CLASSIC KEYS

OPERATION MANUAL

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• FI449 REV. A

MANUAL - RILEY SMITH

IMPORTANT NOTICE:

IN ORDER TO OBTAIN WARRANTY SERVICE ON YOUR CLASSIC KEYS UNIT, THE SERIAL NUMBER STICKER MUST BE INTACT AND YOU MUST HAVE A SALES RECEIPT OR OTHER PROOF OF PURCHASE. IF THERE IS NO SERIAL NUMBER STICKER ON CLASSIC KEYS, PLEASE CONTACT E-MU SYSTEMS AT ONCE.

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Read This First: Important Safety Instructions

Use in countries other than the U.S.A. may require the use of a different line cord or attachment plug, or both. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel. To reduce risk of fire or electric shock do not expose this product to rain or moisture.

DANGER

Improper connection of equipment can result in the risk of electric shock. Check with a qualified electrician or service personnel if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with this product — if it will not fit the outlet, have a proper outlet installed by a qualified technician.

CAUTION

If the Classic Keys (model number 9027), is rack mounted, a standard 19-inch open frame rack must be used.

USER-MAINTENANCE INSTRUCTIONS

1. Classic Keys should be kept clean and dust free. Periodically wipe the unit with a clean, lint free cloth. Do not use solvents or cleaners.

2. There are no user lubrication or adjustment requirements.

3. Refer all other servicing to qualified service personnel.

INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

WARNING; When using electric products, basic precautions should always be followed, including the following:

1. Read all instructions before using Classic Keys.

2. To reduce the risk of injury, close supervision is necessary when Classic Keys is used near children.

3. Do not use Classic Keys near water — for example near a bathtub, washbowl, kitchen sink, in a wet basement, on a wet bar, or near or in a swimming pool.

4. Classic Keys should be situated so that its location or position does not interfere with its proper ventilation.

5. Classic Keys should be located away from heat sources such as radiators, heat registers, fireplaces, stoves, or ovens.

6. Classic Keys should only be connected to a power supply of the type described in the operating instructions and as marked on the product.

7. This product, in combination with an amplifier, headphones, and speakers, may be capable of producing sound levels that could cause full or partial hearing loss or damaged equipment. Do not operate for long periods of time at high volume levels or at a level that is uncomfortable. If you

experience any hearing loss or ringing of the ears consult your physician.

8. Classic Keys may be equipped with a polarized line plug (one blade wider that the other). This is a safety feature. If you are unable to insert this plug into the outlet, do not defeat the safety purpose of the plug. Contact an electrician to replace your obsolete outlet.

9. The power supply cord of Classic Keys should be unplugged from the outlet when left unused for a long period of time.

10. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure of Classic Keys through openings.

11. The product should be serviced by qualified service personnel when:

A. The power supply cord has been damaged; or

B. Objects have fallen, or liquid has been spilled into the product; or

C. The product has been exposed to rain; or

D. The product does not appear to operate normally or exhibits a marked change in performance; or

E. The product has been dropped or the enclosure damaged.

12. All servicing should be referred to qualified service personnel.

SAVE THESE INSTRUCTIONS

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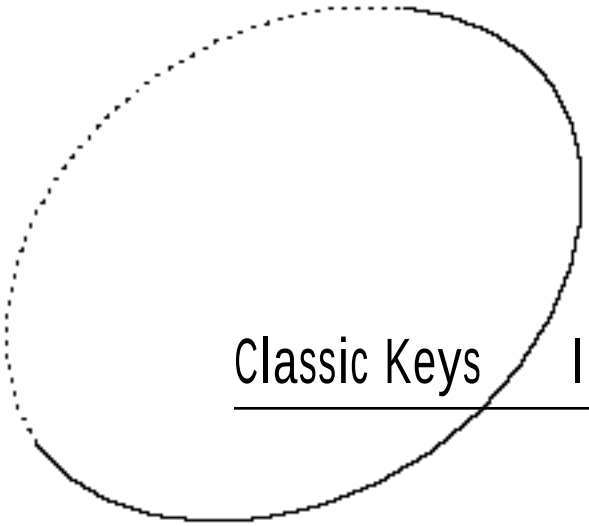
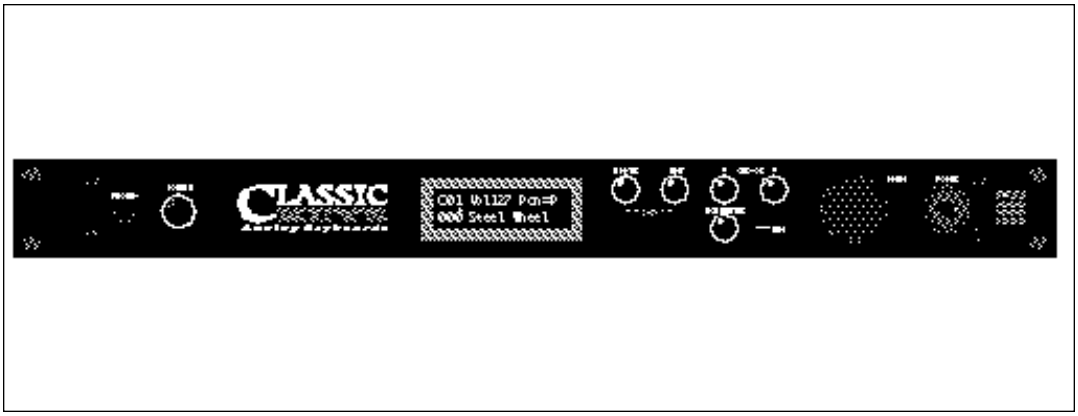


Classic Keys INTRODUCTION

1 Introduction



CLASSIC KEYS

Classic Keys is a musical instrument whose sounds are based on actual digital recordings of “real” instruments. In this way, Classic Keys is very similar to a sampling instrument. With Classic Keys, we have done the sampling for you and loaded it with a collection of the cleanest 16 bit sounds ever sampled.

Classic Keys contains a massive 8 Megabytes of the greatest keyboard sounds in the world. These superb samples have been selected from the Emulator III sound library and stored in ROMs for instant access. We have included everything you need to play and compose in a wide range of contemporary styles. You simply plug in and play.

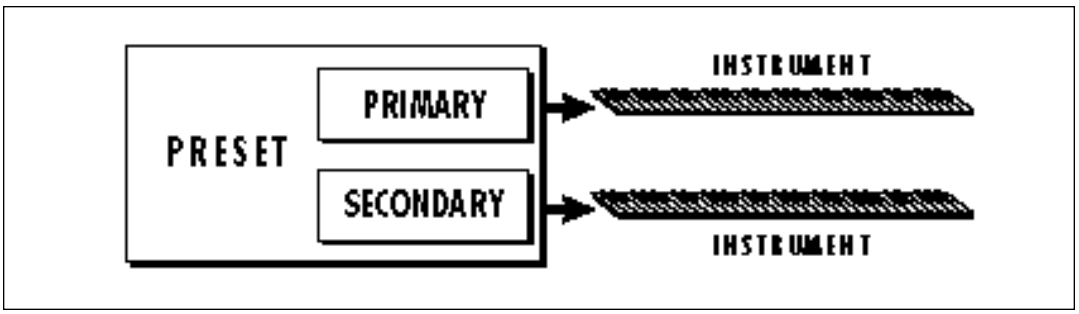
But this is only the beginning. Classic Keys gives you the ability to literally take these sounds apart and reassemble them into an almost limitless number of entirely new sounds, combining parts of one sound with another or with any of a selection of digital waveforms also stored on ROM. For example, the attack of a flute can be faded out as a vibe tone is faded in, giving you a completely new sound! The monophonic and true stereo 16 bit samples are arranged into 512 preset locations, 256 of which are user-programmable.

Classic Keys features 32 voice polyphony, allowing you to take full advantage of its layering capabilities (up to 8 sounds on each key) and its ability to respond multi-timbrally to all 16 MIDI channels makes it ideally suited for multitrack sequencing and composing using a MIDI sequencer.

Other features include two studio-quality effects processors with 27 different effects, a user definable alternate tuning, and of course, an extensive MIDI implementation.

Basic Organization

Classic Keys is organized as shown in the diagram below.



The Preset is a complete set of all program parameters for a complete Classic Keys sound.

The preset memory is organized into two banks of 128 user RAM presets (banks 0-1) and two banks of unalterable ROM presets (banks 2-3).

USER RAM PRESETS CAN BE MOVED, ERASED OR ALTERED AS DESIRED

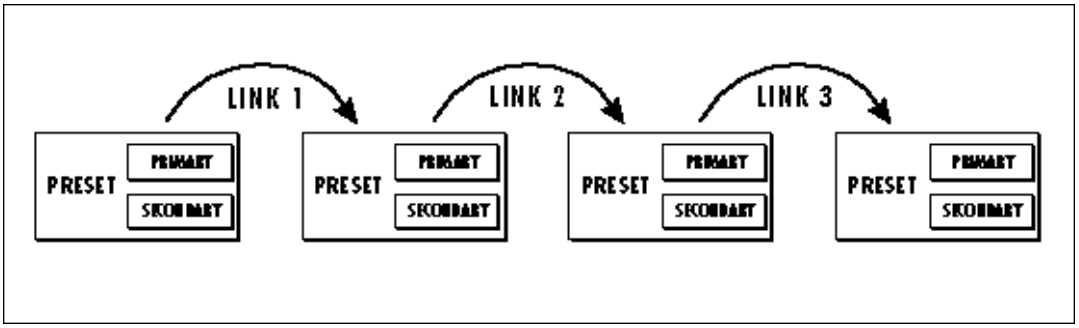
ROM PRESETS CANNOT BE MOVED OR ALTERED UNLESS THEY ARE FIRST COPIED TO A USER LOCATION

Bank	Contents
0	- User RAM Presets
1	- User RAM Presets
2	- ROM Presets
3	- ROM Presets

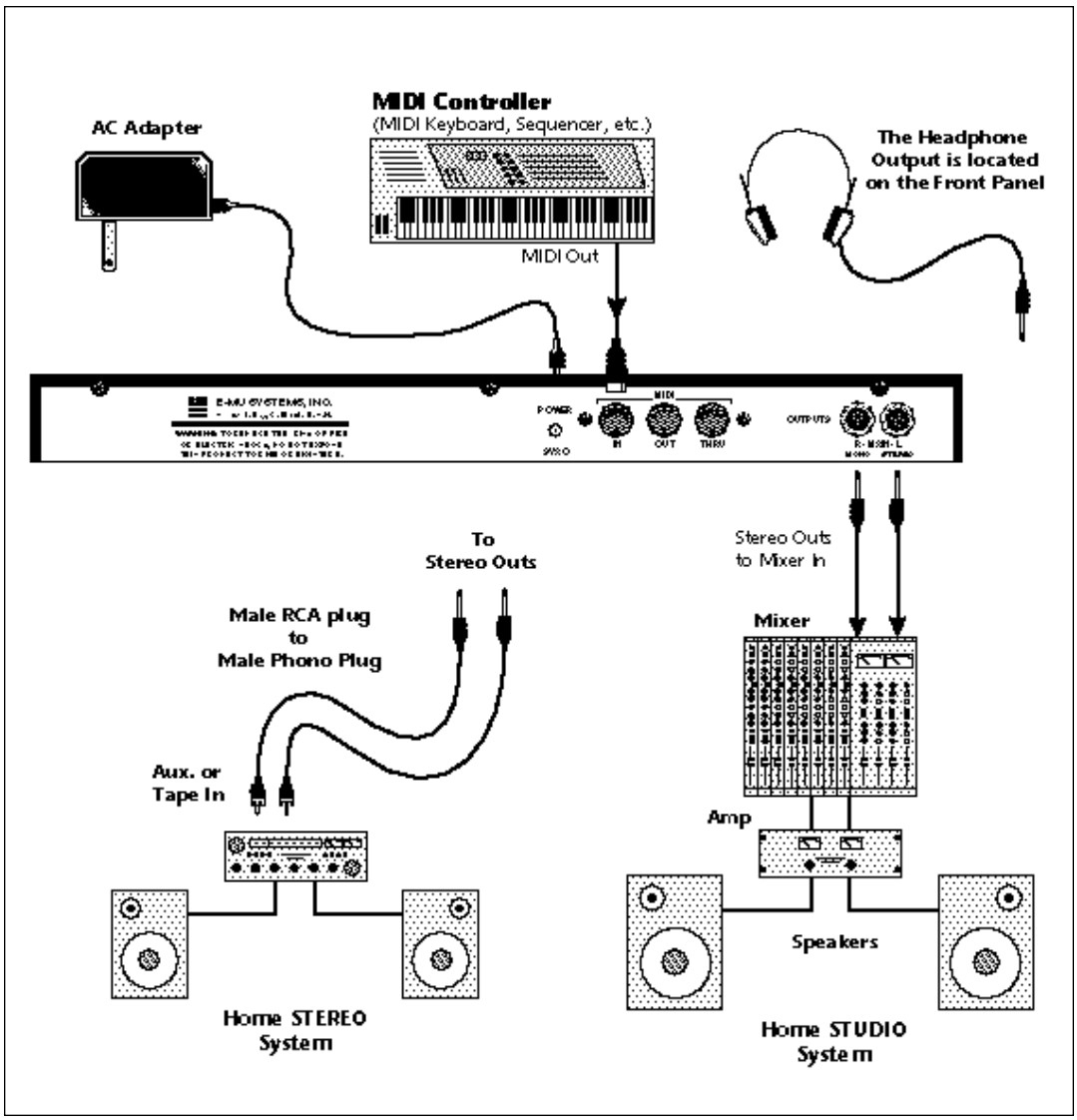
Each preset consists of one or more Instruments. An instrument is a complete set of samples or a digital waveform which covers the entire keyboard range. An instrument can be assigned to each of the *Primary* and *Secondary* layers of the preset.

The primary and secondary layers are essentially two instruments with complete modulation controls. The two layers can be layered or placed adjacent to each other, and can be switched or crossfaded together in various ways.

Up to four presets can be *Linked* in order to have more than one preset on the keyboard at a time. The linked presets may lie on top of each other to create a dense layered sound or be arranged side by side on the keyboard to create a split keyboard.



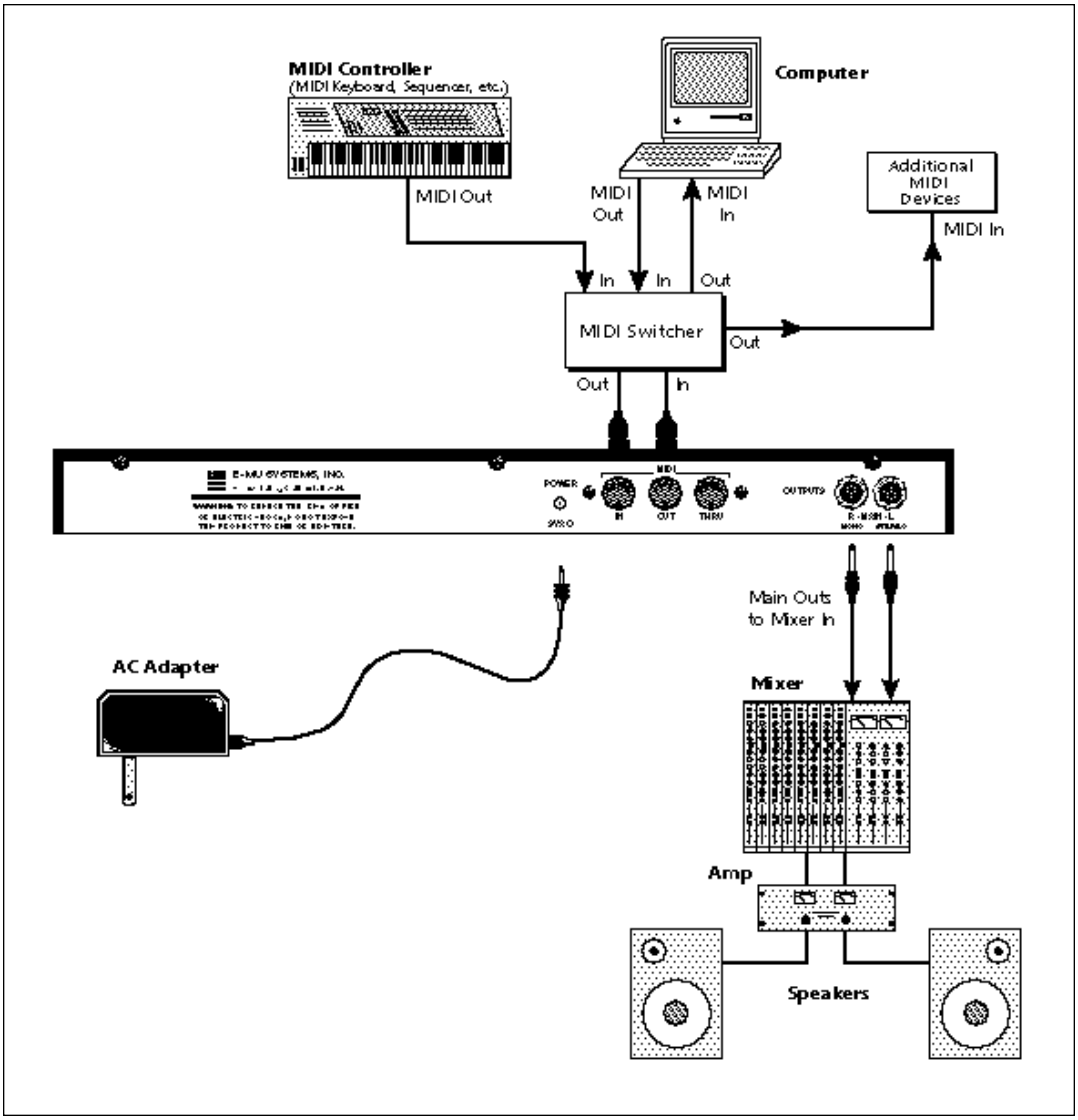
Basic Setup



MIDI In - Classic Keys is controlled by MIDI messages received at the MIDI In connector. Connect the MIDI In of the Classic Keys to the MIDI Out connector of a MIDI controller such as a MIDI keyboard, MIDI wind controller, or MIDI guitar controller.

Outputs - Classic Keys is a high quality, stereo audio device. In order to reproduce its wide dynamic range and frequency response, use a high quality amplification and speaker system such as a recording mixer and amplifier or home stereo system. A stereo setup is highly desirable because of the added realism of stereophonic sound. Headphones can be used if an amplifier and speaker system are not available. The right output jack serves as a mono output when the left jack is not plugged in.

Studio Setup

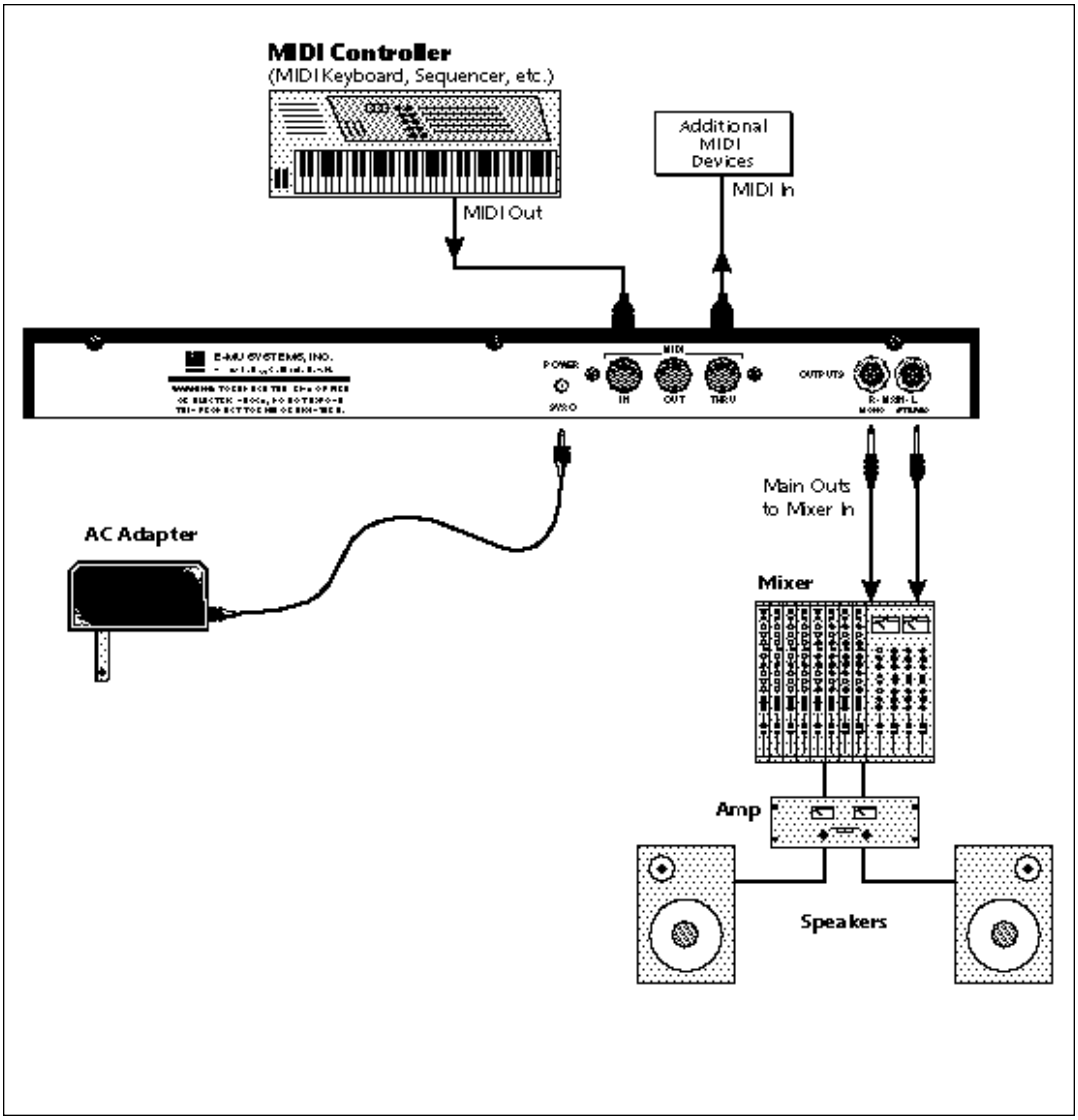


MIDI In - In this setup, Classic Keys is controlled by MIDI messages received at the MIDI In connector which have been routed by a MIDI switcher. The MIDI switcher allows any MIDI controller such as a MIDI keyboard, MIDI wind controller, or a computer to be easily connected.

MIDI Out - The MIDI Out jack is normally used to transmit program data to a computer or other device.

Outputs - Use a high quality amplification and speaker system such as a recording mixer and amplifier or home stereo system. A stereo setup is highly desirable because of the added realism of stereophonic sound. The right output jack serves as a mono output when the left jack is not plugged in.

Performance Setup



MIDI In - Classic Keys is controlled by MIDI messages received at the MIDI In connector. Connect MIDI In of the Classic Keys to MIDI Out of a MIDI controller such as a MIDI keyboard, MIDI wind controller, or MIDI guitar controller.

MIDI Thru - MIDI Thru transmits an exact copy of the messages received at the MIDI In jack and is used to connect additional MIDI devices onto the MIDI chain.

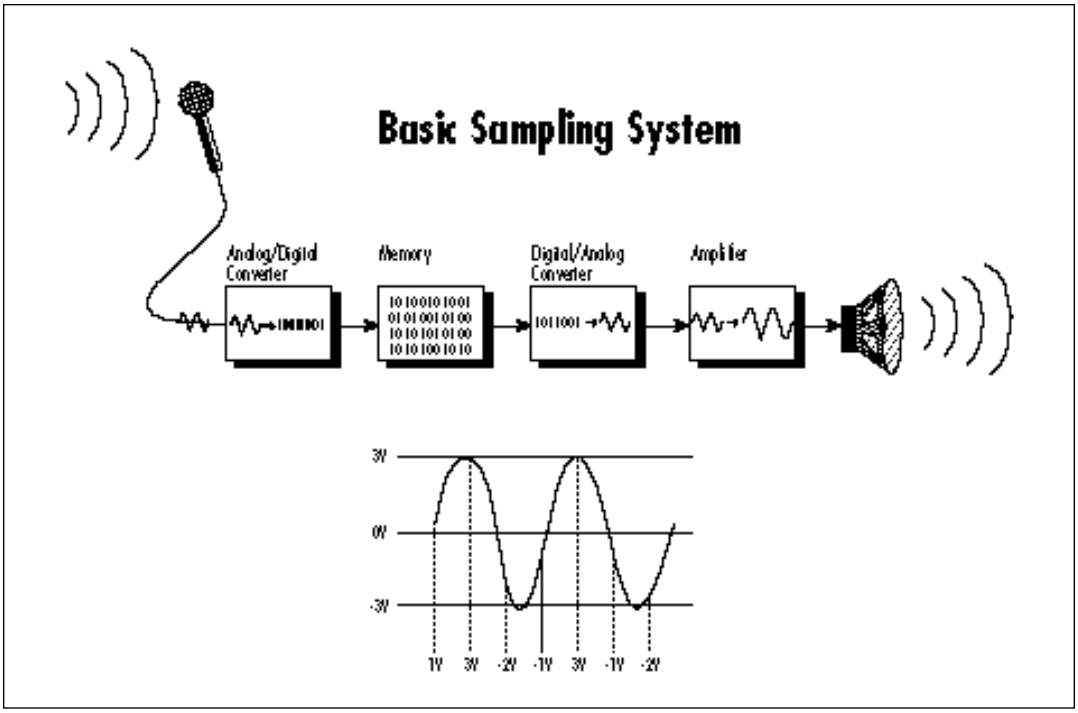
Outputs - Use a high quality amplification and speaker system such as a keyboard amplifier and speakers. A stereo setup is highly desirable because of the added realism of stereophonic sound. The headphone jack is located on the front panel. The right output jack serves as a mono output when the left jack is not plugged in.

POWER UP!

Before applying power, make sure that you have received the correct AC adapter for your part of the world (110V or 220V). Always connect the AC adapter to the Classic Keys before plugging it into the wall. The power switch is located on the right side of the front panel. Classic Keys and its MIDI controller may be turned on in any order. When power is applied, the liquid crystal display will light, indicating that the Classic Keys is operating.

After the sounds and waveforms have been truncated, looped and processed, they are "masked" into the Classic Keys ROM (Read Only Memory) chips.

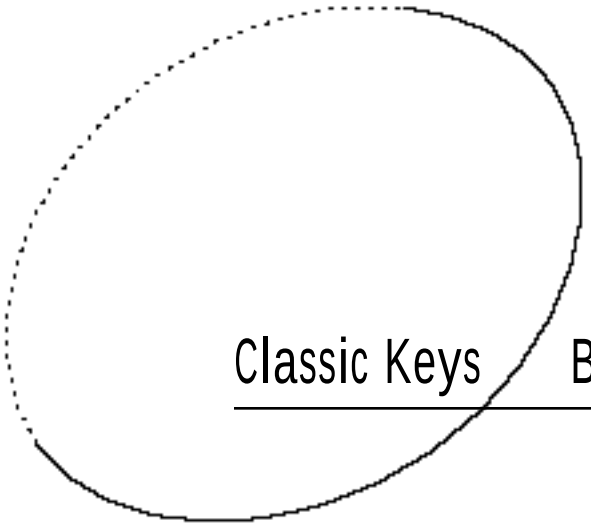
Conceptually, the sampling process is very simple, as shown in the Basic Sampling System diagram. As a sound wave strikes the diaphragm of a microphone, a corresponding voltage is generated. To sample the sound, the voltage level is repeatedly measured at a very high rate



ABOUT CLASSIC KEYS

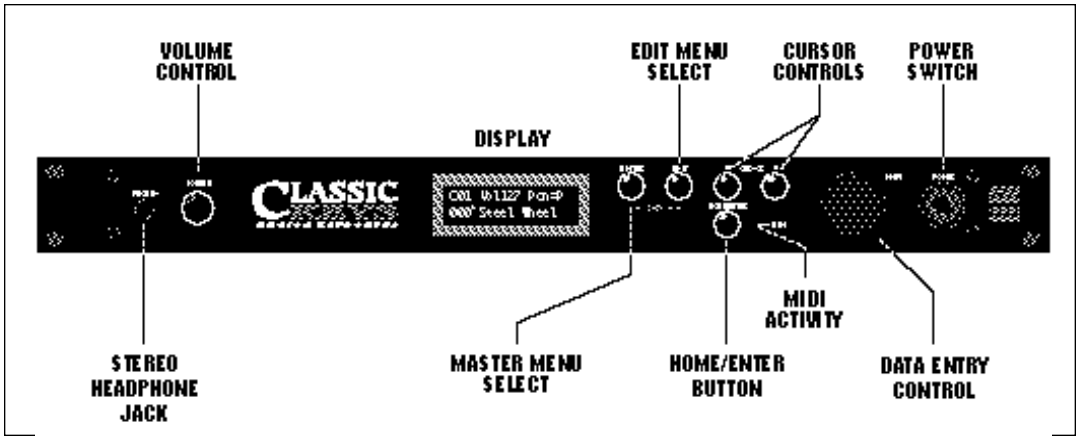
Classic Keys, unlike many synthesizers, utilizes digital recordings of "real" instruments for the basis of its sound. This is similar to a tape recorder except that in Classic Keys, the sounds are permanently recorded on digital memory chips.

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. and the voltage measurements are stored in memory. To play the sound back, the numbers are read back from 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 Classic Keys, we have left out the analog to digital converter stage since the sounds are already sampled for you.



Classic Keys BASIC OPERATION

2 Main Controls



Power Switch
Switches AC power to the Classic Keys On and Off.

MIDI Activity LED
Indicates that MIDI data is being received.

Master Menu Select Button
The Master menu contains parameters that affect the entire machine, not just certain presets. The Effects screens are also located in the Master menu. An illuminated LED to the left of the button indicates that you are in the Master menu.

Edit Menu Select Button
The Edit menu is used when you want to change parameters of a preset. An illuminated LED to the left of the button indicates that you are in the Edit menu.

Home/Enter Button
The Home/Enter button is used to confirm a particular operation or return the cursor to the “Home” position. The adjacent LED flashes to indicate that Classic Keys is waiting for your response.

Cursor Control
These buttons move the cursor to the next parameter on the display in a clockwise or counterclockwise direction. (The cursor is a little flashing line underneath one of the parameters in the display.) Press either cursor control repeatedly until the cursor is underneath the desired parameter.

Data Entry Control
The data entry control is a stepped, variable control which is used to change parameter values. The control increments or decrements the current value one unit with each click. This control incorporates acceleration (values advance faster if the control is turned quickly).

Volume Control
This is the master volume control for all audio outputs. Note: For maximum dynamic range, set this control at full level and adjust the amplifier or mixer volume.

IF CLASSIC KEYS IS NOT RESPONDING PROPERLY OR PLAYS THE WRONG PRESET, MAKE SURE THAT CLASSIC KEYS AND YOUR MIDI CONTROLLER ARE SET TO THE SAME MIDI CHANNEL AND THAT THE MIDI VOLUME IS TURNED UP.

