

# PROTEUS

MASTER PERFORMANCE SYSTEM

## OPERATION MANUAL

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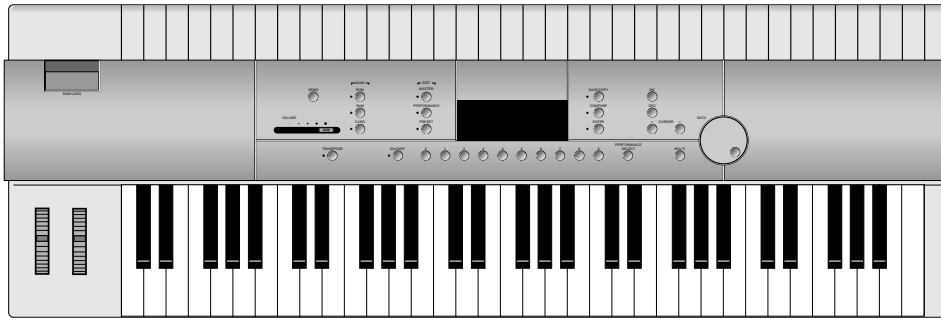
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# ***INTRODUCTION***



## INTRODUCTION



### ***What is the Proteus Master Performance System?***

The Proteus Master Performance System is first and foremost a keyboard instrument with natural instrument sound. This is because its sounds are based on actual digital recordings of “real” instruments. In this way Proteus is very similar to a sampling instrument, except that we have done the sampling for you. The Proteus comes loaded with four megabytes of the highest quality 16 bit samples, selected from the Emulator III sound library. Everything you need to play and compose in a wide range of contemporary styles. You simply plug in and play.

But this is only the beginning. Proteus allows you to take sounds apart and reassemble them into entirely new sounds by combining parts of one sound with another. There's no shortage of sounds either. Proteus contains 100 permanent preset sounds and 100 user-changeable sounds on board. In addition, RAM cards hold another 100 user presets each so you can build a custom library of your favorite sounds. After you have created your sound, you can add reverb or a full range of other studio quality effects using two separate effects at once.

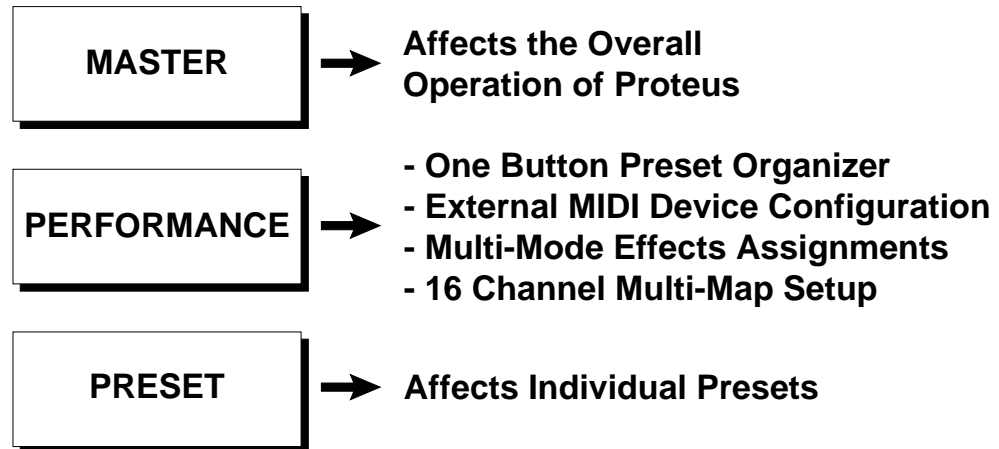
*Master Performance System* describes Proteus' powerful master controller capabilities. You can manage your entire MIDI setup by means of the velocity and pressure-sensitive keyboard, which can be split into four sections. A powerful Performance Mode allows you to reconfigure your other MIDI instruments during a live performance. Other features include user-definable alternate tunings and of course, an extensive MIDI implementation.

Proteus also features 32 voice polyphony with layering capabilities (up to 8 sounds on each key) and the ability to respond multi-timbrally to all 16 MIDI channels. It is ideally suited for multitrack sequencing and composing using a MIDI sequencer.



## THE PROTEUS SYSTEM

The Proteus can be divided into 3 main sections:



■ The **MASTER** section affects the overall operation of Proteus, such as overall tuning or the MIDI Mode. Functions in the Master section stay the same when you change presets.

■ The **PERFORMANCE** section allows you to program overall setups or *Maps* which you may want to associate with a particular song or song set. There are 5 Performance Maps in the Proteus and you can store another 5 Performance Maps on the RAM Card.

Each Performance Map includes:

- A group of 10 *Quick Key* assignments allow you to call up any preset with one button press.
- MIDI receive parameters: Volume, Pan, Preset and Program Change On/Off, for all 16 MIDI channels.
- Multi-mode Effects Assignments for all 16 MIDI channels: Effect Type and Amount.
- Up to 5 MIDI commands may be sent out to your other gear including: Program Change, Song Select, Song Start, Song Stop, Volume, Pan, *plus* one user-definable MIDI command up to 320 bytes long.

■ The **PRESET** section contains the parameters which make up the actual sounds or *Presets*. Parameters such as: the type of instrument, or the tuning of each instrument are found in the Preset section.

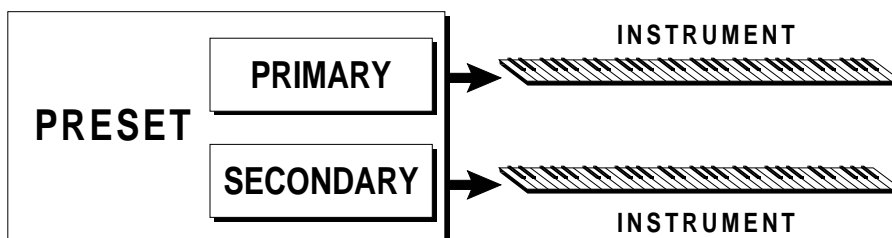
### ■ MORE INFO

Master - Page 25  
Performance - Page 41  
Preset - Page 81

▼ Learn the Basic Operation of Proteus before you move on to the Performance Maps.

## THE PRESET

A Preset is organized as shown in the diagram below.



● The *Preset* is a complete set of all program parameters for a complete Proteus sound. There are 300 preset locations in the Proteus arranged into 3 banks: ROM, RAM, and Card banks.

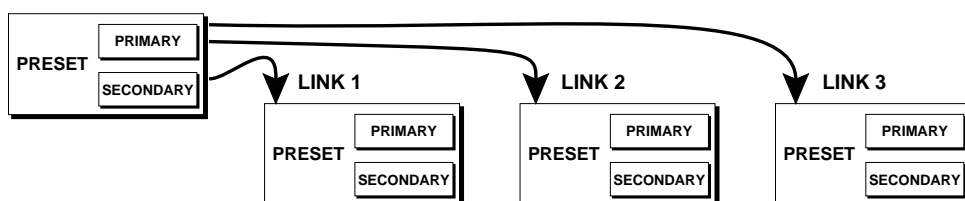
- 100 ROM Presets - Unalterable factory presets
- 100 RAM User Presets - Presets may be changed or modified
- 100 RAM Card Presets - Presets may be changed or modified

**The RAM Card is a convenient way to transfer presets in and out of the instrument.**

● Each preset consists of one or two instruments. An instrument is a complete set of samples which cover the entire keyboard range. An instrument can be assigned to each of the *Primary* and *Secondary* layers of the preset.

● The primary and secondary layers are essentially two complete sounds stacked or placed adjacent to each other, and can be switched or crossfaded together in various ways.

● Up to four presets may be assigned to the keyboard at any time. Presets may also be *Linked* to create massive stacked sounds.

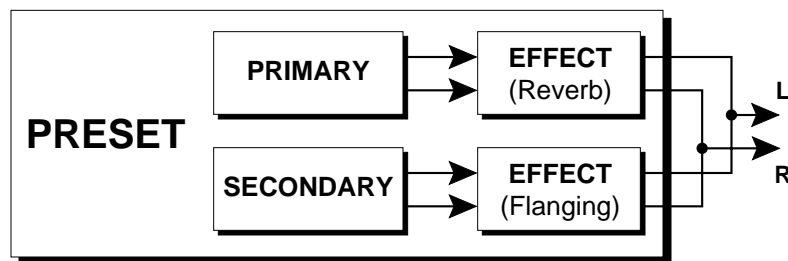


## EFFECTS ROUTING

Proteus contains **two** digital effects sections which can be used to apply Reverb, Flanging, Delay and other effects to the final sound. An effect can either be programmed to be a part of the preset, or can be assigned to an *Effects Buss* so that multiple presets can share effects.

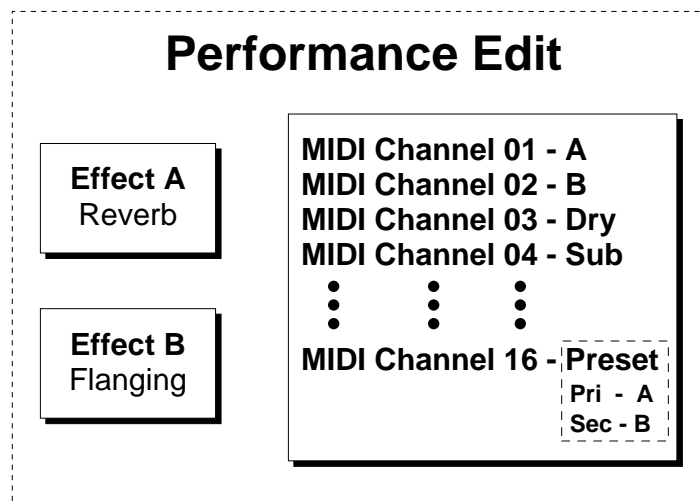
● When using a single preset, the *Effect* is programmed as a part of the *Preset*.

■ **MORE INFO**  
See page 103



### EFFECTS ROUTING FOR A SINGLE PRESET

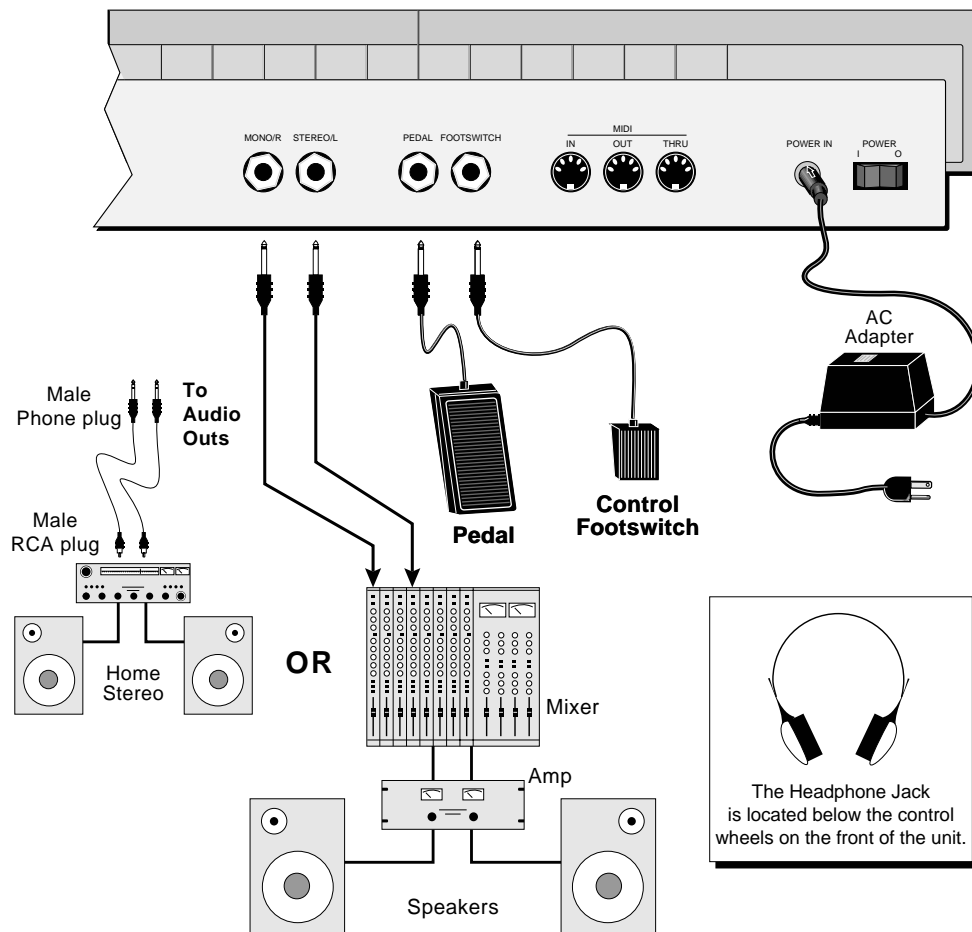
● When using multiple presets the *Effect Buss* assignment (A, B, Sub, Dry or Preset) is programmed in the *Performance Edit menu* by MIDI channel. Preset allows the primary and secondary buss selections in the preset to be used. In multiple preset mode (multimode) the *actual effects and their parameters*, are selected in the *Performance Edit* menu.



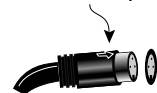
### EFFECTS ROUTING FOR MULTIPLE PRESETS

## CONNECTION INSTRUCTIONS

### Setup #1 BASIC SETUP



Insert Power Plug with Arrow Up



AC Adapter

▼ Make sure that your AC Adaptor is of the correct voltage for your part of the world!

USA ..... 110 Volts  
U.K. .... 240 Volts  
Europe..... 220 Volts  
Japan 100-110 Volts  
Mexico ..... 110 Volts  
S. America 110 Volts

The Headphone Jack is located below the control wheels on the front of the unit.

**Outputs** - Use a high quality amplification and speaker system such as a keyboard amplifier or home stereo system. A stereo setup is highly desirable because of the added realism of stereophonic sound. Plug stereo headphones into the headphone output jack on the front of the unit below the pitch and modulation wheels. The Right Main output jack serves as a mono output when the left jack is not plugged in.

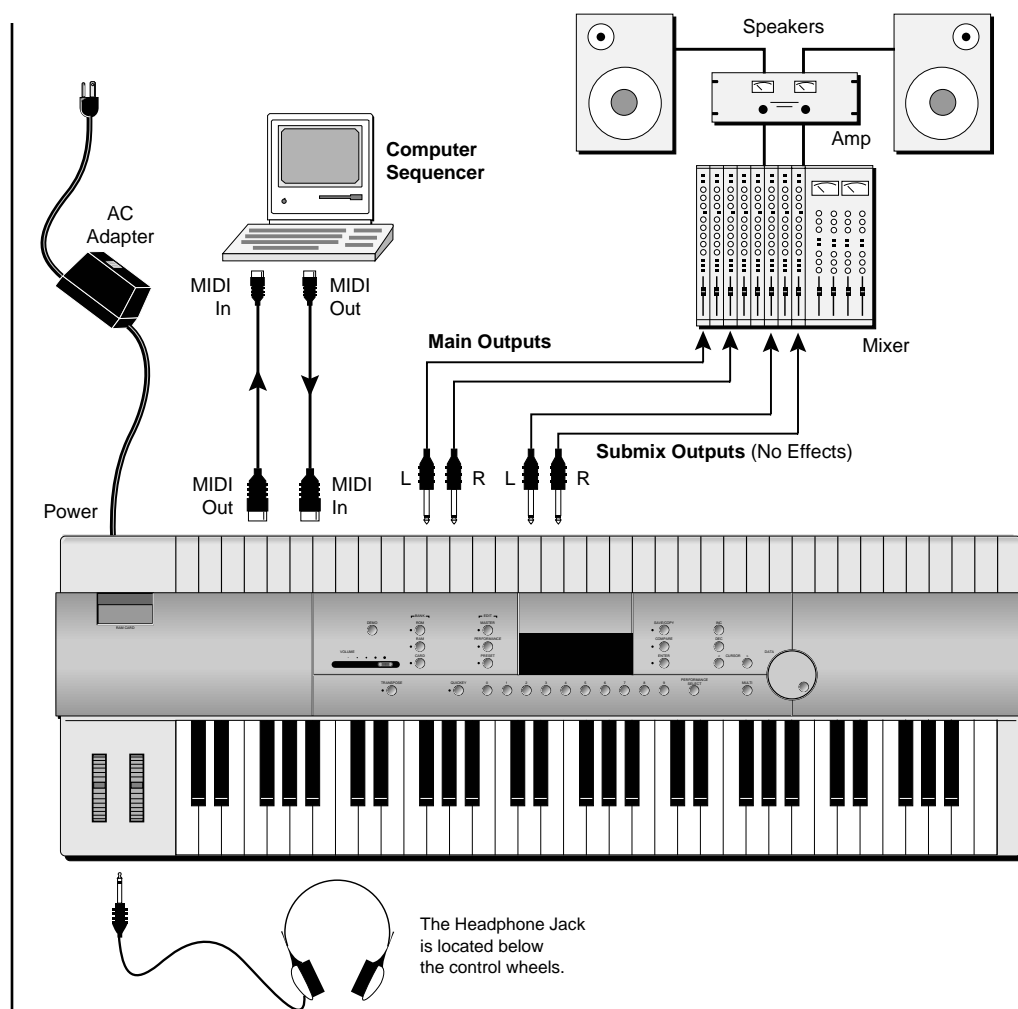
**Footswitch** - Connect either a momentary-open or momentary-closed type of footswitch to the footswitch input jack. Proteus automatically senses the type upon power-up. The footswitch can control various functions (such as sustain) as programmed in each preset.

**Pedal** - Connect a resistance type control pedal to the Pedal input jack. The pedal can control various functions (such as volume) as programmed in the preset.

■ The Control Footswitch and Pedal are available from your E-mu Dealer.

■ See page 38 for the footpedal wiring diagram.

## Setup #2 SEQUENCING SETUP



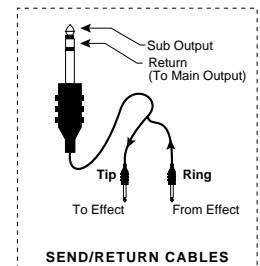
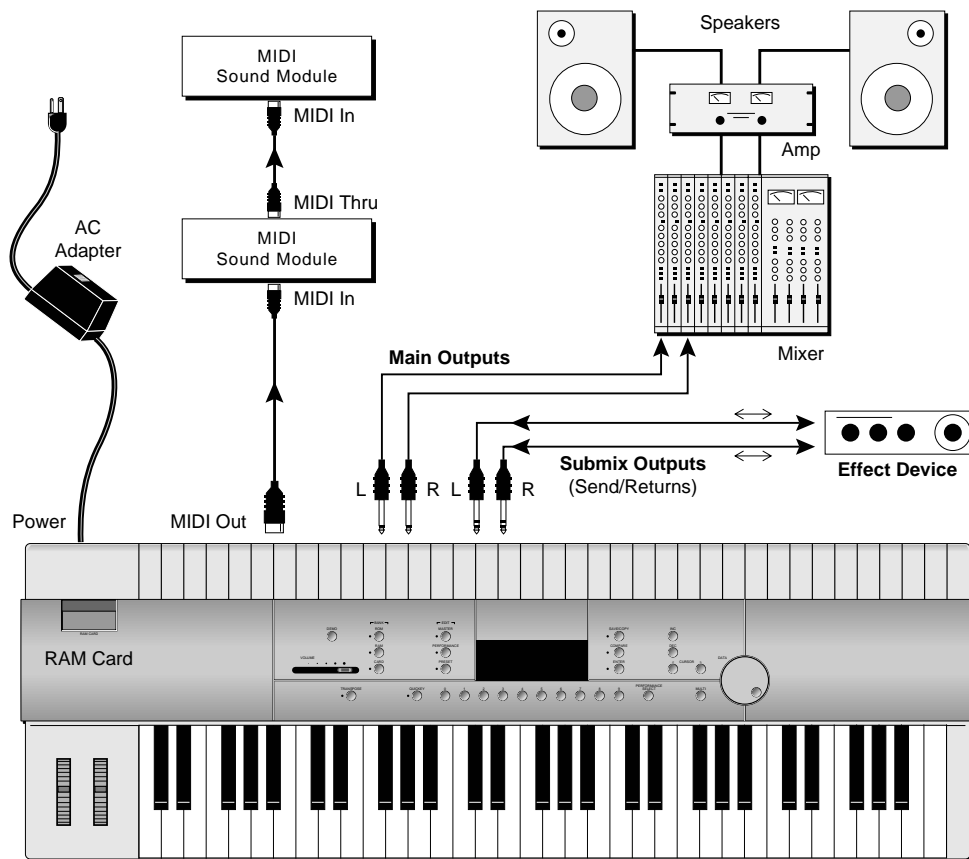
**MIDI In** - MIDI messages from the MIDI sequencer as well as the keyboard control Proteus. Connect the MIDI In of Proteus to the MIDI Out connector of your MIDI Sequencer.

**MIDI Out** - The MIDI Out jack sends MIDI data to the sequencer.

**Settings** - Computer sequencer is set to Echo Thru (incoming MIDI data is sent back out) and Proteus is set to Local Control Off (keyboard is disconnected from the internal sounds).

**Outputs** - Always connect Proteus in stereo (if possible) to a high-quality audio system. The Submix outputs can be used to separately process certain presets or instruments using outboard effects devices.

## Setup #3 - MASTER KEYBOARD



This diagram shows the construction of the Send/Return cables.

Proteus can serve as a *Master* keyboard controlling other MIDI gear as well as its internal voices. The keyboard can be split in up to four locations each of which can be transmitted on a separate MIDI channel.

**MIDI Out**- The MIDI Out jack transmits MIDI data which originates in the Proteus such as (keyboard data, control wheel data, pedal data, footswitch data, and other MIDI data which may be programmed in the Performance section) to additional MIDI devices. See the *Basic Setup* diagram. Connect the MIDI Out of Proteus to the MIDI In connector of a MIDI device such as a sound module, another keyboard, or a MIDI controlled effects unit.

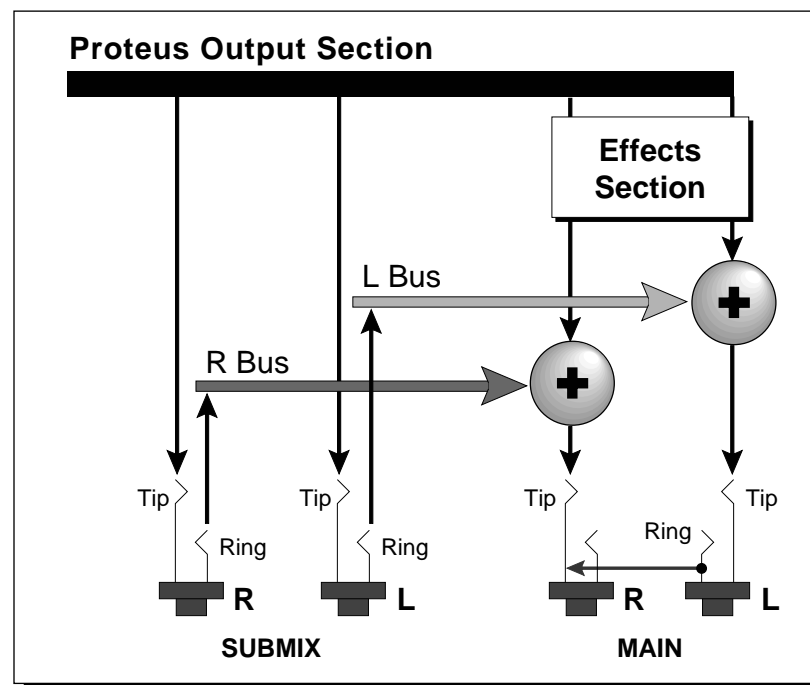
**Outputs** -Use a high quality amplification and speaker system such as a keyboard mixer and amplifier. The Right Main output jack serves as a mono output when the left jack is not plugged in. Each of the Submix Outputs are stereo jacks. The tip of each jack (accessed when a standard

■ See the Performance Edit section for detailed information on the split keyboard.

phone plug is inserted) connects to the left or right output. If a stereo plug is inserted, the Ring of the stereo plug serves a signal Return which sums into the Main outputs.

*Therefore, the Submix jacks can serve as effects sends and returns in order to externally process selected instruments and then return them to the main mix.*

The diagram shows the Submix jacks being used as send / returns in order to further process selected Proteus instruments without using the effect buss on the mixing board. In a pinch, the effect returns could be also be used to sum additional instruments into the main outputs of Proteus.



*The Submix jacks can be used as effect returns to the Main Outputs.*

### **POWER UP!**

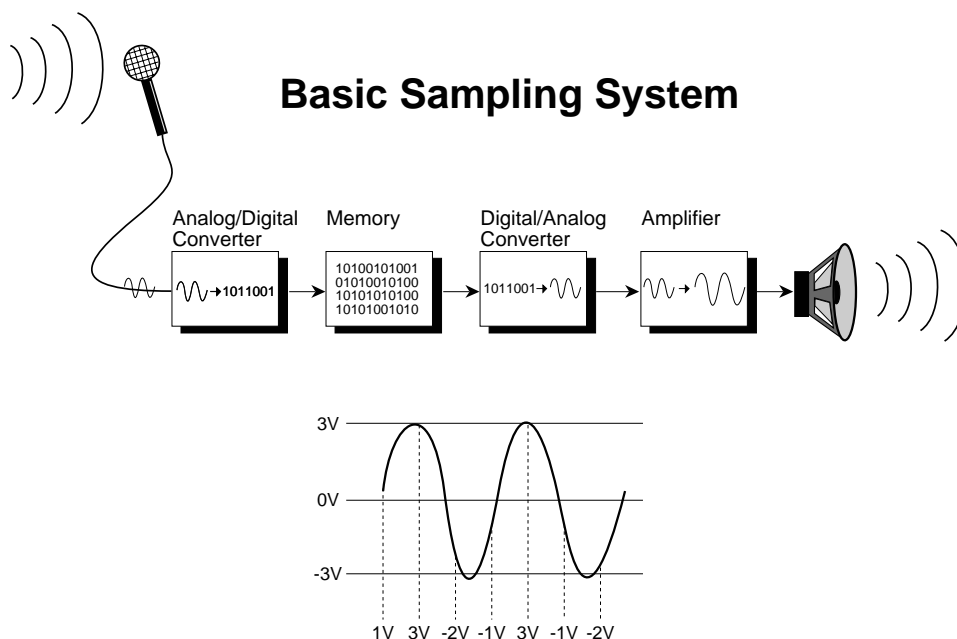
The power switch is located on the left rear panel of the unit. Proteus should be turned on first and your amplification system should be turned on last. When power is applied, the liquid crystal display will light, indicating that the Proteus is operating.

## the **PROTEUS** SOUND

The Proteus, unlike many synthesizers, utilizes digital recordings of real instruments for the basis of its sound. This is similar to a tape recorder except that in the Proteus, the sounds are permanently recorded on digital memory chips.

To perform this modern miracle, sounds and instrument waveforms are first sampled into the Emulator III, our top of the line, 16 bit stereo digital sampler. After the sounds and waveforms have been truncated, looped and processed, they are masked into the Proteus ROM (Read Only Memory) chips.

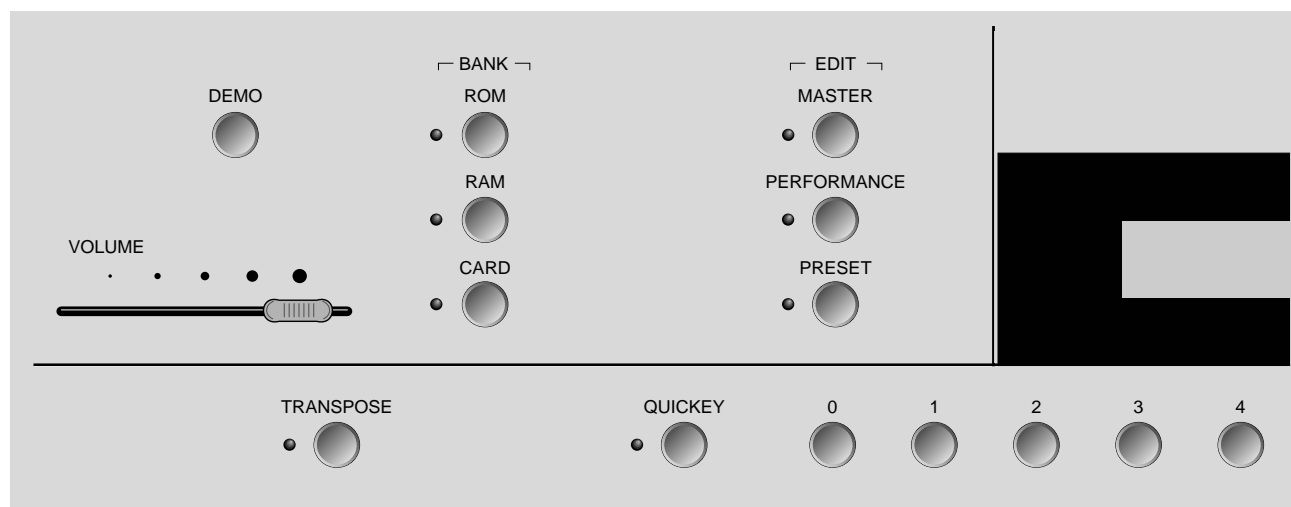
Conceptually, the sampling process is very simple, as shown in the Basic Sampling System diagram. As a sound wave strikes the diaphragm of a microphone, a corresponding voltage is generated. To sample the sound, the voltage level is repeatedly measured at a very high rate and the voltage measurements are stored in memory. To play the sound back, the numbers are read back out of memory, converted back into voltages, then amplified and fed to a speaker which converts the voltage back into sound waves. Of course, playing back 32 channels at different pitches tends to complicate matters, but this is basically how it works. In Proteus, we have left out the Analog/Digital converter stage since the sounds are already sampled for you.







## ***BASIC OPERATION***



■ **Volume** - Functions as the master volume control for all audio outputs. Note: For maximum dynamic range, set this control at full level.

■ **Demo** - Initiates the demo sequence. The sequence can be halted by pressing any front panel button. If a card containing a demo sequence is inserted, the sequence on the card will play.

■ **ROM/RAM/Card Bank** - Selects a bank of 100 presets as the active bank.

■ **Master Edit** - Contains parameters that affect the entire machine, not just certain presets. An illuminated LED to the left of the button indicates that you are in the *Master* menu.

■ **Performance Edit** - Allows you to edit the Performance parameters such as: Quick Key assignments, Effects settings, and Programmable MIDI commands. An illuminated LED to the left of the button indicates that you are in the *Performance Edit* menu.

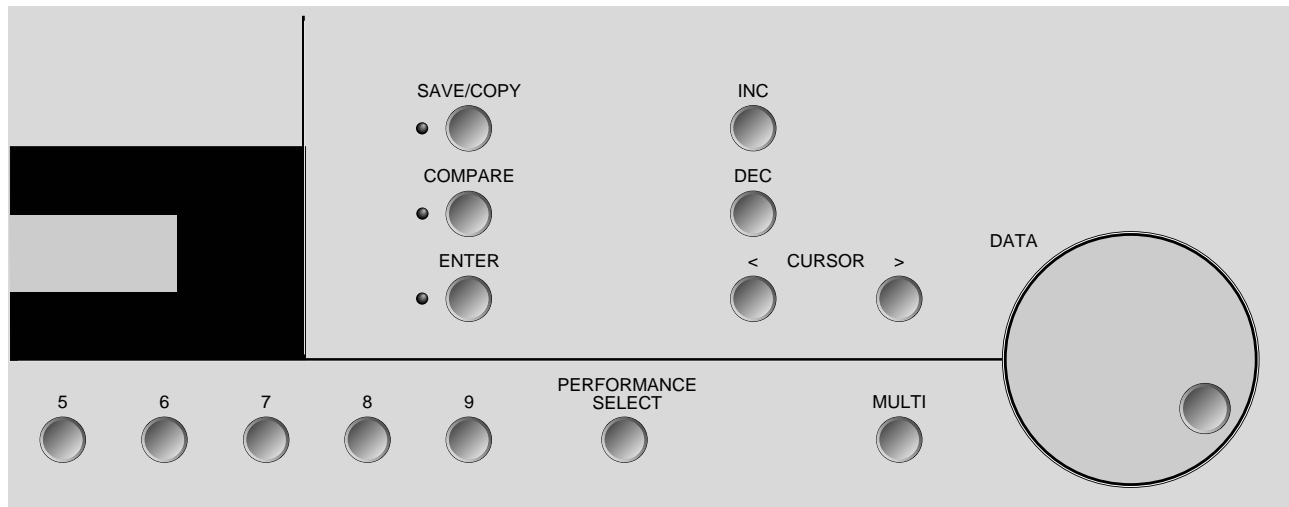
■ **Preset Edit** - Allows you to edit the parameters of a Preset. An illuminated LED to the left of the button indicates that you are in the *Preset Edit* menu.

■ **Transpose** - Transposes the key of the instrument in half-step intervals. While the Transpose button is held down, a transposition is specified by pressing a keyboard key relative to middle C up to +/- 12 semitones. The LED will be lit to indicate that a transposition is in effect. Numeric keys can also be used to select transpositions. Press middle C while holding the Transpose button to return to normal tuning. Transpose does not affect notes received over MIDI.

■ **Quick Key** - Turns the Quick Key function On or Off. Quick Key allows single button preset changes by pressing one of the preset select buttons 0-9. *See Performance Edit.*

■ **Numeric Buttons 0-9** - Are used to enter Preset numbers within a bank, select Quick Key assignments when Quick Keys are enabled, or select a Performance Map using the Performance Select button.

■ **Performance Select** - Selects Performances 0-9. Hold the button down and press one of the numeric keys to select a new Performance Map.



■ **Multi** - Activates the Multi-Map in the current Performance Map including effect routings and assignments. Multi allows Proteus to receive MIDI data on multiple channels. When Multi is Off, the MIDI mode (other than Multi) last specified in the Master menu is used.

■ **Save/Copy Button** - Allows you to:

- **Save a Preset to a RAM or Card location when in Preset Edit Mode.**  
*Press Copy/Save from within the Preset Edit menu. Select the new location and press Enter.*
- **Save a Performance Map to a RAM or Card location when in Performance Edit Mode.**  
*Press Copy/Save from within the Performance Edit menu. Select the new location and press Enter.*
- **Copy a Bank of 100 Presets to the RAM or Card when not in an Edit Mode.**  
*Press Copy/Save from the main menu. Select the desired bank copy function and press Enter.*
- **Copy effects parameters back and forth between a Preset and a Performance Map.**  
*Press Copy/Save from within any effects menu. Select the new location and press Enter (see page 107).*
- **Copy a Quick Key to another location (see page 44).**  
*Press Copy/Save from the Quick Key preset select screen. Select the desired destination and press Enter.*

■ **Compare** - Selects between the edited and un-edited version of a preset while in Preset Edit Mode. The LED lights to indicate that the original un-edited version is currently selected and no further changes can be made until Compare is turned Off.

■ **Enter** - Used to initiate some operations within the Proteus. The red LED above the Enter button flashes to let you know that the Proteus is waiting for your response. Enter also functions as a “Home” button, normally returning the cursor to the upper left corner of the display (or the lower left in the main screen).

■ **Inc / Dec Buttons** - These two buttons increment or decrement the value of the currently selected parameter by one each time they are pressed.

■ **Cursor** - These two buttons move the cursor in either direction to the next parameter on the display. (The cursor is a little flashing line underneath one of the parameters in the display.) Press one of the cursor buttons repeatedly until the cursor is underneath the desired parameter.

■ **Data Entry Control** - Used to change parameter values. The control increments or decrements the current value one unit with each click.

## BASIC OPERATION

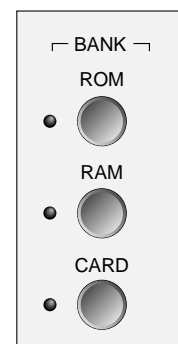
### PRESET SELECTION

The preset selection screen is shown below. This screen appears when the Proteus is first powered-up and when the Master, Performance Edit, and Preset Edit menus are all Off.



Presets are organized into 3 banks:

<b>0-99</b>	<b>ROM Presets</b>
<b>100-199</b>	<b>RAM Presets</b>
<b>200-299</b>	<b>Card Presets</b>



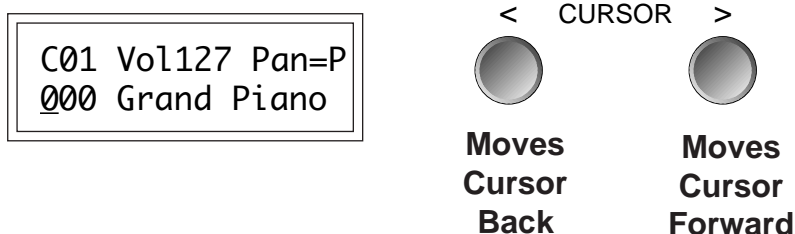
There are several ways in which presets may be selected.

- By rotating the data entry control, presets will be scrolled consecutively from 0-199 (0-299 with a memory card installed) when the cursor is underneath the preset number.
- The Increment/Decrement buttons increment or decrement the preset by one with each press when the cursor is underneath the preset number. If either button is held, the presets will rapidly scroll in the selected direction (inc=up, dec=down).
- When not in Quick Key mode, presets within one of the three banks may be selected by entering the desired preset number using the numeric keys (0-9). Presets may be selected by entering a three digit number. To quickly jump to another bank, simply press the desired bank button. The preset will be immediately selected.
- When Quick Key mode is turned on (and the Quick Key LED is lit), any preset may be selected by pressing a single numeric key (0-9). *For more information on Quick Key, see page 44.*
- Presets may be changed via a MIDI program change (if enabled).

