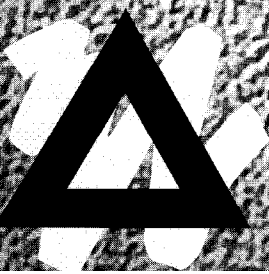
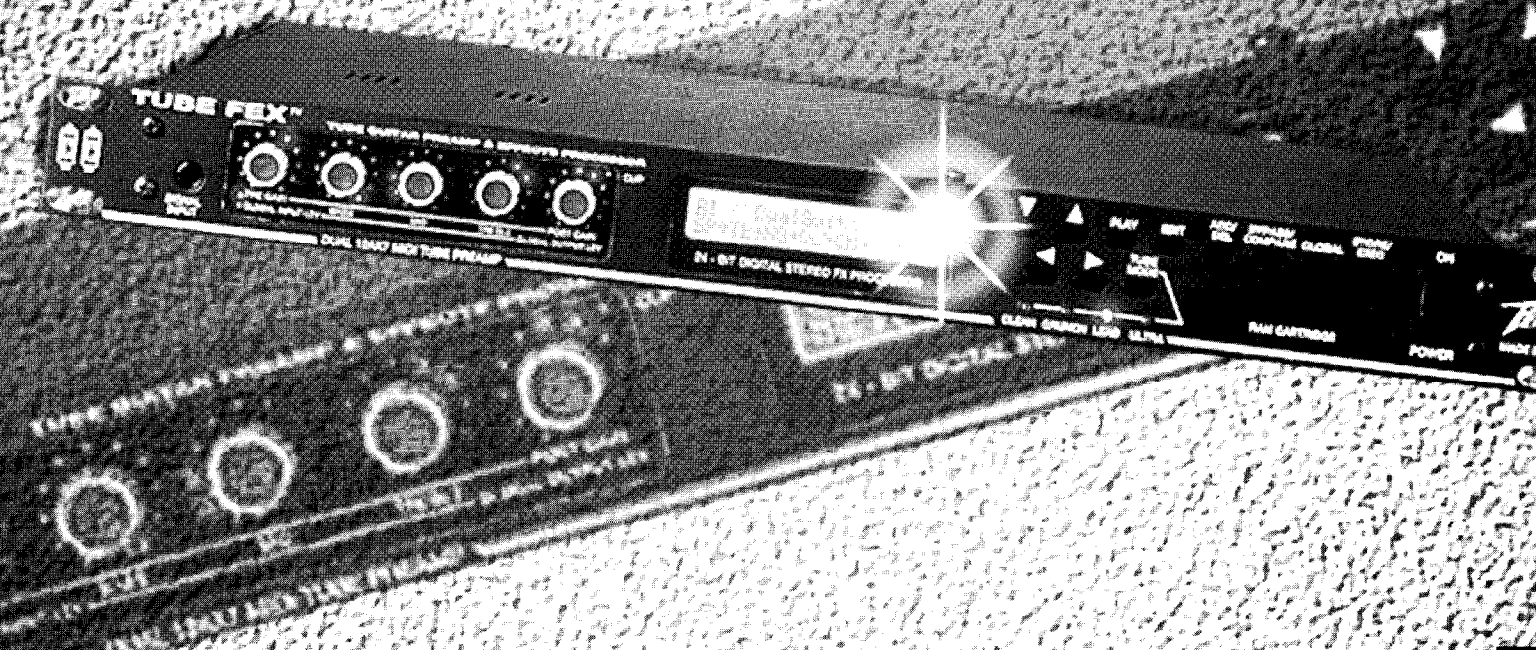


Tube Fex™

Tube Guitar Preamp & Effects Processor



operation manual

A Intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

A Intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

CAUTION: Risk of electrical shock – DO NOT OPEN!

CAUTION: To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

WARNING: To prevent electrical shock or fire hazard, do not expose this appliance to rain or moisture. Before using this appliance, read the operating guide for further warnings.

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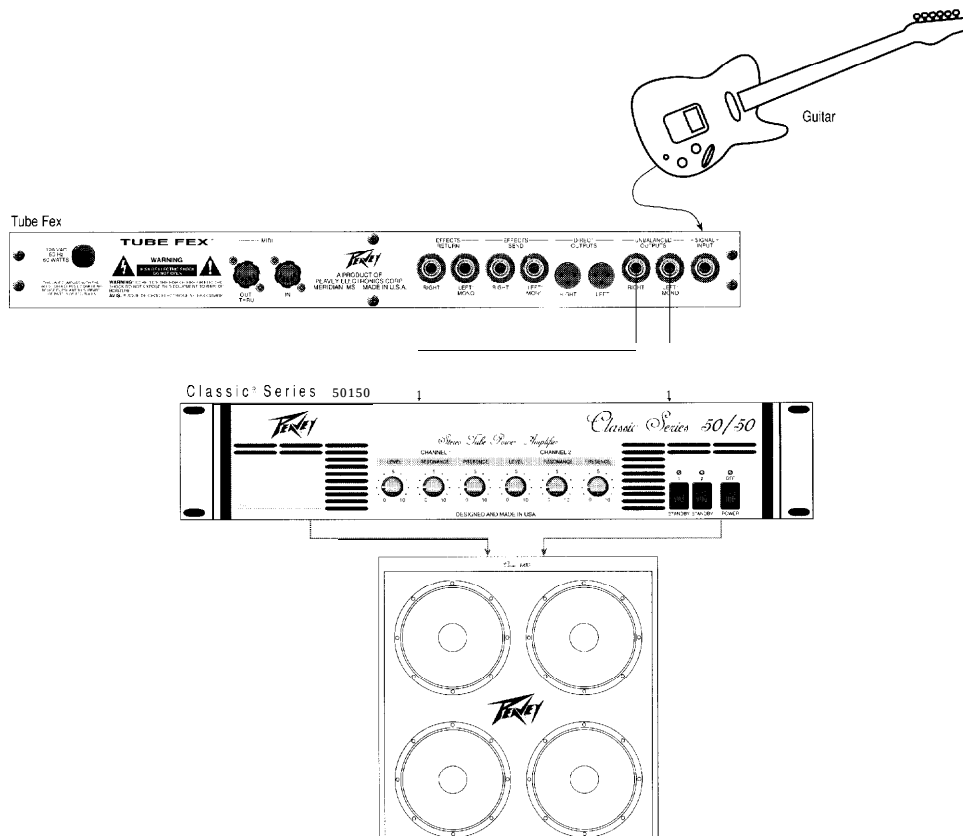
Quick Start

In an effort to make using our products easier to use, we have included this Quick Start section for all of you who just hate to read manuals (and those of you that don't need to read manuals). We hope this makes using your new Peavey equipment a more enjoyable experience. As always, we appreciate any comments you have on how to improve our products. (Hey, we'll even listen to comments about the manual!)

▼ To get started quickly

1. Well, the first thing you need to do (after opening the box and removing the Tube Fex), is to connect the Tube Fex to your system configuration. Here are some things to check first:

- 🔌 Make sure your amplification system is turned off.
- 🔌 Plug your guitar into the **Signal Input** jack (there's one on the front and rear of the Tube Fex, so pick the one that is most convenient).
- 🔌 For mono operation, connect the Left/Mono audio output of the Tube Fex into the audio input of your guitar amplifier or mono power amp. For stereo operation, connect the Left/Mono and Right audio outputs of the Tube Fex into the left and right audio inputs of your power amp or into two individual guitar amplifiers.
- 🔌 Plug the Tube Fex into an electrical outlet and turn on.
- 🔌 Turn on your amplification system.
- 🔌 See the diagram below.



2. Occasionally, plugging directly into a guitar amplifier may overload the input slightly. This won't damage the amplifier, but it will cause unwanted distortion of the signal. To correct this overload condition, press the **Global** button until the following display appears:

```
Inp Lev= 30    [GLOB]
Inp Lo Mi Hi Out
```

Move the cursor under **Out**. This allows you to change the output level of the Tube Fex. Press the ▼ button until you find a level where the unwanted distortion disappears (this usually happens when the output level is around 7). If you are using a power amp, you may want to increase the output level by pressing the ▲ button. See the section titled **Adjusting the Global Input and Output Levels and Global EQ**, on page 16 for more information.

3. (Optional) To send and receive MIDI information it is necessary to properly set up the Tube Fex.

➤ Press the **Global** button several times (the display should show [MIDI] in the upper right hand corner). The first parameter, **RC**, sets the MIDI Receive channel. Use the ▼ and ▲ buttons to change this to the desired channel.

4. Okay. Now it's time to play.

➤ Start playing your guitar; as you play, turn the Tube Fex's **Post Gain/Global Output Level** knob clockwise until you reach the desired level. The Tube Fex's display will show the current patch number. To select a different patch, use the ▼ and ▲ buttons.

5. That's it, you're done. (That wasn't so bad, was it?)

Introduction

(obligatory Opening)

Congratulations and thank you for purchasing the Peavey Tube Fex™. The Tube Fex is a MIDI programmable dual 12AX7 tube guitar preamp with 24-bit digital stereo effects processing in a one-rack-space unit.

The Tube Fex is two different signal processors in one unit. First, it is a dual-tube guitar preamp that delivers fat tone, crisp, clean settings, and thick distortions with a fully programmable, highly user-friendly interface. In fact, it is probably the most user-friendly MIDI-programmable tube preamp in the industry today. The gain and tone knobs are actually data encoders. Each is surrounded by eleven, easy-to-see LEDs that indicate each knob's setting. As each new program is called up, different LEDs around each knob light up, indicating the settings for the new program. You can change gain and tone settings by turning individual data encoders knobs, and when you find the setting you like, simply press the store button and the changes will be saved to the program.

The Tube Fex has 37 effects types available, including eight reverbs, three delays, chorus, flange, exciter, coil tap, auto pan, noise gate, stereo splitter, dual pitch shifters, tube and digital distortions, hum filter, envelope filter, stereo tremolo, compression, selectable front panel tone controls, four internal EQs, speaker simulator, and fx loop. Effects algorithms are completely user-definable and true-stereo effects chains can be written. The tube preamp can be placed anywhere in the effects chain. Even the digital distortion can be used simultaneously with the tube distortion to create unique stereo effects.

The Tube Fex features mono inputs and mono/stereo outputs.

FEATURES

- Up to seven simultaneous effects
- MIDI-programmable dual 12AX7 tube preamp
- MIDI-programmable digital stereo effects processor with over 30 effect types
- User-definable effects algorithms
- Selectable front panel tone controls, 3 internal graphic EQs, or a 4-band parametric EQ
- Stereo effects chains are fully independent
- Dual pitch shifters
- Programmable master output level on each effect
- 128 user programs, 128 factory presets
- RAM card slot for storing or adding 128 additional programs and presets
- Preamp gain and tone knobs are data encoders that allow changes in knob settings to be stored
- 11 easy-to-see LEDs around each knob indicate control position
- Programmable 4-position tube mode adds tube gain stages and utilizes passive and active EQs
- Programmable global room EQ and pre and post gain levels
- On-board chromatic tuner with programmable mute
- Mono inputs (front and rear panel), mono/stereo outputs, stereo balanced direct outputs
- Internal power supply
- Single rack space
- Programmable FX loop with stereo sends and returns
- Assignable clip LED
- Programmable speaker simulator
- and more

ABOUT THIS MANUAL

Still reading? We consider that very high praise indeed! Usually people don't want to bother reading manuals, they'd rather try and figure things out themselves, and that would be unfortunate because in this manual we try to provide you with the information necessary to make the most use of your new equipment. Not just technical stuff, but real everyday type information that will make using the Tube Fex much more fulfilling.

Have Fun.

This manual is separated into several distinct chapters.

Chapter 1, **Setup**, will show you how to setup the Tube Fex in several common application scenarios.

Chapter 2, **Overview**, provides an overview of the Tube Fex ranging from a list of the abbreviations to the user interface. This chapter is a must, don't miss it.

Chapter 3, **Editing Programs**, provides an overview of the effect structure, how to create a custom effects chain, editing individual effects parameters, storing your program, and more. Useful information that's not too technical. You should probably check this out.

Chapter 4, **Using MIDI**, shows you how to setup the Tube Fex to allow for sending and receiving of MIDI data, how to load programs into new (and their original) locations, storing program via MIDI, and more. You should definitely read this chapter, if for no other reason than to find out how to set the MIDI send and receive channels, and how to load programs.

Chapter 5, **RAM Cartridge**, deals with saving your programs in memory and storing them to a RAM cartridge. Useful only if you intend to store programs to cartridge.

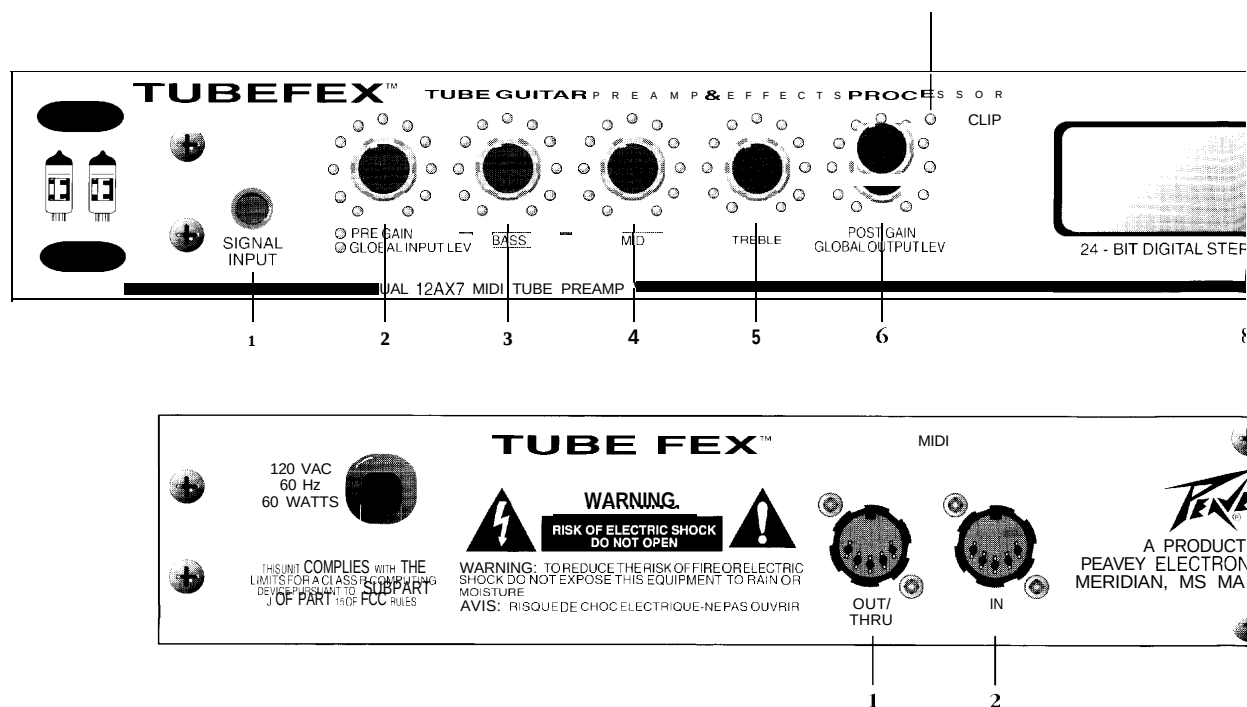
Appendix A, **Individual Effects**, is a reference section for those who want more information about the effects than is provided in Chapter 3. This chapter lists each effect, its parameters, and the range for each parameter. This section provides lots of information that the typical user probably doesn't need.

Appendix B, **MIDI Implementation**, is a chart that summarizes the MIDI support provided by the Tube Fex.

Appendix C, **System Exclusive Format**. At-e you sure you want to go here? This details the system exclusive command format for the Tube Fex. This is very technical, advanced users will gain the most from this.

Appendix D, **Remote Editing with SysEx**, shows you how to use system exclusive messages to program the Tube Fex. Again, this is very technical so advanced users will probably gain the most from this.

Chapter 1 Setup



THE FRONT PANEL

1. Signal Input

The Tube Fex comes with two Signal Input jacks. Both are used for instrument level signals. If an instrument is plugged into both the front and rear jacks, the one plugged into the front input jack will override the one plugged into the rear input jack.

2. Preamp Pre Gain/Global Input Level Knob

3. Preamp Bass/Global Bass Knob

4. Preamp Mid/Global Mid Knob

5. Preamp Treble/Global Treble Knob

6. Post Gain/Global Output Level Knob

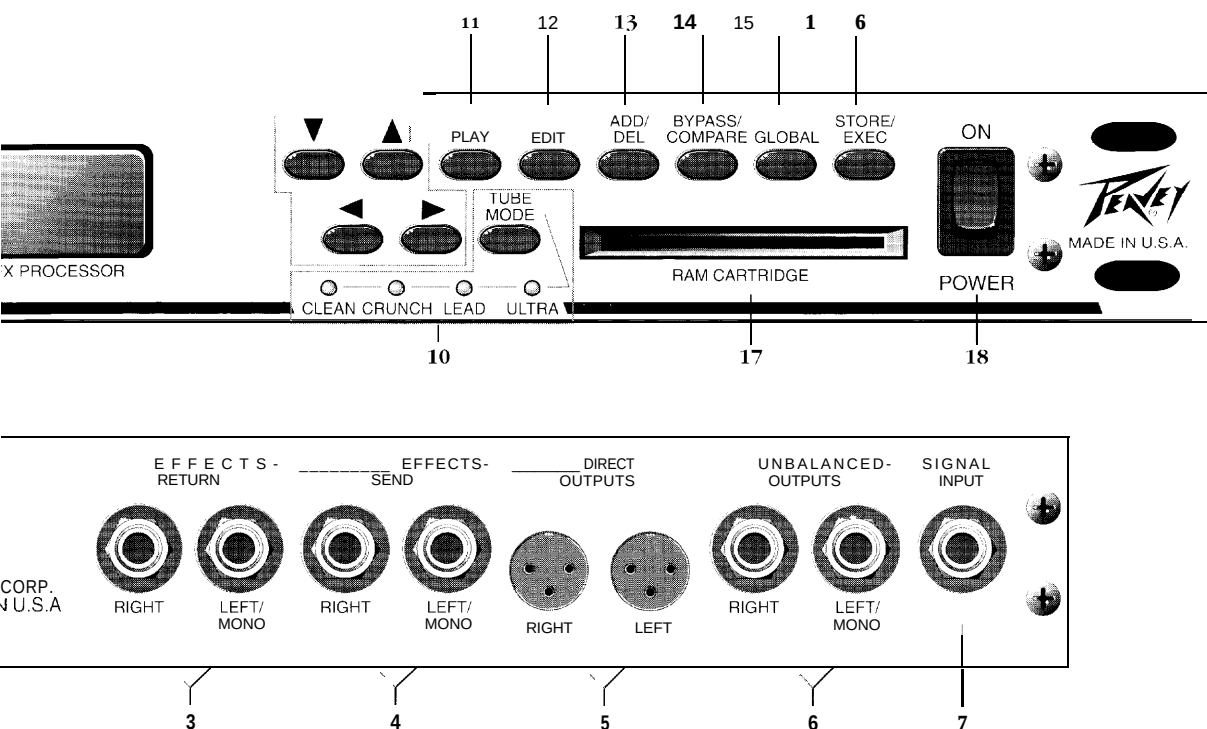
Knobs 2-6 are dual purpose knobs. When a preset contains the Tube (**TB**) effect in an effects chain, these knobs, when changed anywhere other than the **[GLOB]** page, adjust the **Pre Gain**, **Bass**, **Mid**, **Treble**, and **Post Gain**, respectively, of the tube. When The Tube (**TB**) effect *is not* present in an effect chain, these knobs adjust the **Input level**, **Bass**, **Mid**, **Treble**, and **Output level on a global** scale. This means that all presets are affected by these settings.

