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**PRACTICE  
PROGRAMMING**



This section contains step-by-step instructions on how to get started in programming your own custom sounds. It is recommended that you actually try each example on the Vintage Keys unit, rather than just reading through. The best way to learn something is by actually doing it.

## LINKING PRESETS

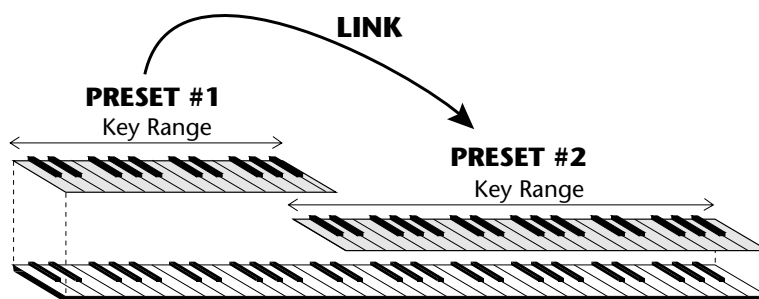
Linking presets is a quick and easy way to create new sounds by “layering” presets and also to “split” a keyboard into sections containing different sounds.

### • *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”. Otherwise, simply change the preset to erase your work.

### • *Create a Split Keyboard Using Links*

- 1) Follow steps 1 through 4 above.
- 2) Now set the range of the linked preset while still in the LINK menu.
- 3) Save the preset.
- 4) Now go back to the first preset, press the Edit button and use the data entry control to move through the screens to KEY RANGE.
- 5) Set the range of this preset so that it fills the remaining range of your keyboard.
- 6) Save the preset.



**CREATING A SPLIT KEYBOARD**

••• To get the most out of this section, please read Chapter 3, *Programming Basics* first.

### EDITING PRESETS

The easiest way to make a new preset is to edit an existing preset. This is also an excellent way of becoming familiar with Vintage Keys. If you don't like what you hear, simply change the preset and Vintage 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: 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 and most dramatic way to modify an existing preset. Scroll through the Edit menu functions until you come to:

```
INSTRUMENT pri
IXXX Instr Name
```

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

```
INSTRUMENT sec
IXXX Instr Name
```

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

### CHANGING THE TUNING OF AN INSTRUMENT

Scroll through the Edit menu functions until you come to:

```
TUNING coarse
pri:+00 sec:+00
```

If the numbers are “00” as in the previous screen, 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.

Tuning an instrument far out of its normal range will completely change the character of the sound. For example, if you tune a bass guitar up 2 octaves, it's going to sound rather petite. On the other hand, if you tune it down 2 octaves, you can probably rattle plaster off the walls! Experiment with radical pitch shifting. You'll be surprised at the results.

## CHORUS

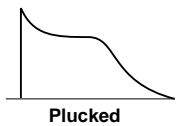
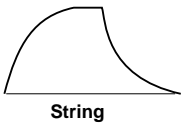
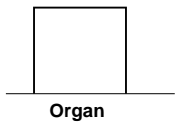
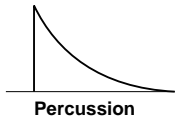
This is an easy one. With the cursor on the top line of the display, turn the data control until you find CHORUS. Various amounts of chorusing can be selected for each of the primary and secondary instruments. Chorus works by doubling the instruments and detuning them slightly. The larger the number, the more detuning will occur. *Warning: Since it works by doubling the instruments, chorus halves the number of notes you can play on Vintage Keys.* Chorus is useful when you want to “fatten up” a part quickly and easily. Just turn chorus on! (The single cycle waves love chorus.)

```
CHORUS
pri:07  sec:0ff
```

## REVERSING THE INSTRUMENT

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

```
REVERSE SOUND
pri:0ff  sec:0ff
```



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

## ALTERNATE VOLUME ENVELOPE

Every sound you hear, be it a piano note, a drum, a bell or whatever, has a characteristic volume curve or envelope, which grows louder or softer in various ways during the course of the sound. The volume envelope of a sound is one of the clues that our brain uses to determine what type of sound is being produced.

