Musician's Manual

SQ1 PLUS

PERSONAL MUSIC STUDIO

SQ2

ensoniq

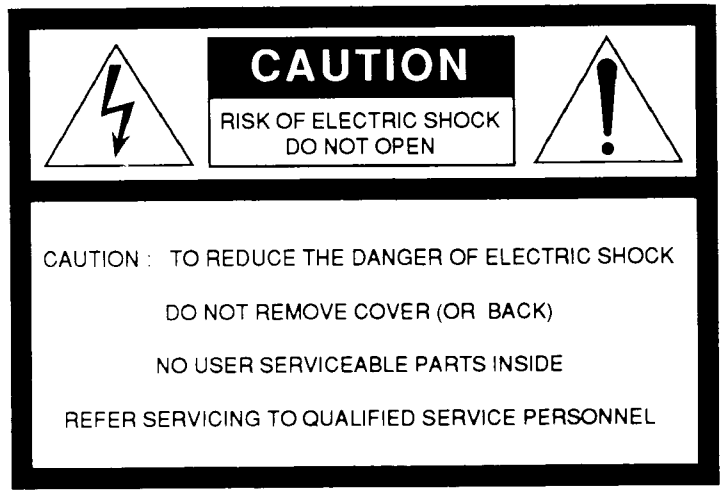
READ THIS FIRST!

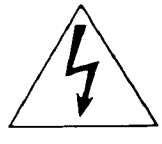
WARNING!!

Grounding Instructions

This product must be grounded. If it should malfunction or break down, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER: Improper connection of the equipment-grounding conductor can result in the risk of electric shock. Check with a qualified electrician or service personnel if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with this product — if it will not fit the outlet, have a proper outlet installed by a qualified electrician.





This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electronic shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

SEE IMPORTANT SAFETY INSTRUCTIONS ON BACK COVER!

ensoniq®

SQ–1 PLUS
SQ–2

Personal Music Studio

Musician's Manual
Version 1.0

SQ–1 PLUS/SQ–2 Musician's Manual:

Written, Designed,
and Illustrated by:

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If you have any questions concerning the use of this unit, please contact your authorized ENSONIQ dealer. For additional technical support, or to find the name of the nearest authorized ENSONIQ Repair Station, call ENSONIQ Customer Service at (215) 647-3930 Monday through Friday 9:30 a.m. to 6:30 p.m. Eastern Standard Time.

IMPORTANT:

"This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been designed to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures."

* reorient the receiving antenna
* relocate the instrument with respect to the receiver
* move the instrument away from the receiver
* plug the instrument into a different outlet so that the instrument and receiver are on different branch circuits

"If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: 'How to Identify and Resolve Radio-TV Interference Problems.' This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4."

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.

In order to fulfill warranty requirements, the SQ–1 PLUS/SQ–2 should be serviced only by an authorized ENSONIQ Repair Station. The ENSONIQ serial number label must appear on the outside of the Unit, or the ENSONIQ warranty is void.

Part # 9310 9801 01 - A

Model # MM-52

Introduction

Section 1 — Getting Started

Section 2 — System Control

Section 3 — Effects

Section 4 — Programming the SQ

Section 5 — Standard Programming

Section 6 — Drum Programming

Section 7 — Presets

Section 8 — Sequencer Basics

Section 9 — Sequencer Edit Functions

Welcome!

Congratulations, and thank you for your purchase of the ENSONIQ SQ–1 PLUS/SQ–2 Personal Music Studio. Your ENSONIQ SQ–1 PLUS/SQ–2 represents the latest advancements in affordable music technology from the company that first brought all the elements together for a self-contained MIDI recording package. The SQ–1 PLUS/SQ–2 combines a great sounding synthesizer, 24-bit digital effects, and a powerful 16 track sequencer featuring full mixdown capabilities. Together, they form a Personal Music Studio for your home.

The Synthesizer

The ENSONIQ SQ–1 PLUS/SQ–2's synthesizer section features 100 high fidelity sounds contained in ROM (Read Only Memory), with 80 additional slots in Internal Memory for sounds you create or edit. Optional RAM or ROM Cards allow access to 160 more sounds, for a massive 340 available at one time. Each SQ–1 PLUS/SQ–2 sound is created with three digital oscillators utilizing 124 sampled acoustic and synthetic waves, as well as ENSONIQ's unique Transwaves™ which possess great harmonic complexity and timbral motion.

The complement to this wide palette of tonal colors is an on-board programmable digital effects processor that adds a dimension of breadth and depth to each SQ–1 PLUS/SQ–2 sound. Various reverb, chorusing, flanging, delay, distortion, and even roto-speaker programs are provided with dynamic control over many of the settings.

The Sequencer

The onboard 16-track sequencer blends ease-of-use with advanced editing features generally found only in dedicated software sequencing programs. It can record 9,000 notes (expandable to 58,000 with the optional SQX-70 memory expansion kit) with a 96 ppq (pulses per quarter-note) clock resolution for dead-steady timekeeping. It will store up to 70 sequences, which can be combined into 30 songs. After recording tracks, editing features such as Quantization, Track Shifting, and Step Editing help you shape your music in ways you may have thought impossible, and always with the ability to audition your changes before making a decision. The Autopunch feature allows you to set Punch-In and Punch-Out points for hands free recording, just like in professional studios.

Each track of the sequencer can play internal sounds from the SQ–1 PLUS/SQ–2, sounds from external devices, or both, with each having its own MIDI Channel, MIDI program number, MIDI Status, and an adjustable output level. The sequencer track buttons also allow you to combine multiple internal and external sounds to create your own layers, splits, and overlaps to enhance your performance. This enables the SQ–1 PLUS/SQ–2 to act as a controller for a complete MIDI system.

Storage

The SQ–1 PLUS/SQ–2 uses credit card-style memory cards to store its sound and sequencer data. Sounds and sequencer data can also be saved via MIDI System Exclusive to any MIDI device which accepts and stores such data.

The Manual

You may have noticed that this manual refers to two different products, the ENSONIQ SQ–1 PLUS, and the ENSONIQ SQ–2. The SQ–1 PLUS has a 61 note keyboard, whereas the SQ–2 has a 76 note keyboard. In this manual when there are notable differences, the keyboards will be specifically addressed as the SQ–1 PLUS or the SQ–2. When the text pertains to both products, they will be mutually refered to as SQ.

This manual is your guide to unlocking the full power of the SQ. At this point, you're probably anxious to plug your SQ in and get playing. The first section, **Getting Started**, is a quick guide covering all the basics for plugging in, hooking up, and getting down to playing the SQ.

After the initial "I just gotta hear it" phase has passed and you're ready to utilize the full potential of the SQ, please take the time to read through the rest of the sections on programming, sequencing, and storage. They'll provide valuable information and tips, as well as speeding up the learning process and enjoyment of the instrument.

Thank you again for choosing ENSONIQ. Enjoy the music!

Section 1 — Getting Started

Turn It On

Insert the line cord into the line receptacle on the rear panel of the SQ, next to the Power switch. Plug the other end of the cable into a grounded AC outlet. (The proper voltage for your SQ is listed on the Serial Number label on the rear panel.) Turn the SQ power on and make sure the display lights up. If not, check your connections and power source.

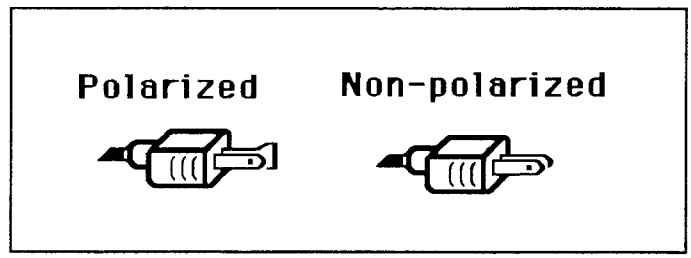
Power— Grounding Information

Like many modern electrical devices, your ENSONIQ product has a three-prong power cord with earth ground to ensure safe operation. Some products have power cords with only two prongs and no earth ground. To ensure safe operation, modern products with two-prong power cords have polarized plugs which can only be inserted into an outlet the proper way.

Some products, such as older guitar amplifiers, do not have polarized plugs and can be connected to an outlet incorrectly. This may result in dangerous high voltages on the audio connections that could cause you physical harm or damage any properly grounded equipment to which they are connected, such as your ENSONIQ product.

To avoid shock hazards or equipment damage, we recommend the following precautions:

- If you own equipment with two pronged power cords, check to see if they are polarized or non-polarized. You might consider having an authorized repair station change any non-polarized plugs on your equipment to polarized plugs to avoid future problems.



- Exercise caution when using extension cords or plug adapters. Proper polarization should always be maintained from the outlet to the plug. The use of polarized extension cords and adapters is the easiest way to maintain proper polarity.

- Whenever possible, connect all products with grounded power cords to the same outlet ground. This will ensure a common ground level to prevent equipment damage and minimize hum in the audio output.

AC outlet testers are available from many electronic supply and hardware stores. These can be used to check for proper polarity of outlets and cords.

AC Line Conditioning

As is the case with any computer device, the SQ is sensitive to sharp peaks and drops in the AC line voltage. Lightning strikes, power drops, or sudden and erratic surges in the AC line voltage can scramble the internal memory, and in some cases, damage the unit's hardware. Here are a few suggestions to help guard against such occurrences:

- A Surge/Spike Suppressor. The cheaper of the options, a surge/spike suppressor absorbs surges and protects your gear from all but the most severe over-voltage conditions. You can get multi-outlet power strips with built-in surge/spike suppressors for little more than the cost of unprotected power strips, so using one is a good investment for all your electronic equipment.

- A Line Conditioner. This is the best, but by far the more expensive way to protect your gear. In addition to protecting against surges and spikes, a line conditioner guards the equipment against excessively high or low line voltages. If you use the SQ in lots of different locations with varying or unknown AC line conditions, you might consider investing in a line conditioner.

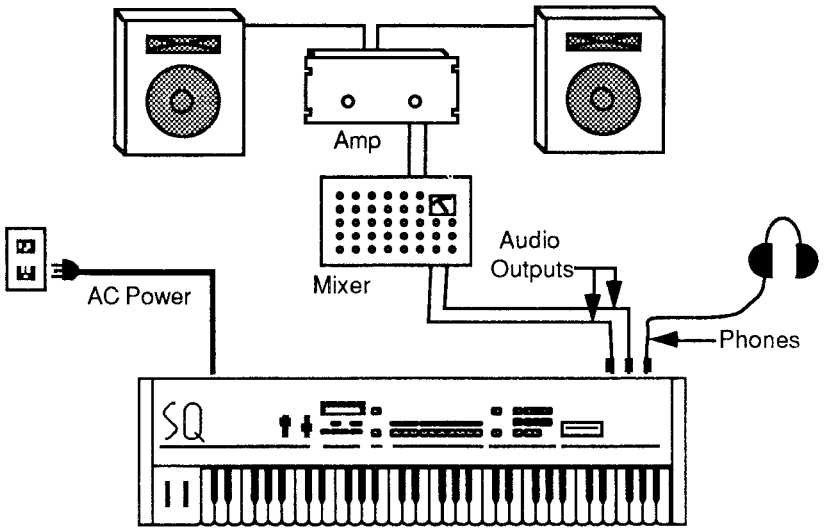
Temperature Guidelines

The inner workings of the SQ contain a substantial amount of computerized and electronic circuitry that can be susceptible to damage when exposed to extreme temperature changes. When the SQ is brought inside after sitting in a cold climate (i.e. the back seat of your car), condensation builds up on the internal circuitry in much the same way a pair of glasses fogs up when when you come inside on a cold day. If the unit is powered up as this condensation occurs, components can short out or be damaged. Excessively high temperatures also pose a threat to the unit, stressing both the internal circuits as well as the case. With this in mind, it is highly advisable to follow these precautions when storing and setting up your SQ:

- Avoid leaving the SQ in temperatures of less than 50 degrees Fahrenheit or more than 100 degrees Fahrenheit.
- When bringing the SQ indoors after travel, allow the unit at least twenty minutes to reach room temperature before powering up. In the case of excessive outdoor temperatures (below 50 degrees Fahrenheit or above 100 degrees Fahrenheit), allow an hour or more before power up.
- Avoid leaving the SQ inside a vehicle exposed to direct sunlight.

Amplification

Connect the Audio Outputs of the SQ to the line level inputs of a mixer, instrument amplifier, stereo, or any other sound system using 1/4 inch audio cables. If your system is stereo, connect the Left and Right Outputs to two channels of your mixer, stereo, etc. If it's mono, use either of the Audio Outputs but make sure nothing is plugged into the other output. For listening through headphones, plug the phones into the rear-panel jack marked *Phones*. If you're running the SQ through a mixer in stereo, be sure to pan the Left input fully left, and the Right input fully right.



It is a good idea to make sure your audio system is turned off (or down) when making connections to avoid damaging speakers or other components.

Warning: The SQ outputs are line-level and are intended to be connected only to line-level inputs such as those on a mixer, stereo pre-amp, keyboard amp, etc. Connecting the SQ audio outputs to a mic-level input, such as a guitar amp or the microphone jacks on a tape deck is not recommended and might result in damage to the device input.

Move the volume fader *all the way up*. As with any digital musical instrument, the SQ will give the best results if you keep the volume slider as high as possible without overloading your sound system, and use the volume control on your mixer or amp to adjust its level.

Switch the audio system on and adjust the amplifier volume for normal listening levels. If you hear no sound while playing the keyboard, switch the audio system off and check your connections.

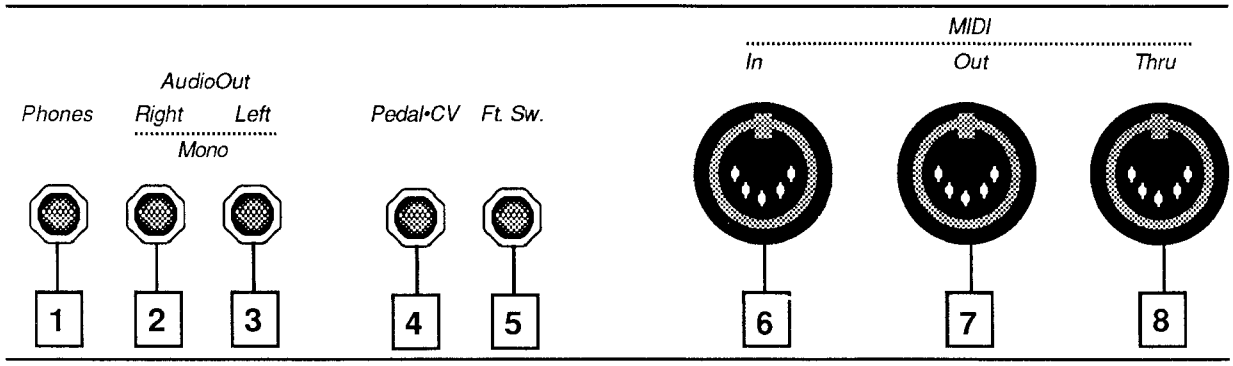
Running Your SQ Through a Home Stereo System

If you are thinking about amplifying your SQ through your home stereo, a word of caution is in order. A home stereo is great for playing CD's, albums, tapes — the dynamic range of these media is limited, and your speakers aren't usually subjected to extreme volume changes and frequency transients. While the dynamic range of CD's is significantly greater than LP's or tapes, the output of a CD player is still conservative compared to the uncompressed, unlimited line-level output of a pro-level keyboard. Running your SQ, or any pro-level keyboard through a home stereo at high volume levels can damage your speakers. If your only means of amplification is your home stereo, then try to keep your levels on the conservative side.

Powering Up Your SQ In a MIDI Configuration

Just as you would power up the individual components before turning on the amplifier in your home stereo system, you should first turn on the MIDI data transmiting source (keyboards, modules, etc.) before you power up the recieving MIDI source. This will prevent any unwanted MIDI information from being "spit" out of the transmitting source during power up, which could confuse the MIDI recievers, thereby disabling them. If this should occur, turn off the recieving module, and then turn it back on.

Rear Panel Connections



1) Phones

To listen to the SQ in stereo through headphones, plug the phones into this jack. Headphone volume is controlled by the volume slider on the front panel. (Note that plugging headphones into this jack *does not* automatically turn off the audio in the regular left and right outputs.)

2) Right/Mono Output

To operate the SQ in stereo, connect this output to a channel of your mixer and pan that channel right. Note that *either* of the audio outputs can be used as a mono output. If you want to use this jack to listen to the outputs in mono, make sure that nothing is connected to the Left/Mono Output jack.

3) Left/Mono Output

When operating the SQ in stereo, connect this output to a channel of your mixer and pan that channel left. To use this jack to listen to the outputs in mono, make sure that nothing is connected to the Right/Mono Output jack.

4) Pedal/CV

This jack is for connecting an optional ENSONIQ Model CVP-1 Control Voltage Foot Pedal, which is assignable as a modulator to various parameters within the SQ. The pedal gives you a handy alternative modulation source when, for example, you would want to use the mod wheel but both hands are busy.
A CV pedal plugged into this jack can also act as a volume pedal, controlling the overall volume level of the SQ.

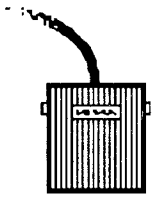
Pedal/CV Specs: 3-conductor (Tip=control voltage input, Ring=2 K Ohm resistor to +12 Volts, Sleeve= ground). 68 K Ohm input impedance, DC coupled. Input voltage range=0 to 10 volts DC. Scan rate=32mS (maximum recommended modulation input= 15 Hz). For use with an external control voltage, use a 2-conductor cable with the voltage on the tip and the sleeve grounded.

5) Foot Switch Input

This jack supports either one or two Foot Switches depending on what is plugged into it:

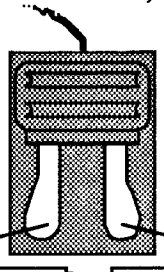
- If you plug the ENSONIQ Model SW-1 Foot Switch (which came with your SQ) into this jack, it will act as a sustain pedal. Holding it down will cause a note to continue to sustain after the key has been released.
- Or you can connect the optional ENSONIQ Model SW-5 Dual Foot Switch here. The SW-5 is a dual (piano-type) foot switch with two separate pedals. When the SW-5 is connected, the right-hand pedal will act as a sustain pedal and the left-hand pedal will act as an Auxiliary Foot Switch.

When the SW-1 is connected to the Foot Switch jack:



It acts as the Sustain Foot Switch.

When the SW-5 is connected to the Foot Switch jack:



The left pedal acts as the Aux. Foot Switch.

The right pedal acts as the Sustain Foot Switch.

There are two parameters in the System Bank which let you reassign the foot switches to a variety of functions, including sostenuto and starting and stopping the sequencer. See System Bank, Section 2 for more.

6) MIDI In

Receives MIDI (Musical Instrument Digital Interface) information from other MIDI instruments or computers.

7) MIDI Out

Sends out MIDI information to other instruments and computers.

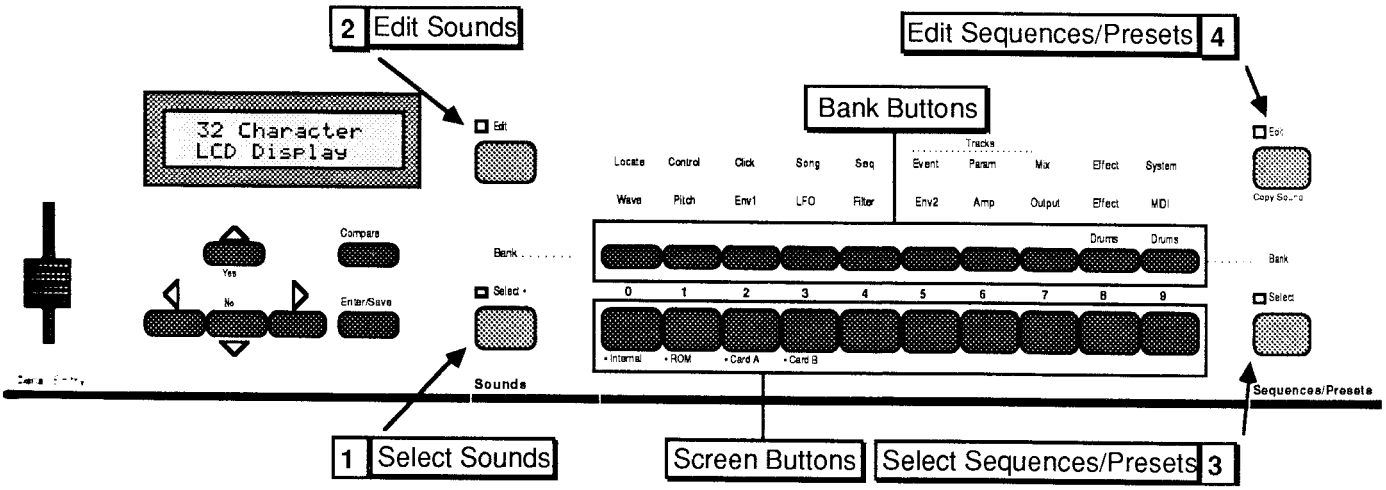
8) MIDI Thru

"Passes on" all MIDI information received by SQ to other devices. Information generated by the SQ itself does not go to this jack — the Thru jack merely echoes what comes in at the MIDI In jack.

The Front Panel — Communicating with the SQ

Almost everything you do on the SQ — whether it's selecting a sound, editing that sound, adjusting the tuning, etc. — is controlled from the front panel using the following controls:

- The 32 character LCD display
- The ***Select Sounds*** and ***Edit Sounds*** buttons
- The ***Select Sequences/Presets*** and ***Edit Sequences/Presets*** buttons
- The ten ***Bank*** buttons located in the center of the front panel
- The ten ***Screen*** buttons located directly beneath the ***Bank*** buttons
- The ***Data Entry Slider*** to the left of the display
- The ***Left/Right*** and ***Up/Down Arrow*** buttons located directly beneath the display.



The display and the data entry controls are primarily used to *select* and *modify* things — sounds, parameters, MIDI Control functions, etc. — all depending on which front panel button you press.

The SQ's user interface is designed to enable you to get around the instrument quickly and easily, whether selecting and playing sounds, or recording and playing back sequences.

In order to accomplish this, the SQ is *always* in one of four *modes*. These are:
1 — Sound Select Mode
2 — Sound Edit Mode
3 — Sequences/Presets Select Mode
4 — Sequences/Presets Edit Mode

You select these modes by using the following four ***Mode Buttons*** (once you have activated any of the SQ's modes using the buttons described below, you can use the ***Bank*** buttons and ***Screen*** buttons to move around inside the selected mode):

1) Select Sounds Button

Pressing the ***Select Sounds*** button, located to the left of the ***Screen*** buttons, lights its LED and places the SQ in Sound Select Mode. Whenever you would like to change a sound, this mode must be activated. After pressing the ***Select Sounds*** button, using the ***Bank*** and ***Screen*** buttons will select any of the available sounds.

2) Edit Sounds Button

Pressing the ***Edit Sounds*** button, located to the right of the display, lights its LED and places the SQ in Sound Edit Mode. This is where all sound editing is done. From this mode you can choose waveforms, change envelopes, etc. Pressing ***Bank*** and ***Screen*** buttons takes you to the individual parameters within the Sound Edit Mode. Rapidly double-clicking the ***Edit Sounds*** button places the SQ into Replace Sound status, allowing sounds on the individual tracks of a preset/sequence or song to be replaced. When in this state, the Edit Sounds LED will flash. For more information, see "Replacing the Sound on a Track" in Section 7 — Presets.

3) Select Sequences/Presets Button

Pressing the ***Select Sequences/Presets*** button, located to the right of the ***Screen*** buttons, lights its LED and places the SQ in Sequence/Preset Select Mode. After pressing the ***Select Sequences/Presets*** button, the ***Bank*** and ***Screen*** buttons can be used to select and play any available Sequence or Preset.

4) Edit Sequences/Presets Button

Pressing the ***Edit Sequences/Presets Button***, located above the ***Select Sequences/Presets*** button, lights its LED and places the SQ in Sequence/Preset Edit Mode. This mode is used for such tasks as Creating and Deleting Sequences or Presets, setting tempo and click status, etc. Using the ***Bank*** or ***Screen*** buttons will select the individual parameters or commands within the Sequence/Preset Edit Mode. Rapidly double-clicking the ***Edit Sequences/Presets*** button places the SQ into Replace Sound status, allowing sounds on the individual tracks of a preset/sequence or song to be replaced. When in this state, the Edit Sequences/Presets LED will flash.

Bank Buttons

The ten smaller buttons in the center of the front panel are called the ***Bank*** buttons. Bank buttons are used to select groups of parameters, commands, sounds, or sequences/presets. Which banks are selected is determined by which Mode the SQ is in.

A color-coding scheme is used on the faceplate of the SQ to help simplify the exact function of the ***Bank*** buttons. You'll notice that both the ***Select Sounds*** and ***Edit Sounds*** buttons are labeled in white, while the ***Select Sequences/Presets*** and ***Edit Sequences/Presets*** are labeled in a light blue.

Now, look at the two rows of printing above the ***Bank*** buttons. Notice that these too are labeled in white and light blue. These indicate which banks are being selected by the Bank buttons. When in Sound Edit Mode (indicated by its LED being lit), the Bank names listed in white are selected. Banks written in blue are selected when in Sequences/Presets Edit Mode (again, indicated by its LED being lit).

As you might expect, when in Sound Select or Sequences/Presets Select Modes, the ***Bank*** buttons select banks of sounds and sequences/presets respectively.

Screen Buttons

The ten larger buttons directly below the ***Bank*** buttons are called the ***Screen*** buttons. Screen buttons are used to select individual items within the current bank.

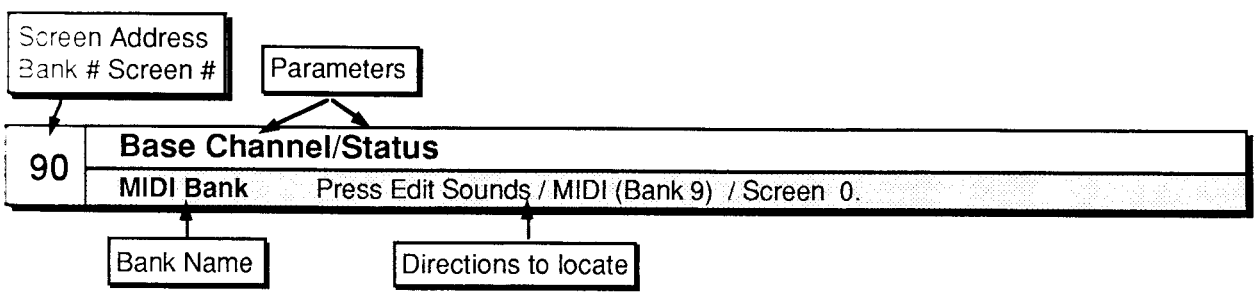
Hint: There is another way to view the individual screens located within a bank. After using any of the ***Bank*** buttons to call up a group of parameters, sounds, or sequences/presets, successive presses on that Bank button will scroll through all the screens within that bank. Also, the first screen within a bank can be selected by holding the bank button for about one second.

When a Screen button calls up a screen with multiple parameters, successive presses on that Screen button will move between those parameters. Screen buttons also have a special function when held. After about one second the first parameter on the screen will become selected.

Screen Address Illustrations

The SQ accesses parameters and commands through *Screens*. Each screen has its own *Screen Address*, a two-digit number which indicates its location. The first digit relates to the Bank in which the screen is located, the second refers to the particular Screen within that Bank. These screen locations are called up with the ***Bank*** and ***Screen*** buttons.

When describing parameters or commands in this manual, Screen Address illustrations are used to communicate the location of the parameter and how to get there. For example:



These illustrations not only help to divide the manual into easy to locate sections for each screen, they also provide the following four important pieces of information about the parameter being discussed:

- **Screen Address** — The two-digit number on the left indicates the location of the parameter(s). In the case of this example, the Screen Address is 90.
- **Parameter(s)** — This tells you the name of the parameter or parameters as they're listed in that screen. When a screen has more than one parameter, they are divided by a slash (/).
- **Bank Name** — Indicates the Bank in which the screen is located. The name listed can be found in the two rows of Bank names written above the ***Bank*** buttons on the faceplate of the SQ.
- **Directions to Locate** — This tells you how to get to the parameter screen. If the LED is already lit, you don't have to press the mode button again.

Parametric Programming

The method used to modify or edit programs, presets, and system parameters is called *Screen-driven Parametric Programming*, which sounds like a mouthful, but don't worry. Once you've grasped a few basic concepts, you'll find that operating the SQ is quite simple, given its many capabilities.

You may have already encountered some form of parametric programming on other synthesizers. What this means is that instead of having a separate knob or slider for each function, you have one master ***Data Entry Slider***, and two arrow buttons, which adjust the value of whichever parameter you select.

This approach has many advantages, the most obvious of which is that it greatly reduces the amount of hardware — knobs, switches, faders, etc. — needed to control a wide variety of functions. (If the SQ had a separate control for each function, it would literally have hundreds of knobs.)

Screens

The 32-character LCD display makes it possible to display information in *Screens*. Each time you press one of the front panel buttons, you are in effect "tuning in" that function's screen. Once you have tuned in the screen you want, the display shows you which parameters are controlled from that screen.

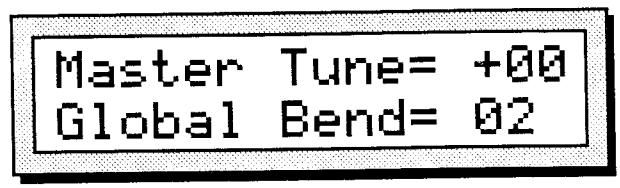
Multiple Parameters

Some of the SQ screens contain more than one editable parameter. When a screen with multiple parameters is displayed, there are two methods of moving between parameters:

- The ***Left/Right Arrow*** buttons. These buttons scroll through the parameters shown on the selected screen, then continue on to the next screen.
- The ***Screen*** buttons. Repeatedly pressing a Screen button scrolls through the parameters related to that screen. When a Screen button is held for about one second, the first parameter on the screen will automatically be selected.

Changing a Parameter

Suppose you want to adjust the master tuning of the SQ. This is a System parameter, so you first need to get to the System Bank. This is located by pressing the ***Edit Sequences/Presets*** button, followed by the ***System*** button (Bank 9), then the ***Screen 0*** button. The display shows the following screen:



The Master Tune parameter comes up in the display. This value segment of the display will now be flashing, telling you that it has been *selected*, and can be modified.

The value of the currently selected parameter on a screen is always flashing.

Once you have selected a parameter to be modified, use the ***Data Entry Slider*** or the ***Up/Down Arrow*** buttons to adjust its value:

- Moving the slider will scroll the entire range of available values. If you move the slider slowly, it will change the parameter relative to the current value. Moving it quickly will cause the parameter to jump to the absolute value which corresponds to the position of the slider.
- Pressing the ***Up/Down Arrow*** buttons will increase or decrease the value one step at a time. Continuing to hold down either button will cause it to accelerate, and run quickly through the values.

Hint: There is a quick way to center or "zero out" the value of any parameter which has a center value, as the Master Tune parameter does. While holding down the ***Down Arrow*** button, press the ***Up Arrow*** button, then quickly release both buttons. This automatically sets the parameter value to its center value.

If you select another screen, change some parameter on that screen, and then return to the Master Tune Screen, the parameter you had last selected will still be flashing. The SQ always "remembers" which parameter was last selected on a given screen.

Be sure that the parameter you want to edit is selected before moving the ***Data Entry Slider*** and/or the ***Up/Down Arrow*** buttons. There is *always* a parameter selected on any given screen.

Playing Sounds

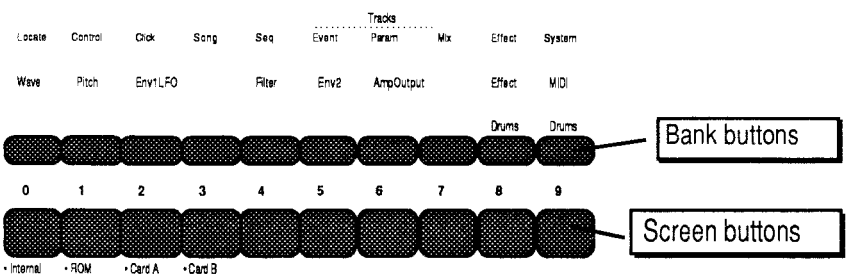
Sound Memory

Each SQ sound is a complex structure consisting of up to three voices per key, and a programmable effects setup. The SQ can give you access to up to 340 different sounds from which to choose at any time:

- INT — 80 sounds are stored in the SQ *Internal Memory* (RAM). These RAM (random access memory) sounds can be either Standard sounds or Drum sounds. (See Sections 5 and 6 for details.)
- ROM — Another 80 sounds are permanently stored in its *ROM Memory*. Like the INT sounds the ROM (read only memory) sounds are contained within the SQ; but unlike the INT sounds they cannot be replaced.
- CARD A and B — 80 additional sounds can be stored in both Bank A and B of a sound card plugged into the card slot. As with the Internals, sounds stored in the Card can be Standard or Drum sounds.
- DRUM BANKS — Sound Banks 8 and 9 each contain ten dedicated Drum kits. These drum kits are available whether you're currently in the Internal, ROM, or Card sound banks. The Drum kits in Banks 8 and 9 are also permanently stored in ROM memory and cannot be modified or replaced.

Bank and Screen Buttons

When the ***Select Sounds*** LED is lit, the ten ***Bank*** buttons and ten ***Screen*** buttons, each labeled 0 through 9, are used to call up the sounds in memory, one at a time, allowing you to then select the one you want to play.



Selecting a Sound

To select an SQ sound:

- Press ***Select Sounds***. This places the SQ in Sound Select mode and the Select Sound LED will light up. Once in Sound Select mode, it is not necessary to press the ***Select Sounds*** button again to select a new sound.
- Press one of the ten ***Bank*** buttons (numbered 0-9) to select a bank of ten sounds.

- Press one of the ten ***Screen*** buttons (also numbered 0-9) below the ***Bank*** buttons to select individual sounds within that bank. Try selecting and playing a few different sounds.

Hint: You can also use the ***Up/Down Arrow*** buttons to scroll through sounds. The arrows will scroll through all sounds within the current sound group (for example, the internals), and then continue scrolling up through the dedicated Drum kits.

Choosing Internal, ROM, Card and Drum Sounds

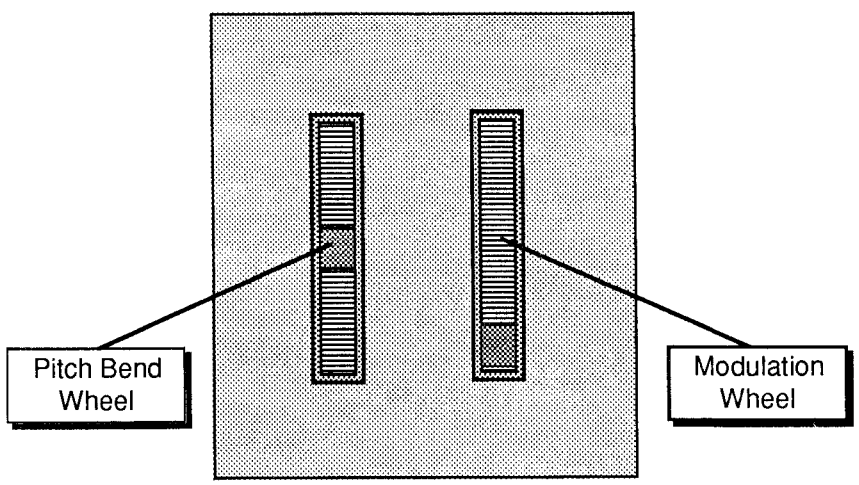
The ***Internal, ROM, Card A,*** and ***Card B*** buttons are used to choose between Internal, ROM, and Card sounds. The top line of the screen tells you the group and location of the sound. There are three methods that can be used to choose between the four sound groups:

- The ***Select Sounds*** and ***Screen*** buttons — You can reach any of the sound groups directly by pressing the ***Select Sounds*** button, *and while continuing to hold the* ***Select Sounds*** *button down,* press one of the first four ***Screen*** buttons. The Screen buttons are labeled underneath to indicate which sound group will be activated.
- The ***Select Sounds*** button — Repeatedly pressing the ***Select Sounds*** button will step through the various sound groups.
- The ***Left/Right Arrow*** buttons — As with the ***Select Sound*** button, repeatedly pressing either the Left or Right Arrow button will step through the various sound groups.

Note: These sound groups contain 80 sounds each, located in Banks 0-7. Banks 8 and 9 will always call up the dedicated Drum kits.

Performance Controllers

The SQ features a number of real-time performance *controllers* which are used to modify sounds as you play for maximum expressiveness. Two of the most important controllers are located to the left of the keyboard:

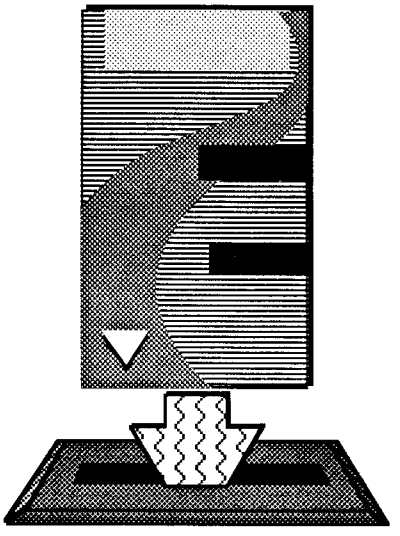


- PITCH BEND WHEEL — This wheel bends the pitch of a note up or down. The wheel is normally centered, where it has no effect on the pitch — moving the wheel up or down will bend the note by the amount specified in the Global Bend parameter contained in the System Bank.
- MODULATION WHEEL — Perhaps the most common use of the Mod Wheel is to add vibrato, but it can also be assigned as a modulator anywhere within the SQ voice architecture to alter the pitch, brightness, timbre, volume,.effect and a great many other aspects of the sound.

Another controller which is available to modify a sound is the optional CVP-1 foot pedal.

Memory Cards

Memory cards can be used to add more sounds to the SQ, and allow you to store your sounds and sequences. Before you can access sounds and sequences from a card, you must first insert an ENSONIQ SC or ISC series card, an MC-32 RAM card, or other SQ cards into the Card slot, as shown below with the label facing towards you. Take care to insert the card straight into the slot in a continuous fashion.



Cards can be inserted or removed at any time (except while you're writing sounds to them), even when the power is on, without doing any harm to the SQ or the card. For more information regarding cards, see Section 11 — Storage.

Re-initializing the SQ

The great power and flexibility of the SQ lies in the fact that it is really a computer — a computer disguised as a keyboard instrument, but a computer nonetheless. The software that operates the SQ is very sophisticated. In fact, there is a 128K computer program that runs inside the SQ (the Operating System code). That's as much as some personal computers. If you have ever used a computer, you should be familiar with the need to occasionally re-boot your system when you get an error message, etc. Re-initializing the SQ is the equivalent of re-booting your computer.

There are a number of things that can happen to the SQ (or any computer system) which might scramble the system software — voltage surges, power failures, static electricity, etc. As with any computer, very infrequently some unforeseen event or combination of events can cause the software to become confused with strange and unpredictable results. Sometimes computers which appear to be broken have no hardware problem, just corrupted data in the internal RAM (Random Access Memory). In some cases, simply turning the SQ power off and then on again will cure the problem. If that doesn't work, perhaps what is needed is to re-initialize the unit.

When to Re-initialize:

If your SQ begins to behave in peculiar ways, if the display shows words or lines that shouldn't be there, if you start getting Unexpected Event messages, if the sequencer and edit functions start doing unpredictable things, try re-initializing the SQ before you seek factory service.

Warning: When you re-initialize your SQ all your current internal sounds and sequences/presets will be lost. (The 80 ROM (Read Only Memory) sounds are automatically loaded back into the internal memory after re-initializing.) Therefore good backup habits should be an important part of your routine. Save any important data to a storage card or MIDI Sys-Ex before re-initializing the SQ.

To Re-initialize the SQ:

- Press the ***Edit Sequences/Presets*** button. Its LED will light, letting you know the SQ is now in Edit Sequence/Preset Mode.
- While holding down the ***System*** button (Bank 9), press the ***Screen 9*** button.
- The display reads "Re-initialize sound & seq RAM?"
- Press the ***Up Arrow*** button. The ***Up Arrow*** button also acts as a ***Yes*** button to respond to questions on the display (the ***Down Arrow*** button acts as ***No***).

If re-initializing your SQ does not correct the problem, then contact an authorized ENSONIQ Repair Station.

Low Battery Voltage — When to Replace the Battery

The reason that the SQ "remembers" sounds, sequences and other parameters, even when the power is off, is that all of its internal RAM is "battery-backed-up." The battery that keeps the SQ memory intact is located inside the SQ, and when it becomes discharged, it must be replaced by an authorized ENSONIQ Repair Station.

The battery that came in your SQ is good for up to five years. You will know when it needs replacing, because the SQ will tell you so. One day you will switch the power on, and instead of its usual wake-up message, the display will read:

WARNING! Battery low
see manual.

Press any button to commence normal operation. Then, make sure that all sounds and sequences/presets are saved to a storage card, and take the SQ to an authorized ENSONIQ Repair Station as soon as possible to have the battery replaced.

Important: If you get a Battery low message after a RAM card is inserted, this message is referring to the battery in the card, not the one in the unit. See Section 11— Storage for how to change the card battery.

SQ Accessories

These optional accessories are available from your **ENSONIQ** dealer:

- **SW-5 Foot Switch** — For sustain, sostenuto, or starting and stopping the sequencer.
- **CVP-1 PEDAL** — A *Control Voltage Foot Pedal* which can be assigned as a modulator within the voice section of the SQ or used as a volume pedal.
- **MC-32 RAM Cards** — For storing the sounds and sequences you create or edit. Sounds and sequences can be saved to the MC-32 in the same manner as saving data to internal memory.
- **SC series ROM Cards** — Contains 160 factory-programmed sounds. Unlike the MC-32, the sounds in SC cards are stored permanently and cannot be replaced.
- **ISC series ROM Cards** — Contains 160 sounds programmed by leading sound developers from around the world. Unlike the MC-32, the sounds in ISC cards are stored permanently and cannot be replaced.
- **SQX-70** — Sequencer Expander. Increases the capacity of the SQ sequencer to 58,000 notes. Contact your authorized ENSONIQ Repair Station for installation details.

Need More Help?

Whether you're an aspiring programmer looking for additional information about basic synthesizer and MIDI theory, or a professional sound designer working with advanced applications, you may want more detailed information that is beyond the scope of this manual. The following books can help enhance your understanding of synthesis, MIDI, and related topics. These, in addition to the numerous monthly magazines, provide a wealth of information. While we don't endorse any one of these publications, we offer this partial list as a resource.

The Mix Bookshelf
For prices and more information call: 1-800-233-9604

MIDI

MIDI FOR MUSICIANS, Craig Anderton
MUSIC THROUGH MIDI, Michael Boom
THE MIDI HOME STUDIO, Howard Massey
THE MIDI BOOK, Steve De Furia, Joe Scacciaferro
MIDI RESOURCE, Steve De Furia, Joe Scacciaferro
MIDI IMPLEMENTATION BOOK, Steve De Furia, Joe Scacciaferro
MIDI SYSTEMS & CONTROL, Francis Rumsey
USING MIDI, Helen Casabona, David Frederick
MIDI, THE INS, OUTS AND THRUS, Jeff Rona
MIDI: A COMPREHENSIVE STUDY, Joseph Rothstein

SAMPLING

THE SAMPLING BOOK, Steve De Furia, Joe Scacciaferro

SYNTHESIZERS

GUITAR SYNTH & MIDI, Guitar Player Magazine
SECRETS OF ANALOG AND DIGITAL SYNTHESIS, Steve De Furia
SYNTHESIZER PERFORMANCE & REAL TIME TECHNIQUES, Jeff Pressing
SYNTHESIZER BASICS, Dean Friedman
MUSIC & TECHNOLOGY, H.P. Newquist
A SYNTHESIST'S GUIDE TO ACOUSTIC INSTRUMENTS, Howard Massey

Alexander Publishing
For prices and additional information call: 1-800-633-1123

MIDI

1991—HOW MIDI WORKS, Dan Walker
MURPHY'S LAW MIDI BOOK, Jeff Burger

SAMPLING

SAMPLING BASICS, Bobby Maestas
EPS SAMPLING BOOK, Bobby Maestas

SEQUENCING

SEQUENCING AND ARRANGING Vol's 1-4, Joseph Wagner

SYNTHESIZERS

RECORDING, SYNCING & SYNTHS, Paul Goldfield
VFX/VFX-SD, Dan Walker

Alfred Publishing Company
For prices and more information call 1-818-891-5999

MIDI

ADVANCED MIDI APPLICATIONS, GPI
BASIC MIDI APPLICATIONS, GPI
WHAT IS MIDI?, GPI

SYNTHESIZERS

BEGINNING SYNTHESIZER, GPI
PLAYING SYNTHESIZERS, GPI
SYNTHESIZER PROGRAMMING, GPI

Hal Leonard Publishing
For prices and more information call 1-414-774-3630

MIND OVER MIDI, GPI
SYNTHESIZER TECHNIQUE (REVISED), GPI

Section 2 — System Control

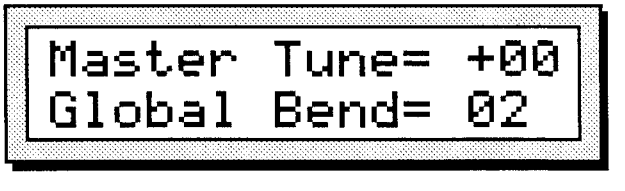
- These parameters control instrument-wide system functions.

System Bank

The System Bank contains several screens. These screens give you control over some of the SQ's instrument-wide system parameters. The settings of these parameters will remain in effect at all times and are preserved while the power is off.

The System controls are located in Bank 9 of the Sequence Edit Mode. Press the ***Edit Sequences/Presets*** button to activate the Sequence Edit mode. Now, press the ***System*** button (Bank 9). You are now in the System Bank.

90	**Master Tune/Global Bend**
	System Bank Press Edit Sequences / System (Bank 9) / Screen 0.



Master Tune

Adjusts the overall master tuning of the keyboard up or down as much as one semitone. A value of +00 will set the SQ to concert A=440 tuning.

Range: -99 to +99 cents.

Global Bend

Adjusts the system pitch bend range, which is the maximum amount of pitch bend which can be applied with the pitch wheel. Each increment represents a semitone.

When the amount is followed by an "H," only notes held by hand can be bent. Notes held with the sustain pedal will remain at their original pitch. This feature can be used to create guitar-style pitch bends.

Range: 0 to 12, 1H to 12H

91	**Touch/Pedal**
	System Bank Press Edit Sequences / System (Bank 9) / Screen 1.

Touch

Allows you to adjust the velocity response of the keyboard to match your playing style and technique. There are four velocity settings: Soft, Medium, Firm, and Hard.

- Soft — This is for someone with a light touch. On this setting, a minimum velocity is required to reach the maximum level of any velocity-controlled parameter.
- Medium — Slightly harder keystrikes are required to reach maximum velocity levels.
- Firm — These settings represent average velocity sensitivity. This setting should be right for the player with an average touch.
- Hard — This setting is for the strong player who strikes the keys hard. It provides the widest possible range of velocity sensitivity.

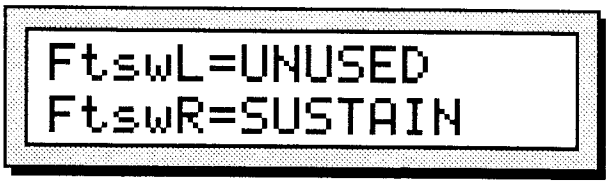
Pedal

Determines whether the optional CVP-1 foot pedal will act as a volume pedal or modulator.

- Volume #7 — the foot pedal will adjust the volume of the SQ.
- Mod #4 — the foot pedal will affect anything that has PEDAL selected as a modulation source. (The "#7" and "#4" refer to the controller number assigned in the MIDI Specification. See the MIDI Implementation chart on Appendix-2.)

