halo

64-VOICE EXPANDABLE KEYBOARD

Operation Manual

FI12326 Rev. B

Important Notice:

In order to obtain warranty service on your Halo unit, the serial number sticker must be intact and you must have a sales receipt or other proof of purchase. If there is no serial number sticker on the Halo, please contact E-MU-ENSONIQ at once.

This product is covered under one or more of the following U.S. patents: 4,404,529; 4,506,579; 4,699,038; 4,987,600; 5,013,105; 5,072,645; 5,111,727; 5,144,676; 5,170,367; 5,248,845; 5,303,309; 5,317,104; 5,342,990; 5,430,244 and foreign patents and/or pending patents. All other trademarks belong to their respective companies. Specifications and features are subject to change without notice.

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Introduction

Product Description

Upgradable Sounds

Halo contains a new collection of presets designed for music composition in a wide variety of styles.These sounds are rich in harmonic texture and a perfect complement to the Z-plane filters. Halo contains three additional, user-upgradable sound SIMM sockets, allowing you to mix and match sound sets according to your needs. New sounds can be added as easily as plugging in a new 16MB or 32MB SIMM module. Each sound set has been meticulously crafted to be the finest of its kind. Samples are expertly matched across the keyboard and perfectly looped to create realistic instruments which form the exceptionally playable presets.

1024 Presets & more

Halo contains 512 user presets and 512 factory ROM presets, but it can be expanded with literally thousands of ROM presets. *(ROM presets are automatically added when sound SIMMs are installed. As an example, a 32 MB SIMM may contain up to 1024 ROM presets.)* Halo's Sound Navigator makes it easy to find the exact sound you want. It's powerful, yet simple to use.

Velocity & Pressure Sensitive Keyboard

The five-octave, velocity sensitive keyboard with aftertouch allows you to perform live or record via MIDI into an external computer/sequencer. The keyboard action is extremely responsive, capturing all the subtle nuances of your performance.

Multi-Function Controllers

Multi-function buttons allow you to trigger arpeggiators and notes internally or on any of your other MIDI devices. They can act as preset select buttons or Beats Mute or MIDI Trigger buttons (latched or unlatched).

Four real-time controller knobs are also multi-function controls. These knobs make it a snap to edit and modify internal preset parameters. The controllers are fully programmable and can control internal preset or other MIDI equipment. They can also be programmed to adjust multiple internal parameters at once, allowing complex levels of control. For example, a single knob can simultaneously turn up filter cutoff, while detuning one

sample, and adjusting the release time of the volume envelope. Virtually every synth parameter in the Halo is controllable using the real-time knobs or by any internal or external control source.

SuperBeats

Beats Mode is a whole new way to create dynamic, original music. With Beats, you trigger, latch and unlatch synced loops and grooves from the sixteen trigger keys. Simply select a **bts:** preset and go. Then use Halo's perfomance controls to alter and mutate the rhythm or the sound itself.

Multi-Channel Arpeggiators

Halo's Rhythmic Pattern Generator/Arpeggiator can play up to 16 synchronized arpeggiator patterns at once using a different sound for each! Patterns can be edited using pattern flow commands such as: delay for 2 bars, play for 4 bars, hold for 2 beats and repeat. You can program or download 100 user patterns in addition to the 200 factory patterns.

Ultra Powerful Synthesizer

The extremely flexible yet easy to use synthesizer makes it easy to build sounds of any kind. Up to 4 four layers can be switched or crossfaded using key position, velocity, real-time controllers or any modulation source. 64 voice polyphony ensures that you can play and sequence the most complex material. Halo also contains 50 different 2nd to 12th order resonant & modeling filters which are used to shape and modify over 1200 waveforms contained in 32 megabytes (MB) of ROM.

Sixty-four modulation sources include three multistage envelopes and two LFOs per layer, as well as full MIDI control over virtually every parameter. The digital patch bay, with 24 cords per layer, (and 12 more cords per preset) lets you connect modulation sources to 64 destinations in any imaginable way. The patch bay also contains a set of arithmetic modifiers, allowing you to create complex synthesis models. Synth parameters as well as arpeggiator and BEAT tempos can be controlled from Halo's internal clock (or an external MIDI clock). Up to 8 LFOs and 12 envelopes can be perfectly synchronized at different rates.

24-bit Effects

Once you have created your preset, you can add richness to your sound using Halo's 24-bit stereo effects. You can choose a different effects setup for each preset from over 60 algorithms. Halo's effects section is actually two separate effects processors with control over each wet/dry mix level on four effects sends. Effects Processor "A" contains primarily ambiance algorithms like reverb and delays, while effects processor "B" contains primarily spectral algorithms such as chorus, flange, phase, distortion, and delay. Effects can be linked to each preset or used globally for increased flexibility.

Other features include multiple solo, voice assignment and performance modes for expressive control, 12 user-definable alternate tunings, and, of course, an extensive MIDI implementation.

Important Safety Instructions

Use in countries other than the U.S.A. may require the use of a different line cord or attachment plug, or both. Refer all servicing to qualified service personnel. There are no user serviceable parts or adjustments inside the unit. There are no user serviceable parts inside the power supply enclosure.

WARNING: To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.

Grounding Instructions

This product must be grounded. If it should malfunction or break down, grounding provides a path of least resistance for electric current, reducing 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 properly installed and grounded in accordance with all local codes and ordinances.

Danger!

Improper connection of the equipment's 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 technician.

User Maintenance Instructions

1. The Halo (Model Number 3725) should be kept clean and dust free. Periodically wipe the unit with a clean, dry, lint free cloth. Do not use solvents or cleaners.
2. There are no user lubrication or adjustment requirements.

Caution -*Servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in these operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.*
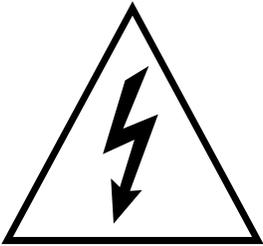
INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

READ THESE INSTRUCTIONS: When using electric products, basic precautions should always be adhered to, including the following:

1. Read all instructions before using Halo.

2. To reduce the risk of injury, close supervision is necessary when using Halo near children.

3. Do not use Halo near water — for example near a bathtub, washbowl, kitchen sink, in a wet basement, on a wet bar, or near or in a swimming pool.

4. Do not expose the unit to drips or splashes. No liquid-filled objects, such as vases, shall be placed on the Halo.

5. The Halo should be situated so that its location or position does not interfere with its proper ventilation.

6. The Halo should be located away from heat sources such as radiators, heat registers, fireplaces, stoves, or ovens.

7. No open flame sources, such as lit candles, should be placed on the Halo.

8. The Halo is designed for use in moderate climates.

9. The Halo should be connected only to a power supply of the type described in the operating instructions and marked on the product.

10. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure of Halo through openings.

11. This Halo is equipped with a grounding-type plug *(a grounding plug has two blades and a third grounding prong)*. This is a safety feature. If you are unable to insert this plug into the outlet, do not defeat the safety purpose of the plug. Contact an electrician to replace your obsolete outlet.

12. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the unit.

13. Unplug the Halo from the power outlet during lightning storms or when left unused for a long period of time.

14. This product, in combination with an amplifier and headphones and 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, consult an audiologist.

15. Only use attachments and accessories specified by ENSONIQ.

16. Refer all servicing to qualified service personnel. The Halo should be serviced by qualified service personnel when:

    A. The power supply cord or plug has been damaged; or

    B. Objects have fallen, or liquid has been spilled into the unit; or

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

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

C. The unit has been exposed to rain or moisture; or

D. The unit has been dropped or damaged in any way; or

E. The Halo does not operate normally or exhibits a marked change in performance.

Save These Instructions

Heed All Warnings

Follow All Instructions

Radio and Television Interference

The equipment described in this manual generates and uses radio-frequency energy. If it is not installed and used properly —that is, in strict accordance with our instructions— it may cause interference with radio and television reception.

This equipment has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of the FCC rules. These rules are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation, especially if a "rabbit ear" TV antenna is used.

If Halo does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures:

• Turn the television or radio antenna until the interference stops.

• Move Halo to one side or the other of the television or radio.

• Move Halo farther away from the television or radio.

• Plug Halo into an outlet on a different circuit than the television or radio.

• Consider installing a rooftop antenna with a coaxial lead-in between the antenna and television set.

Copyright Information

It is the policy of E-MU / ENSONIQ to allow all users free, complete and unrestricted use to all of the presets, beats, riffs, patterns, and audition files contained in our products. However, we are unable to grant you a license to re-use, modify, create derivative works from, sell or redistribute the demonstration files (demos). In most cases, these compositions are copyright protected by their respective authors and are licensed to E-MU / ENSONIQ for product demonstration purposes only. Please contact E-MU / ENSONIQ with additional questions.

Safety Instructions - German

Wichtige Sicherheits- vorschriften

In Ländern ausserhalb den U.S.A. können andere Kabel oder Stecker notwendig werden. Zur Verminderung des Risikos von Feuer oder eines elektrischen Schlages übergebe man den Service an qualifizierte Fachleute. Das Gerät niemals Regen oder Nässe aussetzen.

Erdungsin- struktionen

Das Gerät muss geerdet sein. Bei einem Defekt oder Ausfall bietet Erdung dem elektrischen Strom den Weg des geringsten Widerstandes und reduziert das Risiko eines Schlages. Dieses Gerät ist mit einem geerdeten Kabel und Stecker ausgerüstet. Der Stecker muss in eine passende, einwandfrei montierte und geerdete Steckdose in Übereinstimmung mit den örtlichen Vorschriften eingeführt werden.

Gefahr

Unvorschriftsgemässer Anschluss des Gerätes kann zum Risiko eines elektrischen Schlages führen. Im Zweifelsfalle über die ordnungsgemässe Erdung soll ein qualifizierter Elektriker oder eine Serviecestelle beigezogen werden. Ändern Sie den mitgelieferten Stecker nicht. Sollte er nicht in die Steckdose passen, soll die einwandfreie Installation durch einen qualifi- zierten Techniker erfolgen.

Unterhaltsin- struktionen für anwender

1. Halo (Modell Nummer 3725) soll sauber und staubfrei gehalten werden. Das Gerät mit einem sauberen und säurefreien Tuch periodisch abreiben. Keine Lösungs- oder Reinigungsmittel anwenden.
2. Schmieren und Justieren sind nicht notwendig.
3. Bei weiteren Servicefragen wende man sich an eine qualifizierte Service- stelle.

Vorsicht

Diese Gebrauchsanweisungen sind nur für qualifizierte Techniker beabsichtigt. Um die Gefahr eines elektrischen Schlages zu vermeiden, sollen Sie keine Arbeit unternehmen, die nicht in diesen Instruktionen vorgeschrieben ist. Wenden Sie Sich bei weiteren Servicefragen an eine qualifizierte Servicestelle.

INSTRUKTIONEN BETR. FEUERRISIKO, ELEKTROSCHOCK ODER VERLETZUNG VON PERSONEN

WARNUNG; Beim Einsatz elektrischer Geräte sollten folgende Vorsichtsmassregeln stets beachtet werden:

Dieses Symbol weist den Anwender auf wichtige Gebrauchs- und Service-Vorschriften in den beiliegenden Drucksachen.
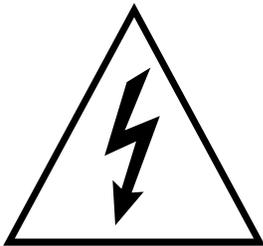
Dieses Symbol verweist auf nicht-isolierte Stromspannungen im Geräte-Innern, welche zu einem elektrischen Schlag führen könnten.

1. Lesen Sie vor dem Einschalten des Halo alle Instruktionen.

2. Zur Vermeidung von Verletzungsrisiken müssen Kinder bei eingeschaltetem Halo sorgfältig überwacht werden.

3. Halo nicht in der Nähe von Wasser in Betrieb nehmen -- z.B. in der Nähe von Badewannen, Waschschüsseln, auf nassen Gestellen oder am Swimmingpool.

4. Halo stets so aufstellen, dass seine Belüftung nicht beeinträchtigt wird.

5. Halo nicht in der Nähe von Hitze aufstellen, wie Heizkörper, offenem Feuer, Öfen oder von Backöfen.

6. Halo ausschliesslich mit einem Netzgerät gemäss Bedienungsanleitung und Gerätemarkierung verwenden.

7. Dieses Gerät kann bei Verwendung von Kopfhörern und Verstärkern hohe Lautpegel erzeugen, welche zu bleibenden Gehörschäden führen. Arbeiten Sie nicht während längerer Zeit mit voller Lautstärke oder hohem Lautpegel. Stellen Sie Gehörverlust oder Ohrenläuten fest, wenden Sie sich an einen Ohrenartz.

8. Halo kann mit einem polarisierten Kabelstecker (mit ungleichen Stiften) ausgerüstet sein. Das geschieht für Ihre Sicherheit. Können Sie den Stecker nicht in die Steckdose einführen, ändern Sie nicht den Stecker ab, sondern wenden Sie sich an einen Elektriker.

9. Das Netzkabel des Halo bei längerem Nichtgebrauch aus der Steckdose ziehen.

10. Vermeiden Sie sorgfältig das Eindringen von Gegenständen oder Flüssigkeiten durch die Gehäuseöffnungen.

11. Das Gerät soll durch qualifizierte Serviceleute gewartet werden, falls:

    A. das Netzkabel beschädigt wurde, oder

    B. Gegenstände oder Flüssigkeit in das Gerät gelangten,

    C. das Gerät Regen ausgesetzt war, oder

    D. das Gerät nicht normal oder einwandfrei arbeitet, oder

    E. das Gerät stürzte oder sein Gehäuse beschädigt wurde.

12. Servicearbeiten sollten nur qualifizierten Fachleuten anvertraut werden.

Safety Instructions - French

Instructions de Sécurité Importantes

Une utilisation dans des pays autres que les U.S.A. peut nécessiter l'usage d'un cordon d'alimentation différent. Afin de réduire les risques d'incendie ou d'électrocution, référez-vous à un personnel de service qualifié, et n'exposez pas cet appareil à la pluie ou à l'humidité.

Instructions de Mise à la Terre

Cet appareil doit être relié à la terre. Dans le cas d'une malfonction éventuelle, la terre fournit un passage de moindre résistance pour le courant électrique, réduisant ainsi les risques d'électrocution. Le Halo est équipé d'un cordon muni d'un conducteur et d'une fiche devant être branchée dans une prise appropriée et reliée à la terre en conformité avec les normes locales.

Danger

Une connexion incorrecte peut résulter en des risques d'électrocution. Vérifiez avec un technicien qualifié si vous avez des doutes quant à la connexion. Ne modifiez pas vous-même le cordon d'alimentation livré avec cet appareil; s'il ne rentre pas dans la prise, faites-en installer un autre par un technicien qualifié.

Instructions de Maintenance

1. Le Halo (Model 3725) doit être maintenu propre et sans poussière. Nettoyez-le périodiquement à l'aide d'un chiffon propre et non-pelucheux. N'utilisez pas de solvants, ou d'autres produits de nettoyage.
2. Aucune lubrification et aucun réglage ne sont nécessaires de votre part.
3. Pour tout autre service, référez-vous à un personnel qualifié.

Instructions Concernant les Risques d'Incendie, d'Electrocution, ou de Blessures Corporelles.

ATTENTION: Lorsque vous utilisez des appareils électriques, certaines précautions élémentaires doivent toujours être prises, incluant les suivantes:
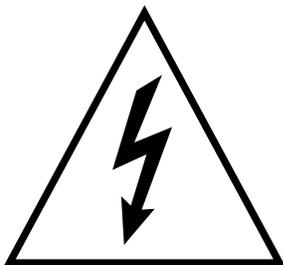
Ces instructions de dépanage sont destinées uniquement aux personnes qualifiées. Afin d'éviter les risques d'électrocution, n'effectuez que les opérations décrites dans ce manuel, à moins que vous ne soyez qualifiê pour cela. Faites effectuer toute r'eparation par une personne qualifié.

1. Lisez bien toutes les instructions avant d'utiliser le Halo.

2. Afin de réduire les risques de blessures, une attention particulière est nécessaire en la présence d'enfants en bas âge.

3. N'utilisez pas le Halo dans ou près d'endroits humides - par exemple près d'une baignoire, d'un lavabo, dans les toilettes, dans une cave humide, sur un bar fréquenté, en présence d'un bull-dog en rut, ou dans une piscine pleine. Protégez cet appareil de tout liquide, éclaboussure ou fuite.

4. Le Halo doit être placé de façon à ce que sa position n'interfére pas avec sa propre ventilation.

5. Le Halo doit être placé loin de sources de chaleur telles que des radiateurs, cheminées, fours, ou groupies en chaleur.

6. Le Halo doit uniquement être connecté à une alimentation du type décrit dans les instructions d'opération et tel qu'indiqué sur l'appareil.

7. Une attention particulière doit être observée quant aux objets pouvant tomber et aux liquides pouvant être versés sur et à l'intérieur de le Halo.

8. Le Halo peut être équipé d'une fiche secteur polarisée (avec une broche plus large que l'autre). C'est une mesure de sécurité. Si vous ne pouvez pas brancher cette fiche dans une prise, ne neutralisez pas cette sécurité. Contactez plutôt un électricien pour remplacer la prise obsolète.

9. Evitez de marcher sur le cordon d'alimentation ou de le coincer, particuliêrement près des prises de courant, des boitiers 'electriques dt du point de sortie de l'appareil.

10. Le cordon d'alimentation de le Halo doit être débranché lorsque ce dernier n'est pas utilisé pendant une longue période.

11. Cet appareil, combiné avec un amplificateur, des haut-parleurs, et/ou un casque, est capable de générer des niveaux sonores pouvant occasionner une perte de l'ouïe permanente. Ne travaillez pas trop longtemps à un volume trop élevé ou même inconfortable. Si vous observez une perte de l'audition ou un bourdonnement dans les oreilles, consultez un O.R.L.

12. N'utilisez que les accessoires sp'ecifi'es par ENSONIQ.

Ce symbole vous alerte de la présence d'instructions importantes d'opération et de maintenance dans la notice accompagnant l'appareil.

Ce symbole vous alerte de la présence d'un voltage non-isolé dangereux à l'intérieur de l'appareil, pouvant être d'une magnitude suffisante pour constituer un risque d'électrocution.

13. Cet appareil doit être examiné par un personnel qualifié lorsque:

   A. Le cordon d'alimentation a été endommagé, ou

   B. Des objets sont tombés, ou du liquide a été versé sur/à l'intérieur de l'appareil, ou

   C. Le Halo a été exposé à la pluie, ou

   D. Le Halo est tombé, ou

   E. Le Halo ne fonctionne pas normalement, ou affiche un changement radical de performance.

14. Tout service doit être effectué par un personnel qualifié.

SAUVEGARDEZ CES INSTRUCTIONS

Interférences Radio et Télévision

L'appareil décrit dans cette notice génère et utilise une énergie de fréquence-radio. S'il n'est pas installé et utilisé correctement - c'est à dire en suivant strictement nos instructions - il peut occasionner des interférences avec la réception d'une radio ou d'une télévision.

Cet appareil a été testé et est conforme aux normes de Classe A en accord avec les spécifications du paragraphe J de la section 15 des lois FCC. Ces lois sont désignées pour fournir une protection raisonnable contre de telles interférences dans une installation résidentielle. Toutefois, il n'est pas garanti qu'aucune interférence n'apparaisse dans des installations particulières, et plus spécialement lorsqu'une antenne de télévision en «oreilles de lapin» est utilisée.

Si le Halo occasionne des interférences , vous pouvez essayer de les corriger en utilisant une ou plusieurs des mesures suivantes:

- Tournez l'antenne de la télé ou de la radio jusqu'à ce que les inter-férences disparaissent.
- Déplacez le Halo d'un côté ou de l'autre de la télé ou de la radio.
- Eloignez le Halo de la télé ou de la radio.
- Branchez le Halo sur une prise différente que la télé ou la radio.
- Installez une antenne sur le toit munie d'une connexion coaxiale entre elle et le poste de télévision.

Declaration of Conformity

Manufacturer:
E-MU / Ensoniq
1600 Green Hills Road
Scotts Valley, CA 95067-0015 USA

We hereby declare that the equipment listed herin conforms to the harmonized standards of the following European Commission Directives: 89/336/EEC and 72/23/EEC.

Trade Name: Halo

Model Number: 3725

Under 89/336/EEC as amended by 92/31/EEC, and 93/68/EEC

In accordance with EN 55103-1:1996, Emission   Environments E4

In accordance with EN 55103-2:1996, Immunity   Environments E4

Test information is contained in a report by Atlas Compliance and Engineering, Inc.

Dated July 5, 2001

Report No.: 0126EMUx17_103

Under 73/23/EEC as amended by 93/68/EEC

In accordance with EN 60950 with amendments A1, A2, A3, A4, A11

This Declaration is made July 5, 2001

Setup

This section thoroughly describes how to set up your new Halo for use. Setup includes unpacking instructions, how to hook up the unit to your sound system and, most importantly, how to turn the thing on and off.

Unpacking

Carefully remove Halo from the packaging material. Take care to save the packing materials in case you need to transport the unit. Check to make sure all components are included and in good condition. If there are missing or damaged components, contact ENSONIQ immediately for replacement or repair.

The Halo box should include the following components:

- Halo unit
- Power cable
- This operation manual

Connection Instructions

Basic Setup

MIDI Sound Module

The Headphone Jack
is located on the front panel
below the Pitch and Mod. Wheels

MIDI In

Rear Panel

R SUB 1 L   R MAIN L
OUTPUTS   IN   OUT   THRU   MIDI   SWITCH PEDAL
                                            FOOT

Main Outs
to
Mixer In

Mixer

Footswitch

Foot Pedal

Amp

Speakers
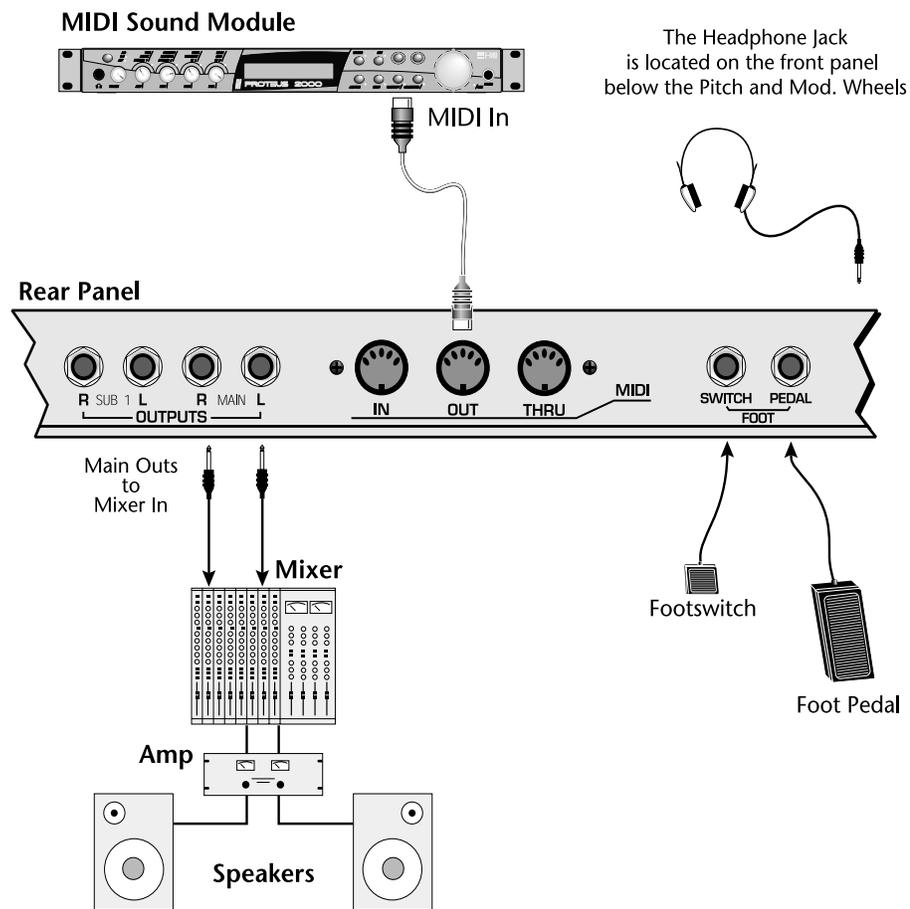
Power Switch & AC Receptacle

The AC power switch is located on the rear panel. There is no 110/220 Volt power selector switch since Halo utilizes an auto-switching power supply which accepts from 100V-250V, 50-60Hz.

MIDI Output

The Halo can control other MIDI instruments by connecting a MIDI cable between the MIDI out of Halo and the MIDI Input of the other instrument.

Outputs

In order to reproduce Halo's wide dynamic range and frequency response, use a high quality amplification and speaker system and a stereo setup is highly desirable The headphone output is the same as the Main output signal. The headphone jack is located on the left side of the front panel.

Footswitch & Footpedal

Connect a momentary footswitch and a Control Pedal for additional control. Halo auto-senses either normally-open or normally-closed switches See page 15 for information about how the footpedal should be wired.

The Right Main output jack carries a mono mix of the left and right channels when the Left Main plug is not plugged in.

The Left Main output jack is a stereo jack carrying both channels when the right output jack is empty.

Performance Setup

Rear Panel
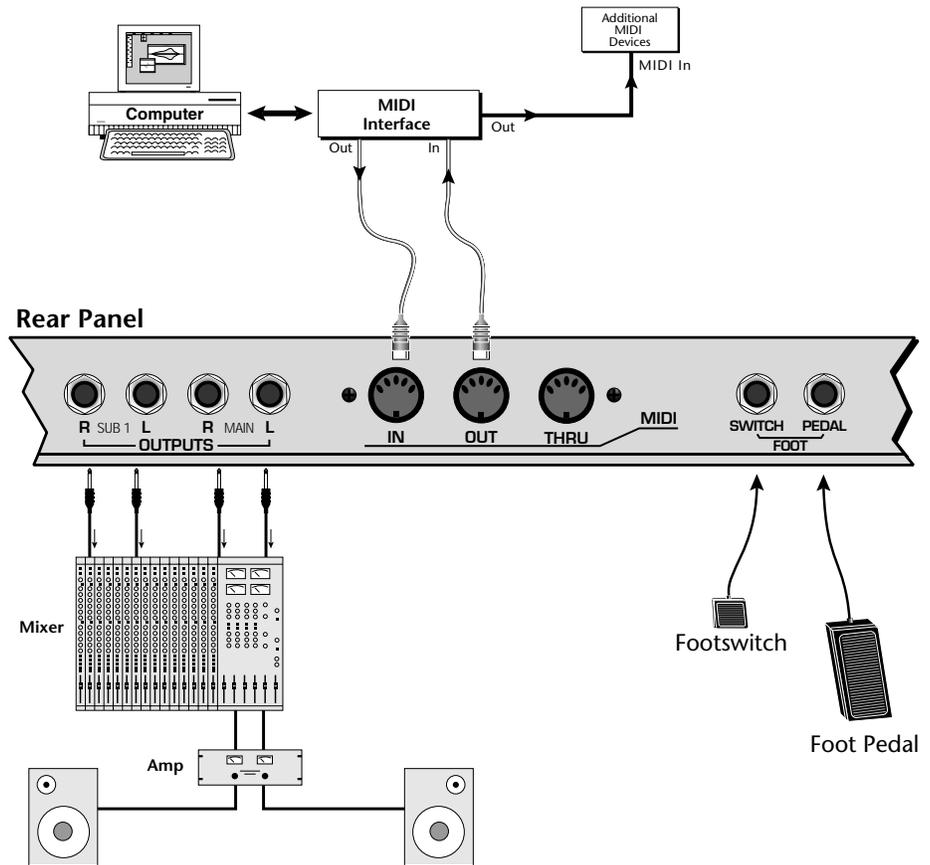
MIDI In/MIDI Out

Halo can be connected to a computer/sequencer via the MIDI In and MIDI Out ports. Halo to playback complex multitimbral sequences.

Audio Outputs

Two pairs of programmable stereo outputs (Main and Sub 1) are provided. The internal effects are available only on the Main outputs. Specific presets (or MIDI channels) can be routed to one of these stereo pairs in order to be processed further or mixed separately.

Footswitch & Footpedal

The footswitch input accepts either a normally-open or normally-closed momentary footswitch. The footpedal input can sense either 0-5 volts on the ring of a stereo jack or a pedal with the potentiometer wired as shown at left. The footswitch and Pedal inputs are programmable in the Controllers, Footswitch menu and the Preset Edit, PatchCord menu.

FootPedal Wiring

Studio Setup

MIDI Controller
(MIDI Keyboard or Sequencer)

Computer

Additional
MIDI
Devices

MIDI In

MIDI Out

Rear Panel

R SUB 1 L   R MAIN L
OUTPUTS

IN   **OUT**   **THRU**

MIDI

**FOOT
PEDAL**   **FOOT
SWITCH**

Send/Return

Main Outs to Mixer In

Effect Device

Sub Output
Return
(To Main Output)

Tip   Ring

To Effect   From Effect

SEND/RETURN CABLE
Signal is sent out on tip of plug and
returned to main outputs via ring of plug.
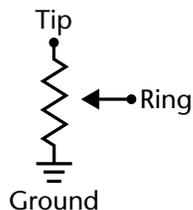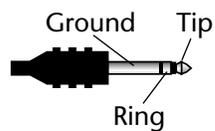
MIDI In
In this setup, Halo is additionally controlled by another MIDI keyboard.

MIDI Thru
MIDI Thru transmits an exact copy of the messages received at the MIDI In jack. It does NOT send keyboard or controller information generated from Halo *(Use the MIDI Out port to send* Halo *data to another instrument.)*

Audio Outputs
The Sub 1 output jacks are stereo jacks. The tip of each jack (accessed when a standard phone plug is inserted) connects to the left or right output of that group.

If you insert a stereo plug into one of the Sub Outputs, the ring of the plug serves as a signal Return which sums into the Main outputs.

Therefore, the Sub 1 jacks can serve as effect sends and returns in order to further process selected instruments and then return them to the main mix.

You can use the Sub 1 jacks as send/returns in order to further process selected Halo presets without using the effects bus on the mixing board. In a pinch, the effect returns can be used to sum additional instruments into the main outputs. It's like having an extra line mixer when you need more inputs!

Output Section

Effects Processors

L Bus

R Bus

Tip   Tip

Ring   Ring

R   L   R   L

SUB 1   MAINS
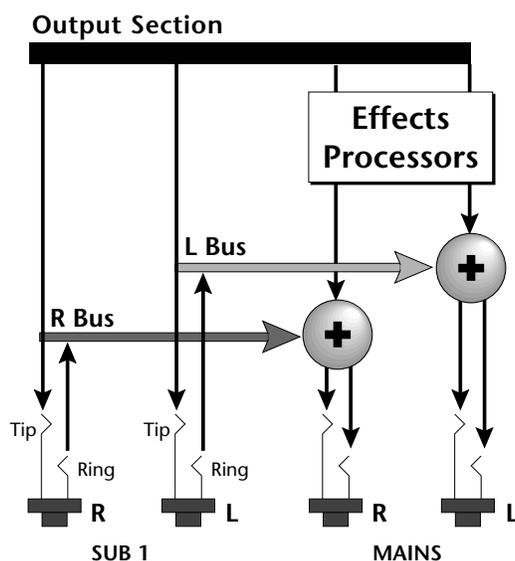
You can use the Sub 1 jacks as effect returns to the Main Outputs.
Note that the Effects Processors are only routed to the Main Outputs.

Instant Gratification

This section presents step-by-step instructions for the most fundamental operations to get you up and running as quickly as possible.

Playing Demo Sequences

Halo has several factory demonstration sequences that let you hear what this incredible machine can do. The actual number of demo sequences depends on which ROM sounds sets are installed. You can play these demo sequences by accessing the Demo Sequence page.

```
DEMO SEQUENCES          HALO
Uncanny 1
```

▶ **To Play a Demo Sequence:**

1. Press and hold the **Main** and **Mix** buttons at the same time to enter the Demo Sequence page. The screen shown above appears.
2. Select a sequence using the **data entry control**. The Enter LED will be flashing.
3. Press the **Enter** button to begin playing the selected sequence. The following screen appears.

```
PLAYING: UNCANNY 1
Press ENTER to stop
```

4. Press the **Enter** button again to stop playing the sequence.
5. When a demo sequence plays to the end, the next demo will automatically begin playing. The screen will display the new demo name.
6. With the sequence stopped, **press any other button** to Exit demo sequence mode.

Auditioning Presets

The front panel audition button allows you to hear any preset in Halo without even playing a note! When the Audition button is pressed, the button's LED will illuminate and a short "Riff" (programmed as part of the preset) will play. The Riff is latched on and plays continuously until the button is pressed again. Presets can be changed while Audition is latched.

✎ *To audition presets with their programmed effects, switch to Omni or Poly mode (located in the MIDI menu).*

The top line of the Main display changes to show the MIDI Bank Select controller values needed to select the preset being auditioned. This is an extremely handy feature when sequencing.

```
┌─────────────────────────────────┐
│ Bank   MSB:008   LSB:2    HALO  │
│ 125²    key: SynhissOrgan        │
└─────────────────────────────────┘
```
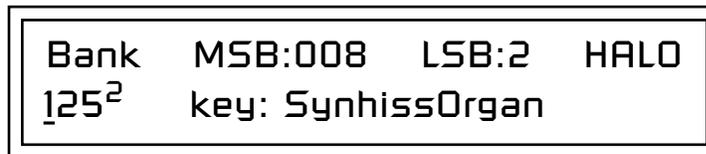
▶ **To Audition a Preset:**

1. Select a preset by turning the **data entry control** while the cursor is anywhere on the lower line of the main screen (shown below).

2. Select a preset by turning the **data entry control** while the cursor is anywhere on the lower line. The preset number field (shown above) is the normal position of the cursor and pressing the Enter button will return the cursor to this position.

3. Press the **Audition** button on the front panel. The Audition LED will illuminate and a short riff will play the selected preset.

4. Continue to select and audition presets.

5. Press the **Audition** button again to turn Audition mode off. The LED will extinguish.

6. Play the keyboard.

7. Be sure to check out the Pitch Wheel, controller knobs and Mod Wheel.

Selecting and Quick Editing Presets

The first thing you'll do with the Halo is select and play the factory provided presets. Halo comes standard with 8 banks containing 128 presets each. See "Main Screen" on page 37.

```
    Channel    Initial    Initial
    Number     Volume      Pan     Arpeggiator   Preset
               Setting    Setting    Setting    Location
      │          │          │          │          │
      ▼          ▼          ▼          ▼          ▼
┌─────────────────────────────────────────────────────┐
│ C01      V127      P01ʀ     A:off     User          │
│ 125²     key: SynhissOrgan                           │
└─────────────────────────────────────────────────────┘
      ▲     ↖      ↖          ↖          ↖
      │      ＼      ＼          ＼          ＼
   Blinking  Preset    Bank      Preset     Preset
   Cursor    Number   Number    Category    Name
```
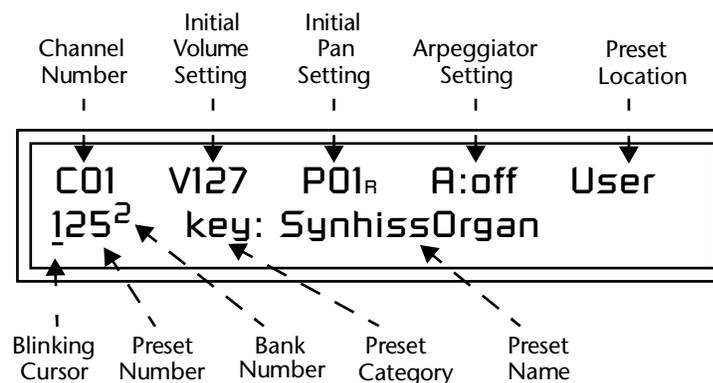
The first four banks are USER locations that can be overwritten and used to store your own presets. The presets that come stored in the USER presets are duplicated in banks 0-3 of the "Halo" ROM bank, so feel free to overwrite them with your own presets. You won't be losing anything.

The *ROM Card* identifier is shown in the top right of the display. The preset is identified in the bottom line of the main screen (the screen that appears when you press the Mode/View Preset button).

Each bank of 128 presets is identified by a superscripted *Bank Number* to the right of the preset number. The bank numbers reset to 0 at the start of each ROM card you have installed. So with the ""HALO ROM installed, the USER banks will go from 0-3, then start over from 0-3 for the Halo ROM banks.

Bank Organization

USER	Bank 0	128 Presets
USER	Bank 1	128 Presets
USER	Bank 2	128 Presets
USER	Bank 3	128 Presets
HALO	Bank 0	128 Presets
HALO	Bank 1	128 Presets
HALO	Bank 2	128 Presets
HALO	Bank 3	128 Presets

The User Banks are duplicated in the Halo ROM bank.
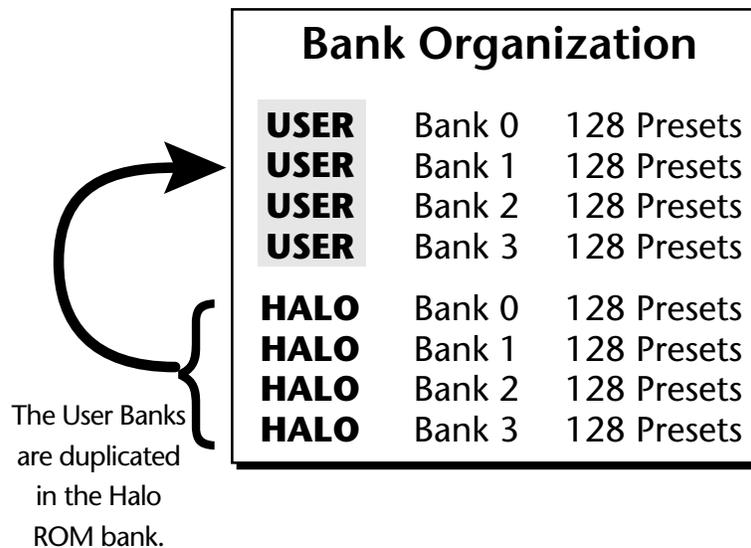
The four User Banks can hold 512 custom presets. Feel free to overwrite these since the factory user presets are duplicated in nonvolatile ROM.

To the right of the preset number and bank is the preset *Category* name followed by the *Preset Name*.

▶ To Change the Preset:

1. Select the main Preset Selection screen by turning off all the menu buttons below the LCD.

2. The cursor will be located under the first character in the Preset Number field. This is the "Home" position which is selected instantly when you press the Home/Enter button. Pressing either of the two cursor buttons repeatedly also gets you there.

3. Turn the **data entry control** knob on the front panel to select a new preset number. If you turn the knob slowly, the presets advance one number for each "click" of the knob. If you spin the knob quickly, the numbers advance much faster (more than one number per click).

You can select presets from the Preset Number, Bank Number, Preset Category or Preset Name fields.

4. **Play the keyboard** (or press the Audition button) and listen to the sounds made by your Halo!

5. **TRY OUT ANY OF THE CONTROLLER KNOBS** on the front panel and note how they change the sound of each preset! Don't worry about ruining the sound, the values are automatically reset as soon as you select a new preset. The three buttons labeled A-D, E-H, I-L allow the four controller knobs to control twelve functions.

Exploring Beats Mode

Halo contains a 16-track play-only sequencer that is optimized for live performance and groove creation. Halo contains dozens of special 16-part Beats Riffs. Beats Riffs are normally used in conjunction with a "**bts:**" preset containing the appropriate percussion mapping. Before you start exploring beats, make sure the Halo is properly set up.

▶ Beats Setup:

Set the Trigger Buttons to Beats Mode

1. Press the **Controllers** button on the front panel.
2. Turn the **data entry control** clockwise until you fin the "TRIGGER BUTTONS FUNCTION" screen.
3. Set the lower line of the display to read, "Play Beats Parts".
4. Press the **Controllers** button on the front panel again to exit the menu.

Set the Trigger Buttons to be Triggers

5. Press the **Triggers** button in the Command Functions section of the front panel. OK, now you're ready to start playing Beats.

▶ Playing Beats:

Selecting Beats Presets

1. Press the **right cursor button twice** so that the cursor is located beneath the **Category** field.
2. Turn the **data entry control** until **bts:** is shown in the Category field.
3. Press the **right cursor button** so that the cursor is underneath the **Preset Name** field.
4. Now turning the **data entry control** selects ONLY **bts:** presets!

Play Beats

5. Press any of the sixteen front panel **Trigger Buttons**. Notice that each button brings in a specific part. The chart below shows which buttons control which part in **bts:** presets.

✎ *If you don't select a "bts:" preset, only the first trigger key will work. Riffs marked "bts:" have 16 parts. Riffs without "bts:" have only 1 part.*

Main Groove	Alt. Groove	Perc / Fills	Instr/Wild
1. Kick1	5. Kick2	9. Perc3/Fill1	13. Inst1/Wild1
2. Snare1	6. Snare2	10. Perc4/Fill2	14. Inst2/Wild2
3. Hihat1	7. Hihat2	11. Perc5/Fill3	15. Inst3/Wild3
4. Perc1	8. Perc2	12. Perc6/Inst.	16. Bass

6. Also notice that the Audition LED comes on when Beats begin playing. Beats are simply multitrack Audition Riffs. Use the **Audition** button to turn Beats on and off.

7. Try out a few different **bts:** presets.

The Arp/Beats LED flashes in time with the Base Tempo.

• Change the Base Tempo from the last screen in the Controllers menu.

Get Busy!

Two of the Controller knobs are programmed to control Beats. Check it out!

8. Press the **M-P** button in the **Controllers** section. Its LED will light.

9. Now turn the **Mod 1 knob** with a Beats Riff playing. Mod 1 is controls the *Beats Busy* parameter which adds or subtracts parts from the Beat.

10. Turn the **Mod 2 knob** with a Beats Riff playing. Mod 2 is controls the *Beats Variation* parameter. Beats Variation changes which parts are playing without changing the number of parts. This makes it easy to try out different combinations of Beat Parts.

▶ **To Play Beats on a different MIDI channel:**

Beats can be assigned to a certain MIDI channel while you play the keyboard on another channel. *(Make sure you have Beats mode set up correctly as described in "Beats Setup" on page 22.)*

1. Press the **Arp/Beats** button. The screen shown below appears.

```
BEATS MODE          Status: P
BtsCh: Basic        TrigCh:Basic
```

2. Set the Beats Channel (BtsCh) to **01**.

3. Select any **bts:** preset on channel **1** *(main screen)*.

4. Press any of the sixteen **Beats buttons** to start your Beat playing. *(Do NOT start Beats by pressing the Audition button.)*

Wrong FX? In Omni mode, the FX assigned to channel 2 will be used. In Multi mode, the Master FX settings will be used. See pages 88 & 98.

5. Press the **+ Channel** button to the left of the LCD to select **channel 2.**

6. Select a preset to jam along with the Beat.

7. The Trigger Keys now play Beats and the other keys play the preset on channel **2**.

8. The Audition button can be used to turn the Beat off. *(If you try to use it to turn Beats on while on channel 2, the Riff on channel 2 will play.)*

Exploring the Master Arpeggiator

Halo's multi-channel Pattern Generator/Arpeggiator is one of the greatest features ever put in a synth. Let's explore the Master Arpeggiator.

▶ **To Arpeggiate a Single Preset:**

1. **Select a preset**. Note that the factory presets all have prefixes which describe the type of sound. For this investigation it might be best to choose a preset with the prefix "arp," for arpeggiator. These presets are optimized for use with the arpeggiator.

2. Set the Arp parameter in the main preset selection screen to "**M**" for Master Arpeggiator.

```
C01   V127   P01ʀ   A:M        HALO1
123³    arp: OrbisTabula1
```

3. Press the **Arp/Beats** button in the Edit section of the front panel to access the master Arpeggiator menu, then use the **data entry control** to scroll to the screen shown below.

```
  MASTER  ARPEGGIATOR
Status                on
```

4. Make sure the arpeggiator Status is "**on**." Play the keyboard to start arpeggiating.

5. Press either **cursor key** repeatedly to move the cursor below the Status field.

6. Turn the **data entry control** clockwise one click. The Mode screen appears.

```
  MASTER  ARPEGGIATOR
Mode               up
```

7. Use the **cursor keys** to move the cursor to the *Mode* field (up, down, up/down, forw asgn, backw asgn, forw/backw, random, pattern). Try out the different modes as you play the keyboard.

8. Move the cursor back to the lower left position and explore the other parameters. The *Note Value* parameter changes the rate of the arpeggios. By the way, note value is a divisor based on the Master Tempo. Try changing the tempo, but come right back.

9. Let's check out the pattern generator. Go back to the **Mode** screen and set the mode to "Pattern".

10. Now advance to the Pattern screen (shown below) and move the cursor to the **Pattern Number** field (the second field from the left).

```
MASTER ARPEGGIATOR
Pattern 38⁰ Inversions
```

See the Arpeggiator Chapter for detailed information on creating Patterns.

11. Try the various patterns. There are 200 permanent factory patterns and 100 user locations to store the patterns you create. Each pattern can have up to 32 notes.

Multi-Channel Arpeggiator

Halo is totally amazing in its ability to run up to 16 arpeggiators at once! Even two or three patterns at once can create very complex sequences and dynamic landscapes of sound.

Here's one way to access this ultra-powerful feature. There is one arpeggiator for each MIDI channel. First you'll assign three of the Trigger Keys to MIDI channels 01-03. Next, you'll assign arpeggiator presets to these channels. Then you'll become addicted to this new way of making music.

Program the Trigger Keys

1. Press the **Controllers** button, then turn the data entry control until the screen shown below appears.
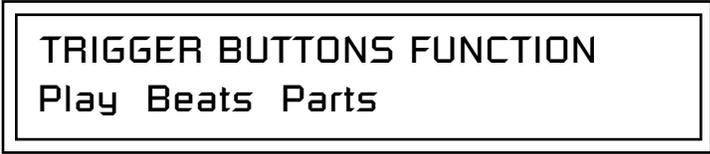
```
TRIGGER BUTTONS FUNCTION
Play  Beats  Parts
```

2. Move the **cursor** to the lower line and turn the data entry control to select "Play Note Events". This sets the Trigger Buttons to play note events instead of selecting Beats parts.

3. Move the **cursor** back to the top line and scroll to the screen shown below.

```
T1   TRIGGERS   Latch: on
Key:C3  Ch: Basic   Vel: 064
```

4. Move the **cursor** until it is underneath the **Latch** field and turn Latch mode On.

5. Move the **cursor** until it is underneath the **Channel** field (Ch) and set the **Channel to 01**.

6. Move the **cursor** until it is underneath the **Trigger** field (T1) and change the **Trigger to T2** (trigger button 2).

7. Turn **Latch On** for trigger button 2 and set the channel to **02**.

8. Change the **Trigger to T3** (trigger button 3).

9. Turn **Latch On** for trigger button 3 and set the channel to **03**.

Set up the Presets

10. Press the **Main** button (located beneath the Data Entry Control). The preset select screen appears.

```
┌──────────────────────────────────────────┐
│ ┌────────────────────────────────────────┐ │
│ │  C01  V127   P00    A:P   HALO         │ │
│ │  026³   arp:Hollographik               │ │
│ └────────────────────────────────────────┘ │
└──────────────────────────────────────────┘
```

11. Move the cursor underneath the **Category** field (as shown above) and select the "**arp**" category.

12. Move the **cursor** underneath the preset name and select any "arp" preset for channel **1**.

13. Press the "**+**" **Channel** select button (located to the left of the LCD), so that **C02** is displayed.

14. Select any other "arp" preset for channel **2**.

15. Select channel **03** and choose another arp preset.

Select Trigger Mode

16. Press the **Selector Button** in the upper left corner of the Command Functions section. Pressing this button will switch between Track Enable/Mute and Triggers mode. Select Triggers mode.

Play it!

17. Now press **Trigger Buttons 1, 2 and 3**. You should be hearing three arpeggiators playing at once.

18. **Change the arp preset** on the current MIDI channel. Since the cursor is located on the preset name, all your selections will be in the arp category.

19. Press the **Channel** button and change the arp presets for channels 1, 2 & 3. Since each factory preset has differently programmed arpeggiator settings, changing the preset not only changes the sound, but the arpeggiator as well.

20. You can also **play the keyboard**. You'll be playing the preset currently showing in the display.

21. Adjusting the front panel **Controller Knobs** modifies the preset showing in the LCD.

22. Press the **M-P** button in the Controllers section to select the Arp control functions. Adjust the **Arp Velocity** and **Arp Gate Time**. Then change the **MIDI channel** and do it for another arp pattern.

23. Press the **Mix** button so that "VOLUMES" is selected. This screen lets you blend the volume of every arpeggiator preset.

There's lots more to the arpeggiators. To find out more, refer to the arpeggiator chapter beginning on page 43.

Sometimes a simple volume change will bring out hidden voices and patterns.

Time to Save?

If you want to SAVE everything exactly as it is, continue on.

Multisetups save your entire Halo setup. Find out more on page 84.

1. Press the **Multi** button (located directly under the Data Entry Control).
2. Rotate the **data entry control** until you get to the menu shown below.

```
MULTISETUP NAME
User Setup
```

3. Press the **right cursor** button to move to the lower line.
4. **Name your Multisetup** so you can find it later, then press **Enter**.
5. Scroll to the next screen using the **data entry control**.

```
SAVE SETUP TO
002 User Setup
```

6. Move the **cursor** to the lower line, select a location and press **Enter**.

Basic Operations
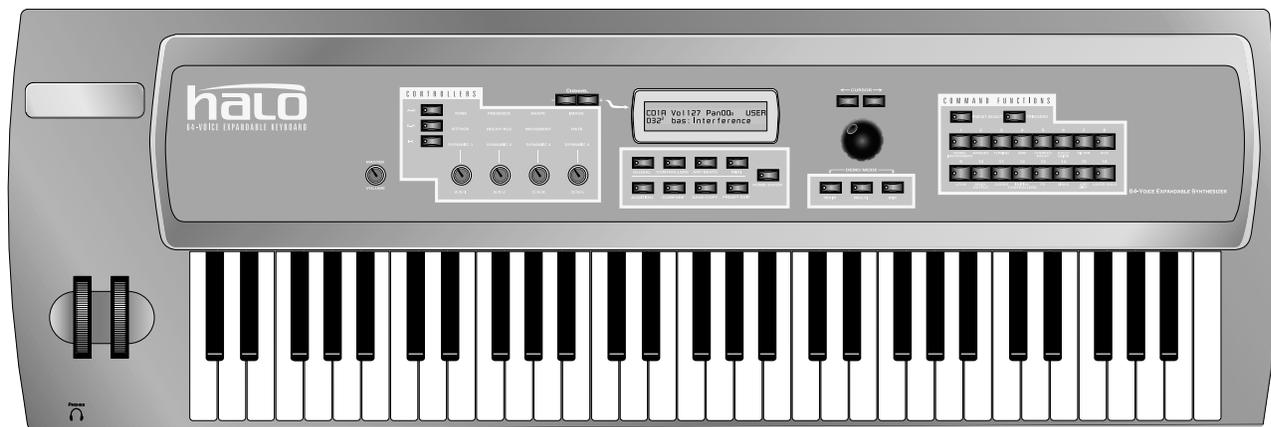
The Halo front panel contains an LCD screen, 35 buttons, and 4 real-time controller knobs. Functions are grouped logically and the controls are arranged for ease of use.

Power Switch

The power switch is located on the rear panel next to the AC power receptacle.

Volume Control

This control is the master volume control for all audio outputs. The Volume Control does not affect any editing or user interface operations.

The front panel volume control is a digital attenuator. For maximum dynamic range, turn this knob all the way up and control the volume from your mixer or amplifier.

Channel +/- Buttons

These very handy buttons, located to the left of the LCD, serve as a shortcut to increment or decrement the MIDI Channel (in Preset mode), Layer (in Preset Edit mode) or Step Numbers (in Arpeggiator Edit mode).

Data Entry Control

The data entry control is a stepped, variable control switch used to change parameter values. The wheel increments or decrements the current value

one unit with each click. This control incorporates acceleration, which advances the value faster if the data entry control is turned quickly.

Cursor Buttons

These buttons, located just above the Data Entry Control, move the cursor to the next parameter on the display. (The cursor is a little flashing line underneath one of the parameters in the display.) Press either cursor button until the cursor is underneath the desired parameter. The cursor buttons have an auto-repeat feature which advances the cursor when the button is held continuously.

← CURSOR →

The cursor can be moved bidirectionally using the data entry control while either cursor select button is held down (for example, press and hold the right cursor button and turn the data entry control).

Pitch & Mod Wheels

These two controls, located to the right of the keyboard, are performance expression controls. The left "Pitch Wheel", is spring-loaded and is normally used to bend the pitch up and down while playing. The center position is off. The pitch bend range is set using the "Pitch Bend Range" parameter in the Global menu (page 84).

The right "Mod Wheel" is programmed to add vibrato in most of the factory presets. Like all the controllers in Halo, the Mod Wheel can be programmed to control any synthesizer parameter. See PatchCords on page 102 and page 157 for more information.

Edit Section

GLOBAL   CONTROLLERS   ARP/BEATS   MIDI

HOME/ENTER

AUDITION   COMPARE   SAVE/COPY   PRESET EDIT
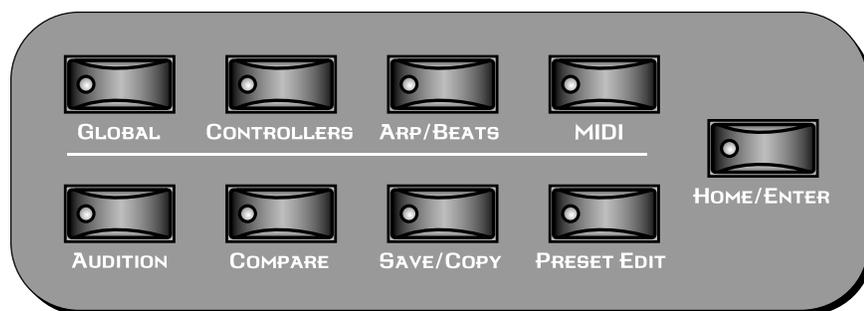
Global Button

The Global menu contains parameters that affect the entire machine. An illuminated LED in the button indicates that you are in the Global menu. For more information about the Global menu, see page 83

Controllers Button

The Controllers menu contains parameters that are related to the front panel controller knob and button triggers. An illuminated LED in the button indicates that you are in the Controllers menu. For more information about the Controllers menu, see page 71.

Arp/Beats Button

The Arpeggiator menu contains parameters that are related to Beats mode and the Master Arpeggiator. Beats is a 16-track play-only sequencer that is optimized for live performance and groove creation. An illuminated LED in the button indicates that you are in the Arp/Beats menu. For more information about the Arp/Beats menu, see page 43.

MIDI Button

The MIDI menu contains parameters that are MIDI related. An illuminated LED in the button indicates that you are in the MIDI menu. For more information about the MIDI menu, see page 93.

MIDI Panic Button

Pressing the MIDI and Home/Enter buttons simultaneously sends a MIDI "All Notes Off" and "All Sound Off" for all 16 MIDI channels. This immediately kills all sounding notes internally and over MIDI.

Audition Button

When the Audition button is pressed, the LED next to the button will illuminate and a short "Riff" (programmed as part of the preset) will play. The Riff is latched on and plays continuously until the button is pressed again. Presets can be changed while Audition is latched on. *See "Bank Select Commands" on page 126 for more information on selecting banks via MIDI.*

The top line of the Preset display changes to show the MIDI Bank Select controller values needed to select the preset being auditioned. This handy feature lets you know the exact Bank and Preset number.

MSB   LSB

```
Bank   MSB:008   LSB:3   HALO1
072³     sfx: Slicer
```
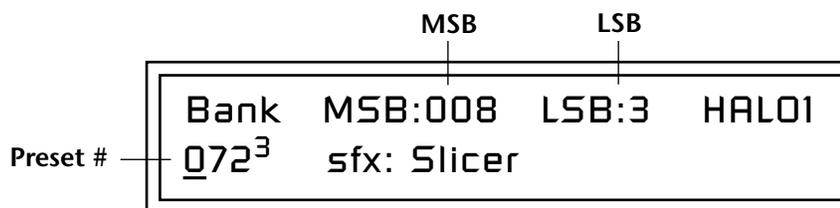
Preset #

Compare Button

The Compare button allows you to toggle between an edited version of a preset and the original, unedited version. When a preset has been edited, the Save/Copy LED flashes. Press the Compare button, lighting its LED, to hear the unedited preset. Press the Compare button again to hear the edited preset. If edits are made to the preset while listening to the compared original version, compare mode is aborted and the compare LED goes off.

Save/Copy Button

The Save/Copy button is used to save changes to a preset, copy data between presets, randomize presets and to move other types of data. Selected groups of parameters, such as PatchCord settings, can be copied between Presets and/or between Layers using this menu. The menu is context-sensitive and will start at the appropriate save screen. See Save/Copy on page 187 for more information.

The LED in the button illuminates to indicate that you are in the Save/Copy menu. The LED also illuminates when any preset parameter has been changed in the Preset Edit menu (or if the front panel knobs have been moved with Quick-Edit mode enabled).

Preset Edit Button

The Preset Edit menu allows you to create and edit presets. An illuminated LED in the button indicates that you are in Preset Edit mode. For more information about the Preset Edit menu, see page 129.

Home/Enter Button

The Home/Enter button is dual purpose. In general, this button acts as the "Home" button. For example, when in an Edit menu, this button snaps the cursor to the page name field of the current screen. When viewing the Preset Select screen, this button snaps the cursor to the preset number field. The flashing green LED of the Home/Enter button indicates that pressing the button will initiate a particular operation.

Real-time Controller Knobs

The Real-time Controller Knobs serve dual purposes. Knobs Preset Quick Edit (page 79) can be enabled to use the knobs for editing in the Preset Edit menu.

1. **Quick Edit** - Real-time control of internal synthesizer parameters and "Quick Editing" the initial settings of the real-time controllers

2. **Programmable Knobs** - Real-time control of MIDI continuous controllers on external synthesizers

CONTROLLERS

A–D
E–H
I–L

TONE	PRESENCE	SHAPE	IMAGE
ATTACK	DECAY/RLS	MOVEMENT	RATE
DYNAMIC 1	DYNAMIC 2	DYNAMIC 3	DYNAMIC 4
A/E/I	B/F/J	C/G/K	D/H/L
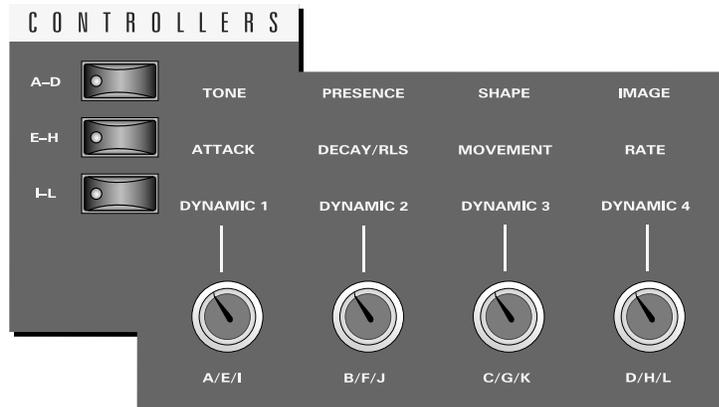
Knob Functions

Quick Edit mode

The Real-time controller knobs provide direct control of the Halo's synthe-sizer parameters when the Controller Function Select is set to Quick Edit.

There is an LED next to each of the control knobs which illuminates to indicate that the knob setting has been changed from the value programmed in the preset ("Knobs Preset Quick Edit" mode must be enabled in the Controllers menu). If the knob position is returned to the original setting, the LED is extinguished.

 Quick Edit knob movements can be recorded into an external sequencer.

Initial controller values can be stored in every preset. When you move a knob with Quick-Edit enabled, the Initial Controller Value is updated with the knob's new value. The knob's LED lights indicating that the preset value has been changed. The MIDI A-L values are stored in the corresponding *Initial Controller Amount* parameter in the Preset Edit menu (see "Initial Controller Amount" on page 167). The Save/Copy button LED flashes to remind you that the preset has been edited. "Quick-Edits" made to a preset are lost if you select another preset before saving them.

The three rows of knobs always control the preset on the basic MIDI channel (the channel showing on the preset select screen), when the control switch is set to Quick Edit.

The labels (Filter Cutoff, Filter Q, Filter Attack, Filter Decay, etc.) printed on these rows show how the factory ROM presets are programmed to respond. *(The controls may not exactly conform to the front panel labels depending on the preset.)* You can change the way a preset responds to MIDI A-L messages from the Preset Edit menu (PatchCords). The knobs only generate a message when you move a knob to a new value. The current value jumps to the new value.

▶ To Quick-Edit a Preset:

1. Select **Quick Edit** mode using the Controller Function Select button.
2. Use the Control Knobs to change the sound of the current preset as desired.
3. Press the **Save/Copy** button. You may have to turn the data entry control so that the display reads, "Save PRESET to."
4. Press the right cursor button to select the bottom row.
5. **Optional:** Select a new preset location if you don't want to overwrite the current preset, or if the current preset is a ROM preset.
6. Press the **Enter** button to save the preset.

Screen View Buttons

MAIN   MULTI   MIX
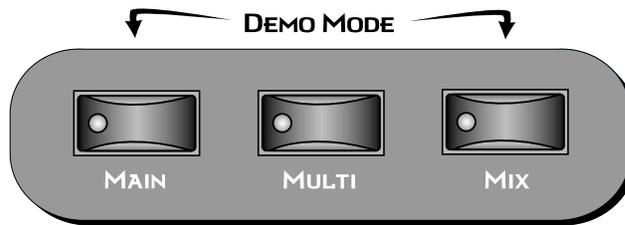
The Screen View buttons switch between three display modes.

Main

This button instantly switches the display to the Main Screen shown below. This screen is used for changing presets, changing MIDI channels and setting the volume and pan positions for each MIDI channel. See page 37 for more information.

```
C01   V127   P01ᵣ   A:off   User
079³   kit: Hide & Seek
```

Multi

This button switches the display to the Multisetup menu. A Multisetup is a group of parameters that you might associate with a particular performance setup or song. See page 41 for detailed information about Multisetups.

```
RESTORE  MULTISETUP
000  User Setup
```

Mix Screen

This button switches the display to the Mix screens (volume & pan). The mix screens allow you view and adjust the volume and pan settings for all 16 channels. This is particularly useful when playing back a MIDI sequence. The volume and pan settings for all 16 channels are saved with the Multi-setup (page 41).

```
VOLUMES   Chan: 01   Vol: 127
▊▊▊▊▊▖▊▖▖▊▊▊
```

```
 ┌─────────────────────────────────────┐
 │                                     │
 │  PANS      Chan: 01   Vol: 127      │
 │ right ·····   ┬┌─┐┬┌──┬┐┌┬─┬─┐┬      │
 │  left ·····  ┘└─┘└─┘  └┘└ └ └┘       │
 │                                     │
 └─────────────────────────────────────┘
```

Demo Mode
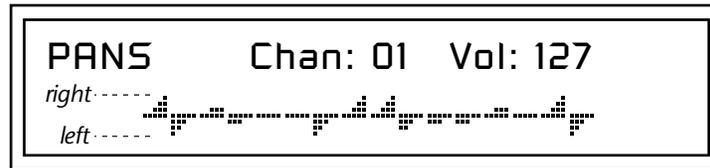
Pressing the Main and Mix buttons simultaneously calls up the Demo Sequence page. Halo has several factory demonstration sequences that let you hear what this incredible machine can do. The actual number of demo sequences depends on which ROM sounds sets are installed.

```
 ┌─────────────────────────────────────┐
 │                                     │
 │  DEMO SEQUENCES          HALO        │
 │  UNCANNY 1                           │
 │                                     │
 └─────────────────────────────────────┘
```

▶ **To Play a Demo Sequence:**

1. Press and hold the **Main** and **Mix** buttons at the same time to enter the Demo Sequence page. The screen shown above appears.
2. Select a sequence using the **data entry control**. The Enter LED will be flashing.
3. Press the **Enter** button to begin playing the selected sequence. The following screen appears.

```
 ┌─────────────────────────────────────┐
 │                                     │
 │  PLAYING: UNCANNY 1                  │
 │  Press ENTER to stop                 │
 │                                     │
 └─────────────────────────────────────┘
```

4. Press the **Enter** button again to stop playing the sequence.
5. When a demo sequence plays to the end, the next demo will automatically begin playing. The screen will display the new demo name.
6. With the sequence stopped, **press any other button** to Exit demo sequence mode.

