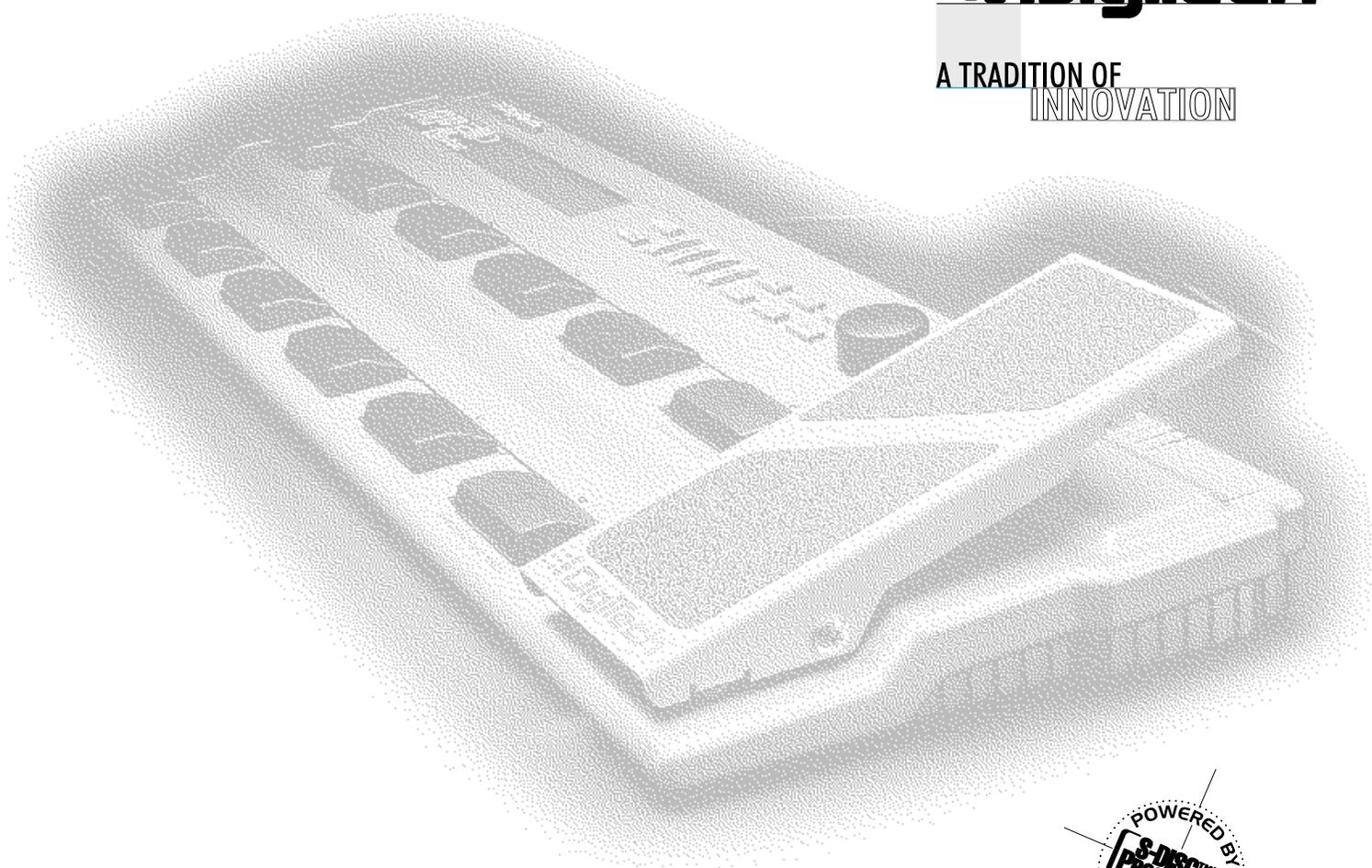


RP20 VALVE

Tube Preamp/Effects Processor & Controller

DiGiTech

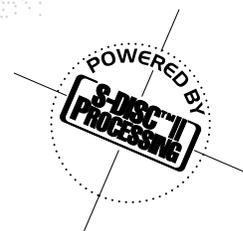
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User's Guide

Please visit DiGiTech Electronics on the World Wide Web at <http://www.digitech.com>

H A Harman International Company





CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



ATTENTION: RISQUE DE CHOC ELECTRIQUE - NE PAS OUVRIR

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE

The symbols shown above are internationally accepted symbols that warn of potential hazards with electrical products. The lightning flash with arrowpoint in an equilateral triangle means that there are dangerous voltages present within the unit. The exclamation point in an equilateral triangle indicates that it is necessary for the user to refer to the owner's manual.

These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.

WARNING

FOR YOUR PROTECTION, PLEASE READ THE FOLLOWING:

WATER AND MOISTURE: Appliance should not be used near water (e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.

POWER CORD PROTECTION: Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

SERVICING: To reduce the risk of fire or electric shock, the user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

FOR UNITS EQUIPPED WITH EXTERNALLY ACCESSIBLE FUSE RECEPTACLE: Replace fuse with same type and rating only.

U.K. MAINS PLUG WARNING

A moulded mains plug that has been cut off from the cord is unsafe. Discard the mains plug at a suitable disposal facility. **NEVER UNDER ANY CIRCUMSTANCES SHOULD YOU INSERT A DAMAGED OR CUT MAINS PLUG INTO A 13 AMP POWER SOCKET.** Do not use the mains plug without the fuse cover in place. Replacement fuse covers can be obtained from your local retailer. Replacement fuses are 13 amps and **MUST** be ASTA approved to BS1362.

ELECTROMAGNETIC COMPATIBILITY

This unit conforms to the Product Specifications noted on the **Declaration of Conformity**. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation. Operation of this unit within significant electromagnetic fields should be avoided.
- use only shielded interconnecting cables.

SAFETY INSTRUCTIONS

NOTICE FOR CUSTOMERS IF YOUR UNIT IS EQUIPPED WITH A POWER CORD.

WARNING: THIS APPLIANCE MUST BE EARTHED.

The cores in the mains lead are coloured in accordance with the following code:

GREEN and YELLOW - Earth BLUE - Neutral BROWN - Live

As colours of the cores in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The core which is coloured green and yellow must be connected to the terminal in the plug marked with the letter E, or with the earth symbol, or coloured green, or green and yellow.
- The core which is coloured blue must be connected to the terminal marked N or coloured black.
- The core which is coloured brown must be connected to the terminal marked L or coloured red.

This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. If the attachment plug needs to be changed, refer servicing to qualified service personnel who should refer to the table below. The green/yellow wire shall be connected directly to the unit's chassis.

CONDUCTOR		WIRE COLOR	
L	Line	Brown	Black
N	Neutral	Blue	White
	Earth Grnd.	Green/Yel.	Green

WARNING: If the ground is defeated, certain fault conditions in the unit or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.

LITHIUM BATTERY WARNING

CAUTION!

This product may contain a lithium battery. There is danger of explosion if the battery is incorrectly replaced. Replace only with an Eveready CR 2032 or equivalent. Make sure the battery is installed with the correct polarity. Discard used batteries according to manufacturer's instructions.

ADVARSEL!

Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

ADVARSEL!

Lithiumbatteri - Eksplosjonsfare ved feilagtig håndtering. Utskiftning må kun ske med batteri av samme fabrikat og type. Levér det brukte batteri tilbake til leverandøren.

VAROITUS!

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

WARNING!

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparatillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

DECLARATION OF CONFORMITY

Manufacturer's Name: ***Digitech Electronics***
Manufacturer's Address: 8760 S. Sandy Parkway
Sandy, Utah 84070, USA

declares that the product:

Product Name: ***RP-20 Valve***
Product Options: All

conforms to the following Product Specifications:

Safety: EN 60065 (1993)
IEC 65 (1985) with Amendments 1, 2 & 3

EMC: EN 55013 (1990)
EN 55020 (1991)

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and EMC Directive 89/336/EEC as amended by Directive 93/68/EEC.

Digitech

President of Digitech
8760 S. Sandy Parkway
Sandy, Utah 84070, USA
Tel: 801.566.8800
Fax: 801.566.7005

Effective August 30, 1997

European Contact: Your Local Digitech Sales and Service Office or

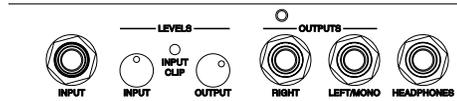
International Sales Office
3 Overlook Drive #4
Amherst, New Hampshire 03031, USA
Tel: 603.672.4244
Fax: 603.672.4246

Quick Start

For those of you who prefer to burn now and read later, we've included this Quick Start section to get you up and running.

Connect Cables:

Connect guitar into the **Input jack** (located on the rear of the RP-20). Now run from the Output of the RP-20 to the Input of the either the Guitar Amp, Power Amp or Mixing board.



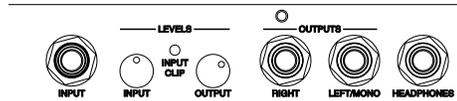
Apply Power:

Note: When applying power to the RP-20 Valve, it is recommended that the <Input> and <Output> be turned down prior to powering up the unit.



Adjust Input and Output:

Use the <Input> level knob on the rear panel to adjust the Input level, so that the loudest guitar signal occasionally lights the clip LED indicator. Now adjust the <Output > level knob on the rear panel of the RP-20 Valve to the desired output level .



Select Preset:

Begin playing your guitar, and choose any preset using the <Data> wheel or pressing any one of the ten footswitches. User Presets 1-100 are duplicates of the Factory Presets. They are user-programmable. You can modify and store them as you want. Factory Presets 1-100 are not user-programmable and cannot be overwritten.

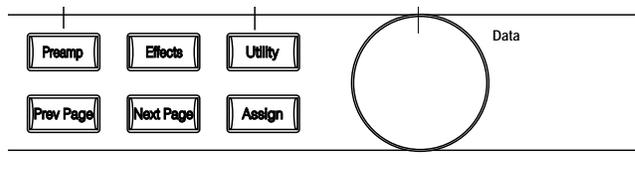


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Section-1 Introduction

Congratulations...

... you are now the proud owner of a Digitech RP-20 Valve Guitar Preamp/Processor. The RP-20 Valve is the first-ever Floor processor with a Tube (12AX7) Preamp section. This allows you to obtain almost any tone imaginable with a full menu of state of the art digital effects right at your feet.

This owner's manual is your key to understanding the powerful world of the RP-20 Valve. Read it carefully. After you've had time to familiarize yourself with the unit, try experimenting with unusual effect combinations. You are certain to achieve sounds never thought possible before. Good luck, and thank you for choosing Digitech.

Your RP-20 Valve was carefully assembled and packaged at the factory. Before you proceed any further, make sure the following items are included:

- *(1) Owner's Manual*
- *(1) Digitech RP-20 Valve Guitar Preamp/Processor*
- *(1) Power Supply*
- *(1) Digitech warranty card*

Please save all packing materials. They were designed to protect the unit from damage during shipping. In the unlikely event that the unit requires service, use only the factory supplied carton to return the unit.

RP-20 Valve Features:

- *Dual distortion path routing*
- *Built-in Expression Pedal*
- *Tube Preamp (12AX7)*
- *Full bandwidth effects (20-20kHz)*
- *24-bit signal path, 48-bit internal data path*
- *Up to 4 digital effects at once*
- *S-DISC II ® Processing*
- *Flexible, easy-to-use effect routing*
- *Effects can be repeated in a chain, (e.g. EQ + flange + EQ + pitch shift)*
- *Instant module access*
- *Exclusive Dynamic Parameter Control*
- *Programmable Speaker Cabinet Emulator*
- *Chromatic tuner*
- *Full MIDI Implementation*
- *All effects and parameters available for MIDI continuous control*
- *2 Expression Pedal insertion jacks to add external CC pedals for additional assigning options*
- *Upgradable System Software (via the MIDI In port)*

We at **Digitech** are very proud of our products and back-up each one we sell with the following *warranty*:

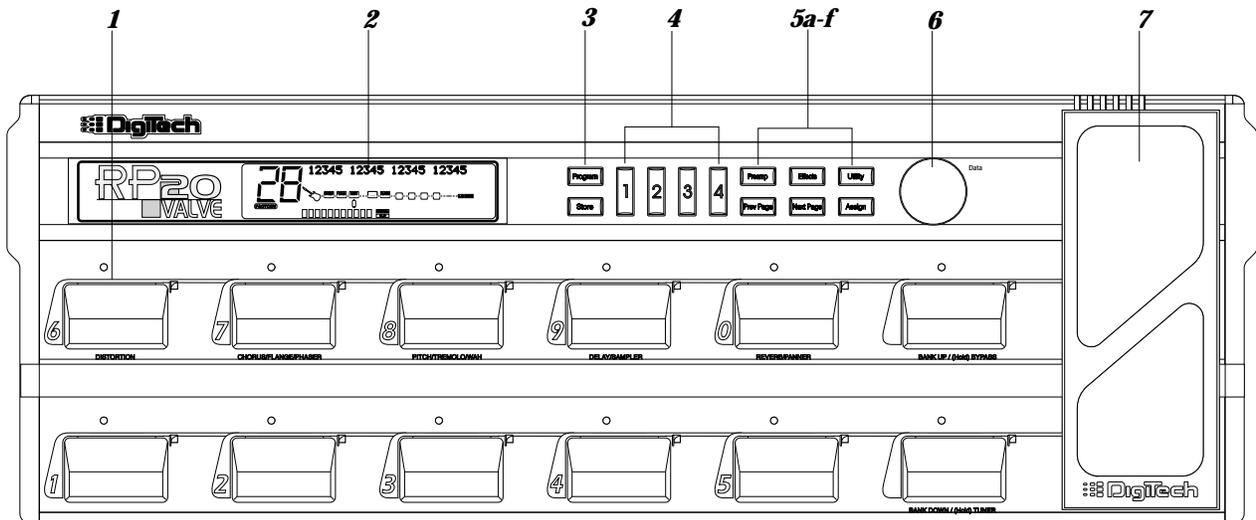
1. *The warranty registration card must be mailed within ten days after purchase date to validate this warranty.*
2. *Digitech warrants this product, when used solely within the U.S., to be free from defects in materials and workmanship under normal use and service.*
3. *Digitech liability under this warranty is limited to repairing or replacing defective materials that show evidence of defect, provided the product is returned to Digitech WITH RETURN AUTHORIZATION, where all parts and labor will be covered up to a period of one year. A Return Authorization number may be obtained from Digitech by telephone. The company shall not be liable for any consequential damage as a result of the product's use in any circuit or assembly.*
4. *Proof-of-purchase is considered to be the burden of the consumer.*
5. *Digitech reserves the right to make changes in design, or make additions to, or improvements upon this product without incurring any obligation to install the same on products previously manufactured.*
6. *The consumer forfeits the benefits of this warranty if the product's main assembly is opened and tampered with by anyone other than a certified Digitech technician or, if the product is used with AC voltages outside of the range suggested by the manufacturer.*
7. *The foregoing is in lieu of all other warranties, expressed or implied, and Digitech neither assumes nor authorizes any person to assume any obligation or liability in connection with the sale of this product. In no event shall Digitech or its dealers be liable for special or consequential damages or from any delay in the performance of this warranty due to causes beyond their control.*

Digitech™, S-DISCH™, Whammy™, and Silencer II™ are registered trademarks of the Harman Music Group Incorporated.

NOTE: The information contained in this manual is subject to change at any time without notification. Some information contained in this manual may also be inaccurate due to undocumented changes in the product or operating system since this version of the manual was completed. The information contained in this version of the owner's manual supersedes all previous versions.

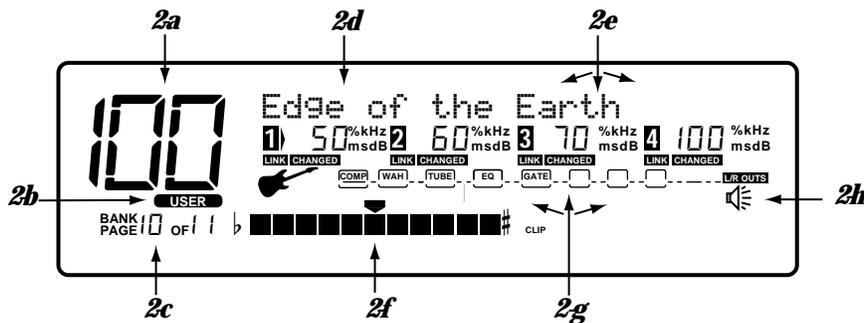
A Quick Tour of the RP-20 Valve

The Front Panel



1) Pedalboard- The RP-20 Valves's pedalboard consists of twelve switches and a real time expression pedal. the footswitches labeled 1-10 can be used to turn effects on or off, change presets or toggle continuous controller. The **<Bypass/(hold) Tuner>** footswitch (located on the bottom row) can be used to bypass all of the effects within the RP-20 Valve or activate the tuner mode when held. The **<Bank Up/(Hold) Bank down>** footswitch is used to move up and down through any one of the 19 banks in the RP-20 Valve.

2) Display - This large custom display is where you receive most of the information you need to optimize performance of the RP-20 Valve. This display has several functions and they are as follows:



2a) Program Number - The three large digits located in the upper left corner of the display indicate which Program is currently selected. This indicator will also display the currently selected note while the RP-20 Valve is in Tuner Mode.

2b) Factory / User indicators - Located directly below the Program number, the Factory and User program icons indicate whether the

current program resides in the Factory or User Bank. To toggle between the Factory and User Programs simply press the **<Program>** button.

2c) Bank / Page Indicators - Located in the bottom left hand corner of the display, the Bank/Page indicators display:

- The RP-20 Valve Bank number in which the current program resides in Program Mode
- The page which is currently selected in various editing modes.

2d) Information Line - The row of 24 characters in the top line of the display indicates more detailed information about specific functions and items such as: Program names, Parameter names and Utility information.

2e) Parameter Data Sections - Immediately below the information line, are four parameter data sections. They correspond with buttons **<1>** through **<4>** on the front panel. Each section displays the current value of the indicated parameter.

A **LINK** icon in each group tells whether the indicated Parameter is linked for expression control. When a parameter has been modified, the **CHANGED** icon will appear under the parameter that has been modified and the **<Store>** button will light to indicate a change has been made to the program, but not stored.

2f) Input Level / Clip Meters / Tune Indicator- An Input Level and Clip meter is located in the bottom center of the display. This meter shows the guitar signal level, and uses a peak detector action to display the highest levels at the input. The **CLIP** icon at the end of the meter, indicates if the the input signal is being clipped at the Analog input section (pre-digital). The **DIGITAL CLIP** icon indicates that there is clipping in the digital effects domain. This meter is also used to show note activity while the RP-20 Valve is in Tuner Mode

2g) Effect Routing Matrix - The Effect Routing Matrix shows the signal flow of the currently selected program through the amp and effect sections. This matrix includes boxes that represent each effect module along with lines that indicate how those effects are connected to inputs, outputs and each other. If an effect module is bypassed, a line appears through that module's box in the Matrix.

**When in FX Edit mode, the box that represents the currently selected effect module will flash.*

2h) Speaker Cabinet Emulator Icon - When the **SPEAKER** icon appears in the display, this indicates that the Speaker Cabinet Simulator is engaged

3) Program and Store - The **<Program>** button (top) will put the RP-20 Valve in program mode and toggle between the Factory and User programs when pressed twice. The **<Store>** button is used to store any editing changes to a program.

4) Parameter Buttons- The parameter buttons **<1>** through **<4>** are used to select the parameter to be modified or the utility item that you wish to edit.

5a-f) Editing Buttons- These 6 buttons are used in the editing functions of the RP-20 Valve and their functions are as follows:

5a) Preamp - Pressing the **<Preamp>** button will enter the Preamp section of the RP-20 Valve. Successive presses will move through the individual modules of the preamp section including: Wah, Tube Distortion, Solid State Distortion, EQ and Noise gate.

5b) Effects - Pressing the **<Effect>** button will take you to the digital effects section. Successive presses of the effects button will move through the individual effect modules one at a time.

5c) Utility - Pressing the <Utility> button will enter the utility mode where editing can be done.

5d) Previous Page - The <Previous Page> button moves to the previous page of the selected module that is being edited or to the previous utility page when the RP-20 Valve is in Utility mode.

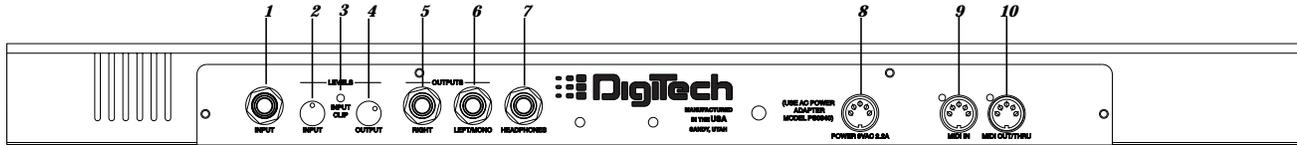
5e) Next Page - The <Next Page> button moves to the next page of the selected module that is being edited or to the next utility page when the RP-20 Valve is in Utility mode.

5f) Assign - The <Assign> button is used for making any continuous controller assignments to footswitches. For more information about assigning functions, please see page 63.

6) Data Wheel - The <Data> Wheel is used for scrolling through the programs of the RP-20 Valve and various editing functions

7) Expression Pedal - The Expression pedal is used for continuous control over any parameter of the RP-20 Valve. For more about continuous control assignments of the RP-20 Valve, please see page 63.

The Rear Panel



- 1) **Input** - This is the audio input jack for the RP-20 Valve.
- 2) **Input Level** - This is the input control knob for the RP-20 Valve. To achieve the optimal setting for the RP-20 Valve, turn the input knob up until the signal clip LED (3) occasionally lights when an input signal is fed into the RP-20 Valve.
- 3) **Input Signal Clip LED** - This is the Input signal clip LED of the RP-20 Valve. When this LED lights, the input signal is too strong and should be turned down until this LED only occasionally lights.
- 4) **Output Level** - This is the Output level control knob, and is used for setting the overall output level of the RP-20 Valve.
- 5) **Right Output** - This is the right output jack of the RP20 Valve.
- 6) **Left (Mono) Output** - This is the left (Mono) audio output of the RP20 Valve. This output jack can be used as the Mono out or can be used with the right output to produce stereo outputs.
- 7) **Headphone Out** - This is the stereo headphone output. The headphone output level is controlled by the output level control knob.
- 8) **MIDI In** - The MIDI IN port allows the RP-20 Valve to respond to incoming MIDI information.
- 9) **MIDI Out/Thru** - This port allows the RP-20 Valve to send out or pass MIDI data to other devices.
- 10) **AC Line Input** - This input is used for the input of the included power supply.

Note- Use only the included PS940 power supply.

The Preamp Section

Dual Distortion Paths: A truly unique feature that the RP-20 Valves offers, is the ability to run dual distortion paths within the same effect configuration. What does this mean? This means that you can run your guitar's signal through two distortion paths at the same time and morph between them. This is a great effect for producing clean and distorted tones at the same time.

Solid State Distortion Path: The Solid State distortion path in the RP-20 Valve gives you the ability to get great clean tones, classic rock fuzz distortions, and even high gain rock distortions.

Tube Distortion Path: The Solid State distortions are great to use alone, but the RP-20 Valve is the first to provide the user with Tube preamp tones in a floor mounted effects processor. This will give you the ability to re-create classic tube distortions which are ideal for playing country rock, blues and all out rock guitar.

Digitally Controlled Analog Wah: Conveniently located in the preamp section, lies a digitally controlled Analog Wah module. The Analog Wah will produce classic wahs, modern wahs, and even auto wahs. The Analog wah is assignable to the built-in expression pedal on the RP-20 Valve. For more information on using the Analog Wah with the expression pedal, please see pages 20.

Preamp Compressor: The RP-20 Valve provides you with a compressor in the preamp section to dial-in all of your preamp tones. The compressor can be used to tighten-up the clean rhythm tones or make a solo come to life.

Dual 10 band EQs: If having dual distortion paths within RP-20 Valve is not appealing enough, you also have 10-band EQ modules in each path. This will give complete tonal control over each distortion type that is being used.

Silencer II™ Noise gate To keep the RP-20 Valve ultra-quiet, we have included the world famous Silencer II™ noise reduction system under the hood. This make the RP-20 Valve an ideal piece for any studio recording.

Digital Effects

Not only does the RP-20 Valve provide you great preamp tones, but it also has a world class digital multi-effect section that includes almost every studio-quality effect imaginable.

Effects include:

- Reverbs (Natural & Spring)
- Chorus
- Tremolos
- Rotary Speaker Simulation
- Phasers
- Flangers
- Digital Compressor
- Auto panners
- Analog/Digital Delays
- Whammy Effects
- Chromatic Pitch Shifters
- Intelligent Pitch Shifter
- Detuners

Real Time Parameter Modifiers: Modifiers are unique tools that can be used to dramatically alter your sound based on information from signal amplitude, the settings of a Low Frequency Oscillator (LFO) or MIDI Continuous Controller information.

Every Program in the RP-20 Valve has a set of modifiers. Up to 16 Modifier links can be assigned to control parameters. There are 5 types of Modifiers that can be linked to a parameter: Foot Switch, Expression Pedal, MIDI CCs, LFOs, and Dynamic (signal level dependent).

MIDI CCs: When you use MIDI CCs, your RP-20 Valve responds to CC numbers 0-127 and CHP (channel pressure or aftertouch). For example, you can have a synth's modulation wheel (usually MIDI CC#1) control the Input level of a reverb and chorus in one Program, while the delay feedback may be controlled in another. For more information on MIDI CCs, please see pg. 51.

LFOs: When you use LFOs, parameter values can be controlled automatically between a defined minimum and maximum setting at a user-definable rate. Your RP-20 Valve has 2 user definable LFOs in each program that can use unique speeds and waveforms, and can be assigned to any Parameter.

For example, you can create an auto panner without using an auto panner module. Simply link an effect's output pan parameter to the LFO modifier and the LFO will move that parameter back and forth. This modifier can be a very useful weapon in the ongoing battle of new sound creation. For more information on LFOs, please see pg. 51.

Dynamic Modifiers: When you use Dynamic Modifiers, the parameter values are controlled in relation to the dynamics of the input signal. The possibilities are nearly endless. For more information on Dynamic Modifiers, please see pg. 51.

For example, you could link the Dynamic Modifier of a Program to control a chorus level. It doesn't sound like much on paper, but imagine the expressiveness of this type of effect on a lead. As you play the guitar harder, the chorus becomes less apparent. Play softly and the chorus increases. ALL IN REAL TIME!

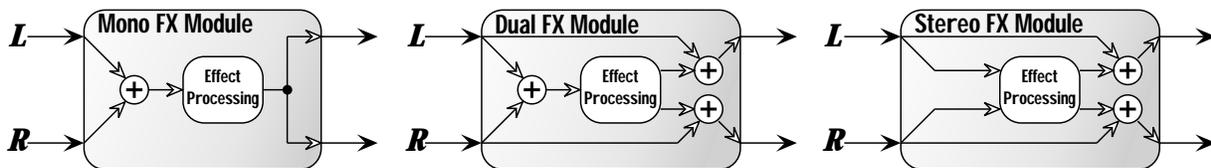
For more information on using modifiers see the "Assigning Modifiers" section on page 51.