7. PreGain/Global Input Level LEDs

When in doubt about whether you are adjusting the Tube or the Global settings, just look at the front panel. Right by the **Pre Gain** knob you will see two LEDs, one located by **Pre Gain** and one located by **Global Input Level**. (Notice that only one is lit at any given time.) By glancing at these LEDs you can instantly determine whether you are changing the Tube or Global settings. If the LED by **Pre Gain** is lit, you are adjusting the Tube's pre and post gain and EQ. If the LED by **Global Input Level** is lit, you are adjusting the Global input, output and EQ.

8. Assignable Active Clip LED

This is a bicolor LED used to indicate normal activity and when clipping occurs. The LED will glow *green* during normal activity and will glow *red* when clipping occurs. The clip LED can be assigned and placed *anywhere* within the effects chain to help run down overload conditions.



9. Display window

20 character x 2 line Liquid Crystal Display (LCD) with variable view angle adjustment for easy visibility.

10. Arrow (Direction) Buttons

Use to navigate through the menus on the display: Left, Right, Up, or Down, and to increment or decrement selected values.

11. Tube Mode Button & LEDs

This button increases the number of tube gain stages. When Clean, Crunch, or Lead are selected the EQ is passive and you will use Pregain, Pad, Postgain, Bass, Middle, Treble, and Presence for editing the tube. When Ultra is used, the EQ is active and Bass, Middle, Treble, and Presence change to; Bottom, Body, Edge, and Shift, respectively.

12. Play Button

This button is used to access the preset selections program mapping, and program volume.

13. Edit Button

This button accesses the editing functions for constructing new presets or editing existing ones.

14. Add/Del Button

This button is used to “add” or “delete” effects from an effect chain.

15. Bypass/Compare Button

Dual function button used to compare two presets (the one being edited to the original) or to bypass the unit. When editing a preset the **Compare** function is accessed when this button is pressed. When in the play mode (press the Play button to enter the play mode) the **Bypass** function is accessed when this button is pressed.

Note: Only the digital effects can be bypassed. The tube preamp (**TB**) cannot be bypassed.

16. Global Button

This button is used to access the view angle adjustment, gain adjustment, MIDI settings, continuous controller assignments, global gain and EQ settings and the chromatic tuner.

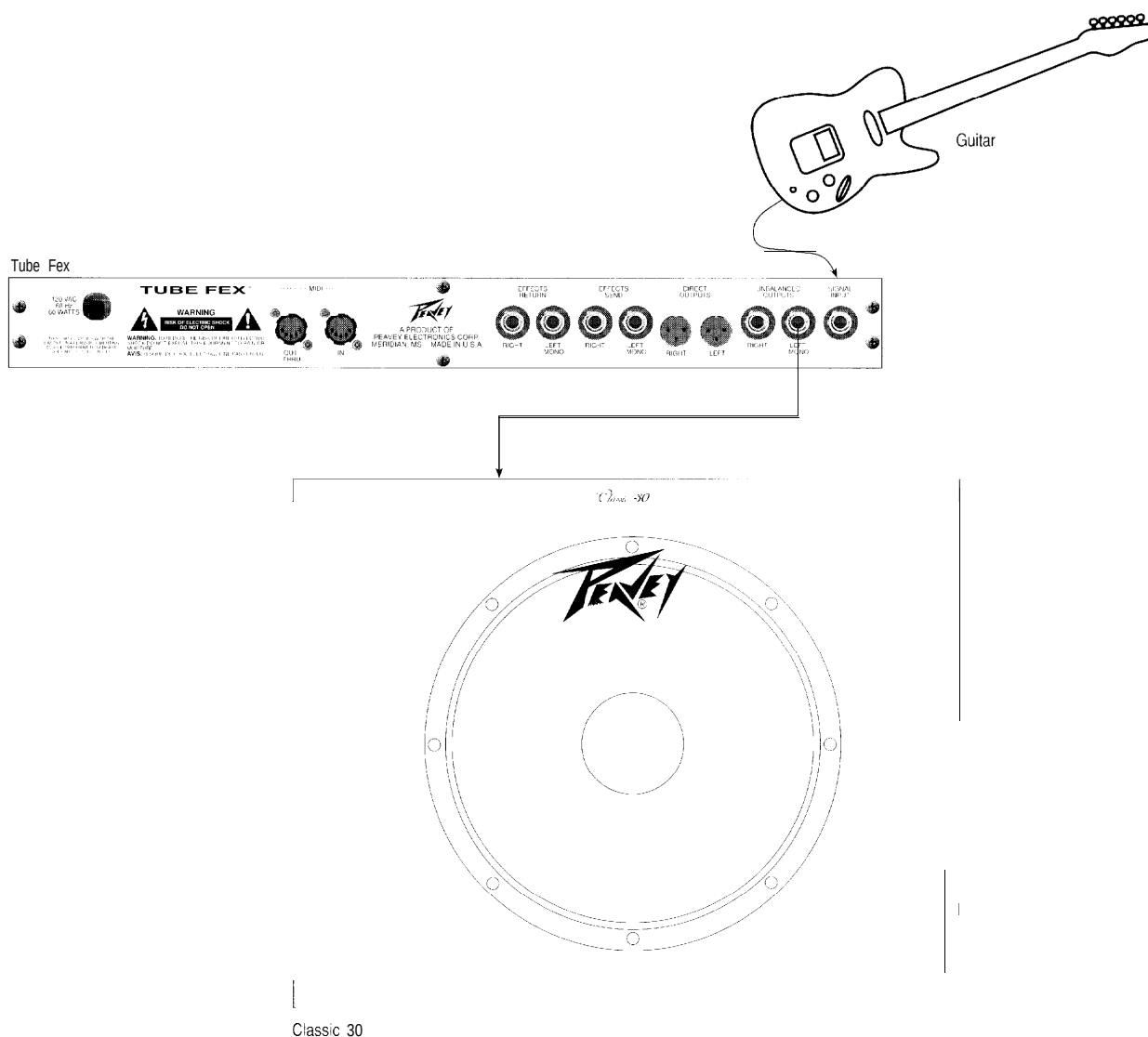
CONNECTION DIAGRAMS

There are many ways to connect the Tube Fex into your instrument system. Shown here are some recommended hookups to give you optimal performance in some common situations.

1. Using the Tube Fex direct into a mono guitar amp.

This is the basic setup many club-band guitarists use. To hook up:

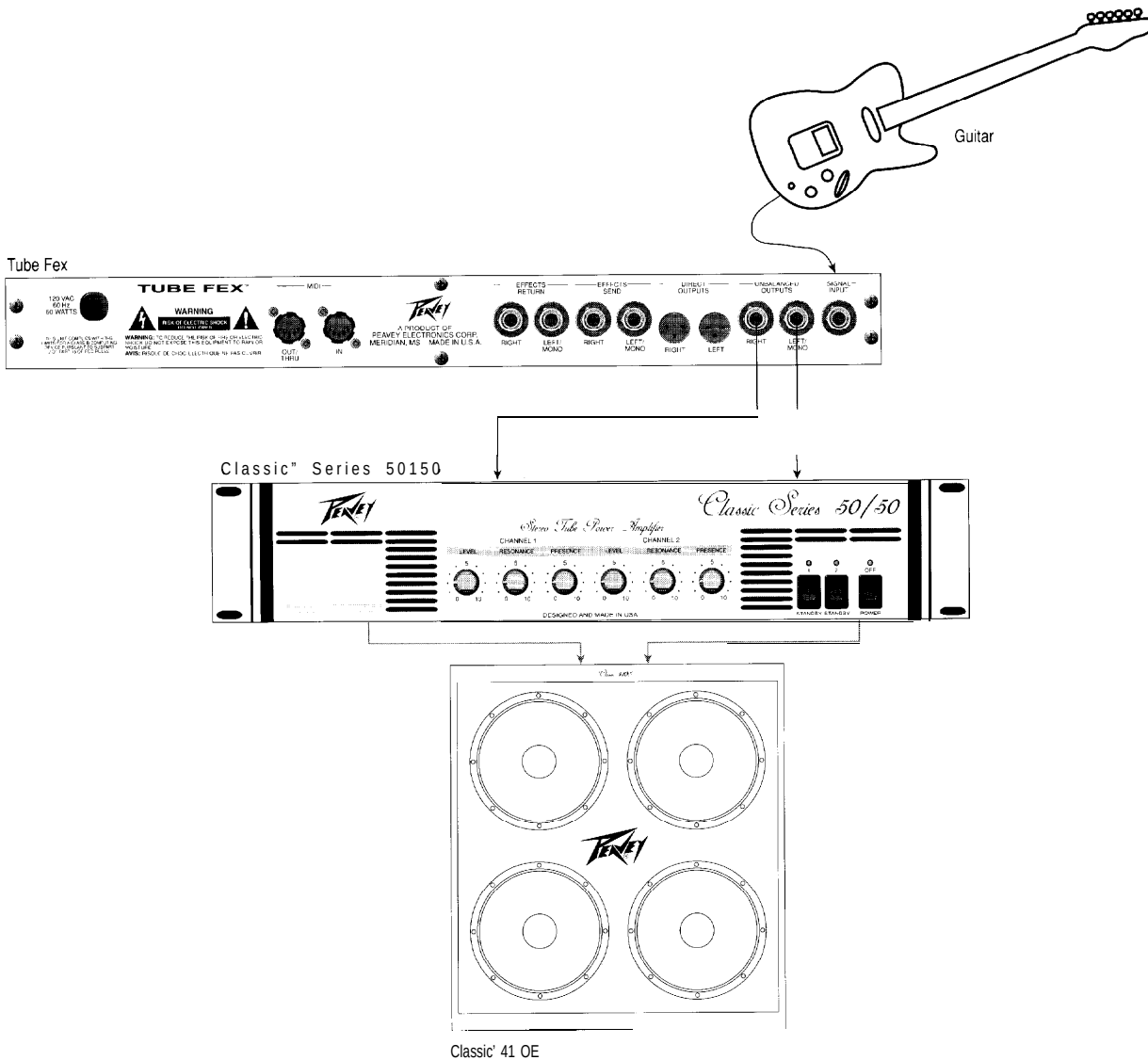
- Connect your guitar to the Signal Input jack on the Tube Fex.
- Connect the Left/Mono Unbalanced audio output to the input of the guitar amp.
- If the signal from the Tube Fex overloads the input of your guitar amp, press the **Global** button to access the **[GLOBI]** display and adjust the output level by placing the cursor under **Out** and pressing the **▼** button until the overload condition disappears.



2. Using the Tube Fex with a separate amplifier and speakers.

This is a typical home, practice, or stage setup where the Tube Fex is not directly connected into the P.A. system, but played through a separate amplifier and speakers. To hook up:

- Connect your guitar to the Signal Input jack on the Tube Fex.
- Connect the Left/Mono and Right Unbalanced Outputs (stereo) to the Left and Right Inputs of the amplifier, respectively. *For mono operation use the Left/Mono Output only.*
- If you haven't already done so, connect the Left and Right Outputs of the amplifier to speakers.

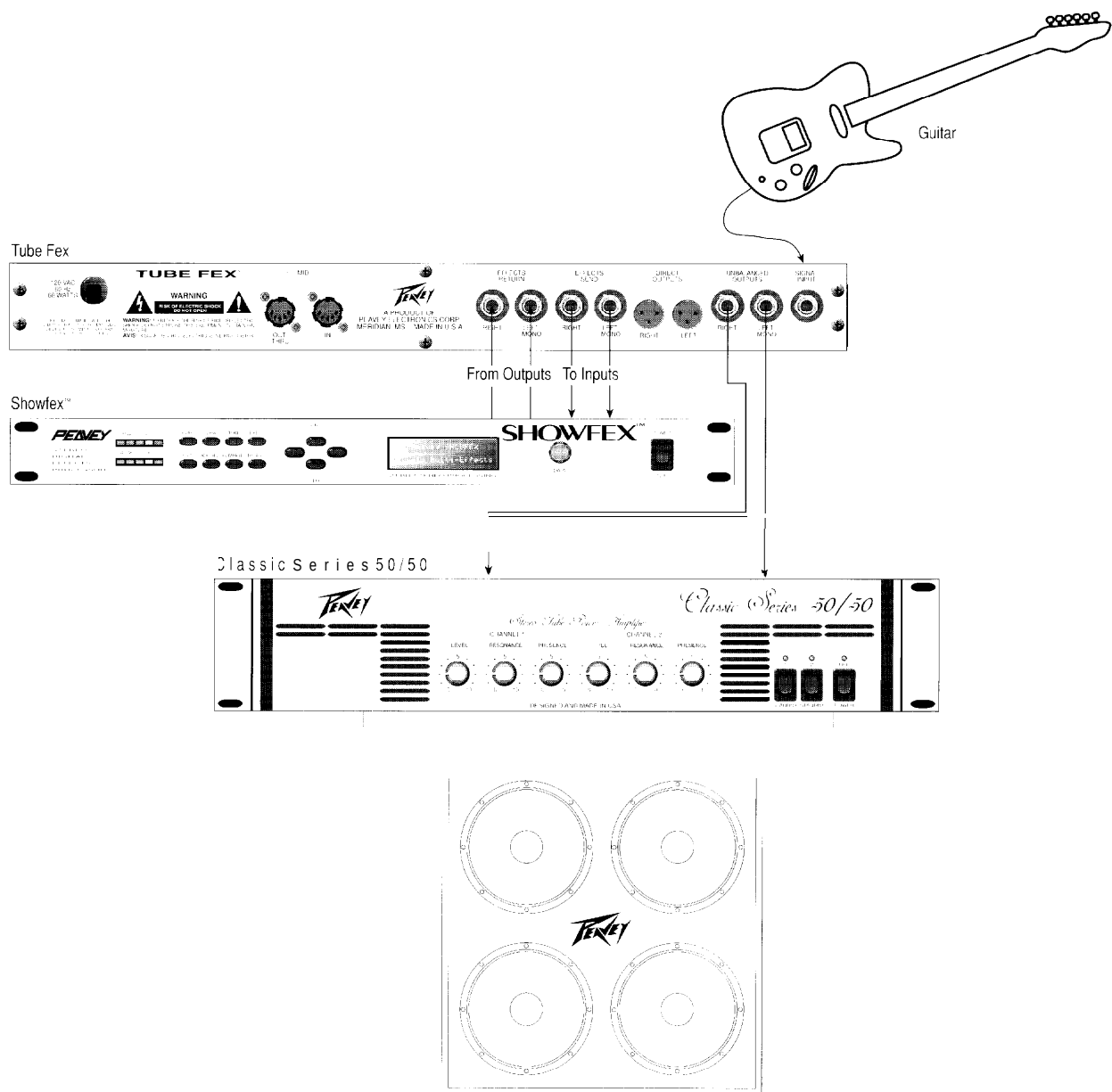


3. Using a separate preamp, distortion box, or effects processor in the Tube Fex effects loop.

If you wish to use the TubeFex with some added outboard effects processing, such as the Peavey Showfex™, you can put that processor into the programmable effects loop of the Tube Fex. To hook up:

- ✎ Connect your guitar to the Signal Input jack on the Tube Fex.
- ✎ Connect the Left/Mono and Right Effects Send jacks to the external device's Effects Inputs jacks.
- ✎ Connect the Left/Mono and Right Effects Return jacks to the external device's Effects Send jacks.
- ✎ Connect the Left/Mono and Right Unbalanced Outputs (stereo) to the Left and Right Inputs of the amplifier, respectively.
- ✎ If you haven't already done so, connect the Left and Right Outputs of the amplifier to speakers.

Note: For mono operation use only the Left/Mono jacks in the steps above.



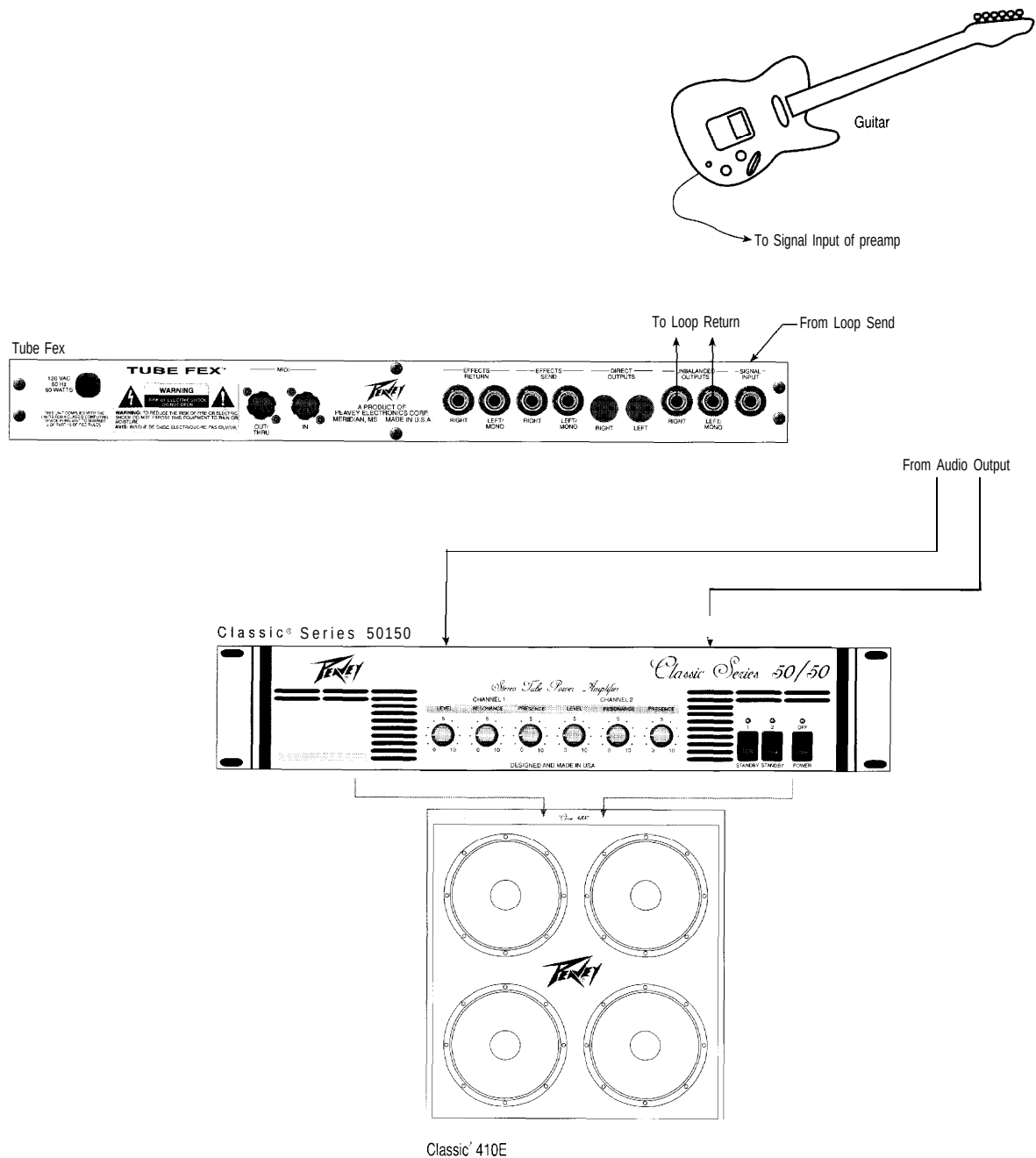
Classic 41 OE

4. Using the Tube Fex in the effects loop of a separate preamp.

In this case, the Tube Fex is used as an outboard effects processor of your preamplifier. To hook up:

- ✎ Connect your guitar to your preamp's input.
- ✎ Connect the preamp's Effects Loop send to the Signal Input jack on the Tube Fex.
- ✎ Connect the Left/Mono and Right Unbalanced Outputs to the Left and Right Loop Return of your preamp, respectively.
- ✎ Connect the Left and Right Outputs of your preamp to your amplifier's audio inputs
- ✎ If you haven't already done so, connect the Left and Right Outputs of the amplifier to speakers.

