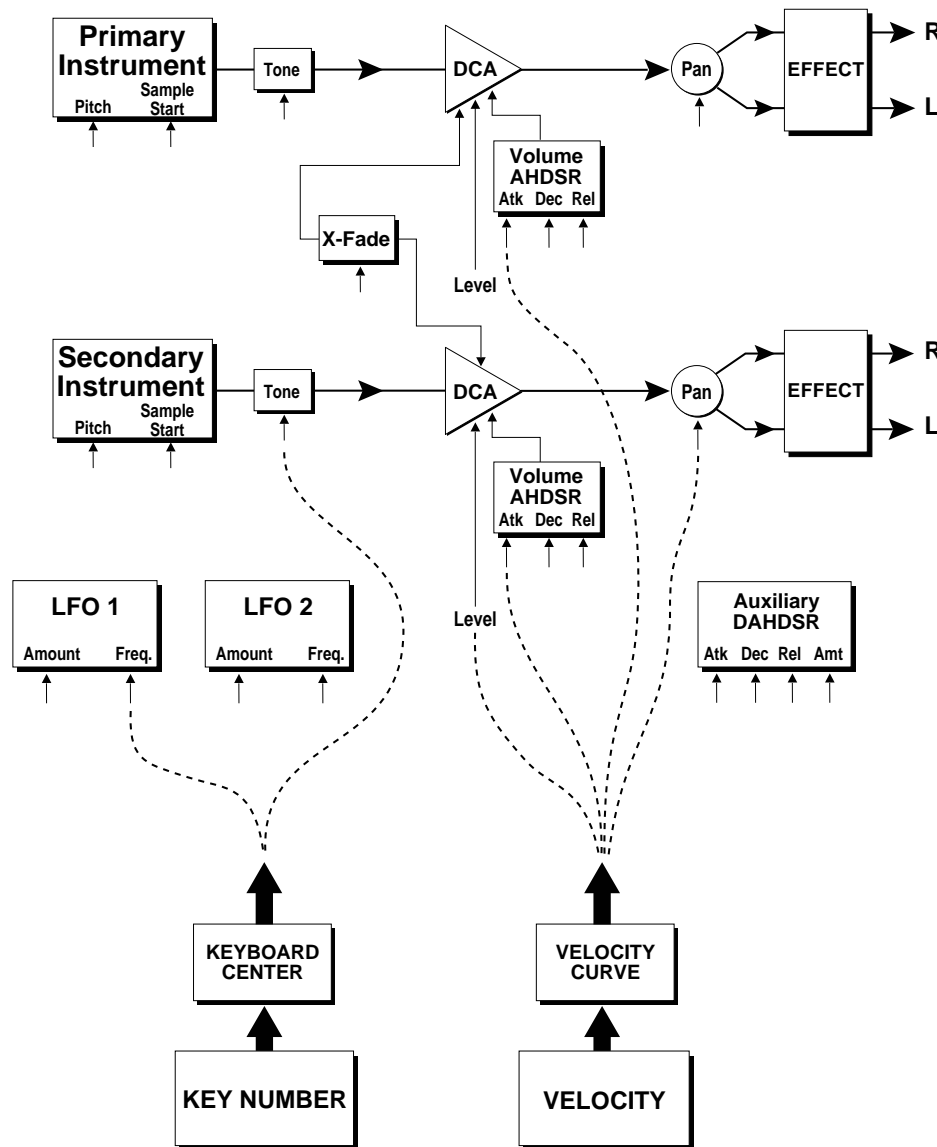


## PROGRAMMING BASICS



### 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

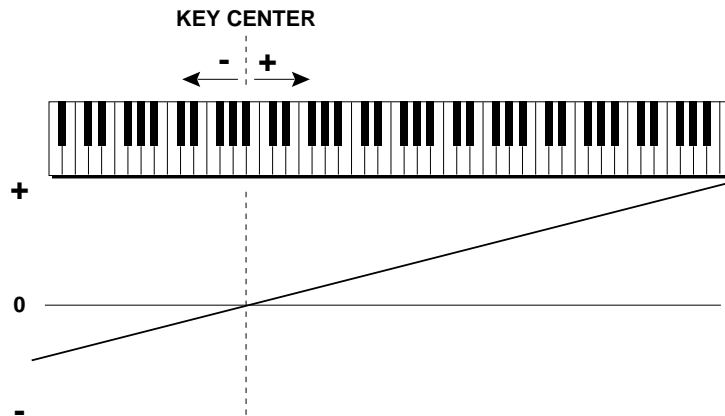
The Key Number is affected by the Keyboard Center parameter which can be set to any key from C-2 to G8. The keyboard center establishes a reference point for keyboard modulation; keys above this point will have a positive value, while keys below it will be negative. For example, if we wished to change 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.*

