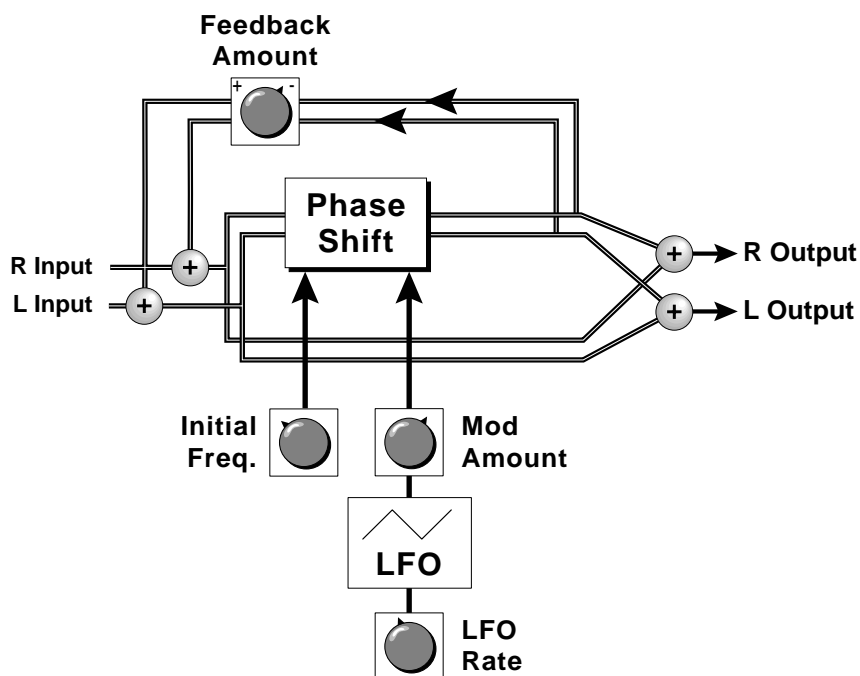


**EFFECT PROGRAMMING****STEREO PHASER**

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



FXA:Phaser	
LFO Rate	150

FXA:Phaser	
LFO Depth	100

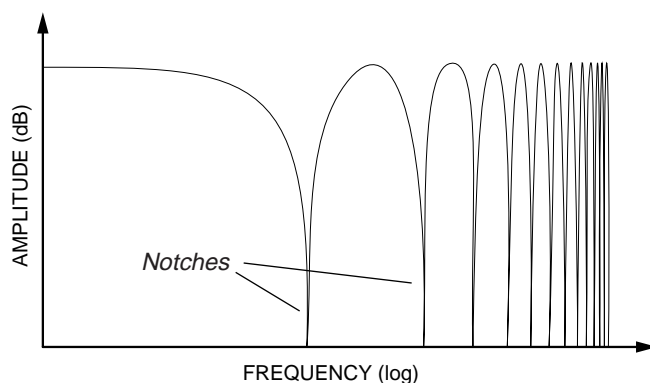
FXA:Phaser	
Min Delay	015

FXA:Phaser	
Feedback	+064

## EFFECT PROGRAMMING

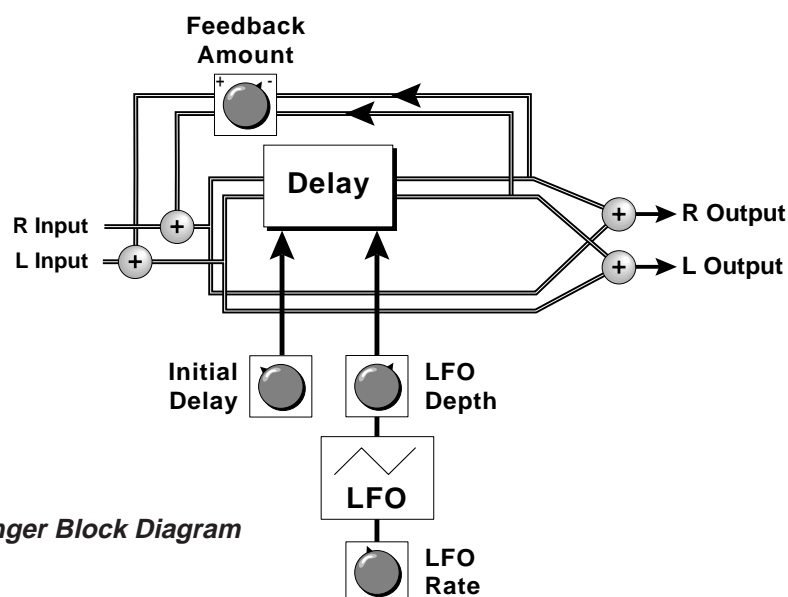
### STEREO FLANGER

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



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

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



**Stereo Flanger Block Diagram**

## EFFECT PROGRAMMING

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

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

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

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

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

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

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

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

## EFFECT PROGRAMMING

### STEREO CHORUS

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

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

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

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

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

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

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

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

```
FXA:StereoChorus
Feedback      100
```