Note: For mono operation use only the Left/Mono jacks in the steps above.



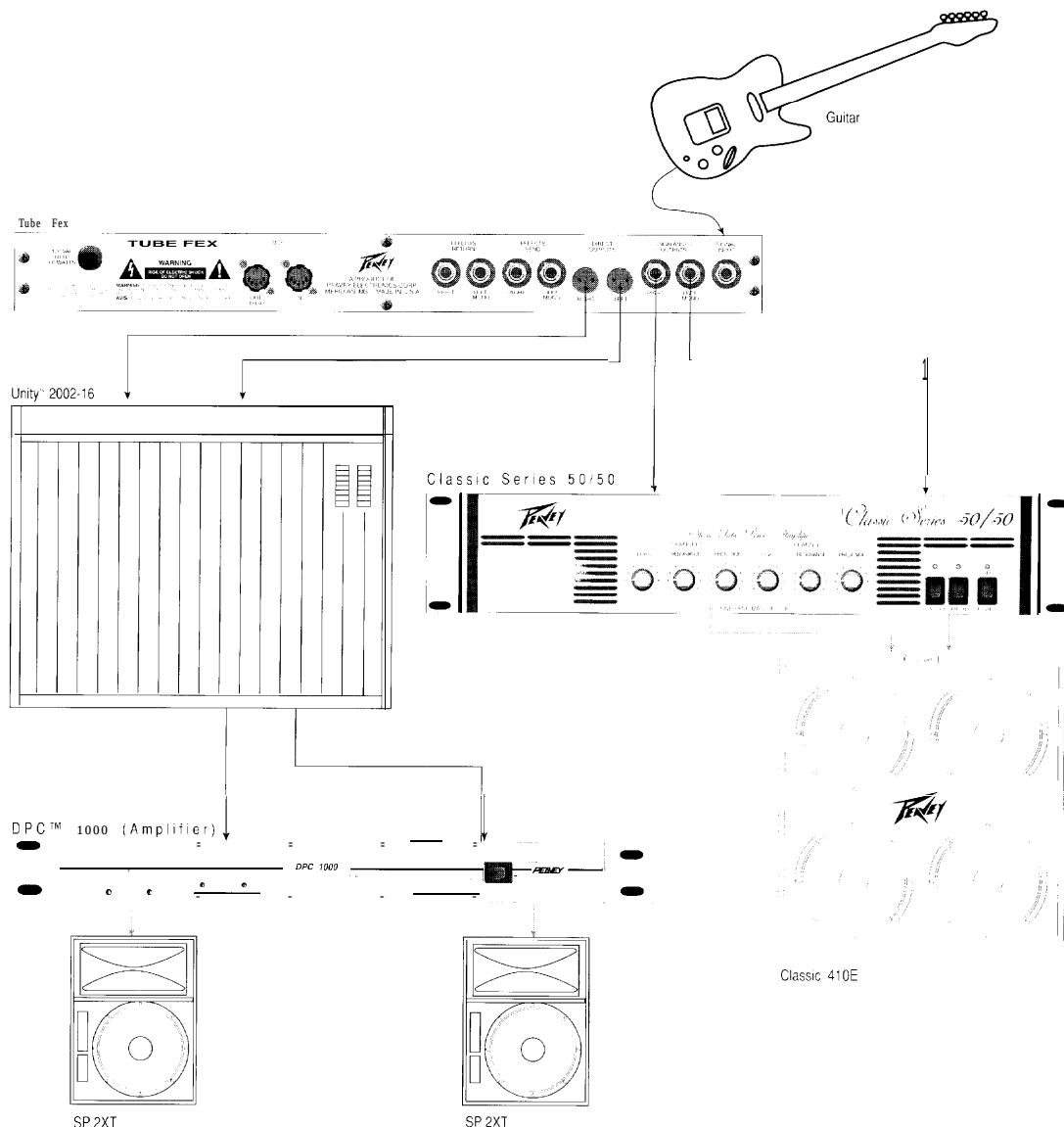
5. Direct connection to a mixing console.

When recording direct, or in some live situations, connect the Direct Outputs of the Tube Fex directly into two channels of a mixing console. If you are using the Tube Fex as a guitar preamp, you may want to experiment with building sounds using the Speaker Simulator effect. To hook up:

- Connect your guitar to the Signal Input jack on the Tube Fex.
- Connect the Left and Right Direct Outputs to the Left and Right mixer inputs, respectively.
- Connect the Left and Right Outputs of your mixer to your amplifier's audio inputs
- If you haven't already done so, connect the Left and Right Outputs of the amplifier to speakers.

Note: We've found the Tube Fex to be so recording friendly that you may not need to use the Speaker Simulator. Experiment and see.

Also, if you use the speaker simulator, you may want it to only affect the sound going direct-to-board. To get signal to your monitor amplifier insert the fx loop directly before the speaker simulator and use the fx loop sends to carry signal to your monitor amplifier.



THE FIRST TIME YOU TURN IT ON (REINITIALIZATION)

This procedure is recommended the first time your Tube Fex is turned on after purchase from your Peavey dealer. This ensures that the memory is initialized and that the battery is fully charged.

WARNING!

The following procedure will overwrite all changes made to the unit's memory storage, replacing them with factory settings. Only perform the following if you desire to re-initialize the unit.

1. While holding both the ▼ (**down /dec arrow**) and **right arrow** buttons on the front panel, power up the unit by hitting on the power switch.

The unit has now been initialized to factory settings. It is recommended that you leave the unit turned on for at least three hours at this time to ensure the battery has a full charge. The unit's battery should then last several years before replacement is required. The unit will warn you when the battery is getting low.

Battery replacement must be performed at an authorized Peavey Service Center.

Adjusting The Global Input And Output Levels, and Global EQ (Very Important)

Once the connections are all made, set up the input and output levels of the Tube Fex as follows:

Turn on the Tube Fex and press the **Global** button until you get to the **IGLOBI** display; set all level controls to 0: input level knob on the front of the Tube Fex, output level knob on the front of the Tube Fex, and the input level control on your power amp (if it has one).

Adjust the input level control on the front of the Tube Fex while playing your instrument. The level should be set so that the *Active/Clip* LED just begins to turn red on your absolute loudest playing level.

Then turn on your power amp. Set the input level control on the amplifier to your normal playing level. No sound will be heard from it yet.

Finally, slowly adjust the output level control on the front of the Tube Fex while playing until a suitable playing level is reached.

Set the Bass, Mid and Treble levels to taste. These settings are *global*. This is a very handy feature. For example: If you develop your effects at home and then go to a live stage and notice that there is not enough high end in that particular room/stage, all you must do is go to the **IGLOBI** display and adjust the Treble (to taste). This will affect all of your patches.

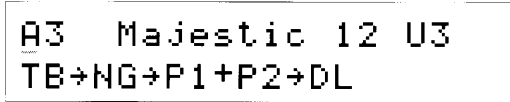
Chapter 2 Overview

GETTING STARTED

After connecting and adjusting the levels on the Tube Fex, you may wish to preview the sounds before continuing on. This short section describes how you can quickly access each of the sounds and gives a brief description of some of the functions of the optional MIDI Foot Controller.

Preview the Sounds from the Front Panel

Pressing the **Play** button twice will always ensure you are in *play mode*. The cursor (short flashing underline) will be under the letter **A**, **B**, or **C** in the top left corner of the display. This letter indicates the **program bank** that is currently selected. (See the section titled, **Setting Up Your Programs**.)



```
A3  Majestic 12 U3
TB→NG→P1+P2→DL
```

The number that immediately follows the program bank, is the **program number**. It is a number between 0 and 127. The name that follows the program number is the **preset name**. Following the preset name is a letter **U**, **F**, or **C** and the **preset number**. This is the **preset** currently being played. The letter indicates which **preset memory bank** this preset is stored in: **U** is for **user** preset memory, **F** is for **factory** preset memory, and **C** is for **cartridge** preset memory.

While the flashing cursor is under the program bank pressing the ▼ or ▲ buttons will change the program being played. In this manner you can listen to each one of the 128 presets in the bank. Incrementing above program 127 or decrementing below program 0 will switch to the next program bank.

DEFINITIONS AND ABBREVIATIONS

Before continuing on into the detailed operations of the Tube Fex, it would be helpful to understand some terms used in describing functions and capabilities of the unit. Also presented here is a reference list of the abbreviations you'll be running across while programming the Tube Fex.

Definitions

Preset: This is the storage location of all parameters pertaining to the sound itself. The preset can be thought of as the effects chain, the settings for all effects in the chain, and the settings of all continuous controllers for that effects chain. Each preset has a name. There are **two preset memory banks** in the Tube Fex: **factory** and **user**. When new, the user bank is identical to the factory bank; however, as you make changes to the presets or create new presets from scratch, you will be saving these changes in the user memory or the optional RAM cartridge. While you can make changes to the presets in the factory memory, those changes can only be saved to locations in the user memory or the cartridge. The factory presets will at all times be available unchanged, as they came from the Peavey factory. When a RAM cartridge is installed, a third bank of 128 presets becomes available for play, editing, and storage.

Program: A program is what changes when the Tube Fex responds to a MIDI program change command (such as those sent to the unit from an optional foot controller). Programs are merely pointers to presets. This really comes in handy when setting up your performance. You can arrange your presets into sets and banks so that they can easily be recalled in playing order from the front panel, from an optional foot controller, or via MIDI. The Tube Fex has two banks of programs inside it: Bank A and Bank B. Each has 128 programs in it, and each of these can be set to recall presets from either user preset memory, factory preset memory, or from the cartridge. The cartridge also provides a third program bank (bank C).

Abbreviations

Effect Types

CM - Compressor	CQ - 'Classic' Equalizer
DS - Distortion	PN - (Auto) Pan
OD - Overdrive	EF - Envelope Filter
CH - chorus	CT - Coil Tap
DL - Delay	EX - Exciter
HF - Hum Filter	SS- Speaker Simulator
P1- Pitch Shift 1	ST - Stereo Simulator
P2- Pitch Shift 2	NG - Noise Gate
RV - Reverb	SP- Splitter
5B- 5 Band Graphic Equalizer	FX- Effects Loop
3B-3 Band Sweep Mid Equalizer	TB- Tube (two 12AX7 tubes)
4B - 4 Band Parametric Equalizer	TR - Tremolo

Parameters

Ba, Bal - Balance	NgT - Noise Gate Threshold
BP - Band Pass	PD, Pdly - PreDelay
BW - Bandwidth	Pram - Parameter
C# - Control number	R - Right
Ch - Channel	Recv - Receive
Env - Envelope	Re, Reson - Resonance
EXEC - Execute	Sh, Shft - Shift
Fb, Fdbk - Feedback	Sim - Simulator
Flt - Filter	Slo - Slow
Fq, Freq - Frequency	Sn, S e n s - Sensitivity
Fst - Fast	Spkr - Speaker
L - Left	Thr - Threshold
LP - Low Pass	TS - Tape Simulator
Lvl - Level	Xmit - Transmit

CHROMATIC TUNER

The Tube Fex comes with a chromatic tuner to allow you to tune your guitar using the front panel display. To access the tuner:

▼ Chromatic Tuner

1. From *Play mode*, press the **Global** button one time. The following screen should be displayed:

```
ACCESS TUNER[TUNER ]
T u n e Mode      →EXEC←
```

2. Press the **Store/Exec** button to access the **Tuner** or move the cursor under **Mode** to change the Tuner mute status. To change the Tuner mute status, use the ▼ and ▲ buttons to change between **Bypass** and **Muted**.

```
Mode: MUTED  [TUNER]
Tune Mode
```

3. Pressing the **Play**, **Edit** or **Global** buttons will exit the Tuner into one of those particular pages.

Note: When entering the Tuner mode, any changes made while editing a preset will be lost unless they are first stored.

4. When the Tuner is accessed, you should see a display similar to one of the following:

```
----- I I -----
CNTS:+12 →← NOTE:A
Note is > 2 cents of being in tune.
```

```
■■■■■■■■■■--■■■■■■■■■■
CNTS:+1 →← NOTE:A
Note is ≤ 2 cents of being in tune.
```

The display on the right shows a note that is, essentially, tuned. The display on the left shows a note that is a little sharp and should be adjusted. Since the bar moves as it tracks the note, this display could also show the bar far to the left with a cents value of, **CNTS:+12**. This would indicate that the note was sharp.

Chapter 3 *Editing Programs*

PLAY MODE

Most of the time during performance, the Tube Fex will be in the *play mode*. The play mode is accessed by pressing the **Play** button. The Tube Fex also switches to play mode each time it responds to a MIDI program change command (such as those sent by an optional foot controller). A typical display for play mode is shown below:

```
A3  Majestic  12  U3  
TB→NG→P1+P2→DL
```

As described in the quick start section, the first letter A in the display (with the flashing cursor under it) indicates that the program being played is in program bank A. The number following it is the program number. The name is the name of the preset which that program points to. The U indicates that this preset is stored in user preset memory, and the number is the number of the preset.

On the bottom line of the display are the first five effects in the effect chain. (If the chain is longer than 6 effects, the others will not be shown. In this case, the chain is: Tube preamp is series with Noise **Gate** in series with **Pitch Shift 1** in parallel with **Pitch Shift 2** in series with Delay.

Note: Lower case letters indicate that the effect has been bypassed.

SETTING UP YOUR PROGRAMS

Any program from any bank can call up any preset. In performance this is an extremely handy feature. To change which preset is called by the program currently selected, press the **right** arrow button so that the cursor is flashing under the preset name. Use ▼ or ▲ buttons to select the preset you desire to have mapped to this program. Changes are automatically stored, so this is all you have to do. Press the **left** arrow button to select the program, switch to the next program, and set it up by repeating the above steps.

When a RAM cartridge is installed, programs in bank A or B can be programmed to point to presets stored on the cartridge. If at a later time the cartridge is removed and this program is selected, the display will show:

```
A2    *NO  CART*  C0  
CM→3B→OD→RV
```

The sound being played will not change. You should replace the cartridge, or select a new preset for this program.

A third program bank is available on the RAM cartridge. When reprogramming this bank, you must ensure that the cartridge write protect is disabled; otherwise you will get the following message:

```
CARTRIDGE  
WRITE-PROTECTED
```

The program will not change. For more information on the RAM cartridge see chapter 5.

PERFORMANCE PARAMETER CONTROL

Most effects' parameters can be varied during performance via MIDI control change commands. These are available from the optional foot controller. Each preset can have up to eight parameters that respond to these changes. Most of the factor); presets are set up with controllers assigned to them (see the playlist). Set the mode of the foot controller to control change. Select an active controller by pressing the necessary buttons on the foot controller corresponding to the effect to be controlled. Now using the ▼ or A buttons, you can change the value of that parameter during performance.

VOLUME CONTROL DURING PERFORMANCE

The Tube Fex will respond to MIDI volume change messages (controller #7). These changes are global. That is, they affect the unit even after the program is changed. A CV pedal assigned to controller #7 will act as a MIDI volume pedal. You can reassign the volume to a different control number if you wish. Volume can also be controlled from the front panel, but this is not usually done during performance. See chapter 4.

Chapter 4 Using MIDI

There are four major functions that can be performed via MIDI on the Tube Fex: change Programs/Banks; change effect parameters during performance via Continuous Controller messages; store presets on remote storage devices via MIDI system exclusive messages; and remotely edit and store any user accessible parameter using special Remote Editing SysEx messages. The Tube Fex can also be setup to transmit MIDI program change messages when a new program is selected from either the front panel or via MIDI.

TRANSMIT AND RECEIVE CHANNELS

MIDI messages are transmitted and received on one of sixteen different MIDI channels. The unit can be set to transmit messages on any of these channels, and to respond to valid incoming messages on any one or all sixteen channels. To change the channel the unit receives on, press the **Global** button until the MIDI menu appears as below:

```
Recv Ch=1    [MIDI]
RC TC TP DP LP DS LS
```

The cursor is flashing under RC (Receive Channel). Use the ▼ or ▲ buttons to select MIDI channel 1-16 or **OMNI**. **OMNI** will allow your unit to respond to valid MIDI commands received on any channel.

To change the MIDI channel the unit transmits on, press the **right arrow** button. The cursor is now flashing under TC (Transmit Channel). Use the ▼ or ▲ buttons to select the desired MIDI transmit channel (one through sixteen).

To turn the transmit program change feature on or off, use the **right** or **left** arrow buttons to position the flashing cursor under TP (Transmit Program Change). Use the ▼ or ▲ buttons to turn this feature ON or OFF. When ON, Transmit Program change will send a MIDI Program Change message out on the transmit channel each time the program is changed either from the front panel or via MIDI (including changes sent from an optional MIDI foot controller).

The other functions on the MIDI menu are system exclusive functions and are described in the section titled System Exclusive Remote Storage.

MIDI PROGRAM CHANGE AND BANK SWITCHING

The Tube Fex will respond to valid *MIDI Program Change* and *Bank Select* messages received on the unit's receive channel. Program changes will cause the unit to recall a program within the program bank currently selected. There are two banks of 128 programs in the unit's memory, bank A and bank **B**. A third bank, **C**, becomes available when the optional RAM cartridge is installed. Program banks can be changed on the front panel by incrementing the program above 127 or below 0 while in play mode, or by sending a MIDI bank select message to the unit.

The format of the MIDI bank select message is:

HO 00 00 20 00/01/02

(all numbers in hexadecimal)

where:

B0 00	=	MIDI continuous controller 0 (bank select)
00	=	bank high byte (always 0)
20	=	MIDI 2 byte data indicator
00/01/02	:	00 selects bank A, 01 selects bank B, 02 selects bank C

A MIDI bank select command will tell the unit to switch to a program in the new bank the next time the program is changed either via MIDI program change or from the front panel.