Module Types

Each effect in the digital FX section is contained in separate effect blocks referred to as “Modules”. There are three basic types of FX Modules used by the Digital FX section of the RP-20 Valve

- Mono FX module
- Dual FX module
- Stereo FX module

The figure below illustrates how signals are routed through each type of FX Module. Although all three Modules are shown with stereo inputs, they can still be used with a mono source. The mono source would just be routed to both sides of the module’s inputs. Notice how the Dual FX Module maintains a stereo image, while the mono FX Module always sums the signal

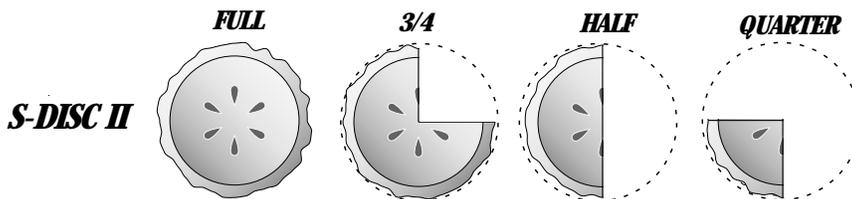


Module Sizes

These modules vary in size ranging from 1/4 size to Full. In order to achieve the nearly endless combinations of effects and routings, we’ve supplied you with four different module sizes and they are as follows:

- Full (module type = FUL)
- 3/4 (module type = 3-4)
- Half (module type = HLF)
- Quarter (module type = 4th)

Dividing the S-DISC II’s processing power allows your RP-20 Valve to produce up to 4 digital effects at one time. The figure below represents how the S-DISC II can be divided to accommodate a wide variety of effect routing.

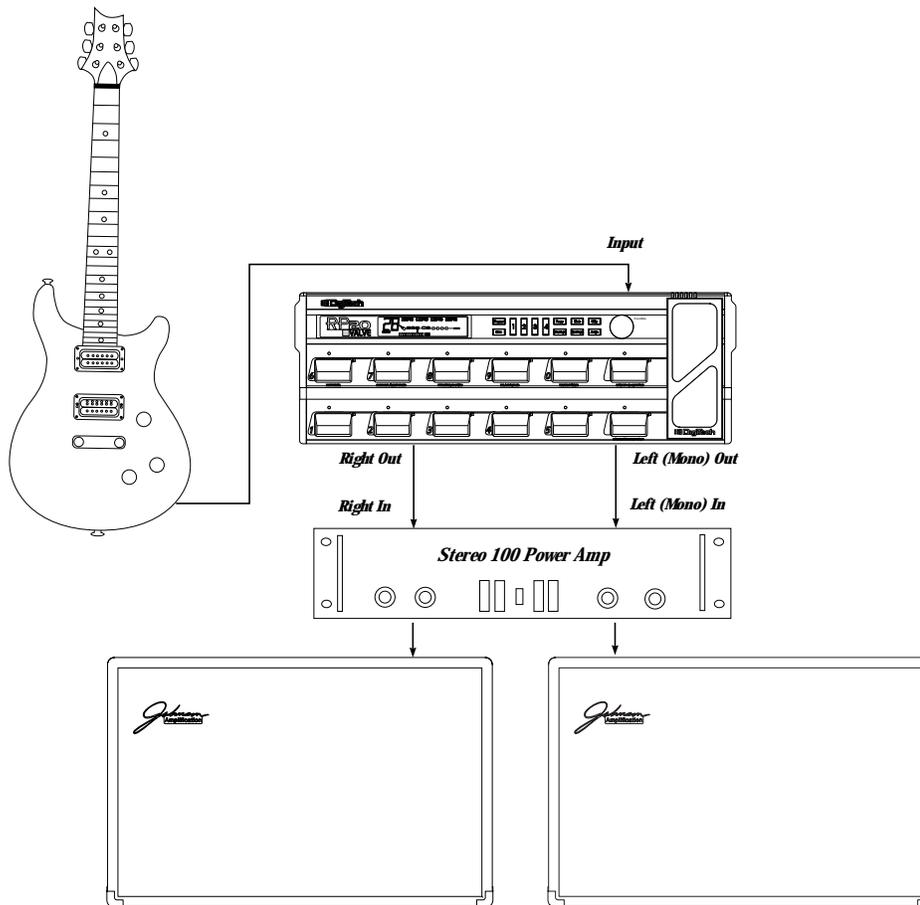


A Full module type offers effects with more flexibility and power than the Half modules, and so on, but all four sizes of FX Modules feature high quality effects, so you don’t have to worry if you need to divide the S-DISC II pie four ways. For a complete list of these FX Types please see the Editing Modules section. For a complete list of effect configurations please see Appendix on page 76.

Section-2 Setting Up

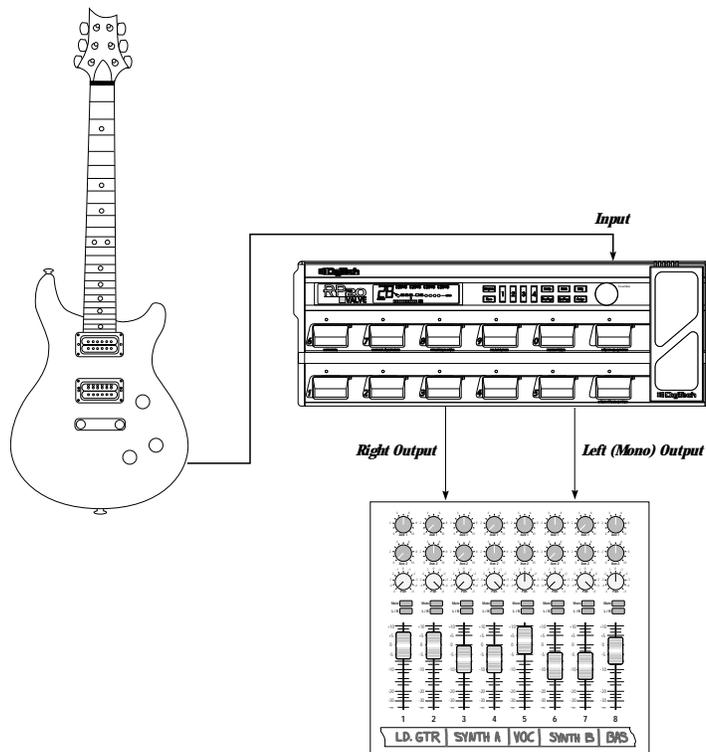
Making Connections

Your RP-20 Valve can be connected in several different ways to meet the requirements of specific applications. The following diagrams offer some different ways your RP-20 Valve can be connected.



RP-20 Valve into a stereo power amp and two 2x12 Extension Speaker Cabinets

For those of you out there that feel that “bigger is better”, this set-up should work quite nicely for you. First plug into the input of the RP-20 Valve. RP-20 Valve run out of both of the outputs into the stereo inputs of the power amp. Using a set-up such as this will let you produce that classic Stack Sound. This is also a great set-up to produce lush and thick stereo effects.



Running Direct with the Programmable Cabinet Emulator

The RP-20 Valve provides you with a speaker cabinet emulator for running direct to a mixing board.

When using the speaker cabinet emulator, it can be done by simply engaging cabinet Emulator in Page 2 of the Utilities menu. To get there, press the **<Utilities>** button. Now press the **<Next Page>** or **<Previous Page>** buttons and move to page 2. Once there, you can globally enable (global on) or disable (global off) the Emulator or enable local settings (local on) by pressing the **<4>** button and then turning the **<Data>** wheel. To set up local (Programs dependent) emulation on page 2 of the Output/Master mix module in edit mode press the **<Effects>** button until you reach the last page in the effect configuration chain where the master mix is located. Now press the **<Next Page>** button to move to page 2 of the parameters. use the **<1>**, **<2>** and **<3>** buttons to set the cabinet emulator parameters.

To Exit this mode, simply press the **<Program>** button.

At this point, you will want to run from either Left or Right outputs (or both for a stereo mix), into the selected inputs of the Mixer. You can set the Output mode to either Stereo (splitting the signal into a stereo soundfield) or Mono (summing the stereo signal) on page 1 of the Utilities menu by using the **<2>** button to select the mode.

As usual, it is a good idea to check all of the cables being used when making connections to ensure that good contact is being made. Notice that once the Speaker Cabinet Emulator is turned On, the **SPEAKER** icon will appear in the display.

Getting Around In the Operating System

The menu structure of your RP-20 Valve has been specially designed to be easy to use. The display shows the information you need, but to make things even easier for you, illumination of the front panel buttons offers additional operating information.

The front panel buttons give you information in one of two ways:

- 1 - If the button is dim, its function is inactive. Pressing a dim button causes it to light brightly and its function becomes the active item in the display. If the dim button doesn't light after you press it, the button is unavailable.
- 2 - If the button is bright, its function is active.

Program Mode

Program mode allows you to scroll through the Factory and User programs using the **<Data>** wheel. When your RP-20 Valve is turned on, it sets itself to Program mode. Program mode is active when the **<Program>** button is lit and a Program name is present on the information line (top line) of the display.

FX Edit Mode

This mode allows you to edit:

1. Digitally controlled Analog Wah
2. Compressor
3. Distortion Types
4. Noise Gate
5. Selecting Effect Configurations
6. FX Modules
7. Output Mode of your Programs

Use either the **<Preamp>** or **<Effects>** buttons to enter the FX Edit mode.

A helpful hint: If you look at the Effect Routing Matrix while you press the FX **<Preamp>** or **<Effects>** button, the currently selected module will flash.

Your RP-20 Valve uses "Pages" to navigate within an effect. A "Page" is a group of up to four effect parameters that appear on the screen at one time. Use the **<Next Page >** or **<Previous Page>** buttons to move through the pages in the menu. Note that as you scroll through the pages, the page indicator in the lower left corner of the display changes to show the currently displayed page number.

Utility Mode

From the initial power-up of the unit, access to all of the menu pages of the utility mode can be made by simply pressing the **<Utility>** button located on the front panel of the unit. From this point, the display will tell you that you are in the Utility mode and you can scroll through the options by turning the **<Next Page >** or **<Previous Page>** pages buttons.

Assign Mode

Once the RP-20 Valve is in assign mode, all modifier assignments can be made. This assign mode gives you the ability to assign dynamic modifiers, foot switches and the expression pedal to almost any parameter in the RP-20 Valve. Access to this function is located on the front panel **<Assign>** button or in the utilities pages within the RP-20 Valve. For more information on assignments, please see page 51.

Getting Sounds

It never fails, there always seems to be a sound man at the back of the room, or an engineer in the control room that wants “more of this, or less of that” (bottom line: your ear is king). But, to accommodate these situations, you may need to make some minor adjusting here and there along the way. So here are some helpful guidelines for getting great sounds, while keeping everyone happy.

Input and Output Adjustments

The best setting for the input control is to use the **<Input level>** knob so you’re occasionally lighting the clip LED. As far as setting the **<Output level>** knob, let your ears be the judge. But, if you can’t hear the rest of the band, chances are that you need to back off on the output level of the RP-20 Valve.

Preamp Effects

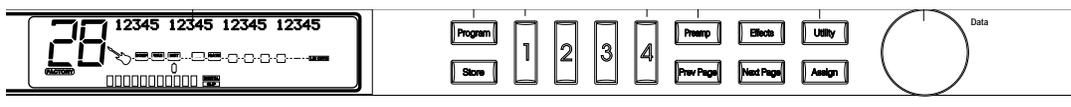
Preamp Section Adjustments

When editing in the preamp section, you have the option of editing the following preamp effects:

1. Solid State Distortion
2. Tube Distortion
3. Analog Wah
4. Compressor
5. 10-band EQ
6. Noise Gate

To dial in the preamp tone that is ideal for you, whether it be Distortion types, Analog Wah, 10-band EQ or noise gate adjustments, simply press the **<Preamp>** button, which will put you in preamp edit mode. From there continue to press the **<Preamp>** button until you reach the preamp module which you wish to edit. Notice that the module for editing will **Flash** in the display. Now that you are at the module that you wish to edit, you can begin to use the **<Next Page>** and **<Previous Page>** buttons to move you through the module. Once you arrive at a page you wish to edit, the display will show up to 4 parameters per page. To edit one of the parameters, simply press one of the four function buttons marked **<1-4>** to select the parameter. At this point you can scroll through that selected parameter by using the **<Data>** wheel. Once you have your sounds, always make sure to store and press the **<Program>** button to exit the edit mode.

The illustration below shows all of the editing tools needed for Preamp section editing.



Digital Effects

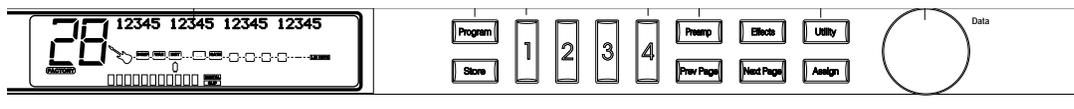
Digital Effect Section Adjustments

When editing in the digital effect section, you have the option of editing the following:

1. Digital Effects
2. Wet/Dry Mix
3. Effect Configuration
4. Effect Module Size

When you are editing the digital effect section of the RP-20 Valve, whether it be effect type, Wet/Dry Mix, Effect configuration or module size, simply press the **<Effects>** button, which will put you in digital effect edit mode. From there continue to press the **<Effect>** button until you reach the digital effect module that you wish to edit. Notice that the module for editing will **Flash** in the display. Once you are at the module that you wish to edit, you can begin to use the **<Next Page>** and **<Previous>** page buttons to move you through the module. Once you arrive at a page you wish to edit, the display will show up to 4 parameters per page. To edit one of the parameters, simply press one of the four function buttons marked **<1-4>** to select the parameter. At this point you can scroll through that selected parameter by turning the **<Program/Effect>** wheel. Once you have your sounds always make sure to store and press the **<Program>** button to exit the edit mode.

The illustration below shows all of the editing tools needed for Digital Effect editing.



Selecting A Program

When you first turn on your RP-20 Valve, you are in Program Mode, and the display will appear something like:



To select a program, do the following:

1. Make sure program mode is selected (the **<Program>** button will be brightly lit). If the **<Program>** button is dim, press it once to return to program mode.
2. Use the **<Program>** button to select the program bank (factory or user). successive presses of the **<Program>** button toggle between the factory and user bank of programs.
3. Using the **<Data>** wheel, scroll to the Program you want to use, or press one of the footswitches.

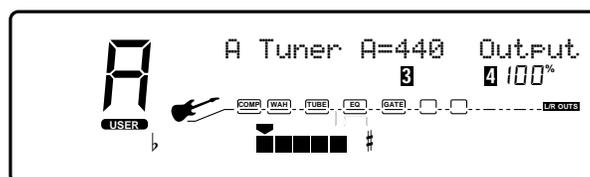
Using the Tuner

The Tuner of the RP-20 Valve can be accessed pressing and holding the **< Bank Down/Tuner>** footswitch.

Instant Tuner Access

To instantly access the Tuner Mode of the RP-20 Valve, press and hold the **<Bypass/Tuner>** footswitch. This will take you directly to the tuner function.

1. As you play a note on the guitar, the large number display will tell you which note you are playing, while the meter will show you if you are flat or sharp. If the meter is moving right, the note you are playing is sharp. If the meter moves left, you are flat. The goal is to tune your guitar so that the meter stops moving, and the display will lock-in, indicating that you are in tune. Once you start playing the selected note, the display will read as follows:



Press the any button to exit the Tuner mode.

Reference and Output

The RP-20 Valve gives you the option of changing the Tuning reference from as low as F# or A=427 to A=453, by simply pressing the <3> button and then turning the <Data> wheel while the RP-20 Valve is in Tuner mode. Another feature available in the RP-20 Valve Tuner mode, is the ability to set the amount of signal that is passed to the output while tuning. This has a range from 0 (mute) to 100%. The output can be changed by pressing the <4> button and then turning the <Data>wheel to the desired level while the RP-20 Valve is in Tuner mode.

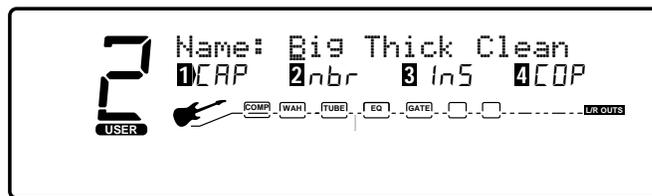
Section-3 Editing Programs

Naming and Storing Programs

Before we get into editing programs and creating your own sounds, let's learn how to store changes so you won't lose any modifications you'll want to keep. The Store procedure allows you to rename, relocate and save any modifications you have made to programs so that they can be accessed easily later.

Naming the Program

1. Press the <Store> button once. The display shows the current program name (which may look something like this):



A cursor appears under the first character of the program name.

2. Using the <Data> wheel, change the character to the one you want in the selected position.
3. When the correct character is displayed in that position, press the <1> button and then turn then <Data> wheel to scroll the cursor to the next character you want to change.
4. Use the <1> button and the <Data> wheel to change the letter's case. The <2> button and <Data> wheel are used to select numbers, The <3> button and <Data> wheel are used to insert spaces. The <4> button and <Data> wheel are used to copy and paste characters.
5. To copy a character, position the cursor under the character you want to copy (using the <Next Page > and <Previous Page> buttons), then press the <4> button and then turn the <Data> wheel clockwise. To paste the copied character, position the cursor where you want to paste the character, then press the <4> knob and then turn the <Data> wheel counter-clockwise.
6. To abort the procedure, press any button other than <Store>.

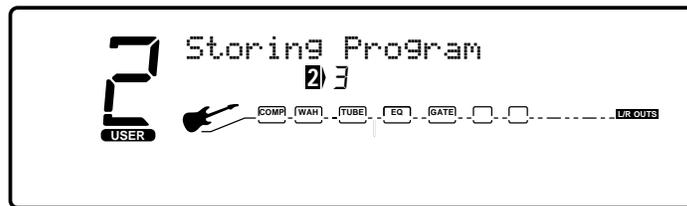
Storing the Program

1. When you have the name how you want it, press the **<Store>** button again. The top line of the display appears something like this:



This screen allows you to select the location of the new Program. Note that when the Program is stored, it is stored in the User bank of programs because factory programs cannot be overwritten.

2. Press the **<2>** button and then turn the **<Data>** wheel to select the program number where you want to store the new program.
3. Press the **<Store>** button again. The top line of the display briefly reads:



after which you are taken to the program you have just stored.

The newly created program is now loaded, and can now be recalled at any time.

4. To abort the procedure, push the **<Program>** button to return you to program mode.

Editing a Program

The RP-20 Valve is capable of producing almost any guitar sound ever thought conceivable. Whether it be Preamp tone or an effect configuration that utilizes the most sophisticated digital effects available. Great sounds aren't just a crazy concept, but a very achievable possibility, and in these next few pages, we will give you some pointers in editing programs, to help achieve your own unique tones.

Program Editing Sections

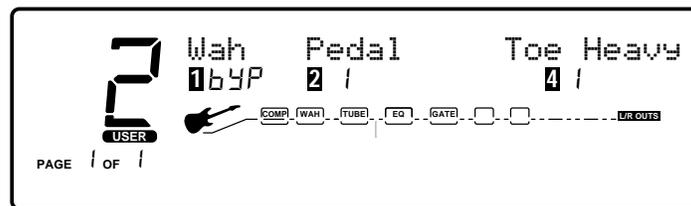
1. Preamp Section Editing
2. Digitally controlled Analog Wah Editing
3. Preamp Compressor
4. Noise Reduction Editing
5. Digital Effects Editing

Preamp Section Editing

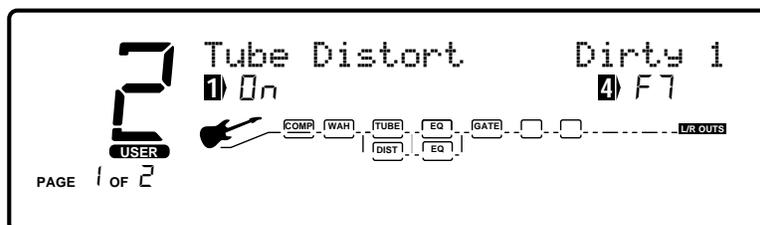
From any program within the Preamp Section you can select and edit any preamp effect by performing the following procedures:

Editing Distortion Types

1. From program mode press the <Preamp> button once and the display will appear something like this:



2. Now continue to press the <Preamp > button until only the selected distortion type (Tube or Solid State) flashes in the display. Once you are there, the display will appear something like this:



- Pressing the <1> button and then turning the <Data> wheel will turn the distortion type on and the <4> button and <Data> wheel will select the default types of the distortion.
- Once the distortion type has been selected, use the <Next Page> or <Previous Page> buttons to move to page 2 of the distortion type menu. Page 2 lets you select and adjust distortion type and gain amount by pressing the <2> button then turning the <Data> wheel you can select the distortion type. Pressing the <4> button and then turning the <Data> wheel you can adjust the gain.

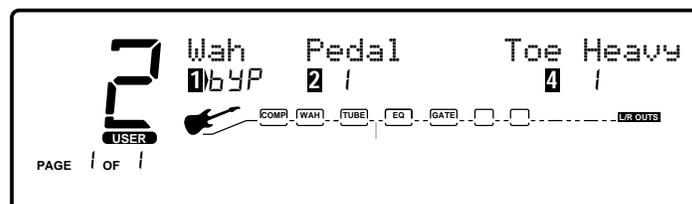


- Once the adjustments are made to the type and gain of the distortion type, make sure to store any changes

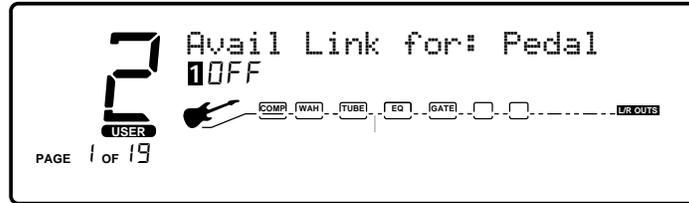
Analog Wah Editing

Analog Wah editing can be done by performing the following procedures:

- From Program mode press the <Preamp > button until the Wah module is flashing. The display will appear something like this:



- Pressing the <1> knob and then turning the <Data> wheel will either turn the Wah On or Off. The <2> button is used to activate the Wah pedal range and the <4> button and <Data> wheel is used to select the Wah type.
- The <2> (pedal parameter) can be assigned to the internal expression pedal. This is parameter can be selected by pressing the <2> button and then turning the <Data> and a Changed icon will appear directly beneath the parameter. At this point press the <Assign> button and the display will appear as follows:



4. Now press the Expression Pedal. If the Expression Pedal is already assigned to control another parameter, the display of the RP-20 Valve will ask you if you want to re-assign. If you wish to re-assign press the <1> knob and turn the <Data> wheel for yes or the <2> knob to abort the assign function.

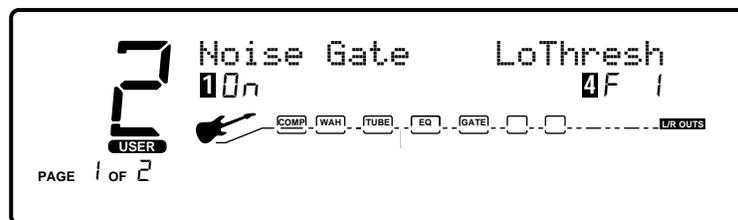
Note: Any time an assignment to turn a parameter On/Off is made you must decide if you want the parameter On when you enter the selected program. If you want it on, make the assignment to the parameter when the parameter is set to On. Otherwise, have the parameter set to Off or Bypass and the parameter will not be active within the program until the footswitch is used to activate the parameter

5. To Exit the Analog Wah edit mode, simply press the <Program> button.

Noise Gate Editing

The procedure for editing the Noise Gate module within the preamp section is as follows:

1. From program mode, press the <Preamp> button until the Noise Gate module is selected and is flashing and the display appears something like this:



2. At this point, you can press the <1> button and then turn the <Data> wheel to turn the Noise gate On or Off and the <4> button and the <Data> wheel are used to select the Noise gate default.

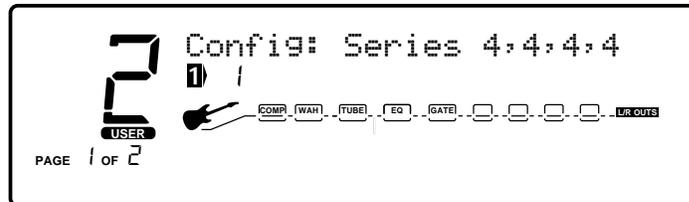
4. Now use the <Next Page> button and move to page 2 of the Noise gate edit module. This page is used to set the Threshold, Attenuation, Attack and Release parameters. Higher Threshold settings will close the gate sooner. Lower Release settings allow the gate to open up faster. To adjust any of these parameters, use the numbered buttons <1-4> and then turn the <Data> wheel.

5. To exit Noise gate edit mode, press the <Program> button.

Selecting Effect Configuration Routes

Within every Program of the RP-20 Valve, you have the option of selecting any 1 of the 15 Effect Configuration routes available in the RP-20 Valve. This can be very helpful when you have a program that uses a preamp tone that you prefer, but the currently selected effect configuration is not ideal for the digital effects that you wish to use in the Program. You can easily change these Effect configurations by using the following procedure as a guide:

1. Accessing the effect configurations can be done by pressing the **<Effects>** button until the display appears like this:



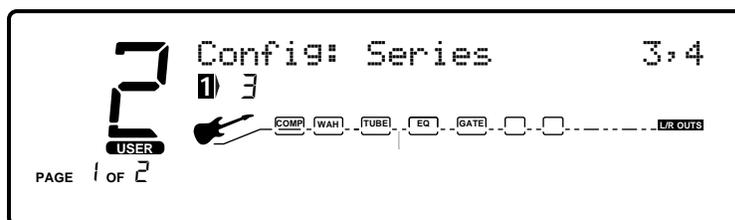
Note that the effect configuration is flashing

2. Now press the **<1>** button and then turn the **<Data>** wheel to select any one of the 15 different configurations available.
3. Once the configuration has been selected, press the **<Store>** button to save any changes.
4. To Exit the configuration menu, just press the **<Program>** button to return to program mode.

A Complete listing of the effect configurations of the RP-20 Valve can be found on page 76.

FX Edit Mode

1. From Program mode, press the **<Effects>** button. The display looks something like this:



2. Successive presses of the **<Effects>** button will move you through the chain of effects modules.

When you enter FX Edit mode, the first page of every FX Module allows you to:

- 1) Bypass that effect module (by turning it on or off) by pressing the **<1>** button and then turning the **<Data>** wheel.
- 2) Select an Effect Module (Only in the Digital Effect section), by pressing the **<2>** button and then turning the **<Data>** wheel.
- 3) Store the Default by pressing the **<3>** button and then pressing the **<Store>** button (for more info on storing Defaults, see pg. 25).
- 4) Select a Default for the selected Effect Module by pressing the **<4>** button and then turning the **<Data>** wheel.

Changing Effect Modules

Each program can be comprised of up to 4 digital effects (in addition to the Preamp section). The following explains the procedure for moving through the digital effects section.

1. Press the **<Effects>** button to enter FX Edit mode successive presses will move through the different modules.
2. Once you have reached the desired effect module, press the **<2>** button to select the effect type menu.
3. Now (turning the **<Data>** wheel) move through the list of effects with each effect being listed in the top line of the information display.

Selecting a Default

Once you have selected the effect you want in the program (ie: Dual Chorus), you can quickly scroll through several different Dual Chorus defaults stored in your RP-20 Valve's library. Defaults are modified effect modules which have custom settings that can be called up to use in a program anytime that particular sound is required.

Example:

There are 10 Dual Chorus defaults to choose from. Some Factory Programs use these default settings. So, if you like the Dual Chorus that is being used in Factory Program #4, and would like to use it in Program #98, simply scroll to the modulation module, then press the **<4>** button and then turn the **<Data>** wheel to recall the default (which happens to be F4-MediumWell) in Program #4. This eliminates the need to copy all those parameters from one location to the other.

For a list of all the FX Modules and their Defaults, see page 29.

Adjusting the Module's Parameters

Once in Edit Mode, the parameters of every default module can be accessed through a series of pages. You can adjust the level of a particular module from Edit page 2. If you're not already in Effects Edit Mode, press the **<Effect>** button until you reach the modules you wish to edit. Now press the **<Next Page>** button which will move you to page 2. You can now change the individual module's level by pressing the **<1>** button and then turning the **<Data>** wheel to the desired level. Settings range from 0 (off) to 100%.