FOR MORE INFORMATION ABOUT MIDI, SEE MIDI REALTIME CONTROLS ON PAGE 60.

MIDI CHANNEL SELECTION

Press the cursor key repeatedly until the cursor is underneath the channel number. (The cursor is a little flashing line underneath one of the parameters in the display.) Rotate the data entry control to select MIDI channel 01-16. As the channel is changed, the display will change to show the preset, volume and pan associated with the displayed channel.

```
C01 Vol127 Pan=P
000° Preset Name
```

PRESET SELECTION

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.

Press the cursor key repeatedly until the cursor is underneath the preset number. (The cursor is a little flashing line underneath one of the parameters in the display.) As the data entry control is rotated, the preset number and name will change. The displayed preset will be assigned to the displayed MIDI channel. Preset numbers are arranged into four banks of 128.

```
C01 Vol127 Pan=P
000° Preset Name
```

PRESET BANK SELECTION

You can jump between preset banks by following the steps outined below.

1. Press and Hold the Home/Enter button. While holding the button, turn the data entry knob.

2. Turning the knob will cause the preset to jump to the same location in the next bank.

CHANNEL VOLUME

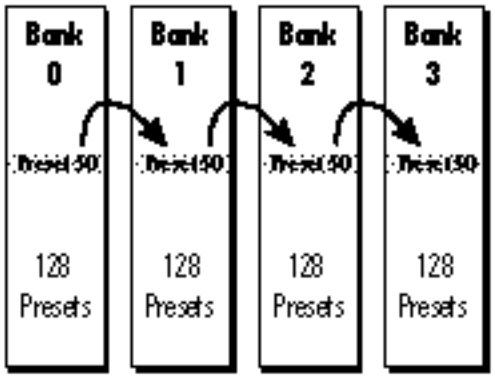
Press the cursor key repeatedly until the cursor is underneath the volume value. Rotate the data entry control to select volume 00-127. (This is the same parameter as MIDI volume control #7, and changes made over MIDI will be shown in the display.)

```
C01 Vol127 Pan=P
000° Preset Name
```

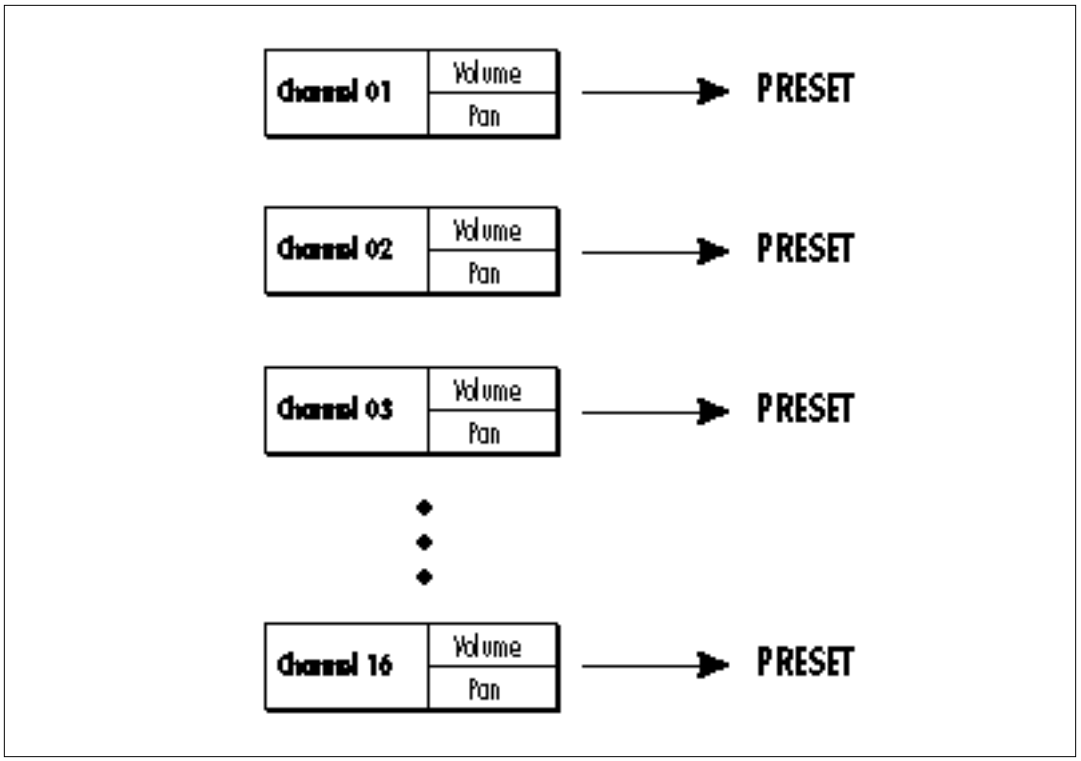
CHANNEL PAN

Press the cursor key repeatedly until the cursor is underneath the pan value. Rotate the data entry control to select pan values -7 to +7 or “P”. When “P” is selected, the pan value specified in the preset is selected. Any other value will override the pan parameter in the preset. (This is the same parameter as MIDI pan control #10, and changes made over MIDI will be shown in the display.)

```
C01 Vol127 Pan+7
000° Preset Name
```



The bank selection feature allows you to jump between banks of 128 presets.



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

MULTI-TIMBRAL OPERATION

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

1. Set the MIDI mode to MULTI-Mode, using the MIDI mode function in the Master menu (page 26).

2. Decide which MIDI channels you wish Classic Keys to receive, and (optionally) turn all other channels OFF using the MIDI Enable function in the Master menu (page 27).

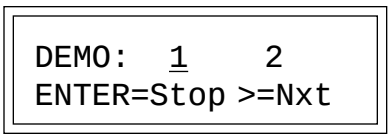
Up to 16 channels can be selected simultaneously!

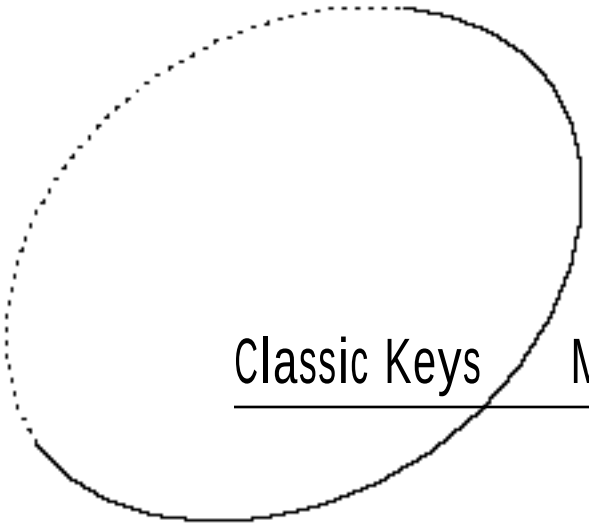
3. Select the desired preset for each of the MIDI channels you wish Classic Keys to receive using the MIDI Channel/Preset selection screen (see previous instructions).

4. Classic Keys 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 MIDI Channel/Preset selection screen.

PLAYING THE DEMO SEQUENCES

Classic Keys contains a play-only sequencer in order to give you an idea of what is possible using this amazing machine. Press and hold both the Master button and the Edit button. The sequence will start in a moment. Press the Enter button to stop the sequence. Press the right cursor button to toggle between the sequences. Press the left cursor button to start the current sequence again. Classic Keys contains 2 sequences.





Classic Keys MASTER MENU

3 The Master Menu

The Master menu contains functions that affect the overall operation of Classic Keys. For example, changing the Master Tune will change the tuning of all the presets, not just the one currently displayed. The Master Menu contains the two digital effects processors, since they are programmed globally for all presets.

TO ENABLE THE MASTER MENU

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

TO SELECT A NEW SCREEN

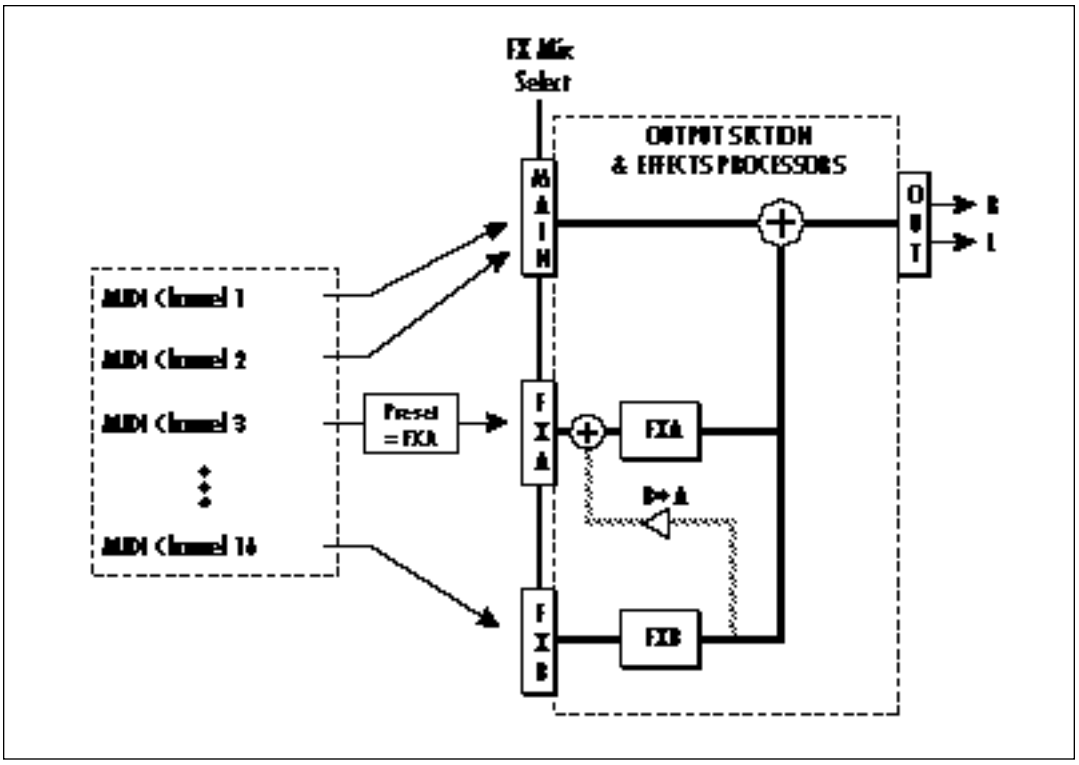
Press the cursor key repeatedly (or hold the cursor key while turning the data entry control) until the cursor is underneath the screen title heading. Rotate the data entry control to select another screen.

TO MODIFY A PARAMETER

Press the cursor key repeatedly (or hold the cursor key while turning the data entry control) until the cursor is underneath the parameter value. Rotate the data entry control to change the value.

TO RETURN TO PRESET SELECT MODE

Press the Master key, turning off the LED.



FX MIX SELECT

This function selects which bus in the output section will be used for each MIDI channel. You can route each MIDI channel through the FxA or FxB processors or directly to the Main outputs (no effects). An additional selection called Preset (Prst), allows the selection to be made in the preset (FX Mix Select). Thus effects can be selected according to MIDI channel or by preset.

```
FX MIX SELECT
channel 01: FxA
```

EFFECT A

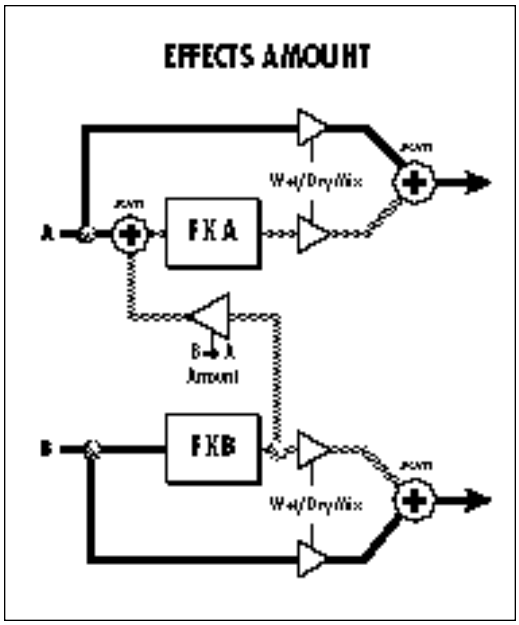
This function allows you to select the type of effect for effect bus A and contains the parameters associated with each effect. See the Effects chapter for detailed information on each effect.

```
FXA:Hall1
Decay Time   140
```

EFFECT B

This function allows you to select the type of effect for effect bus B and contains the parameters associated with each effect. See the Effects chapter for detailed information on each effect.

```
FXB:StereoChorus
Lfo Rate    050
```



FX AMOUNT

This function allows you to adjust the ratio of wet (processed) to dry (unprocessed) signal coming out of each effect processor. A setting of 100% would indicate that all of the signal is being processed by the effect. The B->A parameter allows you to adjust the amount of effect B that will be fed through the A effect. If B->A is set above 100%, the word "Only" is displayed and the B amount changes to "Off". This disconnects effect B from the outputs and routes ALL of effect B through effect A.

```
FX AMOUNT A:50%
B->A:0%   B:75%
```

TO USE THE B->A ONLY ROUTING FEATURE, THE FX MIX SELECT MUST BE SET TO "B".

MASTER TUNE

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

```
MASTER TUNE
+63
```

TRANSPOSE

This function transposes the key of Classic Keys in half-step intervals. The transpose range is ± 12 semitones or one octave.

```
TRANSPOSE
+12 semitones
```

GLOBAL BEND

This function sets the range of the pitch wheel *only* when it is routed to control pitch. The maximum pitch bend range is ± 12 semitones. This function only affects presets which have their individual pitch bend range set to global.

```
GLOBAL BEND
+/- 12 semitones
```

WARNING! WHEN TRANSFERRING SYSEX DATA FROM ONE CLASSIC KEYS TO ANOTHER, THE ID NUMBERS OF BOTH UNITS MUST MATCH.

UNLESS YOU ARE USING MULTIPLE CLASSIC KEYS UNITS IT IS BEST TO LEAVE THE ID NUMBER SET TO 00.

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 58.

```
GLOBAL VEL CURVE
4
```

MIDI MODE

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

Omni mode

Classic Keys responds to note information on all MIDI channels and plays the preset currently displayed in the main screen.

Poly mode

Classic Keys 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

Classic Keys responds to data on any combination of MIDI channels and plays the specific preset associated with each of the MIDI channels.

Mono mode

Classic Keys responds to data on any combination of MIDI channels but plays each channel monophonically. If a new note on a channel 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, etc.

ID number

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

Note: E-mu products Proteus, Proteus FX, Vintage Keys and Classic Keys all use product code 04 to maintain preset compatibility. If you are using more than one of these units in your MIDI setup, set each unit to a separate ID to differentiate each unit.

```
MIDI MODE    ID
Omni         00
```

MIDI MODE CHANGE

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

```
MIDI MODE CHANGE
Disabled
```

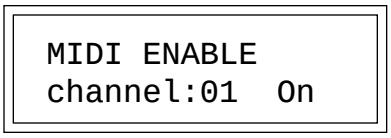
MIDI OVERFLOW

When on, if you play more notes than Classic Keys has channels (32), the additional note data will be directed out the MIDI Out port to a second Classic Keys or other MIDI device. MIDI Overflow can be turned On or Off.

```
MIDI OVERFLOW
Off
```

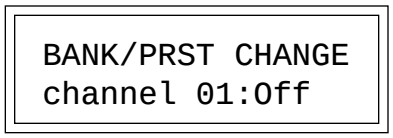
MIDI ENABLE

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

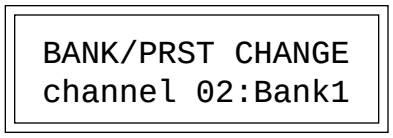


BANK/PRESET CHANGE

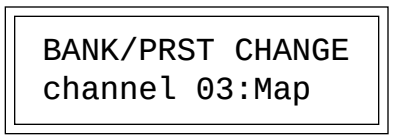
This function allows Classic Keys to utilize or ignore incoming MIDI program change commands for each channel. Since MIDI can only select presets 000-127, this function also allows you to select which bank of 128 presets will be accessed via incoming program change commands. Another option, "Map," routes incoming program changes to the MIDI program -> preset mapping function. *See page 29.*



PROGRAM CHANGES IGNORED ON MIDI CHANNEL 1



PROGRAM CHANGES ROUTED TO PRESET BANK 1 ON MIDI CHANNEL 2



PROGRAM CHANGES ROUTED THROUGH THE PROGRAM ->PRESET MAP ON MIDI CHANNEL 3

MIDI CONTROLLER ASSIGN

Classic Keys allows you to assign up to four realtime control sources from your MIDI controller. These control sources could be modulation wheels, data sliders or whatever. In this screen, you set up which controllers will be received by Classic Keys. What effect the controller will have is programmed separately for each preset. MIDI controllers are each assigned a letter, A-D. Each controller letter can be assigned to a MIDI realtime controller from 01-31. Note: If controller numbers 7 or 10 are selected, they will override the standard MIDI volume and pan control routings.

For more information on MIDI controllers, see “MIDI Realtime Controls” in chapter 5, Preset Programming.

```
CONTROLLER #
A:01     B:02
```

Next Screen:

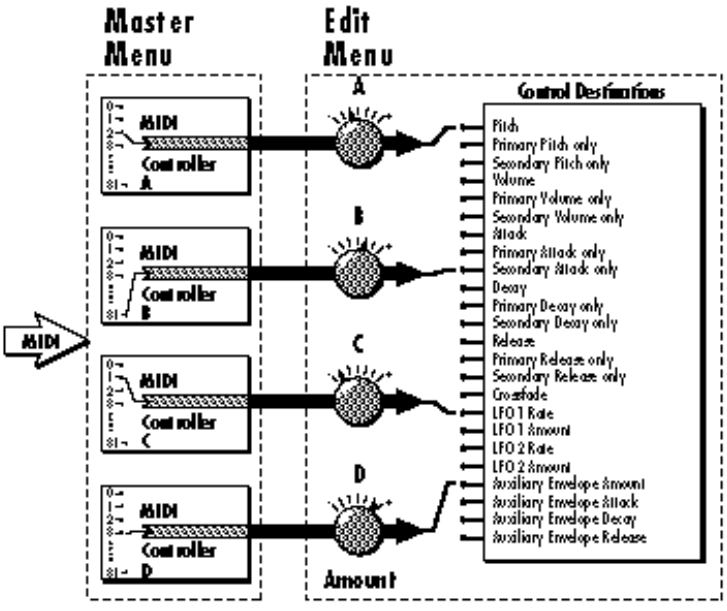
```
CONTROLLER #
C:03     D:04
```

SOME OF THE STANDARD MIDI CONTROLLER NUMBERS ARE LISTED BELOW:

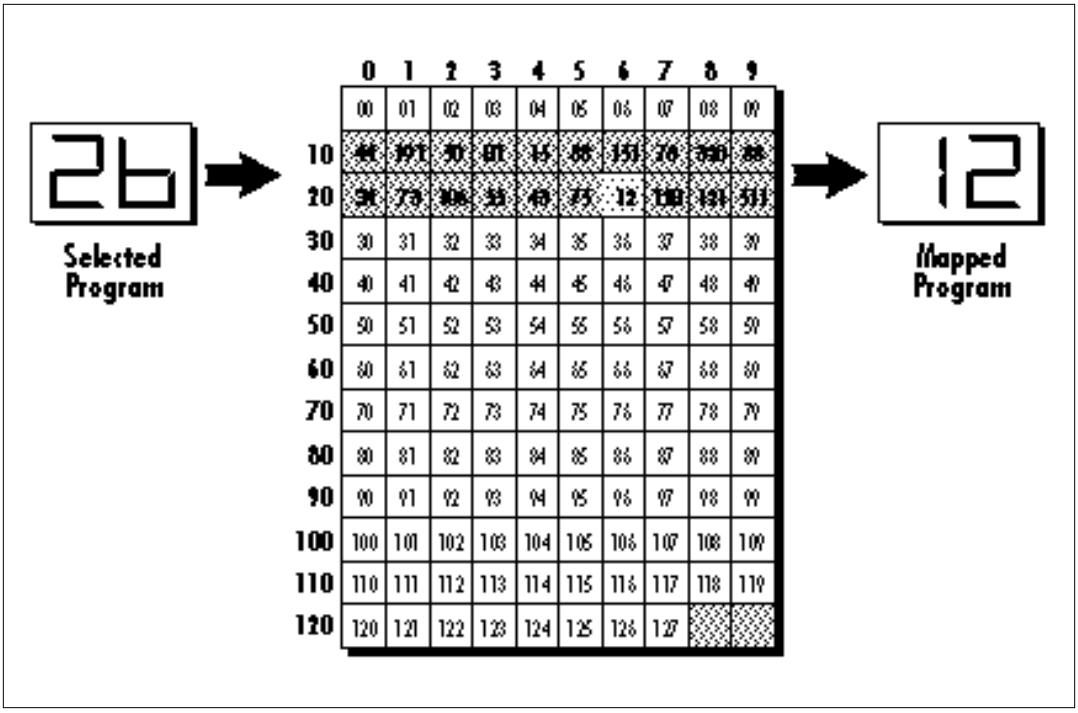
1. ***MODULATION WHEEL OR LEVER***
2. ***BREATH CONTROLLER***
3. ***PRESSURE: REV 1 DX7***
4. ***FOOT PEDAL***
5. ***PORTAMENTO TIME***
6. ***DATA ENTRY***
7. ***VOLUME***
8. ***BALANCE***
9. ***UNDEFINED***
10. ***PAN***

SOME OF THE STANDARD MIDI SWITCH NUMBERS ARE LISTED BELOW.

64. ***SUSTAIN SWITCH (ON/OFF)***
65. ***PORTAMENTO SWITCH (ON/OFF)***
66. ***SOSTENUTO (CHORD HOLD, ON/OFF)***
67. ***SOFT PEDAL (ON/OFF)***
69. ***HOLD PEDAL 2 (ON/OFF)***



The MIDI controller A-B-C-D must have both a source (0-31) and a control destination assigned.



	0	1	2	3	4	5	6	7	8	9
	00	01	02	03	04	05	06	07	08	09
10	44	191	90	611	15	66	151	76	980	88
20	56	73	906	33	49	75	12	188	131	511
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 have been re-mapped. All other programs will be selected normally.

MIDI FOOTSWITCH ASSIGN

Like the MIDI Controllers, 3 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 Edit menu.

```
FOOTSWITCH #
1:64  2:65  3:66
```

IF THE PROGRAM -> PRESET MAP DOES NOT SEEM TO WORK, MAKE SURE THAT THE BANK/ PRESET CHANGE FUNCTION IS SET TO "MAP" (PAGE 27).

PROGRAM ->PRESET MAP

Incoming MIDI program changes can be remapped to a different numbered preset. This is a handy feature when you want a specific preset number sent from the master synth to call up another specific preset number on Classic Keys. For example, the Program Change Map could be set to call up preset 012[3] whenever Classic Keys receives program change number 26. Any preset can be mapped to any incoming MIDI program change number.

```
MAP PROGRAM 026>
012[3] org:Jag Sub5
```

APPLICATION: THE USER KEY TUNING CAN BE USED TO TUNE INDIVIDUAL PERCUSSION INSTRUMENTS.

SEND MIDI DATA

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

Effect Settings

Transmits all the current effects parameters except mix select (for the 16 MIDI channels).

THE PRESET, VOLUME, AND PAN INFORMATION FOR ALL 16 CHANNELS IS INCLUDED WHEN THE MASTER SETTINGS ARE TRANSMITTED OR RECEIVED.

Master Settings

Transmits all parameters in the Master menu except effects, tuning table, program/preset map and viewing angle.

Program / Preset Map

Transmits only the program/preset map.

Tuning Table

Transmits only the user tuning table.

Factory Presets

Transmits all the factory presets.

User Presets

Transmits all the user presets.

Any Individual Preset

Transmits only the selected preset.

```
SEND MIDI DATA
040 air:AngelVox
```

The Enter LED will be flashing. Press the Enter button to confirm the operation.

WARNING! WHEN TRANSFERRING SYSEX DATA FROM ONE CLASSIC KEYS TO ANOTHER, THE ID NUMBERS OF BOTH UNITS MUST MATCH.

TO TRANSMIT MIDI DATA TO A SEQUENCER

1. SET UP SEQUENCER TO RECEIVE SYSTEM EXCLUSIVE DATA.

2. START SEQUENCER RECORDING, THEN SEND PRESET DATA.

TO RECEIVE MIDI DATA FROM A SEQUENCER

1. SIMPLY PLAY BACK THE SEQUENCE INTO CLASSIC KEYS

USER KEY TUNING

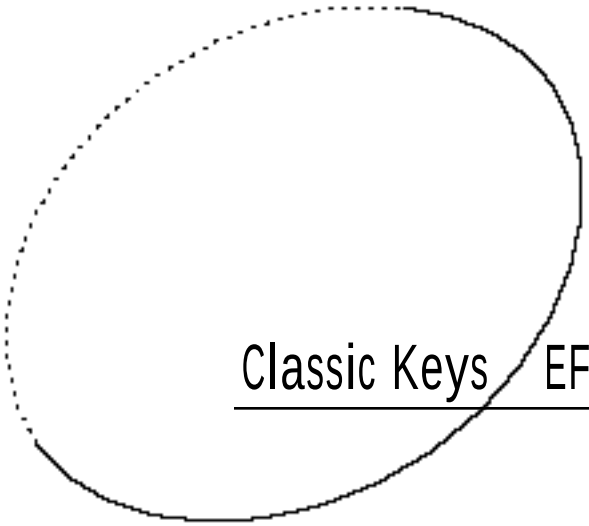
In addition to standard twelve tone equal temperament, Classic Keys contains four additional preset tuning tables (Just C, Vallotti, 19 tone, and Gamelan) and one user definable tuning. User Key Tuning allows you to alter the parameters of the user definable tuning stored in memory. The initial frequency of every key can be individually tuned, facilitating the creation of microtonal 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 (approx. 1.56 cents). For each preset, the specific tuning table is selected in the Edit menu.

```
USER KEY TUNING
Key:C1   036-00
```

VIEWING ANGLE

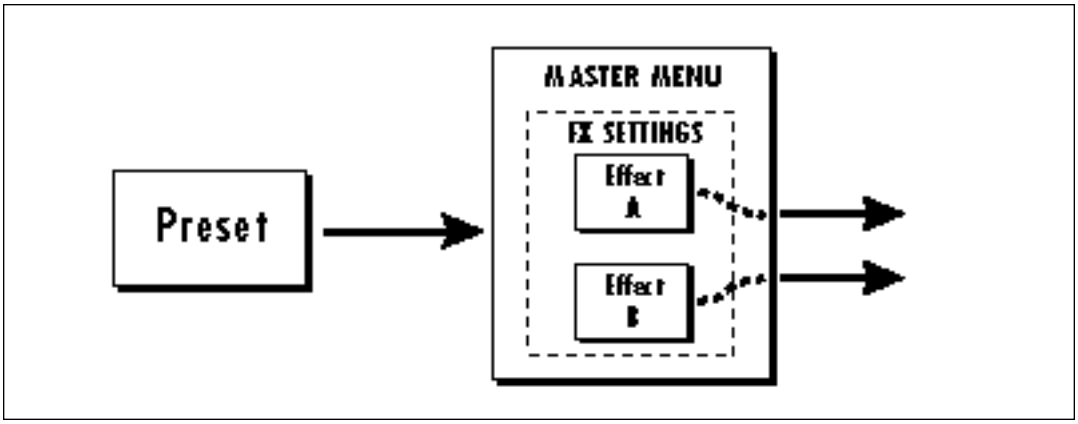
This function allows you to change the viewing angle of the display so that it may be easily read from either above or below. The angle is adjustable from +7 to -8. Positive values will make the display easier to read when viewed from above. Negative values make the display easier to read from below.

```
VIEWING ANGLE
+7
```



Classic Keys EFFECTS SECTION

4 Effects Section



The two effect processors are programmed globally for the entire machine.

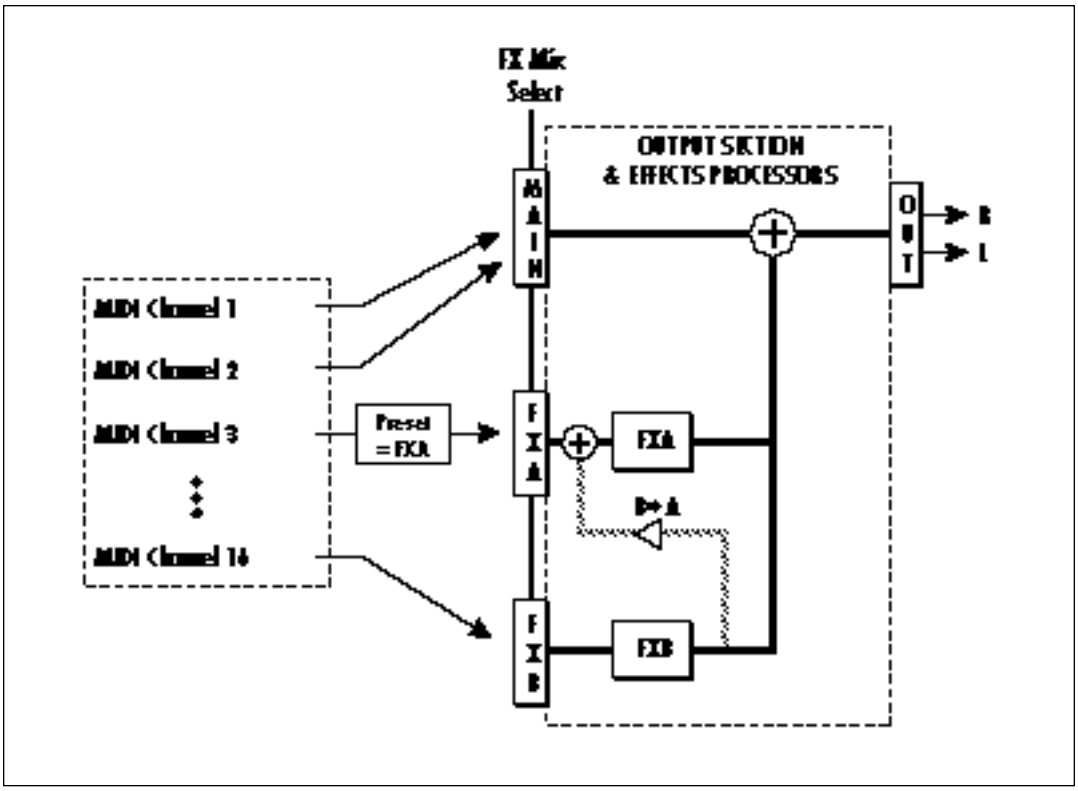
EFFECTS BUS ARCHITECTURE

Two separate digital effects processors are included in the Classic Keys. The “A” effect processor includes several types of Reverberation, which is an electronic simulation of a natural space such as a room or hall, as well as Delays, Echoes, Chorusing, Phaser and Flanging effects. The “B” effect processor contains special effects such as a Ring Modulator and two types of Fuzz.

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 (wet/dry mix). The output of the B effect can also be routed back through processor A.

