Chapter 9
Effects Mode and the Effects Editor

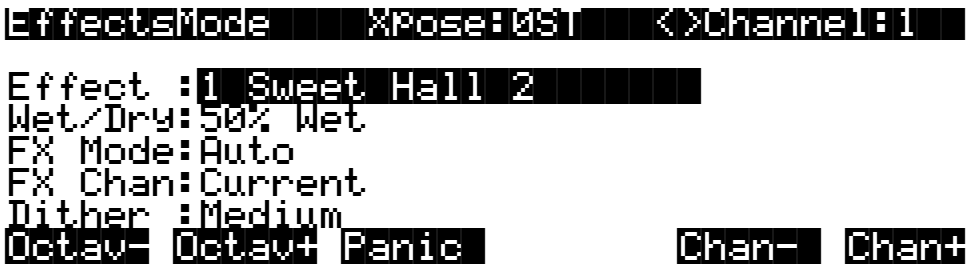
The K2500's global effects processor operates much like an outboard MIDI effects box. You can route your sounds through the processor or bypass it, and you can edit its preset effects from the K2500's front panel. It responds to MIDI programming commands, and you can program control sources to get realtime control over the Wet/Dry mix and two parameters that vary from preset to preset (this is done on the EFFECT page in the Program Editor). You can store ten preset effects in each memory bank (except the Zeros bank, which holds 37). See "Storing Objects in Memory Banks" in the *Reference Guide* for a breakdown of the preset effects ID that belong in each memory bank.

Note: the K2500's effects processor is mono, not stereo, so keep in mind that if you pan any layers, only the dry portion of the sound (the part without effects) will be panned; the wet portion will remain unchanged. The wet portion will come out both the left and right sides of the Mix outs evenly, or will come out of the left side only, depending on the setting of the OUtA->FX parameter on the Master page.

The Effects Mode Page

Every K2500 program and setup can be assigned a different preset effect. There are 47 factory preset effects stored in ROM. You can use the Effects Editor to create your own effects, selecting from 27 configurations of effects types—like chorus, flange, delay, etc. Preset effects are applied to the MIX outputs (and to the headphone jack) when the currently selected program (or the program on the FX Channel) is routed to Output Group A.

There are three purposes for Effects mode. The primary purpose is to define the behavior of the global effects processor, instructing the K2500 how to select preset effects when you select programs or setups. The other two purposes are explained below. Press the Effects mode button to enter Effects mode. You'll see the Effects mode entry level page, as shown below. The top line of the page, as usual, reminds you of your current location, and indicates the amount of transposition and the current MIDI channel.



The Soft Buttons on the Effects mode Page

The **Octav-** and **Octav+** soft buttons let you change the MIDI transposition in increments of one octave. The **Panic** soft button sends All Notes Off and All Controllers Off to the K2500 and on all 16 MIDI channels. The **Chan-** and **Chan+** soft buttons change the current MIDI channel.

Effects Mode Parameters

PARAMETER	RANGE OF VALUES	DEFAULT
EFFECT	Preset Effect list	1 Sweet Hall
WET/DRY	0 to 100% Wet	50%
FX MODE	Auto, Master, Program, Setup	Auto
FX CHANNEL	None, Current, 1 to 16	Current
Dither	None, Flat, Medium, Maximum	Medium

Effect

This indicates the preset effect that's selected while you're in Effects mode. By changing the value of this parameter, you can view and listen to the various preset effects without changing the preset effect for any of the programs or setups. If the FX Mode parameter (explained below) is set to a value of Auto (its default value), then when you enter Effects mode, the value of the Effect parameter automatically changes to match the effect assigned to the most recently selected program or setup. If FX Mode is set to Master, Program, or Setup, the Effect parameter is not automatically updated, so the effect you hear when you enter Effects mode may not be the same as the one assigned to the program or setup you were listening to before you entered Effects mode. There's a list of the factory preset effects in the *Reference Guide*.

Wet/Dry

This gives you the mix level of the currently selected preset effect. Use one of the data entry methods to adjust the effects mix. 0% removes the effect entirely, while 100% removes all of the dry (unaffected) sound, so that you hear only the wet sound (sound with effect). Your best results will usually come from settings near 50%.

If you're using a stereo insert cable in one or both of the Group A outputs to create a loop to an outboard effects processor, you can bring the effects from the outboard unit into the K2500 and out the MIX outputs. If you want to use only the outboard effects, the easiest way to defeat the K2500's effects is to set the Wet/Dry mix to 0%, and the FX Mode to Master. You could also go to the CHANLS page in MIDI mode, and set the OutPair parameter to a value of B(DRY), C(DRY), or D(DRY) for one or more channels. Any program assigned to these MIDI channels will then be routed to Output Group B, C, or D, and will appear at the MIX outputs without going through the effects processor.

Understanding FX Mode and FX Channel

FX Mode and FX Channel are important to understand because they determine how the effects processor is controlled.

The K2500's effects work as a single effects processor. You can combine different effects together, but you can't split them up between programs or channels. In other words, whichever effect you pick is going to affect all of the programs - you can't have reverb for one program and delay on another.

The FX Mode parameter lets you choose what will control the effects processor. The default value is Auto. This means that the current mode is controlling the effects. Each program and setup has an effect assigned to it. So if you go to Program mode and call up a program, the effect assigned to the program on the effects page in the Program editor will be called up. For example, if you go to Program mode, choose program 1, Acoustic Piano and then go back to the Effects mode, you will see that the effect is Small Hall. If you go back to Program Mode, call up program 2, Stage Piano, and go back to Effects, you will see Medium. Setups function similarly.

The FX Mode parameter works in conjunction with the FX Channel parameter. The default value for this is Current. This means that the program assigned to the MIDI channel currently in the display is in control of the effects. But you can also set this to a specific channel. For example, you could set it so that the Program on Channel 1 is in control of the effects.