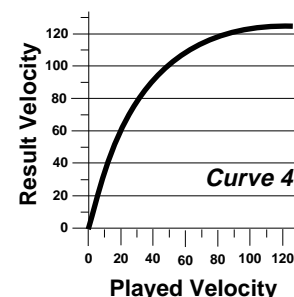
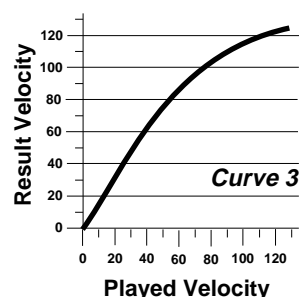
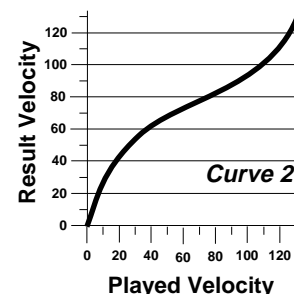
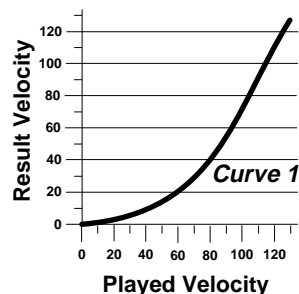
*Change the tone as you move up the keyboard.*

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

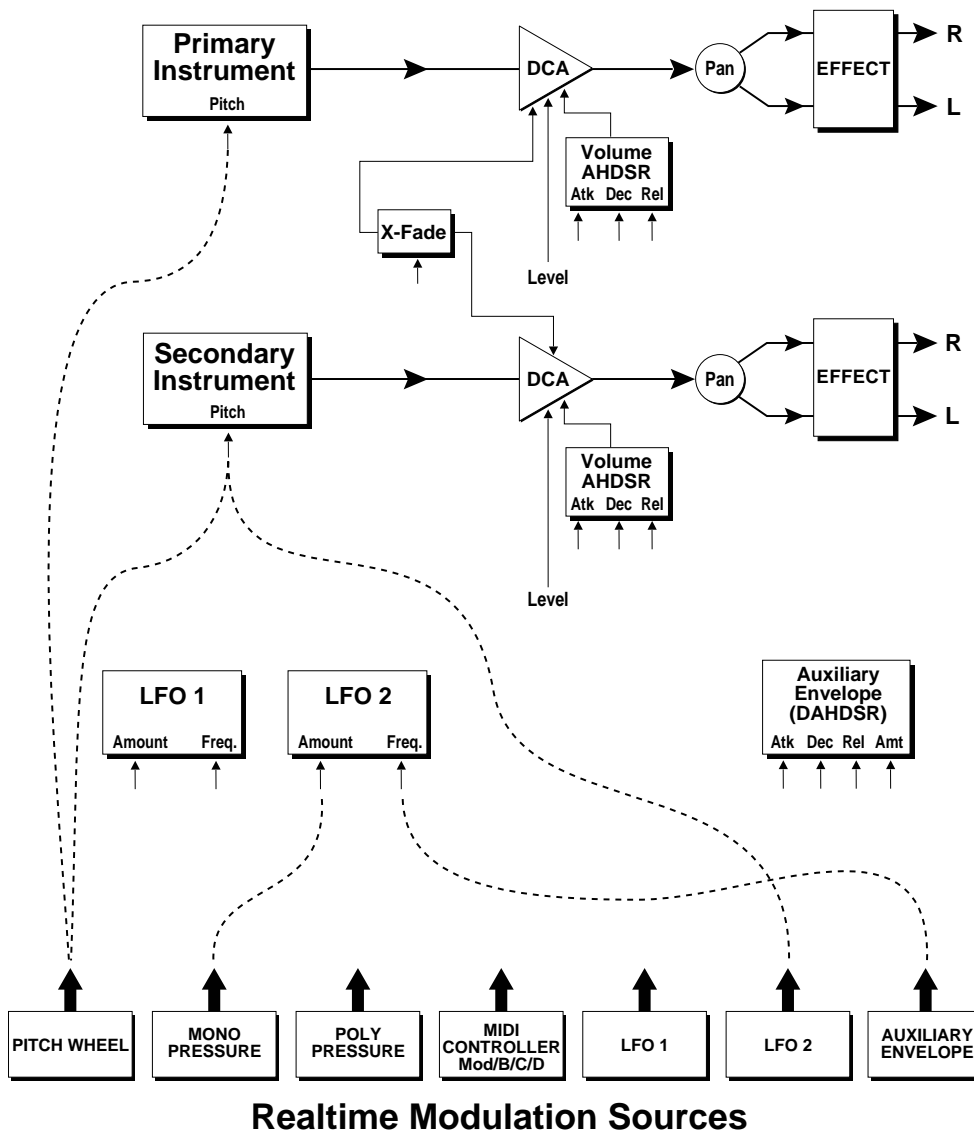


### VELOCITY CURVES

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.