The effect programming is done on a global basis, meaning that the two effects serve the entire machine. This is similar to the way an external effects unit would be connected except that in Classic Keys, the signal path is kept entirely in the digital domain in order to preserve the excellent sound quality.

The choice of which of the two effects is used for a particular sound can be made by MIDI channel or it can be selected per preset.



EFFECTS CAN BE STORED AS PART OF A SEQUENCE BY USING "SEND EFFECTS" IN THE MASTER MENU.

EFFECTS OUTPUT ROUTING

The diagram above shows how the effects section is integrated into the output jack routing scheme. The mix bus can be selected either by the preset or by MIDI channel. When "Preset" is selected, the FX MIX SELECT programmed in the preset is used.

EDITED EFFECTS PARAMETERS ARE NOT REMEMBERED WHEN A NEW EFFECT IS SELECTED.

TO PROGRAM AN EFFECT:

1) Press the MASTER button lighting the LED.
2) The first screen in the Master menu is shown below. Select one of the effect processors for each MIDI channel you wish to use (or select "Preset" if you want the selection in the preset to be used), This control selects the input to the effect processors.

```
FX MIX SELECT
channel 01:FxA
```

3) Select the desired effect and program the appropriate parameters.

```
FXA:Echo
L Delay Time 255
```

4) Set the FX Amount for the A or B effect. This adjusts the ratio of effected to un-effected signal. B->A allows you to route the output of effect B through effect A (set the MIX to FxB).

```
FX AMOUNT A:50%
B->A:0%   B:50%
```

5) That's it!

A EFFECTS

ROOM
WARM ROOM
SMALL ROOMS 1 & 2
HALLS 1, 2 & 3
CHAMBERS 1 & 2
PLATES 1 & 2
EARLY REFLECTIONS 1-4
REVERSE EARLY REFLECTIONS
RAIN & SHIMMER
STEREO CHORUS
STEREO FLANGE
PHASER
ECHO
DELAY
CROSS DELAY

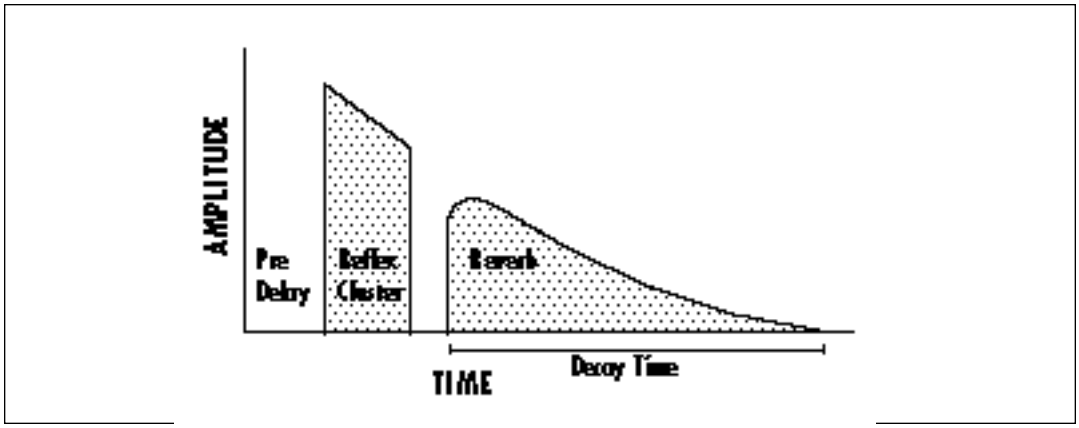
B EFFECTS

STEREO CHORUS
STEREO FLANGE
PHASER
DELAY
CROSS DELAY
FUZZ
FUZZ LITE
RING MODULATOR

REVERB

Reverberation is a simulation of a natural space such as a room or hall. The reverb effects in Classic Keys 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 reverbs - Decay Time. Decay time is the length of time that it takes for the reflected sound from the walls of the room to die away. In general, the larger the room, the longer the decay time.

The diagram below breaks down the reverberated sound into its component parts. After an initial pre-delay period, the echoes from the closest walls or ceiling are heard. These first echoes 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.



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.

Hall programs recreate the open, spacious ambience of large concert halls.

Early Reflection programs consist of the reflection cluster only without the reverb decay. These effects are similar to a multiple tap delay line and have a single adjustable parameter - Ambience.

The special reverbs Rain & Shimmer are variations of the early reflection programs and consist of a dense group of short echoes followed by longer echoes.

```
FXA:Hall 1
Decay Time: 165
```

Place the cursor underneath the reverb name and use the data entry control to change the type of reverb. Moving the cursor to the lower line allows you to change the decay time of the reverb.The decay times of the reverb programs vary from effect to effect (Rooms: 50-250, Small Rooms: 10-128, Halls: 100-255, Chambers: 50-200, Plate 1: 80-200, Plate 2: 80-250.

The Early Reflection programs have an Ambience parameter which is variable between 0-100. The ambience parameter is a diffusion control which simulates the effect of an irregular wall surface as the amount is increased.

REVERB EFFECTS

Room
A bright, medium sized room. The apparent source position is fairly close to the listener. Suitable for use with 100% wet mix setting for adding ambience.

Warm Room
This reverb is similar to “Room” with more high frequency absorption, slightly larger size and a more distant source position.

Small Room 1
This reverb is also similar to “Room” with shorter initial reflections, shorter decay times and higher reflection density due to the reduced room size. The apparent source position is closer to the listener.

Small Room 2
This reverb is a variation of “Small Room 1” with greater high frequency damping and a more distant source position.

Hall 1
Hall 1 is a large, highly reverberant space with auditorium-like acoustics. Like all the Hall programs, “Hall 1” exhibits a warm, distant ambience with slow reflection density buildup. With the decay parameter set to maximum, “infinite” reverberation effects can be obtained. Adjustment of wet-dry mix can be used to position the listener from the “front row” (≈25%) to “back of the balcony” (≈100%).

Hall 2
This reverb is similar to “Hall 1”, but harder and brighter, with more pronounced slap echoes that come from parallel reflecting surfaces in the room. Hall 2 also exhibits a pronounced reverb “bloom” or late-reflection buildup. A 50% wet mix creates the optimum “close” distance adjustment.

Hall 3
Hall 3 is similar to “Hall 2”, but with larger scale stadium-like acoustics. Hall 3 is warmer than Hall 2 (more high frequency damping) and does not display the obvious early reflections and slap echoes. It also exhibits a distinct predelay of approximately 100 milliseconds and a pronounced late reflection buildup both of which contribute to the impression of a large space. Wet mix values of 10% to 50% are most appropriate, although a setting of 100% produces an effective cave simulation.

Chamber 1
A simulation of a bright, medium-sized chamber reverb or recital hall with hard walls. Early reflections are very prominent, with high reflection density. Moderately long decays are possible at the maximum decay setting.

Chamber 2
Similar to “Chamber 1” but with a much warmer sound. The wet mix adjustment provides an effective control over the apparent source location from close (10%) to very distant (100%).

Plate 1
Simulates a plate reverb unit. Gives a tight, bright, slightly metallic sound. Reflection buildup is very rapid, with high density. Early reflections are minimized.

Plate 2
An effect similar to Plate 1, but slightly warmer with less density.

EARLY REFLECTION GROUP

Early Reflection 1

Early Reflection 2

Early Reflection 3

Early Reflection 4

All Early Reflection programs have a single Ambience parameter which adds diffusion to the individual reflections. Lower ambience settings cause reflections to become more discrete, simulating harder reflecting surfaces. The early reflection programs are simulations of increasingly large acoustic spaces, from a small studio (Early Refl 1) to a large room like a sound stage (Early Refl 4). The wet mix control acts effectively as source distance control. In general, lower mix amounts are more effective as the room size increases.

Reverse Early Reflection
More of a special effect than an acoustic simulation, Reverse ER contains a set of exponentially increasing delay taps, creating a kind of “zip” sound at low Ambience settings. At maximum ambience and lower wet mix values, the sound is more authentically acoustic, with a long, delayed reflection “bloom”. The effect is similar to a large but well damped parking garage.

SPECIAL REVERBS

These special reverbs all have a single Decay Time parameter.

Rain

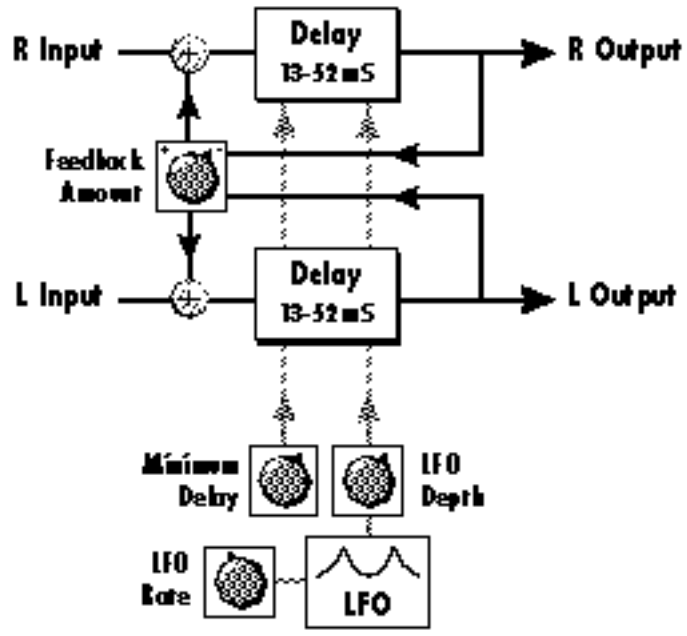
Similar to a repeating delay, but with complex spatial and filtering effects occurring across the stereo panorama. The effect on percussive sounds might be likened to a bucket of marbles raining down on a galvanized steel roof.

Shimmer

Distantly related to the Rain effect, Shimmer causes input signals to be progressively diffused in time and space across the stereo panorama. The spatial diffusion is accompanied by a flanging effect. The program is highly responsive to left or right-panned inputs. A stunning special effect with percussive sounds, especially through headphones.

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 delay times are slightly different for each channel and the LFO phase is inverted on the right channel to help 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.



STEREO (

The stereo chorus in the Classic Keys is very similar to the 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
```

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

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

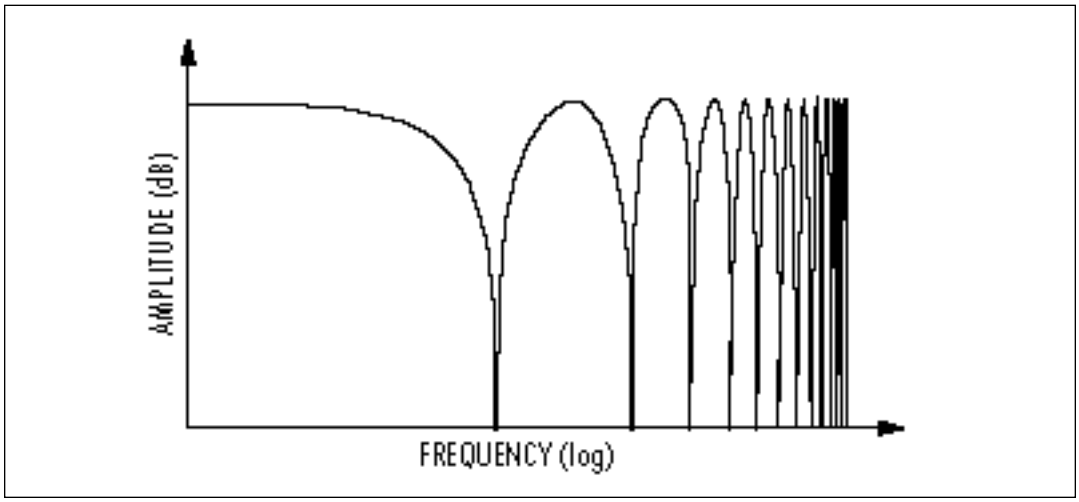
```
FXA:StereoChorus
Feedback    +100
```

STEREO FLANGER

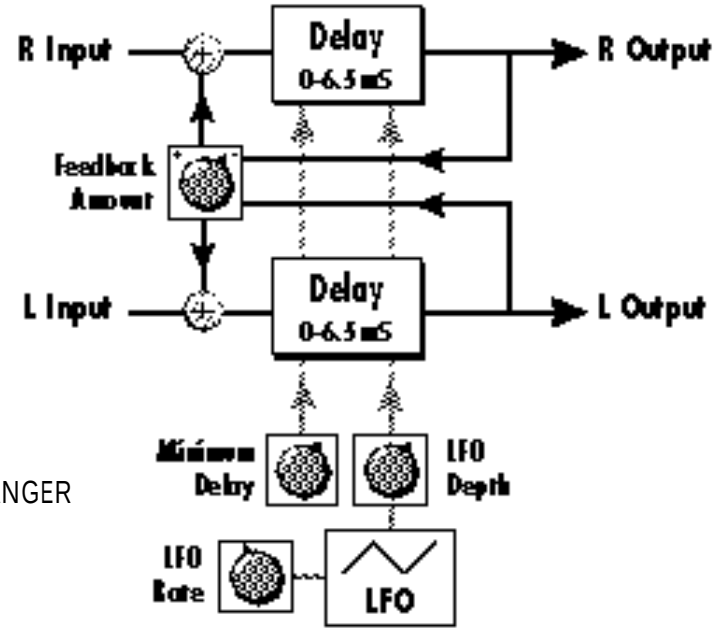
A flanger consists of a short audio delay line whose output is mixed together with the original signal. Mixing the delayed and original signals together results in multiple frequency cancellations creating a comb filter effect as shown in the diagram below. Since the flanger is a type of filter, it works 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 Classic Keys 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 on the following page.



Adding the original signal together with a slightly delayed version creates multiple cancellations in the output signal called “comb filtering”.



STEREO FLANGER

A Minimum 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
Min 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
```

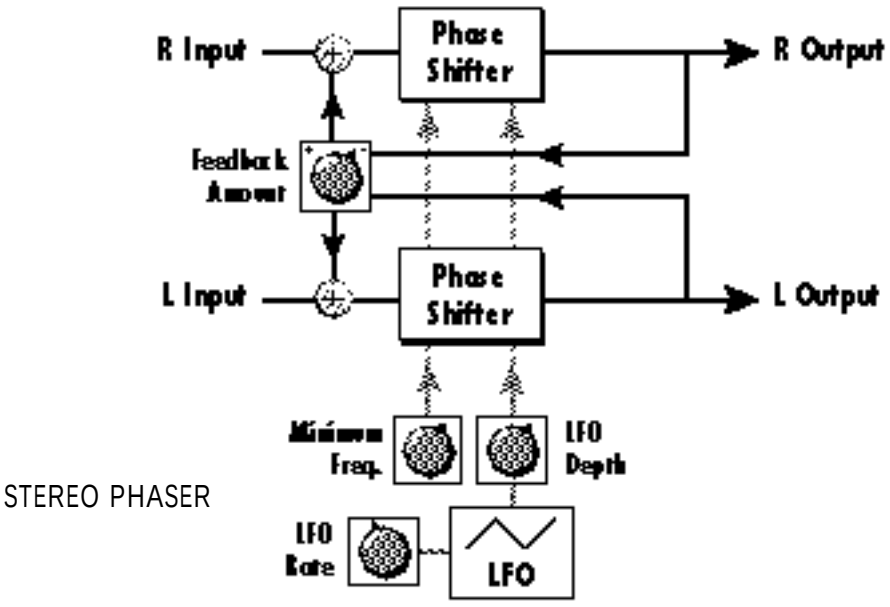
The Feedback control sends some of the delayed signal through the delay line again. When positive feedback is used (values +1 to +127), the comb filter notches are deepened; when negative feedback is used (values -1 to -127) resonant peaks are formed between the notches which increase with the amount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

```
FXA:StereoFlange
Feedback    -127
```

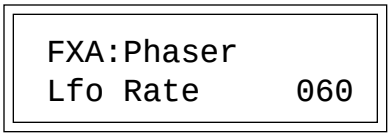
STEREO PHASER

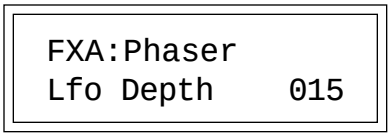
The stereo phaser is an effect similar to the flanger although much more subtle. The phaser creates a swirly animation when used with harmonically rich sounds such as strings and voices. It can also be used like a chorus to thicken-up a thin sound.

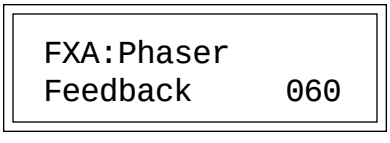
Use the Minimum Frequency control to "tune" the resonant frequencies of the peaks and notches to the sound. The LFO Depth controls the amount of animation that the effect will add. Feedback controls the depth of the peaks and notches.

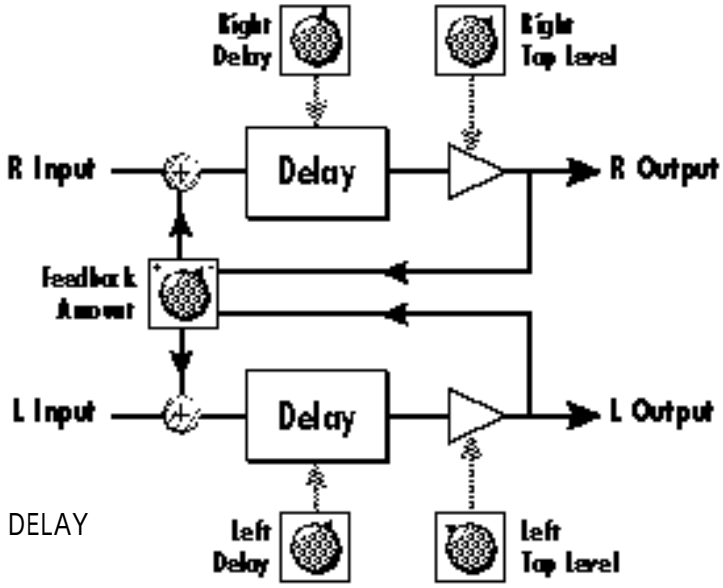


STEREO PHASER









STEREO DELAY

DELAY

The delay line is a stereo effect which can be used for doubling, echoes 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 above.

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 echoes 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.

```
FXA:Delay
R DelayTime   060
```

```
FXA:Delay
R Tap Level   055
```

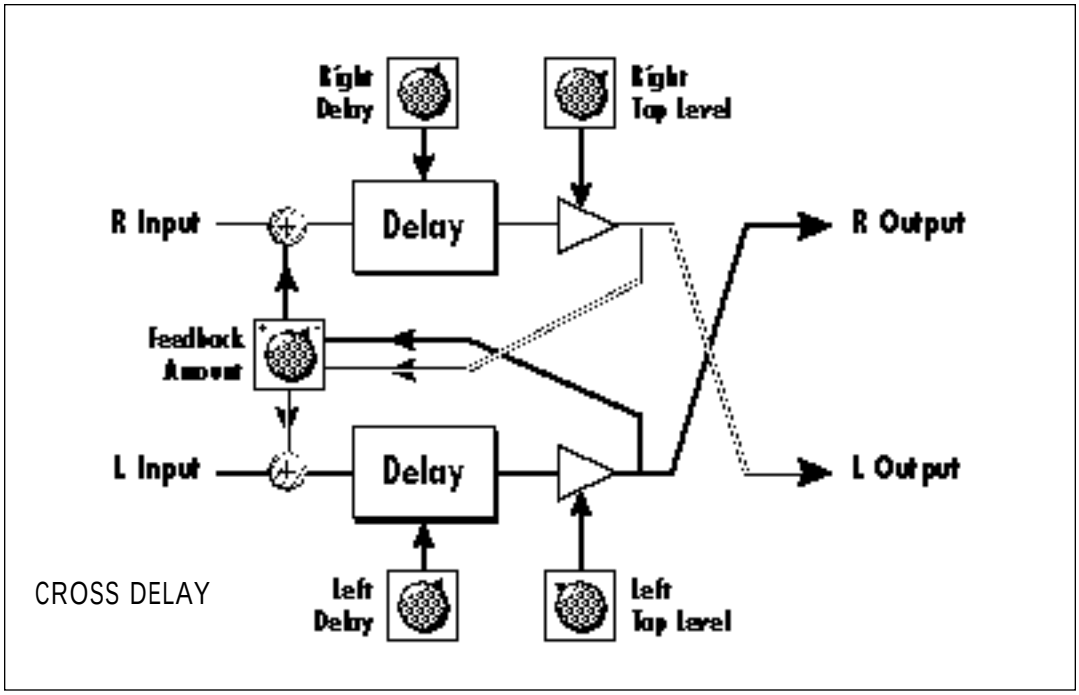
```
FXA:Delay
L DelayTime   255
```

```
FXA:Delay
L Tap Level   120
```

```
FXA:Delay
Feedback      120
```

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.



CROSS DELAY

```
FXA:Cross Delay
R DelayTime   060
```

```
FXA:Cross Delay
L Tap Level   120
```

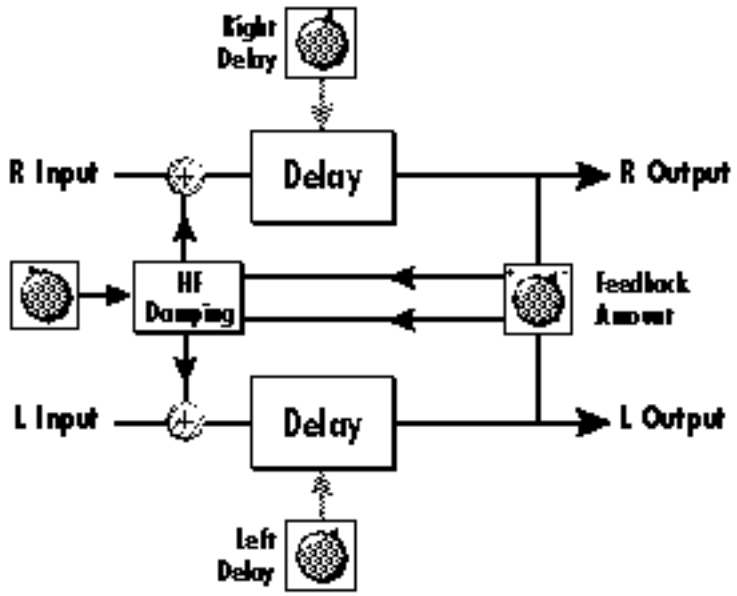
```
FXA:Cross Delay
R Tap Level   055
```

```
FXA:Cross Delay
Feedback    120
```

```
FXA:Cross Delay
L DelayTime   255
```

ECHO

The Echo produces echoes 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 utilizes a high frequency damping (low pass filter) control which can simulate traditional analog tape echo. Because the left and right delay controls are completely independent (0-400 mS) they be adjusted to create very interesting stereo echo effects.



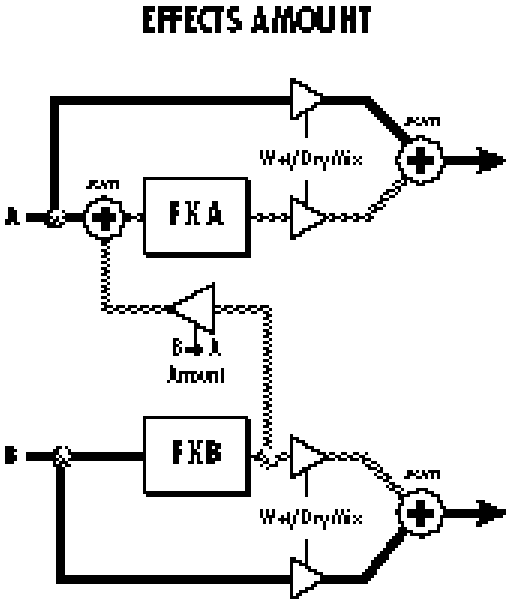
ECHO

```
FXA:Echo
Feedback      100
```

```
FXA:Echo
R DelayTime   100
```

```
FXA:Echo
L DelayTime   255
```

```
FXA:Echo
HF Damping    010
```



B EFFECTS

The B effects include Stereo Flanger, Stereo Chorus, Phaser, Fuzz, Ring Modulator, Delay, Cross Delay 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 above. Simple effects such as Fuzz can take on a completely new character when routed through a 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 milliseconds). This delay is useful for short echoes, 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 echoes, stereo slapback and doubling effects.

STEREO FUZZ

The Stereo Fuzz introduces a controlled distortion to any signal passing through it. Distortion creates harmonics by clipping the top of the wave when it exceeds a certain level. Sine waves are transformed into square waves and complex waves take on noise-like qualities. There are two types of fuzz in Classic Keys: Fuzz and Fuzz Lite.

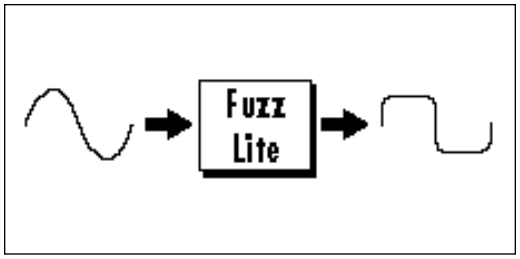
FUZZ

This Fuzz 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 Classic Keys' envelopes can now control harmonic content as well as the volume. Output Volume sets the output level of the fuzz. There are two complete fuzz effects, controlled by the same set of controls as shown in the diagram below.

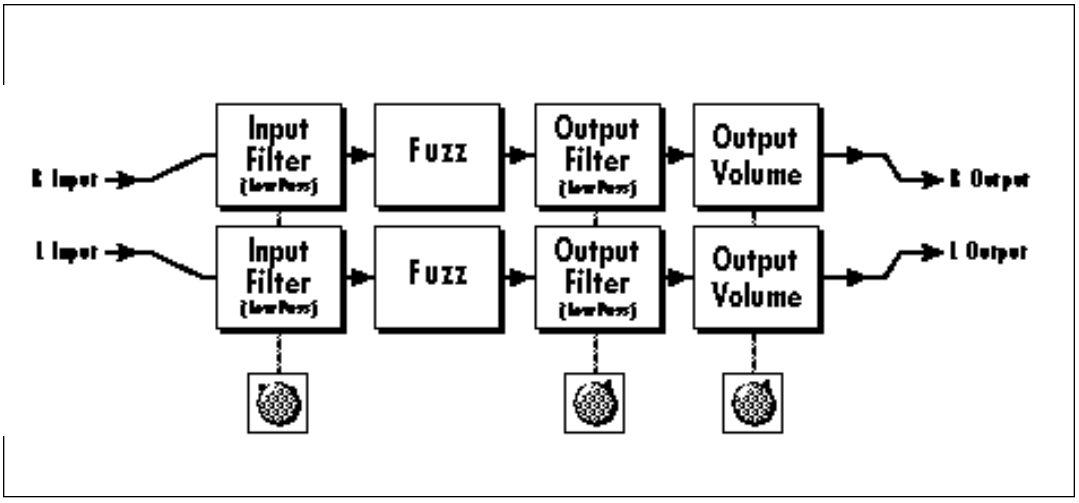
Two independent sounds can be processed by panning primary and secondary to opposite sides, or a single sound can be routed through both sides. If a single sound is panned slightly off center, the fuzz will act slightly differently on each side because of the difference in level.

FUZZ LITE

This is a more restrained type of fuzz utilizing "soft-clipping." As the level increases, the waveform through Fuzz Lite becomes somewhat squared. As signal level is increased further, it transforms into a square wave. There is no Output Volume control on Fuzz Lite.



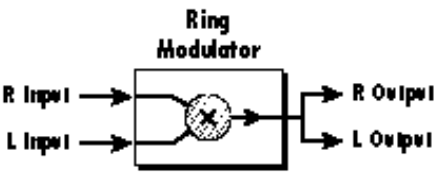
Experiment with the way the input and output filters work on the sound. Fuzz is a specialized effect, not for every situation, but another powerful tool in your musical arsenal.

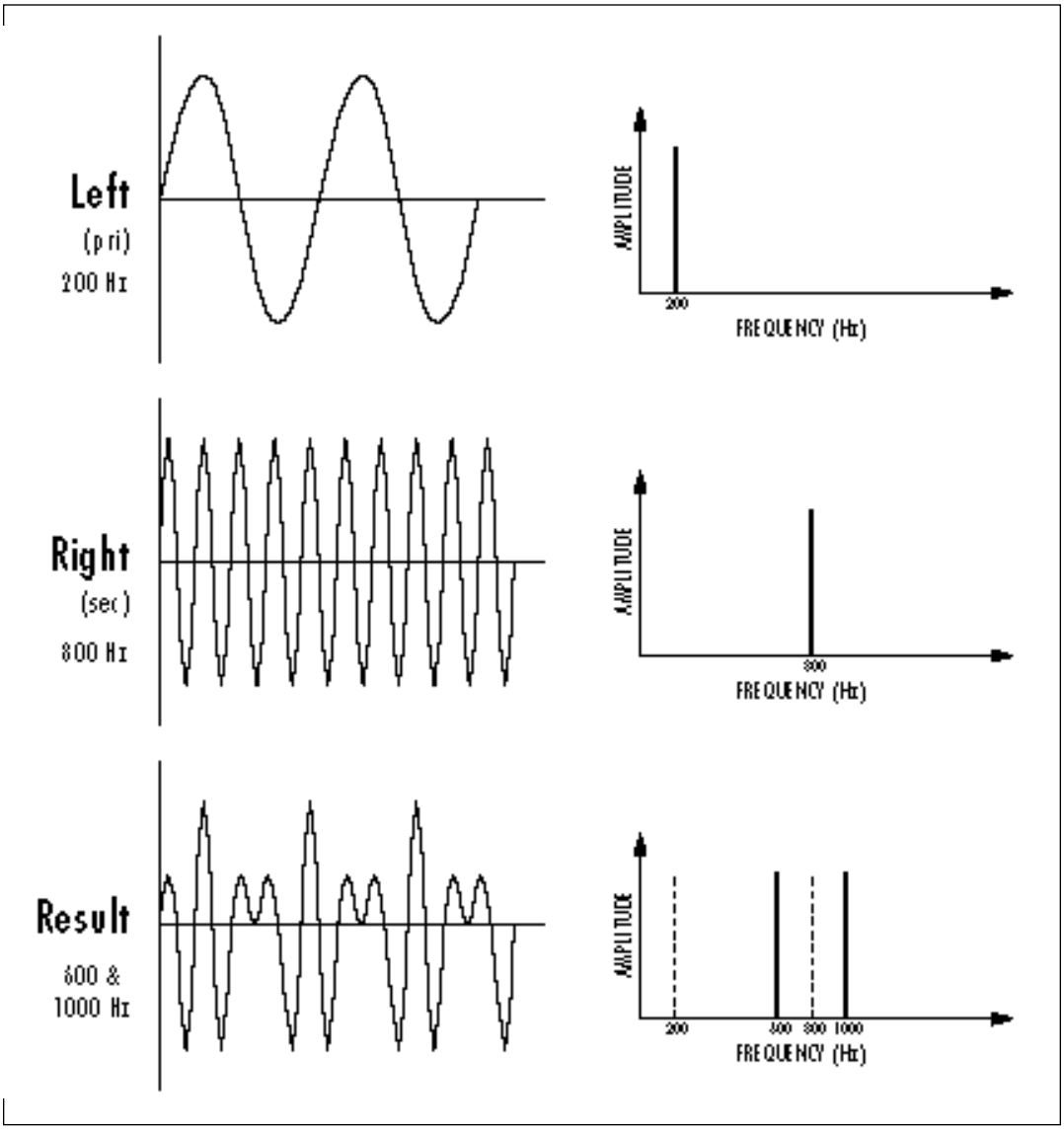


RING MODULATOR

A Ring Modulator is a 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! However, every harmonic of each signal multiplies every other, according to its amplitude. As a result, ring modulators tend to generate a lot of non-harmonic frequencies which can sound very bell-like or out of tune.