As we mentioned, in Auto, either a Program or a Setup can be in control, depending on which mode you are in. You can also set this param to Setup or Program only. The final value is Master. When set to Master, the effect that you call up on this page will be the one you hear, no matter what program you call up. In this situation, the FX channel becomes the channel you would use to send program changes on to call up effects. You can also use this channel to send controllers to alter parameters in real time.

Using Effects in Song Mode

If you are using the K2500's sequencer, you have a couple of additional options. If you set FX Mode to Master, you can choose your effect on the Effects page and it will remain at that setting. If you put it in Auto, then you will have use of the Effect Channel parameter which is found on the Edit Common page of the song. In this case, the program on the Effect Channel will be controlling the effects. See page 12-26 for information on the EffectChan parameter.

FX Mode

The FX Mode parameter determines how preset effects will be selected when you change programs or setups. Refer to "Understanding FX Mode and FX Channel", above, for more information.

The four possible values for FX Mode are explained below.

Master: The preset effect displayed on the Effects mode page will be applied to every program or setup you select, and won't change unless you change it in Effects mode. Use this value when you want to use the same preset effect for every program or setup you select, for example, when recording multi-timbrally. This is also the setting you'll use when you want to be able to use external MIDI to control the K2500's effects in realtime. See the discussion of FX Channel below.

Program: When you select a program on the FX channel (explained below), the K2500 will select the preset effect that's assigned to that program. The program's preset effect is assigned with the Effects Preset parameter on the EFFECT page in the Program Editor. Set FX Mode to Program when you want the preset effect to change every time you select a program on the FX channel. If the value is set to Program, then while you're in Effects mode, the preset effect you hear will be the effect assigned to the program on the FX channel, *not* the one you see displayed. If you select a program on a channel other than the FX channel, the preset effect will not change. If the value of the FX Channel parameter is "Current," then the FX channel always matches the current MIDI channel, and the preset effect will change according to any program you select.

If the value is set to Program and you enter Setup mode, the K2500 uses the preset effect that's assigned to the program on the FX Channel (explained below). Therefore, the effect will change only if you select a setup containing a program assigned to the FX Channel.

Setup: When you select a setup, the K2500 will select the preset effect that's assigned to that setup. The setup preset effect is assigned with the Effect parameter in the Setup Editor. Set FX Mode to Setup when you want the preset effect to change every time you select a setup. The preset effect you hear while in Effects mode will be the effect assigned to the current setup, not the one you see displayed. If you enter Program mode, the effect will not change when you select programs.

Auto: At this setting, the FX mode automatically matches the K2500's operating mode. Selecting a program will select the effect assigned to that program. Selecting a setup will select the effect assigned to that setup. When you enter Effects mode, the value of the Effect parameter is automatically updated to match the effect assigned to the most recently selected program or setup, so when you enter Effects mode, the effect you hear will be the one you were just listening to.

This setting is especially useful if you're using Quick Access mode, and you have programs and setups loaded into your Quick Access banks. A setting of Auto will ensure that the desired effects are selected when you select a program or setup. In Song mode, a setting of Auto lets you use the Effect Channel parameter on the Edit Common page of the song. In this case, the program on the Effect Channel will be controlling the effects. See page 12-26 for information on the EffectChan parameter.

You'll normally leave the FX mode set to Auto, and use the other settings when you want to override the automatic selection of preset effects.

If you've set the FX Mode parameter to a value of other than Auto, and you change the preset effect in the Program or Setup Editor, the value of the FX mode may revert to Auto. This will happen a) when FX Mode is set to Setup and you change the preset effect in the Program Editor; b) when FX mode is set to Program and you change the preset effect in the Setup Editor, and c) when FX Mode is set to Master and you change the preset effect in *either* the Program or Setup Editor. This ensures that if you change the preset effect in either Program or Setup mode, you'll be able to hear the change.

FX Channel

This parameter is closely tied to the FX Mode parameter, and exists to help the K2500 decide which preset effect to select. Refer to "Understanding FX Mode and FX Channel", above, for more information.

When you select a program or setup, the K2500 checks the value of the FX Channel parameter. It then selects the preset effect that's assigned to the program on that channel. The value of the FX Mode parameter determines the range of values for the FX Channel parameter. We'll discuss these values in terms of each of the values for the FX Mode parameter.

FX Mode = Auto: In this case, the preset effect is automatically selected for each program or setup you select. In Setup mode, the FX channel is irrelevant. In Program mode, the FX channel defines the one MIDI channel on which program changes will change the preset effect. This can be set to any of the 16 MIDI channels, or to a value of Current, which means that the FX Channel always matches the current MIDI channel as set in Program mode. When you're in Program mode and you want the preset effect to change whenever you change programs from the K2500's front panel, use a value of Current.

If the value for FX Mode is Auto, and the value for FX Channel is Current, then when you're in Song mode—or you move to another mode during song playback—the channel indicated by the EffectChan parameter on the Edit Song:COMMON page controls the selection of effects. This prevents the effects from changing if you change MIDI channels during song playback. When you exit Song mode—and you're not recording or playing back a song—the currently selected program or setup will regain control over the selection of effects. See page 12-26 for information on the EffectChan parameter.

FX Mode = Master: At this setting the preset effect doesn't change when you select programs or setups, so the FX Channel isn't needed for preset effect selection. When the FX mode is set to Master, the FX channel parameter selects the MIDI channel for realtime effects control via MIDI. Choose a value of 1–16 to specify the channel on which the K2500 will accept incoming MIDI control signals and apply them to the realtime effects parameters (explained in Chapter 3 of the *Reference Guide*). Choose a value of None to disable external MIDI effects control.

FX Mode = Program: In this case, the available values for the FX Channel parameter are Current, and 1–16. Here, the default value of Current is your most likely choice, since preset effect selection and realtime control messages will be tied to the current MIDI channel. Set a value of 1–16 when you want to be able to change programs on the current MIDI channel without changing the preset effect.

