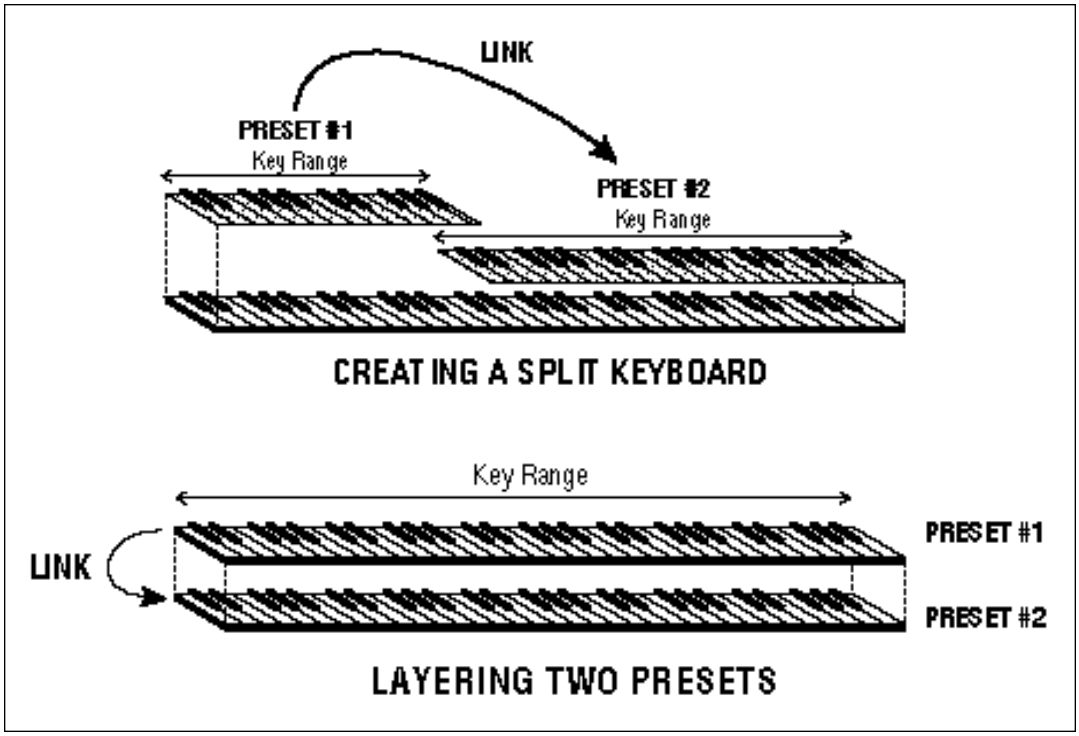
# Classic Keys PRESET PROGRAMMING

# 5 Preset Programming



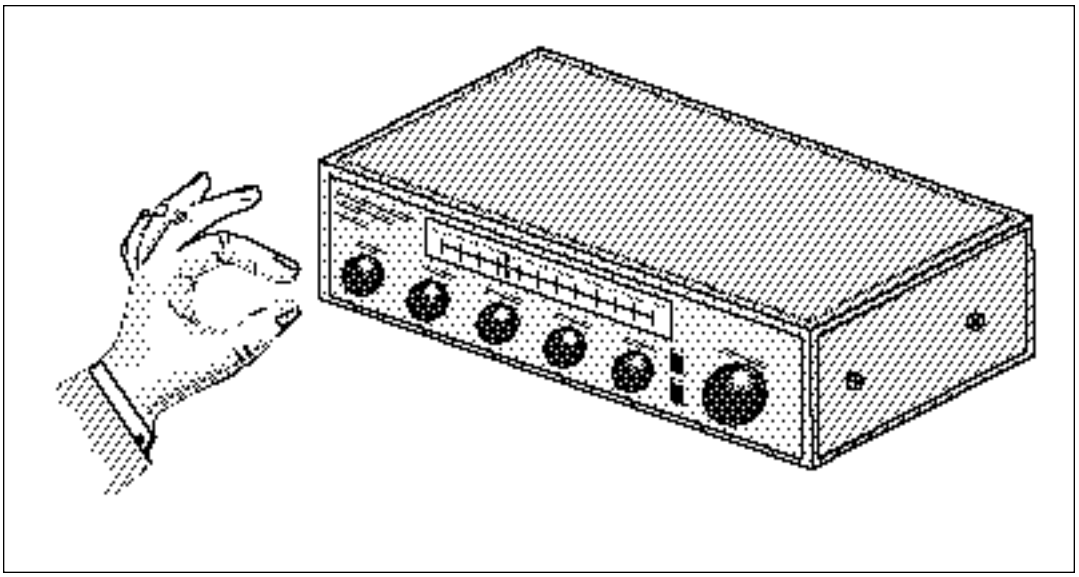

These diagrams show how keyboard splits and layers can be created by linking presets. Remember that each preset can consist of both a primary and secondary layer.

