



KURZWEIL
Music Systems

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Chapter 1

What is KDFX

Introduction

KDFX puts the power of an entire studio—equalizers, signal processors, and mixers—inside your Kurzweil K2500. It allows you to define processing functions, signal paths, and balances, on sounds created by the K2500 and, in Live Mode, sounds from *any* source. Using FX Modulation routings, you have real-time control over any aspects of your studio, from the buttons, sliders, wheels, and pedals on your K2500, or from any MIDI source at all, like a sequencer or a dedicated controller.

KDFX provides up to five individual signal effects processors. Four of these are designed to operate on their own individual buses, and the fifth, the “Auxiliary” processor, is designed to be global.

When the K2500 is being used multi-timbrally, KDFX can provide separate processors for each of several instruments. For example, let’s say four K2500 channels are in use, under the control of a sequencer. Each instrument on each channel can have its own processing: flanger for the piano, delay for the sax, compression for the bass, and tight reverb for the drums. Then all of these signals would go through the global Auxiliary (“Aux”) processor, where they would be given a room reverb. At the outputs of the K2500, the reverb would show up on one pair, while the other instruments’ dry or processed (pre-reverb) signals would show up at the others, either in mono or stereo. Or the entire mix, carefully balanced and panned, could appear at a single pair, ready to be recorded or played through a PA.

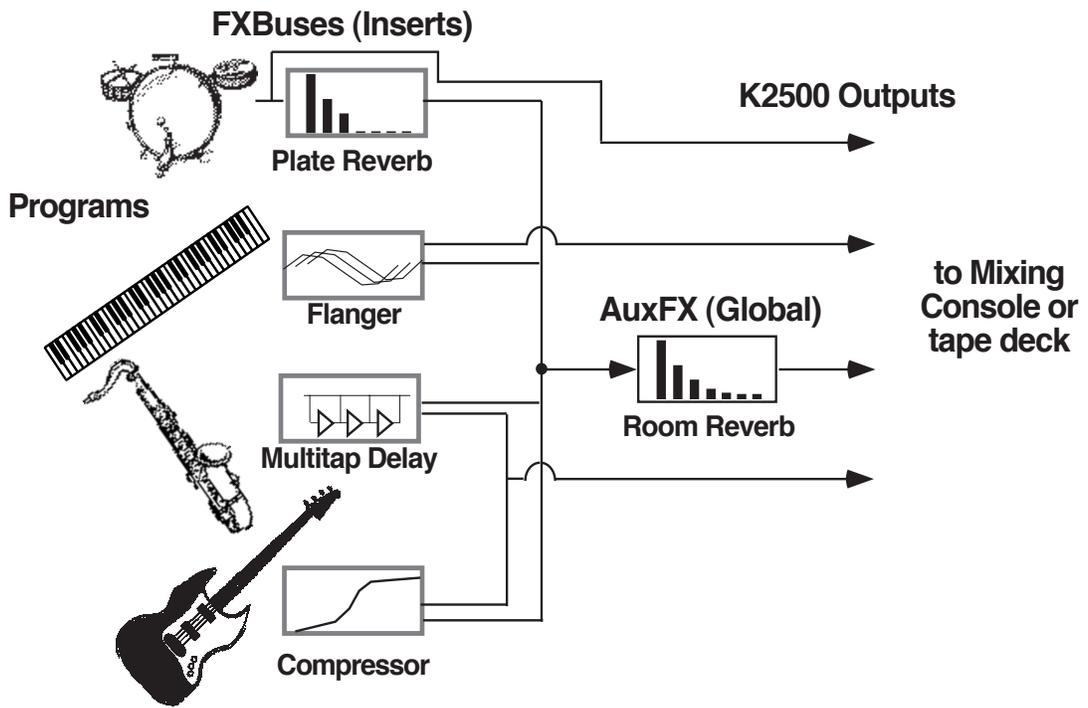


Figure 1-1. A KDFX Studio

Alternatively, in a live performance setting, you can use the KDFX in Setup mode as an entire orchestra, with different instruments layered on top of each other and mapped to different parts of the keyboard, all with their own signal processing; and that signal processing can change completely in an instant when you call up a new Setup.

These are just two of the huge variety of scenarios possible with KDFX. The structure of KDFX is so flexible that you should never run out of ideas for how it can be used.

KDFX Terms

Before starting to work with KDFX, it would be good to go over some important terminology that you will be confronting. Understanding the words will help you get the concepts quickly. Read this chapter first, and refer to it later if something isn't clear.

Studio

A Studio is the entire KDFX environment, consisting of **Inputs**, **FX Buses**, an **Aux FX Bus**, **FX Presets**, **Parameter** settings, **Overrides**, and **Outputs**. One Studio is current at a time in KDFX. Studios are objects, like K2500 programs, and have a number. They can be linked to Programs or Setups using the **FXMode setting**. KDFX comes with a large number of useful Studios, and users can modify them or create new ones and store them in RAM.

FX Bus (also called “Insert FX Bus”)

A signal path with some kind of processing—a delay, reverb, flanger, etc.—on it. It has stereo inputs and outputs, and contains an **FX Preset** which determines the kind of processing that will be applied. A **Studio** has four insert FX Buses, each with its own FX Preset, as well as a fifth FX Bus, known as the **Aux FX Bus**.

Aux FX Bus (or just “Aux Bus”)

A separate FX Bus from the **Insert FX Buses**, which is placed in the signal path after the output of the Insert FX Buses, so that it can act as a “global” processor.

Mix Bus

The various outputs of a Studio can appear individually at the K2500's physical outputs, or two or more of them can be combined before they get to the physical outputs. The Mix Bus is where this combining takes place.

FX Preset

An FX Preset determines the type of signal processing that is present on an **Insert FX Bus** or the **Aux FX Bus**. FX Presets consist of an **Algorithm**, plus the settings of the **Parameters** associated with that Algorithm. More than one FX Preset can use the same Algorithm. KDFX comes with a large number of FX Presets, and users can modify them or create new ones and store them in RAM. Algorithms, however, are stored in ROM and are not changeable by the user. Each FX Bus and the Aux FX Bus gets its own FX Preset, so up to five FX Presets can be active in a studio at a time.

FX Algorithm (or just “Algorithm”)

A specific type of signal processing, like a hall reverb, plate reverb, chorus, flanger, pitcher, compressor, rotary speaker, etc., which is at the core of an **FX Preset**. KDFX comes with a large variety of Algorithms, which are stored in ROM, and are not changeable by the user. Additional Algorithms, supplied by Kurzweil, can be loaded in from disk when they become available. Algorithm **Parameters** (RT_{60} , delay feedback, pitch change, etc.) *are* changeable by the user, and those user-controlled parameters are stored in RAM as part of an FX Preset. (Don't confuse these with the VAST Algorithms used inside the K2500 Program Editor.)

Size/PAUs

How big an Algorithm is, in terms of how much processing power it needs to operate. Size is measured in Processor Allocation Units, or “PAUs”. Some simple algorithms require only 1 PAU, while more complex ones require 2, 3, or even 4. The total number of PAUs available to the four **Insert FX Buses** is 4. PAUs can be allocated automatically as **FX Presets** are assigned to FX Buses, or manually by the user. The **Aux FX Bus** has its own set of 3 PAUs, which are not shared with the Insert FX Buses.

Parameters

Refers to the user-controlled settings for the different characteristics of an **Algorithm**. For example, the user can set the reverb time (RT_{60}) of an Algorithm to 3.5s, or the feedback of a delay line to 90%, or the dynamic ratio of a compressor to 10:1. Parameters are stored, along with the Algorithm they modify, as part of an **FX Preset**. In certain cases, the parameter settings within a Studio can be overridden, either using **FXMods** or **Bus Overrides**.

FXMods

FXMods allow the **Parameters** within a **Studio** to be controlled in real time from outside the Studio. Almost any parameter within a Studio can be controlled by MIDI commands, such as sliders or ribbons or sequencer data, or by internal K2500 functions, such as LFOs, envelopes, clocks, or key states, by setting up an FXMod between the parameter and the desired control source. FXMods are not set up in the Studio, but rather in a K2500 Program or Setup that will be associated with that Studio. These links are created on seven “FX” editing pages in the K2500's Program or Setup editor. A Program or Setup can contain up to 18 FXMods. In addition, Programs and Setups now contain two dedicated LFOs, two ASR envelopes, and four FUNctions just for this purpose. FXMods are stored as part of a Program or Setup, not as part of a Studio or FX Preset.

Bus Overrides (or BusMods)

Bus Overrides allow **Parameters** within an **FX Preset** to be controlled on the **FX Bus** page in the Studio Editor, outside the **FX Preset editor**, but still within the Studio. Any two parameters in an FX Preset can be brought out to its **FXBus** page. Bus Overrides are stored as part of the Studio, not as part of the FX Preset. They are useful when an existing FX Preset is close to what you want, so that you can tweak it without having to create a new FX Preset. Bus Overrides and FXMods can both exist in a Studio at the same time.

FXMode setting

This parameter, which is found on the K2500's "Effects" Mode page, determines whether the parameters in a KDFX **Studio** will be controlled internally or externally—in other words, whether **FX Mods** will be active. If it is set to "Program", "Setup", or "Auto", then as you change the Program or Setup, a different KDFX Studio will load, and any FXMod links between that Program or Setup and the Studio will be active. If it is set to "Master", then the KDFX Studio must be chosen manually, and will not change when the Program or Setup changes, and FXMods in the current Program or Setup will be not be active.

Studio Editor

The Studio Editor section is accessed in one of two ways, depending on the **FX Mode setting**. If FX Mode is "Master", then the Studio Editor is accessed from the "Effects" mode page, by highlighting the current Studio, and pressing "**Edit**". If FX Mode is "Program" or "Setup", then the Studio Editor is accessed from *within* the Program or Setup Editor, by going to the Editor's KDFX page, highlighting the current Studio, and pressing "**Edit**".

The Studio Editor consists of the following pages:

Input, where signals coming from the K2500's four stereo output buses are routed to one or more FX Buses in KDFX.

FX Bus, where **FX Presets** are assigned to the four **FX Buses** and **Bus Overrides** are set up.

Aux FX, where an **FX Preset** is assigned to the **Aux FX Bus** and **Bus Overrides** are set up.

FXPreset Editor, which is accessed from the **FX Bus** page and the **Aux FX** page by highlighting the name of the **FX Preset** and pressing "**Edit**". This is where Algorithms are chosen and Parameters are set for the FX Presets, and where FX Presets are selected, named, and saved.

Output, where the signals coming from the FX Buses and Aux FX are routed to the K2500's eight physical outputs (analog and digital).

Name, Save, Delete, and Dump, for file management of KDFX **Studios**.

Dependent objects

In KDFX, as in K2500 programs, dependent objects are those software objects which make up part of larger objects: in a **Studio**, the dependent objects are its **FX Presets**. The Studio itself is now a dependent object in Programs and Setups.

Internal Effects

The original K2500 effects processor chip is still usable in a KDFX-equipped unit, and functions essentially the same as it always has, quite independently from KDFX (except that the **FXMode Setting** applies both to it and to KDFX). When we refer to Internal Effects in this manual, we're talking about that one-in, two-out effects processor.

The Structure of KDFX

The Studio

All of KDFX's functions are contained in a **Studio**. Only one Studio is active at a time.

Up to four stereo or eight mono inputs feed a Studio. The sources for these inputs are the four output pairs available on the Output pages in the K2500's Program and Setup Editors: A, B, C, and D, which are now called "KDFX-A" through "KDFX-D". Instead of going directly to the K2500's physical outputs, these program outputs now feed KDFX, and only after going through KDFX do they appear at the physical outputs.

The inputs to the Studio can come from one multi-layered program, or from several programs, or from the K2500's own Sample input when the instrument is in Live Mode.

The input signals pass through an input routing system—the **Input Editor**. Here, the signals go through individual two-band equalizers, or **EQs**. Then each input, mono or stereo, is routed to any two of the four **FX Buses**.

Each of the **FX Buses** contains its own signal-processing program, called an **FX Preset**. Each FX Preset has a set of parameters: for example the RT₆₀ value on a reverb, or the Feedback level on a delay line. These parameters can be fixed as part of the FX Preset, or they can be externally controlled, from one of two different places. The four FX Buses are also called "**Insert FX Buses**", because in a conventional studio, that's where they would be found: in the insert loop of a mixer, between the channel input and the mix bus.

There is a fifth FX Preset, which is located on the **Auxiliary FX Bus**. The Aux FX Bus follows the four main FX Presets in the signal path, and is normally configured as a "global" processor.

Each FX Preset is based on an **FX Algorithm**. An Algorithm is a processing function, like a reverb, flanger, or compressor; or a combination of processing functions in a particular order, like a flanger followed by a delay followed by a reverb. The Algorithms themselves are fixed in ROM, like Kurzweil ROM samples, but the values of their operating parameters can be changed.

☛ **The selection of an Algorithm + its user-controlled parameters = an FX Preset.**

Each Algorithm requires a certain amount of processing power, which is expressed in "Processing Allocation Units" (or **PAUs**). Simple Algorithms will require 1 PAU, while more complex Algorithms will require up to 4 PAUs. The amount of processing power available in each FX Preset is set by its **Allocation** parameter. When you are selecting an FX Preset for an insert bus, the number of PAUs its Algorithm requires appears on the display, so you can keep track of how many PAUs are in use.

PAUs are shared among the four Insert FX buses. There is a limit to the total number of PAUs that the insert buses can use, and that limit is 4. PAUs can be manually pre-assigned to specific FX Buses, or using "Auto" mode they can be assigned automatically as FX Presets are assigned to the buses. The Auxiliary FX Bus has a separate set of PAUs—3 of them—which are *not* shared with the insert buses.

Finally, the outputs of the FX Presets are sent to an output routing system—the **Output Editor**—where they are then sent to the physical outputs of the K2500.

☛ **EQs + Input Editor settings + FX Presets + Output Editor settings = a Studio**

On the following page is a schematic overview of a Studio's structure.

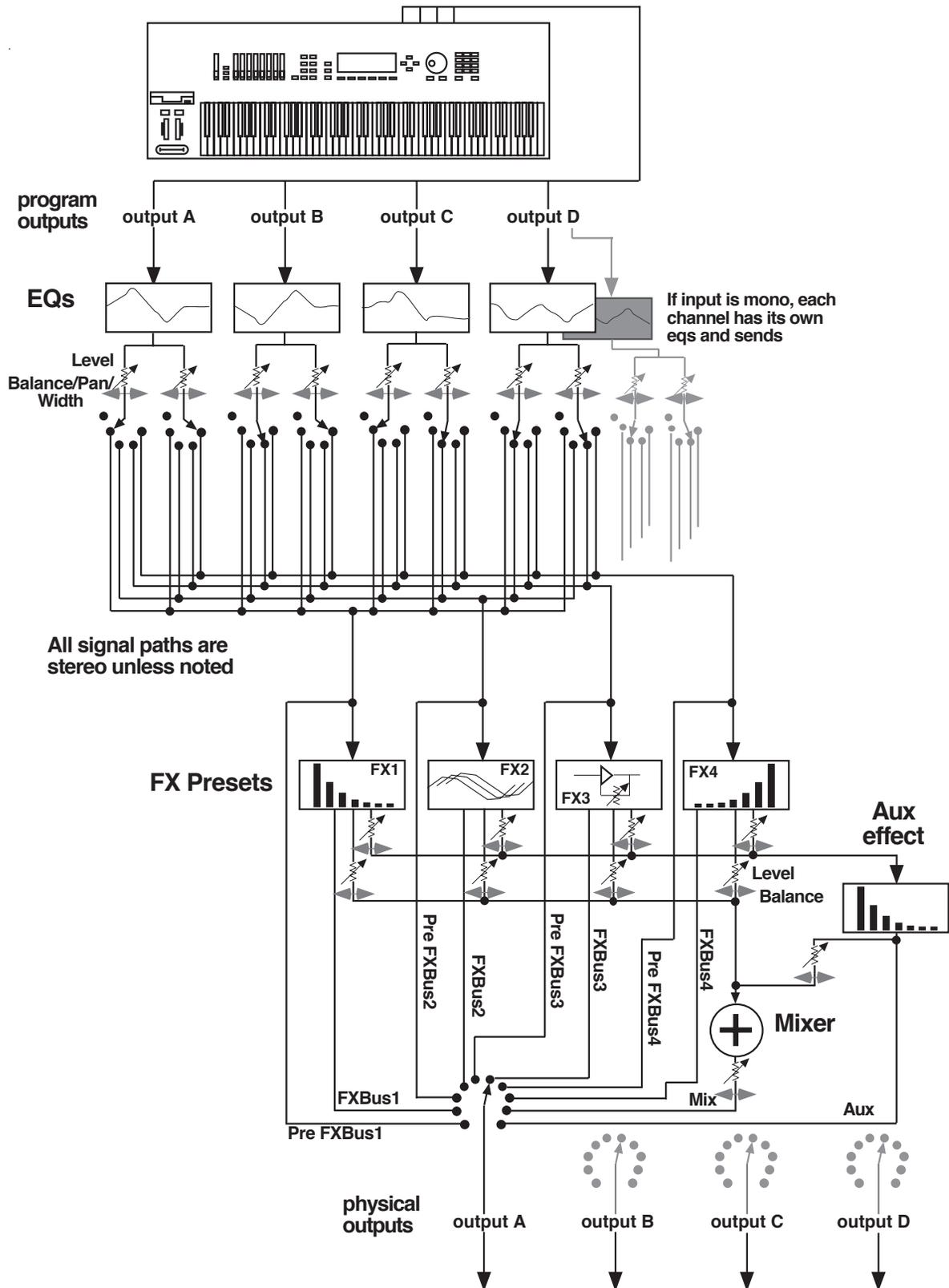


Figure 1-2. KDFX structure

Normal Studio Structure

Many of the Studios provided in ROM follow an overall organizational plan, which uses KDFX's resources efficiently and clearly. While by no means are you required to follow this structure when creating your own studios, you might want to get familiar with it, and see how Kurzweil's own engineers have approached the issue of organization for the Studios in ROM.

- Inside the ROM Programs and Setups, each of the outputs KDFX-A through KDFX-D are assigned based on the type of effects processing that would most likely be appropriate for the sound on that layer or Program.
- Input A/FXBus 1 contains a relatively simple reverb with a low Size requirement.
- Input B/FXBus 2 contains an effect which does not increase the "length" of the sound (i.e., not reverb or delay), which could include chorus, flange, distortion, pitcher, EQ, etc.
- Input C/FXBus 3 contains effects which take up lots of time, such as delays, and delays with reverb.
- Input D/FXBus 4 is dry.
- The AUXFX Bus contains a larger reverb (Size:3), a compressor, or a graphic EQ.

Software Organization

Like K2500 Programs, the software user interface of a Studio is organized in a "top-down" fashion: A Studio is an "Object" in K2500 terms, and the FX Presets within a Studio are also Objects, "dependent" to the Studio, the way a Keymap is to a Program. Studios and FX Presets that are modified or created by the user are stored in Program RAM. A Studio contains up to five FX Presets. The same way that one Keymap can be used in multiple Programs, a particular FX Preset can be used in multiple Studios.

Like ROM Samples in the K2500, KDFX Algorithms are stored in ROM and are unchangeable. Each FX Preset contains one algorithm. Just as you can use the same Sample in more than one Keymap, you can use the same algorithm in as many FX Presets as you like. Although you cannot modify Algorithms, additional KDFX Algorithms will be available from Kurzweil on disk, which can be loaded into KDFX.

To get inside a Studio, you use the **Edit** button to reveal the input/EQ, FX Presets, and output pages. To get inside an FX Preset, use the **Edit** button to access the Algorithm that the FX Preset uses, and its associated parameters.

To leave the FX Preset editor, press **Exit**. If you have made any changes, you will be prompted to Save the new FX Preset. Then to go back to the Studio's main page, press **Exit** again. If you have made any changes in the other parameters in the Studio, or in the name or number of the FX Preset, you will be prompted to Save the new Studio.

Controlling KDFX

Studios can be called up from the K2500 front panel or, like the original K2500 Internal Effects, they can be assigned to specific K2500 Programs or Setups. If you set the **FX Mode** parameter on the K2500's Effects mode page to "Program", "Setup", or "Auto", then changing a Program (if the current channel agrees with the FX Channel) or Setup will select the Studio associated with the new Program or Setup. Of course, just as you can use the same Effect in multiple Programs, you can use the same Studio in multiple Programs or Setups. Setting FX Mode to "Master" means that the Studio will not change with the Program or Setup.

Studio parameters are set in the Studio editor. They initially are given fixed values, but they can be also be controlled in real-time by a wide range of control of sources, including K2500 on-board wheels, sliders, and ribbons; various internal software functions; and external MIDI commands like those coming from a sequencer or a dedicated controller.

Real-time control of parameters in a Studio is not handled in the Studio editor—it’s handled in a Program or Setup that is associated with a Studio. There are several new pages in Programs that contain these controls, known as Effects Modulation or **FXMod** pages. It’s here that the links are set up between real-time control sources and Studio parameters.

In order for these links to work, the FXMode parameter must be set “Program”, “Setup”, or “Auto”.

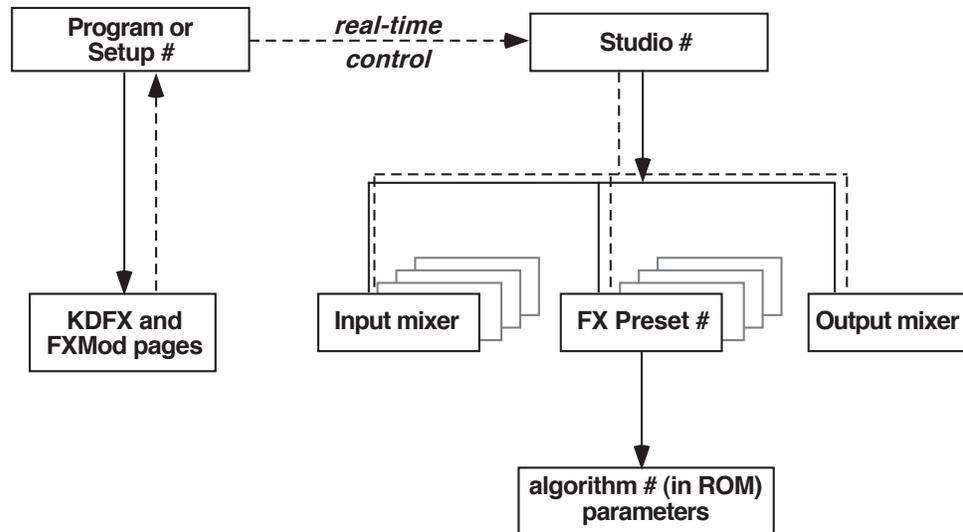


Figure 1-3. KDFX Software organization

Controlling KDFX with a Sequencer

A useful technique for sequencer users is to set up the Program controlling the Studio parameters to be an “empty” program with no Keymaps but with all of the FX Mods you need in place—this program produces no sound by itself, and exists only to control the Studio. That way you can use a dedicated MIDI channel for Studio control. More on this in Chapter 4.

Chapter 2

A Tour of KDFX

Let's take a tour through several KDFX Studios. After you do this, you should have a pretty good idea of what it's like to work with KDFX. You will still, of course, have many questions—answering them is the job of the rest of this manual.

Load the Tutorial files

From the KDFX Objects disk that came with your K2500 or KDFX upgrade, load the file "TUTOR1B.K25" into bank 200...299. You can use a different bank if you like, but then your numbers and the ones in this chapter will be different.

- Insert the disk into the drive
- Press **Disk** to go into Disk mode
- Set **Current Disk** to "Floppy"
- Press **Load**
- Cursor down to "TUTOR1B.K25"
- Press **OK**
- On the "Load this file as:" screen, select **200...299**
- Press **OK**
- Press **OverWrt** (or if you have just installed KDFX or done a Hard Reset, press **Append**).
- Press **Exit** to get back to Program Mode.

A Simple Studio

Call up Program #199 on your K2500. In Program mode, either scroll the Alpha wheel to Program 199 ("Default Program"), or press **1-9-9-Enter** on the Alphanumeric pad.

Now go into Effects Mode by pressing the **Effects** button, and you'll see this screen:

```
EffectsMode XPose:0SI <>Channel:1
FX Mode:Master
FX Chan:None
Studio :199 Default Studio
Effect :1 Sweet Hall
Wet/Dry:0%Wet
Dither :Flat DigOut :16 Bit
Octav- Octav+ Panic Chan- Chan+
```

If the screen looks very different from this, then put the cursor on the **FX Mode** parameter and scroll the Alpha wheel until it says "Master".

Now use the down-arrow button to highlight the **Studio** parameter. Scroll the Alpha wheel until it says "200 Simple".

FXBus Editor

Now press **EDIT**, and this page appears:

```
editStudioFXBUS Size:1 Free:3 <>FXBUS:1
FX1 → 200*4 Tap BPM → [Aux] → [Mix] →
Wet/Dry      :35%wet   Lvl:3.5dB Lvl:-4.5d
Tempo       :120BPM   Bal:0%    Bal:0%
Allocation:Auto
<more> [L1PU] [FXBUS] [AUXFX] [MIXPU] <more>
```

This is the **FXBus editor** for FXBus1. It is where an FX Preset is assigned to the FXBus. Put the cursor on the box containing “200*4 Tap BPM”—this is the current FX Preset, a four-tap delay whose speed is expressed in terms of tempo (Beats Per Minute). Use the Alpha wheel to scroll through the many other FX Presets that come with KDFX. Like all K2500 objects, those that are in RAM (like this one) will have an asterisk in their name, and those that are in ROM will not. There are three more FX Buses, which can be accessed by pressing the Chan/Bank buttons. In this studio they are all empty (“No Effect”).

Go back to “4 Tap BPM” on FXBus 1, and play the piano sound from your keyboard. The arrow next to “FX1” flashes, showing that there is audio passing through this FXBus. The arrow keeps flashing as long as the FX Bus is processing audio.

Below the FX Preset selector is a **Wet/Dry** control, which determines how much of the signal will pass through the FX Preset. Below that is a **Tempo** control, which sets the timing of the delays. These parameters are called “Bus Overrides”, because they override parameters which are actually inside the FX Preset itself—these parameters can be adjusted from inside the FX Preset, or they can be set from out here, where they are much more convenient. If you change FX Presets, these values may change, because the particular Overrides and their values will be different inside the various FX Presets. More about Bus Overrides a little later, and in Chapter 3.

Returns

To the right are two sets of “return” controls from the FX Preset to the output mixer. The first set, **Lvl** and **Bal**, determines how much of the sound will go to the global or Auxiliary Effects bus, and how its two channels are balanced. On this FXBus, the signal to the Aux bus is boosted 3.5 dB. The second set determines how much of the sound goes to the Mix bus. On this FXBus, the Mix signal is attenuated -4.5 dB.

Allocation

The **Allocation** parameter determines how many processor allocation units (PAUs) are reserved for this FXBus. The number of PAUs an FX Preset uses is dependent on the Algorithm at the core of the FX Preset. Algorithms can use anywhere from 1 to 4 PAUs, depending on their complexity. As you scroll through the FX Presets, the number of PAUs required by each one is shown on the top line of the display (“**Size:**”), along with the number of PAUs that are available (“**Free:**”) for other algorithms.

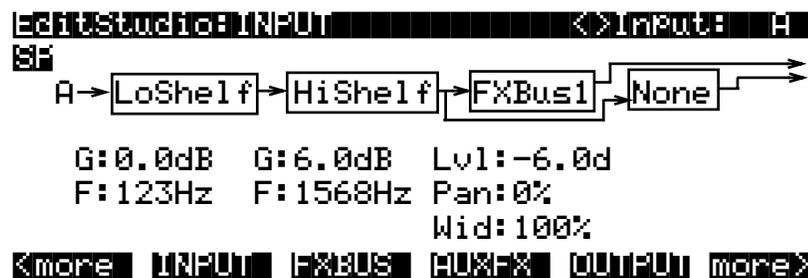
The four Insert FX Buses have 4 PAUs to share among them, so if any bus uses more than one PAU, it means that some buses cannot be assigned an FX Preset. This is a very common situation, as you shall see. The Auxiliary FX Bus has its own set of 3 PAUs, which are completely independent and not shared with the insert FX Bus PAUs.

You can “pre-assign” a PAU value to an FX Bus, in which case any FX Presets that require more PAUs than you have given the bus cannot be loaded into the bus. If you try to put an FX Preset into a bus that requires more PAUs than are currently available on that bus, the Preset’s name appears in parentheses—the same way a K2500 multi-layer drum program is displayed if you try to access it on a non-drum channel.

Most often, the Allocation parameter will be set to “Auto”, in which case PAUs are assigned dynamically as you assign FX Presets to the various buses. As you de-assign FX Presets to buses, or assign FX Presets with smaller PAU requirements, the PAUs freed up are automatically re-assigned to other buses where they are needed.

Input Editor

Press the soft button labelled **INPUT**. This page appears:



This is the **input editor**. It is showing input A, as indicated both on the left side and in the upper right corner—use the **Chan/Bank** buttons to view the other three inputs. Input A is the “KDFX-A” stereo signal pair coming from the output of the K2500 Program Editor. In this case, it’s our piano program.

The “S” at the upper left says that the A input is being handled as a stereo feed; this can be changed to two mono feeds. The “P” means that the stereo feed has a Pan control; you can choose to make this a Balance control instead, by setting this parameter to “SB”

If you play on the keyboard, you can see the arrow next to the letter “A” flashing, as audio is being passed through this part of the Studio. The arrow on this page flashes only as long as there is an input signal present.

Equalization

The first two blocks are the low and high EQs on the input. Put the cursor on either block and turn the Alpha wheel, and you will see the options you have available for types of EQ—these include “None”, which bypasses that EQ. The first block has more choices than the second.

The “G” underneath each block is its Gain: “0.0dB” is unity gain; the signal passes through without change. (There is no Gain parameter when a block is set to LoPass or HiPass.) “F” is the equalizer’s frequency. In this Input section, the frequencies above 1568 Hz are boosted 6.0 dB.

Sends

The third and fourth blocks determine the destinations of the Input A signal: each block can be set to route the signal to any of the four Insert FX Buses, or to “None”. You cannot, however, set both blocks to the same destination.

The “Lvl” control is the FXBus “send”: it sets the level of the signal to the FXBus above it. In this Input section, the level is backed off 6.0 dB, to compensate for the treble boost in the equalizer, so that the signal doesn’t overload the FXBus.

Pan determines the position of the signal relative to the left and right sides. **Width** (which is not shown when you are using mono inputs) determines how much the left and right sides’ signals will be separated or blended.

Auxiliary FXBus Editor

Press the AUXFX soft button below the LCD screen. This screen appears:

```

EditStudio:AUXFX Size:3 Free:0
Aux->204*819 Chamber -> Mix
Wet/Dry   :58%wet      Lvl:0.0dB
Out Gain  :0.0dB       Bal:0%
<more INPUT FXBUS AUXFX OUTPUT more>

```

This is the global AuxFX editor, and shows us what is happening on the Auxiliary Effects bus. The AuxFX Bus is a second processor, which follows the four insert FXBuses. It has its own FX Preset, with Bus Overrides, and level and balance controls to feed it into the Mix bus. Its PAU allocation is fixed at 3, so it doesn’t need an Allocation parameter. It can also be routed all by itself to an output, as we shall see. In this Studio, the Aux FX bus contains a chamber reverb.

Output Editor

Press the **OUTPUT** soft button.

```

EditStudio:OUTPUT
Mix Lvl:0.000      Output A:Mix
Mix Bal:0%        Output B:FXBus1
                  Output C:Off
                  Output D:Off

<more INPUT FXBUS AUXFX OUTPUT more>
  
```

The **Output editor** page is the interface to the real world. It determines which of the signals going through the various KDFX buses show up at the K2500's four sets of *physical* outputs: A, B, C, and D. These four outputs, all stereo, go to the K2500's analog outputs and to the KDS digital bus. In addition, output A also goes to the K2500's AES/EBU digital output.

In this Studio, **Output A** is carrying the Mix Bus, that is, the combination of the outputs of the four FXBuses (only one of which is in use) and the AuxFX Bus. Output B is carrying FXBus1, which is the signal *after* it passes through the delay on FXBus1, but *before* it gets to the reverb on the Aux bus. The other outputs are carrying no signal.

Here's a diagram of what this Studio looks like:

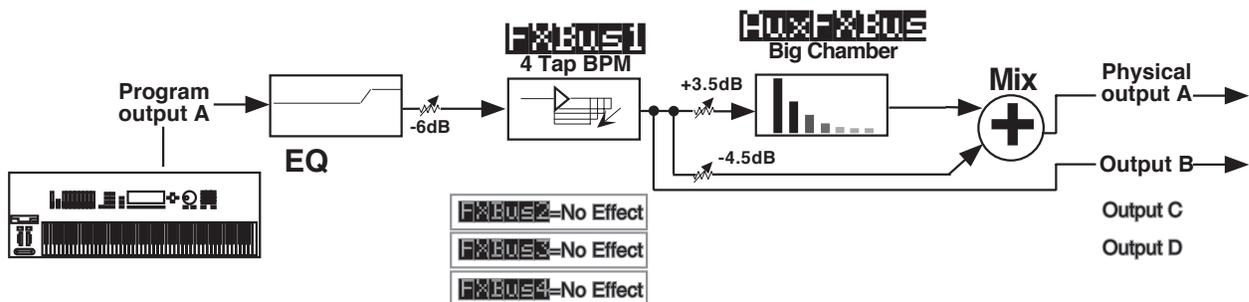


Figure 2-1. Structure of Studio 200

A more complex Studio

Press **Exit** to get to the Effects page, and again to get to Program mode. Call up Program 200, **ElecPno/Flute**. This is a split keyboard program: On Layer 1, which has been assigned to the KDFX-A outputs, is an electric piano, whose key range goes up to B4. On Layer 2, which goes to the KDFX-B outputs, is a flute, whose key range starts at C5.

Press **Effects** and call up Studio 201, **RngMd/PFD/Plt**. Press **Edit** to look inside of this Studio.

FX Bus 1

On the first FX Bus is an FX Preset called **201*Tut Ring Mod**. The Algorithm this uses is a ring modulator. This is a processor that takes the sounds coming into it and combines them with static waveforms by adding and subtracting their frequencies, thereby creating interesting non-harmonic effects. Notice that this FX Preset uses 1 PAU.

```
EDITSTUDIO:FXBUS Size:1 Free:1 <>FXBUS:1
FX1->201*Tut Ring Mod->Aux->Mix
Wet/Dry :100%wet Lvl:0.0dB Lvl:0.0dB
Out Gain :0.0dB Bal:0% Bal:0%
Allocation:Auto
<more UNPUI FXBUS AUXFX UUUPU more>
```

As you play on the lower part of the keyboard, the arrow next to “FX1” flashes, but as you play on the upper part it doesn’t. That’s because the upper part of the keyboard (the flute sound) is routed to a different FXBus.

Bus Overrides

There are two FX Preset parameters on this page: **Wet/Dry** mix and **Output Gain**. These parameters actually exist inside the FX Preset, but are “brought out” to this page so you can control them without editing the FX Preset itself. As we saw earlier, these are called “Bus Overrides”. You can change both the value of the Override parameter *and* the name of the parameter that shows up in the Bus Override: to select a different parameter, simply highlight its name and scroll the Alpha wheel. As you do so, you will see the other parameters inside the FX Preset which can be brought out to this page.

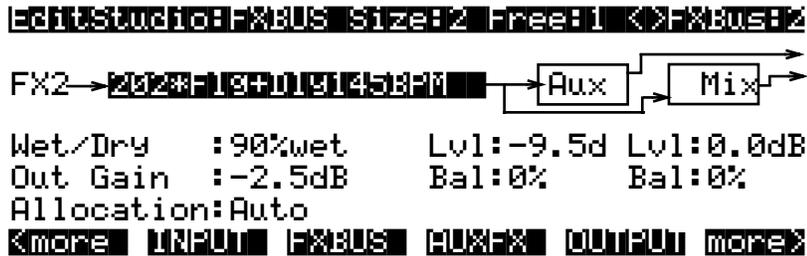
The two pieces of information that make up each Override—the name of the parameter being controlled and its value—are stored as part of the Studio, not as part of the FX Preset, and therefore you don’t have to create new FX Presets just because you want to change a couple of parameters. There are two Studio Overrides available for each of the four Insert FX Buses and two more for the Aux FX Bus.

If you don’t want any parameter control on this page, then just set the Override to “None”.

The **Wet/Dry** value is 100%, and the **Output Gain** is 0.0dB—unity. The signal on this FXBus goes both to the Aux bus and the Mix bus at unity gain (0.0 dB).

FX Bus 2

Press the **Chan/Bank Up** button to get to FX Bus 2.



On this bus is an FX Preset called **Flg+Dly145BPM**, which uses a combination Algorithm that has two flangers, a delay, and a short reverb, all rolled into one. The “145BPM” part refers to the fact that the delay times are based on a tempo of 145 BPM,

As you play the flute sound, the arrow next to “FX2” flashes, and it keeps on flashing as long as the various feedback delays are sounding. It doesn’t flash when you play on the lower part of the keyboard.

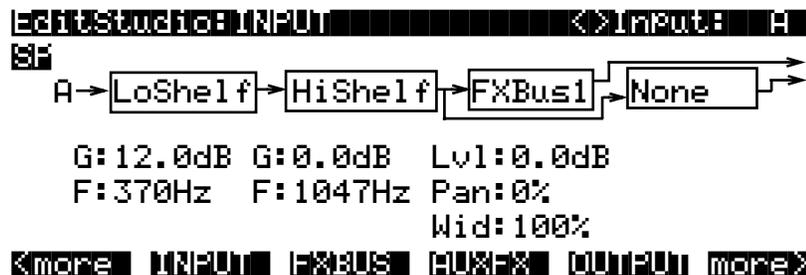
This FX Preset uses 2 PAUs. Along with the 1 PAU in use on FXBus 1, this makes 3 of the 4 available PAUs accounted for, so the “Free” parameter is 1.

The output configuration of this FX Bus has the signal going to the Aux bus attenuated by -9.5 dB, and going to the Mix Bus at unity gain.

The other two FX Buses are empty, which you can confirm by pressing the **Chan/Bank** buttons a few times: they say “199 No Effect”.

Inputs

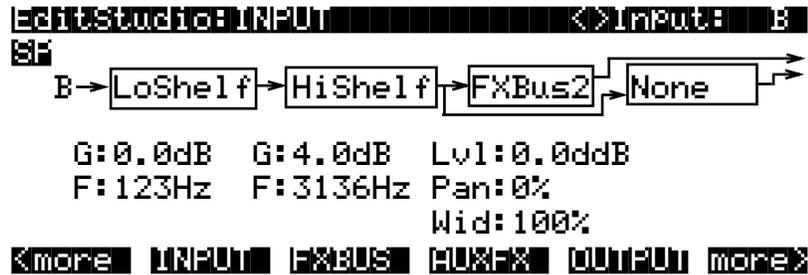
Now let’s look at the inputs to the FX Buses. Press the **INPUT** soft button, and see this page:



Input A carries the electric piano, coming from the Program’s “KDFX-A” outputs. Play on the piano part of the keyboard, and the arrow next to “A” flashes.

This Input is configured to be stereo. It has a large bass boost: 12.0 dB of everything at 370 Hz and below, which adds a strong low-frequency emphasis to the signal being ring-modulated. Its signal is being sent only to the first FX Bus. The stereo separation (Width) of the signal is at maximum.

Use the **Chan/Bank Up** button to go to Input B.



This is the flute, coming from the Program’s “KDFX-B” outputs. It is also stereo. The incoming signal has some treble boost on it. It is sent directly to FX Bus 2 at unity gain and full width. Play on the flute part of the keyboard, and the arrow next to “B” flashes.

The other two Inputs, C and D, are not assigned to any FX Bus.

AuxFX Bus

Now let’s look at the Auxiliary FX Bus. Press the **AUXFX** soft button to look at its page.



Here is an FX Preset called “MedWarmPlate,” which is just what it sounds like: a medium-sized, warm-sounding plate reverb. It has two Bus Overrides, Wet/Dry mix, and Output Gain. The output from the Aux FX Preset is sent to the Mix bus at unity gain.

Since both Insert FXBuses have signal going to the Aux FX Bus, the arrow next to “Aux” will flash as long as any signal processing is going on in either of the Insert FXBuses—in other words, when you play anywhere on the keyboard.

Outputs

Finally, press the **OUTPUT** soft button to get to the Output page. Here we see that the four physical output pairs all are passing different parts of the studio. If the outputs are connected to an external mixer, you can treat each of them separately: recording them on different tracks of a tape deck, sending them to different outboard processors, or mixing them differently in a monitor mix.

```

EditStudio:OUTPUT
Mix Lvl:0.000
Mix Bal:0%
Output A:Mix
Output B:FXBus1
Output C:FXBus2
Output D:AuxFX
<more INPUT FXBUS AUXFX OUTPUT more>
  
```

Output A has the Mix bus. This is the combined output of the two FX Buses, plus the reverb on the AuxFX bus. Its gain and balance (the controls on the left) are at unity.

Output B has the output of FXBus1, that is, the ring-modulated piano, without any reverb.

Output C has the output of FXBus2, the delayed / flanged flute, without any reverb.

Output D has the output of the AuxFX bus, which is *just* the reverb signal, with no dry component.

Here is the overall structure for this Studio:

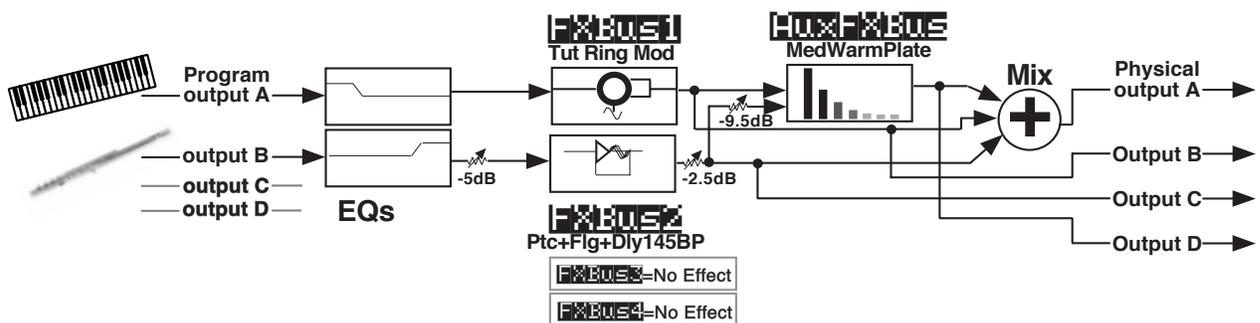


Figure 2-2. Structure of Studio 201

A complex Studio with real-time control

The third Studio we will look at is a very complex one, which allows real-time control using MIDI. Just like the original K2500 Effects, in order to enable MIDI control, the Studio has to be associated with a particular Program or Setup. The assignments of parameters to be controlled are made within the Program or Setup, and the Effects mode must be in Program or Setup (or Auto)

In this example, we'll work with Setup control—the procedure for working with Program control is almost exactly the same.

Setting the FX Mode

To enable real-time control from the Setup of KDFX parameters, we have to put the K2500 in the right Effects mode. Go to the main **Effects** page, and set FX Mode to "Setup". FX Channel will automatically go to "None".

```
EffectMode: Xpose:031 <>Channel:1
FX Mode:Setup
FX Chan:None
```

```
Dither :Medium DigOut 16 Bit
Octave: Octave: Panic Chan: Chan:
```

If you were previously in Master FXMode, you'll notice that the Studio disappears from the screen. When FX Mode is set to Setup, you can't view the KDFX Studio except from inside the Setup. This is so you can't make any changes in the Studio which the Setup doesn't know about, which could cause all kinds of conflict and confusion.

The Setup

Let's look at the Setup that we're going to be controlling our Studio with. Press **Setup** to go into Setup mode, and select number 200, "KDFXCombo".

This is a four-Zone Setup, with the keyboard split into three parts: bass and drums at the bottom, a piano/string pad in the middle, and a breathy-flutey sound on the top. Each layer goes to a separate KDFX output, so they can all get different processing.

If you Edit the Setup and look at the various Zones, you'll see this:

- Zone 1: Gtr Jazz Band, a layered bass and drum program, going to KDFX-A
- Zone 2: Dual Slap Bass, also going to KDFX-A. This and the previous Zone are active from the bottom of the keyboard up to A3.
- Zone 3: Pno & EPno & Pad, a layered piano, electric piano, and string program, going to KDFX-B, which is active from Bb3 to F#5.
- Zone 4: Hybrid Vox, going to KDFX-C, and active from G5 and up.

Note: if you are using a K2500R and controlling it from a conventional MIDI keyboard (i.e., not a PC-88), see "A Note about KDFX in Setups" at the end of this chapter before proceeding further.

Looking at the Studio

To view the Studio, press **Edit**, and **more>** three times, and then the **KDFX** soft button. The name of the Studio associated with this Setup, 202*Complex, will appear.

```

EditSetup:KDFX All Zones
Studio:202*Complex

Bus: Param: Adjust: Source: Depth:
FX1 In/Out Out SoftPd 1
FX1 Aux Lvl -55.0dB MIDI27 52dB
FX2 L Fdbk Lvl 100% MIDI26 120%
<more KDFX FX1002 FX1003 FX1004 more>

```

(There is nothing wrong with your manual—some of the parameters are in grey deliberately. Ignore them for now.)

