ROCKTRON
BASS TECHNOLOGY

User's manual

BLUE THUNDER™

Digital Bass Preamp and Effects for the Stage and Studio

with 24-Bit Internal Processing via Motorola DSP Engine

C E

Your Blue Thunder™ has been tested and complies with the following Standards and Directives as set forth by the European Union:

Low Voltage Directive(s):	72/23/EEC
Council Directive(s):	89/336/EEC (93/68/EEC) Electromagnetic Compatibility
Standard(s):	EN55013, EN50082-1, EN55020
Safety:	IEC 60065

This means that this product has been designed to meet stringent guidelines on how much RF energy it can emit, and that it should be immune from other sources of interference when properly used. Improper use of this equipment could result in increased RF emissions, which may or may not interfere with other electronic products.

To insure against this possibility, always use good shielded cables for all audio input and output connections. Also, bundle audio cables separately from the AC power cables. These steps will help insure compliance with the Directive(s).

For more information about other Rocktron products see the last section in this manual, or see your local dealer or one of our importers closest to you (listed on the Rocktron website www.rocktron.com).

Contents

1. Introduction

   Congratulations on your purchase of the Rocktron Blue Thunder™ bass Preamp and effects processor!   The Blue Thunder has been specifically designed and voiced for bass. The Blue Thunder is a live and studio tool that is a "must have" for all bass players. 24-bit DSP processing via a Motorola DSP engine provides a host of high quality digital effects.

  - **Selectable Hi Pass Filter Section** - The Blue Thunder has a built-in Hi-Pass filter section before the effects processing chain allows the user to choose one of four frequency (80Hz, 160Hz and 240Hz, 320Hz) cutoff points. This allows lush effect mixing while maintaining everything below the selected cutoff point to be left un-effected. The result is effects that leave the bottom end tight and punchy.

    Example - when 160Hz Hi-Pass is selected, all signal content above 160Hz is passed into the effect processing chain. When the direct (original) signal is mixed back in with the effected signal using the Blue Thunder's mixer section, the frequencies below 160Hz will remain virtually un-effected.

  - **Built-in Distortion** - The Blue Thunder has built-in distortion that has been custom voiced for bass. The advance processing power of the Blue Thunder allows you to dial in just the right amount of distortion without effecting your overall clean tone.

  - **Run up to 10 effects at once** - The advanced processing power of the Blue Thunder will allow you to run up to 10 high quality effects at the same time.

  - **High quality digital effects include** - Distortion, multi-voiced delay and chorus, tremolo, flanger, reverb, phaser, HUSH, compressor, speaker simulator, speaker modeling and mic position modeling

  - **Ultra transparent processing** - the cleanest and most clear effects around. Rocktron's direct signal routing allows for mixing the direct signal with the effected signal to reached the desired effect.

  - **Pre-loaded with 128 professional presets** custom designed for bass. Presets 1-64 are meant for live situations. Presets 65-128 are designed for recording or direct connection situations. However, all presets can be used in any situations and are completely user definable.

  - **Preset Spillover** allows for reverb and delays from a current preset to carry over into the next preset and continue decaying when a new preset has been selected.

  - **Real Time Control** of delay times and modulation rates through tap tempo and rate parameters. Delay times and modulation rates can be changed instantly by tapping the tap switch on the front panel or through the use of the Rocktron All Access or MIDI Mate footcontrollers.

  - **HUSH® noise reduction** operates only on incoming preamp noise, and does not affect the digital effects - which are already ultra quiet.

  - **Rocktron's SIMBiotic™ EQ -** is a custom designed EQ circuit providing the ultimate tool for tonal shaping of your sounds. It includes four band full parametric EQ and complete mixing capabilities.

  - **Speaker Exciter** - Adds a completely new dimension to your sound and tone in live and recording situations. It enables you to modify the characteristics of your exisiting speaker cabinet allowing you to emulate different size speakers and tonal response.

  - **Cabinet SIM -** Allows you to record direct or plug directly into a PA system - eliminating the need to carry a heavy amplifier to the gig! The Cabinet SIM is a special fequency response curve that re-creates the natural average frequency response curve found with Bass speaker cabinets. Using the Speaker Exciter along with the Cabinet SIM is the ultimate sound shaping tool for direct, live and recording situations.

  For a thorough explanation of the Blue Thunder and all its features, please read this manual carefully and keep it for future reference. After removing the Blue Thunder from the box, save all the packing materials in case it becomes necessary to ship the unit.

PRECAUTIONS

NOTE: IT IS VERY IMPORTANT THAT YOU READ THIS SECTION TO PRO-VIDE YEARS OF TROUBLE FREE USE. THIS UNIT REQUIRES CAREFUL HANDLING.

All warnings on this equipment and in the operating instructions should be adhered to and all operating instructions should be followed.
Do not use this equipment near water. Care should be taken so that objects do not fall and liquids are not spilled into the unit through any openings.
The power cord should be unplugged from the outlet when left unused for a long period of time.

DO NOT ATTEMPT TO SERVICE THIS EQUIPMENT. THIS EQUIPMENT SHOULD BE SERVICED BY QUALIFIED PERSONNEL ONLY. DO NOT MAKE ANY INTERNAL ADJUSTMENTS OR ADDITIONS TO THIS EQUIPMENT AT ANY TIME. DO NOT TAMPER WITH INTERNAL ELECTRONIC COMPONENTS AT ANY TIME. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY VOID THE WARRANTY OF THIS EQUIPMENT, AS WELL AS CAUSING SHOCK HAZ-ARD.

POWER REQUIREMENTS

This unit accepts power from the 9VAC/1.5A adaptor supplied with the unit. This 9 volt RMS AC voltage is internally processed by a voltage doubler which generates a bipolar ±15 volts to maintain the headroom and sound quality of professional, studio quality equipment. Using an external power source such as this minimizes excessive noise and hum problems often associated with internal transformers, providing optimal perfor-mance for the user.

OPERATING TEMPERATURE

Do not expose this unit to excessive heat. This unit is designed to operate between 32° F and 104° F (0° C and 40° C). This unit may not function properly under extreme temperatures.

2. Quick Setup
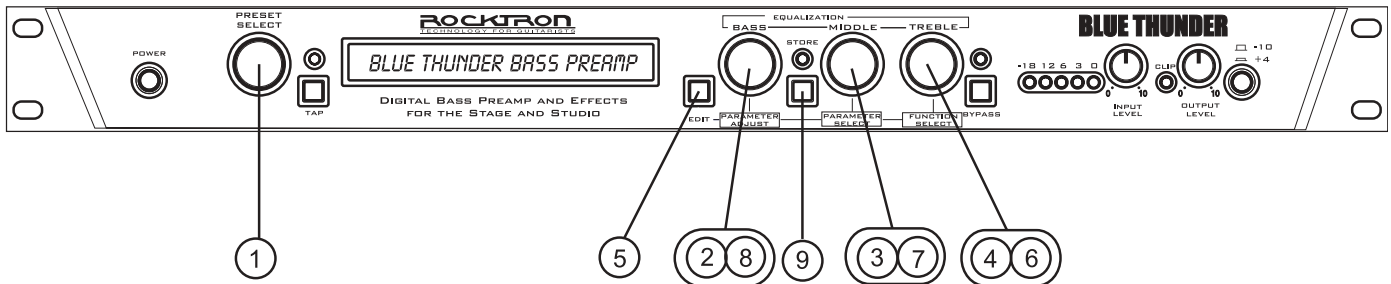
SELECTING A PRESET

STEP 1   Turn the PRESET control to select the desired preset. The new preset will be recalled automatically.

ADJUSTING THE EQUALIZATION

STEP 2   Turn the BASS control to adjust the bass level as desired.

STEP 3   Turn the MIDDLE control to adjust the middle level as desired..

STEP 4   Turn the TREBLE control to adjust the treble level as desired.

CHANGING PRESET PARAMETERS

NOTE: The EQ controls serve a dual purpose. When the Blue Thunder powers up the EQUALIZATION controls are active. To change preset parameters (such as to adjust the delay or distortion, etc.) you must enter into the "EDIT MODE". To do this follow these steps.

STEP 5   Press the EDIT button to enter into the "EDIT MODE" - the display will read the current preset number and "EDIT MODE"

STEP 6   Turn the FUNCTION SELECT control to the desired effect or utility function.

STEP 7   Turn the PARAMETER SELECT control to the parameter you wish to alter after you have selected an effect or utility function.

STEP 8   Use the PARAMETER ADJUST control to select the new parameter value.

NOTE: To return back to the Equalization Mode - press the EDIT button again - the display will read the current preset number and preset name.

STORING CHANGED PARAMETERS

STEP 9   After the desired parameters have been edited, press the STORE button to store the changes into the preset.

3. Front Panel
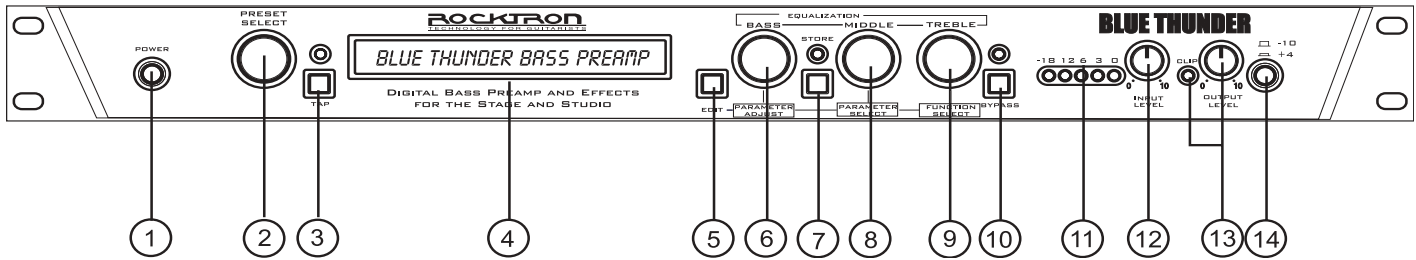
1   **POWER switch**

2   **PRESET control**
This control scrolls through and instantly recalls the successive presets.

3   **TAP (DELAY/RATE) button**
This button is used to select a new delay time or modulation rate based on the length of time occurring between two taps. See Section 7 (page 42): "Tap Delay" for more information.

4   **DISPLAY panel**
The DISPLAY panel provides 16 characters consisting of 14 segments each.

5   **EDIT button**
The EDIT button is used to change the function of the EQUALIZATION knobs (Bass, Middle, Treble) to PARAMETER ADJUST, PARAMETER SELECT and FUNCTION SELECT.

BASS Control becomes PARAMETER ADJUST Control
MIDDLE Control becomes PARAMETER SELECT Control
TREBLE Control becomes FUNCTION SELECT Control

6   **EQUALIZATION BASS/PARAMETER ADJUST control**
This control is used to adjust the BASS LEVEL of the selected preset.
When in the EDIT MODE - (see point 5 - EDIT button) this control is used to adjust the displayed parameter value.

When the bass level or parameter is altered from its stored value, the LED above the STORE button will light until either (a) the new value is stored, (b) a new preset is selected or (c) the parameter is returned to its original value.

7   **STORE button/led**
This button is used to store parameter values into the Blue Thunder™ memory when altered. See *"Storing Changed Preset Parameters"* in Chapter 7 (page 32) for more information on this procedure.

8   **EQUALIZATION MIDDLE/PARAMETER SELECT control**
This control is used to adjust the MIDDLE frequency level of the selected preset.
When in the EDIT MODE - (see point 5 - EDIT button) this control is used to scroll through the available parameters under the current function heading.

In the "Title Edit" function, this control will scroll through the character locations to be edited.

⑨ **EQUALIZATION TREBLE/FUNCTION SELECT control**
This control is used to adjust the TREBLE LEVEL of the selected preset.
When in the EDIT MODE - (see point 5 - EDIT button) this control is used to select the desired FUNCTION.

When in Edit mode this control allows access to each function of the Blue Thunder™.
These functions include:

Global	*Compressor*	*Flanger*	*Copy*
Mixer	*Delay*	*Chorus*	*Program Changes*
HUSH	*Reverb*	*Speaker Exciter*	*MIDI Channels*
Distortion	*Tremolo*	*Title Edit*	*MIDI Dump/Load*
EQ	*Phaser*	*Controller Assign*	*Factory Restore*

⑩ **BYPASS button/led**
When lit, the effects are bypassed and only the input signal is passed to the Blue Thunder™ outputs.

⑪ **INPUT LEVEL meter**
These LEDs provide visual indication of the peak level of the input signal when the preset number and title are displayed. For the optimal signal-to-noise ratio, it is best to adjust the input level so that the last LED (0dB) is rarely lit. This will guard against the possibility of overdriving the unit.

These LEDs also display the final digital mixer output levels when any other functions are displayed. This will help you to guard against clipping the output of the mixer at the digital-to-analog converter.

⑫ **INPUT LEVEL control**
This control adjusts the unit's gain to match the signal level at the input of the Blue Thunder™. Use the INPUT LEVEL meter to determine the setting of this control.

⑬ **OUTPUT LEVEL control and CLIP LED**
This control is used to adjust the overall output level of the unit.

The CLIP L.E.D. is part of the output section and, when lit, indicates that the final analog output is being overdriven due to the Effects Level, Direct Level and Output Level being set too high. If this should occur, reduce these levels until the L.E.D. does not light.

⑭ **REFERENCE LEVEL switch**
This switch adjusts the output range of the unit and may be set at either -10dB or +4dB. In most situations it is recommended that the -10dB switch setting be used this would include the following applications BASS GUITAR, EFFECTS LOOP and DIRECT RECORDING. When more dirve is needed for descrete components such as power amps the +4dBu position may be used.

4. Rear Panel
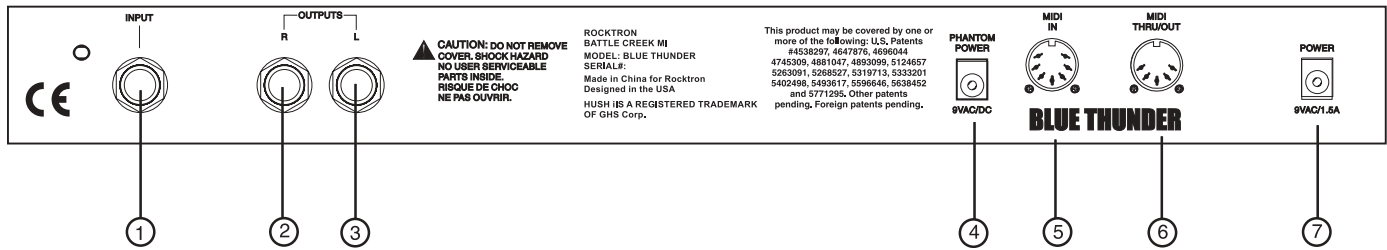
1. **INPUT** jack
This standard ¼" mono jack provides input to the Blue Thunder.

2. **RIGHT CHANNEL OUTPUT** jack
This standard ¼" mono jack provides an output for the right channel of the Blue Thunder. When using the unit in a mono application either jack may be used

3. **LEFT CHANNEL OUTPUT** jack
This standard ¼" mono jack provides an output for the left channel of the Blue Thunder. When using the unit in a mono application either jack may be used.
.

4. **PHANTOM POWER** jack
This 2.5mm PIN jack offers the ability to power Rocktron MIDI foot controllers from a 7-pin MIDI cable which connects from the Rocktron MIDI foot controller to the MIDI IN jack on the rear panel of the Blue Thunder™. This eliminates the need to find an AC outlet near where the footpedal would be placed during a performance, or the need to run an extension cord out to the footswitch. Instead of inserting the AC adaptor into the "POWER" jack of the footswitch as you would normally, plug it into the "PHANTOM POWER" jack on the Blue Thunder™. This will power the Rocktron MIDI foot controller through pins 6 and 7 of the MIDI cable connecting the two units. The Rocktron RMM900 7-pin MIDI cable must be used in this operation and is available from your Rocktron dealer.

5. **MIDI IN** jack
This 7-pin DIN connector must be connected to the MIDI OUT jack of the transmitting MIDI device via a standard MIDI cable, or to the MIDI THRU jack of the preceding MIDI device (if the Blue Thunder™ is within a chain of MIDI devices). Pins 6 and 7 of this connector carry phantom power to power a Rocktron MIDI foot controller (MIDI XChange, All Access and MIDI Mate) when a 7-pin MIDI cable is used.