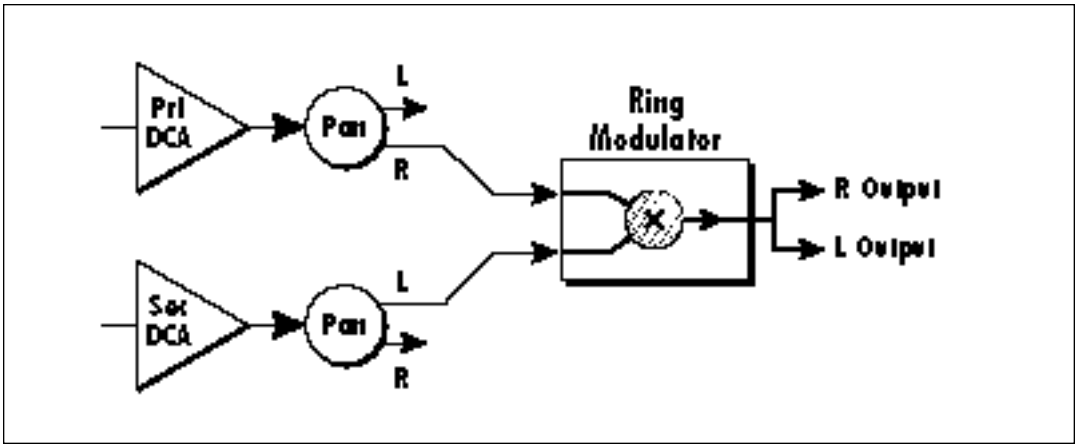
There are no controls on the ring modulator as shown by the block diagram below. The left and right outputs are simply multiplied together to form a monophonic output.





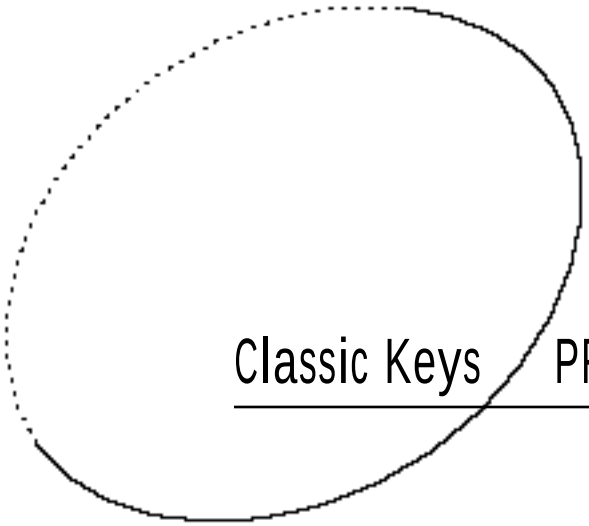
This diagram shows the result of Ring Modulating two sine waves with frequencies of 800 Hz and 200 Hz. Only the Sum and Difference frequencies of 1000 Hz and 600 Hz will result.

By routing the preset (or MIDI channel) 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.



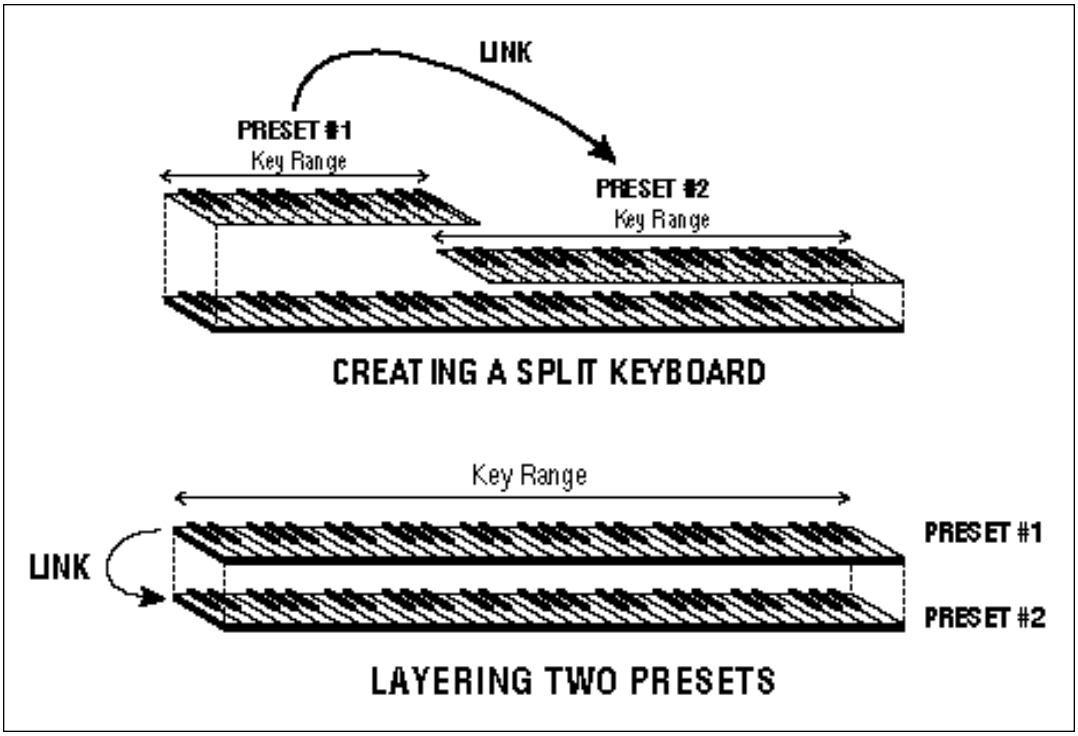
Pan the primary and secondary instruments to left and right in the pan screen and then move to the Effect B screen and select Ring Modulator. There are no parameters to adjust in this effect so the lower line of the display always reads: None.

```
FXB:RingModulate
None          ---
```



Classic Keys PRESET PROGRAMMING

5 Preset Programming



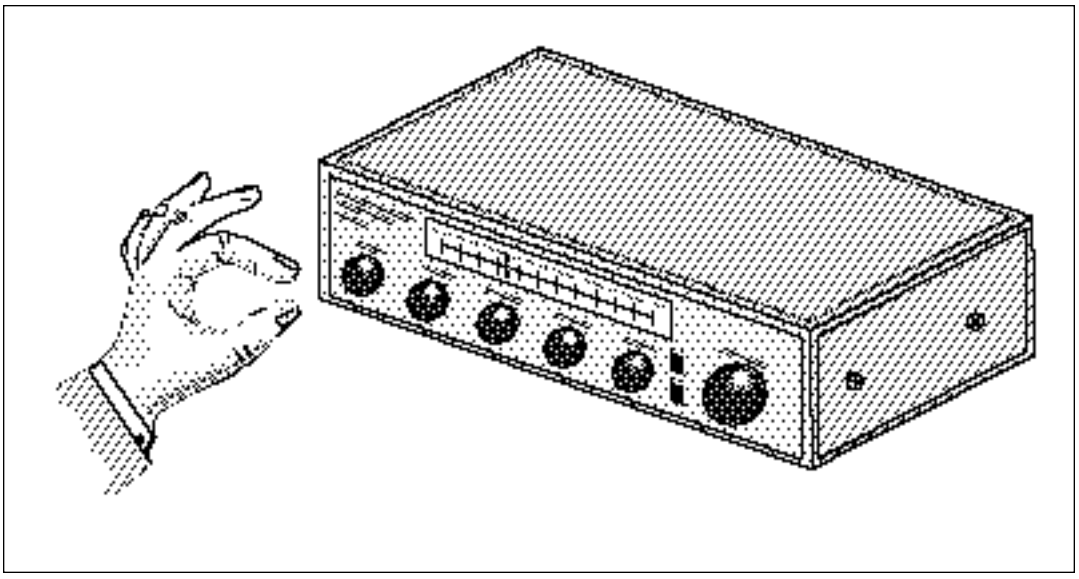
These diagrams show how keyboard splits and layers can be created by linking presets. Remember that each preset can consist of both a primary and secondary layer.

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 waveforms 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.

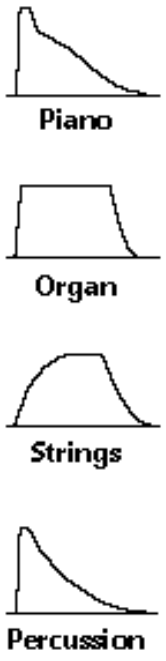
FOOTSWITCH MODULATION

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.

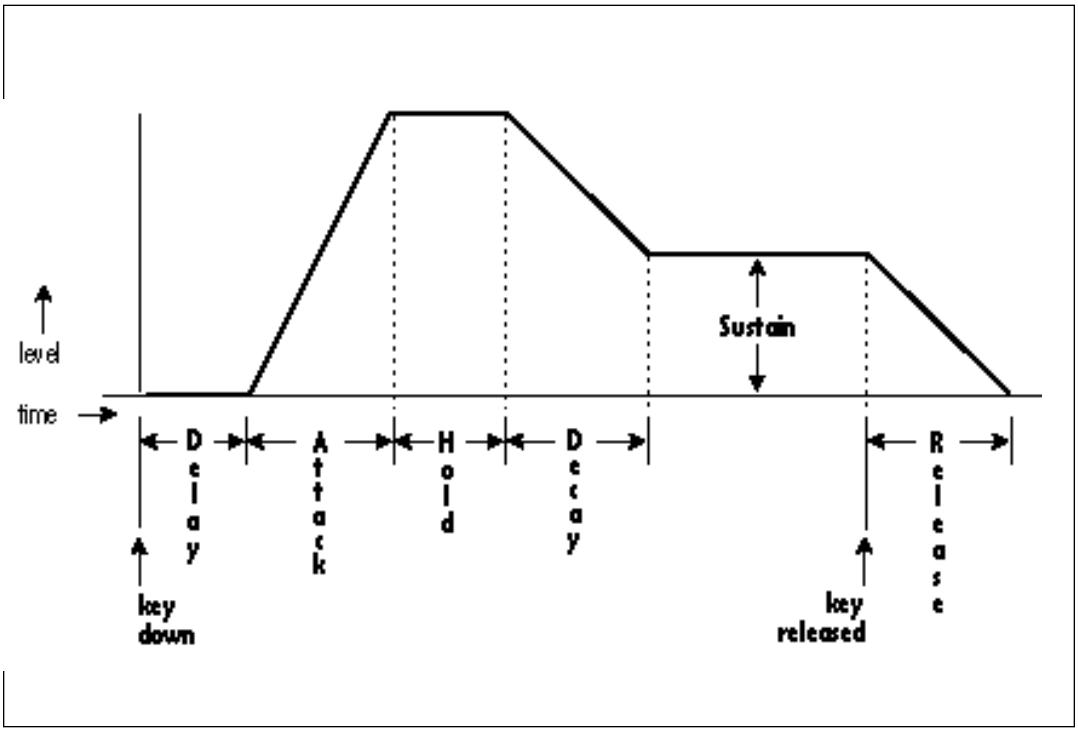
Attack
The time it takes to go from zero to the peak (full) level.

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

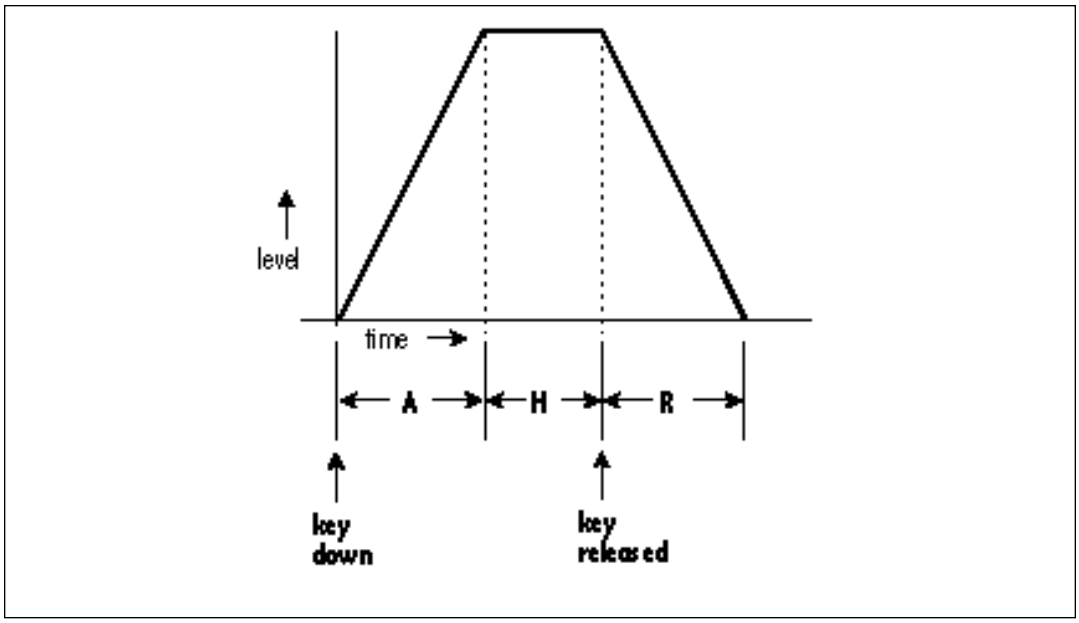
Decay
The time it takes the envelope to go from the peak level to the sustain level.

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.

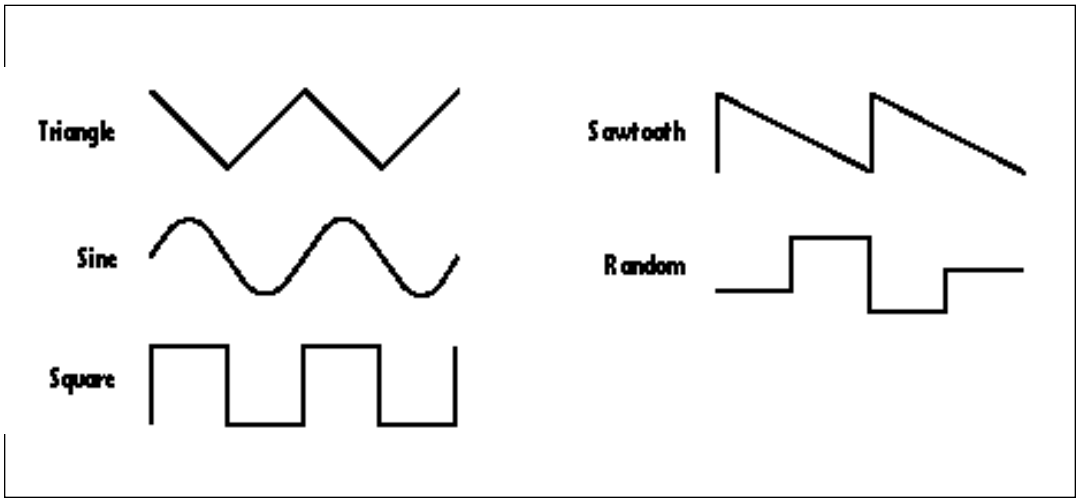


If the key is released during the Hold (H) phase, the Release (R) phase begins.

LOW FREQUENCY OSCILLATORS (LFOs)

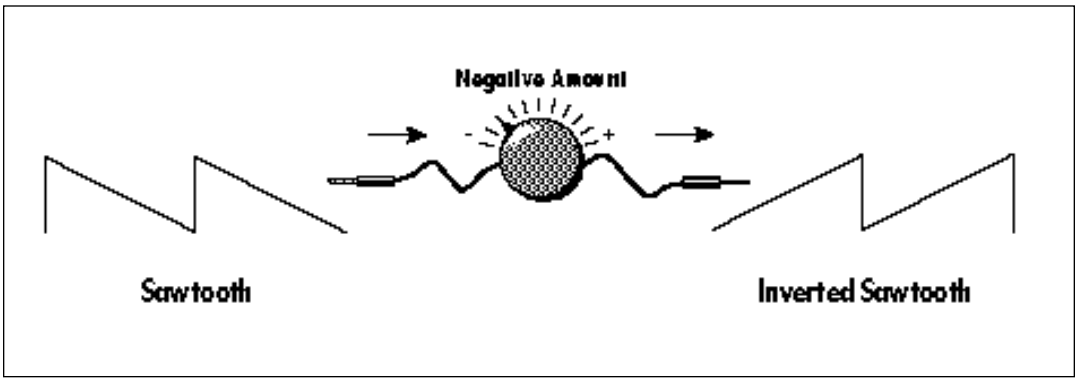
A Low Frequency Oscillator is simply a wave which repeats at a slow rate. Classic Keys has two multi-wave LFOs for each of its 32 channels. The LFO waveforms are: Triangle, Sine, Square, Sawtooth, and Random, which is a random "sample and hold" type of wave.

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.

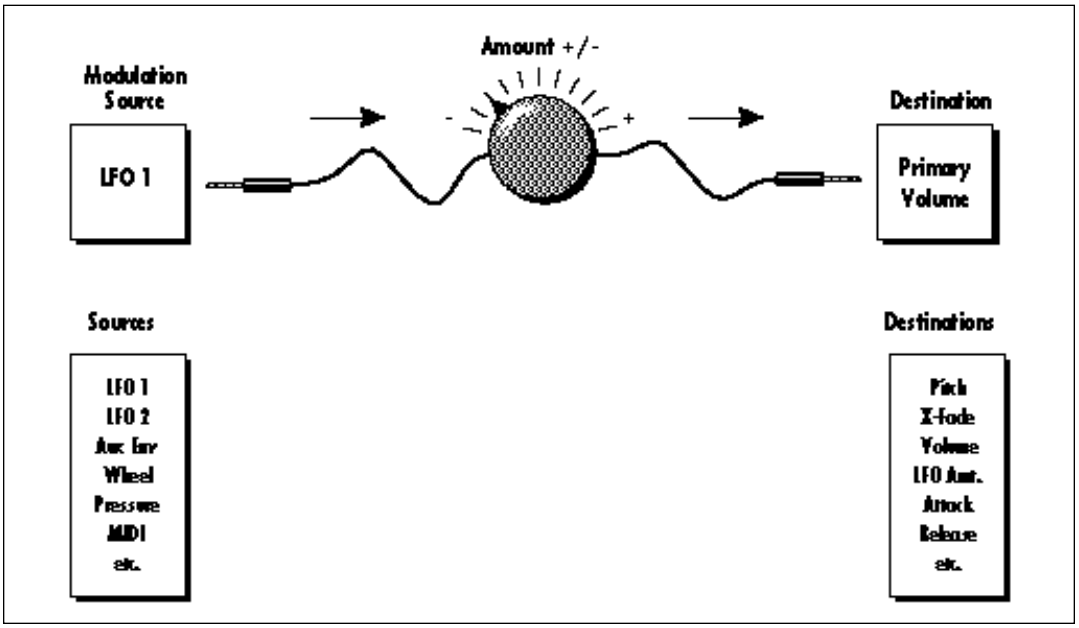
When the amount of an LFO is a negative value, the LFO shape will be inverted. For example, inverting the sawtooth wave produces a wave that smoothly increases, then instantly resets down.



MIDIPATCH

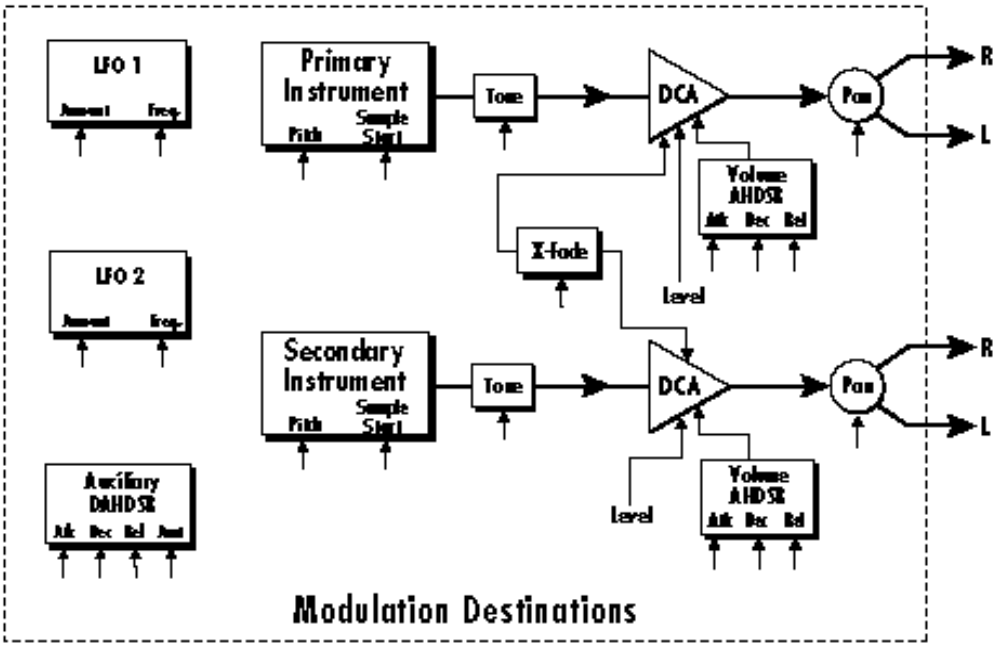
Connecting a modulation source to a destination is called a patch. Classic Keys lets you connect the modulation sources in almost any possible way to the modulation destinations. You can even modulate other modulators. Each patch also has an amount parameter which determines "how much" modulation is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

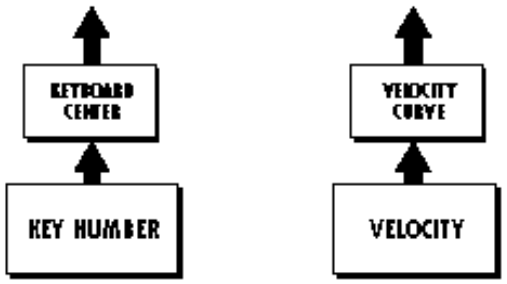


MODULATION SOURCES:
KEY NUMBER
KEY VELOCITY

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



Modulation Destinations

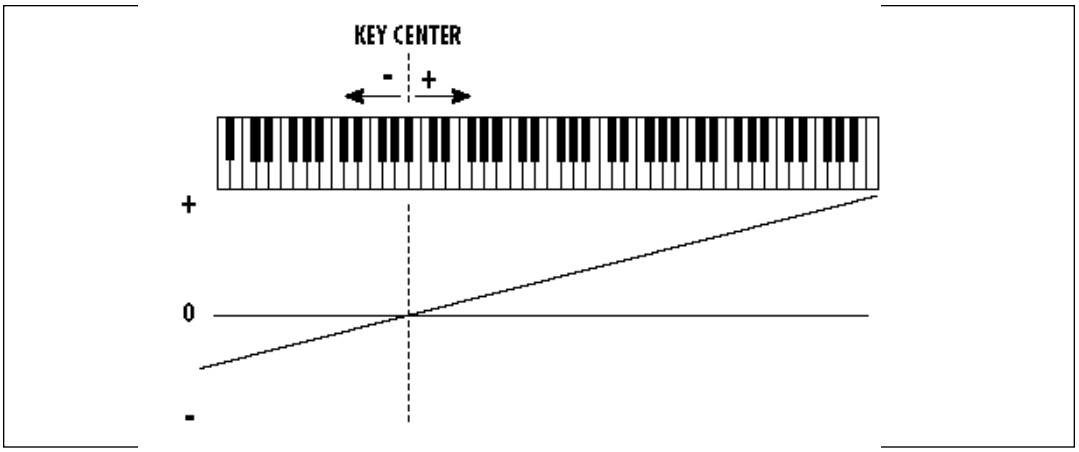


Keyboard and Velocity Modulation Sources

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.

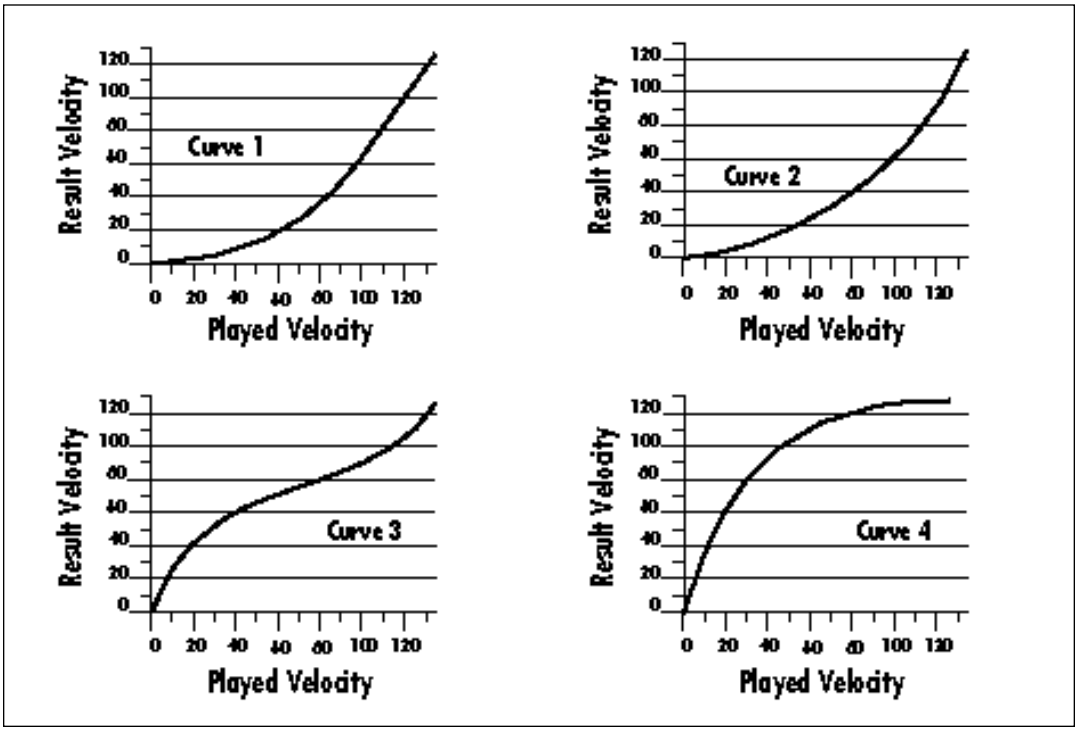
KEY NUMBER

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

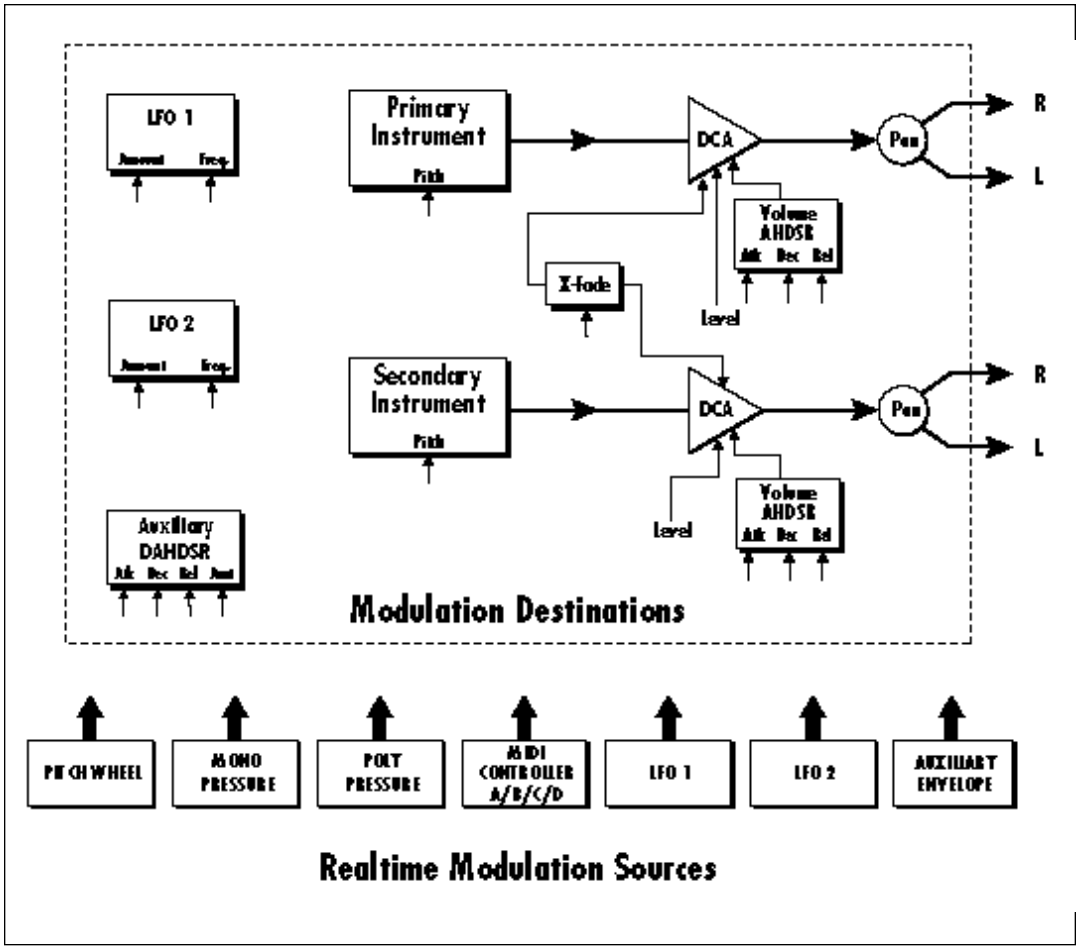
Incoming velocity values can be scaled by one of the four velocity curves in order to match your playing style or better adapt to the MIDI controller. Experiment with the four curves to find the one that works best for your style and MIDI controller.

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



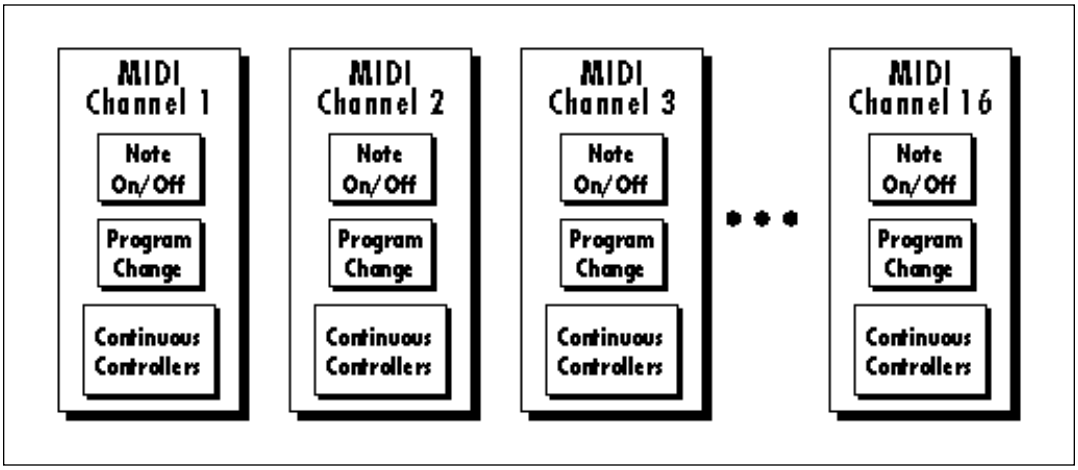
REALTIME MODULATION

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 REALTIME CONTROLS

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.