## BASIC OPERATION

### MOVING THE CURSOR

The *Cursor* is the little flashing line in the display which is used to identify which parameter is being modified. The Cursor keys are used to move the *Cursor* around in the display.



To modify a parameter, press either the left or right cursor control repeatedly (or hold down the button) until the cursor is underneath the desired parameter, then use the data knob, increment/decrement buttons or numeric keys to change the number.

### ENTER

The Enter button is used to confirm some selections (such as saving a preset) and also functions as a "home" button to return the cursor to the upper left corner of the display (in the preset selection screen, home is the lower line). The Enter LED flashes to indicate that Proteus is waiting for your response.

### INCREMENT/DECREMENT AND DATA ENTRY KNOB

The increment/decrement buttons and data entry knob allow you to change value over the cursor. The increment/decrement buttons are handy in that they allow you to fine tune the value since they add or subtract one from the number with each pressing. If the increment/decrement buttons are held, they switch to a *fast* mode.

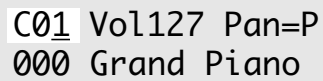
## BASIC OPERATION

■ The main screen shows the Preset, Volume and Pan information for all 16 MIDI channels. As the MIDI channel is changed, the preset name, volume and pan positions will also change.

■ The Volume Slider on the front panel is the master volume control and overrides the channel volume control.

### MIDI CHANNEL SELECTION

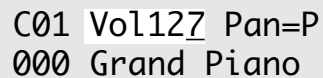
The channel number shown in the upper left corner of the main screen is the channel on which the keyboard will transmit data to other MIDI modules and the channel on which Proteus will receive when in Poly mode (the Basic Channel). Press either of the cursor buttons repeatedly until the cursor is underneath the MIDI Channel number. Rotate the data entry control (or use the inc/dec buttons) to select channels 1-16.



C01 Vol127 Pan=P  
000 Grand Piano

### CHANNEL VOLUME

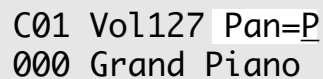
Channel volume controls how loudly the preset will play. When in Multiple preset mode (Multimode) it sets the volume of each of the MIDI channels. Press either of the cursor buttons repeatedly until the cursor is underneath the volume parameter. Rotate the data entry control (or use the inc/dec buttons) to set the volume level from 0 to 127. This is the same parameter as MIDI volume control #7, and changes made over MIDI will show in the display.



C01 Vol127 Pan=P  
000 Grand Piano

### CHANNEL PAN

Press either of the cursor buttons repeatedly until the cursor is underneath the pan parameter. Rotate the data entry control (or use the inc/dec buttons) to set the pan from -7 to +7 or "P". When "P" is selected, the pan value specified in the preset is used. This is the same parameter as MIDI pan control #10, and changes made over MIDI will show in the display.



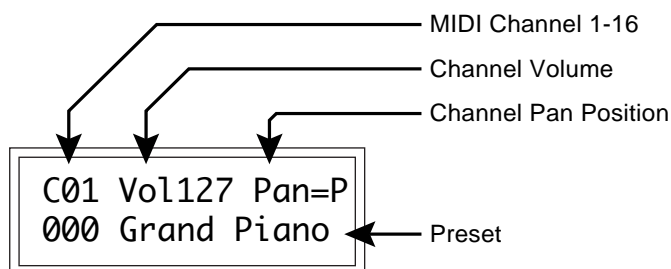
C01 Vol127 Pan=P  
000 Grand Piano

## BASIC OPERATION

### MULTI-TIMBRAL OPERATION

Multi-timbral operation means that the Proteus can play more than one preset at the same time. To access multiple presets on different MIDI channels simultaneously, follow these instructions.

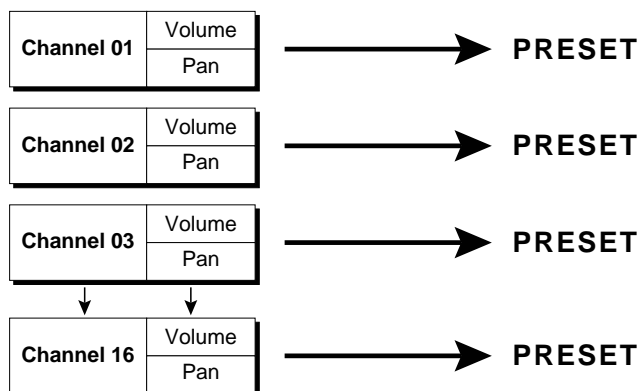
1. Press the **Multi** button. The main screen will change to reflect the multi-map screen. As the MIDI channel is changed, the display will change to show the Volume, Pan and Preset associated with the displayed channel.



2. Press either cursor button repeatedly until the cursor is underneath the desired parameter value (MIDI channel number, volume, pan position and preset).

3. Decide which MIDI channels you wish the Proteus to receive, and turn all other channels OFF using the MIDI Enable function in the Master Edit menu (page 30). **Up to 16 MIDI channels can be used simultaneously!**

4. Proteus will now respond multi-timbrally on the MIDI channels you have specified. The volume and pan position parameters can be adjusted over MIDI (for each MIDI channel) or using the cursor and data entry control in the multi-mode parameter screen shown above.



Each of the 16 MIDI channels can be assigned to play a specific preset in the Proteus.

■ When you are in multi mode, the keyboard will play the preset and channel showing in the window.

■ If your Proteus is not responding properly over MIDI or plays the wrong preset, make sure that Proteus and your MIDI controller are set to the same MIDI channel and that the MIDI Volume is turned up. See MIDI Realtime Controls on page 66.

■ The Multi button also functions as a "Panic" button by turning all notes off when it is pressed.

■ Channel Pan should normally be set to "P" unless realtime control of panning is desired. This will allow the pan settings programmed for each preset to be used. If "0" is shown in the display, the preset will play in mono.

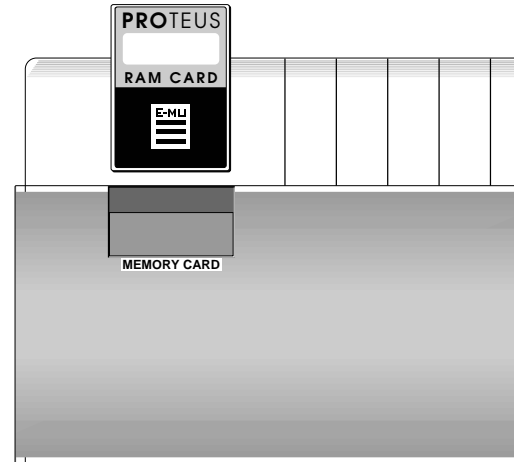


## BASIC OPERATION

■ RAM Cards can be used to store your own presets and maps. ROM cards contain prerecorded presets and sequences. You cannot save data to a ROM card.

### MEMORY CARD

The memory card is a convenient method for saving and transferring Presets and Performance Maps. Insert the card firmly in the slot with the label up as shown. A RAM card stores 100 presets and 5 performance maps. Preset locations 200-299, and Performance Maps 5-9 are located on the RAM Card.



RAM cards may be write protected by moving the little switch on top of the card to the Protect position. If you try to save data to a card that is write protected, the display reads:

Sorry..This card  
is protected...

If an un-initialized card is inserted into the Proteus , the display reads:

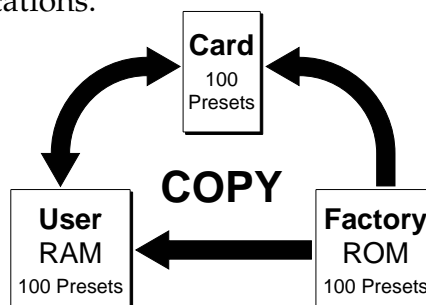
Not an E-mu card  
Use it anyway?

▼ If the RAM Card is defective, the error message, "Cannot read card" will appear.

Press Enter to initialize the RAM card (this erases the card).

### COPY BANK

The Save/Copy button performs several functions depending in which module (Master, Preset Edit, Performance) you are using. When in the preset select mode the Save/Copy button allows you to copy an entire bank of 100 presets from ROM to RAM, ROM to Card, RAM to Card, or Card to RAM locations.



▼ **WARNING:** Copying a bank of presets erases the existing presets in those 100 locations. Make sure that the destination bank does not contain presets that you wanted to keep.

## ***MASTER EDIT MENU***



## MASTER EDIT MENU

The Master menu contains functions that affect the overall operation of the Proteus. For example, changing the Master Tune will change the tuning of all the presets, not just the one currently displayed. **All changes made in the Master Edit menu (with the exception of Local Control) are remembered when the power is turned off.**

### TO ENABLE THE MASTER EDIT MENU

Press the Master button, lighting the LED. The current screen will be the one most recently selected since powering up the Proteus. The cursor will appear underneath the first character of the screen heading on line one.

### TO SELECT A NEW SCREEN

Press either cursor key repeatedly (or hold the cursor key) until the cursor is underneath the screen title heading. (You may also press the Enter button to return the cursor to “Home” position.) Rotate the data entry control or use the increment/decrement buttons to select another screen.

### TO MODIFY A PARAMETER

Press either cursor key repeatedly (or hold the cursor key) until the cursor is underneath the parameter value. Rotate the data entry control or use the increment/decrement buttons to change the value.

### TO RETURN TO PRESET SELECT MODE

Press the Master Edit button, turning off the LED.

## MASTER EDIT FUNCTIONS

### MASTER TUNE


Master Tune adjusts the overall tuning of all presets so that Proteus can be tuned to other instruments. The master tuning range is  $\pm 1$  semitone in 1/64th semitone increments. A master tune setting of “00” would indicate that the Proteus is perfectly tuned to concert pitch (A=440 Hz).

MASTER TUNE +63
--------------------

## MASTER EDIT MENU

### TRANPOSE

This function transposes the key of the Proteus keyboard in half-step intervals. The transpose range is  $\pm 12$  semitones or one octave. Transpose only transposes notes played from the keyboard and sent out over MIDI. It does not transpose incoming MIDI data. This screen performs the same function as the front panel transpose button and changes made from the front panel will be reflected in this display.



TRANPOSE  
+00 semitones

### GLOBAL BEND

This function sets the range of the pitch wheel (the left, spring-loaded wheel) *only* when it is routed to control pitch (in the Preset Edit menu). The maximum pitch bend range is  $\pm 12$  semitones. This function only affects presets which have their individual pitch bend range set to global.



GLOBAL BEND  
+- 12 semitones

### GLOBAL VELOCITY CURVE

Incoming velocity data can be modified by a velocity curve in order to provide different types of dynamics in response to your playing or to better adapt to a MIDI controller. This function allows you to select one of the four velocity curves or leave the velocity data unaltered (off). Global velocity curve only affects presets which have their individual velocity curve set to global. *For more information on the velocity curves, see page 64.*



GLOBAL VEL CURVE  
4

■ "Global" means that a parameter can apply to all presets. Presets may use a specially defined value instead of the global value.

## MASTER EDIT MENU

### GLOBAL PRESSURE AMOUNT

Keyboard pressure or aftertouch is the pressure applied after the key is initially pressed. What keyboard pressure actually controls is programmed separately for each preset (in the Preset Edit menu). Global Pressure Amount allows you to apply an overall scaling to the pressure amount programmed in each preset. Pressure has maximum effect when the value is set to 127.

GLOBAL PRESS AMT 127
-------------------------

### MIDI MODE

This function selects one of the four MIDI modes and the MIDI system exclusive ID number.

■ **Omni mode** - Proteus responds to note information on all MIDI channels and plays the preset currently displayed in the main screen.

■ **Poly mode** - Proteus only responds to note information received on the currently selected MIDI channel (on the preset selection screen) and plays that channel's associated preset.

■ **Multi mode** - Proteus responds to data on any combination of MIDI channels and plays the specific preset associated with each of the MIDI channels. This function is duplicated with the front panel Multi button.

■ **Mono mode** - Proteus responds to data on any combination of MIDI channels but plays each channel monophonically. If a new note is played before the last note is released, the envelopes will not be retriggered (legato). Mono mode is particularly useful with alternate controllers such as MIDI guitars, wind controllers, etc.

■ **ID number** - This function allows an external programming unit to distinguish between multiple Proteus units. In the case of multiple Proteus units, each Proteus should have a different ID number.

MIDI MODE	ID
Poly	00

▼ **Warning:** Presets will not be transferred between two Proteus' unless the ID numbers of both units match.

## **MASTER EDIT MENU**

### **MIDI MODE CHANGE**

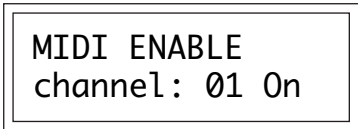
This function selects whether or not MIDI mode change commands are accepted or ignored when received over MIDI (see MIDI mode on the previous page).



MIDI MODE CHANGE  
Disabled

### **MIDI ENABLE**

When in MIDI Multi mode, this function allows you to turn each channel On or Off. This is useful when you have other MIDI devices connected and do not want the Proteus to respond to the MIDI channels reserved for other devices. MIDI Enable only operates in Multi mode.



MIDI ENABLE  
channel: 01 On

### **LOCAL CONTROL**

When on, the Proteus keyboard controls the internal sound generators and sends out MIDI data about which keys are being played. Turning Local Control Off, disconnects the internal sound generators from the keyboard but Proteus still sends and receives MIDI data. Local Control is often turned Off when recording into a MIDI sequencer (set sequencer to Echo Thru ). Local Control is always turned On at power-up.



LOCAL CONTROL  
On

## MASTER EDIT MENU

### RECEIVE PROGRAM CHANGE

MIDI also carries program (preset) change information from one synthesizer to another. When Receive Program Change is turned On, program change messages are received over the MIDI line. When turned Off, all program change messages are ignored.

RECV PROG CHANGE  
On

### SEND PROGRAM CHANGE

When Send Program Change is turned On, program change messages are transmitted over the MIDI line to other devices. When turned Off, the program change messages are not transmitted.

SEND PROG CHANGE  
On

### SEND CONTROLLERS

Continuous Controller data from the Pitch Wheel, Modulation Wheel and Pressure is also transmitted over MIDI. When Send Controllers is turned On, continuous controller messages are transmitted over the MIDI cable to other devices. When turned Off, continuous controller messages are not transmitted.

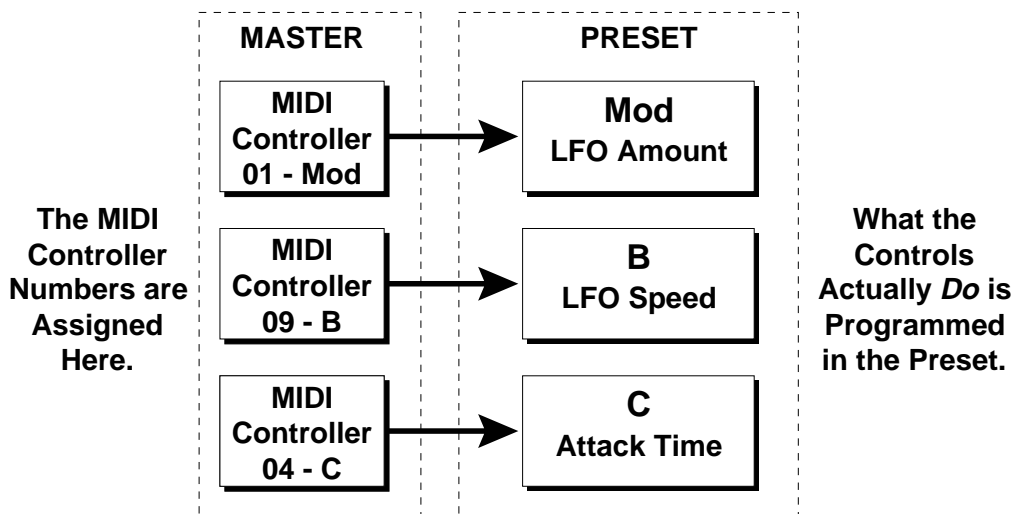
SEND CONTROLLERS  
On

■ With Send Program Change Off, preset change commands will not be sent from Quick Keys, Multi-Map selections or individual preset changes.

■ MIDI program changes are only sent as a result of key presses (numeric and inc/dec buttons), and not through data entry knob selection.



## MASTER EDIT MENU



■ The MIDI spec allows up to 128 controllers per channel. This feature lets you to connect four of them any way you want.

■ If controller numbers 7 or 10 are selected, they will override the standard MIDI volume and pan control routings and Proteus will not respond to MIDI Volume and Pan changes. For more information, see MIDI Realtime Controls on page 66.

### MIDI CONTROLLER ASSIGN

The Proteus Master Performance System allows you to assign up to four realtime controllers. A controller could be the modulation wheel, the footpedal or a realtime controller from another MIDI keyboard. **In this screen, you select the continuous controller numbers that Proteus will transmit and receive.** What effect the controller will have is programmed separately for each preset. The first controller is dedicated to the Proteus Modulation Wheel (right wheel). If controller 001 is selected for the Modulation Wheel then Proteus will transmit the Modulation Wheel data on controller 001 (Incoming MIDI data on controller 001 will also be received and will have the same effects as moving the wheel). The other three controllers are assigned a letter B-D. The Mod. wheel can be assigned a MIDI realtime controller number from 0-120. Each controller letter can be assigned to a MIDI realtime controller number from 01-31.

CONTROLLER #  
MOD:001 B:02

Next Screen:

CONTROLLER #  
C:03 D:04

## MASTER EDIT MENU

### PEDAL CONTROL

This screen allows you to dedicate the footpedal as a volume control for the current preset or to assign it to Controller B to be used as a general purpose controller. When the footpedal is assigned to Controller B, the data will also be transmitted over MIDI (on the realtime control channel selected for Controller B in the previous screen).

PEDAL CONTROL  
Volume

■ When the pedal is assigned to Volume, the pedal data is also transmitted over MIDI continuous controller channel 7.

### MIDI FOOTSWITCH ASSIGN

Like the MIDI Controllers, MIDI footswitches can be assigned to MIDI footswitch numbers. Footswitches can be assigned numbers from 64-79. Destinations for the footswitch controllers are programmed in the Preset Edit menu. The Local footswitch number will be *transmitted* over MIDI when Proteus's footswitch is depressed. Additionally, MIDI footswitch data received on the specified controller number will be routed to the Local destination as programmed in the Preset Edit menu.

FOOTSWITCH #  
Local:64

- Transmitted and  
Received over MIDI

Footswitch numbers 2 and 3 set the footswitch numbers that will be *received* by Proteus from an external MIDI controller (such as another MIDI keyboard).

FOOTSWITCH #  
2:65 3:66

- Received over MIDI

## MASTER EDIT MENU

### EFFECTS TRANSITION

Sometimes when the type of effect is changed, an audible “ping” may be heard. This function allows you to select whether or not the audio is temporarily muted when switching presets (effects). Only the effect buss whose effect is changed will be muted.

FX Transition  
Mute

■ **MIDI Program -> Preset maps** are selected as part of a Performance Map (see page 54).

■ **Note:** On some synthesizers Preset 00 is called Preset 01 with a corresponding difference through all the numbers.

### MIDI PROGRAM -> PRESET

Incoming MIDI program changes can be translated into a different numbered preset. This is a handy feature when you want a specific preset number sent from a MIDI controller to be linked with a specific preset on the Proteus. Simply selecting a preset on the MIDI controller can automatically call up the proper Proteus preset. Any of the presets in Proteus can be mapped to any incoming MIDI program change number. **This feature allows you to call up the presets 128-299, which are not normally accessible over MIDI.** There are four MIDI Program -> Preset maps in the Proteus.

MIDI PROG>PRESET  
#4: 026 -> 012

	0	1	2	3	4	5	6	7	8	9
00	00	01	02	03	04	05	06	07	08	09
10	44	191	50	01	15	88	151	78	99	88
20	34	73	106	55	43	75	12	120	121	180
30	30	31	32	33	34	35	36	37	38	39
40	40	41	42	43	44	45	46	47	48	49
50	50	51	52	53	54	55	56	57	58	59
60	60	61	62	63	64	65	66	67	68	69
70	70	71	72	73	74	75	76	77	78	79
80	80	81	82	83	84	85	86	87	88	89
90	90	91	92	93	94	95	96	97	98	99
100	100	101	102	103	104	105	106	107	108	109
110	110	111	112	113	114	115	116	117	118	119
120	120	121	122	123	124	125	126	127		

This chart shows how MIDI preset changes can be re-mapped. In this example, program changes 10-29 (darkened area) have been re-mapped. All other programs will be selected normally. An incoming program change of 26 is re-mapped through the table above to select program 12.

## MASTER EDIT MENU

### SEND MIDI DATA

This function will send MIDI System Exclusive data to the MIDI Out port of the Proteus. The MIDI data can either be sent to a computer/sequencer or to another Proteus. Using the cursor key and the data entry control, select the type of MIDI data you wish to transmit. The choices are:

- **Master Settings:** Transmits all parameters in the Master menu except tuning table, program/preset map, remote, calibrations and viewing angle.
- **Program/ Preset Map:** Transmits only the program/preset maps.
- **Tuning Table:** Transmits only the user tuning table.
- **Performance Maps:** Transmits all the performance maps.
- **All Card Presets:** Transmits all the memory card presets.
- **All ROM Presets:** Transmits all the ROM (factory) presets.
- **All RAM Presets:** Transmits all the RAM (user) presets.
- **Any Individual Preset:** Transmits only the selected preset.

After selecting the type of data, the Enter LED will be flashing. Press the Enter button to confirm the operation. To receive MIDI data, simply send the MIDI data into Proteus from another Proteus or your sequencer.

SEND MIDI DATA  
 000 Stereo Piano

### ■ To Record MIDI Data into a Sequencer or another Proteus

1. Connect MIDI Out of the Proteus to the MIDI In of the receiving device.
2. Set up the Sequencer to receive MIDI System Exclusive data.
3. Place Sequencer into Record Mode, then Send MIDI Data.

### ■ To Receive MIDI Data from a Sequencer or another Proteus

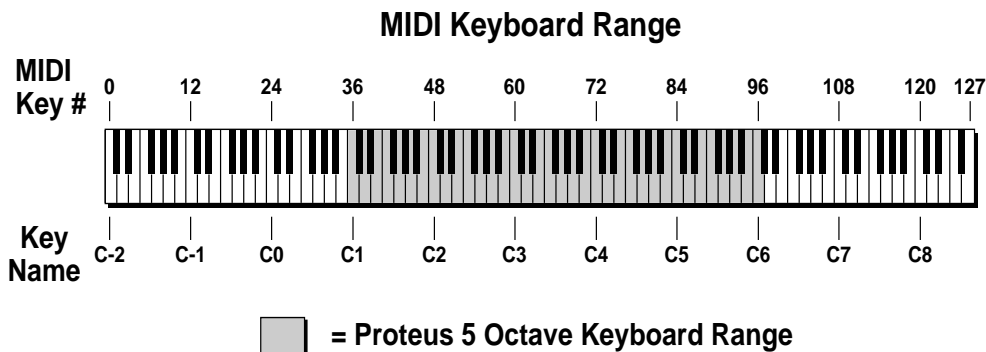
1. Connect MIDI Out of the sending device to the MIDI In of Proteus.
2. Simply play back the sequence into Proteus.  
(If you are sending from another Proteus, just Send MIDI Data.)

▼ *Warning: When transferring SysEx data from one Proteus to another, the ID numbers of both units must match.*

▼ *Warning: When transferring preset banks back and forth from the Proteus to a computer, the data should be recorded as you would a regular sequence. Sending the data in one huge chunk will choke the Proteus.*

▼ *When reloading MIDI data, the ID number of the data and the Proteus must both match.*

## MASTER EDIT MENU

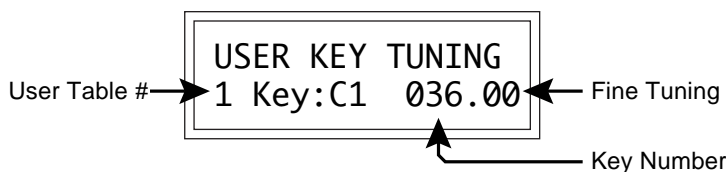


### USER KEY TUNINGS

In addition to standard twelve tone equal temperament, the Proteus contains four preset tuning tables (Just C, Vallotti, 19-tone, and Gamalan) and *four additional user-definable tuning tables*. User Key Tunings allow you to alter the parameters of the four user-definable tunings stored in memory. The initial frequency of each and every key can be individually tuned, facilitating the creation of non-standard scales. Using the cursor key and the data entry control, select the key name, the MIDI key number and the fine tuning. The key name is variable from C-2 to G8. MIDI key number is variable from 0 to 127. The fine tuning is variable from 00 to 63 in increments of 1/64 of a semitone up (approx. 1.56 cents). For each preset, the specific tuning table is selected in the Preset Edit menu.

#### Application:

The user key tuning can be used to tune individual percussion sounds.



### VIEWING ANGLE

This function allows you to change the viewing angle of the display so that it may be easily read from either above or below. The angle is adjustable from +7 to -8. Positive values will make the display easier to read when viewed from above. Negative values make the display easier to read from below.



## MASTER EDIT MENU

### MIDI IN ACTIVITY

This function allows you to monitor incoming MIDI data which may prove helpful in solving MIDI interconnection problems. The lower line reads out MIDI data which was last received. Most MIDI messages are displayed, including MIDI Clocks, SysEx and Active Sensing messages.



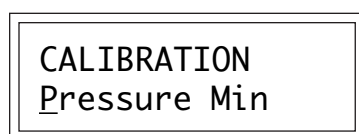
### STARTUP MESSAGE

This feature allows you to program your own startup message which will appear whenever the keyboard is first turned on. Messages can be up to 15 characters long.



### CALIBRATION


The calibration function allows you to recalibrate the pressure, pedal, pitch wheel and modulation wheel. User calibration is desirable for a number of reasons. You may want to recalibrate the pressure to your personal taste or you may own a pedal which doesn't seem to work correctly. Simply recalibrate the pedal function and you're back in business. Over time analog components used in the pitch and mod. wheel circuitry may drift. The calibration function allows you to correct the problem yourself and save a service call.



## MASTER EDIT MENU

### To Calibrate Pressure:

- 1) Press either cursor button to move the cursor to the lower line of the display. The enter LED will be flashing.
- 2) Press a key on the keyboard slightly down to set the minimum amount of pressure. Set the minimum pressure hard enough so that no pressure modulation will be applied with normal playing. When you have the proper amount of minimum pressure, press enter.
- 3) Press the increment button to change the display to pressure max.

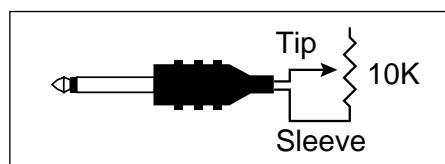


CALIBRATION  
Pressure Max

- 4) Press a key on the keyboard down hard to set the maximum amount of pressure. Set this amount for the hardest you expect to press on the keyboard. When you have the proper amount of maximum pressure, press enter.
- 5) Press either cursor button to move the cursor back to the upper line of the display to quit.

### To Calibrate the Pedal:

- 1) Move the cursor to the lower line of the display. Use the data entry control or the inc/dec buttons to select "Pedal Min".
- 2) Plug in a control pedal (E-mu part number SW 323 or equivalent) to the rear panel jack and move it to its up position (Off). Press enter.
- 3) Use the data entry control or the inc/dec buttons to select "Pedal Max". Depress the pedal to its lowermost position (On), then press enter.



*The control pedal should be internally wired as shown above.*

## **MASTER EDIT MENU**

### **To Calibrate the Modulation Wheel:**

- 1) Move the cursor to the lower line of the display. Use the data entry control or the inc/dec buttons to select "Mod Min".
- 2) Rotate the modulation wheel all the way back toward you. Press enter.
- 3) Use the data entry control or the inc/dec buttons to select "Mod Max". Rotate the modulation wheel fully forward away from you. Press enter.

### **To Calibrate the Pitch Wheel:**

- 1) Move the cursor to the lower line of the display. Use the data entry control or the inc/dec buttons to select "Pitch Center". Press enter.
- 2) Use the data entry control or the inc/dec buttons to select "Pitch Min". Move the pitch wheel all the way back toward you and while holding it in this position, press enter.
- 3) Use the data entry control or the inc/dec buttons to select "Pitch Max". Move the pitch wheel fully forward away from you and while holding it in this position, press enter.





## ***PERFORMANCE EDIT MENU***

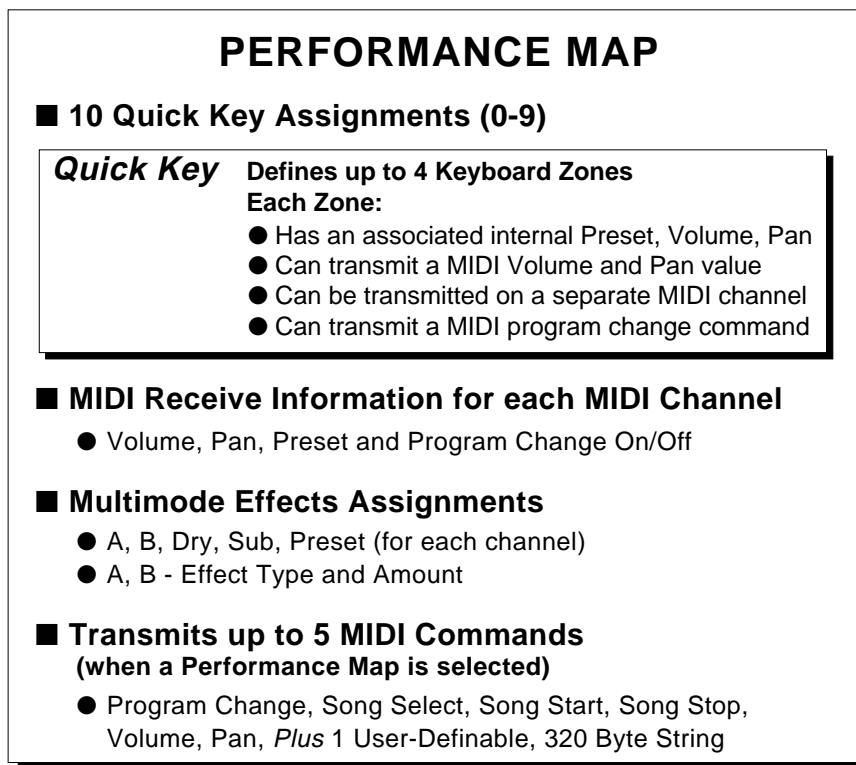


## PERFORMANCE EDIT MENU

### WHAT ARE PERFORMANCE MAPS?

A Performance Map is a set of parameters which can be used to configure the Proteus and your other MIDI gear which you may want to associate with a particular song or song set. There are five Performance Maps in Proteus (0-4) and you can store another five Performance Maps on the RAM Card (5-9).

This chart shows the contents of a single Performance Map.



▼ *Selecting a Quick Key will change the current Multi-Map Presets to the Preset settings programmed for that Quick Key.*

### DEFINITIONS

**ZONES** - A zone is simply a keyboard range which you can define. A zone can be any size from 1 to 127 keys wide. There are four possible Zones which can overlap (for layering) or lie adjacent to each other (for split keyboards).

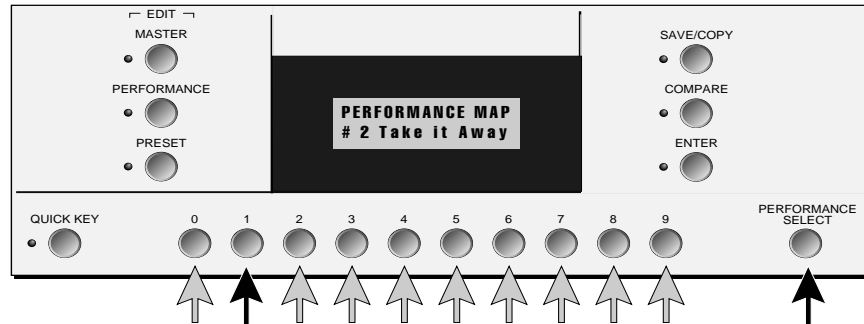
**MULTIMODE** - Allows the Proteus to receive on 16 MIDI channels simultaneously.

**MULTIMAPS** - A Multimap defines the **Preset** and its associated **Volume** and **Pan** position for each of the 16 MIDI channels for multitimbral sequencing. Each Performance Map can store one Multimap.

## PERFORMANCE EDIT MENU

■ **Performance Maps** are selected when the Performance Select button is RELEASED.

### TO SELECT A PERFORMANCE MAP



- 1) Press and Hold
- 2) Select Performance Number (0-9)
- 3) Release Select Button

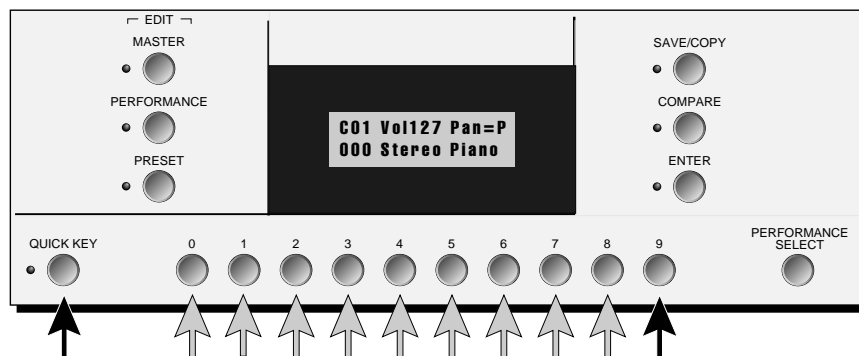
■ **Quick Key-Preset Assignment Shortcut**  
Assigns a preset to zone #1. Erases zones 2-4.

1. Turn Quick Key On.
2. Select the preset you wish to assign with the Data Entry knob.
3. Hold down the Enter button and press the desired Quick Key.
4. The display will confirm the operation, "Quick Key #0-9, OK".

▼ **Warning:** Quick Keys are not saved until the current Performance Map is saved (see page 45).

## QUICK KEYS

When the Quick Key function is enabled and the LED is lit, selected presets can be accessed by pressing a single button (0-9). The Data Entry knob and the inc/dec buttons can still be used to select programs when in Quick Key mode.



- 1) Turn Quick Key On
- 2) Select Quick Key (0-9)

## QUICK KEY COPY

1. Press the Performance Edit button.
2. Find the Quick Key Select screen and choose the Quick Key to copy *From*.
3. Press SAVE/COPY.
4. Choose the Quick Key to copy *To* and press Enter.

KEY0 Z1 C-2 ->G8  
000 Grand Piano

## PERFORMANCE EDIT MENU

The Performance Edit menu contains functions that allow you to program your own Performance Maps and Quick Keys.

### **TO SELECT A PERFORMANCE MAP**

Press and hold the Performance Select button. The current Performance Map will be shown in the display. Pressing one of the numeric buttons while holding Performance Select selects a new Performance Map. The selection is executed when the Performance Select button is *released*.

### **TO ENABLE THE PERFORMANCE EDIT MENU**

Press the Performance Edit button, lighting the LED. The current screen will be the one most recently selected since powering up the Proteus. The cursor will appear underneath the first character of the screen heading.

### **TO SELECT A NEW SCREEN**

Press either cursor key repeatedly (or hold the cursor key) until the cursor is underneath the screen heading. (You may also press the Enter button to return the cursor to "Home" position.) Rotate the data entry control or use the increment/decrement buttons to select another screen.

### **TO MODIFY A PARAMETER**

Press either cursor key repeatedly (or hold the cursor key) until the cursor is underneath the parameter value. The data entry control, the increment/decrement buttons or the numeric keys can be used to change the value.

### **TO SAVE A PERFORMANCE MAP**

While in the Performance Edit menu, press the Save/Copy button. Use the data entry knob, the increment/decrement buttons or the numeric keys to select the map location (0-4 Internal, 5-9 RAM Card), then press Enter.

### **TO COPY A PERFORMANCE MAP**

Select the Performance Map you want to copy. Press Performance Edit, then Save/Copy. Select the new map location (0-4 Internal, 5-9 RAM Card), then press Enter.

### **TO RETURN TO PRESET SELECT MODE**

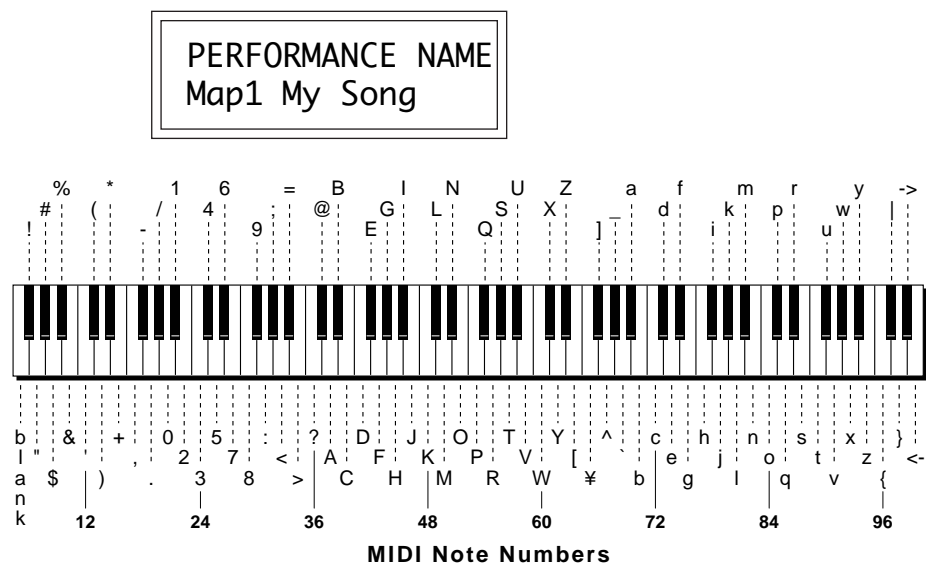
Press the Performance Edit button, turning off the LED.