Your initial involvement with Classic Keys 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, or the attack time. 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 wave-forms with sampled sounds. There are 256 user locations (banks 0-1) available to store your own creations or edited factory presets. Best of all, it's easy to edit or create new presets using the edit menu.

Presets can be made up of both a primary and secondary instrument. Presets can also be "linked" with up to 3 additional presets to create layering or splits.

One way to create a keyboard split is to assign an instrument to a specific range and then link it to other presets which fill in the empty keys. By using both the primary and secondary instrument ranges for each of the individual preset links, up to eight keyboard splits can be produced.

Classic Keys has an extensive modulation architecture using two multi-wave LFO's (Low Frequency Oscillators), two envelope generators and the ability to respond to multiple MIDI controllers. You may simultaneously route any combination of these control sources to multiple destinations.



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

## 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. Classic Keys (and most synthesizers for that matter) are 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. This can be thought of as a type of remote control in which one device automatically controls another in a precise way.

Two main types of modulation sources on Classic Keys 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.

## MODULATION SOURCES

Classic Keys uses three kinds of modulation sources.

### KEYBOARD & 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
A synthesizer pitch bend wheel.

Miscellaneous Controllers (4)
Any type of MIDI controller data.

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

Polyphonic Key Pressure (poly aftertouch)
Polyphonic aftertouch from a controller capable of generating polyphonic pressure data. Poly pressure is received on a “per note” basis.

Low Frequency Oscillators (2)
Generate repeating waves.

Envelope Generators (1)
Generate a programmable volume or pitch contour which changes over time when a key is pressed.

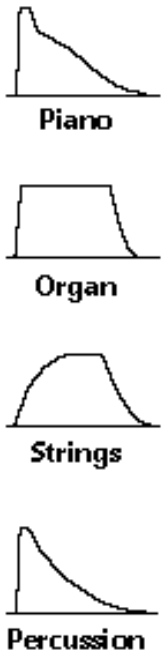
### FOOTSWITCH MODULATION

Changes a parameter when one of three MIDI footswitches are pressed. The 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.

## ENVELOPE GENERATORS

An envelope can be described as a "contour" which can be used to shape the sound in some way over time. Classic Keys contains two different kinds of envelope generators. One of the envelope generators, the Alternate Volume Envelope, controls the volume of the primary or secondary instrument and has 5 stages, Attack, Hold, Decay, Sustain, and Release. The other 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:

***THE GENERALIZED ENVELOPE SHAPES OF A FEW TYPES OF SOUNDS ARE SHOWN BELOW.***




**Delay**
The time between when a key is played and when the attack phase begins.

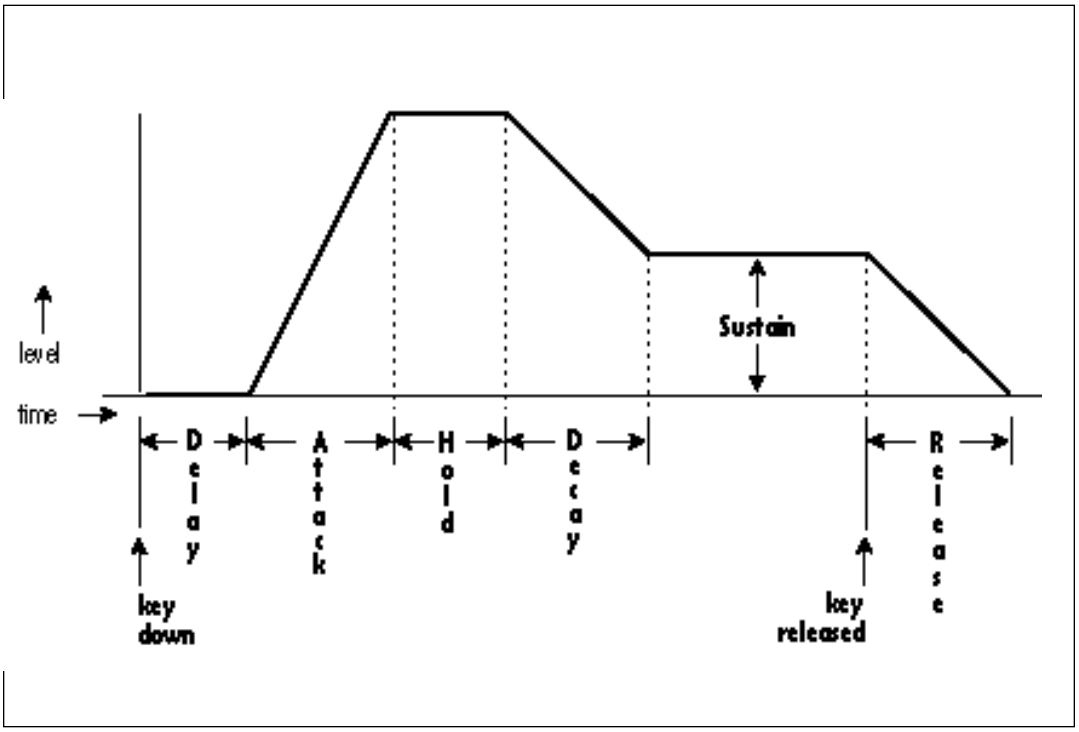
**Attack**
The time it takes to go from zero to the peak (full) level.