92 FtswL/FtswR

System Bank Press Edit Sequences / System (Bank 9) / Screen 2.



FtswL — Foot Switch Left

Available only when the *optional* SW-5 Dual Foot Switch is plugged into the SQ, the settings of this parameter will control the function of the left pedal.

- UNUSED — makes the SQ ignore the left Foot Switch.

  If you are are using the single Foot Switch which came with the SQ (SW-1), then you should keep this parameter set to UNUSED.

- SOSTENUTO — makes the Foot Switch act similarly to the sostenuto pedal on a piano. Any keys that are held down when you press the pedal are sustained until you release the pedal, but subsequent keys are not affected.
- START/STOP — the Foot Switch will start, stop, and continue the sequencer, exactly reproducing the actions of the ***Stop*** button on the front panel.

FtswR — Foot Switch Right

Controls the function of the basic Foot Switch (SW-1), or when the *optional* SW-5 Dual Foot Switch is plugged into the SQ, the settings of this parameter will control the function of the right pedal.

- SUSTAIN — holding the pedal down will cause notes to sustain after a key has been released, much like the sustain pedal on a piano.
- START/STOP — the Foot Switch will stop and continue the sequencer, exactly reproducing the actions of the ***Stop*** button on the front panel.

93 MIDI TrkName/Voice Muting

System Bank Press Edit Sequences / System (Bank 9) / Screen 3.

MIDI TrkName — MIDI Track Name

This parameter determines whether preset and sequencer tracks which have MIDI status will show the sound name (as do LOCAL and BOTH tracks) or show *MIDI-CHAN-# instead of the sound name.

- OFF — When a track's status is set to MIDI or *EXT* in the Parameter bank, any displays which would normally show the track's sound name will show *MIDI-CHAN-# instead of the name. This is helpful when using the SQ as a MIDI controller, or when sequencing remote MIDI devices, as it shows you at a glance which tracks are playing only over MIDI, and on which MIDI channels.
- ON — The track's sound name will always appear on the Track screens and the performance parameter screen (in preset mode) no matter what the track's status.

Voice Muting

This parameter controls whether or not all voices currently playing will be shut off when a new sound is selected. This lets you avoid any audible "glitch" or discontinuity as the new sound's effect is loaded, but at the expense of being able to sustain a note from one sound while selecting and playing another.

- ON — Whenever you select a new sound, any voices that might be sustaining from the previous sound will be stopped.
- OFF — When you select a new sound, voices that are sustaining from previous sounds will continue to play as long as the key(s) are held down. The old voices will go through the effect of the new sound, so they might sound different, especially if the new sound uses a radically different effect.

94	**Store Sounds**
	System Bank Press Edit Sequences / System (Bank 9) / Screen 4.

This parameter is used to save sounds to card or via MIDI System Exclusive commands. See Section 11 — Storage Functions, for more details.

95	**Store Sequences**
	System Bank Press Edit Sequences / System (Bank 9) / Screen 5.

This parameter is used to save sequences to card or via MIDI System Exclusive commands. See Section 11 — Storage Functions, for more details.

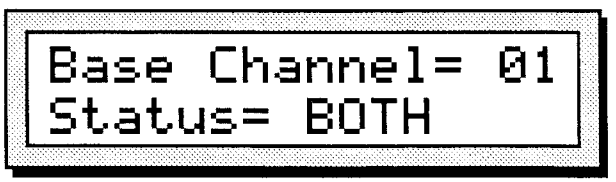
MIDI Bank

- Set system MIDI parameters, such as channel number and mode.
- Control what types of MIDI messages are received and transmitted.

Few developments in recent years have had as great an impact on the way we make music as has the emergence of MIDI. Whether you are simply linking two keyboards together, playing a synth from a guitar controller, or driving a rack of samplers from a drum pad controller, MIDI makes it all possible. The evolution of MIDI has facilitated the merging of existing technologies and has inspired the creation of new technologies. ENSONIQ has always been an industry leader in MIDI development, and the SQ embodies the latest advances in a state-of-the-art sequencer, controller keyboard and multi-timbral sound generator.

The MIDI controls are located in Bank 9 of the Sound Edit Mode. Press the ***Edit Sounds*** button to activate the Sound Edit mode. The Edit Sounds LED will light. Now, press the ***MIDI*** button (Bank 9). You are now in the MIDI Bank.

90	**Base Channel/Status**
	MIDI Bank Press Edit Sounds / MIDI (Bank 9) / Screen 0.



Base Channel

Selects the Base Channel on which the SQ transmits and receives MIDI messages. The base channel is used to transmit and receive MIDI data while the SQ is in Sound Select mode. When working within a Sequence or Preset, the SQ automatically transmits and receives MIDI data on the individual track channels. System Exclusive messages are always sent and received on the base channel.

Range: 01 to 16

Any of 16 MIDI channels may be selected as the basic MIDI channel of the SQ. The effect of setting the base channel varies, depending on the MIDI Mode and whether data is being transmitted or received.

Receive — In POLY mode, keys, controllers, and program changes are only recognized if received on the base channel. In MONO A mode, program changes are received only on the base channel. The base channel is also used in both MONO modes as the first channel of the 8 channel range.

Transmit — The SQ has a fixed MIDI transmitting scheme, depending on the mode it is in. When in Sound Select Mode, the SQ always transmits on the base channel. When in Sequence Mode, the SQ always transmits on the individual track channel.

MIDI Status

This screen determines the MIDI Status of the Base Channel. The four possible settings are:

- BOTH — Keys, controllers, etc., will play locally *and* will be sent via MIDI over the selected MIDI channel. Incoming MIDI will play internal voices.
- LOCAL — The base channel will only play internal voices, and will not send any data out MIDI. Incoming MIDI will play internal voices.
- MIDI — Keys, controllers, etc., will be be sent out via MIDI when the keyboard is played. Incoming MIDI *will* play internal voices. This is comparable to Local Off on some keyboards. Use this status when you want to play remote MIDI devices.
- *EXT* — Same as MIDI except that incoming MIDI *will not* play internal voices. This is useful when using the SQ as a controller with an external sequencer and a number of other MIDI sound modules.

91	**Base Channel Pressure**
	MIDI Bank Press Edit Sounds / MIDI (Bank 9) / Screen 1.

Base Channel Pressure

Determines which type of pressure, if any, the SQ will receive on its Base channel via MIDI.

- NONE — The SQ will not receive any pressure commands.
- KEY — The SQ will receive polyphonic key pressure. This type of specialized pressure, which allows individual pressure control over each key, is found on many of ENSONIQ's other keyboards such as the EPS, EPS–16 PLUS, VFX, and VFX^{SD}.
- CHANNEL — The SQ will receive Channel pressure. This is the most common of the pressure types. Channel pressure will affect the entire keyboard when pressure is added to any key.

92	MIDI Mode/XCtrl
	MIDI Bank Press Edit Sounds / MIDI (Bank 9) / Screen 2.

MIDI Mode — MIDI In Mode

This parameter determines how MIDI information will be *received* by the SQ. MIDI Mode has no effect on what MIDI information is sent.

There are five MIDI modes implemented in the SQ:

- OMNI — In this mode the SQ will receive on any or all of the 16 MIDI channels. This mode is useful when you are only using a few instruments, and you are not concerned with setting up different channels for each device.
- POLY — In this mode the SQ will receive only on the Base MIDI channel. MIDI information on all other channels will be ignored.
- MULTI — An ENSONIQ innovation, MULTI mode is the key to unlocking the potential of the SQ as a multi-timbral receiver from an external MIDI sequencer. In MULTI mode, the 8 tracks of the current song or sequence can receive MIDI information independently and polyphonically on up to 8 different MIDI channels. You can easily create empty sequence templates for use in multi-channel reception; see Section 7 — Presets for details.

  Different MIDI channels should be selected for each track which you want to receive. This can be accomplished on the MIDI Channel screen (see Section 7 — Presets for more information).

  In MULTI mode, independent of what sounds are selected on the front panel, the sounds you hear will depend entirely on what MIDI channel(s) the MIDI data is received on.

MONO Mode

MONO mode is particularly useful for driving the SQ from a guitar controller, or any other application where having up to eight independent, monophonic channels is desirable.

The SQ offers two types of MONO mode operation. In both types, the SQ will receive monophonically on eight consecutive MIDI channels starting with the Base channel (the base channel through base channel +7). The difference has to do with how those MIDI channels are routed within the SQ.

- MONO A — This is another ENSONIQ development intended to make using multi-channel controllers (like guitars) easier. All notes and controllers received will play whatever programs are selected for the note that is played, just as if the note was played from the keyboard. You have the advantage of multiple tracks, which will respond independently to controllers received on multiple channels, but you do not have to set up the programs for each track separately.
- MONO B — This is the more conventional type of MONO mode. It allows you to set up each track of the current song or sequence as a monophonic synthesizer. Each track can have a different program assigned to it. This is the only way to get a different sound on each string when using a MIDI guitar controller.

Global Controllers in MONO Mode

Global controllers are controllers sent on one channel which affect all other channels simultaneously. They can be useful in reducing the number of MIDI events required to achieve particular effects, and can thereby reduce the delays sometimes associated with overloading MIDI. Some guitar controllers can transmit global controllers, and the SQ can respond to them.

In MONO mode (A or B) the base channel minus one becomes the MIDI channel for global controllers (pitch bend, pressure, etc.). For example, if the base channel is channel 3, any controllers received on channel 2 will be interpreted as global controllers and will affect *all* voices being played. If the base channel is channel 1, channel 16 becomes the channel for global controllers. Each track will also respond independently to controllers sent on its own channel. For example, each guitar string on a MIDI guitar can send independent pitch bend, while the "whammy bar" controller could be sent on the global channel to affect all voices.

XCtrl - External Controller

Use XCtrl to assign external MIDI controllers to affect the SQ.

Range: 01 to 95

Most controllers on a synthesizer — mod wheel or breath controller for example — have a MIDI controller number which can be assigned to this parameter. Doing so will make a particular external controller available as a modulator to any of your programs.

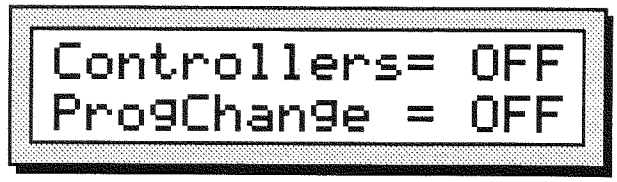
One of the modulation sources that can be selected in the programming section is XCTRL. The value of the "XCtrl" parameter is a MIDI controller number, ranging from 01 to 95. When the SQ receives MIDI Controller messages corresponding to this controller number, they will be routed to *all* parameters which have been programmed with XCTRL as a modulation source. Suppose, for example, you are playing the SQ from a keyboard with a breath controller (or want to use a breath controller as a modulator when playing the SQ keyboard). You can set up a program on the SQ in which the filter cutoff frequency is modulated by XCTRL. If you then set "XCtrl=02," the breath controller will now be able to modulate the filter, or whatever else has its modulation source set to XCTRL, in the program you have created.

The following controller numbers have been agreed upon as MIDI standards:

Number	Controller	Number	Controller
1	Modulation wheel	66	Sostenuto pedal
2	Breath controller	70	Patch selects
4	Foot pedal controller	92	Tremolo Depth
6	Data Entry Slider	93	Chorus Depth
7	Volume	94	Celeste (Detune)
64	Sustain pedal	95	Phaser Depth

Although the range of this control is from 01 to 95, most of the values other than those listed above have no "approved" function, as yet. They are there to provide flexibility and to accommodate future MIDI standards.

93	**Controllers/Prog Change**
	MIDI Bank Press Edit Sounds / MIDI (Bank 9) / Screen 3.



Controllers

This switch controls whether the SQ will send and receive MIDI controllers — pitch bend, mod wheel, pressure, volume, sustain pedal, etc.

Prog Change — Program Changes

This switch controls how the SQ handles MIDI program change messages.

- OFF — the SQ will *not* transmit or receive MIDI program changes.
- ON — the SQ will transmit and receive program changes over MIDI.

Important: Program changes are numbered and displayed from 001 to 128 in the SQ, although in accordance with the MIDI specification they are invisibly transmitted and received as 000..127.

(Refer to the Presets section and the Sequencer Basics section for more information on how program changes are handled.)

Receiving Program Changes

The way in which the SQ receives program changes is slightly more complex than some other systems, because the number of sounds that are available to be selected from MIDI is *larger* than the number of program change messages available within the MIDI standard. To solve this problem, the SQ uses the last four program change numbers (124 to 127) to control how subsequent program changes will be interpreted (again, these program change numbers reflect the *actual program change number* as defined by the MIDI specification). The following chart shows the effect of these four special program changes:

After Program Change:	*Subsequent program changes will select:*
124	000..079 - INT Sounds
125	000..079 - ROM Sounds
126	000..079 - CARD A Sounds
127	000..079 - CARD B Sounds

These special "control" program changes need to be sent only once. All subsequent program changes will be handled according to the range that was set by the last one received.

Note: Program Changes 080-099 *will always* select the default Drum kits.

Selecting a New Sequence or Song Effect from MIDI

There is another special program change, recognized only in MULTI mode which is used to select *both* a sound *and* its effect for one of the 8 sequencer tracks. When program change 123 is received on a channel assigned to a sequencer track, the next program change received on that track will select a new sound and also install the effect from that sound into the sequence (or song) effect. This is the only way to change the sequence or song effect other than manually editing the settings or selecting a new sequence. This can be useful when controlling the SQ from an external sequencer.

This special program change 123 does not change the way in which other program changes are received, including the other special messages. If the sound you wish to select also requires a special control program change, then send the control message immediately after the 123 followed by the program number you want to select.

Remember: All SQ program changes are referred to and displayed as 001 to 128, but the actual codes transmitted and received over MIDI are the number minus one (000 to 127).

94	System Excl/Song Select
	MIDI Bank Press Edit Sounds / MIDI (Bank 9) / Screen 4.

System Excl — System Exclusive

This switch determines whether the SQ is able to receive MIDI System Exclusive messages. When System Excl=OFF, the SQ is not able to receive any MIDI System Exclusive messages. The Sys-Ex messages which are sent from the Storage screens can always be transmitted regardless of the setting of this switch. (Refer to the Appendix for more information about the Sys-Ex implementation.)

Song Select

This determines whether the SQ will receive MIDI Song Select messages. When Song Select=OFF, the SQ will ignore incoming Song Select messages. When Song Select=ON, incoming Song Selects will select the corresponding SQ–1 sequencer location.

MIDI Song Selects # 00-29 will select SQ Song locations # 70-99. Conversely, selecting Song locations # 70-99 will cause the SQ to send MIDI Song Selects # 00-29.

95	MIDI Loop
	MIDI Bank Press Edit Sounds / MIDI (Bank 9) / Screen 5.

MIDI Loop

This determines whether the SQ will treat incoming MIDI information as standard MIDI data, or data that is "looped" from the SQ's MIDI Out.

When using the SQ as a central keyboard controller (or with an external computer-based sequencer), you may encounter situations where it is necessary to configure your MIDI set-up in a "MIDI Loop." Any time you can follow the MIDI path from the SQ's MIDI Out and trace it back into the SQ's MIDI In, you have created a MIDI Loop. When the SQ is used in this fashion, it is possible for some MIDI commands that go out of the SQ to re-enter the SQ through its MIDI In jack and cause it to behave irregularly (for example, MIDI Volume can have the effect of "looping" and causing the track volume to drop to zero). The MIDI Loop parameter will allow you to use the SQ in these situations without running into MIDI difficulties.

- OFF — The SQ receives incoming MIDI information in a normal fashion. This is the default setting.
- ON — The SQ filters incoming data, ignoring commands that would cause difficulty.

Set this parameter to "ON" whenever using the SQ in a MIDI Loop.

Section 3 — Effects

Understanding SQ Effects

The SQ has a powerful built in signal processor which can produce a variety of effects. More importantly, its functions are integrated with, rather than added onto, the rest of the synthesizer. The flexible bus routing scheme and the extensive real-time control give the SQ its *dynamic* effects capability.

The SQ is equipped with an advanced digital signal processing system based on the ENSONIQ Signal Processor (ESP) chip. The ESP is designed specifically for digital audio signal processing, and in the SQ, it works in tandem with a third generation version of the Digital Oscillator Chip (DOC III), and an external 16-bit digital-to-analog converter to provide a very high-quality output signal.

The digital effects processing has been designed to complement the advanced performance features of the SQ, and many of the effects can have specific parameters modulated by various performance controls such as the mod wheel, the Timbre control, and others.

The effects are fully programmable, and may be customized for particular applications. Effects are most often stored as part of a sound, although each individual preset/sequence and song has its own independent effect. Each of these types of effect is treated a little differently, and will be described individually on the following pages.

Sound Effects

Each sound in the SQ contains an effect, and a complete set of parameter values which determine how that effect will sound. The effect is present even if none of the voices in the sound are routed through the effect (e.g. all voices are sent to the DRY destination bus - see the Output bank section). Whenever you save or write a sound, the effect settings are also saved with the sound.

The sound effect is displayed and edited by pressing the ***Effect*** button (Bank 8) in ***Edit Sounds*** mode. The parameters that pertain to each effect are described in the Effect Parameters part of this section.

Sequencer/Song Effect

Each preset/sequence and song contains an effect and a complete set of effect parameter values. The effect is present even if none of the tracks in the sequence are routed through the effect (e.g. all tracks are sent to the DRY destination bus - see the Performance Effects section). This effect applies to all sequencer tracks (or their sound voices) which are routed to either FX destination bus.

The effect is saved with each preset/sequence or song. It will remain unaffected until a new song, sequence, or preset is selected, unless it is specifically edited. A special program change message may be used to load new effects into a sequence from MIDI in MULTI mode (see the MIDI bank description of special program changes in the System Control section).

The sequencer effect is displayed and edited by pressing the ***Effect*** button (Bank 8) when the SQ is in ***Edit Sequence*** mode.

Programming Effects

The SQ effects are highly programmable. There are several effect parameters for every effect type. The first screen contains the effect selector. The effect selector is a little different than all of the other parameters in that it controls how all of the other effect screens will be configured and displayed. When this parameter is changed, a new effect preset is selected which causes several important things to occur.

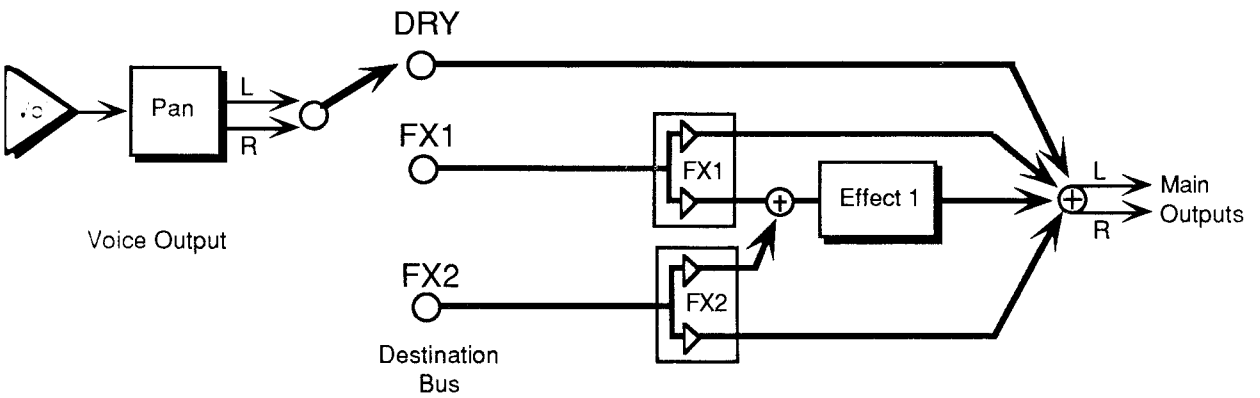
When a new effect preset is selected:
- a new effect preset is loaded, causing a brief pause in the audio output,
- the effect parameter screens are redefined for the particular effect selected, and
- the effect parameter values are reset to their default settings for the preset effect.

Hint: When editing the effect selector, it is possible to change the new effect type quickly and avoid the brief delay caused by the actions described above. Pass rapidly over the types between the old type and the new type, and then pause. The new effect preset will be recalled only after you stop changing the type.

The Effects Busses

The output of every voice in the SQ is assigned to a stereo bus. A bus, like the bus of a mixing board, mixes together all the voices assigned to that bus into a single stereo pair. Of the three busses on the SQ, two are inputs into the signal processor (FX1 and FX2), and the third is a direct path to the Main outputs which bypasses all effect processing (DRY). The Destination Bus assignment for each voice is set in the Output bank. The voice settings in the sound can be over-ridden for each preset and sequencer track in the Parameters bank.

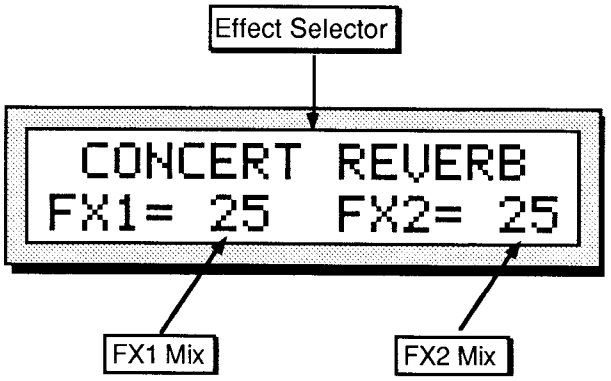
Single function effect



The above illustration shows the effects busses and the output mixing. Every voice is assigned to one of the three stereo busses, which go around or through the effects processing. The heavy lines are stereo paths.

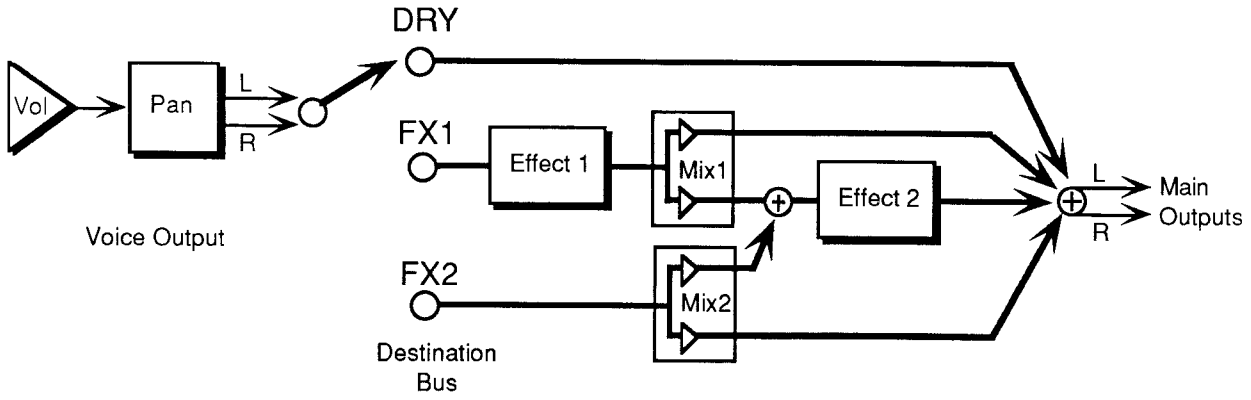
Effects Mixing

All effects have separate mixing controls for the FX1 and FX2 busses. They are found on the bottom line of the Effect Selector screen, which is the first screen (***Screen 0***) of the Effect bank (***Bank 8***). The screen looks like this:



When an effect with a single processing function (such as reverb only) is selected, both busses FX1 and FX2 are routed to it. When using a dual or multi-effect, FX1 will generally route the signal through both or all effects, with FX2 routing only through the second effect.

Multiple function effect



When the selected effect is a *combined effect* that has more than one signal processing function (such as chorus and reverb), the FX1 bus feeds Effect 1, and the FX2 bus feeds Effect 2. The FX2 Mix control sets the amount of Effect 2 (usually reverb) for voices assigned to that bus. FX1 Mix controls the amount of the output from Effect 1 sent to Effect 2, rather than directly to the output. By setting this control to its extremes, you can arrange the two effects to be either in series or in parallel. (For some multiple effects, there is also a separate Dry/Wet mix at the output of Effect 1.)

Selecting Effects

The first parameter of the Effects bank is the effects selector. Changing this parameter causes a new effect to be selected, which in turn changes the type of parameters which will be available on the rest of the screens. Selecting a new effect preset will automatically set all of the effect parameters to their default values for the new effect. The available Effects are:

CONCERT REVERB	Concert Hall Reverb, high density reverberation
HALL.REVERB	Hall, left to right (transverse) reflections
ROOM.REVERB	Small Room emulation
WARM CHAMBER	Chamber Reverb with characteristic resonance
8-VOICE.CHORUS	Eight Voice Chorus with complex modulation
CHORUS & REVERB	Four-Voice Chorus combined with Reverb
FLANGER+REVERB.1	Flanger combined with Reverb
FLANGER+REVERB.2	A variation of above with compound modulation
PHASE SHIFTER	Stereo Phase Shifter with controllable rate and depth
PHASER+REVERB	Phase Shifter combined with Reverb
ROTORY SPKR+VERB	Rotating Speaker Simulator with Reverb
DIST+CHORUS+VERB	Chorus with Distortion plus Reverb
CMPRSS+DIST+VERB	Compression, Distortion, and Reverb. Great for guitar and amp simulation with acoustic feedback.

Sounds and Presets

The complete effects setup, including the values of all effect parameters, is saved when you save a sound. It is *also* saved with each preset/sequence or song. The SQ tries to be smart about switching effects, since all sound must stop for an instant when it changes effects.

When are new effects loaded into the ESP chip?

- When you select a sound from one of the sound Bank pages, the effect saved in that sound will be loaded into the ESP, and you will hear the sound with its effect.
- When you select or layer sounds/tracks from a preset/sequence or song, the effect is *not* changed.
- When you change the sound on a track from Replace sound mode (e.g. with the ***Edit Sequences*** LED blinking), the effect will *not* be changed.
- When you select a song or a preset/sequence, the effect saved in that song or preset/sequence will be loaded into the ESP.

Whenever a new effect is loaded into the ESP, the audio output will pause briefly, allowing the instructions which create the new effect to be loaded into the ESP. If an effect differs only by variation in parameter values, then this pause may not occur.

These are the rules that the SQ follows in deciding when to change effect sounds:

1. When you select a new sound it changes to that sound's effect.
2. When you select a new song or preset/sequence, it changes to that song or preset/sequence's effect.
3. Whenever you go from Sounds mode to Sequence mode (by pressing ***Select Sequences*** or ***Edit Sequences***) the sequence effect is loaded. The same is true when going from Sequence mode to Sounds mode (by pressing ***Select Sounds*** or ***Edit Sounds***).
4. When you bring a sound into an existing preset or sequencer track using the Replace sound function, it will not change the effect.
5. Saving either the sound or the preset/sequence will save the *current* effect.
6. When a special MIDI program change message (#123) is received in MULTI mode, the next program change received will cause the sequence effect to be loaded with the one in the sound.

Performance Control of Effects in Preset/Sequencer mode

When the SQ is in Preset/Sequencer mode, the effect for the current preset, song or sequence is edited by pressing the ***Effect*** button (Bank 8).

The ***Effect*** button calls up the Effect bank. You can then use the ***Screen*** buttons to select the various parameters within the bank.

Normally, different voices in a sequence are assigned to the three different busses, as set in the Output bank.

The available settings are:

- -DRY- forces all voices to the dry bus
- -FX1- forces FX2 voices to FX1; FX1 and DRY are unaffected
- -FX2- forces FX1 voices to FX2; FX2 and DRY are unaffected
- VOICE uses normal voice routing
- CNTRL uses normal voice routing and also routes controller information to the effect. This is the default setting in the track after selecting a primary sound.

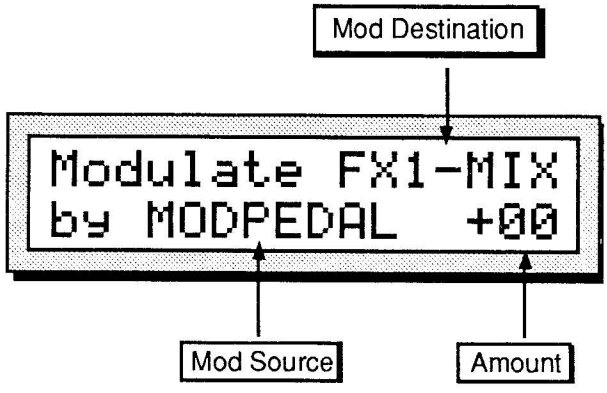
See Section 7 — Presets, for more information.

Controllers Routed to Effects

In effects which allow real-time control, it is sometimes desirable to limit *which tracks* send controller information to the effect. This is particularly true when using multiple MIDI input channels from a sequencer. If more than one track is set to CNTRL, "controller fights" can occur. If set to VOICE, a track will remain routed to the effects, but its controllers (such as the TIMBRE control, MOD WHEEL, etc.) will not affect the effect.

Effect Modulators

All the effects allow real-time control of particular parameters and, with the exception of the Rotory Speaker simulator, share a common modulation control screen. (Modulation of the Rotory Speaker simulator will be covered in detail in the discussion of that effect.)



The exact location of this screen varies depending on the selected effect, but it is always the last screen in the Effect bank for the selected effect. The screen has three parameters:

- Mod Destination — This selects which effect parameter will be modulated. The list of options varies depending on the selected effect, with most parameters within a given effect being available for modulation.
- Mod Source — This selects the source for modulating the Mod Destination.
- Mod Amount — This sets the amount the Mod Destination will be modulated by the Mod Source.

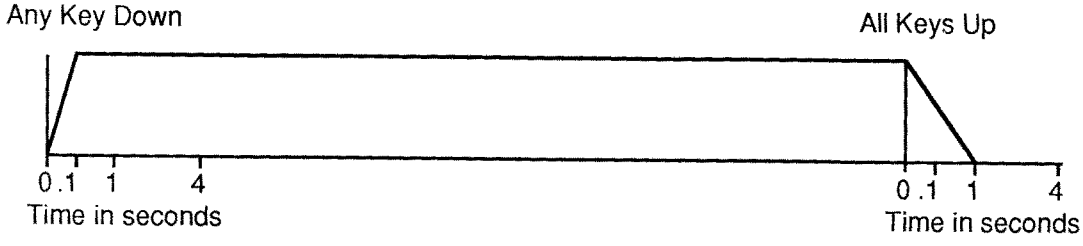
The following modulation sources are available to alter the effects in performance:

Mod Source	*Modulation effect derived from*
KEYBOARD	the number of the last key played
VELOCITY	the average velocity of all keys played
PRESSURE	the channel pressure value for the selected track
PITCHWHL	the value of the pitch wheel
MODWHEEL	the value of the mod wheel
MODPEDAL	the value of the CV/Pedal input
XCONTROL	uses the value of the assignable external MIDI controller, such as the breath controller
SUS-PEDAL	on when the sustain pedal is held down; otherwise off
TIMBRE	the value of the TIMBRE parameter for the track, if the track is set to CONTROL (see below)
*RAMPS 1-6	six separate envelope-type structures
OFF	no modulation

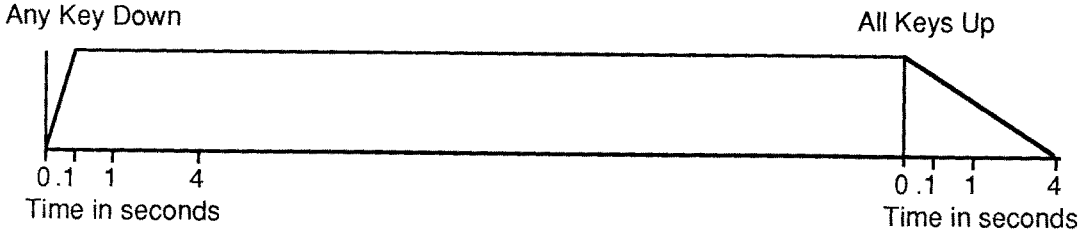
Ramps

Six of the available mod sources are called *ramps*. Ramps are envelope-type structures that modulate the mod destination to the level specified in the mod amount parameter over a period of time. There is also a release time in each ramp which occurs after the key is released. The illustrations below show the available ramps:

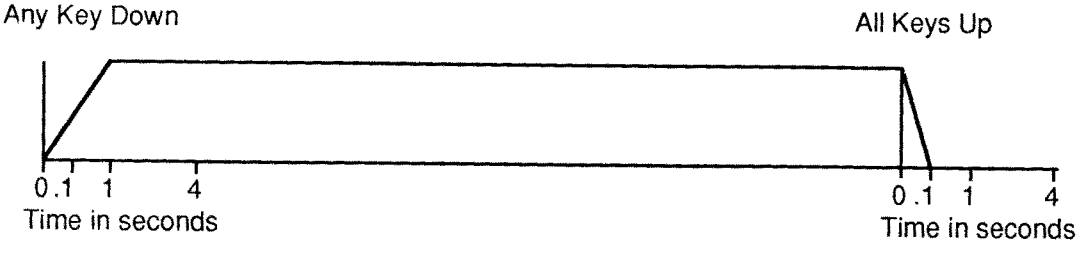
Ramp 1



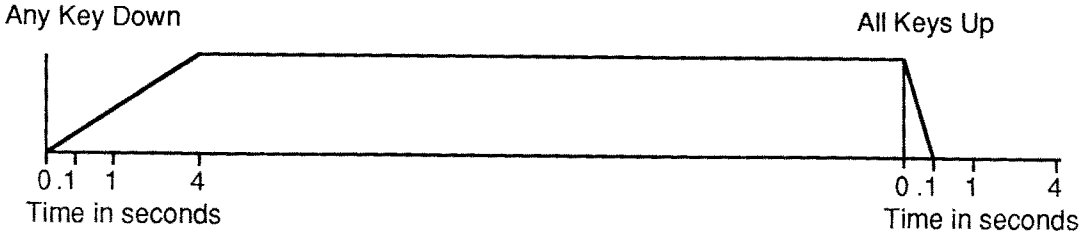
Ramp 2



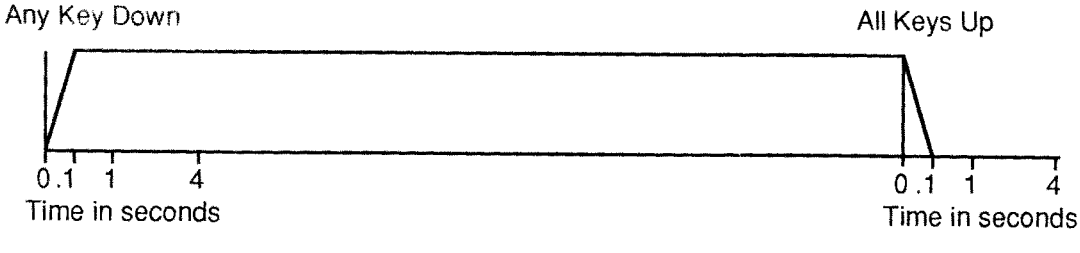
Ramp 3



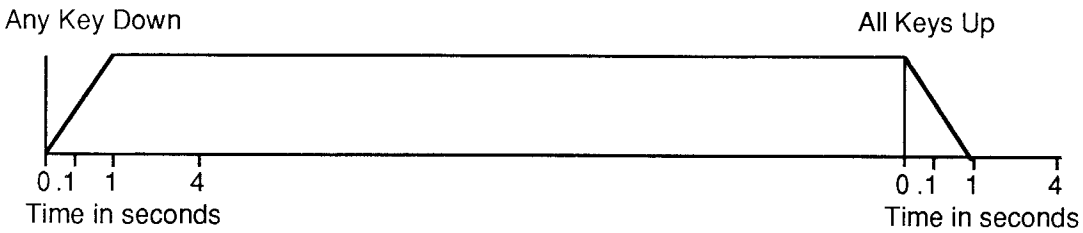
Ramp 4



Ramp 5



Ramp 6


Any Key Down
All Keys Up
0 .1 1 4
Time in seconds
0 .1 1 4
Time in seconds

Effect Parameters

Each of the effect types has multiple screens containing a particular set of parameters associated with the effect. Some of the parameters are common to many effects, and some are specific to certain effects. The first screen of parameters is very similar for all of the effects. Subsequent screens are more variable, and contain the specific parameters.

Each effect has an FX1 Mix and an FX2 Mix, plus a set of parameters which is relevant to the effect. All of these parameters are programmable, and provide much flexibility for customizing the effects.

CONCERT REVERB; HALL REVERB; ROOM REVERB; WARM CHAMBER

The effects algorithms in this category provide a single highly optimized stereo effect, such as studio quality reverb or complex chorusing. The FX1 and FX2 busses may both be routed into the effect with different mixes. CONCERT REVERB is a hall reverb with a relatively long decay. HALL REVERB is a hall reverb with transverse reflections. ROOM REVERB offers a small room emulation. WARM CHAMBER is a chamber reverb, having characteristic resonance.

The parameters available in these four effects algorithms are:

Decay Time
Range: 0 to 99
Controls the amount of time it takes for the reverberation to decay away to a very low level (-60 dB) after the input signal stops.

Diffusion
Range: 00 to 99
This parameter determines whether the early reflections will appear as a series of discreet echoes (lower values), or will be more diffused (higher values).

Detune Rate
Range: 00 to 99
This parameter controls the LFO rate of detuning to be introduced into the reverb. Detuning creates a slight pitch shift into the signal, giving it a more natural sounding decay by breaking up resonant nodes.

Detune Depth
Range: 00 to 99
This parameter controls the depth of the detuning, that is, how much the pitch will change. Low values yield a metallic sound. Some voices may require very low values.

HF Damping — High Frequency Damping
Range: 0 to 99
The High Frequency Damping parameter controls the amount of attenuation of high frequencies in the decay of the reverberation. As natural reverb decays, some high frequencies tend to get absorbed by the environment. Increasing the value of this parameter will filter out increasing amounts of high frequency energy.

HF Bandwidth — High Frequency Bandwidth
Range: 00 to 99
The High Frequency Bandwidth parameter acts as a Low Pass Filter on the signal going into the reverb, controlling the amount of high frequencies that will pass into the effect. The higher the setting, the more high frequencies are allowed to pass.

Low Frequency Decay (Not available on Warm Chamber)
Range: -99 to +99
This control will boost or cut the rate at which low frequencies will decay.

8-VOICE.CHORUS

This is a complex stereo chorus with eight different voices and separately randomized LFOs.

Chorus Rate
Range: 00 to 99
This parameter controls the eight rates of modulation of the delay time of the chorus. The delay modulation produces vibrato and tremolo.

Chorus Depth
Range: 00 to 99
This parameter controls the amount of delay modulation.

Chorus Center
Range: 00 to 99
This parameter controls the delay eight time centers within the chorus. Adjusting this parameter will change the tonal character of the feedback and the Dry/Wet mix.

Feedback
Range: -99 to +99
This parameter controls the amount of positive or negative feedback applied to the chorus.

PHASE SHIFTER

A stereo 12 pole phase shifter with controllable depth and rate, modeled after the classic analog "bi-phase" sound.

Phaser Rate
Range: 00 to 99
This parameter controls the rate of modulation of the phaser poles.

Phaser Depth
Range: 00 to 99
This parameter controls the amount of modulation applied to the phaser poles.

Phaser Center
Range: 00 to 99
This parameter controls the pole centers. A value of "50" places the poles half-way between their extremes, yielding maximum effect.

Feedback
Range: -99 to +99
This parameter controls the amount of local positive or negative feedback applied to the left or right channel of the phaser.

Stereo Cross Feedback
Range: -99 to +99
This parameter controls the amount of signal that will be fed from the output of one channel into the input of the other, creating a stereo feedback effect.

Warning: **Adjust the level of these parameters carefully.** Some feedback combinations can cause very loud sinewaves to be produced that can be harmful to your speakers or your ears. Start with a low value and adjust upward *slowly*.

Phaser Level
Range: 00 to 99
This parameter controls the depth of the notches produced by the phaser. This parameter should normally be set to 99 for maximum effect.

Input Invert
Range: ON/OFF
This parameter inverts the input signal before combining it with the phase shifted version. It creates peaks instead of notches for a different effect.

Combined Effects

The other effects in the system generally include a standard reverb on the FX2 bus combined with a different effect on the FX1 bus. You can control the amount of FX1 that is sent into the reverb (FX2) with the FX1 mix control. Decay Time for the reverb appears on the first screen for all of these combined effects.

CHORUS & REVERB

This effect combines a four voice chorus with the standard reverb. Assign a voice to FX1 to get both chorus and reverb, or use FX2 for reverb only.

Decay Time
HF Damping — High Frequency Damping
See the description under Reverbs in the Single effect section.

Chorus Rate
Range: 00 to 99
This parameter controls the eight rates of modulation of the delay time of the chorus. The decay modulation produces vibrato and tremolo.

Chorus Depth
Range: 00 to 99
This parameter controls the amount of delay modulation.

Chorus Center
Range: 00 to 99
This parameter controls the delay eight time centers within the chorus. Adjusting this parameter will change the tonal character of the feedback and the Dry/Wet mix.

Feedback
Range: -99 to +99
This parameter controls the amount of feedback applied within the chorus. The sign of the value determines the polarity of the feedback.

Chorus Level
Range: 00 to 99
This parameter controls the Dry/Wet mix of the chorus.

FLANGER+REVERB.1 & 2

Flanger 1 is similar to the chorus with a single LFO. Flanger 2 features two LFOs at different rates. Assign a voice to FX1 to get both flanger and reverb, or use FX2 for reverb only.

Decay Time
HF Damping — High Frequency Damping
See the description under Reverbs in the Single effect section.

Flange Rate
Range: 00 to 99
This parameter controls the rate of modulation of the flanger effect.

Flange Depth
Range: 00 to 99
This parameter controls the range of the high to low frequency sweep in the flanger effect.

Flange Center
Range: 00 to 99
This parameter controls the sweep center of the flanger effect.

Feedback
Range: -99 to +99
This parameter controls the amount of feedback applied to the flanger. The sign of the value determines the polarity of the feedback.

Flange Level
Range: 00 to 99
This parameter controls the depth of the notches produced by the flanger. This parameter should be set to 99 for maximum effect.

Input Invert
Range: ON/OFF
This parameter inverts the input signal before combining it with the flanged version. It creates peaks instead of notches in the flanger.

PHASER+REVERB

A 12 pole phase shifter with reverb. Assign a voice to FX1 to get both phaser and reverb, or use FX2 for reverb only.

Decay Time
HF Damping — High Frequency Damping
See the description under Reverbs in the Single effect section.

Phaser Rate
Range: 00 to 99
This parameter controls the rate of modulation of the phaser poles.

Phaser Depth
Range: 00 to 99
This parameter controls the amount of modulation applied to phaser poles.

Phaser Center
Range: 00 to 99
This parameter controls the pole centers.

Feedback
Range: -99 to +99
This parameter controls the amount of feedback applied to the phaser. The sign of the value determines the polarity of the feedback.

Phaser Level
Range: 00 to 99
This parameter controls the depth of the notches produced by the phaser. This parameter should normally be set to 99.

Input Invert
Range: ON/OFF
This parameter inverts the input signal before combining it with the phase shifted version. It creates a peaks instead of notches for a different effect.

ROTORY SPKR+VERB

A rotating speaker simulation with reverb Assign a voice to FX1 to get both rotory speaker and reverb, or use FX2 for reverb only.

Decay Time
HF Damping — High Frequency Damping
See the description under Reverbs in the Single effect section.

Slow Speed
Range: 00 to 99
Determines the rate of the rotory speaker when in the "Slow" setting.

Fast Speed
Range: 00 to 99
Determines the rate of the rotory speaker when in the "Fast" setting.

Rotor Center
Range: 00 to 99
Determines the center point over which the LFO will sweep.

Rotor Depth
Range: 00 to 99
Determines the depth of the LFO.

SpeedMode
Determines how the rotory speaker will switch between slow and fast speeds.

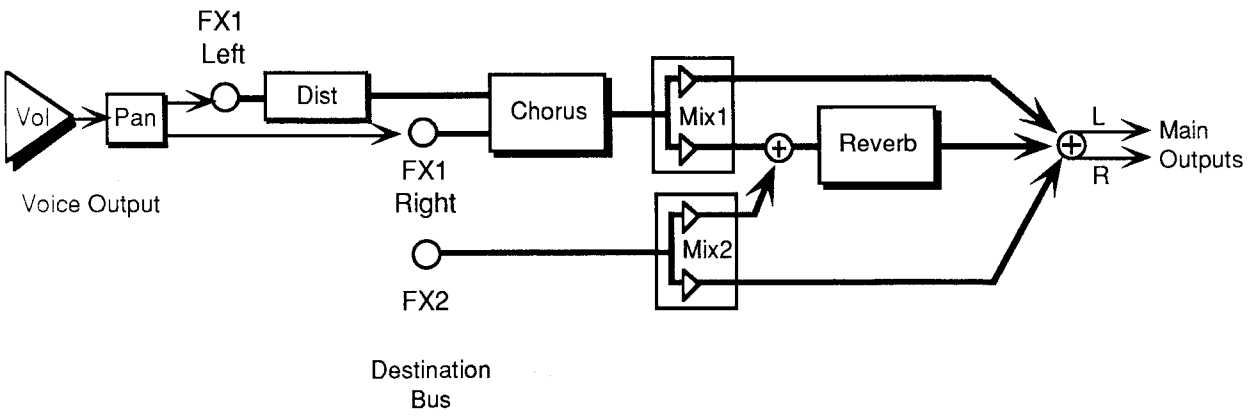
- CONTIN — (Continuous) In this setting, the modulation source directly controls the rotor speed.
- SWITCH — The modulation source acts as a switch to turn on or off the fast rotor speed. The switch accurately reflects an actual rotory speaker, taking some time to speed up or slow down.
- TOGGLE — Every time the modulation source moves from zero in a positive direction, the speaker effect changes speeds, from slow to fast or fast to slow. This is a useful setting when using the foot switch.

ModSrc — Modulation Source
Determines the modulation source for the rotory speaker effect. The available sources are the same as those listed in the Effect Modulators earlier this section.

DIST+CHORUS+VERB

Chorus with overdrive and reverb. Assign a voice to FX1 to get chorus and reverb with or without distortion (see signal path diagram), or use FX2 for reverb only.

DIST+CHORUS+VERB Signal Routing



Decay Time
See the description under Reverbs in the Single effect section.

Distortion Level
Range: 00 to 99
This parameter controls the *output* of the distortion. The input is controlled by the individual voice volume and panning in the Output bank.

Chorus Rate
Range: 00 to 99
This parameter controls the rate of modulation of the delay time of the chorus.

Chorus Depth
Range: 00 to 99
This parameter controls the amount of modulation applied to the delay time of the chorus.

Chorus Center
Range: 00 to 99
This parameter controls the delay time of the chorus.

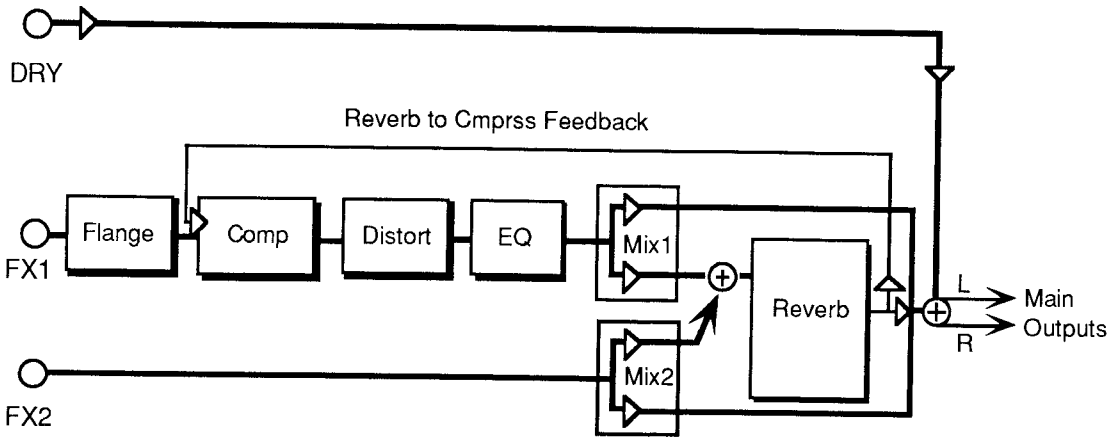
Feedback
Range: -99 to +99
This parameter controls the amount of feedback applied to the chorus. The sign of the value determines the polarity of the feedback.