Put the cursor on the Studio's name and press **Edit**, and let's dig into this Studio.

Press **INPUT** if you'd like to look at the Input pages. These are all set up straightforwardly, with Input A going to FXBus1, Input B going to FXBus2, etc.

On the FX Bus pages: FXBus 1

Press **FXBUS** to look at the FX buses. On FXBus 1 is 205*CompresHK, a hard-knee compressor.

```

EditStudio:FXBUS Size:1 Free:0 <>FXBUS1
FX1→205*CompresHK→Aux→Mix→
In/Out :FXMod Lvl:FXMod Lvl:-5.0dB
None : Bal:0% Bal:0%
Allocation:Auto
<more INPUT FXBUS AUXFX OUTPUT more>

```



Look at the “In/Out” parameter. This is a Bus Override, meaning this parameter is actually inside the FXPreset but it can be changed from here. However, instead of saying “In” or “Out” it says “FXMod”. This means that this parameter isn't controlled from inside the Studio at all—it's controlled by something else entirely outside the studio.

As it happens, it's controlled by the soft pedal, controller number 67—Switch Pedal 3 for K2500 keyboard users. We'll see how this is done in a moment. Pressing this pedal will cause the compressor to kick in, squashing the dynamic range of the sound. However, the MakeUpGain inside the compressor is set to 6.5 dB, so the *level* doesn't change much when the compressor is engaged.

This type of control is useful on this program, because it uses velocity-switching to change drum and bass sounds. Normally as you play harder, the sounds change, and they also get louder. With the compressor engaged, however, the drum and bass sounds can change *without* getting louder.

There's another FXMod, which is assigned to the Aux FX Bus send level. On the Aux bus is a reverb, so this FXMod controls how much of the signal coming through here will get reverbed. It happens to be under the control of Slider G, controller number 27. Play the bass and drums and move that slider, and hear the reverb go in and out.

Setting up FXMods

How are these controls set up? That’s back on the KDFX page in the Setup. Exit the Studio (if you have made any changes, don’t save them—that will only confuse things!) and look at the settings here:

```

editsetup:kdfx All Zones
Studio:202*Complex

Bus: Param: Adjust: Source: Depth:
FX1 In/Out Out SoftPd 1
FX1 Aux Lvl -55.0dB MIDI27 52dB
FX2 L Fdbk Lvl 100% MIDI26 116%
<more kdfx fx100% fx100% fx100% more>
    
```

On FX1 bus, the In/Out parameter has an initial value (“Adjust”) of “Out”, which means that normally it is not engaged.

The controller that controls this parameter is the “Source”, and in this case, it is the Soft Pedal/Switch Pedal 3, MIDI controller 67. The amount the Source can change the parameter is the Depth, and here it is “1”.

On a parameter that has only two states, like “In/Out”, the Depth can only have three values: 1, 0, or -1. If it is set to 1 or -1, then changing the source puts the parameter into its other state—in this case, going from Out to In. (If it’s set to 0, then changing the Source has no effect on the parameter’s state.)

Also on the FX1 bus, the Aux Lvl is initially -55 dB. The Source, MIDI controller 27, can raise that level by as much as 52 dB, to put it at -3 dB—and in fact, that’s what you’re hearing as you move Slider G.

FX Bus 2

Let’s go back into the Studio and look at FXBus 2—press **Edit** and then **Chan/Bank Up**. Here’s our piano and string pad, going through an FX Preset called 206*Fast&RichChorus.

```

editstudio:fxbus Size:1 Free:1 <>fxbus:
FX2->206*Fast&RichChorus->Aux->Mix->
None : Lvl:FXMod Lvl:0.0dB
None : Bal:0% Bal:0%
Allocation:Auto
<more INPUT FXBUS AUXFX OUTPUT more>
    
```

The Aux Lvl, as on FXBus1, is also under FX Mod control. If you now go inside the FX Preset (by pressing **Edit**), you’ll see that the left and right feedback levels (“Fdbk Lvl”) are under FXMod control.

```

editfxpreset:PARHM1 EffectSize:1/1
FXAlgo:ithm:152 Dual Chorus 1
L Wet/Dry :50%wet In Gain :0.0dB
L Out Gain:0.0dB R Wet/Dry :50%wet
L Fdbk Lvl:FXMod L Fdbk Lvl:FXMod
Xcouple :0%
<more PARHM1 PARHM2 PARHM3 more>
    
```

Press **PARAM2**, you'll see that the Left and Right LFO1 Rates are *also* under FXMod control.

```

EditFXPreset:PARAM2 Dual Chorus 1
L Tap Lvl :75%      R Tap Lvl :75%
L Tap Pan :-100%   R Tap Pan :100%
L LFO Rate:FXMod   R LFO Rate:FXMod
L LFODepth:5.0ct  R LFODepth:5.0ct
L Tap Dly :4.0ms   R Tap Dly :4.0ms
L HF Damp :25088Hz R HF Damp :25088Hz
<more> PARAM1 PARAM3 PARAM4 more>

```

Go back out of the FXPreset and the Studio, to the Setup's **KDFX** page. Here we see that on FX Bus 2, L Fdbk Lvl has a starting value of 0%, and can be changed, using MIDI controller 26 (Slider F), up to 100%.

Press **FXMOD2** to go to the next page of FXMods, and you'll see the same slider changing the R Fdbk Lvl, only in this case the Depth is -100%, meaning the feedback on this channel will be out of phase with the main signal.

```

EditSetup:FXMOD2 All zones
Bus: Param: Adjust: Source: Depth:
FX2 R Fdbk Lvl 0% MIDI26 -100%
FX2 L LFO1Rate 0.50Hz MIDI25 8.25H
FX2 R LFO1Rate 0.52Hz MIDI25 8.25H
FX2 Aux Lvl -15.5dB MIDI27 15dB
FX3 Fdbk Level 10% MIDI24 89%
<more> WET% FXMOD1 FXMOD3 FXMOD4 more>

```

Further down the FXMOD2 page are the assignments to the LFO rates: MIDI controller 25 (Slider E) is assigned to the left and right LFO1 Rates, with minimum values of 0.50 and 0.52 Hz, respectively, and maximum change of 8.25 Hz. Set the feedback level high and you can really clearly hear the LFO rate changing (but watch out that the effect doesn't go into oscillation at the highest feedback level).

Finally, MIDI Controller 27, our old friend Slider G, controls the Aux Level send on this bus as well, thereby determining how much reverb will appear on the signal on this bus. There are no limits to how many FXMods a single Source can be assigned to.

FXBus 3

Press **Edit**, then use the **Chan/Bank** button to select FXBus 3. Here's where our breathy flute sound is, and it's going through a delay FXPreset called 207*Adj Delay.

```

EditStudio:FXBUS Size:1 Free:1 <>FXBUS3

```



```

Wet/Dry :50%wet Lvl:FXMod Lvl:0.0dB
Out Gain :0.0dB Bal:0% Bal:0%
Allocation:Auto
<more> INPUT FXBUS AUXFX OUTPUT more>

```

Go inside the FXPreset, and you'll see that the Feedback Level is under FXMod control.

```

EditFXPreset:PARAM1          EffectSize:1/1
FXAlgorithm:131 4-Tap Delay
Wet/Dry      :50%wet      In Gain   :0.0dB
Fdbk Level:FXMod          Out Gain   :0.0dB
HF Damping:25088Hz      Dry Bal    :0%
                                Hold      :Off
<more> PARAM1 PARAM2 PARAM3 <more>
    
```

Press PARAM2, and on that page, you'll see that Delay Scale is also under FXMod control.

```

EditFXPreset:PARAM2          4-Tap Delay
Loop Crs     :480ms      DelayScale:FXMod
Loop Fine    :0.0ms
Tap1 Crs     :120ms     Tap3 Crs   :360ms
Tap1 Fine    :0.0ms     Tap3 Fine  :10.0ms
Tap2 Crs     :240ms     Tap4 Crs   :480ms
Tap2 Fine    :5.0ms     Tap4 Fine  :-5.0ms
<more> PARAM1 PARAM2 PARAM3 <more>
    
```

Go back out to the Setup, and look at the bottom of the FXMOD2 page. Here we see the Feedback Level parameter is under the control of Controller 24 (Slider D), with a minimum of 10% and a maximum of 10+89=99%.

```

EditSetup:FXMOD3          All Zones
Bus: Param: Adjust: Source: Depth:
FX3 DelayScale 0.54x Foot 6.00x
FX3 Aux Lvl -50.0dB MIDI27 52dB
None None OFF
None None OFF
None None OFF
<more> KDFX FXMOD2 FXMOD3 FXMOD4 <more>
    
```

On the FXMOD3 page, we see that the Delay Scale, which scales all of the various delays in the Algorithm, is controlled by the Foot Pedal, MIDI controller 4—Control Pedal 1 for K2500 keyboard users. The delay is nominally a 480 ms loop, with four equal-spaced taps inside it, 120 ms apart. With the Foot Pedal, we can scale all those times by a factor of between 0.54 and 6.00.

Finally, the Aux Level from this bus, controlling the reverb send, is once again assigned to MIDI controller 27, Slider G.

So here's a summary of the FXMods in this studio:

- Switch pedal 3 (Soft pedal) puts compression on the bass and drums.
- Slider F controls the feedback on the chorus on the piano/string pad. Slider E controls the LFO speed on that chorus.
- Slider D controls the feedback on the delay on the breathy flute.
- Control Pedal 1 (Foot Pedal) controls the delay time on the breathy flute.
- Slider G controls the reverb send for all three Zones.

A Note about KDFX in Setups

As we mentioned earlier, using Setups on a K2500R and a conventional MIDI keyboard requires some special consideration. In order to play Setups, which normally require a multi-zoned / multichannel keyboard like the K2500 or PC-88, the K2500R includes a parameter called “Local Keyboard Channel” (**LocalKbdCh**), which is found on the **MIDI:Receive** page. If you set this parameter to the transmitting channel of the keyboard, then the K2500 takes all incoming MIDI data on that channel and treats it as if it was coming from a local keyboard—that is, it plays all the Zones in the Setup.

However when you use this feature, be aware that many MIDI controller commands are “remapped” by the Setup’s parameters. See Chapter 4 for more information, and a list of the MIDI controllers that are remapped.

Building your own

Now that we’ve walked you through a very complex studio, here are some hints on how to go about building your own.

First, you want to decide whether you want the Studio to be static, or to be dynamic under KDFX control from the K2500 keyboard and /or an external MIDI source, and /or to change when the Program or Setup changes. If it’s to be static, then **Effect mode** must be set to Master. If it’s to change in any way in real time, the Effects mode must be Program, Setup, or Auto, depending on how you want to approach it.

Then you need to look at how your Program outputs are arranged, so you can design the Studio intelligently. If you’re using internal Setups, look at the output assignments on the various Zones, and change them so that sounds that need different effects are separated, and those that can use the same effects are grouped. If you’re using a MIDI sequencer, you might want to use the “OutPair” parameter found on the **MIDI:Channels** page (see page 10-9 in the *K2500 Performance Guide*), and arrange your sequence so that the routings of tracks to FX Buses can be determined by their MIDI channel assignments.

Now set up your Studio, assigning FX Presets to the Program outputs /KDFX inputs. Many of the ROM Studios follow a common organizational plan, which might be a good starting point for your Studios:

- FXBus 1 contains a relatively simple reverb with a low Size requirement.
- FXBus 2 contains an effect which does not increase the “length” of the sound (that is, not reverb or delay). Possibilities include chorus, flange, phaser, distortion, shaper, pitcher, enhancer, EQ, or EQ Morpher.
- FXBus 3 contains effects which take up lots of time, such as delays, delays with reverb, or other “Lead” sounds.
- FXBus 4 is dry, and is used as a “bypass” bus going directly to the Aux FXBus. (It’s also good to think this way if all of the PAUs have been used by the other Buses.)
- The Aux FXBus contains a larger reverb (Size: 2 or 3), a compressor, or a graphic EQ. It can often be used instead of an FXBus reverb, such as the one on FXBus1. If you use it in this way (set the Aux Lvl on FXBus 1 to 0dB or higher), it frees up FX Bus 1 for use as an Enhancer, Stereo Image, Flanger, etc.

Finally, set up your KDFX Mods in the Setup or Program you plan to use. If you are using a sequencer, you might want to dedicate a Program *just* to KDFX Mods, with no sound coming from that program.

Static KDFX Mods

Keep in mind that KDFX Mods don't always have to be dynamic—they can be used when you want to just change a few parameters in a Studio. Link the Studio with a Program or Setup. Set the Adjust values of the parameters you want to change to the new values, and set Source to OFF. Now save the Program or Setup. This lets you create as many variations on a Studio as you want, without making each variation a separate Studio. When you want to use the tweaked Studio, just call up its Program or Setup.

Don't forget to Save your Studio!

And don't forget to have fun. But now, read the rest of the manual.

Chapter 3

Inside KDFX

This chapter will analyze the organization of KDFX in detail.

Personalities

KDFX can be said to have two distinct “personalities,” depending on the setting of the “FXMode” parameter on the FX Mode page.

If FXMode is set to “Master”, then all KDFX parameters are set within the Studio, and remain unchanged unless the Studio or any of its FX Presets are edited.

If FX Mode is set to anything else —“Program”, “Setup”, or “Auto”—then one or more parameters within the studio may be under the control of an outside source, such as MIDI or one of the K2500’s control sources, and can be continuously changed in real time without editing the Studio or any FX Presets.

For the sake of clarity, in this chapter, we will deal with KDFX only in “Master” mode. The issues of real-time control will be dealt with in depth in the next chapter.

☛ So for starters, set the **FX Mode** parameter on the Effects Mode page to “Master” and the **Channel** parameter to “None” before going further into this chapter.

Navigating KDFX

The largest component in KDFX is the Studio. The Studio encompasses all of KDFX’s signal routings, processing algorithms, and processing parameters. When you change any parameter in a Studio, you are potentially creating a new Studio, just as when you change a parameter in a Program, the Program is no longer the same. The user interface within a Studio is organized according to the following diagram:

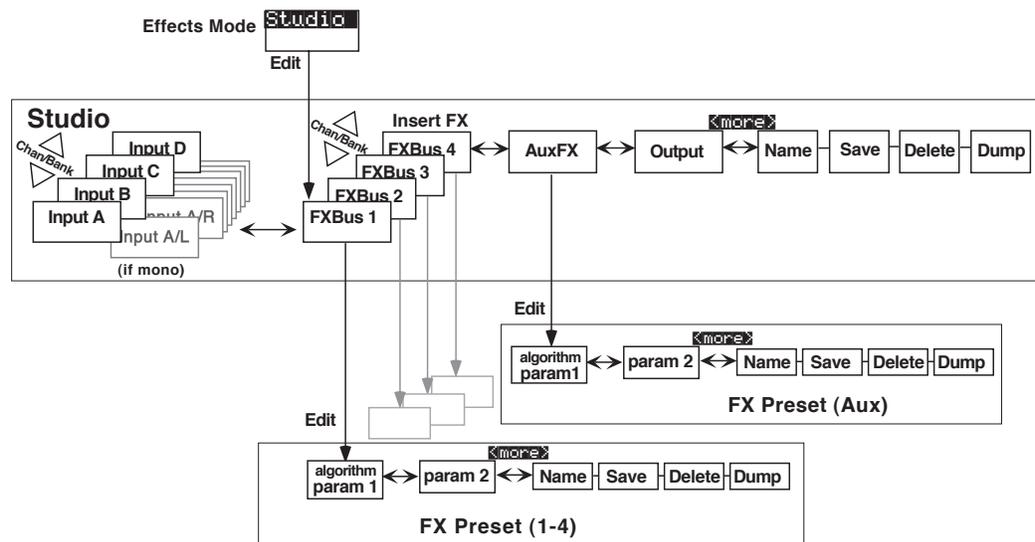


Figure 3-1. KDFX user-interface map

To select a Studio, on the main Effects page move the cursor so the Studio name is highlighted.

```
EffectMode   XPose:081   <>Channel:1
FX Mode:Master
FX Chan:None
Studio :2 3mchoruhall
Effect :1 Sweet Hall
Wet/Dry:0%Wet
Dither :Medium   DigOut :16 Bit
<Back> <Back> Panic   Chan-  Chan+
```

FX Bus

When the Studio is highlighted, pressing **Edit** goes to the Studio Editor (**EditStudio**) level, and the **FXBus** page. There are four FXBus pages, which are selected using the **Channel/Bank Up** and **Down** buttons. If you have just entered the Studio Editor, the first FXBus page you see will be the FXBus1 page. Once you are inside the Studio Editor, however, when you press the **FXBUS** soft button from another page, it will take you to whichever FXBus page you were *last* looking at.

```
EditStudio01FXBUS Size:1 Free:0 <>FXBUS1
FX1 → [Percussive Room] → [Aux] → [Mix] →
Wet/Dry      :33%wet   Lvl:0ff   Lvl:0.0dB
Out Gain     :0.0dB   Bal:0%   Bal:0%
Allocation:Auto
<more> [INPU] [FXBUS] [AUXFX] [OUTPU] <more>
```

The four FXBuses are the equivalent of four effects processors inserted into the effects loop of a mixing console. Therefore, they are known as the “**Insert effects**”.

Parameters

When you are on an FXBus page, highlighting the name of the FX Preset (or any of the parameters directly below it) and pressing **Edit** accesses the first page of **Parameters** for that FX Preset. An FX Preset is an object within the Studio, much like a Keymap is an object within a Program. The same FX Preset can be used in more than one Studio, or more than once in the same Studio (provided you don’t run out of PAUs).

The first **EditFXPreset Parameter** page includes the FX Algorithm that the FX Preset is based on. Additional pages of Parameters are accessed by soft buttons. Depending on how complex the Algorithm is, there may be as many as four Parameter pages in an FX Preset. Algorithms are in the K2500 ROM, and are not normally changeable, deletable, or saveable by the user. Like ROM samples, they are simply always there. (Additional Algorithms, however, may be loaded in from disk when they become available from Kurzweil.)

```

EditFXPreset:PARAM EffectSize:1/1
FXAlgorithm:1 MiniVerb
Wet/Dry :33%wet In Gain :0.0dB
Rvrb Time :2.0s Out Gain :0.0dB
L Pre Dly :0ms HF Damping:4699Hz
R Pre Dly :0ms
<more PARAM MORE more>
  
```

Pressing the **More** soft buttons accesses Name, Save, Delete, and Dump pages for the FX Preset.

Pressing **Exit** goes back to the FXBus page, and if you have made any changes in the FX Preset you will be prompted to save it. If you save the FX Preset to the same location, and the same FX Preset is used on another bus (either in this Studio or another), then any changes you have made will affect all buses using that FX Preset.

Input

From anywhere inside the Studio Editor, pressing the **INPUT** soft button brings you to the **Input A** page.

```

EditStudio:INPUT <>Input: A
SE
A->LoShelf->HiShelf->FXBus1->FXBus2->
G:0.0dB G:0.0dB Lvl:0.0dB Lvl:Off
F:123Hz F:9956Hz Pan:0% Pan:0%
Wid:100% Wid:100%
<more INPUT FXBUS AUXFX OUTPUT more>
  
```

The other Input pages—B, C, and D—are selected by using the **Chan/Bank Up** and **Down** buttons. Depending on how the inputs are configured—stereo or mono—there will be from four to eight Input pages.

Similar to the FX Bus pages, the first time you look at an Input page after entering the Studio Editor, it will be the Input A page (or, if it's mono, the Input A/L page). Once you are in the Studio Editor, when you press the **INPUT** soft button from another page, it will take you to whichever Input page you were *last* looking at.

Aux FX

Another soft button inside the Studio Editor accesses the **AuxFX** page. This is a separate effects bus, which can be used by itself, or in a chain following one or more of the insert Effects.

Like the insert FX buses, you access the FX Preset's parameters, including its Algorithm, by highlighting the FX Preset's name and pressing **Edit**. As on the insert FX Buses, the FX Preset on the AuxFX bus has up to four pages of parameters, and the **More** soft buttons access Name, Save, Delete, and Dump pages for the FX Preset. The same FX Preset can be used in the AuxFX bus as in any of the insert FX Buses.

```

EditStudio:AU%FX Size:3 Free:0
Aux->69 Short Hall -----> Mix
Wet/Dry   :100%wet           Lvl:0.0dB
Out Gain  :0.0dB             Bal:0%
<more INPUT FXBUS AU%FX OUTPUT more>
    
```

The AuxFX page can also be accessed from any of the FXBus pages by placing the cursor on the block labelled "Aux" and pressing **Edit**.

Pressing **Exit** goes back to the AuxFX page on the EditStudio level. If you have made any changes in the FX Preset, you will be prompted to save the FX Preset.

Output

In the Studio Editor, pressing the **Output** soft button accesses the **Output** page, where the KDFX "virtual" outputs are assigned to the K2500's physical outputs.

```

EditStudio:OUTPUT
Mix Lvl:0.0dB           Output A:Mix
Mix Bal:0%              Output B:Off
                        Output C:Off
                        Output D:Off
<more INPUT FXBUS AU%FX OUTPUT more>
    
```

The Output page can also be accessed from any of the FXBus pages by placing the cursor on the block labelled "Mix" and pressing **Edit**.

Name, Save, Delete, Dump

From any of the EditStudio pages, pressing either of the **more** soft buttons accesses Name, Save, Delete, and Dump pages for the Studio. Studios are stored in RAM, like K2500 Programs, and when a Studio is recalled, all of its associated FX Presets and parameters are recalled with it. Studios in ROM occupy slots in the 0...99, 100...199, and 700...799 banks. You may override these if you like, or use the RAM banks (200-699 and 800-999) for your Studios. The ROM Studios are always there, and if you delete a Studio that you've stored in a ROM slot, the original ROM Studio will pop up in its place.

When you save a Studio, you can also rename it, using the standard naming screen:

```

EditStudio:Rename
Studio Name:   RmChorChRv Hall
Delete Insert <<< >>> OK Cancel
    
```

The Compare and FX Bypass Buttons

As with all K2500 objects, the “**Compare**” (Disk) button lets you switch back and forth between the last saved version of whatever you are editing and its current state.

If you are on a page at the EditStudio level, Compare toggles between the last-saved and current versions of the Studio. If you are inside an FX Preset, on the EditFXPreset level, Compare toggles between the last-saved and current versions of the FX Preset.

If you have changed any Algorithms in an FX Preset or Studio during the current editing session, the Compare button will switch back to the old Algorithms. This can create some short-term “holes” in the audio output when the signal momentarily goes dry—see the section on switching studios in real time on Chapter 4.

The **Effects/FX Bypass** button, when you are in the Studio Editor, bypasses all of the FX Presets (all of the Insert FX and the Aux FX) in the current Studio, so that you can hear the signals without processing. It does not, however, change the EQs, gains and balances, or signal routings—those will continue to affect the signal you hear.

Exploring the Studio Parameters

We'll explore the parameters within the Studio in the order in which they affect the signal path, starting on the Input page.

Input section

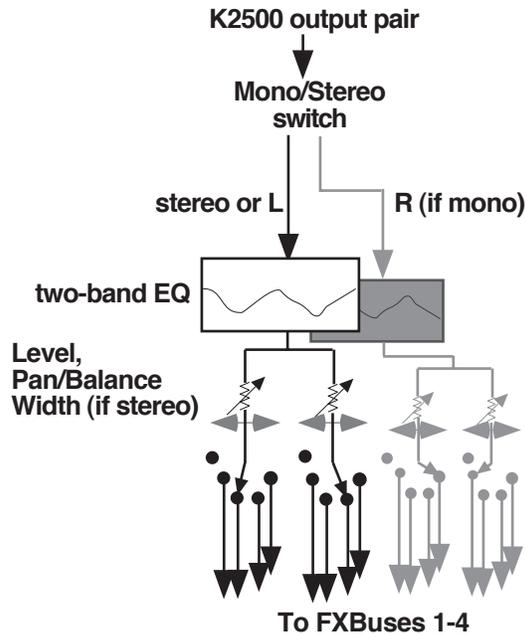
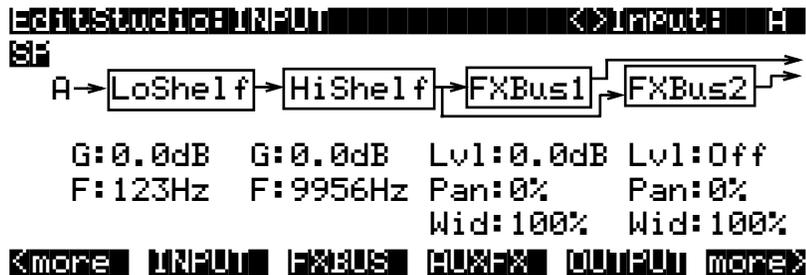


Figure 3-2. Input editor



Inputs are referred to as A, B, C, and D, and correspond to the four output buses (KDFX-A through KDFX-D) from the K2500's VAST Program editor. These signals can be treated as stereo pairs or as individual mono signals. This is determined by the first parameter on each Input page, the Mono/Stereo switch.

If this switch is set to "M", then the left and right channels of the selected Program output pair are split up, and each is given its own Input page, with EQ and FXBus routings. If it is set to "SP" (Stereo with Pan) or "SB" (Stereo with Balance), the two channels of the pair are processed in parallel.

Selecting the Mono/Stereo mode on one Input bus does not affect any of the others, and you can have any combination of stereo and mono Inputs in a Studio. Therefore, there can be anywhere from four to eight Input pages in a Studio.

The Chan/Bank Up and Down buttons let you move among the Input pages.

What's on a Program output bus?

There are a number of ways to determine which signals will be on the buses KDFX-A through KDFX-D coming from the Program editor. Depending on how the K2500 is set up, a Program output bus can contain:

- one or more individual layers of a single Program
- multiple layers from a Program
- *all* the layers on a Program, as set with the "OutPair" parameter on the Program's **Common** page
- multiple programs
- one or more Zones from a Setup, as set on the Setups' **CH/PRG** page
- or the output from one or more MIDI channels, as set on **MIDIMode:Channels** page.

The Arrow Meter

On an Input page, whenever there is signal present on its Bus, the arrow next to the letter of the Bus flashes. This is a good way to check that you have set up your Program output routings correctly. More on this later.

EQ

The input signal first passes through two equalizers. These equalizers are independent of each other, but the signal is chained: it goes through the one on the left of the screen, then through the one to its immediate right. Each equalizer has a frequency ("F") control and, depending on the mode, a gain ("G") control. The mode of each EQ module is changed by placing the cursor in the appropriate block and turning the Alpha wheel or using the + and - keys. There are eight modes on the first EQ, and six on the second:

- **None.** No effect, the signal passes through unchanged.
- **LoShelf.** Boosts or cuts frequencies below the "F" value by "G" decibels.
- **HiShelf.** Boosts or cuts frequencies above the "F" value by "G" decibels.
- **LoPass1.** Cuts frequencies above the "F" level with a 6 dB/oct (1-pole) slope.
- **LoPass2.** Cuts frequencies above the "F" level with a 12 dB/oct (2-pole) slope.
- **HiPass1.** Cuts frequencies below the "F" level with a 6 dB/oct (1-pole) slope.
- **HiPass2** (not available on the second EQ). Cuts frequencies below the "F" level with a steeper 12 db/oct (2-pole) slope.
- **ParaMid** (not available on the second EQ). Provides a cut or boost centered around the "F" frequency. The bandwidth of the equalizer is two octaves. An illustration of the action of this equalizer mode is at the top of page 14-24 of the *K2500 Performance Guide*.

FXBus sends

Following the equalizers are the Insert FXBus sends. Each Input has two sends. Change the destination of each send by placing the cursor on it and doing the usual thing with the Alpha wheel and + and - keys. The FX Bus sends are stereo, and if an Input is stereo, both channels go to the send.

Either send can be assigned to any of the four Insert FXBuses, or to “None”, with one exception: the two sends on a particular Input cannot both be assigned to the same FXBus. So, for example, if the first send on Input B/L is assigned to FXBus2, the second send from Input B/L cannot also be assigned to FXBus2. You can, however, assign as many *different* Inputs to the same FXBus as you like—including the left and right channels from a mono pair.

Each of the FXBus sends has a level parameter (“Lvl”) that determines the gain of the signal going to that send. Maximum level is 24.0 dB, and minimum is -79.0 dB—there is also an “Off” position. 0.0 dB is unity gain.

Mono inputs (“M”)

If an Input is mono, then each of its FXBus sends has a **Pan** parameter. This determines how the signal is distributed between the left and right channels going to the individual FXBus: -100% is left channel only, 100% is right channel only, and 0% is both channels equally.

Stereo inputs with Pan (“SP”)

If the Input is set to “SP”, then each FXBus send has a **Pan** parameter and a **Width** parameter. The Width parameter determines how much separation there will be between the left and right input signals as they are sent to the FXBus: assuming Pan is set to 0%, a Width of 100% means the signals will be completely separate, while 0% means they will be combined into “dual mono”. Negative numbers flip the channels around, so that -100% means the channels are separate, but with left and right reversed, while -50% means they are reversed and partially blended.

The Pan control maintains the stereo image, but “tilts” it one direction or the other. At 0% there is no change to the signal, while at 100% both input signals are sent to the right channel. At 50%, what had been hard left at the input will now be in the center, and what had been in the center at the input will now be halfway between center and right. Negative values tilt the signal to the left.

Stereo inputs with Balance (“SB”)

If the Input is set to “SB”, then each FXBus send has a **Balance** parameter and a **Width** parameter. The Width parameter, again, determines the separation between the two channels, and when it is set to 0%, the signals are combined into “dual mono”. Negative values flip the channels around.

The Balance control raises the gain of one input signal and lowers the gain of the other. So at a setting of 100%, the right input signal will be louder (and totally in the right output), and the left input signal will not be heard at all. At -100%, the left input signal will be louder and in the left output, while the right input signal will be silent.

The Balance control *follows* the Width control, so if the Width is not 100% or -100%, some signal from the opposite channel will “leak” into the Balance control, and thus that signal, at corresponding low levels, will be heard in the outputs even at extreme settings of the Balance control. If the Width is 0%, then the Balance control does the same thing that the Pan control does in “SP” mode, when the Width is 0%: it’s a mono panner.

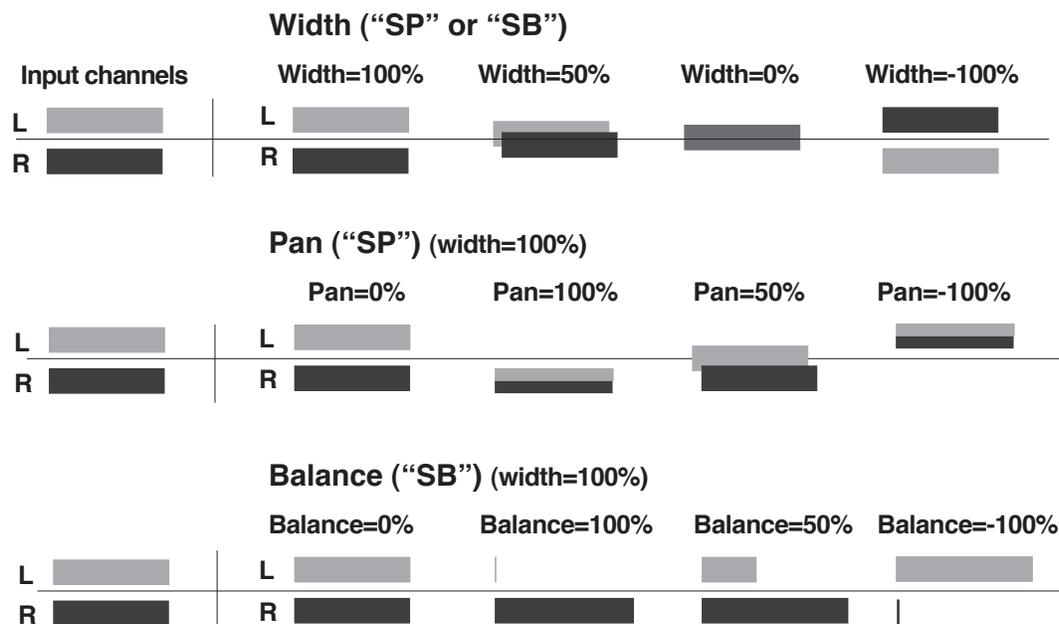


Figure 3-3. Width, Pan, and Balance controls

A word about Gain

Hard panning signals at various stages within KDFX, either for an effect or to keep individual channels isolated, can cause significant cumulative increases in gain. If this occurs, you may want to trim the levels at various stages. More about Gain Staging can be found later in this chapter.

Effects buses

The four Insert FX buses receive the signals from the Input editor and process them. Press the **FXBUS** soft button to go to one of the FXBus pages—the first time you do this after entering the Studio Editor, it will be the **FXBus1** page. To go to the other FXBus pages, use the **Chan/Bank Up** and **Down** buttons. The number of the FXBus appears in the upper right corner.

```

editStudio>FXBUS size:1 Free:0 <>FXBUS:1
FX1->[Percussive Room] -> [Aux] -> [Mix]
Wet/Dry      :33%wet  Lvl:0ff  Lvl:0.0dB
Out Gain    :0.0dB  Bal:0%  Bal:0%
Allocation:Auto
<more UNFUI FXBUS AUXFX OUTFUI more>

```

The Arrow Meter

There are arrow meters on the FXBus pages as well, right next to the number of the FXBus. These tell you when signal is coming into the Bus, and also when signal is present *inside* the bus, so if you have a long reverb or repeating delay, for example, the arrow will keep flashing as long as the processing is going on.

FX Preset

The first parameter on an FXBus page is the FXBus’s FX Preset. Set the cursor on it, and use the Alpha wheel to scroll through the FX Presets currently in memory. If an FX Preset name comes up in parentheses, for example, “(Really Big Plate)”, it means there is not enough processing power (PAUs) available at the moment to use this FX Preset in this FXBus. We’ll get to PAUs in a moment. “199 No Effect” is a “blank” FX Preset, in which all signals pass straight through without any processing. It can be used as a starting point for creating your own FX Preset. If you want to set up a “dummy” effects bus to pass signal directly to the Aux bus, use “0 None”.

Bus outputs (Returns)

The parameters on the right side of this page determine how the effected signal gets to the KDFX outputs, i.e., where the effects returns go. Each FXBus has four outputs: itself *pre* the FX Preset (i.e., dry); the signal *post* the FX Preset (i.e., the return itself); the Mix bus, where it is mixed with other Bus outputs; and the Aux effects Bus, which adds additional processing. All of these outputs are stereo.

The output to the Mix bus has a level control with a range of -79.0 to +24.0 dB, and an Off position. It also has a Balance control that works similarly to the Balance control on the Inputs, by setting the relative levels of the two output channels. The Mix bus is then accessed on the Output page.

The output to the Aux FXBus has an identical pair of controls. Its signal is mixed with similar signals from the other FXBuses, and then put through the Auxiliary FX Preset. The Aux FXBus is can be routed to the Mix bus, and it also can be accessed, by itself, on the Output page.

There is no external level control over the output of the FXBus itself—it just shows up, in pre-effect and post-effect versions, on the Output page.

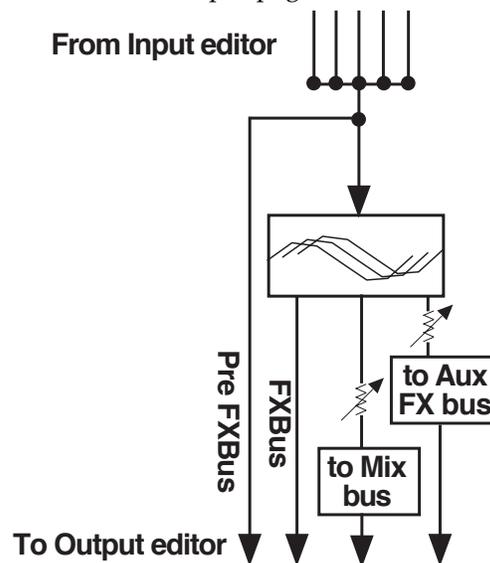


Figure 3-4. FXBus signal routing

Other parameters

The “Wet/Dry” and “Out Gain” parameters are called Bus Overrides, and we will deal with them shortly. The “Allocation” parameter deals with the “Size” of the FX Preset on the FX Bus, and it too will be explained shortly.

The AuxFX Bus

The Auxiliary FX bus is accessed by pressing the **AUXFX** soft button on any page in the Studio Editor. It contains an FX Preset, which is separate from those in the insert FXBuses—although it can be the same FX Preset that is in use on one or more of the Insert FX Buses. There is no Allocation parameter, because the AuxFX bus has a fixed allocation of 3 PAUs. Only a very few highly complex FX Presets require more than 3 PAUs, so as you scroll through the FX Presets here you won't see many names in parentheses.

Aux bus outputs

There are two outputs (returns) from the AuxFX bus: itself, and a feed (post-effect) to the Mix bus. The feed to the Mix bus, where it is combined with other Mix bus feeds from the four FXBuses, has level and balance controls. The AuxFX bus's own output has no post-effect controls, and goes right to the Output page.

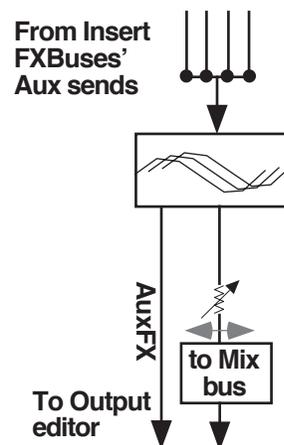


Figure 3-5. Aux bus outputs

About FX Presets

FX Presets are where the processing takes place in KDFX. Each of the insert FXBuses and the AuxFX Bus have their own FX Preset, and they are all independent of each other, although the same FX Preset can be used on more than one FX Bus. If you think of a Studio as being the equivalent of a K2500 Program, then an FX Preset is the equivalent of a Layer or Keymap.

On any of the FXBus pages, the FX Preset is edited by placing the cursor on the name of the FX Preset and pressing **Edit**.

The first parameter page, or "**PARAM1**", appears. The Algorithm that the FX Preset is based on is selected at the top of this page. Highlight the name on the "FXAlgorithm" line, and scroll through the various Algorithms. The Algorithms are in the K2500's ROM (like ROM samples), and are not changeable by the user. As you change Algorithms, the parameters displayed on the page change accordingly.

```

Edit FX Preset: PARAM1      EffectSize:3/3
FXAlgorithm:12 Panaural Room
Wet/Dry      :30%wet      In Gain      :0.0dB
Room Size    :12.8m       Out Gain     :0.0dB
Pre Delay    :0ms         Decay Time   :1.6s
HF Damping   :25088Hz
<more> PARAM1 PARAM2      <more>
    
```

Notice also as you scroll the Algorithms, the “EffectSize” parameter in the upper-right corner changes. This parameter shows how many Processing Allocation Units (PAUs) the currently selected Algorithm requires, followed by how many are available for the Bus this FX Preset is on. If, for example, EffectSize is “2/3”, that means the algorithm requires 2 PAUs, and there are 3 PAUs available. More about PAUs in a moment.

Just below and to the right of the Algorithm name is an Input Gain parameter, which adjusts the level of the signal coming into the FX Preset from the input(s) sending to it. While the relative level of the different inputs is determined on the Input pages, you can change the *overall* level here—for example, if you’ve combined several inputs into one FXBus and the signal is too hot for the FX Preset, you can pad it down here. The Trim is adjustable from Off/-79.0 dB to +24 dB.

Below the Input Gain is usually (but not always) an Output Gain, which sets the level of the signal leaving the FX Preset, which can be further modified by the Mix and Aux sends on the FXBus page.

The other parameters that appear on this page are determined by the Algorithm. Each Algorithm has its own set of parameters, which may take up as many as four pages, accessed using the soft buttons **PARAM2**, **PARAM3**, etc. The parameters associated with each Algorithm are discussed in detail in Chapter 5 and in the *KDFX Algorithm Reference*.

When you change a parameter on one of these pages, you have changed the FX Preset, and if you want the change to be permanent, you must save the FX Preset. Pressing either of the **more** soft buttons accesses Name, Save, Delete, and Dump pages for the FX Preset. FX Presets are stored in RAM, just like K2500 Keymaps. When an FX Preset is recalled, either by itself (from within the Studio Editor) or as part of a Studio, its associated Algorithm and all parameters are recalled with it. If you modify an FX Preset and save it to its same location, then any other Effects Buses in the Studio, or in any other Studio, that incorporate that FX Preset will now use the modified version.

There is another way to edit an FX Preset’s parameters without altering the FX Preset itself, and that is by using Bus Overrides.

Bus Overrides (Bus Mods)

We haven’t yet talked about the two parameters that are on the **FXBUS** and **AUXFX** pages, directly underneath the name of the FX Preset. These are called “Bus Overrides” or “BusMods”, and they allow you to change parameters within an FX Preset without actually going into the FX Preset.

```

Wet/Dry      :35%
Out Gain     :2.0dB
    
```

Here’s an example of what they do. The Bus Overrides on FX1 are often Wet/Dry mix and Output gain. Normally, these parameters would be found inside the FX Preset, and if you changed them, you’d have to save the new FX Preset in order to keep the changes.

Instead, by using Bus Overrides, you can adjust these two parameters and hear what they sound like while you are adjusting them *without* going into the FX Preset. When you save the Studio, these parameter values are saved, but they are not part of the FX Preset—they are part of the *Studio*. Therefore, the FX Preset remains unchanged (and if the FX Preset is in use elsewhere, it hasn't changed there), but these two parameters *in this particular FXBus* have been altered.

“Wet/Dry” and “Out Gain” are the default Bus Overrides you will encounter most often, but in some Algorithms and FX Presets, other parameters are accessed as Bus Overrides. For example, on some Compressor Algorithms (as we saw in Chapter 2), the first Bus Override is an In/Out switch; and on some dual-channel delay and filter Algorithms, the overrides are separate Wet/Dry controls for the left and right channels.

Making and Breaking Bus Overrides

Some Studios supplied with KDFX, when you first encounter them, have the BusMods in place, but they are not “engaged”—that is, they’re not actually overriding anything, but instead simply show the values of the corresponding parameters inside the FX Preset, unchanged. To see this, choose an FX Preset on the FX Bus page and look at the values of the override parameters: “Wet/Dry” and “Out Gain”. Now go inside the FX Preset by highlighting the FX Preset’s name and pressing **Edit**, and find those two parameters on the first parameter page (**PARAM1**). You’ll see their values are the same as on the FX Bus page.

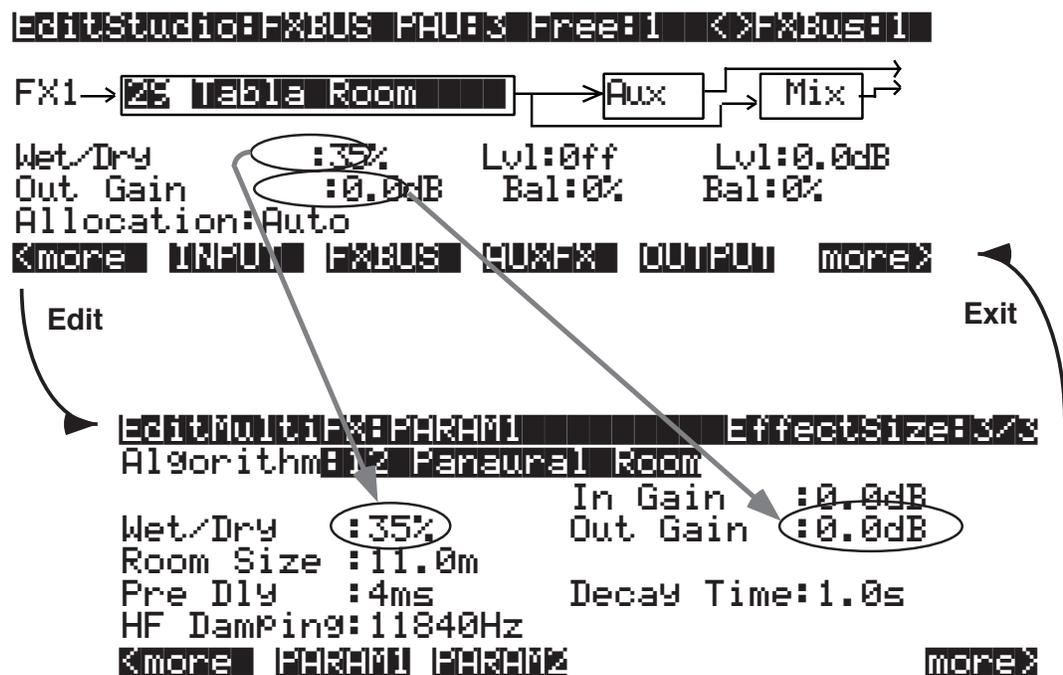


Figure 3-6. Bus Overrides in place, but not engaged

Press **Exit** to go back to the FXBus page.

To engage a Bus Override, you have to use it at the FXBus level, which you do by moving the parameter away from its nominal value on the FXBus page. Try that, and then go back inside the FXPreset. You'll see that the value of the parameter you've changed is now shown as "BusMod", meaning that the FXPreset parameter is under the control of the Bus Override. The Bus Override will stay in effect even if you move the parameter on the FX Bus page back to its original value.