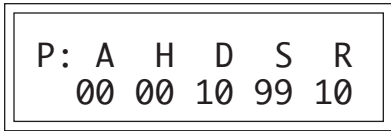
Every instrument in Vintage Keys has its own volume envelope which is used when the Alternate Envelope parameter is turned Off. By turning the Alternate Envelope On, we can re-shape the instrument's natural volume envelope any way we want. By reshaping the volume envelope of an instrument, you can dramatically change the way the sound is perceived. For example, by adjusting the envelope parameters, you can make "bowed" pianos or backwards gongs. The diagrams at the left show the volume envelopes of a few common sounds.

In preparation for this experiment choose a fairly "normal" preset (like an organ or piano) which continues to sustain when the key is held down. Go to the Secondary Instrument screen and set it to "None".

Next go to the Alt. Volume Envelope screen and turn the Primary Volume Envelope On.



Now move on to the next screen:



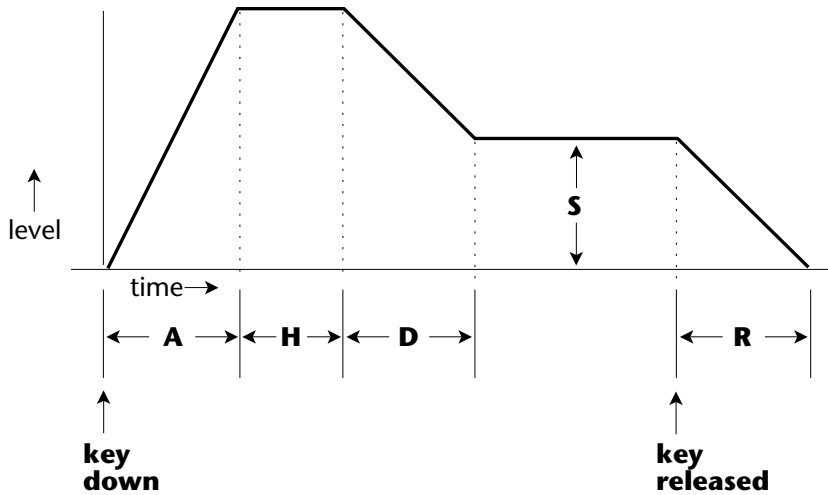
Increase the Attack time and play a note. The attack controls the time it takes for the sound to reach full volume when a key is pressed and held.

Now increase the Release time and note the effect as you release the note. The Release time controls the time it takes for the sound to die away when a note is released.

### • Anatomy of an Envelope

When a key is pressed, the envelope generator starts increasing at the **Attack** rate. When it reaches full level, it **Holds** at that level for the **Hold** time. After the Hold time has elapsed, the envelope begins to **Decay** back down at the specified Decay rate until it reaches the **Sustain** Level. Note that all the other parameters are *Times*, but the Sustain is a *Level*.

The envelope will stay at the Sustain level for as long as the key is held. When the key is released, the envelope falls back down to zero at the **Release** rate.



### WORKING WITH THE FILTER

The low pass filter makes it possible to remove certain components of the sound. A low pass filter removes the high frequency components or put another way, it “lets the lows pass”. In preparation for this experiment choose a fairly “normal” preset (like an organ or piano). Go to the Secondary Instrument screen and set it to “None”, then set the Primary Instrument to one which is rich in harmonics, such as the Violin Trio. (Since the filter works by removing certain frequencies, we want to make sure that we have a lot of frequencies to start with.). Set the parameters as listed in the chart below in order to “clean the slate” for your filter investigation.

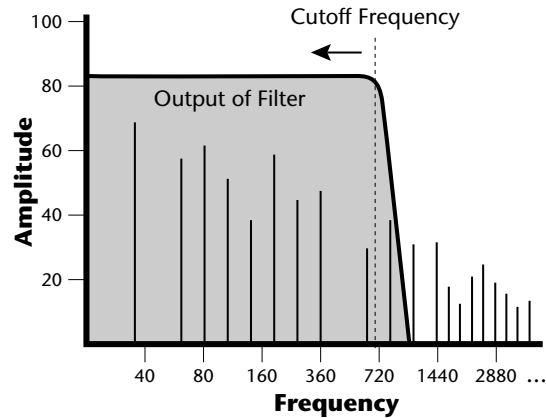
Go to the primary filter cutoff and Q screen shown below and position the cursor below the Fc value.

```

FILTER      pri
Fc:255     Q:00
    
```

