

H3000
Ultra-Harmonizer®
INSTRUCTION MANUAL

Eventide
the next step

Eventide

the next step

H3000 Ultra-Harmonizer® INSTRUCTION MANUAL

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H3000, H3000-S, H3000-SE, H3000-B, 3000-D/SX, H3000-D/SE, H3000-B/LT, H3000-B+, H3500-dfx, H3500-dfx/e MODELS COMBINED
IN ONE MANUAL - January 1996

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EVENTIDE INC.
WARRANTY REGISTRATION FORM - Model H3000 Ultra-Harmonizer®

Date Purchased _____ Serial Number _____

From Whom Purchased _____

Purchaser's Name _____

Street Address _____

City _____ State _____ ZIP _____

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From time to time, application notes and other data may be available. To whom should this information be sent?

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How did you learn of Eventide equipment? _____

Do you plan to use MIDI with the H3000? Yes (☐) No (☐)

Do you own or use a personal computer? Yes (☐) No (☐)

If you use a computer, please indicate which type:

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WARNINGS

FAILURE TO HEED THESE WARNINGS could result in an electrical shock hazard.

Be certain that the Voltage Select Switch on the rear of the H3000 is in the correct position. The choices are 115 or 220 volts.

Always use a properly grounded, three-prong AC outlet.

Always use a 3-wire line cord like the one supplied with the H3000.

Don't expose the H3000 to rain or moisture of any kind.

Always replace the fuse with the value specified (see rear panel).

Dangerous Voltages are present inside the unit. Use extreme caution when operating the unit with its covers removed.

CAUTIONS

FAILURE TO HEED THESE CAUTIONS could result in reduced service life or damage to your equipment.

Heat is the enemy of reliability. Don't block top or bottom ventilation slots. Leave some clearance above and below the H3000 in your rack.

For Road Use we recommend that you don't solely rely on the front support screws when rack-mounting. Support the back of the box as well.

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Ihr Zeichen

Unser Zeichen 2010/02-0309738-KTCR

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The H3000 Family of Products

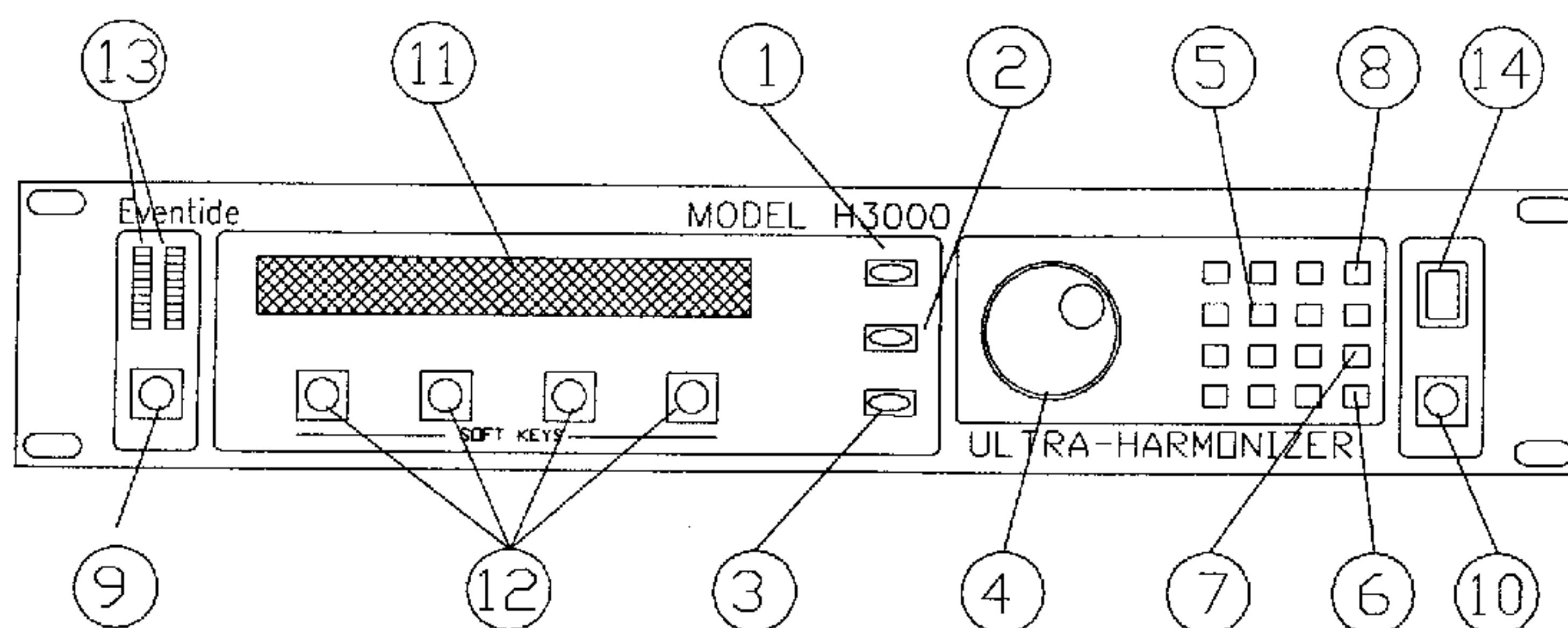
The Eventide H3000 Ultra-Harmonizer is a family of products based around a multi-purpose programmable, digital audio signal processor. The products that make up the H3000 family are:

The H3000-S (Studio), the H3000-SE (Special Edition), the H3000-B (Broadcast), the H3000-B+, the H3000-B/LT, the H3000-D/SX, the H3000-D/SE, the H3500-dfx and the H3500-dfx/e. The H3500 models are also available in broadcast versions.

We call them Ultra because they do more than our earlier models. To begin with, they have full stereo pitch change. They also are digital reverbs. And they're a lot more. The H3000 is capable of creating effects you've never heard before. The H3000 is fully MIDI controllable, with clickless, real-time MIDI control. The H3000 has all these effects, and more, at your fingertips:

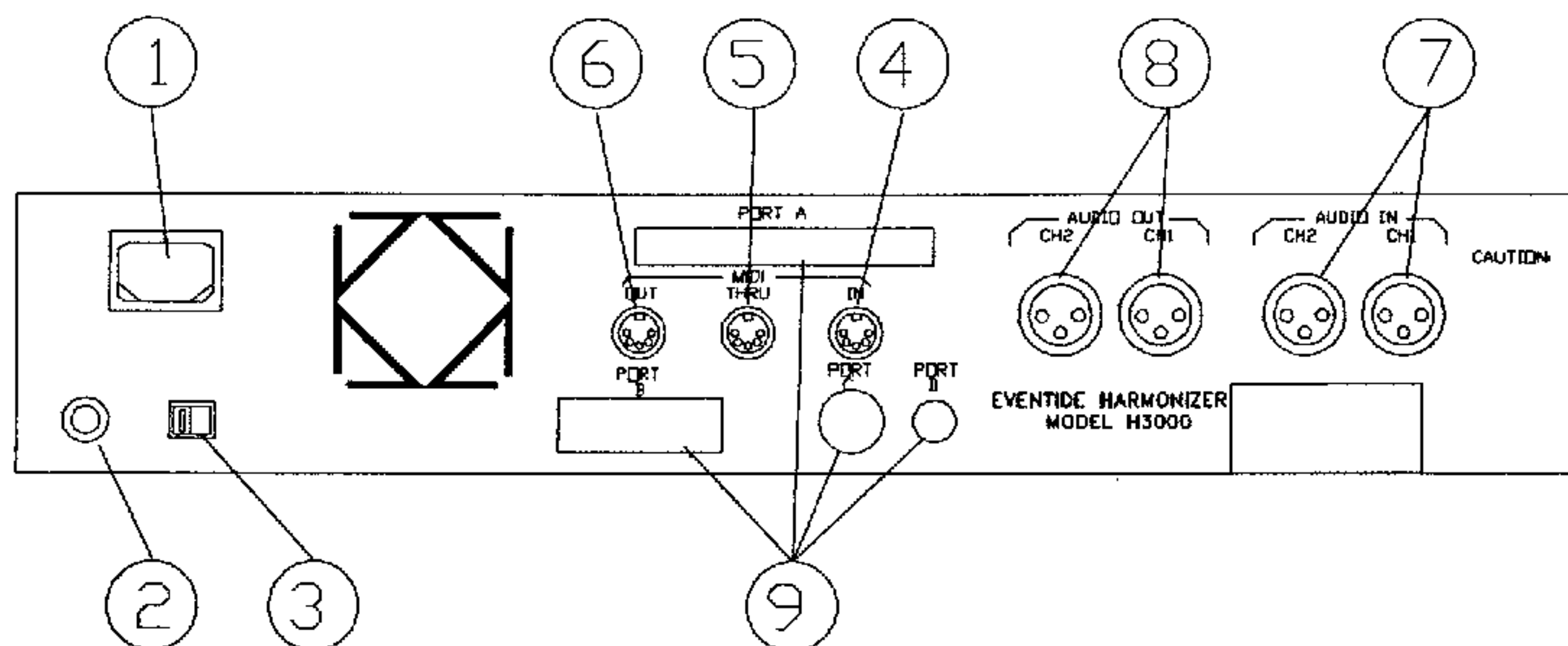
DIATONIC SHIFT	A pitch shifter that stays in key
DUAL SHIFT	Two separate pitch shifters
LAYERED SHIFT	Two pitch shifts from one input
STEREO SHIFT	Mono-compatible stereo pitch shifting (maintains stereo imaging)
REVERSE SHIFT	Backwards-talking pitch shift
SWEPT COMBS	Six sweepable delay lines, with stereo panning
SWEPT REVERB	A dense reverb with smooth sweep capability
REVERB FACTORY	A full-featured reverb with EQ and flexible gating
ULTRA-TAP	Twelve delay taps with full control over panning, level, and delay. Includes a diffuser to generate dense gated reverb effects.
DUAL DIGIPLEX	A stereo delay with smooth delay change
LONG DIGIPLEX	A 1.5 second delay with smooth delay control.
PATCH FACTORY	A "modular" effects program which lets you design your own effect. "Patch" together delay lines, filters and pitch shifting to create never-heard-before effects.
STUTTER	Get that st..st..stutter sound - effortlessly
DENSE ROOM	Our densest reverb, with unique front/back position control.
VOCODER	This is our version of the classic vocoding effect.
MULTI-SHIFT	Two six-octave pitch shifters, two delays, panning and patchable feedback paths make this program incredibly useful.
BAND DELAY	A multi-tap delay line feeding eight resonant bandpass filters make for some sounds like you've never heard.
STRING MODELLER	This program lets the H3000 double as an extra voice in your MIDI rack.
PHASER	A wonderfully thick, smooth, phase-shifting effect that is hard to beat.
MOD FACTORY	The latest algorithms that add effects such as delay ducking, BPM delays and sweeps, compression, manual flanging, smooth autopanning, audio triggered sweeps and much more.
HS322/395 SAMPLER	Included in the H3500 - dfx, digitally records up to 11.8 seconds stereo or 23.7 seconds mono audio (47.5 seconds of stereo or 95 seconds of mono audio with the H3500 - dfx/e).

The Front Panel and Controls

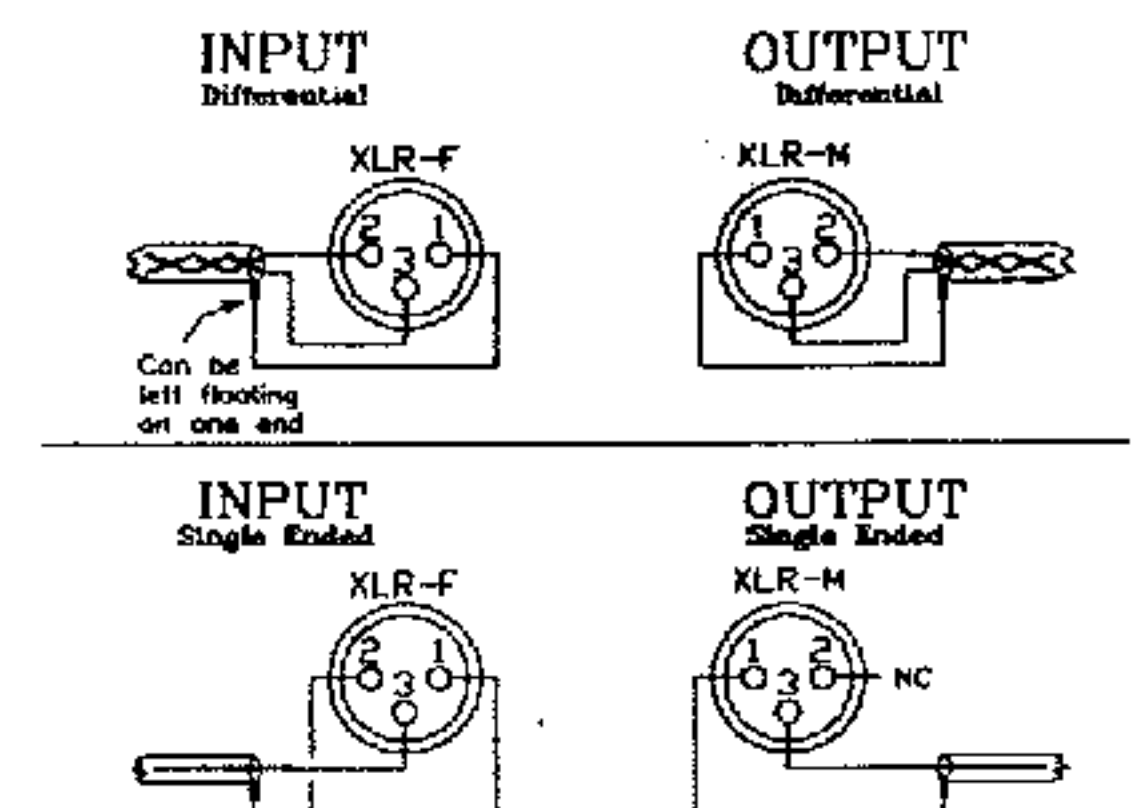


- 1 **Program Button:** Press this button to load, save, or remove programs.
- 2 **Function Button:** Press this button to adjust display contrast and to access user defined functions. Also found here is the internal function generator and anything relating to MIDI.
- 3 **Parameter Button:** Press this button to edit parameters.
- 4 **The Knob:** The knob is the easiest way to change a selected parameter. Just turn it.
- 5 **Numeric Entry:** Use the numbers, decimal point, and minus sign to enter a numeric value.
- 6 **ENT:** Hitting the ENT button actually enters the number.
- 7 **CXL:** Hitting CXL cancels the last keystroke.
- 8 **Up/Down Buttons:** These buttons increment or decrement a parameter or numeric value.
- 9 **Levels Button:** Press this button to permit adjustment of input and output levels.
- 10 **Bypass Button:** Press this button to toggle between effect in line and total relay bypass of the Harmonizer.
- 11 **Display:** This tells you what's going on. The top line displays the program number, name and the parameter or function that is currently being modified. The bottom line is dedicated to the four "softkeys" that are directly below it.
- 12 **Softkeys:** These are explained in "Running The H3000."
- 13 **Input Bargraphs:** These bargraphs display the input signal levels to the H3000. Set levels as high as possible before the top "Clip" light comes on. The bargraphs are calibrated in dB.
- 14 **Power Switch:** This applies AC power to the unit.

The Rear Panel and Connections



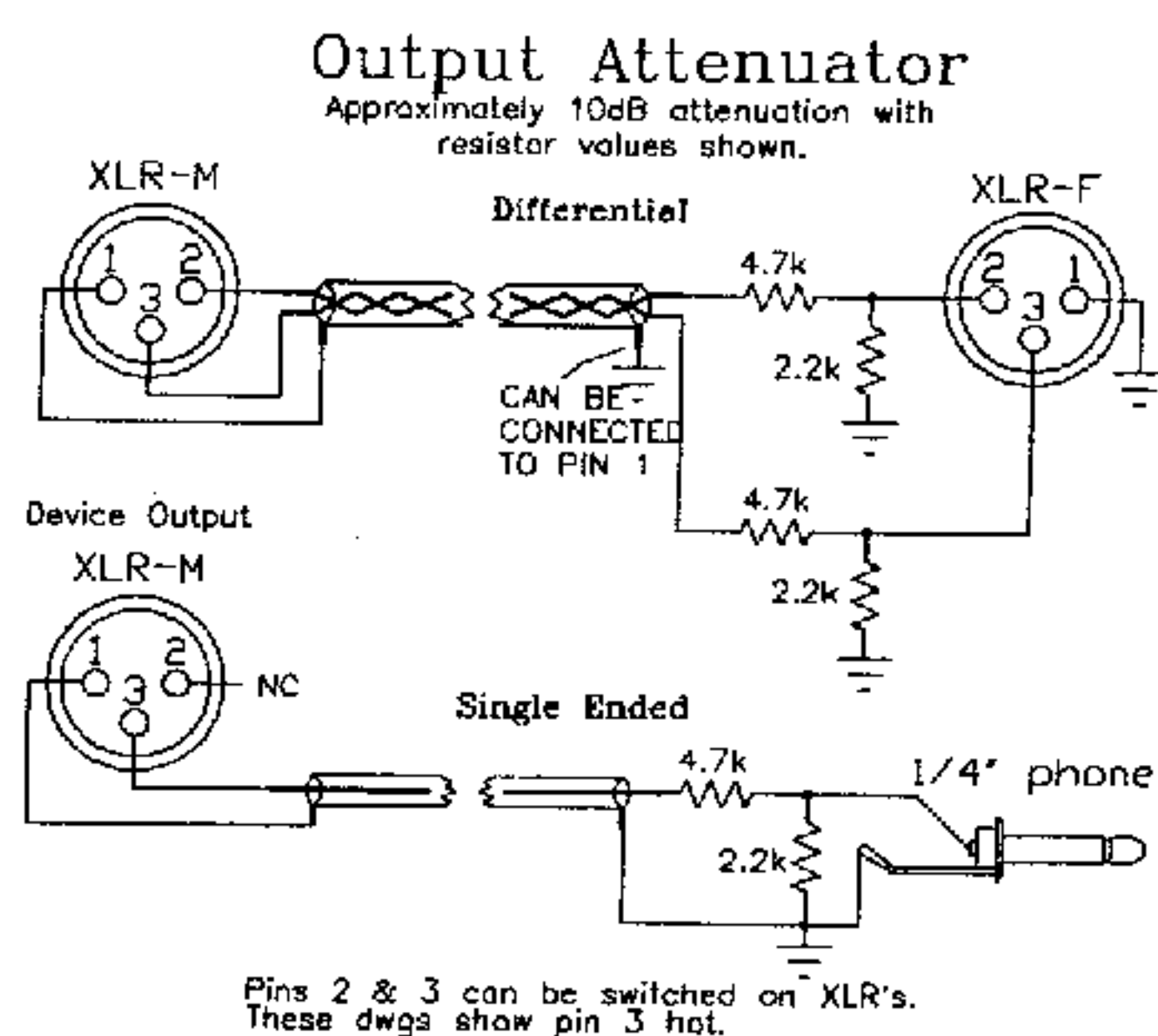
- 1 **AC Connector:** This is where the AC power cord is connected. It's an IEC standard 3 prong connector. The center post is chassis ground.
- 2 **Fuse Holder:** A 1 Amp Slo-blo fuse. Always replace it with the correct value.
- 3 **Line Voltage Select:** This is the switch to set for 115v or 220v AC lines. Make sure it is correctly set for your area.
- 4 **MIDI IN:** This jack accepts MIDI data from a MIDI source, such as a synthesizer, sequencer or computer.
- 5 **MIDI THRU:** This is the MIDI THRU jack. It sends out a duplicate copy of the MIDI IN data.
- 6 **MIDI OUT:** This jack outputs MIDI data from the H3000.
- 7 **Audio In:** These are balanced audio inputs. The female XLR connectors are wired with pin #3 as +phase, pin #2 as -phase and pin #1 grounded (to the case of the external XLR connector).
- 8 **Audio Out:** These are the balanced audio outputs. They're male XLR's wired like the inputs.
- 9 **Tape Machine Control:** This 1/4" phone jack allows for connection to a frequency controlled, variable-speed tape machine. When connected, this port will be used to control the capstan of the tape machine during Timesqueeze® operation (PORT D).
- 10 **Ports A, B, & C:** These are for possible future expansion.



Optimum Performance from the H3000

To obtain the best performance from your new EVENTIDE unit, certain operating principles should be applied. Use the "hottest" input levels possible without clipping. A digital gain device is used in the input section which allows front panel control of levels. This device works best when it is "turned all the way up" in other words when it attenuates least. At the factory, we chose pro levels of +4 dBm, and internal jumpers 1 through 4 should be in the "+4 position" (see diagram on next page) so that the gain control devices will hardly attenuate. If consumer -10dBm levels are used, the jumpers should be moved accordingly so that your unit can operate at its optimum, high levels.

For best signal to noise ratio, always set the input level control so that the top bar of the level indicators flashes from time to time. If this results in output levels that are too "hot", reduce the output levels, not the input! If you are using sensitive inputs (-10dB) you may want to pad the H3000 outputs so that you can operate the output level control near the top of its range and retain its full variation. Suitable attenuator pads are available from stores, or may be constructed with an XLR connector, two resistors, and an appropriate connector.



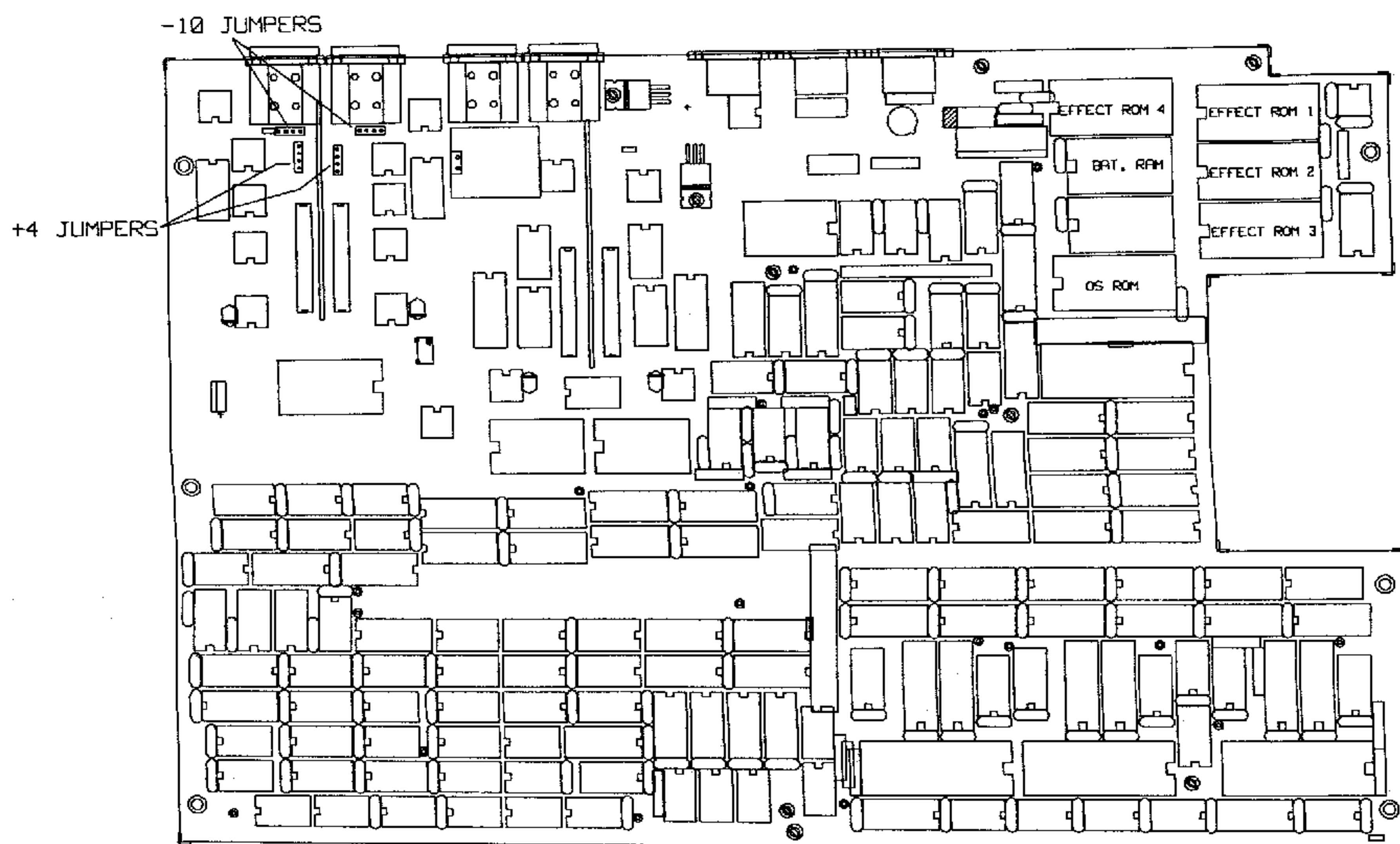
In order to reduce line noise through cable pickup, an instrumentation amp is used at the input to cancel noise. This is called a "differential input," and enables the user to mount the H3000 remotely without fear of signal degradation. If you don't use differential inputs, proper termination of the cable is desirable. For instance, if you only use pin 3 hot of the input XLR connector for signal (the standard), pin 2 should be tied to ground.

The output is differential also and "in-phase" with the input when "dry signal" is selected. If a single ended output is use, leave the unused pin unconnected. The output amp is capable of driving 600 ohm lines up to +21 dBm with negligible distortion.

Normally the H3000 will be rack mounted in a standard 19 inch rack. It is advisable to keep the rack well ventilated and in a dry environment so heat and moisture won't cause degradation of performance. Since your EVENTIDE ULTRA-HARMONIZER has almost no internal connectors, it should hold up well under "road conditions".

Changing Input Levels

The input levels of the H3000 can be changed to accept either +4dBm or -10dBm nominal operating levels. They are set to pro audio, +4dBm at the factory. To change this remove the top cover of the unit and pull the small jumper blocks from the +4 pins and put them on the -10 pins.



H3000 MAINPC

H3000 Specifications

Inputs	Stereo, true differential balanced
Outputs	Stereo, differential, transformerless
Dynamic Range	Greater than 92dB "A" weighted
Distortion	.01 % (.007 % typical) @ 1 kHz, 1 dB below clipping in "pitch change" mode, 0 shift, levels all at 0 dB
Sampling	Full 16 bit resolution at 44.1 kHz sampling rate
Frequency Response	5 Hz to 20 kHz +/-1 dB, +/- .5 dB typical
Delay	Up to 23.7 seconds or 95 seconds with H3000 - dfx/e
Pitch Variation	H3000: 3 octaves up, 3 octaves down
Power	75 watts, 110-130 volts, or 200-240 volts, AC 50/60 Hz
Size	inches: 3.5h x 19w x 13.5d centimeters: 8.9h x 48.3w x 34.3d
Weight	13 lbs. net 20 lbs. shipping weight

Running the H3000

Softkeys and Menus

The bottom line of the display contains the MENU. The menu consists of up to four SOFTKEYS. Each softkey (the text within the parentheses) describes the function of the button immediately below it. In general, the functions of the softkeys will change depending on whether programs are being loaded, effects parameters are being edited, etc. There will usually be more than one menu (set of four softkeys) available at any given time. For example, press the "PROGRAM" key. The display should look like this:

```
Selected Program: [101] LAYERED SHIFT  
( Load ) ( Origin )
```

Press the "PROGRAM" key again and the display will change to this:

```
Current Edit : [101] LAYERED SHIFT  
( Info ) ( Save )
```

The new menu has changed the function of the softkeys. While editing a program, the parameter key has a similar effect. The same also holds for the "FUNCTION" key.

Setting the Display Contrast

If you have a green display and it is hard to read, you probably have to adjust the display contrast. Simply hit the function button and turn the knob until the display is readable. Blue displays do not have a display contrast.

Setting the Levels

Proper setting of input levels on a digital processor like the Ultra-Harmonizer is very important. In order to get clean distortion-free sound, the input level should be set so that the top yellow bar on each channel just flickers. The red light indicates clipping. Output levels should be adjusted so that the H3000 is putting out the hottest signal your equipment can handle without distorting.

To set the input levels, press the "LEVELS" key. The knob will now adjust both input levels simultaneously.

Pressing the "LEVELS" key a second time will allow you to adjust the output levels. The knob will adjust both outputs simultaneously.

If you wish to set the levels individually, use the four softkeys to select one of the four adjustments.

Important

If a "+" or a "-" appears after the dB indication, it means that the currently loaded program has affected that particular level setting. For more on this, be sure to read the "Levels Mode" section. That section describes in detail the level adjustment scheme of the H3000 and describes how level adjustments may be stored and recalled with different effects programs.

The Bypass Control

The bypass control allows you to completely bypass the processed audio. When the light on the bypass switch is on, you are hearing processed audio. When the light is off, the unit is bypassed. Pressing the bypass switch toggles from unbypassed to bypassed and vice versa. The unit is automatically bypassed when power is off.

Loading a Program

To load a program, press the **"PROGRAM"** button. The display should now look like this:

```
Selected program: [100] DIATONIC SHIFT
( Load ) ( Origin )
```

Turn the knob or use the up/down buttons to scroll through the available programs. The PROGRAM NUMBER is displayed in brackets, and the PROGRAM NAME is shown to the right of the number. Each effects program has a unique number from 0 to 999. This includes factory programs and user programs. The program name is used to describe each effects program. There can be more than one program with the same name, so the program number is used to tell them apart.

When the display shows the program that you wish to load, press the (Load) softkey to "load" the new effects programs. (Origin) will show what algorithm that program was derived from.

At the end of the program list is "Selected Program : Last Edit". Pressing (Load) will load the previous program that the H3000 was in as well as all of its edited parameters. Pressing the (Origin) softkey will display the name and number of that program.

Editing a Program

Once you've gotten through the basic operation of the H3000 and are familiar with the preset factory programs, you might want to create some of your own personalized effects. You can do this by editing parameters of an existing program.

To get into edit mode, just press the **"PARAMETER"** button. If #101 Layered Shift is loaded, the display should look something like this:

```
101 left pitch: 1200 cents, [2.000:1]
(1 coarse) (1 fine) (1 delay) (1 fdback)
```

When you're in edit mode, the top left of the display will show the current program number. The top right of the display shows the parameter you are currently adjusting. A parameter is something which will change some aspect of the sound of the currently loaded effect. If you turn the knob, use the up/down buttons, or enter a number on the keypad, you will change that parameter. To adjust a different parameter, just press its softkey. To access other menus not shown, hit the **"PARAMETER"** button. To go backwards through the menus, hit the **"CXL"** key on the keypad.

Soft Functions

Many of the factory programs in the H3000 are set up with something called "Soft Functions." The soft functions are a set of four "user-definable" parameters, intended to allow each factory or user program to have a customized interface. These soft functions will be the first menu to appear after loading a program. If there are no soft functions, the first parameter page will be shown.

Unlike parameters, the Soft Functions will not appear when paging through parameter menus with the **"PARAMETER"** button. To access the soft functions, press the **"FUNCTION"** button. Each of the values of these soft functions can be edited and saved just like parameters. However, the soft functions are not quite the same as parameters. Each soft function is actually controlling one or more parameters (found on the parameter pages). To learn more about soft functions, see the section on parameter modulation.

Expert Mode

The effects programs in the H3000 are set up with a relatively small number of parameters which you can use quickly and easily to get your own personal sound. If you wish to experiment further, (especially those of you who enjoy programming certain FM synthesizers), we have given you access to a whole bunch of extra, detailed parameters. These extra parameters are accessed through the "expert" softkey found in most programs.

Press the (expert) softkey and you'll find a whole new set of menus and parameters. You can edit these parameters just like normal parameters. To get back to the "basic" menus, press the (return) softkey.

Levels Mode

In some cases it may be desirable to have different input and output levels for different effects programs. To allow this, the H3000 has a level adjustment scheme consisting of "master" levels and "offset" levels.

The master levels settings are those made after pressing the **"LEVELS"** button. These settings do not change as different effects programs are loaded. The offset levels settings are those made while editing an effects program. These settings are stored with user and factory programs and are recalled when these programs are loaded.

The actual attenuation value sent to the input and output level attenuators is the sum of the master and offset levels settings. For example, if the master input level setting is -4 dB and the offset for the current program is set to -5dB, the actual attenuation value is -9 dB.

There are a couple of things to keep in mind. The first is that if the master input or output level is set to "off", the input or output is "off" regardless of the offset setting. The other is that the sum of the master level and the offset level is limited to a value between 0 and -48 dB (-48 dB = "off"). If the master level is set to -4 dB and the offset is set to +10 dB, the actual level will be 0 dB, not +6 dB as one might expect.

To adjust the offset levels, press the **"PARAMETER"** key until the (levels) softkey appears. Press the (levels) key. From this menu, the four offset levels can be adjusted. The adjustment range for each of the offsets is +/- 48 dB. To return to the main parameters, press (return).

Note

If the currently loaded program has level offsets which are not zero, the master-level display (the one seen after pressing the "LEVELS" button) will indicate the offset with a "+" or a "-" ("+" for positive offset, "-" for negative offset).

Saving an Edit

Now that you're a pro at editing programs, you'll probably want to save what you've created. If you're in edit mode, pressing the "PROGRAM" button twice will allow you to save your edit. The display should look like this:

```
Current Edit: [101] Layered Shift
( Info ) ( Save )
```

To save the edit as a new program, press the (Save) softkey. The display will change to:

```
Save as: [ 1] Layered Shift Adj Num>
(New Name) (EditName) (Save It )
```

Use the knob or keypad to select a new program number. To create the program name, press the (New Name) softkey or the (EditName) softkey. (New Name) will start you off with a blank slate while (EditName) will allow you to edit the existing name. The display will look like:

```
Save as: [ 1] Adj Name>
( Number ) ( <----- ) ( -----> ) (Save It )
```

Use the arrow softkeys and the knob to enter a new program name. Press (Save It) to actually save the program. Press number to change the program number. If you change your mind about saving this edit, press the "PROGRAM", "FUNCTION" or "PARAMETER" key.

If you're editing one of your own creations and want the new edit to be the final version under the same name, pressing "PROGRAM" twice should get a display something like this:

```
Current Edit : [ 1] Special Effect
( Info ) ( Save ) ( Update )
```

Press (Update). The display should show:

```
Overwrite Program [ 1] Special Effect
( Yes ) ( No )
```

Press (Yes) to save your new edit. Pressing (No) will get you back to the "Current Edit" menu.

Removing User Programs

There may come a time when you wish to remove some of the user programs. Get into the Selected Program list/load mode. Pressing the "PROGRAM" button once from edit mode should do it. The display should show:

```
Selected program: [ 94] Special Effect
( Load ) ( Origin ) ( Remove )
```

Press the (Remove) softkey. The display will change to:

```
Remove Preset [ 94] Special Effect ?
( Yes ) ( No )
```

Press (Yes) to remove the program. Press (No) if you've changed your mind and still want to keep the program.

Miscellaneous

To find out which algorithm a particular preset is based upon, use the (Origin) softkey. Press the "PROGRAM" once, dial up the preset of interest, then press and hold (Origin).

The (Info) softkey will show you much memory is needed to save or update a preset and how much room is left in the memory of the H3000. Press the "PROGRAM" key twice, then press and hold (Info) to see:

```
Amount of bytes available is 7357
Save needs 26 Update needs 6
```

Parameter Modulation

Have you ever wished the H3000 had more than one knob on the front panel? Or perhaps that there was some way to automatically sweep parameters? Or perhaps even some way to control effects parameters from the mod wheel on a MIDI keyboard? If anything like this has crossed your mind, then "Parameter Modulation" is for you.

Simply put, "Parameter Modulation" allows H3000 effects parameters to be controlled in a useful variety of ways. There are three basic ways that effects parameters can be controlled (other than using the normal effect editing keys):

- 1) MIDI - Effects parameters can be "patched" to virtually any MIDI controller, including mod wheel, pitch bend, and note messages.
- 2) The Function Generator - Effects parameters can be patched to the internal function generator of the H3000. The function generator is basically an LFO (low frequency oscillator) that can produce various waveforms and triggered functions.
- 3) Soft Functions - Soft Functions are custom parameter controls which allow the user to control more than one effect parameter simultaneously. Once defined, these functions appear on the display and are controlled in a similar manner to the standard parameters.

Patching Parameters for Modulation

The following example uses the Layered Shift algorithm. If you plan to follow along, first load Layered Shift (program #101).

To set up a parameter modulation patch, press the "FUNCTION" key twice. The display will show this menu:

```
Modulation of Parameters
( Patch ) (SoftFunc) (FuncGen ) (Control )
```

To begin patching, press (Patch). Initially, there will be nothing patched. The display will show:

```
[ pitch -> Patch is disabled
[ Parmtr ] ( Source ) ( range ) (per note)
```

Press (Parmtr) to select the effects parameter to be controlled. (Note: see the factory program description for a list of controllable parameters.) Turning the knob will scroll through the list of controllable parameters.

Press (Source) to select the controller which will be patched to the effect parameter. Turning the knob will scroll through the available controllers. This list contains all the MIDI controllers, the "Soft Functions" and the function generator. As you turn the wheel you may notice softkeys appearing and disappearing. These keys are used to adjust certain parameters of the controllers. If you've pressed any other softkeys (to adjust the controller parameters), pressing (Source) will get you back to selecting a controller. See Appendix A for a more complete description of the controllers and their settings.

Turn the wheel until the desired controller is shown on the display. Turn the knob to the end of the list.

The display should show:

```
l pitch -> Function Generator  
[ Source ] ( Done )
```

This will patch the function generator to the l pitch parameter. Press (done) to make the patch. The display will show:

```
l pitch -> Function Generator  
( Parmtr ) ( Source ) ( range ) (per note)
```

The (range) and (per note) keys determine how much the controller changes the effect parameter. Press (range) and the display will change to:

```
l pitch ->mod range: 1200 [ 0/note ]  
( Parmtr ) ( Source ) ( range ) (per note)
```

The first number (the range) shows how much the effect would change if the controller changed over its full range. In this example, if the function generator changed from zero to maximum, the pitch would increase by 1200 cents.

The second number shows how much the smallest change in the controller data would change the pitch. This is mainly used for MIDI notes. When MIDI notes are patched to a parameter, the "per note" value shows how much the parameter would change for each half-step. To adjust the range in half-step increments, press the (per note) key.

In some cases, instead of (range) and (per note), the softkey (amount) will appear. Like range, (amount) will control the depth of modulation, with the exception that the value shown is the percentage of the parameter's adjustment range.

To see the effect of all this, go into the edit mode and look at the 'l pitch' parameter. (Press the "PARAMETER" button and then press the (l coarse) softkey.) You should see the pitch value changing in the display. See the section on the function generator to change the function type or frequency.

It is important to realize that the setting of the effects parameter through the front panel works together with the controller. Setting the parameter from the panel gives a "base" setting which the controller either adds to or subtracts from.

Patching to Trigger Parameters

So far, we have tried to keep things simple by talking about modulating the "parameters". Some parameters, though, have no values. These parameters usually trigger events. An example of trigger parameters are the trigger keys in the "Stutter" algorithm.

To patch these trigger parameters to controllers, follow the procedure outlined above, with a small difference. When a trigger parameter is selected to be patched, there will not be any scaling softkeys (Range, Per note, Amount). Also, there will be a different list of controllers to select from. See Appendix A for a complete description of the trigger controllers.

Soft Functions

As mentioned above, you can define your own soft keys. These are called "Soft Functions". To use a Soft Function, simply patch it to an effects parameter. To adjust the soft function, press the "FUNCTION" key once. The soft function key will appear on the menu line. It is adjustable just like a parameter.

There are four soft functions available for patching. The first page of the "FUNCTION" key menu is dedicated to the four soft functions. When a soft function is first patched, the menu will display the key as "Knob 1", "Knob 2", etc. These names can be edited to display anything you like.

To edit a soft function, get back to the modulation main menu by pressing "FUNCTION." The display should show this:

```
Modulation of Parameters
( Patch ) (SoftFunc) (FuncGen ) (Control )
```

Now press (SoftFunc) to edit a soft function:

```
Soft 1 is " Knob 1 " Sens= 100 Pol = +
[ Select ] ( Name ) ( Sens ) (Polarity)
```

Press (Select) to select the knob you wish to edit (Knob 1 through Knob 4). Press (Name) to edit the name of the Soft Function. The display will look like this:

```
Soft 1 is " Soft 1 " Sens= 100 Pol = +
( <--- ) ( ---> ) ( Done )
```

Editing the name works just like saving a preset (see "Saving an Edit"). When you are finished press (Done).

Press (Sens) to adjust the resolution of the knob. This allows you to tailor the "feel" of the knob to the parameter that you want to control. Higher settings of sensitivity allow you to adjust the parameter more finely, but require a few turns of the knob to cover the full range of adjustment. Lower settings will give you coarser control over the parameter, but will allow quick changes.

(Polarity) will select whether the softknob's range is 0 to 100 (+) or -100 to 100 (+-).

The Function Generator

You can modulate parameters automatically with the Function Generator. Once you have patched a parameter to the Function Generator, get back to the Modulation Main menu by hitting "FUNCTION". The display should show:

```
Modulation of Parameters
( Patch ) (SoftFunc) (FuncGen ) (Control )
```

To adjust the Function Generator, press (FuncGen). You will get this display:

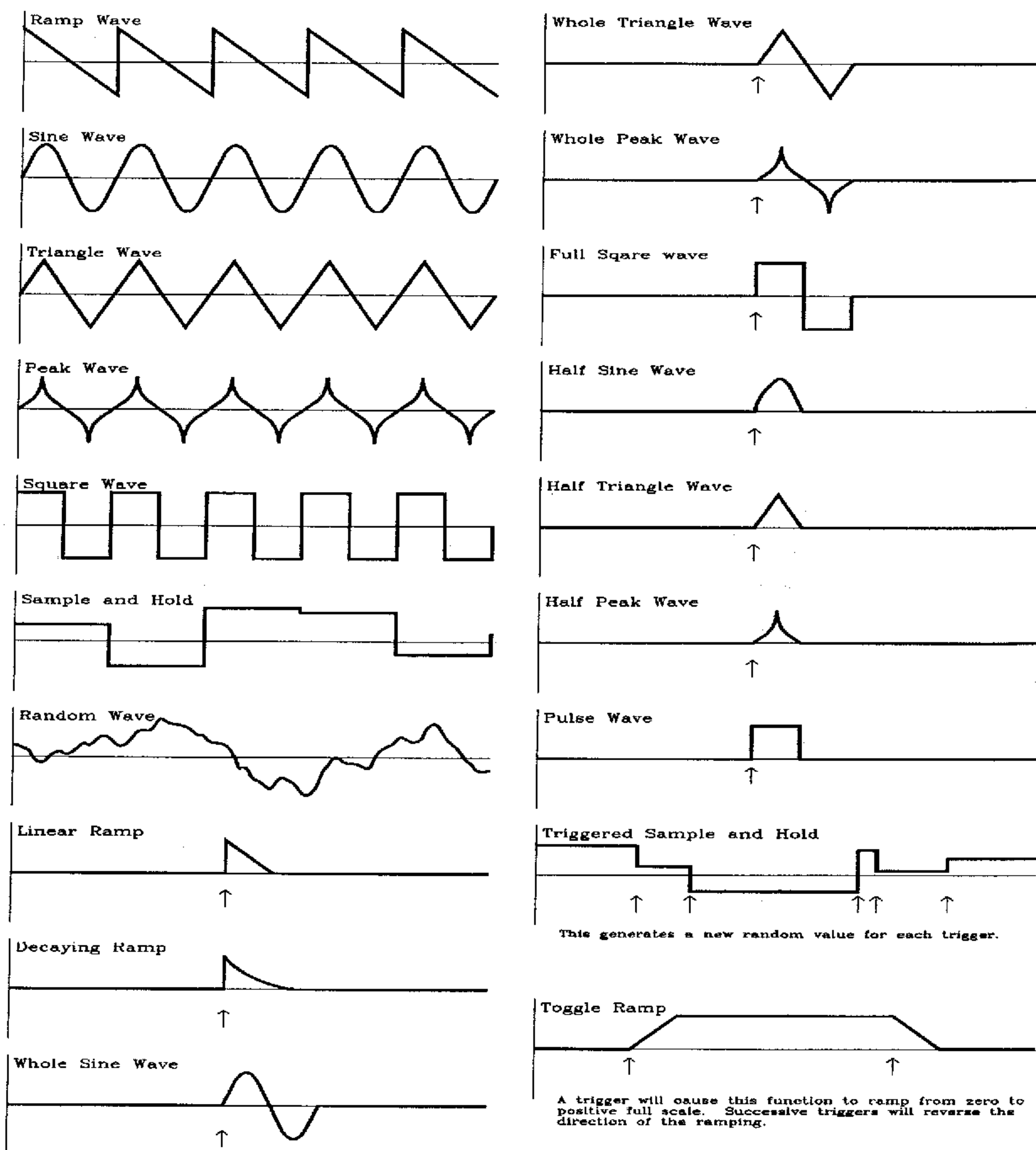
```
Function Generator Parameters
(Function) ( Amount ) ( Rate ) (Trigger )
```

Press (Amount) to adjust the amplitude of the function output. It is in per cent of full scale. Keep in mind that some function types go both positive and negative. This parameter can also be modulated, usually by a soft function.

Press (Rate) to adjust the frequency of the function. This parameter can also be modulated, usually by a soft function. For kicks try patching this parameter to the function generator (you'll get FM type waveforms).

Pressing **(Trigger)** will trigger a one-shot function or restart a continuous function. To activate the trigger from a soft function or through MIDI, patch "FuncTrig" to your desired trigger.

Press **(Function)** to select the type of function. Turn the wheel to scroll through a list of the function types. The function types include continuous functions and one-shot (triggered) functions. See the diagrams below for the function types:



Modulation Control

At times you may wish to disable the modulation of parameters. You can do this by hitting the **(Control)** soft key in the modulation of parameters menu. You will get:

Control of Parameter Modulation
(Mod= On) (ModReset)

Pressing **(Mod= XXX)** will toggle parameter modulation. **(Mod= On)** means modulation is enabled and **(Mod= Off)** means it is disabled. Modulation is automatically enabled when a program is loaded.

Disabling modulation does not reset parameters to their unmodulated states, it only prevents any more changes in modulation. To set all of the modulations to zero, press **(ModReset)**.

Introduction to MIDI

What is MIDI?

MIDI stands for Musical Instrument Digital Interface. That's quite a mouthful. What it means is that there is now a way for musical devices to talk to each other. MIDI was originally devised by a group of synthesizer manufacturers to allow one keyboard or sequencer or computer to control any other keyboard or sequencer or computer in a standard, foolproof way. It has since become so well accepted that just about any imaginable musical (or not so musical) device now comes equipped with a MIDI interface.

MIDI and the Ultra-Harmonizer

So what can MIDI do for us? The simplest and most intuitive use for MIDI with the Ultra-Harmonizer is to change effects programs remotely, on the fly, or automatically in a computer-sequenced piece of music. This is accomplished by using MIDI program change. With MIDI program change, the H3000 can change its effect program every time a keyboard player changes a patch on his MIDI-equipped synth. Or, in a sequenced song, the sequencer could change the effect for different parts of the song. To find out how this works see the section on MIDI Program Change.

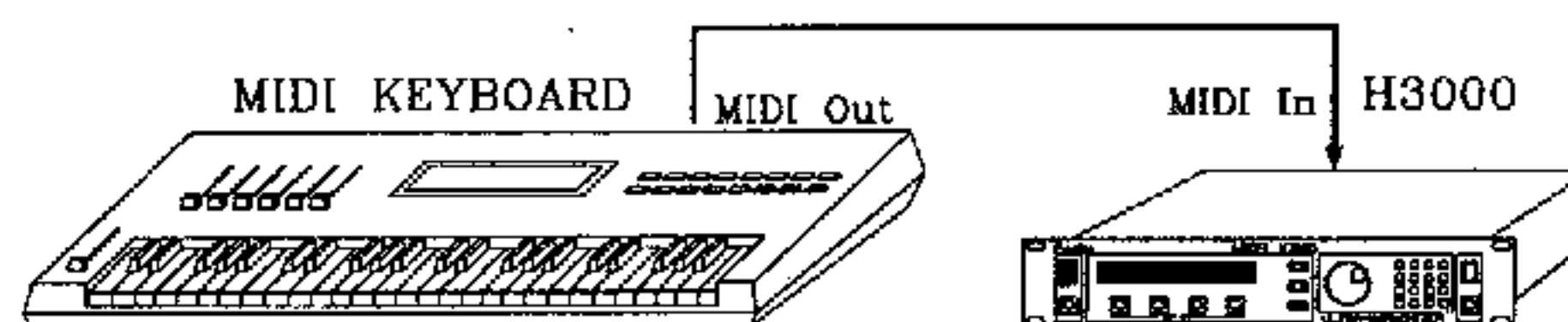
What else can it do? MIDI can be used to dynamically change parameters within a given program. For example, MIDI note commands could be used to set the amount of pitch shift on a pitch shift program. How about arpeggiating a live vocal performance? Or possibly using the modulation wheel on a synthesizer to control flanging rate or depth, or both at the same time? Maybe even have the decay time on a reverb change depending on what notes are being played on a keyboard? All of this and more is possible by using MIDI and the Ultra-Harmonizer. Interested? See the chapter on Parameter Modulation.

Can it do anything else? Yes. If you're a prolific effects programmer, and have come up with more effects programs than the Ultra-Harmonizer's memory can handle, MIDI can help you. Using the program dump feature and a MIDI-equipped computer you can store a virtually limitless number of effects on your computer's floppy disks (or hard disk). For more info, see the MIDI Data Dumping section.

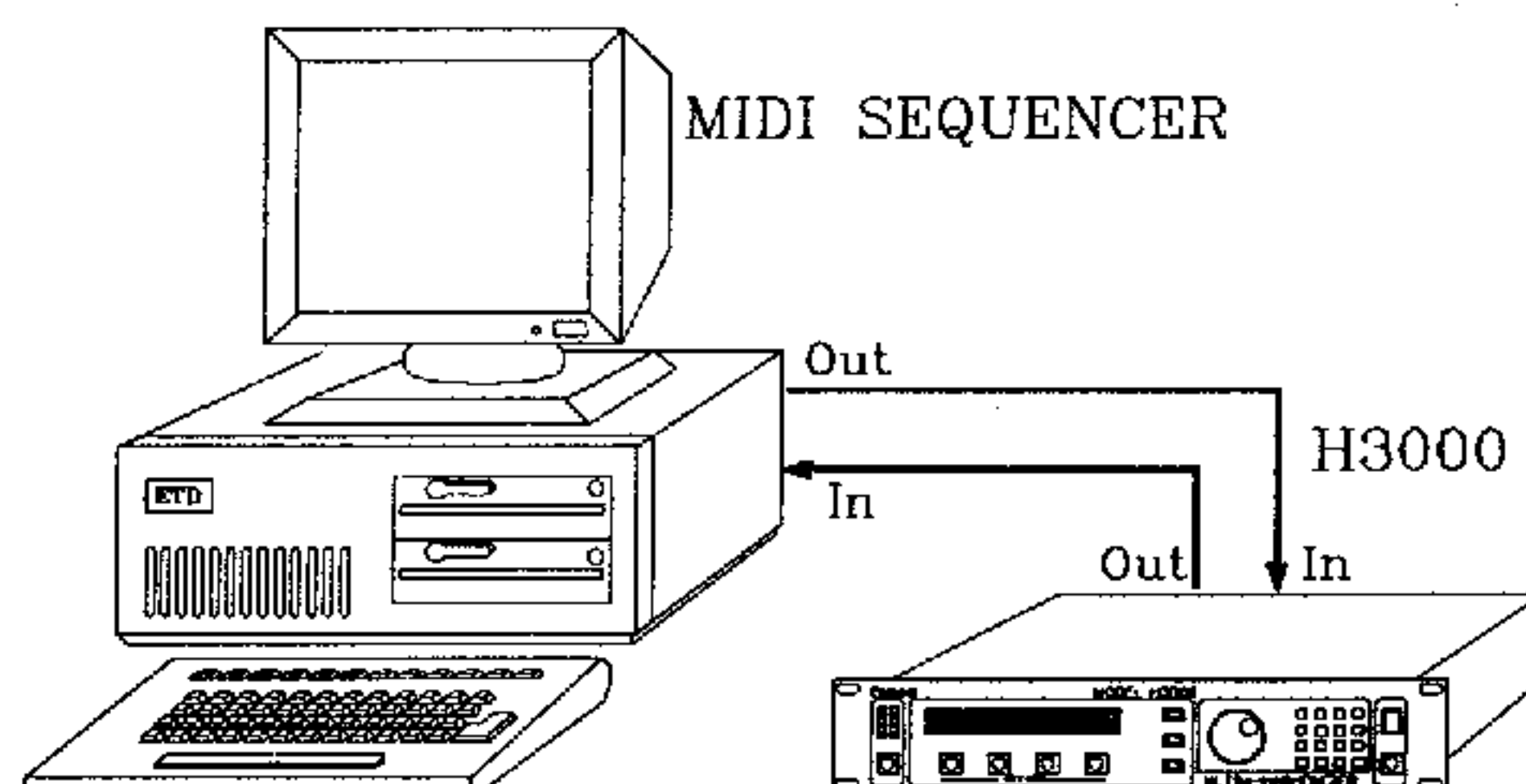
Using a sequencer, any sequencer, (we don't know of any that won't work), you can go through a song, load programs here, change the pitch there. Play the song back using the sequencer and the H3000 will repeat what you just did. Read the section on sequencing.

How to Hook up MIDI

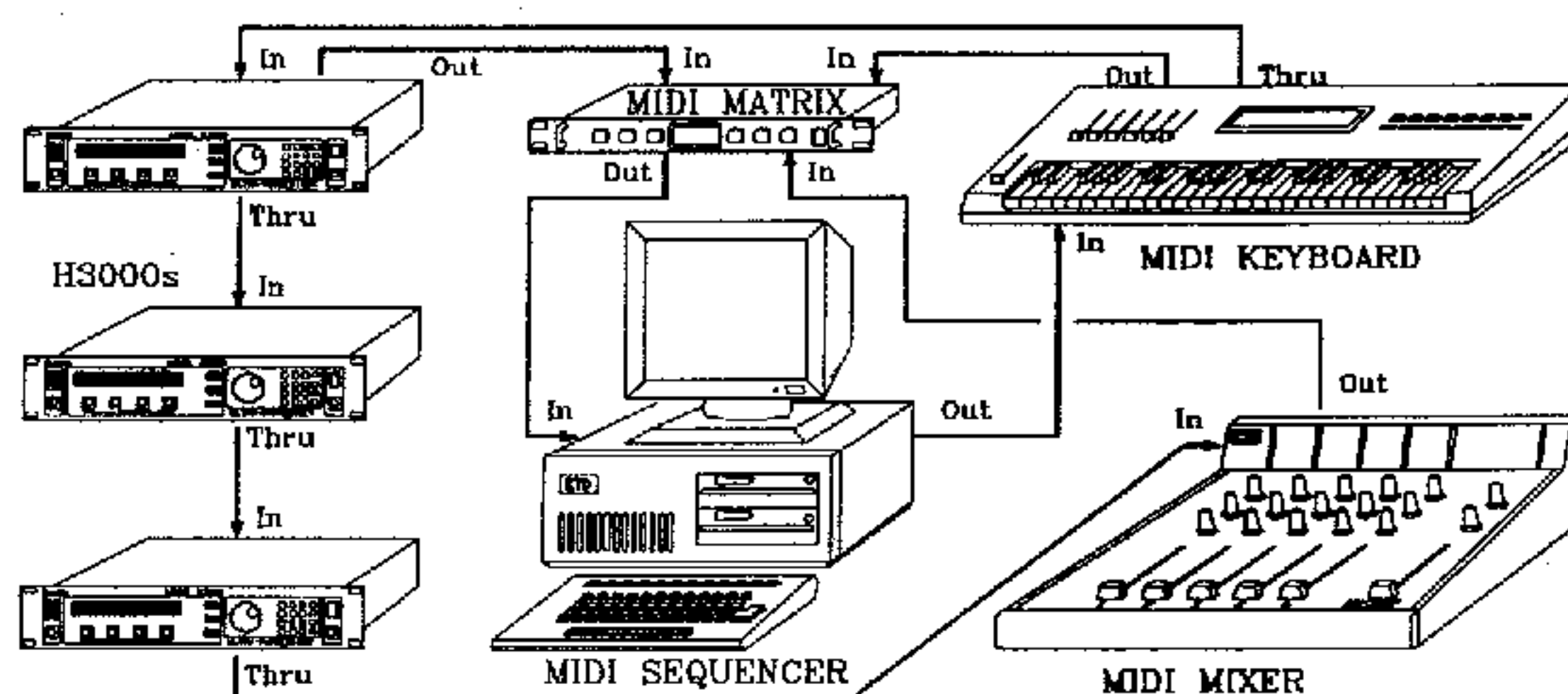
The easiest way to use MIDI is with the Ultra-Harmonizer and one MIDI synthesizer. To hook it up, simply use a MIDI cable to connect the MIDI Out of the synthesizer to the MIDI In of the Ultra-Harmonizer. With this setup you can use MIDI program change and have real-time (live) control over effects parameters.