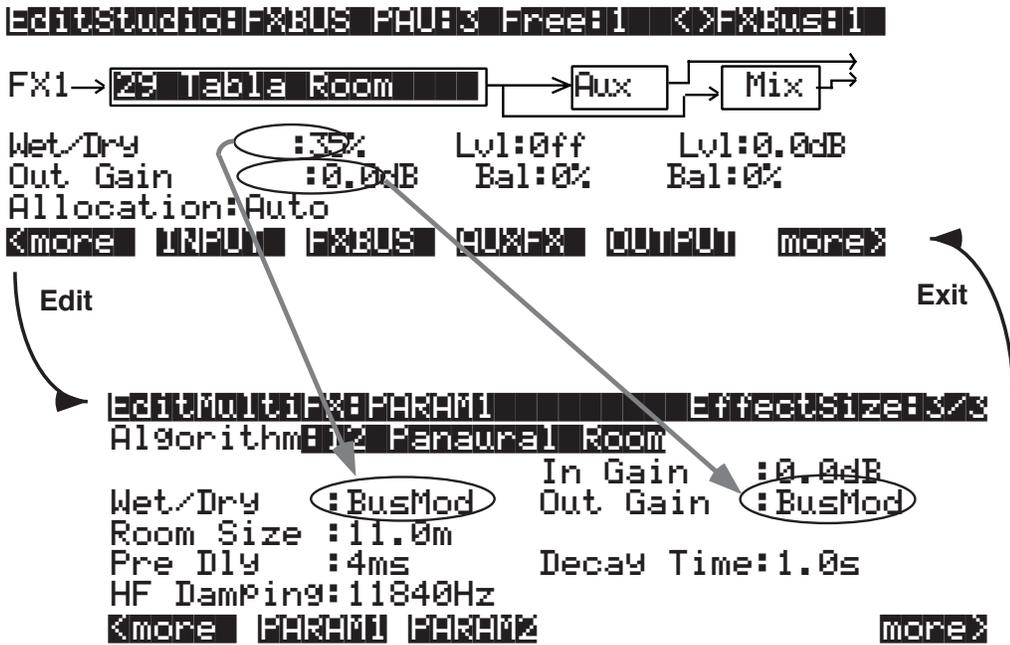


Figure 3-7. Bus Overrides engaged

If you now change the parameter value from *inside* the FX Preset, it *breaks* the Bus Override. By doing this, however, you have changed the FX Preset, and when you leave the FX Preset you will be asked if you wish to save it. If you then save the FX Preset, the Bus Mod will be permanently broken, but if you *don't* save the FX Preset, it remains in its previous state, which means the Bus Mod *remains intact*.

Since Bus Overrides are part of the Studio, they are not saved permanently until the Studio is saved.

Changing the BusOverrides

The default Bus Overrides that come up when you are working in a Studio are often convenient, but you aren't required to use them as they are. You can assign *any* two of the FX Preset's parameters to the Bus Overrides: Decay Time, Room Size, Pre Delay, etc., etc. (You cannot, however, assign both Bus Overrides to the same parameter.) When you save the Studio, the parameter *choices* you have made for the Bus Overrides on each FX Bus are saved, along with their *values*.

If you set up a Bus Override and adjust a parameter's value, and then change your mind and assign a *different* parameter to that override, the value of the first parameter (the one no longer assigned to a Bus Override) will revert to its original value—that is, the value set *inside* the FX Preset. This can be a helpful feature, in that it means you can use Bus Overrides as a “window” into an FX Preset by scrolling through the various parameters. But keep in mind that you can't use this method to tweak parameters, because as soon as you move on, the parameter you tweaked gets “un-tweaked”.

Bus Mods vs. FX Mods

FX Mods are similar to Bus Mods, in that they control parameters within an object (in this case, a Studio) without actually changing the object itself. But while Bus Mods work on an FX Bus within a Studio, FX Mods come from outside the Studio—they are part of a Program or Setup, and can control parameters anywhere inside the Studio associated with that Program or Setup (including any of the FX Buses and FX Presets). More on this in Chapter 4.

Allocation

Understanding Processor Allocation Units (PAUs) and how they work is very important for using KDFX to its fullest potential.

What's a PAU?

The basic unit of signal processing in KDFX is the Processing Allocation Unit, or PAU. There are a total of 4 PAUs that can be split among the four Insert FXBuses, and another 3 PAUs for the AuxFX bus. These two sets of PAUs are distinct and not interchangeable.

The number of PAUs on an FX bus is determined by the Algorithm inside its FXPreset. Different Algorithms require different numbers of PAUs, as shown in the “Size” parameter at the top of the screen when you are on the FXBus edit page:

```
editStudio:FXBUS Size:2
```

or inside an FX Preset:

```
editFXPreset:PARHMI EffectSize:2/1
```

A simple delay, flanger, compressor, exciter, or reverb, will need only 1 PAU. A complex phaser, pitcher, or multiband tone control will need 2 PAUs. A really complicated reverb or graphic equalizer may require 3 PAUs. Only a couple of specialized Algorithms require 4 PAUs.

The **Allocation** parameter on each FXBus page determines how many PAUs will be available for the FX Preset assigned to that bus. If the parameter is set to “1”, then only FX Presets which use Algorithms requiring 1 PAU will be available for the bus. If you try to assign an FX Preset that requires more PAUs, its name will show up in parentheses, and the sound will pass through the bus unprocessed.

If you know you want a certain FX Preset in a particular FXBus, you can select it, and then set the Allocation parameter for that bus to match the PAU requirements of the FX Preset.

A PAU is a terrible thing to waste

Be careful not to set the Allocation parameter *too* high. If you set it on some bus to 3, for example, and you are using an FX Preset on that bus that only requires 1 PAU, the other 2 PAUs are being wasted, since they are not available to be assigned to other buses. The other buses' Allocation parameters will not go higher than 1, and therefore no FX Presets whose Size is greater than 1 can be selected for any of them.

PAUs are normally allocated on a “first-come, first-served” basis. If you set one FXBus to a PAU of “3”, then you will only be able to set the Allocation on the next Bus you set to “0” or “1”. If you then set that second Bus to “1”, then you won’t be able to set a value greater than 0 for *any* of the other Buses.

If you know you will not be using an FXBus, or you will be using it only as a “dummy” to route signals to the Aux Bus or directly to the outputs, you can set its Allocation to “0”.

Auto Allocation

On any of the buses, you can set Allocation to “Auto”. Auto means that the PAU allocation for that Bus will automatically adjust itself to the currently selected FX Preset. However, “Auto” obviously cannot create PAUs when they are in use elsewhere, and Allocations that have been set manually take precedence over Auto Allocations. So for example, if you set the Allocation of FXBus1 to “3”, and set the Allocation of FXBus2 to “Auto”, the maximum number of PAUs available to FXBus 2 is still only 1, and if you try to load a 2-PAU FX Preset into FXBus2, it won’t work and the FX Preset’s name will show up in parentheses.

If *all* buses’ Allocations are set to Auto, then PAUs are not allocated first-come, first-served, but instead are allocated in *numerical* bus order, with lower-numbered buses getting priority: if an FX Preset requiring 3 PAUs is loaded into FXBus1, then only 1 PAU will be available for the other buses, regardless of which FXPreset got assigned to which bus first.

A “Free” parameter is shown at the top of every FXBus page, telling you how many PAUs are currently unassigned to any buses and therefore available.

Effect Size

While you’re editing an FX Preset and selecting Algorithms for it, you are also kept apprised of the PAU situation with the “EffectSize” parameter in the upper-right corner of the screen. The first digit in this parameter is the number of PAUs the currently selected Algorithm requires, and the second digit is the number that have been allocated to the bus, either manually or automatically. If the first digit is larger than the second, the Algorithm is not available, and if you choose it, its name will show up in parentheses and the sound will pass through unprocessed—just like an unavailable FX Preset on an FXBus page.

If the FXBus’s Allocation is Auto, when you change the Algorithm inside the FX Preset editor, *both* digits of the EffectSize display will change. If you call up an Algorithm that requires more PAUs than are currently available, the second digit will change to “0”—since the Algorithm can’t be loaded, the PAUs are freed up for use elsewhere.

PAUs on the Aux Bus

The Aux Bus is a whole separate processor with 3 of its own PAUs. It has none of these issues, since its 3 PAUs are assigned to it permanently. (There is a fourth PAU in the Aux Bus, but it is used for mixing and routing, and so it’s not available for FX Presets.)

Any FX Preset with a PAU requirement of 1, 2, or 3 can be used. When editing the AuxFX, there’s no need for an Allocation parameter or a Free parameter. However, when you are scrolling through Algorithms, the “EffectSize” parameter will be displayed, with its second digit always “3”. Should you try to access on the AuxFX bus one of those rare Algorithms which requires 4 PAUs, the name of that Algorithm will be displayed in parentheses.

The Aux bus is generally used as a global processor, but it doesn’t have to be. You can set up one FXBus as a “dummy”—set its FXPreset to “0 None”—and send its output to the Aux bus, and at the same time turn off the Aux sends from all the *other* buses. Now the Aux bus can

function as an Insert FX Bus, with 3 PAUs all its own. So if you run into trouble with PAUs on the Insert FX buses and can sacrifice a global effect, this is one solution.

Metering

KDFX has two kinds of metering: arrow meters and bar-graph meters.

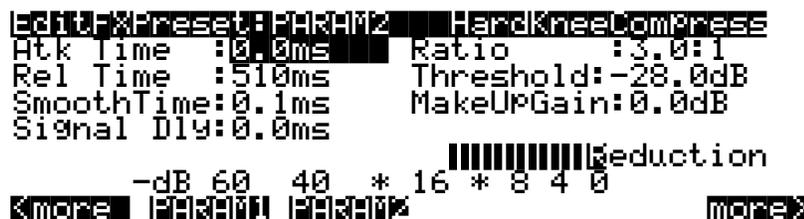
Arrow meters

All Input and FXBus pages have rudimentary signal meters, as we've seen. On the Input pages, the arrow next to the input letter flashes when there is signal present at the input. On the Insert and Aux FXBus pages, the arrow next to the FXBus number flashes as long as there is signal being processed—in effect, it's an output meter. The arrows flash whenever the signal level exceeds 14 bits below full scale, which is -84 dB relative to the maximum level the KDFX can handle. Since typically the K2500 is operated with about 20 dB of headroom, this translates to about -64 dB relative to normal operating level



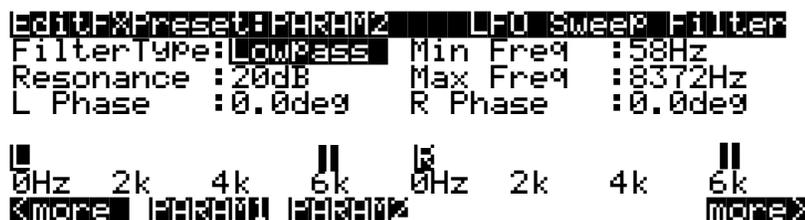
Bar-graph meters

In addition, a number of KDFX Algorithms include a fast visual metering system for monitoring what the Algorithms are doing. Many of these Algorithms deal with dynamics control like compression and limiting. An example is Algorithm 950, HardKneeCompress. Meters are most often found on the PARAM2 page of the FXPreset Editor:



In this Algorithm, the meter is showing the gain reduction that the compressor imposes on the signal coming into it.

Metering is also used for other purposes in some other Algorithms, for example 902 LFO Sweep Filter. In this Algorithm, the meters show the current center frequency of the left and right filters as they sweep up and down the spectrum:



Meters use up a certain amount of KDFX's processing power, although less than a whole PAU, and so they are only used only in Algorithms where they are particularly appropriate.

Output section

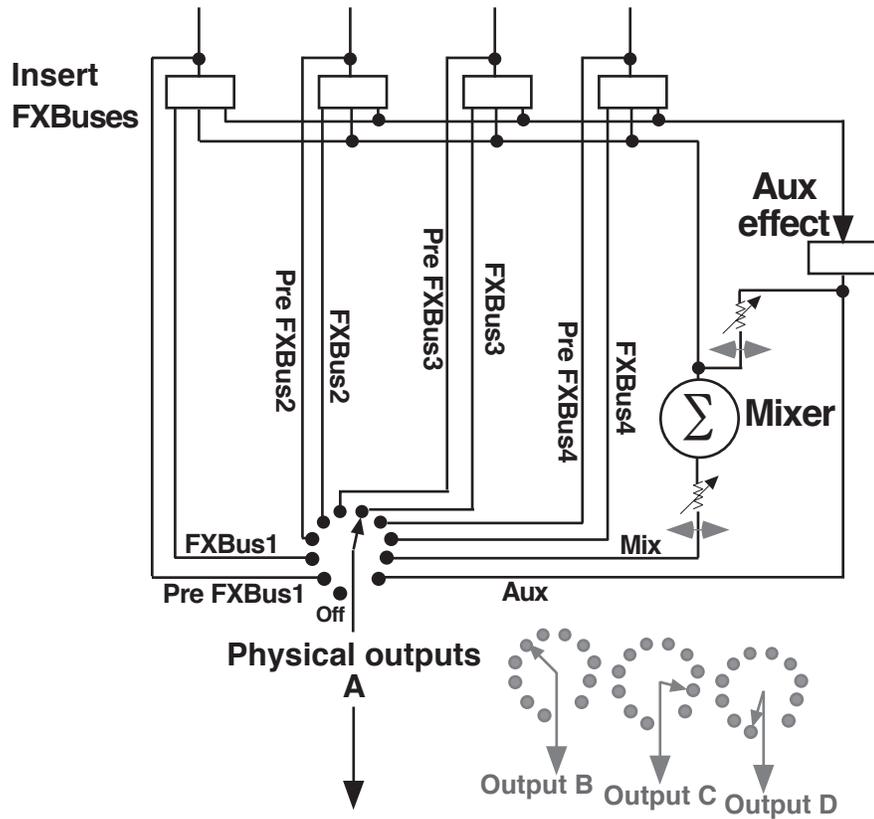


Figure 3-8. Outputs

```
EDITSTUDIO:OUTPUT
Mix Lvl:0.000
Mix Bal:0%
Output A:Mix
Output B:Off
Output C:Off
Output D:Off
<more INPUT FxBus AuxFX OUTPUT more>
```

In the Output section, the various signal paths are routed to the K2500's physical outputs. Each of the four output pairs, A, B, C, and D, has a selector switch to determine which signal it will carry. All signals are stereo. The choices are:

- **Off.** No output.
- **PreFX n** , which is the signal coming *into* the FX Preset on FXBus1, 2, 3, or 4. Depending on how your Inputs are set up, this could be one signal or many. If more than one Input is assigned to FXBus n , then all of the EQs and pan/width/balance settings of the Input modules assigned to the FXBus are active on this signal path—but the FX Preset is not.
- **FXBus n** , the direct output, post-FX Preset (i.e., the return), from any of the four Insert FXBuses.
- **Mix**, the signal from the Mix output, which can include the sum of any or all of the Insert FXBuses, and/or the Aux Bus. The Level and Balance parameters on this page control this output.
- **AuxFX**, the outputs of the Aux Effects bus.

There are no restrictions on the settings on this page. If you like, all four outputs can be carrying the same signal: PreFX1, for example.

Separate Analog and KDS Outputs

The K2500's separate analog outputs (the four pairs) and KDS outputs (also four stereo pairs) are wired in parallel and are "live" at all times. The selectors on the Output page affect both the separate analog and KDS outputs.

Analog Mix Output

The K2500's Analog Mix output, as it always has, combines the four output pairs into a single stereo analog pair. If a plug is inserted into any of the *other* analog output jacks, however, the signal going to that output jack is removed from the Analog Mix bus, and does not appear at the Analog Mix output.

The Internal Effects processor is still active on the "KDFX-A" output bus coming from the K2500's Program Editor, and can be used in conjunction with KDFX. For more information, see Chapter 6.

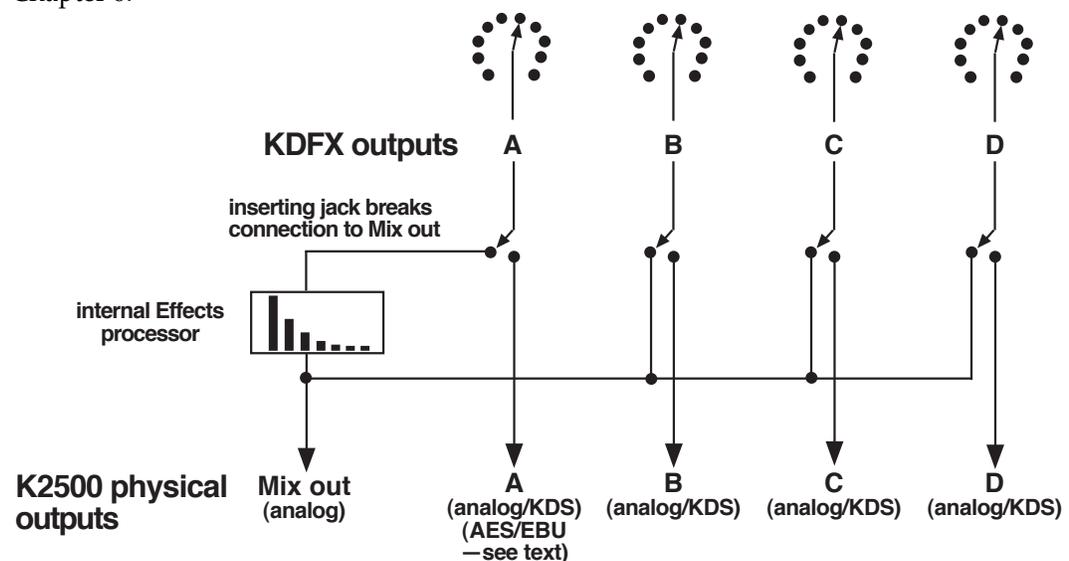


Figure 3-9. Analog, KDFX, and AES/EBU outputs

AES/EBU Outputs

The way the AES/EBU outputs in a K2500 with KDFX is somewhat different from the way they work in a K2500 without KDFX.

The AES/EBU digital output of the K2500 (a single stereo pair) is normally in parallel to output pair A. It gets whichever signal is assigned to that pair.

However, if you have the Sampling Option installed in your K2500, you have more options. These options are determined on the SampleMode page—from the Program or Setup mode, press the “Sample” soft button.

```
SampleMode  Samples:18432K  Memory:218K  
Sample:None                               Src:Ext  
Input:Digital  Time:5s          Out:A/D
```

If the “Out” parameter on the SampleMode page (which you can only see when the “Input” switch is set to “Digital”) is set to “Dir” (Direct), then the AES/EBU output behaves normally and is in parallel to output A.

However, when the Out parameter is set to “A/D”, then the AES/EBU output mirrors whatever signal is coming into the sampler’s analog input. This, in turn, is set by the “Src” parameter *in Analog input mode*. (In Digital input mode, the “Src” parameter has a different function.) If this parameter is set to “Int”, then the signal from the K2500’s Mix output is being *fed back into* the sampler—and thus the AES/EBU outputs will carry the identical signal that the analog Mix outputs are carrying. This is useful when you want to be able to use the Internal effects processor with the digital outputs. More on this in Chapter 6.

This feature is also helpful when re-sampling the K2500, that is, sampling its outputs to create a new, more complex sample. If the Out parameter is set to “Dir”, then re-sampling will be very quiet and clean, but only the output-A signal will be re-sampled. If it is set to “A/D”, then the re-sampled sound will consist of all of the analog outputs, plus the Internal effects processor, and the potential for noise build-up is higher.

If the Analog Src parameter is set to “Ext”, then the signal that appears at the AES/EBU output is the signal coming into the K2500’s *external analog inputs*, and the K2500 is acting as a very fancy, very high-quality A/D convertor.

The following diagram and table should help you understand the possibilities:

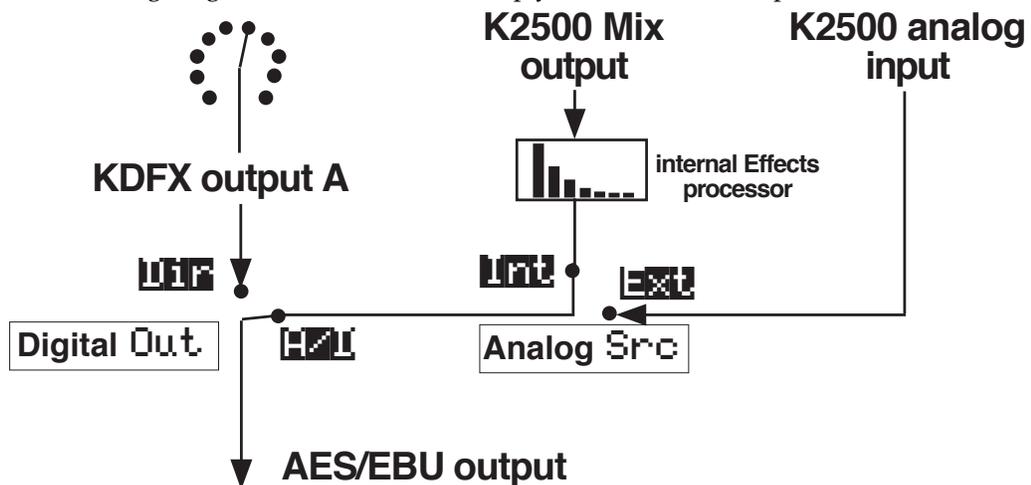


Figure 3-10. AES/EBU output configuration.

Table 3-1. AES/EBU output switch settings

Digital “Out” switch	Analog “Src” switch	What’s on the AES/EBU output
Dir	n/a	KDFX output A
A/D	Int	K2500 Mix output
A/D	Ext	K2500 analog input

Digital Word Length

The K2500 is capable of producing 20-bit digital audio signals. While normal 16-bit digital audio provides a maximum dynamic range of about 96 dB, adding the extra four bits adds some 24 dB to the dynamic range. There are an increasing number of products on the market that can handle 20-bit digital signals, including tape and hard-disk recorders, mixers, and signal processors, and the K2500 can talk to these devices with the highest degree of fidelity.

The “**DigOut**” parameter at the bottom right corner of the **EffectsMode** page turns on this feature, and selects between 16-bit and 20-bit operation.

This setting determines the word length on the KDS eight-channel output, and also on the AES/EBU output, provided it is in “Direct” mode (as set on the **SampleMode** page—see the previous section).

If you are using the K2500 with a Kurzweil DMTi, this switch should be set to “16 Bit”, since the DMTi currently operates only in 16-bit mode. However, if you are connecting the AES/EBU output to a 20-bit (or more) capable device, set the switch to “20 Bit” and you can take advantage of the significantly reduced noise floor.

Note that the switch does not affect any of the K2500’s inputs: those are always operating in 16-bit mode.

Dither

Dithering is a technique in which a small bit of noise is added to a digital signal when you are shortening the digital word length, e.g., from 20 bits to 16 bits. Its effect is to remove quantization distortion that otherwise may result in strange modulation artifacts at low levels. The subjective effect, paradoxically enough, is often that the apparent noise floor of the processed signal is lowered. The Dither parameter at the bottom left of the **EffectsMode** page allows you to select between different digital noise floor characteristics. No setting is superior to another—each one is a tradeoff between perceived noise level and artifacts. Here is a brief explanation of each setting:

Flat—the digital noise floor is spectrally flat, so it’s a good choice for re-sampling the K2500’s own output, as there will be no adding of noise in the process. This is sometimes known as “triangular” dither.

Minimum, Medium, Maximum—these utilize noise-shaping in varying degrees. The noise floor has been essentially equalized to make it softer at midrange frequencies, and louder at bass and treble frequencies. The overall power level of the noise is actually higher than at the Flat setting, but due to the ear’s spectral response at low levels, the noise floor appears lower at these settings.

They are not as good a choice as Flat for re-sampling, since the boosted noise may become quite noticeable if the sample is played transposed down a couple of octaves. In addition, repeated re-sampling would cause build-up at the boosted frequencies.

None—no dither. This is provided primarily for completeness. You generally never want to use this setting, unless you are studying dither in a classroom, or you want to specifically hear digital artifacts. Low level signals are extremely distorted using this setting.

Gain Staging

Proper gain staging—that is, keeping track of gain changes as the signal moves through the various components of KDFX—is helpful in getting the most out of KDFX.

While KDFX has plenty of headroom available for most processing, you may run into problems of digital clipping if extremely high filter resonances or large amounts of distortion are present on an FX Bus. Most headroom problems are best dealt with as “locally” as possible—rather than turning down a Program’s output to reduce clipping, you’re usually better off turning down the offending Bus’s In or Out Gain (using a Bus Override to get inside the FX Preset) or the Aux and/or Mix outputs.

Another potential problem is that the gain of a Program might change drastically when you change Studios, due to an effect being added or removed that itself changes the gain, such as distortion, quantization, or compression. In these cases, again, it can help when you are designing the studio to adjust the FX Preset’s In or Out Gains or the Bus’s Aux or Mix outputs to balance the levels, so that the volume coming from the Program is roughly the same whether or not the effect is present. You can check your work by scrolling through different Studios or FXPresets (particularly the factory ones) and making sure the levels don’t jump out at you or disappear.

As we mentioned earlier, hard-panning a signal can have an effect on the gain. The Pan, Balance, and Width controls all have constant power curves, so that the combined signal level doesn’t change when you move the signals from side to side. This means, however, that when you use these controls to isolate individual channels through an entire Studio by hard-panning the signals, there can be a substantial increase in gain. Each stage of hard-panning adds 3 dB, so if you’ve panned the Input send, the Aux send, the Mix send, and the Mix output all to 100%, you’ve boosted the signal by 12 dB. If this happens, you might want to back off the level at various stages to keep the signals from getting too hot.

Saving Studios and other objects

Saving

Saving a Studio or an FX Preset is handled the same as any other K2500 object—see Chapter 5 of the *K2500 Performance Guide* if you need help with this.

To save an object, from any of the editing pages within the object, press **<more or more>**, until you see the file-management pages:

```
<more Name Save Delete Dump more>
```

Name lets you rename the object, using the standard K2500 naming window. **Save** lets you save the object to its present slot or to a different one, and also gives you the option of Renaming it before saving it, or accessing the Object utilities—see Chapter 13 of the *Performance Guide*.

Delete deletes the object from RAM. If it is in a slot where there is a ROM Studio or FX Preset, then the slot will revert to the ROM Studio or FX Preset.

Dump performs a MIDI System Exclusive dump of the object over the MIDI Out cable for external storage.

The Save option is automatically invoked if you have done any editing within an object and you press **Exit**.

Do I Always Have to Make a New Studio?

While it may sound as if every time you make a change in a Studio parameter, you have to create a new Studio to save it, this is not necessarily true. Studios do take up room in Program RAM, and although the number of Studios that can be maintained inside the K2500 is large, it is not unlimited. Besides, it can be very cumbersome keeping track of a large number of Studios which have only small differences between them.

A way to avoid this problem is to use Program or Setup mode, and use “FXMods”—Studio parameter controls that live inside a Program or Setup—to make changes in the Studio parameters. When you load the Program or Setup, the Studio changes accordingly. This means you don’t have to save each variation in the Studio as a separate Studio; the variations live in the Program or Setup.

More—much more—on this in Chapter 4.

Disk Functions

Studios and FX Presets are loaded from and saved to disk exactly the same as other K2500 objects. FX Presets are dependent objects within Studios, so when you save a Studio, you are given the opportunity to save the dependent FX Presets as well. (Algorithms are in ROM, so they don’t need to be saved.) Again, see Chapter 13 of the *Performance Guide* if you need help.

Chapter 4

Real-time Control of KDFX

KDFX Studios can be static, as we saw in the last chapter, but they don't have to be. One of the most powerful features of KDFX is the ability to change any of the operating parameters in a Studio in real time. Mix levels and pans, eq values, effects parameters, and almost any other settings can be controlled dynamically and smoothly, giving KDFX a high degree of flexibility in performance and automation.

KDFX parameters can be controlled from:

- the K2500's sliders, wheels, ribbons, and pedals
- external MIDI sources like another controller or a sequencer
- internal functions like LFOs, envelopes, and FUN generators.

Real-time control of a Studio is called "Effects Modulation", and a link between a Program or Setup and a Studio parameter is called an "FXMod".

Linking to Programs and Setups

If you're familiar with real-time control of the original Internal K2500 Effects, you'll be happy to know that real-time control of KDFX Studios works the same way.

Real-time KDFX Studio control normally originates within a Program or Setup. For the link between a Studio and a Program to work, the **FX Mode** parameter on the **Effects** page must be set to "Program". You also need to set an **FX Channel**, and the Program controlling KDFX must be assigned to this channel.

```
EffectMode : *Pose:051 <>Channel:1  
FX Mode:Program  
FX Chan:1
```

```
Dither :Medium DigOut :16 Bit  
Octave: Octave: Panic Chan- Chan+
```

If you want to link a Studio and a Setup, the FX Mode parameter on the Effects page must be set to "Setup". There is no Channel parameter in this mode—KDFX will always link to the current Setup.

Setting the FX Mode parameter on the Effects page to "Auto" means that it will follow whatever mode the K2500 is in—Program or Setup—which can be particularly useful when you are switching between Programs and Setups in a Quick Access bank, or when you just don't want to worry about which mode you're in.

Notice that when FX Mode is set to Program or Setup, the Studio is not shown, as it is when the FX Mode is set to Master. So you can't go into a Studio and edit it from this page—you have to go through the Program or Setup, from its KDFX page. (The Internal effects aren't shown either, and the procedure for editing them is the same.)

Note: When FX Mode is set to Auto, and you are on the Effects Mode page, you are actually in *Master* mode. But don't screw up your brain thinking about this—we'll get back to what it means at the end of the chapter.

☞ For the sake of clarity, during most of this chapter we will only talk about linking KDFX to a Program. The procedures for linking KDFX to a Setup are essentially identical, except for the setting of the FX Mode.

The KDFX pages

If you look inside any Program, you will see several new pages to handle the Studio and KDFX control assignments. Open up a Program with the **Edit** button and press **more>** until you see this at the bottom of the display:

```
<more> KDFX FXMOD2 FXMOD3 FXMOD4 more>
```

These are the FXMod setup pages, and in fact there are eight of them—press **more>** again to see the others.

```
<more> FXLFO FXHSR FXFUN LMPFX more>
```

Go back to the first set (press **<more>**), and press the **KDFX** soft button to look at the first of the FXMod setup pages. Unless you've changed your Marked pages since installing KDFX, you can also press **Jump** to get to this page.

```
EditProg:KDFX All Layers
Studio:Z78 Hall+flange+rm

Bus: Param: Adjust: Source: Depth:
FX1 Wet/Dry 12%wet MWheel 40%wet
FX2 Fdbk Level 25% MIDI23 60%
InA EQ1 Bass G 0.0dB MIDI24 21dB
<more> KDFX FXMOD2 FXMOD3 FXMOD4 more>
```

The top line tells us we're in the KDFX section of the Program Editor. The second line shows the Studio that is linked to this Program. Any changes made on this page do not directly affect the Studio, they only affect this Program's *control* over the Studio.

The last three lines (ignoring the Soft buttons) show us some of the FXMods that are active in this Program: one is controlling Wet/Dry mix on insert FX bus 1, one is controlling feedback level on insert FX Bus 2, and one is controlling the Bass Gain on the first EQ of Input A.

Looking into the Studio

You can go into this Studio, to see what the parameters are doing—a good idea when you are setting up FXMods so you understand them in context—or to alter a fixed parameter. You do this without leaving the Program Editor: highlight any parameter on this page and press **Edit**. When you are done with the Studio, pressing **Exit** will bring you back to this page. If you have made any changes in the Studio, you will be prompted to save the Studio, and if you don't do so, the changes will be disregarded.

If you do save the Studio, either in the same numbered location or a new one, the new Studio will now be linked to this Program. If you have changed the location of the Studio, then you'll also have to save the Program when you leave the Program Editor, so that the Program knows which Studio to link to the next time you call it up.

Setting up FXMods

The **KDFX** page allows three different FXMod control assignments to be made. More FXMod assignments are available on the **FXMOD2**, **FXMOD3**, and **FXMOD4** pages, each of which has five setups. This gives a grand total of 18 Studio parameters that can be subjected to real-time control. Don't worry, you don't have to use them all. (And if you run out, there's always System Exclusive—see Appendix C.)

Bus assignments

The first column lets you choose which Bus inside the Studio you want this FXMod to control: Input A, B, C, or D (if any of the Inputs are set to Mono, you will get to choose individual channels, for example A/L and A/R); FXBus 1, 2, 3, or 4; the AuxFX Bus; or the Mix bus.

Parameter assignments

The second column chooses the specific parameter on the selected Bus that you want to control. Scrolling through the choices shows that this selection is context-sensitive: it shows only parameters that are being used in the current Studio on the selected Bus, so you can't make assignments to irrelevant or non-existent parameters. It "knows" which EQs are active, and what modes they are set to; which Input sends are assigned and whether the sends are in Pan or Balance mode; what parameters are being used in the FX Preset on the particular Bus; etc. If you need to know more about how the Studio is set up, you can go into it and look around, as explained above.

Here's an example: set the FX Studio to **201*RngMd/PFD/Plt** which we looked at in Chapter 2. Set the **Bus** on the first line to **InA**. Set the cursor under "Param:" and scroll the choices. They correspond exactly to the parameters available in the Input Editor page: level and frequency for the two EQs, and SendLvl, Pan, and Width for the two FX sends. Note that you *cannot* change the FXBus assignments on an Input from here; you must do that within the Studio itself.

Change the Bus to **FX1**, and now all of the parameters from the FX Preset on FXBus 1 are available for selection, including Mod Mode and the various settings for the Preset's internal oscillators, as well as the bus's output controls: Mix Level, Mix Balance, Aux Level, and Aux Balance. Change the Bus to **AuxFX**, and the Aux FXBus's parameters are available: levels, delays, room types, etc.

Setting the Bus to **Mix** makes available the Level and Balance controls from that page.

What can't be controlled

Parameters that would involve a major reconfiguration of the Studio cannot be assigned an FXMod and modified with a real-time controller. These include:

- Bus assignments on the Input pages
- Selection of FX Presets on the FXBus pages
- Allocation on the FXBus pages
- Selection of Algorithms within the FX Presets
- Bus assignments on the Output page

If you want to be able to change any of these on the fly, you will have to create a new Studio, link it to a different Program or Setup, and then call it up using a Program Change command.

In addition, there are a few parameters that can cause serious glitching if they are changed in real time. The most common of these are the “Room Type” settings in reverb Algorithms, which can create clicks and pops when they are changed while signal is passing through them. While there is nothing in the software to prevent you from assigning an FXMod to Room Type, you need to be cognizant of the potential consequences. See “Static FXMods” later in this chapter.

“Adjust” setting

The **Adjust** setting is the starting value of the selected parameter when it is under KDFX control, similar to the Entry value of a controller in a Setup. This might very well be different from the value of the parameter when the Studio is *not* under FXMod control, so don’t get confused. If you are in Program mode, and this is the current Program, the **Adjust** value takes precedence over the Studio’s fixed value, and it’s the Adjust value that will be called up when you call up the Program.

Source

The **Source** parameter determines which real-time control—internal, MIDI, etc.—is going to affect the selected Studio parameter. As with all K2500 real-time controls, the range of control sources is very large:

- OFF (the parameter is not affected by any source and stays at its “Adjust” value)
- ON (the parameter is set to the maximum value determined by adding the Adjust and Depth values)
- MIDI Continuous Controllers 1-95*
- Channel State
- Pressure
- PitchWheel
- the usual software controllers, as described in Chapter 6 of the *K2500 Reference Guide*: ASRs, FUNctions, Clocks, LFOs, Internal Controls, Random Generators, etc.

*Under some circumstances, particularly when the K2500 is in Setup mode, there are certain restrictions on which MIDI sources you can use. This is explained later in this chapter, in the section “Enabling Controllers in Setups and Programs”.

Dedicated FXMod control sources

A few new control sources, usable only within FXMods, have been added to the list:

- FXLFO1, FXLFO1ph, FXLFO2, and FXLFO2ph—two LFOs and their phases.
- FXASR1 and FXASR2— two three-stage (Attack/Sustain/Release) envelopes with selectable triggers and Normal, Hold, and Repeat modes.
- FXFUN1, FXFUN2, FXFUN3, and FXFUN4—Functions. Yes, more Fun with KDFX!

These LFOs, ASRs, and FUNs work exactly the same way they do in any other part of a Program, except these are extra control sources for use *only* with FXMods, and are not available for other VAST Program functions. They are global for all of the FXMods—each Bus does not have its own.

Their parameter values are saved with the Program. As we saw earlier, you get to the pages for their parameters by pressing the **more>** soft button until you see these soft buttons:



As usual in the Program Editor, you can also get to these pages directly from the KDFX page or one of the FXMOD pages: select one of those parameters as a Source, and then press **Edit**.

Tempo-based parameters

There are several different ways KDFX can respond to tempo information, from the internal sequencer or an external one. These are discussed later in this chapter.

Depth

The **Depth** parameter lets you specify the amount of change in value that the real-time control will make to the target Parameter, using the **Adjust** value as a minimum or starting point. The amount of change can be positive or negative, and Depth values are displayed in the context of the selected Studio Parameter: seconds, dB, %, Hz, cents, etc.

At the maximum setting of the Source (for example, Mod Wheel all the way up), the value of the parameter = Adjust + Depth. So if the parameter is Out Gain, the Adjust is 1.0 dB, the Source is Mod Wheel, and the Depth is 4.0 dB, then at the Mod Wheel's highest point, the output gain will be 5.0 dB.

For Source values less than maximum, the formula is: parameter = Adjust + (Depth \times Source), where the Source is considered to be varying between 0 and 1 (or in some cases, such as Pitch Wheel, between -1 and +1). So using the same example, when the Mod Wheel is halfway up (MIDI value 64), the gain is $1.0 + (4.0 \times 1/2) = 3.0$ dB, and when it is all the way down (MIDI value 0), the gain is $1.0 + (4.0 \times 0) = 1.0$ dB.

The formula works the same way for negative Depth values. Given the same example, but with a Depth of -4.0dB, at the Mod Wheel's minimum point, the gain will be 1.0 dB; at its halfway point it will be $1.0 + (-4.0 \times 1/2) = -1.0$ dB; and at its maximum point it will be -3.0dB.

Showing who's in control

When you are in Program or Setup mode and you look inside the current Studio or its FX Presets, any parameters that are under FXMod control will not display numerical values, but instead will say "FXMod". **Don't touch** any of those parameters for now—we'll explain why in a moment.

```

edit:FXPreset:PARAM1      EffectSize:3/8
Algorithm:12 Panaural Room
                                In Gain   :0.0dB
Wet/Dry   :FXMod          Out Gain  :2.0dB
Room Size :FXMod
Pre Dly   :4ms            Decay Time:1.7s
HF Dampng:14080Hz
<more> PARAM1 PARAM2      <more>

```

☞Note that if you look at the Studio when FX Mode is in "Master", the FXMods will not be displayed, because the FXMods are not in effect! Don't get confused by this—the FXMods will return when you go back into Program or Setup mode.

Breaking the Links

When FX Mode is in “Program” or “Setup” and you are in the Studio Editor, if you change a parameter that has been assigned an FXMod, it “breaks” the link—the parameter is no longer under FXMod control, but is now a static value. If you now save the Studio (either in the same location or a different one), the link stays broken. However, if you leave the Studio *without* saving it, and go back to the FXMod pages of the Program editor, the link automatically re-establishes itself.

If you change the FX Preset on an FXBus, the FXMod links to the FX Preset on that bus may or may not break. If the FX Preset you’re calling up uses *the same Algorithm* as the Preset you’re leaving, the links will stay intact. If it uses a different Algorithm—even a similar one—the links will break. On the other hand, if you are inside an FX Preset, and you change its Algorithm, that breaks the links. Again, the links will be re-established if you leave the Preset without saving it.

If you have FXMod links to the Aux and Mix parameters on an FXBus, they do not get interrupted when you change the FX Preset on that bus.

The same rule applies when you are on the **KDFX** page in a Program or Setup and you change the Studio. If you have links to the Input and Output pages and the Level parameters on the FXBus pages, they will be retained, but links to processing parameters will only be retained on a given FXBus only if the Algorithm inside the FX Preset on that bus isn’t changed.

What about Bus Overrides?

Bus Overrides are transparent, as far as KDFX is concerned. Any FXMods that involve a parameter inside an FX Preset are set up directly between the Program and the FX Preset itself. If a parameter under FXMod control happens also to be assigned a Bus Override, it doesn’t make a difference to KDFX—the FXMod in the Program will control the parameter as if the Bus Override wasn’t there.

However, Bus overrides are still active *within a Studio*, and changing a Bus override value in a Studio will, as usual, change its associated FX Preset parameter. Should there be an FXMod which is also assigned to that same parameter, *the FXMod link will be broken*, just as if you reset the parameter from inside the FX Preset.

For example, let’s say you have a Bus Override on FXBus1 assigned to Wet/Dry for the reverb FX Preset that is on that bus. You also assign an FXMod from a Program to that same Wet/Dry parameter on FXBus1. Now if you change the Bus Override, thus changing the Wet/Dry value of the reverb, the FXMod link to that reverb will be broken, and won’t re-establish itself unless you re-assign it from the Program, or else leave the Program without saving it.

Using FXMods so you don’t have to change Studios

In the previous chapter, we mentioned that FXMods are a good way to get around the need to create a new Studio every time you want to make a small change in a Studio’s parameters. The same Studio can be used for many different purposes if you use FXMods to control it. FXMods can set the gain of the signals going to the various FXBuses, set panning and output levels of the signals from the Buses, configure the mix going to the Aux bus, and even turn FXBuses on or off, as well as set processing parameters within the FX Presets.

Since any parameter except the ones that re-configure a Studio (see “What Can’t Be Controlled”, earlier) can be under FXMod control, the amount of variation between the various Program- or Setup-controlled versions of a single Studio can be very great.

Static FXMods

Static FXMods, that is, FXMods that are just going to be used to “set and forget” Studio parameters when a Program or Studio is called up (as opposed to dynamically controlling them), are easy to set up. On the FXMOD page, select the Bus and Parameter you want to control, set the **Adjust** value to the Parameter value you want, and set **Source** to “OFF”. When you are done, Save the Program or Setup normally. Now whenever you select the Program or Setup, the Parameters in the FXMods will be immediately reset to the values you’ve specified.

Room Type and other potentially glitch-producing parameters work much better as static FXMods than they do under dynamic control. If you need to change a Room Type in a reverb when you change a Program, you can do so with a static FXMod without hearing horrible glitches, as long as you make sure there is no signal passing through the reverb at the moment of the Program change.

Importing Studios from another Program or Setup

If you have a killer Studio with FXMods set up in one Program (or Setup) and you want to use the same Studio and FXMods in a different Program, you don’t have to rebuild the Studio by hand: you can copy Studios between Programs or Setups in one operation.

Scroll with the **more** buttons until the soft button **ImpFX** appears. Press it, and you’ll see this:

```

Edit Program Import KDFX
-----
From Program 200*19 Orchestral Studio
              (Studio 41 auxChorTube Plt  )
Prog Setup Import Cancel

```

Use the soft buttons at the left to select either a Program or a Setup as the source for the Studio and FXMods you are importing. Select the number of the Program or Setup you want to import from. As you change the Program or Setup, the Studio associated with each Program or Setup will display in parentheses below the Program or Setup.

The Studio will also kick in, so you can hear it affecting the Program you’re listening to.

When you’ve chosen a Program or Setup to import a Studio from, press the **Import** soft button. “KDFX from...imported” will flash on the screen, and you will be returned to the Program Editor of the Program or Setup you are working on.

Studios from Setups can be imported into Programs without restriction, and vice versa.

FXMods on Imported Studios

When you import a Studio into a Program (or Setup), the FXMods connected to the Studio you’ve imported come along with it. They will replace the FXMods that are in the Program you’re importing *into*. It doesn’t matter if there were more FXMods in the Program you’re importing into than in the one you’re importing from—even if the Program you’re importing from has *zero* FXMods, the ones that were in the Program you’re importing into are all erased.

Using KDFX live from the K2500 keyboard

The sliders and wheels on the K2500 keyboard, and the pedals connected to the keyboard, can be extremely useful with KDFX, if you assign FXMods to the K2500's controllers. The ribbon, for example, can be used in a "Pitcher" FX Preset to change the pitch of the signal, while sliders and pedals (as we saw in Chapter 2) can be used to control reverb time, flanger feedback, eq, or any of the myriad parameters available in KDFX.

KDFX in Setup Mode

If you are playing the K2500 in Setup mode, then it's probably a good idea to have KDFX also in Setup mode, or in Auto mode. This can help prevent confusion that can arise when mixing modes.

Like Programs, every Setup has a set of FXMod routings associated with it. These are identical to the routings available in Programs: there are four FXMod pages, three dedicated FX function pages, and an Import FX page. The procedure for setting up the routings is the same as in a Program. KDFX settings can be imported into a Setup from either another Setup or a Program.

When KDFX is under Setup control, any FXMods that are in the Programs *within* the Setup are ignored. If you have a Program that contains a Studio and FXMods that you would like to use while playing a Setup, import the KDFX from the Program into the current Setup.

MIDI Control and Setup Mode

You'll notice that when you set FX Mode to "Setup", **FX Chan** goes to "None", and can't be changed. The MIDI receive channel for controlling KDFX is not determined here, it's determined in the Setup itself: it's the channel that Zone 1 of the Setup is receiving. Any incoming MIDI commands on other channels, while they may play *sounds* in the Setup, will not affect KDFX parameters.