**Hold**
The time the envelope will stay at the peak level before starting the decay phase.

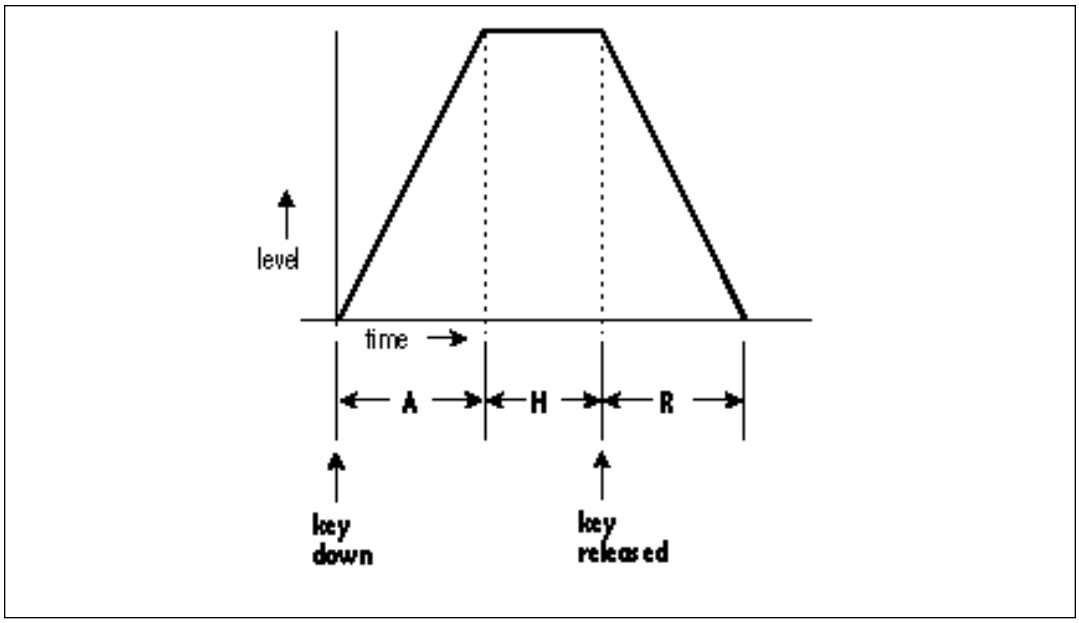
**Decay**
The time it takes the envelope to go from the peak level to the sustain level.

**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 six stages of the auxiliary envelope generator: Delay, Attack, Hold, Decay, Sustain and Release.

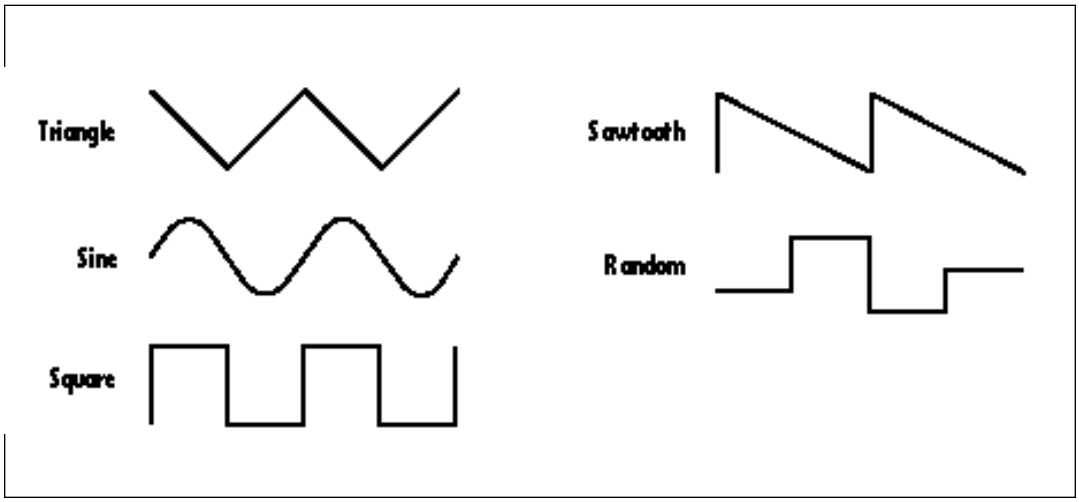



If the key is released during the Hold (H) phase, the Release (R) phase begins.

