Fusion

Reference Manual

ALESIS

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Introduction

Welcome!

Thanks for purchasing the Fusion digital audio workstation! The Fusion one of the most powerful and full-featured products we've ever built, and we're sure you'll love using it!

You could say Alesis knows a few things about synthesis. We have a 15-year long track record of creating some of the most powerful and well-regarded keyboards in the world. We've used everything we learned in the past while keeping our eyes open to future possibilities in order to make the Fusion the best workstation you've ever used. We hope the Fusion will be remembered as the next great Alesis keyboard.

Be sure to register your Fusion at our website (www.alesis.com) so we can give you the best possible service. And since the Fusion's operating system is upgradeable, check the site once in a while for late breaking news. Future versions of the operating system will include things like new features requested by our users as well as improvements to existing features. Also, you might want to check for new program banks and sounds every once in a while.

We hope your investment will bring you many years of creative enjoyment and help you achieve your musical goals.

Sincerely,
The People of Alesis

Unpacking and Inspection

The shipping carton for your Fusion should contain the following items:

- A Fusion 6HD or 8HD workstation
- AC power cable
- This Reference manual
- A Quickstart guide
- Important Safety and Warranty Information
- A registration reminder card

Please log on to the Alesis website at www.alesis.com to register your new Fusion synthesizer. This will help us give you the best support we possibly can.

How to Use This Manual

We're sure you'd like to jump in and start using your Fusion quickly. To help you do this, check out the Fusion's Quickstart guide. The Quickstart guide is a separate manual that should have everything you need to start playing quickly.

Helpful tips and advice are highlighted in a shaded box like this.

Once you're ready for more in-depth information, this reference manual is for you. This manual will describe the workings of every single feature and parameter on the Fusion and you should be able to find answers to all of your Fusion questions here.

When something important appears in the manual, an exclamation mark (like the one shown at left) will appear with some explanatory text.

We've also compiled a list of Frequently Asked Questions at the end of this manual that should address many of your troubleshooting questions. Please check the FAQ before contacting our technical support staff as that will save time and energy for both you and our friendly support staff.

Main Features

Your Fusion workstation is packed with features to help you make better music. Let's take a quick look at these features and get a sense of why each feature is important.

Total Integration

The Fusion has one of the biggest feature lists of any workstation on the market today. That said, the beautiful thing about this workstation is not its sheer number of features, but rather the perfect integration of these features with each other. All the different parts (synthesizers, hard disk recorder, sampler, arranger, mixer, etc.) talk to each other intelligently so that you can focus on writing songs rather than troubleshooting why one part won't work well with another.

For example, you can use Song mode to arrange and record digital audio and MIDI seamlessly on the same screen. You don't need to worry about getting a separate MIDI arranger and hard disk recorder to work together since we've taken care of that for you. Once you're done arranging, each of your synth and audio tracks automatically appear on your mixer for quick and intuitive mixing just like on a hardware mixer. Again, everything is automatically and intuitively laid out in a way that makes sense to musicians. Even loading, saving, and organizing your songs and programs (which can often turn into a troubleshooting headache) has been made completely seamless—you can load programs from either the hard disk or compact flash memory without ever having to worry about what's going on "under the hood" of the workstation (if you don't want to, that is).

Intuitive Interface

We've analyzed how musicians commonly work and figured out ways of streamlining the songwriting process. For example, we've minimized keypresses and placed shortcuts and quick access buttons right where most musicians will want them.

The user interface was carefully designed for both novice keyboard players and hardcore synth enthusiasts alike. We did this through a two level interface design: On the top level, novice users can find what they need quickly without ever having to see (or deal with) the more complex inner workings of the keyboard. On the other hand, knob twiddlers can go digging inside the Fusion's deeper menus and program to their hearts' content. Regardless of the type of user you are, you'll find the interface to be clean and intuitive.

The Fusion's Synthesis Engine

Your Fusion is capable of four completely different types of synthesis: Sample Playback, Virtual Analog, FM, and Physical Modeling. Our brand new "Dynamic DSP Synthesis" engine lets you load up any combination of synthesis types you'd like to use. There are no artificial limits placed on synthesis or polyphony—you're free to configure and push your Fusion as far as the synth engine can handle (which is pretty far considering there are eight processors inside).

Sample Playback
Sample playback synthesis lets you use recorded sounds of actual instruments (or any recorded sound, for that matter) to create a program. For example, the Fusion's "Grand Piano" program is actually a carefully recorded concert grand. In general, sample playback synthesis is a great way of reproducing lifelike versions of real, acoustic instruments.

Virtual Analog (VA) Synthesis
Analog synthesis lets you create wonderfully complex sounds using a small number of simple waveforms, envelopes, and low frequency oscillators.

What does all this mean in musical terms? It means you can create the deep basses, lush pads, and many other sounds analog synthesizers are known for without the difficulty and expense of real-analog synthesis.

FM Synthesis
FM synthesis was created in the 1970s and became an overnight sensation because of its ability to produce electronic piano, bell, and melodic percussion sounds such as vibes and marimba. These sounds are created by taking sound sources and modulating their frequencies.

Programming FM synthesizers used to be a challenge because it can be hard to conceptualize and visualize how your waveforms are interacting with each other. We carefully designed the Fusion's graphical FM signal router to let you know what's going on without overwhelming you with too much information, making it easy to sculpt the perfect sound you want. All of the detailed information can be found on separate sub-pages within the FM Synthesis section.

Physical Modeling

Physical modeling is a state-of-the-art process that mathematically describes how a sound wave would behave if it were Inside a real instrument. This results in incredibly lifelike virtual instruments that you can play on the Fusion. The cool thing is that you can actually create virtual instruments that do not (or cannot) exist in real life by simply setting your parameters accordingly. For example, you can create a 30-foot long flute played with a hurricane-strength breath if you'd like—the sky is the limit!

Physical models involve a lot of math and model parameters are often very complex and difficult to understand. We took a great deal of care in designing an interface that musicians can relate to—enabling you to tweak your sounds in real-time without complex math or confusing parameters. Currently, the Fusion has two physical models letting you create the most realistic (or unreal, if that's what you're into) wind and reed instruments ever to come out of a synthesizer.

Eight Channel Hard Disk Recorder

Most keyboard players that record songs end up taking their synthesizer parts and recording them on to a separate multitrack recorder along with other live instruments (drums, guitar, etc.) Having built some legendary multitrack recorders in the past including the ADAT and the HD24, we integrated an 8-channel, 24-bit hard disk recorder in the Fusion.

There are several advantages to having an integrated multitrack recorder over a separate keyboard and multitrack. First, you have much less gear to buy, carry around, and maintain—with the Fusion, you can do all your recording and mixing in one box making it much easier to record on the road. Second, since the synthesizers, sequencer, and multitrack recorder are built to work together from the ground up, you won't spend any time troubleshooting why things aren't working correctly. Finally, since you're arranging and editing all of your MIDI and audio on one screen, you'll find it much easier and faster to compose and record songs.

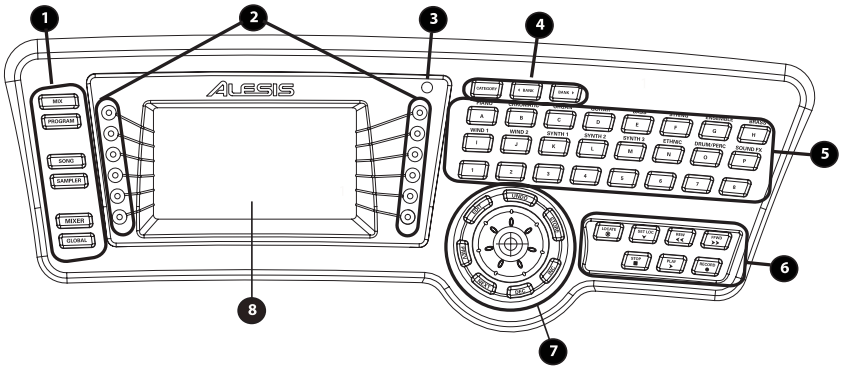
The inputs record at 24 bit, 44.1 kHz and can be active at the same time, letting you record up to eight channels simultaneously. All inputs are balanced and the recorder has standard transport controls with locate points.

Sampling Capability

If you want to create a custom program using your own sounds, you can do it with the Fusion's sampler. The sampler has stereo inputs with a Trim knob for adjusting levels. Your recorded samples can be either mono or stereo, and are recorded and stored files on either the Fusion's internal hard disk or Compact Flash cards.

Chapter 1: Fusion Hardware

Center Section



1. Mode Selection Buttons (Mix, Program, Song, Sampler, Mixer and Global): These buttons select the main modes of the Fusion.

2. Soft Buttons (No Labels on the front panel): These buttons match up with the LCD screen labels and let you navigate the user interface.

3. Contrast Control: This knob adjusts the contrast of the LCD screen.

4. Category and Bank Buttons (Category, Bank forward and reverse): The category button brings up the category function on the LCD screen. The Bank forward and reverse buttons allow you to quickly move through sound banks.

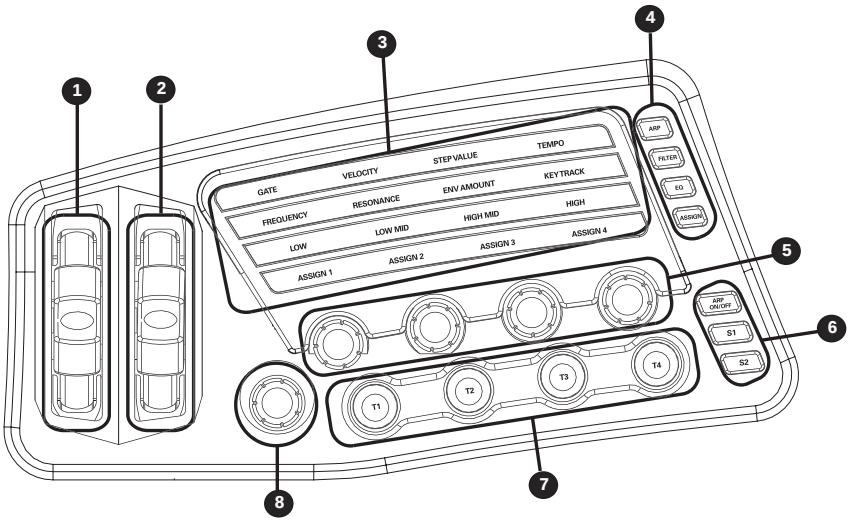
5. Quick Access Buttons (A-P , 1-8): These buttons allow you to directly select a Bank and a specific Program in a Bank.

6. Transport Controls (Locate, Set Locate, Rewind, Fast Forward, Stop, Play and Record): These buttons are used to play songs, set and select Locate points in a song, as well as other control functions in other Modes.

7. Control Wheel and Edit Buttons (Edit, Prev, Next, Inc, Dec, Store and Undo): The Control Wheel is used for quickly moving through values on the screen when the cursor is highlighting a parameter. The Edit button allows you to look "under the hood" of the mode that is currently selected. The undo button allows you to revert to previous settings of parameters in case you change your mind about an edit you've made. The Store button allows you to name and save your work. The Prev and Next buttons let you to navigate the parameters on the pages. Finally, the Inc and Dec buttons let you step through the values of a highlighted parameter.

8. LCD (Liquid Crystal Display): This screen is used to view parameters and information in relationship to the mode you have selected.

Performance Panel Description



The Fusion's Performance Panel has several real-time controllers (wheels, knobs, buttons, and switches) that you can assign to perform a variety of tasks. These controllers let you tweak sounds in real-time as you play for maximum expression and sonic control.

The Performance Panel's components consist of the following:

1. PITCH BEND WHEEL: This wheel lets you raise or lower the pitch of your program during a performance. Push this wheel forward to raise the pitch and pull it back toward you to lower the pitch. The wheel is spring loaded and will snap back to normal once you let go.

You can change the pitch bend range on a per-program basis in the Program/Pitch page under the Program menu. See "Pitch Bend Range" parameter on page 41 for more about this.

2. MODULATION WHEEL: The mod wheel can be assigned to control a variety of parameters including vibrato, tremolo, FM amount, etc. This wheel is usually mapped to vibrato as a default, but it is possible to map it to almost anything on the Fusion.

Use the modulation matrix to map the mod wheel. See page 236 for more about the modulation matrix.

3. PERFORMANCE GRID: The Performance Grid lets you assign what your four Control Knobs do (see section 6 for more on the Control Knobs). By having four "rows," of functions, the knobs can actually control up to 16 different parameters. You can easily tell what row is selected because the active row is brightly lit whereas the other rows remain dimmed. The ARP, FILTER, EQ, and ASSIGN buttons (see below) are used to select your active row.

4. ARP, FILTER, EQ, ASSIGN: These buttons select the active row on the performance panel. ARP, FILTER, and EQ are hard-wired to arpeggiator, filter, and EQ functions whereas the assign row lets you map the Control Knobs to any parameters of your choosing. You'll notice the names of the knobs on the bottom of the LCD screen change to reflect what row you've selected. For example, if you select "EQ," the bottom of the screen will change to Low, Low-Mid, High-Mid, and High.

The Assign row knobs can be assigned through the Modulation Matrix. See page 236 for more about the modulation matrix.

5. CONTROL KNOBS: These knobs can be used to manipulate all kinds of parameters within the Fusion like filter frequencies, resonance, modulation, or even tempo. The Performance Grid (see section #3 above) tells you what your knobs are currently assigned to control. When you then turn a knob, you'll notice the on-screen knob (at the top level of Program, Mix, and Song Modes) will change accordingly.

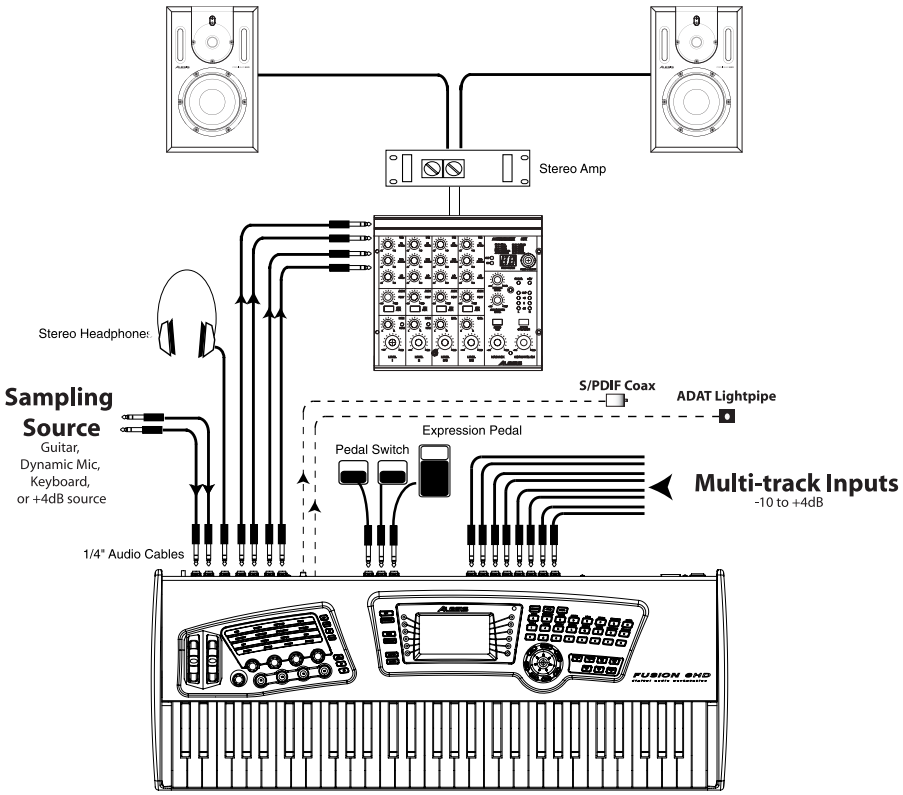
These knobs work in real-time so you can hear the effects of your knob twiddling as you play.

6. ARP On/Off, S1, S2: The ARP On/Off (Arpeggiator) button engages and disengages the Fusion's arpeggiator. The S1 and S2 buttons are assignable ON/OFF switches that can be set to affect all kinds of functions within the Fusion such as filters or effects sends. Switch assignments can be made through the modulation matrix. See page 236 for more about the matrix. See page 213 for more about the Arpeggiator.

7. TRIGGER 1 – 4: These four assignable buttons can trigger envelopes, LFOs, and many other functions. Unlike the S1 and S2 switches described above, these trigger buttons are only active when you are holding them down—once you release the triggers they become inactive. Use the Modulation Matrix to assign these buttons (see page 236 for more).

8. MASTER VOLUME: This is the Fusion's master volume control.

Audio Hookup Diagram:



This diagram will show you how you can hook up your Fusion to the rest of your studio. Let's go through and discuss the inputs and outputs. We'll start from the left side of the diagram above and work our way to the right:

Sampling inputs: These inputs—labeled "Left/Mono" and "Right"—feed the Fusion's internal sampler. You can use these inputs to capture sounds to convert into a custom program. The workstation lets you sample in stereo or mono, and the Gain trim knob lets you to set input level.

Note that you can use these inputs to route a microphone (or other external device) through the Fusion's synthesis or effects engines. This effectively turns the Fusion into an extremely powerful effects processor.

Headphone outputs: Connect your headphones to this output. This output mirrors whatever is coming out of the Main Outputs of the Fusion. In other words, if you've routed any sounds out of the Aux Outputs, you will not hear them in the headphones.

About the Inputs and Outputs:

All audio inputs and outputs use balanced ¼" TRS connectors. You can use unbalanced ¼" TS cables for these connections, but you should consider using balanced cabling for maximum clarity and lowest noise. This is especially important if you have long cables in your studio since audio quality quickly degrades as unbalanced cabling increases in length.

Main Outputs: These are the Fusion's primary outputs. By default, all multitrack and synthesizer audio is routed to these outputs and you'll generally connect these outputs to your amplifier (or mixer).

Aux Outputs: These are a second pair of outputs to which you can route multitrack and synthesizer audio if you'd like to process these tracks differently.

S/PDIF Output: This output is designed to transfer sounds digitally to other gear in your studio that supports S/PDIF. This output mirrors whatever is being sent out of the main outs on the synth.

Optical Output: This optical digital output is supports 8-channel ADAT format. The output will be as follows:

ADAT Channel	Output
1	Main Out Left
2	Main Out Right
3	Aux Out Left
4	Aux Out Right
5	Insert 1 Send Left
6	Insert 2 Send Left
7	Insert 3 Send Left
8	Insert 4 Send Left

Foot Pedals: These three inputs allow you to control a variety of functions. EXPRESSION is the Fusion's continuous controller expression pedal input and can be assigned to control things like volume.

The FOOTSWITCH input is configurable and lets you trigger envelopes, LFOs, and other events with your foot. It is similar to the trigger buttons found on the Performance Panel. Unlike the EXPRESSION input, the FOOTSWITCH is binary and is either "on" or "off" with no range of control in between.

The SUSTAIN input is for a sustain pedal and is commonly used by keyboard instruments to hold notes. Like the FOOTSWITCH, the SUSTAIN pedal input is either "on" or "off" and there is no middle ground.

Why have two sets of outputs?

Let's say you've set up a bass/lead split but you want to EQ and process each part differently using outboard gear. No problem—just route the bass to one output (either Main or Aux Out) and the lead to the other. Now you have two totally separate instruments coming out of each output.

If your programs are mono, you actually have four discrete channels to work with (Main Left, Main Right, Aux Left, and Aux Right), giving you even more flexibility for outboard processing/mixing.

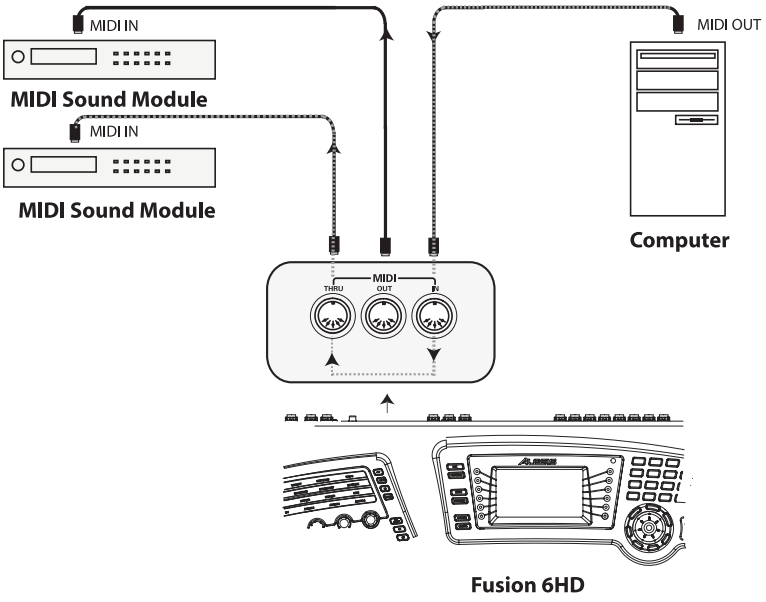
A note on S/PDIF cabling

The S/PDIF jack on the back of the Fusion looks like a standard RCA connector, but you cannot use ordinary audio cables for this connection. S/PDIF requires special 75-ohm "digital audio" cables to work properly and will most likely result in very loud white noise if you use the wrong type of cables. If you're hearing clicks, pops, or white noise when using S/PDIF, your cable is the likely culprit.

Multitrack Inputs: These eight inputs link directly to the Fusion's hard disk recorder. You can use these inputs to record things like live instruments (guitars, bass, drums, etc.) as well as mixers, CD players, turntables, and more. Note that you need to plug in a line level signal into these inputs and many instruments (condenser microphones, guitars, turntables, etc.) will require a preamplifier to bring the signal up to line level before you can record into the Fusion.

The inputs can be switched between -10 and +4 dB to accommodate all kinds of gear ranging from "consumer" to "professional" grade (see page 202 for more on this). The internal recorder captures audio at a sampling rate of 44.1k with 24-bit audio fidelity letting you make extremely high quality recordings without any additional gear.

MIDI Hookup:



This diagram shows common ways of hooking up your Fusion to other gear in your studio through MIDI.

MIDI IN: Hook up the MIDI output of your external gear to the "MIDI In" of the Fusion when you want the Fusion to receive MIDI data from the outside world. There are two common scenarios in which you'll want this:

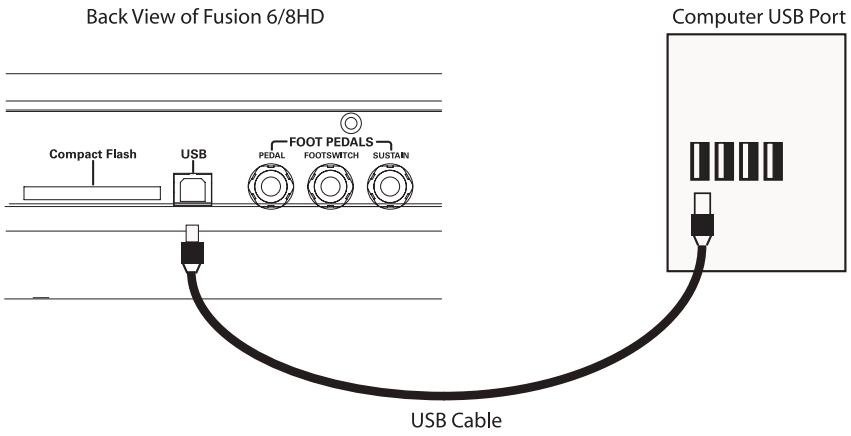
1. You may want to use another keyboard to control the Fusion. This is commonly done by synth players on stage if they want to use one "master" keyboard to control all other keyboards.

2. You may want to arrange a song on a computer MIDI sequencer, and then use the sequencer to play back sounds from the Fusion.

MIDI OUT: If you want to use your Fusion to control other synthesizers or to send MIDI data to a MIDI sequencing program on a computer, you should connect this output to the input of your MIDI destination device (sound modules, other keyboards, external sequencer, etc).

MIDI THRU: All MIDI data that comes in on the "MIDI IN" connection is passed through the Fusion and sent out of the "MIDI THRU" jack completely unaffected. This is a useful feature for people using multiple keyboards (or MIDI modules) along with a "Master" MIDI controller because it lets you pass MIDI data to all of your synths.

Computer/USB Hookup:



USB: Connect your Fusion to a Mac or PC for easy file transfers. The Fusion supports USB 2.0 and is fully backwards-compatible with USB 1.1/1.0, but we highly recommend using 2.0 since audio files tend to be quite large and transfers will be slower on USB 1.1/1.0 connections.

The Fusion is designed to work with any computer that supports "USB Mass Storage" devices using the FAT32 formatting standard. Current versions of virtually all common operating systems support these features.

For more about memory, storage, and file management, see the section titled "Storing Your Work" starting on page 37.

Powering the Fusion

Before connecting the power cable, make sure the Fusion's power switch is turned off. There is no need to worry about whether you are using 110V or 220V since the Fusion has an internal switching power supply that automatically adjusts itself to the correct power setting anywhere in the world.

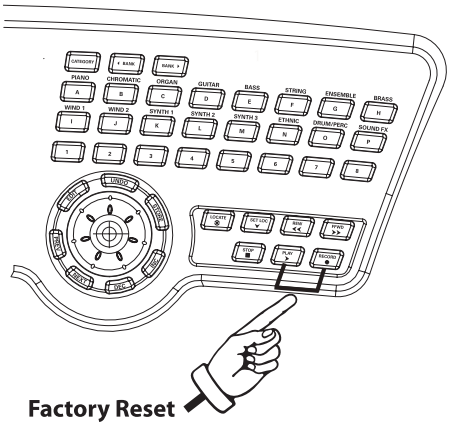
1. Plug the female end of the power cable into the Fusion's power socket.

2. Plug the male (plug) end into a properly grounded power outlet.

Do not power-cycle the Fusion repeatedly! Doing so may damage to the workstation. Repeated power-cycling puts the sensitive internal electronics (particularly the hard drive, memory, and processors) under undue stress and may shorten the lifespan of these components. Under normal use, these components will provide many years of trouble-free performance.

Treat the Fusion just like a computer: If you need to reboot, wait about 10 seconds before restarting the machine. This will give the capacitors inside the unit time to discharge and for memory to clear.

Factory Reset



The Fusion has a "factory reset" option that will reset your global parameters to their initial factory settings. This has been included as a last resort option in case you have accidentally changed a global setting and need to return the workstation back to normal quickly.

Resetting your Fusion is easy: Hold down both the Play and Record buttons as you turn on your Fusion and wait for the unit to finish loading. Once the Program screen is displayed, factory defaults have been loaded, and your Fusion is ready to go.

Note that doing this does not change any of your programmed sounds, songs, samples, or arpeggiations. Factory Reset only affects parameters found in Global mode.

Chapter 2: Fusion Basics

Fusion 101: The Basics

If you're new to workstations and aren't sure about what everything does (or why it is important), this section is for you. Let's take a moment to explain all the basics that you'll need to know:

What is a Program?

The sounds in your Fusion are called "Programs." Programs contain all the samples, routings, settings, and other programming required to create the sound. For example, our "Grand Piano" sound contains all the individual samples, loop points, filter parameters, and other settings that make up the piano.

Why not just call them "Instruments?"

You may be wondering why we don't just call them "instruments." We do this to avoid confusion. The word "instrument" is ambiguous and could potentially be confused with other things (such as the Fusion's actual hardware, or the source of a sample rather than the result of putting together a set of samples to form a program). On the other hand, "Program" has a specific definition that can't be confused.

What is a Mix?

A "Mix" is simply a collection of programs. Each mix can contain up to 16 programs and those programs can be layered, split, or set up in a number of ways to help you get the sound you're looking for. Being able to load up and arrange multiple programs in different ways opens up a world of musical possibilities—The following "Fusion Architecture" will explain your options in detail.

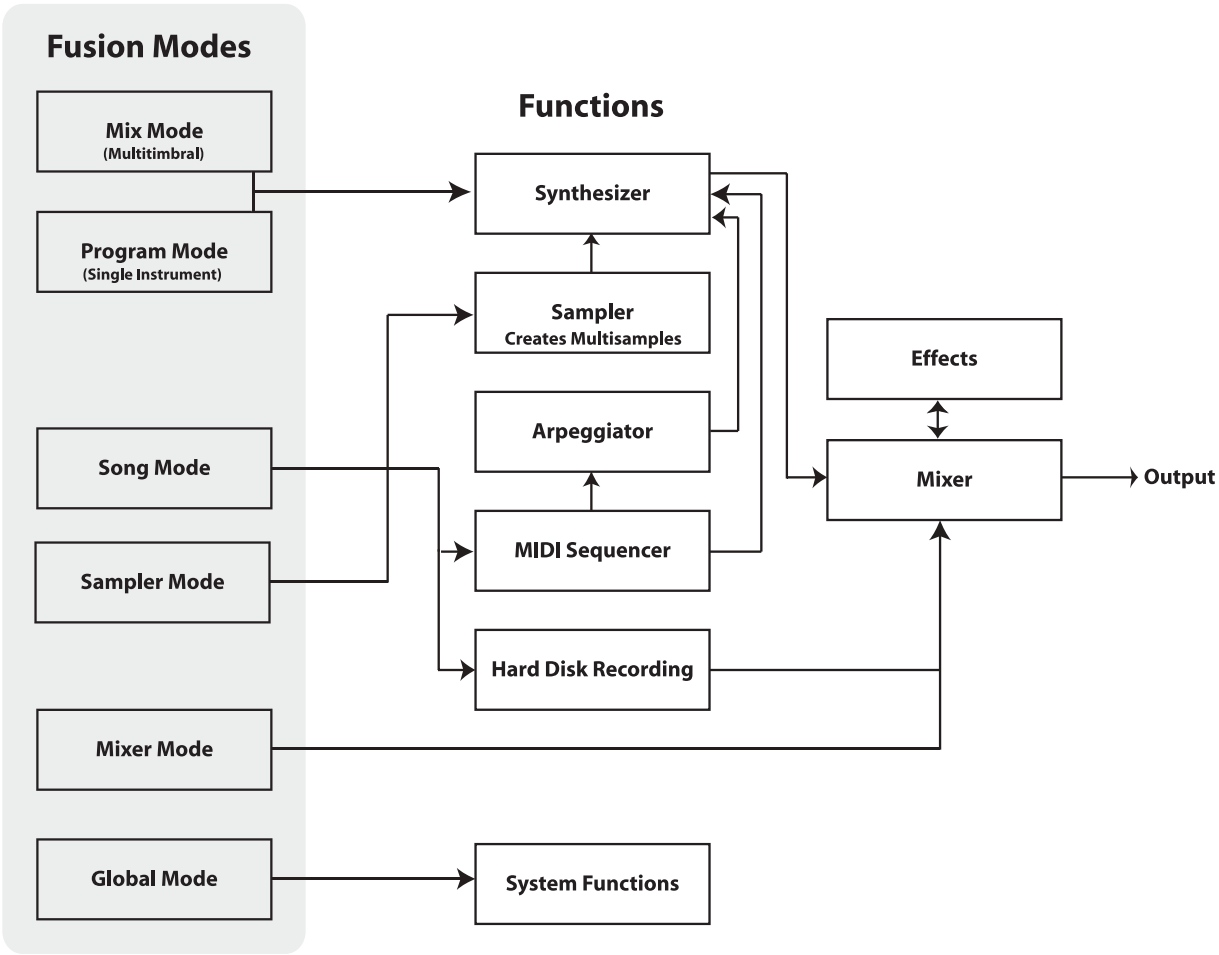
What is a Song?

A "Song" is a complete arrangement (including both synthesizer and digital audio parts) that is created using the Fusion's MIDI sequencer and multitrack digital audio recorder. A song can have up to 32 synthesizer tracks as well as 8 tracks of digital audio. This means you can compose, record, edit, and mix an entire song all within the Fusion.

What is a Sampler?

A "Sampler" is a recording device that lets you capture a sound (called a "sample") that you can then playback and manipulate in a number of different ways. The Fusion's built-in sampler allows you to record your own instruments, loops, and other sounds that you can turn into your own custom programs. This means you are not limited to the world-class set of programs that ship with the Fusion and that you are free to create your very own programs.

Fusion Architecture



The Fusion is packed with a ton of features and it can be easy to be overwhelmed by it all. Let's take a moment to explain how all the different parts interact with one another.

Take a look at the diagram above. The arrows show you how audio, MIDI, and control data flows from one section of the Fusion to another. If you ever find yourself being confused by how signals are routed, refer back to this diagram to help sort things out.

On the left column, you'll notice the different modes of the Fusion. These modes are listed in the same order as they appear on the left of the Fusion's LCD screen.

Getting Around on the Fusion

The Mode Buttons

The Fusion has six modes: Mix, Program, Song, Sampler, Mixer, and Global. Each mode is specialized to handle specific tasks, which are covered below.

Note that Mix, Program, Song, and Sampler modes have parameters that you can edit. To go "under the hood" of these modes, press the EDIT button located on the upper left of the data wheel. To return to the "top" just press that mode button again.

Program Mode

This mode is where you'll probably spend most of your time. In Program Mode, you can load and play one instrument at a time and explore the thousands of sounds that can be found on the Fusion. Say you just want to play a Grand Piano—just enter Program mode, call up the type of piano you want, and go!

The Category button to the right of the display will take you to a special "Librarian" mode that will help you track down specific programs quickly.

Finally, when you're ready to create your own programs, you can do that in Program mode as well.

Mix Mode

Mix Mode is the Fusion's "multitimbral" mode. This means you can have multiple programs loaded and playing at the same time. In general you'll use Mix mode in one of three ways:

1. Layering sounds. Sometimes you'll want to layer two sounds on top of each other so that you can hear both when you play. A common example of this is to have a piano plus strings playing at the same time.

2. Splits. Sometimes you'll want to split the keyboard so you can play one program with your left hand and another program with your right. For example, keyboard players sometimes like to play a bass part with the left hand and a synth lead on the right. Mix mode is the easiest way to set this up.

3. External Sequencing. If you're using an external sequencer and want to use the Fusion as a sound module, you can load up to 16 programs and assign each program to a different channel that you can then control with an external sequencer.

Song Mode
Song mode takes you to the audio and MIDI sequencer found within the Fusion. You can arrange, edit, and record your compositions using this mode. Song mode controls both your MIDI sequencer as well as your hard disk recorder and provides up to 32 MIDI tracks and 8 audio tracks for each song.

Sampler Mode
When you're ready to create your very own sample-playback programs, Sampler mode is where you'll need to go. All sampling and waveform editing takes place here. Press Edit when you're in Sampler mode and you'll see all the editing and mapping capabilities of the Fusion on the Multi, Zone, Sample, Process, and Utility tabs along the left side of the display.

Once you're done with your samples, you can create a custom program (using Program mode) and then load and play it just like any other program on the Fusion.

Mixer Mode
Mixer Mode has been created so you can conveniently mix your synthesizer and audio tracks together on one screen. The mixer lets you set levels and pan positions for each synth and audio track as well as set send levels and enable or solo tracks just like on a hardware mixer.

Note that the mixer is only accessible when you are in Mix and Song modes since these are the only modes in which you can have multiple programs or audio tracks to mix together. Program or Sampler modes only play one instrument at a time and don't require a Mixer (since you have nothing to mix)

Global Mode
Global mode lets you set parameters that affect all areas of the Fusion. For example, things like master tuning, and keyboard velocity scaling can be found here.

The SETTINGS tab lets you modify various keyboard, MIDI, and controller related settings, while the MEDIA tab lets you access the hard drive, and Compact Flash card. The SYSTEM tab lets you view and update the current system information.

Navigating The Fusion's Menus

All navigation on the Fusion takes place using the Center Panel. Let's break down navigation section-by-section:

1. MODE SELECT BUTTONS: These buttons let you switch into the Mix, Program, Song, Sampler, Mixer, or Global modes.

   If you've pressed the EDIT button and you're editing parameters deep within the Fusion, you can return to the "Top Level" of the mode by pressing the mode button again.

2. CONTROL WHEEL & SURROUNDING BUTTONS: The Fusion's control wheel lets you cycle through sounds and parameters quickly. Turning it clockwise is the same as pushing the "Inc" (or Increment) button in rapid succession whereas turning it counter-clockwise is the same as pushing the "Dec" (or Decrement) button.

   Generally, you'll use this wheel to control large parameter changes (such as going from 0% to 100%) whereas you'll will use the Inc/Dec buttons for fine tuning (for example, going from 10%-12%).

3. The EDIT, UNDO, STORE, PREV, NEXT, DEC, and INC buttons that surround the Control Wheel have the following functions:

   • EDIT: This button takes you "under the hood" of Mix, Program, Song, and Sampler modes—letting you adjust or fine-tune the mode's various parameters.

   • UNDO: This button allows you to undo recent actions in case you change your mind about something you've edited. You have 100 levels of undo available for most functions.

   • STORE: This button allows you to save any edits you've made to your program, mix or song.

   • PREV, NEXT: The Previous and Next buttons allow you to select the different editable parameters on each page.

   • DEC, INC: The Decrement and Increment buttons allow you to alter the values of selected parameters.

Undoing Your Actions:

The UNDO button will light when it is possible to undo an action.

Saving Your Work:

Remember to save your work before you change a program, song, or mix. If you change a program, mix, or song without first saving, you'll lose any modifications you've made.

The "  " icon on the upper right of the screen indicates that something has been edited in your program, mix, or song since the last time you saved. If these changes are important, you should save your work before switching to another program, mix, or song.

Returning to Default Settings:

Pressing both INC and DEC buttons at the same time will return whatever parameter you are editing to its "default" state. This is useful in cases where you are tweaking a parameter and decide you'd like to jump back to the default state.

4. SOFT BUTTONS: The 12 unlabeled buttons along the sides of the display and allow you to access different parts of the user-interface. The buttons on the left of the display are "menu" buttons that let you access different tabs within each mode. The buttons to the right of the display bring up different pages and overlays (i.e., prompts, sub-menus, etc.) within each tab.

   Whenever you have opened an overlay or a prompt, you'll need to exit that prompt by pressing the "OK," "Cancel," or "Exit" button before you can edit any further parameters.

   Finally, if you ever get lost navigating through the Fusion's menus, you can re-press the current menu button (on the left side of the display) to take you back to the initial page of that menu.

About the Soft Buttons:

You may have noticed that some soft buttons have a small dot located in the lower left corner while other buttons have a triangle.

The dot indicates that an action will be performed as soon as you press the button. These buttons are known as "action buttons."

The buttons with the triangle in the corner are known as "overlay" buttons and open up a new menu page. This page is known as an "overlay" because it appears on top of your current page and must be closed before you can return to your menu. Overlay pages are closed by pressing soft buttons entitled "OK," "Cancel," or "Exit."

5. CATEGORY and BANK: The CATEGORY button accesses the Fusion's "sound librarian." The sound librarian allows you to view your programs (or mixes if you are in MIX mode) sorted by category. For example, when you're in PROGRAM mode, the Category button brings up a screen that lists programs contained within each category. This makes it easier to find a particular program you're looking for.

   The BANK buttons allow you to cycle through the different banks of programs and mixes that are stored on the Fusion.

6. QUICK ACCESS BUTTONS: The Fusion provides twenty-four QUICK ACCESS buttons for easy access to sounds, editable parameters, and other things. The top sixteen of these buttons are labeled A through P whereas the remaining eight buttons (bottom row) are numbered. This gives you access to the first 128 sounds that can be stored in a bank (since 16 * 8 = 128). Once you're familiar with sounds you like on the Fusion, you can call them up directly from Program mode using these shortcut keys. For example, you can access the Grand Piano (program A-1) by pressing "A" and "1."

   The 1-8 QUICK ACCESS buttons can be set up to serve other useful functions such as quickly enabling/disabling oscillators as you are editing and designing sounds in Program mode. These additional functions will be covered in future sections of this manual as they come up.

7. TRANSPORT CONTROLS: These seven buttons control the Fusion's integrated MIDI sequencer/multitrack audio recorder. The SET LOC button sets a locator point in the song that you can jump to using the LOCATE button. The remaining buttons control the recorder's various Record and transport functions just like on a regular tape machine (or computer-based sequencer).

   Like the 1-8 QUICK ACCESS BUTTONS, the LOCATE button serves a variety of purposes depending on what menu you are in and should help make your life easier (such as setting key ranges, or locating key zones, etc.) These shortcuts and additional functions will be covered in future chapters as they come up.

Useful Navigation Shortcuts

The Fusion has a number of shortcut features that are designed to make your life a lot easier. Take a moment to learn these shortcuts now and you'll save a ton of time in your future sessions with the workstation.

User-Interface (UI) Locates

[Hold SET LOC + 1—8 buttons to set a locate point]
[Hold LOCATE + 1—8 buttons to jump to locate point]

UI Locate points allow you to jump to any page on the Fusion with one keypress combination. Many people will find this to be an extremely useful feature since they can set UI Locate points for up to eight of their most commonly used pages and instantly jump to these pages without having to navigate through any menus.

Hold the SET LOC and press any of the 1 through 8 buttons to set a UI locate point. Then, hold LOCATE and press that number again to return to the page you had previously marked.

Locate Points

[Hold SET LOC + A—P buttons to set a locate point]
[Hold LOCATE + A—P buttons to jump to the locate point]

Locate points are extremely useful in Song mode because they allow you to mark different parts of a song. You can then return to these marked points instantly with one keypress combination. For example, by marking the beginning of each verse and chorus in your song, you will be able to jump to these points without having to search for these points using the fast forward and rewind transport controls.

To set a location point, hold the SET LOC button and press any of the A through P buttons (each button is a different locate point and you have 16 locate points for each song).

To jump to a locate point you've set, hold the LOCATE button and press the A through P button that corresponds to where you want to go.

If you press SET LOC without specifying an A—P button, it will set your locate point to whatever your "Current Loc" parameter is set to on the Song/Song/General page. Similarly, if you press the LOCATE button without pressing one of the A—P buttons, your transport will jump to whatever the "Current Loc" parameter has been set to.

Rewind to Beginning/Fast Forward to End

[Press LOCATE + REW to return to the beginning of a song]
[Press LOCATE + FFWD to jump to the end of a song]

When working in Song mode, you may want to rewind to the beginning of a song or to fast-forward to the end of the song. To rewind, press LOCATE and REW at the same time. To fast-forward, press LOCATE and FFWD at the same time.

Return to Default Settings

[Hold INC + DEC buttons]

Each parameter has a designated "default" setting. If you've changed a parameter and you'd like to return to its "default" settings, press both INC and DEC buttons at the same time.

Setting Parameter Values Quickly

[Hold LOCATE + keyboard note]

A useful shortcut for setting parameter values is to use the LOCATE key and press a note on the keyboard. If you have selected a parameter that accepts either positive or negative values, then middle C corresponds to zero and values become larger (or smaller) as you get farther away from middle C. If the parameter only accepts positive values, then the lowest note on the keyboard selects the lowest value that is available for the parameter.

EDIT/COMPARE Modes

[Press EDIT when you are in EDIT mode]

If you've changed any parameters and would like to compare your changes with the original settings in the saved program, mix, song, or sample, press EDIT once and you will be taken into "Compare" mode. Press the EDIT button again to be taken back to your current settings. This button lets you quickly compare your changes to what has been saved.

Note that the text at the top of the screen changes from "Edit" to "Comp" as you jump between edit and compare modes. Also note that you cannot change any of the settings when you are Compare mode—the mode is only provided as a reference.

Finally, once you save your updated parameter settings, you can no longer compare your current program, mix, song, or sample since your current settings have overwritten the old ones.

EDIT/Back

[Press EDIT when you are out of EDIT mode]

If you have been editing a page and jump to another mode (such as Mixer or Global mode), you can immediately return to that page by pressing the EDIT button.

This may be very useful in Song and Mix modes as you may find yourself jumping back and forth between Mixer mode and in-depth pages in your Mix and Song modes. Once you're done tweaking your mixer, press EDIT and you'll be taken back to whatever page you came from.

Jump to Item Explorer

[Hold LOCATE and press either INC or DEC]
[Hold LOCATE and press either BANK button]

When you're searching for a particular program, mix, song, sample, or arpeggiation pattern, you may spend quite a bit of time looking for it because the Fusion has a massive internal hard disk drive that can store a lot of data. We've made searching much easier by letting you link directly to the Fusion's "Item Explorer."

The next time you are searching for something, make sure the cursor is on a bank or item (items include programs, mixes, songs, samples, and arpeggiation patterns) and hold LOCATE and press either INC or DEC. This will take you to the Global/Item menu where you can see all the items within the current bank laid out before you. Once you have found the item you are looking for, press the "Open" button and this item will be loaded into whatever field you came from and you will be returned from the item explorer back to where you came from.

Alternatively, when the cursor is on a bank or item , you can jump to the item explorer by holding the LOCATE button and pressing either BANK button. When you are using this method, the Fusion will take you to the Global/Item menu where all the banks are laid out before you. Select the desired bank and press "Open", and then select the desired item.

Quick Access Buttons

Whenever you are in Program, Mix, or Sampler modes, you can always select programs, mixes, or multisamples directly by using the A—P and 1—8 buttons. The A—P and 1—8 buttons allow you to load any of the individual items contained within each bank.

Storing Your Work

Before we dive into the inner workings of the Fusion workstation, let's take a moment to learn how to store your programs, mixes, songs, multisamples, and arpeggiation patterns.

