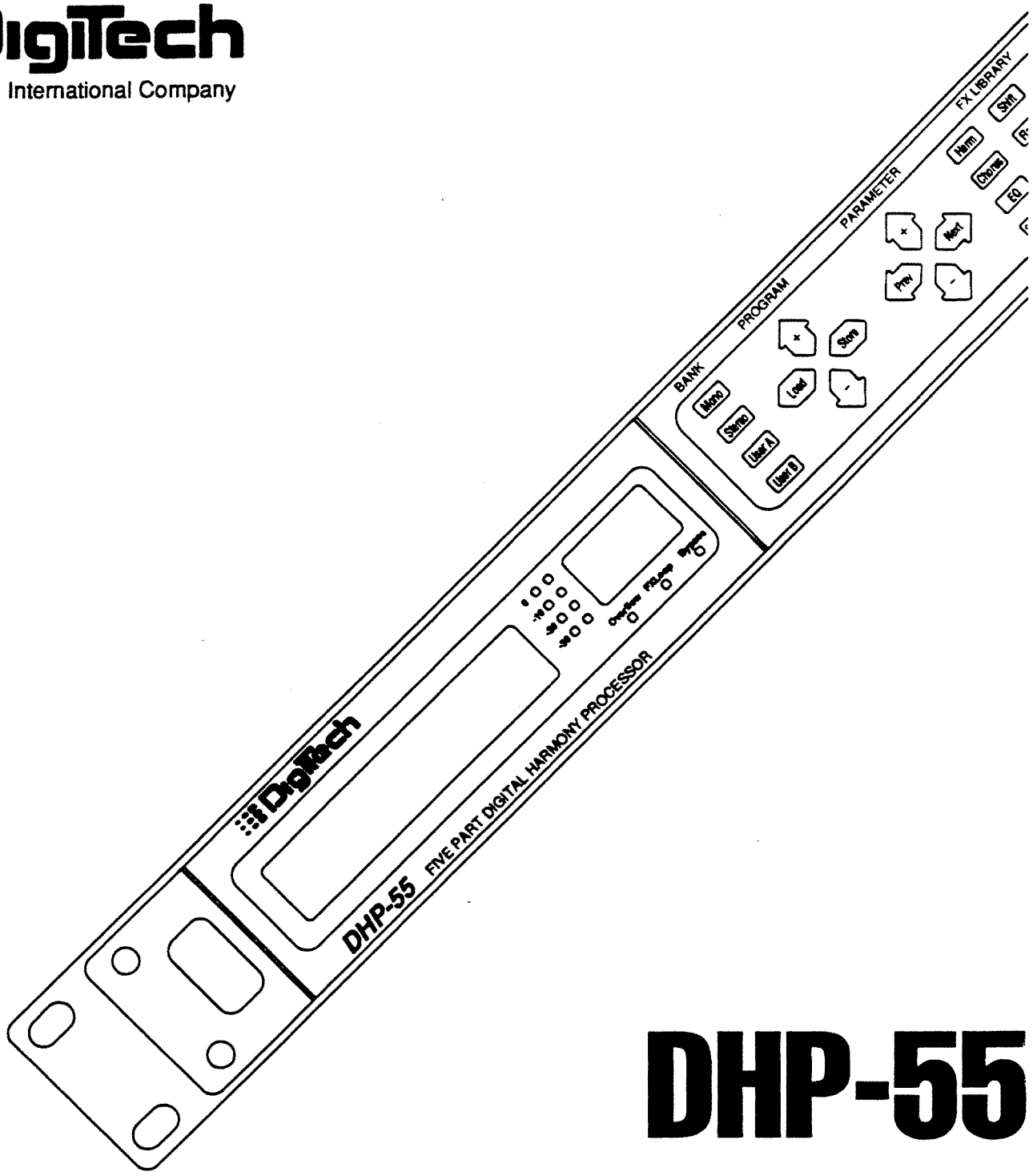
DigiTech

A Harman International Company



DHP-55

Five Part Digital Harmony Processor

Owner's Manual

Section 3 -The DHP-55 Effects Guide

Power and Grounding Information:

Line Conditioning - The DHP-55 is equipped with a three-prong, grounded power cord for your protection. Do not cut off the ground prong of the plug, and do not use an adapter or extension cord to plug the unit into a two prong outlet unless the adapter or extension cord is properly grounded.