FX Mode = Setup: At this setting, the preset effect is determined by the value for the Effect parameter on the Setup Editor page, so the FX Channel parameter is irrelevant, and the only available value is None. Realtime effects are disabled in Setup mode, since there's no way to determine which program should generate the control source signals assigned to control the realtime effects.

Dither

When the K2500 internally requantizes digital word lengths, a small amount of unwanted distortion is produced. Dither converts this distortion into uncorrelated low-level noise, which results in a better sounding output, since the noise added to the signal is usually inaudible. You might be able to hear some noise, however, if you are resampling multiple generations of the K2500's output. For this reason, we recommend that you use Flat dither in a situation where you are repeatedly resampling. Otherwise, you should probably set dither to Maximum, which will sound best in most cases (apart from resampling), or leave it at the default of Medium, which is a convenient compromise between Flat and Maximum.

We don't recommend that you turn dither off, but have provided the None option if you'd like to try that anyway. Keep in mind, however, that any differences will be just barely audible. Furthermore, since None is for your experimentation only, the K2500 will change a dither setting of None to Flat when you restart the unit.

Another Use for Effects Mode

As we mentioned, the main purpose of Effects mode is to tell the K2500 how to select preset effects when you select programs or setups—but there's another convenient use as well.

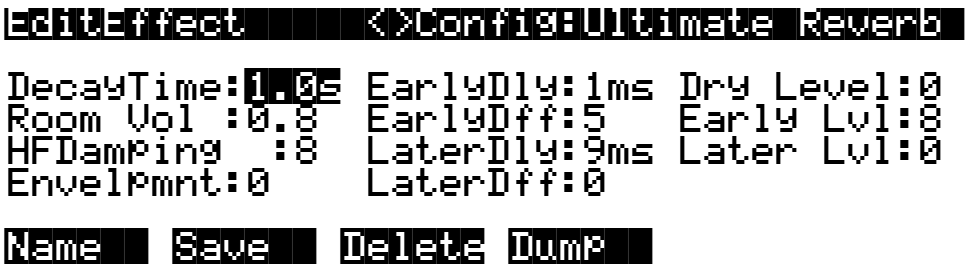
Global Preset Effect

If you set the FX Mode to Master, the effects assignments for programs and setups are overridden. The Effect parameter becomes global. Even when you exit Effects mode and select programs and setups, the preset effect remains unchanged. This is an easy way to hear a particular effect applied to several different programs—without editing the programs themselves. You'll use this when you're playing or recording a multi-timbral sequence and you want to apply a certain effect to every sound.

Setting the FX Mode to Master tells the K2500 to ignore the preset effects settings at the program and setup level. If at some later point you go to Program or Setup mode and change one of the preset effect settings there, the K2500 will assume that the newly selected preset effect is the one you want to use. The value of FX Mode will automatically revert to Auto, so that the newly selected effect can be applied to the program or setup you're editing. This defeats the override, and from that point on, selecting a program or setup will select the preset effect assigned to that program or setup. If you still want the override to apply, return to Effects mode and reset the FX Mode parameter to Master.

The Effects Editor

There are four ways to reach the Effects Editor. One is to select Effects Mode, select the effect you wish to edit, then press EDIT. You also can get there from the EFFECT page in the Program Editor, simply by pressing EDIT. If you're in Setup mode, enter the Setup Editor by pressing EDIT, then select the Program parameter and press EDIT again. You're now in the Program Editor, where you can select the EFFECT page, and press EDIT to enter the Effects Editor. In any case, you'll see a page that looks something like this:



The top line tells you that you're in the Effects Editor, and identifies the configuration (explained below) of the currently selected preset effect. The bottom line labels the active soft buttons. The parameters you see depend on the currently selected configuration.

The **Name**, **Save**, and **Delete** soft buttons handle the basic library functions for user-defined effects, and the **Dump** soft button initiates a System Exclusive dump of the current effect's settings.

Editing Effects

The K2500 interacts with the global effects processor as if it were a separate multi-effects unit that's been mounted internally. There are 47 factory preset effects, and room for you to store 80 of your own preset effects. Like any other K2500 object, the preset effects are edited by selecting parameters and changing their values.

Each factory preset effect—as well as any preset effects you create yourself—uses one of 27 available configurations. The configurations are simply different sets of familiar programmable effects generators, the kind you'd find on any outboard effects unit—reverb, chorus, parametric and graphic EQ, delay, and mixers. Various combinations of these effects generators make up the configurations.

When you enter the Effects Editor, the configuration for the currently selected preset effect is shown on the top line of the display. If you want to tweak a preset effect slightly, simply adjust the values for one or more of the parameters on the page. You can then name and save the new effect, either "replacing" the ROM preset or saving to a RAM location by giving it an unused ID. If you "replace" a ROM effect with one of your own, deleting your effect will restore the ROM effect.

Use the CHAN/BANK buttons to change the configuration to be used by the currently selected preset effect. You'll want to do this only when you're creating new effects that differ in type from the current effect, since changing the configuration can drastically change the nature of the effect.

Configurations and Parameters

The configurations define various types and combinations of effects—reverb, delay, EQ, etc. This section shows you the pages corresponding to each of the configurations. Here's the entire list:

DRY
STEREO CHORUS
STEREO FLANGE
STEREO DELAY
4-TAP DELAY
ULTIMATE REVERB
ROOM SIMULATOR
GATED REVERB
REVERSE REVERB
PARAMETRIC EQ
GRAPHIC EQ
PARAMETRIC EQ+DELAY+MIXER
PARAMETRIC EQ+CHORUS+MIXER
CHORUS+ROOM+MIXER
DELAY+ROOM+MIXER
CHORUS+HALL+MIXER
DELAY+HALL+MIXER
EQ+GATED REVERB+MIXER
EQ+REVERSE REVERB+MIXER
PARAMETRIC EQ+CHORUS+DELAY+MIXER
PARAMETRIC EQ+FLANGE+DELAY+MIXER
CHORUS +DELAY+ROOM+MIXER
FLANGE+DELAY+ROOM+MIXER
CHORUS+DELAY+HALL+MIXER
FLANGE+DELAY+HALL+MIXER
EQ+CHORUS+4-TAP-DELAY+MIXER
EQ+FLANGE+4-TAP DELAY+MIXER

Dry

Use this configuration if you want a particular program or setup to play through the MIX outputs without effects, even though it's routed to Output Group A.