Chorus Level
Range: 00 to 99
This parameter controls the amount of input in relation to the delay signal.

CMPRSS+DIST+VERB

A screaming guitar+amp simulator that features not only compression, distortion, and reverb, but flanger and a high pass/low pass EQ as well. FX1 routes the signal through each of these effect processors, while FX2 is used for reverb only.

CMPRSS+DIST+VERB Signal Routing



Decay Time
HF Damping — High Frequency Damping
See the description under Reverbs in the Single effect section.

Flange Rate
Range: 00 to 99
This parameter controls the rate of modulation of the delay time of the flanger. Set to 00 to eliminate the flanger effect.

Compression
Range: 00 to 99
This parameter controls the threshold level for the compressor. As the input signal dies away, the compressor will increase the gain of the system, causing feedback to increase as well. Normal compression is "72."

Distortion Level — (In and Out)
These two parameters control the levels going into and coming out of the distortion effect. The range for both parameters is 00 to 11, based on the Tufnel theorem, which states that making 10 louder isn't sufficient, since "These go to 11."

Reverb to Cmprss Feedback
Range: -99 to +99
This parameter controls the amount of signal applied from the output of the reverb back into the input of the compressor. The sign of the value determines the polarity of the feedback.

Note: Since the feedback level is taken from the FX1 bus, if FX1 is set to 00 or a low value, feedback will have little or no consequence. Also, it is important to note that since the signal is being taken from the reverb, which is also fed by the FX2 bus, voices sent to the FX2 bus will enter the feedback loop along with the FX1 signals.

Hipass cutoff
Range: 00 to 99
This parameter filters out low frequencies after the distortion signal path. The higher the value, the less low frequencies pass through.

Lopass cutoff
Range: 00 to 99
This parameter filters out high frequencies after the distortion signal path. The higher the value, the less high frequencies pass through.

Section 4 — Programming the SQ

What is a Sound?

SQ Sounds are divided into two categories; *Standard Sounds*, which are dynamic structures made up of three *voices* and an *effect*, and *Drum Sounds*, which feature 17 voices and an effect. Drum Sounds have slightly different programming features due to having the added voices.

Standard Sounds and Drum Sounds each have their own programming guidelines. See Sections 5 and 6 for details. This section of the manual will cover the "common ground" between the two types of sounds.

Voices and Polyphony

When referring to the number of voices in an SQ sound, we are *not* talking about polyphony (as in "you can only play so many notes," see below). We are referring to the number of voices that will sound on each key as you play the sound.

The SQ has a total of 21 voices, which are dynamically assigned among the different sounds that you play. How many voices a sound uses on each key depends on the sound. Many sounds use only one voice — in the case of these sounds you can play 21 notes before "voice stealing" occurs. On sounds that use two voices, you can play 10 notes before any voices are stolen. Three voices, seven notes. Up to three voices can be active in one Standard sound.

Drum Sounds are inherently "one voice" sounds and always use only one voice per key.

Bear in mind that the SQ is "smart" about voice allocation — there are many things that a programmer can do to increase the apparent polyphony of a sound and to minimize the effects of voice stealing. For example:

- As soon as a voice is done playing (either because it reached the the end of the wave or because the volume envelope went to zero) that voice becomes free and a new note can use that voice rather than stealing one that is still sustaining. See "Voice Triggering/Stealing Notes," in Section 5.

- Also, you can assign low, medium or high priority to each voice in a sound, which allows you to control how voices are reassigned. See Output Bank in Section 5.

Compare — Using the Compare Button/LED

As soon as you change any parameter in a sound, the LED above the ***Edit Sound*** button will begin flashing. It will remain flashing until you select another sound, or save (write) the newly edited sound into memory. This is a constant reminder that something in the sound has been changed.

To hear the original, unchanged sound, press the ***Compare*** button. The Edit Sound LED will remain lit without flashing, and you will hear the original sound and see the screen with its original settings. Press ***Compare*** again to return to your edited sound. You can toggle back and forth between the original and the edited sound as often as you like.

Edit Buffer

You can edit a sound, while keeping the original sound intact, because the edited version is kept in a special area of memory called the *Edit Buffer*. Whenever you change any parameter of a sound, the altered sound is put in the edit buffer, replacing whatever was previously there. Only one sound at a time can reside there — the edit buffer always contains the results of your last edit.

When you press the ***Compare*** button, you are alternating between the sound in the original memory location and the sound in the edit buffer. We refer to the sound in the edit buffer as the *Edit Sound.*

You can return to the edit sound, even after selecting another sound (as long as you don't change any parameters there) by pressing the ***Compare*** button. This puts you back in the edit buffer, and any changes you make will affect the edit sound.

The rule of thumb is this: Whichever sound you hear, that's what you're editing.

If you like the results of the changes you have made to a sound, you should rename it and save the new sound permanently, to another location. The procedure for this is covered under "Saving a New Sound Into Memory" later in this section.

Abandoning Your Edits

If you decide, while editing a sound, that you're not happy with what you've done, and you want to start over with the original sound:

Press the ***Compare*** button so the Edit Sound LED remains lit. Then you can start editing the sound again from scratch. You <u>will</u> lose the one you were working on before.

Saving a New Sound Into Memory

After creating a new sound, or editing a current sound to better suit your needs, it must be saved into a memory location in order to be available for future access. New or edited sounds can be saved into any one of the 80 internal sound locations with the following procedure.

1) Check to make sure that the Edit Sound LED is flashing. If not, press the ***Compare*** button. This indicates that the sound you're hearing is in the edit buffer.

2) Press the ***Enter*** button. This tells the SQ that you've finished editing, and are ready to save the sound to a memory location. The display will read "Save Sound <SOUND NAME>?" The name listed is the name of the sound you began with when editing.

3) Select a name of up to 16 characters for your new sound using the data entry controls. The ***Left/Right Arrow*** buttons select the character to be edited, while the ***Data Entry Slider*** and ***Up/Down Arrow*** buttons scroll through the letters, numbers, and icons that can be used to name the sound. (Moving the ***Data Entry Slider*** all the way down gives you a blank space. Also, using dashes, periods and slashes between characters can make a sound name look better when displayed on Sound Bank screens.)

4) Press the ***Enter*** button.

5) Select a memory location for your program using the ten ***Bank*** and ten ***Screen*** buttons. These buttons will display the names of the programs currently residing in internal memory.

   Look for a memory location that contains a sound that you no longer want or use. Sounds that are in memory can be "auditioned" at this point by pressing the ***Compare*** button to toggle between the sound listed on the screen, and the sound in the edit buffer.

6) When a location has been found, press the ***Enter*** button. The display will show a momentary "SAVED" message before returning to the current parameter.

Hint: If you would like your edited sound to be saved in its present memory location, simply "double-click" the ***Enter*** button. As in the above procedure the display will momentarily read "SAVED" and then return to the current parameter.

Copying an Existing Sound to Another Location

Sometimes you'll want to take an existing sound, one that you haven't been editing, and simply copy it to another memory location. For example, you might want to put the six most commonly used sounds in the same bank, for easy access during performance.

- Select the sound you want to copy.
- Press ***Enter***. The display shows "Replace edit sound?"
- Press ***Yes***. The selected sound now resides in the edit buffer. Now proceed from step three as described above to write the sound to the new location.

Section 5 — Standard Programming

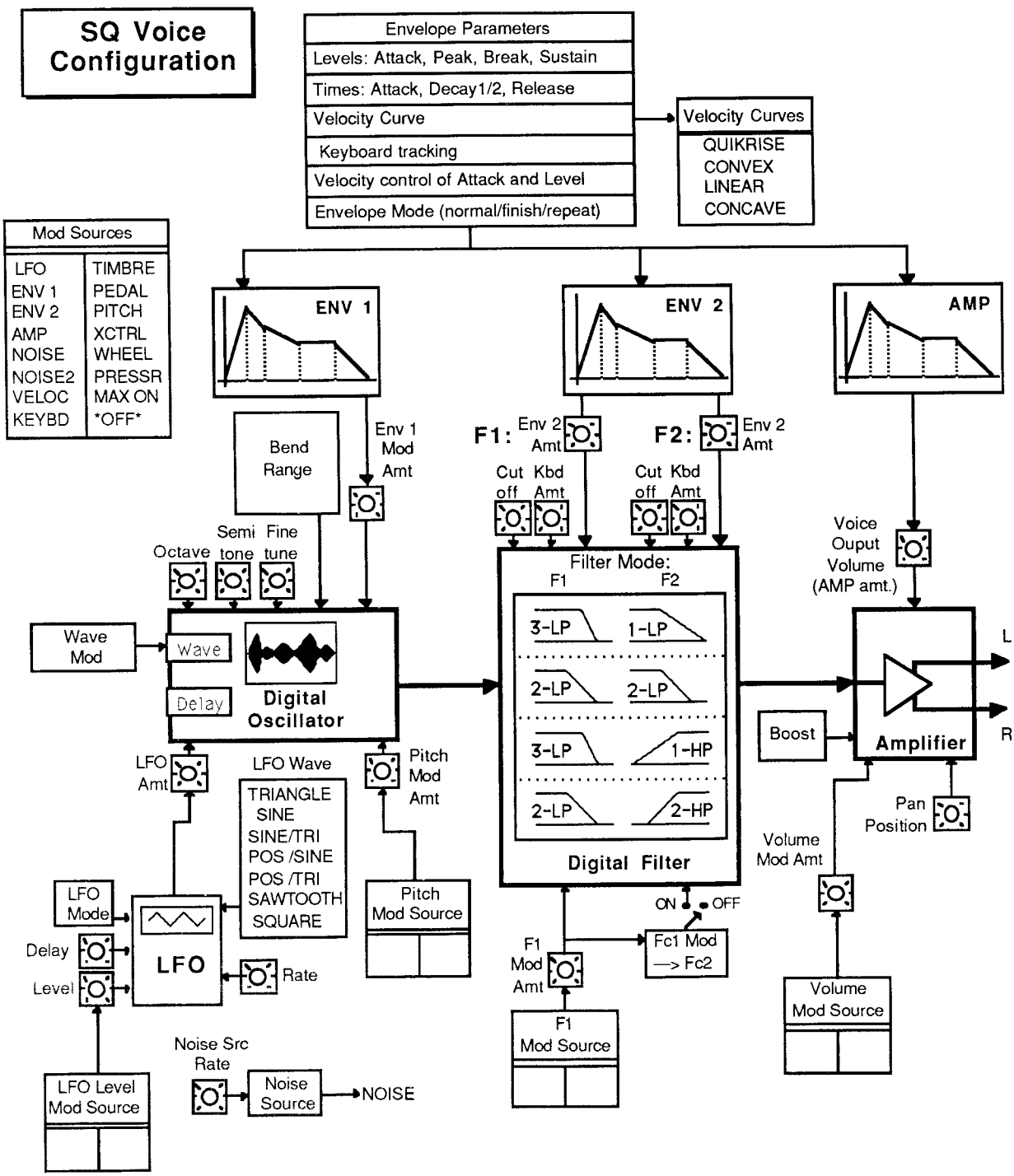
- This section covers those functions which can be edited independently for each individual voice within a Standard Sound.

SQ Standard Sound Configuration

Each of the three voices within a SQ Standard sound consists of:

- a digital oscillator playing one of the 121 waves from the SQ wave memory
- two multi-mode digital filters,
- one LFO (Low Frequency Oscillator),
- three complex envelope generators for controlling volume, pitch, filter frequency, etc., and
- a versatile matrix modulation scheme with 15 routable modulation sources.

The diagram below shows the configuration of one SQ voice.



Modulators

About Modulation

To modulate something is simply to cause it to change. Within the voice architecture of the SQ, we begin by setting basic, or manual levels for the volume, pitch, brightness, etc. of a voice, and we then modulate those levels in various ways in order to create movement and dynamics.

Suppose you switch on your stereo, and turn the volume half way up. We can call this the manual volume setting. It will stay at that level until it's changed. Now suppose that you take the volume knob of your stereo and begin quickly turning it up and down, so the volume gets continuously louder and softer, louder and softer. What you would be doing is modulating the volume of your stereo. If you were to take the treble control, and do the same to that knob, you would be modulating the brightness of your stereo.

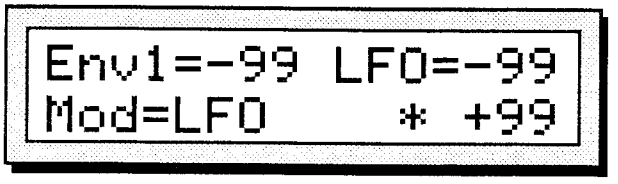
In much the same way we modulate various levels within the SQ (though generally the approach is less haphazard). There are 15 different *Modulation Sources* available, and they can each be independently assigned to vary the manual levels for a great many aspects of a voice, including real time control of some aspects of an effects program.

Selecting a Modulator

On those programming screens where a modulator can be selected to vary the level of some function within a SQ voice, the display shows "Mod=_____" (short for Modulation Source). A modulator is selected using the ***Data Entry Slider*** or the ***Up/Down Arrow*** buttons to choose among the 15 available modulation sources.

Hint: Moving the ***Data Entry Slider*** all the way up selects <OFF>, which is handy if you don't want a Modulator applied in a particular location.

Let's take, for example, the ***Pitch Modulation*** screen, which is where you apply modulation to the pitch of a voice. Press the ***Edit Sounds*** button to place the SQ in Sound Edit Mode. Then press the ***Pitch*** button (Bank 1) followed by the ***Screen 1*** button. In addition to Envelope 1 and the LFO, which are always available, you can choose an additional modulator to alter the pitch:



Modulation Amount

As shown above, where a modulation source is selected, the parameter immediately to its right controls the *Modulation Amount* (the display shows "* ±##"), which controls how deeply the selected modulator will affect the level to which it is being applied.

Select the parameter "LFO=XX." Now, use the data entry controls to adjust the modulation amount. Modulation amount can be positive or negative. A modulation amount of +00 has the same effect as turning the modulator <OFF>.

Hint: With modulation amount, as with all parameter values that have a center value (in this case, +00), there is an easy way to reach that value. With the "LFO=XX" selected, press the ***Down Arrow*** button, and *while holding it down*, press the ***Up Arrow*** button, then quickly release both buttons. This automatically sets the modulation amount to +00.

Modulation Sources

The 15 Modulation Sources available on the SQ are as follows:

- LFO — Low Frequency Oscillator
- ENV 1 — Envelope 1
- ENV 2 — Envelope 2
- AMP — Envelope 3 (Amp)
- NOISE — Noise Generator
- NOISE 2 — Noise 2
- VELOC — Velocity
- KEYBD — Keyboard Tracking
- TIMBRE — Timbre
- PEDAL — Voltage Control Foot Pedal
- PITCH — Pitch Bend Wheel
- XCTRL — External Controller (MIDI)
- WHEEL — Modulation Wheel
- PRESSR — Pressure (MIDI)
- MAX ON — Full Value
- OFF — Off

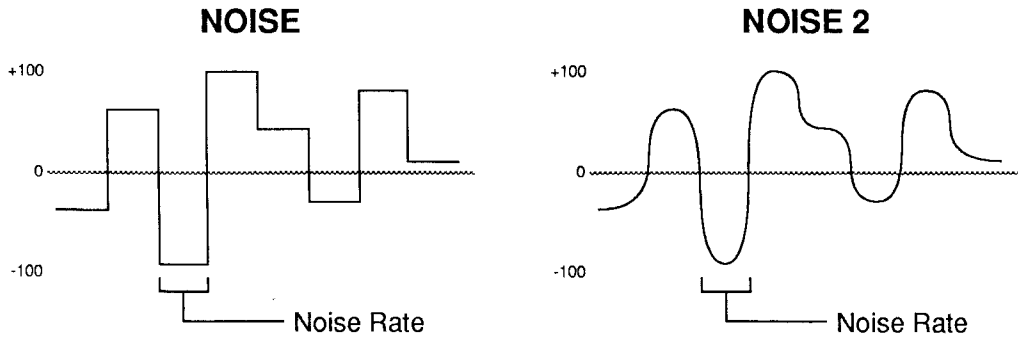
- **LFO — Low Frequency Oscillator**
  The *Low Frequency Oscillator* generates only very low frequency waves, below the audio spectrum, which can produce vibrato, tremolo, and many other effects depending on the LFO wave selected and where it is applied as a modulator. There are seven possible waveshapes for the LFO. See the LFO Screen later in this section for a complete discussion of the LFO.

- **ENV 1, ENV 2, (AMP)**
  The SQ has three complex *Envelopes*. Envelopes are used to create changes over time, in pitch, brightness, volume, etc.
  - ENV 1 is permanently routed to the pitch of the voice, though it can be assigned as modulator elsewhere if you wish.
  - ENV 2 is permanently routed to the filter cutoff frequency. It also can be assigned as a modulator elsewhere.
  - AMP is a special case. AMP *always* controls the volume or *amplitude* of the voice and cannot be selected as a modulator anywhere else.

  A discussion of the SQ Envelopes follows later in this section.

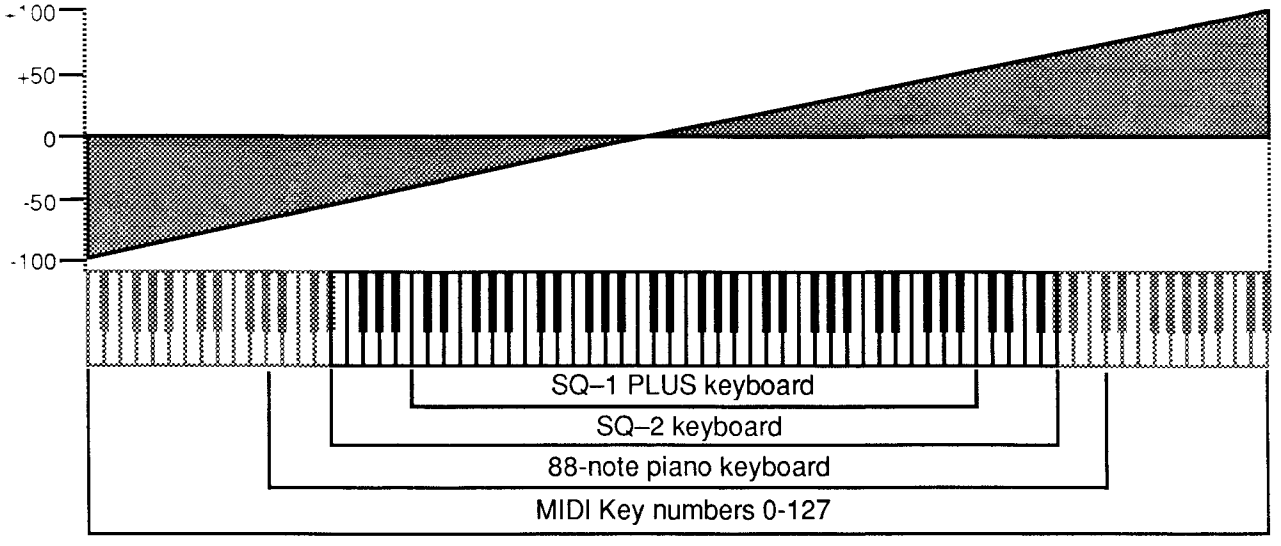
- **NOISE — Noise Generator**
  The Noise generator creates a randomly changing level. It is useful for modulating, among other things, the pitch of a voice (Pitch Mod screen). Applied to pitch with large modulation amounts, it tends to create strange "computer sound" effects. Small modulation amounts (around +02 to +04) can create a subtle random movement in the sound, which imparts a more natural quality.

- **NOISE 2 — Smooth Noise Generator**
  This second Noise generator works on the same principles as NOISE, but NOISE 2 has a "smoothed" wave pattern. When applied to pitch, NOISE 2 has a siren-like quality, as compared to NOISE's computer effects. The following illustration shows the differences in the two Noise generators wave shapes.



- **VELOC — Velocity**
  Velocity means how hard you strike a key. Selecting VELOC as a Modulator allows you to modulate any manual level with velocity. Velocity as a modulation source only goes positive (though assigning a negative modulation amount will make the level reduce with increased velocity).

- **KEYBD — Keyboard Tracking**
  This uses the position of a note on the keyboard as a modulator. The scaling effect of this Modulator is figured over the full 128 MIDI key numbers:



As the above illustration shows, the effect of KEYBD as a modulator goes negative as well as positive. The effect of KEYBD is to reduce the Level on notes below the break point (Middle C, MIDI Key #), and increase levels above that point. Negative Modulation depths will do the opposite.

- **TIMBRE — Timbre Control**
  This is a special modulator, unique to ENSONIQ, which is intended as an "extra" real-time performance controller. TIMBRE can be assigned like any other modulator wherever a modulation source is selected. A parameter in the Mix bank selects the TIMBRE amount. With TIMBRE selected, you can use the ***Data Entry Slider*** to control the modulator.

- **PEDAL — Voltage Control Foot Pedal**
  This selects the optional *CVP-1 Foot Pedal*, which can be plugged into the Pedal/CV jack on the SQ rear panel, as a modulator. Its effect will be the same as that of the mod wheel. It can be applied wherever a Modulator is selected. Note that the Foot Pedal will only act as a modulator when the Pedal Function in the System Bank is set to "Pedal=Mod #4." When that parameter is set to "Pedal=Volume #7" the Foot Pedal will act as a volume pedal, not as a modulator (though this has no effect on incoming MIDI Foot Pedal data). See Section 2 — System Control for more details.

- **PITCH — Pitch Bend Wheel**
  This assigns the Pitch Wheel, located to the left of the mod wheel, as a modulator. It allows you to have the Pitch Wheel, in addition to bending the pitch of a note (its normal function), also affect some other level. Applied to the filter cutoff frequency, for example, this would cause notes to become brighter as you bend them upwards and more muted as you bend them down (or the opposite with negative modulation amounts).

- **XCTRL — External Controller (MIDI only)**
  An external controller such as a Breath Controller, etc., which is received via MIDI from another synthesizer or controller, can be assigned as a modulator within your SQ Sounds. In the MIDI Bank, you select the number of the external controller that will be recognized by the SQ.

  You don't have to be playing the SQ from an external instrument for this to work. For example, if you have a keyboard with a Breath Controller;
  1) Connect its MIDI Out to the SQ MIDI In;
  2) Make sure both instruments have controllers enabled (MIDI Bank);
  3) Select Breath Controller as the external controller that will be received by the SQ (XCTRL=02, also in the MIDI Bank);
  4) Assign XCTRL as a Modulator for LFO level, Filter Cutoff frequency, or some other manual level within a voice, as shown in the Programming section; and
  5) Play the sound from the SQ keyboard, while blowing into the Breath Controller connected to the sending instrument. The modulation will have the same effect as if you were playing from the sending instrument.

- **WHEEL — Modulation Wheel**
  The *Mod Wheel* to the left of the keyboard is assignable wherever a modulator is selected. To use the mod wheel for vibrato (one common application) WHEEL must be assigned to modulate the LFO, and the LFO Amount set to some number other than 0 on the Pitch Mod Screen. The mod wheel's effect is positive, from 0 (wheel towards you) to +99 (wheel away from you). Negative modulation amounts will reverse the effect.

- **PRESSR — Pressure (After-touch)**
  Pressure, also called after-touch, is a modulator which varies a manual level within a voice depending on how hard you press down on a key or keys. When playing the SQ through MIDI from a keyboard with pressure, after you have struck a key, and while the note is sustaining, continuing to press down harder on the key brings in pressure.

  Pressure comes in two varieties — *Poly-Key™* pressure (or Polyphonic pressure), which affects each note individually, and *Channel* pressure (or Mono pressure) which affects all notes that are playing when you exert pressure on any key. Both types are received via MIDI on the SQ.

  Note that not all sounds are necessarily programmed to respond to pressure. If pressure seems to have no effect when you play certain sounds, it is likely that the programmer did not assign pressure as a modulator anywhere within the sound.

  The effect of pressure as a modulator is positive-going only, though assigning a negative modulation depth will cause increased pressure to reduce manual levels.

- **MAX ON — Full Value**
  MAX ON reaches the full value specified in the modulation amount at the instant of the keystroke and maintains it throughout the duration of the note. This can be useful in Drum Sounds, which can play back at their full volume regardless of the velocity of the keystroke. MAX ON can have a positive or negative effect, depending on the item which it is modulating.

Sound Edit Mode

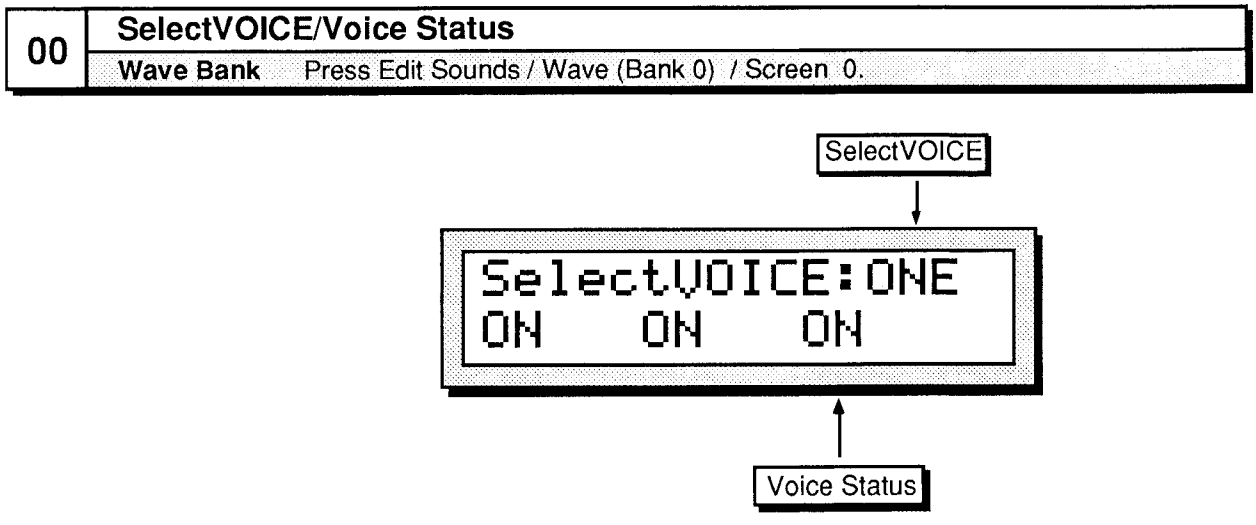
Whenever you want to do any editing to a sound, you must first place the SQ into Sound Edit Mode. This is accomplished by pressing the ***Edit Sounds*** button. Once in Sound Edit Mode you can modify parameters of a sound to better suit your needs or create a completely new sound.

The parameters in Sound Edit Mode are arranged into eight **Banks**. Each Bank contains a series of **Screens** that feature one or more editable parameters.

Each screen in Sound Edit Mode has a two digit *Screen Address*. It is so named because the number relates the location where that screen can be found. The first digit refers to the Bank that screen is contained in, the second digit being the Screen number within that bank. Screen Addresses allow you quick access to all of the Sound Edit Mode parameters. For example, the Pitch Modulation Screen has a *Screen Address* of **11**, and is found by pressing the ***Pitch*** button (Bank 1), followed by the ***Screen 1*** button. These screen addresses will be used throughout the manual when describing parameters within a particular screen.

Wave Bank

Each SQ voice will play one of the 124 Waves in its memory. These waves are the "raw material" from which SQ sounds are crafted. In the Wave Bank you can chose which wave the currently selected voice will play, and modify various playback parameters of the wave.



The first screen of the Wave Bank has three functions; to select whether to edit one voice or all voices within a sound, to select which voice will be edited (if one voice is selected), and to determine the playback status of that voice.

Select VOICE

This parameter determines whether you will be editing one or all voices within a sound.

- ONE — A single voice will be selected for editing. Which of the three voices is active is determined by the voice status parameter, described below.

- ALL — All voices within the sound are selected and can be edited as a group. When "ALL" is selected, the SQ goes into *Group Edit Mode* and changes made to any of the programming parameters will affect all voices playing within that sound.

Voice Status

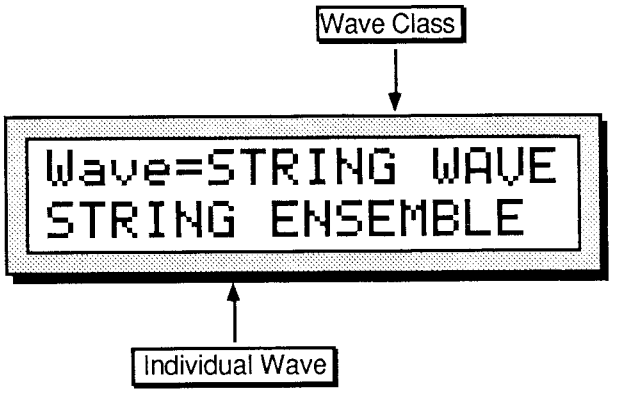
The three values on the bottom of the Oscillator Screen are known collectively as the Voice Status parameter. These values correspond to the three voices that make up an SQ sound. This parameter is used to determine which voice will be edited (when SelectVoice is set to ONE) and the voice's playback status.

A voice is selected for editing by simply choosing that parameter. When the voice is selected, the corresponding Voice Status parameter will begin flashing. From that point, any editing you do will affect that particular voice.

There are three status options that a voice can be set to on this screen;

- OFF — The selected voice is muted and will not play.
- ON — The selected voice will play.
- SOLO — The selected voice will play and all other voices will be muted. This is convenient for occasions when you'd like to hear how your edits are affecting a particular voice.

01	**Wave Class/Individual Wave**
	Wave Bank Press Edit Sounds / Wave (Bank 0) / Screen 1.



Wave Class

This parameter determines the class of waveforms which will be used for a particular voice. By selecting this parameter, you can use the ***Data Entry Slider*** or the ***Up/Down Arrow*** buttons to scroll quickly through the different wave classes to the category you want. Then select the wave name to choose a specific wave from that category.

Whenever the wave class is changed, the first wave in that class is selected and lower-line parameters are reset to default values for the new wave class.

The SQ waves are divided into 12 categories, or *Wave Classes*:

These wave classes contain samples of real acoustic and electronic sounds, which can be used as the basis for a wide variety of realistic musical sounds. Where necessary, these waves have been *multisampled* (sampled at many points through the range of the instrument) for maximum authenticity in reproducing the original.

- **16-BIT PIANOS** - Samples of pianos and attacks with 16-bit resolution.
- **STRING-WAVE** - Samples of stringed instruments — strings, pianos, guitars, etc.
- **BRASS-WAVE** - Samples of brass instruments — horns, sax, etc.
- **BASS-WAVE** - A variety of bass sounds — electric, acoustic and synthesized.
- **BREATH-WAVE** - Flute and vocal sounds with complex, breathy sustains.
- **TUNED-PERCS** - This category contains a wide variety of sounds — generally, these are percussive sounds which are looped (that is, they will sustain).
- **PERCUSSION** - This class contains unlooped (non-sustaining) percussion sounds.
- **DRUM-WAVE** - Individual drum sounds which are used to create customized drum kits. See Section 6 for more details on drum programming.

The next four wave classes contain a variety of sampled and algorithmically generated waves that are more "synthesizer" oriented:

- **TRANSWAVE** - TransWave™ is a special class of waves, unique to ENSONIQ keyboards. Each Transwave consists of many single-cycle waveforms, each with a different harmonic spectrum. The playback parameters allow you to start the wave playing at any one of these waveforms and move through the wavetable, continually varying the timbre of the sound, using any of the 15 modulators.
- **WAVEFORM** - A waveform is a single cycle of a sound repeated over and over. The SQ contains both sampled and synthetic waveforms. Waveforms such as Sawtooth and Square can be used to reproduce a wide array of analog synth sounds.
- **INHARMONIC** - Inharmonic loops are similar to waveforms except that they contain many cycles of the sound and can therefore contain *inharmonics* — frequencies which are not exact multiples of the fundamental frequency.

- **MULTI-WAVE** - Contains only one wave, but it consists of ALL-WAVES in the SQ memory. Starting from any wave in memory, any number of waves can be played, forward or backward, to create effects and "jam-loops."

Individual Waves

Here you select the actual wave which the voice will play. When this parameter is underlined, the ***Data Entry Slider*** will select only among the waves in the current wave class. Pressing the ***Up/Down Arrow*** buttons will allow you to cross over into the next category.

Below is a complete listing of the 124 SQ Waves. The wave class is shown in bold at the top of each group.

STRING-SOUND:
STRING ENSEMBLE
PIZZICATO STRING
GRAND-PIANO
PIANO VARIATION
DIGITAL PIANO
CLAVINET PIANO
ACOUSTIC-GUITAR
GTR VARIATION-1
GTR VARIATION-2
GUITAR-HARMONIC
ELECTRIC GUITAR
PLUCKED GUITAR
CHUKKA-GUITAR

BRASS-SOUND:
BRASS ENSEMBLE
SOLO TRUMPET
TRUMP VARIATION
SAXOPHONE SAX
VARIATION-1
VARIATION-2

BASS-SOUND:
PICKED BASS
THUMB POP BASS
PLUCKED BASS
ACOUSTIC BASS
SYNTH BASS-1
SYNTH BASS-2

BREATH-SOUND:
WOOD FLUTE
CHIFF FLUTE
VOX-OOOHS
VOCAL ENSEMBLE

TUNED-PERCUSSION:
MARIMBA
KALIMBA
STEEL DRUM
DOORBELL
POT LID HIT
SYNTH PLUCK
PLINK HORN
PIANO PING
ORCHESTRA HIT
RACK-BELL

PERCUSSION:
WOODEN HIT
WOOD BLOCK
TEMPLE BLOCK
CLAVES
TIMBALE
BONGOS
AGOGO-BELL
COWBELL
TAMBOURINE
FINGERSNAPS
CLAPS
DINKY HIT
TOY HAMMER
SLINKY POP
MUSICIAN'S TAPE
STEAM DRUM
BIG BLAST
SPRAY CAN
METALLIC DINK
VOCAL PERCUSSION
ANVIL-HIT
SYNTH THUMP

DRUMWAVE:
DYNAMIC KICK
GATED KICK
ROOM KICK
ELECTRIC KICK
TIGHT KICK
THUMP KICK
THUMP SNARE
SYNTH SNARE
ROOM SNARE
BRUSHED SNARE
RIMSHOT SNARE
SIDESTICK SNARE
DRY TOM LOW
DRY TOM HIGH
ROOM TOM LOW
ROOM TOM HIGH
CLOSED HI-HAT 1
CLOSED HI-HAT 2
SYNTH CLOSED HAT
PEDAL HI-HAT
OPEN HI-HAT
RIDE CYMBAL
CRASH CYMBAL

TRANSWAVE:
FORMANT-X
PLANET-X
ELECTRO-X
PULSE 1-X
PULSE 2-X
RESONANT 1-X
RESONANT 2-X
RESONANT 3-X
RESONANT 4-X

MULTI-WAVE:
ALL-WAVES

WAVEFORM:
ORGAN VARIATION1
ORGAN VARIATION2
ORGAN VARIATION3
ORGAN VARIATION4
SAWTOOTH
SQUARE
SINE
TRIANGLE
1+2 HARMONICSS
2 HARMONIC SAW
DIGITAL PNO GRIT
DIGITAL PNO TINE
BUBBAWAVE
CLAVINET
CLAV VARIATION
WOODWIND
WWIND VARIATION
PIPE ORGAN
BRASS ORGAN
VOCAL BELL
SYNTH BELL
CLARINET

INHARMONIC:
TRIANGLE LOOP
ANVIL LOOP
CLUSTER LOOP
TUBULAR LOOP
NOISE LOOP

16BIT PIANO:
16 BIT PIANO- HI
16 BIT PIANO- LO
THUD

02	**Delay Time/Direction**
	Wave Bank Press Edit Sounds / Wave (Bank 0) / Screen 2.

Delay Time

The Delay Time parameter determines how long the voice will wait after a key is struck before playing. Adjustable from 000 to 250, with each value increasing the delay time by 4 milliseconds. A delay of up to 1 second is possible.

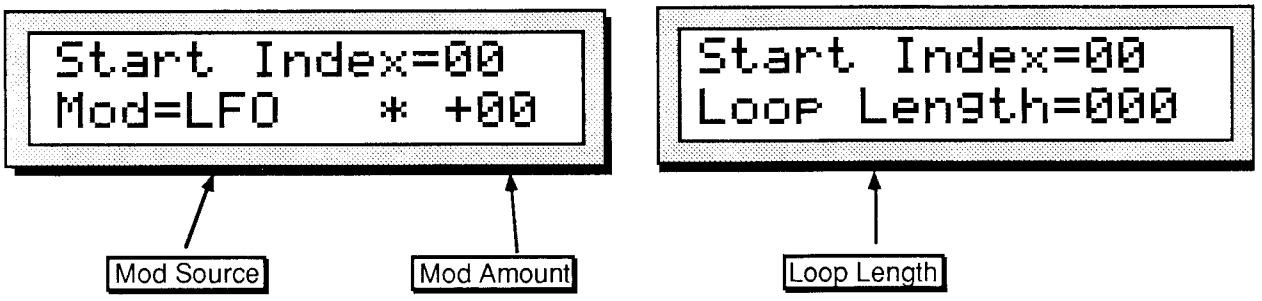
Triggering a voice with a Key up — In the highest position, Delay Time=KEYUP, the voice will wait until the key is released before it plays.

Direction

This parameter determines the direction a wave will play, either Forward or Backward.

Waves found within the TRANSWAVE, WAVEFORM and INHARMONIC wave classes are based upon loops and therefore have a fixed direction. When one of these waves is selected, this parameter will not appear on the screen.

03	**Start Index/Mod Source and Amount (Loop Length)**
	Wave Bank Press Edit Sounds / Wave (Bank 0) / Screen 3.



Start Index

This controls where in the sample the wave will begin playing. When START=00, the whole wave will play. As the start point is adjusted upwards it will begin playing further into the wave. You can use this, for example, to skip the attack and play only the loop portion of looped (sustaining) sounds.

Range: 00 to 99

Type-Specific Wave Parameters

The parameters shown on the lower line of this screen will vary depending on the current wave class. For each wave class, the lower line of the display will contain parameters controlling the features which are specific to that category.

As mentioned earlier, changing the wave class resets these parameters. However, if you scroll only one step away from the current class and then scroll back, any lower-line settings you had will be restored. Go more than one class from the current one and any lower-line settings will be lost.

Mod Source

Modulation Source - Here you can choose which of the 15 modulators will control the movement of the sound. Any of the modulators can be selected.

Mod Amount

Modulation Amount - Determines how much the selected modulator (above) will affect the wave; i.e. how far away from the start point the sound will move. If the mod amount is set to +00, the sound will remain static. Positive amounts will modulate the sound forward (toward the end of the wave); negative modulation amounts will move the sound back toward the beginning. Both Mod Source and Mod Amount are applicable to all wave classes except INHARMONIC, WAVEFORM and MULTI-WAVE.

Range: -99 to +99

Loop Length

Controls how many waves will be included in the loop. This parameter is found only when using MULTI-WAVE.

Range: 000 to 121

Note: Two wave classes, INHARMONIC and WAVEFORM, have no parameters on this screen. When programming a voice that uses a wave contained within these wave classes, choosing this screen will have no effect and the following screen will be displayed.

04	**Voice Restrike Decay Time**
	Wave Bank Press Edit Sounds / Wave (Bank 0) / Screen 4.

Voice Restrike Decay Time

This parameter sets the amount of decay a note will have after it has been restruck. The higher the value, the longer the decay time.

Range: 00 to 99

05	**Change Sound Mode**
	Wave Bank Press Edit Sounds / Wave (Bank 0) / Screen 5.

Change Sound Mode

Press ***Enter*** to switch the current sound mode. When working in Standard Sound mode, this command will place the default Drum Sound into the edit buffer and place the SQ in Drum Sound mode.

Pitch Bank

In the Pitch bank you set the "manual" levels for the pitch of the voice and select the modulation sources for the Pitch.

10	**Oct/Semi/Fine (Oscillator Tune)**
	Pitch Bank Press Edit Sounds / Pitch (Bank 1) / Screen 0.

Oct

Changes the pitch of the oscillator by octaves.

Range: -4 to +4 octaves

Semi

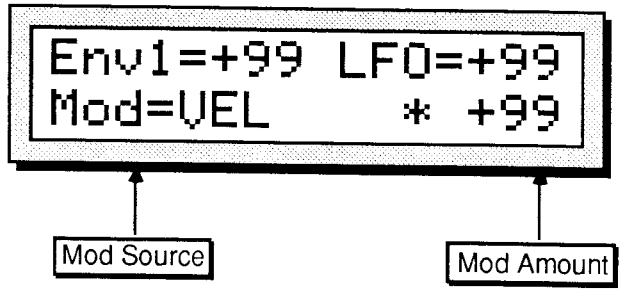
Changes the pitch of the oscillator by semitones. Incrementing/decrementing this control beyond +11 or -11 automatically increases/decreases the octave by one.

Fine

Changes the pitch of the oscillator by steps of one cent (1/100 of a semitone).

Range: -99 to +99

11	**Env1/LFO/Mod Source and Amount**
	Pitch Bank Press Edit Sounds / Pitch (Bank 1) / Screen 1.



On the Pitch Mod Screen, you apply modulation to the pitch of the voice. Envelope 1 and the LFO are always available to modify the pitch, and you can choose one additional modulator.

Env1

Envelope 1 — Determines the amount or depth by which envelope 1 will affect the pitch.

Range: -99 to +99

LFO

Low Frequency Oscillator Amount — Determines the amount by which the LFO will affect the pitch of the voice. LFO is most commonly used for vibrato, but can create many unusual effects, depending on the LFO waveform chosen.

Range: -99 to +99

Mod Source

Modulation Source — Selects an additional modulator for the pitch of the voice from among the 15 available modulation sources.

Mod Amount

Modulation Amount — Determines the amount or depth by which the additional modulation source will affect pitch.

Range: -99 to +99

12 Keyboard Pitch Tracking

Pitch Bank Press Edit Sounds / Pitch (Bank 1) / Screen 2.

Keyboard Pitch Tracking

Determines whether or not the pitch of the selected voice will change across the keyboard, or remain static at C4.

- ON — The pitch of a voice tracks with the keyboard.
- OFF — All keys play at the same pitch; C4.

13 Glide/Glide Time

Pitch Bank Press Edit Sounds / Pitch (Bank 1) / Screen 3.

Glide

Enables Glide (portamento) and several forms of monophonic voice assignment in a sound. All three voices in a sound use the same Glide time, but each voice selects whether it will glide or not. There are four Glide Modes:

- OFF — Glide is off. This is normal polyphonic operation, with no portamento.
- RETRIGGER — This mode plays monophonically, with the envelope and waveform retriggering, or restarting, each time there is a new key down.
- MINI — Similar to mono mode on old analog synths. The voice will play with one-note polyphony and new notes will always glide from the previous note (assuming Glide time is greater than zero). If you just want mono voice assignment without glide, set "GlideMode=MINI" and set the Glide time to zero.
- LEGATO — When GlideMode=LEGATO, if you release a note the SQ "forgets" that note. The SQ will not glide to notes when you play staccato — play a new key with no other keys down. It will glide when you play legato — play a new key while another key is down.

Note: RETRIGGER, MINI, and LEGATO feature "note memory" — if you release a key while still holding down another key, the pitch will return to note you are holding.

Glide Time

Determines the amount of time that it takes for the pitch to glide smoothly from one note to another.

Range: 00 to 99 (the higher the value, the longer the glide time)

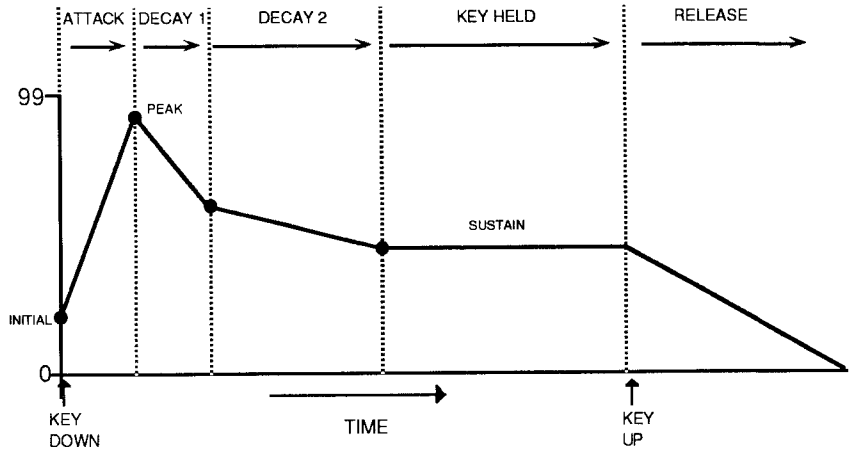
ENV 1, ENV 2, (AMP) — SQ Envelopes

An *Envelope* is a shape, or contour, which we apply to a signal source to make it change over time. Each SQ voice has three envelopes. These envelopes are automatically routed to the pitch, filter frequency, and amplitude of the voice. ENV 1 and ENV 2 can also be assigned elsewhere, wherever a modulator is selectable.

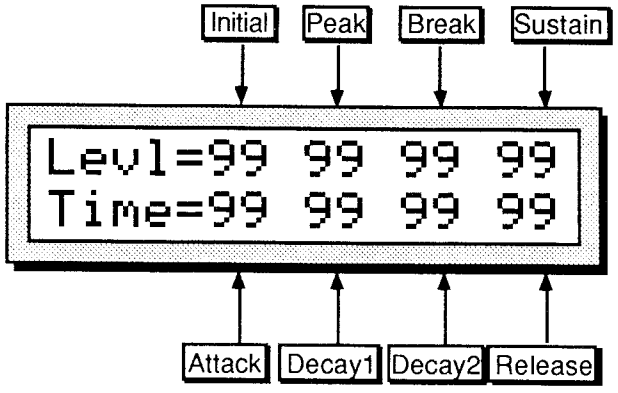
- ENV 1 is routed to the pitch of the voice. There is a parameter always available on the Pitch Mod Screen which lets you adjust the amount by which ENV 1 will modulate the voice's pitch.
- ENV 2 is routed to the filter cutoff frequency of the voice. For each of the voice's two filters, the parameter labeled ENV 2=__ in the Filters bank controls ENV 2 depth.
- AMP is routed to the amplitude (volume) of the voice. The AMP envelope *always* controls the final volume contour of the voice. Any other volume modulators selected in the Output bank will occur before AMP in the signal flow.

The SQ envelopes are descended from the venerable ADSR (attack, decay, sustain, release) envelope, but with many refinements. While the ADSR envelope gives you control over three time segments and one level, the SQ envelopes give you control over *four* levels and *four* time segments.

The illustration below shows the make-up of an SQ envelope:



20	Levl/Time
	Env1 Bank Press Edit Sounds / Env1 (Bank 2) / Screen 0.



Levl

This parameter sets the levels for the four stages of the envelope. The four values correspond to the following levels:

INITIAL
Determines the level at which the envelope will start when a key is depressed.

Range: 00 to 99

PEAK
Determines the level the envelope will reach at the end of the time defined by ATTACK (see below).

Range: 00 to 99

BREAKPOINT
Determines the level the envelope will reach at the end of DECAY 1.

Range: 00 to 99

SUSTAIN
Determines the level the envelope will reach at the end of DECAY 2 and retain as long as the key is held down.

Range: 00 to 99

Time

This parameter is used to set values for the four time segments. Note that the numbers shown here represent *times*, not rates. That is, the envelope will take a fixed amount of time to go from one level to another, no matter what those two levels are.

ATTACK

The amount of time it takes for the envelope level to travel from the INITIAL level (when the key is struck) to the PEAK level. The higher the value, the longer the time. This doesn't necessarily have to be an "attack" in the usual sense — the INITIAL level could be set higher than the PEAK level, in which case this would become another decay stage.