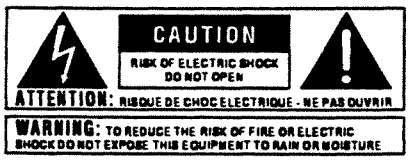
The DHP-55, like any piece of computer hardware, is sensitive to voltage drops, spikes, and surges: Interference such as lightning or power "brownouts" can erase your program memory, or even permanently damage the circuitry inside the unit. Here are two solutions to help protect your DHP-55 from such a fate:

- **Turn it off:** Make a habit of turning off all of your gear when it is not in use. If there is a lightning or severe windstorm, unplug all of your equipment: A surge from a nearby lightning strike or downed power line can destroy electronic equipment even if the switch is off.

- **Spike/Surge Protectors:** This is an inexpensive solution to all but the severest of AC line conditions. Surge protected power strips usually only slightly more expensive than unprotected strips, and higher quality multi-stage surge suppressors usually start under $50, making them a worthy investment for protection of all your valuable electronic equipment.

- **AC Line Conditioners:** This is the best (albeit the more expensive) way to protect your DHP-55 from line voltage fluctuations. Line conditioners constantly monitor the incoming voltage for excessive peaks and dips and make adjustments accordingly, delivering consistent power levels. For expensive equipment, AC line conditioners are highly recommended.

Safety Precautions



The symbols shown at left are internationally accepted symbols that warn of potential hazards with electrical products. The lightning flash with arrow point in an equilateral triangle means that there are dangerous voltages present within the unit. The exclamation point in an equilateral triangle indicates that it is necessary for users to refer to the owner's manual.

These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.

Lithium Battery Warning

CAUTION!
This product contains a lithium battery. There is danger of explosion if battery is incorrectly replaced. Replace only with an Eveready CR 2032 or equivalent. Make sure the battery is installed with the correct polarity. Discard used batteries according to manufacturer's instructions.
ADVARSEL!
Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.
ADVARSEL!
Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri av samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.
VAROITUS!
Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.
VARNING!
Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

Section 1 - Startup

Introduction

Congratulations and thank you for purchasing the DHP-55 Five-Part Digital Harmony Processor. DigiTech has built a reputation for innovation in intelligent harmony processors, and the DHP-55 is at the leading edge of this technology. Prepare yourself for features and sound quality that will open up new dimensions of sound to you! This manual provides detailed information on connecting the DHP-55, basic operations and a guide to its effects.

The DHP-55 is an intelligent harmony processor designed specifically for musical instruments. It is capable of up to five voice intelligent pitch shifted harmony and two voice polyphonic (chord) shifted harmony - a unique sound and another technological first. More than 10 additional appropriate effects are included to enhance the flexibility and usefulness of the DHP-55. Its functions are designed for both studio and live performance use.

At the heart of the DHP-55 are two DSP (Digital Signal Processor) chips. These two DSP's facilitate the intelligent harmony processing and other complementary effects. Each of the two processors has been configured to specialize in a certain group of effects.

About this Manual

There are six basic operating modes available on the DHP-55:

- Performance, where programs are loaded and played
- Tuner, where you can tune your instrument and the DHP-55
- Edit, where user programs are edited, copied and stored
- Name, where user programs are named
- Utility, were system parameters are set
- MIDI, where MIDI parameters are set

This manual will take you through each of these modes in detail, so please read it carefully. It is best if you try the functions out on your DHP-55 as you read the manual. After your first audition of its features, spend some time experimenting to really get a grasp on some of the deeper powers of the unit; this will allow you to enhance your music in ways you haven't yet thought possible. Good luck, and thank you again for choosing DigiTech.