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.

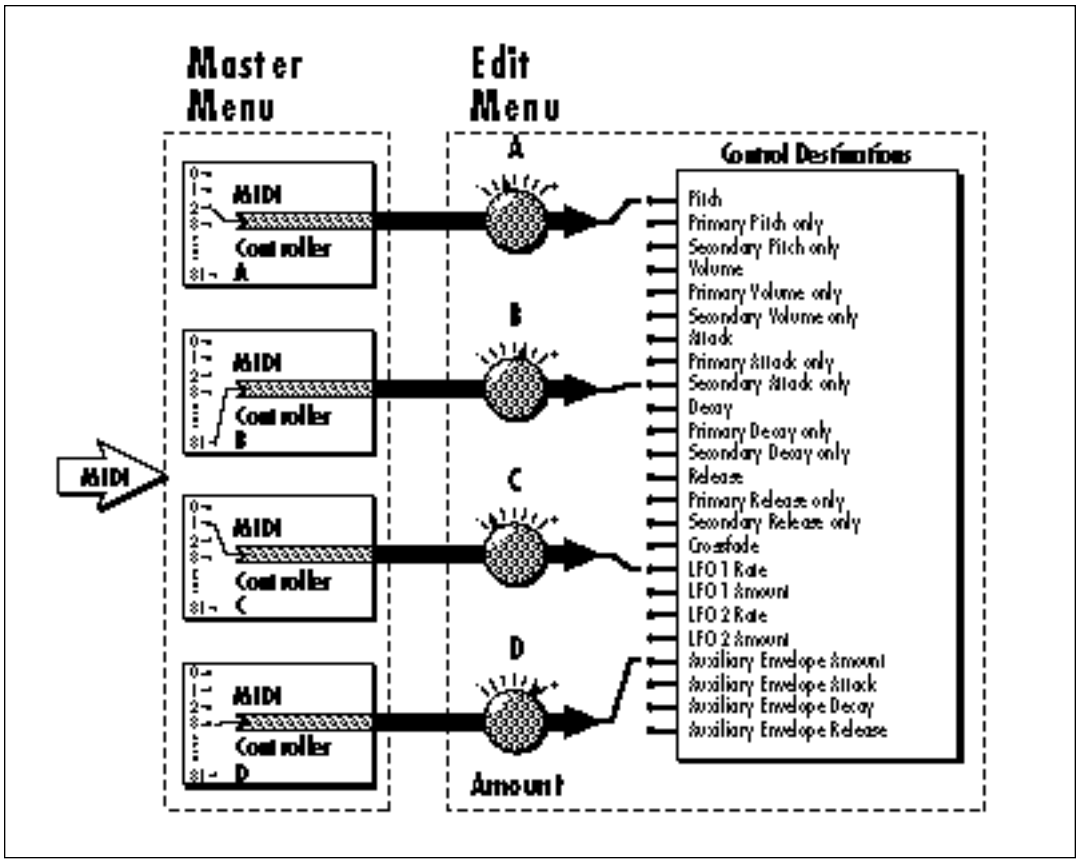
01 - Modulation Wheel A

02 - Breath Controller B

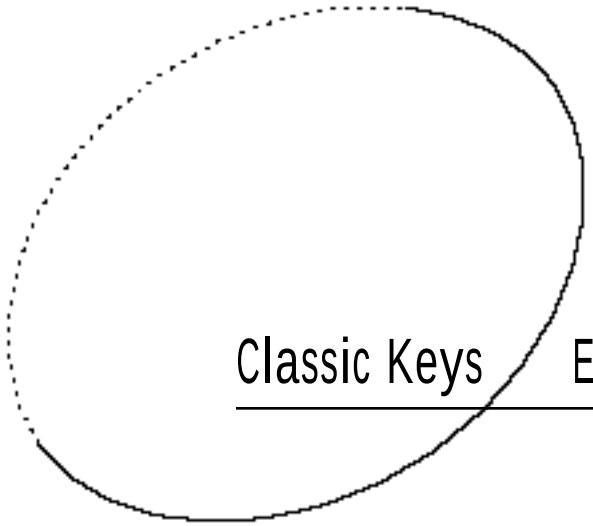
04 - Foot Pedal C

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.



Classic Keys EDIT MENU

6 The Edit Menu

The 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 (Banks 0 and 1).

> WARNING
>
> *Changes made in the Edit menu will be forever lost unless the preset is "saved" using the Save Preset function (page 78) before changing the preset.*

TO ENABLE THE EDIT MENU

Press the Edit button, 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 Home/Enter button or press a cursor button repeatedly until the cursor is underneath the screen heading. Rotate the Data Entry Control to select the screen.

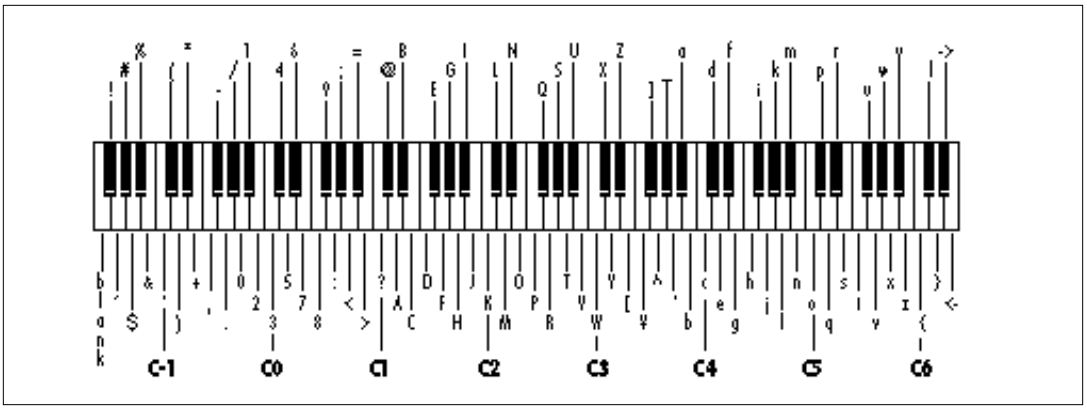
TO MODIFY A PARAMETER

Press a cursor button repeatedly (or hold the right cursor button while turning the data entry control) until the cursor is underneath the parameter value. Rotate the data entry control to change the value.

TO RETURN TO PRESET SELECT MODE

Press the Edit button, turning off the LED.

Edit Menu 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 chart above shows the keyboard character assignment.

```
PRESET NAME
000 Untitled
```

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
I013 Flute
```

CHANGING THE INSTRUMENT IS A SIMPLE WAY TO CREATE A NEW SOUND WHILE RETAINING ALL THE OTHER PARAMETERS OF THE PRESET.

SECONDARY INSTRUMENT

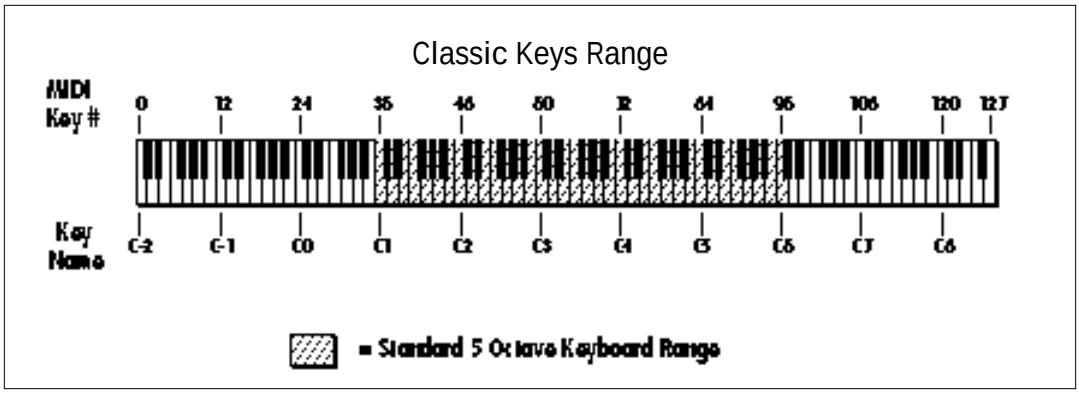
This function allows you to select which of the available instrument sounds (or none) will be placed on the secondary layer of the current user preset.

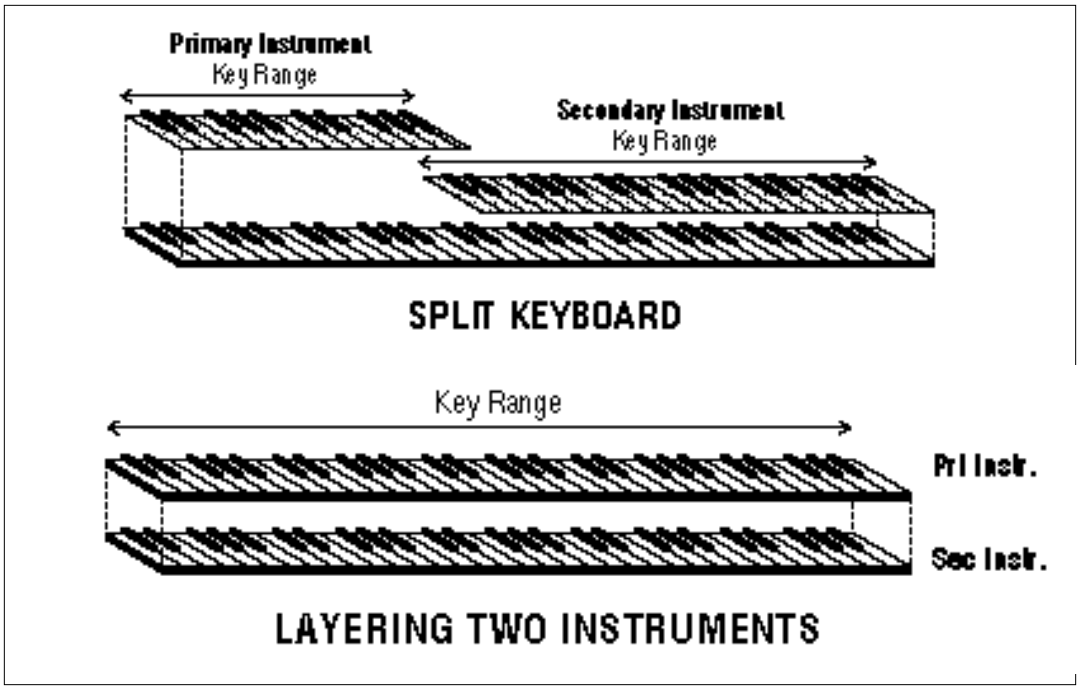
```
INSTRUMENT sec
I023 Farfisa
```

KEY RANGE

Key range sets the 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
```





ENTIRE PRESETS CAN BE LINKED TO FORM SPLIT OR LAYERED PRESETS. SEE THE LINK FUNCTION AT THE END OF THIS CHAPTER.

PRIMARY KEY RANGE

Key range 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.

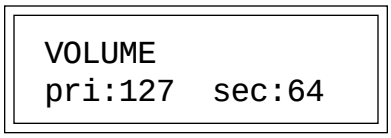
```
KEY RANGE pri
C-2 -> C0
```

SECONDARY KEY RANGE

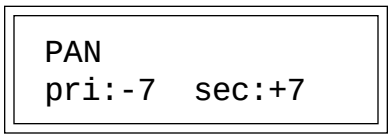
Key range sets the keyboard range of the secondary instrument. The key range can be set anywhere from C-2 to G8.

```
KEY RANGE sec
C#0 -> G8
```

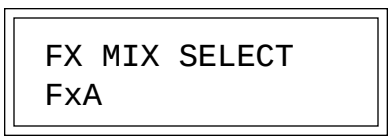
VOLUME
Volume sets the amplitude of the primary and secondary instruments. This function also allows you to compensate for the relative volume differences between instruments.



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.

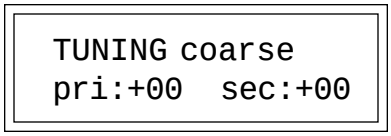


FX MIX SELECT
This function allows you to direct a particular preset to one of the effect processors (FxA, FxB) or leave the preset Dry-no effects (Main). This routing is utilized if Mix Select for a particular MIDI channel is set to "Preset" in the Master menu. Otherwise this parameter is ignored. This function allows you to choose the effect bus in the preset rather than by MIDI channel.

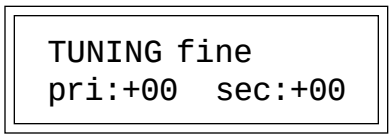


IN ORDER FOR THE FX MIX SELECT TO BE UTILIZED, THE FX MIX SELECT FOR THE MIDI CHANNEL (IN THE MASTER MENU) MUST BE SET TO PRESET.

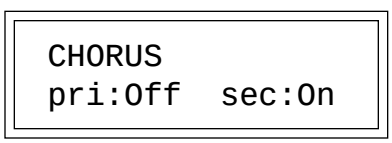
COARSE TUNING
This function allows you to change the tuning of the primary and secondary instruments in semitone intervals. The coarse tuning range is -36 to +36 semitones. A coarse tuning setting of "00" would indicate that the instrument is tuned to concert pitch (A=440 Hz).



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 ± 1 semitone.



CHORUS
Chorus "thickens" the sound by doubling the sound and then detuning it. Chorus can be turned On or Off for the primary and secondary instruments. When Chorus is on, a particular instrument will use twice as many channels. If Chorus is used for both primary and secondary instruments, the preset will use four channels per key which correspondingly reduces the available polyphony.



DELAY

Delay varies the time between the arrival of a MIDI Note On message and the onset of a note. The delay time is adjustable from 0 to 14 seconds (000-127).

```
DELAY
pri:000  sec:000
```

SOLO MODE

Solo mode provides the playing action of a monophonic instrument with single triggering and last-note priority. This mode does not allow you to play a chord. Solo mode will not retrigger the envelope generators if a new note is played while another is being held. This allows a legato playing technique to be used. Solo mode also provides more realistic effects when working with guitar and wind controllers.

```
SOLO MODE
pri:Off  sec:On
```

SOUND START

This function allows you to set where a sample 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.

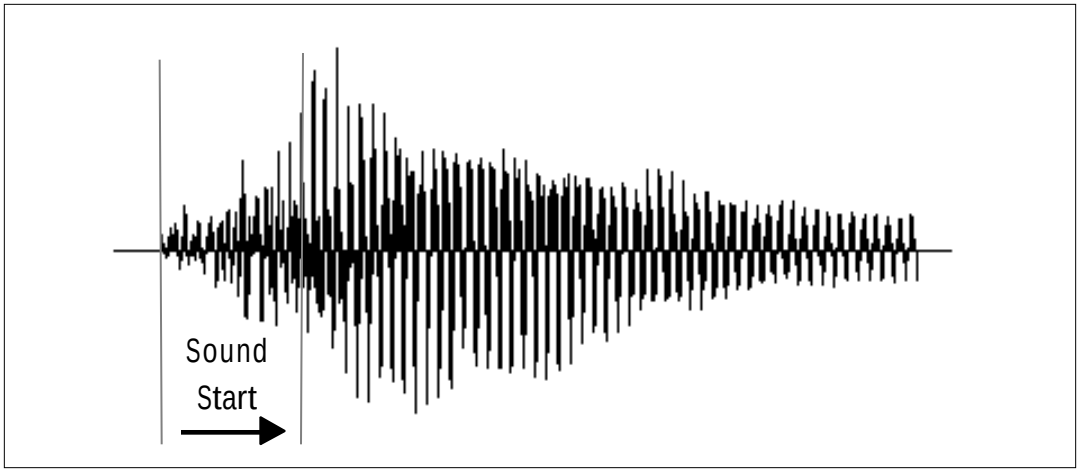
```
SOUND START
pri:000  sec:000
```

REVERSE SOUND

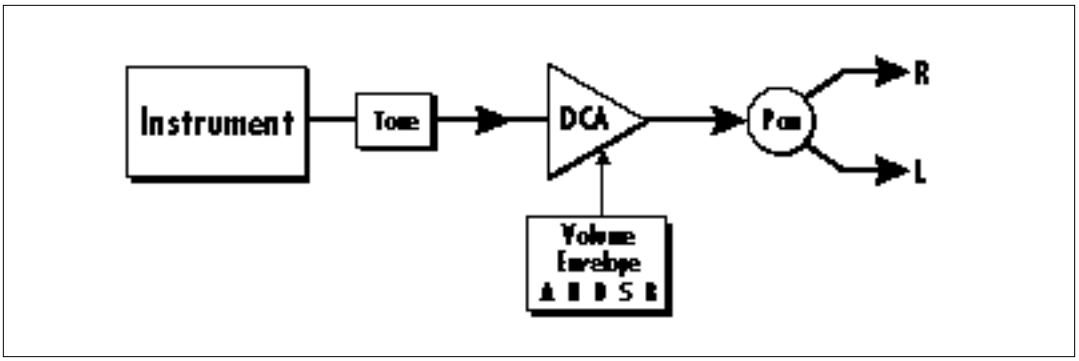
When reverse sound is turned On, the instrument will be played backwards. When an instrument is reversed, any loops in the sound will be ignored, which means that the sound will not sustain indefinitely.

```
REVERSE SOUND
pri:Off  sec:On
```

THE SOUND START PARAMETER CAN BE USEFUL TO REMOVE THE GRADUAL ATTACK OF A REVERSED SOUND. SEE THE STEP-BY-STEP CHAPTER FOR AN APPLICATION USING SOUND START.



The Sound Start parameter allows you to cut off the beginning of the sound. Higher values move the start point toward the end of the sound.



The Alternate Volume Envelope dynamically controls the final output and can completely change the character of a sound.

TO ENABLE THE CROSSFADE OR CROSS-SWITCH FUNCTIONS, YOU MUST ASSIGN CROSSFADE TO A MODULATION SOURCE IN EITHER THE REALTIME OR KEY/VELOCITY MODULATION SCREENS.

ALTERNATE ENVELOPE ON/OFF

Each instrument has its own factory preset AHDSR volume envelope which is used if this parameter is set to Off. Turn Alternate Volume Envelope On to use the user-programmable alternate envelope instead.

```
ALT ENVELOPE
pri:Off  sec:On
```

PRIMARY & SECONDARY ALTERNATE ENVELOPE PARAMETERS

These functions allow 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
```

CROSSFADE MODE

This function determines which of the following crossfade modes will be selected: Off, Crossfade, or Cross-Switch.

Off

When “Off” is selected, none of the crossfade parameters will have any effect.

Crossfade

When Crossfade mode is selected, a control input is used to fade between the primary and secondary. Any modulation source may be used as a control input (velocity, LFO, etc.).

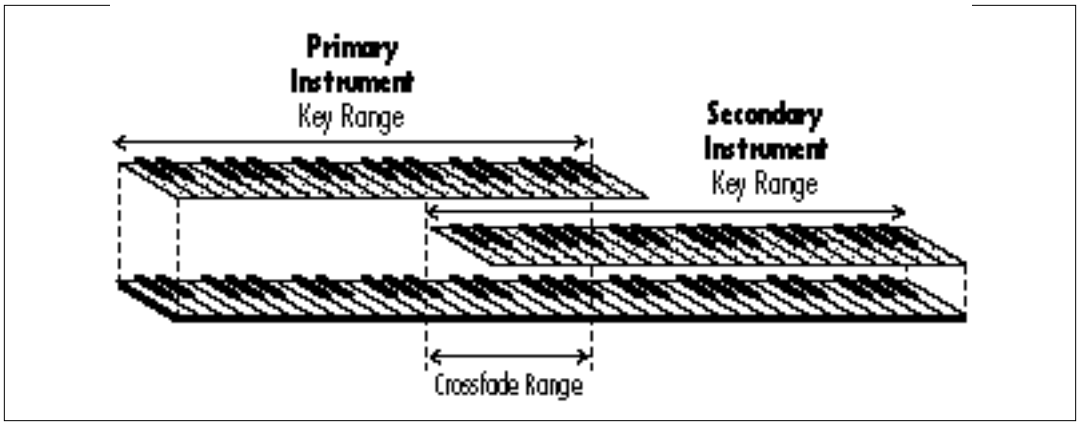
Cross-switch

When Cross-switch mode is selected, the switched layer is selected if the input 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. Realtime controllers do not have any effect when routed to cross-switch. For more information, see Cross-Switch Point on page 72.

```
XFADE MODE
Off
```

TO USE THE KEYBOARD FOR CROSSFADE, SET THE CROSSFADE BALANCE TO 64 AND THE KEY CENTER TO THE SPLIT POINT.



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

SEE ALSO CROSS-SWITCH POINT ON THE FOLLOWING PAGE.

The crossfade and cross-switch functions MUST be connected to a controller in either the Key/Velocity or Realtime Modulation screens. (Otherwise, what is controlling the crossfade?)

CROSSFADE DIRECTION

This function determines the polarity of the crossfade or cross-switch. The direction is either primary -› secondary, or secondary -› primary.

```
XFADE DIRECTION
Pri -> Sec
```

A CROSSFADE BALANCE SETTING OF 000 WOULD BE APPROPRIATE WITH A SOURCE SUCH AS A MODULATION WHEEL OR FOOTPEDAL, EITHER OF WHICH CAN ONLY CHANGE THE VALUE IN A POSITIVE DIRECTION.

CROSSFADE BALANCE

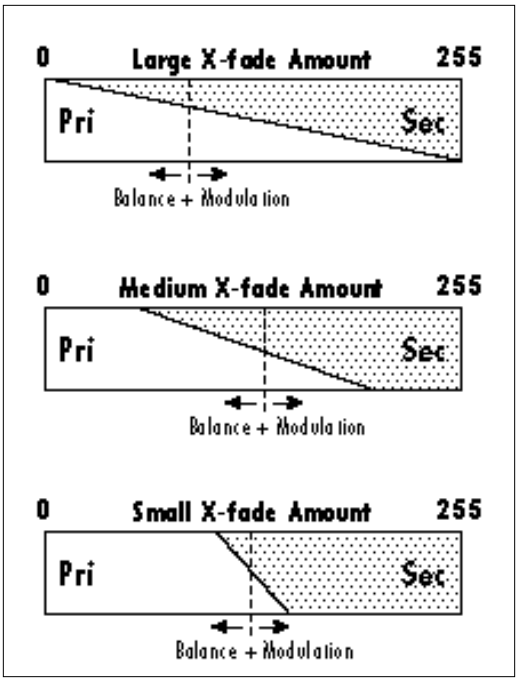
The crossfade balance parameter determines the initial balance between the primary and secondary layers. Any modulation is subsequently added to this value. Crossfade balance is variable between 000 and 127.

```
XFADE BALANCE
064
```

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
```



TO ENABLE THE CROSS-SWITCH FUNCTION, YOU MUST ASSIGN CROSSFADE TO A MODULATION SOURCE IN THE REALTIME OR KEY/VELOCITY SCREENS.

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
064   (E3)
```

Key

LFO 1 - SHAPE AND AMOUNT

FOR MORE INFORMATION ON THE LFOS, SEE THE PRESET PROGRAMMING CHAPTER OF THIS MANUAL.

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 waveshapes.

```
LFO1  SHAPE AMT
      Rand +127
```

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).

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.

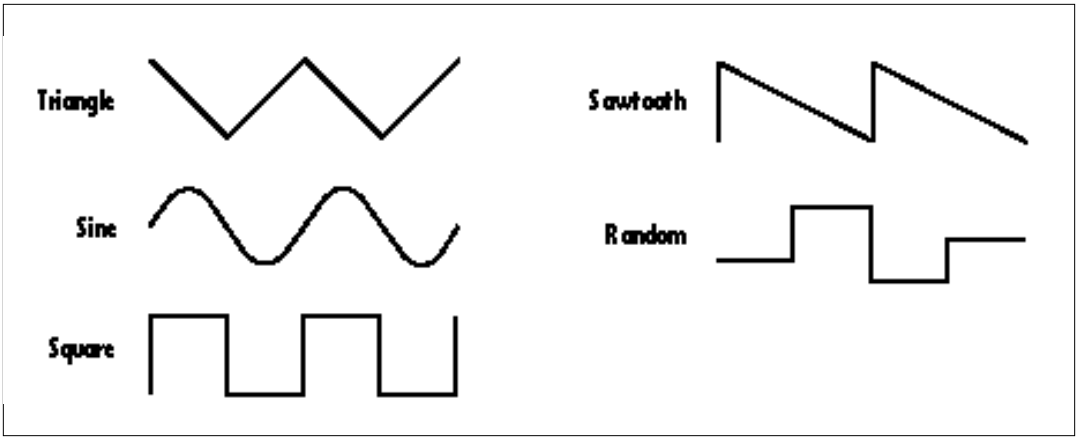
```
LFO1 RT  DLY VAR
     000 000 000
```

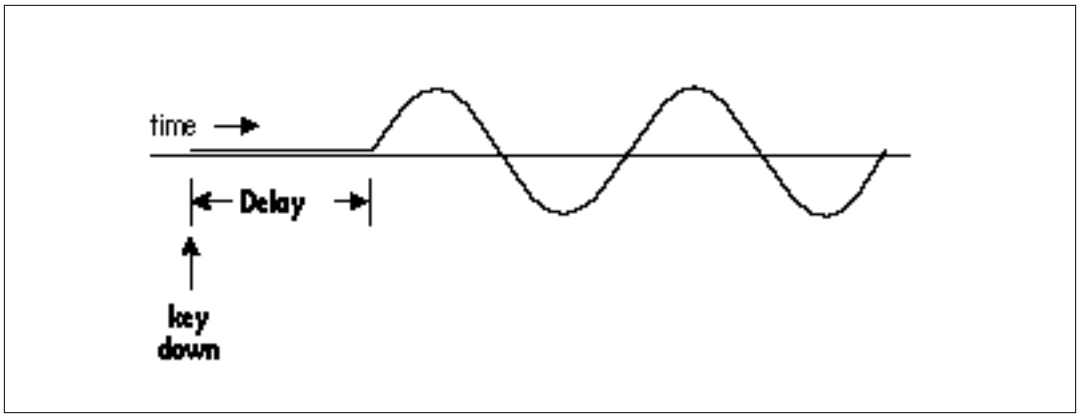
LFO 2 - SHAPE AND AMOUNT

LFO 2 is functionally identical to LFO 1.

LFO 2 - RATE, DELAY AND VARIATION

LFO 2 is functionally identical to LFO 1.





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

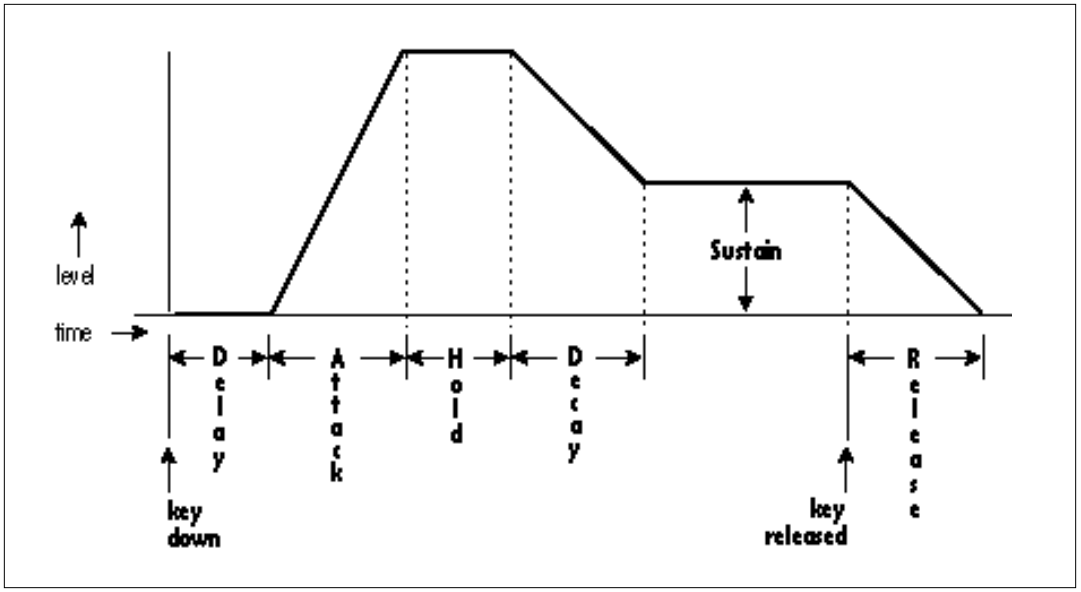
FOR MORE INFORMATION ON THE ENVELOPES, SEE THE PRESET PROGRAMMING CHAPTER OF THIS MANUAL.

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
```



The six stages of the Auxiliary Envelope Generator.