Range: 00 to 99 (see the Envelope Times chart below for a listing of the time values).

DECAY 1

The time it takes the envelope to go from PEAK to BREAK.

Range: 00 to 99

DECAY 2

The time it takes the envelope to go from BREAK to SUSTAIN.

Range: 00 to 99

RELEASE

This defines the time it will take the envelope to return to zero after the key has been released.

Range: 00 to 99

ENVELOPE TIMES

value	time (in sec)	value	time (in sec)	value	time (in sec)	value	time (in sec)	value	time (in sec)
0	.00	20	.20	40	.82	60	3.2	80	13
1	.01	21	.22	41	.88	61	3.5	81	14
2	.02	22	.23	42	.94	62	3.7	82	15
3	.03	23	.25	43	1.0	63	4.0	83	16
4	.04	24	.27	44	1.0	64	4.3	84	17
5	.06	25	.29	45	1.1	65	4.6	85	18
6	.07	26	.31	46	1.2	66	4.9	86	19
7	.08	27	.33	47	1.3	67	5.3	87	21
8	.08	28	.35	48	1.4	68	5.7	88	22
9	.09	29	.38	49	1.5	69	6.1	89	24
10	.10	30	.41	50	1.6	70	6.5	90	26
11	.11	31	.44	51	1.7	71	7.0	91	28
12	.11	32	.47	52	1.8	72	7.5	92	30
13	.12	33	.50	53	2.0	73	8.1	93	32
14	.13	34	.54	54	2.1	74	8.6	94	34
15	.14	35	.58	55	2.3	75	9.3	95	37
16	.15	36	.62	56	2.4	76	9.9	96	39
17	.16	37	.66	57	2.6	77	10	97	42
18	.17	38	.71	58	2.8	78	11	98	45
19	.19	39	.76	59	3.0	79	12	99	49

21 LevV/AtckV/VelCurv
Env1 Bank Press Edit Sounds / Env1 (Bank 2) / Screen 1.

LevV — Velocity Level Control

The Velocity level parameter will lower all envelope settings with a softer keystrike. This means that the settings you assign to INITIAL, PEAK, BREAK, and SUSTAIN are maximum levels, the levels that will be reached with the hardest keystrike. The amount of "LevV" will determine how much those levels will be reduced as you play softer. With this parameter you can have continuous dynamic control over the four levels by varying how hard you play. Changing the Velocity Curve (VelCurv) gives you further control over the velocity response of the envelope.

Range: 00 to 99

AtckV — Velocity Attack Control

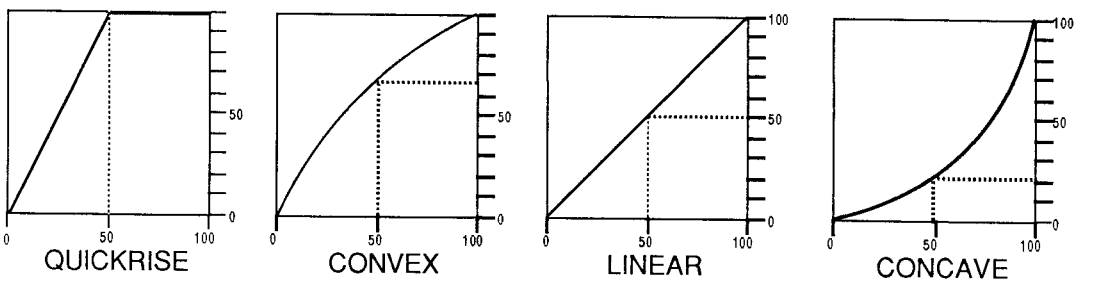
Velocity attack makes the envelope attack time respond to keyboard velocity. When the value of "AtckV" is increased, a harder keystrike will result in faster attack. Note that this parameter will have no effect if "AtckV=00."

Range: 00 to 99

VelCurv — Velocity Curve

This selects which of the four available velocity response curves the envelope will use if the velocity level control (LevV above) is set to some value other than zero.

Available values are: QUIKRISE, CONVEX, LINEAR, and CONCAVE.



22 Mode/KeyboardTrk
Env1 Bank Press Edit Sounds / Env1 (Bank 2) / Screen 2.

Mode — (ENV 1 and ENV 2)

- NORMAL — The envelope plays through normally, as shown in the diagram on the following page.
- FINISH — The envelope runs its full cycle — *finishes* playing through all its stages — ignoring the key-up event. The envelope spends no time at the sustain stage. As soon as DECAY 2 is finished, instead of stopping at the sustain stage, the envelope immediately goes into the release stage. This is good for percussive-type sounds where you want the envelope to be the same for every note, no matter how long the key is held down.
- REPEAT — In this mode, at the end of the DECAY 2 stage, instead of

sustaining, the envelope goes immediately back to the beginning of the envelope and repeats. When the key is released, the envelope stops repeating and moves into the release stage. This type of envelope can be used to create complex LFO-type effects.

MODE (AMP) — Voice Triggering/Stealing Notes

Since AMP controls the volume of the voice there are a number of special considerations to be aware of when using the the different envelope modes:

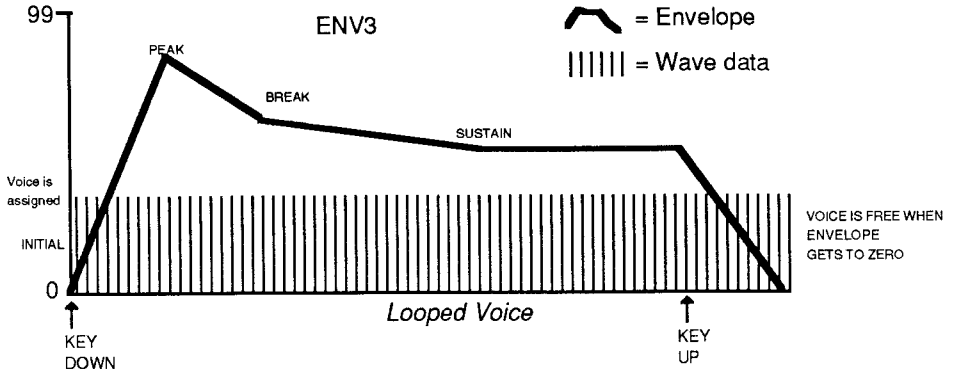
In NORMAL mode, if you set a delay on the voice, and you release the key before the designated delay time elapses, the voice will not sound, even if the sustain pedal is down.

In FINISH mode, if you set a delay on the voice and you release the key before the designated delay time elapses, the note will sound anyway. The envelope finishes what you set it up to do.

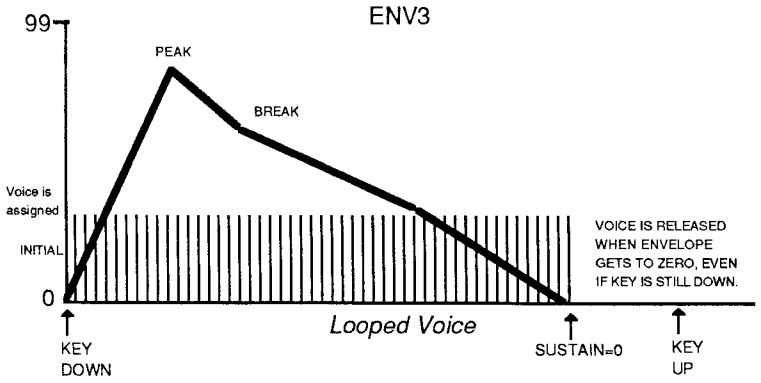
In REPEAT mode the SQ restarts the wave from the beginning every time the envelope repeats. When envelope gets to the SUSTAIN level, it goes back to the INITIAL level.

In order to maximize the use of the SQ's 21 voices, and to manage the "voice stealing" it is sometimes useful to understand when a given voice will be assigned and when it will be released, or "put back" into the pool for use by other sounds. This depends on a combination of envelope mode and the wave type.

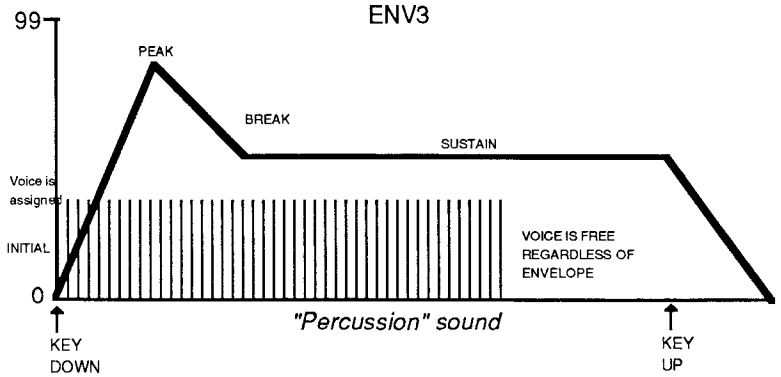
A looped (sustaining) wave will continue to use the voice until the envelope reaches zero. For a sustaining wave, when the Envelope Mode is Normal:



For a sustaining wave, when the Envelope Mode is set to Finish:



For unlooped, non-sustaining, waves (specifically those in the Percussion and Drum categories) the voice becomes free as soon as the sample has played through to the end, no matter where the envelope level is. The voice is released for use by another sound:



KeyboardTrk — Keyboard Tracking

Makes the Envelope time segments longer or shorter, depending on the position of the key on the keyboard.

Raising the value of KeyboardTrk will make all envelope times (except Release) shorter as you play notes above middle C, and longer as you play below middle C — higher notes will have shorter envelopes than lower ones. The greater the value assigned to KeyboardTrk, the greater the difference in decay time between the highest and lowest note. Middle C will always remain the same, and is not affected by this parameter.

Range: -98 to +98

23	**Select Defaults**
	Env1 Bank Press Edit Sounds / Env1 (Bank 2) / Screen 3.

Press ENTER to select Defaults

Pressing the ***Enter*** button lists a group of available "pre-set" envelope values which can be placed into the current envelope. This is particularly useful when setting up typical envelopes as starting points when you are creating new voices.

After selecting the envelope shape, pressing ***Enter*** again places it into the voice.

LFO Bank

The LFO Bank contains the parameters related to the Low Frequency Oscillator. Each voice within a sound has its own LFO, which can be assigned as a modulator wherever a modulation source is selected. LFO's are commonly used to create vibrato, tremolo, and other effects.

30	**LFO Speed/Noise Rate**
	LFO Bank Press Edit Sounds / LFO (Bank 3) / Screen 0.

LFO Speed

Determines the speed of the LFO.

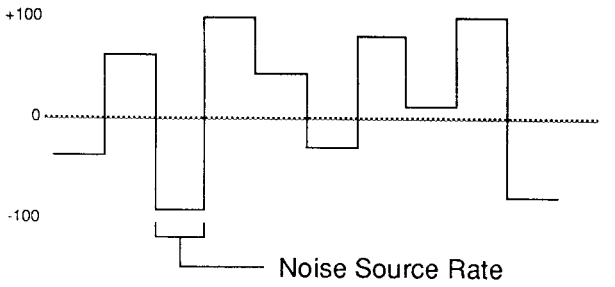
Range: 00 to 99
The table below shows the frequency (in hertz) for each value:

LFO FREQUENCIES

value	freq (in Hz)	value	freq (in Hz)	value	freq (in Hz)	value	freq (in Hz)	value	freq (in Hz)
0	.05	20	1.25	40	6.25	60	11.25	80	16.25
1	.05	21	1.50	41	6.50	61	11.50	81	16.50
2	.06	22	1.75	42	6.75	62	11.75	82	16.75
3	.06	23	2.00	43	7.00	63	12.00	83	17.00
4	.06	24	2.25	44	7.25	64	12.25	84	17.25
5	.07	25	2.50	45	7.50	65	12.50	85	17.50
6	.07	26	2.75	46	7.75	66	12.75	86	17.75
7	.08	27	3.00	47	8.00	67	13.00	87	18.00
8	.08	28	3.25	48	8.25	68	13.25	88	18.25
9	.09	29	3.50	49	8.50	69	13.50	89	18.50
10	.10	30	3.75	50	8.75	70	13.75	90	18.75
11	.11	31	4.00	51	9.00	71	14.00	91	19.00
12	.13	32	4.25	52	9.25	72	14.25	92	19.25
13	.14	33	4.50	53	9.50	73	14.50	93	19.50
14	.17	34	4.75	54	9.75	74	14.75	94	19.75
15	.20	35	5.00	55	10.00	75	15.00	95	20.00
16	.25	36	5.25	56	10.25	76	15.25	96	20.25
17	.33	37	5.50	57	10.50	77	15.50	97	20.50
18	.50	38	5.75	58	10.75	78	15.75	98	20.75
19	1.0	39	6.00	59	11.00	79	16.00	99	21.00

Noise Rate

One of the SQ's 15 available modulation sources is NOISE. The Noise modulator is a signal whose level varies by random amounts. Typically, it might look like this:



The Noise Rate defines how frequently the level will change. Low values will cause it to change very slowly; with high values the level will change quickly.

Range: 00 to 99

31 Level/Dlay/Mod

LFO Bank Press Edit Sounds / LFO (Bank 3) / Screen 1.

Level — LFO Level

Sets the "manual" level (or depth) of the LFO. Level controls the initial amount of LFO. The effect of any LFO modulator will be added to this amount.

Range: 00 to 99

Dlay — LFO Delay

Determines the time it takes for the LFO to go from zero to the level set with the "Level" parameter. This is useful for creating delayed vibrato, tremolo, etc. Higher values give longer delay times.

Range: 00 to 99

Mod — LFO Rate Modulation Source

Selects a modulation source for "LFO Speed" from among the 15 available modulators.

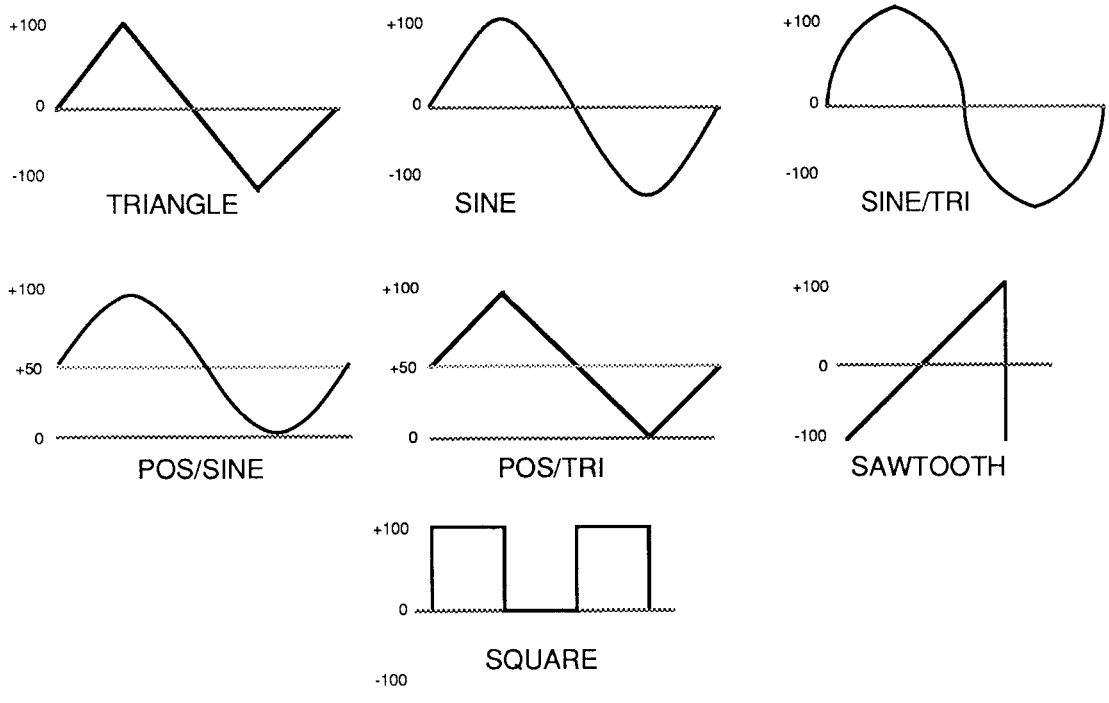
32	**Wave/Restart**
	LFO Bank Press Edit Sounds / LFO (Bank 3) / Screen 2.

Wave

The Wave determines how the signal will rise and fall. There are seven possible values:

- TRIANGLE — the triangle wave is commonly used to modulate the LFO to produce vibrato.
- SINE — the sine wave is a pure fundamental frequency, more abrupt in its peaks and valleys than the triangle wave.
- SINE/TRI — a mixture of a sine and triangle wave, a sort of pointy sine wave.
- POS/SINE — the POS/SINE is similar in application to the POS/TRI.
- POS/TRI — the POS/TRI is a positive-only triangle wave useful for simulating vibrato on instruments like the guitar where vibrato techniques are limited to bending the note up.
- SAWTOOTH — the sawtooth wave is commonly used for special effects.
- SQUARE — the square wave is useful for producing trill effects.

LFO Waveshapes



Restart

Determines whether the LFO will restart with each keystrike: When set to OFF, the LFO will cycle continuously without resetting. When set to ON, the LFO waveform will return to the beginning of its cycle each time a new key is struck.

Filter Bank

Each SQ voice has its own pair of digital filters, Filter 1 and Filter 2, which are connected in series. The filter settings determine which ranges of frequencies will be allowed to pass through to the output.

Low-pass/High-pass

A low-pass filter allows only those frequencies below the filter cutoff frequency to pass — higher frequencies are filtered out. The reverse is true for a high-pass filter — it lets frequencies higher than the cutoff frequency pass and filters out those below. In the SQ, Filter 1 is always a low-pass filter. Filter 2 can be either a high-pass or low-pass filter.

Poles: Rolloff Curves

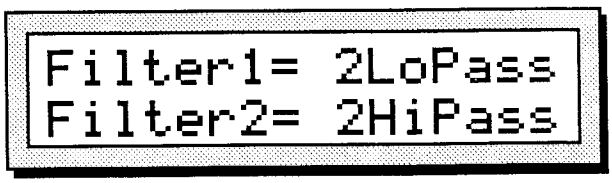
"Pole" is an engineering term which describes the steepness of a filter, or the filter's cutoff *slope*. Each additional pole gives a filter a steeper rolloff curve. In the SQ, the filter modes are interdependent; that is, the combined number of poles in Filter 1 and Filter 2 is always four.

These four poles are divided between the two filters; either as 2 and 2, or as 3 and 1. A 1-pole filter will rolloff at 6 dB per octave; a 2-pole filter, 12 dB per octave; a 3-pole filter, 18 dB per octave; and 4-pole filter, 24 dB per octave. To reproduce a 4-pole low-pass filter (for that "classic" analog synth sound) you would set both low-pass filters to roll off at 12 dB per octave, resulting in a 24 dB per octave rolloff.

Cutoff Frequency

Every filter has a "knee" in the response curve, known as the cutoff frequency. This is the frequency at which the filter begins filtering out frequencies. The filter cutoff frequency can remain fixed over time, or it can be varied by modulating the filter with an envelope, LFO, velocity, etc. You can create some very interesting filter configurations by using a different modulator for each filter. For instance, try using the mod wheel to modulate the filters. You can drive one filter up with the mod wheel, while simultaneously driving the other down.

40	Filter1/Filter2
	Filter Bank Press Edit Sounds / Filter (Bank 4) / Screen 0.



Filter1 — Filter 1 Mode

Determines whether Filter 1 will be a 2-pole or 3-pole low-pass filter.

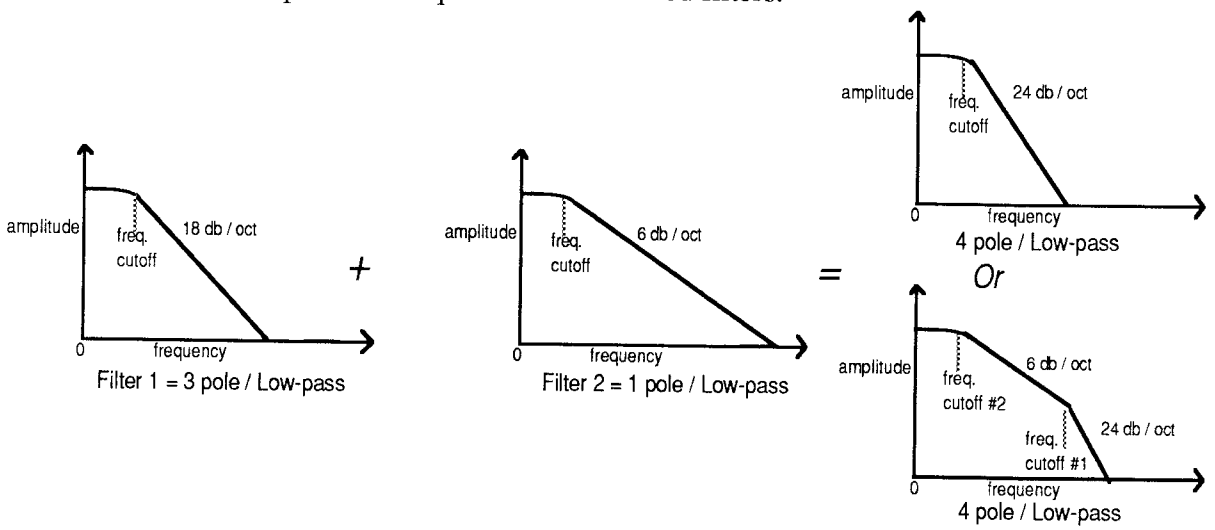
Filter2 — Filter 2 Mode

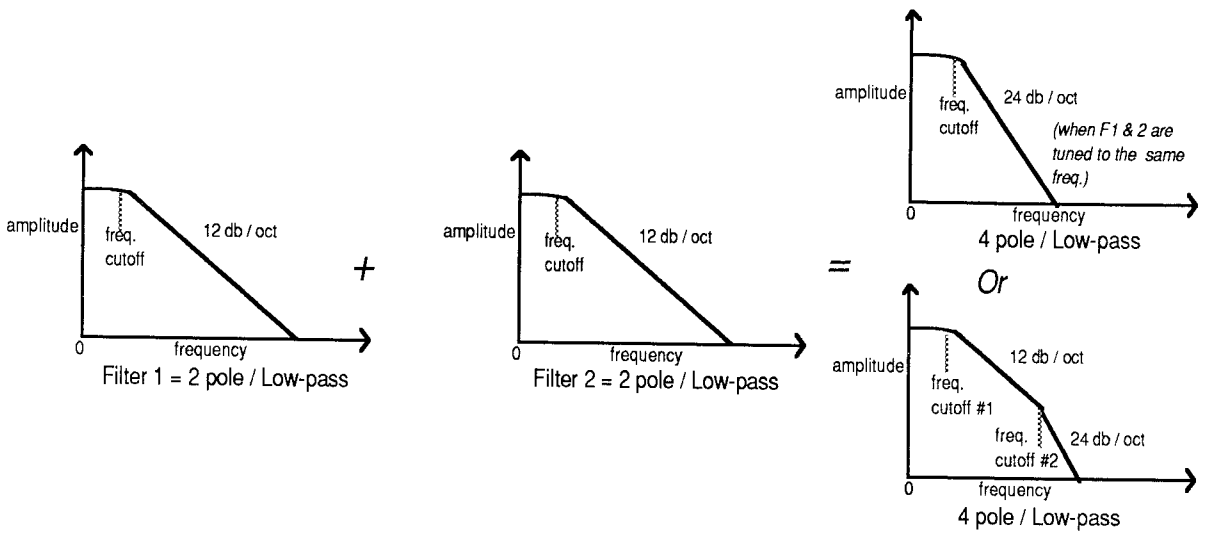
Filter 2 can be configured as a 2-pole or 1-pole high-pass filter, or a 2-pole or 1-pole low-pass filter.

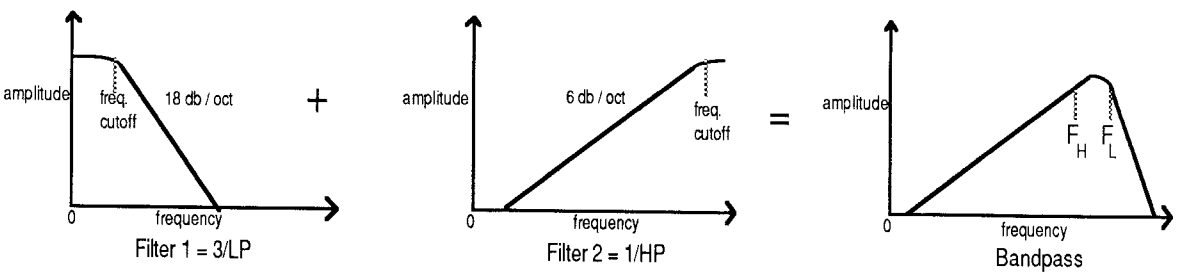
These two parameters are "tied together" in that changing the value of either will result in a corresponding change in the other.

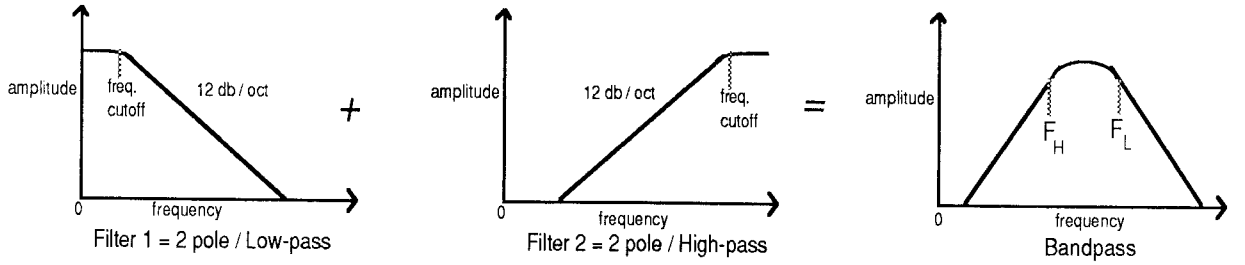
Filter Configurations

The diagrams below show a number of possible filter configurations. On the left are the response curves of the two filters shown separately. On the right are some of the possible shapes of the combined filters.









Filter 1 = 2 pole / Low-pass — Filter 2 = 2 pole / High-pass — Bandpass

41 FC1 Cutoff/Envelope2

Filter Bank Press Edit Sounds / Filter (Bank 4) / Screen 1.

FC1 Cutoff — Filter 1 Cutoff Frequency

Determines the initial, or manual, filter cutoff frequency. With a low-pass filter, a setting of 127 lets all the original signal pass through the filter. Lower settings lower the cutoff frequency, somewhat like turning down the treble on a stereo.

Range: 000 to 127

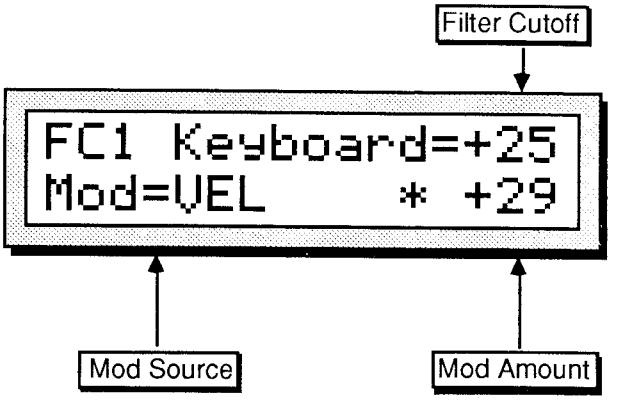
Envelope2

Determines the amount or depth by which envelope 2 will affect the filter cutoff frequency.

Range: -99 to +99

42 FC1 Keyboard/Mod Source and Amount

Filter Bank Press Edit Sounds / Filter (Bank 4) / Screen 2.



FC1 Keyboard

Sets the amount by which the location of a note on a keyboard will modulate the filter cutoff frequency (keyboard filter tracking). To have the filter track the keyboard exactly, set FC1 Keyboard=+50.

Range: -99 to +99

Mod Source

Selects the source of modulation for the filter cutoff frequency from among the 15 available modulation sources.

Mod Amount

Determines the amount or depth by which the modulation source will affect the filter cutoff frequency.

Range: -99 to +99

43	FC2 Cutoff/Envelope2
	Filter Bank Press Edit Sounds / Filter (Bank 4) / Screen 3.

FC2 Cutoff — Filter 2 Cutoff Frequency

Determines the initial, or manual, filter cutoff frequency. With a low-pass filter, a setting of 127 lets all the original signal pass through the filter. Lower settings lower the cutoff frequency, somewhat like turning down the treble on a stereo.

Range: 000 to 127

Envelope2

Determines the amount or depth by which Envelope 2 will affect the filter cutoff frequency.

Range: -99 to +99

44	FC2 Keyboard/FC1 Mod—>FC2
	Filter Bank Press Edit Sounds / Filter (Bank 4) / Screen 4.

FC2 Keyboard

Sets the amount by which the location of a note on a keyboard will modulate the filter cutoff frequency (keyboard filter tracking). To have the filter track the keyboard exactly, set FC2 Keyboard=+50.

Range: -99 to +99

FC1 Mod—>FC2

Allows the modulator assigned to FC1 to also modulate FC2. The FC2 amount has no modulation source of its own, this is the only way to apply modulation to it. When "FC1 Mod—> FC2= ON" the modulation source for FC1 and its modulation amount will be applied to FC2.

Env2 and Amp Banks

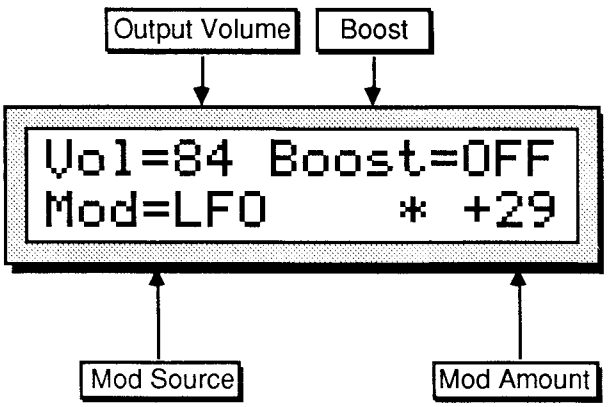
The parameter screens in these banks correspond directly to those found in Env1 (Bank 2). See the section covering Env1 earlier in this section for details. Again, Env1 controls pitch, Env2 controls the filter, and Amp regulates volume.

Output Bank

The parameters in the Output Bank, along with the Amp envelope, regulate the overall volume and panning of the voice, along with keyboard scaling, effects routing and voice reassignment, or "voice stealing" priority.

70 Vol/Boost/Mod Source and Amount

Output Bank Press Edit Sounds / Output (Bank 7) / Screen 0.



Volume — Voice Volume

Adjusts the overall volume of the voice. This is permanently routed to the volume of the voice, so this parameter could be thought of as Amp Amount.

Range: 00 to 99

Boost — Volume Boost

Setting this parameter to "ON" gives the selected voice a +12 dB boost. Not for the feint of heart.

- ON — A +12 dB boost is added to the selected voice.
- OFF — The voice plays normally.

Mod Source — Volume Modulator
Selects one of the 15 available modulators to affect the volume of the voice. This is in addition to the Amp envelope, which is always routed to volume.

Mod Amount — Volume Modulator Amount
Determines how much the modulator selected above will affect the volume of the voice.

Range: -99 to +99

The two parameters on the lower line of the display provide a powerful tool for shaping the volume of the sound across the keyboard:

71	KeybdScale/KeyRange
	Output Bank Press Edit Sounds / Output (Bank 7) / Screen 1.

KeybdScale — Keyboard Scale Amount (or Zone)
Can be used to fade the voice in or out between the two keys specified to the right (see below). This is good for doing keyboard crossfades between voices, or for reducing the volume of a particular voice as you go higher up the keyboard. A value of +99 will fade the voice *in* from silence to full level between the low and high keys. A value of -99 will fade the voice *out* from full level to silence between the low and high keys. Intermediate values will scale the voice from full level to an intermediate level.

When set to ZONE, the voice will sound at an even level between the low and high keys. There will be no sound below the low key or above the high key.

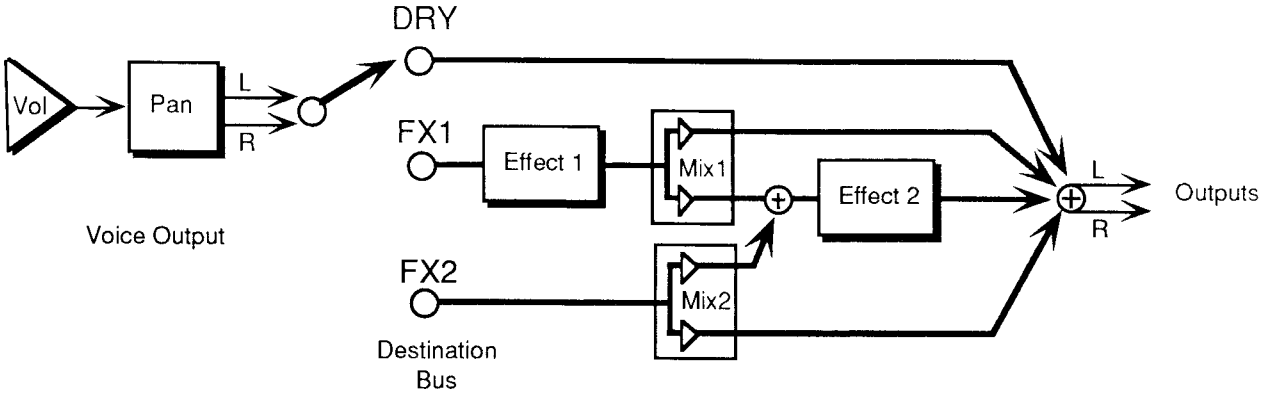
KeyRange — Low and High Key
Sets the key range over which the fade-in, fade-out or keyboard zone will occur. When this parameter is selected, notes can be entered from the keyboard or using the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons. Select this parameter and play the low key; that note is entered as the low key, and the cursor switches to the high key. Now play the high key; that note is entered as the high key, and the cursor disappears. If you made a mistake, or want to enter a different range of values, just select the parameter again and repeat the process.

72 Output Bus/Priority

Output Bank Press Edit Sounds / Output (Bank 7) / Screen 2.

Output Bus

Each voice within a sound can be routed to one of three stereo "busses." The diagram below shows the routing of the signals for each bus. See the section on "Effects" for more on programming specific effects.



Priority

This parameter gives you some control over how voices will be reassigned, or "stolen," to play new notes when all of the SQ's voices are already playing. A voice can be can assigned LOW, MEDIUM or HIGH priority. The rule is that a given voice will only be allowed to steal from voices with the same or lower priority.

MEDIUM is the usual state and should be used for most voices. LOW can be used for voices within a sound which would be missed the least if stolen (such as a voice playing the same wave as another voice but detuned a bit). HIGH is best used only for specific applications in which you want to protect a voice or voices from being stolen — such as drums or a sustaining "pad" sound in a sequencer track.

73 Pan/Vel Window

Output Bank Press Edit Sounds / Output (Bank 7) / Screen 3.

Pan — Pan Location

Pans the voice within the stereo mix. Range is from 00 (panned left) to 99 (panned right). A value of 50 pans the voice center.

Vel Window

Selects a key velocity below which, or above which, the voice will not sound. This allows velocity switching between different voices within the sound. The range is from -127 to +127. When the value is +000, the parameter will have no effect. Values from +001 to +127 mean that the voice will only play when the key velocity is *greater* than the number shown. Values from -001 to –127 mean that the voice will only play when the key velocity is *less than* or equal to the number shown.

Section 6 — Drum Programming

- This section covers those functions which can be edited independently for each individual voice within a Drum sound.

SQ Drum Sound Configuration

As discussed earlier, SQ sounds come in two distinct varieties: Standard sounds and Drum sounds. SQ Drum sounds differ from Standard sounds in two major areas:

Number of Voices — Standard sounds are made up of three voices. Drum sounds are comprised of *17* separate voices. Each voice can be used as a separate drum or percussion instrument. Drum sounds use only one voice per key.

Voice Architecture — Each of the 17 voices within a SQ Drum sound consists of:

- a digital oscillator playing any of the wavesamples from the SQ wave memory (except TRANSWAVES and MULTI-WAVE),
- two multi-mode digital filters that are fixed in a 4-pole low pass mode, and
- a set of parameters specific to Drum sounds.

Selecting Drum Sound Editing

Because the SQ has two types of sounds, it also has two Sound Edit modes; one which pertains to Standard sound editing, and one for editing Drum sounds. In order to create or edit a Drum sound, you must use the Drum edit mode.

There are two methods for entering the Drum edit mode:

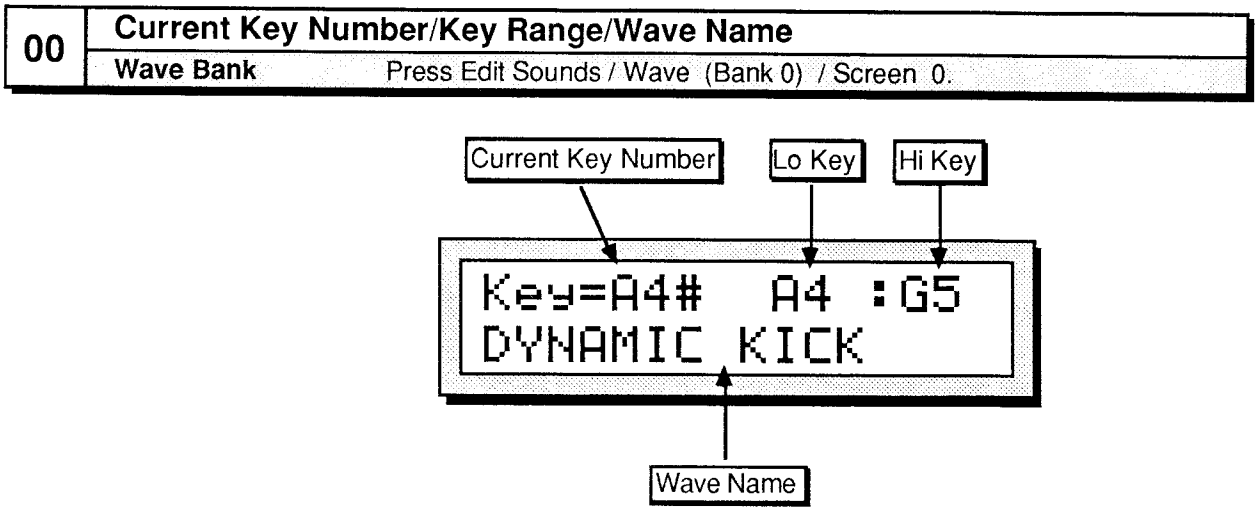
- Change Sound Mode Command — This is the standard method for switching sound edit modes. Located in both Standard sound edit mode and Drum sound edit modes, this command allows access into the other sound edit mode. The Change Sound Mode command is located at screen address 05 in both Sound Edit modes.
- Selecting Sounds — A second method for sound mode hopping is the simple process of selecting sounds. The currently selected sound determines the sound edit mode. You can enter the Drum edit mode by selecting a drum sound, then pressing the ***Edit Sound*** button.

Sound Edit Mode

Whenever you want to do any editing to a sound, you must first place the SQ into Sound Edit Mode. This is accomplished by pressing the ***Edit Sound*** button. Once in Sound Edit Mode you can modify parameters of a sound to better suit your needs, or create a completely new sound.

Wave Bank

In the Wave Bank you can chose which wave the currently selected voice will play, and modify various playback parameters of the wave.



Current Key Number

This parameter is used to select each of the 17 voices for editing.

Select a Standard sound, then use the Change SoundMode command to enter Drum sound Edit mode (for information on the Change SoundMode command, see "5 — Change SoundMode" later in this section). This will place the default drum map into the edit buffer. Take a moment now to play each key on the SQ's keyboard. You'll notice that each time you play a new key, the current key number changes. However, the key range parameters (Low Key and High Key) and the wave name change every several keys. If you count, you'll discover that there are 17 of these changes, corresponding to the 17 voices.

By playing keys on the keyboard, you are selecting a voice to be edited. You can then select a waveform, define a key range and tailor the voice to suit your needs.

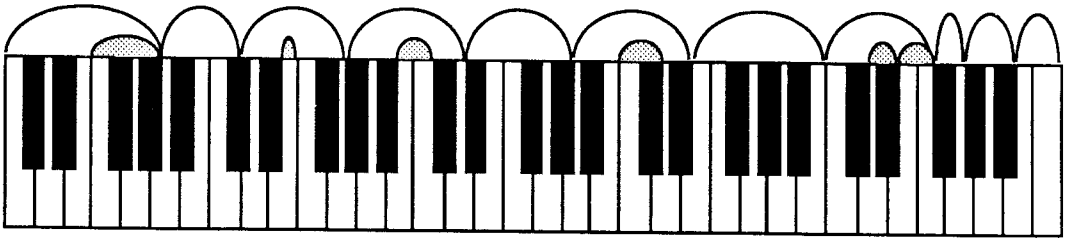
Key Range — Low Key/High Key

The Low and High key parameters work together to form a *key range*,which is the term used to describe the range of notes within which a particular voice will play.

After selecting this parameter, you can set the key range by simply playing the notes on the keyboard where you want the low and high keys to be located. (Low Note is set first, followed by High Note).

Creating "Holes" in the Key Map

It is possible, when setting the key range for a particular voice, for that voice to "cover up" one or more other voices. This would occur if the key range of one voice extended over the entire area of another voice's key range. The result would be something like this:



As you can see, the 11 voices defined cover the entire range of the SQ's keyboard. This has the effect of "covering up" the remaining six voices (shown in shading).

Now, suppose you wanted to add another voice to the sound (you've discovered you just can't live without tambourine). In order to make another voice available for the tambourine waveform, you must:

- First, select a key in the range where you'd like the tambourine to be placed. For this example, we'll choose F6.

Next, you'll need to "create a hole" in the sound's keymap on that particular key.

- Select the voice that currently occupies the F6 key (by playing the F6 key) and reset its key range to where the Low Key is above F6. Because you are not placing additional voices above F6 you can reset the High Key to its original value.

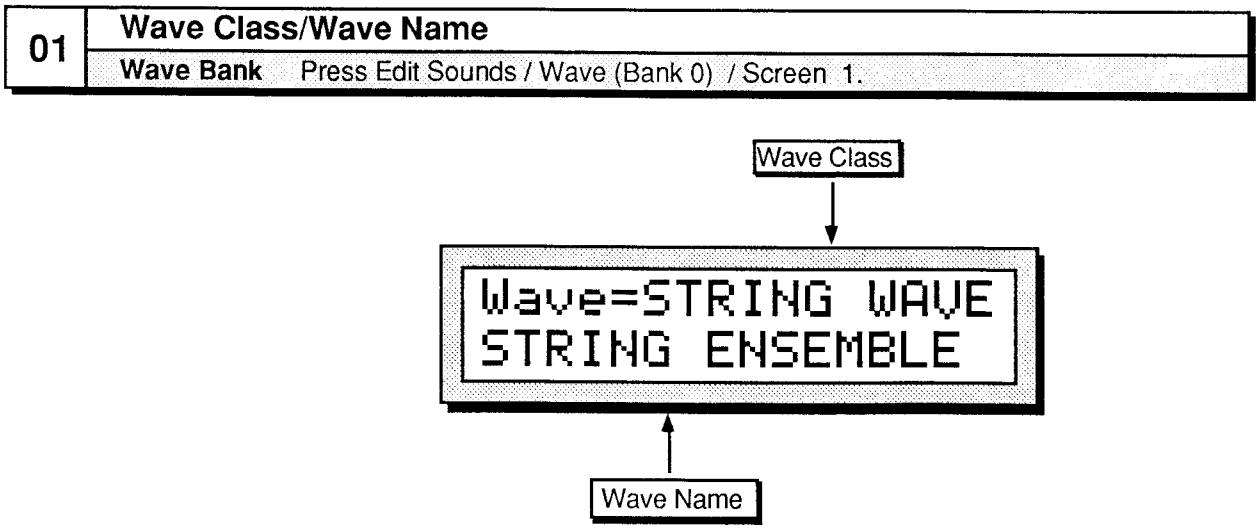
This will have the effect of creating a hole in the key map at F6, since there are no longer any voices with key ranges that cover F6.

- Play the F6 key to select its voice. You'll see the display read:

Pressing the key has the effect of selecting the "covered" voices and bringing them into the newly created hole. If there is more than one voice covered (as there is in our example), repeatedly pressing the key where the hole has been created will select each of the covered voices in rotation.

The question marks in the key value indicate that there is no voice *defined* to that key.

- To complete the process, define a key range for the voice, and it will become a permanent voice in the sound. You can then select which wave the voice will play and make other edits, just as you would with any of the voices.



Wave Class

This parameter determines the class of waveforms which will be used for a particular voice. By selecting this parameter, you can use the the ***Data Entry Slider*** or the ***Up/Down Arrow*** buttons to scroll quickly through the different wave classes to the category you want. Then select the wave name to choose a specific wave from that category.

Whenever the wave class is changed, the first wave in that class is selected, and lower-line parameters are reset to the default values of the new wave class.

The SQ waves are divided into 11 categories, or *Wave Classes*:

These wave classes contain samples of real acoustic and electronic sounds, which can be used as the basis for a wide variety of realistic musical sounds. Where necessary, these waves have been *multisampled* (sampled at many points through the range of the instrument) for maximum authenticity in reproducing the original.

A descriptive list of Wave Classes can be found in the preceding section on Standard sound programming.

Note: Waves found in the TRANSWAVE and MULTI-WAVE categories cannot be selected as voices for Drum sounds.

Wave Name

Here you select the actual wave which the voice will play. When this parameter is underlined, the ***Data Entry Slider*** will select only among the waves in the current wave class. Pressing the ***Up/Down Arrow*** buttons will allow you to cross over into the next category.

(A chart showing the complete list of waves available can be found in the preceding section on Standard sound programming.)

02	**Direction**
	Wave Bank Press Edit Sounds / Wave (Bank 0) / Screen 2.

Direction

This parameter determines the direction a wave will play, either Forward or Backward.

Waves found within the WAVEFORM and INHARMONIC wave classes are based upon loops, and therefore have a fixed direction. When one of these waves is selected, this parameter will not appear on the screen.

03	**Clear Key Map**
	Wave Bank Press Edit Sounds / Wave (Bank 0) / Screen 3.

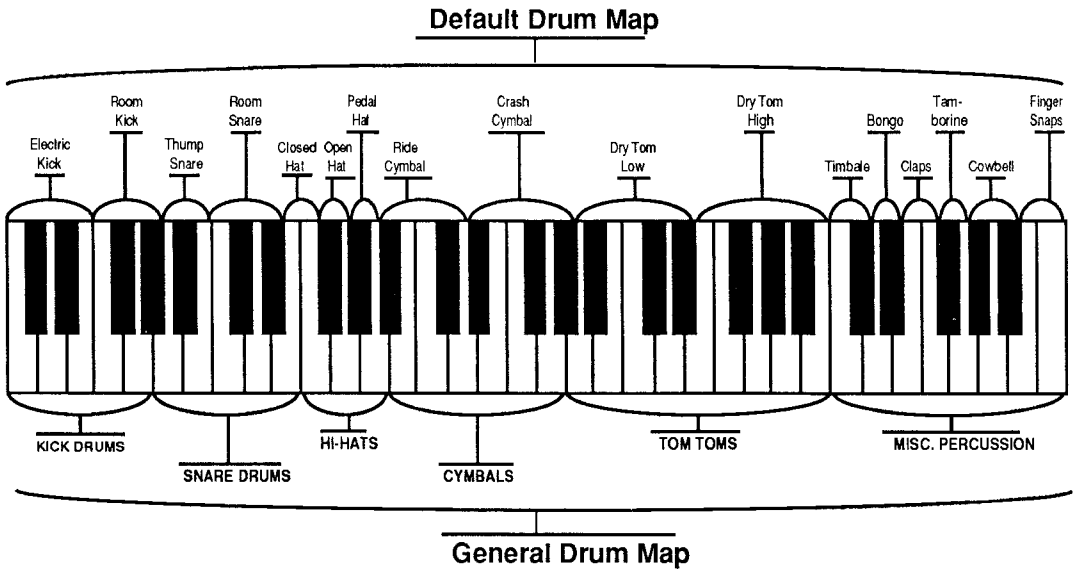
Clear Key Map

This command erases the key map currently residing in the edit buffer, setting all the voices to a key range of A0-A0. You can press the ***Enter*** button to activate the command. Use this command when you want to discard an edit that you've been working on and start over from scratch.