A sequenced MIDI system would use a MIDI sequencer or MIDI-equipped computer and the Ultra-Harmonizer. With this kind of setup you could do sequenced program changes, sequenced parameter changing and MIDI program storage and retrieval. Connection is simple...



The ultimate could be everything mentioned above with the addition of multiple Ultra-Harmonizers, a MIDI equipped mixer, a MIDI switcher, and anything else you might imagine. The rest is left up to you.



Using MIDI

MIDI Receive Enable

Pressing the "FUNCTION" key three times will bring up the MIDI Functions menu. It should look something like this:

```
MIDI Functions
(Base= 7) (Omni=Off) (Rcv=On ) ( Expert )
```

(Rcv=On) is the master MIDI reception enable softkey. This lets MIDI data into the H3000. (Rcv=On) means yes, MIDI data will be received. (Rcv=Off) means no, the H3000 will not receive any MIDI data. However, the MIDI thru jack will still operate. Hitting the softkey will change "on" to "off" and back again.

MIDI Channel and Omni Mode

In order for MIDI to work at all, Omni mode must be on, or the MIDI channel number (base channel) of the sending device (synth or sequencer) must be the same as the MIDI channel of the H3000. To set the MIDI channel on the H3000 press the (Base= ..) softkey and turn the knob to set the channel number in the range 1 through 16.

Omni Mode is a special MIDI mode which allows a device to receive MIDI information on all 16 channels. It just ignores the channel number. To enable or disable Omni Mode hit the (Omni=xxx) softkey once, then again to change to on or off. When the key reads (Omni= On) the H3000 will ignore MIDI channel numbers. When the key reads (Omni=Off), the H3000 will respond to specific channel numbers.

See Appendix B for information about the "expert" MIDI functions.

MIDI Program Change

MIDI Program Change is a number sent out over MIDI from a MIDI synthesizer or sequencer. This number is sent out whenever a patch is changed on a MIDI synth. For example, loading patch 23 on a synth should send out a program change number of 23 over MIDI. Note: On some synths, the program number sent out is actually one less than the patch number on the synth. On a DX7 for example, pressing program 23 will send out a MIDI program number of 22.

To access the MIDI program load functions, press the "FUNCTION" button four times. The screen should look like:

```
MIDI Program Load Functions
( Map ) ( Pgm=ID ) ( Pgm=On ) (Bank= 0)
```

There are three ways the H3000 can deal with MIDI Program Change:

1. Do Nothing - Program Change is disabled. To disable MIDI Program Change, hit the third softkey until the text of the key reads (Pgm=Off). Program Change is enabled when the key reads (Pgm=On).
2. Load the program with the same number as the MIDI program number (a MIDI Program Change 23 from any synth would cause effect program 23 to be loaded). To have the H3000 respond in this way, hit the second softkey until the text of the key reads (Pgm=ID). Also, make sure Program Change is enabled; the third softkey reads (Pgm=on) and (Bank = 0).

3. Map the MIDI program number to some other H3000 effects program number. For example, a MIDI program change of 23 could load effect program 5, while MIDI program change of 24 could cause effect program 19 to be loaded. To have the H3000 respond in this way, hit the second softkey until it reads (**Pgm=Map**). Again, make sure Program Change is enabled.

Program Change Bank Select

When using the "ID" program change method, programs with numbers greater than 127 can be accessed by changing the bank number. To change the bank, press (**Bank= 0**) and turn the knob. When the bank number is set to 0, programs 0 through 99 will be loaded with program change numbers of 0 through 99. If the bank is set to 1, programs 100 through 199 will be loaded. If it is set to 2, programs 200 through 299 will be loaded, etc.

There are a couple of special cases:

For program change numbers of 100 through 127, the bank number is ignored (programs 100 to 127 will always be loaded).

To load the last edit, set the bank to 10 and send any program change number from 0 through 99.

See the section on "Sequencing" if you are interested in changing the bank number through MIDI.

Setting up the Program Change Map

If you want to use program change mapping, you'll first have to set up the map. To do that, press the (**Map**) softkey. You'll see a new display:

```
Midi Pgm # 0 Loads Nothing, Unpatched
( Number ) ( Name ) ( Clear )
```

This display shows that MIDI Program Number 0 loads nothing. To get MIDI Program 0 to load an effect, press (**Name**) and select the effect to be loaded. To set up other MIDI Program numbers, press (**Number**) and turn the knob. To clear the map, press (**Clear**).

Sequencing with MIDI

The H3000 can be hooked up to a MIDI sequencer so that front panel operations can be recorded and played back. This works with almost any sequencer. To set it up, press "FUNCTION" five times. The display should look something like this:

```
MIDI Computer and Sequencer Functions
(Seq= Off) ( Enables ) ( Dumps )
```

To set up the H3000 for sequencing, press (**Seq= Off**) to change the "Off" to an "On". Also, make sure that MIDI reception is enabled, (**Rcv=On**) on the "MIDI functions" page.

To try sequencing, connect the MIDI "out" of the H3000 to the MIDI "in" of your sequencer. Connect the MIDI "in" of the H3000 to the MIDI "out" of your sequencer. Start recording on your sequencer and then change programs, parameters, levels, etc. on the H3000. Stop recording and play the sequence back. The H3000 should repeat everything you just did.

Enables for Sequencing

When in sequence mode ("Seq=on"), you can customize what aspects of the machine get transmitted and received over MIDI. Normally, virtually everything done on the front panel will get transmitted and received. If you wish to change this, press (Enables). The display will show:

```
Enables for transmitting MIDI Sequences
(Lvls=Off) (Pgm= Off)      ( more )
```

Here is a description of the transmission parameters:

Lvls=On/Off: Turns on and off the transmission of front panel level changes and changes in the bypass control.

Pgm=On/Off: Turns on and off the transmission of program changes and parameter changes.

Press (more) to change the reception parameters. Here is a description of the reception parameters:

Lvls=On/Off: Turns on and off the reception of front panel level changes and changes in the bypass control.

Pgm=On/Off: Turns on and off the reception of program changes and parameter changes.

The Effect of Sequencing on MIDI Program Change

When sequencing is enabled, (Seq=On), and sequenced program reception is enabled, (Pgm=On), certain other parameters are automatically set to allow proper sequencing. Specifically, in the MIDI Program Change menu, the display will now show:

```
MidiProgramChange Functions <SEQUENCED>
( Map ) ( Pgm-ID ) ( Pgm=On- ) (Bank= 0)
```

The <SEQUENCED> indicates that the H3000 is in sequence mode and that certain conditions have been "forced". These conditions are:

MIDI Program Change reception is automatically enabled.

The MIDI Program Change patch map is disabled (the ID method is used).

These conditions are forced to ensure that sequencing will be done properly. Once sequencing is disabled (or sequenced program reception is disabled), these parameters will return to their previous settings.

MIDI Data Dumping

So, you've used up all the preset memory in your Ultra-Harmonizer and you don't want to throw away any of your wonderful programs. What can you do? MIDI Data Dumping on the H3000 will allow you to save your user programs on a MIDI equipped computer. You can also save your program change map with a MIDI data dump.

MIDI data dumping uses a special type of MIDI command known as System Exclusive. To take advantage of the MIDI data dump, you'll need a MIDI equipped computer and software which will recognize and save system exclusive data. Hook up the

MIDI OUT from the H3000 to the MIDI IN on the computer. Connect the MIDI OUT from the computer to the MIDI IN on the H3000. To dump data from the H3000, press the "FUNCTION" button five times. You should see this display:

```
MIDI Computer and Sequencer Functions
(Seq= Off) ( Enables )      ( Dumps )
```

Now press (**Dumps**):

```
Dump Data Functions
(DumpEdit) (Dump Pre) (Dump Map)
```

Press (**Dump Pre**) to dump all of the user programs over the MIDI OUT port. Press (**DumpEdit**) to dump the current edit. Press (**Dump Map**) to dump the program change map.

When the H3000 receives a preset dump, it will replace its current set of user programs with the new programs. **Be careful!! Make sure you have saved any valuable programs before sending the H3000 a MIDI dump!** The same is true for the program change map and for the current edit data dumps.

In the MIDI Expert section of this manual (Appendix B), you will find information about how to disable the H3000 from receiving data dumps. Also, there is a description of how to have several H3000s connected to the same computer.

A Final Word...

The information above is intended to allow you to use the H3000 with MIDI and to give you a description of the modes of MIDI operation of which it is capable.

Since MIDI is a relatively new phenomenon, you may have some questions.

If you are a MIDI novice, this entire discussion may be incomprehensible.

If you are a MIDI expert, you may have questions that we never thought of, and to which we have no immediate answers.

We hope we hit the right level for the majority of people who are likely to have purchased this product. If we didn't, here's what to do:

If you are a MIDI novice, buy a book or read some of the excellent articles on the subject published by the many magazines available to amateur and professional musicians, or by the magazines catering to the recording trade, both home and professional.

If you are a MIDI expert, EXPERIMENT. You can't damage the H3000 with MIDI input data. Just be sure you've saved your valuable presets first, and re-load them when you're done.

If you're a MIDI journeyman, you can do either of the above.

And, of course, you can always contact Eventide if you have specific questions about the H3000 MIDI implementation. We realize that the manual is neither 100% complete nor as detailed as it might be for every class of user. We want you to get full use and enjoyment out of your H3000. To this end, we urge you to WRITE to us if you have any questions about MIDI operation that are not resolved by the manual. We promise a quick reply, either answering your question, or at least explaining why it can't be answered. We regret that due to the specialized nature of MIDI inquiries we cannot answer your questions on the telephone.

When writing, please be as specific as possible, and tell us exactly what information you need that isn't covered (or is confusing) in the manual. An additional advantage of writing is that we will add your name to a specific list of MIDI Mavens who will irregularly receive updates which contain some of the interesting and useful questions and answers received from people like yourselves.

Appendix A - Parameter Modulation

The following is a list of the available modulation controllers.

Scaler-type Controllers

The following are used to control value type parameters like pitch, delay, decay, etc.

Modulation Wheel

Moving the Modulation Wheel can change the effect parameter. With the Modulation Wheel moved all the way backward (position zero), the amount of pitch shift, for example, will be at the point you last set. When you move the wheel forward, and if the range is positive, the pitch will go up (until the limit). If the parameter range is negative, the pitch will go down. In the MIDI Standard, this is controller number 1. It is also what we call a large controller meaning that there are coarse and fine controllers used in order to allow precise control. Some synthesizers send only the coarse signal.

Pitch Wheel Only

Most Pitch Wheels have a center position. This is position zero where there is no effect on the parameter. Rolling the Pitch Wheel forward will increase the parameter, rolling it backward lowers the parameter. If range is negative, the reaction will be opposite. The Pitch Wheel will affect the parameter both positively and negatively.

Pitch Wheel Positive

This only affects the parameter positively (with a positive range). Move the Pitch Wheel forward and the selected parameter will go up, center it and the parameter is back again. Now move the Wheel backward and the parameter will go up again.

First Note & PW

PW represents the Pitch Wheel sensitivity. A synthesizer Pitch Wheel rolled all the way up can raise the synth's pitch an octave or some small amount (Major 2nd) depending upon the Pitch Wheel sensitivity control on the synth. The H3000 has the same control. Changing the synth's pitch one octave with its Wheel could change the H3000's pitch parameter (for example) by only a half step. The number is the maximum halftones you can shift. You have a 10 cent resolution and a two octave maximum.

For simplicity's sake, let's assume the PW=0 (no Pitch Wheel). You're at the keyboard. No keys are pressed. We'll call this reset state. You press a key. This first key changes the value of the parameter. The higher the key the more change. The amount of change is based on the lowest note that MIDI knows about. Since most keyboards cannot play this note, you will never get back to no modification by playing notes. You may want to readjust the parameter so that with this particular key you get some amount of pitch shift (using our example). The way to do that is to play the note, then turn the knob on the H3000 to the pitch shift value that you want for that note. Now, lifting up on the key (reset state) the pitch change value will not change. You now press another different note. The pitch will change again. Pressing other notes while this note is down will do nothing. The first note after reset state is the note that will affect the parameter.

Last Note & PW

We now ignore reset state. The last key that has been pressed on the keyboard is used to change the parameter. Every time you press a different key, the parameter will change.

High Note & PW

Now we don't ignore reset state again. With no notes pressed, press a key. It acts like the first note. While holding down that key, press a key lower than the first key. Nothing happens. Press a key higher than the first key, the parameter changes! Lift the last key, nothing will happen. Press a key lower than the last key, nothing will happen. The change is determined by the highest key to be pressed after reset state. (Note, this is not necessarily the highest note currently being pressed.)

Low Note & PW

This is the opposite of the above. It's the lowest key to be pressed after reset state, (no keys pressed). You can use this to control two parameters, like right and left pitch shift on one keyboard.

Note Offset & PW

From no keys down (reset state) press a key. The amount of parameter change goes to zero. Press another key. The difference between the first key and the last key is the amount of change. This can be both positive and negative.

Quantity of Notes Down

The current number of keys pressed is the amount of change of the parameter. Lifting keys will affect the parameter. This control will usually need a large range setting.

First Note Velocity

Last Note Velocity

High Note Velocity

Low Note Velocity

Instead of using the placement of the key on the keyboard, we use how hard that key is struck. Which key is looked at is determined by the mode selected.

Note xxx Velocity

xxx is a specific key that you select. How hard this particular key is struck is how much the parameter changes.

First Note Pressure

Last Note Pressure

High Note Pressure

Low Note Pressure

Like velocity, the polyphonic pressure (aftertouch) determines the parameter changes. The particular key whose pressure affects the parameter is determined by the mode.

Note xxx Pressure

You select the key (number xxx). The pressure of that key changes the parameter.

Global Pressure

DX-7's and the like have global pressure (pressure on the entire keyboard). This ties that into the parameter.

Last Note Release

How fast the last key is released determines the change in the parameter.

Note xxx Release

Again, you select the key (number xxx). How fast that key is released alters the parameter.

Velocity and Release

How fast the last strike was or the last release determines the amount the parameter changes. This could be a measure of keyboard activity.

Breath Controller

Foot Controller

Expression Controller

GP Controller #1-8

These are the various MIDI controllers to which parameters can be patched. They are all large controllers except GP Controllers 5-8.

Breath Controller MIDI #2

Foot Controller MIDI #4

Expression Controller MIDI #11

GP Controller #1 MIDI #16

GP Controller #2 MIDI #17

GP Controller #3	MIDI #18
GP Controller #4	MIDI #19
GP Controller #5	MIDI #80
GP Controller #6	MIDI #81
GP Controller #7	MIDI #82
GP Controller #8	MIDI #83

Damper Pedal

Portamento Pedal

These are pedal controllers. Your synthesizer should send out 0 and max values for these, so the parameter is changed between two values (on or off).

Damper Pedal	MIDI #64
Portamento Pedal	MIDI #65

Notes Down Th(reshold)=xx

Last Note Velocity Th(reshold)=xx

Global Pressure Th(reshold)=xx

These are like the controllers before that have the same names. The difference is that "Th=xx" is a threshold number. They act like off/on pedals, 0 or max (depending on how range is set). The "Th=xx" is the threshold where this change happens. "xx" is the threshold point. For instance, in Notes Down, "xx" is how many keys have to be pressed before the parameter changes.

MIDI Clock Frequency

With sequencers and drum machines, a timing clock is sent out over MIDI. The rate of this clock will alter the parameter. A faster clock, more of a change in the parameter. Note: You cannot reset the parameter if you are using this controller because it constantly updates the parameter. There is no channel number to the MIDI clock.

MIDI Clock Period

This acts as the reciprocal of MIDI Clock Frequency, the faster the MIDI clock, the lower the change. This controller is great to tie to delays. As you speed up the song, the delays will follow in time. This mode also cannot be reset.

Undefined Small 0-121

Undefined Large 0-31

The MIDI specification contains a large number of undefined controllers. In time, they will have new definitions. Also, some manufacturers use these for their own purposes. You can use these to tie parameters to any MIDI controller, so that in the future, you can take advantage of new ones.

Small is a single message MIDI controller. Large refers to MIDI controllers use two messages.

Soft Function 1

Soft Function 2

Soft Function 3

Soft Function 4

These are not MIDI. This is where you patch your own parameters. When a parameter is patched to a Soft Function, the name in the quotes appears as a Softkey when you press the "FUNCTION" key. Hitting the soft key and turning the knob allows you to modulate the parameter that you patched. It's like putting the Modulation Wheel on the front panel of the H3000. See the section on Soft Functions for more information.

Function Generator

This will modulate the parameter automatically. It's like someone turning the modulation wheel for you. See the section on the Function Generator for more information.

Program Specific Modulators

The current program may add some controllers. Certain programs have information that could be useful for modulating parameters (Input Pitch, Amplitude, etc.) These will appear as you scroll through the list.

Trigger-Type Controllers

These are used with trigger-type parameters. They are events that will trigger something to happen in the H3000.

First Note

The first time you hit a note after no notes are down will trigger something to happen.

Last Note

Every time a note is struck on the keyboard the trigger happens.

Note xxx only

Whenever a specific note is hit (xxx) the trigger occurs.

Note xxx above

Whenever the note or a note above the specified note is hit, the trigger occurs.

Note xxx below

Similar to above, whenever the note or a note below is hit, the trigger occurs.

Soft Function 1

Soft Function 2

Soft Function 3

Soft Function 4

This is where you patch your own parameters. When a parameter is patched to a Soft Function, The name in the quotes appears as a Softkey when you press the "FUNCTION" key. Hitting the soft key causes the trigger to happen. See the section on Soft Functions for more information.

Function Gen.

This patches the trigger to the Function Generator. You can have the trigger occur when the value of the function generator rises (or falls) above (or below) a certain value. A threshold adjust picks where on the wave you want to trigger, The polarity selects if the wave should be rising (Up) or falling (Down).

Damper Pedal

Portamento Pedal

These are pedal MIDI controllers. Depressing one of these pedals will cause the trigger.

Damper Pedal MIDI #64

Portamento Pedal MIDI #65

Notes Down Th(reshold)=xx

Last Note Velocity Th(reshold)=xx

Global Pressure Th(reshold)=xx

These are like the controllers before that have the same names. The difference is that "Th=xx" is a threshold number. Whenever the threshold is crossed from below, the trigger occurs. "xx" is the threshold point. For instance, in Notes Down "xx" is how many keys have to be pressed before the parameter changes.

Undefined Small = xxx

This is for pedals or other MIDI controllers. When the value of the controller rises above half the full scale value, the trigger occurs. xxx is the controller number. The controllers are considered one byte MIDI controllers.

Program Specific Modulators

The current program may add some controllers. Certain programs recognize events that could be useful for triggering. These will appear as you scroll through the list.

Specifiers For Modulation Modes

Ch+

This is a number representing a MIDI channel offset. The number shown is added to the base channel. If the sum exceeds 16 then 16 is subtracted from the number (it wraps around). If Omni mode is ON, this has no effect as MIDI channel will be ignored.

PW=

This is the Pitch Wheel sensitivity. It is in semi-tones and it is the maximum shift the pitch wheel will give you. The number has a 10 cent resolution.

Note

Just the word followed by some text usually refers to a specific note. Moving the Wheel will change the text. The text is two parts, on the right is the note and its number. An x instead of a number indicates a note in the lowest octave that MIDI addresses. On the left will occasionally appear text that gives you a reference. All A notes have a frequency and "Mid" refers to Middle C.

Th=

This is a threshold. It will be a number from 0 to 127. It divides the possible values into 128 and you pick which point is the threshold. A special case is with the Function Generator. Here, the value is from -100 to 100 and is a percentage of full scale.

Up / Down

This is used with the Function Generator trigger. It specifies if the trigger occurs when the value of the Function Generator rises above the threshold (Up) or when the value falls below the threshold (Down).

"xxxxxxx"

With Soft Functions, this is the current name of the Softkey for this Soft Function. See the section on the Soft Functions for more information including how you can change this name.

Appendix B - Expert MIDI

Like the programs, MIDI has an expert mode. Hitting the "FUNCTION" key three times should get the MIDI System Functions menu. Press the (Expert) Softkey to get this display:

```
System Exclusive Functions
(Dev = 0) (SysX=On)      ( more )
```

These are functions that deal with MIDI System Exclusive in the H3000.

The (Dev = 0) softkey allows you to set a number from 0 to 99. The data dump functions of the H3000 use the MIDI System Exclusive command. This command information is similar to channel numbers. Your H3000 will respond only to System Exclusive information that was meant for EVENTIDE equipment and containing this number. This allows you to set up lots of H3000s (up to 100, to be exact) and direct messages to a specific one. Normally this is left at zero when only one H3000 is being used. Set this number uniquely for each H3000 you are using.

The (SysX=On) is an enable for reception of Eventide System Exclusive information. Pressing this will change the "On" to "Off", thus preventing any Eventide System Exclusive information from being accepted. This includes dumps to the H3000. Note, this will not stop Universal System Exclusive information, such as bank select.

Press (more) for another MIDI Expert menu:

```
Expert MIDI Functions
(MIDI-mon) (Err= Off)    ( more )
```

These functions are for finding problems that you may have with MIDI.

Pressing (Err= Off) will do nothing. It will stay "Off". If the H3000 detects a lost MIDI information byte, it will read (Err= On). Pressing the softkey then will change the "On" to a "Off".

Pressing the (MIDI-Mon) softkey will put you into the MIDI Monitor. The display will look something like this:

```
MIDI Input in Hex, Bypass to Esc T= 470
F0 2E 45 F1 45 3A F8 F1 37 3E F0 45 00
```

This function monitors the MIDI input data stream. The last 13 bytes are on the bottom line with the most recent data on the right. The numbers are in Hexadecimal. Hexadecimal is easy to use when looking at the bytes of MIDI. You will need a MIDI specification document in order to know what the data means. "T=xxx" is a monitor of the MIDI Timing Clock. The number is related to the frequency of Time Clocks (F8) that are received. The actual number is based on an internal function of the H3000. Also, if the timing clocks stop, the number will not go to zero. This function is provided in order to give you a way to see that the H3000 is receiving data and timing clocks. You can also see the nature of the data received and, if you spend some time, see what your synths are putting out. As we were designing the H3000 we occasionally found this a useful function to diagnose problems.

To leave the MIDI Monitor, press the bypass switch twice. This will take you back to the expert functions.

Press (more) for another MIDI Expert menu:

Fixes for MIDI Problems
(Off=Both) (Bank=SyX) (more)

This menu deals with fixing some problems with MIDI.

Pressing **(Off=Both)** will allow you to select three modes; **(Off=both)**, **(Off=zero)** or **(Off=Off)**. These refer to what the H3000 recognizes as a note off command in MIDI. Some synths send a MIDI Standard Note Off command (with a release velocity). Some synths send a Note On command with an attack velocity of zero. There have been reports of naughty synths that send both. For most tone generators and synths, receiving this is not a problem. With the H3000 it may be a problem with controllers that use keys. If you are experiencing "weirdness" with some of the controllers, setting this to something other than "Both" might help. What you select is what the H3000 will recognize. Don't select Both if you know your synth sends both. **(Off=Off)** means a bona fide Note Off command. **(Off=Zero)** is a Note On with Velocity Zero. Of course **(Off=Both)** means that it will recognize either, and for most synths you won't have to bother with this function.

Pressing **(Bank=SyX)** will change the soft key to **(Bank=Par)**. This is a fix so you can use the H3000 with old sequencers. When you are sequencing and you load a program, the H3000 will send out a bank select command, and then a program load command. At the time of writing, the proposed method for doing a bank select uses MIDI Universal System Exclusive message. Most sequencers should be able to record and playback this message. However, since this is recent, some older sequencers will not since they ignore all System Exclusive messages. (There was a time when there were no Universal ID's.) To fix this problem, we have provided the ability for the H3000 to send out its bank select as a Non-Registered Parameter Change. Since this is a bunch of controller commands, just about every sequencer can record them and play them back. When the softkey is **(Bank=Par)**, the H3000 will send out the bank select as a parameter change. The H3000 will respond to either message.

Note: The System Exclusive bank select will probably be MIDI Standard. This is what you should be using to keep your system "modern".

Appendix C - MIDI Sequencing Details

MIDI Parameter Numbers

The H3000 uses the MIDI parameter system to do sequencing and controlling. This system uses certain controllers to specify parameter numbers and data. Two controllers are the MSB and LSB of the data value to be written into the parameter. Another two are used to define a Registered Parameter. This is a parameter that all of MIDI-dom has decided will have this function. Another two controllers are for non-registered parameters. These are not defined as any specific function. They can change and vary with application. Further, two controllers are used to increment and decrement the data value of the parameter.

The H3000 only uses non-registered parameters and does not support the data increment and decrement functions. The actual parameter numbers vary depending on what application program is running on the H3000. Another detail is that contrary to the MIDI spec, the parameter is only changed when the LSB of the data value is received. This was necessary in order to prevent glitches in the parameter value from being heard.

When a parameter is changed, the following message is put out (one line per byte).

Controller at the base channel
Controller number 99
The MSB of the non-registered parameter number
Controller at the base channel
Controller number 98
The LSB of the non-registered parameter number
Controller at the base channel
Controller number 6
The MSB of the data value
Controller at the base channel
Controller number 38
The LSB of the data value

It should be mentioned that LSB and MSB actually refer to 7 bit bytes. The two are combined to form 14 bit numbers. The H3000 goes even further and considers the 14 bit data value to be two's complement in that if the highest bit of the MSB is high, then the number is negative.

The actual parameter numbers will vary according to the program running on the H3000. You will find this information in the section dealing with the appropriate program.

There are some parameters' numbers that will always be the same. These are for the system.

Left input attenuator is 8192 (2000H)
value is from 0 (on) to -48 (off)

Right input attenuator is 8193 (2001H)
value is from 0 (on) to -48 (off)

Left output attenuator is 8194 (2002H)
value is from 0 (on) to -48 (off)

Right output attenuator is 8195 (2003H)
value is from 0 (on) to -48 (off)

Bypass relay is 8196 (2004H)
value from 0 (bypassed) to 1 (through the H3000)

Program Bank number is 8197 (2005H)
value from 0 to 10
(0 through 9 is first digit of H3000 program number, 10 is last edit)

Soft Function 1 scaler is 8208 (2010H)
value from -5000 to 5000 (50 * displayed value)

Note: due to limitations in MIDI, this is 1/2 the resolution of which the knob is capable.

Soft Function 2 scaler is 8209 (2011H)
value from -5000 to 5000 (50 * displayed value)

Soft Function 3 scaler is 8210 (2012H)
value from -5000 to 5000 (50 * displayed value)

Soft Function 4 scaler is 8211 (2013H)
value from -5000 to 5000 (50 * displayed value)

Soft Function 1 trigger is 8212 (2014H)
any value will trigger

Soft Function 2 trigger is 8213 (2015H)
any value will trigger

Soft Function 3 trigger is 8214 (2016H)
any value will trigger

Soft Function 4 trigger is 8215 (2017H)
any value will trigger

Function Generator type is 8216 (2018H)
value 0 through 20 (type position as scanned)

Function Generator frequency is 8217 (2019H)
value 0 through 2000 (Hz * 100)

Function Generator amplitude is 8218 (201AH)
value 0 to 100 (displayed value)

Function Generator trigger is 8217 (2019H)
any value will trigger

MIDI Program Change

When you are sequencing and you load a program, the H3000 will send out first a Bank Select and then a MIDI Program Change command. Both numbers form the ID of the program that was loaded. The Bank Select number is the first digit (0 through 9) and the Program Change is the last two digits (0 through 99). When moving a change of program around with your sequencer, you must move both commands.

When you load Last Edit, a Bank Select of 10 is sent with a program change of 0. The Bank Select is sent one of two ways. The proposed MIDI Standard way is a Universal System Exclusive Real Time message. There is also a non-standard way using a parameter change command (see above). You can select which way you want in the MIDI Expert section.

The standard Bank Select message looks like this:

```
hex: F0 7F nn 02 01 0c 00 00 00 00 0b 00 F7
dec: 240 127 0nn 002 001 0cc 000 000 000 000 00b 000 247
```

where:

- nn is the device number (see MIDI Expert section)
- c is the channel number (0 through 15 for 1 through 16)
- b is the bank number (0 through 10)

If a Program Change command with a number of 100 to 127 is received, then the Bank Number is ignored and program 100 through 127 is loaded.

MIDI Volume

MIDI Volume is implemented. MIDI Volume is Controller number 7. We only recognize changes with the most significant byte.

When you first turn on the unit, MIDI Volume is assumed to be full scale. It is then set to a value when a MIDI Volume message is received. The MIDI Volume will scale the Output Levels.

Appendix D - MIDI Implementation Chart

	Function	Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1-16 1-16	1-16 1-16	
Mode	Default Messages Altered	Mode 2 X	Mode 2 or 4 Mode 2 or 4 X	1
Note Number	True Voice	X	0-127	
Velocity	Note On Note Off	X X	0X 0X	
After Touch	Keys Ch's	X X	0X 0X	
Pitch Bender		X	0X	
Control Change	Mod Wheel Damper Pedal Portamento Pedal Breath Controller Foot Controller Expression General Purpose 1-8 Undefined Small 1-12 Undefined Large 1-31	X X X X X X X X X	0X 0X 0X 0X 0X 0X 0X 0X	2
Program Change	True Number	0-127	0-127	3
System Exclusive		0X	0X	
System Common	Song Position Song Select Tune	X X X	X X X	
System Real-time	Clock Commands	X X	0X X	
Auxiliary Messages	Local On/Off All Notes Off Active Sensing Reset	X X X X	X X X X	

Mode 1: OMNI ON,POLY

Mode 2: OMNI ON,MONO

Mode 3: OMNI OFF,POLY

Mode 4: OMNI OFF,MONO

X: Yes

0: No

0X: Switchable

Notes:

1. Defaults to mode set before power off.
2. Controllers can be patched to selected effects parameters.
3. Program change numbers can be patched to any effects program.

The H3000 uses unregistered parameter change commands to transmit and receive parameter, input/output level and bypass control commands. This allows the front panel functions to be sequenced with any MIDI sequencer.

Appendix E - MIDI Dump Requests

A computer hooked up to the MIDI input port can order the H3000 to perform dumps over the MIDI output port. The computer can do this by sending messages to the H3000. These messages are called System Exclusive messages. In the beginning of each message are some bytes that are called the leader.

The leader bytes are:

sysex start	manuf.ID	model code	device number	route code
F0H (240)	1CH (28)	60H (96)	xx=dev. num.	0

Device number is selected from the front panel. It is used so that you can have several H3000s connected together.

The route code should always be 0.

After the leader are bytes that tell the H3000 which type of dump to perform. Immediately after the last byte is sent, the H3000 will start dumping.

DUMP EDIT

This routine dumps the program that is currently loaded.

in hex: 7CH 46H 45H 34H 36H 42H 43H

in decimal: 124 70 69 52 54 66 67

DUMPPRESETS

This routine dumps all of the user presets.

in hex: 7CH 46H 45H 34H 32H 43H 30H

in decimal: 124 70 69 52 50 67 48

DUMPPATCH

This dumps the program change patch map.

in hex: 7CH 46H 45H 34H 34H 42H 45H

in decimal: 124 70 69 52 52 66 69

An example of a complete dump request is:

(attention device 1, dump all of your presets)

Hex: F0H 1CH 60H 01H 00H 7CH 46H 45H 34H 32H 43H 30H

decimal: 240 28 96 1 0 124 70 69 52 50 67 48

Appendix F - Clearing RAM

Under certain rare conditions, the user program memory may become corrupted (from corrupted data dumps, bugs in our program, etc.) To return the H3000 to a normal operating state, you may need to clear the memory and begin with a clean slate. We have provided a way for you to do this.

Beware! This will remove all of your presets. Before doing this, make sure that clearing the memory is absolutely necessary.

Here is the procedure:

- 1 - Turn off the H3000.
- 2 - Hold down the "FUNCTION" key.
- 3 - While holding down the "FUNCTION" key, turn on the H3000.

You will then see this message:

```
Remove all presets ?  
      ( Yes ) ( No )
```

Now, if you really want to remove all of your presets, press (Yes). Otherwise press (No).

Next you will see this:

```
Reset the Operating System ?  
      ( Yes ) ( No )
```

This sets all of the enables, channel numbers, etc. to the way they were when you first got the unit. If you want to do this, press (Yes).

The memory should now be clear and the H3000 will restart itself.

Appendix G - Tips and Tricks

Loading Programs

To load a specific program, instead of using the knob or up/down keys, simply enter the program number with the keypad.

To load the program press "Load" or press the enter key on the keypad.

Adjusting Contrast

Any time you press the "FUNCTION" key, you will be able to adjust contrast. Nothing on the display will say so, but if the knob isn't doing anything else, it will adjust contrast.

Editing Names

When you are editing a program or soft function name, the keypad can be used to easily add a number into the name. Just press the number you want to enter and it will appear on the display. Also, a quick way to get a space is to press "9" and then press the up arrow.

Good Pitch Shifting

For the best quality pitch shifting, here are some things to consider. Single notes pitch shift best. To shift chords or program material, set the "Deglitch" settings to a low note range (something like D0 through D4). Also, narrow deglitch ranges work best. To shift a low note, lower the "high note" setting before changing the "low note" setting.

If you are using multiple effects, put the H3000 after any compression or distortion, but before any other effects.

Watch Your Ears

When adjusting feedback or reverb decay, be sure that you know what you are doing. In order to give you the widest range of effects, we allow you to adjust these parameters to values which might create a constantly increasing sound which could damage speakers, ears, etc. Usually, you would put a gate on the sound before that happens, but you should know how to do that before you start playing.

Generally, the danger occurs when you have decay with an "Infinity" sign in it, and when using feedback. Remember that, depending on the algorithm, feedbacks can add, so you might get problems even when it looks like there isn't that much feedback.

Control Several H3000s at Once

If you have several H3000s, you can hook them up so they all slave off of one master H3000. Just hook the MIDI OUT of the master to the MIDI IN of the slaves and enable sequence mode in all of the H3000s. Any program, parameter, level or bypass changes made on the master will now be made on the slaves.

Transferring Presets From One H3000 to Another H3000

By connecting the MIDI OUT of one H3000 to the MIDI IN of another, you can "Dump" a preset, or all the presets from one H3000 to another. Make sure that the "Device Number" is the same for both units and that (SysX=On), (see Appendix B). To send one preset to another H3000, first load that preset. Then go the dump menu and press (DumpEdit). The program is now the current preset in the other machine. Now on the other machine, save the preset. The preset is now in the other H3000.

A word of caution... If you press (Dump Pre), all of the presets from one H3000 will be sent to the other. Any presets in the receiving H3000 will be wiped out.

Selecting Modulation Sources

When patching modulation to parameters, instead of scrolling through the long list of modulation sources, you can use the keypad to quickly get you close to where you want to be. Pressing a number on the keypad will get you to a certain area in the list. For example, pressing 0 will get you to the beginning of the list, pressing 9 will get you to the end of the list, and pressing 5 will get you into the middle.

FM from the Function Generator?

If you look at the list of modulatable parameters in the "Patch" section, at the end of the list you will see parameters for the Function Generator. By experimenting with modulating the Function Generator with itself, you can get some interesting results. Make sure that the Function Generator's amplitude or frequency parameters never go to zero. In that case, the function generator will stop.

Appendix H - Version 2.X Enhancements

This version of the H3000 software contains many new features and some changes. Here is a brief description of what is new for this version:

Modulation of effect parameters has been expanded to include new MIDI modes and to take advantage of the new built in function generator and user-definable knobs.

We've included an on-board function generator that can be used to modulate most effects parameters. The function generator offers a variety of waveforms (sine, triangle, square, sample and hold, noise) and corresponding one-shot triggered waveforms.

You can now define your own effects parameters. The first page of the "FUNCTION" menu is dedicated to these "soft functions". Most of the factory programs have been modified to take advantage of this. Remember, press "FUNCTION" to get to the most relevant effect controls

Most programs will now allow you to store and recall input and output levels with the presets, but still retain master level control over the unit.

Data compression is now used when user presets are stored. This allows many more presets to be saved. Also, now you can find out how much room is left for presets.

We've implemented MIDI bank select (to allow sequencing of any program change, not just programs 0 through 127). Also, MIDI volume control has been implemented.

Warranty Information

LIMITED WARRANTY and other legal stuff, terms and conditions

The H3000 is built to exacting quality standards, and should give years of trouble free service.

If you are experiencing problems which are not cleared up (or explained as normal) in this manual, your recourse is this warranty.

WHAT THE WARRANTY DOES AND DOES NOT COVER

The H3000 is warranted for a period of one year against defects in material and workmanship. During this period we will repair or replace (at our option) the unit.

This means that if the unit fails under normal operation, because of parts that become defective, or because of defects in construction that later become apparent, (such as bad solder joints, PC traces, etc.,) we will repair the unit at no charge for parts and labor. We also assume a limited responsibility for shipping charges, as detailed below.

The warranty DOES NOT COVER damage or defects due to accident or abuse. The H3000 is a complex piece of equipment that does not react well to being dropped, bounced, crushed, soaked or exposed to excessively high voltages. If the unit becomes defective for these similar or causes, and the unit is deemed to be economically repairable, we will repair it and charge our normal rates.

It DOES NOT COVER shipping damage, either to or from Eventide. If you receive a new unit FROM US in damaged condition, notify us and the carrier; we will arrange to file an insurance claim and either repair or exchange the unit.

If you receive a new unit FROM A DEALER in damaged condition, notify them and the carrier.

If WE received the unit FROM YOU with apparent shipping damage, we will notify you and the carrier. In this case, YOU must arrange to collect on any insurance. We will await your instructions on how to proceed with the unit, but will charge for all repairs on damaged units.

WHO IS COVERED UNDER THE WARRANTY

The warranty applies to THE ORIGINAL PURCHASER from an AUTHORIZED EVENTIDE DEALER, providing that the dealer sold a NEW unit. DEMO units are also covered under warranty under slightly different circumstances (see below), and units that are USED, or have been used as part of a rental program, are NOT COVERED under any circumstances.

It is your responsibility to prove or to be able to prove that you have purchased the unit under circumstances that effect the warranty. A copy of your purchase invoice is normally necessary and sufficient for this.

If you have any questions about who is an AUTHORIZED EVENTIDE DEALER, call us.

UNITS WITH THE SERIAL NUMBER PLATE DEFACED OR REMOVED WILL NOT BE SERVICED.

WHEN THE WARRANTY BECOMES EFFECTIVE

The one-year warranty period begins on the day the unit is purchased from an authorized dealer, or, if the unit is drop-shipped from Eventide, on the day shipped, plus a reasonable allowance for shipping delays. This applies WHETHER OR NOT YOU RETURN YOUR WARRANTY FORM.

When we receive a unit, this is how we determine whether it is under warranty:

- 1: IF the unit was shipped within the past CALENDAR YEAR, we assume that it is, unless there is evidence to the contrary, such as its having been sold used, rented, etc.
- 2: IF the unit was shipped LONGER THAN A CALENDAR YEAR AGO, we assume it ISN'T UNDER WARRANTY UNLESS:
 - A: There is a warranty form on file showing that it has been purchased within the past year under appropriate conditions.
 - B: You send a copy of your purchase invoice indicating warranty status along with the unit.
- 3: If the unit was used as a DEMO, the warranty runs from the date that it was received by the dealer. The original purchaser gets the unexpired portion of that warranty.

When you send a unit for repair, you should indicate whether or not you believe it to be under warranty. IF YOU DO NOT SAY SO, AND WE CHARGE YOU FOR THE REPAIR, we will NOT REFUND unless the charge was caused by an error on our part. If you believe the unit to be under warranty and you DO SAY SO, but WE DISAGREE, you will not incur any charges until the dispute is resolved.

Reading the above, you can see that it is to your advantage to send in the warranty form when you purchase the unit. Also, if we know who you are, we can send you updates, notifications, and advise you of new products. It will also enable you to receive pre-shipment of parts discussed below.

WHO PERFORMS WARRANTY WORK

The ONLY company authorized to perform work under this warranty is EVENTIDE, Little Ferry, NJ. While you are free to give it to anyone, (or to work on it yourself), we will not honor claims for payment for LABOR or PARTS from you or from third parties.

HOWEVER, we and our dealers do try to be helpful in various ways:

- 1: Our dealers will assist, usually without charge during the warranty period in:
 - A: Determining whether there IS a problem requiring return to the factory.
 - B: Alleviating "cockpit error" or interconnection problems that may be preventing the gear from operating to its full capability.
- 2: We are available for telephone consultation if the dealer is unable to assist.
- 3: If a part fails during the warranty period, and you wish to replace it yourself, we will normally ship the part immediately at no charge providing your warranty form is on file. (We reserve the right to request that the defective part be returned.)

RESPONSIBILITY FOR WARRANTY-REPAIR SHIPPING

For us to work on your unit, it must be here. Shipping suggestions are given below. This section details who pays for it all.

SHIPPING WITHIN THE 50 UNITED STATES

You are responsible for getting it to our door at no cost to us. We cannot ACCEPT COD or COLLECT SHIPMENTS.

We will return it to you PREPAID, at OUR EXPENSE, using an expeditious shipping method, normally United Parcel Service. In areas not served by UPS we will ship by US Mail.

If you are in a hurry, and want us to use a PREMIUM SHIPPING METHOD (such as air express, next day air, etc.,) be sure you tell us so, and agree to pay shipping charges COLLECT. If you specify a method that does not permit collect or COD charges, remit sufficient funds to prepay shipping.

SHIPPING OUTSIDE THE UNITED STATES

If you purchased the unit from a dealer in your country, consult with them before returning the unit.

If you wish to return it to us, please note the following:

- 1: The unit must be PREPAID TO OUR DOOR. This means that you are responsible for all shipping charges, INCLUDING CUSTOMS BROKERAGE. When a unit is shipped to us it must be cleared through United States Customs by an authorized broker. YOU MUST MAKE ARRANGEMENTS for this to be done. Normally your freight forwarder has a branch in the US which can handle this transaction. We CAN arrange to clear incoming shipments for you. If you want our assistance you must NOTIFY US BEFORE SHIPPING GOODS for repair, giving full details of the shipment, and including a minimum of \$250.00 in US funds to cover the administrative and brokerage expenses. Any balance will be applied to the repair charges, or refunded. If a balance is due to us, we will request a further prepayment.
- 2: ALL SHIPMENTS WILL BE RETURNED COLLECT. If this is impossible because of shipping regulations, or money is due us, we will request prepayment from you for the appropriate amount.
- 3: All funds must be in \$US. Payment may be effected by checks drawn on any bank in the US, or by telegraphic fund transfer to our bank. If you send US Currency, be sure that it is sent by a method you can trace such as registered mail. If you wish to pay by Letter of Credit, be sure that it affords sufficient time for work to be performed and the L/C negotiated, and that it is free from restrictive conditions and documentation requirements.
- 4: WE RESERVE THE RIGHT TO SUBSTITUTE FREIGHT CARRIERS. Although we will attempt to honor your request for a specific carrier, it is frequently necessary to select a substitute because of difficulties in communication or scheduling.

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The Algorithms

There are many factory programs resident in the H3000. These programs are based a smaller number of *algorithms*. An algorithm is the digital signal processing equivalent of an analog circuit, such as a compressor, an equalizer, or an analog delay.

Each of these algorithms is versatile enough to give a wide variety of sounds. Our factory programs are just a starting point for your own imagination.

The following section describes each of the algorithms and their associated softkey-selected parameters. A list of the factory programs and their base algorithms is provided at the end of the manual.

Each parameter listed is preceded by a parameter number. These numbers are used for MIDI sequencing.

Algorithm 100 - Diatonic Shift

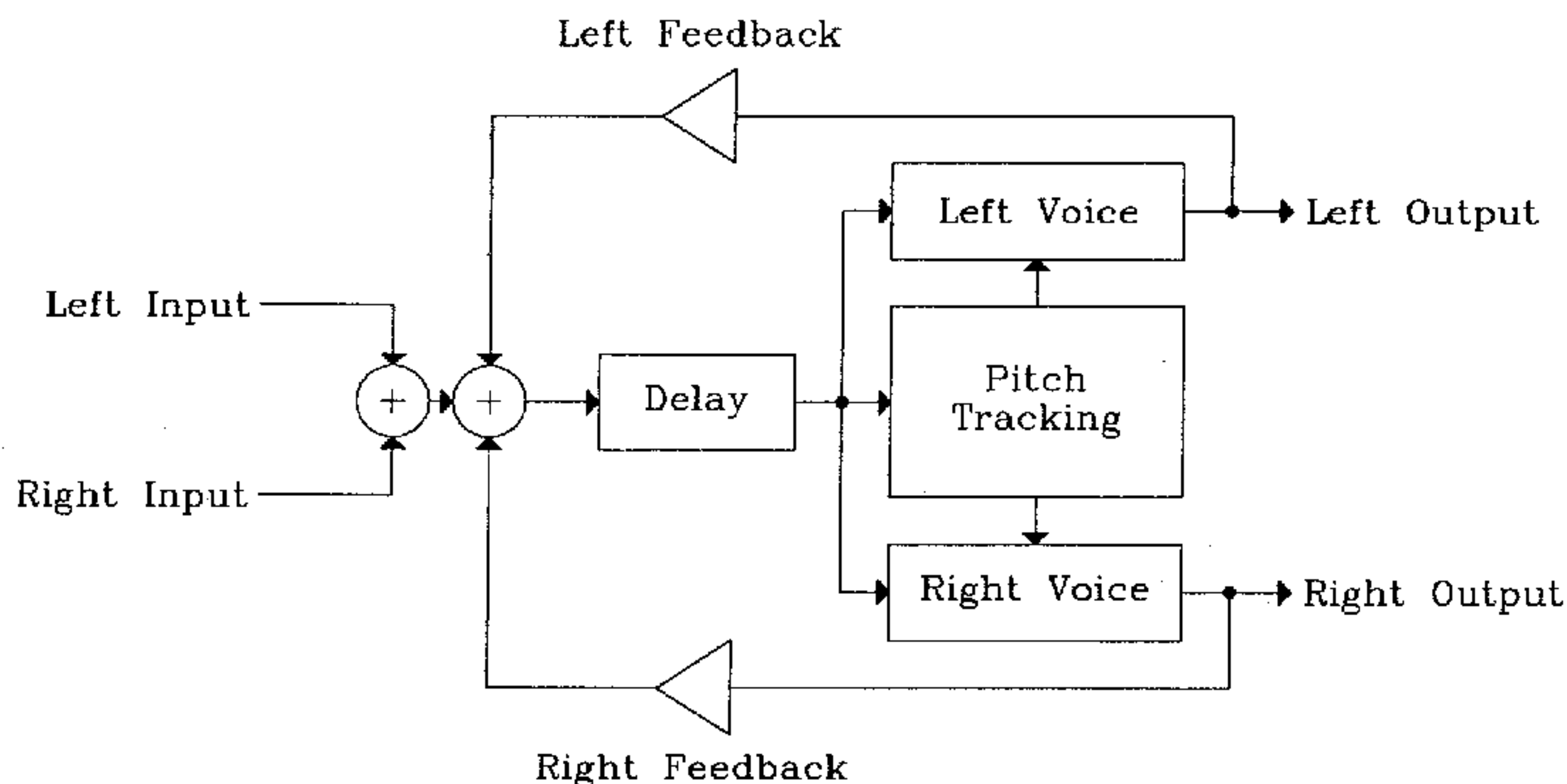
S • SE • B • B+ • B/LT • D/SX • D/SE • 3500

Description

This is the most musically useful, real-time, pitch shifter algorithm. Set the H3000 to any key signature or your own scale or harmonic pattern and play in tune in that key. Pick the right and left voice harmony intervals and now we've got harmony that stays in key. Need an example? With a conventional pitch shifter you set up a harmonic interval and are locked into that harmony with every note played. If that interval is a Major 3rd up and you're playing in the key of C it will always harmonize a Major 3rd. That works great for the notes C, F and G, but what about D, E, A and B? Wrong notes, plain and simple. Those notes require a minor 3rd harmony. Diatonic Shift gets that straight. You define the harmonies and the H3000 tracks your pitch and plays the correct notes.

This is a mono-in stereo-out program with up to one second of delay, mix and feedback on each channel. There are two user defined harmonic patterns and many pitch tracking parameters to optimize pitch shifting.

Block Diagram



Parameters

- #5 **Left Voice** see listing below **Modulation**
#6 **Right Voice** see listing below **Modulation**
- These are the harmonic intervals that the left and right output channel will produce. The standard intervals are all represented as + or -. + is above the input note and - is below it. Other selections are 'lo ton ped' and 'hi ton ped' which are short for low and high tonic pedal. That simply outputs the tonic note of the key either above (high) or below (low) the note played in. 'Hi dom ped' and 'lo dom ped' work the same way only the harmony note is the dominant interval (fifth) of the key. User defined scales 1 and 2 are also available but we'll describe them later. Here are all the choices:

-octave	+second	lo ton ped
-seventh	+third	lo dom ped
-sixth	+fourth	hi ton ped
-fifth	+fifth	hi dom ped
-fourth	+sixth	scale 1
-third	+seventh	scale 2
-second	+octave unison	

#35 Quantize on or off

This parameter tunes the output to the nearest even-tempered interval. **It corrects pitch.** If the H3000 is tuned to A-440 with the Right Voice set to unison an out of tune A at the input (447 for example) will produce a pitch-corrected A-440 at the right output. It corrects both channels at once. Therefore, if the Left Voice was set to +fifth the resulting fifth from the A-447 would be an in tune E-659.255. Quantizing is normally off. Pressing the softkey will change it to on. Press it again to change back to off.

#7 Delay 0 to 1000 milliseconds Modulation

This adjusts the time between the input signal and the affected output signal. Both channels adjust together in 1/1000 of a second steps up to one second.

#0 Left Mix 0 to 100 per cent Modulation
#1 Right Mix 0 to 100 per cent Modulation

The Left Mix level is the balance between the original or dry signal and the effect or wet signal at the left output. A 50% mix will result in equal levels of dry and wet sound.

#2 L Feedback 0 to 100 per cent Modulation
#3 R Feedback 0 to 100 per cent Modulation

This will control the amount of feedback from the left output to the input. With unison pitch shift it works like a normal digital delay. With pitch shift, in-key arpeggios can be created. This sounds great (interesting anyway) with long delays. Both right and left channel feedback are returned to the same point. High settings of both feedback levels could cause unstable output conditions. Some people like that sort of thing and some don't.

Tune -50 to +50 cents

In order for the Diatonic Harmonizer to work properly the instrument or voice signal coming into it must be in tune with the H3000. Tuning can work two ways. The H3000 can be tuned in cents to the tuning of the signal coming in as long as that is within a quarter tone (50 cents) of A-440. Or you can tune to the H3000's A-440. Once you're tuned, the correct notes will be displayed in "Shownote". To tune the H3000 to your instrument, press "Tune" and then play any note on your instrument. While playing the note, press "Enter". The H3000 is now tuned.

Shownote (not adjustable)

This parameter only displays the pitch of the note played into the H3000. It is displayed as note name and octave where middle C is C5.

#4 Key (see listing below)

This parameter sets up one of the twelve standard key signatures. Remember your music theory: Those twelve keys can work as Major, relative minor or the 5 other modes (dorian, phrygian, lydian, mixolydian or locrian). Here are the available keys:

C C# D D# E F F# G G# A A# B

Expert Mode Parameters

#11-22 Scale 1 set using "Note" and "Interval"
#23-34 Scale 2 set using "Note" and "Interval"

Note see listing below

This is where the user scales and harmonies are created. The twelve chromatic notes are listed under Note 1. Turn the knob or use the up/down buttons to get each note. This pattern will be selected under Scale 1 found in the L Voice or R Voice parameters. The notes listed are parameter numbers 11 through 22.

C Db D Eb E F Gb G Ab A Bb B

This key selects the harmonic interval between the note selected in Note 1 and the harmony that the H3000 will play. For example, if you set C = +300 cents and D = +500 cents when you trill between C and D the H3000 will trill between Eb and G. On any note, if no harmony is desired simply set that interval to 0 cents.

This is used to optimize the pitch shifter for the best possible performance (i.e. smallest delay, smoothest pitch shift). Set this for the lowest note you reasonably expect to pitch shift. (Important: The lower this note is set to, the longer the delay of the pitch shifter.)

For the same reasons given above, set this to the highest note you reasonably expect to pitch shift.

The Source parameter is another parameter that optimizes pitch shift performance. Polyphonic or solo relates to the input source. The star will move right or left when the knob is turned. Set it to solo for a monophonic input source and adjust it toward polyphonic for the best sound with polyphonic input sources.

#11	Left In	-48 to 48 dB
#12	Right In	-48 to 48 dB
#13	Left Out	-48 to 48 dB
#14	Right Out	-48 to 48 dB

The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

47

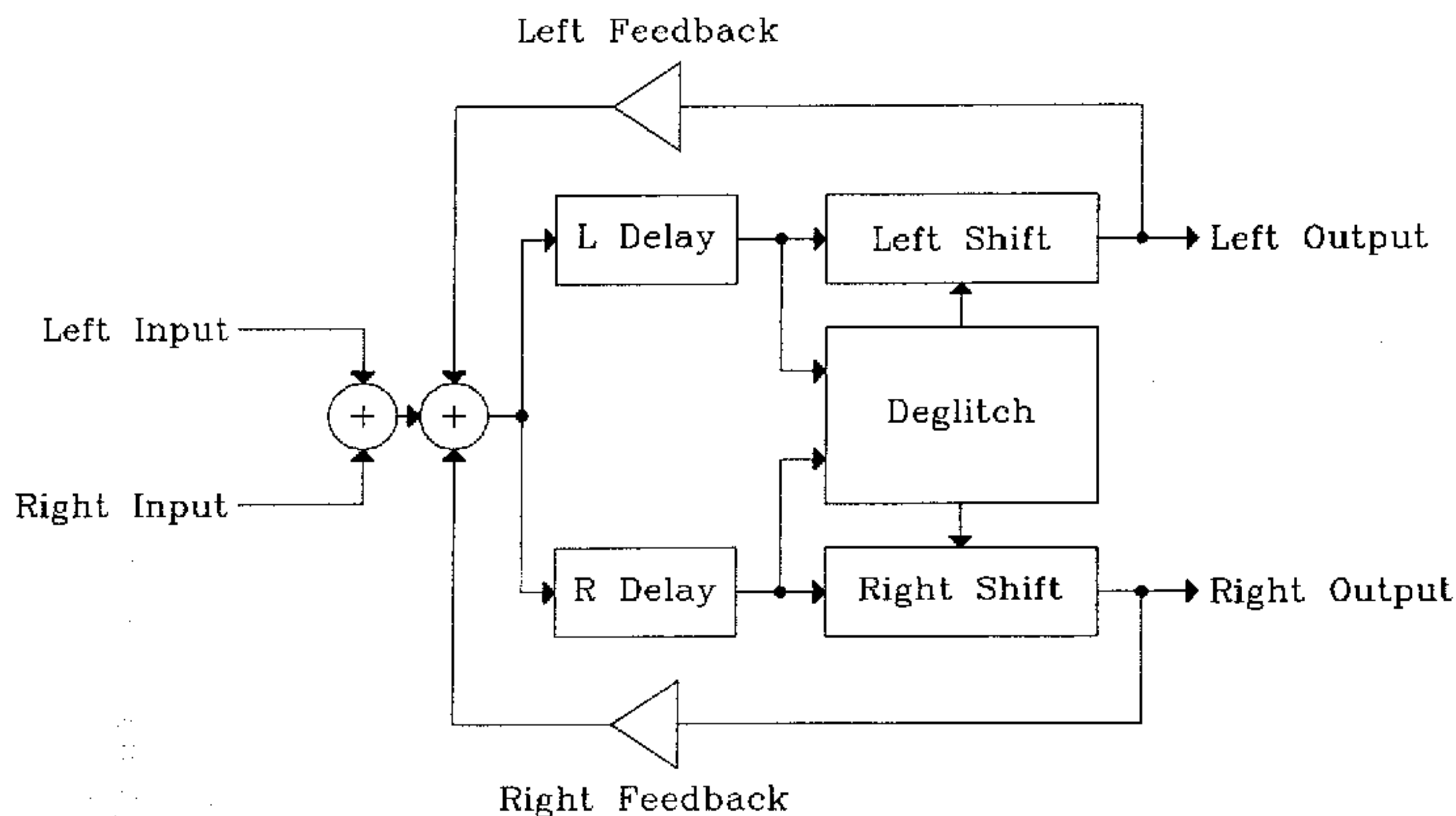
Algorithm 101 - Layered Shift

S • SE • B • B+ • B/LT • D/SX • D/SE • 3500

Description

This algorithm uses the left input to create two separate pitch shifted outputs. The range of the shifters is up one octave and down two octaves (and, of course, any ratio in between). The right and left outputs are able to use any combination of these. The result... instant 3 part harmony. Parameters for each pitch shifter are independently controlled and MIDI capable.