6. **MIDI THRU/OUT** jack
This standard 5-pin DIN connector can be connected to the MIDI IN jack of another device via a standard MIDI cable. There are limitations to the number of devices that can be chained (or series connected) in this fashion.

Note: Inherently in MIDI there is a limit to the number of devices which can be chained together (connected in series). With more than 3 devices, a slight distortion of the MIDI signal can occur (due to signal degradation) which can cause an error in MIDI signal transmission. Should this problem arise, a MIDI Thru box can be used which connects directly to the MIDI device which transmits MIDI information and has multiple connectors for the multiple devices receiving MIDI. MIDI cables should not exceed 50 feet (15 meters) in length.

7. **POWER** jack
This 2.5mm pin jack accepts power from the 9VAC adaptor supplied with the unit.

5. Connections

Using the Blue Thunder™ with a power amp and cabinets

FROM BASS
OUTPUT

BACK PANEL OF BLUE THUNDER

INPUT   OUTPUTS
R   L

CAUTION: DO NOT REMOVE
COVER. SHOCK HAZARD
NO USER SERVICEABLE
PARTS INSIDE.
RISQUE DE CHOC
NE PAS OUVRIR.

ROCKTRON
BATTLE CREEK MI
MODEL: BLUE THUNDER
SERIAL#:
Made in China for Rocktron
Designed in the USA
HUSH IS A REGISTERED TRADEMARK
OF GHS Corp.

This product may be covered by one or
more of the following: U.S. Patents
#4538297, 4647876, 4696044
4745309, 4881047, 4893099, 5124657
5263091, 5268527, 5319713, 5333201
5402498, 5493617, 5596646, 5638452
and 5771295. Other patents
pending. Foreign patents pending.

PHANTOM
POWER

9VAC/DC

MIDI
IN

MIDI
THRU/OUT

POWER

9VAC/1.5A

BLUE THUNDER

TO INPUT

FROM LEFT
OUTPUT

FROM RIGHT
OUTPUT

TO CHANNEL
1 INPUT

TO CHANNEL
2 INPUT

POWER AMP

CHANNEL 1
OUTPUT

CHANNEL 2
OUTPUT

TO BASS
CABINET

TO BASS
CABINET

SPEAKER CABINETS

Using the Blue Thunder with a Bass Amplifier Head

Bass Output Jack

BACK PANEL OF BLUE THUNDER
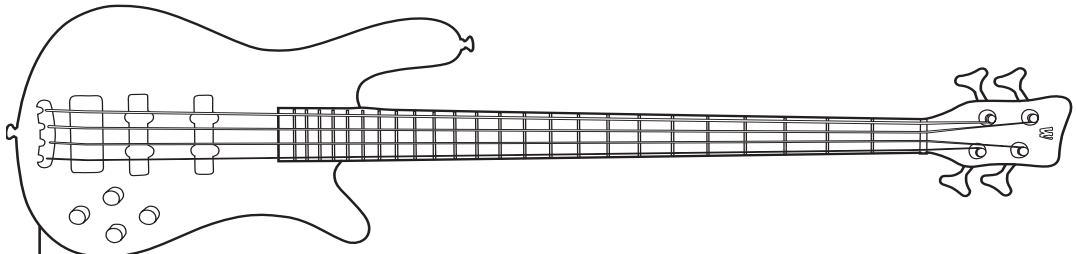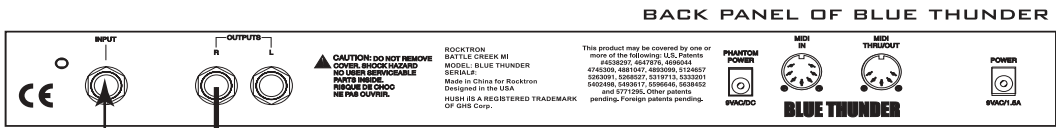
INPUT

FROM RIGHT
OUTPUT

TO EFFECTS
LOOP RETURN

Bass Head

FROM BASS HEAD

TO BASS CABINET

BASS Cabinet

Using the Blue Thunder with a Bass Combo Amplifier

Bass Output Jack

BACK PANEL OF BLUE THUNDER

INPUT

FROM RIGHT

OUTPUT

TO EFFECTS

LOOP RETURN
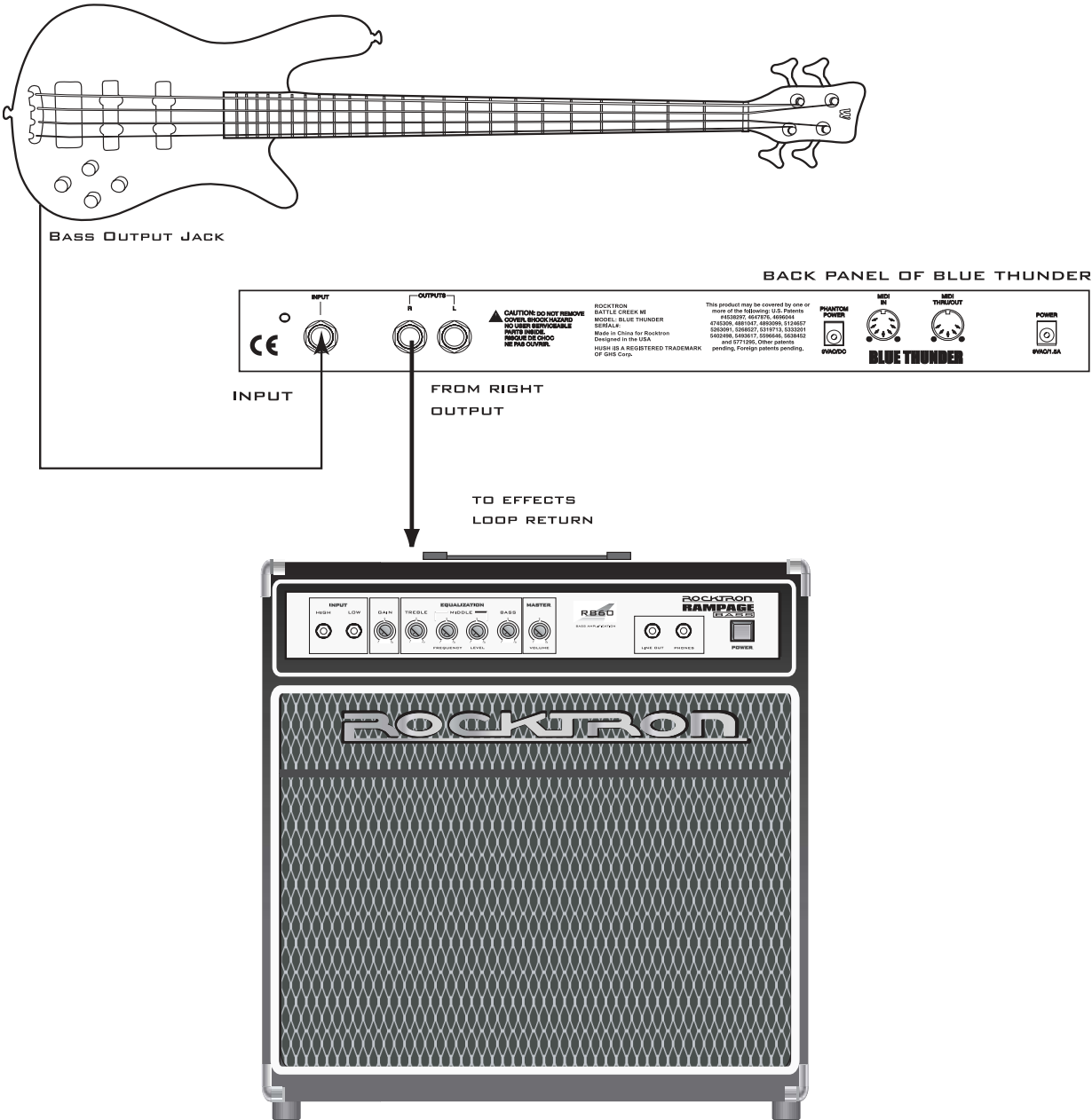
Using the Blue Thunder with a MIDI Footcontroller
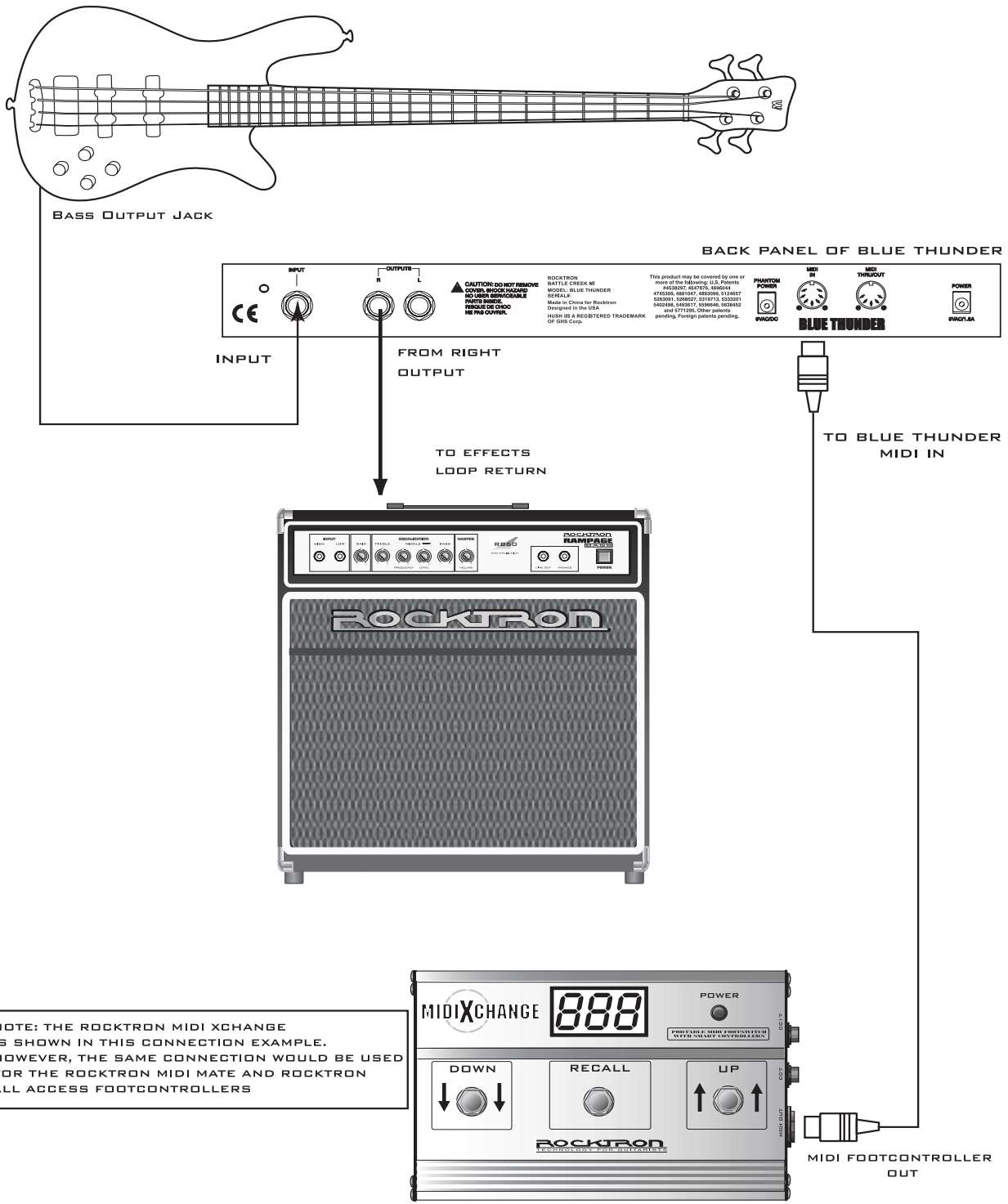
Bass Output Jack

BACK PANEL OF BLUE THUNDER

INPUT

FROM RIGHT
OUTPUT

TO EFFECTS
LOOP RETURN

TO BLUE THUNDER
MIDI IN

NOTE: THE ROCKTRON MIDI XCHANGE
IS SHOWN IN THIS CONNECTION EXAMPLE.
HOWEVER, THE SAME CONNECTION WOULD BE USED
FOR THE ROCKTRON MIDI MATE AND ROCKTRON
ALL ACCESS FOOTCONTROLLERS

MIDI FOOTCONTROLLER
OUT

Using the Blue Thunder with a Phantom Powerable MIDI Footcontroller

Bass Output Jack

BACK PANEL OF BLUE THUNDER

INPUT

FROM RIGHT
OUTPUT

TO EFFECTS
LOOP RETURN

PLUG FOOTCONTROLLER
ADAPTER OUTPUT INTO
PHANTOM POWER JACK.
THIS PROVIDES POWER
TO THE ROCKTRON MIDI MATE
MIDI XCHANGE OR ALL ACCESS
VIA PINS 6 AND 7 OF THE
MIDI CABLE

7-PIN DIN MIDI
CONNECTOR TO
BLUE THUNDER
MIDI IN

FOOTCONTROLLER ADAPTER
PLUG INTO OUTLET

BLUE THUNDER'S
POWER ADAPTER
PLUG INTO OUTLET

WITH THIS CONNECTION WE RECOMMEND THAT YOU USE THE
ROCKTRON RMM900 7 PIN MIDI CABLE
AVAILABLE THROUGH YOUR ROCKTRON DEALER

NOTE: THE ROCKTRON MIDI XCHANGE
IS SHOWN IN THIS CONNECTION EXAMPLE.
HOWEVER, THE SAME CONNECTION WOULD BE USED
FOR THE ROCKTRON MIDI MATE AND ROCKTRON
ALL ACCESS FOOTCONTROLLERS

7-PIN DIN MIDI
CONNECTOR FROM MIDI
FOOTCONTROLLER OUT

6. Operating Format

The Blue Thunder provides 128 stored sounds called ***presets.*** Any of the 128 presets can be called up at any time via the front panel PRESET control (used to both select and recall a preset).

Blue Thunder Equalization Controls

Upon turning on the Blue Thunder the EQUALIZATION controls (BASS, MIDDLE, TREBLE) are active. To adjust the BASS Level, MIDDLE level, or TREBLE level, simply turn the appropriate knob to the right of left to achieve the desired EQ.

Step 1:
Turn to alter the BASS level

Step 2:
Turn to alter the MIDDLE Frequency level
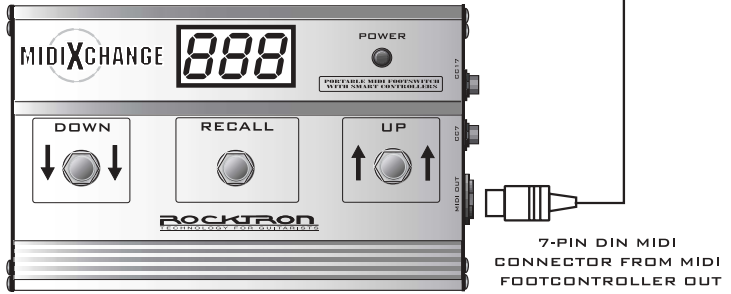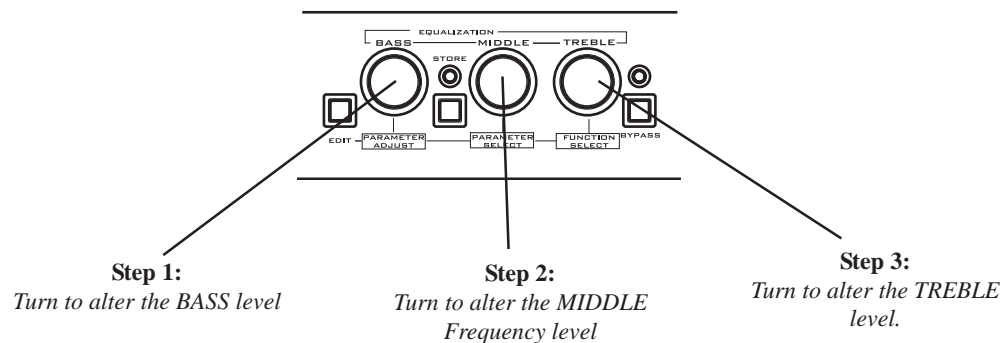
Step 3:
Turn to alter the TREBLE level.