▼ *Changes made to the performance map will be lost when the power is turned off unless the map has been saved.*

▼ *If you are in the Quick Key select screen (see previous page) the Quick Key will be copied instead of the Performance Map.*

## PERFORMANCE NAME

Performance Name allows you to name each of the performance maps with a name of up to 10 characters. Position the cursor under the character location and use the keyboard, data entry control or increment/decrement buttons to change the character. The chart below shows the keyboard character assignment.

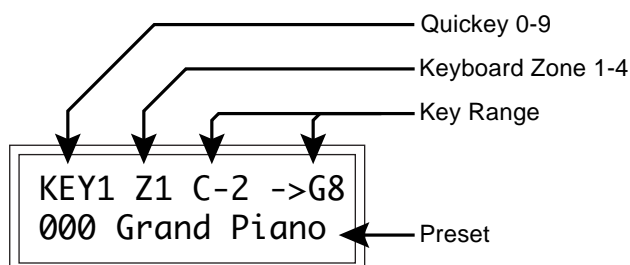


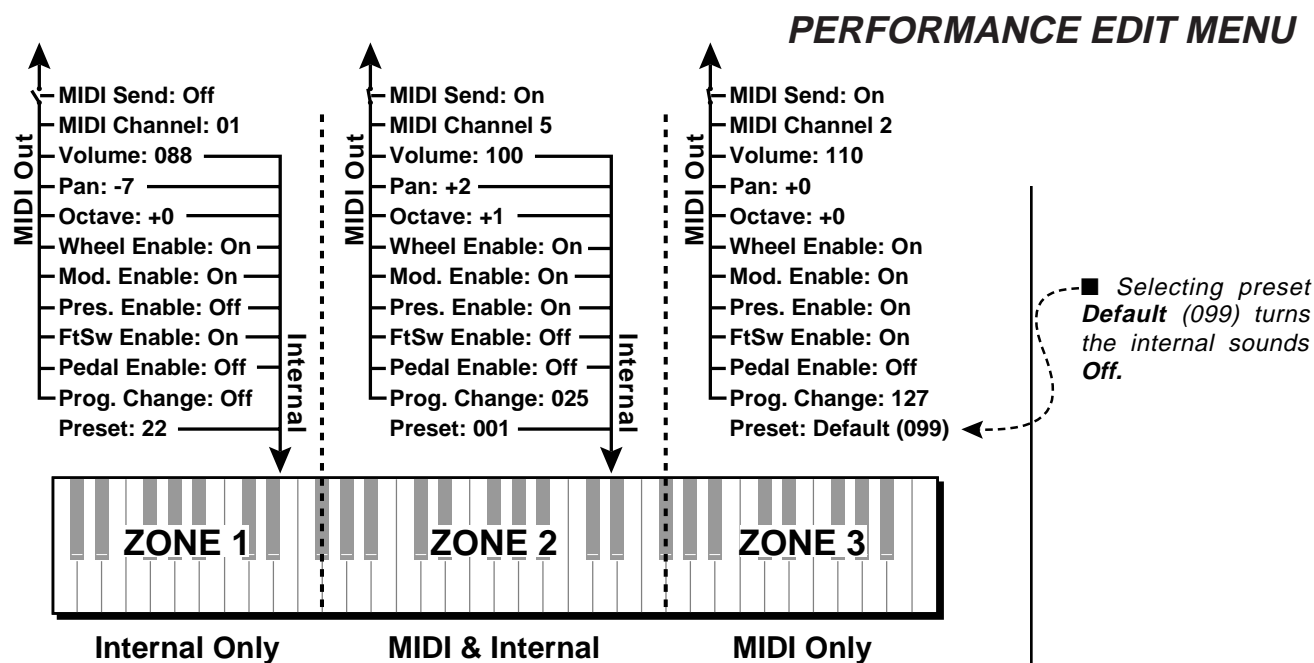
■ An easy way to assign a preset to Zone 1 of a Quick Key **without** going into the Performance Edit module...

1. Turn Quick Key On
2. Select the Preset you wish to assign.
3. Press and hold the Enter button, then press the Quick Key button you want.
4. **REMEMBER TO SAVE THE PERFORMANCE MAP!**

## QUICK KEY KEYBOARD ZONE ASSIGNMENTS

For each Quick Key in a Performance Map, you may define up to four zones (keyboard ranges) across the keyboard, each containing a different Proteus preset. Zones may overlap for stacking presets or lie adjacent to one another to create split keyboards. **Place the cursor under the appropriate parameter and change the Quick Key Number, Zone Number, Keyboard Range and the Preset using the data entry control, inc/dec buttons or numeric keys.** As the Quick Key or Zone is changed, the display will change to show the Key Range and Preset associated with the displayed Quick Key or Zone.





The keyboard can be split or layered for internal sounds and to control external MIDI devices.  
In the diagram above, only 3 of the 4 possible zones are being used.

### ZONE MIDI CHANNEL ASSIGNMENTS

For each Quick Key, each of the four zones can be programmed to transmit on a different MIDI channel. *If Off is selected, that zone will be turned Off for MIDI transmission AND keyboard control.* Place the cursor under each zone's channel number and select the MIDI channel number (or Off) using the data entry control, inc/dec buttons or numeric keys.

CH:1	2	3	4	← Zone Number
01	02	Off	16	← MIDI Channel Number

### ZONE VOLUME ASSIGNMENTS

This screen allows you to adjust the volume of each of the four zones. This function sets the volume of the internal sounds on the four zones. A MIDI volume message is also sent for each zone when a Quick Key is selected (unless the channel select for that zone is turned off). Place the cursor under each zones volume parameter and adjust the volume using the data entry control, inc/dec buttons or numeric keys.

VOL1	2	3	4	← Zone Number
127	100	075	120	← Zone Volume



## PERFORMANCE EDIT MENU

### ZONE PAN ASSIGNMENTS

This screen allows you to adjust the stereo pan position of each of the four keyboard zones. A MIDI pan message is also sent for each zone when a QuickKey is selected (unless the channel select for that zone is turned off). Place the cursor under each zones Pan parameter and adjust the pan position using the data entry control, inc/dec buttons or numeric keys. When Pan is set to "P" the pan settings in the preset will be used.

PAN1	2	3	4	← Zone Number
=P	-7	+7	=P	← Zone Pan

### ZONE OCTAVE TRANSPOSE

This function allows each keyboard zone to be transposed up or down three octaves in octave increments. Notes transmitted over MIDI will also be transposed. Place the cursor under the transpose parameter for each zone and change the transposition using the data entry control, inc/dec buttons or numeric keys. A setting of "0" indicates no transposition.

OCT1	2	3	4	← Zone Number
+0	-3	+3	+0	← Zone Octave Transpose

### ZONE CONTROLLER ENABLE

This function allows you to enable or disable the various continuous controllers for each keyboard zone. MIDI information will also be enabled or disabled. Place the cursor under the controller type and change it using the data entry control, inc/dec buttons or numeric keys.

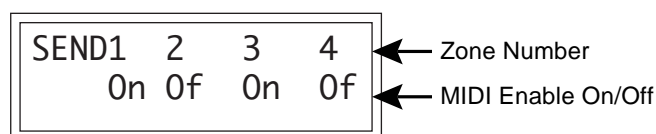
	CTL	1	2	3	4	← Zone Number
Controller →	PWh	On	Of	On	Of	← Status of Controller for each Zone

### ZONE MIDI SEND

<b>PWH</b>	<b>= Pitch Wheel</b>
<b>Mod</b>	<b>= Modulation Wheel</b>
<b>Prs</b>	<b>= Pressure (Aftertouch)</b>
<b>FSw</b>	<b>= Footswitch</b>
<b>Ped</b>	<b>= Pedal</b>

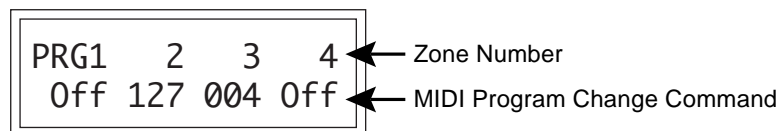
## PERFORMANCE EDIT MENU

This screen allows you turn MIDI transmission On or Off for each of the four keyboard zones. **Turning a zone Off inhibits all MIDI data** associated with the Quick Key such as note data, program change data, volume, pan and other controller data. **The internal preset associated with the zone will be played and controlled normally.**



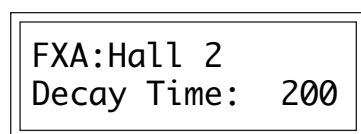
### ZONE MIDI PROGRAM CHANGE ASSIGNMENTS

Each zone can be programmed to send out a MIDI Program Change command whenever a Quick Key is selected. The program change command will be sent on the MIDI channel selected in the Zone MIDI Channel Assignment screen (previously described). Place the cursor under each zones program change parameter and change the program change command (preset change) using the data entry control, inc/dec buttons or numeric keys. When Off is selected, no program change command will be transmitted for that zone.



### EFFECT A (for Multimode)

This function allows you to select which effect is assigned to effect buss A. In addition to several types of reverb, the A effects consist of other stereo time delay effects such as delays, choruser, phase shifters, etc. (see the effects section for details).



■ Effect type can also be changed via MIDI realtime controller commands.

Controller

FXA = 82

FXB = 83

See the charts on pages 140 and 141

## PERFORMANCE EDIT MENU

■ Effect type can also be changed via MIDI realtime controller commands.

Controller  
FXA = 82  
FXB = 83

See the charts on pages 140 and 141

■ The FX amounts can also be changed via MIDI realtime controller commands.

Controller  
A = 84  
B = 85  
B>A = 86

See the charts on pages 140 and 141

■ For detailed explanations of each effect, see the effects chapter in this manual.

### EFFECT B (for Multimode)

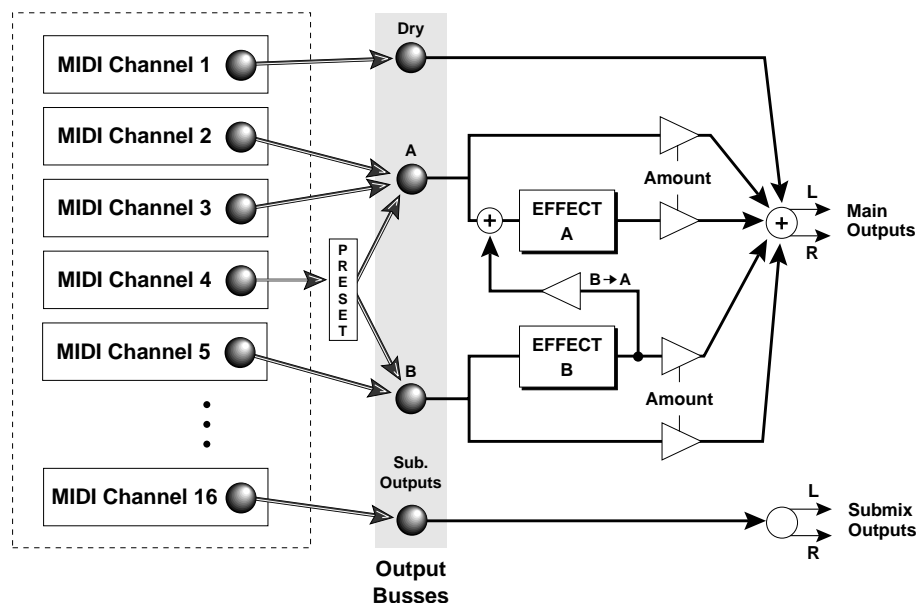
This function allows you to select which effect is assigned to effect buss B. The B effects consist of various delays, chorusers, phase shifters, fuzzes and even a ring modulator (see the effects section for details).

FXB: StereoFlange  
LFO Rate 050

### EFFECTS AMOUNT

This function allows you to adjust the percentage of wet and dry signals (processed and unprocessed) with 100% being only processed signal. Additionally, the B->A parameter allows you to adjust the amount of effect B which is fed through effect A. If B>A is set one value above 100%, "Only" is displayed and the B amount changes to Off. This disconnects effect B from the main outputs and routes all of the effect B signal through effect A.

FX AMOUNT A: 75%  
B>A: 100% B: 30%



Block diagram of the Proteus effects section showing multiple channel effect routing. Each channel can be assigned to the A, B, Dry or Submix buss, or can be assigned to a buss as programmed in the preset.

## PERFORMANCE EDIT MENU

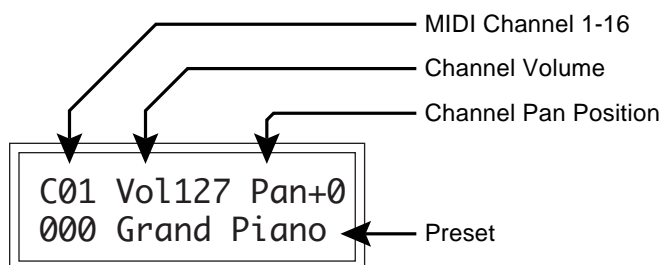
### MULTIMODE EFFECT ASSIGN

For each of the 16 MIDI channels, you may select one of the two available effects busses, have the channel remain dry (no effects) or route the channel to the submix outputs. Selecting Preset allows the assignment selected in the preset to be used. The type of effects used and their amounts are selected in the previous screens.

EFFECT ASSIGN  
 MIDI Ch04:Preset

### MULTIMODE PRESET-VOLUME-PAN ASSIGNMENT

This function allows you to set the Preset, Volume and Pan position for each of the 16 MIDI channels. These settings are only used when Multi-Mode is enabled. Place the cursor under the appropriate parameter and change the MIDI Channel Number, Volume, Pan Position and Preset Number using the data entry control or increment/decrement buttons. As the channel is changed, the display will change to show the preset, volume and pan parameters associated with the displayed channel.



■ Channel Pan should normally be set to "P" unless realtime control of panning is desired. This will allow the pan settings programmed for each preset to be used.

■ The keyboard will play the preset shown in the preset assignment screen last seen.

### MIDI MULTIMODE

This function selects whether Proteus responds polyphonically or monophonically when in Multi mode. Polyphonic mode is the normal setting - chords are possible and channels are used as needed. Monophonic mode is sometimes useful with MIDI guitar controllers - each MIDI channel can only play one note.

MIDI MULTI MODE  
 Polyphonic

**PERFORMANCE EDIT MENU****RECEIVE PROGRAM CHANGE**

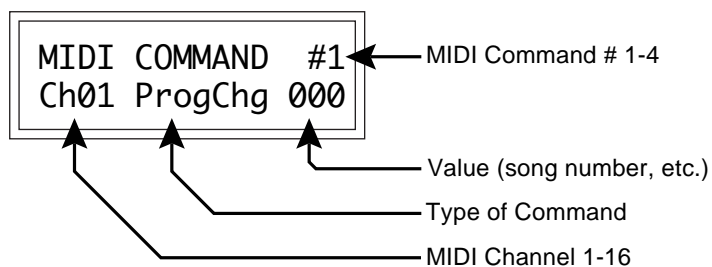
This function lets Proteus either utilize or ignore incoming MIDI program change commands for each channel. Note that MIDI can only select presets 000-127. Presets 128-299 can either be selected manually or over MIDI using the preset mapping function "MIDI PROGRAM > PRESET". See page 34 for more information on the Program-> Preset Map.

RECV PROG CHANGE  
 channel:01 On

**MIDI COMMAND 1-4**

This function allows you to transmit up to four MIDI commands when a Performance Map is selected (not to be confused with a Quick Key selection). The MIDI commands include:

<b>Program Change .....</b>	<b>Value and Channel</b>
<b>Song Select .....</b>	<b>Song Number and Channel</b>
<b>Song Start .....</b>	<b>Song Number and Channel</b>
<b>Song Stop .....</b>	<b>Song Number and Channel</b>
<b>Volume .....</b>	<b>Value and Channel</b>
<b>Pan .....</b>	<b>Value and Channel</b>



## PERFORMANCE EDIT MENU

### RECORD USER DATA

This function allows you to record a string of MIDI data up to 320 bytes in length. This data will be transmitted when the Performance Map is selected. The MIDI data can be virtually anything; SysEx data, controller data, even synthesizer patch data if the file is not too large.

RECORD USER DATA  
Start

#### To Record MIDI User Data:

1. Connect MIDI Out of another MIDI device to the MIDI In of Proteus.
2. Move the Cursor under Start and press Enter.
3. Send data from the MIDI device (play keys, etc.). Press Enter to Stop.

#### To Playback MIDI User Data:

1. Select the Performance Map.

### EDIT USER DATA

This function allows you to edit a string of MIDI data up to 320 bytes in length. You can edit data which was recorded using the Record Data function above or enter MIDI data manually. Any hexadecimal value can be entered. Proteus does not check the data for accuracy, so check your MIDI data carefully if unexpected results occur. Place the cursor underneath the byte locations and use the data entry knob to change values. Place the cursor underneath the arrows (< >) and rotate the data entry knob in order to scroll back and forth through the MIDI data. Setting the data value below 00 deletes the byte location. Pressing the Enter button inserts a new byte location to the left of the cursor position.

EDIT USER DATA  
[F0 18 04 00 03>

■ The user data is transmitted in one quick dump when a performance map is selected. Continuously changing values such as pitch wheel data will not be recorded correctly as they would into a sequencer.

## **PERFORMANCE EDIT MENU**

### **MIDI PROG ->PRESET**

This function selects one of the four MIDI Program to Preset Maps (programmed in the Master Edit menu) or turns the Program->Preset maps Off. The MIDI bank select command is disabled (transmission and reception) whenever a Program->Preset map is selected. For more information on the MIDI Bank select command see the MIDI specification at the back of this manual.

MIDI PROG>PRESET 1
-----------------------

## ***PROGRAMMING BASICS***

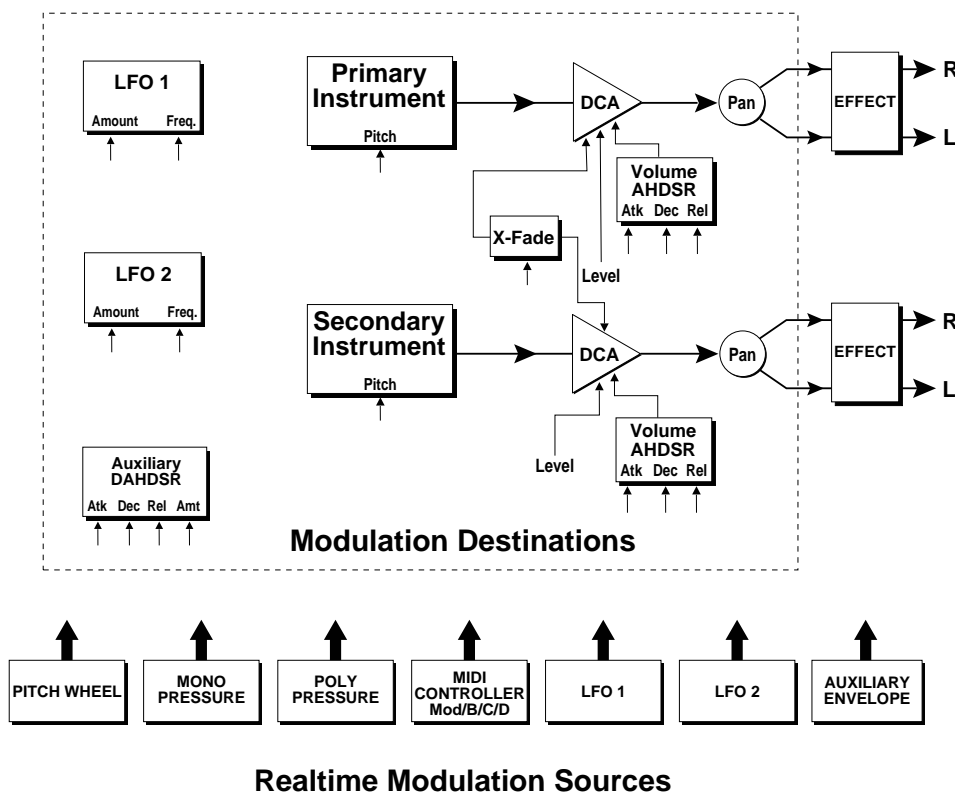




## PROGRAMMING BASICS

This section of the manual covers basic synthesizer operations (which are applicable to many types of synthesizer, not just Proteus), as well as several functions and concepts unique to Proteus.

Your initial involvement with the Proteus will most likely consist of using the existing presets and selecting MIDI channels. While the factory presets are very good, there are probably some things you would like to change, perhaps the LFO speed, the attack time, or the type of effects processing. You may also want to make your own custom presets using complex modulation routings. Entirely new sounds can be created by combining the attack portion of one sound with the body of another sound or by combining the digital waveforms with sampled sounds. There are 200 (100 internal, 100 card) locations available to store your own creations or edited factory presets. Best of all, it's easy to edit or create new presets using the Preset Edit menu.



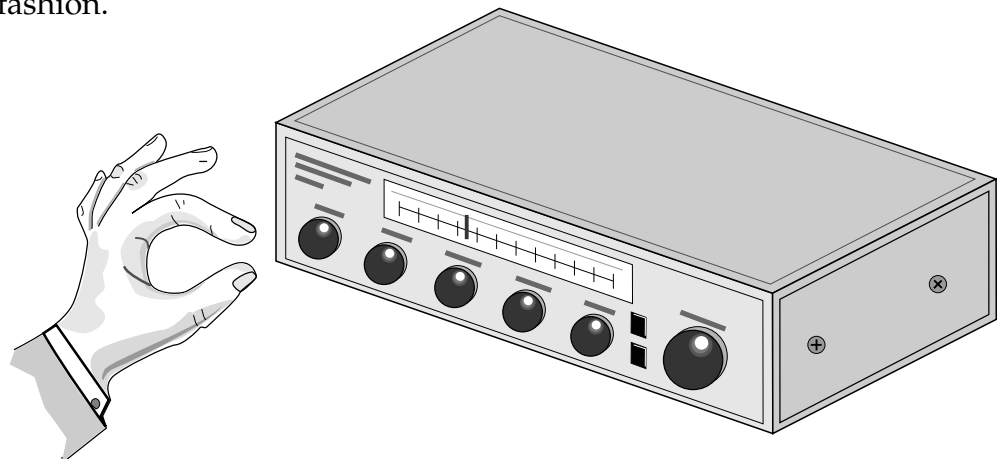
*This block diagram shows the layout of the Proteus. Because of the extensive modulation controls, Proteus is able to synthesize new sounds as well as emulate traditional instruments.*

## PROGRAMMING BASICS

Presets can be made up of both a primary and secondary instrument. Proteus has an extensive modulation implementation using two multi-wave LFO's (Low Frequency Oscillators), two envelope generators and the ability to respond to multiple MIDI controllers. You can simultaneously route any combination of these control sources to multiple destinations.

### MODULATION

Modulation means to *dynamically change* a parameter, whether it be the volume (amplitude modulation), the pitch (frequency modulation), or whatever. Turning the volume control on your home stereo rapidly back and forth would be an example of amplitude modulation. To modulate something we need a modulation *source* and a modulation *destination*. The source is your hand turning the knob, and the destination is the volume control. If we had a device that would automatically turn the volume control, we would also call that device a modulation source. The Proteus is designed so that for each of the variable parameters, such as the volume, there is an initial setting which can be changed by a modulation source. Therefore in the case of volume, we have an initial volume and we can change or modulate that volume with a modulation source. Two main types of modulation sources on the Proteus are *Envelope Generators* and *Low Frequency Oscillators*. In the example above, an envelope generator could be routed to automatically turn the volume control as programmed by the envelope. Or, a low frequency oscillator could be routed to automatically turn the volume control up and down in a repeating fashion.



Turning the volume control back and forth on your home stereo is an example of Amplitude Modulation.

## PROGRAMMING BASICS

### MODULATION SOURCES

Proteus uses three kinds of modulation sources.

#### ■ **KEYBOARD and VELOCITY MODULATION**

Values which are generated at the start of a note and do not change during the note.

**Keyboard Key** - Which key is pressed.

**Key Velocity** - How hard the key is pressed.

#### ■ **REALTIME MODULATION**

Values which can be continuously changed during the entire duration of the sound.

**Pitch Wheel** - The left, spring-loaded pitch bend wheel on Proteus.

**Modulation Wheel** - The right wheel can be programmed to control various functions.

**Control Pedal** - A control pedal can be programmed to control volume or various other functions.

**Miscellaneous Controllers (3)** - Any type of MIDI controller data.

**Keyboard Pressure (mono aftertouch)** - Key pressure applied after the key is initially pressed.

**Polyphonic Key Pressure** - Pressure from a controller capable of generating polyphonic pressure data.

**Low Frequency Oscillators (2)** - Generate repeating waves.

**Envelope Generators** - Generate a programmable “contour” which changes over time when a key is pressed.

#### ■ **FOOTSWITCH MODULATION**

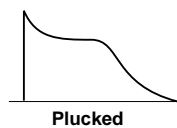
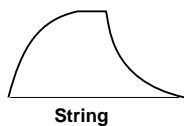
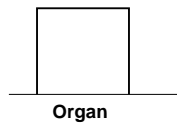
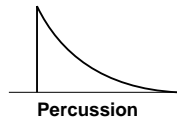
Changes a parameter when a footswitch is pressed. The three footswitches can be programmed to switch: Sustain (pri/sec/both), Alternate Volume Envelope (pri/sec/both), Alternate Volume Release (pri/sec/both), or Cross-Switch between the primary and secondary instruments.

## PROGRAMMING BASICS

### ENVELOPE GENERATORS

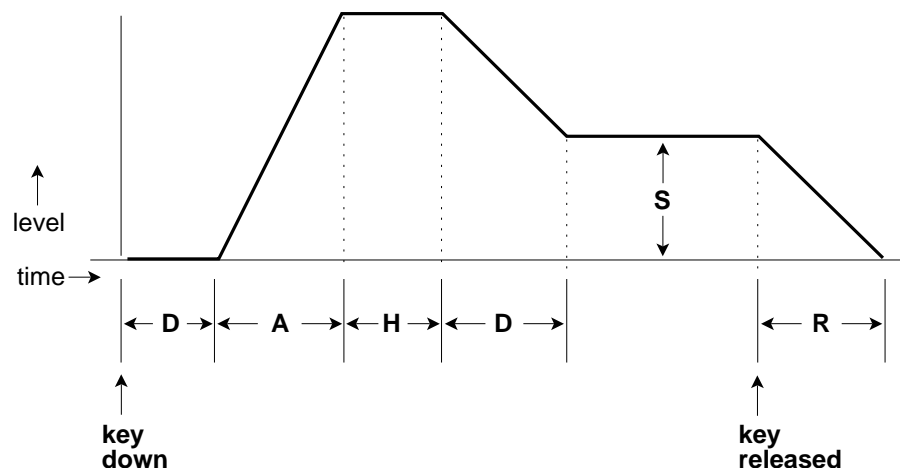
An envelope can be described as a “contour” which can be used to shape the sound in some way over time. Each channel of the Proteus contains three envelope generators. The Alternate Volume Envelopes which control the volume of the primary or secondary instrument have 5 stages: Attack, Hold, Decay, Sustain, and Release. The third envelope, the Auxiliary Envelope, can be routed to any realtime control destination and is a general purpose envelope. The Auxiliary Envelope has 6 stages: Delay, Attack, Hold, Decay, Sustain, and Release. The Envelope parameters can be described as follows:

- **Delay** - The time between when a key is played and when the attack phase begins.
- **Attack** - The time it takes to go from zero to the peak (full) level.
- **Hold** - The time the envelope will stay at the peak level before starting the decay phase.
- **Decay** - The time it takes the envelope to go from the peak level to the sustain level.
- **Sustain** - The level at which the envelope remains as long as a key is held down.
- **Release** - The time it takes the envelope to fall to the zero level after the key is released.

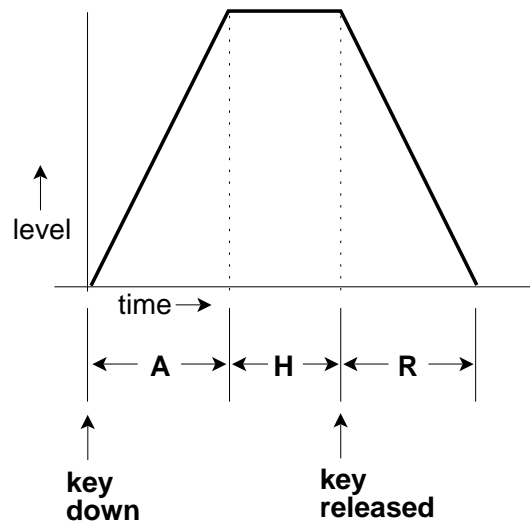


■ The generalized envelope shapes of a few types of sounds are shown above.

■ Note: An envelope only works while there is sound. With some short sounds, slow release rates will have no effect and slow attack rates will shut the sound off.



## PROGRAMMING BASICS

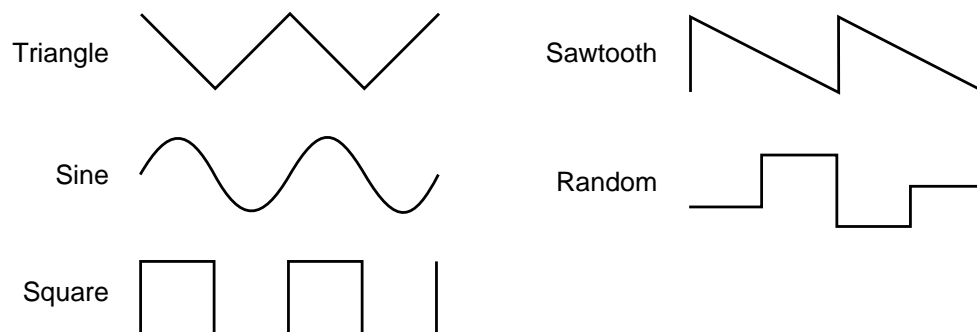


*If the key is released during the Attack (A) or Hold (H) phase, the Release (R) phase begins.*

### LOW FREQUENCY OSCILLATORS (LFOs)

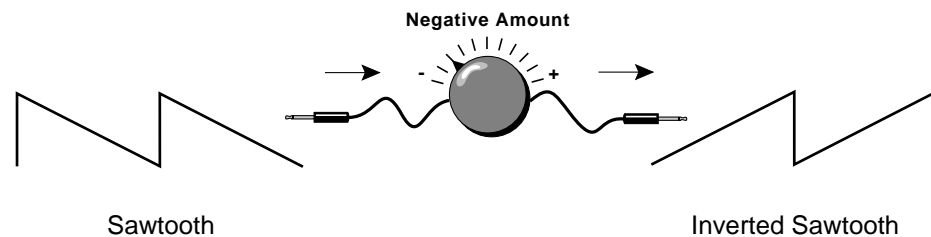
A Low Frequency Oscillator is simply a wave which repeats at a slow rate. The Proteus has two multi-wave LFOs for each of its 32 channels. The LFO waveforms are: Triangle, Sine, Square, Sawtooth, and Random, which is a non-repeating "sample and hold" type of wave.

By examining the diagram of the LFO waveforms, you can see how the LFO will affect a modulation destination. Suppose we are modulating the pitch of an instrument. The sine wave looks smooth, and will smoothly change the pitch. The square wave changes abruptly, and will abruptly change the pitch from one pitch to another. The Sawtooth wave smoothly decreases, then abruptly changes back up. The sound's pitch will follow the same course. Controlling the pitch of an instrument is an easy way to hear the effects of the LFO waves.



## PROGRAMMING BASICS

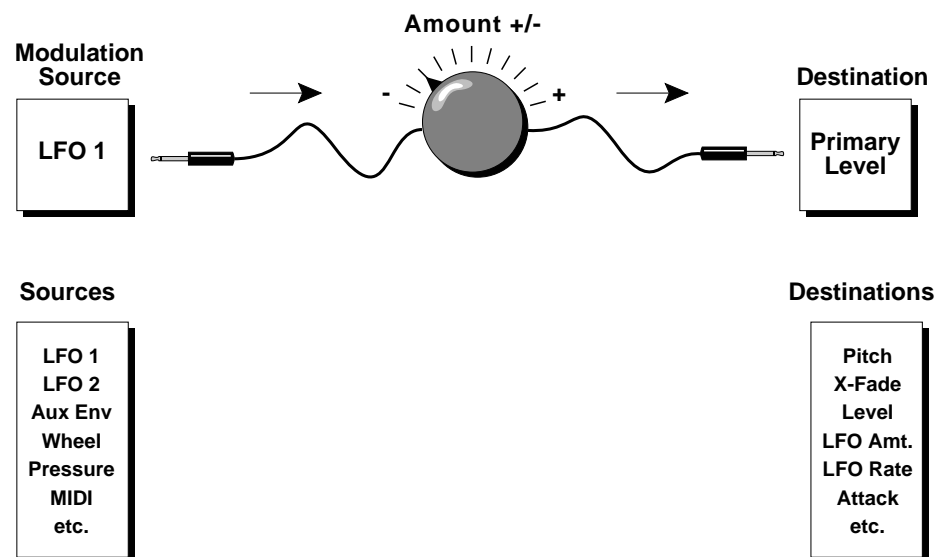
When the amount of an LFO is a negative value, the LFO shape will be inverted. For example, inverting the Sawtooth wave produces a wave that smoothly increases, then instantly resets down.



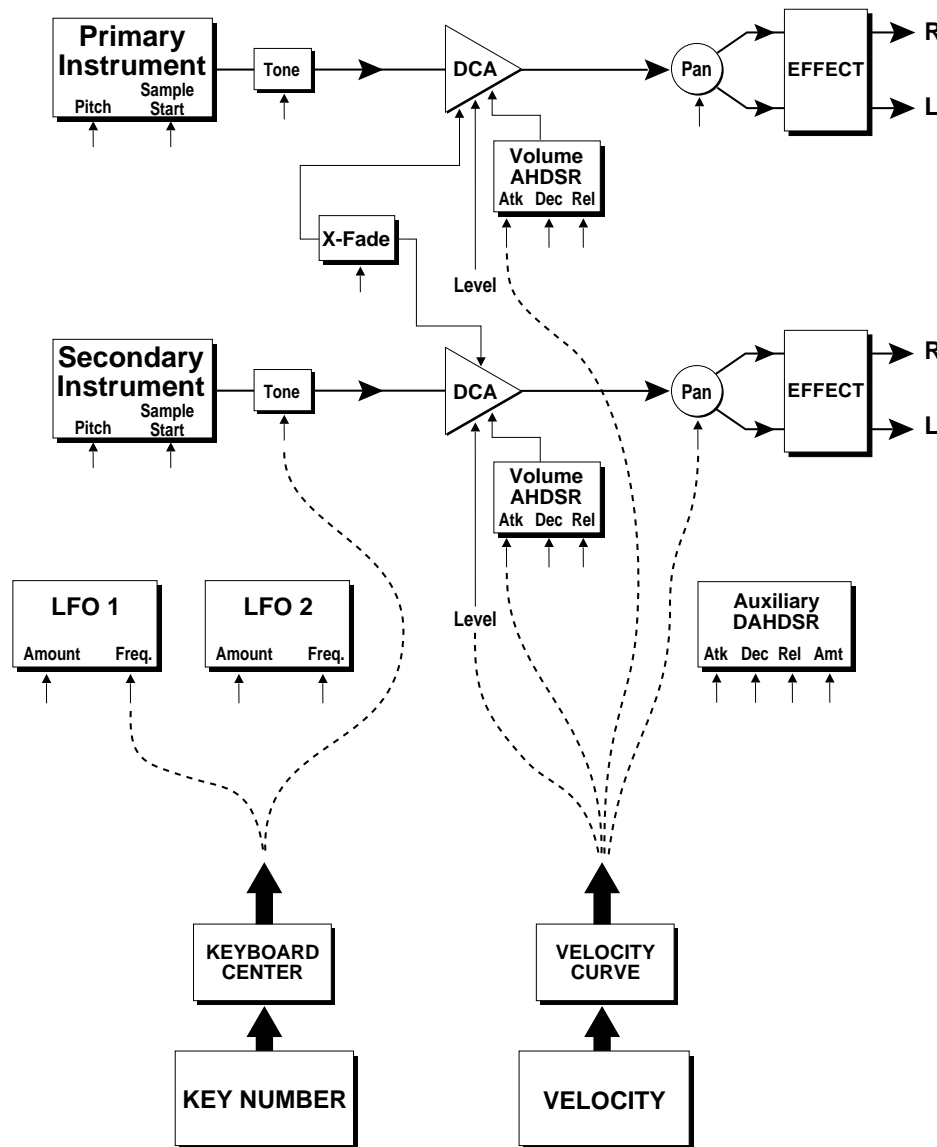
### MIDIPATCH™

Connecting a modulation source to a destination is called a *patch*.

Proteus lets you connect the modulation sources in almost any possible way to the modulation destinations. You can even modulate other modulators. Each patch also has an amount parameter which determines "how much" modulation is applied to the destination. The modulation amount can be positive or negative and will either add or subtract from the initial value. Keyboard and velocity sources can be simultaneously patched to any 6 of the 33 destinations for each preset. Realtime modulation sources can be simultaneously patched to any 8 of the 24 destinations for each preset.



## PROGRAMMING BASICS



### Keyboard and Velocity Modulation Sources

#### KEYBOARD and VELOCITY MODULATION

The Keyboard and Velocity Modulation diagram shows the possible routing of Key Number (which key is pressed), and Velocity (how hard the key is pressed). These modulation sources can control any of the destinations indicated by the small arrows. A total of six connections can be made between key number or velocity and the destinations. The possible modulation routings are completely flexible as shown in the example above.

