears in the display.



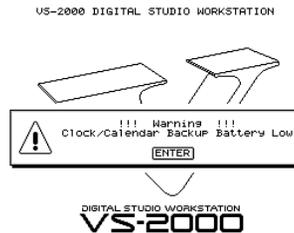
The VS-2000's clock is powered by its battery. Changing the battery may stop the clock or cause it to display the wrong time or date.

- Reset the VS-2000's clock and calendar (Page 67).

French language  
for Canadian Safety Standard

## Remplacement de la pile du VS-2000.fs (French language for Canadian Safety Standard)

Le VS-2000 renferme une pile au lithium qui alimente ses dispositifs de chronométrage; la pile alimente aussi les secteurs de la mémoire du VS-2000™fs où sont stockées certaines valeurs des paramètres. Lorsque la pile faiblit, les dispositifs de chronométrage du VS-2000™fs ne peuvent pas fonctionner correctement et il est possible qu'il ne se rappelle pas certains paramètres au démarrage. Le VS-2000 affiche le message suivant au démarrage lorsqu'il est nécessaire de remplacer la pile :



Utiliser uniquement le type de pile au lithium spécifié (modèle CR2032). S'assurer de l'insérer de la façon indiquée pour obtenir la polarité correcte.



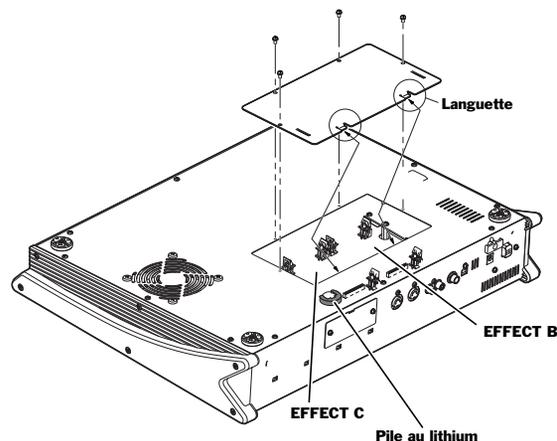
Avant de tourner le VS-2000 sens dessus-dessous pour installer une nouvelle pile, déposez des journaux ou des magazines sous les quatre coins ou aux deux extrémités pour éviter d'endommager les boutons et contrôles. Déposez le VS-2000 soigneusement pour éviter de l'égratigner ou de l'endommager.



Lorsque vous installez une nouvelle pile, prenez les précautions mentionnées à la Page 389.

### Procédure d'installation

1. Mettez le VS-2000 hors tension (Page 85) après avoir enregistré toutes les modifications récentes apportées au projet en cours.
2. Mettez hors tension tous les périphériques connectés et débranchez tous les câbles du VS-2000.
3. Tournez le VS-2000 sens dessus-dessous et retirez uniquement les vis indiquées dans l'illustration ci-dessous.

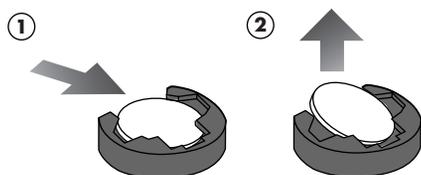


4. Vous devriez maintenant apercevoir la pile, comme le montre l'illustration.
5. Remplacez la pile usée par une nouvelle.



Le VS-2000 utilise une pile au lithium CR2032 offerte dans presque tous les magasins d'appareils électroniques.

■ Retrait

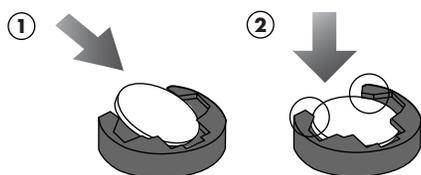


- ① Appuyer sur la pile au lithium vers l'intérieur, dans la direction indiquée par la flèche.
- ② Soulever et retirer la pile avec un doigt.

Retirer le doigt graduellement en prenant soin de ne pas laisser la pile tomber à l'intérieur de l'unité. Si la pression exercée par le doigt est relâchée soudainement après avoir appuyé sur la pile, la pile peut sortir brusquement du support et partir dans la direction indiquée par la flèche (voir l'illustration)



■ Installation



- ① Insérer la pile au lithium en l'inclinant de la façon indiquée par la flèche.
- ② Appuyer sur la pile jusqu'à ce que les languettes la retiennent.

6. Remettez en place et fixez le couvercle inférieur du VS-2000™fs à l'aide des vis retirées à l'étape 3. Le changement de pile au lithium est terminé.
7. Rebranchez les câbles que vous avez débranchés.
8. Mettez le VS-2000 sous tension en procédant comme indiqué dans "Powering Up" on Page 65.
9. Assurez-vous que le message indiquant que la pile au lithium est vide ne s'affiche plus à l'écran.



L'horloge du VS-2000™fs est alimentée par la pile. Changer la pile peut arrêter l'horloge ou faire en sorte que la date ou l'heure affichées sont erronées.