Blue Thunder Functions and Parameter Descriptions

Each Blue Thunder preset is divided into individual blocks called ***functions*** (such as "Mixer", "Reverb", etc.). Within each function is a set of controls which allow you to manipulate various aspects of that function. These controls are called ***parameters.*** The setting of each of the parameters determines the overall sound of each Blue Thunder preset.

To enter the Function and Parameter controls press the "EDIT" button. The Blue Thunder user interface is set up to allow you to first access each function (via the FUNCTION SELECT control), then the list of available parameters for the selected function (via the PARAMETER SELECT control) and, finally, the adjustable value for each parameter (via the PARAMETER ADJUST control).

Step 1:
Pres the EDIT button to enter into the EDIT MODE

Step 4:
Turn to alter the value of the selected parameter.

Step 3:
Turn to select a parameter within the selected function.

Step 2:
Turn to select a function.
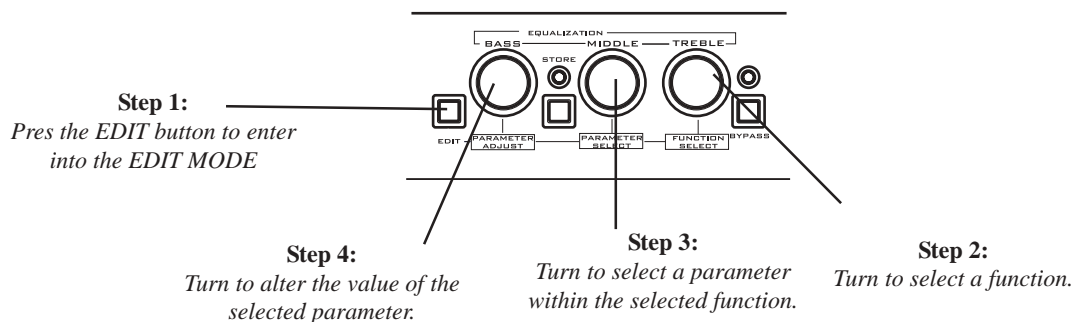
The remainder of this section will discuss each of the effect-based functions and the associated adjustable parameters that they provide. Functions not discussed in this section are utility-based, and are described in Section 7, *"Operating the Blue Thunder" on page 31.*

BLUE THUNDER BLOCK DIAGRAM
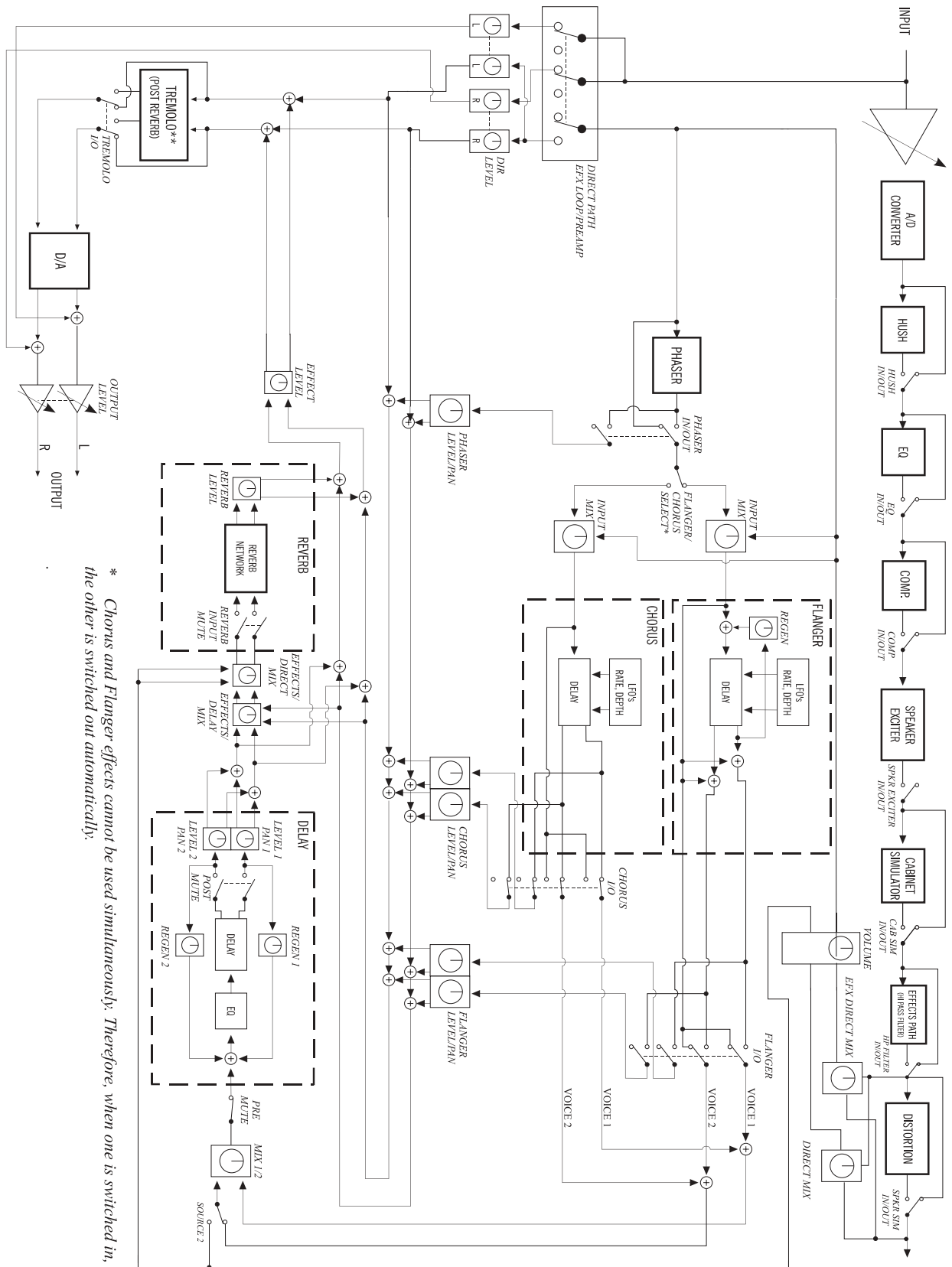
*   *Chorus and Flanger effects cannot be used simultaneously; Therefore, when one is switched in, the other is switched out automatically.*

GLOBAL
Function

The first function displayed when turning the FUNCTION SELECT control is the Global function. The parameters provided in this function affect all presets (i.e. the settings stored for these parameters are the <u>SAME</u> for all presets).

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT knob to the right until ***GLOBAL*** appears on the display.
The PARAMETER SELECT control will allow you to access each of the following Global parameters:
The PARAMETER ADJUST control will allow you to adjust each of the GLOBAL parameters:

]HP FILTER

The HP FILTER parameter allows you to select (with the PARAMETER ADJUST control) either ACTIVE or OFF for that partciular preset.

Selecting ACTIVE will route the signal through the hi pass filter section (controlled by the HP CUT parameter). Selecting OFF will bypass the HP CUT parameter (although the HP CUT parameter will be displayed when adjusting the PARAMETER SELECT control, it will be bypassed).

HP CUT

The HP CUT parameter allows you to select (with the PARAMETER ADJUST control) the amount of low frequency content that gets passed into the effects processing section of the Blue Thunder. The dry signal content remains uneffected at full bandwidth, with EQ when DIGITAL is selected for the Dry Path.

Selecting 80 HZ sends all frequency content above 80 HZ into the effects processing section.
Selecting 160 HZ sends all frequency content above 160 HZ into the effects processing section.
Selecting 240 HZ sends all frequency content above 240 HZ into the effects processing section.
Selecting 320 HZ sends all frequency content above 320 HZ into the effects processing section.

NOTE!!
While the HP FILTER ON/OFF parameter is global, the HP CUT selection is per preset.

OUTPUT

The OUTPUT parameter determines whether the output of the Blue Thunder is a stereo (left and right) signal or two mono signals.

HUSH OFFSET

The HUSH OFFSET parameter allows you to globally (all presets) adjust the HUSH® Expander Threshold. This means that if this parameter is altered from 0dB to +3dB, the Expander Threshold will be 3dB higher for all presets. This feature can be useful when switching from a quiet guitar with passive electronics to a noisy guitar with active electronics - as the active guitar would require a higher Threshold level in all presets.

MUTE

The MUTE parameter allows you to mute the output of the Blue Thunder. This feature is especially useful when changing guitars during a live set. When the Blue Thunder is muted, front panel controls are disabled. However, a MIDI program change will disable the mute (mute = out) and execute the program change. The MUTE parameter can be assigned to a MIDI controller number for use with a MIDI device (such as a Rocktron All Access or Rocktron MIDI Mate).

DIRECT

The DIRECT parameter determines whether the direct signal is switched in or out of the signal path. When using the Blue Thunder in a parallel effects loop, it is recommended that the direct signal is switched out - thereby providing 100% wet (effect)output - allowing you to use the effects mix control of your amplifier/preamp.

MIXER
Function

The next function displayed when turning the FUNCTION SELECT control is the Mixer function. The Mixer function parameters are included in all presets—regardless of which effects are active for the current preset - although the parameter values stored in this function are only for the currently recalled preset.

This digital mixer allows you to control the signal levels pertaining to each preset's configuration and stores those levels for each preset.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT knob to the right until ***MIXER*** appears on the display.
The PARAMETER SELECT control will allow you to access each of the following Mixer parameters.
The PARAMETER ADJUST control will allow you to make adjustments to the selected parameter:

SETUP

The SETUP parameter allows you to select if the Blue Thunder will act as a preamp with effects or just as effects processor. If you would like to use the Blue Thunder as a preamp, select PREAMP. In this setup the direct signal is passed through the digital HUSH circuitry and effects section. In this setup you should have your Blue Thunder connected to a power amplifier.

If you would like to use the Blue Thunder in the effects loop section of your bass head or combo amplifier select EFX LOOP. In this setup the direct signal is not passed through any digital processing (i.e. the direct signal remains analog from input to output). However, this setup can be done to taste - use the setup that sounds the best to you.

LEFT DIR

The LEFT DIRECT parameter determines the level of the direct signal of the current preset at the left output.

RIGHT DIR

The RIGHT DIRECT parameter determines the level of the direct signal of the current preset at the right output.

EFFECT LEVEL

The EFFECT LEVEL parameter determines the volume of the overall effect signal (Chorus, Flange, Phaser, etc.) level.

PHS DIR/EFF
CHR DIR/EFF
FLN DIR/EFF
REV DIR/EFF

These DIR/EFF parameters determine the amount of direct signal input to each individual effect relative to the amount of effect signal. A setting of "0" is 100% direct signal, while a setting of "100" is 100% effect signal.

VOLUME

The VOLUME parameter determines the overall signal level of the current preset.

15

HUSH
Function

The HUSH® function is accessible in all presets—regardless of the configuration currently recalled.

HUSH is Rocktron's patented single-ended noise reduction system. The HUSH system contained in the Blue Thunder is a fully digital implementation of HUSH achieved through Digital Signal Processing (DSP), and is modeled after the latest HUSH design.

The low level expander of the HUSH system operates like an electronic volume control. The analog version of the HUSH utilizes a voltage-controlled amplifier (VCA) circuit which can control the gain between the input and the output from unity to 30, 40 or even 50dB of gain reduction. When the input signal is above the user preset threshold point, the VCA circuit remains at unity gain. (This means that the amplitude of the output signal will be equal to that of the input signal.) As the input signal level drops below the user preset threshold point, downward expansion begins. At this point the expander acts like an electronic volume control and gradually begins to decrease the output signal level relative to the input signal level. As the input signal drops further below the threshold point, downward expansion increases. A drop in the input level by 20dB would cause the output level to drop approximately 40dB (i.e., 20dB of gain reduction). In the absence of any input signal, the expander will reduce the gain so that the noise floor becomes inaudible.

The HUSH circuit is located after the A/D converter in the signal chain to reduce any noise generated from the bass, other effects and the A/D converter. This ensures a quiet input signal to the Blue Thunder effects.

When the SETUP parameter under the Mixer function is set to "PREAMP", the direct signal is passed through the HUSH circuit. When set to "EFX LOOP", the direct signal remains analog and does not pass through the HUSH circuit.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT knob to the right until ***HUSH*** appears on the display.
The PARAMETER SELECT control will allow you to access each of the following Hush parameters.
The PARAMETER ADJUST control will allow you to make adjustments to the parameter selected:

HUSH I/O

The HUSH I/O parameter determines whether the HUSH circuit is active or bypassed for the current preset.

Select IN and the HUSH is active.

Select OUT and the HUSH is bypassed.

EXP THRESH

The EXPANDER THRESHOLD parameter determines the level at which downward expansion begins. For example, if the EXPANDER THRESHOLD was set at -27dB and the input signal dropped below -27dB, downward expansion would begin. There will be more noise reduction at higher settings.

DISTORTION
Function

The Blue Thunder DISTORTION has been custom voiced for Bass. Typically when using distortion and bass - a subtle distortion is ideal - just enough to add some "dirt" to your sound. Adding more gain distortion sounds awesome in a lot of situations but, usually a slight distortion adds a great "edge" to your sound.

This is where the Blue Thunder's distortion mixing capabilities comes into play. The DIRMX is one of the most useful features in the Blue Thunder. This feature allows you to dial in the precise of amount of desired distortion without effecting your overall tone and low-end.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT control to the right until DISTORTION appears on the display.
The PARAMETER SELECT control will allow you to access each of the following Distortion parameters.
The PARAMETER ADJUST control will allow you to make adjustments to be made to the selected parameter:

DISTORT I/O

The DISTORT I/O parameter determines whether the distortion circuit is active or bypassed for the current preset. Select IN if you want activate the distortion. Select OUT if you want to bypass the distortion.

DIST GAIN

The DISTORTION GAIN parameter determines the amount of distortion added to your signal

VARIAC

The VARIAC adjusts the level at which the preamp stage in the Blue Thunder begins to distort.

Note: A Variac is a voltage attenuating device that plugs into an AC wall outlet that adjusts the voltage level to any device that is plugged into it. For years musician's have plugged their tube heads into a Variac and reduced the voltage coming into the amplifier from the AC outlet. This allows the amplifier's tubes to reach saturation at a lower input level and increases the gain produced. The Variac parameter operates in a similar manner as a conventional Variac where lowering the parameter level lowers the level at which saturation will take place.

DIRMX

The DIRMX parameter allows you to "dial in" the precise amount of desired distortion and to mix it with your direct signal. Thus, if you only want a little bit of distortion mixed in with your direct signal - choose higher numbers. If you want a lot of distortion - choose lower numbers.

DST< 0 DRY - in this setting there is 100% distortion is sent into the DIRECT MIX buffer
DST<50>DRY - in this setting 50% distortion and 50% direct (Clean) signal is mixed and sent into the DIRECT MIX buffer
DST 100>DRY - in this setting 100% of the direct (Clean) signal is sent into the DIRECT MIX buffer.

EFXX

The EFXX parameter allows you to adjust the amount of effected signal added to the distortion or the direct signal Thus, if you want more effect on the direct signal and only a little on the distorted signal - choose higher numbers. If you want a lot of effect on the distorted signal and less on the direct signal - choose lower numbers.

DST< 0 DRY - in this setting 100% Distortion is sent into the effect processing buffer.
DST<50>DRY - in this setting 50% Distortion and 50% of the direct (Clean) signal is mixed and sent into the effects processing buffer.
DST 100>DRY - in this setting 100% of the direct (Clean) signal is sent into the effects processing buffer.

EQ
Function

Rocktron's SIMBiotic EQ is a custom designed EQ circuit providing the ULTIMATE tool for tonal shaping of your sound. It includes four bands of full parametric EQ and complete mixing capabilities!

The EQ function provides full parametric control and allows you to shape the tone of the input singal before it reachs each of the effect blocks.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT knob to the right until EQ appears on the display.
The PARAMETER SELECT control will allow you to access each of the following EQ parameters.
The PARAMETER ADJUST control will allow you to make adjustments to be made to the selected parameter:

EQ I/O

The EQ I/O parameter determines whether the EQ circuit is active or bypassed for the current preset. Select IN to activate the EQ or OUT to bypass the EQ.