Storing Programs, Mixes, Songs, and Multisamples

Storing your work on the Fusion is easy. Whenever you want to save your work, press the "STORE" button and you'll be taken to the menu shown below. This menu will let you name and store your work from Program, Mix, Song, and Sampler modes.

[Note: The image above is taken from Program mode but Mix, Song, and Sampler modes look similar and function in the same way.]

Menu: (various modes)/STORE/Store
Parameter: Store (parameter; left side of screen)
Value Range: (varies depending on mode)

In some cases, you may need to specify exactly what you'd like to store. For example, in Sampler mode you can work on an individual sample or a set of samples that are layered and grouped together (called a "multisample"). You need to specify whether you'd like to save the sample or the multisample using this parameter.

Similarly, if you have been working with arpeggiation patterns in either Program, Mix, or Song modes, you will be able to select between "Current Program" which will save the entire program, or "Arp 1 Pattern" through "Arp 4 Pattern" which will only save the selected arpeggiation pattern. Note that you cannot select arpeggiations 1 through 4 unless you've actually loaded or recorded a pattern into your current mix, or song. Also note that Programs can only load one arpeggiation pattern at a time.

If you add or edit samples within a multisample, you must store them before storing your multisample. The same is true for patterns within programs, mixes, and songs.

Menu: (various modes)/STORE/Store
Parameter: Bank
Value Range: (varies depending on available banks)

Your program, mix, song, or multisample can be stored in any bank available to your Fusion. Select that bank using this parameter.

If none of the existing banks are appropriate for your needs, you can always create a new bank using the "New Bank" button (see below).

Menu: (various modes)/STORE/Store
Parameter: #
Value Range: A-1 (000) to P-8 (127)

This program lists where your current program, mix, song, or sample will be stored within the bank.

Note that if an existing program, mix, song, or multisample is already occupying that spot in the bank, its name will be listed in quotes to the right of the bank number. If the quotes are empty, it means that this spot in the bank has never been used and that you can store in this location without overwriting anything.

If you decide to store over an existing program, a prompt will appear asking you to confirm that you want to overwrite the existing item with your current item.

Banks with more than 128 items:

Each bank of the Fusion can contain more than 128 items (i.e., programs, mixes, songs, multisamples, samples, or patterns). However, we do not recommend doing this since you will not be able to access the programs using the Quick Access buttons or "Program Change" messages (via MIDI).

The only way to access such items will be by selecting them using the Control Wheel or the INC/DEC buttons.

Menu: (various modes)/STORE/Store
Parameter: Store (action button; right side of screen)
Value Range: (none)

This button stores your current program at the location indicated by the "Bank" and "#" parameters.

Menu: (various modes)/STORE/Store
Parameter: Rename
Value Range: (none)

This button brings up a page allowing you to rename your program. Use the PREV/NEXT buttons to move the cursor back and forth while using the Control Wheel to select your letters and numbers.

Using Keys to Name Programs:

You can use the keys starting from the left-most note on the workstation to select your letters and numbers. Some users may find this to be faster than using the Control Wheel for selecting characters—especially for longer names.

Press a key once for lowercase and twice for uppercase. Use the PREV/NEXT buttons to move the cursor back and forth.

Menu: (various modes)/STORE/Store
Parameter: New Bank
Value Range: (none)

This button brings up a prompt allowing you to select the name and physical location of a new bank. See page 33 for more.

[Note: The image above is taken from Program mode but Mix, Song, and Sampler modes look similar and function in the same way.]

Menu: (various modes)/STORE/Store/New Bank
Parameter: Device
Value Range: Hard Drive, CF Media

This parameter lets you select the physical location of your new bank on the Fusion. This parameter will vary depending on whether or not you have inserted a Compact Flash card into the Fusion.

Menu: (various modes)/STORE/Store/New Bank
Parameter: New Bank
Value Range: (none)

This button creates the new bank on your Fusion.

Menu: (various modes)/STORE/Store/New Bank
Parameter: Rename
Value Range: (none)

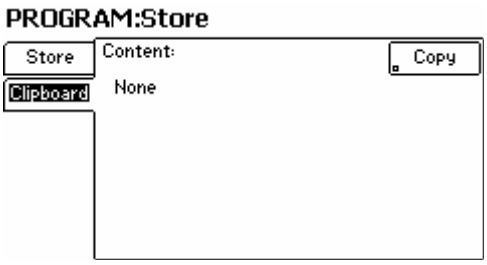
The name of your bank is listed in large letters in the middle of the screen. If you'd like to change the name, press this button. A prompt will appear allowing you to change the name.

The Clipboard

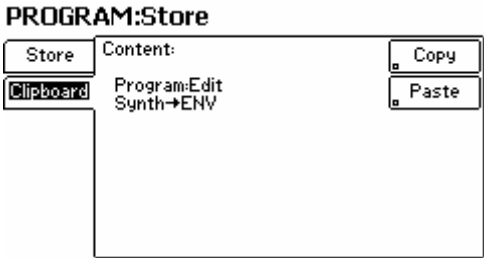
The clipboard of the Fusion is a useful tool for copying and pasting an entire page of parameters. For example, if you want to transfer all of the envelope settings from one program to another, you can do so without having to write down (or remember) all the settings from one program and then manually enter them into another program's envelope page.

The clipboard can be used to copy settings from the following pages in Program mode: Envelope, LFO, Filter, Bus Effects, Insert Effects, and MasterEQ.

To use the clipboard, simply go to one of the pages listed above and press the "Store." Then press the "Clipboard" soft button on the upper left. You screen should then look like the following:



Once you press the "Copy" soft button, the contents of the page you just came from will be copied to the clipboard. Your screen will then look something like the following (the "contents" may be different depending on what you copy to the clipboard):



Notice that the "Paste" button has now appeared on screen and that the page you just copied is now listed under the word "Content:"

Now you can freely navigate through the Fusion's pages. The "Paste" button will appear on the clipboard whenever you access a page to which you can copy the clipboard contents. In other words, if you copied Envelope parameters, every time you access an Envelope page, the "Paste button will become available on this clipboard page.

If the "Paste" button is unavailable, it means you cannot copy the contents of the clipboard to the current page.

Using this functionality, you can save a lot of time and energy when you need to copy things like Envelope, LFO, and other settings to other pages.

Connecting to a Computer via USB

The Fusion's USB port allows you to connect your Fusion to a computer. This is a very useful feature since it allows you to transfer programs, mixes, songs, samples, multisamples, and arpeggiation patterns to (and from) your computer. Once you have your files on your computer, you can back them up for safe-keeping, give them to friends who own Fusion workstations, or even share your Fusion related files over the Internet.

This opens up a lot of possibilities, but you must be careful not to disrupt existing file references by moving (or deleting) files or folders on the Fusion's hard disk. In other words, don't move (or delete) files unless you're sure that doing so won't affect your other files!

This sounds complicated, so let's break it down into a real-world example: Let's say you move a program to a different folder (using either the Fusion's own Item Explorer or through the USB connection). The next time you fire up your Fusion and try to load a mix or song that needs the program you just moved, you'll get an error message telling you that the program can't be found. You'll then have the option to tell the Mix or Song where it can find the moved program. Now, if you had deleted that program you'd be in trouble because the song or mix would no longer be able to load the program.

The moral of the story is this: move and delete files carefully and make sure that doing so won't have unintended consequences!

Moving or Deleting Files:

Be very careful whenever you move or delete any files on your Fusion. If you move (or delete) a file, all other files referencing the moved or deleted item will become invalid and this may turn into an unexpected headache for you.

If you do move files, you'll need to update all other files that refer to the moved file. If you delete files, make sure they are not referenced by any other files.

Formatting the Hard Disk:

Do not format the Fusion's internal hard disk via USB. Using USB to format the hard disk may severely degrade audio playback performance.

Instead, use the "Format" function in Global mode (see page 193) since that will ensure that the drive is formatted for optimal audio performance.

Chapter 3: Fusion Modes

This chapter covers all of the Fusion's modes including Program, Mix, Song, Sampler, Mixer, and Global. Since some features (including Envelopes, LFOs, Filters, Arpeggiations, and Effects) are common to all of these modes, we cover them separately in chapter 4.

Program Mode

This section covers parameters relating specifically to Program mode. This includes everything found on the "Program," "Synth," and "Utility" tabs (to the left of the display). See chapter 4 for detailed descriptions about the "Mod," "Arp," and "Effects" tabs.

Setting Overall Program Parameters

Menu: Program/Program/General
Parameter: Tempo
Value Range: 50 – 300 BPM

The tempo that you set here–expressed in Beats Per Minute (BPM)–determines the tempo at which the arpeggiator plays.

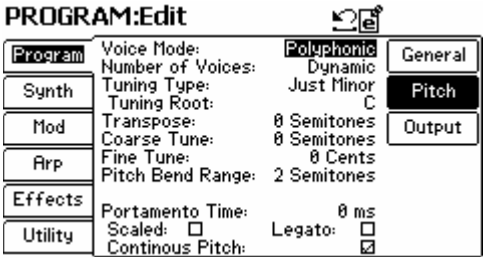
You can change this value during a performance by switching to the "Arp" row on the Performance Panel and turning the corresponding knob. If you change programs without saving your program, the tempo value will revert back to the original tempo value so remember to save your program if you want to keep your newly selected tempo.

Menu: Program/Program/General
Parameter: Category
Value Range: Piano, Chromatic, Organ, Guitar, Bass, Strings, Ensemble, Brass, Reed, Pipe, Lead, Pad, Synth FX, Ethnic, Drum/Perc, Sound FX, OTHER

Use this option to place the program into one of the seventeen categories listed to the right of the parameter. Once you place the program in a category, it will show up under that category when you are browsing through the Fusion's programs menu. Note that if you change this parameter, your program will not show up under the new category until you've saved your program.

Menu: Program/Program/General
Parameter: Alternative Category (Piano, Chromatic, Organ, Guitar, Bass, Strings, Ensemble, Brass, Reed, Pipe, Lead, Pad, Synth FX, Ethnic, Drum/Perc, Sound FX)
Value Range: On, Off

Sometimes a sound fits into more than one category. For example a sawtooth synth sound might work equally well as a bass or a lead. For that reason, the Fusion allows you to assign a program to Alternate Categories. If you select any of these check boxes, the instrument will appear in multiple places when you're browsing through your Fusion's sounds. Like the "Category" parameter, if you check alternative boxes, your program will not show up under the new menus in the category until you've saved your program.



Menu: Program/Program/Pitch
Parameter: Voice Mode
Value Range: Polyphonic, Monophonic

This parameter lets you choose how your program is set up. "Polyphonic" instruments can play many notes at the same time whereas "Monophonic" instruments only play one note at a time. Pianos and organs are examples of polyphonic instruments while flutes and trumpets are examples of monophonic instruments. Fusion programs can either be polyphonic or monophonic.

Menu: Program/Program/Pitch
Parameter: Number of Voices (only available if "Voice Mode" is set to "Polyphonic")
Value Range: Dynamic, 1 – 16

Unlike most synths which have a fixed number of voices that can play at the same time, the Fusion automatically optimizes itself to squeeze the maximum number of voices out of the synth engine. In other words, the Fusion does not set arbitrary limits on how many voices you can play at the same time and lets you push the processor to its absolute limit.

In general, you should leave this parameter set to Dynamic to allow the workstation to optimize itself. The only case in which you might consider changing this to a fixed limit is if you are creating a multi-instrument Mix and want to limit the voices of one instrument to maximize the voices of another.

Menu: Program/Program/Pitch
Parameter: Tuning Type (Not available if your "Synthesis Type" is set to "Drum")
Value Range: Equal Tempered, Just Major, Just Minor

Since the Classical era, pianos and other instruments in Western music have been tuned to "Equal Temperament," in which note pitches are evenly spaced apart from one another.

However, the Fusion's other tuning types can produce fantastic results and may at times be more suitable for particular types of music. With this option, you can experiment with tuning types beyond the standard Equal Tempered.

There are different tuning types?

Yes! "Equal tempered" tuning is the most common scale used today. Each semitone step in a scale is equally spaced apart so it is easily possible to transpose compositions. For example, you can compose a song and then play it in another key without any problems.

"Just major" and "just minor" are tuned in a way in which there are no beats between whole tones and semitones. A byproduct of this kind of tuning is that the intervals between adjacent notes in the scale vary, and so it is not always possible to transpose your compositions into another key. In other words, if you compose a song in just major or just minor tuning and try playing it in another key, there's a good chance your song will sound very odd, out-of-tune, and just plain wrong… unless you're into that sort of thing.

If none of this has made any sense to you, don't worry. Unless a musical composition specifically calls for a different tuning type, just leave your tuning equal tempered.

Menu: Program/Program/Pitch
Parameter: Tuning Root (Not available if "Tuning Type" is set to "Equal Tempered")
Value Range: C through B

Sets the "root" note on which the rest of the note tunings are based. For example, if you're playing a just major (or minor) composition in the key of F, you have to set this value to F for proper tuning.

Equal Tempered tuning does not have a root note because all the notes are equally spaced apart.

If you're playing a composition in Just Major (or Just Minor) and you've set the Tuning Type, but your chords and intervals still sound odd, double check your Tuning Root to make sure it's set correctly.

Menu: Program/Program/Pitch
Parameter: Transpose
Value Range: -48 to +48 semitones

Use transposition to reassign the notes that are triggered when you play the keyboard (or access the Fusion via an external MIDI device). For instance, with a "2 semitones" transposition, every time you play a C key, the Fusion will play the D note instead.

You can transpose the Fusion up to four octaves higher or four octaves lower than the default "0"-semitone setting.

Menu: Program/Program/Pitch
Parameter: Coarse Tune
Value Range: -48 to +48 semitones

Unlike transpose, which reassigns the notes that are triggered when you play the keyboard, Coarse Tune actually pitch-shifts the notes you play. Where transpose generally sounds natural, pitch can create weird and often comical artifacts, especially when you radically pitch-shift sample-based sounds. (If you've ever heard The Chipmunks Christmas record, you've heard enough pitch shifting to last a lifetime… or two.)

Menu: Program/Program/Pitch
Parameter: Fine Tune
Value Range: -99 to +99 cents

Fine tune allows you to make small pitch changes. Use this function to tune the program to a slightly flat or sharp ensemble.

Menu: Program/Program/Pitch
Parameter: Pitch Bend Range
Value Range: 0 – 12 Semitones

Assign the pitch bend wheel's range here. Values range from 0 (no pitch bend) to 12 semitones.

Menu: Program/Program/Pitch
Parameter: Portamento Time
Value Range: 0 – 30 Sec

Portamento is when your instrument "glides" between notes (like a cello for example) instead of abruptly jumping between them (like a piano). This value sets the time it takes to glide between one note and another. You can turn this function off by setting its value to 0.

Menu: Program/Program/Pitch
Parameter: Scaled
Value Range: On, Off

If you check this box, your "Portamento Time" setting (see above) represents the time it takes to glide one octave. If you leave this box unchecked, your "Portamento Time" parameter represents the time it takes to glide from one note to another (regardless of distance between each note).

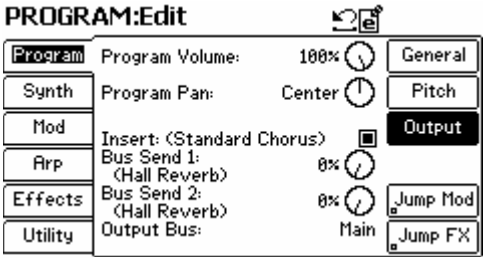
Menu: Program/Program/Pitch
Parameter: Legato
Value Range: On, Off

If this parameter is set, portamento only occurs if when you play in legato fashion (i.e., when you play a note before releasing the last note played).

Menu: Program/Program/Pitch
Parameter: Continuous Pitch
Value Range: On, Off

If this parameter is set to "on," the portamento pitch starts from where the last portamento stopped. In other words, if you stop your portamento in the middle of its glide, it will pick up wherever you left off when you play your next note.

On the other hand, if this parameter is left off, the pitch will simply pick up from the last note played.



Menu: Program/Program/Output
Parameter: Program Volume
Value Range: 0 – 100%

This sets the overall volume for the program you're playing.

Menu: Program/Program/Output
Parameter: Program Pan
Value Range: L100% to R100%

Pan (or Balance) sets the stereo positioning from hard left (L100%) to hard right (R100%). This parameter changes depending upon your sample type—if you're using a mono sample, the screen displays "Pan," but if you're using a stereo sample it says "Balance." See the FAQ section at the end of this manual (page 285) if you'd like to know why we labeled things this way.

Menu: Program/Program/Output
Parameter: Insert (The effect is listed in the parenthesis to the right of the parameter)
Value Range: On, Off

An Insert Effect is "inserted" between the program and the Fusion's audio outputs.

Here you can choose whether to enable or disable an insert effect for the program. Your insert options will vary depending on what insert effect you have selected in the Effects/Insert menu (page 252 for more on this).

Menu: Program/Program/Output
Parameter: Bus Send 1 & 2 (The effect is listed in the parenthesis to the right of each Bus Send parameter)
Value Range: 0 – 100%

Bus Effects, unlike Insert Effects are shared by every program, mix, and song on the Fusion. There are two Bus Effects available, labeled "Bus Send 1" and "Bus Send 2."

Dial in the amount of processing you want from each Bus Effect. For instance, if Bus Effect 1 is a reverb, 0% will have no effect on the program, whereas 100% will yield the maximum amount of reverb which will sound like a washy, indistinct sound. With most Bus Sends (including reverbs), a medium setting will yield the best results.

Selecting Effects:

To select which effects you'd like to use, go to the Effects/Bus/Select menu (see page 253 for more about this).

Note that these settings affect the MAIN outputs only. If you set your program to output on the AUX output (see below), the program will bypass all bus effects.

Menu: Program/Program/Output
Parameter: Output Bus
Value Range: Main, Aux, None

The program's audio output can be played through either the MAIN or AUX outputs or disabled completely by setting this parameter to NONE.

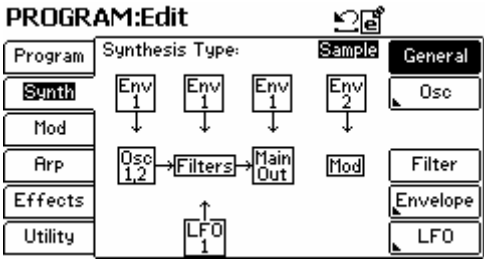
Keep in mind that your sends are prior to the output selection. So if a program has sends to an effect and the output set to MAIN then the user hears the program + effect on the main outputs and nothing on the Aux outputs. If the output setting is set to AUX then the user hears program on the Aux and all "wet" effect output on the mains. If the output is set to NONE, then the user hears all "wet" effect on the main outputs and nothing on the Aux outputs. A setting of NONE is useful if the user wants just the effect output without hearing the actual program output. Also note that the effects bus return volume (on the effects page) must be turned up in order to hear the effect. The diagram on page 262 should clear up any confusion.

Menu: Program/Program/Output
Parameter: Jump Mod
Value Range: (none)

Once you have created a modulation route to a parameter on this page (using the modulation matrix), a new button called "Jump Mod" appears on the right that allows you to immediately jump to the page of the matrix where the connection is being made.

Menu: Program/Program/Output
Parameter: Jump FX
Value Range: (none)

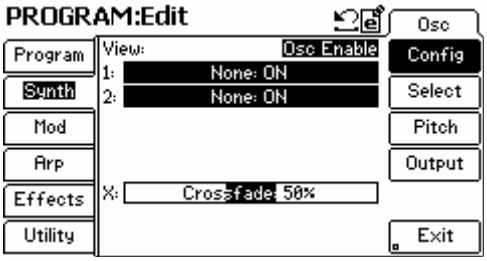
This button will take you to the Effects menu where you can select and edit the effects that you'd like to use.



Synthesis Type: Sample Playback

Sample Synthesis uses looped, layered, and filtered samples of real acoustic sources and the direct output of other electronic instruments for the utmost sonic realism.

- Oscillators: One or two multi-sample sets.
- Filters: 3 Filters total. 2 minimized filters (one at each oscillator) + 1 filter for the voice. Each "minimized filter" is a 1-pole low pass, non-resonant filter. All other filters mentioned above have variable type, steepness, cutoff frequency, and resonance.
- Envelopes: Up to eight envelopes for controlling volume, filter, pitch, or other parameters.
- Low-frequency oscillators (LFO): Up to eight low-frequency oscillators for controlling vibrato, filter operation, or other parameters.



Menu: Program/Synth/Osc/Config
Parameter: View
Value Range: Osc Enable, Osc Multisample, Osc Transpose, Osc Coarse Tune, Osc Fine Tune, Osc Volume, Osc Pan

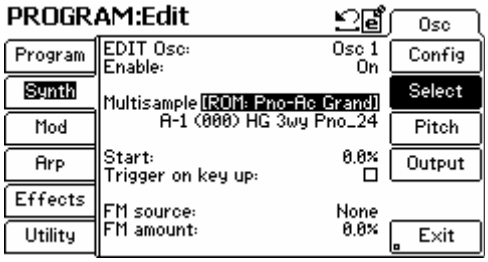
This screen provides a convenient overview showing how many of the commonly used parameters in the Sample Synthesis submenus are configured.

This page shows parameter settings of both oscillators in relation to one another. By having these common parameters on one screen, it saves users from having to jump back and forth between multiple oscillator pages. You can change oscillator settings (volume, pan, tuning, etc) by editing the "1:" and "2:" parameters.

Since our synthesis type is set to Sample Synthesis, we have two oscillators available for editing (remember that the Sample Synthesis type has two oscillators).

Menu: Program/Synth/Osc/Config
Parameter: X: (Crossfade)
Value Range: 0 – 100%

Sets the volume balance between each of your two oscillators. Many users route the velocity of the keyboard to this parameter to achieve a velocity cross-fade in which you hear more of one oscillator and less of another as a key is struck harder.



Menu: Program/Synth/Osc/Select
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 2

Select the oscillator you'd like to edit.

Menu: Program/Synth/Osc/Select
Parameter: Enable
Value Range: On, Off

Allows you to enable or disable each oscillator

Menu: Program/Synth/Osc/Select
Parameter: Multisample
Value Range: (varies depending on available multisamples)

This parameter lets you select the multisample you want to load for each of the two oscillators in Sample Playback mode.

Menu: Program/Synth/Osc/Select
Parameter: Start
Value Range: 0 – 10%

When you set a Start point, you indicate how much of the initial attack of your sample you want to include. When set to "0%," the sample will begin playing at the beginning. At "10%," the sample will begin playing 10% into the sample and will bypass much of the natural "attack" of your sample. Bypassing the attack of your sample results in more "mellow" tone since much of the initial transients have been removed.

Sound designers sometimes use this parameter to control the perceived "hardness" of the sound. For example, by mapping note velocity of the keyboard to the start point of guitar or drum samples, the harder you strike the keyboard, the more of the natural attack comes through resulting in a seemingly "harder" strike (or pick, in the case of a guitar). Conversely, as you play more softly, more of the attack is bypassed and a mellower tone results.

About Zero-Crossing Points:

If you place your start point on a non-zero crossing (i.e., at the top or the bottom of a waveform) then you'll hear a click or a pop as the sample is triggered. This click has nothing to do with the actual sample attack, but can be perceived as an attack. If you do not want this sound to appear in your sample, you can either change the start point until it lands on (or close to) a zero-crossing, or you can set an amplitude envelope attack time to about 5 or 10 milliseconds and that should smooth out any clicks or pops.

Menu: Program/Synth/Osc/Select
Parameter: Trigger on key up
Value Range: On, Off

Usually, you want sounds to play when you press a key. But there are some cases–such as a harpsichord's release sound–where you want the sound to play when you raise your fingers off the keys. Enable Trigger On Key Up in such cases.

About Key Up Envelope Triggering:

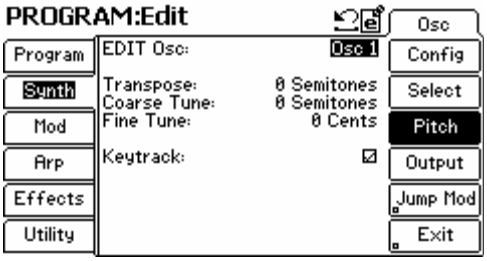
You'll probably want to set the envelope trigger mode (see page 226 for more) to "key up" so that the volume envelope does not jump to the Release state and quickly mute your sound when you release a key. Alternatively, you could leave the trigger mode to "normal" but increase the release time so that this oscillator has a chance to play before being muted.

Menu: Program/Synth/Osc/Select
Parameter: FM source
Value Range: None, Osc 1, Osc 2, Filter

You can have the filter or an oscillator's waveform modulate the frequency of the current oscillator. The result is a more complex waveform with richer harmonics.

Menu: Program/Synth/Osc/Select
Parameter: FM Amount
Value Range: 0 – 100%

Blend in any amount of the FM source. Higher percentages blend in more of the FM source and create richer harmonics. Smaller percentages blend in less of the FM source and leave a more pure tone from your oscillator.



Menu: Program/Synth/Osc/Pitch
Parameter: Edit OSC
Value Range: Osc 1 to Osc 2

Choose the oscillator you'd like to edit.

Menu: Program/Synth/Osc/Pitch
Parameter: Transpose
Value Range: -48 to +48 semitones

Use transpose to reassign the notes that are triggered when you play the keyboard (or access the Fusion via an external MIDI device). For instance, with a "2 semitones" transposition, every time you play a C key, the Fusion will play the D note instead.

Menu: Program/Synth/Osc/Pitch
Parameter: Coarse Tune
Value Range: -48 to +48 semitones

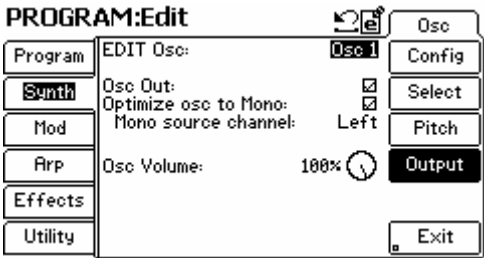
Use this parameter to make large pitch changes to your oscillator (in semitone steps).

Menu: Program/Synth/Osc/Pitch
Parameter: Fine Tune
Value Range: -99 to +99 Cents

Change this parameter to fine tune your oscillator's pitch.

Menu: Program/Synth/Osc/Pitch
Parameter: Keytrack
Value Range: On, Off

Under normal circumstances, you'll most likely want the oscillator pitch to follow the key you're playing on the keyboard so leave this parameter set to "On." Turn this function off if you don't want your oscillator pitch to follow the key you're playing on the keyboard.



Menu: Program/Synth/Osc/Output
Parameter: Edit Osc
Value Range: Osc 1 to Osc 2

Choose the oscillator you'd like to edit.

Menu: Program/Synth/Osc/Output
Parameter: Osc Out
Value Range: On, Off

If you want to mute the output of an oscillator, uncheck this box. This option exists because it allows an oscillator to modulate another oscillator without its output being heard (you only hear the effects of the modulation on another oscillator).

For normal operation, leave this box checked.

Menu: Program/Synth/Osc/Output
Parameter: Optimize osc to Mono
Value Range: On, Off

This option conserves processing power and maximizes the number of voices on your Fusion by removing panning for an oscillator.

About "Optimize to Mono"

When you set Optimize to Mono ON, you can't pan each individual oscillator, but you can still pan the overall program through the Program/Output page.

Menu: Program/Synth/Osc/Output
Parameter: Mono source channel (only appears when "Optimize to Mono" is checked and a stereo sample is being used)
Value Range: Left, Right

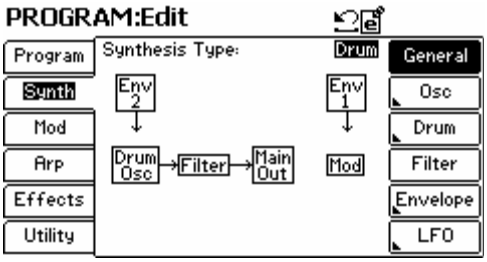
If you check the "Optimize osc to Mono" parameter and are using a stereo sample for this program, your oscillator can only use one channel of your stereo sample. Select which channel you'd like to use here.

Menu: Program/Synth/Osc/Output
Parameter: Osc Volume
Value Range: 0 – 100%

Sets the volume of each oscillator. This is different from the Volume parameter in the Program/Output menu because it lets you set the volume of each individual oscillator in your program, whereas the Volume/Output menu sets the level of the entire program.

Menu: Program/Synth/Osc/Output
Parameter: Osc Pan (only visible if "Optimize to Mono" is turned off)
Value Range: L100% to R100%

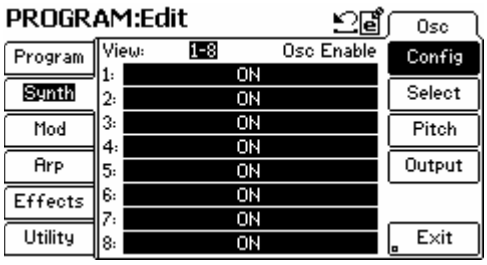
Sets the pan position of each individual oscillator. This is different from the Pan parameter under the Program/Output section because each oscillator can be panned to its own position whereas the Program/Output setting will pan the entire program.



Synthesis Type: Drum

This synthesis type is specifically designed and optimized for drums and other sample sets where each note on the keyboard corresponds to one distinct type of sound (i.e., kick drum, snare drum, ride cymbal, etc.)

- Oscillators: Each oscillator can have up to four cross-switched samples, and up to 64 oscillators can be "stacked" on the same note. This allows you to use up to 256 samples per program.
- Filters: 64 filters total. One filter at each oscillator. You can assign each filter's type, cutoff, frequency, and resonance.
- Envelopes: Up to eight envelopes for controlling volume, filter, sustain, or other parameters.
- Low-frequency oscillators (LFO): Up to eight low-frequency oscillators for controlling vibrato, filter operation, or other parameters.



The Synth/Osc/Config screen provides a convenient overview showing how many of the commonly used parameters in the Drum Synthesis submenus are configured.

This page shows parameter settings of eight consecutive oscillators in relation to one another. By having these common parameters on one screen, it saves users from having to jump back and forth between multiple oscillator pages. You can change oscillator settings (volume, pan, tuning, etc) by editing the parameters labeled "1:", "2:", and so on.

Since our synthesis type is set to Drum Synthesis, we have 64 oscillators available for editing.

Menu: Program/Synth/Osc/Config
Parameter: View (Left Side; oscillator range)
Value Range: 1 to 64 (displayed in groups of 8)

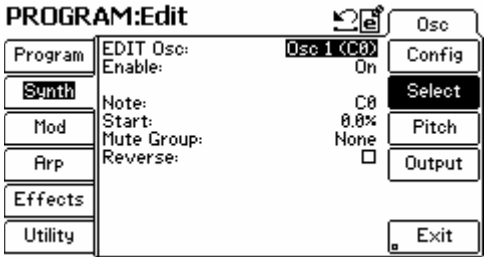
This menu allows you to cycle through all 64 oscillators that you can use under the Drum Synthesis method.

Menu: Program/Synth/Osc/Config
Parameter: View (Right Side; Oscillator Parameter)
Value Range: Osc Enable, Osc Note, Osc Coarse Tune, Osc Fine Tune, Osc Volume, Osc Pan

This section provides quick access to common oscillator parameters. Choose the parameter that you want to edit across your eight drums. Note that this selection changes what appears in the 1: through 64: fields (see below).

Menu: Program/Synth/Osc/Config
Parameter: 1: through 64:
Value Range: Varies depending on View setting (see above)

This section provides quick access to common oscillator parameters. The contents of this parameter change depend on your "view" (Right Side) settings. Use the Control Wheel to adjust the listed values.



Menu: Program/Synth/Osc/Select
Parameter: EDIT Osc:
Value Range: Osc 1 to Osc 64

Select the oscillator you'd like to edit. The value in the parenthesis varies depending on what note the oscillator has been assigned to (using the "Note" parameter—see below).

Menu: Program/Synth/Osc/Select
Parameter: Enable
Value Range: On, Off

Allows you to enable or disable each oscillator.

Menu: Program/Synth/Osc/Select
Parameter: Note
Value Range: C-2 to G8

This parameter selects the note your oscillator will play on. Keep in mind that it is possible for multiple oscillators to be assigned to the same note.

Menu: Program/Synth/Osc/Select
Parameter: Start
Value Range: 0 % to 10%

When you set a Start point, you indicate how much of the initial attack of your sample you want to include. When set to "0%," the sample will begin playing at the beginning. At "10%," the sample will begin playing 10% into the sample and will bypass much of the natural "attack" of your sample. Bypassing the attack of your sample results in more "mellow" tone since much of the initial transient has been removed.

Sound designers sometimes use this parameter to control the perceived "hardness" of the sound. For example, by mapping note velocity of the keyboard to the start point of drum samples, the harder you strike the keyboard, the more of the natural attack comes through resulting in a seemingly "harder" strike (or pick, in the case of a guitar). Conversely, as you play more softly, more of the attack is bypassed and a mellower tone results.

About Zero-Crossings:

If you place your start point on a non-zero crossing (i.e., at the top or the bottom of a waveform) then you may hear a click or a pop as the sample is triggered. This click has nothing to do with the actual sample attack, but can be perceived as an attack. If you do not want this sound to appear in your sample, you can either change the start point until it lands on (or close to) a zero-crossing, or you can set an amplitude envelope attack time to about 5 or 10 milliseconds and that should smooth out any clicks or pops.

Menu: Program/Synth/Osc/Select
Parameter: Mute Group
Value Range: None, Self, A to P

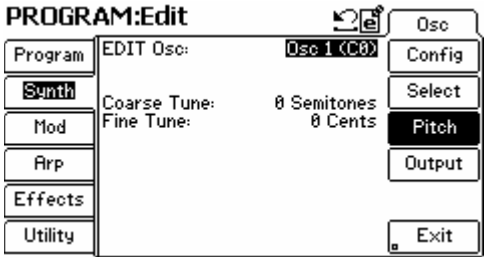
This allows you to mute one oscillator when another is played.

Certain percussion sounds mute other sounds when played in succession. For example, when you play an open hi-hat and then follow it with a closed hi-hat, the closed hi-hat stops the open hat from ringing. By assigning individual oscillators to the same mute group (groups range from A through P) you can have one oscillator mute another oscillator's output as soon as you play it.

You can also assign an instrument to mute itself by setting the parameter to Self. This is commonly used to save polyphony on drum sounds with long decay times (such as ride cymbals). Instead of repeatedly triggering a new voice (and thus, quickly eating up your polyphony), you can stop and re-trigger the same voice.

Menu: Program/Synth/Osc/Select
Parameter: Reverse
Value Range: On, Off

Check this box to make the sample play backwards.



Menu: Program/Synth/Osc/Pitch
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 64

Select the oscillator you'd like to edit. Since we're in Drum Synthesis mode, you have 64 oscillators to choose from.

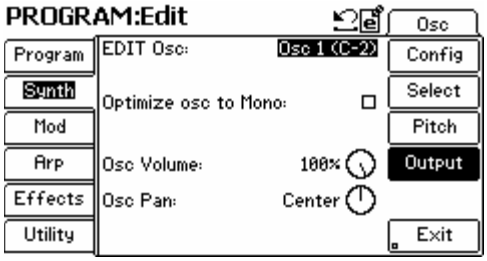
The value in the parenthesis varies depending on what note the oscillator has been assigned to (using the "Note" parameter on the Synth/Osc/Select page).

Menu: Program/Synth/Osc/Pitch
Parameter: Coarse Tune
Value Range: -48 to +48

This parameter pitch-shifts the drum sample you are editing. Smaller amounts of pitch shifting can be used to change the tuning of a drum, whereas large amounts of pitch shifting can be used to create strange and interesting (and sometimes otherworldly) percussion sounds.

Menu: Program/Synth/Osc/Pitch
Parameter: Fine Tune
Value Range: -99 to +99

Change this parameter to tune your oscillator sharp or flat.



Menu: Program/Synth/Osc/Output
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 64

Choose the oscillator you'd like to edit. Since our synthesis type is set to Drum, you have 64 oscillators to choose from.

The value in the parenthesis varies depending on what note the oscillator has been assigned to (using the "Note" parameter on the Synth/Osc/Select page).

Menu: Program/Synth/Osc/Output
Parameter: Optimize osc to Mono
Value Range: On, Off

This option conserves processing power and maximizes the number of voices on your Fusion by removing panning for an oscillator.

About "Optimize Osc to Mono"

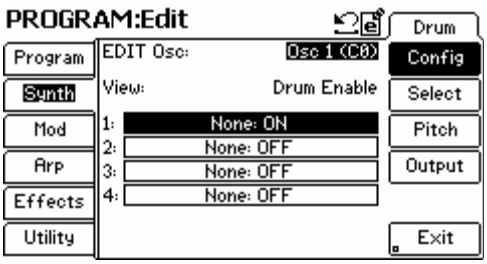
When you set Optimize to Mono ON, you can't pan each individual oscillator, but you can still pan the overall program through the Program/Output page.

Menu: Program/Synth/Osc/Output
Parameter: Osc Volume
Value Range: 0 to 100%

Sets the volume of each oscillator. This is different from the Volume parameter in the Synth/Drum/Output menu because it lets you set the volume of each individual oscillator in your program, whereas the Program/Output menu sets the level of the entire program.

Menu: Program/Synth/Osc/Output
Parameter: Osc Pan (only visible if "Optimize to Mono" is turned off)
Value Range: L100% to R100%

Sets the pan position of each individual oscillator. This is different from the Pan parameter under the Program/Output section because each oscillator can be panned to its own position whereas the Program/Output setting will pan the entire program.



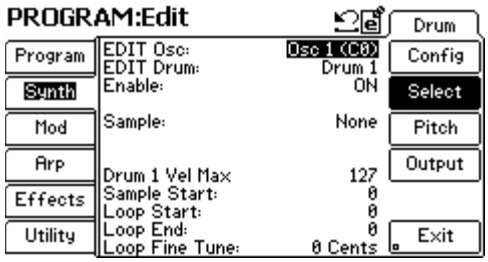
Menu: Program/Synth/Drum/Config
Parameter: View
Value Range: Drum Enable, Drum Sample, Drum Vel Max/Split, Drum Coarse Tune, Drum Fine Tune, Drum Volume, Drum Pan

This screen provides a convenient overview showing how many of the commonly used parameters in the Drum Synthesis submenus are configured.

This page shows parameter settings of several samples in relation to one another. By having these common parameters on one screen, it saves users from having to jump back and forth between multiple drum pages. You can change drum settings (volume, pan, tuning, etc) by editing the "1:" "2:" "3:" and "4:" parameters (see below).

Menu: Program/Synth/Drum/Config
Parameter: 1: to 4:
Value Range: Varies depending on View setting (see above)

This section provides quick access to common drum settings. The contents of this parameter change depend on your "view" parameter settings. Use the Control Wheel to adjust the listed setting.



Menu: Program/Synth/Drum/Select
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 64

Choose the oscillator you'd like to edit. Since our synthesis type is set to Drum, you have 64 oscillators to choose from.

The value in the parenthesis varies depending on what note the oscillator has been assigned to (using the "Note" parameter on the Synth/Osc/Select page).

Menu: Program/Synth/Drum/Select
Parameter: EDIT Drum
Value Range: Drum 1 to Drum 4

Each oscillator in the Drum Synthesis type can have up to four drum samples. Select the individual drum sound you'd like to edit here.

Menu: Program/Synth/Drum/Select
Parameter: Enable
Value Range: On, Off

This parameter lets you enable or disable individual drum samples.

Menu: Program/Synth/Drum/Select
Parameter: Sample
Value Range: [Varies depending on samples available to the Fusion]

You can assign one sample to each drum. Assign that sample here.

Menu: Program/Synth/Drum/Select
Parameter: Drum 1 Vel Max (varies slightly depending on which drums have been enabled)
Value Range: 0 to 127

This parameter sets the maximum drum velocity (or velocity-switching point if you have more than one drum sample enabled).

Note that if you only have one drum enabled and "Drum 1 Vel Max" is set below 127 then you won't hear any sounds when a note is triggered at a velocity above the maximum velocity. By that same token, if your "Drum 1 Vel Min" is set high, then you will not hear any sounds when a note is triggered too softly.

Menu: Program/Synth/Drum/Select
Parameter: Sample Start
Value Range: [depends on sample]

This parameter is identical to the "Start" parameter mentioned earlier in this chapter (see the Synth/Osc/Select section for more).

Menu: Program/Synth/Drum/Select
Parameter: Loop Start
Value Range: [depends on sample]

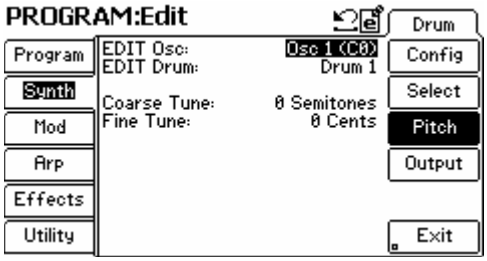
This parameter sets the point at which your looping will start taking place. Once playback of your sample reaches the "Loop End" point (see below), it jumps back to this point and begins looping between these two points. If the Loop Start is greater than or equal to the Loop End, then the Fusion will default to using the loop points defined within the sample.

Menu: Program/Synth/Drum/Select
Parameter: Loop End
Value Range: [depends on sample]

This parameter sets the end point of your loop. Once playback of your sample reaches this point, it will jump back to the "Loop Start" point (see above) and a loop will begin taking place between these two points. If the Loop End is less than or equal to the Loop Start then the Fusion will default to using the loop points defined within the sample.

Menu: Program/Synth/Drum/Select
Parameter: Loop Fine Tune
Value Range: [depends on sample]

This parameter lets you make small adjustments to the loop portion of your sample.



Menu: Program/Synth/Drum/Pitch
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 64

Choose the oscillator you'd like to edit.

Menu: Program/Synth/Drum/Pitch
Parameter: EDIT Drum
Value Range: Drum 1 to Drum 4

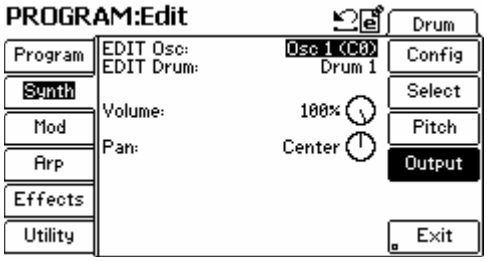
Each oscillator in the Drum Synthesis type can have up to four drum parts. Select the individual drum sound you'd like to edit here.

Menu: Program/Synth/Drum/Pitch
Parameter: Coarse Tune
Value Range: -48 to +48 Semitones

Use this parameter to make large pitch changes to your drum (in semitone steps).

Menu: Program/Synth/Drum/Pitch
Parameter: Fine Tune
Value Range: -99 to +99 Cents

Change this parameter to fine tune your drum's pitch.



Menu: Program/Synth/Drum/Output
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 64

Choose the oscillator you'd like to edit.

Menu: Program/Synth/Drum/Output
Parameter: EDIT Drum
Value Range: Drum 1 to Drum 4

Each oscillator in the Drum Synthesis type can have up to four drum parts. Select the individual drum sound you'd like to edit here.

Menu: Program/Synth/Drum/Output
Parameter: Volume
Value Range: 0 to 100%

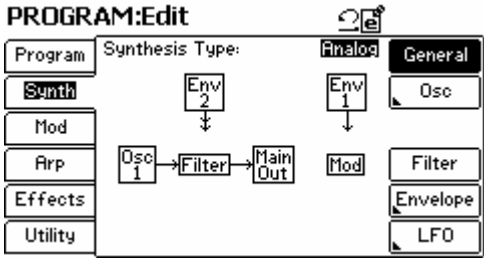
This parameter sets the volume of each individual drum sound for one oscillator. This is different from the "Osc Volume" parameter found in the Synth/Osc/Output menu because it lets you adjust drum sounds relative to one another. The "Osc Volume" parameter, on the other hand, adjusts the volume of the entire oscillator (i.e., all the drums in that oscillator).

Menu: Program/Synth/Drum/Output
Parameter: Pan
Value Range: "Optimized to mono," or L100% to R100%

Sets the pan position of each individual drum. This is different from the Pan parameter under the Program/Output section because each drum can be panned to its own position whereas the Program/Output setting will pan the entire program.

Optimizing to Mono:

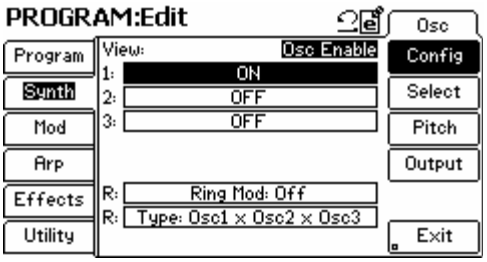
This parameter will be replaced by the words "(Osc is optimized to mono)" if the "Optimize osc to mono" parameter for that drum is checked in the Synth/Osc/Output.



Synthesis Type: Analog

Analog Synthesis uses oscillators, Envelopes, LFOs, and a filter to generate all kinds of sounds ranging from simple bass instruments to complex, otherworldly pad and lead instruments (and everything in between).

- Oscillators: Up to three basic waveforms (sawtooth, pulse, and sine waves, plus white, pink, and red noise, as well as incoming sound from the External Inputs).
- Filters: One filter. You can assign the filter's type, cutoff, frequency, and resonance.
- Envelopes: Up to eight envelopes for controlling volume, filter, pitch, or other parameters.
- Low-frequency oscillators (LFO): Up to eight low-frequency oscillators for controlling vibrato, filter operation, or other parameters.