10. Réglez l'horloge et le calendrier du VS-2000™fs (Page 67).

# Supplemental Information

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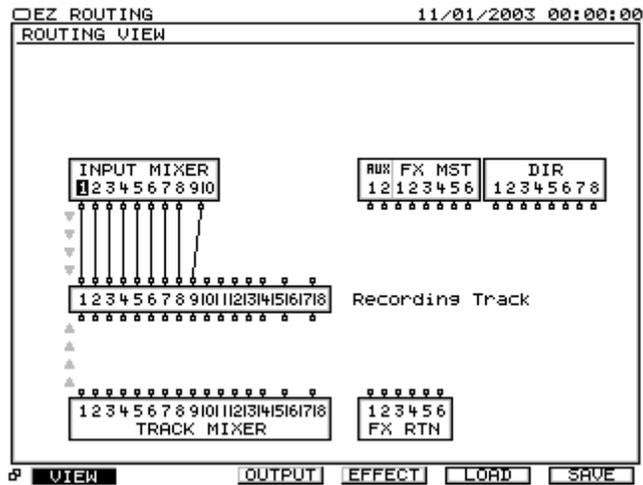
## SHIFT Operations

<i>Hold SHIFT and press:</i>	<i>To:</i>
CH EDIT	display the MASTER EDIT screen.
LOCATOR	enter Scene mode.
SOLO	enter Mute mode.
PAGE	display the Jump pop-up window.
F1	display the PROJECT menu.
F2	display the TRACK EDIT menu.
F3	display the EFFECT VIEW menu.
F4	display the UTILITY menu.
F5	display the wave display screen.
F6	display the MARKER screen.
HOME	change the Home screen view.
CD-RW	display the Mastering Room.
AUTOMIX	display the AUTOMIX SETUP screen.
UNDO	redo the last action.
A. PUNCH	display the A. PUNCH screen.
LOOP	display the LOOP screen.
NEXT	jump to the next marker/phrase.
PREVIOUS	return to the last marker/phrase.
TAP	display the TEMPO MAP screen.
▲	increase the number of displayed tracks.
▶	show less of the project on the display.
◀	decrease the number of displayed tracks.
<i>Hold SHIFT and press:</i>	<i>To:</i>
▼	show more of the project on the display.
ZERO	store the current project.
REW	move to the start of project audio
FF	move to the end of project audio
PLAY	restart the VS-2000 during shutdown

## Factory EZ Routing Templates

The VS-2000 ships with four EZ Routing templates—see Page 280 for information on EZ Routing templates. The settings contained in the factory templates are as follows.

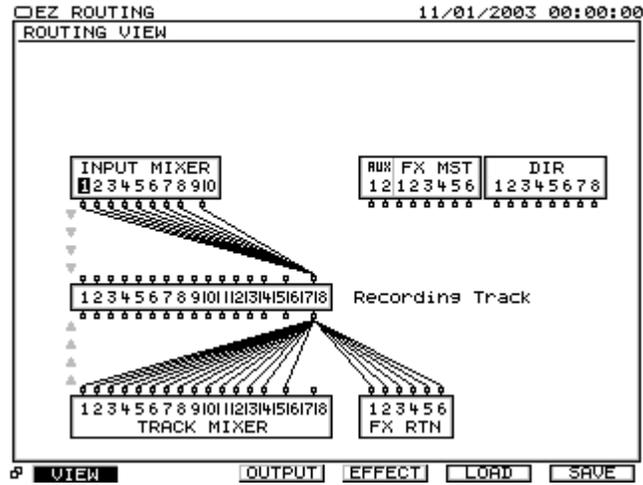
### Recording Template



#### TRACK/STATUS:

TR1	REC
:	:
TR8	REC
TR9	Off
:	:
TR17/18	Off

## Bouncing Template



*TRACK/STATUS:*

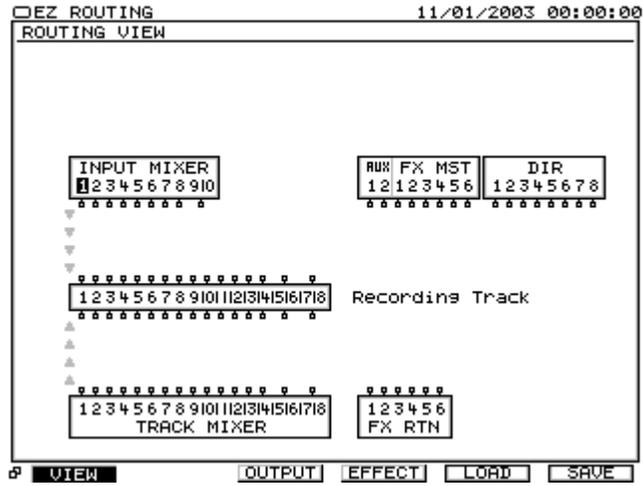
*M16*

TR1	PLAY
:	:
TR14	PLAY
TR17/18	PLAY
TR15/16	REC

*M24*

TR1	PLAY
:	:
TR10	PLAY
TR11/12	REC
TR17/18	Off (TR17/18 is used only as Rhythm Track)

## Mixdown Template



*TRACK/STATUS:*

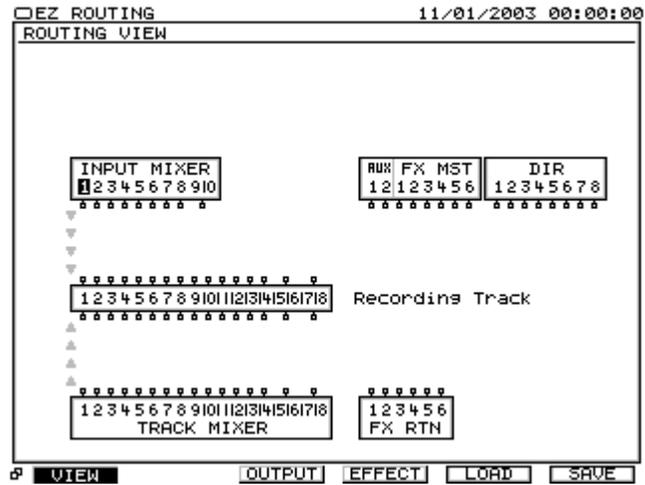
*M16*

TR1	PLAY
:	:
TR17/18	PLAY

*M24*

TR1	PLAY
:	:
TR12	PLAY
TR13	Off
:	:
TR15/16	Off
TR17/18	Off ( <i>TR17/18 is used only as Rhythm Track</i> )