Custom Defaults

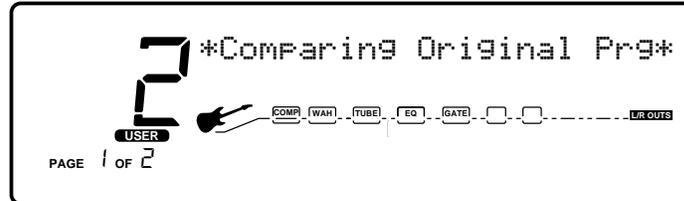
Once you have tweaked the parameters of an effect Module, you can store it off as part of the program. Once it is stored off, it becomes a custom default for that program, but is not added to the User default library. To save the settings as User Defaults, please see pg. 25

Comparing Changes

During the course of editing programs, you may find that you want to compare the edited version of the program to the original, stored version. Fortunately, your RP-20 Valve provides you with a compare function.

To compare an edited program with the original stored version, do the following:

1. While in FX Edit mode, press the **<Program>** button twice. The top line of the display reads:



When this message is displayed, the original version of the program is temporarily loaded and active.

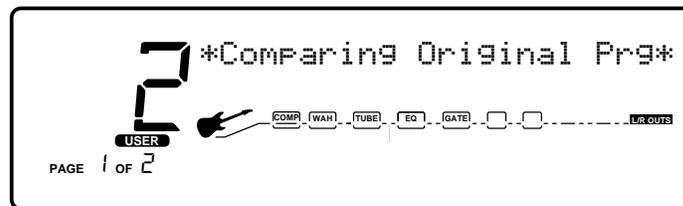
2. To return to the edited version, press either the **<Preamp>** and **<Effects>** buttons to get back to FX Edit Mode.

Section-4 Editing Modules

Storing/Naming Defaults

Before we get into editing modules and creating your defaults, let's learn how to store changes so you won't lose any modifications you'll want to keep. The Store procedure allows you to rename, relocate and save any modifications you have made to defaults so that they can be accessed easily later.

1. When you have satisfactorily altered an effect default (or created a new one), scroll back to Page 1 of the effect module you are editing (if you're not already there). The display looks something like this:



2. From Page 1 of the digital effects edit menu, press the <3> button and then turn the <Data> wheel clockwise. You will then be able to name your new default.

Naming the Default

1. Using the <Program/Effect> wheel, change the character to the one you want in the selected position.
2. When the correct character is displayed in that position, use the <Next Page> or <Previous Page> buttons to scroll the cursor to the next character you want to change.
3. Press the <1> button and then turn the <Data> wheel to change the letter's case. Use the <2> button and the <Data> wheel to select numbers. The <3> button and <Data> wheel are used to insert spaces. The <4> button and <Data> wheel are used to copy and paste characters.
4. To copy a character, position the cursor under the character you want to copy (pressing either the the <Next Page> or <Previous Page> buttons), then press the <4> button and then turn the <Data> wheel clockwise. To paste the copied character, position the cursor where you want to paste the character, then press the <4> button and then turn the <Data> wheel counter-clockwise.
5. To abort the procedure, push the <Program> button to take you to program mode.

Storing the Default

1. When you have the name as you want it to read, press the **<Store>** button. The top line of the display reads:

Store To: [Name]

This screen allows you to select the location of the new default. Note that when the default is stored, it is stored in the User bank of defaults because factory defaults cannot be overwritten.

2. Press the **<2>** button and then turn the , **<Data>** wheel to select the default number where you want to store the new default.
3. Press the **<Store>** button again. The default is saved off and you are taken to page 1 of the digital effects edit menu.

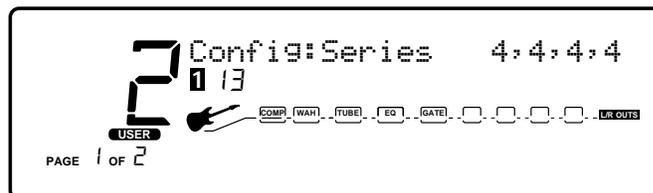
The newly created default is now loaded, and can now be recalled at any time.

4. To abort the procedure, push either the **<Program>** button to take you to Program Mode, the **<Edit>** button to take you to FX Edit Mode, or the **<Utility>** button to take you into Utility Mode, depending upon which mode you want to enter.

Editing a Module

Each of the RP-20 Valve's effects has several usable factory defaults, however, you may need to tweak the parameters of the module in order to the right sound you're looking for. The parameters of each effect module are reached through a series of pages.

1. Press the **<Effect>** button. The display looks something like this:



When you first enter Effect Edit mode (by pressing the **<Effect>** button), you are taken to effect configuration. Continue to press the **<Effect>** button until you reach a digital effect module that you wish to edit. Notice that as you scroll through the different modules, the currently selected module will flash in the Effect Routing matrix of the display. Once you have reached a module in the digital Effects section that you want to edit, use the **<Next Page>** or **<Previous Page>** buttons to move to the particular parameters.

*Notice: Anytime a change is made to either an effect module or Default, the **Changed** icon will appear directly below the effected parameter within the module or default and the **<Store>** button will light.*

Scrolling through a Module's Pages

Notice in the bottom left corner of the display (just under the program number) the display indicates which page you are on and the total number of pages within the module. Each page allows you to access up to four parameters using the <1> - <4> buttons to select the parameter and the <Data> wheel will move you through the selected parameter.

Example:

To scroll through the parameter pages of the Dual Chorus module, from the Program mode press the <Effects> button on the front panel until the module you wish to edit comes up in the display. Now press the <2> button and then turn the <Program/Effect> wheel to scroll to the Dual Chorus module. At this point use the <Next Page> or <Previous Page> buttons to scroll through the parameters of the Dual Chorus module.

For a description of all the FX Modules and their parameters, see pages 30-50.

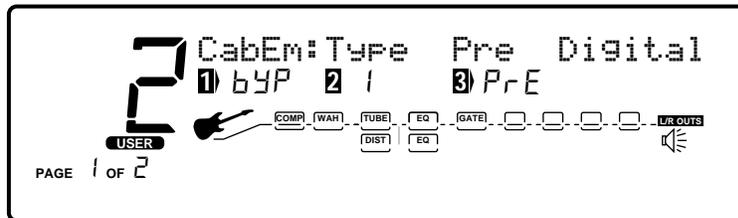
Output Module Functions

The last module in the audio chain within any program of the RP-20 Valve gives you control over crucial output functions of the RP-20 Valve such as: Master Mix, Master Volume and On and Bypass of the cabinet emulator for each program.

1. To access the Output module, press the <Effects> button until the display appears like this:



2. Pressing the <3> and <4> buttons and then turning <Data> wheel will let you set the Dry and Wet levels in the selected program.
3. By pressing the <Next or Previous Page> buttons, you will now be taken to page 2 of the Output module and the display will appear like this:



4. The <1> button is used to turn the Cab emulator on or off and the <2> button is used to select the Cabinet emulator type. The <3> button is used to set the position of the cabinet emulator in the audio chain.

Digital Effect Module Size and Type

With all of the work that these digital effect modules do for your sound, they have a tendency to work up an appetite. So, they consume their food from the FX pies chart referred to on page 9.

Since some of these effect modules have a larger appetite than the others, they require more pie. To help divide up the pie, we have provided you with a chart below that tells you what size of effect block that each will fit in. This helpful chart will also let you know if the selected module is either a Mono, Stereo, or Dual type effect module.

Note: The Effect Module size will always be displayed in Page 1 of the selected effect module next to the number 2 icon located in the display.

Effect Name	Module Type - 4th	Module Type - HLF	Module Type - 3/4	Module Type - FULL	Effect Type
Dual Cho	✓	✓	✓	✓	Dual
Quad Cho		✓	✓	✓	Dual
Octal Cho			✓	✓	Dual
Dual Fla	✓	✓	✓	✓	Dual
Dual Pha	✓	✓	✓	✓	Dual
Pedal Pha	✓	✓	✓	✓	Dual
RotarySpkr		✓	✓	✓	Stereo
St Tremolo	✓	✓	✓	✓	Stereo
Auto Pan	✓	✓	✓	✓	Stereo
Dual Dtn	✓	✓	✓	✓	Dual
Quad Dtn		✓	✓	✓	Dual
Octal Dtn			✓	✓	Dual
Smooth Pch			✓	✓	Stereo
Dual Pitch	✓	✓	✓	✓	Dual
Quad Pitch		✓	✓	✓	Dual
Octal Pch			✓	✓	Dual
St Pitch	✓	✓	✓	✓	Stereo
StDual Pch		✓	✓	✓	Stereo
Harmony			✓	✓	Stereo
Delay	✓	✓	✓	✓	Dual
Dual Delay	✓	✓	✓	✓	Dual
Quad Delay		✓	✓	✓	Dual
Stereo Delay		✓	✓	✓	Stereo
StDual Dly		✓	✓	✓	Stereo
StQuad Dly		✓	✓	✓	Stereo
Long Dly	✓	✓	✓	✓	Dual
Analog Dly	✓	✓	✓	✓	Stereo
StAlog Dly		✓	✓	✓	Stereo

Effect Name	Module Type - 4th	Module Type - HLF	Module Type - 3/4	Module Type - FULL	Effect Type
Chorus/Dly	✓	✓	✓	✓	Dual
Flange/Dly	✓	✓	✓	✓	Dual
Pre Delay	✓	✓	✓	✓	Dual
Reverb	✓	✓	✓	✓	Dual
DualReverb		✓	✓	✓	Dual
St Reverb			✓	✓	Stereo
Gated Rvrb	✓	✓		✓	Dual
St GatRvrb				✓	Stereo
Room Echo				✓	Stereo
Spring Tank			✓	✓	Dual
Auto Wah	✓	✓	✓	✓	Stereo
Compressor	✓	✓	✓	✓	Stereo
GEQ8	✓	✓	✓	✓	Mono
GEQ15		✓	✓	✓	Mono
GEQ31				✓	Mono
St GEQ8		✓	✓	✓	Stereo
St PEQ3	✓	✓	✓	✓	Stereo
PEQ6	✓	✓	✓	✓	Mono
St PEQ6		✓	✓	✓	Stereo
Thru Module	✓	✓	✓	✓	St/Mono

Default List

The Following list contains the names of all of the Effect Defaults in the RP-20 Valve

Preamp

Preamp

- Bluesy Rhythm
- Blues Lead
- Rock Man
- Twin Combo
- 1X12 Combo
- Country 1
- Country 2
- British Stack
- American Stack
- Dirty 1X12
- Fusion Lead
- Violin Lead
- Fuzzy Face
- Daddy's Tone
- Double Overdrive
- High Gain Solo
- Sweet Clean Tube
- Big Honk
- Power 1
- Power 2
- Blues Drive
- Power Clean
- Thick Blue
- Solo 1
- Solo 2
- Bright Comp Tube
- Klean Crunch
- T.Dirty-D.Clean
- T.Clean-D.Dirty
- Tube-DistHybrid
- Wah**
- Toe Heavy
- Linear
- Heel Heavy

Tube Distortion

- Warm Clean 1
- Warm Clean 2
- Warm Clean 3
- Bright Clean 1
- Bright Clean 2
- Bright Clean 3
- Dirty 1
- Dirty 2
- Dirty 3
- Sat Tube 1
- Sat Tube 2
- Sat Tube 3
- SloVibrato
- FstVibrato

Solid State

- Punchy
- Max Crunch
- Hi gain
- Low Fuzz
- Med Fuzz
- "The " Fuzz
- OverDrive1
- OverDrive2
- Chunk 1
- Chunk 2
- Warm Sus 1
- Warm Sus 2
- Warm Sus 3

10-Band EQ T&D

- Lo Boost 1
- Lo Boost 2
- Mid Cut 1
- Mid Cut 2
- Mid Cut 2
- Mid Scoop 1
- Mid Scoop 2
- Mid Boost 1
- Mid Boost 2
- HiLo Boost 1
- HiLo Boost 2

- Hi Boost 1
- Hi Boost 2
- Hi Boost 3
- Warm
- Dark
- Honky
- Quack
- Smiley
- Notchy
- Full Body 3
- Nosey
- Punch
- 4X12 Cab

Wah

- Toe Heavy
- Linear
- Heel Heavy

Noise Gate

- Low Thresh
- Med Thresh
- High Thresh
- Slow
- Fast

Choruses

Dual Chorus

- Medium
- Shallow
- MildWide
- MediumWell
- DeepDepth
- Deep
- Max Depth
- Shimmery
- SloVibrato
- FstVibrato

Quad Chorus

- Medium
- MildWide
- Medium Well
- Thick
- DeepDepth
- Deep
- Max Depth
- Shimmery
- SloVibrato
- FstVibrato
- ChorusLeft

Octal Chorus

- Medium
- Shallow
- DeepDepth
- MaxDepth
- Deep
- Shimmery
- SpcScrmblr

Flangers

- Dual Flange**
- HiSweep30%
- HiSweep70%
- LoSweep30%
- LoSweep70%
- Throaty
- Nasally
- Gonzo
- IntenseL
- Intense R
- FlaChorus1
- FlaChorus2

Stereo Flange

- HiSweep30%
- HiSweep70%
- LoSweep30%
- LoSweep70%
- Throaty
- Nasally
- Gonzo
- IntenseL
- Intense R
- FlaChorus1
- FlaChorus2

Dual Phaser

- ShallowSlo
- ShallowFst
- Mild Slow
- Mild Fast
- Medium
- Deep
- Shimmery
- PhaChorus1
- PhaChorus2
- Psycheic

Pedal Phaser

- Mild

Detuners

Dual Detuner

- 5 Cents
- -12 Cents
- +/- 5 Cents
- +/- 10 Cents
- Single Vox

Quad Detuner

- Shallow
- Medium
- Wide
- Deep

Octal Detuner

- Shallow
- Medium
- Wide
- Deep

Pitch Shifters

Whammy

- Octave Up
- Octave Down
- 2ndMin3rd
- 2ndMaj3rd

Smooth Pitch

- ShiftDn-12
- ShiftDn-5
- ShiftDn-24
- ShiftUp+5
- ShiftUp+7
- ShiftUp+12

Dual Pitch

- 5th/OctUp
- 5thUp/OctDn
- Min3/5thUp
- 4th/OctDn
- OctUp/Dn
- OctDown/Dn
- 5ths Down
- 1&2OctsUp

Quad Pitch

- MajChord
- MinChord
- Oct/Dtn
- 5th/OctDtn
- 5Octaves

Octal Pitch

- Chord/Det1
- MinChord2
- Oct/Dtn
- 5th/OctDtn
- 5thsOcts

Stereo Pitch

- 5th Up
- Min3rdUp
- Maj3rdUp
- OctaveUp
- OctaveDown
- 2 OctDown

Stereo Dual Pitch

- 5th/OctUp
- Min3rdUp
- 3rd/5th Up
- Min 3rd/5th Up
- 4th/OctDn
- OctUp/Down
- OctDown/Dtn
- 1&2OctsUp

Harmony

- Cmaj3rdUp
- Cmaj6thUp
- Emin3rdUp
- Cmaj6thDn
- Cmaj3rdDn
- Emix3rdUp
- Cmaj5thUp
- 1&2OctsUp

Delays

Delay *

- 5sec/15%
- 2.5sec/15%
- 1sec/15%
- Slapback
- 300msEcho
- 400ms/30%
- 500ms/25%
- 800ms/20%
- 1Sec/0%
- 2.5sec/0%
- 5sec/0%
- Max Repeats

Dual Delay *

- PingPong
- 1SecTcToc
- Doubling
- Slapback
- DoubleSlap
- RoundNRound
- Hard2Tap
- Thick Tap

Quad Delay

- RoundN/Rnd
- SynchroTap
- RiotPanTap
- TripleSlow
- Ping Pong
- 400ms Thick
- On the Rise
- Shav&Hrcut
- Horse Trot

Stereo Delay

- 2sec/20%
- 1sec/20%
- CombFilter
- Doubling
- SlapRight
- 400ms/30%
- 500ms/30%
- 600ms/30%
- Max Repeats
- 1sec/0%
- 2sec/0%

Stereo Dual Delay *

- Skip
- SwingPong
- PingPong1
- PingPong2
- DoubleSlap
- RoundN/Rnd
- Hard2Tap
- ThickEcho

Stereo Quad Delay *

- RoundN/Rnd
- SynchroTap
- Ping Pong
- 400msThick
- HorseTrot
- Shav&Hrcut
- Rataat
- Random

Long Delay *

- 2.8sec/15%
- CombFilter
- Slapback
- 300msEcho
- 400ms/30%
- 500ms/25%
- 800ms/20%
- 1 SecEcho
- MaxRepeats
- 2.8sec/0%

Analog Delay *

- 5sec/25%
- True
- 500ms
- 1 Second
- 2.5 Second
- Soft Echo
- Eternity

Stereo Analog Delay *

- 2sec/25%
- SoftEcho
- Eternity

Multi-FX Mods

Chorus/Delay

- MedChoEcho
- LitChoEcho
- MedChoSlap
- DeepChoDly
- ShimryEcho
- ModDly300ms
- DeepModDly

Flange/Delay

- FlatLid300
- FlatMedD300
- HeavyFDly
- LoSweepDly
- ThroatyDly
- DoublGonzo
- Flangbelly

Reverbs

Reverb

- SmoothHall
- Bar nGrill
- OakFloorRm
- Vocal Reverb
- FoilPlate
- GoldPlate
- Smphny Hall
- RichChamber
- Sanctuary
- Salt Palace
- CmntGarage
- PlutoVerb

Dual Reverb

- BrightHall
- LangDrkHall
- ConcrHall
- MiniHall
- FlatChambR
- WarmChambR
- Smphny Hall
- BigCathedrl
- SmlCatherl
- GoldPlate
- Thinplate
- VocalPlate
- PercPlate
- StudiAmb
- StudioRoom
- WoodRoom
- FlutterRvb
- Very thin
- CementRoom
- HugeArena

Stereo Reverb

- SmoothHall
- Bar nGrill
- OakFloorRm
- VocalReverb
- FoilPlate
- GoldPlate
- SmphnyHall
- RichChamber
- Sanctuary
- SaltPalace
- CmntGarage
- PlutoVerb

Gated Reverb

- 100msGated
- 200msDcyEx
- 200msDecay
- 200msGated
- 300msDcyEx
- 300msGated
- SmphnyHall
- RichChamber
- Sanctuary
- SaltPalace
- CmntGarage

Spring Tank Reverb

- Short Decay
- Long Decay
- Wet Spring
- SurSplash
- Rat&Boing

Room Echo

- WideSlap
- LiveSlap
- Springy
- Stage
- Voxy
- Drum 1
- Drum 2

Other Modules

Pre Delay

- 0ms
- 30ms
- 60ms
- 90ms
- 120ms
- Warm0ms
- Warm60ms
- Warm120ms
- 0msHPass1
- 0msHPass2
- 0msHPass3
- 0msHPass4
- 0msLPass1
- 0msLPass2
- 0msLPass3
- 0msLPass4

Rotary Speaker

- SloLeslie
- MedLeslie
- FastLeslie

Stereo Tremolo

- DeepSlow
- DeepMedium
- DeepFast
- MildSlow
- MildMedium
- MildFast

Auto Pan

- WideSlow
- WideMedium
- Wide Fast
- Narrow Slow
- Narrow Med
- Narrow fast

Auto Wah

- Low Sens
- High Sens

Compressor

- Light
- Medium
- Heavy

Equalizers

8-Band Mono GEQ

- Flat
- Low Pump
- Sizzle
- InvertPhase
- Smiley
- InvertPhase

15-Band Mono GEQ

- Flat
- Low Pump
- Sizzle
- Smiley
- InvertPhase

31-Band Mono GEQ

- Flat
- Low Pump
- Sizzle
- Smiley
- InvertPhase

8-Band Stereo GEQ

- Flat
- Low Pump
- Sizzle
- Smiley

3-Band Stereo PEQ

- Flat
- Low Boost
- Smiley
- PhaseInvertL
- PhaseInvertR
- SmlBoost
- LowNudge
- 60HzNotch

6-Band Mono PEQ

- Flat
- Low Boost
- Smiley
- 60HzNotch
- InvertPhase

6-Band Stereo PEQ

- Flat
- Low Boost
- Smiley
- 60HzNotch
- PhaseInvertL

Thru Module

- Stereo Thru
- Mute
- Left Thru
- Right Thru

* Delay Defaults vary from 1/4, 1/2 and Full Module size. The Delay defaults shown are Full module sizes

Effects Library

The following pages offer the complete low-down on all of the effects offered in the RP-20 Valve.

Preamp Effects

Analog Wah

With the Analog Wah, you get the best of both worlds. This Analog Wah is digitally controlled. What exactly does that mean? This means that you get an dead-on accurate Wah emulation (you may have heard a certain Left-handed guitarist at Woodstock with this same tone), which is controlled via the RP-20 Valve's powerful processing. And the best thing is, you no longer have to change batteries every 3 to 4 hours.

The Analog Wah module also gives you the ability to assign a Dynamic Modifier to the pedal parameter to create Auto-Wah effects within the Wah module.

Analog Wah Parameters

ON/Bypass This parameter turns the Analog Wah On or Bypasses the effect module.

Wah Position Controls the pedal position of the Analog Wah effect module. Ranges from 1 to 128. ***The Expression pedal must be assigned to this parameter in order for module to operate.**

Wah Type Selects which Wah type is to be used. Selections are: Toe heavy, Linear, and Heel Heavy.

Distortion Types

All of the great preamp tones of today and the past are present under the hood of the RP-20 Valve. The distortion menu offers solid state and tube distortions that can be used separately or together.

Distortion Type Parameters

Distortion On/Off This the distortion On/Off button turns the distortion or off.

Distortion Type This parameter is used to select the different Distortion types available in the RP-20 Valve. The distortion types include: **Tube-** WarmClean, BrightClean, Dirty Tube, Saturated Tube, **Solid State-** Fuzz, Grunge, Overdrive and Heavy Sustain.

Gain This parameter controls the the distortion gain level. Range is from 0 to 100.

Noise Gate

The Silencer noise reduction system is definitely going to become your best friend in any recording session or live performance for keeping signals quiet.

Noise Gate Parameters

Type	Selects the type and placement of the noise reduction to be used.
Threshold	Set the minimum input level at which the compressor will engage. Ranges from -90 to 0.
Attenuation	Adjusts how far the signal is lowered when the gate is closed. Ranges from 1 to 5.
Attack	Controls how quickly the gate opens after the signal level reaches Thresh. Range: 1 to 10.
Release	Determines how quickly the the gate closes after the signal falls below the Threshold. Ranges from: 1 to 10.

Compressor

Compressor Parameters

Level	Controls the signal input level fed to the module. Ranges from Off to 100%.
Threshold	Sets the threshold level of the compressor. Ranges from -27 to 0.
Ratio	This parameter sets the compressor ratio. Ranges from 1.5 to 40.
Gain	This parameter controls the amount of gain in the compressor. Ranges from 0 to 200%.
Attack	This parameter controls the attack time of the compressor. Settings are: Slo, Med and Fast.
Release	This parameter sets the release of the compressor. Settings are: Slo, Med and Fast.
Delay	This parameter sets the delay time of the compressor. Ranges from 0 to 10 ms.

Digital Effects

Reverbs

Reverberation is probably the most widely used effect because it allows you to simulate the sound reflection characteristics of almost any kind of room. In a real room, reverb is a result of sound reflecting off room surfaces such as the walls, floor, ceiling, and objects in the room. The materials, size, and shape of the room determine how long these reflections echo and decay before dying out completely. These factors also help determine the audio characteristics of the room, such as how long the high-frequency reverberations ring when compared to the low frequencies, or how much initial "slapback" the room wall produces when a sound hits.

Today's technology allows the RP-20 Valve to offer a complete palette of flexible, easy to use reverbs. There are five basic reverbs to choose from:

- 1) **Reverb** - Simple, straight ahead reverb with only the most basic parameters.
- 2) **Dual Reverb** - Multi-dimensional reverb with flexible frequency band-splitting capabilities. The reverb can be divided into primary and secondary stages using selectable High or Low Pass cross-overs.
- 3) **Stereo Reverb** - A true stereo version of the Reverb Module.
- 4) **Spring Reverb** - A recreation of the old Spring Tank Reverb found in Vintage and Modern combo Amps.
- 5) **Gated Reverbs** - A very linear, high energy reverb that can be set to decay, stay flat, or ramp up the reverb decay, creating many unique ambient effects.
- 6) **Room Echo** - A true stereo, multi-tap delay for creating small ambient spaces. The delays are divided into four sections of early reflections. These reflections can be placed anywhere in the stereo field and can be as dense or sparse as necessary. The Room Delay also includes a feedback loop for delay regeneration.

Reverb

Real life reverberation is the result of sound reflecting off surfaces in a room or hall. It can best be described as millions of small echoes that decay over a period of time. The size of the room, the surface type of the walls, or the carpet on the floor all contribute to the way real reverberation behaves and sounds.

When do I use Reverb? When recording in the studio, nearly always. Many guitar tracks, for example, are recorded in a very sterile environment (i.e. very dry), but adding reverb can add lush depth to any guitar track and you can get those great sounds in the Studio or Live.

Why should I use stereo reverb? Digital Effects such as Chorus and Delay produce stereo imaging type effects. Stereo reverb helps maintain that original stereo image. But don't forget that millions of hit recordings were made using mono input reverbs that created a stereo output image. The theory is that sound generally originates from one point in a room, so mono often works just fine. The rule? Don't get caught using too much reverb on your guitar in live situations. Even if the room is small, it still produces some reverb. Too much makes the guitar go away. Let it compliment the room.

Gated Reverb

Gated reverb doesn't behave as naturally as the standard varieties of reverb. Originally, it was created by taking a long, dense reverb and chopping it short with a noise gate. This made for a burst of reverberation energy that could help thicken up a variety of sounds.

Digital signal processing techniques improved and soon allowed ways to create similar gated reverb sounds that were far more usable and flexible. Today's gated reverb doesn't get gated at all, it just sounds like it does. It is actually a large burst of delay taps that create the gated reverb sound. This allows you to choose the length of the effect along with different slope shapes.

When do I use Gated Reverb? Using a Gated Reverb in a multi-effect guitar application is ideal for producing unusual special effects. Using the Gated reverb can produce a very rich and intense and ambience which can thicken up a guitar tone in many ways. This type of reverb is also ideal for producing an effect that is similar to backward masking.

Reverb Parameters:

Note: Not all of the parameters listed below are available in all Reverb modules.