Stereo Chorus

PARAMETER	RANGE OF VALUES
CHORUS DELAY	0 to 60 milliseconds
LFO SPEED	0 to 65
LFO DEPTH	0 to 99
DRY LEVEL	0 to 10
RIGHT—LEFT LEVEL	0 to 10

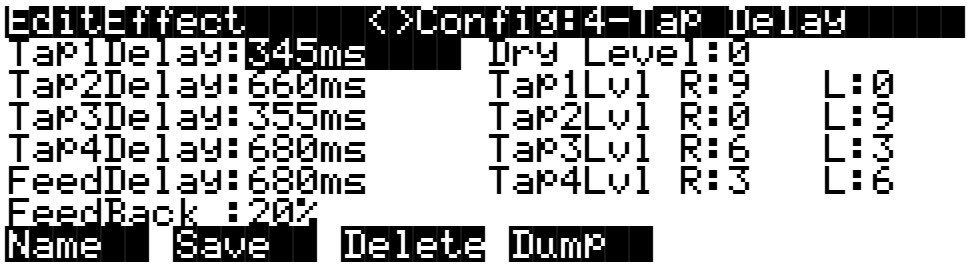
Stereo Flange

PARAMETER	RANGE OF VALUES
FLANGE DELAY	10 milliseconds
LFO SPEED	0 to 65
LFO DEPTH	0 to 99
FEEDBACK	0 to 99%
DRY LEVEL	0 to 10
RIGHT—LEFT LEVEL	0 to 10

Stereo Delay

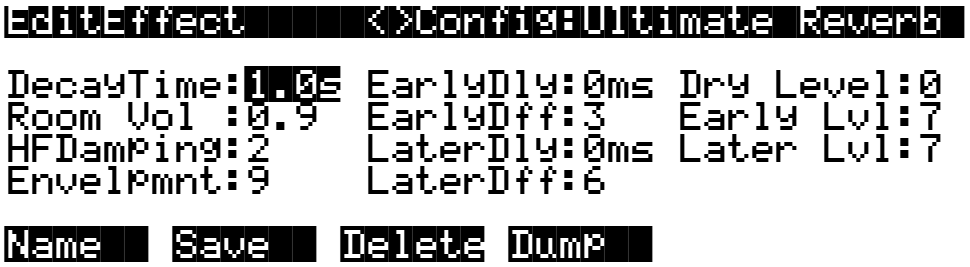
PARAMETER	RANGE OF VALUES
DELAY TIME	0 to 750 milliseconds
FEEDBACK	0 to 99%
DRY LEVEL	0 to 10
RIGHT—LEFT LEVEL	0 to 10

4-Tap Delay



PARAMETER	RANGE OF VALUES
TAP 1—4 DELAY	0 to 1500 milliseconds
FEEDBACK DELAY	0 to 1500 milliseconds
FEEDBACK	0 to 99%
DRY LEVEL	0 to 10
TAP LEVEL 1—4 RIGHT	0 to 10
TAP LEVEL 1—4 LEFT	0 to 10

Ultimate Reverb



PARAMETER	RANGE OF VALUES
DECAY TIME	1 to 99 seconds
ROOM VOLUME	0.0 to 0.9
HIGH-FREQUENCY DAMPING	0 to 9
ENVELOPMENT	0 to 9
EARLY DELAY	0 to 70 milliseconds
EARLY DIFFUSION	0 to 9
LATER DELAY	0 to 70 milliseconds
LATER DIFFUSION	0 to 9
DRY LEVEL	0 to 10
EARLY LEVEL	0 to 10
LATER LEVEL	0 to 10

Room Simulator

PARAMETER	RANGE OF VALUES
GROSS SIZE	Studio, Chamber, Club, Hall, Arena
DECAY TIME	0.7 to 23.8 seconds
LISTENING POSITION	Front, Middle, Back
HIGH-FREQUENCY DAMPING	0 to 9
DRY LEVEL	0 to 10
REVERB LEVEL	0 to 10

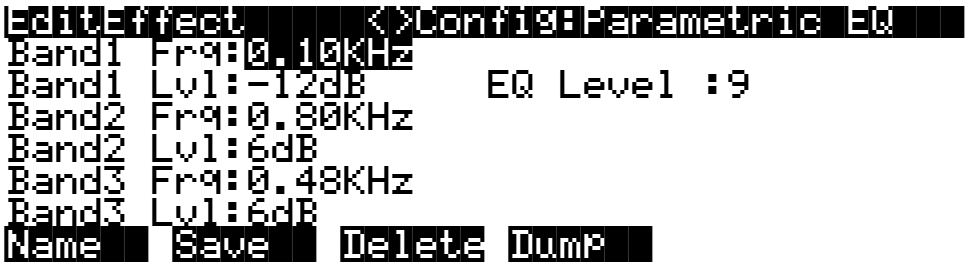
Gated Reverb

PARAMETER	RANGE OF VALUES
PRE-DELAY	0 to 80 milliseconds
ENVELOPE	Flat, Decaying
DECAY TIME	50 to 600 milliseconds
ACCENT DELAY	±50 milliseconds
DRY LEVEL	0 to 10
ACCENT LEVEL	0 to 10
RIGHT—LEFT LEVEL	0 to 10

Reverse Reverb

PARAMETER	RANGE OF VALUES
PRE-DELAY	0 to 80 milliseconds
REVERB TIME	50 to 600 milliseconds
ACCENT DELAY	±50 milliseconds
DRY LEVEL	0 to 10
ACCENT LEVEL	0 to 10
RIGHT—LEFT LEVEL	0 to 10