## Mastering Template



### TRACK/STATUS:

#### M16

TR1	PLAY
:	:
TR17/18	PLAY

#### M24

TR1	PLAY
:	:
TR12	PLAY
TR13	Off
:	:
TR15/16	Off
TR17/18	Off (TR17/18 is used only as Rhythm Track)

#### Others:

MASTERING Sw	On
MASTERING MODE	Rec
FX1 Patch	P231:MTK:Mixdown

## **VS-2000 Tick Resolution Table**

Use this table to convert beats to ticks when using the Measures and Beats counter.

<i>Traditional Name:</i>	<i>Length of Note:</i>	<i>Number of Ticks:</i>
Whole Note	One Whole Bar	1920
Half Note	Half of a Bar	960
Half Note Triplet	Third of a Bar	640
Quarter Note	Quarter of a Bar	480
Quarter Note Triplet	Sixth of a Bar	320
Eighth Note	Eight of a Bar	240
Eighth Note Triplet	Twelfth of a Bar	160
Sixteenth Note	Sixteenth of a Bar	120
Sixteenth Note Triplet	24 <sup>th</sup> of a Bar	80
32 <sup>nd</sup> Note	32 <sup>nd</sup> of a Bar	60
32 <sup>nd</sup> Note Triplet	48 <sup>th</sup> of a Bar	40
64 <sup>th</sup> Note	64 <sup>th</sup> of a Bar	30
64 <sup>th</sup> Note Triplet	96 <sup>th</sup> of a Bar	20

## MIDI Channels and Control Change Maps

### Channels and Master Edit Area MIDI Channels

<i>MIDI Channel</i>	<i>Input Channel</i>	<i>Track Channel</i>	<i>FX Return Channels</i>
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	
8	8	8	
9	9	9/17	
10	10	10/18	
11		11	
12		12	
13		13	<i>Master Edit Area</i>
14		14	Direct paths
15		15	Aux and FX busses
16		16	MASTER/MONITOR

### Control Change Numbers—Input Channel Parameters

#### Input Channels 1-10

<i>Control Change</i>	<i>Parameter</i>
7	Fader Level
10	Pan
12	Aux 1 Send Level
13	Aux 2 Send Level
14	FX 1 Send Level
15	FX 2 Send Level
16	FX 3 Send Level
17	FX 4 Send Level
18	FX 5 Send Level
19	FX 6 Send Level
20	Aux 1/2 Send Pan
21	FX 1/2 Send Pan
22	FX 3/4 Send Pan
23	FX 5/6 Send Pan
24	Offset Fader Level
25	Offset Pan

**Control Change Numbers—Track Channel Parameters**

<b>Track Channels 1-16</b>		<b>Track Channels 17-18</b>	
<i>Control Change</i>	<i>Parameter</i>	<i>Control Change</i>	<i>Parameter</i>
35	TRACK/STATUS	67	TRACK/STATUS
39	Fader Level	71	Fader Level
42	Pan	74	Pan
44	Aux 1 Send Level	76	Aux 1 Send Level
45	Aux 2 Send Level	77	Aux 2 Send Level
46	FX 1 Send Level	78	FX 1 Send Level
47	FX 2 Send Level	79	FX 2 Send Level
48	FX 3 Send Level	80	FX 3 Send Level
49	FX 4 Send Level	81	FX 4 Send Level
50	FX 5 Send Level	82	FX 5 Send Level
51	FX 6 Send Level	83	FX 6 Send Level
52	Aux 1/2 Send Pan	84	Aux 1/2 Send Pan
53	FX 1/2 Send Pan	85	FX 1/2 Send Pan
54	FX 3/4 Send Pan	86	FX 3/4 Send Pan
55	FX 5/6 Send Pan	87	FX 5/6 Send Pan
56	Offset Fader Level	88	Offset Fader Level
57	Offset Pan	89	Offset Pan

**TRACK/STATUS Buttons—The Effects of Control Change Values**

You can change the current setting of a TRACK/STATUS button by sending Control Change messages to the VS-2000. Tracks 1-16 respond to Control Change 35. Tracks 17-18 respond to Control Change 67. The following table shows how a TRACK/STATUS button's setting changes in response to various received Control Change values.

	<i>Values from 0-41</i>	<i>Values from 42-83</i>	<i>Values from 84-127</i>
<i>With the</i>	Off → same	Off → Record-ready	Off → Play
<b>VS-2000</b>	Play → Off	Play → Record-ready	Play → same
<b>stopped</b>	Record-ready → Off	Record-ready → same	Record-ready → Play
<i>X=ignored</i>	<i>Values from 0-41</i>	<i>Values from 42-83</i>	<i>Values from 84-127</i>
<i>During</i>	Off → X	Off → X	Off → Play
<b>playback &amp;</b>	Play → Off	Play → X	Play → X
<b>recording</b>	Record → X	Record → X	Record → X

**Control Change Numbers—FX Return Channel 1-6 Parameters**

<i>Control Change</i>	<i>Parameter</i>	<i>Control Change</i>	<i>Parameter</i>
102	Fader Level	109	FX 4 Send Level
103	Balance	110	FX 5 Send Level
104	Aux 1 Send Level	111	FX 6 Send Level
105	Aux 2 Send Level	112	Aux 1/2 Send Pan
106	FX 1 Send Level	113	FX 1/2 Send Pan
107	FX 2 Send Level	114	FX 3/4 Send Pan
108	FX 3 Send Level	115	FX 5/6 Send Pan