Command Functions

The Command Functions section serves multiple purposes which are listed below.

- **Beats Part enable/disable.** *See page 22.*
- **Assignable & latchable note triggers.** *See page 76.*
- **Preset select keys.** *See page 77.*
- **External preset select keys.** *See page 78.*
- **Preset Edit menu jump keys.** *See below.*
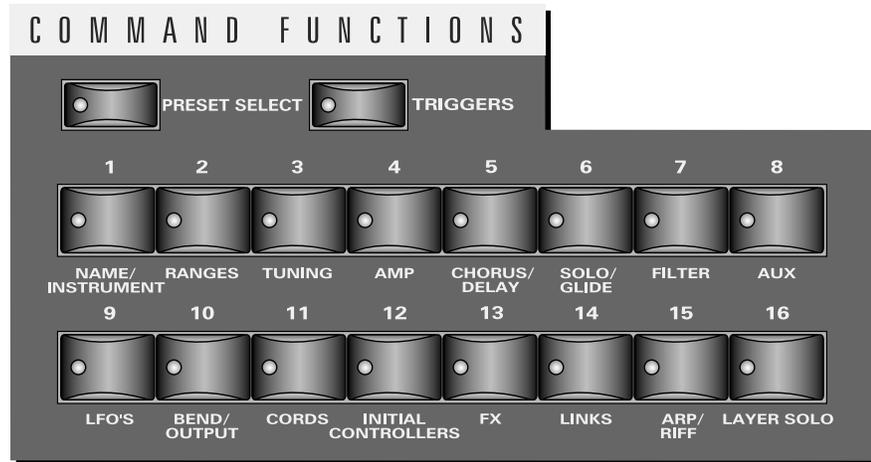
Preset Selection

When the preset selection LED is lit, the command buttons can be used to quickly select sixteen of your favorite presets. In this mode, pressing one of the comand buttons selects the preset you have assigned to the button. See page 77 for more information.

Trigger Mode

Select Triggers mode by pressing the mode select button so that the "Triggers" LED is illuminated. Now the 16 buttons work like keyboard notes. Each of the 16 buttons can be assigned to any MIDI note, on any MIDI Channel (01-16), with any velocity (0-127), and can be set to be latched or momentarily on. Latched note will hold until the button is pressed again. Latched notes will be indicated by the LEDs. Trigger keys are assigned from the Controllers menu. See page 76 for more information.

Preset Menu Jump Keys

Whenever you are in the Preset Edit menu, the sixteen command buttons function as "jump" buttons to the various screens in the Preset Edit menu. The jump location is labelled directly below each button.

Pressing a jump button instantly takes you to the first screen in the selected category. Pressing the button again takes you to the second screen in the category and so on. Repeated pressing will rotate you back to the first screen in the category.

Main Screen

The Main Screen is accessed by pressing the Main button located directly under the data entry control. From this screen you can examine or change the Preset, Volume, Pan Position and Preset Location for each of the 16 MIDI channels.

```
C01   V127   P01ᵣ   A:off   User
079³   kit: Hide & Seek
```

MIDI Channel Selection

▶ **To Change the MIDI Channel:**

1. Press the Main button to display the Main screen.

2. Press the Channel inc/dec buttons located to the left of the liquid crystal display to select channels 01 through 16. The preset, volume and pan settings for each channel will be displayed as you scroll through the channels.

The channel number shown in the main screen is the "Basic MIDI Channel" when in Omni or Poly modes.

Preset Selection

▶ **To Change the Preset:**

1. Press the **Main** button to display the Main screen.

2. Press either **cursor key** until the cursor is underneath the preset number. (The cursor is a little flashing line underneath one of the parameters in the display.) As you rotate the data entry control, the preset number and name changes.

3. The displayed preset is assigned to the displayed MIDI channel. Presets are arranged into banks of 128, as shown in the diagram at left.

Bank	Contents
0 −	**128 RAM Presets**
USER **1** −	**128 RAM Presets**
2 −	**128 RAM Presets**
3 −	**128 RAM Presets**
ROM 1 **0** −	128 ROM Presets
1 −	128 ROM Presets
2 −	128 ROM Presets
⋮	⋮
??	*Depending on ROM sets installed*

Bank Number

Preset Number

```
C01   V127   P01ᵣ   A:off   User
079³   bts: Logic
```
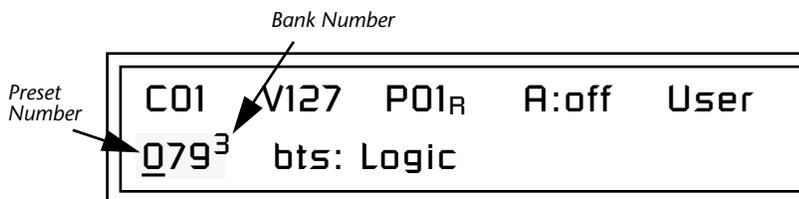
Using the screen above as an example, the superscripted number 2 in the second line of the display identifies the current bank number.

- Select banks independently of the of the preset number by locating the cursor on the Bank field and turning the data entry control.

```
                    MIDI BANK SELECT
                     MSB  LSB
                     cc00 cc32

          USER        00   00     Bank 0
          USER        00   01     Bank 1
          USER        00   02     Bank 2
          USER        00   03     Bank 3

          HALO        08   00     Bank 0
          HALO        08   01     Bank 1
          HALO        08   02     Bank 2
          HALO        08   03     Bank 3
```

This chart shows the MSB and LSB numbers needed to select preset banks over MIDI. Select a bank, then send the program change number. Without a bank select command, presets are selected from within the current bank.

Channel Volume

Channel Volume sets the volume of the selected MIDI channel in relation to the other channels. This is the same parameter as MIDI volume control #7, and changes made over MIDI are shown in the display.

Volume

```
 C01     V127    P01ᵣ   A:off   User
 079³    bts: Logic
```
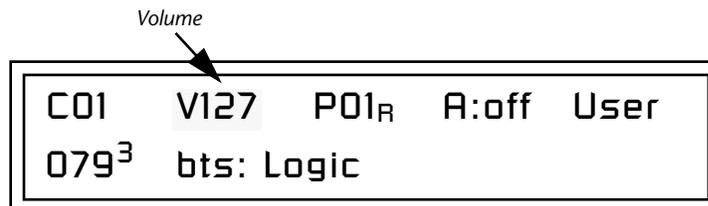
▶ **To Change the Channel Volume:**

1. Press the **Main** button to display the Preset Select screen.
2. Press either **cursor key** until the cursor is underneath the volume value.
3. Rotate the **data entry control** to select a volume level. The Channel Volume range is 000-127.

Channel Pan

Channel Pan sets the stereo position of the selected MIDI channel. This control operates like the balance control on your home stereo system. Channel Pan is the same parameter as MIDI pan controller #10, and changes made over MIDI are shown in the display.

Pan Position

```
┌─────────────────────────────────┐
│                                 │
│  C01   V127  P01ʀ   A:off  User │
│                                 │
│  079³   bts: Logic              │
│                                 │
└─────────────────────────────────┘
```
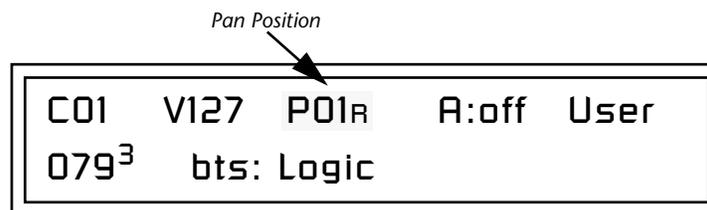
Note: Pan settings in the preset ADD algebraically with the Channel Pan setting. Therefore, if the pan setting in the preset were set to "63ʀ," moving the Channel Pan setting full left would return the sound to the center position.

▶ **To Change the Channel Pan:**

1. Press the **Main** button to display the Preset Select screen.
2. Press either **cursor key** until the cursor is underneath the pan field.
3. Rotate the data entry control to **select a pan value**. 64ʟ indicates a hard left pan, 63ʀ indicates a hard right pan. With a setting of "00," the sound is centered in the stereo field.

Channel Arpeggiator

This function controls the arpeggiator for each MIDI channel. When the channel arpeggiator mode is set to Off, then there is no arpeggiation on that channel, regardless of what is set up in the Master Arpeggiator or preset. If the channel arpeggiator is On, the preset's arpeggiator is used, regardless of whether or not it is turned on in the Preset Edit menu. This lets you turn on arpeggiation from the main screen.

If the mode is set to "P" (for preset), the preset's arpeggiator settings and on/off status is used. If the mode is set to "M" (for master), the master arpeggiator settings and on/off status (located in the Arp menu) are used. *See the "Arp/Beats Menu" on page 43 for more information.*

▶ **To Play the Arpeggiator (Quick Start):**

1. From the **Main** screen, press either cursor key repeatedly until the cursor is underneath the **arpeggiator field** (A:).
2. Rotate the data entry control to select "**P**" for preset.
3. Press either cursor key repeatedly until the cursor is underneath the **Preset Category** field and select "**arp**:" using the data entry control.
4. Press the right cursor button to move it to the **Preset Name** field.
5. **Play notes or chords** on the keyboard. Change presets as desired to audition the various patterns and presets.

Sound Navigator

Sound Navigator allows you to search through preset and instrument categories to find the type of sound you're looking for. Each preset and instrument has a name and a three letter preset category. You can create your own categories in order to group favorite presets. The preset category is assigned in the Preset Edit menu (Preset Name). Instrument categories are fixed.

Preset Category

When you want to find presets in a particular category, you simply change the category field in the Main screen, then move the cursor to the preset name field to scroll through all the presets in the selected category.

When the cursor is on the Preset Category field, turning the data entry control selects different preset categories. The Name Field will change to show the first preset in each category.

```
C01   V127   P00   A:off   User
064¹    w_al: Raverotic
```

Preset Category   *Preset Name*
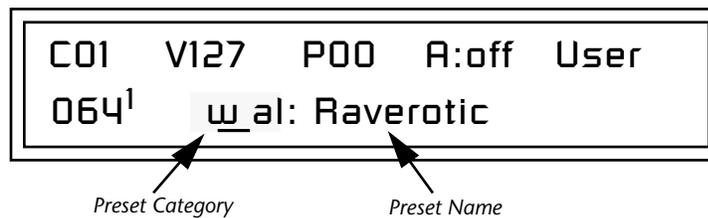
▶ **To Change the Preset Category:**
1. From the Main screen (shown above), press either cursor key repeatedly until the cursor is underneath the preset category field.
2. Rotate the data entry control to select one of the preset categories. Preset Categories are displayed in alphabetical order.

▶ **To Select a Preset within a Category:**
1. After selecting a category, move the cursor to the Preset Name field.
2. Rotate the data entry control to scroll through the presets in the selected category. Note that the preset numbers will no longer change sequentially.

Instrument Category

When the cursor is on the Instrument Category field (Preset Edit menu), turning the data entry control selects different instrument categories. The Name Field changes to show the first instrument in each category. Move the cursor back to the instrument name to choose other instruments in the selected category.

```
ᴸ¹ INSTRUMENT          ROM:HALO
064¹    wal: Raverotic
```

Multisetups

A Multisetup is a group of parameters that you might associate with a particular performance setup or song. It is like a "snapshot" of the current configuration of the Halo. There are 64 setups numbered 0-63. All the Multisetups are user programmable except 63, the factory setup.

A Multisetup includes ALL the following parameters:

- Preset/Volume/Pan/Arp assignments for each of the 16 MIDI channels.
- Multisetup Name
- ALL Controllers menu parameters
- ALL Global Menu parameters, *except…*
    User Key Tuning Tables
- ALL Arp Menu parameters, *except…*
    User Arp Patterns
- ALL MIDI Menu parameters, *except…*
    MIDI Program Change->Preset Map

When a Multisetup is selected, it overwrites the current Preset/Vol/Pan/Arp selections on all MIDI channels. It also overwrites the Controllers, Global, Arp, and MIDI menu parameters (with the exceptions noted above).

If you make changes to any of these menus, Halo will retain the changes, even if power is turned off. They are of course, overwritten when you restore a Multisetup.

Restoring Multisetups

Halo contains 64 Multisetup locations. These are all User locations except location 63, which is a factory defined Multisetup.

Multisetups can be restored using a MIDI Bank Select command.
Select: cc00 = 80, cc32 = 00, (dec) then send a **Program Change** command corresponding to the Multisetup you wish to select.

```
┌─────────────────────────────────┐
│  RESTORE MULTISETUP             │
│                                 │
│  003   Jazzercide               │
│  _                              │
└─────────────────────────────────┘
```

▶ To Restore (Select) a Multisetup:

1. Press the front panel Multisetup button (below the Data Entry Control).
2. Scroll to the Restore Multisetup screen using the data entry control. The menu page most recently selected since powering up Halo will be displayed. The cursor appears below the first character of the screen heading on line one.

3. Press either **cursor** button to move the cursor to the bottom line of the screen.

4. Now, use the **data entry control** to select a Multisetup. The Enter LED will be flashing.

5. Press the **Enter** button to load the selected Multisetup.

Multisetup Name

Multisetups can be named to make it easier to remember their purpose.

1. Scroll to the "Setup Name" screen (shown below) using the **data entry control**.

```
MULTISETUP NAME
020 User Setup 23
```
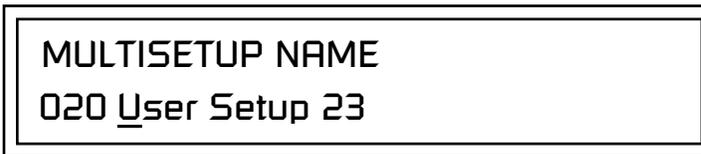
2. Press either **cursor** button to move the cursor to the bottom line of the screen.

3. Change the characters using the **data entry control**. Change the cursor position using the cursor buttons.

4. Press **Enter** or move the cursor to the top line when you're finished naming the multisetup.

Saving Multisetups

▶ **To Save a Multisetup:**

1. Set the Preset, Volume, Pan and Arp settings (in Main mode) for all channels. Set the Global, MIDI, and Controllers menu parameters the way you want them.

2. Press the **Multi** button, then scroll to the "Save Setup" screen (shown below) using the **data entry control**.

```
SAVE SETUP TO
020  Destination Multisetup
```

3. Press either **cursor** button to move the cursor to the bottom line of the screen.

4. Now, use the **data entry control** to select the destination location. The Enter LED will be flashing.

5. Press the **Enter** button to save the Multisetup.

Arp/Beats Menu

Halo's Beats mode allows you to trigger, latch and unlatch synced loops and grooves from separate keys on your keyboard. Simply select a bts: preset and play the 16 trigger keys to bring specific *Parts* in and out. This is *Macro-Music!*

Halo can also run up to 16 simultaneously synced arpeggiators, each with a different preset sound. The arpeggiators can either play one of 7 chord arpeggios or can be set to play a pattern, which is a stored sequence of notes. Combined with Beats, the sheer number of musical permutations is staggering!

▶ To enable the Arpeggiator/Beats menu:

Press the Arp button, lighting the LED. The Arp screen displays the menu page most recently selected since powering up Halo. The cursor appears below the first character of the screen heading on line one.

▶ To select a new screen:

Press the Home/Enter button or press the Cursor button repeatedly until the cursor is below the screen title heading on the top line of the display. Rotate the data entry control to select another screen.

Arp parameters are automatically saved to the current multisetup when you exit the menu, but you may wish to save to another location.

If another Multisetup is "Restored" any unsaved changes will be lost if you haven't saved the Multisetup.

▶ To modify a parameter:

Press either Cursor button repeatedly (or hold down the right cursor button while turning the data entry control) until the cursor is below the desired parameter value. Rotate the data entry control to change the value.

▶ To access a submenu:

The Master Arpeggiator screens have submenus which are accessed by pressing the cursor buttons to move the cursor to the lower left corner of the display. Select the submenu function using the data entry control.

▶ To save Arpeggiator parameters:

Press the front panel Multi button and scroll to "Save Setup To". Select a Setup number and press Enter. *See "Saving Multisetups" on page 42.*

▶ To return to the previously selected Mode/View screen:

Press the Arp/Beats button, turning off the LED.

Beats

Halo contains a 16-track play-only sequencer that is optimized for live performance and groove creation. Halo contains dozens of special 16-part Beats Riffs created by some of the best producers in the business. Beats Riffs are normally used in conjunction with a "**bts:**" preset containing the appropriate percussion mapping, but any preset can be selected and used.

The Beats channel is selected from the Beats enable screen in the Arp/Beats menu.

Here's how it works. Each of the 16 parts is assigned to a trigger key on the selected Trigger MIDI channel. Each part is brought in or out by pressing that key. Keys can also be Latched *(press the key once to turn the part on, press it again to turn the part off)*. Other control keys allow you to Mute All Parts, Clear All Parts, and Start & Stop the beat. The 16 parts are arranged in the following manner:

Main Groove	Alt. Groove	Perc / Fills	Instr/Wild
1. Kick1	5. Kick2	9. Perc3/Fill1	13. Inst1/Wild1
2. Snare1	6. Snare2	10. Perc4/Fill2	14. Inst2/Wild2
3. Hihat1	7. Hihat2	11. Perc5/Fill3	15. Inst3/Wild3
4. Perc1	8. Perc2	12. Perc6/Inst.	16. Bass

For each Beats Riff, you have 2 Grooves, 4 Fills which correspond to the four parts of the Main and Alternate groove, and 4 Instrument parts. By adding and removing parts, you control the complexity of the groove.

Each part can also be scaled by *Key Velocity*, allowing you to fade parts in and out (if velocity is routed to volume) as you play, or can be *Transposed* over a six octave range.

Each part can be assigned to any one of four *Groups,* which allow multiple parts to be triggered from a single key. You can only access Groups using the keyboard trigger keys. See the Factory Setup diagram on the next page.

Trigger layouts are saved with the Multisetup.

👀 *Beats (bts:) Riffs are special 16-part riffs made especially for use with Beats mode. A Riff without the **bts:** prefix only has Part 1 recorded.*

✎ *By assigning Trigger Buttons (page 76) to the keyboard Beats Layout Keys, you can trigger Beats and MIDI notes using the Trigger buttons.*

Factory Setup

Multisetup 63

Clear Parts
Trig. Hold

Snare 1
Perc 1
HiHat 2
Perc 3/Fill 1
Perc 5/Fill 3
Inst 2/Wild 2
Inst 4/Wild 4
Group 3

C-2
C-1
C0

Main Groove

Alternate Groove

Start/Stop
Mute

Kick 1
HiHat 1
Kick 2
Snare 2
Perc 2
Perc 4/Fill 2
Perc 6/Fill 4
Inst 1/Wild 1
Inst 3/Wild 3
Group 1
Group 2
Group 4
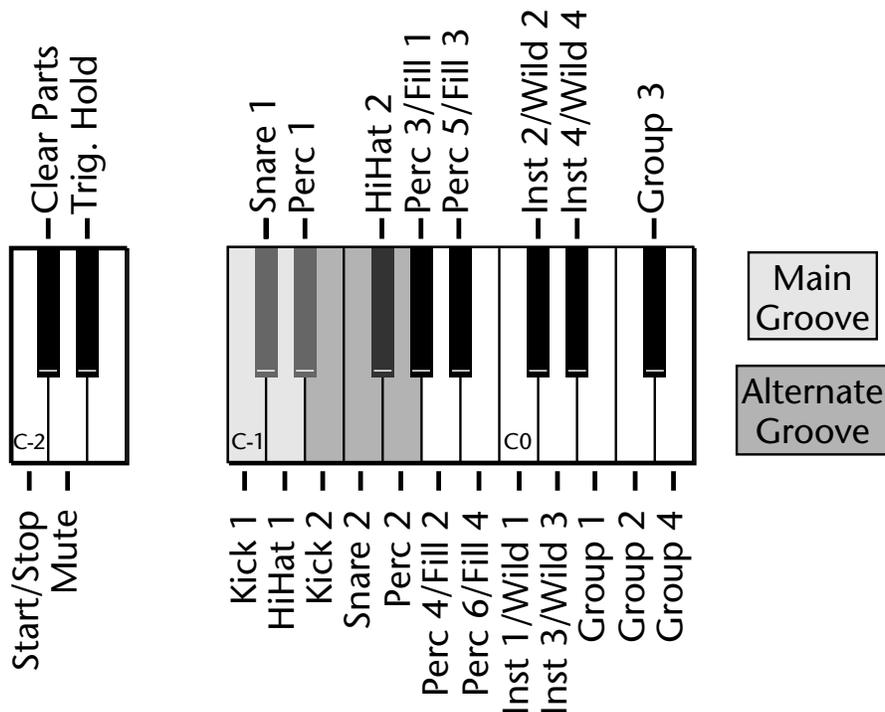
The chart above shows the Factory Multisetup assignment of each Part, the 4 Groups and the Control Keys. These assignments can be modified to suit your personal preference, then saved in one of the Multisetup locations.

✎ Starting Beats mode with the Start/Stop key allows you to start the sequencer rolling silently. Then you can bring Parts in and out using the "Busy" control.

- **Start/Stop Trigger**   Starts the beat sequencer from the beginning of the sequence. When latched, pressing once starts and pressing again stops. When unlatched, the sequence runs as long as the key is held.
Once the Beats sequencer is started, it continues to run even if no triggers are active.

Start/Stop doesn't clear latched parts when it stops the sequencer. Any trigger played after stopping will not only start the sequencer and play that trigger's part, but also play all previously latched parts.

- **Clear Parts**   Clears any enabled parts. This control provides a quick and easy way to shut off all latched Parts. Latch mode has no effect on this key.

✎ If Mute is set to 1-bar, the Part mutes for 1 bar then un-mutes.

- **Mute**   Mutes all Parts while held, but the Beats sequencer continues running.

- **Trig Hold**   When this key is held, all other Trigger Keys behave as if they were in Latch mode.

The Beats sequencer plays as long as any Beats triggers are active. Beats Riffs can also be **Restarted** using a MIDI Song Start command even if the Beats channel is not currently selected. The Audition LED illuminates whenever the Beats sequencer is running (even if no Parts are playing).

Pressing the Audition button or starting a Demo causes the Beats sequencer to stop. Pressing the Audition button plays selected Parts on "bts:" presets.

All Arp/Beats parameters are saved with the Multisetup. (See "Multi-setups" on page 41 for more information.)

Beats Mode

This screen turns Beats mode on and has several other features which allow flexible control over Beats mode. There are several status modes that determine when Beats will be turned on and which Riff will be used.

Beats and BEAT Triggers can be set to different MIDI channels. This allows you to perform on two MIDI channels at once with a keyboard that only transmits on a single MIDI channel.

```
BEATS MODE        Status: P
BtsCh: Basic      TrigCh:Basic
```
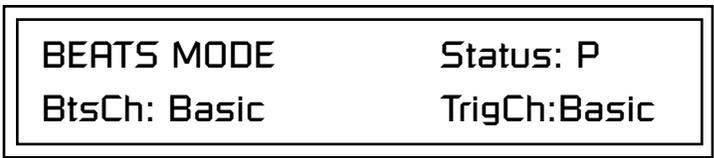
The Basic Channel is the MIDI channel currently displayed in the Main Screen.

Status
- **Off** . . . . Beats mode off.
- **On** . . . . Beats mode on. The Riff assigned in the preset is used.
- **P** . . . . Beats mode is turned on *ONLY* if the Riff assigned in the preset is a "bts:" riff. The Riff assigned in the preset is used. *(Default setting)*
- **M** . . . . Beats mode on. The Master Riff is used (Arp/Beats menu).

```
BEATS MODE        Status: P
BtsCh: Basic      TrigCh:Basic
```
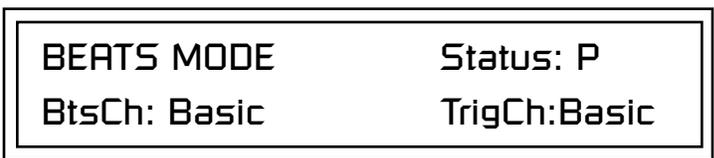
Beats Channel (BtsCh)
- **01-16** . . . . . Selects the MIDI channel on which Beats play.
- **Basic** . . . . . . Beats play on the MIDI channel displayed in the Main Screen.

Trigger Channel (TrigCh)
- **01-16** . . . . Selects the MIDI channel on which Trigger Keys will be active.
- **Basic** . . . . Sets the Trigger Keys to the MIDI channel displayed on the Main Screen.

▶ **Beats Setup:**

Set the Trigger Buttons to Beats Mode

1. Press the **Controllers** button on the front panel.
2. Turn the **data entry control** clockwise until you fin the "TRIGGER BUTTONS FUNCTION" screen.
3. Set the lower line of the display to read, "Play Beats Parts".
4. Press the **Controllers** button on the front panel again to exit the menu.

Set the Trigger Buttons to be Triggers

5. Press the **Triggers** button in the Command Functions section of the front panel. OK, now you're ready to start playing Beats.

▶ **Playing Beats:**

Selecting Beats Presets

1. Press the **right cursor button twice** so that the cursor is located beneath the **Category** field.
2. Turn the **data entry control** until **bts:** is shown in the Category field.
3. Press the **right cursor button** so that the cursor is underneath the **Preset Name** field.
4. Now turning the **data entry control** selects ONLY **bts:** presets!

Play Beats

5. Press any of the sixteen front panel **Trigger Buttons**. Notice that each button brings in a specific part. The chart below shows which buttons control which part in **bts:** presets.

Main Groove	Alt. Groove	Perc / Fills	Instr/Wild
1. Kick1	5. Kick2	9. Perc3/Fill1	13. Inst1/Wild1
2. Snare1	6. Snare2	10. Perc4/Fill2	14. Inst2/Wild2
3. Hihat1	7. Hihat2	11. Perc5/Fill3	15. Inst3/Wild3
4. Perc1	8. Perc2	12. Perc6/Inst.	16. Bass

6. Also notice that the Audition LED comes on when Beats begin playing. Beats are simply multitrack Audition Riffs. You can use the **Audition** button to turn Beats on and off.
7. Try out a few different **bts:** presets.

Get Busy!

Two of the Controller knobs are programmed to control Beats. Check it out!

8. Press the **M-P** button in the **Controllers** section. Its LED will light.

👓 *If you don't select a "**bts:**" preset, only the first trigger key will work.*

Riffs marked "bts:" have 16 parts. Riffs without "bts:" have only 1 part.

9. Now turn the **Mod 1 knob** with a Beats Riff playing. Mod 1 is controls the *Beats Busy* parameter which adds or subtracts parts from the Beat.

10. Turn the **Mod 2 knob** with a Beats Riff playing. Mod 2 is controls the *Beats Variation* parameter. Beats Variation changes which parts are playing without changing the number of parts. This makes it easy to try out different combinations of Beat Parts.

▶ **To Play Beats on a different MIDI channel:**

Beats can be assigned to a certain MIDI channel while you play the keyboard on another channel. *(Make sure you have Beats mode set up correctly as described in "Beats Setup" on page 47.)*

1. Press the **Arp/Beats** button. The screen shown below appears.
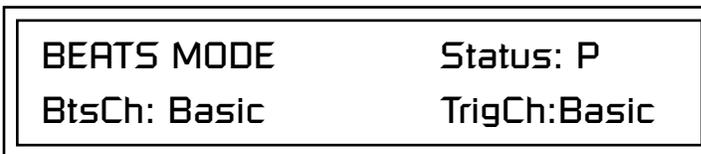
```
┌─────────────────────────────────────┐
│ BEATS MODE        Status: P         │
│                                     │
│ BtsCh: Basic      TrigCh:Basic      │
└─────────────────────────────────────┘
```

2. Set the Beats Channel (BtsCh) to **01**.

3. Select any **bts:** preset on channel **1** *(main screen)*.

4. Press any of the sixteen **Beats buttons** to start your Beat playing. *(Do NOT start Beats by pressing the Audition button.)*

5. Press the **+ Channel** button to the left of the LCD to select **channel 2**.

6. Select a preset to jam along with the Beat.

7. The Trigger Keys now play Beats and the other keys play the preset on channel **2**.

8. The Audition button can be used to turn the Beat off. *(If you try to use it to turn Beats on while on channel 2, the Riff on channel 2 will play.)*

✎ **Wrong FX?** *In Omni mode, the FX assigned to channel 2 will be used. In Multi mode, the Master FX settings will be used. See pages 88 & 98.*

Beats Controllers

Beats can be controlled using the front panel real-time controllers or external MIDI continuous controllers. **Controllers are patched to Beats via the Preset PatchCords located in the Edit menu.** The following Preset PatchCord destinations control Beats.

Beat Velocity Group 1-4 (BtsVelG1 -> BtsVelG4)

Parts assigned to one of the four Beats groups can have their velocity scaled by the controller input. Since most "bts" presets have velocity controlling volume, this control can be used to mix the relative levels of the Groups.

Beats velocity works as a percent *addition*. An input value of 0 (or no Cord) means change the velocity by 0%. A full scale modulation setting of 100% in the PatchCord adds 100% to the velocity value 100% + 100% = 200%. A PatchCord setting of -100% *subtracts* 100% from the velocity (making it 0). Beat velocity scalings are reset with a preset change.

Beat Xpose Group 1-4 (BtsXpsG1 -> BtsXpsG4)

Parts assigned to one of the four Beats groups are transposed by the controller input. Transpose works by shifting the keyboard position and not by changing the tuning of individual notes. Therefore, on a Beats presets (bts), where different instruments are assigned to each key, Transpose has the effect of changing the instrument used by a particular part. This control ADDS to the Part Transpose set in the Beats Transpose screen (page 53). Beat transpose offsets are reset with a preset change.

Original Part → **Transposed +12**

Kick — Fun Scratch — Tick — 909 Click — Machine Kick — **Kick** — Snare — 808 Snare — Simmons Tom — 909 Tom — Tom Wave — 909 Tom — **Waver Tom** — 909 Tom — Cymbal — Ride Cymbal — Splash Cymbal — Splashy Cymbal — Ride Cymbal — Bongo Tone — Bongo Tip — Low Conga — Timbale 3 — Agogo Hi-Tone — Cabasa — Guiro — Guiro — Guiro — Wood Block — Wood Block — Triangle Mute — Triangle Open — Crowd
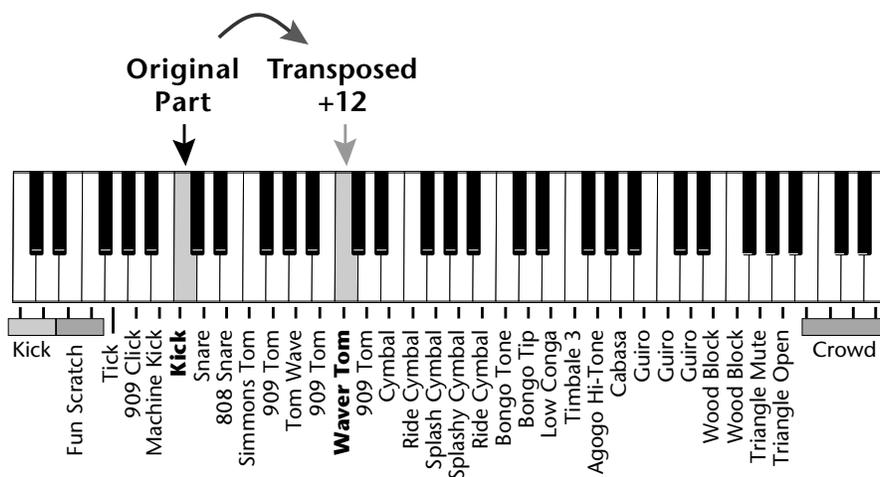
Beat Busy (BtsBusy)

The Mod 1 controller knob is assigned to Beats Busy.

This destination determines which parts are enabled. Beat Busy will accept either positive or negative values.

- **Positive values *Add* parts to whatever parts are triggered**
- **Negative values *Remove* parts that are triggered.**

A PatchCord amount of 50% is enough to drive Beat Busy to the maximum setting.

Hot Tip!
The Bidirectional Mod Wheel:
Set Mod Wheel to BtsBusy with a Cord amount of +100, then add a DC bias to BtsBusy with a Cord amount of -50. Wheel now adds or subtracts "Busyness".

Cool Tip! *Connecting Key Pressure to Beat Busy at 50% increases BEAT complexity the harder you press.*

The Mod 2 controller knob is assigned to Beats Variation.

Suppose the pitch wheel *(which can output both positive and negative values)* were connected to Beat Busy and four Key Triggers are down. As the pitch wheel is moved from center to fully up, the remaining parts will be enabled until the pitch wheel is fully up and all parts are playing. Moving the pitch wheel from center to fully down, the four triggered parts are sequentially removed until at the most negative position of the wheel, no parts are playing.

The Busy control acts on the Beats condition whenever the control is changed. Playing more triggers without changing the Busy control simply adds them until the Busy control is changed again, at which point it will possibly add or subtract parts as needed.

The interaction between the Busy control, Triggers, Part Velocity and Group Velocity can get complicated, but works according to this rule:

WHICHEVER CONTROL WAS LAST CHANGED TAKES OVER

When interacting with the Group Velocity scale control, the Busy control ignores group velocity even when it is set to zero, enabling and disabling parts as necessary. If the Group Velocity is changed *after* the Busy control, it takes control, scaling parts as it deems necessary.

The Busy control *does* take the Part velocity into account when adding and subtracting parts. If a part has a velocity of 0%, it is removed from the list of parts that the Busy control adds or subtracts. Therefore, you can use the Part Velocity control to remove parts you don't want to hear.
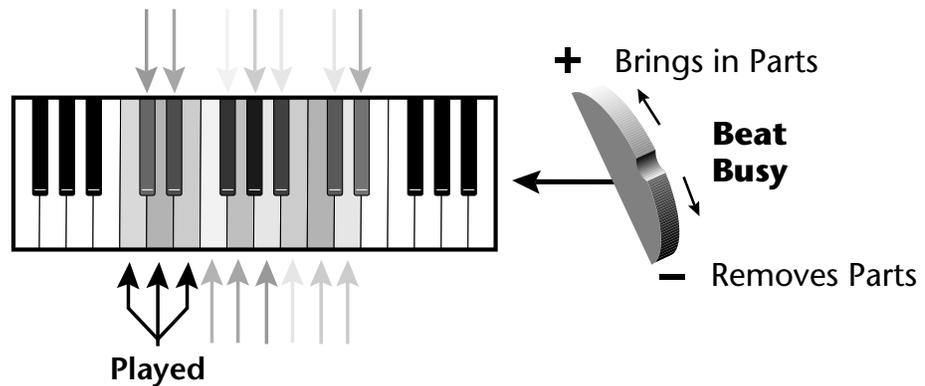
Positive controller values bring in new Parts and negative controller values remove Parts that are latched or held. In this example, the Pitch Wheel is connected to Beat Busy since it outputs negative as well as positive values.

Beat Variation (BtsVari)

Beat Variation varies which Parts are brought in and out using the Beat Busy control. Increasing this control mixes up the order in which Parts are brought in and out, thus providing even more permutations to the Beat.

Beats Keys Layout

This screen assigns the Beats triggers to keyboard notes on the Beats channel. For each Part, Group and Control Key you can select the following options:

- **Key** . . . . Selects which keyboard key triggers the Part
- **Latch** . . . . The first key press turns the Part on, the next turns it off.
- **Unlatch** . . . . . . The Part plays only while the key is held.
- **1-bar** . . . . The Part plays for one bar then stops.

```
BEATS KEYS LAYOUT
Part 1    Key: C1    unlatch
```

1-Bar Trigger Option

The 1-bar option requires a bit of explanation. When a trigger key is pressed before the last beat of the measure, the part will continue playing until the end of the measure. If the Trigger Key is pressed after the last beat of the measure, the part waits until the next measure before playing. Then it plays for the entire measure and stops. The time signature and the measure bounds are determined by the particular Beats Riff you are playing.
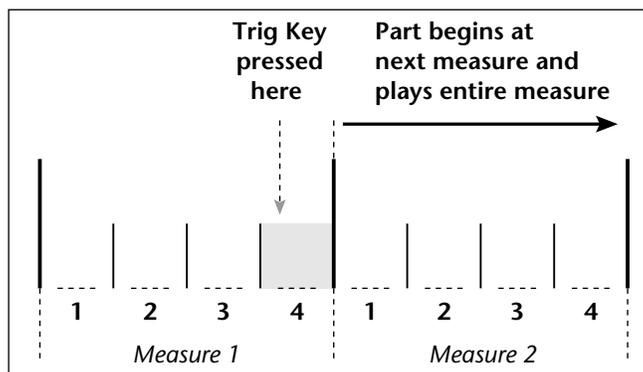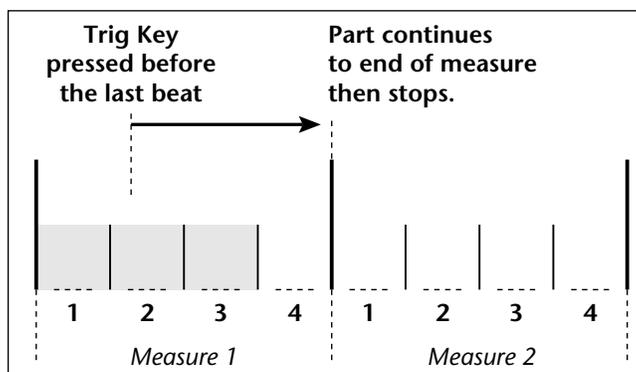
Beats Keys Offset

This function slides the Beats Trigger keys *(assigned in the previous screen)* up and down the keyboard. This makes it easy to change the keyboard location of the trigger keys without having to re-assign each key. A positive offset moves the group of triggers up the keyboard by the designated number of keys. Negative offsets move the trigger group lower on the keyboard.

```
┌──────────────────────────────────────┐
│ BEATS KEYS OFFSET                      │
│ +000 keys                              │
└──────────────────────────────────────┘
```

Negative Offset ← → *Positive Offset*
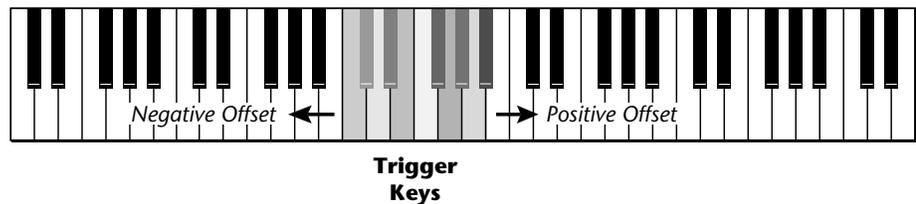
**Trigger
Keys**

Beats Keys Offset slides the entire group of beats triggers up or down the keyboard.

Beats Part Velocity

Each note of a Beats Riff can have its recorded velocity scaled by a value (from 0 to 120%) of the recorded velocity or the actual played velocity of the trigger key can be used (trigger vel). For example, if a note's velocity is 80, scaling by 110% will increase the note's velocity to 88. This feature allows you to control the mix of the different parts in advance or "on-the-fly" as you play. If a part's velocity is set to 0%, that part will be removed from the mix.

Select Part

```
┌──────────────────────────────────────┐
│ P1  BEATS PART VELOCITY                │
│ Scaled by: trigger vel                 │
└──────────────────────────────────────┘
```

▶ **To Set the Velocity for each Part:**

1. Press the left cursor button to move the cursor under the Part field.

2. Select the Part number using the Data Entry Control. Parts 1-16 can be selected. *(All parts, shown as an "A", can be edited at once if "Edit All Layers" is enabled in the Master menu.)*

3. Move the cursor to the bottom line using the cursor keys and adjust the Velocity Scaling percentage using the Data Entry Control.

4. Repeat steps 1 through 3 for all the Parts you wish to adjust.

5. Press the Enter/Home button or use the cursor keys to move the cursor back to the screen heading.

Beats Part Transpose

Each Part of a Beat Riff can be transposed up to 36 semitones up or down. Transpose works by shifting the keyboard position and not by changing the tuning of individual notes. Therefore, on a Beats preset (bts:), where different instruments are assigned to each key, **Transpose has the effect of changing the instrument used by a particular part.** On a preset where a single sound covers the entire keyboard, Transpose will actually transpose the sound.

Select Part

```
P1  BEATS PART TRANSPOSE
+00 semitones
```

▶ **To set the Transposition for each Part:**

1. Press the left cursor button to move the cursor under the Part field.

2. Select the Part number using the Data Entry Control. Parts 1-16 can be selected. *(All parts, shown as an "A", can be edited at once if "Edit All Layers" is enabled in the Master menu.)*

3. Move the cursor to the bottom line using the cursor keys and adjust the Transposition in semitones using the Data Entry Control.

4. Repeat steps 1 through 3 for all the Parts you wish to adjust.

5. Press the Enter/Home button or use the cursor keys to move the cursor back to the screen heading.

Original Part   Transposed +12

Kick   Fun Scratch   Tick   909 Click   Machine Kick   **Kick**   Snare   808 Snare   Simmons Tom   909 Tom   Tom Wave   909 Tom   **Waver Tom**   909 Tom   Cymbal   Ride Cymbal   Splash Cymbal   Splashy Cymbal   Ride Cymbal   Bongo Tone   Bongo Tip   Low Conga   Timbale 3   Agogo Hi-Tone   Cabasa   Guiro   Guiro   Guiro   Wood Block   Wood Block   Triangle Mute   Triangle Open   Crowd
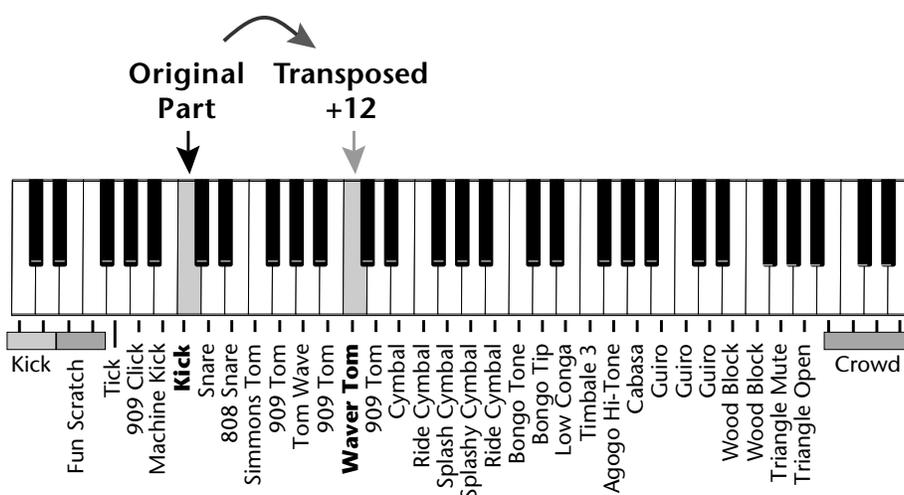
Beats Part Group

This screen is where you assign Parts to one of the four Groups. By grouping, you can play multiple parts with a single key. A part can be in one and only one group, or in no groups.

Select Part

```
┌─────────────────────────────────────┐
│ P1  BEATS  PART  GROUP              │
│ Group:   2                          │
└─────────────────────────────────────┘
```
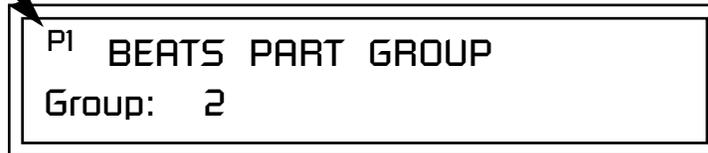
👀 *All Parts assigned to a Group will stop playing when the Group key is triggered, then untriggered even if the individual Parts in the Group are latched.*

▶ **To Assign a Part to a Group:**

1. Press the left cursor button to move the cursor under the Part field.

2. Select the Part number using the Data Entry Control. Parts 1-16 can be selected. *(All parts, shown as an "A", can be edited at once if "Edit All Layers" is enabled in the Master menu.)*

3. Move the cursor to the bottom line using the cursor keys and select the Group (1-4 or none) using the Data Entry Control.

4. Repeat steps 1 through 3 for all the Parts you wish to assign.

5. Press the Enter/Home button or use the cursor keys to move the cursor back to the screen heading.

Master Riff

The Master Riff is selected from this screen. The Master Riff is used when Master (M) is selected for Beats in Beats mode enable screen.

```
┌─────────────────────────────────────┐
│ MASTER RIFF              HALO       │
│ Plays: TranzAmbient 1               │
└─────────────────────────────────────┘
```

▶ **To Assign the Master Riff:**

1. Use the cursor buttons to move the cursor to the lower line of the display.

2. Select the desired Riff using the Data Entry Control. (Beats Riffs are identified by the **bts:** prefix.)

3. If there is more than one ROM in Halo you can select Riffs from either ROM set. Move the cursor under the ROM ID and select using the Data Entry Control.

4. Press the Enter/Home button or use the cursor keys to move the cursor back to the screen heading.

Riff Tempo

This setting determines whether **Riff Tempo** (the tempo stored with each Riff) or the **Current Tempo** (the Base Tempo from the Master Clock) will be used for Beats.

To control the Riff Tempo from MIDI clock, set Riff Tempo to "use current tempo" and Base Tempo to "use MIDI".
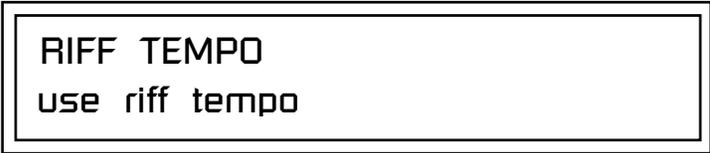
```
RIFF TEMPO
use riff tempo
```

▶ **To Set the Riff Tempo Mode:**

1. Use the cursor buttons to move the cursor to the lower line of the display.
2. Select "use riff tempo" or "use current tempo" using the Data Entry Control.
3. Press the Enter/Home button or use the cursor keys to move the cursor back to the screen heading.

Riff Controllers

Riffs contain real-time control information. This function allows you to turn these controllers On or Off for the Riffs. This control affects Audition Riffs as well as Beats Riffs.

```
RIFF CONTROLLERS
use riff controllers
```

▶ **To Turn Riff Controllers On or Off:**

1. Use the cursor buttons to move the cursor to the lower line of the display.
2. Select "use riff controllers" or "ignore riff controllers" using the Data Entry Control.
3. Press the Enter/Home button or use the cursor keys to move the cursor back to the screen heading.

MIDI Song Start

This function enables or disables MIDI Song Start for the Arpeggiator and Riffs. The MIDI Song Start option restarts the arpeggiator and/or Riff (BEAT) to the beginning when a MIDI Song Start command is received. This is useful for synchronizing arpeggios and Beats when recording into, or playing along with a sequencer. You can choose to resync: Arp, Riff, both Arp and Riff, or disable MIDI Song Start.

```
MIDI SONG START
resyncs arps & riffs
```

Arp/Riff
MIDI Out

This parameter selects whether or not the Arpeggiator and/or Riff (Beats) note data is sent to the MIDI out port. This feature lets you use Halo as an arpeggiator or sequencer for your other MIDI instruments. It also lets you record the arpeggios and Riffs into a MIDI sequencer. You can choose to transmit: Arpeggiator data, Riff data, both Arp and Riff data, or nothing.

```
ARP/RIFF MIDI OUT
don't transmit
```

Arpeggiators

An arpeggiator moves a pattern of notes sequentially over a range of the keyboard. Halo has the unique ability to play a different arpeggiator on each MIDI channel!

Arpeggiator settings can be defined as part of the preset (using the Arp parameters in the Preset Edit menu), or globally in the Arpeggiator menu. The preset and master arpeggiators have the same parameters which we define in this chapter.

The Arp field in the main screen defines which arpeggiator settings will be used. "M" uses the master Arpeggiator settings and on/off status (as defined in the Arpeggiator menu). "P" uses the preset's arpeggiator settings and on/off status (as defined in the Edit menu). Choosing "On" uses the preset's arpeggiator settings regardless of whether or not it is turned on in the Edit menu and Off turns off the arpeggiator regardless of the settings and status specified in either menu.

*SAVE your Arp setups and name them using the "Save Setup To" function located in the **Multi** menu. See "Saving Multisetups" on page 42.*

Arp Settings in the
Preset are Used

```
C01    V127   P00    A:P    USER
047³   arp: Sine Drum
```

All arpeggiators share Halo's master clock and its current setting. The master clock can be Halo's internal clock or an external MIDI clock (page 82). Although the arpeggiators use the master clock setting, the tempo divisor can be unique for each arpeggiator setup.

Arpeggiator modes include up, up/down, forward assign, backward assign, forward/backward assign and random as well as play *Patterns*. Patterns are pre-recorded sequences of notes and rests. All key-on notes play the pattern. For example, if you play a chord, all the notes in the chord play the pattern in harmony. Halo contains 200 factory patterns and 100 user definable patterns.

Arp Controllers

The Arpeggiators can be controlled using the front panel real-time controllers or external MIDI continuous controllers. Controllers are patched to Arps via the Preset PatchCords located in the Preset Edit menu. *See "Preset Patchcords" on page 165.* The following Preset PatchCord destinations control the Arpeggiators.

Arpeggiator Resolution (ArpRes)
This control changes the Arpeggiator Note Value, which defines the length of the notes when playing arpeggiated chords. It *adds* to the note value set in the Arpeggiator Note Value screen. *See "Note Value" on page 60.*

Arpeggiator Extension (ArpExt)
This control changes the Arpeggiator Extension Count. It *adds* to the extension count programmed in the Arpeggiator Note Value screen. *See "Extension Count" on page 62.*

Arpeggiator Velocity (ArpVel)
This control changes the Arpeggiator Velocity Value. It *scales* the velocity value set in the Arpeggiator Note Value screen. *See "Velocity" on page 61.*

Arpeggiator Gate (ArpGate)
This control changes the Arpeggiator Gate Time. It *adds* to the gate time set in the Arpeggiator Gate Time screen. *See "Gate Time" on page 61.*

Arpeggiator Interval (ArpIntvl)
This control modulates the Arpeggiator Extension Interval. It *adds* to the extension programmed in the Arpeggiator Extension Interval screen. *See "Extension Interval" on page 62.*

Master Arpeggiator Parameters

The Master Arpeggiator is defined in the Arp menu. The Arpeggiator mode selected on the Main Screen determines whether the Master arpeggiator or the Preset menu arpeggiator settings are used.

▶ **To Access the Master Arpeggiator Parameters:**

1. Press the **Arp** menu button lighting the LED. The Arpeggiator menu screen displays the menu page most recently selected since powering up Halo. The cursor appears below the first character of the screen heading on line one.

2. Use the right **cursor** button to advance the cursor to the first field in the bottom line of the screen.

3. Now, use the **data entry control** to access the various Master Arpeggiator parameters.

4. **Save** your Arpeggiator settings using the "Save Setup" function on the Multi menu.

Status

The Status parameter turns the Master Arpeggiator on and off. The Channel Arpeggiator setting in the main screen overrides this setting. For example, if you set the Arpeggiator in the main screen to "off," and turn it "on" here, it still will not play.

```
┌─────────────────────────────────────────┐
│                                          │
│   MASTER ARPEGGIATOR                      │
│   Status                           off    │
│                                          │
└─────────────────────────────────────────┘
```

Mode

The Mode parameter determines the direction or pattern mode of the arpeggiated notes.

```
┌─────────────────────────────────────────┐
│                                          │
│   MASTER ARPEGGIATOR                      │
│   Mode                             up     │
│                                          │
└─────────────────────────────────────────┘
```

The eight arpeggiator modes are:

- **Up**   Held notes arpeggiate continuously from lowest to highest pitch.

- **Down**   Held notes arpeggiate continuously from highest to lowest pitch.

- **Up/Down**   Held notes arpeggiate continuously from lowest to highest pitch, then from highest to lowest, then repeat this cycle.

- **Fwd Assign**   Held notes arpeggiate continuously in the order in which the keys were pressed.

- **Bkwd Assign**   Held notes arpeggiate continuously in the reverse order in which the keys were pressed.

- **Fwd/Bkwd**   Held notes arpeggiate continuously in the order in which the keys were pressed, then arpeggiate in the reverse order that they were pressed. The cycle is then repeated.

- **Random**   Held notes arpeggiate continuously in a random fashion.

- **Pattern**   Held notes play the selected pattern (see "Pattern" on page 60 for details).

Note Value

The Note Value determines the duration of each note played. This parameter is used in non-pattern mode only.

```
┌─────────────────────────────────────────┐
│                                         │
│   MASTER  ARPEGGIATOR                   │
│   Note Value              1/8 dot       │
│                                         │
└─────────────────────────────────────────┘
```

Following is a list of possible Note Values and the relative number of clocks used for each.

✎ *Note value has no effect when the mode is set to "pattern."*

Note Value	MIDI Clock
Double Whole Note	**192**
Dotted Whole Note	144
Double Note Triplet	128
Whole Note	**96**
Dotted Half Note	72
Whole Note Triplet	64
Half Note	**48**
Dotted Quarter Note	36
Half Note Triplet	32
Quarter Note	**24**
Dotted Eighth Note	18
Quarter Note Triplet	16
8th Note	**12**
Dotted 16th Note	9
8th Note Triplet	8
16th Note	**6**
Dotted 32nd Note	4.5
16th Note Triplet	4
32nd Note	**3**

Arpeggiator Pattern Speed

The Arpeggiator Pattern Speed parameter lets you change the playback rate of Patterns by 1/4x, 1/2x, 1x (normal), 2x or 4x normal speed.

Pattern

This field lets you choose the pattern used when the arpeggiator Mode is set to "Pattern." There are 200 factory programmed patterns and you can create an additional 100 user definable patterns (see "Editing a User Arpeggiator Pattern" on page 67).

```
┌─────────────────────────────────────────┐
│                                         │
│   MASTER  ARPEGGIATOR                   │
│   Pattern    99¹  Pattern Name          │
│                                         │
└─────────────────────────────────────────┘
```

Velocity

The Velocity parameter determines the velocity at which each note arpeggiates. Velocity can be defined by the velocity value specified (from 1 through 127), or by the actual velocity of the played note (played). Bear in mind that velocity values do not have an effect on the sound unless the preset is programmed to respond to velocity.

✎ *Controller Knob O is programmed to control Arp Velocity.*

```
┌─────────────────────────────────┐
│ ┌─────────────────────────────┐ │
│ │ MASTER  ARPEGGIATOR         │ │
│ │ Velocity           played   │ │
│ └─────────────────────────────┘ │
└─────────────────────────────────┘
```

Gate Time

The Gate Time parameter works together with the Note Value parameter. Just as Note Value defines the length of a note, the Gate Time sets the percentage of the Note Value time played. This can have a dramatic effect on the sound depending on how the envelope generators are programmed.

✎ *Controller Knob P is programmed to control Arp Gate Time.*

```
┌─────────────────────────────────┐
│ ┌─────────────────────────────┐ │
│ │ MASTER  ARPEGGIATOR         │ │
│ │ Gate                 100%   │ │
│ └─────────────────────────────┘ │
└─────────────────────────────────┘
```

✎ *The **note-on** time is used for the start-of-time when calculating note durations. See "Duration" on page 64.*

With a Gate Time setting of 100% the note is held on until the next note starts. The envelope generators never advance to the Release stages. With a Gate Time setting of 50%, the note is released halfway through the note cycle and the envelope generators proceed to their release stages until the next note occurs. Refer to the following illustration.

Selected Note Value *(8th notes, 16th notes, etc.)*

Gate Time	
100%	*key-on time*
75%	*key-on time*
50%	*key-on time*
25%	
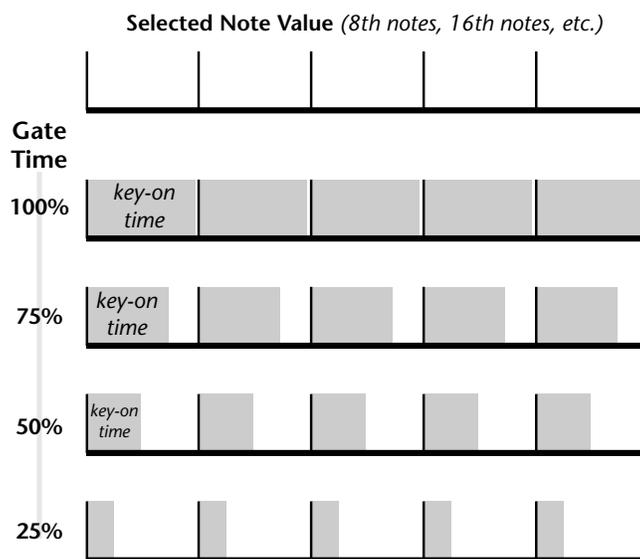
Extension Count

The Extension Count parameter specifies how many times the Extension Interval is carried out. With an Extension Count of 0, the arpeggio plays only the notes pressed. With an Extension Count of 1, the arpeggio plays the notes pressed, then plays the same notes (in the same order), transposed by the Extension Interval amount. The cycle is then repeated.

```
┌─────────────────────────────────────┐
│  MASTER ARPEGGIATOR                  │
│  Extension Count                4    │
└─────────────────────────────────────┘
```

For example, with the Extension Interval set to 12 (an octave) and an Extension Count of 2, and with the Arpeggiator Mode set to Fwd Assign, if you played E2, then C2, then G2, the arpeggiated sequence would consist of: E2, C2, G2, then E3, C3, G3, and then E4, C4, G4. The Extension Count values range from 0 through 15. Refer to the following illustration.
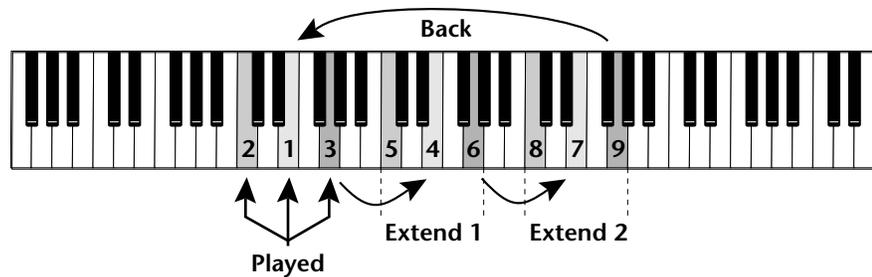
Extension Interval

The Extension Interval specifies the additional intervals played when you press a key. For example, suppose you played C2 with an Interval of 7 (a Major 5th), Up mode, and an Extension Count of 2. The arpeggio alternates between C2 and G2.

The Extension Interval values range from 1 through 16.

```
┌─────────────────────────────────────┐
│  MASTER ARPEGGIATOR                  │
│  Extension Interval             7    │
└─────────────────────────────────────┘
```

Sync

The Sync parameter defines when a note is played in relation to when the key is pressed. When set to "Key Sync", the note sounds the instant a key is pressed. When set to "Quantized", the note does not sound until the next occurrence of the selected note value.

```
MASTER ARPEGGIATOR
Sync                    key sync
```

The following diagram illustrates how Key Sync and Quantize work.
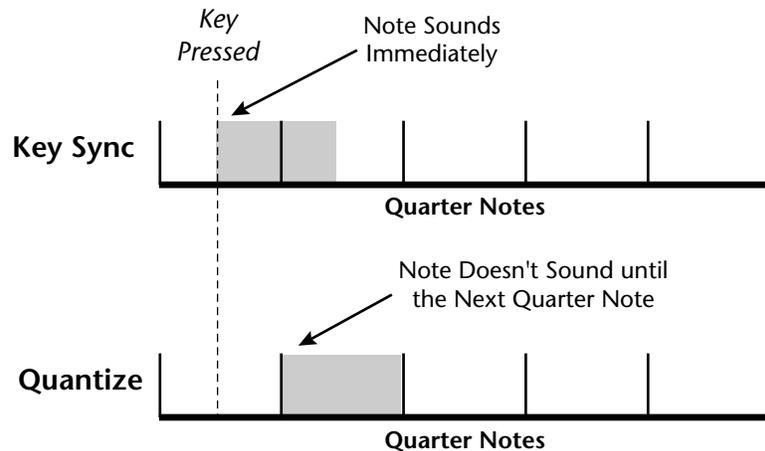
Pre-Delay

The Pre-Delay value determines how long the arpeggiator is delayed before becoming active after the first "note-on." During the pre-delay period, notes are played normally (as if the arpeggiator was off). After the pre-delay period has elapsed, the arpeggiator kicks in. Once you release all the keys on the controller, the pre-delay starts over with the next note-on. In combination with the Duration parameter, Pre-Delay lets you create many more variations in the arpeggio patterns. *Please refer to the diagram on page 65.*

You can play the preset normally as long as you don't hold the notes longer than the Pre-Delay. If you do, the arpeggiator starts in. When used in conjunction with multiple arpeggiators, Pre-Delay allows you to offset the time between the different patterns.

```
MASTER ARPEGGIATOR
Pre-Delay                    off
```

Duration

This parameter defines how long the arpeggiator plays before stopping. The Duration is specified in note values. Therefore if an arpeggio were running at a 16th *Note Value* and the Duration were set to a whole note, the arpeggiator would play 16 steps before stopping. After the duration has elapsed, the arpeggiator remains inactive until the key is released. If Duration is set to Off, the arpeggio repeats as long as the notes are held (Infinite Duration).

```
┌─────────────────────────────────────┐
│ ┌─────────────────────────────────┐ │
│ │  MASTER  ARPEGGIATOR            │ │
│ │  Duration                1 / 1d │ │
│ └─────────────────────────────────┘ │
└─────────────────────────────────────┘
```

Duration can be used to modify the patterns and increase the possible pattern combinations and variations. Because this parameter limits the length of arpeggiator play time, it can change the arpeggio pattern when the Duration is less than the length of the arpeggio. You can set the arpeggio to repeat continuously using the *Recycle* function described below.

Post-Delay

This parameter is only relevant when both the "Duration" and "Recycle" parameters are not in the "Off" state. The Post-Delay value determines how long the arpeggiator is delayed after the Duration period. *Please refer to the diagram on page 65.* During the post-delay period, notes are played normally (as if the arpeggiator was off). After the post-delay period has elapsed, the arpeggiator either jumps to the beginning of the Pre-Delay period or to the beginning of the Duration period depending on the Recycle setting.

If the arpeggiator is playing an extension when the Duration expires, the notes in the extension will continue to sound during the Post-Delay *(and Pre-Delay if on)*. On the next pass through the Duration period, the extension continues where it left off.