Block Diagram



Parameters

#4	L Coarse, Fine	-2400 to 1200 cents	Modulation
#6	R Coarse, Fine	-2400 to 1200 cents	Modulation
This controls the pitch shift at the left output. The pitch shift is given in cents, where 100 cents is equal to an interval of one semitone (one half-step). Negative cents corresponds to a transposition down while positive is up. Zero cents is no pitch shift. The knob and up/down buttons will change the amount of pitch shift in 100 cent increments. Play or sing a constant pitch and turn the knob. You will hear a chromatic scale.			
#5	L Delay	0 to 1000 milliseconds	Modulation
#7	R Delay	0 to 1000 milliseconds	Modulation
This sets the length of time between the input signal and the pitch shifted output for the left pitch shifter. The time is given in milliseconds (1/1000th of a second).			
#2	L Feedback	0 to 100 per cent	Modulation
#3	R Feedback	0 to 100 per cent	Modulation
This controls the amount of feedback from the left output to the input. With zero pitch shift this is like a normal digital delay. Use with pitch shift and delay to get arpeggiation. Use without delay to get wild pitch smears. Use it in subtle amounts with small pitch shifts to get fat sounds. Note that both right and left channel feedback are returned to the same input point. This means that high settings on both feedback levels could cause unstable output conditions.			

- | | | | |
|------------|--|--------------------------|-------------------|
| #0 | L Mix | 0 to 100 per cent | Modulation |
| #1 | R Mix | 0 to 100 per cent | Modulation |
| | The mix levels are the balance between the original or dry signal and the effect or wet signal at the left and right outputs. A 50% mix will result in equal levels of dry and wet sound. | | |
| #11 | Sustain | on or off | |
| | The Sustain key will "loop" one pitch period of the input signal much like a sampler. Pressing the softkey will turn off the input and begin endlessly playing the loop. Pressing it again will restore normal operation. While sustaining something try changing the delay setting through its range. The result is a strange rendition of the 1.5 seconds of audio that was in the H3000's memory just before Sustain was pressed. | | |

Expert Mode Parameters

- | | | | |
|------------|------------------|----------------------------|--|
| #8 | Low Note | 9 Hz to C7 | This is used to optimize the pitch shifter for the best possible performance (i.e., smallest delay, smoothest pitch shift). Set this for the lowest note you reasonably expect to pitch shift. (Important: The lower this note is set, the longer the delay of the pitch shifter.) |
| #9 | High Note | C4 to C8 | For the same reasons as given above, set this to the highest note you reasonably expect to pitch shift. |
| #10 | Source | polyphonic- * -solo | The Source parameter is another parameter that optimizes pitch shift performance. Polyphonic or solo relates to the input source. The star will move right or left when the knob is turned. Set it to solo for a monophonic input source and adjust it toward polyphonic for the best sound with polyphonic input sources. |

Levels

- | | | |
|------------|------------------|---------------------|
| #12 | Left In | -48 to 48 dB |
| #13 | Right In | -48 to 48 dB |
| #14 | Left Out | -48 to 48 dB |
| #15 | Right Out | -48 to 48 dB |
- The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

Hint: This is a real work-horse program for instrumentalists and vocalists.

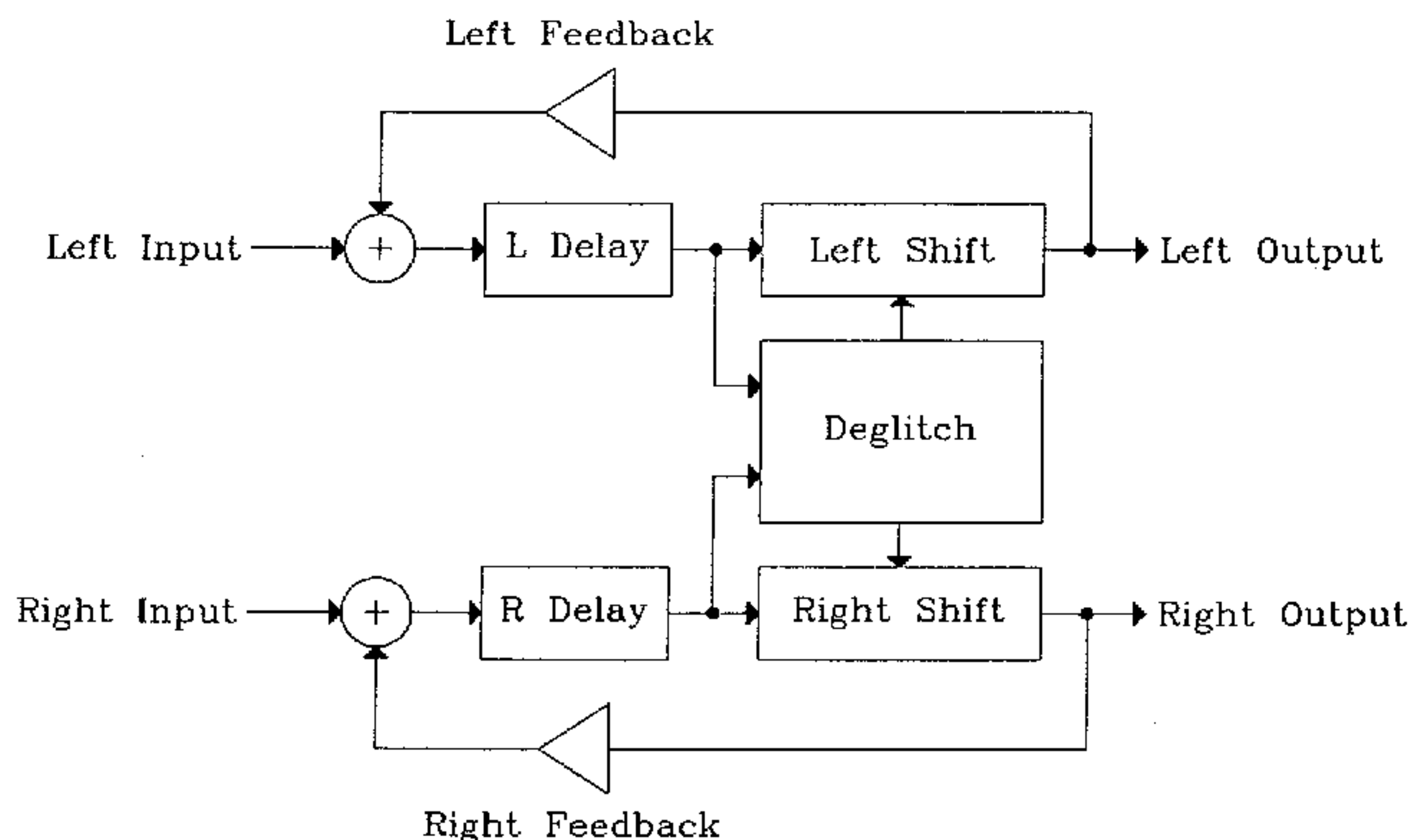
Algorithm 102 - Dual Shift

S • SE • B • B+ • B/LT • D/SX • D/SE • 3500

Description

Algorithm 102 gives you two completely separate pitch shifters. One pitch shifter uses the left channel input and output while the other uses the right channel. Each pitch shifter has independent control over pitch, delay, feedback and mix. These parameters are also MIDI controllable.

Block Diagram



Parameters

- | | | | |
|----|---|------------------------------|-------------------|
| #4 | Left Coarse, Fine | -2400 to 1200 cents | Modulation |
| #6 | Right Coarse, Fine | -2400 to 1200 cents | Modulation |
| | This controls the amount of pitch shift applied to the left input. The pitch shift is given in cents, where +100 cents is equal to a transposition up by one semitone (one half-step). Negative cents corresponds to a transposition down. Zero cents corresponds to no pitch shift. The knob and up/down buttons will change the amount of pitch shift in 100 cent increments. Play or sing a constant pitch and turn the knob. You should hear a chromatic scale. | | |
| #5 | Left Delay | 0 to 500 milliseconds | Modulation |
| #7 | Right Delay | 0 to 500 milliseconds | Modulation |
| | This sets the length of time between the input signal and the pitch shifted output for the left pitch shifter. The time is given in milliseconds (1/1000th of a second). | | |
| #2 | Left Feedback | 0 to 100 per cent | Modulation |
| #3 | Right Feedback | 0 to 100 per cent | Modulation |
| | This will control the amount of feedback from the left output to the left input. With zero pitch shift this is like a normal digital delay. Use with pitch shift and delay to get arpeggiation. Use without delay to get wild pitch smears. Use it in subtle amounts with small pitch shifts to get fat sounds. | | |

- #0 Left Mix 0 to 100 per cent Modulation
 #1 Right Mix 0 to 100 per cent Modulation
 The left mix level is the balance between the original or dry signal and the effected or wet signal at the left output. A 50% mix results in equal dry and wet sound.
- #11 Sustain on or off
 The Sustain key will "loop" one pitch period of the input signal much like a sampler. Pressing the softkey will turn off the input and begin endlessly playing the loop. Pressing it again will restore normal operation. While sustaining something try changing the delay setting through its range. The result is a strange rendition of the 1.5 seconds of audio that was in the H3000's memory just before Sustain was pressed.

Expert Mode Parameters

- #8 Low Note 9 Hz to C7
 This is used to optimize the pitch shifter for the best possible performance (i.e., smallest delay, smoothest pitch shift). Set this for the lowest note you reasonably expect to pitch shift. (Important: The lower this note is set to, the longer the delay of the pitch shifter.)
- #9 High Note C4 to C8
 For the same reasons as given above, set this to the highest note you reasonably expect to pitch shift. Here are some typical settings for various uses:
- | | | | |
|-----------------|----------|-------------|----------|
| High voice | C3 to C6 | Bass guitar | E1 to C4 |
| Low voice | C2 to C5 | Flute | C4 to C7 |
| Electric guitar | E2 to C6 | Trumpet | E3 to C7 |
- #10 Source polyphonic- * -solo
 The Source parameter is another parameter that optimizes pitch shift performance. Polyphonic or solo relates to the input source. The star will move right or left when the knob is turned. Set it to solo for a monophonic input source and adjust it toward polyphonic for the best sound with polyphonic input sources.

Levels

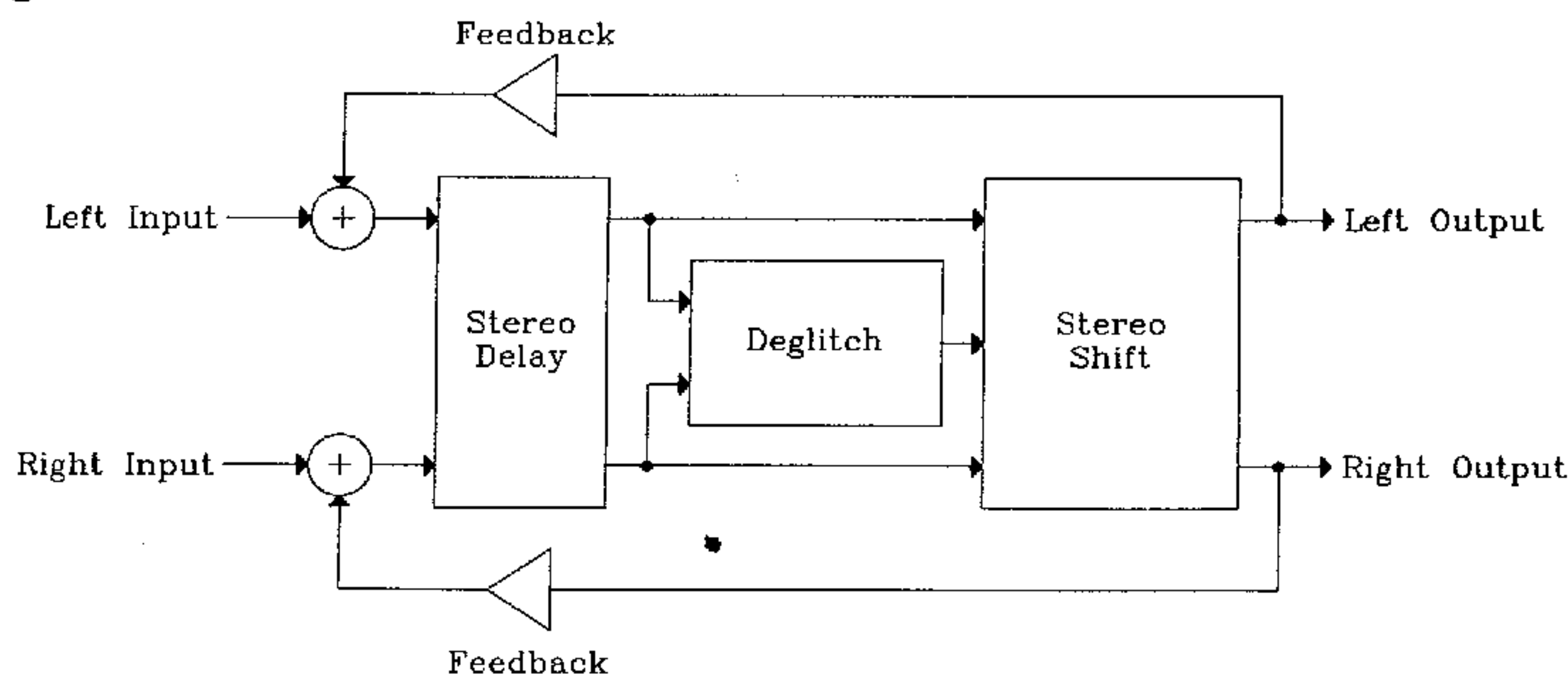
- #12 Left In -48 to 48 dB
 #13 Right In -48 to 48 dB
 #14 Left Out -48 to 48 dB
 #15 Right Out -48 to 48 dB
- The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

Hint: For doubling type effects use the fine pitch controls in a + or - 20 cent range.

Description

The Stereo Pitch Shift algorithm is for operation with true stereo inputs. The unique deglitching takes both input channels into account without mixing the two audio signals. The shifter maintains stereo imaging and mono compatibility. Parameters of both channels adjust together to form a great production tool. As with all H3000 algorithms, the parameters are MIDI controllable.

Block Diagram



Parameters

- | | | | |
|----|--|------------------------------|-------------------|
| #6 | Coarse, Fine | -2400 to 1200 cents | Modulation |
| | The pitch shift of both left and right channels track together. Like other programs the pitch shift is given in cents, where 100 cents is equal to a transposition up by one half-step. Negative cents corresponds to a transposition down. Zero cents corresponds to no pitch shift. The knob and up/down buttons will change the amount of pitch shift in 100 cent increments. Play or sing a constant pitch and turn the knob. You will hear a chromatic scale. | | |
| #7 | Delay | 0 to 500 milliseconds | Modulation |
| | This sets the length of time between the input signal and the output. Both channels have the same delay. | | |
| #1 | Feedback | 0 to 100 per cent | Modulation |
| | This will control the amount of feedback from the output to the input. With zero pitch shift this is like a normal digital delay. Use with pitch shift and delay to get arpeggiation. Use without delay to get wild pitch smears. Use it in subtle amounts with small pitch shifts to get fat sounds. | | |
| #0 | Mix | 0 to 100 per cent | Modulation |
| | The mix level is the balance between the original or dry signals and the effect or wet signals at the output. A 50% mix will result in equal levels of dry and wet sound. | | |

Expert Mode Parameters

- #8 **Low Note** **9 Hz to C7**
This is used to optimize the pitch shifter for the best possible performance (i.e., smallest delay, smoothest pitch shift). Set this for the lowest note you reasonably expect to pitch shift. (Important: The lower this note is set, the longer the delay of the pitch shifter.)
- #9 **High Note** **C4 to C8**
For the same reasons given above, set this to the highest note you reasonably expect to pitch shift.
- #10 **Source** **polyphonic- * -solo**
The Source parameter is another parameter that optimizes pitch shift performance. Polyphonic or solo relates to the input source. The star will move right or left when the knob is turned. Set it to solo for a monophonic input source and adjust it toward polyphonic for the best sound with polyphonic input sources.
- #11 **Deglitch Mode** **'Lock to chan. 1' or 'chan. 1 and chan. 2**
As above, this is used to optimize pitch shift performance. With a true stereo input this should be set to 'channel 1 and channel 2'. With a mono signal going into both channels set this to 'Lock to Channel 1'.

Levels

- #12 **Left In** **-48 to 48 dB**
#13 **Right In** **-48 to 48 dB**
#14 **Left Out** **-48 to 48 dB**
#15 **Right Out** **-48 to 48 dB**

The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

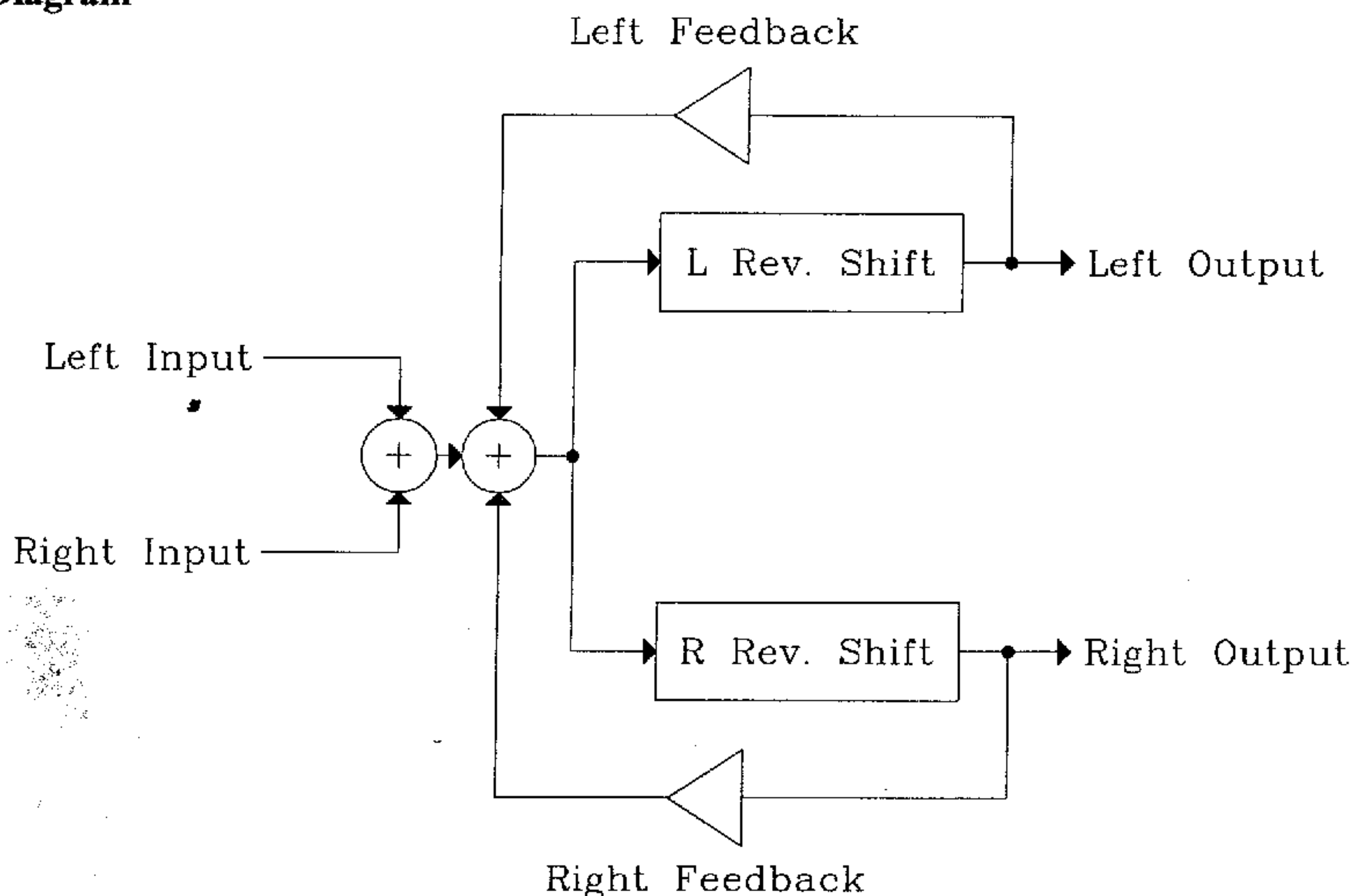
Algorithm 104 - Reverse Shift

S • SE • B • B+ • B/LT • D/SX • D/SE • 3500

Description

Things aren't what they seem to be. This algorithm speaks, sings or grunts back to you in reverse with pitch shift. Two pitch shifters in fact. Add variable splice lengths and feedback to this and the world of bizarre effects (in real time) takes on new proportions. And all with MIDI control. The Reverse Pitch Shift is a one-channel-in, two-channels-out algorithm.

Block Diagram



Parameters

- | | | | |
|----|----------------|---------------------|------------|
| #4 | L Coarse, Fine | -2400 to 1200 cents | Modulation |
| #6 | R Coarse, Fine | -2400 to 1200 cents | Modulation |
- This (like the other pitch change algorithms) controls the pitch shift at the left output. The pitch shift is given in cents, where +100 cents is equal to a transposition up by one half-step. Negative cents corresponds to a transposition down. Zero cents corresponds to no pitch shift. The knob and up/down buttons will change the amount of pitch shift in 100 cent increments.
- | | | | |
|----|----------|------------------------|------------|
| #5 | L Length | 0 to 1400 milliseconds | Modulation |
| #7 | R Length | 0 to 1400 milliseconds | Modulation |
- Think of a tape recorder recording a small length of tape (time) which is set by this length parameter and then playing it back in reverse while it records the next. The left length is independent of the right and can be 0 to 1.4 seconds, set in one millisecond (1/1000th of a second) steps. In addition to the reversal, there is also an average delay of 1/2 the delay setting.

- | | | | |
|----|-------------------|--------------------------|-------------------|
| #2 | L Feedback | 0 to 100 per cent | Modulation |
| #3 | R Feedback | 0 to 100 per cent | Modulation |
- This will control the amount of feedback from the left or right output to the input. With zero pitch shift this is like a backward digital delay. Use with pitch shift and delay to get backward arpeggiation. Note that both right and left channel feedback are returned to the same input point. This means that high settings on both feedback levels could cause unstable output conditions.
-
- | | | | |
|----|--------------|--------------------------|-------------------|
| #0 | L Mix | 0 to 100 per cent | Modulation |
| #1 | R Mix | 0 to 100 per cent | Modulation |
- The Left Mix level is the balance between the original or dry signal and the effected or wet signal at the left output. A 50% mix will result in equal levels of dry and wet sound.

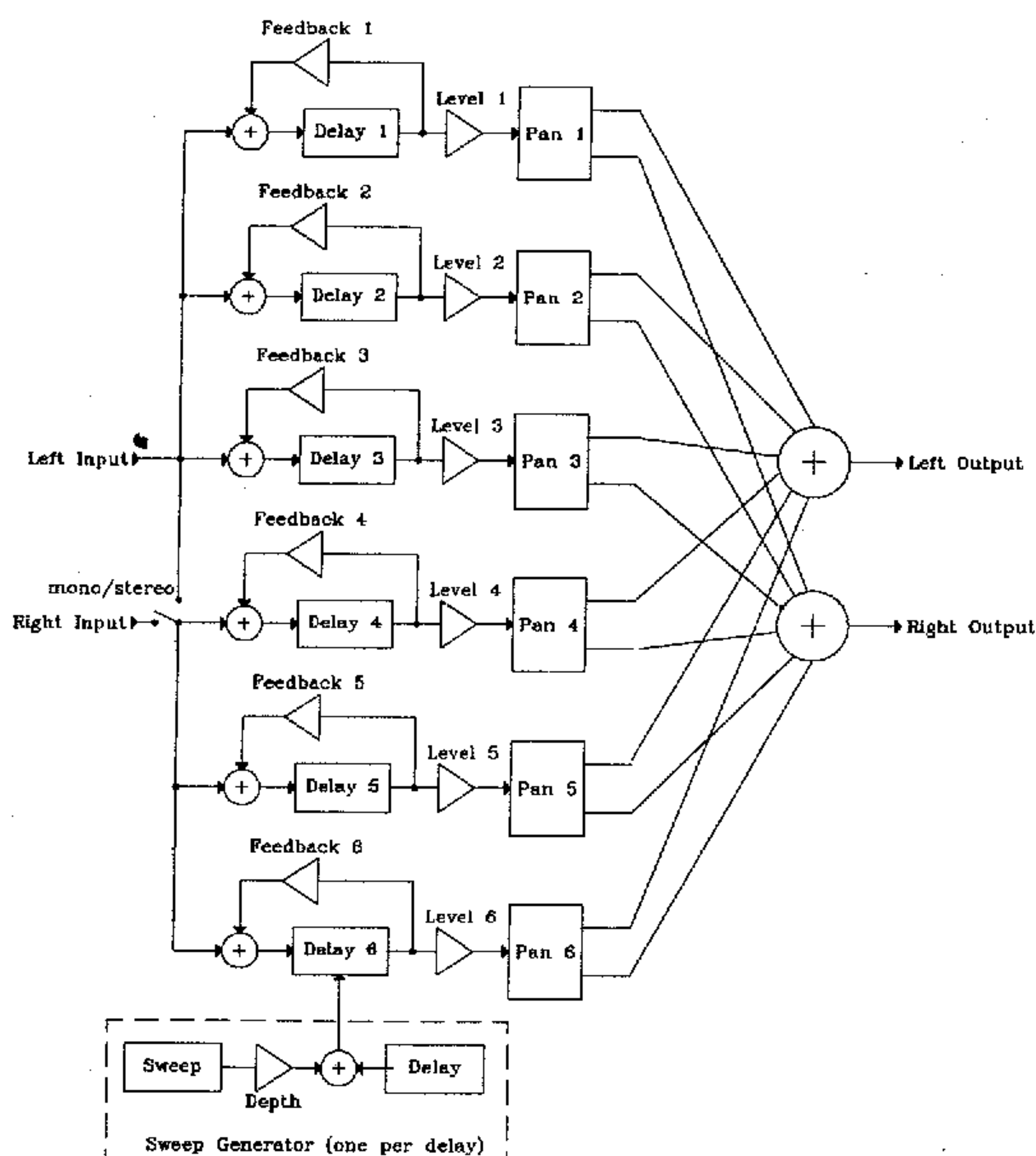
Levels

- | | | |
|-----|------------------|---------------------|
| #8 | Left In | -48 to 48 dB |
| #9 | Right In | -48 to 48 dB |
| #10 | Left Out | -48 to 48 dB |
| #11 | Right Out | -48 to 48 dB |
- The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

Description

Picture six high quality digital delay units racked together; each has 1/4 second delay, modulation control and feedback; all are patched to a 6 input, stereo mixer. Automation allows simultaneous control over the digital delays and mixer or separate control over each. All have extensive MIDI control. That is the power of the Swept Combs algorithm.

Block Diagram



Parameters

- #2 **m Delay** **0 to 100 per cent** **Modulation**
- This parameter is the master control for delay times of each of the 6 delay lines described earlier. Increasing this number will increase all 6 delay times while decreasing it will shorten them all. Changing this per cent will alter each delay time proportionally. As an example; if this was set to 100% and Delay 1 was at 40ms, Delay 2 at 70ms and Delay 3 at 100ms; then changing Delay from 100% to 50% would change Delay 1 to 20ms, Delay 2 to 35ms and Delay 3 to 50ms. Realize that the displays will not change but the perceived effect will. How to set individual delay times will be described later.

- #3 m Rate 0 to 100 per cent Modulation**
Master Sweep Rate is the full name of this parameter. It's the master sweep rate generator control. Sound complex? Let's explain what the sweep generator does. Each of the 6 delays has its own sweep generator and that generator acts as a modulator (synth. fans take note) to the delay time. That means that the delay time can be lengthened and shortened constantly. Let's call that sweeping. Now the speed at which we sweep is this parameter called Sweep Rate. The H3000 uses 6 separate sweep generators and the Master Rate controls them all proportionally just as the Delay parameter described earlier controls delays proportionally.
- #8 m Depth 0 to 100 per cent Modulation**
This master control affects the "depth" of the individual sweep generators we just described. What that really means is how far the delay changes are allowed to go. Synth. fans will ask, "Is it a sine, ramp or triangle sweep?" Actually, it's not any of those. The algorithm uses random numbers to achieve a more complex and thicker texture. This controller is again a Master Depth control and it works proportionally like the others.
- #9 m Fdback -100 to 100 per cent Modulation**
Feedback is also a Master control parameter. This time it's the 6 feedback levels on the 6 delay lines we're working with. In general, high feedback settings will give longer recirculation or sustain times. As usual be careful when using high levels. This Master Feedback control affects all 6 feedback levels proportionally. Changing from positive to negative feedback will reverse the phase of the feedback.
- #10 Width -100 to 100 per cent Modulation**
Width is short for Image Width. It is also a master controller. This parameter relates to the stereo image or panning. Each of the six delay lines is fed to a stereo mixer. Each has its own pan location within the stereo image. The Master Width control is able to change all 6 pans at once. Assuming the 6 Pans are all set at different places, setting the Master Width at 100% will allow their individual places to stay intact. Decreasing the per cent toward 0 will see them all move proportionally toward 0 or to center in the stereo image. At 0% all are at dead center. Moving the control toward -100% will result in an image reversal. Finally, when the control is at -100% all the pans will be opposite their initial location.
- #7 Repeat on or off**
The Repeat function instantly captures the audio signal in the H3000 and keeps replaying it. No new sound is allowed in. Each Delay Time setting determines the repeat length. The master controls all still function, so altering the sound while it is repeating is possible. Changing the Delay Time with no Glide will have the affect of lengthening (or shortening) the repeat time. Doing this with the Glide On (from the knob) will not only lengthen (or shorten) the sound but will also change the pitch. This can be lots of fun.
- #0 Mix 0 to 100 per cent Modulation**
The Left Mix level is the balance between the original or dry signal and the effected or wet signal at the left output. A 50% mix will result in equal levels of dry and wet sound.

Expert Mode Parameters

- #4 Glide Speed 0 to 100 Modulation**
This is the time it takes the H3000 to respond to changes in the delay time settings. Gliding is what happens when the delay times are changed drastically. With glide on, large delay time changes will slowly and smoothly change the perceived audio delay. No noise is created in the output. 100 speed means quick changes and a speed of 0 means very slow changes.
- #5 Glide Enable delay glide on or off**
This turns the delay gliding on or off.
- #6 Stereo/Mono Stereo or Mono**

The Input Mode in this algorithm becomes very powerful. With it set to mono all 6 delay lines, feedback lines and the stereo mixer are dedicated to the left channel input signal only. Take the weakest, most dry, thin sound and process it through the H3000 and ... instant strength. Set the Input Mode to stereo and we have the possibility of two independent programs. Panning delay lines 1, 2 and 3 left and 4, 5 and 6 right plus the Width control to 100% assures total independence. Now we have two units with 3 digital delay lines, with feedback and sweeping and a 3 input 1 output mixer on each channel. That's flexibility.

#23-28 Rates 1-6 0 to 100

Now we've entered a new level of programming on the H3000. Pressing the Rates softkey on the front panel will give not one parameter to adjust but six. They are labeled Rate 1, Rate 2, Rate 3 etc... Pressing the particular Rate # will then allow adjustment of that specific Rate. There are six Rate #'s so the first four are displayed at once, then by pressing the Parameter Key the other two will be displayed. The rates themselves relate to the speed of the delay sweep which was described under Rates. A Rate of 100 is the fastest while 0 is the slowest.

#17-22 Depths 0 to 100 per cent

This parameter works the same way as Rates only control is of the individual Sweep Depths. The Depths are numbered 1 through 6 with a Depth of 0 being no perceived sweeping while a Depth of 100 is the maximum.

#11-16 Delays 1-6 0 to 200 milliseconds

These are the six individual delay time adjustments. All are variable from 0 to .200 seconds in 1 millisecond (1/1000th of a second) steps.

#35-40 Fdbacks 1-6 -100 to 100 per cent

Here are the six Feedback adjustments. As with all feedback, be careful at high levels.

#41-46 Pans -10 to 10

These are the six individual Pan settings for each delay line. A Pan setting of -10 is hard left, 0 is center and 10 is hard right.

#29-34 Levels 0 to 100 per cent

These six independent Level controls are the only ones in this group of parameters that are not under a master control. What these levels do is allow a balance to be achieved between all six delay line outputs. They are the fader controls on our 6 channel mixer. A setting of 0% turns the level off while 100% turns it fully on.

Hint: Don't be intimidated by the complexity of these adjustments. The program will work just fine using the basic parameters.

Levels

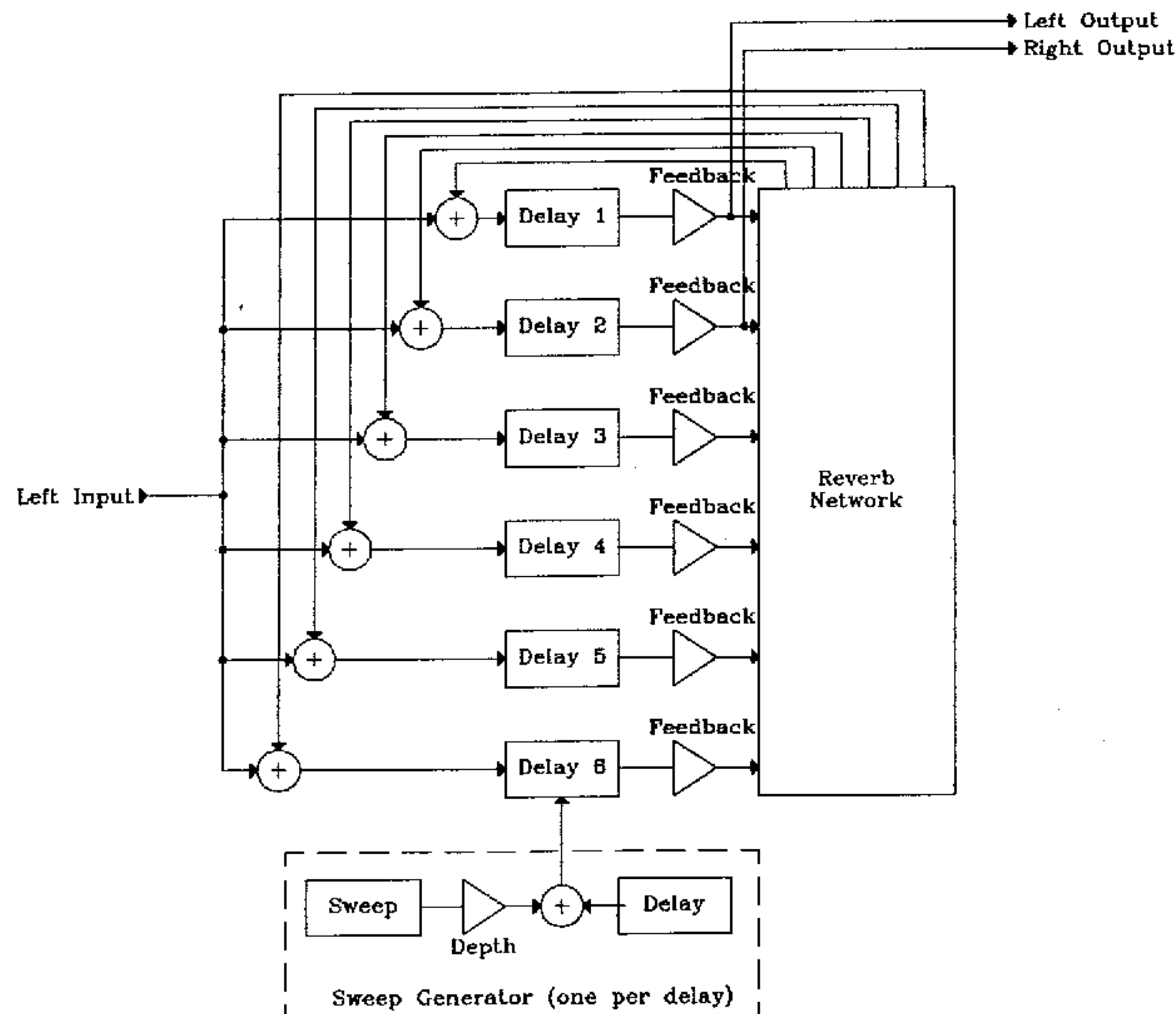
#47	Left In	-48 to 48 dB
#48	Right In	-48 to 48 dB
#49	Left Out	-48 to 48 dB
#50	Right Out	-48 to 48 dB

The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

Description

Imagine this... you're in a large room, a cathedral. There is a wonderful sound ringing through the air (that's your music), now the room starts to move while you stay still. It moves forward, side to side, up and down then around in circles and somersaults. The sound swooshes by your ears in all directions. Your music has taken on spatial characteristics you never imagined. Such is the H3000 Swept Reverb Network. It is a two input, two output modulated reverb algorithm with tight control over parameters like Feedback, Delay, Rate and Depth. It also has MIDI modulation and sequencing to add unlimited automation to all of this.

Block Diagram



Parameters

- | | | | |
|----|--|--------------------------|-------------------|
| #2 | m Delay | 0 to 100 per cent | Modulation |
| | This parameter is the master control for delay times of each of the six internal delay lines. Increasing this number will increase all six delay times while decreasing it will shorten them all. Changing this per cent will alter each delay time proportionally. A 100% change here up or down will effect a 100% change in the preset delay time of each delay line. | | |
| #3 | m Rate | 0 to 100 per cent | Modulation |
| | This is the master sweep rate generator control (like the Swept Combs algorithm). Each of the six delay lines has its own sweep generator and that generator acts as a modulator to the delay time. That means that the delay time can be lengthened and shortened constantly (swept). The speed at which it sweeps is this parameter called "m Rate". This Master Rate Control works proportionally like others, but affects the Sweep Rates. | | |

- #8 m Depth 0 to 100 per cent Modulation**
 This Master Depth Control affects the depth of the individual sweep generators we just described. It determines how far the delay changes are allowed to go. The algorithm uses a random number generator to provide depth. This creates a thicker texture than conventional sweep generators. This controller is again a Master Depth Controller and it works proportionally like the others.
- #1 Fdback -100 to 100 per cent Modulation**
 The H3000's internal reverb network uses (like most digital reverbs) some type of recirculation of sound to make the reverb more or less diffuse. The Feedback parameter is what controls that in this algorithm. Note that this controls all six values which track together.
- #0 Mix 0 to 100 per cent Modulation**
 The mix level is the balance between the original or dry signal and the effect or wet signal. A 50% mix will result in equal levels of dry and wet sound.
- #7 Repeat on or off**
 The Repeat function holds and keeps replaying the current audio in the H3000. No new sound is allowed in. Each Delay Time setting determines the repeat length. The master controls all still function, so altering the sound while it is repeating is possible. Changing the Delay Time with Glide off will have the affect of lengthening or shortening the repeat time. Doing this with the Glide on will not only lengthen or shorten the sound but will also change the pitch.

Expert Mode Parameters

- #4 Glide Speed 0 to 100 Modulation**
 This is the time it takes the H3000 to respond to changes in the Delay time settings. Gliding occurs when the Delay time is changed drastically on the front panel. With glide on, a large Delay time change will slowly and smoothly change the perceived audio delay. No pops, crackles or even snaps in the output. 100 speed means quick changes and a speed of 0 means very slow changes.

- #5 Glide En delay glide on or off**

This turns the delay gliding on or off.

Note: The next six parameters are found by pressing the Rates softkey and then pressing the parameter key.

- #23-28 Rates 1-6 0 to 100**
 These are the six Rates that control the sweep rate generator already described.

Note: The next six parameters are found by pressing the depth softkey and then pressing the parameter key.

- #17-22 Depths 0 to 100 per cent**
 These are the six Depths that control the sweep rate generator already described.

Note: The next six parameters are found by pressing the Delays softkey and then pressing the parameter key.

- #11-16 Delays 0 to 225 milliseconds**
 These are the six Delays that control the reverb network described earlier.

Hint: As with previous programs, don't be intimidated by all the variables. You need not use them to obtain useful effects.

Levels

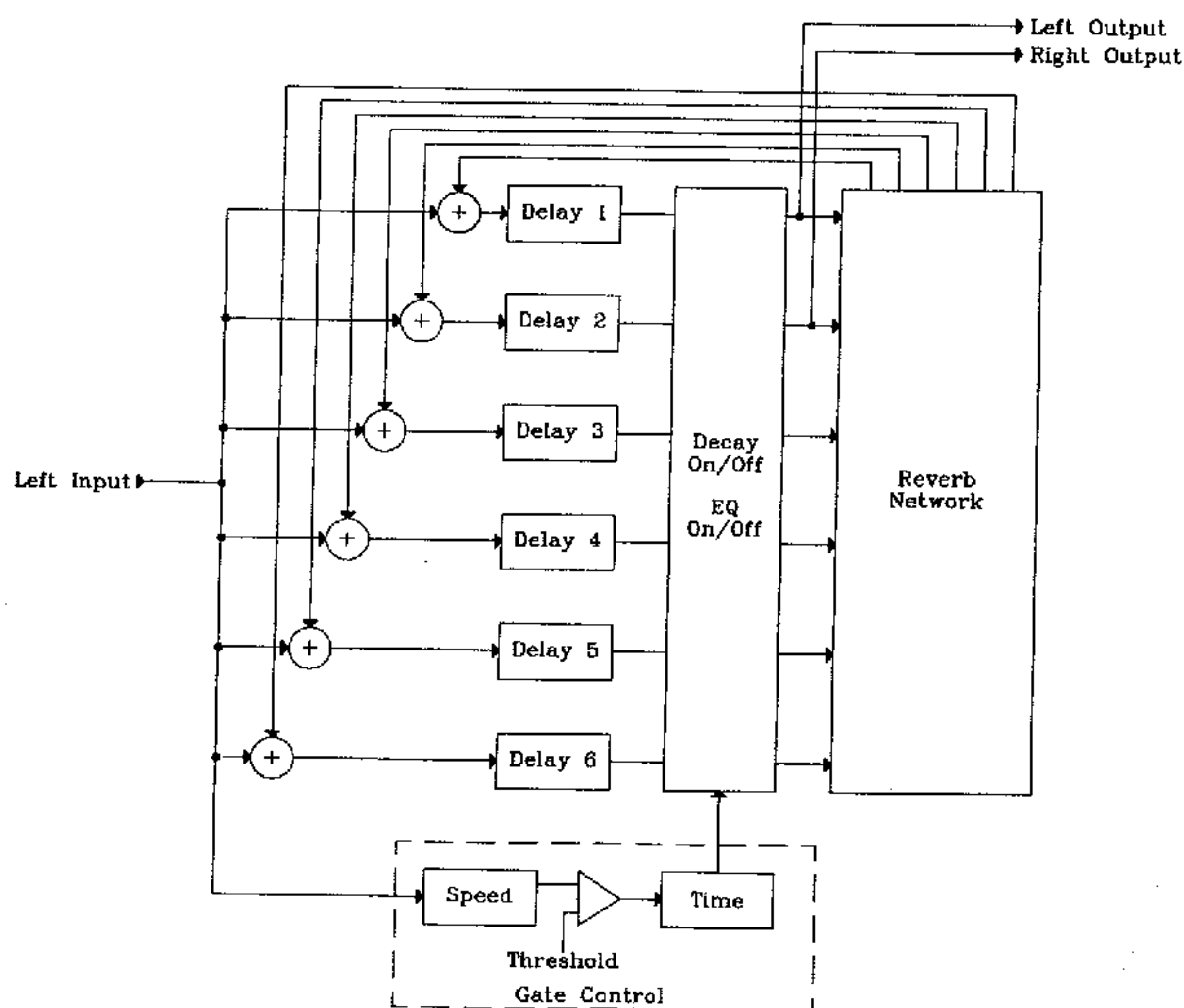
#29	Left In	-48 to 48 dB
#30	Right In	-48 to 48 dB
#31	Left Out	-48 to 48 dB
#32	Right Out	-48 to 48 dB

The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

Description

The amount of user control over critical parameters in the Reverb algorithm makes the H3000 unique. Along with the standard Predelay, Decay and Mix parameters comes a switching Gate and tight control over Delay parameters which change the characteristics of reverb itself. The built in Gate has Response Time and Threshold controls as well as separate parametric EQ on both the open and closed gate. Two decay times are also provided. Softer sounds (below the gate threshold) can have one decay time and EQ while loud sounds (above the gate threshold) can have different decay and EQ.

Block Diagram



Parameters

- | | | | |
|----|--|------------------------------|-------------------|
| #1 | Predelay | 0 to 500 milliseconds | Modulation |
| | This parameter puts up to 1/2 second of delay on the input signal before reverberation. It can be used to simulate the size of a room or the distance from the sound source to the walls, ceiling or floor. It is adjustable in one millisecond steps (1/1000 of a second) from 0 to .5 seconds. | | |

- #2 On Decay .1 to inf.+5 seconds Modulation**
 Reverb decay time is the length of time the sound continues after the sound source has stopped. In this parameter the Decay time for the gate on is adjusted. In other words, when a signal is loud enough to open (or trigger) the gate it will then reverberate for this set length of time. Various Decay Times are available. Some of the delay times are "infinite". This means that they don't actually decay. In fact, infinite delays with a positive number after them, will actually increase in volume. **Watch your speakers!** Using the gate can control this.
- #3 Off Decay .1 to inf.+5 seconds Modulation**
 Off Decay is much the same as On Decay except it is the reverb time when the signal is not strong enough to trigger the gate.
- #4 Gate Time 0 to 25 seconds Modulation**
 The Gate Time is the length of time that the gate will stay open when it has been triggered by a strong enough signal. The gate on state will then use the On Decay and EQ Open settings. The Gate Time is re-triggerable. If for example, the Gate Time was set at 20 seconds, a signal triggered it, then after only 7 seconds along came another trigger, the On Gate Time would begin again at 20 seconds.
- #0 Mix 0 to 100 per cent Modulation**
 The mix level is the balance between the original or dry signal and the effect or wet signal. A 50% mix will result in equal levels of dry and wet sound. The effect of mixing the dry sound with the wet simulates moving further from (more wet) and closer to (more dry) the sound source.

Expert Mode, EQ Parameters

Note: These next 8 parameters are found by pressing the EQ softkey then the parameter key.

- #5 On L Freq 50, 100, 200, 400 Hertz**
 The Low Crossover On point is the frequency, below which we can roll off the bass response. This parameter affects the Gate On state (Gate Open).
- #6 On Low dB -6 to 0 dB**
 On Low dB is the amount of rolloff (low frequency attenuation) that will occur up to the crossover point described above. This will occur in the Gate On state. It is adjustable in one decibel steps from -6dB to 0dB.
- #7 On H Freq 2, 4, 8, 12 kilohertz**
 This parameter also effects the Gate On state. It is the frequency above which we can rolloff the high frequencies.
- #8 On HidB -6 to 0 dB**
 On High dB is the amount of rolloff (high frequency attenuation) that will occur above the crossover point described above. This will occur in the Gate On state. It is adjustable in one decibel steps from -6dB to 0dB.
- #9 Off L Freq 50, 100, 200, 400 Hertz**
 Same as On L Freq, but works on the Gate Off state (signal below threshold).
- #10 Off Low dB -6 to 0 dB**
 Same as On Low dB, but works in Gate Off state.
- #11 Off H Freq 50, 100, 200, 400 Hertz**
 Same as On H Freq, but works in Gate Off state.
- #12 Off Hi dB -6 to 0 dB**
 Same as On HidB, but works in Gate Off state.

Gate Parameters

Note: The next three parameters are found by pressing the Gate softkey.

- #13 Speed 0 to 100**
The parameter that controls how fast the gate responds to a strong enough trigger is the Speed. At slow values (near 0) it will take a longer period of the input signal being above the threshold (described below) to trigger the gate. At fast values (near 100) a quick high level signal will be able to trigger the gate.
- #14 Threshold 1 to 100 per cent**
In order to trigger the gate, the input level must be higher than the threshold setting. Using a low threshold value (near 1%) means a low volume signal could trigger the gate. A high value (near 100%) would need a very strong signal to produce a trigger. Here's an example using drums as the input: Set the Threshold fairly high and the Response time fast. Now we could have light, ambient type playing all reverberated at long decay times with a darker EQ (high frequencies rolled off) because the sound stays below the threshold. A strong slam on the snare drum will open the gate and cut the decay time way down with a brighter EQ.
- #15 Enable Enabled or Disabled**
This parameter lets the gate action work (Enabled) or not work (Disabled). If the gate is Disabled the reverb uses only the Gate On EQ settings.

Delay Parameters

Note: The next six parameters are found by pressing the Delays softkey and then the parameter key.

- #16-21 Delays 1-6 0 to 5000 samples**
The six Delays are very important to the overall quality of the reverb sound itself. The parameter readout is in samples. That relates to the 44.1kHz sample rate that the H3000 uses for audio conversion to digital. This means that about 44 samples is equal to one millisecond. Changing these numbers gives you personalized, fine control over the reverb texture. Have fun.

Levels

- | | | |
|------------|------------------|---------------------|
| #22 | Left In | -48 to 48 dB |
| #23 | Right In | -48 to 48 dB |
| #24 | Left Out | -48 to 48 dB |
| #25 | Right Out | -48 to 48 dB |

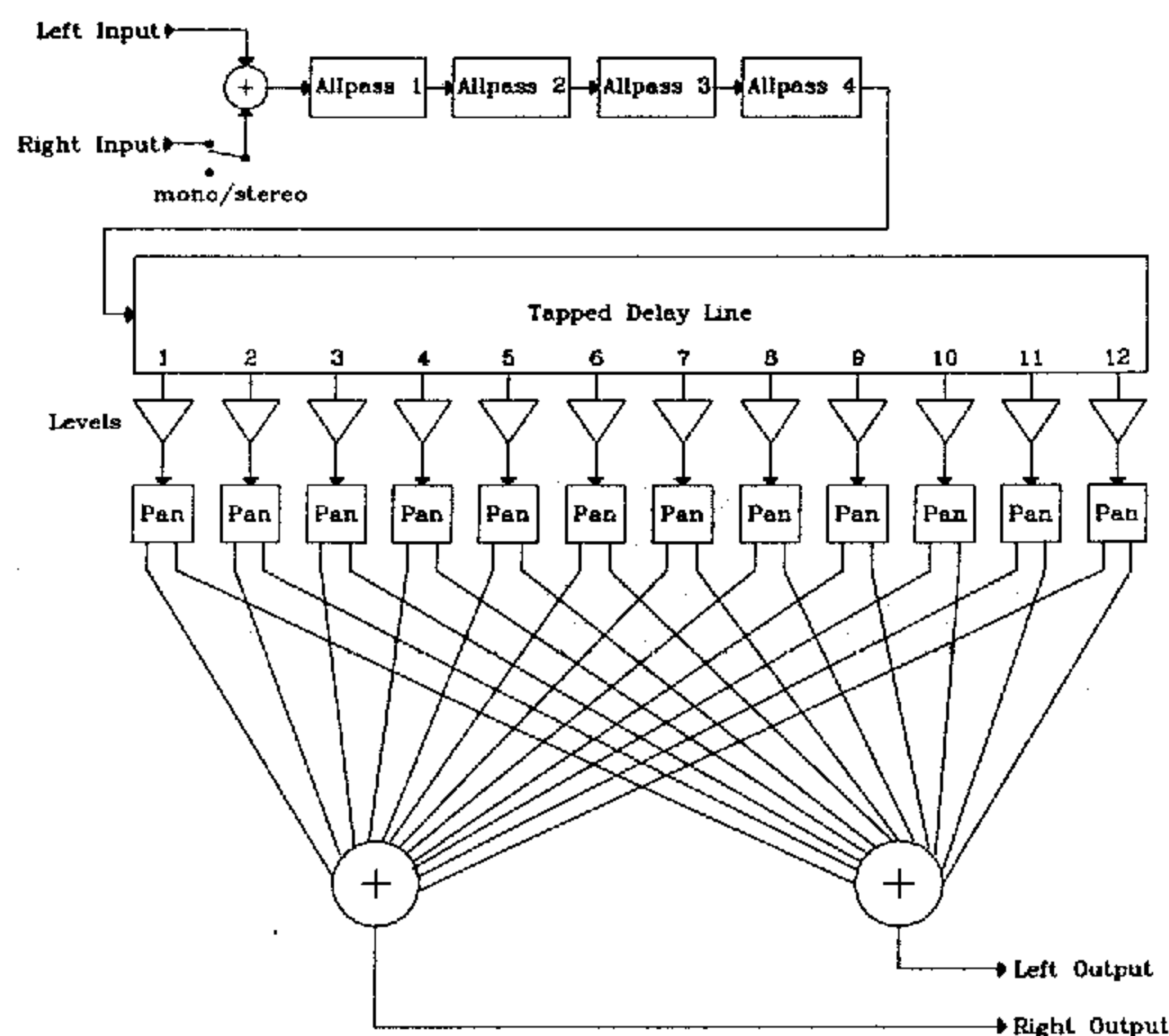
The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

Description

Ultra-Tap is a multi-purpose algorithm that has two separate but connected functions. The mono-in, stereo-out program is a diffusor which generates a dense field of delays and it is a series of twelve digital delays connected to a twelve channel stereo mixer. The two functions can be used in series or one at a time. The diffusor is made of a series of four All Pass Filters which is each controlled by its own Delay parameter and by a Master Diffusion Control.

The twelve delay lines can have a 1.4 second, collective delay time yet each is independently adjustable (Tap Delay) with a Pan and Level control. Master controls include Spacing for setting the twelve delay times to various scales, Weights for the twelve levels and various Pan configurations.

