SYSTEM MIX PLUS

Owner's Manual

DIGITAL MUSIC CORPORATION

Table of Contents

1. Introduction 2
- 1.1 Overview
- 1.2 Unpacking

2. Operation 3
- 2.1 Front Panel
- 2.2 Rear Panel

3. Mixer 6
- 3.1 Mix 1
- 3.2 Mix 2
- 3.3 Setting Levels

4. MIDI Volume 8
- 4.1 Connections for the Volume Control
- 4.2 Using the Volume Control with Ground Control
- 4.3 Using the Volume Control without Ground Control

5. Recording & PA 9
- 5.1 Cabinet Simulator
- 5.2 Headphone System

6. Putting Your System Together 11
- 6.1 Two Typical Systems
- 6.2 Using With a Switching System

Appendix A 16
- Technical Specifications

Appendix B 17
- Block Diagram

Warranty Information 18

1. Introduction

1.1 Overview

System Mix Plus is a dual stereo line level audio mixer designed specifically for electric guitar systems. With System Mix Plus, you can combine the line level outputs of your rack effects with the pure tone of your amp or preamp. This results in lower noise and better tone.

Additional features have been built in to System Mix Plus to facilitate recording directly into a studio mixing console or connecting directly to a PA system for live use. These include:

- Speaker cabinet simulation circuitry, switchable for either "2x12 open" or "4x12 closed" cabinet sounds.
- Balanced XLR outputs.
- A versatile headphone monitoring system with separate volume controls for your signal and an external feed.

System Mix Plus also features a MIDI controlled stereo volume control, also referred to as a VCA (Voltage Controlled Amplifier). The volume control, which can be inserted *anywhere* in your line level signal path, responds to the Ground Control or any device which can send MIDI control change messages. This allows you to control your volume without having to run audio cables out to your volume pedals.

Front-to-back passive feedthrus are provided for four audio feeds and MIDI.

1.2 Unpacking

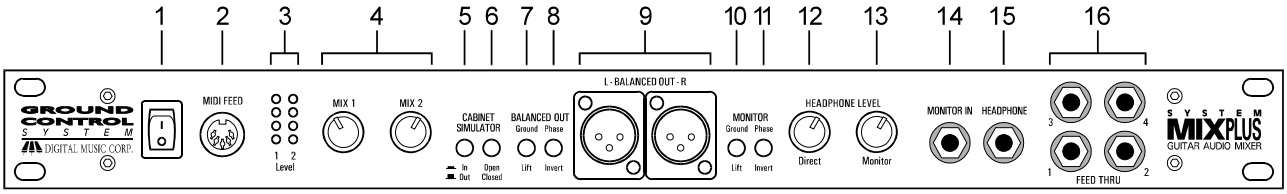
Your factory carton should contain:

1. This manual
2. System Mix Plus
3. Power supply
4. Warranty card

Please fill out the enclosed warranty card and return it to Digital Music Corp. By registering, you enable us to send you important information about related products, updates and accessories.

2. Operation

2.1 Front Panel



1. **Power Switch**: Applies power to System Mix Plus.

2. **MIDI FEED**: Direct passive feed thru to the MIDI FEED on the rear panel.

3. **Level LEDs**: Indicate output level of Mix 1 and Mix 2, *not* left and right. The thresholds are:

   +10 dBu (Red)
   0 dBu (Yellow)
   - 10 dBu (Green)
   - 20 dBu (Green) (Note: 0 dBu = 0.775 volt RMS)

   When setting levels, the signal peaks should barely light the yellow LEDs. You should NEVER see the red LEDs. See section 3.3 for more information.

4. **MIX LEVEL CONTROLS:** Stereo volume for MIX 1 and MIX 2. Unity gain is set with the knob at 12 o'clock.

5. **CABINET SIMULATOR In/Out:** Switches the speaker cabinet simulator on and off. Simulator is on when the button is pushed in.

6. **CABINET SIMULATOR Open/Closed:** Selects between two different speaker cabinet types for the sound of the cabinet simulator.

7. **BALANCED OUT Ground Lift:** Disconnects pin 1 of the BALANCED OUT jacks from ground when pushed in.

8. **BALANCED OUT Phase Invert:** Reverses the phase relationship between pins 2 and 3 of the BALANCED OUT jacks. With the button out, pin 2 is "+" and pin 3 is "-". With the button pushed in, pin 3 is "+".

9. **L - BALANCED OUT - R:** Left and Right balanced outputs from Mix 2 or from the cabinet simulator if it's switched in.

10. **MONITOR Ground Lift:** Disconnects the sleeve of the MONITOR IN jack from ground with the button pushed in.

11. **MONITOR Phase Invert:** With the button pushed in, the phase of the MONITOR IN signal is inverted.

12. **HEADPHONE LEVEL Direct**: Adjusts the headphone volume of your mixer signal.

13. **HEADPHONE LEVEL Monitor**: Adjusts the headphone volume of the MONITOR IN signal.