**Control Change Numbers—Master Edit Parameters**

<b>MIDI Channel 14</b>		<b>MIDI Channel 15</b>	
<i>Control Change</i>	<i>Parameter</i>	<i>Control Change</i>	<i>Parameter</i>
104	Direct 1 Level	104	Aux 1 Level
105	Direct 2 Level	105	Aux 2 Level
106	Direct 3 Level	106	FX 1 Level
107	Direct 4 Level	107	FX 2 Level
108	Direct 5 Level	108	FX 3 Level
109	Direct 6 Level	109	FX 4 Level
110	Direct 7 Level	110	FX 5 Level
111	Direct 8 Level	111	FX 6 Level
112	Direct 1/2 Balance	112	Aux 1/2 Balance
113	Direct 3/4 Balance	113	FX 1/2 Balance
114	Direct 5/6 Balance	114	FX 3/4 Balance
115	Direct 7/8 Balance	115	FX 5/6 Balance
		<b>MIDI Channel 16</b>	
		102	MASTER Level
		103	MASTER Balance
		104	MONITOR Balance

## Automix Parameter List

The VS-2000's Automix feature can record and playback changes to the values of the following parameters.

<b>Input and track channel parameters</b>			
<i>Automix name:</i>	<i>Description:</i>	<i>Automix name:</i>	<i>Description:</i>
LEVEL(Fader)	Mix Send Level	EQ Sw	EQ Switch *7
PAN	Mix Send Pan	EQ Low Gain	EQ Low Gain
OFFSET LEVEL	Offset Level *1	EQ Low Freq	EQ Low Frequency
OFFSET PAN	Offset Pan *2	EQ LoMid Gain	EQ Low Mid Gain
MUTE	Mute *7	EQ LoMid Freq	EQ Low Mid Frequency
AUX1 Send Sw	AUX1 Send Switch *7	EQ LoMid Q	EQ Low Mid Q
AUX2 Send Sw	AUX2 Send Switch *7	EQ HiMid Gain	EQ High Mid Gain
FX1 Send Sw	FX1 Send Switch *7	EQ HiMid Freq	EQ High Mid Frequency
FX2 Send Sw	FX2 Send Switch *7	EQ HiMid Q	EQ High Mid Q
FX3 Send Sw	FX3 Send Switch *7	EQ High Gain	EQ High Gain
FX4 Send Sw	FX4 Send Switch *7	EQ High Freq	EQ High Frequency
FX5 Send Sw	FX5 Send Switch *7	InsFX1 SndLev	Insert Effect 1 Send Level
FX6 Send Sw	FX6 Send Switch *7	InsFX2 SndLev	Insert Effect 2 Send Level
AUX1 Send Lev	AUX1 Send Level	InsFX3 SndLev	Insert Effect 3 Send Level
AUX2 Send Lev	AUX2 Send Level	InsFX4 SndLev	Insert Effect 4 Send Level
FX1 Send Lev	FX1 Send Level	InsFX5 SndLev	Insert Effect 5 Return Level
FX2 Send Lev	FX2 Send Level	InsFX6 SndLev	Insert Effect 6 Return Level
FX3 Send Lev	FX3 Send Level	InsFX1 RtnLev	Insert Effect 1 Return Level
FX4 Send Lev	FX4 Send Level	InsFX2 RtnLev	Insert Effect 4 Return Level
FX5 Send Lev	FX5 Send Level	InsFX3 RtnLev	Insert Effect 5 Return Level
FX6 Send Lev	FX6 Send Level	InsFX4 RtnLev	Insert Effect 6 Return Level
AUX1/2SendPAN	AUX1/2 Send Pan *3	InsFX5 RtnLev	Insert Effect 1 Return Level
FX1/2SendPAN	FX1/2 Send Pan *4	InsFX6 RtnLev	Insert Effect 4 Return Level
FX3/4SendPAN	FX3/4 Send Pan *5	PAN Mode	Pan Mode
FX5/6SendPAN	FX5/6 Send Pan *6	RSS PAN	RSS Pan

\*1 When ChLink or FLink is on.

\*3 When Aux Busses 1 and 2 are linked.

\*5 When FX Busses 3 and 4 are linked.

\*2 When ChLink is on

\*4 When FX Busses 1 and 2 are linked.

\*6 When FX Busses 5 and 6 are linked.

**FX return channel parameters**

<i>Automix name:</i>	<i>Description:</i>	<i>Automix name:</i>	<i>Description:</i>
LEVEL (Fader)	<i>Effect Return Level</i>	AUX1 Send Lev	<i>AUX1 Send Level</i>
BALANCE	<i>Effect Return Balance</i>	AUX2 Send Lev	<i>AUX2 Send Level</i>
MUTE	<i>Mute</i>	FX1 Send Lev	<i>FX1 Send Level</i>
AUX1 Send Sw	<i>AUX1 Send Switch</i>	FX2 Send Lev	<i>FX2 Send Level</i>
AUX2 Send Sw	<i>AUX2 Send Switch</i>	FX3 Send Lev	<i>FX3 Send Level</i>
FX1 Send Sw	<i>FX1 Send Switch</i>	FX4 Send Lev	<i>FX4 Send Level</i>
FX2 Send Sw	<i>FX2 Send Switch</i>	FX5 Send Lev	<i>FX5 Send Level</i>
FX3 Send Sw	<i>FX3 Send Switch</i>	FX6 Send Lev	<i>FX6 Send Level</i>
FX4 Send Sw	<i>FX4 Send Switch</i>		
FX5 Send Sw	<i>FX5 Send Switch</i>		
FX6 Send Sw	<i>FX6 Send Switch</i>		