**Modulation Sources:**  
Key Number and Key Velocity

**Destinations:** Off, Pitch, Primary Pitch, Secondary Pitch, Volume, Primary Volume, Secondary Volume, Attack, Primary Attack, Secondary Attack, Decay, Primary Decay, Secondary Decay, Release, Primary Release, Secondary Release, Crossfade, LFO 1 Amount, LFO 1 Rate, LFO 2 Amount, LFO 2 Rate, Auxiliary Envelope Amount, Auxiliary Envelope Attack, Auxiliary Envelope Decay, Auxiliary Envelope Release, Sample Start, Primary Sample Start, Secondary Sample Start, Pan, Primary Pan, Secondary Pan, Tone, Primary Tone, Secondary Tone



## PROGRAMMING BASICS

### KEY NUMBER

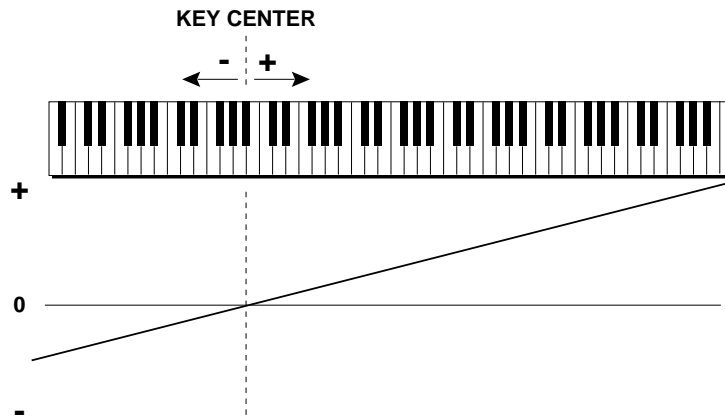
The Key Number is affected by the Keyboard Center parameter which can be set to any key from C-2 to G8. The keyboard center establishes a reference point for keyboard modulation; keys above this point will have a positive value, while keys below it will be negative. For example, if we wished to change the volume of an instrument using key number and the key center were set to middle C, the instrument would get progressively louder above middle C and progressively softer below middle C.

#### ■ Key Number Ideas

*Crossfade between two sounds as you move up the keyboard.*

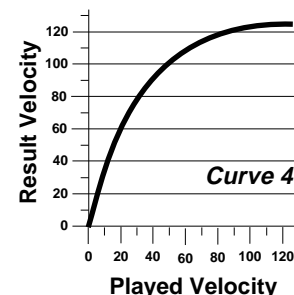
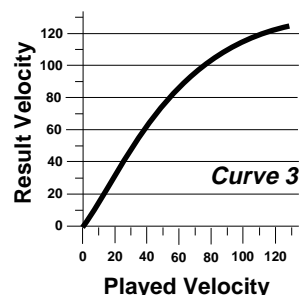
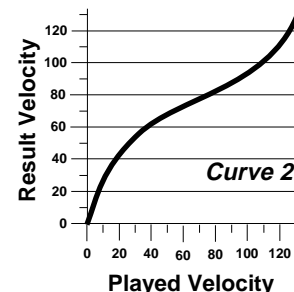
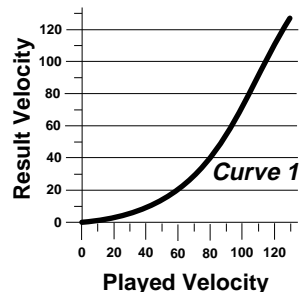
*Change the tone as you move up the keyboard.*

*Change the decay time as you move up the keyboard. etc. etc.*

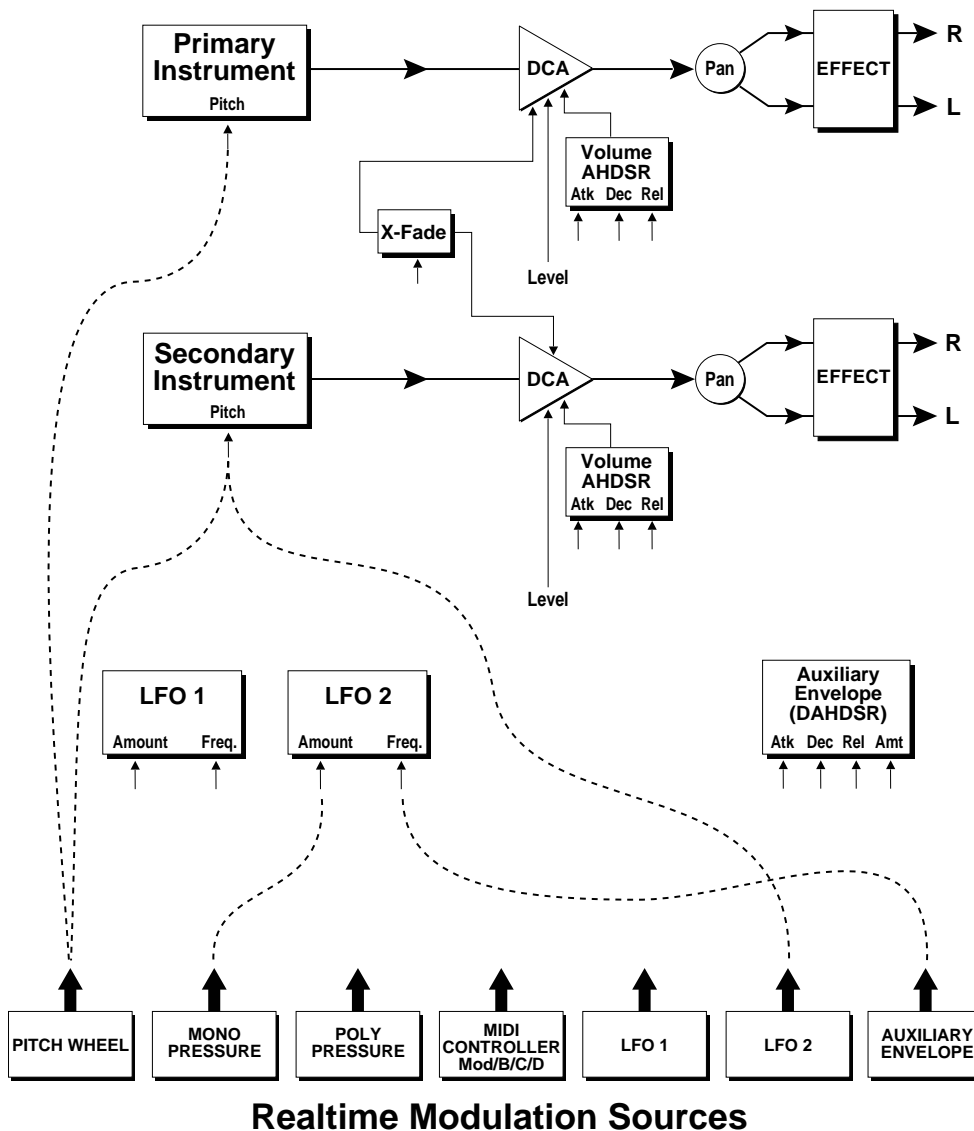


### VELOCITY CURVES

Incoming velocity values can be scaled by one of the four velocity curves in order to match your playing style or better adapt to the MIDI controller. Experiment with the four curves to find the one that works best for your style and MIDI controller.



## PROGRAMMING BASICS



### Modulation Sources:

Pitch Wheel,  
MIDI Control A,  
MIDI Control B,  
MIDI Control C,  
MIDI Control D,  
Mono Pressure,  
Polyphonic Pressure,  
LFO 1, LFO 2,  
Auxiliary Envelope

### Destinations:

Off,  
Pitch, Primary Pitch,  
Secondary Pitch,  
Volume,  
Primary Volume,  
Secondary Volume,  
Attack,  
Primary Attack,  
Secondary Attack,  
Decay,  
Primary Decay,  
Secondary Decay,  
Release,  
Primary Release,  
Secondary Release,  
Crossfade, LFO 1  
Amount, LFO 1 Rate,  
LFO 2 Amount,  
LFO 2 Rate, Auxiliary  
Envelope Amount,  
Auxiliary Envelope  
Attack, Auxiliary  
Envelope Decay,  
Auxiliary Envelope  
Release

## REALTIME MODULATION

In addition to keyboard and velocity modulation, Proteus has multiple realtime modulation sources. Realtime modulation sources are parameters which vary over time. The velocity and keyboard modulations, in comparison, are set at the key depression. The realtime modulation sources can control any of the destinations except Sample Start, Tone and Pan as indicated by the small arrows. A total of eight connections can be made between the realtime modulation sources and the destinations. The possible modulation routings are completely flexible as shown in the example above.

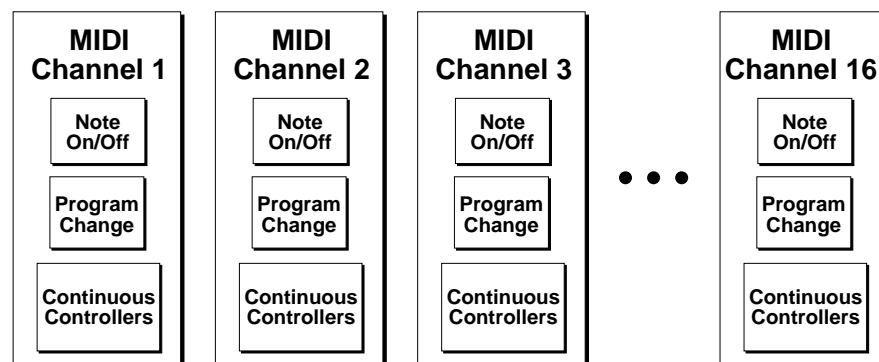
## PROGRAMMING BASICS

### MIDI REALTIME CONTROLS

The MIDI realtime controllers may seem confusing at first, but they are really very simple to understand. You probably already know that there are 16 MIDI channels that can be used. Each of the 16 MIDI channels uses basically 3 types of messages; *note on/off*, *program changes*, and *continuous controller* messages. MIDI keyboards, in addition to transmitting which note was played, also transmit *realtime control* information, which simply means occurring in real time or live. Realtime control sources include such things as pitch wheels or levers, modulation wheels or levers, control pedals, aftertouch, etc. and are used to add more expression or control. Realtime controller information is sent on separate channels called *continuous controller channels*. There is a set of 128 continuous controller channels for each of the 16 MIDI channels. Some of the controller channels, such as pitch wheel, volume, and pan have been standardized. For example, volume is usually sent on continuous controller channel #7.

Common realtime controllers such as the pitch wheel, volume, pan and pressure are pre-programmed to their proper destinations. When you move a wheel or depress the footpedal on the Proteus, MIDI data is transmitted out the MIDI port (unless Send Controllers has been turned Off). Other MIDI keyboards also have realtime controls such as wheels or control pedals which can be programmed to control most of the parameters on the Proteus .

■ MIDI wind controllers may work better if you assign one of the MIDI B, C, D controllers to control volume. This will allow the MIDI volume to be **added** to the current volume instead of controlling the overall volume.



The Proteus is equipped with a sophisticated *MidiPatch™* system, which allows you to route any of the first 32 continuous controllers to any realtime modulation destination. The MidiPatch system is also very easy to use. When controlling the Proteus from an external MIDI device you must know which controller numbers your MIDI source can transmit.

## PROGRAMMING BASICS

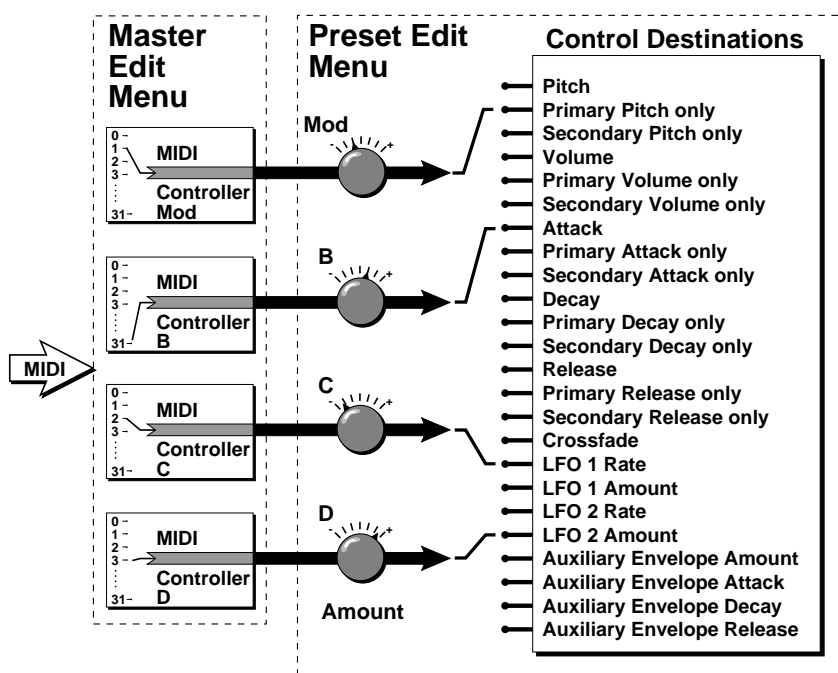
Let's say for example, that you are using a Guitar Synthesizer as your MIDI source controlling the Proteus. Many guitar synthesizers transmit pitch bend data, have one or more data knobs and a foot pedal, all of which transmit their values over MIDI. The standard MIDI controller numbers for the controls are listed at the right. First, we would go to the Master Edit menu, MIDI Controller Assign and define the MIDI controllers that we wish to use. Assign each controller number to either the modulation wheel or to the one of the letters B-C-D.

On MIDI Controller	On Proteus
01 - Data Knob 1	Mod
09 - Data Knob 2	B
04 - Foot Pedal	C
XX - None	D

### Standard MIDI Controller Numbers:

- 1- Modulation Wheel
- 2- Breath Controller
- 3- Pressure Rev 1 DX7
- 4- Foot Pedal
- 5- Portamento Time
- 6- Data Entry
- 7- Volume
- 8- Balance
- 9- Undefined
- 10- Pan

To complete the connections for a particular preset, go to the Preset Edit menu, Realtime Control, and route the modulation wheel or the MIDI Mod, B, C, D to the desired destinations. These could be patched to any 4 destinations or even to the same destination. The MIDI Controller Amount menu, (in the Preset Edit menu) allows you to scale the amounts of each of the controllers by a positive or negative value. The signal flow is shown in the diagram below.



The MIDI controllers Mod -B-C-D must have a source (0-31), **and** a control destination assigned.

## PROGRAMMING BASICS

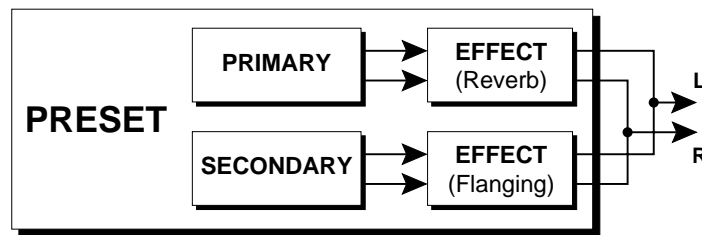
### EFFECTS

Proteus contains two effects channels which can be shared by the primary and secondary layers and even among multiple presets. When using a single preset, the effect is essentially part of the preset. When a new preset is selected, the effect associated with the new preset will also be selected.

The primary and secondary instruments can each have a separate effect, they can both share one effect, or they can be unprocessed (dry).

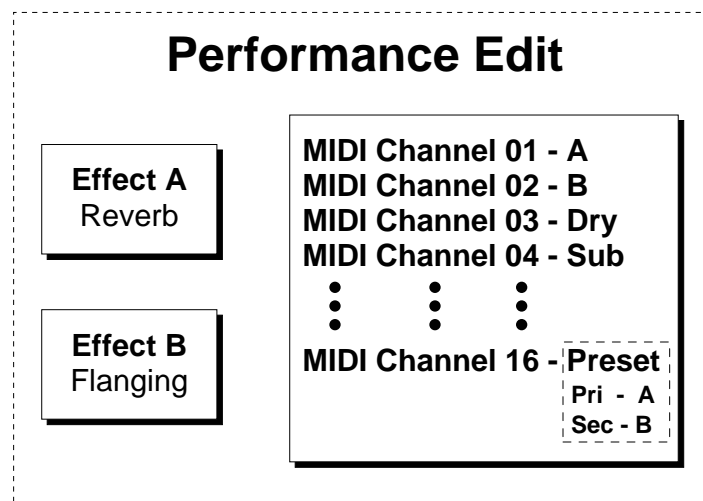
**Single Preset**  
Effect programmed in the Preset is used.

**Multiple Presets**  
Effect programmed in the Performance Map is used.



*Effects can be programmed as a part of a preset.*

When Multi-mode is activated, you may have multiple presets playing at once but only two effects. In the case of Multi-mode, the effect buss (A, B or None) may be programmed as part of the Preset or a Performance Map, but the type of effects and their amounts are programmed in the Performance Edit menu. The effects selected in the preset are ignored.



*When multiple presets are in use, the buss selection (A, B, None or Preset) as well as the type of effects are programmed as part of the Performance Map. When preset is selected the buss routing programmed in the preset is used.*

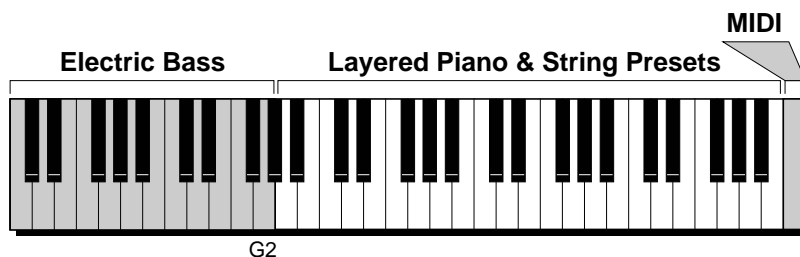
## PROGRAMMING BASICS

### PROGRAMMING EXAMPLES

Now for a Guided Tour of the Performance Edit and Preset Edit menus. We'll also explain the concept of Proteus Synthesis, and give you a few specific programming examples and tips.

### PROGRAMMING A SPLIT KEYBOARD

The Performance section of the Proteus allows you to easily create keyboard “splits” and layers. Suppose for example you wanted to have electric bass on the lowest twelfth, with a piano and a string preset layered on the rest of the keyboard except for the last note which will be used to trigger a special effect on an external sampler via MIDI.



- 1) Press the Performance Edit button.
- 2) Press the Increment button until the following screen appears.

KEY1 Z1 C-2 ->G8
000 Grand Piano

- 3) “KEY1” refers to Quick Key 1. When Quick Key 1 is pressed, your split keyboard will be called up. “Z1” refers to the first keyboard zone, in this case the zone containing the electric bass preset. The keyboard can be divided with up to four zones. “C-2 ->G8” is the keyboard range where the preset will be assigned. The lower line contains the preset assigned to Zone 1.
- 4) Move the cursor underneath C-2 and play the lowest key on the keyboard. The lowest key changes to C1. Move the cursor underneath G8 and play G2 as shown in the diagram above.
- 5) Press the cursor button again to move it underneath the preset number. Use the data entry knob to select the electric bass preset.

## PROGRAMMING BASICS

- 6) Move the cursor so that it is underneath Z1. Press the increment button once and Z2 (zone 2) will be selected. (The preset and keyboard assignments will change.)
- 7) Change the keyboard assignments for zone 2 as you did for zone 1. This zone should extend from G#2 ->B5. Change the preset to a piano.

KEY1 Z2 G#2 ->B5
000 Grand Piano

- 8) For zone 3, set the keyboard range G#2 ->B5 (just like zone 2). Change the preset to a string sound. Assigning two presets to the same range layers the two presets.
- 9) We're almost finished. Select zone 4 and set the range: C6->C6. Set the preset to "099 -default". The default preset prevents internal sounds from playing on that channel. Press Enter, then press the increment button once to move to next screen which looks something like this:

CH:1	2	3	4	← Zone Number
01	02	03	06	← MIDI Channel Number

- 10) Move the cursor to the lower line and set the MIDI channel on zone 4 to the same channel as your hypothetical sampler containing the sound effect. When the highest note is pressed, the sampler will play whatever sound you have assigned to that note.
- 11) Now that everything is just the way you want it, it's time to SAVE! Press the Save/Copy button. The Enter light will be flashing. Select a Performance Map location using the numeric keys, then press Enter. Your work is saved.

To call up this Quick Key assignment again:

- a) Select the proper Performance Map. (Hold Performance Select and press the numeric key.)
- b) Turn Quick Key On and select the Quick Key (in this case: 0) using the numeric keys. That's it!

## PROGRAMMING BASICS

### EDITING PRESETS

The easiest way to make a preset is to edit an existing preset. This is also an excellent way of becoming familiar with Proteus. If you don't like what you hear, simply change the preset and Proteus reverts back to the original sound. Changes are not made permanent until you *Save* them using the "SAVE/COPY" function. (Press Save/Copy from within the Preset Edit menu, choose the new preset location and press Enter.) Let's experiment and modify a few parameters of an existing preset. We'll start with functions that have an obvious effect on the sound like Instrument select, Coarse Tuning, Chorus, and Reverse Sound. First, choose a preset that strikes your fancy and press the Preset Edit button.

### CHANGING THE INSTRUMENT

This is probably the easiest way to modify existing presets. Scroll through the Edit menu functions until you come to:

INSTRUMENT pri  
IXXX Instr Name

Move the cursor down to the bottom line (using the cursor button) and change the primary instrument with the data entry control. Play the keyboard as you scroll through the various instruments. When you find an interesting instrument, move the cursor back up to the first line and select:

INSTRUMENT sec  
IXXX Instr Name

Repeat the process for the secondary instrument. Find an instrument that sounds good when combined with the first one you selected. You can probably see that with all these great instruments to work with, you really can't go wrong. Now let's play with the tuning.



## **PROGRAMMING BASICS**

### **CHANGING THE TUNING OF AN INSTRUMENT**

Scroll through the Preset Edit menu functions until you come to:

TUNING coarse  
pri:+00 sec:+00

If the numbers are “00” as in the example above, it means that the instruments are tuned to concert pitch (A=440 Hz). Each whole number in coarse tuning represents a semitone interval. To tune one or both of the instruments up an octave, move the cursor to the number (using the cursor button) and set the number to +12 using the data entry control. Try tuning one of the instruments to a perfect fifth above the other. Simply set the coarse tuning to +7.

### **DOUBLE+DETUNE**

This is an easy one. With the cursor on the top line of the display, turn the data control until you find DOUBLE+DETUNE. Doubling can be turned on or off for each of the primary and secondary instruments. In addition, the amount of detuning (which thickens the sound) is adjustable from 0 (no detuning) to 15 (maximum detuning). Try it.

DOUBLE+DETUNE  
pri:0ff sec:07

### **REVERSING THE SOUND**

A simple concept. The instrument sounds can be played in reverse. This will normally make an instrument sound quite a bit different. It also virtually doubles the number of raw instruments you have to work with, and it's fun.

REVERSE SOUND  
pri:0ff sec:0ff

You're probably getting the idea by now. Remember not to change presets or the preset will return to its un-edited state.

## PROGRAMMING BASICS

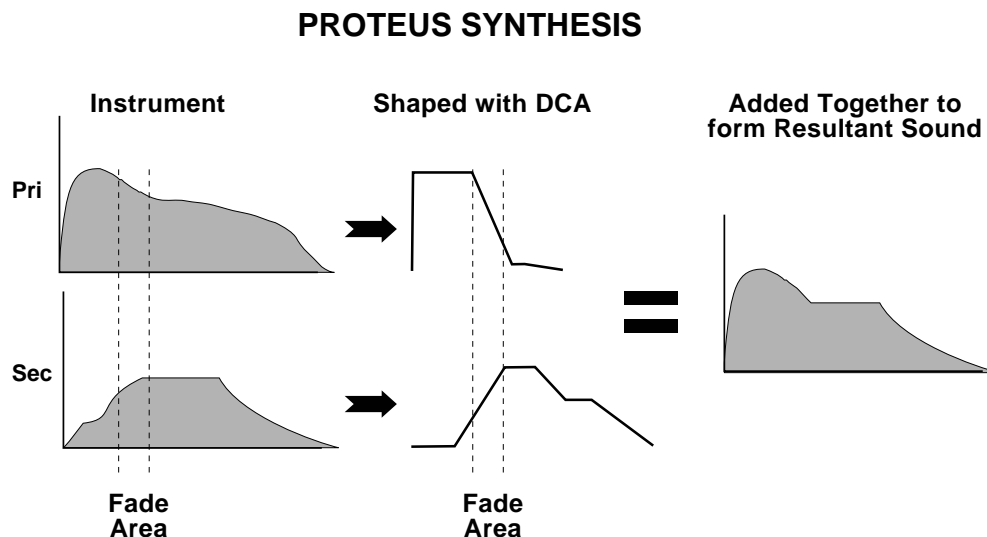
If you want to save your creation, press the Save/Copy button, select the new preset location and press Enter. That's all there is to it.

The previous examples were offered solely to pique your curiosity. By all means, go ahead and experiment with any of the other functions. Some of the best sounds have been discovered by accident. If it sounds good ... Do it!

### PROTEUS SYNTHESIS

Oh, no! Not another form of synthesis to learn.  
Relax. It's easy.

Proteus Synthesis is actually just a form of additive synthesis. Only, instead of building a sound from simple sine waves, Proteus starts with complete sampled sounds or complex waveforms and combines all or part of these together to form a new sound. The process is illustrated below.



*Portions of two sounds are dynamically crossfaded in order to produce a new sound containing elements of both.*

The envelope generators controlling the DCAs (digitally controlled amplifiers) can be used to fade between two instruments (primary and secondary) during the course of a note. This powerful technique allows

## PROGRAMMING BASICS

you to combine elements of different instruments together to form completely new sounds. These new sounds are totally natural, because they are based on natural sounds. Proteus also contains many digitally generated waveforms that can be combined with other digital waves or with sampled instruments in order to change the character of the sound, perhaps to add a digital “edge” or add more bottom. In addition to the envelope generators, parameters such as Delay, Sound Start, and Cross-fade allow you to further control the blend of primary and secondary instruments.

As an example, let's combine the electric guitar and a synthesized waveform to create a new instrument. Refer to the Preset Edit menu parameters in the chart below. The Electric Guitar is the basic sound and is augmented by a chorused, synthesized wave which adds a digital sheen. Note that the guitar has a slower attack, which completely changes its character. Basically, the attack of the guitar has been replaced by the synthesized wave. In addition, the guitar is tuned up one octave and the two sounds have been panned to different positions in the stereo field.

Primary	Secondary
Instrument: Oct. 7 All	Instrument: El. Guitar
Alt Envelope: On	Alt Envelope: On
A H D S R 00 00 51 00 36	A H D S R 05 05 27 88 44
Volume: 45	Volume: 88
Chorus: On	Chorus: Off
Tuning: +00	Tuning: +12
Pan: +2	Pan: -2

### ANOTHER EXAMPLE

As another example, we'll use the attack portion of the Soft Flute and the sustain portion of the Tenor Sax as raw material. This time we will use the Delay and Sound Start parameters as well as the Alternate Envelopes to blend the two instruments. The attack portion of the secondary instrument is removed using the Sound Start parameter and then delayed slightly so it will sound only after the flute attack portion begins to decay.

## PROGRAMMING BASICS

The alternate envelopes are used to “fine tune” the splice. Furthermore, the flute attack has been detuned a bit sharp so the composite sound will start sharp and fall into correct pitch. Continue your experiments using this example, but changing the primary and secondary instruments. When you have found a good combination, fine tune the delay, sample start, volume and envelope parameters. Feel free to play with the modulation parameters as well.

Primary	Secondary
Instrument: Soft Flute	Instrument: Tenor Sax
Alt Envelope: On	Alt Envelope: On
A H D S R 04 02 16 00 16	A H D S R 06 00 38 85 40
Volume: 109	Volume: 83
Fine Tuning: +05	Fine Tuning: +00
Tuning: +12	Tuning: +12
Delay: 000	Delay: 002
Sound Start: 000	Sound Start: 040

### USING PROTEUS WITH A SEQUENCER

The Proteus was designed from its conception with multi-timbral sequencing in mind. Just take a look at the main screen (or the 14th screen in the Performance Edit menu). Each Performance Map can store a different multi-mode setup for all 16 MIDI channels.



■ The main screen and the 14th screen in the Performance Edit menu are identical.

**In order to respond to multiple MIDI channels, Proteus must be in Multi-Mode.**

Multi-Mode is enabled by pressing the Multi button on the front panel. When the Multi LED is lit, Proteus will respond to multiple MIDI channels.

## PROGRAMMING BASICS

The preset for each MIDI channel is selected from this screen. Press the cursor button to move the cursor up so that it is underneath the channel number.

C01 Vol127 Pan+P  
 000 Grand Piano

Turn the data entry control and you will see that every MIDI channel has a preset assigned to it. Just select a preset for each of the MIDI channels. It's simple! (The multi-mode selection screen is also available in the second screen of the Performance Edit menu.) If you wish to reserve certain channels for other MIDI synthesizers, set the preset to "099-default". Volume and Pan position can also be adjusted for each channel.

**The following ROM presets use only one output channel:**

007 Sweet n' Saxy  
 011 Metal Cables  
 013 Acoustic Guitar  
 024 Solo Trumpet  
 027 Latin Drums  
 028 Latin Perc.  
 044 Solo Trombone  
 053 Underground  
 065 Rock Drums  
 098 Machine Snare

### USING THE 32 CHANNELS

The Proteus has 32 independent audio channels which are utilized dynamically. With 32 channels and 300 presets, you have a universe of sonic textures at your disposal. Some Proteus presets utilize linked presets or use the double+detune function to make them sound fatter. While this is fine when the preset is played solo, you may begin to run out of channels when Proteus is played multi-timbrally. Linking and doubling cause twice as many channels to be used by the preset. Learn to "budget" your output channels for maximum efficiency.

### CHANNEL RIPOFF

When Proteus uses up all its 32 channels and needs more, it steals a channel from the key that has been held the longest. This is commonly known as channel ripoff. You will most commonly encounter this ripoff when using Proteus in multi-timbral mode. Since the Proteus dynamically allocates channels as needed, to eliminate ripoff you must either, play fewer notes, use simpler sounds, or turn off doubling (pri/sec, or linked presets).

## PROGRAMMING BASICS

### INSTRUMENT DEFINITION

If your sequence has a instrumental section using numerous chords, it may be advantageous to use a basic preset without links or doubling. A preset will sound much different alone than when combined with an ensemble. Try to resist the temptation to make every sound as fat as possible or you can wind up with “MIDI Soup”; a huge, stifling sound with every possible audio frequency filled. Each voice in your composition should have it’s own identity. Save the monster sounds for solos or dramatic effects.

### PRE-SEQUENCE SETUP

One way to keep everything neat and tidy is to centralize everything at the sequencer (patch changes, continuous controllers, etc.). This is especially easy if you have a “full-featured” sequencer which allows you to store and edit continuous controller messages. The advantage of storing everything in the sequence is that all the data will be in one place and changing a performance map in the Proteus won't cause the sequence you wrote two weeks ago to play the wrong presets or effects.

The basic idea of a pre-sequence setup is to send out MIDI information just before the start of the song. This MIDI information will select all the proper presets, adjust the mix and pan positions of each preset.

**Note:** Proteus setup information should be transmitted from the sequencer *before* the song actually starts, perhaps during a lead-in measure or countdown. DO NOT send setup information just before the first beat of the song or MIDI timing errors could result.

### USING EFFECTS IN MULTI MODE

It would be nice if there was a separate effect for each MIDI channel. Unfortunately, there isn't! There are only two effect processors so you have to “budget” them in your multi-timbral sequence. Effects *can* be changed during a sequence either by selecting a new performance map or by using the realtime MIDI control numbers shown on pages 140 and 141. To avoid nasty pops and glitches, sound must **not** be playing through the effect while it is being changed.

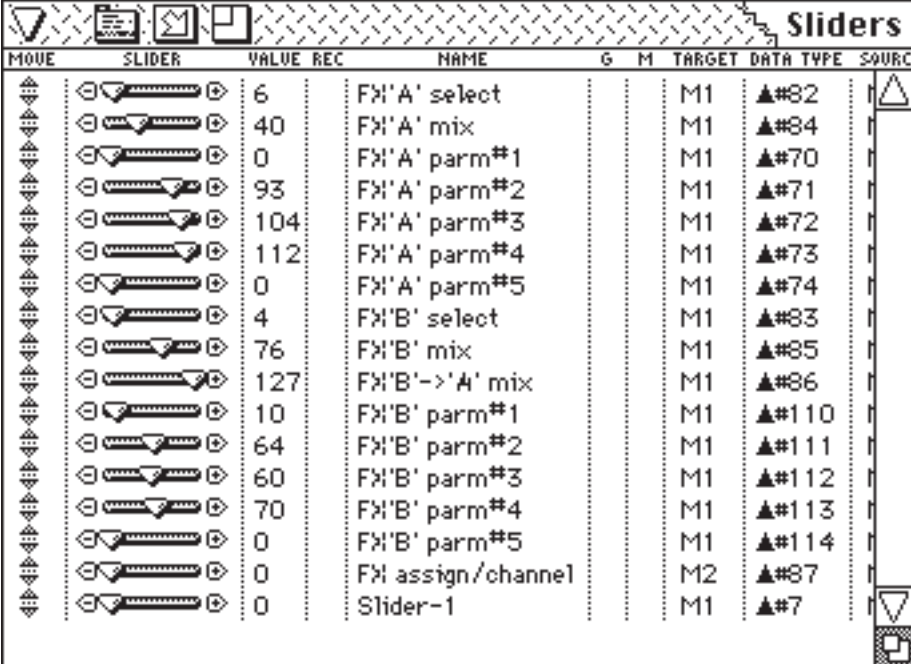
### REMEMBER...

**In Multimode, the effects settings in the Performance Map are used.**

## PROGRAMMING BASICS

### REALTIME EFFECTS CONTROL

Special continuous controller messages can be set up to control the effects parameters as shown in the Performer™ sequencer screen below.



MOVE	SLIDER	VALUE	REC	NAME	G	M	TARGET	DATA TYPE	SOURCE
		6		FX'A' select			M1	▲#82	
		40		FX'A' mix			M1	▲#84	
		0		FX'A' parm#1			M1	▲#70	
		93		FX'A' parm#2			M1	▲#71	
		104		FX'A' parm#3			M1	▲#72	
		112		FX'A' parm#4			M1	▲#73	
		0		FX'A' parm#5			M1	▲#74	
		4		FX'B' select			M1	▲#83	
		76		FX'B' mix			M1	▲#85	
		127		FX'B' -> 'A' mix			M1	▲#86	
		10		FX'B' parm#1			M1	▲#110	
		64		FX'B' parm#2			M1	▲#111	
		60		FX'B' parm#3			M1	▲#112	
		70		FX'B' parm#4			M1	▲#113	
		0		FX'B' parm#5			M1	▲#114	
		0		FX assign/channel			M2	▲#87	
		0		Slider-1			M1	▲#7	

In the Performer screen above, the Proteus effect parameters have all been programmed and named so that they can be adjusted during the sequence. Labelling everything helps to reduce the confusion factor. One caution however. The effects parameters have not been “de-zipped”, meaning that there may be slight glitches in the sound if an effect is being used while its parameters are being changed. The MIDI continuous controller numbers for all the effect parameters are listed on pages 140 and 141 of this manual.

### MIDI BANK SELECT

Another function you may want to access over MIDI is preset bank select. To change Proteus preset banks send:

- 1) Controller 0      Value 00
- 2) Controller 32    Value 00 = ROM, Value 01 = RAM, Value 02 = Card
- 3) Send Program Change (Program Change MUST be sent to change bank.)

This patch sheet can be photocopied and used to keep written records of your favorite Proteus sounds.