BASS LVL

The BASS LEVEL parameter allows you to cut or boost the low frequencies by up to 15dB. This parameter is also controlled by the knob labelled BASS when not in the EDIT MODE

BASS FREQ

The BASS FREQUENCY parameter allows you to select a center frequency between 63Hz and 500Hz to be cut or boosted by the BASS LEVEL parameter.

BASS BW

The BASS BANDWIDTH parameter determines (in octaves) the width of the selected bass band.

MID LVL

The MID LEVEL parameter allows you to cut or boost the mid band frequencies by up to 15dB. This parameter is also controlled by the knob labelled MIDDLE when not in the EDIT MODE.

MID FREQ

The MID FREQUENCY parameter determines a mid band center frequency between 250Hz and 2KHz to be cut or boosted via the MID LEVEL parameter.

MID BW

The MID BANDWIDTH parameter determines (in octaves) the width of the selected mid band.

TREBLE LVL

The TREBLE LEVEL parameter allows you to cut or boost the high band frequencies by up to 15dB. This parameter is also controlled by the knob labelled TREBLE when not in the EDIT MODE.

TREBL FRQ

The TREBLE FREQUENCY parameter determines a high band center frequency between 1KHz and 8KHz to be cut or boosted via the TREBLE LEVEL parameter.

TREBLE BW

The TREBLE BANDWIDTH parameter determines (in octaves) the width of the selected high band.

PRESENCE LVL

The PRESENCE LEVEL parameter allows you to cut or boost an additional high band frequency by up to 15dB.

PRES FREQ

The PRESENCE FREQUENCY parameter allows you to select a high band center frequency between 2KHz and 8KHz to be cut or boosted via the PRESENCE LEVEL parameter.

PRES BW

The PRESENCE BANDWIDTH parameter determines (in octaves) the width of the selected high band.

COMPRESSOR
Function

Compression is often used to maintain an even level when using clean tones, and is also used to increase sustain when using high gain distortion.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE"and turn the FUNCTION SELECT knob to the right until COMPRES-SOR appears on the display.
The PARAMETER SELECT control will allow you to access each of the following Compressor parameters.
The PARAMETER ADJUST control will allow you to make adjustments to be made to the selected parameter:

COMPRESR I/O

The COMPRESSOR I/O parameter determines whether the compression circuit is active or bypassed for the current preset.

Select IN if you want activate the compressor

Select OUT if you want to bypass the compressor

COMP THRESH

The COMPRESSOR THRESHOLD parameter determines the input level (in dB) at which compression will begin. Lower settings of this parameter will result in more compression.

COMP ATTACK

The COMPRESSOR ATTACK parameter determines the speed (in milliseconds) at which the compressor will reach its maximum compression level after the input signal has exceeded the threshold level (set by the COMPRESSOR THRESHOLD parameter).

COMP RELEASE

The COMPRESSOR RELEASE parameter determines the speed (in seconds) at which compression will cease after the input signal has dropped below the threshold level.

NOTE - We suggest you use longer release times - up to 1 to 2 seconds. This will keep the dynamic range limited producing a more smooth consistent level output.*

DELAY
Function

Delay provides a reproduction of the input signal, occurring at a prescribed time (usually expressed in milliseconds) following the input signal. The Blue Thunder provides two discrete delays (Delay 1 and Delay 2), each of which has its own set of parameters to determine its particular characteristics.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT knob to the right until ***DELAY*** appears on the display.
The PARAMETER SELECT control will allow you to access each of the following Delay parameters:
The PARAMETER ADJUST control allows you to adjust the selected parameter:

DELAY I/O

The DELAY I/O parameter determines whether the delay circuit is active or bypassed for the current preset. Select IN to active the delay. Select OUT to bypass the delay.

MUTE TYPE

The MUTE TYPE parameter allows for muting the delay at its input (PRE), its output (POST) or BOTH.

Muting the input (PRE) of the delay will not allow any signal to enter the delay section until the delay is switched in. When using a moderate amount of regeneration, switching out the delay with the input muted will allow you to generate a non-delayed signal which will play over the decaying regenerated signal which continues on after the delay is switched out.

Muting the output (POST) of the delay will result in the delayed signal being immediately turned off when the delay is switched out. This means that delays and regeneration will not continue when the delay is switched out. If the output were not muted, signals that were input before the delay was switched out would be allowed to regenerate, even after switching out the delay.

It is also possible to mute both the input and the output (BOTH) so that no signal enters or exits the Delay section until it is switched in.

TIME1

The TIME1 parameter determines the multiplier by which a new delay time will be selected for Delay Time 1 when the Tap Delay feature of the Blue Thunder is used. *(See Section 7 page 42: "Tap Delay" for more information on the Tap Delay feature.)*

TIME2

The TIME2 parameter determines the multiplier by which a new delay time will be selected for Delay Time 2 when the Tap Delay feature of the Blue Thunder is used. *(See Section 7 page 42: "Tap Delay" for more information on the Tap Delay feature.)*

DELAY LVL

The DELAY LEVEL parameter determines the overall level of the delayed signal at the output of the Blue Thunder.

D-MIX S1/S2

The D-MIX S1/S2 parameter defines the ratio of Source 1 signal to Source 2 signal to be input to the Delay section. Source 1 is the Voice 1 output from the previous effect in the signal chain (chorus, flanger, pitch shifter, etc.), while Source 2 may be the Voice 2 output from the previous effect in the signal chain <u>or</u> the direct signal (selectable via the SOURCE 2 parameter). *(Refer to the block diagram shown on page 13 for a visual representation of the input to the Delay section.)*

SOURCE 2	This parameter is used to select whether the Source 2 input will be the VOICE 2 output from the previous effect in the signal chain or the DIRECT signal. In configurations where there is no effect immediately preceding the delay, both Source 1 and Source 2 will be the direct signal.
DLY HF DAMP	The DELAY HIGH FREQUENCY DAMPING parameter controls the amount of high frequency content in the delayed and regenerated signals. Higher amounts of damping will result in less high frequency information in the delayed signal.
DELAY OUT 1	The DELAY OUT 1 parameter determines the volume of Delay 1.
DLY PAN1	The DLY PAN1 parameter allows you to pan the Delay 1 signal to the left or right channel.
DLY TIME1	The DELAY TIME1 parameter determines the length of time (in 10 milliseconds increments) after the input signal that the Delay 1 signal will begin. The DELAY TIME can be adjusted via the PARAMETER ADJUST control, MIDI controller changes or via the Tap Delay feature.
FINE 1	The FINE 1 parameter allows for adjustment of Delay 1 in 1 millisecond increments.
DLY RGN 1	The DLY RGN 1 parameter determines how many times the Delay 1 signal is fed back into the input and repeated.
DELAY OUT 2	The DELAY OUT 2 parameter determines the volume of Delay 2.
DLY PAN2	The DLY PAN2 parameter allows you to pan the Delay 2 signal to the left or right channel.
DLY TIME2	The DELAY TIME2 parameter determines the length of time (in 10 milliseconds increments) after the input signal that the Delay 2 signal will begin. The DELAY TIME can be adjusted via the PARAMETER ADJUST control, MIDI controller changes or via the Tap Delay feature.
FINE 2	The FINE 2 parameter allows for adjustment of Delay 2 in 1 millisecond increments.
DLY RGN 2	The DLY RGN 2 parameter determines how many times the Delay 2 signal is fed back into the input and repeated.
D>SPILLOVER	The SPILLOVER parameter determines whether delays from the current preset will "spill over" into the next preset when it is recalled. Select ON to have the delay spill over into the next preset. Select OFF to bypass the spill over feature.

Note!

When delays from the current preset are spilled over into the next preset recalled (i.e. SPILLOVER "ON"), the delay parameters for the new preset will be changed to match those of the previous preset (except for the DELAY I/O and SPILLOVER parameters) - even if the Delay effect is switched "OUT" in the previous preset.

The EFFECT LEVEL parameter in the next preset recalled does not change, therefore delays spilled into it may be of higher or lower volume - depending on the EFFECT LEVEL setting in each preset.

Also, recalling the same preset twice via MIDI will cancel the Spillover effect and reset the new preset to its stored parameter values (only when the SPILLOVER parameter in the recalled parameter is set "OFF").

REVERB
Function

Reverb is a multitude of echos spaced so close together that, to the human ear, seem as a single continuous sound. These echos gradually decrease in intensity until they are ultimately absorbed by the boundaries and obstacles within a room. As the sound waves from the sound source strike the boundaries of a room, a portion of the energy is reflected away from the obstacle while another portion is absorbed into it - thereby causing both the continuance of sound as well as the decaying or "dying out" of the sound.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT knob to the right until ***REVERB*** appears on the display.
The PARAMETER SELECT control will allow you to access each of the following Reverb parameters.
The PARAMETER ADJUST control allows you to adjust the selected parameter:

REV INPUT

The REV INPUT parameter determines whether the reverb circuit is active or bypassed for the current preset.

R-MIX EFF/DLY

The R-MIX EFFECT/DELAY parameter is used to define the ratio of direct signal to delayed signal to be input to the reverb section.

REVERB LVL

The REVERB LEVEL parameter allows you to control the level of the reverb signal at the output of the Blue Thunder relative to the direct signal and other effect signals.

REV DECAY

The REVERB DECAY parameter determines the length of time that the reverb signal will sound before it has completely died out.

REV HF DAMP

The REVERB HIGH FREQUENCY DAMPING parameter is used to control the decay rate of high frequency information in the reverb signal. Higher parameter settings will result in a faster decay of high frequency information.

R>SPILLOVER

The R>SPILLOVER parameter determines whether reverbs generated in the current preset will continue decaying when the next preset is recalled.When switched off, reverbs will be abrubtly cut off when the next preset is recalled.

Note!

When reverb from the current preset is spilled over into the next preset recalled (SPILLOVER "ON"), the reverb parameters for the new preset will be changed to match those of the previous preset (except for the REV INPUT and SPILLOVER parameters) - even if the Reverb effect itself is switched "OUT" in the previous preset.

The EFFECT LEVEL parameter in the next preset recalled does not change, therefore reverb spilled into it may be of higher or lower volume - depending on the EFFECT LEVEL setting in each preset.

Also, recalling the same preset twice via MIDI will cancel the Spillover effect and reset the new preset to its stored parameter values (only when the SPILLOVER parameter in the recalled parameter is set "OFF").

TREMOLO
Function

The Tremolo effect continuously varies the volume of the signal.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT knob to the right until ***TREMOLO* appears on the display.**
The PARAMETER SELECT control will allow you to access each of the following Tremolo parameters:
The PARAMETER ADJUST control allows you to adjust the selected parameter:

TREMOLO I/O

The TREMOLO I/O parameter determines whether the tremolo circuit is active or by-passed for the current preset. Select IN if you want to engage the tremolo. Select OUT if you want to bypass the Tremolo.

TREM DPTH

The TREMOLO DEPTH parameter determines the amount of modulation for the Tremolo signal. Lower DEPTH settings produce more subtle tremolo effects, while higher settings will result in a more extreme tremolo effect.

TREM RATE

The TREMOLO RATE parameter determines the speed at which the tremolo signal modulates (or increases and decreases in volume).

SHAPE

The SHAPE parameter determines the waveshape of the tremolo signal. Selecting a different waveshape produces a different tremolo effect.

TIME

The TIME parameter determines the multiplier by which a new modulation rate will be selected for the RATE parameter when the Tap Delay feature of the Blue Thunder is used. *(See Section 7 page 42: "Tap Delay" for more information on the Tap Delay feature.)*

PHASER
Function

Phase shifting involves splitting the input signal into two signals, then shifting the phase of different frequencies of one signal before mixing it back with the original signal.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT control to the right until ***PHASER*** appears on the display.
The PARAMETER SELECT control will allow you to access each of the following Phaser parameters.
The PARAMETER ADJUST control allows you to adjust the selected parameter:

PHASER I/O

The PHASER I/O parameter determines whether the phase shift circuit is active or bypassed for the current preset. Select IN to active the phaser. Select OUT to bypass the phaser circuit.

PSR PAN

The PHASER PAN parameter allows you to pan the phase shifted signal to the left or right channel by any amount.

PSR DEPTH

The PHASER DEPTH parameter determines the modulation depth of the phase shift effect. Higher parameter settings result in the sweep of the filtering effect occurring over a wider frequency range.

RATE

The RATE parameter determines the speed at which the phase shifted signal is modulated.

P>RESONANCE

The PHASER RESONANCE parameter adds feedback to the Phaser so that it has a more pronounced effect.

PSR STAGES

The PHASER STAGES parameter determines how many stages of phase shift are to be active. A parameter setting of "4" produces a result similar to a vintage Phase 90, while a setting of "6" emulates other common phaser pedals.

TIME

The TIME parameter determines the multiplier by which a new modulation rate will be selected for the RATE parameter when the Tap Delay feature of the Blue Thunder is used. *(See Section 7 page 42: "Tap Delay" for more information on the Tap Delay feature.)*

PHASER LVL

The PHASER LEVEL parameter allows you to control the level of the phaser signal at the output of the Blue Thunder relative to the direct signal and other effect signals. A setting of "0" (zero) will set the phaser level at unity gain.

FLANGER
Function

Flanging splits the input signal into two individual delayed signals *(Voice 1 and Voice 2)*, then modulating the delayed signals so that, when summed back with the direct signal, phase cancellations will occur at some frequencies while peaks in the response will occur at others.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT knob to the right until ***FLANGER*** appears on the display.
The PARAMETER SELECT control will allow you to access these FLANGER parameters.
The PARAMETER ADJUST control allows you adjust the selected parameter:

FLANGER I/O
The FLANGER I/O parameter determines whether the flange circuit is active or bypassed for the current preset. Select IN to engage the flanger circuit. Select OUT to bypass the circuit.

FLN OUT 1
The FLANGER OUTPUT 1 parameter determines the overall volume of Voice 1.

FLN PAN1
The FLANGER PAN 1 parameter allows you to pan Voice 1 to the left or right channel.

FLN DPTH 1
The FLANGER DEPTH 1 parameter adjusts the amount of modulation of Voice 1. Lower DEPTH settings produce more subtle effects, while higher settings will result in a more drastic effect.

FLN RATE 1
The FLANGER RATE 1 parameter determines the speed at which Voice 1 is modulated.

TIME1
The TIME1 parameter determines the multiplier by which a new modulation rate will be selected for the RATE 1 parameter when the Tap Delay feature of the Blue Thunder is used. *(See Section 7 page 42: "Tap Delay" for more information on the Tap Delay feature.)*

FLN OUT 2
The FLANGER OUTPUT 2 parameter determines the overall volume of Voice 2.

FLN PAN2
The FLANGER PAN 2 parameter allows you to pan Voice 2 to the left or right channel.

FLN DPTH 2
The FLANGER DEPTH 2 parameter adjusts the amount of modulation of Voice 2. Lower DEPTH settings produce more subtle effects, while higher settings will result in a more drastic effect.

FLN RATE 2
The FLANGER RATE 2 parameter determines the speed at which Voice 2 is modulated.

TIME2
The TIME2 parameter determines the multiplier by which a new modulation rate will be selected for the RATE 2 parameter when the Tap Delay feature of the Blue Thunder is used. *(See Section 7 page 42: "Tap Delay" for more information on the Tap Delay feature.)*

FLN REGEN
The FLANGER REGENERATION parameter determines how much of the the delayed output signal is fed back into the input. More regeneration produces a more pronounced "jet airplane" type of effect.

CHORUS
Function

The Chorus effect in the Blue Thunder is produced by detuning two delayed signals (Voice 1 and Voice 2), then modulating the detune effect so that the amount of pitch detune is constantly varying. Using different detune amounts, modulation rates, modulation depths and pan settings for each delayed signal will produce a greater perceived spaciousness.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT knob to the right until ***CHORUS*** appears on the display.
The PARAMETER SELECT control will allow you to access each of the following Chorus parameters
The PARAMETER ADJUST control allows you adjust the selected parameter:

CHORUS I/O
The CHORUS I/O parameter determines whether the chorus circuit is active or bypassed for the current preset. Select IN to engage the chorus circuit. Select OUT to bypass the chorus circuit.