**Master Edit**

<i>Automix name:</i>	<i>Description:</i>	<i>Automix name:</i>	<i>Description:</i>
LEVEL	<i>Master Level</i>	Balance	<i>Master Balance</i>

**Aux bus parameters**

<i>Automix name:</i>	<i>Description:</i>	<i>Automix name:</i>	<i>Description:</i>
LEVEL	<i>AUX Master Level</i>	POSITION	<i>AUX Master Position *7</i>
BALANCE	<i>AUX Master Balance</i>		

**FX bus parameters**

<i>Automix name:</i>	<i>Description:</i>	<i>Automix name:</i>	<i>Description:</i>
LEVEL	<i>FX Master Level</i>	POSITION	<i>FX Master Position *7</i>
BALANCE	<i>FX Master Balance</i>		

**Direct path parameters**

<i>Automix name:</i>	<i>Description:</i>	<i>Automix name:</i>	<i>Description:</i>
LEVEL	<i>DIR Master Level</i>	POSITION	<i>DIR Position</i>
BALANCE	<i>DIR Master Balance</i>		

**Effect 1-6 parameters**

<i>Automix name:</i>	<i>Description:</i>
PATCH	<i>Effect Patch Number *8</i>

**V-LINK parameters**

<i>Automix name:</i>	<i>Description:</i>	<i>Automix name:</i>	<i>Description:</i>
BANK	<i>Clip Bank Select</i>	COLOR Cb	<i>Color Cb Control</i>
CLIP	<i>Clip Select</i>	DISSOLVE	<i>Dissolve Time</i>
BRIGHTNESS	<i>Brightness Control</i>	PLAY SPEED	<i>Play Speed</i>
COLOR Cr	<i>Color Cr Control</i>		

\*7 Can't record when realtime recording or snapshot

\*8 Recorded when snapshot

## V-Studio Song/VS-2000 Project Compatibility

### Recording Mode Tables

A project using the following recording modes can be converted into a VS-2000 project using the project IMPORT operation.

Recording mode:	VS-880/ 880EX:	VS-890/ VSR880:	VS-1680:	VS-1880/1824/ 1824CD:	VS-2400CD/ 2480/2480CD:
M24	—	—	—	—	M24
M16	—	—	—	—	M16
MTP	—	—	M24 or M16*	M24 or M16*	M24 or M16*
VSR	—	M24 or M16*	—	M16	—
CDR	—	M16	—	M16	M16
MAS	M16	M16	M16	M16	—
MT1	M16	M16	M16	M16	M16
MT2	M16	M16	M16	M16	M16
LIV	M16	M16	M16	M16	M16
LIV2	—	—	M16	M16	M16

\*User can select bit rate at "recording mode within PROJECT IMPORT screen.

A project using the following recording modes can be exported as an earlier V-Studio song using the project EXPORT operation.

Recording mode:	VS-880/ 880EX:	VS-890/ VSR880:	VS-1680:	VS-1880/1824/ 1824CD:	VS-2400CD/ 2480/2480CD:
M24	—	—	—	—	M24
M16	MAS	MAS	MAS	MAS	M16

### Parameter Translations

#### Level Values

When a, earlier, pre-VS-2480 V-Studio's song is imported, and when a VS-2000 project is exported, level values are translated as follows.

Earlier V-Studio:	VS-2000:
0	-∞dB
100	0dB
127	+6dB

## Busses

When importing earlier V-Studio songs into the VS-2000, busses are re-assigned as follows.

VS-880:	VS-880EX/890, VSR-880:	VS-1680/1880:	VS-2400CD/ 2480/2480CD	VS-2000
AUX A/B	AUX1 L/R	FX1 L/R	AUX 1/2	AUX 1/2
FX1 A/B	AUX2 L/R (FX1 L/R)	FX2 L/R	AUX 3/4	FX 1/2
FX2 A/B	FX1 L/R (FX2 L/R)	AUX1 L/R (FX3 L/R)	AUX 5/6	FX 3/4
—	—	AUX2 L/R (FX4 L/R)	AUX 7/8	FX 5/6
—	—	FX1 L/R (AUX L/R)	DIR 1/2	DIR 1/2

## EQ

When importing earlier V-Studio songs into the VS-2000, EQ parameters are re-mapped as follows.

VS-880/880EX/890, VSR-880:	VS-1680/1880:	VS-2000:
EQL	EQ Low	Lo
EQM	EQ Mid	Lo-Mid
EQH	EQ High	Hi

## Effect Patches

This table notes the existence of certain VS-2000 effect patches in earlier V-Studios.

VS-880:	VS-880EX v. 1.x* VS-1680 v. 1.x*:	VS-880EX/890/1680/1880, VSR-890:	VS-2000:
—	—	OK	Speaker Modeling
—	—	OK	Mastering Tool Kit
—	OK	OK	3Band Isolator
—	OK	OK	Tape Echo
—	OK	OK	Analog Flanger
—	OK	OK	Analog Phaser

\* Speaker Modeling and the Mastering Tool Kit effects are available in the current VS-880EX and VS-1680 operating system versions. Visit [www.rolandus.com](http://www.rolandus.com) or call Roland Product Support for more info.

## Attenuator

When an earlier V-Studio's song is imported, and when a VS-2000 project is exported, attenuator values are translated as follows.