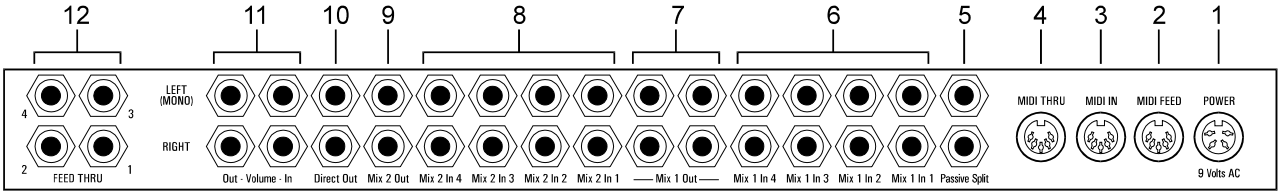
14. **MONITOR IN**: Accepts a stereo (TRS) plug for headphone monitoring of external signals (monitor mixes, etc.)

15. **HEADPHONE**: Stereo headphone output. The impedance of the headphones should be 30 Ω or greater.

16. **FEED THRU 1-4**: These four separate, passive mono feeds connect directly to the four FEED THRUs on the rear panel.

2.2 Rear Panel

[**Note:** All of the 1/4 inch jacks on the rear panel are for mono plugs. Except for the four FEED THRUs, the top row is for the Left channel of your stereo signal and the bottom is for the Right. Any mono signals should be plugged into the Left inputs (except for Mix 2 In 1). They will automatically feed both the Left and Right channels.]



1. **POWER:** Requires 9 VAC at 1.0 amp.

2. **MIDI FEED:** Direct passive feed thru to the MIDI FEED on the front panel.

3. **MIDI IN:** Standard 5 pin MIDI connector. Accepts commands for MIDI controlled volume, and passes all data to the MIDI THRU jack.

4. **MIDI THRU:** Standard 5 pin MIDI connector. Outputs all MIDI data that comes in through the MIDI IN jack.

5. **Passive Split:** These outputs carry the same signals coming in the "Mix 1 In 1" inputs. Enables you to feed these signals somewhere else without having to use Y-cables.

6. **Mix 1 Inputs:** Four stereo, line level inputs to Mix 1.

7. **Mix 1 Out:** Two identical sets of Left and Right line level outputs from Mix 1.

8. **Mix 2 Inputs:** Four stereo, line level inputs to Mix 2.
   Note: Mix 2 In 1 controls the internal connection (normal) from Mix 1 to Mix 2. If nothing is plugged in to these inputs, the outputs from Mix 1 feed through to Mix 2.
   If something is plugged in to these inputs, the internal Mix 1/Mix 2 connection is broken.

9. **Mix 2 Out:** Left and Right line level outputs from Mix 2.

10. **Direct Out:** Line level outputs from Mix 2. If the Cabinet Simulator is switched in, these outputs are affected.

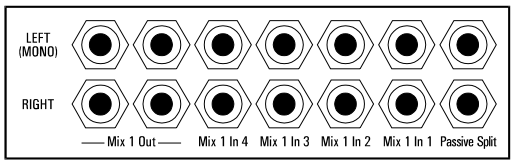
11. **Volume - In:** Stereo line level inputs to the MIDI controlled volume control. As with the other inputs, a single cable plugged into the Left input will appear at both output jacks.

12. **Volume - Out:** Stereo line level outputs from the MIDI controlled volume control.

13. **FEED THRU 1-4**: These four separate, passive mono feeds connect directly to the four FEED THRUs on the front panel.

3. Mixer

3.1 Mix 1



General

Mix 1 consists of four pairs of Left and Right inputs, two Passive Split outputs, and two pairs of MIX 1 outs. All of these jacks are for mono plugs, and are intended for line level signals.

For mono signals, use only the Left input and the signal will feed into both the Left and Right channels.

After the four inputs are combined, their overall volume is controlled by the MIX 1 knob on the front panel, and the resulting signal is passed to the two sets of Mix 1 Out jacks.

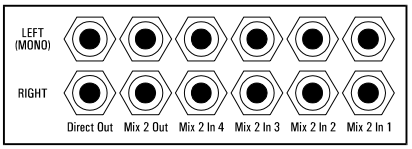
Mix 1 In 1 and the Passive Split

You will blend the outputs of your effects with the pure tone of your preamp. In most cases, the output of your preamp (or your amp's effect send) will be connected to Mix 1 In 1. The Passive Split outputs are copies of the signal coming in Mix 1 In 1. These outputs are used to drive the inputs of your effects devices.

Mix 1 Outputs

There are two identical stereo pairs of outputs for Mix 1. Mix 1 is also internally connected to Mix 2. These outputs can be used to drive the inputs of more stereo effects devices for a second "stage" of processing. The outputs of these effects can then be connected to Mix 2 inputs. In this way you can have two stages of parallel effects, one cascading into another. In Section 6 you will see how it all comes together in a system.