Block Diagram



Parameters

- | | | | |
|----|---|-------------------|-------------------|
| #2 | Length | 1 to 100 per cent | Modulation |
| | The Master Length parameter controls the delay time of all twelve delays proportionally. Increasing this number will increase all twelve delay times while decreasing it will shorten them all. | | |

- | | | | |
|-----|---|-----------------------------|-------------------|
| #3 | Diffusor | 0 to 100 per cent | Modulation |
| | This is the Master Diffusor control for the All Pass Filters. It works proportionally like the other master controls. An All Pass Filter recirculates (feeds back) a delayed signal to its own input. However, unlike a delay line with feedback, its frequency response is flat. The delayed signal is then delayed again and fed back again. This continues until the signal decays. If a slap sound is the input with short delay times the result is a thick reverb sound with a short decay time. With the delay set long the result is many echoes that trail off slowly. Individual control over the four All Pass Delays is found in the Tedium mode described later. | | |
| #4 | Width | -100 to 100 per cent | Modulation |
| | Width is short for Image Width. It is also a master controller. This parameter relates to the stereo image or panning of the twelve delay lines. We describe the delay lines as being fed into a stereo mixer. Each has its own Pan location within the stereo image. The Master Width control is able to change all twelve Pans at once. Assuming that the twelve Pans are all set to different places, setting the Master Width at 100% will keep these settings intact. Decreasing toward 0% will move them all proportionally toward 0 or center in the stereo image. At 0% all are at dead center. Moving the control toward -100% will result in image reversal. In other words anything that was panned slightly right will now begin to be slightly left. Finally, when the control is at -100% all the pans will be opposite where they began. | | |
| #49 | Feedback | -100 to 99 per cent | Modulation |
| | This controls the level of effect signal to be added (recirculated or fed back) to the input signal. 0% feedback will give a single repeat while -100% will capture a signal infinitely. Be careful not to add too much material at high feedback levels or the output will soon turn to chaos. | | |
| #0 | Left Mix | 0 to 100 per cent | Modulation |
| #1 | Right Mix | 0 to 100 per cent | Modulation |
| | The left and right mix levels are the balance between the dry signals and the wet signals. 50% mix results in equal levels of dry and wet sound at the output. | | |

Expert Mode Parameters

- | | | | |
|-----|--|-----------------------|-------------------|
| #5 | Stereo/Mono | Stereo or Mono | Modulation |
| | Here the right input channel can be switched on or off. In stereo mode both right and left channels are added (mixed) together and sent to the delay line. In mono mode only the left channel is used. | | |
| #50 | Fb Tap | tap 1 to 12 | |
| | The feedback parameter described earlier is assigned to one of the 12 delay taps with this control. Only the selected tap's output will be recirculated to the input. | | |

Quickset Parameters

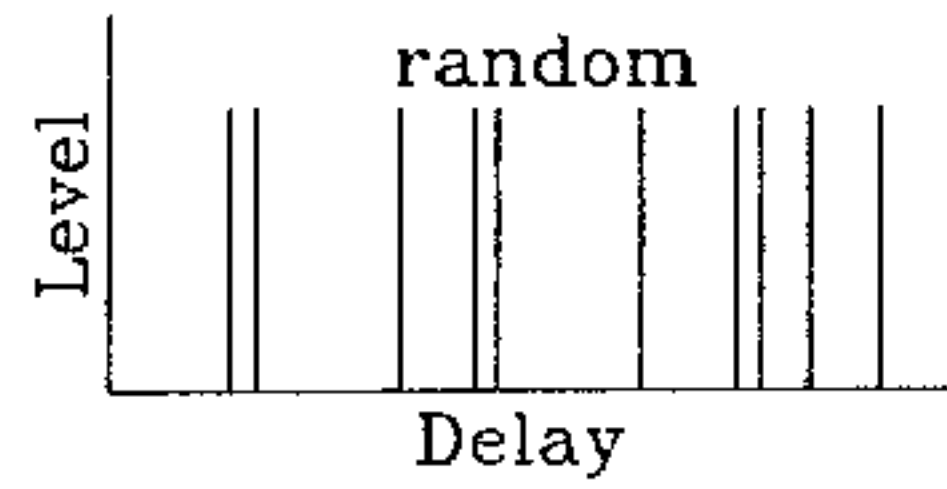
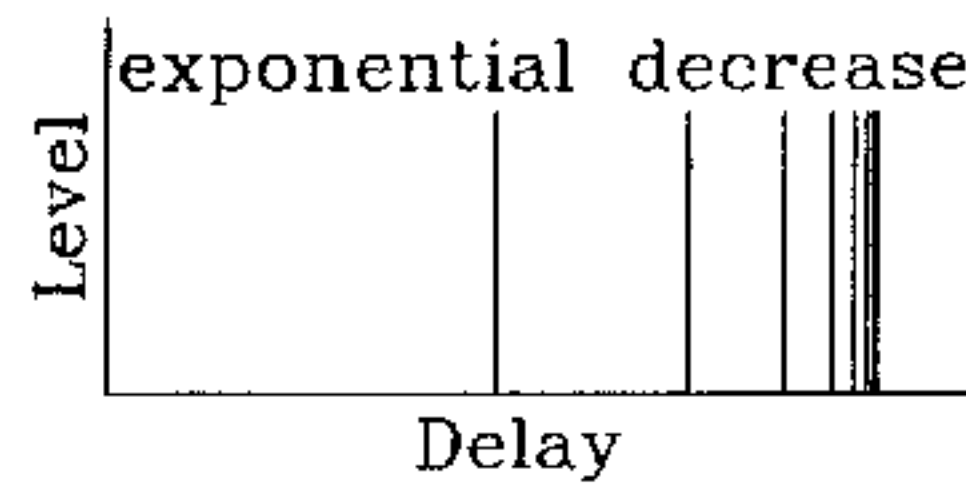
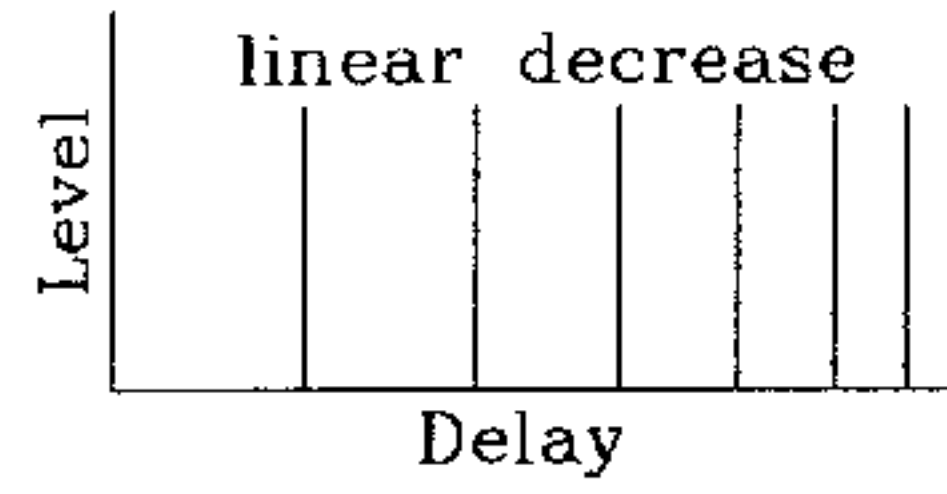
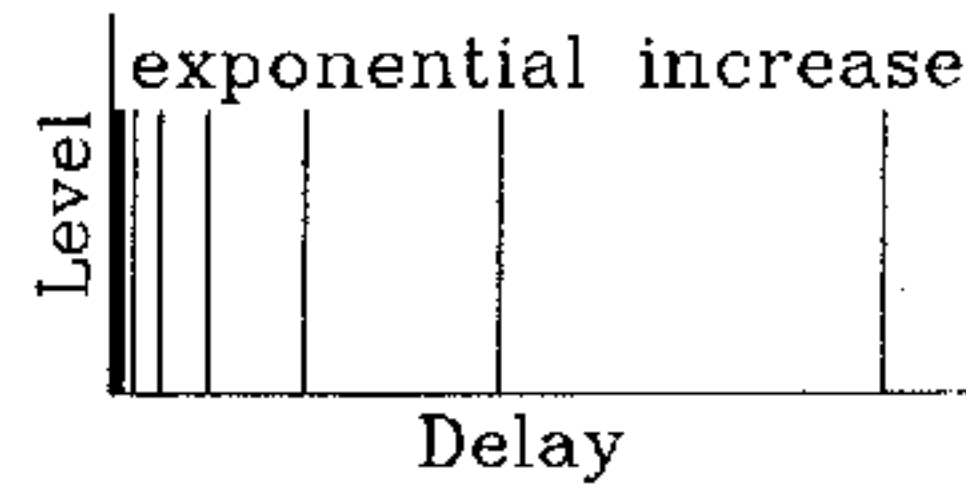
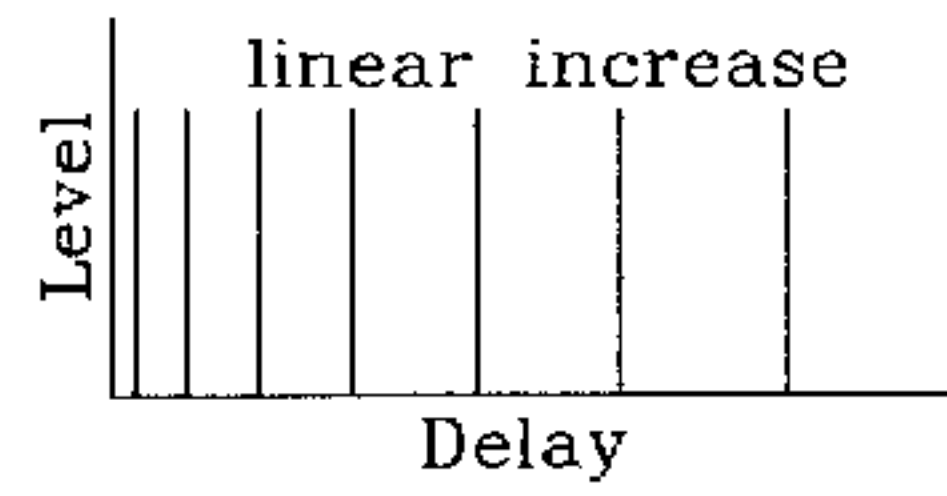
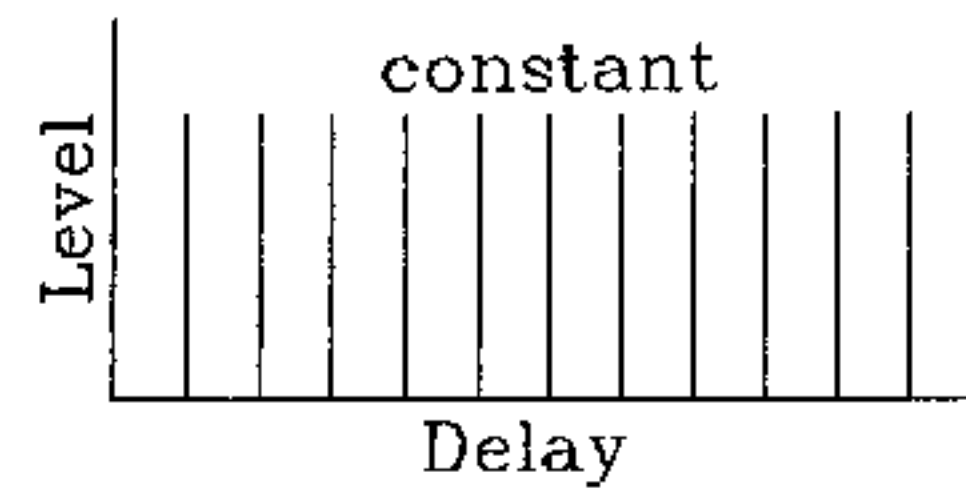
Note: The following three parameters are found by pressing the Quickset softkey. Quickset is a chosen group of three parameters which make this algorithm easy to learn and control. For the real expert, see Tedium.

Warning: Using the Quickset parameters will change the related settings in the Tedium mode. If you have painstakingly adjusted the Tedium parameters do not change the Quickset values. These parameters are used to "preset" all of the Tedium values.

- #6 Spacing** see listing below
Spacing controls the time delay between each delay line (tap). The six parameter choices are:

Constant	Linear Increasing
Linear Decreasing	Exponential Increasing

Here are graphic illustrations of each:



#7

Weights

see listing below

The Weights parameter controls the relative volume level of each tap. The six parameter choices are the same as in Spacing:

Constant

Linear Increasing

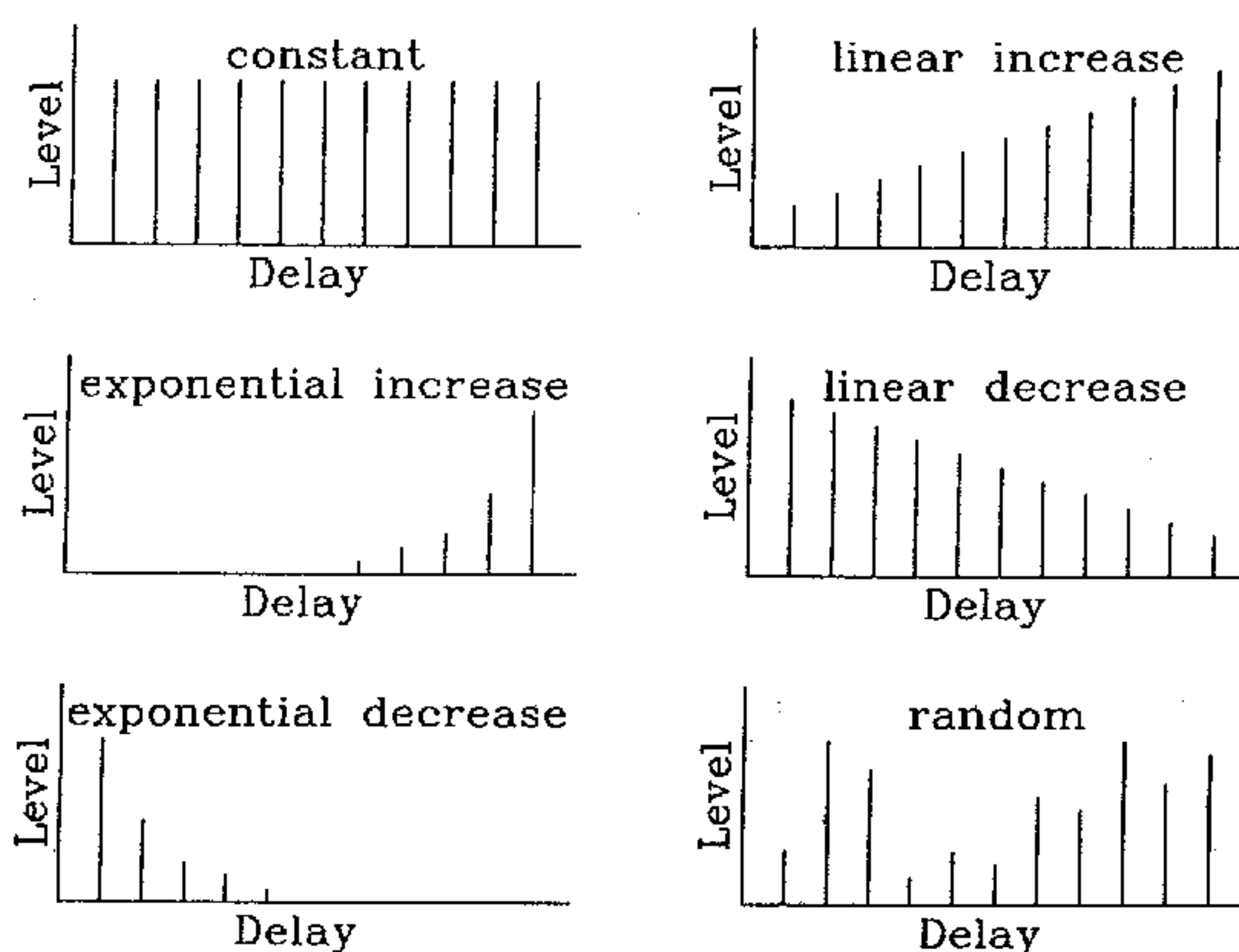
Linear Decreasing

Exponential Increasing

Exponential Decreasing

Random Spacing

Here are graphic illustrations of the weight settings:



#8

Pans

see listing below

Each of the twelve delay taps has a pan location. This parameter gives different shapes to the stereo image. Here are the nine choices:

Panned Center	Panned Left
Panned Right	Alternating Left and Right
Left to Right Sweep	Right to left Sweep
Spread from Center	Merge to Center
Random Pans	

Center, Left and Right simply put all twelve Pans to that location. Alternating Left and Right will pan the first delay tap hard left, the second hard right, the third hard left, etc. Left to Right Sweep will pan the first delay tap hard left then pan each following tap a bit closer to right until the last tap is at hard right. Right to Left Sweep does the same only reverses the direction. Spread from Center pans the first tap at center, the next a bit left of center, the next further right of center, etc., until the last tap ends at hard left. Merge to Center pans the first tap hard right, the next not so hard left and the next less hard right etc... until the last tap which ends at center. Random Pans is just that.

Tedium Parameters

Note: The following forty parameters are found by pressing the Tedium softkey, the desired softkey and then the parameter key until the desired number is found, followed by the numbered softkey. These Tedium parameters give very flexible control over each delay tap and the Diffusor. They can also make you crazy.

#9-20 Tap Delay 1-12 0 to 1450.0 milliseconds

These parameters control each individual delay line's delay time. Note that the values are not the time delay from input signal to output but the time between each tap. Here's an example; if all Tap Delays are set to 20ms the first tap would sound 20ms after the input signal, the second would be 20ms after that or 40ms from the input signal. The total Tap Delay cannot exceed 1450.0 milliseconds. In other words, all the Tap Delay settings added together can't be greater than 1450.0 ms. If you try to adjust them over the limit the H3000 will display the "OOPS" message and not let the value go beyond the limit.

#21-32 Tap Level 1-12 0 to 100 per cent

These parameters control the output level of each delay tap.

#33-44 Pan Taps -11 to 11

These are the pan locations of each individual delay tap. A setting of -11 is panned hard left, 0 is dead center and 11 is hard right.

#45-48 All-pass delays 0 to 800 milliseconds

The four All Pass Delays control the All Pass Filters described earlier. These filters make up the Diffusor in this algorithm. In general, setting these numbers high (near 800ms) will give a long decay time with a discrete echo sound. Setting these numbers low (near 0ms) will give dense (diffuse) sounds. Since there are four filters a mixture of the qualities can have great results. The parameter adjusts in .1 millisecond steps (1/10,000 of a second) from 0 to 800 milliseconds. There is one limitation to the length. The total delay of all four filters and the twelve tap delays cannot exceed 1450 milliseconds and no single delay setting can exceed 800ms. The H3000 will give you an "OOPS" message if you try to go past that.

Levels

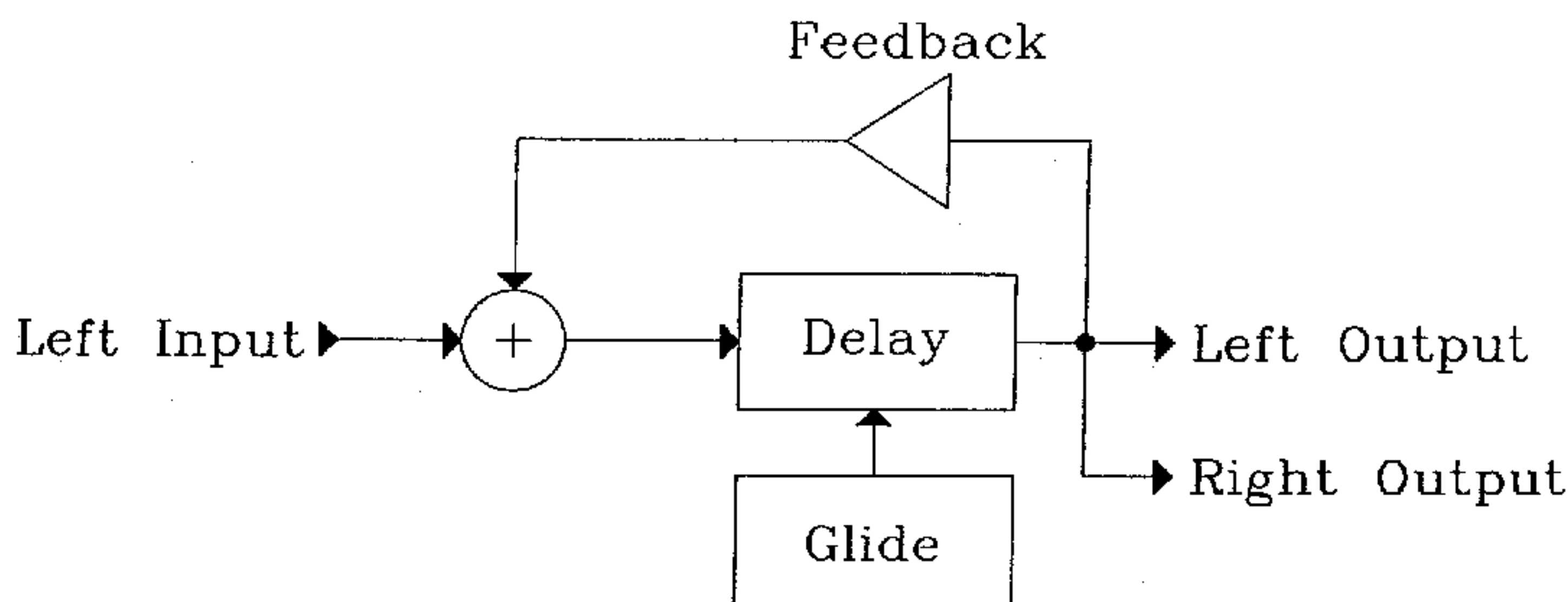
#50	Left In	-48 to 48 dB
#51	Right In	-48 to 48 dB
#52	Left Out	-48 to 48 dB
#53	Right Out	-48 to 48 dB

The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

Description

Algorithm 109 is one long delay line capable of recirculating its output back to its input. The output is sent to both right and left channels. MIDI controllable parameters include up to 1.4 seconds of delay, an adjustable feedback (recirculation) level, infinite repeat and mix level.

Block Diagram



Parameters

- | | | | |
|----|--|------------------------|-------------------|
| #1 | Delay | 0 to 1400 milliseconds | Modulation |
| | This sets the length of time between the input signal and the delayed output signal. The delay time is adjustable in one millisecond steps (1/1000th of a second) up to 1.4 seconds. | | |
| #2 | Feedback | -100 to 99 per cent | Modulation |
| | This controls the level of delayed signal to be added (recirculated or fed back) to the input signal. 0% feedback will give a single repeat while -100% will capture a signal infinitely. Be careful not to add too much material at high feedback levels or the output may turn to chaos. In general -100% feedback will work better when doing tape loop type effects. | | |
| #3 | Repeat | on or off | |
| | The Repeat switch will capture up to 1.4 seconds of audio and replay it continuously. Pressing Repeat again will release the segment. | | |
| #4 | Mix | 0 to 100 per cent | Modulation |
| | The mix level is the balance between the original or dry signal and the effected or wet signal. A 50% mix will result in equal levels of dry and wet sound. | | |

Expert Mode Parameters

- #5 Glide Speed 0 to 100 Modulation**
This is the time it takes the H3000 to respond to changes in the delay time settings. What's gliding? Well, that's what happens when the delay time is changed drastically on the front panel. With glide on, a large delay time change will slowly and smoothly change the perceived audio delay. No pops, crackles or even snaps in the output. 100 speed means quick changes and a speed of 0 means very slow changes.
- #6 Glide Enable delay glide on or off**
This turns the delay gliding on or off. It's normally on.

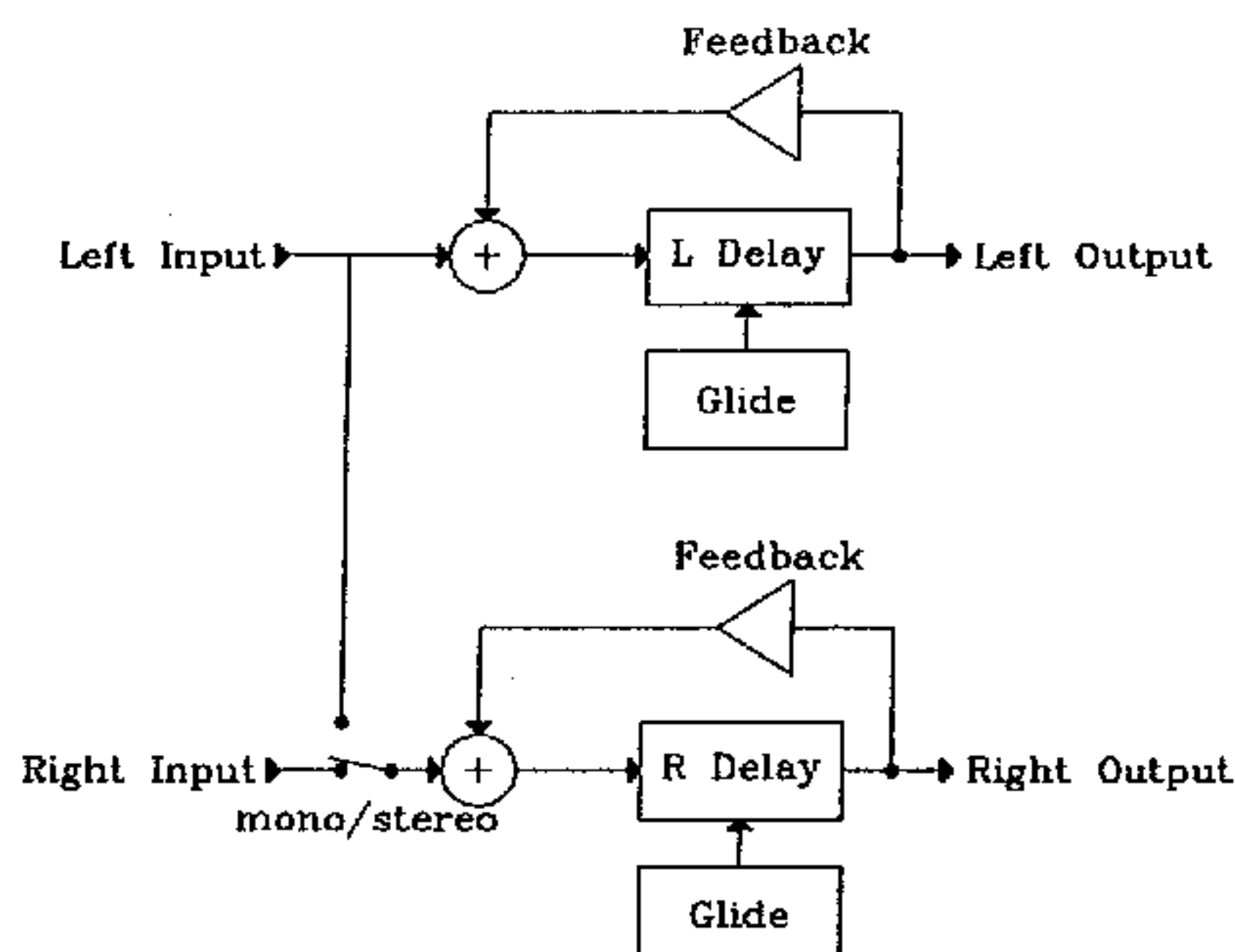
Levels

- #7 Left In -48 to 48 dB**
#8 Right In -48 to 48 dB
#9 Left Out -48 to 48 dB
#10 Right Out -48 to 48 dB
The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

Description

Dual Digiplex is similar to Long Digiplex (Algorithm 109) it provides two separate delay lines each with its own controls. Delay time on each channel is up to .7 seconds.

Block Diagram



Parameters

- | | | | |
|---|------------|-----------------------|------------|
| #2 | L Delay | 0 to 700 milliseconds | Modulation |
| #8 | R Delay | 0 to 700 milliseconds | Modulation |
| This sets the length of time between the left or right input signal and the delayed output signals. The delay time is adjustable in one millisecond steps (1/1000th of a second) from 0 up to .7 seconds. | | | |
| #3 | L Feedback | -100 to 99 per cent | Modulation |
| #9 | R Feedback | -100 to 99 per cent | Modulation |
| This controls the amount of left or right channel delayed signal to be fed back to the left or right channel's input. 0 per cent feedback means nothing is recirculated so that only one delay is heard. -100 percent will capture the signal indefinitely. Be careful with the input levels when working with high feedback. The output can quickly build up to clipping. In general -99 per cent feedback will work better when doing digital tape loop type effects. | | | |
| #0 | L Mix | 0 to 100 per cent | Modulation |
| #1 | R Mix | 0 to 100 per cent | Modulation |
| The left and right mix levels control the balance between the dry signals and the wet signals. A 50% mix will result in equal levels of dry and wet sound at the output. | | | |
| #7 | Repeat | on or off | |
| The Repeat switch will capture up to 1.4 seconds of audio and replay it continuously. Pressing Repeat again will release the segment. | | | |

Expert Mode Parameters

- #4 Glide Speed 0 to 100 Modulation**
This is the time it takes the H3000 to respond to changes in the delay time settings. Gliding occurs when the delay time is changed drastically. With glide on, a large delay time change will slowly and smoothly change the perceived audio delay. No noise is created in the output. 100 speed means quick changes and a speed of 0 means very slow changes.
- #5 Glide Enable delay glide on or off**
This turns the delay gliding on or off. It is normally on.
- #6 Stereo/Mono Stereo or Mono**
Here the right input channel can be switched on or off. If set for stereo the H3000 is two independent, 700ms digiplex units. If set to mono the signal at the left input channel can have two separate delay times, each with its own feedback and mix level.

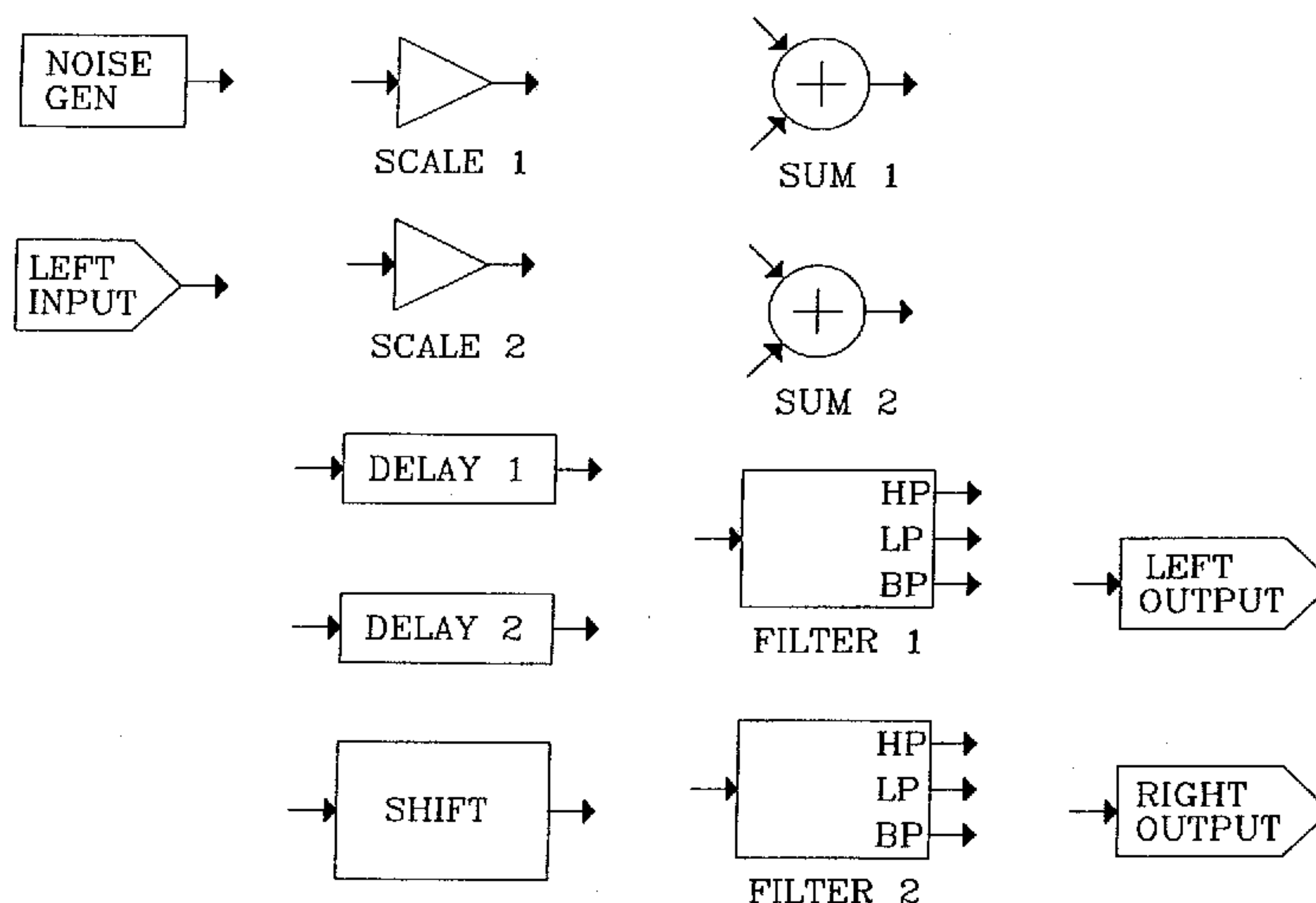
Levels

- #10 Left In -48 to 48 dB**
#11 Right In -48 to 48 dB
#12 Left Out -48 to 48 dB
#13 Right Out -48 to 48 dB
- The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels. See the levels section in "Running the H3000" for further information.

Description

The Patch Factory algorithm gives the user a bit of almost everything. This algorithm contains a pitch shifter, two tuneable filters (These can be lowpass, highpass, or bandpass), two delay lines and a white noise generator. Using these basic effect elements, a flexible patching scheme and some "glue" (a pair each of summing junctions and attenuators), clever users can create sound effects limited only by their imaginations.

Block Diagram



Parameters

- | | | | |
|----|----------|-----------------|------------|
| #0 | Cutoff 1 | 0 to 7000 Hertz | Modulation |
| #1 | Cutoff 2 | 0 to 7000 Hertz | Modulation |
- Cutoff 1 and 2 control the cutoff frequencies of filters 1 and 2. The adjustment is made in Hertz, and determines the point at which the filter attenuates by 3 dB (for lowpass and highpass filters). For bandpass filters, this parameter controls the center frequency (or resonant frequency) of the filter.
- | | | | |
|----|------------|------------|------------|
| #2 | Q Factor 1 | 0 to 1.000 | Modulation |
| #3 | Q Factor 2 | 0 to 1.000 | Modulation |
- This parameter adjusts the shape of the frequency response of filters 1 and 2. When the Q factor is set to zero, the filter will be relatively flat up to its cutoff frequency. As the Q is increased, the filter will develop a peak at the center frequency. At a Q factor of 1, the filter will oscillate at the center frequency.

- | | | | |
|----|---------|---------------------------|------------|
| #4 | Delay 1 | 0.0 to 500.0 milliseconds | Modulation |
| #5 | Delay 2 | 0.0 to 500.0 milliseconds | Modulation |
- These parameters control the amount of delay for delay lines 1 and 2. The delay is adjusted in milliseconds and is adjustable to the nearest tenth of a millisecond.
- | | | | |
|----|---------|--------------------------|------------|
| #6 | Scale 1 | -100.0 to 100.0 per cent | Modulation |
| #7 | Scale 2 | -100.0 to 100.0 per cent | Modulation |
- Scale 1 and 2 control the amount of attenuation for attenuators 1 and 2. The attenuation is adjusted in per cent. An adjustment of 100 per cent corresponds to no attenuation. An adjustment of 0 per cent turns the signal off. Negative settings invert the phase of the signal.
- #8 **Coarse, Fine** -4800 to 1200 cents Modulation
- This controls the amount of pitch shift in the pitch shift section. The pitch shift is given in cents, where +100 cents transposes the signal up by one half-step and -100 cents transposes the signal down by one half-step. The coarse adjustment of pitch allows pitch shift control in 100 cents (or semitone) intervals.
- #9 **P Delay** _____ 0 to 500 milliseconds Modulation
- P Delay (Pitch shift delay) controls the amount of delay in the pitch shift section. The delay is adjusted in milliseconds. This delay can be used just like delay lines 1 and 2, with the exception that it is always connected to the pitch shifter.
- Hint:** If you want real-time, clickless delay control, use this delay instead of delay lines 1 and 2.
- | | | | |
|-----|-----------|-------------------|------------|
| #10 | Left Mix | 0 to 100 per cent | Modulation |
| #11 | Right Mix | 0 to 100 per cent | Modulation |
- These control the dry/wet mix for the left or right output channels. A setting of 100 per cent corresponds to full wet (effect) output. Setting the mix to 0 per cent corresponds to a full dry output.

Levels

To access the level adjustment parameters, press the softkey labelled "levels" on the last parameter page. Pressing "return" will bring you back to the normal parameter pages.

- | | | |
|-----|-----------|--------------|
| #12 | Left In | -48 to 48 dB |
| #13 | Right In | -48 to 48 dB |
| #14 | Left Out | -48 to 48 dB |
| #15 | Right Out | -48 to 48 dB |

The level parameters allow individual level adjustments to be edited and saved with each user preset. All of the level adjustments are made in dB and are added to the master level adjustments (The master level adjustments are those made after pressing the "levels" key beneath the bargraphs).

Expert, Deglitch Parameters

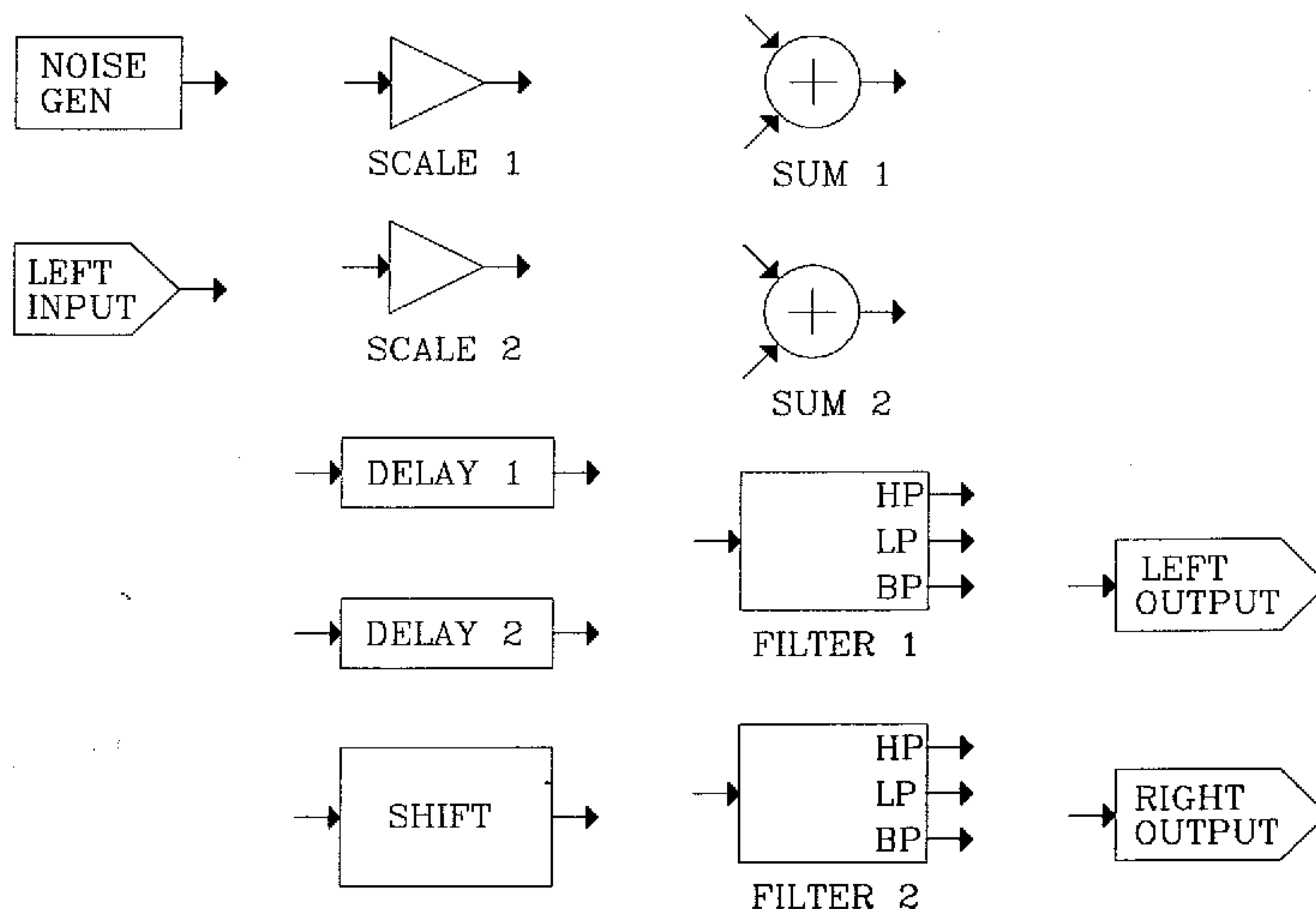
The deglitch parameters are used to optimize the pitch shift software to get the best, smoothest sound. To get to these parameters, press the "expert" key on the last parameter page, and then press the "deglitch" key.

- | | | |
|-----|----------|------------|
| #16 | Low Note | 9 Hz to C7 |
|-----|----------|------------|
- Set this parameter for the lowest note you reasonably expect to pitch shift. Note: The lower the setting on this parameter, the longer the processing delay of the pitch shifter. In other words, don't set this parameter any lower than needed.
- | | | |
|-----|-----------|----------|
| #17 | High Note | C4 to C8 |
|-----|-----------|----------|
- Set this to the highest note you expect to pitch shift. Typically, the smaller the range between the high note and the low note, the better the pitch shifter will sound.

Description

The Patch Factory algorithm gives the user a bit of almost everything. This algorithm contains a pitch shifter, two tuneable filters (These can be lowpass, highpass, or bandpass), two delay lines and a white noise generator. Using these basic effect elements, a flexible patching scheme and some "glue" (a pair each of summing junctions and attenuators), clever users can create sound effects limited only by their imaginations.

Block Diagram



Parameters

#0	Cutoff 1	0 to 7000 Hertz	Modulation
#1	Cutoff 2	0 to 7000 Hertz	Modulation
Cutoff 1 and 2 control the cutoff frequencies of filters 1 and 2. The adjustment is made in Hertz, and determines the point at which the filter attenuates by 3 dB (for lowpass and highpass filters). For bandpass filters, this parameter controls the center frequency (or resonant frequency) of the filter.			
#2	Q Factor 1	0 to 1.000	Modulation
#3	Q Factor 2	0 to 1.000	Modulation
This parameter adjusts the shape of the frequency response of filters 1 and 2. When the Q factor is set to zero, the filter will be relatively flat up to its cutoff frequency. As the Q is increased, the filter will develop a peak at the center frequency. At a Q factor of 1, the filter will oscillate at the center frequency.			

- | | | | |
|----|----------------|----------------------------------|-------------------|
| #4 | Delay 1 | 0.0 to 500.0 milliseconds | Modulation |
| #5 | Delay 2 | 0.0 to 500.0 milliseconds | Modulation |
- These parameters control the amount of delay for delay lines 1 and 2. The delay is adjusted in milliseconds and is adjustable to the nearest tenth of a millisecond.
- | | | | |
|----|----------------|---------------------------------|-------------------|
| #6 | Scale 1 | -100.0 to 100.0 per cent | Modulation |
| #7 | Scale 2 | -100.0 to 100.0 per cent | Modulation |
- Scale 1 and 2 control the amount of attenuation for attenuators 1 and 2. The attenuation is adjusted in per cent. An adjustment of 100 per cent corresponds to no attenuation. An adjustment of 0 per cent turns the signal off. Negative settings invert the phase of the signal.
- #8 **Coarse, Fine** **-4800 to 1200 cents** **Modulation**
- This controls the amount of pitch shift in the pitch shift section. The pitch shift is given in cents, where +100 cents transposes the signal up by one half-step and -100 cents transposes the signal down by one half-step. The coarse adjustment of pitch allows pitch shift control in 100 cents (or semitone) intervals.
- #9 **P Delay** **0 to 500 milliseconds** **Modulation**
- P Delay (Pitch shift delay) controls the amount of delay in the pitch shift section. The delay is adjusted in milliseconds. This delay can be used just like delay lines 1 and 2, with the exception that it is always connected to the pitch shifter.
- Hint:** If you want real-time, clickless delay control, use this delay instead of delay lines 1 and 2.
- | | | | |
|-----|------------------|--------------------------|-------------------|
| #10 | Left Mix | 0 to 100 per cent | Modulation |
| #11 | Right Mix | 0 to 100 per cent | Modulation |
- These control the dry/wet mix for the left or right output channels. A setting of 100 per cent corresponds to full wet (effect) output. Setting the mix to 0 per cent corresponds to a full dry output.

Levels

To access the level adjustment parameters, press the softkey labelled "levels" on the last parameter page. Pressing "return" will bring you back to the normal parameter pages.

- | | | |
|-----|------------------|---------------------|
| #12 | Left In | -48 to 48 dB |
| #13 | Right In | -48 to 48 dB |
| #14 | Left Out | -48 to 48 dB |
| #15 | Right Out | -48 to 48 dB |
- The level parameters allow individual level adjustments to be edited and saved with each user preset. All of the level adjustments are made in dB and are added to the master level adjustments (The master level adjustments are those made after pressing the "levels" key beneath the bargraphs).

Expert, Deglitch Parameters

The deglitch parameters are used to optimize the pitch shift software to get the best, smoothest sound. To get to these parameters, press the "expert" key on the last parameter page, and then press the "deglitch" key.

- | | | |
|-----|-----------------|-------------------|
| #16 | Low Note | 9 Hz to C7 |
|-----|-----------------|-------------------|
- Set this parameter for the lowest note you reasonably expect to pitch shift. Note: The lower the setting on this parameter, the longer the processing delay of the pitch shifter. In other words, don't set this parameter any lower than needed.
- | | | |
|-----|------------------|-----------------|
| #17 | High Note | C4 to C8 |
|-----|------------------|-----------------|
- Set this to the highest note you expect to pitch shift. Typically, the smaller the range between the high note and the low note, the better the pitch shifter will sound.

#18 Source polyphonic- * -solo

This is another parameter used to tune the pitch shifter performance. Move the star towards "polyphonic" for polyphonic input sources (for example, a full mix), and move it towards the "solo" for monophonic instruments (like a solo flute). The last word though, is your own ear. Adjust this and all parameters until the effect sounds the best!

Patching

This is where the fun really starts. The patching adjustments of this algorithm let you virtually design your own effect algorithms. To start patching, press the "expert" key on the last parameter page, then press the "patching" key.

Patching allows you to connect the basic effect elements (shown on the block diagram) in almost any way you wish. To make a "patch", simply find the desired patch destination in the menu.

Important Note: Before experimenting with different patches, turn your speaker or headphone level down to a quiet level. Changing the patching can result in bizarre and possibly very loud sounds.

For example, to patch something to the left output, press the "parameter" key until you see the "l output" key appear. Press the "l output" key. The display will show what "l output" or the left output is connected to. Turning the knob will change the patch. To send white noise to the left output, turn the knob until "l output:noise gen" appears on the display. If you listen to the left channel output, you will hear full amplitude white noise. (This is an example of a "very loud" sound).

Patch destinations

#19	Filt 1 In	Filter 1 input	#20	Filt 2 In	Filter 2 input
#21	Delay 1 In	Delay 1 input	#22	Delay 2 In	Delay 2 input
#23	Scale 1 In	Scaler 1 input	#24	Scale 2 In	Scaler 2 input
#25	Sum 1a In	Summing junction 1, "a" input	#26	Sum 1b In	Summing junction 1, "b"
#27	Sum 2a In	Summing junction 2, "a" input	#28	Sum 2b In	Summing junction 2, "b"
#29	Shift In	Pitch shifter input	#30	L Output	Left output
#31	R Output	Right output			

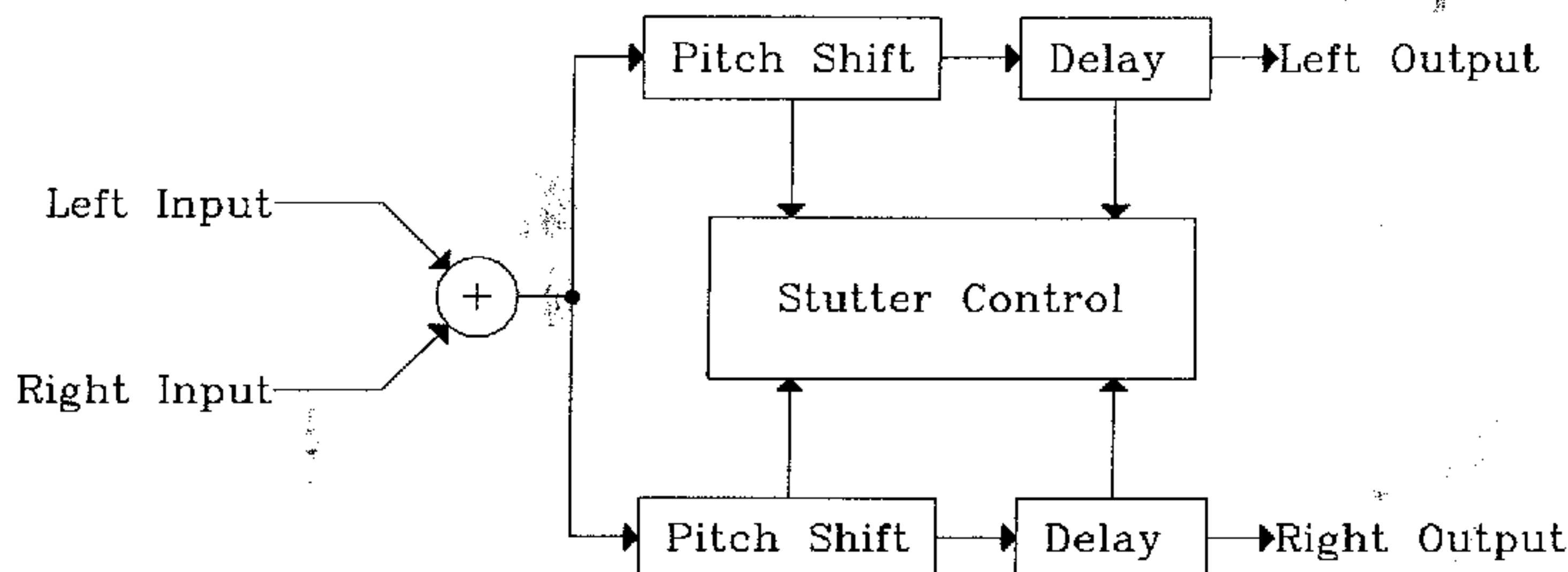
Patch Sources

Left Input	- The left channel audio input	Sum 1	- The output of summing junction 1
Sum 2	- The output of summing junction 2	Delay 1	- The output of delay line 1
Delay 2	- The output of delay line 2	Scaler 1	- The output of scaler 1
Scaler 2	- The output of scaler 2	Lowpass 1	- Lowpass filter 1 output
Lowpass 2	- Lowpass filter 2 output	Bandpass 1	- Bandpass filter 1 output
Bandpass 2	- Bandpass filter 2 output	Highpass 1	- Highpass filter 1 output
Highpass 2	- Highpass filter 2 output	Noise Gen	- Noise generator output
Pitch Shift	- Pitch shifter output	Null Input	- Connects to nothing (no sound)

Description

The Stutter algorithm is used to create that popular st..st..stutter sound - in real-time, without the need for a sampler or cumbersome digital delay acrobatics.

Block Diagram



Parameters

- | | | | |
|----|----------|---------------|------------|
| #0 | Trigger1 | no adjustment | Modulation |
| #1 | Trigger2 | no adjustment | Modulation |
| #2 | Trigger3 | no adjustment | Modulation |
| #3 | Trigger4 | no adjustment | Modulation |
- Pressing the any of the four trigger keys will trigger an effect. The effect may consist of a stutter, a pitch sweep or a change of pitch shift. What happens depends on what is "patched" to that particular trigger key (The patching is set up in the expert parameters).
- | | | | |
|----|-------------|-----------|--|
| #4 | Auto On/Off | On or Off | |
|----|-------------|-----------|--|
- This parameter turns on the automatic stutter sequencer. When the sequencer is on, preset triggers will be sent out at a rate determined by the "program rate" parameter.
- | | | | |
|----|-------|----------|------------|
| #5 | Speed | 0 to 100 | Modulation |
|----|-------|----------|------------|
- This controls the rate at which the trigger sequencer generates triggers. At a setting of 0, the triggers will occur very infrequently. When set to 100, the triggers will occur constantly.
- | | | | |
|----|---------|----------------|--|
| #6 | Program | see list below | |
|----|---------|----------------|--|
- The "program" parameter determines what type of triggers are generated by the trigger sequencer. Here is a description of each setting:
- total random - generates random stutters, random pitch sweeps and random pitch shifts
 - random sweep - generates random pitch sweeps only
 - random pitch - generate random pitch shifts only
 - just stutter - generate random stutters only
- | | | | |
|----|-----------|-------------------|------------|
| #7 | Left Mix | 0 to 100 per cent | Modulation |
| #8 | Right Mix | 0 to 100 per cent | Modulation |
- These control the dry/wet effect mix at the left or right outputs. When set to 0 per cent, the mix is full dry. When set to 100 per cent the output is full wet effect.

Levels

To access the level adjustment parameters, press the softkey labelled "levels" on the last parameter page. Pressing "return" will bring you back to the normal parameter pages.

#9	Left In	-48 to 48 dB
#10	Right In	-48 to 48 dB
#11	Left Out	-48 to 48 dB
#12	Right Out	-48 to 48 dB

The level parameters allow individual level adjustments to be edited and saved with each user preset. All of the level adjustments are made in dB and are added to the master level adjustments (The master level adjustments are those made after pressing the "levels" key beneath the bargraphs.)

Expert Parameters, Trigger Menu

The trigger menu contains parameters used to set up different types of stutters and to assign stutters and pitch sweeps to the trigger keys, "trigger1" through "trigger4". To access the trigger menu, first press the "expert" key on the last page of the parameter menus. Then press the "triggers" key.

Stutter Parameters

There are two sets of stutter parameters, labelled "stutter 1" and "stutter 2". This allows the user to set up two different types of stutters and assign them to different trigger keys. For example, a single, long repeat can be assigned to trigger 1 and a short, repetitive stutter can be assigned to trigger 2.

#13	Length 1	0 to 500 milliseconds	Modulation
#14	Length 2	0 to 500 milliseconds	Modulation

The length 1 and length 2 parameters set the length of the segments to be repeated after stuttering is triggered. The "length 1" parameter will be used when "stutter 1" is patched to a trigger key. The "length2" parameter will be used when "stutter 2" is patched to a trigger key.

#15	Count 1	0 to 16	Modulation
#16	Count 2	0 to 16	Modulation

These parameters determine how many times the stutter segment is to be repeated. The "count 1" parameter will be used when "stutter 1" is patched to a trigger key. The "count 2" parameter will be used when "stutter 2" is patched to a trigger key.

Trigger Parameters

The trigger parameters are used to patch stutters and pitch sweeps to the four trigger keys "trigger1" through "trigger4". Each trigger key can trigger two things. This allows a pitch sweep and a stutter to be triggered by one key press.

To make a patch to the "trigger1" key, press "expert", "triggers", and "PARAMETER" to bring up the page with "trig 1a", "trig 1b", "trigger 1", and "return". Press the "trig 1a" key. Turn the knob to select a stutter or pitch sweep to be triggered. (See below for a list of the different triggers.) Do the same thing for the "trig 1b" parameter. Pressing the "trigger1" key will now simultaneously trigger the effects patched to "trig 1a" and "trig 1b". (We've included an extra "trigger1" key on this menu. By pressing this key you can easily audition the effect of your patching.) Follow the same procedure to set up triggers 2 through 4.

#17	Trigger 1a	see trigger list
#18	Trigger 1b	see trigger list
#19	Trigger 2a	see trigger list
#20	Trigger 2b	see trigger list
#21	Trigger 3a	see trigger list
#22	Trigger 3b	see trigger list
#23	Trigger 4a	see trigger list
#24	Trigger 4b	see trigger list

These eight parameters select the effects to be patched to trigger keys 1 through 4. Each trigger can have two effects patched to it, hence the "a" and the "b" for each parameter. See the trigger list below for the available effects.

Trigger List

no action	- This does nothing.
stutl l	- Stutter on the left channel using stutter 1 parameters.
stutl r	- Stutter on the right channel using stutter 1 parameters.
stutl l&r	- Stutter on both channels using stutter 1 parameters.
stut2 l,r,l&r	- Stutter using stutter 2 parameters.
rands l,r,l&r	- Stutter using random stutter parameters.
swpu1 l,r,l&r	- Sweep up pitch using the sweep 1 parameters.
swpu2 l,r,l&r	- Sweep up pitch using the sweep 2 parameters.
swpd1 l,r,l&r	- Sweep down pitch using the sweep 1 parameters.
swpd2 l,r,l&r	- Sweep down pitch using the sweep 2 parameters.
sw lu/rd	- Sweep up the left channel while sweeping down the right channel.
sw ld/ru	- Sweep down the left channel while sweeping up the right channel.
rpit1 l,r,l&r	- Set a random pitch shift using sweep 1 parameters.
rpit2 l,r,l&r	- Set a random pitch shift using sweep 2 parameters.
zero1 l,r,l&r	- Set sweep generator 1 and the specified channel to no pitch shift.
zero2 l,r,l&r	- Set sweep generator 2 and the specified channel to no pitch shift.