## LOW FREQUENCY OSCILLATORS (LFOs)

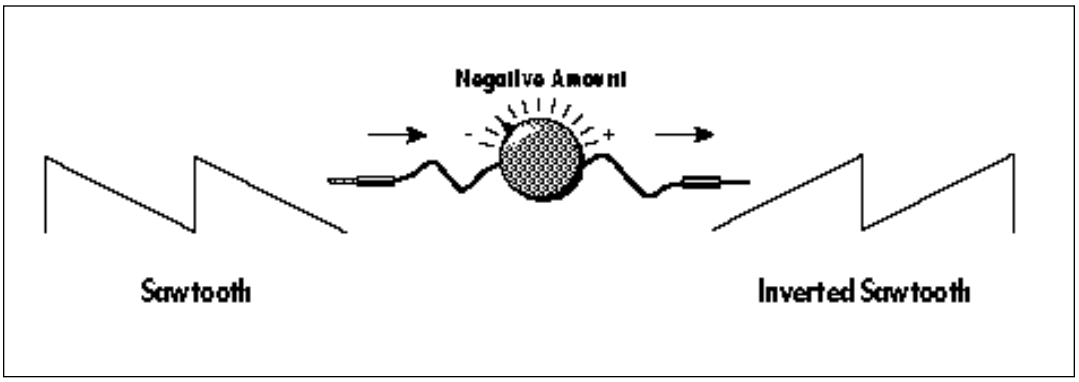
A Low Frequency Oscillator is simply a wave which repeats at a slow rate. Classic Keys has two multi-wave LFOs for each of its 32 channels. The LFO waveforms are: Triangle, Sine, Square, Sawtooth, and Random, which is a random "sample and hold" type of wave.

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.




LFO waveforms.

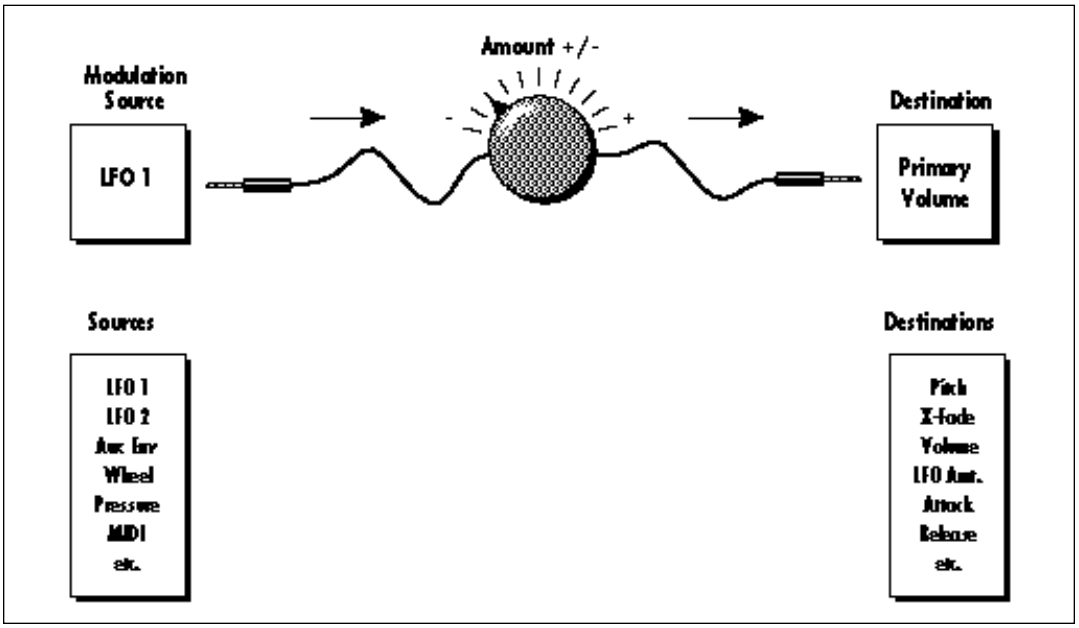
When the amount of an LFO is a negative value, the LFO shape will be inverted. For example, inverting the sawtooth wave produces a wave that smoothly increases, then instantly resets down.