There may be circumstances in which you don't want KDFX to be in Setup mode while you are playing a Performance Setup. For example, you may want to have an external sequencer controlling KDFX, while you are playing along on the K2500 keyboard in Setup mode. Or you may just want to be able to play in Setup mode and not worry about changing Studios when you change Setups

In these cases, it makes sense to set the **FX Mode** to "Program". You will have to set an FX Channel, and the *Program that is in the Zone assigned to the FX Channel* will control KDFX. If *none* of the Zones are assigned to the FX Channel, then the Setup will not be able to control KDFX. However, an *external* device sending MIDI data to the K2500 on the FX Channel *will* be able to control KDFX.

Here's an example: say a Setup has three Zones, which are assigned to channels 2, 4, and 6 respectively. If **FX Chan** is set to 6, then the FXMods in the Program in Zone 3 will be active. But if none of the Zones' channel assignments match the FX Channel—say it's set to 16—then nothing you do on the K2500 will control the FXMods. However, an external sequencer sending on channel 16 will control the FXMods, and the Program that is on channel 16 will determine what they are.

Using an External Keyboard with Setup mode

As we mentioned in Chapter 2, using a K2500 (or more commonly, a K2500R) with an external MIDI keyboard presents some special situations. If you are not using this configuration, you are advised to skip this section, because it gets a little hairy (unless you are morbidly curious about such things, in which case, read on!)

Playing a Setup with a single-channel keyboard

Playing Setups normally requires a multi-zoned / multichannel keyboard like the K2500 itself or a Kurzweil PC88. However, it is also possible to play Setups from a conventional, single-channel MIDI keyboard, thanks to a parameter called “Local Keyboard Channel” (**LocalKbdCh**), which is found on the **MIDI:Receive** page. If you set this parameter to the transmitting channel of the external keyboard, then the K2500 takes all incoming MIDI data on that channel and treats it as if it was coming from a local keyboard—that is, it plays all the Zones in the Setup.

However, when this feature is enabled, the K2500 will only respond correctly to the MIDI commands on Table 4-1 coming in on this channel under the following conditions:

- That command has been specified as a “Destination” on the controller assignment pages in the Setup (**SLIDER**, **SLID/2**, etc.)
- The command has been assigned to its *customary* physical controller in the Setup.

If these conditions are not met, then one of two things will happen:

- if the customary physical controller is assigned no destination, then the incoming command will be ignored
- if the customary physical controller is assigned a *different* MIDI command than normal, the incoming command will be “mapped”—that is, changed—to the MIDI command that is *in its place*.

Table 4-1. Physical and MIDI Control assignments

Slider A	Data (6)	Slider E	MIDI 25	Foot Sw1	Sustain(64)
Slider B	MIDI 22	Slider F	MIDI 26	Foot Sw2	Sostenuto(66)
Slider C	MIDI 23	Slider G	MIDI 27	Foot Sw3	SoftPed(67)
Slider D	MIDI 24	Slider H	MIDI 28	Foot Sw4	Tap Tempo
CPedal 1	Foot (4)	SmPrs	MPressure	PSwitch 1	Arpeg On/Off(116)
CPedal 2	Breath (2)	Pitch Whl	BendUp	PSwitch 2	MIDI 29
SmRib	AuxBend2 (15)	Mod Whl	MWheel (1)	Pressure	MPressure

How Remapping works

Here’s an example: Slider A, as the table shows, is customarily Data (MIDI Continuous Controller 6). If on the Setup’s **SLIDER** page, Slider A is assigned to **Data**, then Data commands will be accepted by the Setup and passed on to wherever they have been assigned, either as VAST modulators or KDFX modulators.

If, however, Slider A has been assigned to something else, say **MIDI 31**, then Data (CC 6) commands coming from the external keyboard on the local channel will be treated as if they are actually MIDI Controller 31 commands. If Slider A is set to “Off”, then Data (CC 6) information will simply be ignored.

Here’s another example. Let’s say that on the **CPEDAL** page of the Setup, you have assigned “MWheel” (MIDI Controller 1) to CPed1 instead of the customary “Foot” (MIDI Controller 4). Any incoming Foot Control messages (CC 4) will be remapped to Modulation Wheel (CC 1) messages. When you send a Foot Control message, any KDFXMod that is set to respond to Foot will *not* change, but any KDFXMod that is set to respond to MWheel *will* change. (The Modulation Wheel still behaves normally—unless you’ve reassigned MWh1 on the **WHEEL** page.

Watching Remapping in action

You can confirm that this reassignment is going on by assigning a MIDI controller to a physical controller, and then using Intuitive Entry on a different parameter to see how it responds. Use the example above: assign MWheel as the Destination for CPed1. Then go down to the Destination for CPed2, hold down the **Enter** key, and move the Foot Pedal plugged into CPed1. Instead of “Foot” popping into the “Dest” column, you’ll see “MWheel”, since the incoming Foot commands are being remapped to Modulation Wheel.

You can also see this happening if you go right from Setup mode into **Master:Utility** mode and ask to display MIDI. Any incoming events that are being re-assigned to “Off” by the current Setup will not display at all, and any events that are being remapped will show up in their modified form.

Do I Need to Worry About This?

In many ROM Setups, the Sliders, Wheels, and Pedals are assigned to their normal physical controllers, but in others, they are not. In the Default Setup (99), only the pitch wheel, modulation wheel, channel pressure, and the sustain, sostenuto, and soft pedals are assigned. However, the Control Setup used when you are in Program mode, 97 Control Setup, has all of the physical controllers assigned, so 97 may make a better starting point when building your own Control Setups.

Keep in mind that you only have to deal with this in Zone1 of the Setup, because that’s where all the controller action is.

Also, remember that this is not an issue in Program mode, nor when using the K2500 with an external sequencer. In those cases the LocalKbdCh should be set to “None”, and there is no restriction or remapping on the MIDI data coming into the K2500.

KDFX in Program Mode

If you are playing the K2500 in Program mode, then you must make sure that the Current channel of the K2500 (at the upper right of the Program Mode screen) agrees with the FX Channel (on the Effect Mode screen). Otherwise the local keyboard commands, while they will control the other current Program parameters, will not address KDFX. You can avoid dealing with this problem by setting **FX Chan** to “Current”.

Control Setups and on-board controllers

Control Setups are a special type of Setup that is used only in Program mode. Although Control Setups have KDFX modulation routings in them, they are actually ignored, in favor of the KDFX modulation routings of the Program that you are using.

So why bother with them? Here’s why: In every Setup, as we have seen, there are several pages where the real-time functions of the physical controllers—sliders, footswitches, control pedals, wheels, ribbons, switches, channel pressure (aftertouch), velocity maps, and arpeggiator—are set. When you are in Program mode, Programs don’t contain that information. It has to come from somewhere, however, and so that’s where a **Control Setup** comes in—it’s where all the real-time controller settings can be found when you are in Program mode.

The Control Setup is accessed from MIDI mode—press **MIDI**, then the **XMIT** soft button, and the Control Setup (“CtlSetup”) is displayed on the top line of the screen.

Note that when you are in Setup mode, this Control Setup is ignored, in favor of the controller settings within the Setup itself. If you happen to go into MIDI mode from Setup mode, the K2500 automatically *goes out of Setup mode* and into Program mode, and the settings in the Control Setup on the display go into effect.

```

MIDI Mode: TRANSMIT
Ctrl Setup: 97 Control Setup
Channel : 1          PrgChg   : On
TransPos: 0ST       Buttons  : Off
Control  : Both     ChgSetups: KeyUP
VelocMap: 1 Linear
PressMap: 1 Linear
MIDI RECV CHANNEL PRGCHG RSETUP PANIC

```

Editing the Control Setup

You can change the parameters of the current Control Setup, and save your settings into the same Control Setup or a new one, so that you can have different Control Setups for different playing environments. Different Control Setups for Program mode can *only* be called up from this page—the Control Setup doesn't change when you change Programs, and the Control Setup on this page will always be active whenever you are in Program mode.

On the **MIDI:Transmit** screen, select the name of the Control Setup and press **Edit**. You will see a group of parameters pertaining to the current Control Setup. Press **more>** and you'll see a series of soft buttons pertaining to the sliders, footswitches and control pedals:

```
<more> SLIDER SLIDE FOOTSW FOOTSW more>
```

press **more>** again and you'll see the pages for the ribbons, wheels, switches, and pressure:

```
<more> RUBBER WHEEL SWICH PRESS more>
```

See Table 4-1 in the previous section for the customary Destination settings for all of the various real-time controls.

From within the Setup Editor you can also Rename and Save the Control Setup. Press **more>** or **<more** until you come to the appropriate pages.

Unlike a Performance Setup, a Control Setup only affects the real-time operation of the on-board controls and arpeggiator, and *nothing else*—not programs, internal effects, or KDFXMods. But because it is a "Setup", it has all of these other parameters in it, and you may well wonder what you're supposed to do about them when you are working on a Control Setup. The answer is: **Ignore them!** They have no meaning when the Setup is being used as a Control Setup in Program mode.

A perverse question

So what happens when the K2500 is in Program mode, and the FX Mode is "Setup"? There's really no reason why you should ever be in this situation, but for the perverse among you who want to try it, the Studio and FXMods that are in effect will be those that are in the Setup which is displayed when or if you put the K2500 into Setup mode. This is generally the *last Setup called* when the K2500 was in Setup mode—but even if you've never used a Setup in your life, there's still one in there, as you can see if you go to Setup mode. Hey, you asked.

Modes table

Here's how to tell what's controlling what, depending on the various Performance and FX modes:

Table 4-2. What's in control

K2500 Mode	Effects Mode	What's determining what the sliders, wheels, etc. do	What's controlling KDFX	MIDI Channel for external KDFX control
Program	Program or Auto	Control Setup	Program's FXMods	FX Chan
Setup	Setup or Auto	Setup	Setup's FXMods	MIDI channel of Zone 1
Setup	Program	Setup	FXMods of Program in Zone assigned to FXChan	FX Chan
Program	Setup	Control Setup	the last Setup that was selected in K2500 Setup mode	MIDI channel of Zone 1 of the most-recently used Setup
Program	Master	Control Setup	nothing	System exclusive*
Setup	Master	Setup	nothing	System exclusive*

*see page 4-19

More information on Setups and Control Setups can be found in Chapter 7 of the *K2500 Performance Guide*.

Using KDFX with an external Sequencer

If you use an external MIDI sequencer, you are probably thinking about how powerful it will be putting KDFX under sequencer control. Certainly being able to record, edit, and automate a Studio's parameters as part of a MIDI sequence is one of the most attractive aspects of KDFX.

Any Program on any channel can be the one that controls KDFX. On the **Effects** page, put **FX Mode** into "Program", select the **FX Channel** you want to control KDFX with, and put your KDFX-controlling Program on that MIDI channel. Now any MIDI commands coming from the sequencer on that MIDI channel will be sent to KDFX.

Dedicating a Program and Channel

Perhaps the most efficient and least confusing way to do this is to have a dedicated program that *only* controls KDFX, on a channel that is otherwise not being used to play music. Many K2500 and K2000 users know this trick for automating the old internal effects, but it becomes even more important given the complex nature of KDFX. It requires sacrificing a MIDI channel, but few users should have a problem with that.

Again, go to the **Effects** page and, keeping the **FX Mode** set to **Program** (or **Auto**), set the channel you're going to use as an **FX Chan**—in this case, 16 is often a good choice. Go to **Program** Mode and select Program 199, **Default Program**. Press **Edit**, and then **KEYMAP**, and set the **Keymap** to "0 None". This program will now make no sound in response to MIDI notes, and use up none of the K2500's polyphony.

Alternatively, if your sequencer uses a MIDI metronome, then you might want to use Program 198, **Click**, as a starting point. When the metronome is turned off, this voice won't use any polyphony either.

Now use the **more** keys to get to the KDFX page, and start setting up your Studio and FXMods, or, if you have another program already set up with the Studio and FXMods you want, use **Import FX** to bring that Studio and FXMods into the current Program.

Finally, save the Program to a new location, giving it a name like "Studio Controller1". You can now use this Studio with your sequencer: start by calling up its bank and Program number, and then put appropriate MIDI commands into the sequencer for controlling the Studio's parameters.

If the MIDI sources for the FXMods are also K2500 on-board controllers, then you can record your parameter changes from the K2500 into the sequencer.

Changing Studios with a sequencer

If you need more than one Studio available in a sequence, or you want a selection of Studios to use in different sequences, simply create new Programs, which call up the different Studios on their KDFX pages, the same way. To switch from one to the other, send an appropriate **Program Change** command on channel 16 from your sequencer.

Setting up static FXMods in different Programs, all of which address the same Studio, as we saw earlier, is a good way to make one-shot changes in KDFX parameters without having to construct a bunch of different Studios.

Also as we saw earlier, this technique can be useful even when you are playing the K2500 in **Setup** mode along with a sequencer. If **FX Mode** is "Program", and the **FX channel** is 16, the sequencer can control the FXMods independently of which **Setups** are in use on the keyboard.

Using KDFX with the internal sequencer.

If you are using the K2500's internal sequencer, you have some other options when it comes to setting up KDFX control. See Chapter 6 for this information.

Preventing glitches when changing Studios

As with any digital effects unit, you need to take some care when you are sending real-time commands to KDFX which radically alter the nature of the processing it is doing. The trickiest situations will occur when you are changing Studios, and calling up new FX Presets, Algorithms, and/or signal routings.

Under the best of circumstances, the transition between two Studios can be seamless, and the effects in one will “morph” into the effects of the other. Under the worst of circumstances, there will be a momentary “hole” in the sound, as the effects from the first Studio are cleared out and the effects of the second Studio build up.

The chances of a smooth transition between Studios will be highest if the Algorithms on the FXBuses in the two Studios are the same. (In some reverb Algorithms, the **Room Type** parameter should also be the same.) For example, if FX1 in Studio 300 uses an FX Preset based on the reverb in Algorithm 12, and FX1 in Studio 301 uses a different FX Preset based on the same reverb Algorithm 12, then when you switch from Studio 300 to Studio 301, the signals going through FX Bus 1 should experience a smooth reverb change.

However, if the FX1 Bus's FX Preset in Studio 301 uses a *different* Algorithm, say the 4-Tap Delay, Algorithm 131, then at the moment the Studio changes, the reverb effect will ramp down quickly, there will be a very brief point at which the signal will pass dry, and then the multitap delay will quickly ramp up. This ramping will take place any time the two Algorithms (or Room Types) are different—even if on the surface they seem very similar, like a Room and a Hall.

Even if the Algorithms are the same, however, there is a chance that the transition will not be completely smooth. Some parameters cause glitches if they are changed in real time even within a Studio—delay lengths, for example—and so if a parameter like that changes when you *switch* Studios, the software will clear it out as the Studio changes, and a small hole will appear. In some cases, instead of a hole, you will hear a momentary pitch shift as the Studio changes. A bit of experimentation will help you determine how to achieve acceptable transitions between Studios.

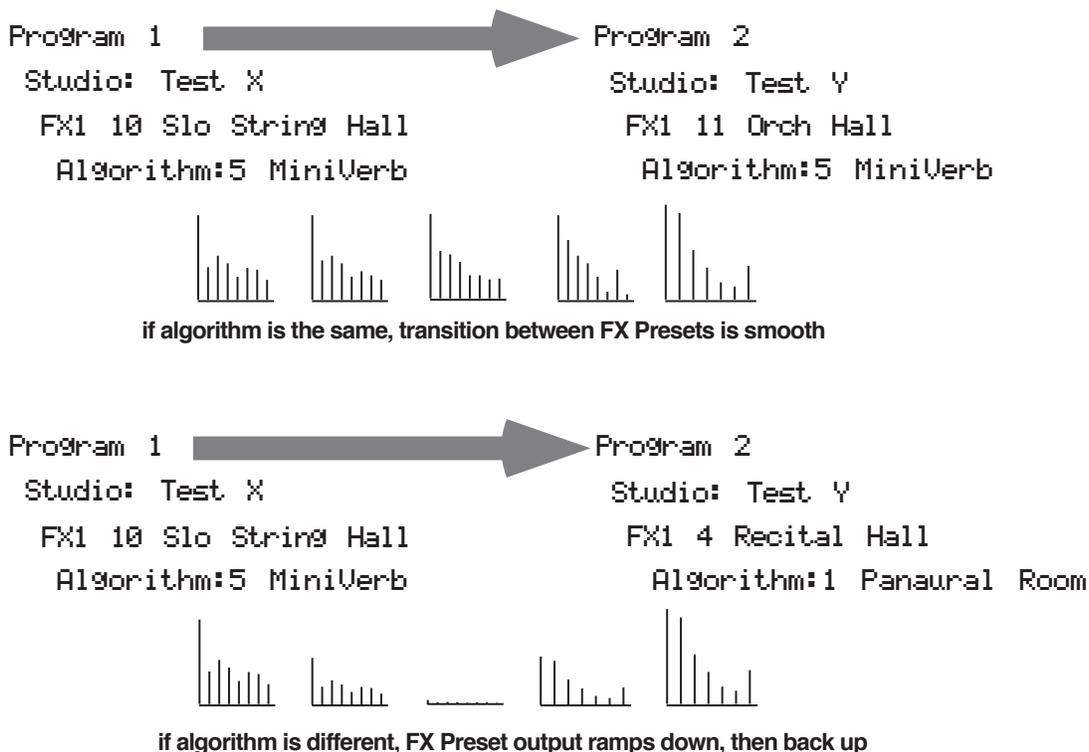


Figure 4-1. Transition between different FX Presets with the same and different Algorithms

Changing PAU Allocations

There are other circumstances under which using the same Algorithm will not ensure a smooth transition. If for any reason the PAUs have to be re-allocated when you move from one Studio to another, then even if the Algorithms on a given FX Bus are the same in both Studios, there will be a ramp-down/ramp-up. This can happen when there is a change in the *number of PAUs* being used in any FX Bus that has a *lower number* than the FX Bus you want to have a smooth transition. That's because re-allocating PAUs on the fly forces some of the processors to re-configure themselves, inasmuch as they are now being called upon to do different functions.

Here's an example: say Studio 300's FX1 Bus uses a Flanger that requires 2 PAUs, while the FX2 Bus has a small reverb that uses 1 PAU. In Studio 301, the FX1 Bus has a Chorus that uses only 1 PAU, while FX2 uses the same small reverb as Studio 300. When you switch from Studio 300 to Studio 301, one of the PAUs that was previously being used for FX1 is now being used for FX2—it's been re-allocated. Since it's not the *same* PAU that's handling the reverb, the transition isn't going to be smooth—even though the Algorithm hasn't changed.

There are a couple of ways around this. First is to set up your studios so that any transitions between them that are going to force changes in PAU allocations occur in the *higher-numbered* FX Buses—if the situation just described were reversed, and the reverb was in FX1, there would be no problem, because that same PAU would be used in FX1 in both Studios. A second method is to *manually* allocate the PAUs in the lower-numbered FX Buses, rather than using Auto allocation. Using the same example, if Studio Y had 2 PAUs hard-assigned to FX1, even though the FX Preset is only using one of the PAUs, then that second PAU would not get reassigned to the reverb, and the reverb's transition would be smooth.

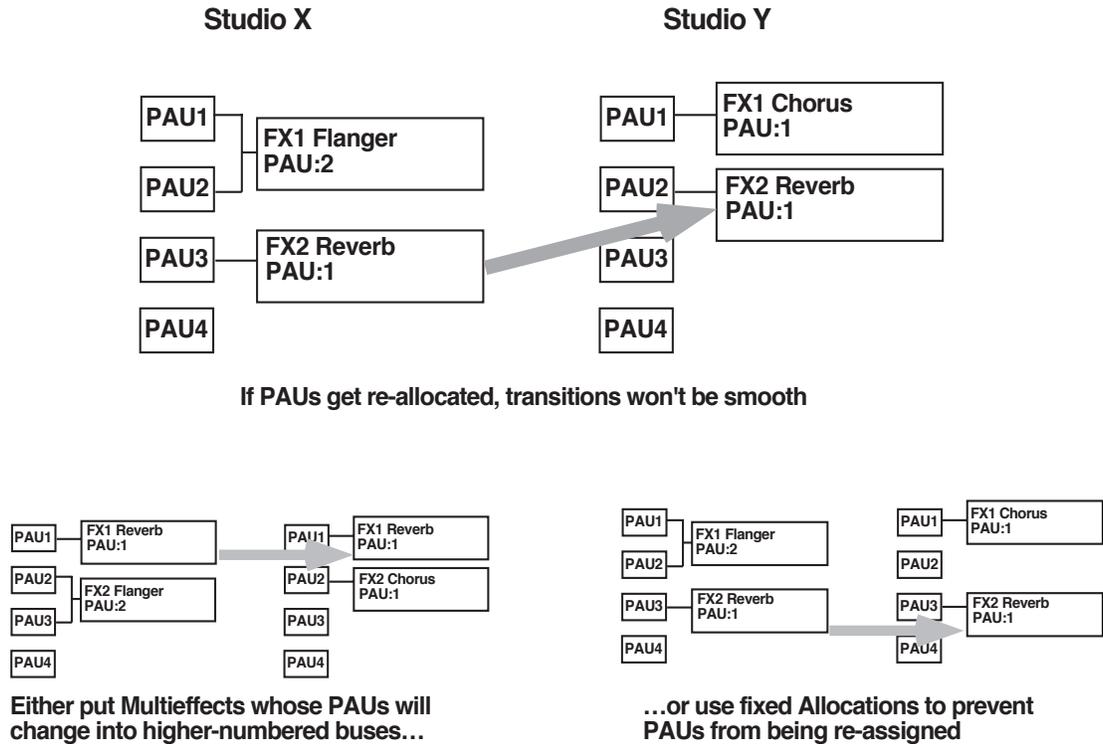


Figure 4-2. Avoiding transition problems when PAUs get re-allocated

Tempo-based control of KDFX

Many parameters within KDFX can be set up to respond to musical tempo. The tempo information can come from a number of sources: it can be fixed within an FX Preset, it can come from the K2500's internal sequencer, or it can come from an external MIDI sequencer which has been configured to send MIDI Timing Clocks to the K2500.

The procedures for using tempo from the internal sequencer and from an external sequencer are essentially the same, with one crucial difference in one setting: in **Song** mode, on the **MISC** page, the **Clock** parameter must be set to "Int" when using the internal sequencer and to "Ext" when using an external sequencer.

The **Sync** parameter controls how KDFX responds to other MIDI timing commands besides tempo—that is, Start, Stop, and Continue. Many KDFX parameters respond to these commands in special ways. For example, an LFO controlling a delay will set itself to zero (or its initial value, if there's an offset) when it receives a Start or a Continue command. For this to occur, the Sync parameter must be set to "Recv" or "Both"—not to "Off" or "Xmit". The Sync parameter does not affect tempo control—regardless of how it is set, the clock speed, either internal or external, will always affect any parameter that is assigned to **Clock**.

Note that MIDI Timing Clocks (otherwise known as "MIDI Sync") is not the same as MIDI Time Code (or MTC). MIDI Sync, which is used for syncing sequencers together, changes its speed in response to tempo changes; MIDI Time Code, which is used for syncing a sequencer to an audio or video tape or disk system, does not. KDFX (and the K2500 in general) responds to MIDI Timing Clocks, but not to MIDI Time Code.

Tempo within an FX Preset

Some Algorithms have a “Tempo” parameter, which allows certain time-based functions, such as LFOs, envelopes, or delay lengths, to be expressed in beats per minute (BPM). A second parameter immediately below Tempo, “Period”, multiplies or divides the tempo. The Period is expressed in beats (“bts”) and ranges from 1/24 (the actual time is 24 times faster than the Tempo) to 32 (the time is 32 times slower than the Tempo) in a sliding scale based on 24ths of a beat. So for example, if an LFO has a Tempo setting of 120 BPM and a Period of 12/24 bts, the LFO will oscillate 240 times per minute, or 4 Hz.

The formula for converting tempos and beats to frequency values is:

$$f \text{ in Hz} = (\text{Tempo in BPM} / 60) \times (\text{number of beats per period}), \text{ or}$$
$$f \text{ in Hz} = (\text{Tempo in BPM} / 60) \times (1 / \text{bts}).$$

The formula for converting tempos and beats to time values (e.g., delay lengths) is:

$$T \text{ in seconds} = (\text{bts} / \text{tempo}) \times 60$$

Variable tempos using “System”

You can also have these parameters respond to tempo in real time, by setting the Tempo parameter to “System”, which is set by scrolling below 1 BPM (or pressing “0” and “Enter” on the numeric keypad). Now instead of Tempo being a fixed value, it will vary according to the system clock—which, depending on the setting of the Clock parameter on the **Song** mode’s **MISC** page as described above, will either be the internal sequencer’s clock, or tempo coming from an external source of MIDI Sync. The System Tempo will be multiplied or divided by the Rate or Beats setting, to determine the parameter’s actual speed, just as if it were a fixed value.

If the Clock setting is “Int”, then the current tempo of the internal sequencer (as shown on the Song Mode’s **MAIN** page) will be in effect *whether or not the sequencer is running*.

If the Clock setting is “Ext”, the external sequencer (assuming it is sending MIDI Timing Clocks) controls the Tempo parameter. If *no* MIDI sync is being received by the K2500, the tempo will not go to “0”; instead, it will retain the last valid value it saw—either the tempo of the internal sequencer at the time when you switched the Clock to “Ext”, or the last tempo sent by an external sequencer before it stopped.

Tempo as an FXMod Source

KDFX Algorithms that don’t have a “Tempo” parameter can also respond to tempo information, using FXMods.

In the Control Source list, there is now a parameter called “Tempo,” located at number 55. You can call it up quickly by pressing **5-5-Enter** on the keypad, or holding down the **Enter** key and playing *Ab* below middle C on the keyboard.

This source reads the current tempo (fixed or variable, internal or external) and turns it into a numerical value between 0 and 1, which is then used to scale the Depth value of the parameter under the control of the FXMod. The “virtual” range of this parameter is 3.75 to 240 BPM—that is, a tempo of 3.75 BPM (or less) will scale the Depth parameter value to 0, while a tempo of 240 BPM (or greater) will scale it to 1, or its highest value.

This may sound confusing, but there is a relatively simple method to follow when using this feature: set the “Adjust” value of an FXMod to the value of the parameter that you want when the tempo is 3.75 BPM, and set the “Depth” value so that the sum Adjust+Depth equals the value that you want when the tempo is 240 BPM.

For example, let's look at an Algorithm that has an LFO Rate parameter in Hz. Let's say we want the LFO speed to be twice as fast as the tempo. Here are the values for the FXMod:

Parameter: LFO Rate

Adjust: The slowest vibrato we want is $2 \times (3.75 \text{ BPM} / 60)$, or 0.125 Hz. **0.13 Hz** is the nearest value available.

Source: Tempo

Depth: The fastest vibrato we want is $2 \times (240\text{BPM} / 60)$, or 8.00 Hz, so this parameter is 8.00–0.13, or 7.87 Hz; the nearest value available is **7.80 Hz**.

The Tempo parameter exists in Control Source lists throughout the K2500's operating system, not just in FXMod pages, so you can use it for controlling just about any function, including pitches of sample loops, envelope lengths, filters, volume, and more.

Tap Tempo

A real-time tap on a footswitch or button can also be used to control the tempo of a parameter in KDFX. Like the Tempo parameter, Tap Tempo is not KDFX-specific, but can be used throughout the K2500's operating system, including the Sequencer.

To use Tap Tempo, you have to assign it a physical controller inside a Setup or Control Setup (if you are in Program mode). "Tap Tempo" is on the controller Destinations list, located at number 39 (press **3-9-Enter** on the keypad or hold **Enter** and play *Ab* an octave and a major 3rd below middle C). Tapping or pressing on a controller that is set to "Tap Tempo" sends tempo information, based on the average time between taps, to the Internal Clock.

It takes four taps to determine the tempo—if you tap fewer than four times, no information is sent. If you tap more than four times, the average of *all* of your taps is continuously calculated and sent to the Clock. Later taps are weighted more heavily than earlier ones, so that if you change the rate at which you tap, the tempo information being sent will change accordingly, but there is a "flywheel" effect, so the Clock's tempo changes will lag somewhat behind the changes in your tapping rate.

☛ In order for Tap Tempo to have any effect, the **Clock** parameter on the **Song Mode:MISC** page must be set to "Internal".

KDFX in Master mode

So far we've been telling you that setting FX Mode to "Master" on the Effects page disables real-time control over KDFX, but this is not strictly true. In that mode, KDFX will respond to specific system-exclusive (Sysex) commands. If you are a serious Sysex jockey, you can take advantage of this by using Sysex commands.

Sysex, in fact, can be used to control KDFX *regardless* of the FX Mode setting, so if you need to tweak certain parameters in real time without setting up an FXMod to do it, you can use Sysex. There's no reason why you can't use Sysex control and FXMod control simultaneously, and in fact if you have a situation in which you need to control more than 18 parameters at a time (the maximum number of FXMods in a Program or Setup), you can use Sysex for the extra ones.

The Sysex commands for controlling KDFX are described in Appendix C of this manual.

Internal Effects in Master mode

The internal effects processor, which normally is controlled through a Program or Setup in one of those modes, can also be controlled in Master mode. Unlike KDFX in Master mode, this is done through Continuous Controller commands, not Sysex. The table that shows how to address the parameters is in Chapter 3 of the *K2500 Reference Guide*.

For these Controller commands to work with internal effects, the K2500 *must* be in Master mode, which means that Program or Setup control over the internal effects cannot be used simultaneously.

KDFX in Auto Mode

When the **FX Mode** is set to "Auto", then control of KDFX changes according to where you take the K2500: either Program mode or Setup mode. But when you are on the Effects Mode page itself, you are actually in *Master* mode. Therefore, you can go into the Studio whose name appears on the page and tweak its parameters, but you won't see any FXMods that might be in place. If you change a parameter that has an FXMod link attached to it through a Program or Setup, you won't disturb that link—when you go back to the Studio through the Program or Setup, the link will still be there.

However, if you have gone into a Studio from the FX Mode page, tweaked it, and then *saved* it, then when you go into Program or Setup mode and call up a Program or Setup that links to that Studio, any changes you have made in the Studio will show up—and any parameters that you changed that had been under FXMod control will no longer be linked.

From Auto Mode to Song Mode

When you are on the Effects page and if FX Mode is set to "Auto", and then you go into Song Mode, something slightly different happens: KDFX is now under control of the Program that is on the Effect Channel within the song—from **Song** mode press **Edit** and look at the "EffectChan" parameter.

The Effect Channel is saved with the song, so make sure that it is set so that the program that you want to be in control of KDFX is active.

More about KDFX in Song mode in Chapter 6.

Chapter 5

Using the Algorithms

This Chapter will discuss the processing Algorithms found in KDFX: what their parameters mean, and how to use them. It is designed to be read through so that you can get a general understanding of the Algorithms.

The descriptions here do not include all of the parameters associated with every Algorithm, and some Algorithms may not have some of the parameters described here for their category. A more complete reference, with every Algorithm and the meaning and range of every Parameter, arranged in the order they appear on the screen, can be found in the *KDFX Algorithm Reference*.

But first, a word about how the KDFX Studios in ROM are organized.

Conventional Studio Structure

Many of the Studios provided in ROM follow an overall organizational plan, which uses KDFX's resources efficiently and clearly. While by no means are you required to follow this structure when creating your own Studios, it's a good idea to become familiar with it, and see how Kurzweil's own engineers have approached the complex issue of Studio organization. And certainly it can serve as a good starting point when you strike out on your own.

The organization of the ROM Studios follows the following guidelines:

- ROM Programs and layers in ROM Setups are assigned to outputs (KDFX-A through KDFX-D on the **Program:Output** or **Setup:CH/PRG** page) based on the type of effects processing that would most likely be appropriate for their sound.
- All Inputs go to their respective FXBuses (Input A to FXBus 1, Input B to FXBus 2, etc.), and *only* to their respective FXBuses—the Lvl parameter for the second FXBus on each Input page is turned Off.
- FXBus 1 contains a relatively simple reverb with a low Size requirement.
- FXBus 2 contains an effect which does not increase the “length” of the sound (that is, not reverb or delay). Possibilities include chorus, flange, phaser, distortion, shaper, pitcher, enhancer, EQ, or EQ morpher.
- FXBus 3 contains effects that take up lots of time, such as delays, delays with reverb, or other “Lead” sounds.
- FXBus 4 is dry (since the first three FXBuses have probably used up all the PAUs), and can provide a “bypass” path for sounds to go directly to the AuxFX Bus effect.
- The AuxFX Bus contains a larger reverb (Size=2 or3), a compressor, or a graphic EQ. It can be used instead of an FXBus reverb, such as the one on FXBus1. When used this way (set the Aux Lvl on the FXBus to 0dB or higher), it frees up that FX Bus for use as an Enhancer, Stereo Image, Flanger, etc.

General Parameters

There are a number of Parameters that are common to all or almost all Algorithms, and we'll deal with those first.

Wet/Dry balances the levels of the processed and unprocessed signals passing through the FXPreset. The range is 0% wet (the signal is unprocessed) through 100% wet (no dry signal is present). A setting of 50% wet means the dry and processed signals are equal in level. In some Algorithms, separate Wet/Dry parameters are provided for the Left and Right input channels. In some cases, this parameters can have negative values, which indicate that the Wet signal is polarity-inverted.

In Gain sets the level of the signal coming into the FXPreset from the Input page. As with most Gain controls in KDFX, the range is -79.0 dB to 24.0 dB, and there is an "Off" position. 0.0 dB is unity gain.

Out Gain sets the level of the signal after it passes through the FXPreset. From here the signal goes directly to the Output page, if one of the Outputs is set to "FXBusn". The level can be further changed (on the FX Bus page) before it goes to the Mix and/or AuxFX buses.

In/Out enables or disables the effect. You can think of it as a Wet/Dry parameter with only two positions: 100% (In) and 0% (Out).

HF Damping is the cutoff (-3 dB) frequency of a 6dB/octave lowpass filter that's inserted before the processor. In the case of processors where multiple iterations of the signal are heard, such as in a delay, each iteration of the signal will pass through the filter, and will therefore be duller.

XCouple (Cross Couple). In stereo effects, this controls how much of any signal being fed back is going to the channel *opposite* to the one where it first appeared. At 100%, all feedback from signals at the left input goes to the right channel and vice versa, causing a "spreading" or in the case of delay lines, a "ping-pong" effect. At 0%, fed-back signals stay with the channel they came in on.

A->B cfg (configuration). In combination Algorithms that contain two (or more) components, and whose name uses "<>", as in 719 "Reverb<>Compress", the order in which the signal passes through the two components can be changed. For example, this Algorithm can be configured so the signal passes through the reverb first and then the compressor, or through the compressor first and then the reverb. The **cfg** parameter determines the configuration, and its value is context-sensitive—in this example, the choices would be "Rvb->Cmp" and "Cmp->Rvb".

A/Dry->B is also found in many combination Algorithms, and controls the amount of signal that will pass dry (unprocessed) through the first component into the second component. Different combination Algorithms use different variations on this parameter, depending on the context. The range is 0 to 100%.

Reverbs

Room Type changes the configuration of the algorithm to simulate a wide array of room types and sizes including booths, small rooms, chambers, halls and large spaces can be selected. Because this parameter changes the structure of the reverb algorithm, you need to be careful when assigning it an FXMod—changing it in real time while signal is passing through it is likely to cause audible artifacts. Room types in different Algorithms with similar names do not necessarily sound the same.

Rvrb Time is the RT_{60} —the time it takes for the reverb to decay to 60 dB below its initial level—in seconds. It is accurate assuming that several other parameters (HF Damping, Diff Scale, Size Scale, and Density) are at their nominal levels. It is adjustable up to “Inf”, which creates an infinitely-sustaining reverb.

LateRvbTim adjusts the basic decay time of the late portion of the reverb after diffusion.

L/R Pre Dly (Pre-Delay) is the time between the start of a sound and the output of the first reverb reflections from that sound. Longer pre-delays can help make larger spaces sound more realistic. Longer times can also help improve the clarity of a mix by separating the reverb signal from the dry signal, so the dry signal is not obscured.

EarRef Lvl adjusts the mix level of the early-reflection portion of Algorithms which offer early reflections.

Late Lvl adjusts the mix level of the late-reverb portion of Algorithms which offer early reflections.

Diff Scale scales the “diffusion” of the early reflections, that is, how spread out they are as a group over time. At very low settings, the early reflections start to sound quite discrete, and at higher settings the early reflections are seamless. It is adjustable from 0.00 to 2.00, with 1.00 being nominal for the given Room Type.

Density controls how tightly the early reflections are packed in time. Low Density settings group the early reflections close together, while higher values spread the reflections for a smoother reverb. It is adjustable from 0.00 to 4.00, with 1.00 being nominal (and usually optimal) for the given Room Type.

Expanse controls the amount of late reverb energy biased toward the edges of the stereo image. A setting of 0% will bias energy towards the center. Moving away from 0% will bias energy towards the sides. Positive and negative values will have a different character.

Build adjusts the envelope of certain portions of the reverb. Positive values speed up the envelope, and negative values slow it down.

Size Scale changes the size of the current room. Altering this parameter will change the reverb time and also cause some coloration of the reverb. It is adjustable from 0.00 to 4.00, with 1.00 being nominal (and usually optimal) for the given Room Type.

InfinDecay, when turned “On”, causes the reverb tail to decay indefinitely. When it’s “Off”, the decay time is determined by the “Rvrb Time” or “LateRvbTim” parameters. This is a good parameter to use under KDFX control with a footswitch.

Wet Bal (Wet Balance). Some reverb Algorithms are actually two stereo reverbs in one, with each one receiving a different mono signal. This balances the outputs of the two reverbs—0% means they are being mixed equally.

Delays

There are two types of taps in the Multitap delays: The “Loop” tap, which has a feedback loop back to its input, and the numbered taps. The numbered taps can be single iterations or they can repeat as part of a loop, but they do not have individual feedback paths.

Fdbk (Feedback) **Level** controls the repeating function of the Loop Tap. A setting of 0% means there will only be a single delay, while a setting of 100% means the signal keeps repeating without ever stopping.

Both types of taps are individually adjustable from 0 to 2.55 seconds. The **Loop Crs** and **Tap n Crs** (n being the number of the tap) parameters set the coarse value of the loop in 20-ms increments, while the **Loop Fine** and **Tap n Fine** parameters set the fine value in 0.2-ms increments.

In Delay Algorithms that use tempo to determine tap lengths, there is a **Tempo** parameter which can be set from 1 to 255 BPM or to “System”. The **Loop Length** and **Tap n Delays** are then expressed in beats relative to that overall Tempo. See Chapter 4 for more information about tempo control of KDFX parameters.

Hold is a switch that, when turned on, “locks” any signal currently in the delay and plays it until Hold is turned off. When Hold is on, no signal can enter the delay and Feedback is set to 100%. A good parameter to use under FXMod control with a footswitch.

Dry Bal (Balance) is the left/right balance of the dry signal. At -100%, only the left dry signal goes to the left output, while at 100% only the right dry signal passes to the right output, and at 0%, equal amounts of the left and right dry signals pass to their respective outputs.

Tap n Level is the level of each numbered tap, from 0% to 100%, relative to the overall output of the effect.

Tap n Bal is the left/right balance of each of the numbered taps. At -100%, only the left channel of tap n goes to the left output, while at 100% only the right channel of tap n goes to the right output. At 0%, equal amounts of the left and right channels of the tap pass to their respective outputs. In some delays, pairs of taps (1 and 5, 2 and 6, etc.) are controlled together as stereo pairs.

DelayScale lets you change the lengths of all the taps together. Its range is 0 to 10x.

☛ Note that it is possible for KDFX to run out of delay memory with over-generous settings of DelayScale or very slow Tempos. Some Delay Algorithms will simply go to a maximum value and stay there, while in some, a calculation is made that automatically cuts the delay times in half, thereby maintaining a relationship with tempo.

Complex Echo

This Algorithm has two feedback taps per channel as well as three independent taps, and also a feedback diffuser for “smearing” the delays. Feedback line 1 feeds the signal back to the delay input of the same channel, while feedback line 2 feeds the signal back to the opposite channel.

FB2/FB1>FB is a balance control between feedback lines 1 and 2. 0% (minimum) turns off feedback line 2, only allowing use of feedback line 1. 50% is an even mix of both lines, and 100% (maximum) turns off line 1.

L Diff Dly and **R Diff Dly** adjusts the delay lengths of the diffusers. Range is 0 to 100 ms.

Diff Amt adjusts the diffuser intensity. Range is 0 to 100%.

C Fdbk *n* Dly adjusts the delay length of the C channel's *n*th feedback tap, fed back to the C channel's delay input. Range is 0 to 2600 ms.

Spectral Multitap Delays

These 4- and 6-tap delays have their feedback and output taps modified with shapers and filters. In the feedback path of each tap are a diffuser, hipass filter, lopass filter, and imager. Each delay tap has a shaper, comb filter, and balance and level controls.

Fdbk Image sets the amount that the stereo image is shifted each time it passes through the feedback line. Range is -100 to 100%.

Tap *n* Shapr adjusts the intensity of the shaper at each output tap. Range is 0.10 to 6.00 **x**.

Tap *n* Pitch adjusts the frequency of the comb filter at each output tap. Range is C-1 to C8, in semitones.

Tap *n* PtAmt adjusts the intensity of the comb filter at each output tap. Range is 0 to 100%.

Equalizers (EQ)

KDFX has both Graphic and Parametric EQ Algorithms. Parametric EQ sections are also found on a number of combination Algorithms.

The **Graphic** equalizer is available as stereo (linked parameters for left and right) or dual mono (independent controls for left and right). It has 10 bandpass filters per channel, each of whose gain is adjustable from -12 dB to +24 dB.

Like all graphic equalizers, the filter response is not perfectly flat when all gains are set to the same level (except at 0 dB), but rather has ripple from band to band. To minimize this ripple, it is best to center the overall settings around 0 dB.

The **Parametric** equalizer ("5-Band EQ") has two bands of shelving filters and three bands of true parametric EQ.

Treb Freq and **Bass Freq** set the center frequencies for the shelving filters. Both of these are adjustable over the full range of 16 to 25088 Hz, in increments of a semitone.

Treb Gain and **Bass Gain** control the amount of cut or boost above (Treb) or below (Bass) the center frequency. The range is -79 to +24 dB.

Mid*n* Gain sets the cut or boost for the parametric band *n*, with a range of -79 to +24 dB.

Mid*n* Freq sets the center frequency for parametric band *n*, with a range of 16 to 25088 Hz, in increments of a semitone.

Mid*n* Width set the bandwidth of the filter on band *n*, with a range of 0.01 to 5 octaves.

Enhancers

Enhancers modify the spectral content of the input signal by boosting existing spectral content, or stimulating new ones. Two- and three-band versions are provided.

Drive adjusts the input into each band. Increasing the drive will increase the effects. Range is -79.0 to 24.0 dB.

Xfer adjusts the intensity of the transfer curves. Range is -100 to 100%.

EQ Morpher

This Algorithm uses two four-band bandpass filters, A and B, and moves between them, which among other things, can produce a very convincing simulation of a human vocal tract.

FreqScale offsets the filter frequencies for each set of filters. After setting the filter parameters (**Freq**, **Gain**, and **Width**), the FreqScale parameters will move each of the four filter frequencies together by the same relative pitch. Range is -8600 to 8600 cents.

Morph A>B. When set to 0% the “A” parameters are controlling the filters, and when set to 100%, the “B” parameters control the filters. Between 0 and 100%, the filters are at interpolated positions. When morphing from A to B settings, the A filter #1 will change to the B filter #1, A filter #2 moves to B filter #2, and so on. Range is 0 to 100%.

Compressors, Expanders, and Gates

A wide range of Compression and Expansion effects is available in KDFX. The various Algorithms include different combinations of:

- compressor with soft-knee characteristic—the compression action comes in gradually as the signal level approaches the threshold
- compressor with hard-knee characteristic—the compression action comes in abruptly when the signal reaches the threshold
- expander
- multiband compressor that breaks the signal up into three frequency bands and compresses them all separately
- sidechain or output EQ
- reverb and compressor in combination
- gate
- gated reverb

All of the Compression Algorithms use these parameters:

FdbkComprs (Feedback Compression) selects whether to use feed-forward (set this to “Out”) or feed-back (set this to “In”) compression. The feed-forward configuration uses the input signal as a side-chain source, which is useful when the compressor has to act really quickly. The feed-back configuration uses the compressor *output* as the side-chain source, which lends itself to more subtle, but not as quick-reacting, compression.

Atk (Attack) **Time** for the compressor is adjustable from 0.0 to 228.0 ms.

Rel (Release) **Time** for the compressor is adjustable from 0 to 3000 ms.

SmoothTime smooths the output of the expander’s envelope detector by putting a lowpass filter in the control signal path. Smoothing will affect the Attack or Release times only when this parameter is longer than one of the other times. The range is 0.0 to 228.0 ms.

Signal Dly (Delay) puts a small delay in the signal relative to the sidechain processing, so that the compressor (or gate) “knows” what the input signal is going to be before it has to act on it. This means the compression can kick in before an attack transient arrives. In the SoftKneeCompress and HardKneeCompress Algorithms, delay is really only useful in feed-forward configuration (FdbkComprs is “Out”). For other compressors, the delay can be useful in feedback configuration (FdbkComprs is “In”). The range is 0 to 25 ms.