CRS OUT 1
The CHORUS OUTPUT 1 parameter determines the volume of Voice 1.

CRS PAN 1
This parameter allows you to pan Voice 1 to the left or right channel.

CRS DPTH 1
The CHORUS DEPTH 1 parameter adjusts the amount of modulation of the Voice 1 signal. A lower depth setting will produce a more subtle detune effect, while a higher setting results in a more extreme detuning of Voice 1.

CRS RATE 1
The CHORUS RATE 1 parameter determines the sweep speed (or the speed at which Voice 1 is modulated).

CRS>DLY1
This parameter allows you to select the minimum delay time (in milliseconds) for Voice 1. This delayed signal (along with Voice 2) is detuned and modulated to produce the chorus effect. Using shorter delay times will result in a tighter sounding chorused signal, while longer delay times will produce a larger ambient effect.

TIME1
The TIME 1 parameter determines the multiplier by which a new modulation rate will be selected for the RATE 1 parameter when the Tap Delay feature of the Blue Thunder is used. *(See Section 7 page 42: "Tap Delay" for more information on the Tap Delay feature.)*

CRS OUT 2
The CHORUS OUTPUT 2 parameter determines the volume of Voice 2.

CRS PAN 2
This parameter allows you to pan Voice 2 to the left or right channel.

CRS DPTH 2
The CHORUS DEPTH 2 parameter adjusts the amount of modulation of the Voice 2 signal. A lower depth setting will produce a more subtle detune effect, while a higher setting will produce a more extreme detuning of Voice 2.

CRS RATE 2
The CHORUS RATE 2 parameter determines the sweep speed (or the speed at which Voice 2 is modulated).

CRS>DLY 2
This parameter allows you to select the minimum delay time (in milliseconds) for Voice 2. This delayed signal (along with Voice 1) is detuned and modulated to produce the chorus effect. Using shorter delay times will result in a tighter sounding chorused signal, while longer delay times will produce a larger ambient effect.

TIME2
The TIME 2 parameter determines the multiplier by which a new modulation rate will be selected for the RATE 2 parameter when the Tap Delay feature of the Blue Thunder is used. *(See Section 7 page 42: "Tap Delay" for more information on the Tap Delay feature.)*

SPEAKER EXCITER
Function

The Speaker Exciter adds spacial dynamics to your tone. It is an excellent tool in live and recording situations. It is extremely useful in live situations where you may need to play at lower volumes but need to be pronounced with a solid low-end response. The Sonic Clarity and Sonic Boom controls will provide these characteristics.

In recording situations or when connecting directly to a PA system, the cabinet simulator function will reproduce the frequency characteristics of a bass speaker cabinet. This will allow you to make your presets compatible for both live and recording purposes.

To access this function you must first press the "EDIT" button to enter into the "EDIT MODE" and turn the FUNCTION SELECT knob to the right until SPEAKER EXCITER appears on the display.
The PARAMETER SELECT control will allow you to access each of the following Speaker Exciter parameters
The PARAMETER ADJUST control allows you adjust the selected parameter:

SPKR EXCITER

The SPEAKER EXCITER parameter determines whether the Speaker Exciter circuit is active or bypassed for the current preset. Select ON to activate the Speaker Exciter - Select OFF to bypass the Speaker Exciter.

SPKR TYPE

The SPEAKER TYPE parameter determines the type of speaker to be simulated. 15", 12" 10", 8" and full range speakers are available.

SONIC CLARITY

The SONIC CLARITY parameter enhanses the overall articulation of your playing by boosting or cutting the middle high frequencies depending on the value selected.

SONIC BOOM

The SONIC BOOM parameter will add depth to your sound by boosting the perception of low-end.

CABINET SIM

CABINET SIM - Allows you to record direct or plug directly into a PA system - eliminating the need to carry a heavy amplifier to the gig! The Cabinet Sim is a special frequency response curve that r e-creates the natural average frequency response curve found with Bass spea ker cabinets. Using the Speaker Exciter along with the Cabinet SIM is the ultimate sound shaping tool for direct live and recording applications.

*HINT - WHEN YOU ARE READY TO RECORD DIRECT OR PLUG INTO A PA SYSTEM - TURN ON THE CABINET SIMULATOR ON THE PRESETS YOU WANT TO USE AND YOU WILL BE READY TO GO!

Master Blue Thunder Effects Parameter List

(The actual functions displayed are configuration-dependent)

Function	Parameter	Parameter Range
(Press the "EDIT" button to enter the "EDIT MODE" via FUNCTION SELECT control)	(via PARAMETER SELECT control once in "EDIT MODE")	(via PARAMETER ADJUST control once in "EDIT MODE)
GLOBAL	HP FILTER	Active, OFF
	HP CUT	80 Hz, 160 Hz, 240 Hz, 320 Hz
	OUTPUT	Stereo, Mono
	HUSH OFFSET	-10dB to +30dB
	MUTE	Out, In
	DIRECT	Out, In
MIXER	SET UP	Preamp, EFX LOOP
	LEFT DIR	-∞ to +6dB
	RIGHT DIR	-∞ to +6dB
	EFFECT LEVEL	-∞ to +6dB
	PHS DIR/EFF	Direct<0 to 100>Effect
	CHR DIR/EFF	Direct<0 to 100>Effect
	FLN DIR/EFF	Direct<0 to 100>Effect
	REV DIR/EFF	Direct<0 to 100>Effect
	VOLUME	0 to 127
HUSH	HUSH I/O	Out, In
	EXP THRESH	-90 to -27
DISTORTION	DISTORT I/O	In, Out
	DIST GAIN	0 to 100
	VARIAC	0 to 5
	DIR MX	DST <0 to 100> DRY
	EFXX	DST <0 to 100> DRY
EQ	EQ I/O	Out, In
	BASS LVL	-15dB to +15dB
	BASS FREQ	63Hz to 500Hz
	BASS BW	.2 to 2 octaves
	MID LEVEL	-15dB to +15dB
	MID FREQ	250Hz to 2kHz
	MID BW	.2 to 2 octaves
	TREBL LVL	-15dB to +15dB
	TREBL FRQ	1kHz to 8kHz
	TREBLE BW	.2 to 2 octaves
	PRES LVL	-15dB to +15dB
	PRES FREQ	2kHz to 8kHz
	PRES BW	.2 to 2 octaves
COMPRESSOR	COMPRESR I/O	In, Out
	COMP THRESH	-30dB to -6dB
	COMP ATTACK	1ms to 75ms
	COMP RELEASE	.05 to 2 seconds

Function

Parameter

Parameter Range

Function	Parameter	Parameter Range
DELAY	DELAY I/O	Out, In
	MUTE TYPE	Pre, Post, Both
	TIME1	32nd, 16th, 8th, Triplet, ¼, ½, or None
	TIME2	32nd, 16th, 8th, Triplet, ¼, ½, or None
	DELAY LVL	-∞ to 0dB
	D-MIX S1/S2	Source 1<0 to 100>Source 2
	SOURCE 2	Direct, Voice 2
	DLY HF DAMP	0 to 99
	DELAY OUT 1	-∞ to 0dB
	DLY PAN1	Left<0 to 100>Right
	DLY TIME 1	Direct, Voice 20ms to 1000ms
	FINE 1	0ms to 9ms
	DLY RGN 1	-∞ to 0dB
	DELAY OUT 2	-∞ to 0dB
	DLY PAN2	Left<0 to 100>Right
	DLY TIME2	0ms to 1000ms
	FINE 2	0ms to 9ms
	DLY RGN 2	-∞ to 0dB
	D>SPILLOVER	Off, On
REVERB	REV INPUT	Muted, Active
	R-MIX EFF/DLY	Effect<0 to 100>Delay
	REVERB LVL	-∞ to 0dB
	REV DECAY	0 to 99
	REV HF DAMP	0 to 99
	R>SPILLOVER	Off, On
TREMOLO	TREMOLO I/O	Out, In
	TREM DPTH	0 to 100
	TREM RATE	0 to 254
	SHAPE	Triangle, Square
	TIME	32nd, 16th, 8th, Triplet, ¼, ½, or None
PHASER	PHASER I/O	Out, In
	PSR PAN	Left<0 to 100>Right
	PSR DEPTH	0 to 100
	RATE	0 to 254
	P>RESONANCE	0 to 100
	PSR STAGES	4, 6
	TIME	32nd, 16th, 8th, Triplet, ¼, ½, or None
	PHASER LVL	-∞ to 0dB

Function

(Press the "EDIT" button to enter the "EDIT MODE" via FUNCTION SELECT control)

Parameter

(via PARAMETER SELECT control once in "EDIT MODE")

Parameter Range

(via PARAMETER ADJUST control once in "EDIT MODE")

Function	Parameter	Parameter Range
FLANGER	FLANGER I/O	Out, In
	FLN OUT 1	-∞ to 0dB
	FLN PAN1	Left<0 to 100>Right
	FLN DPTH 1	0 to 100
	FLN RATE 1	0 to 254
	TIME1	32nd, 16th, 8th, Triplet, ¼, ½, or None
	FLN OUT 2	-∞ to 0dB
	FLN PAN2	Left<0 to 100>Right
	FLN DPTH 2	0 to 100
	FLN RATE 2	0 to 254
	TIME2	32nd, 16th, 8th, Triplet, ¼, ½, or None
	FLN REGEN	-∞ to 0dB
CHORUS	CHORUS I/O	Out, In
	CRS OUT 1	-∞ to 0dB
	CRS PAN 1	Left<0 to 100>Right
	CRS DPTH 1	0 to 100
	CRS RATE 1	0 to 254
	CRS>DLY1	2ms to 40ms
	TIME1	32nd, 16th, 8th, Triplet, ¼, ½, or None
	CRS OUT 2	-∞ to 0dB
	CRS PAN 2	Left<0 to 100>Right
	CRS DPTH 2	0 to 100
	CRS RATE 2	0 to 254
	CRS>DLY2	2ms to 40ms
	TIME 2	32nd, 16th, 8th, Triplet, ¼, ½, or None
SPEAKER EXCITER	SPKR EXCITER	Off, On
	SPKR TYPE	15, 12, 10, 8, Full Range
	SONIC CLARITY	-15dB to +15dB
	SONIC BOOM	-15dB to +15dB
	CABINET SIM	Off, On

30

7. Operating the Blue Thunder™

Selecting a preset
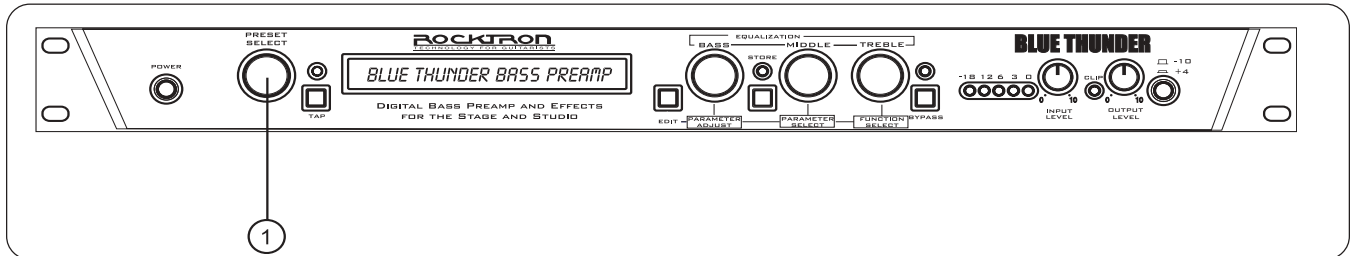
Step 1   Turn the PRESET control to the desired preset you wish to recall. The selected preset will be recalled automatically.

```
29  PRESET TITLE
```

Changing preset parameters
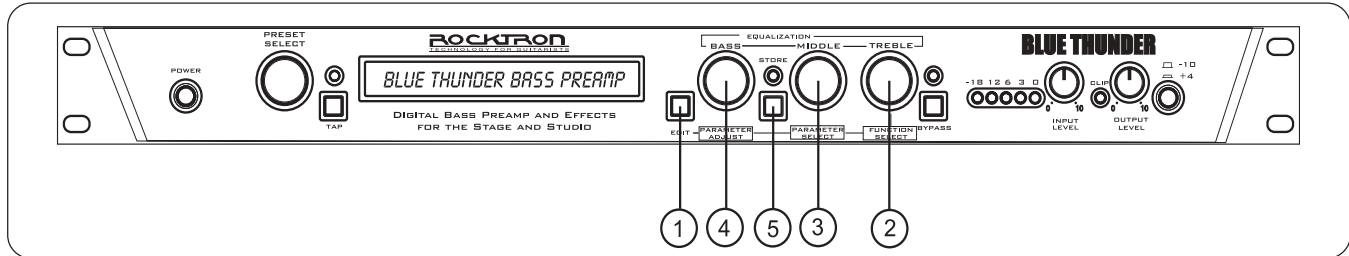
Step 1   Press the EDIT button to enter the "EDIT MODE"

> EDIT MODE

Step 2   Turn the FUNCTION SELECT control to select the function heading which contains the parameter(s) you wish to change.

> ****   REVERB   ****

Step 3   Turn the PARAMETER SELECT control to the specific parameter you wish to change.

> REV DECAY   59

Step 4   Turn the PARAMETER ADJUST control to alter the parameter value. The LED above the STORE button will light, indicating that the preset has had a parameter altered from its stored value.

> REV DECAY   32

Storing changed preset parameters

Step 5   While viewing a function or parameter title, press the STORE button to store the altered parameter(s). "STORED" will flash briefly on the display.

> STORED

Editing a preset title

Step 1   Press the EDIT button to enter the "EDIT MODE"

```
┌─────────────────────────────────┐
│           EDIT MODE             │
└─────────────────────────────────┘
```

Step 2   To begin the Title Edit function, turn the FUNCTION SELECT control clockwise until the Blue Thunder™ displays "TITLE EDIT".

```
┌─────────────────────────────────┐
│         **  TITLE EDIT **       │
└─────────────────────────────────┘
```
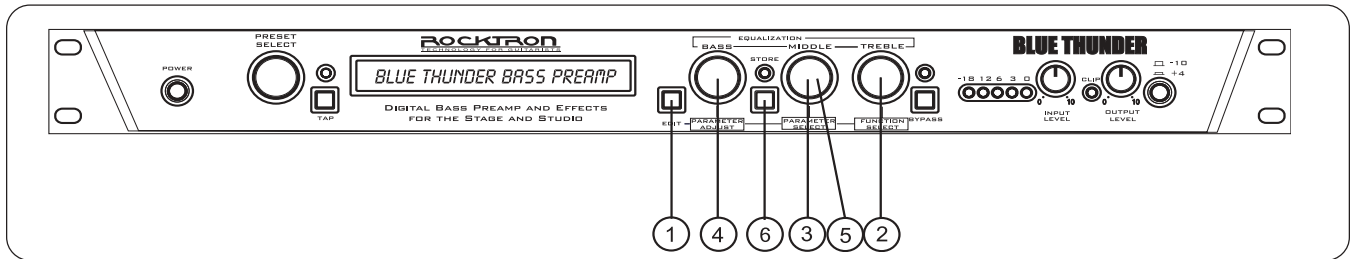
Step 3   Turn the PARAMETER SELECT control clockwise to initiate the Title Edit mode. Turning this control will also select the character location to be edited. A flashing decimal will follow the character currently selected.

```
┌─────────────────────────────────┐
│   57          P.RESET TITLE     │
└─────────────────────────────────┘
```
                    (Flashing Decimal)

Step 4   Use the PARAMETER ADJUST control to select the desired character for the current position (flashing decimal).

```
┌─────────────────────────────────┐
│   57          M.RESET TITLE     │
└─────────────────────────────────┘
```

Step 5   To edit the character in the next position, turn the PARAMETER SELECT control one step clockwise. The flashing decimal will move to the next character.

```
┌─────────────────────────────────┐
│   57          MR.ESET TITLE     │
└─────────────────────────────────┘
```
                    (Flashing decimal)

Step 6   After all the characters have been edited as needed, press the STORE button to save the new title memory. The Blue Thunder™ will flash "STORED" briefly.