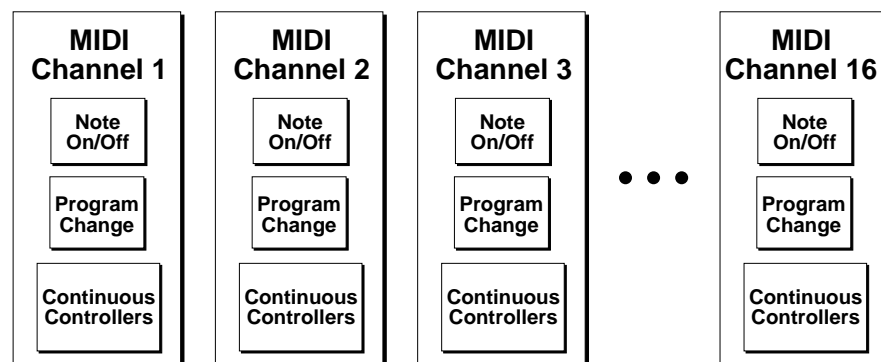
## PROGRAMMING BASICS

### 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

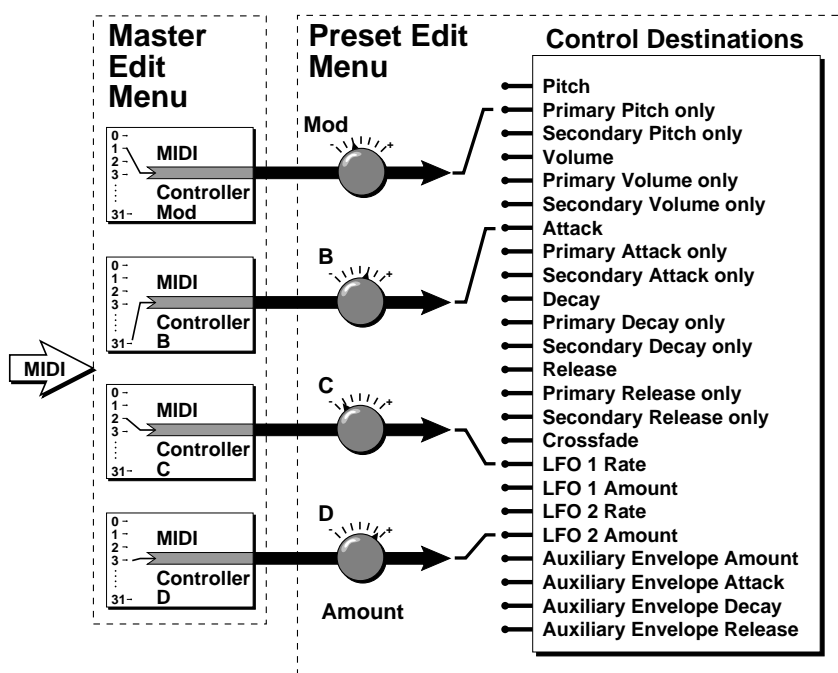
Let's say for example, that you are using a Guitar Synthesizer as your MIDI source controlling the Proteus. Many guitar synthesizers transmit pitch bend data, have one or more data knobs and a foot pedal, all of which transmit their values over MIDI. The standard MIDI controller numbers for the controls 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

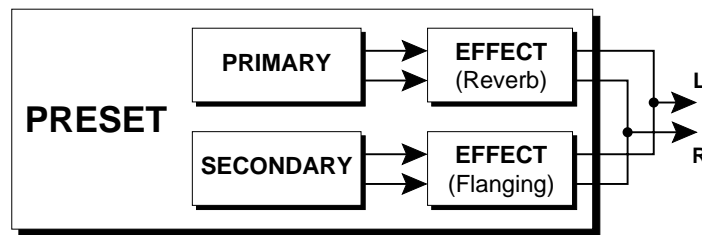
### EFFECTS

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).

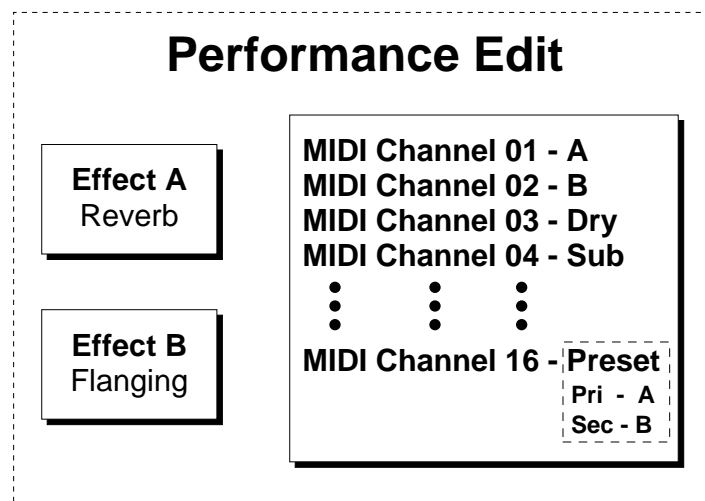
**Single Preset**  
Effect programmed in the Preset is used.

**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.*