# PROTEUS Patch Sheet

## part 1

Pri INSTRUMENT	
Sec INSTRUMENT	
KEY RANGE	
Pri KEY RANGE	
Sec KEY RANGE	
Pri VOLUME	
Sec VOLUME	
Pri PAN	
Sec PAN	
Pri COARSE TUNE	
Sec COARSE TUNE	
Pri FINE TUNE	
Sec FINE TUNE	
Pri DOUBLE+DELAY	
Sec DOUBLE+DELAY	
Pri DELAY	
Sec DELAY	
Pri SOLO	
Sec SOLO	
Pri SOUND START	
Sec SOUND START	
Pri EFFECT ASSIGN	
Sec EFFECT ASSIGN	
A EX AMOUNT	
B FX AMOUNT	
B->A FX AMOUNT	
Pri REVERSE	
Sec REVERSE	
Pri ALT. ENVELOPE	
Sec ALT. ENVELOPE	

Pri ATTACK	
Pri HOLD	
Pri DECAY	
Pri SUSTAIN	
Pri RELEASE	
Sec ATTACK	
Sec HOLD	
Sec DECAY	
Sec SUSTAIN	
Sec RELEASE	
XFADE MODE	FD Xsw
XFADE DIRECTION	→
XFADE BALANCE	
XFADE AMOUNT	
SWITCH POINT	
LFO 1 SHAPE	
LFO 1 AMOUNT	
LFO 1 RATE	
LFO 1 DELAY	
LFO 1 VARIATION	
LFO 2 SHAPE	
LFO 2 AMOUNT	
LFO 2 RATE	
LFO 2 DELAY	
LFO 2 VARIATION	
AUX ENV AMOUNT	
AUX ENV DELAY	
AUX ENV-ATTACK	
AUX ENV-HOLD	
AUX ENV-DECAY	
AUX ENV-SUSTAIN	
AUX ENV-RELEASE	

KEY/VELOCITY CONTROL	
1 >	
2 >	
3 >	
4 >	
5 >	
6 >	
REALTIME MOD. CONTROL	
1 - →	
2 - →	
3 - →	
4 - →	
5 - →	
6 - →	
7 - →	
8 - →	
FOOTSWITCH CONTROL	
LOCAL →	
2 →	
3 →	
P-BEND RANGE	
CONTROLLER AMOUNT	
CONTROLLER MOD	
CONTROLLER B	
CONTROLLER C	
CONTROLLER D	
PRESSURE AMT.	
VEL. CURVE	
KYBD CENTER	
KYBD TUNING	
LINK 1 →	
LINK 2 →	
LINK 3 →	



# **PROTEUS Patch Sheet**

## *part 2*

### "A" EFFECTS

DELAY X-DELAY ECHO	
R DELAY TIME	
R TAP LEVEL	
L DELAY TIME	
L TAP LEVEL	
FEEDBACK	

REVERB EFFECTS	
REVERB TYPE	
DECAY TIME	

STEREO EQ A	
FREQUENCY 1	
BANDWIDTH 1	
BOOST/CUT 1	
FREQUENCY 2	
BANDWIDTH 2	
BOOST/CUT 2	

CHORUS	
LFO RATE	
LFO DEPTH	
MIN DELAY	
FEEDBACK	
MIX	

PHASER FLANGER	
LFO RATE	
LFO DEPTH	
MIN DELAY	
FEEDBACK	

### "B" EFFECTS

**RING MODULATOR** ☐

DELAY X-DELAY	
R DELAY TIME	
R TAP LEVEL	
L DELAY TIME	
L TAP LEVEL	
FEEDBACK	

PHASER FLANGER	
LFO RATE	
LFO DEPTH	
MIN DELAY	
FEEDBACK	

CHORUS	
LFO RATE	
LFO DEPTH	
MIN DELAY	
FEEDBACK	
MIX	

STEREO EQ B	
FREQUENCY L	
BANDWIDTH L	
BOOST/CUT L	
FREQUENCY R	
BANDWIDTH R	
BOOST/CUT R	

FUZZ 1 FUZZ LITE	
INPUT FILTER	
OUTPUT FILTER	
OUTPUT LEVEL	

## ***PRESET EDIT MENU***



## PRESET EDIT MENU

The preset edit menu contains functions that can be modified by the user and then saved as preset information in one of the user presets. For example, the LFO speed or other parameter can be edited, then the preset can be saved to a user location (100-199 Internal RAM, 200-299 RAM Card).

### TO ENABLE THE PRESET EDIT MENU

Press the Preset Edit key, lighting the LED. The current screen will be the one most recently selected since powering up the machine. The cursor will appear underneath the first character of the screen heading on line one.

### TO SELECT A NEW SCREEN

Press the left or right cursor key repeatedly until the cursor is underneath the screen heading (or press Enter ). Rotate the data entry control or use the increment/decrement keys to select the screen.

### TO MODIFY A PARAMETER

Press the left or right cursor key repeatedly until the cursor is underneath the desired parameter. Rotate the data entry control, use the increment/decrement keys or use the numeric keys to change the parameter.

### TO SAVE A PRESET

While in the Preset Edit menu, press the Save/Copy button. Use the data entry knob or the increment/decrement buttons to select the new preset location. Press Enter to store the preset.

### TO RETURN TO PRESET SELECT MODE

Press the Preset Edit button, turning off the LED.

■ While the Preset Edit menu is activated, incoming MIDI preset changes are ignored. This is a quick and easy way to temporarily turn MIDI Preset Change OFF.

▼ Warning: If you select another preset or turn off power, changes made in the Preset Edit menu will be lost unless the preset is saved using the Save/Copy function .

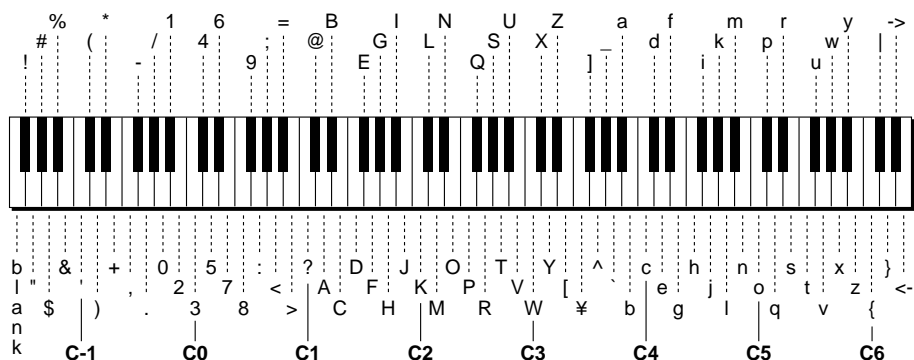
## PRESET EDIT MENU

### PRESET EDIT FUNCTIONS

#### PRESET NAME

Preset Name allows you to name each of the user presets with a name of up to 12 characters. Position the cursor under the character location and use the data entry control to change the character. The keyboard can also be used to select characters. The charts below show the keyboard character assignment.

PRESET NAME  
 000 Untitled



	C	C#	D	D#	E	F	F#	G	G#	A	A#	B	Pitch
-2						blank	!	"	#	\$	%	&	
-1	'	(	)	*	+	,	-	.	/	0	1	2	
0	3	4	5	6	7	8	9	:	;	<	=	>	
1	?	@	A	B	C	D	E	F	G	H	I	J	
2	K	L	M	N	O	P	Q	R	S	T	U	V	
3	W	X	Y	Z	[	¥	]	^	_	`	a	b	
4	c	d	e	f	g	h	i	j	k	l	m	n	
5	o	p	q	r	s	t	u	v	w	x	y	z	
6	{		}	→	←								

Octave  
No.

## PRESET EDIT MENU

### PRIMARY INSTRUMENT

This function allows you to select which of the available instrument sounds (or none) will be placed on the primary layer of the current user preset.

INSTRUMENT pri  
I002 Piano Pad

### SECONDARY INSTRUMENT

This function allows you to select which of the available instrument sounds (or none) will be placed on the secondary layer of the current user preset.

INSTRUMENT sec  
I001 Piano

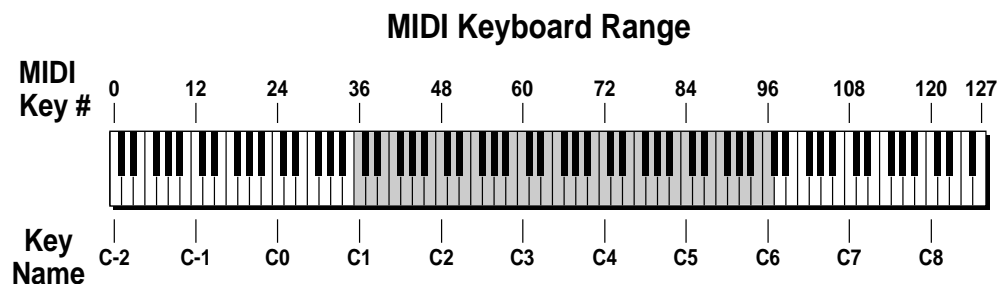
### PRESET KEY RANGE

Key range sets the maximum keyboard range of both primary and secondary instruments. This sets the keyboard range for the entire preset and will further limit the primary and secondary keyboard ranges. The key range can be set anywhere from C-2 to G8.

KEY RANGE  
C-2 -> G8

■ Simply changing the instrument creates an entirely new sound while retaining all other parameters of the preset.

■ Any value that is a key number can be set by playing the desired key.



= Proteus 5 Octave Keyboard Range

## PRESET EDIT MENU

■ **Preset Key Range**  
will further limit both the  
primary and secondary  
instruments.

### PRIMARY KEY RANGE

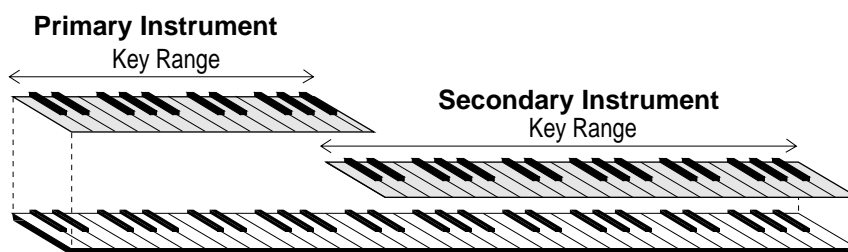
This sets the keyboard range of the primary instrument. This is useful for creating positional crossfades and keyboard splits between the primary and secondary layers. The key range can be set anywhere from C-2 to G8.

KEY RANGE pri  
C-2 -> G8

### SECONDARY KEY RANGE

This sets the keyboard range of the secondary instrument. The key range can be set anywhere from C-2 to G8.

KEY RANGE sec  
C-2 -> G8



*This diagram shows how a "split" keyboard can be programmed using the primary and secondary instruments.*



*This diagram shows how instruments can be layered or "stacked" using the primary and secondary instruments.*

## PRESET EDIT MENU

### VOLUME

Volume sets the amplitude of the primary and secondary instruments. This function also allows you to compensate for the relative volume differences between instruments.

VOLUME  
pri:127 sec:64

■ There are three volume controls on the Proteus.

1. Front Panel Volume
2. Channel Volume
3. Instrument Volume

### PAN

Pan allows you to independently set the initial pan position of the primary and secondary instruments. A value of -7 pans the instrument hard left and a value of +7 pans the instrument hard right. This pan setting is only valid if "P", for preset pan, is selected in the main display.

PAN  
pri:-7 sec:+7

### COARSE TUNING

This function allows you to change the tuning of the primary and secondary instruments in semitone intervals. The coarse tuning range is -36 to +36 semitones. A coarse tuning setting of "00" would indicate that the instrument is tuned to concert pitch (A=440 Hz).

TUNING coarse  
pri:+00 sec:+00

### FINE TUNING

This function allows you to change the tuning of the primary and secondary instruments in 1/64 semitone intervals (approx. 1.56 cents). The fine tuning range is  $\pm 1$  semitone.

TUNING fine  
pri:+00 sec:+00



## PRESET EDIT MENU

### DOUBLE + DETUNE

Double + Detune thickens the sound by doubling the sound and then detuning it. This screen allows you select the amount from a range of 1 to 15 or turn the effect Off. When on, the number of output channels used by an instrument will be doubled.

DOUBLE + DETUNE  
pri:Off sec:07

### DELAY

Delay varies the time between when a MIDI Note On message is received and the onset of a note. The delay time is adjustable from 0 to 13 seconds (000-127).

DELAY  
pri:000 sec:000

### SOLO MODE

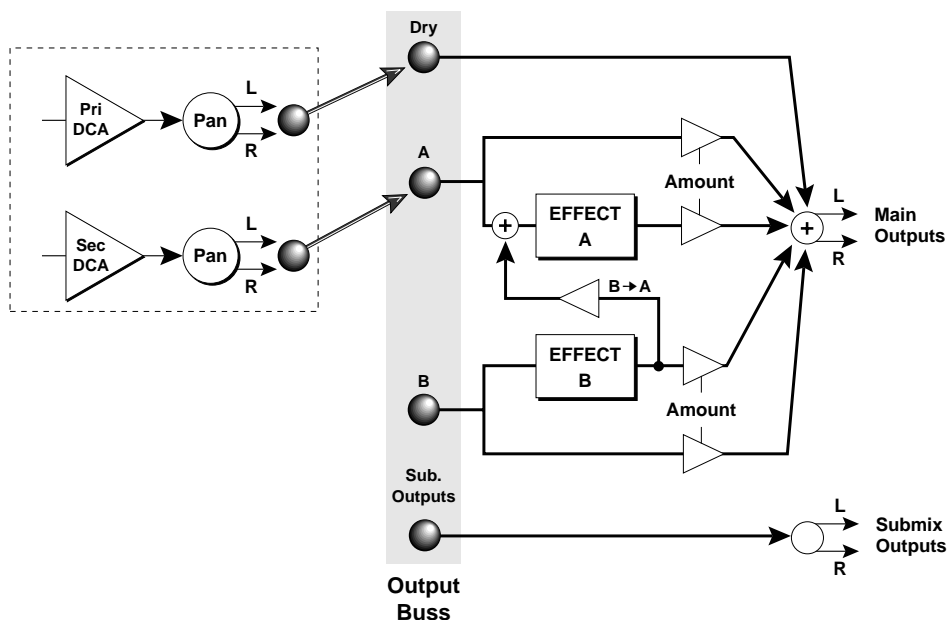
Solo mode switches an instrument into monophonic (no chords) mode. If a new note is played while another is being held, the pitch will change but the envelope generator will not restart the attack. This allows a legato or slurred playing style. Solo mode works well with guitar and wind controllers.

SOLO MODE  
pri:Off sec:0n

### SOUND START

This sets the point along its length where a sound begins playing when you hit a key. A setting of 000 plays a sound from the beginning, higher values move the sample start point toward the end of the sound.

SOUND START  
pri:000 sec:000

**PRESET EDIT MENU**

Block diagram of the Proteus effects section. The effect pathways are stereo.

**EFFECTS**

This function allows you to select one of the two available effects busses for each instrument, have the instrument remain dry (no effects) or to route the instrument to the submix outputs. The type of effects used and their amounts are selected in the next two screens.

EFFECTS	
pri:Dry	sec:A

**EFFECT A**

This function allows you to select which effect is assigned to effect buss A. The A effects consist of several types of stereo reverb, two kinds of stereo delay, stereo flanger, stereo chorus, stereo echo and stereo phaser.

FXA:Hall 2	
Decay Time:	200

## **PRESET EDIT MENU**

### **EFFECT B**

This function allows you to select which effect is assigned to effect buss B. The B effects include: stereo flanger, stereo chorus, stereo digital delay, stereo fuzz and ring modulator.

FXB:StereoFlange
LF0 Rate      050

### **EFFECTS AMOUNT**

This function allows you to adjust the percentage of wet and dry signals (processed and unprocessed) with 100% being only processed signal. Additionally, the B->A parameter allows you to adjust the amount of the B effect which is fed through the A effect device. If B>A is set one value above 100%, "Only" is displayed and the B amount changes to Off. This disconnects effect B from the main outputs and routes all of the effect B signal through effect A.

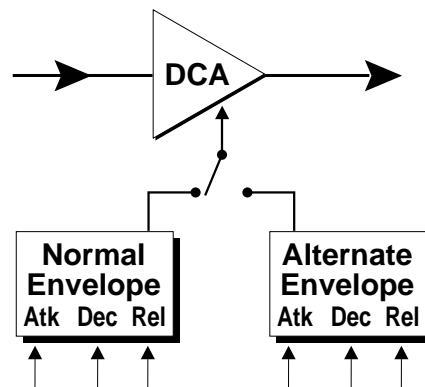
FX AMOUNT A:40%
B>A:0%      B:82%

**FOR DETAILED EXPLANATIONS OF EACH EFFECT,  
SEE THE EFFECTS CHAPTER IN THIS MANUAL.**

### **REVERSE SOUND**

When reverse sound is turned On, the instrument sample will be played backwards. When an instrument is reversed, any loops in the sound will be ignored, which means that the sound will not sustain indefinitely.

REVERSE SOUND
pri:Off    sec:On

**PRESET EDIT MENU****ALTERNATE ENVELOPE ON/OFF**

Each instrument has its own factory preset AHDSR volume envelope which is normally employed. Turn the alternate envelope On if you wish to alter the factory preset volume envelope.

ALT ENVELOPE
pri:0ff sec:0n

**PRIMARY and SECONDARY ALTERNATE ENVELOPE**

This function allows you to adjust the alternate volume envelope parameters for the primary and secondary instruments. The parameters are Attack time, Hold time, Decay time, Sustain level, Release time and are adjustable from 00 to 99.

P: A H D S R
00 00 00 99 16

S: A H D S R
00 00 00 99 16

■ See page 139 for the envelope time charts.

## PRESET EDIT MENU

### CROSSFADE MODE

Crossfade is the relative loudness of the primary and secondary instruments. Crossfade mode selects how the relative loudness is controlled.

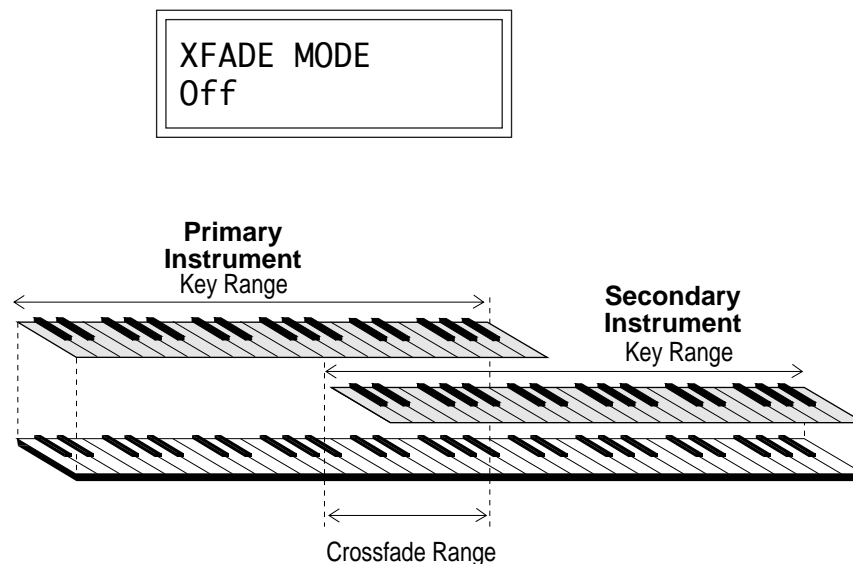
■ **Off:** When Off is selected, none of the crossfade parameters will have any effect and both instruments will be fully On.

■ **Crossfade:** When crossfade is selected, a control input is used to fade between the primary and secondary. Any modulation source may be used as an input (velocity, wheel, etc.) The modulation source is programmed in the key/velocity or realtime modulation screens.

■ **Cross-switch:** When cross-switch mode is selected, you get only one layer at a time. The other layer is selected if the key position or velocity crosses a certain threshold or if a footswitch controlling cross-switch is activated. The switch occurs only at the start of the note; no further switching takes place while the key is held down. If key position or velocity is routed to cross-switch, the threshold is the *switch point*. **To enable the Cross-switch function, you must assign Crossfade to a modulation source in the Realtime or Velocity Modulation screen.** Realtime controllers do not have any effect when routed to cross-switch.

■ For more information, see *Cross-Switch Point* on page 94.

■ To use the keyboard for crossfade, set the balance to 64 and key center to the split point.



By overlapping the primary and secondary instruments, you can crossfade or cross-switch between the two layers.

## PRESET EDIT MENU

### CROSSFADE DIRECTION

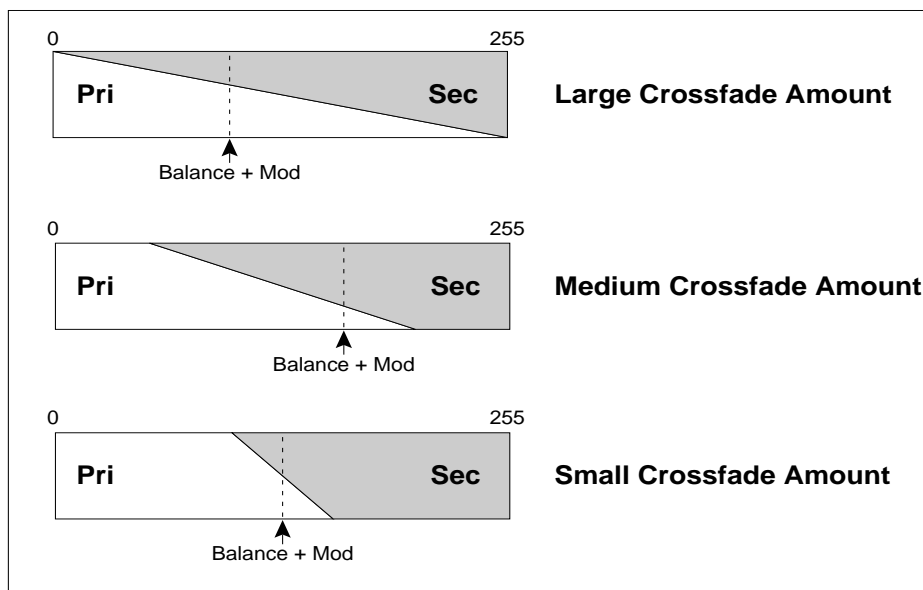
This function determines the polarity of the crossfade or cross-switch. The direction is either primary → secondary, or secondary → primary. The primary instrument is louder when the control source is below the crossfade balance point.

XFADE DIRECTION  
Pri -> Sec

### CROSSFADE BALANCE

The crossfade balance parameter determines the initial balance between the primary and secondary layers. Higher values shift the volume to the secondary instrument. **Modulation subtracts from the primary volume and adds to the secondary volume.** When crossfade modulation and balance equal 64, the two instruments are equal.

XFADE BALANCE  
064



Modulation and Crossfade Balance are **added** together to determine the mixture of primary and secondary instruments. Higher values increase the secondary volume.

■ A Crossfade Balance setting of 000 would be appropriate with a source such as a modulation wheel or footpedal which only change the value in a positive direction.

▼ Crossfade must be assigned to a modulation source in the Realtime or Velocity modulation screens.

## PRESET EDIT MENU

### CROSSFADE AMOUNT

The crossfade amount parameter determines the range over which crossfading will occur. Crossfade amount is variable from 000 to 255. The larger the value, the more modulation will be required to effect a complete crossfade.

XFADE AMOUNT  
128

### CROSS-SWITCH POINT

The cross-switch point parameter determines the point at which cross-switching will occur when key position or velocity is controlling cross-switch.

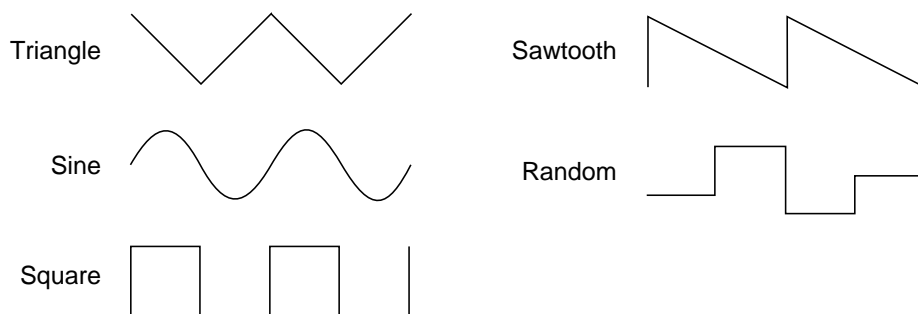
Velocity — SWITCH POINT — Key  
064 c#2

■ To enable the Cross-switch function, you must assign **Crossfade** to a modulation source in the Realtime or Velocity Modulation screen.

### LFO 1 - SHAPE and AMOUNT

This screen controls the waveshape and amount of Low Frequency Oscillator 1. The LFO can be used to produce vibrato (when routed to pitch), or tremolo (when routed to volume). The five LFO waveshapes are: Triangle, Sine, Square, Sawtooth, and Random. The amount can be varied from -128 to +127. Negative values will produce inverted wave-shapes.

LF01 SHAPE AMT  
Rand +127

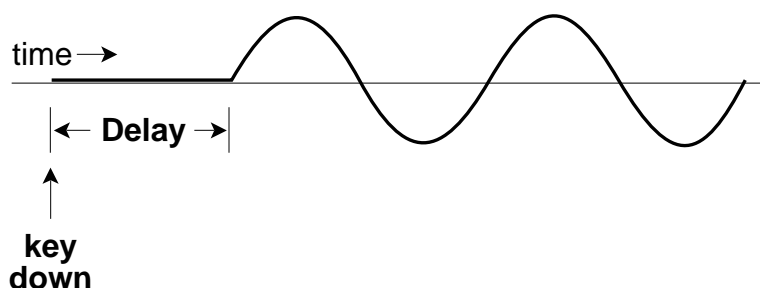


**PRESET EDIT MENU****LFO 1 - RATE, DELAY and VARIATION**

This screen controls the rate, delay and variation of LFO 1.

■ **LFO Rate:** varies the LFO speed from 0.052 Hz to 25 Hz (000-127).

■ **LFO Delay:** sets the amount of time between hitting a key and the onset of modulation. This can be used to simulate an effect often used by acoustic instrument players, where the vibrato is brought in only after the initial note pitch has been established. The delay range is variable from 0 to 13 seconds (000-127).



*The LFO wave begins after the specified delay time has elapsed.*

■ **LFO Variation:** sets the amount of random variation of an LFO each time a key is pressed. This function is useful for ensemble effects, where each note played has a slightly different modulation rate. The higher the number, the greater the note to note variation in LFO rate. LFO variation is variable from 000-127.

LF01	RT	DLY	VAR
000	000	000	000

**LFO 2 - SHAPE and AMOUNT**

LFO 2 is functionally identical to LFO 1.

**LFO 2 - RATE, DELAY and VARIATION**

LFO 2 is functionally identical to LFO 1.



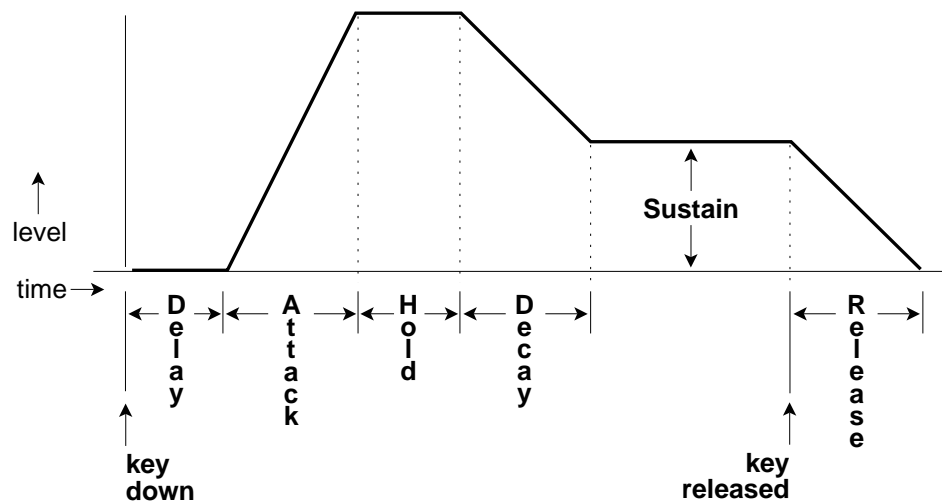
## PRESET EDIT MENU

### AUXILIARY ENVELOPE

This is a supplementary, utility envelope that can be routed to any realtime control destination. The auxiliary envelope parameters are: Envelope Amount, Delay, Attack Time, Hold Time, Decay Time, Sustain Level, and Release Time. The delay time is variable from 0 to 13 seconds (000-127). The envelope amount is variable from -128 to +127. Negative values will produce inverted envelopes.

AUX ENV AMT DLY
+127 000

A: A H D S R
00 00 00 99 20

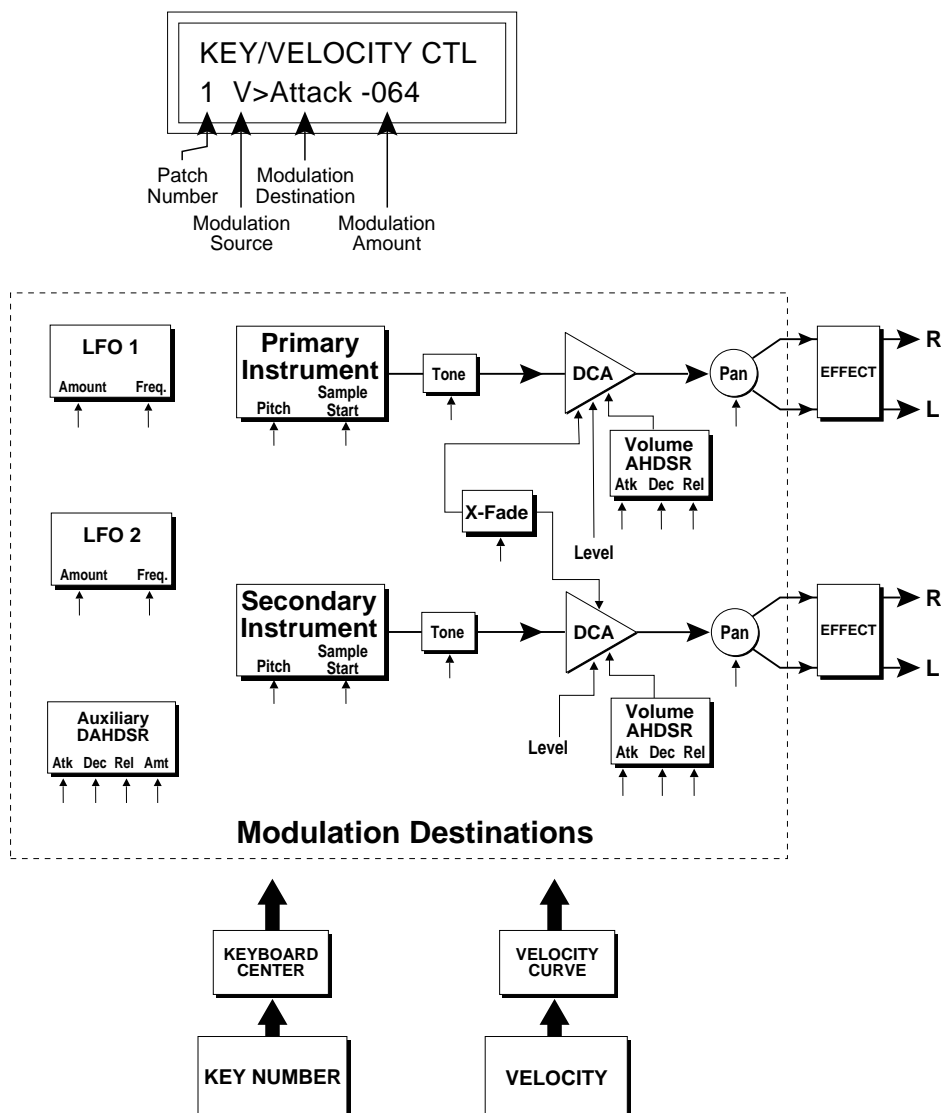


*This diagram shows the six stages of the Auxiliary Envelope Generator.*

## PRESET EDIT MENU

### KEYBOARD and VELOCITY MODULATION CONTROL

These functions allow you to route keyboard and velocity information to any of the modulation destinations on the Proteus. Up to 6 simultaneous paths or patches may be programmed. For each modulation patch, there is a source (keyboard or velocity), and a corresponding amount parameter which is variable from -128 to +127. **Place the cursor under the appropriate parameter and change the patch number, modulation source, modulation destination, or the amount using the data entry control.** If a parameter is not labeled either primary or secondary, it affects both.



Keyboard and Velocity Modulation Sources

**Modulation Sources:**  
Key Number and Key Velocity

**Destinations:** Off, Pitch, Primary Pitch, Secondary Pitch, Volume, Primary Volume, Secondary Volume, Attack, Primary Attack, Secondary Attack, Decay, Primary Decay, Secondary Decay, Release, Primary Release, Secondary Release, Crossfade, LFO 1 Amount, LFO 1 Rate, LFO 2 Amount, LFO 2 Rate, Auxiliary Envelope Amount, Auxiliary Envelope Attack, Auxiliary Envelope Decay, Auxiliary Envelope Release, Sample Start, Primary Sample Start, Secondary Sample Start, Pan, Primary Pan, Secondary Pan, Tone, Primary Tone, Secondary Tone

**When Modulating Envelope Attack, Decay, or Release Times:**

Positive amounts of modulation **increase** the time.

Negative amounts of modulation **decrease** the time.

## PRESET EDIT MENU

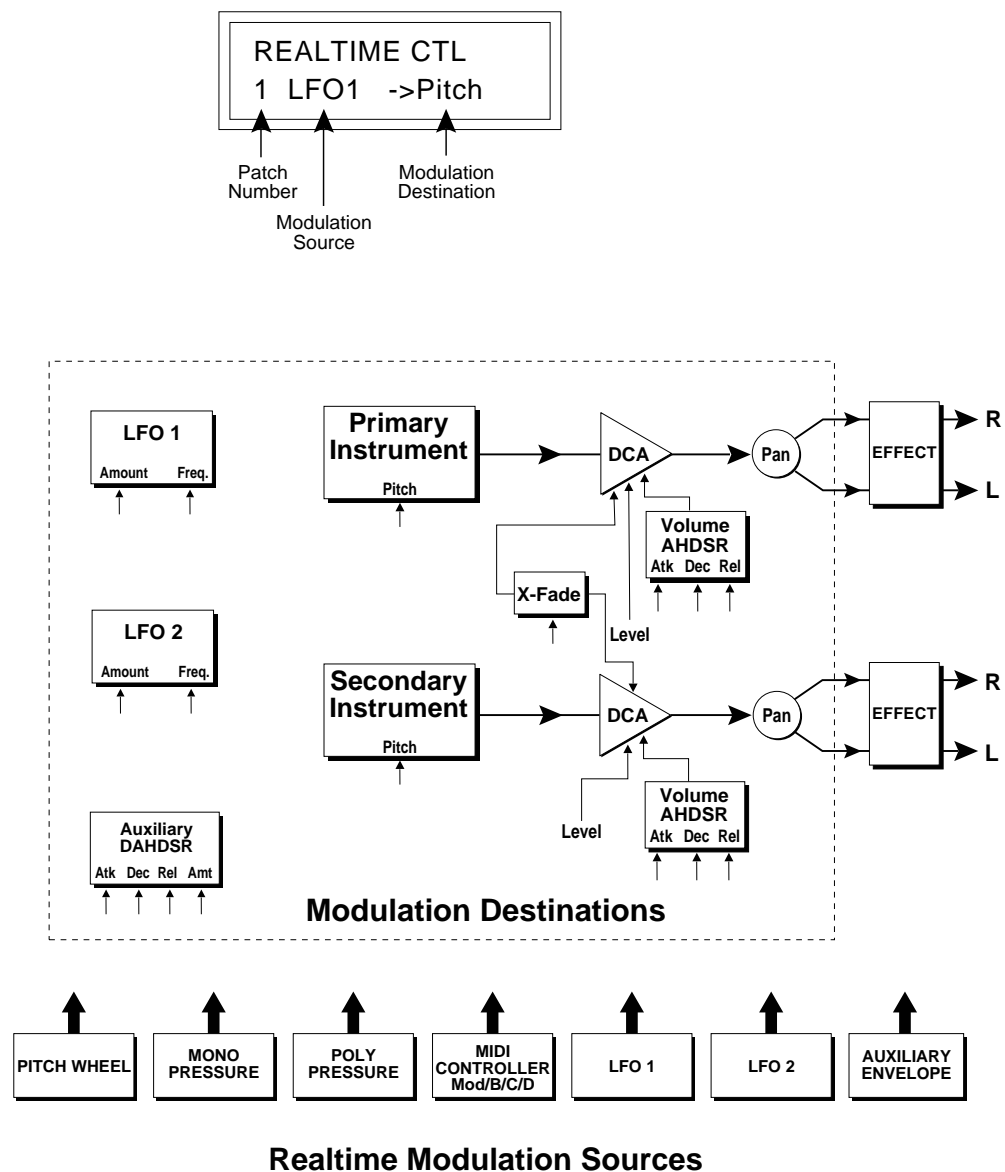
### Modulation Sources:

Pitch Wheel, MIDI  
Control A, MIDI  
Control B, MIDI  
Control C, MIDI  
Control D, Mono  
Pressure, Polyphonic  
Pressure, LFO 1, LFO  
2, Auxiliary Envelope

**Destinations:** Off,  
Pitch, Primary Pitch,  
Secondary Pitch,  
Volume, Primary  
Volume, Secondary  
Volume, Attack,  
Primary Attack,  
Secondary Attack,  
Decay, Primary  
Decay, Secondary  
Decay, Release,  
Primary Release,  
Secondary Release,  
Crossfade, LFO 1  
Amount, LFO 1 Rate,  
LFO 2 Amount, LFO 2  
Rate, Auxiliary  
Envelope Amount,  
Auxiliary Envelope  
Attack, Auxiliary  
Envelope Decay,  
Auxiliary Envelope  
Release

### REALTIME MODULATION CONTROL

These functions allow you to route realtime controllers to any of the modulation destinations on Proteus except Tone, Sample Start and Pan. Up to 8 simultaneous patches may be programmed. For each modulation patch, there is a source and a destination parameter. **Place the cursor under the appropriate parameter and change the patch number, modulation source or modulation destination using the data entry control.** If a parameter is not labeled either primary or secondary, it affects both.



## PRESET EDIT MENU

### FOOTSWITCH CONTROL

This function allows you route the 3 footswitch controllers (Local, 2 or 3) to any of the footswitch destinations. Local refers to the footswitch jack on the rear panel. Footswitches 2 and 3 are MIDI footswitches. (See *MIDI Footswitch Assign* in the Master Edit menu.) The footswitches can be routed to switch: Sustain (pri/sec/both), alternate volume envelope (pri/sec/both), alternate volume release (pri/sec/both), or cross-switch between the primary and secondary instruments.

FOOTSWITCH CTL  
Local-> Sustain

### MIDI CONTROLLER AMOUNT

This function allows you to specify an amount parameter (variable from -128 to +127) for each of the modulation controllers. MOD refers to the Proteus modulation wheel. Controllers B, C and D are MIDI controllers as assigned in the Master Edit menu. The Control Pedal jack on the rear panel can be assigned to Controller B. (See *MIDI Controller Assign* in the Master menu.)

CONTROLLER AMT  
MOD:+32    B:-090

CONTROLLER AMT  
C:-64    D:-090

### PRESSURE AMOUNT

This function allows you to specify an amount parameter for mono or poly keyboard pressure data. The pressure amount is variable from -128 to +127.