Ratio is the amount of gain reduction imposed on the compressed signal, adjustable from 1.0:1 (no reduction) to 100:1, and Inf:1.

Threshold is the level in dBFS (decibels relative to full scale) above which the signal begins to be compressed. Adjustable from -79.0 to 0 dB.

MakeUpGain allows additional output gain to compensate for gain reduction in the compressor. It is essentially the same parameter as **Out Gain**, with which it is summed. The minimum is -79.0, and the maximum summed gain (**MakeUpGain** + **Out Gain**) is +24.0 dB.

Expansion

Algorithms containing Expanders have these controls:

Atk or **Exp Atk** (Attack), how fast the expander turns off when the input signal rises above the threshold level, adjustable from 0.0 to 228.0 ms.

Rel or **Exp Rel** (Release), how fast the expander turns back on after the signal drops below the threshold level, adjustable from 0 to 3000 ms.

Ratio or **Exp Ratio**, how much the gain is reduced below the expansion threshold, adjustable from 1:1.0 (no expansion) to 1:17 (extreme downward expansion).

Threshold or **Exp Threshold**, the level below which the signal is expanded, adjustable from -79.0 to 0 dB.

In addition, the two-segment compressors with expander have separate **Ratio** and **Threshold** controls for each of the compression segments.

Multiband Compression

The Multiband Compression Algorithm has **Attack**, **Release**, **Smooth**, **Signal Delay**, **Ratio**, **Threshold**, and **MakeUp Gain** parameters for each of the three bands (“Low”, “Mid”, and “High”). In addition, it has:

Crossover1 and **Crossover2**. These set the frequencies which divide the three compression frequency bands. The two parameters are interchangeable, so either may contain the higher frequency value. The range is 16 to 25088 Hz, in increments of a semitone.

Gates

SC Input lets you select which input channel(s) will control the sidechain, which is responsible for opening and closing the gate. It can be set to L, R, or the average of the two channels, $(L+R)/2$. You can use this, if you arrange the signal paths and pan controls appropriately, to gate one mono signal with a different mono signal—the venerable “Keyfex” effect.

Gate Time is the time that the gate will stay open after the sidechain signal reaches the Threshold. Its range is 0 to 3000ms.

Ducking reverses the action of the gate. Normally this is set to “Off”, and the gate opens when the input signal rises above the threshold. But when this is “On”, the gate *closes* when the input signal rises above the threshold.

Atk (Attack) **Time** is the time for the gate to ramp from closed to open (reverse if Ducking is on) after the signal rises above threshold, adjustable from 0.0 to 228.0 ms.

Rel(ease) **Time** is the time for the gate to ramp from open to closed (reverse if Ducking is on) after the gate timer has elapsed, adjustable from 0 to 3000 ms.

Super Gate

Super Gate is a more sophisticated gate that includes these two functions:

Env Time is the amount of time it takes for the sidechain signal envelope to drop below the threshold. If this time is too short, the gate can close and open too quickly from amplitude modulation in the sidechain signal. If it is too long, the gate may stay closed until the envelope has a chance to fall, and some signals would not get through. This parameter is only in effect when **Retrigger** is Off.

Retrigger determines whether the gate timer will reset itself each time the sidechain signal goes above the threshold. If it is "On", the timer resets itself, and therefore the gate stays open as long as the signal is above the threshold, or keeps going above the threshold, within the interval specified by **Gate Time**. If it is "Off", the gate closes down after **Env Time** has elapsed, regardless of the sidechain level, and the sidechain level must fall below the threshold and come back up again before the gate will open again.

Chorus

Chorus is an effect which gives the illusion of multiple voices playing in unison. The effect is achieved by detuning copies of the original signal and summing the detuned copies back with the original. Low frequency oscillators (LFOs) are used to modulate the positions of output taps from a delay line. The movement of the taps causes the pitch of the signal to shift up and down, producing the required detuning.

The choruses are available as stereo or dual mono. The stereo choruses have the parameters for the left and right channels ganged, while the dual mono choruses have separate left and right controls.

Fdbk Level is the level of the feedback signal from the LFO1 delay tap into the delay line. Negative values polarity-invert the feedback signal.

Tap Lvl sets the levels of the LFO-modulated delay taps. Negative values polarity-invert the signal. Setting any tap level to 0% turns it off.

Tap Pan sets the stereo position for a given tap's output. The range is -100% for fully left, to 100% for fully right.

LFO Rate sets the speed of modulation of the delay lines with a range of 0.01 to 10 Hz.

LFO Dpth sets the maximum detuning depth of the LFO-modulated delay lines, with a range from 0 to 50 cents (= 1/2 semitone).

Tap Dly adds extra delay in front of the LFO modulated delay taps from 0 to 230 ms.

L/R Phase or **LFO n LRPhs** adjusts the relative phases of the LFOs for the left and right channels in the stereo Choruses.

Flanger

Flanging is the process of adding or subtracting a signal with a time-displaced replica of itself, which results in a series of notches in the frequency spectrum, generally referred to as a comb filter. In KDFX, the flanger is a multi-tap delay line, all (but one) of whose taps can have their lengths modulated up and down by a low frequency oscillator (LFO). The rate of the LFO is expressed in Tempo (see Chapter 4).

StatDlyLvl (Static Delay Level) is the level of the first, non-moving tap. Negative values invert the polarity of the tap. The range is -100 to 100%; 0% turns the tap off.

DlyCrs and **DlyFin** are the coarse and fine length controls for the Static delay (**StatDly...**) and for the minimum value of the moving delays (**Dlyn...**). The coarse range is 0 to 228 ms, and the fine range adjusts the coarse range in samples ($= 1/48,000 \text{ sec} = 20.8\mu\text{sec}$) from -127 to 127.

Xcurs Crs and **Xcurs Fin** determine how far the LFO-modulated delay taps can move from the center of their ranges. The total range of the LFO sweep is twice the excursion. If the excursion is set to 0, the LFO does not move and the tap behaves like a simple delay line set to the minimum delay. The coarse range is 0 to 228 ms; the range 0 to 5 ms is most effective for flanging. The fine range adjusts the coarse range in samples from -127 to 127.

Quantize + Flange

The Quantize portion of this Algorithm produces digital distortion known as quantization noise, by limiting the number of bits available to the signal.

DynamRange (dynamic range) controls how many bits to remove from the signal data words. The lower the level, the greater the distortion. At 0 dB the hottest of signals will toggle between only two quantization levels, thereby producing a square wave. Every 6 dB added doubles the number of quantization levels, reducing the noise and getting closer to the original signal. If the signal has a lot of headroom (available signal level before digital clipping), then not all quantization levels will be reached. Range is 0 to 144 dB.

Headroom sets the available signal level before digital clipping. Setting this properly prevents the signal from getting ridiculously loud at low levels of DynamRange. You want to have it match the amount of level still available above the input signal: this is done by finding the DynamRange level at which the signal starts getting louder, and setting Headroom to match the DynamRange value. Range is 0 to 144 dB.

DC Offset adds a positive DC Offset to the input signal, which allows you to alter the position where digital zero is with respect to your signal. At low DynamRange settings, this can cause the output to “sputter”. Range is Off/-79.0 to 0.0 dB.

LaserVerb

LaserVerb is a new kind of reverb which produces a delayed train of closely spaced reflections, or impulses. As time passes, the spacing between the impulses gets wider, which creates a discernible buzzy pitch that gets lower as the spacing increases. The signal can be fed back into itself to extend the effect.

Dly Coarse is the overall delay length, which controls the duration or decay time. 0.5 sec is a good starting point. Range is 0 to 1.3 seconds in the 2 PAU version of the Algorithm, and 0 to 2 seconds in the 3-PAU version.

Dly Fine adjusts the delay with a resolution down to 0.2 ms. Range is -20.0 to 20.0 ms.

Filters

Spacing determines the starting pitch of the descending buzz and how fast it descends, by setting the initial separation of impulses and the subsequent rate of increasing impulse separation. The spacing between impulses is given in samples (20.8 μ s). At low values, the buzz starts at high frequencies and drops slowly, while at high values the buzz starts at a lower pitch and drops rapidly. Range is 0.0 to 40.0 samples, with a resolution of 0.2 sample.

Contour controls the overall shape of the reverb. When set to a high value, sounds passed through the reverb start at a high level, and it slowly decays. As the control value is reduced, it takes more time for the effect to build up before decaying. At a value of around 34%, the reverb behaves like a reverse reverb, building up to a hit. When it is set to zero, the Algorithm acts like a simple delay. Range is 0 to 100%.

Filters

There are four types of Resonant Filter Algorithms in KDFX. All of them have these parameters in common:

Filter Type (or **FiltType**) can be Lowpass, Highpass, Bandpass, or Notch (band-cut).

Resonance is the resonance of the filter, adjustable from 0 to 50 dB.

Resonant Filter

Frequency (or **Freq**) is the fixed resonant frequency of the filter. Its range is 16 to 8372 Hz.

Envelope Filter

Envelope Filter is a resonant filter whose center frequency can be made to vary according to the level of the incoming signal.

Filter Type can be Lowpass, Highpass, Bandpass, or Notch (band-cut).

Min Freq is the minimum resonant frequency of the filter, that is, the filter frequency when the input gain is below the triggering threshold. Its range is 16 to 8372 Hz.

Sweep determines how far the resonant frequency moves when the input level increases. At positive levels it moves up in pitch, and at negative levels it moves down. The highest possible resonant frequency is 8372 Hz, the lowest is 0 Hz. This parameter's range is -100% to +100%.

Resonance is the resonance of the filter, adjustable from 0 to 50 dB.

Atk Rate adjusts the upward slew of the attack portion of the envelope detector. Range is 0 to 300.0 dB/sec.

Rel Rate adjusts the downward slew of the release portion. Range is 0 to 300.0 dB/sec.

Smooth Rate slows down the envelope follower. If it is set to a lower rate than **Atk Rate** or **Rel Rate**, it can dominate those parameters. Range is 0 to 300.0 dB/sec.

Triggered Filter

The Triggered Filter is a sweeping resonant filter that triggers when a certain input threshold is reached, and then follows its *own* envelope, consisting of an instantaneous attack and an exponential release, rather than the envelope of the input signal.

Max Freq is the resonant frequency of the filter at the peak of the internal envelope. It can be set lower than **Min Freq** (above), in which case the filter will sweep downwards, then back up. Range is 16 to 8372 Hz.

Trigger is the input-signal threshold at which the envelope detector triggers. Range is -79 to 0 dB.

Retrigger is the input-signal threshold at which the envelope detector resets, so that it can trigger again. This parameter is only useful when it is set below the value of Trigger. Range is from -79 to 0 dB.

Env Rate is the envelope detector decay rate. This can be used to prevent false triggering. When the signal envelope falls below the retrigger level, the filter can be triggered again when the signal rises above the trigger level. Since the input signal can fluctuate rapidly, it is necessary to adjust the rate at which the signal envelope can fall to the retrigger level. The range is 0 to 300.0 dB/sec.

Rel Rate is the downward slew (release) rate of the triggered envelope generator. The range is 0 to 300.0 dB/sec.

Smth Rate slows down the envelope follower. If set lower than the release rate, it will dominate it. You can also use the smoothing rate to lengthen the attack of the internal envelope. The range is 0 to 300.0 dB/sec.

LFO Filter

The LFO filter is continuously swept between two resonant frequencies over a period of time. The LFO frequency, expressed in BPM and beats, can be fixed or set to follow **System** tempo. (See Chapter 4 for information about tempo control of KDFX parameters.)

Min Freq and **Max Freq** are the low and high limits of the resonant frequency as the filter is swept. You can set the Min Freq higher than the Max Freq, in which case the filter will sweep “upside down” relative to the controlling clock. The range for both is 16 to 8372 Hz.

LFO Shape is the waveform type for the LFO. Choices are Sine, Saw+, Saw-, Pulse, and Tri.

LFO PlsWid (Pulse Width). When the LFO Shape is set to Pulse, this sets the pulse width as a percentage of the waveform period. When the width is set to 50%, the result is a square wave. This parameter has no effect if other waveform types are chosen. Range is 0 to 100%.

LFO Smooth smooths (removes the higher harmonics from) the Saw+, Saw-, and Pulse waveforms. A Sawtooth wave becomes more like a triangle wave, and a Pulse wave becomes more like a sine wave. Range is 0 to 100%.

Distortion

Distortion Algorithms on KDFX may also include a parametric equalizer or a cabinet simulator.

Dist Drive applies a boost to the input signal to overdrive the distortion algorithm into soft clipping. This will tend to make the signal very loud, so you may have to reduce the Out Gain as this parameter is increased. Range is 0 to 96 dB.

Warmth is a lowpass filter in the distortion control path. This filter may be used to reduce some of the harshness of some distortion settings without reducing the bandwidth of the signal. Range is 16 to 25088 Hz.

Highpass allows you to reduce the bass content of the distortion content in the smaller distortion algorithms that don't have true parametric EQ. Range is 16 to 25088 Hz.

Cab Preset selects from eight cabinet simulations which have been created based on measurements of real guitar amplifier cabinets. The presets are: Basic, Lead 12, 2x12, Open 12, Open 10, 4x12, Hot 2x12, and Hot 12.

Cab Bypass switches on and off the cabinet-simulation part of the algorithm. When this is set to “In”, the cabinet simulation is active; when it is “Out”, there is no cabinet action.

Cabinet HP and **Cabinet LP** are highpass and lowpass filters to set the frequency response limits of the cabinets. Range of both filters is 16 to 25088 Hz.

Polydistort

This is a more complex distortion Algorithm that provides two, four, or six stages of distortion.

Curve *n* controls the curvature of the individual distortion stages. 0% is no curvature (no distortion at all). At 100%, the curve bends over smoothly and becomes perfectly flat right before it goes into clipping. Maximum value is 127%.

LP *n* Freq are shelving frequencies for one-pole lowpass filters on each of the distortion stages. LP0 Freq handles the initial low pass prior to the first distortion stage. The other low pass controls follow their respective distortion stages. Range is 16 to 25088 Hz.

Rotating Speakers

An Algorithm that includes Rotating Speakers breaks the signal into two frequency bands, “rotates” each band separately through a virtual speaker, and then combines the outputs with a pair of virtual “microphones” whose angle relative to the speakers is adjustable. A number of very sophisticated parameters have been included in the Rotating Speakers Algorithm, to give the effect a great degree of realism. Because of the complexity of the Algorithms, you might want to approach any parameters that seem a little obscure to you with caution.

Roto InOut engages or bypasses the rotary speaker effect.

There are four virtual microphones, with two each on the woofer (**LoMic A** and **LoMic B**) and on the tweeter (**HiMic A** and **HiMic B**). Each microphone has:

Pos (position), the angle of the microphone from the front of the virtual speaker, from -180 to 180 degrees;

Lvl (level) from 0 to 100%; and

Pan, the left/ right panning of the microphone’s output, from -100% (full left) to 100% (full right).

Other parameters:

Lo Beam W and **Hi Beam W** set the acoustic radiation patterns (“beam width”) of the two drivers in the rotating speaker. If you imagine looking down on the rotating speaker, this is the angle between the -6 dB levels of the beam. The range is from 45° to 360°. At 360°, the driver is omnidirectional.

Xover (Crossover) is the frequency at which high and low frequency bands are split and sent to separate rotating drivers. The range is 16 to 25088 Hz.

Lo Gain and **Hi Gain** are the gains of the signal passing through the rotating woofer or tweeter, respectively. The range is Off/ -79.0 to 24.0 dB.

Lo Rate and **Hi Rate** are the rotation rates of the rotating woofer and tweeter. Each driver woofer can rotate clockwise or counter-clockwise, which is determined by the sign of this parameter: assuming the microphones are positioned in front of the driver and the microphones are panned positively (positive numbers go to the right), then a positive value for this parameter causes the driver to spin clockwise when viewed from the top. The range is -10.00 to 10.00 Hz.

Lo Size and **Hi Size** are the effective sizes (radius of rotation) of the rotating speakers in millimeters. This affects the amount of Doppler shift or vibrato of the low frequency signal. The range is 0 to 250 mm.

Lo Trem and **Hi Trem** control the depth of tremolo (amplitude modulation) of the signals. It is expressed as a percentage of full scale tremolo. The range is 0 to 100%.

LoResonate and **HiResonate** are simulations of cabinet resonant modes expressed as a percentage. For realism, you should use very low settings. The range is 0 to 100%.

Lo Res Dly and **Hi Res Dly** are the number of samples of delay in each resonator circuit in addition to the rotation excursion delay. The range is 10 to 2550 samples.

LoResXcurs and **HiResXcurs** are the number of samples of delay to sweep through the resonator at the rotation rate of each rotating speaker. The range is 0 to 510 samples.

ResH/LPhs sets the relative phases of the high and low resonators. The angle value in degrees is somewhat arbitrary and you can expect the effect of this parameter to be rather subtle. The range is 0 to 360.0 degrees.

Mic Angle is the angle of the virtual microphones in degrees from the "front" of the rotating speaker. For the left microphone the angle increases clockwise (when viewed from the top), while for the right microphone the angle increases counter-clockwise. Assigning an FXMod to this parameter should be done with caution: real-time adjustments to it will result in large sample skips, which will cause clicks in the signal passing through. The range is 0 to 360.0 degrees. (In **Distort + Rotary** only.)

Vibrato/Chorus

The Vibrato/Chorus Algorithm (and also the KB3 Effects Algorithm) simulates the vibrato and chorus effects on a Hammond organ, and is used in conjunction with the Rotary Speaker. It has several unique parameters:

VibChInOut is an in/out switch for the Vibrato/Chorus effect.

Vib/Chor is the type of Vibrato/Chorus effect to be used. The choices are from three vibratos, "V1", "V2", "V3", or three choruses, "C1", "C2", "C3".

Tremolo and AutoPan

Tremolo is amplitude modulation using an LFO. AutoPan moves the signal between the left and right channels, using an LFO. They have several parameters in common and several unique ones.

LFO Rate is the rate of the LFO. The range is 0 to 10.00 Hz, or in Tremolo BPM Algorithm, 0 to 12.00 **x** the tempo.

Rate Scale multiplies the speed of the LFO rate into the audio range. The range is 1 to 25088 **x**. When above 16**x**, the values increment in semitone steps. When the LFO Rate is set to 1.00 Hz, the value of this parameter is equal to the LFO frequency in Hertz.

Pitcher

LFO Shape is the waveform type for the LFO. Choices are Sine, Saw+, Saw-, Pulse, and Tri.

LFO PlsWid or **Pulse Width**. When the LFO Shape is set to Pulse, this sets the pulse width as a percentage of the waveform period. When the width is set to 50%, the result is a square wave. This parameter has no effect if other waveform types are chosen. Range is 0 to 100%.

AutoPan

Origin determines the axis for the panning motion. At 0%, the panning is centered between the speakers. Positive values shift the axis to the right, while negative values shift it to the left. At -100% or +100% (the range limits), there is no panning action.

ImageWidth is the width of the original input program material before it is auto-panned. At 0% (minimum), the input image is shrunk to a single point source, allowing maximum panning excursion. At 100% (maximum), the original width is maintained so no panning can occur.

Pan Width controls the amount of pan excursion. It is the percentage of total panning motion available after Origin and ImageWidth are set. Range is 0 to 100%.

CentrAtten (Attenuation) is the amount the signal level drops as it is panned through the center of the stereo image. For the smoothest tracking, a widely accepted subjective reference is -3dB. Values above -3dB will cause somewhat of a bump in level as an image passes through the center, while values below -3dB will cause a dip. Range is -12 to 0 dB.

Tremolo

Depth controls the amount of attenuation applied when the LFO is at its deepest excursion point. Range is 0 to 100%.

LFO Phase shifts the phase of the tremolo LFO relative to the beat reference. Range is 0.0 to 360.0 degrees.

50% Weight is the relative amount of attenuation added when the LFO is at the -6dB point. This causes the LFO shape to bow up (positive values) or down (negative values). Range is -16 to 3 dB.

L/R Phase sets the phase relationship of the channels. "In" flips the left channel's LFO out of phase, with the result that the effect turns into an auto-balancer. "Out" leaves the left LFO alone.

Pitcher

Pitcher applies a filter to the input signal which has a series of peaks in the frequency response. These peaks are normally adjusted so that their frequencies are all multiples of a specific, selectable frequency, which imposes a strong sense of pitch at the selected fundamental frequency.

Pitch. The fundamental pitch imposed upon the input, in MIDI note numbers from C-1 to G9.

Ptch Offst is an offset from the pitch frequency in semitones, from -12.0 to 12.0. It can be useful to assign pitch bend, a ribbon, or another continuous controller to this parameter through an FXMod.

Odd Wts, **Pair Wts**, **Quartr Wts**, **Half Wts** are parameters that control the shape of the frequency response of Pitcher. An exact description of what each one does is, unfortunately, impossible, since there is a great deal of interaction between them. For more information and examples, see the *KDFX Algorithm Reference*.

Ring Modulation

Ring modulation multiplies two signals (the “carrier” and the “modulator”) together to produce unusual, often non-harmonic, overtones. The Ring Modulator Algorithm in KDFX has two modes: “L*R” in which two mono signals are modulated together; and “Osc”, in which the input is stereo, and it is modulated with the sum of five waveforms that are generated from oscillators within the Algorithm itself. Four of these oscillators are sine waves, while one (Oscillator 1) offers a selection of waveforms.

Wet/Dry. When the Algorithm is in “L*R” mode, this controls how much of the left signal only is passed dry (the right signal isn’t passed dry at all).

Mod Mode selects between the two modes.

Osc1 Lvl is the level of Oscillator 1, from 0 to 100%.

Osc1 Freq is the frequency of Oscillator 1, from 16 to 25088 Hz.

Osc1 Shape is the waveshape of Oscillator 1, selectable from Sine, Saw+, Saw-, Pulse, and Tri.

Osc1PlsWid (Pulse Width). When **Osc1 Shape** is set to Pulse, this sets the pulse width as a percentage of the waveform period. When the width is set to 50%, the result is a square wave. This parameter has no effect if other waveform types are chosen. Range is 0 to 100%.

Osc1Smooth smooths (removes the higher harmonics from) the Saw+, Saw-, and Pulse waveforms. A Sawtooth wave becomes more like a triangle wave, and a Pulse wave becomes more like a sine wave. Range is 0 to 100%.

The other four oscillators, **Sine2** through **Sine5**, each have **Lvl** and **Freq** controls.

SRS® (Sound Retrieval System)

SRS, which is used under license from SRS Labs, Inc., is a single-ended processing system that produces a fully immersive, three-dimensional sound image from any audio source—mono, stereo, surround sound, or encoded with any other audio enhancement technology—with two or more standard speakers.

The four parameters control the ambience of the image, and may have different optimal settings depending on the amount of stereo content in the input signal. To match the optimal settings specified by SRS Labs, the bass and treble gains should be set to 0 dB. This Algorithm will have no effect on mono signals. All ranges are -79.0 to 24.0 dB.

Center varies the amount of “center channel” in the output. It has an “Off” position.

Space controls the width of the image. It, too, has an “Off” position.

Bass Gain and **Treb Gain** set the amount of ambience added to the low and high frequencies, respectively, in the signal. Setting both of these to 0 dB gives a best match to the optimizations of SRS Labs.

Stereo Simulation

The Mono to Stereo Algorithm converts a monaural input to simulated stereo output.

In Select selects the input signal to be “stereo-ized”. It can be Left, Right, or both: $(L+R)/2$.

CenterGain is the level of the summed left and right channels. Range is Off/ -79.0 to 24.0 dB.

Diff Gain is the level of the difference signal produced, which is the spatial component of the stereo signal. Range is Off/ -79.0 to 24.0 dB.

DiffBassG controls the gain of a bass-shelf filter on the difference signal. By boosting the low frequency components of the difference signal, you can increase the sense of acoustic envelopment. Range is -79.0 to 24.0 dB.

DiffBassF is the transition frequency for the bass-shelf frequency. Range is 16 to 25088 Hz.

The processed signal is split into three frequency bands—Lo, Mid, and High—each of which can be delayed and panned separately.

Crossover1 and **2** are the two Crossover frequencies at which the band-split filters split the signal into three bands. The two parameters are interchangeable: either may have a higher frequency than the other. Range is 16 to 25088 Hz.

Pan [High/Mid/Low] sets the pan position for each band. Range is -100% (fully left) to 100% (fully right.)

Delay [High/Mid/Low] sets the delay for each band. Range is 0 to 1000 ms.

Stereo Image

This Algorithm provides enhancement for a stereo signal. It also features a stereo correlation meter. It uses some parameters from **Mono to Stereo** and some from **Stereo Analyze** (following).

Stereo Analyze

In this Algorithm you can look at the two channels of a stereo signal, and also their inversions, sums, and differences. You can adjust their gains, and apply small delays to either or both channels.

L Invert and **R Invert** inverts the phase of the channels.

L Out Mode and **R Out Mode** determines which signal is going to be metered and sent to the output of each of the channels. The choices for each are: “L” (left), “R” (right), “ $(L+R)/2$ ” (normalized sum), “ $(L-R)/2$ ” (normalized difference), and polarity inverted versions of these.

L/R Delay “time balances” the two signals. At negative values, the right channel is delayed, while at positive values, the left channel is delayed. The range is -500 to 500 samples.

RMS Settle controls how fast the RMS (average-reading) meters can rise or fall with changing signal levels. Range is 0 to 300 dB/second.

FXMod Diagnostic

This Algorithm allows you to view the current levels of any data sliders, MIDI controls, switches, or internally generated VAST LFOs, ASRs, FUNs, etc. which are available as modulation sources. It has no effect on any signal being routed through it.

Up to eight modulation sources may be monitored simultaneously. Meters #1 through #4 can monitor bipolar sources, meaning sources that can have both positive and negative values. The range of the bipolar meters is -1 to +1. Four monopolar meters #5 through #8 provide better resolution, but the range is limited to 0 though +1. Use the monopolar meters for sources which you do not expect to go negative.

Eight parameters are provided to connect modulation sources to the meters. The parameter values are fixed at "NoDpth" and have no function except to connect sources to meters.

To use the algorithm, save an FX Preset and Studio containing the Algorithm, then go to one of the FXMod pages of your Program or Setup (with the Studio selected). Select the FX bus which contains the FXPreset that uses the FXMod Diagnostic Algorithm, and choose one of the meter parameters (Bipole N or Monopole N). You will not be able to modify the Adjust or Depth fields, but you can select any source you want. Finally press the Edit button to re-enter the Studio and Multieffect editor where you can view the meters on parameter page 2.

Bipole1 through **Bipole4** attach bipolar modulation sources (those that can go positive or negative) to the bipolar meters. The parameters are not adjustable.

Monopole5 through **Monopole8** attach monopolar modulation sources (can go positive only) to the monopolar meters. The parameters are not adjustable.

Chapter 6

Special Topics

Live Mode

One of the most exciting aspects of KDFX is that its use is not restricted to sounds coming from the K2500. If you have the Sampling Option installed in your K2500, then you can also use KDFX with any *external* sound sources using the K2500's "Live Mode" feature. The modified sound will be available through any of the K2500's outputs you choose.

To use Live Mode, go to the **Sample** page, from Program or Setup mode. Move the cursor down to the **Mode** parameter, and move the Alpha wheel clockwise until it says "LiveIn". Now go up to the **Input** parameter and choose between analog and digital inputs. If you are using the analog inputs, you can also set the input gain (the sampling rate is essentially irrelevant); or if you are using the digital inputs, you can set the cable and signal format. The **Time** parameter has no effect in this mode.

You probably don't want to set the "Src" parameter to "Int", since this has the potential to create a feedback loop.

Programs using Live Mode

There are Programs already set up to use Live Mode in the ROM set that comes with KDFX. They are located at numbers 740 through 749.

If you want to create your own Live Mode Programs, you can do so by assigning Keymaps 197 and/or 198 to a Program. 197 is for use with the left input and 198 is for the right. The input signals are treated exactly like ROM or RAM samples: you can use most real-time VAST functions on the input signals, as well as KDFX processing.

To use the program, play C4, and input the audio source that you want to run through Live Mode. For alternative ways of triggering the sound (e.g., with assignable controller buttons or pedals), edit the Control Setup.

(Hint: Set the Velocity Tracking—"VelTrk" on the **EditProg:F4 AMP** page—to 0 dB; otherwise, the velocity with which you strike C4 will affect your output.)

Live Mode requires that there be between 1.0 and 1.5 Mbytes of free sample memory. If there is not enough sample RAM available, you will get an error message.

Can I sample and use Live Mode together?

Sorry, no. Since the two functions use the same K2500 components, you can't have both running at once. But you can certainly play back RAM samples and have Live Mode active at the same time.

Some ideas for using Live Mode

If you've ever used an old-fashioned mono analog synthesizer with an audio input (anything from a Moog Rogue to an ARP 2500 or Serge Modular), you know how much fun it can be to pass a musical signal through the synth and modify it in real time with the filters, envelopes, modulators, etc. Live Mode brings that concept to digital synthesis, and lets you use all of the power of the K2500 and KDFX on any kind of input signal.

For starters, you can simply hook up a CD player to the K2500's sampling input, get a bunch of your favorite CDs, and start fooling around. (A turntable works well too.) Here are some ideas for going further:

Pitch changing

Unlike an analog synthesizer, the K2500 makes it possible to alter the pitch of the incoming signal in real time. But the K2500 is not a conventional pitch shifter, so if you are used to working with such a device you will have to alter your thinking a little.

For example, when you bend the pitch down from the unity pitch (C4), using a VAST function, it slows the playback of the incoming signal, but it doesn't change the rate at which the signal is coming in—your CD is still spinning, and putting out a constant audio signal. So as you lower the pitch, the playback lags behind, and when you return the pitch to normal, the playback snaps back to the present—which means some of your audio literally disappears into the ether. If you bend the pitch down and hold it there for a while, eventually the buffer fills up and updates itself, and you will hear it snap forward in time, although the data playing will continue to be slowed down. Again, some of the audio disappears.

Changing the pitch upwards is perhaps even more interesting. As you raise the pitch, the K2500 tries to play data that hasn't arrived yet. (Unfortunately, it is not capable of creating a temporal vortex to receive audio data from the future—although that may be available in a future revision, taking advantage of the recent discovery of the endochronic properties of resublimated thiotimeline by the late Dr. I. Asimov.)

Instead, in the current version, playback begins from a few seconds back (the data is held in the buffer), playing sped-up audio from the past. As with lowered pitch, when the raised pitch returns to unity, playback snaps back to the present. Again, when holding a note above unity pitch, you will eventually hear a repeat of a few seconds of time, as the sample buffer loops before being able to update itself.

These details aside, all kinds of wonderful pitch effects are achievable. Here's an example.

- Start with Program **749 LiveMode Default**.
- Go to the **PITCH** page.
- Assign **LFO1** to **Src1**, with a depth of **-200ct**.
- In order to keep the playback from constantly crossing above unity, set the **Coarse** parameter to **-2ST**.

Or try these settings:

- **Src1:MWheel**
- **Depth:-1200c**
- **Src2:LFO1**
- On the **LFO** page, set **MnRate:.50Hz**, **MxRate:20.00**, and **RateCt:Data**.
- **DptCtl:MWheel**
- **MinDpt:0ct**
- **MaxDpt:1200ct**

Sometimes you can hear the snaps back and forth when the LFOs and the buffers get out of sync. You might be able to smooth out the rough spots by making another layer with no pitch alterations, and crossfading between the layers:

- Duplicate the layer
- Clear all the settings on the **PITCH** page
- Go to the **OUTPUT** page and assign **Crossfade: Mwheel** on both layers.
- On layer 1, set **XFadeSense** to **Rvrs**; on layer 2, set **XFadeSense** to **Norm**.

Now at the Mod Wheel extremes, you will hear only one layer or the other, while in the middle, you will hear a combination of the pitch-modulated signal and the unmodulated signal. By experimenting with FUNs, you can get more precise crossfades.

The program **744 LM Synth Sliders** includes this kind of crossfade, tied to the Pitch Wheel, to implement a 3-layer crossfade. Moving the Pitch Wheel up fades to a layer which is bending the pitch up. The surprise is that moving the Pitch Wheel down bends the pitch down, then up again, crossfading to a layer that is playing back in reverse! Yes, reverse playback works with Live Mode: on the **KEYMAP** page, set **PlayBackMode** to **Reverse**. A temporal vortex? Hmmm.

Arpeggiator

You can also do controlled pitch shifting on incoming audio using the arpeggiator. By constantly sending new note starts, it is possible to bend the pitch without losing the tempo of the incoming signal.

It can work in both directions, although when you are shifting signals up in pitch, you're "borrowing" the audio from a few seconds previous.

- Go to **Setup** Mode and select **97 Control Setup**.
- Press **Edit**, and on the **CH/PRG** page, set the program to **749 LiveMode Default**.
- With the Program highlighted, press **Edit** and go to the **AMPENV** page.
- To make the crossfading less choppy, you want short attack and release segments: set **Att1** to **0.06/100%** and **Rel1** to **0.10/0%**.
- Press **Exit** and save the Program to some new location.
- Now go to the **ARPEG** page and set **Active:On**.
- Set the **Duration** to, say, **99%**.
- For this example, set **Order:Simultaneous** and **Beats:1/32**.
- Tempo should already be 120BPM.

Now play C4 and you will hear the live signal at the correct pitch. Play G3 and you will hear the signal pitched down a fourth. You can use the ribbon or similar controller to bend the pitch smoothly. Going above unity pitch will cause a jump back into the past.

Experiment with the Tempo, the Beats setting, the Duration value, and the AMPENV parameters to get useful variations on the program. Remember that because we set the Order to Simultaneous, you can play several notes at once. And finally, try setting **Glissando:On**.

Sustained Notes and Loops

If the incoming signal is a single, sustained pitch, like a saxophone note, then you can consider the Live Mode keymap to be playing a normal, looped sound. In this case, the fact that an upward bend jumps back a few seconds is no big deal because the sound hasn't changed much during that time.

With this technique, melodies or chords can be played based on a segment of a live performance. Keep in mind that, unless your incoming signal is a C, notes and chords played on the K2500 keyboard will be transposed relative to the incoming pitch. Also remember that a rhythm pitched an octave down will play at half the speed, while one pitched an octave up will play twice as fast. Fifths produce a 3-against-2 pattern. To keep some sort of relative sync with the live signal, you may want to experiment with re-triggering the notes, perhaps using the arpeggiator, at some appropriate tempo.

If the passage you want to play is long, and the input signal isn't so long—say, the sax player needs to take a breath—you may run into a problem as the K2500 tries to play the buffer where the audio was interrupted. If the input signal is mono, you might be able to overcome this by using a delay line to “hold” the signal. The delay line could be part of KDFX, or it could be an external device, but either way its output is sent back to the K2500 through the unused Live Mode input channel.

Chord Progressions

Record a few bars of block chords—all notes under C4—into the sequencer, using a simple quarter-note or half-note pattern. What sound you use doesn't matter. Now replace the Program on the recorded track with the LiveMode Default Program. Play back the sequence (you will probably want it to loop), and at the same time play single notes from an external instrument into the K2500, in the same rhythm as your recorded chords. If you change the notes on the instrument, the chords will transpose. If you play intervals or chords, you're on your own as to the consequences!

Vocoding

There are a number of ways to achieve a vocoder-type effect using Live Mode and both VAST and KDFX processing. While explaining the VAST programming involved is beyond the scope of this discussion, we can suggest using a KDFX Pitcher algorithm to make a simple monophonic vocoder-like sound.

- Make a studio with FXPreset **915 PitcherB** on the FXBus which is receiving the Live Mode signal.
- Go into a Live Mode program, and on its KDFX page, assign this Studio to the program.
- Now assign an FXMod to the Pitch parameter on the correct FXBus, with an **Adjust** value of **C0**, **Source** set to **GKeyNum**, and a **Depth** value of **128ST**. Also set the **KeyTrk** on the **KEYMAP** page of the program to **0ct/key**.

Another suggestion is to bring in a signal, put it through multiple bandpass filters, and control the amplitudes of the various layers with sliders and a sequencer, thus providing a very crude vocoder—if you're really good with the sliders.

Feedback

Live Mode gives you the ability to feed back a live signal into itself, similar to pointing a microphone at the speaker it's sending audio to. Before you hook anything up, turn the volume down very low (but not necessarily off). Then, check to see that the volume is down. After that, make sure the volume is down. Get it?

Now go to the **Sample** page and choose **Internal** as the **Source**. Go to a multi-layer ROM Program of your choice, and go to the **Import** page. Import Layer 1 from LiveMode Default.

Play one note, then a few. As you play more notes, the noise will build up. You'll have a better time controlling the feedback loop if you have a healthy delay, with no dry path around it, in the loop. Perhaps add a little modulation of the loop to provide some pitch shifting, a big reverb, and a compressor to keep from blowing your ears out. Inject a little something from the synthesizer to get things started—and you are instantly transported to an alien dimension.

For more complexity, split the incoming signal and run it through multiple VAST layers in parallel—you can use up to 32, each one processing, panning, and routing the signal differently. You can crosslink the inputs and outputs (right into left, left into right) to create a double feedback loop for even more fun.

Your ideas?

If you have Internet access, please join our mailing list and exchange ideas with other Live Mode fans. We will also be putting information about Live Mode on our Website: www.youngchang.com.

Live Mode is opening a whole new era in synthesis and signal processing, and we, the Kurzweil engineers and musicians, look forward to working with you to develop its possibilities.

Song Mode

We've referred to the special aspects of KDFX in Song mode elsewhere in the manual. Here is a summary of what's been said, along with some additional information.

FX Mode in Song Mode

If **FXMode** on the **Effects** page is set to "Program", and you put the K2500 into Song mode, control of KDFX will remain with the Program that is on the current FX Channel, as set on the Effects page. However, if FX Mode is set to "Auto", and you put the K2500 into Song Mode, KDFX will now be in its own version of Song mode—which means it will be under the control of the Program that is on the Effect Channel *within* the song. To set this channel from Song mode, press **Edit** to go to the **EditSong:COMMON** page, and find the **EffectChan** parameter.

The Effect Channel is saved with the song, so make sure that it is set so that the Program that you want to be in control of KDFX is active on that channel.

Clock Setting for tempo-based parameters

The clock setting in Song mode determines how tempo (BPM)-based parameters behave. If you are using the K2500's internal tempo clock, the **Clock** parameter on the **MISC** page in **Song** mode must be set to "Int". If you are using an external MIDI timing source, such as a sequencer, then that parameter must be set to "Ext". The "Sync" parameter does not affect tempo control of KDFX, but it will determine whether KDFX events such as LFO resets will respond to MIDI Start and Continue commands—see Chapter 4 for more on this.

If you are using Tap Tempo as a tempo source, then the **Clock** parameter must be set to "Internal".

Recording a Setup in Song Mode

In order to record a Setup into the internal sequencer, you first need to set the **RecTrk** parameter on the **MAIN** Song page to "Mult". Then go back into **Setup** mode, and then into **Song** mode—the current Setup will be displayed in the Song window. Then you need to make sure the record channels that are addressed by the Setup (and *only* those record channels) are record-enabled.

If you are using an external keyboard that sends on only one MIDI channel, you must also go to the **Receive** page in **MIDI** mode and turn on the **LocalKbdCh** parameter, setting it to agree with the MIDI Out channel of your keyboard.

There is a complication, however, if you want to record KDFX Mods while you're recording your track(s) using the Setup. The sequencer will faithfully record all of your controller movements, but when it plays them back, it plays them as part of a single track. That track contains a Program, not a Setup, because the sequencer doesn't know how to play Setups.

Since all of the KDFX Mods were part of the Setup, even though the data on the track is being played back, it's not being sent to KDFX (although it might be affecting the Program on the track), and so no KDFX Mods are being played.

The solution is to have a *Program* playing back the data you've just recorded, which has the identical KDFX Studio and FXMods as the Setup you used to record with. The data has been recorded on the MIDI channel of Zone 1 of the setup. Find the Program on that channel, press **Edit** to get inside it, and then import the KDFX Studio from the Setup you used originally—that's what the **ImpFX** function is for.

Now save that Program (in the same location or a new one) and go back to the song. Make sure that the Program's channel and the song's EffectChannel agree. If you've changed the Program, make sure the new Program is included in the Song. The KDFX Mods should now all play correctly.

Studios and Songs in Master Mode

When you are using KDFX in Master FX mode, the Studio does not get saved with the Song, since it is not a dependent object of the Song, or of anything in it. Therefore, if you want to recall a Studio whenever you load in a particular Song, you have to do one of the following:

- remember to recall the Studio by hand, or
- make sure the Song you want to save is selected, and then save the Master file with its dependents: press Save, scroll to the bottom of the list of banks until you get to "Master", press OK, and name and save your Master file. When asked to save dependents, press **Yes**. When you reload that file, you will get the Song along with the master table, which includes the Studio. For more about Master files, see Chapter 13 in the *K2500 Performance Guide*.

Configuring the Program outputs in Song mode

Back in Chapter 3 we discussed how the various Program outputs (KFDX-A through KFDX-D) can be configured to feed KDFX. Sometimes, you may find that the most efficient way to set up these outputs is to use the MIDI Channel overrides on the **MIDIMode:Channels** page, so that when you choose a MIDI channel to put a Program on, you are also choosing its processing path.

Other times, you may not want to use these MIDI Channel overrides, but you'd like to organize your outputs on a Program-by-Program basis. However, the Programs you like may have multiple layers which are assigned to different outputs. You can tame these, and quickly bring all the layers' outputs to a single output, by using the **OutPair** parameter on the **Program:Common** page. This parameter overrides the output assignments on all of a Program's layers, and sends all of the layers to one designated output. By setting this parameter, of course, you are changing the Program, so you have to now save the new version of the Program into RAM. You could overwrite the ROM version, if you know for sure you are never going to need the original version again, but you might be better off putting the new Program into a RAM bank.

After you do this, make sure that when you save the Song, you "Save Dependent Objects"—that way, the Program is sure to get saved and to be there when you next load the Song. (And if the Studio that you're using in the Song happens to be inside the Program, that gets saved too—very convenient!)

KB3 Effects

In the K2500's KB3 mode, KDFX processing is being used to its utmost. Several Studios have been included for use with KB3, which have a special characteristic: the insert and Aux FX buses are made to be used together, forming a "virtual" single processing Algorithm with 7 (count 'em) PAUs.

There are two Algorithms that are designed for this special use: Algorithm 735 (to be used on an Insert FX Bus) and Algorithm 736 (to be used on the Aux bus). They don't work very well individually, and should probably not be used that way. The ROM FXPresets that use these Algorithms are 779 and 780, respectively.

Using the Internal Effects

The original Internal Effects processor on the K2500 is in the signal chain *after* the KDFX Studio. It is only connected to the "Mix" analog physical outputs (not to be confused with KDFX's Mix bus output). Without KDFX, all sounds assigned to the "A" outputs go through the Effects processor on their way to the Mix physical outputs (analog only). With KDFX, this is still true, although sounds first go through KDFX and *then* are assigned to the A output pair on the Studio's Output page.

As always, if there are any plugs inserted into the "A" physical outputs, the A signal is disconnected from the Mix outputs, and the Effects processor will not be heard. This is true of all of the outputs: inserting a plug into any of them disconnects that pair from the Mix outputs. See chapter 18 of the *K2500 Performance Guide* for more information.

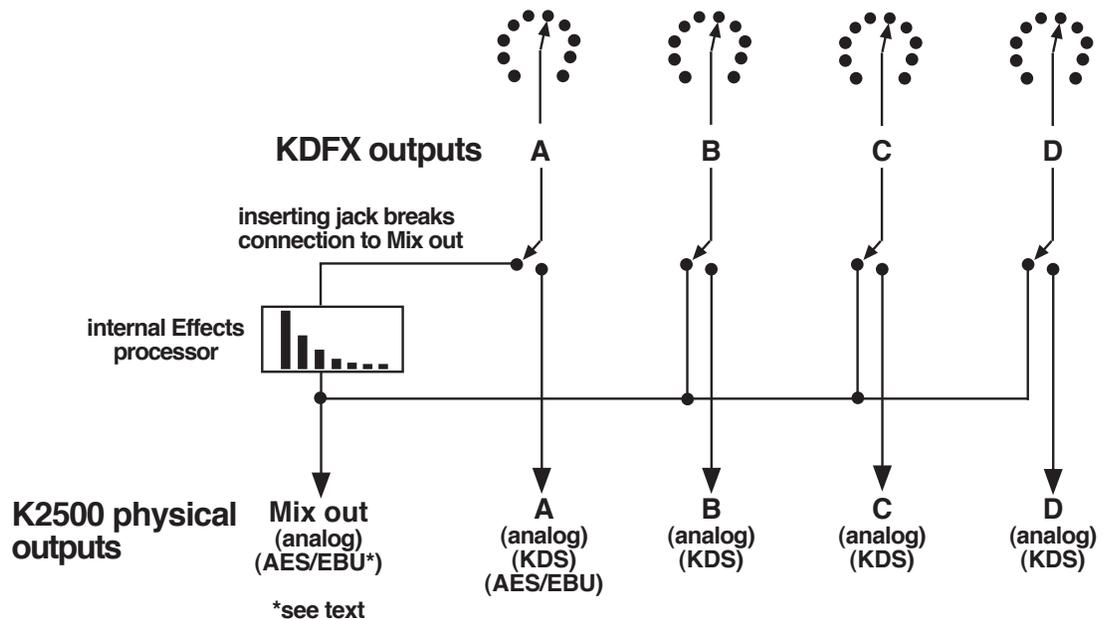


Figure 6-1. KDFX and the K2500's physical outputs

Getting the Effects onto the AES/EBU digital output

Although normally the AES/EBU output does not carry the signal from the internal Effects processor, there is a way to get it to do so. This is useful when you want to record the K2500 digitally, and want to use the internal Effects.