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

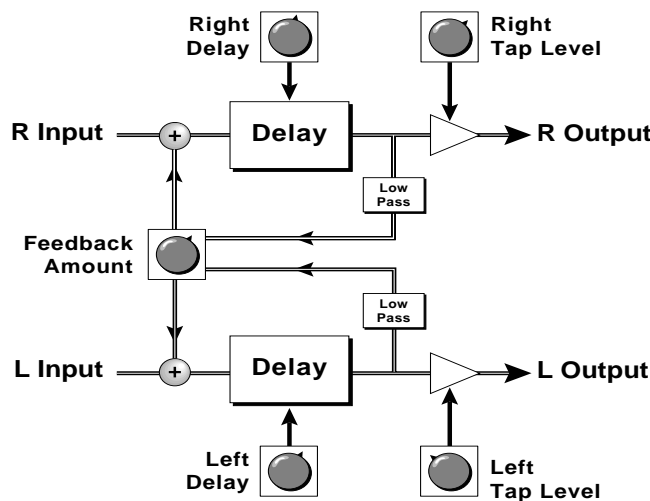
```
FXA:StereoChorus
Mix           050
```

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

## EFFECT PROGRAMMING

### STEREO ECHO

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



Max Delay = 400mS

FXA:Echo  
L DelayTime 120

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

FXA:Echo  
L Tap Level 255

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

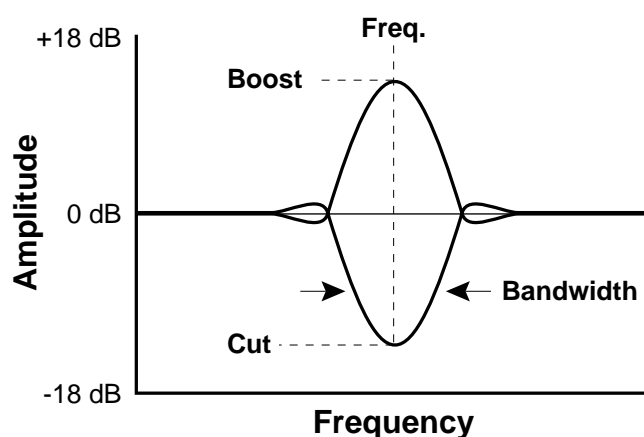
FXA:Echo  
Feedback 100

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

## EFFECT PROGRAMMING

### STEREO EQ A

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

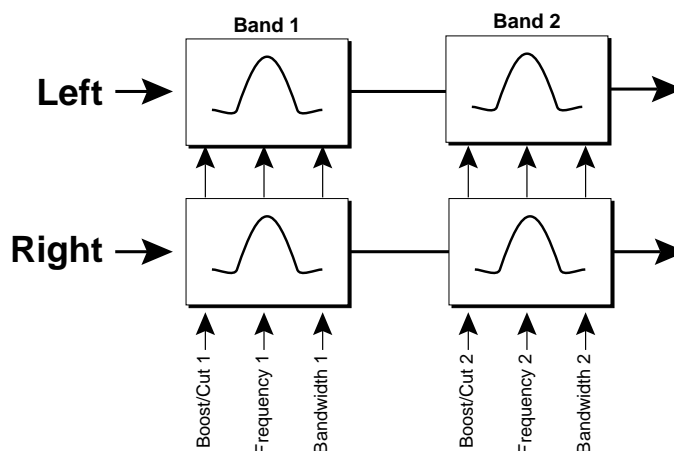


**Frequency** ..... Selects the desired frequency range.

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

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

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



## EFFECT PROGRAMMING

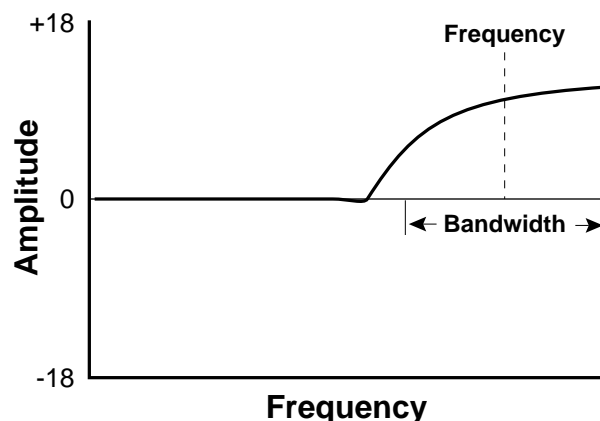
### USING THE EQUALIZER

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