PRESSURE AMOUNT  
+127

## PRESET EDIT MENU

### PITCH BEND RANGE

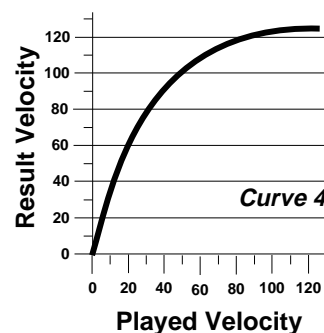
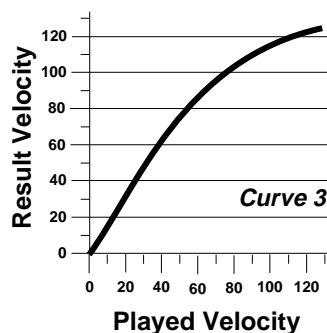
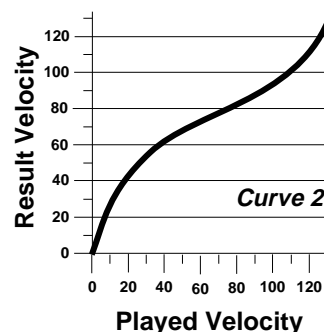
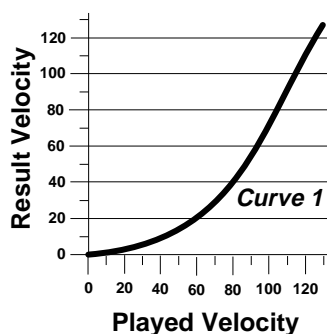
This function allows you to specify the pitch wheel range for the current preset or it can be set to be controlled globally (set in the Master menu). Pitch bend range is only applied when the pitch wheel is used to control pitch.

PITCH BEND RANGE  
+/- 12 semitones

### VELOCITY CURVE

Keyboard velocity data can be modified by a velocity curve in order to provide different types of dynamics in response to your playing or better adapt to the MIDI controller. This function allows you to select one of the four velocity curves or leave the velocity data unaltered (off). In addition, the velocity curve can be set to "Global", which means that the global velocity curve (programmed in the Master menu) is used.

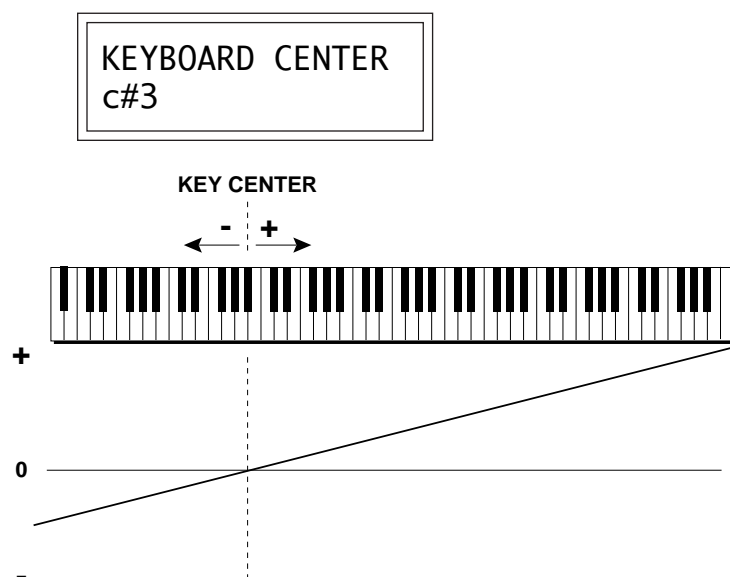
VELOCITY CURVE  
Global



## PRESET EDIT MENU

### KEYBOARD CENTER

The Keyboard Center parameter establishes a reference point for keyboard modulation. Keys above this point will have a positive value and keys below it will be negative. The keyboard center can be set to any key within the range C-2 to G8.



### KEYBOARD TUNING

In addition to the standard equally divided octave tuning, Proteus contains three other types of scale tuning and one user-definable tuning. This function selects which tuning will be used in the current preset. The choices of keyboard tunings are:

**Equal tuning** (12 tone equal temperament)

Standard Western tuning

**Just C tuning** (just intonation)

Based on small interval ratios; sweet and pure; non-beating intervals

**Vallotti tuning** (Vallotti and Young non-equal temperament)

Similar to 12 tone equal temperament; for a given scale, each key has a different character

**19 Tone tuning** (19 tone equal temperament)

19 notes per octave; difficult to play but works well with a sequencer

**Gamelan (Javanese) tuning** (5 tone Slendro and 7 tone Pelog)

Pelag-white keys; Slendro-black keys; exotic tunings of Gamelan flavor

**User tuning (1-4)** which is defined in the Master menu.

## PRESET EDIT MENU

### PRESET LINKS

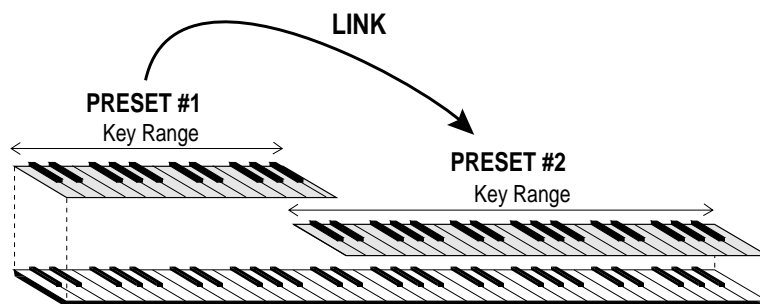
Presets may be linked to other presets in order to create layering or keyboard splits as part of the preset instead of a performance map. The current preset can be linked with up to three other presets. Each linked preset can be assigned to a specific range in order to easily create keyboard splits. The modulation parameters specified in each preset remain in effect for each preset in the link. Beginning with the lowest numbered links, presets will retain their programmed effect assignments until the two effect processors have been used up. All other linked presets will retain their effect *buss* routings only. See page 106 for more information.

LINK 1 c#1->f#4  
000 Preset Name

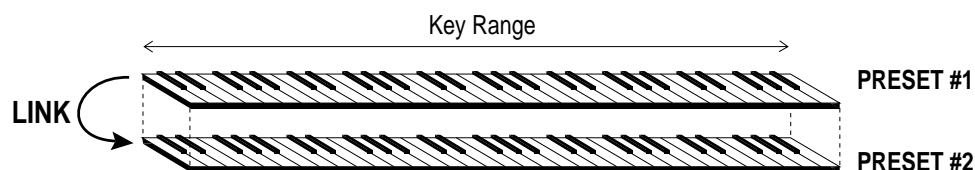
LINK 2 c#1->f#4  
191 Preset Name

LINK 3  
Off

■ Split or Layered keyboards can also be created in the Quick Key section of the Performance Edit menu.



CREATING A SPLIT KEYBOARD



LAYERING TWO PRESETS

## ***EFFECT PROGRAMMING***





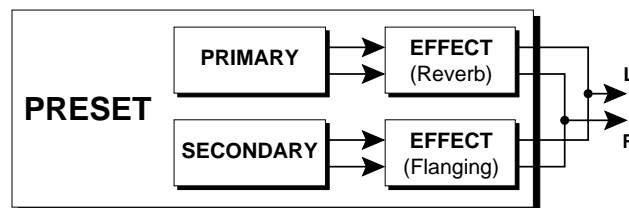
## EFFECT PROGRAMMING

### BACKGROUND: EFFECT ROUTING MODES

The Proteus Master Performance System contains two separate effects processors which may be applied to the final sound. The effect processors can be a part of the individual preset when single presets are being used, or they can be connected via an effects buss system when multiple presets are in use. The main point is that there are **two and only two effect processors**.

#### Single Preset Mode

When using single presets, it is desirable to have the type of effect linked with the preset. Proteus goes a little further by allowing you to assign a separate effect to the primary and secondary instruments.



#### Single Preset

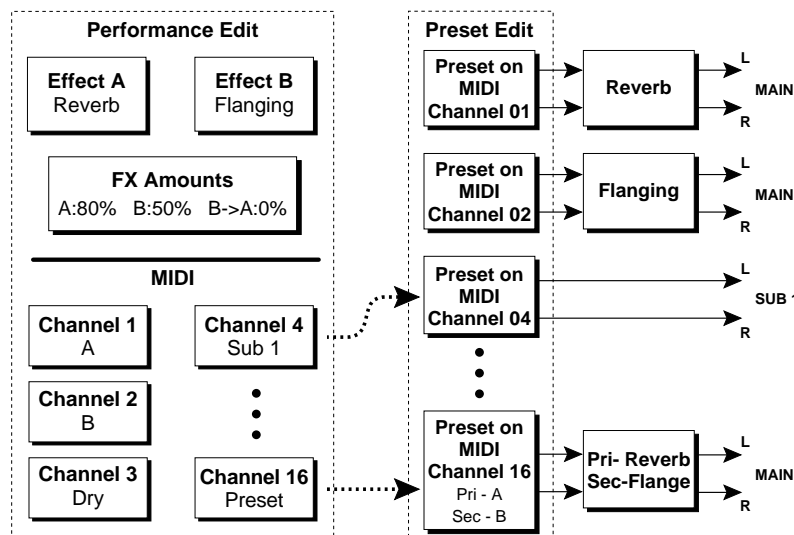
*Effect programmed in the Preset is used.*

#### Multiple Presets

*Effect programmed in the Performance Map is used.*

#### Multiple Preset Mode

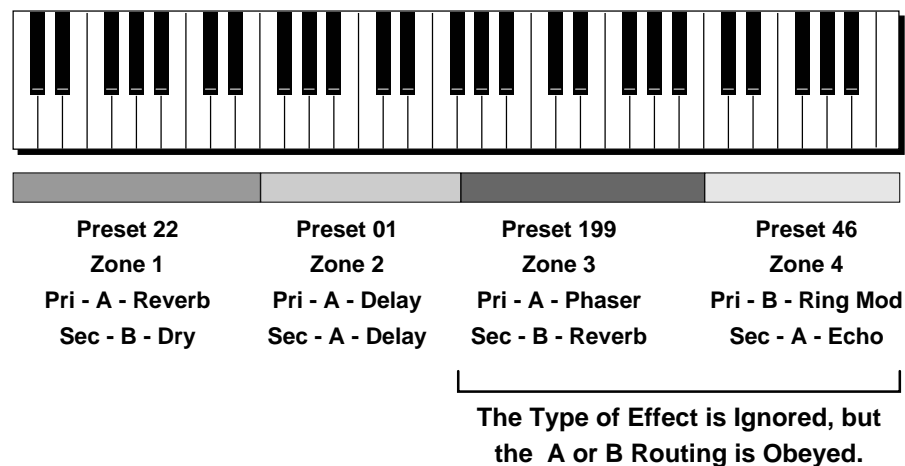
When using multi-mode, where up to 16 presets can be accessed at once, the effect buss (A, B or None) may be programmed as part of the Preset or a Performance Map, but the type of effects and their amounts are always programmed in the Performance Edit menu. The effects selected in the preset are ignored. These two assignment schemes give you the best of both worlds whether you are playing single or multiple presets.



## EFFECT PROGRAMMING

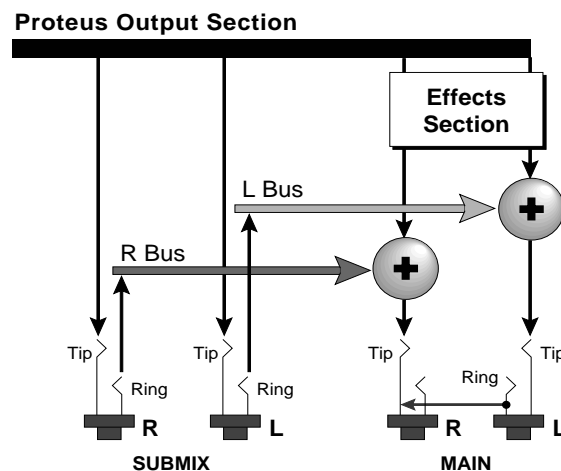
### SPLIT KEYBOARD EFFECTS

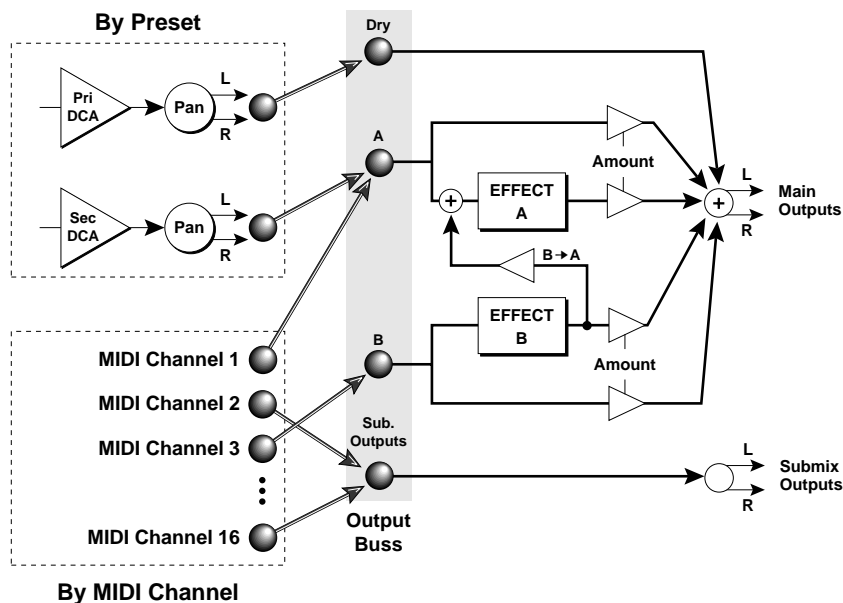
A special case arises when the Proteus keyboard is split using a Quick Key program (see the Performance Edit menu). There are only two effect processors, but up to eight possible assignments. Effects are still assigned according to the preset assignment as long as no more than two effects are used. If more than two effects *are* used (see diagram below), the effects will be assigned normally beginning with Zone 1 (then Zone 2, 3, 4). When the two effects are used up, the remaining zones will follow the preset effect buss routing (A, B, Dry, or Sub), but the type of effect will be determined by the first two effects used.



### EFFECTS OUTPUT ROUTING

The diagram below shows the way that the effects section is integrated into the output jack routing scheme.



**EFFECT PROGRAMMING****PROTEUS EFFECT BUSS ARCHITECTURE**

The two stereo effect processors on Proteus are designated as A and B effects. A effects contain Reverb and other miscellaneous effects. The B effects do not include Reverbs, but include a host of other weird and wacky effects.

Each effect has its own set of control parameters which are appropriate to that particular effect. For both the A and B effects there is an amount parameter which determines the relative mix of the processed and unprocessed signals. The output of the B effect can also be routed back through the A. In addition, there are a set of stereo submix outputs which can be used to externally process selected presets.

**COPY EFFECTS**

Effect parameters can be copied back and forth between presets and performance maps. By using a performance map as an intermediate holding area, effects can be copied between presets.

To copy the effects:

- 1) Press SAVE/COPY from within any effects editing screen (either the Performance or Preset Edit menus).
- 2) The display will read: "COPY EFFECTS, Preset -> Map". Use the inc/dec buttons or the data knob to change the source and destination.
- 3) Press Enter to Copy the effect parameters.

## EFFECT PROGRAMMING

### A EFFECTS

**Room, Warm Room**  
**Plates 1 and 2**  
**Chambers 1 and 2**  
**Halls 1 and 2**

Delay, Cross Delay  
 Phaser  
 Stereo Flange  
 Stereo Chorus  
 Echo  
 Stereo EQ

**Small Rooms 1 and 2**  
**Hall 3**  
**Early Reflections 1, 2, 3 and 4**  
**Rain**

### B EFFECTS

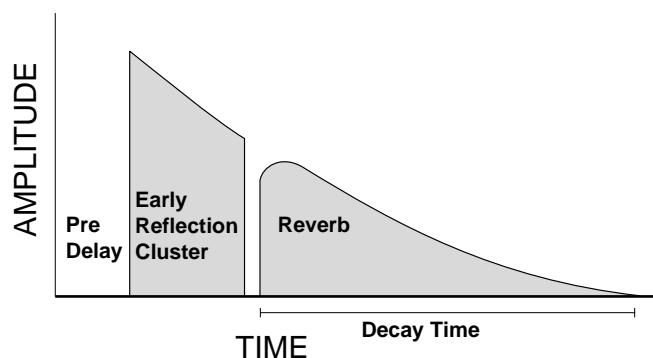
Stereo Flange  
 Stereo Chorus  
 Phaser  
 Fuzz 1  
 Ring Modulator  
 Delay  
 Cross Delay  
 Stereo EQ  
 Fuzz Lite

■ When using single presets, the effect programmed in the Preset Edit menu is used.

When using multiple presets, (Multi-mode), the effects selected in the Performance Edit menu are used.

### REVERB

The A effects are the most commonly used because they include reverb. Reverberation is a simulation of a natural space such as a room or hall. The reverb effects in Proteus simulate various halls, chambers, rooms and reverberation plates. In addition, there are several other reverb effects such as Early Reflections and Rain. There is only one adjustable parameter on the reverb effects - Decay Time. Decay time is the time it takes for the reflected sound from the room to decay or die away. The diagram below shows a generalized reverberation envelope. After an initial pre-delay period, the echos from the closest walls or ceiling are heard. These first echos or the *early reflection cluster*, vary greatly depending on the type of room. Roughly 20 milliseconds after the reflection cluster, the actual reverberation begins and decays according to the time set by the decay time parameter.



## EFFECT PROGRAMMING

The **Room** programs simulate small rooms with high frequency absorption caused by drapes and furniture. **Plates** simulate plate type reverbs with their tight, dense early reflections and sharp reverb build-up. **Chambers** simulate medium sized rooms with hard reflective surfaces. The **Hall** programs recreate the open, spacious ambience of a large concert hall. The **Early Reflection** programs consist of the reflection cluster only without the reverb decay. These are similar to a multiple tap delay line. **Rain** is a variation of the early reflection programs which consists of a dense group of short echos followed by longer echos.

FXA:Hall 1  
Decay Time: 165

Place the cursor underneath the reverb name and use the data entry control (or the inc/dec buttons) to change the type of reverb. Moving the cursor to the lower line allows you to change the decay time of the reverb. Plate 2 decay times are the shortest and range from 0 - 127. The decay times of the reverb programs range from 100 - 255. The decay time of the Early Reflection programs range from 0-255.

### **ROOM**

Mid-sized room (or gigantic-sized room depending on the decay time).

### **WARM ROOM**

Mid-sized room with more high frequency absorption.

### **PLATE 1**

Nice tight, clean plate reverb.

### **PLATE 2**

Plate reverb with a shorter decay time.

### **CHAMBER 1**

Bright and resonant reverberation chamber.

### **CHAMBER 2**

Less bright and resonant reverberation chamber.

### **HALL 1**

Large concert hall with a very balanced and musical sound.

## **EFFECT PROGRAMMING**

### **HALL 2**

A large concert hall with a lighter, more airy atmosphere

### **SMALL ROOM 1**

A petite yet perky room, possibly in a country mansion with hardwood floors.

### **SMALL ROOM 2**

A bolder but still modest room, with a tall slanted ceiling and a ruffled couch at one end.

### **HALL 3**

A small cathedral, with a few hanging tapestries, somewhere in the south of France. (Use Hall 3 with a long decay for an infinite reverb effect.)

### **EARLY REFLECTION GROUP**

The early reflections group are a cross between delay effects and reverb effects. There is no diffusion, so there is no buildup of dense reflections, only the discrete initial reflections of a reverb. This group is useful for those sounds that cannot tolerate the fullness of a reverb, but need a bigger image spread than a delay can provide.

### **EARLY REFLECTION 1**

A plucky early reflection effect, without the diffusion of a standard reverb. Compact reflection spread, similar to a tiled bathroom with a medium sized bath mat, and a full tub.

### **EARLY REFLECTION 2**

A broader reflection cluster, and a slightly different room shape. Again, early reflections only, no diffusion.

### **EARLY REFLECTION 3**

A still broader time domain reflection spread. Useful for nice stutter attacks, and multiplying a percussive attack into a strum-like cluster.

### **EARLY REFLECTION 4**

The longest time spread reflection cluster, with a rising impulse response placing the listener towards the back of an empty non-diffusing concrete outdoor amphitheater, with wooden benches.

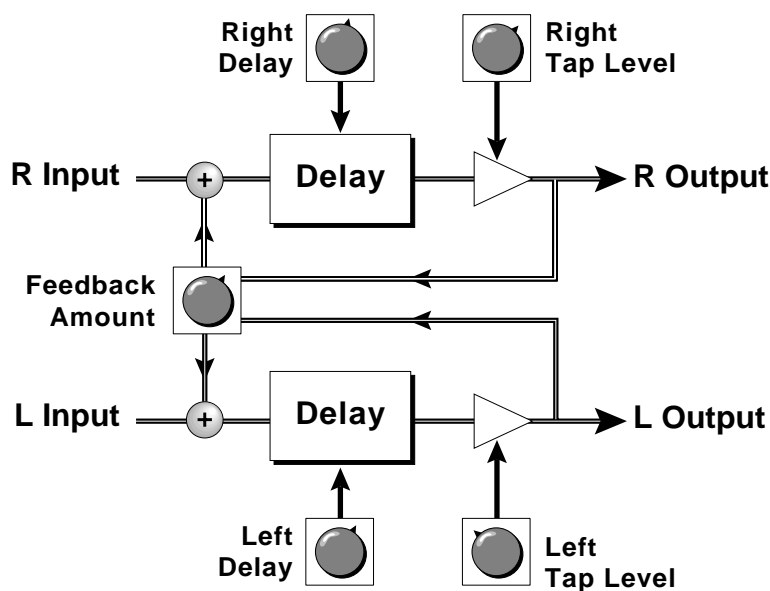
### **RAIN**

A first-order simulation of rain falling on a metal roof, in a redwood grove on a foggy afternoon.

## EFFECT PROGRAMMING

### STEREO DELAY

The delay line is a stereo effect which can be used for doubling, echos or fixed formant comb filtering with completely independent delay time and tap levels for the left and right sides. The delay is shown in the diagram below.



*The stereo delay line can function as two independent digital delays by panning the primary and secondary instruments to opposite sides.*

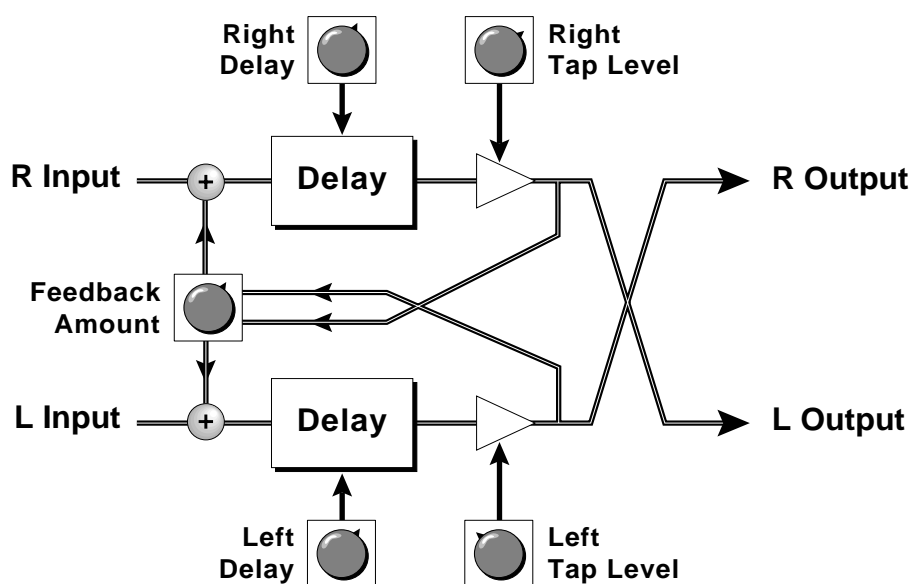
The **Delay Time** parameter is independently variable from 0 to 209 milliseconds for both the left and right channels. The **Tap Level** parameters control the amount of signal from the left and right delays as well as how much signal from each is supplied to the Feedback control. **Feedback** controls how many echos are produced. A setting of 0 produces only one echo. The Delay line is incredibly stable even with large amounts of feedback. This quality allows the delay line to be used as a resonator, where it acts as a kind of oscillator when excited by an input signal. Infinite delay effects are also possible without the risk of runaway. The stereo delay can function as two independent delay lines by panning the primary and secondary instruments to the extreme left and right.



## EFFECT PROGRAMMING

### CROSS DELAY

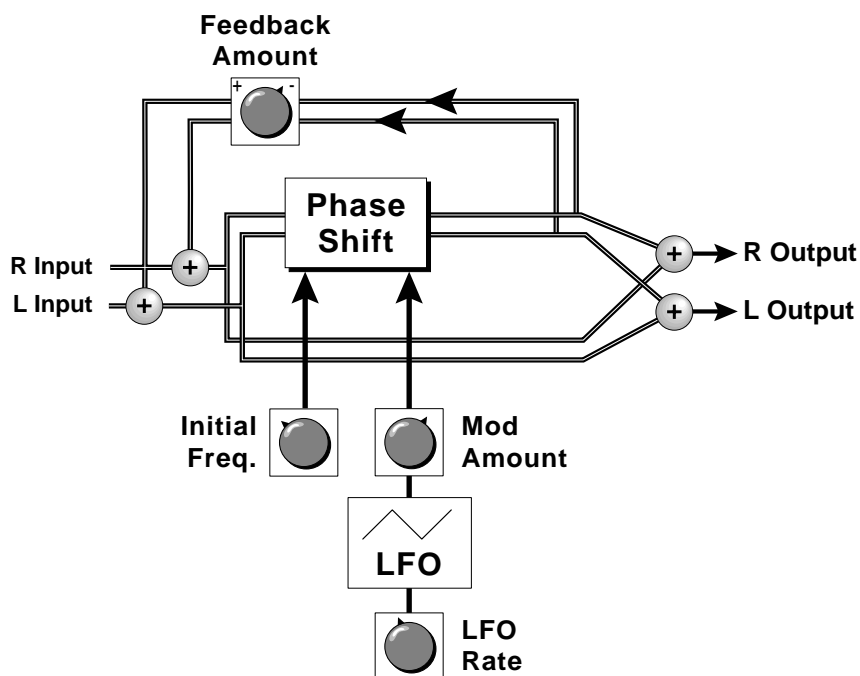
Cross Delay is identical to the normal delay line except that the output paths and the feedback paths cross over to the opposite channel in order to produce a ping-pong type of effect when reproduced in stereo. Delay time is adjustable from 0 to 209 milliseconds. The Cross Delay is shown in the diagram below.



*The outputs and the feedback paths cross over to the opposite channel to produce a ping-pong echo effect.*

**EFFECT PROGRAMMING****STEREO PHASER**

The Stereo Phaser is similar to the flanger although its effect is more subtle. A phaser is a type of filter which creates a series of notches in the frequency spectrum. This creates a swirly animation when used with harmonic-rich sounds such as strings and voices. It can also be used much the same as a chorus to thicken-up a thin sound or as a rotating speaker simulator.



FXA:Phaser	
LFO Rate	150

FXA:Phaser	
LFO Depth	100

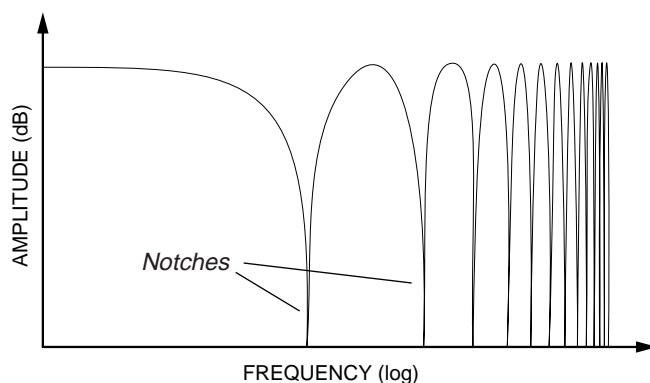
FXA:Phaser	
Min Delay	015

FXA:Phaser	
Feedback	+064

## EFFECT PROGRAMMING

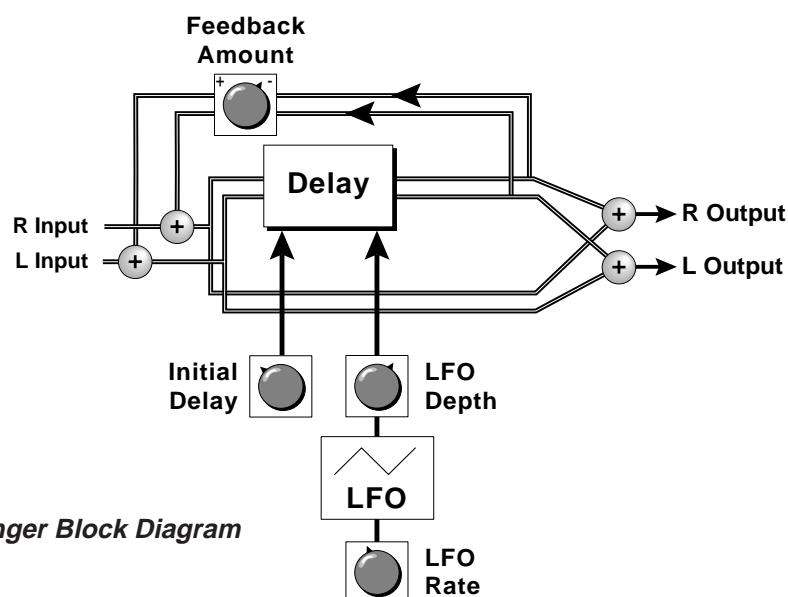
### STEREO FLANGER

A flanger consists of a short audio delay line whose output is mixed together with the original signal. Mixing the delayed and original signals together results in multiple frequency cancellations creating a comb filter effect as shown in the diagram below. Since the flanger is a type of filter, it works best with harmonically rich sounds such as strings.



The flanging effect was originally created using two tape recorders playing identical recordings. By exactly synchronizing the two decks and then slowing the speed of one by grasping the tape reel flanges, the flanging effect was born.

The flanger in the Proteus is a stereo device consisting of two separate delay lines controlled by a single set of controls. The block diagram of the flanger is shown below.



**Stereo Flanger Block Diagram**

## EFFECT PROGRAMMING

An **Initial Delay** control serves to tune the flanger. In other words, it adjusts the placement of the comb filter notches. The initial delay is variable from 26 microseconds to 6.5 milliseconds.

```
FXA:StereoFlange  
Init Delay    100
```

A **Low Frequency Oscillator (LFO)** varies this initial delay setting, changing the frequency of the notches and adding animation to the sound. The **LFO Rate** controls the rate of change and the **LFO Depth** controls how much the delay is changed by the LFO. The LFO adds to the initial delay time so that with LFO Depth set to 255 the maximum delay time is 13 milliseconds.

```
FXA:StereoFlange  
LFO Rate      038
```

```
FXA:StereoFlange  
LFO Depth     150
```

The **Feedback** control sends some of the delayed signal through the delay line again. When positive feedback is used (values +1 to +127), the comb filter notches are deepened; when negative feedback is used (values -1 to -128) resonant peaks are formed between the notches which increase with the amount of negative feedback.

```
FXA:StereoFlange  
Feedback      -150
```

■ *Panning the primary and secondary instruments to opposite sides allows each instrument to be processed separately.*

## EFFECT PROGRAMMING

### STEREO CHORUS

The function of a chorus device is to thicken the sound or to make one voice sound like many. The way the effect is achieved is by mixing one or more delayed versions of the signal in with the original. The delay times used are too short to be perceived as an echo, but long enough so that comb filtering does not occur. In addition, the delay time is varied to simulate the random differences which occur when multiple instruments are playing together. A slight amount of feedback improves the effect by creating multiple images of the sound as it recirculates again and again. The fact the delay times are slightly different for the left and right channels and your stereo speakers are in different room locations both contribute to the overall chorus effect. The LFO Rate and Depth settings are critical to achieving a realistic effect with faster LFO Rates generally requiring less LFO Amount and vice-versa.

The stereo chorus in the Proteus works exactly like the previously described stereo flanger except that the delay time is longer. The delay times for the stereo chorus range from 13 milliseconds to 52 milliseconds, compared with the 26 microsecond to 6.5 millisecond range of the flanger.

```
FXA:StereoChorus
LFO Rate      050
```

**LFO Rate** varies the speed of the LFO.

```
FXA:StereoChorus
LFO Depth     050
```

**LFO Depth** sets the amount of LFO controlling the delay time.

```
FXA:StereoChorus
Min Delay     036
```

**Min Delay** sets the initial delay time.

```
FXA:StereoChorus
Feedback      100
```

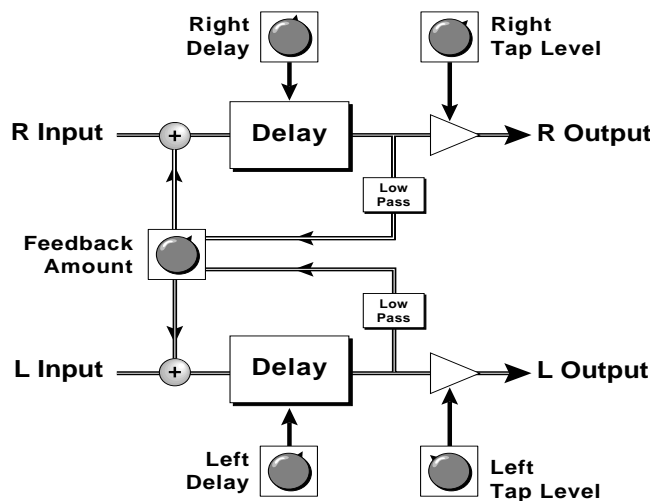
**Feedback** controls the amount of delayed signal sent back through the delay line.

```
FXA:StereoChorus
Mix           050
```

**Mix** controls the mix of delayed and dry signal.

**EFFECT PROGRAMMING****STEREO ECHO**

The Stereo Echo produces echos up to 400 milliseconds in length (twice that of the Delay and Cross Delay effects). The feedback path is independent of the output level and contains a low pass filter which simulates an analog tape echo. The left and right signals are kept completely independent throughout the effect and have separate controls except for the feedback amount control which affects both channels.



Max Delay = 400mS

FXA:Echo  
L DelayTime 120

**Delay** - varies the delay time from 0-400 mS.

FXA:Echo  
L Tap Level 255

**Tap Level** - controls the volume of each channel.

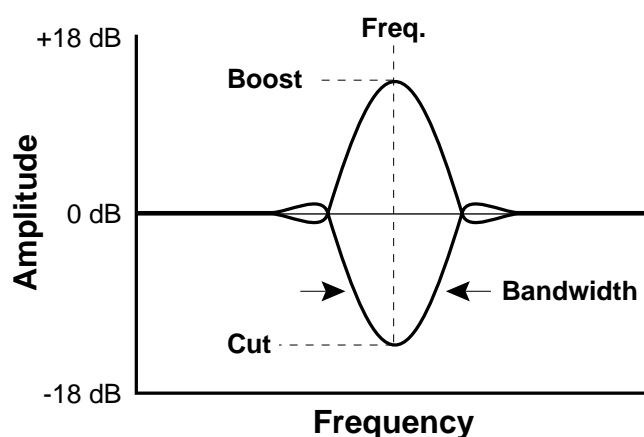
FXA:Echo  
Feedback 100

**Feedback** - controls the number of echos from both channels.

## EFFECT PROGRAMMING

### STEREO EQ A

The Stereo EQ A or Stereo Equalizer A, is a stereo two band parametric equalizer. Unlike standard bass and treble controls, a parametric equalizer has controls which allow you to adjust not only the **boost** and **cut**, but the **width** and **frequency** range of the filter. Refer to the diagram below.

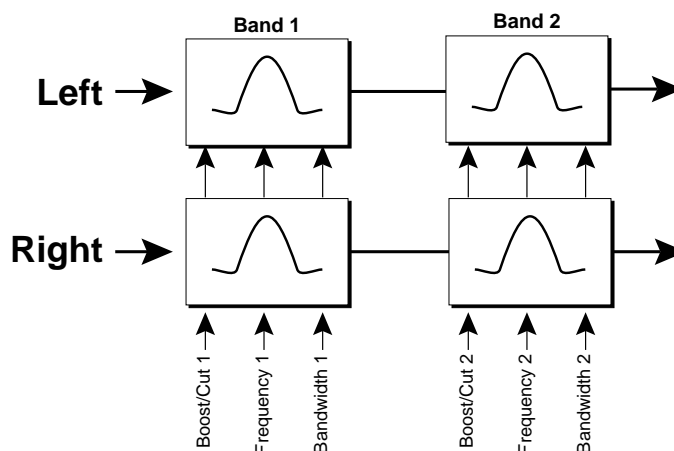


**Frequency** ..... Selects the desired frequency range.

**Bandwidth** ..... Controls the width of the frequency band.

**Boost/Cut** ..... The amount that the selected band of frequencies will be Boosted or Cut (Amplified or Attenuated).

There are two completely independent EQ bands per channel in EQ A (EQ B only has one band per channel). However, both the left and right channels share the same set of parameters.



## EFFECT PROGRAMMING

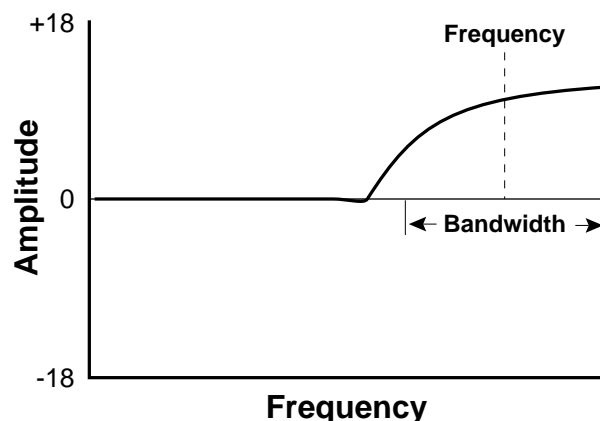
### USING THE EQUALIZER

The equalizer can be used in a number of ways. It can be used to radically alter the sound of the samples so that a string section sounds like a string synthesizer, or can be used to fine tune your presets in the most subtle way. Samples can be completely transformed using the equalizer, multiplying the number of possible sounds.