Post-Delay increases the number of possible variations in the beat and allows the recycle loop to be set to an exact measure of time.

```
┌─────────────────────────────────────┐
│ ┌─────────────────────────────────┐ │
│ │  MASTER  ARPEGGIATOR            │ │
│ │  Post-Delay                 off │ │
│ └─────────────────────────────────┘ │
└─────────────────────────────────────┘
```

**Keys
Pressed**

Notes Sound   *Arp Plays*   *Notes Sound*

Pre-Delay   **Duration**   **Post-Delay**

Recycle on/No-PreDly
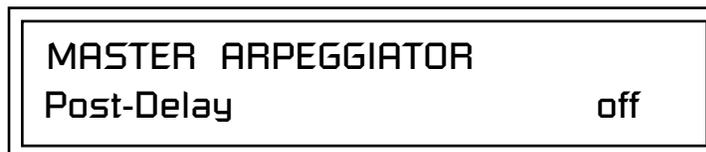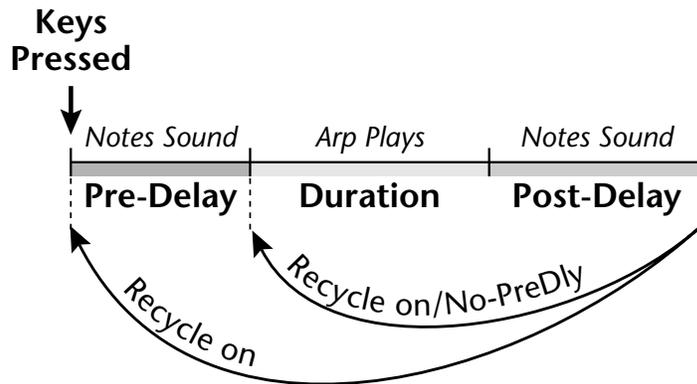
Recycle on

Recycle

Recycle enables the pattern or arpeggio to repeat. This parameter works together with the *Duration* and *Pre/Post Delay* parameters to allow the loop to be set to an exact measure of time. The "on/No-PreDelay" option bypasses the predelay period. With Recycle turned Off, the pattern or arpeggio stops at the end of the Post-Delay period.

```
MASTER ARPEGGIATOR
Recycle            on/No-PreDly
```
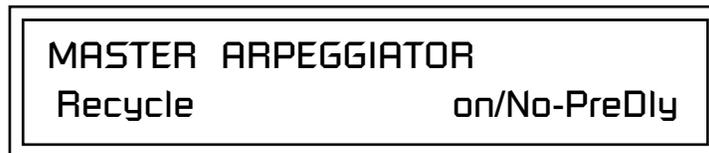
Keyboard Thru

When enabled, Keyboard Thru merges the notes not arpeggiated with the notes being produced by the arpeggiator. This gives the effect of two parts playing at once.

```
MASTER ARPEGGIATOR
Keyboard Thru               off
```

Latch

With Latch mode On, any notes you play remain on until you press them again. Latched notes can also be halted by turning Latch off in this screen, or by turning off the Arpeggiator for the channel in the main screen.

```
MASTER ARPEGGIATOR
Latch                        on
```

Use the Key Range parameter to set the keyboard range for the arpeggiator. Notes inside the range will arpeggiate while notes outside the specified range will not arpeggiate. Use the Extensions parameters to exceed the upper boundary of the Key Range (see the information about Extensions beginning on page 62).

```
MASTER ARPEGGIATOR
Key Range              C-2->G8
```

Move the cursor under the first key and use the data entry control to define the lowest key to be arpeggiated. Move the cursor under the second key value and use the data entry control to define the highest key to be arpeggiated.

Send MIDI System Exclusive Data

Transmits the Arpeggiator Patterns via the MIDI out port as MIDI System Exclusive data to another Halo or to a computer/sequencer for backup. Using the cursor key and the data entry control, select the MIDI data you want to transmit. See *Send MIDI System Exclusive Data* in the Master chapter for additional details about recording SysEx.

User Patterns
Transmits all the User patterns.

00^0 to 99^0
Transmits only the individual pattern you have selected.

✎ *Send data as you would a regular sequence. Sending data in one huge chunk may clog the MIDI input buffer on Halo.*

```
SEND MIDI SYSEX DATA
All User Arp Patterns
```

Editing a User Arpeggiator Pattern

Halo lets you create and edit your own arpeggiator patterns. Using the Edit User Pattern menu, you can create up to 100 user patterns and each pattern can be up to 32 steps in length.

When you edit a pattern, you are writing directly into memory—no Save command is required (however, you must exit the Arp module). This is different from the Edit menu where you must Save a preset before it will be overwritten. If you want to modify an existing pattern and keep the original, you must first COPY the pattern you want to edit to another location using the function in the Save/Copy menu (See page 191). Refer to the instructions below and the following parameter descriptions to create your own patterns.

Bank 0 = User Patterns
Bank 1 = Factory Patterns
Bank 2 = Factory Patterns

```
┌─────────────────────────────────┐
│                                 │
│   EDIT USER PATTERN             │
│   01¹  DRUMnBASS 1              │
│                                 │
└─────────────────────────────────┘
```
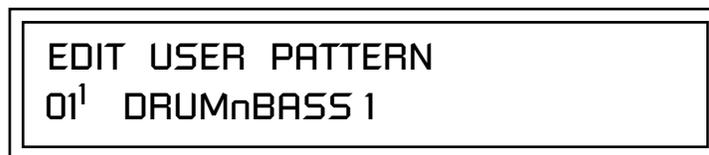
▶ **To Select the Pattern to Edit:**

✎ *Before editing a Pattern, select Master Arpeggiator (M) in the main screen and set the Arpeggiator to the Pattern you are editing. This lets you hear the Pattern as you edit it.*

1. From the Edit User Pattern screen shown above, move the cursor to the bottom line and **select the pattern** you want to edit. The Enter LED begins flashing. Press **Enter** to move back to the Home position.

2. Select the **next screen** in the list, "User Pattern Edit". This is where you edit the currently selected pattern.

```
┌─────────────────────────────────────┐
│                                     │
│  PTRN   KEY   VEL   DUR   RPT       │
│  S01    +0    ply   1/8    2        │
│   ↑      ↑     ↑     ↑      ↑        │
│   ¦      ¦     ¦     ¦      ¦        │
└─────────────────────────────────────┘
```

Pattern Step   Key offset   Velocity   Duration   Repeat
number
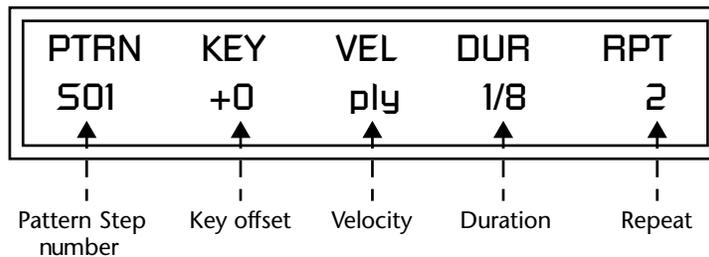
3. Move the cursor to the **lower line** of the display. For each step, you can select: key, velocity, duration, and number of repeats.

Pattern Step Number

You can set up to 32 steps for each arpeggiator pattern. This field selects which step you will be editing from 1 to 32.

Key

This parameter defines what happens during the current step. The Key parameter can do one of five different operations. Following is a description of each of the key functions and how to use them.

Key Offset

This parameter defines not the actual note of the arpeggiator playback, but instead specifies the amount of offset, in semitones, from the original note played. You can set a Key Offset from -48 to +48 for each step. For example, if you play a "C" on the keyboard with the Key Offset amount for the first step set to "+1," the first step in the pattern will be "C#."

| -48 | -36 | -24 | -12 | 0 | +12 | +24 | +36 | +48 |

⟵   − Offset   Played   + Offset   ⟶
                        Note
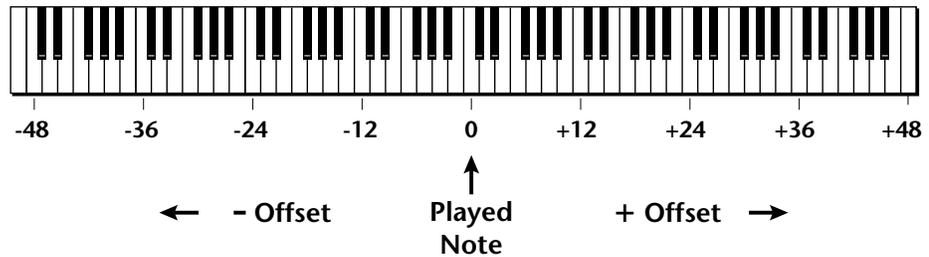
Tie

This function *extends* the duration of notes beyond the values given in the duration field by "tying" notes together. You can tie together any number of consecutive steps.

| +2 | tie | -5 |

Step 1   Step 2   Step 3

✎ *IMPORTANT: The Gate function in the arpeggiator MUST be set to 100% when using the tie function, otherwise the tied note is retriggered instead of extended.*
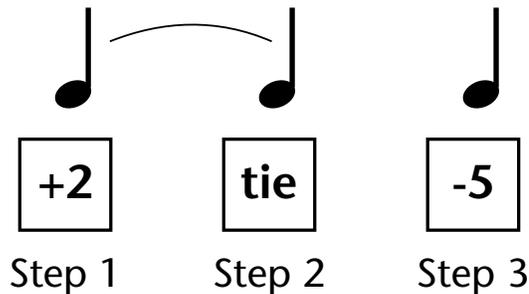
Rest

Instead of playing a note, you can define the step as a Rest. The Duration parameter specifies the length of the rest. Rests can be tied together to form longer rests.

Skip

This command simply removes the step from the pattern. The Skip feature makes it easy to remove an unwanted step without rearranging the entire pattern. You'll be happy to know that the velocity, duration and repeat parameters are remembered if you decide to put the step back later.

End

This command signals the end of the pattern. Any steps programmed after the step containing the End command are ignored.

Velocity

Each note in the pattern plays using either a preset velocity value (from 1 through 127), or using the actual velocity of the played note (ply).

Note: Velocity values will not have an effect on the sound unless velocity is programmed to do something in the preset.

Duration

This parameter sets the length of time for the current step, defined as a note value, based on the Master Tempo. The selectable note durations are described below.

1/32	32nd Note	**1/2t**	Half Note Triplet
1/16t	16th Note Triplet	**1/4d**	Dotted Quarter Note
1/32d	Dotted 32nd Note	**1/2**	Half Note
1/16	16th Note	**1/1d**	Dotted Whole Note
1/8t	8th Note Triplet	**1/1t**	Whole Note Triplet
1/16d	Dotted 16th Note	**1/2d**	Dotted Half Note
1/8	8th Note	**1/1**	Whole Note
1/4t	Quarter Note Triplet	**2/1t**	Double Whole Note Triplet
1/8d	Dotted Eighth Note		
1/4	Quarter Note	**2/1**	Double Whole Note

Repeat

Each step can be played from 1 to 32 times. A repeat setting of "1" indicates the step will be played one time (not repeated one time or played twice).

▶ **To Edit a User Pattern:**

1. The first field in the Edit User Pattern field defines the pattern's step number. Start with the pattern Step 01.
2. Define the Key Offset, Velocity, Duration and Repeat values.
3. Repeat steps 1 and 2 until you have setup the desired number of steps in the pattern.
4. Set the Key Offset to "End" on the last step in the pattern.

User Pattern Name

The User Pattern Name page lets you enter a name for any User Arpeggiator Pattern.

```
┌─────────────────────────────────────────┐
│  PTRN    KEY    VEL    DUR    RPT        │
│  S01     +0     ply    1/8    2          │
└─────────────────────────────────────────┘
```

▶ **To Name a User Pattern:**

1. From the Pattern Edit screen shown above, position the cursor under the **PTRN** field.
2. Turn the **data entry control** clockwise. The following screen appears.

```
┌─────────────────────────────────────────┐
│  USER PATTERN NAME                       │
│  00⁰  Mod Cycle                          │
└─────────────────────────────────────────┘
```

3. Move the cursor to the bottom line and **edit the Pattern** name using the data entry control and Cursor keys.
4. Move the cursor to the "**Home**" position (shown above) by pressing the **Home/Enter** button.
5. Turn the **data entry control** counter-clockwise one click to return to the Pattern Edit screen.
6. Turn the **data entry control** counterclockwise multiple clicks to jump back to the main Arpeggiator menu screen.

Multichannel Arpeggiating

Presets with the arpeggiator assigned will play when they receive note-on data from the keyboard or external MIDI source.

Please refer to the instructions on page 26 to learn one way to perform using multiple arpeggiators.

Controllers Menu

The Controllers menu contains functions related to the keyboard, knobs or trigger buttons of Halo. For example, the Command Function Trigger Keys are programmed in this menu. All Controllers menu data is saved with the Multisetup. See page 41 for more information about Multisetups.

▶ **To enable the Controllers menu:**
Press the Controllers button, lighting the LED. The Controllers Menu screen displays the menu page most recently selected since powering up Halo. The cursor appears below the first character of the screen heading on line one.

▶ **To select a new screen:**
Press the Home/Enter button or press the Cursor button repeatedly until the cursor is below the screen title heading. Rotate the data entry control to select another screen.

▶ **To modify a parameter:**
Press either Cursor button repeatedly (or hold down the right cursor button while turning the data entry control) until the cursor is below the desired parameter value. Rotate the data entry control to change the value.

▶ **To return to the previously selected Mode/View screen:**
Press the Controllers button, turning off the LED.

Realtime Control Functions

This section describes how set up the Realtime Controllers on Halo. Realtime Controllers are performance controls such as the controller knobs, velocity & pressure sensitive keyboard, and the trigger buttons.

Keyboard Channel

This option allows you to select which channel is controlled by the Keyboard, Knobs as well as the Pitch & Mod Wheels. You can select any of the 16 channels or "Basic". If the "Basic" channel is selected, the keyboard and knobs always control the preset showing in the Main screen.

✎ *in Quick Edit mode the front panel knobs only control the "Basic Channel".*

```
KEYBOARD CHANNEL
Channel: Basic
```

Keyboard Transpose

This option allows you to offset the transposition of the keyboard in semitone intervals. This is allows you to easily play in different keys with the keyboard and lets you access different groups of instruments in a drum map. The transpose range is ±36 semitones.

```
KEYBOARD TRANSPOSE
+00 semitones
```

Local Control On/Off

Local Control is used to disconnect the keyboard and controllers (knobs, wheels, footswitches) from the sound generating section. Even though disconnected from the internal synthesizer, the keyboard and controllers are still transmitted over MIDI. Local Control is normally turned Off when recording into an external MIDI sequencer (set sequencer to Echo Thru). Played data and recorded data are merged in the computer sequencer and then sent back to the module. This feature can also be used if you want to control another MIDI sound generator from the keyboard and knobs without playing internal sounds.

```
LOCAL CONTROL ON/OFF
on
```
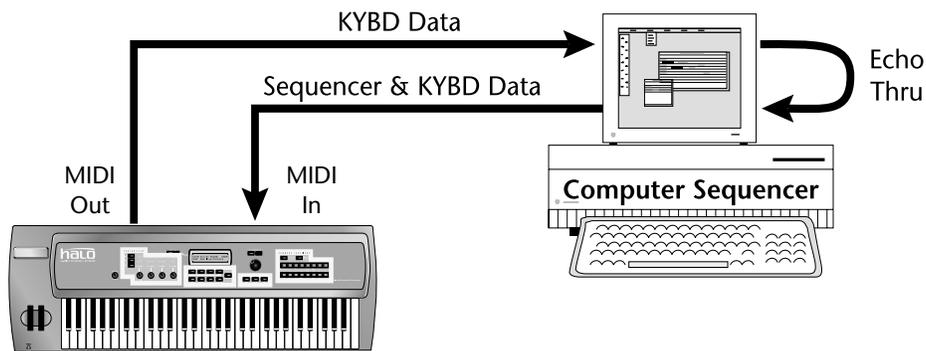
Turning Local Control Off allows you to use the Echo Thru feature on your sequencer while sequencing. In conjunction with Echo Thru, Local Control Off allows you to record into the external sequencer and hear the correct sounds whether you are recording or playing back the sequence.

Keyboard Velocity Curve

The velocity response of the keyboard can be adjusted using any of 17 curves in order to customize the dynamic feel of the keyboard to your individual playing style. This curve adjusts the output of the Halo keyboard before it is sent to the MIDI output port and to the Master Velocity Curve described on page 85.

```
KEYBOARD VELOCITY CURVE
soft #2
```
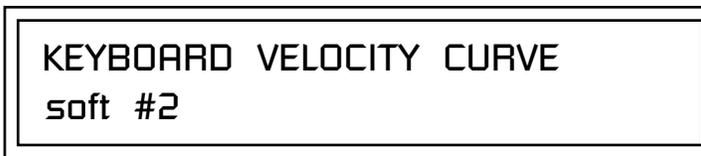
✎ *The Keyboard Velocity Curve diagrams are located on page 227.*
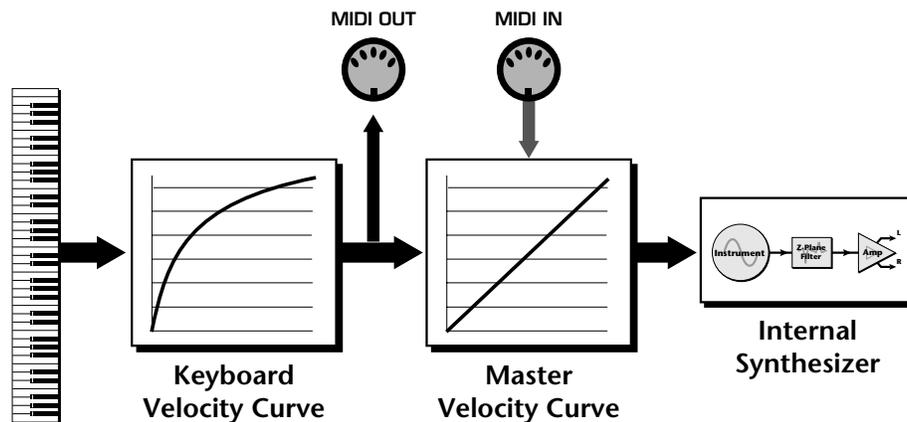
The Keyboard Velocity Curve modifies the velocity data from the keyboard keys. This data is sent to the MIDI output port and through the Master Velocity Curve before reaching the Synthesizer. Incoming MIDI data is filtered through the Master Velocity Curve only.

Channel Aftertouch On/Off

The keyboard generates channel aftertouch messages. Aftertouch is generated when you continue to press the keys *after* the note has been played. Aftertouch can be a very useful controller for adding a bit of vibrato or creating a volume swell. Aftertouch is routed to the **Pressure** source in the PatchCord screen. This control allows you to turn aftertouch on or off without having to modify each preset.

```
CHANNEL AFTERTOUCH
on
```

Footswitch Function

The footswitch jack on Halo's rear panel can be programmed to perform a variety of functions. The footswitch jack is designed to accept a momentary footswitches which shorts the tip and ground. Halo senses either normally-on or normally-off switches on power-up.

The following functions can be controlled via the footswitches.

```
FOOTSWITCH JACK FUNCTION
MIDI FtSw
```

- **MIDI Footswitch**   In this mode the footswitch is routed to the "FootSw1" PatchCord source in the Preset Edit, Cords menu. *(See pages 159 and 166.)* It is also transmitted out on the Footswitch Controller number as programmed in the Controllers menu. *(See page 80.)*

- **Tap Tempo**   Pressing the footswitch allows you to tap in the current tempo with your foot.

- **Channel +**   Pressing the footswitch increments the MIDI channel number.

- **Channel -**   Pressing the footswitch decrements the MIDI channel number.

- **Preset +**   Pressing the footswitch increments the current preset number.

- **Preset -**   Pressing the footswitch decrements the current preset number.

Foot Pedal Function
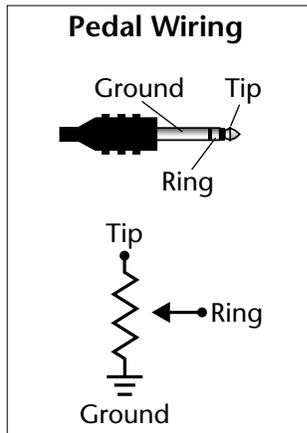
The foot pedal jack on Halo's rear panel can be programmed to perform a variety of functions. The foot pedal input can sense either 0-5 volts on the ring of a stereo jack or a foot pedal with the potentiometer wired as shown at left.

The following functions can be controlled via the foot pedal jack.

Pedal Wiring


```
┌──────────────────────────────────────────┐
│                                            │
│  FOOT PEDAL FUNCTION                       │
│  FootCtrl                                  │
│                                            │
└──────────────────────────────────────────┘
```

- **Foot Controller**   In this mode the Foot Pedal is routed to the "Pedal" PatchCord source in the Preset Edit, Cords menu. *(See pages 159 and 166.)* It is also transmitted out on MIDI Continuous Controller #4 on the basic MIDI channel.

- **Channel Volume**   The Foot Pedal controls the volume of the current channel. (The MIDI channel currently showing in the main screen.) Channel volume is pre-effect—reverb or echoes will continue to sound even when the pedal is off.

- **Master Volume**   The Foot Pedal controls the overall volume of the Halo. This duplicates the function of the Master Volume knob on the front panel. Master volume is post-effect—effects will be cut off when the pedal is off.

Trigger Buttons Function

This option selects the function of the front panel "Triggers" button. The "Triggers" button can be used either to **Play Beats Parts** or to **Play Note Events**.

- **Play Beats Parts**   In this mode and when the Triggers button is selected, the sixteen command buttons turn Beats parts on and off.

- **Play Note Events**   In this mode and when the Triggers button is selected, the sixteen command buttons work like keyboard notes. Each button can be assigned to any MIDI note, on any MIDI Channel (01-16), with any velocity (0-127), and can be set to be latched or momentarily on.

```
┌──────────────────────────────────────────┐
│                                            │
│  TRIGGER BUTTONS FUNCTION                  │
│  Play Note Events                          │
│                                            │
└──────────────────────────────────────────┘
```

Trigger Buttons

This screen allows you to program the 16 trigger buttons to play note events. **Note:** This screen is not available when the "Trigger Buttons Function" *(see previous page)* is set to "Play Beats Parts".

Set the previous screen to "Play Note Events". Select Triggers mode by pressing the mode select button so that the "Triggers" LED is illuminated. Now the 16 buttons work like keyboard notes. Each of the 16 buttons can be assigned to any MIDI note, on any MIDI Channel (01-16), with any velocity (0-127), and can be set to be latched or momentarily on. Latched notes will hold until the button is pressed again. Latched notes will be indicated by the LEDs.

✎ By assigning Trigger Buttons to the keyboard Beats Layout Keys (page 51), you can trigger Beats and MIDI notes using the Trigger buttons.

Simply move the cursor from the "TRIGGERS" field and play a note to enter the MIDI key and velocity. Pressing a Trigger Button anytime while in this screen automatically selects that trigger button for programming!

Trigger Button Select   Latch on/off

```
┌─────────────────────────────┐
│  T1  TRIGGERS Latch:off      │
│  Key: C3  Ch: 01   Vel: 127  │
└─────────────────────────────┘
```

         MIDI Key   MIDI Channel   Velocity

✎ Latched buttons are especially useful for triggering arpeggiated presets.
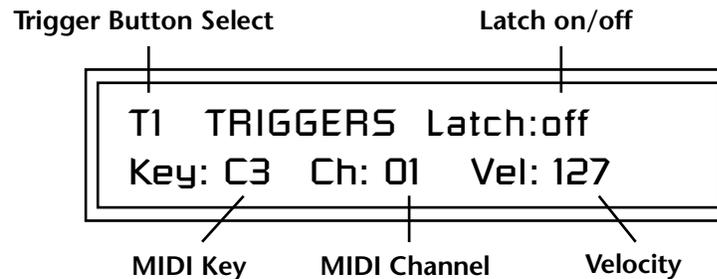
▶ To Setup the Trigger Buttons:

1. Press the Controllers button. Its LED will illuminate.
2. Turn the data entry control to select the "TRIGGERS" screen.
3. Use the left/right cursor controls to select the fields shown above.
4. Select the MIDI key, the MIDI channel, the Velocity and Latch on/off for each of the 16 trigger buttons.
5. Save the Multisetup if you want to save these settings. See page 42.

▶ To Play the Trigger Buttons:

1. Press the Controllers button. Its LED will illuminate.
2. Turn the data entry control to select the "TRIGGERS BUTTONS FUNCTION" screen.
3. Move the cursor to the lower line and select "Play Note Events".
4. Press the Command Functions "Triggers" button so that its LED illuminates.
5. Play the Trigger buttons.

Preset Select Buttons

The 16 command buttons can also be used for preset selection. Each button can be programmed to select any preset on the Basic MIDI channel. For your next song, selecting another Multisetup (page 41) selects another group of sixteen presets.

In Preset Select mode, whenever the current preset on the basic channel matches any of the 16 "favorites" assigned to the Preset Select buttons, its LED will illuminate.

✎ *The Basic MIDI channel is the channel currently showing in the main screen.*

Select Preset Select mode from the Command Functions. Now the 16 buttons are programmable preset selection buttons.

Trigger Button Select   **Preset Location**

```
 T1  PRESET - SELECT   User
 006⁰  bas: Fatty
```

Preset Number   **Category**   **Preset Name**
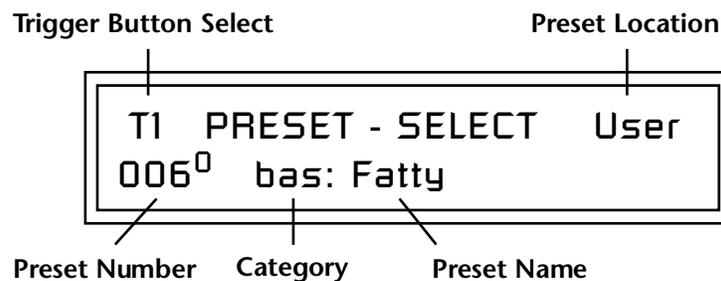
When a preset is selected using the Preset Select buttons, the cursor is automatically located underneath the Preset Name field. This feature makes it easy to select other presets of the same type.

▶ **Quick Method of Programming the Preset Select Buttons:**

1. **Select the preset** you want from the Main screen.
2. Press and hold the **Preset Select** button, then press one of the sixteen **Trigger** buttons.
3. The preset will be stored in the trigger button you selected.

▶ **To Program the Preset Select Buttons from the Menu:**

1. Press the **Controllers** button. Its LED will illuminate.
2. Turn the **data entry control** to select the "PRESET - SELECT" screen.
3. Use the left/right cursor controls to select the fields shown above.
4. Select the desired preset for each of the 16 trigger buttons.
5. Save the Multisetup if you want to save these settings. See page 42.

▶ **To Use the Preset Select Buttons:**

1. From the main preset selection screen, press the **Preset Select** button. Its LED will illuminate.
2. Press any of the 16 buttons to select a new preset.

Preset Select Send Buttons

Suppose you wanted to send another MIDI program change message to an external synthesizer. The 16 command buttons can also send external MIDI program changes on the Basic MIDI channel. Each button can be programmed to select any preset from 0-127, in any bank.

Select Preset Select mode from the Command Functions. Now the 16 buttons are programmable preset selection buttons.

Trigger Button Select

```
┌─────────────────────────────────┐
│  T1   PRESET - SELECT SEND      │
│  MSB:015  LSB:003  PROG: 127    │
└─────────────────────────────────┘
```

Bank MSB   **Bank LSB**   **Program Change Number**
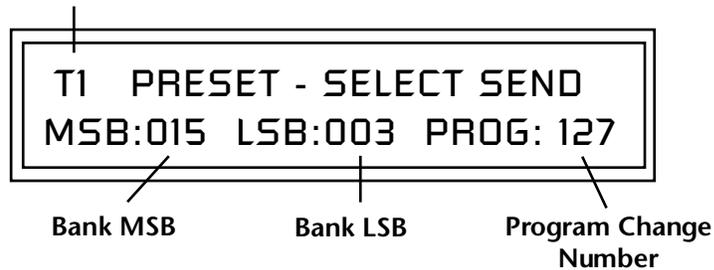
▶ **To Program the Program Change Send Buttons:**

1. Press the Controllers button. Its LED will illuminate.
2. Turn the data entry control to select the "PRESET - SELECT SEND" screen.
3. Use the left/right cursor controls to select the fields shown above.
4. Select the desired program change and bank for each of the 16 trigger buttons. (If you don't want to send an external program change, set the fields to "off".)
5. Save the Multisetup if you want to save these settings. See page 42.

▶ **To Send an External Program Change:**

1. From the main preset selection screen, press the **Preset Select** button. Its LED will illuminate.
2. Press one of the 16 buttons to send the program change.

Knob Preset Quick-Edit

"Quick-Edit" changes the initial controller setting in the preset whenever you move a Control Knob. This parameter selects whether or not the front panel Controller Knobs are used to Quick-Edit the currently selected preset. See "Preset Edit Button" on page 32 in the Operations chapter for more details.

```
┌──────────────────────────────────────────┐
│  KNOBS  PRESET  QUICK-EDIT                │
│  disabled                                 │
└──────────────────────────────────────────┘
```

Real-time Controller Assignment

Use these three pages to assign sixteen real-time control sources. Each MIDI Controller is assigned a letter (A - P). The front panel Controller Knobs *and* sixteen MIDI controller numbers share the first 12, A-L controller routings. **These screens let you select which MIDI real-time controllers numbers will be received** *(from 1 to 31 and from 64 to 95)* **and which controller numbers will be transmitted over MIDI if the front panel controls are turned**. The PatchCord routing and amount in the Preset Edit menu determine what effect the controller has on each preset. Real-time controllers are shown in the PatchCord menu as MIDI A through MIDI P.

The Real-time Controller assignment also specifies which controller numbers are transmitted when the "Knobs Output MIDI" is enabled (see "Knobs Output MIDI" on page 94).

✎ **Tip:** *Halo factory presets have certain synth parameters assigned to each controller letter and so these are "Global" controller assignments.*

For example, assigning a MIDI controller to "A" in this screen would let you control filter Fc for all the factory presets. See "Front Panel Knob Functions" on page 209.

✎ *The front panel knobs use the controllers A-L. External MIDI controllers can be assigned to letters M-P.*

```
┌──────────────────────────────────────────┐
│  REALTIME CONTROLLER #                    │
│  A: 74    B: 71    C: 25    D: 26         │
└──────────────────────────────────────────┘
```

```
┌──────────────────────────────────────────┐
│  REALTIME CONTROLLER #                    │
│  E: 73    F: 75    G: 85    H: 72         │
└──────────────────────────────────────────┘
```

```
┌──────────────────────────────────────────┐
│  REALTIME CONTROLLER #                    │
│   I: 78    J: 77    K: 27    L: 28        │
└──────────────────────────────────────────┘
```

```
┌──────────────────────────────────────────┐
│  REALTIME CONTROLLER #                    │
│  M: 01    N: 03    O: 82    P: 83         │
└──────────────────────────────────────────┘
```

Note: Controllers 7 and 10 are already assigned to Volume and Pan for each MIDI channel. Controllers 91 & 93 are the standard controller numbers for reverb and chorus send amounts, but are not assigned.

Following are a few of the standardized MIDI Controller numbers as defined by the MIDI manufacturers association. The controllers shown in **Bold** are automatically routed to the destination (volume & pan) or have their own PatchCord source. Others, such as Portamento Time, can be routed using a PatchCord to have the desired effect.

1 - **Modulation Wheel**	7 - **Volume**
2 - Breath Controller	8 - Balance
4 - **Foot Pedal**	9 - Undefined
5 - Portamento Time	10 - **Pan**
6 - Data Entry	11 - **Expression**

MIDI Footswitch Assign

Like the MIDI Controllers, you can assign three MIDI footswitches to MIDI footswitch numbers. Footswitches numbers are from 64-79. Destinations for the footswitch controllers are programmed in the PatchCord section of the Preset Edit menu. The rear panel footswitch 1 is connected to footswitch controller 1 in this screen. Pressing the footswitch transmits on the MIDI controller number programmed here. Footswitches 2 & 3 route incoming MIDI footswitch data to the PatchCord section of Halo.

```
 FOOTSWITCH  CONTROLLER #
 1: 64     2: 65     3: 66
```
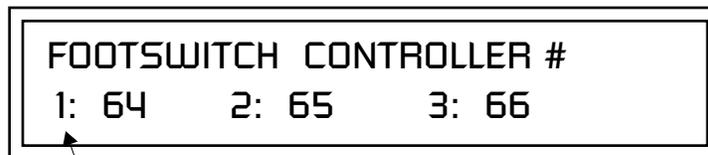
Rear panel footswitch input

Calibrate Controllers

This screen allows you to calibrate the Pitch Wheel, Modulation Wheel, Aftertouch, and Foot Pedal controller. The controls should be recalibrated periodically in order to compensate for normal changes in the controls themselves. If a control doesn't seem to be responding properly, it may simply need to be recalibrated.

✎ *The Controllers should ALWAYS be calibrated after you reinitialize user data. (And you should always reinitialize user data after updating the operating system.)*

```
 CALIBRATE CONTROLLERS
 Start Mod Wheel
```
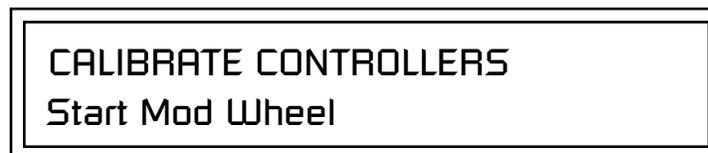
▶ **To Calibrate the Controllers:**

1. Press the Global button. Its LED will illuminate.

2. Turn the data entry control to select the "CALIBRATE CONTROLLERS" screen shown below.

```
CALIBRATE CONTROLLERS
Start Mod Wheel
```

3. Move the cursor to the lower line of the display and rotate the Data Entry Control to select the control to be calibrated. The choices are:

   • **Mod Wheel**   • **Pitch Wheel**   • **Foot Pedal**   • **Aftertouch**

4. Press **Enter** to select a control, then follow the instructions given in the display. You will be asked to mover the control through its entire range (minimum through maximum), then press **Enter**.

5. In the case of the Pitch Wheel, you first move the wheel through its min-max range and leave the wheel resting in its center position. Then press **Enter**.

Tempo Controller

This function allows a MIDI controller to change the Base Tempo of the Master Clock. The Master Clock is used by the arpeggiators, clock divisor PatchCords, tempo-based envelopes and synced LFOs. (See "Clock Modulation" on page 106.) You can assign any controller number from 0-31, mono key pressure, or the Pitch Wheel to change the Global Tempo.

A different controller can be used to change the tempo up or down. The Pitch Wheel can be assigned to both the up and down parameters to vary the tempo up and down from a single controller. If any other controller is assigned to both the up and down parameters, Halo redefines the center of the controller's range as zero (so it acts like a pitch wheel).

MIDI Controller values are added to the Base Tempo with a range of ±64. When the controller is set to "off" the tempo returns to its original setting. Controllers are only recognized on the selected MIDI channel, unless Halo is in Omni mode, in which case all channels are accepted. This control has no effect when using an external clock.

```
TEMPO CONTROLLER#        CHAN
Up: 03   Down: 09          16
```

Base Tempo

Halo contains an internal Master Clock which runs the arpeggiators, synchronizes the LFOs when in tempo-based mode, controls the times of tempo-based envelopes, and can be used as a modulation source in the PatchCords section.

You'll notice that there are two tempo values shown in the display.

- **Base Tempo** - This is the base tempo setting before being modified by the Tempo Controller (if engaged). *See "Tempo Controller" on page 81.*
- **(Current Tempo)** - **This is the actual tempo**! The current tempo is equal to the base tempo modulated by the MIDI controller specified in the Tempo Controller screen. If no MIDI Tempo controller message has been received since the last Base Tempo change, the Current Tempo will be equal to the Base Tempo.

The Arp/Beats LED flashes in time with the Base Tempo.

▶ **To Change the Base Tempo:**

1. Move the cursor to the lower line of the display.
2. Adjust the Base Tempo using the data entry control.

```
 BASE TEMPO          TAP->enter
 120 bpm  (current: 182)
```

You can also tap tempo using a footswitch. See page 74.
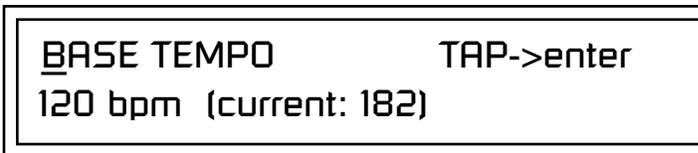
3. **To Tap Tempo** - Tap the Enter button at least three times. Keep tapping to continuously update the tempo on each tap. The tap tempo range is 25-300 bpm. The Base Tempo values range from 1 through 300 beats per minute (BPM).

▶ **To Use an External MIDI Clock:**

1. Move the cursor to the lower line of the display.
2. Turn the data entry control all the way counter-clockwise and select **"ext"** to use an external MIDI clock source.

Global Menu

The Global menu contains functions that affect the overall operation of Halo. For example, changing the Master Tune parameter changes the tuning of all the presets, not just the one currently displayed.

▶ **To enable the Global menu:**
Press the Global button, lighting the LED. The Global Menu screen displays the menu page most recently selected since powering up Halo. The cursor appears below the first character of the screen heading on line one.

▶ **To select a new screen:**
Press the Home/Enter button or press the Cursor button repeatedly until the cursor is below the screen title heading. Rotate the data entry control to select another screen.

▶ **To modify a parameter:**
Press either Cursor button repeatedly (or hold down the right cursor button while turning the data entry control) until the cursor is below the desired parameter value. Rotate the data entry control to change the value.

▶ **To return to the previously selected screen:**
Press the Global button, turning off the LED.

👀 *Warning: Global Menu changes are automatically saved when you exit the menu. If the power is turned off before you exit the menu any changes you have made will be lost.*

Defining Global Parameters

Global setup parameters affect overall performance, range, and global effects. This section describes the Global parameters and how to define them.

Master Transpose/ Tune

The Transpose parameter transposes the key of all presets, in semitone intervals. The transpose range is ± 24 semitones.

Master Tune adjusts the fine tuning of all presets so that you can tune Halo to other instruments. The master tuning range is ± 1 semitone in 1/64th semitone increments (1.56 cents). A master tune setting of "+00" indicates that Halo is perfectly tuned to concert pitch (A=440 Hz).

```
MASTER TRANSPOSE        TUNE
+00 semitones            +00
```

Master Bend Range

The Master Bend Range parameter sets the range of the pitch wheel. This affects only presets that have their individual Pitch Bend range (defined in the Preset Edit menu) set to Master. *See page 160.* The maximum pitch bend range is ±12 semitones or one octave in each direction.

```
MASTER BEND RANGE
+/- 7 semitones
```

Master Velocity Curve

✎   *The Master Velocity curve is normally set to "Linear" and the Keyboard Velocity Curve is used to adjust the keyboard feel.*

The two curves can also be combined if you wish.

Incoming velocity data or internal keyboard velocity can be altered by one of thirteen velocity curves. These curves are designed to adapt Halo to a external MIDI controller. You can select one of thirteen global velocity curves or to leave the data unaltered (linear). To adjust Keyboard velocity, see "Keyboard Velocity Curve" on page 73.

```
┌─────────────────────────────────────┐
│                                      │
│   MASTER VELOCITY CURVE              │
│   13                                 │
│                                      │
└─────────────────────────────────────┘
```

MIDI OUT   **MIDI IN**

The Master Velocity Curve filters MIDI In as well as data from the Keyboard Velocity Curve.

Keyboard Velocity Curve   **Master Velocity Curve**   **Internal Synthesizer**
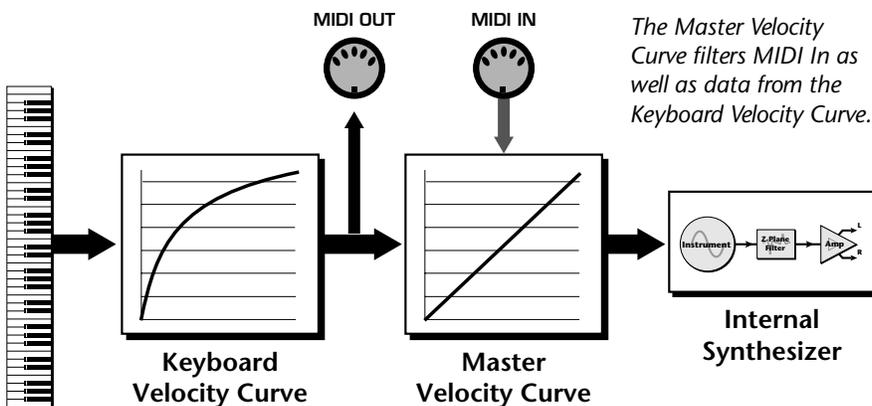
✎   *For a complete list of all available velocity curves, see "Master Velocity Curves" on page 228 of the Appendix.*
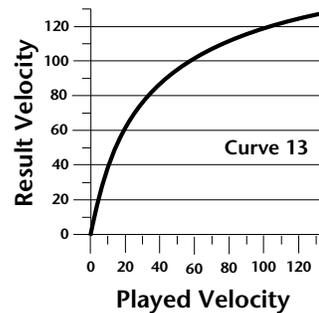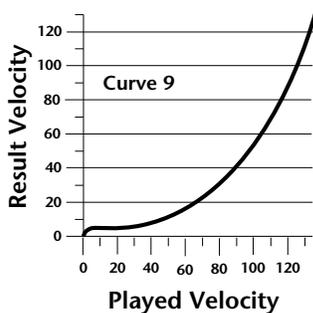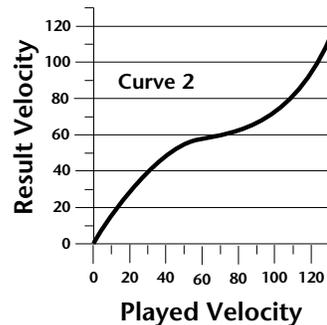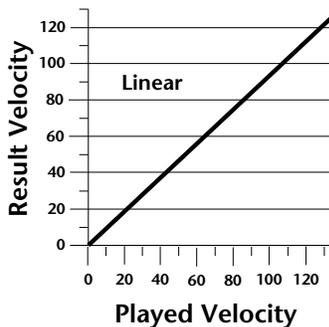
Mix Output

The Mix Output parameter allows you to override the routing assignments made in each preset and instead assign the outputs according to MIDI channel. For each of the 16 MIDI channels, you can select Send 1-4, or Preset. When Preset is selected, the output assignment defined in the Preset Edit menu is used.

```
MIX OUTPUT
channel 16:  Send 1->main
```

*Indicates that the dry signal is
routed to the Main output jacks.*

The **Output Routing** field (pointed to by the arrow) reflects the true routing of Send 2 or Send 3 to either:
1) the effects processor input or… 2) the rear panel submix jacks.

Since the Sub 1 output is NOT being used, the signal is routed through the effects processors, then on to the main outputs. If a plug were inserted into one of the Sub 1 jacks the destination field would read "Sub1" for Send 2 and the dry signal would be routed directly to the Sub 1 outputs on the back panel.

```
MIX OUTPUT
channel 15: use preset
```

✎ Send Routings
Send 1 - Main Outputs
Send 2 - Subout 1 or Main Outs
*Send 3 - Main Outs*
Send 4 - Main Outputs

The Sends function as effect processor inputs (effect sends). Send 2 is also used to route sounds to the Sub 1 outputs on the back panel. When a plug is inserted into the associated Submix jack on the back panel, **the Dry portion of the Send is disconnected** from the effects processor and the signal is routed directly to the output jack. **The Arrow points to the actual output routing.** If you don't want the wet portion of the signal in the main mix, turn down the Send Level. *The entire Send is disconnected from the Effects Processors even if only one plug is inserted into the Submix jack.*

The four Effect Sends allow you to get the most out of the two effect processors. For example, with Effect B set to an echo algorithm, you could route one MIDI channel to Send 3 and set the effect amount to 80%. Another MIDI channel could be routed to Send 4 with an effect amount of only 5%. This is almost like having two different effects!

The Mix Output function is also useful when sequencing since it lets you route specific MIDI channels to specific Sub outputs (on the back panel) where there they can be processed with EQ or other outboard effects.

OUTPUT SECTION
& EFFECTS PROCESSORS

MIDI CHANNEL

MIDI Channel 1 → Preset

MIDI Channel 2

MIDI Channel 3

MIDI Channel 16

FX Sends | Hall 1
Send 1 15%
Send 2 10%
Send 3 0%
Send 4 0%

Effect A

B ➡ A

FX Sends | Chorus
Send 1 0%
Send 2 0%
Send 3 20%
Send 4 15%

Effect B

SEND1

SEND2

SEND3

SEND4

MAIN

Jack Detect

SUB1
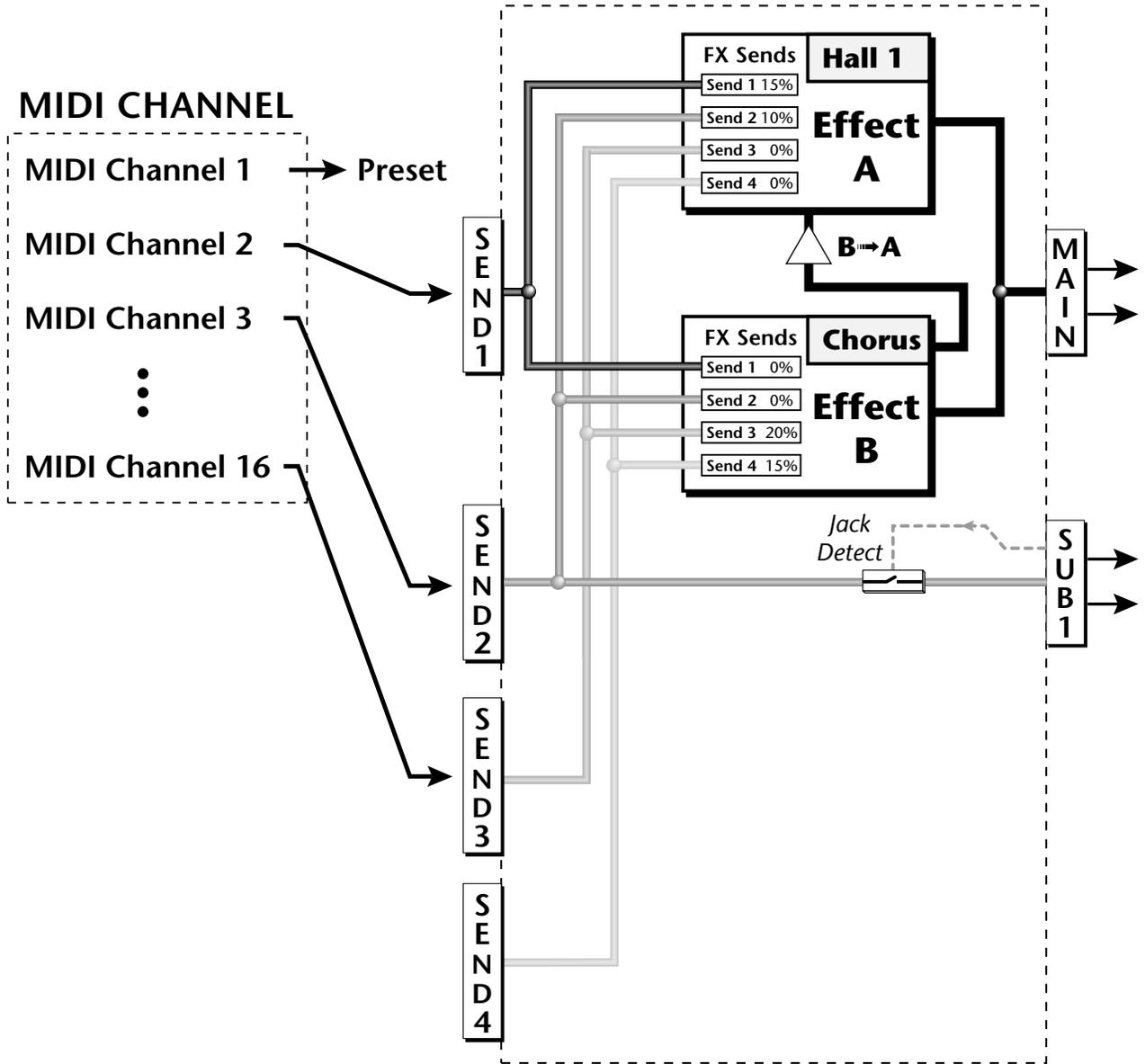
Send 2 can be routed to the effects processors or to rear panel submix jacks. When a plug is inserted into a Submix jack, the dry portion of the Send is disconnected from the effects processor and is routed **directly** to the Submix output jacks.

Master Effects

The digital effect processors can be programmed as part of the preset (using the Preset Edit menu) so that effects will change along with the preset. However, there are only two effect processors, and so you cannot have a different effect on each preset when in Multi mode.

The Master Effects settings assign the effect processors "globally" for all presets to provide a way to use the effects in Multi mode. Detailed information is presented in the Effects chapter (see Effects on page 173).

Effects Mode

The FX Mode page enables or bypasses the effects. When the FX Mode is set to "bypass," the effects are turned off on a global scale. This includes Effects programmed in the preset.

```
FX MODE
enabled
```

Effects Multi Mode Control

The routing scheme for the two stereo effects processors provides a lot of versatility. When in multi mode, you can "use master settings" which applies the Master effects settings to all 16 MIDI channels.

```
FX MULTIMODE CONTROL
use master settings
```

If you want more control, you can use the "channel" setting which applies the effects settings of the preset on a specified channel to all the other channels. Changing the preset on the specified channel changes the effect.

```
FX MULTIMODE CONTROL
preset on channel 1
```

If you are in Omni or Poly modes this parameter is disabled and the message in parentheses explains that Halo is currently in Omni mode.

```
FX MULTIMODE CONTROL
(using Omni mode)
```

Master FXA Algorithm

This function selects the type of effect used for the "A" effect. The following effect types are available.

```
MASTER FXA ALGORITHM
Room 1
```

A Effect Types

1.	Room 1	23.	BBall Court
2.	Room 2	24.	Gymnasium
3.	Room 3	25.	Cavern
4.	Hall 1	26.	Concert 9
5.	Hall 2	27.	Concert 10 Pan
6.	Plate	28.	Reverse Gate
7.	Delay	29.	Gate 2
8.	Panning Delay	30.	Gate Pan
9.	Multitap 1	31.	Concert 11
10.	Multitap Pan	32.	Medium Concert
11.	3 Tap	33.	Large Concert
12.	3 Tap Pan	34.	Large Concert Pan
13.	Soft Room	35.	Canyon
14.	Warm Room	36.	DelayVerb 1
15.	Perfect Room	37.	DelayVerb 2
16.	Tiled Room	38.	DelayVerb 3
17.	Hard Plate	39.	DelayVerb 4 Pan
18.	Warm Hall	40.	DelayVerb 5 Pan
19.	Spacious Hall	41.	DelayVerb 6
20.	Bright Hall	42.	DelayVerb 7
21.	Bright Hall Pan	43.	DelayVerb 8
22.	Bright Plate	44.	DelayVerb 9

FXA Parameters: Decay/HF Damping FxB -> FxA

This page lets you define the parameters of the selected Effects algorithm. Use this page to setup the effect decay, high frequency damping amount and to route "B" effects through the "A" effects. See "Effect Parameters" on page 175 for more details.

```
┌─────────────────────────────────┐
│ FXA   DECAY   HFDAMP   FxB>FxA  │
│        040      096       001   │
└─────────────────────────────────┘
```

FXA Send Amounts

These parameters set the effects amounts for each of the four stereo effects busses. See "Master Effects" on page 178 for detailed information.

```
┌─────────────────────────────────┐
│ FXA SEND AMOUNTS      1:100%    │
│ 2: 50%       3: 10%     4: 0%   │
└─────────────────────────────────┘
```

Master FXB Algorithm

This parameter selects the type of effect used for the "B" effect. The following effect types are available.

```
┌─────────────────────────────────┐
│ MASTER FXB ALGORITHM            │
│ Chorus 1                        │
└─────────────────────────────────┘
```

B Effect Types

1.	Chorus 1	**17.**	Ensemble
2.	Chorus 2	**18.**	Delay
3.	Chorus 3	**19.**	Delay Stereo
4.	Chorus 4	**20.**	Delay Stereo 2
5.	Chorus 5	**21.**	Panning Delay
6.	Doubling	**22.**	Delay Chorus
7.	Slapback	**23.**	Pan Delay Chorus 1
8.	Flange 1	**24.**	Pan Delay Chorus 2
9.	Flange 2	**25.**	Dual Tap 1/3
10.	Flange 3	**26.**	Dual Tap 1/4
11.	Flange 4	**27.**	Vibrato
12.	Flange 5	**28.**	Distortion 1
13.	Flange 6	**29.**	Distortion 2
14.	Flange 7	**30.**	Distorted Flange
15.	Big Chorus	**31.**	Distorted Chorus
16.	Symphonic	**32.**	Distorted Double

FXB Parameters:
Feedback/LFO Rate
Delay Time

The FXB parameters setup the characteristics of the effect. Use this page to define the feedback amount, the LFO rate and delay amount for the selected type "B" effect. See "Effect Parameters" on page 175 for details.

```
FXB    FEEDBK   LFORATE   DELAY
        000       003         0
```

FXB Send Amounts

These parameters set the effects amounts for each of the four stereo effects busses. See the Effects chapter for detailed information.

```
FXB SEND AMOUNTS      1:100%
2: 50%       3: 10%       4: 0%
```

Miscellaneous Parameters

Edit All Layers Enable

This function allows you to turn the Edit All Layers feature on or off. "Edit All Layers" is an Edit menu feature which allows you to select all layers (the letter "A" appears in the layer field) in order to edit all four layers simultaneously. Because this feature can be confusing to the beginning programmer, it can be disabled here in the Global menu.

```
EDIT ALL LAYERS
enabled
```

User Key Tuning

User Key Tuning lets you create and modify 12 user definable tuning tables. The initial frequency of every key can be individually tuned, facilitating the creation of alternate or microtonal scales.

Using the cursor keys and the data entry control, select the user table number, the key name, the coarse tuning and the fine tuning. The key name is variable from C-2 to G8. Coarse Tuning is variable from 0 to 127 semitones. The fine tuning is variable from 00 to 63 in increments of 1/64 of a semitone (approx. 1.56 cents). For each preset, the specific tuning table is selected in the Preset Edit menu. See page 168.

✎ *The user key tuning can be used to tune individual percussion instruments.*

```
USER  KEY  TUNING       Table: 1
Key: C1    Crs: 036       Fine: 00
```
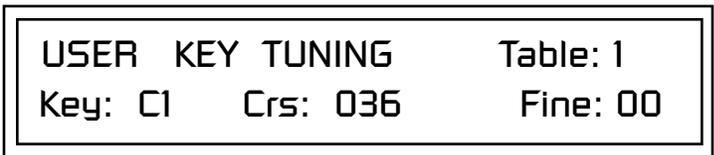
Screen Viewing Angle

This function changes the viewing angle of the display so that you can read it easily from either above or below the unit. The angle is adjustable from +7 to -8. Positive values will make the display easier to read when viewed from above. Negative values make the display easier to read from below.

```
VIEWING ANGLE
+0
```

MIDI Menu

Most of the parameters in Halo that relate to MIDI are contained within this menu. You can merge MIDI data, change the continuous controller assignments, turn program changes off or on, and lots more.

MIDI menu settings are saved with the current Multimap.

▶ **To enable the MIDI menu:**
Press the MIDI button, lighting the LED. The MIDI Menu screen displays the menu page most recently selected since powering up Halo. The cursor appears below the first character of the screen heading on line one.

▶ **To select a new screen:**
Press the Home/Enter button or press the Cursor button repeatedly until the cursor is below the screen title heading. Rotate the data entry control to select another screen.

▶ **To modify a parameter:**
Press either Cursor button repeatedly (or hold down the right cursor button while turning the data entry control) until the cursor is below the desired parameter value. Rotate the data entry control to change the value.

▶ **To return to the previously selected Mode/View screen:**
Press the MIDI button, turning off the LED.

👓 *Warning: MIDI Menu changes are automatically saved when you exit the menu. If the power is turned off before you exit the menu any changes you have made will be lost.*

Keyboard Outputs MIDI

This option allows you select whether or not the keyboard, pitch/mod wheel and footswitch data is transmitted on the MIDI output port. When this option is set to: "don't transmit", the keyboard, pitch/mod wheels, and footswitch only control the "current" preset. *(The current preset is the one currently showing in the Main screen).* The footswitch is transmitted on the MIDI CC number defined for Footswitch 1 in the Controllers menu.

```
┌─────────────────────────────────────┐
│  KEYBOARD  OUTPUTS  MIDI             │
│  transmit                            │
└─────────────────────────────────────┘
```
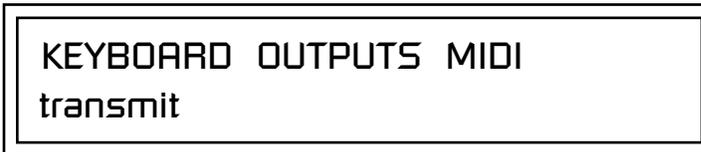
Knobs Output MIDI

This function allows you to select whether or not knob data is transmitted. The knobs transmit on the controller numbers defined by the Real-time Controller Assign parameter (See page 79).

```
┌─────────────────────────────────────┐
│  KNOBS OUTPUT MIDI                   │
│  don't transmit                      │
└─────────────────────────────────────┘
```

Transmit MIDI Clock

This option enables or disables the transmission of MIDI clock from the MIDI out port. When Halo is running on its own internal clock (page 82) it transmits 24 MIDI clocks per quarter note. When Halo is slaved to an external MIDI clock, it mirrors the incoming clock data.

```
┌─────────────────────────────────────┐
│  TRANSMIT MIDI CLOCK                 │
│  off                                 │
└─────────────────────────────────────┘
```

MIDI Enable

MIDI Enable lets you turn each MIDI channel on and off independently when in Multi mode. This feature is helpful when you have other devices connected to the same MIDI line and do not want the Halo unit to respond to the MIDI channels reserved for the other devices.

```
┌─────────────────────────────────────┐
│  MIDI ENABLE                         │
│  channel 01: On                      │
└─────────────────────────────────────┘
```
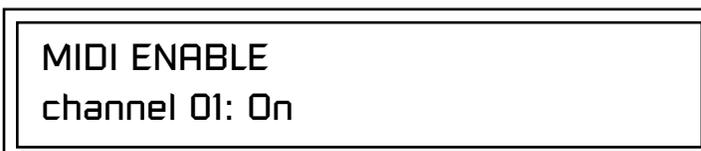
Because the MIDI Enable function only makes sense if you are in Multi mode, Halo disables this feature when in Omni or Poly mode.

In Multi Mode

```
MIDI  ENABLE
channel 16: On
```

In Omni Mode

```
MIDI  ENABLE
(using  Omni  mode)
```

Receive Program Change

Use this function to instruct Halo to utilize or ignore incoming MIDI preset changes or Bank Select commands for each channel. Use the cursor buttons to select the channel number field, then use the data entry control to select a channel number. Use the cursor button again to select the On/Off field and the data entry control to change the value.

```
RECEIVE PROGRAM CHANGE
channel 01 : on
```

MIDI Program Change -> Preset

You can also remap incoming MIDI program changes to a different numbered preset. This is a handy feature when your master keyboard cannot send a bank change or you want to reorder preset numbers. Any preset can be mapped to any incoming MIDI program change number.

For example, you could set up the Program -> Preset map to call up preset #12 whenever Halo receives MIDI program change #26.

The four fields shown below are editable.

✎ *The Program->Preset Change only works for program changes received in Bank 0.*

```
MIDI  PROG  CHNG   ->   PRESET
                000   User   000⁰
```

Incoming Program Change in Bank 0

ROM Bank

Program No.

Bank No.
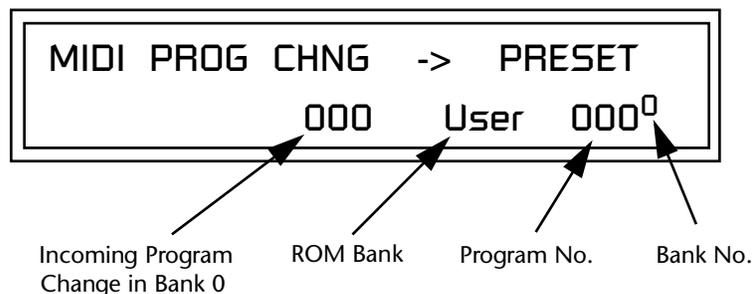
Programs and presets are the same thing. We use the word "Preset" for MIDI Program.

Selected Program: **26** →

	0	1	2	3	4	5	6	7	8	9
	00^0	01^0	02^0	03^0	04^0	05^0	06^0	07^0	08^0	09^0
10	44^2	91^0	50^1	01^0	15^0	88^0	99^1	78^0	32^4	88^0
20	34^1	73^0	106^0	55^0	43^2	75^0	12^0	120^0	121^0	100^2
30	30^0	31^0	32^0	33^0	34^0	35^0	36^0	37^0	38^0	39^0
40	40^0	41^0	42^0	43^0	44^0	45^0	46^0	47^0	48^0	49^0
50	50^0	51^0	52^0	53^0	54^0	55^0	56^0	57^0	58^0	59^0
60	60^0	61^0	62^0	63^0	64^0	65^0	66^0	67^0	68^0	69^0
70	70^0	71^0	72^0	73^0	74^0	75^0	76^0	77^0	78^0	79^0
80	80^0	81^0	82^0	83^0	84^0	85^0	86^0	87^0	88^0	89^0
90	90^0	91^0	92^0	93^0	94^0	95^0	96^0	97^0	98^0	99^0
100	100^0	101^0	102^0	103^0	104^0	105^0	106^0	107^0	108^0	109^0
110	110^0	111^0	112^0	113^0	114^0	115^0	116^0	117^0	118^0	119^0
120	120^0	121^0	122^0	123^0	124^0	125^0	126^0	127^0		

→ Mapped Program: **12**

In this chart, program changes 10-29 have been remapped to new preset numbers. All other presets are selected normally.

MIDI SysEx ID

WARNING: When transferring SysEx data from one Halo to another, the ID numbers of both units must be the same.

This page defines the MIDI system exclusive (SysEx) device ID number. The SysEx ID lets an external programming unit to distinguish between multiple Halo units connected to the same preset editor. In this case each unit must have a unique SysEx ID number.

```
MIDI SYSEX ID
000
```

MIDI SysEx Packet Delay

The MIDI SysEx Packet Delay command lets you specify the amount of delay between MIDI SysEx packets going out of Halo so that your computer sequencer can record this large chunk of data over a longer period of time. On playback from the sequencer, the SysEx data will be fed more slowly into Halo so that the its input buffer does not overflow, causing an error. Many sequencers allow you to "Time Stamp" SysEx data as it is recorded. This is the preferred mode for recording SysEx data.

The packet delay range is from 0 through 8000 milliseconds. A delay value of zero allows full speed MIDI transfer. If you are experiencing data transmission errors, try increasing the delay value until the problem disappears.

```
MIDI SYSEX PACKET DELAY
300  milliseconds
```

Send MIDI System Exclusive Data

This command transmits MIDI System Exclusive (SysEx) data to the MIDI Out port of Halo. The MIDI data can be sent to a computer, sequencer or to another Halo. When transferring data between two Halo's be sure both units have the same SysEx ID number! Using the cursor key and the data entry control, select the type of MIDI data you want to transmit. Following are descriptions of the types of MIDI data that can be transmitted.

Current Multisetup
Transmits all parameters in the Global menu except Tuning Tables, Program/Preset Map and Viewing Angle. Transmits the entire Controllers menu.

Program /Preset Map
Transmits the MIDI Program -> Preset Map.

Tuning Tables
Transmits all 12 user User Tuning Tables.

Bank 0 User Presets
Transmits all the user defined presets in Bank 0.

Bank 1 User Presets
Transmits all the user defined presets in Bank 1.

Bank 2 User Presets
Transmits all the user defined presets in Bank 2.

Bank 3 User Presets
Transmits all the user defined presets in Bank 3.

Any Individual Preset
Transmits only the selected preset.

🐛 *WARNING: When transferring SysEx data from one Halo to another, the ID numbers of both units must match.*

The Enter LED will be flashing. Press the Enter button to confirm the operation. To receive MIDI data, simply send the MIDI data into Halo from another Halo or from a computer/sequencer.

```
SEND MIDI SYSEX DATA
bank 1 user presets
```

▶ **To Record MIDI SysEx Data into an External Sequencer:**

1. Setup the sequencer to receive system exclusive data.
2. Place the sequencer into record mode, then Send MIDI Data.

▶ **To Receive MIDI SysEx Data from an External Sequencer:**
Simply play back the sequence containing the SysEx data into Halo.

MIDI Mode

MIDI Mode selects one of the three MIDI modes: Omni, Poly or Multi.

```
MIDI MODE              CHANGE
multi                 ignored
```

The **MIDI Mode Change** parameter specifies whether mode changes made through an external MIDI controller are accepted or ignored.

The MIDI modes are as follows:

Omni
Responds to note information on all MIDI channels and plays the preset currently displayed in the main screen.

Poly
Responds only to note information received on the currently selected MIDI channel (on the preset selection screen) and plays that channel's associated preset.