Sweep Menu

The sweep menu contains parameter adjustments for the pitch shifters and pitch sweep generators. To get to these parameters, press the "expert" key on the last parameter page and then press the "sweeps" key.

#25	l coarse, fine	-4800 to 1200 cents	Modulation
#28	r coarse, fine	-4800 to 1200 cents	Modulation
These control the amount of pitch shift in the left and right channels. The pitch shift is given in cents, where +100 cents transposes the signal up by one half-step and -100 cents transposes the signal down by one half-step. The coarse adjustment of pitch allows pitch shift control in 100 cents (or semitone) intervals.			
#26	l delay	0 to 500 milliseconds	Modulation
#29	r delay	0 to 500 milliseconds	Modulation
These control the amount of delay in the left and right channels. The delay is adjusted in milliseconds.			
#27	l fdback	0 to 100 per cent	
#30	r fdback	0 to 100 per cent	
These control the amount of feedback in the left and right channels. When this parameter is set to 0 per cent, there is no feedback.			
#31	up1 rate	0 to 100	
#35	up2 rate	0 to 100	
These control the rate of pitch sweep generators 1 and 2 for sweeping up in pitch.			

#32 up1 max 0 to 100
#36 up2 max 0 to 100
These set the maximum pitch for sweep generators 1 and 2.

#33 dn1 rate 0 to 100
#37 dn2 rate 0 to 100
These control the rate of pitch sweep generators 1 and 2 for sweeping down in pitch.

#34 dn1 min 0 to 100
#38 dn2 min 0 to 100
These set the minimum pitch for sweep generators 1 and 2.

#39 rand1 max -1200 to 1200 cents
#40 rand2 max -1200 to 1200 cents
This sets the pitch limit for the random sweep value for sweep 1.

Deglitch Menu

The deglitch parameters are used to optimize the pitch shift software to get the best, smoothest sound. To get to these parameters, press the "expert" key on the last parameter page, and then press the "deglitch" key.

#41 Low Note 9 Hz to C7
Set this parameter for the lowest note you reasonably expect to pitch shift. Note: The lower the setting on this parameter, the longer the processing delay of the pitch shifter. In other words, don't set this lower than needed.

#42 High Note C4 to C8
Set this to the highest note you expect to pitch shift. Typically, the smaller the range between the high note and the low note, the better the pitch shifter will sound.

#43 Source polyphonic- * -solo
This is another parameter used to tune the pitch shifter performance. Move the star towards "polyphonic" for polyphonic input sources (for example, a full mix), and move it towards the "solo" for monophonic instruments (like a solo flute). The last word though, is your own ear. Adjust this and all parameters until the effect sounds the best!

Description

The Timesqueeze algorithm is used to speed up or slow down pre-recorded program material without altering the pitch. When used in conjunction with a variable-speed audio tape recorder, this algorithm will automatically control the tape machine playback speed and make the necessary pitch correction for the desired amount of time compression (speeding up) or expansion (slowing down).

Timesqueeze finds itself most useful in the production of radio or television commercial spots, where fitting program material in 30 second or 1 minute slots is crucial.

Important note for first-time users: If you want to control the speed of your tape machine with the H3000, see first the section labelled "Tape Machine Hook-up" and also the section on "Tape Machine Interfacing Parameters".

Block Diagram

Parameters

#0 set up

Pressing the "set-up" key allows you to precisely change the length of a piece of program material without any messy arithmetic (that is, calculating per cent of time change, tape machine inches per second, and pitch ratios.) All that is needed is to enter the length of the original source material and the desired length of the compressed (or expanded) result. The H3000 will do the necessary math.

Press "set-up" to start:

```
How long is your program ? 0: 0: .0  
[ hours ] (minutes) (seconds) ( done )
```

Now enter the length of the original program. The length is displayed as **hours:minutes:seconds**. Press the "hours", "minutes", or "seconds" softkeys and enter the time with either the keypad or the knob. When the correct time has been entered, press "done".

The display will now show:

```
How long do you want it ? 1:32:10.2  
[ hours ] (minutes) (seconds) ( done )
```

Now enter the desired length of the compressed (or expanded) program. For convenience, the original length is given as a starting point. Enter the time as before. When the desired time has been entered, press **(done)**.

The H3000 (and the tape machine, if it is using the H3000B speed control) is now set up to change the length of the recorded program. The display will now show how much time compression or expansion is being used to change the program length. The change in length is displayed in per cent. Negative percentages correspond to time compression while positive numbers correspond to time expansion.

```
131 |change in program length: -11.3 %
    | ( set up ) ( pitch ) | time | ( expert )
```

- #0 **time** **-87.5 to 100.0 per cent** **Modulation**
Pressing the (**time**) softkey will allow direct entry of the percentage of time change. The time is entered in per cent, with negative percentages corresponding to time compression (speeding up) and positive numbers corresponding to time expansion (slowing down). Changing this parameter will automatically set the tape machine speed and the correct amount of pitch shift.
- #1 **pitch** **.001 to 2.000** **Modulation**
This parameter allows the user to change the pitch of the output material independently of the pitch shift necessary for time compression or expansion. This is occasionally desirable when vocal material is speeded up considerably. In these cases, even though the pitch has been corrected, listeners may perceive the speaker as having a higher voice. This effect may be reduced by slightly lowering the pitch of the voice. The pitch shift is displayed as a ratio (just like the old Harmonizers) and can be adjusted either up or down. A ratio of 1,000 corresponds to no pitch shift. Numbers lower than 1,000 shift the pitch down while larger numbers shift the pitch up. A ratio of .5 corresponds to an octave shift down, while a ratio of 2,000 corresponds to an octave shift up.

Expert Mode Parameters

Deglitching Parameters

These parameters are provided for the user to fine tune this algorithm for the most transparent performance.

- #2 **min delay** **0 to 400 milliseconds**
This parameter controls the overall delay of the pitch shifter. Longer delay settings will generally result in a better sound (long delay settings give the H3000 more time to analyze the input signal). A setting of 50 to 100 milliseconds will normally give very good results.
- #3 **delayrng** **0 to 100 milliseconds**
the "delay range" parameter controls to amount of variation allowed to the processing delay. Here again, larger settings will result in a cleaner sound. The only drawback for large settings of this parameter is that rhythmic material will tend to have tempo variations as the delay varies. A setting of 50 milliseconds strikes a good balance between "tightness" of rhythm and clean sound.
- #4 **min freq** **44 to 90 Hertz**
The "minimum frequency" parameter determines the lowest frequency that the H3000 will be able to cleanly process. Set this to the lowest frequency that is expected to be time compressed. The **higher** this parameter is set, the **better** (unless the input frequency goes below minimum). At higher settings, the H3000 will respond faster to changes in the input signal, while at lower settings it will be able to process lower frequencies. In general, for voice only processing, this parameter should be set to the higher ranges (70 to 90 Hertz). For music or mixed program material (especially if the program is bass heavy) this parameter may have to be set in the lower ranges.
- #5 **silence** **0 to 99.9 per cent**
In order to better compress or expand program material, the H3000 looks for gaps, or silences in the input signal. This parameter controls the level that is considered as silence. Adjustment of this may be necessary when the input noise level to the H3000 changes. If there is a large input noise level, this parameter should be set higher. If the noise

level is low, this parameter should be set lower. This parameter should be adjusted by ear for the best sound. If this parameter is set too high, weak vocal sounds may sound "chopped out". If that is the case, adjust this parameter to a lower value.

Tape Machine Interfacing Parameters

The tape machine parameters are used to enable the H3000 to control the speed of a tape machine for time compression and expansion. If you wish to control the speed of your tape machine with this program, you must set these parameters properly. If this is the first time you are attempting time compression or expansion with the H3000, follow this procedure:

- 1) Set the machine parameters to be compatible with your particular tape machine (below).
- 2) Save these settings on a preset. (Press the "PROGRAM" button twice, then the "SAVE" softkey.)
- 3) Connect the frequency control output of the H3000 to your tape machine, following the procedure given below (under "Tape Machine Hook-up").

select (list of tape machines)

This parameter provides the easiest way to set up the H3000 to control the speed of your tape machine. To get here from the main parameters, press (**expert**), then (**machine**), and then (**select**). Turn the knob to see a list of tape machines. When the proper machine is in the display, press (**that's it**). The H3000 will now be set up to control the speed of your tape machine automatically. If your tape machine is not listed, use the (**custom**) softkey to set up the machine (see below).

A note about (**note**): Some tape recorders may have peculiar characteristics relevant to speed control. In these cases, we have provided extra information for the user. To access this information, press and hold the (**note**) softkey in the machine selection menu.

Important: Don't forget to save this set-up as a preset!

custom

If it is desired to interface to a tape machine that is not listed in the machine list, it is necessary to make a custom set-up. From the machine selection menu press the (**custom**) softkey. The H3000 supports only frequency controlled machines. For these machines, making a custom set-up is only a matter of setting a reference frequency parameter (see below).

reference

This parameter must be set to the nominal operating control frequency for the tape machine. This information should be found in the tape machine's operating manual. This frequency should be set to give a playback speed equal to the original recording speed of the program material.

Important: Don't forget to save this set-up as a preset.

Levels

To access the level adjustment parameters, press softkey (**levels**) on the last parameter page. Pressing (**return**) will bring you back to the normal parameter pages.

#6	Left In	-48 to 48 dB
#7	Right In	-48 to 48 dB
#8	Left Out	-48 to 48 dB
#9	Right Out	-48 to 48 dB

The level parameters allow individual level adjustments to be edited and saved with each user preset. All of the level adjustments are made in dB and are added to the master level adjustments. (The master level adjustments are those made after pressing (**levels**) beneath the bargraphs.)

Tape Machine Hook Up

In order to control the speed of a tape machine, the H3000 must have a tape machine interface (this is included in the H3000B, B+ and H3500B). The H3000 only supports frequency controlled tape machines.

To connect a tape machine for frequency control, connect the frequency output of the H3000 to the frequency output of the tape machine. The frequency output is available at the 1/4 inch phone jack labelled 'PORT D' on the rear of the H3000. The frequency output is a positive five volt square wave (TTL compatible) at the tip of the PORT D phone jack connection. The ring and sleeve of this connection are connected to ground.

It will be necessary to wire a cable to interface to the tape machine. Wire the tip of the H3000 PORT D output to the frequency input of the tape machine. Wire the ring and sleeve of PORT D to the ground connection on the tape machine interface. See the tape machine manual for information on how to wire the other side of the cable.

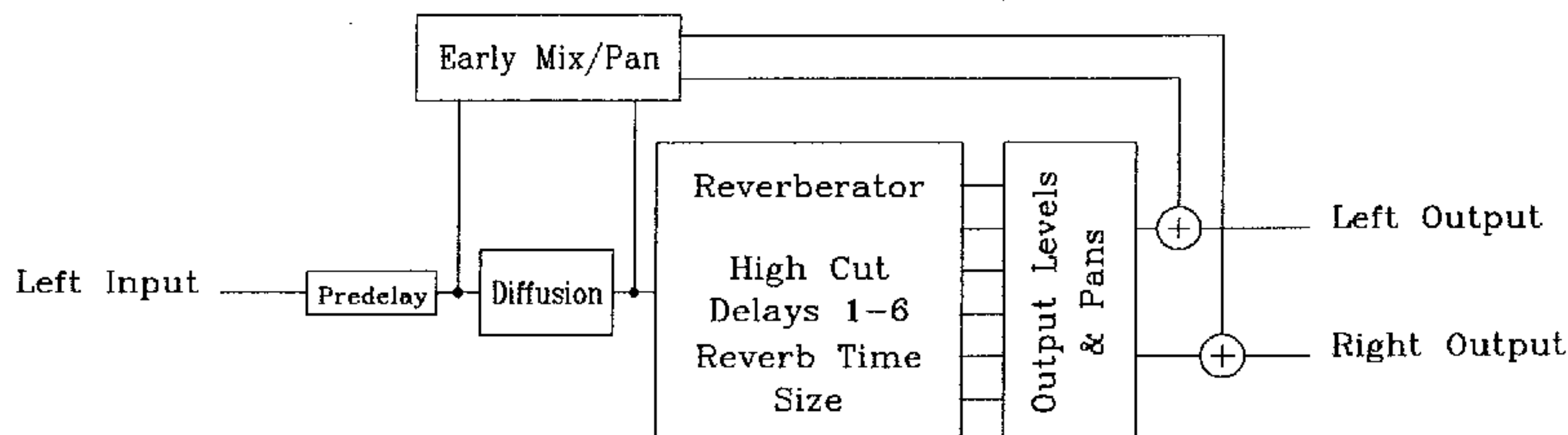
It may also be necessary to take other steps with the tape machine to enable it to accept remote control. Some machines have a pin that needs to be grounded before they will run using an external frequency.

Once connected, put the machine into external variable speed mode. Then run the Timesqueeze program to see if the speed control is working. Make sure the machine set-up parameters have been properly set. Change the (time) parameter by large amounts to see if the machine is responding to the frequency changes. If it is not responding correctly, check carefully the wiring to the tape machine and the machine set-up parameters.

Description

This algorithm offers a much improved early response characteristic over the original "Reverb Factory" program. In addition, this algorithm has greater reverb "density" and better control over source positioning within the simulated room. The apparent source location can be easily controlled with the front/back position control and the panning control. The parametric EQ of Reverb Factory has been replaced by a simple "high-cut" control, and the noise gate has been removed to allow for the extra-dense processing.

Block Diagram



Parameters

- | | | | |
|----|---|-------------------------------|-------------------|
| #0 | Predelay | 0 to 500 milliseconds | Modulation |
| | This parameter controls the amount of delay added before the reverberated sound. This can be used to increase the illusion of a large room. | | |
| #1 | Rev Time | 0.1 second to infinity | Modulation |
| | This parameter controls the reverb time or "liveness" of the simulated room. | | |
| #2 | High Cut | 0 to 100 per cent | Modulation |
| | The High Cut control is used to roll off the higher frequencies of the reverb to give a more natural response. Increasing this makes the room sound "warmer". | | |
| #3 | Size | 0 to 100 per cent | Modulation |
| | Use the size control to adjust the apparent size of the room. This one control simultaneously scales all of the delay lengths in the reverb algorithm. | | |
| #4 | Position | Front to Rear | Modulation |
| | The position control affects the apparent location of the listener within the room. Moving the icon towards "rear" or "front" will simulate the sound of a listener seated towards the rear or front of the room. | | |
| #5 | Pan | Pan Left to Pan Right | Modulation |
| | Like the position control, the pan control moves the apparent location of the listener. Instead of front/rear location, this controls the left/right positioning. | | |

- #6 **Early Mix** **0 to 100 per cent** **Modulation**
 The Early Mix parameter controls the nature of the early response of this reverb. A setting of 0 will result in a more coherent early response, especially with the position set to the front of the room. Higher settings will result in a more diffuse sound.
- #7 **Diffusion** **0 to 100 per cent** **Modulation**
 This control affects the overall diffusion within the reverb. Low settings of this parameter will result in a coarser reverb sound, while high settings will give a smoother overall reverb. The effect is most noticeable in the early response of the reverb.
- #8 **Mix** **0 to 100 per cent** **Modulation**
 This controls the overall dry/wet mix of the reverb.

Expert Parameters

- #9-14 **Delay 1-6** **0 to 5000 samples**
 These six parameters control the delay settings of the six delay lines which are the heart of this reverb. These parameters are the key to getting different type room sounds. Because of the critical nature of these settings, the delay values are adjusted in samples, where 1 sample equals 22 microseconds.
- #15-17 **Allpass Delay 1-3** **0 to 5000 samples**
 These three parameters control the delay values of the diffusion section of this reverb. Like the above parameters, these settings are critical in determining the actual quality of the reverb.
- #18-20 **Allpass Gain 1-3** **0 to 100 per cent**
 The actual feedback gains of the three diffusors are controlled with these parameters. In combination with the delay settings, the gains determine the overall smoothness of the reverb sound.
- #21-26 **Pan 1-6** **Left to Right**
 These six pan controls are used to control the panning of the six delay outputs of this reverb. These settings can have an incredible effect upon the stereo imaging of the reverb.
- #27-32 **Level 1-6** **-100 to 100 per cent**
 The output levels of the six delay lines are controlled with these parameters. Use these settings to tailor the shape, or "envelope" of the early response.

Levels

To access the level adjustment parameters, press the softkey labelled "levels" on the last parameter page. Pressing "return" will bring you back to the normal parameter pages.

- #33 **Left In** **-48 to 48 dB**
 #34 **Right In** **-48 to 48 dB**
 #35 **Left Out** **-48 to 48 dB**
 #36 **Right Out** **-48 to 48 dB**

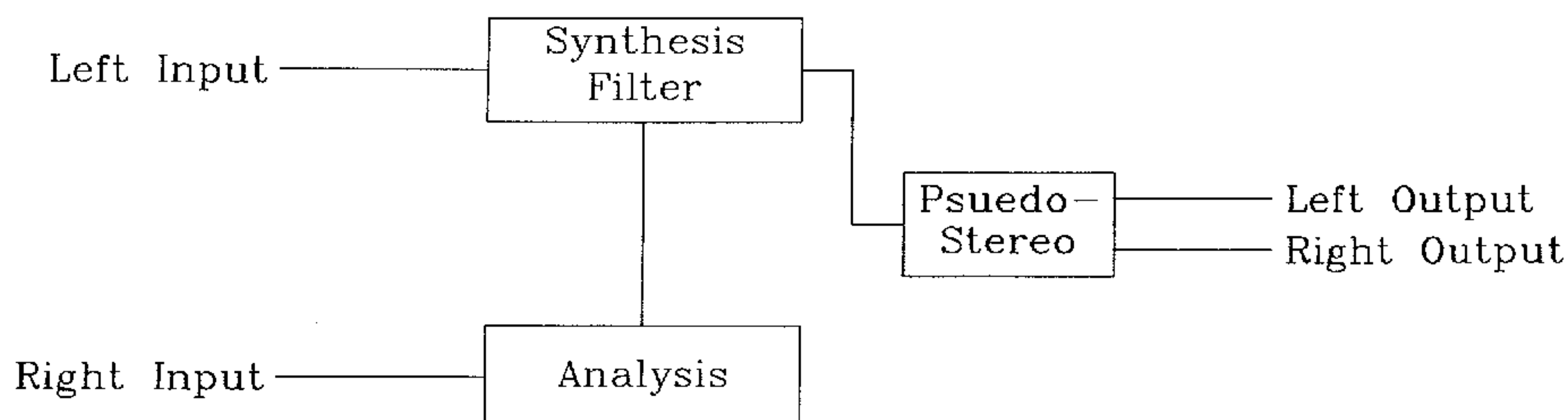
The level parameters allow individual level adjustments to be edited and saved with each user preset. All of the level adjustments are made in dB and are added to the master level adjustments. The master level adjustments are those made after pressing the "levels" key beneath the bargraphs.

Hint: The smooth build-up of this reverb makes it perfect for simulating large halls and auditoriums.

Description

This is the H3000 version of the classic "vocoder". A vocoder is used to impress the articulatory characteristics of one instrument onto the timbre and pitch of another. Usually the articulation information (the "analysis" input) comes from a spoken voice, while the timbre and pitch come from a keyboard, guitar, or any other instrument (the "synthesis" input). This is a great way to get that "talking" guitar sound. Make sure to get the channel inputs right when you're using this program. The right channel input is the analysis (voice) input, and the left input is the synthesis (instrument) input.

Block Diagram



Parameters

- | | | | |
|----|--|------------------------|-------------------|
| #0 | Formant Speed | 0 to 100 per cent | Modulation |
| | This parameter controls the speed at which the synthesis filter tracks the spectrum of the analysis input. Low settings will result in smooth, but slow tracking. High settings will give quick response, at the expense of some smoothness. | | |
| #1 | Envelope Speed | 0 to 100 per cent | Modulation |
| | The Envelope Speed parameter controls the speed at which the synthesis filter tracks the articulation of the analysis input. A low setting will tend to smear out the articulation while a high setting will quickly track input level changes. | | |
| #2 | Formant Shift | 0 to 100.0 per cent | Modulation |
| | The Formant Shift parameter changes the sound of the vocoder by "modulating" the synthesis filter. The modulation is such that high values of formant shift tend to "munchkin-ize" the vocoded sound. Sweeping this parameter with the function generator will add a pleasant modulation to the vocoder. | | |
| #3 | Depth | 0 to 100 per cent | Modulation |
| | This parameter controls the depth of the pseudo-stereo effect at the output of the vocoder. A setting of zero will result in a non-stereo output. | | |
| #4 | Width | 0 to 10.0 milliseconds | Modulation |
| | The width parameter controls the image width of the pseudo-stereo effect. | | |
| #5 | Mix | 0 to 100 per cent | Modulation |
| | This controls the overall wet/dry mix of the vocoder. | | |

Expert Parameters

- #6 **Max Resonance** 0 to 100.0 per cent **Modulation**
The maximum resonance control determines how "ringy" the synthesis filter is allowed to get. High settings of this may result in more accurate tracking, but may result in more "blurbles" in the output.
- #7 **Min Error** 0 to 100.0 per cent **Modulation**
This parameter, the minimum error, determines how close the synthesis filter tracks the input spectrum. With low settings, the synthesis filter will closely track the analysis input. With high settings, the tracking is looser.
- #8 **Threshold** 0 to 100 per cent **Modulation**
The vocoder has a built-in noise gate which eliminates mis-tracking caused by input noise or hum. This setting determines the threshold of that noise gate.

Levels

To access the level adjustment parameters, press the softkey labelled "levels" on the last parameter page. Pressing "return" will bring you back to the normal parameter pages.

- #9 **Left In** -48 to 48 dB
#10 **Right In** -48 to 48 dB
#11 **Left Out** -48 to 48 dB
#12 **Right Out** -48 to 48 dB

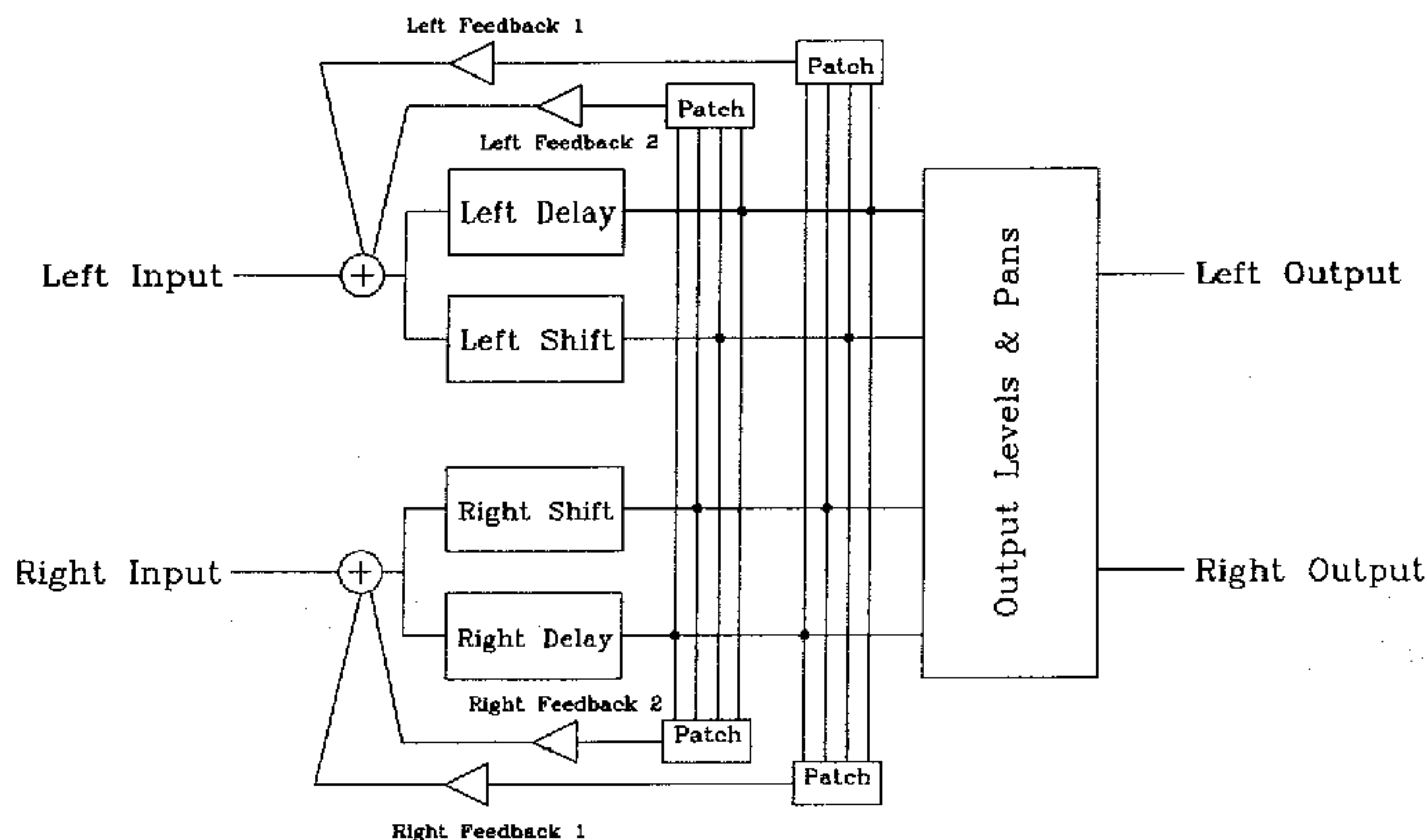
The level parameters allow individual level adjustments to be edited and saved with each user preset. All of the level adjustments are made in dB and are added to the master level adjustments. The master level adjustments are those made after pressing the "levels" key beneath the bargraphs.

Hint: Make sure the input levels are good and hot, but not clipped. Extremely low input levels or clipping can give you some horrible sounds. Also, you will get the best results if the synthesis input is harmonically rich. Synthesized string ensemble type sounds are usually good to use. Distorted guitar also works very well. Using noise as an input is also interesting.

Description

What, another pitch shift program? Well, yes, but this one's got a few neat tricks up its proverbial sleeve. Borrowing from research done with the TimeSqueeze® program, this program has superior pitch shift quality. The Multi-Shift algorithm has been optimized for micro-pitch shift, allowing any source material to be processed without adding artifacts. This algorithm is similar to the dual shift program, allowing discrete stereo pitch shifting. In addition to the pitch shifters, a delay tap has been added to each pitch shift channel, giving a total of four outputs. Each of the four outputs can be panned anywhere in the stereo field. The pitch shift range has been increased to plus or minus three octaves. Also, a "patchable" feedback structure has been set up, allowing each pitch shifter to use any two of the four outputs as feedback. Finally, each of the pitch shifters can be set, independently, to "reverse" pitch shift mode.

Block Diagram



Parameters

#0	L Coarse/Fine	-3600 to 3600 cents	Modulation
#3	R Coarse/Fine	-3600 to 3600 cents	Modulation
The left and right coarse/fine parameters control the amount of pitch shift in the left and right channels. Press once to adjust the value in 100 cent increments, press again to adjust in 1 cent increments.			
#1	L Pitch Delay	0 to 675 milliseconds	Modulation
#4	R Pitch Delay	0 to 700 milliseconds	Modulation
These adjust the amount of delay for the left and right pitch shifters. The adjustment is in milliseconds.			
#2	L Delay	0 to 675 milliseconds	Modulation
#5	R Delay	0 to 700 milliseconds	Modulation
These control the amount of delay for the left and right dry delay taps.			
#6	Mix	0 to 100 per cent	Modulation
This controls the overall wet/dry effect mix for this effect.			

- | | | | |
|----|---|-----------------------------------|-------------------|
| #7 | Feedback | 0 to 10.0 milliseconds | Modulation |
| | This is a "global" scaling control for the amount of feedback. This has the effect of controlling all four feedback levels at once. | | |
| #8 | Image | L<->R to R<->L | Modulation |
| | The "Image" control determines the width of the output stereo field. This works in conjunction with the expert "Pan" parameters. | | |

Expert Parameters, Outputs

- | | | |
|-----|----------------------|-----------------------------|
| #9 | L Pitch Level | -100 to 100 per cent |
| #10 | R Pitch Level | -100 to 100 per cent |
| #11 | L Delay Level | -100 to 100 per cent |
| #12 | R Delay Level | -100 to 100 per cent |
- These four parameters control the output levels of the left and right pitch shifters and the left and right dry delay taps. Negative settings will invert the phase of the audio signal.
- | | | |
|-----|--------------------|------------------------------|
| #13 | L Pitch Pan | Pan Left to Pan Right |
| #14 | R Pitch Pan | Pan Left to Pan Right |
| #15 | L Delay Pan | Pan Left to Pan Right |
| #16 | R Delay Pan | Pan Left to Pan Right |
- The four pan controls are used to set the left/right panning of the left and right pitch shifts and the left and right delays.

Patching

- | | | |
|-----|---------------------|-----------------------------|
| #17 | L Feedback 1 | -100 to 100 per cent |
| #18 | L Feedback 2 | -100 to 100 per cent |
| #21 | R Feedback 1 | -100 to 100 per cent |
| #22 | R Feedback 2 | -100 to 100 per cent |
- These control the amount of feedback for the two feedback paths of the left pitch shifter. This value is scaled by the main feedback control. (The non-expert parameter.)
- | | | |
|-----|-------------------|---|
| #19 | Left fb1= | l pitch, r pitch, l delay or r delay |
| #20 | Left fb2= | l pitch, r pitch, l delay or r delay |
| #23 | Right fb1= | l pitch, r pitch, l delay or r delay |
| #24 | Right fb2= | l pitch, r pitch, l delay or r delay |
- This parameter selects which source is to be fed back into the first feedback point of the left pitch shifter. Pressing the softkey will scroll through the various sources. **Warning:** Be careful. Certain combinations of feedback sources can result in an unstable program. Keep the volume low while adjusting the feedback parameters.

Control

- | | | |
|-----|--------------------|---------------------------|
| #25 | L Direction | Forward or Reverse |
| #29 | R Direction | Forward or Reverse |
- When this parameter is set to "reverse", the left pitch shifter is set to reverse pitch shift mode (exactly like program 104). The reverse shift length is set by the splice length control.
- | | | |
|-----|----------------|---------------------|
| #26 | L Xfade | Slow or Fast |
| #30 | R Xfade | Slow or Fast |

This parameter selects between two different pitch shifting modes. "Fast" is exactly like our old pitch shifters. "Slow" is intended for small pitch shift amounts, such as micro-pitch applications. This allows us to have virtually glitchless micro-pitch shifting.

#27 **L Deglitch** **On or Off**

#31 **R Deglitch** **On or Off**

This parameter controls whether "deglitching" is to be turned on or off. Normally, this should be set to "on" When set to "off", signal analysis stops, and the pitch shifter works with a fixed "splice" interval. This may be useful for some micro-pitch applications where the stereo image shift due to deglitching is annoying.

#28 **L Splice** **1 to 700 milliseconds**

#32 **R Splice** **1 to 700 milliseconds**

This control sets the **maximum** splice length. This control is equivalent to the "minimum" frequency control of the TimeSqueeze® program or the "low note" control of the other pitch shifters. To deglitch lower notes, set this parameter to a higher value. To shift the low E on a guitar, this should be set to 13 milliseconds. To shift the low E on a bass, this should be set to 26 milliseconds. For optimum pitch shifting, this parameter should not be set any higher than necessary. **Note:** When this parameter is set to 43 milliseconds or higher, deglitching is automatically turned off. The large splice values are intended for reverse pitch shifting or special effects.

Levels

To access the level adjustment parameters, press the softkey labelled "levels" on the last parameter page. Pressing "return" will bring you back to the normal parameter pages.

#34 **Left In** **-48 to 48 dB**

#35 **Right In** **-48 to 48 dB**

#36 **Left Out** **-48 to 48 dB**

#37 **Right Out** **-48 to 48 dB**

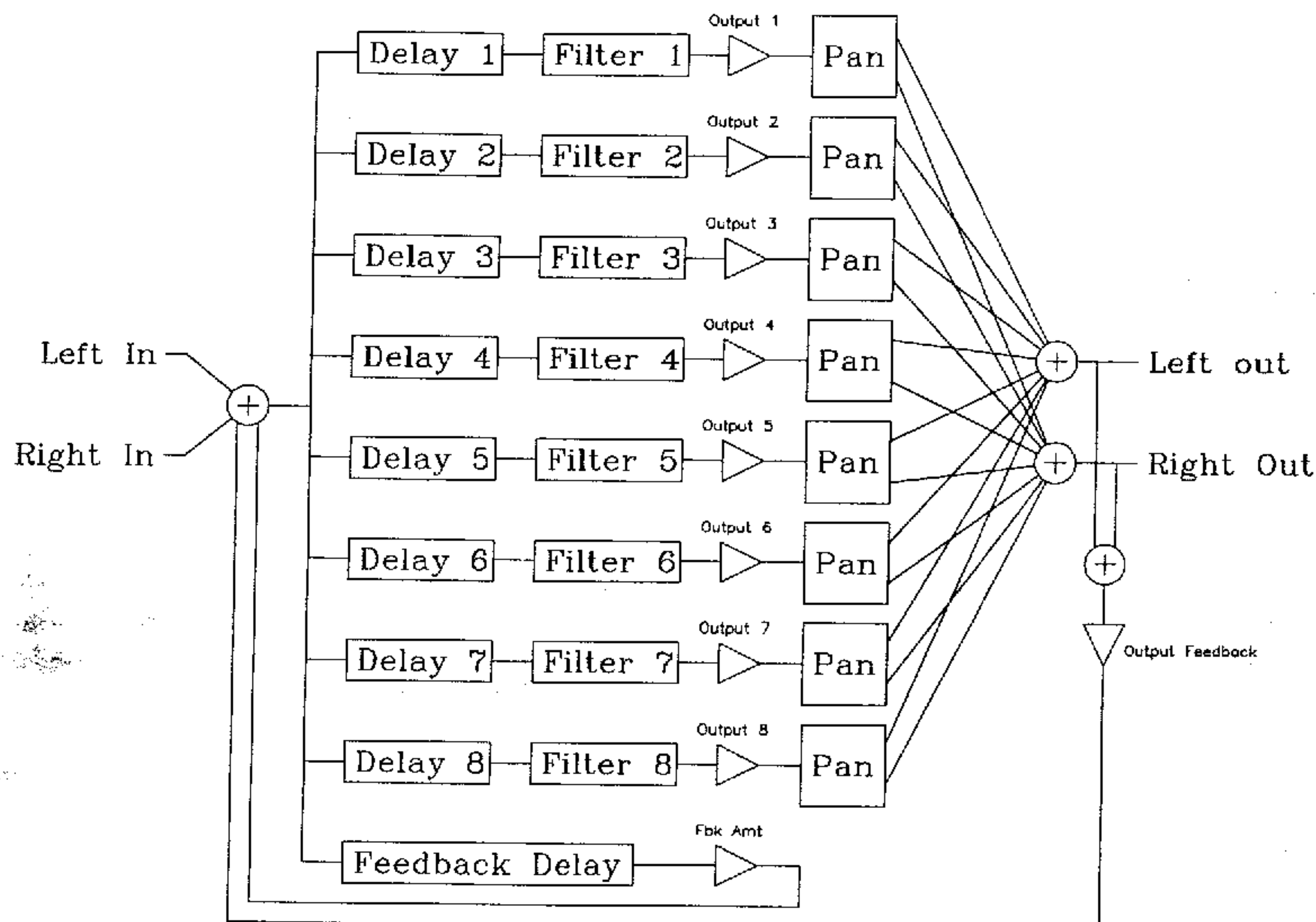
The level parameters allow individual level adjustments to be edited and saved with each user preset. All of the level adjustments are made in dB and are added to the master level adjustments. The master level adjustments are those made after pressing the "levels" key beneath the bargraphs.

Hint: For best pitch shift quality, make sure that the pitch shifter delay is set to something more than zero. This gives our software time to properly analyze the input signal. Usually, setting the pitch delay to the same value as the splice-time gives good results.

Description

This algorithm is a multi-tap delay line, with each of its eight delay outputs connected to a separate bandpass filter. The outputs of the eight bandpass filters are combined in a stereo mixer. Many unusual effects can be created by adjusting the parameters of the bands. For keyboard players, the center frequencies of the filters can be easily set to musical values by playing notes on a MIDI keyboard.

Block Diagram



Parameters

- #0 Delay 0 to 100.00 per cent Modulation**
 This is a "master" delay parameter which scales the eight individual delay values. A setting of 100 percent will yield maximum delay, while smaller values yield proportionately smaller delays. **Note:** The knob will give you a coarse adjustment. The up/down arrows will give you a fine adjustment. This is true for several of the parameters here.
- #1 Frequency -128 to 128 notes Modulation**
 This parameter is the "master" frequency control. The frequencies of all eight bandpass filters can be controlled with this parameter. The frequency value here is added to the individual frequency setting of each filter. The frequency value is adjusted in semitones, allowing the musical pitch of the filters to be easily set.

- | | | | |
|-----|--|-----------------------------------|-------------------|
| #2 | Q Factor | 0 to 100.00 per cent | Modulation |
| | This simultaneously scales the Q factor, or "resonance" of all of the filters. The filters are such that the higher the Q factor, the higher the gain through the filter. But since a smaller band of sound is being let through, the perceived gain is about the same. However, you should be careful when using high Q factors since they can distort the signals. | | |
| #8 | Global Pan | L - R to R - L | Modulation |
| | The Global Pan parameter controls the width of the stereo field. | | |
| #58 | Feedback Delay | 0 to 1485.0 milliseconds | Modulation |
| | This parameter determines the amount of delay in the feedback loop. This, in combination with the feedback parameter, can be used to set up a digital delay repeat loop. | | |
| #59 | Feedback | -100.00 to 100.00 per cent | Modulation |
| | This controls the amount of feedback. | | |
| #3 | Mix | 0 to 100 per cent | Modulation |
| | This controls the wet/dry output mix. A setting of 100 per cent corresponds to full wet effect. | | |

Expert Parameters

- | | | |
|--|---|---------------------------------------|
| #9, 15, 21, 27, 33, 39, 45, 51 | F1-F8 Frequency | 0 to 12800 cents |
| These eight parameters are the center frequencies for each of the filters. The values are adjusted in cents. Cents are a musical measure of frequency, where 100 cents is equal to one semitone. If you are using MIDI to set the filter frequencies, set all of these to zero. | | |
| #10, 16, 22, 27, 34, 40, 46, 52 | F1-F8 Q Factor | 0 to 999 |
| These parameters control the individual Q factors for the eight filters. 0 corresponds to a very gentle bandpass filter, while higher settings yield an increasingly narrow, more resonant filter. A setting of 999 will give a filter that is almost oscillating, one which will ring for a long time after any input is gone. Normally, these are all set to 999 and the global Q factor is used to adjust the value of all of the Q factors simultaneously. | | |
| #14, 20, 26, 31, 38, 44, 50, 56 | F1-F8 Note | Cx to G9 |
| Like the frequency parameters above, these adjust the center frequencies of the filters. Here, the filter frequencies are shown as actual musical notes. For example, if the Note 1 is set to G#4, filter 1 will be tuned to G#4. In addition to setting these parameters from the front panel, a MIDI keyboard can be used to adjust the note values. See below for a description of the MIDI "Note Modes". | | |
| #57 | Note Mode | off, routed, ordered, circular |
| This parameter determines how notes played on a MIDI keyboard will set the above mentioned "Note" parameters. The modes are: | | |
| "Off" | MIDI will not affect the note settings. | |
| "Routed" | This is perhaps the most intuitive mode. Each time a new note value is received (i.e., a key is pressed), the filters are tuned to the currently pressed keys. Filter 1 is tuned to the lowest note, filter 2 is tuned to the next lowest, and so on. If less than 8 keys are pressed, the notes will be repeated, until all filters are tuned. As a consequence, holding only one note down will tune all of the filters to the same note. | |
| "Ordered" | Filter 1 gets tuned to the first note that is played, filter 2 is tuned to the next note, and so on, up to filter 8. Releasing all of the keys will reset this mode, i.e., the next note received will tune filter 1. | |

"Circular"

This is like "Ordered", with the exception that it doesn't reset to filter 1 after an "all notes off" condition. The filter tunings continue circulating from 1 through 8 as more notes are received.

#11, 17, 23, 28, 35, 41, 47, 53

F1-F8 Delay

0 to 1496.0 milliseconds

These are the individual delays for each of the eight filters. The actual delay will depend on the setting of the global delay parameter. The delay value shown assumes that global delay is set to 100 per cent.

#12, 18, 24, 29, 36, 42, 48, 54

F1-F8 Output

-100 to 100 per cent

The output levels for the eight filters are set with these parameters. Generally it is a good idea to set the output levels to alternating positive and negative values in order to cancel out extremely low frequencies.

#13, 19, 25, 30, 37, 43, 49, 55

F1-F8 Pan

left to right

Each of the filters can be panned anywhere in a stereo mix. These eight parameters determine where each of the filters is to be panned. To change the panning, simply use the knob to move the "*" to the desired location in the stereo field.

Levels

To access the level adjustment parameters, press the softkey labelled "levels" on the last parameter page. Pressing "return" will bring you back to the normal parameter pages.

#4	Left In	-48 to 48 dB
#5	Right In	-48 to 48 dB
#6	Left Out	-48 to 48 dB
#7	Right Out	-48 to 48 dB

Hint: The filter frequencies are controlled by three sources, the global frequency, the individual frequencies, and the individual notes. These parameters represent musical pitch, and the final tuning of the filter is determined by adding the values together. If the filter 1 settings are:

Global Frequency: -12.00
F1 Frequency: 200 cents
F1 Note: C4

The tuning of filter 1 is:

C4 + 200 cents - 12 semitones.

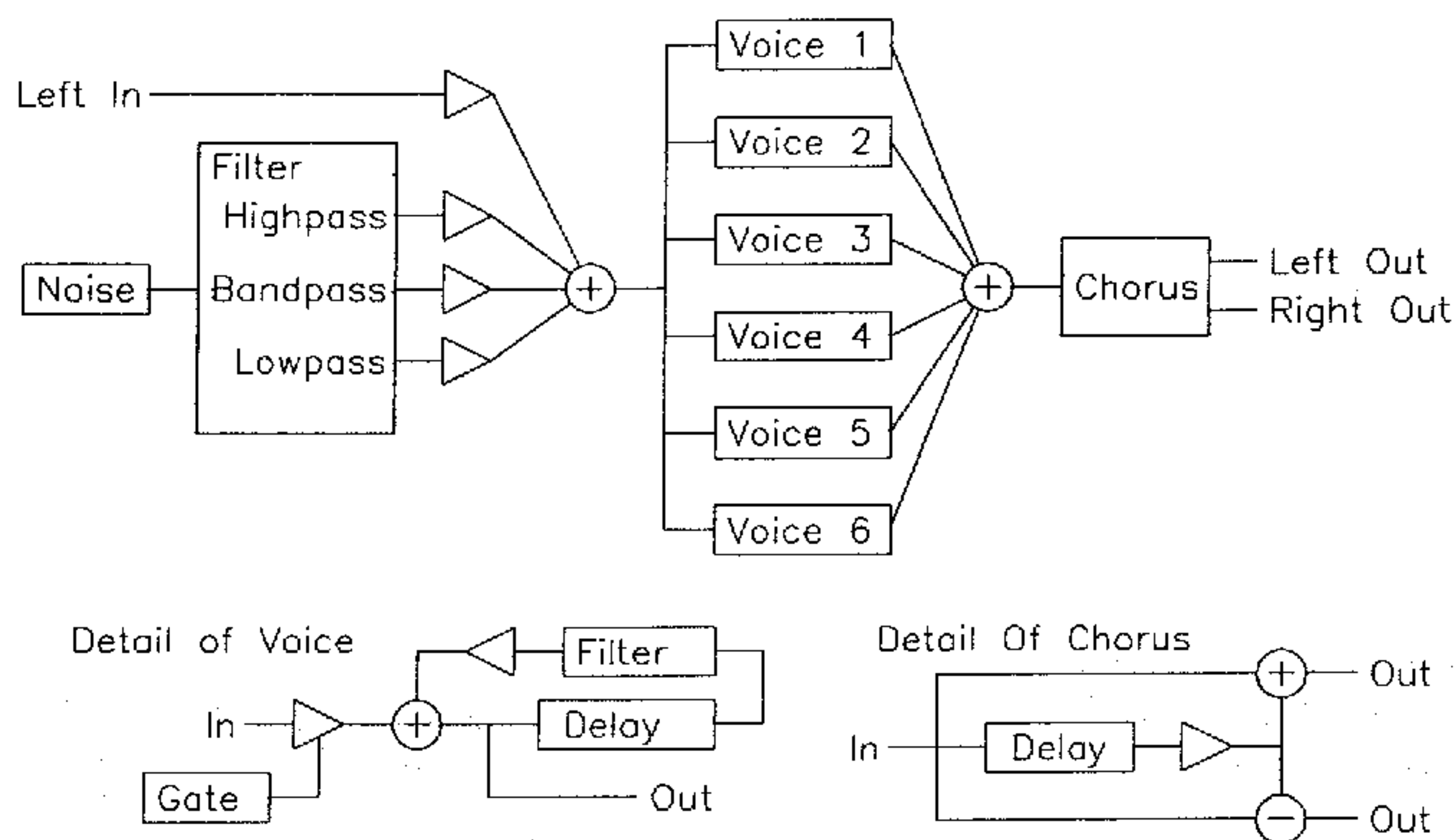
Since 200 cents is equal to two semitones, the actual tuning is:

C4 - 10 semitones, or, 10 semitones below C4, or, D3

Description

This algorithm is a bit of a departure from our usual. Instead of just processing audio, the String Modeller algorithm can create sounds of its own. This algorithm digitally simulates a set of six strings. When processing audio input, these strings act as passive resonators, yielding a sound similar to singing into a piano while holding down the damper pedal. To generate some amazingly realistic sounds, the "strings" can be "plucked" by playing notes on a MIDI keyboard. In this mode, the H3000 acts like an extra synthesizer module in your MIDI rack.

Block Diagram



Parameters

- | | | | |
|----|--|-------------------------|-------------------|
| #0 | Pitch | -100.00 to 100.00 notes | Modulation |
| | This parameter controls the overall tuning of the string resonators. The tuning is displayed in semitones, and is relative to the standard tuning of A440. | | |
| #7 | Offset | -100.00 to 100.00 notes | Modulation |
| | This parameter is very similar to the "Pitch" parameter in that it also controls the tuning of the string resonators. However, "Offset" affects only incoming MIDI information, altering the pitch in relation to any subsequent MIDI note messages that are received. | | |
| #1 | Decay | 0 to 100 | Modulation |
| | The "Decay" parameter controls the length of the note decay after it is triggered from a MIDI keyboard. This affects the sound while a key is being held down. Larger values of this parameter result in longer note decay times. | | |
| #2 | Release | 0 to 100 | Modulation |
| | The "Release" parameter controls the length of the note decay after a key is released (a MIDI "note-off" message is received). | | |

- #3 **Sustain** **on or off** **Modulation**
 This parameter functions very much like a sustain pedal on a synthesizer. Setting "Sustain" to "on" will sustain any notes received (limited by the available voices). When playing with a MIDI keyboard, this parameter can be patched to the sustain pedal. Patch "Sustain" to "Undefined Small #64" to get a standard MIDI Sustain Pedal.
- #4 **Gate** **1 to 100** **Modulation**
 The "Gate" parameter controls the characteristic attack sound of the plucked string. High settings of the gate parameter result in louder, buzzier string sounds. Small settings of this parameter result in soft, sharp plucking sounds.
- #5 **Gate Mode** **Normal, Keyed or Open**
 This parameter selects different triggering modes for the string resonators. Here is a description of the three available modes:
- "Normal" triggers a new plucked string for each key pressed (MIDI "note-on" message received). The envelope of the sound is determined by the "decay" and "release" parameters.
- "Keyed" is vaguely similar to the action of a bowed string. When a key is held down, the string resonator is constantly stimulated with filtered noise. When the key is released, the string decays according to the setting of the "release" parameter. The "decay" parameter is ignored for this mode.
- "Open" will stimulate the strings constantly, regardless of whether any keys are pressed. In this mode, the keyboard will "tune" the resonators, but will not affect the dynamics of the sound. The "decay" and "release" parameters are ignored in this case, since the strings are always stimulated at full level. **Warning:** This mode can be quite loud. Turn down your levels before playing with this parameter.
- #6 **Hold** **on or off** **Modulation**
 This parameter, when set to "on", will inhibit MIDI from affecting the tuning of the string resonators. This is useful for using a MIDI keyboard to tune the strings to be used as passive resonators.
- #8 **Freq** **0 low to 100** **Modulation**
 This parameter controls the center frequency for the stimulation noise filter. This parameter will affect the resultant tone of the plucked string resonators.
- #9 **Qfac** **0 to 100** **Modulation**
 This parameter controls the resonance of the noise filter. High values will result in a very resonant filter.
- #10 **Bright** **0 to 100** **Modulation**
 This controls the tone of the decaying string. Low settings of brightness will give a warmer decay.
- #11 **High Amt** **-100 to 100 per cent** **Modulation**
 #12 **Band Amt** **-100 to 100 per cent** **Modulation**
 #13 **Low Amt** **-100 to 100 per cent** **Modulation**
 These parameters control the relative amount of highpass, bandpass, and lowpass noise that is used as the string stimulation. With these, and the frequency control, you can shape the tonal characteristic of the plucked string sound.
- #14 **In Amt** **-100 to 100 per cent** **Modulation**
 This parameter controls the amount of external input signal feeding the string resonators. This is usually used when the strings are acting as passive resonators. See "Tips and Tricks" to set up passive resonators.
- #15 **Chorus** **0 to 100**
 This is the amount of chorus that is mixed into the output signal.
- #16 **Speed** **0 to 100**

This is the speed of the chorus sweep. Large values will give a faster rate, and a more intense chorus.

#17 Depth 0 to 100

This is the range of delay that the chorus will sweep. The maximum value of 100 corresponds to a sweep range of about 300 milliseconds.

#19 Mix 0 to 100 per cent Modulation

This is the wet/dry effect mix. A setting of 100 per cent will result in a full wet effect output mix.

Expert Parameters

#25 V Decay -100 to 100

#26 V Gate -100 to 100

#27 V Level -100 to 100

#28 V Bright -100 to 100

These parameters control how much the received MIDI key velocity affects the particular parameter. If you set "V Level" to a positive number, then the harder you hit, the louder the voice is. The other parameters act similarly. A negative value reverses the effect.

#20 K Decay -100 to 100

#21 K Gate -100 to 100

#22 K Level -100 to 100

#23 K Bright -100 to 100

#24 K Release -100 to 100

These parameters scale the keyboard to the parameters. A positive number for "K Level" causes the higher note on the keyboard to sound louder. For "Decay" and "Release" a -12 gives an even envelope across the keyboard range. A value of 12 for "K Gate" gives a natural sounding pluck across the keyboard.

#29-34 Note 1-6 notes Cx to G9

#35-40 Start 1-6 0 to 127

These parameters are included so that you can manually set the string tunings (without a MIDI keyboard). They are automatically set when you play on the MIDI keyboard. The "Note" is the note to be played. The "Start" is the value derived from the velocity and is used for velocity scaling.

Levels

To access the level adjustment parameters, press the softkey labelled "levels" on the last parameter page. Pressing "return" will bring you back to the normal parameter pages.

#41 Left In -48 to 48 dB

#42 Right In -48 to 48 dB

#43 Left Out -48 to 48 dB

#44 Right Out -48 to 48 dB

The level parameters allow individual level adjustments to be edited and saved with each user preset. All of the level adjustments are made in dB and are added to the master level adjustments.

Interesting Ideas

Instead of using noise to stimulate the strings, use the external input. If you play your synth into the input, the strings will take on some of the character of your synth sound.

To set up this algorithm as a sympathetic resonator, set "high amt", "band amt" and "low amt" to 0. Set "in amt" to about 20 per cent and set the gate mode to "open". The strings will now resonate with the input signal. The strings

can be tuned either manually (by setting the "note" parameters) or with a MIDI keyboard. If you've set up a tuning with MIDI and you desire to save it, set "hold" to "on" and save a preset. Once hold is set to "on" MIDI will no longer affect the tuning.

Things to be Aware of

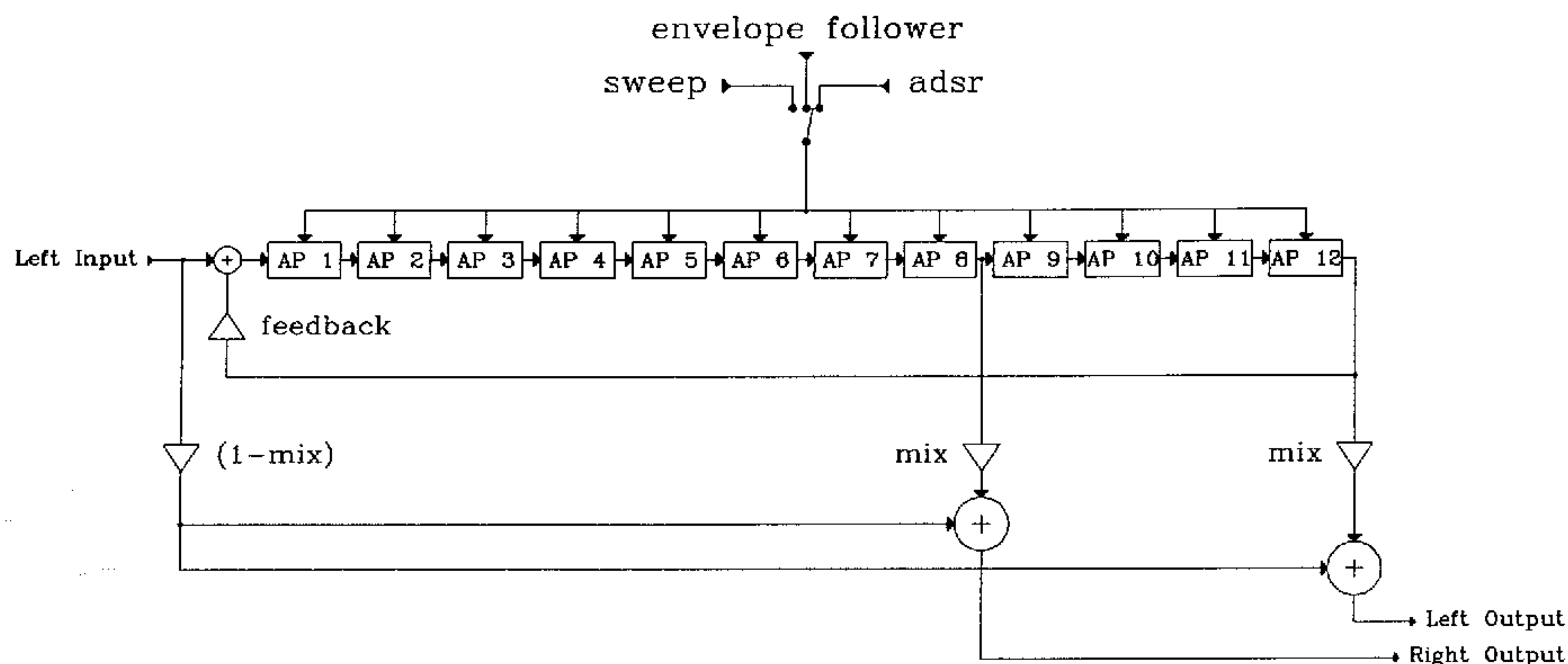
When modulation is patched to some of the parameters, the parameters will be changed after the MIDI notes are received.

If many parameters are being modulated, the MIDI response may be a bit sluggish.

Description

This algorithm is a mono-in, stereo-out phase shifter, similar in theory to a guitarist's foot-pedal phaser. The dry signal is mixed with the phase-shifted signal (created by a series of all-pass filters) to produce a series of notches, whose frequencies can be swept by altering the filter characteristics. The sweep can be done by an LFO, an envelope follower, or an ADSR shape which is triggered by MIDI or by the envelope follower. The envelope or ADSR can follow either the audio signal on channel 1, or a different signal on the other channel (channel 2).