Here's how you do it. Note that the order in which you do these steps is very important.

- Go to the Sample page by pressing the **Sample** soft button.
- Set the **Input** to "Digital".
- Set the **Output** ("Out") to "A/D".
- Now set the **Input** to "Analog".
- Set the **Source** ("Src") to Internal ("Int").
- Set the desired Sample **Rate**—29.4, 32, 44.1, or 48 kHz.
- Now adjust the **Gain** control. In this context, the Gain control sets the level of the signal going *to* the AES/EBU output. Normally there is lots of headroom going through this stage, so you want to set this control fairly high—14 or 21 dB—to maximize the signal going to the AES/EBU outputs.

You have now set up a signal path where the K2500's Mix output is going back into the Sampler, is converted to analog, passed through the internal Effects processor, converted back to digital, and out the AES/EBU output.

Appendix A

KDFX Objects

KDFX Algorithms

Number	Algorithm Name	Size
REVERB		
1	MiniVerb	1
2	Dual MiniVerb	2
3	Gated MiniVerb	2
4	Classic Place	2
5	Classic Verb	2
6	TQ Place	3
7	TQ Verb	3
8	Diffuse Place	3
9	Diffuse Verb	3
10	OmniPlace	3
11	OmniVerb	3
12	Panaural Room	3
13	Stereo Hall	3
14	Grand Plate	3
15	Finite Verb	3
DELAY		
130	Complex Echo	1
131	4-Tap Delay	1
132	4-Tap Delay BPM	1
133	8-Tap Delay	2
134	8-Tap Delay BPM	2
135	Spectral 4-Tap	2
136	Spectral 6-Tap	3

Number	Algorithm Name	Size
CHORUS/FLANGE/PHASER		
150	Chorus 1	1
151	Chorus 2	2
152	Dual Chorus 1	1
153	Dual Chorus 2	2
154	Flanger 1	1
155	Flanger 2	2
156	LFO Phaser	1
157	LFO Phaser Twin	1
158	Manual Phaser	1
159	Vibrato Phaser	1
160	SingleLFO Phaser	1
COMBINATION		
700	Chorus+Delay	1
701	Chorus+4Tap	1
702	Chorus<>4Tap	2
703	Chor+Dly+Reverb	2
704	Chorus<>Reverb	2
705	Chorus<>LasrDly	2
706	Flange+Delay	1
707	Flange+4Tap	1
708	Flange<>4Tap	2
709	Flan+Dly+Reverb	2
710	Flange<>Reverb	2

KDFX Objects

KDFX Algorithms

Number	Algorithm Name	Size
711	Flange<>LasrDly	2
712	Flange<>Pitcher	2
713	Flange<>Shaper	2
714	Quantize+Flange	1
715	Dual MovDelay	1
716	Quad MovDelay	2
717	LasrDly<>Reverb	2
718	Shaper<>Reverb	2
719	Reverb<>Compress	3
720	MonoPitcher+Chor	2
721	MonoPitcher+Flan	2
722	Pitcher+Chor+Dly	2
723	Pitcher+Flan+Dly	2
DISTORTION		
724	Mono Distortion	1
725	MonoDistort+Cab	2
726	MonoDistort + EQ	2
727	PolyDistort + EQ	2
728	StereoDistort+EQ	3
729	TubeAmp<>MD>Chor	3
730	TubeAmp<>MD>Flan	3
731	PolyAmp<>MD>Chor	3
732	PolyAmp<>MD>Flan	3
TONE WHEEL ORGAN		
733	VibChor+Rotor 2	2
734	Distort + Rotary	2
735	KB3 FXBus	4
736	KB3 AuxFX	3
737	VibChor+Rotor 4	4

Number	Algorithm Name	Size
SPECIAL FX		
900	Env Follow Filt	2
901	TrigEnvelopeFilt	2
902	LFO Sweep Filter	2
903	Resonant Filter	1
904	Dual Res Filter	1
905	EQ Morpher	4
906	Mono EQ Morpher	2
907	Ring Modulator	1
908	Pitcher	1
909	Super Shaper	1
910	3 Band Shaper	2
911	Mono LaserVerb	1
912	LaserVerb Lite	2
913	LaserVerb	3
STUDIO/MIXDOWN FX		
950	HardKneeCompress	1
951	SoftKneeCompress	1
952	Expander	1
953	Compress w/SC EQ	2
954	Compress/Expand	2
955	Comp/Exp + EQ	3
956	Compress 3 Band	4
957	Gate	1
958	Super Gate	2
959	2 Band Enhancer	1
960	3 Band Enhancer	2
961	Tremolo	1
962	Tremolo BPM	1
963	AutoPanner	1
964	Dual AutoPanner	2

Number	Algorithm Name	Size
965	SRS	1
966	Stereo Image	1
967	Mono -> Stereo	1
968	Graphic EQ	3
969	Dual Graphic EQ	3
970	5 Band EQ	3

Number	Algorithm Name	Size
TOOLS		
998	FXMod Diagnostic	1
999	Stereo Analyze	1

KDFX Presets

Number	Preset Name	Alg	Size
1	NiceLittleBooth	1	1
2	Small Wood Booth	4	2
3	Natural Room	5	2
4	PrettySmallPlace	4	2
5	Sun Room	5	2
6	Soundboard	7	3
7	Add More Air	10	3
8	Standard Booth	8	3
9	A Distance Away	6	3
10	Live Place	8	3
15	BrightSmallRoom	1	1
16	Bassy Room	1	1
17	Percussive Room	1	1
18	SmallStudioRoom	4	2
19	ClassRoom	5	2
20	Utility Room	5	2
21	Thick Room	5	2
22	The Real Room	5	2
23	Sizzly Drum Room	5	2
24	Real Big Room	5	2
25	The Comfy Club	9	3
26	Spitty Drum Room	7	3
27	Stall One	7	3
28	Green Room	7	3
29	Tabla Room	12	3
30	Large Room	7	3
31	Platey Room	14	3
40	SmallDrumChamber	1	1

Number	Preset Name	Alg	Size
41	Brass Chamber	1	1
42	Sax Chamber	1	1
43	Plebe Chamber	1	1
44	In The Studio	4	2
45	My Garage	4	2
46	School Stairwell	4	2
47	JudgeJudyChamber	7	3
48	Bloom Chamber	7	3
55	Grandiose Hall	1	1
56	Elegant Hall	1	1
57	Bright Hall	1	1
58	Ballroom	1	1
59	Spacious Hall	5	2
60	Classic Chapel	5	2
61	Semisweet Hall	5	2
62	Pipes Hall	704	2
63	Reflective Hall	5	2
64	Smooth Hall	5	2
65	Splendid Palace	5	2
66	Pad Space	11	3
67	Bob'sDiffuseHall	9	3
68	Abbey Piano Hall	7	3
69	Short Hall	13	3
70	The Long Haul	7	3
71	Predelay Hall	9	3
72	Sweeter Hall	7	3
73	The Piano Hall	7	3
74	Bloom Hall	9	3

Number	Preset Name	Alg	Size
75	Recital Hall	12	3
76	Generic Hall	12	3
77	Burst Space	9	3
78	Real Dense Hall	7	3
79	Concert Hall	9	3
80	Standing Ovation	11	3
81	Flinty Hall	7	3
82	HighSchool Gym	7	3
83	My Dreamy 481!!	9	3
84	Deep Hall	9	3
85	Immense Mosque	7	3
86	Dreamverb	10	3
87	Huge Batcave	12	3
95	Classic Plate	5	2
96	Weighty Platey	5	2
97	Medm Warm Plate	7	3
98	Bloom Plate	9	3
99	Clean Plate	9	3
100	Plate Mail	11	3
101	RealSmoothPlate	9	3
102	Huge Tight Plate	9	3
103	BigPredelayPlate	7	3
110	L:SmlRm R:LrgRm	2	2
111	L:SmlRm R:Hall	2	2
112	Gated Reverb	3	2
113	Gate Plate	3	2
114	Exponent Booth	10	3
115	Drum Latch1	10	3
116	Drum Latch2	10	3
117	Diffuse Gate	39	

Number	Preset Name	Alg	Size
118	Acid Trip Room	10	3
119	Furbelows	9	3
120	Festoons	9	3
121	Reverse Reverb	15	3
130	Guitar Echo	130	1
131	Stereo Echoes1	130	1
132	Stereo Echoes2	130	1
133	4-Tap Delay	132	1
134	OffbeatFlamDelay	132	1
135	8-Tap Delay	134	2
136	Spectral 4-Tap	135	2
137	Astral Taps	135	2
138	SpectraShapeTaps	136	3
150	Basic Chorus	152	1
151	Chorus Comeback	152	1
152	Chorusier	152	1
153	Ordinary Chorus	152	1
154	SlowSpinChorus	152	1
155	Chorus Morris	152	1
156	Everyday Chorus	152	1
157	Thick Chorus	153	2
158	Soft Chorus	153	2
159	Rock Chorus	153	2
160	Sm Stereo Chorus	150	1
161	Lg Stereo Chorus	151	2
170	Big Slow Flange	154	1
171	Wetlip Flange	154	1
172	Sweet Flange	154	1
173	Throaty Flange	154	1
174	Delirium Tremens	154	1

KDFX Objects

KDFX Presets

Number	Preset Name	Alg	Size
175	Flanger Double	154	1
176	Squeeze Flange	154	1
177	Simply Flange	155	2
178	Analog Flanger	155	2
190	Circles	156	1
191	Slow Deep Phaser	157	1
192	Manual Phaser	158	1
193	Vibrato Phaser	159	1
194	ThunderPhaser	159	1
195	Saucepan Phaser	160	1
199	No Effect	0	0
700	Chorus Delay	700	1
701	Chorus PanDelay	700	1
702	Doubler & Echo	700	1
703	Chorus VryLngDly	700	1
704	FastChorusDouble	700	1
705	BasicChorusDelay	700	1
706	MultiTap Chorus	701	1
707	ThickChorus no4T	701	1
708	Chorused Taps	702	2
709	Chorus Slapbacks	705	2
710	MultiEchoChorus	705	2
711	ChorusDelayHall	703	2
712	ChorDlyRvb Lead	703	2
713	ChorDlyRvb Lead2	703	2
714	Fluid ChorDlyRvb	703	2
715	ChorLite DlyHall	703	2
716	ChorusSmallRoom	703	2
717	DeepChorDlyHall	703	2
718	Chorus PercHall	703	2

Number	Preset Name	Alg	Size
719	Chorus Booth	703	2
720	ClassicEP ChorRm	703	2
721	ChorusMedChamber	704	2
722	Vanilla ChorRvb	704	2
723	Chorus Slow Hall	704	2
724	SoftChorus Hall	704	2
725	ChorBigBrtPlate	704	2
726	Chorus Air	704	2
727	Chorus HiCeiling	704	2
728	Chorus MiniHall	704	2
729	CathedralChorus	704	2
730	PsiloChorusHall	704	2
731	GuitarChorLsrDly	705	1
732	Flange + Delay	706	
733	ThroatyFlangedly	706	1
734	Flange + 4Tap	707	1
735	Bap ba-da-dap	707	1
736	Slapback Flange	706	1
737	Quantize+Flange	714	1
738	FlangeDelayHall	709	2
739	FlangeDelayRoom	709	2
740	SloFlangeDlyRoom	709	2
741	FlangeDlyBigHall	709	2
742	Flange Theatre	710	2
743	FlangeVerb Clav	710	2
744	FlangeVerb Gtr	710	2
745	Flange Hall	710	2
746	Flange Booth	710	2
747	Flange->LaserDly	711	2
748	FlangeTap Synth	708	2

Number	Preset Name	Alg	Size
749	Lazertag Flange	711	2
750	Flange->Pitcher	712	2
751	Flange->Shaper	713	2
752	Shaper->Flange	713	2
753	Warped Echoes	715	1
754	L:Flange R:Delay	715	1
755	StereoFlamDelay	715	1
756	2Dlys Ch Fl Mono	716	2
757	LaserDelay->Rvb	717	2
758	Shaper->Reverb	718	2
759	MnPitcher+Chorus	720	2
760	MnPitcher+Flange	721	2
761	Pitcher+Chor+Dly	722	2
762	Pitcher+Flng+Dly	723	2
763	SubtleDistortion	724	1
764	Synth Distortion	727	2
765	Dist Cab EPiano	725	2
766	Distortion+EQ	726	2
767	Burnt Transistor	728	3
768	TubeAmp DlyChor	729	3
769	TubeAmp DlyChor2	729	3
770	TubeAmp DlyFlnge	730	3
771	TubeAmp Flange	730	3
772	PolyAmp Chorus	731	3
773	PolyAmp DlyFlnge	732	3
774	VibrChor Rotors	733	2
775	SlightDistRotors	734	2
776	Rotostort	734	2
777	VibrChor Rotors2	733	2
778	Full VbCh Rotors	737	4

Number	Preset Name	Alg	Size
779	KB3 FXBus	735	4
780	KB3 AuxFX	736	3
781	Pitch Spinnter	712	2
900	Basic Env Filter	900	2
901	Phunk Env Filter	900	2
902	Synth Env Filter	900	2
903	Bass Env Filter	900	2
904	EPno Env Filter	900	2
905	Trig Env Filter	901	2
906	LFO Sweep Filter	902	2
907	DoubleRiseFilter	902	2
908	Circle Bandsweep	902	2
909	Resonant Filter	903	1
910	Dual Res Filter	904	1
911	EQ Morpher	905	4
912	Mono EQ Morpher	906	2
913	Ring Modulator	907	1
914	PitcherA	908	1
915	PitcherB	908	1
916	SuperShaper	909	1
917	SubtleDrumShape	910	2
918	3 Band Shaper	910	2
919	LaserVerb	913	3
920	Laserwaves	913	3
921	Crystallizer	913	3
922	Spry Young Boy	912	2
923	Cheap LaserVerb	912	2
924	Drum Neurezonate	911	1
925	LazerfazerEchoes	911	1
950	HKCompressor 3:1	950	1

KDFX Objects**KDFX Presets**

Number	Preset Name	Alg	Size
951	DrumKompres 5:1	950	1
952	SK FB Compr 6:1	951	1
953	SKCompressor 9:1	951	1
954	SKCompressr 12:1	951	1
955	Compress w/SC EQ	953	2
956	Compress/Expand	954	2
957	Compr/Expnd +EQ	955	3
958	Reverb>Compress	719	3
959	Reverb>Compress2	719	3
960	Drum Compr>Rvb	719	3
961	Expander	952	1
962	3Band Compressor	956	4
963	Simple Gate	957	1
964	Gate w/ SC EQ	958	2
965	Graphic EQ	968	3

Number	Preset Name	Alg	Size
966	5 Band EQ	970	3
967	ContourGraphicEQ	969	3
968	Dance GraphicEQ	969	3
969	OldPianoEnhancer	959	1
970	3 Band Enhancer	960	2
971	3 Band Enhancer2	960	2
972	Extreem Enhancer	960	2
973	Tremolo	962	1
974	Dual Panner	964	2
975	SRS	965	1
976	Widespread	966	1
977	Mono->Stereo	967	1
978	3 Band Compress	956	4
998	Stereo Analyze	999	1
999	FX Mod Diag	998	1

KDFX Studios

Number	Studio Name	Bus1 FX Preset	Bus2 FX Preset	Bus3 FX Preset	Bus4 FX Preset	Aux Bus FX Preset
1	RoomChorDly Hall	16	156	714	0	78
2	RmChorChRv Hall	17	154	722	0	69
3	RoomChorCDR Hall	16	156	714	0	76
4	RoomChor Hall	23	157	0	0	78
5	RoomChrCh4T Hall	22	156	706	0	72
6	RoomFlngCDR Hall	42	170	711	0	75
7	RoomFlngEcho Hall	21	176	131	0	85
8	RmFlngStImg Garg	19	172	976	0	45
9	RmFlngChDly Room	20	172	151	0	24
10	ChmbFlngGtRv Hall	42	170	112	0	75
11	RoomFlngCDR Hall	16	172	718	0	87
12	RoomFlngLsr Echo	22	172	925	0	119
13	RmFlngFXFlng Flng	23	174	173	0	171
14	SpaceFlng Hall	58	170	0	0	30
15	ChmbFlngCDR Verb	42	170	711	0	83
16	RoomPhsrCDR Hall	16	190	712	0	76
17	RmPhsrQuFlg Hall	19	190	737	0	76
18	RoomPhsr Space	25	191	0	0	114
19	RmEQmphEcho Comp	17	912	131	0	954
20	RmEQmphEcho Hall	17	912	131	0	65
21	RmEQmph4Tp Space	17	912	133	0	5
22	RmEQmph4Tap Hall	17	912	133	0	65
23	RmSweepEcho Hall	15	906	130	0	69
24	RoomResEcho Hall	3	909	131	0	71
25	RmRotoFl4T CmpRv	15	777	734	0	959
26	RoomSrsCDR Hall	16	975	712	0	75
27	RoomSRSRoom Room	17	975	15	0	29
28	RoomSRSChDl Hall	22	975	700	0	78
29	RoomSrsCDR CDR	16	975	712	0	711
30	RmStImgChDl Hall	22	976	700	0	73
31	RoomSRSRoom Chmb	17	975	15	0	47
32	RoomSRSRoom Hall	17	975	15	0	78

KDFX Objects

KDFX Studios

Number	Studio Name	Bus1 FX Preset	Bus2 FX Preset	Bus3 FX Preset	Bus4 FX Preset	Aux Bus FX Preset
33	ChmbCompCDR Hall	42	953	711	0	75
34	RoomCmpChor Hall	15	951	152	0	78
35	RoomComp Hall	27	951	0	0	79
36	RoomComp Hall	7	953	0	0	67
37	BthComp SRS Hall	2	952	0	975	63
38	RoomCmpCh4T Hall	23	951	706	0	78
39	RmDsRotFl4t RvCm	15	776	734	0	959
40	RoomRmHall Hall	22	17	55	0	100
41	Room Room SRS2	22	0	44	0	975
42	RoomRmHall Hall	22	17	55	0	78
43	Room Room Hall	22	0	44	0	75
44	Room Hall Hall	23	0	61	0	78
45	Room Room Hall2	22	0	23	0	79
46	Room Room Hall2	22	44	0	0	85
47	Room Room Hall2	22	0	44	0	85
48	Room Hall Hall2	22	0	62	0	85
49	Sndbrd Room Hall	6	0	15	0	68
50	Sndbrd Rm Hall2	6	0	15	0	73
51	Room Room Hall3	22	0	15	0	68
52	auxChrMDly Room	0	158	753	0	30
53	auxFlngChRv Room	0	170	723	0	28
54	auxShp4MDly Hall	0	917	756	0	63
55	auxDistLasr Room	0	763	920	0	29
56	auxEnhSp4T Class	0	970	136	0	19
57	auxDistLasr Acid	0	767	924	0	118
58	EnhcManPhs Room	970	192	0	0	27
59	EnhrFlg8Tap Room	969	170	135	0	15
60	EnhcCmpFlng Room	969	950	177	0	24
61	CompEQmphCh Room	952	912	153	0	4
62	BthQFlg4Tap Hall	2	737	133	0	76
63	ChmbTremCDR Room	42	973	715	0	29
64	ChmbCmpFlRv Hall	41	952	744	0	69
65	ChamDstEcho Room	41	764	131	0	28
66	ChamFlg4Tap Hall	41	173	136	0	75
67	ChmbEnv4Tap GtRv	42	903	134	0	112

Number	Studio Name	Bus1 FX Preset	Bus2 FX Preset	Bus3 FX Preset	Bus4 FX Preset	Aux Bus FX Preset
68	CmbrShapLsr Hall	42	916	922	0	69
69	auxPtchDst+ Chmb	0	914	772	0	48
70	auxChorFlRv Cmbr	0	150	742	0	42
71	auxChorFlRv Cmb2	0	155	742	0	42
72	auxChorFlRv Cmb3	0	150	745	0	42
73	auxChorFlRv Cmb4	0	150	742	0	18
74	HallFlgChDl Room	56	177	700	0	29
75	HallPtchLsr Hall	57	915	922	0	75
76	HallGateFl4T Bth	55	963	748	0	1
77	HallChorFDR Room	55	707	739	0	29
78	HallPtchPtFl Lsr	57	915	760	0	919
79	HallFlng8Tp Room	56	176	135	0	29
80	HallChrEcho Room	55	158	132	0	31
81	HallChorCDR Hall	55	152	715	0	55
82	HallRsFltChDl Rm	46	909	700	0	18
83	Hall ChDly Hall	56	0	704	0	30
84	HallFlgChDl Hall	56	177	700	0	65
85	Hall Room SRS	75	0	17	0	975
86	Hall Room Room	78	0	15	0	22
87	Hall CmpRvb	67	0	0	0	958
88	Hall Flng Hall	63	177	0	0	86
89	HallRoomChr Hall	46	15	151	0	82
90	auxPhsrFDR Hall	0	193	741	0	75
91	auxChrDist+ Hall	0	150	768	0	75
92	auxFlgDist+ Hall	0	170	769	0	75
93	auxChrDst+ Hall	0	150	768	0	76
94	auxChorMDly Hall	0	159	755	0	76
95	auxChorSp6T Hall	0	152	138	0	75
96	auxChorChDl Hall	0	153	702	0	64
97	auxPhasStIm Hall	0	195	976	0	95
98	auxFlngCDR Hall	0	172	713	0	65
99	auxPhsrFldblHall	0	193	175	0	75
100	auxSRSRoom Hall	0	975	25	0	78
101	auxFlLsr SwHall	0	170	922	0	72
102	auxEnh4Tap Hall	0	972	133	0	79

KDFX Objects

KDFX Studios

Number	Studio Name	Bus1 FX Preset	Bus2 FX Preset	Bus3 FX Preset	Bus4 FX Preset	Aux Bus FX Preset
103	EnhcChorCDR Hall	969	152	716	0	56
104	EnhChorChDl Hall	970	156	703	0	61
105	EnhcChor Plate	971	152	0	0	98
106	CompFlgChor Hall	952	173	153	0	63
107	ChorChorFlg Hall	159	150	170	0	55
108	ChapelSRS Hall	60	975	0	0	79
109	ChapelSRS Hall2	60	975	0	0	85
110	Chapel Room Hall	60	0	23	0	78
111	PltEnvFl4T Room	43	903	735	0	25
112	PlatEnvFl4T Filt	43	903	735	0	907
113	PltEnvFl4T Plate	43	902	735	0	103
114	PltTEnvFlg Plate	43	905	170	0	31
115	PlateRngMd Hall	102	913	0	0	95
116	auxDist+Echo Plt	0	772	130	0	31
117	auxEnvSp4T Plate	0	904	136	0	31
118	auxShap4MD Plate	0	918	756	0	31
119	auxChorDist+ Plt	0	156	768	0	31
120	auxShFlgChDl Plt	0	752	710	0	103
121	auxMPFlgLasr Plt	0	760	923	0	103
122	auxShap4MD Plate	0	917	756	0	31
123	FlgEnv4Tap Plate	173	904	133	0	31
124	EnhrFlgCDR Plate	969	170	712	0	96
125	auxRingPFD Plate	0	913	762	0	97
126	GtRvShapMDl Room	112	916	754	0	29
127	GtdEnhcStIm Room	112	969	976	0	17
128	Gtd2ChrEcho 2Vrb	112	151	130	0	110
129	GtdEnhcStIm Hall	112	969	976	0	72
130	auxEnvSp4T GtVrb	0	904	136	0	112
131	GtRbSwpFlt Lasr	112	908	0	0	924
132	GtRbSwpFlt Fldly	112	907	0	0	733
133	ChRvStIEcho Hall	724	976	130	0	75
134	ChorChorCDR Spac	151	152	715	0	58
135	ChDlDstEQ Hall	701	767	0	0	83
136	auxDPanCDR ChPlt	0	974	713	0	725
137	AuxChorFlng CDR	0	157	173	0	712

Number	Studio Name	Bus1 FX Preset	Bus2 FX Preset	Bus3 FX Preset	Bus4 FX Preset	Aux Bus FX Preset
138	auxEnhcSp4T CDR	0	970	136	0	711
139	auxPtchDst+ ChRv	0	914	772	0	721
140	EnhcChorChDl PCD	970	156	703	0	761
141	auxPoly FDR	0	764	0	0	738
142	EnhcChorChDl FDR	970	156	703	0	740
143	EnhcChrChDl FDR2	970	156	705	0	740
144	auxRotoSp4T FlRv	0	777	136	0	743
145	auxRotaryFDR Plt	0	774	739	0	97
146	RotoOrgFX Hall	778	0	0	0	59
147	CmpRvbFlDl Hall	960	0	732	0	86
148	auxEnhSp4T CmpRv	0	971	136	0	958
149	auxPtchRoom RvCm	0	914	17	0	958
150	PhsrChorCDR Phsr	194	151	717	0	194
151	ChDlSp4TF1Dl Phs	151	137	732	0	192
152	auxFlgDst+ ChLsD	0	170	769	0	709
153	auxFlgDst+ ChLs2	0	170	771	0	709
154	RoomRoomSRS CmRv	4	15	0	975	960
155	RoomRoom Room	5	18	0	0	27
156	GtRvPlate Hall	113	96	0	0	82
157	RoomRoom SRS	17	26	0	0	975
158	EnhcSp4T Hall	970	136	0	0	61
159	Room RoomChr SRS	17	0	15	157	975
160	KB3 V/C ->Rotary	779	0	0	0	780
161	EQStImg 5BndEQ	199	965	976	199	966
162	aux5BeqStIm Hall	199	966	976	199	78
163	10Band StIm Hall	199	965	976	199	73
164	3BndCmp PtFl	978	0	0	0	781
165	auxDst+Lsr Plt	0	768	925	0	103
166	auxRsFltEnvSwFlt	0	909	901	0	906
198	Digitech Studio	0	0	0	0	0
199	Default Studio	0	0	0	0	0

KDFX Objects

KDFX Studios

Appendix B

KDFX Controller Assignments in Programs & Setups

This appendix provides complete KDFX controller assignment information for all of the ROM-based K2500 programs and setups, including those in the Stereo Piano ROM, Orchestral ROM, and Contemporary ROM.

A Note about Secondary Effects in Programs

Some of the Programs in ROM use a technique called “secondary effects”, in which the processing on one or more layers of the Program can be changed completely with a single button push. Secondary effects in these Programs are enabled by Panel Switch 2 (MIDI Controller 29), which acts as a toggle, going back and forth between the “primary” effect and the secondary one. In practice, what this switch does is to turn off (set **Lvl** to **Off**) one of the two FX Bus sends on an Input page, and simultaneously turns on (set **Lvl** to **0.0dB**) the other FX Bus send.

```
PSw2 Off:   FXBus1      FXBus2
            Lvl:0.0dB   Lvl:Off
```

```
PSw2 On:    FXBus1      FXBus2
            Lvl:Off     Lvl:0.0dB
```

Most of the time, this effects-switching only affects a single Program layer on a single Input pair, although in some Programs the switching is more complicated, and toggling the Panel switch moves two or more layers to different FX Buses. PSw2 may also change EQ settings, or it may merely change an Aux reverb's decay time, depending on the Program.

Here's an example: Program **813 Prs Koto**. It has one layer, routed to Input A. Normally, Input A is routed to FX Bus 1, which in this case is a room reverb. Pressing PSw2 re-routes this to FX Bus 2, a flanger. FX Bus 2 is also routed to the “Big Room” reverb on the Aux bus (which FX Bus 1 is not), so the reverb changes as well.

In the chart, any controllers that operate exclusively on secondary effects are in *italics*. The line showing the panel switch's operation is also *italicized*.

813		Prs Koto	9 RmFlgChDly Room
	B	room1 rvb w/d	
	C	aux room rvb lvl	
	D	flange lvl, flange Xcouple	
	PSw2	toggle: room1 rvb/flange	

In this example, Slider B controls the first reverb's (“room1”) wet/dry balance when PSw2 is off. Slider C controls the Aux room reverb send level when the switch is on. Slider D controls flange level and crosscouple amount when the switch is on. Panel Switch 2 toggles between room1 reverb and flange.

Programs

Controller assignments for KDFX parameters used by K2500 programs are provided on the following pages.

1	Acoustic Piano (49 Sndbrd Room Hall) B hall rvb lvl, rvb time PSw2 <i>soundboard rvb w/d</i>
2	Stage Piano (51 Room Room Hall3) B hall rvb lvl, time, rooml w/d
3	BriteGrand (49 Sndbrd Room Hall) B hall rvb lvl, time PSw2 <i>soundboard rvb w/d</i>
4	ClassicPiano&Vox (103 EnhcChorCDR Hall) B hall rvb lvl, time (piano) C chor(vox) w/d,tap lvl PSw2 <i>adds chor/room</i>
5	Ballad Pno&St (83 Hall ChDly Hall) B aux hall rvb lvl (piano) C hall rvb w/d (strings)
6	Rock Piano (48 auxEnhSp4T CmpRv) B aux booth rvb time C aux booth rvb lvl D aux booth/compressor configuration A->B
7	Honky-Tonk (138 auxEnhcSp4T CDR) B rvb time C chor mix, fb lvl D delay mix, time
8	E Grand & Pad 9 (28 RoomSRSchDl Hall) B hall lvl, room rvb time, strings bass boost C <i>SRS center, space, EQ treble boost</i> D chor/delay w/d E chor mix F chor fb lvl G delay mix PSw2 <i>toggle: room rvb/hall+SRS</i>
9	Classic E Piano (22 auxShap4MD Plate) B rvb lvl, time C rvbHF damp; shaper w/d, crossover freq D EQ bass gain, shaper bass band lvl E/F shaper mid band/hi band lvls G EQ treble gain
10	Dyno E Piano (119 auxChorDist+ Plt) B rvb lvl, decay time C chor fb lvl D chor rate E chor LFO depth F chor tap lvl cut, XCouple G chor w/d
11	E Piano PF (136 auxDPanCDR ChPlt) B aux chor/plate lvl & aux plate mix C aux chor fb lvl & mix D panner rate E panner pulse width F panner pulse width
12	Suitcase E Pno (59 EnhcFlg8Tap Room) B rvb lvl C enhcr hi drive D <i>flange w/d</i> E <i>flange fb lvl, enhancer mix lvl</i> PSw2/ GKeyNum PSw2 <i>EQ bass</i> <i>toggle: enhcr & flange, EQ treble</i>
13	Brite Klav (153 auxFlgDst+ ChLs2) B aux chor/slapback lvl C <i>flange w/d</i> D <i>flange rate & Xcursion, aux chor mix</i> E <i>flange depth</i> F <i>flange fb lvl</i> G <i>aux delay fb lvl</i> H <i>aux delay tempo</i> PSw2 <i>toggle: flange & tube amp flange</i>
14	Match Stick (151 ChDlSp4TF1Dl Phs) B delay w/d C delay fb lvl D mix delay lvl, aux phaser lvl E delay fb image F aux phaser fb lvl G notch/bandpass depth H delay tempo

MW GKeyNum	aux phaser center freq delay tap pitch
15 B C D E MW PSw2	Big PWM (24 RoomResEcho Hall) room w/d, aux hall lvl & LF time room rvb time, aux hall diffusion amt scale aux hallHF damp EQ filt resonance/ freq toggle: room rvb & resonant filt/aux hall
16 B C D,E Gattavel PSw2	Matrix 12 (24 RoomResEcho Hall) room lvl & w/d, aux hall LFO rate room rvb time EQ filt resonance +& freq toggle: room/aux hall & resonant filt
17 B C D E F G GKeyNum PSw2	OBX Braz (78 HallPtchPtFl Lsr) hall w/d hall rvb time hall predelay aux LaseVerb lvl pitcher tone shaping LaserVerb contour pitcher pitch toggle: hall rvb & pitcher/aux LaserVerb
18 B C D E F G H MW PSw2	Memorymoog (78 HallPtchPtFl Lsr) hall w/d hall rvb time LaserVerb contour LaserVerb spacing, EQ bass LaserVerb w/d, EQ treble LaserVerb lvl & fb lvl LaserVerb coarse delay pitcher out gain & pitch & pan width; LaserVerb mix balance adds pitcher
19 B C D E PSw2	ProphetPulse (9 RmFlgChDly Room) aux room lvl flange w/d flange fb lvl flange rate toggle: flange & chor/delay
20 B C D H MW PSw2	Prophet Square (151 ChDlSp4TF1Dl Phs) EQ, delay out gain astral taps mix, delay w/d & fb lvl delay fb image delay tempo phaser center freq toggle: astral taps & phaser+flg/dly
21 B C D E F G H PSw2	New Shaper (116 auxDist+Echo Plt) plate rvb lvl poly drive chor fb lvl chor depth chor w/d echo w/d echo fb lvl toggle: polyAmp chor & echo
22 B C D PSw2	Klicomp tree (59 EnhrFlg8Tap Room) room rvb lvl flange fb lvl EQ Bass toggle: flange & 8-tap delay
23 B C D E F G H PSw2	Digicomp (117 auxEnvSp4T Plate) env filt threshold, aux plate lvl filt sweep freq filt resonance toggle: envelope LP, BP, & notch filters filt minimum freq filt release rate delay fb lvl & LF damping toggle: env filt & aux plate+spectral 4-tap
24 B C D	Da Clav (116 auxDist+Echo Plt) plate rvb lvl polyAmp drive polyAmp chor treble tone

	E F PSw2	echo lvl, aux plate lvl echo w/d toggle: polyAmp chor & echo; aux plateHF damp & decay time
25	B PSw2	Simpilton (127 GtdEnhcStIm Room) room rvb time & lvl toggle: st img & gated rvb
26	B PSw2	Synth Caliope (16 RoomPhsrCDR Hall) room w/d, aux hall lvl toggle: room rvb & CDR
27	B C D PSw2	Chiffloots (16 RoomPhsrCDR Hall) hall rvb lvl phaser w/d delay mix toggle: phaser & CDR
28	B C D E PSw2	Bamboo Voices (6 RoomFlngCDR Hall) hall rvb lvl, chamber rvb time hall rvb predelay chor fb delay mix toggle: CDR+hall rvb/chamber rvb
29	B C D E PSw2	Hyper Guitar (97 auxPhasStIm Hall) hall rvb lvl phaser w/d phaser rate EQ toggle: phaser/aux hall & st img
30	B C D E F G PSw2	Dreamers (6 RoomFlgCDR Hall) aux hall lvl flange w/d flange fdbk lvl EQ treble CDR rvb mix CDR dly mix toggle: flange & CDR
31	B C D E F PSw2	Pluxichord (6 RoomFlngCDR Hall) hall rvb lvl flange w/d flange rate EQ hall mix toggle: flange/aux hall & CDR
32	B C D E PSw2	Fluty Lead (3 RoomChorCDR Hall) hall rvb lvl mix lvl, chor mix EQ treble aux hall lvl toggle: CDR & chamber/aux hall
33	B C D E PSw2	Gooshy Lead (12 RoomFlngLsr Echo) echo lvl (FX1) room rvb lvl LaserVerb w/d LaserVerb contour toggle: room rvb/LaserVerb
34	B C D MPress PSw2	Orient Wind (63 ChmbTremCDR Room) XFades room & chamber rvbs room rvb predelay & HF damp EQ treble tremelo rate & depth toggle: chamber & tremelo+room rvb, EQ bass
35	B C D PSw2	DC Pitcher Lead (69 auxPtchDst+ Chmb) rvb lvl pitcher pitch offset pitcher color toggle: pitcher & dist
36	B C D E F PSw2	Duke's Lead (119 auxChorDist+ Plt) rvb lvl delay lvl chor fb tube amp drive bass tone cut toggle: tube amp/delay/chor in/out
37	B	FM Harmonica (16 RoomPhsrCDR Hall) rvb lvl

	C D PSw2	lo/mid boost treble boost toggle: rvb & phaser
38	C D PSw2	Mini Lead Poly (36 RoomComp Hall) EQ boost: treble freq EQ boost: bass freq compressor in/out, treble boost, bass cut
39	B C D PSw2	AlaZawi (92 auxFlgDist+ Hall) rvb lvl rvb pre-delay modulation delay w/d toggle: tube amp/dly/chor in/out
40	B C D E PSw2	JR's Lead (141 auxPoly FDR) aux rvb lvl & time delay lvl, EQ flange fb flange tempo adds dist
41	B PSw2	Funky Lead (99 auxPhsrFldblHall) rvb lvl toggle: flange & phaser (Left channel only)
42	B C D E F G H MPress PSw2	Hammeron Synth (92 auxFlgDist+ Hall) rvb lvl delay w/d chor w/d bass boost mid boost treble boost aux rvb lvl tube drive toggle: tube amp/delay/chor in/out
43	B C D E F PSw2	Synthitar Lead (28 RoomSRSchDl Hall) hall rvb lvl chor Xcouple chor/delay w/d delay lvl chor fb, hall rvb time toggle: chor/delay & room
44	B C PSw2	Modular Lead (98 auxFlngCDR Hall) hall rvb lvl flange w/d toggle: flange & CDR
45	B C D E F G PSw2	Prophet Sync (90 auxPhsrFDR Hall) rvb lvl rvb lvl phaser center freq & bandwidth phaser "in width" rvb lvl delay lvl toggle: pitcher & FDR
46	B PSw2	Brt Saxy Lead (33 ChmbCompCDR Hall) hall rvb lvl toggle: chamber rvb & compressor
47	B PSw2	Don Corllione' (9 RmFlgChDly Room) aux room rvb lvl toggle: rvb & flange
48	B C	Studio Kit 1 (154 RoomRoomSRS CmRv) rvb lvl room size & density
49	B C	Studio Kit 2 MW (155 RoomRoom Room) aux room rvb lvl rvb time
50	B C	2 Live Kits MW (156 GtRvPlte Hall) hall rvb lvl rvb gate threshold
51	B C D	Rock Kit (36 RoomComp Hall) room rvb w/d comp ratio, hall HF damp hall rvb lvl
52	B C	Jazz Kit (42 RoomRmHall Hall) rvb w/d aux hall rvb lvl
53	B	Reggae Kit (157 RoomRoom SRS) rvb w/d

	C	pre-delay lvl	
54	B C	Light Kit aux hall rvb lvl rvb w/d	(83 Hall ChDly Hall)
55	B C D	Garage Kit MW rvb w/d phaser lvl space rvb lvl	(18 RoomPhsr Space)
56	B C D	Techno Kit gated rvb w/d, aux rvb lvl (FX1&2) rvb time LaserVerb lvl (FX4)	(131 GtRbSwpFlt Lasr)
57	B C	General MIDI Kit hall rvb lvl rvb w/d	(147 CmpRvbFlDl Hall)
58	B C D GAttVel	Slam'n Drums gated rvb w/d, HF damp aux flg/dly lvl filt w/d shaper amt, gated rvb gate time	(132 GtRbSwpFlt FlDly)
59	B C D E	Perc Section MW rvb w/d (FX1) rvb w/d (FX2) rvb time aux rvb lvl	(42 RoomRmHall Hall)
60	B C D E PSw2	Industry Set rvb lvl delay lvl delay time delay fb lvl toggle: shaper/delay	(126 GtRvShapMDl Room)
61	B C	Techno Loops rvb lvl dist drive	(55 auxDistLasr Room)
62	B PSw2	Rhythmatic rvb time toggle: hall/booth rvbs	(76 HallGateFl4T Bth)
63	B C D MPress PSw2	Dualimba room rvb lvl space rvb lvl EQMorph freq sweep depth EQMorph sweep EQMorph in/out, lengthen space rvb time	(21 RmEQmph4Tp Space)
64	B C D PSw2	TouchDrums rvb lvl, absorption quantization dist lvl quantization dist headroom quantization dist in/out	(62 BthQFlg4Tap Hall)
65	B C	Hand Drums rvb lvl rvb time	(42 RoomRmHall Hall)
66	B C D E PSw2	Dynamic Perc "Real Room" rvb lvl "Percussive Room" rvb lvl rvb time cymbal rvb lvl& time toggle: room/hall rvbs	(42 RoomRmHall Hall)
67	B PSw2	Mark Tree rvb lvl toggle: "Real Room"/"Percussive Room" rvbs	(42 RoomRmHall Hall)
68	B C D E MPress PSw2	Bell Player rvb lvls sweep filt w/d sweep filt resonance sweep filt LFO tempo sweep filt LFO period toggle: room rvb/sweep filt+hall rvb	(23 RmSweepEcho Hall)
69	B C PSw2	Marimba rvb lvls rvb time toggle: room/hall rvbs	(34 RoomCmpChor Hall)
70	B	Excited Marimba rvb lvls	(34 RoomCmpChor Hall)

	PSw2	toggle: room/hall rvbs
71	B C D E PSw2	Dual E Bass (61 CompEQmphCh Room) rvb lvl comp ratio EQ bass gain, lowers freq EQ treble gain comp -10dB, rvb mix +10dB
72	B C D	Warm Bass (61 CompEQmphCh Room) rvb lvl comp ratio EQ bass gain
73	E F G H PSw2	Sustain E Bass (61 CompEQmphCh Room) compressor attack time compressor release time comp ratio compressor threshold, makeup gain toggle: chor/compressor, room rvb in/out, EQ bass gain (attenuates)
74	B C D PSw2	Ripper Bass (106 CompFlgChor Hall) rvb lvl rvb lvl comp ratio toggle: compressor/flange
75	B C D PSw2	Yama Bass (106 CompFlgChor Hall) rvb lvl flange lvl flange L/R phase toggle: flange/chor
76	B C D PSw2	Synth Fretless (16 RoomPhsrCDR Hall) rvb lvls delay lvl, phaser lvl CDR w/d toggle: CDR/phaser
77	B C D MPress PSw2	Fretless Lead (106 CompFlgChor Hall) rvb lvl flange fb lvl flange L/R phase flange lvl toggle: chor/flange
78	B C D E F G MWheel PSw2	Moogy Bass 1 (61 CompEQmphCh Room) rvb lvl EQMorph "B" gain EQMorph "A" freq scale EQMorph "B" freq scale EQMorph "A" width EQMorph "B" freq treble cut EQMorph in/out
79	B C D PSw2	Moogy Bass 2 (130 auxEnvSp4T GtVrb) gated rvb lvl env filt lowest freq env. filt freq sweep env filt in/out
80	B C D E F G PSw2	Mix Bass (66 ChamFlg4Tap Hall) rvb lvl flange fb lvl flange lvl flange L/R phase delay lvl delay tempo toggle flange/delay
81	B C D E F PSw2	Tite Rave Bass (66 ChamFlg4Tap Hall) hall rvb lvl flange fdbk lvl flange w/d flange phase echo w/d toggle: hall rvb+flange/echo
82	B C D	Synth Bass (61 CompEQmphCh Room) rvb lvl chor fb lvl chor pitch envelope shape
83	B	House Bass (78 HallPtchPtFl Lsr) LaserVerb lvl

	C D	pitcher w/flange w/d pitcher offset
84	B C D E F G H PSw2	Acoustic Guitar (3 RoomChorCDR Hall) rvb lvl rvb decay time rvb build time chor lvl CDR rvb lvl (attenuates) CDR delay lvl (attenuates) CDR chor lvl (attenuates) toggle: chor/CDR
85	B C D E F G PSw2	Steel Str Guitar (103 EnhcChorCDR Hall) hall rvb lvl enhcr EQ bass mix enhcr EQ treble mix enhcr hi gain aux chamber rvb lvl chor lvl toggle: enhcr/CDR chor, hall/chamber rvb
86	B C D E F PSw2	12-str Guitar (42 RoomRmHall Hall) primary hall rvb lvl "Real Room" lvl (attenuates) "Real Room" brightness hall rvb brightness hall rvb lvl toggle: "Real Room"/"Percussive Room" rvbs
87	B C D PSw2	Strummer Guitar (149 auxPtchRoom RvCm) rvb lvl rvb brightness (attenuates) comp ratio Pitcher in/out
88	B C D PSw2	Slo Chor Gtr (3 RoomChorCDR Hall) hall rvb lvl, room rvb decay time CDR rvb time CDR delay lvl hall size+time, CDR chor rate+depth
89	B C D E F/GAttkVe l G	Captain Crunch (141 auxPoly FDR) FDR rvb time+lvl delay mix flange fb flange tempo dist drive dist cut highs, boost mids
90	B C D PSw2	Dist Jazz Guitar (93 auxChrDst+ Hall) rvb lvl attenuate chor lvl, pan cabinet output attenuate delay lvl dist in/out
91	B C D E F PSw2	Dist Harmonics (33 ChmbCompCDR Hall) hall rvb lvl & HF damp CDR w/d delay lvl chor fb hall rvb lvl toggle: CDR & chamber rvb
92	B C D PSw2	Kotolin (90 auxPhsrFDR Hall) hall rvb lvl phaser w/d delay lvl toggle: layer 1 phaser & FDR layer 2+3 phaser in/out
93	B PSw2	Cee Tuar (52 auxChrMDly Room) rvb lvl toggle: chorus/delay
94	B C D E PSw2	Green Acres (70 auxChorFlRv Cmbr) chamber rvb lvl chamber rvb lvl chor w/d treble boost toggle: chor in/out, chamber rvb time
95	B C D	Perc Organ 2500 (145 auxRotaryFDR Plt) vib chor config+in/out plate rvb lvl rvb time