04	**Set Default Map**
	Wave Bank Press Edit Sounds / Wave (Bank 0) / Screen 4.

Set Default Map

This command clears out whatever sound is residing in the edit buffer, and replaces it with the default key map settings. The illustration below shows the default map settings:



05	**Change SoundMode**
	Wave Bank Press Edit Sounds / Wave (Bank 0) / Screen 5.

Change SoundMode

Press ***Enter*** to switch the current sound mode. When working in Drum sound mode, this command will place the default Standard sound into the edit buffer, and place the SQ into Standard sound mode.

Pitch Bank

In the Pitch bank you set the "manual" levels for the pitch of the voice, and select whether the pitch will be tracked by the keyboard.

10	**Oct/Semi/Fine (Voice Tune)**
	Pitch Bank Press Edit Sounds / Pitch (Bank 1) / Screen 0.

Oct

Changes the pitch of the voice by octaves.

Range: -4 to +4 octaves

Semi

Changes the pitch of the voice by semitones. Incrementing/decrementing this control beyond +11 or -11 automatically increases/decreases the octave by one.

Fine

Changes the pitch of the voice by steps of one cent (1/100 of a semitone).

Range: -99 to +99

11	**Keyboard Pitch Tracking**
	Pitch Bank Press Edit Sounds / Pitch (Bank 1) / Screen 1.

Keyboard Pitch Tracking

Determines whether or not the pitch of the selected voice will change across the keyboard or remain static at C4.

- ON — The pitch of a voice tracks with the keyboard.
- OFF — All keys play at the same pitch; C4.

Filter Bank

The filter settings determine which ranges of frequencies will be allowed to pass through to the output. Drum sounds always have a fixed 4 pole low pass filter. See the Filter Bank description in the Standard sound programming section for further details.

40	Fc Cutoff/LevV	
	Filter Bank	Press Edit Sounds / Filter (Bank 4) / Screen 0.

Fc Cutoff — Filter Cutoff Frequency

Determines the initial, or manual, filter cutoff frequency. A setting of 127 lets all the original signal pass through the filter. Lower settings lower the cutoff frequency, somewhat like turning down the treble on a stereo.

Range: 000 to 127

LevV — Velocity Level Control

The Velocity level parameter will lower all filter cutoffs with a softer keystrike. This means that the setting you assign to Fc Cutoff is the maximum level, the level that will be reached with the hardest keystrike. The amount of "LevV" will determine how much that level will be reduced as you play softer. With this parameter you can have continuous dynamic control over the filter cutoff by varying how hard you play.

Range: 00 to 99

Amp Bank

In the AMP bank you control the volume of the individual voices within a drum sound.

60	Gate Time/Release Time
	Amp Bank Press Edit Sounds / Amp (Bank 6) / Screen 0.

Gate Time

Determines the amount of time the envelope stays at full level before entering the release stage.

Range: 00 to 99

Note: This parameter pertains to FINISH mode only.

Release Time

In NORMAL mode, this defines the time it will take the envelope to return to zero after the key has been released. When in FINISH mode, this controls the amount of time it takes for a voice to return to zero after the Gate Time.

Range: 00 to 99

61	LevV/Mode
	Amp Bank Press Edit Sounds / Amp (Bank 6) / Screen 1.

LevV — Velocity Level Control

The Velocity level parameter will lower the volume with a softer keystrike. This means that the settings you assign to Voice Volume is the maximum level, the level that will be reached with the hardest keystrike. The amount of "LevV" will determine how much that level will be reduced as you play softer. With this parameter you can have continuous dynamic control over the volume by varying how hard you play. Changing the Velocity Curve (VelCurv) gives you further control over the velocity response of the envelope.

Range: 00 to 99

Mode — (ENV 1 and ENV 2)

- NORMAL — The envelope plays through normally, as shown in the diagram on the following page.

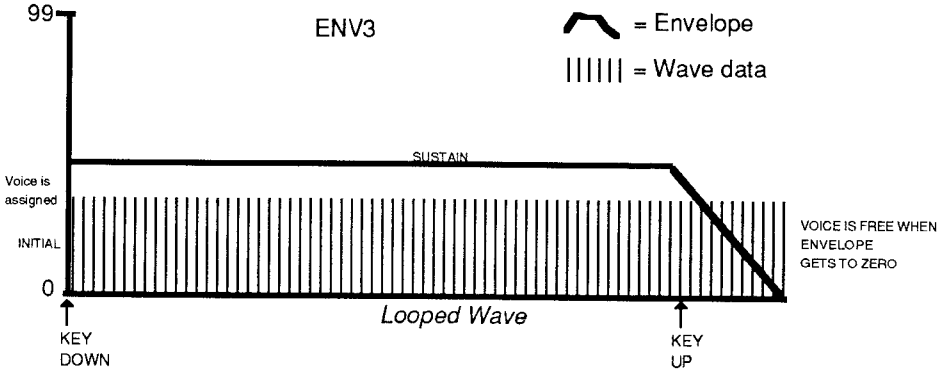
- FINISH — The envelope runs its full cycle, ignoring the key-up event. The envelope waits to enter the release stage until the Gate Time is finished, instead of stopping as soon as the key is released. This is good for percussive-type sounds where you want the envelope to be the same for every note, no matter how long the key is held down.

MODE (AMP) — Voice Triggering/Stealing Notes

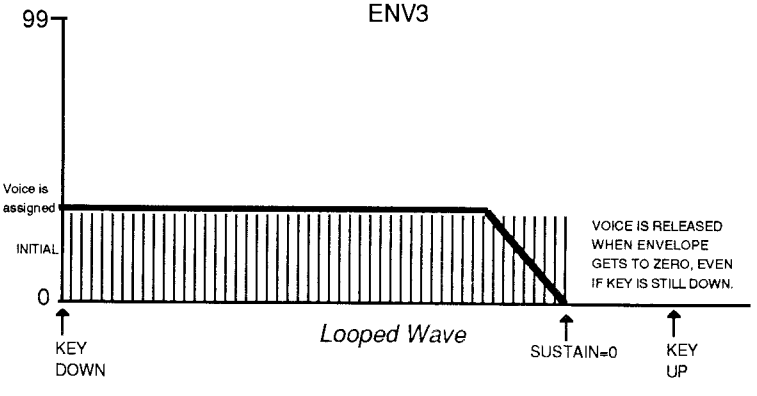
In NORMAL mode, if you set a delay on the voice, and you release the key before the designated delay time elapses, the voice will not sound.

In FINISH mode, if you set a delay on the voice and you release the key before the designated delay time elapses, the note will sound anyway. The envelope finishes what you set it up to do.

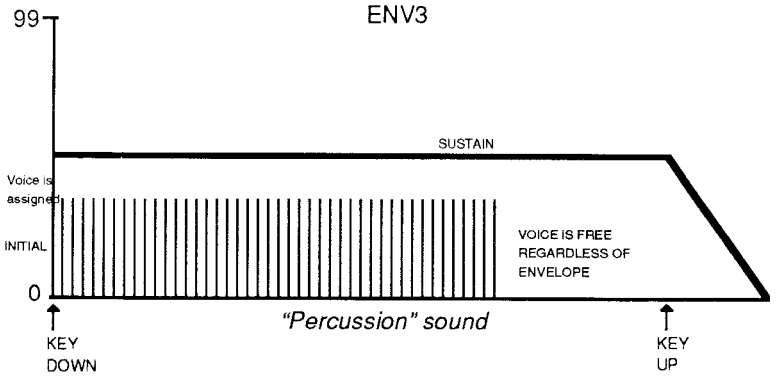
In order to maximize the use of the SQ's 21 voices, and to manage the "voice stealing," it is sometimes useful to understand when a given voice will be assigned and when it will be released, or "put back" into the pool for use by other sounds. This depends on a combination of envelope mode and the wave type. A looped (sustaining) wave will continue to use the voice until the envelope reaches zero. For a sustaining wave, when the Envelope Mode is Normal:



For a sustaining wave, when the Envelope Mode is set to Finish:



For unlooped, non-sustaining, waves (specifically those in the Percussion and Drum categories) the voice becomes free as soon as the sample has played through to the end, no matter where the envelope level is. The voice is released for use by another sound:



Output Bank

The parameters in the Output Bank regulate the overall volume and panning of the voice.

70	Volume/Boost/Pan	
	Output Bank	Press Edit Sounds / Output (Bank 7) / Screen 0.

Volume — Voice Volume

Adjusts the overall volume of the voice. Since Envelope 3 is permanently routed to the volume of the voice, this parameter could also be thought of as Env 3 Amount.

Range: 00 to 99

Boost — Volume Boost

Setting this parameter to "ON" gives the selected voice a +12 dB boost. Not for the feint of heart.

- ON — A +12 dB boost is added to the selected voice.
- OFF — The voice plays normally.

Pan — Pan Location

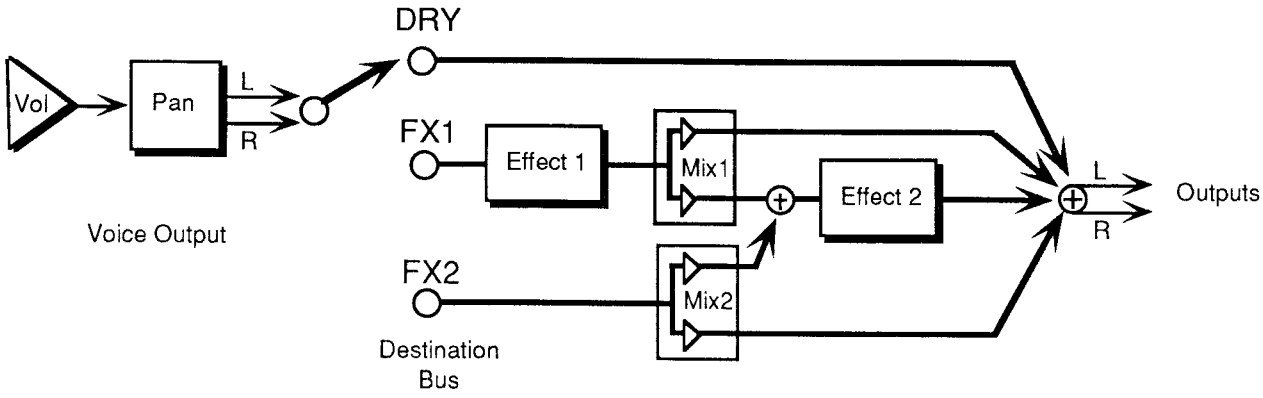
Pans the voice within the stereo mix.

Range is from -98 (panned left) to +99 (panned right). A value of 00 pans the voice center.

71	**Output Bus/VelCurv**
	Output Bank Press Edit Sounds / Output (Bank 7) / Screen 1.

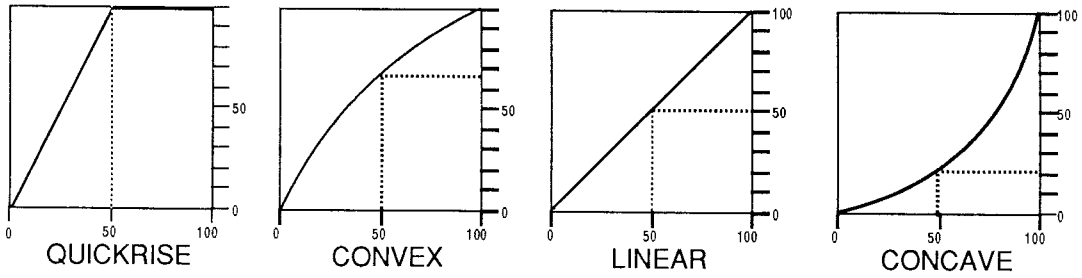
Output Bus

Each voice within a sound can be routed to one of three stereo "busses." The diagram below shows the general routing of the signals for each bus. See the section on "Effects" for more on programming specific effects.



VelCurv — Velocity Curve

This selects which of the four available velocity response curves the envelope will use if the velocity level control (LevV above) is set to some value other than zero. Available values are: QUIKRISE; CONVEX; LINEAR, and CONCAVE.



Section 7 — Presets

About Presets

A *Preset* is a combination of up to eight sounds with their corresponding performance parameters, and an effects set-up which can be instantly recalled for use in performance. Presets are handy "performance memories" which allow you to create and save sound combinations, splits, layers, etc. Presets are also used as the basis for sequencing, encompassing all of the performance parameters for the sounds used within a sequence.

The eight sounds in a preset reside on eight *Tracks*. For *each* of these eight tracks, the SQ remembers:

- Which sound is assigned to the track,
- whether the sound is selected, layered, or neither, and
- the values of all the Performance parameters for that track.

A preset also has one Effects program which is common to all eight tracks.

Selecting Presets

Press ***Select Sequences/Presets***. The LED above the ***Select Sequences/Presets*** button lights, indicating that you are in Sequences/Presets Select mode. Across the lower line, the display shows the name of the preset. On the top line you see "context" information about the current preset, and its screen address.

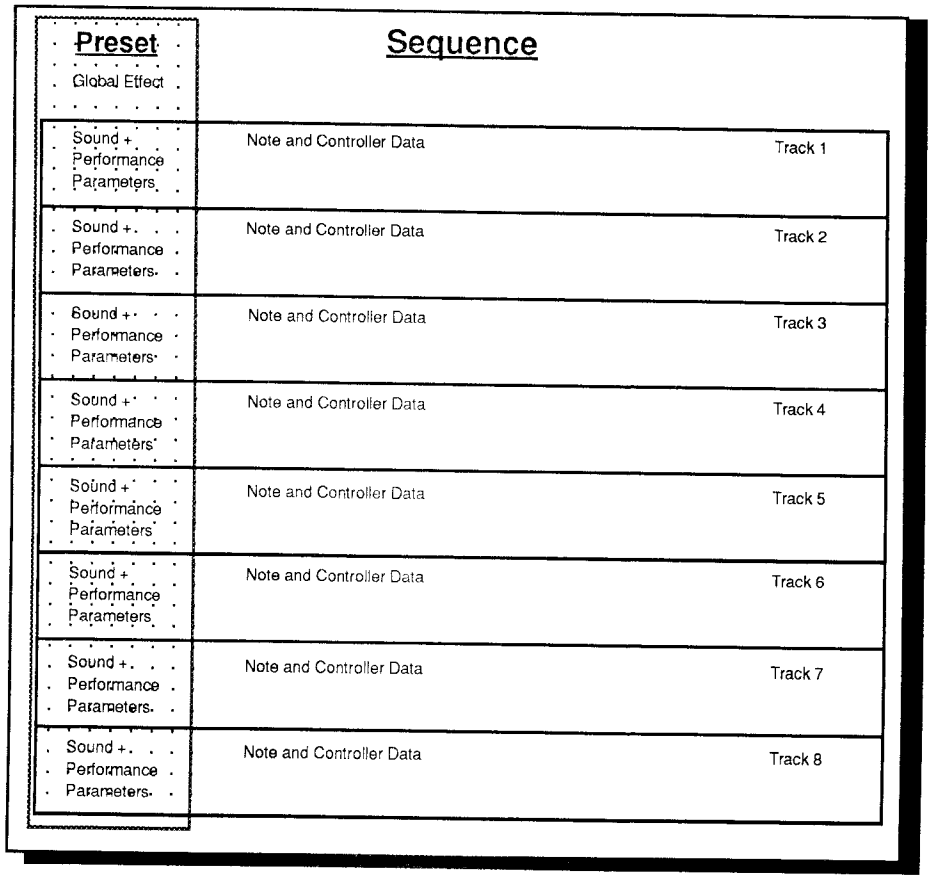
Whenever the ***Select Sequences/Presets*** LED is solidly lit, this indicates that the SQ is in Sequences/Presets Select mode , and the 10 ***Bank*** and 10 ***Screen*** buttons will now select sequences/presets (rather than selecting Sounds, as they do when the ***Select Sounds*** LED is lit).

Preset Mode vs. Sequencer Mode

A *Preset* is a set of eight tracks, which can be layered or not, each of which has a sound and a set of performance parameters associated with it.

A *Sequence* is, in essence, a preset with recorded note data. As a matter of fact, presets form the foundation of a sequence; containing all the sounds and performance parameters for each of the tracks to be recorded. A preset can be thought of as a sequence without note data.

At any point, note data can be added to a preset, making it a sequence. The relationship between Presets and Sequences looks like this:



As you can see, a Preset is contained within a Sequence, acting as a "template" for note data.

About Tracks

In the SQ, the term *track* refers to one of the eight internal "channels" (16 in song mode), each of which contains a sound and a complete set of performance parameters, including volume, pan, controller settings, MIDI channel, keyboard Range, and others.

When the SQ is used as a multi-timbral sound generator and played from its own sequencer, the various tracks of the sequencer control the sounds to be played by the SQ. Similarly, the sequencer or the keyboard of the SQ can be used to send on MIDI channels to which external devices are connected.

When the SQ is controlled from an external MIDI sequencer, the various tracks of the sequencer can be assigned to different MIDI channels, which in turn control the sounds played by the SQ. Each MIDI channel can be thought of as an extension of the sequencer's track.

Whether playing locally, sending MIDI to a remote device, or receiving MIDI from an external sequencer, we describe this logical construct, comprised of a MIDI channel and a program and various performance parameters, as a track.

Each SQ Preset has eight independent polyphonic *Tracks* which are selected from the eight ***Track*** buttons labeled ***Tracks 1-8***. Let's take a look at the Preset Tracks:

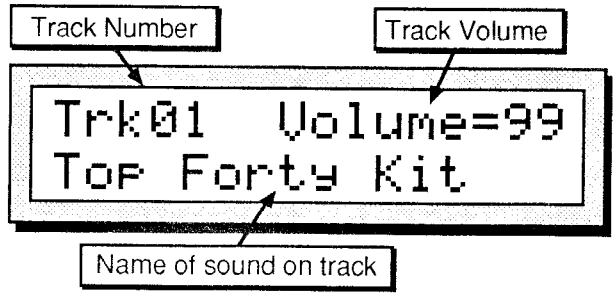
- Press ***Select Sequences/Presets***. This puts the SQ in Sequences/Presets Select mode.
- Press ***Track 1***. This takes you to the first Track and activates the Replace Sound function described below. Pressing other track buttons will select the other 7 tracks.

Replacing the Sound on a Track

There are three ways to get to the Replace Sound function, which lets you change the SQ sound on a track with a sound of your choice:

1) Press ***Select Sequences/Presets***, then press any of the 8 ***Tracks*** buttons. The Select Sequences/Presets LED will begin to flash, indicating the SQ is in Replace Sound status. Or,
2) Rapidly *double-click* ***Select Sequences/Presets*** button. Again, the Select Sequences/Presets LED flashes. Or,
3) Rapidly *double-click* ***Edit Sequences/Presets*** button. The Edit Sequences/Presets LED flashes.

Any of these methods takes you to the Replace Sound screen, which is distinguished by the LEDs in either the ***Select Sequences/Presets*** or the ***Edit Sequences/Presets*** button flashing. The display shows the track number, track volume and the name of the sound on the track.



- Use the ***Bank*** and ***Screen*** buttons to change sound on the track. In Replace Sound status, the Bank and Screen buttons select new sounds for the current track, rather than selecting songs, sequences, or parameter banks.
- To select a sound from a different bank set (INT, ROM, CARD A or CARD B) press and hold ***Select Sounds***, and *while still holding it down* press ***Screen*** button 1, 2, 3 or 4 to select the desired set.
- Press the ***Select Sequences/Presets*** button or the ***Edit Sequences/Presets*** button again to return the ***Bank*** and ***Screen*** buttons to their normal functions. The LED will light solidly to indicate its return to normal functions.

Putting a Sound onto a Track along with its Effect

To copy a sound *along with* its effect into the track/preset (replacing the current preset effect with the one in the sound):

- Press ***Select Sounds***.
- Use the ***Bank*** and ***Screen*** buttons to find the sound/effect combination.
- Press and hold the ***Edit Sequences/Presets*** button, and *while holding it down,* press one of the 8 ***Track*** buttons. The sound now appears in the Track selected, with the effect placed globally in the preset.
- Press the ***Select Sequences/Presets*** again to return the ***Bank*** and ***Screen*** their normal functions. The Select Sequences/Presets LED will light solidly to indicate its return to normal functions.

Layering Sounds with the Track Buttons

In a preset, a maximum of seven sounds may be layered with the selected sound. You can have up to 8 sounds layered (stacked) on one key, or up to 8 different sounds split across the keyboard by using the Key Range function described later in this section.

To layer sounds in presets:

- Press ***Select Sequences/Preset***, then select one of the 8 tracks.
- Rapidly double-click the ***Track*** button for the track you wish to layer. Layered tracks are identified by a blinking LED. If a track is layered, it can be un-layered by pressing its track button.

Using Effects With Presets

All eight tracks in a sequence or preset share the same effects program. The effects program for the sequence, preset, or song is inherited from the current sequencer effect at the time they were created. If this effect is incompatible with other programs in the preset sequence or song, there are several options:

- Set the effects routing to DRY for any of the programs which are incompatible. (See Output Screen in the Mix Bank later in this section.)
- Change the preset/sequencer effect to be something more suitable. (See Replacing Sounds earlier in this section.)

About Performance Parameters

A group of Performance Parameters is associated with each sequence/preset track. These parameters control various aspects of the track, including some important and useful sound controls which may be easily adjusted during performance or recorded into the sequencer. The settings of these parameters are saved with every preset. These instantly recallable presets include an effect setup and eight sounds on eight tracks with a full set of programmable performance parameters, including key ranges, transpositions, and others. The settings of all performance parameters on preset, sequencer and song tracks are saved for each track and are maintained while the power is off.

The buttons which control the Screens containing these parameters are found in the Parameter and Mix banks in Sequences/Presets Edit mode.

The Performance/Track Parameters are:

Parameter Bank:

KeyRange	set track key ranges
Transpose	key number transposition
MIDI Channel	track MIDI channel number
MIDI Program	track MIDI Program number
(MIDI) Status	enable or defeat MIDI function
Pressure	type of pressure responded to (MIDI)
SustainPedal	enables or disables the sustain pedal

Mix Bank

Volume	overall track volume adjust
Pan	stereo panning control for track sound
(Play) Status	Play, Mute, or Solo tracks
Output	controls routing of track to effects
Timbre	programmable sound variation control
Release	sound release time adjust

Effect Bank

Contains all parameters for programming and mixing the sequence/preset effect. Screens and parameters are the same as in Sound Edit mode.

These parameters can be used to create complex performance set-ups for your SQ and other MIDI equipment. A full discussion of the performance/track parameters and their functions appears later in this section.

Unless otherwise noted in the detailed descriptions which follow, use the increment/decrement buttons or the ***Data Entry Slider*** to adjust the value of the parameter.

Performance Parameter Banks (Parameter and Mix)

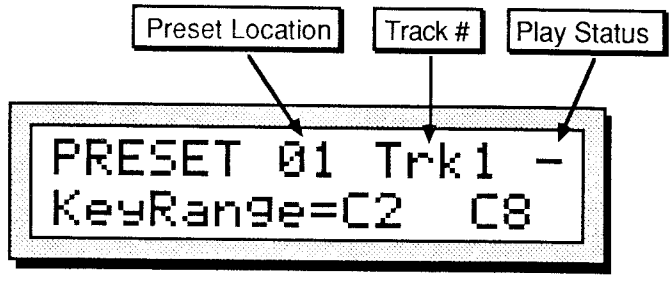
In order to edit any of the performance parameters described below, you must first press the ***Edit Sequences/Presets*** button. The LED above the button will light, indicating that the SQ is in Sequences/Presets Edit mode.

Parameter Bank

The parameter bank is used to define performance controls within each track of a preset, sequence, or song.

60	KeyRange
	Parameter Bank Press Edit Sequences / Param (Bank 6) / Screen 0.

The top line of the display indicates the preset or sequence location, the track which is being edited, and the play status of the track. This line is the same on each screen within the bank.



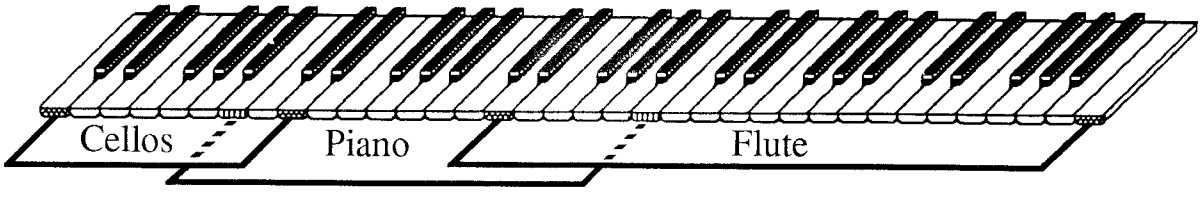
Key Range

Each track has its own independent Key Range within which the track will play. Key Ranges can be used to create simple two-sound splits, or to create more complex keyboard layouts. Key Ranges control which keys will be sent out via MIDI as well as which keys will play on the local voices of the SQ.

You can divide the keyboard into as many as eight different key ranges by using the eight sequence/preset tracks. In addition, you can set the key range so that each range overlaps the next, producing "layered" ranges in which you would hear the sounds from more than one track.

Range: A0..C8

The illustration below shows an example of three tracks with overlapping key ranges. The Piano is layered with, and partially overlaps, the Cellos on the lower end and the Flute on the upper end.



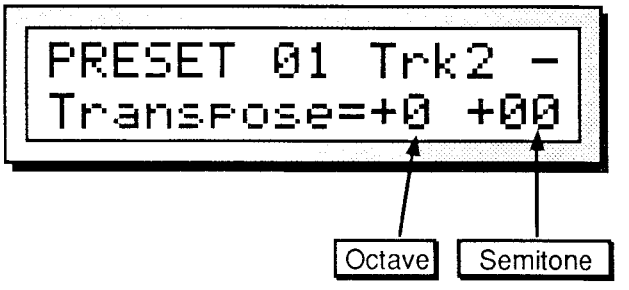
In order to set a Key Range:

- Play the key on the keyboard which you want to be the *lowest* key of the range. The flashing will automatically move to the right for the High Key of the range.
- Play the key for the *highest* key of the range. The new values for the range will be displayed and the flashing will stop.
- If you wish to change the range, simply re-select this parameter and repeat the process.

Changing the key range will *not* affect the playback of sequencer tracks (though it does affect what is recorded). Sequencer tracks will play all keys that were recorded, regardless of the key range at the time of playback. To eliminate notes within a key range from a track, use the Erase Key Range function in the Event Bank (Section 9).

Warning: If the key range is accidentally set to where the High Key is actually *below* the Low Key, then the track will not play. To correct this situation, re-select the Key Range parameter and reset the key range values.

61	**Transpose**
	Parameter Bank Press Edit Sequences / Param (Bank 6) / Screen 1.



Transpose

Each track can have its pitch transposed (raised or lowered) by octaves and semitones within an eight octave range. The transpose setting affects both the pitch played by local SQ voices and the key number transmitted via MIDI.

Ranges: Octave parameter -4 to +4 octaves
Semitone parameter -11 to +11 semitones

In Sequencer mode, the Transpose function provides a way to transpose tracks in real time without changing the data in the track.

Warning: You should take care never to transpose a track whose status is MIDI or BOTH while holding keys down or while the sequencer is running. This could cause the key-up events to be missed by the receiving device, causing notes to "hang."

62	**MIDI Channel**
	Parameter Bank Press Edit Sequences / Param (Bank 6) / Screen 2.

MIDI Channel

Use this screen to determine which MIDI channel a Track will use to transmit and receive data. The difference in how this parameter controls the track for transmitting and receiving is important to understand, and is described below. You may also wish to refer to the sections covering the MIDI bank and Sequencer Applications.

Transmit Controls which channel the selected track of a preset will *send* data on. MIDI data will be transmitted *only* if the selected track has a MIDI Status of BOTH, MIDI, or *EXT*.

Receive Controls which channel an individual sequencer track will *receive* data on if "MIDI Mode=MULTI or MONO B" is selected in the MIDI bank. In POLY or MONO A modes the SQ will receive only on the base MIDI channel no matter which track, sound or preset is selected. Individual preset tracks will *not* receive on different MIDI channels. For presets, this is a send-only function.

Range: MIDI channels 1 through 16

63	**MIDI Program**
	Parameter Bank Press Edit Sequences / Param (Bank 6) / Screen 3.

MIDI Program Number

This screen lets you choose which MIDI Program Change number will be sent via MIDI when the track is selected. If the track MIDI status has been set to LOCAL, the track will not send program changes.

The number which appears is usually the number of the internal SQ sound assigned to the track. This number is automatically set whenever a sound is selected from the Sound Bank. Assigning a new sound to a Preset track by replacing the sound (as described earlier this section) does *not* change the program number automatically, but sequencer tracks will acquire the new sound's number.

You can set this number to any other legal program number if you wish to override the default value. This can be useful in presets and sequencer tracks, which will transmit a program change for every MIDI-enabled track when selected.

Range: 001 through 128 (MIDI program numbers 0 to 127)

Program Changes in the SQ

When sounds are assigned to a track from the sound bank, their program number is automatically set.

All sound banks are assigned program numbers 000-079, with "smart" MIDI Out sending a bank change whenever the program bank (INT, ROM, CARD A, or CARD B) is changed.

- Internal RAM sounds (INT banks) are numbered from 001 to 079.
- Card programs (CARD A or CARD B banks) are numbered from 001 to 079.
- Internal ROM programs (ROM banks) are also numbered from 001 to 079.
- The Drum Kit sounds send their program numbers 080 to 099 when selected.

Receiving Program Changes

The way in which the SQ receives program changes is slightly more complex than some other systems, because the number of sounds that are available to be selected from MIDI is *larger* than the number of program change messages available within the MIDI standard. To solve this problem, the SQ uses the last four program change numbers (124 to 127) to control how subsequent program changes will be interpreted (again, these program change numbers reflect the *actual program change number* as defined by the MIDI specification). The following chart shows the effect of these four special program changes:

After Program Change:	*Subsequent program changes will select:*
124	000..079 - INT Sounds
125	000..079 - ROM Sounds
126	000..079 - CARD A Sounds
127	000..079 - CARD B Sounds

These special "control" program changes need to be sent only once. All subsequent program changes will be handled according to the range that was set by the last one received.

Note: Program Changes 080-099 *will always* select the default Drum kits.

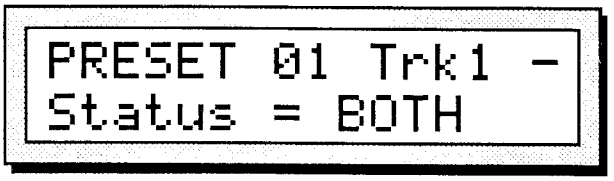
Selecting a New Sequence or Song Effect from MIDI

There is another special program change, recognized only in MULTI mode, which is used to select *both* a sound *and* its effect for one of the 8 sequencer tracks. When program change 123 is received on a channel assigned to a sequencer track, then the next program change received on that track will select a new sound and also install the effect from that sound into the sequence (or song) effect. This is the only way to change the sequence or song effect other than manually editing the settings, or selecting a new sequence. This can be useful when controlling the SQ from an external sequencer.

This special program change 123 does not change the way in which other program changes are received, including the other special messages. If the sound you wish to select also requires a special control program change, then send the control message immediately after the 123, followed by the program number you want to select.

Remember: All SQ program changes are referred to and displayed as 001 to 128, but the actual codes transmitted and received over MIDI are less by one (000 to 127).

64	**MIDI Status**
	Parameter Bank Press Edit Sequences / Param (Bank 6) / Screen 4.



MIDI Status

This Screen determines the MIDI Status of a track. The four possible settings are:

- BOTH Keys, controllers, etc., will play locally *and* will be sent via MIDI over the selected MIDI channel. Incoming MIDI will play internal voices.

- LOCAL The track will only play internal voices, and will not send any data out MIDI. Incoming MIDI will play internal voices.

- MIDI Keys, controllers, etc., will be be sent out via MIDI when the track is played from the keyboard. However, keys played or recorded on the track will not play SQ voices at all. Incoming MIDI *will* play internal voices. This is comparable to Local Off on some keyboards. Use this status when you want to create MIDI-only tracks for sequencing or playing remote MIDI devices. When MIDI status has been selected for a track, instead of showing the program name, the display will show "*MIDI-CHAN-#," indicating its status and what MIDI channel it is sending on (assuming the MIDI-TRK-NAMES switch in the MIDI bank is OFF; see Section 2).

- *EXT* Same as MIDI status except that incoming MIDI *will not* play internal voices. This is useful when using the SQ as a controller with an external sequencer and a number of other MIDI sound modules. It is also good for turning off certain tracks when using the SQ as a multi-timbral receiver in MULTI Mode, thereby limiting the number of channels to which the SQ will respond.

The chart below details the behavior of sequencer tracks for each status:

Track Status =	BOTH	LOCAL	MIDI	*EXT*
Playing the keyboard plays local voices	Yes	Yes	No	No
Playing the keyboard sends out MIDI	Yes	No	Yes	Yes
Playing the sequencer track (pressing Play) plays local voices	Yes	Yes	No	No
Playing the sequencer track (pressing Play) sends out MIDI	Yes	No	Yes	Yes
Incoming MIDI data plays local voices	Yes	Yes	Yes	No

65	**Pressure**
	Parameter Bank Press Edit Sequences / Param (Bank 6) / Screen 5.

Pressure (MIDI)

The Pressure screen enables you to assign one of three pressure modes to each Track. This parameter controls which pressure mode a track will respond to via MIDI.

- NONE — Pressure information will not be received from MIDI or recorded by the sequencer.

- KEY — This setting enables the track to receive via MIDI the most expressive kind of pressure — Polyphonic Aftertouch. Polyphonic Aftertouch lets you add pressure modulation to each note independently. If you press down on any particular key within a chord, only that note will be affected by pressure — all others remain unaffected. When a sequencer track is set to KEY, Polyphonic Aftertouch will be recorded into the track (when recording from an external MIDI device that transmits pressure), even if the sound is not programmed to respond to it.

- CHANNEL — This enables the track to receive via MIDI the most common type of pressure — channel pressure. With channel pressure, after a note is played, pressing down harder on a key modulates *every* note currently playing. Like a mod wheel, channel pressure is "global," it affects the entire keyboard when activated. When a sequencer track is set to CHANNEL, Channel pressure will be recorded into the track (when recording from an external MIDI device that transmits pressure).

You should consult the MIDI implementation chart of the MIDI device you will be using in conjunction with the SQ to see which (if any) type of pressure it responds to and transmits. For best results, set the SQ Pressure parameter to match the type of pressure supported by the external MIDI device which will send to or receive from the track you are setting.

66	**SustainPedal**
	Parameter Bank Press Edit Sequences / Param (Bank 6) / Screen 6.

Sustain Pedal

The Sustain parameter allows you to determine whether each of the individual tracks will respond to sustain controller events. The effect of all sustain events, whether from the SQ sustain pedal (FtswR=SUSTAIN in the Master bank) or sustain commands received from MIDI, is controlled by this switch. There are two settings for this switch, ON and OFF.

- ON sustain events will affect all notes played within the active key range for this track.
- OFF sustain events will have no effect on the notes played on this track.

For example, it may be useful to turn off sustain events on a track set up as a bass sound in a split keyboard configuration. This allows you to play staccato bass lines on the lower part of the keyboard, while playing chords on the upper part of the keyboard and using the sustain pedal. The bass notes will not be affected by the sustain pedal because the track is set to OFF, but the chords will sustain.

Mix Bank

The Mix bank is used to control the output aspects of the sounds in presets and sequences. Parameters found in the Mix bank include volume, panning, track status, and effect routing.

70	**Volume**
	Mix Bank Press Edit Sequences / Mix (Bank 7) / Screen 0.

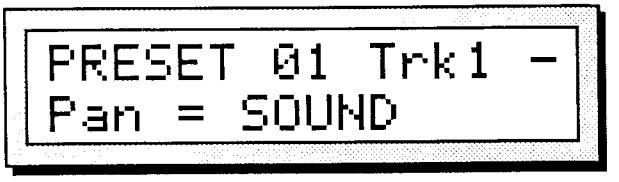
Volume

The Volume screen enables you to make volume changes to the individual tracks, allowing you to balance the SQ sounds and/or control the volume of external MIDI devices.

Range: 0 to 99

All tracks whose MIDI Status is set to MIDI or BOTH will send a MIDI Volume Change message (controller 7) with the indicated value whenever this parameter is edited. Sequence and preset tracks will also send the current volume for each track when a sequence or preset is selected.

71	**Pan**
	Mix Bank Press Edit Sequences / Mix (Bank 7) / Screen 1.



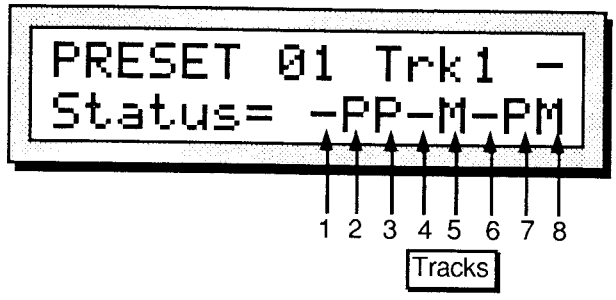
Pan

The Pan screen gives you control over the placement of the track's sound in a stereo field.

When a track is set to SOUND, the voices of a sound are panned according to the settings originally programmed in the Output bank for each voice. Setting this parameter to any other pan value will override the original settings and will force ALL of the voices of the program to be panned to that location.

Range: -98 (hard pan left) to +99 (hard pan right). A setting of +00 places the sound in the center of the stereo field. The minimum setting is SOUND which indicates that the individual voice's pan settings will be used.

72	**Track Status**
	Mix Bank Press Edit Sequences / Mix (Bank 7) / Screen 2.



Track Status

This parameter determines the play status of each of the eight tracks within a preset or sequence. There are four play status options:

- M — Mute. The indicated track will not play.
- P — Play. The indicated track will play, along with any other tracks that have a "P" shown in the display.
- S — Solo. The indicated track plays "solo," allowing it to be heard in isolation from other tracks. When a track is set to solo, all other tracks change from their current play status to mute. However, it is possible to solo more than one track in order to hear how a particular group of tracks sound together.
- (dash) — When a dash is shown in the display, it indicates that the track has no data recorded on it. When in this state, the ***Data Entry Slider*** and ***Up/Down Arrow*** buttons will have no effect.

73	**Output**
	Mix Bank Press Edit Sequences / Mix (Bank 7) / Screen 3.

Output

Normally, different voices in a sound are assigned to the three different busses, as set in the Output bank. On this screen, you can override the normal effects routing of the program for each track. This may be useful when two sounds are split or layered in a performance preset, and the effect is not appropriate for both.

The available settings are:

- -DRY- forces all voices to the dry bus
- -FX1- forces FX2 voices to FX1; FX1 and DRY are unaffected
- -FX2- forces FX1 voices to FX2; FX2 and DRY are unaffected
- VOICE- uses normal voice routing
- CONTROL- uses normal voice routing and also routes controller information to the effect. This is the default setting in the track after copying a sound to a track.

74	**Timbre**
	Mix Bank Press Edit Sequences / Mix (Bank 7) / Screen 4

Timbre

The Timbre parameter provides an easy way to make useful changes to the character of a sound without getting into more complex programming. This performance parameter uses the data entry slider or up/down arrow buttons to control various aspects of the sound, depending on the what the programmer has decided would be useful.

As one of the voice modulation sources, TIMBRE can be assigned to anything that can be modulated in a program or effect. The Timbre control can be connected to parameters such as filter cutoff, waveform modulation, LFO depth, and others. It is a good idea to experiment with the Timbre setting to hear what it has been programmed to do in each program.

Range: 00 to 99

All tracks whose MIDI Status is set to MIDI, *EXT, or BOTH will send a MIDI Continuous Controller message (controller 71) with the indicated value whenever this parameter is edited.

75	**Release**
	Mix Bank Press Edit Sequences / Mix (Bank 7) / Screen 5

Release

The Release parameter enables you to increase or decrease the release time of the program on a selected track. (Release time is the time it takes for the sound to fade away when the key is released.) This is useful when you need to adjust the release characteristics of a sound for a particular application without getting more deeply into programming.

Range: -64 to +64 Higher values lengthen release time.
Lower values shorten release time.

All tracks whose MIDI Status is set to MIDI, *EXT, or BOTH will send a MIDI Continuous Controller message (controller 72) with the indicated value whenever this parameter is edited.

The MIDI Connection

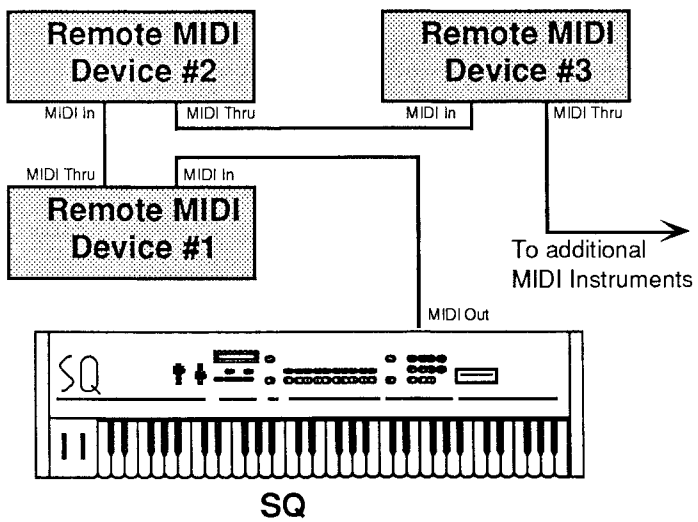
Musical Instrument Digital Interface — that magical connection that lets you play one instrument (or a whole roomful of them) from another. MIDI is a standard that has been agreed upon by manufacturers for translating musical events into specific numbers which are transmitted and received by MIDI instruments.

For instance,when you play middle C on the SQ, it instantly sends out to its MIDI Out jack a series of numbers representing a *Key Down* event, along with the location of the note on the keyboard and how hard the key was struck. When you release the key, the SQ sends a number meaning *Key Up*. A MIDI instrument connected to the SQ can receive and translate those numbers, and will play the middle C itself. The same thing happens whenever you move a controller, such as the pitch or mod wheel, or when you select a new sound — each of these events is translated into a series of numbers which are transmitted out the MIDI Out jack.

Controlling remote MIDI devices from the SQ — MIDI Connections

You can use the SQ sequences/presets to drive external MIDI instruments, greatly enhancing the number of available voices and timbres. A sequence/preset or song track can be assigned MIDI status (in the Parameter Bank) so that it plays only out MIDI; LOCAL status, so that it will play only locally on the SQ; or BOTH in which case it will play a local sound *and* send on its designated MIDI channel.

When controlling multiple MIDI devices, first connect the various destination instruments to the SQ, and to each other, as shown here. Connect the MIDI Out jack of the SQ to the MIDI In jack of the first instrument. Then connect the MIDI Thru jack of the first instrument to the MIDI In jack of the second instrument. Connect the MIDI Thru jack of the second instrument to the MIDI In jack of the third instrument. And so on, for as many devices as you will be using.



With this arrangement, once you set up the proper MIDI channels, etc. (see below), each device will receive and play only the data that is intended for it, and will "pass along" all other data. Also, each can be played from its own keyboard (as well as from the SQ's) without affecting the others, because MIDI Thru jacks only pass along incoming MIDI data, and do not transmit what is played on the instrument.

This set up is ideal for controlling everything right from the SQ. Simply by selecting the track which is set to the same MIDI channel as a particular instrument, you can:

1) Play that instrument from the SQ keyboard;
2) Record a track that will play back on that instrument when you play the sequence or song; and
3) Send the destination device Program Changes and adjust its volume (assuming the device receives MIDI Volume).

In other words, once you have made the appropriate connections and set up the MIDI configuration of the tracks and all destination devices, you can use the SQ's keyboard and its front panel to control and record all the instruments in your rig.

MIDI Mode and Channel — Destination Instruments

The next step is to set up each destination instrument to receive only the MIDI information that is intended for it. When each of the receiving units is set to receive on a different MIDI channel (or a number of them, for multi-timbral units), you can control them all right from the SQ.

For each destination instrument:

- **Set to POLY (OMNI OFF) or MULTI Mode.** Each destination synth must be in a mode where it receives only on its selected MIDI channel (or channels). This is usually referred to as POLY (or OMNI OFF) Mode for receiving on a single channel, or MULTI mode for receiving independently on multiple channels. Consult the owner's manual if there is any question about a particular instrument.

- **Select a MIDI channel (or channels).** The best idea is to assign each destination Instrument its own MIDI channel(s) and leave it that way. For instance, if you know that a certain synth is always set to receive on MIDI channel 4, you can quickly set up a track to drive that synth by simply selecting an undefined track, then assigning that track MIDI Status and MIDI channel 4 in the Parameter Bank. Also when each destination instrument is always set to its own distinct MIDI channel, it means that different sequences and songs recorded at different times will always play the right instrument on the right track.

  Once you have assigned MIDI channels to each instrument in your rig, *write them down*, and keep the paper handy for quick reference.

MIDI Track Configuration

After you have made the MIDI connections and set up your destination instruments as described above, you can now configure the tracks of a sequence/preset to send to those instruments. Let's suppose that you are sequencing several external instruments, as depicted in the illustration on the previous page.

For each track which you want to drive a remote MIDI device, set the track's MIDI Status and select a MIDI Channel and Program Number. These parameters are covered in detail earlier in this section.

Performance Tip — Creating Keyboard Splits

One of the most common usages of presets is a keyboard split, in which your left hand plays an "accompaniment" sound and your right hand plays a "solo" sound. This is easy to set up on the SQ by layering the two sounds and assigning them different key ranges. You can save this arrangement as a preset so that any time you select that preset, you'll recall the keyboard split. In fact, using this method you can create up to eight split points across the keyboard.

Since each track in the keyboard split has its own Transpose value, you are not limited to bass notes on the piano just because it's on the bottom of the keyboard. Just set the key range to the keys you want to play and then transpose the sound up or down until it's playing in the range you want.

Once you have a keyboard split, you can change any of the sounds without affecting the split points by using the Replace Sounds function (see "Replacing the Sound on a Track," earlier this section).

Section 8 — Sequencer Basics

- This section contains an introduction to the SQ sequencer and all the information you'll need to get started sequencing. More advanced functions are covered in Section 9 - Sequencer Edit Functions and Section 10 - Sequencer Applications.

Introduction — What you need to know about Presets

ENSONIQ was the first company to build a powerful multi-track sequencer into a keyboard instrument. The SQ with its 16-track sequencer represents the continuation of ENSONIQ's leadership in this area. The SQ sequencer incorporates a range of features and capabilities you would expect to find in stand-alone or computer sequencers, yet with the advantage of an integrated system.

As a true Personal Music Studio, the SQ is both powerful and easy to use — having your synthesizer, sequencer, and master keyboard controller right at your fingertips in one unit is what makes the ENSONIQ approach to digital sequencing so intuitive and efficient.

If you've turned here first because you can't wait to start sequencing, you should turn back to the preceding section on Presets. The Presets section contains important information on choosing and playing tracks, setting performance parameters and MIDI controls, among other things, and is integral to the sequencing process. We recommend that you read that section first, then come back and familiarize yourself with the many other sequencer controls and functions described in this section. *This is the only way to truly take advantage of the power of the SQ sequencer.*

Digital Sequencing

Multi-channel audio tape recorders have numerous physical tape tracks onto which you can magnetically record complex polyphonic information. Sequencers simulate this by recording events which describe a performance onto virtual tracks in computer memory. When these sequence tracks are played back, the recorded information can play local sounds or can be sent to remotely controlled sound generators to recreate the performance. Multi-timbral instruments can respond to inbound information from such sequencers on multiple channels, with each channel responding to a track from the sequencer.