> *STORED*

Note: *The STORE button must be pressed to save the new title. Exiting the Title Edit function before pressing the STORE button will erase any editing that was done in Title Edit.*

Also, after flashing "STORED", the Blue Thunder™ will remain in the Title Edit mode. You may either (a) turn the PRESET control to display and edit other preset titles without having to exit and re-enter Title Edit, or (b) turn the FUNC-TION SELECT control to exit the Title Edit mode.

Controller Assignments

The Controller Assignment function allows for specific Blue Thunder™ adjustable parameters to be mapped (or assigned)* to a MIDI controller for real-time control by an expression pedal.

The Controller Assignment option also lets you store an upper and lower parameter value limit which the controller cannot exceed. For example, when using an expression pedal with a Rocktron All Access™, MIDI Mate™, MIDI XChange™ footcontroller to send continuous control changes to control the "VOLUME" parameter, an upper limit of +100 can be set and a lower limit of -0 can be set - even though the actual parameter range is from +0 to +127. When the expression pedal is at its heel position in this example, the "VOLUME" parameter will be at -0, while at its toe position it will be at +100. Up to ten controllers can be assigned for each individual preset.
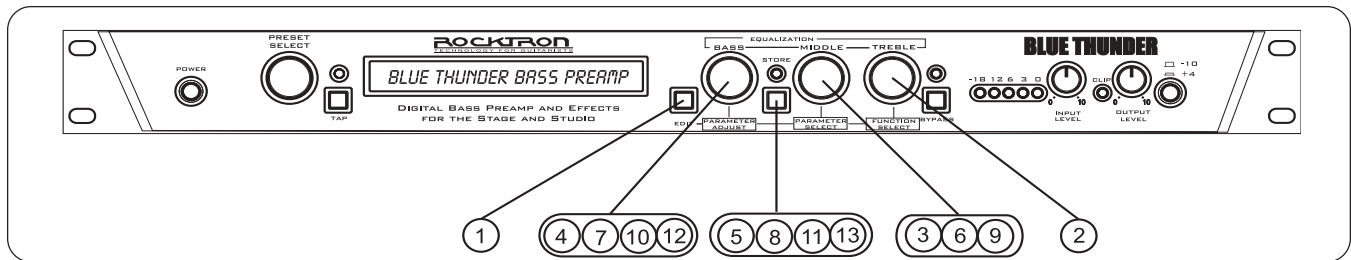
Step 1   Press the EDIT button to enter the "EDIT MODE"

EDIT MODE

Step 2   To access the Controller Assign function, turn the FUNCTION SELECT control clockwise to "CONTROLLER ASSIG".

CONTROLLER ASSIG

Step 3   Turn the PARAMETER SELECT control for the first parameter of the Controller Assign function. This parameter allows you to select a controller number for the "CTR A" (Controller A) parameter to respond to.

CTR A   6
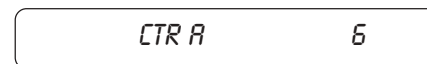
This parameter (CTR A only) also gives you the option of selecting "ADJ". When "ADJ" is selected, the parameter assigned to the first controller (PA-A) can be instantly accessed by turning the PARAMETER ADJUST control when the preset title is displayed. This allows you to access a parameter that you adjust frequently without paging through function headings and parameters.

Step 4 Use the PARAMETER ADJUST control to select the controller number to be assigned to the PA-A parameter. Any number from 0 to 120 may be selected, as well as OFF *(will not respond to MIDI control changes)*. Match the number selected for this parameter with the controller number on the MIDI transmitter.

$$\boxed{\quad CTR\ A \qquad\qquad 7 \quad}$$
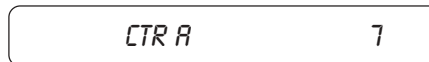
Step 5 After selecting the desired controller number, press the STORE button to save the number for the "CTR A" parameter. "STORED" will flash briefly on the display.

$$\boxed{\quad STORED \quad}$$

Step 6 Turn the PARAMETER SELECT control one step clockwise to display the parameter that is currently mapped to the "CTR A" control number.

$$\boxed{\quad PA\text{-}A \qquad\qquad BYPASS \quad}$$

Step 7 Turn the PARAMETER ADJUST control to scroll through the available parameters for the current configuration.

$$\boxed{\quad PA\text{-}A \qquad\qquad REVERB\ LVL \quad}$$

Step 8 After selecting the parameter that you which to assign to a controller, press the STORE button to save it. The Blue Thunder™ will flash "STORED" briefly.

$$\boxed{\quad STORED \quad}$$

> *Note:* *The Blue Thunder*™ *allows you to select an upper and lower value limit which the parameter cannot exceed. For example, if a parameter has a value range from -∞ to 0dB, yet you would like the range of the parameter to vary from only -12dB to -2dB, you may set a lower limit of -12 and an upper limit of -2 via the Upper and Lower Limit parameters. When a parameter is stored in the Controller Assign function (Step 7), the maximum parameter value is automatically stored as the upper limit, while the minimum value is stored as the lower limit.*

Step 9   Turn the PARAMETER SELECT control one step clockwise to display the Upper Limit parameter (for PA-A).

```
┌─────────────────────────────────┐
│   ULIM A              XXX        │
└─────────────────────────────────┘
```

Step 10   Use the PARAMETER ADJUST control to choose the highest value that the parameter is not to exceed through MIDI control changes.

```
┌─────────────────────────────────┐
│   ULIM A               -2        │
└─────────────────────────────────┘
```

Step 11   After selecting a value for the upper limit, press the STORE button to save it. "STORED" will flash briefly on the display.

```
┌─────────────────────────────────┐
│          STORED                  │
└─────────────────────────────────┘
```

Step 12   Turn the PARAMETER SELECT control one step clockwise to access the Lower Limit parameter (for PA-A).

```
┌─────────────────────────────────┐
│   LLIM A              -∞         │
└─────────────────────────────────┘
```

Step 12   Use the PARAMETER ADJUST control to select the lowest value which the parameter is not to fall below through MIDI control changes.

```
╭─────────────────────────────────────╮
│   LLIM A                      -12    │
╰─────────────────────────────────────╯
```

Step 13   After selecting a value for the lower limit, press the STORE button to save it. "STORED" will flash briefly on the display.

```
╭─────────────────────────────────────╮
│              STORED                  │
╰─────────────────────────────────────╯
```

Selecting a lower limit value that is greater than the upper limit value will invert the response of the controller - i.e. the toe position of the expression controller will provide the minimum value, while the heel position will provide the maximum value.

Note: *Steps 1-13 can be repeated nine times for a total of 10 controllers. To exit Controller Assign at any time, turn either the PRESET or FUNCTION SELECT control. Only those changes that have been stored will be saved after exiting the Controller Assign function.*

Copying Blue Thunder Presets, Titles and Controller Assignments

The Copy function allows you to copy any preset, preset title or controller assignment into any other preset location instantly.
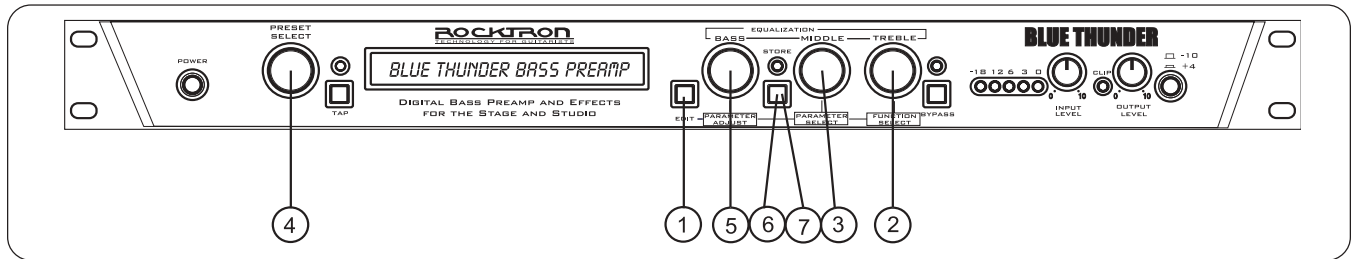
Copying presets:

Step 1   Press the EDIT button to enter the "EDIT MODE"

> EDIT MODE

Step 2   Turn the FUNCTION SELECT control to "COPY".

> **** COPY ****

Step 3   Turn the PARAMETER SELECT control <u>one</u> <u>step</u> clockwise to access the "PR> XX to >PR XX" parameter, as shown below. The number on the left represents the preset to be copied, while the number on the right represents the preset location to copy to.

> PR> 4   TO   >PR 4

Preset to copy   *Preset location to copy to*
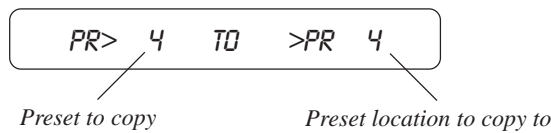
Step 4   Use the PRESET control to select the desired preset to be copied.
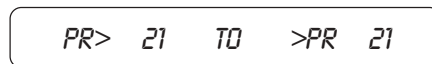
> PR> 21   TO   >PR 21

Step 5   Use the PARAMETER ADJUST control to select the location to copy the selected preset into.

> PR> 21   TO   >PR 59
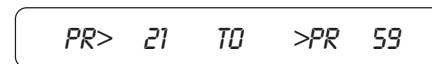
Step 6   Press the STORE button to copy the selected preset into the selected preset location. "STORED" will flash briefly on the display.

> STORED

Step 7   After flashing "STORED", the Blue Thunder™ will display "COPY TITLE TOO?". This allows you to copy the title from the copied preset into the new location as well. To copy the title, press the STORE button a second time. "STORED" will flash briefly before the Blue Thunder™ displays the new preset number and title.

> STORED

Turning the PARAMETER ADJUST control instead of pressing the STORE button allows you copy the title from the preset being copied to any other location. Once a location has been selected, press the STORE button to copy the title.

If you do not wish to copy the preset title, turn the PARAMETER SELECT or FUNCTION SELECT control to exit the preset copy function. The preset has been copied to the new location, but its title will be the title which was already at the new location.

Copying preset titles:

Step 1   Press the EDIT button to enter the "EDIT MODE"

> EDIT MODE

**Step 2**   Turn the FUNCTION SELECT control to "COPY".

> **** COPY ****

Step 3   Turn the PARAMETER SELECT control two steps clockwise to access the "TI> XX to >TI XX" parameter, as shown below. The number on the left represents the preset title to be copied, while the number on the right represents the preset location to copy the title to.

> TI>   4   TO   >TI   4

Preset title to copy   *Preset location to copy to*

Step 4   Use the PRESET control to select the desired preset title to be copied.

> TI>   21   TO   >TI   21

Step 5   Use the PARAMETER ADJUST control to select the location to copy the selected preset into.

> TI>   21   TO   >TI   59

Step 6   Press the STORE button to copy the selected title into the selected preset location.
"STORED" will flash briefly before displaying the preset title at its new location.

```
┌─────────────────────────────────┐
│           STORED                │
└─────────────────────────────────┘
```

Copying controller assignments:

Step 1   Press the EDIT button to enter the "EDIT MODE"

```
┌─────────────────────────────────┐
│          EDIT MODE              │
└─────────────────────────────────┘
```

Step 2   Turn the FUNCTION SELECT control to "COPY".

```
┌─────────────────────────────────┐
│       ****  COPY  ****           │
└─────────────────────────────────┘
```

Step 3   Turn the PARAMETER SELECT control <u>three</u> <u>steps</u> clockwise to access the "CA> XX to
>CA XX" parameter, as shown below. The number on the left represents the preset from
which the controller assignments will be copied, while the number on the right represents the
preset location to copy those controller assignments to.

```
┌─────────────────────────────────┐
│    CA>  4    TO    >CA   4       │
└─────────────────────────────────┘
```

Preset to copy controller   *Preset location to copy*
assignments from   *controller assgnments to*

Step 4   Use the PRESET control to select the desired preset to copy controller assignments from.

```
┌─────────────────────────────────┐
│    CA>  21    TO    >CA   21     │
└─────────────────────────────────┘
```

Step 5   Use the PARAMETER ADJUST control to select the location to copy the controller assign-
ments into.

```
┌─────────────────────────────────┐
│    CA>  21    TO    >CA   59     │
└─────────────────────────────────┘
```

Step 6   Press the STORE button to copy the selected preset into the selected preset location.
"STORED" will flash briefly before the Blue Thunder™ displays the preset number and title
that the controller assignments were stored into.

```
┌─────────────────────────────────┐
│           STORED                │
└─────────────────────────────────┘
```

Tap Delay

The Blue Thunder allows you to change the delay times and/or modulation rates for any given preset while you are playing two different ways:

1. By tapping the TAP DELAY/RATE button on the front panel of the Blue Thunder, or
2. By using a Rocktron All Access™ or MIDI Mate™ with the Blue Thunder (consult the All Access or MIDI Mate manual for details on this operation)

When any "TIME" parameter within a given preset is set to ½, ¼, TRIPLET, 8TH, 16TH or 32ND NOTE, tapping the assigned footswitch or the front panel TAP DELAY/RATE button two times will change the current delay time and/or modulation rate based on the amount of time that passes between taps. The Blue Thunder™ will detect the amount of time between any two taps that are less than one second apart *(i.e., if more than one second passes after the first tap, two additional taps - less than one second apart - will be required to change the delay time again).*

After the Blue Thunder™ detects the length of time between each tap, it then multiplies or divides that time based on the type of note stored for the TIME parameter(s) of the preset. The resulting delay time can be:

- one-eighth of the time between taps (32ND)
- one-fourth of the time between taps (16TH)
- one-half of the time between taps (8TH)
- two-thirds of the time between taps (TRIPLET)
- equal to the time between taps (¼), or
- two times the amount of time between taps (½)

The maximum delay time the Blue Thunder™ provides is 1000ms, therefore the Tap Delay feature will automatically default to a lower "TIME" parameter value when the time between taps requires a delay time over 1000ms. For example, if the HALF setting is stored for the TIME 1 parameter and the time between taps is 600ms, a delay time of 1200ms would be required (i.e. 600ms x 2). Because the maximum delay time is 1000ms, the Blue Thunder™ will default to the next lower multiplier (¼) and provide a delay time equal to the delay time detected (600ms).

"NONE" can also be selected for the TIME parameter(s) so that they will not respond to taps from the footswitch or front panel TAP DELAY/RATE button.

> *Note:*   *If delay times for each preset are selected via the Tap Delay feature (instead of manually setting the parameters), the flashing front panel tap delay rate L.E.D. will accurately reflect the tapped value that was stored in each preset when it is recalled. However, the Blue Thunder™ <u>must</u> be displaying either a function heading or a parameter to store the flashing tap delay rate (i.e., not while displaying a preset title). If a preset title is displayed when the STORE button is pressed, only the Power On preset is stored (see page 56).*

Program Changes

Program Changes allow for different MIDI program numbers to be assigned to Blue Thunder preset numbers. For example, MIDI program #58 can be mapped to Blue Thunder preset #34. Then, when program #58 is selected from a MIDI transmitting device (such as a Rocktron All Access foot controller), preset #34 will be recalled on the Blue Thunder.

The Program Changes Map table is shipped from Rocktron at a one-to-one correspondance (i.e. MIDI program #1 is mapped to Blue Thunder preset #1, 2 to 2, 3 to 3, etc.).
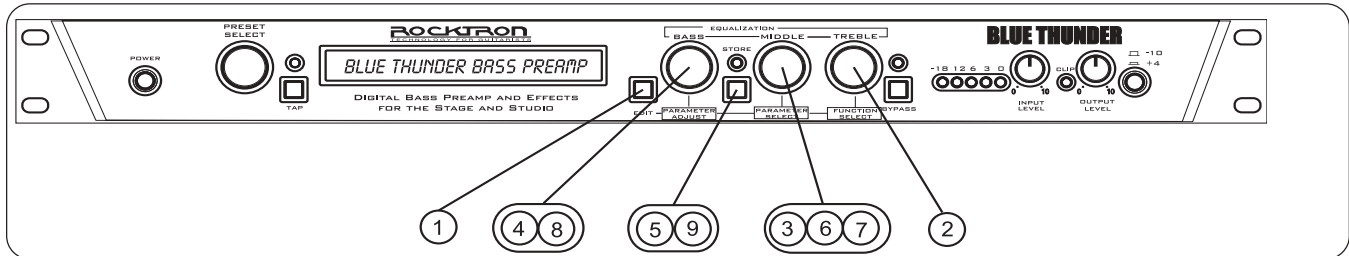
Step 1   Press the EDIT button to enter the "EDIT MODE"

> EDIT MODE

Step 2   To access MIDI Program Mapping, turn the FUNCTION SELECT control clockwise until the Blue Thunder displays "PROGRAM CHANGES".