Connecting the Audio

Since the DHP-55 can process both mono and stereo signals, you have the following input options:

- one mono input (right input on rear panel)
- stereo left and right inputs

Connect your instrument's output to the INPUT jack(s) on the rear panel of the unit. Either balanced (tip-ring-sleeve) or unbalanced (tip-sleeve) cables may be used.

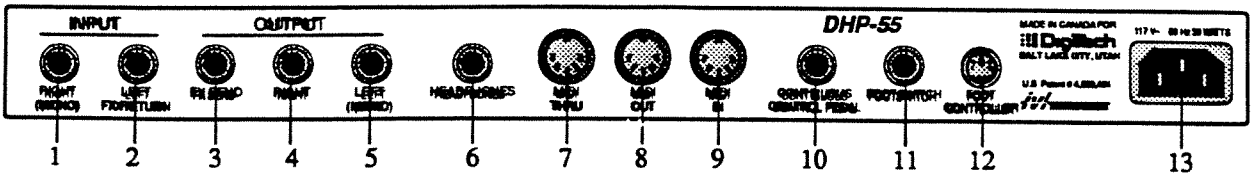
You have two options regarding the output of the DHP-55: you can make it mono by connecting the LEFT OUTPUT jack to the mono input of your amplifier, or leave it stereo by connecting both the LEFT and RIGHT OUTPUT jack(s) to the input jack(s) of your amplifier or mixer. If you are using stereo headphones to monitor the DHP-55's output, plug your headphone's 1/4" plug into the HEADPHONES jack on the rear panel of the unit.

Make sure that the FX Loop is disabled (the FX Loop LED should not be illuminated). If the FX Loop is enabled, turn it off by pressing the FXLoop key once.

Adjusting Signal Levels

- Set your instrument to its loudest playing level
- Set your amplifier for a clean sound
- Set your amplifier's tone controls flat (to a neutral position)
- Turn your amplifier's output down to zero
- Begin playing your instrument and adjust the DHP-55's front panel INPUT Level knob(s) until the red Input LED comes on occasionally
- Set the front panel Left output and Right output level knobs to the 12 o'clock position
- Turn up your amplifier to the desired volume

The Rear Panel



1) **Input: Right (mono)** - The mono and stereo right input jack

2) **Input: Left / FX Return** - The left stereo input and also the effects return jack for the external effects loop for mono inputs.

3) **Output: FX Send** - The effects send jack for the external effects loop.

4) **Output: Right** - The right stereo output.

5) **Output: Left (mono)** - The left stereo output; also used for mono output .

6) **Headphones** - Stereo jack for headphone monitoring.

7) **MIDI Thru** - Any MIDI data received at the MIDI in port is sent directly through the unit and out of this jack: use it to "daisy-chain" the DHP-55 with other MIDI devices.

8) **MIDI Out** - All DHP-55 generated MIDI data such as program dumps and continuous controller messages are sent out of this jack: use it to copy user programs to other DHP-55s and data filing devices such as computers & musical sequencers.

9) **MIDI In** - MIDI input jack; all MIDI controlling messages for the DHP-55 must enter the unit here from other MIDI devices.

10) **Continuous Control Pedal** - Jack for a standard volume pedal controller or control voltage pedal.

11) **Footswitch** - Jack for an optional FS300 footswitch.

12) **Foot Controller** - Controller plug for footswitch option.

13) **AC Line Input** - The power cord receptacle.

Connecting the Controllers

There are two optional controllers you may use with your DHP-55, the DigiTech FS300 footswitch and a standard volume pedal. The FS300 connects to the Footswitch jack, and the volume or control voltage pedal connects to the Continuous Control Pedal jack; both jacks are on the rear panel of the DHP-55.

For MIDI control of your DHP-55, connect the MIDI output of your system to the MIDI In jack on the rear panel.