Multi
Responds to data on any combination of MIDI channels and plays the specific preset associated with each of the MIDI channels. You must select multi mode for multitimbral operation.

Programming Basics

This chapter explains how Halo sounds are constructed and contains important background information on how to create your own custom presets.

Your initial involvement with Halo will most likely be using the existing presets and selecting MIDI channels. While the factory presets are very good, there are some things you will probably want to change eventually, perhaps the LFO speed, the filter frequency or the attack time. You may also want to make your own custom presets using complex modulation routings. This module will do far more than you ever imagined and there are whole new classes of sound just waiting to be discovered.

Each preset can consist of up to four instrument layers. Each of the four layers can be placed anywhere on the keyboard and can be crossfaded or switched according to key position, velocity, or by using a real-time control such as a wheel, slider, pedal, LFO or envelope generator. A preset can also be "linked" with up to 2 more presets creating additional layering or splits.

Halo has an extensive modulation implementation using two multi-wave LFO's (Low Frequency Oscillators), three multi-stage envelope generators and the ability to respond to multiple MIDI controllers. You can simulta-neously route any combination of these control sources to multiple desti-nations.

There are 512 user locations (USER Banks 0-3) available to store your own creations or edited factory presets. It's easy and fun to edit or create your own unique presets.

Modulation

To modulate means to dynamically change a parameter, whether it be the volume (amplitude modulation), the pitch (frequency modulation), and so on. Turning the volume control on your home stereo rapidly back and forth is an example of amplitude modulation. To modulate something we need a modulation source and a modulation destination. In this case, the source is your hand turning the knob, and the destination is the volume control. If we had a device that could turn the volume control automatically, we would call that device a modulation source.
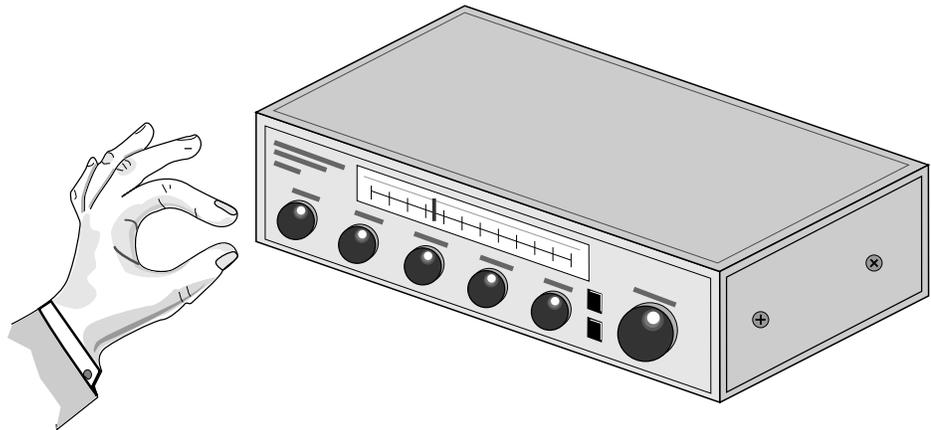
Turning the volume control back and forth on your home stereo is an example of Amplitude Modulation.

Halo is designed so that each of the variable parameters, such as the volume, has an initial setting which is changed by a modulation source. Therefore in the case of volume, we have an initial volume that we can change or modulate with a modulation source.

Two main kinds of modulation sources on Halo are *Envelope Generators* and *Low Frequency Oscillators*. In the example above, an envelope generator could be routed to automatically turn the volume control as programmed by the envelope. Or, a low frequency oscillator could be routed to turn the volume up and down in a repeating fashion.

Positive modulation adds to the initial amount. Negative modulation subtracts from the initial amount.

Summing Nodes

All the modulation inputs on Halo are summing nodes. This means that you can connect as many modulation sources as you want to an input *(such as Pitch or AmpVol)*. Modulation sources are simply added algebraically—connecting two knobs one set to -100 and the other set to +100 yields a net value of zero.

Modulation Sources

Modulation sources include *Envelope Generators, Performance Controllers* and *Low Frequency Oscillators*. In the previous example, an envelope generator was routed to automatically turn the volume control as programmed by the envelope, or, a low frequency oscillator could be routed to turn the volume control up and down in a repeating fashion. The following is a list of the modulation sources used in Halo.

Keyboard Key
Which key is pressed.

Key Velocity
How fast the key is pressed.

Release Velocity
How fast the key is released.

Gate
High if the key is pressed, low when the key is released.

Key Glide
A smoothly changing control source based on the Glide Rate and the interval between the last two notes played.

Pitch and Mod Controllers
Synthesizer pitch bend and modulation controllers.

Keyboard Pressure (mono aftertouch)
Key Pressure applied after the keyboard key is initially pressed.

Pedal
A continuously variable pedal controller.

Miscellaneous Controllers A -P
Any type of MIDI continuous controller data.

Low Frequency Oscillators (2 per layer)
Generate repeating waves.

Envelope Generators (3 per layer)
Generate a programmable "contour" which changes over time when a key is pressed.

Noise & Random Generators
Generate spectrums of noise and random signals.

Footswitches
Change a parameter when the switch is pressed.

Clock Divisor
The master tempo clock can be divided and used as a modulation source.

Tip: *Try routing Key Glide to Filter Frequency if you want the filter to smoothly follow pitch in solo mode. Routing Key Glide to Pan creates another interesting effect.*

Random Sources

Random modulation sources can be used when you want the timbre of the sound to be "animated" in a random or non-consistent manner.

- **Key Random 1 & 2** generate different random values for each layer which do not change during the note.

- The **White & Pink Noise** Generators produce varying random values. Both white and pink noise sources are low frequency noise designed for control purposes. Either noise source can be filtered even more by passing it through a lag processor.

- The **Crossfade Random** function generates the same random value for all layers in a preset. This source is designed to be used for cross-fading and cross-switching layers, although you may find other uses.

Modulation PatchCords

✎ *The controller Knobs assignments printed on the front panel are the system defaults. You can change any of these assignments using the Real-time Controller Assignment page in the MIDI menu (see page 94 for details).*

When setting up modulation with the Halo, you define a modulation source and a modulation destination. Then, you connect the source to the destination using "PatchCords." Halo's PatchCords are connected in the software. Halo has 24 general purpose PatchCords for each layer.

You can connect the modulation sources in almost any possible way to the modulation destinations. You can even modulate other modulators. Each PatchCord also has an amount parameter which determines "how much" modulation is applied to the destination. The modulation amount can be positive or negative. Negative values invert the modulation source.

Modulation Source

Amount +/-

Destination

LFO 1	**Amp Volume**

Modulation Source

Destination

LFO 1
LFO 2
Amp Env
Filt Env
Aux Env
Wheel
Pressure
etc.

Amp Vol
Pitch
Pan
LFO Rate
Aux Env
Env Atk
Glide
etc.

Envelope Generators

An envelope can be described as a "contour" which is used to shape the sound over time in a pre-programmed manner. There are three envelope generators per layer and all of them are the rate/level type.

This is how the rate/level *(time based)* envelopes work: When a key is pressed, envelope starts from zero and moves toward the Attack 1 Level at the Attack 1 Rate. As soon as it reaches this first level, it immediately begins the next phase and moves toward the Attack 2 level at the Attack 2 rate. As long as the key is held down, the envelope continues on through the Decay 1 and Decay 2 stages. If the key is still held when the envelope reaches the end of Decay 2, it simply waits there for you to release the key. When you release the key, the envelope continues into the Release 1 and Release 2 stages, stopping at the end of the Release 2 stage. Halo's envelope generators provide great flexibility for programming both complex and simple envelopes.

If two adjacent segments have the same level in a "time-based" envelope, the segment will be skipped. Adjacent segments must have different levels for the rate control to work.
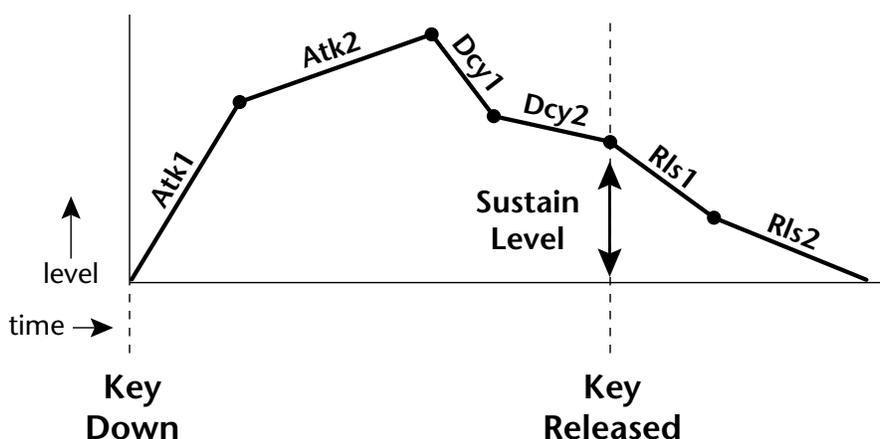
All three envelope generators have the six stages described above. The Volume Envelope generator controls the volume of the voice over time. The Filter Envelope generator is a general purpose envelope most often used to control the filter frequency. Unlike the Volume Envelope, however, the Filter Envelope can have a negative level value as well as a positive level. There is also an Auxiliary Envelope generator which is a general purpose envelope. The Auxiliary Envelope is identical to the Filter Envelope and can have negative as well as positive levels. You can adjust the time of each stage to create myriad envelope shapes, which in turn shape the sound over time.

ADSR mode: *To create a standard ADSR envelope: Set Atk1, Atk2 & Dcy1 Level to 100, Rls 1 & 2 level to 0, and Atk2, Dcy1, Rls2 Rates to 0. Program Atk1, Dcy2 and Rls1 segments as you wish. See page 201.*

By routing the Auxiliary or Filter Envelopes to control the pitch (PatchCords) you can easily hear the shape of the envelopes you are creating.

- Volume envelopes contour the way the volume of a sound changes over time determining how we perceive that sound. For example, a bell struck with a hammer is instantly at full volume, then slowly dies away. A bowed violin sound fades in more slowly and dies away slowly. Using Halo's Volume Envelope, you can simulate the different types of natural instrument volume envelopes by programming them appropriately.

Tempo-based Envelopes
Tempo-based envelopes are based on *Time* which is controlled by the
Master Tempo *(located in the Global menu)*. The Master Tempo rate scales the
time of the Tempo-based envelope segments. The Master Tempo can be set
to use an external MIDI clock so that the envelope times can be synchro-
nized to external sequencer or arpeggiator tempo changes. See page 82.
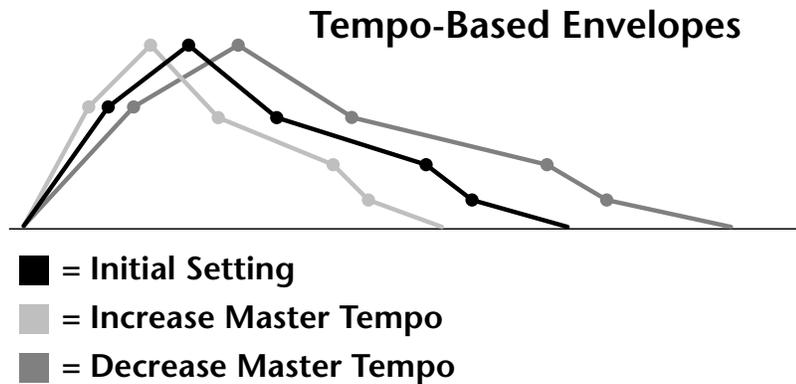
Envelope Repeat
The Envelope Generators can also be made to repeat. When the envelope
repeat function is On, the Attack (1&2) and Decay (1&2) stages will
continue to repeat as long as the key is held. As soon as the key is released,
the envelope continues through its normal Release stages (1 & 2).

The diagram above show how the looping envelopes work. When the key is
pressed the envelope goes through its regular Attack 1, Attack 2, Decay 1
and Decay 2 stages. In non-looping mode, the envelope would hold at the
end of the Decay 2 stage until the key was released. In looping mode
however, it jumps back to the Attack 1 stage and repeats the first four
stages. It continues to loop through these four stages until the key is
released where it immediately jumps to the Release 1 stage.

*Only the Filter and
Auxiliary Envelopes have the
repeating feature.*

Low Frequency Oscillators (LFOs)

A Low Frequency Oscillator or LFO is simply a wave which repeats at a slow rate. The Halo has two multi-wave LFOs for each channel. The LFO waveforms are shown in the following illustration.

LFO Tricks & Tips:

• *The Random LFO wave is truly random and is different for each voice and layer.*

• *The Pattern (Pat) waveforms will sound the same on different layers and voices.*

• *Sine + Noise is very useful for simulating trumpet and flute vibrato.*

★ *When routing Hemi-quaver to Pitch:*

+38 = major scale
-38 = phrygian scale
+76 = whole tone scale
(+38) + (+76) = diminished (two cords)

odd amount = S+H sound

Note: *References to musical intervals in the pattern LFO shapes are with the LFO routed to pitch and a PatchCord amount of +38.*

✎ *Try combining the Pattern LFOs, or controlling the amount of one with another, or combining them with the clock divisors.*

By examining the diagram of the LFO waveforms, you can see how an LFO affects a modulation destination. The shape of the waveform determines the result. Suppose we are modulating the pitch of an instrument. The sine wave looks smooth, and changes the pitch smoothly. The square wave changes abruptly and abruptly changes from one pitch to another. The sawtooth wave increases smoothly, then changes back abruptly. The sound's pitch follows the same course. Controlling the pitch of an instrument is an easy way to hear the effects of the LFO waves.

Like the Auxiliary Envelope, LFOs can be routed to control any real-time function such as Pitch, Filter, Panning, or Volume. A common use for the LFO is to control the pitch of the sound (LFO -> Pitch). This effect is called vibrato and is an important performance effect. Many presets use this routing with the modulation wheel controlling "how much" LFO modulation is applied. Another common effect, Tremolo, is created by controlling the volume of a sound with the LFO (LFO -> Volume).

You might use the LFOs to add a slight bit of animation to the sound by routing the LFO to control the filter. For this effect, set the LFO "amount" low for a subtle effect.

When a PatchCord amount is a negative value, the LFO shape is inverted. For example, inverting the sawtooth wave produces a wave that increases abruptly, then smoothly glides down.

Negative Amount

Sawtooth   **Inverted Sawtooth**
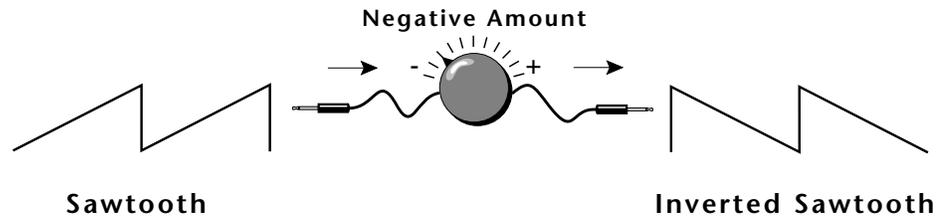
Clock Modulation

✎ *Envelopes are triggered on the positive going edge of the clock. LFOs are triggered on the negative going edge of the clock.*

✎ *The tempo of the master clock is set in the Global menu.*

You can use the Master Clock as a modulation source, to trigger the Filter or Auxiliary Envelope generators, trigger Sample Start, synchronize the LFOs, or directly as a square wave modulation source. The Clock source is available in eight divisions (octal whole note, quad whole note, double whole note, whole note, half note, quarter note, eighth note, sixteenth note). You can use the different rates separately or in conjunction to create complex "synchro-sonic" rhythm patterns. You can also use a MIDI Clock as the Master Clock to synchronize to an external MIDI device such as a drum machine or sequencer. *(See Master Tempo in the Global menu.)*

Clocks are routed exactly like the other modulations sources using the PatchCords. The PatchCord Amount MUST be positive (+) for the clock to pass. By modulating the PatchCord Amount, you can route the divided clocks using real-time controllers or other modulation sources.

When an LFO is triggered by a clock, the LFO wave resets to zero every time the clock wave goes low. If the LFO rate is close to the clock rate, the LFO virtually synchronizes with the clock. If the two rates are far apart, the waveform of the LFO will be mildly or radically altered.

Triggered LFO

LFO Wave
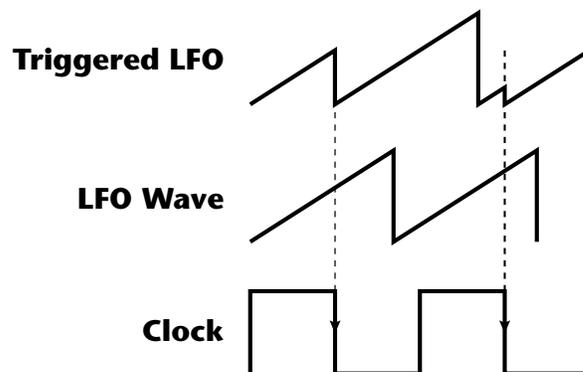
Clock

LFO Trigger causes the LFO to reset each time the clock waveform goes low.
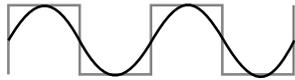
LFOs can also be perfectly synchronized with the clock at any of 25 note divisions. This allows you to create very cool "synchro-sonic" effects that work perfectly at any tempo. Choosing one of the note divisors in the LFO rate screen selects the synced LFO function.

There are many possibilities for clock modulation and retrigger. For example, you can create a repeating six segment curve of any shape by triggering the Filter or Auxiliary Envelope generators with the clock. A few other possibilities are listed below.

LFO Synced to 1/4 Note Clock

- Turn different voice layers on and off using different clock divisors.
- Switch between Auxiliary and Filter Envelope retriggering using a slider or footswitch.
- Retrigger LFOs or Envelopes using noise or other LFOs to create random or semi random effects.
- Alter the LFO waveform by modulating the rate of a triggered LFO.
- Route multiple clocks with different divisors to the same destination (such as pitch) to create complex patterns. *(Hint: Adjust the PatchCord Amounts.)*
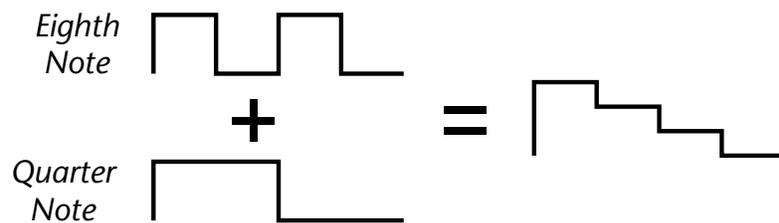
Adding these two clocks together in equal amounts produces a stairstep waveform.
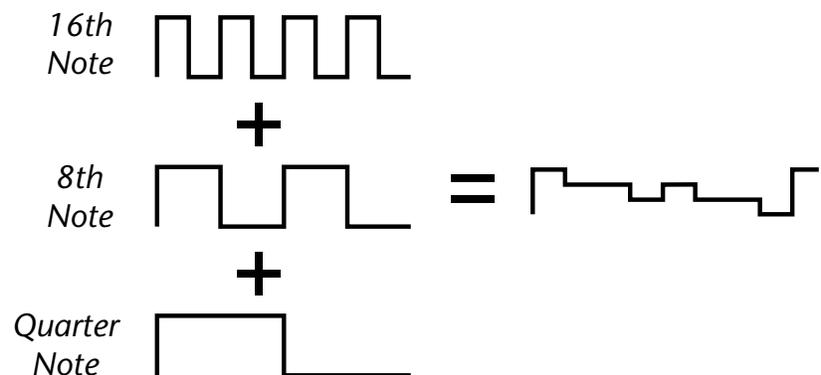
Adding multiple clocks with unequal amounts produces complex repeating patterns.

Modulation Destinations

The PatchCords section of the Preset Edit menu is where you connect sources to destinations. Each PatchCord has an amount associated with it which controls how much modulation is applied.

```
 L1  PATCHCORD                #01
ModWhl  ->  RTXfade          +036
```

The PatchCords screen above and the diagram below show how modulation sources are connected to destinations. The modulation sources can control any of the destinations in the layer.

All the modulation destinations are summing nodes. This means that you can connect as many modulation sources as you want to a destination. Modulation sources are simply added algebraically — connecting two sources, one with a value of -100 and the other with a value of +100 yields a net value of zero.
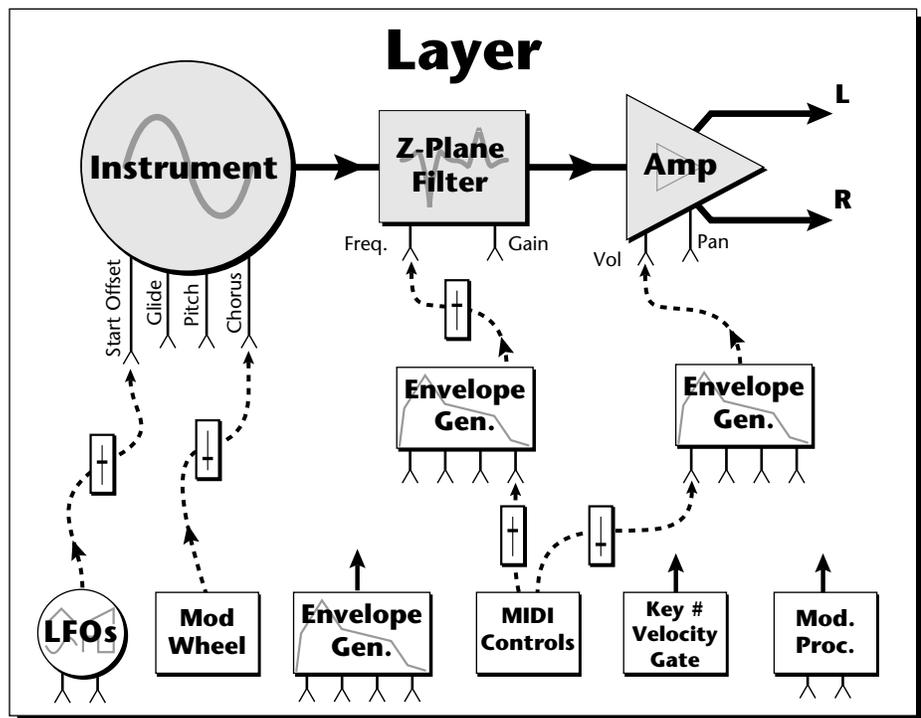
- Note-on modulation sources, such as key, velocity and gate output a single value at note-on time. Realtime modulation sources such as LFOs, envelope generators and modulation wheels output continuously changing values.

The possible modulation routings are completely flexible as shown in the diagram above. Multiple sources can control the same destination, or a single source can control multiple destinations.

Modulation Processors

Modulation processors are devices which can modify modulation sources such as LFOs and envelope generators before they are applied to a destination. Modulation processors let you create patches and do tricks which would not be possible otherwise. These modulation processors are independently programmable on each of the four layers.

Switch
Outputs a digital "1" when the input is greater than "0".
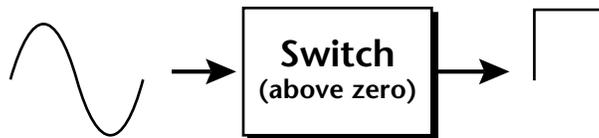
Summing Amp
Lets you add several modulation signals together before applying them to a destination. This processor can save PatchCords when routing the output to multiple destinations.
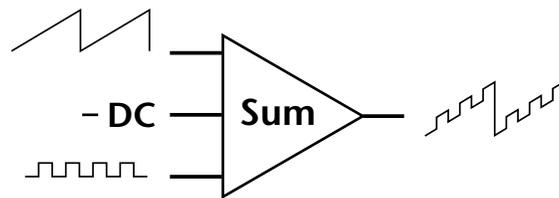
Lag Processors
Slows down rapid changes in the input signal. The output "lags" behind the input at a pre-programmed rate. There are two lag processors, Lag 0 and Lag 1. Lag 1 has a longer lag time than Lag 0.
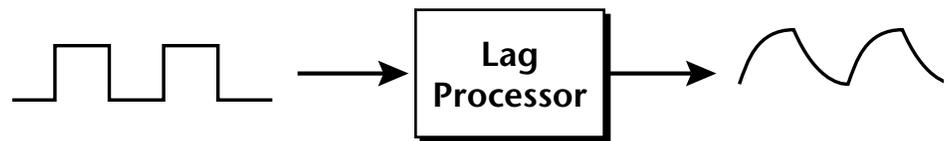
Absolute Value
This function inverts negative input values and outputs only positive values. This device is also called a full wave rectifier.
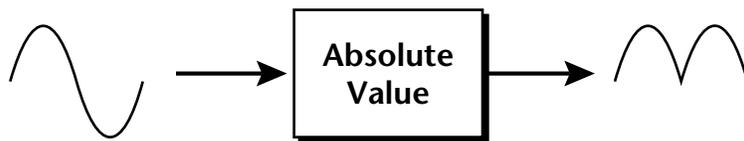
Diode
The diode blocks negative input values, passing only positive values.

The value of a digital "1" is equal to the PatchCord amount.
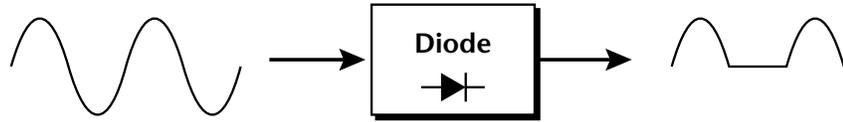
Flip-Flop
The output of this processor alternates between a digital "1" and digital "0" each time the input goes positive from zero or a negative value. With an LFO input, the output will be a square wave of half the input frequency.

Quantizer
With the input PatchCord set to 100%, the output value is limited to 16 discrete values. The value of the input PatchCord controls the number of steps. The value of the output PatchCord controls the size of the steps.

# of Steps   **Quantizer**   *Size of Steps*
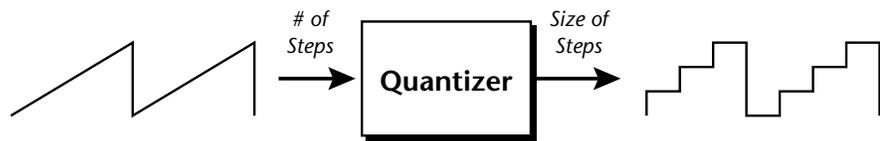
4x Gain
This processor amplifies the modulation source by a factor of 4.

4x Gain

Lag Inputs
Summing Amps can be useful in complicated patches where you want to control a combination of modulation signals with a single patchcord.
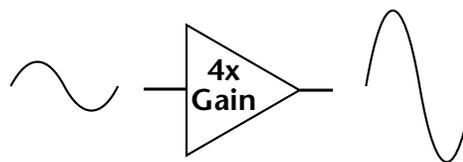
The Lag processors can be used as 2 additional summing amps. Lag0sum and Lag1sum are modulation sources which equal the sum of PatchCords connected to the Lag in destination. The summing amp is located before the lag processor as shown in the following illustration.

Sum Node   **Lag**   *Lag 0*

Lag 0 sum

Preset Modulation Processors

✎ *Preset Modulation Processors start working as soon as the preset is selected. The Layer Modulation Processors take effect only when a key is pressed.*

There are also two "Preset Level" modulation processors located in the "Preset Patchcords" screen of the Edit menu. It is important to understand that although the preset processors *originate* at the *Preset Level PatchCords*, their output is used in the *Layer PatchCords*.

Preset Lag
Like the Layer Lag processors *(described on page 109)* the Preset Lag slows down rapid changes in the input signal. The output "lags" behind the input at a pre-programmed rate. Unlike the layer level lag processors, the *preset lag* takes effect as soon as the preset is selected. In contrast, the layer level lag processors begin acting only after a keyboard key has been depressed. The Preset Lag also has a *Lag Amount* input which controls the lag time. Positive lag amounts increase the lag time. A MIDI controller *(front panel knob)* is commonly used to control lag amount.

The preset lag can be used to "spin-up" and "spin-down" an LFO which controls some other effect, perhaps left/right panning, pitch, or the filter. A MIDI footswitch could be used as the input to the lag which acts to slow down the instantaneous change of the switch. The slowly changing output value is then routed using a layer patchcord to crossfade between layers or change the speed of an LFO.


ex. footswitch → **Preset Lag** →

Lag Amount
(+ value = longer)
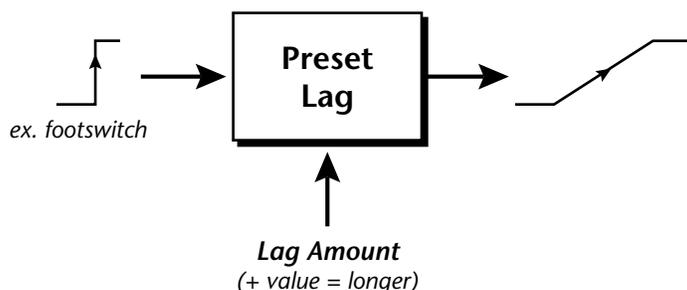
Preset Ramp
This processor generates a positive or negative going slope whenever the **first** key is depressed on the MIDI channel.

Preset Ramp
Positive Rate

1st Note Played

increase

original value

time ⟶

Preset Ramp
Negative Rate

time ⟶

original value

decrease

1st Note Played
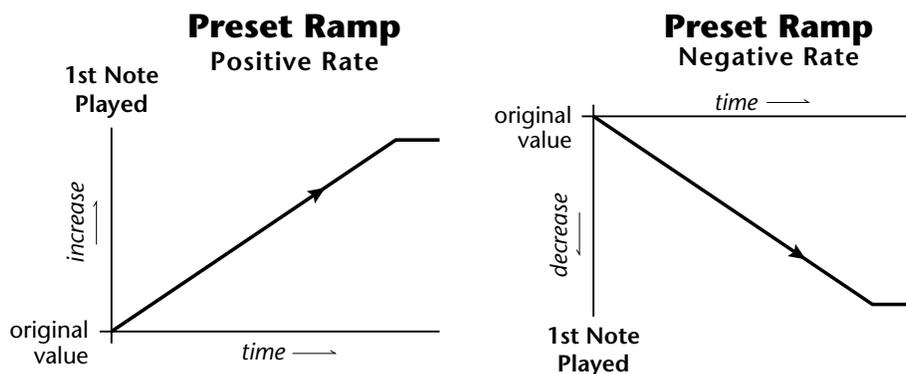
The preset ramp instantly resets when all notes have been released and the next *first key* on the MIDI channel is pressed. The Ramp Rate polarity *(+ or -)* determines if the ramp will be positive or negative going. The value of the ramp rate sets the increment. Large values produce fast ramps and small values produce slow ramps. Multiple inputs can be connected to the ramp rate (just like all the other destinations in Halo).

The patch below shows an application for the Preset Ramp which generates an adjustable decay envelope ONLY on the first note played to bring in the sound from another layer. Instead of routing the output to the Amp Volume you could just as easily route it to control Pitch, LFO Speed or any other destination you can think of. Study this patch if you want to learn a few new tricks using the patchcords.


Real Rocket Science
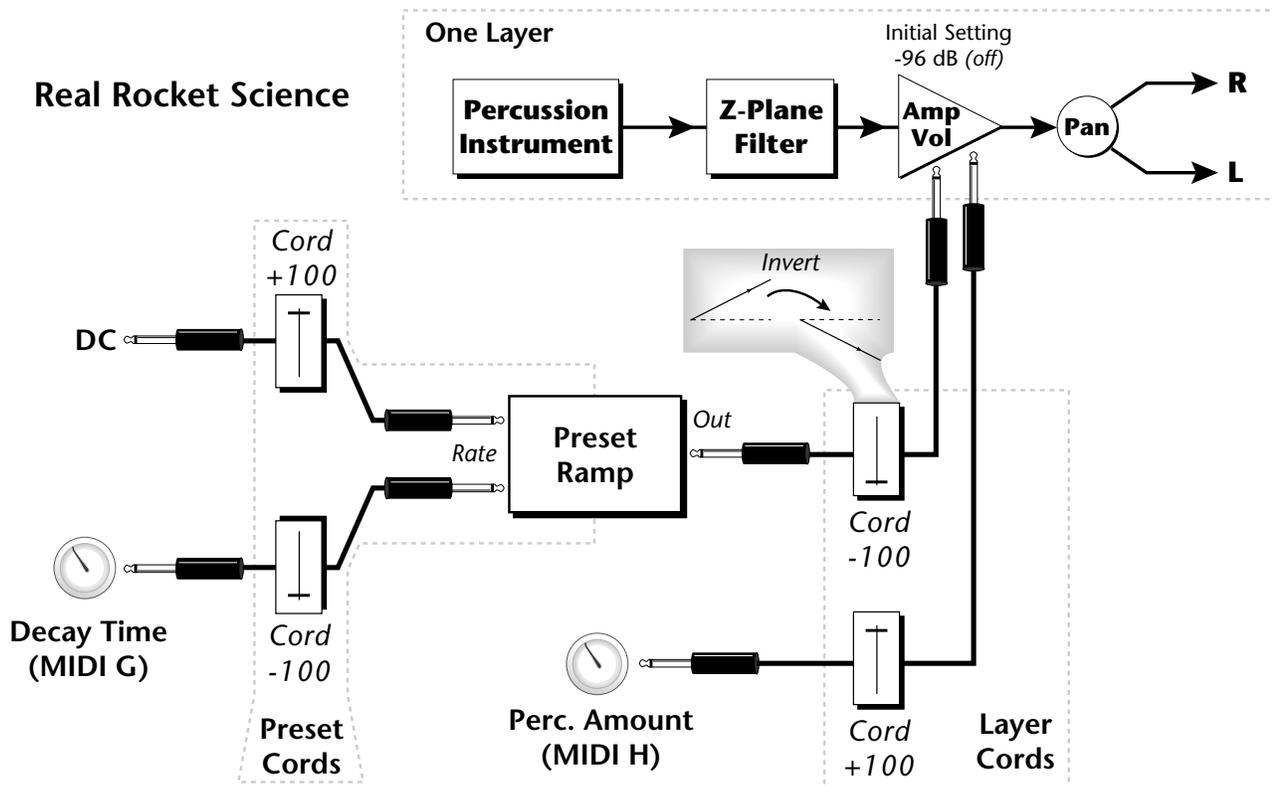
1. **DC** - Sets initial ramp Fast-Positive (+100)
2. **Decay Knob** - Inverted value slows ramp as the knob value is increased.
3. **Ramp Out Cord** - Inverts Ramp slope (downward).
4. **Amp Vol** - Initial setting is Off (-96dB). Ramp cannot overcome this negative bias.
5. **Perc. Amt** - When this knob is turned up, the positive bias on the Amp is restored so that so that the Ramp can now affect Amp Volume.
6. **Volume Envelope** - Fast Attack, Full Sustain, No Release

The combination of the DC & Perc. Decay Time Cords has the effect of reversing the Percussion Decay Time knob. The decay time increases as the knob is turned up.

Using the Modulation Processors

Modulation processors are inserted into a modulation routing as shown in the following diagram.

The modular analog synthesizers of yesteryear were incredibly flexible, partly because processing devices could be connected in any order. Modulation processors are designed according to this modular concept. They can be linked and used in a wide variety of ways limited only by your imagination. Consider the following example:
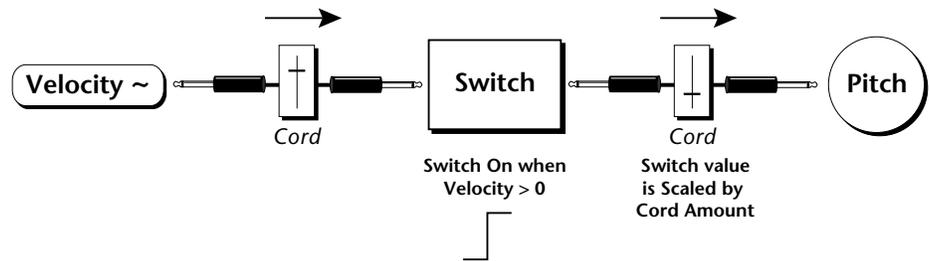

The patch illustrated above is programmed by setting the PatchCord screens as shown below.

```
ᴸ¹ PATCHCORD                    #01
Vel+-  ->   Switch             +100
```

```
ᴸ¹ PATCHCORD                    #02
Switch ->  Pitch               +022
```

This particular modulation shifts the overall pitch up a fifth when the key velocity exceeds 64. Velocities below 64 play at normal pitch. Notes with velocities of 64 and above are raised a perfect fifth. The Velocity "~" source scales the played velocity around zero. In other words, low velocities (below 64) will have negative values and high velocities (64 and above) will be positive. A velocity of 64 would be zero. The Switch module only outputs a "1" if the input value is greater than zero. This digital "1" value can be scaled through the attenuator on the PatchCord to raise or lower the pitch by any amount. In this case, a scaling value of +22 raises the pitch by a perfect fifth. The amount of the PatchCord on the input to the switch is unimportant because ANY velocity value equal or greater than 64 will flip the switch. If the input PatchCord amount were a negative value however, the action of the velocity would be reversed and velocities less than 64 would raise the pitch and velocities equal or greater than 64 would play the original pitch.

But what if you want the velocity switch point to be something other than 64? Thanks to modulation processors, it can be done. Here's how.
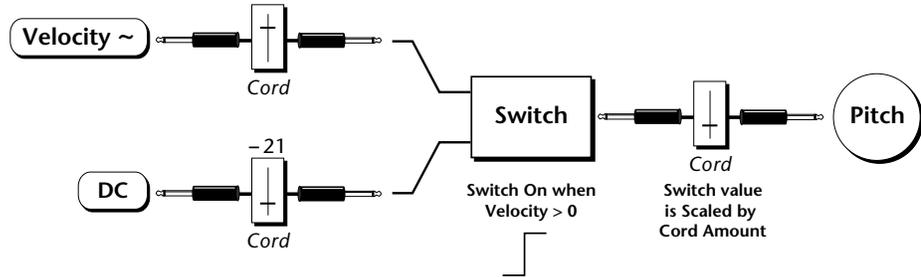
Connect the DC level to the input of the switch along with the velocity value. Note that more than one modulation source can be applied to the input of a processor.

DC offset adds a fixed value based on the PatchCord Amount setting. If applied to the switch along with the velocity, it changes the velocity value required to trip the switch. By setting the DC amount to a negative amount, higher velocity values are required to trip the switch. Setting the DC value to a positive value would bring the velocity switch point down. The PatchCord screens for this patch are shown below.

```
ᴸ¹ PATCHCORD                    #01
Vel+-  ->   Switch             +100
```

```
ᴸ¹ PATCHCORD                    #02
DC   ->    Switch              -021
```

```
ᴸ¹ PATCHCORD                    #03
Switch   ->   Pitch            +022
```

More Examples

To derive a smooth random function you could route the Pink Noise generator through one of the Lag Processors. A smooth random wave is useful in small amounts to add a degree of natural variation to timbre when routed to filter cutoff. Normal pink noise is low pass filtered audio frequency noise with a 3 dB/octave slope to give equal energy per octave. Halo pink noise is actually more like very low frequency filtered noise, but it is perfect for use as a random control source.
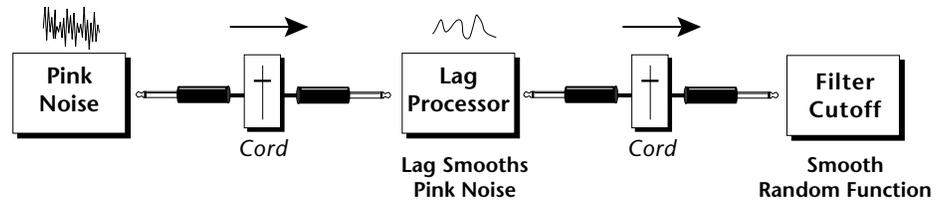

The **Quantizer** can generate interesting whole-tone scales when envelope generators or LFOs are routed to the input. The quantizer turns a smoothly changing input signal into a series of steps. By routing the output of the quantizer to Pitch and adjusting the PatchCord amounts, you can control both the number of steps and the pitch interval of each step.
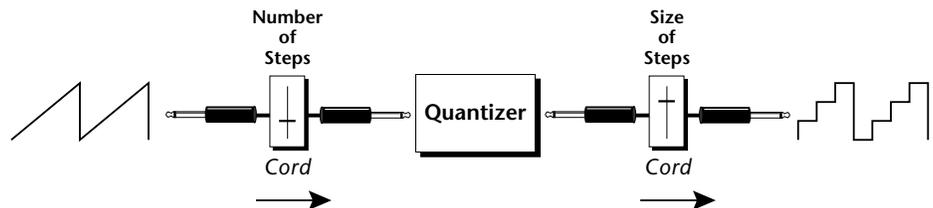
The input PatchCord amount controls how many steps will be generated. With a sawtooth wave (LFO+) feeding the input and the PatchCord amount set to 100%, sixteen steps are generated. The output PatchCord amount controls the size (or interval) of the steps.

Try setting up the following patch exactly as shown below using your favorite preset as a starting point.

```
L1  LFO1     SHAPE              SYNC
            sawtooth          key sync
```

```
L1  LFO1     RATE     DELAY      VAR
            0.35Hz     000       000
```

The 4x Amp can be used to get more steps or increase the interval of the Quantizer.

```
 L1  PATCHCORD            #01
LFO1+  ->   Quantize      +030
```

```
 L1  PATCHCORD            #02
Quantize  ->  Pitch       +100
```

Experiment with this patch by connecting other sources and destinations to the Quantizer.

```
 L1  PATCHCORD            #03
DC   ->   Pitch           -050
```

This patch generates an ascending arpeggio every time a key is pressed. A diagram of the patch is shown below. The patch is very straightforward except for the DC offset which was added to bring the pitch down into tune. (Sometimes you have to fix a problem, but using the mod processors there's usually a way around it to achieve the desired result.)
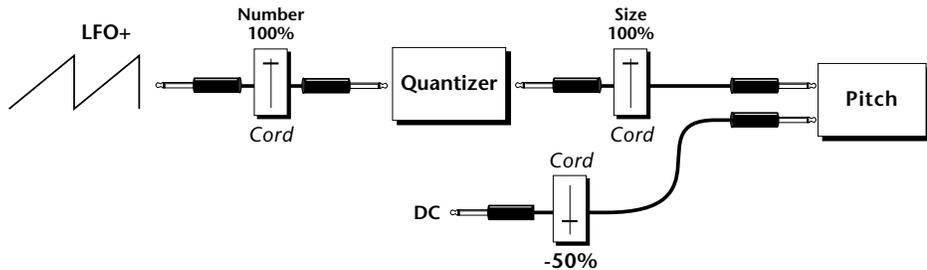

You can start to see some of the possibilities (and there are many). Whenever you find yourself wishing for some esoteric type of control, take a minute to think and see if there is a way to achieve the desired result using the modulation processors.

Dynamic Filters

The block diagram of the Halo's signal path is shown below.
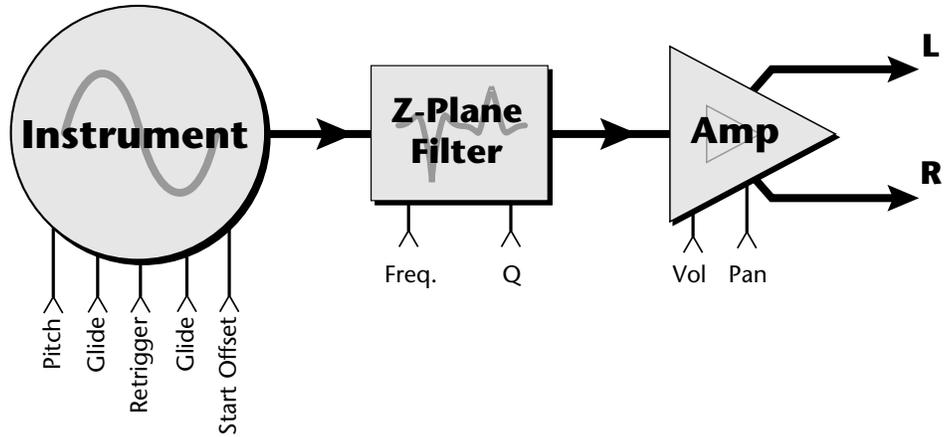
To understand how a filter works, we need to understand what makes up a sound wave. A sine wave is the simplest form of sound wave. Any waveform, except a sine wave, can be analyzed as a mix of sine waves at specific frequencies and amplitudes.
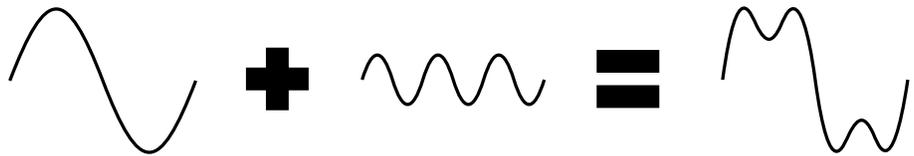
Any waveform can be analyzed as a mixture of sine waves.

One way to represent complex waveforms is to use a chart with frequency on one axis and amplitude on the other. Each vertical line of the chart represents one sine wave at a specific amplitude and frequency.
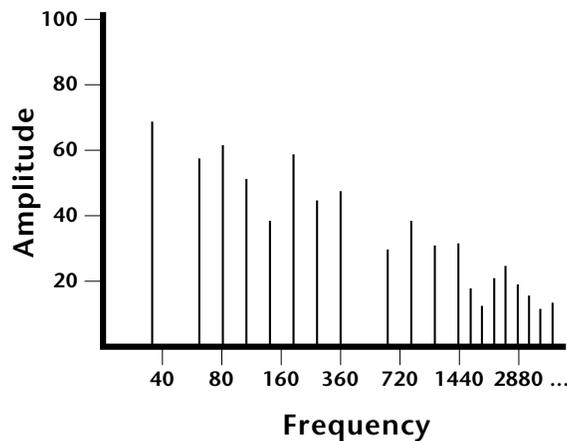
What is a Filter?

Most sounds are complex waves containing many sine waves of various amplitudes and frequencies. **A filter is a device which allows us to remove certain components of a sound depending on its frequency.** For example, a *low-pass filter* lets the low frequencies pass and removes only the high frequencies as illustrated in the following diagram.
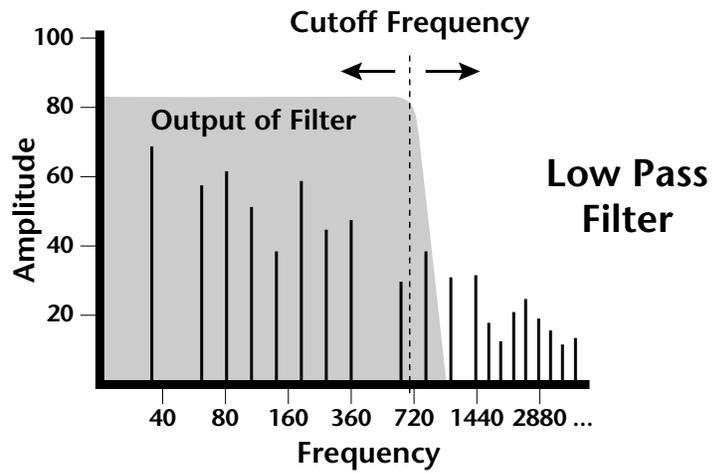
A filter that lets only the high frequencies pass is called a *high-pass filter* as illustrated in the following diagram.
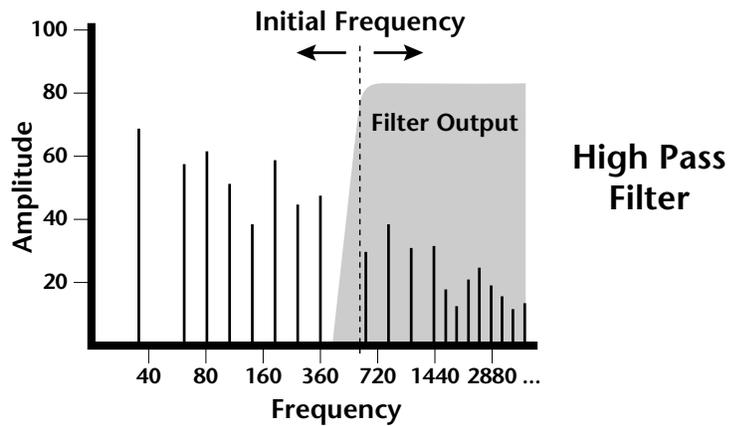
A filter which only lets a certain band of frequencies pass is called a *band-pass filter.*
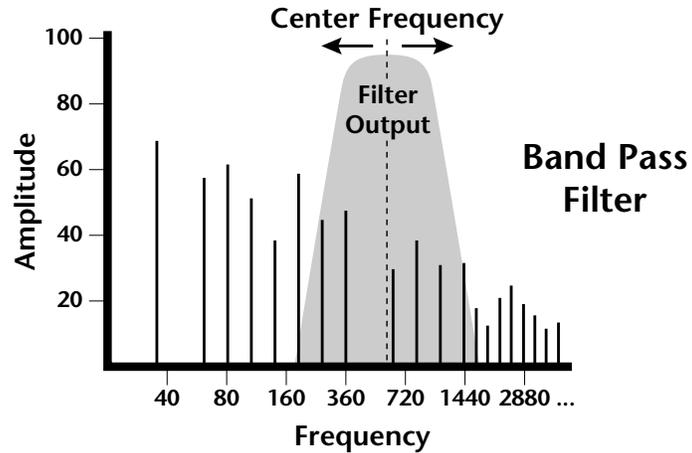
A *notch filter* is just the opposite of a band-pass filter and is used to eliminate a narrow band of frequencies.

Another control found on traditional filters is called Q or resonance. A lowpass filter with a high Q emphasizes the frequencies around the cutoff frequency. The following chart shows how different amounts of Q affect the low-pass filter response. In terms of sound, frequencies around the cutoff tend to "ring" with high Q settings. If a filter with high Q is slowly swept back and forth, various overtones are "picked out" of the sound and amplified as the resonant peak sweeps over them. Bells and gongs are real world examples of sounds which have a high Q.
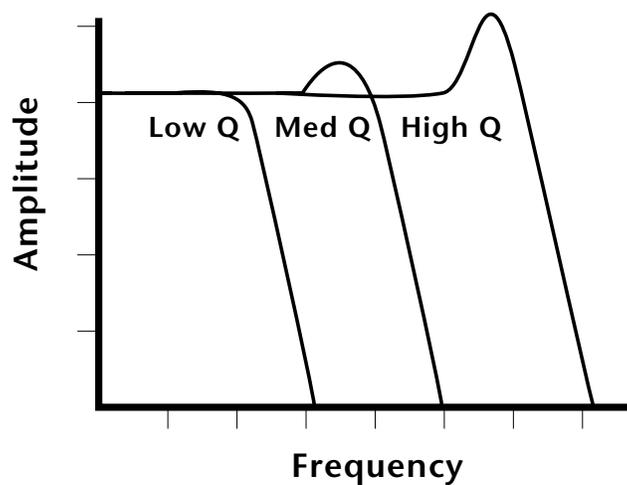
Another characteristic of a filter is the number of poles it contains. Traditional synthesizer filters were usually either 2-pole or 4-pole filters. The Halo has selectable 2, 4, and 6-pole low-pass filters. The number of poles in a filter describes the steepness of its slope. The more poles, the steeper the filter's slope and the stronger the filtering action. The tone controls on your home stereo are probably one-pole or two-pole filters. Parametric equalizers are usually either two-pole or three-pole filters.

In terms of vintage synthesizers, Moog and ARP synthesizers used 4-pole filters, Oberheim and Eμ synthesizers were famous for their 2-pole filter sound.
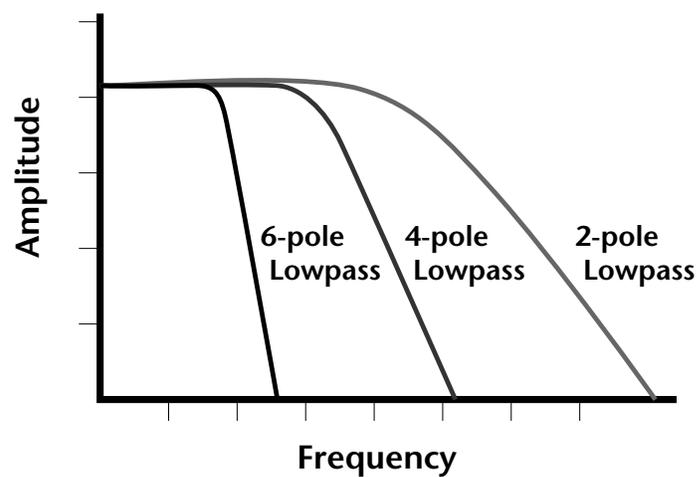
Using a filter, we have a way to control the harmonic content of a sound. As it turns out, even a simple low-pass filter can simulate the response of many natural sounds.

For example, when a piano string is struck by its hammer, there are initially a lot of high frequencies present. If the same note is played softer, there are fewer high frequencies generated by the string. We can simulate this effect by routing keyboard velocity to control the low-pass filter. The result is expressive, natural control over the sound.

If you use an envelope generator to control the cutoff frequency of a filter, the frequency content can be varied dynamically over the course of the note. This adds animation to the sound as well as simulates the response of many natural instruments.

Parametric Filters

A more complex type of filter is called a parametric filter or *Swept EQ*. A parametric filter allows control over three basic parameters of the filter. The three parameters are: *Bandwidth, Frequency* and *Gain*. The Bandwidth allows you to select the width of the range of frequencies to be boosted or cut, the Frequency defines the center frequency of the bandwidth, and the Gain parameter either boosts or cuts the frequencies within the selected band by a specified amount. Frequencies not included in the selected band are left unaltered. This is different from a band-pass filter which attenuates (reduces) frequencies outside the selected band.
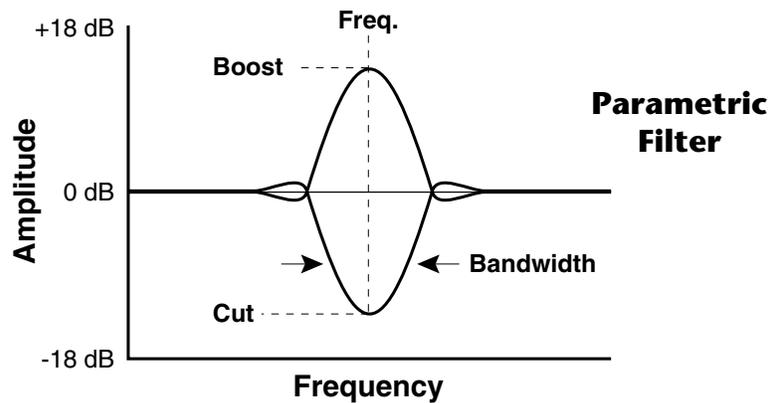
The parametric filter is quite flexible. Any range of frequencies can be either amplified or attenuated. Several parametric sections are often cascaded in order to create complex filter response curves.

If four parametric filter sections were cascaded, it would be possible to create the following complex filter response.
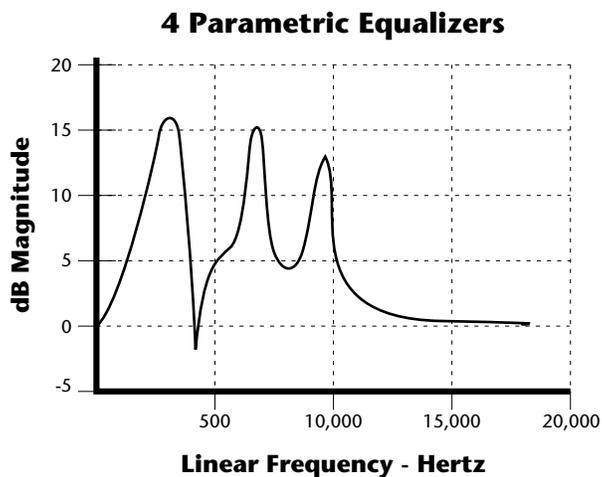
Many natural instruments have complex resonances which are based on their soundboard or tube size. The resonance shown above would be impossible to create using a normal synthesizer filter.

The Z-Plane Filter

A Z-plane filter is a filter which can change its function over time. In a Z-plane filter, we start with two complex filter types and interpolate between them using a single parameter. See the following diagram.
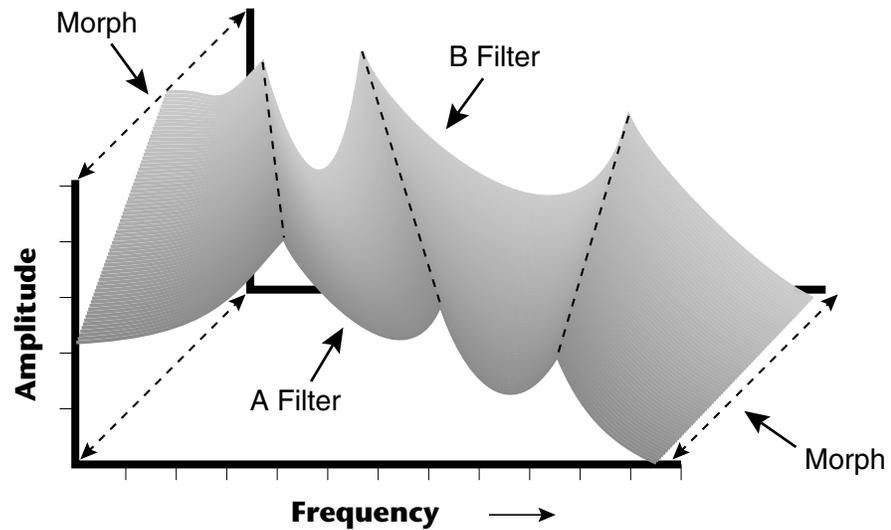
The Z-plane filter has the unique ability to change its function over time.

Filters A and B represent two different complex filters or "frames." Changing a single parameter, the Morph, changes many complex filter parameters simultaneously. Following along the Morph axis you can see that the filter response smoothly interpolates between the two filters. This is the essence of the Z-plane filter. Through the use of interpolation, many complex parameters are condensed into one manageable entity.

Consider, as an example, the human vocal tract, which is a type of complex filter or resonator. There are dozens of different muscles controlling the shape of the vocal tract. When speaking, however, we don't think of the muscles, we just remember how it feels to form the vowels. A vowel is really a configuration of many muscles, but we consider it a single object. In changing from one vowel to another, we don't need to consider the frequencies of the resonant peaks. You remember the shape of your mouth for each sound and interpolate between them.

This Z-plane filter sweep can be controlled by an envelope generator, an LFO, modulation wheels or pedals, keyboard velocity, key pressure, and so on. In fact, any of the modulation sources can control the Z-plane filter.

Because creating the complex filtering is difficult and very time consuming, we have created 50 different filters and installed them permanently in ROM for your use. You simply select and use the filters in a manner similar to choosing an instrument. Because there are so many types of instruments and filters to choose from, the number of possible permutations is staggering.

Signal Flow

Going back to the Signal Path diagram for a single channel we can reexamine the complete signal path.
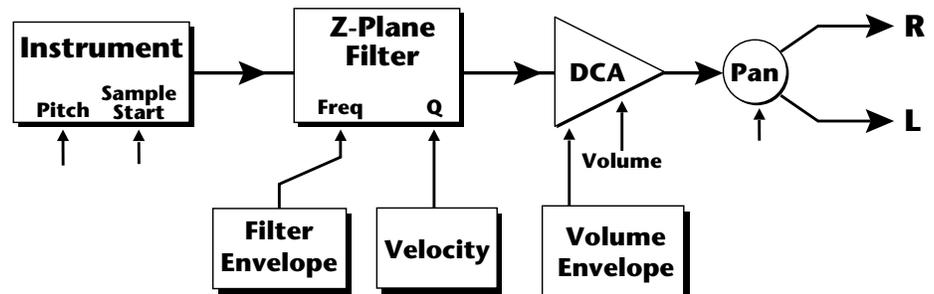
Instrument

This is the sampled sound wave. The pitch of the instrument can be modulated by any modulation source. The sample start point can be changed only at the time the note is played.

Z-Plane Filter

The Z-Plane Filter is used to shape the harmonic content of an instrument. The filter envelope is commonly used to shape the harmonic content dynamically over time but the filter frequency can be modulated by any source. The Q parameter can be modulated only at note-on time. There are 50 types of filters available. See "Halo Filter Types" on page 148 for a complete list of the filters.

Digitally Controlled Amplifier (DCA)

Together with the Volume Envelope, the DCA is used to shape the volume contour of a sound. The DCA can be controlled by any modulation source. Velocity is often used as a modulation source for the DCA so that the harder you play, the louder the sound becomes.

Pan

Adjusts the balance of sound to the left and right channels. Pan can be modulated by any modulation source.

MIDI Channels & Real-time Controls

Pitch Wheel   *pwh*
Modulation Wheel   *01*
Pedal   *04*
Volume   *07*
Pan   *10*
Expression   *11*

The MIDI real-time controllers may seem confusing at first, but they are really very simple once you understand them. You already know that there are 16 MIDI channels per MIDI cable. Each MIDI channel uses three basic types of messages; note on/off, preset changes, and continuous controller messages. Halo can also send real-time control information, which simply means control occurring in real-time or "live." Real-time control sources include such things as controller knobs, pitch wheels, modulation wheels, control pedals and aftertouch. These are used to add more expression or control.

The front panel control knobs send out real-time controller information on separate continuous controller numbers. There is a set of 32 continuous controller numbers for each MIDI channel. Some continuous controllers, such as modulation wheel, volume, and pan have standardized numbers. For example, volume is usually sent on continuous controller #7. The front panel controller knobs on are pre-programmed to control the Halo.

MIDI Channel 1	MIDI Channel 2	MIDI Channel 3	• • •	MIDI Channel 16
Note On/Off	Note On/Off	Note On/Off		Note On/Off
Program Change	Program Change	Program Change		Program Change
Continuous Controllers	Continuous Controllers	Continuous Controllers		Continuous Controllers
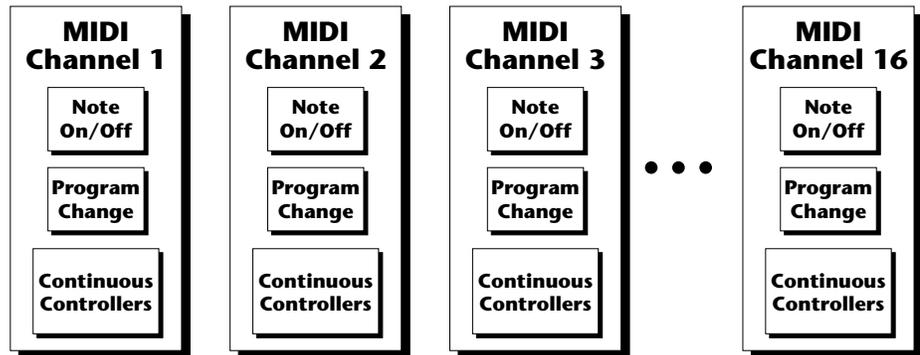
Any MIDI controller can be routed to any modulation destination. First, you have to know which controller numbers your keyboard transmits. Most modern MIDI keyboards let you select a controller number for each control on the keyboard. For example, it may let you select a number from 0-31 for the data slider. The realtime controller numbers that the keyboard transmits must match the numbers Halo is receiving, otherwise nothing will happen when you move the controls.

Suppose you wanted to send the four data knobs on another keyboard via MIDI to Halo. Halo can handle up to 16 MIDI controllers (A-P) of your choosing. "MIDI A-P" are simply names for the internal connections that link external MIDI continuous controllers to the PatchCord section of Halo. There are two parts to the connection. First, MIDI controller numbers are assigned to the letters A-P in the Controllers menu. Next, the letters A-P are connected to synthesizer control parameters in the PatchCord section of the Preset Edit menu. The PatchCord Amount scales the amount of each controller by a positive or negative value.

The factory presets have the MIDI A-P controls connected to standard synthesizer functions (marked on the front panel). By choosing any four of the 16 standard functions, the four sliders on your keyboard will work the

same on every preset. The chart below shows how this might work if your keyboard transmitted the slider settings on MIDI controllers 21-24.