To set up the preset-to-program map, see chapter 2.

MIDI CONTINUOUS CONTROLLERS

Many of the factory presets in the TubeFex have MIDI continuous controllers assigned to them. The controller assignments are set up to take advantage of the *General Purpose Controller* messages transmitted by an optional MIDI foot controllers. Continuous controllers make temporary changes to effect parameters depending upon the value of the controller message received. These changes are only made in the DSP and not in Preset memory or the edit buffer. Continuous controllers are not intended for sound editing, but only for variation during performance. For a description of how to assign controllers to effect parameters, see chapter 3. For a list of controller assignments of the factory presets, see the playlist.

MIDI VOLUME CONTROL

The Tube Fex responds to *MIDI Volume* (controller 7) commands on its receive channel. You may turn this function on or off, change the controller that volume responds to, change the response scale, or manually change the global volume level. These functions are performed on the Volume menu under the **Global** button.

Press the **Global** button several times until the volume menu appears as below:

```
VOLUME= 100    [VOL]
midi:OFF #7    Sc=+50
```

With the cursor flashing under the volume level, use the ▼ of A buttons to adjust the volume. This volume level affects all presets and remains the same even while changing from one preset to another. That's why we refer to it as the *global* volume.

To turn the MIDI volume feature ON, press the **right arrow** button to move the cursor under **midi:OFF** on the bottom line of the display. Use the ▼ or ▲ buttons to turn MIDI volume ON or OFF.

To change the controller number to which the volume responds, place the cursor under the # sign on the bottom line, and use the ▼ or A buttons to select a new controller number.

The MIDI Scale can change the range of volume affected by the controller. A Scale of +50 will give you full range control. To vary this, place the cursor under SC for scale and use the ▼ or A buttons.

MIDI SYSTEM EXCLUSIVE REMOTE STORAGE

The Tube Fex can utilize MIDI System Exclusive (SysEx) to store and reload presets on a remote MIDI storage device such as a Peavey MIDI Librarian™, MIDI Streamer™, DPM® 3, or other sequencer or computer equipped with MIDI and the appropriate software. The Tube Fex can dump *all* the user presets, sets of ten presets, or individual presets. When reloading sets or individual presets, they can be loaded back to where they originated or into any other set or preset location. Presets can even be reloaded directly into the edit buffer.

MIDI SysEx functions are in the MIDI menu under the **Global** button. Press the **Global** button several times until the MIDI menu appears.

```
Recv Ch=1      [MIDI]
RC TC TP DP LP DS LS
```

To dump a single preset to an external storage device (or another Tube Fex): In the MIDI menu display press the **right** or left arrow button until the cursor is under DP (Dump Preset).

```
Dump Prst U1  →EXEC←
RC TC TP DP LP DS LS
```

Use the ▼ or A buttons to select the preset(s) (**1-128**, Prst All, or Edit Buf) to be dumped. Press the **Store/Exec** button to execute the dump. The display will briefly show:

```
SYSEX DUMP
in progress
```

Note: The MIDI transmit channel of the Tube Fex must be set the same as the MIDI receive channel on the external device unless the external device is set to OMNI.

The Tube Fex can also dump sets of presets. The sets are arranged as follows:

Set 0	0-9
Set 1	10-19
Set 2	20-29
Set 3	30-39
Set 4	40-49
Set 5	50-59
Set 6	60-69
Set 7	70-79
Set 8	80-89
Set 9	90-99
Set 10	100-109
Set11	110-119
Set12	120-127

To dump a set of presets to an external device (or another Tube Fex): In the MIDI menu display press the **right** or **left arrow** button until the cursor is under DS (Dump Set).

```
Dump Set  U1  →EXEC←  
RC TC TP DP LP DS LS
```

Use the ▼ or ▲ buttons to select the set (0-12) to be dumped. Press the **Store/Exec** button to execute the dump. The display will briefly show:

```
SYSEX DUMP  
in progress
```

Note: The MIDI transmit channel of the Tube Fex must be set the same as the MIDI receive channel on the external device unless the external device is set to OMNT.

LOADING SETS OR PRESETS TO THEIR ORIGINAL LOCATIONS

To load sets or presets to their original locations from an external storage device or another Tube Fex, set the MIDI receive channel to match the MIDI send channel on the external storage device (or other Tube Fex). Then send the set or presets to the Tube Fex. That's all there is to it!

Note: See the owners manual of the storage device for instructions on sending MIDI dumps.

LOADING SETS OR PRESETS TO NEW LOCATIONS

To load sets or presets to a new location. Set the MIDI receive channel to match the MIDI send channel on the external storage device or Tube Fex. Then select LP (Load Preset) if loading a preset to a new location or LS (Load Set) if loading a set to a new location. Select the new location. Then send the preset or set to the Tube Fex.

Note: The MIDI receive channel of the Tube Fex must be the same as the channel the data was *originally* transmitted on. An error message will appear if they are not the same. If this occurs, set the receive channel to the channel shown in the message and transmit again.

REMOTE EDITING USING MIDI SYSTEM EXCLUSIVE

A set of special system exclusive editing commands is available on the TubeFex. This will allow remote programming of all effect parameters, effect levels, the effect chain, and continuous controller assignments. The edit buffer can also be stored in any user preset location remotely. These changes can be heard immediately, but will not appear on the screen unless the parameter being edited is currently selected. See **Appendix B** for complete remote editing command information for programmers of remote editing devices or software.

HOW TO SETUP A CONTINUOUS CONTROLLER

For this example let's walk through the steps required to create a "wah wah" effect using a continuous controller pedal. Assuming you have a continuous pedal hooked up to the Tube Fex via a MIDI foot controller, first select or write a patch that has the envelope filter (EF) effect and store it. Then push the **Edit** button, select EF and push the **Edit** button again. Next, push the **Global** button until the following screen is displayed:

```
Recv Ch=1      [MIDI]  
RC TC TP DP LP DS LS
```

Move the cursor under RC and use the ▼ and A buttons to select channel 1. For this example we will assume your foot controller has channel 7 as a continuous channel send. Next push the **Global** button until the following screen is displayed:

```
ENVFLT Freq [CNTRL]  
#1 P r a m C# Ch Sc
```

Move the cursor under Pram and use the ▼ and A buttons to select Freq. Next move the cursor under C# and select **Cntrl#=7**. Next move the cursor under Ch and select RCV. Next move the cursor under Sc and select **+100**. It is important to note that the scale can be set from ± 100 allowing normal or reverse wah wah effects. You can set the scale anywhere in between to adjust the effect to your tastes. Next press the **Edit** button and move the cursor under Sn and select a sensitivity level. Try **+48** to start. Next move the cursor under Fq and select a frequency, try **50**. Next move the cursor under Rs and set the resonance, try 52. Next move the cursor under Ty to select a filter, try **LP-Slo**. Next move the cursor under Mx and try a mix level of 50%. Now work the continuous controller pedal to try the effect. Adjust the envelope filter parameters and the scale to suit your taste. Press the **Store** button to save the settings and continuous controller to your preset.

Note: If you get volume control instead of wah wah, push the **Global** button until the following screen is displayed:

```
VOLUME=100     [VOL]  
midi:ON  #7  Sc=+54
```

Move the cursor under **midi** and change the setting to OFF. Now try your effect. You can also use the 4-band parametric EQ to create this effect.

Chapter 5 RAM Cartridge

The optional RAM Cartridge acts as a memory extension for the storage of 128 additional presets. Presets can be accessed individually, and played directly off the RAM cartridge without the need to move them into internal user memory. The 128 additional programs appear as program bank C and can be set up to point to any preset in cartridge, user, or factory preset memory.

Note: The RAM cartridge menus are accessed through the **Global** button.

INITIALIZING NEW CARTRIDGES

RAM Cartridges are sold separately by your Peavey Dealer. Ask for the *Cache Card 32* part #71023. When new, cartridges must be initialized for use with the Tube Fex. To **do** this, press the **Global** button until you get to the CART menu. Place the cursor under In (Initialize), and press the **Store/Exec** button.

WARNING

Initializing the RAM Cartridge will overwrite all current data on the cartridge with the user presets.

SAVING PRESETS ON THE CARTRIDGE

Presets may be stored individually to the cartridge by using the normal store procedure, or all user presets may be saved on the cartridge by using the **Save User -> Cart** function on the CART menu. This function also writes program bank A into the program bank C, converting all pointers to user presets into pointers to cartridge presets in the process.

LOADING PRESETS FROM THE CARTRIDGE

Cartridge presets may be recalled individually from the cartridge to the edit buffer, or all presets may be loaded to user preset memory by using the **Load Cart -> User** function on the CART menu. This function also writes program bank C into program bank A, converting all pointers to cartridge presets into pointers to user presets in the process.

CARTRIDGE BATTERY

Most cartridges have a replaceable backup battery which maintains memory storage while the cartridge is removed from the unit or the unit is turned off. The battery will last from two to five years depending on the model. If the battery becomes low, the unit will warn you by periodically displaying the following screen:

CAUTION
Cart. Battery Low

Note: If this message is displayed you should back up your cartridge data immediately, then replace the battery and restore the backed up data to the cartridge.

Tutorials

Here are several of the most common functions performed with the Tube Fex in tutorial form.

Editing and Storing a Preset

Why edit a preset? While we try to provide presets that kick a . . . uh, that is, are useful, sometimes it is necessary to adjust parameter settings to achieve the sound you are looking for. The easiest way to do that is to edit an existing preset and store it to a user location (since the factory presets are “read-only”). Initially you may notice that the factory presets and the user presets look identical—they are. They are also identical whenever the Tube Fex is initialized. This is because the Tube Fex copies all the factory presets to the user preset locations when initialized. So if you don’t want to lose your presets, we suggest you save them via MIDI. The MIDI Streamer”, a MIDI Data Storage Processor, from Peavey is an excellent choice for doing this.

1. Press the **Play** button and use the ▼ and A buttons to select the preset you want to edit. The preset name/number in this example is Abduction U4.

```
A4   Abduction   U4
CM→TB→NG→RV
```

2. Press the **Edit** button one time.

```
CM→TB→NG→RV
```

3. Position the cursor under the effect you want to edit. Use the **left** and **right arrow** buttons to move the cursor.
4. Press the **Edit** button again.

```
Atk= X Fast [COMPRS]
Atk Rel Sus Lev NgT
```

5. Position the cursor under the parameter you want to change. Use the **left** and **right** arrow buttons to move the cursor.
6. Change the value using the ▼ and A buttons. (Go ahead, experiment!)
7. Repeat steps 3 through 6 until all changes are made.
8. Now its time to store the changes you made (you don’t want lose your changes, do you?).
9. Press the **Store** button.

```
STORE [Abduction ]
TO U4   Abduction
```

10. From this display it is possible to change the name of the preset and set the storage location.
11. To change the name: Press the **left arrow** button until the cursor is under the first character of the name, then use the ▼ and A buttons to change the character.
12. To change the storage location: Press the **left arrow** button until the cursor is under the storage location, then use the ▼ and A buttons to select the new user storage location.
13. That’s it! You have just successfully edited and stored a preset. Congratulations!

Program Mapping

'Twas the night before Christmas and all through the house not a creature was stirring, not even a mouse... whoops, wrong story.

Once upon a time there lived a musician who was very discouraged with the trouble he had to go through to change from one preset to the next (he had only one button to use, and all it did was go up one preset at a time...gasp!). He wished that it was possible to take his favorite and most useful presets and place them in such a way that he could move from one to the next with ease, but he didn't want to reprogram them, that would be too cumbersome. It was then that this young musician discovered a wondrous invention—program mapping. This magical thing called a Program Map allowed the musician to place all his favorite presets in whatever order he chose—it was a dream come true, and he programmed happily ever after.

Okay, maybe a Program Map isn't "wondrous" or even "magical" but it is a useful way to move from one preset to the next when you are using the front panel, or a foot controller with an increment and decrement button.

A Program Map is simply a diagram that points from a **program** (say, A1) to a **preset** (for instance, **DualGuitar U 1**).

When new, or reinitialized, the Tube Fex restores the Program Map to the factory default settings, where the program number corresponds one-to-one with the preset number (e.g., A0=U0...A50=U50, etc.)

The following tutorial should help to illustrate the usefulness of the Program Map.

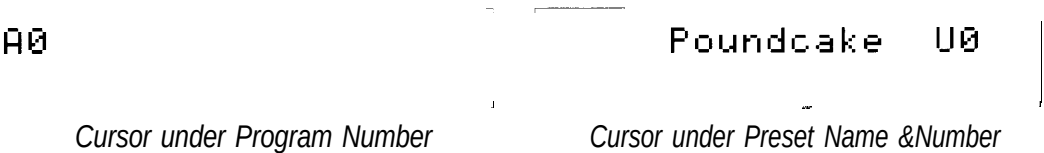
Suppose you have the following presets that you use all the time and you want to be able to have quick access to them from the front panel of the Tube Fex:

Preset #	Preset Name	Current Program Map #	Target Program Map #
U110	Thru0 Dirt	A110	A0
F112	OutOfPhase	B112	A1
U12	SwarmKorus	A12	A2
F64	FOLLOW WAH	B64	A3

Going from one preset to the next without mapping them would be nearly as bad as what our young musician had to put up with. (Just think about changing from **Thru0Dirt** to **OutOfPhase** using the ▼ and ▲ buttons!)

Luckily, we are going to show you an easier way using the Program map. Pay attention, we're only going to do this once.

- 1. Press the **Play** button. This places you in the play mode. In this mode you can view both the program number and the preset name/number on one screen. For instance:



- 2. Press the **right arrow** button one time to place the cursor under the preset name. This leaves you in program number A0, but allows you to change the preset name/number assigned to A0.

```
A0    Poundcake U0
TB→P1→P2→NG→DL
```

3. Use the ▼ and ▲ buttons to change Poundcake U0 to **Thru0** Dirt U 110. At this point you are telling the Tube Fex-“I want to stay in program number A0, but I want to change the preset that program number **A0** calls up from Pouindcake U0 to **Thru0** Dirt U **110**.”

```
A0    Thru0 Dirt U110
DS→DL+CH
```

4. Press the **left** arrow button one time to place the cursor under the program number. (Notice that when the cursor is under the program number, both the program number and the preset name/number change when either the ▼ and A button is pressed.)

```
A0    Thru0 Dirt U110
DS→DL+CH
```

5. Press the A button one time to move to program number A1. This is like saying -“Okay, I’m through with program number A0, now I want to go to program number A1 and assign a preset to it.”

```
A1    DualGuitar U1
SP→TB→NG→DL→CM→DS→CH
```

6. Press the right arrow button one time to place the cursor under the preset name.

```
A1    DualGuitar U1
SP→TB→NG→DL→CM→DS→CH
```

7. Use the ▼ and A buttons to change **DualGuitar** U 1 to **OutOfPhase** F 112.

```
F112  OutOfPhase
      T→DL→RV
```

8. Press the **left** arrow button one time to place the cursor under the program number.

```
A1    OutOfPhase F112
DS→CT→DL→RV
```

9. Press the A button one time to move to program number **A2**.

```
A2    The Bosman U2
P1→SP→TB→NG→DL→DS→CH
```

10. Press the **right** arrow button one time to place the cursor under the preset name.

```
A2   The Bosman U2
P1→SP→TB→NG→DL→DS→CH
```

11. Use the ▼ and A buttons to change The Bosman **U2** to **SwarmKorus U 12**.

```
A2   SwarmKorus U12
TB→TR→CH→P1+P2→DL
```

12. Press the **left arrow** button one time to place the cursor under the program number.

```
A2   SwarmKorus U12
TB→TR→CH→P1+P2→DL
```

13. Press the ▲ button one time to move to program number A3.

```
A3   Majestic12 U3
TB→NG→P1+P2→DL
```

14. Press the **right** arrow button one time to place the cursor under the preset name.

```
A3   Majestic12 U3
TB→NG→P1+P2→DL
```

15. Use the ▼ and ▲ buttons to change Majestic12 U3 to FOLLOW WAH F64.

```
A3   FOLLOW WAH F64
TB→EF→CQ→CH→ST→RV
```

16. Congratulations! You are now a Program Mapping pro. (Okay, maybe you're not a pro yet but at least you're familiar with program mapping.)

Assignable Clip LED

After you've written a new preset, if you notice that the Clip LED changes from green to red, this means you have an overload problem somewhere in the effects chain. No problem! Push the **Global** button until the following screen appears:

```
Bypass Mode: DIRECT
By VA Mtr
```

Move the cursor under Mtr and using the ▲ and ▼ buttons you can move the clip LED to the output of each segment of the effects chain. As you move the clip LED play your instrument and watch the clip LED. It will stay green for the effects that have correct output levels, but will turn red when you find the effect, input or output that is overloading. Once you locate the problem, simply press the **Edit** button and adjust the effect or its output level to fix the overload.

Global Stuff: Utility, MIDI and Controller Screens

These mini-tutorials provide instruction on several of the most common global settings for the Tube Fex. Each mini-tutorial is independent of the previous mini-tutorials. This allows you to learn what you want when you want to and proceed without wondering if you missed anything in a previous mini-tutorial!

Setting the View Angle

1. Press the **Global** button until the following screen is displayed:

```
Bypass Mode: DIRECT
By VA Mtr
```

2. Position the cursor under VA, use the **right** or left **arrow** button. Use the ▼ and ▲ buttons to adjust the display to a comfortable viewing angle.

Setting the MIDI Receive Channel

1. Press the **Global** button until you get to the MIDI screen.

```
Recv Ch=1      [MIDI]
RC TC TP DP LP DS LS
```

2. Position the cursor under RC; use the **right** or **left arrow** button. Use the ▼ and ▲ buttons to change the channel over which MIDI messages are received.

Setting the MIDI Transmit Channel

1. Press the **Global** button until you get to the MIDI screen.

```
Xmit Ch=2      [MIDI]
RC TC TP DP LP DS LS
```

2. Position the cursor under TC; use the **right** or **left arrow** button. Use the ▼ and ▲ buttons to change the channel over which MIDI messages are transmitted.

Dumping a Preset

1. Press the **Global** button until you get to the MIDI screen.
2. Position the cursor under TC; use the **right** or left **arrow** button. Use the ▼ and ▲ buttons to change the channel over which MIDI messages are transmitted. (Make sure the receiving unit is set to receive on the channel selected.)

```
Xmit Ch=2      [MIDI]
RC TC TP DP LP DS LS
```

3. Position the cursor under DP; use the **right** or **left arrow** button. Use the ▼ and A buttons to select the preset to dump via MIDI.

```
Dump Prst U3 →EXEC←  
RC TC TP DP LP DS LS
```

4. Press the **Exec** button to send the preset. The following display is shown:

```
IGNORING SYSEX  
on channel 3
```

Loading a Preset (to a new location)

(Loading a preset to its original location does not require a procedure. Simply send the preset from the transmitting unit. The Tube Fex will automatically store it in its original location.)