Parametric EQ



PARAMETER	RANGE OF VALUES
BAND 1 FREQUENCY	0.1 to 12.60 KHz (cycles per second)
BAND 1 LEVEL	±12 DB
BAND 2—3 FREQUENCY	0.1 to 12.80 KHz
BAND 2—3 LEVEL	±12 DB
EQ LEVEL	0 to 10

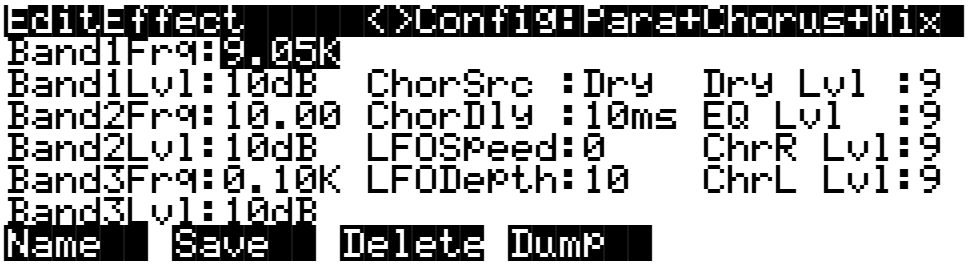
Graphic EQ

PARAMETER	RANGE OF VALUES
ALL (Frequency in Hz)	±12 dB in 2dB increments

Parametric EQ, Delay, and Mixer

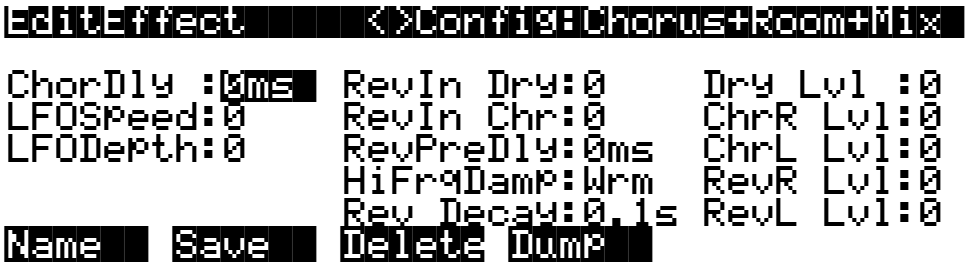
PARAMETER	RANGE OF VALUES
BAND 1 FREQUENCY	0.10 to 12.60 KHz
BAND 1 LEVEL	±12 dB
BAND 2—3 FREQUENCY	0.10 to 12.80 KHz
BAND 2—3 LEVEL	±12 dB
DELAY SOURCE	EQ, Dry
DELAY IN LEVEL	0 to 10
DELAY TIME	0 to 1500 milliseconds
FEEDBACK	0 to 99%
DRY LEVEL	0 to 10
EQ LEVEL	0 to 10
DELAY LEVEL RIGHT—LEFT	0 to 10

Parametric EQ, Chorus, and Mixer



PARAMETER	RANGE OF VALUES
BAND 1 FREQUENCY	0.10 to 12.60 KHz
BAND 1 LEVEL	±12 dB
BAND 2—3 FREQUENCY	0.10—12.80 KHz
BAND 2—3 LEVEL	±12 dB
CHORUS SOURCE	EQ, Dry
CHORUS DELAY	0 to 60 milliseconds
LFO SPEED	0 to 65
LFO DEPTH	0 to 99
DRY LEVEL	0 to 10
EQ LEVEL	0 to 10
CHORUS RIGHT—LEFT LEVEL	0 to 10

Chorus, Room Reverb, and Mixer

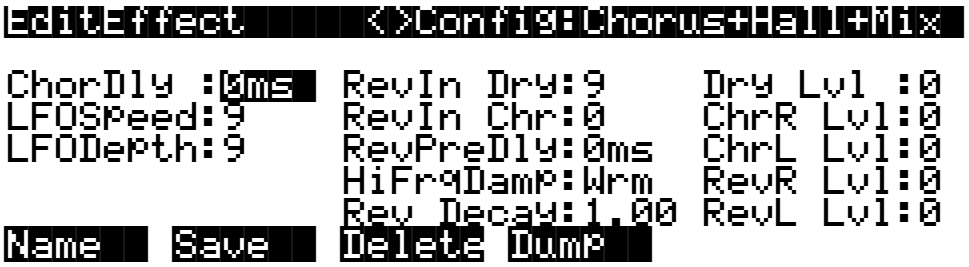


PARAMETER	RANGE OF VALUES
CHORUS DELAY	0 to 60 milliseconds
LFO SPEED	0 to 65
LFO DEPTH	0 to 99
REVERB IN DRY	0 to 10
REVERB IN CHORUS	0 to 10
REVERB PRE-DELAY	0 to 60 milliseconds
HIGH-FREQUENCY DAMPING	Warm, Soft, Bright
REVERB DECAY	0.1 to 1.2 seconds
DRY LEVEL	0 to 10
CHORUS LEVEL RIGHT—LEFT	0 to 10
REVERB LEVEL RIGHT—LEFT	0 to 10

Delay, Room Reverb, and Mixer

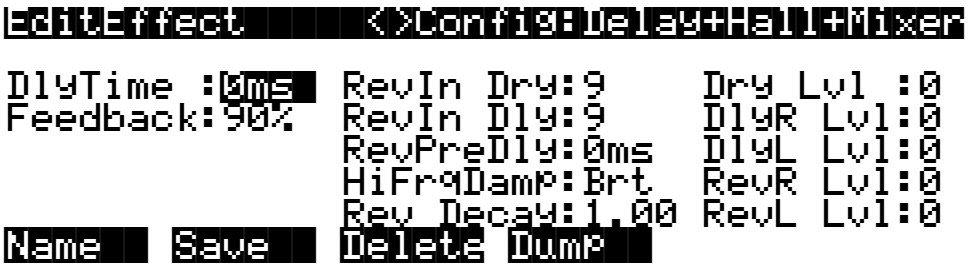
PARAMETER	RANGE OF VALUES
DELAY TIME	0 to 750 milliseconds
FEEDBACK	0 to 99%
REVERB IN DRY	0 to 10
REVERB IN DELAY	0 to 10
REVERB PRE-DELAY	0 to 60 milliseconds
HIGH FREQUENCY DAMPING	Warm, Soft, Bright
REVERB DECAY	0.1 to 1.2 seconds
DRY LEVEL	0 to 10
DELAY LEVEL RIGHT—LEFT	0 to 10
REVERB LEVEL RIGHT—LEFT	0 to 10