FX: Lvl	Controls the signal input level fed to the Module. Ranges from Off to 100%.
Dry: Lvl	Controls the level of the dry (unaffected) signal. Ranges from Off to 100%.
Balance	Controls the left/right positioning of the dry signal in the stereo soundfield. Ranges from -99 (all left) to 99 (all right).
Type	Selects the reverb type. Each room type has a different decay range (just as real rooms do), so changing TYPE also changes the decay time of the room. Types are: Studio Room, Wood Room, Vocal Plate, Concert Hall, Plate Reverb, Chamber, Cathedral, Arena, Cement Shelter, and Infinite Spring (for Reverbs), and: Flat, Shelf, Decaying Linear, Decaying Logarithmic, Decaying Exponential, Decaying Sine, Reverse Linear, Reverse Logarithmic, Reverse Exponential, Reverse Sine, Peaking Linear, and Peaking Exponential (for Gated Reverbs).
Density	Controls the number of discrete room wall reflections during the early portions of DECAY. Higher settings produce more reflections while low settings yield fewer initial wall echoes. Use this control in conjunction with DISPERSION to build or reduce the thickness of early reflection clusters heard near the beginning of the reverberation. Ranges from 0% to 99%.
Dispersion	Controls the distance (time) between the echoes set by DENSITY. If DENSITY is set low and DISPERSION is set high, the initial room echoes. Dispersion can be heard as discrete echoes followed by smoother room reverberations. Set DISPERSION low for a dense cluster of reflections during the early portions of DECAY. Ranges from 1 to 5.
Diffusion	Simulates the presence of different room materials by controlling the smoothness of reverberations through the course of DECAY. Low DIFFUSION settings are great for simulating hard, flat surfaces while higher DIFFUSION settings can be used to simulate the presence of irregular surfaces in the room such as natural rock masonry or man-made diffusers. Unlike flat surfaces, these materials reflect (diffuse) the sound in many directions because of the

X-Over Type	irregularity of the surfaces themselves. This builds smoothness over the reverb progression. Ranges from 0% to 99%. Selects which crossover type will be used for the Primary Secondary reverb stages. The two crossover types are High Pass (HP) and Low Pass (LP).
X-Over Freq.	Selects the Frequency where the crossover begins to function. Ranges from 25Hz to 20kHz.
Prim & Secd X-Over	These two Parameters allow the crossover to be turned On or Off for each reverb stage. When Off, that particular stage will be full bandwidth, otherwise its frequency response is limited by the X-Over Type and Frequency Parameters.
Prim & Secd Damp	Adjusts how quickly the room absorbs the high-frequency reverberations. In a real room, absorptive materials can be used to dampen the natural high-frequency reverberations of the room. High settings of DAMP cause the reverberations to darken tonally and become less defined over the course of DECAY. Low settings cause less dramatic room effects on the tone of the reverberations. Ranges from 1 to 7.
Low Pass	Selects the frequency above which all frequencies are rolled off. This control can be used to darken the response of bright-sounding gated reverbs. Ranges from 100 Hz to 8 kHz in the Gated Reverb and from 100 Hz to 20 kHz in the Stereo Gated Reverb.
Time	Controls the length of the gated reverb in milliseconds (much like the DECAY control of a normal reverb). Ranges from 25 milliseconds to 300 milliseconds in the Gated Reverb and from 500 milliseconds in the Stereo Gated Reverb.
Blend	Cross-mixes reverberations from the left side into the right side and vice-versa. This can be used to increase the realism of the simulated room by adding reverberations from different parts of the room to each channel. Ranges from 0% to 99%.
Prim & Secd Blend	Adjusts the amount of BLEND for the Primary and Secondary reverb stages. See BLEND above for a complete parameter description.
Decay	Controls the length (RT60) of the room reverberations. This one control could have been divided among Size and Reflection controls but has been simplified here for easier use. To simulate a large room, use longer DECAY settings. For small rooms, use shorter DECAY settings. For more natural sounding reverbs, you may also want to decrease the DENSITY setting as DECAY is shortened. Ranges from .5 to 23 seconds depending on the Reverb Type currently selected.
Prim & Secd Decay	Controls the length (RT60) for the Primary and Secondary reverberation stages. This Parameter interacts with the SIZE and REFLCT Parameters. Larger SIZE and REFLCT settings will allow longer reverb decay times while smaller settings reduce the length of the reverb decays but produce better small environment emulations. Ranges from .26 to 11 seconds.
Prim & Secd Size	Changes the relative room size of the Primary and Secondary reverb stages. Ranges from 1 to 5.
Prim & Secd Reflect	Controls the simulation of energy loss of sound each time it is reflected. Hard, smooth materials like glass and wood have more reflectivity that softer, more porous materials. This control can be thought of as determining the “liveness” of the room. Ranges from 1 to 10.

Note: The following Delay Parameters that are utilized within the Reverb section are to be used in the Room Echo reverb module.

Delay A	Sets the length of time before hearing Delay Group A. Ranges from 0 to 120 milliseconds.
Delay B	Sets the length of time before hearing Delay Group A and Delay Group B. Ranges from 0 to 120 milliseconds.
Delay C	Sets the length of time before hearing Delay Group B and Delay Group C. Ranges from 0 to 120 milliseconds.
Delay D	Sets the length of time before hearing Delay Group C and Delay Group D. Ranges from 0 to 120 milliseconds.
Out A - D	Controls the output level of the Delay Groups. Ranges from Off to 100%.
Bal A - D	Controls the left/right balance of the Delay Groups. Ranges from -99 to 99.
Shape	Selects the shape of the output levels for the delay group taps. Shape selections are: Flat, Peak, Decreasing, Increasing, Shelf, and Reverse Shelf.
Spread	Controls the width of the effect's stereo imaging. Ranges from 1 to 10.
FB: Dly	Sets the amount of time before the delay is feedback in. Ranges from 0 to 170 ms.
Amount	Sets how much delay is feedback into the signal. Ranges from Off to 50%.
Out L - R	Adjusts the overall level of the left/right side of the reverb. Ranges from Off to 100%.
Prim Out L	Adjusts the overall level of the left side of the Primary reverb. Ranges from Off to 100%.
Prim Out R	Adjusts the overall level of the right side of the Primary reverb. Ranges from Off to 100%.
Secd Out L	Adjusts the overall level of left side of the Secondary reverb. Ranges from Off to 100%.
Secd Out R	Adjusts the overall level of the right side of the Secondary reverb. Ranges from Off to 100%.

Choruses and Flangers

Both choruses and flangers use a Low Frequency Oscillator (LFO) to produce their rich, swirling effects. When you change the speed and depth Parameters of modulation effects, you're actually controlling the frequency and amplitude of the LFO. These settings determine the rate and intensity of the modulation effect.

In general, here's how a chorus works: after entering the Module, the source signal is split into two paths. One is allowed to pass through the Module unaltered, while the other is delayed and pitch modulated with an LFO. The modified sound is then sent to the output, along with the original. In Fig. 4-1 below, a sine wave is used to modulate the pitch of the split sound source.

The Dual Chorus creates two different pitch “voices”, while the Octal Chorus creates eight voices for extremely full, rich sounds .

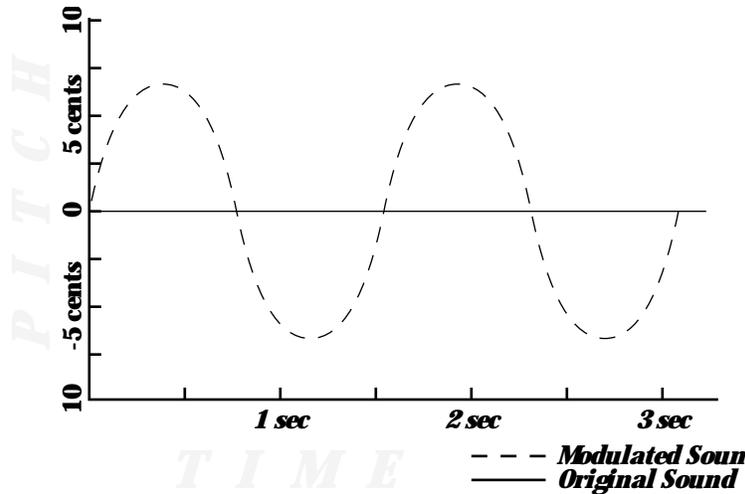


Figure 4-1 Modulation Example

The only difference between choruses and flangers is that flangers use less delay and have a feedback Parameter that sends a portion of the effected signal back to the input of the Module. When the effected signal reaches the input, it is sent through the Module again, building thickness and depth. If you increase the feedback enough, the source begins to lose its own original pitch to the dramatic pitch modulation of the feedback loop.

LFO Waveforms: There are four LFO waveforms available for Choruses, Flangers, Phasers, Tremolos, Auto Panners. They include SINE, TRiangle, SPecial-1, SPecial-2, and SPecial-3. See figure 4-2 for examples of what these waveforms look like.

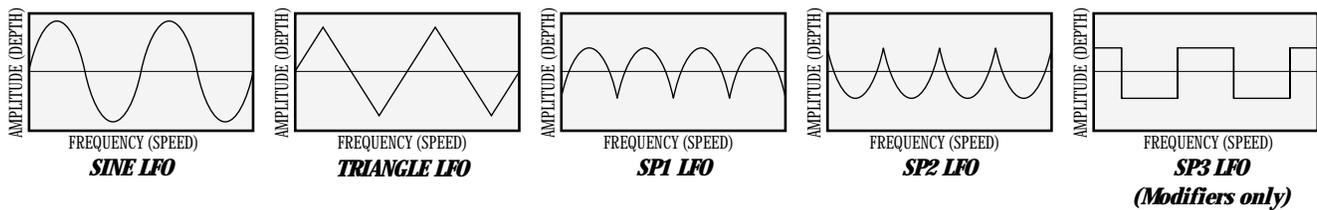


Figure 4-2 LFO Types

Chorus

Chorus is probably the most basic modulation effect. It is really just a very small delay whose time is always changing. As the time is varied, the delayed signal’s pitch changes (just like a tape recording’s pitch raises when you play it faster). By moving the time back and forth, you hear a sound that goes in and out of tune. When combined with the original sound, it almost sounds like more than one instrument is playing. The Millennium uses several choruses at once to make huge rich sounds. For example, the octal chorus uses eight chorus voices at once to create an incredible ensemble of sound. Aside from the more obvious speed and depth parameters (which adjust respectively how fast and far the sound goes out of tune), the Millennium allows you to use different waveforms. The waveform defines how it will move in and out of tune. The triangle waveform is very popular for slow, shallow chorus settings, while the sine waveform works nicely for faster, deeper settings.

When do I use Chorus? The Chorus effect is so vast in applications, an easier question would probably be “When can’t I use a Chorus. When playing the Blues, turn the Speed and Depth parameters up to produce an almost Leslie-Type effect. When trying to obtain “Big” rock guitar tone, use the Chorus to thicken-up and add depth to your sound. And, any time your using a clean tone program, guitar always sounds so lush when chorus is added.

Chorus Parameters:

Note: not all of the parameters listed below are available in all Chorus modules.

FX: Lvl	Controls the signal input level fed to the Module. Ranges from Off to 100%.
Dry: Lvl	Controls the level of the dry (unaffected) signal. Ranges from Off to 100%.
Balance	Controls the left/right positioning of the dry signal in the stereo soundfield. Ranges from -99 (all left) to 99 (all right).
Speed	Controls the Low Frequency Oscillator (LFO) speed of the chorus. Ranges from 0.06 to 16.0 Hz.
Depth	Adjusts the intensity of the chorus effect. High settings produce dramatic modulation, while lower settings can be used to produce a more subtle, ambient swirling. Ranges from 0 to 30 milliseconds.
Depth 1 - 2	DEPTH1 adjusts the intensity of chorus voices 1-4. DEPTH2 adjusts the intensity of chorus voices 5-8. Ranges from 0 to 30 milliseconds.
Wander Speed	Controls the secondary LFO speed of chorus voices 5-8. This is a secondary oscillator for voices 5-8 that causes deviations from the oscillation path set by DEPTH2. This control can produce radical new textures when used creatively. Try setting it slightly faster or slower than SPEED. Ranges from 0.06 to 2.0 Hz.
Wander Depth	Adjusts the intensity of the oscillation deviations produced by WANDER SPEED. WANDER DEPTH produces dramatic psycho-acoustic swirling effects when set higher than DEPTH2. Ranges from 0 to 10 milliseconds.
WvFrm	Selects which waveform the LFO follows. Options: sine, triangle, SP1 (special 1), and SP2 (special 2). See figure 3-4
Dly A - B	Controls the delay time of chorus voices A and B. Higher delay time settings produce a more dramatic sweeping sound. Ranges from 0 to 60 milliseconds.
Dly C - D	Controls the delay time of chorus voices C and D. Higher delay time settings produce a more dramatic sweeping sound. Ranges from 0 to 60 milliseconds
Dly E - H	Controls the delay time of chorus voices E through H. Higher delay time settings produce a more dramatic sweeping sound. Ranges from 0 to 60 milliseconds
Out A - B	Adjusts the overall level of chorus voice A or B. Ranges from Off to 100%.

Pan A - B	Controls the placement of chorus voice A or B. Ranges from -99 to 99.
Out C - D	Adjusts the overall level of chorus voice C or D. Ranges from Off to 100%.
Pan C - D	Controls the placement of chorus voice C or D in the stereo image. Ranges from -99 to 99.
Out LA - LB	Adjusts the left-side level of chorus voice A or B. Ranges from Off to 100%.
Out RA - RB	Adjusts the right-side level of chorus voice A or B. Ranges from Off to 100%.
Spread	Controls the width of the effect's stereo imaging. The higher the setting, the wider the image. The lower the setting, the more monophonic the effect becomes. Ranges from 1 to 10.

Flanger

A flanger is just a chorus that loops back into itself, causing what can be described as a tubular sound (since it sounds much like the reflections heard inside a large cement or metal pipe). It is still a modulating effect, so you hear a lot of sweeping movement. This makes the flanger a very colorful effect that can be easily overused if you're not careful. The more you feed the flanger back to itself, the more intense the sound becomes.

When do I use Flanger? An electric guitar is the first sound that begs for the flanger effect. It works very well with both clean and distorted guitar sounds. By setting the Speed and Depth parameters to higher settings, this will add more depth and body to the overall guitar signal.

Flanger Parameters

Note: Not all of the parameter listed below are available in all of the Flanger modules.

FX: Lvl	Controls the signal input level fed to the Module. Ranges from Off to 100%.
Dry: Lvl	Controls the level of the dry (unaffected) signal. Ranges from Off to 100%.
Balance	Controls the positioning of the dry signal in the stereo soundfield. Ranges from -99 (all left) to 99 (all right).
Speed	Controls the Low Frequency Oscillator (LFO) speed of the flanger. Ranges from 0.06 to 16.0 Hz.
Depth	Controls the intensity of the flange effect. High settings of DEPTH combined with high settings of FDBCK produce dramatic, synth-like textures. Ranges from 0 to 30 milliseconds.
FdBck	Controls how much of the flanged signal is fed back to the input of the Module. The FDBACK Parameter is what gives flangers their distinctive voice. Flangers are capable of both positive and negative feedback loops, so experiment to find the sound you like best. Ranges from -99% to 99%.
WvFrm	Selects which waveform the LFO follows. Options for this control include sine, triangle, SP1 (Special 1), and SP2

(Special 2). The sine wave setting is probably the most easily recognized, but the smooth response of the triangle wave or the intensity of SP1 or SP2 typically produce better results. See figure 4-2.

Dly A - B	Controls the delay time of flange voice A or B. Shorter delay times produce a more dramatic, deeper sweeping sound. Ranges from 0 to 60 milliseconds.
Out A - B	Adjusts the overall level of flange voice A or B. Ranges from Off to 100%.
Pan A - B	Controls the stereo soundfield placement of flange voice A or B. Ranges from -99 to 99.
Out L - R	Controls the output level of the left or right side of the flanger. Ranges from Off to 100%.

Phasers

The Phaser or “Phase Shifter” as it is sometimes called, is a classic effect from the 70’s that uses phase cancellation to create a warm sweeping effect. The effect is created by making a copy of a signal and moving it in and out of phase while mixing it with the original signal. As it moves, different frequencies are cancelled out creating a smooth curling sound. There is also a feedback control that sends the shifting signal back into the phaser’s input. This intensifies the sound even more.

When do I use a Phaser? A great example of this can be heard most when you listen to music of the 70’s. Guitarist of the day loved their Phasers. A Phaser is a great effect to use when playing clean and funky rhythms.

Phaser Parameters:

Dry: Lvl	Controls the level of the dry (unaffected) signal. Ranges from Off to 100%.
Balance	Controls the positioning of the dry signal in the stereo soundfield. Ranges from -99 (all left) to 99 (all right).
Speed	Controls the Low Frequency Oscillator (LFO) speed of the phaser. Ranges from 0.06 to 16.0 Hz.
Depth	Controls the intensity of the phaser effect. High settings of DEPTH combined with high settings of FDBCK produce dramatic, synth-like textures. Ranges from 0 to 30 milliseconds.
FdBck	Controls how much of the flanged signal is fed back to the input of the Module. The FDBACK Parameter is what gives phasers their distinctive resonating sound. Ranges from -99% to 99%.
WvFrm	Selects which waveform the LFO follows. Options for this control include sine, triangle, SP1 (Special 1), and SP2 (Special 2). The sine wave setting is probably the most easily recognized, but the smooth response of the triangle wave or the intensity of SP1 or SP2 typically produce better results. See figure 4-2.
Out A - B	Adjusts the overall level of phaser voice A or B. Ranges from Off to 100%.
Pan A - B	Controls the stereo soundfield placement of phaser voice A or B. Ranges from -99 to 99.

Out L - R Controls the output level of the left or right side of the flanger. Ranges from Off to 100%.

Pedal Phaser

The Pedal phaser is a phaser that can be controlled by an expression pedal to control the depth and feedback of the effect

Pedal Phaser Parameters

FX and Dry Level Controls the FX and Dry level of the Pedal Phaser module. Ranges from Off to 100%.

Balance Sets the Balance of the effect. Ranges from L 100 to R 100.

Pedal This parameter is used to be controlled by the expression pedal to control Depth and Feedback. Range: 0 to 100.

Depth This parameter controls the amount of modulation depth in the phaser. Range is 0 to 100%.

Feedback This parameter controls amount of feedback in the phaser effect. Range is 0 to 100%.

Output A-B This parameter sets output of the pedal phaser effect. Range is from 0 to 100%.

Pan A-B This parameter sets pan of the pedal Phaser Range is from 0 to 100%.

Rotary Speaker Simulator

The Rotary Speaker Simulator allows you to emulate the classic rotating speaker sound, without the chiropractic problems that come with moving bulky speaker cabinets. The Rotary speaker is directly responsible for some of the most unique sounds in music. The applications for this effect are so diverse, it can be used to achieve sounds ranging from the Allman Brothers Band to the legendary Stevie Ray Vaughan.

A unique parameter in the Rotating Speaker simulation is the Acceleration parameter. This parameter is used emulate the the time that it takes to get the Speaker up and spinning at full speed. The parameter can be assigned to a footswitch or the expression pedal so you can control the acceleration speed.

Rotary Speaker Simulator Parameters:

FX: Lvl Controls the signal input level fed to the Module. Ranges from Off to 100%.

Dry: Lvl Controls the level of the dry (unaffected) signal. Ranges from Off to 100%.

Balance Controls the positioning of the dry signal in the stereo soundfield. Ranges from -99 (all left) to 99 (all right)

Mode Selects which speed mode the Rotor and Horn are in. Settings are fast or slow.

Spread Sets the horn stereo microphone spread. Ranges from 0 to 100%.

H - R: Level Sets the overall level of the Rotor or Horn. Ranges from Off to 100%.

- Slo - Fast Hrn Speed** Controls the Low Frequency Oscillator (LFO) speed of the Horn. Ranges from 0.06 to 16.0 Hz.
- Slo - Fast Hrn Depth** Controls the intensity of the rotating effect. Ranges from 0 to 30 milliseconds.
- Slo - Fast Hrn Doppler** Sets the amount of shifted pitch heard in the Horn. Ranges from 0 to 50 milliseconds.
- Slo - Fast Rtr Speed** Controls the Low Frequency Oscillator (LFO) speed of the Rotor. Ranges from 0.06 to 16.0 Hz.
- Slo - Fast Rtr Depth** Controls the intensity of the rotating effect. Ranges from 0 to 30 milliseconds.
- X-Over** Selects the frequency where the signal is split between the Horn and Rotor. Ranges from 25Hz to 20kHz.
- Acceleration: H - R** Sets the amount of time that the Rotor and Horn take to come up to their full rotating speed. Ranges from 0 to 10 seconds.

Tremolo and Auto-Panner

Look out, because the popular Tremolo and Auto panner effects of the 50's and 60's are back with a vengeance. These effects that revolutionized "Surf-Style" music can be heard all over the air waves in the 90's. Tremolos and auto panners are similar to one another in that they both use an LFO to modulate input levels to produce vibrato effects.

Tremolo

The word tremolo actually has several definitions in the music world. It basically means that a sound is being modulated in amplitude (the volume is beating or pulsing). It could be emulated by turning a volume knob up and down. But you probably have better things to do than turn a volume control up and down throughout a whole song, so let the RP-20 Valve do it for you.

Aside from speed and depth parameters, the tremolo also has an LFO waveform that determines the way a signal's volume is increased and decreased. While the Sine wave is probably the most common to the ear, the Triangle and Special 2 waveforms are progressively more intense.

When do I use Tremolo? Tremolo is truly a vintage sound for the guitar, electric piano and organ. Most pronounced on the guitar, you can hear it used on everything from sweet ballads to blues rock 'n roll.

Auto Panner

The auto panner is really just a dual version of a tremolo. It changes the amplitude of the left signal just as a tremolo does, but the amplitude of the right signal is inverse to that of the left signal. This gives the illusion that the signal is moving back and forth between the left and right speakers.

The Auto Panner's Speed typically doesn't get set as fast as the Tremolo since you usually want a sound to move smoothly back and forth in the stereo image. The Millennium auto panner is especially flexible since it can be used for either mono or stereo input sources. When used with a mono source, the signal pans back and forth as described earlier. When a stereo sound source is used, the original stereo image is maintained by moving the volume of the left signal exactly opposite of the right signal. The stereo image fades back and forth between the

stereo extremes.

When do I use an auto panner? The auto panner can be a very creative tool. When running your guitar rig in a stereo set-up with the right amount of cabinet separation, the Auto-Panner creates a stereo panning effect that is right out of this world.

Auto panners can also add life to delays or choruses by moving them around instead of just sitting in one place in the mix. Simply place an auto panner module after a delay or chorus module. You don't need to set the auto panner's depth parameter too deep since you just want some gentle movement.

Tremolo & Auto Panner Parameters:

FX: Lvl	Controls the signal input level fed to the Module. Ranges from Off to 100%.
Speed	Controls the Low Frequency Oscillator (LFO) speed of the effect. Ranges from 0.06 to 16.0 Hz.
Depth	Controls the intensity of the effect. As DEPTH increases, volume changes become more dramatic. Ranges from 0 to 30 milliseconds.
WvFrm	Selects which waveform the LFO follows. Options for this control include sine, triangle, SP1 (Special 1), and SP2 (Special 2). The sine wave setting is probably the most easily recognized, but the smooth response of the triangle wave or the intensity of SP1 or SP2 typically produce better results. See figure 4-2 on page 41.

Pitch Shifters and Harmony

The pitch shifter allows you to move sound from one pitch to another. It accomplishes this by recording a small part of the original sound and then playing it back either faster (to raise the pitch) or slower (to lower the pitch). It does this over and over again to create a new pitch.

The Harmony modules give you almost unlimited possibilities. you can use different harmony intervals to produce slide guitar effects. or Major or Minor 3rd intervals to create dual soloing lines reminiscent of the Eagles' "Hotel California".

When do I use pitch shifting? Guitarists are probably the most well known users of pitch shifters. They commonly pitch shift their sound down by an octave to get a deep rumble out of their distortion, or shift it an octave up to emulate a 12 string guitar.

Both guitar and synth players have created some amazing textures by pitch shifting their sound up a fifth (7 semitones). This creates more complex chords out of simple ones (e.g. a basic Cmaj chord sounds like a Cmaj9 chord, or Cmin7 becomes a Cmin11 chord). Lead lines sound amazing when using major 5th intervals up.

Pitch Shifters Parameters

Note: not all of the parameters listed below are available in all Pitch Shifter modules.

FX: Lvl	Controls the signal input level fed to the Module. Ranges from Off to 100%.
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Dry: Lvl	Controls the level of the dry (unaffected) signal. Ranges from Off to 100%.
Balance	Controls the positioning of the dry signal in the stereo soundfield. Ranges from -99 (all left) to 99 (all right)
Shft A - B	SHFTA and SHFTB control the pitch intervals between the original note and voices A and B of the pitch shifter. Pitch shifters can be used for a wide variety of effects, including doubling, octave division, and chromatic harmonies. Each Pitch Shifter has a 4-octave range, stepped in semitones from -24 to +24.
Dtn A - B	Controls the detuning amount for pitch-shifted voices A and B. As DTN moves away from zero, dissonance becomes more pronounced. Low DTN settings can be useful for thickening or enhancing the imaging of the source material. Ranges from -50% to 50%.
Shft C - D	See Shift A - B.
Dtn C - D	See Dtn A - B.
Shft E - H	See Shift A - B.
Dtn E - H	See Dtn A - B.
Key	Sets the diatonic key for the harmonies. If the song you are playing is in the key of G Major, you would select G for the scale.
Scale	Sets the scale type for the Harmony you want to hear. Scale types include: Major, Minor, Harmonic Minor, Melodic Minor, Dorian, Mixolydian, Lydian, Lydian Augmented, Major Pentatonic, Minor Pentatonic, Blues, Whole Tone, Half-Whole, and Whole-Half.
Interval	Sets the basic interval of the Harmony. You can choose from one of several Harmony intervals. See the Harmony Interval Charts for reference.
Out A - B	Adjusts the overall level of pitch-shifted voice A or B. Ranges from Off to 100%.
Pan A - B	Controls the placement of pitch-shifted voice A or B in the stereo image. Ranges from -99 (all left) to 99 (all right).
Out C - D	Adjusts the overall level of pitch-shifted voice C or D. Ranges from Off to 100%.
Pan C - D	Controls the placement of pitch-shifted voice C or D in the stereo image. Ranges from -99 (all left) to 99 (all right).
Out E - H	Adjusts the overall level of pitch-shifted voice E through H. Ranges from Off to 100%.
Pan E - H	Controls the placement of pitch-shifted voice E through H in the stereo image. Ranges from -99 (all left) to 99 (all right).
Out L - R	Adjusts the left or right output level of the pitch-shifted voice. Ranges from Off to 100%.

Out LA - LA	Adjusts the left-side level of pitch-shifted voice A or B. Ranges from Off to 100%.
Out RA - RB	Adjusts the right-side level of pitch-shifted voice A or B. Ranges from Off to 100%.
Spread	Controls the width of the effect's stereo imaging. The higher the setting, the wider the image. The lower the setting, the more monophonic the effect becomes. Ranges from 1 to 10.

Detuners

The detuner effect does exactly what its name implies; it detunes a sound (moves it out of tune) and allows you to add it to the original sound. The result can be almost chorus-like, but it doesn't move like the chorus effect does. This actually makes the detuner more transparent and not quite as thick as the chorus effect, which in many applications is a good thing (since effects can quickly pile up and clog up great sounding audio).

When do I use a detuner? The detuner falls into the same guidelines as the chorus effect. It works with just about everything; It is ideal for thickening up a rhythm guitar track. Remember to experiment with the delay parameters if you are looking for a wider detuning sound. Adding 30-60 ms of delay to the detuner's voices that are panned hard to one side (while not delaying the other side) will change the detuner's stereo imaging greatly.

Detuner Parameters

FX: Lvl	Controls the signal input level fed to the Module. Ranges from Off to 100%.
Dry: Lvl	Controls the level of the dry (unaffected) signal. Ranges from Off to 100%.
Balance	Controls the positioning of the dry signal in the stereo soundfield. Ranges from -99 (all left) to 99 (all right).
Dtn A - B	Controls the detuning amount for detuner voices A and B. Higher detune settings produce a more dissonant sound. Ranges from -50% to 50%.
Dtn C - D	Controls the detuning amount for detuner voices C and D. Ranges from -50% to 50%.
Dtn E - H	Controls the detuning amount for detuner voices E through H. Ranges from -50% to 50%.
Dly A - B	Controls the amount of time before detuner voices A and B are heard. Higher delay time settings produce a short slapback delay effect. Ranges from 0 to 60 milliseconds.
Dly C - D	Controls the amount of time before detuner voices C and D are heard. Ranges from 0 to 60 milliseconds.
Dly E - H	Controls the amount of time before detuner voices E through H are heard. Ranges from 0 to 60 milliseconds.
Out A - B	Adjusts the overall level of detuner voice A or B. Ranges from Off to 100%.
Pan A - B	Controls the stereo soundfield placement of detuner voice A or B. Ranges from -99 (all left) to 99 (all right).