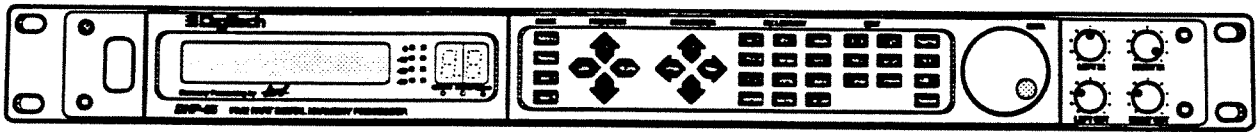
Auditioning the Programs

Select a Bank of programsby pressing the Mono or Stereo Bank selector keys on the front panel of the DHP-55. Select a Program by pressing the Program <+> and Program <–> keys or by turning the Data wheel. To hear the selected Program's effect on your sound, press the <LOAD> key (if you prefer to have Programs automatically loaded without the <LOAD> keybetween programs, you'll want to change the Utility AutoLoad setting so that the DHP-55 automatically loads each program you scroll to. To change the Utility AutoLoad setting, the procedure is as follows:

- Press the Utility key on the front panel of the DHP-55.
- Press the PARAMETER Next key once to access the autoload presets menu.
- Press the PARAMETER + key to set this parameter to "ON".
- Press the Exit key to return to your playing.

All of the programs in the User A and User B banks are programmable, and you can modify and store them as you like. The programs in the Mono and Stereo Banks are stored permanently in your DHP-55's memory: you cannot change or erase them, so they will always be available for your use.

The Front Panel



1) **Power switch** - Turns the DHP-55 on and off.
2) **20 x 2 Character back-lit LCD** - Main display for performance, program and utility editing
3) **Left & Right Input LEDs** - Stereo input level indicators: the red LED(s) illuminate when the input signal is 3dB short of clipping.
4) **2 digit LED program # display** - Displays currently selected program number.
5) **Overflow Indicator** - Lights when the FX Library Effects are overloaded.
6) **FxLoop Indicator** - Lights when the external effects loop is enabled.
7) **Bypass Indicator** - Lights when the Bypass feature is in use.

8) **BANK selector Keypad** - The DHP-55 is equipped with 4 banks of programs, which are accessed with these keys. Each program bank contains specific programs: The Mono and Stereo banks contain the uneditable Factory Preset programs designed for mono and stereo output instruments, while the User A and User B banks are editable versions of the Mono and Stereo bank programs.

9) **Program Keypad** - Programs are selected, loaded, copied and saved with these keys. Programs are selected with the Program <+> and Program <-> keys, and then loaded and saved with the Load and Store keys.

10) **Parameter Keypad** - All parameter editing is performed with these keys: parameters are selected (made to flash in the display) with the Parameter <NEXT> and Parameter <PREV> keys, while their values are changed with the Parameter <+> and Parameter <-> keys.

11) **FX LIBRARY Keypad** - 12 keys allowing you to "jump" directly to the editing menu of the effect printed on the key. These keys "jump" you to the location of an effect within the current program's effect chain (its Configuration). For example, when the Harm key is pressed, the current program's Harmony effect (if there is one) is selected, and you are "jumped" to its location in the current program's configuration (on the LCD).

12) **EDIT Keypad** - These keys are used to access the various parameters in each effect: The Edit key accesses the normal parameters, the Mix key accesses the Mixer parameters and the Mod key accesses the Modulation parameters of the currently selected effect. The Tuner and Compare features are turned on and off via the <TUNER> and <CMPARE> keys.

13) **System Keypad** - The Name key allows you to change the current program name, the Bypass key bypasses the unit, and the Utility and MIDI keys access the Utility and MIDI menus.

14) **DATA Wheel** - The DATA wheel is useful for program selection and parameter editing: It may be used wherever you would use the Program + and Program <-> or Parameter + and Parameter <-> keys.