> PROGRAM CHANGES

Step 3   Turn the PARAMETER SELECT control one step clockwise to display the current Program Change On/Map/Off status.
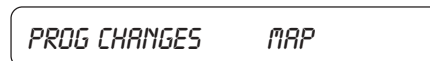
> PROG CHANGES   ON

Program Changes status options

ON - *Execute MIDI program changes as received by a MIDI controller*
MAP - *Use mapping table when a program change is received*
OFF - *Do not execute MIDI program changes*

Step 4   Turn the PARAMETER ADJUST control to select the desired Program Changes status setting.

> PROG CHANGES   MAP

Step 5   Press the STORE button to save the status selection. "STORED" will flash briefly on the display.
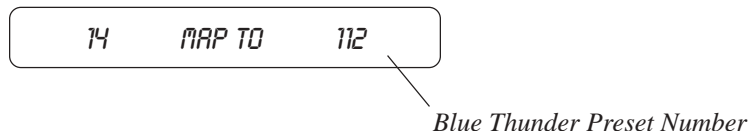
> STORED

Step 6   If "MAP" has been selected, turn the PARAMETER SELECT control <u>one step</u> clockwise to display the current Program Changes mapping assignments.

> XXX   MAP TO   XXX

Step 7   The number on the left of the display is the MIDI program number (or the number sent via a MIDI footswitch or other MIDI transmitter). Turn the PARAMETER SELECT control to select the MIDI program number to map to a preset.

> 14   MAP TO   14

MIDI Program Number
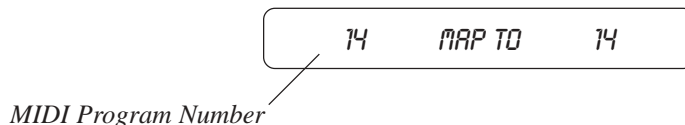
Step 8   The number on the right of the display is the preset number to map to (or the preset number that will be recalled when the MIDI program number on the left is received). Turn the PA-RAMETER ADJUST control to select the preset number to map to.

> 14   MAP TO   112

Blue Thunder Preset Number

* The preset number to map to can also be set to "OFF"—thereby not responding to that program change command.

Step 9   After selecting both the MIDI program number and the preset number, press the STORE button to save the change for each altered mapping. "STORED" will flash briefly on the display.

> STORED

MIDI Channels

The Blue Thunder can receive MIDI commands from other MIDI transmitting devices, as well as transmit MIDI program changes to other MIDI-based equipment when a preset is recalled on the Blue Thunder. The MIDI Channels function allows you to select the MIDI channels that the Blue Thunder will receive and transmit MIDI information on.
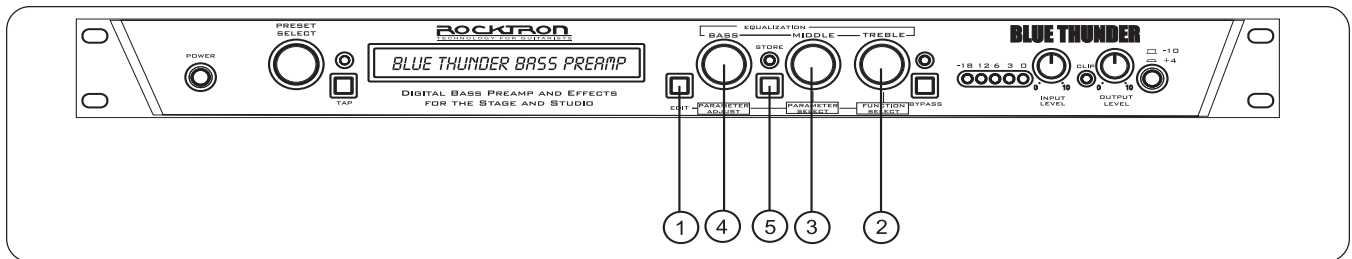
Step 1 Press the EDIT button to enter the "EDIT MODE"

EDIT MODE

Step 2 Turn the FUNCTION SELECT control clockwise until the Blue Thunder displays "MIDI CHANNELS".

MIDI CHANNELS

Step 3 Turn the PARAMETER SELECT control one step clockwise to display the current MIDI Receive channel.

RECEV CHANL   1

Step 4 Turn the PARAMETER ADJUST control to select the desired MIDI channel. You may select channels 1-16, OMNI (all channels) or OFF (will not receive MIDI commands).

RECEV CHANL   OMNI

Step 5 Press the STORE button to save the new MIDI Receive channel. "STORED" will flash briefly on the display.
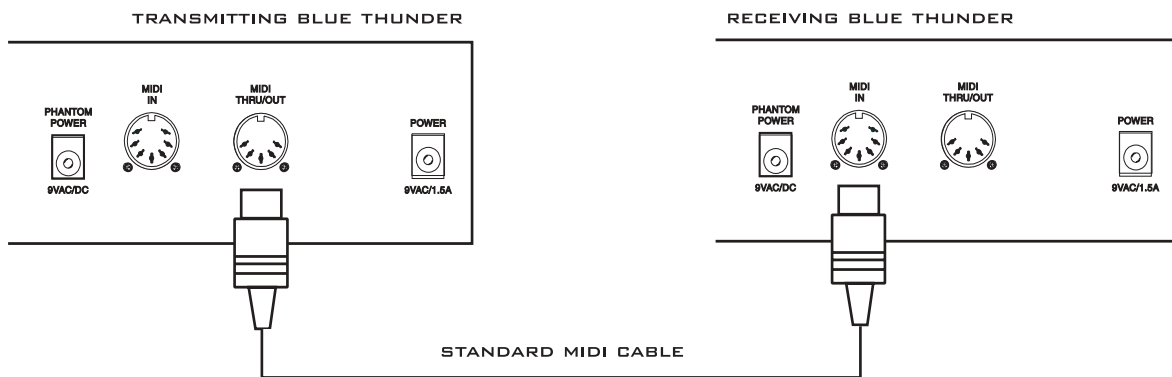
STORED

MIDI Dump/Load

Any or all of the Blue Thunder presets may be dumped to a sequencer or another Blue Thunder via system exclusive messages. The information exchanged when performing a MIDI Dump consists of parameter values, title characters and controller assignment information. When dumping a single preset into another Blue Thunder, the dumped preset may be loaded into any preset location on the receiving Blue Thunder.

To dump a single Blue Thunder preset into another Blue Thunder

Step 1   Connect a standard MIDI cable from the MIDI OUT of the transmitting Blue Thunder to the MIDI IN on the receiving Blue Thunder.

IMPORTANT: *Do not allow a looping connection from the MIDI OUT/THRU of the receiving Blue Thunder back to the MIDI IN of the transmitting Blue Thunder.*

TRANSMITTING BLUE THUNDER   RECEIVING BLUE THUNDER

PHANTOM POWER   MIDI IN   MIDI THRU/OUT   POWER   9VAC/DC   9VAC/1.5A

PHANTOM POWER   MIDI IN   MIDI THRU/OUT   POWER   9VAC/DC   9VAC/1.5A

STANDARD MIDI CABLE

Step 2   Press the EDIT button to enter the "EDIT MODE"

EDIT MODE

Step 3   Turn the FUNCTION SELECT controls on both the transmitting and receiving Blue Thunders until "MIDI DUMP/LOAD" is displayed on each.

MIDI DUMP/LOAD
TRANSMITTING Blue Thunder

MIDI DUMP/LOAD
RECEIVING Blue Thunder

Step 4   Turn the PARAMETER SELECT control on each unit one step clockwise to "PR DUMP/LOAD".

1 PR DUMP/LOAD
TRANSMITTING Blue Thunder

1 PR DUMP/LOAD
RECEIVING Blue Thunder

46

Step 5   Turn the PRESET control on the transmitting Blue Thunder to the preset that is to be dumped into the receiving Blue Thunder. As the PRESET control is turned, the preset number will be displayed in the first three characters of the display.

```
┌─────────────────────────────────┐
│  32   PR DUMP/LOAD              │
└─────────────────────────────────┘
```
TRANSMITTING BLUE THUNDER

Step 6   Use the PRESET control on the receiving Blue Thunder to select the preset location to store the received preset. (The preset currently stored at the selected location will be lost when the new preset is received, therefore caution should be used when selecting a preset location.)

```
┌─────────────────────────────────┐
│  122  PR DUMP/LOAD              │
└─────────────────────────────────┘
```
RECEIVING BLUE THUNDER

Step 7   To initiate the dump, press the STORE button on the transmitting Blue Thunder. The transmitting Blue Thunder will display the preset number being dumped and "DUMPED". The receiving Blue Thunder will display the preset location being stored to and "RECEIVING..." while it receives and stores the preset parameters and title.

```
┌─────────────────────────────┐        ┌─────────────────────────────┐
│  32   DUMPED               │        │  122   RECEIVING...         │
└─────────────────────────────┘        └─────────────────────────────┘
```
TRANSMITTING BLUE THUNDER   *RECEIVING BLUE THUNDER*

After all the information for the dumped preset is stored, the receiving Blue Thunder will display "LOADED". The receiving Blue Thunder also recalls the loaded preset at this time so that it may be verified.

```
┌─────────────────────────────────┐
│  122  LOADED                   │
└─────────────────────────────────┘
```
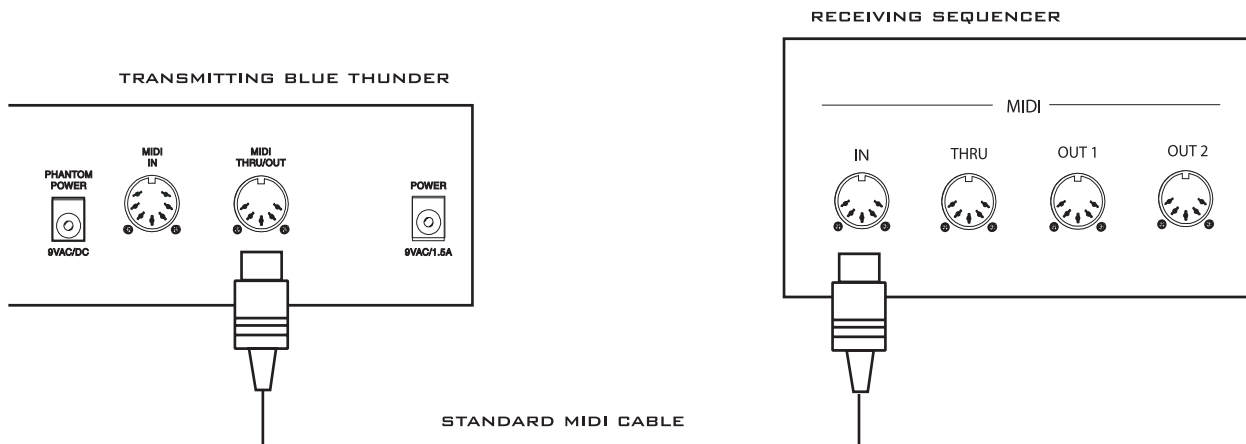*RECEIVING BLUE THUNDER*

Note: *If there is an error in transmission, the unit will display "RECEIVE ERROR". Should this occur, check connections and try again. If other errors occur, check the Error Messages chart in the Appendix.*

To dump a single Blue Thunder preset into a sequencer

Note: *When performing data dumps to and from the Blue Thunder, always perform the dump in real time sequence mode. This will ensure that data loaded back into the Blue Thunder is not sent faster than the Blue Thunder can receive it.*

Also, make sure that the sequencer's MIDI filter is set to accept SYSX information.

Step 1 Connect a standard MIDI cable from the MIDI OUT of the transmitting Blue Thunder to the MIDI IN on the receiving sequencer.

Step 2 Press the EDIT button to enter the "EDIT MODE"

EDIT MODE

Step 3 Turn the FUNCTION SELECT controls on the transmitting Blue Thunder until "MIDI DUMP/LOAD" is displayed.

MIDI DUMP/LOAD
TRANSMITTING BLUE THUNDER

Step 4 Turn the PARAMETER SELECT control on the transmitting Blue Thunder until "BULK DUMP/LOAD" is displayed.

BULK DUMP/LOAD
TRANSMITTING BLUE THUNDER

Step 5 Start the sequencer recording.

RECORD

Step 6   Press the STORE button on the Blue Thunder to initiate the data dump. As the Blue Thunder performs the dump, it will display "XXX DUMPED" - where "XXX" = the number of the data string currently transmitting (i.e. strings 1-254 are presets, titles, controller information and 2-tap delay information; string 255 contains program mapping information; and string 256 contains miscellaneous information. Contact Rocktron for information on how to receive a detailed MIDI spec).

XXX DUMPED

TRANSMITTING BLUE THUNDER

Step 7   After the Blue Thunder displays "TRANS COMPLETE", stop the sequencer. The sequencer should have recorded all of the data that was dumped from the Blue Thunder. Keep this data stored on a disk in a safe place. Turn the PARAMETER SELECT control to continue.

STOP

To reload user data from a sequencer

Step 1   Connect a standard MIDI cable from the MIDI OUT of the transmitting sequencer to the MIDI IN on the receiving Blue Thunder.

<u>**IMPORTANT**</u>:   *Do not allow a looping connection from the MIDI OUT/THRU of the receiving Blue Thunder back to the MIDI IN of the transmitting sequencer.*

Step 2   Press the EDIT button to enter the "EDIT MODE"

```
EDIT MODE
```
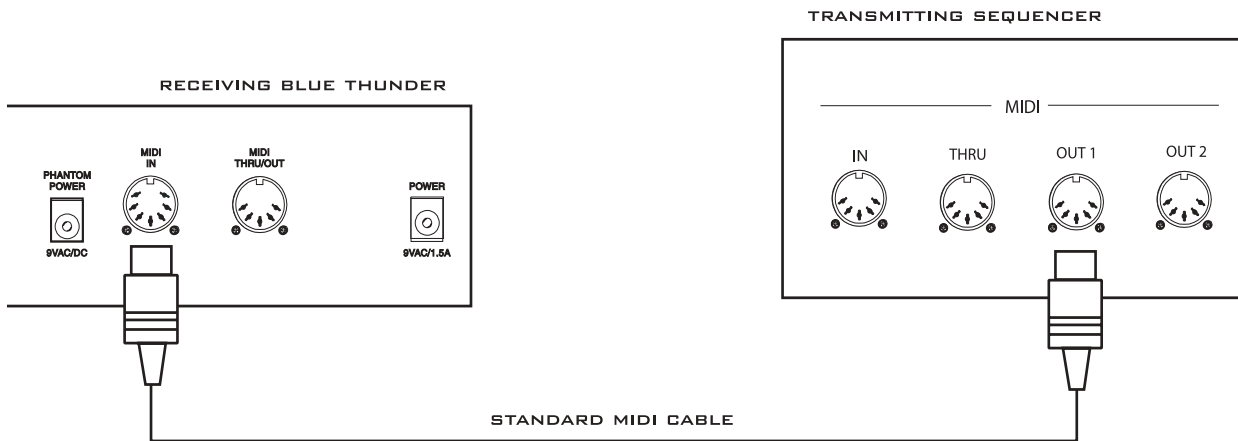
Step 3   Turn the FUNCTION SELECT controls on both the receiving Blue Thunder until "MIDI DUMP/LOAD" is displayed.

```
MIDI DUMP/LOAD
```
RECEIVING BLUE THUNDER

Step 4   Turn the PARAMETER SELECT controls on the receiving Blue Thunder until "BULK DUMP/LOAD" is displayed.

```
MIDI DUMP/LOAD
```
RECEIVING BLUE THUNDER

Step 5   Play back the data stored on the sequencer. The Blue Thunder will display the data strings as it is storing them. Each data string will appear with the word "LOADED". After all the user data has been loaded, the Blue Thunder will display "LOAD COMPLETE". Do not play back the data from the sequencer faster than it was loaded, as errors may occur (errors may also occur if any knob is turned or any button is pressed before the message "LOAD COMPLETE" appears).

```
┌─────────────────────────────────────┐
│         LOAD COMPLETE                │
└─────────────────────────────────────┘
```
RECEIVING BLUE THUNDER

If errors occur during transmission, the unit will display "RECEIVE ERROR" for transmission errors and "XMEM ERROR" for internal hardware errors. Errors occurring in transmission does not indicate that all of the received data is corrupted. Only the transmission string where the error occurred is corrupted.