Earlier V-Studio:	VS-2000:	Earlier V-Studio:	VS-2000:
-42dB	-42.0 to -39.1dB	-12dB	-15.0 to -9.1dB
-36dB	-39.0 to -33.1dB	-6dB	-9.0 to -3.1dB
-30dB	-33.0 to -27.1dB	0dB	-3.0 to +2.9dB
-24dB	-27.0 to -21.1dB	+6dB	+3.0 to +6.0dB
-18dB	-21.0 to -15.1dB		



# Glossary

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Throughout the *VS-2000 Owner's Manual*, we've noted terms that may be unfamiliar to beginners, using the symbol to the left. This glossary provides basic definitions for these terms. You'll find a second glossary in the *VS-2000 Appendices* with definitions for additional terms with which you may not be familiar.

## **Analog audio**

Analog audio is a type of electrical signal in which sound is represented by varying amounts of voltage. Cassettes and vinyl records contain analog audio. Analog audio signals are converted back into sound by speakers.

## **ASCII**

Short for "American Standard Code for Information Exchange." A universally recognized standard for representing characters, numbers and symbols. Most computer keyboards are ASCII keyboards.

## **Audio**

A technical word for "sound."

## **Automix**

Automix is the VS-2000's automated mixing system. It records and plays back changes you make to the VS-2000's mixer settings. See Chapter 25.

## **Auto Punch**

The VS-2000's Auto Punch feature automatically starts and stops recording for you when you're punching, by storing your punch-in and -out points. See "Punching."

## **Aux bus**

An Aux bus—short for "Auxiliary bus"—is a pathway that can carry multiple signals to a destination. The VS-2000's two Aux busses can carry signals to outputs on their way to external devices such as headphone amplifiers and external effect processors.

## **Back up**

To "back up" is to make a copy of project data and to store the copy on an external medium—such as a CD-R or CD-RW disk—for safekeeping. This copy is called a "backup." Backing up is extremely important to safeguard against unexpected events. To play or work on a project that's been backed up, it must be "recovered" by the VS-2000.

## **Balanced**

Balanced cables and connectors produce low-noise signals by using all three of the cable's wires. In a balanced connection, two copies of the signal travel through the cable—one copy is 180 degrees out of phase. If the two signals have picked up any noise along the way, the noise is eliminated due to phase cancellation when the out-phase-signal is flipped back into phase at the destination connector. The third wire is the ground. Use balanced cables and connectors if possible. See "Phase cancellation."

**Bit depth**

Digital recording can capture audio using number strings of varying lengths—a longer string allows more detail in the description of level changes in the signal. The size of a string is referred to as its “bit depth.” Most often, digital devices record and play audio using bit depths of 16 or 24 bits. Audio CDs use 16 bits.

**Bouncing**

Bouncing is the copying of tracks onto other tracks. Typically, this is done to combine a greater number of tracks into a fewer tracks, though there are other reasons to bounce. Some people call bouncing “ping-ponging.”

**Burn**

“Burn” is music industry slang for writing data onto a CD.

**Bus**

A bus is a pathway down which one or more signals travel to a common destination.

**CD-R/RW drive**

A CD-R/RW drive—short for “CD-Recordable/ReWritable”—is a device that can burn audio onto CD-R (“CD-Recordable”) or CD-RW (“CD-ReWritable”) discs. You can write unerasable, permanent data onto a CD-R one time. A CD-RW disk can be reused: You can erase a CD-RW and write new data onto the disk.

**Channel**

A channel is a set of tools for managing and shaping an audio signal. The VS-2000 has input channels, track channels, Aux master channels and FX return channels.

**Channel strip**

A channel strip is a physical set of channel controls. In the VS-2000, there are 16 channel strips that can control the VS-2000’s 18 track channels (see “Channels” above).

**Compressor**

A device that can reduce the level of signals that are louder than a specified volume.

**dB, dBu**

Units of measurement for the levels of audio signals.

**Dither**

Dither is a process that deliberately adds a tiny amount of noise to a signal in order to mask unwanted sounds that can be introduced when the signal’s original bit depth is reduced. Dithering is recommended when transferring audio to an external device that uses a lower bit depth. See “Bit depth.”

**Dry**

A signal to which no effect processing has been applied.

**Digital audio**

A form of computer-based data that represents audio as strings of binary numbers—that is, digits. When audio is captured by a digital recorder, it's converted into numbers. Digital audio sounds great and can be subjected to a wide array of processes without any unwanted degradation to its quality.

**EQ**

Abbreviation for “equalization.”

**Equalization**

The process of adjusting the volumes of individual sound waves within an audio signal in order to shape the signal's overall character. Bass and treble controls on a stereo system are equalizers.

**Fader**

The handle in each channel strip that you can slide forward or back to raise or lower, respectively, the corresponding signal's level—the fader is a channel's volume control. On the VS-2000, you can also raise or lower parameter values using its faders.

**Frame**

In SMPTE and MTC time codes, seconds are divided into frames as determined by the current frame rate.

**FX Bus**

In the VS-2000, an FX bus acts as the pathway input and track channel signals travel to get to the VS-2000's internal effects.

**GPI**

GPI is short for “General Purpose Interface,” a control jack found on some video editing devices. By connecting this jack to the VS-2000's FOOT SWITCH jack, you can stop and start VS-2000 project playback remotely from the video device.

**Hard drive**

A device that stores data on one or more rigid platters mounted inside its case. The VS-2000's hard drive stores all of your project data, including its audio.