1. **Press** the **Global** button until you get to the MIDI screen.
2. Position the cursor under RC; use the **right** or **left arrow** button. Use the ▼ and A buttons to change the channel over which MIDI messages are received. (Make sure the sending unit is set to transmit on the channel selected.)

```
Recv Ch=1 [MIDI]  
RC TC TP DP LP DS LS
```

3. Position the cursor under **LP**; use the **right** or **left arrow** button. Use the ▼ and ▲ buttons to select the preset to receive via MIDI.

```
Load Prst U8  
RC TC TP DP LP DS LS
```

4. Now send the preset to the Tube Fex from the transmitting unit. You should see the following display:

```
SYSEX DUMP  
in progress
```

If you see:

```
IGNORING SYSEX  
on channel 3
```

You need to:

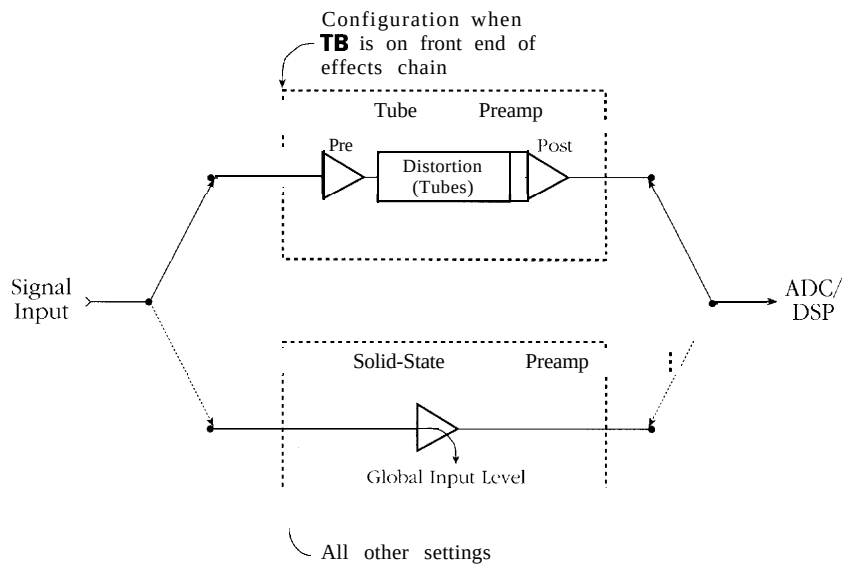
- ➡ Set the receive channel on the Tube Fex to the MIDI channel shown in the display.
- ➡ Send the preset again from the transmitting unit.

Appendix A Individual Effects

Tube (TB)

The Tube effect uses the two 12AX7 tubes to alter the audio signal in a more traditional manner. The Tube effect has four modes (or voices) to select from. These are accessed by using the **Mode** button.

Note: To change the tube mode you must be in Play Mode (accessed by pressing the Play button), Edit Mode (accessed by pressing the **Edit** button), or the Tube page (accessed when you press the **Edit** button a second time to begin editing the Tube parameters).



Note: The Global Input Level is non-functional when the Tube (**TB**) is at the front of the effects chain.

- 🔊 **CLEAN** Two gain stages and a passive EQ to achieve clean to slightly distorted tones.
- 🔊 **CRUNCH** Three gain stages and a passive EQ for medium distortion amounts.
- 🔊 **LEAD** Four gain stages and a passive EQ for high gain distortion.
- 🔊 **ULTRA** Same as Lead, except with active EQ, allowing for greater tonal variation.

Parameters

- Pr:* The **Pr** (Pregain) parameter adjusts the amount of gain the signal has before entering the tubes. Range is **0-100**. When **TB** (tube) is present in a chain, turning the **Pre** Gain knob will alter this parameter's value even if you are not directly editing the **TB** parameters.
- Pd:* The **Pd** (Pad) parameter changes gain of first tube stage without effecting tone. Select either **Hi** (for distortion) or **Lo** (for clean).
- Pt:* The **Pt** (Postgain) parameter adjusts the amount of gain the signal has as it leaves the tubes. Range is **0-100**. When **TB** (tube) is present in a chain, turning the **Post Gain** knob will alter this parameter's value even if you are not directly editing the **TB** parameters.

Note: The previous three parameters apply to all four tube modes; however, the following four parameters (**Bs**, **Mi**, **Tr**, **Ps**) change to (**Bt**, **Bd**, **Sd**, **Sh**), respectively, when **ULTRA** is selected as the mode.

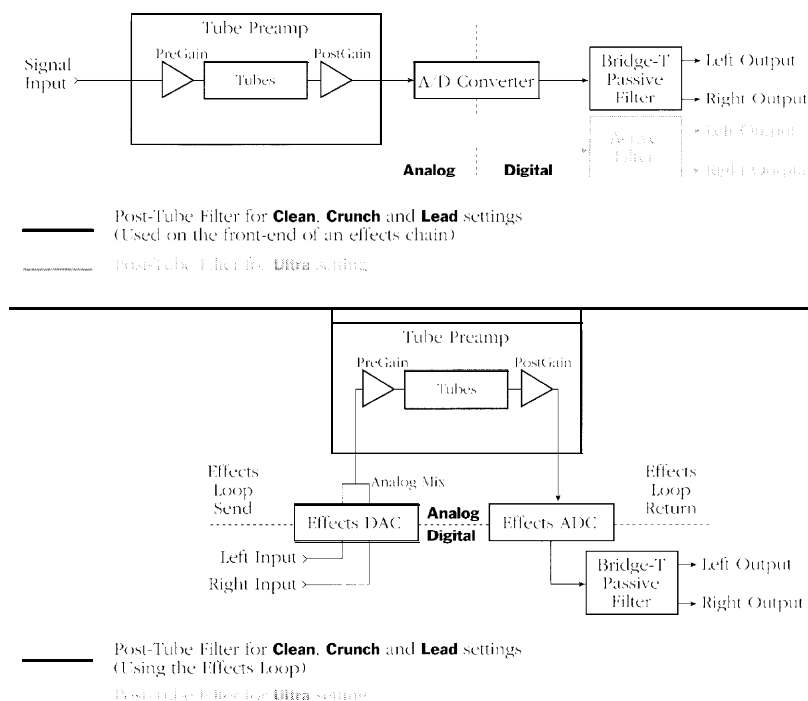
Clean, Crunch, Lead parameters (Passive EQ)

- B.S.** The **Bs** (Bass) parameter adjusts the amount of low frequencies present in the audio signal. Range is **0-100**. When TB (tube) is present in a chain, turning the **Bass** knob will alter this parameter's value even if you are not directly editing the TB parameters.
- Mi.** The **Mi** (Middle) parameter adjusts the amount of midrange frequencies present in the audio signal. Range is **0-100**. When TB (tube) is present in a chain, turning the **Mid** knob will alter this parameter's value even if you are not directly editing the TB parameters.
- Tr:** The **Tr** (Treble) parameter adjusts the amount of high frequencies present in the audio signal. Range is **0-100**. When TB (tube) is present in a chain, turning the **Treble** knob will alter this parameter's value even if you are not directly editing the TB parameters.
- Ps:** The **Ps** (Presence) parameter determines the amount of high frequency boost or cut. Range is **±30**.

Ultra parameters (Active EQ)

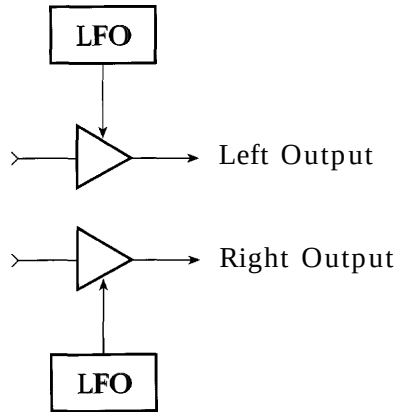
- Bl.** The **Bt** (Bottom) parameter adjusts the amount of low frequencies present in the audio signal. Range is **±50**. When TB (tube) is present in a chain, turning the **Bass** knob will alter this parameter's value even if you are not directly editing the TB parameters.
- Bd.** The **Bd** (Body) parameter adjusts the amount of midrange frequencies present in the audio signal. Range is **±50**. When TB (tube) is present in a chain, turning the **Mid** knob will alter this parameter's value even if you are not directly editing the TB parameters.
- Ed.** The **Ed** (Edge) parameter adjusts the amount of high frequencies present in the audio signal. Range is **±50**. When TB (tube) is present in a chain, turning the **Treble** knob will alter this parameter's value even if you are not directly editing the TB parameters.
- Sh.** The **Sh** (Shift) parameter determines the center of the two mid-frequency bands. Range is **300Hz to 900Hz** in 10 Hz increments.

Note: The Effects Loop (**FX**) is only available when the Tube (**TB**) effect is on the front-end of an effects chain or when it is not used at all.



Tremolo (TR)

The stereo Tremolo effect is the traditional amplitude modulated effect, with the exception of allowing independence between left and right channels.

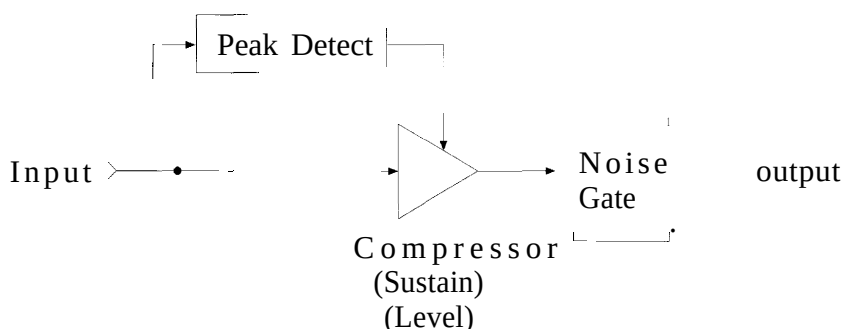


Parameters

- Lsp:* The **Lsp** (Left Speed) parameter adjusts the speed of the left modulator. Range is **0.0-10.9Hz** in increments of 0.1 Hz.
- Lin:* The **Lin** (Left Intensity) parameter determines the amount of left signal being modulated. Range is **0400%**.
- Rsp:* The **Rsp** (Right Speed) parameter adjusts the speed of the right modulator. Range is **0.0-10.9Hz** in increments of 0.1 Hz.
- Rin:* The **Rin** (Right Intensity) parameter determines the amount of right signal being modulated. Range is **0400%**.

Compressor (CM)

The Compressor effect suppresses high input levels while boosting small signal levels as the input decreases. The net result is a more consistent output volume and increased sustain.

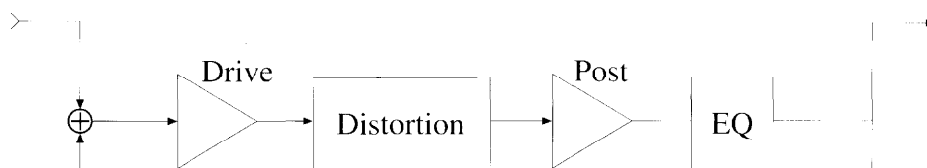


Parameters

- Atk:* The **Atk** (Attack) parameter adjusts the speed at which the compressor responds to increases in signal level. Range is from **X Slow to X Fast**.
- Rel:* The **Rel** (Release) parameter adjusts the time for the output signal to decay. Range is from **X Slow to X Fast**. Setting the release to **X Fast** results in a very rapid decay, while setting the release to **X Slow** results in a very slow decay.
- Sus:* The **Sus** (Sustain) parameter provides seven levels of sustain to vary the maximum amount of gain that can be achieved by the compressor at small signal levels. Range is **0-6**.
- Lev:* The **Lev** (Level) parameter adjusts the maximum output of the compressor. Range is **0-100%**.
- NgT:* At low signal levels, a compressor's gain may be very high, thus raising the level of noise output with no signal present. The **NgT** (Noise Gate Threshold) parameter provides ten levels of noise suppression on the output. Range is **1-10**.

Distortion (DS)

The Distortion effect consists of a digital distortion followed by an equalizer section. This is a mono effect.



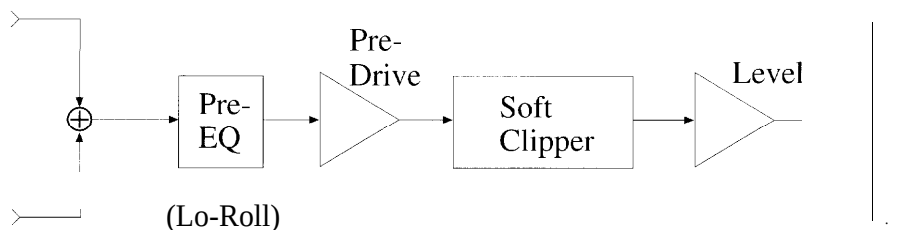
Parameters

- Dr:* The **Dr** (Drive) parameter- controls the amount of distortion by pre-filtering and boosting the input signal. Range is **0-100**.
- Ps:* The **Ps** (Post Gain) parameter is used to reduce the signal level to prevent overdriving the EQ section of the effect. Range is **0- 100**.
- Ft:* The **Ft** (Fat) parameter controls the low frequency gain. Parameter range **±50**.
- Ed:* The **Ed** (Edge) parameter controls the high frequency gain. Range is **±50**.
- Bd:* The **Bd** (Body) parameter controls the mid frequency gain. Range is **±50**.

- Sh.* The **Sh** (Shift) parameter is used to select the center point of the mid frequency range. The shift frequency is adjustable from 300 Hz to 900 Hz in 10 Hz increments.
- Rs.* The **Rs** (Resonance) parameter adjusts the bandwidth of the midrange frequency. Range is 0.1 to 4.9.

Overdrive (OD)

The Overdrive effect consists of an overdrive type digital distortion. Overdrive is a mono effect.



Parameters

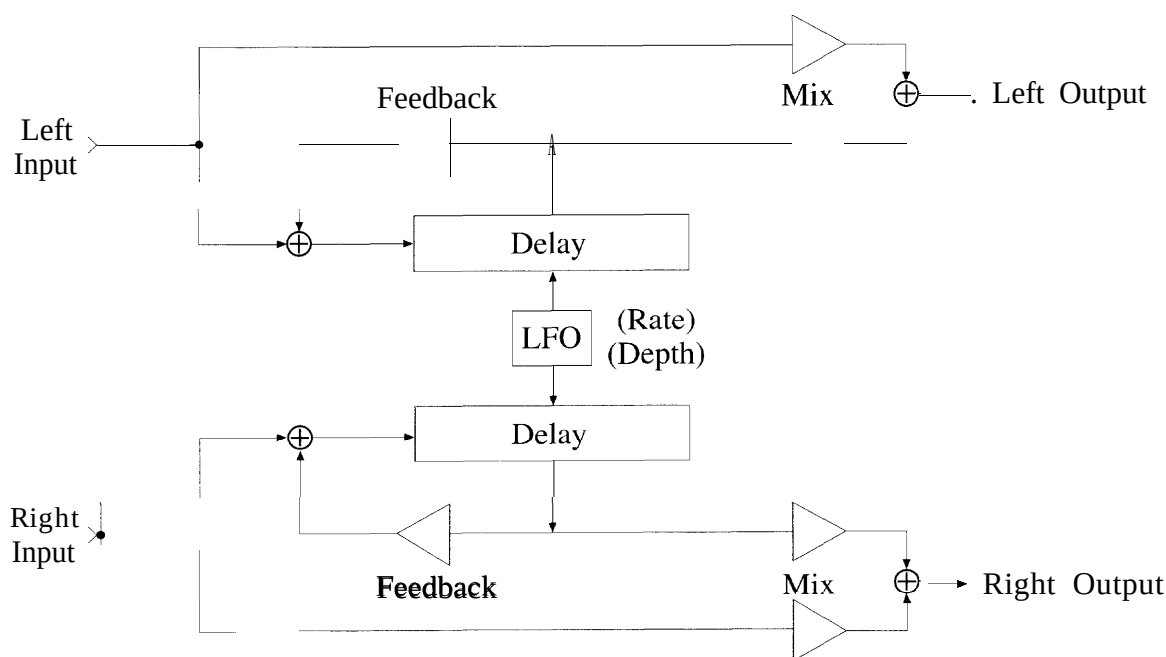
- LR:* The **LR** (Low Rolloff) parameter is used to adjust the overall tone by rolling off the low frequencies. Range is NORML, and 0.1 to 1.9 (kHz).
- PD:* The **PD** (Pre Drive) parameter is a gain control used to overdrive the signal. Range is 1-10.
- Cl:* The **Cl** (Clip) parameter is a “soft-clipping” control which provides increased sustain. Reducing the clip level increases the sustain. Range is 0-99.

Note: As the clip level is reduced, the overall output level of the overdrive is reduced. Therefore, very low clip levels will require a large increase in output volume. This can greatly decrease the dynamic range of the effect and increase noise.

- Lv.* The **Lv** (Level) parameter adjusts the output level of the Overdrive effect. Range is 0- 100%.

Chorus (CH)

The versatile Chorus effect allows for generation of all the common modulated effects (Chorus, Flange, Doubling) and many uncommon effects. The Chorus effect can create a stereo effect from a mono input, or maintain the stereo integrity of a stereo input.



Parameters

- Rt:* The *Rt* (Rate) parameter controls the chorus rate. Range is **0-9.9Hz**.
Dp: The *Dp* (Depth) parameter controls the chorus depth. Range is **0-100%**.
DI: The **DI** (Delay) parameter controls the width of the Chorus modulation. Range is **0-28.9ms**.
Fb: The *Fb* (Feedback) parameter is used to create flange effects. Range is **±99**.
Mx: The *Mx* (Mix) parameter sets the direct/effect mix. Range is **±100**.

Some setting examples:

To produce a **Chorus** effect, try setting:

Rt: 1.4Hz
Dp: 31%
DI: 3.0ms
Fb: +0
Mix: +100

To produce a **Doubling** effect, try setting:

Rt: 2.1Hz
Dp: 13%
DI: 15.8ms
Fb: +11
Mix: +69

To produce a **Flange** effect, try setting:

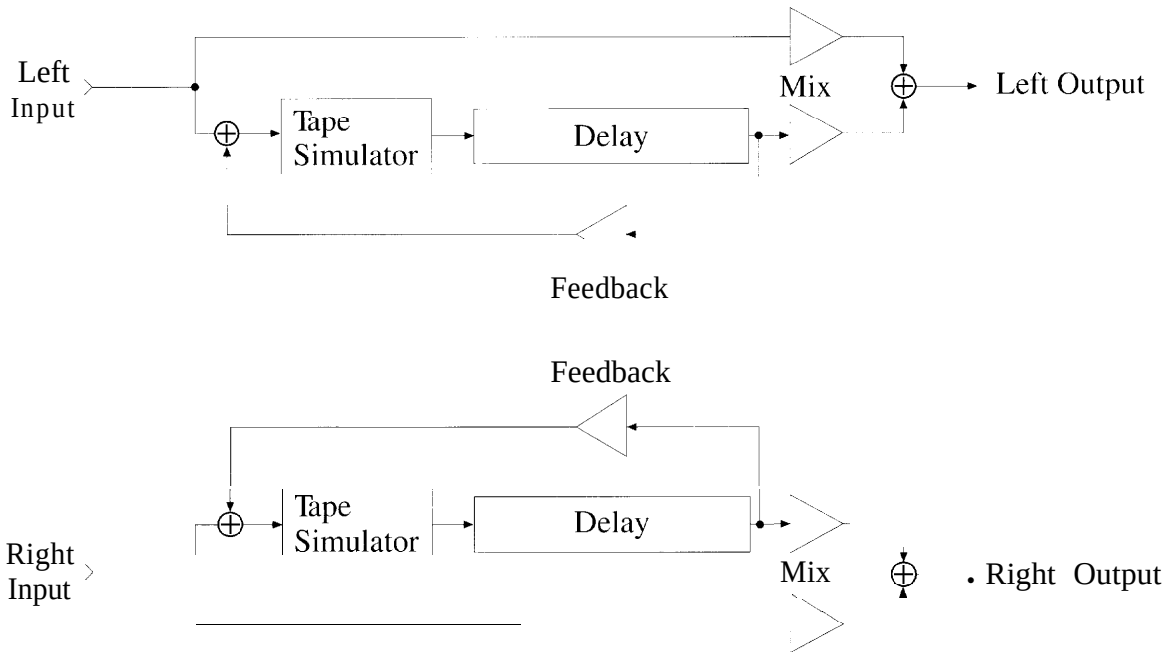
Rt: 0.1Hz
Dp: 100%
DI: 6.1ms
Fb: +42
Mix: +43

Delay (DL)

The Tube Fex offers three types of delays: Stereo, Tapped, and Mono. Each of these delays offers the ability to set the delay time using a special MIDI Sync Delay feature. The Left and Right delay times can be set independently to track MIDI clock messages.