| Primary                    |                                |
|----------------------------|--------------------------------|
| <b>Instrument:</b>         | Violin Trio                    |
| <b>Tuning course:</b>      | +00                            |
| <b>Volume:</b>             | 100                            |
| <b>Alt. Vol. Envelope:</b> | Off                            |
| <b>Realtime CTL:</b>       | 1-8 -> All Off                 |
| <b>Filter Type Pri:</b>    | 4 Pole Lowpass                 |
| <b>Filter Fc:</b>          | 255                            |
| <b>Filter Q:</b>           | 00                             |
| <b>Aux Envelope Amt:</b>   | +000                           |
| <b>Aux Env.:</b>           | A: A H D S R<br>40 00 00 99 50 |

Playing the keyboard now, you should hear the raw Violin Trio sound. Slowly decrease the filter Fc as you play the keyboard. The sound will get duller and duller as more and more high frequencies are filtered out until at some point the sound will completely disappear. (You have filtered out everything.) The chart below illustrates what you just did. You moved the cutoff frequency down.



Open the filter back up to 255, then move the cursor underneath the Q. Set the Q to 15, then move the cursor back under the Fc. As you change the Fc, notice that the sound now has a sharp, nasal quality. With a high Q, frequencies at the cutoff frequency (Fc) are being boosted or amplified.

Now let's modulate the filter Fc with the Auxiliary envelope generator. The envelope generator is a device that can automatically change the filter Fc during the course of the note. Set the Fc way down until you can just hear the sound (about 60), then press Enter and go to the REALTIME CTL screen.

```

REALTIME CTL
1 PWhl -> Off
    
```

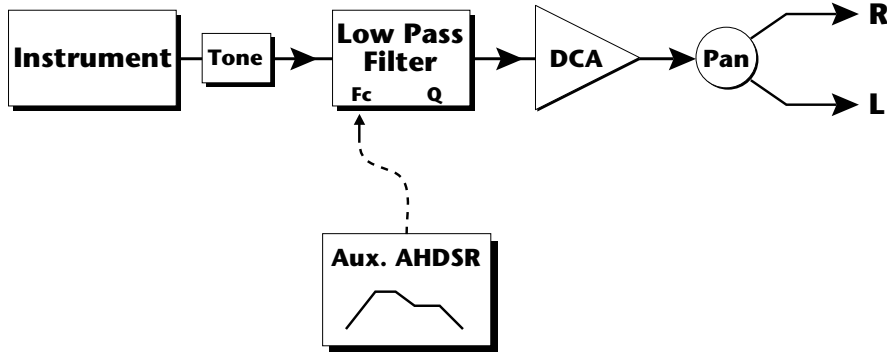
Move the cursor down underneath the source and set it to Aux (for Auxiliary Envelope). Next move the cursor underneath the destination and set it to Filter Fc. The screen should look like this:

```

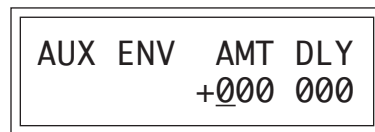
REALTIME CTL
1 Aux -> FiltFc
    
```



You have just connected the Auxiliary Envelope Generator to the Filter Cutoff as shown in the diagram below.

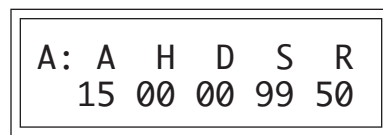


Now go back to the Aux Envelope screen shown below.

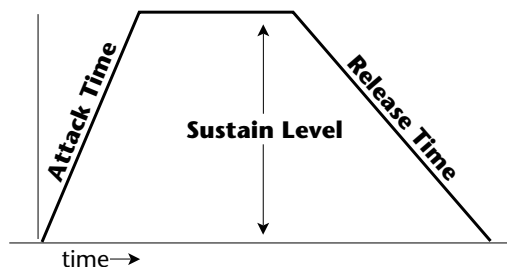


Move the cursor underneath the envelope amount and change the value to about +100. Now when you press a key the filter will slowly sweep up. Because the filter Q is set high, you can hear the different harmonics of the sound being accentuated as the filter cutoff sweeps past.

Now, scroll back to the Auxiliary Envelope parameter screen.



Change the attack rate and note the change in the sound. The diagram below shows approximately how the envelope looks when the parameters are set as shown above.