Control	MIDI Controller #	Routing	Standard Function
Slider 1	74	A	Controls Filter Frequency
Slider 2	71	B	Controls Filter Resonance
Slider 3	25	C	Controls Filter Attack
Slider 4	26	D	Controls Filter Decay
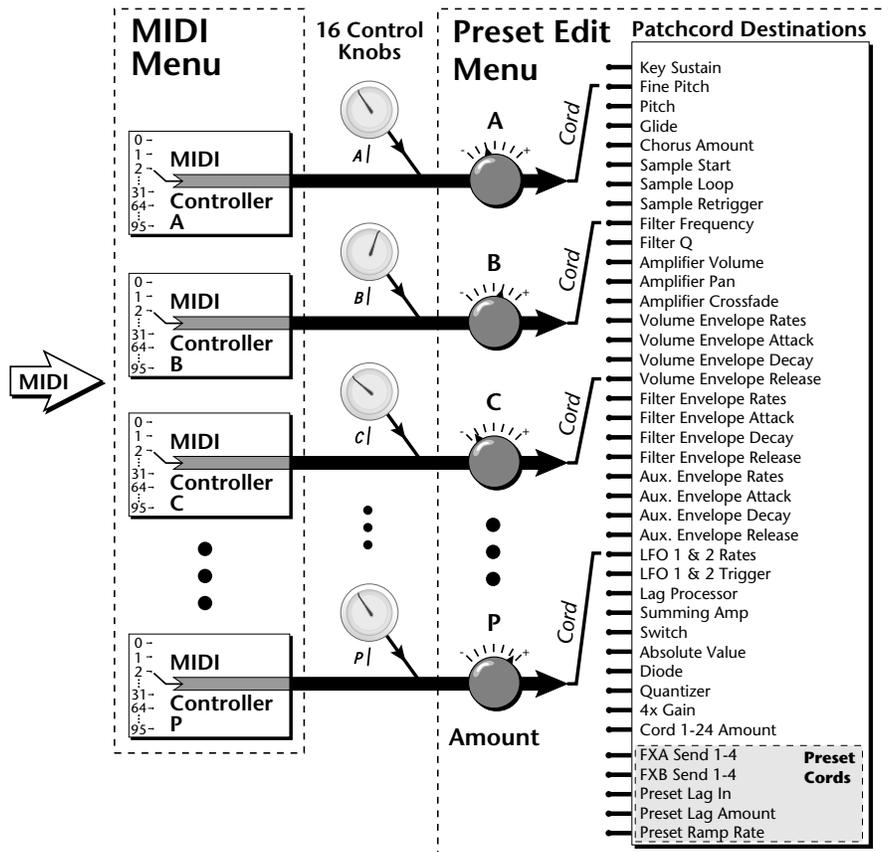
MIDI A-P are internal connections which simultaneously carry front panel controller knob data and MIDI continuous controller data.

The front panel controller knobs work just like MIDI real-time controllers. The four controller knobs can be assigned to the first 12 letters A-L. The front panel knob and incoming MIDI controller messages assigned to that letter, both control the same parameter that you select in the PatchCord screen. Letters M-P can be used to route 4 more external MIDI controllers.

*Bank Select
Commands*

When the original MIDI specification was developed, no synthesizer had more than 40 preset locations. At that time being able to select up to 128 presets didn't seem like much of a limitation. So it was that the original MIDI specification provided for the selection of up to 128 presets.

Musicians wanted *MORE* presets and so the MIDI specification was later amended to include ***Bank Select Commands***. It was decided that Bank Select Commands would use Continuous Controllers 0 and 32 to allow the selection of up to 16,384 banks of 128 presets (over two million presets).

Because Bank Selects are implemented using Continuous Controllers, the Bank Selections can be made *per channel*. (This is getting better and better.) For each MIDI channel, you can select any of 16,384 banks and then one of the 128 presets in the bank. Of course no synthesizer has 16,384 banks (yet), but hey, it's nice to know it's possible (for that really BIG project).

Continuous Controller (CC) 0 is the MSB (most significant byte) and CC 32 is the LSB (least significant byte). Normally you send both the MSB and LSB controllers to implement a bank change.

✎ *When you press the Audition button, the Bank Select MSB and LSB are displayed on the top line of the display.*

Halo remembers the MSB and the LSB that were last sent (or last changed from the front panel). For example, if you have already set the Bank MSB to 04, you need only send the LSB to change banks within the Halo sound set. See the MIDI Bank Select chart below.

The selected bank remains selected until you change it (either via MIDI or by changing the bank from the front panel). Standard MIDI Program Change commands select from 128 presets within the selected bank.

MIDI BANK SELECT			
	MSB cc00	LSB cc32	
USER	00	00	Bank 0
USER	00	01	Bank 1
USER	00	02	Bank 2
USER	00	03	Bank 3
HALO	08	00	Bank 0
HALO	08	01	Bank 1
HALO	08	02	Bank 2
HALO	08	03	Bank 3

Stereo Mix Outputs

This feature is useful for adding signal processing (EQ, reverb, etc.) of individual sounds prior to final mixdown.

The routing can be performed according to MIDI channel from the Mix Output screen in the Global menu. Simply assign each channel to the desired output.

Global Menu

```
MIX OUTPUT
channel  01:  Send 1->main
```

To route a particular preset to a Send, first go to the Mix Output screen in the Global menu and set the MIDI channel to "use preset".

Global Menu

```
MIX OUTPUT
channel  01: use preset
```

Next set the Mix Output routing in the preset to the desired output (for each layer). Yes, you can send each layer to a different send if you want.

Preset Edit Menu

```
L1  MIX OUTPUT
Send 2 -> main
```

By sending different amounts of presets to the effects, subtle or striking effects can be achieved using the two effect processors. This feature allows you to get the most out of two effects since you can have eight different mixes.

For more information, refer to the diagram on the following page or, *See "Mix Output" on page 86.*

**OUTPUT SECTION
& EFFECTS PROCESSORS**

**PRESET
EDIT MENU**

FX Sends	**Hall 1**
Send 1 15%	
Send 2 10%	**Effect**
Send 3 0%	**A**
Send 4 0%	

**Mix
Output**

Send 1

S
E
N
D
1

B→A

M
A
I
N

FX Sends	**Chorus**
Send 1 0%	
Send 2 0%	**Effect**
Send 3 20%	**B**
Send 4 15%	

Mix Output

Ch 1   **PRESET**

Ch 2   **SEND 2**

Ch 3   **SEND 3**

Ch 16 **SEND 4**

GLOBAL MENU

S
E
N
D
2

S
E
N
D
3

S
E
N
D
4

Jack Detect

S
U
B
1
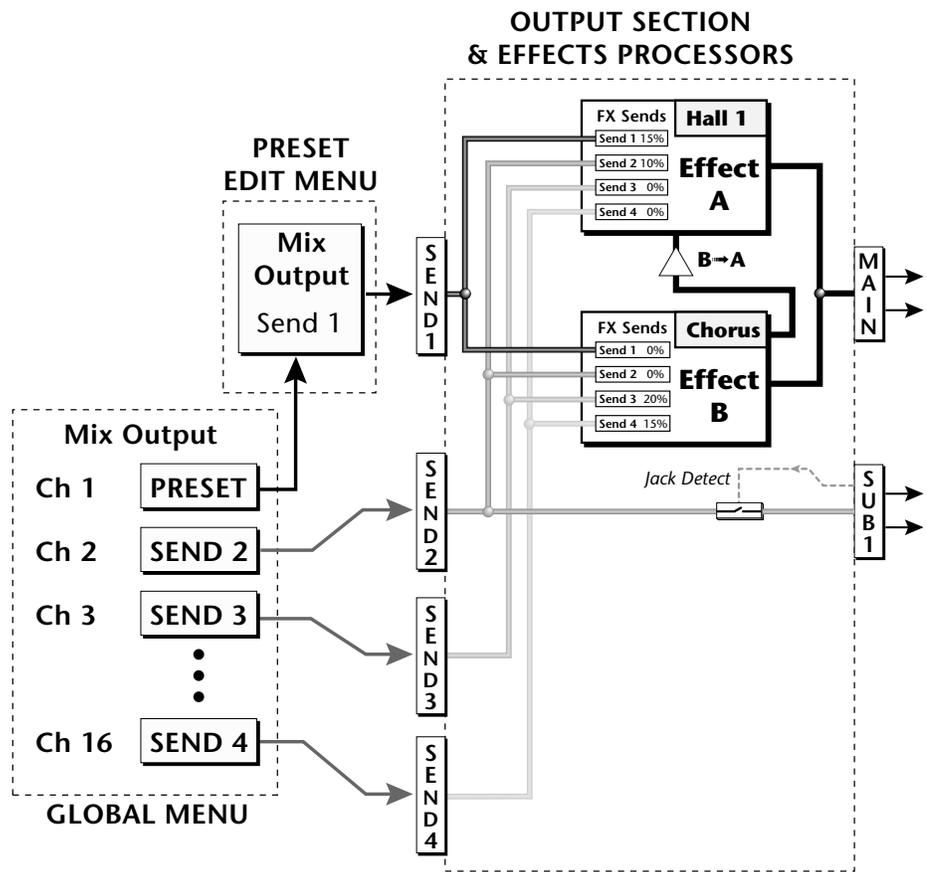
The Mix Output screen in the **Global** menu assigns each MIDI channel to a
Send (1-4) or to "Preset".

The Mix Output screen in the **Preset Edit** menu is ONLY used if the Global
Mix Output is set to "Preset". Otherwise the Preset Edit menu Mix Output
settings are ignored.

Preset Edit Menu

The Preset Edit Menu contains four layers of preset parameters that you can modify and then save as preset information in one of the user preset locations. There are four instrument layers in the Preset Edit menu. See the illustration on page 130 for a description of the Preset Layer model.

While the Preset Edit menu is activated, all incoming MIDI preset changes on the selected channel are ignored.

▶ **To Access the Preset Edit Menu:**
Press the Preset Edit button, lighting the LED. The Preset Edit Menu screen displays the menu page most recently selected since powering up Halo. The cursor appears below the first character of the screen heading on line one.

▶ **To Scroll through Layers:**
Place the cursor below the layer field. Rotate the data entry control to select a layer (1-4).

If there is no "A" option in the Layer field, you must enable the "Edit All Layers" function in the Global Menu (page 92).

You can also select **All Layers** by choosing "A" in the layer field. When All Layers is selected, the existing parameter value for any field will be displayed if the values of all four layers are equal. If the values of all four layers are NOT equal, the value of layer 1 will be displayed with flashing characters. If you change the parameter value, all layers will assume the new value and the display will stop flashing.

▶ **To Scroll through Pages:**
Whenever you are in the Preset Edit menu, the sixteen command buttons function as "jump" buttons to various screens in the Preset Edit menu, which are labelled below each button. Pressing a jump button instantly takes you to the first screen in the selected category. Pressing the button again takes you to the second screen in the category and so on. Repeated pressing will rotate you back to the first screen in the category.

You can also change pages by placing the cursor below the page title field. This will automatically be done when you press the Home/Enter button. Rotate the data entry control to scroll through the pages.

▶ **To Change a Parameter:**
Place the cursor below the parameter field. Rotate the data entry control to change the parameter value.

Preset Name

The Preset names consists of two parts: a 3 letter preset category and a 12 letter preset name. Position the cursor under the character location and use the data entry control to change the character.

The preset category is used in conjunction with the Sound Navigator feature. Using the Sound Navigator, a category is selected and the presets in that category are listed in alphabetical order. Creating categories makes it easier to find specific sounds when you need them. For more information on Sound Navigator, see Sound Navigator in Chapter 2: Operations.

You can also select characters using the keyboard.

```
PRESET NAME
000¹  syn: VOSIM-Voc
```

Four Layer Architecture

Halo provides a 4 layer instrument structure. Each layer is a complete synthesizer voice with 50 filter types, over 64 modulation sources, more than 64 modulation destinations and 24 patchcords to connect everything together. In addition, the four layers can be crossfaded or switched by key position, velocity or any real-time modulation source.
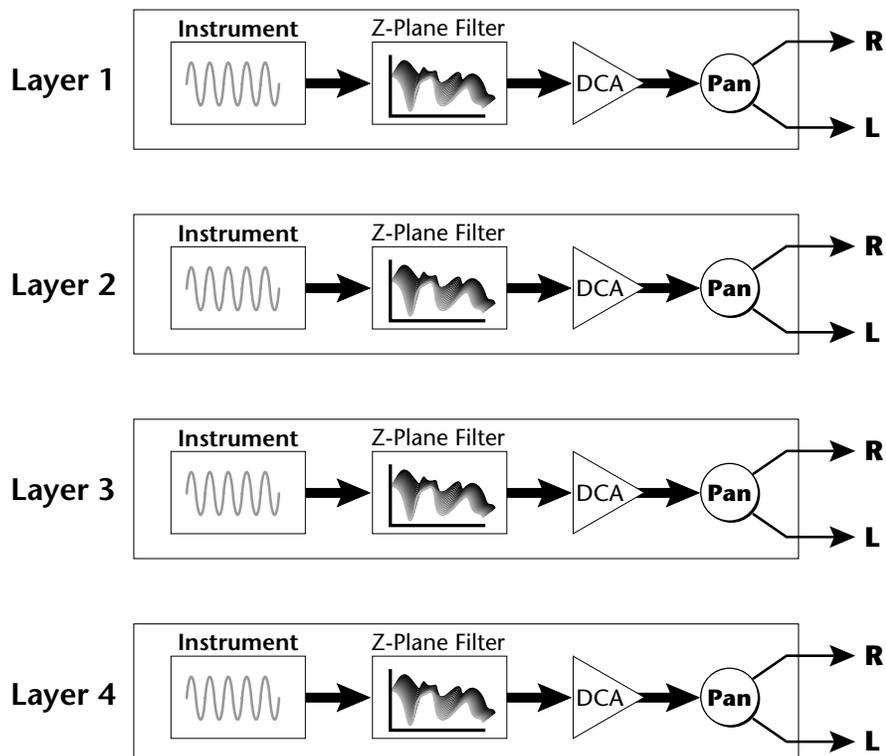
Selecting Layers

In most of the Preset Edit screens, the selected layer is shown in the upper left corner of the display. Layers 1-4 or All can be selected by positioning the cursor on this field and using the data entry control to change the layer. In the screen shown below, Layer 1 is selected.

```
ᴸ¹ INSTRUMENT        ROM:HALO
0305  bas:Moog Sub
```

When "All Layers" (A) is selected, the existing parameter value for any field will be displayed if all layers are equal. If the layer parameter values are NOT equal, the value of Layer 1 will be displayed with flashing characters. If you move the data entry control all values will be equal to this new value and the parameter value will no longer flash.

Defining Layer Parameters

The Preset Edit menu parameters define the four layers and include the instrument assigned to the layer, the ranges of the layer, tuning, envelopes, filters, and patch cords. These parameters are defined for each layer on an individual basis (based on the currently selected layer). See "Common Preset Parameters" on page 161 for global preset settings.

Selecting an Instrument

The Instrument parameter defines which of the available instrument sounds is played by the current layer.

ROM SIMM Name

```
 L1  INSTRUMENT          ROM: HALO
 0078  bas : Booty Q 2
```

Instrument Category   *Instrument Name*
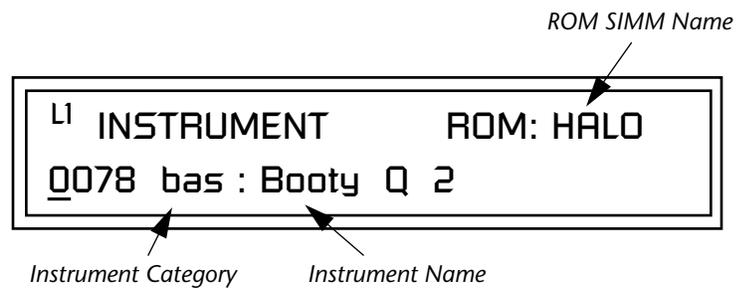
To select an instrument for the selected layer(s), move the cursor to the bottom line of the display and change the instrument using the data entry control.

Sound Navigator

Sound Navigator also works to help select Instruments although the category names are predefined. When the cursor is on the Instrument Category field, turning the data entry control selects different instrument categories. The Name Field will change to show the first instrument in each category. Move the cursor to the instrument name to select instruments in the selected category.

```
 L1  INSTRUMENT          ROM: HALO
 0078  bas : Booty Q 2
```

1. Choose Category

2. Scroll through Instruments
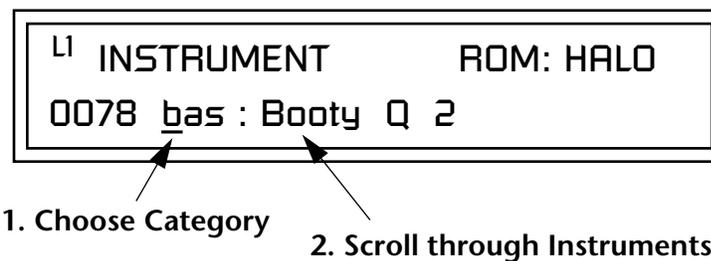
Selecting Categories of Instruments using Sound Navigator.

Defining Key Range | The Key parameter defines the range on the keyboard used by the current layer. The Key range is from C-2 through G8.
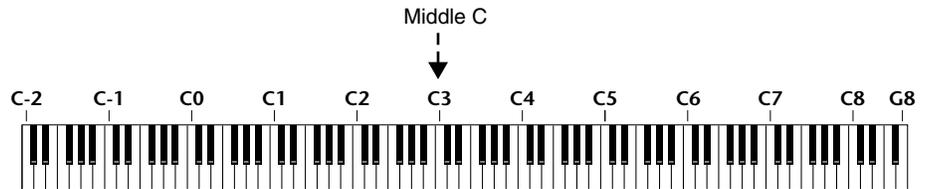
To define the range, set the low key value and the high key value.

You can select key numbers by simply pressing the desired keyboard key when the cursor is positioned on the low or high key field in the display.
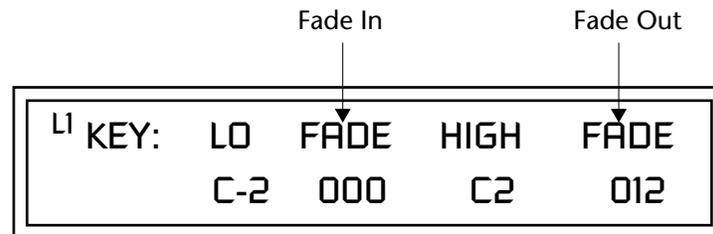
Layers can be crossfaded according to key position by adjusting the Low and High Fade parameters. The first Fade field determines how many semitones it takes the layer to Fade In from the low key. The second Fade field determines how many semitones it takes the layer to Fade Out to the high key. The screen shot above and the diagram below show Layer 1 being faded out over a one octave range.
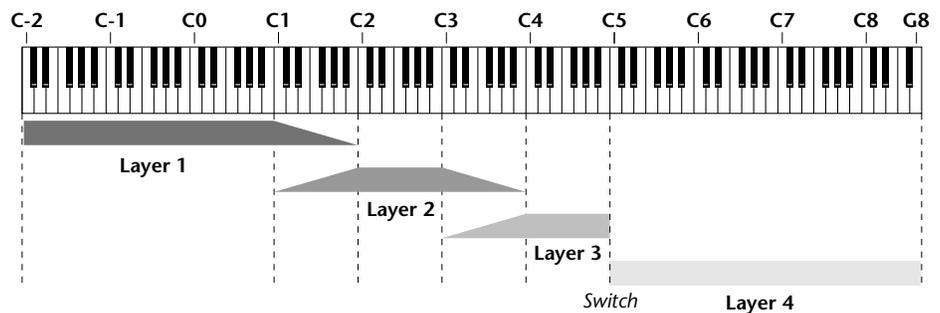
With a High Fade value of zero (as in layer 3 of the diagram), the layer simply switches off at the high key.

▶ **To Switch Layers According to Key Position:**
The Key Range parameter allows you to create a "split" keyboard with up to four sounds adjacent to each other on the keyboard. This is shown in the diagram below.
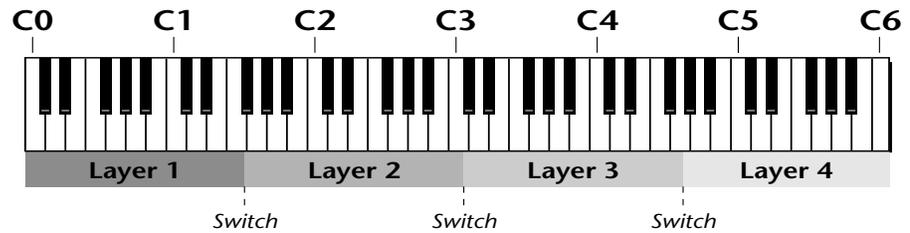
Just assign the low and high key range for each of the four layers with Fade set to zero. Set the Low and High Keys so they don't overlap other layers.

✎ *You can select key numbers by simply pressing the desired keyboard key when the cursor is positioned on the low or high key field n the display.*

```
L1 KEY:   LO      FADE     HIGH     FADE
          C0      000       F1      000
```

```
L2 KEY:   LO      FADE     HIGH     FADE
          F#1     000       C3      000
```

```
L3 KEY:   LO      FADE     HIGH     FADE
          C#3     000      F#4      000
```

```
L4 KEY:   LO      FADE     HIGH     FADE
          G4      000       C6      000
```

If two layers do overlap, both will play as shown in the next example.

▶ **To Stack Layers:**

If the ranges of two or more Layers overlap it is called *stacking layers*. All Layers assigned to a key sound when the key is played. This is shown in the following diagram. It's very easy to stack layers. Simply duplicate the key ranges for any layers you want to stack.

```
C0        C1        C2        C3        C4        C5        C6
```
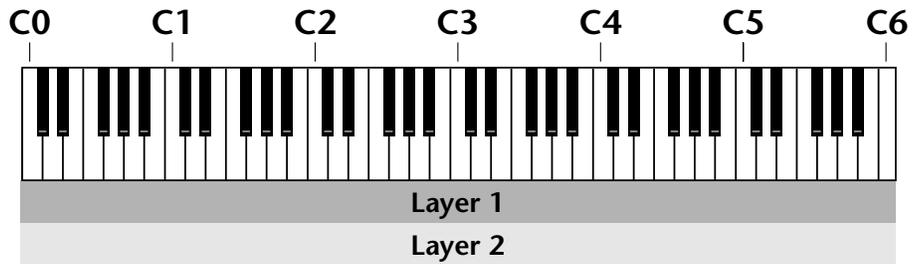
| Layer 1 |
| Layer 2 |

```
┌─────────────────────────────────────────────┐
│ L1 KEY:   LO      FADE     HIGH     FADE      │
│           C0      000      C6       000       │
└─────────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────────┐
│ L2 KEY:   LO      FADE     HIGH     FADE      │
│           C0      000      C6       000       │
└─────────────────────────────────────────────┘
```

Defining the Velocity Crossfade Range

Velocity is a measure of how hard the key is pressed. Velocity Range lets you control the volume of the layers using velocity. Using this function you can crossfade or cross-switch between layers according to how hard you play the keyboard.

Set the velocity range of the layer by defining the high and low velocity values. Values range from 0 (off) to 127 (hardest).

```
┌─────────────────────────────────────────────┐
│ L2 VEL:   LO      FADE     HIGH     FADE      │
│           36      012      96       012       │
└─────────────────────────────────────────────┘
```

The Fade fields define the velocity crossfade range for the currently selected layer. The first Fade field defines the Fade In range for the low velocity value. The second defines the Fade Out range for the high velocity value.
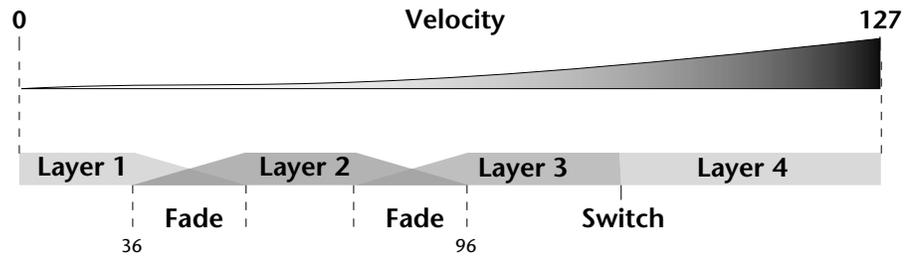
With soft playing, Layer 1 sounds. As you play harder, Layer 1 gradually fades out and Layer 2 fades in. When the keyboard is played hard, Layer 3 plays.

▶ **To Set Up a Velocity Crossfade Between Layers:**
Set the velocity fades so that layer 1 fades out with higher key velocity, while layer 2 fades in. At a velocity of 64, the two sounds are equal volume. You may want to adjust the fade in and fade out points to achieve a natural sounding crossfade. These parameters vary depending on the sounds.
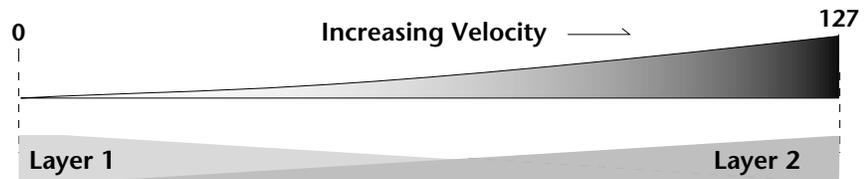

```
L1 VEL:  LO     FADE    HIGH    FADE
         000     000     127     127
```

```
L2 VEL:  LO     FADE    HIGH    FADE
         000     127     127     000
```

Defining the Real-time Crossfade Range

The Real-time Crossfade window lets you control the volume of the four layers using a real-time controller such as a front panel knob, a pedal or an LFO or Envelope generator. The controller is defined by the PatchCord parameter (see "PatchCords" on page 157).

The Fade fields define the crossfade range in velocity for the currently selected layer. The first Fade field defines the Fade In amount for the low Real-time Control value. The second defines the Fade Out amount for the high Real-time Control value. The Fade value range is from 0 to 127.

0	Realtime Control Value	127

Layer 1	Layer 2	Layer 3	Layer 4
Fade	Fade	Switch	
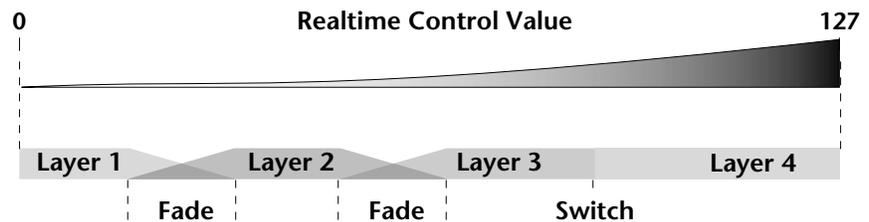
After the Ranges and Fades have been adjusted for each layer in the Real-time Crossfade screen, you must assign a real-time controller to RTXfade (Real-time Crossfade) **on each Layer** in the PatchCord screen. Set the PatchCord Amounts to +100.

▶ To Set Up a Real-time Crossfade Between Two Layers:

As the real-time control (knob, pedal, LFO, etc.) is increased, Layer 1 fades out as Layer 2 fades in. This example only uses two of the possible four layers. Refer to the screen diagrams below.

```
L1 RT:  LO    FADE    HIGH    FADE
        000    000     127     127
```

```
L2 RT:  LO    FADE    HIGH    FADE
        000    127     127     000
```

1. **Select a prese**t.
2. Press the **Preset Edit** button to access the Preset Edit menu.
3. Go to the **Instrument** page and select instruments for Layers 1 and 2.

4. Press **Enter**, then use the data entry control to advance to the **Real-time Crossfade** page.

5. Define the High and Low range of each Layer. In this example the entire range of 0-127 is used.

6. Define the Fades for each Layer. This is just an initial setting. The Range and Fade parameters may have to be adjusted later to get a smooth crossfade.

7. Press **Home/Enter** and use the data entry control to advance to the **PatchCord** page. Select Layer 1.

8. Select the modulation source for the crossfade (knob, pedal, LFO, Envelope) and set the destination to RTXfade. Set the Cord Amount to +100.

9. **Select Layer 2**. Select the same source and destination for the crossfade and set the Cord Amount to +127.

```
┌─────────────────────────────────────┐
│ ᴸ¹ PATCHCORD                    #01  │
│                                      │
│ MidiA    ->    RTXfade         +100  │
└─────────────────────────────────────┘
```

10. **Play the keyboard** while adjusting the real-time controller. Go back to the Real-time Crossfade screens to fine tune the crossfade if necessary. Decreasing the fade size will narrow the region where both layers are sounding.

▶ **To Randomly Cross-Switch Between Four Layers:**

In certain situations, you may want to switch between several layers randomly. **Crossfade Random** is a modulation source specifically designed to handle this situation. Unlike the other random sources, Crossfade Random generates one random number for all layers each time a key is pressed.

To set up a four layer Cross-Switch, simply assign each of the four layers to a different Real-time Crossfade range, then assign XfdRnd to RTXfade in the PatchCords for each layer.

Realtime Control Value

0	16	32	48	64	80	96	112	127

Layer 1	Layer 2	Layer 3	Layer 4

Switch *Switch* *Switch*
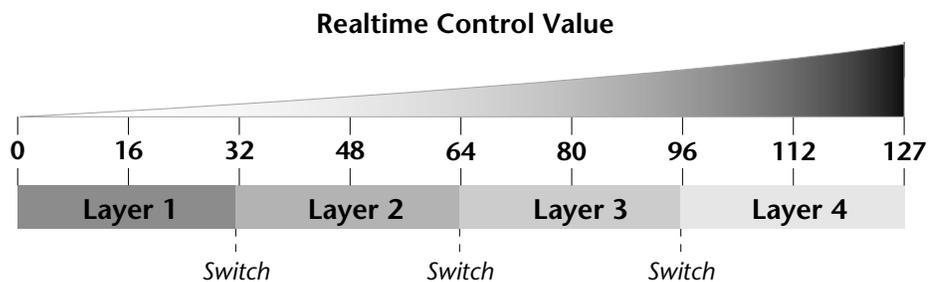
1. Press the **Preset Edit** button to access the Preset Edit menu.

2. Go to the **Instrument** screen and select Instruments for Layers 1 through 4.

3. Press **Enter**, then use the data entry control to advance to the **Real-time Crossfade** page.

```
┌─────────────────────────────────────────┐
│ L1  RT:  LO    FADE    HIGH    FADE      │
│          000    000    031     000       │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│ L2  RT:  LO    FADE    HIGH    FADE      │
│          032    000    063     000       │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│ L3  RT:  LO    FADE    HIGH    FADE      │
│          064    000    095     000       │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│ L4  RT:  LO    FADE    HIGH    FADE      │
│          096    000    127     000       │
└─────────────────────────────────────────┘
```

4. Define the High and Low range of each Layer as shown above.

5. Press **Home/Enter** and use the data entry control to advance to the **PatchCord** page. Select Layer 1.

6. Select **XfdRnd** as the modulation source and **RTXfade** as the destination. Set the **Cord Amount to +100**.

7. Repeat step 6 for the remaining three layers.

```
┌─────────────────────────────────────────┐
│ L1 PATCHCORD                         #01 │
│                                          │
│ XfdRand  ->  RTXfade              +100   │
└─────────────────────────────────────────┘
```

8. That's it! Now set each Layer up the way you want. Try radically different instruments, filter settings, or tunings. Or you can make each layer just slightly different for a more natural effect. Try adjusting the Fades or overlapping the ranges if you want more than one layer to play at once.

Transposing the Instrument

The Transpose parameter lets you transpose the key of the current layer's Instrument. Transpose works by shifting the keyboard position in semitone intervals relative to middle C. Use this parameter to transpose different layers apart by semitone intervals. For example, by transposing one layer by +7 semitones, it will track other layers at a perfect fifth interval.
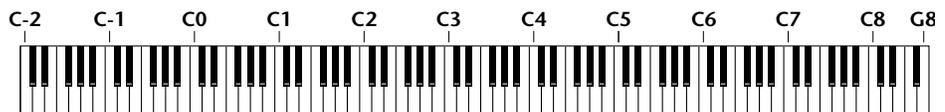
The range of transposition is -36 to +36 semitones.

```
┌─────────────────────────────────────────┐
│ L1 TRANSPOSE                             │
│ +36 semitones                            │
└─────────────────────────────────────────┘
```

Tuning

The Tuning parameter changes the pitch of the key in semitone and 1/64 semitone intervals.

```
┌─────────────────────────────────────┐
│ ᴸ¹ TUNING                            │
│                                      │
│ Coarse:    +36        Fine:    +63   │
└─────────────────────────────────────┘
```

Use the Coarse field to shift the tuning by semitone intervals. Use the Fine field to shift tuning by 1/64 semitones (or 1.56 cents) intervals.

Background: Transpose vs. Coarse Tuning
Transpose works by shifting the keyboard assignment of the Instrument (as if you were sliding the keyboard up and down with the Instrument remaining in the same position). Coarse Tuning keeps the instrument placement on the keyboard and actually tunes the samples up using a digital process called interpolation. Use Course Tuning on drum instruments to change the pitch while keeping sample placement constant. Coarse Tuning can also be useful to slightly change the timbre of the instrument.

Amplifier

This parameter sets the initial volume and pan position of the current layer. These values can be changed using any Real-time Controller set up in the PatchCords. The value range for the volume is from -96 dB to +10 dB. 0 dB is the default setting. Routinely turning the volume up to +10 dB is not recommended because it doesn't allow other modulation sources to increase the volume further.

```
┌─────────────────────────────────────┐
│ ᴸ¹ AMPLIFIER                         │
│                                      │
│ Volume:  +10dB         Pan:   48ʟ    │
└─────────────────────────────────────┘
```

This field determines the initial Pan value for the current layer. The value range for Pan is from 64L to 0 (left) and 0 to 63R (right). Pan adjusts the volume into the left and right output channels relative to the Pan setting in the main Preset Select screen (see "Channel Pan" on page 39). So, if you, for example, set the Pan value in the Preset Select screen to 64L and set this Pan value to 63R, the actual pan amount would be 0 as these two pan parameters are relative to each other.

Volume Envelope

An envelope can be described as a "contour" which is used to shape the sound over time. The *Volume Envelope* controls the volume of the sound in the current layer over time. The way the volume of a sound evolves has a profound effect on how we perceive the sound.

Each instrument has its own Factory preset Volume Envelope setting. The Volume Envelope allows you to program your own envelope settings.

Selecting the Mode
The Mode field determines whether the layer will use the instrument's default envelope (Factory) or use the user-programmed Volume Envelope. There are three mode options and repeat.

• **Factory**: Uses the factory preset envelope contained in each instrument. If you select the "Factory" mode, the Volume Envelope parameters are disabled and the factory defined settings are used instead.

Factory Mode is useful for Instruments containing multiple drums, since each drum can have its own envelope settings.

A factory drum kit envelope actually contains a separate envelope for every voice on every key instead of a single global envelope.

```
ᴸ¹ VOLUME ENVELOPE

Mode:  factory
```

• **Time-based**: Defines the Volume Envelope rates from 0 to 127 (approximately 1 ms to 160 seconds). The Master clock has no affect on time-based rates.

If two adjacent segments have the same level in a "time-based" envelope, the segment will be skipped. Adjacent segments must have different levels for the rate control to work.

• **Tempo-based**: The Volume Envelope times vary based on the master tempo setting. Note values are displayed instead of a number when the time corresponds to an exact note value. Tempo-based envelopes are useful when using external sequencers and arpeggiators because the envelope rates compress and expand according to the Master Tempo setting, keeping the envelopes in sync with the sequence or arpeggio.

Tempo-Based Envelopes

■ = Initial Setting
□ = Increase Master Tempo
▨ = Decrease Master Tempo
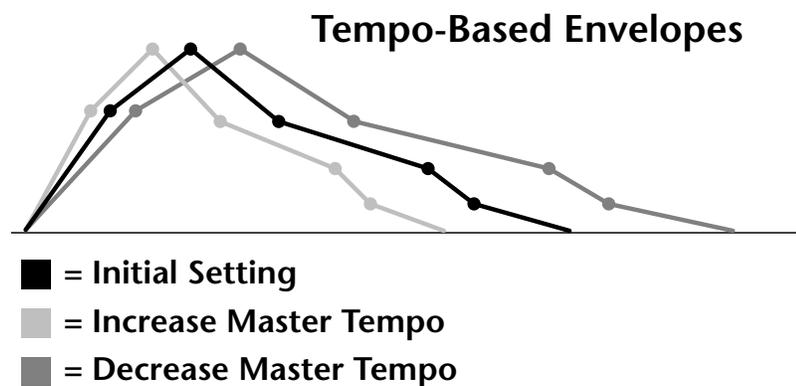
Tempo-based envelope rates change according to the Master Tempo rate.

Defining the Volume Envelope

The Volume Envelope controls the volume of the layer over time. The Volume Envelope has six stages to the contour: Attack 1, Attack 2, Decay 1, Decay 2, Release 1 and Release 2. When a key is pressed, the Envelope goes through the first four stages. If you continue to hold down the key, the envelope holds at the Decay 2 level. When the key is released, the envelope continues through the Release stages ending at the Release 2 level.

```
┌─────────────────────────────────────────┐
│ L1  VOL ENV      RATE        LEVEL      │
│                                          │
│ Attack 1          84         100%       │
└─────────────────────────────────────────┘
```

As soon as the Attack 1 level is reached, the Attack 2 phase begins. When the Attack 2 Level is reached, the Decay 1 phase begins. When the key is released, the envelope immediately jumps to the Release 1 stage, then the Release 2 stage finally ending at the Release 2 level.

If you have selected the factory mode, the Volume Envelope parameter screen looks like the following illustration.

```
┌─────────────────────────────────────────┐
│ L1  VOL ENV      RATE        LEVEL      │
│                                          │
│ (using factory envelope)                │
└─────────────────────────────────────────┘
```

👀 *If the Release 2 level is set at a value other than zero, the note will continue to sound after the key is released. This might be useful for drone effects, but the channel won't stop sounding until all channels are used up.*
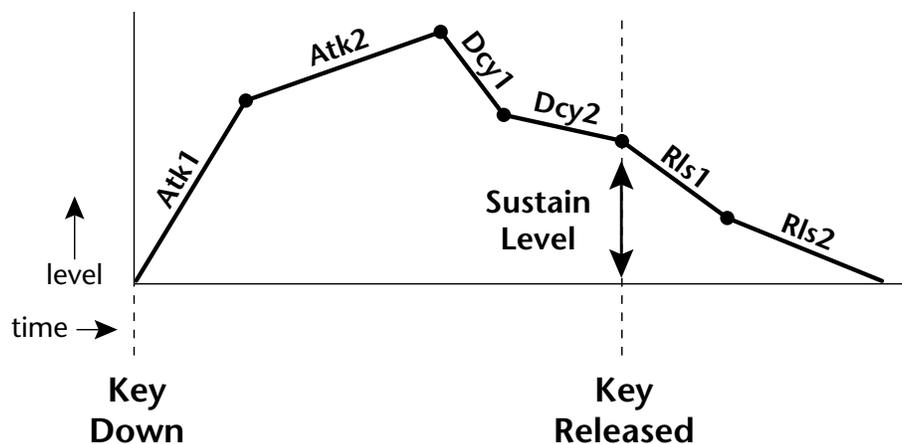
On the Volume Envelope, levels can only be set to positive values. The value range is from 0 to +100.

Chorusing the Layer

👓 *WARNING: Because it works by doubling instruments, Chorusing halves the number of notes you can play.*

Chorusing "thickens" the sound by doubling the sound in stereo and then detuning it. Every layer with chorus turned on uses twice the polyphony for that layer.

```
L1 CHORUS                WIDTH
   off                    100%
```

The first field in this screen turns Chorus On or Off and allows you to adjust the amount of detuning (1 to 100%). The *Width* parameter controls the stereo spread. 0% reduces the chorus to mono and 100% provides the most stereo separation.

Sound Start Offset and Delay

Sound Start sets where the instrument begins playing when you hit a key. Setting the Start Offset amount to "0" plays the sample from the beginning. Higher values move the Sample Start Point further into the sample toward the end. There is also a PatchCord source which can be used to change the Sound Start point at note-on time.

```
L1 SOUND      START      DELAY
               127         127
```


Sample
Start
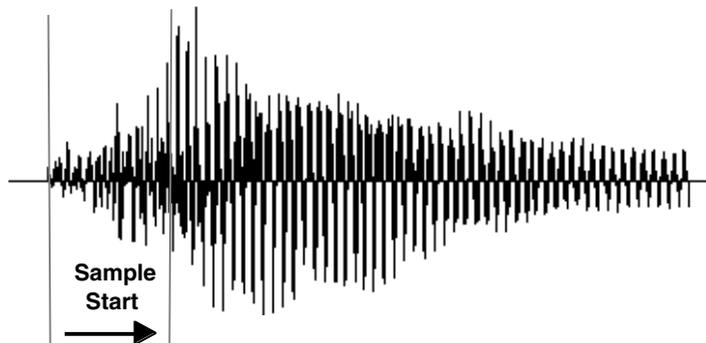
Controlling the Sound Start using Key Velocity (< Amt -) brings in the attack of the wave only when you play hard. This is especially effective with percussion instruments.

Delay defines the time between when you hit a key (note-on) and the onset of the current layer's note and the start of the envelopes (if applicable). Delay values below zero are *Tempo-based* values, meaning the time is based on the Master Tempo setting. Note values are displayed by adjusting the Delay Time value below zero. The sound will be delayed by the selected note value based on the master clock.

Non-Transpose Mode

This function turns keyboard transposition On or Off for the current layer. With Nontranspose "on," the keyboard will not control the pitch of the instrument. This is a useful function for drones, attack "chiffs," or other sound effects which you may not want to track the keyboard.

```
┌─────────────────────────────────────┐
│  L1  NONTRANSPOSE                    │
│                                      │
│  off                                 │
└─────────────────────────────────────┘
```

Solo Mode

Provides the playing action of a monophonic instrument such as a lead synthesizer by preventing more than one note from sounding at once. There are eight different solo modes provided. Try setting up different layers with different solo mode and glide rates or combine solo mode with polyphonic playing modes.

```
┌─────────────────────────────────────┐
│  L1  SOLO MODE                       │
│                                      │
│  synth (low)                         │
└─────────────────────────────────────┘
```

✎ *In order to define a monophonic glide (see the Portamento parameter), you must be in Solo mode.*

The Solo modes are:

Multiple Trigger: Last note priority. No key-up action. Retriggers envelopes and samples when a key is pressed.

Melody (last): Last note priority. No key-up action.

First solo note: Envelopes start at Attack segment from zero. Samples start at the beginning.

If previous note is releasing: Envelopes start at Attack segment, but from current level. Samples start at the beginning.

When playing "Legato": Envelopes continue from current segment and level. Samples start at the loop or the beginning if unlooped.

Melody (low): Same as Melody (last), but with low note priority. Newly played keys which are higher than the lowest solo key held do not sound.

Melody (high): Same as Melody (last), but with high note priority. Newly played keys which are lower than the highest solo key held do not sound.

Synth (last): Similar to Melody (last) but this mode has key-up action. When you release the currently sounding solo key while holding other keys down, the highest held solo key sounds in a Legato fashion.

Synth (low): Same as Synth (last) but with low note priority. When you release the currently sounding solo key while holding other keys down, the lowest held solo key sounds in a Legato fashion (MiniMoog).

Synth (high): Same as Synth (last) but with high note priority. When you release the currently sounding solo key while holding other keys down, the highest held solo key sounds in a Legato fashion.

Fingered Glide: Same as Synth (last), except that Glide is disabled when playing Staccato, enabled when playing Legato.

Assign Group

Use the Assign Group parameter to assign a certain number of channels to each layer. By assigning all voices in the preset to assign groups, important parts are protected from being "stolen" by more recently played keys. Or you can assign a voice, such as an open high hat, to a mono channel so it is cancelled by a closed high hat on the same mono channel. Layers rotate within their assigned "bin" of channels, not interfering with other bins.

```
 L1  ASSIGN GROUP
poly all
```

The modes are:

Poly All: Notes are played polyphonically with dynamic channel assignment using all 64 channels.

Poly 16 A-B: Two bins of 16 channels each. Notes are played polyphonically with dynamic channel assignment using no more than 16 channels.

Poly 8 A-D: Four bins of 8 channels each. Notes are played polyphonically with dynamic channel assignment using no more than 8 channels each.

Poly 4 A-D: Four bins of 4 channels each. Notes are played polyphonically with dynamic channel assignment using no more than 4 channels each.

Poly 2 A-D: Four bins of 2 channels each. Notes are played polyphonically with dynamic channel assignment using no more than 2 channels each.

Mono A-I: Nine monophonic channels. Any layers assigned to the same letter interrupt each other without affecting other layers.

Glide

Glide creates a smooth transition from one note to the next instead of the normal instantaneous change in pitch when a new key is pressed. This effect is commonly heard on slide guitars, synthesizers and violins.

```
 L1  GLIDE RATE                 CURVE
     0.000 sec/oct              linear
```

The front panel **Glide Button** LED comes on when the any layer of the current preset has a glide rate greater than 0.000 seconds (regardless of if a PatchCord is connected or not). Pressing the button turns the LED and glide off. Pressing the front panel glide button when all layers are set to a glide of 0.000 turns glide on with a rate of 0.142 seconds/octave.

The **Glide Rate** parameter defines the time it takes to glide to the new pitch (the larger the value, the slower the glide rate) The glide rate value range is from 0 through 32.738 seconds (zero means off).

The **Glide Curve** describes how the glide accelerates as it slides between notes. Because of the ear's non-linear response to pitch, a linear glide sounds slow at the beginning and speeds up toward the end. Exponential curves actually sound smoother and more linear. Eight exponential curves are provided. Choose one that suits your style.
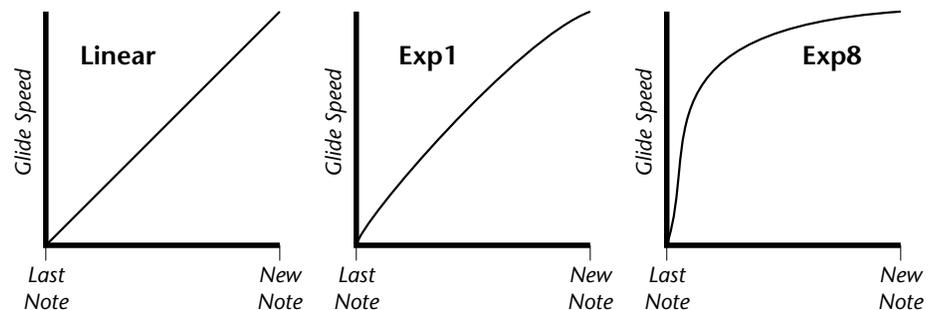
Glide can be either polyphonic or monophonic depending of the state of *Solo Mode*.

▶ **To Set up a Glide Rate Knob:**

1. Set at least one layer to the minimum setting of 0.002 sec/oct. (This forces the Glide LED to come on.)

2. Connect the MIDI controller of your choice to Glide Rate on the layers you'd like to glide. Adjust the Cord Amount for the desired range.

3. Disconnect the MIDI controller from whatever else it was connected to before you started mucking about.

4. The Glide button turns Glide on/off and the knob controls the rate.

Z-Plane Filters

A filter is a device which changes the output of a signal (sound) by removing certain elements of the signal based on the frequency and amplitude. The "Order" of a filter defines the number of filter elements it contains. The more elements, the more complex the filter.

Halo contains 50 different types of E-MU's celebrated Z-plane filters. In addition to the standard Low pass, High pass and Band pass filters, Halo contains Swept Octave Equalizers, Phasers, Flangers, Vocal Formant Filters, and digital models of classic synthesizer filters.

In the filter chart below you will notice that the "Order" of the filters varies from 2 to 12 order. Higher order filters have more sections and can produce more complex formants. Halo can produce 128 filters of up to 6th order or 64 filters of 12th order complexity. Therefore, if you decided to use all 12th order filters, Halo would be limited to 64 voices.

Halo Filter Types

This screen allows you to choose the type of filter for the current layer.

```
┌─────────────────────────────────────────┐
│ L1  FILTER          Ord        Type      │
│ Phazer 2 E4          6         PHA       │
└─────────────────────────────────────────┘
```

Filter Types

LPF	Low-pass filter
PHA	Phaser
HPF	High-pass filter
FLG	Flanger
BPF	Band-pass filter
VOW	Vowel/ formant
EQ+	EQ boost
EQ-	EQ cut
SFX	Special Effect

| Filter Name	Order	Type	Description
Smooth	02	LPF	Typical OB type low-pass filter with a shallow 12 dB/octave slope.
Classic	04	LPF	4-pole low-pass filter, the standard filter on classic analog synths. 24 dB/octave rolloff.
Steeper	06	LPF	6-pole low-pass filter which has a steeper slope than a 4-pole low-pass filter. 36 dB/octave rolloff!
MegaSweepz	12	LPF	"Loud" LPF with a hard Q. Tweeters beware!
EarlyRizer	12	LPF	Classic analog sweeping with hot Q and Lo-end.
Millennium	12	LPF	Aggressive low-pass filter. Q gives you a variety of spiky tonal peaks.
KlubKlassik	12	LPF	Responsive low-pass filter sweep with a wide spectrum of Q sounds
BassBox-303	12	LPF	Pumped up lows with TB-like squelchy Q factor.
Shallow	02	HPF	2-pole high-pass filter. 12 dB/octave slope.
Deeper	04	HPF	Classic 4-pole high-pass filter. Cutoff sweep progressively cuts 4th Order High-pass.
Band-pass1	02	BPF	Band-pass filter with 6 dB/octave rolloff on either side of the passband and Q control.
Band-pass2	04	BPF	Band-pass filter with 12 dB/octave rolloff on either side of the passband and Q control.

Filter Name	Order	Type	Description
ContraBand	06	BPF	A novel band-pass filter where the frequency peaks and dips midway in the frequency range.
Swept1>1oct	06	EQ+	Parametric filter with 24 dB of boost or cut and a one octave bandwidth.
Swept2>1oct	06	EQ+	Parametric filter with 24 dB of boost or cut. The bandwidth of the filter is two octaves wide at the low end of the audio spectrum, gradually changing to one octave wide at the upper end.
Swept3>1oct	06	EQ+	Parametric filter with 24 dB of boost or cut. The bandwidth of the filter is three octaves wide at the low end of the audio spectrum, gradually changing to one octave wide at the upper end.
DJAlkaline	12	EQ+	Band accentuating filter, Q shifts "ring" frequency.
AceOfBass	12	EQ+	Bass-boost to bass-cut morph
TB-OrNot-TB	12	EQ+	Great Bassline "Processor."
BolandBass	12	EQ+	Constant bass boost with mid-tone Q control.
BassTracer	12	EQ+	Low Q boosts bass. Try sawtooth or square waveform with Q set to 115.
RogueHertz	12	EQ+	Bass with mid-range boost and smooth Q. Sweep cutoff with Q at 127.
RazorBlades	12	EQ-	Cuts a series of frequency bands. Q selects different bands.
RadioCraze	12	EQ-	Band limited for a cheap radio-like EQ
AahAyEeh	06	VOW	Vowel formant filter which sweeps from "Ah" sound, through "Ay" sound to "Ee" sound at maximum frequency setting. Q varies the apparent size of the mouth cavity.
Ooh-To-Aah	06	VOW	Vowel formant filter which sweeps from "Oo" sound, through "Oh" sound to "Ah" sound at maximum frequency setting. Q varies the apparent size of mouth cavity.
MultiQVox	12	VOW	Multi-Formant, Map Q To velocity.
Ooh-To-Eee	12	VOW	Oooh to Eeee formant morph.
TalkingHedz	12	VOW	"Oui" morphing filter. Q adds peaks.
Eeh-To-Aah	12	VOW	"E" to "Ah" formant movement. Q accentuates "peakiness."
UbuOrator	12	VOW	Aah-Uuh vowel with no Q. Raise Q for throaty vocals.
DeepBouche	12	VOW	French vowels! "Ou-Est" vowel at low Q.
PhazeShift1	06	PHA	Recreates a comb filter effect typical of phase shifters. Frequency moves position of notches. Q varies the depth of the notches.

Filter Name	Order	Type	Description
PhazeShift2	06	PHA	Comb filter with slightly different notch frequency moving the frequency of notches. Q varies the depth of the notches.
FreakShifta	12	PHA	Phasey movement. Try major 6 interval and maximum Q.
CruzPusher	12	PHA	Accentuates harmonics at high Q. Try with a sawtooth LFO.
FlangerLite	06	FLG	Contains three notches. Frequency moves frequency and spacing of notches. Q increases flanging depth.
AngelzHairz	12	FLG	Smooth sweep flanger. Good with vox waves. eg. I094, Q =60
DreamWeava	12	FLG	Directional Flanger. Poles shift down at low Q and up at high Q.
MeatyGizmo	12	REZ	Filter inverts at mid-Q.
DeadRinger	12	REZ	Permanent "Ringy" Q response. Many Q variations.
ZoomPeaks	12	REZ	High resonance nasal filter.
AcidRavage	12	REZ	Great analog Q response. Wide tonal range. Try with a sawtooth LFO.
BassOMatic	12	REZ	Low boost for basslines. Q goes to distortion at the maximum level.
LucifersQ	12	REZ	Violent mid Q filter! Take care with Q values 40-90.
ToothComb	12	REZ	Highly resonant harmonic peaks shift in unison. Try mid Q.
EarBender	12	WAH	Midway between wah & vowel. Strong mid-boost. Nasty at high Q settings.
FuzziFace	12	DST	Nasty clipped distortion. Q functions as mid-frequency tone control.
BlissBatz	06	SFX	Bat phaser from the Emulator 4.
KlangKling	12	SFX	Ringing Flange filter. Q "tunes" the ring frequency.

Filter Parameters

The Freq and Q parameters control various elements of the filter depending on the type of filter used. See the table in the *Filter Types* section for details about what the Freq and Q fields control in each filter.

```
 L1  FILTER

Freq:   255           Q:   019
```
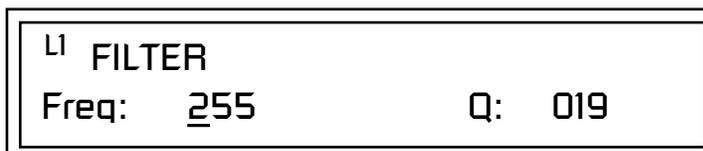
Filter Envelope

The Filter Envelope is normally used to control the filter frequency and has six stages. Unlike the Volume Envelope, the Filter Envelope must be patched to the Filter Frequency using a PatchCord. In this respect, it can be thought of as a general purpose envelope generator which is normally patched to control the filter. The Filter Envelope Levels can be negative as well as positive.

There are three mode options:

• **Time-based**: Defines the Filter Envelope rates from 0 to 127 (approximately 1 ms to 160 seconds). The Master clock has no affect on time-based rates.

```
 L1  FILT ENV        RATE         LEVEL
Attack 1              84          100%
```

• **Tempo-based:** The Filter Envelope times vary based on the master tempo setting and are displayed in values such as 1, 2, 3, etc. Note values are displayed instead of a number when the time corresponds to an exact note value. Tempo-based envelopes are useful when using arpeggiators and sequencers because the envelope rates compress and expand according to the Master Tempo setting, keeping the envelopes in sync with the music. See the illustration on page 104.

```
 L1  FILT ENV        RATE         LEVEL
Attack 1             1/4          100%
```

• **Envelope Repeat:** The Envelope Generators can also be made to repeat. When the envelope repeat function is On, the Attack (1&2) and Decay (1&2) stages will continue to repeat as long as the key is held. As soon as the key is released, the envelope continues through its normal Release stages (1 & 2). For more information see page 104.

▶ **To Turn on Envelope Repeat:**

1. Move the cursor until it is underneath the Mode field as shown below.

```
 L1  FILTER ENVELOPE
Mode:  time-based
```

2. Turn the data entry control clockwise. The lower line changes to:

```
ᴸ¹  FILTER  ENVELOPE
Repeat:  off
```

3. Move the cursor underneath the on/off field, then turn the data entry control clockwise so that Repeat is On.

Defining the Filter Envelope

The Filter Envelope controls the filter frequency of the layer over time. The Envelope has six stages to the contour: Attack 1, Attack 2, Decay 1, Decay 2, Release 1 and Release 2. When a key is pressed, the Envelope goes through the first four stages. If the key continues to be held, the envelope holds at the Decay 2 level. When the key is released, the envelope immediately jumps to the Release 1 stage, then the Release 2 stage finally ending at the Release 2 level.
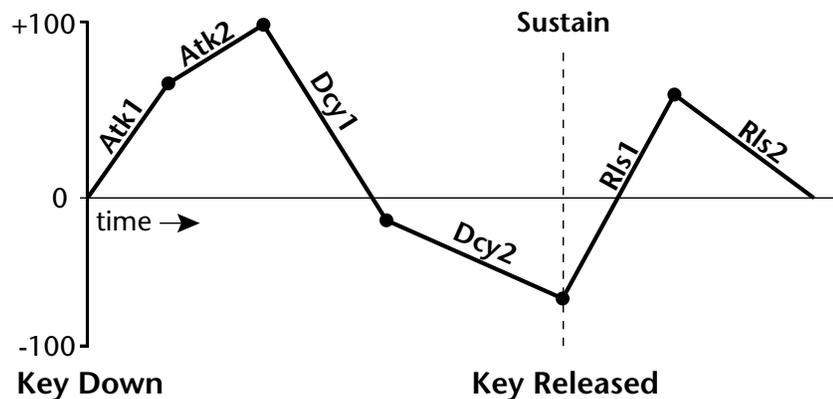
See the Programming Basics section of this manual for detailed information about how the Envelopes work.

The default PatchCord settings connect the Filter Envelope to Filter Frequency but the envelope can be routed to any real-time control destination using a PatchCord.

Auxiliary Envelope

The Auxiliary Envelope is a supplementary general purpose envelope that can be routed to any real-time control destination in the PatchCords. It is identical to the filter envelope generator. See "Filter Envelope" on page 151 for full details.

Low Frequency Oscillators (LFOs)

A Low Frequency Oscillator or LFO, is simply a wave that repeats at a slow speed. Halo has two LFOs per layer identified on the display as LFO1 and LFO2.

An LFO can be routed to any real-time control destination using a PatchCord. LFOs have a myriad of uses, some of which probably haven't been thought of yet. The following examples show a few common uses.

- Control the pitch of the sound (LFO -> Pitch). This effect is called "vibrato" and is an important performance tool. Many presets use this routing with the modulation wheel controlling "how much" modulation is applied.
- Create a "tremolo" effect by routing the LFO to control the volume (LFO -> AmpVolume).
- Add a bit of animation to the sound by routing the LFO to control the filter. Set the PatchCord amount low for a subtle effect.

The LFOs have five parameters: Shape, Sync, Rate, Delay and Variation.

Shape

LFO waveforms have different shapes. The shape of the waveform determines the effect of the LFO. LFOs have traditionally been used to add vibrato or repeating movement to a sound. These new shapes offer a lot of new programming possibilities.

```
┌─────────────────────────────────────┐
│ L1  LFO1        SHAPE        SYNC    │
│                                      │
│             sawtooth     key sync    │
└─────────────────────────────────────┘
```

If you modulate the pitch of an instrument, it's easy to visualize the shape of the waveform. For example, the sine wave has a smooth, rolling shape that changes the pitch smoothly. The square waveform changes between two pitches abruptly. A sawtooth waveform increases the pitch smoothly, then abruptly changes back down. The available waveforms are shown below.

LFO Tricks & Tips:

- *The Random LFO wave is truly random and is different for each voice and layer.*

- *The Pattern (Pat) waveforms will sound the same on different layers and voices.*

- *Sine + Noise is very useful for simulating trumpet and flute vibrato.*

★ *When routing Hemi-quaver to Pitch:*

+38 = major scale
-38 = phrygian scale
*+76 = whole tone scale*
(+38) + (+76) = diminished (two cords)

odd amount = S+H sound

Note: *References to musical intervals in the pattern LFO shapes are with the LFO routed to pitch and a PatchCord amount of +38.*

LFO Synced to 1/4 Note Clock

Random   Triangle   Sawtooth

Sine   Square   33% Pulse

25% Pulse   16% Pulse   12% Pulse

Pat: Octaves   Pat: Fifth+Octave   Pat: Sus4 trip

Pat: Neener   Sine 1,2   Sine 1,3,5

Sine + Noise   Hemi-quaver
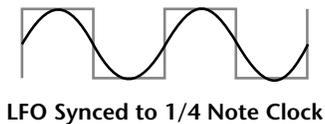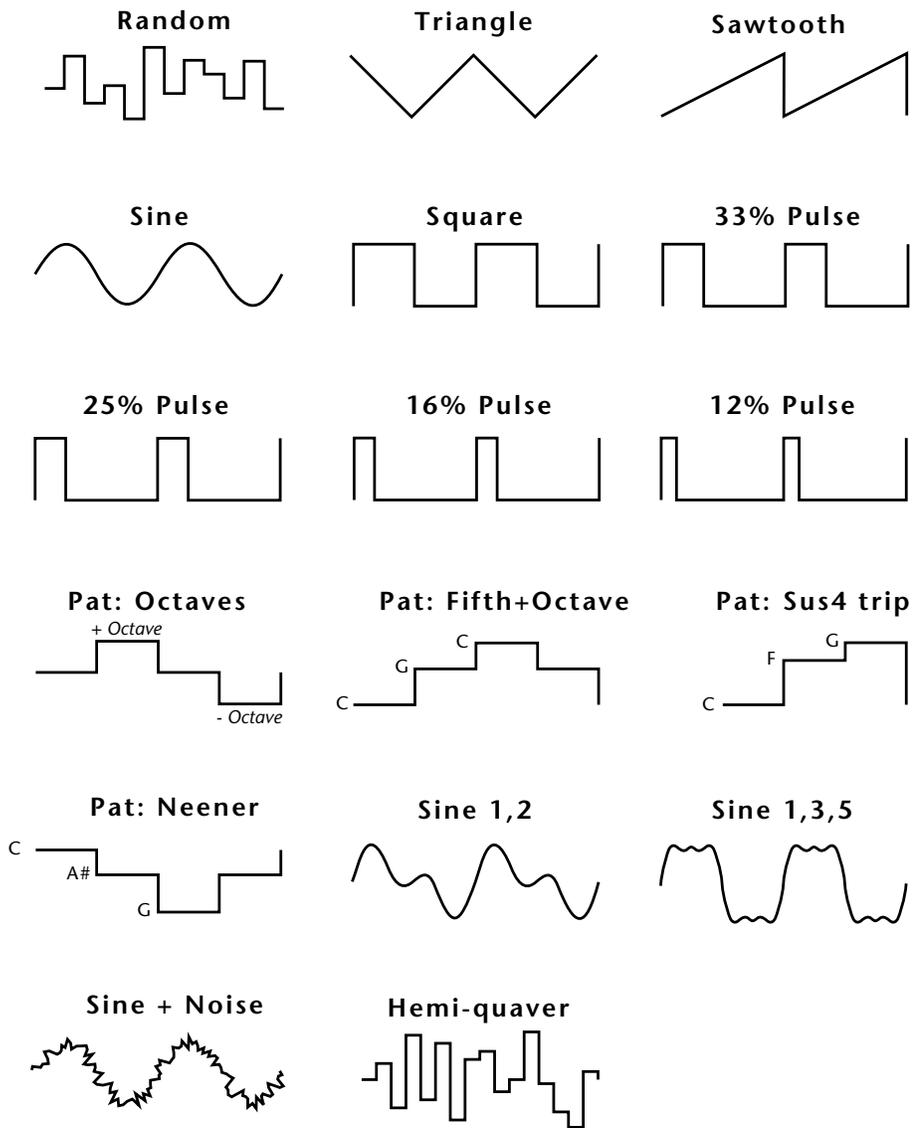
Sync

The Sync field specifies whether the LFO is synchronized to a key stroke or is Free Running. Key Sync starts the LFO wave at the beginning of its cycle each time you press a key on the controller. In Free Run mode, the LFO wave begins at a random point in its cycle each time you press a key on the controller.

Rate

The Rate field determines the LFO speed in absolute frequency rate values or tempo-based note values. All values equal to or greater than zero specify absolute frequency values from 0.08 Hz to 18.14 Hz.