Stereo Delay

A true stereo delay with delay times from 0 to 255 clks if using the MIDI sync feature or 0 to 361 ms if using a normal delay.

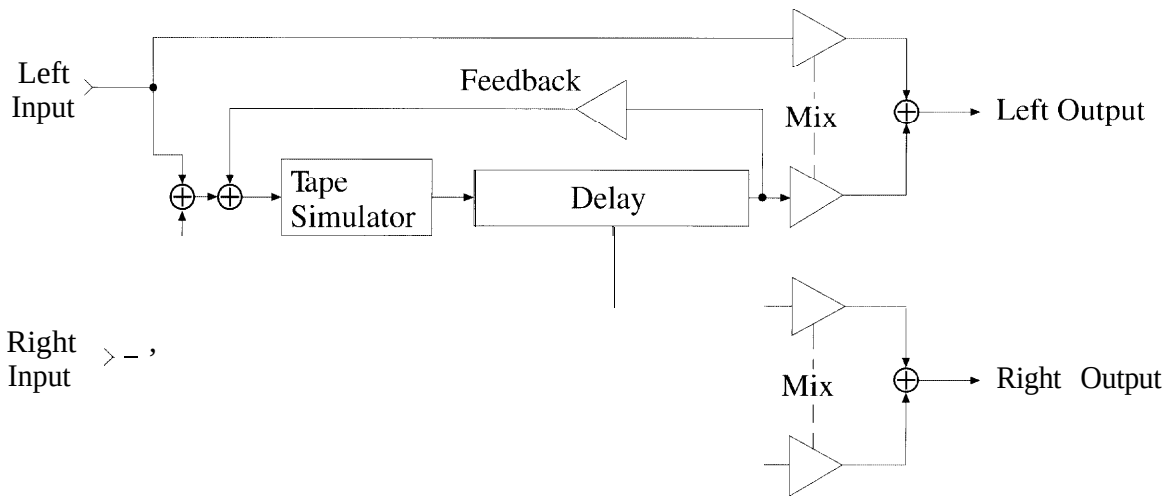


Parameters

- Ty:** The **Ty** (Type) parameter selects the type of delay desired. Select **STEREO**, **TAPPED**, or **MONO**. The parameters will change depending on the type of delay selected.
- LD:** The **LD** (Left Delay) parameter selects the amount of delay on the left channel. Range is **0-361ms**.
- LF:** The **LF** (Left Feedback) parameter selects the amount of delay feedback on the left channel. This generates a repeating or echoing sound. Range is **0-99%**.
- RD:** The **RD** (Right Delay) parameter selects the amount of delay on the right channel. Range is **0-361ms**.
- RF:** The **RF** (Right Feedback) parameter selects the amount of delay feedback on the right channel. This generates a repeating or echoing sound. Range is **0-99%**.
- TS:** The **TS** (Tape Simulator) parameter is used as a low pass filter before the signal is put through the feedback circuit. This feature is used to simulate a warmer, more realistic room sound. Range is **1K, 2K, 4K, 8K**, or **OFF**.
- Mx:** The **Mx** (Mix) parameter sets the direct / effect mix. Range is **±100**.

Tapped Delay

This delay creates a stereo delay from a mono source. The range is from 0 to 255 clks if using the MIDI sync feature and 0 to 724 ms if using a normal delay.

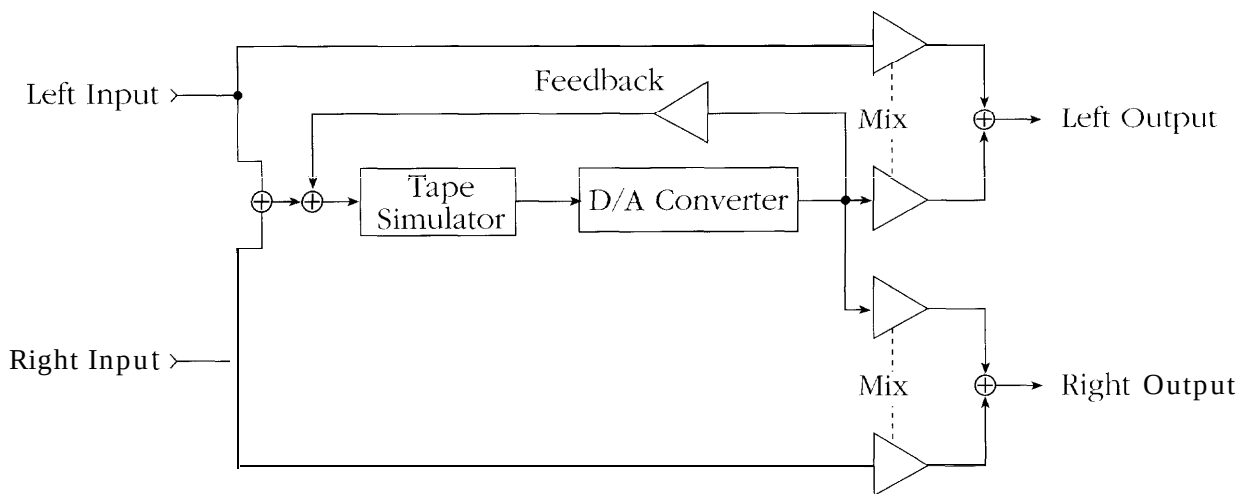


Parameters

- Ty.* The **Ty** (Type) parameter selects the type of delay desired. Select **STEREO**, **TAPPED**, or **MONO**. The parameters will change depending on the type of delay selected.
- LD.* The **LD** (Left Delay) parameter selects the amount of delay on the left channel. Range is **0-255clks** when using the MIDI Sync feature or **0-724ms** using normal delay.
- RD.* The **RD** (Right Delay) parameter selects the amount of delay on the left channel. Range is **0-255clks** when using the MIDI Sync feature or **0-724ms** when using normal delay.
- Fb.* The **Fb** (Feedback) parameter **selects** the amount of delay feedback. Feedback is always taken from the longest delay output. Range is **0-99%**.
- TS.* The **TS** (Tape Simulator) parameter is used as a low pass filter before the signal is put through the feedback circuit. This feature is used to simulate a warmer, more realistic room sound. Range is **1K, 2K, 4K, 8K**, or **OFF**.
- Mx.* The **Mx** (Mix) parameter sets the direct/effect mix. Range is ± 100 .

Mono Delay

A Mono delay with delay times ranging from 0 to 255clks if using the MIDI sync feature or 0 to 724ms if using a normal delay.



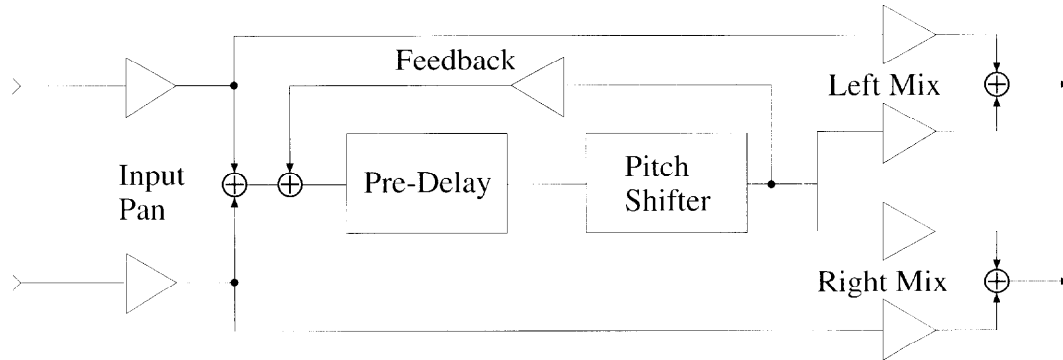
Parameters

- Ty.* The **Ty** (Type) parameter selects the **type** of delay desired. Select **STEREO**, **TAPPED**, or **MONO**. The parameters will change depending on the type of delay selected.
- DI.* The **DI** (Delay) parameter selects the amount of delay. Range is **0-724ms**.
- Fb.* The **Fb** (Feedback) parameter selects the amount of delay feedback. Feedback is always taken from the longest delay output. Range is **0-99%**.
- TS.* The **TS** (Tape Simulator) parameter is used as a low pass filter before the signal is put through the feedback circuit. This feature is used to simulate a warmer, more realistic room sound. Range is **1K, 2K, 4K, 8K**, or **OFF**.
- Mx.* The **Mx** (Mix) parameter sets the direct/effect mix. Range is **±100**.

Pitch 1 and Pitch 2 (P1 and P2)

In order to allow stereo pitch shifting yet still have a pitch shifter available which does not use a large amount of effect space, we have developed a pitch shift effect with a panning input and independent left and right mix control. This effect is the only one that can be used in two locations in the chain simultaneously, thus allowing true stereo and independently controllable pitch shifting on each channel.

By placing two pitch shifters in parallel or series, and setting their inputs and mix levels panned to opposite sides, independent stereo detuning will be available.



Parameters

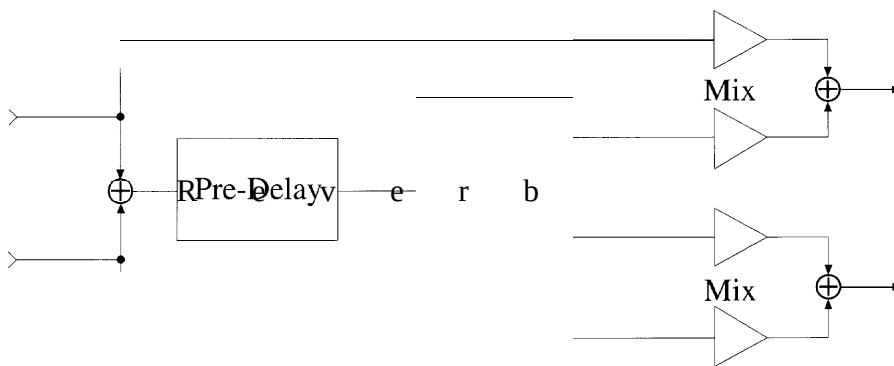
- In:* The **In** (Input) parameter controls the left/right input pan.
- PD:* The **PD** (PreDelay) parameter allows up to **46** milliseconds of delay before the pitch transposition begins. This creates a doubling or chorusing type sound. Range is **0-46ms**.
- Pt:* The **Pt** (Pitch) parameter is used to select large amounts of transposition in half-step increments. Range is ± 12 (1 octave).
- Ct:* The **Ct** (Cents) parameter is used to fine tune the transposed pitch when necessary. Range is ± 50 . ($1/2$ step is 100 cents)
- Fb:* The **Fb** (Feedback) parameter controls the amount of output signal that is sent back to the input of the PreDelay. This can be used to create climbing or descending pitch type. Range is **0-99%**.
- LM:* The **LM** (Left Mix) parameter controls the direct/effect mix to the output of the effect for the left output channel. Range is 0-100%.
- RM:* The **RM** (Right Mix) parameter controls the direct/effect mix to the output of the effect for the right output channel. Range is 0-100%.

Reverb (RV)

The versatile stereo Reverb effect contains eight types of reverb, each with fully adjustable parameters.

Reverb Types

- 🔊 **PLATE** Produces a smooth reverb similar to that achieved with plate-reverbs.
- 🔊 **TUNNEL** Produces the many echoes associated with the acoustics of a tunnel.
- 🔊 **SPRING** Simulates the reverb produced by a spring reverb machine.
- 🔊 **ROOM** Produces the ambience of a live room.
- 🔊 **STAGE** Produces the ambience associated with a club stage.
- 🔊 **HALL** Produces the reverberation ambience associated with a concert hall.
- 🔊 **GATED** Produces a smooth rolling reverb that cuts off sharply rather than decaying away.
- 🔊 **REVRs** Produces a reverb that builds from a quiet attack to a sharp decay, giving the impression of an instrument sound being played in reverse.



Parameters

- Ty:** The **Ty** (Type) parameter selects the type of reverb desired. Select **PLATE**, **TUNNEL**, **SPRING**, **ROOM**, **STAGE**, **HALL**, **GATED**, or **REVRs**. The parameters will change depending on the type of reverb selected.
- Sz:** The **Sz** (Size) parameter determines the size of the reverb being used. Range is **SMALL**, **MEDIUM**, **LARGE**, or **HUGE**. This parameter is not available when using the **GATED** or **REVRs** reverb type.
- PD:** The **PD** (PreDelay) parameter determines the amount of delay that is to be added before the reverberations begin. Range **0-46ms**. This parameter is not available when using the **GATED** or **REVRs** reverb type.
- Tm:** The **Tm** (Time) parameter allows vary each reverb time. Range is 0-30s (seconds) for all reverb types except **GATED** and **REVRs**. For **GATED** and **REVRs** types, the range is **25-365ms**.
- Dp:** The **Dp** (Damping) parameter controls the overall tone of the reverb being produced. Range is **125 Hz** to **8 kHz** or **OFF**. A low setting (**250 Hz**) results in high frequency reverberations being decayed very quickly; higher settings (**4 kHz**, **8 kHz**, or **OFF**) allow the high frequencies to continue on in the reverberation. This parameter is not available when using the **GATED** or **REVRs** reverb type.
- Mix:** The **Mx** (Mix) parameter controls the direct/effect mix at the output of the effect. Range is **0-100%**.

Classic EQ (CQ)

The Classic Equalizer effect is a sweepable mid EQ used on many guitar amplifiers.

Parameters

- Lo:* The **Lo** (Low) parameter controls the level of the low frequency range. Range is **0- 100**.
- Md:* The **Md** (Mid) parameter controls the level of the mid frequency range. Range is **0-100**.
- Sh:* The **Sh** (Shift) parameter is used to select the center of the mid frequency. Range is **0-100**.
- Hi:* The **Hi** (High) parameter controls the level of the high frequency range. Range is **0-100**.

5-Band Graphic Equalizer (5B)

The 5-Band Graphic Equalizer effect is a full stereo, five-band EQ with ± 12 dB gain on each frequency band, allowing emphasis or de-emphasis of any of the five bands. The center frequencies of the five bands are as follows: 100 Hz, 330 Hz, 1 kHz, 3 kHz, 10 kHz

3-Band EQ with Sweepable Mid (3B)

The 3-Band Sweepable Mid EQ effect is a standard stereo EQ with ± 12 dB of gain on each frequency band.

Parameters

- Ty:* The **Ty** (Type) parameter allows you to select from the following three EQ types: Guitar, Voice, and Drastic.
- Lo:* The **Lo** (Low Gain) parameter adjusts the gain of the low frequency band parameter. Range is ± 50 .
- MFrq:* The **MFrq** (Mid Frequency) parameter is used to select the center frequency of the mid frequency band. Range is 99 Hz-3.3 kHz.
- Mid:* The **Mid** (Mid Gain) parameter adjusts the gain of the mid frequency band parameter. Range is ± 50 .
- Hi:* The **Hi** (High Gain) parameter adjusts the gain of the high frequency band parameter. Range is ± 50 .

4-Band Parametric EQ (4B)

The Parametric Equalizer is a four band stereo equalizer with individually adjustable center frequencies, bandwidths, and gains for each of the four bands.

Parameters

- Band#:* The **Band#** (Band, where # is 1, 2, 3, or 4) parameter is used to select any one of the four bands. After a band has been selected, the frequency, bandwidth, and gain setting may be made for that particular band.
- Frq:* The **Frq** (Frequency) parameter is used to select the center frequency point of each band. Range is 20 Hz-16 kHz.
- BW:* The **BW** (Bandwidth) parameter determines the width of the band. Range is $1\text{--}1/100$ of an octave.
- Gain:* The **Gain** parameter adjusts the gain of the band. Depending upon the setting, the gain can be used to emphasize (+dB) or de-emphasize (-dB) the particular band. Ranges is -24dB to **+12dB**.

Hum Filter (HF)

The Hum Filter effect is effective in removing the A.C. line noise from a signal.

Parameter

Fq: The Fq (Frequency) parameter selects between an AC line frequency. Select either **60Hz** (U.S.A.) or **50Hz** (European).

Coil Tap (CT)

The Coil Tap effect is a special digital filter which can be used to emphasize or de-emphasize harmonics.

Parameters

Fq: When the phase parameter is set to a positive number, the Fq (Frequency) parameter controls the amount of harmonics being emphasized. When the phase parameter is set to a negative number, the harmonics are de-emphasized. Range is **1- 10**.

Ph: The Ph (Phase) parameter is used to select the emphasis or de-emphasis of harmonics. Setting the Phase to a positive number will emphasize harmonics, while setting the Phase to a negative number de-emphasizes the harmonics. Range is **±100**.

Exciter (EX)

The Exciter effect uses a “distortion technique” to add harmonics. Using this technique does not, in fact, result in a distorted sound, but instead produces an exciter effect.

Parameters

Dr: The Dr (Drive) parameter setting determines the amount of harmonics added. Range is 0 (no harmonics) to 100 (maximum harmonics).

Tu: The Tu (Tune) parameter controls the amount of emphasis. Range is **0.1K** (excites lower frequencies) to **4.9K** (excites higher frequencies).

Ty: The **Ty** (Type) parameter is used to select between three different distortion types which produce three different sounds. Range is **1-3**. Type **1** adds even harmonics, type **2** adds odd harmonics, type **3** adds even and odd harmonics.

Ba: The Ba (Balance) parameter is used to set the balance. Range is 0 (direct) to **100** (excited).