*   **When receiving a Bulk Load, it is important that the data loaded to the Blue Thunder is not transmitted faster than it was originally dumped from the Blue Thunder. If information is sent too fast to the Blue Thunder, an error will occur.**

When dumping information from a data storage device, such as an Alesis Data Disk, it is necessary to perform the dump in *sequence* mode rather than *sysx* mode. Sequence mode will dump the information back to the Blue Thunder at the same rate as it was received from the Blue Thunder. The Blue Thunder can receive a data dump at about 65Hz (or about 1 byte every 15 milliseconds).

Factory Restore

The Factory Restore function allows you to restore altered Blue Thunder presets to their original condition as shipped from the factory. Either the entire Blue Thunder memory can be restored, a single preset can be restored to any preset location, or the controller information alone can be restored.

Restoring a single factory preset:
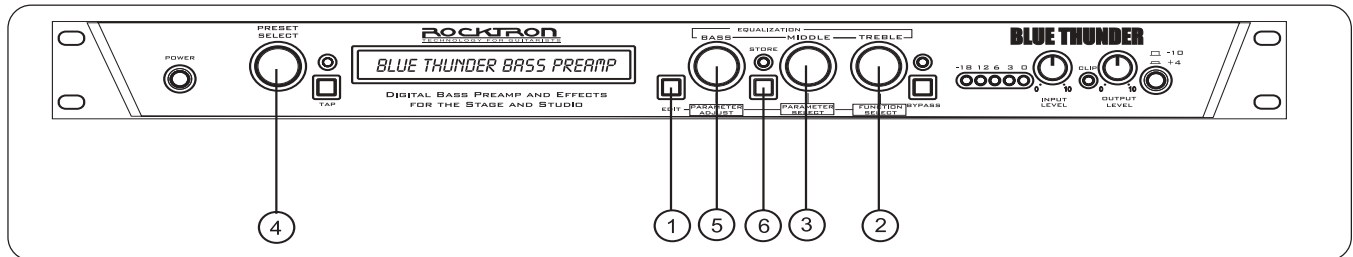
Step 1   Press the EDIT button to enter the "EDIT MODE"

$$\boxed{\textit{EDIT MODE}}$$

Step 2   Turn the FUNCTION SELECT control clockwise to "FACTORY RESTORE".

$$\boxed{\textit{FACTORY RESTORE}}$$

Step 3   Turn the PARAMETER SELECT control <u>one</u> <u>step</u> clockwise to "RESTR 1 TO 1". The number on the left is the original factory preset number to be restored. The number on the right is the preset location that the preset will be stored into.
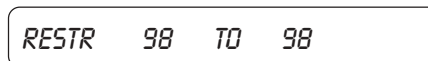
$$\boxed{\textit{RESTR} \qquad \textit{1 TO 1}}$$
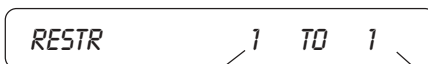
Factory preset to be restored   *Preset location to store into*

Step 4   Turn the PRESET control to select the factory preset to be restored.

$$\boxed{\textit{RESTR} \qquad \textit{98 TO 1}}$$

Step 5   Turn the PARAMETER ADJUST control to select the preset location to store the restored preset into.

$$\boxed{\textit{RESTR 98 TO 98}}$$

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> **!! CAUTION !!**
> **Pressing the STORE button at this time will overwrite**
> **the current preset with the displayed factory preset.**

Step 6   Press the STORE button to begin restoring the selected preset into the selected location. After the process is completed, the display should read "ERRORS 0". This represents the number of bytes that the Blue Thunder found did not initialize properly. Any number of errors other than "0" means that the Blue Thunder may not have initialized properly and the process should be repeated.

```
ERRORS                    0
```

   The Blue Thunder will remain in this condition until the FUNCTION SELECT control is turned to exit the Factory Restore function. The preset currently recalled will be the preset most recently restored into the current location.

Restoring the Blue Thunder memory (all presets):

> # !! CAUTION !!
> **This procedure will permanently erase all user presets (1-128) and replace them with the original factory presets. If you have altered and stored presets which you do not want to erase, do not perform the following procedure.**
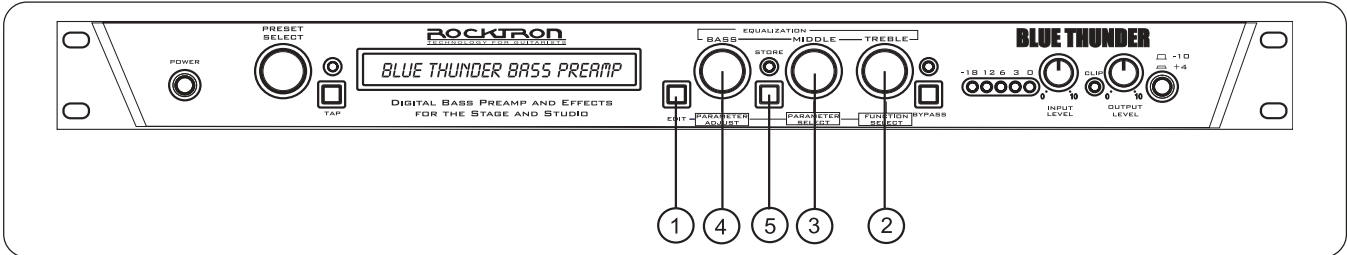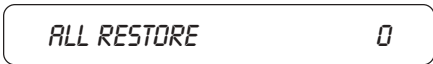

Step 1   Press the EDIT button to enter the "EDIT MODE"

> *EDIT MODE*

Step 2   Turn the FUNCTION SELECT control clockwise to "FACTORY RESTORE".

> *FACTORY RESTORE*

Step 3   Turn the PARAMETER SELECT control two steps clockwise to "ALL RESTORE 0".

> *ALL RESTORE   0*

Step 4   A specific code number must be entered to restore the Blue Thunder memory. Use the PARAMETER ADJUST control to enter the number "243".

> *ALL RESTORE   243*

> # !! WARNING !!
> **Pressing the STORE button at this time will permanently erase all user presets and replace them with the original factory presets. If you have altered and stored presets which you do not want to erase, turn the FUNCTION SELECT control to exit this function.**

Step 5   Press the STORE button at this time to initiate the All Restore procedure and erase all current Blue Thunder presets, replacing them with the original factory presets. The Blue Thunder will display "INITIALIZING" as the Blue Thunder memory is restored.

```
┌─────────────────────────────────────────┐
│              INITIALIZING               │
└─────────────────────────────────────────┘
```

After the All Restore process is completed, the display should read "ERRORS 0". This is the number of bytes that the Blue Thunder found that did not initialize properly. Any number of errors other than "0" means that the Blue Thunder may not have initialized properly and the process should be repeated.

```
┌─────────────────────────────────────────┐
│  ERRORS                            0    │
└─────────────────────────────────────────┘
```

The Blue Thunder will remain in this condition until the FUNCTION SELECT control is turned to exit the Factory Restore function. The preset currently recalled will be the preset most recently restored into the current location.

Restoring the Blue Thunder controller assignments:

The controller assignments for the Blue Thunder can also be reinitialized without affecting presets and other stored information.

To reinitialize only the controller assignments, enter a code number of "244" at Step 3 on the preceding page (instead of the "243" shown).

Selecting a Power On Preset

     The Blue Thunder allows you to store a Power On preset which will always be recalled when the unit is turned on.
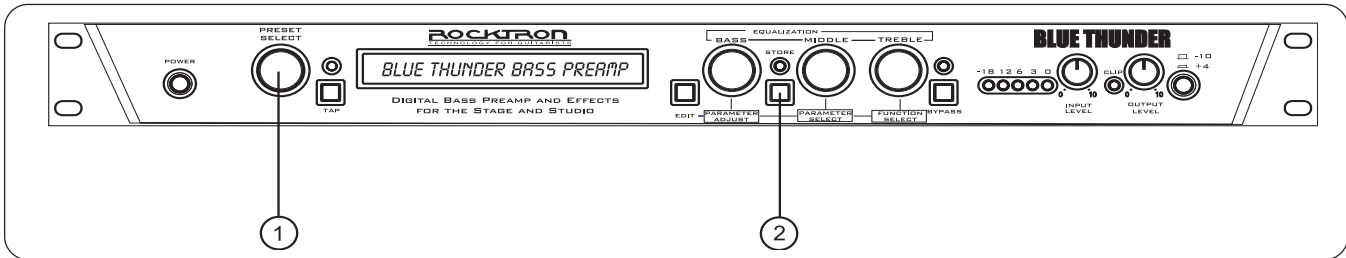
Step 1   Turn the PRESET control to the preset number you wish to be recalled each time the unit is turned on.

Step 2   Press the STORE button while viewing the preset number and title to save it as the Power On preset.

8. Appendix

ERROR MESSAGES

Message	Possible Reason	Corrective Action
MEMORY ERROR	CODE BYTE IS NOT CORRECT IN EEPROM MEMORY.	*MAKE SURE EEPROM IS TIGHT IN SOCKET.* *MAKE SURE WITHIN CORRECT OPERATING TEMPERATURE.*
DUMP ERROR	MIDI INFORMATION IS BEING RECEIVED AT THE MIDI IN AT THE SAME INFORMATION IS BEING DUMPED.	*DISCONNECT MIDI CORD AT MIDI IN OF TRANSMITTING BLUE THUNDER.*
RECEIVE ERROR	MIDI SYSTEM EXCLUSIVE INFORMATION WAS NOT RECEIVED CORRECTLY.	*BULK LOAD WAS TRANSMITTED TOO FAST.* *CHECK SUM BYTE WAS NOT CORRECT.* *DATA STRINGS NOT CORRECT LENGTH.* *DATA STRINGS OUT OF ORDER.*
XMEM ERROR	EEPROM MEMORY IS NOT BEING STORED TO CORRECTLY.	*MAKE SURE EEPROM IS TIGHT IN THE SOCKET.* *MAKE SURE WITHIN THE CORRECT OPERATING TEMPERATURE.*
LOAD ERRORS	MIDI SYSTEM EXCLUSIVE INFORMATION WAS NOT RECEIVED CORRECTLY OR STORED CORRECTLY.	*CHECK RECEIVE ERROR AND XMEM ERROR.*

MIDI IMPLEMENTATION

Blue Thunder

Date: March 1, 2003   Version: 1.01

FUNCTION		TRANSMITTED	RECOGNIZED	REMARKS
BASIC	DEFAULT	1-16	1-16	May be saved in
CHANNEL	CHANGED	1-16	1-16	non-volatile memory
MODE	DEFAULT	X	X	
	MESSAGES	X	X	
	ALTERED	X	X	
NOTE				
NUMBER	TRUE VOICE	X	X	
VELOCITY	NOTE ON	X	X	
	NOTE OFF	X	X	
AFTER	KEY'S	X	X	
TOUCH	CHANNEL	X	X	
CONTROL		X	O	
CHANGE**				
PROGRAM	TRUE NUMBER	O	O	
CHANGE*				
SYSTEM		O	O	For Bulk Dump/Load
EXCLUSIVE				and Preset Dump/
				Load
SYSTEM	SONG POSITION	X	X	
COMMON	SONG SELECT	X	X	
	TRUE REQUEST	X	X	
SYSTEM	CLOCK	X	X	
REAL TIME	COMMANDS	X	X	
AUXILIARY	LOCAL ON/OFF	X	X	
MESSAGES	ALL NOTES OFF	X	X	
	ACTIVE SENSING	X	X	
	SYSTEM RESET	X	X	

```
O=YES
X=NO
```

*   Actual MIDI program value sent is 0-127, corresponding to presets 1-128.
Optional implementation of program mapping also available.

** The control number may be from 0-120, or OFF. An upper and lower
range may also be specified for most parameters.

TECHNICAL DATA

MEASUREMENT		***CONDITIONS***
Maximum Input:	+20dBu	*Input Level pot minimum*
Maximum Output:	+20dBu	*Output Level pot maximum*
Nominal Input Range: (16dB Headroom)	+4dBu to -21dBu	*Input Level pot minimum* *Input Level pot maximum*
Input Impedance:	470K ohms	
Output Impedance:	120 ohms	
Dynamic Range:	104dB (HUSH IN) 94dB (HUSH OUT)	*Peak Signal/A Weighted Noise Floor, Direct Level = +6dB, Digital, Effects Level = -∞*
THD+N	.009%	*1kHz, -5dB input level 22Hz to 22kHz bandwidth Direct Level = +6dB, Digital, Effects Level = -∞*
Dry Frequency Response	(10Hz to 30kHz) ±.25	
Wet Frequency Response	(20Hz - 19.5kHz) ±3dB	

Check out some of our other products:

<u>Rack Gear:</u>

Gainiac *(preamp w/12ax7 tube)*   **Chameleon 2000** *(preamp w/multi-effects)*

Voodu Valve *(preamp w/12ax7 tube and multi-effects)*

Prophesy *(our top of the line preamp with multi-effects)*

Xpression*(guitar and bass multi-effects)* **HUSH Super C** *(guitar noise silencing system)*

Vendetta VP4 Preamp *(All Tube 4-Channel Guitar preamp - 2 Rack Space)*

<u>Stomp Boxes/Pedal:</u>

Rampage Distortion, Metal Planet Distortion, Silver Dragon Tube Distortion, Deep Blue Chorus,

Tsunami Chorus, Austin Gold Overdrive, Sonic Glory Overdrive, Big Crush Compressor, Short

Timer Digital Delay, X-Tune Pedal Tuner, Banshee Talk Box, HUSH The Pedal, Surf Tremolo,

Black Cat Moan Wah, HEX Volume/Expression Pedal

<u>Electric Guitar - Acoustic Guitar and Bass Amplifiers:</u>

Vendetta Head*(100 W Head 4-Channels All Tube - MIDI Switchable)*

Vendetta Combo *(100W 2x12 Combo - Celestion 90s all Tube -4-Channel - MIDI Switchable)*

R80DSP *(80W 1x12 Amp w/Digital Effects)*   **RT80** *(80W 1x12 Amp w/Reverb & Built-in Tuner)*

R120DSP *(120W 2x10 Amp w/Digital Effects)* **R120C** *(120W 2x12 Amp w/Stereo Chorus and Reverb)*

RT122C *(120W 2x12 Amp w/Stereo Chorus, Reverb & Chromatic Tuner)*

R50DSP *(50 Watt 2x8"Guitar Amp w/Digital Effects)*

R50C *(50 Watt 2x8"Guitar Amp w/Reverb & Chorus)*

R20 *(20 Watt 1x8"Amp w/Reverb)*   **R10** *(10 Watt 1x6.5")*

ACOUSTIC *(60 Watt Acoustic Amp with Chorus & Reverb)*

RA50DSP *(50W Acoustic Amp w/Digital Effects - Wedge Shape)*

RA30DSP *(30W Acoustic Amp w/Digital Effects - Wedge Shape)*

RB20 *(Bass Amp 20W with 8" Speaker)*   **RB30** *(Basss Amp 30W with 10" Speaker)*

RB60 *(Bass Amp 60W with 12" Speaker)*   **RB100** *(Basss Amp 100W with 15" Speaker)*

<u>Foot Controllers:</u>

MIDI Mate *(Midi Foot Controller)*   **MIDI XChange** *(MIDI Footcontroller)*

All Access *(Midi Foot* Controller   **RMM900***(7-pin Din MIDI Cable)*

RFS1 and RFS2 *(Single and Double Latching Footswitches for Rampage Amps)*

ROCKTRON
BASS TECHNOLOGY

BLUE THUNDER

Suggested MIDI Footcontrollers:

Rocktron All Access
Rocktron MIDI Mate
Rocktron MIDI XChange

WWW.ROCKTRON.COM

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