Chorus, Hall Reverb, and Mixer



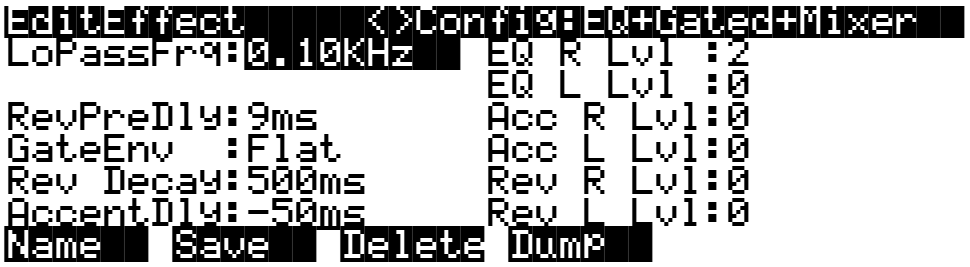
PARAMETER	RANGE OF VALUES
CHORUS DELAY	0 to 60 milliseconds
LFO SPEED	0 to 65
LFO DEPTH	0 to 99
REVERB IN DRY	0 to 10
REVERB IN CHORUS	0 to 10
REVERB PRE-DELAY	0 to 60 milliseconds
HIGH-FREQUENCY DAMPING	Warm, Soft, Bright
REVERB DECAY	1.00 to 20.0 seconds
DRY LEVEL	0 to 10
CHORUS LEVEL RIGHT—LEFT	0 to 10
REVERB LEVEL RIGHT—LEFT	0 to 10

Delay, Hall Reverb, and Mixer



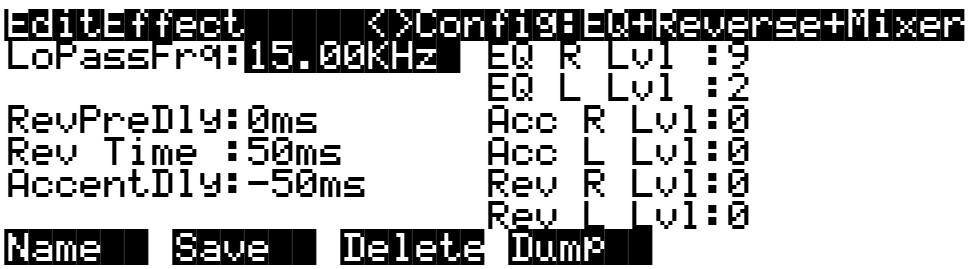
PARAMETER	RANGE OF VALUES
DELAY TIME	0 to 750 milliseconds
FEEDBACK	0 to 99%
REVERB IN DRY	0 to 10
REVERB IN DELAY	0 to 10
REVERB PRE-DELAY	0 to 60 milliseconds
HIGH FREQUENCY DAMPING	Warm, Soft, Bright
REVERB DECAY	1.00 to 20.0 seconds
DRY LEVEL	0 to 10
DELAY LEVEL RIGHT—LEFT	0 to 10
REVERB LEVEL RIGHT—LEFT	0 to 10

EQ, Gated Reverb, and Mixer



PARAMETER	RANGE OF VALUES
LOWPASS FILTER CUTOFF FREQ.	0.10 to 18.00KHz
REVERB PRE-DELAY	0 to 80 milliseconds
GATE ENVELOPE	Flat, Decaying
GATE DECAY TIME	50 to 600 milliseconds
ACCENT DELAY	±50 milliseconds
EQ LEVEL RIGHT—LEFT	0 to 10
ACCENT LEVEL RIGHT—LEFT	0 to 10
REVERB LEVEL RIGHT—LEFT	0 to 10

EQ, Reverse Reverb, and Mixer



PARAMETER	RANGE OF VALUES
LOWPASS FILTER CUTOFF FREQ.	100 Hz to 18.00KHz
REVERB PRE-DELAY	0 to 80 milliseconds
REVERSE TIME	50 to 600 milliseconds
ACCENT DELAY	±50 milliseconds
EQ LEVEL RIGHT—LEFT	0 to 10
ACCENT LEVEL RIGHT—LEFT	0 to 10
REVERSE LEVEL RIGHT—LEFT	0 to 10

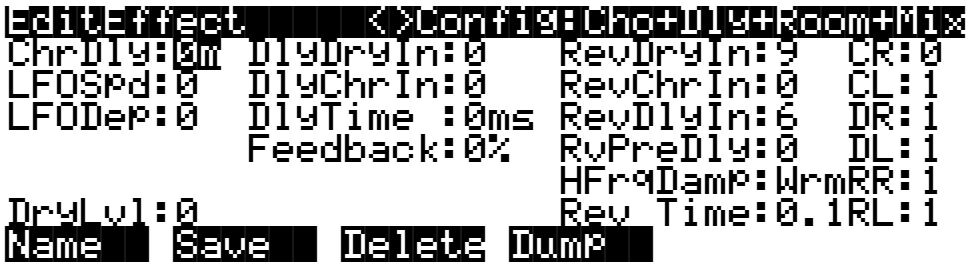
Parametric EQ, Chorus, Delay, and Mixer

PARAMETER	RANGE OF VALUES
BAND 1 FREQUENCY	0.1 to 12.60 KHz
BAND 1 LEVEL	±12 dB
BAND 2—3 FREQUENCY	0.1 to 12.80 KHz
BAND 2—3 LEVEL	±12 dB
CHORUS EQ SOURCE	EQ, Dry
CHORUS DELAY	0 to 60 milliseconds
CHORUS LFO SPEED	0 to 65
CHORUS LFO DEPTH	0 to 99
DELAY EQ SOURCE	EQ, Dry
DELAY EQ IN	0 to 10
DELAY CHORUS IN	0 to 10
DELAY TIME	0 to 1500 milliseconds
DELAY FEEDBACK	0 to 99%
DRY LEVEL	0 to 10
EQ LEVEL	0 to 10
DELAY LEVEL RIGHT—LEFT	0 to 10
CHORUS LEVEL RIGHT—LEFT	0 to 10