Values less than zero specify tempo-based rates. If you modulate the rate of a tempo-based LFO, the rates will jump between the tempo-based note values with each PatchCord increment of "1". As an example: if the LFO rate was set to 8/1 and you patched the Mod Wheel to control rate with a PatchCord amount of +1, turning the Mod Wheel to maximum would change the LFO rate to 4/1d. Refer to the chart below.

```
┌────────────────────────────────────────────┐
│ L1  LFO1     RATE      DELAY      VAR        │
│             0.08Hz        60      020        │
└────────────────────────────────────────────┘
```

Tempo-based Rates (based on Master Tempo)	Display
octal whole note	8/1
dotted quad whole note	4/1d
octal whole note triplet	8/1t
quad whole note	4/1
dotted double whole note	2/1d
quad whole note triplet	4/1t
double whole note	2/1
dotted whole note	1/1d
double note triplet	2/1t
whole note	1/1
dotted half note	1/2d
whole note triplet	1/1t
half note	1/2
dotted quarter note	1/4d
half note triplet	1/2t
quarter note	1/4
dotted 8th note	1/8d
quarter note triplet	1/4t
8th note	1/8
dotted 16th note	1/16d
8th note triplet	1/8t
16th note	1/16
dotted 32nd note	1/32d
16th note triplet	1/16t
32nd Note	1/32

Delay

The Delay parameter defines the amount of time between hitting a key on the controller and the onset of the LFO modulation. Delay can be used to simulate an effect often used by acoustic instrument players where the vibrato is brought in only after the initial note pitch is established. The following illustration demonstrates how delay works.
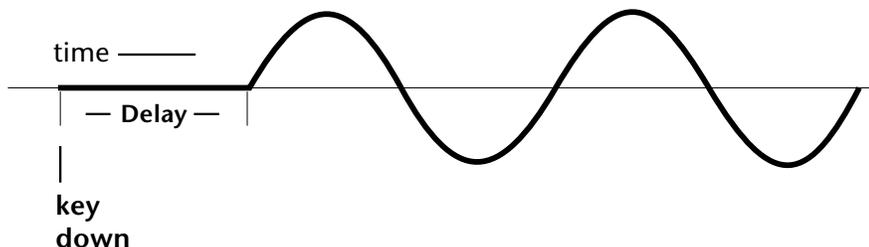
All Delay values equal to or greater than zero specify absolute time rates from 0 to 127. Values less than zero specify Tempo-based mode. Refer to the previous table for times and tempo-based rates.

Variation

LFO Variation sets the amount of random variation of the LFO each time you press a key on the controller. This creates a chorus or ensemble effect since each note played has a slightly different modulation rate. The higher the value entered, the greater the note to note variation in the LFO.

The Variation value range is from 0 through 100.

☜☞ *Variation is disabled when a Tempo-Based LFO is selected.*
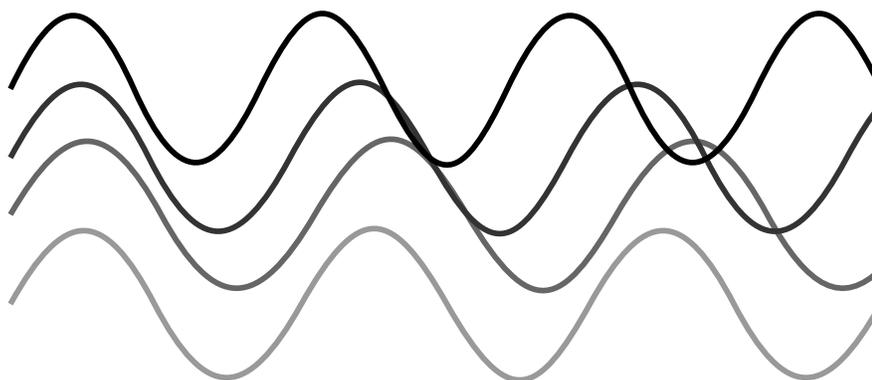
LFO variation changes the rate of each note to create an "ensemble" effect.

PatchCords

PatchCords tie everything together by connecting modulation sources to destinations. Each PatchCord has its own *Amount* control which can be positive or negative (negative amounts invert the signal). In addition, the PatchCord amounts themselves can be controlled by any modulation source. Halo provides 24 patches for each layer.

There are three permanently connected control routings: volume envelope to amplifier, pitch wheel to pitch and key to pitch. All other connections must be made using the PatchCords.
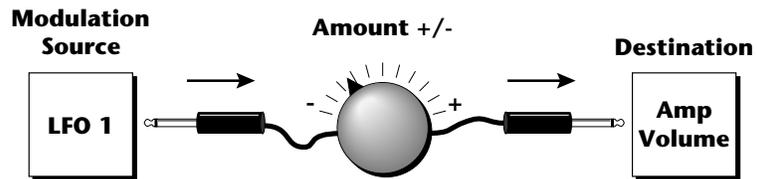
Each patch has an amount field which determines how much modulation is applied to the destination. The modulation amount can be positive or negative. Negative values invert the input. The amount value range is from -100 to +100.
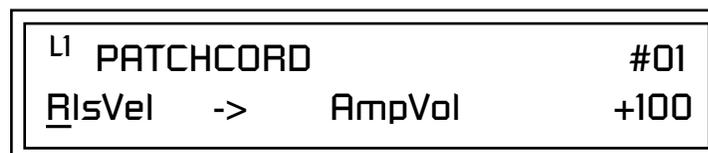
Modulator Polarity

You will notice that some of the modulation sources have symbols following their names. For example, there are three Velocity modulation sources, Vel +, Vel ±, and Vel <.

Control Value ⊢————————————⊣
0   63   127

Control Value Applied

+ ⊢————————————⊣
0   63   127   **+** modulation ADDS to the initial value. (Normal)

± ⊢————————————⊣
-63   0   +64   **±** centers around Zero. (Use for LFOs, Filt. Freq.)

< ⊢————————————⊣
-127   -63   0   **<** modulation SUBTRACTS from the initial value
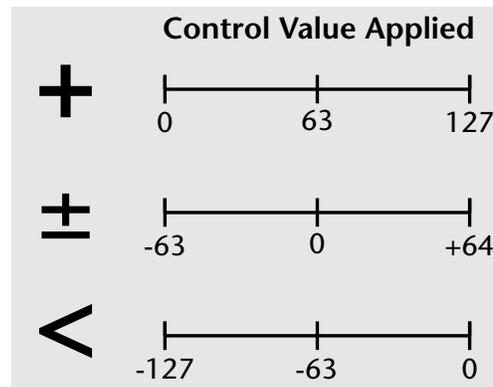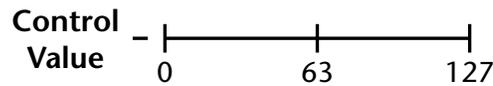
"+" Modulation: Uses only the positive half of the range, adding to the current value. For example, if the filter frequency were set to 100 and you patched Vel+ to the filter, the filter frequency would increase from 100 as velocity was applied.

"±" Modulation: Uses both sides (full) range and both adding and subtracting from the current value. For example, if the filter frequency were set to 100 and you patched Vel ± to the filter, the filter frequency would decrease from 100 with key velocities of 63 or less and increase from 100 with key velocities of 64 and above. Therefore with medium velocity, the Filter frequency is approximately where you set it at 100.

An LFO ± works the same way; on the positive half of the cycle it increases the initial amount and on the negative half of the cycle it decreases the initial amount. With a ± modulation source, a value of 64 equals 0.

"<" Modulation: Uses only the negative half of the range, subtracting from the current value. For example, if the Amplifier Volume were set to +3 dB and you patched Vel < to AmpVol, the volume would be at +3 dB only when maximum key velocity were applied. Lower key velocities would scale back the volume. In general, < modulation is the proper choice when modulating Volume.

Here is a list of all layer modulation sources and destinations in Halo.

Modulation Sources:	**Modulation Destinations**
Off	Off
Key (+, +)	KeySust (Key Sustain)
Velocity (+, +, <)	FinePtch (Fine Pitch)
RlsVel (Release Velocity)	Pitch
Gate	Glide
Pressure (Aftertouch)	ChrsAmt (Chorus Amount)
PitchWhl (Pitch Wheel)	'SStart (Sample Start) -note-on)
ModWhl (Modulation Wheel)	SLoop (Sample Loop)
Pedal	SRetrig (Sample Retrigger)
MIDI Volume (Controller 7)	FiltFreq (Filter Frequency)
MIDI Pan (Controller 10)	'FiltRes (Filter Resonance -note-on)
MIDI Expression (Controller 11)	AmpVol (Amplifier Volume)
MIDI A-P	AmpPan (Amplifier Pan)
PLagOut (Preset Lag Out)	RTXfade (Real-time Crossfade)
PRampOut (Preset Ramp Out)	VEnvRts (Volume Envelope Rates -all)
FootSw1 - 3 (Foot Switch 1-3)	VEnvAtk (Volume Envelope Attack)
FootFF (Flip-Flop Foot Switch 1 -3)	VEnvDcy (Volume Envelope Decay)
Key Glide	VEnvSus (Volume Envelope Sustain)
VolEnv +, +, < (Volume Envelope)	VEnvRls (Volume Envelope Release)
FilEnv +, +, < (Filter Envelope)	FEnvRts (Filter Envelope Rates -all)
AuxEnv +, +, < (Auxiliary Envelope)	FEnvAtk (Filter Envelope Attack)
LFO 1 & 2 (+, +)	FEnvDcy (Filter Envelope Decay)
White (White Noise)	FEnvSus (Filter Envelope Sustain)
Pink (Pink Noise)	FEnvRls (Filter Envelope Release)
XfdRand (Crossfade Random)	FEnvTrig (Filter Envelope Trigger)
KeyRand 1 & 2 (Key Random)	AEnvRts (Auxiliary Envelope Rates -all)
Lag 0 sum (summing amp out)	AEnvAtk (Auxiliary Envelope Attack)
Lag 1 sum (summing amp out)	AEnvDcy (Auxiliary Envelope Decay)
Lag 0 & 1 (Lag Processor)	AEnvSus (Auxiliary Envelope Sustain)
Clk Divisors (Octal, Quad, Double Whole, Whole, Half, Qtr, 8th,16th)	AEnvRls (Auxiliary Envelope Release)
DC (DC Offset)	AEnvTrig (Auxiliary Envelope Trigger)
Summing Amp	LFO 1 & 2 Rate
Switch	LFO 1 & 2 Trigger
Absolute Value	Lag Processor In 0 & 1
Diode	Sum (Summing Amp)
Flip-Flop	Switch
Quantizer	Abs (Absolute Value)
4x Gain	Diode
	Quantize
	Flip-Flop
	Gain 4x
	Cord 1-24 Amount

Note: *Flip-Flop Footswitches 1 & 2 remain in their last condition when a new preset is selected.*

Flip-Flop Footswitch 3 resets to the Off condition whenever a new preset is selected.

Note: *The Envelope Sustain parameter controls the Decay 2 Level segment of the envelope generator.*

Pitch Bend Range

Specifies the Pitch Wheel range in semitones for the current layer. Pitch Wheel is a standard synthesizer control which is transmitted as a MIDI continuous controller message used (normally) to bend the pitch up and down.

The PitchBend range is from 0 to +12 semitones or "Master." A setting of "0" turns the pitch wheel Off for the current layer. The Master setting uses the Pitch Bend range defined in the *Global menu*.

```
┌─────────────────────────────────────┐
│  L1  PITCHBEND RANGE                 │
│      +/-  12 semitones               │
└─────────────────────────────────────┘
```

Mix Output

This feature allows you to program the Effect Send as a part of the preset. Note that for this feature to work, the Mix Output setting in the Global menu MUST be set to "Preset" on the selected MIDI channel. If you want to define output routing by MIDI channel, set it up using the Mix Output page in the Global menu. *See "Mix Output" on page 86 for more information.*

```
┌─────────────────────────────────────┐
│  L1 MIX OUTPUT                       │
│  Send2->main                         │
└─────────────────────────────────────┘
```

FX Send Routing   *Output Routing*
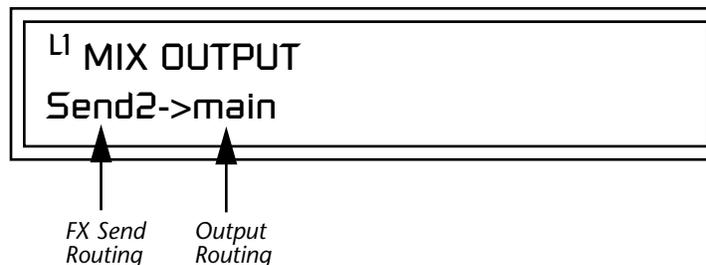
The Sends function as effect processor inputs (effect sends). The Output Routing field shows the true routing of the Sends to the Main output.

▶ **To Control the Mix Output from the Preset:**

1. Move the cursor until it is underneath the Layer field and change the Layer using the data entry control.
2. Move the cursor until it is underneath the FX Send Routing field and change the Send (1-4) using the data entry control.
3. Locate the MIX OUTPUT screen in the Global menu.
4. Set the MIDI channel you are using to "use preset".

Common Preset Parameters

This section of the Preset Edit menu chapter describes parameters that affect all layers in the preset.

Preset Effects

Halo has two stereo effects processors. When playing presets one at a time, the two processors can be programmed as part of the preset. The diagram below shows how the effects are integrated into the signal path using a parallel effects send/return model, similar to a mixing console.
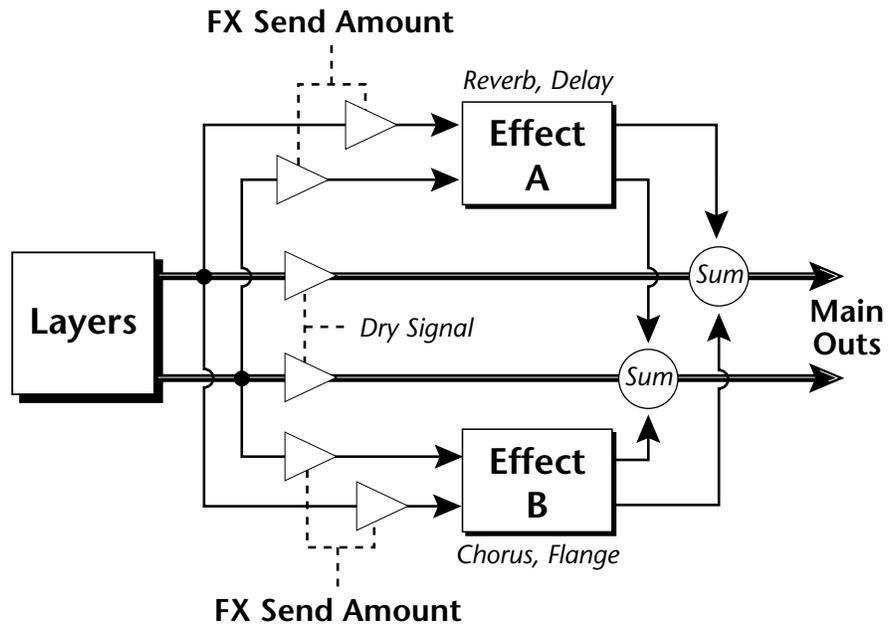
Refer to the Effects chapter for additional information and instructions for setting up both the Preset Effects and the Master Effects.

OUTPUT SECTION
& EFFECTS PROCESSORS

**PRESET
EDIT MENU**

**Mix
Output**

Send 1

FX Sends **Hall 1**

Send 1 15%

Send 2 10%

Send 3 0%

Send 4 0%

**Effect
A**

B⇒A

FX Sends **Chorus**

Send 1 0%

Send 2 0%

Send 3 20%

Send 4 15%

**Effect
B**

S E N D 1

M A I N

Mix Output

Ch 1 | PRESET

Ch 2 | SEND 2

Ch 3 | SEND 3

Ch 16 | SEND 4

GLOBAL MENU

S E N D 2

S E N D 3

S E N D 4

Jack Detect

S U B 1
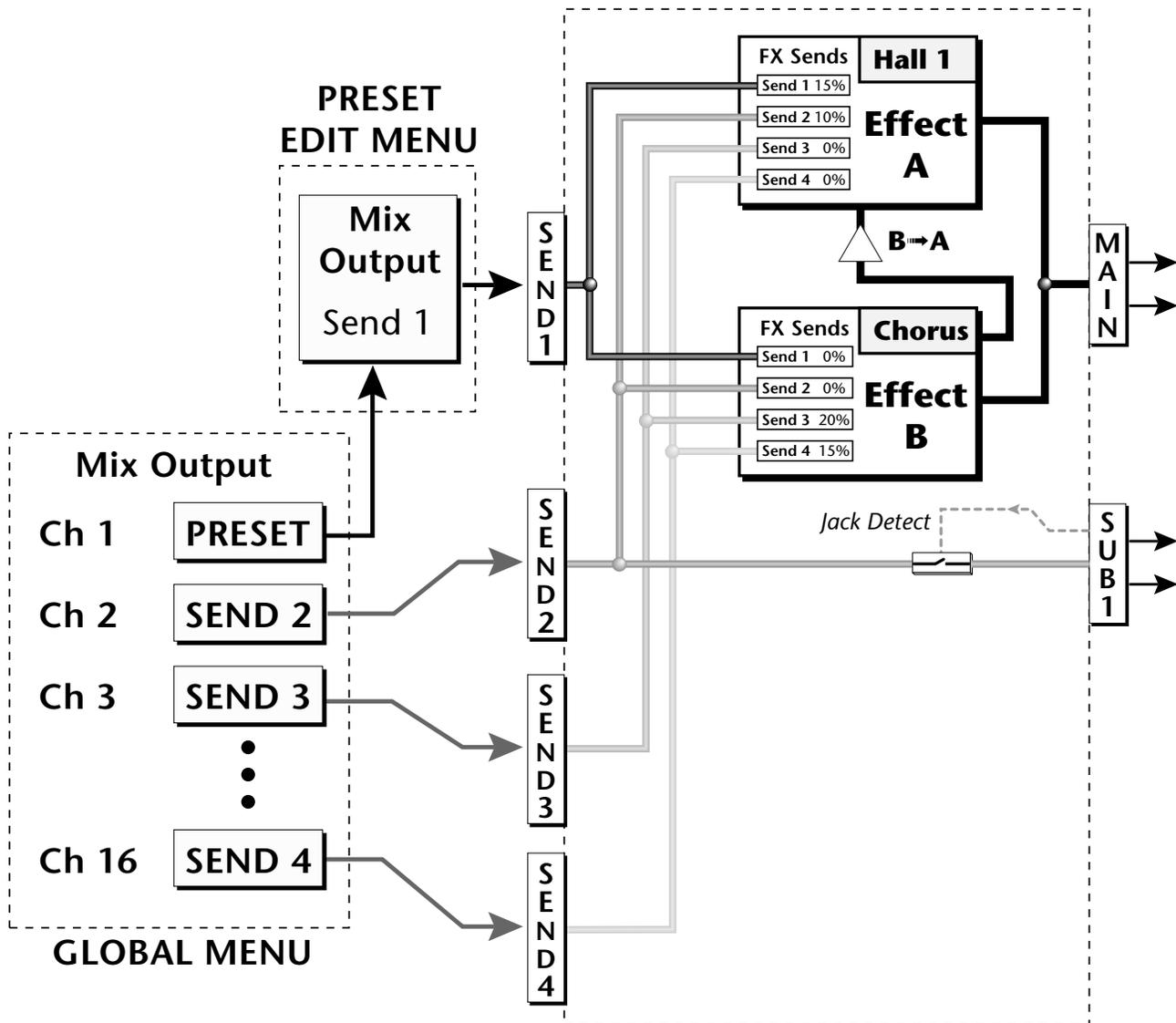
The Mix Output setting in the Global Menu determines if the Preset's Mix
Output routing will be used. This allows the Sends to be programmed by
either **MIDI Channel** or by **Preset**, whichever you prefer.

FXA Algorithm

This screen selects the effect type for Effect Processor A. The "A" effects consist of different reverb types and digital delays. Move the cursor to the lower line of the display and select the effect you want.

```
┌─────────────────────────────┐
│ FXA ALGORITHM               │
│ Lg Concert Pan              │
└─────────────────────────────┘
```

A Effect Types

1.	Room 1	23.	BBall Court
2.	Room 2	24.	Gymnasium
3.	Room 3	25.	Cavern
4.	Hall 1	26.	Concert 9
5.	Hall 2	27.	Concert 10 Pan
6.	Plate	28.	Reverse Gate
7.	Delay	29.	Gate 2
8.	Panning Delay	30.	Gate Pan
9.	Multitap 1	31.	Concert 11
10.	Multitap Pan	32.	Medium Concert
11.	3 Tap	33.	Large Concert
12.	3 Tap Pan	34.	Large Concert Pan
13.	Soft Room	35.	Canyon
14.	Warm Room	36.	DelayVerb 1
15.	Perfect Room	37.	DelayVerb 2
16.	Tiled Room	38.	DelayVerb 3
17.	Hard Plate	39.	DelayVerb 4 Pan
18.	Warm Hall	40.	DelayVerb 5 Pan
19.	Spacious Hall	41.	DelayVerb 6
20.	Bright Hall	42.	DelayVerb 7
21.	Bright Hall Pan	43.	DelayVerb 8
22.	Bright Plate	44.	DelayVerb 9

FXA Parameters

The FXA parameters are Decay, High Frequency Damping, and the FxB to FxA send. **Decay** sets the length of time it takes an effect to fade out. **HF Damping** causes the high frequency energy to fade away more quickly during the reverb decay. **FxB to FxA** controls the amount of the "B" effect sent through effect "A". This allows you to place the two effects in series and create setups such as "distortion through reverb" among others. Please refer to the Effects chapter for more information about the effects.

```
┌─────────────────────────────────────┐
│  FXA   DECAY   HFDAMP   FxB>FxA      │
│         048      064       000       │
└─────────────────────────────────────┘
```

FXA Send Amounts

These parameters set the effects amounts for each of the four stereo effects busses.

```
┌─────────────────────────────────────┐
│  FXA SEND AMOUNTS      1:100%        │
│  2: 50%        3: 10%     4:  0%     │
└─────────────────────────────────────┘
```
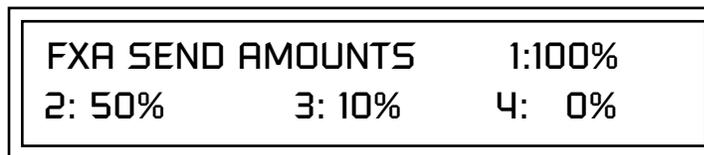
FXB Algorithm

This screen selects the effect type for Effect Processor A. Move the cursor to the lower line of the display and select the effect you want.

```
┌─────────────────────────────────────┐
│  FXB ALGORITHM                       │
│  Panning Delay                       │
└─────────────────────────────────────┘
```

B Effect Types

1. Chorus 1	**12.** Flange 5	**23.** PanDelay Chorus 1
2. Chorus 2	**13.** Flange 6	**24.** PanDelay Chorus 2
3. Chorus 3	**14.** Flange 7	**25.** Dual Tap 1/3
4. Chorus 4	**15.** Big Chorus	**26.** Dual Tap 1/4
5. Chorus 5	**16.** Symphonic	**27.** Vibrato
6. Doubling	**17.** Ensemble	**28.** Distortion 1
7. Slapback	**18.** Delay	**29.** Distortion 2
8. Flange 1	**19.** Delay Stereo	**30.** Distorted Flange
9. Flange 2	**20.** Delay Stereo 2	**31.** Distorted Chorus
10. Flange 3	**21.** Panning Delay	**32.** Distorted Double
11. Flange 4	**22.** Delay Chorus	

FXB Parameters

The FXB parameters are Feedback, LFO Rate and Delay. **Feedback** sends the output of the effect back into the input. This creates multiple echoes on a delay effect and intensifies a chorus or flange effect. **LFO Rate** allows you to change the speed of the modulation oscillator for flange and chorus effects. **Delay** sets the length of the delay line. This affects the time between echoes, or the tone of flange effects.

```
┌─────────────────────────────────────┐
│                                      │
│  FXB   FEEDBK   LFORATE    DELAY     │
│         032       003      200ms     │
│                                      │
└─────────────────────────────────────┘
```

FXB Send Amounts

These parameters set the effects amounts for the four stereo effects busses.

```
┌─────────────────────────────────────┐
│                                      │
│  FXB SEND AMOUNTS       1:100%       │
│  2: 50%       3: 10%     4:  0%      │
│                                      │
└─────────────────────────────────────┘
```

Preset Patchcords

Preset PatchCords give you real-time control of global parameters. The effect processors are a powerful synthesis tool and this feature lets you control and use them in exciting new ways. For example, you can dynamically adjust the effects mix during a sequence or live performance.

There are many exciting performance possibilities using Preset PatchCords to control Arpeggiator parameters and Effects Sends. The front panel knobs 15 & 16 are usually connected to Arp parameters in factory presets marked "arp:" Be sure to try out these controls

There are 12 Preset PatchCords per preset with a source, a destination and an amount control. The amount can be set from -100 to +100. The Preset PatchCord controls are *added* to the FX Send Amounts set in the Global or Preset Edit menus. In other words, multiple sources connected to destinations are *summed*.

To crossfade between effects.

1) Set FXA Send 1 to 100%.
2) Set FXB Send 1 to 0%.
3) Set FX Cord #1 to FXA Send 1 at -100.
4) Set FX Cord #2 to FXB Send 1 at +100.

Increasing the controller amount will crossfade from FXA to FXB.

```
┌─────────────────────────────────────┐
│                                      │
│  PRESET CORDS              #01       │
│  Pedal     -> FXBSend2     +100      │
│                                      │
└─────────────────────────────────────┘
```

Modulation Sources:	Modulation Destinations
Off	Off
PitchWhl (Pitch Wheel)	Effect A Send 1
ModWhl (Modulation Wheel)	Effect A Send 2
Pedal	Effect A Send 3
MIDI Volume (Controller 7)	Effect A Send 4
MIDI Pan (Controller 10)	Effect B Send 1
MIDI A-L	Effect B Send 2
Footswitch 1	Effect B Send 3
Flip-Flop Footswitch 1	Effect B Send 4
Footswitch 2	Preset Lag In
Flip-Flop Footswitch 2	Preset Lag Amount
Footswitch 3	Preset Lag Rate
Flip-Flop Footswitch 3	Preset Ramp Rate
DC	Arp Resolution
	Arp Extension
	Arp Velocity
	Arp Gate
	Arp Interval
	Beats Velocity, Group 1-4
	Beats Transpose (Xps), Group 1-4
	Beats Busy
	Beats Variation

Initial Controller Amount

This parameter sets the initial value of MIDI controllers A-P when the preset is first selected. The front panel Control Knobs can be thought of as front panel MIDI controllers because in the Halo, they are treated just as if they originated from an external MIDI device. Refer to the following diagram. There are 4 Initial Controller Amount screens (A-D, E-H, I-L, M-P).
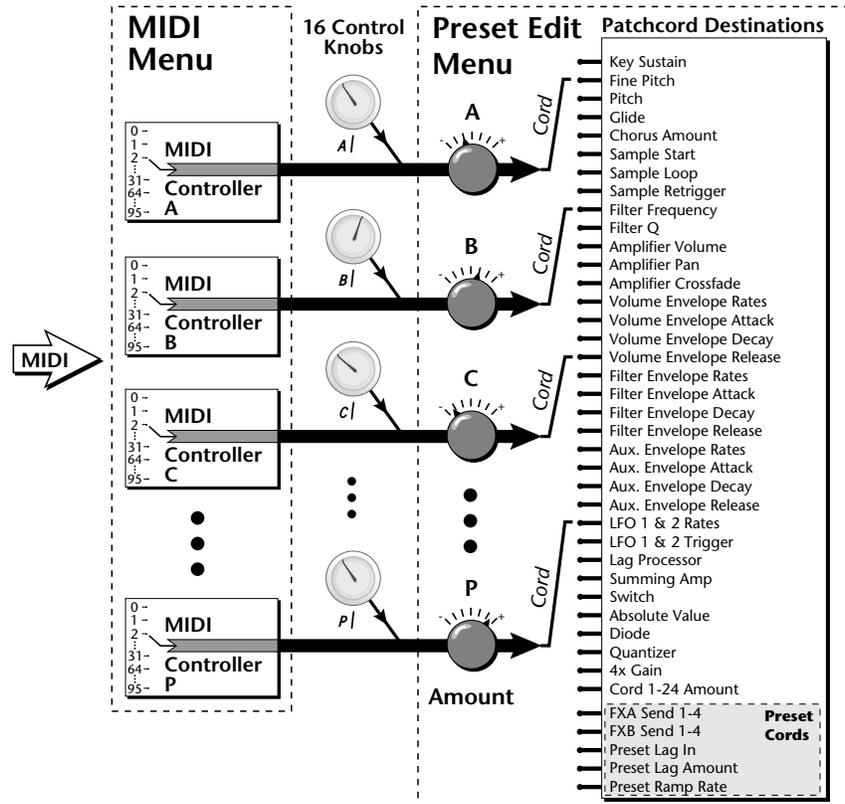
External MIDI controller numbers are assigned to the Letters A-P in the MIDI menu. The Initial Controller Amount value is sent to the PatchCord destination when the Preset is first selected. If you move the Control Knob, then that value replaces the initial value. If MIDI controller data is received it will similarly replace the knob or initial setting.

```
INITIAL  CONTROLLER  AMT
A:017      B:112      C:127      D: off
```

The Initial controller amounts can be set from 000-127 or they can be turned Off. If set to Off, the current controller value is used when the preset is first selected. Setting the Initial Amount to "off" uses the values from the previously selected preset.

Keyboard Tuning

In addition to the standard equally divided octave tuning, Halo contains twelve factory programmed tunings and 12 user-definable tunings. The Keyboard Tuning parameter selects which tuning is used by the current preset. The User Tuning tables are defined in the Global menu**.**

The factory Keyboard Tuning tables are described in the following table.

Tuning Tables	Description
Equal Temperament	Standard Western tuning (12 equally spaced notes per octave)
Just C	Just intonation. (Based on small interval ratios. Sweet and pure, non-beating intervals.)
Vallotti	Valotti & Young non-equal temperament. (Similar to 12 tone equal temperament. Each key has a different character for a given scale.)
19-Tone	19 tone equal temperament. (19 notes per octave. Difficult to play, but works well with a sequencer.)
Gamelan	5 tone Slendro and 7 tone Pelog. (Javanese. Pelog are white keys, Slendro are black keys. Exotic tunings of Gamelan flavor.
Just C2	Allows you to play the following chords in the key of C: C, E, F, G, A, B, C#m, D#m, Em, F#m, G#m, Am, Bm
Just C-minor	Allows you to play the following chords in the key of C: C, E, F, G, A, B, Em, Am, Bm, C#m, D#m, G#m
Just C3	Allows you to play the following chords in the key of C: C, D, F, Bb, C#m, Dm, Em, F#m, G#m, Am
Werkmeister III	A "well" temperament developed in the 17th century. Although you can play in all keys, each key sounds slightly different.
Kirnberger	Another well temperament developed by Johann Philipp Kirnberger where no pitch is more than 12 cents off from equal temperament.
Scarlatti	A variant of Meantone tuning which was used from the 15th to 18th centuries.
Repeating Octave	Middle C octave is repeated up and down the keyboard. Link with a preset in equal temperament to form unusual inversion up and down the keyboard.
User 1-12	Define your own tuning tables *(Global menu)*.

Refer to "User Key Tuning" on page 92 in the Global Menu chapter for instructions on how to define your own Keyboard Tunings.

The Just C Tuning Tables

Well Tempered and Just were standard keyboard tunings up until the 20th-century when the current "equal tempered" scale became prevalent. In an equal tempered scale, the octave is equally divided into 12 parts. In Just or Well Tempered scales, the 12 notes are separately tuned to produce pure chords. However, in Just tunings you are limited to playing certain chords and if you play the wrong chord it may sound very BAD!

Halo implements the MIDI Tuning Dump protocol which allows you to create tuning tables on your personal computer and download them via MIDI. There are several computer applications available on the internet which let you create and download tuning tables via MIDI.

Halo allows you to modulate between keys by providing you 12 user tuning tables. Tuning tables can be changed as you play using a program change (create several presets with the same sound and different tuning tables), by MIDI SysEx command (using a programmable MIDI footswitch or other device), or using a continuous controller (link 2 presets and crossfade between them using a controller).

The Just C2, Just C min, Just C3 Tuning Tables

These new tuning tables take the concept of just intonation a step beyond previous products. Fully explaining the mysteries of just intonation is beyond the scope of this manual, but the subject is covered exhaustively in Hermann Helmholtz's On the Sensations of Tone, available at most libraries and bookstores.

The new tables are called Just C2, Just C3, and Just C Minor. Try playing in the key of C/Cm using each table. You'll quickly discover both the wonders and the frustrations of just intonation! In Just C, for example, you'll find that the chords C, Em, F, G, and Am sound beautiful. If you hold one of these chords, you'll hear no "beating". After playing for a few minutes, switch back to Equal Temperament for a rude awakening!

At this point you might wonder why anyone would use Equal Temperament to begin with. For the answer to that question, play a D, Dmi, or Bb chord!.The intervallic ratios that make the C & G chords sound so pure make the D chord sound horribly out of tune. That's why we had to include Just C3. In this tuning, D, Dmi and Bb sound in tune, but the G chord will sound wrong.

Each of the 4 tables allows you to play a different group of common chords in just intonation. Sadly, there is no single 12 note tuning that will allow all of the common chords to be in tune, and of course that's why they invented the equal temperament tuning system that we use today.

Just C
Play these chords: **C, E, F, G, A, Cm, C#m, Em, F#m, Gm, Am**

Just C2
Play these chords: **C, E, F, G, A, B, C#m, D#m, Em, G#m, Am, Bm**

Just C2 minor
Play these chords: **C, D^b, D, E^b, G, A^b, Cm, Em, Fm, Gm**

Just C3
Play these chords: **C, D, F, B^b, C#m, Dm, Em, F#m, G#m, Am**

Preset Links

You can link presets to other presets to create layering or keyboard splits. The current preset can be linked with up to two other presets (Links 1 & 2). Each linked preset can be assigned to a specific range in order to create keyboard splits or can be assigned a velocity range to switch links according to key velocity. In addition, you can specify Volume, Pan, Transpose and Delay settings for each Link. The modulation parameters specified in each preset remain in effect for each preset in the link.

```
┌─────────────────────────────────────────┐
│  LINK  1  Preset              HALO        │
│  000² Preset Name                         │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│   LINK  1          KEY          VEL       │
│   RANGE     C-2    G8       000-127       │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│   LINK  1         VOLUME        PAN       │
│                    +0dB          00       │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│   LINK  1      TRANSPOSE      DELAY       │
│                  +00            0         │
└─────────────────────────────────────────┘
```

Links provide an easy way to create new sounds by combining the existing presets. Or, you can create your own custom stacked presets with up to 12 layers! We're talking LARGE sounds here. Of course Links can also be used when you just want to stack up two sounds.

As an example, let's stack two presets to create a big sound. Start with a preset you like, then go into the Links screen and start scrolling through the preset list while you play to hear both presets together. When you find a winner, simply Save the preset and you're finished!

• You can "Split" the keyboard up to 12 ways by using combinations of the Layers and Links.

• By adjusting the Velocity for the link, you can bring in the link by playing hard.

• Transposing the Link can radically change the sound.

• The delay parameter lets you create surprise effects, echoes or cascades of sound as you continue to hold the keys.

Preset Tempo Offset

This function allows you to double or halve the Master Tempo as it applies to this preset. When playing or sequencing several presets in Multi mode, the Master Tempo may be too fast or slow for one preset. Using this feature, you can adjust the tempo for the misbehaving preset. The Tempo Offset can use the **current tempo** or be set to **half** or **twice** the current tempo.

```
┌─────────────────────────────────────┐
│                                      │
│  TEMPO OFFSET                        │
│  use current tempo x 2               │
│                                      │
└─────────────────────────────────────┘
```

Audition Riff Selection

A Riff is a short pre-recorded musical phrase which can be anything from a single note to a full 16-track sequence. This function allows you to assign a Riff to a Preset. The Preset Riff will be used when the front panel Audition button is pressed.

The Riffs themselves cannot be modified.

Listening to the Riffs is a quick way to learn the sounds in Halo. If a preset has hidden tricks or controllers, these will be shown off in the Riff.

```
┌─────────────────────────────────────┐
│                                      │
│  AUDITION SELECTION                  │
│  Plays:KEY-MiddleC                   │
│                                      │
└─────────────────────────────────────┘
```

Play Solo Layers

When constructing multilayer sounds it is often useful to turn off one or more of the layers so you can hear what you're doing! This feature allows you to temporarily solo individual layers or listen to them in any combination. This screen differs from the other Preset Edit screens in that it is NOT saved with the preset. The values reset each time you exit the Preset Edit menu.

Solo is activated by setting any layer to On (On = the layer is being Soloed). Any layers set to **On will play** and any layers set to **Off will be muted**. If all layers are set to Off, then Solo mode ends and all layers play normally. When you exit the Preset Edit menu, all layers play normally.

```
┌─────────────────────────────────────┐
│                                      │
│  PLAY SOLO LAYERS                    │
│  1: off     2: off     3: off     4: off │
│                                      │
└─────────────────────────────────────┘
```

Effects

Effects Overview

Halo has two stereo effects processors. When playing presets one at a time, the two processors can be programmed as part of the preset. When the MIDI Mode is set to "multi," the Halo uses a global effects assignment (Master Effects). The diagram below shows how the effects are integrated into the signal path using a parallel effects send/return model, similar to a mixing console.

FX Send Amount

Reverb, Delay

Effect A

Preset

Dry Signal

Sum

Sum

Main Outs

Effect B

Chorus, Flange

FX Send Amount
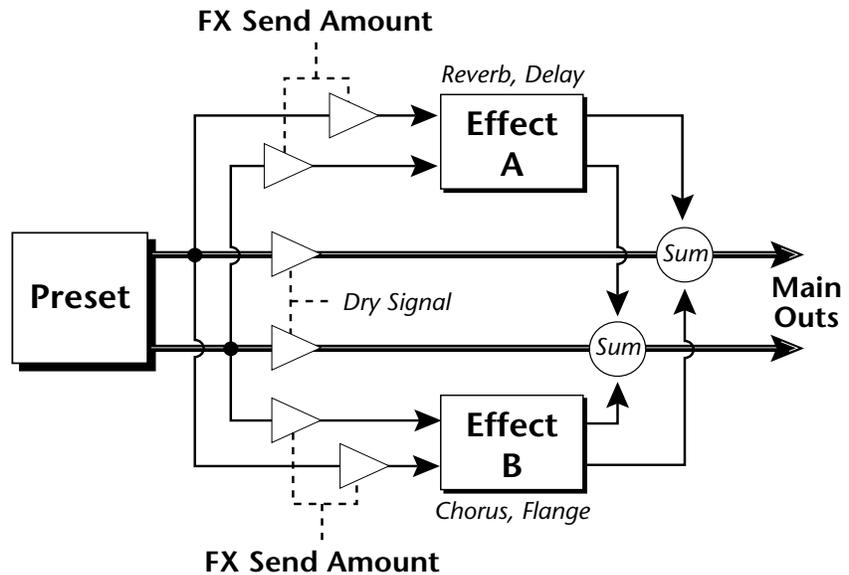
The Effects Sends

On a mixing console you can control the amount of signal each channel Sends to the effect bus. This allows each channel to be placed in a slightly different "sonic space" which creates an airy, open sound.

Halo uses this basic concept, but works in a slightly different manner. There are four effects busses: Send1-Send4. Each preset or each MIDI channel (you determine which), can be directed to one of the four busses. Each effect processor has four Send Amounts which allow you to set the wet/dry mix on each of the four busses going into the effect. A setting of 0% is completely dry (no effect). A setting of 50% contains an equal mix of affected and normal (dry) signal.

Send 2 is also used to route sounds to the Sub 1 outputs on the back panel. When a plug is inserted into the associated Submix jack on the back panel, the Dry portion of the Send is disconnected from the effects processor and the Dry signal is routed directly to the output jack. **The Arrow (->) in the display points to the actual output routing**. *The Dry Send is disconnected from the Effects Processors even if only one plug is inserted into a Submix pair.*

The Effects Send is programmed for each layer in the Preset Edit menu. These routings can be overruled in the Global menu *Mix Output* screen by changing the submix setting from "preset", which uses the preset routing, to Send1-Send4. In the diagram below, MIDI channel 1 is programmed to obey the preset routing, which in this case is Send 1.
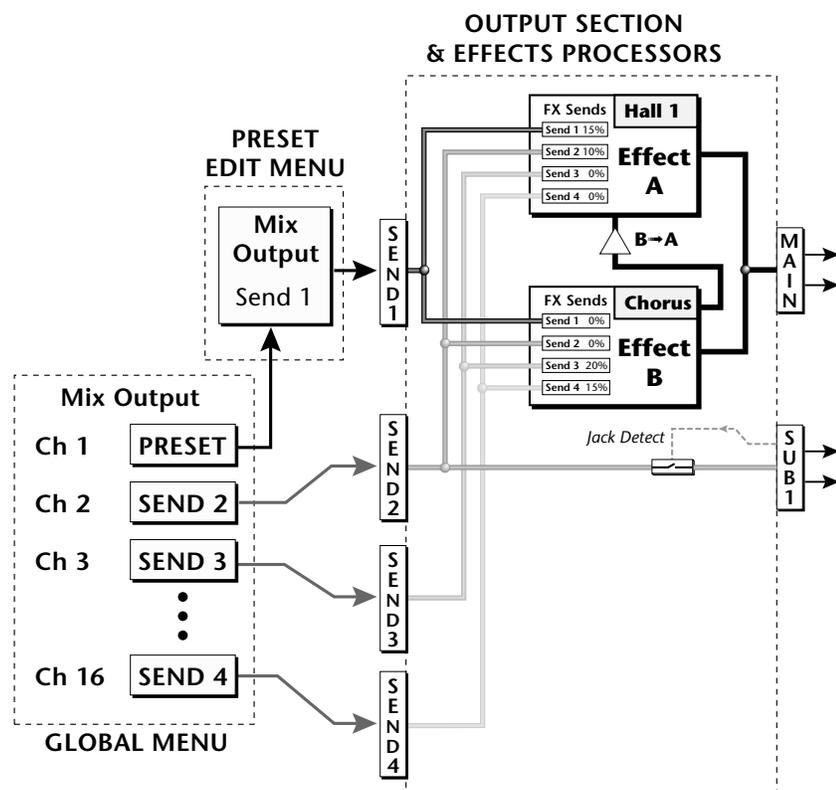
Individual layers or entire MIDI channels can be routed to any of the four busses.

The four Effect Sends allow you to get the most out of the two effect processors. For example, with Effect B set to an echo algorithm, you could route one MIDI channel to Send 3 and set the effect amount to 80%. Another MIDI channel could be routed to Send 4 with an effect amount of only 5%.

The Mix Output function is also useful when sequencing since it lets you route specific MIDI channels to specific Sub outputs (on the back panel) where there they can be processed with EQ or other outboard effects.

Effect Types

A Effect Types
Room 1-3
Hall 1 & 2
Plate
Delay
Panning Delay
Multitap 1
Multitap Pan
3 Tap
3 Tap Pan
Soft Room
Warm Room
Perfect Room
Tiled Room
Hard Plate
Warm Hall
Spacious Hall
Bright Hall
Bright Hall Pan
Bright Plate
BBall Court
Gymnasium
Cavern
Concert 9
Concert 10 Pan
Reverse Gate
Gate 2
Gate Pan
Concert 11

Medium Concert
Large Concert
Large Concert Pan
Canyon
DelayVerb 1-3
DelayVerb 4-5 Pan
DelayVerb 6-9

B Effect Types
Chorus 1-5
Doubling
Slapback
Flange 1-7
Big Chorus
Symphonic
Ensemble
Delay
Delay Stereo
Delay Stereo 2
Panning Delay
Delay Chorus
Pan Delay Chorus 1 & 2
Dual Tap 1/3
Dual Tap 1/4
Vibrato
Distortion 1 & 2
Distorted Flange
Distorted Chorus
Distorted Double

Effect Parameters

"A" Effect types contain Reverb and Delay effects. "B" Effect types contain Chorus, Flange and Distortion effects. There are 44 "A" effects and 32 "B" effects. In addition to the effect type, there are user adjustable parameters for each effect. The "A" effects have programmable Decay and High Frequency Damping. The "B" effects have user programmable Feedback, LFO Rate, and Delay Time.

Decay
The Decay parameter is used when setting "A" type effects. Decay sets the length of time it takes an effect to fade out. When setting up reverb effects, Decay controls the room size and the reflectivity of the room. For larger room sizes and greater reflectivity, set the Decay value higher. When setting up delay effects, the Decay parameter controls how many echoes are produced or how long the echoes last. The greater the value, the more echoes and longer lengths of time.

The Decay value range is from 0 through 90.

High Frequency Damping
The HF Damping parameter is used when setting "A" type effects. High Frequency energy tends to fade away first as a sound is dissipated in a room. the HF Damping parameter adjusts the amount of damping applied to the signal's high frequency elements which, in turn, changes the characteristics of the room. Rooms with smooth, hard surfaces are more reflective and have less high frequency damping. Rooms filled with sound absorbing materials, such as curtains or people, have more high frequency damping.

The value range for High Frequency Damping is from 0 through 127.

Feedback
The Feedback parameter is used when setting "B" type effects. The Chorus and Flange effects have a controllable feedback loop after the delay element. Feeding back a small amount of the signal intensifies the effect by creating multiple cancellations or images. Higher feedback values increase the amount of the Feedback loop.

The Feedback value range is from 0 to 127.

LFO Rate
The LFO Rate parameter is used when setting "B" type effects. Both Chorus and Flange effects use a Low Frequency Oscillator (LFO) to animate the effect. LFO applied to a chorus effect creates the slight changes necessary for a realistic choral effect. Applied to a flanger effect, the LFO moves the comb filter notches and adds animation to the sound.

The LFO Rate value range is from 0 to 127.

Delay
Flanging, chorus and echoes are all based on a delay line where the signal is delayed by some time period and then mixed back with the unaltered signal. This parameter specifies the how much time passes before you hear the delayed signal. On some effects, this value cannot be changed. In this case, the field contains a dash.

The Delay value range is from 0ms to 635ms.

Effects Programmed in the Preset

Effects are normally programmed as part of the preset allowing you to have a different effect for each. This section describes how to program and modify Halo's preset effects.

▶ **To Program the Effects as Part of the Preset:**

1. Press the Preset Edit button. The LED illuminates and the Preset Edit screen appears.

2. Use the data entry control to select the FXA Algorithm screen.

```
FXA ALGORITHM
 Lg Concert Pan
```

3. Select an Effect. Do not select the "Master Effect" setting or the global effects set up in the Global menu will be used instead of the Preset Effect settings.

4. Use the data entry control to select the FXA parameter screen.

```
FXA    DECAY    HFDAMP    FxB>FxA
         90       127        127
```

The FxB -> FxA parameter lets you route the B effect through the A effect. See "Effect B Into Effect A" on page 182.

5. Set the other effect parameters to your preference. Refer to the information in the last section for detailed descriptions of these parameters.

6. Use the data entry control to select the FXB Algorithm screen.

```
FXB ALGORITHM
 Distorted Flange
```

7. Select an Effect. Do not select the "Master Effect" setting or the global effects set up in the Global menu will be used instead of the Preset Effect settings.

8. Use the data entry control to select the FXB parameter screen.

```
┌─────────────────────────────────────────┐
│  FXB    FEEDBK    LFORATE     DELAY      │
│           127        127      635ms      │
└─────────────────────────────────────────┘
```

9. Set the other effect parameters to your preference. Refer to the information in the last section for detailed descriptions of these parameters.

10. Save the preset. The programmed effects setting will be saved along with the preset.

Master Effects

When playing single presets, the effects are normally programmed as part of the preset. In Multimode the Master effects are used, since there are only two effect processors to serve 16 MIDI channels.

You might also want the effects to be programmed on a global basis when in Omni or Poly modes. You could choose your favorite reverb, for example, and have it applied to any preset you select.

▶ **To Program the Master Effects**

1. Press the Global menu button. The LED illuminates and the Global screen appears.

2. Use the data entry control to select the FXA Algorithm screen.

```
┌─────────────────────────────────────────┐
│  FXA ALGORITHM                           │
│  Lg Concert Pan                          │
└─────────────────────────────────────────┘
```

3. Select an Effect.

4. Use the data entry control to select the FXA parameter screen.

```
┌─────────────────────────────────────────┐
│  FXA    DECAY     HFDAMP     FxB>FxA     │
│           90        127        127       │
└─────────────────────────────────────────┘
```

The FxB -> FxA parameter lets you route the B effect through the A effect. See "Effect B Into Effect A" on page 182.

5. Set the other effect parameters to your preference. Refer to the information in the last section for detailed descriptions of these parameters.

6. Use the data entry control to select the FXB Algorithm screen.

```
FXB ALGORITHM
Distorted Flange
```

7. Select an Effect.

8. Use the data entry control to select the FXB parameter screen.

```
FXB     FEEDBK   LFORATE    DELAY
          127       127     145ms
```

9. Set the other effect parameters to your preference. Refer to the information in the last section for detailed descriptions of these parameters.

10. Press the Preset Edit menu button. The LED illuminates and the Preset Edit menu displays the last screen used.

11. Use the data entry control to access the FXA Algorithm page and select "Master Effect A."

The MIDI mode (MIDI Menu) must be set to Omni or Poly mode in order to select the effects in the preset.

```
FXA ALGORITHM
Master Effect A
```

12. Repeat step 11 for the FXB Algorithm

13. Save the preset. The Master effects routing will be saved along with the preset.

Effects Mode

This control provides a true bypass of the effects engine. Bypass is a useful feature if you are using external effects at the mixing console and want to turn the effects off for all presets.

▶ **To Bypass the Effects:**
1. Press the Global menu button. The LED lights and the last Global parameter screen used is displayed.
2. Use the data entry control to select the Effects Mode screen.

```
FX MODE
enabled
```
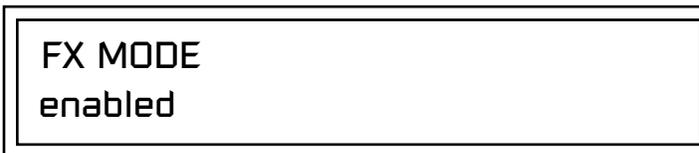
3. Use the cursor button to advance the cursor to the bottom line in the screen.
4. Use the data entry control to change the value.
5. Press the Enter key to save the settings.

The Effects Mode values are "enabled" and "bypassed." Enabling the Effects Mode turns on effects. Selecting "bypassed" turns off the effects.

Flexible Effects Control

The effects processor controls are very flexible. The effects can be controlled in three different ways to suit your personal preference and to adapt to different situations.

When in Omni or Poly mode, effects are normally programmed as part of the preset. In Multi mode, the two effects processors can be controlled using the Master settings or by using the effects settings of a preset on a specific MIDI channel. Effects can be programmed in the following ways:

✎ *You can create special "Effects Presets" which are assigned to the FX Multi mode Control channel, then use standard MIDI Program Change commands to switch effects during sequence playback.*

1. **Programmed as part of the preset when playing single presets (Omni or Poly Modes).**

2. **Programmed from the Master Effects Section when playing either single presets (preset Effect Type set to "Master") or when in Multi Mode.**

3. **Programmed from the designated control preset when in Multi Mode.**

Refer to the following diagram for a look at how effects are programmed.

1 (Omni or Poly Mode) — Effects are part of the Preset

2 (Multi mode) — Master Effects

3 (Multi mode) — Selected FX Control Channel → One Channel's Preset determines the Effect Settings
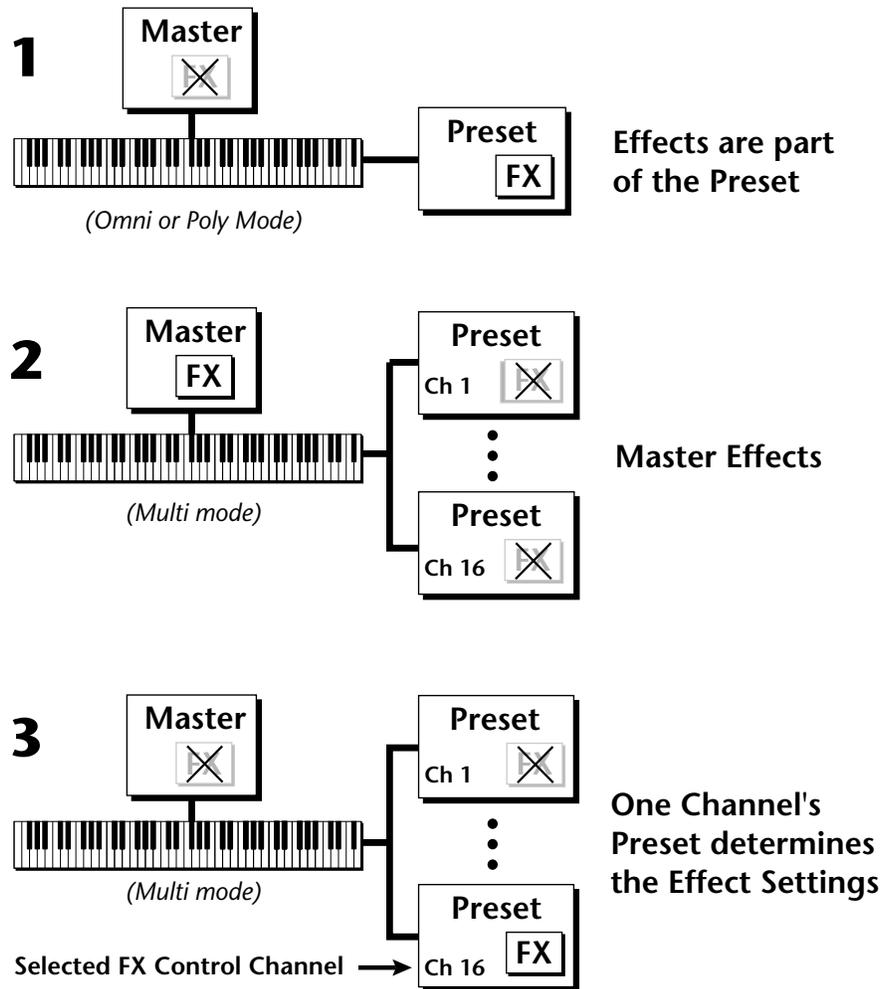
▶ **To Program the Effects Globally for all Presets in Multi Mode:**

1. Press the MIDI menu button. The LED illuminates and the MIDI menu screen appears.

2. Use the data entry control to select the MIDI mode page. Choose "multi" for the mode.

```
MIDI MODE                    CHANGE
multi                      accepted
```
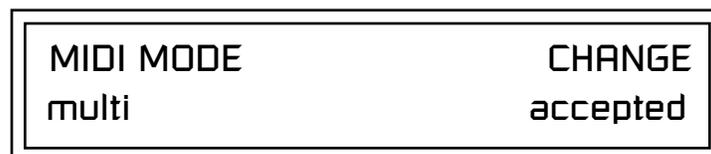
3. Move the cursor to the Multi mode Effects Control page using the data entry control.

```
FX MULTIMODE CONTROL
use master settings
```

4. Set the Effect Control channel to *use master settings* using the data entry control.
5. Press the Enter key to save the settings and return to the main screen.

Using the Effects Channel Settings in Multi Mode
In Multi mode, the two effects processors can be controlled from the Master Effects settings or they can follow the effects settings of the preset on a special MIDI channel. The effect settings on this special channel will be applied to all the other MIDI channels. This allows the effects to be changed during a sequence simply by changing the preset on a specified MIDI channel.

▶ To Program the Effects by Channel Number in Multi Mode:
1. Press the MIDI menu button. The LED illuminates and the MIDI menu screen appears.
2. Use the data entry control to select the MIDI mode page. Choose "multi" for the mode.
3. Move the cursor to the Multi mode Effects Control field using the data entry control
4. Set the Effect Control to "preset on Channel #" (where # is replaced by the actual channel number from 1 through 16) using the data entry control.
5. Press Enter to save the settings and return to the main screen.

Effect B Into Effect A

The output of effects processor B can be routed into effects processor A. This connects the effects in series instead of their normal parallel configuration. Two effects connected in series sound very different than the same two effects in parallel. For example, a chorus patched through reverb can turn a bland string section into a lush wall of sound. The B –>A amount can also be controlled for even more flexibility.

▶ To Send the Output of Effect B through Effect A:
In this example, 100% of Effect B will be sent into Effect A.

1. Access the FXA parameter screen (in either the Global or Preset Edit menus) that contains the FXB –>FXA parameter.

```
┌─────────────────────────────────────────────┐
│  FXA   DECAY    HFDAMP    FxB>FxA              │
│          127       127        127             │
└─────────────────────────────────────────────┘
```

2. Set this amount to 127. Press the cursor button to return the cursor to the top line in the display.

3. Use the data entry control to select the FXA submix routing parameter screen.

```
┌─────────────────────────────────────────────┐
│  FXA  SEND AMOUNTS         1: 10%             │
│  2: 20%        3: 30%        4: 40%           │
└─────────────────────────────────────────────┘
```

4. Press the cursor buttons to advance the cursor to the Main field.

5. Set the Main send amount to any amount other than zero.

6. Press the cursor button again to return the cursor to the FXA title. Use the data entry control to advance to the FXB Algorithm page.

7. Select an effect.

8. Advance to the FXB submix routing page and set the Main FXB send percentage to zero.

9. Play the keyboard and you should hear the B Effect running through Effect A. This patch is shown below.

Main Send
50% → **Effect B** → **B➠A** *100%* → Main Send *0%* ✕ → **Effect A** →
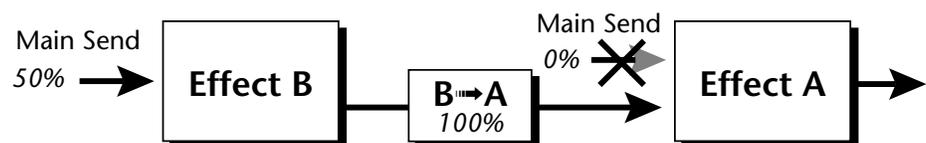
General Effect Descriptions

Reverb

Reverberation is a simulation of a natural space such as a room or hall. The reverb algorithms in Halo simulate various halls, rooms and reverberation plates. In addition, there are several other reverb effects such as Gated Reverbs, Multi Tap (early reflections), Delay and Panning effects. There are two adjustable parameters on the reverb effects - Decay Time and High Frequency Damping.

Decay time defines the time it takes for the reflected sound from the room to decay or die away. The diagram below shows a generalized reverberation envelope.
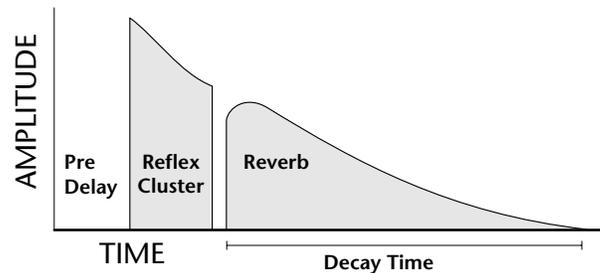
After an initial pre-delay period, the echoes from the closest walls or ceiling are heard. These first echoes, or the early reflection cluster, vary greatly depending on the type of room. Roughly 20 milliseconds after the early reflection cluster, the actual reverberation begins and decays according to the time set by the Decay Time parameter.

High frequency energy tends to fade away first as a sound is dissipated in a room. The High Frequency Damping parameter allows you adjust the amount of high frequency damping and thus change the characteristics of the room. Rooms with smooth, hard surfaces are more reflective and have less high frequency damping. Rooms filled with sound absorbing materials such as curtains or people have more high frequency damping.

General Descriptions of the Reverb Types

Room: Programs simulate small rooms with high frequency absorption caused by drapes and furniture.

Plates: Simulates plate type reverbs with their tight, dense, early reflections and sharp reverb buildup.

Hall: Presets recreate the open, spacious ambience of large concert halls.

Gated Reverbs: Add ambience only while the original signal is still sounding. As soon as the signal falls below a threshold, reverb is cut off.

Delay: Programs can be used to create echo and doubling effects.

Multi Tap: Programs consist of the reflection cluster only without the reverb decay.

Chorus

The function of a chorus device is to thicken the sound or to make one voice sound like many. This effect is usually created by mixing one or more delayed versions of the signal with the original. The delay times used are too short to be perceived as an echo, but long enough so that comb filtering does not occur. In addition, the delay time is varied via a low frequency oscillator to simulate the random differences which occur when multiple instruments are playing together. A slight amount of feedback improves the effect by creating multiple images of the sound as it recirculates again and again.

All the choruses are true stereo using two separate delay lines controlled by a single set of controls. The delay times are slightly different for each channel and the LFO phase is inverted on one channel to help contribute to the overall chorus effect. The LFO Rate and Depth settings are critical to achieving a realistic effect, with faster LFO rates generally requiring less LFO amount and vice-versa.

Doubling

When a copy of a sound delayed by about 26 milliseconds is added back to the original, two audio images are perceived by your brain. When the delayed image is slightly varied or modulated, the illusion of two voices is created.

Slapback

Slapback is a single short echo in the range of 50-60 milliseconds. A sound delayed by this length of time is perceived as a discrete and separate image which is useful for a thickening effect or as a pre-delay for reverb simulating a hard, reflective surface such a gymnasium wall.

Stereo Flanger

A flanger consists of a short audio delay line whose output is mixed together with the original signal. Mixing the delayed and original signals results in multiple frequency cancellations called a comb filter. Since the flanger is a type of filter, it works best with harmonically rich sounds.
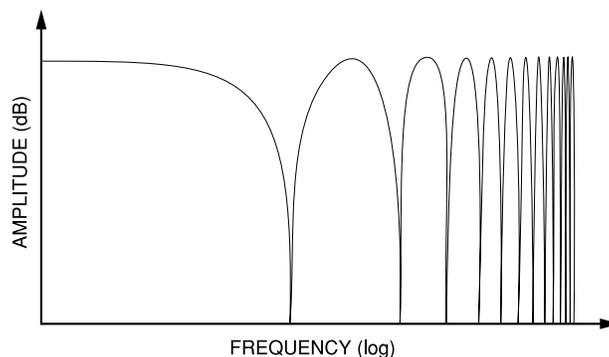
This is the frequency response of a Comb Filter.

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

The Halo flanger is a stereo device consisting of two separate delay lines controlled by a single set of controls. A Low Frequency Oscillator (LFO) varies this initial delay setting, changing the frequency of the notches and adding animation to the sound. LFO Rate controls the rate of change and LFO Depth controls how much the LFO changes the delay.

The Feedback control sends some of the delayed signal through the delay line again. When feedback is used the comb filter notches are deepened.

Delay

Delay is an effect which can be used for doubling, reverb pre-delay, or echoes.

Delay Time is variable from 0-635 mS and controls the time between echoes. Feedback and determines how long the echoes continue sounding. "Infinite" delay effects are also possible without the risk of runaway.

Stereo Delay

Similar to delay except that the delay line outputs a stereo signal from the mono input. The two output signals are a few milliseconds apart to create a stereo image. The delay times are variable from 0-635 mS.

Panning Delay

A panning delay is similar to the normal delay lines except that the echoes bounce back and forth between the two stereo speakers.

Dual Tap

These are delay lines where the signal is "tapped off" at two unevenly spaced locations. When feedback is used, multiple complex echoes are produced. The fraction in some of the algorithm names (i.e. 1/3, 1/4) refers to the time ratio between the taps.

Vibrato

Basically, this a delay line modulated by an LFO, but with none of the original signal added in. The LFO modulation creates a Doppler shift and a resultant cyclical pitch shift. The vibrato created in this manner sounds very different than vibrato created by frequency modulating the sample.

Distortion

Distortion uses a technique called "soft-clipping" to create additional harmonics in the signal. As the level increases, the top of the waveform becomes somewhat squared. As the level increases further, it transforms into a true square wave.

Soft clipping gradually squares the edges of the waveform as the amplitude is increased.