Out C - D	Adjusts the overall level of detuner voice C or D. Ranges from Off to 100%.
Pan C - D	Controls the stereo soundfield placement of detuner voice C or D. Ranges from -99 (all left) to 99 (all right).
Out LA - LB	Adjusts the left side level of detuner voice A or B. Ranges from Off to 100%.
Out RA - RB	Adjusts the right side level of detuner voice A or B. Ranges from Off to 100%.
Spread	Controls the width of the effect's stereo imaging. The higher the setting, the wider the image. The lower the setting, the more monophonic the effect becomes. Ranges from 1 to 10.

Delays

A delay produces discrete, repeating echoes of the source material at a specified interval. In digital delays, the input signal is "sampled" or recorded into memory, where it is held for the amount of time you specify with the delay time setting, after which the sample is replayed at the output. The RP-20 Valve's delays have a feedback meter that is used to send a portion of the delayed signal back to the input to be re-recorded along with new source material. The feedback setting determines how long the delay repeats take to decay to inaudibility.

When do I use delay? When you're the lone guitarist in a band, the Delay can be your best friend. The Delay repeats can create the illusion that there is more than one guitar being played. One trick to using delays effectively is setting the delays to fall in time with the music. This used to mean grabbing a calculator, dividing 60 by the tempo (beats per minute), then dividing that answer by the desired sub-beats . . . Sound like a hassle? Yeah, we thought so too. So the RP-20 Valve takes care of all the calculations for you! All you have to do is tap the TapIt (assign the tapit parameter to a footswitch) and manually tap in the desired delay time and the new time is added.

Another common use for delay is for stereo imaging. Very small amounts of delay (10-25ms) can be used to make a signal sound like it is panned to one side. This trick works because of the way the brain interprets sounds. When your left ear hears something before the right ear, it thinks that the source of that sound is found somewhere to your left. You can also use delays set at 30-60ms, which spreads a sound to the extremes of the stereo image. Be careful with this technique if your mix has a chance of being listened to in mono.

Delay Parameters

Note: not all of the parameters listed below are available in all Delay modules.

FX: Lvl	Controls the signal input level fed to the Module. Ranges from Off to 100%.
Dry: Lvl	Controls the level of the dry (unaffected) signal. Ranges from Off to 100%.
Balance	Controls the positioning of the dry signal in the stereo soundfield. Ranges from -99 (all left) to 99 (all right).
Dly Time	Sets the maximum delay time available to each delay voice. For example, if DELAYTIME is set to 1000 ms, each delay voice can be set from 0 to 100% of that delay time. Ranges from 0 to 1.4 seconds (Maximum delay times differ between 4th, 3/4, HLF, and FUL module Types.) Half bandwidth delay times automatically double the set delay time used used.

FdBck	Controls the fade time of the delay repeats. Higher settings take longer to fade out, while a setting of zero could be used to limit the delay to one repeat per voice. The delay provide both positive and negative feedback settings. Ranges from -99% to +99%.
TapIt	Allows you to change DELAYTIME in real-time, by tapping the TAPIT button at the tempo you want. Delay voice percentages do not change when using this control.
Smear	Sets the spread of Diffusion of the Delay Repeats. Ranges from 0 to 100%.
LPF	Selects where the Low Pass Filter is positioned within the Delay Module. Positions are: Pre Delay or Post Delay.
Frequency	Selects the Frequency band that appears in the LPF. Ranges from 25 Hz to 20 kHz.
Gain	Controls the output gain of the LPF. Ranges from -12 to 12.
Dly A - B	Controls the percentage of DELAYTIME allocated to delay voices A and B. For example, if DELAYTIME (above) is set to 1000 ms and DLYA is set to 75%, the voice A delay time is 750 ms. Remember, each voice in the Module can have any delay time up to 100% of DELAYTIME. Ranges from 0% to 100%.
Dly C - D	See Dly A - B.
Out	Adjusts the overall level of the Delay. Ranges from Off to 100%.
Pan	Controls the stereo soundfield placement of the delay. Ranges from -99 (all left) to 99 (all right).
Out L - R	Adjusts the left or right output level of the Delay. Ranges from Off to 100%.
Out A - B	Adjusts the output level of delay voice A or B. Ranges from Off to 100%.
Pan A - B	Controls the stereo soundfield placement of delay voice A or B. Ranges from -99 (all left) to 99 (all right).
Out C - D	Adjusts the output level of delay voice C or D. Ranges from Off to 100%.
Pan C - D	Controls the stereo soundfield placement of delay voice C or D. Ranges from -99 (all left) to 99 (all right).
Out LA - LB	Adjusts the left-side output level of delay voice A or B. Ranges from Off to 100%.
Out RA - RB	Adjusts the right-side output level of delay voice A or B. Ranges from Off to 100%.
Out LC - LD	Adjusts the left-side output level of delay voice C or D. Ranges from Off to 100%.
Out RC - RD	Adjusts the right-side output level of delay voice C or D. Ranges from Off to 100%.

Equalizers

The RP-20 Valve has a broad selection of equalizer Modules to cover virtually any need. If you need bigger Guitar tone, the EQs will give it to you. Both mono and stereo modules are available. Remember that mono equalizers connected to stereo sources will always sum the stereo signal together for equalization (thus eliminating the stereo image). If you need to maintain the stereo image, use a stereo equalizer module.

The Parametrics allow you to cover very specific regions of the sound spectrum with extreme precision and control. Up to 6 bands of either stereo, or mono parametric equalization are available.

The Graphic equalizers use $1/3$, $2/3$, or $1\ 2/3$ octave ISO-standard frequency centers. Equalization or EQ is probably one of the most valuable tools the RP-20 Valve offers. EQ allows you to change the level of certain frequencies of a sound, and it comes in two different basic

flavors: graphic and parametric. Graphic is the most common and easiest to use, but the parametric offers much more flexibility and power.

When do I use EQ? This may seem overly simplistic, but you should use EQ whenever your ears tell you to use it! However, you need to remember that EQ can do more harm than good when not used carefully. The EQ can take that thin and “Clangy” sounding Guitar and add all of the low end in the world that your heart may desire. This can also be used on the other side. If you have a song that needs tight and bright rhythm guitar, you can use the EQ modules to take out the Lows and build up your mids

Here are a couple of simple examples:

If you feel your guitar tone is just a little dull, try cutting some of the lower frequencies, you always have to boost up the guitar's high frequencies, because it could quickly become too bright. Often, good EQ techniques use cut more than boost. This is where the old saying “less is more” definitely applies.

If you are having a hard time being heard in the mix, don't make it louder. Listen carefully and see if there is another instrument that is conflicting with your Guitar. Adding a little EQ in the right spot of the less dominant guitar will allow it to speak a little easier through the rest of the music.

Graphic Equalizers

Graphic EQs give you control of the levels for fixed or pre-selected frequencies (bands) that are evenly spaced. The RP-20 Valve offers 8 and 15 band Mono and 8-band Stereo GEQs and a 31 band mono GEQ. They all cover the complete range of frequencies, but the spacing between the 31 bands is much closer than the 8 bands, therefore offering more exact control of the sound.

Graphic Equalizer Parameters

Level	Controls the signal input level fed to the Module. Ranges from Off to 100%.
Phase	Inverts the phase of the source signal. Can be set either IN or OUT of phase.
Phase L - R	Inverts the phase of the left or right side of the stereo source signal. Can be set either IN or OUT of phase.
Freq	Controls the amount of boost / cut applied to the selected frequency. The GEQ 8 uses $1\text{-}1/3$ octave ISO standard frequency centers, (Hz) while the GEQ15 and GEQ31 use $2/3$ octave and $1/3$ octave frequencies. Boost/cut range for

each band is from -12 to 12.

Parametric Equalizers

Parametric EQs offer the added flexibility of letting you define the center frequency you want to adjust, and how many frequencies around that center frequency you want to affect. Some of the PEQ modules in the RP-20 Valve, also include high shelf and low shelf EQ bands. A high shelf allows you select a frequency, and the boost/cut parameter changes the level of all the frequencies above that selected frequency. The low shelf works the same way but works on frequencies below the selected frequency.

Parametric Equalizer Parameters

Level	Controls the signal input level fed to the Module. Ranges from Off to 100%.
Phase	Inverts the phase of the source signal. Can be set either IN or OUT of phase.
Phase L - R	Inverts the phase of the left or right side of the stereo source signal. Can be set either IN or OUT of phase.
LoShlv Freq	Selects the center frequency of the low-frequency shelving EQ band. Ranges from 25Hz to 20kHz.
LoShlv Level	Adjusts the amount of boost or cut applied to the center frequency of the low-frequency shelving EQ band (selected by LOSHLV FREQ). Ranges from -12 to 12.
Band # Freq	Sets the center frequency of the selected band. 6-band PEQs have four true parametric bands of EQ plus shelving high- and low-frequency controls with variable frequency. Bands 1 and 2 range from 25 Hz to 20 kHz. Bands 3 and 4 range from 1 kHz to 20 kHz.
Band # Width	Controls the bandwidth of the selected frequency. The higher the setting of WIDTH, the more frequency-selective the boost/cut becomes. In other words, with low (narrow) WIDTH settings, frequencies around the selected center frequency are not affected by the LEVEL setting. As WIDTH increases, frequencies around the center frequency become affected by the setting of LEVEL. Range is from 0.08 to 4.00 kHz.
Band # Level	Adjusts the amount of boost or cut applied to the selected frequency. Varies from -12 to 12.
HiShlv Freq	Selects the center frequency of the high-frequency shelving EQ band. Ranges from 1kHz to 20kHz.
HiShlv Level	Adjusts the amount of boost or cut applied to the center frequency of the high-frequency shelving EQ band (selected by HISHLV FREQ). Ranges from -12 to 12.

Multi Effects Modules - Chorus/Delay and Flange/Delay

The RP-20 Valve, Multi Effect Modules allow the User to combine either Delay and Chorus or Delay and Flange within one Effect module block. This is ideal for situations where the User needs to add another effect to the Effect Configuration, but is running low on signal processing resources. Within the module, there is a unique parameter that allows you route the signal several different ways between the two effects.

Multi-Effect Module Parameters

FX: Lvl	Controls the signal input level fed to the Module. Ranges from Off to 100%.
Dry: Lvl	Controls the level of the dry (unaffected) signal. Ranges from Off to 100%.
Balance	Controls the positioning of the dry signal in the stereo soundfield. Ranges from -99 (all left) to 99 (all right).
Route	Selects the route signal path within the Chorus/Delay, and Flange/Delay Multi effects modules. The 3 settings are: 1) Chorus/Flange into Delay with feedback into the Delay 2) Chorus/Flange into Delay with feedback into Chorus/Flange 3) Delay into Chorus/Flange with feedback thru the Chorus/Flange.
Speed	Controls the Low Frequency Oscillator (LFO) Speed of the Chorus or Flanger. Ranges from 0.06 to 16.0 Hz.
Depth	Adjusts the intensity of the Chorus or Flanger effect. Ranges from 0 to 30 milliseconds.
Feedback (Flanger)	Controls how much of the flanged signal is fed back to the input of the Module. The FDBACK Parameter is what gives flangers their distinctive voice. Flangers are capable of both positive and negative feedback loops, so experiment to find the sound you like best. Ranges from -99% to 99%.
WvFrm	Selects which waveform the LFO follow. Options for this control include: Sine, Triangle, SP1 (Special 1), and SP2 (Special 2).
C/F: Delay	Controls the delay time of the Chorus or Flanger voice. Ranges from 0 to 40 milliseconds.
Delay Time	Sets the delay time for the delay tap. Ranges from 0 to 300 milliseconds.
Feedback	Controls the fade time of the delay repeats. Higher settings take longer to fade out, while a setting of zero will limit the delay to one repeat. Ranges from 0 to 99%.
TapIt	Allows you to change the Delay time in real-time by tapping the TAPIT button at the tempo you want. Delay voice percentages do not change when using this control.
Level: C/F/D	Controls the overall output level of each effect block. Ranges from Off to 100%.
Pan: C/F/D	Controls the stereo soundfield placement of each effect block. Ranges from -99 (all left) to 99 (all right).

Whammy Effects

In today's music industry, it seems that every album on the charts, whether it be Country, Rock, Industrial, or Alternative, are using the Whammy technology in some shape or form. Whether it be a subtle chorus Detune, or an all out 2 octave Whammy Dive, this thing is a definite attention getter, and first-call studio effect. At this rate, the Whammy effect could possibly log-in as much studio time as Chet Atkins.

Whammy Effect Parameters

Whammy On/Off Turns the Whammy module on or off. When the module is turned off, the signal will only continue to pass through

the module if the dry level is turned up.

FX Level	This parameter lets you select the overall FX level mix of the Whammy Effect module. Ranges from: Off to 100%.
Dry Level	This parameter lets you select the amount of Dry signal that is included in the Whammy effect. Ranges from: Off to 100%.
Balance	This parameter allows you to pan the Dry signal either to the Right or the Left in the stereo soundfield. Ranges from Left 99 to Right 99.
Min Shift	This parameter sets the minimum pedal shift level of the Whammy effect. Ranges from: -72 (6 octaves down), to 24 (2 octaves up).
Max Shift	This parameter set the maximum pedal shift level of the Whammy effect. Ranges from: -72 (6 octaves down), to 24 (2 octaves up).
Min Detune	This parameter sets the minimum pedal level of detune effect. Ranges from: -50% (down 50 cents), to 50% (up 50 cents).
Max Detune	This parameter sets the maximum pedal level of detune effect. Ranges from: -50% (down 50 cents), to 50% (up 50 cents).
Pedal	This parameter is used for the assignment of an expression pedal. This parameter also shows the pedal travel range. Ranges from: 0 to 100
Out	This parameter is used to set the overall output level of the Whammy module. Ranges from: 0 to 100%
Pan	This parameter is used to position the Whammy effect in the Stereo soundfield. Ranges from: Left 99 to Right 99.

Auto Wah

Break out the Bell-bottom jeans and the Disco mirror balls, because the Auto-Wah is here to play. The Auto Wah is a great effect use when you want a nasally wah-type effect, but you don't want to do the leg work. The Auto Wah utilizes a sensitivity detector that reads the input signal, then simulates the action of a wah pedal.

Auto Wah Effect Parameters

Auto Wah On/Off	Turns the Auto Wah module on or off. When the module is turned off, the signal will continue to pass through the module.
FX Level	This parameter lets you select the overall FX level mix of the Auto Wah Effect module. Ranges from: Off to 100%.
Sensitivity	This parameter adjusts the sensitivity of the detection of the automatic wah. The higher the sensitivity is set, the wider the Wah range will be. Ranges from: Off to 100%.

Section-5 Advanced Topics

Assigning Modifiers

Modifiers are unique tools that can be used to dramatically alter your sound based on information from External expression pedals and external footswitches, signal amplitude, the settings of a Low Frequency Oscillator (LFO) or MIDI Continuous Controller.

Every Program in your RP-20 Valve has a set of Modifiers. Up to 16 Modifier links can be assigned to control any parameter. There are five types of Modifiers that can be linked to a parameter:

- External expression pedal
- The foot pedals and switches on the RP-20 Valve.
- LFOs
- MIDI CCs
- Dynamic (signal amplitude dependent).

MIDI CCs

When you use MIDI CCs, the RP-20 Valve responds to CC numbers 0-127 and CHP (channel pressure or aftertouch). This means that you could assign an Expression pedal, a keyboard's modulation or pitch bend wheel, or any other MIDI CC device to control effect Parameters.

LFOs

When you use LFOs, Parameter values can be controlled automatically between a defined minimum and maximum setting at a rate set by the user. The RP-20 Valve has 2 user definable LFOs in each program that can be assigned to any Parameter.

For example, you can create an auto panner without using an auto panner module. Simply link an effect's output pan parameter to the LFO modifier and the LFO will move that parameter back and forth. This modifier can be a very useful weapon in the ongoing battle of new sound creation. There are two LFOs available in each program that can use unique speeds and waveforms.

Dynamic Modifiers

When you use Dynamic Modifiers, the Parameter values are controlled in relation to the dynamics of the input signal. The possibilities are nearly endless, and they cannot be duplicated using any other method.

For example, you could link the Dynamic Modifier of a Program to control a chorus level. It doesn't sound like much on paper, but imagine the expressiveness of this type of effect on the guitar part. As the dynamics of the music increase, the chorus becomes less apparent. Ease up on the string attack a little and the chorus increases. ALL IN REAL TIME!

***NOTE:** Linking a Modifier to a Parameter causes the Parameter to change as if you were changing it using the <Data> wheel. The only difference is that the <Store> button and **CHANGED** icon do not light. Therefore, the Default name may display 'Custom' if a parameter is consistently being changed by a Modifier. Storing the Program will store these new parameter values.*

Expression Pedal

The RP-20 Valve has a built-in expression pedal for the assignment of continuous control over any effect parameter.

The assignment procedure to be followed is listed below.

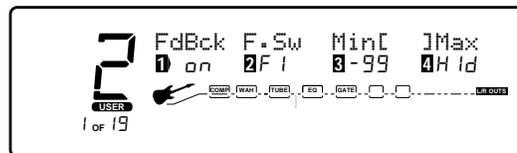
Linking a Parameter to a Modifier

To link a parameter to a Modifier, please complete the following steps:

1. Scroll to the parameter you would like to link to a modifier (ie: Delay feedback).
2. Press the <Assign> button and the display appears something like:



3. Now press the <1> button and turn the <Data> wheel to turn the link for that parameter on. The display will look something like this:



4. Press the <2> button and then turn the <Data> wheel to scroll through the different modifiers that can be linked to the parameter you want assigned. The selections are:

MIDI CC's (CC): 0-127 & ChP (aftertouch)

Real Time modifiers (RT): LF1, LF2, dY1, & dY2

Int Pedal (Int)

NOTE: The MUTE and THRU effect types do not have any Parameters to connect to, so they will not appear in the parameter list.

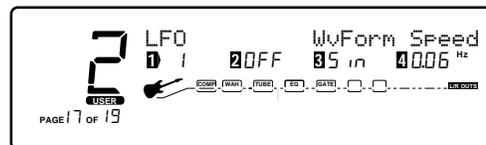
5. Press the <3> button and turn the <Data> wheel to select the minimum parameter value you want when the controller is in the maximum position.
6. Press the <4> button and turn the <Data> wheel to select the maximum parameter value you want when the controller is in the maximum position.

NOTE: Make sure you store any changes you want to save before moving on.

Setting up an LFO

To set up an LFO that is linked to an effect parameter, the procedure is as follows:

1. Enter Assign Mode by pressing the **<Assign>** button.
2. Use the **<Data>** knob to scroll to the LFO page. The display looks something like:

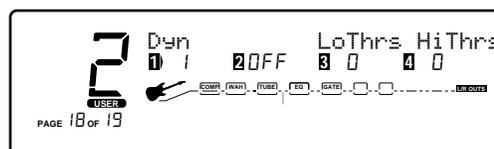


3. You can press the **<1>** and turn the **<Data>** wheel to select which of the two LFOs you want to adjust.
4. Press the **<2>** button and turn the **<Data>** wheel to turn the LFO on or off.
5. Press the **<3>** button and turn the **<Data>** wheel to change the selected LFO's waveform. You can select Sine, TRiangle, SPecial1, SPecial2.
6. Press the **<4>** button and turn the **<Data>** wheel to adjust the speed of the LFO cycle.

Any parameters assigned to the LFOs will now follow the modulating waveform of the LFO you selected.

Setting up a Dynamic Modifier

1. Enter assign Mode by pressing the **<Assign>** button.
2. Use the **<Next Page>** and **<Previous Page>** buttons to scroll to the first of two Dyn pages. The display looks something like:



3. You can press the **<1>** button and turn the **<Data>** wheel to select which of the two Dyns you want to adjust.
4. Press the **<2>** button and turn the **<Data>** wheel to turn the Dyn on or off.
5. Press the **<3>** button and turn the **<Data>** wheel to set the threshold above which dynamic modification of the parameter begins.

6. Press the <4> button and then turn the <Data> wheel to set the point at which maximum parameter modification occurs.
7. Press the <Next Page> button to move to the next Dyn page.
8. Press the <2> button and then turn the <Data> wheel to adjust the attack time of the Dyn.
9. Press the <3> button and then turn the <Data> wheel to adjust the hold time of the Dyn.
10. Press the <4> button and then turn the <Data> to adjust the release time of the Dyn.

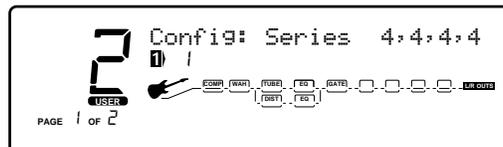
Morphing Pedal Assignments

The RP-20 Valve preamp distortion modules and the effect configurations within the RP-20 Valve have special morphing capabilities that allow you to morph between one Amplifier type to another in selected Amplifier models. This feature is also available in certain Effect configurations so you can pan between effects. This will allow you to either morph from a distorted Tube distortion type, to a clean Solid State preamp tone type or morph between digital effects. Morphing can be done by linking an Expression Pedal to the Morph pedal parameter.

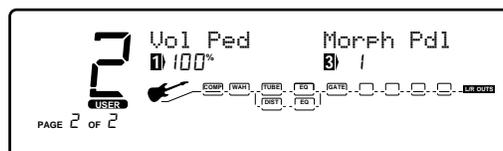
Morphing

To assign the morphing pedal to morph between distortion types use the following procedure.

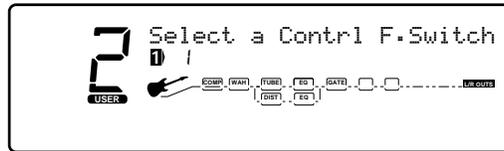
1. From Program mode, press the <Effects> button until the effect configurations are showing. The display will appear something like this:



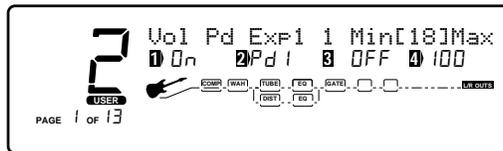
2. Press the <Next Page> button, and the display will appear like this:



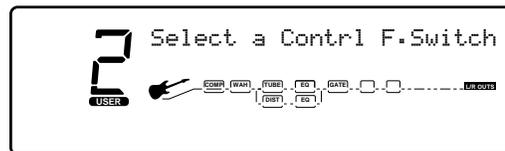
3. At this point, you want to assign the Morphing pedal by pressing the <Assign> button and the display will appear something like this:



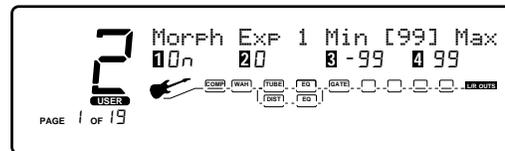
4. Now move the expression pedal to assign the pedal and the display will appear like this:



5. By pressing the <3> button, this will activate the Morph pedal parameter making it ready for assignment. Now press the <Assign> button and the display will appear something like this:



6. Now select the Expression pedal, and the display will appear something like this:



7. In this example, the expression pedal is now assigned to morph between Solid State and Tube distortion modules. Note that -99 as the minimum value represents the Solid State (bottom) Amp and the Maximum being 99, represents the Tube (top) distortion. To return to Program mode, press the <Program> button. Always remember to save any changes.

Morphing Between Effect Modules

Not only does the RP-20 Value allow you to morph between Distortion types, but it also gives you the ability to morph between effect modules. This can be done when using Effect Configurations 6, 12 or 15 which are split configurations.

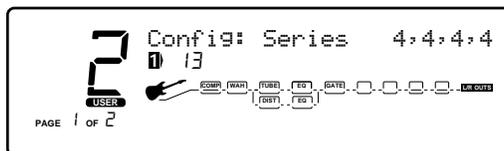
The procedure for assigning the morph pedal to the Effect modules uses the same steps as 3 through 7 of the distortion of morphing assignment procedure.

Volume Pedal Assignments

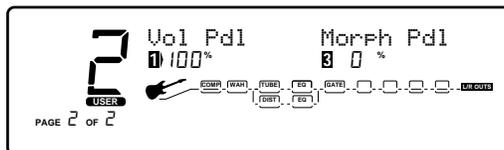
Volume control can be assigned to any program within the RP-20 Valve. When volume control is used in a selected program.

The procedure for assigning volume control to any program of the RP-20 Valve is as follows:

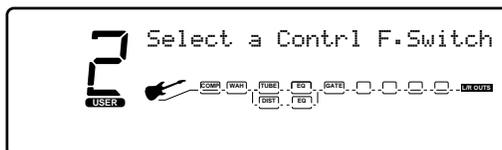
1. From Program mode, you must get to the configuration screen by pressing the **<Effects>** button until the display reads as follows:



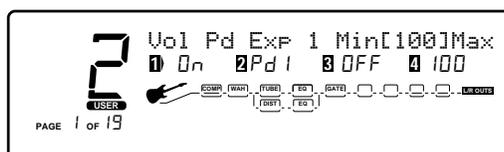
2. Now press the **<Next Page>** button to page 2 and the display will appear like this:



3. Now press the **<1>** button and turn the **<Data>** wheel making the Volume Pedal parameter active for assignment to the Expression pedal. Now press the **<Assign>** button and the display will appear like this:



4. Now all you have to do is rock the Expression Pedal to assign the Volume Pedal parameter control, and the display will appear something like this:



5. Now that the assignment has been made, make sure that you store your changes and press the **<Program>** button to return to Program mode.

MIDI Functions

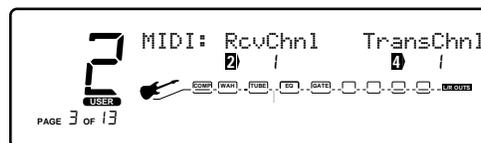
In this day and age where the role of the Guitarist has taken on so many new responsibilities, his or her equipment has to be fast, and has to be able to communicate with other devices at the drop of a hat. So, we at Digitech have given the RP-20 all of the MIDI goodies that your heart may desire.

Setting the MIDI Channels

This option sets the MIDI Channel that the RP-20 Valve will respond to MIDI program changes and CC messages and transmit program changes on. MIDI channel settings include: Off, 1, 2,...15, 16, and All.

To change the MIDI channel assignment, do the following:

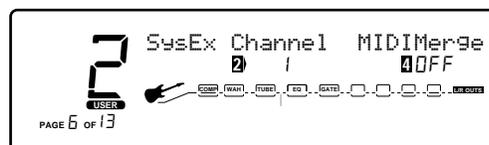
1. Go to Page 3 of the Utility menu by pressing the **<Utility>** button and then press either the **<Next Page>** or **<Previous Page>** buttons until you reach page 3 and the display reads:



2. Press the **<2>** button and then turn the **<Data>** to select the MIDI channel number you want your RP-20 Valve to receive on.
3. Now press the **<4>** button and then turn the **<Data>** wheel to select the MIDI channel number you want your RP-20 Valve to transmit on.

MIDI Merging

MIDI merging allows incoming MIDI data to be merged with any MIDI data generated by your RP-20 Valve before being sent to the MIDI Out/Thru port. Selecting the MIDI Merge option can be accessed in Page 6 of the Utility menu. Once there, the display will look like this:



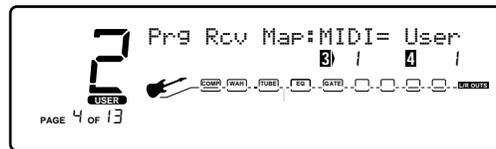
Program Receive Map

The Program mapping features of the RP-20 Valve allow you to access any of your RP-20's 200 Programs using the standard 128 Program Change commands through MIDI. From the Factory, the RP-20 is set to access User Program 1 through 100 using MIDI Program change numbers 1 through 100. MIDI Program change numbers 101 through 128 access the Factory Program bank.