Menu: Program/Synth/Osc/Config
Parameter: View
Value Range: Osc Enable, Osc Type, Osc Coarse Tune, Osc Fine Tune, Osc Random Tune, Osc Volume, Osc Pan

This screen provides a convenient overview showing how many of the commonly used parameters in the Analog Synthesis submenus are configured.

This page shows parameter settings of several oscillators in relation to one another. By having these common parameters on one screen, it saves users from having to jump back and forth between multiple oscillator pages. You can change oscillator settings (volume, pan, tuning, etc) by editing the "1:" "2:" and "3:" parameters (see below).

Since our synthesis type is set to Analog Synthesis, we have three oscillators available for editing (remember that the Analog Synthesis type has three oscillators).

Menu: Program/Synth/Osc/Config
Parameter: 1:, 2:, 3:
Value Range: Varies depending on View setting (see above)

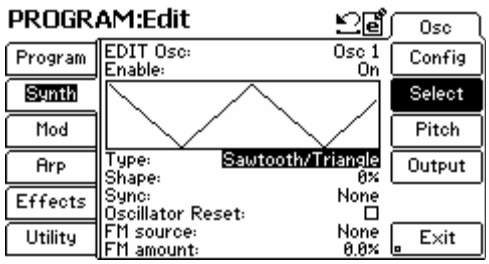
This section provides quick access to common oscillator settings. The contents of this parameter change depend on your "view" parameter settings. Use the Control Wheel to adjust the listed setting.

Menu: Program/Synth/Osc/Config
Parameter: R: (Ring Mod On/Off)
Value Range: On, Off

Enable or disable ring modulation with this parameter.

Menu: Program/Synth/Osc/Config
Parameter: R: (Ring Mod Type)
Value Range: None, Osc 1 x Osc 2, Osc 1 x Osc 3, Osc 2 x Osc 3, Osc 1 x Osc 2 x Osc 3

Allows you to choose how the three oscillators will modulate each other.



Menu: Program/Synth/Osc/Select
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 3

Select the oscillator you'd like to edit.

Menu: Program/Synth/Osc/Select
Parameter: Enable
Value Range: On, Off

Allows you to enable or disable each oscillator

Menu: Program/Synth/Osc/Select
Parameter: Type
Value Range: Sawtooth, Pulse, Sine, White Noise, Pink Noise, Red Noise, Ext In

This parameter allows you to select the shape of your oscillator. When you select "Ext In" as your oscillator type, your oscillator becomes whatever audio is being played into the ¼" input jacks labeled "Input Left" and Input Right" on the back of the Fusion.

Menu: Program/Synth/Osc/Select
Parameter: Shape (only available on Sawtooth and Pulse oscillator types)
Value Range: -100% to 100%

Shape alters the waveform of your Sawtooth or Pulse oscillator type. This parameter is sometimes called "Pulse Width Modulation" on some synthesizers when referring to square waves.

How do I make Sawtooth and Up/Down Saw waveforms?

You can create down-saw, triangle, and up-saw waveforms by selecting "Sawtooth" and changing the "shape" parameter (see below). To create a down-saw, set your "shape" parameter to "-100%" whereas to create an up-saw, set this parameter to +100%. For a triangle wave, leave the parameter set to 0%.

You can create a square wave by selecting a "Pulse" waveform and setting the "Shape" parameter to 0% (see below).

Menu: Program/Synth/Osc/Select
Parameter: Sync
Value Range: None, Osc 1, Osc 2, Osc 3, Ring Mod, Filter

Resets the phase of your oscillator in relation to the initial phase of another Oscillator, Ring Mod, or Filter. This creates richer harmonic content on your currently selected oscillator.

Note that you generally end up with better results if your current oscillator is synced to another oscillator that is lower in pitch. If both oscillators are at the same pitch (or close to one another), little or no harmonics will be generated.

Menu: Program/Synth/Osc/Select
Parameter: Oscillator Reset
Value Range: On, Off

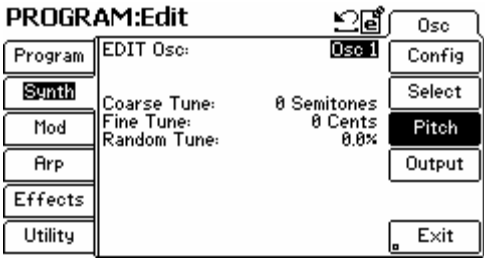
If set to "on" this parameter starts the oscillator from the beginning of the waveform every time a voice is triggered. If set to "off" the oscillator is free running and does not reset whenever a new voice is triggered.

Menu: Program/Synth/Osc/Select
Parameter: FM Source
Value Range: None, Osc 1, Osc 2, Osc 3, Ring Mod, Filter

You can use a filter, ring mod, or another oscillator's waveform to modulate the frequency of the current oscillator. The result is a more complex waveform with richer harmonics.

Menu: Program/Synth/Osc/Select
Parameter: FM Amount
Value Range: 0-100%

Blend in any amount of the FM source. Higher percentages blend in more of the FM source and create richer harmonics. Smaller percentages blend in less of the FM source and leave a more pure tone from your oscillator.



Menu: Program/Synth/Osc/Pitch
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 3

Choose the oscillator you'd like to edit. Since our synthesis type is set to Analog, you have three oscillators to choose from.

Menu: Program/Synth/Osc/Pitch
Parameter: Coarse Tune
Value Range: -48 to +48 Semitones

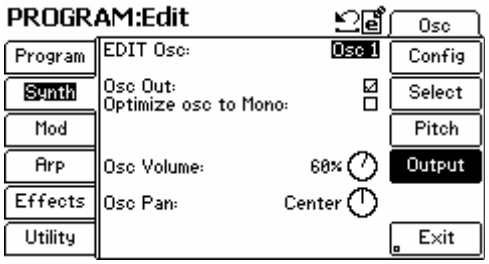
This parameter pitch-shifts the oscillator you are playing.

Menu: Program/Synth/Osc/Pitch
Parameter: Fine Tune
Value Range: -99 to +99 Cents

Use this parameter to fine-tune (or detune) your oscillator.

Menu: Program/Synth/Osc/Pitch
Parameter: Random Tune
Value Range: 0-100%

Random Tune generates unpredictable tuning variances in your oscillator. The higher you set this value, the more unpredictable your tuning becomes.



Menu: Program/Synth/Osc/Output
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 3

Choose the oscillator you'd like to edit. Since our synthesis type is set to Analog, you have three oscillators to choose from.

Menu: Program/Synth/Osc/Output
Parameter: Osc Out
Value Range: On, Off

When using an oscillator as a modulation source for another oscillator (this often happens in FM, sync, or ring modulation), you may want to mute the actual output of the oscillator so that you only hear the effects of its modulation.

If you want to mute the output of an oscillator, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Program/Synth/Osc/Output
Parameter: Optimize Osc to Mono
Value Range: On, Off

This parameter reduces DSP load on the Fusion by summing the oscillator's output into mono. Turning this option on allows you to have higher polyphony, but it means you cannot pan the oscillator across a stereo field.

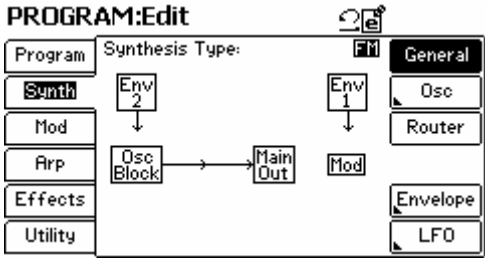
In cases where the oscillator is panned to the center, it is best to leave this option set to "on" since you're not using panning anyway.

Menu: Program/Synth/Osc/Output
Parameter: Osc Volume
Value Range: 0 – 100%

Sets the volume of each oscillator. This is different from the Volume parameter in the Volume/Output menu because it lets you set the volume of each individual oscillator in your program, whereas the Program/Output menu sets the level of the entire program.

Menu: Program/Synth/Osc/Output
Parameter: Osc Pan (only visible if "Optimize to Mono" is turned off)
Value Range: L100% to R100%

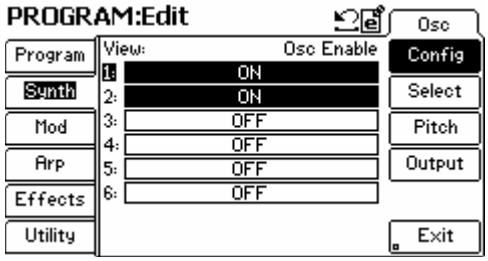
Sets the pan position of each individual oscillator. This is different from the Pan parameter under the Program/Output section because each oscillator can be panned to its own position whereas the Program/Output setting will pan the entire program.



Synthesis Type: FM

FM is a form of synthesis that relies on two (or more) oscillators modulating each other to create a sound. Since its inception in the 1970s, FM synthesis has found its way into countless hit songs and continues to be used today because of the wide palette of sounds it can produce.

- Oscillators: Six basic waveforms (sine wave variations, plus white noise).
- Filters: One filter. You can assign this filter's type, cutoff, frequency, and resonance.
- Envelopes: Up to eight envelopes for controlling volume, filter, pitch, or other parameters.
- Low-frequency oscillators (LFO): Up to eight low-frequency oscillators for controlling pitch, volume, or other parameters.



Menu: Program/Synth/Osc/Config
Parameter: View
Value Range: Osc Enable, Osc Output, Osc Type, Osc Coarse Tune, Osc Fine Tune, Osc Random Tune, Osc Pan

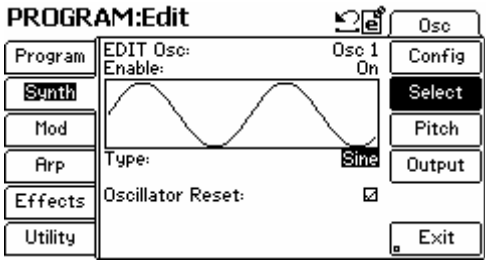
This screen provides a convenient overview showing how many of the commonly used parameters in the FM Synthesis submenus are configured.

This page shows parameter settings of several oscillators in relation to one another. By having these common parameters on one screen, it saves users from having to jump back and forth between multiple oscillator pages. You can change oscillator settings (volume, tuning, etc) by editing to the "1:" through "6:" parameters (see below).

Since our synthesis type is set to FM Synthesis, we have six oscillators available for editing.

Menu: Program/Synth/Osc/Config
Parameter: 1: to 6:
Value Range: Varies depending on View setting (see above)

This section provides quick access to common oscillator settings. The contents of this parameter change depend on your "view" parameter settings. Use the Control Wheel to adjust the listed setting.



Menu: Program/Synth/Osc/Select
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 6

Select the oscillator you'd like to edit.

Menu: Program/Synth/Osc/Select
Parameter: Enable
Value Range: On, Off

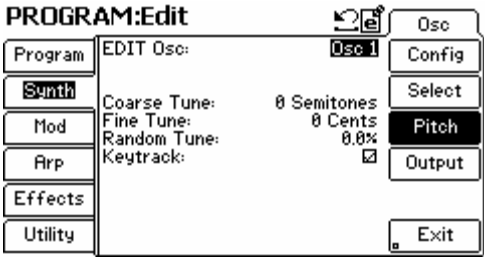
Allows you to enable or disable each oscillator.

Menu: Program/Synth/Osc/Select
Parameter: Type
Value Range: Sine, Sine Square Root, Sine Squared, Sine Warp, White Noise

This parameter allows you to select the shape of your oscillator.

Menu: Program/Synth/Osc/Select
Parameter: Oscillator Reset
Value Range: On, Off

If set to "on" this parameter starts the oscillator from the beginning of the waveform every time a voice is triggered. If set to "off" the oscillator is free running and does not reset whenever a new voice is triggered



Menu: Program/Synth/Osc/Pitch
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 6

Choose the oscillator you'd like to edit. Since our synthesis type is set to FM, you have six oscillators to choose from.

Menu: Program/Synth/Osc/Pitch
Parameter: Coarse Tune
Value Range: -48 to +48 Semitones

This parameter pitch-shifts the oscillator you are playing.

Menu: Program/Synth/Osc/Pitch
Parameter: Fine Tune
Value Range: -99 to +99 Cents

Use this parameter to fine-tune (or detune) your oscillator.

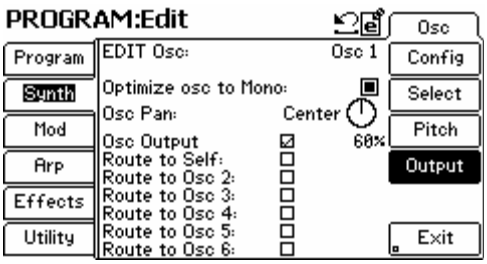
Menu: Program/Synth/Osc/Pitch
Parameter: Random Tune
Value Range: 0-100%

Random Tune generates unpredictable tuning deviations in your oscillator. The higher you set this value, the greater the range of pitch variance.

Menu: Program/Synth/Osc/Pitch
Parameter: Key Track
Value Range: On, Off

Turn this function off if you don't want your oscillator pitch to follow the key you're playing on the keyboard. For example, sound designers sometimes want certain modulation sources to stay constant whereas the destination oscillator pitches follow the keyboard normally. To do this, go ahead and turn "Key Track" off.

Under normal circumstances, you'll most likely want the oscillator pitch to follow the key you're playing on the keyboard so leave this parameter set to "On."



Menu: Program/Synth/Osc/Output
Parameter: EDIT Osc
Value Range: Osc 1 to Osc 6

Choose the oscillator you'd like to edit. Since our synthesis type is set to FM, you have six oscillators to choose from.

Menu: Program/Synth/Osc/Output
Parameter: Osc Out
Value Range: On, Off

Check this parameter if you want to route your oscillator to the output.

Menu: Program/Synth/Osc/Output
Parameter: Osc Volume (only visible if "Osc Output" box is checked)
Value Range: 0 – 100%

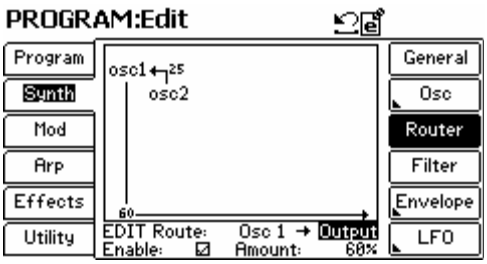
This parameter sets the output volume for the oscillator that is currently selected. Note that this parameter is only available if the "Osc Out" box is checked.

Menu: Program/Synth/Osc/Output
Parameter: Route To (All oscillators including self)
Value Range: On, Off

These checkboxes allow you to route the output of your currently selected oscillator to modulate any other oscillator.

Menu: Program/Synth/Osc/Output
Parameter: Modulation Amount (only visible when the corresponding "Route To" box is checked)
Value Range: 0 – 100%

This parameter determines how much your source oscillator is going to modulate the destination oscillator. The higher you set this value, the more modulation will take place (resulting in richer harmonics).



Menu: Program/Synth/Router
Parameter: EDIT Route (Source)
Value Range: Osc 1 to Osc 6

Choose the oscillator you'd like to edit.

Menu: Program/Synth/Router
Parameter: EDIT Route (Destination)
Value Range: Osc 1 to Osc 6, Output

Use this parameter to select where you'd like the oscillator to be routed. The Fusion allows you to route an oscillator to any other oscillator (including itself) or to the audio output of the keyboard. Keep in mind it is possible to connect one source to multiple destinations.

The diagram on the top indicates how each oscillator is routed. Note that your source is not routed to the destination until the "Enable" box is checked. Also note in order to modulate an FM route, this box must be checked. If it is not checked then it will not show up as a possible choice within the destination choices in the Mod Menu.

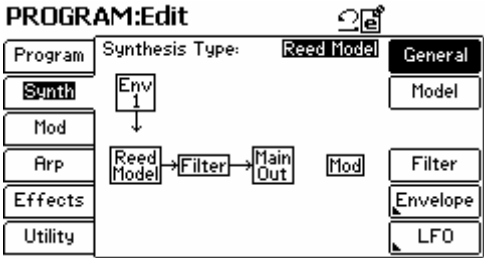
Menu: Program/Synth/Router
Parameter: Enable
Value Range: On, Off

This box indicates whether your currently selected source is being routed to the current destination. To make a connection, select your source and destinations (see above) and check this box. Conversely, to break a connection select your source and destinations and uncheck the "Enable" box.

As stated in the section above, in order to modulate an FM route, the enable box must be checked. If left unchecked, the FM route will not show up as a possible choice within the destination choices in the Mod Menu.

Menu: Program/Synth/Router
Parameter: Amount
Value Range: 0-100%

This parameter determines how much your currently selected source is going to modulate the currently selected destination. Note that the "Enable" box has to be checked for any modulation to take place.



Synthesis Type: Reed Model

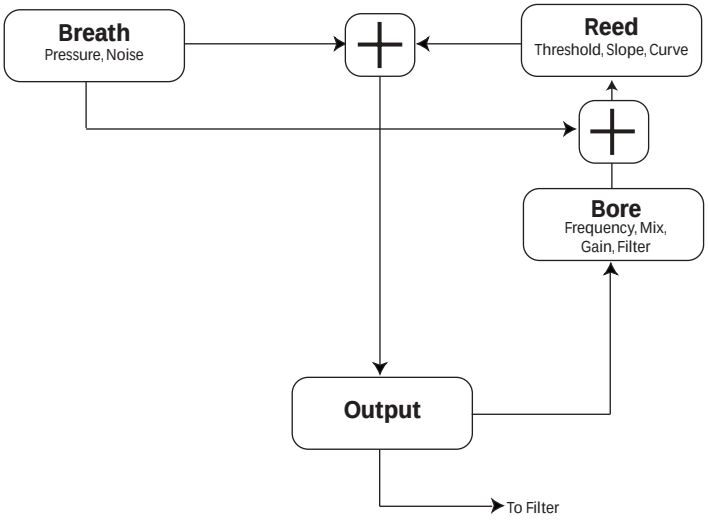
The Reed Model synthesis type uses complex mathematics to simulate the behavior of sound waves inside a reed instrument. This allows you to create extremely realistic programs of any instrument that has a mouthpiece with a vibrating reed connected to a cylindrical bore (such as a clarinet.) You can also use this model to create instruments that do not (or cannot) exist in real life.

- Model Parameters: Breath, Noise, Threshold, Slope, Curve, Frequency, Mix, Gain.
- Filters: One filter. You can assign this filter's type, cutoff, frequency, and resonance.
- Envelopes: Up to eight envelopes for controlling volume, filter, pitch, or other parameters.
- Low-frequency oscillators (LFO): Up to eight low-frequency oscillators for controlling vibrato, filter operation, or other parameters.

The Reed Physical Model:

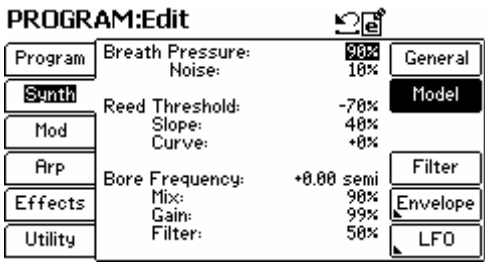
The following diagram describes the Fusion's Reed Model. In it, you'll notice three distinct groups of parameters including "Breath," "Reed," and "Bore." Each group makes up a different portion of the physical model and these groups interact with one another to create the overall sound that you hear.

The "Breath" parameters model the performer blowing into the instrument, while the "Reed" parameters model the mouthpiece of the instrument that is being played. Finally, the "Bore" parameter models the body of the instrument.



Why Can't I Hear Anything?

Since Physical Modeling creates a mathematical model of a "real world" instrument, it is possible to set your Synth/Model menu settings in a way where no sound or unmusical tones (or noise) will be synthesized. This is analogous to either playing a physical instrument incorrectly or building an instrument that is incapable of creating musical tones. If you adjust a parameter and your program doesn't make any sound (or you only hear strange noises and tones), this is not an error. You've probably just pushed the physical model into unmusical territories. If this happens, scale back the parameter you were editing until you start hearing musical tones again.



Menu: Program/Synth/Model
Parameter: Breath
Value Range: 0 – 100%

This is the volume parameter for the Model. This simulates the strength of the player's breath which can excite the model and produce different timbres.

The "Breath" and "Noise" parameters are used to model the act of blowing into the instrument.

Menu: Program/Synth/Model
Parameter: Noise
Value Range: 0 – 100%

This parameter adds in white noise to simulate the natural sound of the wind blowing into the mouthpiece. In general, a small amount of white noise gives your instrument more realism.

Menu: Program/Synth/Model
Parameter: Threshold
Value Range: -100% to +100%

This parameter sets the minimum breath pressure required to cause the instrument to generate sound.

Menu: Program/Synth/Model
Parameter: Slope
Value Range: 0 – 100%

Sets the steepness of the Threshold boundary. Low values create extremely steep curves (i.e., your sound is usually very soft and then becomes loud very quickly as velocity increases). High values create more gradual curves (i.e., your sound gradually becomes louder as note velocities increase).

The "Threshold," "Slope," and "Curve" parameters are used to model the mouthpiece of the instrument.

Menu: Program/Synth/Model
Parameter: Curve
Value Range: -100% to +100%

This parameter affects the tonal character of the mouthpiece and contributes to the attack of the sound.

Menu: Program/Synth/Model
Parameter: Frequency
Value Range: -12.00 to +12.00 Semitones

This parameter determines the frequency of the harmonic component of the bore's tone.

Menu: Program/Synth/Model
Parameter: Mix
Value Range: 0 – 100%

This parameter determines the tonal mix of the base tone and the harmonic component from the bore. At 50% it is an equal mix of both parts. At 100% there is no harmonic component. At 0% there is no base tone.

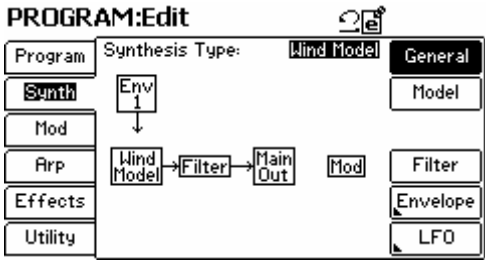
The "Frequency," "Mix," "Gain," and "Bore Filter" parameters are used to model the body of the instrument.

Menu: Program/Synth/Model
Parameter: Gain
Value Range: 0 – 100%

This parameter determines the amount that the resonance at the reed instrument's body—or "bore," contributes to the sound.

Menu: Program/Synth/Model
Parameter: Bore Filter
Value Range: 0 – 100%

This parameter determines the tonal character of the instrument's body. This parameter acts like a low-pass filter on the bore of the instrument.



Synthesis Type: Wind Model

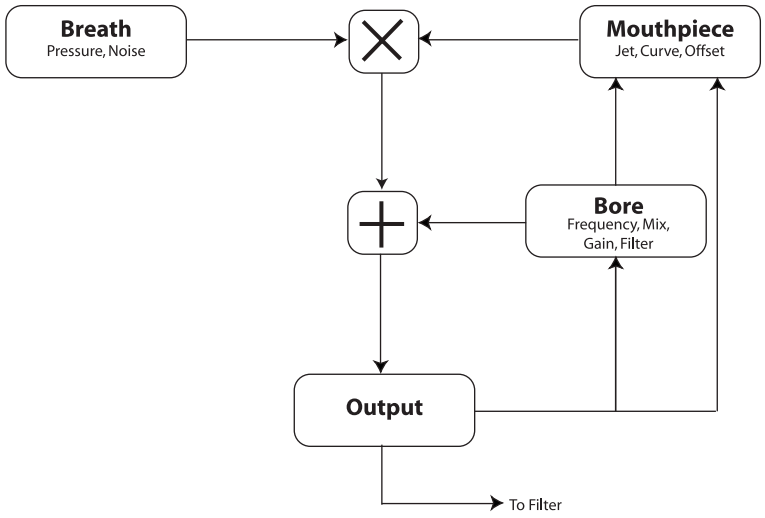
The Wind Model synthesis type uses complex mathematics to simulate the behavior of a sound wave inside a wind instrument. This allows you to create extremely realistic programs of any instrument that has an embouchure (i.e., a player's lips and tongue) acting on a mouthpiece that is connected to a bore (such as a flute). You can also use this model to create instruments that do not (or cannot) exist in real life.

- Model Parameters: Breath, Noise, Jet, Curve, Offset, Frequency, Mix, Gain, Bore Filter
- Filters: One filter. You can assign this filter's type, cutoff, frequency, and resonance.
- Envelopes: Up to eight envelopes for controlling volume, filter, pitch, or other parameters.
- Low-frequency oscillators (LFO): Up to eight low-frequency oscillators for controlling vibrato, filter operation, or other parameters.

The Wind Physical Model:

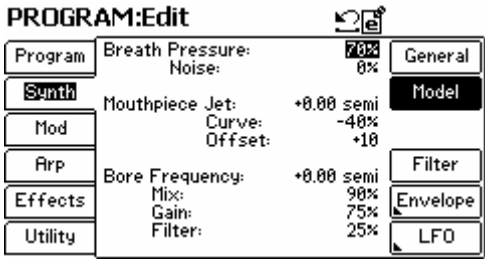
The following diagram describes the Fusion's Wind Model. In it, you'll notice three distinct groups of parameters including "Breath," "Mouthpiece," and "Bore." Each group makes up a different portion of the physical model and these groups interact with one another to create the overall sound that you hear.

The "Breath" parameters model the performer blowing into the instrument, while the "Mouthpiece" parameters model the mouthpiece of the instrument that is being played. Finally, the "Bore" parameters model the body of the instrument.



Why Can't I Hear Anything?

Since Physical Modeling creates a mathematical model of a "real world" instrument, it is possible to set your Synth/Model menu settings in a way where no sound or unmusical tones (or noise) will be synthesized. This is analogous to either playing a physical instrument incorrectly or building an instrument that is incapable of creating musical tones. If you adjust a parameter and your program doesn't make any sound (or you only hear strange noises and tones), this is not an error. You've probably just pushed the physical model into unmusical territories. If this happens, scale back the parameter you were editing until you start hearing musical tones again.



Menu: Program/Synth/Model
Parameter: Breath
Value Range: 0 – 100%

This is the volume parameter for the Model. This simulates the strength of the player's breath which can excite the model and produce different timbres.

The "Breath" and "Noise" parameters are used to model the act of blowing into the instrument.

Menu: Program/Synth/Model
Parameter: Noise
Value Range: 0 – 100%

This parameter adds in white noise to simulate the natural sound of the wind blowing into the mouthpiece. In general, a small amount of white noise gives your instrument more realism.

Menu: Program/Synth/Model
Parameter: Jet
Value Range: -12 to +12 Semitones

The "jet" parameter determines the frequency of the harmonic component of the mouthpiece's tone.

Menu: Program/Synth/Model
Parameter: Curve
Value Range: -100% to +100%

This parameter affects the tonal character of the mouthpiece and contributes to the attack of the sound.

The "Jet," "Curve," and "Offset," parameters are used to model the mouthpiece of the instrument.

Menu: Program/Synth/Model
Parameter: Offset
Value Range: -100 to +100

This parameter adjusts the tonal interaction between the mouthpiece and the bore.

Menu: Program/Synth/Model
Parameter: Frequency
Value Range: -12.00 to +12.00 Semitones

This parameter determines the frequency of the harmonic component of the bore's tone.

Menu: Program/Synth/Model
Parameter: Mix
Value Range: 0 – 100%

This parameter determines the tonal mix of the base tone and the harmonic component from the bore. At 50% it is an equal mix of both parts. At 100% there is no harmonic component. At 0% there is no base tone.

The "Frequency," "Mix," "Gain," and "Bore Filter" parameters are used to model the body of the instrument.

Menu: Program/Synth/Model
Parameter: Gain
Value Range: 0 – 100%

This parameter determines the amount that the resonance at the wind instrument's body—or "bore," contributes to the sound.

Menu: Program/Synth/Model
Parameter: Bore Filter
Value Range: 0 – 100%

This parameter determines the tonal character of the instrument's body. This parameter acts like a low-pass filter on the bore of the instrument.

Program Utility Page

Menu: Program/Utility
Parameter: Create a new Program
Value Range: (none)

This button creates a new program with default settings. Remember to save your current program otherwise you will lose your work once the new program is created.

Menu: Program/Utility
Parameter: Add to Favorites
Value Range: 1-8

This button adds your program to any of the 8 "favorite" program categories of the Fusion for easy access. Press the Category button and scroll down to the "Fav 1" through "Fav 8" categories to see your favorite programs.

Note that you can't add a program to a favorites category until it has been saved (see pg. 31 for more about saving programs, mixes, and songs).

Once you have selected a favorite category, press the "Favorite" action button (on the right side of the screen) to add the program to that category. If a program already belongs to a Favorites category, the display will read "Remove from Favorites." This allows you to remove this program from a Favorites category.

Menu: Program/Utility
Parameter: To Mix
Value Range: Generate Layer Mix, Generate Split Mix, Add to Current Mix

This button adds your current program to a Mix. If you'd like to simply add the current program as a new part in the mix, select "Add to Current Mix." If you'd like to create a layer (i.e., to have two programs playing at the same time when you play one part), select "Generate Layer Mix." Finally, if you'd like to "split" the keyboard (i.e., to play one instrument on one side of the keyboard and another instrument on the other side), select "Generate Split Mix."

Press the "To Mix" action button to add the program to a mix.

Menu: Program/Utility
Parameter: Split point (only available for "Generate Split Mix")
Value Range: C-2 to G8

This parameter lets you select at which point the split will take place in your mix. Note that this parameter is only available when you select "Generate Split Mix" for the parameter listed above. You can also hold LOCATE and press the desired split key when the cursor is on this parameter to select the split point.

Menu: Program/Utility
Parameter: To Song
Value Range: Generate Song, Add to Current Song

This button adds the current program to a song. To add the program to a new song, select "Generate Song." To add the program to the song that is currently loaded in Song mode, select "Add to Current Song."

Menu: Program/Utility
Parameter: Multi (only available for sample and drum programs)
Value Range: (varies)

This button allows you to select any of your multisamples (from a sample or drum based program) for further editing in Sampler mode. Select the oscillator you'd like to edit and press the "Multi" action button to the right of the screen.

Note that this button is only available if your current program is a Sample or Drum program (since the other program types do not use samples).

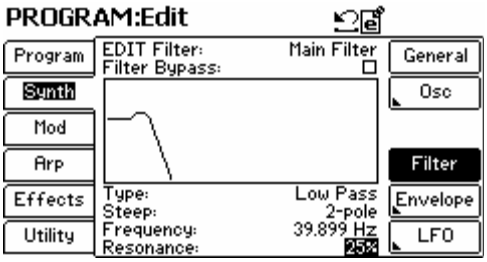
Filters

Filters are an integral part of a synthesizer's ability to create sounds and the Fusion has variety of filters to help you achieve the sound you're looking for. All of the Fusion's synthesis modes have at least one filter per voice. The following chart will explain the small differences in filter implementation between all of the different synthesis types:

Sample	- 3 Filters total. 2 minimized filters (one at each oscillator) + 1 filter for the voice.
Drum	- 64 filters total. One filter at each oscillator.
Analog	- 1 Filter per voice
FM	- 1 Filter per voice
Reed Model	- 1 Filter. per voice
Wind Model	- 1 Filter. per voice

What is a "Minimized" filter?

A "minimized filter" is a 1-pole low pass, non-resonant filter. All other filters mentioned above have variable type, steepness, cutoff frequency, and resonance.



Menu: Program/Synth/Filter
Parameter: Filter Bypass
Value Range: On, Off

Check this box if you want to bypass the filter.

Menu: Program/Synth/Filter
Parameter: Type
Value Range: Low Pass, High Pass, Band Pass, Band Stop, Band Boost

The Fusion has several different filter types that you can select in this menu. The on-screen diagram shows the shape of filter you've selected.

Menu: Program/Synth/Filter
Parameter: Steep
Value Range: 1-pole, 2-pole, 4-pole, 6-pole, 8-pole

This parameter determines the number of poles on your filter. Filters with one or two poles are more gradual whereas filters with six or eight poles are much steeper in cutoff. All filters on the Fusion except the 1-pole have variable resonance (see below).

Menu: Program/Synth/Filter
Parameter: Frequency
Value Range: 20.000 Hz to 20.000 kHz

This parameter sets the point (or region) at which the filter starts affecting the incoming signal. As you change this value, you will see the cutoff point move right or left to correspond with your changes.

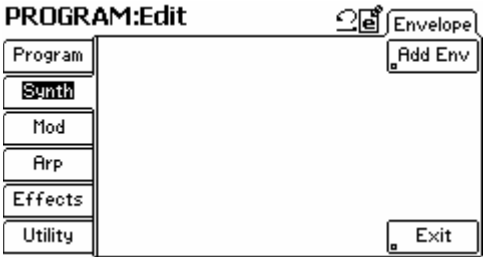
Menu: Program/Synth/Filter
Parameter: Resonance (Not available on 1-pole filter Steep setting)
Value Range: 0-100%

Filter resonance is a "bump" that is located at the cutoff frequency of a filter. This resonance is a big part of the unique "sound" of many of the analog synthesizers from the 70s and 80s. The Fusion allows you to add as much (or as little) resonance as you'd like using this parameter. The shape of the filter on the screen will change to reflect how much resonance you're adding.

Envelopes

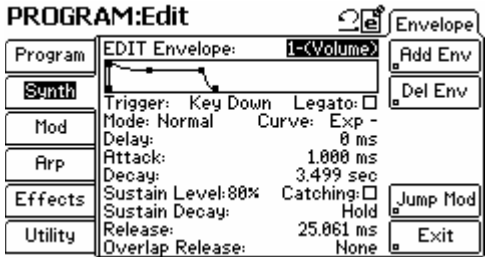
If you play a note on a piano (or most other acoustic instruments), you'll hear a burst of sound energy as the hammer strikes the string, followed by lower level of loudness as you hold down the note and let the string ring out, which fades quickly as soon as you release the note and the damper is applied. Synthesizer designers model this behavior using ADSR envelopes. ADSR stands for "attack, decay, sustain, release", and represents the different stages that the sound goes through over the life of the note.

ADSR envelopes are commonly used to control amplitude, but can also be used to control countless other parameters (i.e., pitch, filter frequency, etc.) The Fusion allows you to hook up an envelope to any modulatable parameter using the modulation matrix (see page 236).



Menu: Program/Synth/Envelope
Parameter: Add Env
Value Range: You can create up to 8 envelopes

If the Envelope page appears blank (like the picture above), it means no envelopes have been created for this program. Go ahead and press the Add Env. button and this will create an envelope for you. Your screen will then look like the one below.



Menu: Program/Synth/Envelope
Parameter: Edit Envelope
Value Range: 1-8 Envelopes (Varies depending on how many envelopes you have created)

All programs on the Fusion have up to eight envelopes to modulate things like volume, filter, and other parameters. Choose the envelope you'd like to edit here.

The word in parenthesis indicates where the current envelope is routed in the modulation matrix. If you see "(Unused)" that means your current envelope has not been mapped to any parameter in that program. Once you map an envelope in the modulation matrix, a new button called "Jump Mod" appears on the right that allows you to immediately jump to the page of the matrix where the connection is being made.

Menu: Program/Synth/Envelope
Parameter: Trigger (Trigger Source)
Value Range: Key Down, Key Up, FS Down, FS Up, T1 Down, T2 Down, T3 Down, T4 Down, T1 Up, T2 Up, T3 Up, T4 Up

This setting selects what will trigger the envelope you are currently editing. The following chart explains what each setting does:

Key Down	Triggers when a note is played.
Key Up	Triggers when a note is released.
Foot Switch Dn	Triggers when foot switch is pressed.
Foot Switch Up	Triggers when the foot switch is released.
Trigger 1-4 Dn	Triggers when the T1-T4 buttons (to the left of the screen, below the control knobs) are pressed.
Trigger 1-4 Up	Triggers when the T1-T4 buttons (to the left of the screen, below the control knobs) are released

Menu: Program/Synth/Envelope
Parameter: Legato
Value Range: On, Off

Legato mode keeps the envelope from re-triggering if you play in legato fashion (i.e., you play a note before releasing the last note played).

Menu: Program/Synth/Envelope
Parameter: Mode (Trigger Type)
Value Range: Normal, Freerun

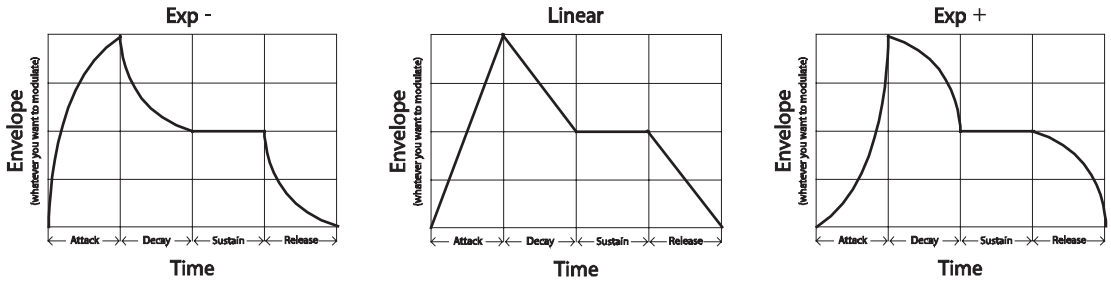
This determines how the envelope will start and stop based on how the keys are held and released.

When set to Normal, the envelope will play from the attack stage through the sustain stage as long as the note is held. When the note is released, the envelope will jump to its release stage.

When set to Freerun, the envelope will complete its entire cycle even if the note is released before the envelope has completed its cycle.

Menu: Program/Synth/Envelope
Parameter: Curve
Value Range: Exp -, Linear, Exp +

Sets how your envelope will ramp up (and down) once triggered. Your envelope will look like one of the following:

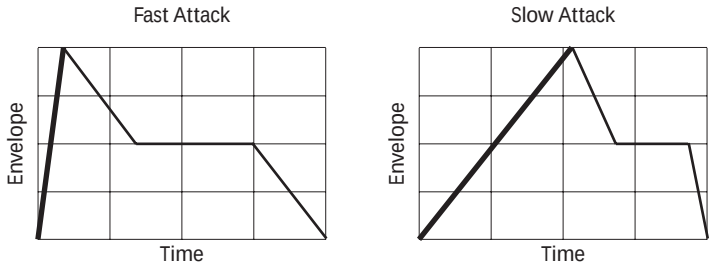


Menu: Program/Synth/Envelope
Parameter: Delay
Value Range: 0 – 30 Sec

This is the amount of time the envelope will wait before doing anything. When the delay is set to zero, the envelope begins its attack right away.

Menu: Program/Synth/Envelope
Parameter: Attack
Value Range: 0 – 30 Sec

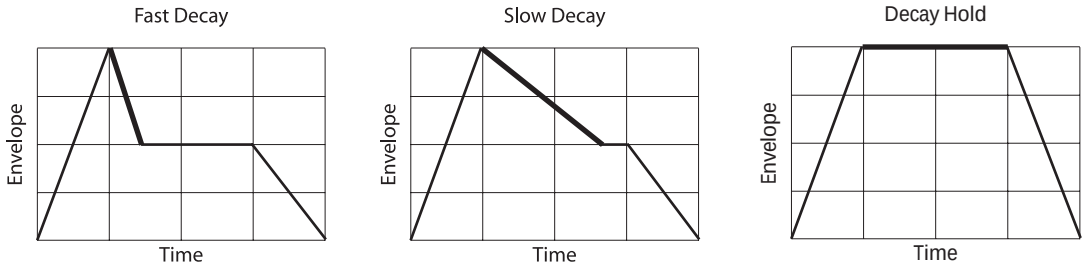
This sets the amount of time the envelope will take to reach its maximum level. The higher the value, the slower the attack.



Menu: Program/Synth/Envelope
Parameter: Decay (not available if sustain level is set to 100%)
Value Range: 0 – 29.953 Sec, Hold

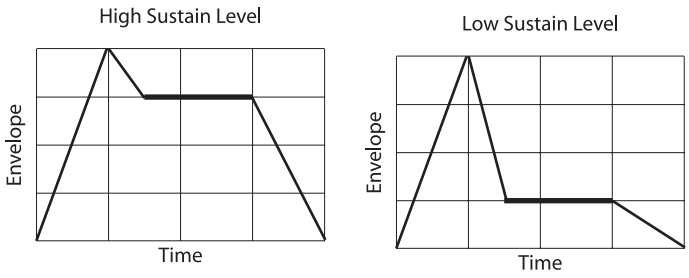
This sets the amount of time the envelope takes from the end of the Attack stage to reach the Sustain level. The higher the value, the longer it will take.

You can set this parameter to Hold by setting the value higher than 29.953. By doing this, the envelope will remain at maximum until it reaches the Release stage. Since the envelope is held at maximum level, the Sustain and Sustain Decay parameters are removed from the menu to avoid confusion.



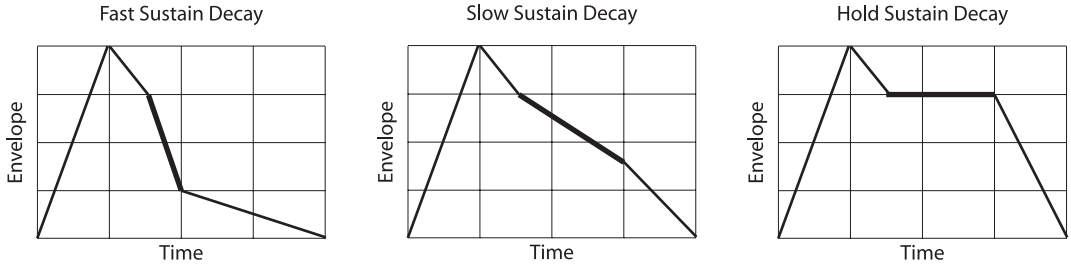
Menu: Program/Synth/Envelope
Parameter: Sustain Level
Value Range: 0-100%

This sets the level that the envelope will reach at the end of the Decay stage.



Menu: Program/Synth/Envelope
Parameter: Sustain Decay (not available if sustain level is set to 0%)
Value Range: 0 – 29.953 Sec, Hold

This parameter determines the time it takes for the "Sustain Decay" stage to drop to 0. If this parameter is set to "Hold" the envelope will sustain at a constant level as long as the key is held down.



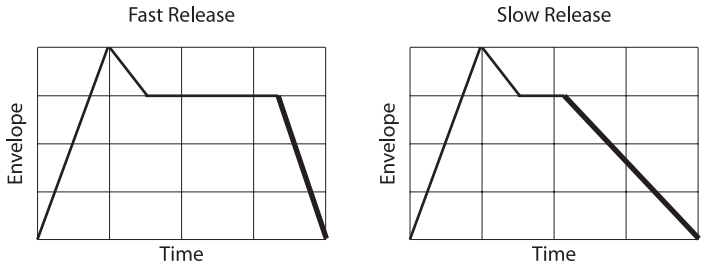
Menu: Program/Synth/Envelope
Parameter: Catching (not available when Mode is set to "Freerun")
Value Range: On, Off

When enabled, catching allows you to switch back to the sustain stage of the envelope when you step on the sustain pedal during the release stage. This parameter allows you to mimic the feel of a piano's sustain pedal.

If this parameter is set to "off" stepping on the sustain pedal during the release stage will not have any effect on the envelope.

Menu: Program/Synth/Envelope
Parameter: Release
Value Range: 0 – 30 Sec

This sets the amount of time the envelope will take to get from its current level to zero after the note has been released. The higher the value, the longer it will take.



Menu: Program/Synth/Envelope
Parameter: Overlap Release
Value Range: None, 1.002 ms – 30 Sec

If you play a note and trigger it a second time, the first instance of that note goes into "overlap release" state and decays at whatever time defined in this parameter. This parameter can be used to efficiently steal voices in order to make better use of the Fusion's DSP (which ultimately leads to higher polyphony count).

If set to "none" both voices (or however many voices you have repeatedly triggered) will release as normal.

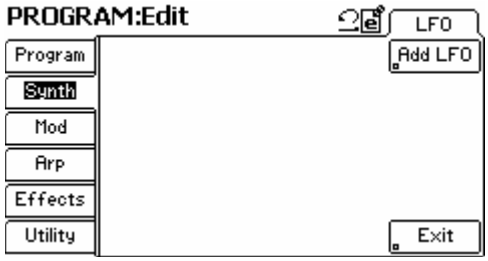
Menu: Program/Synth/Envelope
Parameter: Del Env
Value Range: Yes, No

This button deletes the currently selected Envelope. A dialog box (see above) will appear asking you to confirm whether you want to delete your envelope. Press "Yes" to delete.

Low Frequency Oscillators (LFOs)

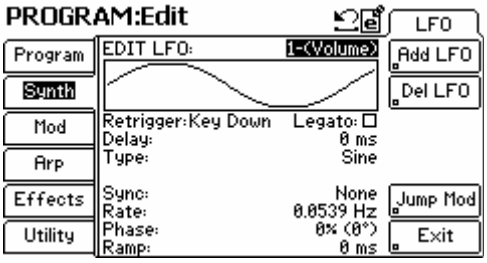
LFO stands for "low frequency oscillator." Unlike the normal oscillators, the LFOs are not designed for producing sound. Instead, their purpose is to tweak a program parameter according to a looping pattern. For example, if you are looking to add some vibrato to your instrument, you'll need the pitch to continuously waver up and down. An LFO is perfect for this application. Simply hooking up an LFO to the oscillator pitch parameter will get you the effect you need.