Block Diagram



Parameters

- | | | | |
|----|--|----------------------|-------------------|
| #0 | Mix | 0 to 100 per cent | Modulation |
| | This parameter controls how much of the phase-shifted signal is present in the final mix. At 0, the output is completely dry. At 100, the output contains only the phase-shifted signal and will have the same frequency response as the dry signal if the feedback is 0. At 50, the mix is equal and has the deepest notches if the feedback is 0. For best result, do your mixing with this parameter, rather than with a console mixer. | | |
| #1 | Feedback | -100 to 100 per cent | Modulation |
| | This parameter controls the amount of feedback in the phase-shifted signal. With 100% feedback, no more dry signal is admitted into the phase-shifter loop, and the loop will resonate. | | |
| #2 | Sweep Rate | 0 to 100 per cent | Modulation |
| | This controls how fast the LFO sweeps if in LFO mode. This parameter is not visible on the front panel when not in LFO mode. | | |
| #3 | Envelope Decay Rate | 0 to 100 per cent | Modulation |
| | The envelope follower tries to track the peaks of the input signal. It has an instantaneous rise time, and this parameter is how fast it decays. This parameter appears on the main menu screen in envelope mode, and can be accessed as an expert parameter from other modes as well. | | |

- #4 **ADSR Rate Scaler** **0 to 100 per cent** **Modulation**
This just scales down the Attack, Decay, and Release rates of the ADSR. This does not appear on the front panel when not in ADSR mode.
- #5 **Sweep Mode** **0 (sweep), 1 (envelope), or 2 (adsr)**
This switch is used to patch either the LFO, the envelope, or the ADSR to control the allpass filter frequencies (and therefore the notch frequencies).
- #6 **Sweep Bottom** **0 to 100 per cent** **Modulation**
The frequency to be used at one extreme of the sweep in LFO mode, or when the envelope or ADSR are at their low points. Please note that this frequency may be set higher than the sweep top if you desire to invert the envelope or ADSR.
- #7 **Sweep Top** **0 to 100 per cent** **Modulation**
The frequency to be used at the other extreme of the sweep in LFO mode, or when the envelope or ADSR are at their peaks. See sweep bottom.

Expert Parameters

- #8 **ADSR Attack Rate** **0 to 100 per cent** **Modulation**
This controls the attack segment of the ADSR. This amount (multiplied by the ADSR rate scaler) is added to the ADSR level until it reaches the top, at which point it enters the decay segment. If a MIDI trigger is received in the attack phase, it will just continue to attack.
- #9 **ADSR Decay Rate** **0 to 100 per cent** **Modulation**
This controls the decay segment of the ADSR. This amount (multiplied by the ADSR rate scaler) is subtracted from the ADSR level until it reaches the sustain level, at which point it enters the sustain phase. If a MIDI trigger is received during the decay segment, the attack segment is immediately reentered.
- #10 **ADSR Sustain Level** **0 to 100 per cent** **Modulation**
The ADSR will stay at this level until the envelope follower goes below the release threshold, at which time it enters the release phase. If a MIDI trigger is received during the sustain portion, the attack segment is immediately reentered.
- #11 **ADSR Release Rate** **0 to 100 per cent** **Modulation**
During the release segment of the ADSR, this amount (multiplied by the ADSR rate scaler) is subtracted from the ADSR value until it reaches 0, or until the envelope follower goes above the attack threshold, at which time it enters the attack segment once again. If a MIDI trigger is received during the release segment, the attack segment is immediately reentered.
- #12 **ADSR Attack Threshold** **0 to 100 per cent** **Modulation**
This is the level that the envelope follower must rise above in order to begin the ADSR in its attack segment.
- #13 **ADSR Release Threshold** **0 to 100 per cent** **Modulation**
When the envelope follower falls below this level, the ADSR may enter the release segment from the sustain segment.
- #14 **ADSR Trigger** **Trigger only** **Modulation only**
This parameter does not appear on any menu, but can be patched to a MIDI event to trigger a new ADSR, starting from the attack segment.
- #15 **Envelope Channel** **0 (channel 1) or 1 (channel 2)**
This switch determines whether the envelope is to follow the signal which is actually being phase-shifted (0) or the signal in the other channel (1).

#16 Envelope Decay Shape 0 (linear) or 1 (exponential)

This switch controls whether the envelope decays in a linear fashion (0), or whether the envelope's decay slows down gradually as the level decreases (1).

Levels

To access the level adjustment parameters, press the softkey labelled "levels" on the last parameter page. Pressing "parameter" will bring you back to the normal parameter pages.

#17	Left In	-48 to 48 dB
#18	Right In	-48 to 48 dB
#19	Left Out	-48 to 48 dB
#20	Right Out	-48 to 48 dB

The level parameters allow individual level adjustments to be edited and saved with each user preset. All of the level adjustments are made in dB and are added to the master level adjustments. The master level adjustments are those made after pressing the "levels" key beneath the bargraphs.

Hint: For best result, do not mix any dry analog signal with the phaser output, as this will affect the phasing. Instead, use the Mix parameter; this gives the best control over the effect. The phaser works well with guitar or other sounds rich in harmonics. Envelope or ADSR mode are subtler effects; adding more feedback can bring the effect a bit more forward. In ADSR and envelope modes, you can invert the envelope shape by switching the values for top and bottom frequencies.

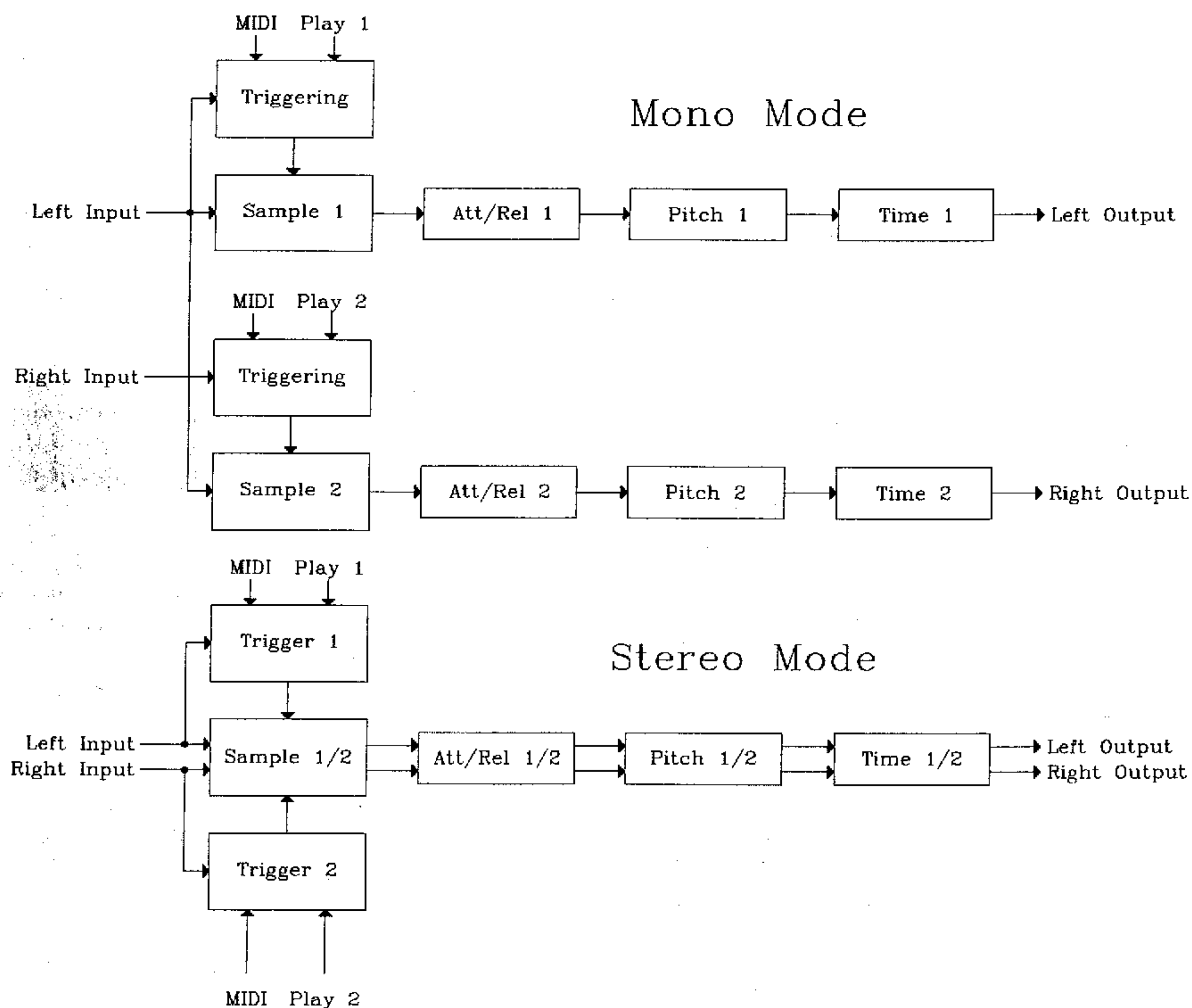
Algorithm 120 - Studio Sampler

H3500, available as an upgrade option for all other units

Description

This algorithm will digitally record 11.8 seconds of stereo or 23.7 seconds of mono audio (47.5/95 if you bought the H3000 - dfx/e). Two separate samples can be recorded into memory and played back using front panel buttons, audio triggering, or with a MIDI keyboard. The begin and end points of the two samples can be edited using "rock 'n' reel" style editing. Also, the pitch of the samples can be shifted over a six octave range, without altering the playback length. Conversely, the length of the sample can be altered without changing pitch. This allows independent control of the length and pitch of the recorded samples.

Block Diagram



New for Version 1.31

Stereo samples are now re-triggerable. In previous versions, audio triggering of stereo samples required that the entire sample be played out before it could be re-triggered.

Additional trigger keys have been added to allow easy auditioning of samples while adjusting the pitch, time, attack and release parameters.

Recording

After loading the Studio Sampler program, the display will show the sample memory being cleared and will then present this menu:

```
0.000 --stopped---|| 0.000 --stopped---  
(-record-)(--stop--)(-play 1-)(-play 2-)
```

To record a sample into the H3000, first press (record). If the program has just been loaded, the display will then show:

```
0.000 set trigger|XXXXXtX  
(-trg en-)(-record-)
```

If a sample has been recorded into memory since loading the program, you will have the option of recording to sample 1 or sample 2. The display will show:

```
Select record destination:  
(record 1)(record 2)
```

Press "Record 1" or "Record 2" to select which of the samples you wish to record to. The display will then show the "set trigger" menu.

At this point, the LCD display will show a VU meter indicating the recording level, and the H3000 will be passing its audio input to both output channels. To use the audio source to trigger the recording, use the knob to adjust the trigger threshold relative to the VU reading. The small "t" will show the location of the trigger threshold. Press "-trg en-" to enable the audio trigger for recording. To manually start the recording, press "-record-". To cancel the recording, press the parameter key. To stop recording, press "--stop--".

Once the sample is recorded, the display will return to the main menu, and will probably be flashing the message "--analyzing--". This indicates that the H3000 is analyzing the newly recorded sample for the purpose of time alteration and pitch shifting. If you wish to play back the sample without pitch shift or time scale modification, disregard the flashing message; the playback will be perfectly normal. If, however, you wish to shift the pitch or change the time of the sample, you may hear some "glitches" in the output. These will disappear once the "analyzing" message has stopped flashing.

Playback

To play a sample that was recorded into memory, press "play 1" or "play 2". The two keys will play samples 1 and 2 respectively. In mono mode, sample 1 will be played in the left output channel and sample 2 will be played in the right output channel. In stereo mode, each sample uses both output channels, and only one sample may be played at a time. Pressing the play keys repetitively will re-trigger the samples, creating a "stutter" effect.

Press "stop" to stop the playback of both of the samples.

Use pitch 1 and 2 to control the pitch of the samples.

Use time 1 and 2 to stretch or compress the samples in time.

To "loop" the samples (i.e., play them back repetitively, in an infinite loop) press and hold the appropriate play key for about 1 second. The display will show "--looping--", when the sample is in loop mode. To disengage the loop

mode, press the appropriate play key; the loop will play out to the end of the sample. To stop the sample immediately, press "stop".

Editing

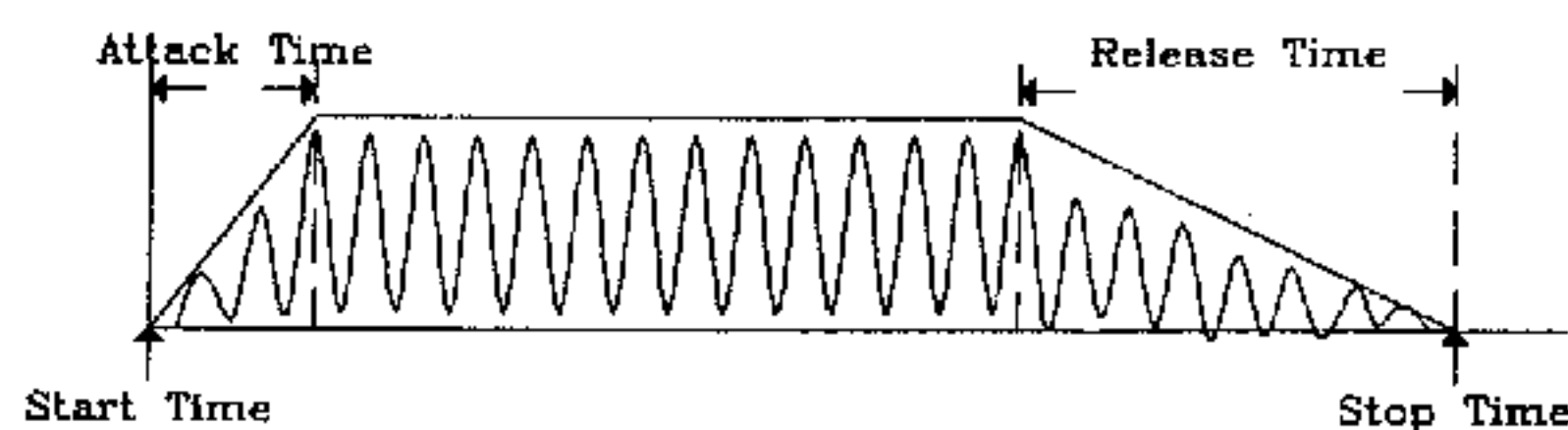
Press the "-edit 1-" and "-edit 2-" keys to edit the start and end points of the two samples. Then press the "start" key to edit the start point of the sample, or press the "stop" key to edit the stop point of the sample. Turning the knob will control the start and stop points, and the display will indicate the times in seconds. The audio output will mimic the effect of an analog tape recorder that is being manually shuttled back and forth to find an edit point. Think of the knob as a reel on that imaginary tape recorder. (Note: Because of the quantized nature of the front panel controls, turning the knob very slowly will not shuttle the edit point.) Press "play" to quickly preview the edit.

If the sample to be edited was "looping" when edit mode was entered, the editing function is slightly different. The audio will continue looping while the start and stop points are changed. The knob will still control the edit points. Simply adjust the start and stop points until the loop sounds right.

To play the sample backwards, set the stop time larger than the start time. Playback will always begin at the start point and end at the stop point, regardless of the settings.

Parameters

- | | | | |
|--|-----------|------------------------|------------|
| #0 | Pitch 1 | -3600 to 3600 cents | Modulation |
| #1 | Pitch 2 | -3600 to 3600 cents | Modulation |
| This parameter controls the playback pitch of sample 1 and 2. | | | |
| #2 | Time 1 | 0 to 800 per cent | Modulation |
| #3 | Time 2 | 0 to 800 per cent | Modulation |
| This parameter controls the playback speed of the sample, independent of pitch. A setting of 100 per cent will result in normal speed playback. Higher settings will "compress" the sample in time, resulting in higher speed playback, without altering the pitch of the sample. | | | |
| #4 | Attack 1 | 1 to 1000 milliseconds | |
| #5 | Attack 2 | 1 to 1000 milliseconds | |
| Attack 1 and 2 control the length of the attack portion of the envelope of two samples. | | | |
| #6 | Release 1 | 1 to 1000 milliseconds | |
| #7 | Release 2 | 1 to 1000 milliseconds | |
| Release 1 and 2 control the length of the release portion of the envelope of samples 1 and 2. The release portion begins at a point before the preset stop time such that the end of the envelope will coincide with the end of the sample. A press of the "stop" key or the reception of a note off command (when triggering with MIDI) will cause the sample to begin its release phase early. | | | |



- | | | |
|--|-----|-------------------|
| #8 | Mix | 0 to 100 per cent |
| The mix control allows the dry input signal to be mixed in with the output of the sampler. A setting of 0 per cent will allow only the input signal to be heard at the outputs, and a setting of 100 per cent will pass only the sampler output. | | |

Expert Parameters

Triggers

- #9 Trigger Mode** **off or audio trigger**
The Trigger Mode parameter is used to enable or disable audio level triggering of the sample playback.
- #10 Threshold 1**
#11 Threshold 2
These two parameters determine the threshold at which an audio signal will trigger sample playback. Threshold 1 is used for the triggering of sample 1 by the left input channel and Threshold 2 is used for sample 2 with the right input channel.

MIDI

- #12 MIDI Mode** **off, keyboard split, or layered (mono only)**
MIDI Mode determines how MIDI note events will trigger the sample playback.
- Keyboard Split mode allows the MIDI keyboard to be split into two zones, determined by the Key Split parameter. Notes played below the split point will trigger sample 1 and notes played above it will trigger sample 2. In mono mode, the playback will be polyphonic (two voice) while in stereo mode, only 1 voice may sound at a time.
- Layered Mode, only offered while in mono record mode, will trigger both samples 1 and 2 from a single MIDI note event. This is useful to create thick layered sounds. It can also be used to fatten monophonic sounds by setting the edit points of sample 1 and 2 to the same values. By subtly altering the pitches and playback times of sample 1 and 2, a very convincing double track effect may be obtained.
- #13 Base Note** **C-1 to C8**
#14 Base Note 1 **C-1 to C8**
#15 Base Note 2 **C-1 to C8**
The Base Note determines which MIDI note will give a non-pitch-shifted playback. Playing above the base note will shift the pitch upward; playing below will lower the pitch. The Base Note parameter is used with the "layered" MIDI mode and Base Note 1 and 2 are used for the "Key Split" MIDI mode.
- #16 Split Point** **C-1 to C8**
The split point parameter is used only in conjunction with the "Keyboard Split" MIDI mode. Notes played below the split point will trigger sample 1; those played above will trigger sample 2.
- #17 Drum Trigger** **off or on**
The drum trigger enable is used in conjunction with MIDI trigger of the samples. When drum triggering is on, a single note-on message will play the entire sample; the note off will be ignored. For normal, keyboard-type playback, this parameter should be set to "off".

Sampler Control

- #18 Shift Mode** **constant length, generic sampler**
In constant length mode, splicing is used to shift the pitch of the sample without changing the playback length. In generic sample mode, the sample is simply played back faster or slower to alter the pitch.

#19 Record Mode monophonic, stereophonic

The Record Mode setting determines whether the H3000 records in stereo or mono. The record mode should only be changed before recording a new sample. More specifically, a sample recorded in mono cannot be changed into a stereo sample by changing this parameter. Also, when the record mode is set to stereo, the available recording time will be halved and only one sample may be played back at a time.

To help you save time when you wish to record a stereo sample, we have provided algorithm 121. The default of this algorithm is set to stereo, thus saving you the tedium of changing the default of the mono/stereo option parameter when you wish to record a stereo sample. Therefore, when you wish to record a mono sample, we suggest you use algorithm 120. When you wish to record a stereo sample, use 121.

Using mod factory™

mod factory for the Eventide H3000 is a collection of two new algorithms and one hundred preset effects patches that add a new angle to the already impressive effects repertoire of the H3000. With this software, effects such as delay ducking, BPM delays and sweeps, compression, manual flanging, smooth autopanning, audio triggered sweeps and much, much more are now possible.

The two algorithms of the mod factory software are designed with the era of analog synthesis in mind. Each algorithm gives the user access to a dozen or so basic digital signal processing "modules". Using software "patch cords", the user can connect the modules to create literally thousands of unique signal processing algorithms. To learn more about creating your own effects patches, look at the patching section in the algorithm descriptions.

If the idea of creating your own effects algorithms makes you weak in the knees, don't worry. We've included a very comprehensive and useful collection of effects patches that should keep you very happy. Dial up program numbers 800 and up on your H3000 to see for yourself.

Basics

The mod factory algorithms and presets essentially work like any other H3000 effects program, with some minor differences. The two new algorithms, mod factory|one, and mod factory|two can be found at program numbers 122 and 123. The library of presets that we've created is located at program number 800 and beyond.

In order to make the presets easy to use, we've made extensive use of "soft knobs", found when you first press the "function" key. In addition, the mod factory algorithms have a tricky feature that might make your life a bit easier; when a mod factory preset is saved, the current page of parameters is remembered so that it will show up the next time the preset is loaded. This allows you quick access to your favorite page of parameters.

There is one thing to watch out for. Because of the modular, patchable nature of the mod factory algorithms, some of the parameters may have no audible effect on a particular patch. This would occur if, for example, the delay blocks were not "patched" into the signal chain. You could still change the "delay" parameters, but because the audio was not going through the delay module, you would not hear any effect on the sound.

Our final word of advice is to feel free to experiment. Play with things, let your imagination run wild. Use your ears as your guide to what works and what doesn't. Don't be afraid to try unusual patches; you just might create that next hot sound. Good luck and enjoy!

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Description

This is a "modular" effects processing algorithm. Software "patch cords" can be used to connect the processing modules shown below in any desired configuration. The main building blocks are a pair of sweepable delays, a pair of state-variable filters, two low-frequency oscillators, two envelope detectors, and two amplitude modulators.

Block Diagram**Mod Knobs, Mix and BPM Control**

The Modulation Knobs are specially designed controls that convert the digital, quantized nature of parameter entry on the H3000, to a smoother, analog-style control. This is very useful for creating effects such as manual flanging and filter sweeps. Mod Knobs 1 and 2 produce signals that can be patched to the modulation inputs of the any of other module. To create a manual flanger, the output of Knob 1 would be patched to the modulation input of delay 1. By mixing the delayed and undelayed signals a very simple flanger has been created. To modulate the delay, simply press "knob 1" and turn the knob on the H3000.

#30	Knob 1	0 to 100.0 per cent	Modulation
#31	Knob 2	0 to 100.0 per cent	Modulation

These parameters control the value of the modulation output of Mod Knobs 1 and 2. A value of zero will produce a zero output, and a value of 100 will produce a maximum modulation output.

#32	Mix	0 to 100 per cent	Modulation
-----	-----	-------------------	------------

This controls the wet/dry mix of the H3000. A setting of 100 per cent will give only the effected signal at the outputs.

#33 BPM 30 to 200 beats/min Modulation

The BPM control works in conjunction with the BPM controls of delay 1 and 2 and lfo 1 and 2. Essentially, this parameter determines the time value of a beat (quarter note). If the BPM value is set to 60, one quarter note will equal one second. This feature is extremely useful when delays must be in time to a particular tempo.

In addition to using the knob or keypad to enter the desired tempo, the beats per minute may be set by "tapping" the BPM key. To "tap in" the tempo, rhythmically press the BPM key 4 times. The time between taps will be taken as the new tempo.

Also, a MIDI controller may be used to "tap" in the tempo. By default, the MIDI Damper Pedal is patched to the BPM tap control. To set the tempo, simply tap the damper pedal three times. To use a different MIDI controller, go to the MIDI patching menu, under the "FUNCTION" key on the front panel. If you have difficulty making this feature work, check to see that the MIDI out of your controller is connected to the MIDI in of the H3000 and that the two devices are using the same MIDI channel.

Filters

The filter modules of this algorithm allow flexible control over the timbre within an effects patch. Modulation inputs on the filter allow dynamic control of the filter cutoff frequency. This can be used to create dramatic envelope filter effects or more subtle dynamic tonal shaping.

#34 Cutoff 0 to 7000 Hz

#35 Cutoff 0 to 7000 Hz

The cutoff controls the frequency at which the filter effects the audio path. For a low-pass filter, frequencies above the cutoff frequency will be attenuated. For a high-pass filter, frequencies below the cutoff will be attenuated. For a bandpass filter, frequencies above and below the cutoff will be reduced. In the case of a bandpass filter, the cutoff frequency is commonly known as the "center" frequency.

#36 Q Factor 1 1 to 1000

#37 Q Factor 2 1 to 1000

The Q factor controls the amount of resonance of a particular filter. A Q setting of 1 will give a smooth, natural response, while a setting of 1000 will give a highly resonant, oscillatory sound. Higher Q settings also increase the gain of the filter, increasing the likelihood of clipping. Also, at very high Q settings, lowpass and highpass filters will begin to sound like bandpass filters because of the high resonance.

#38 Type 1 lowpass, bandpass, or highpass

#39 Type 2 lowpass, bandpass, or highpass

Use this to set the type of filter desired. A lowpass filter will reduce high frequencies, producing a warmer sound. A highpass filter setting can be used to remove bass frequencies or to produce a thinner sound. Use a bandpass filter to pass a selected portion of the frequency range or to produce resonant peaks.

#40 Mod Amount 1 0 to 7000 Hz

#41 Mod Amount 2 0 to 7000 Hz

These parameters determine how the modulation input of the filters will affect the cutoff frequency. If set to 1000 Hz, a maximal change on the modulation input will produce a 1000 Hertz change in the cutoff frequency of the filter.

Delays

The two delay modules in this algorithm have a variable amount of delay, depending on the hardware configuration of the H3000. With a standard H3000, each delay line has up to 700 milliseconds of delay. With an Eventide HS322 board, the maximum delay is 11000 milliseconds (11 seconds) per delay module. When an Eventide HS395 board is installed, up to 32000 milliseconds (32 seconds) of delay is available per module.

Each delay module has a modulation input which allow smooth modulation of the delay, allowing for effects such as manual flanging and dynamic or triggered delay sweeps.

#42	Delay 1	0 to 700, 11000, or 32000 msec
#43	Delay 2	0 to 700, 11000, or 32000 msec

Use this to control the amount of delay in the delay modules. This parameter works in conjunction with the Delay BPM setting to determine the final delay. When strict beat per minute control of delays is desired, this should be set to zero.

#44	Delay 1 BPM	0/24 to 96/24 beats
#45	Delay 2 BPM	0/24 to 96/24 beats

The Delay BPM control determines how the master BPM tempo control affects the delay. When this is set to zero, the tempo setting has no effect on the delay time. To get a BPM setting of delay, set the normal delay parameter to zero, and set this to the number of beats the delay should correspond to. The settings are in 1/24 subdivisions of a quarter note. To get a quarter note delay, the delay BPM should be set to 24/24. To get an eighth note delay, set this parameter to 12/24. A setting of 8/24 will give quarter note triplets.

#46	Delay 1 Feedback	-100 to 100 per cent
#47	Delay 2 Feedback	-100 to 100 per cent

This controls how much of the delay's output is fed back to its input. Settings other than zero will result in recirculating, repeating delays.

#48	Loop 1	off or on	Modulation
#49	Loop 2	off or on	Modulation

To "loop" the delays, i.e., to make them repeat indefinitely, set this parameter to "on". When set to "on" all input to the delay lines will be blocked, repeating the most recent audio, but preventing any further input.

#50	Delay 1 Mod	-500.0 to 500.0 milliseconds
#51	Delay 2 Mod	-500.0 to 500.0 milliseconds

The Delay Mod controls determine how much the modulation input affects the final delay. For flanging effects, this should usually be set to several milliseconds. For chorusing, set this to about 10 or 20 milliseconds. Negative settings will sweep the delay in the opposite direction. This is useful if sweeping the two delays with the same signal, allowing for a richer sound.

Low Frequency Oscillators

The low frequency oscillators are the modules to use when creating sweep and triggered sweep effects. These oscillators work in a different way than the H3000 Function Generator, allowing much smoother modulation of delays, filters and gain. The waveshape of the LFO can be selected from a variety of continuous or audio-triggered waveforms. In addition, the LFOs have frequency modulation inputs that open up new dynamic sweeping effects.

#52	LFO 1 Frequency	0.00 to 300.0 Hertz	Modulation
#53	LFO 2 Frequency	0.00 to 300.0 Hertz	Modulation

These parameters control the frequency of LFO 1 and 2. This works in conjunction with the LFO Beat per Minute control. When tempo tracking of the LFOs is desired, set this parameter to zero.

#54	LFO 1 BPM	0/24 to 96/24 beats
#55	LFO 2 BPM	0/24 to 96/24 beats

Similar to the Delay BPM control, this parameter allows the master BPM tempo to control the frequency of the LFOs. With this, effects such as in-tempo autopanning can be obtained.

#56	LFO 1 Waveform	sine, square, sawtooth, triangle, exponential sawtooth, exponential triangle, triggered sine, triggered saw, triggered triangle, triggered exponential saw, triggered exponential triangle, toggle linear, toggle exponential
#57	LFO 2 Waveform	same as above

The LFO Waveform parameter determines the shape of the output of the LFOs. The first 8 waveforms in the list are continuous; that is, they always do what they do. The next 5 waveforms are audio-triggered. When the level of whatever is patched to the input of the oscillator goes above the threshold, the oscillator sweeps through one cycle. The last 2 waveforms, the toggle waves are also audio-triggered. They will alternately sweep up and down with every other audio trigger. This is useful for such things as autopanning, where alternate hits of a drum would cause the input to pan from left to right, then right to left.

#58	LFO 1 Threshold	0 to -40 dB
#59	LFO 2 Threshold	0 to -40 dB

The LFO threshold controls the level at which the oscillators are triggered. This parameter only has effect when the oscillator is set to an audio-trigger waveform.

#60	LFO 1 Mod	0 to 300.0 Hertz
#61	LFO 2 Mod	0 to 300.0 Hertz

For continuous LFO waveforms, the oscillator input will modulate the frequency of the LFO. This parameter controls how much the frequency will change for a full level input to the LFO.

Envelope Detectors

The two envelope detectors are used to modulate various parameters based on the envelope of the signal. The envelope of a signal is simply its level at any given instant, so, the envelope detectors allow us to build effects that vary with the signal level. The input to the envelope detectors can be patched anywhere, allowing this dynamic modulation to be based on the signal level of any point in our effects patch.

The envelope detectors each have two outputs, the envelope output and the ducker output. The envelope output is what you would expect, a signal that varies in proportion to the input of the envelope detector. The ducker output is a signal that is useful in building effects that reduce their level in the presence of another signal; i.e. they duck out of the way, allowing you to hear the other signal. So, the ducker output is normally at a high level. When the input to the envelope detector exceeds a threshold, the output gets progressively smaller.

#62	Env 1 Attack	0.0 to 1000.0 milliseconds
#63	Env 2 Attack	0.0 to 1000.0 milliseconds

The Attack Time controls how fast the envelope and ducker outputs respond to increases in signal level.

#64	Env 1 Decay	0.0 to 1000.0 milliseconds
#65	Env 2 Decay	0.0 to 1000.0 milliseconds

The Decay Time controls how fast the envelope and ducker outputs respond to decreases in signal level. Often it is desirable to have a fast attack time and a slow decay time (especially in something like a compressor).

#66	Threshold 1	0 to -40 dB
#67	Threshold 2	0 to -40 dB

The Threshold determines the level at which the ducker begins reducing its level. This is very similar to the threshold control on a compressor.

#68	Ratio 1	1.0:1 to 100.0:1
#69	Ratio 2	1.0:1 to 100.0:1

The Ratio parameter controls how much the output of the ducker will decrease in relation to the input signal level. If the ducker output is patched to the modulation input of one of the AmpMod modules, this parameter will function similar to the ratio control on a compressor.

Amplitude Modulator Parameters

The amplitude modulator modules allow the gain of a signal to be smoothly varied. These modules are the basis for autopanning, compression, ducking, and many other dynamic effects.

#70	AM 1 Amount	-200 to 200 per cent
#71	AM 2 Amount	-200 to 200 per cent

The Amp Mod Amount determines how much the modulation input effects the gain of the audio signal. A setting of 100 per cent will give no attenuation for a maximum modulation input and full attenuation for a zero modulation input. When the amount is set to 200 per cent, a maximum modulation input will add 6 dB of gain to the signal.

#72	AM 1 Offset	-200 to 200 per cent
#73	AM 2 Offset	-200 to 200 per cent

The Amp Mod Offset controls how much gain or attenuation the signal will have when the modulation input is zero.

Mixer Parameters

The four simple two-input mixers are essential in building useful patches. They are used for controlling level, mixing, building feedback loops and much more.

A mixer is used to combine two signals with control over the amount and phase of each signal. A mixer can be used to simply control the level of a signal by patching the B input of a mixer to zero.

#74	Mix 1 A Amount	-100 to 100 per cent	Modulation
#75	Mix 1 B Amount	-100 to 100 per cent	Modulation
#76	Mix 2 A Amount	-100 to 100 per cent	Modulation
#77	Mix 2 B Amount	-100 to 100 per cent	Modulation
#78	Mix 3 A Amount	-100 to 100 per cent	Modulation
#79	Mix 3 B Amount	-100 to 100 per cent	Modulation
#80	Mix 4 A Amount	-100 to 100 per cent	Modulation
#81	Mix 4 B Amount	-100 to 100 per cent	Modulation

Each of the mixers has two inputs, an "A" input and a "B" input. This is like a mixing console that only has two channels, channel A and B. The mix amount control is like the fader for that particular input. A setting of 0% means the fader is fully off. A setting of 100% means the fader is fully on. A setting of 50% will cut that channel's level by one-half.

To invert the phase on a mixer input, use negative settings instead of positive settings. A setting of -100% will give a full "on" signal that has its phase inverted. A setting of -50% will cut the signal by half and also invert the phase.

Modulation Scalers

The modulation scalers are useful in controlling the gain of a particular modulation signal. They are particularly useful in allowing MIDI or the softknobs to control a particular parameter. To do this, patch fullscale into one of the control scalers. Then, to modulate delay, patch the output of the control scaler into the delay mod input. Then, patch MIDI or a SoftKnob to control the scaler. Using this method, most parameters can be MIDI controlled.

#82	Mod Scale 1	-100 to 100.0 per cent	Modulation
#83	Mod Scale 2	-100 to 100.0 per cent	Modulation

The Mod Scale Amount determines the amount of attenuation given to the input modulation signal. A setting of 100 per cent gives no attenuation and a setting of zero turns off the input. Negative settings reverse the polarity of the input signal.

Level Parameters

The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels.

#84	Left In	-48 to 48 dB
#85	Right In	-48 to 48 dB
#86	Left Out	-48 to 48 dB
#87	Right Out	-48 to 48 dB

Patching Parameters

#88	Prg Load Speed	slow or fast
-----	----------------	--------------

The program load speed control is definitely considered an expert parameter. This parameter affects the speed at which presets are loaded. When set to slow, the loading speed will be noticeably slower than when the load speed is set to fast. The drawback to the fast load mode is that the contents of delay lines and other internal registers are not "cleared" before the new patch begins working. This means that if loading a patch with long delay times and/or lots of feedback, the patch may load with clicks or noise in the output audio.

Here's the basic rule of thumb. If you aren't sure about what to do, set this parameter to slow. If you think you know what you're doing and have a patch that has a very small amount of delay and little feedback, try setting this parameter to fast. If you find that the patch loads in a noisy manner, set the mode back to slow.

How to Patch

To create an effects "patch" press (patch). The display will look like:

```
122 mod factory|one      dly 1 in<mixer
```

This display shows that mixer 1 is patched to dly 1 in. The input is always shown on the left and the output on the right, in the form input<output. Here, dly 1 in is the input, and mixer 1 is the output. To select an input to patch, press (input). The knob will scroll through a list of all available inputs. To re-patch a particular input, scroll the input list until the signal is shown in the display. Then, press (output). The knob will now scroll through the outputs that may be patched to the currently selected input. As you turn the knob, you will instantly hear the effect of the signal being repatched.

An important note of warning! Please, keep your monitor volume low when creating new patches. It is fairly easy to create feedback loops capable of producing ear and speaker damaging signals. Be careful out there.

One thing to make note of when creating a patch is the difference between audio inputs and modulation inputs. Generally, the modulation inputs are used to change some parameter of the effect, such as a filter frequency or delay time. In most cases, patching a slowly changing signal, such as an LFO to a modulation input will result in the most aurally satisfying result. It is possible and might sometimes be tempting to patch an audio signal directly into a modulation input. The main problem with this is that modulation signals are processed at a slower sample rate than audio signals. Because of this, patching an audio signal into a modulation input may result in audible aliasing. (Aliasing is a non-harmonic modulation distortion that results when a digital signal is sampled too slowly.) To minimize the potential for aliasing, it is suggested that an audio signal be passed through a lowpass filter before patching into a modulation input.

The inputs and outputs are shown below:

Inputs

#0	left out	The left output of the H3000.
#1	right out	The right output of the H3000.
#2	mix1a in	The "A" input of mixer 1.
#3	mix1b in	The "B" input of mixer 1.
#4	mix2a in	The "A" input of mixer 2.
#5	mix2b in	The "B" input of mixer 2.
#6	mix3a in	The "A" input of mixer 3.
#7	mix3b in	The "B" input of mixer 3.
#8	mix4a in	The "A" input of mixer 4.
#9	mix4b in	The "B" input of mixer 4.
#10	am1 in	Amplitude modulator 1 audio input.
#11	am1 mod	Amplitude modulator 1 modulation input.
#12	am2 in	Amplitude modulator 2 audio input.
#13	am2 mod	Amplitude modulator 2 modulation input.
#14	dly 1 in	Delay 1 audio input.
#15	dly1 mod	Delay 1 modulation input.
#16	dly 2 in	Delay 2 audio input.
#17	dly 2 mod	Delay 2 modulation input.
#18	filt1 in	Filter 1 audio input.
#19	filt1 mod	Filter 1 modulation input.
#20	filt2 in	Filter 2 audio input.
#21	filt2 mod	Filter 2 modulation input.
#22	env1 in	Envelope follower 1 input.
#23	env2 in	Envelope follower 2 input.
#24	lfo1 in	Low frequency oscillator 1 modulation/trigger input.
#25	lfo2 in	Low frequency oscillator 2 modulation/trigger input.
#26	mdscl1 in	Modulation scaler 1 input.
#27	mdscl2 in	Modulation scaler 2 input.

Outputs

#0	zero	A zero, or "off" signal.
#1	left input	The left audio input of the H3000.
#2	right input	The right audio input of the H3000.
#2	mixer 1	Audio output of mixer 1.
#3	mixer 2	Audio output of mixer 2.
#4	mixer 3	Audio output of mixer 3.
#5	mixer 4	Audio output of mixer 4.

#6	amp mod 1	Amplitude modulator 1 output.
#7	amp mod 2	Amplitude modulator 2 output.
#8	delay 1	Delay line 1 audio output.
#9	delay 2	Delay line 2 audio output.
#10	filter 1	Filter 1 audio output.
#11	filter 2	Filter 2 audio output.
#12	ducker 1	Ducker 1 modulation output.
#13	ducker 2	Ducker 2 modulation output.
#14	envelope 1	Envelope 1 modulation output.
#15	envelope 2	Envelope 2 modulation output.
#16	lfo 1	Low frequency oscillator 1 modulation output.
#17	lfo 2	Low frequency oscillator 2 modulation output.
#18	knob 1	Mod knob 1 modulation output.
#19	knob 2	Mod knob 2 modulation output.
#20	noise gen.	Noise generator output.
#21	fullscale	Fullscale, a maximum positive signal.
#22	-fullscale	Minus fullscale, a maximum negative signal.
#23	modscale 1	Modulation scaler 1 modulation output.
#24	modscale 2	Modulation scaler 2 modulation output.

Description

This algorithm is a cousin to algorithm #122, mod factory|one. This too, is a "modular" effects processing algorithm. Software "patch cords" can be used to connect the processing modules shown below in any desired configuration. The main building blocks are a pair of sweepable, filtered delays, a pair of detuning pitch shifters, one low-frequency oscillator, one envelope detector, and two amplitude modulators.

Block Diagram

Mod Knob, Mix and BPM Control

The Modulation Knob is a specially designed control that converts the digital, quantized nature of parameter entry on the H3000, to a smoother, analog-style control. This is very useful for creating effects such as manual flanging and filter sweeps. The Mod Knob produces a signal that can be patched to the modulation inputs of the any of other module. To create a manual flanger, the output of ModKnob would be patched to the modulation input of delay 1. By mixing the delayed and undelayed signals a very simple flanger has been created. To modulate the delay, simply press "mod knob" and turn the knob on the H3000.

#30 Mod Knob 0 to 100.0 per cent Modulation

These parameters control the value of the modulation output of Mod Knobs 1 and 2. A value of zero will produce a zero output, and a value of 100 will produce a maximum modulation output.

#31 Mix 0 to 100 per cent Modulation

This controls the wet/dry mix of the H3000. A setting of 100 per cent will give only the effected signal at the outputs.

The BPM control works in conjunction with the BPM controls of delay 1 and 2, the LFO, and the two detuners. Essentially, this parameter determines the time value of a beat (quarter note). If the BPM is set to 60, one quarter note will equal one second. This feature is extremely useful when delays must be in time to a particular tempo.

In addition to using the knob or keypad to enter the desired tempo, the beats per minute may be set by "tapping" the BPM key. To "tap in" the tempo, rhythmically press the BPM key 4 times. The time between taps will be taken as the new tempo.

Also, a MIDI controller may be used to "tap" in the tempo. By default, the MIDI Damper Pedal is patched to the BPM tap control. To set the tempo, simply tap the damper pedal three times. To use a different MIDI controller, go to the MIDI patching menu, under the "FUNCTION" key on the front panel. If you have difficulty making this feature work, check to see that the MIDI out of your controller is connected to the MIDI in of the H3000 and that the two devices are using the same MIDI channel.

Detuners

This algorithm contains two detuning modules. The most common use of these modules is to slightly shift the pitch on the left and right channels to create a very rich chorus effect. Modulation inputs on the detuners allow dynamic control of the amount of detuning. This can be used to create more realistic chorus effects, dynamic vibrato or wild modulations.

Note: The detune modules used in this algorithm have been optimized for small amounts of pitch shifting. While they are capable of shifting the pitch over a two-octave range (using the mod inputs), the result will not necessarily be very nice.

#33	Detune 1	-100 to 100 cents
#34	Detune 2	-100 to 100 cents

This parameter controls the amount of detuning. For a moderate chorus effect the left and right channels are usually shifted plus and minus ten cents.

#35	Delay 1	0 to 90 or 700 milliseconds
#36	Delay 2	0 to 90 or 700 milliseconds

This parameter controls the amount of delay through the detune modules. This parameter works in conjunction with the BPM setting to determine the final delay. When strict beat per minute control of delays is desired, this should be set to zero.

#37	BPM 1	0/24 to 96/24 beats
#38	BPM 2	0/24 to 96/24 beats

The BPM control determines how the master BPM tempo control affects the delay of the detuners. When this is set to zero, the tempo setting has no effect on the delay time. To get a BPM setting of delay, set the normal delay parameter to zero, and set this to the number of beats the delay should correspond to. The settings are in 1/24 subdivisions of a quarter note. To get a quarter note delay, the delay BPM should be set to 24/24. To get an eighth note delay, set this parameter to 12/24. A setting of 8/24 will give quarter note triplets.

#39	Mod Amount 1	-1200 to 1200 cents
#40	Mod Amount 2	-1200 to 1200 cents

These parameters determine how the modulation input of the detuners affects the amount of pitch shift. If set to 10 cents, a maximal change on the modulation input will produce a 10 cent change in the amount of detuning.

#41	Fadelength 1	1 to 1000 milliseconds
#42	Fadelength 2	1 to 1000 milliseconds

The fadelength parameter controls the nature of the crossfade that occurs when audio segments are spliced together in the detuner. Large settings of this parameter will generally give the most pleasing results, with the least audible glitching. Small settings will tend to produce sharper, more noticeable glitching in the output, but will reduce the flanging effect produced by long crossfades.

#43	Splice Length 1	1 to 700 milliseconds
#44	Splice Length 2	1 to 700 milliseconds

The splice length parameter determines the length of the audio segments that the detuner splices together. (A detailed explanation of pitch shifting is beyond the scope of this manual.) Longer settings of this parameter will result in less glitches in the detuned audio, but will result in longer and less predictable delays. Smaller settings of this parameter will result in a tighter, more predictable delay, but will cause more audible glitching and modulation in the output audio.

Filtered Delays

The filtered delay modules work just like those in mod factory/one with the added feature of adjustable high frequency rolloffs for each of the delays. This allows for warm, natural sounding delays.

The two modules each have a variable amount of delay, depending on the hardware configuration of the H3000. With a standard H3000, each delay line has up to 650 milliseconds of delay. With an Eventide HS322 board, the maximum delay is 11000 milliseconds (11 seconds) per delay module. When an Eventide HS395 board is installed, up to 32000 milliseconds (32 seconds) of delay is available per module.

Each delay module has a modulation input which allow smooth modulation of the delay, allowing for effects such as manual flanging and dynamic or triggered delay sweeps.

There is also a high-cut modulation input for each of the delay modules. These allow dynamic variation of the amount of high frequency rolloff.

#47	Delay 1	0 to 650, 11000, or 32000 milliseconds
#48	Delay 2	0 to 650, 11000, or 32000 milliseconds

Use this to control the amount of delay in the delay modules. This parameter works in conjunction with the Delay BPM setting to determine the final delay. When strict beat per minute control of delays is desired, this should be set to zero.

#49	Delay 1 BPM	0/24 to 96/24 beats
#50	Delay 2 BPM	0/24 to 96/24 beats

The Delay BPM control determines how the master BPM tempo control affects the delay. When this is set to zero, the tempo setting has no effect on the delay time. To control the delay in beats-per-minute, set the normal delay parameter to zero, and set the Delay BPM to the number of beats of delay desired. The settings are in 1/24 subdivisions of a quarter note. To get a quarter note delay, the delay BPM should be set to 24/24. To get an eighth note delay, set this parameter to 12/24. A setting of 8/24 will give quarter note triplets.

#51	Delay 1 Fdback	-100 to 100 per cent
#52	Delay 2 Fdback	-100 to 100 per cent

This controls how much of the delays output is fed back to its input. Settings other than zero will result in recirculating, repeating delays.

#53	Highcut 1	0 to 20000 Hz
#54	Highcut 2	0 to 20000 Hz

The highcut parameters control the amount of high frequency rolloff applied to the delay outputs. The setting is in Hertz, and represents the frequency at which the audio is attenuated by 3 dB. A setting of 20000 will give a full bandwidth signal, with no attenuation of high frequencies. Lower settings will take the edge off of the delay, giving a much warmer, analog-style sound.

#55	Loop 1	off or on	Modulation
#56	Loop 2	off or on	Modulation

To "loop" the delays, i.e., to make them repeat indefinitely, set this parameter to "on". When set to "on" all input to the delay lines will be blocked, repeating the most recent audio, but preventing any further input.

#57	Delay 1 Mod	-500.0 to 500.0 milliseconds
#58	Delay 2 Mod	-500.0 to 500.0 milliseconds

The Delay Mod controls determine how much the modulation input affects the final delay. For flanging effects, this should usually be set to several milliseconds. For chorusing, set this to about 10 or 20 milliseconds. Negative settings will sweep the delay in the opposite direction. This is useful if sweeping the two delays with the same signal, allowing for a richer sound.

#59	Cut Mod 1	0 to 20000 Hz
#60	Cut Mod 2	0 to 20000 Hz

This parameter controls how much the modulation affects the amount of high cut. This is useful for dynamic control of the timbre of the delay lines.

Low Frequency Oscillator

The low frequency oscillator is the module to use when creating sweep and triggered sweep effects. The oscillator works in a different way than the H3000 Function Generator, allowing much smoother modulation of delays, filters and gain. The waveshape of the LFO can be selected from a variety of continuous or audio-triggered waveforms. In addition, the LFO has a frequency modulation input that opens up new dynamic sweeping effects.

#61	LFO Frequency	0.00 to 300.0 Hertz	Modulation
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This parameter controls the frequency of the LFO. This works in conjunction with the LFO Beat per Minute control. When tempo tracking of the LFO is desired, set this parameter to zero.

#62	LFO BPM	0/24 to 96/24 beats
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Similar to the Delay BPM control, this parameter allows the master BPM tempo to control the frequency of the LFO. With this, effects such as in-tempo autopanning can be obtained.

#63	LFO Waveform	sine, square, sawtooth, triangle, exponential sawtooth, exponential triangle, triggered sine, triggered saw, triggered triangle, triggered exponential saw, triggered exponential triangle, toggle linear, toggle exponential
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The LFO Waveform parameter determines the shape of the output of the LFO. The first 8 waveforms in the list are continuous, that is, they always do what they do. The next 5 waveforms are audio-triggered. When the level of whatever is patched to the input of the oscillator goes above the threshold, the oscillator sweeps through one cycle. The last 2 waveforms, the toggle waves are also audio-triggered. They will alternately sweep up and down with every other audio trigger. This is useful for such things as autopanning, where alternate hits of a drum would cause the input to pan from left to right, then right to left.

#64 LFO Threshold 0 to -40 dB

The LFO threshold controls the level at which the oscillator is triggered. This parameter only has effect when the oscillator is set to an audio-trigger waveform.

#65 LFO Mod 0 to 300.0 Hertz

For continuous LFO waveforms, the oscillator input will modulate the frequency of the LFO. This parameter controls how much the frequency will change for a full level input to the LFO.

Envelope Detector

The envelope detector is used to modulate various parameters based on the envelope of the signal. The envelope of a signal is simply its level at any given instant; hence, the envelope detector allows us to build effects that vary with the signal level. The input to the envelope detector can be patched anywhere, allowing this dynamic modulation to be based on the signal level of any point in our effects patch.

The envelope detector has two outputs, the envelope output and the ducker output. The envelope output is what you would expect, a signal that varies in proportion to the input of the envelope detector. The ducker output is a signal that is useful in building effects that reduce their level in the presence of another signal; i.e., they duck out of the way, allowing you to hear the other signal. Hence, the ducker output is normally at a high level. When the input to the envelope detector exceeds a threshold, the output gets progressively smaller.

#66 Env Attack Time 0.0 to 1000.0 milliseconds

The Attack Time controls how fast the envelope and ducker outputs respond to increases in signal level.

#67 Env Decay Time 0.0 to 1000.0 milliseconds

The Decay Time controls how fast the envelope and ducker outputs respond to decreases in signal level. Often it is desirable to have a fast attack time and a slow decay time, (especially in something like a compressor).

#68 Threshold 0 to -40 dB

The Threshold determines the level at which the ducker begins reducing its level. This is very similar to the threshold control on a compressor.

#69 Ratio 1.0:1 to 100.0:1

The Ratio parameter controls how much the output of the ducker will decrease in relation to the input signal level. If the ducker output is patched to the modulation input of one of the AmpMod modules, this parameter will function similar to the ratio control on a compressor.

Amplitude Modulator Parameters

The amplitude modulator modules allow the gain of a signal to be smoothly varied. These modules are the basis for autopanning, compression, ducking, and many other dynamic effects.

#70 AM 1 Amount -200 to 200 per cent

#71 AM 2 Amount -200 to 200 per cent

The Amp Mod Amount determines how much the modulation input effects the gain of the audio signal. A setting of 100 per cent will give no attenuation for a maximum modulation input and full attenuation for a zero modulation input. When the amount is set to 200 per cent, a maximum modulation input will add 6 dB of gain to the signal.

#72	AM 1 Offset	-200 to 200 per cent
#73	AM 2 Offset	-200 to 200 per cent

The Amp Mod Offset controls how much gain or attenuation the signal will have when modulation input is zero.

Mixer Parameters

The four simple two-input mixers are essential in building useful patches. They are used for controlling level, mixing, building feedback loops and much more.

A mixer is used to combine two signals with control over the amount and phase of each signal. A mixer can be used to simply control the level of a signal by patching the B input of a mixer to zero.

#74	Mix 1 A Amount	-100 to 100 per cent	Modulation
#75	Mix 1 B Amount	-100 to 100 per cent	Modulation
#76	Mix 2 A Amount	-100 to 100 per cent	Modulation
#77	Mix 2 B Amount	-100 to 100 per cent	Modulation
#78	Mix 3 A Amount	-100 to 100 per cent	Modulation
#79	Mix 3 B Amount	-100 to 100 per cent	Modulation
#80	Mix 4 A Amount	-100 to 100 per cent	Modulation
#81	Mix 4 B Amount	-100 to 100 per cent	Modulation

Each of the mixers has two inputs; an "A" input and a "B" input. This is like a mixing console that only has two channels, channel A and B. The mix amount control is like the fader for that particular input. A setting of 0% means the fader is fully off. A setting of 100% means the fader is fully on. A setting of 50% will cut that channel's level by one-half.

To invert the phase on a mixer input, use negative settings instead of positive settings. A setting of -100% will give a full "on" signal that has its phase inverted. A setting of -50% will cut the signal by half and also invert the phase.

Modulation Scalers

The modulation scalers are useful in controlling the gain of a particular modulation signal. They are particularly useful in allowing MIDI or the softknobs to control a particular parameter. To do this, patch fullscale into one of the control scalers. To modulate delay, patch the output of the control scaler into the delay mod input, then patch MIDI or a SoftKnob to control the scaler.

Using this method, most parameters can be MIDI controlled.

#82	Mod Scale 1	-100 to 100.0 per cent	Modulation
#83	Mod Scale 2	-100 to 100.0 per cent	Modulation

The Mod Scale Amount determines the amount of attenuation given to the input modulation signal. A setting of 100 per cent give no attenuation and a setting of zero turns off the input. Negative settings reverse the polarity of the input signal.

Level Parameters

The level parameters allow individual presets to alter the input and output levels of the H3000. The levels set here are added to or subtracted from the "master" levels.

#84	Left In	-48 to 48 dB
#85	Right In	-48 to 48 dB
#86	Left Out	-48 to 48 dB
#87	Right Out	-48 to 48 dB

Patching Parameters

#88 Prg Load Speed slow or fast

The program load speed control is definitely considered an expert parameter. This parameter affects the speed at which presets are loaded. When set to slow, the loading speed will be noticeably slower than when the load speed is set to fast. The drawback to the fast load mode is that the contents of delay lines and other internal registers are not "cleared" before the new patch begins working. This means that if loading a patch with long delay times and/or lots of feedback, the patch may load with clicks or noise in the output audio.

Here's the basic rule of thumb. If you aren't sure about what to do, set this parameter to slow. If you think you know what you're doing and have a patch that has a very small amount of delay and little feedback, try setting this parameter to fast. If you find that the patch loads in a noisy manner, set the mode back to slow.

How to Patch

To create an effects "patch" press (patch). The display will look like:

```
123 mod factory|two      dly 1 in<mixer
```

This display shows that mixer 1 is patched to dly 1 in. The input is always shown on the left and the output on the right, in the form input<output. Here, dly 1 in is the input, and mixer 1 is the output. To select an input to patch, press (input). The knob will scroll through a list of all available inputs. To re-patch a particular input, scroll the input list until the signal is shown in the display. Then, press (output). The knob will now scroll through the outputs that may be patched to the currently selected input. As you turn the knob, you will instantly hear the effect of the signal being repatched.

An important note of warning! Please, keep your monitor volume low when creating new patches. It is fairly easy to create feedback loops capable of producing ear and speaker damaging signals. Be careful out there.

One thing to make note of when creating a patch is the difference between audio inputs and modulation inputs. Generally, the modulation inputs are used to change some parameter of the effect, such as a filter frequency or delay time. In most cases, patching a slowly changing signal, such as an LFO to a modulation input will result in the most aurally satisfying result. It is possible and might sometimes be tempting to patch an audio signal directly into a modulation input. The main problem with this is that modulation signals are processed at a slower sample rate than audio signals. Because of this, patching an audio signal into a modulation input may result in audible aliasing. (Aliasing is a non-harmonic modulation distortion that results when a digital signal is sampled too slowly.) To minimize the potential for aliasing, it is suggested that an audio signal be passed through a lowpass filter before patching into a modulation input.

The inputs and outputs are shown below:

Inputs

#0	left out	The left output of the H3000.
#1	right out	The right output of the H3000.
#2	mix1a in	The "A" input of mixer 1.
#3	mix1b in	The "B" input of mixer 1.
#4	mix2a in	The "A" input of mixer 2.
#5	mix2b in	The "B" input of mixer 2.
#6	mix3a in	The "A" input of mixer 3.
#7	mix3b in	The "B" input of mixer 3.
#8	mix4a in	The "A" input of mixer 4.
#9	mix4b in	The "B" input of mixer 4.