To gain MIDI access to other programs not mentioned and bypass you must use the program mapping feature.

To remap a program number to a MIDI Program change number, do the following:

1. Press the **<Utility>** button and scroll to Page 4 of the Utility menu pressing either the **<Next Page>** or **<Previous Page>** buttons until you reach page 4 and the display will read:



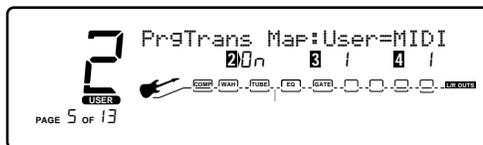
2. Press the **<3>** button and then turn the **<Data>** wheel to select the MIDI Program change number you want mapped. Note that the number under RP-20 Valve USER changes along with the MIDI number.
3. Press the **<4>** button and then turn the **<Data>** wheel to select the RP-20 Valve program you want the selected MIDI program change number to recall. As this number increases above program 100, note that RP-20 Valve USER changes to RP-20 Valve FACT, indicating that the mapped number will recall the indicated program number in the Factory bank..

Program Transmit Map

With the Program Transmit Map function, you can use your RP-20 Valve to send MIDI patch changes of your other effects devices. When you call up a program in your RP-20 Valve, the appropriate programs in your other FX unit's will also be recalled.

To remap a MIDI program change number to a program number, do the following:

1. Press the **<Utility>** button and scroll to Page 5 of the Utility menu pressing either the **<Next Page>** or **<Previous Page>** buttons until you reach page 5. Now press the **<1>** button and then turn the **<Data>** wheel to turn the setting to **Off**. The display will now appear like this:



2. Press the **<3>** button and then turn the **<Data>** wheel to select the RP-20 Valve program number you want mapped. Note that the number under MIDI changes along with the program number.
3. Press the **<4>** button and then turn the **<Data>** wheel to select the MIDI program change number to be sent out the MIDI Out port when the corresponding program number is recalled.

SysEx Device Channel

An easy way to think of the System Exclusive Device Channel option is to separate System Exclusive data from normal MIDI data. Each type of data has its own group of 16 channels upon which data can be transmitted. This feature will also allow individual remote control of more than one RP-20 Valve with SysEx commands.

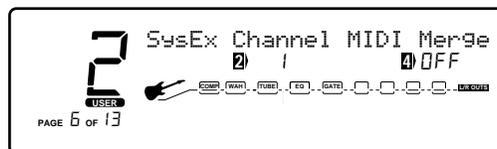
From the Factory and in most situations, the SysEx channel is set at Channel 1.

Normal MIDI data, like Program Changes, MIDI Volume, Modulation, etc. is transmitted and received on the MIDI channel designated by the setting of MIDI RECEIVE CHANNEL). SysEx data, on the other hand, is transmitted and received on the SysEx channel designated by the setting of SYSEX DEVICE CHANNEL.

This setup frees up your regular MIDI channels for other control options, and gives you the flexibility to request SysEx data from only the devices you want in your setup, whether they share the same MIDI channel or not.

To change the SysEx Device Channel number do the following:

1. Press the <Utility> button, and scroll to Page 6 of the Utility menu by pressing either the <Next Page> or <Previous Page> buttons until you reach page 6. The display reads:



2. Press the <2> button and then turn the <Data> wheel to select the desired SysEx channel (1, 2,...15, 16).

Sysex Dumps

Program Dump: Allows you to dump individual RP-20 Valve programs to another RP-20 Valve or external MIDI devices like patch librarians, computers, or sequencers for backup, storage, or organization. This option allows you to select the program to be dumped, and, when dumping to another RP-20 Valve, the program location where you want the program dumped.

To initiate an individual patch dump from the RP-20 Valve, do the following:

1. Press the <Utility> button and scroll to Page 8 of the Utility menu by pressing either the <Next Page> or <Previous Page> buttons. The display reads:



2. Press the function <3> button and then turn the <Data> wheel, select the program number you want to dump. Note that the MIDI number changes as you scroll.
3. Press the function <4> button and then turn the <Data> wheel to select the program location where you want the program dumped.
4. To initiate the dump, press the function <1> button and then turn the <Data> wheel. The Information line briefly reads:

Sending Program DUMP...

after which it returns to the program dump screen.

Default Dump: Allows you to dump individual RP-20 Valve User defaults to another RP-20 Valve or external MIDI devices like patch librarians, computers, or sequencers for backup, storage, or organization. This option allows you to select the default to be dumped.

To initiate an individual Default dump from the RP-20 Valve, do the following:

1. Press the <Utility> button and scroll to Page 9 of the Utility menu by pressing either the <Next Page> or <Previous Page> buttons. The display reads:



2. Press the function <2> button and then turn the <Data> wheel to select the Effect Module whose Default you want to dump.
3. Press the function <4> button and then turn the <Data> wheel to select the User Default you want to dump.
4. To initiate the dump, press the function <1> button and then turn the <Data> wheel. The Information line briefly reads:

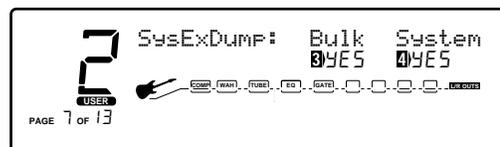
Sending User Default...

after which it returns to the User default screen.

Bulk Dump: This option allows you to dump all resident Programs in memory to an external recording device, like a patch librarian, computer, or sequencer for backup, storage, or organization. This option dumps all Programs simultaneously. It does not send any RP-20 Valve system information, such as SysEx Device channel or Programs maps.

To perform a SysEx Bulk Dump of all RP-20 Valve Programs, do the following:

1. Press the <Utility> button and scroll to Page 7 of the Utility menu by pressing either the <Next Page> or <Previous Page> buttons until you reach page 7. The display reads:



2. To initiate a bulk dump, press the <3> button and then turn the <Data> wheel. The Information line of the display reads:

SENDING BULK DUMP...

after which the display returns to the Dump screen. Bulk Dumps are very large and may take several minutes to complete.

System Dump: This is the option to use for dumping system data to an external MIDI or SysEx recording device. All the item settings in the Utility menu are sent using this option. Programs are not included in this dump.

The System Dump procedure is the same as the Bulk Dump procedure (see above), except that to initiate a System Dump, turn the <4> knob.

Other Utility Functions

The following page, lists some additional Utility functions included in the RP-20 Valve that make your programming life a little easier.

Factory Reset

Allows you to erase all User Programs, Default and Utility settings at once and restore the RP-20 Valve's memory to its factory settings.

WARNING! This procedure will destroy and reset ALL User Programs in the RP-20 Valve memory. Be sure you want to erase the memory, and start fresh before continuing with this procedure.

To perform a factory reset, do the following:

1. Press the <Utility> button and scroll to page 13 of the Utility Menu by pressing either the <Next Page> or <Previous Page> buttons. The display reads:



2. To initiate the reset, press the function <1> button and then turn the <Data> wheel.
3. This is your last chance to change your mind. If you are sure, press the <3> button and then turn the <Data> wheel. If not, you can abort the procedure by pressing the <4> button. If you press the <3> button, the Information line of the display briefly reads: `Resetting...` after which the unit resets, and returns to Program 1.

Note: In extreme situations, the RP-20 Valve can be completely reset using a special power-up procedure. This will also completely reset the RP-20 Valve, eliminating any custom settings created by the user. The procedure is as follows:

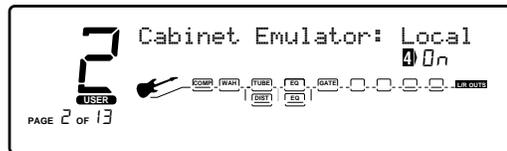
1. Press and hold the <Preamp> button while powering up your RP-20 Valve.
2. Release the <Preamp> button after an asterisk appears in the information line on the screen.
3. Press the <Effect> button and the RP-20 Valve will re-initialize itself.

Global vs. Local Cabinet Emulation

The thing to factor in when using the Cabinet emulator in either global or local mode is whether or not you want all of your sounds affected by this change. A good time to use Global mode is when your frequently playing in different venues (because each room always sounds different).

The procedure for selecting either the Local or Global Cabinet emulation is as follows:

1. Press the <Utility> button and then press either <Next or Previous> page button until you reach page 2 of the Utility page. The display reads:

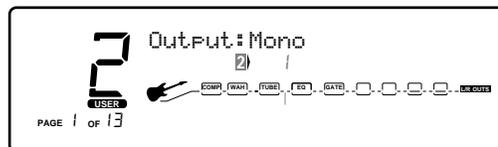


2. By pressing the <4> button and then turning the <Data> wheel, you can set the Cabinet Emulator to either Local On or Global On mode, or Global Off.

Output Mode

You can output the signal of your RP-20 Valve as either a Stereo or Mono signal.

1. Press the <Utility> button and then press either the <Next or Previous Page> buttons until you reach page 1 of the Utility page using. The display reads:



2. Pressing the <2> button and then turning the <Data> wheel, you can turn set your RP-20 Valve to output either a Stereo or Mono signal.

Assigning Functions

The footswitches of the RP-20 Valve helps you organize your sounds into 19 groups called Banks. Each of these Banks utilize the 10 footswitches patches, which are user programmable to do one of several functions. These functions include:

- *Selecting any RP-20 Valve Program*
- *Modifying or turning On/Off any Parameter in real-time*
- *Sending MIDI CC information out of the MIDI out port (Toggle CC# for values 0 or 127)*
- *Assign a MIDI CC# for the Expression pedal to send out the MIDI port*

To change Banks, Press either the Bank Up or Bank Down footswitches on the RP-20 Valve to take you up or down one bank at a time.

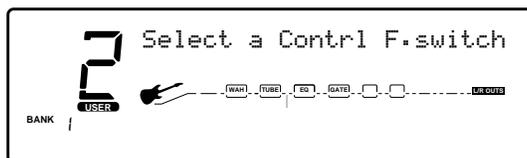
The Foot Controller setup menu contains all the setup options necessary to use the RP-20 Valve footswitches. The submenus included under the Foot Controller setup are located on pages 10, 11 and 12 of the Utility menu and they include:

- *Patch Assignment*
- *Continuous Control*

Assigning Programs to Footswitches

To assign any currently selected Program to a patch footswitch in the currently selected bank, do the following:

1. Once the selected Program has been chosen, press the **<Assign>** button once. The display reads:



2. Press one of the ten footswitches to Link the selected program to that switch. If you choose a footswitch that is already assigned to do something else besides select a program, the display reads:



3. Pressing the **<3>** function and then turning the **<Data>** wheel re-assigns the function of the footswitch while pressing **<4>** button will leave everything as it was, aborting the procedure.

Once you link a Program to a Patch in a Bank, the LED lights above the footswitch that you selected indicating the Link was successful.

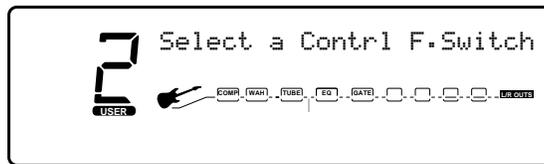
4. Press the **<Program>** button to exit.

Assigning Parameter control to Footswitches or the Expression Pedal

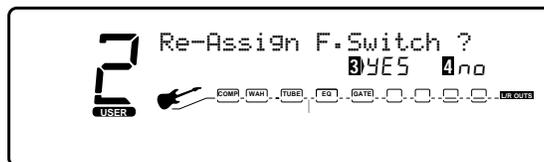
The RP-20 Valve allows you to control up to 16 Parameters per Program. Each time you link a parameter to a footswitch or expression pedal, it is added to any assignments already made to that controller. This is where the RP-20 Valve becomes the dedicated work horse that it is, by doing all of the organizing for you so all you have to do is select which parameter is being controlled, then tell the RP-20 Valve to “Make it so”.

To assign any currently selected Parameter to a footswitch or Expression pedal in the currently selected bank, do the following:

1. Be sure that the parameter you want to link is displayed and selected. Once the parameter has been selected, press the **<Assign>** button and the display will appear like this:



2. Now press the footswitch that you wish assign and the display will appear something like this if the footswitch is already assigned to control another parameter:



3. If you wish to re-assign, press the **<3>** button. If you do not wish to re-assign the footswitch, press the **<4>** button and now the footswitch is assigned to the selected parameter.

Other Footswitch Functions

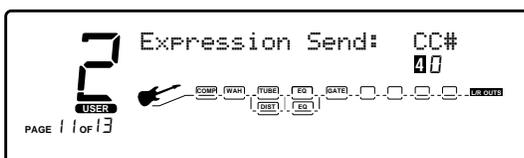
The footswitches on the RP-20 Valve can be assigned to do several functions. This is done through the Foot Controller menus in the Utility section of the RP-20 Valve. These functions include:

Toggle MIDI CC: This function allows you to send MIDI Continuous Controller (CC) information out the MIDI port while the footswitch still maintains its ability to control a parameter directly. When assigned to a footswitch, CC values 0 or 127 are sent. CC numbers 0 through 127 are available.

Expression CC send: The Expression pedal of the RP-20 Valve can also send MIDI CC data to other MIDI devices.

The procedure for setting up a MIDI CC toggle footswitch function is as follows:

1. Press the <Utility> button once. The display reads:



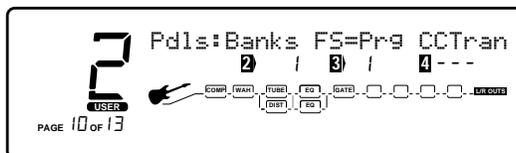
2. Press the <4> button and then turn the <Data> wheel to select the CC send for the expression pedal.

CC Transmit Channel - This option allows you to set the MIDI channel on which CCs will be sent out the RP-20 Valve MIDI Out port to other MIDI devices. If you are using the RP-20 Valve only, you don't need to worry about setting up this option.

However, if you plan to use the RP-20 Valve for continuous control over other MIDI devices (either in conjunction with the RP-20 Valve or by themselves), you need to assign a MIDI transmit channel for each of the CC numbers you'll be using for continuous control of the other devices.

To change the MIDI channels on which the selected CCs will transmit to other MIDI devices, do the following:

1. Press the <Utility> button once, then turn the <Data> wheel until you reach page 10 of the utility menu. The display will appear something like this:



2. Now press either <2> and then turn the <Data> wheel to select the bank, <3> and then turn the <Data> wheel to select the footswitch and press the <4> button and then turn the <Data> wheel to set the CC transmit number. To exit, press the <Program> button.

Other Pedalboard Tidbits

Here are a few other features that you will want to learn about to get the most out the footswitches on the RP-20 Valve.

Bank Up/ Tuner and Bank Down / Bypass Footswitches

These two foot switches are located at top right side of the RP-20 Valve. The Bank Up/Tuner footswitch, as you may have guessed, will move to the next Bank Up in the RP-20 Valve, as well as access the Tuner Mode by simply pressing and holding the footswitch until the Tuner appears in the display.

To access the next bank down press the Bank Down footswitch once. To bypass the Digital effects in the RP-20 Valve, press and hold the footswitch until the LEDs indicate that the unit is now in effect bypass mode.

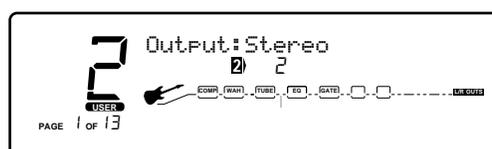
Using the Tuner

1. To access the Tuner mode using the footswitch of the RP-20 Valve, press and hold the **<Bank Up/Tuner>** footswitch to engage tuner mode.
2. As you play a note on the guitar, the indicator in the display of the RP-20 Valve will move either to the right, or the left. If the indicator is moving right, the note you are playing is sharp. If the indicator moves left, you are flat. The goal is to tune your guitar so that the indicator stops in the middle and the display locks-in, indicating you are in tune.
3. In both methods of tuning, the tuner is referenced to A=440Hz. If you prefer tuning sharp or flat according to the A reference, press the **<3>** button and then turn the **<Data>** wheel to select a new reference. This can be set as high as A=453Hz or as low as A=427Hz. The tuner can also be used for alternate tuning references where A=Ab (meaning you play an A note, but you hear an Ab note). It is possible to tune as low as A=Gb.
4. At this point, press any footswitch on the RP-20 Valve to exit the Tuner mode.

Naming Banks

Straight out of the box, the RP-20 Valve has 19 user banks to choose from. Each of the Banks have been given a specific named to give indication to what type of programs exist with the bank. In your constant editing mode to make the box custom to your needs, we have given you the ability to rename the banks. The procedure is as follows (and please don't worry, we won't be hurt):

1. From Program mode press the **<Utility>** button and the display will appear something like this:
2. Now press either the **<Next Page>** or **<Previous Page>** buttons until you reach page 13 and appears like this:



3. At this point, press the <2> button and then turn the <Data> wheel to select the bank to be named. Once the Bank has been selected, press the <4> button to rename the bank. The display now appears like this:



4. To exit the naming bank assignment, press the <Utility> button.
5. Press the <1> button and then turn the <Data> wheel to change the character to the one you want in the selected position.
6. When the correct character is displayed in that position, use the <Next Page> or <Previous Page> buttons to scroll the cursor to the next character you want to change.
7. Press the <2> button and then turn the <Data> wheel to select numbers. Press the <3> button and then turn the <Data> wheel to insert spaces and press the <4> button and then turn the <Data> wheel to copy and paste characters.
8. To copy a character, position the cursor under the character you want to copy (using the <Next Page> button), then turn the <4> knob clockwise. To paste the copied character, position the cursor where you want to paste the character, then turn the <4> button counter-clockwise.
9. To abort the procedure, push either the <Program> button to take you to Program Mode, the <Edit> button to take you to FX Edit Mode, or the <Utility> button to take you to Utility mode, depending upon which mode you want to enter.

Section-6 Appendix

RP-20 Factory Program List

Bank 1 Top 5

1- Tube Idol Solo	Cfg-7
2- Big Thick Clean	Cfg-4
3- WahdStock '97	Cfg-4
4- Big Bad Rhythm	Cfg-4
5- Effects Chain Morph	Cfg-15

Bank 2 Signature 1

6- Eddie Of Old	Cfg-1
7- Every Breath You Fake	Cfg-4
8- Rockin' SRV	Cfg-1
9- Foxy	Cfg-1
10-Angus In The House	Cfg-1

Bank 3 Signature 2

11- Cliff Notes of Dover	Cfg-4
12- Rock N' Roll	Cfg-1
13- Run Like Heck	Cfg-4
14- Mysterious Waybills	Cfg-12
15- Lemonlite	Cfg-4

Bank 4 Morphing

16-Clean Chorus >>Dist Octv	Cfg-15
17- Slappy Pan>>ThrashPhase	Cfg-15
18- Tube>>Fuzz Auto Morph	Cfg-4
19- Clean Chorus>>12 String	Cfg-8
20- Octave Thump>>Phase Pan	Cfg-15

Bank 5 Dual Tones

21- L) Tube R) Fuzz	Cfg-6
22- Clean Crunch Chor/Pong	Cfg-4
23- L) Dirt R) Clean	Cfg-6
24- Sweet Pannable Solo	Cfg-15
25- Dirty/Clean Squeeze	Cfg-1

Bank 6 Preamp Only 1

26- Warm Rythm	Cfg-13
27- Metal Scoop	Cfg-13

28-Twin Combo	Cfg-13
29- Custom British Stack	Cfg-13
30- Rocket Mang	Cfg-13

Bank - 7 Preamp Only 2

31-Death Metal Scoop	Cfg-13
32- Smooth Solo	Cfg-13
33- Super Fuzz	Cfg-13
34-Rock Tube	Cfg-13
35-Tube Solo	Cfg-13

Bank - 8 Blues Tones

36- Bluesy Hall	Cfg-1
37- Blues Slide	Cfg-2
38- Baddest Blues Solo	Cfg-4
39-Riviera Pair O' Dice	Cfg-4
40- Chicago Shuffle	Cfg-4

Bank - 9 Country Tones

41- Kentucky Fried Picken	Cfg-4
42- Desert Campfire	Cfg-4
43- Pedal Steel	Cfg-2
44- Dirty Lil Ditty	Cfg-13
45- Harmony Solo (D Mix)	Cfg-2

Bank 10 Metal Tones

46- Metal Stereo Pedal	Cfg-4
47- 2-Tone Stereo Grind	Cfg-6
48- Big Delay Stack	Cfg-4
49- Clean Ballad	Cfg-8
50- Pedal Phase to the Metal	Cfg-1

Bank 11 Alternative Tones

51- Clean Pong Phase	Cfg-4
52- Panning Wah	Cfg-4
53- Stereo Envy	Cfg-13
54- Funk Strat	Cfg-4
55- Whammy Child	Cfg-2

Bank 12 Studio Applications

56- Huge Chorus/Delay	Cfg-12
57- L.A. Super Solo	Cfg-8
58- Power Stack	Cfg-4
59- Compressed Mod/Delay	Cfg-4
60- Stereo Rhythm	Cfg-1

Bank 13 Vintage Tones

61- Trem-O-Surf	Cfg-4
62- Fuzztronic	Cfg-1
63- Analog Delayed Stack	Cfg-4
64- Electric Sitar	Cfg-9
65- Transistor Buzz	Cfg-1

Bank 14 Clean Tones

66- Crisp Clean	Cfg-1
67- Warm Panner	Cfg-9
68- Clean Thick Detune/Delay	Cfg-4
69- Clean Mod-Delay	Cfg-9
70- Phase w/Moving Delay	Cfg-7

Bank - 15 Jazz/Fusion

71- Classic Jazz Room	Cfg-10
72- Gain Solo	Cfg-8
73- Blank	Cfg-13
74- Modern Fusion Solo	Cfg-7
75- Jazzy Chorus	Cfg-8

Bank - 16 Acoustic Guitar

76- New Age Acoustic	Cfg-4
77- Simulated 12 String	Cfg-2
78- Chorus / Delay w/ PEQ	Cfg-4
79- Acoustic Phase/Panner	Cfg-7
80- Stereo Detune/Reverb	Cfg-7

Bank - 17 Dynamics Effected

81- Ducking Delay Solo	Cfg-4
82- Dynamic Chorus	Cfg-4
83- Ping Pong AutoWah Solo	Cfg-1
84- Psycho Phase	Cfg-4
85- Blank	Cfg-13

Bank 18 Jam-Along

86- Sound On Sound 1>4>5	Cfg-14
87- Sound On Sound Jam	Cfg-4
88- Space Chord	Cfg-15
89- Wacko Whammy	Cfg-2
90- Guitar Orgran	Cfg-4

Bank 19 Bass Guitar

91- Fat Bass Room	Cfg-9
92- High Freq Chorus	Cfg-15
93- Bowed Church Bass	Cfg-4
94- Funk Slap Detune	Cfg-1
95- Cool Bass Solo	Cfg-7
96- Hold That Note	Cfg-15
97- Hynotic Phase	Cfg-8
98- 60's Sci-Fi Movie	Cfg-7
99- Look, Goodzilla!!	Cfg-2
100-Edge Of the Earth	Cfg-1

RP-20 Valve Program Descriptions

To help all of you Tone and Effect connoisseurs along the way, this list gives you a brief description all 100 Factory Programs of the RP-20 Valve.

Bank - 1 Top 5

- 1- **Tube Idol Solo** - Use this program when you really want the solo to be heard by using big tube distortion, Detuner, Delay and Reverb.
- 2- **Big Thick Clean** - This program is a clean tone must. The Quad detuner and Dual delay effects modules thicken up this program.
- 3- **WahdStock '97** - Great Wah and excellent tube distortion are present in this program that also uses chorus and delay.
- 4- **Big Bad Rhythm** - Use this program when you want the rhythm guitar to drive the band with overdriven tube distortion.
- 5- **Effects Chain Morph** - Create out of this world special effects with this program by morphing from one side of the effects chain to the other.

Bank - 2 Signature 1

- 6- **Eddie of Old** - Vintage Brown Sound Tones of the "Great One" can be heard in this program with Tube distortion and dual reverb.
- 7- **Every Breath You Fake** - The Classic Police sound with Chorus and Reverb and just a tad of distortion can be heard in this program.
- 8- **Rockin' SRV** - Tones of quite possibly the greatest blues player of all time sound out on this program with Tube overdrive and Reverb.
- 9- **Foxy** - The Jimmy tone with a Fuzz face distortion is present on this program.
- 10- **Angus In The House** - The quintessential rock guitar guitar tone that is straight forward and in your face is heard here.

Bank - 3 Signature 2

- 11- **Cliff Notes Of Dover** - The great big tone of Mr. Johnson is brought out by big tube distortion and delay and reverb.
- 12- **Rock N' Roll** - The "Zep-Tone" climbs the stairway on this program that uses Tube distortion and Reverb effects.
- 13- **Run Like Heck** - Classic Gilmour rings out with clean tone and Chorus and Delay effects to thicken things up.
- 14- **Mysterious Waybills** - Special effects are the way to go in this program that utilizes the pedal phaser along with Reverb and Fuzz.
- 15- **Lemon Lite** - Dual distortion paths are in place on this program with dual chorus and Reverb effects which will bring you closer to the heart.

Bank - 4 Morphing Programs

- 16- **Clean Chorus>>Dist Octv** - This program morphs from a clean chorus type program, to a tube distortion program with an octave pitch shifter all at the push of an expression pedal.
- 17- **Slappy Pan>>ThrashPhase**- This morphing program changes from a clean auto pan effect to a Tube distortion with Phaser.
- 18- **Tube>>Fuzz Auto Morph** - Automatically morph from a Tube overdrive program to a Fuzz distortion thanks to the assigned LFO.
- 19- **Clean Chorus>>12 String** - Use the Expression pedal to morph from from a clean chorus tone to a simulated 12-string program.
- 20-**Octave Thump>>Phase Pan** - Bring out the low-end on this program with a deep octave dive and a panning phaser effect.

Bank - 5 Dual Tones

- 21- **L)Tube R)Fuzz** - This program uses dual distortion paths to sound out Tube and Fuzz distortions.
- 22- **Clean Crunch Chor/Pong** - Clean and Crunch tones can be heard here with Chorus and Pong delays.
- 23- **L) Dirt R) Clean** - This dual distortion path program combines both dirty and clean preamp tones.
- 24- **Sweet Pannable Solo** - You can pan between two different distortion tones along with delay.
- 25- **Dirty/Clean Squeeze**- Both dirty and clean tones ring though with the addition of a dual reverb module.

Bank - 6 Preamp Only 1

- 26- **Warm Rhythm** - Just simple tube overdrive is heard in this program.
- 27- **Metal Scoop** - A heavily saturated tube distortion is very present in this preamp tone program
- 28- **Twin Combo** - The tone of the Twin sounds through on this program.
- 29- **Custom British Stack** - A dirty tube distortion type is used on this program to bring out the tone of a classic British stack.
- 30- **Rocket Mang** - A saturated tube voice is present in this preamp only program.

Bank - 7 Preamp Only 2

- 31- **Death Metal Scoop** - The classic Grunge distortion is used in this program.

32- **Smooth Solo** - A heavy sustain distortion is used in this program that is ideal for the big solo spot.

33- **Super Fuzz** - The classic Fuzz Face distortion is used in this program to bring out the tone nuances of the RP-20 Valve.

34- **Rock Tube** - A dirty tube overdrive distortion type is used with just a touch of distortion.

35- **Tube Solo** - A heavily Saturated tube distortion rings out here with the gain boosted all of the way up.

Bank - 8 Blues Tones

36- **Bluesy Hall** - This program uses a Tube overdrive distortion with a big reverb effect module for adding size to any venue.

37- **Blues Slide (ExpPdl)** - Use the Expression pedal to control the whammy effect that will help you create Delta blues slide type effects.

38- **Baddest Blues Solo** - A Tube distortion and Delay and Reverb effects are used to in this program that is ideal for soloing.