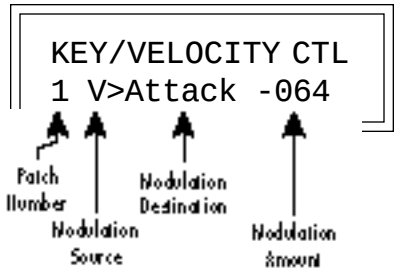
MODULATION SOURCES:
KEY NUMBER
KEY VELOCITY

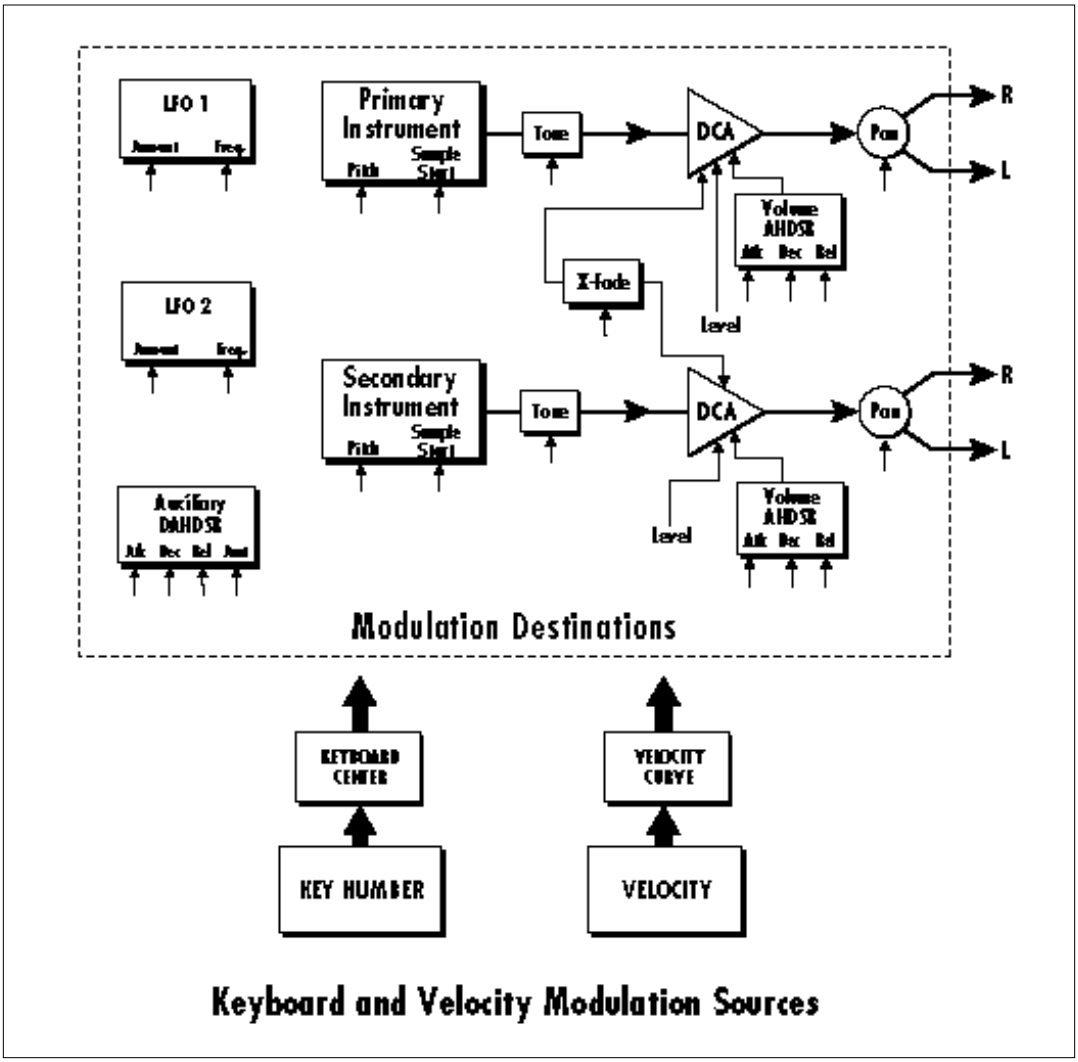
DESTINATIONS:
PITCH, PRIMARY PITCH, SECONDARY PITCH, VOLUME, PRIMARY VOLUME, SECONDARY VOLUME, ATTACK, PRIMARY ATTACK, SECONDARY ATTACK, DECAY, PRIMARY DECAY, SECONDARY DECAY, RELEASE, PRIMARY RELEASE, SECONDARY RELEASE, CROSSFADE, LFO 1 AMOUNT, LFO 1 RATE, LFO 2 AMOUNT, LFO 2 RATE, AUX. ENVELOPE AMOUNT, 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

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

KEYBOARD & VELOCITY MODULATION

These functions allow you to route keyboard and velocity information to any of the modulation destinations on Classic Keys. 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 will affect both.





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

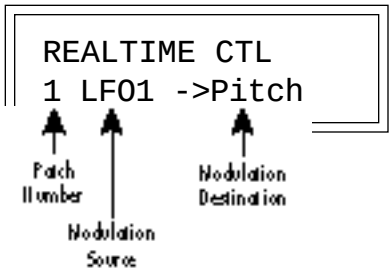
WHEN MODULATING ENVELOPE ATTACK, DECAY OR RELEASE TIMES:

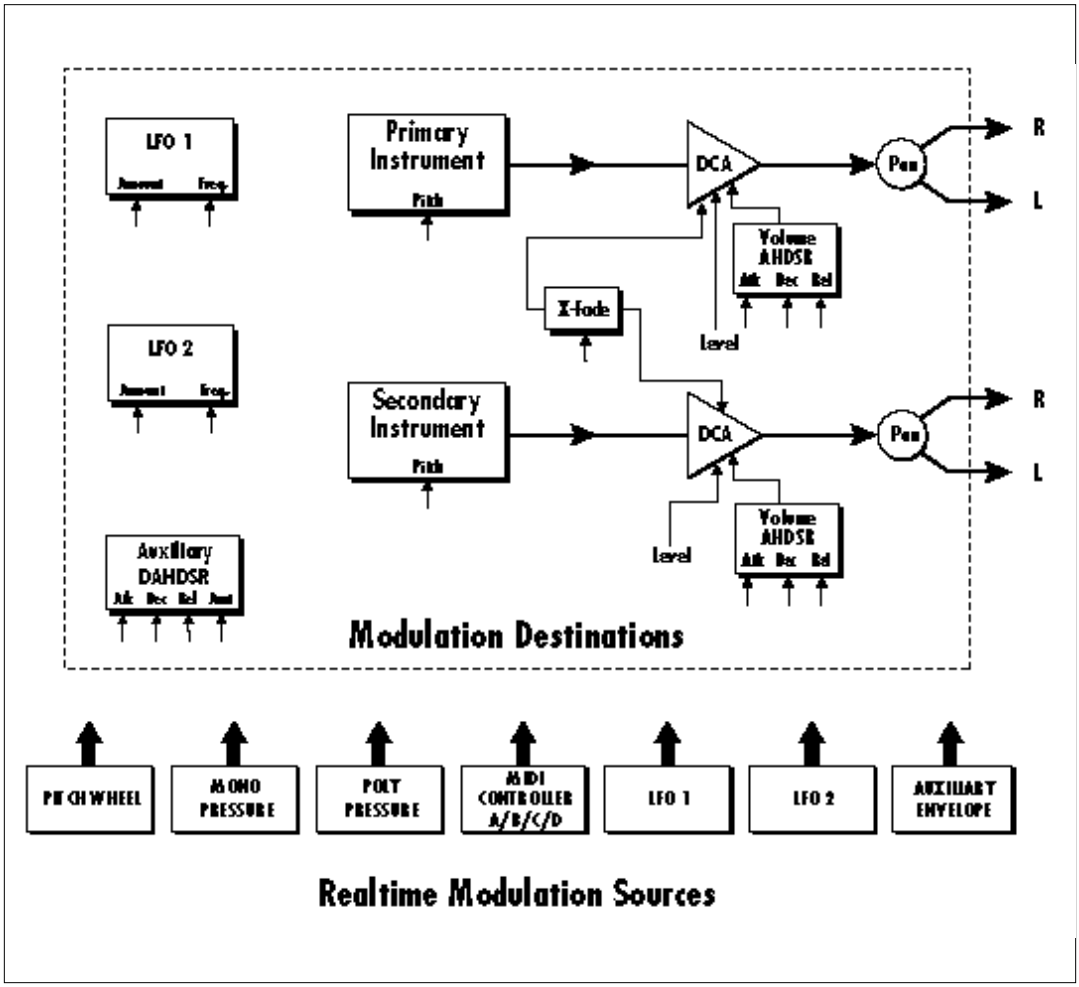
POSITIVE AMOUNTS OF MODULATION INCREASE THE TIME.

NEGATIVE AMOUNTS OF MODULATION DECREASE THE TIME.

REALTIME MODULATION CONTROL

These functions allow you to route realtime controllers to any of the modulation destinations on Classic Keys 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 will affect both.



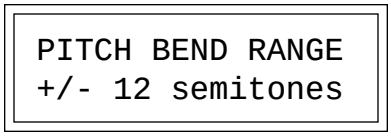


FOOTSWITCH CONTROL

This function allows you route the 3 footswitch controllers to any of the footswitch destinations. 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.

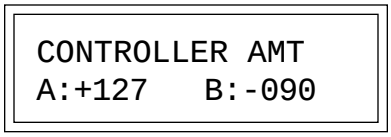
PITCH BEND RANGE

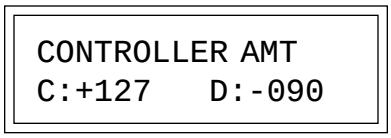
This function allows you to specify the pitch wheel range for the current preset or it can be set to be controlled globally (set in the Master menu). Pitch bend range is only applied when the pitch wheel is used to control pitch.



MIDI CONTROLLER AMOUNT

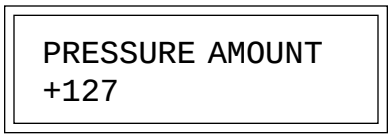
This function allows you to specify an amount parameter (variable from -128 to +127) for each of the MIDI controllers.





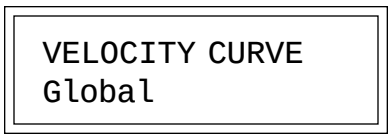
PRESSURE AMOUNT

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



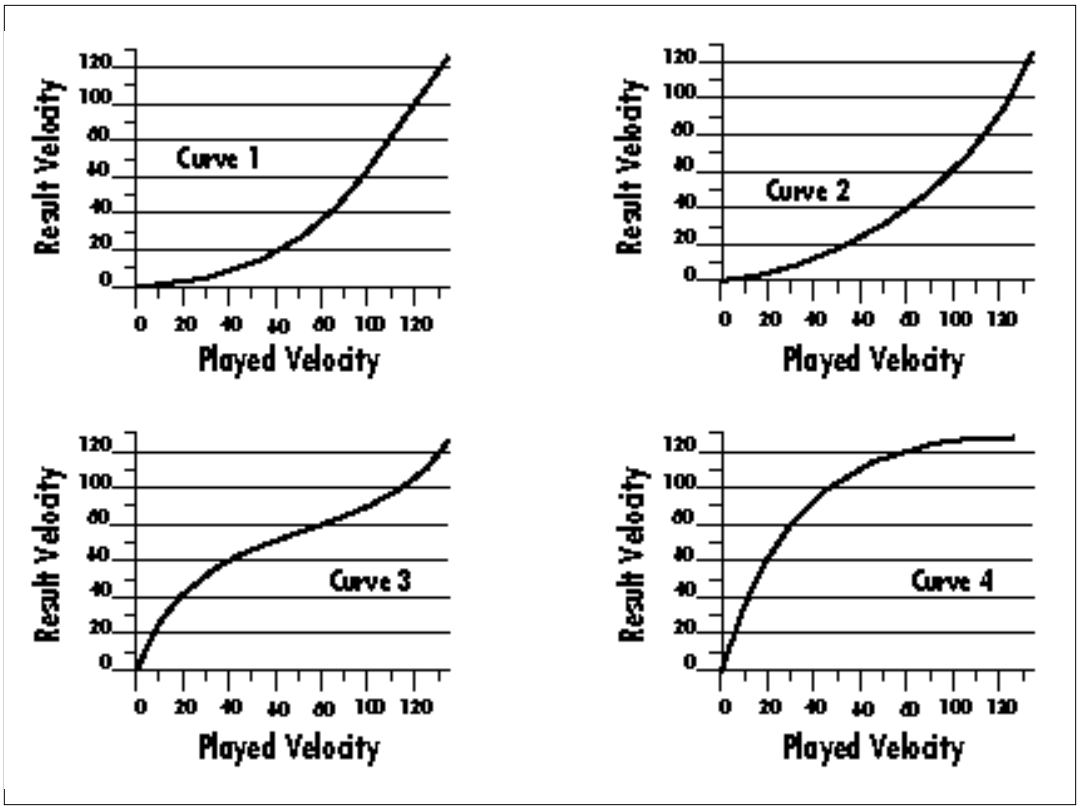
VELOCITY CURVE

Incoming velocity data can be modified by a velocity curve in order to provide different types of dynamics in response to your playing or 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.

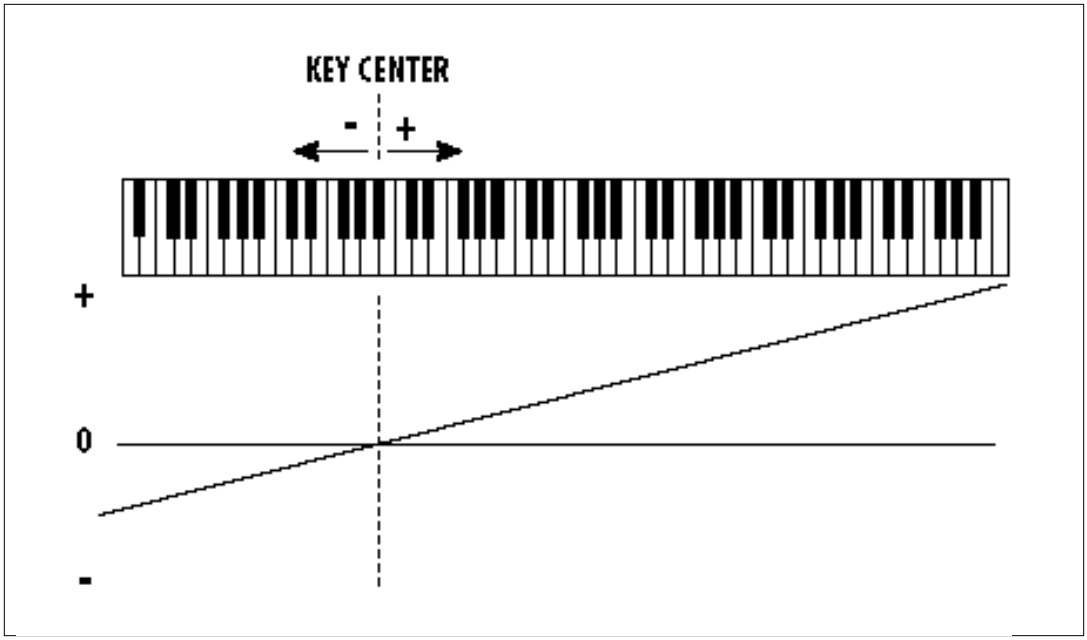


KEYBOARD CENTER

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.



Choose the velocity curve that works best for your playing style and your MIDI controller.



Above the Keyboard Center point, key values will be positive; below the Keyboard Center, key values will be negative.

KEYBOARD TUNING

In addition to the standard equally divided octave tuning, Classic Keys contains four other types of scale tuning and one user-definable tuning. This function selects which tuning will be used in the current preset. The available 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 & Young non-equal temperament
(Similar to 12 tone equal temperament; for a given scale, each key has a different character)

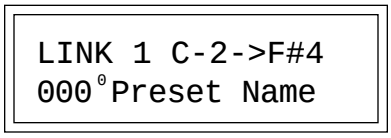
19-Tone tuning
19-tone equal temperament
(19 notes per octave; difficult to play but works well with a sequencer)

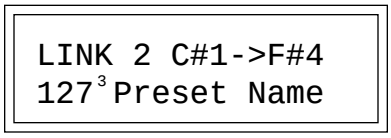
Gamelan tuning
Javanese tuning: 5-tone Slendro and 7-tone Pelog
(Pelog-white keys; Slendro-black keys
Exotic tunings of Gamelan flavor)

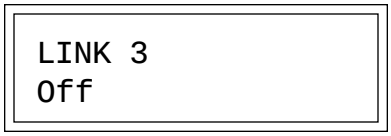
User tuning
Defined in the Master menu.

PRESET LINKS

Presets may be linked to other presets in order to create layering or keyboard splits. 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.

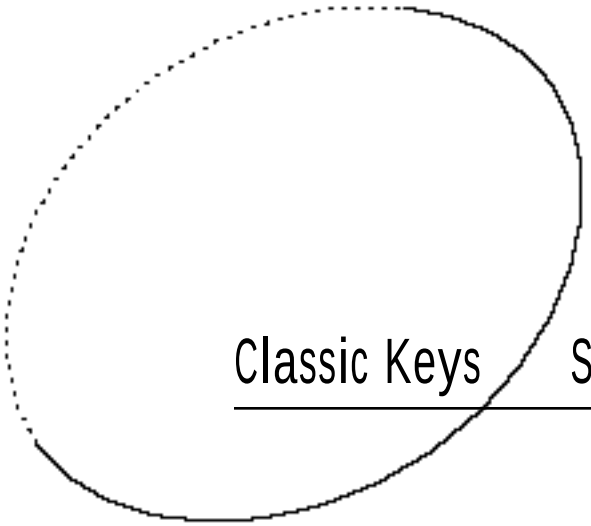






SAVE PRESET

Changes made to a preset in the Edit menu are not made permanent until the preset is Saved. To save a preset, move the cursor to the bottom line and select the location for the new preset with the data entry control. The Enter LED will be flashing. Pressing the Enter switch will confirm the operation. Any user preset (Banks 0 and 1) may be selected using the data entry control. Writing to a user preset erases the existing preset in that location. Make sure that the destination preset does not contain information that you want to keep.



Classic Keys STEP-BY-STEP

7 Step-By-Step

This section is an introduction to the Edit menu, explains the concept of Sound Splicing Synthesis, and contains specific programming examples and tips.

LINKING PRESETS

Linking presets is a quick and easy way to create new sounds by “layering presets” and also to “split” the keyboard into sections containing different sounds.

LAYERING TWO PRESETS

1) Select the first preset you wish to layer.
2) Press the Edit button.
3) Use the data entry control to move through the screens until you find one of the “LINK” screens.
4) Move the cursor to the second line of the display, then select the preset that you want to be linked with this preset. You may want to play the keyboard as you scroll through the various presets in order to hear the results.
5) If you want the link to be a permanent part of the preset, be sure to “SAVE PRESET”.

CREATE A SPLIT KEYBOARD USING LINKS

1) Follow steps 1 through 4 at left.
2) Now set the range of the linked preset while still in the LINK menu. Press Enter.
3) Now use the data entry control to move through the screens to KEY RANGE.
5) Set the range of the preset so that it fills the remaining range of your keyboard.
6) Save the preset.

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 Classic Keys. If you don't like what you hear, simply change the preset and Classic Keys reverts back to the original sound. Changes are not made permanent until you Save them using the "SAVE PRESET" function, which is the last screen in the Edit menu. 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 Edit button.

CHANGING THE INSTRUMENT

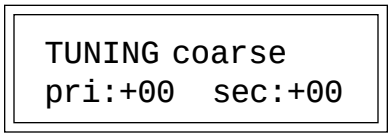
This is probably the easiest way to modify existing presets. Scroll through the Edit menu functions until you come to:

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:

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.

CHANGING THE TUNING OF AN INSTRUMENT

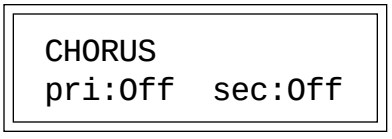
Scroll through the Edit menu functions until you come to:



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.

CHORUS

This is an easy one. With the cursor on the top line of the display, turn the data control until you find CHORUS. Chorus can be turned on or off for each of the primary and secondary instruments. Chorus works by doubling the instruments and detuning them slightly. Try it.