**When using the EQ (either A or B), turn up the Effects Amount to 100%. Otherwise the EQ effect will be severely diluted as a result of being mixed with the unprocessed signal.**

A parametric equalizer can be a little confusing at first, especially if you haven't worked with one before. First off, we have to find the band of frequencies that we want to boost or cut. Turn up the boost to about +15 dB (so we can easily hear the effect of the EQ). Next, set the Bandwidth to about 45 (which corresponds to about 100 Hz). Now slowly sweep the frequency up and down. Stop when you find the band of interest and widen the bandwidth (wider bandwidths tend to sound more musical). Finally, adjust the Boost control to the desired amount. Play with the Bandwidth and Boost controls until the sound is to your liking.

The Equalizer can also function as a shelving type of EQ by setting the bandwidth very wide and moving the frequency parameter close to the ends of the frequency range. The diagram below shows a High Shelving Filter. A Low Shelving Filter could be created by moving the Frequency parameter to the lower end of the frequency spectrum.

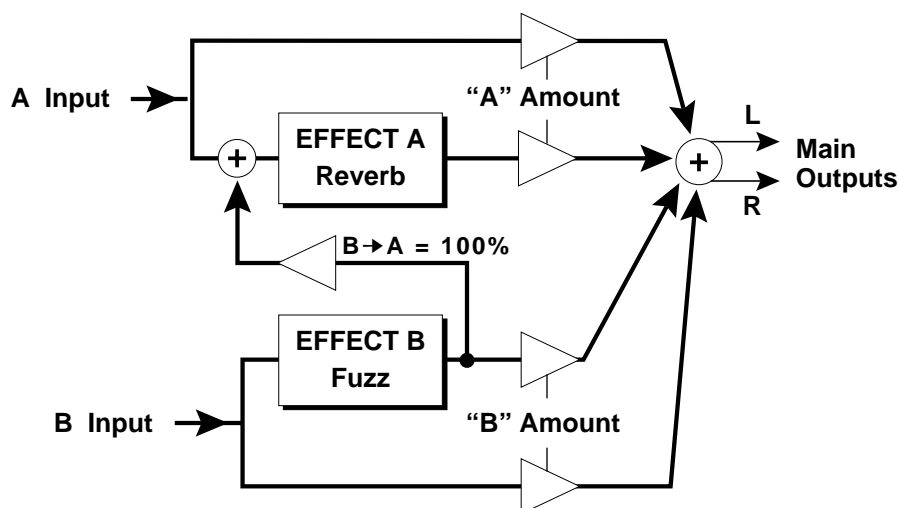




## EFFECT PROGRAMMING

### B EFFECTS

The B effects include Stereo Flanger, Stereo Chorus, Phaser, Fuzz 1, Ring Modulator, Delay, Cross Delay, Stereo EQ, and Fuzz Lite. Some of the B effects such as the Fuzz and the Ring Modulator are a bit bizarre (you won't want to use them on every sound), but can be used to create some truly amazing effects. The B effects can additionally be routed through the A effect as shown in the diagram below. Simple effects such as Fuzz can take on a completely new character when routed through the Reverb.



### STEREO DELAY B

The B Delay is identical to the delay line in the A effect group except that the maximum delay time is 104 milliseconds (instead of 209 mS). This delay is useful for short echos, slapback and doubling effects, as well as for fixed formant comb filtering. Like Stereo Delay A, the feedback parameter is extremely stable even with high amounts, making it useful as a resonator for "infinite" delays.

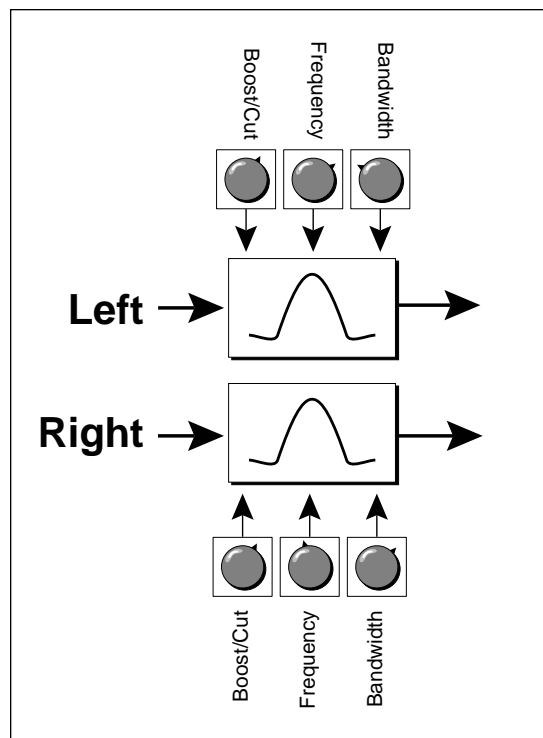
### STEREO CROSS DELAY B

The B Cross Delay is identical to the cross delay line in the A effect group except that the maximum delay time is 104 milliseconds (instead of 209 mS). This delay is useful for short ping-pong echos, stereo slapback and doubling effects.

## EFFECT PROGRAMMING

### STEREO EQ B

The Stereo EQ B or Stereo Equalizer B, is a stereo single band parametric equalizer. Unlike standard bass and treble controls, a parametric equalizer has controls which allow you to adjust not only the **boost** and **cut**, but the **width** and **frequency** range of the filter. This EQ differs from EQ A in that it only has a single filter band per channel. Another difference is that the left and right channels are independently adjustable, unlike EQ A in which the left and right controls are ganged. Refer to the diagram below.



■ See Stereo EQ A for additional programming tips.

**Frequency..** Selects the desired frequency range.

**Bandwidth .** Controls the width of the frequency band.

**Boost/Cut...** The amount that the selected band of frequencies will be Boosted or Cut (Amplified or Attenuated).

When using the EQ (either A or B), turn up the Effects Amount to 100%. Otherwise the EQ effect will be severely diluted as a result of being mixed with the unprocessed signal.

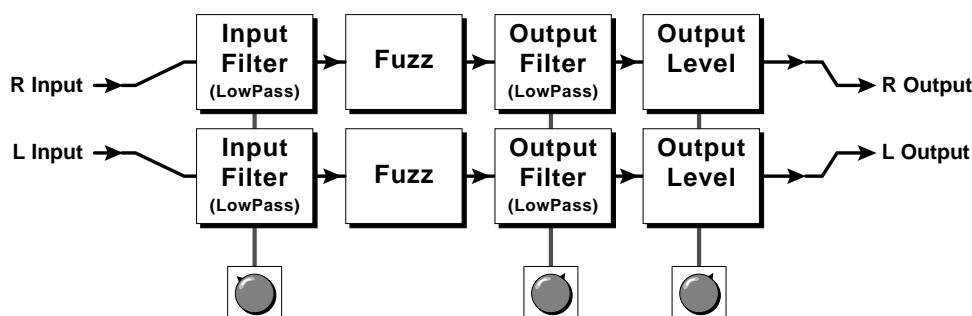
## EFFECT PROGRAMMING

### STEREO FUZZ

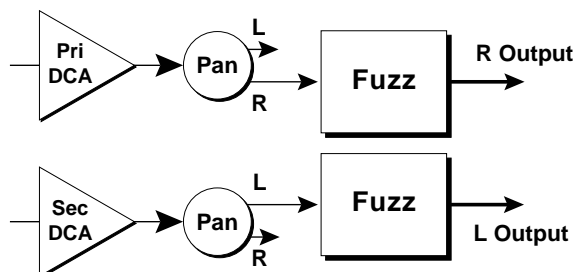
The Stereo Fuzz introduces a controlled distortion to any signal passing through it. Distortion creates harmonics. Simple sounds will become complex sounds and complex sounds will become even more complex to the point of becoming noise in many cases. There are two types of fuzz in the Proteus effects arsenal, Fuzz 1 and Fuzz Lite.

#### FUZZ 1

Fuzz 1 is probably the grungiest fuzz you have ever heard. Two filters, one at the input and one at the output of the fuzz, allow you to control the amount and type of harmonics added to the sound. The **Input Filter** controls the amount of harmonics produced by the fuzz and the **Output Filter** removes harmonics at the output, smoothing the sound. Higher values allow more harmonics to pass. The level of the input sound greatly affects the amount of fuzz, so that the Proteus' envelopes can now control harmonic content as well as the volume. **Output Level** sets the output of the fuzz. There are two complete fuzz effects, controlled by the same set of controls as shown in the diagram below.



Two independent sounds can be processed by panning primary and secondary to opposite sides, or a single sound can be routed through both sides. If a single sound is panned slightly off center, the fuzz will act slightly differently on each side because of the difference in level.



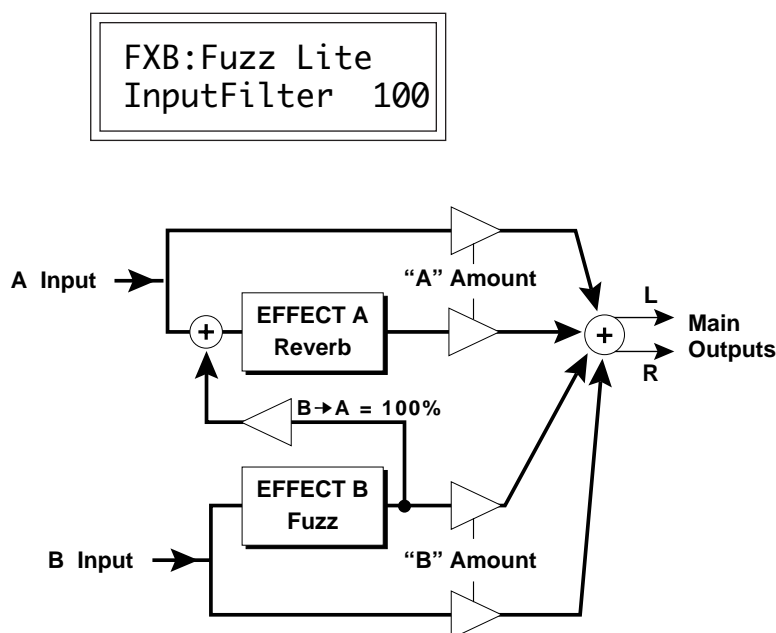
*Primary and Secondary instruments can be separately processed by panning to opposite sides.*

## EFFECT PROGRAMMING

### FUZZ LITE

Fuzz Lite is a more restrained type of fuzz (it tastes great, yet is less filling). According to the designer, *"Fuzz Lite is a mathematical model of a Soviet made 6L6 vacuum tube, using the results of recent Neural Network modeling. This fuzz is much less aggressive than the existing fuzz, suitable for guitar overdrive, innovative new waveform distortion signals, and general fried brain full frontal instruments."* Yeah.

Experiment with the way the input and output filters work on the sound. Like the Ring Modulator, the Stereo Fuzz is a specialized effect, not for every situation, but another powerful tool in your arsenal.



Using the B->A parameter allows the stereo fuzz to be followed by stereo reverb.

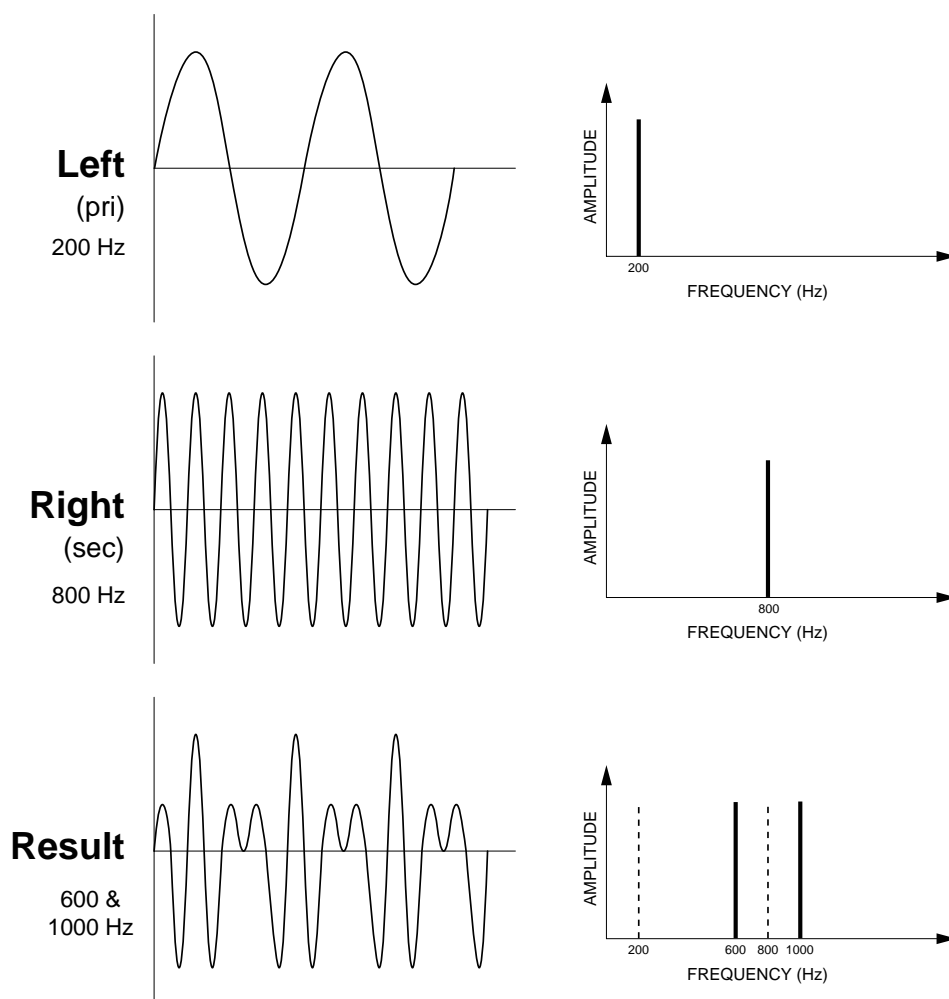
You may want to run the output of the fuzz back through a reverb effect using the B->A feedback mixer in the FX amount screen. (Try it!) By adjusting the three amounts you can precisely control the amount of Original Signal, Dry Fuzz Signal, and Reverb Fuzz Signal.

FX AMOUNT A:50%  
B>A:100% B:50%

## EFFECT PROGRAMMING

### RING MODULATOR

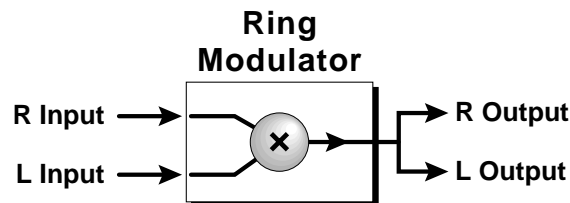
A Ring Modulator is a simple device which takes two signals and multiplies them together into one resultant signal **containing only the sum and difference frequencies** of the two input waves. The original frequencies are **not** output! Ring modulators tend to generate a lot of inharmonic frequencies which sound very bell-like and sometimes out of tune.



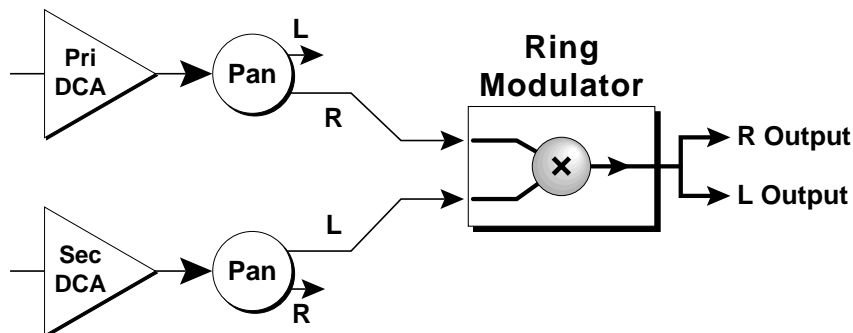
*This diagram shows the result of Ring Modulating two sine waves with frequencies of 200 Hz and 800 Hz. Only the Sum and Difference frequencies of 600 Hz and 1000 Hz will result.*

## EFFECT PROGRAMMING

There are no controls on the ring modulator as shown by the block diagram below. The left and right outputs are simply multiplied together to form a monophonic output.



By routing both the primary and secondary sounds to effect B and panning to opposite sides (shown below), two different waves can be ring modulated. Ring modulation works well with simple waves such as sine waves and the harmonic waveforms. Also, try complex waves modulated with sine waves. (Play chords!) Complex waveforms tend to sound rather noise-like.



Pan the primary and secondary instruments to left and right in the pan screen, then move to the Effect B screen and select Ring Modulator. There are no parameters to adjust in this effect so the lower line of the display reads: None.

FXB: Ring Mod  
 None



## ***REFERENCE SECTION***



## PROTEUS ROM PRESETS

### KEYBOARDS

000 Dark Grand  
008 Heavens Sake  
020 Prok'l Harem  
023 Soft Electric Piano  
033 Concert Keys  
034 Mellow Piano  
050 Chorused Clav  
060 Church  
071 Pianoharp  
076 Ring MoD  
081 Rock Piano  
086 Med Electric Piano  
088 Ham'nd Cheese  
096 Harpsikord

### STRINGS

002 Orchestral!  
012 Inxs Strings  
022 Orchestra Hit  
032 Strings/Horns  
043 Omnimax  
051 Sforz Strings  
082 New Orchestra

### VOICES

005 Chorus Choir  
016 Herb Essence  
035 Dirty Pad  
055 Master Choir

### BRASS

004 Brass Section  
024 Solo Trumpet  
032 Strings/Horns  
038 Big City Brass  
040 French Horn Section  
044 Solo Trombone  
047 Exhibition

### REEDS/FLUTES

007 Sweet'n' Saxy  
017 Chiff Whiff  
057 Bari/Alto Sax  
068 Big Band Sax  
089 Verb Flute

### PLUCKED

006 Major Solo  
013 Acoustic Gtr  
026 Agent Cooper  
036 Funk Guitar  
046 Power Chords  
056 Modern Harp  
067 Swirl'n Git  
072 Rock Solo  
077 Rock 5ths  
083 12 String  
094 Electric 12

\* Denotes a linked preset.

**PROTEUS ROM PRESETS****SYNTHESIZER**

001 Shimmer Waves  
003 Metallivox  
014 New Age Solo  
025 Sezdin Nites  
030 Ice Forest  
037 Wayoo  
041 Phantazia  
045 Spun Glass  
052 Synth Pad  
054 Wynwood Solo  
061 Stagger Waves \*  
063 Synth Quartet  
073 UK Pad  
080 Waves  
087 Voiceofmind  
090 Harmonic Syn  
097 Waves...2 \*

**BASS**

010 Miracle Bass  
018 Bad Bass  
029 Cosmo Low Man  
059 Analog Bass  
066 Fat Bass  
070 Thunder Bass  
079 Slap/Pop Bass  
085 Fat Boy Bass  
093 Last Bass

**TUNED****PERCUSSION**

015 Vibe n Me  
069 Airimba  
075 Cosmo Bells  
078 Wide Marimba

**PERCUSSION**

009 Pop Percussion  
027 Latin Drums  
028 Latin Percussion  
039 Yin Yang Percussion  
058 Concert Percussion  
065 Rock Drums  
084 Rez Flange Kit  
091 Tusk Toms  
092 Slave Percussion  
098 Machine Snare

**WORLD**

019 Kalimba Synth  
048 Island Fun  
062 Balonesia

**SOUND EFFECTS**

011 Metal Cables  
021 Waterfone  
031 Synthyricon  
042 Planet X  
053 Underground  
064 Lost Souls  
095 Waterways

099. Default Patch

\* Denotes a linked preset.

## PROTEUS INSTRUMENTS

### SAMPLED SOUNDS

1. Piano ..... 9 foot Grand Piano
2. Piano Pad ..... Piano with slow attack and sustained loop
3. Loose Piano ..... Old style Grand Piano
4. Tight Piano ..... Contemporary 9 foot Grand Piano
5. Strings ..... String section with Basses, Cellos, Violas and Violins
6. Long Strings ..... String section with long attack and release
7. Slow Strings ..... Section Strings with longer attack and release
8. Dark Strings ..... Section Strings with a darker tone
9. Voices ..... Female Choir
10. Slow Voices ..... Female Choir with longer attack and release
11. Dark Choir ..... Female Choir with a darker tone
12. Synth Flute ..... Genuine Flute with a short loop
13. Soft Flute ..... Slow attack Flute
14. Alto Sax ..... Alto Sax
15. Tenor Sax ..... Tenor Sax
16. Baritone Sax ..... Baritone Sax
17. Dark Sax ..... Tenor sax with a darker tone
18. Soft Trumpet ..... Soft blown Trumpet
19. Dark Soft Trumpet ..... Soft blown Trumpet with a darker tone
20. Hard Trumpet ..... Hard blown Trumpet
21. Dark Hard Trumpet ..... Hard blown Trumpet with a darker tone
22. Horn Falls ..... Descending pitch Trumpets
23. Trombone 1 ..... Trombone
24. Trombone 2 ..... Trombone
25. French Horn ..... French Horn
26. Brass 1 ..... Combination Trombone/Soft Trumpet
27. Brass 2 ..... Combination Trombone/Hard Trumpet
28. Brass 3 ..... Combination Trombone/Soft Trumpet/Hard Trumpet
29. Trombone/Sax ..... Combination Trombone and Sax
30. Guitar Mute ..... Palm muted Electric Guitar
31. Electric Guitar ..... Clean, Humbucking Electric Guitar
32. Acoustic Guitar ..... Steel String Acoustic Guitar
33. Rock Bass ..... Carbon Fiber Bass Guitar
34. Stone Bass ..... Rare, Aluminum Neck Bass Guitar
35. Flint Bass ..... Bass Guitar with altered harmonics
36. Funk Slap ..... Lower two Bass Guitar strings slapped
37. Funk Pop ..... Popped Bass Guitar strings (combine with Funk Slap)
38. Harmonics ..... Bass Guitar Harmonics
39. Rock/Harmonics ..... Combination Rock Bass and Bass Harmonics

**PROTEUS INSTRUMENTS**

- |  |  |
|--|--|
| 40. Stone/Harmonics ..                     | Combination Alum. Neck Bass and Harmonics      |
| 41. Nose Bass .....                        | Chunky, Popped Bass Guitar                     |
| 42. Bass Synth 1 .....                     | Classic, Analog Synthesizer Bass Sound         |
| 43. Bass Synth 2 .....                     | Digital Bass Synthesizer                       |
| 44. Synth Pad .....                        | Fat, Digital Synthesizer pad                   |
| 45. Medium Envelope Pad .....              | Digital Synth pad with altered envelope        |
| 46. Long Envelope Pad .....                | Digital Synth pad with long attack and release |
| 47. Dark Synth .....                       | Digital Synthesizer with a darker tone         |
| 48. Percussive Organ .....                 | Classic, Tone Wheel Organ sound                |
| 49. Marimba .....                          | Marimba  |
| 50. Vibraphone .....                       | Vibraphone                                     |
| 51. All Percussion (balanced levels) ..... |  |
| 52. All Percussion (unbalanced levels) ... |  |
| 53. Standard Percussion Setup 1 .....      |  |
| 54. Standard Percussion Setup 2 .....      |  |
| 55. Standard Percussion Setup 3 .....      |  |
| 56. Kicks .....                            |  |
| 57. Snares .....                           |  |
| 58. Toms .....                             |  |
| 59. Cymbals .....                          |  |
| 60. Latin Drums .....                      |  |
| 61. Latin Percussion .....                 |  |
| 62. Agogo Bell .....                       |  |
| 63. Woodblock .....                        |  |
| 64. Conga .....                            |  |
| 65. Timbale .....                          |  |
| 66. Ride Cymbal .....                      |  |
| 67. Percussion FX1 .....                   |  |
| 68. Percussion FX2 .....                   |  |
| 69. Metal .....                            | Percussive, Metallic, Analog Synthesizer Sound |

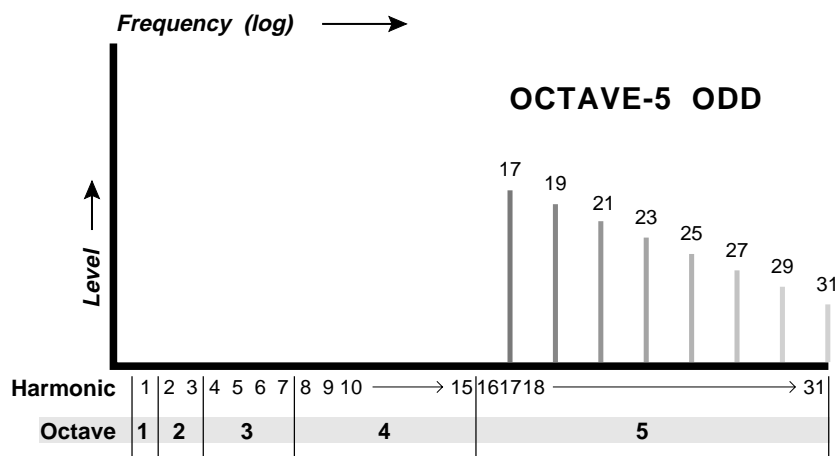
See the  
**Percussion  
Instrument Location  
Diagrams**  
on the following pages.

## PROTEUS INSTRUMENTS

### HARMONIC WAVEFORMS

- 70. Oct 1 (Sine)
- 71. Oct 2 All
- 72. Oct 3 All
- 73. Oct 4 All
- 74. Oct 5 All
- 75. Oct 6 All
- 76. Oct 7 All
- 77. Oct 2 Odd
- 78. Oct 3 Odd
- 79. Oct 4 Odd
- 80. Oct 5 Odd
- 81. Oct 6 Odd
- 82. Oct 7 Odd
- 83. Oct 2 Even
- 84. Oct 3 Even
- 85. Oct 4 Even
- 86. Oct 5 Even
- 87. Oct 6 Even
- 88. Oct 7 Even
- 89. Low Odds
- 90. Low Evens
- 91. Four Octaves

Starting from the first octave (fundamental), the harmonic waveforms contain the harmonics (odd, even, or all) present in each octave. In each successive octave the number of harmonics doubles. By combining (pri/sec or link) the harmonic waveforms in various amounts (volume), and transposing them (coarse/fine tuning), a vast range of timbres may be produced.



As an example, this chart shows the harmonics present in the **Octave 5 Odd** waveform.

## PROTEUS INSTRUMENTS

### **SINGLE CYCLE WAVEFORMS**

- 92. Synth Cycle 1
- 93. Synth Cycle 2
- 94. Synth Cycle 3
- 95. Synth Cycle 4
- 96. Fundamental Gone 1
- 97. Fundamental Gone 2
- 98. Bite Cycle
- 99. Buzzy Cycle 1
- 100. Metalphone 1
- 101. Metalphone 2
- 102. Metalphone 3
- 103. Metalphone 4
- 104. Duck Cycle 1
- 105. Duck Cycle 2
- 106. Duck Cycle 3
- 107. Wind Cycle 1
- 108. Wind Cycle 2
- 109. Wind Cycle 3
- 110. Wind Cycle 4
- 111. Organ Cycle 1
- 112. Organ Cycle 2

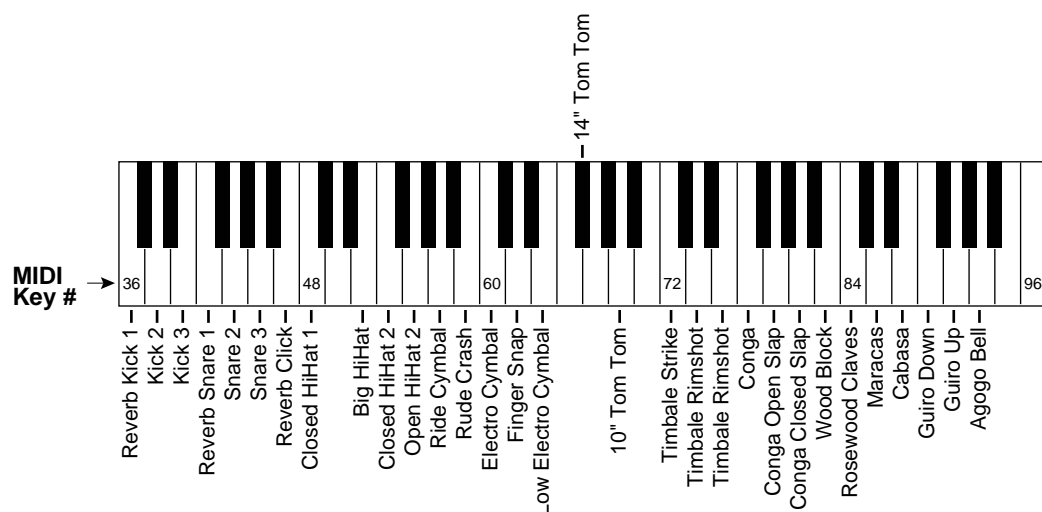
These single cycle waveforms were either synthesized or taken from actual sampled sounds. They were chosen for their diversity and interesting qualities.

### **MULTI-CYCLE WAVEFORMS**

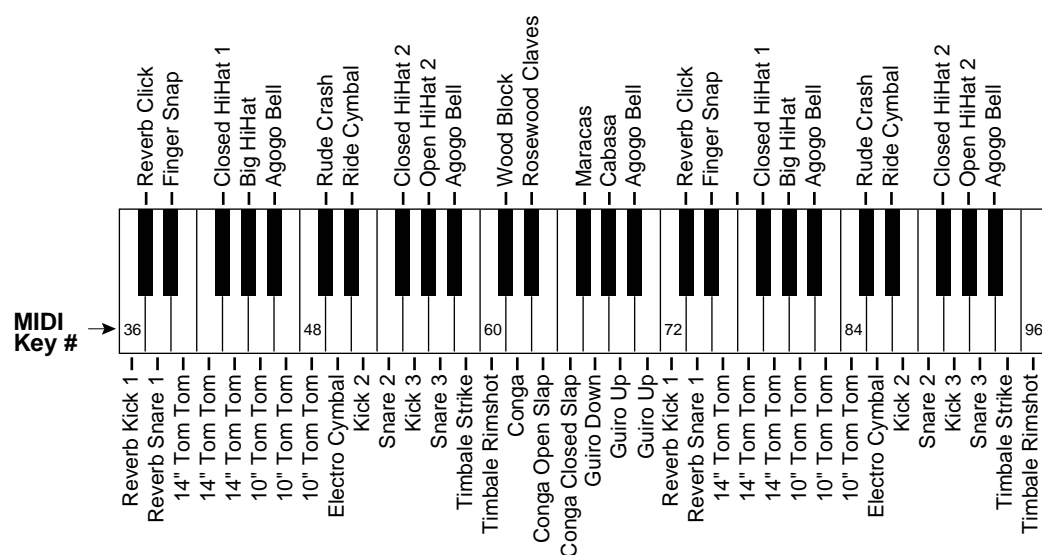
- 113. Noise
- 114. Stray Voice 1
- 115. Stray Voice 2
- 116. Stray Voice 3
- 117. Stray Voice 4
- 118. Synth String 1
- 119. Synth String 2
- 120. Animals
- 121. Reed
- 122. Pluck 1
- 123. Pluck 2
- 124. Mallet 1
- 125. Mallet 2

The multi-cycle cycle waveforms are short sections of sampled sounds.

# PERCUSSION INSTRUMENT LOCATIONS

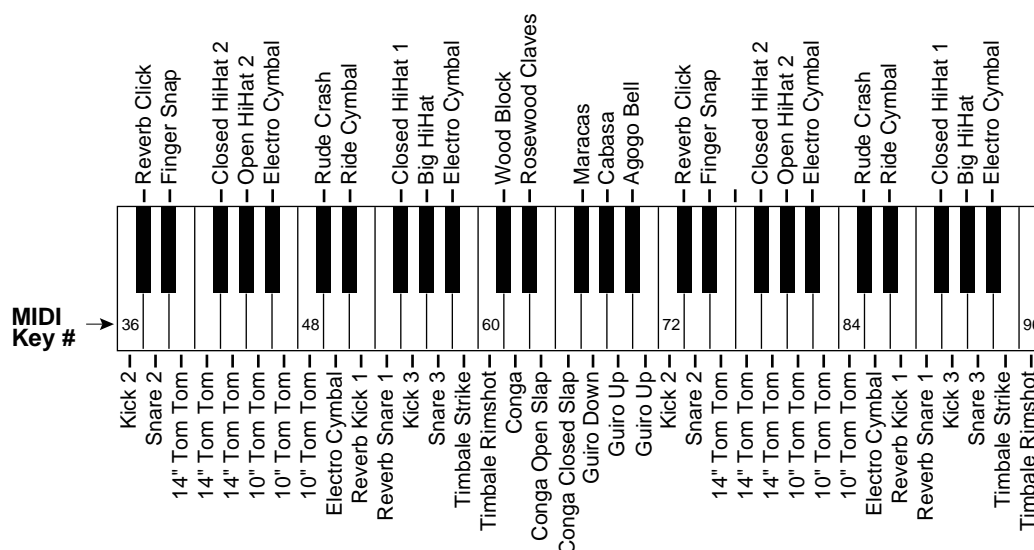


**All Percussion**  
Instruments 51, 52

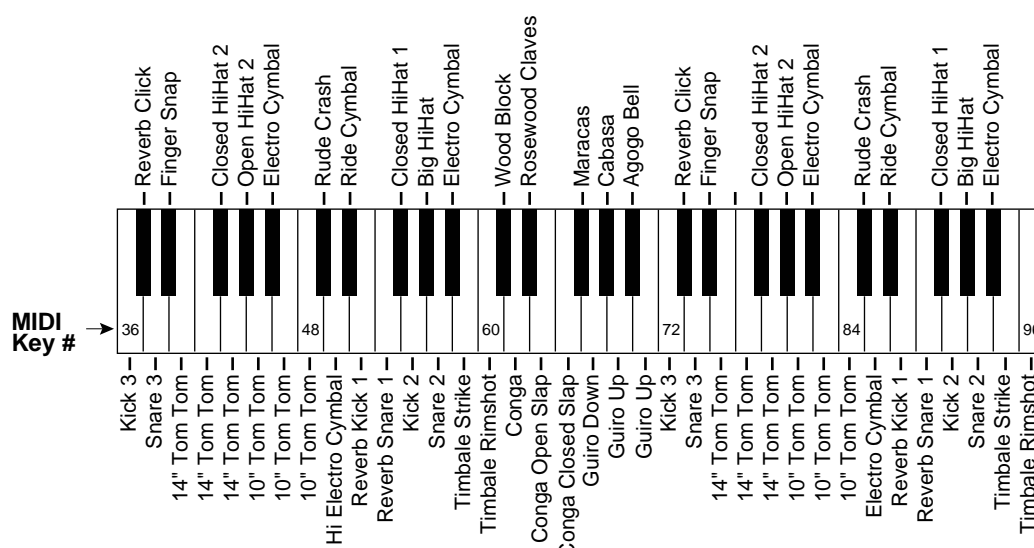


**Standard 1**  
Instrument 53

## PERCUSSION INSTRUMENT LOCATIONS



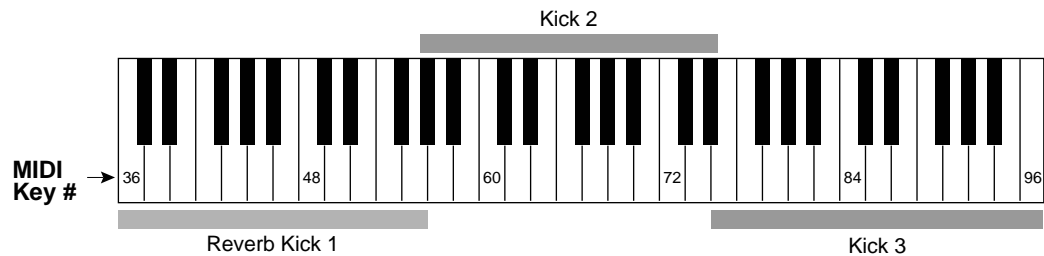
**Standard 2**  
Instrument 54



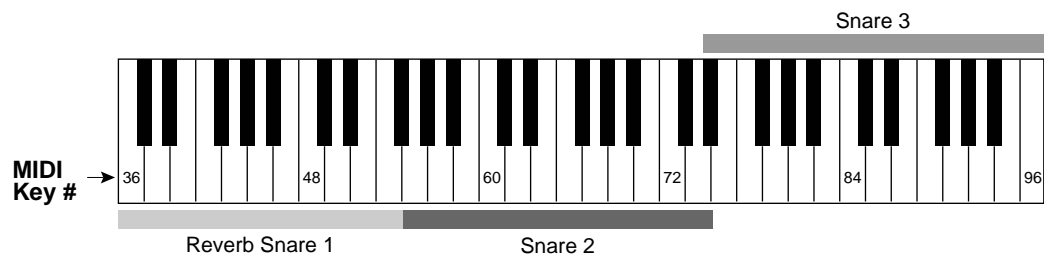
**Standard 3**  
Instrument 55

Standard percussion setups 1, 2, and 3 are compatible with the Alesis HR16, Korg M1, Dr. T's "Dr. Drum" patterns as well as other devices and programs.