39- **Riviera Pair O' Dice** - A nice and clean blues tone with chorus and reverb will help you get the SRV lush tones.

40- **Chicago Shuffle** - A slightly overdriven tube distortion with delay, help you achieve the sweet home Chicago tones.

Bank - 9 Country Tones

41- **Kentucky Fried Picken** - This is an ideal program for chicken picken country overdrive with delay and reverb effects.

42- **Desert Campfire** - This program uses a tube overdrive distortion with tremolo and dual chorus digital effects.

43- **Pedal Steel** - Slide guitar emulation can be done in this program with the help of the whammy effect that is assigned the expression pedal.

44- **Dirty Lil Ditty** - Dirty tube distortion and chorus and delay make this program great country rock solos.

45- **Harmony Solo (D Mix)** - Harmony solos are great on this program that uses intelligent harmony effects

Bank - 10 Metal Tones

46- **Metal Stereo Pedal** - Bring back the tones of the 80s with this heavy metal program that uses a delay and detune module.

47- **2-Tone Stereo Grind** - Dual distortion paths are present in this program that will produce a wall of sound.

48- **Big Delay Stack** - Tube distortion is shines through with a dual flange and delay that makes this perfect for soloing.

49- **Clean Ballad** - This clean program uses a dual chorus and delay effect modules.

50- Pedal to the Metal Phase- A big rectifier tone that uses a grunge distortion with lush phasing effects for the big tones.

Bank - 11 Alternative Tones

51- Clean Pong Phase - A clean toe program uses a ping pong delay and dual phaser module.

52- Panning Wah - A dirty tube distortion with autopanning of the wah effect will produce out of this world tones.

53- Stereo Envy - There are two distortion paths in this program that use a detuning effect that will large industrial tones.

54- Funk Strat - Bright and Clean tube tones with a dual detune and reverb effect will help get you great funk tones.

55- Whammy Child - This program uses a saturated tube distortion type preamp with whammy pitch shifting assigned to the expression pedal.

Bank - 12 Studio Applications

56- Huge Chorus/Delay - Bright clean tube tones With a Dual chorus, Dual Delay and quad Chorus effect modules are used on this program.

57- L.A. Super Solo - A heavily saturated tube distortion is used with Quad Chorus, Delay and Reverb to produce great solos for the studio.

58- Power Stack - This powerful tube distortion program uses a Dual Reverb effect module which will add size to any tone.

59- Compressed Mod/Delay -Warm Tube distortion is used in this program with Dual Chorus and Delay

60- Stereo Rhythm - A slightly overdriven distortion is used in this program with a Delay effect

Bank - 13 Vintage

61- Trem-O-Verb - Classic Tremolo sounds out in this program that uses a custom Tube Distortion.

62- Fuzztronic - The Fuzz face distortion is alive and well in this program that will also use Tremolo and Delay effect modules.

63- Analog Delayed Stack - The distorted classic stack sound gets and added boost with the vintage sound of an analog delay module.

64- Electric Sitar - the ideal emulation of the electric sitar is emulated through a pitch-shifting module.

65- Transistor Buzz - For better or worse, this classic transistor sound is brought back in this program.

Bank - 14 Clean Tones

66- Crisp Clean- Crisp and Clean preamp tones sound out in this program that also uses a Stereo Dual Reverb effect module.

67- **Warm Panner** - This program uses a warm-clean tube distortion type that uses an Autopanner and a dual delay effect module.

68- **Clean Thick Detune/Delay** - This overdrive solid state distortion program will also provide you with a Quad Detuner and Delay module.

69- **Clean Mod-Delay** - A clean tube distortion rings out in this program with a multi-effect module that will use chorus and delay.

70- **Phase w/ Moving Delay** - The phaser with delay will help create a modulating delay effect in this clean tone program.

Bank - 15 Jazz/Fusion

71- **Classic Jazz Room** - A bright and clean tube tone with a Stereo Dual Reverb will provide you great jazz tones on this program.

72- **Gain Solo** - A distorted heavy gain tone with dual chorus, delay and reverb are used in this program to make it great for comping solos.

73- **String Swell** - This program is great for producing string swell type effects by utilizing pitch shifting and dual delay and chorus.

74- **Modern Fusion Solo** - Take it to the limit with this program heavy sustain program dual reverb, delay and dual detune.

75- **Jazzy Chorus** - A classic jazz essential tone is heard in this one with dual chorus and reverb.

Bank - 16 Acoustic Guitar

76- **New Age Acoustic** - The Dual Detune and Reverb effects help make this program a great one for acoustic guitar.

77- **Simulated 12 String** - The amazing pitch-shifter helps create a perfect 12 string simulator.

78- **Chorus/Delay w/PEQ** - Chorus and Delay with parametric EQ help make this program ideal for acoustic guitar applications

79- **Acoustic Phase/Panner** - Try this program with acoustic guitar with phaser and panner to get unique effects.

80- **Stereo Detune/Reverb** - Stereo Detune and Reverb help bring out the best in your acoustic guitar.

Bank - 17 Dynamics Effected

81- **Ducking Delay Solo** - This dynamic ducked delay solo program brings in more delay with a harder pick attack.

82- **Dynamic Chorus** - A clean tone is heard in this program with a dynamic modifier used to control the chorus modulation.

83- **Ping Pong AutoWah Solo** - Tube distortion and a modifier is used to control the Wah effect with an auto panner in this one.

84- **Psycho Phase** - The phaser is set to dynamic modifier with a bright clean tube tone

85- Strum and Wait - Dual Phaser and Dual Flanger effects pan back and forth in this special effect program.

Bank - 18 Sound On Sound

86- Sound On Sound 1>4>5 - A Dynamic modifier is used in this program so the harder your attack is, the more delay will be heard.

87- Sound On Sound Jam - This is beautiful clean chorus program that has a dynamic modifier assigned to the chorus module. This means, harder attack, more chorus.

88- Space Chord - Use this program for bringing out the special effects in a by using dual distortion paths and letting the whammy be heard in one side and pedal phaser in the other while being controlled by the expression pedal.

89- Wacko Whammy - Pitch shifting down is great effect that can be used in this program with dirty tube distortion.

90- Guitar Orgran - Use this program when you want to use a leslie speaker simulator effect in your sound.

Bank - 19 Bass Guitar

91- Fat Bass Room - This program is great for adding dimension to the bass with Dual Chorus and Reverb effect modules.

92- High Freq Chorus - Bring out the Bass even ,ore with this high EQ boosted program that also uses a Pre delay, Dual chorus and Reverb modules.

93- Bowed Church Bass - This Bright-Clean tube voicing along with Dual detuner and Reverb can help you emulate a bowed Bass.

94- Funk Slap Detune - Let your Bass presence be felt in this program that uses a Bright-Clean tube preamp tone with a Dual Detuner.

95- Cool Bass Solo - This slightly overdriven distortion with Dual Chorus, Delay and Reverb will let any solo shine through.

96- Hold That Note - Perform great pitch shifting effects with this program by having a pitch shift assigned to shift harmonies when the expression pedal is moved back and forth.

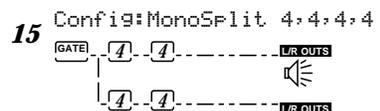
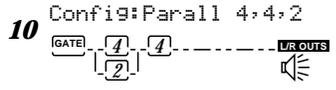
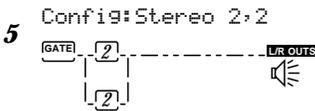
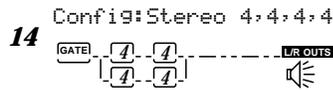
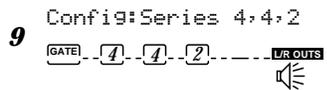
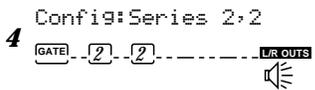
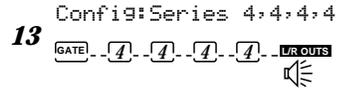
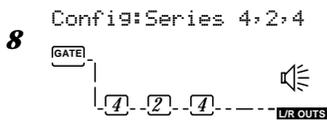
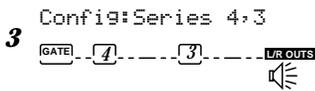
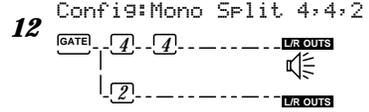
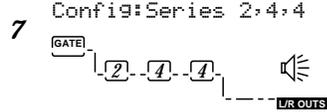
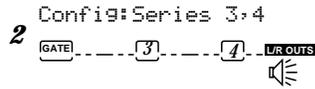
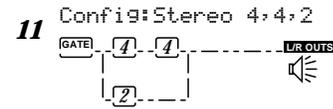
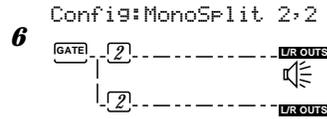
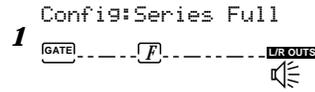
97- Hypnotic Phase - Everything is doubled on this program with dual distortion paths, dual delays, dual chorus, and Dual flanger effects.

98- 80's Sci-fi Movie- Use this Program to create bad 80's movie sound tracks with auto wah and pitch shifting effects.

99- Look, Goodzilla!!- You can create the sounds of the mythical beast with this program that uses a Whammy down effect and tons of Reverb that are assigned to the expression pedal.

100- Edge of the Earth - Use this program to create a larger than life tone with big tube distortion and mammoth Reverb.

Effect Configuration Chart



Dual Output Configurations -Take notice that several effect configurations (ie: 12 and 14) use dual outputs. This indicates that Dual distortion paths can be run to both the right and the left outputs. This will be dictated by panning either distortions to the right or the left.

Key: 4= 1/4 size module
 3= 3/4 size module
 2= 1/2 size module
 F= Whole size module

Harmony Interval Charts

Interval	Major	Minor	Harm.Minor	Mel.Minor	Dorian	Mixolydian	Lydian
↑Oct	C	C	C	C	C	C	C
↑7th	B	B _♭	B	B	B _♭	B _♭	B
↑6th	A	A _♭	A _♭	A	A	A	A
↑5th	G	G	G	G	G	G	G
↑4th	F	F	F	F	F	F	F#
↑3rd	E	E _♭	E _♭	E _♭	E _♭	E	E
↑2nd	D	D	D	D	D	D	D
Ref	C	C	C	C	C	C	C
↓2nd	B	B _♭	B	B	B _♭	B _♭	B
↓3rd	A	A _♭	A _♭	A	A	A	A
↓4th	G	G	G	G	G	G	G
↓5th	F	F	F	F	F	F	F#
↓6th	E	E _♭	E _♭	E _♭	E _♭	E	E
↓7th	D	D	D	D	D	D	D
↓Oct	C	C	C	C	C	C	C

Int.	Lydian Aug.	Int.	Major Pent.	Int.	Minor Pent.	Int.	Blues	Int.	Whole Tone	Int.	Hlf-Whl Dim.	Int.	Whl-Hlf Dim.
										↑Oct	C	↑Oct	C
↑Oct	C									↑♭7th	B _♭	↑6th	B
↑7th	B					↑Oct	C	↑Oct	C	↑6th	A	↑5th	A
↑6th	A	↑Oct	C	↑Oct	C	↑♭7th	B _♭	↑♭7th	A#	↑5th	G	↑♭6th	G#
↑#5th	G#	↑6th	A	↑♭7th	B _♭	↑5th	G	↑#5th	G#	↑#4th	F#	↑♭5th	F#
↑#4th	F#	↑5th	G	↑5th	G	↑♭5th	F#	↑#4th	F#	↑3rd	E	↑4th	F
↑3rd	E	↑3rd	E	↑4th	F	↑4th	F	↑3rd	E	↑#2nd	E _♭	↑♭3rd	E _♭
↑2nd	D	↑2nd	D	↑♭3rd	E _♭	↑♭3rd	E _♭	↑2nd	D	↑2nd	D _♭	↑2nd	D
Ref	C	Ref	C	Ref	C	Ref	C	Ref	C	Ref	C	Ref	C
↓♭2nd	B	↓♭3rd	A	↓2nd	B _♭	↓2nd	B	↓2nd	A#	↓2nd	B _♭	↓♭2nd	B
↓♭3rd	A	↓4th	G	↓4th	G	↓4th	G	↓3rd	G#	↓♭3rd	A	↓♭3rd	A
↓3rd	G#	↓♭6th	E	↓5th	F	↓♭5th	F#	↓♭5th	F#	↓4th	G	↓3rd	G#
↓♭5th	F#	↓♭7th	D	↓6th	E _♭	↓5th	F	↓♭6th	E	↓♭5th	F#	↓♭5th	F#
↓♭6th	E	↓Oct	C	↓Oct	C	↓6th	E _♭	↓♭7th	D	↓♭6th	E _♭	↓5th	F
↓♭7th	D					↓Oct	C	↓Oct	C	↓6th	E	↓6th	E _♭
↓Oct	C									↓7th	D _♭	↓♭7th	D
										↓Oct	C	↓Oct	C

RP-20 Valve Specifications

A/D Converter: 16 bit PCM
D/A Converter: 16 bit PCM
Sampling Frequency: 40 kHz

Tube Complement:

1- 12AX7 triode: 300 volt power supply

DSP Section:

Architecture: Static-Dynamic Instruction Set Computer (S-DISC II™)
Digital Signal Path Width: 24 bits (144.5 dB)
Internal Data Path: 48 bits (289 dB)
Dynamic Delay Memory: 64k x 24 bits (1.68 seconds)
Static Delay Memory: 256 24-bit registers (6.55 milliseconds)
Data ALU Processing: 10.0 MIPS
Address ALU Processing: 15.0 MIPS
Multiplier Size: 24 bits x 24 bits

Input Section:

Connector: 1/4" Unbalanced
Nominal Value: -8 dBu
Maximum Level: +10 dBu
Impedance: 470 ohms

Output Section:

Connector: 1/4" TRS
Nominal Level: +4 dBu
Maximum Level: + 18 dBu
Impedance: 50 ohms

General:

Frequency Response: 20 Hz - 20 kHz +0, -3 dB
S/N Ratio: Greater than 90 dB: ref= max signal, 22 kHz measurement
bandwidth
Total Harmonic Distortion: Less than 0.04% (1 kHz)

Memory Capacity:

Factory: 100 Programs
User: 100 Programs

Dimensions: 19" W x 1.75" H x 9" D
Net Weight: 12 lbs
Shipping Weight: 13.5 lbs

MIDI Implementation Chart

Function...		Transmitted		Recognized		Remarks
<i>Basic Channel</i>	<i>Default Channel</i>	<i>X</i>	<i>X</i>	<i>1-16</i>	<i>1-16</i>	<i>Memorized</i>
<i>Mode</i>	<i>Default Messages Altered</i>	<i>X</i>	<i>X</i>	<i>Mode 2, Mode 4</i>	<i>Mode 2, Mode 4</i>	<i>Memorized</i>
			<i>N/A</i>		<i>X</i>	
<i>Note Number</i>	<i>True Voice</i>	<i>X</i>	<i>N/A</i>	<i>X</i>	<i>X</i>	
<i>Velocity</i>	<i>Note ON</i>		<i>X</i>		<i>X</i>	
	<i>Note OFF</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	
<i>After Touch</i>	<i>Key's</i>		<i>X</i>		<i>X</i>	
	<i>Ch's</i>	<i>X</i>	<i>X</i>	<i>0</i>	<i>X</i>	
<i>Pitch Bender</i>			<i>X</i>		<i>X</i>	
<i>Control Change</i>			<i>X</i>		<i>0</i>	<i>1*</i>
<i>Preset Change</i>	<i>True #</i>	<i>X</i>	<i>N/A</i>	<i>0</i>	<i>0-127</i>	<i>2*</i>
<i>System Exclusive</i>			<i>0</i>		<i>0</i>	<i>See SysEx (see appendix)</i>
<i>System</i>	<i>:Song Pos</i>		<i>X</i>		<i>X</i>	
	<i>:Song Sel</i>				<i>X</i>	
<i>Common</i>	<i>:Tune</i>		<i>X</i>		<i>X</i>	
<i>System</i>	<i>:Clock</i>		<i>X</i>		<i>X</i>	
<i>Real Time</i>	<i>:Commands</i>		<i>X</i>		<i>X</i>	
<i>Aux</i>	<i>:Local ON/OFF</i>		<i>X</i>		<i>X</i>	
<i>Mes-</i>	<i>:All Notes Off</i>		<i>X</i>		<i>X</i>	
<i>sages</i>	<i>:Active Sense</i>		<i>X</i>		<i>X</i>	
	<i>:Reset</i>		<i>X</i>		<i>X</i>	
<i>Notes</i>		<p><i>1* Each Parameter can be linked to any control change. These assignment tables are stored in memory.</i></p> <p><i>2* For Preset map 1-128 (Preset Change can be mapped to Factory Presets, User Presets, or Bypass function).</i></p>				

Mode 1 : OMNI ON, POLY
Mode 3 : OMNI OFF, POLY

Mode 2 : OMNI ON, MONO
Mode 4 : OMNI OFF, MONO

0 : Yes
X : No

System Exclusive Implementation

MIDI System Exclusive communication allows a user to control a device directly through MIDI in a very powerful and flexible manner. Much care has gone into creating and testing this documentation but Digitech can not guarantee 100% accuracy, nor can Digitech be held responsible for programs and data lost in a product from System Exclusive Information use.

A working knowledge of the MIDI Version 1.0 Detailed Specification can be useful while implementing any manufacturer's SysEx commands. For a copy of the MIDI spec contact:

MIDI Manufacturers Association
5316 West 57th Street
Los Angeles, California 90056 USA
(213) 649-6434

It is a good practice to back up any user programs and/or user algorithms in the device before you begin to work with SysEx commands due to the fact that incorrect commands can produce unexpected results. Should you encounter any discrepancies between this documentation, and a Digitech S-DISC II™ MIDI, product please feel free to contact us at:

Digitech
Attn: Product Management Dept.
8760 South Sandy Parkway
Sandy, Utah 84070 USA
(801) 566-8800
<http://www.digitech.com>

MIDI Basics

MIDI Channels: The RP-20 Valve can be set so that it communicates on 1 of 16 discrete MIDI channels. Some devices may also be set up to transmit or receive information on all channels in an Omni mode or to none of the channels in a Disabled mode.

Program Changes: When the RP-20 Valve is set to communicate on one or all of the MIDI channels, it will recognize a Program Change command. If the number is legal (e.g. within the device's range of selectable programs) the Digitech device will respond by changing to the new program. MIDI sends Program Changes 0 through 127. Digitech devices begin their program numbering with 1, thus Program Change 0 will select program 1. The RP-20 Valve also allows the user to 're-map' the Program Change commands so that Program Change 0 could call program 135, if so desired.

Continuous Controllers: A MIDI Continuous Controller may be 'Linked' to nearly any available parameter in the RP-20 Valve. CC links (Modifiers) and their ranges are treated uniquely in each program with the assignments being saved only if they are stored as part of the program.

Channel Pressure: DigiTech products treat Channel Pressure as simply another type of Continuous Controller which can be linked to parameters for control.

Pitch Bend: Pitch Bend information is a higher resolution controller that is not supported in Digitech products, due to the density of the information and the resources needed to process it properly. Many MIDI control products offer the ability to map Pitch Bend to normal Continuous Controllers if a user wanted to control a parameter with a device such as a Pitch Bend Wheel.

General Format

The general format for the System Exclusive information is as follows (note: all SysEx values are displayed in Hexadecimal format, along with this symbol (h) for clarification):

Hex Value	Definition
F0(h)	System Exclusive 'Begin Message' byte
00(h)	
00(h)	Manufacturer's ID Number (Digitech)
10(h)	
0n(h)	n = Unit's Device or SysEx Channel number (minus one) e.g. 00(h) is device or SysEx Ch 1 01(h) is device or SysEx Ch 2 etc... 0F(h) is device or SysEx Ch 16
dd	dd = device ID number 4B(h) identifies the RP-20 Valve
pp	pp = Procedure number. The different procedure's names and general formats are described in the Procedures Section.
dd(1)1, dd(1)2.....dd(n)1, dd(n)2	dd = Data as needed by procedures. Since the standard MMA MIDI Specification reserves 80(h) through FF(h) (decimal numbers 128 through 255) for specific commands, a split byte format is adopted for all data communication in this SysEx implementation. dd(n)2 denotes the 1st through 7th bits of the nth byte and dd(n)1 denotes the 8th bit of the nth byte. Note: All data that is requested or received, is in split byte format unless noted otherwise.
F7(h)	System Exclusive 'End Message' byte

Procedures

In the following section, SYS_HEAD refers to a valid System Exclusive header. The System Exclusive header starts with the System Exclusive status byte, and includes all bytes through the Digitech device type. F7(h) is the System Exclusive 'Message End' byte. All SysEx numbers in the format definition of each procedure are given as hexadecimal values, along with this symbol (h) for clarification. Binary numbers are identified with this symbol (b).

REQUEST ONE PROGRAM (01b)

SYS_HEAD, 01(h), yy1, yy2, zz1, zz2 F7(h)

When yy = 00(h)	User bank is selected
When yy = 01(h)	Factory bank is selected
zz	The Program number, 1-100 User (00-63(h)) or 1-100 Factory (00-63(h))

When a Request One Program procedure is received, the RP-20 Valve will respond with a Receive One Program procedure.

RECEIVE ONE PROGRAM (42b)

SYS_HEAD 42(h), vv(1)1, vv(1)2, vv(2)1, vv(2)2, yy1, yy2, zz1, zz2, dd(1st)1, dd(1st)2, ... dd(nth)1, dd(nth)2, F7(h)

vv software version number

When yy = 00(h)	User bank is selected
When yy = 01(h)	Factory bank is selected
zz	The Program number, 1-100 (00-63h)
dd(n)	Program data

The Receive One Program procedure is used to load a program into the RP-20 Valve. The number of program bytes to be received (n) is different for each program. If the RP-20 Valve is sent a Receive One Program procedure where the program number is not a valid RAM destination, it will be ignored.

REQUEST BULK DUMP (49b)

SYS_HEAD, 49(h), F7(h)

When a Request Bulk Dump procedure is received, the RP-20 Valve will respond with a Receive Bulk Dump procedure.

RECEIVE BULK DUMP (48b)

SYS_HEAD 48(h), dd(1st)1 dd(1st)2, ... dd(nth)1, dd(nth)2, F7(h)

dd(n)	Bulk Dump Data
-------	----------------

The Receive Bulk Dump procedure is used to load all User Programs into the RP-20 Valve. A software version number is imbedded in the data.

REQUEST UTILITY SETTINGS (11b)

SYS_HEAD, 11(h), F7(h)

When a Request Utility Settings procedure is received, the RP-20 Valve will respond with a Receive Utility Settings procedure.

RECEIVE UTILITY SETTINGS (12b)

SYS_HEAD 12(h), vv(1)1, vv(1)2, vv(2)1, vv(2)2, rr1, rr2, tt1, tt2, ee1, ee2, ff1, ff2, ss1, ss2, nn1, nn2, mm1, mm2, qq1, qq2, yy (1st)1,yy(1st)2, zz(1st)1,zz(1st)2 ... yy(128th)1,yy(128th)2, zz(128th)1,zz(128th)2, F7(h)

vv =	software version number
rr =	MIDI Receive Channel (range = 00(h) ~ 07(h))
tt =	MIDI Transmit Channel (range = 00(h) ~ 07 (h))
ee =	Cabinet Emulator (range = 00(h) ~ 07 (h))
ff =	Foot Controller (range = 00(h) ~ 07(h))
ss =	SysEx Channel (Millennium only)
nn	MIDI Merge On/Off (RP-20 Valve only)
mm	Mono-Stereo (range = 00(h) ~ 01(h))
qq	EQ mode (range = 00(h) ~ 07(h))
yy, zz	Program Map Settings (MIDI Program changes 1 ~ 128 = map)
When yy = 00(h)	User Bank is selected
When yy = 01(h)	Factory Bank is selected
When yy = 02(h)	and zz =00(h), Bypass toggle is selected
zz	Program Number.

REQUEST PARAMETER VALUE (17b)

SYS_HEAD 17(h), aa1, aa2,bb's1, bb's2, F7(h)

aa	Effect Module's Position
bb's	Effect Parameter's Position

When a Request Parameter Value procedure is received, the RP-20 Valve will respond with a Receive Parameter Value procedure.

RECEIVE PARAMETER VALUE (18b)

SYS_HEAD 18(h), aa1,aa2, bb's1, bb's2,cc1, cc2, F7(h)

aa	Effect Module's Position
bb's	Effect Parameter's Position
cc	Parameter Value

The Receive Parameter Value procedure is used to load Parameter Values into the RP-20 Valve. Please refer to the Parameter Charts for more information.

REQUEST ALL CURRENT PARAMETER VALUES (23b)

SYS_HEAD, 23(h), ww1, ww2, F7(h)

When ww= 7F(h)	All module's parameters will be requested.
When ww= 68(h)	(position of the module minus 1), only that module's parameters will be requested.
ww	Requested Module's parameter Values

When a Request All Current Parameter Values procedure is received, the RP-20 Valve will respond with a Respond All Current Parameter Values procedure.

RECEIVE ALL CURRENT PARAMETER VALUES FOR CURRENT PROGRAM (24b)

SYS_HEAD, 24(h), nn1, nn2, ww1, ww2, mm1(1st), mm2(1st), aa1(1st), aa2(1st), dd1(1st)(1st), dd2(1st)1st, ... dd1(1st)(wth), dd2(1st)(wth), ... mm1(xth),...mm2(xth), aa1(xth), aa2(xth), dd1(xth)(1st), dd2(xth)(1st), ... dd1(xth)(wth), dd2(xth)(wth), F7(h)

When ww= 7F(h)	All module's parameters will be received.
When ww= 68(h)	(position of the modules minus 1), only that module's parameters will be received.

nn	Number of Modules.
ww	Modules User requested.
mm	Indicates the beginning of the xth Module.
aa	Number of available parameters in the FX Module.
dd	Current value for the wth parameter.

The Receive All Current Parameter Values procedure is used to receive Parameter Values from the RP-20 Valve for the currently selected program.

Warning: Sending data that was retrieved from a different program will delete the memory. Be sure to only send data that was received from the same program.

REQUEST MODULE CONFIGURATION (25b)

SYS HEAD , 25 (h) , F7 (h)

When a Request Module Configuration procedure received, the RP-20 Valve will respond with a Respond Module Configuration procedure.

RESPOND MODULE CONFIGURATION (26b)

SYS HEAD , 26(h) , nn1, nn2, cc(1st)1, cc(1st)2, ee(1st)1, ee(1st)2, ... cc(nth)1, cc(nth)2 , ee(nth)1, ee(nth)2, F7(h)

nn	Number modules present in the algorithm
cc	Class I.D. of the nth module in the algorithm
ee	I.D. number of the effect currently loaded in the nth module (see pg. 12 for ID numbers)

Class I.D. Numbers for RP-20 Valve

00(h)	Distortion Type
01(h)	1/4 Effect Module

02(h)	1/2 Effect Module
03(h)	3/4 Effect Module
04(h)	Whole Effect Module

RECEIVE KEY SCAN CODE (54b)

SYS_HEAD, 54(h), cc, F7(h)

cc Code for the Key Scan (*note: there is only one byte, not two*)

The Receive Key Scan Code procedure is used to emulate a button press on the front panel of the. See the Key Scan Code Maps (page 87) for a list of Key Scan codes.

RECEIVE HOLD KEY SCAN CODE (55b)

SYS_HEAD, 55(h), cc, 68, F7(h)

cc Code for the Key Scan (*note: there is only one byte, not two*)

68 Time key is pressed expressed in 0.1 seconds increments (*note: there is only one byte, not two*)

The Receive Hold Key Scan Code procedure is used to emulate a button press and hold on the front panel of the RP-20 Valve. The device will respond with a Receive Key Accepted procedure.