## MIDIPATCH

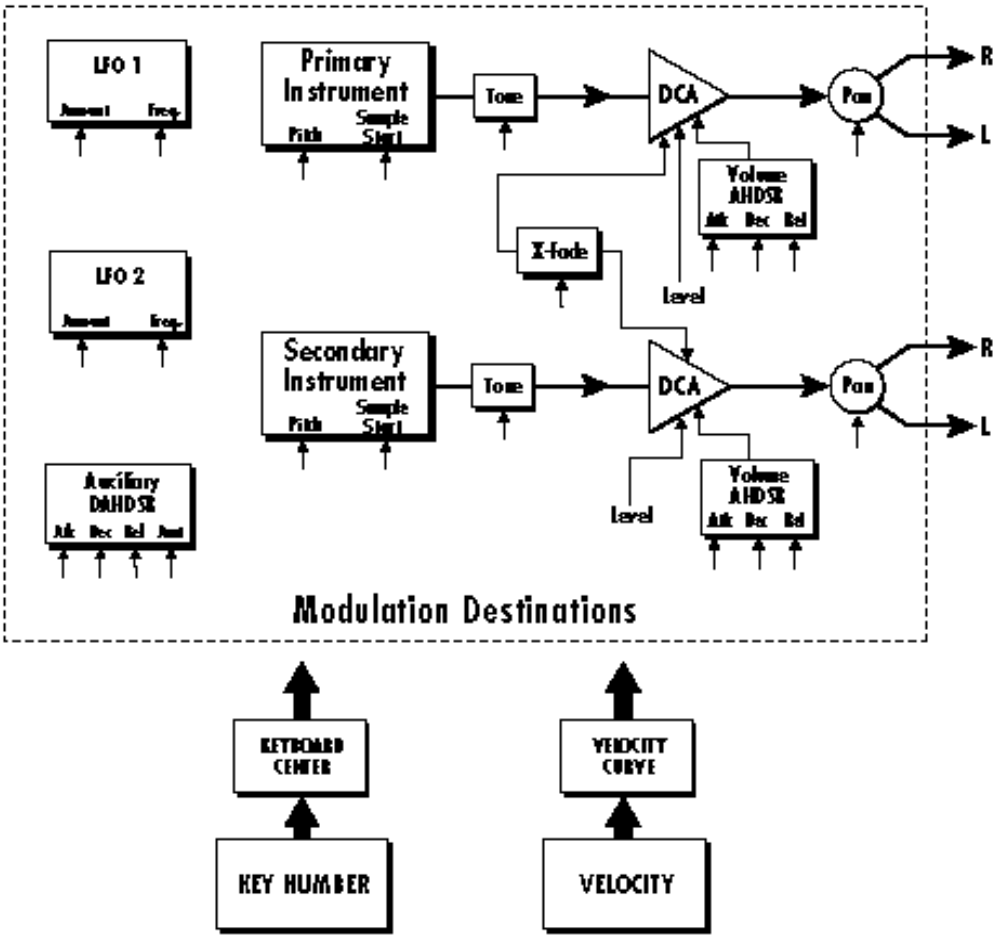
Connecting a modulation source to a destination is called a patch. Classic Keys lets you connect the modulation sources in almost any possible way to the modulation destinations. You can even modulate other modulators. Each patch also has an amount parameter which determines "how much" modulation is 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.



***MODULATION SOURCES:***
***KEY NUMBER***
***KEY VELOCITY***

***DESTINATIONS:***
***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, AUX. ENVELOPE AMOUNT, AUX. ENVELOPE ATTACK, AUX. ENVELOPE DECAY, AUX. ENVELOPE RELEASE, SAMPLE START, PRIMARY SAMPLE START, SECONDARY SAMPLE START, PAN, PRIMARY PAN, SECONDARY PAN, TONE, PRIMARY TONE, SECONDARY TONE***