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:Off  sec:Off
```

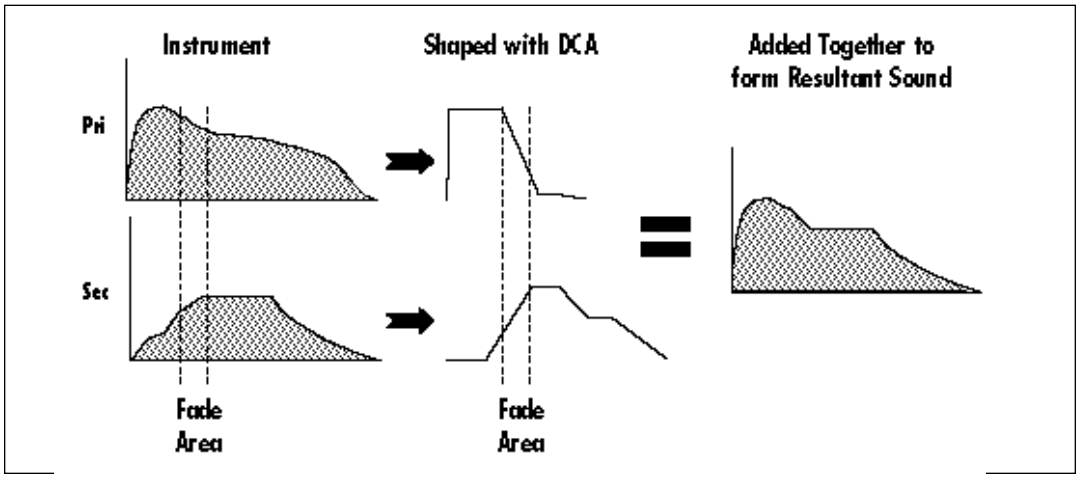
You're probably getting the idea by now. Remember not to change presets or the preset will return to normal. If you want to save your creation, select the last screen in the Edit menu and select a destination preset location for your masterpiece, then press Enter. That's it.

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!

SOUND SPLICING SYNTHESIS

Oh, no! Not another form of synthesis to learn. Relax. It's easy. Sound Splicing Synthesis is actually just a form of additive synthesis. Only, instead of building a sound from simple sine waves, Classic Keys 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.

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 you to combine elements of different instruments together to form completely new sounds. New sounds that are totally natural, because they are based on natural sounds. Classic Keys 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, Sample Start, and Crossfade allow you to further control the blend of primary and secondary instruments.



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

CREATING A NEW SOUND

As an example, let's add a sampled flute attack to a Mini Moog synthesizer sound to create a sort of Flute Synth. Start with one of the default presets and change only the parameters listed in the chart below. The flute instrument is shaped by the Alternate Volume Envelope so that only the breathy attack "chiff" is heard (a short Decay with the Sustain set to zero). Also the attack time has been set to 2 to soften the breath sound a bit.

The Mini Moog 1 instrument serves as the body of the sound. The delay parameter is used to delay the onset of the Mini Moog until the flute sound has died away. The Attack parameter of the Secondary Alternate Volume Envelope is set so that the Mini Moog will smoothly fade in as the Flute is fading out. Lastly, the volume of each instrument is adjusted to balance the sound.

Primary	Secondary
Instrument: Flute	Instrument: Mini Moog 1
Volume: 127	Volume: 91
Alt Envelope: On	Alt Envelope: On
A H D S R 02 02 16 00 16	A H D S R 12 00 43 59 40
Delay: 000	Delay: 003

REVERB SPACES

The reverb spaces allow you to add reverb ambience to Classic Keys drums. By layering an instrument containing only reverb with a "dry" drum instrument, the effect of real reverb is created. In addition, the reverb spaces can be shaped and filtered just like any other instrument. There are eleven reverb spaces (instruments 76-84, 86, 88) in Classic Keys.

Using the reverb spaces is easy. Use one of the default presets as your starting point. Set up the Edit menu parameters as in the chart below and change only the parameters specified.

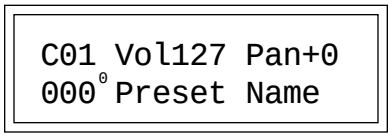
All we have done here is layer a drum kit with a reverb space, then adjust the volumes slightly. That's all there is to it! Try out all the different reverb spaces and note the differences. The reverb decay time can be shaped using the Alternate Volume Envelope.

The reverb spaces can be further shaped using Reverse, Chorus, or any of the other modulation parameters. How about using the Auxiliary Envelope to control the pitch of the reverb? You can do all kinds of new things with this reverb.

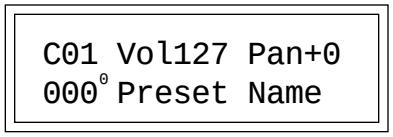
Primary	Secondary
Instrument: Drum Kit 1	Instrument: Medium Room
Alt Envelope: Off	Alt Envelope: Off
Volume: 100	Volume: 127

USING CLASSIC KEYS WITH A SEQUENCER

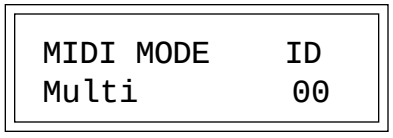
We thought you'd never ask. Classic Keys was designed from its conception with multi-timbral sequencing in mind. Just take a look at the main screen.



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



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! In order to respond to multiple MIDI channels, Classic Keys must be in Multi-Mode. Multi-Mode is selected in the Master menu. Press the Master menu button and use the data entry control to scroll through the screens until you find MIDI MODE.



Move the cursor down to the second line and change the mode to Multi as shown. Classic Keys will now respond to multiple MIDI channels.

MORE ADVANCED SEQUENCING

Pre-Sequence Setup

Suppose that you want to have your sequencer set up everything for you before the start of the song. Good idea. This will make the Classic Keys setup procedure automatic and prevent the wrong presets from playing.

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: Classic Keys 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.

Initial Setup

In the Master menu:

1) Turn ON Multi-Mode
2) Turn ON Preset Change enable for each channel.
3) Turn OFF MIDI Enable on MIDI channels that are to be used for other synthesizers.

PRESET, VOLUME & PAN SETUP

Program your MIDI sequencer to transmit the following information before the song starts.

1) Select the proper presets for each MIDI channel used on Classic Keys.
2) Send MIDI volume information (controller #7) for each MIDI channel used on Classic Keys.
3) Send MIDI pan information (controller #10) for each MIDI channel used on Classic Keys.

Now your song will play perfectly every time using the proper presets, volumes and pan positions. In addition, presets, volumes and pan positions (or anything else for that matter) can be adjusted in realtime during the song. Note: If the wrong presets are being selected, check the MIDI Program -> Preset Map.

To carry the pre-sequence setup even further, you can even include preset data for each preset used in the sequence. See page 30 for details.

USING THE 32 CHANNELS

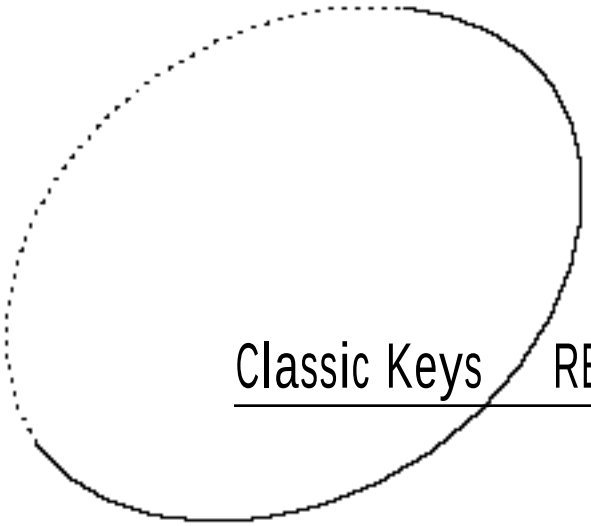
As stated earlier, Classic Keys has 32 independent audio channels which are utilized as needed. With 32 channels and 512 presets, you have a universe of sonic textures at your disposal. But you have probably noticed that many of the best sounding presets in Classic Keys are linked with other presets or have chorus applied to them in order to make them sound larger. While this is fine when the preset is played solo, you may begin to run out of channels when Classic Keys is played multi-timbrally. Linking and chorusing cause twice as many channels to be used by the preset. Learn to "budget" your output channels for maximum efficiency.

CHANNEL RIPOFF

When Classic Keys 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 Classic Keys in multi-timbral mode. To eliminate ripoff you must either, play fewer notes, use simpler sounds, turn off doubling (pri/sec, chorus, or linked presets), or use MIDI overflow to another Classic Keys.

INSTRUMENT DEFINITION

If your sequence has an instrumental section using numerous chords it may be advantageous to use a basic preset without links or chorus. 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. A solo saxophone in a band isn't chorused and it sounds great. Each voice in your composition should have it's own identity. Save the monster sounds for solos or dramatic effects.



RAM Presets Bank 0

Organ	0. org:Panner1%
	1. org:Rocky B3
	2. org:PercGrt%
	3. org:LoMidPr%
	4. org:LoHiPrc%
	5. org:HiPerc %
	6. org:StopsOut
	7. org:Lo Dark
	8. org:Airgan %
	9. org:Sticky %
	10. org:Bell Atk
	11. org:Rococo
	12. org:GrandM12
	13. org:Funeral
	14. org:Dynorg1
	15. org:w/Vibes
Electric Piano	16. epo:DXThang%
	17. epo:Dyno'd %
	18. epo:3 Dogs %
	19. epo:BasicEl.
	20. epo:Wurltzr%
	21. epo:WurlBel%
	22. epo:Clav Whl
	23. epo:DblHonr%
	24. epo:DoubleCP
	25. epo:Bright70
	26. epo:TakPiano
	27. epo:WideCP70
	28. epo:TronFade
	29. epo:Vox Fade
	30. epo:DX-70 %
	31. epo:CP-B3-70
String Synth	32. str:P5ala'99
	33. str:Solina
	34. str:SuperMel
	35. str:ThikMoog
	36. str:Moog Too
	37. str:OBXStrng
	38. str:ARPcomb1
	39. str:ARPcomb2
Airy Synth	40. air:WindKeys
	41. air:GasDyno
	42. air:PanninOz
	43. air:PanPiper
	44. air:Siku
	45. air:ARPreedz
	46. air:M12Quack
	47. air:DeepHeat
Buzzy Synth	48. buz:M12 Pad
	49. buz:BigBob55
	50. buz:ARP Pad
	51. buz:MoogPad3
	52. buz:MoogPad5
	53. buz:Rezo SEM
	54. buz:EMU/Moog
	55. buz:Wheel Op
Resonant Synth	56. rez:MoogPad1
	57. rez:MoogPad4
	58. rez:MoogPad6
	59. rez:OB Pad
	60. rez:P5Syncer
	61. rez:MoogPad2
	62. rez:ManyMoog
	63. rez:Cartoon
Bells	64. bel:StikBell
	65. bel:4OctBell
	66. bel:Gamalan
	67. bel:Metlimba
	68. bel:PanBells
	69. bel:Tubular
	70. bel:Led Xtal
	71. bel:WndChime
Warm Synth	72. wrm:Harmonia
	73. wrm:SineWave
	74. wrm:FlutWave
	75. wrm:Bendolin
	76. wrm:Beautifl
	77. wrm:Bend 4>5
	78. wrm:StrngGld
	79. wrm:WineGlas
Bass Synth	80. bas:Punchy
	81. bas:Hunted %
	82. bas:Moog5th%
	83. bas:SyncBtm%
	84. bas:TwoMoogs
	85. bas:B3 Pedal
	86. bas:PerkPedl
	87. bas:UduSynth
Synth Leads	88. led:MoogSqrs
	89. led:MoogSaws
	90. led:MoogRect
	91. led:OB Saws
	92. led:ARPpulse
	93. led:M12 Sync
	94. led:Pro5Sync
	95. led:Sweepy
Mellotron	96. trn:M&F Vox
	97. trn:Vln&FVox
	98. trn:Vln&MVox
	99. trn:Vln&Flut
	100. trn:FVx&Flut
	101. trn:Vx/Flut&
	102. trn:SwoopVox
	103. trn:HuluGurl
Brass	104. brs:Orson55%
	105. brs:Memories
	106. brs:MemMg5th
	107. brs:BigSect%
	108. brs:Section%
	109. brs:MiniWarm
	110. brs:BrassyMg
	111. brs:Taurs5th
Sound FX	112. sfx:Psycotic
	113. sfx:Who Me ?
	114. sfx:Ahh-Ahh
	115. sfx:Crazy
	116. sfx:Triffids
	117. sfx:Outer %
	118. sfx:Limits
	119. sfx:Huuuuge%
Plucked	120. plk:Kotolith
	121. plk:Hawaiian
	122. plk:SurfBird
	123. plk:Twangly%
	124. plk:Bass&Gtr
	125. plk:JazzBass
	126. plk:FunkBass
	127. plk:Bright %

% Indicates that the preset contains a Layered Link to one or more presets.

& Indicates that the preset contains a Split Link to one or more presets.

RAM Presets Bank 1

Organ	0. org:Panner2%
	1. org:Solo 1 &
	2. org:Solo 2 &
	3. org:Solo 3 &
	4. org:Solo 4 &
	5. org:Solo 5 %
	6. org:Solo 6 &
	7. org:Solo 7 &
	8. org:AirPower
	9. org:GameShow
	10. org:Cathedrl
	11. org:Liteness
	12. org:Morgan %
	13. org:RockPls&
	14. org:Dynorg2
	15. org:Clav Atk
Electric Piano	16. epo:Suitcs &
	17. epo:DynoRhd&
	18. epo:Hyper D&
	19. epo:Mark I &
	20. epo:HevyDyno
	21. epo:DynoDlay
	22. epo:TufWurli
	23. epo:WurlBs1&
	24. epo:WurlBs2&
	25. epo:WurliPan
	26. epo:ClavPanr
	27. epo:BuzzClav
	28. epo:SyncClav
	29. epo:CP/M12
	30. epo:CP/MemMg
	31. epo:Eko CP70
String Synth	32. str:LikeNife
	33. str:Bob&Toms
	34. str:M12 5ths
	35. str:OBcanyon
	36. str:GreatBig
	37. str:RotorTrn
	38. str:RotorARP
	39. str:RotorM12
Airy Synth	40. air:Omatic
	41. air:PanProV
	42. air:PanGtrz
	43. air:Subteran
	44. air:Escaping
	45. air:Flutgong
	46. air:Creepy
	47. air:Hu-Hu-Hu
Buzzy Synth	48. buz:ARPinet
	49. buz:Brazzzzz
	50. buz:DuckRock
	51. buz:ClavLike
	52. buz:Britely
	53. buz:Zophone
	54. buz:Buzync
	55. buz:Qwaack
Resonant Synth	56. rez:HotPile
	57. rez:Scary
	58. rez:ARPbssn
	59. rez:Harpspad
	60. rez:Fuzzywuz
	61. rez:FuzGrowl
	62. rez:GrowlWav
	63. rez:Rev Moog
Bells	64. bel:Vibalong
	65. bel:Malltbel
	66. bel:OohBells
	67. bel:Magic
	68. bel:Popsikl%
	69. bel:Disobel%
	70. bel:DigiMoog
	71. bel:Ironbel%
Warm Synth	72. wrm:Accordia
	73. wrm:RoadTone
	74. wrm:Clavsine
	75. wrm:DarkPipe
	76. wrm:PercPad
	77. wrm:Generatr
	78. wrm:Swirly
	79. wrm:PipeBndr
Bass Synth	80. bas:ARP Rez2
	81. bas:2 Micros
	82. bas:EkoMini%
	83. bas:Solidar%
	84. bas:ClavSyn
	85. bas:Watery %
	86. bas:B3 Bass
	87. bas:M12 Bass
Synth Leads	88. led:Interval
	89. led:Jumper
	90. led:55 Moogs
	91. led:2 OBies
	92. led:2 Moogz
	93. led:ISawMoog
	94. led:RezoMoog
	95. led:Moonman
Mellotron	96. trn:FemSwell
	97. trn:SwellGyz
	98. trn:SwlStrng
	99. trn:5thStrng
	100. trn:Strg&Vio
	101. trn:Vox &Vio
	102. trn:DualBend
	103. trn:Hulalins
Brass	104. brs:SoloAlto
	105. brs:SoloTenr
	106. brs:SoloBari
	107. brs:TwoSaxes
	108. brs:&Reeds %
	109. brs:Moog&Tpt
	110. brs:BrassPan
	111. brs:Sforzan%
Sound FX	112. sfx:TheOcean
	113. sfx:Nostromo
	114. sfx:Desent
	115. sfx:BronzAge
	116. sfx:Lifetime
	117. sfx:DripDrum
	118. sfx:VanDgraf
	119. sfx:Scanline
Plucked	120. plk:AsiaEns%
	121. plk:SlideHrm
	122. plk:LesliGtr
	123. plk:Spageti%
	124. plk:BassChr1
	125. plk:BassChr2
	126. plk:Bas/Harm
	127. plk:BasicBas

% Indicates that the preset contains a Layered Link to one or more presets.

& Indicates that the preset contains a Split Link to one or more presets.

ROM Presets Bank 2

Organ	0. org:B3 Fast
	1. org:Lo&Mid %
	2. org:Lo&Hi %
	3. org:MostHi %
	4. org:Mid&Hi %
	5. org:LoPerc %
	6. org:FulPerc%
	7. org:DrkPerc%
	8. org:Airy B3
	9. org:FulBars%
	10. org:Topper %
	11. org:Bostone%
	12. org:Chappel%
	13. org:SimpleLo
	14. org:SimpleHi
	15. org:SmplFull
Electric Piano	16. epo:MkI Chrs
	17. epo:LA Dyno%
	18. epo:DynoWhl%
	19. epo:SpltRoad
	20. epo:RuffDyno
	21. epo:Suitcase
	22. epo:HypDyno%
	23. epo:DoorBas%
	24. epo:Stereo
	25. epo:Xpresive
	26. epo:GrandOrg
	27. epo:Pianofla
	28. epo:CP/M12
	29. epo:CP/ARP
	30. epo:Out West
	31. epo:Gospel
String Synth	32. str:For Film
	33. str:Early80s
	34. str:Matrix12
	35. str:MeloMoog
	36. str:ARPtron
	37. str:NoyzTron
	38. str:Tron #1
	39. str:Tron #2
Airy Synth	40. air:Enchantd
	41. air:Asiatic
	42. air:Delicate
	43. air:D50ish 1
	44. air:WindPowr
	45. air:Digital
	46. air:Kaliopad
	47. air:Jacinto
Buzzy Synth	48. buz:ARPwave1
	49. buz:OBXwave1
	50. buz:EMUwave1
	51. buz:MoogPuls
	52. buz:OBXwave2
	53. buz:P5Gitarz
	54. buz:EMUHarps
	55. buz:P5 Harps
Resonant Synth	56. rez:ARP Poly
	57. rez:MoogFilt
	58. rez:KtchSynk
	59. rez:ARPenatr
	60. rez:Moogles
	61. rez:Al & Bob
	62. rez:OBXJump
	63. rez:Growl %
Bells	64. bel:Patina
	65. bel:Mystery
	66. bel:Ringer
	67. bel:Vibrafon
	68. bel:Carillon
	69. bel:Xtal 1 %
	70. bel:MusicBox
	71. bel:ToyPiano
Warm Synth	72. wrm:Sub Dude
	73. wrm:Flautish
	74. wrm:BrassPad
	75. wrm:Pluto
	76. wrm:Carousel
	77. wrm:Matrix
	78. wrm:AirMen
	79. wrm:Infinity
Bass Synth	80. bas:MinMog1%
	81. bas:MinMog2%
	82. bas:ARPrezo%
	83. bas:MicroMg%
	84. bas:MinMog3
	85. bas:MinMog4%
	86. bas:MinMog5%
	87. bas:Rez Body
Synth Leads	88. led:Emu Saws
	89. led:Emu Sqrs
	90. led:Emu Tri
	91. led:EchoMoog
	92. led:MicroMem
	93. led:P5 Sync
	94. led:Dual SEM
	95. led:Winter
Mellotron	96. trn:Flute
	97. trn:FlutMoog
	98. trn:VerbFlut
	99. trn:FlutePan
	100. trn:FemChoir
	101. trn:MenChoir
	102. trn:MixChoir
	103. trn:Noys2Men
Brass	104. brs:MemMoog
	105. brs:FatBrass
	106. brs:Regality
	107. brs:3 Piece
	108. brs:With Sax
	109. brs:SoloMood
	110. brs:Scoop
	111. brs:TronBrs%
Special FX	112. sfx:Peckerz
	113. sfx:Vynlator
	114. sfx:Dicer
	115. sfx:Landing
	116. sfx:Yes Sir
	117. sfx:Microbs
	118. sfx:DigiSlic
	119. sfx:MagiFlut
Plucked	120. plk:TheGitar
	121. plk:Ricki 12
	122. plk:Hrmonics
	123. plk:AcGuitar
	124. plk:PickBass
	125. plk:Fretless
	126. plk:WithTop%
	127. plk:Fingerz

% Indicates that the preset contains a Layered Link to one or more presets.

& Indicates that the preset contains a Split Link to one or more presets.

ROM Presets Bank 3

Organ	0. org:HmndGrit
	1. org:ChrchLdy
	2. org:KeyClick
	3. org:AirSatz%
	4. org:Cussive%
	5. org:Chopper
	6. org:EchoHall
	7. org:Meddle
	8. org:Vox Cont
	9. org:Farfisa
	10. org:Voxfisa
	11. org:Jaguar 1
	12. org:Jag Sub5
	13. org:Jag Sub8
	14. org:FarfClik
	15. org:FarfPerc
Electric Piano	16. epo:DryWurli
	17. epo:Back Jak
	18. epo:WurliChr
	19. epo:Clavinet
	20. epo:DblClav%
	21. epo:Sweetbel
	22. epo:Faux DX%
	23. epo:Zircon %
	24. epo:Pianet
	25. epo:CP Wheel
	26. epo:&MoogStr
	27. epo:CPChorus
	28. epo:CP/Tron
	29. epo:PlusDXep
	30. epo:SlapEcho
	31. epo:Mono Pan
String Synth	32. str:SmalHall
	33. str:ThickSyn
	34. str:ARPStrng
	35. str:M12Strng
	36. str:LargHall
	37. str:Tron/M12
	38. str:StopTron
	39. str:Trn+Brs%
Airy Synth	40. air:AngelVox
	41. air:Fairlite
	42. air:BeloVox
	43. air:MoogPipe
	44. air:Breath
	45. air:OzonLayr
	46. air:P5 Echo
	47. air:D50ish 2
Buzzy Synth	48. buz:BizzARP
	49. buz:Tamboras
	50. buz:Air Gtrs
	51. buz:ARP 2600
	52. buz:ARPreedz
	53. buz:OB SEM3
	54. buz:Elecroad
	55. buz:ARPwave2
Resonant Synth	56. rez:DualSync
	57. rez:Moog 55
	58. rez:EchoSync
	59. rez:Sitarz %
	60. rez:Reztyne%
	61. rez:AbleCmp%
	62. rez:Rippoff
	63. rez:DublM12%
	64. bel:BelPiper
Bells	65. bel:ToyPno 2
	66. bel:DxAngels
	67. bel:ViboMoog
	68. bel:Xtal 2 %
	69. bel:PerKlavr
	70. bel:Xylosyn
	71. bel:Dreamy %
Warm Synth	72. wrm:Monk Vox
	73. wrm:Moogoid
	74. wrm:Ancients
	75. wrm:Pan Comp
	76. wrm:Submerge
	77. wrm:Tangerin
	78. wrm:Alaska
	79. wrm:Steam
Bass Synth	80. bas:LowMoog%
	81. bas:Garggle%
	82. bas:MoogRip%
	83. bas:WetMoog%
	84. bas:MoogPerc
	85. bas:MoogRez%
	86. bas:DeepBas9
	87. bas:Taurus I
Drums	88. drm:JimerWhl
	89. drm:BoomKick
	90. drm:Lo Toms
	91. drm:SnareTom
	92. drm:ElCowBel
	93. drm:El Snare
	94. drm:El Stick
	95. drm:BasicKit
Links	96. lnk:1 4Split
	97. lnk:2 4Split
	98. lnk:3 4Split
	99. lnk:4 4split
	100. lnk:5 4Split
	101. lnk:FullPan%
	102. lnk:EpoBoost
	103. lnk:Organ 1
	104. lnk:Organ 2
	105. lnk:Organ 3
	106. lnk:Organ 4
	107. lnk:Organ 5
	108. lnk:Organ 6
	109. lnk:Organ 7
	110. lnk:Organ 8
	111. lnk:Organ 9
	112. lnk:Organ10%
	113. lnk:Organ 11
	114. lnk:Organ 12
	115. lnk:Booster1
	116. lnk:Booster2
	117. lnk:Booster3
	118. lnk:DXBoost1
	119. lnk:DXBoost2
	120. lnk:Organ 13
	121. lnk:Organ 14
	122. lnk:Organ 15
	123. lnk:Sfrz 2
	124. lnk:0>11
	125. lnk:Clavlink
	126. lnk:MeatBotm
	127. – default –

% Indicates that the preset contains a Layered Link to one or more presets.

& Indicates that the preset contains a Split Link to one or more presets.

Classic Instruments

SAMPLED SOUNDS

1. B3DistLwSlw ..... Distorted B3 Organ, Low Drawbars, Slow Rotor
2. B3 Dist Fast ..... Distorted B3 Organ, Fast Rotor
3. B3 Hi Slow ..... B3 Organ, High Drawbars, Slow Rotor
4. B3 Hi Fast ..... B3 Organ, High Drawbars, Fast Rotor
5. B3 Full Slow ..... B3 Organ, Full Drawbars, Slow Rotor
6. B3 Full Fast ..... B3 Organ, Full Drawbars, Fast Rotor
7. B3 Perc 3rd ..... B3 Organ 3rd Harmonic Percussion
8. Male Choir ..... Mellotron - Male Choir
9. Femme Choir ..... Mellotron - Female Choir
10. Males to Mix ..... Mellotron - Male Choir (to mix with Inst. 11)
11. Femmes to Mix ..... Mellotron - Female Choir (to mix with Inst. 10)
12. Violin Trio ..... Mellotron - Violins
13. Flute ..... Mellotron - Flute
14. Bari Sax ..... Baritone Saxophone
15. Tenor Sax ..... Tenor Saxophone
16. Alto Sax ..... Alto Saxophone
17. Trumpet Sft ..... Soft-blown Trumpet
18. Trumpet Hrd ..... Hard-blown Trumpet
19. Trombone ..... Trombone
20. Trom/STpt ..... Trombone/Soft Trumpet Split
21. Trom/HTpt ..... Trombone/Hard Trumpet Split
22. Trom/Sax ..... Trombone/Sax Split
23. Farfisa ..... Farfisa Organ
24. CP-70 ..... CP-70 Piano
25. CP-70 Mellow ..... CP-70 Piano with Mellow Tone
26. CP-70 Brite ..... CP-70 Piano with Bright Tone
27. Piano Bass ..... CP-70 Piano Bass - Transposed
28. Wurlitzer1 ..... Wurlitzer Electric Piano 1
29. Wurlitzer2 ..... Wurlitzer Electric Piano 2
30. Dyno Rhodes1 ..... Dyno-My-Rhodes Electric Piano 1
31. Dyno Rhodes2 ..... Dyno-My-Rhodes Electric Piano 2
32. FendrRhodes ..... Fender Rhodes Electric Piano
33. Clavinet ..... Hohner Clavinet
34. Brite Clavinet ..... Bright Hohner Clavinet
35. Mini Moog 1 ..... Mini Moog w/Low Resonance
36. Mini Moog 2 ..... Mini Moog w/ Med Resonance
37. Mini Moog 3 ..... Mini Moog w/High Resonance
38. Mini Moog 4 ..... Mini Moog w/Lower Cutoff
39. Mini Moog 5 ..... Mini Moog Horn Sound
40. Mini Moog 6 ..... Mini Moog w/Osc->Filter Modulation
41. Micro Moog ..... Micro Moog w/ Osc->Filter Modulation
42. Taurus Pedal ..... Moog Taurus Bass Pedal

Classic Instruments

43. Jaco Bass ..... DX-7 Bass Sound
44. M12 Lead 1 ..... Oberheim Matrix-12 Sync Patch 1
45. M12 Lead 2 ..... Matrix-12 Sync Patch 2
46. ARP 2600 ..... ARP 2600 Synth w/ Osc->Filter Modulation
47. Rock DXman ..... DX-7 played through Rockman
48. P5 Sync Lead ..... Prophet-5 Sync Patch
49. Moog 55 Rez ..... Moog Model 55 w/ Filter Resonance
50. Memory Moog ..... Memory Moog - Horn Patch
51. OBX Saws ..... Oberheim OBX - Sawtooth Patch
52. P5 Guitar Pad ..... Prophet-5 - Guitar-like Patch
53. Matrix Pad ..... Matrix-12 - Hollow Patch
54. P5 Piper ..... Prophet-5 - Overblown Pipe Patch
55. P5 Strings ..... Prophet-5 - String Patch
56. M12 Strings ..... Matrix-12 - String Patch
57. ARP Strings ..... ARP String Ensemble
58. AHHHs ..... Fairlight Vocals
59. Picked Bass ..... Picked Bass Guitar
60. Finger Bass ..... Fingerpicked Bass Guitar
61. Finger Tre ..... Fingerpicked Bass Guitar
62 Pickd 8 Top ..... 8-String Bass Guitar
63. Finger 8 Top ..... 8-String Bass Guitar
64. Finger 8 Tre ..... 8-String Bass Guitar
65. The Guitar ..... Clean Electric Guitar
66. Twelve Top 1 ..... 12-String Guitar
67. Twelve Top 2 ..... 12-String Guitar
68. Twelve Top 3 ..... 12-String Guitar
69. Drum Kit 1 .....
70. Drum Kit 2 .....
71. Drum Kit 3 .....
72. Drum Kit 4 .....
73. Drum Kit 5 .....
74. Drum Kit 6 .....
75. Drum Kit 7 .....

See the Percussion Instrument Location Diagrams on pages 101-103.

76. Large Hall .....
77. Medium Room .....
78. Tiled Room .....
79. Gated Short .....
80. Gated Long 1 .....
81. Gated Long 2 .....
82. Lush Reverb .....
83. Blush Reverb .....
84. Full On Reverb .....

Reverb Spaces to combine with Drum Kits 1-7.

See the Reverb Space Diagram on page 103.

* The names of the above-mentioned instruments may be trademarks of third parties. In order to create the instrument sounds, E-mu records such sound from the respective instrument and the recording is converted into a digital signal which is then modified as necessary to be stored in a read only memory (ROM) device.

Waveforms

85. Dry Kick ..... Dry Kick Drum over the full keyboard range
86. Kick Verb ..... Kick Drum Reverb over the full keyboard range
87. Dry Snare ..... Dry Snare Drum over the full keyboard range
88. Snare Verb ..... Snare Drum Reverb over the full keyboard range
89. Dry Tom ..... Dry Tom Tom over the full keyboard range
90. Wet Tom ..... Ambient Tom Tom over the full keyboard range
91. High Hat 1 ..... Closed Hi-Hat over the full keyboard range
92. High Hat 2 ..... Half Closed Hi-Hat over the full keyboard range
93. High Hat 3 ..... Open Hi-Hat over the full keyboard range
94. Ride Ping ..... Ride Cymbal Ping over the full keyboard range
95. Ride Bell ..... Ride Cymbal Bell over the full keyboard range
96. Crash ..... Crash Cymbal over the full keyboard range
97. Cowbell ..... Cowbell over the full keyboard range
98. Tambourine ..... Tambourine over the full keyboard range
99. Side Stick ..... Snare Side Stick over the full keyboard range
100. Clave ..... Rosewood Clave over the full keyboard range

SYNTHESIZER & ORGAN WAVEFORMS

The single cycle waveforms are sampled waves from various synthesizers and organs. The Moog, ARP & OB waves have been sampled with various filter settings characteristic of each unit.

The B3 waves are various harmonic drawbar settings designed to be used alone or layered together with the multi-cycle organ samples (instruments 1-7). The various drawbar settings were selected to produce an extremely wide degree of variation. See the B3 Wave Drawbar Setting Diagrams on pages 98-100.

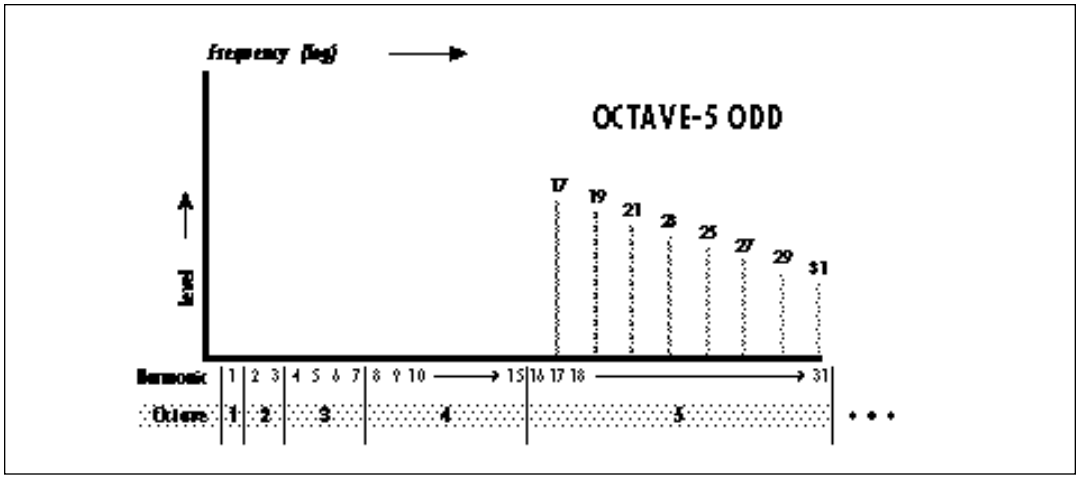
101. Square
102. Sawtooth
103. Triangle
104. Moog Saw 1
105. Moog Saw 2
106. Moog Saw 3
107. Moog Saw 4
108. Moog Square 1
109. Moog Square 2