RECEIVE KEY ACCEPTED (56b)

SYS_HEAD, 56(h), cc1, cc2, F7(h)

cc Code echoed for the Key Scan received. (00(h) if key is invalid)

The Receive Key Accepted procedure is sent from the RP-20 Valve in response and acceptance of a Receive Scan Code Key or Receive Hold Scan Code Key procedure but is ignored if received by the RP-20 Valve.

SELECT ONE PROGRAM (1Fb)

SYS_HEAD, 1F(h), yy1, yy2, zz1, zz2 F7(h)

When yy = 00(h) User bank is selected

When yy = 01(h) Factory bank is selected.

zz The Program number, 1-100 User (00-63(h)) or 1-191 Factory (00-BE(h))

This command behaves like a standard MIDI Program Change command, except that it allows the selection of any program in the RP-20 Valve without the use of mapping.

RESET PROGRAM (20b)

SYS_HEAD, 20(h), F7(h)

The Reset Program procedure causes the RP-20 Valve to reload the current saved program.

RESET DEVICE (21b)

SYS_HEAD, 21(h), F7(h)

The Reset Device procedure causes the RP-20 Valve to reboot the software as if the power had been turned off, and then back on. If edits have been made to the current program without saving, they will be lost.

RESET FACTORY SETTINGS (22b)

SYS_HEAD, 22(h), F7(h)

The Reset Factory Settings procedure causes the RP-20 Valve to reload a sections of the EPROM factory defaults and perform a hard reset.

REQUEST USER DEFAULTS (13b)

SYS_HEAD, 13(h), yy1, yy2, zz1, zz2 F7(h)

When a Request User Default procedure is received, the RP-20 Valve will respond with a Receive User Defaults procedure.

yy= effect ID #

zz= index map max = 5

FX ID # = 255

RECEIVE USER DEFAULTS (14b)

SYS_HEAD, 14(h), yy1, yy2, zz1, zz2 F7(h)

The Receive User Defaults procedure is used to receive User Defaults.

yy= effect ID #

zz= index map max = 5

FX ID # = 255

SysEx Button/Keys/Footswitch codes

The following are codes for each of the buttons or keys on the RP-20 Valve. Numbers are given as hexadecimal values.

Key Label	Hex equivalent	Key Label	Hex equivalent
Footswitch 1	5(h)	Footswitch 2	13(h)
Function Button 1	9(h)	Footswitch 3	21(h)
Function Button 2	17(h)	Footswitch 4	6(h)
Function Button 3	2(h)	Footswitch 5	14(h)
Function Button 4	10(h)	Footswitch 6	7(h)
Preamplifier Button	3(h)	Footswitch 7	15(h)
Effects Button	11(h)	Footswitch 8	23(h)
Store Button	18(h)	Footswitch 9	8(h)
Program Button	1(h)	Footswitch 0	16(h)
Assign Button	12(h)	Bank Up Footswitch	24(h)
Next Page Button	20(h)	Bank Down Footswitch	22(h)
Previous Page Button	4(h)	Tuner Footswitch	26(h)
Utility Button	19(h)	Bypass Footswitch	27(h)

SysEx Program Dump Example

For those of you that are reluctant to stick your feet in the SysEx water, we have included a simple example of a SysEx Program jump. It takes you set by step through all of the operation commands of a typical SysEx procedure.

```

<<SysEx Header>>
F0 00 00 10 47
<<Procedure>>
42
<<Program Dump Version>>
00 01 00 01
<<Bank and Program for User Program 1>>
00 00 00 00
<<Program's Transmit Count...Lo Bytes, Hi Bytes>>
00 0A 00 06
<<FX Module Count for Module IDs>>
00 07
<<Module ID Numbers>>
00 0C 00 10 00 15 00 20 00 01 00 5A 00 77
<<Algorithm Number>>
00 00
<<FX Module Count for Module Types>>
00 07
<<FX Module Class Type
00 22 00 24 00 18 00 07 00 00 00 06 00 03
<<20 Character Program Name...dynamic>>
00 31 00 3A 00 52 00 76 00 62 00 20 00 32 00 3A 00 47 00 74 00 52 00 76
00 20 00 33 00 3A 00 44 00 6C 00 79 00 20 00 34 00 3A 00 43 00 68 00 6F
<<Null to indicate end of Character String>>
00 00
<<Misc Program Data...too dynamic to document>>
00 07 00 00 00 06 00 00 00 03 00 06 00 03 00 32 00 08 00 03 00 00 00 00 00 02 00 04 00 00 00 00 00 02 00 08
00 00 00 00.....
                                ..... 01 7E 00 00 00 00 20 01 7F 00 00 00 00 00 20 00 00 00 00 00 00 20 00 01 00 00 00
00 00 20 00 02 00 00 00 00 00 20 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
<<SysEx End>>
F7

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NOTE: When the length of the program name is modified, the Program's Transmit Count must also be modified accordingly.

		08(h)	100Hz			1F(h)	8.0kHz
	Page 4	09(h)	160Hz			20(h)	10.0kHz
		0A(h)	250Hz		Page 9	21(h)	12.5kHz
		0B(h)	400Hz			22(h)	16.0kHz
		0C(h)	630Hz			23(h)	18.0kHz
	Page 5	0D(h)	1kHz				
		0E(h)	1.6kHz	41(b)	St GEQ 8	Page 1	00(h) On/Off
		0F(h)	2.5kHz				01(h) FX Type
		10(h)	4.0kHz				02(h) Default
	Page 6	11(h)	6.3kHz		Page 2	03(h)	Level
		12(h)	10.0kHz			04(h)	Phase L
		13(h)	16.0kHz			05(h)	Phase R
					Page 3	06(h)	80Hz
43(b)	GEQ 31	Page 1	00(h) On/Off			07(h)	160Hz
			01(h) FX Type			08(h)	315Hz
			02(h) Default Type			09(h)	630Hz
	Page 2		03(h) Level		Page 4	0A(h)	1.25kHz
			04(h) Phase			0B(h)	2.5kHz
	Page 3		05(h) 20Hz			0C(h)	5.0kHz
			06(h) 25Hz			0D(h)	10.0kHz
			07(h) 31.5Hz				
			08(h) 40Hz				
	Page 4		09(h) 50Hz	44(b)	St PEQ 3	Page 1	00(h) On/Off
			0A(h) 63Hz				01(h) FX Type
			0B(h) 80Hz				02(h) Default
			0C(h) 100Hz		Page 2	03(h)	Level
	Page 5		0D(h) 125Hz			04(h)	PhaseL
			0E(h) 160Hz			05(h)	PhaseR
			0F(h) 200Hz		Page 3	06(h)	Band1 Freq
			10(h) 250Hz			07(h)	Width Level
	Page 6		11(h) 315Hz		Page 4	08(h)	Band2 Level
			12(h) 400Hz			09(h)	Width Level
			13(h) 500Hz		Page 5	0A(h)	Band3 Freq
			14(h) 630Hz			0B(h)	Width Level
	Page 7		15(h) 800Hz				
			16(h) 1.0kHz	45(b)	PEQ 6	Page 1	00(h) On/Off
			17(h) 1.25kHz				01(h) FX Type
			18(h) 1.6kHz				02(h) Default
	Page 8		19(h) 2.0kHz		Page 2	03(h)	Level
			1A(h) 2.5kHz			04(h)	Phase Inv
			1B(h) 3.15kHz		Page 3	05(h)	LoShlv Freq
			1C(h) 4.0kHz			06(h)	Level
	Page 9		1D(h) 5.0kHz		Page 4	07(h)	Band1 Freq
			1E(h) 6.3kHz			08(h)	Width Level

	Page 5	09(h)	Band2 Freq			0C(h)	PanA
		0A(h)	Width Level			0D(h)	OutB
	Page 6	0B(h)	Band3 Freq			0E(h)	PanB
		0C(h)	Width Level				
	Page 7	0D(h)	Band4 Freq	20(b) Quad Cho	Page 1	00(h)	On/Off
		0E(h)	Width Level			01(h)	FX Type
	Page 8	0F(h)	HiShlv Freq			02(h)	Default
		10(h)	Level		Page 2	03(h)	FX Level
						04(h)	Dry Level
46(b) St PEQ 6	Page 1	00(h)	On/Off			05(h)	Balance
		01(h)	FX Type		Page 3	06(h)	Speed
		02(h)	Default			07(h)	Depth
	Page 2	03(h)	Level			08(h)	Waveform
		04(h)	Phase L		Page 4	09(h)	DlyA
		05(h)	Phase R			0A(h)	DlyB
	Page 3	06(h)	Loshlv Freq			0B(h)	DlyC
		07(h)	Level			0C(h)	DlyD
	Page 4	08(h)	Band1 Freq		Page 5	0D(h)	OutA
		09(h)	Width			0E(h)	PanA
		0A(h)	Level			0F(h)	OutB
	Page 5	0B(h)	Band 2 Freq			10(h)	PanB
		0C(h)	Width		Page 6	11(h)	OutC
		0D(h)	Level			12(h)	PanC
	Page 6	0E(h)	Band3 Freq			13(h)	OutD
		0F(h)	Width			14(h)	PanD
		10(h)	Level				
	Page 7	11(h)	Band4 Freq	22(b) Octal Cho	Page 1	00(h)	On/Off
		12(h)	Width			01(h)	FX Type
		13(h)	Level			02(h)	Default
	Page 8	14(h)	HiShlv Freq		Page 2	03(h)	FX Level
		15(h)	Level			04(h)	Dry Level
						05(h)	Balance
1F(b) Dual Cho	Page 1	00(h)	On/Off		Page 3	06(h)	Speed
		01(h)	FX Type			07(h)	Depth1
		02(h)	Default			08(h)	Depth2
	Page 2	03(h)	FX Level		Page 4	09(h)	Speed
		04(h)	Dry Level			0A(h)	Depth
		05(h)	Balance		Page 5	0B(h)	DlyA
	Page 3	06(h)	Speed			0C(h)	DlyB
		07(h)	Depth			0D(h)	DlyC
		08(h)	Waveform			0E(h)	DlyD
	Page 4	09(h)	DlyA		Page 6	0F(h)	DlyE
		0A(h)	DlyB			10(h)	DlyF
	Page 5	0B(h)	OutA			11(h)	DlyG

		12(h)	DlyH			09(h)	Rotor Lvl	
	Page 7	13(h)	Spread		Page 4	0A(h)	Dummy (ignore)	
47(b) Dual Flange	Page 1	00(h)	On/Off			0B(h)	Horn Slow Speed	
		01(h)	FX Type			0C(h)	Horn Slow Depth	
		02(h)	Default			0D(h)	Horn Slow Doppler	
	Page 2	03(h)	FX level		Page 5	0E(h)	Dummy (ignore)	
		04(h)	Dry Level			0F(h)	Horn Fast Speed	
		05(h)	Balance			10(h)	Horn Fast Depth	
	Page 3	06(h)	Speed			11(h)	Horn Fast Doppler	
		07(h)	Depth		Page 6	12(h)	Dummy (ignore)	
		08(h)	Feedback			13(h)	Rotor Slow Speed	
		09(h)	Waveform			14(h)	Roto Slow Depth	
	Page 4	0A(h)	DlyA		Page 7	15(h)	Dummy (ignore)	
		0B(h)	DlyB			16(h)	Rotor Fast Speed	
	Page 5	0C(h)	OutA			17(h)	Roto Fast Depth	
		0D(h)	PanA		Page 8	18(h)	X-Over	
		0E(h)	OutB			19(h)	Horn Acceleration	
		0F(h)	PanB			1A(h)	Rotor Acceleration	
				50(b) St. Tremolo	Page 1	00(h)	On/Off	
4B(b) Dual Phaser	Page 1	00(h)	On/Off			01(h)	FX Type	
		01(h)	FX Type			02(h)	Default	
		02(h)	Default		Page 2	03(h)	Level	
	Page 2	03(h)	FX Level			04(h)	Speed	
		04(h)	Dry Level			05(h)	Depth	
		05(h)	Balance			06(h)	Waveform	
	Page 3	06(h)	Speed					
		07(h)	Depth		51(b) AutoPanner	Page 1	00(h)	On/Off
		08(h)	Feedback				01(h)	FX Type
		09(h)	Waveform				02(h)	Default
	Page 4	0A(h)	OutA		Page 2	03(h)	Level	
		0B(h)	PanA			04(h)	Speed	
		0C(h)	OutB			05(h)	Depth	
		0D(h)	PanB			06(h)	Waveform	
				2C(b) Dual Detune	Page 1	00(h)	On/Off	
30(b) Rotary Speaker	Page 1	00(h)	On/Off			01(h)	FX Type	
		01(h)	FX Type			02(h)	Default	
		02(h)	Default		Page 2	03(h)	FX Level	
	Page 2	03(h)	FX Level			04(h)	Dry Level	
		04(h)	Dry Level			05(h)	Balance	
		05(h)	Balance					
	Page 3	06(h)	Mode		Page 3	06(h)	DtnA	
		07(h)	Spread			07(h)	DtnB	
		08(h)	Horn Lvl			08(h)	DlyA	

		09(h)	DlyB			0F(h)	DlyB
	Page 4	0A(h)	OutA			10(h)	DlyC
		0B(h)	PanA			11(h)	DlyD
		0C(h)	OutB		Page 6	12(h)	DlyE
		0D(h)	PanB			13(h)	DlyF
						14(h)	DlyG
2E(h) Quad Detune	Page 1	00(h)	On/Off			15(h)	DlyH
		01(h)	FX Type		Page 7	16(h)	Spread
		02(h)	Default				
	Page 2	03(h)	FX Level	26(h) Smooth Pitch	Page 1	00(h)	On/Off
		04(h)	Dry Level			01(h)	FX Type
		05(h)	Balance			02(h)	Default
	Page 3	06(h)	DetnA		Page 2	03(h)	FX Level
		07(h)	DetnB			04(h)	Dry Level
		08(h)	DetnC			05(h)	Balance
	Page 4	09(h)	DetnD		Page 3	06(h)	Shift
		0A(h)	DlyA			07(h)	Dtn
		0B(h)	DlyB			08(h)	OutB
		0C(h)	DlyC			09(h)	PanB
	Page 5	0D(h)	DlyD				
		0E(h)	OutA				
		0F(h)	PanA	28(h) Dual Pitch	Page 1	00(h)	On/Off
		10(h)	OutB			01(h)	FX Type
		11(h)	PanB			02(h)	Default
	Page 6	12(h)	OutC		Page 2	03(h)	FX Level
		13(h)	PanC			04(h)	Dry Level
		14(h)	OutD			05(h)	Balance
		15(h)	PanD		Page 3	06(h)	ShiftA
						07(h)	DtnA
						08(h)	ShiftB
2F(h) Octal Detune	Page 1	00(h)	On/Off			09(h)	DtnB
		01(h)	FX Type				
		02(h)	Default		Page 4	0A(h)	OutA
	Page 2	03(h)	FX Level			0B(h)	PanA
		04(h)	Dry Level			0C(h)	OutB
		05(h)	Balance			0D(h)	PanB
	Page 3	06(h)	DetnA				
		07(h)	DetnB	2A(h) Quad Pitch	Page 1	00(h)	On/Off
		08(h)	DetnC			01(h)	FX Type
		09(h)	DetnD			02(h)	Default
	Page 4	0A(h)	DetnE		Page 2	03(h)	FX Level
		0B(h)	DetnF			04(h)	Dry Level
		0C(h)	DetnG			05(h)	Balance
		0D(h)	DetnH		Page 3	06(h)	ShiftA
	Page 5	0E(h)	DlyA			07(h)	DtnA

		08(h)	ShftB			1D(h)	OutH
		09(h)	DtnB		Page 9	1E(h)	Spread
	Page 4	0A(h)	ShftC				
		0B(h)	DtnC	27(b) Stereo Pitch	Page 1	00(h)	On/Off
		0C(h)	ShftD			01(h)	FX Type
		0D(h)	DtnD			02(h)	Default
	Page 5	0E(h)	Out A		Page 2	03(h)	FX Level
		0F(h)	PanA			04(h)	Dry Level
		10(h)	OutB			05(h)	Balance
		11(h)	PanB		Page 3	06(h)	Shft
	Page 6	12(h)	OutC			07(h)	Dtn
		13(h)	PanC			08(h)	OutL
		14(h)	OutD			09(h)	OutR
		15(h)	PanD				
				29(b) St Dual Pitch	Page 1	00(h)	On/Off
						01(h)	FX Type
						02(h)	Default
					Page 2	03(h)	FX Level
	Page 2	03(h)	FX Level			04(h)	Dry Level
		04(h)	Dry Level			05(h)	Balance
		05(h)	Balance		Page 3	06(h)	ShftA
	Page 3	06(h)	ShftA			07(h)	DtnA
		07(h)	DetnA			08(h)	ShftB
		08(h)	ShftB			09(h)	DtnB
		09(h)	DtnB		Page 4	0A(h)	OutLA
	Page 4	0A(h)	ShftC			0B(h)	OutLB
		0B(h)	DetnC			0C(h)	OutRA
		0C(h)	ShftD			0D(h)	OutRB
		0D(h)	DetnD				
	Page 5	0E(h)	ShftE	25(b) Harmony	Page 1	00(h)	On/Off
		0F(h)	DetnE			01(h)	FX Type
		10(h)	ShftF			02(h)	Default
		11(h)	DetnF		Page 2	03(h)	FX Level
	Page 6	12(h)	ShftG			04(h)	Dry Level
		13(h)	DetnG			05(h)	Balance
		14(h)	ShftH		Page 3	06(h)	Key
		15(h)	DetnH			07(h)	Scale
	Page 7	16(h)	OutA		Page 4	08(h)	Interval
		17(h)	OutB		Page 5	09(h)	Level
		18(h)	OutC			0A(h)	Pan
		19(h)	OutD				
	Page 8	1A(h)	OutE	12(b) Delay(370ms)			
		1B(h)	OutF	14(b) Delay(700ms)			
		1C(h)	OutG	19(b) Delay(1400ms)	Page 1	00(h)	On/Off
						01(h)	FX Type

		02(h)	Default			0F(h)	OutB
Page 2		03(h)	FX Level			10(h)	PanB
		04(h)	Dry Level		Page 6	11(h)	OutC
		05(h)	Balance			12(h)	PanC
Page 3		06(h)	Delay Time			13(h)	OutD
		07(h)	FeedBack			14(h)	PanD
		08(h)	Tapit (ignore)				
Page 4		09(h)	Out				
		0A(h)	Pan				
				17(b) S Delay(370ms)			
				1C(b) S Delay(700ms)	Page 1	00(h)	On/Off
						01(h)	FX Type
						02(h)	Default
Dual Dly(370ms)							
15(b) Dual Dly(700ms)					Page 2	03(h)	FX Level
1A(b) Dual Dly(1400ms)	Page 1	00(h)	On/Off			04(h)	Dry Level
		01(h)	FX Type			05(h)	Balance
		02(h)	Default		Page 3	06(h)	Delay Time
Page 2		03(h)	FX Level			07(h)	FeedBack
		04(h)	Dry Level			08(h)	Tapit (ignore)
		05(h)	Balance		Page 4	09(h)	OutL
Page 3		06(h)	Delay Time			0A(h)	OutR
		07(h)	FeedBack				
		08(h)	Tapit (ignore)				
Page 4		09(h)	DlyA				
		0A(h)	DlyB				
Page 5		0B(h)	OutA				
		0C(h)	PanA		Page 2	03(h)	FX Level
		0D(h)	OutB			04(h)	Dry Level
		0E(h)	PanB			05(h)	Balance
					Page 3	06(h)	Delay Time
						07(h)	FeedBack
16(b) Quad Dly(700ms)						08(h)	Tapit (ignore)
1B(b) Quad Dly(1400ms)	Page 1	00(h)	On/Off			09(h)	DlyA
		01(h)	FX Type		Page 4	0A(h)	DlyB
		02(h)	Default			0B(h)	OutLA
Page 2		03(h)	FX Level		Page 5	0C(h)	OutLB
		04(h)	Dry Level			0D(h)	OutRA
		05(h)	Balance			0E(h)	OutRB
Page 3		06(h)	Delay Time				
		07(h)	FeedBack				
		08(h)	Tapit (ignore)				
Page 4		09(h)	DlyA				
		0A(h)	DlyB				
		0B(h)	DlyC		Page 2	03(h)	FX Level
		0C(h)	DlyD			04(h)	Dry Level
Page 5		0D(h)	OutA			05(h)	Balance
		0E(h)	PanA		Page 3	06(h)	Delay Time
				1E(b) St. Quad Delay	Page 1	00(h)	On/Off
						01(h)	FX Type
						02(h)	Default

		07(h)	FeedBack		0B(h)	Freq	
		08(h)	TapIt (ignore)		0C(h)	Gain	
	Page 4	09(h)	DlyA		Page 5	0D(h)	OutL
		0A(h)	DlyB			0E(h)	OutR
		0B(h)	DlyC				
		0C(h)	DlyD	37(b) Chorus/Dly	Page 1	00(h)	On/Off
	Page 5	0D(h)	OutLA			01(h)	FX Type
		0E(h)	OutLB			02(h)	Default
		0F(h)	OutLC		Page 2	03(h)	FX Level
		10(h)	OutLD			04(h)	Dry Level
	Page 6	11(h)	OutRA			05(h)	Balance
		11(h)	OutRB		Page 3	06(h)	Route
		13(h)	OutRC		Page 4	07(h)	Speed
		14(h)	OutRD			08(h)	Depth
					Page 5	09(h)	WvFrm
32(b) Alog Dly(370ms)						0A(h)	Chorus Delay
34(b) Alog Dly(700ms)					Page 6	0B(h)	Delay Time
36(b) Alog Dly(1400ms)	Page 1	00(h)	On/Off			0C(h)	Delay Feedback
		01(h)	FX Type			0D(h)	Tapit (ignore)
		02(h)	Default		Page 7	0E(h)	Chorus Level
	Page 2	03(h)	FX Level			0F(h)	Chorus Pan
		04(h)	Dry Level			10(h)	Delay Level
		05(h)	Balance			11(h)	Delay Pan
	Page 3	06(h)	Delay Time				
		07(h)	FeedBack	38(b) Flange/Dly	Page 1	00(h)	On/Off
		08(h)	TapIt (ignore)			01(h)	FX Type
	Page 4	09(h)	Smear			02(h)	Default
		0A(h)	LPF Type		Page 2	03(h)	FX Level
		0B(h)	Freq			04(h)	Dry Level
		0C(h)	Gain			05(h)	Balance
	Page 5	0D(h)	Out		Page 3	06(h)	Route
		0E(h)	Pan		Page 4	07(h)	Speed
						08(h)	Depth
						09(h)	Flange Feedback
33(b) St.A.Dly(370ms)					Page 5	09(h)	WvFrm
35(b) St.A.Dly(700ms)	Page 1	00(h)	On/Off			0A(h)	Flange Delay
		01(h)	FX Type			0B(h)	Delay Time
		02(h)	Default		Page 6	0C(h)	Delay Feedback
	Page 2	03(h)	FX Level			0D(h)	Tapit (ignore)
		04(h)	Dry Level			0E(h)	Flange Level
		05(h)	Balance		Page 7	0F(h)	Flange Pan
	Page 3	06(h)	Delay Time			10(h)	Delay Level
		07(h)	FeedBack			11(h)	Delay Pan
		08(h)	TapIt (ignore)			12(h)	Balance
	Page 4	09(h)	Smear0A(h) LPF Type				

					Page 8	12(h)	Secondary Decay
09(b) PreDelay	Page 1	00(h)	On/Off			13(h)	Secondary Size
		01(h)	FX Type			14(h)	Second Reflection
		02(h)	Default		Page 9	15(h)	Primary OutL
	Page 2	03(h)	FX Level			16(h)	Primary OutR
		04(h)	Dry Level		Page 10	17(h)	Secondary OutL
		05(h)	Balance			18(h)	Secondary OutR
	Page 3	06(h)	Delay				
		07(h)	Filter Type	0D(b) Stereo Reverb	Page 1	00(h)	On/Off
		08(h)	Frequency			01(h)	FX Type
	Page 4	09(h)	OutL			02(h)	Default
0A(h)		OutR	Page 2		03(h)	FX Level	
0A(b) Reverb	Page 1	00(h)	On/Off			04(h)	Dry Level
		01(h)	FX Type		Page 3	05(h)	Balance
		02(h)	Default			06(h)	Reverb Type
	Page 2	03(h)	FX Level		Page 4	07(h)	Decay
		04(h)	Dry Level			08(h)	Density
		05(h)	Balance		Page 5	09(h)	Diffusion
	Page 3	06(h)	Type		0A(h)	Blend	
		07(h)	Decay		0B(h)	OutL	
		Page 4	08(h)	Density		0C(h)	OutR
	09(h)		Diffusion	10(b) Gated Reverb	Page 1	00(h)	On/Off
Page 5	0A(h)	OutL			01(h)	FX Type	
	0B(h)	OutR			02(h)	Default	
0C(b) Dual Reverb	Page 1	00(h)	On/Off		Page 2	03(h)	FX Level
		01(h)	FX Type			04(h)	Dry Level
		02(h)	Default		Page 3	05(h)	Balance
	Page 2	03(h)	FX Level			06(h)	Type
		04(h)	Dry Level		Page 4	07(h)	Time
		05(h)	Balance			08(h)	Density
	Page 3	06(h)	Density			09(h)	LowPass
		07(h)	Diffusion	Page 5	0A(h)	OutL	
		08(h)	Dispersion		0B(h)	OutR	
	Page 4	09(h)	X-Over Type	11(b) St Gated Reverb	Page 1	00(h)	On/Off
0A(h)		Frequency			01(h)	FX Type	
Page 5		0B(h)	Primary X-Over			02(h)	Default
	0C(h)	Secondary X-Over	Page 2		03(h)	FX Level	
Page 6	0D(h)	Primary Damp			04(h)	Dry Level	
	0E(h)	Secondary Damp			05(h)	Balance	
	Page 7	0F(h)	Primary Decay		Page 3	06(h)	Type
10(h)		Primary Size			07(h)	Time	
11(h)		Primary Reflection	Page 4		08(h)	Density	

		09(h)	Dispersion			06(h)	Thrsh Closed
		0A(h)	Low Pass			07(h)	Attn
	Page 5	0B(h)	Blend		Page 3	08(h)	Delay
		0C(h)	OutL			09(h)	Attack
		0D(h)	OutR			0A(h)	Hold
						0B(h)	Release
8(h) Spring Reverb	Page 1	00(h)	On/Off	7D(h) Thru	Page 1	00(h)	FX Type
		01(h)	FX Type				
		02(h)	Default	7E(h) Mute	Page 1	00(h)	FX Ty
	Page 2	03(h)	FX Level				
		04(h)	Dry Level				
0F(h) Room Echo	Page 1	00(h)	On/Off				
		01(h)	FX Type				
		02(h)	Default				
	Page 2	03(h)	FX Level				
		04(h)	Dry Level				
		05(h)	Balance				
	Page 3	06(h)	Delay A				
		07(h)	Delay B				
		08(h)	Delay C				
		09(h)	Delay D				
	Page 4	0A(h)	Out A				
		0B(h)	Bal A				
		0C(h)	Out B				
		0D(h)	Bal B				
	Page 5	0E(h)	Out C				
		0F(h)	Bal C				
		10(h)	Out D				
		11(h)	Bal D				
	Page 6	12(h)	Shape Type				
		13(h)	Spread				
	Page 7	14(h)	Diffusion				
		15(h)	Feedback Delay				
		16(h)	Feedback Amount				
	Page 8	17(h)	OutL				
		18(h)	OutR				
52(h) Noise Gate	Page 1	00(h)	On/Off				
		01(h)	FX Type				
		02(h)	Default				
	Page 2	04(h)	Level				
		05(h)	Thrsh Open				



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