A sequencer records and plays back the "control information" rather than the actual notes. This means that there is no degradation of the sound in the recording process no matter how many times you overdub or re-record a part. A sequencer is sort of like an electronic player piano.

It is important to bear in mind that a sequencer only records what you play. Sequencer memory is used up on the basis of *Events* (keys struck, controllers, etc.), while a tape recorder's memory (the tape) is always used up by the same amount over a fixed period of time.

This means that a sequencer will use virtually the same amount of memory to record 100 notes, whether you play those notes over ten seconds or ten minutes. When you strike a key, the sequencer records a Key Down event. It then counts the clock pulses until you release the key, when it records a Key Up event. The amount of time between the key down and the key up doesn't really affect the amount of memory required to record the note. Compare this to an audio tape recorder. With tape, *time is* the important factor. A tape recorder will use the same amount of tape to record a minute of music, whether the signal contains one note or one hundred.

You might say that tape is *linear* — it is spent at a fixed rate — while digital sequencer memory is *dynamic* — it is used only as needed. Understanding the difference will help you to manage the SQ sequencer memory. For example, while key events (the notes you play) use up relatively little memory each, controllers such as mod wheel, pitch bend, etc., are recorded as a flood of numbers which can fill up the memory in a hurry. So if you're trying to squeeze one more track into a sequence when there isn't much memory left, you know to go easy on the controllers.

What is a Sequence?

A Sequence on the SQ is a collection of eight independent tracks and an effects program. Each track has its own sound and complete set of track parameters (volume, pan, and all the other performance parameters, including MIDI channel, status, etc.) all of which are remembered with the sequence.

A sequence has a fixed length (though you can change it at any time) which is set by the length of the first track you record. A given sequence can be as short or as long as you like (within the limitations of memory).

Each sequence has a 16-character name which is assigned at the time of its creation. The name can be changed at any time from the Sequence bank in Sequence Edit mode.

When you select a new sequence, each track used within that sequence will send out a MIDI program change and MIDI volume instructions on its designated MIDI channel, unless the track has been assigned LOCAL only status.

What is a Song?

In Song Mode, sequences are assigned to play arranged in *Steps* with up to 99 *Steps*, and up to 99 *Repetitions* of each Step. Within each Song Step, individual tracks within the sequence can be muted or transposed.

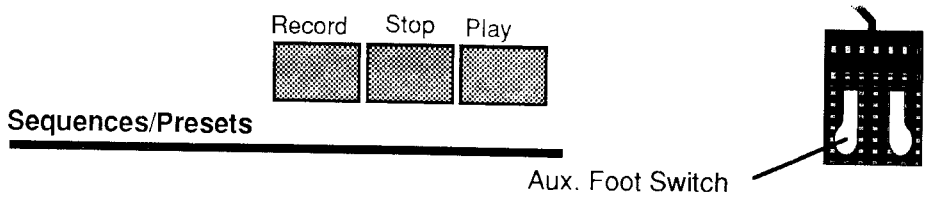
But a Song on the SQ is much more than just a collection of sequences playing in order. This is because each song has an additional set of eight tracks which are completely independent of the tracks in its component sequences.

Each *Song Track* has its own sound and a full set of track/performance parameters, just like a sequence track. The length of the song tracks is defined by the combined length of the sequence steps and repetitions which make up the song. Song tracks are selected with the ***Track*** buttons when a song is selected.

This means that after you have completed a number of sequences and linked them together to form a song, you have eight more linear tracks which run the entire length of the song. This gives you 16 tracks to work with. (For more information, see "Song Tracks" later in this section.)

Sequencer "Transport Controls"

The three buttons at the bottom of the Sequencer section serve to start, stop and continue the sequencer, and to put it into Record and Overdub modes. In addition to these three buttons, either the basic Foot Switch (SW-1) or the Auxiliary Foot Switch (available only when an optional SW-5 dual-pedal Foot Switch is connected to the SQ) can be used to start and stop the sequencer when both hands are busy (see System Bank).



Assuming the Auto Punch function is off:

- Pressing ***Play*** will start the current sequence or song (whichever is selected) playing from the beginning.
- Pressing ***Stop*** will stop the sequencer (if pressed while it is running); or will play the current sequence or song from wherever it was last stopped (if pressed while the sequencer is stopped).
- The Foot Switch can duplicate the behavior of the ***Stop*** button.

- Pressing ***Play*** while holding down ***Record*** will start the sequencer recording on the current track from the beginning of the sequence or song.
- Pressing ***Stop*** while holding down ***Record*** will start the sequencer recording on the current track from wherever it was last stopped.
- Pressing ***Record*** while the sequencer is playing will put the sequencer into "Punch in" mode. It will wait for you to start playing before going into Record on the current track.

When the Auto Punch function is on, the sequencer will only enter and exit Record mode at the points specified by the Edit Times on the Locate bank.

Sequencer Status

On many sequencer Banks the upper right-hand corner of the display indicates the *Sequencer Status*. The sequencer is always in one of the following states:

- STOP — Sequencer at rest
- PLAY — Playing current sequence (sequence selected)
- SNGS — Song Stop: sequencer at rest with a song selected
- SNGP — Song Play: playing current song
- REC — Recording on current track, first pass
- ODUB — Overdub: re-recording current track
- play (lower case) — Countoff playing prior to going into Play, Record or Overdub
- rec (lower case) — Record Standby: waiting for you to play before going into Record (first track only)
- odub (lower case) — "Punch-in" Standby: waiting for you to play before going into Overdub
- mrec (lower case) — MIDI sync Record Standby: same as Record Standby except that the sequencer is synced to external MIDI clocks (CLOCK=MIDI in the Control bank) and is waiting for MIDI clocks before going into Record.
- AUDP — Audition Play. This state is entered automatically from Record when the end of the sequence is reached (assuming LOOP=ON). After leaving Record and entering Audition Play, the sequence will continue to play in this state, with the newly recorded track, until you press the ***Stop*** or ***Enter*** buttons. The Display will show "Press ENTER to keep NEW track."
- AUDS — Audition Stop is entered when you stop the sequencer from the Audition Play state. To exit Audition Stop and return to the normal stop state, you must first instruct the SQ to KEEP either the new or the original track (see PLAY/KEEP screen later in this section).

Sequencer and Song Banks

Pressing the ***Select Sequences/Presets*** button puts the SQ into sequences/presets select mode. The ten ***Bank*** buttons (labeled 0-9) will now select Sequence/Preset or Song Banks. Banks 0 to 6 contain sequences/presets, while banks 7 through 9 hold the songs. Each bank contains ten sequence/preset or song locations which can be selected with the ten ***Screen*** buttons located below the ***Bank*** buttons.

Locations which have not yet been defined as a song or sequence show "*Empty Seq/Pset*" or "*Empty Song*" on the bottom line of the display. The top line will indicate the currently selected sequence, preset, or song, and indicate the location being displayed.

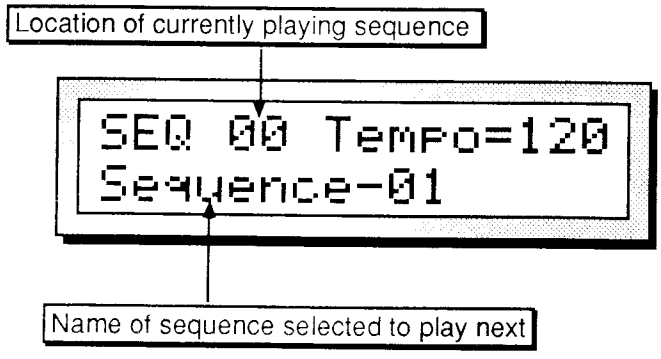
Selecting an undefined field and pressing the ***Enter*** button will initiate the Create New Sequence or Create New Song function (see Create a New Sequence or Create a New Song, later in this section).

Selecting a Sequence or Song

- Press ***Select Sequences/Presets***, then press the ***Bank*** buttons labeled 0-9 to select the ten Sequences/Presets and Song Banks.
- Press the ***Screen*** buttons labeled 0-9 to choose an individual Sequence or Song within the selected bank.

Playing Sequences and Songs

Try selecting a sequence, and pressing the ***Play*** button in the Sequencer section. The selected sequence will begin to play.



While one sequence is playing you can select another one. The bottom line of the screen will display the name of the new sequence with a cursor alternating between the lower left and right hand corners, with the original sequence continuing to play. When the first sequence is finished, the upper left hand corner of the display will switch to indicate the new sequence, and it will play. In this fashion you can string sequences together in real time, as they play. The display always tells you which is playing (upper left-hand corner) and which is selected to play next (bottom line).

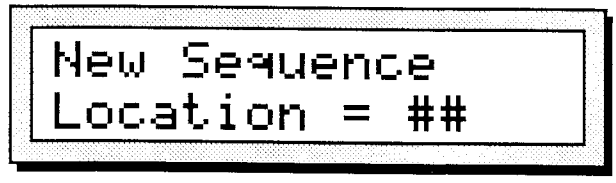
Note that if the new sequence uses a different effect than the previous one, the audio output will be muted temporarily while the new algorithm is loaded.

Creating a New Sequence or Song

To Create a new sequence:

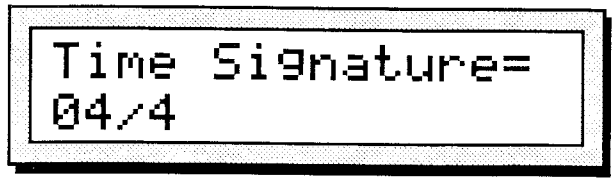
- Press the ***Select Sequences/Presets*** button to enter Sequences/Presets Select mode.
- Using the Sequencer ***Bank*** and ***Screen*** buttons, select any undefined sequence location (Banks 0-6). Remember, Bank 0 through 6 contain sequences, and 7 through 9 contain songs. The screen will display the following prompt:

- Press the ***Enter*** button. The display shows:

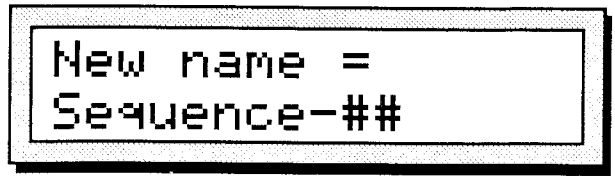


The ***Data Entry Slider*** or ***Up/Down Arrow*** buttons will now scroll through all available unused sequence locations. (When creating a song the arrows scroll through unused song locations.)

- Once a location has been chosen, press the ***Right Arrow*** button. The display reads:



The ***Up/Down Arrow*** buttons will now set the time signature values. The ***Right Arrow*** button will advance to the second value. Pressing the ***Right Arrow*** button a second time will cause the display to read:



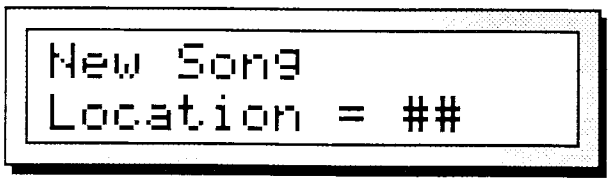
Once again, use the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons to select various letters, numbers, and icons to create a name and use the ***Left/Right Arrow*** buttons to choose which character to edit.

- Now that you've selected a location, time signature, and name for your

sequence, press the ***Enter*** button again. The display will briefly read "Command Successful!"

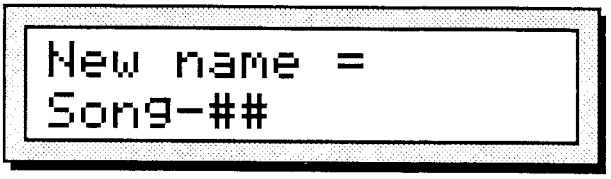
To Create a new song:

- Press the ***Select Sequences/Presets*** button to enter Sequences/Presets Select mode.
- Using the Sequencer ***Bank*** and ***Select*** buttons, select an unused song location (Banks 7-9).
- Press the ***Enter*** button. The display shows:



The ***Data Entry Slider*** or ***Up/Down Arrow*** buttons will now scroll through all available unused song locations. (When creating a sequence the arrows scroll through unused sequence locations.)

- Once a location has been chosen, press the ***Right Arrow*** or the ***Enter*** button. The display reads:



Once again, use the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons to select various letters, numbers, and icons to create a name and use the ***Left/Right Arrow*** buttons to choose which character to edit.

- Now that you've selected a location and name for your song, press the ***Enter*** button again. The display will briefly read "Command Successful!"

Erasing All Sequencer Memory

When you want to erase all sequences and songs in the SQ sequencer memory, first make sure you have saved any important data to a storage card or to a MIDI data device using system exclusive, then:

- If not currently in Sequence Edit mode, press the ***Edit Sequences/Presets*** button. The LED above the button will light.
- Select the Control bank by pressing the ***Bank 1*** button.
- Press the ***Screen 7*** button. The display reads: "Press ENTER to Reinit Sequencer."
- Press ***Enter***. The SQ display reads: "Erase sequencer memory?"
- Press the ***Yes*** or ***Enter*** button. The SQ erases all presets, sequences, and songs from memory. After the memory is erased there will be one blank sequence and one blank song in locations 00 and 70 respectively. (There is always one song and one sequence in memory.)

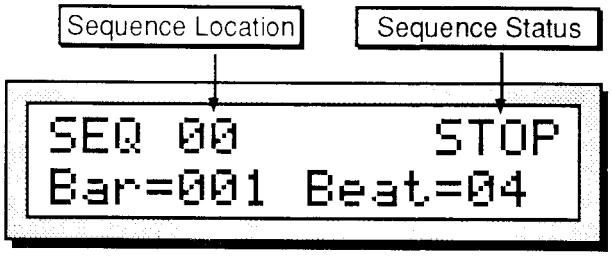
Locate Bank

The Locate Bank provides valuable sequencer information as well as control over tempo and GOTO (Auto Locate) functions.

00	Sequence/Song Locate	
	Locate Bank	Press Edit Sequences / Locate (Bank 0) / Screen 0.

First we will look at the Locate screen as it appears when a sequence is selected. When a song is selected, the Locate screen is a little different (see below).

Sequence Locate



The upper left corner of the screen displays the location of the current sequence.

The status of the sequencer (whether it is in Play, Stop, Record, etc.) is always shown in the upper right hand corner of the display on this screen.

Bar/Beat — Sequence Goto control

Using the Goto function, you can quickly locate to any bar and beat within the sequence, in order to play or record from there.

- Press the ***Enter*** button. The display shows:

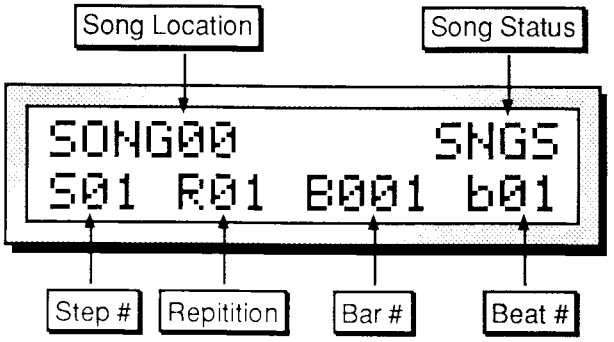
- The Bar number will be *flashing* and the locate point may be set using the ***Data Entry Slider*** or the ***Up/Down Arrow*** buttons. Press the ***Left/Right Arrow*** buttons to move the cursor between the Bar and Beat.

- Press the ***Enter*** button to complete the locating process, and return to the main Locate screen. The Goto function provides a quick and easy way to repeatedly locate to a certain place in a sequence — the destination remains set until a new sequence or song is selected (or a new destination is set). Once the destination is set, simply press the ***Enter*** button twice (while on the Locate screen) to locate to the same place.

- After using the Goto function to locate to a spot in the sequence, press the ***Stop*** button to begin playing the sequence from that point. (The ***Stop*** button also acts as a Continue button.)

Song Locate

With a song selected, the Locate screen looks like this:



Note that the Sequencer Status (shown in the upper right corner of the display) now shows SNGS, for Song Stop, indicating that a song is selected.

- Press the ***Enter*** button. The display now reads:

- As with the sequence Goto function, the first parameter (in this case, the step number) is flashing. Once again the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons will select a location and the ***Left/Right Arrow*** buttons will change parameters.

The Song Locate parameters are:
- **STEP** — shows your current location in the song by steps.
- **REPETITION** — shows your location within the current song step by repetitions.
- **BAR** — shows your location within the current song step by bar.
- **BEAT** — shows your location within the current bar of the current song step by beats.

- Press the ***Enter*** button to complete the locating process and return to the main Locate screen. The Goto function provides a quick and easy way to repeatedly locate to a certain place in a song — the destination remains set until a new sequence or song is selected. Once the destination is set, simply press the ***Enter*** button twice (while on the Locate screen) to locate to the same place.

- After using the Goto function to locate to a spot in the song, press the ***Stop*** to begin playing the song from that point. (The ***Stop*** button also acts as a Continue button.)

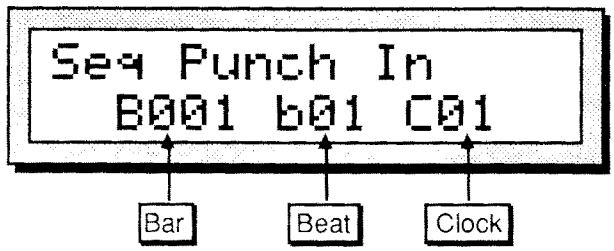
01	Sequence/Song Punch In
	Locate Bank Press Edit Sequences / Locate (Bank 0) / Screen 1.

Seq Punch In — Using the Auto Punch feature

When a sequence is selected, the display shows the Bar, Beat and Clock at which the SQ will enter record when Auto Punch is on. This parameter works in tandem with the Seq/Song Punch Out parameter, which immediately follows.

When the Auto Punch function is on, the SQ will enter and exit record only at the points specified by the Edit Times. For example, if you want to have the SQ automatically record over just the third bar of a four bar sequence:

- Select the Auto Punch parameter and set to Auto Punch=ON. (See Control Bank later in this section for more.)
- Select the Punch In Edit Time and set to Punch In = B003.b01.c01 (bar 3, beat 1, clock 1).
- Select the Punch Out Edit Time and set to Punch Out = B003.b04.c96 (bar 3, beat 4, clock 96).
- Press ***Record/Play*** and play along with the track. The SQ will automatically enter record at the first clock of the third bar, and exit record on the last clock of the third bar.



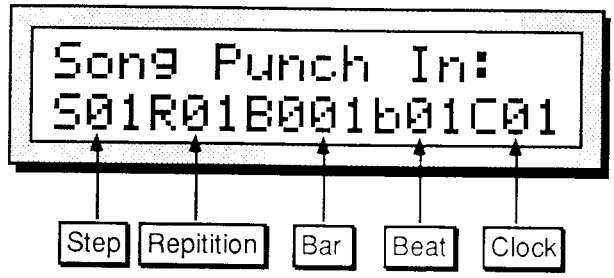
- The edit times are set using the ***Data Entry Slider*** or the ***Up/Down Arrow*** buttons. The ***Left/Right Arrows*** move the cursor between the Bar, Beat and Clock.

- Press the ***Enter*** button once to set the Auto Punch parameter to the current time. (Double-clicking the ***Enter*** button will reset the Auto Punch to bar 1, beat 1, clock 1.)

These times are automatically set to their default values (the beginning and end of the sequence or song) when a new sequence is created. If other values are installed, they will remain in effect until they are reset or a different sequence or song is selected. The current Edit Times are remembered for each sequence.

Edit Times in Song Mode

You can use the Auto Punch mode and Edit Times to punch in and out on the song tracks as well as sequence tracks. When a song is selected, the Punch In screen shows the following:



Notice that two more numbers are added to the Edit Times: the Song Step number and the Repetition of that step are added to the Bar, Beat and Clock within the sequence that plays during the step. You can set the Punch In or Punch Out time to any point within the song.

Setting the Edit Times in Real Time

If you know the exact bar, beat and clock (or step, rep, bar, beat and clock in song mode) at which you want to punch in and out, you can simply select and set the Edit Times using the data entry controls. If not, you can set them "on the fly" using the following procedure:

- Have the "Seq Punch In:" screen on the display.
- Press ***Play*** to begin playing the sequence or song.
- When the sequence or song reaches the point where you want to punch in, press ***Enter***. This installs that time as the Seq Punch In time.
- Press the ***Screen 2*** button. The "Seq Punch Out" screen is on the display.
- At the point where you want to punch out, press ***Enter*** again. This installs that time as the Seq Punch Out time.
- Now, assuming Auto Punch is on, you can go into record and play along with the track, and the SQ will automatically enter and exit record at those points which you chose.

02	Sequence/Song Punch Out
	Locate Bank Press Edit Sequences / Locate (Bank 0) / Screen 2.

Seq Punch Out

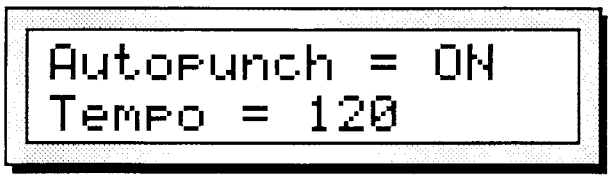
When a sequence is selected, the display shows the Bar, Beat and Clock at which the SQ will exit record when Auto Punch is on. This parameter works in conjunction with "Seq Punch In" to control the Auto Punch feature. See the Punch In parameter description above for a complete discussion.

03	**Auto Punch/Tempo**
	Locate Bank Press Edit Sequences / Locate (Bank 0) / Screen 3.

Auto Punch

This is the same parameter found in the Control bank — it is also located in this bank so that you have a handy way to enable or disable the Auto Punch function in the same bank where the Edit Times are located. See "Control bank" later in this section for a full discussion.

- ON — the SQ uses the Edit Times for entering and exiting record state.
- OFF — normal recording without using Edit Times.



Tempo

Sets the tempo of the current sequence. This can be adjusted using the data entry controls or by *tapping* on the ***Enter*** button whenever the tempo is selected.

When "Clock=MIDI" in the Control bank, this field will read "Tempo=EXT" to indicate that the tempo is controlled by incoming MIDI clocks.

Range: 25 to 250 BPM, or EXT.

Tap Tempo

In both of the banks where tempo appears (***Locate*** and ***Click***), the ***Enter*** button can be used to "tap" in the tempo. The ***Enter*** button will *always* be able to be used for tap tempo when a sequence tempo parameter is displayed.

Tempo — Song Tempo Offset

This controls the tempo of the song. It is expressed as a percentage of the sequence tempo — changing the song tempo offset automatically adjusts the tempo of each the sequences in the song by +/–99%, within the legal limits of 25-250 BPM. When "TEMPO=+00" the sequences will play at their designated tempo.

When "Clock=MIDI" in the Control bank, this field will read "Tempo=EXT" to indicate that the tempo is being controlled by incoming MIDI clocks.

Range: -99 to +99 %, or EXT

Control Bank

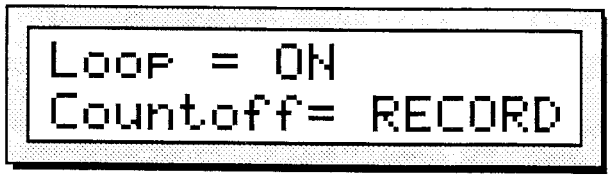
The ***Control*** bank contains parameters which control the basic operation of the sequencer.

10	Loop/Countoff
	Control Bank — Press Edit Sequences / Control (Bank 1) / Screen 0.

Loop

This parameter controls whether or not the sequence or song will loop. The setting of this control is remembered for each sequence and song.

- ON — the sequence or song will play continuously, looping back to the beginning when it reaches the end. This is the default.
- OFF — the song or sequence will not loop — it will play once and stop.



Countoff

This determines whether playing and/or recording sequences and songs will be preceded by a 1-bar countoff.

- OFF — no countoff will occur in Play or Record modes. The song or sequence will begin as soon as ***Play*** (or ***Record/Play***) is pressed.
- ON — a one bar countoff plays before the sequence or song begins to play.
- RECORD — a one bar countoff will occur during Record only. This is the default.
- QUIET — the countoff will occur in Play or Record without the click.

11	Step Entry/Record
	Control Bank — Press Edit Sequences / Control (Bank 1) / Screen 1.

Step Entry

This parameter places the SQ into Step Entry recording. Step Entry allows you to record notes and controller information by placing them at specific points within the sequence, instead of recording in real time. This method can be very useful for recording blisteringly fast runs, or placing program changes in the middle of a sequence.

To enter Step Entry recording:

- Set the Step Entry parameter to ON.

• Press ***Record*** and ***Play***. The display reads:

The Auto Step parameter determines whether the sequencer will advance to the next step automatically each time a key is pressed.

• OFF — The sequencer will not advance to the next step until the ***Enter*** button is pressed. This permits the recording of more than one note on the same event location.

• ON — The sequencer will automatically advance to the next step each time a key is pressed. This provides an easy way for recording arpeggios. With Auto Step on, chords cannot be recorded.

With this parameter set as desired, press the ***Right Arrow*** button. The display now reads:

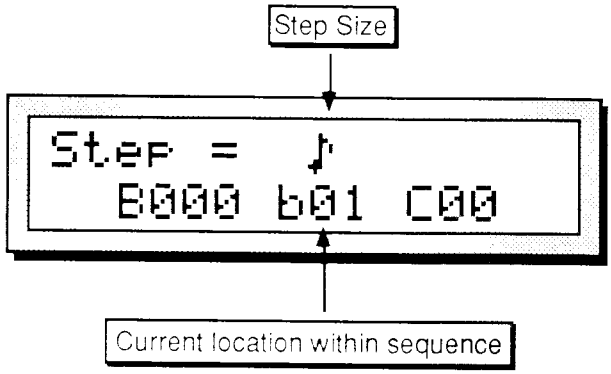
The Gate select determines the duration of the notes that are recorded in Step Entry record.

• MANUAL — The duration of notes is determined by when a key is released. Press down a key and keep it held down as you step through clocks. Release the key at the appropriate clock and the note is recorded for that duration.
• STEP — The duration is determined by the Step parameter, found on the next screen. Each key played will then be recorded with the same duration.
• FIXED — FIXED is similar to STEP in that all notes recorded will have the same duration. However, unlike STEP, the duration of the notes is not determined by the Step parameter. Instead, it is set independently by an additional parameter which appears on the display:

• This added parameter can be selected and adjusted.

Range: Half notes to 64th note triplets.

Now, press the ***Right Arrow*** button again to move to the Step parameter. Its display reads as follows:



This is the final screen of Step Entry recording, and the one that should be displayed when entering notes.

The Step parameter determines the amount that the sequencer will move each time you advance to the next location. The amount is expressed in time values.

Range: Half notes to 64th note triplets.

With the parameters all set, you can now begin entering notes for Step Entry recording. Recording will continue until either the sequence reaches the end of its defined length or the ***Stop*** button is pressed. The display will read "Press ENTER to keep NEW track" (or "Press ENTER to keep first XXX bars" if its the first track recorded).

Hint: When in Step Record, holding down the ***Record*** button while playing the keys does *not* record into the sequencer. This is useful for step entering drum tracks, where you may need to play the keyboard to find a particular drum.

Record — Record Mode

The second parameter on this screen selects between the three recording modes for the sequencer.

- REPLACE — Anything recorded into an existing track will replace the data that was in the track previously. The sequencer will stop recording after one time through the sequence or song, and will enter Audition/Play mode. This is the default setting.
- ADD — New data recorded into an existing track will be added to (or merged with) data already in the track — the existing data will be left intact. Again, the sequencer will exit record after one time through the sequence or song and enter Audition/Play.
- LOOPED — As with ADD mode, new data recorded into an existing track will be added to (or merged with) data already in the track. However, when in "Record=LOOPED," the sequencer will remain in Record for as many times as you play the song or sequence through (rather than dropping out of Record after one time through). Think of this as "drum machine mode" — as long as the sequence or song keeps playing, you can keep adding parts each time around.

There is a fourth Record Mode which is available only when a song is selected:

- MIXDOWN — Records dynamic Volume and Pan changes into sequence and song tracks. The SQ will record *only* changes made on the Volume and Pan screens in the Performance bank. Notes, controllers, program changes, etc. will *not* be recorded in this mode.

Depending on the setting of the "Edit Tracks" parameter (see below) you can mix down either the song tracks or sequence tracks over the length of the song.

12	Auto Punch/Clock
	Control Bank — Press Edit Sequences / Control (Bank 1) / Screen 2.

Auto Punch

This parameter controls an extremely powerful feature of the SQ — the Auto Punch function. Auto Punch means that when overdubbing a track, the SQ will automatically enter and exit record mode at predetermined times which you specify. You can play along with the track and have the SQ "punch" in and out for you like an invisible engineer. We refer to the points at which recording will begin and end as the *Edit Times* and they are set on Screens 02 and 03 in the Locate Bank.

- ON — the SQ uses the Edit Times specified in the Locate bank for entering and exiting record state.
- OFF — normal recording without using Edit Times. This is the default setting.

Clock — Sequencer Clock Source

This parameter selects the clock source for the sequencer.

- INTERNAL — Selects the SQ's own internal clock to run the sequencer. The SQ features 96 ppq (pulses per quarter-note) resolution for extremely accurate recording. This is the default setting.
- MIDI — Selects external MIDI clocks as the sequencer clock source. Use this setting if you want to use another device (such as a computer sequencer or drum machine) as the master clock source and sync the SQ to it. Whenever "Clock=MIDI," the tempo display will read "Tempo=EXT" to indicate that the SQ is syncing to an external clock source.

13	Song uses effect from:
	Control Bank — Press Edit Sequences / Control (Bank 1) / Screen 3.

Song uses effect from:

This controls which effect(s) will be used while a song is playing — those from each individual sequence or a single "override" effect saved with the song. A song contains a series of sequences which will play in order. Each sequence has its own effect. When switching from one sequence to another in the course of a song, there can be a momentary "glitch" of the sound as the effect for the new sequence is loaded. This can be avoided by setting this parameter to "Song uses effect from: SONG" so that the entire song will use the same effect.

- SEQUENCES — the individual sequence effects will be selected as the sequences are played.
- SONG — the song effect will override the individual sequence effects. This is the default setting.

14	**Song Edit Tracks Displayed**
	Control Bank — Press Edit Sequences / Control (Bank 1) / Screen 4.

Song Edit Tracks Displayed

This determines whether song or sequence tracks will be affected by volume or pan changes when you select Mixdown mode (see above). The default setting after a song is selected is SONG.

- SEQ — the sequence tracks from the current song step will be displayed. When "Song Edit Tracks Displayed: SEQ" the LEDs above the Tracks buttons will *flash* to remind you that you are looking at the tracks from the sequence currently playing and not at the song tracks.
- SONG — the song tracks will be displayed when a song is selected. This is the default setting.

Note: When you are working with a song, you may want to switch back and forth between the Song and Sequence tracks without having to go to the Control bank. There is a shortcut for toggling this parameter between "Song Edit Tracks Displayed: SEQ" and "Song Edit Tracks Displayed: SONG:"

- While in Sequence Edit mode, *rapidly* double-click any ***Track*** button. This switches between the song tracks and the sequence tracks, just as if you had changed the setting of the Song Edit Tracks Displayed parameter. The LED in the track button flashes when you are looking at sequence tracks; it remains solidly lit when song tracks are displayed.

15	**Prompt to Save Changes**
	Control Bank — Press Edit Sequences / Control (Bank 1) / Screen 5.

Prompt to Save Changes

This parameter switches the SQ between assuming that you might want to save changes you make to the sequencer track parameters, and allowing you to select a new sequence or song without the changes being saved.

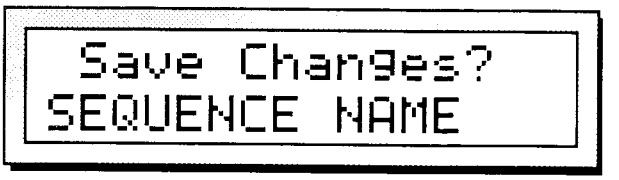
- OFF — when "Prompt to Save Changes=OFF," you can edit any of the Track parameters, replace the program on a track, etc. and the changes will be "forgotten" as soon as you select a new sequence or song. Recording any new track data, however, will automatically reset this parameter to ON. This is helpful when you're not sequencing, and don't want to be slowed down by the Save Changes prompt.
- ON — when "Prompt to Save Changes=ON," if you edit any of the Track parameters, replace the program on a track, etc. and then select a different sequence or song, you will be asked if you want to save those changes, as explained below. This is the default setting.

About the Save Changes... Screen

Along with the notes, controllers and program changes that are recorded on each track, there are many other parameters that are saved with each sequence or song. These are:

- the name of the sequence or song
- the tempo of the sequence or song
- the sound assigned to each track
- all Performance/Track parameters for each track of the sequence or song
- which tracks are selected and layered on the tracks
- the setting of the LOOP switch in the Control bank
- the setting of the CLICK parameter in the Click bank
- Punch-In and Punch-Out points

Whenever you record a track of a sequence or song, all of these values are automatically saved — that is, they will be remembered by the SQ if you leave the sequence (by selecting another one) and return to it later. However, if you change any of the above things, and then select a new sequence or song before you record any new track data, the following message will appear:



- Pressing the *Yes* button saves the sequence or song, with the current settings of all the parameters listed above, into sequencer memory.
- Pressing the *No* button leaves the settings of the parameters listed above as they were when you last recorded a track.

In either case, the track data (notes, controllers and program changes) is always saved. Sometimes it's hard to remember, when you get this screen, exactly what you changed. As a general rule, if you are happy with the sequence or song as it is, answer YES. If you have just been experimenting with different tempos, programs, MIDI configurations, etc., and want to leave the sequence as it was before your experiments, answer NO.

Hint: While in Select Sequences/Presets mode, there is one quick way to save any changes you make to a sequence or song. Simply double-click the ***Enter*** button.

As mentioned above, you can avoid being asked to save changes by setting the Prompt to Save Changes parameter to OFF. For live performance, and other applications in which you want to experiment with tempo, track parameters, etc. without being bothered about saving the changes, this is the preferred setting.

16	**Total Sequencer Free Memory**
	Control Bank Press Edit Sequences / Control (Bank 1) / Screen 6.

Total Sequencer Free Memory (display only)

This parameter displays the remaining percentage of available sequencer memory. This readout is informational only and cannot be selected or changed.

Range: 00% to 100%

17	**Reinit Sequencer**
	Control Bank Press Edit Sequences / Control (Bank 1) / Screen 7.

Reinitialize Sequencer

This command allows the entire contents of the SQ's sequencer memory to be erased. To erase sequencer memory, first select this parameter. Then:

- Press ***Enter***. The SQ display reads: "Erase sequencer memory?"
- Press the ***Yes*** or ***Enter*** button. The SQ erases all presets, sequences, and songs from memory. After the memory is erased, there will be one blank sequence and one blank song in locations 00 and 70 respectively. (There is always one song and one sequence in memory.)

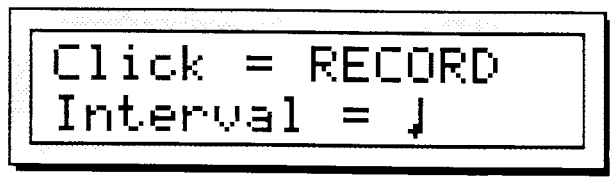
Click Bank

The Click Bank controls parameters dealing with the click and tempo of a sequence or song.

20	Click/Interval
	Click Bank Press Edit Sequences / Click (Bank 2) / Screen 0.

Click

Controls whether or not the click will be heard.
- OFF — the click will not be heard during Play or Record.
- ON — the click will be heard whenever the sequencer is running.
- RECORD — the click will be heard only when the sequencer is recording, not playing. This is the default.



Interval

Sets the note value of the metronome click.

Range: 1/2 to 1/32T notes (1/4 note is the default)

21	Click Volume/Click Pan
	Click Bank Press Edit Sequences / Click (Bank 2) / Screen 1.

Click Volume

Controls how loud the click will be.
Range: 00 to 99 (99 is the default)

Click Pan

Controls the stereo position of the click.
- LEFT — The click will be panned hard left and play through the Left output only.
- CENTER — The click will be panned center and play through both outputs. This is the default.
- RIGHT — The click will be panned hard right and play through the Right output only.

22	Tempo
	Click Bank Press Edit Sequences / Click (Bank 2) / Screen 2.

Tempo

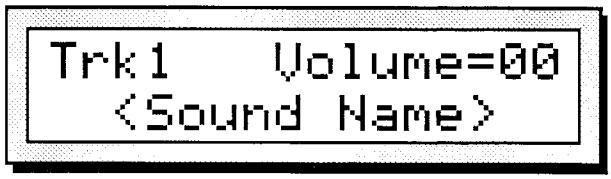
Sets the tempo of the current sequence. When the sequencer is running and the tempo parameter is selected, you can tap on the ***Enter*** button at the tempo you want to install as the current tempo. When "Clock=MIDI," this display reads "Tempo=EXT."

Range: 25 to 250 BPM (beats per minute) or EXT

Recording a Sequence

Here we will describe recording a new sequence from scratch. First we will concentrate on sequencing with the SQ alone, and then cover sequencing remote MIDI instruments.

1) Create a New Sequence:
- Following the steps outlined earlier in this section, create a new sequence.
- Double-click the ***Edit Sequences/Presets*** button. The display will now read:



2) Select a Track:
- Track 1 is already defined and selected (there is always one track selected in a sequence) and the current program has been placed on the track. All other tracks are as yet -UNDEFINED-.
- To begin recording the sequence with a track other than Track 1, press the track button corresponding to that track. This defines the track and puts the currently selected sound on it. Otherwise, you can just leave Track 1 selected and start from there.

3) Select a Sound for the Track:
- Select a sound as you normally would, using the ten ***Bank*** and ten ***Select*** buttons to locate the sound you want. Each new sound is assigned to the track, replacing the previous one.

4) Check the "Click" and "Countoff" settings:
- Press ***Edit Sequences***. Go to the Click bank by pressing the ***Click*** button (Bank 2), followed by the ***Screen 0*** button. This Screen controls the functions of the SQ's internal metronome. Select the "Click" parameter and set to "Click=RECORD." This will provide a click track when you are in record, but not during playback.
- Select the Countoff screen by pressing the ***Locate*** button (Bank 1), followed by the ***Screen 0*** button. Select the "Countoff" parameter and set to "Countoff=RECORD". This will play a one bar countoff before recording (but not when playing back) all tracks.

5) Record the First Track:
The length of the first track defines the length of the sequence. For this reason, there is a special procedure for recording the first track of a new sequence.
- While holding down ***Record***, press ***Play***. The click track starts playing, giving the tempo. The first beat of each measure is emphasized. The tempo parameter in the Click bank is automatically selected.
- Adjust the Tempo. Use the ***Data Entry Slider*** or the ***Up/Down Arrow*** buttons to set it to the tempo you want. The bar in which you start playing becomes Bar 1 of the Sequence.

- Press ***Stop*** (or the Aux. Foot Switch) to end recording. The display will ask "Trk1 Keep first ## bars?" This will determine the length of the sequence.
- Press the ***Yes*** button to keep the track, defining the length of the sequence, or
- Press the ***No*** button to erase the first track and start over again.

6) Record Additional Tracks:
After you have answered *YES* to the question "Trk1 Keep first ## bars?" all other recording, including re-recording the first track, will follow the same basic routine. The length of the sequence is now defined (by the length of the first track). The rest of the tracks will automatically have the same length.

- Press the ***Track 2*** button, and select a second track (or leave the first track selected if you want to record over it). The name of the program and all the track parameters from the previous track are copied onto to the new track.
- Select a sound for the track. As shown in step 3 above, use the Replace Sound function to put the sound of your choice on the selected track.
- While holding down ***Record***, press ***Play*** to begin recording. The click track will play for one measure (assuming Countoff=RECORD or CLICK) and then the sequencer will enter record mode. It will record whatever you play on the new track until:
  1) the end of the sequence is reached, or 2) you press ***Stop*** (or hit the Aux. foot switch).

- At the end of the sequence, the SQ will leave record mode and (assuming Loop=ON) enter Audition Play mode. At that time, the Keep NEW/OLD screen is displayed. It reads as follows:

- Press the ***Down Arrow*** button to hear the track as it was before you recorded the new track. The display then reads "OLD" where it shows "NEW" in the above illustration. This is invaluable when you begin to do second and third takes, since it allows you to compare the tracks before deciding which to keep.
- Press the ***Up Arrow*** button to hear what you just recorded.
- Press the ***Enter*** button while the display reads "OLD" to leave the track as it was in memory, and "trash" the one you just recorded. If the track was empty before recording, pressing this button will leave it empty.
- Press the ***Enter*** button while the display reads "NEW" to save the new track into memory, replacing whatever was on the track before.

The Keep NEW/OLD screen appears after all track recording and after all track edit functions. The SQ always gives you a chance to audition changes to the track data before deciding whether to keep them. You'll find this capability to be of great use for those occasions when you need to hear both versions back-to-back to make a decision.

"Punching In" on a Track

The SQ offers two methods for "punching in" (or re-recording) a specific part of a track. When the Auto Punch function is *off*, you can punch in manually just by playing the keyboard to start recording. When Auto Punch is *on* the SQ will enter and exit Record mode automatically at the precise times that you specify in the Locate bank. (See the description of the Auto Punch features earlier in this section.)

To punch in manually on a track (meaning Auto Punch=OFF in the Control bank):

- Press the proper ***Track*** button to select the track you want to record on.
- Press ***Play*** to start the sequence or song playing.
- Press ***Record***. This puts the SQ in Overdub Standby — "odub" appears in the upper right corner of the display and the sequencer is waiting for you to play keys before going into record.
- Start playing at the point where you want to punch in. As soon as you play anything the SQ goes into overdub (or record for a new track) and records what you play, leaving intact the part of the track before the punch in. Unless you then press ***Stop*** or the Aux. Foot Switch, new track data will be recorded from the point where you punched in to the end of the sequence or song.
- Press ***Stop***. You will see the Keep NEW/OLD screen as shown earlier, letting you audition the new or the old track before deciding which to keep.

To Punch In and Out automatically on a track (meaning AUTOPUNCH=ON in the Control bank):

- Set the Punch In and Punch Out times in the Locate bank as described earlier in this section. These define the exact bar, beat and clock at which the SQ will enter and exit record.
- Press ***Record/Play*** to start the sequencer. It will begin to play, but will not go into record until the Punch In time is reached. You can play along with the sequence if you wish without being recorded.
- When the Punch In time is reached, the sequencer will automatically enter record, and will record whatever you play until the Punch Out time is reached.
- At the Punch Out time, the sequencer automatically exits record and goes into Audition Play mode.
- Audition the new track as usual from the Keep NEW/OLD screen before deciding whether to keep the new or the old track.

When Auto Punch is on, the SQ will record events *only* within the window of time specified by the Edit times; no matter how you enter record. Thus, if you press ***Play*** then ***Record,*** the SQ will wait for you to play before entering record, but recording will only be triggered by notes within the Edit times window. Notes played before the Punch In time or after the Punch Out time will not initiate recording.

If the Record=LOOPED (in the Control bank) and Auto Punch is on, the sequencer will continue to go in and out of record at the Edit times each time the sequence repeats, for as long as you let it play.

Note: When footswitch is set to control sequencer START/STOP, depressing the footswitch while the sequencer is running in Overdub Standby mode (lower case"odub"), forces the sequencer into Overdub Record mode (upper case "ODUB"). This allows for hands-free punch-ins without using punch times.

Playing along with a Sequence/Auditioning New Sounds

Whenever you go from Sequence mode to Sounds mode (by pressing the ***Select Sounds*** button), the SQ loads the effect for the current sound into the effects processor, replacing the sequence effect. (Remember, there is only one effect current at a time, and any voices that play will go through that effect.) Each sound that is selected in ***Select Sounds*** mode causes that sound's effect to be the effect used by the sequencer. (This does not change the sequence, but allows you to audition the sequence with different effects.)

While the sequencer is playing back in ***Select Seq*** mode, it is possible to layer tracks by double clicking on the track buttons. This permits you to play a multi-timbral lead along with the sequencer.

The preferred way to audition new sounds, or to just play along while the sequencer is running, is to use Replace Sound function, as described in Section 7 — Presets.

Recording MIDI Tracks

Once everything is set up, you can proceed with recording MIDI tracks exactly as you would for tracks with LOCAL or BOTH status. Tracks that are sent out MIDI are treated the same as internal tracks in terms of recording, overdubbing, punching in, editing, etc. Follow the same steps outlined earlier in this section for recording the first track, and then for all additional tracks.

For each successive track you record, the procedure will follow the same lines:
1) Define the MIDI configuration of the track in the Parameter bank,
2) Record the track, and then
3) Either keep or reject the new track from the Keep NEW/OLD screen.

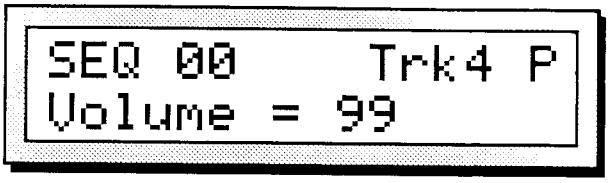
MIDI tracks can be selected and stacked from the ***Track*** buttons, and can be muted or soloed from the Mix bank, the same as any other tracks. Performance/Track parameters such as Volume, Key Range and Transpose all apply to MIDI tracks just as with LOCAL tracks.

Most often you will be recording sequences and songs which contain some MIDI tracks and some LOCAL tracks. When this is the case, be sure that you assign LOCAL status (as opposed to BOTH) to the tracks that you want to play only on the SQ. This will avoid sending unintended MIDI data to an external instrument.

Track Volume Functions — Mixing, Muting and Soloing Tracks

Once you have recorded a few tracks of a sequence, you will want to balance the levels of the tracks, and maybe listen to them one or two at a time. This is done from the Mix bank.

Select a track from the ***Track*** buttons, then press the ***Edit Sequences*** button. The SQ is now in Sequence Edit mode. Now, press the ***Mix*** button (Bank 7), followed by ***Screen 0*** button. The display shows:



From this bank, in addition to balancing the levels of the tracks in the sequence, you can solo and mute individual tracks just as you can with voices on the select voice Screen:

- Press the track button to select the track for editing. The data entry controls will now adjust the level of the selected track from 00 to 99.
- Press the ***Screen 2*** button to *Mute* or *Solo* the track. (See the discussion on Track Status in Section 7 — Presets for full details.)

Song Mode

The SQ's *Song Mode* is the key to unlocking its true power as a Personal Music Studio. In song mode you can chain a number of sequences together to form a song. Songs are made up of *Steps* — for each song step you can choose a sequence to play and the number of repetitions of that sequence, as well as mute and transpose status for each track of the sequence. The process for editing song steps is covered in Section 9 — Sequencer Edit Functions.

But wait, there's more. Each SQ song also contains its own effects set-up (see below) and eight additional tracks which are independent of the tracks in the component sequences that form the song steps. This gives you a 16 track sequencer with tremendous flexibility. You can choose which musical parts you want to put into the component sequences, and which parts you put in the song tracks. Discussion of song tracks begins on the next page.

Switching Effects in Song Mode

As you are probably aware, when you are playing SQ sounds, and you select a sound which uses a different effect from the previous one, there is a momentary muting of the audio output. This is because, like all digital signal processors, the SQ requires some time to switch from one effect to another. The software program which defines the effect must be changed for each different effect.

The same holds true when selecting sequences. Each sequence has its own effects set-up, which is completely programmable and is saved with the sequence. When you select a sequence, if the new one has a different effect than the previous one there will be a brief muting of the output.

This can pose a problem when playing a song — as a new song step begins to play, if the sequence in that step has a different effect than the previous one, there might be a muting of the audio output. Since it is usually not desirable during sequencer play to mute the output, the SQ offers some alternatives.

The parameter "Song Uses Effect from=SEQUENCES/SONG" in the Control bank determines which effect(s) will be heard when a song is played:

- When "Song Uses Effect from=SEQUENCES," each time a new sequence begins as a step in a song, its effect will be loaded, resulting in a brief muting of the output (unless the new effect is the same as in the previous sequence).
- When "Song Uses Effect from=SONG," the effect which is stored in the song will be used for all the song steps and there will never be any muting or "glitching" of the output when new sequences play.