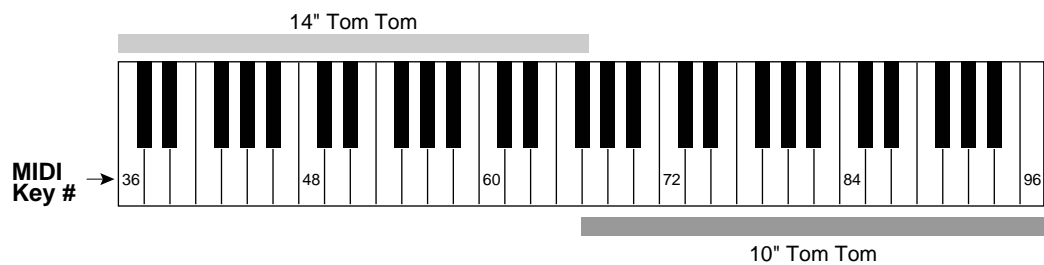


**PERCUSSION INSTRUMENT LOCATIONS**

**Kicks**  
Instrument 56

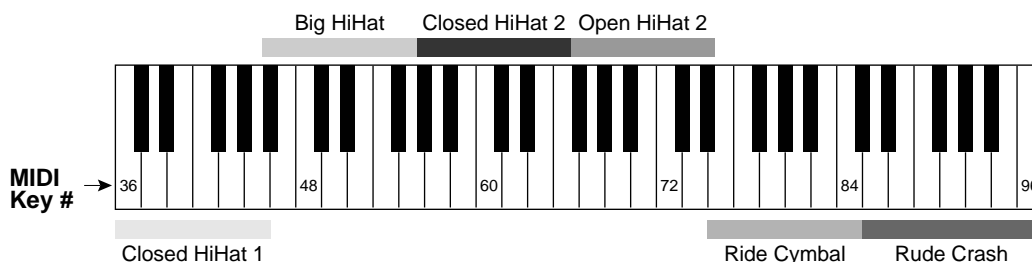


**Snares**  
Instrument 57

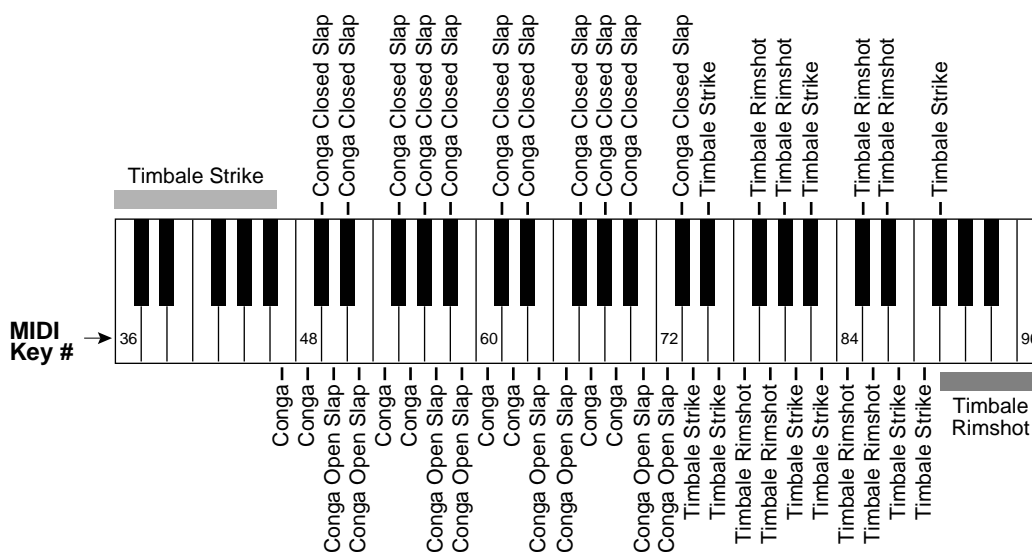


**Toms**  
Instrument 58

## PERCUSSION INSTRUMENT LOCATIONS

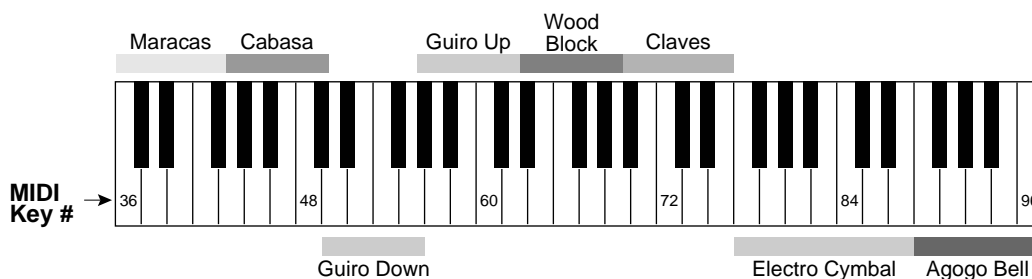


**Cymbals**  
Instrument 59



## Latin Drums

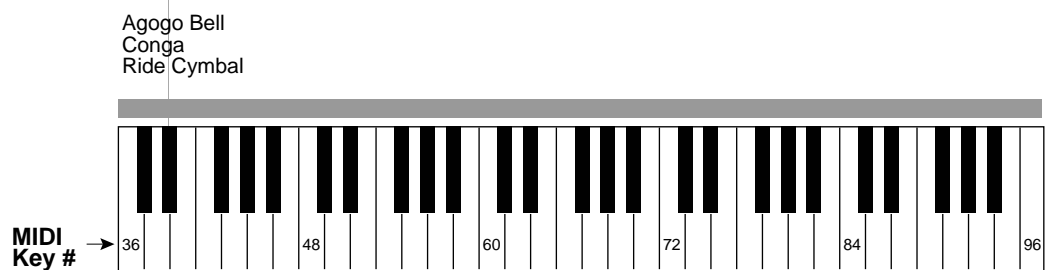
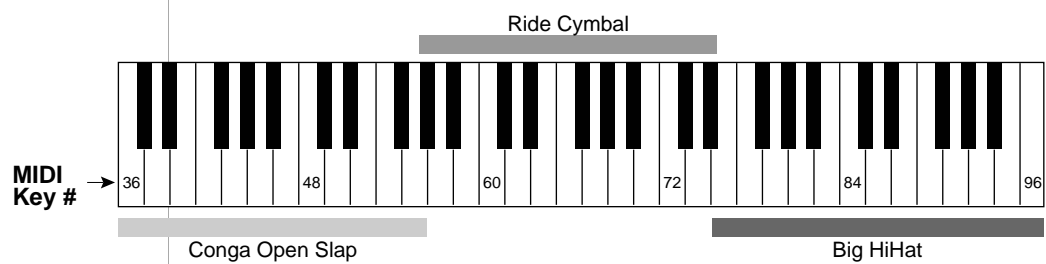
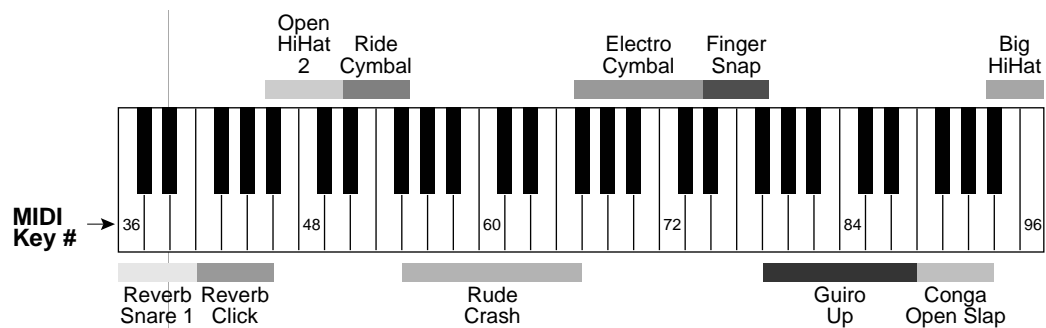
### Instrument 60



## Latin Percussion

### Instrument 61

## PERCUSSION INSTRUMENT LOCATIONS



## PROTEUS PARAMETER CHARTS

**A DELAY**

Knob	Time (mS)
5	4
10	8
20	16
30	24
50	40
75	60
100	81
125	101
150	121
175	141
200	161
255	206

**B DELAY**

Knob	Time (mS)
5	2
10	4
20	8
30	12
50	20
75	30
100	40
125	50
150	60
175	71
200	81
255	103

**ECHO DELAY**

Knob	Time (mS)
5	8
10	16
20	32
30	48
50	81
75	121
100	161
125	202
150	242
175	282
200	323
255	412

**EQ  
FREQUENCY**

Knob	Freq (Hz)
0	48.5
12	291
24	533
36	823.5
48	1218
60	1801
72	2663
84	3938
96	5823.5
108	8612
120	12735
127	16000

**EQ  
BANDWIDTH**

Knob	Freq (Hz)
0	9
12	17
24	33
36	64
48	122.5
60	235
72	452
84	868
96	1667
108	3202
120	6150
127	9000

**VOLUME  
ATTACK**

Knob	Time (sec)
0	0
5	.125
10	.25
15	.4
20	.6
30	1.2
40	2.2
50	4
60	9
75	15
80	20
99	60

**INSTRUMENT/  
ENVELOPE  
DELAY**

Knob	Time (sec)
000	0
5	.125
10	.25
20	.6
32	1
40	1.5
64	2.5
75	3.5
80	4.2
96	6.2
100	7
127	13

**LFO RATES**

Knob	Rate (Hz)
000	.052
5	.1
10	.6
15	.8
20	1.33
25	1.8
30	2.2
40	3.3
50	7
60	10
80	16
127	25

**AUXILIARY  
ATTACK**

Knob	Time (sec)
0	0
5	.125
10	.25
15	.5
20	.8
30	1.5
40	2.75
50	5.25
60	9
75	23
88	99
99	136

**HOLD**

Knob	Time (sec)
0	0
5	.125
10	.25
20	.4
30	.8
40	1.3
50	1.75
60	2.3
70	3.2
75	3.5
80	4.2
99	6.5

**DECAY**

Knob	Time (sec)
0	0
5	.125
10	.25
20	.4
30	.75
40	1.5
50	3
60	5
70	9
75	12
80	18
99	40

**RELEASE**

Knob	Time (sec)
0	0
5	.125
10	.25
15	.4
20	.6
30	1.2
40	2.2
50	4
60	9
75	15
80	20
99	60

## MIDI EFFECTS CONTROL

The internal effect processors on Proteus can be controlled in realtime using MIDI continuous controller channels. The controller channels are always connected to the destinations shown below. The parameters are not de-zippered (glitches may be heard if parameters are changed while sound is being processed), but we decided to include them anyway to further expand your control over the Proteus. Example: To turn effect B Off, send a value of 00 over continuous controller number 83. Try it!

Effects Amounts	
Parameter	Controller #
A Amount	84
B Amount	85
B>A Amount	86

"B" Effect Delay	
Parameter	Controller #
L Delay Time	110
L Tap Level	111
R Delay Time	112
R Tap Level	113
Feedback	114

"B" Effect Cross Delay	
Parameter	Controller #
R Delay Time	110
R Tap Level	111
L Delay Time	112
L Tap Level	113
Feedback	114

"B" Effect Stereo EQ B	
Parameter	Controller #
Frequency L	110
Bandwidth L	111
Boost/Cut L	112
Frequency R	113
Bandwidth R	114
Boost/Cut R	115

FX B Effect Type Controller #83	
Effect	Value
Off	00
Stereo Flange	01
Stereo Chorus	02
Phaser	03
Fuzz 1	04
Ring Modulator	05
Delay	06
Cross Delay	07
Stereo EQ B	08
Fuzz Lite	09

"B" Effect Fuzz1/Fuzz Lite	
Parameter	Controller #
Input Filter	110
Output Filter	111
Output Level	112

"B" Effect Flanger/Phaser	
Parameter	Controller #
LFO Rate	110
LFO Depth	111
Min Delay	112
Feedback	113

"B" Effect Chorus	
Parameter	Controller #
LFO Rate	110
LFO Depth	111
Min Delay	112
Feedback	113
Mix	114

For Chorus/Flanger/Phaser, a value of 40H = 0

## MIDI EFFECTS CONTROL

The A effects are controlled in the same way. As another example, to change the reverb decay time, change the value of continuous controller #70 from your sequencer. You can see the changes in the Proteus display.

Effects Amounts	
Parameter	Controller #
A Amount	84
B Amount	85
B>A Amount	86

“A” Effect Reverb Effects	
Parameter	Controller #
Decay Time	70

“A” Effect Delay/Echo	
Parameter	Controller #
L Delay Time	70
L Tap Level	71
R Delay Time	72
R Tap Level	73
Feedback	74

“A” Effect Cross Delay	
Parameter	Controller #
R Delay Time	70
R Tap Level	71
L Delay Time	72
L Tap Level	73
Feedback	74

“A” Effect Stereo EQ	
Parameter	Controller #
Frequency 1	70
Bandwidth 1	71
Boost/Cut 1	72
Frequency 2	73
Bandwidth 2	74
Boost/Cut 2	75

FX A Effect Type Controller #82	
Effect	Value
Off	00
Room	01
Warm Room	02
Plate 1	03
Plate 2	04
Chamber 1	05
Chamber 2	06
Hall 1	07
Hall 2	08
Delay	09
Cross Delay	0A
Phaser	0B
Stereo Flange	0C
Stereo Chorus	0D
Echo	0E
Stereo EQ A	0F
Small Room	10
Small Room 2	11
Hall 3	12
Early Refl. 1	13
Early Refl. 2	14
Early Refl. 3	15
Early Refl. 4	16
Rain	17

“A” Effect Flanger/Phaser	
Parameter	Controller #
LFO Rate	70
LFO Depth	71
Min Delay	72
Feedback	73

“A” Effect Chorus	
Parameter	Controller #
LFO Rate	70
LFO Depth	71
Min Delay	72
Feedback	73
Mix	74

For Chorus/Flanger/Phaser, a value of 40H = 0

## **TECHNICAL SPECIFICATIONS**

Audio Channels: 32  
Audio Outputs: 4  
Submix Inputs: 2  
Max. Output Level: +6 dBV  
Headphone Output Level: 60 mW into 60 $\Omega$   
Output Impedance (main): 1 K $\Omega$   
MIDI: In, Out, Thru  
Data Encoding: 16 bit Linear  
Signal to Noise: >90 dB  
Dynamic Range: >90 dB  
Frequency Response: 20Hz-18kHz  
THD +N: <.05%  
IMD: <.05%  
Stereo Phase: Phase Coherent

Power Requirements: 10 watts

Dimensions: H: 3.25" W: 13" L: 39.5"  
Weight: 22.8 lb (10.34 Kg)

## MIDI IMPLEMENTATION CHART

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1 1-16	1 1-16	Memorized
Mode	Default Messages	X	Mode 1, 3, 4 MONO, POLY OMNI ON/OFF	Memorized
Note Number	True Voice	0-127 0-127	0-127 0-127	
Velocity	Note ON Note OFF	0 X	0 v = 1-127 X 8N	xmit rel. is ignored v = 40H (64)
After Touch	Keys Channels	X 0X	0 0X	Key = recognized Chan = xmit/recog
Pitch Bender		0X	0X	0-12 semitones
Control Change		0X 0 - 120	0X	
Program Change	True Number	0X 0-127 * 0-127	0X 0-127 * 0-127	
System Exclusive		0	0	
System Common	:Song Pos :Song Sel :Tune	0 0 0	X X X	Any MIDI data up to 320 bytes can be transmitted
System Real Time	:Clock :Commands	X X	X X	
Aux. Messages	:Local ON/OFF :All Notes Off :Active Sense :Reset	X 0 X X	0 0 X X	Not Memorized
Notes:	Reset Controls * Bank Change Pan 0=hard left 127=hard right	0 0	0 0	

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

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

12/1/91



## MIDI SPECIFICATIONS

### RECEIVED CHANNEL COMMANDS

Channels number (n) = 0-15. Message bytes are represented in hex. All other numbers are decimal.

Command	Message	Comments
Note Off	8n kk vv	release velocity is ignored
Note Off	9n kk vv	velocity 0 = note off
Key Pressure	An kk pp	
Program Change	Cn pp	
Channel Pressure	Dn pp	
Pitch Wheel	En ll mm	l = lsb, m = msb
Realtime Controller	Bn cc vv	cc = 00-31
Performance Map Select	Bn 50 mm	mm = map #
Quick Key Select	Bn 51 qq	qq = quickey #
Effect A Select	Bn 52 ee	ee = effect A #
Effect B Select	Bn 53 ee	ee = effect B #
Effect A Amount	Bn 54 ee	ee = effect A amount#
Effect B Amount	Bn 55 ee	ee = effect B amount#
Effect Series Amount	Bn 56 ee	ee = B->A effect amount#
Effect Assign Pri.	Bn 57 ee	ee = Pri. effect assign. value

*In multi-mode, this selects  
effect buss channel  
assignment.*

**MIDI SPECIFICATIONS****RECEIVED CHANNEL COMMANDS (cont)**

<b>Command</b>	<b>Message</b>	<b>Comments</b>
Effect Assign Sec.	Bn 58 ee	ee = Sec. effect assign. value  <i>In multi-mode, this selects effect buss channel assignment.</i>
Effect A Parameter Value	Bn cc vv	cc = 70-79 vv = parameter value
Effect B Parameter Value	Bn cc vv	cc = 110-119 vv = parameter value
Footswitch	Bn cc vv	cc = 64-79, vv ≥ 64 = on
Volume	Bn 07 vv	
Pan	Bn 0A vv	0 = hard left, 127 = hard right
Pan = "P"	Bn 5A 40	sets pan to "P"
Reset All Controllers	Bn 79 00	ignored in omni mode
Local Control	Bn 7A vv	0 = off, ≥ 1 = on
All Notes Off	Bn 7B 00	ignored in omni mode
Omni Mode	Bn 7D 00	forces all notes & controls off
Mono Mode	Bn 7E 00	forces all notes & controls off
Poly Mode	Bn 7F 00	forces all notes & controls off
Bank Select	Bn 00 mm 20 ll Cn pp	

*Bank Select is ignored if a  
Program->Preset Map is turned on.*

**mm = msb, ll = lsb**  
**pp = preset within new bank**

## MIDI SPECIFICATIONS

■ When Product ID 04 is received, MIDI commands are interpreted and responded to using the original Proteus MIDI specification.

### RECEIVED SYSTEM COMMANDS

For system exclusive commands, the following format is used:

```

F0  system exclusive status byte
18  E-mu ID byte
08  product ID byte
dd  device ID byte
cc  command byte
...  data bytes
F7  EOX

```

Two MIDI bytes (lsb, msb) are required for each 14 bit data word. Bits 0-6 are sent first, followed by bits 7-13 in the next MIDI byte. All data words are signed 2's complement values with sign-extension out to the most significant bit (bit 13). This convention applies to all data words, regardless of the parameter's value range.

Command	Message	Comments
Preset Data Request	F0 18 id dd 00 ll mm F7	ll= preset # lsb, mm = msb
Preset Data	F0 18 id dd 01 ll mm ... .. cs F7	cs = checksum = sum of all data bytes
Parameter Value Request	F0 18 id dd 02 pl pm F7	pl = parameter # lsb      pm = msb
Parameter Value	F0 18 id dd 03 pl pm vl vm F7	vl = value lsb      vm = msb
Tuning Table Request	F0 18 04 dd 04 F7	Original Proteus M.P.S. will send table #1
Tuning Table	F0 18 04 dd 05 ... .. F7	Original Proteus
Tuning Table Request	F0 18 08 dd 04 tt F7	Proteus M.P.S. tt = tuning table #

**MIDI SPECIFICATIONS****RECEIVED SYSTEM COMMANDS (Continued)**

<b>Command</b>	<b>Message</b>	<b>Comments</b>
Tuning Table	F0 18 08 dd 05 ... .. F7	Proteus M.P.S.
Program Map Request	F0 18 04 dd 06 F7	Original Proteus
Program Map Data	F0 18 04 dd 07 ... .. F7	Original Proteus
Program Map Request	F0 18 08 dd 06 mm F7	Proteus M.P.S. mm = map #
Program Map Data	F0 18 08 dd 07 mm ... .. F7	Proteus M.P.S. mm = map #
Performance Map Req.	F0 18 08 dd 14 rr F7	rr = map #
Performance Map Data	F0 18 08 dd 15 rr ... .. F7	rr = map #
User Data Request	F0 18 08 dd 16 rr F7	rr = map #
User Data	F0 18 08 dd 17 rr ll ml lm mm ... .. cs F7	rr=map # ll=ls byte of ls word ml= ms byte of ls word lm=ls byte of ms word mm= ms byte of ms word cs = checksum = sum of data bytes

*Note: When Proteus sends Performance Map data (invoked from the Master Edit menu), it sends both the Performance Map data (message #15) and its corresponding User Data (message #17). This method splits up the performance map into two more manageable chunks of MIDI SysEx data and provides more independence and flexibility.*

**WARNING:** *When transferring preset banks back and forth from the Proteus to a computer, the data should be recorded as you would a regular sequence. Sending the data in one huge chunk will choke the Proteus on playback. In particular, utilities like the Master Tracks Pro4 Sysx loader will not work because they send the data all at once.*

## MIDI SPECIFICATIONS

### TRANSMITTED SYSTEM COMMANDS

Command	Message	Comments
Preset Data	F0 18 id dd 01 ll mm ... .. CS F7	
		cs = checksum = sum of all data bytes
Parameter Value	F0 18 id dd 03 pl pm vl vm F7	
	pl = parameter # lsb    pm = msb    vl = value lsb    vm = msb	
Tuning Table	F0 18 id dd 05 ... .. F7	TT data = 256 bytes
Program Map Data	F0 18 08 dd 07 ... .. F7	
Performance Map Data	F0 18 08 dd 15 ... .. F7	

#### Parameter Editing

Preset performance map and setup parameters may be edited individually using system exclusive commands. **The preset or performance map being edited is the one which is currently active.** The value of a given parameter may be changed by sending a *parameter value* command. The value of a parameter may be read by sending a *parameter value request*, to which the machine will respond by sending back the parameter value.

Preset data may also be transmitted or received in a single block (one complete preset) using system exclusive commands. A *preset data request* may be issued by a host computer, to which the machine will respond sending the data block for the requested preset. Conversely, the computer may send new preset data which will replace the specified preset currently in the machine. Additionally, a front panel command will transmit one or all user presets for backup onto an external sequencer. These presets may be restored by simply playing back the sequence into the machine.

#### Alternate Tuning

The “user tuning table” allows any key to be tuned to an arbitrary pitch over an 8 octave range. If selected in the preset, an alternate tuning may

## MIDI SPECIFICATIONS

be achieved by modifying the tuning values from the front panel or downloading a new table into the machine. The table consists of 128 words, corresponding to the MIDI key range, kept in non-volatile memory. Each word is a pitch value expressed in 1/64 semitones, offset from key number 0 (c-2). Therefore, for equal temperament, each entry in the table would be equal to its key number times 64.

### Preset Data Format

Preset data is transmitted and received using the following format: The standard system exclusive header (described below) is followed by the preset number (lsb, msb), a 14 bit word for each preset parameter (lsb, msb) starting at parameter #0 and continuing upward, a one-byte checksum, and the end-of-exclusive byte (F7). The checksum is the modulo 128 sum of all the parameter value bytes; that is, all of the data bytes following the preset number and before the checksum.

### PRESET PARAMETERS

Parameter#	(H)	Parameter Name
0-11	(00 00-0B 00)	preset name (12 ASCII characters)
12-14	(0C 00-0E 00)	link 1-3
15-18	(0F 00-12 00)	low key 0-3
19-22	(13 00-16 00)	high key 0-3
23	(17 00)	pri instrument
24	(18 00)	pri sample start offset
25	(19 00)	pri tuning (coarse)
26	(1A 00)	pri tuning (fine)
27	(1B 00)	pri volume
28	(1C 00)	pri pan
29	(1D 00)	pri delay
30	(1E 00)	pri low key
31	(1F 00)	pri high key
32	(20 00)	pri alt attack
33	(21 00)	pri alt hold
34	(22 00)	pri alt decay
35	(23 00)	pri alt sustain
36	(24 00)	pri alt release
37	(25 00)	pri alt envelope on
38	(26 00)	pri solo mode

**MIDI SPECIFICATIONS****PRESET PARAMETERS (cont)**

<b>Parameter#</b>	<b>(H)</b>	<b>Parameter Name</b>
39	(27 00)	pri double + detune
40	(28 00)	pri reverse sound
41	(29 00)	sec instrument
42	(2A 00)	sec sample start offset
43	(2B 00)	sec tuning (coarse)
44	(2C 00)	sec tuning (fine)
45	(2D 00)	sec volume
46	(2E 00)	sec pan
47	(2F 00)	sec delay
48	(30 00)	sec low key
49	(31 00)	sec high key
50	(32 00)	sec alt attack
51	(33 00)	sec alt hold
52	(34 00)	sec alt decay
53	(35 00)	sec alt sustain
54	(36 00)	sec alt release
55	(37 00)	sec alt envelope on
56	(38 00)	sec solo mode
57	(39 00)	sec double + detune
58	(3A 00)	sec reverse sound
59	(3B 00)	crossfade mode
60	(3C 00)	crossfade direction
61	(3D 00)	crossfade balance
62	(3E 00)	crossfade amount
63	(3F 00)	switch point
64	(40 00)	LFO 1 shape
65	(41 00)	LFO 1 frequency
66	(42 00)	LFO 1 delay
67	(43 00)	LFO 1 variation
68	(44 00)	LFO 1 amount
69	(45 00)	LFO 2 shape
70	(46 00)	LFO 2 frequency
71	(47 00)	LFO 2 delay
72	(48 00)	LFO 2 variation
73	(49 00)	LFO 2 amount
74	(4A 00)	aux delay
75	(4B 00)	aux attack
76	(4C 00)	aux hold
77	(4D 00)	aux decay

**MIDI SPECIFICATIONS****PRESET PARAMETERS (cont)**

<b>Parameter#</b>	<b>(H)</b>	<b>Parameter Name</b>
78	(4E 00)	aux sustain
79	(4F 00)	aux release
80	(50 00)	aux amount
81-86	(51 00-56 00)	key/vel source 1-6
87-92	(57 00-5C 00)	key/vel dest 1-6
93-98	(5D 00-62 00)	key/vel amount 1-6
99-106	(63 00-6A 00)	realtime source 1-8
107-114	(6B 00-72 00)	realtime dest 1-8
115-117	(73 00-75 00)	footswitch dest 1-3
118-121	(76 00-79 00)	controller amount A-D
122	(7A 00)	pressure amount
123	(7B 00)	pitch bend range
124	(7C 00)	velocity curve
125	(7D 00)	keyboard center
126	(7E 00)	submix ( <i>Use parm 128 on M. P. S.</i> )
127	(7F 00)	keyboard tuning

*(This is the last parameter transmitted if the ID is 04)*

128	(00 01)	effect buss assignment primary
129	(01 01)	effect buss assignment secondary
130	(02 01)	effect "A" type
131	(03 01)	effect "A" amount
132-141	(04 01-0D 01)	effect "A" parameter values
142	(0E 01)	effect "B" type
143	(0F 01)	effect "B" amount
144-153	(10 01-19 01)	effect "B" parameter values
154	(1A 01)	series effect feed amount



## MIDI SPECIFICATIONS

### GLOBAL/SETUP PARAMETERS

If the ID in the data requesting message is 04, then the first 4 parameters (basic channel through current preset) are sent 16 times to communicate the current multi-map. Other differences are that the extra setup parameters are not sent.

Parameter #	msb lsb	Parameter Name
256	(00 02)	MIDI basic channel
257	(01 02)	MIDI volume
258	(02 02)	MIDI pan
259	(03 02)	current preset
260	(04 02)	master tune
261	(05 02)	transpose
262	(06 02)	global pitch bend range
263	(07 02)	global velocity curve
264	(08 02)	MIDI mode
265	(09 02)	MIDI overflow
266-269	(0A 02- 0D 02)	controller A-D numbers
270-272	(0E 02-10 02)	footswitch 1-3 numbers
273	(11 02)	mode change enable
274	(12 02)	device ID number
275 *	(13 02)	global pressure amount
276 *	(14 02)	pedal routing
277 *	(15 02)	local control
278 *	(16 02)	receive program change
279 *	(17 02)	send program changes
280 *	(18 02)	send controllers
281-295 *	(19 02-27 02)	startup message characters #1-15
296 *	(28 02)	effect transition mode
384-399	(00 03- 0F 03)	MIDI channel enable
512-639	(00 04-7F 04)	MIDI program/preset map #1

### Program Mapping

MIDI program changes will normally correspond to internal preset numbers 0-127. If the current performance map option is set to 'Off' then Cosmo will respond to the MIDI bank select command. In addition, the user may "re-map" any MIDI program number, assigning it to an arbitrary internal preset. This feature allows any of the internal presets to be selected from a MIDI keyboard controller.

\* Not sent for Proteus ID (04)

**MIDI SPECIFICATIONS****PERFORMANCE MAP PARAMETERS**

<b>Parameter Number</b>	<b>Parameter Name</b>
1024-1033	map name (10 ASCII characters)
1034-1043	quick key preset assign (0-9 Zone 1)
1044-1053	quick key preset assign (0-9 Zone 2)
1054-1063	quick key preset assign (0-9 Zone 3)
1064-1073	quick key preset assign (0-9 Zone 4)
1074-1083	quick key MIDI prog. change (0-9 Zone 1)
1084-1093	quick key MIDI prog. change (0-9 Zone 2)
1094-1103	quick key MIDI prog. change (0-9 Zone 3)
1104-1113	quick key MIDI prog. change (0-9 Zone 4)
1114-1023	quick key MIDI channel # (0-9 Zone 1)
1024-1033	quick key MIDI channel # (0-9 Zone 2)
1034-1143	quick key MIDI channel # (0-9 Zone 3)
1144-1153	quick key MIDI channel # (0-9 Zone 4)
1154-1063	quick key MIDI low split pt. (0-9 Zone 1)
1064-1073	quick key MIDI low split pt. (0-9 Zone 2)
1074-1183	quick key MIDI low split pt. (0-9 Zone 3)
1184-1193	quick key MIDI low split pt. (0-9 Zone 4)
1194-1003	quick key MIDI high split pt. (0-9 Zone 1)
1104-1113	quick key MIDI high split pt. (0-9 Zone 2)
1114-1123	quick key MIDI high split pt. (0-9 Zone 3)
1124-1133	quick key MIDI high split pt. (0-9 Zone 4)
1134-1143	quick key preset volume (0-9 Zone 1)
1144-1153	quick key preset volume (0-9 Zone 2)
1154-1163	quick key preset volume (0-9 Zone 3)
1164-1173	quick key preset volume (0-9 Zone 4)
1174-1183	quick key preset pan (0-9 Zone 1)
1184-1193	quick key preset pan (0-9 Zone 2)
1194-1203	quick key preset pan (0-9 Zone 3)
1204-1213	quick key preset pan (0-9 Zone 4)
1214-1223	quick key octave transpose (0-9 Zone 1)
1224-1233	quick key octave transpose (0-9 Zone 2)
1234-1243	quick key octave transpose (0-9 Zone 3)
1244-1253	quick key octave transpose (0-9 Zone 4)
1254-1263	quick key control enable (0-9 Zone 1)
1264-1273	quick key control enable (0-9 Zone 2)
1274-1283	quick key control enable (0-9 Zone 3)
1284-1293	quick key control enable (0-9 Zone 4)

## MIDI SPECIFICATIONS

### PERFORMANCE MAP PARAMETERS (cont)

Parameter Number	Parameter Name
1394-1409	MIDI volume per channel (multimap)
1410-1425	MIDI pan per channel (multimap)
1426-1441	preset per channel (multimap)
1442	MIDI multi mode
1443-1458	receive program changes (16)
1459-1474	effect assign (16)
1475	effect A type
1476	effect A amount
1477-1486	effect A parameter values
1487	effect B type
1488	effect B amount
1489-1498	effect B parameter values
1499	series effect feed amount
1500	MIDI program -> preset map
1501-1504	MIDI command string channels
1505-1508	MIDI command string type
1509-1512	MIDI command string values

### Preset Data Request

Proteus Master Performance System presets are organized into banks. Each bank consists of 100 presets. Banks may be requested using the preset request command and the appropriate preset code listed below:

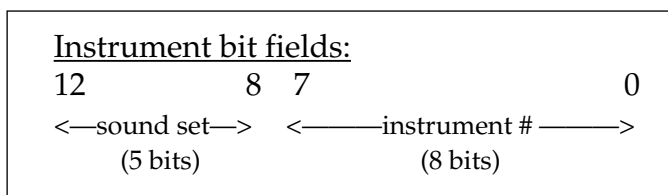
Bank	Preset	Requested Preset#	MIDI Message
0	0-99	1024 (0x400)	F0 18 id dd 00 00 08 F7
1	100-199	1025 (0x401)	F0 18 id dd 00 01 08 F7
2	200-299	1026 (0x402)	F0 18 id dd 00 02 08 F7

The original commands for requesting user presets (-1:100-199) and factory presets (-2:0-99) are still supported to retain compatibility with existing software.



## MIDI SPECIFICATIONS

In order to achieve this compatibility between different Proteus configurations, it is necessary to include the sound set number as part of the instrument number when exchanging data. The instrument number (as expressed over MIDI) now contains two fields: bits 8-12 specify the sound set (0-31) and bits 0-7 specify the instrument within the sound set (0-255). Since Proteus/1 contains sound set #0, compatibility with existing products is maintained.



Within any given sound set, the first instrument is #1. #0 selects None.

### Expanded Presets

An expanded Proteus/1 will contain additional factory presets in ROM. The additional presets can be uploaded using the “preset/bank request” command. The new presets will be in bank #3 (0x403) for non-XR, and bank #6 (0x406) for XR versions.

### Product ID

The product ID code is the same for all configurations.

### Configuration Message

A new MIDI command has been added to identify the sound sets in a given Proteus. The configuration request command is:

**F0 18 id dd 0C F7**

Proteus will respond to this command with the configuration message:

**F0 18 id dd 0D pl pm s1 l1 m1 s2 l2 m2 F7**

where pl and pm are the lsb and msb of the total number of presets, s1 and s2 are the ID numbers of the sound sets contained in this unit, and n1 = l1, m1 and n1 = l1, m1 represent the lsb and msb of the number of instruments in each sound set.

## MIDI SPECIFICATIONS

If no expansion set is present, s2 will be 7F and n2 will be zero. If the Proteus contains firmware earlier than version 2.10, no response will be given, and one can assume sound set #0. The current configurations are as follows:

Product	Sound Set(s)
Proteus/1	0
Proteus/2	1, 2
Proteus/1+	0, 2

### INSTRUMENT LIST

A new MIDI command has been added to allow external software to upload the instrument list as an array of ascii strings. The instrument list request command is: **F0 18 id dd 0E F7**

Proteus will respond to this command with the instrument list message:

**F0 18 id dd 0F (14 bytes per instrument) ... .. F7**

The instruments are transmitted in the same order they appear to the user on Proteus. Note that a given instrument's position in this list may be different from its actual number within the sound set.

**Instrument entry: il im (11 ASCII bytes) 00**

Each instrument entry in the list consists of the actual instrument number (as defined in "Sound Sets" above) in lsb, msb format, followed by the instrument name (11 ascii characters plus a zero terminator) for a total of 14 (decimal) bytes. The first instrument is #1 as displayed on Proteus. The total number of instrument names is equal to (n1 + n2) in the configuration message above. Proteus firmware earlier than version 2.10 will not respond to this command.

## **MIDI SPECIFICATIONS**

### **PRESET LIST**

A new MIDI command has been added to allow external software to upload all preset names as an array of ascii strings. The preset list request command is: **F0 18 id dd 12 F7**

Proteus will respond to this command with the preset list message:

**F0 18 id dd 13 (13 bytes per preset) ... .. F7**

Each preset name is 12 ascii characters, plus a zero terminator, for a total of 13 (decimal) bytes. The first preset is #0. The total number of preset names is equal to pp in the configuration message above. Proteus firmware earlier than version 2.10 will not respond to this command.

### **VARIABLE CHORUS**

Proteus firmware starting with version 2.10 features a variable chorus depth. The range of values is now 0 (Off) through 15, with a value of 7 corresponding to 1 (On) in Proteus/1. The MIDI parameter number is unchanged.

## **E-MU SYSTEMS PRODUCT WARRANTY**

*Please read this warranty, as it gives you specific legal rights.*

### **Length of Warranty**

This warranty covers all defects in materials and workmanship for a period of one year from the date of purchase by the original owner, provided that the Warranty Registration Card is filled out and returned to E-mu Systems within 14 days from the date of purchase. Cases may arise where E-mu's Service Department or one of E-mu's authorized service centers will ask for a copy of your sales receipt to facilitate warranty service. Please keep your purchase receipt in a safe place.

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- Damages due to improper or inadequate maintenance, accident, abuse, misuse, alteration, unauthorized repairs, tampering, or failure to follow normal operating procedures as outlined in the owner's manual.
- Deterioration or damage of the cabinet.
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All E-mu products are manufactured with the highest standards of quality. If you find that your instrument does require service, it may be done by an authorized E-mu service center. If you are unable to locate a service center in your area, please contact E-mu Systems Service Department at (408) 438-1921. They will either refer you to an authorized service center or ask that you return your instrument to the factory. When returning an instrument to the factory, you will be issued a Return Merchandise Authorization number (RMA). Please label all cartons, shipping documents and correspondence with this number. E-mu suggests you carefully and securely pack your instrument for return to the factory. Mark the outside of the shipping carton clearly with your RMA number. Send to E-mu Systems, Inc. 1600 Green Hills Road, Scotts Valley, California, 95066. You must pre-pay shipping charges to the service location. E-mu Systems will pay return shipping fees. You will be responsible for any damage or loss sustained during shipment in any direction.



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