#10	am1 in	Amplitude modulator 1 audio input.
#11	am1 mod	Amplitude modulator 1 modulation input.
#12	am2 in	Amplitude modulator 2 audio input.
#13	am2 mod	Amplitude modulator 2 modulation input.
#14	dly 1 in	Delay 1 audio input.
#15	dly1 mod	Delay 1 modulation input.
#16	dly1 ctmd	Delay 1 highcut modulation input.
#17	dly 2 in	Delay 2 audio input.
#18	dly2 mod	Delay 2 modulation input.
#19	dly2ctmd	Delay 2 highcut modulation input.
#20	dtune1in	Detuner 1 audio input.
#21	dtun1mod	Detuner 1 modulation input.
#22	dtune2in	Detuner 2 audio input.
#23	dtun2mod	Detuner 2 modulation input.
#24	env in	Envelope follower input.
#25	lfo in	Low frequency oscillator modulation/trigger input.
#26	mdscl1 in	Modulation scaler 1 input.
#27	mdscl2 in	Modulation scaler 2 input.

Outputs:

#0	zero	A zero, or "off" signal.
#1	left input	The left audio input of the H3000.
#2	right input	The right audio input of the H3000.
#3	mixer 1	Audio output of mixer 1.
#4	mixer 2	Audio output of mixer 2.
#5	mixer 3	Audio output of mixer 3.
#6	mixer 4	Audio output of mixer 4.
#7	amp mod 1	Amplitude modulator 1 output.
#8	amp mod 2	Amplitude modulator 2 output.
#9	delay 1	Delay line 1 audio output.
#10	delay 2	Delay line 2 audio output.
#11	detune 1	Detuner 1 audio output.
#12	detune 2	Detuner 2 audio output.
#13	ducker	Ducker modulation output.
#14	envelope	Envelope modulation output.
#15	lfo	Low frequency oscillator modulation output.
#16	mod knob	Mod knob modulation output.
#17	noise gen.	Noise generator output.
#18	fullscale	Fullscale, a maximum positive signal.
#19	-fullscale	Minus fullscale, a maximum negative signal.
#20	modscale 1	Modulation scaler 1 modulation output.
#21	modscale 2	Modulation scaler 2 modulation output

Quick Reference: H3000

The next few pages contain a "quick reference" guide to all the presets available in our H3000 line. Basic effect algorithms are found between numbers 100 and 123. Factory programs are found between numbers 150 and 999. Gaps in the numbered sequence are intentional, as these spots are reserved for future upgrades.

The column on the far right indicates which H3000 model the program is available in. You may upgrade any H3000 to include the programs listed here (except for H3500-specific presets). See the Eventide document titled "Harmonizer brand selection guide" for more details.

For additional information and specifications, ask your Eventide dealer for our color brochures or contact us directly at (201) 641-1200.

All presets described in this booklet are based on the following algorithms:

DIATONIC SHIFT	Two channels of pitch shift create diatonic harmonies in any user-specified key
DUAL SHIFT	Two independant pitch shifters in a dual mono in and out configuration
LAYERED SHIFT	Mono in, stereo out pitch shifter
STEREO SHIFT	Phase-compensated stereo pitch shifting, stereo in and out
REVERSE SHIFT	Backwards pitch shifting over a three-octave range
SWEPT COMBS	Six sweepable delay lines with stereo panning
REVERB FACTORY	Extremely versatile reverb with EQ and flexible gating
ULTRA-TAP	Twelve delays with stereo panning, level control and diffusion
DUAL DIGIPLEX®	Smooth, stereo delay
LONG DIGIPLEX	Mono delay with twice the maximum length of Dual Digiplex
VOCODER	Superbly articulate, linear, predictive vocoder
DENSE REVERB	Smooth, natural reverb that recalls the SP2016
MULTI-SHIFT	Six-octave, multi-positional pitch shifter
BAND DELAY	Eight-resonant bandpass filters with multi-tap delay
STRING MODELLER	Six-voice polyphonic synth and resonant-ambience generator
PHASER	The return of the classic Eventide Instant Phaser
STUTTER	Random pitch-shifted stutters for voice or instrument
PATCH FACTORY	Create your own algorithms with this powerful effects tool
MOD FACTORY	Dynamic algorithm construction kit

User Program Worksheets

This section contains worksheets for programming the H3000 algorithms. These are included to make it easier for you to create and document your own custom sound effects. We recommend that you use these to keep a permanent record of your valuable presets. The faithful use of these sheets will insure that your creative inspirations will never be lost and will provide a way of recreating your sounds in the case of any bizarre mishaps with your H3000.

We encourage you to make photocopies of the worksheets in the following pages.

Programming Worksheets

For Programming Worksheets, visit this link on Eventide's Web Site:

<http://www.eventide.com/oldies/progform/index.html>

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PATCH FACTORY	Create your own algorithms with this powerful effects tool
MOD FACTORY	Dynamic algorithm construction kit

#	NAME	ALGORITHM	DESCRIPTION	UNIT
150	12BYRD-STRING	MULTI-SHIFT	Nice, 12-stringy program. Uses lower octave doubling. Watch clipping.	D/SX, D/SE, 35
151	12 STRING & 5th	MULTI-SHIFT	Similar to 12BYRD STRING with added 5th above.	D/SX, D/SE, 35
152	3+ OF ME	DUAL DIGIPLEX	Doubling delays.	D/SX, D/SE, 35
153	60sSITAR FLANGE	SWEPT REVERB	Psychedelic, twangy flange and reverb.	D/SX, D/SE, 35
154	8 SEC REVERB	SWEPT REVERB	Long, SWEPT REVERB. Indoor stadium-like.	D/SX, D/SE, 35
155	ANALOG DELAYS 2	PATCH FACTORY	Warm, filtered delays. Newer version of program 535 in SE. Delay 1 is longer and swept.	D/SX, D/SE, 35
156	BACK TAPPING	ULTRA-TAP	Reversed-sounding delays with feedback.	D/SX, D/SE, 35
157	BassChor DDL	MULTI-SHIFT	Nice doubling for the bass. Stereo image.	D/SX, D/SE, 35
158	BIG 5TH HARMONY	MULTI-SHIFT	A 4th above and a 5th below.	D/SX, D/SE, 35
159	THE BIG CHEEZ 2	MULTI-SHIFT	An octave Harmonizer® thing with 'roomy,' ambient delays added.	D/SX, D/SE, 35
160	BLACK JACK	LAYERED SHIFT	Manually triggered sweep. Up then down.	D/SX, D/SE, 35
161	CHORUS SLAP	SWEPT COMBS	Nice, swept thickener, sounds lush on everything.	D/SX, D/SE, 35
162	COOL PRES	MOD FACTORY	Complex but warm delays. Dynamically affected by input.	D/SX, D/SE, 35
163	CRYSTAL ECHO 2	REVERSE SHIFT	An H3000 original, slightly modified. A shimmering, hypnotic ambience. Derivative of H3000-SE preset 642.	D/SX, D/SE, 35
164	DELAY & HARM	MULTI-SHIFT	A fifth is added and then sent through a delay.	D/SX, D/SE, 35
165	DETUNE + DELAY	MULTI-SHIFT	Gentle detuning with a long delay.	D/SX, D/SE, 35
166	DIFFUSED SLAP	ULTRA-TAP	Diffused delay with mix control.	D/SX, D/SE, 35
167	DOLPHIN TALK	REVERSE SHIFT	How many times have you wanted that mating call sound of these aquatic mammals? Well, here it is.	D/SX, D/SE, 35
168	DREAM FANTASY3	LAYERED SHIFT	Whole-tone extravaganza. 'Beam up' with a swelled harmonic on your guitar.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
169	DUAL GTR DELAYS	DUAL DIGIPLEX	Two long delays, for really beeg guitar sound.	D/SX, D/SE, 35
170	FATASSCAN-B	LAYERED SHIFT	Another thickener. Has soft knobs for easy control.	D/SX, D/SE, 35
171	FLESH 4 FANTASY	SWEPT COMBS	Flangy, swoopy, doubly thing.	D/SX, D/SE, 35
172	FLOAT!	ULTRA-TAP	Long, thick, swingin' delays.	D/SX, D/SE, 35
173	FLOAT FLANGE	SWEPT REVERB	Strong, satisfying flange using negative feedback.	D/SX, D/SE, 35
174	FRIZZLE FRY	ULTRA-TAP	Strong initial echoes, followed by diffuse, fed back echoes.	D/SX, D/SE, 35
175	G MAJ MOD WHEEL	DIATONIC SHIFT	Turning the Mod Wheel on will turn mix up to 40% and bring in a third and fifth above your note. For live shows, those of you with MIDI pedals can control harmonies.	D/SX, D/SE, 35
176	GTR OFF STAGE L	MOD FACTORY	If you use a stereo stage setup, send Left output to left cabinet and Right to right. A person standing in the middle will hear the guitar off to the left of the stage, when the balance is set properly. Experiment with settings and position of cabinets.	D/SX, D/SE, 35
177	GTR OFF STAGE R	MOD FACTORY	Complement of GTR OFF STAGE L.	D/SX, D/SE, 35
178	GUITAR ROOM	REVERB FACTORY	Nice and tight kind of room. Nice guitar space.	D/SX, D/SE, 35
179	HEAVEN I KNOW 9	REVERSE SHIFT	Squirrely, backwards shift effect.	D/SX, D/SE, 35
180	HEAVENLY PAD DM	REVERSE SHIFT	Just like it says. High, reversed echoes.	D/SX, D/SE, 35
181	HUNTER DELAY	REVERB FACTORY	Unusual, quickly repeating delays, becoming diffused as they decay.	D/SX, D/SE, 35
182	JERRY RACE CAR	MULTI-SHIFT	A small, roomy-type ambience with detuning.	D/SX, D/SE, 35
183	JIMI JAMES	REVERSE SHIFT	Basic reverse delays - like playing backwards in one-second snippets.	D/SX, D/SE, 35
184	LUSH LIFE	SWEPT COMBS	Six wildly swept, tight delays with feedback. What a life.	D/SX, D/SE, 35
185	MAJ3RD-MIN3RD+	MULTI-SHIFT	Lots of fun to solo with. A major chord is formed. One key fits all.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
150	12BYRD-STRING	MULTI-SHIFT	Nice, 12-stringy program. Uses lower octave doubling. Watch clipping.	D/SX, D/SE, 35
151	12 STRING & 5th	MULTI-SHIFT	Similar to 12BYRD STRING with added 5th above.	D/SX, D/SE, 35
152	3+ OF ME	DUAL DIGIPLEX	Doubling delays.	D/SX, D/SE, 35
153	60sSITAR FLANGE	SWEPT REVERB	Psychedelic, twangy flange and reverb.	D/SX, D/SE, 35
154	8 SEC REVERB	SWEPT REVERB	Long, SWEPT REVERB. Indoor stadium-like.	D/SX, D/SE, 35
155	ANALOG DELAYS 2	PATCH FACTORY	Warm, filtered delays. Newer version of program 535 in SE. Delay 1 is longer and swept.	D/SX, D/SE, 35
156	BACK TAPPING	ULTRA-TAP	Reversed-sounding delays with feedback.	D/SX, D/SE, 35
157	BassChor DDL	MULTI-SHIFT	Nice doubling for the bass. Stereo image.	D/SX, D/SE, 35
158	BIG 5TH HARMONY	MULTI-SHIFT	A 4th above and a 5th below.	D/SX, D/SE, 35
159	THE BIG CHEEZ 2	MULTI-SHIFT	An octave Harmonizer® thing with 'roomy,' ambient delays added.	D/SX, D/SE, 35
160	BLACK JACK	LAYERED SHIFT	Manually triggered sweep. Up then down.	D/SX, D/SE, 35
161	CHORUS SLAP	SWEPT COMBS	Nice, swept thickener, sounds lush on everything.	D/SX, D/SE, 35
162	COOL PRES	MOD FACTORY	Complex but warm delays. Dynamically affected by input.	D/SX, D/SE, 35
163	CRYSTAL ECHO 2	REVERSE SHIFT	An H3000 original, slightly modified. A shimmering, hypnotic ambience. Derivative of H3000-SE preset 642.	D/SX, D/SE, 35
164	DELAY & HARM	MULTI-SHIFT	A fifth is added and then sent through a delay.	D/SX, D/SE, 35
165	DETUNE + DELAY	MULTI-SHIFT	Gentle detuning with a long delay.	D/SX, D/SE, 35
166	DIFFUSED SLAP	ULTRA-TAP	Diffused delay with mix control.	D/SX, D/SE, 35
167	DOLPHIN TALK	REVERSE SHIFT	How many times have you wanted that mating call sound of these aquatic mammals? Well, here it is.	D/SX, D/SE, 35
168	DREAM FANTASY3	LAYERED SHIFT	Whole-tone extravaganza. 'Beam up' with a swelled harmonic on your guitar.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
205	BASS SHIFT	LAYERED SHIFT	A doubling effect intended for bass guitar. One channel is shifted up an octave. The other is slightly detuned.	D/SX, D/SE, 35
206	BIG SNARE	REVERB FACTORY	Thickens up weak, drum sounds. Try increasing gate time to get a more 'gated' effect.	D/SX, D/SE, 35
207	BIG SWEEP	SWEPT REVERB	To really hear the sweep, turn up the master feedback, make some noise, and then change the master delay.	D/SX, D/SE, 35
208	BIZARRMONIZER	LAYERED SHIFT	Generates a bizarre, upward sweeping pitch shift.	D/SX, D/SE, 35
209	BRIGHT ROOM	REVERB FACTORY	A short, bright reverb.	D/SX, D/SE, 35
210	CANNONS	REVERSE SHIFT	A unique, sweeping sound that's great on drums. Try playing a tom solo through this.	D/SX, D/SE, 35
211	CANYON	REVERB FACTORY	Our biggest reverb sound, like an echoing canyon.	D/SX, D/SE, 35
212	CIRCLES	ULTRA-TAP	A stereo-delay effect that seems to circle around your head. The effect is most noticeable on short sounds, like handclaps.	D/SX, D/SE, 35
213	DARK ROOM	REVERB FACTORY	A very mellow, room sound.	D/SX, D/SE, 35
214	DEATH FLANGE	SWEPT REVERB	A deep, intense flange that's great for thickening up a synthesized bass line.	D/SX, D/SE, 35
215	DISCRETE-VERB	SWEPT COMBS	A sparse, reverb effect.	D/SX, D/SE, 35
216	DRUM PROCESSOR	SWEPT REVERB	This very different effect tends to make things that aren't drums sound like drums. Try adjusting the first four parameters for a variety of effects.	D/SX, D/SE, 35
217	DUAL H910s	DUAL SHIFT	This program is designed to function like two Eventide H910 Harmonizer effects processors. The glitching you hear is intentional. This is a true dual program, where both left and right channels are processed separately.	D/SX, D/SE, 35
218	DUEL EFFECT	DUAL SHIFT	The left input is processed with a detuned slap delay, while the right channel is processed with a downward pitch sweep.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
186	MIGHTY DUCK	MOD FACTORY	A delay that swells up when signal is removed. It 'ducks' out of the way of a solo.	D/SX, D/SE, 35
187	MOD WHEEL CLIMB	LAYERED SHIFT	Will pitch shift up an octave with a Mod Wheel (through MIDI).	D/SX, D/SE, 35
188	MOD WHEEL DIVE	LAYERED SHIFT	Compliment of Mod Wheel Climb. This one will dive an octave with a Mod Wheel controller through MIDI.	D/SX, D/SE, 35
189	MULTI SLAP	SWEPT COMBS	Six swept delays that sound a little like a gated room.	D/SX, D/SE, 35
190	SHOULDER PHONE	MOD FACTORY	Put the phone to your shoulder, this is what it sounds like.	D/SX, D/SE, 35
191	RAYGUN	LAYERED SHIFT	Sounds like a PHASER. Set on STUN.	D/SX, D/SE, 35
192	ResoVibroEee	SWEPT COMBS	Sharp, resonant reverb around low E.	D/SX, D/SE, 35
193	ROOM OF DOOM	REVERB FACTORY	Warm, medium reverb. Groovy name.	D/SX, D/SE, 35
194	RHYTHM & REVERB	MULTI-SHIFT	Nice ambience, built of short delays.	D/SX, D/SE, 35
195	SEAS OF CHEESE	LONG DIGIPLEX	Long, long delay .	D/SX, D/SE, 35
196	SLUDGWIK	SWEPT COMBS	Another nice, Eventide, fat chorus.	D/SX, D/SE, 35
197	SON OF KAMIKAZE	MOD FACTORY	Delays that dive after a phrase stops and input drops below threshold. Scary.	D/SX, D/SE, 35
198	STEREO W FLANGER	SWEPT COMBS	Variation on the flange theme.	D/SX, D/SE, 35
199	SWEPT FLANGE 2	SWEPT REVERB	Flange theme with a variation.	D/SX, D/SE, 35
200	ALIENS	REVERSE SHIFT	Transforms voice into a rough, alien-like sound.	D/SX, D/SE, 35
201	AMBIENCE	ULTRA-TAP	Use this to add ambience without muddying the mix.	D/SX, D/SE, 35
202	A MINOR CHORDS	DIATONIC SHIFT	Play or sing a solo line in A minor. The H3000 will generate two perfect 'in-key' harmonies.	D/SX, D/SE, 35
203	ANTI-AMBIENCE	REVERSE SHIFT	This is a reverb-like sound created from REVERSE SHIFT. Sounds great on guitar. Mr. Cooder's favorite.	D/SX, D/SE, 35
204	AVANT-GARDE	REVERSE SHIFT	A REVERSE SHIFT effect that generates descending, chromatic lines.	D/SX, D/SE, 35

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205	BASS SHIFT	LAYERED SHIFT	A doubling effect intended for bass guitar. One channel is shifted up an octave. The other is slightly detuned.	D/SX, D/SE, 35
206	BIG SNARE	REVERB FACTORY	Thickens up weak, drum sounds. Try increasing gate time to get a more 'gated' effect.	D/SX, D/SE, 35
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216	DRUM PROCESSOR	SWEPT REVERB	This very different effect tends to make things that aren't drums sound like drums. Try adjusting the first four parameters for a variety of effects.	D/SX, D/SE, 35
217	DUAL H910s	DUAL SHIFT	This program is designed to function like two Eventide H910 Harmonizer effects processors. The glitching you hear is intentional. This is a true dual program, where both left and right channels are processed separately.	D/SX, D/SE, 35
218	DUEL EFFECT	DUAL SHIFT	The left input is processed with a detuned slap delay, while the right channel is processed with a downward pitch sweep.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
219	EXPLODING 'VERB	REVERB FACTORY	This sounds like a reverb, until the input level goes above the gate threshold. Once triggered, the reverb sound grows explosively.	D/SX, D/SE, 35
220	FAT SLAP	ULTRA-TAP	A slap delay with an ambient sound.	D/SX, D/SE, 35
221	FLANGE & REVERB	SWEPT COMBS	This is a reverb with a subtle, flanging effect.	D/SX, D/SE, 35
222	FLANGER	SWEPT COMBS	This is a basic stereo flanger. For the best effect, mix the H3000 output with the dry signal.	D/SX, D/SE, 35
223	GATED REVERB	REVERB FACTORY	That very familiar drum effect. To change the length of the 'gate' sound, set the gate length parameter.	D/SX, D/SE, 35
224	GENERIC HALL	ULTRA-TAP	A 'cheap,' reverb effect.	D/SX, D/SE, 35
225	GLITCH SHIFT	DUAL SHIFT	A 'cheap' pitch shifter. If glitches are what you want, here they are.	D/SX, D/SE, 35
226	H949	LAYERED SHIFT	This gives you what the H949 gave you. One output is a straight delay, while the other is pitch shifted. Both outputs are fed back to the input.	D/SX, D/SE, 35
227	HUMP-VERB	ULTRA-TAP	A very unique reverb with a sound not unlike the name.	D/SX, D/SE, 35
228	JUST 3RD & 5TH	DIATONIC SHIFT	A 'diatonic' pitch shifter that will generate just intoned 3rds and 5ths above the input. Make sure to set the key properly.	D/SX, D/SE, 35
229	JUST 4TH & 6TH	DIATONIC SHIFT	This generates just intoned 4ths and 6ths above the input.	D/SX, D/SE, 35
230	LOCKER ROOM	REVERB FACTORY	A small, resonant reverb.	D/SX, D/SE, 35
231	MICROPITCHSHIFT	LAYERED SHIFT	This is the perfect effect to fatten up or widen a sound without adding any color.	D/SX, D/SE, 35
232	MICROPITCH-SLAP	LAYERED SHIFT	The left channel is micro-shifted and the right is a slap delay with micro-shift. Great for guitar.	D/SX, D/SE, 35
233	MIDI 3 ON 2	DUAL DIGIPLEX	This preset will sync up its delay times to a MIDI drum machine or sequencer. The delays are in the familiar 3 on 2 pattern.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
234	MIDI PEDALSWEEP	SWEPT REVERB	The MIDI foot pedal controller will manually sweep the delays in this program to generate a flange-like sound. The Modulation Wheel controls modulation of the delays.	D/SX, D/SE, 35
235	MIDIPLEX	LONG DIGIPLEX	Connect a MIDI drum machine or sequencer to this program and the delay will automatically be in time.	D/SX, D/SE, 35
236	MODWHEEL REVERB	SWEPT REVERB	When connected to a MIDI keyboard, the Mod Wheel controls the decay time and the Pitch Wheel controls the delay (room size). Use this to easily generate dramatic reverb sweeps.	D/SX, D/SE, 35
237	MULTI-FLANGE	SWEPT COMBS	With six delays being swept at once, this program creates a very thick, flange sound.	D/SX, D/SE, 35
238	MUSIC SHIFT	STEREO SHIFT	This stereo, pitch shift program is optimized for shifting input program material.	D/SX, D/SE, 35
239	PITCH QUANTIZE	DIATONIC SHIFT	This program quantizes the input to the nearest chromatic interval.	D/SX, D/SE, 35
240	RANDOM GATE	ULTRA-TAP	Great for drums. A 'gated reverb' sound created with the ULTRA-TAP program.	D/SX, D/SE, 35
241	REVERSE GATE	ULTRA-TAP	Another standard, drum reverb.	D/SX, D/SE, 35
242	RICH CHORUS	SWEPT COMBS	This program uses six delay lines to create a useful chorus effect. Try increasing 'm delay' to get a subtler but more realistic effect.	D/SX, D/SE, 35
243	RICH PLATE	SWEPT REVERB	A slight sweep in this reverb gives it a rich sound and a smooth tail.	D/SX, D/SE, 35
244	ROCK 'N' ROLL	LAYERED SHIFT	This one's a bit different. Capture an audio loop by pressing the 'sustain' parameter. Play a note on a MIDI keyboard to hear the loop. Moving the Mod Wheel will alter the loop points (a bit like rocking tape reels). Playing different notes will change the pitch of the loop.	D/SX, D/SE, 35
245	SCARY MOVIE	REVERSE SHIFT	This program uses REVERSE SHIFT to create an evil-sounding voice. Use with guitar to create that tape splice, psychedelic sound.	D/SX, D/SE, 35
246	SHIMMERISH	SWEPT REVERB	A recirculating delay effect that fades into a smooth reverb.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
247	SLAP/MICROPITCH	DUAL SHIFT	The left channel is processed with a slap delay. The right channel is processed with a micro-shift.	D/SX, D/SE, 35
248	SMALL ROOM	REVERB FACTORY	A small-room reverb.	D/SX, D/SE, 35
249	SPACE FLANGE	SWEPT REVERB	This program is a cross between a digital delay, a reverb and a flanger.	D/SX, D/SE, 35
250	SWEEP RIGHT	ULTRA-TAP	This ULTRA-TAP program sweeps the taps across the stereo field.	D/SX, D/SE, 35
251	THICK LOOP	SWEPT REVERB	A repeating delay that fades into a reverb sound.	D/SX, D/SE, 35
252	THIRD & FIFTH	DIATONIC SHIFT	Generates an 'in-key' third and fifth above the input.	D/SX, D/SE, 35
253	THIRD & OCTAVE	DIATONIC SHIFT	This generates a diatonic third above and an octave below the input.	D/SX, D/SE, 35
254	TONAL ROOM	SWEPT REVERB	With pitched inputs, this reverb will actually generate many other tones. On drums, this is one of the biggest sounds you can get.	D/SX, D/SE, 35
255	TWELVE STRING	LAYERED SHIFT	Using a micro-pitch shift and an octave shift this generates a great twelve-string sound. Wonderful for guitar.	D/SX, D/SE, 35
256	VOICE SHIFT	STEREO SHIFT	This STEREO SHIFT program is optimized for pitch shifting program material whose main content is spoken voice.	D/SX, D/SE, 35
257	WARM HALL	REVERB FACTORY	Our basic, reverb sound.	D/SX, D/SE, 35
259	SymphonicChorus	SWEPT COMBS	Rich, multi-voice chorus.	D/SX, D/SE, 35
260	SYNTHISH ON YOU	DUAL SHIFT	Sci-fi, ring-modulating thickener with added pitches above and below.	D/SX, D/SE, 35
261	THRAX-VERB	REVERB FACTORY	Nice, full, medium reverb.	D/SX, D/SE, 35
262	TWIRLING ROOM	SWEPT REVERB	Twirling-room reverb.	D/SX, D/SE, 35
263	UnderwaterDelay	PATCH FACTORY	Gurgling and bubbling, these delays are something new.	D/SX, D/SE, 35
264	UNREAL 12 STRNG	PATCH FACTORY	Adds processed, 12-stringy thickness to guitars.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
265	USEFUL VERB	REVERB FACTORY	Bright and generic, medium-large verb. Quite roomy.	D/SX, D/SE, 35
266	MODULATOR-VERB	MULTI-SHIFT	Unique ring-modulaty, yet reverb-like effect.	D/SX, D/SE, 35
267	OCTAVE ECHOES	MULTI-SHIFT	Nice, subtle doubling with octave thrown into a delay.	D/SX, D/SE, 35
268	PanPitchDlyVerb	MULTI-SHIFT	Shifted ambience, with a fourth above and a fifth below.	D/SX, D/SE, 35
269	PanOctavDlyVerb	MULTI-SHIFT	Gently sweeping ambience with octave harmonic.	D/SX, D/SE, 35
270	SkilScale	DIATONIC SHIFT	An example of a user-scale mapping one input note to a wild set of nonlinear, output notes.	D/SX, D/SE, 35
271	3 OCTAVES UP	MULTI-SHIFT	Two Harmonizer effects processors, both set to 3 octaves up. Great on top four guitar strings.	D/SX, D/SE, 35
272	LO & BEHOLD	REVERSE SHIFT	Octaves up and down, reversed, then re-reversed.	D/SX, D/SE, 35
273	ABOUT YOU VIBD	MOD FACTORY	Smooth vibrato with panning.	D/SX, D/SE, 35
274	CHORWASHdual	MOD FACTORY	Long delays with thickener that cut their feedback with next input signal, cleaning up the wash of delays.	D/SX, D/SE, 35
275	MY BLOODY VAL	REVERSE SHIFT	Evil, reversed and down shifted delays. Perfect for that scary, solo sound.	D/SX, D/SE, 35
276	DRY CHORUS	MULTI-SHIFT	Subtle, chorus sound, tweaked for guitar.	D/SX, D/SE, 35
277	MILD CHORSDELAY	MULTI-SHIFT	Self descriptive.	D/SX, D/SE, 35
278	FLUTTEROUS ROOM	STEREO SHIFT	Warbly, bathroom-like ambience. Thickens with micro-shifting quite a bit.	D/SX, D/SE, 35
279	WATERY CHORUS	LAYERED SHIFT	Name says it all.	D/SX, D/SE, 35
280	DRUNK ROOM	REVERSE SHIFT	Unusual small-room ambience, built from reversed and slightly shifted delays.	D/SX, D/SE, 35
281	HARMONY ROOM 2	LAYERED SHIFT	Cool, fifthy ambience.	D/SX, D/SE, 35
282	MARKS MED DARK	REVERB FACTORY	This is a medium-small, dark room.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
283	LG GUITAR ROOM	REVERB FACTORY	A large room, suitable for guitar.	D/SX, D/SE, 35
284	LONG LEAD PING	MOD FACTORY	Ducking, ping-pong delay that goes from side to side.	D/SX, D/SE, 35
286	PANDELAY250/125	LAYERED SHIFT	Tight left and right delays with mix control for easy, live performance adjustment.	D/SX, D/SE, 35
287	GIANT 3D DELAYS	ULTRA-TAP	Wide complex delays. Use delay to shorten.	D/SE, H3500
288	3D DELAY LEFT	MOD FACTORY	Delay with off-the-speaker left image.	D/SE, H3500
289	GHOST 3D DELAY,	ULTRA-TAP	Spinning delays, randomly moving in space.	D/SE, H3500
290	INSIDE OUT 3D	ULTRA-TAP	Delays moving ever outward from center.	D/SE, H3500
291	3D DUCKY DELAYS	MOD FACTORY	Cave-like delays way off the left speaker.	D/SE, H3500
292	3D DUAL DUCK DLY	MOD FACTORY	Another Eventide first - 3D Ducking taps.	D/SE, H3500
293	3D HAAS PAN	MOD FACTORY	A manual-close delay manipulation w/ pan.	D/SE, H3500
294	FAR LEFT	MOD FACTORY	Dry processing to pan input off left speaker.	D/SE, H3500
295	FAR RIGHT	MOD FACTORY	Ditto.	D/SE, H3500
296	PRISTINE CLEANS	STRING MODELER	Unusual chorus effect with wide 3D image.	D/SE, H3500
297	SHIFT FAR LEFT	PATCH FACTORY	3D micro-shifter on far left.	D/SE, H3500
298	SHIFT FAR RIGHT	PATCH FACTORY	3D micro-shifter on far right.	D/SE, H3500
300	AIRPORT PAGE	PATCH FACTORY	This program simulates a large paging system: (size) sets room size, (echo lvl) sets the amount of echo mixed into effect, (pitch) controls overall pitch effect, (mix) wet/dry effect mix.	B+, B/LT
301	ALVIN	LAYERED SHIFT	An easy way to get that familiar chipmunk sound: (munkness) controls chipmunk pitch.	B+, B/LT
302	AUTO-MAX	STUTTER	Automatically generates st-st-stutters and sweeps: (rate) controls how often stutters or sweeps occur.	B+, B/LT
303	AUTOPANNER	SWEPT COMBS	Produces automatic stereo: (left<->right) is panning, (delay) controls delay of panned signal, (feedback) increase for repeated panning echoes, (pan rate) sets speed of panning.	B+, B/LT

#	NAME	ALGORITHM	DESCRIPTION	UNIT
304	AVANT-GARDE	REVERSE SHIFT	Produces a unique, reverse pitch shifted effect: (pitch) controls amount of pitch shift, (length) controls reverse splice length, (mix) wet/dry effect mix.	B+, B/LT
305	BACKWARDS	REVERSE SHIFT	Turns the input around in one-second chunks: (length) controls length of reversed segments, (feedback) feeds back reversed output, (pitch) sets pitch of reversed signal, (mix) wet/dry effect mix.	B+, B/LT
306	BRIGHT ROOM	REVERB FACTORY	A short, bright reverb: (size) controls room size, (distance) controls reverb predelay, (mix) wet/dry effect mix.	B+, B/LT
307	CANNONS	REVERSE SHIFT	Great on drums.	B+, B/LT
308	CANYON	REVERB FACTORY	Our biggest reverb sound, like an echoing canyon: (size) controls decay time of reverb; (predelay) sets predelay, in milliseconds; (mix) wet/dry effect mix.	B+, B/LT
309	CAVE ECHO	DUAL DIGIPLEX	A cave-like, long echo: (size) controls length of echo, (liveness) controls feedback on echo, (mix) wet/dry effect mix.	B+, B/LT
310	CB	PATCH FACTORY	Simulates CB radio sound, with two different voices and mike keying noise: (mike) triggers mike noise and changes pitch of speaker.	B+, B/LT
311	CHORUS	SWEPT COMBS	This program produces a swishy, chorus effect: (depth) sets depth of delay sweep, (rate) sets rate of delay sweep, (feedback) increase to get a more resonant sound, (mix) wet/dry effect mix.	B+, B/LT
312	CIRCLES	ULTRA-TAP	Try clapping into it. Many delays are panned to get a circular sweep.	B+, B/LT
313	CUZZIN IT	REVERSE SHIFT	Talk into this one. It might not be intelligible but it will be funny: (depth) increase to make voice lower in pitch, (speed) makes output 'splice' faster.	B+, B/LT
314	CYLONS	SWEPT COMBS	Creates a monotone, resonant voice sound: (resonate) makes resonance more intense, (tone) changes the pitch of the resonance.	B+, B/LT

#	NAME	ALGORITHM	DESCRIPTION	UNIT
315	DRAGWAY AD	PATCH FACTORY	Use this to create those cliché'd racecourse ads: (pitch) controls pitch of voice, (delay) controls amount of delay in echo, (echo) controls amount of echo in output mix, (feedback) controls amount of feedback.	B+, B/LT
316	FADE TO DREAM	LAYERED SHIFT	This effect produces a fade to a dream-like sound: (fade) triggers the fade, pressing again will fade back to dry; (faderate) increase to make the fade faster; (mix) wet/dry effect mix.	B+, B/LT
317	FLANGER	SWEPT COMBS	Increase delay to produce flanging effect: (depth) depth of delay sweep, (rate) rate of delay sweep, (feedback) increase for resonant effect, (mix) wet/dry effect mix.	B+, B/LT
318	FLYING SAUCERS	PATCH FACTORY	Adds downward, sweeping pitch to input signal: (length) controls decay time of effect, (mix) wet/dry effect mix.	B+, B/LT
319	GREGORIAN CHANT	PATCH FACTORY	This program filters and pitch shifts input voices to produce a chorus of droning monks.	B+, B/LT
320	GREMLINS	LAYERED SHIFT	This program randomly varies pitches and delays to produce interesting, unintelligible voices: (speed) controls how fast delay and pitch are changed, (amount) decrease to get less delay and pitch change.	B+, B/LT
321	HELLVERB	PATCH FACTORY	An eerie, reverb-like sound. Play with the controls!: (tone) makes reverb darker or brighter, (delay) sets amount of delay in feedback loop, (feedback) controls reverb decay, (pitch) controls pitch sweep.	B+, B/LT
322	JAVA THE HUN	LAYERED SHIFT	This sounds like the insidious voice of a famous movie character: (deepness) will lower the pitch of the voice.	B+, B/LT
323	LOCKER ROOM	REVERB FACTORY	This reverb program sounds like a concrete room: (size) controls the reverb decay time, (predelay) use this to add distance to the reverb, (mix) wet/dry effect mix.	B+, B/LT
324	LOWPASS FILTERS	PATCH FACTORY	Two lowpass filters connected in series process the audio. Use cutoff 1 and 2 to control the rolloff frequencies. Use Q factor 1 and 2 to control the resonance of the filters.	B+, B/LT
325	MAGIC	LAYERED SHIFT	Whistle into the mic.	B+, B/LT

#	NAME	ALGORITHM	DESCRIPTION	UNIT
326	MANY PITCHES	SWEPT COMBS	Use this effect to produce a cacophony of different pitched voices: (freq) lowering this slows the pitch modulation, (amount) this will increase the pitch variation, (mix) wet/dry effect mix.	B+, B/LT
327	MARTIANS	LAYERED SHIFT	The planet is surrounded! Surrender, earthlings!: (pitch) makes the voice higher in pitch.	B+, B/LT
328	MEGAPHONE	PATCH FACTORY	This produces the effect of speaking through a megaphone: (echo) increasing this mixes in an echo, (distance) controls the delay time of the echo, (macho) turning this up lowers the voice pitch, (mix) wet/dry effect mix.	B+, B/LT
329	MORE ALIENS	REVERSE SHIFT	This produces a rough, monotone, alien voice: (pitch) sets the pitch of the voice, (splice) controls the 'splice' rate, (mix) wet/dry effect mix.	B+, B/LT
330	NEW HOUSE	SWEPT COMBS	Use this to get that metallic sound of an empty, reflective room: (size) use this to make the room bigger or smaller; (liveness) to make the room deader, lower this.	B+, B/LT
331	OKSY ELEVEN	TIMESQUEEZE	Get that deep, smooth, announcer voice with this: (deepness) adjusts the voice pitch.	B+, B/LT
332	PLANET ZORGON	REVERSE SHIFT	Use this to get an unintelligibly deep, space voice: (pitch) controls the voice pitch, (speed) controls 'splice' rate.	B+, B/LT
333	PSYCHO-PANNER	SWEPT COMBS	This program swirls the input in pitch, pan and delay: Wild! (range) controls the range of delay and pitch sweep, (feedback) lower this to reduce the decay time, (pan rate) controls the panning and sweep speed, (mix) wet/dry effect mix.	B+, B/LT
334	RANDOM SHIFT	LAYERED SHIFT	This program changes the pitch randomly, great for spreading sounds in stereo: (depth) controls the amount of random pitch shift, (rate) controls speed of pitch modulation, (mix) wet/dry effect mix.	B+, B/LT
335	SHAKY	LAYERED SHIFT	If you were standing on a paint shaker, your voice might sound like this: (amount) use this to increase the pitch modulation, (rate) controls the rate of pitch modulation. On Golden Pond, to boot!	B+, B/LT

#	NAME	ALGORITHM	DESCRIPTION	UNIT
336	SHIMMERISH	SWEPT REVERB	This reverb starts out discrete and ends with a smooth tail: (length) controls the delay lengths, (decay) controls reverb decay time, (warble) use this to add a sweep to the reverb, (mix) wet/dry effect mix.	B+, B/LT
337	SIMPLE DELAY	LONG DIGIPLEX	Here is a basic delay, with control over delay, feedback, mix and a repeat control.	B+, B/LT
338	SISSY	LAYERED SHIFT	This program turns a he-man into a 90-pound wimp: (% sissy) controls the voice pitch.	B+, B/LT
339	SMALL ROOM	REVERB FACTORY	This is a small-room reverb: (size) controls reverb decay time, (mix) wet/dry effect mix.	B+, B/LT
340	SPACE FLANGE	SWEPT REVERB	Use this to get a thick-loop delay with a flange: (delay) controls loop delay time, (depth) controls depth of delay sweep, (rate) controls delay sweep rate, (feedback) use this to control loop feedback.	B+, B/LT
341	STADIUM	PATCH FACTORY	This program simulates the low-fidelity PA system of a sports arena: (pitch) changes the pitch of the announcer's voice, (size) increase or decrease arena size, (echo 1) controls level of first echo, (echo 2) controls level of second echo.	B+, B/LT
342	STEAM BATH	PATCH FACTORY	This recreates the sound of a steam bath, including the steam: (size) adjusts the steam bath size, (echo) controls the level of the echo, (steam) controls the level of the steam hiss, (mix) wet/dry effect mix.	B+, B/LT
343	ST PETERS CATH	REVERB FACTORY	This is a large, reverb sound, like a cathedral: (size) controls reverb decay time, (pew) controls apparent distance from front of room.	B+, B/LT
344	STUTTER	STUTTER	Use this for that popular STUTTER sound: (stut) will trigger the STUTTER, (speed) controls the speed of the STUTTER, (count) controls how many stutters occur, (pitch) controls the pitch of the voice.	B+, B/LT
345	STUTTER DOWN	STUTTER	This works just like the 'STUTTER' program, but the pitch will sweep down with the STUTTER effect.	B+, B/LT

#	NAME	ALGORITHM	DESCRIPTION	UNIT
346	STUTTER DUAL	STUTTER	This program allows two different STUTTER speeds to be set up and triggered: (stutter1) triggers a STUTTER using 'speed 1'; (speed 1) controls the speed of STUTTER 1, ditto for STUTTER 2.	B+, B/LT
347	STUTTER RANDOM	STUTTER	This program generates various random stutters: (stut) triggers a random STUTTER; (up) triggers a STUTTER with pitch sweep up; (down) triggers a STUTTER with pitch sweep down; (updown) STUTTER and sweep up left, down right.	B+, B/LT
348	STUTTER UP	STUTTER	This program works like the 'STUTTER' program, except the pitch will sweep up with the STUTTER.	B+, B/LT
349	STUTTER UP/DOWN	STUTTER	This also works like the 'STUTTER Dual' program, but with one side sweeping up and the other down.	B+, B/LT
350	SWEEP RIGHT	ULTRA-TAP	Using multiple delays, this sweeps to the right: (delay) controls length of sweep, (feedback) use this to echo the sweep, (mix) wet/dry effect.	B+, B/LT
351	SWEET FLANGE	LAYERED SHIFT	Use this program for a smooth, subtle flange sound: (amount) controls depth of delay sweep, (freq) controls sweep rate, (feedback) use this to add resonance, (mix) wet/dry effect mix.	B+, B/LT
352	TELEPHONE	PATCH FACTORY	This imitates the sound quality of a telephone: (distance) simulates long distance by adding echoes, (noise) adds noise to voice for realism, (pitch) changes pitch of voice.	B+, B/LT
353	THREE OF ME	DUAL SHIFT	This program randomizes the input delay to simulate three voices: (detune) controls the amount of pitch shift, (sweep) adjusts the amount of delay modulation, (feedback) controls the amount of feedback, (mix) wet/dry effect mix.	B+, B/LT
354	THREE ON TWO	DUAL DIGIPLEX	The delays in this program are set such that the familiar three against two rhythm is produced: (feedback) controls the amount of feedback, (mix) wet/dry effect mix.	B+, B/LT

#	NAME	ALGORITHM	DESCRIPTION	UNIT
355	TIME WARP	DUAL SHIFT	Speeds up and slows down whatever goes in. Try counting to ten while listening to the output: (speed) controls rate of time warp, (amount) controls amount of delay variation, (pitch) controls pitch of output, (feedback) use this to generate warped echoes.	B+, B/LT
356	TONAL ROOM	SWEPT REVERB	This program is a unique, pitched reverb. This is great for percussive sounds.	B+, B/LT
357	TRAFFIC REPORT	PATCH FACTORY	This sounds like a person sitting in a traffic helicopter. Also generates the CB voice sound: (speed) controls the chopper rotor speed, (nearness) controls the voice/chopper noise.	B+, B/LT
358	TV IN NEXT ROOM	PATCH FACTORY	Using filtering and delays, this program simulates that TV or radio in the next room: (tinniness) increase this to make the sound tinnier, (muffle) increase this to make the sound muffled, (delay 1) controls the length of the first echo.	B+, B/LT
359	UNDERWATER	PATCH FACTORY	This is a pretty good simulation of dunking your head under water and speaking: (depth) controls the intensity of the effect, (speed) increase this to get more.	B+, B/LT
360	WAH WAH	PATCH FACTORY	This sounds like an automatic wah-wah pedal: (amount) controls the depth of the sweep, (speed) controls the wah-wah rate.	B+, B/LT
361	WARM HALL	REVERB FACTORY	This is a nice, medium-length reverb program: (size) controls the reverb decay time, (predelay) simulates distance from the source, (mix) wet/dry effect mix.	B+, B/LT
362	WARPED 45	STEREO SHIFT	This can ruin even the best records: (warpsness) controls the amount of pitch variation.	B+, B/LT
363	WARPED LP	STEREO SHIFT	This is the same as Warped 45, but slower.	B+, B/LT
366	1/2SEC GATORVRB	REVERB FACTORY	1/2-second delayed, 1/2-second gated verb.	D/SE, H3500
367	ACIDREIGN	REVERSE SHIFT	Detuned reversed slices.	D/SE, H3500
368	ACCURATE ROOM	DENSE ROOM	Nuff said.	D/SE, H3500
369	AMBIENT BOOTH	DENSE ROOM	Small, bathroom-sized booth reverb.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
370	ATLANTIS	REVERSE SHIFT	Backwards, swelling delays.	D/SX, D/SE, 35
371	BASS SPACE	DENSE ROOM	Bathroom with lots of rugs and towels.	D/SE, H3500
372	BriteBrassPlate	REVERB FACTORY	Twangy plate, good on dark brass.	D/SE, H3500
373	DAVES SPIN	MOD FACTORY	An improved spinning-speaker-cabinet simulator.	D/SX, D/SE, 35
374	CABO BOING	SWEPT COMBS	Gurgling-sounding chorus.	D/SE, H3500
375	CHORUS SLOW	SWEPT COMBS	Subtle, chorus effect.	D/SE, H3500
376	CLOSENCOUNTERS	STRING MODELER	Mystic bell resonance. Try on anything.	D/SE, H3500
377	CLOSE MIKED	REVERB FACTORY	Small, tiled bathroom.	D/SE, H3500
378	COMB SPACE 1	REVERB FACTORY	Resonant, small space.	D/SE, H3500
379	COMPRESSED AIR	DENSE ROOM	Compressed, close-miked sound.	D/SE, H3500
380	CRYSTALESQUE	MULTI-SHIFT	Micropitch thickener with some tight, bathroomy delays.	D/SX, D/SE, 35
381	DOUBLE SPACE	DENSE ROOM	Small, slap-room delay.	D/SE, H3500
382	DENSE HALL 2	DENSE ROOM	Large, dense hall.	D/SE, H3500
383	DELAY W/ ROOM	DENSE ROOM	Half-second delayed room.	D/SE, H3500
384	VERBY CHORUS	SWEPT REVERB	Great reverb and chorus combo.	D/SX, D/SE, 35
385	DRAGON BREATH	SWEPT REVERB	Tight, ambient delays. Try on guitar.	D/SX, D/SE, 35
386	DrewzNooRoom	DENSE ROOM	Small, cozy reverb.	D/SE, H3500
387	DRUM AMBIENCE	DENSE ROOM	Small, tight room.	D/SE, H3500
388	FLASHBACK	STUTTER	Psychotic, sweeping delay.	D/SE, H3500
389	SORE THROAT	SWEPT COMBS	Gargling-sounding ambience.	D/SE, H3500
390	GATED FENCE	REVERB FACTORY	Nice, gated verb for drums.	D/SE, H3500
391	GATED ROOM 2	REVERB FACTORY	Twangy, gated room.	D/SE, H3500
392	GENERIC HALL	ULTRA-TAP	High School Gym sound.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
393	GREAT DRUMSPACE	REVERB FACTORY	Another small, rehearsal room.	D/SE, H3500
394	5SEC HANG VERB	REVERB FACTORY	Gated verb with 5-second hang time.	D/SE, H3500
395	HUGE DENSE HALL	DENSE ROOM	Dense, arena-like verb.	D/SE, H3500
396	HUGE SYNTHSPACE	DENSE ROOM	Self-descriptive.	D/SE, H3500
397	ACID REIGN	REVERSE SHIFT	Reversed delays. Very psychedelic.	D/SX, D/SE, 35
398	KALEIDOSCOPEYES	SWEPT REVERB	Flangy, swirling delays.	D/SE, H3500
399	FAN WHIPPER	MULTI-SHIFT	Sounds like sound through slow fan.	D/SX, D/SE, 35
400	A 440	PATCH FACTORY	This program generates a 440 Hertz sine wave output: (level) controls the sine wave output level, (freq) use this to adjust the output frequency.	B+, B/LT
401	ALERT	PATCH FACTORY	This program produces a harsh alarm sound: (rate) controls the alarm sweep rate, (tone) controls the tone of the sound.	B+, B/LT
402	BOINGY BUZZ	PATCH FACTORY	A dramatic bass swell is produced when this program is triggered: (pluck) triggers the effect, (detune) use this to detune the left output pitch, (tone) makes the sound smoother or harsher, (tune) adjusts the overall tuning of the sound.	B+, B/LT
403	DOORBELL	PATCH FACTORY	This program generates a familiar doorbell sound when triggered: (ring) will ring the doorbell, (tone) adjusts the tone of the doorbell, (tune) controls the pitch of the doorbell.	B+, B/LT
404	JET	PATCH FACTORY	Look out! A 747 is passing through your control room!: (fly by) triggers the jet sound, (speed) controls the speed of the jet approach, (rumble) controls the amount of bass rumble, (whine) controls the amount of jet whine.	B+, B/LT
405	JETTISON	PATCH FACTORY	Similar to "Jet," this sound is reminiscent of rocket stages being jettisoned, or perhaps a spaceship blasting off: (jettison) will trigger the effect, (speed) controls the speed of the jettison sound, (whine) controls the amount of high-pitched whine.	B+, B/LT