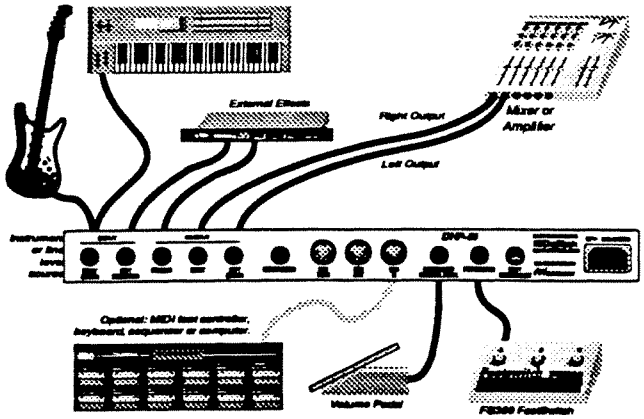
15) **INPUT & OUTPUT controls** - Controls the input, external effects return, and stereo output levels.

> **NOTE:** In stereo input mode, the left and right input LED indicators show the left and right input levels. In mono input mode, the right meter shows the right (mono) input signal level while the left LED meter shows the compressed and gated signal level (or the FX Loop Return signal level, depending on whether the FX Loop is engaged or not).

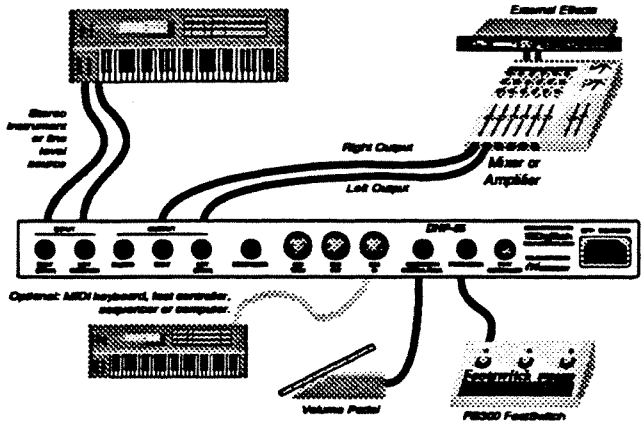
MIDI and Audio Routing

Following are several diagrams showing possible MIDI and audio routing setups using the DHP-55:

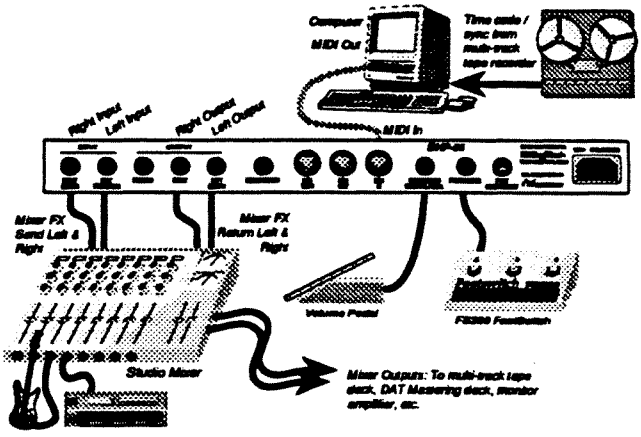
Stage / Live setup:
Use the Left output for mono, or both Left and Right outputs for stereo. You can either run the outputs to your mixer, or directly to one or two amplifiers. Your favorite effects device can be run from the DHP-55 FX Send and FX Receive jacks.



Stereo Setup:
For stereo input / output. Note that the DHP-55's external FX Send and Receive are not connected when using stereo inputs.

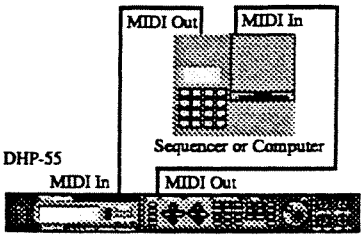


Recording Studio Setup:
Using the DHP-55 on the effects or auxiliary send and receive loops of your mixer.

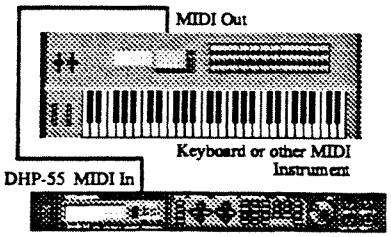


In all three examples, the DHP-55's Programs and Parameters can be controlled via MIDI from computers, sequencers, foot controllers and keyboards.