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

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

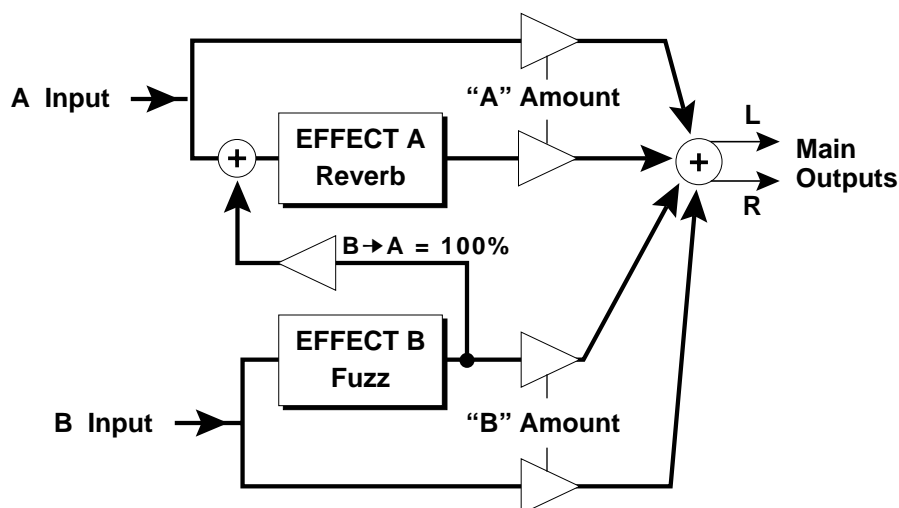
The Equalizer can also function as a shelving type of EQ by setting the bandwidth very wide and moving the frequency parameter close to the ends of the frequency range. The diagram below shows a High Shelving Filter. A Low Shelving Filter could be created by moving the Frequency parameter to the lower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



## EFFECT PROGRAMMING

### B EFFECTS

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



### STEREO DELAY B

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

### STEREO CROSS DELAY B

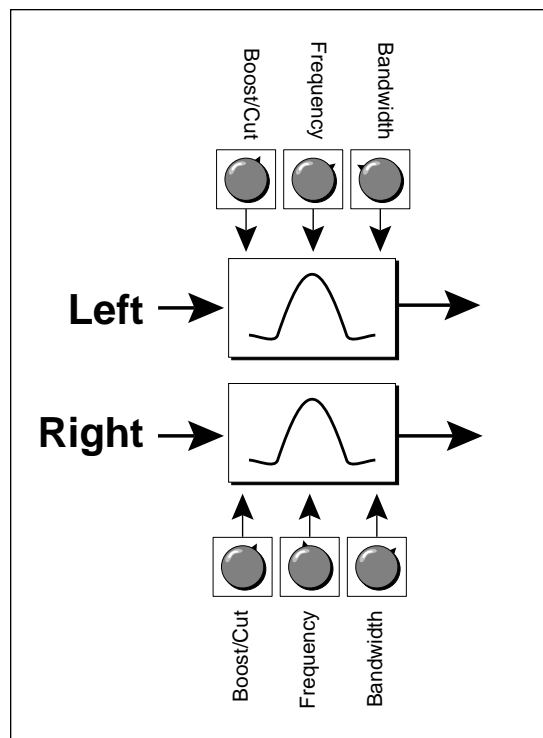
The B Cross Delay is identical to the cross delay line in the A effect group except that the maximum delay time is 104 milliseconds (instead of 209 mS). This delay is useful for short ping-pong echos, stereo slapback and doubling effects.



## EFFECT PROGRAMMING

### STEREO EQ B

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



■ See Stereo EQ A for additional programming tips.