Save/Copy Menu

The Save/Copy button is used to save changes to a preset, copy data between presets, randomize presets and to move other types of data. The menu is context-sensitive and will start at the appropriate save screen. If multiple items need to be saved, then the screens have the following priority: pattern, song, preset. Use the data entry control to navigate to other pages that support copying information.

Saving a Preset

Any time you make a change to a preset, either using the Preset Edit menu or by changing the Controller Knobs in Quick Edit mode, you must save the preset in order for the change to become permanent. When you save a preset it erases any existing preset information in that location. Make sure that the destination location does not contain preset information you want to keep.

```
SAVE PRESET  to           User
020¹ Destination Preset
```

▶ **To Save a Preset:**
1. Press the **Save/Copy** menu button.
2. **Move the cursor** to the bottom line on the display.
3. **Select** the new preset location using the data entry control.
4. Press the **Home/Enter** button.

Copying Information

The Copy operations let you copy information from any preset or layer to any other preset or layer. To use the copy command, first select the preset or layer to which you want to copy (the destination location). Then, from the copy screen, select the preset or layer you want to copy to the currently selected location (the source location). Using the copy commands you can copy preset, layer, PatchCord and arpeggiator information.

Copy Preset

The Copy Preset command lets you copy all of the preset information from one location into the preset of the current location. The preset information in the source location (the preset location from which you want to copy) is not deleted from the original location, just copied to the destination location.

```
COPY PRESET from        HALO
009³  pad: Dreamer
```

✎ *All the Sound Navigator features work when using the Copy functions.*

▶ **To Copy a Preset:**

1. **Select the Preset** you want to copy information *into*.
2. Press the **Save/Copy** menu button.
3. Select **"Copy Preset from"** using the data entry control.
4. **Select the preset** you want to copy using the data entry control. The ROM Bank, Preset Number, Bank Number, Category and Preset Name fields are all selectable.
5. Press the **Home/Enter** button.
6. A warning appears asking you to confirm once more. Press the **Home/Enter** button to copy the selected preset into the current location.

Copy Layer

The Copy Layer command lets you copy any layer information from one preset into any layer of the current preset location. The layer information in the source location (the layer location from which you want to copy) is not deleted from the original location, just copied to the destination location.

```
COPY LAYER    User    L1 -> L4
020¹ Source Preset
```

▶ **To Copy a Layer:**

1. **Select the Preset and Layer** you want to copy information *into*.
2. Press the **Save/Copy** menu button.
3. Move the cursor to the bottom line on the display.
4. **Select the preset location** using the data entry control, of the preset containing the information you want to copy into the current preset.
5. Move the cursor to the top line in the display.
6. **Select the layer** of the source preset in the first field on the right.
7. **Select the destination layer** in the second field.
8. Press the **Home/Ent**er button.

Copy PatchCords

The Copy Patch Cord command lets you copy the PatchCord settings from one layer of the preset location into the current layer of the current preset location. The preset information in the source location (the preset location from which you want to copy) is not deleted from the original location, just copied to the destination location.

```
COPY CORDS    User     L1 -> L4
020¹ Source Preset
```

▶ **To Copy a PatchCord:**

1. **Select the Preset and Layer** you want to copy information *into*.
2. Press the **Save/Copy** menu button.
3. Move the cursor to the bottom line on the display.
4. **Select the preset location** using the data entry control, of the preset containing the information you want to copy into the current preset.
5. Move the cursor to the top line in the display.
6. **Select the layer** of the source preset in the first field on the right.
7. Select the **destination layer** in the second field.
8. Press the **Home/Enter** button.

Copy Preset PatchCords

The Copy Preset PatchCord command lets you copy the preset patchcord settings from one preset location into the current preset location. The preset information in the source location (the preset location from which you want to copy) is not deleted from the original location, just copied to the destination location.

```
COPY PRESET CORDS          User
020¹ Source Preset
```
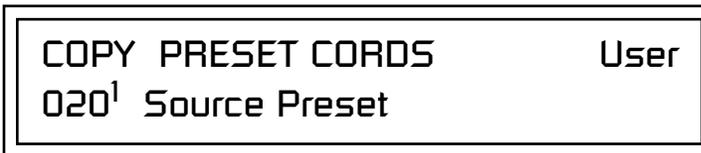
▶ **To Copy a Preset PatchCord:**

1. **Select the Prese**t you want to copy information *into*.
2. Press the **Save/Cop**y menu button.
3. Move the cursor to the bottom line on the display.
4. **Select the prese**t containing the information you want to copy.
5. Press the **Home/Enter** button.

Copy Arpeggiator Settings

This function lets you copy the Arpeggiator settings from any ROM or RAM preset location into the current RAM (User) preset.

▶ **To Copy the Arpeggiator Settings:**

1. From the Main display, **select the User Preset** you want to copy the Arp setting *into*.
2. Press the **Save/Copy** menu button.
3. Move the cursor to any of the fields on the bottom line on the display.
4. Use the data entry control to **select the preset** you want to copy *from*.
5. Press **Enter** when you have made your selection. *The Enter LED is flashing indicating that Halo is waiting for your response.*
6. The Arp Settings are copied into the current preset.

Copy Arpeggiator Pattern

This function lets you copy the Arpeggiator pattern from any ROM or RAM preset to any RAM (user) pattern.

```
COPY  ARP  PAT  from    HALO
96¹ TRANCED
```

▶ **To Copy the Arpeggiator Pattern:**

1. Press the **Save/Copy** menu button.
2. Move the cursor to any of the fields on the bottom line on the display.
3. Use the data entry control to **select the preset** you want to copy *from*.
4. Press **Enter** when you have made your selection.

```
Overwrite  pattern:
00⁰ No  Control
```

5. Press **Enter**. The Arp Pattern is copied into the selected User Pattern.

Copy Preset Bank

The Copy Preset Bank command lets you copy an entire bank from any ROM or RAM bank location to any RAM (user) bank. This function can be especially useful after installing a new sound SIMM.
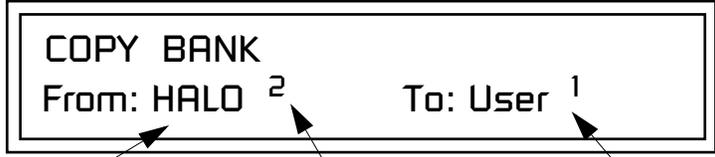
```
COPY  BANK
From: HALO  ²    To: User  ¹
```

ROM or RAM Preset Location　　　　*Bank No.*　　　　*Destination Bank No.*

▶ **To Copy a Preset Bank:**

1. Press the **Save/Copy** menu button.
2. Move the cursor to the **"From"** field on the bottom line on the display.
3. Use the data entry control to **select the preset bank** you want to copy *from*.
4. Move the cursor to the **"To"** field on the bottom line on the display.
5. Use the data entry control to **select the User preset** bank you want to copy *into*.
6. Press the **Home/Enter** button to overwrite the bank.

Sound Authoring

Copy User Bank to Flash

This is a special purpose function to be used with the Flash sound authoring feature. Flash Sound SIMMs created on an EOS Ultra sampler can be used as a custom Halo bank. Presets are then created in a User bank. When the bank of presets is finished, it can be copied, using this function, to the Flash SIMM. Flash SIMMs contain two separate memory locations. One of these memories contains the sound samples and the other memory can hold four banks of 128 presets.

For instructions on how to remove and replace ROM SIMMs, please see "Installing Sound SIMMs" on page 232.

The four sound SIMM sockets in Halo are marked 0-3. **The destination Flash SIMM must be placed in SIMM socket 1.**

```
COPY USER BANK TO FLASH
From: User⁰        To: Flash²
```

▶ To Copy a User Bank to Flash:

1. Make sure a Flash SIMM is inserted into the extra Halo SIMM socket.
2. Press the **Save/Copy** menu button.
3. Rotate the data entry control to select the **"Copy User Bank"** function shown above.
4. Move the cursor to the **"From"** field and select the User bank that you want to copy to the Flash SIMM.
5. Move the cursor to the **"To"** field and select the Flash bank that you want to contain the User bank.
6. Press **Enter**. The Enter LED will flash and the screen below appears.

```
Press  ENTER  to  Overwrite
Flash  SIMM  Presets
```

7. Press **Enter** again to confirm. The following screen appears:

```
COPYING USER BANK TO FLASH
Done. Please Reboot Now.
```

8. The Flash presets cannot be used until Halo is rebooted (power off then on). **Reboot** the Halo and verify that the new Flash bank has been properly copied.

👓 *If there is no Flash SIMM in the unit, the error message, "Requires Flash SIMM" will be displayed.*

Rename Flash SIMM

This utility allows you to rename the Flash SIMM and change its ID number. Flash SIMMs can have any five letter name you choose. Each Flash SIMM in a Halo unit must have a unique ID number (106-119).

The field in the upper right corner selects between multiple Flash SIMMs. If only one Flash SIMM is installed, the field cannot be modified.

The Flash ID is the MSB of the MIDI Bank Select command used to select the Sound Bank.

```
RENAME FLASH SIMM        Flash
New Name: Drums          ID: 110
```

If there is no Flash SIMM in the unit, the error message, "Requires Flash SIMM" will be displayed.

1. Make sure a Flash SIMM is inserted in a Halo SIMM socket.
2. Press the **Save/Copy** menu button.
3. Rotate the data entry control to select the "Rename Flash SIMM" function shown above.
4. Move the cursor to the **"New Name"** field and rename the SIMM using the data entry control to select the letter and the cursor keys to select the position.
5. **Set the Sound ID number** for the SIMM. It doesn't matter which number you choose as long as the same number isn't used in another SIMM.
6. Press **Enter**. The following screen appears and the Enter LED will be flashing.

```
Press  ENTER  to  Update
Flash  SIMM  data
```

7. Press **Enter** again to confirm or any other button to abort. The following screen appears:

```
CHANGING  SIMM  NAME  &  ID
(takes  about  2  minutes)
```

8. The Flash presets cannot be used until Halo is rebooted (power off then on). **Reboot** the Halo and verify that the new Flash bank has been properly renamed.

Duplicate Flash

This utility allows you to duplicate Flash SIMMs using Halo. Both Sound and Preset data is copied when a Flash SIMM is duplicated. A factory sound SIMM cannot be copied using this utility.

The SIMM sockets are marked 0, 1, 2, 3. The Flash SIMM you want to copy MUST be placed into SIMM Socket 0. The destination Flash SIMM must be placed in SIMM socket 1. See "Installing Sound SIMMs" on page 232.

```
┌─────────────────────────────────────┐
│  DUPLICATE  SLOT  0  FLASH          │
│  Start                              │
└─────────────────────────────────────┘
```

1. Make sure the two Flash SIMM are located in the required SIMM sockets.
2. Press the **Save/Copy** menu button.
3. Rotate the data entry control to select the **"Duplicate Flash SIMM"** screen shown above.
4. **Move the cursor** to the bottom line and press **Enter**. The following screen appears and the Enter LED will be flashing.

👀 *If there are no Flash SIMMs in the unit, or if the SIMMs are in the wrong slots, an error message will be displayed.*

```
┌─────────────────────────────────────┐
│  Press   ENTER   to overwrite       │
│  the  Flash  SIMM  in  Slot 1       │
└─────────────────────────────────────┘
```

5. Press **Enter** again to confirm or any other button to abort. The following screen appears and the SIMM is copied.

```
┌─────────────────────────────────────┐
│  DUPLICATING  SLOT 0  ->  SLOT 1    │
│  (Takes about 5  minutes)           │
└─────────────────────────────────────┘
```

6. When Halo has finished duplicating the SIMM, turn power off, remove the copied SIMM, then **reboot**. That's it!

Create Random Preset

This is a great feature which creates a new preset using portions of the ROM presets as source material. By merging random presets, really great sounding presets can be generated with ease. Use this feature to generate wild new sounds, get new programming ideas or just for fun.

```
RANDOMIZE  PRESET          User
000⁰ Any User Preset
```

Examine interesting presets to learn how they work using the Edit menu.

▶ **To Create a Random Preset:**

1. Press the **Save/Copy** menu button.
2. Move the cursor to the bottom line on the display and press **Enter**.
3. A new random preset will be created.
4. Don't like the sound? Press **Enter** again and a new random sound will be generated.

Preset Programming

There is so much you can do with the Halo it would be impossible to describe it all. This chapter is will give you a few ideas for programming your own custom sounds and contains step-by-step instructions to help you get started. In order to get the most from this chapter, we recommend you actually try each example.

Editing Presets

One of the easiest ways to make a new preset is to edit an existing preset. This is also an excellent way of becoming familiar with Halo. If you don't like what you hear, simply select a new preset, then Halo reverts to the original sound. Changes are not permanent until you Save them (see "Saving a Preset" on page 187).

Let's experiment and modify a few parameters of an existing preset. We'll start with functions that have an obvious effect on the sound: Instrument Select, Tuning, and Chorus.

Changing the Instrument

Changing the instrument is the easiest and most dramatic way to modify an existing preset.

▶ **To Change the Instrument for the Current Layer:**

1. Choose any cool preset, then press the **Preset Edit** button.

2. Press the **#1 Jump button** twice to jump directly to the Instrument page. *See "Preset Menu Jump Keys" on page 36.*

*The **Preset Edit Jump Buttons** are located in the "Command Functions" section of the front panel.*

```
L1  INSTRUMENT          ROM:HALO
0185  syn: Pad Synth
```

3. Move the **cursor** down to the bottom line (using a Cursor button).

4. Use the **Channel** button to turn select the various layers. Use the **data entry control** to turn **OFF** all layers except **L1**. This allows you to hear the different instruments by themselves.

5. **Play the keyboard** as you scroll through the various instruments.

▶ **To Change the Instrument for any Layer in the Preset:**

6. Use the **Channel Select** buttons to select another layer.

```
 L2  INSTRUMENT        ROM:HALO
0078  str:Pizz Strings
```

7. Find another instrument that sounds good when combined with the previous instrument selected.

8. Repeat steps 6 and 7 if you want to add additional layers (although two layers will be enough for these experiments).

Now let's play with the tuning.

Changing the Tuning of an Instrument

Tuning the selected layer of the preset changes the pitch of the key on the controller. If the numbers are "00," it means that the instruments are tuned to concert pitch (A=440 Hz). The Coarse tuning value represents whole semitone intervals. The Fine tuning value shifts the pitch in 1/64 semitones (or 1.56 cents).

▶ **To Tune the Instrument of the Current Layer:**

1. Press the **#3 Jump button** twice to jump directly to **Tuning** page.

```
 L1  TUNING
    Coarse:  +36        Fine:   +6
```
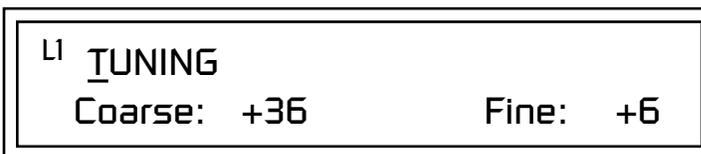
2. Move the cursor to the **Coarse** field (using the cursor button).

3. **Set the value to +12** to shift the pitch up a whole octave. To shift the pitch in smaller units than a semitone, **use the Fine field**.

Try tuning one of the instruments to a perfect fifth above the other by setting the Coarse value to +7.

Tuning an instrument far out of its normal range completely changes the character of the sound. For example, if you tune a bass guitar up 2 octaves, it's going to sound rather petite. On the other hand, if you tune it down 2 octaves, you can probably rattle plaster off the walls! Experiment with radical pitch shifting. You'll be surprised at the results.

Chorus

This is an easy one. Chorus works by doubling the instruments and detuning them slightly. The larger the chorus value, the more detuning occurs. The Width parameter controls the stereo spread. A Width value of 0% reduces the chorus to mono, a value of 100% provides the most stereo separation. Chorus is useful when you want to "fatten up" a part quickly and easily.

👀 *WARNING: Since it works by doubling the instruments, Chorusing halves the number of notes you can play on Halo.*

▶ **To Chorus a Layer:**

1. Press the **#5 Jump button** to jump directly to the Chorus page.
2. Use the **cursor buttons** to advance the cursor to the Chorus field (the first field in the bottom line of the display). Use the **data entry control** to turn on chorus.

```
 L1  CHORUS              WIDTH
     off                 100%
```
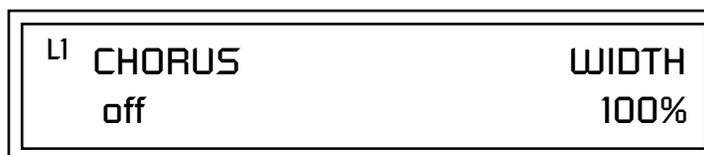
3. **Select a Width value** based on the amount of detuning you want. Smaller numbers mean less detuning, larger ones more.

You can select various amounts of chorusing for each of the instruments, just play around with the Chorus and Width parameter until you like what you hear.

Volume Envelope

Every sound you hear, whether it's a piano note, a drum, or a bell, has a characteristic volume curve or envelope. This Volume Envelope shapes the volume of the sound which grows louder or softer in various ways during the course of the sound. The volume envelope of a sound is one of the clues our brain uses to determine what type of sound is being produced.

An envelope shapes the sound or volume of the sound over time. The envelope generators in Halo all have six stages to the contour: Attack 1, Attack 2, Decay 1, Decay 2, Release 1 and Release 2. When you press a key on the keyboard, the envelope goes through each of the first four stages, advancing to the next stage when the defined Level for each is reached. As long as you continue to hold the key down, the envelope continues through the first four stages holding at the end of the Decay 2 level until the key is released. When you release the key, the envelope jumps to the Release stages (no matter where the envelope is when you release the key) ending at the Release 2 level.
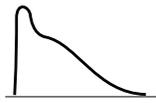
Piano

Organ

Strings
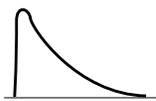
Percussion
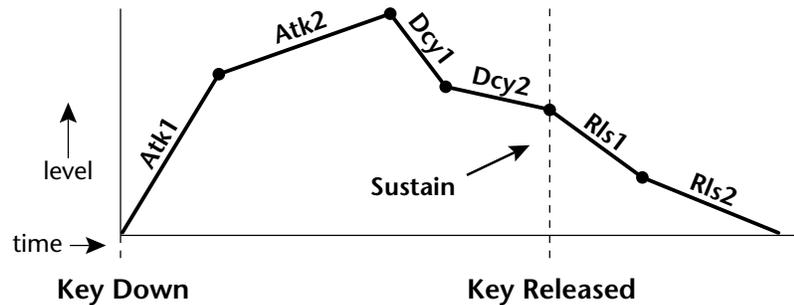
Every instrument in Halo has it's own predetermined volume envelope which is used when the Volume Envelope parameter is set to "factory." By setting the Volume Envelope to "time-based" or "tempo-based," we can reshape the instrument's natural volume envelope any way we want. By reshaping the volume envelope of a instrument, you can dramatically change the way the sound is perceived. For example, you can make "bowed" pianos or backward gongs. The diagrams to the left show the characteristic volume envelopes of a few common sounds.

In preparation for this experiment choose almost any of the standard organ presets which sustain as long as the key is held down. Go to the Instrument page and set it to "None" on all layers except Layer 1. Now you're ready to play with the Volume Envelope.

▶ **Adjusting the Volume Envelope (the easy way):**
Many sounds don't require a complex six-segment envelope. Over the years, a simpler Attack-Decay-Sustain-Release envelope, or ADSR, have become standard. The front panel controller knobs on Halo have been preprogrammed to adjust these four volume envelope parameters. A diagram of this standard ADSR envelope is shown below.
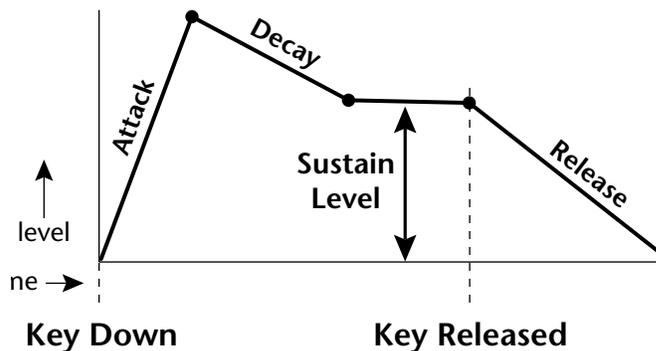
1. Front panel knobs E-H are routed to the volume envelope parameters. This is the easiest way to change the volume envelope settings.

2. Press the front panel Controller button E-H to select: Amp Attack, Amp Decay, Amp Sustain, Amp Release.

3. Increase the Amp Attack knob and play a note. The attack controls the time it takes for the sound to reach the Attack level when a key is pressed and held.

4. Increase the Amp Release knob. Note the effect as you release the key. The Release stages controls the time it takes for the sound to die away when a note is released.

5. Try out the Sustain & Release knobs. The Sustain knob control the volume LEVEL after the Decay phase has finished and while the key continues to be held. As soon as you release the key, the Release phase begins.

▶ **To Create a Complex Volume Envelope:**

1. Go to the **Volume Envelope** mode screen, by pressing the "Amp" jump button twice, and set the Volume Envelope mode to "time-based."

```
L1  VOLUME ENVELOPE
Mode:  time-based
```

2. Now move on to the next screen to set the Volume Envelope parameters.

Front panel knobs 5-8 are routed to the volume envelope parameters and thus affect the settings. You may want to disconnect the PatchCords to gain total control of the envelope parameters. (Alternately, you can create a completely blank preset and start from there.)

```
L1  VOL ENV      TIME        LEVEL
Attack 1          50         100%
```
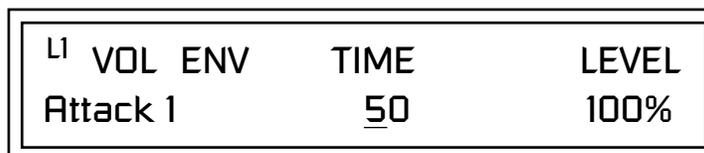
3. Increase the Attack 1 time value and play a note. The attack controls the time it takes for the sound to reach the Attack level when a key is pressed and held.

4. Move the cursor to the first field in the bottom line and use the cursor buttons to advance to the Release pages.

5. Increase the Release 1 and 2 times. Note the effect as you release the key on the controller. The Release stages controls the time it takes for the sound to die away when a note is released.

▶ **To Setup the Volume Envelope as an ADSR:**
The classic synthesizer ADSR (Attack-Decay-Sustain-Release) envelope is easy to create using the Halo six segment envelope generators. The trick is to only use segments: Attack1, Decay2, and Release1.

1. Set Atk1, Atk2 & Dcy1 levels to 100.

2. Set Rls1 & Rls2 levels to 0.

3. Set Atk2, Dcy1 and Rls2 rates to 0.

4. Program the Atk1, Dcy2 and Rls1 segments as you wish. Decay 2 level is your Sustain level.
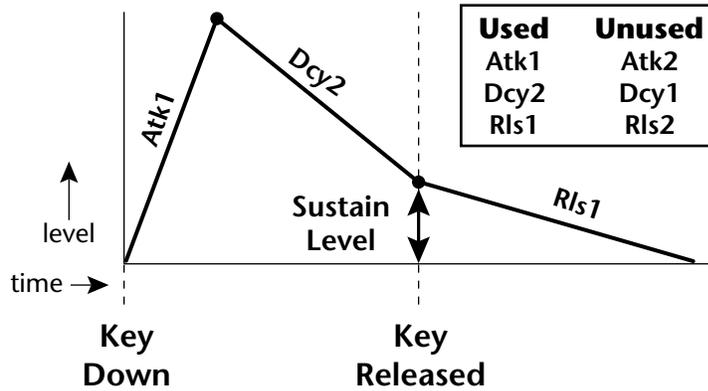
Working with Filters

The filters make it possible to remove certain components of the sound. A low pass filter removes the high frequency components or put another way, it "lets the low frequencies pass." A high-pass filter removes the low frequency components from the sound letting only the high frequencies pass. See "Halo Filter Types" on page 148 for a complete list of Halo's filters and their descriptions.

In preparation for the next tutorial, set up the Halo with a single instrument layer on Layer 1.

1. Go to the Instrument screen (Preset Edit menu) and select **Instrument #140 - wav:Sawtooth 1**. This is a harmonically rich sound. Since filters work by removing or accentuating certain frequencies, we want to make sure that we have a lot of frequencies to start with.

1. Advance to the Filter Type screen using the data entry control. Select the **Classic 4th order filter**.

```
L1  FILTER        Ord      Type
    Classic        4       LPF
```

✎ *Front panel knobs A & B are routed to the filter parameters and will affect the initial settings made here.*

1. The Filter Frequency and Q (resonance) are preprogrammed to the front panel controller knobs A & B. This is the easiest way to change the volume envelope settings.

2. Press the front panel **Controller button A-D** to select controls A-D

The Frequency parameter determines the filter cutoff frequency or the frequency the filter uses as the highest frequency allowed to pass. If you play the keyboard now, you should hear the raw sound. Slowly decrease the filter cutoff frequency value as you play the keyboard. The sound

gets more and more dull as you remove more and more high frequencies from the sound. At some point, the sound completely disappears. (You have filtered out everything.) The chart on the following page illustrates what you just did.
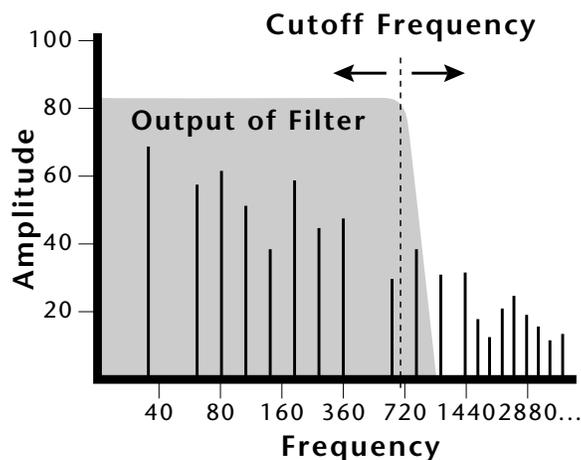
3. Turn the filter back up to full, then **adjust the Q**.

4. Set the Q about halfway up, then adjust the **Cutoff** as you play the keyboard. As you change the Cutoff, notice that the sound now has a sharp, nasal quality. A high Q boosts or amplifies the frequencies at the cutoff frequency (Fc).

Adding the Filter Envelope

Now let's modulate the Filter Frequency with the Filter Envelope. The Filter Envelope is a device that can automatically change the filter frequency during the course of the note. Before we define the Filter Envelope, we need to patch the Filter Envelope to the Filter Frequency.

▶ **To Setup the Filter Envelope:**

1. Go to the **PatchCord** screen by pressing the **Cords** Jump Key.

```
ᴸ¹ PATCHCORD                 #03
FiltEnv+   ->   FiltFreq      +100
```

2. Move the **cursor** to **PatchCord #3**. This patchcord is preprogrammed to connect the Filter Envelope to Filter Cutoff Frequency.

3. Move the **cursor** to the last field in the lower line. This is the **Amount** field. The Amount field determines the amount of modulation applied. Set this value to **+100**.

```
L1  PATCHCORD                    #01
FiltEnv+    ->    FiltFreq       +100
```

This setup connects the Filter Envelope Generator to the Filter Cutoff as shown in the following diagram.
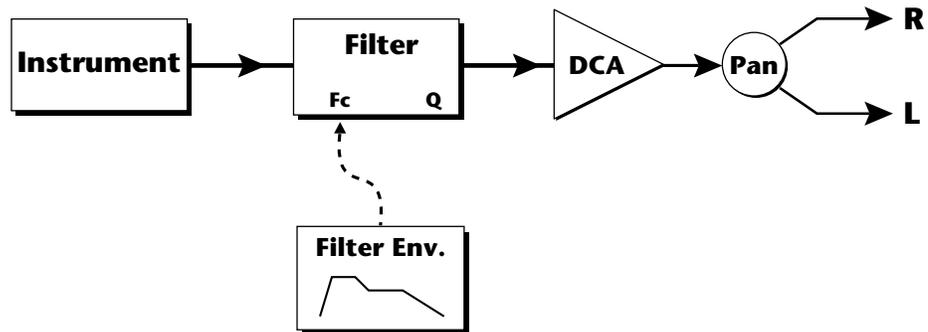
4. On the front panel knob controllers, choose controls **A-D**.

5. Adjust **Filter Attack** and **Filter Release** knobs and note their effect on the sound.

6. Now, return to the **Filter Envelope Mode** screen. Set the Mode to "time-based."

```
L1  FILTER ENVELOPE
Mode:   time-based
```

7. Advance to the **Filter Envelope** parameter page.

```
L1  FILT ENV       RATE          LEVEL
Attack1            50            100%
```

8. Move the cursor underneath the **time field** and change the value to about +50. Now when you press a key the filter slowly sweeps up.

```
Ll FILT ENV        RATE           LEVEL
Attack1            50             +88%
```

9. Change the **attack rate** and note the change in the sound.
10. Set the envelope parameters as shown in the following table.

Envelope Phase	Time	Level %
Attack 1	40	65
Attack 2	65	100
Decay 1	80	85
Decay 2	25	50
Release 1	97	20
Release 2	73	0

With the above setup, the filter sweeps up, then Decays back down to the Decay 2 Level until you release the key. Then it sweeps down at the Release rates. Play with the envelope parameters for awhile to get a feel for their function. (If you're having trouble understanding the Envelope Generators, please refer to the Programming Basics section in this manual.)

Changing Filter Types

Go back to the Filter Type screen shown below and move the cursor down the lower line of the display. Change the filter type while playing the keyboard. There are 50 different filter types.

```
Ll FILTER           Ord    Type
Aah-Ay-Eeh          6      VOW
```

These filters are extremely powerful and have been carefully crafted to offer maximum flexibility and musical control. You may want to change the Envelope (PatchCord) Amount, Q and/or the Filter Frequency to get the right sound for each filter and instrument. These three controls, coupled with the Filter Envelope, are perhaps the most important controls on any synthesizer. Take the time to learn how they interact with each other and you will be able to create sounds beyond imagination.

Envelope Repeat

The Envelope Generator can also be made to repeat. When the envelope repeat function is On, the Attack (1&2) and Decay (1&2) stages will continue to repeat as long as the key is held.

▶ **To Make the Filter Envelope Repeat:**

1. Go to the Filter Envelope **Mode** screen shown below.

2. Move the **cursor** to the Mode field.

```
 L1 FILTER  ENVELOPE
Mode:      time-based
```

3. Turn the **data entry control** clockwise. The Mode field will change to Repeat as shown below.

```
 L1 FILTER  ENVELOPE
Repeat: on
```

4. Move the **cursor** to the on/off field and turn **Envelope Repeat On**.

5. **Play a key** on the keyboard. You should now hear the envelope repeating.

6. Go back to the envelope parameter page and **adjust the Attack 1&2**, and Decay 1&2 parameters. The repeating envelope cycles through these four stages as long as the key is held.

Practice Modulating

• Try modulating the pitch with the Filter Envelope generator.

• Use Velocity to modulate the Filter Envelope PatchCord or the Filter Frequency. This brightens the sound as you play harder.

• Program the LFO to modulate Filter Frequency and Volume (Patch-Cord screen).

• Modulate the LFO with the other LFO, with Velocity, and with the Pitch Wheel.

• Examine the Factory presets to learn how they're constructed. There are lots of cool synthesis tricks you can use in your own presets.

• We've programmed the front panel knobs our way, but since they're completely programmable there's no reason why you can't create your own custom controls.

• Think of ten exotic modulation routings, then try them out. Experimentation is the key to learning how to control Halo.

Troubleshooting

A common source of confusion when working with the filter envelope is that the Attack or Release parameters might not seem to be working correctly. If you are not getting the expected result, try to analyze the situation. There will be many times when you will have to stop for a minute and think, "What am I trying to do and why isn't it working?" When this happens (and it will), don't panic. Troubleshooting is a normal part of the synthesis process. Simply examine the various parameters and try to be as analytical as possible as you solve the problem. The solution is usually simple. ("The filter is already wide open and can't open any more." or "Another PatchCord is connecting something to the parameter and affecting it.") Learning to play any instrument takes a little patience and practice.

Referring to the diagram below which shows the Halo signal flow, notice that the DCA comes after the Filter. The DCA controls the final volume of the sound, so if the filter's release is longer than the release for the DCA, you won't hear it, because the DCA has already shut off the sound.
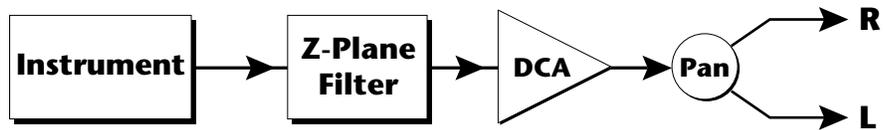
You're getting the general idea by now. Remember not to select a new preset before saving the current one or all your changes will be lost (the preset reverts to the last saved version). If you want to save your creation, select the Save/Copy menu and select a destination preset location for your masterpiece, then press Enter.

Because you can save your work, it's worth spending time to get the sound just right. When designing sounds you become an instrument builder as well as a musician. With Halo you can design the custom radical instruments you've always wanted!

Linking Presets

Using the Link pages in the Edit menu is a quick and easy way to create new sounds. Use the Links to "layer" presets and to "split" a keyboard into sections containing different sounds.

▶ **To Layer Two Presets:**

1. Select the first preset you want to layer.
2. Press the **Preset Edit** button.
3. Go to the **Link** screen by pressing the **Links** Jump Key.

See "Preset Links" on page 170 for more information.

```
LINK 1   PRESET          HALO
off
```

4. Move the cursor to the second line of the display. Select the preset you want to link with the preset you selected in step 1. Play the keyboard as you scroll through the various presets to hear the results.
5. If you want the link to be a permanent part of the preset, be sure to save the preset. Otherwise, simply change the preset to erase your work.

▶ **To Create a Split Keyboard Using Links:**

1. Follow steps 1 through 4 above.
2. Press **Enter** and use the **Jump Key** to advance to the next page.

```
LINK 1          KEY        VEL
RANGE    C-2  B4      000 127
```
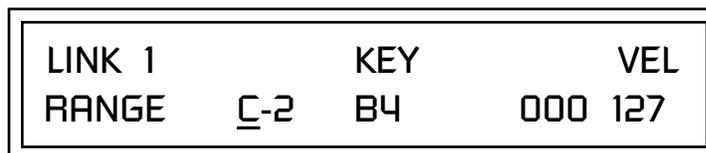
3. Set the keyboard range of the linked preset as desired.
4. Press **Enter** and use the **data entry control** to go to the Key Range page using the **Ranges** jump key.

```
L1 KEY:LO   FADE   HIGH   FADE
            C5    000     G8    000
```
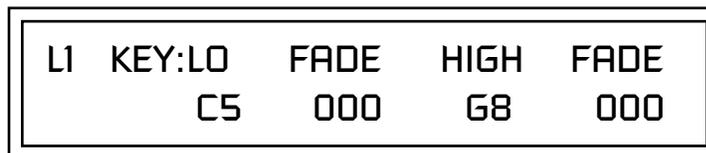
5. Set the range of the original preset so it fills the remaining keyboard area. **Save the preset.**

Appendix

This section provides some of the more technical information about Halo. In this appendix, you will find information about velocity curves, MIDI commands and PatchCord charts.

Front Panel Knob Functions

The front panel knob functions are standardized for most of the factory presets. The typical functions of the controller knobs are described below. Match the controller knobs on an external MIDI controller to the Realtime Controller Assignments in the Controllers menu if you want to externally control these functions.
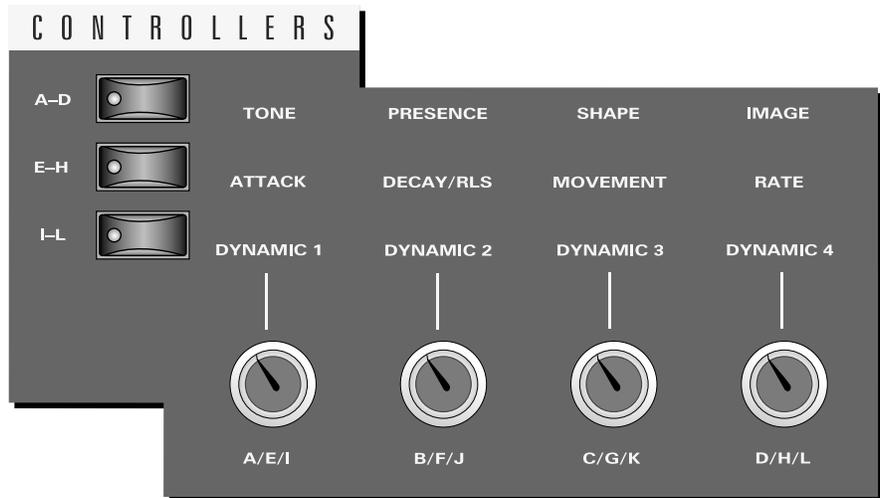
Knob Controller Descriptions

Tone .... Filter Frequency

Presence.................... Filter Resonance

Shape .... Volume or Filter Envelope Attack

Image .... Pitch/Glide/Chorus Amt/Layer Volume

Attack........................ Volume or Filter Envelope Attack

Decay/Release............ Vol./Filt. Envelope Release and/or Decay

Movement.................. LFO -> Dynamic Movement (i.e. panning)

Rate .... LFO Rate

Dynamic 1 .... Typically Velocity -> Amplifier Volume

Dynamic 2 .... Typically Velocity -> Filter Frequency

FX A........................... Effects Processor A Amount

FX B........................... Effects Processor B Amount

✎ *The Front Panel Knobs can be reprogrammed for each preset and stored in any of the User Presets. The functions shown here are the factory programmed settings.*

Presets

Preset Categories

The presets are organized in categories according to the types of sound. Listed below are the categories and their three letter prefixes:

arp: Arpeggiated	**brs**: Brass Instrument
bpm: Synchro-sonic, rythmic	**bs1**: Bass 1, Acoustic Bass
bs2: Bass 2, Bass Guitar	**bs3**: Bass 3, Synth Bass
bts: Beats presets	**gtr**: Guitar
kb1: Keyboard 1, Piano	**kb2**: Keyboard 2, Electric Piano
kb3: Keyboard 3, Organ	**jam**: Press Audition & play along
key: Keyboard instrument, organ	**kit**: Drum Kit
	led: Lead Instrument
orc: Orchestral Instrument	**pad**: Sustained, full
prc: Percussion	**sfx**: Sound Effects
str: String, Violin, Cello, etc.	**syn**: Synthesizer
vox: Vocal Sound	**wnd**: Wind Instrument

Jam Presets

Jam presets are very similar to **bts:** presets, but are designed for you to jam along playing the keyboard part. Simply select a **jam:** preset and press the Audition button. Select the **Triggers** command function and press the sixteen trigger buttons to turn the accompaniment parts on and off. Please note that not all the buttons are assigned on jam: presets.

Preset Listing

User Bank 0, Halo Bank 4

0. jam:Grand Piano
1. jam:Jammin EP
2. jam:LA Keys
3. jam:Piano Split
4. jam:Big B
5. jam:Gospel Split
6. jam:Wurli Split
7. jam:Salsa Piano
8. jam:Dream Scape
9. jam:Vocal Moog
10. jam:All Drums
11. jam:Chase String
12. jam:Leader
13. jam:Trans Oh
14. bts:The Standard
15. bts:That's Right
16. bts:Fall Brushes
17. bts:Kranked
18. bts:Golden Boy
19. bts:Ya Baby
20. kb1:PerfectPno12
21. kb1:Piano Tine
22. kb1:Piano String
23. kb2:Tine Love 2
24. kb1:Latin Octave
25. kb3:Rock Organ 3
26. kb3:Green O
27. str:Full Strings
28. bs2:Deep Fret
29. bs2:P-B Slap
30. bs2:Picked Delay
31. brs:Bone+Tpt 3
32. brs:The Tower
33. syn:Chatter
34. syn:Red Planet
35. bpm:Voices Pad
36. cmb:Tenor/Tpt.
37. kit:Standard 2
38. kit:Studio Kit-E
39. kit:CountryKit-E
40. cmb:Key/Bass 1
41. cmb:Key/Bass 2
42. cmb:Key/Bass 3

43. cmb:Key/Bass 4
44. cmb:Key/Bass 5
45. cmb:Key/Bass 6
46. cmb:Key/Bass 7
47. cmb:Key/Bass 8
48. cmb:Key/Bass 9
49. cmb:Key/Bass 10
50. bts:Dynamic
51. bts:Smooth
52. bts:Ellie
53. bts:Mr. Clean
54. bts:Sunrise
55. bts:Chill'n
56. bts:Beating Halo
57. bts:Mission X
58. bts:Fastbuck
59. bts:Feel It
60. bts:Gospel Soul
61. bts:Big Rock
62. bts:Sailing
63. bts:Euro Fantasy
64. bts:On The Bay
65. bts:Wangadang
66. bts:Prettw B-3
67. bts:Latin Dreams
68. bts:Hip Twang
69. bts:Cortez
70. bts:Dropping In
71. bts:Agogo
72. bts:Club Swing
73. bts:Slider
74. bts:Platinum
75. bts:Jazz Man
76. bts:Bangin
77. bts:Drums/Bass 1
78. bts:Drums/Bass 2
79. bts:Drums/Bass 3
80. arp:System Down
81. arp:B-Movie
82. arp:Do the Do
83. arp:Landing
84. arp:Choppy Arp

85. arp:Night Life
86. arp:Techno Ride
87. arp:Spiral
88. arp:Ice Palace
89. arp:Ravorotic
90. arp:Mystic Falls
91. arp:Worldy
92. arp:Free Ride
93. arp:Out There
94. arp:One World
95. arp:Gentle Bell
96. arp:Razor Guitar
97. arp:BB Hit
98. arp:Magical
99. arp:Classical
100. arp:Box Maker
101. arp:Kick'n Room
102. arp:In The Air
103. arp:Harp Delay
104. arp:Breath
105. arp:Up/Down Pno
106. arp:303 Groove
107. arp:Warning
108. arp:Deeper
109. arp:Muted Wish
110. arp:Sunday
111. arp:Bouncy Tenor
112. arp:Classic Arp
113. arp:Flange Kit
114. arp:Tribal-T
115. bpm:Falling
116. bpm:Soft Decay
117. bpm:Moving Sync
118. bpm:Cutter
119. bpm:Cluster
120. bpm:Smack Jam
121. bpm:Boogy Vox
122. bpm:Bounce Haus
123. bpm:Waver
124. bpm:She Pad
125. bpm:Sonar
126. bpm:Deep Blue
127. bpm:The End

Preset Listing

User Bank 1, Halo Bank 0

0. kb1:PerfectPno 1	43. kb3:Pop Organ 12	86. bs2:P-Bass Slap
1. kb1:PerfectPno 2	44. kb3:Pop Organ 13	87. bs2:PickdFretles
2. kb1:PerfectPno 3	45. kb3:Pop Organ 14	88. bs2:Picked Bass1
3. kb1:PerfectPno 4	46. kb3:Pop Organ 15	89. bs2:Picked Bass2
4. kb1:PerfectPno 5	47. kb3:Pop Organ 16	90. bs2:Switch Bass
5. kb1:PerfectPno 6	48. kb3:Pop Organ 17	91. bs2:Switch Pop 1
6. kb1:PerfectPno 7	49. kb3:Pop Organ 18	92. bs2:Switch Pop 2
7. kb1:PerfectPno 8	50. kb3:Pop Organ 19	93. bs3:303 Bass
8. kb1:PerfectPno 9	51. kb3:Pop Organ 20	94. bs3:Big Bottom
9. kb1:PerfectPno10	52. kb3:Pop Organ 21	95. bs3:Dance Bass
10. kb1:PerfectPno11	53. kb3:Pop Organ 22	96. bs3:Fat Bottom
11. kb1:PerfPno+EP 1	54. kb3:Pop Organ 23	97. bs3:GreasySynBs
12. kb1:PerfPno+EP 2	55. kb3:Pop Organ 24	98. bs3:Rap Bass
13. kb1:PerfPno+EP 3	56. kb3:Pop Organ 25	99. bs3:Smack Bass
14. kb1:PerfPno+Str1	57. kb3:CathedralOrg	100. bs5:Harmonix Fun
15. kb1:PerfPno+Str2	58. kb3:Stately Org	101. bs3:Rapper
16. kb1:PerfPno+Str3	59. kb3:Organ Hall	102. brs:Bone+Tpt 1
17. kb1:Bright Grand	60. kb3:Full Pipes	103. brs:Bone+Tpt 2
18. kb1:ConcertGrand	61. kb3:Recital	104. brs:Flugelhorn
19. kb1:Dark Piano	62. kb3:With Pedals	105. brs:Fr.Horn Sect
20. kb1:Jazzy Grand	63. kb3:Reed Stops	106. brs:Muted Tpt
21. kb1:Grand Room	64. kb3:Chapel	107. brs:Solo Fr.Horn
22. kb1:Warm Piano	65. kb3:Processional	108. brs:Solo Trumpet
23. kb2:Tine Love	66. kb3:Soft Pipes	109. brs:Stereo Brass
24. kb1:Latin Octave	67. kb3:Flute Stops	110. brs:Trombone
25. kb2:Wurli	68. kb3:Chime Organ	111. brs:SectionHorns
26. kb4:Classic EP	69. kb3:Deep Pedals	112. brs:3 Horns #1
27. kb4:ElecPno+Str1	70. kb1:Harpsichord	113. brs:3 Horns #2
28. kb4:ElecPno+Str2	71. orc:Harp	114. wav:Rez Lead
29. kb4:ElecPno+Str3	72. orc:New Age Harp	115. wav:Rez Q
30. kb4:ElecPno+Vox	73. str:Warm Strings	116. syn:Formant Sync
31. kb4:Hybrid EP 1	74. str:Digi Section	117. led:Chatty Lead
32. kb3:Pop Organ 01	75. str:Pizz Strings	118. sfx:Tape Rewind
33. kb3:Pop Organ 02	76. bs1:Upright Bass	119. sfx:Vinyl Noise
34. kb3:Pop Organ 03	77. bs1:Guitarron	120. pad:Swept Voices
35. kb3:Pop Organ 04	78. bs1:Fretless 1	121. syn:Big Bell
36. kb3:Pop Organ 05	79. bs2:Bs Harmonix1	122. syn:Coffee
37. kb3:Pop Organ 06	80. bs2:Bs Harmonix2	123. pad:Formant Pad
38. kb3:Pop Organ 07	81. bs2:Finger Bass	124. vox:Cascades
39. kb3:Pop Organ 08	82. bs2:Fretless 2	125. syn:Lush Str-Whl
40. kb3:Pop Organ 09	83. bs2:Muted Bass1	126. syn:Sparkles
41. kb3:Pop Organ 10	84. bs2:Muted Bass2	127. syn:Step Bells
42. kb3:Pop Organ 11	85. bs2:P-Bass	

Preset Listing

User Bank 2, Halo Bank 1

0. kb1:Piano 1-GM	43. str:ContraBs-GM	86. syn:5ths Wave-GM
1. kb1:Piano 2-GM	44. str:Trem Str-GM	87. syn:Bs & Lead-GM
2. kb1:Piano 3-GM	45. str:Pizz Str-GM	88. syn:Fantasia-GM
3. kb1:HonkyTonk-GM	46. orc:Harp-GM	89. syn:Warm Pad-GM
4. kb2:ElPiano 1-GM	47. orc:Tympani-GM	90. syn:Poly Syn-GM
5. kb2:ElPiano 2-GM	48. str:Strings-GM	91. syn:Space Vox-GM
6. kb4:Harpsichr-GM	49. str:SlowStrng-GM	92. syn:BowedGlas-GM
7. kb4:Clavinet-GM	50. str:SynStrng1-GM	93. syn:Metal Pad-GM
8. orc:Celeste-GM	51. str:SynStrng2	94. syn:Halo Pad-GM
9. orc:Glocken-GM	52. vox:ChoirAah-GM	95. syn:Sweep Pad-GM
10. kb4:Music Box-GM	53. vox:Vox Oohs-GM	96. syn:Ice Rain-GM
11. orc:Vibraphone-G	54. vox:Syn Vox-GM	97. syn:SoundTrackGM
12. orc:Marimba-GM	55. orc:Orch Hit-GM	98. syn:Crystal-GM
13. orc:Xylophone-GM	56. brs:Trumpet-GM	99. syn:AtmosphereGM
14. orc:TubularBl-GM	57. brs:Trombone-GM	100. syn:Briteness-GM
15. gtr:Santur-GM	58. brs:Tuba-GM	101. syn:Goblin-GM
16. kb3:Organ 1-GM	59. brs:MutedTrpt-GM	102. syn:Echo Drop-GM
17. kb3:Organ 2-GM	60. brs:FrenchHrn-GM	103. syn:StarTheme-GM
18. kb3:Organ 3-GM	61. brs:Brass 1-GM	104. 104..gtr:Sitar-GM
19. kb3:ChurchOrg-GM	62. brs:SynBrass1-GM	105. gtr:Banjo-GM
20. kb3:ReedOrgan-GM	63. brs:SynBrass2-GM	106. gtr:Shamisen-GM
21. wnd:Accordion-GM	64. wnd:Sopr Sax-GM	107. gtr:Koto-GM
22. wnd:Harmonica-GM	65. wnd:Alto Sax-GM	108. prc:Kalimba-GM
23. wnd:Bandoneon-GM	66. wnd:Tenor Sax-GM	109. wnd:Bagpipes-GM
24. gtr:Nylon Gtr-GM	67. wnd:Bari Sax-GM	110. str:Fiddle-GM
25. gtr:Steel Gtr-GM	68. wnd:Oboe-GM	111. wnd:Shannai-GM
26. gtr:Jazz Gtr-GM	69. wnd:Eng. Horn-GM	112. syn:TinkleBellGM
27. gtr:Clean Gtr-GM	70. wnd:Bassoon-GM	113. prc:Agogo-GM
28. gtr:Muted Gtr-GM	71. wnd:Clarinet-GM	114. prc:SteelDrum-GM
29. gtr:Overdrive-GM	72. wnd:Piccolo-GM	115. prc:Woodblock-GM
30. gtr:Distorted-GM	73. wnd:Flute-GM	116. prc:Taiko-GM
31. gtr:Harmonix-GM	74. wnd:Recorder-GM	117. prc:MellowTom-GM
32. bs1:Ac Bass-GM	75. wnd:Pan Flute-GM	118. prc:SynthDrum-GM
33. bs2:Finger Bs-GM	76. wnd:BottleBlowGM	119. prd:RevCymbal-GM
34. bs2:PickBass-GM	77. wnd:ShakuhachiGM	120. gtr:FretNoise-GM
35. bs2:FretlsBs-GM	78. wnd:Whistle-GM	121. wnd:BreathNse-GM
36. bs2:SlapBass1-GM	79. wnd:Ocarina-GM	122. sfx:Seashore-GM
37. bs2:SlapBass2-GM	80. syn:Square Wv-GM	123. sfx:Birdsong-GM
38. bs3:SynBass 1-GM	81. syn:Saw Wave-GM	124. sfx:Telephone-GM
39. bs3:SynBass 2-GM	82. syn:SynCaliopeGM	125. sfx:HelicopterGM
40. str:Violin-GM	83. wnd:ChiffLead-GM	126. sfx:Applause-GM
41. str:Viola-GM	84. str:Charang-GM	127. sfx:Gunshot-GM
42. str:Cello-GM	85. vox:Solo Vox-GM	

Preset Listing

User Bank 3, Halo Bank 2

0. syn:Bella
1. syn:CascadeBell
2. syn:Chimey
3. kb1:Tack Grand
4. kb2:Rock Wurli
5. syn:DelayBells 1
6. syn:DelayBells 2
7. syn:Drone One
8. syn:Echo Stabber
9. syn:Frozen Wind
10. syn:Harpily
11. led:Lucky
12. pad:Marscape
13. syn:Milky Way
14. syn:Mr.Square
15. syn:Nebula
16. pad:Pop Stab Pad
17. pad:Pulsation
18. syn:RandmPanBell
19. syn:SFZ SynBrass
20. syn:SimpleBell 1
21. syn:Sitarred
22. syn:Slow Bells 1
23. syn:Sneezy
24. pad:Sweep Time
25. syn:Swept Voxes
26. syn:SynBrass 1
27. syn:Sync Man 1
28. syn:Tempo Stab 1
29. syn:Tempo Stab 2
30. syn:TempoFilter1
31. pad:Timed Env
32. syn:Vaporous
33. syn:Vint.Filter1
34. syn:Arpy
35. led:Loose Lead
36. pad:Wash
37. syn:WaWaWaWaaa
38. pad:WindyStrings
39. vox:Air Song
40. vox:DreamChoir
41. vox:E I E I O
42. vox:Ether

43. vox:Lush Love
44. vox:Monk's Song
45. bs1:Fat Upright
46. bs2:Ana-Fingers1
47. bs2:Ana-Fingers2
48. bs2:HybridAcBass
49. bs2:Picked Bass3
50. bs2:Q Bass1
51. bs3:Dull Thud
52. bs3:MonoMan
53. bs3:Snap Bass
54. bs3:Squarely
55. bs3:Techno Bs 1
56. bs3:Techno Bs 2
57. bs3:Tight Bs 1
58. bs3:Tri-Angled
59. bs3:Vel Bass 1
60. bs4:1/16 Bass
61. bs4:Moogy 1
62. bs4:Rez FM Bs 1
63. bs4:Swept FM Bs1
64. bs5:Fat Dance 1
65. bs5:Modern FM
66. bs5:Old Time
67. bs5:Splatt 1
68. bs5:Veloci-Wow
69. bs5:Beoww
70. gtr:12 String
71. gtr:Coral
72. gtr:Electric 12
73. gtr:Ethereal 12
74. gtr:Rock 5ths
75. gtr:SpaghettiGtr
76. gtr:Steel String
77. gtr:Wakka 1
78. gtr:Wakka 2
79. gtr:Wheel Wah
80. kb1:Moms Old Pno
81. kb2:Clacky Tines
82. kb2:E.Pno Pan 1
83. kb2:El.& Ac.EP1
84. kb4:Afrika
85. kb4:Clav, Eh!

86. kb4:FM Clav
87. kb4:FM Wurly
88. kb4:Lucy 2000
89. kb4:New EP Pad
90. led:Analog 1
91. led:Rezzy
92. str:Clouds
93. pad:Soft & Slow
94. str:Swept String
95. wav:Simple Sqr
96. wnd:Bluesy Harm.
97. wnd:ChrHarmonica
98. wnd:Pan Flute 1
99. wnd:Recorder 1
100. pad:Lush Sawz
101. brs:Hybrid Horn1
102. brs:Jazzy Tpt.
103. gtr:Funk Muted
104. gtr:R&B Mute Gtr
105. vox:Gregorian
106. syn:Rich Bells 1
107. kb2:Vintage Clav
108. kb2:Rez-o-Clav
109. kb2:FM Klav
110. kb2:Synth Clav
111. wav:Simple Bass
112. pad:Now & Later
113. syn:Choppy Stab
114. bs3:FatDarkMono
115. wnd:BreathyTenor
116. wnd:Breathy Alto
117. wnd:Breathy Sop.
118. wnd:Solo Bassoon
119. wnd:Solo Oboe
120. syn:Dance Stab 1
121. syn:Dance Stab 2
122. bs3:FatBoy Mono
123. syn:RepeatOctave
124. wnd:Alto + Tenor
125. syn:ReznantVowel
126. syn:SquareTooth
127. syn:BlatzdString

Preset Listing

Halo Bank 3

0. kit:Live
1. kit:Standard
2. kit:Agressive
3. kit:Slam Dance
4. kit:Big Room
5. kit:Vanilla
6. kit:Machine
7. kit:808 Toys
8. kit:Dance Techno
9. kit:Kranked
10. kit:Nice & Plain
11. kit:Jazzz Brush
12. kit:Tight
13. kit:Gated
14. kit:Loop Maker
15. kit:Clean
16. kit:Abrasive
17. kit:Junky
18. kit:Trashy
19. kit:Roomy
20. kit:Electro
21. kit:Low Down
22. kit:Tuned Up
23. kit:Little Toys
24. kit:Slash
25. kit:Wheel Filter
26. kit:Talkin' Set
27. kit:Way High
28. kit:Low Low Low
29. kit:Basic Kit-E
30. kit:Studio Kit-E
31. kit:Pop Kit-E
32. kit:CountryKit-E
33. kit:Dance Kit-E
34. kit:Room Kit-E
35. kit:Brush Kit-E
36. kit:Rock Kit-E
37. kit:Slam Kit-E
38. kit:Deep Kit-E
39. kit:Funky Kit-E
40. kit:Grungy Kit-E
41. kit:Thin Kit-E
42. kit:Flange Kit-E

43. kit:EFX Kit-E
44. kit:Whack Kit-E
45. kit:HiPass Kit-E
46. kit:Un-Kit-E
47. prc:Kick Drums 1
48. prc:Kick Drums 2
49. prc:Kick Drums 3
50. prc:Snare Drums1
51. prc:Snare Drums2
52. prc:Brushes
53. prc:Cymbals 1
54. prc:Cymbals 2
55. prc:Crash Cym 1
56. prc:Crash Cym 2
57. prc:Choked Crash
58. prc:China Crash1
59. prc:China Crash2
60. prc:Choked China
61. prc:All Toms
62. prc:Big Toms
63. prc:Live Toms
64. prc:Dry Toms
65. prc:Pure Toms
66. prc:Rock Toms
67. prc:Percussion 1
68. prc:Percussion 2
69. prc:Shakers 1
70. prc:Shakers 2
71. prc:Tambourines
72. prc:Timbales
73. prc:Cowbells
74. prc:Congas
75. prc:Shaker Up-Dn
76. prc:Tamb Up-Down
77. prc:Cabasa Up-Dn
78. prc:Claps
79. prc:Snaps
80. prc:Syn Cabasa
81. prc:Sm TunedGong
82. prc:OrchBassDrum
83. prc:Tympani
84. prc:ShortTympani
85. prc:Toy Percs

86. prc:Toy Percs Lo
87. prc:Rainstick
88. prc:RainstickHit
89. prc:Nut Rattle 1
90. prc:Nut Rattle 2
91. sfx:Frontier
92. sfx:Spinvox
93. sfx:Arctic Winds
94. sfx:Silly Boids
95. prc:Tuned Clave
96. prc:Sleighbell
97. bpm:TempoClaps 1
98. bpm:TempoConga 1
99. bpm:TempoConga 2
100. bpm:TempoConga 3
101. bpm:TempoCowbel1
102. bpm:TempoCowbel2
103. bpm:TempoShaker1
104. bpm:TempoShaker2
105. bpm:TempoShaker3
106. bpm:TempoShaker4
107. bpm:TempoShaker5
108. bpm:TempoTambo 1
109. sfx:Wind on Mars
110. prc:Windchimes
111. hit:Dance Hit 1
112. hit:Dance Hit 2
113. hit:Orch Hit 1
114. hit:Tape Stop!
115. scr:Scratches
116. prc:Gong
117. prc:Jaw Harp
118. sfx:Synth RezZap
119. prc:Cactus Loop
120. prc:Karimbell
121. prc:Log Drums
122. prc:Kalimba
123. prc:Handbells
124. prc:Bowl Gongs
125. sfx:Ghosts
126. sfx:Machinery
127.   :default

Riff Listing

1. KEY-C3
2. KEY-C3 (2 Bars)
3. KEY-C3 (4 Bars)
4. KEY-C4
5. KEY-Cs Up
6. KEY-Cs Up-Down
7. KEY-C Triad
8. KEY-Cm7
9. KEY-Cm9
10. KEY-Cmaj7
11. BAS-2600
12. BAS-3 O Worm
13. BAS-A Ku Stq
14. BAS-ATC 3
15. BAS-BadTube
16. BAS-Brolin's 1st
17. BAS-Distorto-TB
18. BAS-Easy
19. BAS-Finger1
20. BAS-Fingered In
21. BAS-FingerHarms2
22. BAS-Finger Out
23. BAS-Finger&Harms
24. BAS-Four U
25. BAS-Fretless 2
26. BAS-Froggy
27. BAS-Homeboy E
28. BAS-In the Money
29. BAS-Lead Bottom
30. BAS-Metal Heart
31. BAS-Mini More
32. BAS-Mod da Wheel
33. BAS-Mr. Clean
34. BAS-Mutation
35. BAS-Plexy
36. BAS-PuLs A'ting
37. BAS-Q Bass 2
38. BAS-Reverend JB
39. BAS-RoundabouT
40. BAS-SE Micro
41. BAS-Say What
42. BAS-Shift
43. BAS-SignFeld Pop
44. BAS-Simple 3
45. BAS-Slap Me
46. BAS-Slappity
47. BAS-Soft&Hard
48. BAS-Stomper
49. BAS-Sub Core
50. BAS-Sub Pummeled
51. BAS-Sub-Basement
52. BAS-Sugar Freak
53. BAS-The Reason
54. BAS-ThickFretles
55. BAS-Thickley Dub
56. BAS-VeloFretless
57. BAS-WalkinUprite
58. BAS-WalknUprite2
59. BAS-Walky Talk
60. BAS-WalkyTalk2
61. BRS-Alt TptLoops
62. BRS-Barry Bones
63. BRS-Brass&Bari
64. BRS-BreathTBone
65. BRS-Centurions
66. BRS-Don'sTrumpet
67. BRS-Horny
68. BRS-Huge Brass
69. BRS-MelloD'Trmp
70. BRS-Milez
71. BRS-Movie Brass
72. BRS-MutedTrumpet
73. BRS-Soft Trumpet
74. BRS-The Ensemble
75. BRS-Trmpt&Sect
76. GTR-Carlos
77. GTR-Cast Teller
78. GTR-Cast Teller2
79. GTR-Chuckin
80. GTR-Dark Gut
81. GTR-Distorter-X
82. GTR-Distorter-X2
83. GTR-Distorter-X3
84. GTR-Distorter-X4
85. GTR-Dolobroso
86. GTR-Electric 1
87. GTR-Electric 2
88. GTR-ElectricDis
89. GTR-EmmTVCrunch
90. GTR-FallingNylon
91. GTR-FlangnVioWah
92. GTR-FullNylon
93. GTR-GenericClean
94. GTR-Grusty
95. GTR-JangleWah
96. GTR-Jazzed
97. GTR-LA Strata
98. GTR-Looz 12s
99. GTR-MellowElect
100. GTR-Metal Head
101. GTR-Mutant Pick
102. GTR-Mutant Pick2
103. GTR-Mutes
104. GTR-Nrysty12
105. GTR-Nylon
106. GTR-NyloSteel
107. GTR-Nylon Silk
108. GTR-Nylonistic
109. GTR-Spy
110. GTR-Steel
111. GTR-SteelReal
112. GTR-Stolen7
113. GTR-Stolen7Away
114. GTR-WaaKeeGa
115. HIT-Brass Hits 2
116. HIT-Fashion
117. HIT-MasterBlast
118. HIT-Organ Hits 2
119. KBD-And Voice
120. KBD-And Voice2
121. KBD-B3 X-Wheel
122. KBD-B3 X-Wheel 1
123. KBD-Ballad Tine
124. KBD-Bally Yard
125. KBD-Classic EP
126. KBD-Clav 1
127. KBD-Clavinetti 1
128. KBD-Clavinetti 2
129. KBD-Comp Keyz 2
130. KBD-Crystal
131. KBD-DynofunkEP
132. KBD-DynamcGrand