3.2 Mix 2



General

Mix 2 consists of four pairs of Left and Right inputs, and one pair of MIX 2 outs. After the four inputs are combined, their overall volume is controlled by the MIX 2 knob on the front panel, and the resulting signal is passed to the Mix 2 Out jacks, and to the Cabinet Simulator circuitry (which feeds the rear panel Direct Outs and the front panel Balanced Outs).

Mix 2 In 1

If the Mix 2 In 1 jacks are empty, the stereo output of Mix 1 will be fed into Mix 2. Inserting a plug into them will break this normal connection between the two mixers.

Mix 2 Outputs

The Mix 2 Outs carry the sum of all the Mix 2 inputs. This is the output to connect to your power amp, or to your amp's effect return jacks. If you need an output with the Cabinet Simulator, then use the Direct or the Balanced Outs instead.

3.3 Setting Levels

[**Note:** This section assumes you have already connected your system together properly. You may want to come back to this section later if you are not ready to set levels now.]

The System Mix Plus inputs are set to unity gain. The relative levels of all of your inputs are therefore determined by the output levels of your devices. Setting levels is a critical part of your guitar system. Proper levels allow you to minimize noise, maximize your tone, and control the overall effect balance.

1. Setting up
- Set both Mix Level knobs at unity gain (12 o'clock).
- Turn the input and output levels of your effects all the way OFF.
- Set each effects device to 100% effects, by turning the wet/dry mix to wet or the "direct" signal off.
- If you are using the System Mix Plus volume control, set the volume to its maximum.

2. Amp signal
Play the guitar and adjust the preamp output level or the amp's effect send level until the yellow level LED just barely lights during signal peaks. *The red LEDs indicate clipping. Lower the level if you see them light up.*

3. Effects Inputs
One by one, raise the input level of each of your effects devices to the maximum level recommended by the manufacturer.

4. Effects Outputs
One by one, raise the output level of each of your effects devices, always checking the System Mix Plus LEDs. Set the levels as high as you can without overloading.

5. Wet/Dry Balance
You may reduce the output level of the effects devices if you want less effects in your final mix. If you want more effects, lower the output of your preamp or effect send, and repeat steps 3 and 4.

6. Final Output Level
The Mix 2 knob typically acts as the master volume control for the entire system. This knob can control your stage volume, or direct signal volume. The Mix 2 level control does provide up to 6 dB of gain, so be careful to avoid overloading the inputs to your power amp. Unity gain (straight up) or less is typical.

4. MIDI Volume Control

4.1 Connections for the Volume Control

To use the volume control, you must "patch" it into your signal path. There are no internal audio connections to or from the MIDI volume control. The volume control can be used for stereo volume, panning, or two separate mono volumes depending on your connections and the type of MIDI commands sent to it.

- **Stereo volume control:** Connect the left and right outputs of your source to the left and right inputs of the volume control. The two volume control outputs are then connected to the next device in the system.
- **Mono volume control:** Using the left inputs and outputs, connect the volume control just like a normal volume pedal.
- **Dual mono volume control:** Connect the left and right volume control input/output jacks independently.
- **Stereo pan control:** Connect the mono output of your source to the left volume control input. Then connect the left *and* right volume control outputs to the next device in the system.

To use the MIDI volume control in your System Mix Plus, you also need to plug something into the MIDI IN jack on the rear panel that can send the appropriate MIDI commands. You have two choices: 1) Digital Music Corporation's Ground Control or 2) something other than Ground Control.

4.2 Using the Volume Control with Ground Control

See the Ground Control 2.1 manual or the Ground Control VCA (Volume Control) Addendum for specific information on controlling volume from Ground Control.

4.3 Using the Volume Control without Ground Control

The System Mix Plus Volume Control responds to Continuous Controller messages on MIDI Channel 16. The VCA responds to the following Continuous Controller commands:

007 - Stereo Volume
010 - Pan
012 - Left Volume
013 - Right Volume

5. Recording & PA

5.1 Cabinet Simulator

The System Mix Plus Cabinet Simulator processes your line level signal to make it sound like it was amplified through a speaker cabinet and miked. This allows you to connect your guitar directly and still sound like a carefully miked, high quality cabinet.

For Recording:
Connect the System Mix Plus to your mixer or recorder for quick and easy direct recording.

For Live Performance:
Connect the System Mix Plus directly to the PA to avoid the hassle of miking, feedback or isolation problems, or when low stage volume is required.

You can choose between two sounds:

- **Open** - The sparkly, punchy sound of an open back 2x12 combo speaker
- **Closed** - The deep, powerful sound of a closed back 4x12 cabinet

The output of Mix 2 is internally sent to the Cabinet Simulator. When the Cabinet Simulator switch is out, the simulator is bypassed. When the switch is pushed in, the simulator is on. When turned on, the Cabinet Simulator affects three different audio outputs:

- The two Direct Out unbalanced ¼ inch jacks on the rear panel
- The two BALANCED OUT jacks on the front panel
- The Headphone System

The rear panel Mix 2 Out jacks are *not* affected by the Cabinet Simulator. Use these to connect to your power amp (or amp effects return).