The setting of this parameter is saved with each song. Whenever a new song is created, it defaults to "Song Uses Effect from=SONG." This ensures that there will be no output muting between sequences, but it also means that a sequence might sound different in a song than when it was played on its own.

If you do use the "Song Uses Effect from=SEQUENCES" setting for a given song, you can minimize the muting by doing the following:

- Whenever possible, use the same effects algorithm in sequences which will be adjacent to each other in the song.
- Program a rest into the beginning of sequences where the effect will switch to a different algorithm from the previous one. Or create a silent one-bar sequence whose only function is to switch to a new effect. Then make sure the sequences that follow use the same effect.

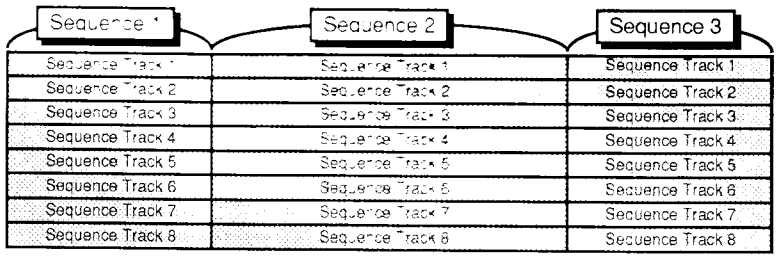
Song Tracks

A Song on the SQ is much more than simply a group of sequences chained together. Once you have created a song and edited its steps, you can record another complete set of eight song-length tracks. These *Song Tracks* are completely independent from the individual sequence tracks: each has its own sound and complete set of track parameters. The length of the song tracks is determined by the combined length of the song's component sequences.

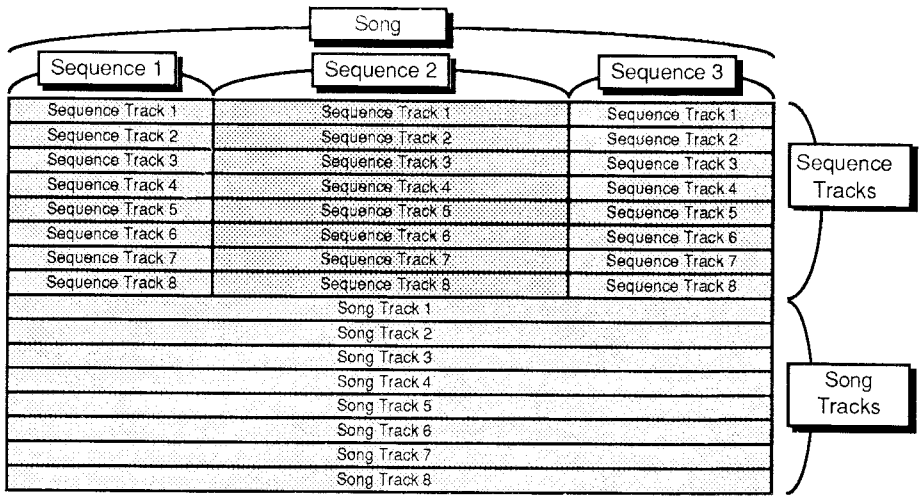
Let's suppose you have constructed a song, as described in Section 9. For our example we will take a simple case:

- You have recorded three sequences, each using up to eight tracks, and combined those sequences into a song.
- Step 1 of the Song is Sequence 01 (a 4-bar Sequence) for 1 Repetition;
- Step 2 is Sequence 02 (an 8-bar Sequence) for 1 Repetition; and
- Step 3 is Sequence 03 (a 4-bar Sequence) for 1 Repetition.

Your Song would look like this:



Now, with the song selected, you can press the ***Track*** buttons and see an entirely new set of empty tracks. These are the song tracks. (If you are not sure which tracks you're viewing, check the track LED's. They flash when sequence tracks are displayed in Song mode.) Continuing with the above example, the song tracks might look like this:



Song tracks are treated like normal sequence tracks whose length is equivalent to the combined length of all the sequences which make up the song. The length of the song tracks is set according to the song length at the time the first song track is recorded. Changes made to the song structure after the first song track is recorded will not affect the length of the song tracks.

- You can change the sound on a song track using the replace sound procedure, just as you would a sequence track.
- You can enter record (by holding down ***Record*** and pressing ***Play***) and record on any of the eight song tracks. Follow the same procedures (as outlined earlier in this section) for recording song tracks that you would for sequence tracks. The only difference is that a song track is associated with the song itself, and not with the individual sequences that comprise the song.
- You can edit the song tracks using any of the Track Edit functions discussed in Section 9. Selecting any Track Edit function when a song is selected, will cause the current song track to be edited.
- You can use the Sequence Edit functions to edit the song tracks as a group, erasing them, or adding and deleting bars. When a song is selected, the Sequence Edit functions will affect the song tracks, as if they were a sequence.
- You can solo, mute and adjust the volume of song tracks from the Mix bank as with sequence tracks.

Viewing Sequence Tracks in Song Mode

When a song is selected, what you see on the Tracks screens and the performance parameter screens depends on the setting of the "Song Edit Tracks Displayed" parameter in the Control bank.

- When "Song Edit Tracks Displayed=SONG," the Tracks screens and the performance parameter screens will show the song tracks. Any changes you make will affect the song tracks only.
- When "Song Edit Tracks Displayed=SEQ," the Tracks screens and the performance parameter screens will show the tracks for the individual sequences which make up the song steps. Any changes made to these tracks when a song is selected will *not* be remembered after the song step is done playing. To change anything about a sequence track, you must first select the sequence and then change it there.

When a song is selected and "Song Edit Tracks Displayed=SEQ," the LED's above the ***Tracks*** buttons will *flash* to remind you that the track data is for the currently selected sequence in the song step and *not* the actual song tracks.

Note: There is a shortcut for toggling this parameter between "Song Edit Tracks Displayed= SEQ" and "Song Edit Tracks Displayed=SONG:"

- While on either of the Tracks screens, *rapidly* double-click any of the ***Tracks*** buttons. This switches between the song tracks and the sequence tracks, just as if you had changed the setting of the "Song Edit Tracks Displayed" parameter. The LED above the ***Tracks*** button flashes when you are looking at sequence tracks; it remains solidly lit when the song tracks are displayed.

Mixing down Song and Sequence Tracks in Song Mode

After you have created and edited a song, you can "mixdown" the volume and pan of the song tracks and/or sequence tracks that make up the song steps. The mixdown process does not affect the data in the individual sequences that compose the song steps; it creates a song-length *Mixdown Track* (which is actually a part of the song track) on which you can record volume and pan changes which will affect the song and/or sequence tracks over the course of the entire song. You can use this function to fine-tune the dynamics of certain tracks during part of a song, or to simply fade them out at the end of the song.

To record volume or pan changes to sequence tracks in a song:

- Select a song containing sequence tracks you want to mixdown.
- Select the Control bank by pressing the ***Control*** button (Bank 1), select the Record Mode (***Screen 1***) and set to "Record= MIXDOWN."
- Set the Song Edit Tracks Displayed parameter to "Song Edit Tracks Displayed=SEQ."
- Press any of the ***Tracks*** buttons and select the sequence track you want to mix down. If you select Track 3, for example, the volume and pan changes you are about to record will affect whatever is on Track 3 of each sequence throughout the song.
- Select the Mix bank by pressing the ***Mix*** button (Bank 7). The bank contains the volume levels for the tracks, with the current track displayed. (Or select the Pan parameter to record dynamic panning changes.)
- While holding down ***Record***, press ***Play***. The SQ enters Overdub.
- Use the ***Data Entry Slider*** or the ***Up/Down Arrow*** buttons mix the volume (or pan) of the selected track. All changes you make will be recorded.
- At the end of the song, or when you press ***Stop***, the Keep NEW/OLD screen appears. Here you can audition the changes before deciding whether to keep the new or the original track.
- To mix another track, press a ***Track*** button and select a different track; then select the Volume or Pan parameters and repeat the procedure.

To record volume or pan changes to a song track:

- Select a song containing song tracks you want to mixdown.
- Select the Control bank by pressing the ***Control*** button (Bank 1), select the Record Mode (***Screen 1***) and set to "Record= MIXDOWN."
- Set the Song Edit Tracks Displayed parameter to "Song Edit Tracks Displayed=SONG." (Note that you can toggle between Song tracks and Sequence tracks in song mode by *double-clicking* the any of the eight Tracks buttons while in Edit Sequences/Presets mode) button. The track's LED will flash when the sequence tracks are being displayed, and remain solidly lit when song tracks are shown. Note also that song tracks are always shown as 9-16, where sequence tracks are shown as 1-8.
- Press any of the ***Tracks*** buttons and select the song track you want to mix down. If you select Track 3, for example, the volume and pan changes you are about to record will affect whatever is on Song Track 3 (listed as Track 11) throughout the song.
- Select the Mix bank by pressing the ***Mix*** button (Bank 7). The bank contains the volume levels for the tracks, with the current track displayed. (Or select the Pan parameter to record dynamic panning changes.)
- While holding down ***Record***, press ***Play***. The SQ enters Overdub.
- Use the ***Data Entry Slider*** or the ***Up/Down Arrow*** buttons mix the volume (or pan) of the selected track. All changes you make will be recorded.

- At the end of the song, or when you press ***Stop***, the Keep NEW/OLD screen appears. Here you can audition the changes before deciding whether to keep the new or the original track.
- To mix another track, press a ***Track*** button and select a different track; then select the Volume or Pan parameters and repeat the procedure.

Notes about Mixdown Mode

Mixdown Volume and Mixdown Pan are recorded on the song track in a special form of ADD mode. When you record Mixdown Volume or Pan, the information is *added* to the data in the song tracks. This means that:

- The mixdown data is *always* recorded into the current song track, whether you are mixing a sequence track or a song track.

- If you have recorded Mixdown volume or pan into a track and want to erase and re-record it, you must first remove the original volume or pan using the Filter Events command in the Event bank (See Section 9 for details). Otherwise new mixdown information would be added to (and thus conflict with) the existing information.

- If you erase the song track, the mixdown volume and pan data will be lost. Recording notes, controllers, etc. on the song track does not affect the Mixdown information, but erasing the track (using the Erase command in the Event bank) will remove the Mixdown data.

Whenever possible, you should use this function as the last step in the production chain, after you have finished changing the song length, recording and erasing song tracks, etc.

Note: There is another way to record dynamic volume changes into a sequence or song track. You can use the optional CVP-1 Foot Pedal to record volume changes into a sequence track while the sequence is selected, or into a song track. Just set to "Pedal=Volume #7" in the System bank, and then record the foot pedal changes in ADD mode. This will record Volume (MIDI controller #7) messages into the track which are separate from the mixdown volume described above.

Section 9 — Sequencer Edit Functions

While in Sequence Edit mode, the ***Song***, ***Seq***, and ***Event*** buttons (Banks 3,4 and 5) provide access to the various sequencer editing functions. These are divided into Song, Seq, and Event edit functions. Pressing any of these three buttons activates a bank which contains the available functions in that category.

Song	Seq	Event
Filter	Env2	Amp

Song Bank — Song Edit Functions

Pressing the ***Song*** button (Bank 3) while in Sequence Edit mode activates the song editing bank. If you press the ***Song*** button (Bank 3) when a sequence is selected, the display will respond "SORRY! Select a song first" and will not allow you into this bank.

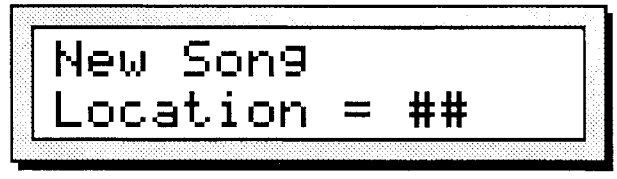
30	Create Song
	Song Bank Press Edit Sequences / Song (Bank 3) / Screen 0.

Create Song

This command is used to create new songs, which can then be assembled using the Song Step Editor described later in this section.

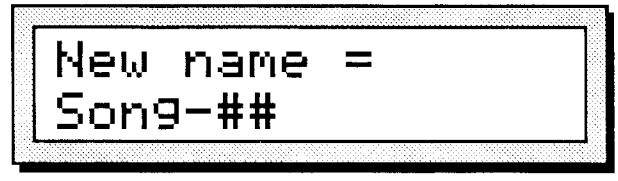
When this parameter is selected, the initial display shows the following:

- Press the ***Enter*** button. The display shows:



The ***Data Entry Slider*** or ***Up/Down Arrow*** buttons will now scroll through all available unused song locations.

- Once a location has been chosen, press the ***Right Arrow*** button. The display reads:



Once again, use the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons to select various letters, numbers, and icons to create a name and use the ***Left/Right Arrow*** buttons to choose which character to edit.

- Now that you've selected a location and name for your song, press the ***Enter*** button again. The display will briefly read "Command Successful!"

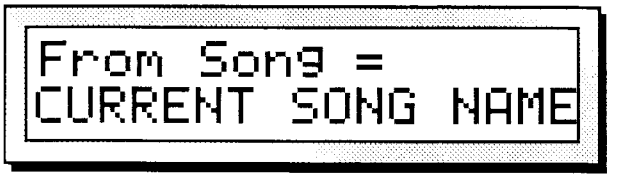
Note: As mentioned on the previous page, you can only select the Song Bank when already in Song Mode. The quickest method of creating a new song is to select an empty song location and press ***Enter*** as described in "Creating a new Sequence or Song" - Section 8.

31	**Copy Song**
	Song Bank Press Edit Sequences / Song (Bank 3) / Screen 1.

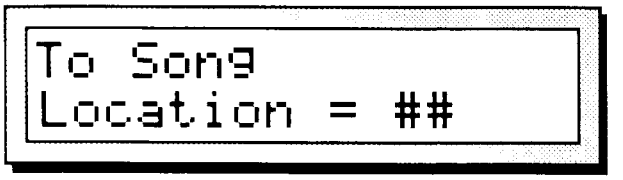
Copy Song

Use this command to make a copy of the currently selected song in another song location. Note that the original song remains intact in its original location. First, make sure the Song you want to copy is selected. Then, select the Copy Song parameter. The display reads: "Copy Song."

- Press ***Enter***. The display now reads:



- Press the ***Right Arrow*** button. Now the display reads:



The Data Entry Controls will now scroll through all available unused Song locations. Once you have set the location, press the ***Right Arrow*** once more.

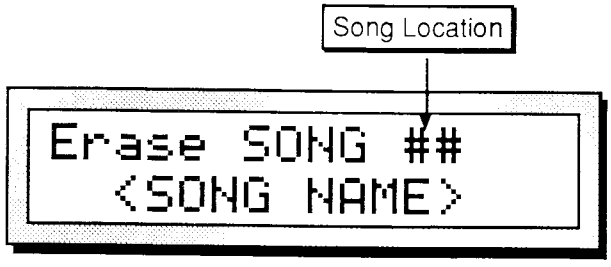
You can now select a name of up to 16 characters for the new song using the Data Entry Controls. The ***Data Entry Slider*** and ***Up/Down Arrow*** buttons select the letters, numbers and icons for naming, while the ***Left/Right Arrow*** buttons select which character will be edited.

- Once you have selected a name, press the ***Enter*** button to complete the operation. The screen will briefly display "Command Successful!" to let you know the operation is complete.

32	Erase Song Pset
	Song Bank Press Edit Sequences / Song (Bank 3) / Screen 2.

Erase Song/Preset

The Erase Song command will erase any song currently in memory and leave its location undefined. First, select the Erase Song command. Then, press the ***Enter*** button. The display reads:



The ***Data Entry Slider*** and the ***Up/Down Arrow*** buttons will now scroll through all of the songs in memory. The upper right hand corner of the screen will display the Song location, the lower line imparts the Song name.

- When the Song you wish to remove is shown in the display, press the ***Enter*** button. The screen will briefly display "Command Successful!" to acknowledge the operation.

33	Song Information
	Song Bank Press Edit Sequences / Song (Bank 3) / Screen 3.

Song Information

Selecting the "Song Information" command displays information about the Song, including the number of steps, the size in events, and the total song time. To display information about a particular song:

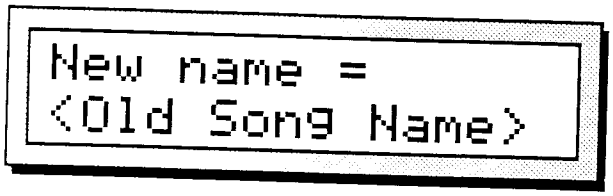
- Select the Song and choose the Song Information command.
- Press ***Enter***. The screen will now display the Song name and location.
- Press the ***Right Arrow*** button. The screen displays two parameters:
  "Song Steps" — Indicating the number of steps in the song.
  "Song Size" — Which displays the size of the current song in events.
- Press the ***Right Arrow*** button again. The screen now displays the total time of the song in minutes, seconds, and hundredths of a second.

34	Rename Song/Pset
	Song Bank Press Edit Sequences / Song (Bank 3) / Screen 4.

Rename Song/Preset

This command allows you to edit the name of the song. When this command is first selected, the display looks like this:

- Press *Enter*. Now the display looks like this:



- Use the Data Entry Controls to rename the song. Then, press ***Enter*** to complete the command. The display will briefly display "Command Successful!" to acknowledge the operation.

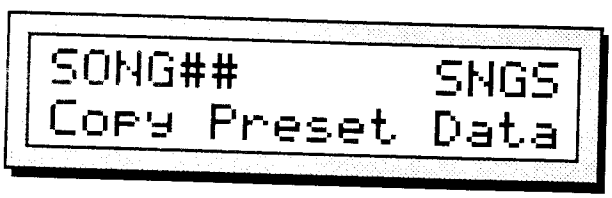
35	Copy Preset Data
	Song Bank Press Edit Sequences /Song (Bank 3) / Screen 5.

Copy Preset Data

As discussed earlier, Presets act as a subset of sequences, containing vital information about the "performance" aspects of the tracks. Sounds, Key Ranges, MIDI information, and more are contained within Presets. (For a full discussion, see Section 7.)

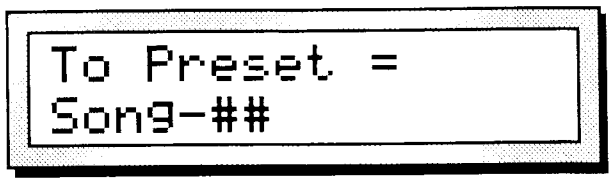
This command is used to transfer the Preset portion of a Song to another location. This command uses the Preset pertaining to the *Song Tracks*, as opposed to the Presets from any of the sequences within the song.

Choosing a song and selecting this command will bring up the following on the SQ's display:



- Press ***Enter***. The display now reads "From Preset Song ##" to indicate the currently selected song.

- Press the ***Right Arrow*** button. The display now shows:



You can now use the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons to select any existing preset location. Because there is no note data involved, the preset can be copied to any existing preset location, not just those in the song banks.

- When a new location has been selected, press the ***Enter*** button to complete the command. The display will briefly display "Command Successful!" to acknowledge the operation.

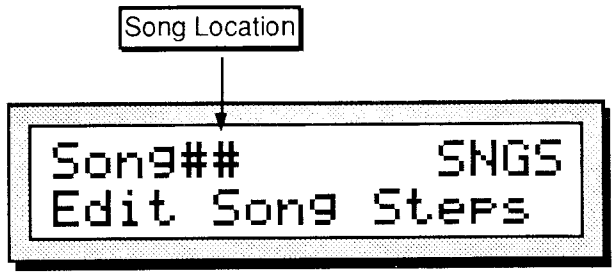
36	**Edit Song Steps**
	Song Bank Press Edit Sequences / Song (Bank 3) / Screen 6.

Edit Song Steps — Song Step Editor Screen

Selecting the Edit Song Steps command activates the song step editor. Here you can chain sequences together to define the basic structure of the song.

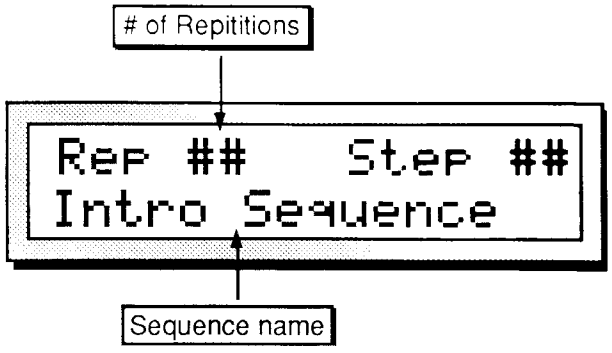
A song is composed of *Steps*. Each Step consists of:
- A sequence which will play during that step,
- the number of Repetitions, or *Reps*, of the sequence during the step, and
- the Mute and Transpose status for each sequence track during the step.

When you select the Edit Song Steps command, the display shows the following:



- Press the ***Enter*** button to call up the main Edit Song Step screen. From this screen you can select the Step number, which sequence will play in that particular step, and the number of repetitions the sequence will play.

The display reads as follows:



The default parameter on this screen is the Step number. When this screen is first selected, it is the Step number field which is flashing and active. This allows quick access between the two most frequently used parameters on this screen: Step number and Sequence name. The ***Left/Right Arrow*** buttons toggle between these two parameters. To select the Repetitions parameter, use the ***Left Arrow*** button to scroll past the Step number parameter.

- Step — While this field is selected, the step number can be edited using the ***Data Entry Slider*** or the ***Up/Down Arrow*** buttons, allowing you to move up and down through the song and view each step.

  Range: 01-99

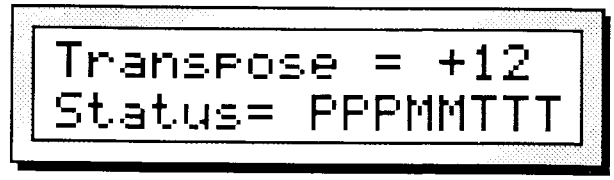
- Sequence Name — Selects the sequence to be used for the current song step. An empty song step will show "UNDEFINED STEP." To add another step to the end of the song, select "* END OF SONG *" and press ***Up Arrow*** to define the step. This puts a sequence in that step and moves the Song End back one more step.

- Rep — This controls the number of times the sequence in the current song step will be repeated.

  Range: 01 to 99, or FS

  FS stands for Foot Switch. When REP=FS, the song step will loop continuously until the Aux. foot switch (available only when the optional SW-5 foot switch is connected) is pressed. When the foot switch is pressed, the current step will finish playing and then advance to the next step.

With these parameters in place, press the ***Right Arrow*** button repeatedly until you scroll past the Sequence Name parameter. The screen will switch to the following:



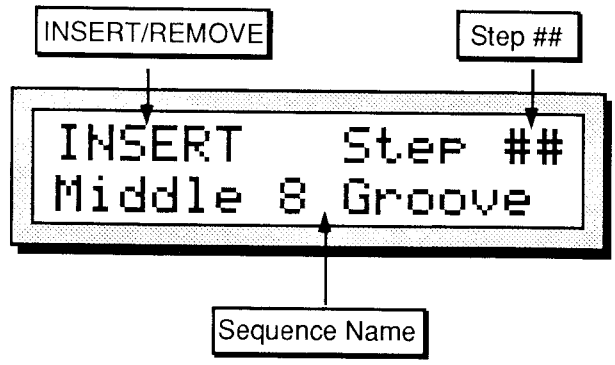
On this screen you can select which tracks will play, which will be muted, and which tracks will be transposed within the particular Song Step selected. You can also set the Transpose Amount.

- Transpose — Sets the transpose amount to be used by any tracks which you wish to Transpose for that song step (see below). This will raise or lower the pitch of the entire track.

  Range: -12 to +12, each increment representing one semitone.

- MUTING AND TRANSPOSING TRACKS — Repeated presses of the ***Right Arrow*** button will scroll across the set of 8 tracks, and allow each track to be transposed, muted, or unmuted individually. An **M** indicates that the track is muted for the entire step, a **P** indicates that the track will play at normal pitch, and a **T** indicates that the track will be transposed.

- After the all tracks have had their Play Status set, pressing the ***Right Arrow*** one more time will again bring up a new set of parameters.



The last parameter screen in the Edit Song Steps command allows you to Insert or Delete steps of a previously defined song.

- INSERT — inserts a blank song step *before* current song step.
- REMOVE — removes the current song step, and shifts the remaining steps ahead to fill in the gap.

Editing Song Steps — Using the Song Step Editor

For each Song Step you want to create:

- Select the Edit Song Steps command by pressing the ***Song*** button (Bank 3), followed by ***Screen 6*** while in the Sequence Edit mode.
- By using the ***Right Arrow***, select the Sequence Name field, which for Step 1 of a new song will read: "* END OF SONG *."
- Use the ***Up/Down Arrow*** buttons to define the song step and select among the sequences in memory until the display is showing the name of the sequence you want to play during that step.
- Press the ***Left Arrow*** twice to activate the Repetitions parameter. Select the number of Repeats (REPS=##), and adjust the number of times you want the sequence to play during the step. (If you only want the sequence to play once during the song step, leave it set to 01.)
- Repeatedly press the ***Right Arrow*** button until the Transpose/Status parameters are shown. If you want to mute any tracks for that step, select the character(s) representing the track(s) on the lower line of the display and set to **M**. To transpose tracks during the step, select the character(s) representing the track(s) on the lower line of the display and set to **T**. Select and adjust the Transpose amount.
- Repeatedly press the ***Left Arrow*** until you have returned to the Step parameter. (The number of ***Left Arrow*** presses will depend on your current location.)
- Once the Sequence and number of Reps is correct, select "Step=##" and press the ***Up Arrow*** button to select the next step (the sequence name will read: * END OF SONG *) and edit that in the same way. For each successive Song Step, select the Sequence Name and use the ***Up/Down Arrow*** buttons to choose a sequence; then set the number of repeats, then proceed to the next step.
- There is always one final step which reads "* END OF SONG *" *after* the last defined step in the Song.

To go to a different Step in the Song:

- Select "Step =", and use the ***Up/Down Arrow*** buttons to go to any step within the song. After you have finished editing the Song Steps (or at any point during the process, for that matter) you can go back through the song to check that all the steps are right.

To change anything in an existing Song Step:

- To change any of the variables (sequence name, number of reps, track mute or transpose status) within a Song Step which has already been created, simply go to that step, as described above, select the thing you want to edit and change it.

To **Insert** a step anywhere in the song:

- Select "Step=##" and go to the step *before which* you want to insert the step. That is, if you want to insert a step between Step 2 and Step 3, go to Step 3.
- Use the ***Left Arrow*** to scroll to the "INSERT/DELETE" parameter. Select "INSERT," then press the ***Enter*** button. A Blank step (the display reads *EMPTY LOCATION*) is created.
- Select the Sequence Name field and use the ***Up/Down Arrow*** buttons to select a sequence for the new Step.
- Set the number of repeats and any mute or transpose settings for the step as shown earlier.

To **Delete** a step anywhere in the song:
- Select "Step=##" and go to the step which you want to delete.
- Use the ***Left Arrow*** to scroll to the "INSERT/DELETE" parameter. Select "DELETE," then press the ***Enter*** button. The step is erased and all steps after it are moved ahead by one.

When you are done editing the song, press ***Select Sequences*** to exit. You can then press ***Play*** to hear your new song.

Seq Bank — Sequence Edit Functions

Pressing the ***Seq*** button (Bank 4) while in Sequence Edit mode activates the sequence editing bank. If you press the ***Seq*** button when a song is selected, the display will respond "SORRY! Select a sequence first" and will not allow you into this bank.

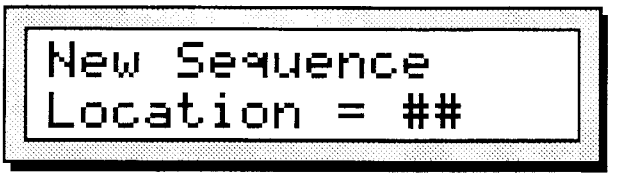
40	Create SEQ/Pset
	Sequence Bank Press Edit Sequences / Seq (Bank 4) / Screen 0.

Create SEQ/Pset

This command is used to create new sequences.

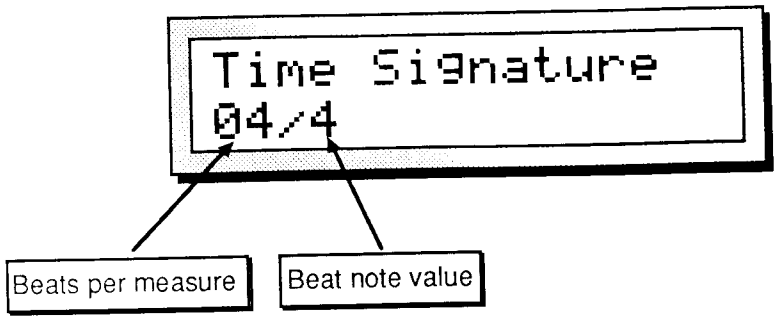
When this parameter is selected, the initial display shows the following:

- Press the ***Enter*** button. The display shows:



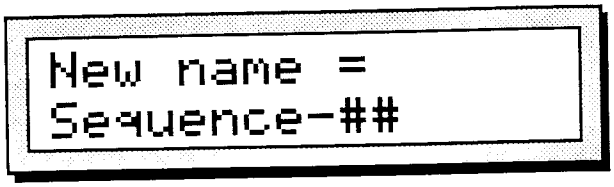
The ***Data Entry Slider*** or ***Up/Down Arrow*** buttons will now scroll through all available unused sequence locations.

- Once you have selected a location for the sequence, press the ***Right Arrow*** button. The following display appears:



The two parameters on this screen are used to set the time signature for the sequence being created. Use the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons to set the beats per measure, then press the ***Right Arrow*** to activate the beat note value command. Again the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons set the value.

- With the time signature set, press the ***Right Arrow*** button. The display reads:



Once again, use the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons to select various letters, numbers, and icons to create a name and use the ***Left/Right Arrow*** buttons to choose which character to edit.

- Now that you've selected a location, name, and time signature for your sequence, press the ***Enter*** button again. The display will briefly read "Command Successful!"

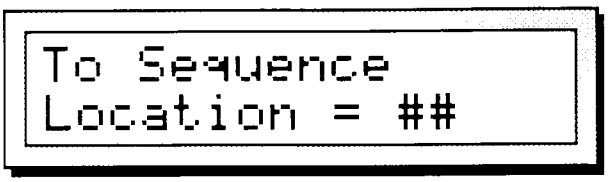
41	**Copy Sequence**
	Sequence Bank Press Edit Sequences / Seq (Bank 4) / Screen 1.

Copy Sequence

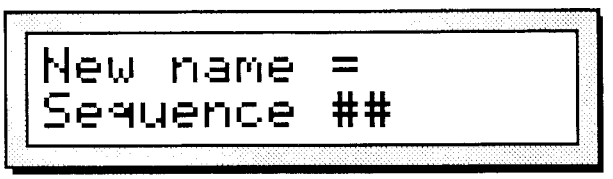
Use this command to make a copy of the currently selected sequence in another sequence location. Note that the original sequence remains intact in its original location. First, make sure the Sequence you want to copy is selected. Then, select the Copy Sequence parameter. The display reads: "Copy Sequence."

• Press ***Enter***. The display now reads:

• Press the ***Right Arrow*** button. Now the display reads:



The Data Entry Controls will now scroll through all available unused Sequence locations. Once you have set the location, press the ***Right Arrow*** once more.



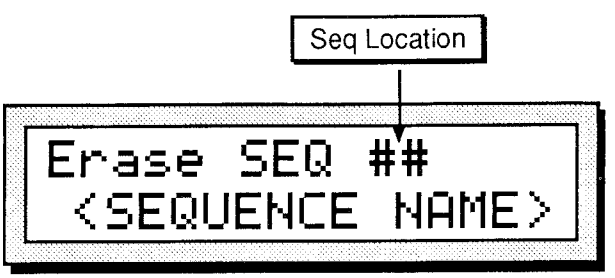
You can now select a name of up to 16 characters for the new sequence using the Data Entry Controls. The ***Data Entry Slider*** and ***Up/Down Arrow*** buttons select the letters, numbers and icons for naming, while the ***Left/Right Arrow*** buttons select which character will be edited.

• Once you have selected a name, press the ***Enter*** button to complete the operation. The display will briefly read "Command Successful!" to let you know the operation is complete.

42	**Erase Seq/Pset**
	Sequence Bank Press Edit Sequences / Seq (Bank 4) / Screen 2.

Erase Sequence/Preset

The Erase Sequence command will erase any sequence currently in memory and leave its location undefined. First, select the Erase Sequence command. Then, press the ***Enter*** button. The display reads:



The ***Data Entry Slider*** and the ***Up/Down Arrow*** buttons will now scroll through all of the sequences in memory. The top line of the display will show the Sequence location, the lower line shows the Sequence name.

- When the sequence you wish to remove is shown in the display, press the ***Enter*** button. The screen will briefly display "Command Successful!" to acknowledge the operation.

43	Sequence Info
	Sequence Bank — Press Edit Sequences / Seq (Bank 4) / Screen 3.

Sequence Information

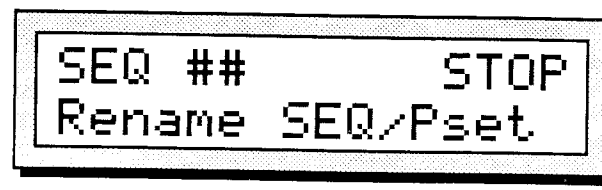
Selecting the "Sequence Information" command displays information about the sequence, including the length in bars, the size in events, and the total sequence time. To display information about a particular sequence:

- Select the sequence and choose the Sequence Information command.
- Press ***Enter***. The display will now indicate the Sequence name and location.
- Press the ***Right Arrow*** button. The display shows two parameters:
  "Length" — Indicating the number of bars in the sequence.
  "Size" — Which displays the size of the current sequence in events.
- Press the ***Right Arrow*** button again. The display now shows the time signature of the current sequence.
- Press the ***Right Arrow*** button again. The display now shows the total time of the sequence in minutes, seconds, and hundredths of a second.

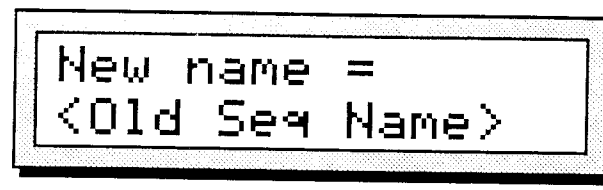
44	Rename Seq/Pset
	Sequence Bank — Press Edit Sequences / Seq (Bank 4) / Screen 4.

Rename Sequence/Preset

This command allows you to edit the name of the sequence. When this command is first selected, the display looks like this:



- Press ***Enter***. Now the display looks like this:



- Use the Data Entry Controls to rename the sequence. Then, press ***Enter*** to complete the command. The display will briefly display "Command Successful!" to acknowledge the operation.

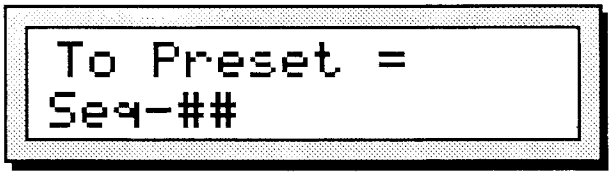
45	**Copy Preset Data**
	Sequence Bank Press Edit Sequences / Seq (Bank 4) / Screen 5.

Copy Preset Data

As discussed earlier, Presets act as a subset of sequences, containing vital information about the "performance" aspects of the tracks. Sounds, Key Ranges, MIDI information, and more are contained within Presets. (For a full discussion, see Section 7.)

This parameter is used to transfer the Preset portion of a Sequence to another location. Choosing a sequence, and selecting this command, will bring up the following on the SQ's display:

- Press ***Enter***. The display now reads "From Preset Seq ##" to indicate the currently selected sequence.
  Press the ***Right Arrow*** button. The display now shows:



You can now use the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons to select any existing preset location. Because there is no note data involved, the preset can be copied to any existing preset location including songs, not just those in the sequence banks.

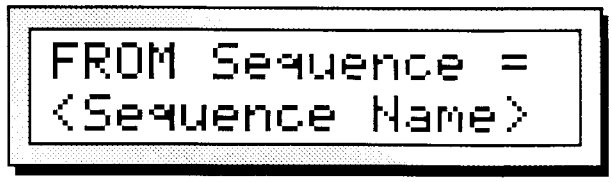
- When a new location has been selected, press the ***Enter*** button to complete the command. The display will briefly read "Command Successful!" to acknowledge the operation.

46	**Append Sequence**
	Sequence Bank Press Edit Sequences / Seq (Bank 4) / Screen 6.

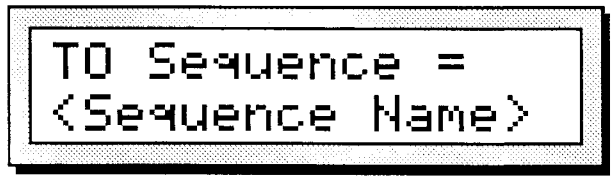
Append Sequence

Appending is the process of taking one sequence and "tacking it on" to the end of another, thereby creating a sequence which contains data from both the source and destination sequences. This function allows you to append one sequence to another (or to itself, doubling its length). The currently selected sequence will have a sequence appended to it (tacked on to the end of it). The sequence that you have appended from remains unchanged.

- Make sure the sequence which you want to append to is selected.
- Select the Append Sequence command. The display reads "Append Sequence."
- Press ***Enter***. The display shows:



- This parameter is used to select which sequence will append to the end of the selected sequence. The ***Data Entry Slider*** or ***Up/Down Arrow*** buttons will scroll through all the available sequences in memory.
- Press the ***Right Arrow*** button. Now the display reads:



This is a display-only parameter. It is there to verify that the correct sequence is having another sequence appended to it.

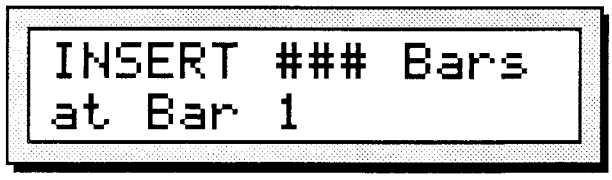
- Press ***Enter***. The screen will briefly display "Command Successful!" to acknowledge the operation.

47	Change Length	
	Sequence Bank	Press Edit Sequences / Seq (Bank 4) / Screen 7.

Change Length — Inserting and Removing Bars from a Sequence

Though the length of the first track determines the length of the sequence, you can use the Insert Bars and Remove Bars functions to add empty bars, starting from any bar within the sequence, or to remove any number of bars from the sequence.

From the Sequence Edit bank, select the change length command. The display reads "Change Length," press ***Enter***. The display will now show:



There are three parameters on this screen. The parameter in the upper left hand corner determines whether bars will be inserted or removed from a sequence. Once that has been selected, use the ***Left/Right Arrow*** buttons to access the parameters which determine how many bars will be inserted/deleted and at which bar the insertion/deletion will take place.

INSERT Bars

The Insert Bars function lets you add any number of bars to the sequence up to a total sequence length of 999 bars. It consists of two steps: 1) specify at which bar you want to start adding bars, and then 2) select how many bars you want to add.

- Use the Data Entry Controls to determine at which bar the new measures will be added. This can be any bar within the sequence:
  > Selecting Bar 01 will cause bars to be added at the beginning of the sequence.
  > Selecting the bar *after* the last bar of the sequence will cause bars to be added at the end of the sequence.
  > Selecting any other bar will cause bars to be added starting from that point in the sequence.
- Use the ***Left/Right Arrow*** buttons to access the parameter determining the number of bars.
- Use the Data Entry Controls to select how many bars you want to add. You can add any number up to a total sequence length of 999 bars. Empty bars (no track data) will be added beginning from the bar selected in the previous step.

REMOVE Bars

The Remove Bars function lets you remove any number of bars from a sequence, starting from any bar within the sequence.

This is handy when, for example, you record a first track which is perfect except that it runs to 5 Bars instead of 4. With this edit function you can easily chop off the extra bar.

To REMOVE Bars from the selected sequence:

- Use the Data Entry Controls to determine at which bar you want to begin removing bars. This can be any Bar within the Sequence. Bars will be deleted from the beginning of the Bar you select here.
- Scroll to the parameter determining the number of bars.
- Use the Data Entry Controls to select how many bars you want to delete.
- Press the ***Enter*** button. The display will briefly read "Command Successful!" to acknowledge the operation.

Event Bank — Event Edit Functions

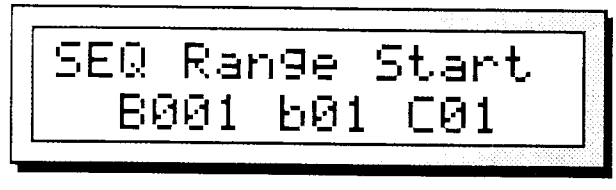
These functions found in the Event bank will affect the selected track. If a sequence is chosen, the selected sequence track will be edited; if a song is chosen, the selected song track will be edited.

Setting the Track Range — Using the Track Range function

Most of the commands found in the Event Edit bank allow you to define a "track range" within which the specified command will have an effect. This can be very useful when, for example, you would like to quantize the bass and snare drum, but would like to leave the hi-hats and toms with a "human feel." For each of these commands, the following steps are used when setting the track range.

- When first accessed, the Track Range display shows the following:

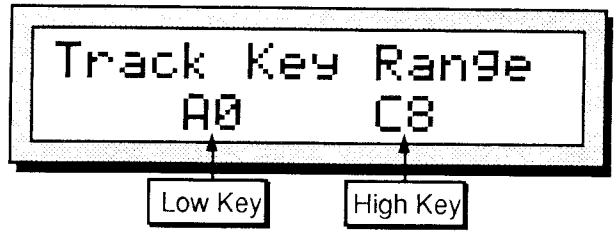
- "DO ENTIRE TRACK" will be flashing.
- Press the ***Up Arrow*** to change the display to "SET TRACK RANGE."
- Press ***Enter***. The display now reads:



- You can now use the Data Entry Controls to select the Bar, Beat, and Clock where the editing will begin to affect the track.

Note: **The above shows the track range start display for sequence tracks.** Song tracks have their own display, which includes extra parameters for Song Step and Repetition.

- Once the Range Start value has been set, press the ***Right Arrow*** again.
- The display now asks for the Range End value, which is set in the same manner as the Range Start. Once again, sequence and song tracks have different displays, with song tracks including Song Step and Repetition parameters.
- With the Range End value set, press the ***Right Arrow*** once more. The display now reads:



- This display is the same for both sequence and song tracks. With it, you set the key range you want the command to affect. This can be set with either the Data Entry Controls, or by playing the low and high keys on the keyboard as described in Section 7.
- With the Key Range set, press ***Enter***. The display now reads "Press ENTER to DO RANGE ONLY."
- Press ***Enter*** once more to complete the command.

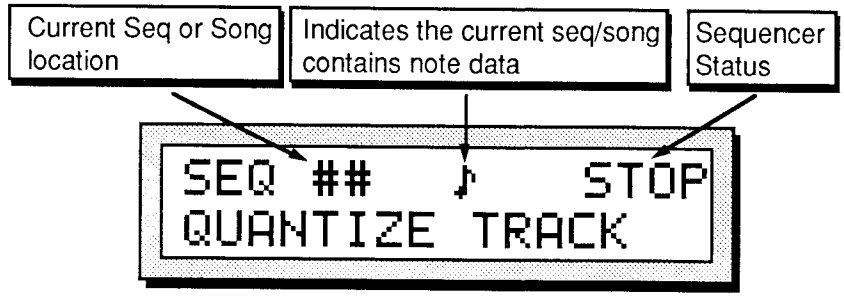
Important: The Range Start and Range End times specified in the Edit Track Range function are the same as the Edit Times found in the Locate bank and used by the Auto Punch function. They are interactive — changing the Start or End times in either location will cause them to be changed in the other.

50	Quantize Track	
	Event Bank	Press Edit Sequences / Event (Bank 5) / Screen 0.

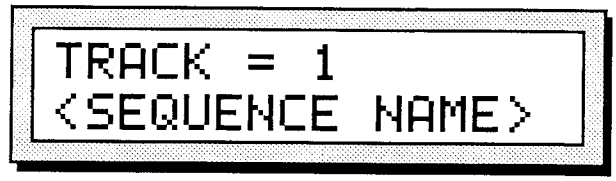
Quantize Track

The Quantize Track (or auto-correct) function can take an uneven track and put it right on the beat. The SQ uses post-quantization — that is, you first record a track, then apply the quantize later as a track editing option. You can select any note value up to 1/64 note triplets and move all notes in the track directly onto the nearest beat of that value.

- Select the Quantize Track function. The display shows:



- Press ***Enter***. The display now shows:



The top line indicates the track number which is to be edited. This parameter can be edited with the Data Entry Controls. The bottom line of the display indicates the name of the sequence or song which is being edited. This parameter is display only, and cannot be edited.

- Press the ***Right Arrow*** button. The display reads: "Quantize to nearest XX."
- Use the Data Entry Controls to specify the note value to which the track is to be quantized. Available values are:

1/4 — quarter notes
1/4T — quarter note triplets
1/8 — eighth notes
1/8T — eighth note triplets
1/16 — sixteenth notes
1/16T — sixteenth note triplets
1/32 — thirty-second notes
1/32T — thirty-second note triplets
1/64 — sixty-fourth notes
1/64T — sixty-fourth note triplets

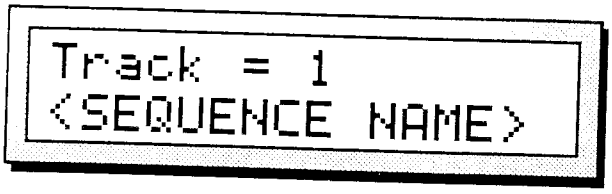
- The note values listed are displayed on the screen in their musical notation.
- Press the ***Right Arrow*** button again and set the time and/or key range on the Edit Track Range screen, as shown earlier in this section. (If you wish to do the entire track, simply continue.)
- With the range set (or entire track selected), press ***Enter.***

51	Copy Track
Event Bank	Press Edit Sequences / Event (Bank 5) / Screen 1.

Copy Track

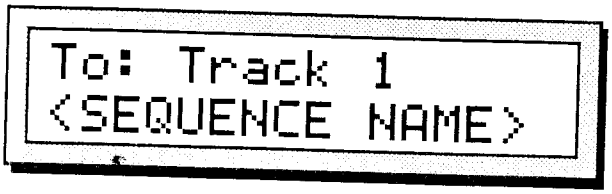
This command will copy all or part of the current track (the source track) to another track. The destination track can be in the same sequence or in a different sequence.

- Select the Copy Track command. Press ***Enter***. The display shows:



The top line indicates the track number which is to be edited. This parameter can be edited with the Data Entry Controls. The bottom line of the display indicates the name of the sequence or song which is being edited. This parameter is display only, and cannot be edited.

- Press the ***Right Arrow*** button. The display reads:



- If you want to copy the source track to a different song or sequence, select the parameter on the bottom line of the screen and use the Data Entry Controls to choose the one you want. The default is the current sequence, the one the source track is in.

- Select the track parameter and use the Data Entry Controls to select a track for the source track to be copied into.
- Press the ***Right Arrow*** button. The display reads:

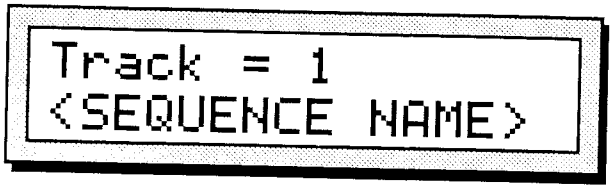
- Use the Data Entry Controls to select the bar at which you want the copied data to be inserted.
- Press the ***Right Arrow*** button again and set the time and/or key range on the Edit Track Range screen, as shown earlier in this section. (If you wish to do the entire track, simply continue.)
- With the range set (or entire track selected), press ***Enter.***

52	Erase Track	
	Event Bank	Press Edit Sequences / Event (Bank 5) / Screen 2.

Erase Track

This command will erase notes, controllers and all other data from the entire track, or from a given range if you so specify.