#	NAME	ALGORITHM	DESCRIPTION	UNIT
406	LASER ECHO	PATCH FACTORY	Use this to destroy those enemy invaders. This one sounds like a sci-fi movie or a video game noise: (fire) triggers the laser blast, (sweep) adjusts the pitch sweep of the sound, (feedback) controls the decay of the sound, (tune) controls the basic pitch.	B+, B/LT
407	PLUCK	PATCH FACTORY	This effect is a convincing simulation of a string being plucked, in stereo: (pluck) press this to pluck the string, (detune) controls the pitch of the left output, (tone) increase for harsher string sound, (tune) controls the pitch of the string.	B+, B/LT
408	SIREN	PATCH FACTORY	If a siren is what you need, here's where to look: (rate) controls the rate of the siren sweep, (range) controls the range of the pitch sweep.	B+, B/LT
409	SONAR	PATCH FACTORY	This simulates the sound of a submarine's sonar echo: (ping) triggers the sonar sound.	B+, B/LT
410	STEREO COPTER	PATCH FACTORY	Use this if you need an easy helicopter sound: (speed) controls the helicopter rotor speed.	B+, B/LT
411	TANK ATTACK	PATCH FACTORY	This program sounds like an arcade tank game: (fire) will fire the tank when pressed, (rumble) controls the bass rumble of the explosion.	B+, B/LT
412	THUNDER	PATCH FACTORY	Try our thunderbolt: (bolt) triggers the thunder effect.	B+, B/LT
413	UFO	PATCH FACTORY	This is our version of a spaceship taking off and landing: (take off) will make the spaceship take off. Press again to make it land.	B+, B/LT
414	WAVE	PATCH FACTORY	This sounds like a single, ocean wave: (waveit) triggers the wave sound.	B+, B/LT
415	WIND STORM	PATCH FACTORY	Put your parka on before loading. Here is our howling Arctic wind: (gales) controls the intensity of the storm, (mix) allows a voice to be mixed over the wind.	B+, B/LT
416	BOB C'S PHASER	PHASER	PHASER tweaked by Mr. Clearmountain himself.	D/SE, H3500
417	DEEPENED CLAPS	ULTRA-TAP	Swelling, fat delay, good on percussives.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
418	SPACE FLANGE BC	SWEPT REVERB	Customized preset with flangy, panning delays.	D/SX, D/SE, 35
419	STEREO W FLANGE	SWEPT COMBS	Widens your stereo image with flangy things.	D/SE, H3500
420	SWEPT PANNER	SWEPT COMBS	Has LFO tied to width.	D/SE, H3500
421	TITE STEREO DLY	STEREO SHIFT	Real, tite-locked delays.	D/SE, H3500
422	TITE STEREO CUE	MULTI-SHIFT	Tight, unlocked delays.	D/SE, H3500
423	VOC DOUBLER BC	MULTI-SHIFT	A voice thickener with a moving pitch.	D/SE, H3500
425	2 MULTI EFFECTs	MULTI-SHIFT	Two independent shifters with panning, semi-equivalent to two H949s.	H3500
426	AMBIENT SLAP	ULTRA-TAP	Quick slap with an element of reverb.	H3500
427	BALLAD SNARE	DENSE ROOM	A good verb for slow tunes. Has a long predelay.	H3500
428	BOOGALOO	PATCH FACTORY	A jungle-sounding patch, try on toms.	H3500
429	CASTANET PSYCHO	BAND DELAY	Rhythmic, resonant delays.	H3500
430	CLACK	PATCH FACTORY	Adds a clacky noise.	H3500
431	CRACK O'SNARE	PATCH FACTORY	One of several presets good for snare processing.	H3500
432	DARK CELLAR	REVERB FACTORY	Good for growing mushrooms.	H3500
433	DAVE'S PLATE	SWEPT REVERB	Plate-type reverb w/ a little chorusing.	H3500
434	DITH VERB	REVERB FACTORY	Unusual, warm and thick verb.	H3500
435	DRUM WHEEZE	PATCH FACTORY	Funny wheeze for something a little different.	H3500
436	DRUNKIT	SWEPT REVERB	Too much tequila the night before.	H3500
437	DUAL FLAT FIXER	MULTI-SHIFT	Correct the 'out-of-tuneness' of two vocalists at the same time. The knob will control Ch 1's pitch, and a pitch bend wheel will control Ch 2's. A sequencer will store your pitch changes if you record them to it.	H3500
438	DUAL TOM SHIFT	DUAL SHIFT	'NUFF SAID!	H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
439	DUCK VERB	REVERB FACTORY	Reverb will 'duck' slightly while a signal is present.	H3500
440	EMPTY WATER TANKS	REVERB FACTORY	Sounds like the inside of one of those water towers.	H3500
441	FALLING FLANGE	PATCH FACTORY	Use 'P DELAY' to change repeat interval.	H3500
442	FAT FLAM	LAYERED SHIFT	Tight delays to widen drum strokes.	H3500
443	FineYoung Snare	PATCH FACTORY	Pretty, poppy processing.	H3500
444	FIXT PITCH TOMS	DIATONIC SHIFT	Interesting tom thickener.	H3500
445	FUNKshunTAPS	ULTRA-TAP	Discrete, reverb-like delays sweeping right to left.	H3500
446	GATED KIK	REVERB FACTORY	This is a gated, bass drum reverb.	H3500
447	GATED SNARE	REVERB FACTORY	Guess what this is?	H3500
448	GRIF RANDOM	DUAL SHIFT	A great thickener reminiscent of H949 random.	H3500
449	H949 REV 3	PATCH FACTORY	Basic configuration and sound of H949.	H3500
450	HAT ROOM	SWEPT REVERB	Check your hi-hat in here.	H3500
451	HI HAT BREATH	SWEPT REVERB	Makes hat a little more ambient.	H3500
452	HI HAT DELAY	PATCH FACTORY	EQ'd delays for hat.	H3500
453	ITCHY COO TOM	SWEPT REVERB	Try it on toms. By the way, do you remember the song?	H3500
454	JOE'S GATE	REVERB FACTORY	A nice, gated reverb. Thanks Joe!	H3500
455	JUNGLE 7	BAND DELAY	Adds jungle rhythms in 7/8.	H3500
456	KERR VERB	REVERB FACTORY	Medium-dark, gated verb.	H3500
457	KIT FLANGER	SWEPT REVERB	Neato, overall kit flanger.	H3500
458	LEXY ROOM	REVERB FACTORY	Bright-sounding room with white tail.	H3500
459	LITE ROOM	REVERB FACTORY	Sounds great, less filling.	H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
460	LONG ROOM	DENSE ROOM	Long Verb.	H3500
461	LO PROCESSOR	SWEPT REVERB	Adds low percussive ambience to anything.	H3500
462	MIDI GATE VERB	REVERB FACTORY	Use keyboard controller to change parameters. Sustain pedal is tied to gate and Mod Wheel is tied to decay.	H3500
463	MIDI SWEPT VERB	SWEPT REVERB	Size is tied to pitch wheel and the sweep is tied to modulation wheel.	H3500
464	OCTAVE DOWNERs	DIATONIC SHIFT	Both channels take the drums down an octave.	H3500
465	One And Ah 16th	ULTRA-TAP	Gives you great 16th note subdivisions ('one-and-ah' as Lawrence Welk used to say).	H3500
466	One Car Garage	REVERB FACTORY	Small, tight reverb like a one-car garage.	H3500
467	One Ee And Ah	ULTRA-TAP	One ee and ah sixteenth note subdivisions.	H3500
468	One Ee Ah 16ths	ULTRA-TAP	One Ee Ah (16ths).	H3500
469	PERC WAH WAH	PATCH FACTORY	And now, wah-wah for drums!	H3500
470	PHONERING DELAY	ULTRA-TAP	Delays timed to sound like an old, phone-ring effect.	H3500
471	ROOM 90x40x15	ULTRA-TAP	Simulates discrete style reverb of small room with mentioned dimentions.	H3500
472	ROCK ROOM	DENSE REVERB	Power verb.	H3500
473	SEXTUPLETS A	ULTRA-TAP	Variation of above.	H3500
474	SEXTUPLETS	ULTRA-TAP	This is, well, sextuplet delays.	H3500
475	SEWER VERB	PATCH FACTORY	Foul, liquid-sounding reverb.	H3500
476	SHORT ROOM	REVERB FACTORY	A small reverb (four-car garage?).	H3500
477	SIMMONIZE	PATCH FACTORY	See (#476).	H3500
478	SMALL TILED RM	REVERB FACTORY	The sound of Ivana's bathroom.	H3500
479	SON OF BIGSNARE	DENSE ROOM	Remember Big Snare (#576)?	H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
480	STEREO TOM DLAY	MULTI-SHIFT	Delays that will follow the panning of the inputs.	H3500
481	SWEEP 8	BAND DELAY	Pitched and timed delays.	H3500
482	THICK RICK	SWEPT REVERB	Thickening, sweeping ambience.	H3500
483	TILED HAT ROOM	REVERB FACTORY	This is a very large bathroom.	H3500
484	TImBrAl bRoOm	PATCH FACTORY	Wah-wahing ambience.	H3500
485	TIMID VERB	SWEPT REVERB	Subtle reverb/flanger.	H3500
486	TINY WAREHOUSE	DENSE ROOM	This is the reverb of a small Hoboken, N.J. sock outlet factory.	H3500
487	TOMBALLS	REVERB FACTORY	Good on toms.	H3500
488	TOM SWEEP	BAND DELAY	Pitched delays for toms.	H3500
489	TRASHY DRUMS	SWEPT REVERB	Want a really gritty drum sound? Load this one.	H3500
490	TWINKIE SHIFT	MULTI-SHIFT	Adds adorable, higher octaves.	H3500
491	Two Warm Delays	PATCH FACTORY	These are so useful to add ambience without "swishing" around.	H3500
492	WARP 2	SWEPT REVERB	Kind of a seasick preset. Warps pitch of input.	H3500
493	WORD UP	LAYERED SHIFT	Noise effect for snare or percussion.	H3500
496	MOON TURN TIDES	MOD FACTORY	Long delay that falls in pitch and time signal is removed.	D/SX, D/SE, 35
497	SMOOTH DELAYS	MOD FACTORY	Slow, attacking delays with a lil' ducking.	D/SE, H3500
498	GIGUNDO CHORUS	MOD FACTORY	Use on vocal chorus to enlarge and thicken.	D/SE, H3500
499	KAMIKAZE DELAYS	MOD FACTORY	New, distorted delays that dive with signal.	D/SX, D/SE, 35
500	ADSR FILTER	PHASER	When the sound into the H3500 goes over a threshold, a sweeping, 'wah'-like, filter effect is triggered.	D/SE, H3500
501	ADSR PHASER	PHASER	Like above, the input audio level will trigger a sweeping, PHASER effect.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
502	ANALOG THICK	PATCH FACTORY	A warm, chorused, echo sound. Two adjustable, lowpass filters provide the warmth.	D/SE, H3500
503	BASS CHORUS	MULTI-SHIFT	Specifically tailored for bass, this is a simple, micro-pitched chorus.	D/SE, H3500
504	BUENOS NOTCHES	PHASER	Pleasant, sweeping notches will result when this effect is mixed with the dry audio.	D/SE, H3500
505	DEATH FLANGE	SWEPT REVERB	A deep, intense flange that's great for thickening up a synthesized bass line.	D/SE, H3500
506	DIGDLY & MICRO	MULTI-SHIFT	Dual digital delays with micro-shift on the outputs. A nice sounding setup useful for thickening up a synthesized bass line.	D/SE, H3500
507	DGDLY+WAH+MICRO	PATCH FACTORY	This is an unusual combination of a digital delay, a cycling 'wah-wah' filter, and a micro-pitch shift.	D/SE, H3500
508	DUAL H910 MICRO	MULTI-SHIFT	This program is designed to function like two Eventide H910 Harmonizer effects processors. The glitching you hear is intentional. This is a true dual program, where both left and right channels are processed separately.	D/SE, H3500
509	ENVELOPE FILTER	PHASER	This program consists of a resonant filter that sweeps as the input level changes. Try experimenting with the envelope-rate parameter.	D/SE, H3500
510	ENVELOPE PHASER	PHASER	Here, a PHASER sweep follows the input signal level.	D/SE, H3500
511	FLANGE & REVERB	SWEPT COMBS	This is a reverb with a subtle, flanging effect.	D/SE, H3500
512	FLANGER	SWEPT COMBS	This is a basic, stereo flanger. For the best effect, mix the H3500 output with the dry signal.	D/SE, H3500
513	INSTANT PHASER	PHASER	A straightforward, sweeping PHASER, in memory of our famous product.	D/SE, H3500
514	JUST STEREO	MULTI-SHIFT	A very subtle, micro-pitch shift. Just enough to add a presence to an otherwise flat, mono sound.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
515	MAGIC AIR	MULTI-SHIFT	This has two upward micro-shifts and two delays in a tight, ambient formation. Use to liven and slightly raise flat vocals or to generally thicken sources.	D/SE, H3500
516	MANY REFLECTIONS	MULTI-SHIFT	Numbers of micro-pitched echoes slowly decaying upwards. Good, chorused, echo effect.	D/SE, H3500
517	MICRO + DRYSLAP	MULTI-SHIFT	A general-purpose thickener with some delay with feedback.	D/SE, H3500
518	MICRO + REVERB	MULTI-SHIFT	Includes a micro-shift and a quasi-reverb set of delays with feedback.	D/SE, H3500
519	MICROPITCHSHIFT	MULTI-SHIFT	This is the perfect effect to fatten up or widen a sound without adding any color.	D/SE, H3500
520	MICRO-REVERB	MULTI-SHIFT	Similar to above but much less discrete, with tighter delays.	D/SE, H3500
521	MICROPITCH-SLAP	MULTI-SHIFT	The left channel is micro-shifted and the right is a slap delay with micro-shift. Great for guitar.	D/SE, H3500
522	MULTI-DLYEFFECT	SWEPT COMBS	All kinds of subtle things going on here. Delays, echoes, flanging, chorusing.	D/SE, H3500
523	MULTI-FLANGE	SWEPT COMBS	With six delays being swept at once, this program creates a very thick, flange sound.	D/SE, H3500
524	QUADRUPLER	MULTI-SHIFT	Provides a dense, panned stereo field with two sweeping shifters and two delays. Denser than Voice Doubler (572) but similar in effect.	D/SE, H3500
525	RANDOM FLANGE	MULTI-SHIFT	Another doubling effect with random, moving, micro-pitch shifts.	D/SE, H3500
526	RESONANT SWEEP	PHASER	A medium-speed, resonant PHASER.	D/SE, H3500
527	RICH CHORUS	SWEPT COMBS	This program uses six delay lines to create a useful chorus effect. Try increasing (m delay) to get a subtler but more realistic effect.	D/SE, H3500
528	REAL CHORUS	MULTI-SHIFT	A convincing doubling effect. Pretty smooth.	D/SE, H3500
529	SPACE FLANGE	SWEPT REVERB	This program is like a digital delay, a reverb and a flanger all rolled into one.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
530	TREMOLO DELAY	MULTI-SHIFT	A long delay whose pitch warbles, creating a thick atmospheric effect. Use on guitar sound effects.	D/SE, H3500
531	TWO THICKENERS	MULTI-SHIFT	Two independent effects, each made up of a delay with pitch shift, and a discrete delay.	D/SE, H3500
532	ULTRA-THICK	MULTI-SHIFT	General thickener with a nice, stereo image.	D/SE, H3500
533	VOICE DOUBLER	LAYERED SHIFT	Sweeps two pitch shifters in opposite directions giving a convincing doubling effect.	D/SE, H3500
534	WATERY FLANGE	SWEPT COMBS	Just as the name suggests.	D/SE, H3500
535	ANALOG DELAYS	PATCH FACTORY	Warm echoes provided by lowpass filters.	D/SE, H3500
536	BUILD-A-SHIMMER	ULTRA-TAP	Eerie echoes that fade in and fade out.	D/SE, H3500
537	CIRCLES	ULTRA-TAP	A stereo delay effect that seems to circle around your head. The effect is most noticeable on short sounds, like handclaps.	D/SE, H3500
538	DIGITAL DELAY	LONG DIGIPLEX	A basic digital delay line, with feedback control.	D/SE, H3500
539	DUAL DELAYS	DUAL DIGIPLEX	Two simple delays. One left, one right.	D/SE, H3500
540	ECHOPLEXINGPONG	DUAL DIGIPLEX	An echo that bounces from one side to another.	D/SE, H3500
541	ECHO RAMP	LONG DIGIPLEX	A manually triggerable program with a delay that sweeps down and up when the trigger key is pressed.	D/SE, H3500
542	FAT SLAP	ULTRA-TAP	A slap delay with an ambient sound.	D/SE, H3500
543	5TH AVE ECHO	ULTRA-TAP	Delays and diffusion are selected to sound a lot like those on a big city street.	D/SE, H3500
544	LONG DELAY	LONG DIGIPLEX	Simple, long delay.	D/SE, H3500
545	MULTI-TAP	ULTRA-TAP	If you own an Eventide SP2016, you'll be familiar with this sound. This preset emulates the SP2016 Multi-Tap program, with a slightly shorter overall.	D/SE, H3500
546	PING PONG BALL	ULTRA-TAP	Another echo that bounces side to side. But, the echo shortens with time.	D/SE, H3500
547	SETTLEDOWN ECHO	BAND DELAY	Echoes that go from bright to warm.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
548	SOFT SHORT ECHO	DENSE ROOM	A very smooth, diffuse echo.	D/SE, H3500
549	SPACE ECHO	PATCH FACTORY	Simulates a very popular tape delay from the 70's. Even adds tone controls and tape warble for that thick, analog sound.	D/SE, H3500
550	SUBTLE SWEEP	DUAL SHIFT	Two subtle, sweeping delays. This is ideal for turning mono sources into stereo. Pan original source to one side and its sweeping delay to another.	D/SE, H3500
551	SWEEP RIGHT	ULTRA-TAP	Exponential increasing delays that are panned from left to right. Mono in, stereo out.	D/SE, H3500
552	THICK LOOP	SWEPT REVERB	A repeating delay that fades into a reverb sound.	D/SE, H3500
553	THREE ON TWO	DUAL DIGIPLEX	The delays in this program are set such that the familiar three against two rhythm is produced: (feedback) controls the amount of feedback, (mix) wet/dry effect mix.	D/SE, H3500
554	WIDENING TAPS	ULTRA-TAP	The echoes get longer as time goes on, spreading from the center to the sides of the stereo field.	D/SE, H3500
555	AMBIENCE	ULTRA-TAP	Use this to add ambience without muddying the mix.	D/SE, H3500
556	AMBIENT BOOTH	DENSE ROOM	A short but natural reverberation.	D/SE, H3500
557	BATHROOM	REVERB FACTORY	Lots of highs left in by those ceramic tiles.	D/SE, H3500
558	CHORUS ROOM	SWEPT REVERB	Short reverb with chorus. Nice for instruments but perhaps not with drums.	D/SE, H3500
559	CRASS ROOM	DENSE ROOM	A harsh, hollow reverb reminiscent of those good old school days.	D/SE, H3500
560	DE-BURR	ULTRA-TAP	Takes the edge off of sharp attacks.	D/SE, H3500
561	DREW'S CHAMBER	DENSE ROOM	Medium-short, natural reverb.	D/SE, H3500
562	DRUM AMBIENCE	DENSE ROOM	A soft ambience that just barely livens up otherwise dry sounds.	D/SE, H3500
563	EMPTY CLOSET	SWEPT REVERB	This reverb is very short. You almost can't detect it. Use it for situations where you really don't want to hear a reverb.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
564	EMPTY ROOM	SWEPT REVERB	Medium reverb with slight chorus. Sounds nice on regular instruments.	D/SE, H3500
565	MEDIUM SPACE	SWEPT REVERB	Another medium reverb with slight chorus. This has a more natural sound and the chorus is very slight.	D/SE, H3500
566	NEW HOUSE	SWEPT COMBS	Use this to get that metallic sound of an empty, reflective room.	D/SE, H3500
567	PRCSVHORN PLATE	DENSE ROOM	A plate reverb that enhances natural or synthesized horn sounds.	D/SE, H3500
568	REAL ROOM	SWEPT REVERB	Short reverb with a natural airiness.	D/SE, H3500
569	SMALL ROOM	REVERB FACTORY	A small-room reverb.	D/SE, H3500
570	SMLSTEREOSPACE	SWEPT REVERB	Very short ambience with a slight chorus added in order to give it a big, full sound for its short duration.	D/SE, H3500
571	SMALLVOCAL ROOM	DENSE ROOM.	Medium-length reverb tailored for vocals.	D/SE, H3500
572	TIGHT ROOM	DENSE ROOM	A short, bright reverb.	D/SE, H3500
573	TIGHT & BRIGHT	DENSE ROOM	Like above but longer and brighter.	D/SE, H3500
574	VOCAL BOOTH	DENSE ROOM	Short, natural reverb with a slight delay.	D/SE, H3500
575	ALIVE CHAMBER	SWEPT REVERB	Large, chorus reverb. A real, full sound.	D/SE, H3500
576	BIG SNARE	REVERB FACTORY	This is a sizzling reverb, somewhat gated with lots of punch for drums.	D/SE, H3500
577	BIG SWEEP	SWEPT REVERB	To really hear the sweep, turn up the master feedback, make some noise and then change the master delay.	D/SE, H3500
578	BOB'S ROOM	DENSE ROOM	A warm, long reverb, useful on lots of sources.	D/SE, H3500
579	BREATHING CANYON	SWEPT REVERB	A very long reverb. Very roomy.	D/SE, H3500
580	BRIGHT ROOM	REVERB FACTORY	A short, bright reverb.	D/SE, H3500
581	CANYON	REVERB FACTORY	Our biggest reverb sound, like an echoing canyon.	D/SE, H3500
582	CONCERT HALL	DENSE ROOM	A big hall with a lot of predelay.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
583	DARK ROOM	DENSE ROOM	Yes, another dark reverb. Sounds like the inside of a big, petroleum tank.	D/SE, H3500
584	DISCRETE-VERB	SWEPT COMBS	A sparse, reverb effect.	D/SE, H3500
585	NORTHWEST HALL	DENSE ROOM	Very similar to Concert Hall except that the reverb is somewhat more discrete.	D/SE, H3500
586	RICH PLATE	SWEPT REVERB	A slight sweep in this reverb gives it a rich sound and a smooth tail.	D/SE, H3500
587	SLAPVERB	DENSE ROOM	A short delay and then a bright, long reverb.	D/SE, H3500
588	SMOOTH PLATE	DENSE ROOM	Airy and smooth.	D/SE, H3500
589	WARM HALL	REVERB FACTORY	Our basic reverb sound.	D/SE, H3500
590	BACKWARD REVERB	MULTI-SHIFT	A quasi-reverb made up of little, backward bits of the input. One of a kind.	D/SE, H3500
591	ECHO-VERB	DENSE ROOM	A discrete, echo-like reverb.	D/SE, H3500
592	EXPLODING 'VERB	REVERB FACTORY	This sounds like a reverb, until the input level goes above the gate threshold. Once triggered, the reverb sound grows explosively.	D/SE, H3500
593	GATED REVERB	REVERB FACTORY	That very familiar drum effect. To change the length of the 'gate' sound, set the gate length parameter.	D/SE, H3500
594	GATED ROOM	REVERB FACTORY	A warm-sounding, gated room best used on one source such as snare drum or toms.	D/SE, H3500
595	GATE ROOM	REVERB FACTORY	Like above but with a more natural decay.	D/SE, H3500
596	HUMP-VERB	ULTRA-TAP	A very unique reverb with a sound not unlike the name.	D/SE, H3500
597	METALVERB	ULTRA-TAP	A metallic set of closely packed delays approaching reverb density.	D/SE, H3500
598	RANDOM GATE	ULTRA-TAP	A 'gated reverb' sound created with the ULTRA-TAP program. Great for drums.	D/SE, H3500
599	RESONANT WORLD	STRING MODELER	This one is different. A long-lasting 'reverb' with bizarre resonances and echoes.	D/SE, H3500
600	REVERSE GATE	ULTRA-TAP	Another standard drum reverb.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
601	REVERB RAMP	SWEPT REVERB	A triggerable, sweeping reverb. It sweeps up the first time it is triggered and toggles from then on.	D/SE, H3500
602	SHIMMERISH	SWEPT REVERB	A recirculating delay effect that fades into a smooth reverb.	D/SE, H3500
603	TONAL ROOM	SWEPT REVERB	With pitched inputs, this reverb will actually generate many other tones. On drums, this is one of the biggest sounds you can get.	D/SE, H3500
604	UP/DOWN REVERB	MULTI-SHIFT	User selectable, rising or falling reverb-like effect.	D/SE, H3500
605	A MINOR CHORDS	DIATONIC SHIFT	Play or sing a solo line in A minor. The H3500 will generate two perfect 'in-key' harmonies.	D/SE, H3500
606	ARPEGGIOS	MULTI-SHIFT	Adds a fifth and an octave rhythmically, along with a short delay.	D/SE, H3500
607	BASS SHIFT	MULTI-SHIFT	A doubling effect intended for bass guitar. One channel is shifted up an octave. The other is slightly detuned.	D/SE, H3500
608	DEEPEN	PATCH FACTORY	Adds lower octave harmonics with a pitch shifter sweep.	D/SE, H3500
609	DIATONIC DANCE	DIATONIC SHIFT	You play a note and after half a second, you get a harmony. Use one note at a time, in an effect loop.	D/SE, H3500
610	DUAL SHIFT EASY	DUAL SHIFT	An easy-to-use program featuring two pitch shifters with function knobs set up, with pitch calibrated in semitones (1/2 steps).	D/SE, H3500
611	GLITCH SHIFT	DUAL SHIFT	A 'cheap' sounding pitch shifter. If glitches are what you want, here they are.	D/SE, H3500
612	GREGORIAN SHIFT	PATCH FACTORY	This program filters and pitch shifts input voices to produce a chorus of droning monks.	D/SE, H3500
613	H949	LAYERED SHIFT	This gives you what the H949 gave you. One output is a straight delay while other is pitch shifted. Both outputs are fed back to the input.	D/SE, H3500
614	HAMMER-ON 3RD	DUAL DIGIPLEX	You, too, can play like the flashiest guitarist, without the years of hard work and shredded fingers. Will take one note and arpeggiate it to sound like a familiar two-handed guitar technique.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
615	HAMMER-ON 5TH	DUAL DIGIPLEX	Similar to above but different intervals.	D/SE, H3500
616	HARMO-CHORUS	MULTI-SHIFT	A pitch shifter and chorus combined.	D/SE, H3500
617	IN SIX	MULTI-SHIFT	6/8 time is implied in this preset which adds a fourth down, a minor third up, and a minor sixth up.	D/SE, H3500
618	JUST 3RD & 5TH	DIATONIC SHIFT	A 'diatonic' pitch shifter that will generate just-intoned 3rds and 5ths above the input. Make sure to set the key properly.	D/SE, H3500
619	JUST 4TH & 6TH	DIATONIC SHIFT	Generates just-intoned 4ths and 6ths above the input.	D/SE, H3500
620	MUSIC SHIFT	STEREO SHIFT	This stereo, pitch shift program is optimized for shifting input program material.	D/SE, H3500
621	OCTAVE ECHOES	MULTI-SHIFT	Complex delays which are fed back and combined with a radically down-shifted signal.	D/SE, H3500
622	PITCHED ECHO	MULTI-SHIFT	Shows off one aspect of the MULTI-SHIFT algorithm's feedback setup. Long echoes come back shifted but the shorter delays don't.	D/SE, H3500
623	PITCH QUANTIZE	DIATONIC SHIFT	This program quantizes the input to the nearest chromatic interval.	D/SE, H3500
624	SUSPENSE	MULTI-SHIFT	Echoes are shifted to create suspenseful harmonies.	D/SE, H3500
625	THIRD & FIFTH	DIATONIC SHIFT	Generates an 'in-key' third and fifth above the input.	D/SE, H3500
626	THIRD & OCTAVE	DIATONIC SHIFT	This generates a diatonic third above and an octave below the input.	D/SE, H3500
627	TWELVE STRING	MULTI-SHIFT	Provides an octave down and a micro-pitch shift, simulating a twelve-string guitar.	D/SE, H3500
628	VIBRATO	MULTI-SHIFT	Instant vibrato at the press of a button.	D/SE, H3500
629	VOICE SHIFT	STEREO SHIFT	This STEREO SHIFT program is optimized for pitch shifting program material whose main content is spoken voice.	D/SE, H3500
630	ALIENS	REVERSE SHIFT	Transforms voice into a rough, alien-like sound.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
631	ANTI-AMBIENCE	REVERSE SHIFT	This is a reverb-like sound created from REVERSE SHIFT. Sounds great on guitar.	D/SE, H3500
632	AUTOPANNER	SWEPT COMBS	Produces automatic stereo (left->right) panning.	D/SE, H3500
633	AVANTE-GARDE	REVERSE SHIFT	A REVERSE SHIFT effect that generates descending, chromatic lines.	D/SE, H3500
634	BACKWARDS	REVERSE SHIFT	Turns the input around in one-second chunks.	D/SE, H3500
635	BAND PAN	BAND DELAY	Rhythmically, panned and delayed, with its own bandpass filter.	D/SE, H3500
636	BAND SLAP	BAND DELAY	A stereo, slap effect using two bands that are fed back. One band is tuned higher.	D/SE, H3500
637	BANDSWEEP RAND	BAND DELAY	A random-pitched set of bands that are delayed and pass from left to right in the stereo field.	D/SE, H3500
638	BAND SWEEP	BAND DELAY	Upward-sweeping bands passing from left to right.	D/SE, H3500
639	BIZARRE MONIZER	LAYERED SHIFT	Generates a bizarre, upward-sweeping pitch shift.	D/SE, H3500
640	CANNONS	REVERSE SHIFT	A unique, sweeping sound that's great on drums. Try playing a tom solo through this.	D/SE, H3500
641	CRITICAL BAND	PATCH FACTORY	A close approximation to Fletcher/Munson bandpass curves. Use to brighten signals or key compressors and gates to frequencies to which our ears are most sensitive.	D/SE, H3500
642	CRYSTAL ECHOES	MULTI-SHIFT	Words fail. A stairway of echoes reaching for heaven.	D/SE, H3500
643	DRUM PROCESSOR	SWEPT REVERB	This very different effect tends to make things that aren't drums sound like drums. Try adjusting the first four parameters for a variety of effects.	D/SE, H3500
644	FILTER PAN	PATCH FACTORY	A filter, sweep effect that seems to pan as it sweeps.	D/SE, H3500
645	FUTURE SHIFT	MULTI-SHIFT	A shimmering, orchestral effect. Try on swelling, monophonic synths or single-line voices.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
646	LIQUID REVERB	BAND DELAY	A reverb-like program with band delays whose filters sweep downward with increasing delay length.	D/SE, H3500
647	LOWPASS FILTERS	PATCH FACTORY	Two lowpass filters connected in series process the audio. Use cutoff 1 and 2 to control the rolloff frequencies. Use Q factor 1 and 2 to control the resonance of the filters.	D/SE, H3500
648	MAJOR WIND HARP	STRING MODELER	The first in a series of resonant, reverb-like programs. This program acts like sympathetically resonating strings tuned to a major scale.	D/SE, H3500
649	MODULATORS	MULTI-SHIFT	Remember that ring-modulated astronaut sound? Here it is, constructed from a pitch shifter that reverses little segments of the input.	D/SE, H3500
650	MODULATOR-VERB	MULTI-SHIFT	Similar to above with more reverb-like decay.	D/SE, H3500
651	OCTAVE FILTERS	BAND DELAY	Gurgling, upward-sweeping filter bands.	D/SE, H3500
652	PSYCHO-PANNER	SWEPT COMBS	This program swirls the input in pitch, pan and delay: (range) controls the range of delay and pitch sweep, (feedback) lower this to reduce the decay time, (pan rate) controls the panning and sweep speed, (mix) wet/dry effect mix.	D/SE, H3500
653	RESONANT MAJ7	STRING MODELER	Sets up sympathetic resonances that form a Major seventh chord.	D/SE, H3500
654	RESONANT PENT	STRING MODELER	Same as above, except resonances form pentatonic scale.	D/SE, H3500
655	REVERSERB	MULTI-SHIFT	A reverb-like effect made up of little, backward bits of the input signal. Try shortening the 'size' parameter to smooth it out a little.	D/SE, H3500
656	RUNTHRUMYMIND	BAND DELAY	An echo that bounces and changes timbre back and forth.	D/SE, H3500
657	SCARY MOVIE	REVERSE SHIFT	This program uses REVERSE SHIFT to create an evil-sounding voice. Use with guitar to create that tape splice, psychedelic sound.	D/SE, H3500
658	S/H PAN-A-DELAY	BAND DELAY	Very similar to RunThruMyMind but with different timbres.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
659	SLAP+WAH+MICRO	PATCH FACTORY	A slap delay, a sweeping wah-wah, and a microshift all from one program.	D/SE, H3500
660	SPACE CRICKETS	BAND DELAY	Circulating, up-sweeping band delays.	D/SE, H3500
661	STUTTER	STUTTER	Use this for that popular STUTTER sound.	D/SE, H3500
662	STUTTER RANDOM	STUTTER	Random stutters at your control.	D/SE, H3500
663	SWEEP DOWN	BAND DELAY	Rhythmically panned and delayed, with its own bandpass filter.	D/SE, H3500
664	SWEEP & REVERB	STRING MODELER	Sounds reverb-like until manually triggered, which causes a radical, mystical, up-and-down sweep.	D/SE, H3500
665	SWEEP UP/DOWN	BAND DELAY	Band Delays on left sweep up, band delays on right sweep down.	D/SE, H3500
666	SWEEP UP LINEAR	BAND DELAY	Rising band delays sweeping from right to left.	D/SE, H3500
667	SWEEP UP	BAND DELAY	Similar to above w/bands tuned one octave apart.	D/SE, H3500
668	TALKING GUITAR	VOCODER	Vocoder tailored for the guitar.	D/SE, H3500
669	TRIGGERED SCALE	STRING MODELER	Another sympathetic resonator program, except this one has a twist. Press the 'trigger' key to get a unique, harp-like strumming sound.	D/SE, H3500
670	TUBE CLONE	BAND DELAY	This is strictly meant for guitars. Play, with distortion, directly through the H3500 and this program will add a nice, crunchy EQ.	D/SE, H3500
671	TWO-BAND FILTER	PATCH FACTORY	Two general-purpose bandpass filters with tunable center frequency and filter Q.	D/SE, H3500
672	WAH WAH + MICRO	PATCH FACTORY	Combines a sweeping filter (wah-wah) with a micro-shift.	D/SE, H3500
673	WAH WAH	PATCH FACTORY	A basic, cyclical wah-wah sound using filters and a function generator.	D/SE, H3500
674	WAH-VERB	BAND DELAY	This sounds like a reverb with a wah-wah.	D/SE, H3500
675	A 440	PATCH FACTORY	Need a reference tuning tone? Here it is. You can mix in the sound you are tuning or fine adjust the pitch for slightly different tunings.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
676	GUITAR-ESQUE	STRING MODELER	Connect MIDI up and you have a mellow, guitar sound. The input signal will also affect the sound out.	D/SE, H3500
677	HVYMETAL CELLO	STRING MODELER	The string is briefly bowed and left to ring. The harder you hit the key, the longer the bowing. Feeding input sound will affect the timbre of the note.	D/SE, H3500
678	KEYBOARD	STRING MODELER	An adjustable keyboard sound where you can tailor the sound to your tastes. Also, try your pitch wheel and hit the same note a number of times.	D/SE, H3500
679	KOTO	STRING MODELER	By itself, a very delicate sound. Feed in some input, and the sound takes on all kinds of characters.	D/SE, H3500
680	LS BACH HARPSCD	STRING MODELER	Bright and crisp harpsichord.	D/SE, H3500
681	LS BOWED STRING	STRING MODELER	An airy, resonant noise.	D/SE, H3500
682	LS CLAVICHORD	STRING MODELER	This is a more classical clavichord sound than we're used to. Use pressure to bend the notes.	D/SE, H3500
683	LS FAR STRINGS	STRING MODELER	Your not-so-standard string section.	D/SE, H3500
684	LS HARP RESONS	STRING MODELER	A hollow, harp sound.	D/SE, H3500
685	LS HARPSICHORD	STRING MODELER	Like the Bach but fuller.	D/SE, H3500
686	LS HIT STRING	STRING MODELER	Crisp and full-struck strings.	D/SE, H3500
687	LS NOSTALGIA	STRING MODELER	This has that honky-tonk sound.	D/SE, H3500
688	LS PSEUDO PIANO	STRING MODELER	An almost piano.	D/SE, H3500
689	LS ZITHER	STRING MODELER	Plucked strings that are full and chorused. Hitting harder will change the timbre.	D/SE, H3500
690	ALICE-VERB	DENSE ROOM	This is a reverb. With each note you hit, you could have a different decay time. Also, the harder you hit, the less bright the reverb.	D/SE, H3500
691	DUAL GLIDEDELAY	DUAL DIGIPLEX	The delay lines are controlled by MIDI.	D/SE, H3500
692	FILTER SWEEPS	BAND DELAY	A recirculating sweep up is swept by the function generator.	D/SE, H3500
693	GLIDE DELAY	LONG DIGIPLEX	This is a mono version of Dual Glide Delay.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
694	MIDI 3 ON 2	DUAL DIGIPLEX	This preset will sync up its delay times to a MIDI drum machine or sequencer. The delays are in the familiar 3 on 2 pattern.	D/SE, H3500
695	MIDI PEDALSWEEP	SWEPT REVERB	The MIDI foot-pedal controller will manually sweep the delays in this program to generate a flange-like sound. The Modulation Wheel controls modulation of the delays.	D/SE, H3500
696	MIDIPLEX	LONG DIGIPLEX	Connect a MIDI drum machine or sequencer to this program and the delay will automatically be in time.	D/SE, H3500
697	MIDI BANDSWEEP	BAND DELAY	This program does process audio, but generates an interesting sweep when a MIDI note message is received.	D/SE, H3500
698	MODWHEEL REVERB	SWEPT REVERB	When connected to a MIDI keyboard, the Mod Wheel controls the decay time and the Pitch Wheel controls the delay (room size). Use this to easily generate dramatic reverb sweeps.	D/SE, H3500
699	ROCK 'N' ROLL	LAYERED SHIFT	This one's a bit different. Capture an audio loop by pressing the 'sustain' parameter. Play a note on a MIDI keyboard to hear the loop. Moving the Mod Wheel will alter the loop points (a bit like rocking tape reels).	D/SE, H3500
700	AIR	STEREO SHIFT	A long, subtle echo.	D/SX, D/SE, 35
701	A LYDIAN 6THS	DIATONIC SHIFT	Play solo lines using A Lydian modal scales. If you don't know what a modal scale is, play in the key of E major.	D/SX, D/SE, 35
702	A mi WATER WELL	DIATONIC SHIFT	Creates delayed harmonies in A minor.	D/SX, D/SE, 35
703	A MIXO AIR	DIATONIC SHIFT	A seventh and third that's way back in the mix. Play in A Mixolydian.	D/SX, D/SE, 35
704	ANGEL HAIR	STEREO SHIFT	Ascending-octave echoes.	D/SX, D/SE, 35
705	ARP	DUAL SHIFT	Arpeggio with major sixth and fourth.	D/SX, D/SE, 35
706	ARPEGGIATOR	DUAL SHIFT	Ascending-arpeggiated echoes.	D/SX, D/SE, 35
707	BELL ECHOES	LAYERED SHIFT	Slap echoes, first up a fifth, then unshifted.	D/SX, D/SE, 35
708	BIG & LONG	DUAL DIGIPLEX	Doubling on the left, a long delay on the right. Be sure to use both inputs.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
709	BIG ROOM CHORUS	SWEPT COMBS	A BIG, chorused-room sound.	D/SX, D/SE, 35
710	BIG GROUND	REVERSE SHIFT	A killer, atonal effect.	D/SX, D/SE, 35
711	BIG LIGHT ECHO	REVERSE SHIFT	A psychedelic, REVERSE SHIFT effect. You may see the light.	D/SX, D/SE, 35
712	BOUNCE VERB	ULTRA-TAP	A boingy reverb that's perfect for adding a real crunch to overdriven guitar.	D/SX, D/SE, 35
713	CHORUS 'N' ECHO	DUAL SHIFT	Chorus on both channels, echo on the right.	D/SX, D/SE, 35
714	CHORUS 'N' FLANGE	DUAL SHIFT	Chorus on the left, flange on the right. To get more 'flange,' turn up the right feedback.	D/SX, D/SE, 35
715	CLUSTER ECHO	DIATONIC SHIFT	A slap that comes back as a tone cluster.	D/SX, D/SE, 35
716	DEATHLESS ROOM	ULTRA-TAP	Even crunchier than Bounce-Verb.	D/SX, D/SE, 35
717	DELAY TO WASH	REVERB FACTORY	This repeating delay eventually fades into a reverb.	D/SX, D/SE, 35
718	ECHO BOUND	ULTRA-TAP	Left/Right echoes keep coming at you then stop.	D/SX, D/SE, 35
719	ENDLESS CAVE	ULTRA-TAP	A dense, cave-like reverb.	D/SX, D/SE, 35
720	EZCHORUS	LAYERED SHIFT	Instant, stereo guitar.	D/SX, D/SE, 35
721	FALLING FLANGER	LAYERED SHIFT	Flanger left, delay right.	D/SX, D/SE, 35
722	GREEN WRINGER	STEREO SHIFT	Turns your guitar into vegemite.	D/SX, D/SE, 35
723	HEAVEN	REVERSE SHIFT	Play anything into this. It will sound good.	D/SX, D/SE, 35
724	HELL	REVERSE SHIFT	An unearthly sound.	D/SX, D/SE, 35
725	HEXA CHORUS	SWEPT COMBS	Super-thick chorus.	D/SX, D/SE, 35
726	HEXA FLANGE	SWEPT COMBS	Super-thick flange.	D/SX, D/SE, 35
727	INSOMNIA	DUAL SHIFT	Descending, chromatic intervals. This one will keep you up.	D/SX, D/SE, 35
728	KICK BACK CHORUS	DUAL DIGIPLEX	A long delay that comes back in stereo.	D/SX, D/SE, 35
729	LOVE GUNPLAY IN C	DIATONIC SHIFT	If you like sevenths, you'll like this one.	D/SX, D/SE, 35
730	MINOR 7TH ECHOES	DIATONIC SHIFT	Backwards minor 3rd and 7th echoes. Sounds great if you play up high and dirty.	D/SX, D/SE, 35
731	MONDO CHORUS	DUAL SHIFT	A wide chorus that still keeps its punch.	D/SX, D/SE, 35

#	NAME	ALGORITHM	DESCRIPTION	UNIT
732	OCTAVE DISPLACE	LAYERED SHIFT	Delayed octaves, up and down.	D/SX, D/SE, 35
733	OCTAVE FRENZY	LAYERED SHIFT	Octaves with feedback.	D/SX, D/SE, 35
734	OUTDOOR ARENA	REVERSE SHIFT	Big stadium, backwards echoes.	D/SX, D/SE, 35
735	PARADITTLE	ULTRA-TAP	Diffused machine-gun echoes.	D/SX, D/SE, 35
736	REVERB-a-BOUND	ULTRA-TAP	Thick reverb with a long attack time.	D/SX, D/SE, 35
737	SLOPPY 5THS	STEREO SHIFT	Detuned fifths. Great for solos.	D/SX, D/SE, 35
738	SMALL Chorus ROOM	SWEPT COMBS	A small room with an intense chorus.	D/SX, D/SE, 35
739	SMALL DARK ROOM	REVERB FACTORY	A realistic, small-room reverb.	D/SX, D/SE, 35
740	SPACE CATS	SWEPT COMBS	This defies explanation.	D/SX, D/SE, 35
741	STUPID GUN	STEREO SHIFT	A dissonant pitch, sweep down.	D/SX, D/SE, 35
742	SYNTHISH	DUAL SHIFT	Distorted guitar in, synth out.	D/SX, D/SE, 35
743	TARUS BULBA Em	DIATONIC SHIFT	A fifth up, fourth down, in E minor.	D/SX, D/SE, 35
744	THE BLUBBA HOZE	LAYERED SHIFT	First a fourth down, then a fifth up.	D/SX, D/SE, 35
745	TIGHT CHORUS	STEREO SHIFT	A micro-shift that preserves stereo imaging.	D/SX, D/SE, 35
746	TRIPPLE SLAP	SWEPT COMBS	Three closely spaced echoes.	D/SX, D/SE, 35
747	TRIPPLE TREAT	DUAL DIGIPLEX	Two long echoes, plus the original, make three.	D/SX, D/SE, 35
750	ADR TAPE HISS	PATCH FACTORY	Provides hiss to use for matching edits between analog and digital sources.	H3500
751	BOING HIT	PATCH FACTORY	Sounds like a boing hit you know the show.	H3500
752	CIRCLES	ULTRA-TAP	Delays that sound like they sweep in circles.	H3500
753	DAY IN THE LIFE	SWEPT REVERB	Long, nightmarish reverb.	H3500
754	DRAGWAY AD	PATCH FACTORY	One-stop preset for those annoying ads.	H3500
755	FADE TO DREAM	LAYERED SHIFT	Gives illusion of drifting off into dream.	H3500
756	GIL'S ROOM	REVERB FACTORY	Smooth, roomy reverb. Sounds good to Gil.	H3500
757	GREGORIAN CHANT	PATCH FACTORY	Adds fifths to input ala Gregorian Monks.	H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
758	HOUSE VERB	SWEPT COMBS	Sounds like the echo in a new house without furniture.	H3500
759	JET FLY BY	PATCH FACTORY	Convincing stereo, jet plane.	H3500
760	LASER HIT	PATCH FACTORY	"Captain, I can't make the shields last much longer!"	H3500
761	MassiveStringTap	ULTRA-TAP	Delays set mondo-wide and big for strings.	H3500
762	MEGAPHONE	PATCH FACTORY	Come out with your hands up.	H3500
763	MovingVocalSprd	MULTI-SHIFT	Left output moves up nine cents, right moves down nine cents, with sine wave modulation.	H3500
764	PLUCK HIT	PATCH FACTORY	Hi-tech, plucking sound.	H3500
765	PULSING ROOM	DENSE ROOM	Long, warm verb.	H3500
766	RANDOM SHIFT	LAYERED SHIFT	Random-shifting thickener.	H3500
767	REVERSE DOGS	REVERSE SHIFT	Low octaves, howling backwards.	H3500
768	RIPPED WOOFER	PATCH FACTORY	Damn! Should have kicked in the subsonic filter for that jet sample!	H3500
769	SHIMMERISH	SWEPT REVERB	Ethereal sounding, verb-like effect.	H3500
770	STEREO COPTER	PATCH FACTORY	Stereo-sounding helicopter.	H3500
771	ST PETERS CATH	REVERB FACTORY	BEEEG reverb senior!	H3500
772	TELEPHONE	PATCH FACTORY	One-stop, telephone-voice sound.	H3500
773	THUNDER BOLT	PATCH FACTORY	Sounds like thunder.	H3500
774	TV/RADIO/JUKE	PATCH FACTORY	Sounds like box in the next room.	H3500
775	VOICE DISGUISER	SWEPT COMBS	Useful for covering identity of interviewee's voice for controversial/confidential radio or television appearances.	H3500
776	WalaWala	DUAL SHIFT	Conversation simulator three from one.	H3500
777	WARPED LP	STEREO SHIFT	Guess what this sounds like?	H3500
778	WINDSTORM	PATCH FACTORY	Bundle up before you load this preset.	H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
779	DIRECT BOX	PATCH FACTORY	Very clean, direct box. See manual for changing gain. Avoids analog to digital converters unless 'effect' is turned up. At unity gain, S/N is well over 100dB on Channel 1.	H3500
780	MEAN OCTAVES	PATCH FACTORY	Distortion with octave pitch shift.	H3500
781	PIGNOSY	PATCH FACTORY	A popular, little guy.	H3500
782	R & B PLUCK	PATCH FACTORY	Has that clean sound with flange and delay.	H3500
783	SCREAMER DELAY	PATCH FACTORY	Gritty distortion with delay.	H3500
784	SCREAMER uPITCH	PATCH FACTORY	Gritty distortion with added delay and harmony.	H3500
785	SILVERTONE II	PATCH FACTORY	That old beginner's sound.	H3500
786	ULTRALUX	PATCH FACTORY	Bright, rhythm sound.	H3500
793	CLONEVERB	REVERB FACTORY	Bright, medium room.	D/SE, H3500
794	LIKE ENOSE IN E	REVERB FACTORY	Resonating gated and echo in key of E.	D/SE, H3500
795	LONG & SMOOTH	REVERB FACTORY	Long, smooth, bright hall.	D/SE, H3500
796	MEAT LOCKER	REVERB FACTORY	Sounds like a meat-locker-sized space.	D/SE, H3500
797	MIDI 3 ON 2	DUAL DIGIPLEX	Delays scaled by MIDI clock period.	D/SE, H3500
798	MIDIPLEX	LONG DIGIPLEX	Single delay scaled by MIDI clock.	H3500
799	MULTI FLANGERS	SWEPT COMBS	Resonant set of flangers. Watch clipping.	D/SE, H3500
800	allpass detune	MOD FACTORY	Uses two detuners in series to give a unique, reverb-like chorus.	All Units
801	anti-duck feedback	MOD FACTORY	Dual delays that feedback only while audio is present.	All Units
802	awesome flange	MOD FACTORY	Two flangers in series give some super notches with pitch detuning on the output.	All Units
803	awesome knob	MOD FACTORY	The awesome flanger with manual control: (the knob) use this to manually sweep the flanger.	All Units

#	NAME	ALGORITHM	DESCRIPTION	UNIT
804	band compress	MOD FACTORY	A fixed 2:1 dual-band compressor.	All Units
805	band flip	MOD FACTORY	This patch splits the input signal into two bands, a high band and a low band. The output continuously crossfades between these two bands.	All Units
806	bandsplit delay	MOD FACTORY	Splits input signal into two bands and passes each band through a separate delay line. The low band goes to the left output channel and the high band to the right.	All Units
807	boing	MOD FACTORY	A strange, triggered, pitch mutilation.	All Units
808	bpm panner	MOD FACTORY	An autopanner with the pan rate controlled by the BPM setting.	All Units
809	bpm trips and qtr	MOD FACTORY	Beat-per-minute triplets on one side, quarter note on the other.	All Units
810	bpm trip pan	MOD FACTORY	Beat-per-minute triplets feeding an autopanner.	All Units
811	bpm x-fed duck	MOD FACTORY	Two ducked delays adjusted in beats-per-minute. The output of delay 1 feeds back into the input of delay 2 and vice-versa.	All Units
812	chorus/duck trm	MOD FACTORY	Detune chorus to the left and right and a ducked, tremolo delay in the center.	All Units
813	chorus/duck dly	MOD FACTORY	A detuned chorus and ducked delays.	All Units
814	chorus/pan dly	MOD FACTORY	Pitch detuning on the left and right with a dry, autopanned repeating delay.	All Units
815	chorus room	MOD FACTORY	A reverb-like chorus.	All Units
816	compress 2:1	MOD FACTORY	A fixed 2:1 compressor. Use env1 parameters to control the compressor.	All Units
817	detuned space	MOD FACTORY	Detuners arranged to give a small-room sound.	All Units
818	detune darkly	MOD FACTORY	Detuning with control over high-frequency rolloff.	All Units
819	dual long delay	MOD FACTORY	Two independent delay loops. Use delay controls to change delay and feedback.	All Units

#	NAME	ALGORITHM	DESCRIPTION	UNIT
820	dual duck delay	MOD FACTORY	Two independent delay loops with gain ducking. Use delay controls to change delay and feedback. Use envelope controls to adjust gain ducking.	All Units
821	dual panners	MOD FACTORY	Two independent autopanners.	All Units
822	dual tremolo	MOD FACTORY	Two tremolos, with delays.	All Units
823	ducked 'verb	MOD FACTORY	A chorused, reverb-like effect that ducks with the input.	All Units
824	dynamic feedback	MOD FACTORY	Dual delay loops with lowpass filters in the feedback loop. The filter frequencies are modulated by the input envelope to give a downward sweep to the feedback.	All Units
825	dynamic flange	MOD FACTORY	The input level controls the amount of feedback in this two-voice flanger. Higher input levels give a more resonant flange.	All Units
826	dynamic tremolo	MOD FACTORY	Tremolo, with the rate controlled by the input level. The output is detuned to give a stereo, chorus effect.	All Units
827	envelope detune	MOD FACTORY	A stereo detuner with dynamic control of the detune amount. Greater input levels increase or decrease the amount detuning.	All Units
828	envelope filter	MOD FACTORY	That classic, funky sound. This uses both filter 1 and 2. Use env1 attack and env1 decay times to control the envelope response.	All Units
829	envelope flange	MOD FACTORY	A two-voice flanger with the envelope sweeping the delay.	All Units
830	env filter/slap	MOD FACTORY	Envelope filter into a slap delay.	All Units
831	env filter/verb	MOD FACTORY	Envelope filter into a cheap reverb.	All Units
832	envelope pan	MOD FACTORY	Pan position varies with input signal level. Higher levels are panned left and lower levels are panned right. Use env 1 controls to set attack and decay times.	All Units
833	ethereal	MOD FACTORY	A very watery, haunting reverb.	All Units
834	ethereal logic	MOD FACTORY	The ethereal reverb modulated with a square wave.	All Units
835	etherpan	MOD FACTORY	The ethereal reverb followed by an autopanner.	All Units

#	NAME	ALGORITHM	DESCRIPTION	UNIT
836	ethertrem	MOD FACTORY	The ethereal reverb feeding a tremolo.	All Units
837	exponential	MOD FACTORY	Four chorused, delay taps with exponential spacing. Use BPM to set the amount of delay.	All Units
838	filter sweep	MOD FACTORY	A funky, triggered, filter sweep. The input signal triggers the sweep. To set the trigger level, adjust LFO 1 threshold.	All Units
839	flange pan	MOD FACTORY	Dual autopanners with delay modulation.	All Units
840	flutter	MOD FACTORY	A more intense, dynamic tremolo.	All Units
841	funky squares	MOD FACTORY	A pair of highly resonant, square-wave, modulated filters.	All Units
842	fuzz/chorus	MOD FACTORY	A fuzz box feeding a detuned chorus. The detune is right and left, with dry distortion in the center.	All Units
843	fuzz/clean chrs	MOD FACTORY	Fuzz in the center with a clean-pitch detune left and right.	All Units
844	fuzz/eq/comp	MOD FACTORY	A 21 compressor precedes the distortion. Also has two bands of eq and independent left/right channel delays. Adjust filter 1 and 2 to control eq.	All Units
845	fuzz/eq/rotary	MOD FACTORY	Fuzz into a rotating speaker simulation.	All Units
846	fuzz/eq/tremolo	MOD FACTORY	Fuzz into a tremolo.	All Units
847	fuzz-head	MOD FACTORY	Super, high-gain fuzz with resonant overtones.	All Units
848	gated ghost	MOD FACTORY	The ethereal reverb followed by a noise gate. Use the envelope follower parameters to adjust the gate.	All Units
849	gated multitap	MOD FACTORY	A chorused, multi-tap delay followed by a noise gate.	All Units
850	haas panner	MOD FACTORY	An autopanner that varies the delay to the left and right channels to enhance the realism of the panning effect.	All Units
851	Haas pan/manual	MOD FACTORY	A manual panner that varies the delay to the left and right channels to enhance the realism of the panning effect.	All Units

#	NAME	ALGORITHM	DESCRIPTION	UNIT
852	hi->efx lo->noefx	MOD FACTORY	A frequency-dependent gate that lets the high notes into a chorus delay effect. Use cutoff1 and cutoff2 to adjust the crossover point.	All Units
853	high->lft low->rt	MOD FACTORY	A frequency-dependent gate that steers the high notes to the left channel and the low notes to the right channel. Use cutoff1 and cutoff2 to adjust the crossover point.	All Units
854	knob zippers	MOD FACTORY	Use the knob to control delay time, giving a zipper effect.	All Units
855	manual flange	MOD FACTORY	Use the knob to flange. This is a subtle version, try "awesome knob" (#803) or "rich flange/man" (#872) for more intense flanging.	All Units
856	midi efx rack	MOD FACTORY	This is set up to use with a MIDI controller like the MIDI mitigator. Each parameter of this patch is assigned to a different MIDI controller. This patch gives you a pair of ducked, BPM delays in parallel with a pitch-detuning chorus.	All Units
858	overdub loop	MOD FACTORY	A long loop with delay modulation that overdubs without overload. Use delay 1 to control the length of the loop.	All Units
859	overdub/detune	MOD FACTORY	An overdubbing loop like above, except with detuning on the left and right outputs. The dry loop output is panned center. Also, this patch has BPM control over the loop length.	All Units
860	overdub/tremolo	MOD FACTORY	An overdubbing loop with chorus and tremolo. BPM controls the loop length. The chorus is panned left and right. The tremolo is panned center.	All Units
861	overdub dual	MOD FACTORY	Dual overdubbing delay loops with knob modulation of the delay times.	All Units
862	panning bands	MOD FACTORY	Dual autopanners fed by fixed bandpass filters. Use filter 1 and 2 parameters to adjust the characteristics of the bands.	All Units
863	panning delays	MOD FACTORY	Dual delays, each with its own autopanner.	All Units
864	panning detune	MOD FACTORY	An autopanner with the left and right channels detuned.	All Units
865	pan into delays	MOD FACTORY	An autopanner that feeds a cross-fed pair of delays.	All Units

#	NAME	ALGORITHM	DESCRIPTION	UNIT
866	panner	MOD FACTORY	Autopan using a frequency-modulated oscillator.	All Units
867	pan squarely	MOD FACTORY	Autopan with a square-wave oscillator.	All Units
868	ping-pong	MOD FACTORY	A ping-pong delay with controllable high cut.	All Units
869	ping-pong duck	MOD FACTORY	Like above, with ducking on the delays. Use envelope controls to adjust ducking parameters.	All Units
870	quivering echo	MOD FACTORY	A uniquely modulated delay. Use BPM to adjust delays and modulation.	All Units
871	rich flange	MOD FACTORY	A flanger built with two delays and cross-coupled feedback.	All Units
872	rich flange/man	MOD FACTORY	The same flanger as above, but this one has manual control.	All Units
873	rich rhythm	MOD FACTORY	A very diffuse, chorused pair of repeating delays. Use BPM to set the tempo.	All Units
874	sine flange	MOD FACTORY	A very smooth flange that uses a sine wave to sweep the delays.	All Units
875	slap center	MOD FACTORY	Detuned chorus on left and right with a dry slap in the middle.	All Units
876	slide into tune	MOD FACTORY	The input envelope bends the pitch upward. Use envelope controls to vary the dynamics of the pitch bend.	All Units
877	speaker spinner	MOD FACTORY	A rotating speaker simulation. Even takes time to come up to speed.	All Units
878	square chorus	MOD FACTORY	Pitch, detuning modulated by a square wave.	All Units
879	stereo detune	MOD FACTORY	Splits stereo signal into L+R and L-R. In addition to controlling the balance of L+R and L-R, L+R can be detuned.	All Units
880	stereo enhance	MOD FACTORY	This patch plays around with the L-R component of a stereo mix. Delay and EQ of the L-R signal are controllable with softknobs.	All Units
881	stereo widen	MOD FACTORY	Adds delay to L+R to give wider center image.	All Units

#	NAME	ALGORITHM	DESCRIPTION	UNIT
882	strange loop	MOD FACTORY	Output switches between two different delay loops, giving an interesting, rhythmic effect.	All Units
883	swell	MOD FACTORY	A gain swell triggered by the audio input. Use thresh1 to adjust the trigger threshold.	All Units
884	swell reverb	MOD FACTORY	The ethereal reverb modulated by a triggered, amplitude swell.	All Units
885	swell taps	MOD FACTORY	A multi-tap delay gated with a triggered LFO. Use LFO thresh to adjust trigger threshold.	All Units
886	throaty	MOD FACTORY	An envelope flanger based on the awesome flanger.	All Units
887	tremolo	MOD FACTORY	A stereo tremolo with independent left/right delay control. Use delay 1 and delay 2 parameters to set delays.	All Units
888	triggered air	MOD FACTORY	A rich, chorused reverb whose output is gated by a triggered LFO. The left input triggers the swell. Use thresh1 to set the trigger threshold.	All Units
889	triggered flange	MOD FACTORY	Audio input triggers flange sweep. Thresh1 adjusts the trigger threshold.	All Units
890	triggered pan	MOD FACTORY	Audio input alternately triggers a pan to the left, then to the right. Thresh1 controls the trigger threshold.	All Units
891	trig pan r->l->r	MOD FACTORY	Audio trigger pans right to left to right. Thresh1 controls the trigger threshold.	All Units
892	true flange	MOD FACTORY	Thru-zero flanging. This uses two delays to get flanging that actually passes through zero delay.	All Units
893	undulator	MOD FACTORY	Tremolo on top of a multi-tap delay.	All Units
894	vibrato	MOD FACTORY	Vibrato with controllable delay.	All Units
895	whaaat-a-panner	MOD FACTORY	Two bands that pan and change cutoff frequency.	All Units
896	whoopie	MOD FACTORY	Very strange envelope-modulated noises.	All Units
897	wide tremolo	MOD FACTORY	Tremolo with different delay on left and right gives a nice, stereo effect.	All Units
898	wilting phrase	MOD FACTORY	After a phrase is played, the pitch drops.	All Units

#	NAME	ALGORITHM	DESCRIPTION	UNIT
899	x-coupled ducks	MOD FACTORY	Two ducked delays with cross-coupled feedback.	All Units
975	MULTI DOUBLER	SWEPT COMBS	Flangy thickener. Try on background vox.	D/SE, H3500
976	MUTRUM	PATCH FACTORY	Garbly, alien sound.	D/SE, H3500
977	HIGH SWELLS	REVERSE SHIFT	High shimmer for synth pads.	D/SE, H3500
978	NewBrightChambr	DENSE ROOM	Medium-large, bright chamber.	D/SE, H3500
979	SmallEmptyClub	DENSE ROOM	Tiny, empty club you worked at last week.	D/SE, H3500
980	PAPER PLATE	REVERB FACTORY	Small, thin-plate reverb.	D/SE, H3500
981	OTHERS MONO DLY	LAYERED SHIFT	Basic delay with feedback.	D/SE, H3500
982	007 PHASE GUN	PHASER	Sci-fi, fun gun.	D/SE, H3500
983	PHASER GTR	PHASER	General-purpose PHASER. Try on Guitar.	D/SE, H3500
984	ROEYs PHASOLOGY	PHASER	Deep and slow, is the way to go.	D/SE, H3500
985	USEFUL VERB 2	REVERB FACTORY	Generic reverb, medium well.	D/SE, H3500
986	POOBLICE ON 9	LAYERED SHIFT	Degitched, hi-end sound, L+12, R-11.	D/SE, H3500
987	R & B DIRTSKI*	PATCH FACTORY	Nice thickener for guitars. Distorted ambience.	D/SX, D/SE, 35
988	REAL CHORUS 2	MULTI-SHIFT	Randomized doubler. Smaller than preset #528.	D/SX, D/SE, 35
989	ResonateInEnozE	SWEPT COMBS	Verby at first, then more tuned delay-like.	D/SE, H3500
990	ROBO DRUM	PATCH FACTORY	Adds cylon ambience to percussives.	D/SE, H3500
991	AIR SHAMIR	DENSE ROOM	Tight, lil' thang.	D/SE, H3500
992	ONVELOPE FILTER	PHASER	Long, cool sweep. Cool on bassy things.	D/SE, H3500
993	UK STYLE VERB	REVERB FACTORY	It's Brit-ish, mate.	D/SE, H3500
994	SHO IZ TITE VRB	REVERB FACTORY	Tight, gated reverb. Bright.	D/SE, H3500
995	SMALL & LIVE VERB	REVERB FACTORY	Funny, gated, little verb. Ha Ha.	D/SE, H3500

#	NAME	ALGORITHM	DESCRIPTION	UNIT
996	SNARE SLAP	PATCH FACTORY	Poppy, delayed effect.	D/SE, H3500
997	STRING MODLER#9	STRING MODELER	Droning sounds in the background.	D/SE, H3500
998	TALKIN BUM	PATCH FACTORY	Sounds like bums sayin 'walla, walla.'	D/SE, H3500
999	THUNDER TOMS	PATCH FACTORY	One-of-a-kind, falling ambience for toms.	D/SE, H3500