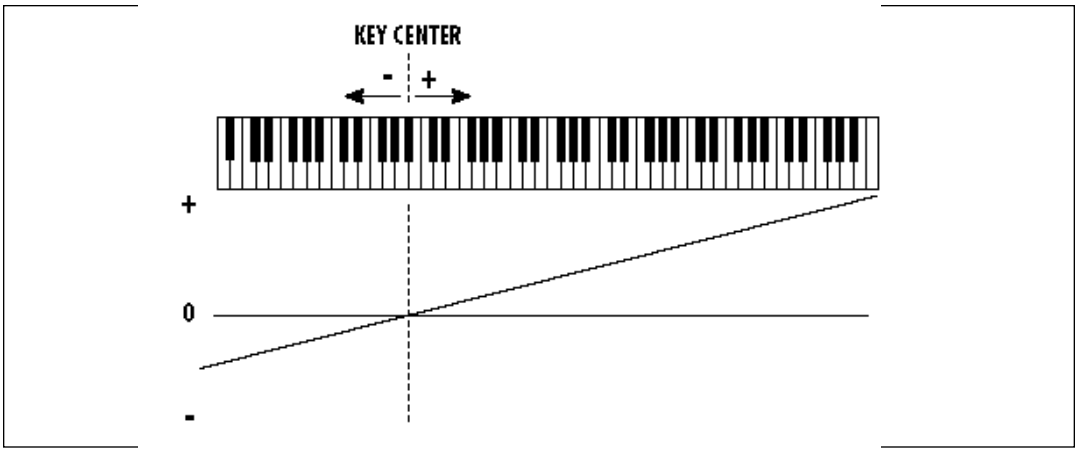

**Keyboard and Velocity Modulation Sources**

***THE TONE FILTER IS A SIMPLE LOW-PASS TONE CONTROL WHICH CAN BE USED TO DARKEN THE TONE OF AN INSTRUMENT.***

## KEYBOARD & VELOCITY MODULATION

The Keyboard and Velocity Modulation diagram shows the possible routings 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 modulation source can control up to six destinations or one destination can be controlled by up to six modulation sources. The possible modulation routings are completely flexible as shown in the example above.

*KEYS ABOVE THE KEYBOARD CENTER POINT WILL HAVE A POSITIVE EFFECT. KEYS BELOW THE KEYBOARD CENTER WILL HAVE A NEGATIVE EFFECT.*



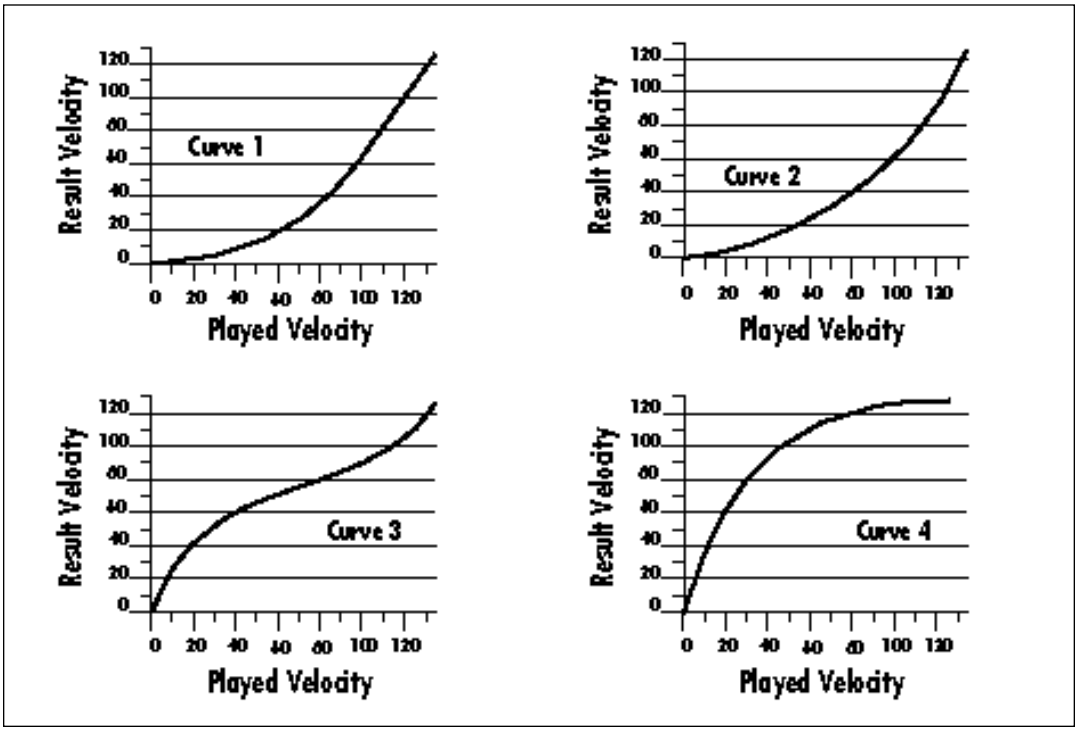

## KEY NUMBER

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.