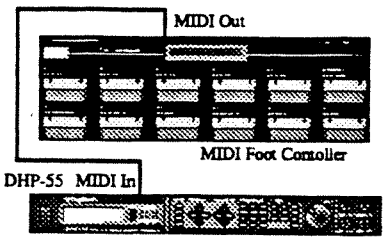
MIDI Routings



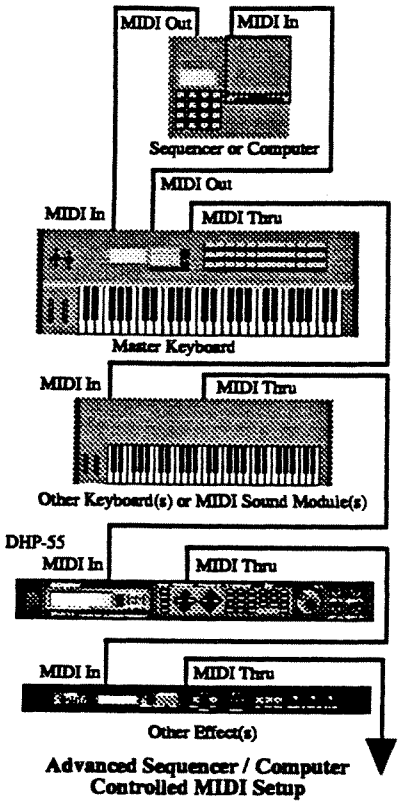
Basic Sequencer / Computer Controlled MIDI Setup



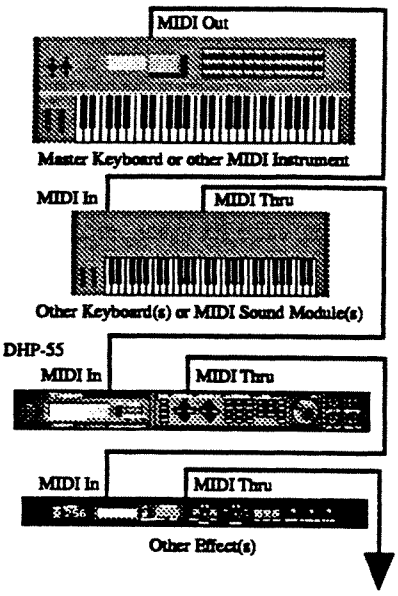
Basic Keyboard / MIDI Instrument Controlled MIDI Setup