IMPORTANT:
Do not connect speaker outputs of an amplifier to the System Mix Plus. Doing so may cause serious damage to your mixer and *your amplifier. The System Mix Plus inputs are intended for line level signals only.*

5.2 Headphone System

The Headphone System allows you to listen to the output of Mix 2 and any external signal coming in the stereo MONITOR IN jack.

- **Direct Knob:** Controls the headphone volume of your guitar system. (If the Cabinet Simulator switch is pushed in, the simulator will affect the guitar signal in the headphones.)
- **MONITOR Knob:** Controls the volume of the incoming monitor signal.
- **Ground Lift Button:** Disconnects the sleeve of the MONITOR IN jack from ground when pushed in. This solves ground hum problems in certain situations.

- **Phase Invert Button:** Inverts the phase of the MONITOR IN signal. If the guitar signal in the mixer is out of phase with the one coming back in the MONITOR IN, you will notice some frequency cancellation. If the guitar signal in the headphone mix sounds "funny" or "hollow" try this switch.

For Recording:
Connect a stereo (TRS) cable from the headphone feed at the studio to the MONITOR IN jack. Now you can blend the incoming reference tracks (drums, bass etc.) with your guitar signal and control your own monitor mix.

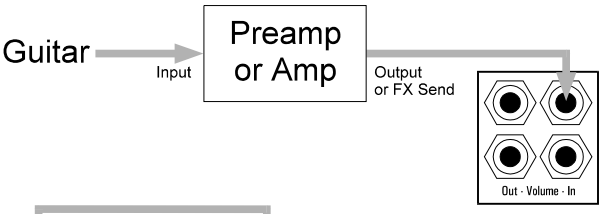
For Practice:
Turn off your power amp and use the Headphone System for practicing anytime without blasting your cabinet.

6. Putting Your System Together

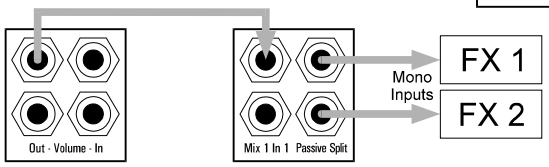
The System Mix Plus is a very flexible and versatile mixer. It can be used in many different ways. The following examples demonstrate some typical systems. Your needs may require different connections. These systems are simply meant to be starting points. *Remember, all connections are intended for line level signals only, NOT speaker connections.*

6.1 Two Typical Systems

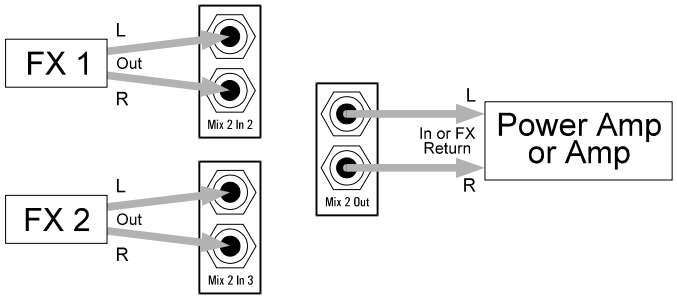
System #1
This is a system for a preamp (or amp effect loop) and one or two separate effects devices. It takes advantage of the volume control and demonstrates a very basic system.



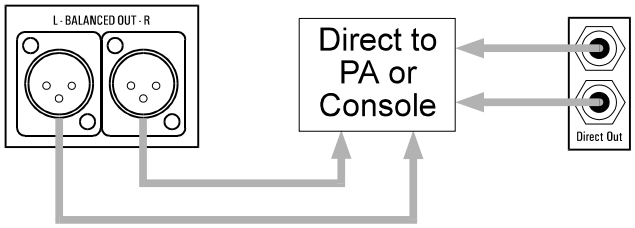
1. The guitar is connected to the amp or preamp input. The preamp output or amp effect send is connected to the Left volume control input.



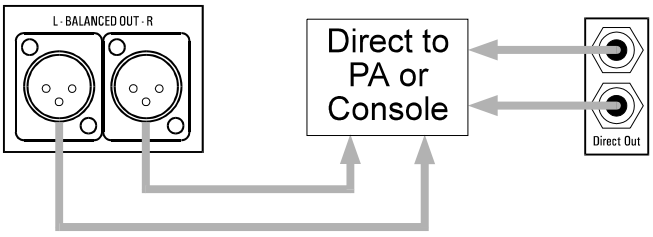
2. The signal comes out of the volume control and is fed into Mix 1 In 1 Left. (If you don't want to use the volume control, connect your amp directly to Mix 1 In 1.) The passive split sends copies of the preamp signal to the mono inputs of the effects devices.