The Fusion allows you to hook up an LFO to any modulatable parameter using the Modulation Matrix (See page 236).



Menu: Program/Synth/LFO
Parameter: Add LFO
Value Range: You can create up to 8 LFOs

If the LFO page appears blank (like the picture above), it means no LFOs have been created for this program. Go ahead and press the Add LFO button to create an LFO. Your screen will then look like the one below.



Menu: Program/Synth/LFO
Parameter: EDIT LFO
Value Range: 1-8 LFOs (You can create up to 8 LFOs)

Select the Low Frequency Oscillator (LFO) you'd like to edit here.

The word in parenthesis indicates where the current LFO is routed in the modulation matrix. If you see "(Unused)" that means your current LFO has not been mapped to any parameter in that program. Once you map an LFO in the modulation matrix, a new button called "Jump Mod" appears on the right that allows you to immediately jump to the page of the matrix where the connection is being made.

Menu: Program/Synth/LFO
Parameter: Retrigger
Value Range: None, Key Down, Key Up, FS Down, FS Up, T1 Down, T2 Down, T3 Down, T4 Down, T1 Up, T2 Up, T3 Up, T4 Up

This allows you to select a trigger that restarts the LFO for your current oscillator. For example: If you select T1, your LFO will restart whenever you push the T1 button. The following chart explains what each trigger setting means:

None	When set to "None" you have one free running LFO across all voices for your current program
Key Down	Each voice's LFO is retriggered from the starting phase when you play a key.
Key Up	The LFO restarts when a note is released.
Foot Switch Dn	The LFO restarts when foot switch is pressed.
Foot Switch Up	The LFO restarts when the foot switch is released.
Trigger 1-4 Dn	The LFO restarts when the T1-T4 buttons are pressed.
Trigger 1-4 Up	The LFO restarts when the T1-T4 buttons is released

Menu: Program/Synth/LFO
Parameter: Legato
Value Range: On, Off

Legato mode keeps the trigger from restarting if you play in legato fashion (i.e., you play a note before releasing the last note played).

Menu: Program/Synth/LFO
Parameter: Delay
Value Range: 0 – 30 Sec

This is the amount of time the LFO will wait before doing anything. When the delay is set to 0 seconds, the LFO begins working right away.

Where are the Saw, Triangle, and Square LFO types???

You can create down-saw, triangle, and up-saw waveforms by selecting "Sawtooth" and changing the "shape" parameter (see below). To create a down-saw, set your "shape" parameter to -100% whereas to create an up-saw, set this parameter to +100%. For a triangle wave, leave the parameter set to 0%.

You can create a square wave by selecting a "Pulse" waveform and setting the "Shape" parameter to 0% (see below).

Menu: Program/Synth/LFO
Parameter: Type
Value Range: Sawtooth, Pulse, Sine, Random

Sets the shape of the LFO. Take a look at the waveform on screen to see a representation of your LFO.

Menu: Program/Synth/LFO
Parameter: Shape (only available when Type is set to "Sawtooth" or "Pulse")
Value Range: -100% to +100%

Shape lengthens and shortens the duration of square and saw wave LFOs. This setting is sometimes referred to as "Pulse Width" on other synthesizers.

Menu: Program/Synth/LFO
Parameter: Sync (Unavailable when Type is set to "Random")
Value Range: None, 8 Whole Notes, 6 Whole Notes, 4 Whole Notes, Triple Whole Note, Double Whole Note, Dotted Whole Note, Whole Note, Dotted Half Note, Half Note, Dotted Quarter, Half Note Triplet, Quarter Note, Dotted 8th Note, Quarter Triplet, 8th Note, Dotted 16th Note, 8th Note Triplet, 16th Note, 16th Note Triplet, 32nd Note

Synchronizes your LFO to the tempo (see p. 37 for more about setting your tempo). This is important for tempo-dependent effects like wah-wah and vibrato.

Menu: Program/Synth/LFO
Parameter: Rate (Only available when Sync is set to "None")
Value Range: 0.0200 Hz – 200 Hz

Sets the speed of the LFO. The higher the value, the faster the LFO will oscillate every second.

Menu: Program/Synth/LFO
Parameter: Phase (Unavailable when Type is set to "Random")
Value Range: -100% (-180 Degrees) to +99% (178 Degrees), Random

Shifts your waveform to the right (or left) allowing you to start your oscillator on an offset. Setting this parameter to "Random" causes your LFO to begin at a random point in its cycle.

Menu: S Program/Synth/LFO
Parameter: Ramp
Value Range: 0 – 30 Sec

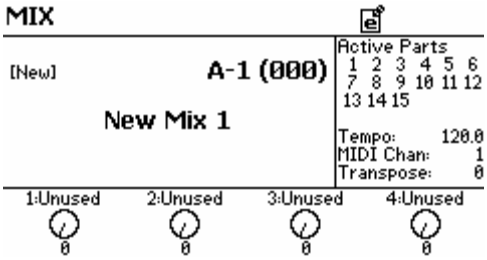
Sets the amount of time it takes your LFO to gradually "fade in" from zero to the maximum amount of modulation. If you set this value to 0, then the LFO starts immediately.

Menu: Program/Synth/LFO
Parameter: Del LFO
Value Range: Yes, No

This button deletes the currently selected Envelope. A dialog box will appear asking you to confirm whether you want to delete your LFO. Press "Yes" to delete.

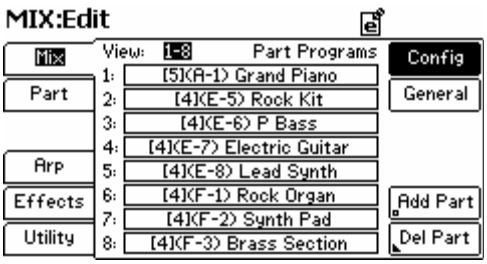
Mix Mode

This section covers parameters relating specifically to Mix mode. This includes everything found on the "Mix," "Part," and "Utility" tabs (to the left of the display). See chapter 4 for detailed descriptions of the "Arp," and "Effects" tabs.



Mix mode is a multitimbral mode that allows you to load up to 16 programs in order to create splits, layer sounds, and set up programs on separate channels for use with an external sequencer. Each program in a mix is stored under its own "part" and the active parts are listed on the upper right corner of the screen. The active part number is highlighted whenever that part is being triggered using the keyboard or an external sequencer.

Setting Overall Mix Parameters



Menu: Mix/Mix/Config
Parameter: View
Value Range: Part Programs, Part Enables, Part Volumes, Part Pans, Part Inserts, Part 1-2 Send Levels, Part Arpeggiators, Part Key Ranges (Edit lo), Part Key Ranges, (Edit hi), Part Alt Ranges (Edit lo), Part Alt Ranges, (Edit hi)

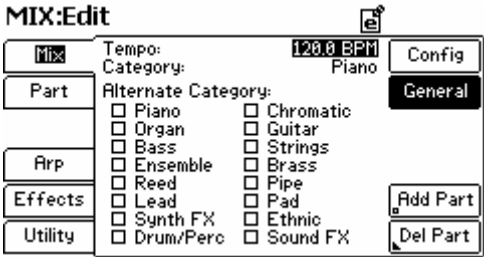
This screen provides a convenient overview showing how many of the commonly used parameters of your mix parts are configured.

This page shows parameter settings of several parts in relation to one another. By having these common parameters on one screen, it saves users from having to jump back and forth between multiple part pages. You can change part settings (volume, pan, tuning, etc) by editing the "1:" through "16:" parameters (see below).

The number of parts appearing on this page will vary depending on how many parts have been created for this mix. See the "Add Part" and "Del Part" buttons below for more about creating and deleting parts.

Menu: Mix/Mix/Config
Parameter: 1 – 16 (varies depending on how many parts you have created using the "Add Part" button)
Value Range: (varies)

This section provides quick access to common part settings. The contents of this parameter change depend on your "view" parameter settings. Use the Control Wheel to adjust the listed setting.



Menu: Mix/Mix/General
Parameter: Tempo
Value Range: 50 – 300 BPM

The tempo that you set here–expressed in Beats Per Minute (BPM)–determines the tempo at which the arpeggiator plays.

You can change this value during a performance by switching to the "Arp" row on the Performance Panel and turning the corresponding knob. If you switch to another mix without saving your current mix, the tempo value of your current mix will revert back to the original tempo, so remember to save your mix if you want to keep your newly selected tempo.

Menu: Mix/Mix/General
Parameter: Category
Value Range: Piano, Chromatic, Organ, Guitar, Bass, Strings, Ensemble, Brass, Reed, Pipe, Lead, Pad, Synth FX, Ethnic, Drum/Perc, Sound FX, OTHER

Use this option to place the mix into one of the seventeen categories listed to the right of the parameter. Once you place the mix in a category, it will show up under that category when you are browsing through the Fusion's Mix Category menu. Note that if you change this parameter, your mix will not show up under the new category until you've saved the mix.

Menu: Mix/Mix/General
Parameter: Alternative Category
Value Range: On, Off

Sometimes a mix may fit into more than one category. For example, a mix consisting of a piano/string layer can be placed under either the Piano or the Strings category. For that reason, the Fusion allows you to assign a mix to Alternate Categories so that you can place this mix in both the Strings and Piano categories. Once you select any of these check boxes, the mix will appear in multiple places when you're browsing through your Fusion's sounds. If you check alternative boxes, your mix will not show up under the new menus in the category until you've saved the mix.

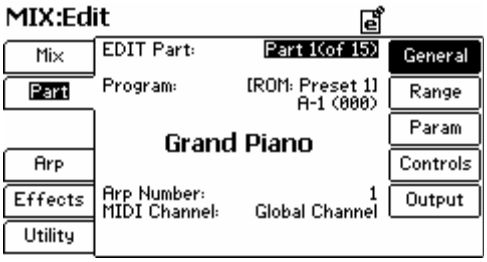
Menu: Mix/Mix
Parameter: Add Part (Disappears once 16 parts have been created)
Value Range: (none)

This button creates a new part and jumps straight to the Mix/Part/General page where you can assign programs, channel numbers, and other parameters related to the newly created part.

Menu: Mix/Mix
Parameter: Del Part (only visible when more than one part has been created)
Value Range: (none)

This button lets you delete a part. Once you press the button, you are taken to a prompt asking which part you'd like to delete. This button disappears if there is only one part in your mix (since a mix must have at least one part).

Setting Individual Part Parameters



Menu: Mix/Part/General
Parameter: EDIT Part
Value Range: (Varies depending on how many parts have been created)

Select the part you'd like to edit using this parameter.

Menu: Mix/Part/General
Parameter: Program
Value Range: (Varies depending on what programs are available to the Fusion)

Select the bank (the top line) and program number (the bottom line) that you'd like to select for this part. The name of the program is listed in the large, bold letters in the middle of the screen.

Menu: Mix/Part/General
Parameter: Arp Number
Value Range: None, 1-4

Each mix can have up to four arpeggiation patterns. Select the arpeggiation pattern you'd like to use for this part. If you do not want to use an arpeggiation pattern for this part, set this parameter to "None."

Menu: Mix/Part/General
Parameter: MIDI Channel
Value Range: Global Channel, 1-16

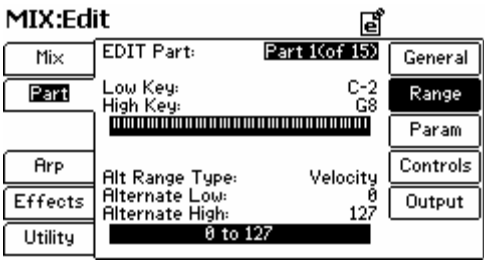
This parameter selects the channel on which your part can be sending and receiving data. Once you have selected a channel here, you can decide whether the channel will send and/or respond to MIDI data by setting the parameters found on the Mix/Part/Controls page (see pg. 109).

This parameter is often used in situations where you are using the Fusion with an external sequencer. In such cases, you may want to place each part on a separate channel so that your sequencer can trigger individual parts.

About "Global Channel"

Global Channel is a MIDI channel that is defined in Global mode. This is useful if you need to change MIDI channel settings on many mixes quickly, because you can simply edit the "Global MIDI Channel" parameter on the Global/Settings/MIDI page.

Once you change this setting, all mix parts that have been set to "Global Channel" will be changed immediately. There is no need to change every Mix individually.



Menu: Mix/Part/Range
Parameter: EDIT Part
Value Range: (Varies depending on how many parts have been created)

Select the part you'd like to edit using this parameter.

Menu: Mix/Part/Range
Parameter: Low Key
Value Range: C-2 to G8

This parameter sets the lowest note of the range to which your part will respond. The graphic will change to reflect the lowest key that has been selected.

Menu: Mix/Part/Range
Parameter: High Key
Value Range: C-2 to G8

This parameter sets the highest note of the range to which your part will respond. The graphic will change to reflect the highest key that has been selected.

Menu: Mix/Part/Range
Parameter: Alt Range Type
Value Range: Velocity, Aftertouch, Mod Wheel, Pitch Wheel, Pedal, Knob 1-4, Random

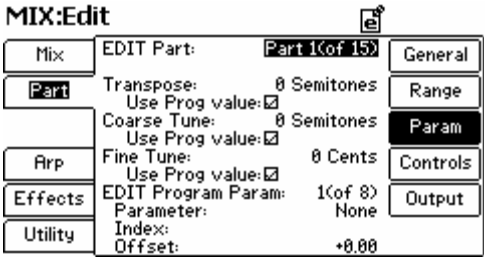
Each part can have an "alternate" range to which it will respond. For example, if this parameter is set to "Velocity," your part will only respond if notes are within range (see the "Low Key" and "High Key" parameters above) AND within the "alternate range" (see the "Alternate Low" and "Alternate High" parameters below).

Menu: Mix/Part/Range
Parameter: Alternate Low
Value Range: 0-127

This parameter sets the lowest point of the alternate range to which your part will respond.

Menu: Mix/Part/Range
Parameter: Alternate High
Value Range: 0-127

This parameter sets the highest point of the alternate range to which your part will respond.



Menu: Mix/Part/Param
Parameter: EDIT Part
Value Range: (Varies depending on how many parts have been created)

Select the part you'd like to edit using this parameter.

Menu: Mix/Part/Param
Parameter: Transpose
Value Range: -48 to 48 Semitones

Use transposition to reassign the notes that are triggered when you play the keyboard (or access the Fusion via an external MIDI device). For instance, with a "2 semitones" transposition, every time you play a C key, the Fusion will play the D note instead.

You can transpose the Fusion up to four octaves higher or four octaves lower than the default "0"-semitone setting.

Menu: Mix/Part/Param
Parameter: Use Prog Value (for Transpose)
Value Range: On, Off

If the program for your currently selected part already has a transposition setting, you can use it by checking this box.

Menu: Mix/Part/Param
Parameter: Coarse Tune
Value Range: -48 to 48 Semitones

This parameter pitch-shifts your currently selected part.

Menu: Mix/Part/Param
Parameter: Use Prog Value (for Coarse Tune)
Value Range: On, Off

If the program for your currently selected part already has a coarse tune setting, you can use it by checking this box.

Menu: Mix/Part/Param
Parameter: Fine Tune
Value Range: -99 to 99 Cents

Use this parameter to fine-tune (or detune) your currently selected part.

Menu: Mix/Part/Param
Parameter: Use Prog Value (for Fine Tune)
Value Range: On, Off

If the program for your currently selected part already has a fine tune setting, you can use it by checking this box.

Menu: Mix/Part/Param
Parameter: EDIT Program Param
Value Range: 1-8

This parameter allows you to select and edit different program parameters of your parts without actually changing the stored program. This is a useful feature if you have assembled several programs in a mix and want to make minor tweaks to your programs for just that mix (the original program is left alone). You can edit up to eight parameters for each part of your mix. Select that parameter here.

This may sound complicated, so let's take a look at a real world example: Let's say you've created a mix with piano, bass, and drums, but the piano sounds too bright and you want to filter out some of the treble frequencies for this mix. If you edited the actual piano program, then ALL mixes that use that piano program would now have a darker piano (since you've edited the program at the source). If you want only the current mix to have the darker piano, then you can use the "EDIT Program Param" parameter to adjust the filter setting and only your current mix will be affected.

Menu: Mix/Part/Param
Parameter: Parameter
Value Range: None, Pitch, Volume, Pan, Portamento Time, Amount, Curve, S&H Rate, Smoothing, Delay, Attack, Decay, Sustain Level, Sustain Decay, Release, Env Time, Delay, Ramp, Rate, Shape, Osc Start, Osc Frequency, Osc FM Amount, Osc Volume, Osc Pan, Filt Cutoff, Filt Resonance, Crossfade

This selects what program parameter you'd like to edit.

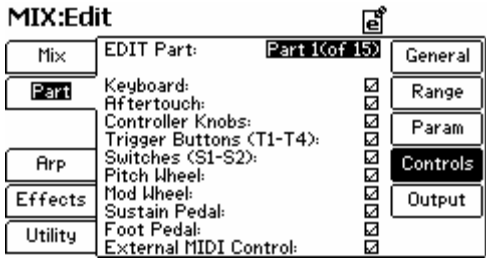
Menu: Mix/Part/Param
Parameter: Index
Value Range: (Varies depending on Parameter selection)

Certain parameters have several sub-parameters that further specify what you'd like to edit. Index lets you select the specific item you'd like to edit.

For example, if you want to edit filter cutoff on a sample-playback based program, you will have to select which filter you'd like to change (remember that sample playback programs have three filters: one for each of the two oscillators as well as a "main filter"). Use index to select the specific filter you'd like to edit.

Menu: Mix/Part/Param
Parameter: Offset
Value Range: -100 to 100

This parameter lets you determine how much your selected parameter is affected.



Menu: Mix/Part/Controls
Parameter: EDIT Part
Value Range: (Varies depending on how many parts have been created)

Select the part you'd like to edit using this parameter.

Menu: Mix/Part/Controls
Parameter: Keyboard
Value Range: On, Off

This parameter determines whether the currently selected part can be triggered by the keyboard.

In some cases (such as when you're using an external sequencer), you need to disconnect your "local" keyboard so that the Fusion does not trigger notes twice (from both the keyboard and the sequencing application).

To do this, turn the "Keyboard" parameter off.

Menu: Mix/Part/Controls
Parameter: Aftertouch
Value Range: On, Off

If you do not want the currently selected part to respond to aftertouch, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Mix/Part/Controls
Parameter: Controller Knobs
Value Range: On, Off

If you do not want the currently selected part to respond to the control knobs, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Mix/Part/Controls
Parameter: Trigger Buttons (T1-T4)
Value Range: On, Off

If you do not want the currently selected part to respond to the T1-T4 trigger buttons, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Mix/Part/Controls
Parameter: Switches (S1-S2)
Value Range: On, Off

If you do not want the currently selected part to respond to the S1-S2 switches, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Mix/Part/Controls
Parameter: Pitch Wheel
Value Range: On, Off

If you do not want the currently selected part to respond to the pitch wheel, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Mix/Part/Controls
Parameter: Mod Wheel
Value Range: On, Off

If you do not want the currently selected part to respond to the mod wheel, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Mix/Part/Controls
Parameter: Sustain Pedal
Value Range: On, Off

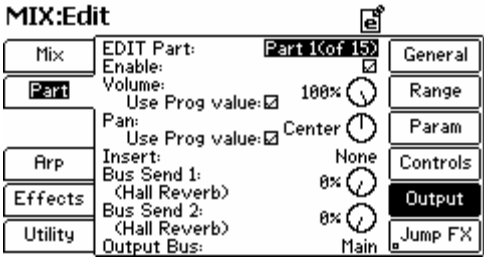
If you do not want the currently selected part to respond to the sustain pedal, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Mix/Part/Controls
Parameter: Foot Pedal
Value Range: On, Off

If you do not want the currently selected part to respond to the foot pedal, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Mix/Part/Controls
Parameter: External MIDI Control
Value Range: On, Off

If you do not want the currently selected part to respond to external MIDI control, uncheck this box. Otherwise, leave this box checked for normal operation.



Menu: Mix/Part/Output
Parameter: EDIT Part
Value Range: (Varies depending on how many parts have been created)

Select the part you'd like to edit using this parameter.

Menu: Mix/Part/Output
Parameter: Enable
Value Range: On, Off

This parameter lets you enable and disable the currently selected part. If you need to mute a part, uncheck this box. Otherwise leave this box checked for regular operation.

Menu: Mix/Part/Output
Parameter: Volume
Value Range: 0-100%

This parameter lets you set the volume of the currently selected part.

Menu: Mix/Part/Output
Parameter: Use Prog Value (for Volume)
Value Range: On, Off

If the program for your currently selected part already has the desired volume setting, you can use it by checking this box.

Menu: Mix/Part/Output
Parameter: Pan
Value Range: L100% to R100%

This parameter lets you set the pan position of the currently selected part.

Menu: Mix/Part/Output
Parameter: Use Prog Value
Value Range: On, Off

If the program for your currently selected part already has the desired pan setting, you can use it by checking this box.

Menu: Mix/Part/Output
Parameter: Insert
Value Range: None, 1-4

If you'd like to run your currently selected part through an insert effect, select which inset effect you'd like to use. The name of the effect appears in parenthesis next to the word "insert" on screen. If you do not want to use any insert effects, set this parameter to none.

In most cases you'll want to route only one part into one insert, but we've programmed the Fusion to allow multiple parts to be routed to the same insert. This allows for more creative routing options, but keep in mind that once two parts are routed to the same insert effect they become summed and cannot be "unsummed" as the output of the insert effect is routed back to the parts.

Menu: Mix/Part/Output
Parameter: Bus Send 1, Bus Send 2
Value Range: 0-100%

This parameter determines how much of your program output is being sent to effects busses 1 and 2. A "dry" setting of 0% means that none of your signal is being sent to the bus effects. A "wet" signal of 100% means that equal amounts of your original signal and effected signal are being routed to the output.

Menu: Mix/Part/Output
Parameter: Output Bus
Value Range: Main, Aux, None

Select the output bus of your part here. Set this parameter to "Aux" if you want the part to be routed out of the Aux outputs, or to "none" if you do not want the output routed out of the Fusion. Otherwise, leave this parameter set to "Main" for normal operation.

Mix Utility Page

Menu: Mix/Utility
Parameter: New Mix
Value Range: (none)

This button creates a new mix. Remember to save your current mix before you press this button otherwise you will lose the settings for your current mix.

Menu: Mix/Utility
Parameter: Favorite
Value Range: 1-8

This button adds your mix to any of the 8 "favorite" mix categories of the Fusion for easy access. Press the Category button and scroll down to the "Fav 1" through "Fav 8" categories to see your favorite mixes.

Note that you can't add a mix to a Favorites category until it has been saved (see pg. 31 for more about saving programs, mixes, and songs). If a mix already belongs to a Favorites category, the display will read "Remove from Favorites". This allows you to remove this mix from a Favorites category

Menu: Mix/Utility
Parameter: To Song
Value Range: Generate Song, Add to Current Song

This button lets you take your current mix and move it directly into Song mode. This function is useful if you have set up a mix and want to use the Fusion's internal sequencer (in Song mode) to compose a song using that mix. The "Generate Song" setting lets you create a new song with your mix parts whereas "Add to Current Song" lets you add your mix parts to whatever song that is currently selected in Song mode.

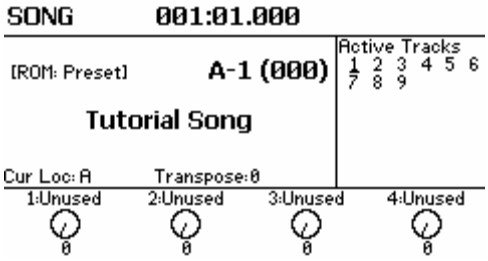
When you are using the "Add to Current Song" setting, keep in mind a song can have up to 32 synth tracks and additional tracks will not be added. For example, you can combine two mixes with 16 parts each into one song. However, if you add one mix with 16 parts to a song that already has 22 synth tracks, only the first ten parts of the mix will be added to the song.

Menu: Mix/Utility
Parameter: Edit Prog
Value Range: (Varies depending on programs loaded)

This button lets you jump directly to your selected program in Program mode. Use this button if you want to make tweaks to your program.

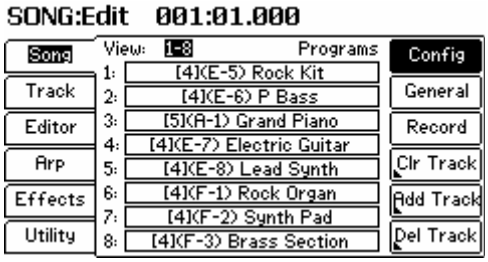
Song Mode

This section covers parameters relating specifically to Song mode. This includes everything found on the "Song," "Track," "Editor," and "Utility" tabs (to the left of the display). See chapter 4 for the "Arp," and "Effects" tabs.



Song mode integrates all of the Fusion's different parts together letting you create a complete song within the workstation. In this mode, you can load programs, arrange your synthesizer tracks, record live instruments, and mix your musical compositions into finished songs.

Setting Overall Song Parameters



Menu: Song/Song/Config
Parameter: View
Value Range: Programs, Enables, Record Armed, Volumes, Pans, Inserts, Send 1-2 levels, Arpeggiators, Key Ranges (low), Key Ranges (high), Alt Ranges (low), Alt Ranges (high)

This screen provides a convenient overview showing how many of the commonly used parameters of your song's tracks are configured.

This page shows parameter settings of several tracks in relation to one another. Having these common parameters on one screen saves users from having to jump back and forth between multiple pages. You can change track settings (volume, pan, tuning, etc) by editing the "1:" through"40:" parameters (see below).

The number of tracks appearing on this page will vary depending on how many tracks have been created for this mix. See the "Add Track" and "Del Track" buttons below for more about creating and deleting tracks.

Menu: Song/Song/Config
Parameter: 1 – 40 (varies depending on how many tracks you have created using the "Add Part" button)
Value Range: (varies)

This section provides quick access to common track settings. The contents of this parameter change depend on your "view" parameter settings (see above). Use the Control Wheel to adjust the listed setting.

Menu: Song/Song/Config
Parameter: Clr Track
Value Range: (varies)

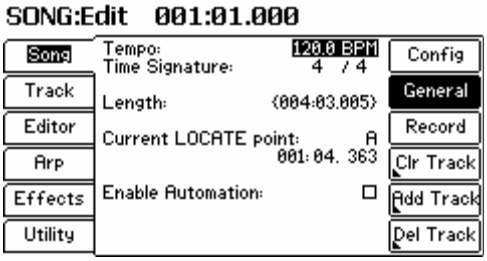
This button lets you delete the MIDI events contained within a track.

Menu: Song/Song/Config
Parameter: Add Track
Value Range: (varies)

This button creates a new track. This button disappears once 32 synth tracks and 8 audio track have been created (since this is the maximum number of tracks available in one song).

Menu: Song/Song/Config
Parameter: Del Track
Value Range: (varies)

This button lets you delete tracks. Once you press the button, you are taken to a prompt asking which track you'd like to delete. This button disappears if there is only one track in your song (since a song must have at least one track).



Menu: Song/Song/General
Parameter: Tempo
Value Range: 50 – 300 BPM

The tempo that you set here–expressed in Beats Per Minute (BPM)–determines the tempo at which the song and arpeggiator play.

You can change this value during a performance by switching to the "Arp" row on the Performance Panel and turning the corresponding knob. If you switch to another song without saving your current song first, the tempo value of your current song will revert back to the original tempo, so remember to save your song if you want to keep your newly selected tempo.

Menu: Song/Song/General
Parameter: Time Signature
Value Range: (varies. Beats per measure range from 1 – 99; beat values can be set to 1, 2, 4, 8, 16, 32)

Time signature of a song is expressed as a fraction. The beats per measure are listed on top and the beat value is listed on the bottom. Use this parameter to set the signature of your song.

Menu: Song/Song/General
Parameter: Length
Value Range: (not user-editable)

This parameter shows you the length of your song in measures, beats, and pulses. The length of the song is dependent on the current "Time Signature" setting (see above). Note that this parameter is not editable, and is included as a reference.

Menu: Song/Song/General
Parameter: Current LOCATE point (Point Letter)
Value Range: A-P

This parameter lets you select a locate point. Each song in the Fusion can have up to 16 locate points.

Menu: Song/Song/General
Parameter: Current LOCATE point (Point Time)
Value Range: (varies)

This parameter lets you set the location for the currently selected locate point. This parameter is set in measures, beats, and pulses (formatted on screen from left to right as "measures:beats.pulses")

Menu: Song/Song/Record
Parameter: Record Method
Value Range: Overdub, Replace, Spot Erase

The Fusion has three recording methods for synth tracks (audio is always set to "replace"). They are as follows:

1. Overdub – Overdub recording keeps whatever is already recorded and lets you record additional performances on top of the original recording.

2. Replace – Replace record erases whatever is currently on the track while recording whatever you play.

3. Spot Erase – Spot erase lets you erase specific notes by holding down those notes while recording. In other words, if you hold down notes while recording, the sequencer will automatically delete these notes as they come up in your track. Once you release these notes, the remainder of the track will be left alone.

Menu: Song/Song/Record
Parameter: Quantize
Value Range: Off, 32-note Triplet, Dotted 64-note, 32-note, 16-note triplet, Dotted 32-note, 16-note, 8-note triplet, Dotted 16-note, 8-note, Quarter-note Triplet, Dotted 8-note, Quarter Note

Quantize allows you to "clean up" your timing by automatically "snapping" each note you play to the nearest logical point in the beat. By setting this parameter to "off" the sequencer will record your performance exactly as you play it. Otherwise, you can set this parameter to any of the additional settings that are right for your composition and small inaccuracies in timing will be automatically fixed as you record.

Note that it is possible to quantize your recorded MIDI tracks after they've been recorded. See page 163 for more.

Menu: Song/Song/Record
Parameter: Record Filter (Notes)
Value Range: On, Off

Turn this parameter off if you do not want note data to be recorded. Otherwise, leave this parameter set to "on" for normal operation.

Menu: Song/Song/Record
Parameter: Record Filter (Contlrs)
Value Range: On, Off

Turn this parameter off if you do not want MIDI control data to be recorded. Otherwise, leave this parameter set to "on" for normal operation.

Menu: Song/Song/Record
Parameter: Record Filter (AftrTch)
Value Range: On, Off

Turn this parameter off if you do not want aftertouch data to be recorded. Otherwise, leave this parameter set to "on" for normal operation.

Menu: Song/Song/Record
Parameter: Record Filter (Pitch)
Value Range: On, Off

Turn this parameter off if you do not want pitch bend data to be recorded. Otherwise, leave this parameter set to "on" for normal operation.

Menu: Song/Song/Record
Parameter: Record Filter (Tempo)
Value Range: On, Off

Turn this parameter "on" if you want to record Tempo changes. Otherwise, leave this parameter set to "off" for normal operation.

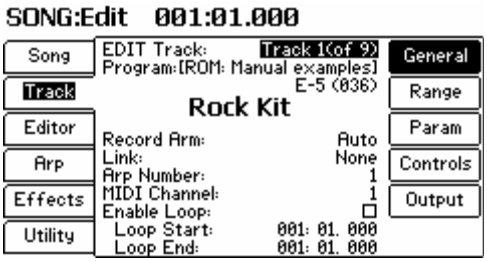
Menu: Song/Song/Record
Parameter: Record Filter (Other)
Value Range: On, Off

If you do not want any MIDI data (other than MIDI data explicitly stated above) to be recorded, set this parameter to off. Otherwise, leave this parameter set to "on" for normal operation.

Menu: Song/Song/Record
Parameter: Input Meter
Value Range: Channel 1-2, 3-4, 5-6, 7-8

The two bars along the bottom of the screen indicate incoming audio levels on your Fusion. Use this parameter to view levels on multitrack inputs 1 through 8.

Setting Track Parameters



Menu: Song/Track/General
Parameter: EDIT Track
Value Range: (Varies depending on how many tracks have been created)

Select the track you'd like to edit using this parameter.

Menu: Song/Track/General
Parameter: Program (not available for audio tracks)
Value Range: (Varies depending on what program has been selected)

Select the bank (the top line) and program number (the bottom line) that you'd like to select for this track. The name of the program is listed in the large, bold letters in the middle of the screen.

Menu: Song/Track/General
Parameter: Record Arm
Value Range: Auto, Off, On

This parameter determines whether the currently selected track will be recorded once you enter record mode. Set this parameter to "on" when you want the current track to be recorded and "off" when you want the track to simply playback without being recorded. Note that audio tracks set to "Auto" will only change record arm state will the song is stopped.

The "Auto" setting will arm the track for recording when selected as the current "EDIT Track." When a different track is selected then this track will disable its arm status.

Menu: Song/Track/General
Parameter: Link
Value Range: None, A-T

Link allows for mixes to be emulated in Song mode.

If you link several tracks to the same "Link" letter then the programs can be played and recorded together, as if playing the mix in Song mode.

Menu: Song/Track/General
Parameter: Arp Number (not available for audio tracks)
Value Range: None, 1-4

Each song can have up to four arpeggiation patterns. Select the arpeggiation pattern you'd like to use for this track. If you do not want to use an arpeggiation pattern for this track, set this parameter to "None."

Menu: Song/Track/General
Parameter: MIDI Channel (not available for audio tracks)
Value Range: Global Channel, 1-16

This parameter sets the MIDI channel on which the current track will transmit and respond to MIDI data.

Menu: Song/Track/General
Parameter: Enable Loop
Value Range: On, Off

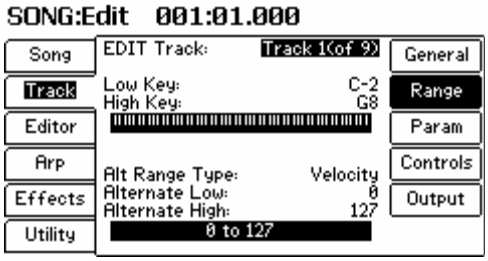
This parameter lets you enable or disable looping a particular segment of the song. The segment is determined by the "Loop Start" and "Loop End" parameters (See below). Check this box if you want looping to take place, and leave the box unchecked if you want the song to play through normally. Tracks will loop until the end of the song is reached.

Menu: Song/Track/General
Parameter: Loop Start
Value Range: (Varies depending on loop length)

This parameter determines where the looping will begin in your song.

Menu: Song/Track/General
Parameter: Loop End
Value Range: (Varies depending on loop length)

This parameter sets the end point of the loop in your song. When you are playing a song and you reach this point, the song will jump back to the "Loop Start" point (see above) and replay the looped portion of the song until you press the "Stop" button on the transport or until the end of the song is reached.



Menu: Song/Track/Range
Parameter: EDIT Track
Value Range: (Varies depending on how many tracks have been created)

Select the track you'd like to edit using this parameter.

Menu: Song/Track/Range
Parameter: Low Key (not available for audio tracks)
Value Range: C-2 to G8

This parameter sets the lowest note of the range to which your track will respond.

Menu: Song/Track/Range
Parameter: High Key (not available for audio tracks)
Value Range: C-2 to G8

This parameter sets the highest note of the range to which your track will respond.

Menu: Song/Track/Range
Parameter: Alt Range Type (not available for audio tracks)
Value Range: Velocity, Aftertouch, Mod Wheel, Pitch Wheel, Pedal, Knob 1-4, Random

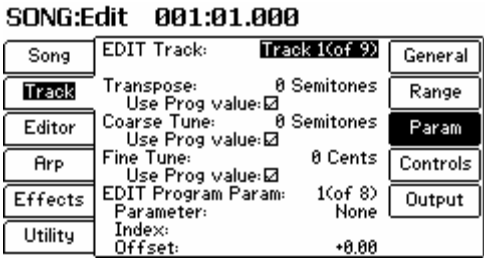
Each track can have an "alternate" range to which it will respond. For example, if this parameter is set to "Velocity," your track will only respond if notes are within range (see the "Low Key" and "High Key" parameters above) AND within the "alternate range" (see the "Alternate Low" and "Alternate High" parameters below).

Menu: Song/Track/Range
Parameter: Alternate Low (not available for audio tracks)
Value Range: 0-127

This parameter sets the lowest point of the alternate range to which your track will respond.

Menu: Song/Track/Range
Parameter: Alternate High (not available for audio tracks)
Value Range: 0-127

This parameter sets the highest point of the alternate range to which your track will respond.



Menu: Song/Track/Param
Parameter: EDIT Track
Value Range: (Varies depending on how many parts have been created)

Select the track you'd like to edit using this parameter.

Menu: Song/Track/Param
Parameter: Transpose (not available for audio tracks)
Value Range: -48 to 48 Semitones

Use transposition to reassign the notes that are triggered when you play the keyboard (or access the Fusion via an external MIDI device). For instance, with a "2 semitones" transposition, every time you play a C key, the Fusion will play the D note instead.

You can transpose the Fusion up to four octaves higher or four octaves lower than the default "0"-semitone setting.

Menu: Song/Track/Param
Parameter: Use Prog Value (not available for audio tracks)
Value Range: On, Off

If the program for your currently selected track already has a transposition setting, you can use it by checking this box.

Menu: Song/Track/Param
Parameter: Coarse Tune (not available for audio tracks)
Value Range: -48 to 48 Semitones

This parameter pitch-shifts your currently selected track.

Menu: Song/Track/Param
Parameter: Use Prog Value (not available for audio tracks)
Value Range: On, Off

If the program for your currently selected track already has a coarse tune setting, you can use it by checking this box.

Menu: Song/Track/Param
Parameter: Fine Tune (not available for audio tracks)
Value Range: -99 to 99 Cents

Use this parameter to fine-tune (or detune) your currently selected track.

Menu: Song/Track/Param
Parameter: Use Prog Value (not available for audio tracks)
Value Range: On, Off

If the program for your currently selected track already has a fine tune setting, you can use it by checking this box.

Menu: Song/Track/Param
Parameter: EDIT Program Param (not available for audio tracks)
Value Range: 1-8

This parameter allows you to select and edit different parameters of your track without editing the actual program that is loaded in the track. This is a useful feature if you have assembled several programs in a song and want to make minor tweaks to your programs for just that song (the original program is left alone). You can edit up to eight parameters for each part of your song. Select that parameter here.

This may sound complicated, so let's take a look at a real world example: Let's say you've created a song with piano, bass, and drums, but the piano sounds too bright and you want to filter out some of the high frequencies for this song. If you edited the actual piano program, then ALL songs that use that piano program would now have a darker piano (since you've edited the program at the source). If you want only the current songs to have the darker piano, then you can use the "EDIT Program Param" parameter and only your current song will be affected

Menu: Song/Track/Param
Parameter: Parameter (not available for audio tracks)
Value Range: None, Pitch, Volume, Pan, Portamento Time, Amount, Curve, S&H Rate, Smoothing, Delay, Attack, Decay, Sustain Level, Sustain Decay, Release, Env Time, Delay, Ramp, Rate, Shape, Osc Start, Osc Frequency, Osc FM Amount, Osc Volume, Osc Pan, Filt Cutoff, Filt Resonance, Crossfade

This parameter selects what part of your program you'd like to edit.

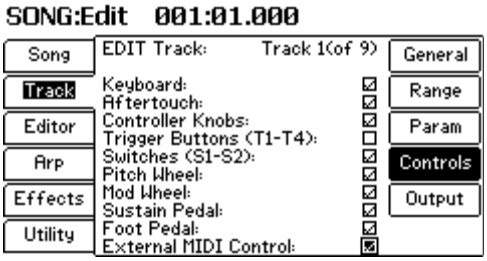
Menu: Song/Track/Param
Parameter: Index (not available for audio tracks)
Value Range: (Varies depending on Parameter selection)

Certain parameters have several sub-parameters that you can select and those sub-parameters here.

For example, if you want to edit filter cutoff on a sample-playback program, you will have to select which of the oscillator(s) you'd like to apply the filter to (remember that sample playback programs have three filters: one for each of the two oscillators as well as a "main filter"). Use index to select the specific filter you'd like to edit.

Menu: Song/Track/Param
Parameter: Offset (not available for audio tracks)
Value Range: -100 to 100

This parameter lets you affect how much of your selected parameter (or index) is affected.



[Note: In some cases, you may want specific tracks to ignore certain kinds of incoming MIDI data. For example, if you are composing using an external sequencer, you may want to turn the "keyboard" off so that the track isn't triggered twice (once when you press the key and once again when the MIDI data comes back from your sequencer).]

Menu: Song/Track/Controls
Parameter: EDIT Track (not available for audio tracks)
Value Range: (Varies depending on how many tracks have been created)

Select the track you'd like to edit using this parameter.

Menu: Song/Track/Controls
Parameter: Keyboard (not available for audio tracks)
Value Range: On, Off

This parameter determines whether the currently selected track can be triggered by the keyboard.

A Note on Local Control:

If you're using an external controller, you don't need to disable the Keyboard parameter for every track you create in song mode. Instead, you can disable the "Local Control" parameter on the Global/Settings/MIDI page (see page 185 for more). This effectively disables the Keyboard parameter for all tracks in Song mode.

Menu: Song/Track/Controls
Parameter: Aftertouch (not available for audio tracks)
Value Range: On, Off

If you do not want the currently selected track to respond to aftertouch, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Song/Track/Controls
Parameter: Controller Knobs (not available for audio tracks)
Value Range: On, Off

If you do not want the currently selected track to respond to the control knobs, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Song/Track/Controls
Parameter: Trigger Buttons (T1-T4) [not available for audio tracks]
Value Range: On, Off

If you do not want the currently selected track to respond to the T1-T4 trigger buttons, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Song/Track/Controls
Parameter: Switches (S1-S2) [not available for audio tracks]
Value Range: On, Off

If you do not want the currently selected track to respond to the S1-S2 switches, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Song/Track/Controls
Parameter: Pitch Wheel (not available for audio tracks)
Value Range: On, Off

If you do not want the currently selected track to respond to the pitch wheel, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Song/Track/Controls
Parameter: Mod Wheel (not available for audio tracks)
Value Range: On, Off

If you do not want the currently selected track to respond to the mod wheel, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Song/Track/Controls
Parameter: Sustain Pedal (not available for audio tracks)
Value Range: On, Off

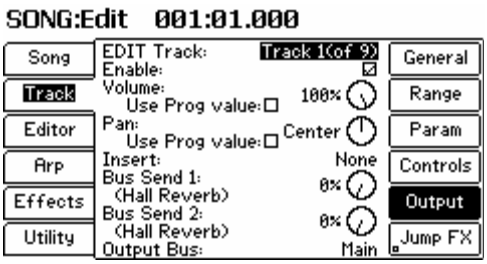
If you do not want the currently selected track to respond to the sustain pedal, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Song/Track/Controls
Parameter: Foot Pedal (not available for audio tracks)
Value Range: On, Off

If you do not want the currently selected track to respond to the foot pedal, uncheck this box. Otherwise, leave this box checked for normal operation.

Menu: Song/Track/Controls
Parameter: External MIDI Control (not available for audio tracks)
Value Range: On, Off

If you do not want the currently selected track to respond to external MIDI control, uncheck this box. Otherwise, leave this box checked for normal operation.



Menu: Song/Track/Output
Parameter: Edit Track
Value Range: (Varies depending on how many tracks have been created)

Select the track you'd like to edit using this parameter.

Menu: Song/Track/Output
Parameter: Enable
Value Range: On, Off

This parameter lets you enable and disable the currently selected track. If you need to mute a track, uncheck this box. Otherwise, leave this box checked for regular operation.

Menu: Song/Track/Output
Parameter: Volume
Value Range: 0-100%

This parameter sets the volume of the currently selected track.

Menu: Song/Track/Output
Parameter: Use Prog value (not available for audio tracks)
Value Range: On, Off

If the program for your currently selected track already has a volume setting, you can use it by checking this box.

Menu: Song/Track/Output
Parameter: Pan
Value Range: L100% to R100%

This parameter sets the pan position of the currently selected track.

Menu: Song/Track/Output
Parameter: Use Prog value (not available for audio tracks)
Value Range: On, Off

If the program for your currently selected track already has a pan setting, you can use it by checking this box.

Menu: Song/Track/Output
Parameter: Insert
Value Range: None, 1-4

If you'd like to run this track through an insert effect, select which inset effect you'd like to use. The name of the effect appears in parenthesis next to the word "insert" on screen. If you do not want to use any insert effects, set this parameter to none.

In most cases you'll want to route only one part into one insert, but we've programmed the Fusion to allow multiple parts to be routed to the same insert. This allows for more creative routing options, but keep in mind that once two parts are routed to the same insert effect they become summed and cannot be "unsummed" since the mixed output of the insert effect is routed back to the parts.

Menu: Song/Track/Output
Parameter: Bus Send 1 & 2
Value Range: 0-100%

This parameter determines how much of your track output is being sent to effects busses 1 & 2. A "dry" setting of 0% means that none of your signal is being sent to the bus effects. A "wet" signal of 100% means that equal amounts of your original signal and effected signal are being routed to the output.

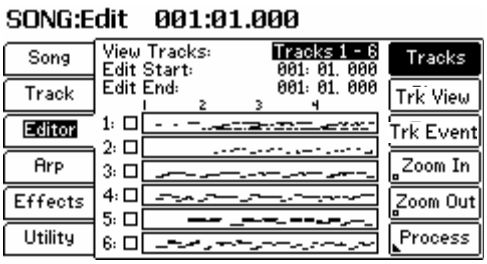
Menu: Song/Track/Output
Parameter: Output Bus
Value Range: Main, Aux, None

Select the output bus of your track here. Set this parameter to "Aux" if you want the part to be routed out of the Aux outputs, or to "none" if you do not want the output routed out of the Fusion. Otherwise, leave this parameter set to "Main" for normal operation.