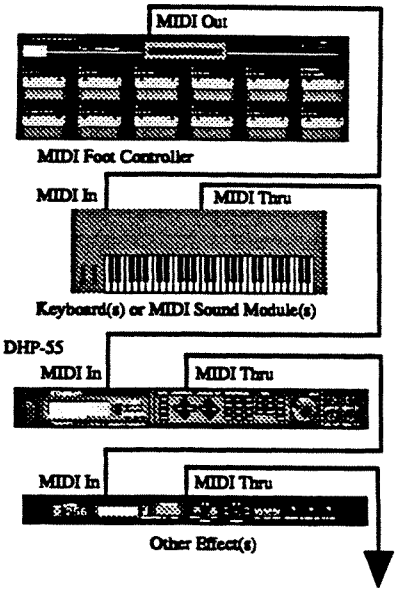
Basic MIDI Foot Controller MIDI Setup



Advanced Sequencer / Computer Controlled MIDI Setup



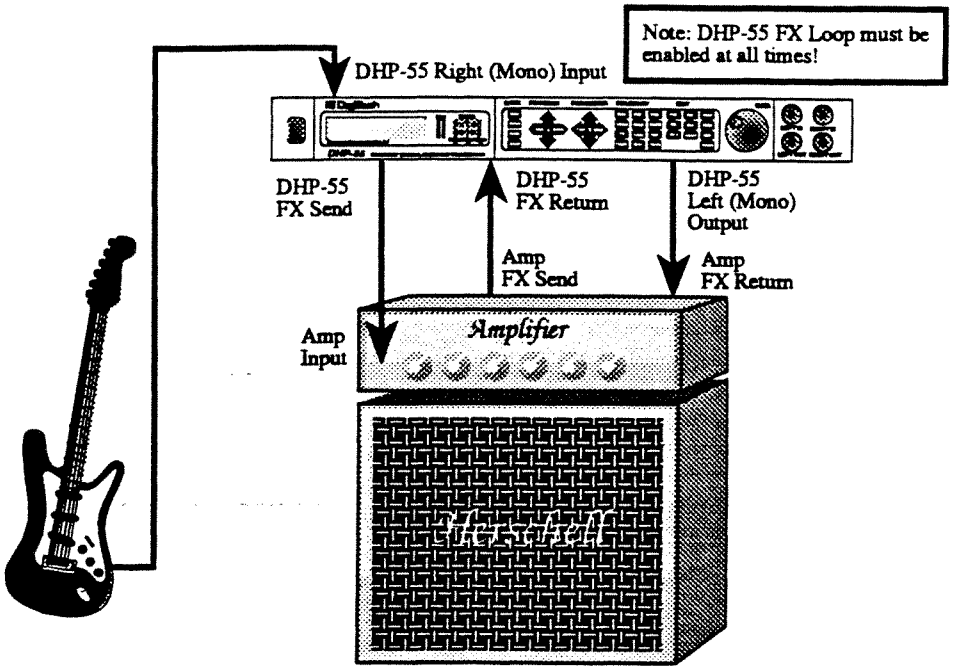
Advanced Keyboard / MIDI Instrument Controlled MIDI Setup



Advanced MIDI Foot Controller MIDI Setup

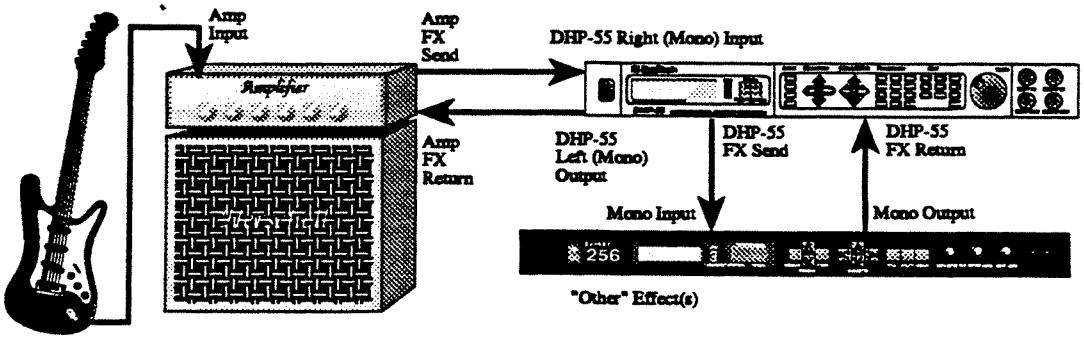
The following diagrams detail some of the ways to set up the DHP-55 for performance and studio use with guitar amps.

BEST SETUP FOR AMPLIFIERS WITH FX SEND AND RETURN JACKS:



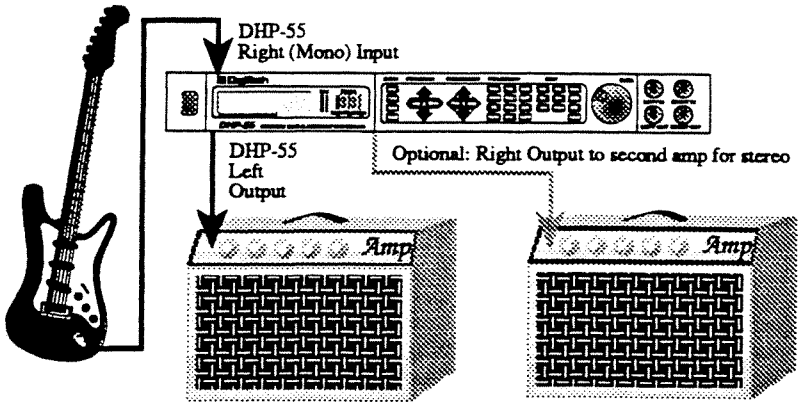
This is the best setup for guitarists who wish to take full advantage of their guitar amplifier's pre-amp section: The DHP-55 is given a dry undistorted guitar signal for pitch analysis purposes, while all of the amplifier's tone controls and built-in effects can retain their normal functionality. This setup requires that your amplifier has its own effects loop, and that you use the DHP-55 in mono input mode.