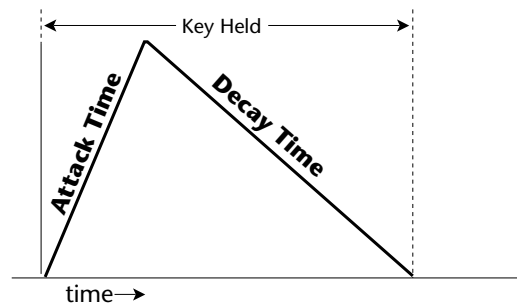
••• Note that all the envelope parameters are **Rates** except for **Sustain**, which is a **Level**.

Because the Sustain level is set to maximum, the decay parameter has no effect. Lower the Sustain to 00, then set the Decay to around 27.

```

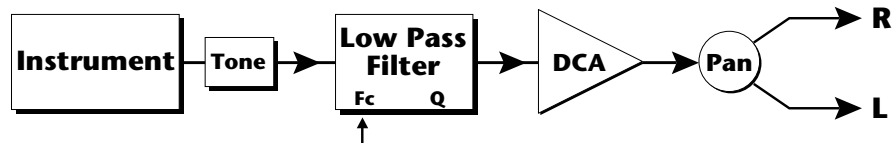
A: A H D S R
   15 00 27 00 50
    
```

Now the filter sweeps up, then decays back down to the Sustain Level (which is zero). Play with the envelope parameters for awhile to get a feel for their function. (If you're having trouble understanding the Envelope Generators, please refer to the Programming Basics section in this manual.)



### • Troubleshooting

A common source of confusion when working with the filter envelope is that the Attack or Release parameter might not seem to be working correctly. Referring to the diagram below which shows the Vintage Keys signal flow, you will notice that the DCA comes *after* the Filter. The DCA controls the final volume of the sound, so if the filter's release is longer than the release for the DCA, you won't hear it, because the DCA has already shut off the sound.



This is just an example of why troubleshooting is important. If you are not getting the expected result, try to analyze the situation. There will be many times when you will have to stop for a minute and think, "What am I trying to do and why isn't it working?" When this happens (*and it will*), don't panic. Troubleshooting is a normal part of the synthesis process. Simply examine the various parameters and try to be as analytical as possible as you solve the problem. Usually the solution will be simple. (The filter is already wide open and can't open any more.) Learning to play an instrument takes... Practice.

You're probably getting the general 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.

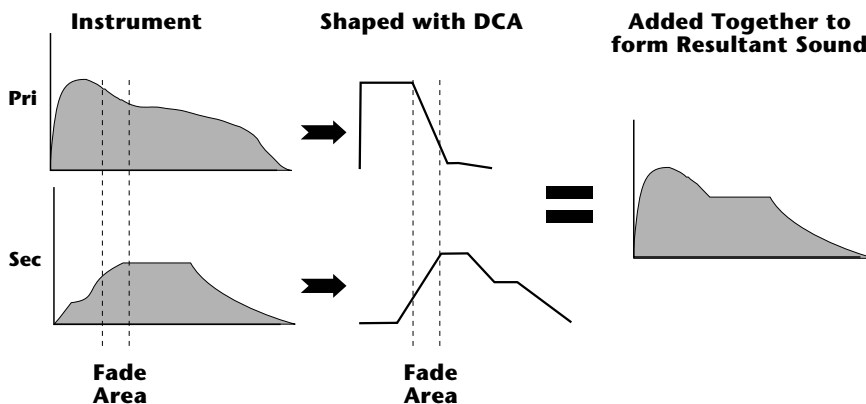
### Practice Modulating

- Try modulating the pitch with the Aux. Envelope generator
- Use velocity to modulate the Aux Envelope Amount or the filter Fc. (Key/Vel. screen). This will brighten the sound as you play harder.
- Program the LFO to modulate filter Fc and volume (Realtime modulation screen).
- Modulate the LFO with the other LFO, with velocity, and with the modulation wheel.
- Think of ten different modulation routings, then try them out. The key to learning about Vintage Keys is to experiment.

••• Presets can be stored in any of the non-volatile RAM locations (0-255).

## VINTAGE SYNTHESIS

Vintage Synthesis is actually just a form of additive synthesis. Only, instead of building a sound from simple sine waves, Vintage Keys supplies you with complete sampled sounds or complex waveforms allows you to combine all or part of these together to form a new sound. The process is illustrated below.