Menu: Song/Track/Output
Parameter: Jump FX
Value Range: (none)

This button will take you to the Song/Effects menu where you can select and edit the effects that you'd like to use.

Editing Song Tracks



Menu: Song/Editor/Tracks
Parameter: Edit Track
Value Range: (Varies depending on how many tracks have been created)

Select the track you'd like to edit using this parameter. The screen can display groups of 6 tracks at a time.

Menu: Song/Editor/Tracks
Parameter: Edit Start
Value Range: (Varies depending on length of your song)

Selects the beginning of the region you'd like to edit using the Process menu.

Menu: Song/Editor/Tracks
Parameter: Edit End
Value Range: (Varies depending on length of your song)

Selects the end of the region you'd like to edit.

Menu: Song/Editor/Tracks
Parameter: Track Check-box (to the left of each track)
Value Range: On, Off

This check box lets you select a track (or tracks) that will be edited using the Process menu.

Menu: Song/Editor/Tracks
Parameter: Zoom In
Value Range: (none)

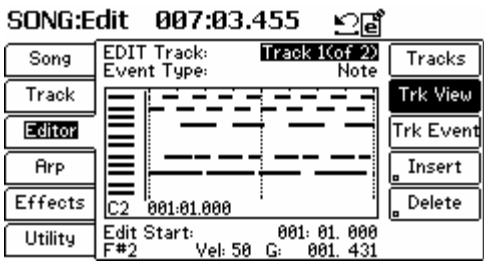
This button expands your timeline and lets you see your tracks in more detail.

Menu: Song/Editor/Tracks
Parameter: Zoom Out
Value Range: (none)

This button compresses your timeline and lets you see more events on screen.

Menu: Song/Editor/Tracks
Parameter: Process
Value Range: (none)

This button takes you to the Process page where you can make edits and other changes to your selected tracks. See page 147 for more about these processes.



[Note: You must select a synth track for your screen to appear like the one above. If the parameters on the screen look different from what you see above, it is because you have selected an audio track.]

Menu: Song/Editor/Trk View
Parameter: Edit Track
Value Range: (Varies depending on how many tracks have been created)

Select the track you'd like to edit using this parameter.

Menu: Song/Editor/Trk View
Parameter: Event Type
Value Range: Note, Controller, Mono Aftertouch, Pitch

Select the type of event you'd like to edit here. The remaining parameters on the page change depending on what you select here. The following chart will break things down by selection. Note that the piano roll appears blank unless a MIDI event has been created (you can add an event by either recording it in the sequencer, or by pressing the "Insert" action button).

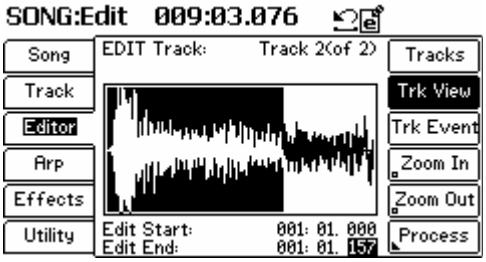
Event Type	Sub Categories	Value Range
Note	Time	Varies
	Note Value	C-2 to G8
	Velocity	1-127
	Gate	Varies depending on length of note played
Controller	Time	Varies
	MIDI CC Controller	0-119
	CC Value	0-127
Aftertouch	Time	Varies
	Aftertouch	0-127
Pitch	Time	Varies
	Pitch	-8192 to +8191

Menu: Song/Editor/Trk View
Parameter: Insert
Value Range: (None)

This button creates an event in the event editor window.

Menu: Song/Editor/Trk View
Parameter: Delete
Value Range: (None)

This button deletes the currently selected event within the event editor window.



[Note: You must select an audio track for your screen to appear like the one above. If the parameters on the screen look different from what you see above, it is because you have selected a synth track.]

Menu: Song/Editor/Trk View
Parameter: Edit Track
Value Range: (Varies depending on how many tracks have been created)

Select the track you'd like to edit using this parameter.

Menu: Song/Editor/Trk View
Parameter: Edit Start
Value Range: (Varies depending on length of your song)

Selects the beginning of the region you'd like to edit using the Process menu.

Menu: Song/Editor/Trk View
Parameter: Edit End
Value Range: (Varies depending on length of your song)

Selects the end of the region you'd like to edit.

Menu: Song/Editor/Trk View
Parameter: Zoom In
Value Range: (None)

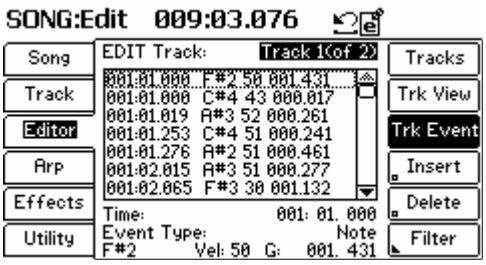
This button lets you "zoom in" to see your individual samples in more detail. This is useful for making precise edits such as setting loop points. The number on the lower right of the graphical editor indicates your "zoom factor."

Menu: Song/Editor/Trk View
Parameter: Zoom Out
Value Range: (None)

This button "zooms out" to let you see more of your sample (but with less detail). This is useful for making general edits to your sample such as cropping out unnecessary segments of your sample.

Menu: Song/Editor/Trk View
Parameter: Process
Value Range: (none)

This button takes you to the Process page where you can make edits and other changes to your selected tracks. See page 147 for more about these processes.



[Note: You must select a synth track for your screen to appear like the one above. If the parameters on the screen look different from what you see above, it is because you have selected an audio track.]

Menu: Song/Editor/Trk Event
Parameter: Edit Track
Value Range: (Varies depending on how many tracks have been created)

Select the track you'd like to edit using this parameter.

A note on the Master Track:

Each song you create has a "Master Track" that appears before Track 1. This track allows you to insert two types of events: Tempo and Meter changes.

Menu: Song/Editor/Trk Event
Parameter: Time
Value Range: (Varies depending on length of song)

States the time at which the selected event will occur.

Menu: Song/Editor/Trk Event
Parameter: Event Type
Value Range: Note, Controller, Mono Aftertouch, Pitch, Patch, Poly Aftertouch, RPN, NRPN

This parameter selects the type of event you'd like to place. The remaining parameters on the page change depending on what you select here. The following chart will break things down by event type:

Event Type	Sub Categories	Value Range
Note	Note Value	C-2 to G8
	Velocity	0-127
	Gate	Varies depending on length of note played
Mono Aftertouch	Aftertouch Value	0-127
Poly Aftertouch	Note	C-2 to G8
	Velocity	0 - 127
Pitch	Pitch Value	-8192 to +8191

Patch	Bank	0-127
	Number	0-127
Controller	MIDI CC Controller	0-119
	CC Value	0-127
RPN	Pitch Range	0 - 16383
	Fine Tune	0 - 16383
	Coarse Tune	0 - 16383
	RPN 3 – RPN1683	0 - 16383
NRPN	NRPN 0 – NRPN 1683	0 - 16383

Menu: Song/Editor/Trk Event
Parameter: Insert
Value Range: (None)

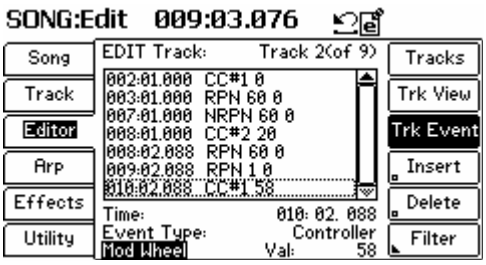
This button creates an event in the event editor window.

Menu: Song/Editor/Trk Event
Parameter: Delete
Value Range: (None)

This button deletes the currently selected event within the event editor window.

Menu: Song/Editor/Trk Event
Parameter: Filter
Value Range: (None)

This button brings up an additional page letting you hide specific types of data from your event editor. This makes it easier for you to edit the data that you do see onscreen. See page 145 for more about these filters.



[Note: You must select an audio track for your screen to appear like the one above. If the parameters on the screen look different from what you see above, it is because you have selected a synth track.]

Event Editor for Audio Tracks?

Event Editors are typically associated with MIDI editing and you may be wondering why we have an event editor for audio tracks. The audio event editor is included so that you can automate (or edit the automation for) things like volume and pan positions of your audio tracks.

Menu: Song/Editor/Trk Event
Parameter: Edit Track
Value Range: (Varies depending on how many tracks have been created)

Select the track you'd like to edit using this parameter.

Menu: Song/Editor/Trk Event
Parameter: Time
Value Range: (Varies depending on length of song)

States the time at which the selected event will occur.

Menu: Song/Editor/Trk Event
Parameter: Event Type
Value Range: Controller, RPN, NRPN

This parameter selects the type of event you'd like to place. The remaining parameters on the page change depending on what you select here. The following chart will break things down by event type:

Event Type	Sub Categories	Value Range
Controller	MIDI CC Controller	0-119
	CC Value	0-127
RPN	Pitch Range	0 - 16383
	Fine Tune	0 - 16383
	Coarse Tune	0 - 16383
	RPN 3 – RPN1683	0 - 16383
NRPN	NRPN 0 – NRPN 1683	0 - 16383

Menu: Song/Editor/Trk Event
Parameter: Insert
Value Range: (None)

This button creates an event in the event editor window.

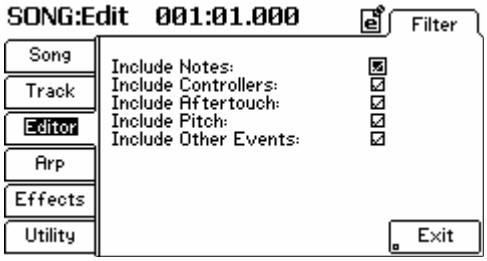
Menu: Song/Editor/Trk Event
Parameter: Delete
Value Range: (None)

This button deletes the currently selected event within the event editor window.

Menu: Song/Editor/Trk Event
Parameter: Filter
Value Range: (None)

This button brings up an additional page letting you hide specific types of data from your event editor. This makes it easier for you to edit the data that you do see onscreen. See page 145 for more about these filters.

Track Editing Filters



[About these filters: When you record pitch changes, continuous controller changes, or aftertouch into a MIDI sequencer, the event window can easily get cluttered with lots of data that you may not need to see. This is a problem because it becomes harder to spot data that you actually want to edit. For that reason, we've added this event editor filter—this filter lets you avoid displaying much of the data that would otherwise clutter your event editor. Keep in mind, this filter does not actually remove any data from your tracks—it simply does not display them in the event editor.]

Menu: Song/Editor/Event/Filter
Parameter: Include Notes
Value Range: On, Off

Turn this parameter off if you do not want the event editor to display note data. Otherwise, leave it on for normal operation.

Menu: Song/Editor/Event/Filter
Parameter: Include Controllers
Value Range: On, Off

Turn this parameter off if you do not want the event editor to display continuous controller data. Otherwise, leave it on for normal operation.

Menu: Song/Editor/Event/Filter
Parameter: Include Aftertouch
Value Range: On, Off

Turn this parameter off if you do not want the event editor to display aftertouch data. Otherwise, leave it on for normal operation.

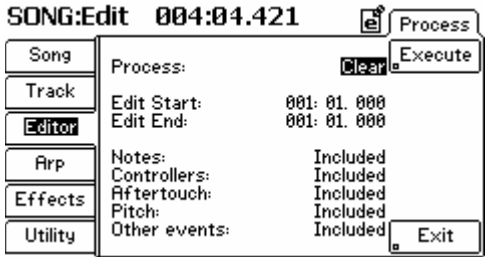
Menu: Song/Editor/Event/Filter
Parameter: Include Pitch
Value Range: On, Off

Turn this parameter off if you do not want the event editor to display pitch changes. Otherwise, leave it on for normal operation.

Menu: Song/Editor/Event/Filter
Parameter: Include Other Events
Value Range: On, Off

Turn this parameter off if you do not want the event editor to display any event that is not explicitly stated above. Otherwise, leave it on for normal operation.

Processing Synth and Audio Tracks



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Clear" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Clear.")

The "clear" setting allows you to erase different parts of your selected track.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

This parameter sets the end point after which your track will not be affected.

Menu: Song/Editor/Tracks/Process
Parameter: Notes
Value Range: Included, Not Included

Set this parameter to "Included" if you want your notes to be cleared upon execution. If you'd like note values to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Controllers
Value Range: Included, Not Included

Set this parameter to "Included" if you want your continuous controller data to be cleared upon execution. If you'd like continuous controller data to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Aftertouch
Value Range: Included, Not Included

Set this parameter to "Included" if you want your aftertouch data to be cleared upon execution. If you'd like aftertouch data to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Pitch
Value Range: Included, Not Included

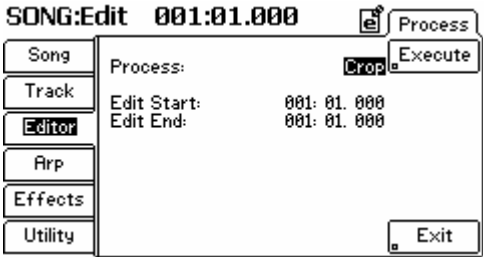
Set this parameter to "Included" if you want your pitch-bend changes to be cleared upon execution. If you'd like pitch bend changes to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Other events
Value Range: Included, Not Included

Set this parameter to "Included" if you want all other events not explicitly stated above to be cleared upon execution. If you'd like these events to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Execute
Value Range: (none)

This button executes the current process you've selected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Crop" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Crop.")

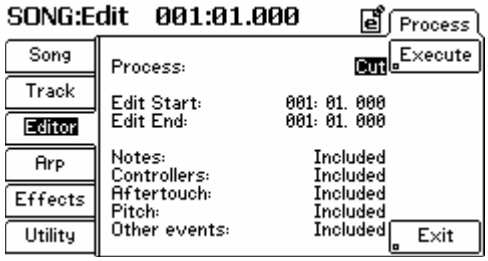
The "Crop" setting allows you to erase everything other than what is selected using the "Edit Start" and "Edit End" parameters.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

This parameter sets the end point after which your track will not be affected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Cut" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Cut.")

The "Cut" setting allows you to erase a selected portion of your track. You can then paste this portion elsewhere in your song using the "Paste" process.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

This parameter sets the end point after which your track will not be affected.

Menu: Song/Editor/Tracks/Process
Parameter: Notes
Value Range: Included, Not Included

Set this parameter to "Included" if you want your notes to be cut upon execution. If you'd like note values to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Controllers
Value Range: Included, Not Included

Set this parameter to "Included" if you want your continuous controller data to be cut upon execution. If you'd like continuous controller data to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Aftertouch
Value Range: Included, Not Included

Set this parameter to "Included" if you want your aftertouch data to be cut upon execution. If you'd like aftertouch data to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Pitch
Value Range: Included, Not Included

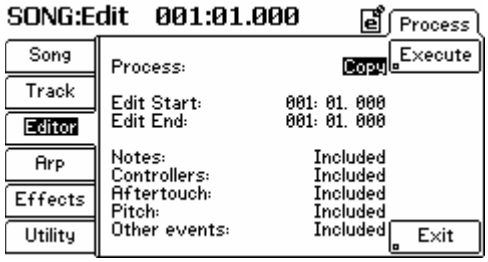
Set this parameter to "Included" if you want your pitch-bend changes to be cut upon execution. If you'd like pitch bend changes to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Other events
Value Range: Included, Not Included

Set this parameter to "Included" if you want all other events not explicitly stated above to be cut upon execution. If you'd like these events to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Execute
Value Range: (none)

This button executes the current process you've selected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Copy" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Copy.")

The "Copy" setting allows you to copy a portion of your track to memory. You can then use the "Paste Over" and "Paste Mix" processes to place this portion of the track in other parts of the song.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

This parameter sets the end point after which your track will not be affected.

Menu: Song/Editor/Tracks/Process
Parameter: Notes
Value Range: Included, Not Included

Set this parameter to "Included" if you want your notes to be copied upon execution. If you'd like note values to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Controllers
Value Range: Included, Not Included

Set this parameter to "Included" if you want your continuous controller data to be copied upon execution. If you'd like continuous controller data to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Aftertouch
Value Range: Included, Not Included

Set this parameter to "Included" if you want your aftertouch data to be copied upon execution. If you'd like aftertouch data to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Pitch
Value Range: Included, Not Included

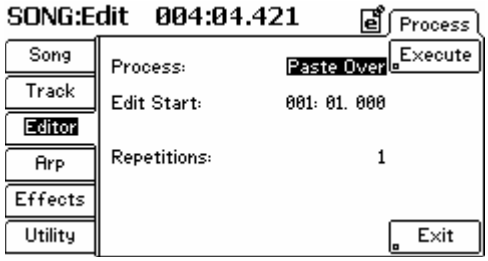
Set this parameter to "Included" if you want your pitch-bend changes to be copied upon execution. If you'd like pitch bend changes to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Other events
Value Range: Included, Not Included

Set this parameter to "Included" if you want all other events not explicitly stated above to be copied upon execution. If you'd like these events to be left alone, set this value to "Not Included."

Menu: Song/Editor/Tracks/Process
Parameter: Execute
Value Range: (none)

This button executes the current process you've selected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Paste Over" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Paste Over.")

The "Paste Over" setting allows you to take a segment from your track (using either the "Cut" or "Copy" processes and to place this segment over an existing part of your track. Note that this method deletes whatever is already on your track before the new material is placed.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

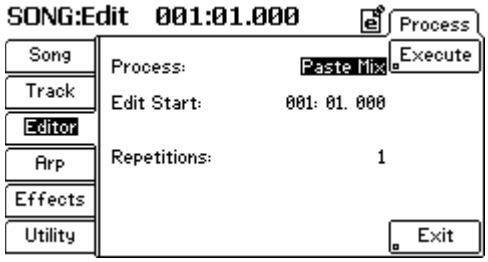
This parameter sets the start point at which your cut (or copied) track segment will be placed.

Menu: Song/Editor/Tracks/Process
Parameter: Repetitions
Value Range: 1 – 100

If you want your cut (or copied) segment to be placed one time, leave this parameter set to "1." If you would like to paste multiple copies of this segment, change this parameter accordingly. Once you press the "Execute" action button, copies of the segment will be placed back-to-back as many times as you have specified here.

Menu: Song/Editor/Tracks/Process
Parameter: Execute
Value Range: (none)

This button executes the current process you've selected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Paste Mix" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Paste Mix.")

The "Paste Mix" setting allows you to take a segment from your track (using either the "Cut" or "Copy" process—see above) and to mix this segment with an existing part of your track. Note that this method keeps whatever is already on your track and adds the new material on top of whatever is already there.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

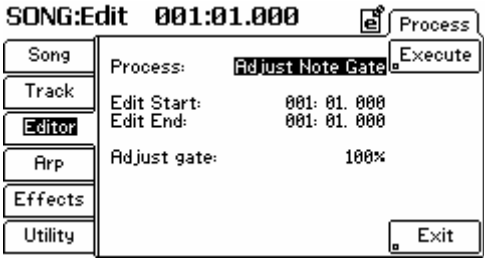
This parameter sets the start point at which your cut (or copied) track segment will be placed.

Menu: Song/Editor/Tracks/Process
Parameter: Repetitions
Value Range: 1 – 100

If you want your cut (or copied) segment to be placed one time, leave this parameter set to "1." If you would like to place multiple copies of this segment, change this parameter accordingly. Once you press the "Execute" action button, copies of the segment will be placed back-to-back as many times as you have specified here.

Menu: Song/Editor/Tracks/Process
Parameter: Execute
Value Range: (none)

This button executes the current process you've selected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Adjust Note Gate" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Adjust Note Gate.")

The "Adjust Note Gate" setting allows you to change the length of the notes on your selected track.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

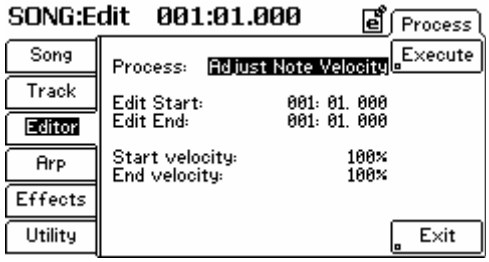
This parameter sets the end point after which your track will not be affected.

Menu: Song/Editor/Tracks/Process
Parameter: Adjust Gate
Value Range: 1-200%

This parameter lets you adjust the length of the notes on your track. For example, a setting of 5% will cause all the notes within your "Edit Start" and "Edit End" points to be reduced to 5% of their original length. A setting of 100% will result in no changes. A setting of 200% will double the length of each note.

Menu: Song/Editor/Tracks/Process
Parameter: Execute
Value Range: (none)

This button executes the current process you've selected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Adjust None Velocity" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Adjust None Velocity.")

The "Adjust Note Velocity" setting allows you to change the note velocities of your track.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

This parameter sets the end point after which your track will not be affected.

Menu: Song/Editor/Tracks/Process
Parameter: Start velocity
Value Range: 1-200%

This parameter lets you adjust the velocity of the notes near the "Edit Start" point of your track. For example, a setting of 5% will reduce the velocity of all notes near your "Edit Start" point to about 5% of their original strength. A setting of 100% will result in no in velocity change, while a setting of 200% will double the velocity of each note.

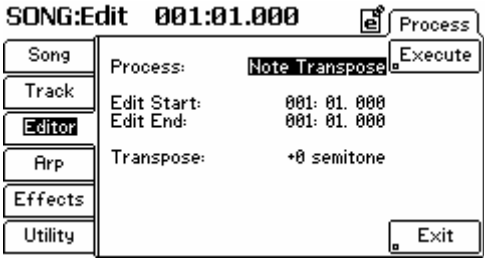
Note that you can have different starting and ending values for this process. In other words, if you set your "Start" setting to 1% and your "End" velocity to 200%, your velocities will start small and gradually get louder until you reach the "Edit End" point. This allows you to create things like crescendos, decrescendos, and other effects with little effort.

Menu: Song/Editor/Tracks/Process
Parameter: End velocity
Value Range: 1-200%

This parameter lets you adjust the velocity of notes near the "Edit End" point of your track.

Menu: Song/Editor/Tracks/Process
Parameter: Execute
Value Range: (none)

This button executes the current process you've selected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Note Transpose" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Note Transpose.")

The "Note Transpose" setting allows you to shift notes either up or down.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

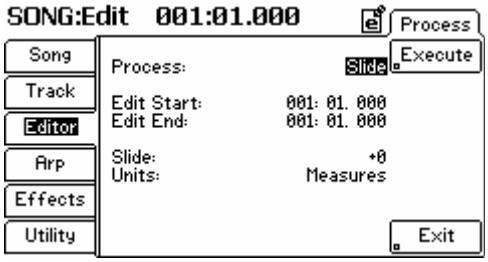
This parameter sets the end point after which your track will not be affected.

Menu: Song/Editor/Tracks/Process
Parameter: Transpose
Value Range: -48 to +48 semitones

This parameter determines how many semitones your selected region is going to be shifted up or down.

Menu: Song/Editor/Tracks/Process
Parameter: Execute
Value Range: (none)

This button executes the current process you've selected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Slide" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Slide.")

The "Slide" setting allows you move a segment (or all of) your track forward or backward in relation to the rest of your song.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

This parameter sets the end point after which your track will not be affected.

Menu: Song/Editor/Tracks/Process
Parameter: Slide
Value Range: -999 to 999

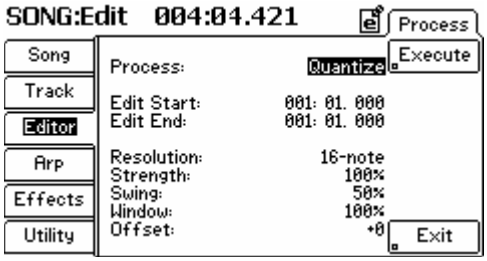
This parameter lets you move your selected region forward or backward in relation to the rest of your track.

Menu: Song/Editor/Tracks/Process
Parameter: Units
Value Range: Measures, Beats, Pulses

This parameter determines how your region will be moved. "Measures" moves your region by full measures, whereas beats lets you move your region by individual beats. "Pulses" lets you move your region with the most amount of precision (each beat has 480 pulses).

Menu: Song/Editor/Tracks/Process
Parameter: Execute
Value Range: (none)

This button executes the current process you've selected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Note Quantize" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Note Quantize.")

The "Note Quantize" setting allows you to quantize your notes in order to fix timing inconsistencies during your performance.

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

This parameter sets the end point after which your track will not be affected.

Menu: Song/Editor/Tracks/Process
Parameter: Resolution
Value Range: Dotted 2x whole-note, 3x whole-note triplet, Double whole-note, Dotted whole-note, 2x whole-note triplet, whole-note, Dotted half-note, Whole-note triplet, Half-note, Dotted quarter-note, Half-note triplet, Quarter-note, Dotted 8-note, Quarter-note triplet, 8-note, Dotted 16-note, 8-note triplet, 16-note, Dotted 32-note, 16-note triplet, 32-note, Dotted 64-note, 32-note triplet

This parameter determines the feel of your quantization. Each of these settings causes your quantized notes to snap to different parts of the beat and your actual composition determines what setting will work best.

Menu: Song/Editor/Tracks/Process
Parameter: Strength
Value Range: 0-100%

This parameter sets how rigidly your track will be quantized. In other words, a 0% setting will not quantize your track at all, whereas a 100% setting will cause every note to "snap" to its perfect position within the beat. Settings closer to 0% allow note timing to be more "relaxed" and true to the original performance while settings closer to 100% make the track more "rigid" and precise.

Menu: Song/Editor/Tracks/Process
Parameter: Swing
Value Range: 0-100%

This parameter determines how the "swing" or second quantization is treated. Settings of 0-49% pull the second quantization closer to the first whereas settings of 51-100% pull the second quantization closer to the third. A setting of 50% has no swing and all quantization are equally spaced apart.

Menu: Song/Editor/Tracks/Process
Parameter: Window
Value Range: 0-100%

This parameter lets you set the amount of "pull" that will exist for each ideal quantized note position. At 100% all notes pull toward the nearest quantization point. At lower percentages, notes far from a quantization point may not be pulled.

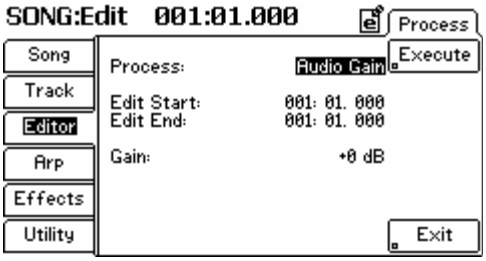
Using this parameter, you can set how far away a note has to fall from an "ideal" quantize position before the quantize process ignores that note.

Menu: Song/Editor/Tracks/Process
Parameter: Offset
Value Range: -1000 to +1000 pulses

This parameter lets you shift the quantization forward or backwards in time by up to 1000 pulses.

Menu: Song/Editor/Tracks/Process
Parameter: Execute
Value Range: (none)

This button executes the current process you've selected.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Audio Gain" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Audio Gain.")

The "Audio Gain" setting allows you to increase or decrease the loudness of your selected audio track (or tracks).

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

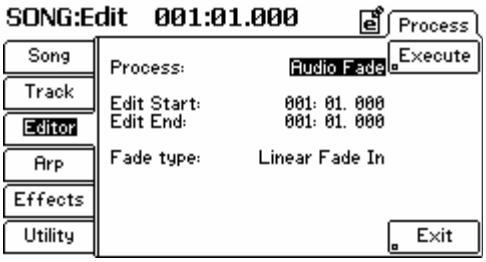
This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

This parameter sets the end point after which your track will not be affected.

Menu: Song/Editor/Tracks/Process
Parameter: Gain
Value Range: -18 to +18 dB

This parameter sets how many decibels of gain you'd like to have for your selected audio track (or tracks). Positive settings will make your selected segments louder whereas negative settings will make your track softer.



Note: This page will look different depending on what you select for the "Process" parameter (see below).

Menu: Song/Editor/Tracks/Process
Parameter: Process
Value Range: Clear, Crop, Cut, Copy, Paste Over, Paste Mix, Slide, Adjust Note Gate, Adjust Note Velocity, Note Transpose, Note Quantize, Audio Gain, Audio Fade

(Note: This parameter MUST be set to "Audio Fade" for the correct parameters to be displayed on the remainder of the page. If your page looks different than the one displayed above, it is probably because this parameter is not set to "Audio Fade.")

The "Audio Fade" setting allows you to increase or decrease the loudness of your selected audio track (or tracks).

Menu: Song/Editor/Tracks/Process
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your edits will start to take place.

Menu: Song/Editor/Tracks/Process
Parameter: Edit End
Value Range: (varies)

This parameter sets the end point after which your track will not be affected.

Menu: Song/Editor/Tracks/Process
Parameter: Fade Type
Value Range: Linear Fade In, Linear Fade Out, Logarithmic Fade In, Logarithmic Fade Out, Exponential Fade In, Exponential Fade Out

This parameter determines the shape of the fade in (or fade out) over the selected region.

Song Utility Page

Menu: Song/Utility
Parameter: Create a new Song
Value Range: (none)

This button creates a new song with empty tracks and default settings. Remember to save your current song otherwise you will lose your work once the new song is created.

Menu: Song/Utility
Parameter: Song Utilities
Value Range: (none)

This button takes you to another page where you can perform additional functions to your song. See page 168 for more about these functions.

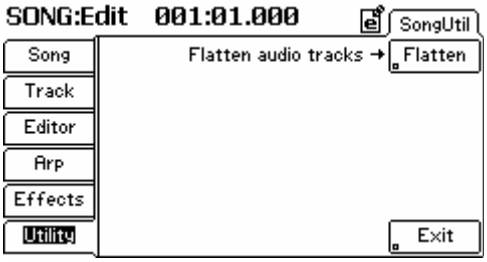
Menu: Song/Utility
Parameter: Track Utilities
Value Range: (none)

This button takes you to another page where you can perform additional functions to individual tracks. See page 169 for more about these functions.

Menu: Song/Utility
Parameter: Clean audio directory
Value Range: (none)

This button opens a prompt asking you if you'd like to delete unused parts of audio tracks in order to conserve disk space. The amount of disk space you save will depend on how you have edited your tracks. Press "Yes" if you'd like to delete unused audio and "No" to leave the recorded audio tracks whole.

Once you clean your audio directory, unused segments of audio are permanently deleted from the hard disk of the Fusion and cannot be recovered. Use this function with caution!

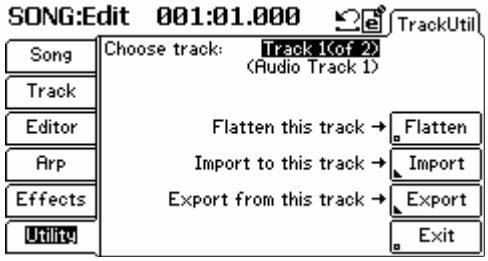


Menu: Song/Utility/SongUtil
Parameter: Flatten
Value Range: (none)

Every time you record audio (whether you are creating a new section of a song or overdubbing an existing section), the Fusion creates a new file. This process is totally transparent and most regular users will never have to worry this.

However, certain power users (i.e., those who record on all eight audio tracks and perform lots of complicated edits on each track) may run into playback problems because the Fusion's hard disk cannot keep up with the sequencer's requests for lots of audio fragments.

The "flatten" function consolidates all of your audio segments into one single file that is much easier for the Fusion to play back. This will improve audio performance (particularly if you have edited a track heavily).



Menu: Song/Utility/TrackUtil
Parameter: Choose track
Value Range: (none)

Select the track you'd like to edit here.

Menu: Song/Utility/TrackUtil
Parameter: Flatten this track (only available for "Audio" tracks)
Value Range: (none)

This button creates one continuous audio file from the collection of smaller chunks of files that may have been created within that track. This will improve audio performance for both recording and playback.

About "Flatten this track:"

Every time you record audio (whether you are creating a new section of a song or overdubbing an existing section), the Fusion creates a new file on the hard disk. All these separate chunks are then played back in order to create your audio track. This process is totally transparent and most regular users will never know (or care) that this is taking place.

However, certain power users (i.e., those who record on all eight audio tracks and perform lots of complicated edits and overdubs) may run into playback problems because the Fusion's hard disk cannot locate and playback all of the audio fragments scattered on the Fusion's hard disk.

The "flatten" function consolidates all of your audio segments into one single file that is much easier for the Fusion to play back. This will improve recording and playback performance (especially if you have edited a track heavily).

Menu: Song/Utility/TrackUtil
Parameter: Import to this track (only available for "Audio" tracks)
Value Range: (none)

This button allows you to select a 24-bit WAV file and import the file to replace an audio track.

Menu: Song/Utility/TrackUtil
Parameter: Export from this track (only available for "Audio" tracks)
Value Range: (none)

This button allows you to export an audio track to a user-selected folder.

Menu: Song/Utility/TrackUtil
Parameter: Edit Program (only available for "Synth" tracks)
Value Range: (Varies depending on programs loaded)

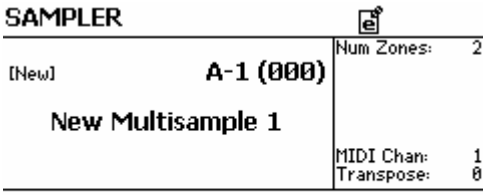
You can select which program you'd like to edit (in Program mode) using this prompt. Once you've found the program, you can press the "Edit Prog" action button (see below) to edit the program.

Menu: Song/Utility/TrackUtil
Parameter: Edit Prog (only available for "Synth" tracks)
Value Range: (none)

This button will load the selected synth track into Program mode for editing.

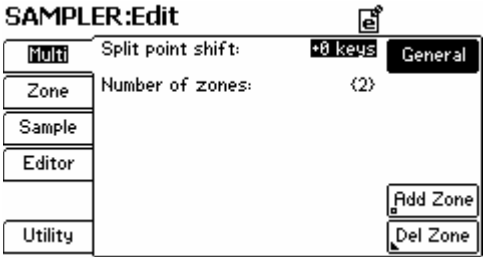
Sampler Mode

This section covers all of the parameters found in Sampler mode.



Sampler Mode gives you access to the Fusion's internal sampler. Using this mode, you can record and edit sounds that you can then use in your own sample-playback programs.

Setting Overall Sample Settings



Menu: Sampler/Multi/General
Parameter: Split point shift
Value Range: -127 to +127 keys

This parameter moves your split points but keeps the root note value of each zone. This lets you move the keygroup splits, but keeps the tuning constant.

Menu: Sampler/Multi/General
Parameter: Number of zones
Value Range: (not editable)

This parameter tells you how many zones have been created in the current multisample.

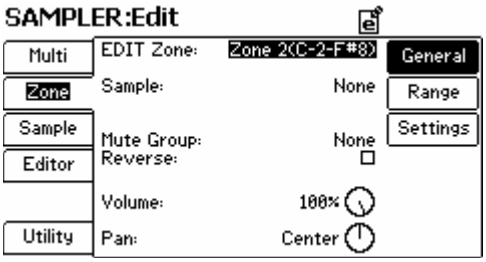
Menu: Sampler/Multi/General
Parameter: Add Zone
Value Range: (none)

This button creates a new zone and automatically takes you to the Sampler/Zone/General page for further editing. A multisample can have up to 512 zones.

Menu: Sampler/Multi/General
Parameter: Del Zone
Value Range: (none)

This button brings up a page allowing you to delete any zone that has been created. Note that this button is only visible when more than one zone has been created since each multisample must have at least one zone.

Setting Individual Zone Settings



Menu: Sampler/Zone/General
Parameter: EDIT Zone
Value Range: (varies depending on number of zones created)

Select the zone you'd like to edit using this parameter.

Menu: Sampler/Zone/General
Parameter: Sample
Value Range: (varies)

This parameter lets you select a sample for the current zone. The top row you select the bank whereas the bottom row lets you select an individual sample.

Menu: Sampler/Zone/General
Parameter: Mute Group
Value Range: None, Self, A – P

This allows you to mute one or more zones when another zone is played. For example, let's say you're sampling a hi-hat in a drum kit. When you play an open hi-hat and then follow it with a closed hi-hat, the closed hi-hat stops the open hat from ringing. By assigning these zones to the same mute group (groups range from A through P) you can have one sample mute a second sample as soon as the first one is triggered.

Menu: Sampler/Zone/General
Parameter: Reverse
Value Range: On, Off

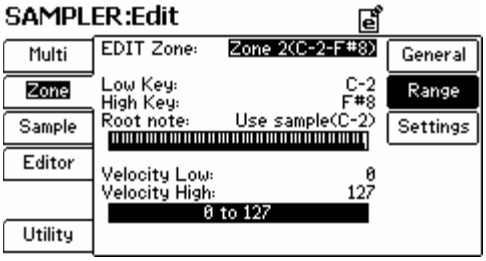
Check this box to make the sample in the selected zone play backwards.

Menu: Sampler/Zone/General
Parameter: Volume
Value Range: 0 – 100%

Sets the volume of the selected zone. Note that the volume for each zone can be set independently.

Menu: Sampler/Zone/General
Parameter: Pan (or "Balance" depending on sample type)
Value Range: L100% to R100%

Sets the pan position of each individual zone. Note that each zone can be panned to its own position.



Menu: Sampler/Zone/Range
Parameter: EDIT Zone
Value Range: (varies depending on number of zones created)

Select the zone you'd like to edit using this parameter.

Menu: Sampler/Zone/Range
Parameter: Low Key
Value Range: C-2 to G8

This parameter sets the lowest note of the range to which the sample in the zone will respond.

Menu: Sampler/Zone/Range
Parameter: High Key
Value Range: C-2 to G8

This parameter sets the highest note of the range to which the sample in the zone will respond.

Menu: Sampler/Zone/Range
Parameter: Root Note
Value Range: C-2 to G8, Use sample

This parameter determines what note on the keyboard will play the sample back at its original pitch. In other words, if you set the root note to "C3" when you trigger the sample using the C3 key, you will hear it just as it was recorded. If you press any keys higher than C3 then the sample will be pitched up. Conversely, if you press any keys lower than C3 the sample will be pitched down.

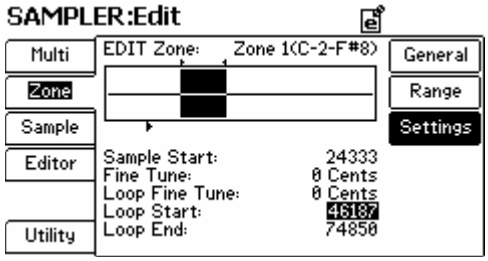
The "Use sample" setting uses the root note stored with the sample (see the sample "Root Note" parameter on page 182 for more).

Menu: Sampler/Zone/Range
Parameter: Velocity Low
Value Range: 0 – 127

This parameter sets the lowest velocity of the range to which the sample in the zone will respond.

Menu: Sampler/Zone/Range
Parameter: Velocity High
Value Range: 0 – 127

This parameter sets the highest velocity of the range to which the sample in the zone will respond.



Menu: Sampler/Zone/Settings
Parameter: EDIT Zone
Value Range: (varies depending on number of zones created)

Select the zone you'd like to edit using this parameter.

Menu: Sampler/Zone/Settings
Parameter: Sample Start
Value Range: (Varies depending on length of recorded sample)

This parameter sets the starting point of the sample contained on that zone. The sample start point is represented by an arrow on the bottom of the waveform display—you can use this visual cue to set sample points quickly.

The "Default" Setting:

If your "Sample Start," "Loop Start," and "Loop End" points are set to "0" then the sample's own loop points (specified on the Sampler/Sample/Edit page) are used and the words "Using Sample Loop Points" are displayed along the bottom of the screen.

Menu: Sampler/Zone/Settings
Parameter: Fine Tune
Value Range: -99 to +99 Cents

This parameter lets you make precise adjustments to the pitch of your sample.

Menu: Sampler/Zone/Settings
Parameter: Loop Fine Tune
Value Range: -99 to +99 Cents

This parameter lets you make precise pitch adjustments to the looped portion of your sample. This is different from the "Fine Tune" parameter in that this parameter only deals with the pitch in the looped part of the sample.

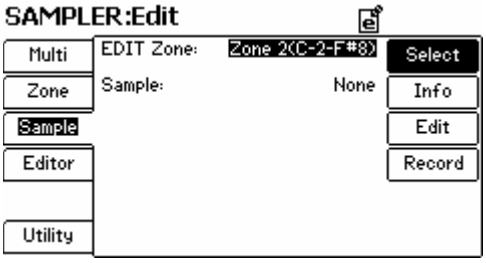
Menu: Sampler/Zone/Settings
Parameter: Loop Start
Value Range: (Varies depending on length of recorded sample)

Sets the starting point of your looped section. The loop start position is indicated with a right-facing arrow above the waveform display.

Menu: Sampler/Zone/Settings
Parameter: Loop End
Value Range: (Varies depending on length of recorded sample)

Sets the end point of your looped section. Once your sample playback reaches this point, looping will begin on your sample. The loop end point is indicated with a left-facing arrow above the waveform display.

Capturing Samples

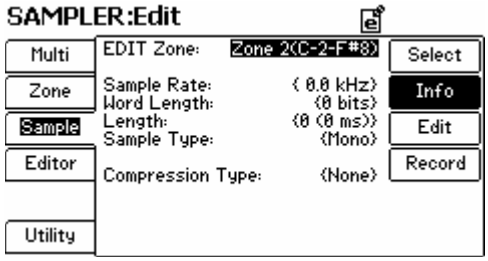


Menu: Sampler/Sample/Select
Parameter: EDIT Zone
Value Range: (varies depending on number of zones created)

Select the zone you'd like to edit using this parameter.

Menu: Sampler/Sample/Select
Parameter: Sample
Value Range: (varies)

This parameter lets you select a sample for the current zone. The top line row you select the bank whereas the bottom row lets you select an individual sample.



Menu: Sampler/Sample/Info
Parameter: EDIT Zone
Value Range: (varies depending on number of zones created)

Select the zone you'd like to view using this parameter. Note that none of the parameters on this page are editable—they are simply provided as a reference.

Menu: Sampler/Sample/Info
Parameter: Sample Rate
Value Range: (not editable)

This parameter reports the sampling rate for the currently selected sample.

Menu: Sampler/Sample/Info
Parameter: Word Length
Value Range: (not editable)

This parameter reports the bit depth for the currently selected sample.

Menu: Sampler/Sample/Info
Parameter: Length
Value Range: (not editable)

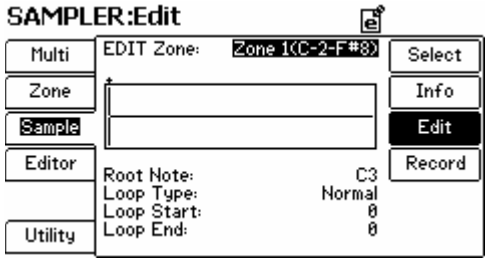
This parameter reports the length of the currently selected sample in both number of samples (on the left side) and length of time (within the parenthesis).

Menu: Sampler/Sample/Info
Parameter: Sample Type
Value Range: (not editable)

This parameter reports whether the currently selected sample is mono or stereo.

Menu: Sampler/Sample/Info
Parameter: Compression Type
Value Range: (not editable)

This parameter reports what type of data compression has been used on the current sample, if any has been used at all.



Menu: Sampler/Sample/Edit
Parameter: EDIT Zone
Value Range: (varies depending on number of zones created)

Select the zone you'd like to edit using this parameter.

Menu: Sampler/Sample/Edit
Parameter: Root Note
Value Range: C-2 to G8

This parameter determines what note on the keyboard will play back your sample at its original pitch. In other words, if you set the root note to "C3" when you trigger the sample using the C3 key, you will hear it just as it was recorded. If you press any keys higher than C3 then the sample will be pitched up. Conversely, if you press any keys lower than C3 the sample will be pitched down.

Why can't I hear any changes I make?

Note that the parameters you set on the Zone pages can override the parameters found on this page. If you find that you are editing the parameters on this page but are not hearing the effects of your changes, take a look at the Sampler/Zone pages. If the parameters on those pages are set to anything other than the "Default" values, you will not be able to hear changes on this page.

Menu: Sampler/Sample/Edit
Parameter: Loop Type
Value Range: Normal, Forward-Reverse

This parameter sets how your loop behaves:

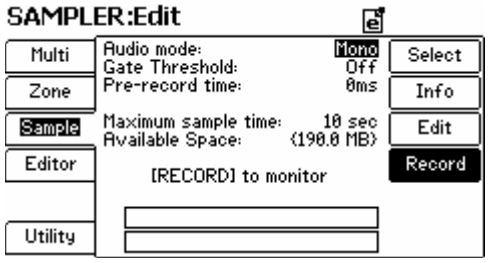
Normal:	When set to "Normal" the sample plays from the beginning to the "Loop End" point and jumps back to the "Loop Start" position and continues playing through the file.
Forward-Reverse:	When set to "Forward-Reverse" your loop starts playing from the beginning to the "Loop End" point and then plays the sample in reverse until it reaches the "Loop Start" position. At the "Loop Start" position sample playback switches and the sample plays regularly again.

Menu: Sampler/Sample/Edit
Parameter: Loop Start
Value Range: (Varies depending on length of recorded sample)

Sets the starting point of your looped section. The loop start position is indicated with a right-facing arrow above the waveform display.