	E F G MW/ SftPed PSw2	crossover lo, hi gain hi+lo tremolo HF damp rotary speed toggle: rotary/FDR
96	B C D E F G	Ballad Organ (145 auxRotaryFDR Plt) vib depth rvb lvl rvb time vib chor hi/lo gain vib chor hi/lo trem rvbHF damp
97	B C D E F G	Gospel Organ (145 auxRotaryFDR Plt) vib chor depth rvb lvl rvb time vib chor hi/lo gain vib chor hi/lo trem rvbHF damp
98	B C D E F G	Overdrive Organ (145 auxRotaryFDR Plt) vib chor depth rvb lvl rvb time vib chor hi/lo gain vib chor hi/lo trem rvbHF damp
99	B C D E F G	Rotating B's & M's (145 auxRotaryFDR Plt) vib chor depth rvb lvl rvb time vib chor hi/lo gain vib chor hi/lo trem rvbHF damp
100	B D E F PSw2	Cheeze (70 auxChorFlRv Cmbr) rvb lvl chor fb lvl chor LFO rate chor LFO depth chor in/out
101	B C D F G H PSw2	Tamborgan (144 auxRotoSp4T FlRv) rvb time+lvl vib chor in/out vib chor configuration flange fb lvl flange LFO rate flange LFO tempo echo in/out
102	B C D E F G H PSw2	Organ Pad (144 auxRotoSp4T FlRv) rvb time+lvl vib chor in/out vib chor configuration flange 1 fb lvl flange 2 fb lvl flange LFO rate flange LFO tempo add echoes
103	B C D E PSw2	Chiffy Pipes (96 auxChorChDl Hall) rvb lvl rvb time early reflections rvb lvl chor in/out, adj rvb parameters
104	B C D E F PSw2	Offertory (96 auxChorChDl Hall) rvb lvl rvb time early reflections rvb lvl chor fb lvl chor in/out
105	B C D PSw2	Pedal Pipes (96 auxChorChDl Hall) rvb lvl rvb time early reflections boosts rvb brightness, predelay time

106	Church Organ (96 auxChorChDl Hall)
B	rvb lvl
C	rvb time
D	early reflections
PSw2	boosts rvb brightness, predelay time, cuts dry signal
107	Resorgan (96 auxChorChDl Hall)
B	rvb lvl
C	rvb time
D	early reflections
PSw2	boosts rvb brightness, predelay time, cuts dry signal
108	Fast Strings (86 Hall Room Room)
B	hall rvb lvl, time
109	Att ctl Fast Str (86 Hall Room Room)
B	rvb lvl
110	Att ctl Med Str (86 Hall Room Room)
B	room rvb lvl+time, hall rvb lvl
111	SfzTrem Strings (108 ChapelSRS Hall)
B	rvb lvl
112	ClassicalStrinnngs (86 Hall Room Room)
B	rvb lvl, time
113	SloClassical Str (86 Hall Room Room)
B	rvb lvl, time
114	Silk Strings (110 Chapel Room Hall)
B	hall rvb lvl, time
C	room rvb w/d
115	Fast Violin (42 RoomRmHall Hall)
B	rvb lvl
116	Slo Solo Cello (35 RoomComp Hall)
B	hall rvb lvl, room rvb w/d
117	Stereo Slo Str (115 PlateRngMd Hall)
B	rvb lvl
C	ring modulator oscillator freq
PSw2	ring modulator in/out
118	Cathedral Choir (28 RoomSRSchDl Hall)
B	rvb lvl
C	SRS center, space, treble gain
119	Mixed Choir (28 RoomSRSchDl Hall)
B	hall rvb lvl
C	room rvb lvl
D	room rvb time
E	EQ treble gain
F	EQ Bass gain
PSw2	infinite rvb in/out
120	The Choir (105 EnhcChor Plate)
B	rvb lvl
C	enhcr lo drive, lo mix
D	enhcr mid drive, mid mix
E	enhcr hi drive, hi mix
121	Wendy's Flute (42 RoomRmHall Hall)
B	rvb lvl, time (primary& secondary)
PSw2	toggle: room rvb1/room2 rvb
122	Treble Flute (42 RoomRmHall Hall)
B	rvb lvl, time (primary& secondary)
PSw2	toggle: room rvb1/room rvb2
123	Baroque Flute (42 RoomRmHall Hall)
B	rvb lvl, time (primary& secondary)
PSw2	toggle: room rvb1/room2 rvb
124	Soft Tenor Sax (65 ChamDstEcho Room)
B	rvb lvl
C	bass shelf lvl
D	treble shelf lvl
PSw2	toggle: chamber rvb & dist
125	Fast Solo Tenor (41 Room Room SRS2)
B	rvb lvl, time, EQ
C	rvb late reflection lvl
126	Dynamic Trumpet (65 ChamDstEcho Room)
B	chamber rvb lvl
C	chamber rvb time
D	treble shelf lvl
PSw2	toggle: chamber rvb/dist+hall rvb
127	Miles Unmuted (40 RoomRmHall Hall)
B	room1 rvb w/d

	C PSw2	treble shelf + gain, room1 rvb HF damp toggle: room rvbs
128	B PSw2	Strght Mute Trpt (35 RoomComp Hall) room rvb lvl, time toggle: room rvb/compressor+hall rvb
129	B C PSw2 PSw2	Almost Muted (19 RmEQmphEcho Comp) room rvb lvl room rvb HF damp morphs EQ "A" to "B" toggle: EQmorphing/rvb
130	B C D E PSw2	Solo Trombone (65 ChamDstEcho Room) chamber rvb lvl chamber rvb HF damp treble gain dist cut toggle: chamber rvb/dist+room rvb
131	B C D E PSw2	Sfz Bone (70 auxChorFlRv Cmbr) chamber rvb lvl chamber rvb time chor w/d chor fb lvl adds chor
132	B PSw2	Trumpet Section (70 auxChorFlRv Cmbr) chamber rvb w/d adds chor, boosts highs, cuts lows
133	B C D PSw2	Hip Brass (23 RmSweepEcho Hall) hall rvb lvl room rvb w/d hall rvb pre-delay adds sweep filt
134	B C D PSw2	Brt Miami Brass (128 Gtd2ChrEcho 2Vrb) gated rvb w/d & time room/hall rvb lvls gate release time, EQ bass gain toggle: gated rvb/chorus, treble cut
135	B C D PSw2	Orchestral Brass (44 Room Hall Hall) room rvb w/d, aux hall rvb lvl aux hall rvb time EQ treble (attenuates) toggle: room/aux hall rvb, bass cut
136	B C D GAttVel PSw2	Sax Section (82 HallRsFltChDl Rm) booth rvb lvl booth rvb absorption EQ bass gain resonant filt freq toggle: booth rvb & resonant filt
137	B C D PSw2	Dyn Big Band (65 ChamDstEcho Room) rvb lvl, time rvb late reflections lvl EQ treble (attenuates) toggle: chamber rvb/dist+EQ bass cut
138	B PSw2	Flute & Slo Str (108 ChapelSRS Hall) room rvb w/d, time toggle room rvb/SRS
139	B PSw2	Horn&Flute w/ Str (110 Chapel Room Hall) rvb lvls, times toggle: chapel+room rvbs/chapel+hall rvbs
140	B PSw2	DynamicOrchestra (110 Chapel Room Hall) rvb lvls, times room1 rvb in/out
141	B PSw2	Touch Orchestra (110 Chapel Room Hall) rvb lvls, times room1 rvb in/out
142	B C D E F PSw2	Slo Ensemble (72 auxChorFlRv Cmb3) chamber rvb lvl flange+rvb w/d flange lvl flange LFO lvl flange<>rvb routing flange+rvb in/out
143	B PSw2	W Tell Orchestra (110 Chapel Room Hall) rvb lvls, times toggle: chapel/hall rvbs

144	Jazz Band (100 auxSRSRoom Hall) B rvb lvls C SRS center, space, bass gain& treble gain D hall rvb early& late reflection lvls PSw2 activates SRS
145	Rock Quartet (25 RmRotoFl4T CmpRv) B vib/chor in/out & config C chamber rvb time, HF damp, aux rvb w/d MW vib/chor rate
146	Gargantuanism (3 RoomChorCDR Hall) B hall rvb lvl C rvb w/d D chor w/d E treble boost PSw2 toggle: room rvb & CDR
147	Tranquil Pluck (12 RoomFlngLsr Echo) B delay lvl C flange w/d D delay time coarse E delay contour PSw2 toggle: flange+echo/LaserDly
148	The Chase (43 Room Room Hall) B hall rvb lvl, room rvb w/d (FX2) C room rvb w/d (FX3) PSw2 toggle: room1/room2
149	Enterprize (57 auxDistLasr Acid) B "Acid" rvb lvl C mix lvl D dist drive & gain PSw2 adds distortion
150	Magic Orchestra (19 RmEQmphEcho Comp) B rvb w/d C rvb time D "morph" gain, treble cut PSw2 toggle: EQMorpher/echo
151	Passion Source (8 RmFlngStImg Garg) B "Garage" rvb lvl C rvb w/d D flange fb lvl PSw2 toggle: room/flange
152	Microwave (97 auxPhasStIm Hall) B hall rvb lvl C hall rvb lvl D phaser w/d E diffusion bass freq PSw2 toggle: phaser/stereo image
153	Fuzz Lite (8 RmFlngStImg Garg) B "Garage" rvb lvl C flange fb lvl, EQ PSw2 toggle: room/st img, EQ treble boost
154	Solina Phaze (6 RoomFlngCDR Hall) B hall rvb lvl C flange w/d+mix lvl D CDR w/d E chor mix lvl PSw2 toggle: flange/CDR
155	Arystal (96 auxChorChDl Hall) B hall rvb lvl C chor w/d PSw2 toggle: chor/chor+dly, EQ
156	Timershift (139 auxPtchDst+ ChRv) B aux chor/chamber lvl C pitcher w/d PSw2 EQ, dist out gain, pitcher quarter weights GKeyNum pitcher pitch, pitch offset, dist drive
157	Aurora (12 RoomFlngLsr Echo) B delay/rvb lvl C delay/rvb lvl, flange mix lvl D rvb/phaser/echo w/d PSw2 toggle: LaserVerb/flange, EQ FXASR1 EQ
158	Gongers (6 RoomFlngCDR Hall) B hall rvb lvl C flange w/d MWheel

PSw2	<i>mix lvl</i> <i>toggle: flange/CDR</i>
159 B PSw2	Arrakis Grand (33 ChmbCompCDR Hall) hall rvb lvl <i>toggle: comp/CDR, EQ</i>
160 B C D PSw2	Sisternal (120 auxShFlgChD1 Plt) plate rvb lvl chor/delay w/d shaper lvl, shaper pad lvl <i>shaper+flg in/out, EQ</i>
161 B C D E F FXASR1 PSw2	PPG 4 (119 auxChorDist+ Plt) plate rvb lvl chor w/d <i>modulation delay fb lvl</i> <i>tube drive, mix lvl</i> dist warmth <i>modulation delay chor depth</i> <i>toggle: chor/chor+dly+dist</i>
162 B C D E F PSw2	Pseudomento MW (3 RoomChorCDR Hall) hall rvb lvl & mix chor mix delay mix delay fb hall rvb time +HF damp; aux hallHF damp <i>room rvb in/out</i>
163 B MPress	Big Strings (14 SpaceFlng Hall) rvb lvl EQ
164 B C D PSw2	Spaced (98 auxFlngCDR Hall) hall rvb lvl flange w/d flange fb lvl <i>flange out & hall boost</i>
165 B MPress PSw2	Digital Choir (97 auxPhasStIm Hall) hall rvb time, early reflection, HF damp EQ <i>add phaser</i>
166 B C D E F PSw2	Meditation Pad (11 RoomFlngCDR Hall) hall rvb lvl & decay time flange w/d flange fb lvl flangeHF damp <i>delay fb</i> <i>toggle: flange & CDR</i>
167 B C PSw2	The Cymbal Sings (78 HallPtchPtFl Lsr) LaserVerb lvl, EQ LaserVerb contour <i>toggle: pitcher & pitcher/flange</i>
168 B C	Slo FlangeStrngs (85 Hall Room SRS) SRS lvl, hall w/d +HF damp & decay time SRS mix lvl
169 B C PSw2	Lushlife (34 RoomCmpChor Hall) hall & room rvb lvls chor w/d <i>toggle: chor & room rvb</i>
170 B C D PSw2	Crystal too (80 HallChrEcho Room) room rvb lvl chor w/d <i>echo w/d</i> <i>toggle: chor & echo</i>
171 B C PSw2	Multi Marimba (27 RoomSRSRoom Room) room1 rvb w/d, aux room rvb lvl room1 & aux room rvb HF damp; aux room rvb decay time <i>toggle: room1 rvb & SRS</i>
172 B C PSw2	Wave Power (17 RmPhsrQuFlg Hall) hall rvb lvl clav aux hall lvl <i>toggle: phaser & quant+flange</i>
173 B C D PSw2	Noo Mutes (77 HallChorFDR Room) room rvb mix FDR blend, delay mix & fb lvl delay time <i>toggle: chor & FDR</i>

174	Hammer Violin (103 EnhcChorCDR Hall)
B	hall rvb lvl +HF damp
C	hall rvb time
PSw2	toggle: enhcr & chor
175	Mallet Flutes (134 ChorChorCDR Spac)
B	aux room rvb lvl & time, CDR w/d
C	delay mix
D	delay time
PSw2	toggle: CDR & chor
176	Malletoo (137 AuxChorFlng CDR)
B	CDR lvl
C	CDR rvb mix, time & HF damp
D	CDR delay mix
E	flange w/d & fb lvl
PSw2	flange in/out
177	Ethereal Echoes (68 CmbrShapLsr Hall)
B	strings aux hall lvl
C	piano hall rvb lvl, LaserDelay HF damp
E	partial aux hall lvl, shaper mix cut
PSw2	toggle: hall rvb & shaper (strings)
178	Padifier (3 RoomChorCDR Hall)
Data	aux hall & CDR rvb HF damp & bass EQ
B	aux hall rvb lvl, CDR rvb mix
C	aux hall rvb & CDR rvb times
D	chor mix
E	chor depth
F	delay mix
PSw2	toggle: CDR & room rvb
179	Spaced Inn (46 Room Room Hall3)
B	strings booth w/d hall rvb lvl
C	voices aux hall rvb lvl
180	Glass Bow (142 EnhcChorChDl FDR)
B	FDR lvl
C	FDR rvb mix
D	FDR flange fb
PSw2	EQ & flange tempo cut
181	Angel Pass (82 HallRsFltChDl Rm)
B	room rvb lvl
C	chor/delay w/d & fb lvl
D	delay mix
E	chor rate
F	delay fb lvl
MWheel	room rvb early & late reflection lvl
	resfilt freq
PSw2	toggle: resfilt & chor/delay
182	In the Air (104 EnhChorChDl Hall)
B	hall rvb lvl
C	chor w/d
D	chor fb lvl
E	EQ treble boost
F	delay mix
G	delay fb lvl
MPress	EQ Bass cut
PSw2	toggle: chor & chor/delay
183	Matrix Mellostr (82 HallRsFltChDl Rm)
B	room rvb lvl
C	resfilt freq
D	resonance boost, delay mix
E	chor rate
F	chor fb lvl
PSw2	toggle: resfilt & chor/delay
184	Ethereal String (11 RoomFlngCDR Hall)
B	hall rvb lvl
C	flange w/d
D	hall rvb decay time
E	flange fb lvl
F	EQ treble boost
PSw2	toggle: flange & CDR
185	Dawning (10 ChmbFlgGtRv Hall)
B	hall rvb lvl
C	flange w/d
D	flange fb lvl
PSw2	toggle: chamber/flange & all flange
186	Synth Strings (119 auxChorDist+ Plt)
B	plate rvb lvl

	C	chor w/d	
	D	chor fb lvl	
	E	plate rvb lvl	
	MPress	EQ treble freq	
	PSw2	toggle: chor & dist	
187		Choir Fixer (5 RoomChrCh4T Hall)	
	B	hall rvb lvl	
	C	hall rvb lvl	
	D	chor w/d	
	E	chor LFO depth	
	PSw2	toggle: room/chor & all chor	
188		Shine On (104 EnhChorChD1 Hall)	
	B	hall rvb lvl	
	C	hall rvb lvl	
	D	chor LFO depth	
	MPress	EQ treble boost	
	PSw2	toggle: enhcr & chor	
189		ChoirStrings (53 auxFlngChRv Room)	
	B	strings room rvb lvl, vox hall w/d	
	C	room rvb time	
	MPress	EQ bass & treble boost	
	PSw2	toggle: chor/rvb & flange	
190		Launch Pad (6 RoomFlngCDR Hall)	
	B	CDR hall rvb lvl	
	C	flange w/d, fb & HF damp	
	D	flange crosscouple	
	PSw2	toggle: flange+aux hall/CDR	
191		cymbal thing (125 auxRingPFD Plate)	
	B	plate rvb lvl	
	C	ring modulator w/d	
	E	ring mod lvls (sine 2+3)	
	F	ring mod freq (sine 2)	
	G	ring mod freq (sine 3)	
	H	ring mod lvl & freq (sine 4), <i>pitcher pitch</i>	
	PSw2	toggle: ring modulator & PFD	
192		a no way CS (19 RmEQmphEcho Comp)	
	B	EQmorph A freq scale	
	C	EQmorph B freq scale	
	D	echo fb	
	PSw2	toggle: EQMorph & echo	
193		Environments (55 auxDistLasr Room)	
	B	room rvb lvl	
	C	LaserVerb contour & w/d +HF damp & fb lvl	
	D	LaserVerb coarse delay time	
	E	aux room mix & lvl & decay time & dist drive	
	PSw2	aux room size +HF damp & build envelope	
194		Gremlin Group (75 HallPtchLsr Hall)	
	B	aux hall rvb lvl	
	C	pitcher w/d	
	D	pitcher color	
	E	LaserVerb w/d	
	F	LaserVerb coarse delay time	
	G	LaserVerb delay spacing	
	H	LaserVerb contour	
	PSw2	pitcher, LaserVerb	
195		Thunderstorm (150 PhsrChorCDR Phsr)	
	B	phaser amt (thunder layer)	
196		Northern Winds (150 PhsrChorCDR Phsr)	
197		Doomsday (133 ChRvStIEcho Hall)	
	B	hall lvl on explosion	
198		Click (199 Default Studio)	
199		Default Program (199 Default Studio)	
740		LM VirtualDesk 1 (6 RoomFlngCDR Hall)	
	Data	dry level	
	B	room rvb lvl	
	C	flanger lvl	
	D	CDR lvl	
	E	room rvb -> hall rvb	
	F	flanger -> hall rvb	
	G	CDR -> hall rvb	
	H	hall rvb master	

741	LM VirtualDesk 2 (21 RmEQmph4T Room)
Data	dry lvl
B	room rvb lvl
C	EQMorpher lvl
D	echo lvl
E	dry -> aux room rvb
H	aux room rvb master
742	LM EQ Room Hall (1 RoomChorDly Hall)
Data	EQ bass freq
B	EQ bass gain
C	EQ treb freq
D	EQ treb gain
E	room rvb w/d
F	hall rvb lvl
G	rvb HF damping
H	room rvb time, late reflection lvl
MW	reverse FX
743	LM Tube Amp+ Gtr (165 auxDst+Lsr Plt)
Data	drive cut
B	Laser w/d cut
C	bass tone cut
D	mid tone cut
E	treble tone cut
F	plate rvb lvl
G	delay w/d cut
H	chor w/d cut
PSw2	toggle: dist/LaserDelay
MW	LaserDelay time
744	LM Synth Sliders (131 GtRvSwpFlt Lasr)
A	attack time
B	release time
C	sweep filt tempos, LaserVerb dly time
D	VAST filter freq
E	sweep filt resonances
F	sweep filt w/d
G	LaserVerb lvl
H	LaserVerb contour
LgRbn	panning
PW up	pitch shift
PW Down	reverse playback effect
MW	sweep filt freq
PSw2	sweep filt LFO shape
KeyNum	VAST filter freq
745	LM EQ StIm Hall (163 10Band StIm Hall)
Data	62 Hz boost
B	125 Hz boost, center gain boost
C	250 Hz boost, spread
D	500 Hz boost, Diff bass cut
E	1000 Hz boost, Diff gain cut
F	4000 Hz boost, Diff bass freq
G	8000 Hz boost
H	16000 Hz boost
MW	aux rvb lvl
PSw2	toggle: 10Band EQ/st img
746	LM ParaFlange (8 RmFlngStImg Garg)
Data	VAST filter freq
B	flange fb lvl, EQ bass cut
H	flange/stereo image balance
MW	VAST filter width
747	LM EQ Overload (57 auxDistLasr Acid)
Data	EQ bass boost
B	VAST EQ para EQ boost
C	EQ treble gain
D	Dist drive, out gain
E	bass boost
F	mid boost
G	treble boost
H	width
748	LM Filters (166 auxRsFltEnvSwFlt)
Data	VAST filter freq
B	resonant/envelope filters balance
C	resonant freq
D	aux sweep filt lvl boost, res/env filt cut
E	VAST filter width

	F G MW	VAST filter separation threshold (env filt) VAST filter LFO rate
749		LM Default (199 Default Studio)
750-769	Button2 Button3	KB3 Organ Programs vib/chor in/out toggle: vib/chor
770	B PSw2	Concert Piano 1 (49 Sndbrd Room Hall) hall rvb lvl, rvb time w/d
771	B PSw2	Studio Grand (49 Sndbrd Room Hall) hall rvb lvl, rvb time w/d
772	B C suspended	Brt Grand & Str (50 Sndbrd Rm Hall2) hall rvb lvl, rvb time (piano) hall rvb lvl (strings) w/d
773	B	Stereo Solo Pno (49 Sndbrd Room Hall) hall rvb lvl, time
774	B	Brt Concert Pno (49 Sndbrd Room Hall) hall rvb lvl, time
775	B	Concert Piano 2 (51 Room Room Hall3) hall rvb lvl, time, room1 rvb time
776	B suspended	Soft Piano (49 Sndbrd Room Hall) hall rvb lvl, time w/d
777	B	Piano for Layers (49 Sndbrd Room Hall) hall rvb lvl, time
778	B	Rok Piano (51 Room Room Hall3) hall rvb lvl, time, w/d
779	B	RandomPan Grand (50 Sndbrd Rm Hall3) hall rvb lvl, time
780	B	MonoStudioGrand (49 Sndbrd Room Hall) hall rvb lvl, time
781	B	Grand & Elec 1 (40 RoomRmHall Hall) hall rvb lvl, time, w/d
782	B C D E F	Grand & Elec 2 (4 RoomChor Hall) hall rvb lvl chor w/d chor fb lvl chor Xcouple rvb early reflection lvl
783	B	St Pno & Vox Pad (30 RmStImgChDl Hall) hall rvb lvl (piano), rvb time; room1 w/d & time
784	B C D E F	Funky Piano (9 RmFlgChDly Room) room rvb lvl, rvb time flange w/d flange fb lvl flange Xcouple flange LFO Tempo
785	B C D	E Grand Stack (142 EnhcChorChDl FDR) rvb lvl, FDR w/d, FDR mix delay FDR flange mix FDR flange tempo
786	B C	Way Dark Piano (136 auxDPanCDR ChPlt) plate rvb lvl & w/d & time aux chor fb
787	B C D E F	Piano Chase (123 FlgEnv4Tap Plate) plate rvb lvl flange w/d flange fb lvl, rvb decay time flange LFO tempo flange X couple
788	B C D	Piano Trio (87 Hall CmpRvb) chamber rvb lvl, hall w/d & late rvb time bass EQ gain treble EQ gain
789	B C	Pno & Syn String (28 RoomSRSchDl Hall) hall rvb lvl; room rvb time & w/d SRS: center, space, treble gain
790	B	Fluid Grand (142 EnhcChorChDl FDR) FDR rvb lvl, aux w/d, aux mix delay

	C	FDR mix flange	
	D	FDR flange tempo	
791		Haunted Piano (144 auxRotoSp4T FlRv)	
	B	rvb lvl, aux mix rvb, aux rvb time	
	C	flange tempo	
	D	4-tap delay w/d	
792		Xylopiano (28 RoomSRSchDl Hall)	
	B	hall rvb lvl, room rvb time,	
	C	room rvb w/d; SRS center, space, bass gain	
	D	room rvb HF damp	
	E	SRS (piano) out gain	
	F	room rvb out gain	
793		Grand,Harp&Lead (1 RoomChorDly Hall)	
	B	hall rvb lvl	
	C	chor fb	
	D	room rvb w/d	
794		Water Piano (142 EnhcChorChDl FDR)	
	B	FDR rvb lvl, FDR w/d, FDR Mix Delay	
	C	FDR mix flange	
	D	FDR flange tempo	
795		StPno & OrchPad (28 RoomSRSchDl Hall)	
	B	hall rvb lvl, room rvb time, pad bass cut	
	C	SRS: center/space, treble gain	
	D	chor w/d	
	E	mix chor	
	F	chor fb	
	G	mix delay	
796		Grand & Pad (134 ChorChorCDR Spac)	
	B	space rvb lvl, CDR w/d	
	C	space rvb time	
797		Pop Grand Stack (143 EnhcChrChDl FDR2)	
	B	FDR w/d, rvb lvl, & mix delay;	
		chorus+delay w/d	
	C	chor+delay mix chor	
	D	chor+delay chor rate	
	E	FDR mix flange	
	F	FDR flange tempo	
	G	chor+delay mix delay	
798		Prepared Piano (151 ChDlSp4TF1Dl Phs)	
	B	rvb lvl, delay mix lvl	
	C	delay w/d	
	D	phaser fb	
	E	chor w/d	
	F	delay tempo	
	GKeyNum	tap delay pitch	
	MW	aux center freq LFO	
799		Tack Piano Stack (122 auxShap4MD Plate)	
	B	plate rvb lvl+time	
	C	treble boost, plate rvb HF damp	
	D	lo-mid boost	
	E	bass boost	
	F	treble boost	
	G	mix lvl (bells)	
800		Jungle Jam (62 BthQFlg4Tap Hall)	
	B	hall rvb lvl (FX1+FX2)	
	C	hall rvb lvl (FX4)	
	E	quantization dynamic range	
	F	flange fb	
	G	flange tempo	
	H	quantization w/d	
	PSw2	quantization+flange in/out	
801		Mbira Stack (99 auxPhsrFldblHall)	
	B	hall rvb lvl	
	C	hall rvb lvl	
	E	phaser LFO rate & center freq	
	F	phaser rate scale	
	PSw2	phaser in/out, EQ treble boost	
802		Ritual Metals (39 RmDsRotFl4t RvCm)	
	B	chamber rvb lvl, chamber rvb lvl	
	C	room rvb w/d	
	D	chamber rvb lvl	
	E	Lo & Hi rte	
	PSw2	toggle: room rvb/rotary+dist	
803		Prepared Mbira (7 RoomFlgEcho Hall)	
	B	room rvb w/d+time	

	C hall rvb lvl+time, flange w/d D flange fb lvl E flange LFO tempo F hall rvb lvl+HF damp, flange HF damping PSw2 toggle: room rvb/flange
804	Balinesque (7 RoomFlgEcho Hall) B room rvb w/d C hall rvb lvl (hybrid pan) D echo w/d (hybrid pan) E hall rvb lvl F flange w/d G flange fb lvl H flange LFO tempo PSw2 toggle: room rvb/flange
805	Ambient Bells (94 auxChorMDly Hall) B hall rvb lvl C delay w/d PSw2 MDly in/out, EQ parameters
806	World Jam 1 (34 RoomCmpChor Hall) B room rvb w/d C room rvb size scale D hall rvb lvl PSw2 toggle: room rvb/comp
807	World Jam 2 (3 RoomChorCDR Hall) B hall rvb lvl C room rvb time D hall rvb decay time E hall rvb lvl PSw2 toggle: room rvb/chor
808	India Jam (27 RoomSRSRoom Room) B aux room rvb lvl (C0 - F5) C aux room rvb lvl (F#5 - C 8) D aux rvb lvl (C0 - F5) PSw2 toggle: room rvb & SRS
809	Slo Wood Flute (69 auxPtchDst+ Chmb) B chamber rvb lvl C chamber rvb time PSw2 adds pitcher
810	Hybrid Pan Flute (7 RoomFlgEcho Hall) B hall rvb lvl, hall rvb lvl C room rvb time D room rvb HF damp PSw2 toggle: room rvb/flange
811	Chiff Brass Lead (26 RoomSrsCDR Hall) B hall rvb lvl C room rvb w/d, rvb time (synth brass) D delay lvl PSw2 toggle: SRS/CDR (pan flute)
812	Bell Players (11 RoomFIngCDR Hall) B hall rvb lvl C room rvb & flange w/d PSw2 toggle: room+flange/flange+CDR
813	Prs Koto (9 RmFlgChDly Room) B room1 rvb w/d C aux room rvb lvl D flange lvl, flange Xcouple PSw2 toggle: room1 rvb/flange
814	Medicine Man (7 RoomFlgEcho Hall) B hall rvb lvl, room rvb cut D hall rvb lvl E flange LFO tempo PSw2 toggle: room rvb/flange
815	Mbira (7 RoomFlgEcho Hall) B room rvb w/d D hall rvb lvl F flange fb lvl G flange LFO tempo PSw2 toggle: room rvb/flange
816	Kotobira (11 RoomFIngCDR Hall) B hall rvb lvl D hall rvb lvl E flange fb lvl F flange LFO tempo G flange Xcouple PSw2 toggle: room rvb/flange

817	Cartoon Perc (62 BthQFlg4Tap Hall)
B	booth rvb w/d
D	hall rvb lvl
E	quantization+flange lvl (dynamic range)
PSw2	toggle: booth rvb/quant+flg
818	CowGogiBell (76 HallGateFl4T Bth)
B	booth rvb lvl
C	hall rvb w/d
D	booth rvb time
E	booth rvb level
PSw2	toggle: hall/gate
819	Perc Pan Lead (98 auxFlngCDR Hall)
B	hall rvb lvl+time
C	delay mix
D	hall rvb lvl
PSw2	CDR in/out, EQ treb boost
820	Trippy Organ (126 GtRvShapMD1 Room)
B	gated rvb gate time
C	gated rvb rvb time
D	shaper amt
PSw2	toggle: gated rvb/shaper
821	Koto Followers (3 RoomChorCDR Hall)
B	hall rvb lvl
C	CDR rvb mix, hall rvb lvl
D	delay mix
E	delay fb
F	chor fb
PSw2	toggle: chor/CDR
822	Hybrid Horn (10 ChmbFlgGtRv Hall)
B	hall rvb lvl
C	flange w/d
D	hall rvb lvl
E	gated rvb w/d
F	gate time
G	gate release time
PSw2	toggle: flanger/gated rvb
823	Dyno EP Lead (3 RoomChorCDR Hall)
B	CDR rvb time
C	CDR delay mix
D	hall rvb lvl
E	hall rvb lvl
F	hall rvb w/d, time & HF damp
PSw2	toggle: CDR/room rvb
824	ParaKoto (92 auxFlgDist+ Hall)
B	hall rvb lvl
C	flange w/d
D	hall rvb lvl
PSw2	toggle: flange/dist
825	Super Clav (92 auxFlgDist+ Hall)
B	hall rvb lvl
C	flange fb lvl
D	delay w/d
PSw2	toggle: flange/dist+dly+chor
826	StrataClav (92 auxFlgDist+ Hall)
B	hall vb lvl
C	flange fb lvl
PSw2	toggle: flange/dist+dly+chor
827	Touch Clav (92 auxFlgDist+ Hall)
B	hall rvb lvl
C	flange w/d & fb lvl
PSw2	toggle: flange/dist+dly+chor
828	Bad Klav (91 auxChrDist+ Hall)
B	hall rvb lvl
C	chor fb lvl
D	rvb lvl
PSw2	chor in/out
829	Rad Rotor
830	B-2001
831	Perc Organ
832	Drawbar Organ CS (145 auxRotaryFDR Plt)
B	vib+chor in/out, vib/chor config
C	plate rvb lvl
D	plate rvb time
E	rotary hi+lo gain

	F rotary trem lvl G plate rvbHF damp MW rotary rate PSw2 toggle: rotary/FDR
833	Bebop Alto Sax (25 RmRotoFl4T CmpRv) B room rvb w/d, rvb time C aux comp+rvb lvl MW rotor speed PSw2 toggle: room rvb/rotary effect
834	Soft Alto Sax (65 ChamDstEcho Room) B room rvb lvl C room rvb time D chamber w/d E room rvb lvl F EQ treb boost PSw2 toggle: chamber & dist, EQ
835	Soprano Sax (63 ChmbTremCDR Room) B CDR rvb lvl C CDR chor mix D CDR delay mix E room rvb lvl F chamber rvb lvl G EQ treble cut PSw2 toggle: CDR/chamber rvb
836	Low Soft Sax (6 RoomFlngCDR Hall) B hall rvb lvl C room rvb w/d D room rvb time E EQ treble boost F hall rvb lvl G flange w/d H flange fb lvl PSw2 toggle: room rvb/flange
837	Air Reeds CS (34 RoomCmpChor Hall) B room rvb w/d & hall rvb lvl C room rvb time D room rvb HF damping E hall rvb lvl PSw2 toggle: room rvb & compressor
838	Jazz Muted Trp (23 RmSweepEcho Hall) B room rvb w/d, hall rvb lvl, hall rvb time C room rvb time D room+hall rvbs HF damp E hall rvb lvl PSw2 toggle: room rvb/LFO filt sweep
839	Jazz Lab Band (3 RoomChorCDR Hall) B room rvb w/d, hall rvb lvl C room rvb time D room rvb HF damp E hall rvb lvl F chor w/d G chor fb lvl PSw2 toggle: room rvb/chor
840	Harmon Section (73 auxChorFlRv Cmb4) B chamber rvb lvl C chmbr rvb absorption, HF dmpng, treb cut D chamber rvb lvl E chor fb lvl F chor w/d PSw2 chor in/out
841	Sfz Cres Brass (111 PltEnvFl4T Room) B plate rvb w/d, room rvb lvl C room rvb HF damp, lopass freq D room rvb lvl F env filt resonance G env filt minimum freq GAttVel env filt freq sweep range PSw2 toggle: plate rvb/env filt
842	Neo Stabs (127 GtdEnhcStIm Room) B room rvb lvl C room rvb time D gate rvb w/d, room rvb pre-delay E gated rvb gate release rate F room rvb lvl G enhancer EQ high boost

	PSw2	toggle: gated rvb/enhcr
843	B C D E PSw2	Gtr Jazz Band (42 RoomRmHall Hall) hall rvb lvl room1 rvb w/d (bass & drums) room2 rvb w/d (gtr & horns) room2 rvb time (gtr & horns) room2 size (gtr & horns)
844	B C D MW/ SftPed PSw2	Full Rock Band (25 RmRotoFl4T CmpRv) vib config+in/out chamber rvb w/d flange fb+4Tap mix (gtrs) rotary speed tap level
845	B C D E PSw2	World Rave Kit (132 GtRbSwpFlt FlDly) gated rvb w/d sweep filt w/d gated rvb time flange delay lvl toggle: gated rvb/sweep filt
846	B C PSw2	Punch Gate Kit (154 RoomRoomSRS CmRv) room rvb lvl & aux rvb lvl; room rvb absorption cut compress+rvb lvl (hi-hat & snare) compressor release time, config
847	B C PSw2	Shadow Kit (155 RoomRoom Room) rvb lvls aux room lvl (elec. drum kit C#6-G 9) rvb boost
848	B C D PSw2	Fat Traps (7 RoomFlgEcho Hall) room rvb w/d flange w/d+fb lvl hall rvb lvl room rvb time cut, flange tempo
849	B C D PSw2	Generator Kit (158 EnhcSp4T Hall) hall rvb lvl 3-band enhcr (in/out) tap delay w/d hall rvb time, EQ, echo length, HF damp
850	B C D E PSw2	Shudder Kit (75 HallPtchLsr Hall) aux hall rvb lvl, room size pitcher w/d hall rvb w/d Pitcher pitch toggle: Pitcher/LasrVerb
851	B C PSw2	Crowd Stomper (154 RoomRoomSRS CmRv) FX1 rvb w/d, aux rvb w/d & time FX1 aux lvl & predly, FX2 rvb time toggle: room1/room2 rvbs
852	B C PSw2	Econo Kit (38 RoomCmpCh4T Hall) hall rvb lvl+time room rvb w/d+time toggle: compressor/chor+4Tap
853	B C D E	EDrum Kit 1 (135 ChDlDstEQ Hall) hall rvb lvl dist w/d chor/delay w/d hall HF damp, late rvb time
854	B C PSw2	EDrum Kit 2 (154 RoomRoomSRS CmRv) rvb lvls aux rvb lvl toggle room rvb/SRS
855	B C D E PSw2	Dog Chases Tail (57 auxDistLasr Acid) rvb lvl (FX2) rvb lvl (FX3) rvb lvl (FX1) LaserVerb w/d in A: dist in/out in B: toggle: dist & LaserVerb
856	Data B C D	Saw Loop Factory (123 FlgEnv4Tap Plate) Filter threshold, freq & EQ rvb lvl env filt w/d filt resonance

	PSw2	toggle: env filt/4Tap, EQ
857	B C D GAttVel PSw2	Two Live Bass (61 CompEQmphCh Room) room rvb lvl comp ratio EQMorph panning EQMorph config toggle: compressor/EQMorph
858	B C D E F G PSw2	Dual/Tri Bass (61 CompEQmphCh Room) room rvb lvl comp ratio EQ treble boost room rvb lvl EQ gain EQ freq scale toggle: comp/EQmorph
859	B C D PSw2	Clav-o-Bass (58 EnhcManPhs Room) room rvb lvl notch control phaser LFO rate phaser fb boost
860	B C D E F MWheel MPress PSw2	Chirp Bass (130 auxEnvSp4T GtVrb) gated rvb lvl env filt w/d env filt attk rate gated rvb lvl delay w/d env filt freq sweep env filt resonance toggle: env filt/delay
861	B C D E F G MPress PSw2	DigiBass (69 auxPtchDst+ Chmb) chamber rvb lvl pitcher w/d Pitcher pitch odd wts pitch offset LFO chamber rvb lvl dist lvl Pitcher pair wts. toggle: pitcher/dist+
862	B C D E PSw2	Mono Synth Bass (57 auxDistLasr Acid) rvb lvl dist w/d dist drive LaserDelay time toggle: dist/LaserDelay
863	B C D E F G PSw2	Touch MiniBass (23 RmSweepEcho Hall) hall rvb lvl sweep filt w/d sweep filt LFO period sweep filter phase sweep filter LFO amplitude min freq sweep filter LFO amplitude max freq toggle: sweep filt/echo
864	B C D E F PSw2	Ostinato Bass (62 BthQFlg4Tap Hall) hall rvb lvl booth rvb w/d quant+flg w/d & mix flange w/d flange fb toggle: booth/aux hall & quant+flg
865	B C PSw2	House Bass (77 HallChorFDR Room) hall rvb w/d, room rvb lvl chor w/d toggle: hall rvb/chor
866	B C D PSw2	Dubb Bass bad (90 auxPhsrFDR Hall) hall rvb lvl phaser LFO depth phaser LFO rate vib phaser in/out
867	B C PSw2	Straight Strat (6 RoomFlngCDR Hall) hall rvb lvl & HF damp CDR w/d toggle: CDR/room rvb

868	Chor Gtr (63 ChmbTremCDR Room) B room rvb lvl C CDR w/d D CDR rvb mix E CDR chor mix F CDR delay mix PSw2 tremelo/CDR
869	Strataguitar (101 auxFlLsr SwHall) B hall rvb lvl C LaserVerb w/d PSw2 flange in/out, EQ, LaserVerb config
870	Elect 12 String (39 RmDsRotFl4t RvCm) B rvb+comp lvl C flange mix D flange tempo E flange Xcursion F tap delay mix G flange+4T w/d, out gain MW rotor rate PSw2 toggle: rotary+dist/flng+4Tap
871	Dyn Jazz Guitar (101 auxFlngLasr Hall) B hall rvb lvl C hall rvb time D flange w/d E flange LFO tempo F flange fb lvl PSw2 flange in/out
872	Pedal Steel (101 auxFlngLasr Hall) B rvb lvl, time, HF damping D flange fb lvl E flange LFO tempo PSw2 adds flange
873	Strummer DistGtr (94 auxChorMDly Hall) B hall rvb lvl C delay w/d PSw2 chor in/out
874	Rock Axe (93 auxChrDst+ Hall) B delay w/d, hall rvb lvl C chor fb lvl D chor rate E chor depth (left channel) PSw2 dist EQ, chorus in/out
875	Hammeron (16 RoomPhsrCDR Hall) B hall rvb lvl C delay lvl PSw2 toggle: CDR/room
876	Rock Axe mono (93 auxChrDst+ Hall) B delay lvl, rvb lvl C dist+chor w/d D dist+chor fb lvl E dist+chor rate F dist+chor depth PSw2 toggle: chorus/dist+chor+dly
877	Attack Stack (84 HallFlgChDl Hall) B rvb lvls, times C HF damp, EQ boost PSw2 toggle: hall/flange
878	SkinnyLead (137 AuxChorFlng CDR) B CDR lvl, rvb time C flange w/d & fb lvl, treble cut D CDR chor fb E flange LFO tempo G CDR delay tempo & fb PSw2 flange LFO1 phase, CDR chor rate cut, EQ
879	Q Sweep SynClav (137 AuxChorFlng CDR) B CDR lvl, rvb time C chor w/d, bass cut D chor fb & Xcouple E CDR delay mix F CDR delay tempo G CDR delay fb H CDR delay w/d PSw2 toggle: chor+CDR/flange
880	Anna Mini (13 RmFlgFXFlng Flng) B flange lvls

	C FX2 flange tempo & lvl D FX2 flange fb lvl E EQ bass boost F aux flange w/d & fb lvl G aux flange LFO tempo PSw2 toggle: "Delirium" & "Throaty" flanges
881	Ballad Stack (29 RoomSrsCDR CDR) B aux CDR lvl C aux CDR chor fb lvl D aux CDR delay fb & mix lvl E aux CDR chor rate F aux CDR delay tempo G SRS center freq cut, space boost PSw2 toggle: SRS/CDR
882	Big Stack (85 Hall Room SRS) B hall rvb w/d C SRS lvl D SRS center/space, EQ lo+hi boost PSw2 hall in/out, EQ
883	BrazKnuckles (85 Hall Room SRS) B hall rvb w/d & decay time C SRS lvl D SRS center/space E SRS EQ boost PSw2 hall rvb in/out, EQ, SRS panning
884	Hybrid Breath (140 EnhcChorChDl PCD) B PCD chor fb lvl C PCD delay fb & mix lvl D PCD lvl PSw2 chorus in/out
885	Hybrid Stack (13 RmFlgFXFlng Flng) B rvb w/d & quality C aux flange lvl D aux LFO tempo E aux flange w/d & fb lvl PSw2 toggle: room+aux flange/flange
886	Eye Saw (13 RmFlgFXFlng Flng) B aux flange lvl, EQ C flange w/d D flange fb lvl E aux flange w/d & fb lvl F aux LFO tempo G flange Xcursion, LFO tempo & Xcouple
887	Mello Hyb Brass (3 RoomChorCDR Hall) B room & hall rvb lvl, room w/d C chor fb lvl D chor Xcouple GAttVel EQ bass boost PSw2 toggle: room & chor
888	Sizzl E Pno (97 auxPhasStIm Hall) B hall rvb lvl, time, & HF damp C phaser w/d D phaser LFO rate E hall rvb lvl F EQ, st img spread & ctr gain PSw2 toggle: phaser/st img
889	My JayDee (8 RmFlngStImg Garg) B rvb lvl C rvb HF damp (all) PSw2 toggle: room rvb/flange
890	Slo SynthOrch (97 auxPhasStIm Hall) B hall rvb w/d & time C EQ boost, st img in gain D hall rvb early refl boost, late refl cut PSw2 st img mix
891	SpaceStation (8 RmFlngStImg Garg) B EQ mod F flange fb lvl G flange LFO tempo, garage rvb lvl H garage rvb w/d PSw2 st img mix
892	Glass Web (152 auxFlgDst+ ChLsD) B aux chor/delay lvl, flange LFO tempo, aux chor mix & fb C flange fb