- Select the Erase Track command. Press ***Enter***. The display shows:



The top line indicates the track number which is to be edited. This parameter can be edited with the Data Entry Controls. The bottom line of the display indicates the name of the sequence or song which is being edited. This parameter is display only, and cannot be edited.

- Press the ***Right Arrow*** button again and set the time and/or key range on the Edit Track Range screen, as shown earlier in this section. (If you wish to do the entire track, simply continue.)
- With the range set (or entire track selected), press ***Enter.***

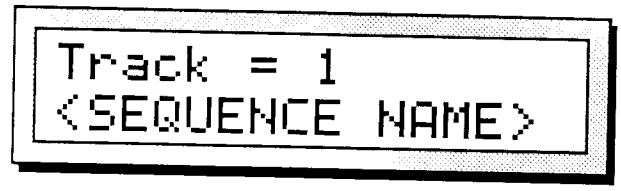
Note: If erasing the entire track, there *is no audition.*

53	Merge Track
	Event Bank — Press Edit Sequences / Event (Bank 5 / Screen 3.

Merge Track

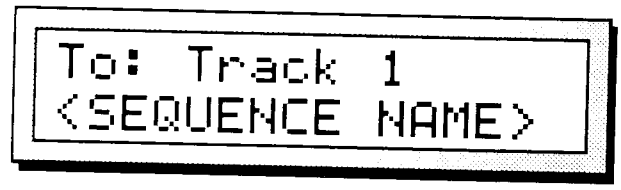
This command will take the data in the selected track and merge, or combine, it together with that of another track. The destination track can be in the same sequence, or in a different sequence from the source track. Note that the source sequence is not altered or erased by this process.

- Select the Merge Track command. Press ***Enter***. The display shows:



The top line indicates the track number which is to be edited. This parameter can be edited with the Data Entry Controls. The bottom line of the display indicates the name of the sequence or song which is being edited. This parameter is display only, and cannot be edited.

- Press the ***Right Arrow*** button. The display reads:



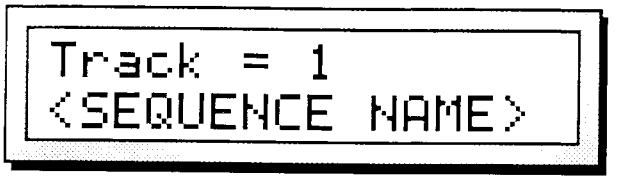
- If you want to merge the source track to a different song or sequence, select the parameter on the bottom line of the screen and use the Data Entry Controls to choose the one you want. The default is the current sequence, the one the source track is in.
- Select the track parameter and use the Data Entry Controls to select a track for the source track to be merged into.
- Press ***Enter***.

54	Transpose Track
	Event Bank — Press Edit Sequences / Event (Bank 5) / Screen 4.

Transpose Track

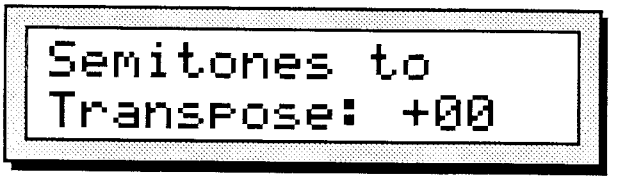
The Transpose function will raise or lower the notes in the track by a specified number of semitones. In addition to simply transposing the entire track, you can use the transpose function to re-map existing drum and percussion tracks for use with programs and instruments that have different key layouts, using the key range function to a transpose a single key at a time.

- Select the Transpose Track command. Press ***Enter***. The display shows:



The top line indicates the track number which is to be edited. This parameter can be edited with the Data Entry Controls. The bottom line of the display indicates the name of the sequence or song which is being edited. This parameter is display only, and cannot be edited.

- Press the ***Right Arrow*** button. The display reads:



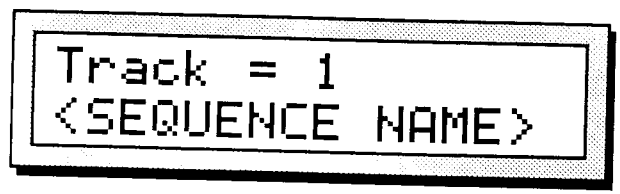
- Use the Data Entry Controls to specify the amount the track is to be transposed: Range: -12 to +12 semitones. (If you wish to transpose by more than an octave, execute the command multiple times.)
- Press the ***Right Arrow*** button again and set the time and/or key range on the Edit Track Range screen, as shown earlier in this section. (If you wish to do the entire track, simply continue.)
- With the range set (or entire track selected), press ***Enter.***

55	Shift Track
	Event Bank Press Edit Sequences / Event (Bank 5) / Screen 5.

Shift Track

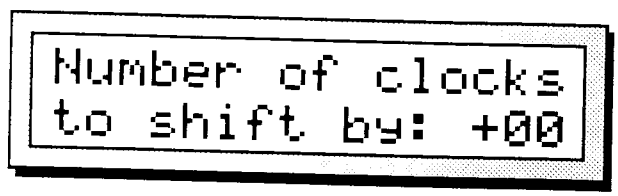
This command will cause all the events in the track to be moved ahead or back in time by a specified number of clocks (1 clock=1/96 quarter note). You can use this to create a "lazy" or "pushed" feel in a track. You can also create interesting delay effects by copying a track, then shifting the timing of the copied track to create delays.

- Select the Shift Track command. Press ***Enter***. The display shows:



The top line indicates the track number which is to be edited. This parameter can be edited with the Data Entry Controls. The bottom line of the display indicates the name of the sequence or song which is being edited. This parameter is display only, and cannot be edited.

- Press the ***Right Arrow*** button. The display reads:



- Use the Data Entry Controls to specify the amount the track is to be shifted. Positive values will move the events in the track later in time, toward the end of the sequence; negative amounts will shift the events sooner, toward the beginning.
  Range: -96 to +96, with 96 clocks representing one quarter note.
- Press ***Enter***.

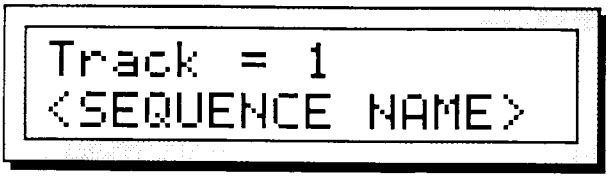
Note: **A track range cannot be set for shifting tracks.**

56	Scale Track
	Event Bank — Press Edit Sequences / Event (Bank 5) / Screen 6.

Scale Track

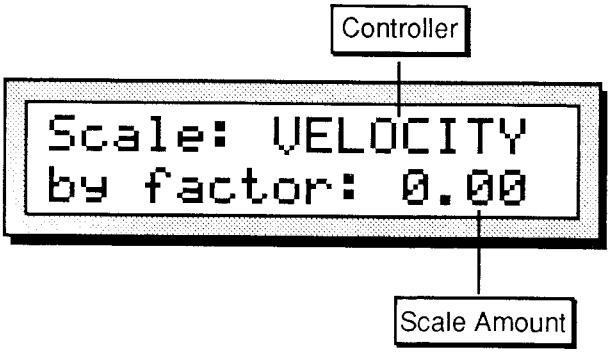
The Scale Track command lets you increase or decrease the level of any controller information in the track by a specified amount. You could use this function, for example, to tame some over-zealous mod wheel work, or to increase the key velocity of all the notes in the track by some amount.

- Select the Scale Track command. Press ***Enter***. The display shows:



The top line indicates the track number which is to be edited. This parameter can be edited with the Data Entry Controls. The bottom line of the display indicates the name of the sequence or song which is being edited. This parameter is display only, and cannot be edited.

- Press the ***Right Arrow*** button. The display reads:



- Use the Data Entry Controls to choose which type of controller(s) you would like to scale. The following event types can be scaled:

VELOCITY — Velocity
MODWHEEL — Mod Wheel
PEDAL — Foot Pedal
VOLUME — Volume Pedal
SUSTAIN — Sustain Pedal
SOSTENUTO — Sostenuto Pedal
TIMBRE — Timbre Controller
RELEASE — Release Controller
EXT CONTRL — Ext. Controller
ALL CONTRL — All Controllers
CHN-PRESSR — Channel (mono) Pressure
MIX VOLUME — Mixdown Volume
MIX PAN — Mixdown Pan
PITCH BEND — Pitch Bend Wheel

- Use the Data Entry Controls to set the scale amount that the chosen controller will be scaled. The scale factor is actually two parameters, the first setting the integer segment (0-9), the second setting the fraction segment (.00 -.99). Scale values less than 1.00 will lower the controller values. Scale values greater than 1.00 will raise controller values.

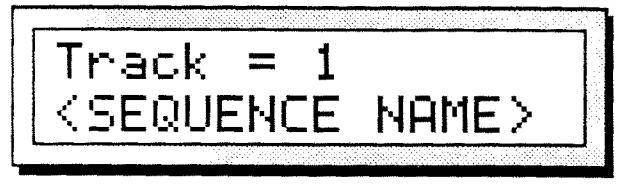
- Press the ***Right Arrow*** button again and set the time and/or key range on the Edit Track Range screen, as shown earlier in this section. (If you wish to do the entire track, simply continue.)
- With the range set (or entire track selected), press ***Enter.***

57	Filter Events	
	Event Bank	Press Edit Sequences / Event (Bank 5) / Screen 7.

Filter Events

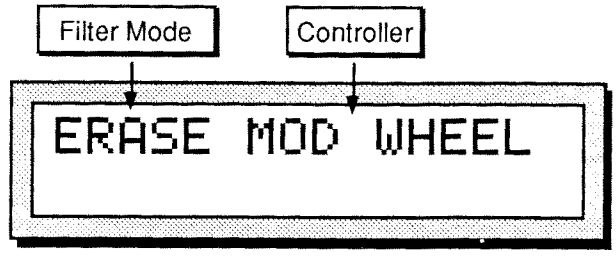
The Filter Events command can be used to selectively remove events (such as notes, controllers and program changes) from a track, or to copy selected events to a different track for further editing. The Filter command has two modes, Erase and Copy. Depending on which mode is selected, it will either remove the specified events from the track, or simply copy them to another track, leaving the original track intact.

- Select the Filter Events command. Press ***Enter***. The display shows:



The top line indicates the track number which is to be edited. This parameter can be edited with the Data Entry Controls. The bottom line of the display indicates the name of the sequence or song which is being edited. This parameter is display only, and cannot be edited.

- Press the ***Right Arrow*** button. The display reads:



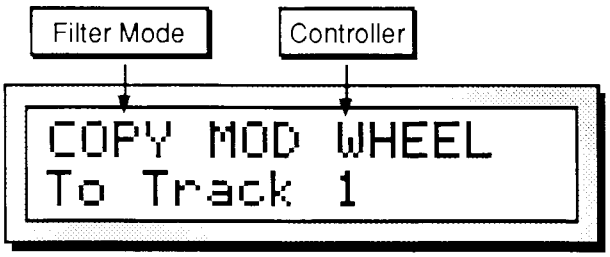
- Use the Data Entry Controls to choose which type of events you would like filtered from the track. The following event types can be filtered:

MODWHEEL — Mod Wheel
PEDAL — Foot Pedal
VOLUME — Volume Pedal
SUSTAIN — Sustain Pedal
SOSTENUTO — Sostenuto Pedal
TIMBRE — Timbre Controller
RELEASE — Release Controller
EXT CONT — Ext. Controller

ALL CONTRL — All Controllers
CHN PRESSR — Channel (mono) Pressure
MIX VOLUME — Mixdown Volume
MIX PAN — Mixdown Pan
PITCH-BEND — Pitch Bend Wheel
PROGRAM-CHNG — Program Changes
KEY PRESSR — Key Pressure
KEY-EVENTS — Notes only, no controllers

- Press the ***Right Arrow*** button again and set the time and/or key range on the Edit Track Range screen, as shown earlier in this section. (If you wish to do the entire track, simply continue.)
- With the range set (or entire track selected), press ***Enter.***

- Using the Data Entry Controls to change the mode to "COPY" will result in the display changing to the following:



- If you want to copy the data to another track, select the Track parameter and choose a destination track.
- If you wish to copy a specific range rather than the entire track, press the ***Right Arrow*** button and set the time and/or key range on the Edit Track Range screen, as shown earlier in this section. If not, press ***Enter***.

Note: If you chose Copy mode, the SQ returns with the new track (the copy) selected. If you wanted to copy and then erase the data, re-select the original track and then repeat the above procedure, using Erase mode.

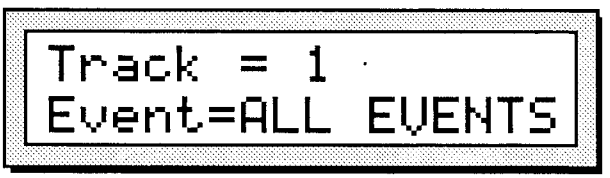
58	**Event Edit Track**
	Event Bank Press Edit Sequences / Event (Bank 5) / Screen 8.

Event Edit Track

The Event Edit Track function provides you with an extremely powerful tool for viewing and editing each event in the track. Every key event, controller change and program change can be individually located and edited.

The Event Edit Track function works on an individual track basis, as do the other commands in this bank. However, the Event Edit Track function requires the user to specify the track to be edited *before* the command is activated. Once inside the Event Edit Track function there is no provision for changing tracks.

- Using the ***Track*** buttons, select the track which is to be edited.
- Select the Event Edit Track command. Press ***Enter***. The display shows:



The top line indicates the track number which is to be edited. This parameter is display only, and cannot be edited. The bottom line displays the Event Type Filter.

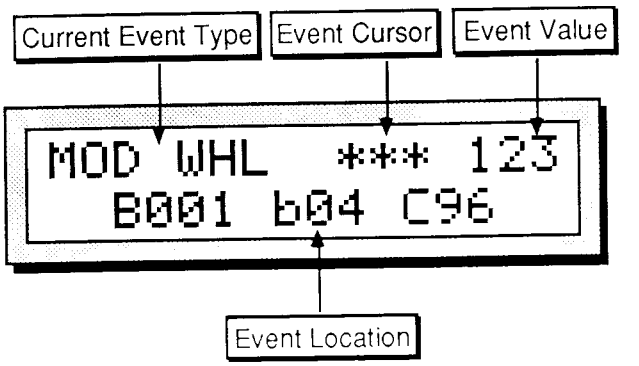
Event — Event Type Filter

This controls which types of events will be shown as you scroll up through the events in the track. When set to ALL EVENTS, every event in the track will be listed. On the other settings, some types of events will be left out of the list — when the Event Cursor (below) is changed, the display will jump directly to the next event of the type shown, skipping other types. Event Types which can be selected here are:

MOD WHEEL — Modulation Wheel
PEDAL — Foot Pedal
VOLUME — Volume Pedal
SUSTAIN — Sustain Pedal
SOSTENUTO — Sostenuto Pedal
TIMBRE — Timbre Controller
RELEASE — Release Controller
EXT CONTRL — External Controller
ALL CONTRL — All Controllers

CHN PRESSR — Channel (mono) Pressure
MIX VOLUME — Mixdown Volume
MIX PAN — Mixdown Pan
PITCH BEND — Pitch Bend Wheel
PGM CHANGE — Program Changes
KEY PRESSR — Key Pressure
KEY EVENTS — Notes only, no controllers
ALL EVENTS — All notes and controllers

- Press the ***Right Arrow*** button. The display reads:



This is the Event Locating Screen for most event types. For All Events, Key Pressure, and Key Event, the display is slightly different and will be discussed later.

Current Event Type

This displays the current event type being viewed. This parameter is display only and cannot be changed from this screen.

Event Cursor

When this field is selected, you can use the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons to step ahead or back in time among the events in the track to find the one(s) you want to edit. When you press the ***Up/Down Arrow*** buttons, it will advance to the next or previous event of the type specified in the Event Type Filter. Moving the ***Data Entry Slider*** will scroll quickly through all the events in the track. You will hear the notes in the sequence play as you step through the track.

Event Value

This shows the value of the current event. The values can be changed using the ***Data Entry Slider*** or ***Up/Down Arrow*** buttons. These changes take place as they are made.

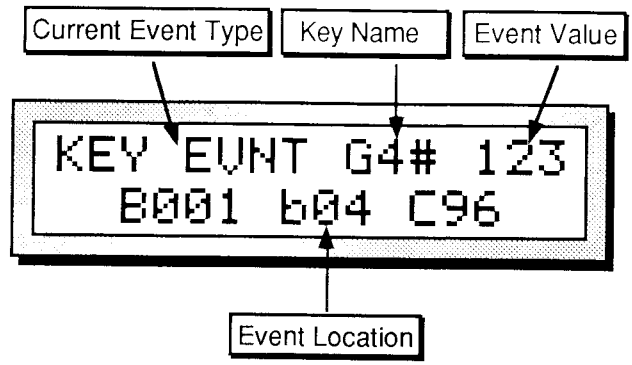
Event Location

Shows the current location in terms of Bar, Beat and Clock. These three location fields can be individually selected by repeated presses of the ***Left/Right Arrow*** buttons. This allows you to use the ***Up/Down Arrow*** buttons to step ahead, or back in time by bars, beats, or clocks, depending on which field is selected. Note that this parameter does not alter the track data in any way, it merely provides a method for viewing and locating events within a track.

Note: When event editing a Song Track, this display will have two addition location values, corresponding to the Step and Repetition of the song.

Event Locating Screen for All Events, Key Events and Key Pressure

When event editing Key Events or Key Pressure, the display has an additional parameter and looks like this:



Key Name

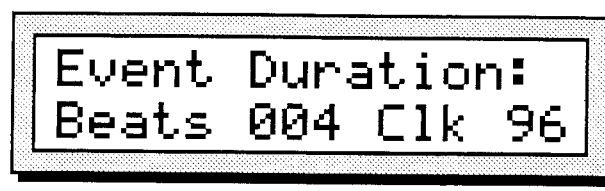
This additional parameter displays the key name that is either being played (when Event Type is KEY EVNT) or being affected by pressure (when Event Type is KEY PRSR).

The Key Name parameter behaves in the same fashion as the Event Cursor would, enabling you to use the Data Entry Controls to scroll to the next or previous event.

To change the Key Name for the current event, select the Key Name parameter and play the new key on the keyboard.

Note: When the current event type is KEY EVNT, the event value refers to the keys velocity value. When adjusting this value, you will notice that the ***Up/Down Arrow*** buttons change the value by three or four, instead of one. This is due to the velocity response of the SQ and is perfectly normal.

When the current event type is KEY EVNT, the duration of a given note is set by pressing the ***Right Arrow*** repeatedly until the screen displays the following:



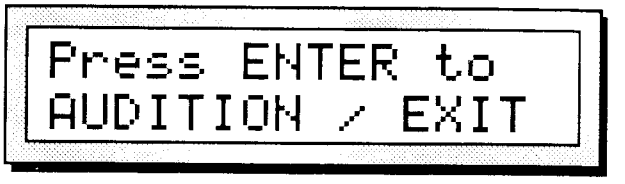
These two parameters set the duration for a particular note in beats and clocks. This screen only appears when Current Event Type is KEY EVNT, for all other event types the Location screen is immediately followed by the Audition Screen.

Note: When ALL EVENTS is selected in the Event Type Cursor, the display will switch between the two screens shown above, depending on the current event type.

AUDITION, INSERT and REMOVE

After selecting a location with the Event Locating Screen, the next screen allows you to INSERT or REMOVE notes, controllers, or program changes, as well as auditioning any changes made to the track.

- From the Event Locating Screen, press the ***Right Arrow*** button until the display reads:



From this screen, you can do three things:
1) INSERT a note, controller, or program change into the selected track
2) REMOVE a note controller, or program change from the selected track
3) AUDITION changes made with either the Event Location Screen or the INSERT/REMOVE commands.

- AUDITION/EXIT — If events within the track were edited (either through the Event Location Screen or the INSERT/REMOVE commands), pressing ***Enter*** triggers the KEEP NEW/OLD screen. If Events were viewed but not changed, pressing ***Enter*** exits out to the Edit Event bank.
- INSERT EVENT — This command is used to insert an event into the selected track. To utilize this function, select the type of command to be inserted with the Event Type Filter on the first screen of the Event Edit Track command. Advance to the Event Locating Screen and select the location where the event is to be placed. On events other than key events, set the desired event value. Finally, use this screen to insert the event. Pressing ***Enter*** will insert the event.
- REMOVE EVENT — Removes the event displayed on the Event Locating Screen. As with the INSERT command, select the type of command to be removed with the Event Type Filter on the first screen of the Event Edit Track command. Advance to the Event Locating Screen and select the location where the event that is to be removed is located. Finally, use this screen to remove the event. Pressing ***Enter*** will remove the event.

Hint: When a key event is deleted, the key name and velocity are remembered. The next time a key event is inserted, it will default to the last key event deleted. This provides a convenient way to move a single key event that may be off-time. This is only true for key events.

Section 10 — Sequencer Applications

This section covers a number of advanced sequencer applications, including using the SQ with a variety of external MIDI devices.

Using the SQ with a Drum Machine

When you use the SQ in conjunction with a drum machine or other rhythm sequencer, there are basically three ways to go:

1) Sync the drum machine's clock to the SQ;
2) Sync the SQ's clock to the drum machine; or
3) Sequence the drum machine from the SQ, just as you would a synthesizer.

To Sync a Drum Machine to the SQ:

- Connect the MIDI Out of the SQ to the MIDI In of the drum machine.
- Set the drum machine to sync to MIDI clocks.
- Set the drum machine to receive on an unused MIDI Channel, OMNI Off; or disable Channel information. You don't want the drum machine playing SQ sequence data intended for other instruments. MIDI Clocks, Start, Stop and Continue are *Real Time* commands, and are sent and received regardless of MIDI channel or mode.
- The drum machine should now sync to the SQ's clock. Pressing ***Play*** or ***Stop*** will Start, Stop and Continue the drum machine, assuming it receives those commands.

To Sync the SQ to a Drum Machine:

- Connect the MIDI Out of the drum machine to the MIDI In of the SQ.
- Set the SQ to sync to MIDI clocks. In the Seq Control bank, select "Clock=MIDI."
- Set the drum machine to not send channel info, or to send on a MIDI Channel that is not being used by any of the SQ tracks. Again, MIDI Clocks, Start, Stop and Continue are sent and received regardless of MIDI channel or mode.
- The SQ should now sync to the drum machine's clock. Starting, Stopping or Continuing the drum machine will Start, Stop and Continue the SQ.

To Sequence a Drum Machine from a Track of the SQ:

- Connect the MIDI Out of the SQ to the MIDI In of the drum machine.
- Set the drum machine to Tape Sync or External Clock, or any setting other than Internal or MIDI Clock. This way it will not play it's own patterns, but will act only as a sound-producing device, sequenced from a track of the SQ.
- Set the drum machine to POLY (OMNI Off) mode, and select a MIDI Channel.
- From the MIDI Control bank, assign a track on the SQ MIDI Status, and set it to the same MIDI Channel you assigned the drum machine.
- You should now be able to play the drum machine from the SQ keyboard. You can then record a track on the SQ, from the SQ keyboard, which will play on the drum machine — just as if you were sequencing an external synthesizer.

The advantage of this approach is that some drum machines respond better to velocity when played from MIDI than when played from their own front panels. Thus, you may get more dynamic range out of your drum machine if you use this approach. The disadvantage is that you use up SQ sequencer memory to sequence the drum machine.

Song Position Pointers

The SQ sends and receives Song Position Pointers via MIDI. Song Position Pointers are MIDI commands that tell a sequencer or drum machine where to locate within a song or sequence.

When the SQ receives a Song Position Pointer, it will locate to the appropriate place in the selected song or sequence.

The SQ sends a Song Position Pointer over MIDI whenever you use the Auto-Locate control (the Goto function in the Locate bank). Any receiving unit which recognizes Song Position Pointers will locate to the same spot. (Not all devices recognize Song Position Pointers. Consult the manual of any other sequencing device you are using, to see if it does.)

MIDI Song Selects

MIDI Song Selects allow a sequencer such as the SQ to instruct a remote sequencer or drum machine to select a new song whenever you select a Sequence or Song on the SQ. Whether or not the SQ sends and receives them depends on the setting of the "Song Select" parameter in the MIDI bank.

The SQ transmits and receives MIDI Song Selects in Sequence Mode as well as Song Mode (depending again on the setting on the "Song Select" parameter). This allows you to select any SQ sequencer location from a remote sequencer, computer or drum machine, and vice versa. They are set up as follows:

MIDI Song Selects # 00-29 will select SQ Sequencer locations # 70-99.

Conversely, selecting Sequencer locations # 70-99 will cause the SQ to send MIDI Song selects # 00-29

Using The SQ with a MIDI Guitar Controller

The SQ makes an ideal voice module to use with any MIDI Guitar Controller which is capable of sending in MONO Mode. MONO Mode (MIDI Mode 4) allows a guitar controller to send the notes played on each string on a different MIDI Channel. This has the advantage of letting each string send pitch bends independently, which is the only way to truly recreate guitar technique on a synthesizer.

Some earlier guitar synths do not support MONO mode. You will have to consult the manual of your particular model to see if it does. If you have a guitar synth which only sends in POLY Mode (i.e. sends all six strings on the same MIDI Channel) you should use the SQ in POLY Mode (or OMNI Mode) and set the guitar controller to send on the MIDI Channel that is selected for the Base Channel on the MIDI Page.

For MIDI Guitar Controllers which do support MONO Mode, the SQ provides two types of MONO mode reception. The first is MONO A Mode, which is a simple and straightforward way of using MONO mode without getting involved with tracks or other complications:

- Connect the MIDI Out of the guitar controller (or its MIDI converter) to the MIDI In of the SQ.
- Set your guitar controller to send in MONO Mode on Channels 1-6. (Some models have an easy shortcut for getting into this state.)
- In the MIDI Control bank, set the Base MIDI Channel to "Base Channel=01."
- Also in the MIDI Control bank, set the MIDI Mode parameter to "MIDI Mode=MONO A." This sets up the SQ to respond monophonically to eight consecutive MIDI channels starting from the Base Channel (Consult Section 2 for a more complete description of MONO Mode).

You can now select sounds or presets on the SQ, either from the front panel or from MIDI program changes, and the guitar controller will play those sounds exactly as if they were played from the keyboard.
If you are a little more adventurous, and would like the flexibility to put a different sound program on every string of the guitar, you can use MONO B mode, in which each track of the current sequence receives monophonically on its own MIDI channel, and can receive program changes independently. Where MONO A is like POLY mode with monophonic reception, MONO B is just like MULTI mode, except that each track is monophonic.

- In the MIDI Control bank, set the MIDI mode to "MIDI Mode= MONO B." The eight tracks of the current preset will now each receive monophonically on its own MIDI channel
- Create a new preset. You might want to name it "MONO-B IN", or something similar, to indicate that it is specially set up for this type of reception.
- Select each of the first six tracks, defining them and putting the current sound on them. You can leave Tracks seven and eight undefined.
- Enter the Edit Preset mode and select the Parameter bank. Here you select the MIDI channels for the different tracks. Select each track and edit it accordingly. Unlike MONO A, in this mode the consecutive channel assignments are not automatic. You must set the tracks to six consecutive channels.

Now you're ready to play. A few things to bear in mind:

- Notes played on each string will play only the corresponding track. Each string/track combination is totally independent.
- You can change the program for each track manually from the SQ's front panel (using the Replace Sound function) or by sending Program Changes from the controller via MIDI.
- Each track will accept Program Changes independently. In many cases you will want to have the guitar controller send the same-numbered Program Change on all six channels so that all six strings play the same sound. You can, however, send the SQ a different Program Change for each track. You could use this effect to have, for example, a bass sound play on the bottom two strings and a piano sound on the top four. Or if you are feeling experimental, you could play a different sound on each string.
- It's a good idea to set up and save to card a special preset, as described above, which you always use in conjunction with the guitar synth. That way you won't accidentally change the sounds in the tracks of an existing sequence.
- If your guitar synth can send certain MIDI controllers on their own MIDI Channels, have it send any controllers you want to affect all the tracks (such as the "whammy bar") on the Base-Channel-minus-1. When the Base Channel is 1, Global controllers should be sent on Channel 16.

Section 11 — Storage Functions

The Storage functions on the SQ found in the System Bank enable you to:

- transfer Sounds or Sequencer data to or from SQ-compatible memory cards, and
- transmit dumps containing Sounds or Sequencer data via MIDI system exclusive messages.

Memory Card Storage

The SQ uses credit card-type memory cards for sound and sequence storage. Only ENSONIQ memory cards, or cards approved by ENSONIQ, can be used with the SQ. Similar memory cards sold for use with other manufacturer's products may be incompatible with the SQ, and may cause damage to the card or to the SQ itself.

Installing the Battery in a RAM Card

To maximize battery life, MC-32 RAM Cards are shipped with the battery not installed. Before using these cards, you must first install the battery, following the instructions below.

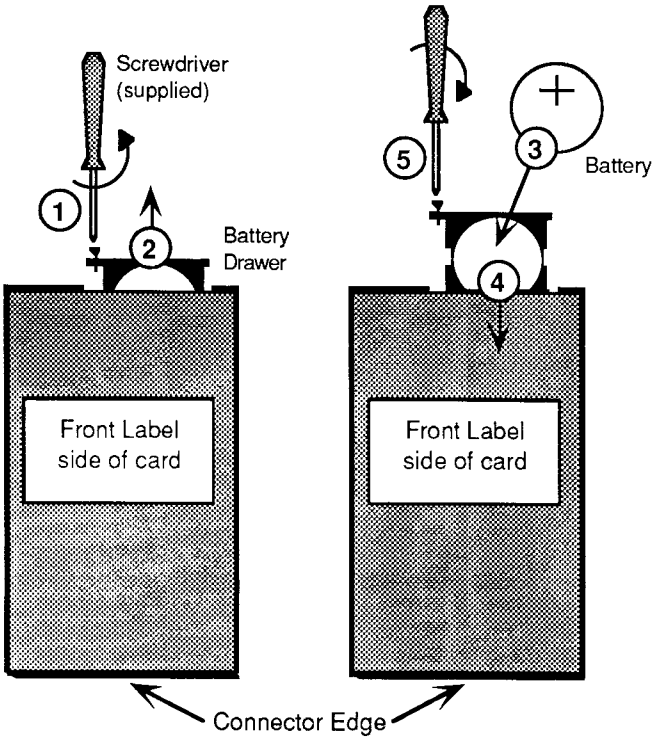
1. Using the supplied screwdriver, loosen the battery-drawer screw. Do not try to remove the screw; it remains attached to the battery drawer.

2. Pull gently on the plastic tab at the top of the card to open the battery drawer to the position shown at the far right. (Do not try to pull it out any further.)

2. Insert the Battery in the Battery Drawer with the flat (+) side of the battery facing up.

3. Slide the the battery drawer closed.

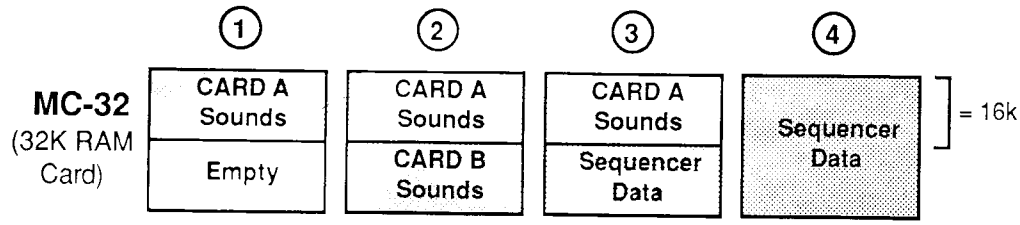
4. Retighten the battery drawer screw to lock the battery drawer closed.



Memory Card Configurations

ENSONIQ MC-32 RAM Cards can be used to store up to two banks of sounds (which we refer to as CARD A and CARD B) and/or sequencer data.

There are a number of different ways that a memory card can be configured, depending on which size card it is, and what type of data is stored to the card first. The drawing below shows the possible configurations for the two types of cards:



Possible RAM Card configurations

- Starting from a blank memory card, copying the internal sounds (INT) to CARD A (described later in this section) will format the card, and will put 80 sounds in CARD A, leaving the rest of the card memory empty, as shown in Configuration 1 above.
- Once you have copied sounds into CARD A, you can copy another bank of sounds to CARD B (Configuration 2) or you can save the internal sequencer memory to the card (Configuration 3).
- Starting from a blank memory card, saving the internal sequencer memory to the card (described later in this section) will format the card, and will allocate the entire card for sequence storage, as shown in Configuration 4 above.

Important: The amount of the card memory allocated to sequence storage depends on what portion of the card is empty, or unused, at the time you first save sequences to the card. That is, when you save sequences to the card, the SQ will allocate all available card memory for sequencer storage. Thus, if you want to use the entire card memory for sequences, be sure not to store any sounds to the card. If there are sounds already on the card, you can erase them by removing the battery for a few minutes (exact time varies for each card), then replacing it.

It is also important to note that sounds stored to a RAM card can be played directly from the cartridge, while sequence data stored to the card must be transferred to the internal sequencer memory before it can be played.

Formatting a Blank Memory Card

When you first install the battery in a RAM card, the card will not be recognized by the SQ until it is formatted. *Formatting a card is done by simply storing a sound bank or sequence data to the card.* With a new card, you first decide whether you want to use it to store sounds, sequences or both (see the note on the previous page) and then format it, either by copying the internal sounds to Card A, or by saving the internal sequencer memory to the card.

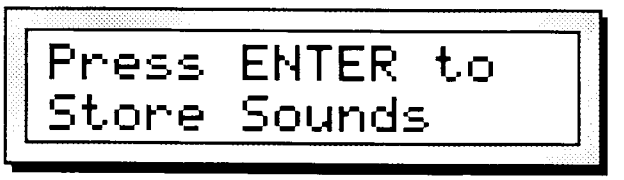
SOUNDS

Copying Sounds Between Internal and Card Memory

The functions described here are used to do "bulk copies" of the 80 INT sounds to the memory card, or vice-versa. Also, as noted above, it is necessary to copy the internal sounds to Card A before the card can be used to store sounds at all. If you wish to copy a single sound to a different location, use instead the procedure described in Section 4.

To Copy sound banks between Internal and Card memory:

- Press the ***Edit Sequences/Presets*** button.
- Select the System bank by pressing the ***Bank 9*** button.
- Press the ***Screen 4*** button. The display reads:



- Press ***Enter***. The display now lets you choose which type of storage to use.
- Use the ***Up/Down Arrow*** buttons to select "Storage Type=MEMORY CARD," as shown below:

- Press ***Enter***. The display now offers four choices:

- "Operation = COPY INT TO CARD A" — this command copies the entire contents of the eight INT Sound Banks (0-7) to CARD A.
- "Operation = COPY INT TO CARD B" — this command copies the entire contents of the eight INT Sound Banks (0-7) to CARD B.
- "Operation = COPY CARD A TO INT" — this command copies the entire contents of the eight CARD A Sound Banks (0-7) to the Internal (INT) memory.
- "Operation = COPY CARD B TO INT" — this command copies the entire contents of the eight CARD B Sound Banks (0-7) to the Internal (INT) memory.

- Once you have have selected the operation you want from the four options above, press ***Enter***.

- If the card was blank or unformatted and you chose COPY INT TO CARD A, the display asks "Card is wrong type, erase?" Press ***Yes***.
- The copy function is almost instantaneous. The display will read "Command Successful" after the sounds have been copied.

Sound Storage Prompts and Error Messages

- "Sorry! Install a RAM Card First." — You will get this message if you attempt to copy INT TO CARD A or INT TO CARD B when there is no card installed, or when a ROM (Read Only Memory) card is installed.

- "Sorry! Install a Card First." — You will get this message if you attempt to copy CARD A TO INT or CARD B TO INT when there is no card installed.

- "Sorry! Write to Card A first." — You will get this message if you attempt to copy INT TO CARD B before you have copied sounds to CARD A. CARD A must be written before you can copy sounds to CARD B.

- "Sorry! Card B is empty." You will get this message if you attempt to copy CARD B TO INT when the card is formatted but does not contain sound data in Card B.

- "Erase sequencer data on card?" If you attempt to copy INT TO CARD B with a card which already has Sequencer data stored in the area normally occupied by Card B sounds, you will get this message. Press ***Yes*** to proceed, or ***No*** to cancel the command.

- "Sorry, write to card failed." — This message will appear whenever the SQ fails to verify data that it has written to the card. It could mean that the card is a ROM card and cannot be written. It might also mean that the card is write-protected or possibly defective.

- "WARNING! Battery low. See manual." — If this message appears when a RAM card is inserted into the card slot, it means that the battery in the card is getting low and should be replaced as soon as possible. To replace the battery, you can use essentially the same procedure outlined earlier in this section under "Installing the Battery in a RAM Card." Also, if you replace the battery *while the card is plugged into the SQ, with the SQ power on*, you will not lose the data stored on the card. This will not harm the card or the SQ. (Make sure, though, that you do not turn off the SQ–1's power while the card is installed with the battery removed, or any data on the card *will* be lost.)

SEQUENCES

Saving Sequencer Data to Memory Card

You can save the contents of the SQ sequencer memory to an MC-32 RAM card.

To Copy sound banks between Internal and Card memory:

- Press the ***Edit Sequences/Presets*** button.
- Select the System bank by pressing the ***Bank 9*** **button.**.
- Press the ***Screen 5*** button. The display reads:

- Press ***Enter***. The display now lets you choose which type of storage to use.
- Use the ***Up/Down Arrow*** buttons to select "Storage Type=MEMORY CARD," as shown below:

- Press ***Enter***. The display now offers two choices:

- "Operation = COPY ALL TO CARD" — this command will copy the entire contents of the SQ sequencer memory to the RAM Card. This is the proper choice when you want to save, or "back up" your sequences and songs to the card.
- "Operation = COPY ALL FROM CARD" — this command will copy sequencer data from the card into the internal sequencer memory. This is the proper choice when you want to reload data previously saved to the card.

- Once you have selected either COPY ALL TO CARD or COPY ALL FROM CARD, press ***Enter***.
- The copy function is almost instantaneous. The display will read "Command Successful" after the sequencer data have been copied.

Sequence Storage Prompts and Error Messages

- "Sorry! Install a RAM Card First." — You will get this message if you attempt to copy ALL TO CARD when there is no card installed, or when a ROM (Read Only Memory) card is installed.

- "Sorry! Install a Seq Card First." — You will get this message if you attempt to copy ALL FROM CARD when the card installed is unformatted, or contains only sound data, or there is no card installed.

- "Erase Sound data on Card B?" — This prompt occurs whenever you attempt to store sequencer data to a card which already contains sounds in Card B. Answer ***Yes*** to erase the sounds stored in Card B and use that memory (plus any other free memory in the card) for sequence storage. If you answer ***No***, the SQ will use whatever space remains for sequence storage.

  For example, with an MC-32, if both Card A and Card B contain sounds, and you get you this message, answering ***Yes*** will erase the sounds stored in Card B and replace them with sequence data. Answering ***No*** will effectively cancel the command.

- "Sorry, write to card failed." — This message will appear whenever the SQ fails to verify data that it has written to the card. It could mean that the card is a ROM card and cannot be written. It might also mean that the card is write-protected or possibly defective.

- "Sorry, need more space on card." — This prompt means that the amount of data in the sequencer memory exceeds the available memory in the card. If you get this message, you could erase some sequences, erase any sound data already stored on the card (by removing the battery), get a larger card, or use a different form of storage, such as MIDI Sys-Ex, described later in this section.

- "Sorry, need expanded RAM." — You will get this message if you attempt to copy ALL FROM CARD, when the amount of sequencer data stored in the card exceeds the amount of sequencer memory in the SQ. This could happen if you saved the data from a unit with a memory expander installed, and then tried to reload it into a unit without memory expansion.

- "WARNING! Battery low. See manual." — If this message appears when a RAM card is inserted into the card slot, it means that the battery in the card is getting low and should be replaced as soon as possible. To replace the battery, you can use essentially the same procedure outlined earlier in this section under "Installing the Battery in a RAM Card." Also, if you replace the battery *while the card is plugged into the SQ, with the SQ power on*, you will not lose the data stored on the card. This will not harm the card or the SQ. (Make sure, though, that you do not turn off the SQ–1's power while the card is installed with the battery removed, or any data on the card *will* be lost.)

MIDI SYS-EX Storage

Sending MIDI Sys-Ex Messages to another SQ or to a Storage Device

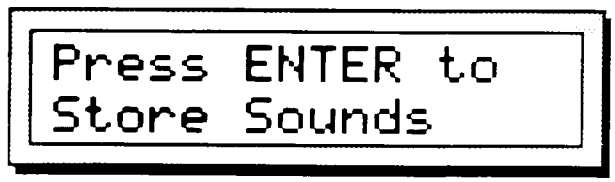
The SQ is able to send system exclusive dumps of Sounds, either singly or in banks, as well as Sequencer dumps containing either the entire sequencer memory or the current sequence/song. These dumps can be understood by another SQ, or can be recorded by a remote device which has MIDI Sys-Ex Recorder capabilities (such as the ENSONIQ EPS–16 PLUS or VFX^{SD}), to be stored and later re-transmitted to the SQ.

Banks of sounds are always transmitted from the internal RAM memory (INT). If you want to send card data, use the Sound Storage function to transfer data from the card into the internal RAM first.

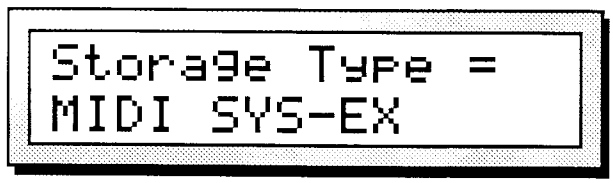
SOUNDS

Sending One or All Sounds out via MIDI Sys-Ex

- Press the ***Edit Sequences/Presets*** button.
- Select the System bank by pressing the ***Bank 9*** button.
- Press the ***Screen 4*** button. The display reads:



- Press ***Enter***. The display now lets you choose which type of storage to use.
- Use the ***Up/Down Arrow*** buttons to select "Storage Type=MIDI SYS-EX," as shown below:



- Press ***Enter***. The display now offers two choices:

- "Operation = SAVE INT TO MIDI" — this command transmits the entire contents of the eight Internal Sound Banks (0-7) as a system exclusive message. The dump contains data for the complete set of 80 Sounds.
- "Operation = SAVE SOUND TO MIDI" — this command will transmit the currently selected sound as a system exclusive message. The sound to be transmitted can be in any bank, including the INT, ROM CARD A or CARD B banks.

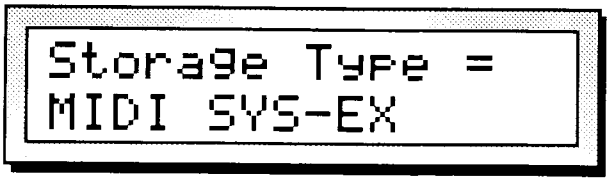
- Once you have selected either SAVE INT TO MIDI or SAVE SOUND TO MIDI, press ***Enter***. The display will read "Please wait . . . sending data" while the sounds are being transmitted.

SEQUENCER DATA

Sending Sequences/Songs out via MIDI Sys-Ex

- Press the ***Edit Sequences/Presets*** button.
- Select the System bank by pressing the ***Bank 9*** button.
- Press the ***Screen 5*** button. The display reads:

- Press ***Enter***. The display now lets you choose which type of storage to use.
- Use the ***Up/Down Arrow*** buttons to select "Storage Type=MIDI SYS-EX," as shown below:



- Press ***Enter***. The display now offers two choices:

- "Operation = SAVE CURRENT SEQ/SONG" — this command will transmit the currently selected sequence or song as a system exclusive message.
- "Operation = SAVE ALL SEQUENCES" — this command will transmit the entire contents of the sequencer memory as a system exclusive message. The dump contains data for the complete set of 70 sequence locations and 30 song locations.

- Once you have have selected either SAVE CURRENT SEQ/SONG or SAVE ALL SEQUENCES, press ***Enter***. The display will read "Please wait . . . sending data" while the sounds are being transmitted.

Receiving MIDI Sys-Ex Messages

The receiving of data dumps is initiated automatically by System Exclusive messages sent from the transmitting unit. No front-panel commands are necessary to receive dumps if the receiving of System Exclusive messages is enabled on the MIDI bank (System Excl=ON).

When a single-sound message is received, three things happen:
- the display briefly says "Press ENTER to Save New Sound,"
- the new sound is placed in the edit buffer, and
- the SQ enters Sound Edit mode, with the ***Edit Sounds*** LED flashing, so that you can hear, edit and/or save the new sound which has been received.

When a one-Seq/Song message is received, the new sequence will be placed in the *lowest-numbered* empty sequence location. Or, if it is a song which is received, it will be placed in the lowest-numbered empty song location. After it is received, the new sequence or song will be selected.

Appendix - SQ MIDI Implementation

The SQ features extensive MIDI (Musical Instrument Digital Interface) implementation. For normal applications, you will find all the information you need regarding the SQ's MIDI functions in this manual. You can also refer to the MIDI Implementation Chart on the next page for a summary of the SQ MIDI implementation.

If you are writing a computer program to communicate with the SQ via MIDI, or otherwise require a copy of the full SQ–1 PLUS/SQ–2 MIDI Specification, it is available free of charge by writing to:

ENSONIQ Corp
MIDI Specification Desk
155 Great Valley Parkway
Malvern, PA 19355

Include in your written request your name and address, and indicate that you would like a copy of the "SQ–1 PLUS/SQ–2 External MIDI Specification." Please allow 2 to 3 weeks for delivery.

SQ MIDI Implementation Chart

MODEL: SQ **MIDI Implementation Chart** **Version: 1.0**

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Channel	1 1 - 16	1 1 - 16	
Mode	Default Messages Altered	1 X X	1, 3, 4, Multi X X	memorized (Global Controllers in MONO Mode)
Note Number	True Voice	21 - 108	21 - 108	
Velocity	Note ON Note OFF	O O	O X	
After Touch	Key's Ch's	X X	O O	
Pitch Bender		O	O	
Control Change		1 - 95 1 Mod Wheel 4 Foot 7 Volume 71 Timbre Parameter 72 Release Parameter 100 Registered Param Select 101 Registered Param Select	1 - 95 1 Mod Wheel 4 Foot 7 Volume 71 Timbre Parameter 72 Release Parameter 100 Registered Param Select 101 Registered Param Select	programmable
Prog Change	True #	0 - 127	0 - 119, 123 - 127	
System Exclusive		O	O	
System Common	: Song Pos : Song Sel : Tune	O O X	O O X	
System Real Time	: Clock : Commands	O Clock O Start, Stop, Cont	O Clock O Start, Stop, Cont	
Aux Mes-sages	: Local On/Off : All Notes Off : Active Sense : Reset	X X X X	X X X X	
Notes				

Mode 1: OMNI ON, POLY
Mode 2: OMNI ON, MONO
Mode 3: OMNI OFF, POLY
Mode 4: OMNI OFF MONO

O : YES
X : NO

"INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS"

IMPORTANT SAFETY INSTRUCTIONS

WARNING—When using electric products, basic precautions should always be followed, including the following:

1. Read all the instructions before using the product.

2. To reduce the risk of injury, close supervision is necessary when a product is used near children.

3. Do not use this product near water - for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.

4. This product should be used only with a cart or stand that is recommended by the manufacturer.

5. This product, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

6. The product should be located so that its location or position does not interfere with its proper ventilation.

7. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.

8. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

9. This product may be equipped with a polarized line plug (one blade wider than the other). This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace your obsolete outlet. Do not defeat the safety purpose of the plug.

10. The power supply cord of the product should be unplugged from the outlet when left unused for a long period of time.

11. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

12. The product should be serviced by qualified service personnel when:

    a. The power supply cord or the plug has been damaged; or
    b Objects have fallen, or liquid has been spilled into the product; or
    c. The product has been exposed to rain; or
    d. The product does not appear to operate normally or exhibits a marked change in performance; or
    e. The product has been dropped, or the enclosure damaged.

13. Do not attempt to service the product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

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