Envelope Filter (EF)

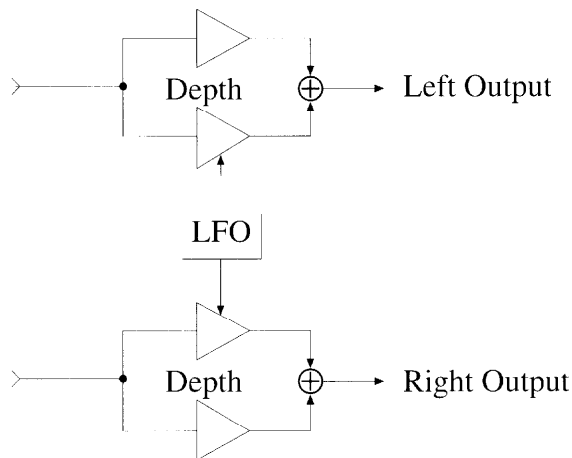
The Envelope Filter effect is an amplitude modulated filter. As the input signal level to the envelope filter changes, the filter frequency changes. This effect is sometimes referred to as an “automatic wah.”

Parameters

- Sn:* The **Sn** (Sensitivity) parameter is used to adjust the sensitivity to changing input signal levels. Range is ± 100 . If the sensitivity is set to a positive number, then the filter frequency will increase with a rising input. If sensitivity is negative, then frequency decreases with a rising input level.
- Fq:* The **Fq** (Frequency) parameter adjusts the starting point of the filter frequency. Range is **0-100**. From there the filter will sweep up or down (depending on sensitivity) as the playing level changes frequency ranging from 2K to 5K, respectively. When the sensitivity is positive, the frequency values correspond to the frequency range 100 Hz to 2 kHz.
- Rs:* When the Bandpass filter type is selected, the **Rs** (Resonance) parameter is used to adjust the amount of the Bandpass filter. Range is 0 (narrowest) to **100** (widest). When the Lowpass filter is selected, Resonance adjusts the steepness of the filter cutoff.
- Ty:* The **Ty** (Type) parameter is used to select the filter type. Select **LP-Slo** (lowpass-slow), **LP-Fst** (lowpass-fast), **BP-Slo** (bandpass-slow), or **BP-Fst** (bandpass-fast).
- Mx:* The **Mx** (Mix) parameter is used to control the direct / effect mix at the output of the effect. Range is 0-100%.

Auto Pan (PN)

The Auto Pan effect is used to pan the output signal between the left and right outputs. The panning rate and depth are both user selectable. The Auto Pan is a stereo effect.



Parameters

- Rt:* The **Rt** (Rate) parameter selects the speed at which the signal pans between the two outputs. Range is **0.0-99.9Hz**.
- Dp:* The **Dp** (Depth) parameter determines the amount of signal being panned. Range is **0-100%**. Selecting a depth setting of **10%** would yield a less defined pan, and setting the depth to **90%** would result in a deep panning from side to side.

Speaker Simulation (SS)

The Tube Fex has four stereo speaker simulation curves:

- 🔊 2x12 Open Simulates the frequency response of an open backed cabinet.
- 🔊 2x12 Closed Simulates the frequency response of a closed backed cabinet.
- 🔊 4x12 Cabinet Simulates the sound of four 12” speakers in a single cabinet.
- 🔊 4x12 British Simulates the frequency response of a well known British manufacturer’s guitar speaker setup.

These speaker simulation curves are convenient for both live performance and recording applications where the guitar is directly connected to a mixing console.

Tip: To only affect what goes out the balanced (direct) outputs and have full range going to your cabinet try adding the following to the end of your effects chain:

...→**FX**→**SS** (use the stereo Effects Send outputs to go to your cabinet)

Stereo Simulator (ST)

A transverse filter approach is used to simulate stereo separation of a mono signal. The mono signal is fed into a comb filter and the output and input is summed in the right channel and subtracted from the left channel. The resulting output simulates stereo separation of frequency bands. **Tune** adjusts the distance between the separated frequency bands. There is a **LowPass** filter which, when on, will keep the bass centered between the two channels. The **Depth** of the stereo separation is variable from **0-100%**.

Parameters

- LP:** The **LP** (LowPass) parameter is a lowpass filter which, when on, will keep the bass centered between the two channels. Choose **ON** or **OFF**.
- Tune:** The **Tune** parameter adjusts the distance between the separated frequency bands. Range is **100-500Hz**.
- Depth:** The **Depth** parameter is the depth of the stereo separation. Range is **0-100**.

Noise Gate (NG)

The Noise Gate effect is a downward expander.

The Peak level is determined by the input signal plus attack and decay variables which set the speed at which the peak can change.

Parameters

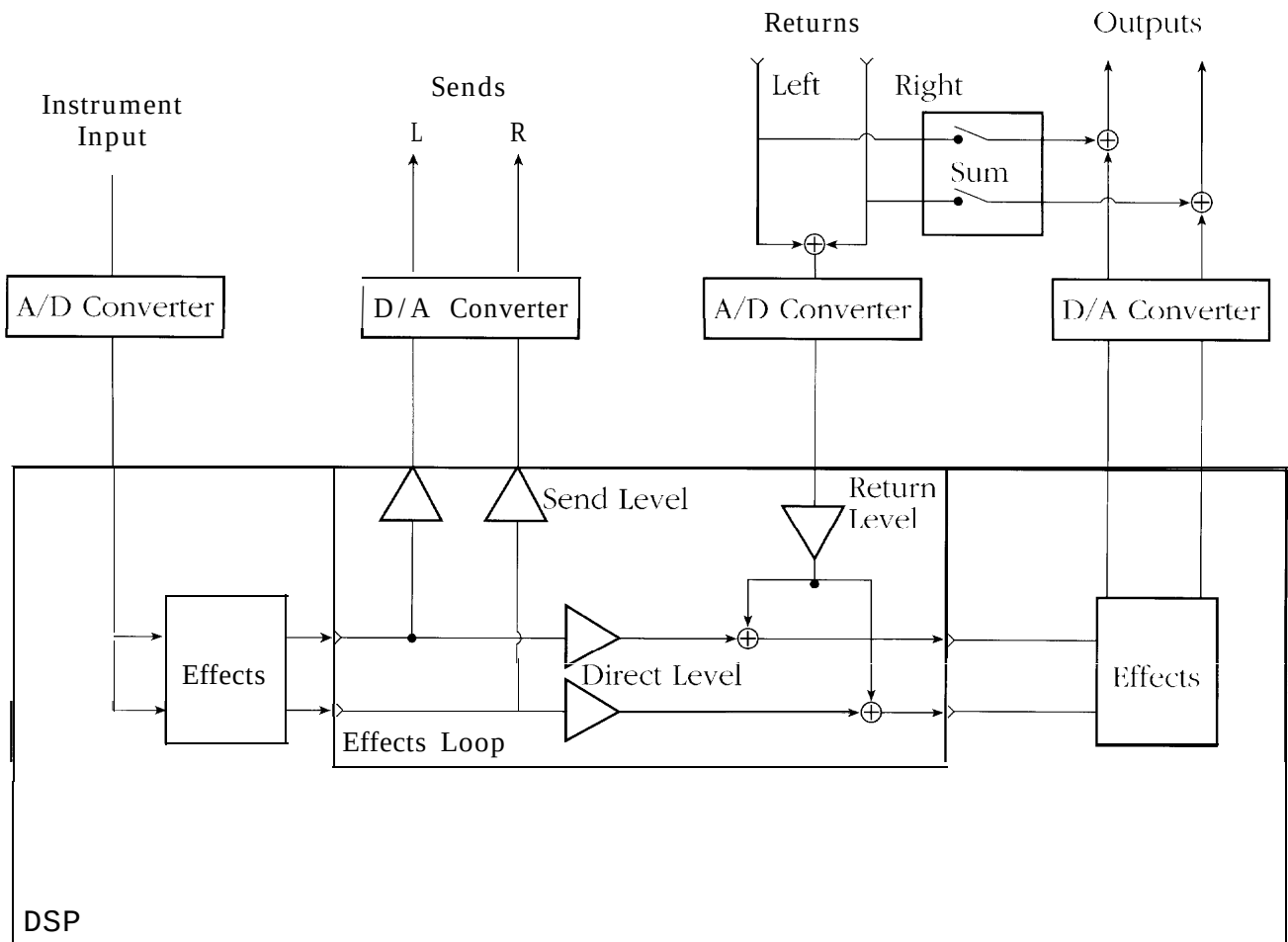
- Atk:** The **Atk** (Attack Time) parameter is used to remove sharp attack transients. The larger this number the longer the attack will take to open the gate once closed. Range **0-99**.
- Rel:** The **Rel** (Release Time) parameter adjusts the amount of time it takes a decaying signal to drop below the threshold. The larger this number the longer it will take for a decaying signal to drop below the threshold. Range **1-99**.

- Thr:* The Thr (Threshold) parameter sets the level, in dB, below digital clipping that the gate will begin to close. Range is -2 to -90 **dB**.
- Sen:* The Sen (Sensitivity) parameter determines the peak level below threshold that the gate will be fully closed. Range is 1-9.

Effects Loop (FX)

The movable effects loop appears just as any other effect and can be placed anywhere in the effects chain. The sends are stereo and are available from two jacks at the back of the unit. The returns are in stereo, and this stereo signal may be **summed** in stereo with the output from the DSP after the last effect in the chain. The signal returning to the DSP is summed to mono, then added to the stereo **direct** signal. This signal is then passed on to the next effect in the chain.

Note: When a MONO signal is returned, plug the signal into the LEFT/MONO effects return jack. This ensures that 100% of the return signal is summed back into the A/D converter.

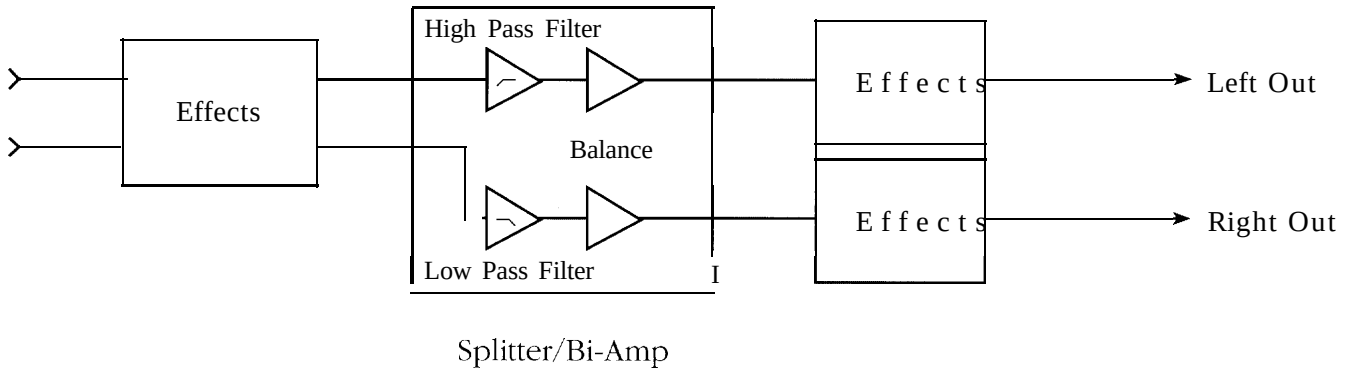


Parameters

- Send:** The **Send** (Send Level) parameter determines the level of the signal that is sent to the Effects Send jacks. Range is **0-100**.
- Dir:** The **Dir** (Direct Level) parameter determines the level of the direct signal that is mixed with the input from the effect loop returns. Range is **0-100**.
- Rtn:** The **Rtn** (Return Level) parameter determines the level of the signal that is returned to the effects chain. Range is **0-100**.
- Sum:** The **Sum** (Summed Return Level) parameter turns *ON* and *OFF* an analog switch that sums the stereo returns with the analog output from the digital effects.

Splitter/Bi-Amp (SP)

The splitter/bi-amp effect enables you to split the stereo signal into two separate chains, placing different effect types on each chain. The signal following the splitter is **MONO** and only appears on one channel. Therefore, note that the signal on the **LEFT** path (top line) only passes through the **LEFT** half of effects following the splitter, and the signal on the **RIGHT** path (bottom line) only appears on the **RIGHT** channel of effects following the splitter.



Parameters

- Mode:** There are two modes available; **SPLITTER** and **BI-AMP**.
- Bal:** The **Bal** (Balance) parameter controls the right/left balance of the splitter output. This works like a normal stereo balance where the signal output from both sides is 100% at a balance of **50**; at **0**, 100% of the right signal is passed through and none of the left signal is passed; at **100**, 100% of the left signal passes and none of the right signal is passed.
- Hi-L:** This is a high pass filter that allows frequencies higher than the specified frequency to pass to the left channel. Range is **20 Hz** to **3.3 kHz**. This parameter is not available when **SPLITTER** is used.
- Lo-R:** This is a low pass filter that allows frequencies lower than the specified frequency to pass to the right channel. Range is **20 Hz** to **3.3 kHz**. This parameter is not available when **SPLITTER** is used.

Appendix B MIDI Implementation

MIDI Implementation

Date: 1/95
Version: 1.0

Model: Tube Fex

Function		Transmitted	Recognized	Remarks
Basic Channel	Default Channel	1-16	1-16	Memorized
Mode	Default Messages Altered	3 X X	1, 3 X X	
Note Number	True Voice	X	0	MIDI Dynamic Effects Controller
Velocity	Note On Note Off	X X	X X	
After-touch	Key's Ch's	X X	0 X	MIDI Dynamic Effects Controller
Pitch Bender		X	0	MIDI Dynamic Effects Controller
Control Change		X	0-120	MIDI Dynamic Effects Controller Controller #91—Bypass
Program Change	True #	0-127	0-127	
System Exclusive		0	0	
System Common	: Songs Pos : Song Sel : Tune	X X X	X X X	
System Real Time	: Clock : Commands	X X	0 X	Sync Delay
Auxiliary Messages	: Local On/Off : All Notes Off : Active Sense : Reset	X X X X	X X X X	

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO

0 : Yes
X : No

Appendix C System Exclusive Format

The following is the format for the System Exclusive dump and load requests:

FO 00 00 1B 09 05 rs ch cm nn data . . . cksum (data . . . cksum . . .) F7

Where:

rs = reserved for future use.
ch = MIDI receive channel.
cm = MIDI command. (See Table of Commands)
nn = number of selected User Preset or Set. (Include only for Dump One Preset, Dump One Controller, or Dump Set requests. Do not include in Dump All Presets, Controllers, or Programs.)
data = parameter data included only in load messages.
cksum = modulo 128 checksum included only in load messages.

Note: For valid SYSEX DUMP requests, the data and checksum is not included.

Table of Commands

Note: All numbers are in hexadecimal

cm nn

00 nn Dump One Preset (nn=00-7F) including continuous controllers.
02 nn Dump Preset Set (nn=00-0B) including continuous controllers.
04 — Dump All Presets (nn not included) including continuous controllers.
06 — Dump All Programs
0E — Dump Edit Buffer

Dump One Preset: Dumps one preset's parameter data and continuous controllers.
Dump Preset Set: Dumps ten preset's parameter data and continuous controllers.
Dump All Presets: Dumps all 128 user preset's parameter data, continuous controllers, and the program/volume map.
Dump All Programs: Dumps the program/volume map.
Dump Edit Buffer: Dumps contents of name, chain, parameter, and continuous controller from edit buffer.

SYSEX Dump File Format

The following information is provided for programmers wishing to make use of sysex dump files to initialize remote editing software.

The first ten bytes transmitted in response to a dump one preset request is the sysex load one preset header.

Following that, in nybbled form are ten *name* bytes. Next come ten *nybbled* bytes representing the effects chain.

Finally come 129 nybbled bytes representing the effect parameters. The format of this data is the same format used in the remote editing commands. The order of the effects and the number of bytes for each effect is as follows:

Levels:	8 bytes	Env. Filter:	5 bytes
Reverb:	8 bytes	Exciter:	5 bytes
Overdrive:	5 bytes	Classic eq:	4 bytes
Chorus:	7 bytes	Noise gate:	4 bytes
Delay:	8 bytes	Distortion:	8 bytes
Compressor:	5 bytes	Hum filter:	1 byte
Pitch1:	7 bytes	Stereo sim:	3 bytes
Coil tap:	2 bytes	Pitch2:	7 bytes
Speaker sim:	1 byte	Effects loop:	4 bytes
5 band eq:	5 bytes	Tube:	8 bytes
3 band eq:	6 bytes	Tremolo:	6 bytes
4 band eq:	17 bytes	Splitter:	6 bytes
Pan:	3 bytes		

Then follow twenty-eight nybbled zeros (at the time of this printing). This is an expansion area for effects in future updates to the Tube Fex.

Following that are forty nybbled bytes representing the eight continuous controller assignments. Once again, the format is the same as the remote editing format in **Appendix D**.

The last two bytes are the Modulo 128 checksum and the End Of Exclusive message.
dump all format:

During a sysex dump, all 128 presets are dumped each with its own modulo 128 checksum for error trapping during reload. These are followed by the two program maps.

System Exclusive Dump Examples:

To dump Preset #1(00H) over MIDI channel 1, send the following string:

```
FO 00 00 1B 09 05 00 00 00 00 F7
```

To dump Preset Set #3(02H) over MIDI channel 1, send the following string:

```
FO 00 00 1B 09 05 00 00 02 02 F7
```

To dump all Presets over MIDI channel 1, send the following string:

```
FO 00 00 1B 09 05 00 00 04 F7
```

To dump all Programs over MIDI channel 1, send the following string:

```
FO 00 00 1B 09 05 00 00 06 F7
```

To dump the Edit Buffer over MIDI channel 1, send the following string:

```
FO 00 00 1B 09 05 00 00 0E F7
```

FX_TYPE 0: Effect Chain

This is the command to edit the effect chain. Pram is a number between 0 and 7 which corresponds to the location of the parameter in the effect. The data corresponds to each effect as follows:

(all numbers in hexadecimal)

Data	
00	= End of Chain
01	= Compressor
02	= Distortion
03	= Overdrive
04	= chorus
05	= Delay
06	= Pitch 1
07	= Pitch 2
08	= Reverb
09	= Classic EQ
0A	= 5 Band Graphic Equalizer
0B	= 3 Band Mid Sweep Equalizer
0C	= 4 Band Parametric Equalizer
0D	= Hum Filter
0E	= Coil Tap
0F	= Exciter
10	= Envelope Filter
11	= Pan
12	= Speaker Simulator
13	= Stereo Simulator
14	= Noise Gate
15	= Effects Loop
16	= Splitter
17	= Tube
18	= Tremolo
FF	= End of Left (top) path

Important note to programmers: When adding a splitter to the chain, add the splitter at the desired location, then be sure to add an End of Left Path in the position following the last desired effect for the left path. Right path effects follow this marker. When deleting the splitter from the chain, the end of left path marker **must** be replaced with an End of Chain marker before replacing the splitter with another effect.

Effects can be added to the current end of the effect chain, or any existing effect can be changed to another type. Any attempt to add an effect beyond the end of the existing chain or to duplicate an existing effect will be ignored by the unit.