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

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

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

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

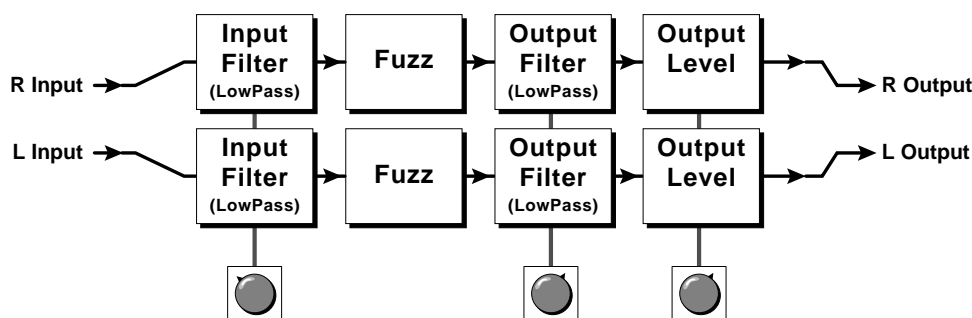
## EFFECT PROGRAMMING

### STEREO FUZZ

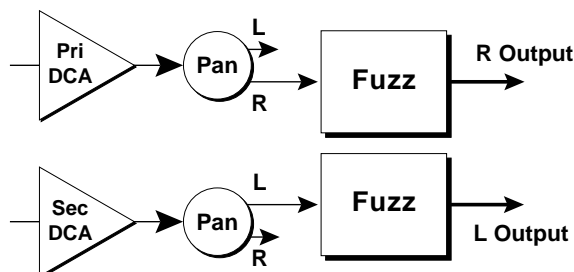
The Stereo Fuzz introduces a controlled distortion to any signal passing through it. Distortion creates harmonics. Simple sounds will become complex sounds and complex sounds will become even more complex to the point of becoming noise in many cases. There are two types of fuzz in the Proteus effects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

#### FUZZ 1

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



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



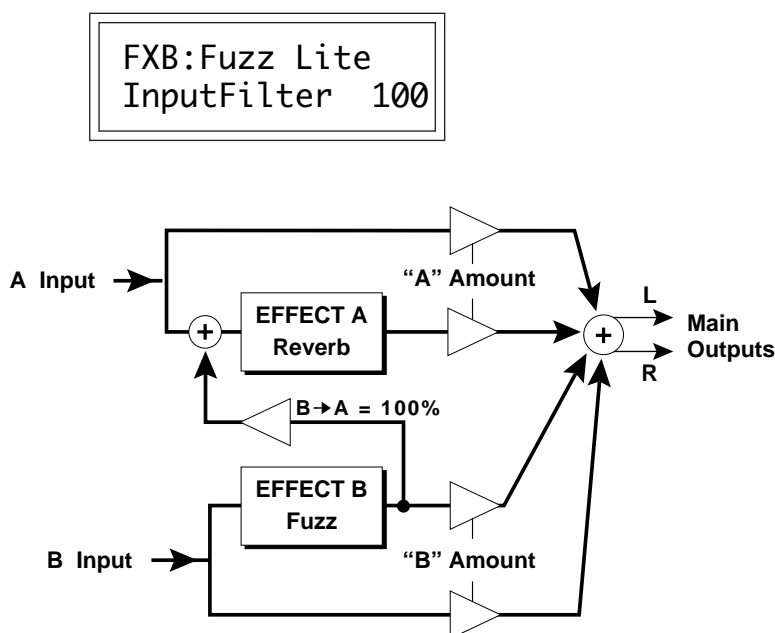
*Primary and Secondary instruments can be separately processed by panning to opposite sides.*