## VELOCITY CURVES

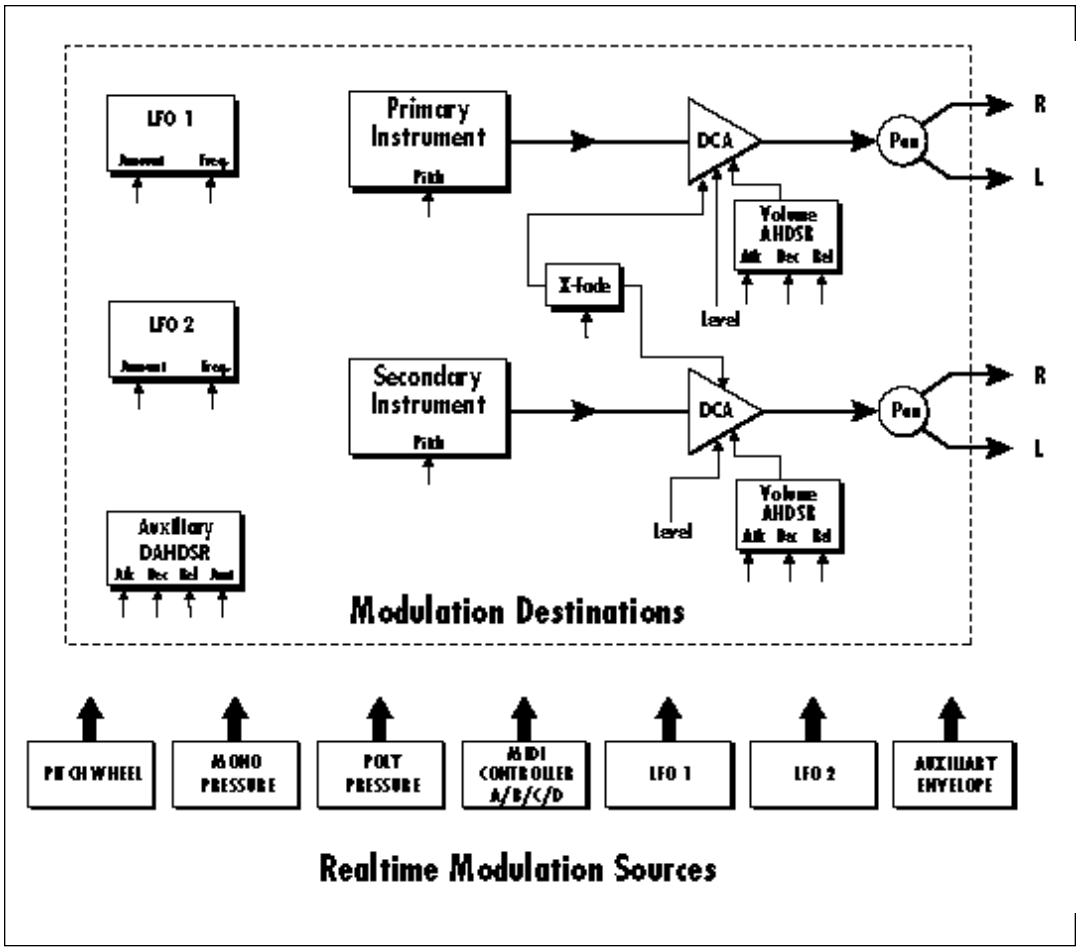
Incoming velocity values can be scaled by one of the four velocity curves in order to match your playing style or better adapt to the MIDI controller. Experiment with the four curves to find the one that works best for your style and MIDI controller.

*CHOOSE THE VELOCITY CURVE THAT WORKS BEST FOR YOUR PLAYING STYLE AND YOUR MIDI CONTROLLER.*



***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:***
***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,***
***AUX. ENVELOPE AMOUNT,***
***AUX. ENVELOPE ATTACK,***
***AUX. ENVELOPE DECAY,***
***AUX. ENVELOPE RELEASE***



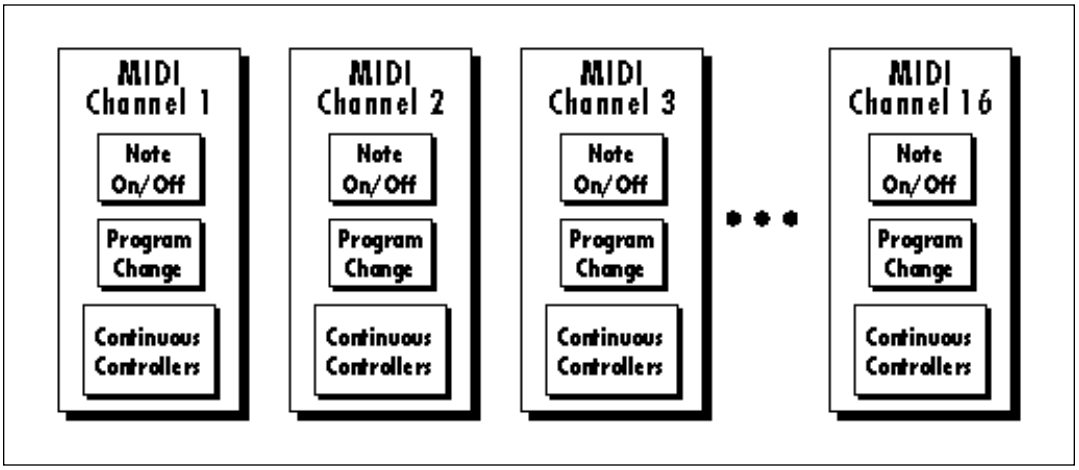

## REALTIME MODULATION

In addition to keyboard and velocity modulation, Classic Keys 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 modulation source can control up to eight destinations or one destination can be controlled by up to eight modulation sources. The possible modulation routings are completely flexible as shown in the example above.