Menu: Sampler/Sample/Edit
Parameter: Loop End
Value Range: (Varies depending on length of recorded sample)

Sets the end point of your looped section. Once your sample playback reaches this point, looping will begin on your sample. The loop end point is indicated with a left-facing arrow above the waveform display.



Menu: Sampler/Sample/Record
Parameter: Audio mode
Value Range: Mono, Stereo

Select whether you want to record in mono or stereo using this parameter.

Menu: Sampler/Sample/Record
Parameter: Gate Threshold
Value Range: Off, -60dB to 0 dB

Recording does not take place until the sampler's incoming levels exceed the minimum that you set here. If you leave this parameter set to "Off," recording will start as soon as you press the RECORD and PLAY buttons on the transport.

Menu: Sampler/Sample/Record
Parameter: Pre-record time
Value Range: 0 ms – 999 ms

When you are using the "Gate Threshold" parameter to automatically capture a sound, you may miss the initial few milliseconds of the sample where the sound is "building up" before reaching the threshold. By setting this parameter between 1 and 999 milliseconds, the Fusion buffers the audio input allowing you to capture the initial portion of the sample.

If you do not want to capture the audio preceding the threshold point, go ahead and set this parameter to "0."

Menu: Sampler/Sample/Record
Parameter: Maximum sample time
Value Range: 1 – 60 Sec.

This parameter sets a maximum time limit on capturing a sample. For example, if you set this parameter to "12 sec" and start recording, the sampler will automatically shut off after 12 seconds.

A Note on "Maximum Sample Time"

This parameter sets the amount of time in RAM memory allocated for sample recording. If you set this value too high, other samples will be "pushed out" of existing memory. This means, that samples previously loaded programs will need to be re-loaded when you call up those programs again. To keep this from happening, set this value to the minimum amount necessary for your sample.

Menu: Sampler/Sample/Record
Parameter: Available space
Value Range: (not editable)

This lets you know how many megabytes of sampling memory remain on your Fusion.

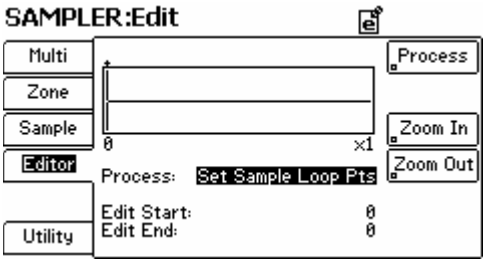
Menu: Sampler/Sample/Record
Parameter: VU Meters (along bottom of the screen)
Value Range: (not editable)

These meters let you monitor incoming audio levels for sampler. You can adjust these incoming levels by using the Gain knob on the back of the Fusion (near the sampler inputs). When you are sampling, your levels should ideally peak around -6 dB since that will give you a healthy signal but leave enough headroom for the occasional loud transient.

The Record Button

The Fusion has a "monitor" mode that allows you to hear what will actually pass through the sampler as you are recording. Whenever you are in sampler mode, if you press the "Record" button on the Center Section, you will jump to the Sampler/Sample/Record page so that you can view levels on the bottom of the display.

Editing and Processing Samples



[Note: The parameters on this page will look different depending on what you have selected for the "Process" parameter. If your screen looks different from the one above, it is probably because you have selected a different process type.]

Menu: Sampler/Editor
Parameter: Process (page parameter)
Value Range: Set Sample Loop Pts, Set Zone Loop Pts, Crop Region, Adjust Region Gain, Normalize, Silence Region, Insert Silence, Cut Region, Copy Region, Paste Over Region, Mix Paste Region, Insert Paste, Region Fade In, Region Fade Out

This parameter determines how you're going to edit your current sample. The remaining parameters on the page will vary depending on what has been selected here and so we will break things down by process type.

Process	Description of process (and its parameters)
Set Sample Loop Pts	This parameter selects a region for looping for the sample
Edit Start	Select the start point of your region here
Edit End	Select the end point of your region here
Set Zone Loop Pts	This parameter selects a region for looping in the zone
Edit Start	Select the start point of your region here
Edit End	Select the end point of your region here
Crop Region	This parameter deletes everything outside your selected region
Edit Start	Select the start point of your region here
Edit End	Select the end point of your region here
Adjust Region Gain	This process adjusts the gain of a selected region of your sample
Edit Start	Select the start point of your region here
Edit End	Select the end point of your region here
Gain	Select how many dB of gain (or cut) you would like
Normalize	This process analyzes your recording and adjusts the volume to make the loudest part of your waveform equal to 0 dB (i.e., the loudest possible level)

Silence Region	This parameter creates silence in the selected region
Edit Start	Select the start point of your region here
Edit End	Select the end point of your region here
Insert Silence	This parameter inserts silence in the selected region
Edit Start	Select the start point of your region here
Length	Select the length of the silence using this parameter
Cut Region	This parameter removes the selected region (and copies it to the clipboard). When you cut a segment of audio, the remaining gap is closed.
Edit Start	Select the start point of your region here
Edit End	Select the end point of your region here
Copy Region	This parameter copies the selected region to the clipboard
Edit Start	Select the start point of your region here
Edit End	Select the end point of your region here
Paste Over Region	This parameter pastes your copied segment at the Edit Start point
Edit Start	Select the start point of your region here
Mix Paste Region	This parameter mixes your copied segment with whatever is currently on the track. The Edit Start parameter determines where the segment is brought in.
Edit Start	Select the start point of your region here
Insert Paste	Inserts the clipboard material at that point and the rest of the audio is moved to the side to make room for it.
Edit Start	Select the start point of your region here
Region Fade In	This parameter creates an amplitude fade in over the selected region
Edit Start	Select the start point of your region here
Edit End	Select the end point of your region here
Fade Type	This parameter determines how your fade will take place
Region Fade Out	This parameter creates an amplitude fade out over the selected region
Edit Start	Select the start point of your region here
Edit End	Select the end point of your region here
Fade Type	This parameter determines how your fade will take place

Menu: Sampler/Editor
Parameter: Process (action button)
Value Range: (none)

This button executes whatever command you've selected using the "Process" parameter.

Menu: Sampler/Editor
Parameter: Zoom In
Value Range: (none)

This button lets you "zoom in" to see your individual samples in more detail. This is useful for making precise edits such as setting loop points. The number on the lower right of the graphical editor indicates your "zoom factor."

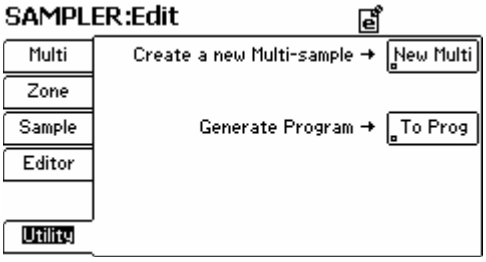
Zooming In and Out:

A factor of "x1" means you're seeing the entire sample displayed on screen whereas higher values mean you're seeing smaller and smaller segments of your sample. For example, a factor of "x512" means that you're only seeing 1/512th of the entire sample.

Menu: Sampler/Editor
Parameter: Zoom Out
Value Range: (none)

This button "zooms out" to let you see more of your sample (but with less detail). This is useful for making general edits to your sample such as cropping out unnecessary segments of your sample.

Sampler Utility Page



Menu: Sampler/Editor
Parameter: New Multi
Value Range: (none)

This button creates a new multi-sample. Note that when you do this, any samples you've recorded for your current multi-sample will be deleted. If you have recorded any samples you'd like to save, make sure to store that sample before pressing this button.

Menu: Sampler/Editor
Parameter: Generate Program
Value Range: (none)

This button creates a new program based on the current multisample loaded in Sampler mode.

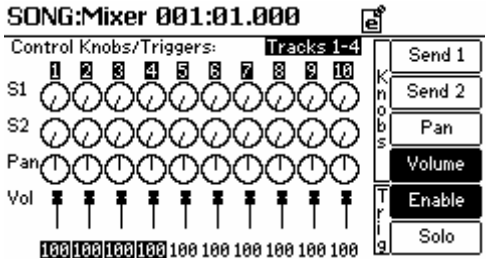
Mixer Mode

Mixer Mode has been created so you can conveniently mix your synthesizer and audio tracks together on one screen. The mixer lets you set levels and pan positions for each synth and audio track as well as set send levels, and enable or solo tracks just like on a hardware mixer.

Note that the mixer is only accessible when you are in Mix and Song modes since these are the only modes in which you can have multiple programs or audio tracks to mix together. Program or Sampler modes only play one instrument at a time and don't require a Mixer (since you have nothing to mix).

Using the Mixer

Mixer Mode has been designed for ease of use. The four Control Knobs allow you to edit the virtual knobs or faders on screen and the T1-T4 buttons let you enable or solo different tracks that are active. The Control Wheel allows you to select which "virtual channels" you'd like to edit on the mixer.



Menu: Mixer Mode
Parameter: Control Knobs/Triggers
Value Range: (Varies depending on number of tracks created)

This parameter determines which channels are currently selected for editing. Notice that active channels are highlighted on the bottom of the screen.

Menu: Mixer Mode
Parameter: Send 1
Value Range: (none)

This button assigns the Control Knobs to set send levels to Bus Effect 1.

Menu: Mixer Mode
Parameter: Send 2
Value Range: (none)

This button assigns the Control Knobs to set send levels to Bus Effect 2.

Menu: Mixer Mode
Parameter: Pan
Value Range: (none)

This button assigns your Control Knobs to set pan position on your selected mixer channel.

Menu: Mixer Mode
Parameter: Volume
Value Range: (none)

This button assigns your Control Knobs to set volume levels on your selected mixer channel.

Menu: Mixer Mode
Parameter: Enable
Value Range: (none)

This button assigns your T1-T4 trigger buttons to enable and disable your currently selected mixer channel.

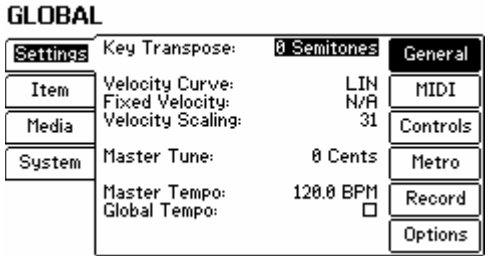
Menu: Mixer Mode
Parameter: Solo
Value Range: (none)

This button assigns your T1-T4 trigger buttons to solo your currently selected mixer channel. Note that it is possible to solo multiple channels.

Global Mode

This section covers all of the pages found in Global mode. Global mode includes parameters that affect all different modes found on the Fusion.

Global Workstation Settings



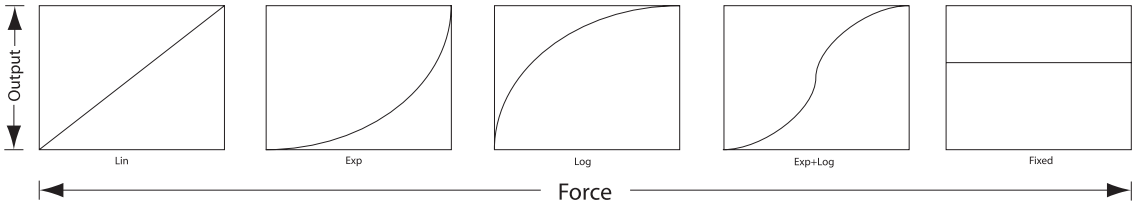
Menu: Global/Settings/General
Parameter: Key Transpose
Value Range: -12 to +12 Semitones

Use Key Transpose to reassign the notes that are triggered when you play the keyboard (or access the Fusion via an external MIDI device). For instance, with a "2 semitones" transposition, every time you play a C key, the Fusion will play the D note instead.

You can transpose the Fusion up to 12 semitones (1 octave) higher or lower than the default "0"-semitone setting.

Menu: Global/Settings/General
Parameter: Velocity Curve
Value Range: LIN, EXP, LOG, EXP+LOG, Fixed

Velocity Curve lets you set the "feel" of the dynamics of the keyboard. Many keyboardists try different settings until they find one that suits their style of playing best. This setting affects the keyboard velocities both to the Fusion and the MIDI out port. The following diagrams describe each curve:



Menu: Global/Settings/General
Parameter: Fixed Velocity [Only available when Velocity Curve is set to Fixed]
Value Range: 1 - 127

If your Velocity Curve is set to "Fixed," this value determines the output velocity of each note.

If the velocity curve is set to anything other than "Fixed," this parameter will display "N/A" and cannot be edited.

Menu: Global/Settings/General
Parameter: Velocity Scaling
Value Range: 7 - 255

Velocity Scaling allows you to fine tune the velocity sensitivity of the keyboard. Setting this parameter to low values makes the keyboard more expressive in the lower note velocity range but makes it more difficult to reach the highest velocities (120-127, for example). Setting this parameter to higher values makes the keyboard more expressive in the higher velocity range and makes it more difficult to play very soft notes (Velocity values 0-10, for example).

Most users tweak this value over time until they find a value that feels right for their style of playing.

Menu: Global/Settings/General
Parameter: Master Tune
Value Range: - 99 to +99 Cents

Master Tune allows you to make small pitch changes globally to all sounds on the keyboard. Use this function to tune the keyboard to a slightly flat or sharp ensemble. This parameter tunes all sounds on the keyboard—to tune programs individually, see the Program section.

Menu: Global/Settings/General
Parameter: Master Tempo
Value Range: 50.0 - 300.0 BPM

The tempo that you set here–expressed in Beats Per Minute (BPM)–determines the tempo at which different parts of the Fusion (i.e., arpeggiator, synced LFOs, etc.) will operate when the Global Tempo parameter is checked.

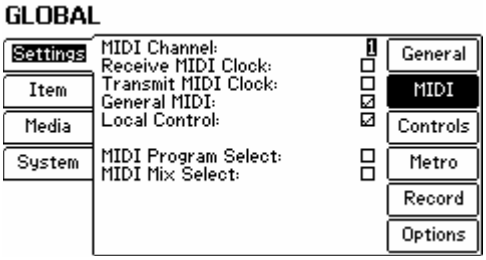
You can change this value by using the arpeggiator tempo knob on the performance panel if Global Tempo is checked.

Menu: Global/Settings/General
Parameter: Global Tempo
Value Range: On, Off

The Fusion is capable of having completely independent tempos for each program or mix. If you want each program or mix to play at its own tempo, uncheck this box.

In some circumstances, you will want to check this box because you'll want things like arpeggiations to be at the same tempo when changing programs. When this box is checked, the system tempo will be the Master Tempo.

Global MIDI Settings



Menu: Global/Settings/MIDI
Parameter: MIDI Channel
Value Range: 1 to 16

This parameter selects the MIDI input and output channel for the Fusion used in Program mode or for a part in Mix mode (or a track in Song mode) that uses the Global MIDI Channel.

Menu: Global/Settings/MIDI
Parameter: Receive MIDI Clock
Value Range: On, Off

Check this box if you'd like to Receive MIDI clock from an external source such as a drum machine or an external sequencer. Receiving MIDI clock lets all of your Fusion's tempo-dependent functions (arpeggiations, synced LFOs, etc.) stay in sync with your other MIDI devices. Leave this box unchecked if you are not using any external devices or are using devices that do not send a MIDI clock signal.

Menu: Global/Settings/MIDI
Parameter: Transmit MIDI Clock
Value Range: On, Off

Check this box if you'd like the Fusion to transmit MIDI clock to an external device such as a drum machine or a sequencer. This clock lets your Fusion and the external device remain in sync despite tempo changes. The device that receives this clocking signal must support MIDI clock otherwise sync will not be established.

If you are not using any external devices, leave this box unchecked so that MIDI bandwidth is not wasted on an unused clock.

Menu: Global/Settings/MIDI
Parameter: General MIDI
Value Range: On, Off

This parameter causes the Fusion to behave just like a General MIDI module. For example, if you load a song with a track set to MIDI channel 10, then the Fusion will automatically load a drum kit on that channel (having a drum kit on channel 10 is common General MIDI protocol).

Menu: Global/Settings/MIDI
Parameter: Local Control
Value Range: On, Off

Uncheck this box if you'd like to "disconnect" the Fusion's keys from the Fusion's synthesizer engine. This essentially turns the Fusion's into a separate "controller" keyboard and synthesis engine. This is necessary in situations in which you are composing using an external sequencing program on a computer and your notes are being triggered twice when you play a key (once from the local keyboard and once again as the MIDI data passes through your sequencer and comes back to the Fusion). Turning local control off will make it so that only one note will sound when you play a key.

If you are not using any kind of external sequencer, leave this box checked for normal operation.

Menu: Global/Settings/MIDI
Parameter: MIDI Program Select
Value Range: On, Off

Check this box if you'd like to select different programs through MIDI (for example if you are controlling the Fusion through another MIDI controller). Leave this box unchecked if you don't want to be able to change programs through MIDI.

Why are these Parameters Important?

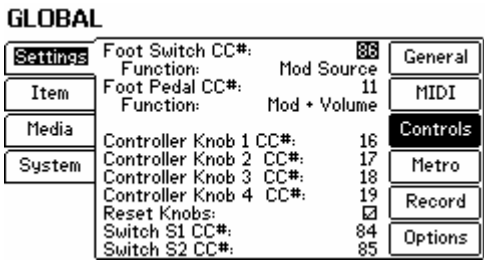
You may be wondering why we have included the MIDI Program Select and MIDI Mix Select parameters within the Fusion. Complex MIDI setups sometimes have MIDI data being routed serially to many devices and this may cause program (or mix) change messages intended for other synthesizers to unintentionally affect the Fusion. If you find that other devices are unintentionally affecting your Fusion, set this parameter to "off."

Menu: Global/Settings/MIDI
Parameter: MIDI Mix Select
Value Range: On, Off

Check this box if you'd like to select different mixes through MIDI (for example if you are controlling the Fusion through an external sequencer). When this box is checked, any program change messages received by the Fusion on the Global channel are interpreted as a mix change.

Leave this box unchecked if you don't want to be able to change mixes through MIDI.

Global Controller Settings:



Menu: Global/Settings/Controls
Parameter: Foot Switch CC#
Value Range: 1 – 119

This parameter determines what continuous controller (CC) number is used for the Foot Switch.

Menu: Global/Settings/Controls
Parameter: Foot Switch Function
Value Range: Mod Source, Increment, Decrement, Song Punch in/out, Song Play/Stop

This parameter determines the alternate function of the Foot Switch. For normal operation the Foot Switch simply acts as a "Mod Source". Setting this parameter to "Increment" or "Decrement" will allow the user to use the Foot Switch to increment or decrement the current parameter (rather than its default use as a mod source). This can be used to change the current program using the Foot Switch. Setting this parameter to "Song Punch in/out" or "Song Play/Stop" will allow the user to operate the transport controls in Song mode using the Foot Switch. When not in Song mode the Foot switch will act as a mod source.

Menu: Global/Settings/Controls
Parameter: Foot Pedal CC#
Value Range: 1 – 119

This parameter determines what continuous controller (CC) number is used for the Foot Pedal.

Menu: Global/Settings/Controls
Parameter: Foot Pedal Function
Value Range: Mod Source, Mod + Volume, Mod + Expression, Mod + Pan

This parameter determines the alternate function of the Foot Pedal. In addition to acting as a mod source, the Foot Pedal can also act as a volume, expression, or pan pedal for synth programs.

Menu: Global/Settings/Controls
Parameter: Controller Knob 1 CC#
Value Range: 1 – 119

This parameter determines what continuous controller (CC) number is used for Controller Knob 1.

Menu: Global/Settings/Controls
Parameter: Controller Knob 2 CC#
Value Range: 1 – 119

This parameter determines what continuous controller (CC) number is used for Controller Knob 2.

Menu: Global/Settings/Controls
Parameter: Controller Knob 3 CC#
Value Range: 1 – 119

This parameter determines what continuous controller (CC) number is used for Controller Knob 3.

Menu: Global/Settings/Controls
Parameter: Controller Knob 4 CC#
Value Range: 1 – 119

This parameter determines what continuous controller (CC) number is used for Controller Knob 4.

Menu: Global/Settings/Controls
Parameter: Reset Knobs
Value Range: On, Off

This parameter resets your knobs to "0" when you change programs, mixes, or songs. If you'd like to keep existing knob settings when you change your programs, mixes, or songs, uncheck this box.

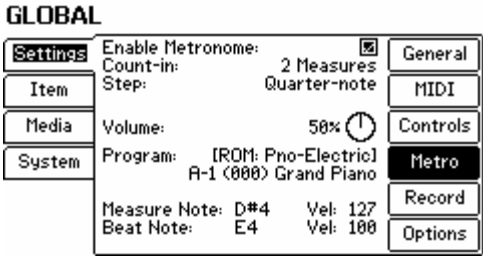
Menu: Global/Settings/Controls
Parameter: Switch S1 CC#
Value Range: 1 – 119

This parameter determines what continuous controller (CC) number is used for the S1 Switch.

Menu: Global/Settings/Controls
Parameter: Switch S2 CC#
Value Range: 1 – 119

This parameter determines what continuous controller (CC) number is used for the S2 Switch.

Metronome Settings



Menu: Global/Settings/Metro
Parameter: Enable Metronome
Value Range: On, Off

Check this box to enable the metronome during recording.

Menu: Global/Settings/Metro
Parameter: Count-in
Value Range: Off, 1-2 Measures

Many musicians like having one or two bars to "count-in" before the sequencer starts recording the performance. Set the number of measures you'd like to have here. If you'd like to immediately start recording without a count-in, set this parameter to "off."

Menu: Global/Settings/Metro
Parameter: Step
Value Range: Whole-note, Dotted half-note, Whole-note triplet, Half-note, Dotted quarter-note, Half-note triplet, Quarter-note, Dotted 8-note, Quarter-note triplet, 8-note

This parameter determines the length of each step.

Menu: Global/Settings/Metro
Parameter: Volume
Value Range: 0-100%

This parameter sets the volume of your metronome click.

Menu: Global/Settings/Metro
Parameter: Program
Value Range: (varies)

You can select any program for your metronome's sound. The top row selects the program bank and the bottom selects the individual program you'd like to use.

Menu: Global/Settings/Metro
Parameter: Measure Note (value)
Value Range: C-2 to G8

The metronome can play a different note when you're at the top of a measure making it easier to keep track of where you are in the beat. Select that note here.

Menu: Global/Settings/Metro
Parameter: Measure Note Velocity
Value Range: 0-127

Select the velocity of your "Measure Note" (see above).

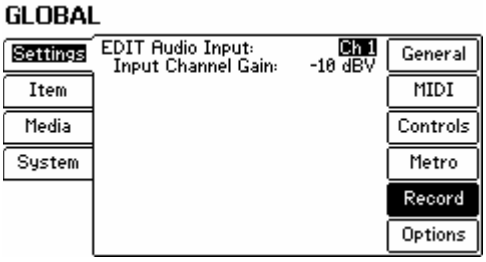
Menu: Global/Settings/Metro
Parameter: Beat Note (value)
Value Range: C-2 to G8

This is the note that the metronome will play on all beats other than the "Measure Note" (i.e., the first beat of your measure).

Menu: Global/Settings/Metro
Parameter: Beat Note Velocity
Value Range: 0-127

Select the velocity of your "Beat Note" (see above) here.

Multitrack Audio Input Settings



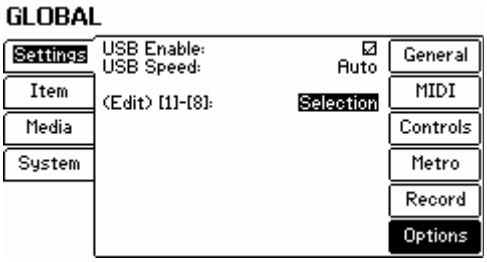
Menu: Global/Settings/Record
Parameter: EDIT Audio Input
Value Range: Ch 1 to Ch 8

Select the audio input channel you'd like to edit here.

Menu: Global/Settings/Record
Parameter: Input Channel Gain
Value Range: -10 dBV, +4 dBu

This parameter sets the input sensitivity of the currently selected audio input channel. The device you are recording should specify whether its output is set to "-10 dBV" or "+4 dBu" and you should set this parameter accordingly.

Other Global Settings (USB & User Interface)



Menu: Global/Settings/Options
Parameter: USB Enable
Value Range: On, Off

You can disable USB functionality by unchecking this box. For normal operation, leave this box checked.

Menu: Global/Settings/Options
Parameter: USB Speed
Value Range: Auto, Full-Speed

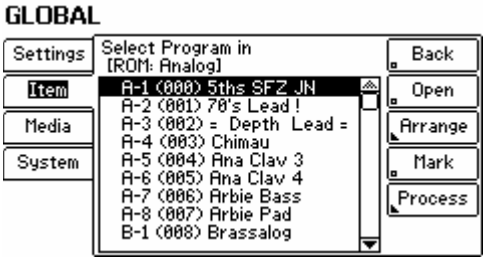
The Fusion workstation is supports USB 2.0 and is fully backward-compatible with USB 1.0 and 1.1 devices. In other words, leaving this parameter set to "Auto" should allow the Fusion to automatically select the best USB speed.

However, sometimes your computer may have difficulty connecting with the workstation (particularly if you have an older computer or USB card). Because of this, we've included a "Full-Speed" setting. Selecting this will slow down your Fusion's USB connection from USB 2.0 "High-Speed" (480 mbps) to USB 1.1 "Full-Speed" (12 mbps), ensuring better connectivity.

Menu: Global/Settings/Options
Parameter: (Edit) [1]-[8]
Value Range: Selection, Enable/Disable

Set this parameter to "Enable/Disable" if you'd like to use the "1" through "8" buttons for enabling and disabling oscillators (in Program mode) or enabling and disabling tracks (in Song mode) while in Edit mode. Otherwise, set this track to "Selection" if you'd like the "1" through "8" buttons to change programs within a bank.

The Item Explorer



Menu: Global/Item
Parameter: Back (not available when you're in the root directory)
Value Range: (none)

This button returns you to the previous level of the directory structure.

Menu: Global/Item
Parameter: Open
Value Range: (none)

This button opens whatever is currently highlighted in your item explorer window.

Menu: Global/Item
Parameter: Arrange (not available in the root directory or ROM banks)
Value Range: (none)

This button opens a window allowing you to rearrange the order of your selected bank or item. Once you have moved the selected item to its desired position, press the "Store" button to save your rearranged order. Otherwise, press "Exit" to return to the previous screen without editing anything.

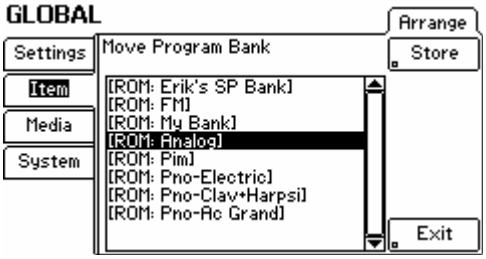
Once you have reordered banks or items using the Item Explorer, those banks and items will appear in that order whenever you browse in other modes.

Menu: Global/Item
Parameter: Mark (not available in the root directory or ROM banks)
Value Range: (none)

This button allows you to select multiple items for editing using the "Process" functions (see below). Once you press the mark button, a checkmark appears to the left of the item you've marked. Press the Mark button again to de-select that item.

Menu: Global/Item
Parameter: Process (not available in the root directory or ROM banks)
Value Range: (none)

This button brings up a tab allowing you to manipulate whatever is selected (or marked using the "Mark" button—see above) in a number of different ways.

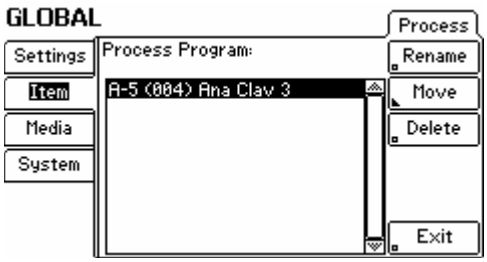


Menu: Global/Item/Arrange
Parameter: Store
Value Range: (none)

Use the Control Wheel (or INC/DEC buttons) to rearrange the order of your selected bank or item. Once you have moved the selected item to its desired position, press the "Store" button to save your rearranged order and return to the previous screen.

Menu: Global/Item/Arrange
Parameter: Exit
Value Range: (none)

Press "Exit" to return to the previous screen without editing anything.



Menu: Global/Item/Process
Parameter: Rename (Only available for bank and item selections, but not volume folders)
Value Range: (none)

This button brings up a prompt allowing you to rename your item or bank selection.

Menu: Global/Item/Process
Parameter: Move (Only available for item selections, but not volume folders or banks)
Value Range: (none)

This button brings up a page allowing you to move your item selection to another destination.

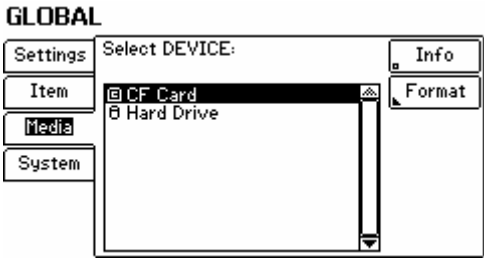
Menu: Global/Item/Process
Parameter: Delete (Only available for bank and item selections, but not volume folders)
Value Range: (none)

This button brings up a prompt allowing you to delete bank and item selections. Use this option with caution as you will not be able to undo this action.

Menu: Global/Item/Process
Parameter: Verify (Only available for volume folders and banks, but not items)
Value Range: (none)

This button analyzes and verifies that all of the items contained within the currently selected bank exist and removes all items that do not exist. It will also add items to the bank that exist in the folder but not in the bank list. End users will usually not need to be worried about this unless they add, delete, or move files contained on the Fusion using the USB connection. Doing this may cause the Fusion's bank list to become "out of sync" with whatever is actually contained in the Fusion and the bank list will need to be resynched using the Verify command. If you add a program to a bank directory using USB, this command will allow you to actually see the program that you have added.

The Media Explorer:



Menu: Global/Media
Parameter: Info
Value Range: (none)

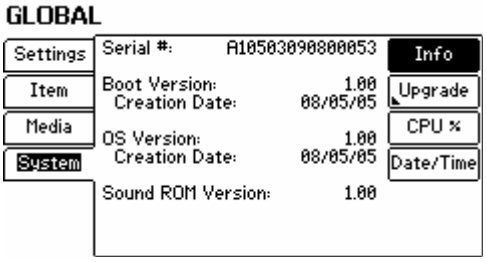
This button brings up a prompt that describes the currently selected device, the name of the device, the amount of space available, and the total size of that device.

Menu: Global/Media
Parameter: Format
Value Range: (none)

This button brings up a prompt allowing you to erase the entire contents of the selected source device. During this process you can also rename the device.

Formatting a device will delete all of its contents. There is no way to undo this action or to recover data that has been erased due to formatting. Please use this function carefully.

Operating System Information



Menu: Global/System/Info
Parameter: Serial #
Value Range: (not editable)

The serial number of your Fusion workstation is listed here.

Menu: Global/System/Info
Parameter: Boot Version
Value Range: (not editable)

The version of the boot code and its creation date are listed here. If you think your system may be out of date, take a look at this menu and compare it with the latest version of the boot code available on our website. If your system is not up to date, you can update using the Global/System/Upgrade menu (see below).

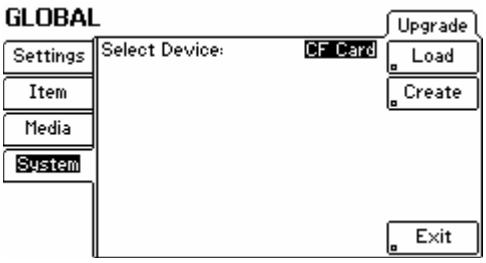
Menu: Global/System/Info
Parameter: OS Version
Value Range: (not editable)

The version of operating system and its creation date are listed here. If you think your OS may be out of date, take a look at this menu and compare it with the latest OS version available on our website. If your system is not up to date, you can update using the Global/System/Upgrade menu (see below).

Menu: Global/System/Info
Parameter: Sound ROM Version
Value Range: (not editable)

The version of your sound ROM is listed here. The sound ROM contains all the sounds that are shipped with the Fusion.

Upgrading your Operating System



Menu: Global/System/Upgrade
Parameter: Select Device
Value Range: CF Card, Hard Drive

Select which device (either the Compact Flash card, or the Hard Drive) you'd like to access.

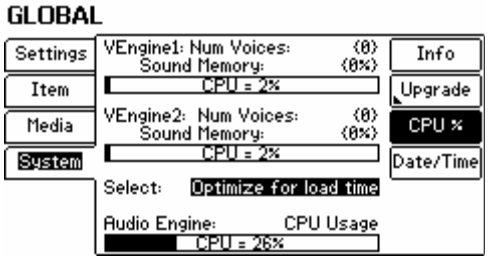
Menu: Global/System/Upgrade
Parameter: Load
Value Range: (none)

This button loads the operating system from the currently selected device.

Menu: Global/System/Upgrade
Parameter: Create
Value Range: (none)

This button creates a copy of your current operating system onto the currently selected device. This is useful for creating backups of your current system.

System CPU Usage

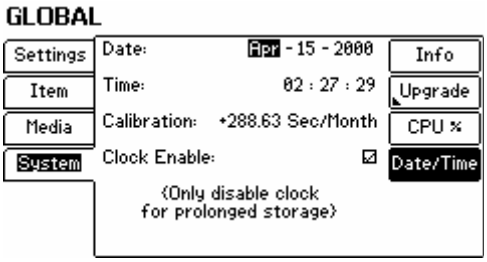


This page is designed to let you know how much of your Fusion's resources are being used. There are three bars on this screen—the "VEngine1" and "VEngine2" are your "Voice Engines" that are responsible for all synthesis that takes place on the Fusion. The "Audio Engine" bar monitors the processor that handles all recording and playback that takes place on the Fusion's multitrack recorder.

Menu: Global/System/CPU%
Parameter: Select
Value Range: Load Time, Polyphony

This parameter allows you to optimize the Fusion's voice engines for different types of applications. Set this parameter to "Load Time" in order to minimize the load time of your programs. This setting gives you a lower polyphony count, but loads samples more quickly. Set the parameter to "Polyphony" to maximize the number of voices you can achieve from the voice engine. This increases polyphony but also increases load times for samples.

Setting the Date and Time



Menu: Global/System/Date/Time
Parameter: Date
Value Range: (Varies; in Month – Day – Year format)

This parameter sets the date for the Fusion's internal clock.

Menu: Global/System/Date/Time
Parameter: Time
Value Range: (Varies: Hour : Minutes : Seconds)

This parameter sets the time for the Fusion's internal clock. Note that time is set in a 24-hour format instead of an AM/PM system.

Menu: Global/System/Date/Time
Parameter: Calibration
Value Range: -165.85 Sec/Month to 331.39 Sec/Month, N/A

If you find your Fusion's internal clock to be drifting slightly over long periods of time (for example, over a month), use this parameter to compensate for clocks that are slightly too fast (or slow). If your clock is right on, leave this parameter set to "N/A."

Menu: Global/System/Date/Time
Parameter: Clock Enable
Value Range: On, Off

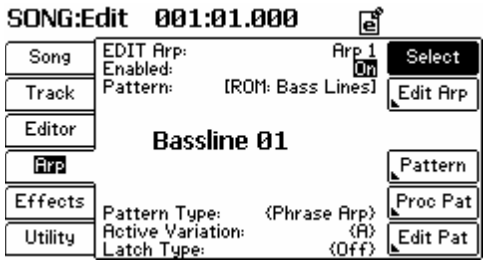
When the Fusion is powered off, its internal clock must always remain active in order to maintain basic timekeeping functions. Because of this, the Fusion's internal battery (that powers the internal clock) is very slowly drained over long periods of time. The "Clock Enable" parameter has been included so that you can turn the clock off in case you plan to leave your Fusion off for a long period of time. For normal use, you should leave this box checked.

If you've turned off the clock, every time you turn on the Fusion, you'll see a prompt informing you the clock is not accurate. This prompt will then take you to the Global/System/Date/Time page where you can set the correct time and re-enable the clock

Chapter 4: Common Features

The Arpeggiator

The Fusion's Arpeggiator is a powerful device that lets you play pre-programmed patterns by simply holding down one or more notes. This is very useful feature because it allows you to play extremely complex (or repetitive) passages of music with ease.



Menu: (various modes)/Arp/Select
Parameter: EDIT Arp (only available in Song and Mix modes)
Value Range: Arp 1 to Arp 4

Select the arpeggiation pattern you'd like to edit here.

Menu: (various modes)/Arp/Select
Parameter: Enabled
Value Range: On, Off

You can enable or disable arpeggiation patterns using this parameter.

Menu: (various modes)/Arp/Select
Parameter: Pattern
Value Range: Default, ROM Phrases, ROM Arpeggiators, ROM Drum (Note: additional patterns may be available on Compact Flash cards inserted into the Fusion.)

This parameter lets you select the arpeggiation pattern you'd like to use. The top line allows you to switch between banks of patterns whereas the bottom line allows you to select individual patterns.

Menu: (various modes)/Arp/Select
Parameter: Pattern Type
Value Range: (Not Editable)

The Fusion has three classifications of arpeggiation patterns for you to work with. These arpeggiations include "Standard" "Phrase" and "Drum Machine." This parameter lets you know what your currently loaded arpeggiation pattern is. Note that this parameter is provided as a reference and is not editable.

Menu: (various modes)/Arp/Select
Parameter: Active Variation
Value Range: (Not Editable)

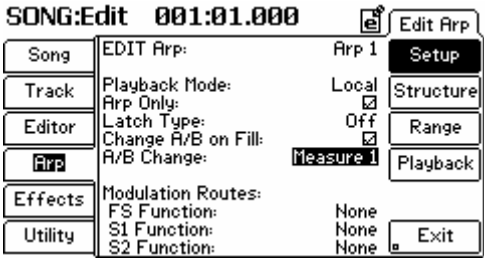
Each arpeggiation contains up to four variations. These variations are labeled "A," "A Fill," "B," and "B Fill." Only one variation can be playing at a time and this is known as the "Active Variation." This parameter lets you know what the current Active Variation is.

The four variations are completely independent and can be programmed and recorded however you'd like. However, the Fusion is optimized for having independent "A" and "B" variations whereas variations "A Fill" and "B Fill" are intended to be used for fills, or transitions, between the two variations.

Menu: (various modes)/Arp/Select
Parameter: Latch Type
Value Range: (Not Editable)

"Latching" is a method of letting your arpeggiation play without having to hold down any notes (or trigger sources). This parameter lets you know what your current arpeggiation is set to (see "Latch Type" below for more about this).

Configuring Your Arpeggiation Patterns



Menu: (various modes)/Arp/Edit Arp/Setup
Parameter: EDIT Arp (only available in Song and Mix modes)
Value Range: Arp 1 to Arp 4

Select the arpeggiation pattern you'd like to edit here.

Menu: (various modes)/Arp/Edit Arp/Setup
Parameter: Playback Mode
Value Range: Local, MIDI, Local+MIDI

This parameter determines whether your arpeggiation pattern only plays locally or if the Fusion actually sends out the MIDI data contained in your arpeggiation pattern. The following chart should help clarify the different uses of each mode

Setting	Definition
Local	The arpeggiation pattern is played inside the Fusion and not transmitted to external devices over MIDI. This is useful in situations where you want the Fusion to play an arpeggiation while an external sound module simply plays the notes you are holding.
MIDI	The arpeggiation pattern is transmitted to external devices over MIDI but not played on the Fusion itself. This allows you to play your arpeggiation pattern on an external MIDI device while having the Fusion play the chord you are holding.
Local+MIDI	The arpeggiation pattern is both played locally and transmitted to external devices over MIDI. This plays the arpeggiation on both the Fusion and the external MIDI device.

Menu: (various modes)/Arp/Edit Arp/Setup
Parameter: Arp Only
Value Range: On, Off

If you want only your arpeggiation pattern to sound when you press a key (or chord), check this box. If you leave this box unchecked, you'll hear both the arpeggiation pattern as well as the underlying note (or chord) that you play. This is true regardless of the setting of the "Playback Mode" parameter.

Menu: (various modes)/Arp/Edit Arp/Setup
Parameter: Latch Type
Value Range: Off, Latch, Mask

"Latching" is a method of letting your arpeggiation play without having to hold down any notes (or trigger sources). This is useful because it frees up your hands to do other things in a performance (twiddle knobs, play other keyboards or instruments, etc.). The Fusion has two different modes of latching that are explained below. Note that latching does not take place until it is actually engaged using the modulation route (see below).

Latch: This mode simply plays your arpeggiation pattern based on what you have played (either a single note or a chord) and continues to play until you turn latching off.

Mask: This mode lets your arpeggiation pattern run silently in the background and only makes sound when you press a key (or chord). This is useful if you want to accent certain parts of your arpeggiation pattern while leaving other parts silent.

Menu: (various modes)/Arp/Edit Arp/Setup
Parameter: Change A/B on Fill
Value Range: On, Off

This parameter automatically shifts your arpeggiation variation from "A Fill" to "B" and from "B Fill" to "A" once you reach the end of the fill.

Menu: (various modes)/Arp/Edit Arp/Setup
Parameter: A/B Change
Value Range: Now, Measure 1, Measure 2, Measure 3 and Measure 4

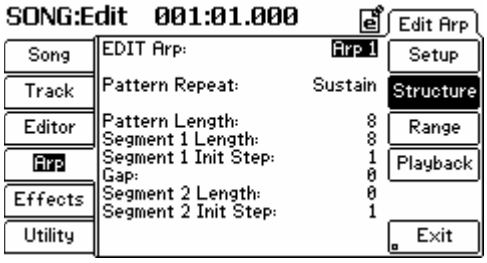
This parameter determines how quickly the shift between variation "A" and "B" take place. Set this parameter to "Now" if you want the change to be immediate (no fill will be played). If you want the changeover to take place after the end of the first, second, third, or fourth measure, set this parameter accordingly.

Menu: (various modes)/Arp/Edit Arp/Setup
Parameter: Modulation Routes (Source)
Value Range: FS Function, S1 Function, S2 Function, FS(m) Function, T1 Function, T2 Function, T3 Function, T4 Function

Each arpeggiation pattern can have up to three sources for modulation. Your options include the T1-T4 trigger buttons, the S1-S2 buttons, and your Foot Switch (displayed as "FS Function"). Note that "FS(m) Function" is simply your footswitch in "momentary" mode (this mode modulates when your foot is on the switch and reverts back to the original state once you take your foot off the switch). Select that source here.

Menu: (various modes)/Arp/Edit Arp/Setup
Parameter: Modulation Routes (Destination)
Destination Range: None, Latch, Latch(Mask), A/B Change, Fill

Each arpeggiation pattern has a number of things that you may want to change during a performance (such as the latch type or active variation). Once you've set your modulation source (see above), set the destination using this parameter.



Menu: (various modes)/Arp/Edit Arp/Structure
Parameter: EDIT Arp (only available in Song and Mix modes)
Value Range: Arp 1 to Arp 4

Select the arpeggiation pattern you'd like to edit here.

Menu: (various modes)/Arp/Edit Arp/Structure
Parameter: Pattern Repeat
Value Range: Sustain, 1 to 126

This parameter determines how many times the current arpeggiation will repeat. Set this parameter to "Sustain" if you'd like the arpeggiation to repeat indefinitely (until you decide to stop it). Otherwise, set this parameter to any number of repetitions you'd like to have.

Menu: (various modes)/Arp/Edit Arp/Structure
Parameter: Pattern Length
Value Range: 1-8

This parameter determines how many "steps" are contained within the current arpeggiation pattern. The length of a step is defined on the Arp/Edit Arp/Playback page.

Menu: (various modes)/Arp/Edit Arp/Structure
Parameter: Segment 1 Length
Value Range: (Varies depending on "Pattern Length" setting)

Each arpeggiation pattern can be split up into two parts called "segments." This parameter sets the length of the first segment.

Menu: (various modes)/Arp/Edit Arp/Structure
Parameter: Segment 1 Init Step
Value Range: 1-8

This parameter determines what step your first segment will start on. You can use this parameter to make offsets in the start point and this can create interesting variations on your pattern.

Menu: (various modes)/Arp/Edit Arp/Structure
Parameter: Gap
Value Range: Varies

This parameter determines how many steps of silence there will be between the first and second segments. The number of steps available depends on the length of "Segment 1" and "Segment 2" since Segment 1 + Segment 2 + Gap cannot be larger than your "Pattern Length" setting. Set this parameter to "0" if you don't want a gap.

If segment 2 has a length of 0, your gap value will be subtracted from segment 1 (though the length of the pattern will remain constant). For example, if segment 1 length is "8" and your segment two length is "0", as you increase the gap value to "1," the last step of segment 1 will be replaced with silence. If you increase your gap value to "2," then the last two steps of segment 1 will be replaced with silence.

Go Ahead—Tweak these parameters!

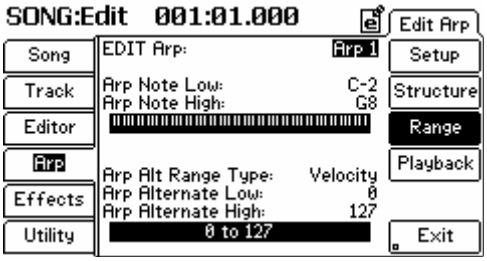
The Gap parameter may sound like a complicated feature, but by simply adjusting the Segment and Gap values, you can get all kinds of very interesting variations on your existing pattern. Go ahead and try adjusting these values and see what you come up with.