**High impedance**

Impedance is the amount of force with which analog audio voltages are sent into jacks or accepted by jacks. High-impedance devices include electric guitars and basses, and some semi-pro microphones. Connect high-impedance devices to the VS-2000's GUITAR/BASS Hi-Z (for “High Impedance”) jack.

### ***IDE***

Short for “Integrated Device and Electronics.” A set of data transmission standards employed by high-speed disk drives. The VS-2000 has an internal IDE hard drive.

### ***Limiter***

A limiter is a compressor with a ratio setting of 10:1 or greater. This has the effect of preventing all but the fastest signals from exceeding the threshold volume, forcing them into the desired level range.

### ***Line level***

The high-level signal produced at the outputs of synths, samplers, beat boxes, turntable preamps, CD players, multitrack recorders, cassette decks and so on.

### ***Locator***

A bookmark for a time location within a project. Locators are fast and easy to recall, and are ideal for navigating a project, which can have up to 96 locators.

### ***Loop***

As a verb, the act of playing the same project section over and over until STOP is pressed. As a noun, the section of the project that’s played when the VS-2000’s Loop feature is turned on.

### ***Low Impedance***

Impedance is the amount of force with which analog audio voltages are sent into jacks or accepted by jacks. Low-impedance devices include pro-quality mics, as well as synths, samplers, beat boxes, effect processors and so on. Connect low-impedance devices to the VS-2000’s XLR or 1/4”TRS jacks.

### ***Marker***

A bookmark for a specific time location within a project. You can have up to 1,000 markers in a project. Markers are best used for events within a project that you want to pinpoint, but that you won’t often need to return to.

### ***Mastering***

The final step in the process of preparing your project mix for publication and/or mass-duplication.

### ***Mastering tracks***

The pair of V-Tracks onto which a project’s final mix is recorded. Mastering tracks can be burned onto an audio CD. See “V-Tracks.”

### ***Mic level***

The low-level signal produced by microphones and electric instruments such as electric guitar or bass.

**MIDI**

For “Musical Instrument Digital Interface,” the wiring and message protocol that allows the VS-2000 and other MIDI devices to communicate by exchanging instructions called “MIDI messages.”

**MIDI control surface**

A hardware device that transmits MIDI messages, and whose purpose is the control of a second MIDI device.

**MIDI Control Change messages**

A type of MIDI message that’s permanently assigned to a particular parameter. When you send a MIDI Control Change value, it sets the value of the parameter in the MIDI device that receives it.

**MMC**

Short for “MIDI Machine Control.” MMC messages are a type of MIDI message that communicates button-press instructions—PLAY, STOP, etc.—between MIDI devices.

**MTC**

For “MIDI Time Code,” a form of SMPTE time code that travels between MIDI devices through MIDI cables.

**Panning**

Panning controls how much of a signal is sent to the left and/or right speaker in a stereo system, creating the illusion that the sound is occurring at a physical location between the two speakers.

**Phase Cancellation**

Each sound wave is a series changes in air pressure that your ears interpret as sound. It’s possible to have two identical or very similar sound waves that conflict: at the exact moment when one is increasing air pressure, the other is lowering it. The result is that the two sound waves cancel each other out, and neither is heard. This is called “phase cancellation.” The problem can be solved by turning the air pressure changes of one of the signals upside down so that both soundwaves agree—this is referred to as “inverting,” or “flipping,” the signal’s “phase.”

**Phrase**

A phrase is a set of pointers that instructs the VS-2000 when and how to play a take—an audio file—stored on its hard drive. See “Take.”

**Playlist**

A list of all of the data to be played in a project, arranged along a horizontal, left-to-right axis. On the Home screen, a playlist presents the project’s phrases. On the AUTOMIX EDIT screen, Automix data is listed.

**Project**

All of the audio and settings for a recorded work in the VS-2000, stored as a project disk file on the VS-2000’s hard drive.

**PS/2**

PS/2 is a wiring standard for computer peripheral devices developed by IBM.

**Punch**

The process of re-recording sections of a previously recorded track. The act of starting a punch is called “punching in.” Ending a punch is called “punching out.”

**Realtime**

A realtime process is one that occurs while you’re recording or playing back a project without requiring you to stop either action, since it takes place in “real time.”

**Redo**

You can reverse an undo by performing a “redo.” See “Undo.”

**Region**

A region is a section of time within a project, defined by the placement of IN and OUT edit points—it’s the portion of the project that falls between these two edit points.

**Recover**

To reload a project you’ve backed up, use the project RECOVER operation. When you recover backup data, the VS-2000 re-converts it back to its original form.

**Routing**

The connection of a component’s output to the input of another component. For example, you can route input channels to tracks, FX channels to tracks, and so on.

**Sample rate**

Digital audio recorders don’t actually capture sound continually—they sample the sound many, many times per second. When the samples are played back, the ear perceives what it’s hearing as continuous audio. The number of times per second that a digital recorder samples its audio is referred to as its “sample rate.” CDs use a 44.1kHz sample rate—44,100 samples per second. The VS-2000 can record at various sample rates.

**Scene**

A scene is an object that stores all of the mixer’s current settings. Each project can hold 96 scenes. You can instantly recall a scene to restore the settings it contains.

**Slave**

One device controls the timing of synchronized devices. That device is the master. Any device controlled by the master is a slave device.

**Signal flow**

The journey a signal takes from one place to another, including all of the components it passes through along the way.

**SMPTE**

Short for “Society of Motion Picture and Television Engineers.” SMPTE is a form of time code data that’s sent from a master device to a slave device(s)—see “Slave” above. It allows you to synchronize the VS-2000’s hard disk recorder with external devices.