3. The stereo outputs of the effects are brought back to the mixer to be blended with the original preamp tone. For this example, we will use Mix 2 In 2 and Mix 2 In 3. Remember, Mix 2 In 1 is being used by the internal connection with Mix 1 (the preamp). Next, the Mix 2 Outputs are connected to the power amp input, or the amp effect return.

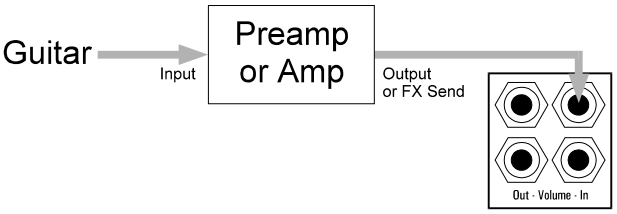


4. Additionally, you can connect the rear panel Direct Outs, or the front panel Balanced Outs to a mixing console or recorder. Be sure the Cabinet Simulator is on.

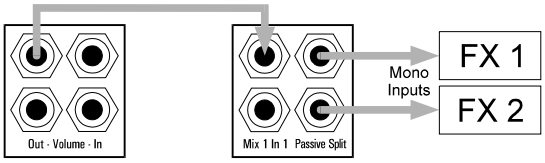


In this example, the Mix 1 knob controls the level of the preamp, and the Mix 2 knob controls the level of the entire mix. Please refer to Section 3.3 to correctly set levels.

System #2

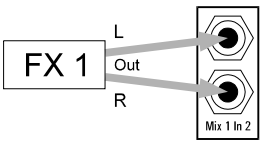


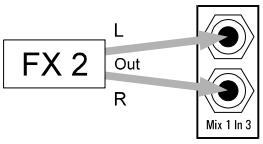
This is a system that demonstrates a two stage effects system. This allows certain effects to affect other ones. Traditionally, the final effects are delays or reverbs that you want to affect the entire signal.



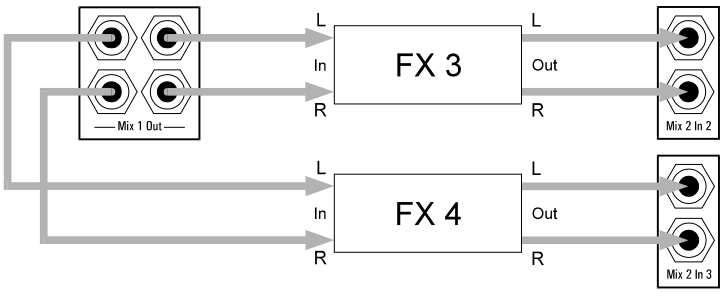
1. The guitar is connected to the amp or preamp input. The preamp output or amp effect send is connected to the Left volume control input.

2. The signal comes out of the volume control and is fed into Mix 1 In 1 Left. (If you don't want to use the volume control, then connect the amp directly to Mix 1 In 1.) The passive split sends copies of the preamp signal to the mono inputs of the effects devices.

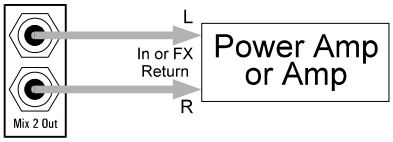




3. The stereo outputs of the effects are brought back to the mixer to be blended with the original preamp tone. For FX 1 and 2, we will use In 2 and In 3 of Mix 1. These effects will be blended in parallel with the original preamp tone.



4. Next, the two stereo Mix 1 Outs are used to drive the second stage effects. FX 3 and 4 will be affecting all of Mix 1 (the preamp signal *and* the outputs of FX 1 and 2). Remember, the Mix 1 signal is also sent to Mix 2 via the internal connection. The stereo outputs of FX 3 and 4 are brought back to the mixer (In 2 and In 3 of Mix 2) to be blended with the original Mix 1 signal.



5. Mix 2 Outs are connected to the power amp input, or the amp effect return.

6. Additionally, you can connect the rear panel Direct Outs, or the front panel Balanced Outs to a mixing console or recorder. Be sure the Cabinet Simulator is on.

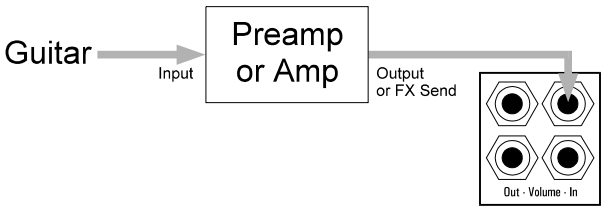
   In this example, the Mix 1 knob controls the level of the preamp and FX 1 and 2. The Mix 2 knob controls the level of the entire mix. Please refer to Section 3.3 to correctly set levels.