Riff Listing

133. BD-DynoPiano	**176.** KBD-Yo My Dynos	**219.** KIT-Kit 03 c
134. KBD-E Grand	**177.** KIT-424	**220.** KIT-Kit 03 d
135. KBD-EP Roll 2	**178.** KIT-Acoustic 1	**221.** KIT-Kit 03 e
136. KBD-Elecre 2	**179.** KIT-Acoustic 2	**222.** KIT-Kit 03 f
137. KBD-Elecro7CP80	**180.** KIT-BMF	**223.** KIT-Kit 04 a
138. KBD-FM2Classc	**181.** KIT-Bag O Tricks	**224.** KIT-Kit 04 b
139. KBD-Filmscore	**182.** KIT-Berzerker	**225.** KIT-Kit 05 a
140. KBD-GenBalladEP	**183.** KIT-Booster	**226.** KIT-Kit 05 b
141. KBD-Gospel Soul	**184.** KIT-ClassicHouse	**227.** KIT-Kit 06
142. KBD-Grand FM	**185.** KIT-Clean R&B	**228.** KIT-Kit 07 a
143. KBD-Grand Piano2	**186.** KIT-ClubVinyl	**229.** KIT-Kit 07 b
144. KBD-Grande 4	**187.** KIT-CookUsAHit	**230.** KIT-Kit 07 c
145. KBD-GreenEyed	**188.** KIT-CookUsAHit 2	**231.** KIT-Kit 08
146. KBD-Hard Comp 1	**189.** KIT-DerLyBeEmuD	**232.** KIT-Kit 09 a
147. KBD-Hard Comp 5	**190.** KIT-DeepBooty	**233.** KIT-Kit 09 b
148. KBD-Hard Dyno	**191.** KIT-DeepBooty2	**234.** KIT-Kit 09 c
149. KBD-HonTonkeyz	**192.** KIT-DeepBooty3	**235.** KIT-Kit 10
150. KBD-JimmyJazzyB	**193.** KIT-Disengrate	**236.** KIT-Kit 11 a
151. KBD-Klassical	**194.** KIT-Drum 303	**237.** KIT-Kit 11 b
152. KBD-Knockkerz	**195.** KIT-Drum Buzza	**238.** KIT-Kit 11 c
153. KBD-KoolNMelo	**196.** KIT-Drum-Bass 1a	**239.** KIT-Kit 11 d
154. KBD-Lovers FM EP	**197.** KIT-Drum-Bass 1b	**240.** KIT-Kit 12 a
155. KBD-Med Dyno	**198.** KIT-Drum-Bass 2	**241.** KIT-Kit 12 b
156. KBD-Med EP	**199.** KIT-Drum-Bass 3a	**242.** KIT-Kit 12 c
157. KBD-Mellow man	**200.** KIT-Drum-Bass 3b	**243.** KIT-Kit 13 a
158. KBD-Melosoul EP	**201.** KIT-Drum-Bass 4a	**244.** KIT-Kit 13 b
159. KBD-Miami Grand	**202.** KIT-Drum-Bass 4b	**245.** KIT-Kit 14
160. KBD-Organomics X	**203.** KIT-Drum-Bass 5	**246.** KIT-Kit 15 a
161. KBD-PerkyRhodes	**204.** KIT-Drum-Bass 6	**247.** KIT-Kit 15 b
162. KBD-Piano&Strng1	**205.** KIT-Electro	**248.** KIT-Kit 15 c
163. KBD-Pure Fog	**206.** KIT-For Real	**249.** KIT-Kit 16 a
164. KBD-Pure Roll 2	**207.** KIT-For Real 2	**250.** KIT-Kit 16 b
165. KBD-Pure Roll 3	**208.** KIT-Gett..OutPt2	**251.** KIT-Kit 17
166. KBD-Rock'in B	**209.** KIT-GritKitt	**252.** KIT-Kit 18
167. KBD-RollinDreams	**210.** KIT-Hot Swing	**253.** KIT-Kit 19
168. KBD-Stereo Grand	**211.** KIT-Jams	**254.** KIT-Kit 20
169. KBD-StereoGrand2	**212.** KIT-Kit 01 a	**255.** KIT-OnTheTip
170. KBD-StereoGrand3	**213.** KIT-Kit 01 b	**256.** PRC-Progress a
171. KBD-Suitcase EP	**214.** KIT-Kit 02 a	**257.** PRC-Progress b
172. KBD-Supatramp EP	**215.** KIT-Kit 02 b	**258.** KIT-Shag
173. KBD-TechnoUprite	**216.** KIT-Kit 02 c	**259.** KIT-Smackers
174. KBD-WheelSpeed B	**217.** KIT-Kit 03 a	**260.** KIT-SounDfacTory
175. KBD-WideSuitcase	**218.** KIT-Kit 03 b	**261.** KIT-Swing Hop 3

Riff Listing

262. KIT-Swing Hop a	**306.** KIT-Drum-Bass 6	**350.** SYN-ThinTecPulse
263. KIT-Swing Hop b	**307.** KIT-Gett..OutPt2	**351.** SYN-Z&C Leeder
264. KIT-Tribal House	**308.** PRC-Hats 1	**352.** VOX-Ahhs
265. KIT-Werzerker	**309.** PRC-Kalimba	**353.** VOX-Frozen Time
266. LED-Apple Eater	**310.** PRC-Log On	**354.** VOX-Lo-Fi Ether
267. LED-Blue Danube	**311.** PRC-Marimba	**355.** VOX-MauzeWowz
268. LED-Ethereosity	**312.** PRC-Plexitone	**356.** VOX-Mist
269. LED-Freakus	**313.** PRC-Shakers	**357.** VOX-New Age Oohs
270. LED-Post 90's DM	**314.** PRC-SiameseCats	**358.** VOX-Odd Boys
271. LED-Sci-Fi B	**315.** PRC-TV Spy Vibes	**359.** VOX-Pop Oohs
272. LED-Shiner	**316.** KIT-This & That	**360.** VOX-Slo Lunarvox
273. LED-Soft Slip	**317.** PRC-Velo Vibes	**361.** VOX-Spiritworld
274. LED-Worm	**318.** PRC-Village	**362.** VOX-SynthSing
275. LED-Worm Up	**319.** PRC-Xylophone	**363.** VOX-Voxicord
276. LED-Wormwood	**320.** SFX-MetalScience	**364.** WAV-Lowtronics
277. LED-Zimppler	**321.** SFX-Oh No Its	**365.** WAV-M12
278. LED-inBottles	**322.** STR-AbbeyStrngs	**366.** WAV-Metal 2
279. ORC-Combo	**323.** STR-Allin a Pizz	**367.** WAV-vs37
280. ORC-Orchestra	**324.** STR-ArcotremPizz	**368.** WND-A-Sax
281. PAD-Airborn	**325.** STR-Dyna-heim	**369.** WND-Bottle Blow
282. PAD-Ganic	**326.** STR-ExtremeStrng	**370.** WND-Breather
283. PAD-Highway	**327.** STR-Filmscore	**371.** WND-Chamber Orch
284. PAD-Infants	**328.** STR-HindooKurdoo	**372.** WND-Ethnic Reed
285. PAD-Infants2	**329.** STR-Japanman	**373.** WND-Fieldberries
286. PAD-MetalBeats	**330.** STR-Kult E Vatn	**374.** WND-Flute
287. PAD-My Hero	**331.** STR-Pizzicati	**375.** WND-Harmonica
288. PAD-Pad Life	**332.** STR-SitarTalk	**376.** WND-Nuages
289. PAD-Paddy	**333.** STR-Solo Quartet	**377.** WND-Ocarina a
290. PAD-Phat	**334.** STR-Strg + Choir	**378.** WND-Ocarina b
291. PAD-Sophia	**335.** STR-Swoon	**379.** WND-Pan Flute
292. PRC-Acidphone	**336.** STR-Texture	**380.** WND-Pastoral
293. PRC-Claves	**337.** STR-TronStrings	**381.** WND-Real Flute
294. PRC-Congas	**338.** STR-Victrola	**382.** WND-Synth Flute
295. PRC-Cymbals	**339.** SYN-Bender	**383.** WND-Virtuaccord
296. KIT-Drum 303	**340.** SYN-Brazz	**384.** GTR-Electric 2
297. KIT-Drum Buzza	**341.** SYN-Ensemblist	**385.** GTR-ElectricDis
298. KIT-Drum-Bass 1a	**342.** SYN-Euro Wave	**386.** GTR-Nrysty12
299. KIT-Drum-Bass 1b	**343.** SYN-Festival	**387.** GTR-NyloSteel
300. KIT-Drum-Bass 2	**344.** SYN-Hydraine	**388.** BAS-Finger1
301. KIT-Drum-Bass 3a	**345.** SYN-ProfitMargin	**389.** BAS-FingerHarms2
302. KIT-Drum-Bass 3b	**346.** SYN-Silk OBXsaws	**390.** BAS-Fingered In
303. KIT-Drum-Bass 4a	**347.** SYN-Sync Trance	**391.** BAS-Fretless 2
304. KIT-Drum-Bass 4b	**348.** SYN-Syntax On2	**392.** BAS-VeloFretless
305. KIT-Drum-Bass 5	**349.** SYN-Synthall AT	**393.** KIT-Clean R&B

Riff Listing

407.	WND-Oboe	**444.**	ZR-DrumSolo	**481.**	BTS-Jammin EP
408.	WND-Real Flute 2	**445.**	ZR-Easy 1	**482.**	BTS-Jazz Man
409.	BAS-2600	**446.**	ZR-Easy 2	**483.**	BTS-Kranked
410.	BAS-Q Bass 2	**447.**	ZR-Easy 3	**484.**	BTS-LA Keys
411.	KEY-Cs Up-Down	**448.**	ZR-House	**485.**	BTS-Leader
412.	PRC-Congas 2	**449.**	ZR-Jazz	**486.**	BTS-Mission X
413.	KIT-Kit 19 b	**450.**	ZR-Loop 1	**487.**	BTS-Mr. Clean
414.	STR-AllinaPizz 3	**451.**	ZR-Loop 2	**488.**	BTS-On The Bay
415.	WND-Clarinet	**452.**	ZR-Loop 3	**489.**	BTS-Piano Split
416.	GM-5-4 Groove	**453.**	ZR-Loop 4	**490.**	BTS-Platinum
417.	GM-Agressive	**454.**	ZR-Loop 5	**491.**	BTS-Pretty B-3
418.	GM-Brush	**455.**	BTS-Agogo	**492.**	BTS-Sailing
419.	GM-Clean	**456.**	BTS-ALL Drums	**493.**	BTS-Salsa Piano
420.	GM-Kranked	**457.**	BTS-Bangin	**494.**	BTS-Slider
421.	GM-LittleToys	**458.**	BTS-Beating Halo	**495.**	BTS-Smooth
422.	GM-LiveKit	**459.**	BTS-BIG B	**496.**	BTS-Sunrise
423.	GM-Loop 1	**460.**	BTS-Big Rock	**497.**	BTS-That's Right
424.	GM-Loop 2	**461.**	BTS-Chase String	**498.**	BTS-The Standard
425.	GM-LowDown	**462.**	BTS-Chill'n	**499.**	BTS-Trans Oh
426.	GM-Machine	**463.**	BTS-Club Swing	**500.**	BTS-Vocal Moog
427.	GM-Nice Plain	**464.**	BTS-Cortez	**501.**	BTS-Wurli Split
428.	GM-SlamDance	**465.**	BTS-DB One	**502.**	BTS-Ya Baby
429.	GM-Slashed	**466.**	BTS-DB Three	**503.**	BTS-Latin Dreams
430.	GM-Standard Kit	**467.**	BTS-DB Two	**504.**	BTS-Wangadang

Instrument Listing

This section lists the raw instruments in the Halo "HALO1" set. Instruments consist of either multisamples or single samples.

0. None	**41.** org:Organ Wave 1	**82.** brs:Trumpet
1. pno:PerfectPno 1	**42.** org:Organ Wave 2	**83.** brs:Mute Trumpet
2. pno:PerfectPno 2	**43.** org:Rotary Organ	**84.** brs:Trombone
3. pno:PerfectPno 3	**44.** org:Reed Organ	**85.** brs:PopBrassSect
4. pno:PerfectPno 4	**45.** bas:Pick Bass 1	**86.** brs:Flugelhorn
5. pno:PerfectPno 5	**46.** bas:Pick Bass 2	**87.** brs:Fr Horn Sect
6. pno:PerfectPno 6	**47.** bas:Muted Bass	**88.** brs:Solo Fr Horn
7. pno:PerfectPno 7	**48.** bas:Slap Bass	**89.** wnd:Accordion 1
8. pno:PerfectPno 8	**49.** bas:Bs Pop Noise	**90.** wnd:Accordion 2
9. pno:PerfectPno 9	**50.** bas:Bs Harmonics	**91.** wnd:Accordion 3
10. pno:Grand Piano1	**51.** bas:El Bass Tap	**92.** wnd:Clarinet
11. pno:Grand Piano2	**52.** bas:Fretless Bs	**93.** wnd:Alto Sax
12. pno:Grand Piano3	**53.** bas:Finger Bs 1	**94.** wnd:Bassoon
13. pno:Pno HammerUp	**54.** bas:Finger Bs 2	**95.** wnd:Chiff
14. pno:PnoHarpNoise	**55.** bas:Tube Bass	**96.** wnd:Chiff Flute
15. pno:Piano Thud	**56.** bas:FM Bass 1	**97.** wnd:Conch Shell
16. pno:Celeste	**57.** bas:FM Bass 2	**98.** wnd:English Horn
17. pno:Harpsichord	**58.** bas:Analog Bs 1	**99.** wnd:Double Reed
18. epo:FM EPno A	**59.** bas:Analog Bs 2	**100.** wnd:Flute
19. epo:FM EPno B	**60.** bas:Analog Bs 3	**101.** wnd:Harmonica
20. epo:FM EPno C	**61.** bas:Standup Bass	**102.** wnd:Ocarina
21. epo:Wurli Lo Vel	**62.** gtr:Elec Gtr 1	**103.** wnd:Pan Flute
22. epo:Wurli Hi Vel	**63.** gtr:Elec Gtr 2	**104.** wnd:Recorder
23. epo:Tine EPno A	**64.** gtr:Fret Noise	**105.** wnd:Sax Air
24. epo:Tine EPno B	**65.** gtr:Goto	**106.** wnd:Oboe
25. epo:Tine EPno C	**66.** gtr:Dist Guitar	**107.** wnd:Soprano Sax
26. epo:Tine EPno D	**67.** gtr:Banjo	**108.** wnd:Tenor Sax
27. epo:Digi Piano	**68.** gtr:Gtr Harmonix	**109.** vox:Breathy Ooh
28. org:Church Organ	**69.** gtr:Guitarron	**110.** vox:Vocal Oohs
29. org:Perc Organ 1	**70.** gtr:Jazz Guitar	**111.** vox:Vocal Aahs
30. org:Perc Organ 2	**71.** gtr:Muted Guitar	**112.** vox:SynthVoxAahs
31. org:Org Keyclick	**72.** gtr:Nylon Guitar	**113.** vox:Vocal Air
32. org:Pipe Organ	**73.** gtr:Shamisen	**114.** vox:Doo Attack
33. org:Org775305004	**74.** gtr:Sitar	**115.** vox:Countoffs
34. org:Org845351402	**75.** gtr:Steel Guitar	**116.** vox:Monsters
35. org:Org875434578	**76.** gtr:FeedbackHarm	**117.** wav:Analog WV 1
36. org:Org875645332	**77.** str:Cello	**118.** wav:Analog WV 2
37. org:Org888000000	**78.** str:Pizz Strings	**119.** wav:Analog WV 3
38. org:Org888808008	**79.** str:String Sect	**120.** wav:Analog WV 4
39. org:Org888856444	**80.** str:Violin	**121.** wav:Analog WV 5
40. org:Org888880880	**81.** str:Harp	**122.** wav:Analog WV
		123. wav:Analog WV 7

Instrument Listing

124.	wav:Analog WV 8	**169.**	wav:MultiBell XW	**214.**	prc:Vibraphone
125.	wav:Big Bell	**170.**	wav:Osc Sync XW1	**215.**	prc:Xylophone
126.	wav:Big Bell WF	**171.**	wav:Osc Sync XW2	**216.**	prc:Tubular Bell
127.	wav:Doorbell	**172.**	wav:Tine X	**217.**	prc:Sm TunedGong
128.	wav:E Bass WF 1	**173.**	wav:Tri Sweep XW	**218.**	prc:Kick Drums 1
129.	wav:E Bass WF 2	**174.**	wav:TranswaveZ	**219.**	prc:Kick Drums 2
130.	wav:Sine Wave	**175.**	wav:Transwave AA	**220.**	prc:Kick Drums 3
131.	wav:Bell Wave 1	**176.**	wav:Transwave AH	**221.**	prc:Snare Drums1
132.	wav:Bell Wave 2	**177.**	wav:Transwave EE	**222.**	prc:Snare Drums2
133.	wav:Bell Wave 3	**178.**	wav:Transwave OH	**223.**	prc:Cymbals 1
134.	wav:Bell Wave 4	**179.**	wav:Rez Sweep XW	**224.**	prc:Cymbals 2
135.	wav:Bell Wave 5	**180.**	wav:Organ XW	**225.**	prc:Percussion 1
136.	wav:Bell Wave 6	**181.**	wav:MoogX	**226.**	prc:Percussion 2
137.	wav:Bell Wave 7	**182.**	wav:Drawbar XW	**227.**	prc:Toy Percs
138.	wav:Digi Wave 1	**183.**	wav:Crystal	**228.**	prc:Toy Percs Lo
139.	wav:Digi Wave 2	**184.**	syn:FM Clav	**229.**	prc:Toms 1
140.	wav:Sawtooth 1	**185.**	syn:Pad Synth	**230.**	prc:Big Toms
141.	wav:Sawtooth 2	**186.**	syn:Synth Bell	**231.**	prc:Dry Tom High
142.	wav:Reed WF	**187.**	syn:Synkey Wave	**232.**	prc:Live Toms
143.	wav:Single Reed	**188.**	syn:Synth Brass	**233.**	prc:Pure Toms
144.	wav:Wind Chime	**189.**	syn:Clavinet	**234.**	prc:Rock Toms
145.	wav:Piano Bs WF	**190.**	syn:Moog Lead	**235.**	prc:Brushes
146.	wav:Piano WF	**191.**	hit:Dance Hit	**236.**	prc:Snaps
147.	wav:Vocal WF 1	**192.**	hit:Orch Hit	**237.**	prc:Claps
148.	wav:Vocal WF 2	**193.**	sfx:Air Loop	**238.**	prc:Congas
149.	wav:Vocal WF 3	**194.**	sfx:Applause	**239.**	prc:Cowbells
150.	wav:Vocal WF 4	**195.**	sfx:Bird Song	**240.**	prc:Timbales
151.	wav:Vocal WF 5	**196.**	sfx:Helicopter	**241.**	prc:Shakers 1
152.	wav:Vocal WF 6	**197.**	sfx:Spectrum	**242.**	prc:Shakers 2
153.	wav:TriangleWave	**198.**	sfx:SurfaceNoise	**243.**	prc:Tambourines
154.	wav:Square Wave	**199.**	sfx:Telephone	**244.**	prc:Windchimes
155.	wav:Aah Ooh XW	**200.**	sfx:Synth Kiss	**245.**	prc:Rainstick
156.	wav:MoogX XW	**201.**	sfx:Texture	**246.**	prc:RainstickHit
157.	wav:Resonance	**202.**	sfx:Tape Loop	**247.**	prc:Sleighbell
158.	wav:Techno Bs XW	**203.**	nse:Noise	**248.**	prc:Cactus Loop
159.	wav:PulseX XW	**204.**	nse:Scratch	**249.**	prc:NutRattleHit
160.	wav:Phase SyncXW	**205.**	nse:Wakka XW 1	**250.**	prc:Nut RattleLP
161.	wav:Rap Bass XW	**206.**	nse:Wakka XW 2	**251.**	kit:Kit 1
162.	wav:Rezz Bs XW	**207.**	prc:Marimba	**252.**	kit:Kit 2
163.	wav:SoftAnalogXW	**208.**	prc:Kalimba	**253.**	kit:Kit 3
164.	wav:Analog PadXW	**209.**	prc:Log Drum	**254.**	kit:Kit 4
165.	wav:Bell XW 1	**210.**	prc:Handbells	**255.**	kit:Kit 5
166.	wav:Bell XW 2	**211.**	prc:Glockenspiel	**256.**	kit:Kit 6
167.	wav:Bell XW 3	**212.**	prc:Gamelan Bell	**257.**	kit:Kit 7
168.	wav:Bell XW 4	**213.**	prc:Steel Drum	**258.**	kit:Kit 8

Instrument Listing

260. kit:Kit 9	**305.** prc:Snare 1	**350.** prc:Tom 6
261. kit:Kit 10	**306.** prc:Snare 2	**351.** prc:Tom 7
262. kit:Kit 11	**307.** prc:Snare 3	**352.** prc:Tom 8
263. kit:Kit 12	**308.** prc:Snare 4	**353.** prc:Tom 9
264. kit:Kit 13	**309.** prc:Snare 5	**354.** prc:Tom 10
265. kit:Kit 14	**310.** prc:Snare 6	**355.** prc:Tom 11
266. kit:Kit 15	**311.** prc:Snare 7	**356.** prc:Tom 12
267. kit:Kit 16	**312.** prc:Snare 8	**357.** prc:Tom 13
268. kit:Kit 17	**313.** prc:Snare 9	**358.** prc:Tom 14
269. kit:Kit 18	**314.** prc:Snare 10	**359.** prc:Tom 15
270. kit:Kit 19	**315.** prc:Snare 11	**360.** prc:Tom 16
271. kit:Kit 20	**316.** prc:Snare 12	**361.** prc:Cymbal 1
272. kit:Kit 21	**317.** prc:Snare 13	**362.** prc:Cymbal 2
273. kit:Kit 22	**318.** prc:Snare 14	**363.** prc:Cymbal 3
274. kit:Kit 23 E	**319.** prc:Snare 15	**364.** prc:Cymbal 4
275. kit:Kit 24 E	**320.** prc:Snare 16	**365.** prc:Cymbal 5
276. kit:Kit 25 E	**321.** prc:Snare 17	**366.** prc:Cymbal 6
277. kit:Kit 26 E	**322.** prc:Snare 18	**367.** prc:Cymbal 7
278. kit:Kit 27 E	**323.** prc:Snare 19	**368.** prc:Cymbal 8
279. kit:Kit 28 E	**324.** prc:Snare 20	**369.** prc:Crash Cym 1
280. kit:Kit 29 E	**325.** prc:Snare 21	**370.** prc:Crash Cym 2
281. prc:Kick 1	**326.** prc:Snare 22	**371.** prc:Crash Cym 3
282. prc:Kick 2	**327.** prc:Snare 23	**372.** prc:China Cym 1
283. prc:Kick 3	**328.** prc:Snare 24	**373.** prc:China Cym 2
284. prc:Kick 4	**329.** prc:Snare 25	**374.** prc:China Cym 3
285. prc:Kick 5	**330.** prc:Snare 26	**375.** prc:Hat 1
286. prc:Kick 6	**331.** prc:Snare 27	**376.** prc:Hat 2
287. prc:Kick 7	**332.** prc:Snare 28	**377.** prc:Hat 3
288. prc:Kick 8	**333.** prc:Snare 29	**378.** prc:Hat 4
289. prc:Kick 9	**334.** prc:Snare 30	**379.** prc:Hat 5
290. prc:Kick 10	**335.** prc:Snare 31	**380.** prc:Hat 6
291. prc:Kick 11	**336.** prc:Snare 32	**381.** prc:Hat 7
292. prc:Kick 12	**337.** prc:Snare 33	**382.** prc:Hat 8
293. prc:Kick 13	**338.** prc:Snare 34	**383.** prc:Hat 9
294. prc:Kick 14	**339.** prc:Snare 35	**384.** prc:Hat 10
295. prc:Kick 15	**340.** prc:Brush 1	**385.** prc:Hat 11
296. prc:Kick 16	**341.** prc:Brush 2	**386.** prc:Hat 12
297. prc:Kick 17	**342.** prc:Brush 3	**387.** prc:Hat 13
298. prc:Kick 18	**343.** prc:Brush 4	**388.** prc:Hat 14
299. prc:Kick 19	**344.** prc:Brush 5	**389.** prc:Hat 15
300. prc:Kick 20	**345.** prc:Brush 5	**390.** prc:Hat 16
301. prc:Kick 21	**346.** prc:Tom 1	**391.** prc:Hat 17
302. prc:Kick 22	**347.** prc:Tom 2	**392.** prc:Hat 18
303. prc:Kick 23	**348.** prc:Tom 4	**393.** prc:Hat 19
304. prc:Orch Bs Drum	**349.** prc:Tom 5	**394.** prc:Conga 1

Instrument Listing

395. Hrc:Conga 2	**412.** prc:Maraca 2	**429.** prc:Taiko
396. prc:Conga 3	**413.** prc:Maraca 3	**430.** prc:Timpani 1
397. prc:Conga 4	**414.** prc:Cowbell 1	**431.** prc:Timpani 2
398. prc:Sm TunedGong	**415.** prc:Cowbell 2	**432.** prc:Timbale 1
399. prc:Tambo 1	**416.** prc:Cowbell 3	**433.** prc:Timbale 2
400. prc:Tambo 2	**417.** prc:Clap 1	**434.** prc:Timbale 3
401. prc:Tambo 3	**418.** prc:Clap 2	**435.** prc:Whistle 1
402. prc:Tambo Up-Dwn	**419.** prc:Clave 1	**436.** prc:Whistle 2
403. prc:Shaker 1	**420.** prc:Clave 2	**437.** prc:Agogo
404. prc:Shaker 2	**421.** prc:Tuned Clave	**438.** prc:Guiro
405. prc:Shaker 3	**422.** prc:Synth Drum	**439.** prc:Cuica
406. prc:Shake Up-Dwn	**423.** prc:Snaps	**440.** prc:Clink
407. prc:Cabasa 1	**424.** prc:Spoons	**441.** prc:Woodblock
408. prc:Cabasa 2	**425.** prc:Jawharp	**442.** prc:Triangle
409. prc:Cabasa 3	**426.** prc:Syn Rim	**443.** prc:Vibraslap
410. prc:CabasaUp-Dwn	**427.** prc:Bongo	
411. prc:Maraca 1	**428.** prc:Gun	

Keyboard Velocity Curves

The keyboard velocity curves modify the response of the Halo keyboard to adapt to your personal playing style. The "Keyboard Velocity Curve" selection screen is located in the Controllers menu.
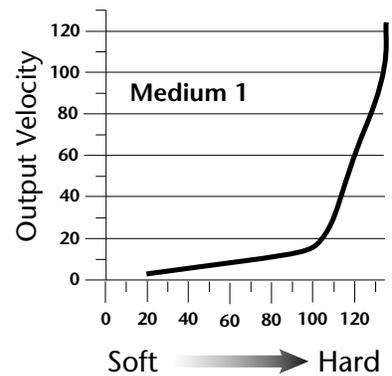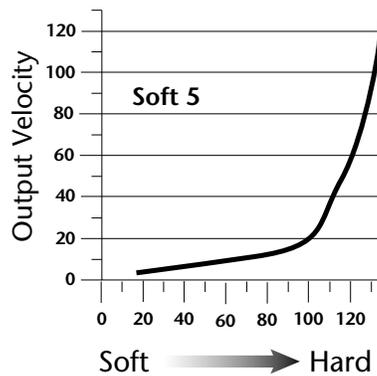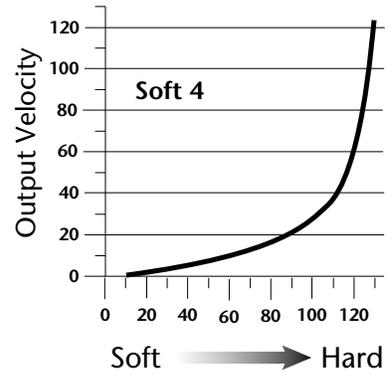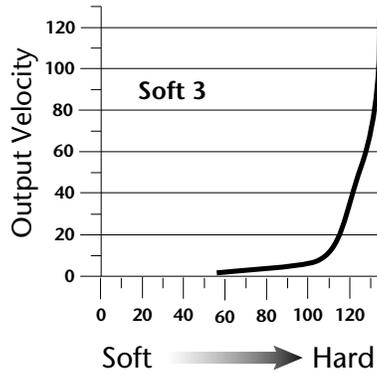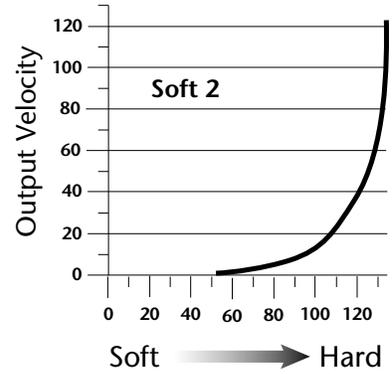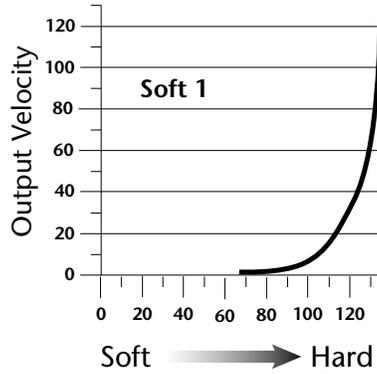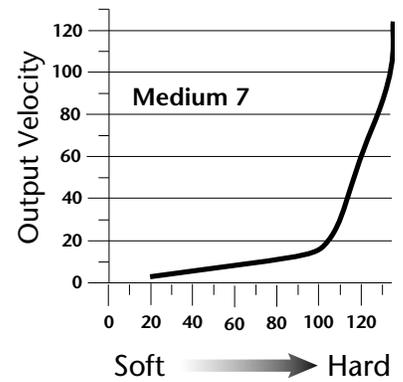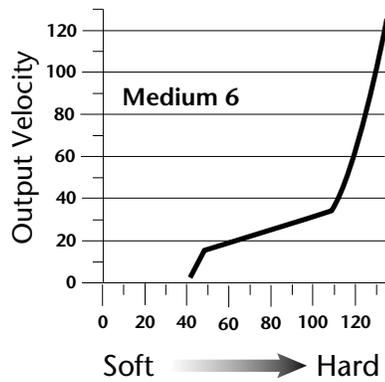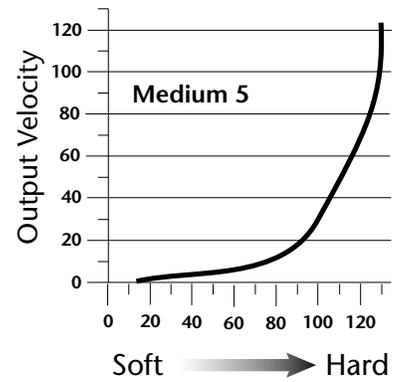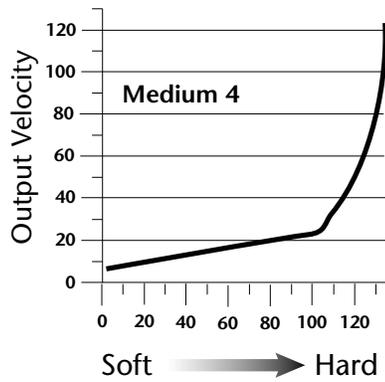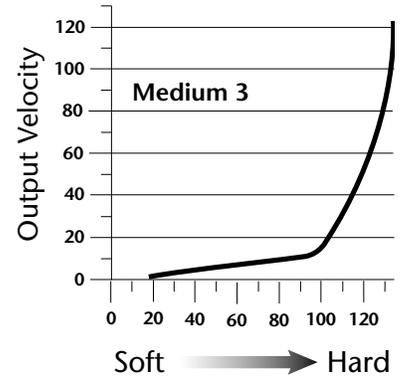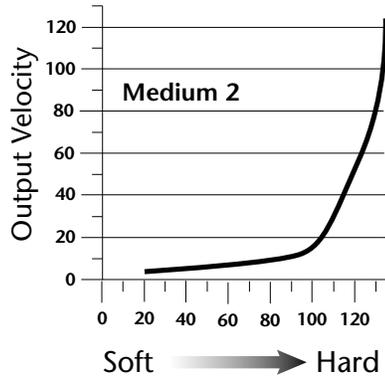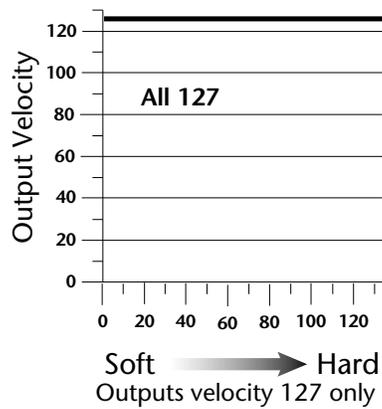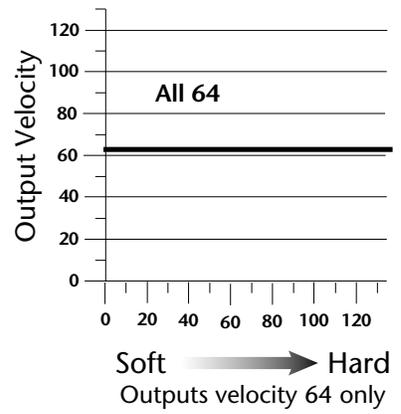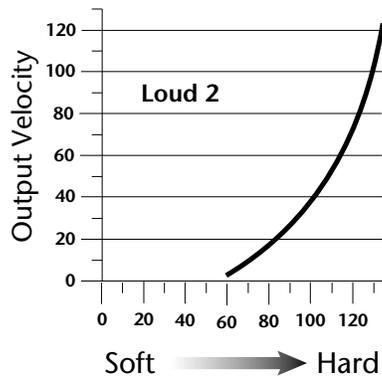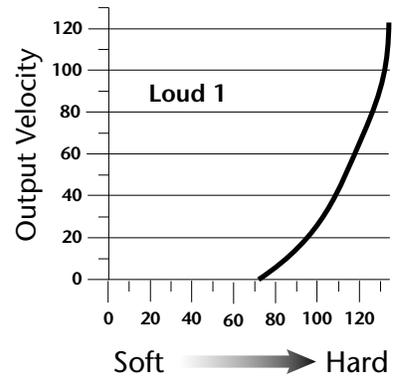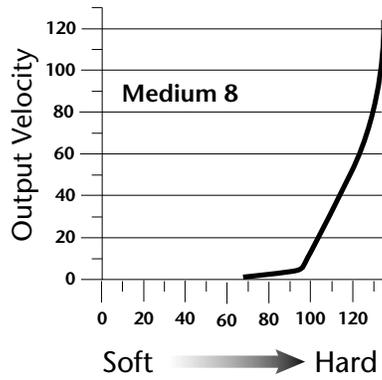
✎ *For more information about the velocity curves, see page 73.*

Keyboard Velocity Curves

Medium 2

Output Velocity

120
100
80
60
40
20
0

0 20 40 60 80 100 120

Soft → Hard

Medium 3

Output Velocity

120
100
80
60
40
20
0

0 20 40 60 80 100 120

Soft → Hard

Medium 4

Output Velocity

120
100
80
60
40
20
0

0 20 40 60 80 100 120

Soft → Hard

Medium 5

Output Velocity

120
100
80
60
40
20
0

0 20 40 60 80 100 120

Soft → Hard

Medium 6

Output Velocity

120
100
80
60
40
20
0

0 20 40 60 80 100 120

Soft → Hard

Medium 7

Output Velocity

120
100
80
60
40
20
0

0 20 40 60 80 100 120

Soft → Hard

Keyboard Velocity Curves

Medium 8

Output Velocity

Soft ➤ Hard

Loud 1

Output Velocity

Soft ➤ Hard

Loud 2

Output Velocity

Soft ➤ Hard

All 64

Output Velocity

Soft ➤ Hard

Outputs velocity 64 only

All 127

Output Velocity

Soft ➤ Hard

Outputs velocity 127 only

Master Velocity Curves

This section provides diagrams and descriptions of the Halo velocity curves. The master velocity curves modify the velocity values from the MIDI input port and the keyboard before going into theHalo synthesizer engine.

Linear

Output Velocity vs *Input Velocity*
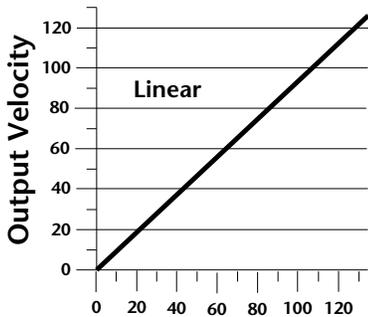
Linear - No Change to Velocity

Curve 1

Output Velocity vs *Input Velocity*
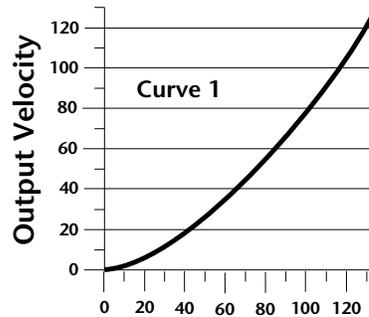
Compresses Velocity Range

Curve 2

Output Velocity vs *Input Velocity*
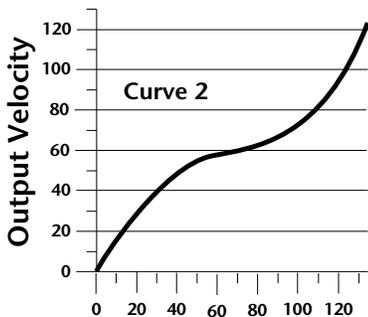
Expands Dynamics in low range, emphasizing medium velocity values and compressessing high velocity values.

Curve 3

Output Velocity vs *Input Velocity*
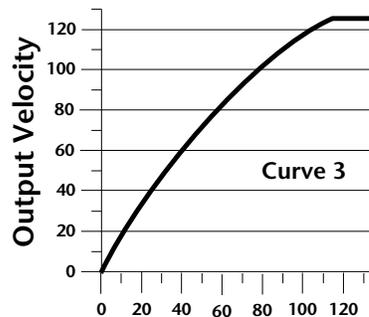
Expands Velocity Range.
Soft -> Loud

Curve 4

Output Velocity vs *Input Velocity*
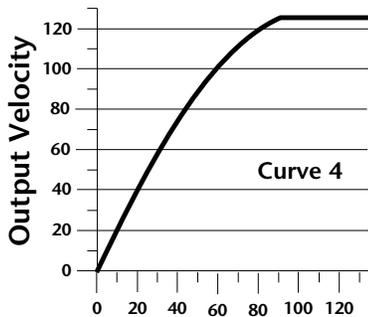
Expands Velocity Range.
Outputs High Values.

Curve 5

Output Velocity vs *Input Velocity*
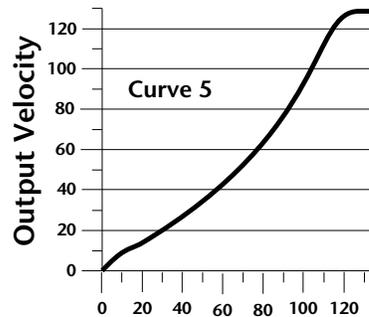
Shifts Velocity Values Upward.
Good Dynamic Range.

Master Velocity Curves

Curve 6
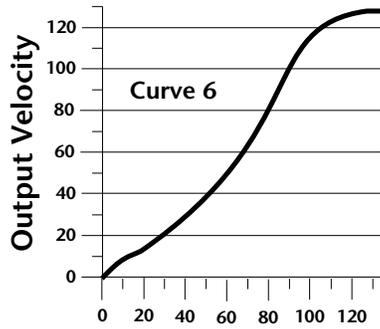
Output Velocity / Input Velocity

Shifts Velocity Values Up, while compressing the middle range

Curve 7
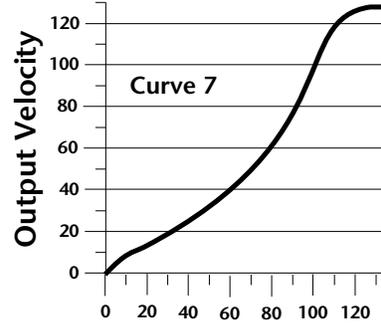
Output Velocity / Input Velocity

Similar to Curve 6.

Curve 8
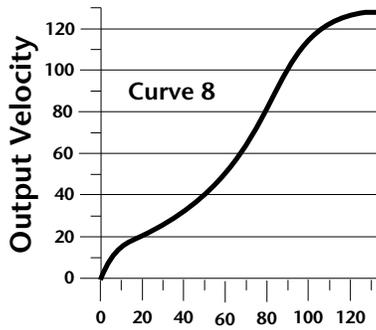
Output Velocity / Input Velocity

Similar to number 6 with more emphasis on the middle range.
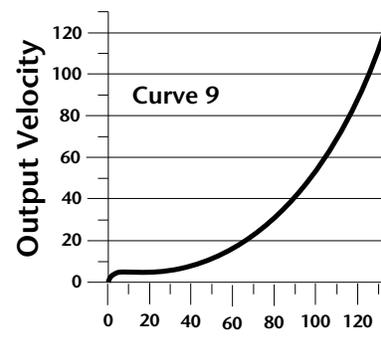
Curve 9

Output Velocity / Input Velocity

Extreme Dynamic Range Compression.

Curve 10
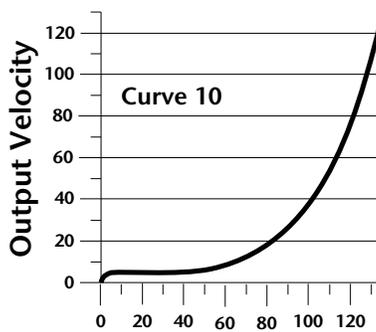
Output Velocity / Input Velocity

Extreme Dynamic Range Compression. Outputs Low Values.

Curve 11
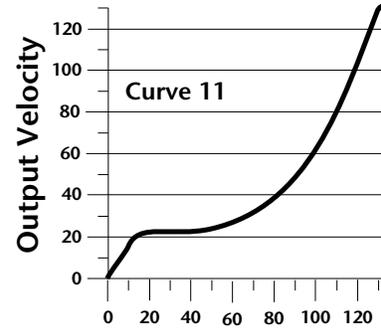
Output Velocity / Input Velocity

Extreme Dynamic Range Compression, but doesn't output low values.

Input Velocity
Less Severe Version of Curve 11.
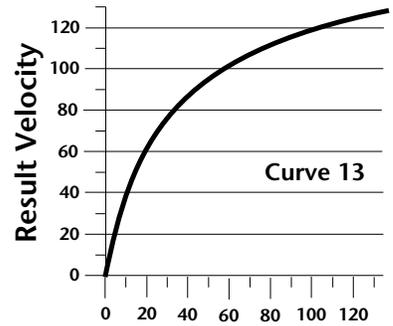
Input Velocity
Extreme Expansion of Velocity Range.

PatchCord Amount Chart

The following chart shows the PatchCord "Amount" settings in order to get semitone intervals when modulation sources are connected to pitch.

Semitone	PatchCord Amount	Semitone	PatchCord Amount
1	3	21	66
2	6	22	69
3	approx. 9	23	approx. 72.5
4	approx. 12	24	approx. 76
5	16	25	79
6	19	26	82
7	22	27	88
8	25	28	91
9	28	29	approx. 95
10	approx. 31	30	98
11	35	31	
12	38	32	
13	41	33	
14	44	34	
15	47	35	
16	50	36	
17	approx. 53	37	
18	57	38	
19	60	39	
20	63	40	

Expansion Sound Sets

Eleven different ROM expansions are currently available, with more being developed every day. ROM expansions typically add 32MB of sound data and 512 additional presets. Adding new sounds is like getting a new instrument and a sure way to spark your creativity. ROM Expansions are available from your ENSONIQ dealer. Also check out the official E-MU / ENSONIQ website: **www.emu.com** for the latest sounds.

Orchestral Sessions VOLUME 1

The Orchestral Sessions Vol. 1 expansion 32 MB ROM offers you the most realistic and comprehensive collection of section strings available, complete with legato, spiccato, pizzicato and tremolande samples, and includes special presets for 4 speaker applications.

Orchestral Sessions VOLUME 2

The Orchestral Sessions Vol. 2 expansion 32 MB ROM offers you the most realistic and comprehensive collection of woodwinds, brass, percussion, and solo strings available, complete with velocity switching between p/mf/ff samples, special presets for 4 speaker applications and a percussion battery with over 20 instruments.

Siedlaczek Orchestra Special Edition

The Peter Siedlaczek Advanced Orchestra Special Edition puts 32 MB of his finest ensembles onto a single expansion ROM for your Halo. String, brass, woodwind and percussion ensembles are included in a variety of styles (i.e. vibrato, tremolo, pizzicato, sordino, etc.), to give you a diverse collection of samples.

Protozoa

E-MU / ENSONIQ presents the 16 MB Protozoa expansion ROM—the ultimate sound compilation containing presets from the ground breaking Proteus sound modules, all optimized for your Halo's advanced synthesis and filter architecture.

Sounds of the ZR *(This is the standard Halo sound set)*

The Sounds of the ZR Expansion ROM faithfully reproduces the diverse sounds of ENSONIQ,s popular ZR-76 keyboard, including William Coakley's Perfect Piano. You'll find everything from synths and orchestral instruments to one of the finest pianos ever sampled in one soundset.

Definitive B-3

John Novello and E-MU / ENSONIQ present the 32 MB Definitive B-3 expansion ROM, a diverse collection of tone wheel organ drawbar settings sampled direct and with rotary speakers (chorale and tremolo) to give you the most versatile and playable B-3 available!

X-Lead

The X-Lead soundset consists primarily of analog, noise and modern synthesizer waveforms. These sounds are rich in harmonic texture and are a perfect match with the Z-plane filters in your Proteus® family sound module. With the included software upgrade, you now have access to dynamic and rhythmic features not found on any other instrument.

PURE PHATT

The 32 MB Pure Phatt is E-MU / ENSONIQ's latest Hip-Hop soundset that produces the freshest and newest sounds and grooves from top notch producers from the East, Southeast and West coasts. Pumping leads and basses, silky pads and those unique hits, scratches and drones that your mix needs to bring it to the next level are ready to provide the love.

World Expedition

An amazing collection of traditional instruments from the four corners of the globe including exotic stringed instruments, winds, percussion, and chromatic percussion. World Expedition provides you with the most realistic ethnic soundset in the world. Discover a world of sounds to bring to your music.

Techno Synth

Rob Papen and E-MU / ENSONIQ introduce the 32 MB Techno Synth Construction Yard Expansion ROM, a compilation of synth, techno, and ambient sounds from one of Europe's finest programmers. From atmospheric pads to punchy sub-basses and crunch drum loops, these sounds will help you tear up the dance floor!

Beat Garden

Dutch sound designer Rob Papen and E-MU / ENSONIQ introduce the 32 MB Beat Garden expansion ROM, a diverse palette of all-new Electronica/ Dance beats, synths, basses, drumkits, acoustic and electronic percussion. Experience the Beat Garden for yourself and add a unique dimension to your tracks.

Installing Sound SIMMs

Halo can be easily expanded to contain up to 128 MB of sound data (4 SIMMs).

▶ Remove the ROM Hatch Cover:

1. The sound SIMM sockets in Halo are located beneath a small hatch on the bottom panel. Unplug power from the unit and carefully turn it keyboard-side down on a soft, padded surface.

2. The ROM hatch is a 125cm x 140cm rectangle secured by four screws. *(You can't miss it.)* Remove the four phillips head screws securing this hatch and place them and the hatch cover where they won't get lost.

▶ To Remove ROM SIMMs (if necessary):

1. Orient the unit so that the rear panel is facing you. Ground yourself by touching a grounded object. *(Such as the chassis of another piece of equipment connected to the wall socket with a three-prong power plug.)*

2. On each end of the SIMM socket there is a silver or plastic tab. Use a screwdriver or a ball point pen to squeeze the tabs toward the outside of the socket while gently nudging the SIMM toward the right side of the unit. The old SIMM should "hinge" to the right and can now be removed.

1. **Set SIMM into socket with the notch toward back of unit.**

2. **Tilt the SIMM up so that both tabs click and lock the SIMM into place.**

Notch

rear of unit

front of unit

ROM 0   ROM 1   ROM 2   ROM 3
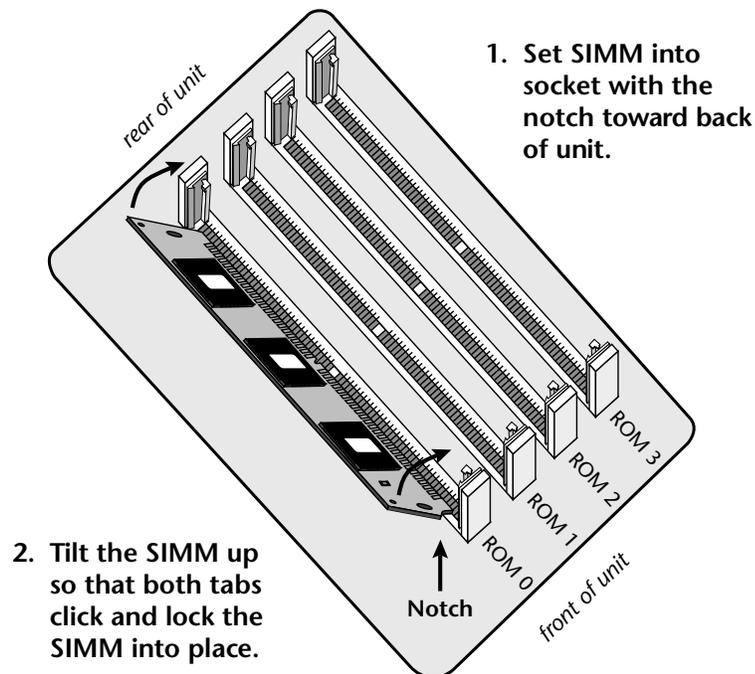
► **Install a New ROM SIMM**

1. Ground yourself by touching a grounded object, then remove the memory SIMM modules from the static protected packaging.

2. Notice that one end of the SIMM connector is notched. This notch Install the SIMM closest to the LEFT side first. *(When the rear of the unit is closest to you.)*

3. Gently set the SIMM deep into the SIMM socket at a 45º angle with the notch toward the keyboard. Without forcing the insertion, let the board rest in the socket as deep as it will go. It should rest naturally in place at this 45° angle. See the following diagrams.

4. While applying a slight downward pressure on the top of the SIMM to keep it from popping out of the socket, tilt the SIMM board into a vertical position. You should hear an audible click. Make sure both sides of the silver tabs have latched.

► **Reassemble the Unit**

5. Replace the hatch cover and the four screws. The screws are all identical.

► **Test It**

The installation is almost finished.

1. Turn the unit right-side up and plug in the power cord.

2. Turn on power.

3. Place the cursor under the ROM field of the Main screen and turn the data entry control to verify that the new sound ROM has been recognized.

4. Play the presets on the new ROM banks and verify that they sound OK.

Problems?

1. Disconnect power immediately.

2. Open the unit, and try re-seating the ROM SIMMs. Take care that the RAM SIMMs are properly installed in the sockets. If you're still having problems, return the unit to its original configuration and call EMU / ENSONIQ Customer Service at (831) 438-1921. Telephone support hours are 8:00-5:00 PST, Monday through Friday.

MIDI

MIDI Implementation Chart (part 1)

MIDI Information	Transmitted	Recognized	Remarks
MIDI Channels	1-16	1-16	
Note Numbers	0-127	0-127	
Program Change	0-127	0-127	
Bank Select Response?	No	Yes	MSB + LSB

Modes: Omni *(Mode 1)*
     Mono *(Mode 2)*
     Poly *(Mode 3)*
     Mode 4
     Multi *(Mode 5)*
	No
	No
	No
	No
	No
		Yes
		Yes
		Yes
		No
		Yes	

Note On Velocity	Yes	Yes	
Note Off Velocity	No	Yes	
Channel Aftertouch	Yes	Yes	
Poly (Key) Aftertouch	No	No	
Pitch Bend	Yes	Yes	
Active Sensing	No	No	
System Reset	No	No	
Tune Request	No	No	
System Exclusive Sample Dump Standard File Dump MIDI Tuning Master Volume Master Balance Notation Information Turn GM1 System On Turn GM2 System On Turn GM1 System Off Other *(See Remarks)*	Yes No Yes Yes No No No No No No No	Yes No Yes Yes Yes No No No No No No	
NRPNs	No	No	
RPN 00 *(Pitch Bend Sensi.)* RPN 01 *(Chan. Fine Tune)* RPN 02 *(Chan Coar. Tune)* RPN 03 *(Tuning Prog Sel.)* RPN 04 *(Tuning Bank Sel.)* RPN 05 *(Mod Depth Rang)*	No No No No No No	No No No No No No	
MIDI Timing & Sync			
MIDI Clock	Yes	Yes	
Song Position Pointer	No	No	
Song Select	No	No	
Start Continue Stop	No No No	Yes No No	

MIDI Information	Transmitted	Recognized	Remarks
MIDI Time Code	No	No	
MIDI Machine Control	No	No	
MIDI Show Control	No	No	
Extension Capability			
General MIDI Compat? Is GM default mode?	No No	No No	
DLS compatible? Import DLS Files? Export DLS Files?	No No No	No No No	
Import Std MIDI files Export Std MIDI files	No No	No No	

MIDI Implementation Chart (part 2 - Controllers)

Control #	Function	Transmitted	Recognized	Remarks
0	Bank Select MSB	Yes	Yes	
1	Mod Wheel MSB	Yes	Yes	* *see note*
2	Breath Cntrl MSB	No	No	* *see note*
3		No	No	*
4	Foot Cntrl MSB	Yes	No	*
5	Portamento MSB	No	No	*
6	Data Entry MSB	No	No	*
7	Chan Volume MSB	Yes	Yes	*
8	Balance MSB	No	No	*
9				*
10	Pan MSB	Yes	Yes	*
11	Expression MSB	No	Yes	*
12	Effect Cntrl 1 MSB	No	No	*
13	Effect Cntrl 2 MSB	No	No	*
14				*
15				*
16	GenPur Ctrl 1 MSB			*
17	GenPur Ctrl 2 MSB			*
18	GenPur Ctrl 3 MSB			*
19	GenPur Ctrl 4 MSB			*
20				*
21				*
22				*
23				* *see note*
24				*
25	↦	Yes	Yes	* *Filt Attck*
26	↦	Yes	Yes	* *Filt Decy*
27				*
28				*
29				*
30				*
31				*
32	Bank Select LSB	Yes	Yes	*
33	Mod Wheel LSB			*
34	Breath Cntrl LSB			*
35				*
36	Foot Cntrlr LSB	No	No	*

Control #	Function	Transmitted	Recognized	Remarks
37	Portamento LSB			*
38	Data Entry LSB			*
39	Chan Volume LSB			*
40	Balance LSB			*
41				*
42	Pan LSB			*
43	Expression LSB			*
44	Effect Cntrl 1 LSB			*
45	Effect Cntrl 2 LSB			*
46				*
47				*
48	Gen Pur Ctrl 1 LSB			*
49	Gen Pur Ctrl 2 LSB			*
50	Gen Pur Ctrl 3 LSB			*
51	Gen Pur Ctrl 4 LSB			*
52				*
53				*
54				*
55				*
56				*
57				*
58				*
59				*
60				*
61				*
62				*
63				*
64	Sustain Pedal	Yes	Yes	*
65	Portamento on/off	No	No	*
66	Sostenuto	No	No	*
67	Soft Pedal			*
68	Legato Footswitch			*
69	Hold 2			*
70	Variation			*
71	Timbre/Har Inten	Yes	Yes	*
72	Release Time	Yes		*
73	Attack Time	Yes		*
74	Brightness	Yes		*

Control #	Function	Transmitted	Recognized	Remarks
75	Sound Cntrlr 6 ⇥	Yes	Yes	* *Decay*
76	Sound Cntrlr 7			*
77	Sound Cntrlr 8 ⇥	Yes	Yes	* *Vel->Filt*
78	Sound Cntrlr 9 ⇥	Yes	Yes	* *Vel->amp*
79	Sound Cntrlr 10	Yes	Yes	↧ *See note*
80	Gen Purp Cntrlr 5	Yes	Yes	⚖ *See note*
81	Gen Purp Cntrlr 6			*
82	Gen Pur Ctrlr 7 ⇥	Yes	Yes	* *Arp Vel*
83	Gen Pur Ctrlr 8 ⇥	Yes	Yes	* *Arp Gate*
84	Portamento Cntrl			*
85	⇥	Yes	Yes	* *Sustain*
86				*
87				*
88				*
89				*
90				*
91	Effects 1 Depth	Yes		*
92	Effects 2 Depth			*
93	Effects 3 Depth	Yes		*
94	Effects 4 Depth			*
95	Effects 5 Depth			*
96	Data Increment			
97	Data Decrement			
98	NRPN (LSB)			
99	NRPN (MSB)			
100	RPN (LSB)			
101	RPN (MSB)			
102				
103				
104				
105				
106				
107				
108				
109				
110				
111				
112				

Control #	Function	Transmitted	Recognized	Remarks
113				
114				
115				
116				
117				
118				
119				
120	All Sound Off	No	Yes	↩ *See note*
121	Reset All Contlrs	No	Yes	
122	Local Cntrl on/off	No	No	
123	All Notes Off	No	Yes	
124	Omni Mode Off	No	Yes ★	★ *if enabled*
125	Omni Mode On	No	Yes ★	★ *if enabled*
126	Poly Mode Off	No	Yes ★	★ *if enabled*
127	Poly Mode On	No	Yes ★	★ *if enabled*

NOTES:

* Halo can transmit and receive ANY continuous controller number from 1 to 95. Because of Halo's powerful synth engine, many of the standard MIDI controllers can be user programmed to provide the desired function. A "Yes" response in this chart means that a controller is programmed by default in Halo.

⚓ Controller 79 is hard-coded to the Mix Output parameter.
   0=Use Preset, 1=Send 1, 2=Send 2, 3=Send 3, 4=Send 4

⚖ Controller 80 is hard-coded to the Arp Status parameter.
   0=Off, 1=On, 2=P (preset), 3=M (master)

↩ Value of 0 = reset all except vol & pan; value of 127 = reset all

Other: Pan: -64 = hard left, +63 = hard right

Product ID for Halo = 0F (15)

MIDI Device Inquiry Responses

Family

MSB   0x04 (Musical Instruments)

LSB   0x04 (ROM Players)

Members

MSB   0x00 (Proteus 2000 series)

LSB   0x02 Audity 2000
        0x03 Proteus 2000
        0x04 B-3
        0x05 XL-1
        0x06 Virtuoso 2000
        0x07 Mo'Phatt
        0x08 B-3 Turbo
        0x09 XL-1 Turbo
        0x0A Mo'Phatt Turbo
        0x0B Planet Earth
        0x0C Planet Earth Turbo
        0x0D XL-7
        0x0E MP-7
        0x0F Proteus 2500
        0x10 Orbit 3
        0x11 PK-6
        0x12 XK-6
        0x13 MK-6
        0x14 Halo
        0x15 Proteus 1000

There is only one edit buffer which is used by the current preset (the preset shown in the display). You can edit only one preset at a time via SysEx commands, although these presets can be edited independently of the current preset edited using the Front Panel. Remote Preset selection is independent of the edit buffer. Changing the current preset erases the edit buffer.

Received Channel Commands

Channels number (n) = 0-15. Message bytes are represented in hex. All other numbers are decimal. Running Status is supported.

Command	Message	Comments
Note Off	8n kk vv	
Note On	9n kk vv	velocity 0 = note off
Program Change	Cn vv	0-127
Channel Aftertouch	Dn vv	0-127
Pitch Bend	En ll mm	l = lsb, m = msb
Real-time Controller	Bn cc vv	cc = 00-31, 64-95
Footswitch	Bn cc vv	cc = 64-79, vv ≥ 64 = on
Volume	Bn 07 vv	0-127
Pan	Bn 0A vv	0=left, 127=right, 64=center
All Sound Off	Bn 78 00	turns all sound off
Reset All Controllers	Bn 79 00	ignored in omni mode
All Notes Off	Bn 7B 00	ignored in omni mode
Omni Mode Off*	Bn 7C 00	forces all notes & controls off
Omni Mode On*	Bn 7D 00	forces all notes & controls off
Mono Mode On (Poly Off)*	Bn 7E 00	forces all notes & controls off
Poly Mode On (Mono Off)*	Bn 7F 00	forces all notes & controls off
Bank Select MSB	Bn 00 bb	bb = bank MSB (see page 126)
Bank Select LSB	Bn 20 bb	bb = bank LSB (see page 126)

* Special Notes:

- **From Omni Mode**...........Omni Off turns Poly On.
- **From Poly Mode**.............Omni On turns Omni On; Mono On turns Mono On.
- **From Mono Mode**...........Mono Off turns Poly On; Omni On turns Omni On.
- **From Multi Mode** ....Omni On turns Omni On; Omni Off or Mono Off turns Poly On; Mono On turns Mono On.
- All other changes have no effect.

SysEx Specification

Halo contains an extensive set of MIDI SysEx commands. *(Virtually every parameter is controllable via SysEx.)* Because of the size and technical nature of the System Exclusive specification, it is beyond the scope of this manual. The complete SysEx specification for Halo will be available soon on the official E-MU / ENSONIQ web site: www.emu.com

Technical Specifications

Audio Channels:	64
MIDI:	MIDI In, MIDI Out, MIDI Thru
MIDI Channels:	16
Presets:	512 user presets. *(The number of ROM presets is determined by the sound SIMMs installed.)*
Filters:	2nd order to 12th order filters (50 different types)
Audio Outputs:	4 polyphonic analog outputs
Submix Inputs:	2 analog inputs (sum to main outs)
Max. Output Level:	+4 dB
Output Impedance:	1000 Ohms
Sound Memory:	64 MB (expandable to 128 MB)
Data Encoding:	16-bit linear data
Effects Engine:	24-bit internal processing
Sample Playback Rate:	44.1 kHz
Signal to Noise:	>92 dB
Dynamic Range:	>90 dB
Frequency Response:	20 Hz - 20 kHz (+2/-1 dB)
THD + Noise:	< 0.02% (1kHz sine wave, A-weighting)
IMD	< 0.05%
Stereo Phase	Phase Coherent +/- 1º at 1 kHz
Power Consumption:	20 Watts
Voltage Input:	90VAC-260VAC at 50Hz-60Hz

Warranty

Please read this warranty, as it gives you specific legal rights.

Limited Warranty

This product is warranted, to the original consumer purchaser, to be free of all defects in workmanship and materials for a period of one (1) year (warranty period is two (2) years in the European Union, effective Jan-1-2002), from the date of such purchase from an authorized E-MU/ ENSONIQ dealer, provided that: (a) the Warranty Registration Card is filled out and returned to E-MU / ENSONIQ within 14 days of the purchase date; (b) the E-MU / ENSONIQ service center is provided a copy of the consumer purchaser's sales receipt; and (c) E-MU / ENSONIQ has confirmed the validity of the subject unit's serial number.

Warranty Restrictions

Specifically, but without limitation, E-MU / ENSONIQ does not provide warranty service for:

• Damages due to improper or inadequate maintenance, accident, abuse, misuse, alteration, unauthorized repairs, tampering, or failure to follow normal operating procedures as outlined in the owner's manual;

• Deterioration or damage of the cabinet;

• Damages occurring during any shipment of the unit;

• Any unit which has been modified by anyone other than E-MU / ENSONIQ.

• Any unit with an invalid or wholly or partially obliterated serial number.

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The foregoing will apply notwithstanding the failure of essential purpose of any remedy provided herein. Some jurisdictions do not allow the exclusion of implied warranties or conditions, or limitations on how long an implied warranty or condition may last, so the above limitations may not apply. This warranty gives you specific legal rights. You may have other rights which vary from jurisdiction to jurisdiction.

How To Obtain
Warranty Service

All E-MU / ENSONIQ products are manufactured with the highest standards of quality. If you find that your unit does require service, it may be done by any authorized E-MU / ENSONIQ service center. If you are unable to locate a service center in your area, please contact EMU's Service Department at (831) 438-1921. They will either refer you to an authorized service center in your area or ask that you return your unit to the E-MU / ENSONIQ factory.

When returning your unit to the E-MU / ENSONIQ factory, you will be issued a Return Merchandise Authorization (RMA) number. Please label all cartons, shipping documents and correspondence with this number. E-MU / ENSONIQ suggests you carefully and securely pack your unit for return to the factory. (Do not send the power cord or operation manual.) Send the unit to E-MU / ENSONIQ, 1600 Green Hills Road, Scotts Valley, CA 95066. You must pre-pay shipping charges to E-MU / ENSONIQ. E-MU / ENSONIQ will pay return shipping charges. You will be responsible for any damage or loss sustained during shipment in any direction.

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