Parametric EQ, Flange, Delay, and Mixer

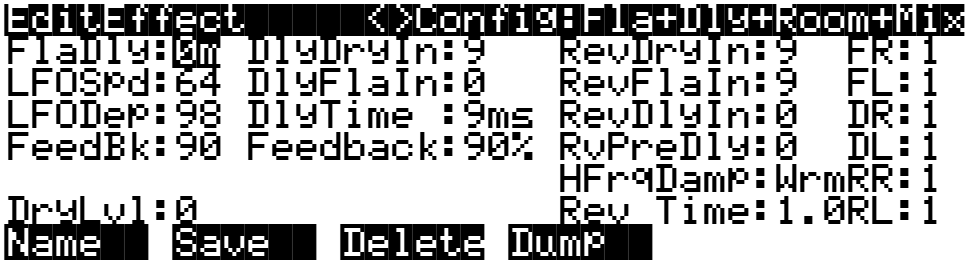
PARAMETER	RANGE OF VALUES
BAND 1 FREQUENCY	100 Hz to 12.60 KHz
BAND 1 LEVEL	±12 dB
BAND 2—3 FREQUENCY	0.1 to 12.80 KHz
BAND 2—3 LEVEL	±12 dB
FLANGE SOURCE	EQ, Dry
FLANGE DELAY	0 to 10 milliseconds
LFO SPEED	0 to 65
LFO DEPTH	0 to 99
FLANGE FEEDBACK	0 to 99%
DELAY EQ SOURCE	EQ, Dry
DELAY EQ IN	0 to 10
DELAY FLANGE IN	0 to 10
DELAY TIME	0 to 1500 milliseconds
DELAY FEEDBACK	0 to 99%
DRY LEVEL	0 to 10
EQ LEVEL	0 to 10
DELAY LEVEL RIGHT—LEFT	0 to 10
FLANGE LEVEL RIGHT—LEFT	0 to 10

Chorus, Delay, Room Reverb, and Mixer



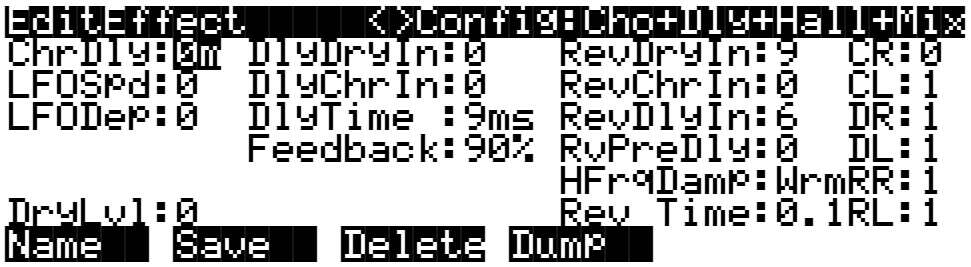
PARAMETER	RANGE OF VALUES
CHORUS DELAY	0 to 60 milliseconds
CHORUS LFO SPEED	0 to 65
CHORUS LFO DEPTH	0 to 99
DRY LEVEL	0 to 10
DELAY DRY IN	0 to 10
DELAY CHORUS IN	0 to 10
DELAY TIME	0 to 750 milliseconds
DELAY FEEDBACK	0 to 99%
REVERB DRY IN	0 to 10
REVERB CHORUS IN	0 to 10
REVERB DELAY IN	0 to 10
REVERB PRE-DELAY	0 to 60 milliseconds
HIGH FREQUENCY DAMPING	Warm, Soft, Bright
REVERB TIME (DECAY)	100 milliseconds to 1.2 seconds
CHORUS LEVEL RIGHT—LEFT	0 to 10
DELAY LEVEL RIGHT—LEFT	0 to 10
REVERB LEVEL RIGHT—LEFT	0 to 10

Flange, Delay, Room Reverb, and Mixer



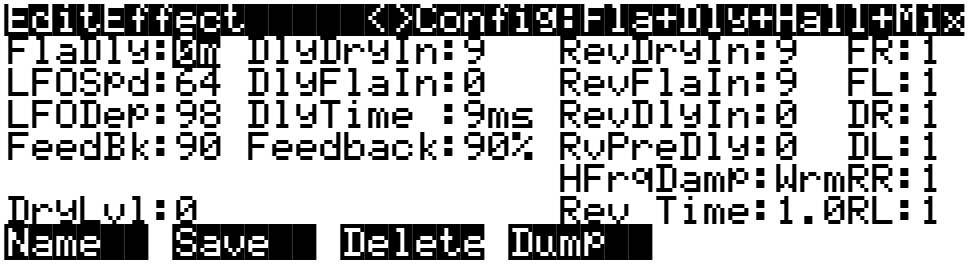
PARAMETER	RANGE OF VALUES
FLANGE DELAY	0 to 60 milliseconds
FLANGE LFO SPEED	0 to 65
FLANGE LFO DEPTH	0 to 99
FLANGE FEEDBACK	0 to 99%
DRY LEVEL	0 to 10
DELAY DRY IN	0 to 10
DELAY FLANGE IN	0 to 10
DELAY TIME	0 to 750 milliseconds
DELAY FEEDBACK	0 to 99%
REVERB DRY IN	0 to 10
REVERB FLANGE IN	0 to 10
REVERB DELAY IN	0 to 10
REVERB PRE-DELAY	0 to 60 milliseconds
HIGH FREQUENCY DAMPING	Warm, Soft, Bright
REVERB TIME (DECAY)	100 milliseconds to 1.2 seconds
FLANGE LEVEL RIGHT—LEFT	0 to 10
DELAY LEVEL RIGHT—LEFT	0 to 10
REVERB LEVEL RIGHT—LEFT	0 to 10