FX_TYPE 1: Compressor

This command allows remote access to the Compressor parameters. The data is stored as follows:

PRAM

0 = Attack Time

1 = Release Time

2 = Sustain

3 = Level

4 = Noise Gate Threshold (**0-9** => 1-10)

FX_TYPE 2: Distortion

PRAM

0 = Drive

1 = Post Gain

2 = Fat (Bottom)

3 = Edge

4 = Body

5 = Shift

6 = Resonance (units) \may be loaded as 1 byte or 2 bytes of data

7 = Resonance (tenths) /

FX_TYPE 3: Overdrive

PRAM

0 = LoRollOff (units) \may be loaded as 1 byte or 2 bytes of data

1 = LoRollOff (tenths) /

2 = PreDrive

3 = Clip Level

4 = **O**u**t**put L e v e l

FX_TYPE 4: Chorus

PRAM

0 = Rate (units) \may be loaded as 1 byte or 2 bytes of data

1 = Rate (Tenths) /

2 = Depth

3 = Delay (units) \may be loaded as 1 byte or 2 bytes of data

4 = Delay (tenths) /

5 = Feedback (0-200=> -100 to +100)
6 = Mix (0-200=> -100 to +100)

FX_TYPE 5: Delay

PRAM

0 = Left (mono) Delay (low byte) \ may be loaded as 1 byte or 2 bytes of data
1 = Left (mono) Delay (high byte) /
2 = Left (mono) Feedback
3 = Right Delay (low byte) \ may be loaded as 1 byte or 2 bytes of data
4 = Right Delay (high byte) /
j = Right feedback
6 = Mix (0-200=> -100 to +100)
7 = Tape Sim/ Delay Type
(high nybble = tape sim freq, low nybble = delay type)

FX_TYPE 6: Pitch Shift 1

PRAM

0 = Pitch (0-24 => -12 to +12)
1 = Cents (0-100=> -50 to +50)
2 = Feedback
3 = Left Mix
4 = PreDelay Length
5 = Right Mix
6 = Input Pan (0=full right, 100=full left)

FX_TYPE 7: Pitch Shift 2

PRAM

0 = Pitch (0 - 24 => -12 to +12)
1 = Cents (0 - 100 => -50 to +50)
2 = Feedback
3 = Left Mix
4 = PreDelay Length
5 = Right Mix
6 = Input Pan (0 = full right, 100 = full left)

FX_TYPE 8: Reverb

PRAM

0 = Type
1 = Size
2 = Time (seconds) \ may be loaded as 1 byte or 2 bytes of data
3 = Time (tenths) /
4 = Damping
5 = Mix
6 = Gated Reverb Time
7 = Pre-delay

FX-TYPE 9: Classic EQ

PRAM

0 = Low Gain
1 = Mid Gain
2 = Mid Shift
3 = High Gain

FX_TYPE \$A: 5-Band Graphic Equalizer

PRAM

0 = 100 Hz Gain (0 - 48 => -12 to +12 in .5 dB steps)
1 = 330 Hz Gain (0 - 48 => -12 to +12 in .5 dB steps)
2 = 1 kHz Gain (0 - 48 => -12 to +12 in .5 dB steps)
3 = 3 kHz Gain (0 - 48 => -12 to +12 in .5 dB steps)
4 = 10 kHz Gain (0 - 48 => -12 to +12 in .5 dB steps)

FX_TYPE \$B: 3-Band Mid Sweep Equalizer

PRAM

0 = Lo Gain (0 - 50)
1 = Mid Freq (mantissa) \ may be loaded as 1 byte or 2 bytes of data
2 = Mid Freq (exponent) /
3 = Mid Gain (0 - 50)
4 = High Gain (0 - 50)
i = Type

FX_TYPE \$C: 4-Band Parametric Equalizer

PRAM

0 = Band 1 Frequency (mantissa) \ may be loaded as 1 byte or 2 bytes of data
1 = Band 1 Frequency (exponent) /
2 = Band 1 1/Bandwidth
3 = Band 1 Gain (0 - 72 => -24 to +12 in .5 dB steps)
4 = Band 2 Frequency (mantissa) \ may be loaded as 1 byte or 2 bytes of data
5 = Band 2 Frequency (exponent) /
6 = Band 2 1/Bandwidth
7 = Band 2 Gain (0 - 72 => -24 to +12 in .5 dB steps)
8 = Band 3 Frequency (mantissa) \ may be loaded as 1 byte or 2 bytes of data
9 = Band 3 Frequency (exponent) /
A = Band 3 1/Bandwidth
B = Band 3 Gain (0 - 72 => -24 to +12 in .5 dB steps)
C = Band 4 Frequency (mantissa) \ may be loaded as 1 byte or 2 bytes of data
I> = Band 4 Frequency (exponent) /
E = Band 4 1/Bandwidth
F = Band 4 Gain (0 - 72 => -24 to +12 in .5 dB steps)

FX_TYPE \$D: Hum Filter

PRAM

0 = Frequency (0 - 1 => 50 - 60 Hz)

FX_TYPE \$E: Coil Tap

PRAM

0 = Frequency

1 = Phase

FX_TYPE \$F: Exciter

PRAM

0 = Drive

1 = Tune (integer) \ may be loaded as 1 byte or 2 bytes of data

2 = Tune (fraction) /

3 = Type

4 = Balance

FX_TYPE \$10: Envelope Filter

PRAM

0 = Sensitivity

1 = Frequency

3 = Resonance

4 = Type

5 = Mix

FX_TYPE \$11: Auto Pan

PRAM

0 = Rate (units) \ may be loaded as 1 byte or 2 bytes of data

1 = Rate (tenths) /

2 = Depth

FX_TYPE \$12: Speaker Simulator

PRAM

0 = Type

FX_TYPE \$13: Stereo Simulator

PRAM

0 = Lowpass Filter (off/on>

1 = Tune

2 = Depth

FX_TYPE \$14: Noise Gate

PRAM

0 = Attack Time

1 = Release Time

2 = Threshold

3 = Sensitivity

FX_TYPE \$15: Effects Loop

PRAM

0 = Send Level

1 = Direct Level

2 = Return Level

3 = Summer

FX_TYPE \$16: Splitter

PRAM

0 = Mode

1 = Balance

2 = High pass Freq (mantissa) \ may be loaded as 1 byte or 2 bytes of data

3 = Highpass Freq (exponent) /

4 = Lowpass Freq (mantissa) \ may be loaded as 1 byte or 2 bytes of data

j = Lowpass Freq (exponent) /

FX_TYPE \$17 Tube

PRAM

0 = Mode

1 = Pregain

2 = **Pad**

3 = Postgain

4 = Bass/Bottom gain

j = Middle/Body gain

6 = Treble/Edge gain

7 = Presence/Shift

FX_TYPE \$18: Tremolo

PRAM

- 0 = Left Speed (units)
- 1 = Left Speed (tenths)
- 2 = Left Intensity
- 3 = Right Speed (units)
- 4 = Right Speed (tenths)
- 5 = Right Intensity

FX_TYPE \$19: Name Buffer Edit

PRAM

Ten PRAMS each refer to a character position in the name buffer.

FX_TYPE \$1A- \$21 correspond to controllers 1 - 8. Each controller has five parameters; they are:

PRAM

- 0 = Effect type \ may be loaded as 1 byte or 2 bytes of data
- 1 = Effect parameter /
- 3 = Continuous Controller Number (1-128)
- 4 = Channel 0 -16 (16 is Omni)
- 5 = Scale Factor (-100 - 100)

These Effect type / Parameter Pairs are identical to the pairs listed above. Each of the 2 byte parameters are referenced by the first PRAM of the pair. Some effects parameters do not have controllers available. An error message will appear if an unused FX_TYPE/Parameter pair is sent.

FX_TYPE \$22: Effect Levels

PRAM

- 0 = Effect 1 level
- 1 = Effect 2 level
- 2 = Effect 3 level
- 3 = Effect 4 level
- 4 = Effect 5 level
- 5 = Effect 6 level
- 6 = Effect 7 level
- 7 = Effect 8 level

Specifications

Frequency Response

12 Hz to 20 kHz +1, -2 dB

Total Harmonic Distortion

Less than 0.02% at 1 kHz (1 V RMS)

Signal-to-Noise Ratio

Greater than 90 dB

Input and Output Jacks

¼" differential or single-ended

XLR balanced outs (-10 dBV)

A/D Conversion

Rate: 44.1 kHz

Quantization: 16 bit

64x Oversampled

D/A Conversion

Rate: 44.1 kHz

Quantization: 18 bit

Presets/Programs

256 presets (128 user, 128 factory)

mappable to 256 programs

(optional cartridge adds 128 more presets
and 128 more programs)

MIDI

MIDI In, MIDI Thru/Out

Simultaneous Effects

Up to 7 maximum (any order)

Effect Types

Tube (Clean, Crunch, Lead, Ultra)

Stereo Tremolo

Compressor

Chorus

Delay:

Stereo: 360 ms per channel maximum

Tapped: 724 ms per channel maximum

Mono: 724 ms per channel maximum

Auto Pan

Pitch Shift 1: One octave up or down maximum

Pitch Shift 2: One octave up or down maximum

Reverb:

Plate

Spring

Tunnel

Room

Stage

Hall

Gated

Reverse

Exciter

Coil Tap

Envelope Filter

Preamp Tone Control

5-Band Graphic Equalizer

3-Band Sweep Mid Equalizer

4-Band Parametric Equalizer

Classic (guitar) Equalizer

Hum Filter

Speaker Simulation:

2x12 Open

2x12 Closed

4x12 Cabinet

4x12 British

Distortion

Overdrive

Noise Gate

Stereo Simulator

Stereo Splitter/Bi-Amp

Effects Loop:

User Interface

20 character by 2 line LCD

12 push-buttons

Data Knobs

Dimensions

Width: 17 3/4"

Depth: 12"

Height: 1 3/4"

Weight: 12 pounds

Power Supply requirements

U.S.: 120 VAC, 60 Hz, 25 watts

Export: 220/240 VAC, 50/60 Hz, 25 watts

THIS LIMITED WARRANTY VALID ONLY WHEN PURCHASED AND REGISTERED IN THE UNITED STATES OR CANADA. ALL EXPORTED PRODUCTS ARE SUBJECT TO WARRANTY AND SERVICES TO BE SPECIFIED AND PROVIDED BY THE AUTHORIZED DISTRIBUTOR FOR EACH COUNTRY.

Ces clauses de garantie ne sont valables qu'aux Etats-Unis et au Canada. Dans tous les autres pays, les clauses de garantie et de maintenance sont fixées par le distributeur national et assurées par lui selon la législation en vigueur.

Diese Garantie ist nur in den USA und Kanada gültig. Alle Export-Produkte sind der Garantie und dem Service des Importeurs des jeweiligen Landes unterworfen. Esta garantía es válida solamente cuando el producto es comprado en E.U. continentales o en Canada. Todos los productos que sean comprados en el extranjero, están sujetos a las garantías y servicio que cada distribuidor autorizado determine y ofrezca en los diferentes países.

**PEAVEY ONE-YEAR LIMITED
WARRANTY/REMEDY**

PEAVEY ELECTRONICS CORPORATION ("PEAVEY") warrants this product, EXCEPT for covers, footswitches, patchcords, tubes and meters, to be free from defects in material and workmanship for a period of one (1) year from date of purchase, PROVIDED, however, that this limited warranty is extended only to the original retail purchaser and is subject to the conditions, exclusions, and limitations hereinafter set forth:

PEAVEY 90-DAY LIMITED WARRANTY ON TUBES AND METERS

If this product contains tubes or meters, Peavey warrants the tubes or meters contained in the product to be free from defects in material and workmanship for a period of ninety (90) days from date of purchase; PROVIDED, however, that this limited warranty is extended only to the original retail purchaser and is also subject to the conditions, exclusions, and limitations hereinafter set forth.

CONDITIONS, EXCLUSIONS, AND LIMITATIONS OF LIMITED WARRANTIES

These limited warranties shall be void and of no effect, if:

- a. The first purchase of the product is for the purpose of resale; or
- b. The original retail purchase is not made from an AUTHORIZED PEAVEY DEALER; or
- c. The product has been damaged by accident or unreasonable use, neglect, improper service or maintenance, or other causes not arising out of defects in material or workmanship; or
- d. The serial number affixed to the product is altered, defaced, or removed.

In the event of a defect in material and/or workmanship covered by this limited warranty, Peavey will:

- a. In the case of tubes or meters, replace the defective component without charge.
- b. In other covered cases (i.e., cases involving anything other than covers, footswitches, patchcords, tubes or meters), repair the defect in material or workmanship or replace the product, at Peavey's option; and provided, however, that, in any case, all costs of shipping, if necessary, are paid by you, the purchaser.

THE WARRANTY REGISTRATION CARD SHOULD BE ACCURATELY COMPLETED AND MAILED TO AND RECEIVED BY PEAVEY WITHIN FOURTEEN (14) DAYS FROM THE DATE OF YOUR PURCHASE.

In order to obtain service under these warranties, you must:

- a. Bring the defective item to any PEAVEY AUTHORIZED DEALER or AUTHORIZED PEAVEY SERVICE CENTER and present therewith the ORIGINAL PROOF OF PURCHASE supplied to you by the AUTHORIZED PEAVEY DEALER in connection with your purchase from him of this product.

If the DEALER or SERVICE CENTER is unable to provide the necessary warranty service you will be directed to the nearest other PEAVEY AUTHORIZED DEALER or AUTHORIZED PEAVEY SERVICE CENTER which can provide such service.

OR

- b. Ship the defective item, prepaid, to:

PEAVEY ELECTRONICS CORPORATION

International Service Center
326 Hwy. 11 & 80 East
MERIDIAN, MS 39301

including therewith a complete, detailed description of the problem, together with a legible copy of the original PROOF OF PURCHASE and a complete return address. Upon Peavey's receipt of these items:

If the defect is remedial under these limited warranties and the other terms and conditions expressed herein have been complied with, Peavey will provide the necessary warranty service to repair or replace the product and will return it, FREIGHT COLLECT, to you, the purchaser.

Peavey's liability to the purchaser for damages from any cause whatsoever and regardless of the form of action, including negligence, is limited to the actual damages up to the greater of \$500.00 or an amount equal to the purchase price of the product that caused the damage or that is the subject of or is directly related to the cause of action. Such purchase price will be that in effect for the specific product when the cause of action arose. This limitation of liability will not apply to claims for personal injury or damage to real property or tangible personal property allegedly caused by Peavey's negligence. Peavey does not assume liability for personal injury or property damage arising out of or caused by a non-Peavey alteration or attachment, nor does Peavey assume any responsibility for damage to interconnected non-Peavey equipment that may result from the normal functioning and maintenance of the Peavey equipment.

UNDER NO CIRCUMSTANCES WILL PEAVEY BE LIABLE FOR ANY LOST PROFITS, LOST SAVINGS, ANY INCIDENTAL DAMAGES, OR ANY CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT, EVEN IF PEAVEY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

THESE LIMITED WARRANTIES ARE IN LIEU OF ANY AND ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE; PROVIDED, HOWEVER, THAT IF THE OTHER TERMS AND CONDITIONS NECESSARY TO THE EXISTENCE OF THE EXPRESSED, LIMITED WARRANTIES, AS HEREINABOVE STATED, HAVE BEEN COMPLIED WITH, IMPLIED WARRANTIES ARE NOT DISCLAIMED DURING THE APPLICABLE ONE-YEAR OR NINETY-DAY PERIOD FROM DATE OF PURCHASE OF THIS PRODUCT.

SOME STATES DO NOT ALLOW LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THESE LIMITED WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

THESE LIMITED WARRANTIES ARE THE ONLY EXPRESSED WARRANTIES ON THIS PRODUCT, AND NO OTHER STATEMENT, REPRESENTATION, WARRANTY, OR AGREEMENT BY ANY PERSON SHALL BE VALID OR BINDING UPON PEAVEY.

In the event of any modification or disclaimer of expressed or implied warranties, or any limitation of remedies, contained herein conflicts with applicable law, then such modification, disclaimer or limitation, as the case may be, shall be deemed to be modified to the extent necessary to comply with such law.

Your remedies for breach of these warranties are limited to those remedies provided herein and Peavey Electronics Corporation gives this limited warranty only with respect to equipment purchased in the United States of America.

INSTRUCTIONS — WARRANTY REGISTRATION CARD

1. Mail the completed WARRANTY REGISTRATION CARD to:

PEAVEY ELECTRONICS CORPORATION
POST OFFICE BOX 2898
MERIDIAN, MISSISSIPPI 39302-2898

- a. Keep the PROOF OF PURCHASE. In the event warranty service is required during the warranty period, you will need this document. There will be no identification card issued by Peavey Electronics Corporation.
2. IMPORTANCE OF WARRANTY REGISTRATION CARDS AND NOTIFICATION OF CHANGES OF ADDRESSES:
 - a. Completion and mailing of WARRANTY REGISTRATION CARDS — Should notification become necessary for any condition that may require correction, the REGISTRATION CARD will help ensure that you are contacted and properly notified.
 - b. Notice of address changes — If you move from the address shown on the WARRANTY REGISTRATION CARD, you should notify Peavey of the change of address so as to facilitate your receipt of any bulletins or other forms of notification which may become necessary in connection with any condition that may require dissemination of information or correction.
3. You may contact Peavey directly by telephoning (601) 483-5365.

IMPORTANT SAFETY INSTRUCTIONS

WARNING: When using electric products, basic cautions should always be followed, including the following.

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be retained for future reference.
3. Obey all cautions in the operating instructions and on the back of the unit.
4. All operating instructions should be followed.
5. This product should not be used near water, i.e., a bathtub, sink, swimming pool, wet basement, etc.
6. This product should be located so that its position does not interfere with its proper ventilation. It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
7. This product should not be placed near a source of heat such as a stove, radiator, or another heat producing amplifier.
8. Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
9. Never break off the ground pin on the power supply cord. For more information on grounding, write for our free booklet "Shock Hazard and Grounding."
10. Power supply cords should always be handled carefully. Never walk or place equipment on power supply cords. Periodically check cords for cuts or signs of stress, especially at the plug and the point where the cord exits the unit.
11. The power supply cord should be unplugged when the unit is to be unused for long periods of time.
12. If this product is to be mounted in an equipment rack, rear support should be provided.
13. Metal parts can be cleaned with a damp rag. The vinyl covering used on some units can be cleaned with a damp rag or an ammonia-based household cleaner if necessary. Disconnect unit from power supply before cleaning.
14. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation holes or any other openings.
15. This unit should be checked by a qualified service technician if:
 - a. The power supply cord or plug has been damaged.
 - b. Anything has fallen or been spilled into the unit.
 - c. The unit does not operate correctly.
 - d. The unit has been dropped or the enclosure damaged.
16. The user should not attempt to service this equipment. All service work should be done by a qualified service technician.
17. This product should be used only with a cart or stand that is recommended by Peavey Electronics.
18. Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably in susceptibility to noise induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures.

Duration Per Day In Hours	Sound Level dBA, Slow Response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

According to OSHA, any exposure in excess of the above permissible limits could result in some hearing loss.

Ear plugs or protectors in the ear canals or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss if exposure is in excess of the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as this amplification system be protected by hearing protectors while this unit is in operation.

SAVE THESE INSTRUCTIONS!



Features and specifications subject to change without notice.

Peavey Electronics Corporation 711 A Street / Meridian, MS 39301 / U.S.A. / (601) 483-5365 / Fax 486-1 278