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

The envelope generators controlling the DCAs (digitally controlled amplifiers) can be used to fade between two instruments (primary and secondary) during the course of a note. This powerful technique allows you to combine elements of different instruments together to form completely new sounds.

For example, the attack portion of one instrument can be crossfaded into the body of another instrument, creating a hybrid of the two. Vintage Keys also contains many digitally generated waveforms that may 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 bass. In addition to the envelope generators, parameters such as Delay, Sound Start and Crossfade allow you to further control the blend of primary and secondary instruments. And of course, the dynamic Low Pass Filters allow you to control the harmonic content of each instrument during the course of the note.

### • *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         | A H D S R               |
| 02 02 16 00 16    | 12 00 43 59 40          |
| Delay: 000        | Delay: 003              |

## REVERB SPACES

The reverb spaces allow you to add reverb ambience to Vintage 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 Vintage 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 on the following page and change only the parameters specified.

••• *The reverb spaces were created on our Emax II 16-bit sampling system using a technique called Transform Multiplication.*

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

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, the Low Pass Filter 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.

## USING VINTAGE KEYS WITH A SEQUENCER

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

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

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.

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

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, Vintage 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.

```
MIDI MODE    ID
Multi        00
```

Move the cursor down to the second line and change the mode to **Multi** as shown. Vintage 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 Vintage 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:** Vintage 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 Vintage Keys.
- 2) Send MIDI volume information (controller #7) for each MIDI channel used on Vintage Keys.
- 3) Send MIDI pan information (controller #10) for each MIDI channel used on Vintage 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 22 for details.

••• *The Preset, Volume and Pan information for all 16 channels is included when the Master Settings are transmitted or received over MIDI.*

••• *The MIDI specification only allows for changing presets 0-127. If you need to access presets in locations above 127, use the Program → Preset Map (page 21). You can save the Program → Preset Map along with your sequence by saving the Master Settings (page 22).*

### • *Using the 32 Channels*

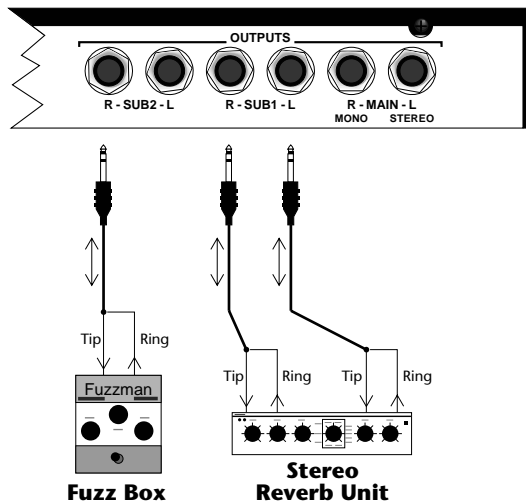
As stated earlier, Vintage Keys has 32 independent audio channels which are utilized dynamically. With 32 channels and 383 presets, you have a universe of sonic textures at your disposal. You may have noticed that many of the very big sounding presets in Vintage Keys are *linked* with other presets or they have *chorus* applied to them. While this is fine when the preset is played solo, you may begin to run out of channels when Vintage 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 Vintage 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 rip-off”. You will most commonly encounter this “rip-off” when using Vintage Keys in multi-timbral mode or when using massive preset links. Since Vintage Keys dynamically allocates channels as needed, to eliminate rip-off you must either, play fewer notes, use simpler sounds, turn off doubling (pri/sec, chorus, or linked presets), or use MIDI overflow to another Vintage Keys unit.

### • *Using External Processing*

Don't be afraid to use external processing on specific sounds if you feel the urge. The submix sends and returns on Vintage Keys are there for a reason. In many instances a bit of reverb or EQ will be just the thing an instrument needs to give it a distinct identity. Incidentally, an external fuzz box can work wonders on the clean guitar sound. If you think about it, adding distortion to a clean guitar sound is much closer to the way an electric guitar is normally processed. By dedicating one of your old fuzz boxes to a submix out/in, you can have programmable distortion for use on guitars, organs or whatever.



*Using the programmable outputs and returns, specific presets can be routed through your favorite effects without using up precious mixer channels.*