6.2 Using With a Switching System

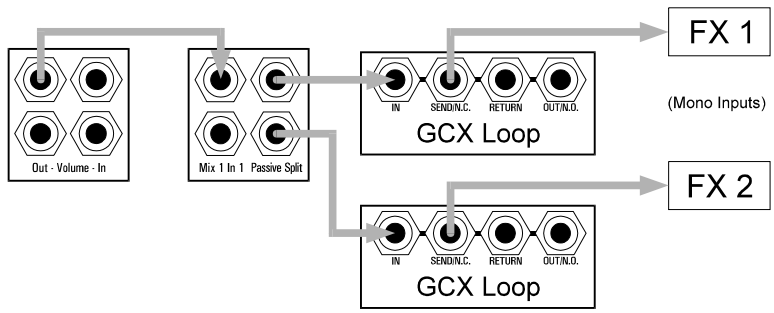
Switching systems, such as the Digital Music Corp. GCX Guitar Audio Switcher, can be used to connect/disconnect the amp signal from the input of the effects. By muting the *input* of the effect, not the *output,* effects like delays and reverbs will trail off gradually. This means the last delayed notes of your solo can linger on as you start to play rhythm again. There are many benefits and uses of this type of smooth transition.

The following examples show how to use the GCX with the System Mix Plus. For simplicity's sake, they show how the GCX would be added to the same systems described above.

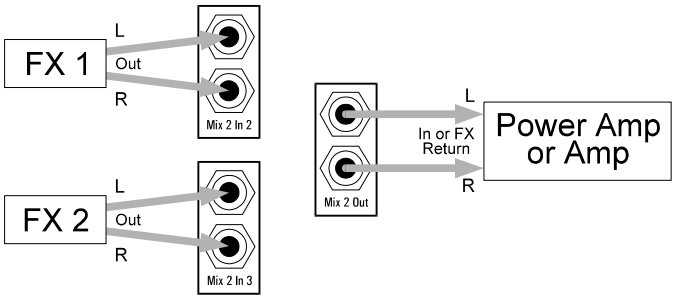
System #1 + GCX Loops
This example uses two GCX loops to switch the inputs of the two effects devices.



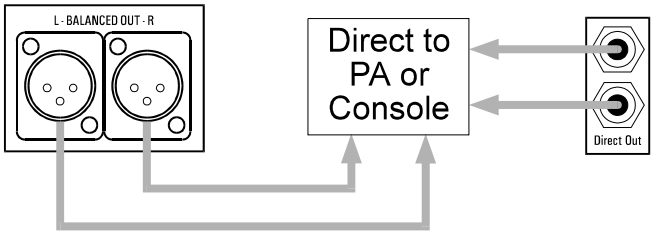
1. The guitar is connected to the amp or preamp input. The preamp output or amp effect send is connected to the Left volume control input.



2. The signal comes out of the volume control and is fed into Mix 1 In 1 Left. The passive split sends copies of the preamp signal to the inputs of two different GCX loops instead of going directly to the inputs of the effects devices. Next, the Send of each GCX loop is connected to effect inputs. When the loops are on, the signals pass through. When the loops are off, the sends to the effects are muted.



3. The stereo outputs of the effects are brought back to the mixer to be blended with the original preamp tone using In 2 and In 3 of Mix 2. Mix 2 In 1 is being used by the internal connection with Mix 1 (the preamp). Next, the Mix 2 Outputs are connected to the power amp input, or the amp effect return.

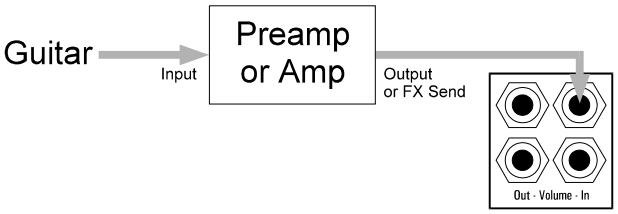


4. Additionally, you can connect the rear panel Direct Outs or the front panel Balanced Outs to a mixing console or recorder. Be sure the Cabinet Simulator is on.

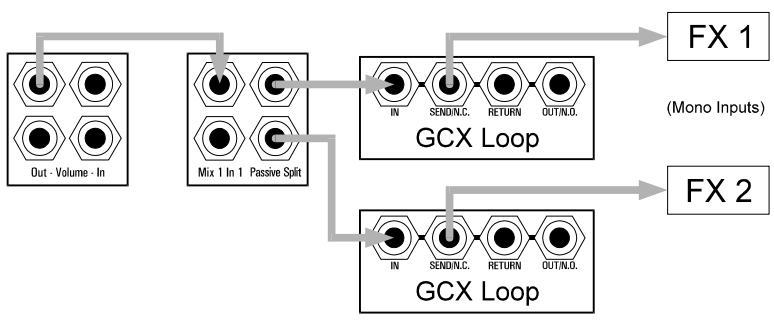
In this example, the Mix 1 knob controls the level of the preamp, and the Mix 2 knob controls the level of the entire mix. Please refer to Section 3.3 to correctly set levels.