Chorus, Delay, Hall Reverb, and Mixer



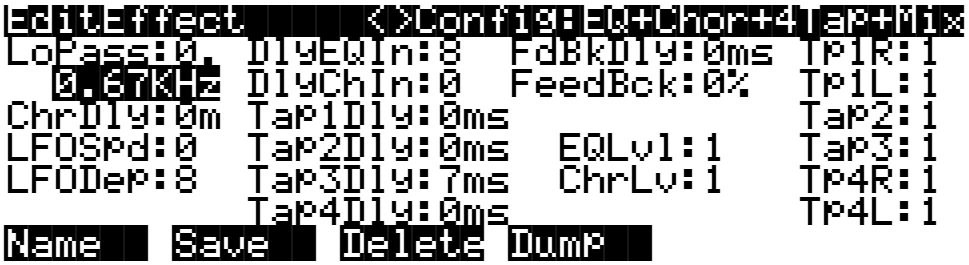
PARAMETER	RANGE OF VALUES
CHORUS DELAY	0 to 60 milliseconds
CHORUS LFO SPEED	0 to 65
CHORUS LFO DEPTH	0 to 99
DRY LEVEL	0 to 10
DELAY DRY IN	0 to 10
DELAY CHORUS IN	0 to 10
DELAY TIME	0 to 750 milliseconds
DELAY FEEDBACK	0 to 99%
REVERB DRY IN	0 to 10
REVERB CHORUS IN	0 to 10
REVERB DELAY IN	0 to 10
REVERB PRE-DELAY	0 to 60 milliseconds
HIGH FREQUENCY DAMPING	Warm, Soft, Bright
REVERB TIME (DECAY)	1.0 to 20.0 seconds
CHORUS LEVEL RIGHT—LEFT	0 to 10
DELAY LEVEL RIGHT—LEFT	0 to 10
REVERB LEVEL RIGHT—LEFT	0 to 10

Flange, Delay, Hall Reverb, and Mixer



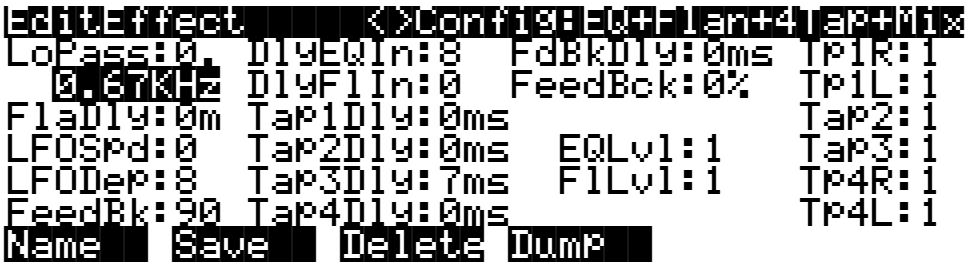
PARAMETER	RANGE OF VALUES
FLANGE DELAY	0 to 60 milliseconds
FLANGE LFO SPEED	0 to 65
FLANGE LFO DEPTH	0 to 99
FLANGE FEEDBACK	0 to 99%
DRY LEVEL	0 to 10
DELAY DRY IN	0 to 10
DELAY FLANGE IN	0 to 10
DELAY TIME	0 to 750 milliseconds
DELAY FEEDBACK	0 to 99%
REVERB DRY IN	0 to 10
REVERB FLANGE IN	0 to 10
REVERB DELAY IN	0 to 10
REVERB PRE-DELAY	0 to 60 milliseconds
HIGH FREQUENCY DAMPING	Warm, Soft, Bright
REVERB TIME (DECAY)	100 milliseconds to 1.2 seconds
FLANGE LEVEL RIGHT—LEFT	0 to 10
DELAY LEVEL RIGHT—LEFT	0 to 10
REVERB LEVEL RIGHT—LEFT	0 to 10

EQ, Chorus, 4-Tap Delay, and Mixer



PARAMETER	RANGE OF VALUES
LOWPASS FILTER CUTOFF FREQ.	100 Hz to 18 KHz
CHORUS DELAY	0 to 60 milliseconds
CHORUS LFO SPEED	0 to 65
CHORUS LFO DEPTH	0 to 99
DELAY EQ IN	0 to 10
DELAY CHORUS IN	0 to 10
TAP 1—4 DELAY	0 to 1500 milliseconds
FEEDBACK DELAY	0 to 1500 milliseconds
4-TAP FEEDBACK AMOUNT	0 to 99%
EQ LEVEL	0 to 10
CHORUS LEVEL	0 to 10
TAP 1—4 LEVEL RIGHT—LEFT	0 to 10

EQ, Flange, 4-Tap Delay, and Mixer



PARAMETER	RANGE OF VALUES
LOWPASS FILTER CUTOFF FREQ.	100 Hz to 18 KHz
FLANGE DELAY	0 to 60 milliseconds
FLANGE LFO SPEED	0 to 65
FLANGE LFO DEPTH	0 to 99
FLANGE FEEDBACK	0 to 99%
DELAY EQ IN	0 to 10
DELAY FLANGE IN	0 to 10
TAP 1—4 DELAY	0 to 1500 milliseconds
FEEDBACK DELAY	0 to 1500 milliseconds
4-TAP FEEDBACK AMOUNT	0 to 99%
EQ LEVEL	0 to 10
FLANGE LEVEL	0 to 10
TAP 1—4 LEVEL RIGHT—LEFT	0 to 10