***MIDI WIND CONTROLLERS MAY WORK BETTER IF YOU ASSIGN ONE OF THE MIDI A, B, C, D CONTROLLERS TO CONTROL VOLUME. THIS WILL ALLOW THE MIDI VOLUME TO BE ADDED TO THE CURRENT VOLUME.***

## 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. Your MIDI keyboard, in addition to telling Classic Keys which note was played, may also send realtime control information, which simply means occurring in real time or live. (You may be using a MIDI device other than a keyboard, but for simplicity's sake we'll presume that you're using a keyboard.) 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. Your MIDI keyboard sends out realtime controller information on separate channels called continuous controller channels. There is a set of 32 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. Your keyboard may have other realtime controls such as a control pedal or data slider which can also be programmed to control most of the parameters on Classic Keys.

Classic Keys is equipped with our sophisticated MidiPatch™ system, which allows you to route any continuous controller to any realtime modulation destination. The MidiPatch system is also very easy to use. First, you must know which controller numbers your keyboard can transmit.

**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

As an example, imagine you are using a master keyboard which has pitch and modulation wheels, a breath controller, a data slider and a foot pedal, all of which transmit their values over MIDI. The standard MIDI controller numbers for the controls are listed below (the pitch wheel has a dedicated controller, PWH). First, we would go to the Master menu, MIDI Controller Assign and define the 4 MIDI controllers that we wish to use. Assign each controller number to one of the letters A-B-C-D.

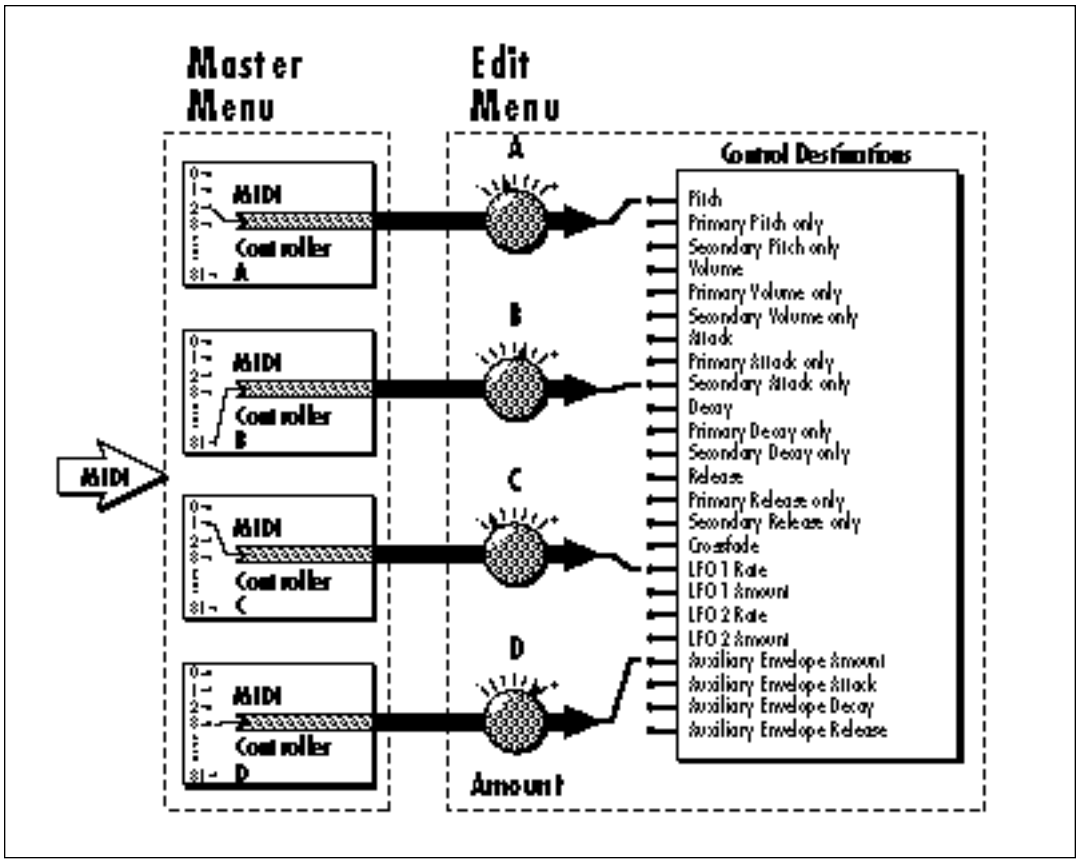
01 - Modulation Wheel A

02 - Breath Controller B

04 - Foot Pedal C

06 - Data Entry D

To complete the connections for a particular preset, go to the Edit menu, Realtime Control, and route the MIDI A, 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 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 A-B-C-D must have both a source (0-31), and a control destination assigned.