Menu: (various modes)/Arp/Edit Arp/Structure
Parameter: Segment 2 Length
Value Range: Varies

This parameter determines the length of your second segment. Note that the sum of Segment 1, Segment 2, and the Gap cannot be greater than the "Pattern Length" parameter.

Menu: (various modes)/Arp/Edit Arp/Structure
Parameter: Segment 2 Init Step
Value Range: 1-8

This parameter determines what step your second segment will start on. You can use this parameter to make offsets in the start point and this can create interesting variations on your pattern.



Menu: (various modes)/Arp/Edit Arp/Range
Parameter: EDIT Arp (only available in Song and Mix modes)
Value Range: Arp 1 to Arp 4

Select the arpeggiation pattern you'd like to edit here.

Menu: (various modes)/Arp/Edit Arp/Range
Parameter: Arp Note Low
Value Range: C-2 to G8

This parameter sets the lowest note of the range in which your arpeggiation can be triggered. Notes outside this range will play normally.

Menu: (various modes)/Arp/Edit Arp/Range
Parameter: Arp Note High
Value Range: C-2 to G8

This parameter sets the highest note of the range in which your arpeggiation can be triggered. Notes outside this range will play normally.

Menu: (various modes)/Arp/Edit Arp/Range
Parameter: Arp Alt Range Type
Value Range: Velocity, Aftertouch, Mod Wheel, Pitch Wheel, Pedal, Knob 1-4, Random

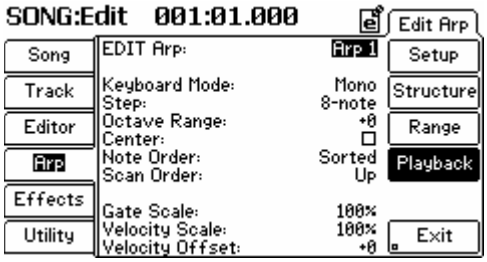
Each arpeggiation can have an "alternate" range in which it will respond. For example, if this parameter is set to "Velocity," your arpeggiation will only be triggered if notes are within range (see the "Low Key" and "High Key" parameters above) AND within the "alternate range" (see the "Alternate Low" and "Alternate High" parameters below).

Menu: (various modes)/Arp/Edit Arp/Range
Parameter: Arp Alternate Low
Value Range: 0-127

This parameter sets the lowest point of the alternate range in which your arpeggiation can be triggered.

Menu: (various modes)/Arp/Edit Arp/Range
Parameter: Arp Alternate High
Value Range: 0-127

This parameter sets the highest point of the alternate range in which your arpeggiation can be triggered.



Menu: (various modes)/Arp/Edit Arp/Playback
Parameter: EDIT Arp (only available in Song and Mix modes)
Value Range: Arp 1 to Arp 4

Select the arpeggiation pattern you'd like to edit here.

Menu: (various modes)/Arp/Edit Arp/Playback
Parameter: Keyboard Mode
Value Range: (Varies depending on arpeggiation type)

This parameter will vary depending on what arpeggiation type you have chosen in the Arp/Pattern/Setup menu. The following will break things down by arpeggiation type. Note that while these arpeggiation patterns are called "Standard," "Phrase Arp," and "Drum Machine," you can use any of the arpeggiation types with any program.

Standard	Mono	Your arpeggiation pattern will play one note at a time with the rhythm of the arpeggiation.
	Chord	All of the notes that you are holding down will play back (at the same time) with the rhythm of the arpeggiation.
	Hybrid	Your arpeggiation pattern will play single or groups of notes based on the pattern
Phrase Arp	Mono	Your first note starts the full arpeggiation pattern and determines its key. Any subsequent notes restart the pattern (and transpose it if you play a different key).
	Mono Legato	Your first note starts the full arpeggiation pattern and determines its key. If the first is held while a second note is played, the pattern will transpose to the key of the second note without restarting the pattern.
	Quantity Assign	Your first note starts the arpeggiation pattern and determines its key. All subsequent keys that are pressed will bring in additional notes in the order that they were played in the original pattern.

Drum Machine	Mono	Your first note starts the full drum arpeggiation pattern. Any subsequent notes are ignored.
	Octave Assign	Any note that you play will begin the arpeggiation pattern. The first 12 notes that were played when the pattern was recorded are assigned to the chromatic scale starting on the note "C." This means that any "C" on the keyboard will trigger the first note of the pattern as it shows up in the pattern, while any C# note will trigger the second note, etc. Be aware that if the part triggered by the selected note does not come in until the end of the pattern, you won't hear anything until you have reached the end of the pattern.
	Key Assign	The first note starts the arpeggiation pattern and also inherits the first note that was played when the pattern was recorded, substituting the sound of the chosen note for the original sound used in the pattern. Likewise, the next note played inherits the second note of the pattern and substitutes its sound. This allows you to mix and match sounds while keeping the rhythmic structure (i.e., the groove) of the pattern.
	Quantity Assign	Your first note starts the arpeggiation pattern. All subsequent keys that are pressed will bring in additional notes in the order that they were played.

Menu: (various modes)/Arp/Edit Arp/Playback
Parameter: Step
Value Range: 32-note triplet, Dotted 64-note, 32-note, 16-note triplet, Dotted 32-note, 16-note, 8-note triplet, Dotted 16-note, 8-note, Quarter-note triplet, Dotted 8-note, Quarter-note, Half-note triplet, Dotted quarter-note, Half-note, Whole-note triplet, Dotted half-note, Whole-note, 2x whole-note triplet, Dotted whole-note, and Double whole-note

This parameter determines the length of time that is given to each step.

Menu: (various modes)/Arp/Edit Arp/Playback
Parameter: Octave Range
Value Range: -4 to +4

This parameter spreads the notes in your arpeggiation pattern across +/- 4 octaves. This allows you to make wider-ranging arpeggiations as notes are generated across multiple octaves.

Menu: (various modes)/Arp/Edit Arp/Playback
Parameter: Center
Value Range: On, Off

This parameter lets your arpeggiation pattern be spread to both sides of the octave that you play. Check this box if you want your notes to be generated both above and below the octave in which you play. Note that is parameter only makes a difference in your pattern when your "Octave Range" parameter is not set to "0."

Menu: (various modes)/Arp/Edit Arp/Playback
Parameter: Note Order
Value Range: Sorted, Played, RevPlayed

The Fusion can treat your arpeggiation chords in a number of ways. The following will break it down by type:

Sorted	This setting sorts all notes you play from lowest to highest note.
Played	This setting sorts your arpeggiation pattern exactly as you played it on the keyboard.
RevPlayed	This setting sorts all of your notes in the reverse order of what you played. In other words, the last note you played becomes the first note in the arpeggiation pattern.

Menu: (various modes)/Arp/Edit Arp/Playback
Parameter: Scan Order
Value Range: Up, Down, Up/DnInc, Up/DnEx, Dn/Up Inc, Dn/Up Ex

This parameter determines how your notes are sorted and played back. The following will explain each setting in detail:

Up	Plays notes according to the note order.
Down	Plays the notes in the reverse note order.
Up/DownInc	Plays the notes in the note order and then plays the notes in the reverse note order. The "inc" in the parameter name stands for "inclusive" meaning that the first and last note in the note order are played twice.
Up/DnEx	Plays the notes in the note order and then plays the notes in the reverse note order. The "ex" in the parameter name stands for "exclusive." This means that the first and last note in the note order are only played once.
Dn/Up Inc	Plays the notes in the reverse note order and then plays the notes in the normal note order. The "inc" in the parameter name stands for "inclusive" meaning that the first and last note in the note order are played twice.
Dn/Up Ex	Plays the notes in the reverse note order and then plays the notes in the normal note order. The "ex" in the parameter name stands for "exclusive." This means that the first and last note in the note order are only played once.

Menu: (various modes)/Arp/Edit Arp/Playback
Parameter: Gate Scale
Value Range: 1 to 200%

This parameter lets you adjust the length of your arpeggiation notes. For example, 1% causes notes to be one percent of the original length whereas 200% causes notes to be twice as long. A setting of 100% leaves the notes unaffected.

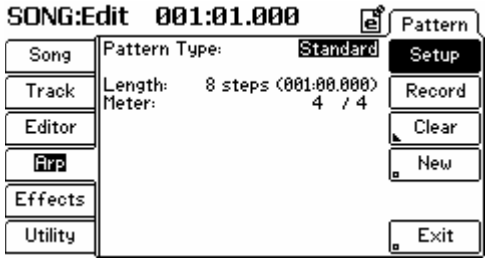
Menu: (various modes)/Arp/Edit Arp/Playback
Parameter: Velocity Scale
Value Range: 1 to 200%

This parameter lets you scale the velocities of your arpeggiation notes. For example, 1% causes velocities to be one percent of the original velocity value whereas 200% causes notes to be played back at twice their original velocity. A setting of 100% leaves velocity values unaffected.

Menu: (various modes)/Arp/Edit Arp/Playback
Parameter: Velocity Offset
Value Range: -63 to + 63

Velocity Offset lets you increase or decrease the velocity of your notes by a fixed amount. This is different than the "velocity scaling" parameter since an integer value is simply added to note velocities rather than multiplying your velocities by a percentage (as happens with velocity scaling).

Recording Arpeggiation Patterns



Menu: (various modes)/Arp/Pattern/Setup
Parameter: Pattern Type
Value Range: Standard, Phrase Arp and Drum Machine

This parameter lets you select what type of arpeggiation pattern you'd like this to be. The Fusion supports three different arpeggiation types and they are outlined below:

Standard	"Standard" arpeggiation mode is when you hold down one or more notes and the arpeggiator plays a pattern based the notes you have pressed. This is commonly used when you want to play an "auto accompaniment" in a specific key (that you determine by simply playing a chord for that key).
Phrase	"Phrase" arpeggiation is designed to play more complex phrases in the key of whatever note that is being held down.
Drum Machine	"Drum Machine" setting is similar to the "Phrase" but has a variety of additional features that are optimized for the playback of drum and percussive patterns.

What's is the difference?

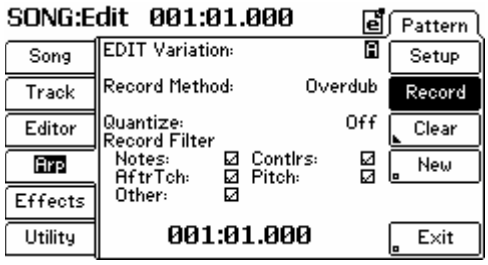
For more detailed information about Standard, Phrase, and Drum Machine arpeggiations, *see page 220.*

Menu: (various modes)/Arp/Pattern/Setup
Parameter: Length
Value Range: 1 Step to 512 Steps

This parameter lets you set how many "steps" your arpeggiation can have.

Menu: (various modes)/Arp/Pattern/Setup
Parameter: Meter
Value Range: 1-99 / 1,2,4,8,16,32

This parameter lets you set the time signature of your arpeggiation pattern.



Menu: (various modes)/Arp/Pattern/Record
Parameter: EDIT Variation
Value Range: A, Fill A, B, Fill B

An arpeggiation pattern can have up to four variations. Select which variation you'd like to record here.

Menu: (various modes)/Arp/Pattern/Record
Parameter: Record Method
Value Range: Overdub, Replace, Spot Erase

Your arpeggiation variations can be recorded in the following ways:

1. Overdub – Overdub recording keeps whatever is already recorded and lets you record additional performances on top of the original recording.

2. Replace – Replace record erases whatever is currently on the arpeggio variation while recording what you play.

3. Spot Erase – Spot erase lets you erase specific notes by holding down those notes while recording. In other words, if you hold down notes while recording, the sequencer will automatically delete these notes as they come up in your arpeggiation. Once you release these notes, the remainder of the arpeggiation will be unaffected.

Menu: (various modes)/Arp/Pattern/Record
Parameter: Quantize
Value Range: Off, 32-note triplet, Dotted 64-note, 32-note, 16-note triplet, Dotted 32-note, 16-note, 8-note triplet, Dotted 16-note, 8-note, Quarter-note Triplet, Dotted 8-note, Quarter-note

Quantize allows you to "clean up" your timing by automatically "snapping" each note you play to the nearest logical point in the beat. By setting this parameter to "off" the sequencer will record your performance exactly as you play it. Otherwise, you can set this parameter to any of the additional settings that are right for your composition and small inaccuracies in timing will be automatically fixed as you record.

Menu: (various modes)/Arp/Pattern/Record
Parameter: Record Filter (Notes)
Value Range: On, Off

Turn this parameter off if you do not want note data to be recorded. Otherwise, leave this parameter set to "on" for normal operation.

Menu: (various modes)/Arp/Pattern/Record
Parameter: Record Filter (Contlrs)
Value Range: On, Off

Turn this parameter off if you do not want controller data to be recorded. Otherwise, leave this parameter set to "on" for normal operation.

Menu: (various modes)/Arp/Pattern/Record
Parameter: Record Filter (AT)
Value Range: On, Off

Turn this parameter off if you do not want aftertouch data to be recorded. Otherwise, leave this parameter set to "on" for normal operation.

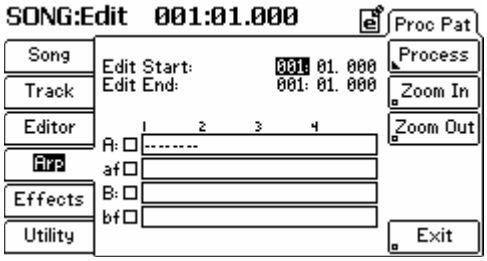
Menu: (various modes)/Arp/Pattern/Record
Parameter: Record Filter (Pitch)
Value Range: On, Off

Turn this parameter off if you do not want pitch bend data to be recorded. Otherwise, leave this parameter set to "on" for normal operation.

Menu: (various modes)/Arp/Pattern/Record
Parameter: Record Filter (Other)
Value Range: On, Off

If you do not want any type of data (other than types of data explicitly stated above) to be recorded, set this parameter to off. Otherwise, leave this parameter set to "on" for normal operation.

Processing Your Recorded Arpeggiations



Menu: (various modes)/Arp/Proc Pat
Parameter: Edit Start
Value Range: (varies)

This parameter sets the point at which your arpeggiation variation edits will start to take place.

Menu: (various modes)/Arp/Proc Pat
Parameter: Edit End
Value Range: (varies)

This parameter sets the end point after which your arpeggiation variation will not be affected.

Menu: (various modes)/Arp/Proc Pat
Parameter: A, A Fill, B, B Fill (Check-box to the left of each variation)
Value Range: On, Off

This check box lets you select one or more arpeggiation variations that will be edited using the Process menu.

Menu: (various modes)/Arp/Proc Pat
Parameter: Zoom In
Value Range: (none)

This button expands your timeline and lets you see your arpeggiation in more detail.

Menu: (various modes)/Arp/Proc Pat
Parameter: Zoom Out
Value Range: (none)

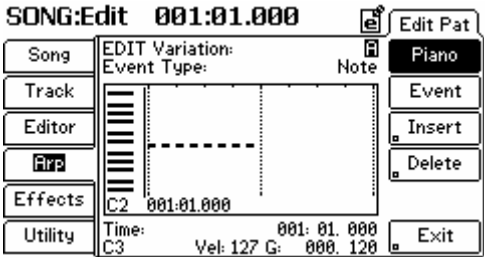
This button compresses your timeline and lets you see more events on screen.

Menu: (various modes)/Arp/Proc Pat
Parameter: Process
Value Range: (none)

This button takes you to the Process page where you can make edits and other changes to your selected arpeggiation variation. See page 147 for detailed descriptions of each process.

Note that while the descriptions starting on page 147 describe the processes as they relate to Song mode, the processes themselves are identical when applied to arpeggiation variations. In other words, the "Clear" parameter you see on page 147 affects your arpeggiation variation exactly the same way as it does a song track.

Editing your Arpeggiation Patterns



Menu: (various modes)/Arp/Edit Pat/Piano
Parameter: EDIT Variation
Value Range: A, Fill A, B and Fill B

Select which variation you'd like to edit using this parameter.

Menu: (various modes)/Arp/Edit Pat/Piano
Parameter: Event Type
Value Range: Note, Controller, Mono Aftertouch, Pitch

Select the type of event you'd like to edit here. The remaining parameters on the page change depending on what you select here. The following chart will break things down by selection. Note that the piano roll appears blank unless a MIDI event has been created (you can add an event by either recording it in the sequencer, or by pressing the "Insert" action button).

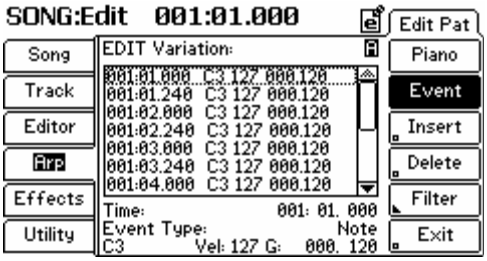
Event Type	Sub Categories	Value Range
Note	Time	Varies
	Note Value	C-2 to G8
	Velocity	1-127
	Gate	Varies depending on length of note played
Controller	Time	Varies
	MIDI CC Controller	1-119
	CC Value	0-127
Mono Aftertouch	Time	Varies
	Aftertouch	0-127
Pitch	Time	Varies
	Pitch	-8192 to +8191

Menu: (various modes)/Arp/Edit Pat/Piano
Parameter: Insert
Value Range: (none)

This button creates an event in the event editor window. The type of event inserted is determined by what you have selected for the Event Type parameter.

Menu: (various modes)/Arp/Edit Pat/Piano
Parameter: Delete
Value Range: (none)

This button deletes the currently selected event within the event editor window.



Menu: (various modes)/Arp/Edit Pat/Event
Parameter: Edit Variation
Value Range: A, Fill A, B, Fill B

Select the variation you'd like to edit using this parameter.

Menu: (various modes)/Arp/Edit Pat/Event
Parameter: Time
Value Range: (Varies depending on length of arpeggiation pattern)

This parameter states the time at which the selected event will occur.

Menu: (various modes)/Arp/Edit Pat/Event
Parameter: Event Type
Value Range: Note, Controller, Mono Aftertouch, Pitch, Patch, Poly Aftertouch, RPN, NRPN

This parameter selects the type of event you'd like to place. The remaining parameters on the page change depending on what you select here. The following chart will break things down by event type:

Event Type	Sub Categories	Value Range
Note	Note Value	C-2 to G8
	Velocity	1-127
	Gate	Varies depending on length of note played
Controller	MIDI CC Controller	1-119
	CC Value	0-127
Mono Aftertouch	Aftertouch Value	0-127
Pitch	Pitch Value	-8192 to +8191
Patch	Bank	0-127
	Number	0-127
Poly Aftertouch	Note	C-2 to G8
	Velocity	0 - 127

RPN	Pitch Range	0 - 16383
	Fine Tune	0 - 16383
	Coarse Tune	0 - 16383
	RPN 3 – RPN16383	0 - 16383
NRPN	NRPN 0–NRPN 16383	0 - 16383

Menu: (various modes)/Arp/Edit Pat/Event
Parameter: Insert
Value Range: (None)

This button creates an event in the event editor window.

Menu: (various modes)/Arp/Edit Pat/Event
Parameter: Delete
Value Range: (None)

This button deletes the currently selected event within the event editor window.

Menu: (various modes)/Arp/Edit Pat/Event
Parameter: Filter
Value Range: (None)

This button brings up an additional page letting you hide specific types of data from your event editor. This makes it easier for you to edit the data that you do see onscreen. See page 145 for more about these filters.

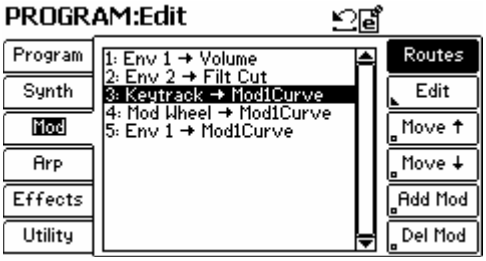
The Modulation Matrix

A "Modulation Matrix" might sound (and look) like an intimidating part of a synthesizer, but there's nothing to be intimidated by. You can think of the Modulation Matrix as being a giant patchbay that connects different parts of the keyboard together. For example, if you want to control the amount of frequency modulation (FM) with one of the knobs on the performance panel, you can simply create a modulation matrix route (or "Mod Route" for short) that connects the knob to the FM amount parameter. Once this is done, you can control the FM amount with the knob.

The Fusion has some major advantages over its competitors when it comes to the modulation matrix. Whereas our competitors have a limited amount of flexibility for each route, the Fusion lets you route virtually everything to everything else on the keyboard. This gives you all kinds of creative options not possible on other keyboards.

Let's dive in.

Creating and Deleting Modulation Routes



Menu: Program/Mod/Routes
Parameter: Varies Depending on the number and type of routes created
Value Range: (none)

You can create up to 32 modulation routes for each program on the Fusion. This page shows you each route's source and destination at a glance. The source is listed to the left of the arrow and the destination is listed to the right.

For example, on the picture above, we can see that for Mod Route #1, "Envelope 1" is routed to the "Volume."

Menu: Program/Mod/Routes
Parameter: Move Up
Value Range: (none)

This button moves your currently selected mod route up in the list. When working with lots of routes, many users find it helpful to group similar routes together (for example, by keeping all routes with an envelope as the source together on the list).

Menu: Program/Mod/Routes
Parameter: Move Down
Value Range: (none)

This button moves your currently selected mod route down in the list. Again, when working with lots of routes, many users find it helpful to group similar routes together (for example, by keeping all routes with an envelope as the source together on the list).

Menu: Program/Mod/Routes
Parameter: Add Mod
Value Range: (none)

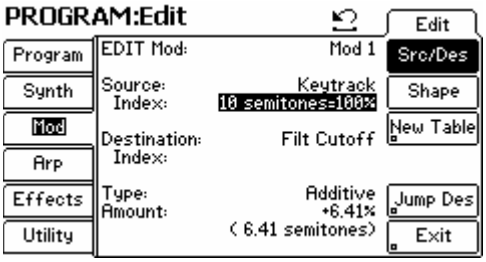
This button creates a new modulation route and automatically takes you to the "Edit" screen for that route so you can assign Sources and Destinations (as well as other parameters depending on the type of route you're trying to make). You can create up to 32 routes for each program.

Menu: Program/Mod/Routes
Parameter: Del Mod
Value Range: (none)

This button lets you delete the mod route that is currently selected. A confirmation prompt will appear to keep you from accidentally deleting an existing route.

As you jump into the "Edit" menu, you can change the source/destination of each route as well as a number of other parameters associated with your source and destination. This menu is slightly tricky to document because the "Index" parameters automatically change depending on what you've assigned as your source and destination. If your screen appears slightly different from the one shown below, don't worry—you may have different sources and destinations selected.

Editing Your Modulation Routes



Menu: Program/Mod/Edit/Src/Des
Parameter: EDIT Mod
Value Range: Mod 1 up to Mod 32 (depends on how many Mod Routes you've created in the Program/Mod/Routes menu)

Select the Modulation Route you'd like to edit here.

Menu: Program/Mod/Edit/Src/Des
Parameter: Source
Value Range: None, Keytrack, Velocity, Rel Velocity, Mono Aftertouch, MIDI Poly Aftertouch, Controller , Envelope, LFO (Envelope and LFO are only available for this parameter if you have enabled them for the program)

Select the source for the current mod route you'd like to edit here. This will cause the "Source Index" parameter (see below) to change depending on what you pick here.

Menu: Program/Mod/Edit/Src/Des
Parameter: Source Index
Value Range: Varies depending on the assigned source (see above)

Some of the sources that you select (see above) have a number of additional options that let you define your source more specifically.

Keytrack – This range can vary from 1 semitone = 100% to 8 octaves+4 semitones = 100%. Keytrack is bi-polar around middle-C, and you can select the keytracking range in 1 semitone increments. In other words, if you set this parameter to "1 octave = 100%" the effect of your modulation gradually reaches 100% as you move up or down one octave from middle-C.

Controller – The Fusion has a number of different physical control sources (i.e., buttons, knobs, etc.) that you can select as your modulation source. Select a specific physical controller from the following: Mod wheel, Foot Pedal, Switch S1, Switch S2, Knob Assign 1-4, Trigger T1-T4, Footswitch, Sustain Pedal, Pitch Wheel, Aftertouch.

Envelope – You can create up to eight envelopes for each program on the Fusion, and any of those envelopes can serve as a source for a mod route. Select which envelope you'd like to use here. Note that the available envelopes will vary depending on how many envelopes have been created for that program (i.e., you will not see envelopes 5 though 8 if a program only uses 4 envelopes).

LFO – You can create up to eight LFOs for each program on the Fusion, and any of those LFOs can serve as a source for a mod route. Select which LFO you'd like to use here. Note that the available LFOs will vary depending on how many LFOs have been created for that program (i.e., you will not see LFOs 5 though 8 if a program only uses 4 LFOs).

Menu: Program/Mod/Edit/Src/Des
Parameter: Destination
Value Range: None, Pitch, Volume, Balance, Portamento Time, Amount, Curve, S&H Rate, Smoothing, Delay, Attack, Decay, Sust Level, Sust Decay, Release, Env Time, Delay, Ramp, Rate, Shape

Available under Sample Synthesis only: Osc Start, Osc Frequency, Osc FM Amount, Osc Volume, Osc Pan, Filter Cutoff, Filt Resonance

Available under Drum Synthesis only: Osc Start, Osc Frequency, Osc Volume, Osc Pan, Filt Cutoff, Filt Resonance

Available under Analog Synthesis only: Osc Frequency, Osc FM Amount, Osc Random Tune, Osc Shape, Osc Volume, Osc Pan, Filt Cutoff, Filt Resonance

Available under FM Synthesis only: Osc Frequency, Osc Random Tune, Osc Amount, Osc Volume, Osc Pan, Filt Cutoff, Filt Resonance

Available under Reed Synthesis only: Breath Pressure, Breath Noise, Reed Threshold, Reed Slope, Reed Curve, Bore Frequency, Bore Mix, Bore Gain, Bore Filter, Filt Cutoff, Filt Resonance

Available under Wind Synthesis only: Breath Pressure, Breath Noise, Mouth Jet, Mouth Curve, Mouth Offset, Bore Frequency, Bore Mix, Bore Gain, Bore Filter, Filt Cutoff, Filt Resonance

Select the destination for the current mod route you'd like to edit here. This will cause the "Destination Index" parameter (see below) to change depending on what you pick here.

Menu: Program/Mod/Edit/Src/Des
Parameter: Destination Index
Value Range: Varies depending on the assigned destination (see above)

Some of the destinations that you select (see above) have a number of additional options that let you define your destination more specifically. Each of the parameters here are defined and explained in their respective chapters throughout this manual.

The following parameters are common to all synthesis types:
Amount- Mod 1-32
Curve- Mod 1-32
S&H Rate- Mod 1-32
Smoothing- Mod 1-32
Delay- Env 1-8
Attack- Env 1-8
Decay- Env 1-8
Sust Level, Release- Env 1-8
Env Time- Env 1-8
Delay- LFO 1-8
Ramp- LFO 1-8
Rate- LFO 1-8
Shape- LFO 1-8

The following are available under Sample Synthesis only:
Osc Start- Osc 1-2
Osc Frequency- Osc 1-2
Osc FM Amount- Osc 1-2
Osc Volume- Osc 1-2
Osc Pan- Osc 1-2
Filt Cutoff- Main Filter, Osc 1-2
Filt Resonance
Crossfade

The following are available under Drum Synthesis only:
Osc Start- Osc 1-64
Osc Frequency- Osc 1-64
Osc Volume- Osc 1-64
Osc Pan- Osc 1-64
Filt Cutoff- Osc 1-64
Filt Resonance- Osc 1-64

The following are available under Analog Synthesis only:
Osc Frequency- Osc 1-3
Osc FM Amount- Osc 1-3
Osc Random Tune- Osc 1-3
Osc Shape- Osc 1-3
Osc Volume- Osc 1-3
Osc Pan- Osc 1-3
Filt Cutoff
Filt Resonance

The following are available under FM Synthesis only:
Osc Frequency- Osc 1-6
Osc Random Tune- Osc 1-6
Osc Amount- dependent on the number of enabled osc routes
Osc Volume- Osc 1-6
Osc Pan- Osc 1-6
Filt Cutoff
Filt Resonance

The following are available under Reed Synthesis only:
Breath Pressure
Breath Noise
Reed Threshold
Reed Slope
Reed Curve
Bore Frequency
Bore Mix
Bore Gain
Bore Filter
Filt Cutoff
Filt Resonance

The following are available under Wind Synthesis only:
Breath Pressure
Breath Noise
Mouth Jet
Mouth Curve
Mouth Offset
Bore Frequency
Bore Mix
Bore Gain
Bore Filter
Filt Cutoff
Filt Resonance

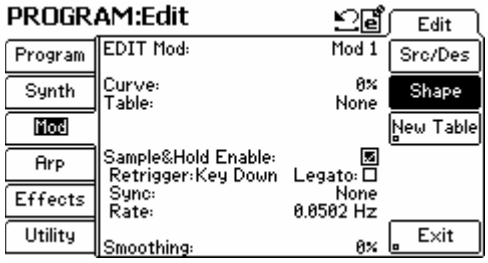
Menu: Program/Mod/Edit/Src/Des
Parameter: Type
Value Range: Additive, Multiplicative

This parameter determines how your modulation source interacts with the destination. The additive setting takes your modulation source and adds it to your destination whereas the multiplicative setting scales your modulation source and destination.

Menu: Program/Mod/Edit/Src/Des
Parameter: Amount
Value Range: -100% to +100%

This parameter sets the strength of modulation from your source to your destination. For example, if you have set your source to envelope and your destination to pitch, then as your amount value gets closer to 100% (or -100%), the changes in pitch will become more pronounced.

The effect of the modulation is described in parenthesis below the amount parameter you are editing.



Menu: Program/Mod/Edit/Shape
Parameter: EDIT Mod
Value Range: Mod 1 up to Mod 32 (depends on how many Mod Routes you've created in the Program/Mod/Routes menu)

Select the Modulation Route you'd like to edit here.

Menu: Program/Mod/Edit/Shape
Parameter: Curve
Value Range: -100% to 100%

This parameter changes the feel and sound of your modulation by applying a logarithmic or exponential transfer function to the source. A setting of "0%" has no effect since it yields a linear (i.e., flat) slope.

Menu: Program/Mod/Edit/Shape
Parameter: Sample&Hold Enable
Value Range: On, Off

Sample and Hold is a feature of a modulation route where the source of the route is "sampled". Let's say the source of your modulation route is an LFO. That LFO is sampled (i.e., a reading of the LFO's current amplitude is taken at regular intervals), the amplitude is held for a period of time – and the result is a modified mod source which then affects the destination of the route. So, the output of the S & H function becomes a series of "steps" rather than an LFO. The amplitude of those steps at any given time depends on the relationship between the sampling rate (see "Rate" parameter below) and the rate of change of the source being sampled.

This parameter lets you enable or disable the Sample & Hold functionality for your currently selected Mod Route.

Menu: Program/Mod/Edit/Shape
Parameter: Retrigger [only visible if "Sample&Hold Enable" is enabled]
Value Range: None, Key Down, Key Up, FS Down, FS Up, T1 Down, T2 Down, T3 Down, T4 Down, T1 Up, T2 Up, T3 Up, T4 Up

This allows you to select a trigger that restarts the Sample & Hold clock. For example: If you select T1, your Sample & Hold will restart whenever you push the T1 button. The following chart explains what each trigger setting means:

None	When set to "None" you have one free running Sample & Hold across all voices
Key Down	Each voice's Sample & Hold's clock is retriggered when you play a key
Key Up	The Sample & Hold restarts when a note is released
Foot Switch Dn	The Sample & Hold restarts when foot switch is pressed
Foot Switch Up	The Sample & Hold restarts when the foot switch is released
Trigger 1-4 Dn	The Sample & Hold restarts when the T1-T4 buttons are pressed
Trigger 1-4 Up	The Sample & Hold restarts when the T1-T4 buttons is released

Menu: Program/Mod/Edit/Shape
Parameter: Legato
Value Range: On, Off

Legato mode keeps the trigger from restarting if you play in legato fashion (i.e., you play a note before releasing the last note played).

Menu: Program/Mod/Edit/Shape
Parameter: Sync
Value Range: None, 8 Whole Notes, 6 Whole Notes, 4 Whole Notes, Triple Whole Notes, Double Whole Notes, Dotted Whole Note, Whole Note, Dotted Half Note, Half Note, Dotted Quarter, Half Note Triplet, Quarter Note, Dotted 8th Note, Quarter Triplet, 8th Note, Dotted 16th Note, 8th Note Triplet, 16th Note, 16th Note Triplet, 32nd Note

Synchronizes your Sample & Hold function to the tempo (see p. 37 for more about setting your tempo). This is important if you want your Sample & Hold modulations to be synced with the tempo.

Menu: Program/Mod/Edit/Shape
Parameter: Rate [Only visible if "Sync" parameter is set to "None"]
Value Range: 0.0200 Hz to 200 Hz

Sets the rate of your Sample & Hold clock.

Menu: Program/Mod/Edit/Shape
Parameter: Smoothing
Value Range: 0 to 100%

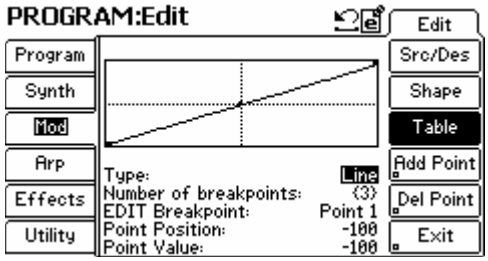
Smoothing is analogous to the "Portamento" parameter as it applies to notes. This parameter smoothes out the transitions to be less abrupt. Low values cause your changes to be abrupt, whereas higher values cause transitions to be smoothed out.

Menu: Program/Mod/Edit/Shape
Parameter: New Table
Value Range: (none)

This button creates a "custom table" on which you can plot your own transfer function for the current modulation route. A program can only have one table at a time—once you create a table the "New Table" button is replaced with a "Del Table" button that deletes the table.

Menu: Program/Mod/Edit/Shape
Parameter: Del Table (only available when a table has been created)
Value Range: (none)

This button deletes the table that has been created for the current program.



Menu: Program/Mod/Edit/Table
Parameter: Type
Value Range: Line, Curve and Step

This parameter determines how the table interpolates between points. The "line" creates straight lines between points, whereas the "curve" setting creates gradual changes between the points. Finally, the "step" creates abrupt changes at the point value.

Menu: Program/Mod/Edit/Table
Parameter: Number of Breakpoints
Value Range: 1 up to 16

Every table on the Fusion can have up to 16 breakpoints. This parameter cannot be edited—it simply tells you how many breakpoints have been created.

Menu: Program/Mod/Edit/Table
Parameter: EDIT Breakpoint
Value Range: 1 to 16 [varies depending on how many breakpoints have been created]

This parameter lets you select a breakpoint for editing.

About Breakpoints:

When editing breakpoints on the Fusion, the point with the smallest "Point Position" value automatically becomes breakpoint #1.

In other words, let's say you have breakpoint #1 with its Point Position set to "-25" and breakpoint #2 set to "-10." If you take the second point and reduce its value to "-35" the second breakpoint automatically turns into #1 and the first breakpoint (which is still set at "-25") now becomes breakpoint #2.

This may sound confusing being explained here, but in practice it makes editing tables easier since you always know your breakpoints are always arranged from smallest to largest as they appear from left to right on screen.

Menu: Program/Mod/Edit/Table
Parameter: Point Position
Value Range: -100 to +100

This parameter lets you place a point along the X-axis of your table. A setting of -100 places your point all the way to the left of the table whereas a setting of +100 sets you all the way to the right. A setting of 0 places you in the middle of the table.

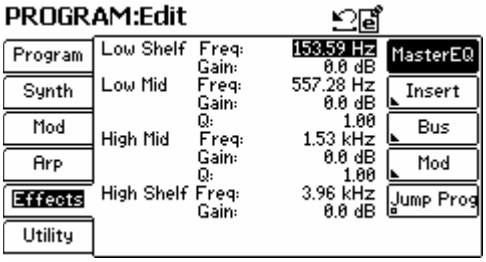
Menu: Program/Mod/Edit/Table
Parameter: Point Value
Value Range: -100 to +100

This parameter sets the Y-axis position of your table point. Positive values place your point on the upper half of the table whereas negative values place you on the lower half of the table.

Effects

Master EQ

The MasterEQ section is a global equalization curve that is applied to all sound before it leaves the "Main Outs" of the Fusion. Take a look at the Output Block Diagram on page 262 to see where the MasterEQ is located in your signal path.



Menu: (various modes)/Effects/MasterEQ
Parameter: Low Shelf Freq
Value Range: 20.00Hz to 1000.00 Hz

Recording engineers refer to a wide-bandwidth boost (or cut) at the ends of the spectrum as a "shelf." This is because if you graph the equalization curve, it looks like a shelf (or a plateau) that sits at the ends of the frequency spectrum.

This parameter sets the cutoff point for your low frequency shelving filter. All frequencies below this setting will be boosted (or cut) depending on your "Low Shelf Gain" setting (see below).

Menu: (various modes)/Effects/MasterEQ
Parameter: Low Shelf Gain
Value Range: -18.0 to 18.0 dB

This parameter sets the amount of gain (or cut) in your Low Shelf.

Menu: (various modes)/Effects/MasterEQ
Parameter: Low Mid Freq
Value Range: 300.00 Hz to 10.00 kHz

This parameter sets the center frequency of your Low-Mid filter.

Note that there are no restrictions on center-frequency selection for the "Low Mid" and "High Mid" bands so it is possible to set your "Low Mid" center frequency higher than your "High Mid" frequency (or vise-versa).

Extreme EQ:

Setting extreme EQ boosts can overload the Fusion's outputs resulting in nasty distortion. If you find your output distorting after you've applied EQ, try turning down the gain.

Menu: (various modes)/Effects/MasterEQ
Parameter: Low Mid Gain
Value Range: 18.0 to 18.0 dB

This parameter sets the amount of gain (or cut) in your Low-Mid Gain.

Menu: (various modes)/Effects/MasterEQ
Parameter: Low Mid Q
Value Range: 0.50 to 4.00

The "Q" of a filter describes how "wide" or "narrow" the filter is. A filter with a Q value closer to .50 is considered to be a "wide" filter that rolls off gradually and affects lots of frequencies around its center-frequency. Conversely, a filter with a high Q value (near 4.00 for example) is an extremely "narrow" filter with a sharp cutoff that only affects frequencies very close to the center-frequency setting while leaving the rest of your signal unaffected.

Menu: (various modes)/Effects/MasterEQ
Parameter: High Mid Freq
Value Range: 300.00 to 10.00 kHz

This parameter sets the center frequency of your High-Mid filter.

Again, note that there are no restrictions on center-frequency selection for the "Low Mid" and "High Mid" filter bands so it is possible to set your "High Mid" center frequency lower than your "Low Mid" frequency (or vise-versa).

Menu: (various modes)/Effects/MasterEQ
Parameter: High Mid Gain
Value Range: 18.0 to 18.0 dB

This parameter sets the amount of gain (or cut) in your High-Mid Filter.

Menu: (various modes)/Effects/MasterEQ
Parameter: High Mid Q
Value Range: 0.50 to 4.00

This parameter is identical in function to "Low Mid Q." See the "Low Mid Q" description in the section above.

Menu: (various modes)/Effects/MasterEQ
Parameter: High Shelf Freq
Value Range: 500.00 Hz to 10.00k Hz

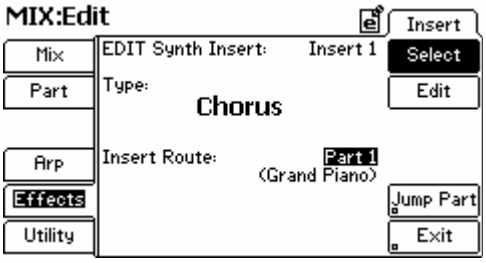
This parameter sets the cutoff point for your high frequency shelving filter. All frequencies above this setting will be boosted (or cut) depending on your "High Shelf Gain" setting (see below).

Menu: (various modes)/Effects/MasterEQ
Parameter: High Shelf Gain
Value Range: 18.0 to 18.0 dB

This parameter sets the amount of gain (or cut) in your High Shelf.

Insert Effects

An "insert" is any effect that is inserted into the signal path between the program's output and the Fusion's mixer. This menu allows you to select the type of effect you want to use, as well as that effect's parameters. Take a look at the Output Block Diagram on page 262 to see how the Insert effects are routed.



[Note: The image above is taken from Mix mode whereas most other images in this chapter have been taken from the Program mode. This is because Mix and Song modes have a few additional parameters that are not included in Program mode.]

Menu: (various modes)/Effects/Insert/Select
Parameter: EDIT Synth Insert (only available in Mix and Song modes. Program mode has one insert available.)
Value Range: Insert 1 – 4

Song and Mix modes have up to four inserts available. Select the insert you'd like to edit here.

Note that this parameter is not available when you are in Program mode. Program mode has one insert available.

Menu: (various modes)/Effects/Insert/Select
Parameter: Type
Value Range: (varies; see page 264 for complete list)

Select the type of effect you'd like to use with this parameter. The large text just below describes the effect you'll be hearing.

Please see page 264 for a detailed description of each Insert effect.

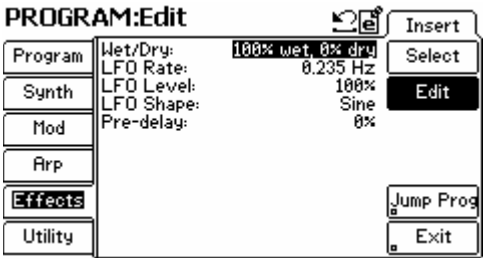
Menu: (various modes)/Effects/Insert/Select
Parameter: Insert Route
Value Range: (Varies depending on mode)

The settings of this parameter vary depending on what mode you are in. The following will explain how insert mode works in each mode:

Program Mode: Insert Route determines whether or not the effect is inserted into the signal path. Setting this parameter to "On" will insert the effect into the signal path whereas setting this parameter to "off" will bypass the effect completely.

Mix & Song Modes: In Mix and Song modes, you have a total of four inserts available for all of the parts in your mix (or tracks of your song.) This parameter selects what part (or track) your current insert will be placed on.

Note that once you place an insert on one part (or track if you are in song mode), the insert is no longer available for placement on other parts (or tracks). Also note that insert effects cannot by applied to an audio track.



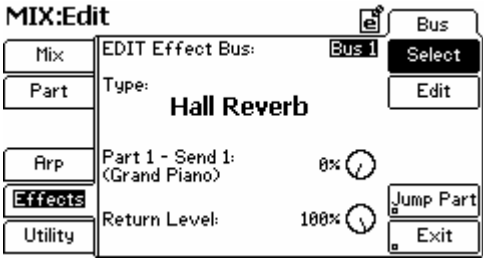
Menu: (various modes)/Effects/Insert/Edit
Parameter: Varies
Value Range: Varies depending on your selection of insert "Type" (see above)

This menu lets you adjust and fine tune your insert effect settings. The parameters listed in this menu will change depending on what kind of insert you have selected (using the "Type" parameter in the Program/Effects/Insert/Select menu).

See page 264 for a detailed description of each Insert effect's parameters.

Bus Effects

Each Program on the Fusion has two effects sends. This menu lets you assign the type of effect as well as send and return levels. Take a look at the Output Block Diagram on page 262 to see how the Bus Sends are routed.



[Note: The image above is taken from Mix mode whereas most other images in this chapter have been taken from the Program mode. This is because Mix and Song modes have a few additional parameters that are not included in Program mode.]

Menu: (various modes)/Effects/Bus/Select
Parameter: EDIT Effect Bus
Value Range: Bus 1, Bus 2

Each program, mix, or song has two send busses for effects. Select which one you'd like to edit using this parameter.

Menu: (various modes)/Effects/Bus/Select
Parameter: Type
Value Range: (varies; see page 273 for complete list of effects)

Select the type of effect you'd like to use with this parameter. The name of the effect is listed in large letters on the screen just below the "Type" parameter.

Please see page 273 for a detailed description of each Send effect.

Menu: (various modes)/Effects/Bus/Select
Parameter: (Only visible when you are in Mix or Song modes—it is not required in Program mode.)
Value Range: Varies depending on if you are in Program, Mix, or Song modes

The settings of this parameter vary depending on what mode you are in. The following will explain how this parameter works in each mode:

Mix & Song Modes:	In Mix and Song modes, you have up to 16 different parts and each part has its own send level. Use this parameter to select an individual part you'd like to edit.
Program Mode:	Since you can only load one program at a time in Program mode, you are not given the option of selecting any other programs.

Menu: (various modes)/Effects/Bus/Select
Parameter: Send Level
Value Range: 0 – 100 %

This parameter determines how much of your program output is being sent to the effects bus. A "dry" setting of 0% means that none of your signal is being sent to the bus effects. A "wet" signal of 100% means that equal amounts of your original signal and effected signal are being routed to the output.

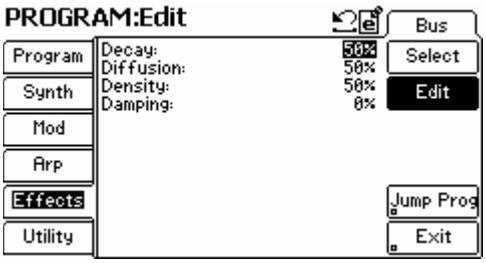
Menu: (various modes)/Effects/Bus/Select
Parameter: Return Level
Value Range: 0 – 100%

This parameter determines how much of your bus effect is mixed back into the main output. A high percentage will mix most or all of your effect back into the main bus whereas lower percentages will mix little or none of the effect into the output path.