System #2 + GCX Loops

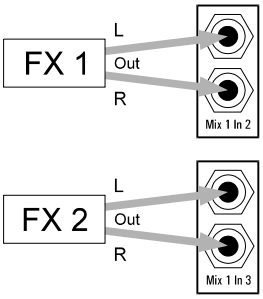
This example uses six loops to switch the inputs of the effects. It is important to note that although FX 1 and 2 are stereo, they begin with a mono signal and therefore need only one loop each to switch them. FX 3 and 4 are shown using two loops each for switching.



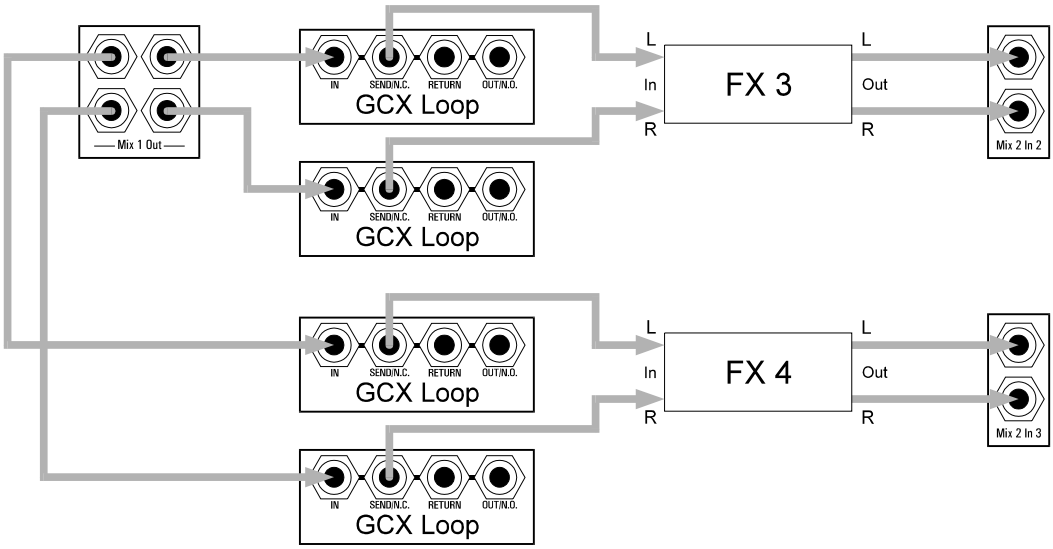
1. The guitar is connected to the amp or preamp input. The preamp output or amp effect send is connected to the Left volume control input.



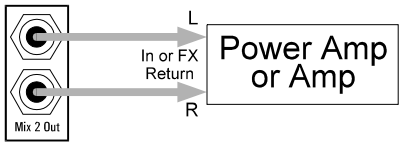
2. The signal comes out of the volume control and is fed into Mix 1 In 1 Left. The passive split sends copies of the preamp signal to the inputs of two different GCX loops instead of going directly to the inputs of the effects devices. Next, the send of each GCX loop is connected to effect inputs. When the loops are on, the signals pass through. When the loops are off, the sends to the effects are muted.



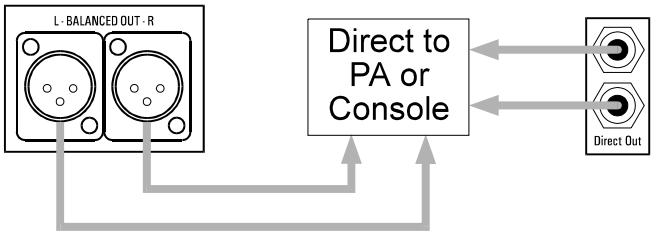
3. The stereo outputs of the effects are brought back to the mixer to be blended with the original preamp tone. For FX 1 and 2, we will use In 2 and In 3 of Mix 1. These effects will be blended in parallel with the original preamp tone.



4. Next, the two stereo Mix 1 Outs are used to drive four different GCX loops (Left and Right for two devices). The sends of the loops are connected to the appropriate inputs on FX 3 and 4, allowing them to be muted by the GCX. The Mix 1 signal is sent to Mix 2 via the internal connection and the stereo outputs of FX 3 and 4 are brought back to the mixer (In 2 and In 3 of Mix 2) to be blended with it.



5. Mix 2 Outs are connected to the power amp input or the amp effect return.



6. Additionally, you can connect the rear panel Direct Outs, or the front panel Balanced Outs to a mixing console or recorder. Be sure the Cabinet Simulator is on.

In this example, the Mix 1 knob controls the level of the preamp and FX 1 and 2. The Mix 2 knob controls the level of the entire mix. Please refer to Section 3.3 to correctly set levels.