## EFFECT PROGRAMMING

### FUZZ LITE

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

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



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

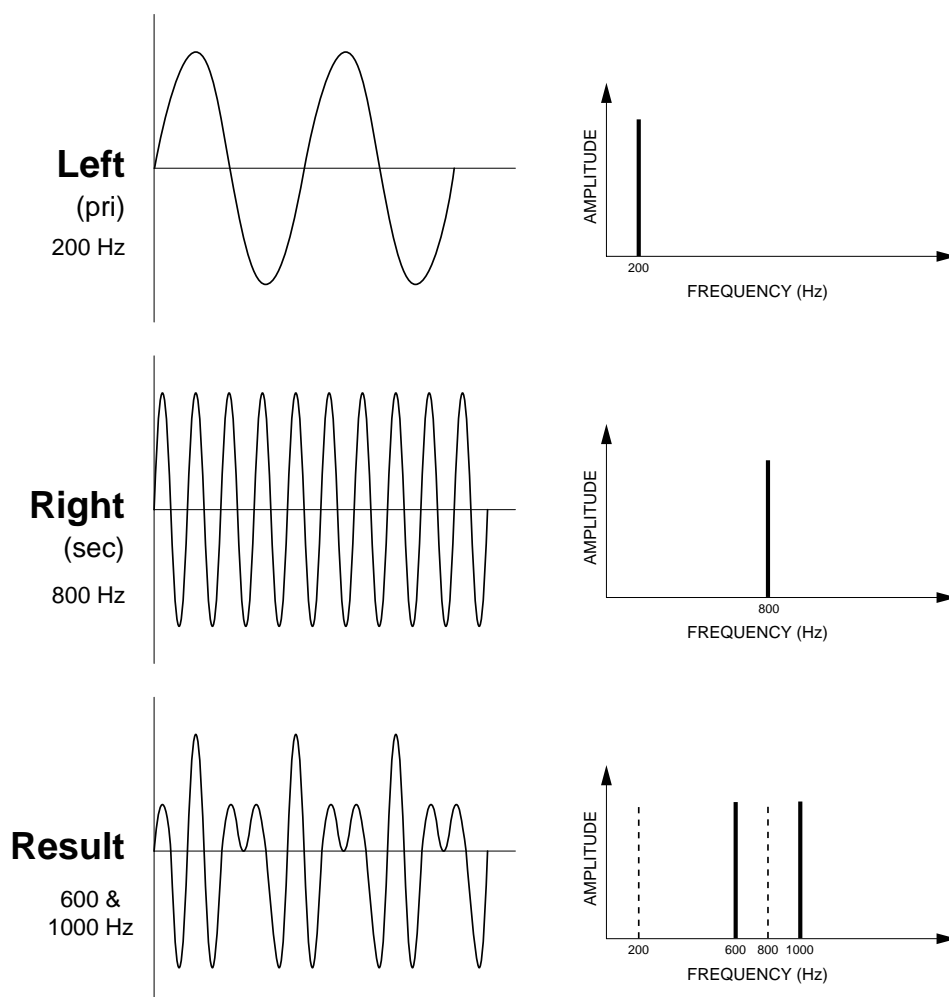
You may want to run the output of the fuzz back through a reverb effect using the B->A feedback mixer in the FX amount screen. (Try it!) By adjusting the three amounts you can precisely control the amount of Original Signal, Dry Fuzz Signal, and Reverb Fuzz Signal.

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

## EFFECT PROGRAMMING

### RING MODULATOR

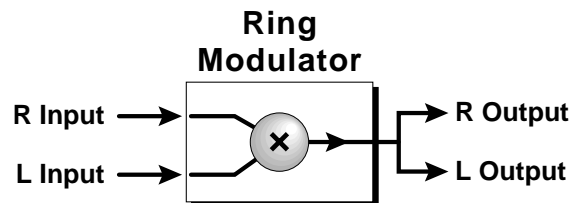
A Ring Modulator is a simple device which takes two signals and multiplies them together into one resultant signal **containing only the sum and difference frequencies** of the two input waves. The original frequencies are **not** output! Ring modulators tend to generate a lot of inharmonic frequencies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



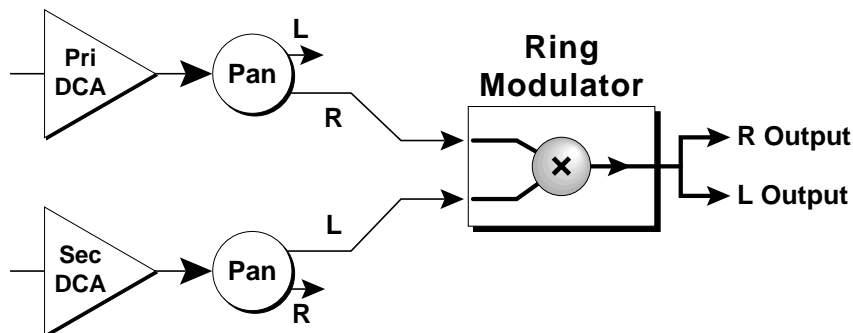
*This diagram shows the result of Ring Modulating two sine waves with frequencies of 200 Hz and 800 Hz. Only the Sum and Difference frequencies of 600 Hz and 1000 Hz will result.*

## EFFECT PROGRAMMING

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



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



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

FXB: Ring Mod  
None