Menu: (various modes)/Effects/Bus/Select
Parameter: Jump Prog (or "Jump Part" in Mix Mode or "Jump Trk" in Song Mode)
Action: Varies depending on whether you are in Program, Mix, or Song Modes

This quick access button is included for the convenience of the user. The button behaves differently depending on what mode you are in. The following explains how the button works in each mode:

Program Mode	In Program Mode, this button is labeled "Jump Prog" and takes you to the Program/Output page where you can set your send levels.
Mix Mode	In Mix Mode, this button is labeled "Jump Part" and takes you to the selected part's Part/Output page.
Song Mode	In Song Mode, this button is labeled "Jump Trk" and takes you to the selected track's Track/Output page.

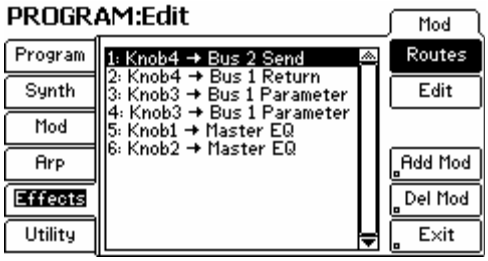


Menu: (various modes)/Effects/Bus/Edit
Parameter: Varies
Value Range: Varies depending on your selection of Bus Send "Type" (see above)

This menu lets you adjust and fine tune your bus effect settings. The parameters listed in this menu will change depending on what kind of bus effect you have selected (using the "Type" parameter in the Program/Effects/Bus/Select menu).

See section 264 for a detailed description of each effect and its parameters.

Creating and Deleting Effects Modulation Routes



Menu: (various modes)/Effects/Mod/Routes
Parameter: Add Mod
Value Range: (none)

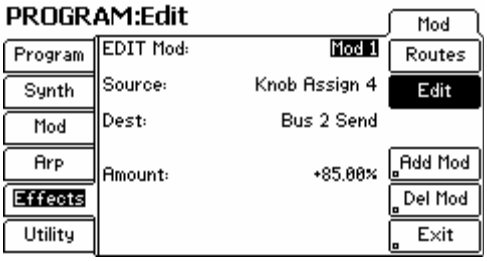
This button creates a new modulation route and automatically takes you to the "Edit" screen for that route so you can assign Sources and Destinations (as well as other parameters depending on the type of route you're trying to make). You can create up to 32 routes for each program.

Menu: (various modes)/Effects/Mod/Routes
Parameter: Del Mod
Value Range: (none)

This button lets you delete the mod route that is currently selected. A confirmation prompt will appear to keep you from accidentally deleting an existing route.

Editing Your Effects Modulation Routes

As you jump into the "Edit" menu, you can change the source/destination of each route as well as a number of other parameters associated with your source and destination. This menu is slightly tricky to document because the "Index" parameters automatically change depending on what you've assigned as your source and destination. If your screen appears slightly different from the one shown below, don't worry—you may have different sources and destinations selected.



Menu: (various modes)/Effects/Mod/Edit
Parameter: EDIT Mod
Value Range: Mod 1 up to Mod 32 (depends on how many Mod Routes you've created in the Synth/Mod/Routes menu)

Select the Modulation Route you'd like to edit here.

Menu: (various modes)/Effects/Mod/Edit
Parameter: Source
Value Range: Mod Wheel, Foot Pedal, Switch S1-S2, Knob Assign 1-4, Trigger T1-T4, Foot Switch, Sustain Pedal, Pitch Wheel, Aftertouch

Select the source for the current mod route you'd like to edit here.

Menu: (various modes)/Effects/Mod/Edit
Parameter: Dest
Value Range: None, Master EQ, Bus 1 Send, Bus 1 Return, (B1), Bus 2 Send, Bus 2 Return, (B2),(I1)

Select the destination for the current mod route you'd like to edit here. Some settings will need to be defined more precisely for a modulation route to be created. In such cases, a "sub-parameter" will appear below the "Dest" parameter. For example, if you select "Master EQ," you'll need to define which band of the Master EQ (Low Freq, Low-Mid, Mid-High, High) you want to route something to. These options will appear on screen as they are needed.

Menu: (various modes)/Effects/Mod/Edit
Parameter: Amount
Value Range: -100% to +100%

This parameter sets the strength of modulation from your source to your destination. For example, if you have set your source to envelope and your destination to pitch, then as your amount value gets closer to 100% (or -100%), the changes in pitch will become more pronounced.

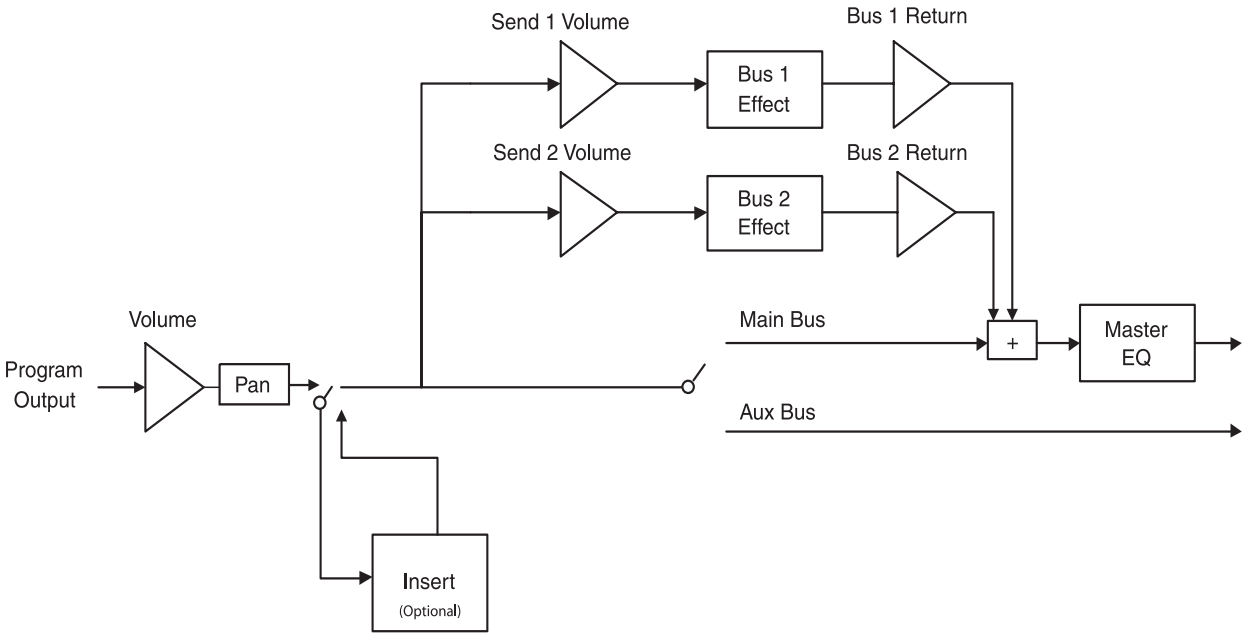
Menu: (various modes)/Effects/Mod/Edit
Parameter: Add Mod
Value Range: (none)

This button creates a new modulation route You can create up to 32 routes for each program.

Menu: (various modes)/Effects/Mod/Edit
Parameter: Del Mod
Value Range: (none)

This button lets you delete the mod route that is currently selected. A confirmation prompt will appear to keep you from accidentally deleting an existing route.

Output Block Diagram



This block diagram describes the flow of the signal after it leaves your Program. The triangles represent volume control points (engineers often use triangles in block diagrams to represent amplifiers).

Note that the Effect Sends are returned back only to the Main Bus. This means you will not hear any effects on your signal if you have routed the signal to the Aux Bus. If you route a signal to the Aux Bus and use Bus Effects (like reverb or delays, for example), only the effect will be present on the Main Bus whereas the original "dry" signal will be output from the Aux Bus.

Also, note that the MasterEQ section is only on the Main Bus and that EQ settings will be bypassed if you route your signal out of the Aux Bus.

Master EQ Effects Parameters

Parameter	Default	Range Low	Range High
Low Freq:	153.59 kHz	20 Hz	1000.00 Hz
Low Gain:	0.0 dB	18.0	18.0
Low Mid Freq	557.28 Hz	300 Hz	10.00 kHz
Low Mid Gain	0.0 dB	18.0	18.0
Low Mid Q	1.00	.50	4.00
High Mid Freq	1.53 kHz	300 Hz	10.00 kHz
High Mid Gain	0.0 dB	18.0	18.0
High Mid Q	1.00	.50	4.00
High Freq	3.96 kHz	500 Hz	10.00 kHz
High Gain	0.0 dB	18.0	18.0

Insert Effects Parameters

Chorus

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	0.235 Hz	0.100 Hz	4.800 kHz
LFO Level	100%	0%	100%
LFO Shape	Sine	Sine	Triangle
PreDelay	0	0	100

HP Chorus

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	0.235 Hz	0.100 Hz	4.800 kHz
LFO Level	100%	0%	100%
LFO Shape	Sine	Sine	Triangle
LFO Phase	Unison	Contrary, Unison	Quadrature
PreDelay	0%	0%	100%
HP Cutoff	153.59%	20.00 Hz	1000.00 kHz

Overdrive Chorus

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	0.235 Hz	0.100 Hz	4.800 kHz
LFO Level	100%	0%	100%
LFO Shape	Sine	Sine	Triangle
LFO Phase	Unison	Contrary, Unison	Quadrature
PreDelay	30%	0%	100%
Drive	40%	0%	100%

Flanger

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
LFO Shape	Sine	Sine	Triangle
Mod Depth	50%	0%	100%
Feedback	0%	0%	100%

Contrary Flanger

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Notch	50%	0%	100%
LFO Rate	1.014Hz	0.100 Hz	4.800 kHz
LFO Shape	Sine	Sine	Triangle
Mod Depth	50%	0%	100%
Feedback	0%	0%	100%

Quadrature Flanger

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Notch	50%	0%	100%
LFO Rate	1.014Hz	0.100 Hz	4.800 kHz
LFO Shape	Sine	Sine	Triangle
Mod Depth	50%	0%	100%
Feedback	0%	0%	100%

Inverse Flanger

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
LFO Shape	Sine	Sine	Triangle
Mod Depth	50%	0%	100%
Feedback	0%	0%	100%

Envelope Flanger

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Attack Speed	10%	0%	100%
Release Speed	50%	0.100 Hz	4.800 kHz
Sensitivity	100%	Sine	Triangle
Notch	10%	0%	100%
Feedback	-50%	-100%	100%
Mod Depth	75%	0%	100%

S&H Flanger

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Notch	50%	0%	100%
Feedback	-50%	-100%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%

S&H Cont Flanger

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Notch	50%	0%	100%
Feedback	-50%	-100%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%

S&H Quad Flanger

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Notch	50%	0%	100%
Feedback	-50%	-100%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%

Phaser

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Num Stages	12	4	12
Notch	75%	0%	100%
LFO Rate	0.473 Hz	0.100 Hz	4.800 kHz
Mod Depth	25%	0%	100%
LFO Shape	Sine	Sine	Triangle
Feedback	100%	-100%	100%

Contrary Phaser

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Num Stages	12	4	12
Notch	75%	0%	100%
LFO Rate	0.473 Hz	0.100 Hz	4.800 kHz
Mod Depth	25%	0%	100%
LFO Shape	Sine	Sine	Triangle
Feedback	100%	-100%	100%

Quadrature Phaser

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Num Stages	12	4	12
Notch	75%	0%	100%
LFO Rate	0.473 Hz	0.100 Hz	4.800 kHz
Mod Depth	25%	0%	100%
LFO Shape	Sine	Sine	Triangle
Feedback	100%	-100%	100%

Vintage Phaser

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Num Stages	12	4	12
Notch	75%	0%	100%
LFO Rate	0.473 Hz	0.100 Hz	4.800 kHz
Mod Depth	25%	0%	100%
LFO Shape	Sine	Sine	Triangle
Feedback	100%	-100%	100%

S&H Phaser

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Num Stages	12	4	12
Notch	75%	0%	100%
LFO Rate	0.473 Hz	0.100 Hz	4.800 kHz
Mod Depth	25%	0%	100%
Feedback	100%	-100%	100%

S&H Cont Phaser

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Num Stages	12	4	12
Notch	75%	0%	100%
LFO Rate	0.473 Hz	0.100 Hz	4.800 kHz
Mod Depth	25%	0%	100%
Feedback	100%	-100%	100%

S&H Quad Phaser

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Num Stages	12	4	12
Notch	75%	0%	100%
LFO Rate	0.473 Hz	0.100 Hz	4.800 kHz
Mod Depth	25%	0%	100%
Feedback	100%	-100%	100%

Rotary

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Motor Power	On	Off	On
Low Motor Rate	1.462 Hz	0.100 Hz	4.800 kHz
Low Rotor Depth	100%	0%	100%
High Rotor Rate	2.859 Hz	0.100 Hz	4.800 kHz
High Rotor Depth	100%	0%	100%

Overdrive Rotary

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Motor Speed	Fast	Slow	Fast
Motor Power	On	Off	On
Drive	25%	0%	100%
Low Rotor Depth	100%	0%	100%
High Rotor Depth	100%	0%	100%

Organ Rotary

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Motor Speed	Fast	Slow	Fast
Drive	25%	0%	100%

Stack Drive Distortion

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Drive	25%	0%	100%
Low EQ	0.0 dB	-18.0 dB	18 dB
Mid-Low EQ	0.0 dB	-18.0 dB	18 dB
Mid-High EQ	0.0 dB	-18.0 dB	18 dB
High EQ	0.0 dB	-18.0 dB	18 dB

Tube Overdrive

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Drive	50%	0%	100%
Low EQ	0.0 dB	-18.0 dB	18 dB
Mid-Low EQ	0.0 dB	-18.0 dB	18 dB
Mid-High EQ	0.0 dB	-18.0 dB	18 dB
High EQ	0.0 dB	-18.0 dB	18 dB

Chubby Cab

Parameter	Default	Range Low	Range High
Low EQ	0.0 dB	-18.0 dB	18 dB
Mid EQ	0.0 dB	-18.0 dB	18 dB
High EQ	0.0 dB	-18.0 dB	18 dB
Drive	50%	0%	100%
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry

Fat Cab

Parameter	Default	Range Low	Range High
Low EQ	0.0 dB	-18.0 dB	18 dB
Mid EQ	0.0 dB	-18.0 dB	18 dB
High EQ	0.0 dB	-18.0 dB	18 dB
Drive	50%	0%	100%
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry

Small Combo

Parameter	Default	Range Low	Range High
Low EQ	0.0 dB	-18.0 dB	18 dB
Mid EQ	0.0 dB	-18.0 dB	18 dB
High EQ	0.0 dB	-18.0 dB	18 dB
Drive	50%	0%	100%

Small Combo Off Axis

Parameter	Default	Range Low	Range High
Low EQ	0.0 dB	-18.0 dB	18 dB
Mid EQ	0.0 dB	-18.0 dB	18 dB
High EQ	0.0 dB	-18.0 dB	18 dB
Drive	50%	0%	100%

Blues Amp

Parameter	Default	Range Low	Range High
Low EQ	0.0 dB	-18.0 dB	18 dB
Mid EQ	0.0 dB	-18.0 dB	18 dB
High EQ	0.0 dB	-18.0 dB	18 dB
Drive	50%	0%	100%

Blues Amp Off Axis

Parameter	Default	Range Low	Range High
Low EQ	0.0 dB	-18.0 dB	18 dB
Mid EQ	0.0 dB	-18.0 dB	18 dB
High EQ	0.0 dB	-18.0 dB	18 dB
Drive	50%	0%	100%

Stack Amp

Parameter	Default	Range Low	Range High
Low EQ	0.0 dB	-18.0 dB	18 dB
High EQ	0.0 dB	-18.0 dB	18 dB
Drive	50%	0%	100%

2 Band, 2 Shelf PEQ

Parameter	Default	Range Low	Range High
Low Shelf Freq:	101.88 Hz	20 Hz	1000 kHz
Low Gain:	0.0 dB	18.0	18.0
High Shelf Freq	6.86 kHz	500 Hz	10.00 kHz
High Gain	0.0 dB	18.0	18.0
Band1 Freq	397.70 Hz	300 Hz	10.00 kHz
Band1 Gain	0.0 dB	18.0	18.0
Band1Q	1.00	0.50	4.00
Band2 Freq	1.83 kHz	300 Hz	10.00 kHz
Band2 Gain	0.0 dB	18.0	18.0
Band2 Q	1.00	0.50	4.00

4 Band PEQ

Parameter	Default	Range Low	Range High
Band1 Freq	397.70 Hz	300 Hz	10.00 kHz
Band1 Gain	0.0 dB	18.0	18.0
Band1Q	1.00	0.50	4.00
Band2 Freq	1.83 kHz	300 Hz	10.00 kHz
Band2 Gain	0.0 dB	18.0	18.0
Band2 Q	1.00	0.50	4.00
Band3 Freq	1.83 kHz	300 Hz	10.00 kHz
Band3 Gain	0.0 dB	18.0	18.0
Band3Q	1.00	0.50	4.00
Band4 Freq	1.83 kHz	300 Hz	10.00 kHz
Band4 Gain	0.0 dB	18.0	18.0
Band4 Q	1.00	0.50	4.00

Classic Compressor

Parameter	Default	Range Low	Range High
Attack	50%	0%	100%
Release	50%	0%	100%
Output Level	50%	0%	100%

Compressor

Parameter	Default	Range Low	Range High
Attack	50%	0%	100%
Release	50%	0%	100%
Threshold	50%	0%	100%
Output Level	50%	0%	100%

Classic Limiter

Parameter	Default	Range Low	Range High
Attack	50%	0%	100%
Release	50%	0%	100%
Output Level	50%	0%	100%

Expander/Gate

Parameter	Default	Range Low	Range High
Attack	50%	0%	100%
Release	50%	0%	100%
Threshold	50%	0%	100%
Ratio	50%	0%	100%

Slicer

Parameter	Default	Range Low	Range High
LFO Rate	21.891 Hz	0%	100%
MOD Depth	20%	0%	100%
LFO Phase	Quadrature	Contrary, Unison	Quadrature

Tremolo

Parameter	Default	Range Low	Range High
LFO Rate	4.800 Hz	0.100 Hz	4.800 Hz
MOD Depth	20%	0%	100%
LFO Shape	Sine	Sine	Triangle

Autopan

Parameter	Default	Range Low	Range High
LFO Rate	2.108 Hz	0.100 Hz	4.800 Hz
MOD Depth	50%	0%	100%
LFO Shape	Sine	Sine	Triangle

Ring Modulator

Parameter	Default	Range Low	Range High
LFO Rate	21.891 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%
LFO Shape	Quadrature	Contrary, Unison	Quadrature

Envelope LP Filter

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Attack speed	50%	0%	100%
Release speed	50%	0%	100%
Sensitivity	50%	0%	100%
Filter Q	2.50	1.00	4.00

LFO LP Filter

Parameter	Default	Range Low	Range High
Center	1%	1%	100%
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
LFO Shape	Sine	Sine	Triangle
Mod Depth	50%	0%	100%

S&H LP Filter

Parameter	Default	Range Low	Range High
Frequency	73%	1%	100%
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

S&H Contrary LP

Parameter	Default	Range Low	Range High
Frequency	73%	1%	100%
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

S&H Quadrature LP

Parameter	Default	Range Low	Range High
Frequency	73%	1%	100%
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

Envelope HP Filter

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Attack speed	10%	0%	100%
Release speed	50%	0%	100%
Sensitivity	50%	0%	100%
Resonance	66%	0%	100%

LFO HP Filter

Parameter	Default	Range Low	Range High
Center	1%	1%	100%
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
LFO Shape	Sine	Sine	Triangle
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

S&H HP Filter

Parameter	Default	Range Low	Range High
Freq	1.83 kHz	300 Hz	10.00 kHz
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

S&H Contrary HP

Parameter	Default	Range Low	Range High
Freq	1.83 kHz	300 Hz	10.00 kHz
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

S&H Quadrature HP

Parameter	Default	Range Low	Range High
Freq	1.83 kHz	300 Hz	10.00 kHz
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

Decimator

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%
LFO Shape	Sine	Sine	Triangle

Contrary Decimator

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%
LFO Shape	Sine	Sine	Triangle

Quadrature Decimator

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%
LFO Shape	Triangle	Sine	Triangle

Envelope Decimator

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Attack speed	50%	0%	100%
Release speed	50%	0%	100%
Sensitivity	100%	0%	100%
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Decimation	16.0	1.0	32.0
MOD Depth	20%	0%	100%

S&H Decimator

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%

S&H Cont Decimator

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%

S&H Quad Decimator

Parameter	Default	Range Low	Range High
Wet/Dry	100% wet, 0% dry	0% wet, 100% dry	100% wet, 0% dry
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%

Bus Effects Parameters

Hall Reverb

Parameter	Default	Range Low	Range High
Decay	28%	0%	100%
Diffusion	80%	0%	100%
Density	60%	0%	100%
Damping	34%	0%	100%

Plate Reverb

Parameter	Default	Range Low	Range High
Decay	60%	0%	100%
Diffusion	80%	0%	100%
Density	35%	0%	100%
Damping	30%	0%	100%

Room Reverb

Parameter	Default	Range Low	Range High
Decay	30%	0%	100%
Diffusion	70%	0%	100%
Density	100%	0%	100%
Damping	48%	0%	100%

Reverse Reverb

Parameter	Default	Range Low	Range High
Rate	50%	0%	100%
Time	50%	0%	100%
Damping	0%	0%	100%

Gated Hall Reverb

Parameter	Default	Range Low	Range High
Decay	50%	0%	100%
Diffusion	50%	0%	100%
Density	50%	0%	100%
Color	50%	0%	100%
Damping	0%	0%	100%
Attack	50%	0%	100%
Release	50%	0%	100%
Threshold	50%	0%	100%
Ratio	50%	0%	100%

Gated Reverse Reverb

Parameter	Default	Range Low	Range High
Decay	50%	0%	100%
Diffusion	50%	0%	100%
Damping	0%	0%	100%
Attack	50%	0%	100%
Release	50%	0%	100%
Threshold	50%	0%	100%
Ratio	50%	0%	100%

Input Gate Reverse

Parameter	Default	Range Low	Range High
Decay	50%	0%	100%
Diffusion	50%	0%	100%
Damping	0%	0%	100%
Attack	50%	0%	100%
Release	50%	0%	100%
Threshold	50%	0%	100%
Ratio	50%	0%	100%

Input Gate Hall

Parameter	Default	Range Low	Range High
Decay	50%	0%	100%
Diffusion	50%	0%	100%
Density	50%	0%	100%
Color	50%	0%	100%
Damping	0%	0%	100%
Attack	50%	0%	100%
Release	50%	0%	100%
Threshold	50%	0%	100%
Ratio	50%	0%	100%

Mono Delay

Parameter	Default	Range Low	Range High
Time	500 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Brightness	100%	0%	100%

Split Delay

Parameter	Default	Range Low	Range High
Left Time	250.0 ms	0.1 ms	340.0 ms
Left Fb	50%	0%	100%
Right Time	250.0 ms	0.1 ms	340.0 ms
Right Fb	50%	0%	100%
Brightness	100%	0%	100%

Slapback Delay

Parameter	Default	Range Low	Range High
Time	10.0 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Brightness	100%	0%	100%

Doubling Delay

Parameter	Default	Range Low	Range High
Time	60.0 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Brightness	100%	0%	100%

Tape Delay

Parameter	Default	Range Low	Range High
Time	500 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%

Overdrive Delay

Parameter	Default	Range Low	Range High
Time	500.0 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Drive	100%	0%	100%

Wah+Dist+ Delay

Parameter	Default	Range Low	Range High
Time	500.0 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Attack speed	10%	0%	100%
Release speed	50%	0%	100%
Sensitivity	50%	0%	100%
Resonance	66%	0%	100%
Drive	50%	0%	100%

Wah+OvDrv+ Delay

Parameter	Default	Range Low	Range High
Time	500.0 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Attack speed	10%	0%	100%
Release speed	50%	0%	100%
Sensitivity	50%	0%	100%
Resonance	66%	0%	100%
Drive	50%	0%	100%

Lowpass Delay

Parameter	Default	Range Low	Range High
Time	500 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Frequency	100%	0%	100%
Resonance	50%	0%	100%

Highpass Delay

Parameter	Default	Range Low	Range High
Time	500 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Frequency	100%	0%	100%
Resonance	50%	0%	100%

Growling Delay

Parameter	Default	Range Low	Range High
Time	500 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Attack Speed	10%	0%	100%
Release Speed	50%	0%	100%
Sensitivity	50%	0%	100%
Resonance	66%	0%	100%

Screaming Delay

Parameter	Default	Range Low	Range High
Time	500 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Attack Speed	10%	0%	100%
Release Speed	50%	0%	100%
Sensitivity	50%	0%	100%
Resonance	66%	0%	100%

Flanger+Delay

Parameter	Default	Range Low	Range High
Time	500.0 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Notch	50%	0%	100%
LFO Rate	1014 Hz	0.100 Hz	4.800 Hz
LFO Shape	Sine	Sine	Triangle
MOD Depth	50%	0%	100%
Feedback	0%	0%	100%

Chorus+Delay

Parameter	Default	Range Low	Range High
Time	500.0 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
LFO Rate	0.235 Hz	0.100 Hz	4.800 Hz
LFO Level	100%	0%	100%
LFO Shape	Sine	Sine	Triangle
Pre-delay	0%	0%	100%
LFO Phase	Quadrature	Contrary, Unison	Quadrature

Decimator Delay 1

Parameter	Default	Range Low	Range High
Time	500.0 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	4.800 Hz
MOD Depth	20%	0%	100%

Decimator Delay 2

Parameter	Default	Range Low	Range High
Time	500.0 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	4.800 Hz
MOD Depth	20%	0%	100%

Chorus

Parameter	Default	Range Low	Range High
LFO Rate	0.235 Hz	0.100 Hz	4.800 kHz
LFO Level	100%	0%	100%
LFO Shape	Sine	Sine	Triangle
PreDelay	0	0	100

Multi Chorus 1

Parameter	Default	Range Low	Range High
LFO Rate	0.235 Hz	0.100 Hz	4.800 kHz
LFO Level	50%	0%	100%

Multi Chorus 2

Parameter	Default	Range Low	Range High
LFO Rate	0.235 Hz	0.100 Hz	4.800 kHz
LFO Level	50%	0%	100%

Multi Chorus HP

Parameter	Default	Range Low	Range High
LFO Rate	0.235 Hz	0.100 Hz	4.800 kHz
LFO Level	50%	0%	100%
HP Cutoff	153.59	20.00 Hz	1000.00 Hz

Analog Multi Chorus

Parameter	Default	Range Low	Range High
LFO Rate	0.235 Hz	0.100 Hz	4.800 kHz
LFO Level	50%	0%	100%
Pre Delay	50.0 ms	0.1 ms	200.00 ms

Flanger

Parameter	Default	Range Low	Range High
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
LFO Shape	Sine	Sine	Triangle
Mod Depth	50%	0%	100%
Feedback	0%	0%	100%

HP Flanger

Parameter	Default	Range Low	Range High
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
LFO Shape	Sine	Sine	Triangle
Mod Depth	50%	0%	100%
Feedback	0%	0%	100%
HP Cutoff	153.59 Hz	20.00 Hz	1000.00 Hz

Contrary Flanger

Parameter	Default	Range Low	Range High
Notch	50%	0%	100%
LFO Rate	1.014Hz	0.100 Hz	4.800 kHz
LFO Shape	Sine	Sine	Triangle
Mod Depth	50%	0%	100%
Feedback	0%	0%	100%

Quadrature Flanger

Parameter	Default	Range Low	Range High
Notch	50%	0%	100%
LFO Rate	1.014Hz	0.100 Hz	4.800 kHz
LFO Shape	Sine	Sine	Triangle
Mod Depth	50%	0%	100%
Feedback	0%	0%	100%

Inverse Flanger

Parameter	Default	Range Low	Range High
Notch	50%	0%	100%
LFO Rate	1.014Hz	0.100 Hz	4.800 kHz
LFO Shape	Sine	Sine	Triangle
Feedback	0%	0%	100%

Envelope Flanger

Parameter	Default	Range Low	Range High
Attack Speed	10%	0%	100%
Release Speed	50%	0.100 Hz	4.800 kHz
Sensitivity	100%	Sine	Triangle
Notch	10%	0%	100%
Feedback	-50%	-100%	100%
Mod Depth	75%	0%	100%

S&H Flanger

Parameter	Default	Range Low	Range High
Notch	50%	0%	100%
Feedback	-50%	-100%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%

S&H Cont Flanger

Parameter	Default	Range Low	Range High
Notch	50%	0%	100%
Feedback	-50%	-100%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%

S&H Quad Flanger

Parameter	Default	Range Low	Range High
Notch	50%	0%	100%
Feedback	-50%	-100%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 khz
Mod Depth	50%	0%	100%

Phaser

Parameter	Default	Range Low	Range High
Num Stages	12	4	12
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%
LFO Shape	Sine	Sine	Triangle
Feedback	0%	-100%	100%

Contrary Phaser

Parameter	Default	Range Low	Range High
Num Stages	12	4	12
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%
LFO Shape	Sine	Sine	Triangle
Feedback	0%	-100%	100%

Quadrature Phaser

Parameter	Default	Range Low	Range High
Num Stages	12	4	12
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%
LFO Shape	Sine	Sine	Triangle
Feedback	0%	-100%	100%

S&H Phaser

Parameter	Default	Range Low	Range High
Num Stages	12	4	12
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%
LFO Shape	Sine	Sine	Triangle
Feedback	0%	-100%	100%

S&H Cont Phaser

Parameter	Default	Range Low	Range High
Num Stages	12	4	12
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%
Feedback	0%	-100%	100%

S&H Quad Phaser

Parameter	Default	Range Low	Range High
Num Stages	12	4	12
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%
Feedback	0%	-100%	100%

Vintage Phaser

Parameter	Default	Range Low	Range High
Num Stages	12	4	12
Notch	50%	0%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 kHz
Mod Depth	50%	0%	100%
LFO Shape	Sine	Sine	Triangle
Feedback	0%	-100%	100%

Rotary

Parameter	Default	Range Low	Range High
Motor Power	On	Off	On
Low Motor Rate	1.462 Hz	0.100 Hz	4.800 kHz
Low Rotor Depth	100%	0%	100%
High Rotor Rate	2.859 Hz	0.100 Hz	4.800 kHz
High Rotor Depth	100%	0%	100%

Overdrive Rotary

Parameter	Default	Range Low	Range High
Motor Speed	Fast	Slow	Fast
Motor Power	On	Off	On
Drive	25%	0%	100%
Low Rotor Depth	100%	0%	100%
High Rotor Depth	100%	0%	100%

Organ Rotary

Parameter	Default	Range Low	Range High
Motor Speed	Fast	Slow	Fast
Drive	25%	0%	100%

Rotary Delay

Parameter	Default	Range Low	Range High
Motor Speed	Fast	Slow	Fast
Motor Power	Fast	Slow	Fast
Drive	25%	0%	100%
Low Rotor Depth	100%	0%	100%
High Rotor Depth	100%	0%	100%
Time	500.00 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%

Delay Rotary

Parameter	Default	Range Low	Range High
Motor Speed	Fast	Slow	Fast
Motor Power	Fast	Slow	Fast
Drive	25%	0%	100%
Low Rotor Depth	100%	0%	100%
High Rotor Depth	100%	0%	100%
Time	500.00 ms	0.1 ms	680.0 ms
Feedback	50%	0%	100%

Rotary Room

Parameter	Default	Range Low	Range High
Motor Speed	Fast	Slow	Fast
Motor Power	Fast	Slow	Fast
Drive	25%	0%	100%
Low Rotor Depth	100%	0%	100%
High Rotor Depth	50%	0%	100%
Reverb Mix	50%	0.1 ms	680.0 ms
Decay	50%	0%	100%
Diffusion	50%	0%	100%
Density	50%	0%	100%
Damping	0%	0%	100%

Rotary Hall

Parameter	Default	Range Low	Range High
Motor Speed	Fast	Slow	Fast
Motor Power	Fast	Slow	Fast
Drive	25%	0%	100%
Low Rotor Depth	100%	0%	100%
High Rotor Depth	50%	0%	100%
Reverb Mix	50%	0.1 ms	680.0 ms
Decay	50%	0%	100%
Diffusion	50%	0%	100%
Density	50%	0%	100%
Damping	0%	0%	100%

S&H LP Filter

Parameter	Default	Range Low	Range High
Frequency	73%	1%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

S&H Contrary LP

Parameter	Default	Range Low	Range High
Frequency	73%	1%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

S&H Quadrature LP

Parameter	Default	Range Low	Range High
Frequency	73%	1%	100%
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

S&H HP Filter

Parameter	Default	Range Low	Range High
Freq	1.83 kHz	300 Hz	10.00 kHz
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

S&H Contrary HP

Parameter	Default	Range Low	Range High
Freq	1.83 kHz	300 Hz	10.00 kHz
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

S&H Quadrature HP

Parameter	Default	Range Low	Range High
Freq	1.83 kHz	300 Hz	10.00 kHz
LFO Rate	1.014 Hz	0.100 Hz	4.800 Hz
Mod Depth	50%	0%	100%
Resonance	30%	0%	100%

Decimator

Parameter	Default	Range Low	Range High
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%
LFO Shape	Triangle	Sine	Triangle

Contrary Decimator

Parameter	Default	Range Low	Range High
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%
LFO Shape	Triangle	Sine	Triangle

Quadrature Decimator

Parameter	Default	Range Low	Range High
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%
LFO Shape	Triangle	Sine	Triangle

S&H Decimator

Parameter	Default	Range Low	Range High
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%

S&H Cont Decimator

Parameter	Default	Range Low	Range High
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%

S&H Quad Decimator

Parameter	Default	Range Low	Range High
Decimation	16.0	1.0	32.0
LFO Rate	0.184 Hz	0.100 Hz	5000.000 Hz
MOD Depth	20%	0%	100%

MIDI Implementation Chart (Synthesizer)

Fusion Synthesizer Section (Fusion 6HD/8HD) 7/15/05 Version 1.00

Function		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1 — 16 1 — 16 each	1 — 16 1 — 16 each	Memorized
Mode	Default Messages Altered	Mode 3 X * * * * * * * *	Mode 3 X	
Note Number	True Voice	0 — 127 * * * * * * * *	0 — 127 0 — 127	
Velocity	Note On Note Off	O O	O O	
After Touch	Keys Ch's	X O[1]	O O	
Pitch Bend		O	O	
Control Change		O	O	
Program Change	True #	O 0 — 127 * * * * * * * *	O 0 — 127 0 — 127	
System Exclusive		O	O	
System Common	Song Pos Song Sel Tune	X X X	X X X	
System Realtime	Clock Commands	X X	X X	
Aux Messages	Local On/Off All Notes Off Active Sense Reset GM On	X O[3] X X X	O O X O[2] X	

Notes : [1] O,X selectable
[2] Recognized as All Notes Off
[3] On pressing [STOP]

Mode 1: OMNI ON, POLY Mode 3: OMNI OFF,POLY O : Yes
Mode 2: OMNI ON, MONO Mode 4: OMNI OFF, MONO X : No

MIDI Implementation Chart (Sequencer)

Fusion Sequencer Section (Fusion 6HD/8HD) 7/15/05 Version 1.00

Function		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1 — 16 1 — 16 each	1 — 16 1 — 16 each	Memorized
Mode	Default Messages Altered	Mode 3 X * * * * * * * *	Mode 3 X	
Note Number	True Voice	0 — 127 * * * * * * * *	0 — 127 0 — 127	
Velocity	Note On Note Off	O O	O O	
After Touch	Keys Ch's	X O[1]	O O	
Pitch Bend		O	O	
Control Change		O	O	
Program Change	True #	O 0 — 127 * * * * * * * *	O 0 — 127 0 — 127	
System Exclusive		O	O	
System Common	Song Pos Song Sel Tune	O O X	O O X	
System Realtime	Clock Commands	O X	O X	
Aux Messages	Local On/Off All Notes Off Active Sense Reset GM On	X O[3] X X X	O O X O[2] X	

Notes : [1] O,X selectable
[2] Recognized as All Notes Off
[3] On pressing [STOP]

Mode 1: OMNI ON, POLY Mode 3: OMNI OFF,POLY O : Yes
Mode 2: OMNI ON, MONO Mode 4: OMNI OFF, MONO X : No

B Frequently Asked Questions

1. Why are the 12 unlabeled buttons around the LCD called "soft-buttons?"

Most of the buttons on the Fusion are "hard wired." In other words, the "Program" button will always take you to the program screen and the "Inc" and "Dec" buttons will always increase and decrease your currently selected parameter. Soft-buttons, however, do not have "hard" assignments and can serve different functions depending on what is displayed on screen, hence, the term "soft-button."

2. Why do some menus say "pan" while others say "balance?" Isn't that the same thing?

The Fusion menus display "pan" when you're working with a mono sample and "balance" if you're using a stereo sample. Many people think these are the same but they are slightly different: When you pan a mono sound, you're moving that sound (in its entirety) to one part of the stereo field. On the other hand, if you take a stereo sample and you turn the balance knob, you're just hearing more of one side and less of the other—you're not actually panning the sound around.

That sounds complicated, so let's take a look at a concrete example to clarify: Let's say you have a mono sample with lots of bass and treble. If you pan that sound to the left, both the bass and the treble will move to the left. Now let's imagine you have that same sample in stereo, with the bass on the left and the treble on the right. If you turn the balance knob to the left, you'll be hearing more of the bass and less of the treble. The effect is similar to panning, but it's not technically the same thing.

We deliberately named them differently for two reasons:

1. It's technically a more accurate description (and we're geeky that way).

2. You'll never mistake a stereo sample for a mono one when programming the Fusion because now you know the difference between "Pan" and "Balance."

If nobody is around watching, go ahead and give yourself a high five!

3. Can I expand my Fusion's internal memory?

Yes! The Fusion's internal memory can be expanded from 64MB to 192MB allowing you to load more programs, mixes, and samples.

4. How can I expand the internal memory of my Fusion?

Upgrading your Fusion's memory requires opening up the unit and installing a special expansion board. This is not a trivial task and should only be performed by an authorized Alesis service center.

5. Why do you call the sounds on the Fusion "Programs?" Why not just call them "Instruments?"

We do this to avoid confusion. The word "instrument" is ambiguous and could potentially be confused with other things (such as the Fusion's actual hardware, or the source of a sample rather than the result of putting together a set of samples to form a program). On the other hand, "Program" has a specific definition that can't be confused.

6. Can I send and receive MIDI data through the Fusion's USB port?

That feature is not supported in the current version of the Fusion's operating system.

7. Does Alesis plan to release sound expansion Compact Flash cards?

There aren't any plans for Alesis sound expansion cards. However, you can save your custom programs, mixes, songs, samples, and arpeggiation patterns onto Compact Flash cards or your home computer (using the USB port). This makes it easy for Fusion users to swap files among themselves.

8. Can I load my Ion or Micron virtual-analog synth patches into the Fusion?

Unfortunately, this is not possible. The Fusion uses a fundamentally different synthesis engine that is not compatible with the Ion/Micron family of synthesizers. There is no way to translate the patches between the two synthesizers.

9. Can I use the Fusion as a control surface for the soft-synths on my computer?

Yes. You can configure the four Control knobs, T1-T4 trigger buttons, S1-S2 switches, foot switch, and expression pedal to output MIDI CC data that can be used to control software. Furthermore, the Fusion's transport controls send MMC data that can be used to control your computer's sequencing program (assuming your sequencing application supports MMC commands).

10. Do sample-based programs play samples direct-from-disk?

No. Program samples are first loaded into the Fusion's memory and then played back from memory.

11. Do sample-playback programs use compressed samples?

Yes, and no! We do use compression to save space, but it is a form of "lossless" compression. In other words, when the files are "decompressed" during playback, the samples are bit-for-bit identical to the original, uncompressed, sample. It's the best of both worlds!

C Troubleshooting

If you experience problems while operating your Fusion, please use the following table to check for possible causes and solutions before contacting Alesis customer service for assistance.

Symptoms	Cause	Solution
The display does not light up when the ON/OFF switch is turned on.	No power.	Check that the power cable is plugged in properly.
The LCD screen is appearing blank.	The Contrast Control knob is not adjusted properly.	Turn the Contrast Control knob until you can see the LCD screen clearly.
The LCD screen contrast changes after the unit has been on for a few minutes.	Temperature changes within the Fusion (or your room) can cause minor contrast changes on the LCD.	Adjust Contrast Control knob until you can see the LCD screen clearly. Once the Fusion has had a chance to warm up (after a few minutes) you won't have to adjust contrast again.
No sound.	Bad audio cabling or improper hookup.	Check your audio cables; if necessary, swap cables.
	Master Volume is turned down.	Raise the Master Volume knob on the performance panel.
	Local keyboard is disabled.	Make sure the "Local Control" is enabled in the Global/Settings/MIDI menu (see page 197.)
Notes sustain continuously.	Sustain pedal was plugged in after power was turned on.	Turn the unit's power off, wait a moment, and then turn it on again.
	Stuck notes due to incomplete MIDI data.	Press the STOP button on the transport panel.
Poor audio performance	Formatting of the internal hard disk via USB	If you need to format the Fusion's internal hard disk, make sure to do it using the "Format" function found in Global mode (see page 208).
Notes played from Fusion have a "doubled" or "flanged" sound	MIDI echo/Thru enabled on external MIDI device or computer	Disable MIDI echo/Thru on external MIDI device
		Turn "Local Control" off in the Global/Settings/MIDI menu (see page 197).

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Specifications

Sound Engine

Sound Generation: Dual TI processors

Polyphonic Voices: Varies depending on type of program loaded. Basic programs using minimal oscillators, filters, and envelopes play back the following number of voices on *each* engine (the Fusion has two voice engines in total):

Sample playback: 136 voices (272 total)
FM: 120 voices (240 total)
Virtual Analog: 70 voices (140 total)
Physical Model (Reed): 30 voices (60 total)
Physical Model (Wind): 24 voices (48 total)

Program Memory: Programs can be stored on the Fusion's internal memory, hard disk, or compact flash cards giving you virtually unlimited storage for your programs. The workstation ships with the following:

384 Preset programs
24 Drum kits
128 General MIDI programs (with 8 drum kits)
128 Mixes

Effects:
57 Insert Effects
64 Bus Effects
4 Band Master EQ (low shelf, low, mid, high mid, Hi shelve)

Sampling Inputs

(Using Minimum Gain)

Connectors: 2 Balanced ¼" TRS jacks
Input Impedance: 100 kΩ
Gain Trim Range: 0dB to 21dB
Signal To Noise Ratio: 102dB typ A-weighted
THD+N: 0.005% typ @ -1dBFS/1KHz
Frequency Response: +/-0.05 dB, 20-20KHz
Maximum Input Level: 3dBV

Multitrack Inputs

Connectors: 8 Balanced ¼" TRS jacks
Input Impedance: 16 kΩ

(+4dBu setting)
Signal To Noise Ratio: 107dB typ A-weighted
THD+N: 0.005% typ @ -1dBFS/1KHz
Frequency Response: +/-0.15 dB, 20-20KHz
Maximum Input Level: 19dBu

(-10dBV setting)
Signal To Noise Ratio: 104dB typ A-weighted
THD+N: 0.005% typ @ -1dBFS/1KHz
Frequency Response: +/-0.15 dB, 20-20KHz
Maximum Input Level: 6dBV

About these measurements:

All measurements done over a 20Hz – 20kHz range with a 1kHz sine wave at -1dBFS input.

These measurements were done under real-world conditions using a production model of the Fusion. The performance on your unit should be similar to what is listed here.

Audio Output

Output Connectors:	4 Impedance-Balanced 1/4" TRS jacks, ¼" TRS Headphone Jack
Signal To Noise Ratio:	105dB typ A-weighted
THD+N:	0.005% typ A-weighted
Frequency Response:	+/-0.15dB, 20-20KHz
Maximum Output Level:	+18dBV Main L/R, +15.8 dBV Aux 3-4
Output Impedance:	1kΩ

Physical

Keyboard:	Fusion 6HD: 61 keys (semi-weighted with aftertouch) Fusion 8HD: 88 keys (fully weighted with aftertouch)
Real-Time Controllers:	Four 360-degree Control Knobs with four layers of parameters (giving you 16 knobs in total), Assignable Modulation Wheel, Pitch Wheel
Pedal Jacks:	Sustain pedal, Assignable Footswitch, Assignable Expression Pedal
MIDI Connections:	MIDI In, MIDI Out, MIDI Thru
Audio Outputs:	Main L/R , Aux L/R, Headphone (1/4" TRS) S/PDIF (RCA), ADAT (Optical)
Dimensions (WxHxD):	Fusion 6HD: 35.5x14x4 in / 90.2x35.6x10.2 cm Fusion 8HD: 51.5x14x5 in / 130.8x35.6x12.7cm
Weight:	Fusion 6HD: 30.4 lbs / 13.8 kg Fusion 8HD: 58.4 lbs / 25.6 kg
Power Consumption:	50 Watts max (100-240VAC/50-60Hz)

Legal Information:

7-51-0174-C