110. Moog Square 3
111. Moog Square 4
112. Moog Square 5
113. Moog Square 6
114. Moog Rectangle 1
115. Moog Rectangle 2
116. Moog Rectangle 3
117. Moog Rectangle 4
118. Moog Rectangle 5
119. Moog Pulse 1
120. Moog Pulse 2
121. Moog Pulse 3
122. Moog Pulse 4
123. Moog Pulse 5
124. OB Wave 1
125. OB Wave 2
126. OB Wave 3
127. OB Wave 4
128. OB Wave 5
129. ARP 2600 1
130. ARP 2600 2
131. ARP 2600 3

Waveforms

132. B3 Wave 1
133. B3 Wave 2
134. B3 Wave 3
135. B3 Wave 4
136. B3 Wave 5
137. B3 Wave 6
138. B3 Wave 7
139. B3 Wave 8
140. B3 Wave 9
141. B3 Wave 10
142. B3 Wave 11
143. B3 Wave 12
144. B3 Wave 13
145. B3 Wave 14
146. B3 Wave 15
147. B3 Wave 16
148. B3 Wave 17
149. B3 Wave 18
150. ARP Clarinet
151. ARP Bassoon
152. P5 No-Tone
153. Noise Non-X

HARMONIC WAVEFORMS

154. Oct 1 (Sine)
155. Oct 2 All
156. Oct 3 All
157. Oct 4 All
158. Oct 5 All
159. Oct 6 All
160. Oct 7 All
161. Oct 2 Odd
162. Oct 3 Odd
163. Oct 4 Odd
164. Oct 5 Odd
165. Oct 6 Odd
166. Oct 7 Odd
167. Oct 2 Even
168. Oct 3 Even
169. Oct 4 Even
170. Oct 5 Even
171. Oct 6 Even
172. Oct 7 Even
173. Low Odds
174. Low Evens
175. Four Octaves



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

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 wide range of timbres may be produced.

Waveforms

SINGLE CYCLE WAVEFORMS

These single cycle waveforms were either synthesized or taken from actual sampled sounds. Each wave has a unique tonal quality.

176. Synth Cycle 1
177. Synth Cycle 2
178. Synth Cycle 3
179. Synth Cycle 4
180. Fundamental Gone 1
181. Fundamental Gone 2
182. Bite Cycle
183. Buzzy Cycle
184. Metalphone 1
185. Metalphone 2
186. Metalphone 3
187. Metalphone 4
188. Duck Cycle 1
189. Duck Cycle 2
190. Duck Cycle 3
191. Wind Cycle 1
192. Wind Cycle 2
193. Wind Cycle 3
194. Wind Cycle 4
195. Organ Cycle 1
196. Organ Cycle 2
197. Violin Essence
198. Buzzoon
199. Brassy Wave
200. Reedy Buzz
201. Growl Wave
202. HarpsiWave
203. Fuzzy Gruzz
204. Power 5ths
205. Filter Saw
206. Ramp
207. Evens Only
208. Odds Gone
209. Ice Bell
210. Bronze Age
211. Iron Plate
212. Aluminum
213. Lead beam
214. Steel Xtract
215. Winter Glass
216. Town bell
217. Orch Bells
218. Tubular SE
219. Soft Bell
220. Swirly
221. Tack Attack
222. Shimmer Wave
223. Mild Tone
224. Ah Wave
225. Vocal Wave
226. Fuzzy Clav
227. Electrhode
228. Whine 1

MULTI-CYCLE WAVEFORMS

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

229. Filter Bass
230. Harmonics
231. ElecPiano
232. Marimba Attack
233. Vibe Attack
234. Xposed Noise

Waveforms

LOOPS AND PILES

Loops are single samples continuously looped.

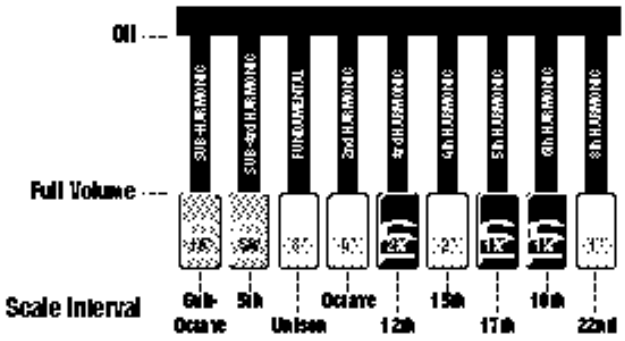
Piles are continuous loops containing multiple samples.

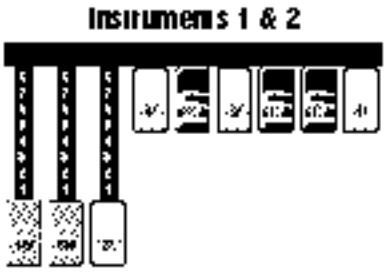
Loops and Piles are useful for special effects and can provide rhythmic accompaniment when chords are played. Extreme transpositions may also yield unusual effects.

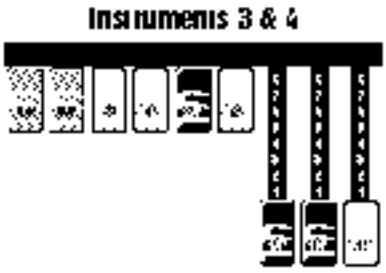
235. Marimba Loop
236. Vibes Loop
237. Stick Loop
238. Cowbell Loop
239. Clave Loop
240. Hi Hat Loop
241. Drum Pile
242. CP-70 Pile
243. Pick Bass Pile
244. Guitar Pile
245. Finger Bass Pile
246. Moog Loop
247. OB Loop
248. Frost Loop
249. Memory Loop

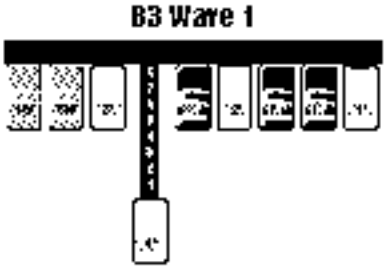
Drawbar Diagrams

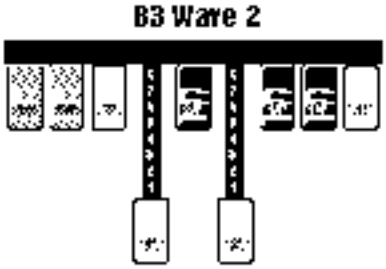
Each drawbar controls the volume of its associated harmonic or overtone. The 8" drawbar is the fundamental pitch of the sound. Note that instruments 1-7 are full length samples, while waves 1-18 are single cycle loops.

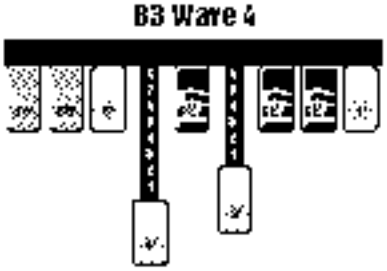


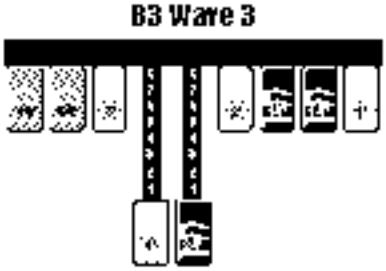






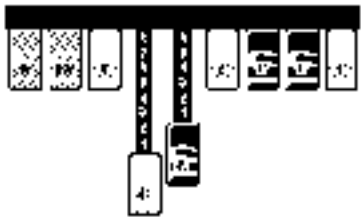




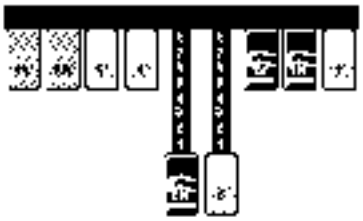


Drawbar Diagrams

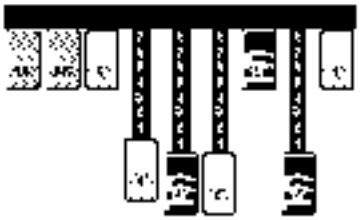
B3 Wave 5



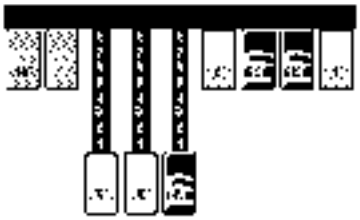
B3 Wave 6



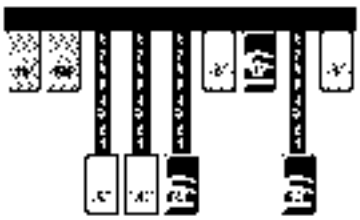
B3 Wave 7



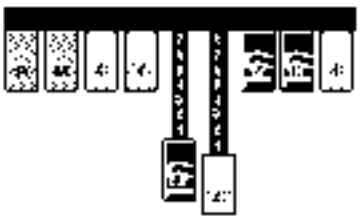
B3 Wave 8



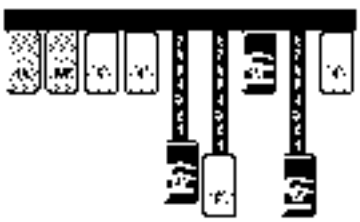
B3 Wave 9



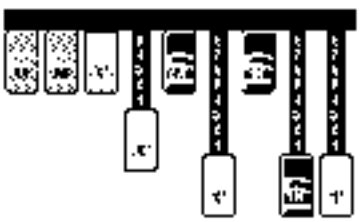
B3 Wave 10



B3 Wave 11



B3 Wave 12

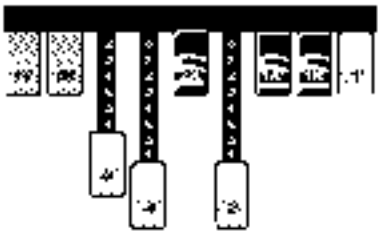


Drawbar Diagrams

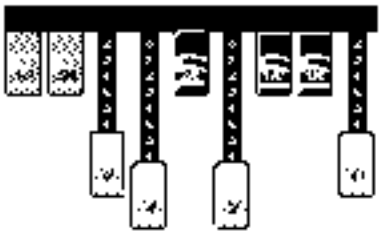
B3 Wave 13

B3 Wave 14

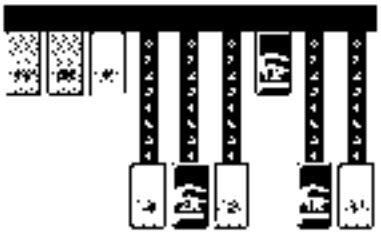
B3 Wave 15



B3 Wave 16



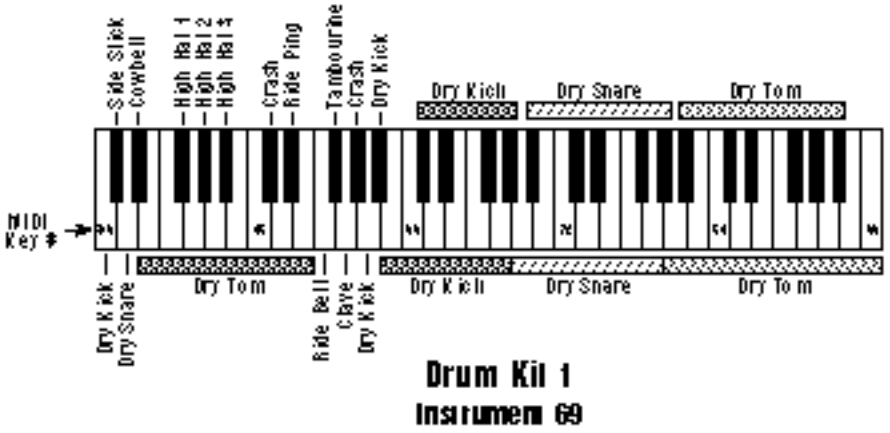
B3 Wave 17



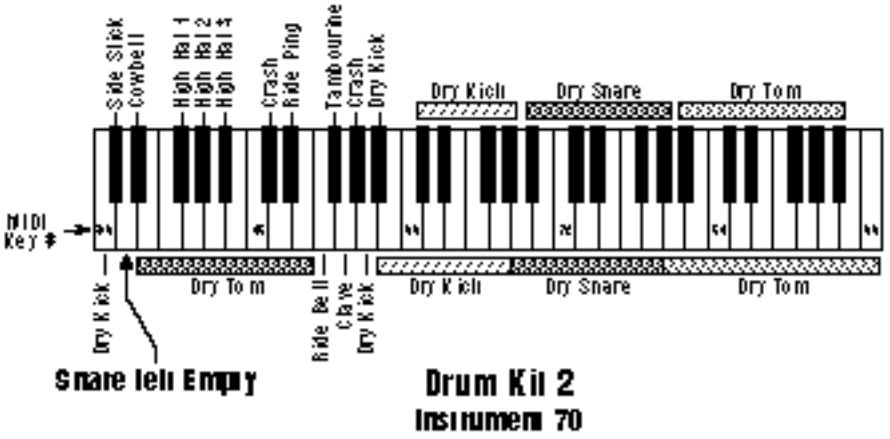
B3 Wave 18

Percussion Instrument Locations

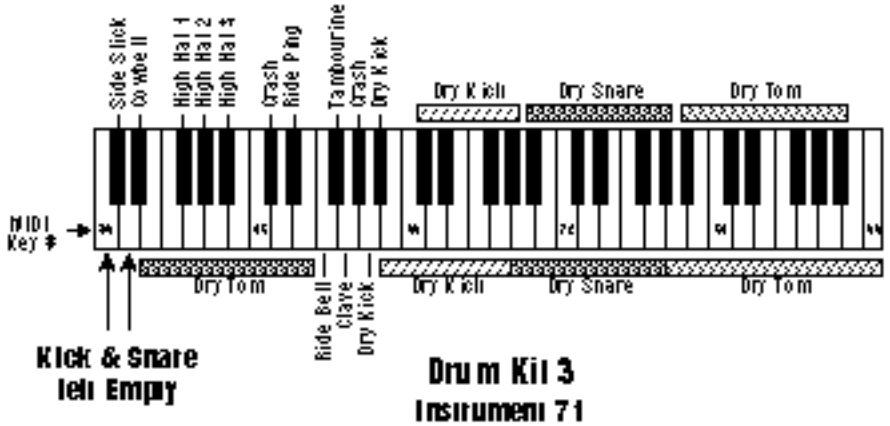
ALL DRUMS



SNARE EMPTY
Allows you to place a tuned snare (inst. #87) in this location using the secondary layer.

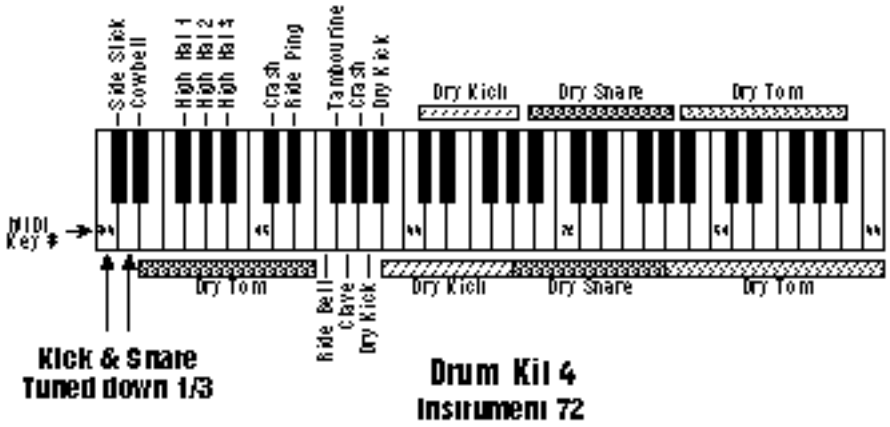


KICK & SNARE EMPTY
Allows you to place tuned kick & snares (inst. 85 & 87) in these locations using the secondary layer or links.

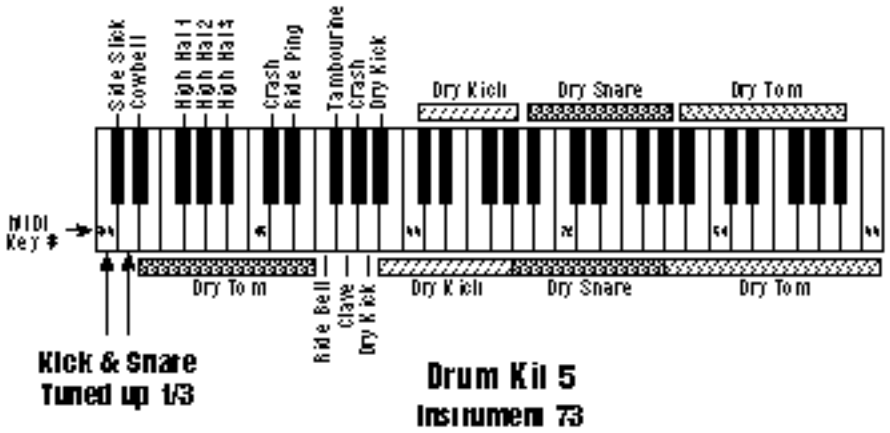


Percussion Instrument Locations

KICK & SNARE TUNED DOWN

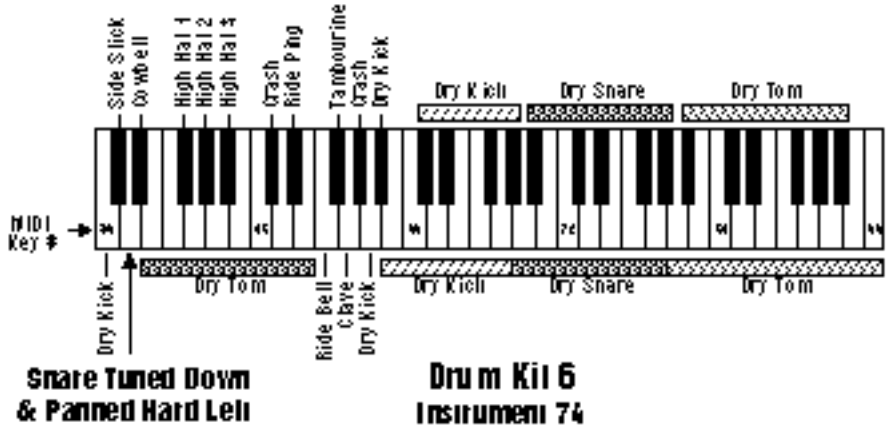


KICK & SNARE TUNED UP



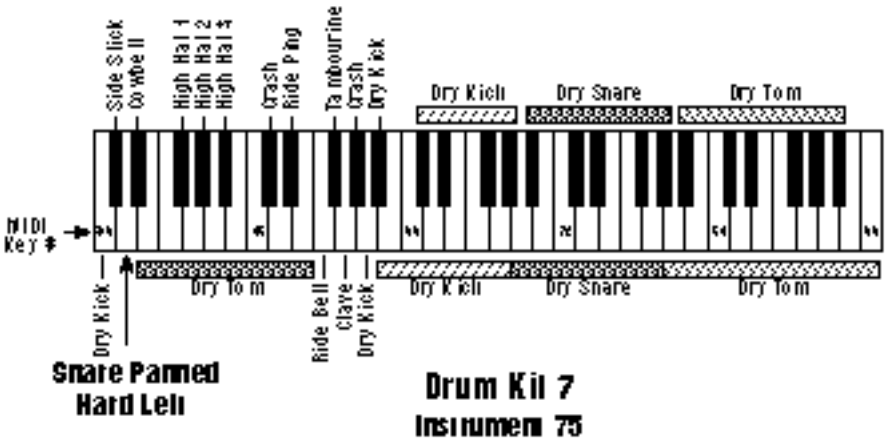
SNARE TUNED DOWN, PANNED LEFT

Allows you to create a stereo snare by panning the secondary snare hard right. (Hint: use delay, tuning, sound start.)

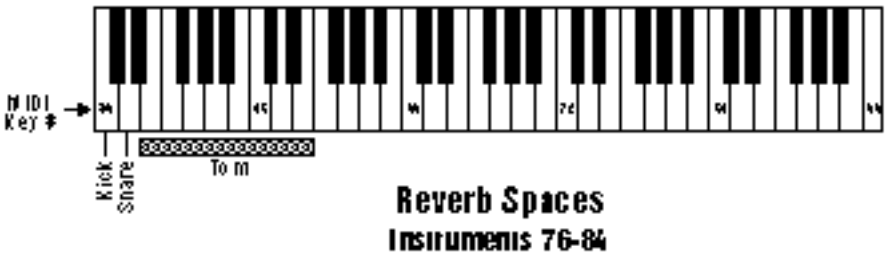


Percussion Instrument Locations

SNARE PANNED LEFT
Allows you to create a stereo snare by panning the secondary snare hard right. (Hint: use delay, tuning, sound start.)



REVERB SPACES
Allows you to add reverb by layering with Drum Kits 1-7.



For more information on the Reverb Spaces, see page 84 of this manual.

Technical Specifications

Audio Channels 32

Max. Output Level ..... +4 dB into 600Ω

Output Impedance 100Ω

MIDI ..... In, Out, Thru

Data Encoding ..... 16 bit linear

Sample Playback Rate ..... 39 kHz

Signal to Noise: ..... >90 dB

Dynamic Range ..... >90 dB

Frequency Response ..... 20 Hz - 18 kHz

THD + N ..... <.05%

IMD ..... <.05%

Power Requirements ..... 25 Watts

Operating Temperature ..... 100° F Max.

Dimensions ..... H: 1.75" W: 19" L: 6"
(H: 4.4cm W: 48.3cm L: 15.2cm)

Weight ..... 4 lb, 9 oz (2 Kg)

MIDI Implementaion Chart

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	No No	1 1-16	Memorized
Mode	Default Messages	Yes	Mode 1, 3, 4 MONO, POLY OMNI, ON/OFF	Memorized
Hole Number	True Voice	No No	0-127 0-127	
Velocity	Hole ON Hole OFF	No No	Yes v=1-127 No	
After Touch	Keys Channels	No No	Yes Yes	
Pitch Bender		No	Yes	
Control Change		No	Yes	0-31 64-79
Program Change	True Number	No No	Yes 0-127 Yes 0-127	
All Sound Off		No	Yes	
All Holes Off		No	Yes	
Reset All Controllers		No	Yes	
System Exclusive		Yes	Yes	
System Common	Song Pos Song Sel :Tune	No No No	No No No	
System Real Time	:Clock :Commands	No No	No No	
Aux Messages	:Local On/Off :Active Sense :Reset	No No No	No No No	

Notes: Pan 0=hard left 127=hard right

Mode 1: OMNI ON, POLY Mode 2: OMNI ON, MONO
Mode 3: OMNI OFF, POLY Mode 4: OMNI OFF, MONO

GENERAL INFORMATION FOR CLASSIC KEYS

- Product ID is 04.
- Device ID is [00-0F] (0-15 decimal).
- Since MIDI data bytes cannot be greater than [7F] (127 decimal), the data values are “nibble-ized” to a 14-bit signed 2's complement format.
- There is only one edit buffer which is for the current preset (the preset shown in the display). Only one preset at a time can be edited via SysEx commands and changing the current preset erases the edit buffer.

MIDI Specification

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 = 01-31
Footswitch	Bn cc vv	cc = 64-79, vv ≥ 64 = on
Volume	Bn 07 vv	
Pan	Bn 0A vv	0 = hard left, 127 = hard right
Effect Control A	Bn 0C vv	See • Note below
Effect Control B	Bn 0D vv	See • Note below
Effect A Mix	Bn 5B vv	
B->A Feed	Bn 5C vv	
Effect B Mix	Bn 5D vv	
Reset All Controllers	Bn 79 00	ignored in omni mode
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 00 20 bb Cn pp	bb = bank #, pp = prog. in bank

Bank 0 = 000-127 - bb=00
Bank 1 = 128-255 - bb=01
Bank 2 = 256-383 - bb=02
Bank 3 = 384-511 - bb=03

• Note: These controls adjust the currently selected parameter of the currently selected effect. The “currently selected” parameter is either the 1st one in an effect's parameter list (as initialized after power up) or the parameter selected either by hand or by SysEx parameter edits.

MIDI Specification

RECEIVED SYSTEM COMMANDS

For system exclusive commands the following format is used:

F0	system exclusive status byte
18	E-mu ID byte
04	product ID byte
dd	device ID byte
cc	command byte
...	data bytes (256 bytes/preset)
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 04 dd 00 ll mm F7	ll = preset # lsb, mm =preset # msb see note 6
Preset Data	F0 18 04 dd 01 ll mm ... ... cs F7 cs = checksum = sum of all data bytes	
Parameter Value Request	F0 18 04 dd 02 pl pm F7 pl = parameter # lsb	pm = msb
Parameter Value	F0 18 04 dd 03 pl pm vl vm F7 vl = value lsb	vm = msb
Tuning Table Request	F0 18 04 dd 04 F7	
Tuning Table	F0 18 04 dd 05 ... ... F7	
Program Map Request	F0 18 04 dd 06 F7	see note 1
Program Map Data	F0 18 04 dd 07 ... ... F7	
Version Request	F0 18 04 dd 0A F7	see note 3
Configuration Request	F0 18 04 dd 0C F7	see note 4
MMA Tuning Dump	F0 7E dd 08 01 tt <name (16 ascii)>…F7	see note 5

MIDI Specification

TRANSMITTED SYSTEM COMMANDS

Command	*Message*	*Comments*
Preset Data	F0 18 04 dd 01 ll mm ... ... cs F7	cs = checksum = sum of all data bytes
Parameter Value	F0 18 04 dd 03 pl pm vl vm F7	pl = parameter # lsb pm = msb vl = value lsb vm = msb
Tuning Table	F0 18 04 dd 05 ... ... F7	TT data = 256 bytes
Program Map Data	F0 18 04 dd 07 ... ... F7	see note 1

PARAMETER EDITING

Preset and setup parameters may be edited individually using system exclusive commands. The preset being edited is the active preset (the preset which is assigned to the received channel). 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 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.

MIDI Specification

PRESET PARAMETERS

Parameter Number	Parameter Name	Parameter Number	Parameter Name
0-11	preset name (12 ascii chars)	46	sec pan
12-14	link 1-3	47	sec delay
15-18	low key 0-3	48	sec low key
19-22	high key 0-3	49	sec high key
23	pri instrument	50	sec alt attack
24	pri sample start offset	51	sec alt hold
25	pri tuning (coarse)	52	sec alt decay
26	pri tuning (fine)	53	sec alt sustain
27	pri volume	54	sec alt release
28	pri pan	55	sec alt envelope on
29	pri delay	56	sec solo mode
30	pri low key	57	sec chorus
31	pri high key	58	sec reverse sound
32	pri alt attack	59	crossfade mode
33	pri alt hold	60	crossfade direction
34	pri alt decay	61	crossfade balance
35	pri alt sustain	62	crossfade amount
36	pri alt release	63	switch point
37	pri alt envelope on	64	LFO 1 shape
38	pri solo mode	65	LFO 1 frequency
39	pri chorus	66	LFO 1 delay
40	pri reverse sound	67	LFO 1 variation
41	sec instrument	68	LFO 1 amount
42	sec sample start offset	69	LFO 2 shape
43	sec tuning (coarse)	70	LFO 2 frequency
44	sec tuning (fine)	71	LFO 2 delay
45	sec volume	72	LFO 2 variation

MIDI Specification

PRESET PARAMETERS

Parameter Number	Parameter Name
73	LFO 2 amount
74	aux delay
75	aux attack
76	aux hold
77	aux decay
78	aux sustain
79	aux release
80	aux amount
81-86	key/vel source 1-6
87-92	key/vel dest 1-6
93-98	key/vel amount 1-6
99-106	realtime source 1-8
107-114	realtime dest 1-8
115-117	footswitch dest 1-3
118-121	controller amount A-D
122	pressure amount
123	pitch bend range
124	velocity curve
125	keyboard center
126 *	preset submix
127	keyboard tuning

GLOBAL / SETUP PARAMETERS

Parameter Number	Parameter Name
256	MIDI basic channel
257	MIDI volume
258	MIDI pan
259	current preset
260	master tune
261	transpose
262	global pitch bend range
263	global velocity curve
264	MIDI mode
265	MIDI overflow
266-269	controller A-D numbers
270-272	footswitch 1-3 numbers
273	mode change enable
274	device ID number
384-399	MIDI channel enable
400-415**	MIDI program change enable
416-431†	Bus Assign (per MIDI channel)
512-639	MIDI program/preset map
2381††	FxA ID
2382-2391	Current FxA Parm Values
2392††	FxB ID
2393-2402	Current FxB Parm Values
2403	FxA Wet Mix Percent
2404	FxB Wet Mix Percent
2405	Series B->A Percent

* See note 7

** See note 8

† See note 9

†† See note 10

MIDI Specification

NOTE 1 - PROGRAM MAPPING

MIDI program changes will normally correspond to internal preset numbers 0-127. However, 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.

NOTE 2 - SOUND SETS

A Classic Keys sound set consists of sample data (sound ROMs), plus additional instrument data in the program ROMs. Each sound set has a unique ID number.

The sound set for Classic Keys is 6.

It is necessary to include the sound set number as part of the instrument number when exchanging data. The complete instrument number 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).

Instrument Bit Fields:

12	8	7	0
<— sound set —>		<—instrument # —>	
(5 bits)		(8 bits)	

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

The "magic number" 1536 represents the start number for the Classic Keys instruments. To calculate the complete instrument number follow the instructions below.

SysEx Instr. No. = 1536 + Instr. No.

Next you must convert the SysEx instrument number to a 14-bit MIDI number. See the information on 14-bit 2's complement numbers.

Example:
Suppose we want to change the instrument to I002 B3 Dist Fast.

1) 1536 + 2 = 1538
2) 1538 ÷ 128 = 12 r-2 = 12 (ignore remainder)
3) 12 in Hex = 0C = msb
4) remainder 2 in Hex = 02 = lsb
5) SysEx Instrument Number =

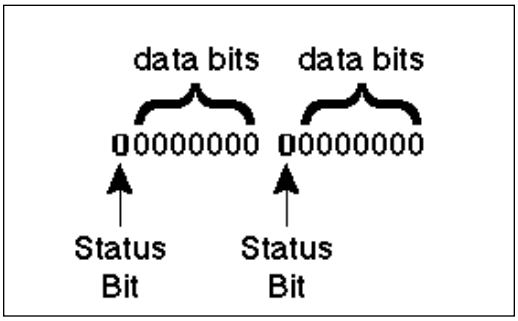
lsb	msb
02	0C

The complete message to change the primary instrument to #002:

F0 18 04 dd 03 17 00 02 0C F7

14-bit Signed 2's Complement Numbers
If the data value is negative, you must first take the 2's complement of the number: In the case of a 14-bit number this is equivalent to adding 16384 to the original negative value.

To fit the 7-bit MIDI protocol, numbers must be "nibble-ized".



• To get the 14-bit nibble-ized value (of a positive value or a 2's complemented negative value):

msb = value DIV 128 (divide and ignore the remainder)

lsb = value MOD 128 (divide and use only the remainder)

MIDI Specification

• To go the other way (convert 14-bit signed 2's complement to a signed real number)

raw Value = (msb*128) + lsb (gives you the unsigned raw value)

if raw Value ≥ 8192 (8192 = 2^13)

then signed Value = raw value - 16384 (16384 = 2^14)

Example: To find the "nibble-ized" Hex value of -127:

1) -127 + 16384 = 16257
2) 16257 ÷ 128 = 127 r-1
3) 127 in Hex = 7F = msb
4) 01 in Hex = 01 = lsb
5) Parameter value would be transmitted as 01 7F

Example: To find the "nibble-ized" Hex value of parameter number 257:

1) 257 ÷ 128 = 2 r-1
2) 2 in Hex = 02 = msb
3) 1 in Hex = 01 = lsb
4) Parameter number would be transmitted as 01 02

NOTE 3 - VERSION REQUEST

This command allows identification of machine type and software revision. Classic Keys will respond to the request with the version data:

F0 18 04 dd OB 01 r1 r2 r3 F7
r1, r2, r3 = software revision number in ascii (decimal point between r1 & r2).

NOTE 4 -CONFIGURATION REQUEST

This MIDI command is used to identify the sound sets in a given Classic Keys. The configuration request command is:

F0 18 04 dd OC F7

Classic Keys will respond to this command with the configuration message:

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

where pl and pm are the lsb and msb are 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 m2 = l2, m2 represent the lsb and msb of the number of instruments in each sound set.

NOTE 5 - BULK TUNING DUMP

Classic Keys can receive MIDI Tuning Standard dumps in addition to its own SysEx tuning table dumps. Classic Keys will only transmit in it's own SysEx tuning format. The MIDI Tuning Standard is as follows:

F0 7E dd 08 01 tt <tuning name (16 ascii)> … F7

dd= device ID tt= tuning prog # (ignored) tuning name = (ignored)

… = data (xx yy zz) frequency data for one note repeated 128x

xx yy zz = 0xxxxxxx 0abcdefg 0hijklmn

xxxxxxx = semitone, abcdefghijklmn = fraction of semitone in .0061 cent units.

Examples: Middle C = 3C 00 00
A-440 = 45 00 00

MIDI Specification

NOTE 6 - PRESET DATA REQUEST

Classic Keys presets are organized into groups of 64 presets for the purpose of bulk preset dumps. There are 8 groups of 64 presets (0-511). Each group may be requested using the preset request command and the appropriate preset code listed below.

Group	Preset Range	Preset Code	MIDI Message
0	0-63	1024	F0 18 04 dd 00 00 08 F7
1	64-127	1025	F0 18 04 dd 00 01 08 F7
2	128-191	1026	F0 18 04 dd 00 02 08 F7
3	192-255	1027	F0 18 04 dd 00 03 08 F7
4	256-319	1028	F0 18 04 dd 00 04 08 F7
5	320-383	1029	F0 18 04 dd 00 05 08 F7
6	384-447	1030	F0 18 04 dd 00 06 08 F7
7	448-511	1031	F0 18 04 dd 00 07 08 F7
1	64-127	-1	F0 18 04 dd 00 7F 7F F7
0	0-63	-2	F0 18 04 dd 00 7E 7F F7
0-3	0-255	-3	F0 18 04 dd 00 7D 7F F7
4-5	256-511	-4	F0 18 04 dd 00 7C 7F F7

NOTE 7 - PER PRESET BUS ASSIGNMENTS

(Preset Parameter 126)

0 - Main
1 - FxA
2 - FxB

NOTE 8 - PER CHANNEL PROGRAM/BANK ENABLE

(Global Parameters 400-415)

Respond to:		Bank Select	Program Change
-1	Enabled, Use Program Map	No	Yes
0	Disabled	No	No
1	Enabled, initially Bank 1	Yes	Yes
2	Enabled, initially Bank 2	Yes	Yes
3	Enabled, initially Bank 3	Yes	Yes
4	Enabled, initially Bank 4	Yes	Yes

MIDI Specification

NOTE 9 -
PER CHANNEL BUS ASSIGNMENTS
(Global Parameters 416-431)

0 - Main
1 - FxA
2 - FxB
3 - From Preset

NOTE 10 - SYSEX EFFECTS CONTROL
Parameter values transmitted via MIDI SysEx can be used to control all aspects of the Classic Keys effects processors. This SysEx protocol overlaps somewhat the channel-based MIDI controller numbers already assigned to effects; the MIDI controllers are designed for realtime performance control, or from a sequencer during mixdown, whereas the SysEx protocol is oriented towards setup at the start of the sequence, or use by editor and librarian programs.

Parameter 2381, 2392
FxA, FxB ID numbers
These parameters select which A and B effect to execute. Sending the parameter value will trigger loading a new A or B effect, using the effect's default settings. The parameter values are unique ID numbers which "name" the effect, and are given in the table on the following page. To cause "No effect" (a straight-through signal path) to be loaded, send ID #0 for FxA or ID #128 for FxB. Sending ID numbers not found in the table, or an FxA ID number for the FxB parameter or vice versa, will also cause "No effect" to be loaded.

Parameter 2382-2391, 2393-2402
FxA, FxB effects parameter values
Both FxA and FxB each have 10 SysEx parameter numbers assigned to them to control up to 10 parameter values per effects program (most programs have far fewer.) Editing parameters which are not active can have unpredictable results (usually, the value of the first of or last valid parameter will be inadvertantly changed.). The order of the parameters is the same order as they appear in the Classic Keys display. The allowed range of SysEx parameter values is also the same as for the values displayed on the screen, and may be both positive and negative, depending on the parameter; out of range values are clipped. (Note that this differs from the way that MIDI channel effects controllers 12 and 13 work - their entire range of 0-127 is mapped to cover exactly the range of the effects parameter.)

Parameter 2403, 2404, 2405
FxA Mix %, FxB Mix %, B->A Feed %
These parameters are used to control the relative Wet/Dry mix, from 0 (dry) to 100 (wet, ie all effect.) These duplicate the function of realtime MIDI channel continuous controller numbers 91 (FxA Mix), 92 (B->A Feed) and 93 (FxB Mix).

In addition, parameter 2405 (B->A Feed %) uses the value 101 to set "ONLY" (100% wet) FxB output into FxA input and "Off" (no B output); this special value is not available from the continuous controller 92.

HOW TO EDIT AN EFFECT VIA SYSEX
Use the SysEx format shown on page 107 for parameter value:

F0 18 04 00 03 pl pm vl vm F7

Example: Change Effect A to Flange.

1) FxA = 2381(paragraph at left)
2) 2381÷128 = 18 remainder 77
3) 18 in Hex = 12 = msb
4) 77 in Hex = 4D = lsb
5) Flanger = 11 (chart on next page)
6) 11÷ 128 = 0 remainder 11
7) 00 in Hex = 00 = msb
8) 11 in Hex = 0B = lsb
9) Send - F0 18 04 00 03 4D 12 0B 00 F7

MIDI Specification

EFFECTS CONTROLLER MESSAGES

The following standard MIDI controllers will be mapped to effects parameters. The MIDI channel on which these controllers are transmitted must be enabled in the Classic Keys Master Menu, but is otherwise ignored.

0x0C (12) Effect Control 1
This adjusts the currently selected parameter of the currently selected "A" effect.

0x0D (13) Effect Control 2
This adjusts the currently selected parameter of the currently selected "B" effect

The Effect Control controllers will map 0-127 onto the whole range of the selected effect parameter. The "currently selected" parameter is either the first one in an effect's parameter list, (as initialized after power up) or the parameter selected either by hand or by SysEx parameter edits.

0x5B (91) FxA Mix %
Adjusts the A mix amount

0x5C (92) B->A Feed %
Adjusts the B->A mix amount

0x5D (93) FxB Mix %
Adjusts the B mix amount

These controllers, defined in the MIDI spec as "Effects Depth Controllers", map controller values from 0-100 directly onto their corresponding mix percentages (to 101 in the case of B->A feed.) Note that these parameters may not respond as quickly as incoming controller data can be received by the unit, so you may hear the mix values jump in large steps in order to "catch up".

FxA Programs	Parameter Value
Room	1
WarmRoom	2
Plate 1	3
Plate 2	4
Chamber 1	5
Chamber 2	6
Hall 1	7
Hall 2	8
Delay	9
Cross Delay	10
Flange	11
Phaser	13
Chorus	12
Echo	15
Small Room 1	16
Small Room 2	17
Hall 3	18
Early Refl 1	19
Early Refl 2	20
Early Refl 3	21
Early Refl 4	22
Rain	23
Reverse ER	24
Shimmer	25

FxB Programs	Parameter Value
Ring Modulate	29
Flange	130
Chorus	31
Fuzz	132
Phaser	133
Delay	134
Cross Delay	135
Fuzz Lite	138

MIDI Specification

CHANNEL BANK SELECT MESSAGES

The following standard MIDI controllers will be mapped to MIDI Bank Select:

0x00 (0) Bank Select MSB

0x20 (32) Bank Select LSB

After a valid Bank Select message has been received, any subsequent program changes on that channel will occur within the selected bank. Partial or invalid bank select messages on a channel will not affect the bank selected for that channel. The BANK/ PRST CHANGE screen will be updated if necessary to reflect the newly selected bank.

The possible range of controller values are:	
0x0000	- Classic Keys Bank 0
0x0001	- Classic Keys Bank 1
0x0002	- Classic Keys Bank 2
0x0003-0xffff	- Classic Keys Bank 3

(Note that controller values specifying bank numbers greater than Bank 3 are clipped. Note also that, because of a difference in naming conventions, Proteus Bank 0 corresponds to MIDI Bank 1 as defined in the MMA spec.)

As per the MIDI spec, these messages must be sent in MSB/LSB order without intervening messages; response to these messages in any other order or format is undefined, but Classic Keys will generally not respond to anything but the MSB followed directly by the LSB on the same channel.

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