	D	aux chor/LaserDelay w/d
	E	aux delay fb
	F	aux delay tempo
	G	flange w/d & Xcurs, aux chor rate
893		Circus Music (151 ChDlSp4TF1Dl Phs)
	B	4Tap w/d
	C	4Tap fb lvl
	D	phaser lvl, 4Tap mix lvl
	E	4Tap fb image
	F	phaser fb
	G	phaser notch/bandpass
	H	4Tap delay tempo
	MW	phaser rate
	GKeyNum	4Tap pitch adj
894		Mandala (151 ChDlSp4TF1Dl Phs)
	B	phaser lvl (koto)
	C	4Tap w/d & fb (koto)
	D	4Tap fb image
	E	phaser fb
	F	4tap delay tempo
	GKeyNum	4Tap pitch adj
	MW	phaser rate
895		Slow Strat 136 auxDPanCDR ChPlt)
	B	aux chor/plate rvb lvl
	C	panner LFO rate & pulsewidth
	D	aux chor fb
	E	aux chor depth
	F	aux chor Xcouple
896		Fluid Koto (151 ChDlSp4TF1Dl Phs)
	B	phaser lvl, EQ
	C	tap delay w/d & fb
	D	tap delay fb image
	E	phaser fb
	H	tap delay tempo
	GKeyNum	tap delay pitch adj
	MW	aux phaser center freq
897		Koreana Pad (134 ChorChorCDR Spac)
	B	space rvb lvl, tap chor w/d
	C	tap chor fb
	D	tap chor LFO rate
	E	chor fb lvl
	PSw2	toggle: tap chor/chor
898		Tangerine (140 EnhcChorChDl PCD)
	B	PCD chor fb, enhcr mid & lo drive
	C	PCD delay mix & fb
	D	PCD lvl
899		Planet 9 (137 AuxChorFlng CDR)
	B	CDR lvl & rvb mix & time
	C	flange w/d & fb, EQ
	D	CDR chor fb
	E	flange LFO tempo
	F	flange LFO phase
	G	CDR delay tempo & fb
900		TotalCntrl Orchl (110 Chapel Room Hall)
	B	room, hall, & chapel rvb time
	C	chapel level
	PSw2	toggle room rvb
901		TotalCntrl Orch2 (110 Chapel Room Hall)
	B	room, hall, & chapel rvb lvl+time
	PSw2	toggle chapel
902		BaroqueOrchestra (110 Chapel Room Hall)
	B	room, hall, and chapel rvb lvl+time
	PSw2	toggle chapel
903		Oboe&Flute w/Str (108 ChapelSRS Hall)
	B	chapel rvb w/d+time
904		Horn&Flute w/Str (110 Chapel Room Hall)
	B	room & hall rvb lvl, room rvb time
905		Trp&Horns w/Str (110 Chapel Room Hall)
	B	room & hall rvb lvl
	PSw2	decreases reverb time
906		Piccolo (42 RoomRmHall Hall)
	B	aux hall rvb lvl+time, room rvb w/d
	PSw2	decreases aux hall brightness
907		Orchestral Flute (42 RoomRmHall Hall)

	B PSw2	aux hall rvb lvl+time increases room (FX1) time
908	B PSw2	Solo Flute (42 RoomRmHall Hall) aux hall rvb lvl+time, room rvb time decreases aux hall brightness
909	B PSw2	Orchestral Oboe (42 RoomRmHall Hall) aux hall rvb lvl+time decreases aux hall brightness and room (FX1) time
910	B PSw2	Solo Oboe (42 RoomRmHall Hall) aux hall rvb lvl+time decreases aux hall brightness and room (FX1) time
911	B	2nd Oboe (42 RoomRmHall Hall) aux hall rvb lvl
912	B	Orch EnglishHorn (42 RoomRmHall Hall) aux hall rvb lvl+time
913	B	Solo EnglishHorn (42 RoomRmHall Hall) aux hall rvb lvl+time
914	B	Orch Clarinet (42 RoomRmHall Hall) aux hall rvb lvl+time
915	B	Solo Clarinet (42 RoomRmHall Hall) aux hall rvb lvl+time
916	B	Orch Bassoon (42 RoomRmHall Hall) aux hall rvb lvl+time
917	B	Solo Bassoon (42 RoomRmHall Hall) aux hall rvb lvl+time
918	B	Woodwinds 1 (42 RoomRmHall Hall) aux hall rvb lvl & time
919	B	Woodwinds 2 (42 RoomRmHall Hall) aux hall rvb lvl+time
920	B	Dynamic Trumpet (34 RoomCmpChor Hall) room & hall rvb lvl+time
921	B	Copland Sft Trp (42 RoomRmHall Hall) aux hall rvb lvl
922	B	Orch Trumpet (42 RoomRmHall Hall) aux hall rvb lvl, room rvb time
923	B	Soft Trumpet (42 RoomRmHall Hall) aux hall rvb lvl
924	B	Strght Mute Trp (35 RoomComp Hall) aux hall rvb lvl
925	B	French Horn MW (44 Room Hall Hall) aux hall rvb lvl, room rvb time
926	B	Slow Horn (44 Room Hall Hall) aux hall rvb lvl, room rvb time
927	B	F Horn Con Sord (44 Room Hall Hall) aux hall rvb lvl+time, room rvb time
928	B MWheel	F Horn a2 MW (44 Room Hall Hall) aux hall rvb lvl, room rvb time aux hall time
929	B	French Horn Sec (44 Room Hall Hall) aux hall rvb lvl, room rvb time
930	B	French Horn Sec2 (44 Room Hall Hall) aux hall rvb lvl, room rvb time
931	B	Solo Trombone (44 Room Hall Hall) aux hall rvb lvl, room rvb time
932	B	Tuba (44 Room Hall Hall) room & aux hall rvb lvl
933	B C D E PSw2	Dyn Hi Brass (42 RoomRmHall Hall) room (FX1) time & aux hall rvb lvl room (FX2) w/d room (FX2) HF damp room (FX2) time toggle room (FX1) and room (FX2)
934	B C PSw2	Dyn Lo Brass (44 Room Hall Hall) aux hall rvb lvl, room rvb time aux hall HF damp toggle room
935	B MWheel PSw2	Dyn Brass & Horn (44 Room Hall Hall) aux hall rvb lvl & room rvb time room rvb roll-off toggle room

936		Soaring Brass	(44 Room Hall Hall)
	B	aux hall rvb lvl+time	
937		MarcatoViolin MW	(35 RoomComp Hall)
	B	room & hall rvb lvl	
938		Solo Violin	(35 RoomComp Hall)
	B	room & hall rvb lvl	
939		2nd Violin	(35 RoomComp Hall)
	B	hall rvb lvl	
	C	room level	
940		Orch Viola	(35 RoomComp Hall)
	B	room & hall rvb lvl	
941		Solo Viola	(35 RoomComp Hall)
	B	room & hall rvb lvl	
942		Slow Viola	(35 RoomComp Hall)
	B	hall rvb lvl	
943		MarcatoCello MW	(35 RoomComp Hall)
	B	room & hall rvb lvl	
944		Solo Cello	(35 RoomComp Hall)
	B	room & hall rvb lvl	
945		Slow Cello	(35 RoomComp Hall)
	B	room & hall rvb lvl	
946		Arco Dbl Bass	(35 RoomComp Hall)
	B	hall rvb lvl	
	C	room level	
947		Slow Arco Bass	(35 RoomComp Hall)
	B	room & hall rvb lvl	
948		Brt Dbl Bass	(35 RoomComp Hall)
	B	room & hall rvb lvl	
949		Touch Strings	(86 Hall Room Room)
	B	hall rvb w/d+time	
950		Fast Strings MW	(86 Hall Room Room)
	B	hall rvb w/d+time	
951		Chamber Section	(86 Hall Room Room)
	B	hall rvb time	
952		Sfz Strings MW	(86 Hall Room Room)
	B	hall rvb w/d+time	
953		Sweet Strings	(86 Hall Room Room)
	B	hall rvb w/d+time	
954		Baroque Strg Ens	(86 Hall Room Room)
	B	hall rvb w/d+time	
955		Big String Ens	(86 Hall Room Room)
	B	hall rvb w/d+time	
956		Bass String Sec	(86 Hall Room Room)
	B	hall rvb w/d+time	
957		Pizzicato String	(86 Hall Room Room)
	B	hall rvb w/d+time, HF damp	
958		Wet Pizz	(86 Hall Room Room)
	B	hall rvb w/d+time, HF damp	
959		Arco & Pizz	(86 Hall Room Room)
	B	hall rvb w/d+time, HF damp	
960		Classical Guitar	(108 ChapelSRS Hall)
	B	chapel rvb w/d+time	
961		Virtuoso Guitar	(108 ChapelSRS Hall)
	B	chapel rvb w/d+time	
962		Acoustic Bass	(34 RoomCmpChor Hall)
	B	room rvb w/d	
963		Snappy Jazz Bass	(34 RoomCmpChor Hall)
	B	room rvb w/d	
964		Dynamic Harp	(108 ChapelSRS Hall)
	B	chapel rvb w/d+time	
965		Harp w/8ve CTL	(108 ChapelSRS Hall)
	B	chapel rvb w/d+time	
966		Harp Arps	(108 ChapelSRS Hall)
	B	chapel rvb w/d+time	
967		Celesta	(108 ChapelSRS Hall)
	B	chapel rvb w/d+time	
968		Pipes	(108 ChapelSRS Hall)
	B	chapel rvb w/d	
	C	hall rvb lvl	
969		Pedal Pipes 2	(108 ChapelSRS Hall)
	B	chapel rvb w/d	
	C	hall rvb lvl	

970	B	Church Bells room & hall rvb lvl	(109 ChapelSRS Hall2)
971	B C	Glockenspiel chapel rvb w/d+time hall rvb lvl	(108 ChapelSRS Hall)
972	B C	Xylophone chapel rvb w/d+time hall rvb lvl	(108 ChapelSRS Hall)
973	B C	Chimes chapel rvb time hall rvb lvl	(109 ChapelSRS Hall3)
974	B	Timpani/Chimes chapel+hall rvb lvl & time	(108 ChapelSRS Hall)
975	B C	Timpani chapel rvb w/d hall rvb lvl	(108 ChapelSRS Hall)
976	B C	Timpani & Perc chapel rvb w/d+time hall rvb lvl	(110 Chapel Room Hall)
977	B	Big Drum Corp rvb w/d	(89 HallRoomChr Hall)
978	B C	Orch Percussion1 hall rvb lvl dry lvl cut	(100 auxSRSRoom Hall)
979	B	Orch Percussion2 hall rvb lvl	(100 auxSRSRoom Hall)
980	B C	Jam Corp (89 HallRoomChr Hall) rvb w/d rvb absorption amount	
981	B C	Conga & Perc room rvb w/d hall rvb lvl	(45 Room Room Hall2)
982	B C	Woody Jam Rack rvb w/d rvb absorption amount	(37 BthComp SRS Hall)
983	B C	Metal Garden booth rvb w/d+absorption amount hall reverb lvl	(62 BthQFlg4Tap Hall)
984	B C D	Hot Tamali Kit room rvb w/d+time hall rvb lvl & time hi freq damping lvl	(38 RoomCmpCh4T Hall)
985	B	Funk Kit aux rvb lvl	(158 EnhcSp4T Hall)
986	B C D	Magic Guitar hall rvb lvl ChorDelayRvb w/d rvb w/d	(3 RoomChorCDR Hall)
987	B	Glass Bow 2 hall rvb lvl	(26 RoomSrsCDR Hall)
988	B C D SostPd	Synth Orch room rvb lvl room rvb time LFO depth infinite decay i/o	(52 auxChrMDly Room)
989	B	Nooage InstaHarp hall rvb lvl	(102 auxEnh4Tap Hall)
990	B	AC Dream rvb lvl	(121 auxMPFlgLasr Plt)
991	B	Synth Dulcimer aux hall rvb lvl	(40 RoomRmHall Hall)
992	B C	Glistener aux plate rvb lvl flange+delay w/d	(113 PltEnvFl4T Plate)
993	B C	Afro Multi CTL hall rvb lvl gate rvb w/d	(129 GtdEnhcStIm Hall)
994	B C	Tranquil Sleigh room rvb lvl flange w/d	(74 HallFlgChDl Room)
995	B C	Batman Strings Batcave rvb lvl flange w/d	(11 RoomFingCDR Hall)

996	Ethnoo Lead (119 auxChorDist+ Plt)
B	plate rvb lvl
C	chor w/d
D	tube drive lvl
E	MD delay w/d
F	MD delay time
G	MD delay fb
997	Orch Pad CTL (66 ChamFlg4Tap Hall)
B	room & hall rvb lvl
C	hall rvb decay time
D	EQ bass boost
E	EQ treble boost
998	Choral Sleigh (2 RmChorChRv Hall)
B	aux hall rvb lvl, voice aux lvl
C	voice room rvb w/d
MWheel	pad chor w/d, voice chor w/d
PSw2	toggles room & chorus
999	Pad Nine (98 auxFlngCDR Hall)
B	hall rvb lvl
C	hall rvb time
D	hall rvb lvl
F	flange w/d
G	flange fb lvl
PSw2	toggle flanger

Setups

1	Sahara Touch (33 ChmbCompCDR Hall) F "The Chase" (zone 3) rvb G "Cee Tuar" dly/chor lvl; "Magic Orch" rvb
2	Ethereal Split (96 auxChorChDl Hall) F fretless bass rvb G flutes rvb, echo w/d + mix lvl
3	Slo Orchestra (104 EnhChorChDl Hall) G all zones rvb lvl GattVel high strings enhcr hi drive, rvb HF
4	Whirligig (96 auxChorChDl Hall) G arpeggiated percussion (zone 7) rvb & chor fb; marimba and bell tree rvb
5	ModernHarpsichord (6 RoomFlngCDR Hall) F organ & synth rvb & echo lvl G zones 1-4 hall rvb lvl
6	Kogs & Things (75 HallPtchLsr Hall) G upper voices LaserVerb w/d, contour & hall rvb lvl
7	Desert Soil (98 auxFlngCDR Hall) F pad flange w/d G pad & marimba delayed rvb
8	Mellow BigBand (70 auxChorFlRv Cmbr) E cymbals flange lvl F bass chor lvl G all zones rvb lvl
9	Fusion Split (93 auxChrDst+ Hall) E synth clavinet tube drive F synth clavinet delay lvl G electric pianos rvb lvl
10	Touch Rock Band (25 RmRotoFl14T CmpRv) F organ small rvb w/d G all zones rvb H guitars delay lvl MW/SftP rotor control
11	Plucksynths (6 RoomFlngCDR Hall) G marimba & EP CDR w/d; pads hall rvb lvl H marimba & EP delay lvl
12	Big pad RbnVel (90 auxPhsrFDR Hall) E pad phaser LFO Rate F pad phaser w/d G "Aurora" & "med pad" hall rvb lvl
13	Cembellophone (98 auxFlngCDR Hall) G zones 3-6, 8 hall rvb lvl
14	Mideast Drone (17 RmPhsrQuFlg Hall) G zones 1,3,7,8 rvb lvl
15	Ribbon Thunder (97 auxPhasStIm Hall) F thunder panning & phaser rate G hall rvb lvl
16	Press Roll Orch (104 EnhChorChDl Hall) E all zones rvb HF damp F all zones rvb lvl
17	C7 F7 G7 Groove (10 ChmbFlgGtRv Hall) E rvb HF damp F bass, electric kick rvb lvl G drums, percussion, synth bass, brass rvb lvl
18	Folk Comper (74 HallFlgChDl Room) F guitars delay w/d G all zones rvb lvl MPress bass flange LFO fb
19	Extra Perc Drums (8 RmFlngStImg Garg) F stereo image LFO rate G all zones rvb lvl
20	Chiffer Lead (124 EnhrFlgCDR Plate) F flute delay lvl G synth calliope rvb lvl
21	Slider Play (20 RmEQmphEcho Hall) F EQmorph "B" freq G rvb lvl MWheel EQmorph "A" freq
22	Mist Strings (65 ChamDstEcho Room) G synth pads rvb lvl
23	New Pulsar (75 HallPtchLsr Hall) F synth pad LaserVerb lvl & contour G "Cymbal Sings", arp synth rvb lvl

24	It's Coming (119 auxChorDist+ Plt) F "Microwave" (zone 3) chor pan G choir rvb lvl
25	SummerSnows (23 RmSweepEcho Hall) E EP echo w/d F fretless bass hall rvb lvl G EP, ac gtr hall rvb lvl; ac gtr rm rvb lvl
26	OrchScape (99 auxPhsrFldblHall) E rvb HF damp F F - zones 2-4, 6,7 rvb lvl G violins, "Horn & Flute" (zone 5) rvb lvl
27	Threeway Xfade (99 auxPhsrFldblHall) F rvb HF damp G all zones rvb lvl
28	Royal DynBrass (99 auxPhsrFldblHall) E strings & synth brass flange depth F trumpet rvb lvl G rvb lvl
29	Fairlite Stack (133 ChRvStIEcho Hall) G string pads rvb lvl
30	Mr. Wiz (9 RmFlgChDly Room) E arpeggiated bass flange lvl F string pad chor lvl G guitar pad rvb lvl
31	New Dawn (88 Hall Flng Hall) E synth pad flange LFO fb F synth pad flange Tempo G slow pad+choir rvb lvl & time H rvb HF damp
32	Sudden Horrors (84 HallFlgChDl Hall) E strings flange fb & rate F pad chor fb & rate G hall rvb lvl
33	Cisco Kid (25 RmRotoFl14T CmpRv) E bass aux rvb+comp lvl G "Dynamic Percussion" (zone 3) rvb time SftPed rotor speed
34	ToyBuphone (77 HallChorFDR Room) E bells, synth chor w/d G marimba rvb w/d
35	F1 Perc Comper (73 auxChorFlRv Cmb4) E synth marimba chor w/d F bells flange w/d G rvb lvls
36	Multi Chords (82 HallRsFltChDl Rm) F synth pad chor lvl; EQ LFO rate G arpeggiated marimbas hall rvb
37	3-Sec Talk Sldrs (19 RmEQmphEcho Comp) E EQmorph "B" freq scale G EQmorph "A" freq scale
38	FM Slider Play (112 PlatEnvFl14T Filt) G rvb mix H LFO filter lvl & phase
39	E Grand pad (94 auxChorMDly Hall) D piano (zone 1) chor w/d E crystal pad chor w/d G all zones rvb lvl
40	BalladCompsplit (103 EnhcChorCDR Hall) D synth basses enhcr brightness E pad, synth, EP chor w/d F EP chor LFO depth G plate & hall rvb lvl
41	Maggie May (71 auxChorFlRv Cmb2) F ac gtr, banjo chor w/d G rvb lvls H guitars flange lvl
42	EPno pad RbnVel (3 RoomChorCDR Hall) LRbn marimbas room rvb lvl D "Meditation Pad" (zone 2) delay lvl E EP chor w/d F "Meditation Pad" chor w/d G all zones hall rvb lvl
43	Dukes Up (6 RoomFlngCDR Hall) E synth clav chor lvl

Setups

F	clav delay lvl
G	room & hall rvb lvl
44	F1 Latin Comper (2 RmChorChRv Hall)
F	EP+ac gtr chor fb
G	all zones rvb lvl
45	Floyd's Echo (66 ChamFlg4Tap Hall)
E	mute gtr, "Tranquil Pluck" delay fb
F	mute gtr, "Tranquil Pluck" delay lvl
G	mute gtr chmb & hall rvb lvl
46	Poly Portem (79 HallFlng8Tp Room)
F	portamento synths flange w/d
G	hall & room rvb lvl
47	C2 & Lead (64 ChmbCmpFlRv Hall)
F	drms cmb rvb lvl;synth pad+lead room rvb lvl
G	synth lead hall rvb lvl
48	PowerLead (93 auxChrDst+ Hall)
F	zones 2-4 delay lvl
G	zone 1 hall rvb lvl
H	zones 2-4 delay time
49	Big Synbrass (6 RoomFlngCDR Hall)
F	synth brass delay Tempo
G	synth brass & bass rvb, flg & dly lvls
H	synth brass delay fb
50	CtlPedZawiSplit (92 auxFlgDist+ Hall)
G	pads, strings, lead synth rvb lvl
Breath	lead synth chor attenuation
51	Clav EP Organ (117 auxEnvSp4T Plate)
E	EP env filt w/d
F	EP env filt attack rate
G	all zones rvb lvl
MPress	env filter resonance cut
52	Toxic Cheese (75 HallPtchLsr Hall)
E	"Malletoo" (zone 3) Pitcher freq
F	"Malletoo" LsrVrb lvl & contour
G	Ptchr lvl & LsrVrb spacing; EP rvb lvl
53	Floyd Wheel (70 auxChorFlRv CmbR)
E	"Arystal" (zone 2) rvb/flg routing
F	"Arystal" flange fb
G	string pad, 12-string rvb lvl
54	Under Water (33 ChmbCompCDR Hall)
E	delay lvl
G	"Arrakis Grand" (zone 2)+pad rvb lvl
55	Lullaby (90 auxPhsrFDR Hall)
F	"Bamboo Voices" (zone 2) flange w/d
G	"Bamboo Voices" rvb lvl
MPress	flute lead phaser w/d, LFO Rate, rvb lvl
56	Alazawilude (23 RmSweepEcho Hall)
G	all zones rvb lvl
57	Three Leads (16 RoomPhsrCDR Hall)
F	flute lead delay lvl
G	calliope lead, synth lead, bass pad rvb lvl
58	News Room (66 ChamFlg4Tap Hall)
G	bass, gtrs flange w/d
MPress	synth brass rvb lvl
59	Aqua Ribbon (7 RoomFlgEcho Hall)
E	string pad delay lvl
F	string pad flange w/d & rvb lvl
G	percussive pad rvb lvl
60	New Age Organ (123 FlgEnv4Tap Plate)
E	synth bass env filt release rate
F	synth gtr delay lvl cut, fb boost
G	env filt w/d; "Resorgan"/fretless flange w/d; rvb lvl
61	Drum Arps (123 FlgEnv4Tap Plate)
D	zone 1 env filt resonance
E	zone 4 delay lvl
F	zone 4 rvb lvl
G	zone 1 rvb lvl
62	Perc Stack (27 RoomSRSRoom Room)
E	calliope lead rvb Lvl
F	marimba rvb lvl
G	percussion rvb lvl
63	3-sec E Pno (118 auxShap4MD Plate)
A	Mdly Tap1R mix (flange)

B	Mdly Tap1L mix (echo)
C	Mdly Tap2L mix (chor)
D	Mdly Tap2L LFO depth (chor)
E	Mdly Tap2R mix (flange)
F	Mdly Tap2R LFO rate (flange)
G	rvb lvl & time
64	Touch Stick (71 auxChorFlRv Cmb2)
E	electric piano chor w/d
F	synth clav flange w/d
G	hall & chmb rvb lvl
65	Ballad Comp (92 auxFlgDist+ Hall)
E	EP chor w/d, panning
F	EP echo lvl
G	rvb lvl
66	Dual Synth (98 auxFlngCDR Hall)
F	"Magic Orch" CDR w/d
G	all zones rvb lvl
67	C2 Jam (97 auxPhasStIm Hall)
E	drums (zones 2,3)+synth StImg lvl
F	rvb HF damp (boost)
G	all zones rvb lvl
68	Hertz (22 RmEQmph4Tap Hall)
E	synth gtr echo fb lvl
F	synth gtr echo lvl
G	hall & room rvb lvl
69	Digi Ensemble (33 ChmbCompCDR Hall)
G	slow strings CDR w/d; pad+bass hall rvb lvl
70	Pluck Stack (81 HallChorCDR Hall)
E	synth gtr delay lvl
F	synth gtr chor w/d
G	cymbal & EP rvb lvl; synth gtr CDR w/d
MPress	synth guitar chor depth
71	Quillmeister (41 Room Room SRS2)
F	synth gtr SRS lvl
G	room rvb lvls
72	Organ Select (43 Room Room Hall)
G	church & pipe organs hall rvb lvl
73	Perc Stack 2 (6 RoomFlngCDR Hall)
F	marimba delay lvl
G	synth gtr, percussion hall rvb lvl
74	Action Scene (92 auxFlgDist+ Hall)
E	clavinet (zones 1+2) flange w/d & fb
F	fuzz bass Mdly w/d & chor depth
G	pad hall rvb lvl
75	Rusty Teeth (95 auxChorSp6T Hall)
D	bass chor w/d
E	lead & bass synth chor fb
F	lead & bass synth rvb lvl
G	pad rvb lvl
76	Split Stack (9 RmFlgChDly Room)
E	bells echo (attenuates)
G	all zones rvb lvl; synth gtr flange lvl
77	Pulse Brass (62 BthQFlg4Tap Hall)
E	synth brass quant lvl
F	synth brass echo lvl
G	synth (zone 5) flange w/d, rvb lvl cut
78	Majesty (120 auxShFlgChDl Plt)
F	rvb time
G	all zones rvb lvl
H	synth bass delay lvl, chor w/d
79	Classy Orch (2 RmChorChRv Hall)
F	bone & synthbrass chor w/d
G	rvb lvl, time & HF damp
80	Motion pad (16 RoomPhsrCDR Hall)
F	EP phaser w/d
G	all zones rvb lvl
81	Wiry Comp 3-Sec (17 RmPhsrQuFlg Hall)
G	synth clav room w/d; clavinet hall lvl
82	GrimlyFiendish (101 auxFlLsr SwHall)
F	"Microwave"+"Enterprize" LaserVerb lvl
G	"Solina Phaze"+"Magic Orch" hall rvb lvl
83	Hold & Tap (95 auxChorSp6T Hall)
E	percussion echo fb
F	percussion echo lvl

Setups

G	string pad rvb lvl
84	LayeredSnare Kit (60 EnhcCmpFlng Room)
F	zones1-6, 8 rvb HF damp
G	zones1-6, 8 rvb lvl
GAttVel	zones1-6, 8 rvb time; zone 7 flange parameters
85	C#2 Jam (106 CompFlgChor Hall)
F	arpeggiated percussion chor fb lvl
G	rvb time & early ref
MW	trigger organ flanger
86	PassionPad (85 Hall Room SRS)
E	SRS center boost, space cut
LRib	SRS bass cut, treble boost
G	rvb lvls
87	Fusioner (17 RmPhsrQuFlg Hall)
F	synth bass quant dist lvl
G	rvb lvl; e. piano phaser lvl
88	Duo (26 RoomSrsCDR Hall)
F	kalimba, synth gtr CDR w/d, delay lvl
G	ac gtrs room rvb lvl
89	A2 Foot Drummer (3 RoomChorCDR Hall)
E	arpeggiated drums CDR w/d
F	static drums rvb pre-delay
G	static drums rvb lvl
90	Aqua Choir (20 RmEQmphEcho Hall)
F	choir delay lvl
G	all zones rvb lvl
91	Massy Orch (28 RoomSRSchDl Hall)
G	all zones hall rvb lvl
92	Mechanical Mike (120 auxShFlgChDl Plt)
F	guitar echo lvl
G	all zones plate rvb lvl
93	Haunted House (92 auxFlgDist+ Hall)
F	arpeggiated instruments flange fb lvl
G	organ & ghost whistle rvb decay time
94	All Alone (85 Hall Room SRS)
G	kotolin+marimba SRS lvl, rvb time
95	Witchcraft (14 SpaceFlng Hall)
G	all zones rvb lvl
96	Fallout (11 RoomFlngCDR Hall)
G	all zones rvb lvl
97	ControlSetupx015 (199 Default Studio)
-	none
98	Clear Setup (199 Default Studio)
-	none
99	Default Setup (199 Default Studio)
-	none
800	HyperGroov<-C4-> (112 PlatEnvFl4T Filt)
E	filter type
F	filter lvl
G	rvb w/d & quality; flange fb lvl
801	PianoPad w/Percs (74 HallFlgChDl Room)
E	flute flange fb
F	flute & percussion rvb lvl
G	piano rvb w/d
802	Slo Held Arper (6 RoomFlngCDR Hall)
G	piano/vox rvb w/d & dly lvl
803	Don'tGetFooled (25 RmRotoFl4T CmpRv)
F	flange lvl
G	aux rvb w/d
H	4-Tap lvl
Psw1	arpeggiator in/out
PSw2	vib/chor in/out
MW/SftP	rotor rate
804	Touch Game (114 PltTEEnvFlg Plate)
F	perc rvb w/d & env filt expression
G	comp rvb w/d & env filt expression
805	BeatBoy E1 (67 ChmbEnv4Tap GtRv)
E	kick/snare gate time
F	pad-under-lead flam dly w/d
G	gated rvb w/d
806	ZawiClav Split (92 auxFlgDist+ Hall)
G	lead Mdly/fb
MPress	lead tube drive

807	Dyn Piano Pad (159 Room RoomChr SRS)
F	SRS center/space (EQ Lvl)
G	SRS rvb w/d
808	Pulsar Stack (153 auxFlgDst+ ChLs2)
D	lead-pad flange lvl/fb
E	lead-pad HF damp
F	lead-pad delay color
G	lead-pad flange gain/LFO Tempo
809	Mt Chicorora C2 (71 auxChorFlRv Cmb2)
G	perc rvb time
MWheel	pad bass boost
810	Hold Low 3sec Rb (78 HallPtchPtFl Lsr)
Data	bass+lead LaserVerb fb lvl
G	bass+lead LaserVerb w/d
SmRbn	slithery alien effect
Tempo	bass+lead delay & pitch
811	Mettlorfus Pad (69 auxPtchDst+ Chmb)
E	perc pitch lvl
F	perc rvb
G	lead drive out gain lvl
LgRbn	perc pitch quality
MPress	lead drive crunch
812	Black Keys xtra (6 RoomFlngCDR Hall)
E	kit flange lvl
F	Perc CDR lvl
G	kit rvb Lvl & perc(zone1) rvb time
813	Jungle Jammer (23 RmSweepEcho Hall)
F	right hand perc sweep filt lvl
G	right hand perc rvb w/d
814	Huge Rock Band (25 RmRotoFl4T CmpRv)
E	lead rvb w/d, band delay lvl
F	aux rvb w/d
G	rotor trigger
Psw1	zone mutes
Psw2	vib in/out
815	Rock Ballad (39 RmDsRotFl4t RvCm)
F	Dist gtr flange lvl
G	kit rvb time
H	aux rvb w/d
SftP	rotor trigger
816	Jazz Setup (94 auxChorMDly Hall)
E	lead delay lvl & feedback
F	bass chor w/d
G	rvb lvl
817	Two Touchers (94 auxChorMDly Hall)
E	right hand lead delay w/d
F	right hand lead rvb lvl
G	left hand comp rvb lvl
818	Frontier prs (23 RmSweepEcho Hall)
G	pad rvb lvl
819	Eclectic Grand (43 Room Room Hall)
E	piano1 rvb w/d
F	piano2 rvb w/d
G	hall rvb lvl
820	Bad Trip FtSw/MW (55 auxDistLasr Room)
F	LaserDelay time
G	room rvb lvl
821	WhirliToys (90 auxPhsrFDR Hall)
E	(zones 1,3,7) flange lvl & feedback
F	(zones 1,3,7) delay lvl; flg+dly w/d
G	hall rvb lvl
822	PluckSynths Perc (72 auxChorFlRv Cmb3)
F	fluty synth orch flange lvl
G	chamber rvb lvl
823	SusPed RhythmJam (68 CmbRShapLsr Hall)
F	lead LaserVerb w/d
G	hall rvb w/d & chamber w/d
GAttVel	lead LaserVerb delay time/contour
Sustain	comp shaper intensity
824	Ballad Piano Pad (82 HallRsFltChDl Rm)
F	pad res filt w/d
G	pad rvb send
GKeyNum	bass EQ freq
Sustain	filt sweep ASR

Setups

825	Big AnaLoveVibe (63 ChmbTremCDR Room)
G	room rvb lvl; CDR w/d
GAttVel	stack panning trem rate/depth
826	ShockBreaks Pswl (17 RmPhsrQuFlg Hall)
F	flange w/d, fb lvl
G	hall rvb lvl
Pswl	quant dist effect
827	Four Pluckers (75 HallPtchLsr Hall)
E	LaserDelay coarse
F	LaserDelay fine
G	aux rvb lvl; LaserVerb spacing
H	LaserDelay contour
GKeyNum	pitch tracking
828	WaterPiano Pad (56 auxEnhSp4T Class)
F	pad delay w/d
G	lead rvb lvl
829	Padded Room (94 auxChorMDly Hall)
F	lead delay w/d
G	hall rvb lvl
830	AtmosPolySphere (90 auxPhsrFDR Hall)
G	pad FDR w/d
831	Breath Pad (63 ChmbTremCDR Room)
G	lead delay w/d, fb, HF damp
MPress	pad trem Tempo, room rvb lvl
832	Trippy Jam (74 HallFlgChDl Room)
F	organ flange fb
G	bell-lead room rvb lvl; organ flng fb
GAttVel	bell-lead delay mix lvl
833	MeditationGuits (63 ChmbTremCDR Room)
F	lead chor mix lvl
G	lead rvb w/d, room rvb lvl, delay fb
834	Cool Down Funk (137 auxChorFlng CDR)
F	clav flange w/d & excursion; CDR delay w/d
G	CDR rvb lvl and e.piano treble boost
835	Tek`Groov C5-> (128 Gtd2ChrEcho 2Vrb)
F	bass rvb lvl
G	kits rvb lvl
836	Big Fat Split (6 RoomFlngCDR Hall)
F	bass hall rvb lvl
G	lead delay mix, hall rvb lvl
837	The Pump C2 (21 RmEQmph4Tp Space)
D	kit EQ freq & morph
E	kit delay w/d
F	kit aux rvb lvl
G	kick, snare, bass aux rvb lvl
838	Ana Bases (62 BthQFlg4Tap Hall)
F	lead quant+flg w/d
G	lead hall rvb lvl
839	Multi Followers (33 ChmbCompCDR Hall)
F	pad delay
G	room+hall rvb lvl
840	Plucksynths (85 HallFlgChDl Hall)
F	pad chor rate, quality
G	lead rvb w/d, time; mix hall rvb lvl
841	10 Leagues Under (90 auxPhsrFDR Hall)
G	pad hall rvb lvl, FDR w/d
Chan S	pad treb boost, phaser w/d
842	Gremlin Arps (75 HallPtchLsr Hall)
G	arp pitcher & LaserVerb w/d
MPress	pitcher LFO rate
843	Broken Toys (76 HallGateFl4T Bth)
F	booth rvb lvl
G	delay depth
844	Two Synth (33 ChmbCompCDR Hall)
G	hall rvb lvl, pad hi boost, piano lo boost
845	Machine Shop (17 RmPhsrQuFlg Hall)
D	kit1 phaser w/d
E	kit2 quant+flg w/d
F	lead rvb w/d
G	hall rvb lvl
Tempo	hall rvb space, phaser rate
846	Faraway Place (90 auxPhsrFDR Hall)
F	pad hall rvb lvl
G	organ hall rvb lvl

847	BehindEnemyLines (91 auxChrDist+ Hall)
G	hall rvb lvl, MDdelay w/d
848	Tunnel Visionprs (6 RoomFlngCDR Hall)
E	flange w/d
F	CDR w/d
G	hall rvb lvl
Chan S	treble boost & fade
849	Seismic Trance (132 GVrbSwpFlt DlyFl)
E	kit gateverb w/d
F	kit gate threshold lvl
G	delay+flg w/d, sweep filt w/d
850	Medal (74 HallFlgChDl Room)
E	pad chor/dly w/d
F	brazz lvl
G	brazz rvb lvl
900	Deep Piano Rbn (16 RoomPhsrCDR Hall)
G	CDR w/d, pad & pno hall rvb lvl
901	Choir & Harp (42 RoomRmHall Hall)
E	room2 w/d & time
F	choir hall1 rvb time
G	all zones (aux)hall2 lvl
902	Orchestrator (133 ChRvStIEcho Hall)
G	chor/rvb w/d
903	Piano Concerto (42 RoomRmHall Hall)
E	woodwinds & brass rvb w/d
F	strings & perc rvb w/d
G	aux rvb lvl
H	piano rvb w/d
904	Xmas Carols (44 Room Hall Hall)
E	brass room rvb w/d
F	chimes & timpani hall1 rvb w/d
G	all zones hall2 rvb lvl
905	Sideline Perc (89 HallRoomChr Hall)
F	drums & perc chor w/d
G	rvb lvl
906	TonalGroov C5-> (34 RoomCmpChor Hall)
G	hall rvb lvl
907	Exotic Grooves (149 auxPtchRoom RvCm)
G	perc aux rvb lvl
908	Lunar Harp (133 ChRvStIEcho Hall)
G	pad & harp chor/rvb w/d, harp hall rvb lvl
909	Themes (77 HallChorFDR Room)
F	choir chor w/d
G	room rvb lvl
910	Wet Piano (42 RoomRmHall Hall)
F	piano distance
G	hall rvb lvl; flute room rvb level
H	piano lead room rvb w/d
911	enter the Jester (42 RoomRmHall Hall)
G	rvb lvl & time
912	Tap the Jester (42 RoomRmHall Hall)
G	rvb lvl & time
913	Hybrid Strings (42 RoomRmHall Hall)
F	pad rvb w/d
G	aux rvb lvl
914	Wonderous Spaces (74 HallFlgChDl Room)
F	harp delay mix w/d
G	room rvb lvl
915	Metal Orch Pad (11 RoomFlngCDR Hall)
G	hall rvb lvl & time
916	Toon prs (42 RoomRmHall Hall)
G	aux rvb lvl
917	Tranquil Sea (11 RoomFlngCDR Hall)
G	hall rvb lvl
918	Sick Clock Jam (149 auxPtchRoom RvCm)
G	bell aux rvb lvl
GAttVel	bass reverb/compressor level
919	Orc Split (26 RoomSrsCDR Hall)
G	rvb lvl
920	Baroque Brass (45 Room Room Hall2)
G	hall2 rvb lvl
921	Unison Orchestra (45 Room Room Hall2)
G	hall2 rvb lvl

Setups

922 G	Unison w/Pizz hall2 rvb lvl	(45 Room Room Hall2)
923 F	Switch Orchestra hall rvb lvl	(100 auxSRSRoom Hall)
924 G	Pizz/Str/Winds hall rvb lvl	(2 RmChorChRv Hall)
925 G	Harp Arps Cmaj plate rvb lvl	(121 auxMPFlgLasr Plt)
926 G	Desert Bloom E1 string pad flange w/d	(6 RoomFlngCDR Hall)
927 F G	Exotic Charge pad delay mix w/d rvb lvl	(33 ChmbCompCDR Hall)
928 G	ET Comes Home hall rvb lvl	(129 GtdEnhcStIm Hall)
929 E F G	Fanfare Orch delay mix w/d, chor fb lvl chor mix w/d hall rvb w/d & delay w/d	(1 RoomChorDly Hall)
930 E F G	Switch Orch 2 delay mix w/d chor mix w/d rvb lvl & delay w/d	(1 RoomChorDly Hall)
931 E F G H	Orbiting Venus echo fb image chor w/d & fb echo w/d & HF damp rvb w/d echo fb lvl	(80 HallChrEcho Room)
932 D E F G	Glass Dulcimer CDR dly mix lvl, chor fdbk lvl chor w/d CDR w/d pad rvb w/d	(81 HallChorCDR Hall)
933 E F G	Hybrid Reeds lead delay mix lead chor mix rvb & effects w/d	(1 RoomChorDly Hall)
934 G GattVel	Two Hand Pizz rvb w/d bass cut	(1 RoomChorDly Hall)
935 G	Slo Str & Horn rvb w/d	(47 Room Room Hall2)
936 F G H PSw2	Pianist Band drums rvb w/d piano rvb w/d & time SRS center/space SRS in/out	(159 Room RoomChr SRS)
937 E F G	Prepared Pianos toggles rvb delay effect toggles rvb density effect room1 rvb w/d, time, HF damp, diffusion	(16 RoomPhsrCDR Hall)
938 E F G	FSW1 solo winds pad rvb w/d pad hall2 rvb lvl lead hall2 rvb lvl	(47 Room Room Hall2)
939 E F G	Strings&Winds winds rvb w/d winds hall2 rvb lvl strings hall2 rvb lvl	(47 Room Room Hall2)
940 F G MWheel	Str Ens Solo MW room rvb lvl hall2 rvb lvl treb EQ gain	(48 Room Hall Hall2)
941 F G	Pno&Vox&Pizz room1+room2 rvbs w/d chamber rvb lvl	(31 RoomSRSRoom Chmb)
942 G MWheel	Down Wind SmRbn rvb & chor & delay w/d wind chor LFO rate	(5 RoomChrCh4T Hall)
943 D E F G	Gtr & Piano ac gtr delay mix, piano chor w/d elec gtr chor w/d elec gtr chor fb ac gtr rvb w/d, elec gtr chor depth	(134 ChDlyChrCDR Spac)

H	ac gtr chor mix, elec gtr + piano rates	
944 E F G	Cirrus 9 hall rvb lvl & enhancer high drive pad chor w/d & chorus rate hall rvb space, pad chor fb	(103 EnhcChorCDR Hall)
945 F G	Dry Plucks bass chor w/d & feedback level piano rvb lvl	(5 RoomChrCh4T Hall)
946 F G	String Collage hall rvb time hall rvb lvl	(32 RoomSRSRoom Hall)
947 F G	Esoterica "Cymbal Thing" lvl hall rvb lvl	(107 ChorChorFlg Hall)
948 D E F G H	Poseidon pan balance pad EQ freq & bass gain pad treb boost pad flange fb pad flange LFO Tempo	(59 EnhcFlg8Tap Room)
949 F G	Stalkers CDR delay mix CDR rvb lvl	(138 auxEnhcSp4T CDR)
950 F G	Diabolic Trickle aux rvb lvl, pad chorus level, fdbk, & rate bell rvb lvl, doom fb	(15 ChmbFlngCDR Verb)

Appendix C

System Exclusive Control of KDFX Parameters

Any KDFX parameter that can be assigned to an FXMod can also be controlled by MIDI system exclusive ("Sysex") commands. Controlling KDFX parameters using Sysex can be more complicated than programming an FXMod, but allows more flexibility. It's especially useful when the K2500 is in Master effects mode, and it is also a way to use additional real-time control above the 18 FXMods that are allowed in a given Program or Setup.

A Sysex message to control KDFX starts with the standard K2000/K2500 Sysex format (all numbers are hexadecimal):

- F0** start of sysex
- 07** manufacturer ID = Kurzweil/Young Chang
- NN** unit ID, typically 0
- 78** product ID = K2000/K2500
- 1B** message type = KDFX parameter control

Then a "Device", or section of a KDFX Studio, is selected. Then a specific Parameter within the Device is selected, and its value set:

- NN** KDFX **Device** select, valid Devices are 0-46 (decimal)
- NN** KDFX **Parameter** select, valid range depends on selected device
- NN** parameter value MSB
- NN** parameter value LSB

And finally the standard End of Exclusive byte:

F7

Device Codes

Here are the Device codes for each of the different parts of the KDFX Studio (numbers are decimal):

Device	KDFX part
0	Send1 for Input A (or A/L if mono input)
1	Send1 for Input A/R (if mono input)
2	Send1 for Input B (or B/L)
3	Send1 for Input B/R
4	Send1 for Input C (or C/L)
5	Send1 for Input C/R
6	Send1 for Input D (or D/L)
7	Send1 for Input D/R
8-15	Send2 for Inputs A thru D (for stereo input, use even # devices)
16-23	EQ1 for Input A thru D
24-31	EQ2 for Input A thru D
32,34,36,38	Aux send for FXBusses 1-4
33,35,37,39	Mix send for FXBusses 1-4

40	Mix send for Aux bus
41	Final Mix
42	Effect preset for Aux bus
43-46	Effect preset for FXBusses 1-4

Parameters

Here are the valid parameters for each Device (numbers are decimal):

Device	Parameter	Description
0-15	0	Level
0-15	1	Pan or Balance
0-15	2	Width (only for stereo inputs)
16-31	0	Gain (or frequency if hipass or lopass)
16-31	1	Frequency
32-41	0	Level
32-41	1	Balance
42-46	0	Wet/Dry (or In/Out)
42-46	1-43	Depends on the Effect

The following example sets the wet/dry mix for the Aux bus effect to 50%:

```
F0 07 00 78 1B (standard header)
2A (Device 42 decimal)
00 (Parameter = Wet/Dry)
00 (MSB = there isn't any)
32 (LSB = 50 decimal)
F7 (End of Exclusive)
```

The same example in decimal reads:

```
240, 7, 0, 120, 27, 42, 0, 0, 50, 247
```

Under Sysex control, KDFX parameter values are not mapped through display tables, but instead are handled as "raw" numbers. So while on the K2500's LCD you might set "RoomType" to "Hall2", under Sysex control you have to determine the number of the parameter and the number corresponding to the value you want: in this case, you would set parameter 8 to a value of 7.

Signed and Unsigned values

Parameters are either signed or unsigned. Unsigned parameters can range from 0 to 255, signed parameters can range from -128 to 127. For unsigned values above 127, the MSB is 01 and the LSB is (value - 128 decimal). For signed values below zero, the MSB is 7F (hex), and the LSB is (value + 128 decimal). For other values, the MSB is 00.

Here are some examples of parameter values encoded into LSB and MSB:

Parameter value (decimal)	hexadecimal	MSB	LSB
255	00FF	01	7F
200	00C8	01	48
128	0080	01	00
127	007F	00	7F
0	0000	00	00
-1	FFFF	7F	7F
-50	FFCE	7F	4E
-128	FF80	7F	00

While this may seem complex, if you are using a dedicated controller to generate Sysex, you may not need to worry about encoding parameter values, because the controller will do it for you. For example, with one popular MIDI fader box, the following will give you control of wet/dry mix for the Aux bus effect:

```
Function = String  
String = F0 07 00 78 1B 2A 00 pr pr F7  
Min = 0 Max = 100  
Param format = 2Byte,7Bits,hi->lo
```

Note: Sysex disables FXMods

If a parameter is assigned to an FXMod, and you then modify it by Sysex control, the FXMod will be temporarily disabled. It will re-establish itself the next time the Program or Setup is selected.

Sysex and the rest of the K2500

Information about using Sysex with other aspects of the K2500 can be found in Chapter 11 of the *K2500 Reference Guide*.

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