Appendix A

Technical Specifications

Mix 1 and Mix 2

Input Impedance	
Left and Right channels	44kΩ
Left only, used as mono input	22kΩ
Maximum Input Level	7 V RMS or +19dBu
Maximum Voltage Gain	+6 dBu
Output Drive	7 V RMS across 5kΩ

Direct Out

Output Drive	7 V RMS across 5kΩ

Balanced Outputs

Output Drive	7 V RMS across 600Ω

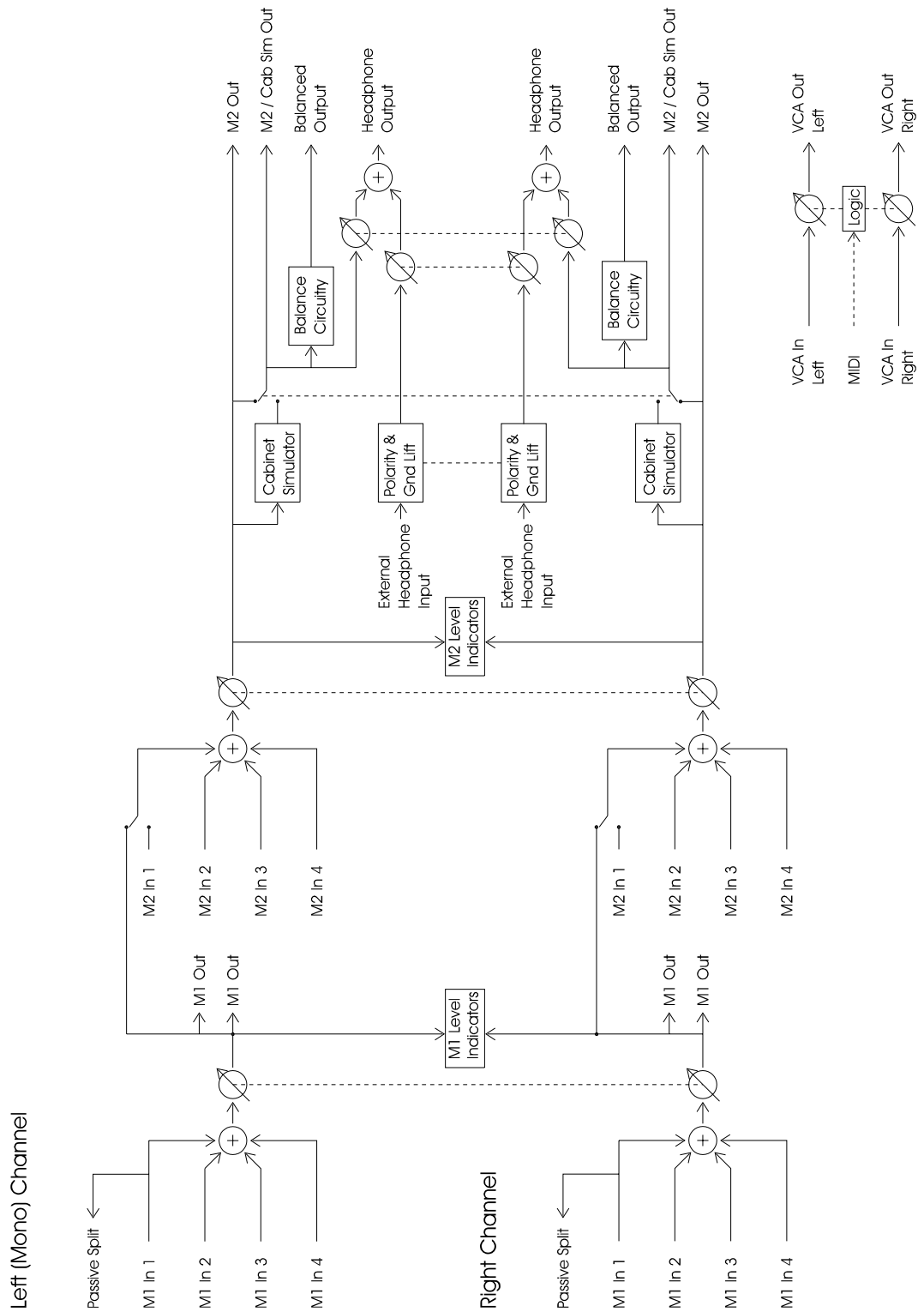
Headphones

Headphone Impedance	30Ω or greater
Output Drive	150 mW into 30Ω

MIDI Volume Control

Input Impedance	
Left and Right channels	100kΩ
Left only, used as mono input	50kΩ
Maximum Input Level	7 V RMS or +19 dBu
Output Drive	7 V RMS across 5kΩ

Appendix B: Block Diagram



Warranty Information

Digital Music Corp. warrants this product against any defects that are due to faulty material or workmanship for a period of five years from the date of original retail purchase. This warranty does not include damage to the product resulting from accident or misuse, and is valid only to the original retail purchaser.

If the product should become defective within the warranty period, Digital Music Corp. will repair it or elect to replace it free of charge, provided it is returned freight pre-paid to Digital Music Corp. with a valid Return Merchandise Authorization number (RMA#).

This warranty shall not apply to any goods that have been repaired or altered by anyone other than the manufacturer. There are no warranties which extend beyond the terms described herein.

Should you experience any difficulty with this Digital Music product, contact us as described below. If it is determined that the product must be returned to the factory for repair, you will be issued an RMA and given shipping and packaging instructions.

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