**Snapshot**

An Automix object that stores the values of all automatable parameters at a particular moment in a project. When the project is played, Automix re-installs the parameters’ values when the now line reaches the location at which the snapshot was taken. Also a Harmony object that captures the current Harmony module settings.

**Song Position Pointer (SPP)**

A type of MIDI message that communicates song/sequence/project location information by transmitting the number of 16th notes since the beginning of the song/sequence/project.

**Subframe**

A subdivision of a SMPTE or MTC frame equaling 1/98th of a frame.

**Synchronization**

The process of coordinating the timing of two devices.

**Take**

In the VS-2000, a take is an audio file recorded on your hard drive. In general studio usage, “take” refers to an attempt to record a performance, successful or otherwise.

**Tick**

One 480th of a quarter note at the current project tempo.

**Now line**

The dark vertical line at the center of a playlist that represents your current position in the playlist. Also called a “now line.”

**TRS**

Short for “Tip/Ring/Sleeve.” A type of 1/4” audio cable connector that uses three wires for carrying audio signals and for grounding. The wires are attached to the connector’s tip, ring and a second ring called a “sleeve.”

**Track**

In the VS-2000’s hard disk recorder, a track is a collection of 16 V-Tracks, any one of which can be active at a time. With the Automix feature, a track is a string of parameter values for a mixer channel or bus recorded as Automix data. See “V-Track.” A Harmony sequencer track contains playback instructions for one Harmony part.

**Unbalanced**

A type of audio cable and connector that uses two wires, one for the audio and one for the ground—a third wire isn’t used.

### **Undo**

The VS-2000's Undo feature allows you to reverse up to 99 of your most recent recording and editing actions in a project. The act of reversing an action is referred to as "undoing" the action.

### **V-Track**

A V-Track ("Virtual Track") is a string of phrases arranged one after another in the order in which they're to be played back by the VS-2000's hard disk recorder. Each VS-2000 track contains 16 V-Tracks, any one of which can be played back or recorded on at any given time.

### **Virtual Track**

See "V-Track."

### **Waveform**

A waveform is an audio signal displayed in a grid. The horizontal axis shows elapsed time, and the vertical axis shows volume, or "amplitude."

### **Wet**

A "wet" signal is a signal to which an effect has been applied.

### **Word clock**

A type of timing information carried within a digital audio signal that keeps multiple digital recording devices precisely synchronized when exchanging digital audio.

### **XLR**

Also called "Cannon connectors." XLR connectors are found on almost all studio-quality, low impedance microphones and other professional audio equipment. XLR connectors are male-type or female-type. XLR connections can carry phantom power to condenser mics that require it. XLR audio cables are typically balanced—see "Balanced."

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### ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.  
Udskiftning må kun ske med batteri af samme fabrikat og type.  
Levér det brugte batteri tilbage til leverandøren.

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Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

### CAUTION

Danger of explosion if battery is incorrectly replaced.  
Replace only with the same or equivalent type recommended by the manufacturer.  
Discard used batteries according to the manufacturer's instructions.

### VARNING

Explosionsfara vid felaktigt batteribyte.  
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Kassera använt batteri enligt fabrikantens instruktion.

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For EU Countries



This product complies with the requirements of European Directive 89/336/EEC.

For the USA

## FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Tested To Comply With FCC Standards

### FOR HOME OR OFFICE USE

Unauthorized changes or modification to this system can void the users authority to operate this equipment.  
This equipment requires shielded interface cables in order to meet FCC class B Limit.

For the USA

## DECLARATION OF CONFORMITY Compliance Information Statement

Model Name : VS-2000  
Type of Equipment : DIGITAL STUDIO WORKSTATION  
Responsible Party : Roland Corporation U.S.  
Address : 5100 S. Eastern Avenue, Los Angeles, CA 90040-2938, U. S. A.  
Telephone : (323) 890-3700

For Canada

### NOTICE

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

### AVIS

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## Copyright

- Unauthorized recording, distribution, sale, lending, public performance, broadcasting, or the like, in whole or in part, of work (musical composition, video, broadcast, public performance, or the like) whose copyright is held by a third party is prohibited by law.
- When exchanging audio signals through a digital connection with an external instrument, this unit can perform recording without being subject to the restrictions of the Serial Copy Management System (SCMS). This is because the unit is intended solely for musical production, and is designed not to be subject to restrictions as long as it is used to record works (such as your own compositions) that do not infringe on the copyrights of others. (SCMS is a feature that prohibits second-generation and later copying through a digital connection. It is built into MD recorders and other consumer digital-audio equipment as a copyright-protection feature.)
- Do not use this unit for purposes that could infringe on a copyright held by a third party. Roland assumes no responsibility whatsoever with regard to any infringements of third-party copyrights arising through your use of this unit.

## About the License Agreement

The VS-2000 and its CD-R/RW capability are designed to allow you to reproduce material to which you have copyright, or material which the copyrighted material without permission of the copyright owner avoiding technical prohibiting features of second-generation and later copying like SCMS or others constitutes copyright infringement and may incur penalties even in case such reproduction is for your own personal use and enjoyment (private use). Consult a copyright specialist or special publications for more detailed information on obtaining such permission from copyright holders.

## Disclaimer of liability

Roland will take no responsibility for any "direct damages," "consequential damages," or "any other damages" which may result from your use of the VS-2000. These damages may include but are not limited to the following events which can occur when using the VS-2000.

- Any loss of profit that may occur to you
- Permanent loss of your music or data
- Inability to continue using the VS-2000 itself or a connected device

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