AMPLIFIER WITH EFFECTS LOOP SETUP



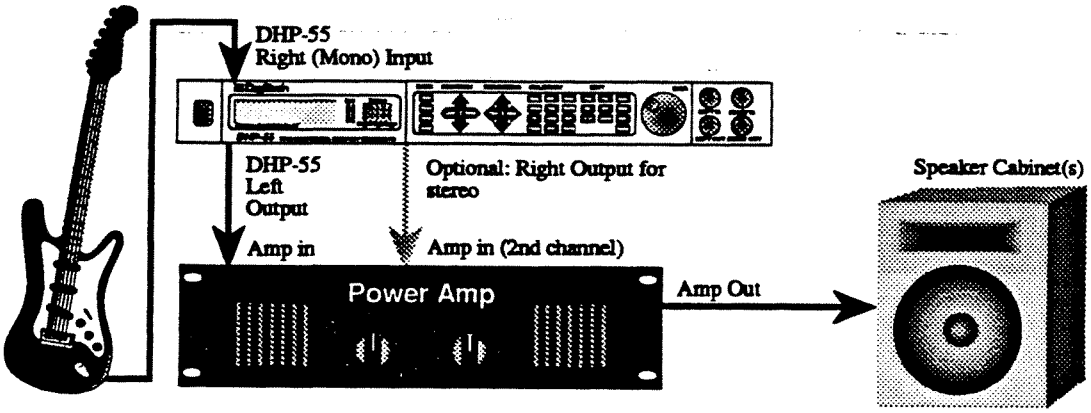
This setup is not as foolproof as the "best" setup on the previous page, since it requires that your amplifier's effects loop be *pre-distortion*;this is because a distorted signal passed to the DHP-55 input jack will result in very unreliable pitch shifting. On the positive side, this setup offers the option of "ganging" multiple effects units through the DHP-55 FX Loop. Check your amplifier owner's manual for details of its effects loop before using this setup.

AMPLIFIER WITHOUT EFFECTS LOOP SETUP



If an effects loop is not available on your guitar amplifier, this setup will give you maximum control over your sound: the DHP-55 acts as a pre-amp, processing and harmonizing your guitar signal before it goes through the amplifier.

POWER AMPLIFIER AND SPEAKER SETUP



This setup is appropriate for guitar users without dedicated guitar amplifiers. The DHP-55 takes a dry, undistorted signal, harmonizes and processes it, and then passes it to a mono or stereo sound reinforcement system.

The DHP-55 Operating System

When the first digital music devices were released, musicians were forced to learn computer terms such as *RAM*, *Byte*, and *Parameter* in order to use them properly. If you already know what an operating system is, skip ahead to the next section. If you're not sure what an operating system is, and how it relates to your DHP–55, then read on!

All digital devices are computers inside: rack effects devices, synthesizers, VCRs and microwave ovens are all examples of innocent-looking devices that are actually computers. Any digital device's *Operating System* is a built-in collection of programs that define what it does, and how it is controlled. The quality of a device's operating system is the difference between a powerful yet easy to use effects device such as the DHP-55 and that aggravating VCR in your living room with the clock that's always flashing 12:00.

Inside your DHP-55, the operating system is stored in four socket-mounted ROM (Read Only Memory) chips: this means it can be upgraded as DHP-55 software options are released by DigiTech.

Operating System Structure

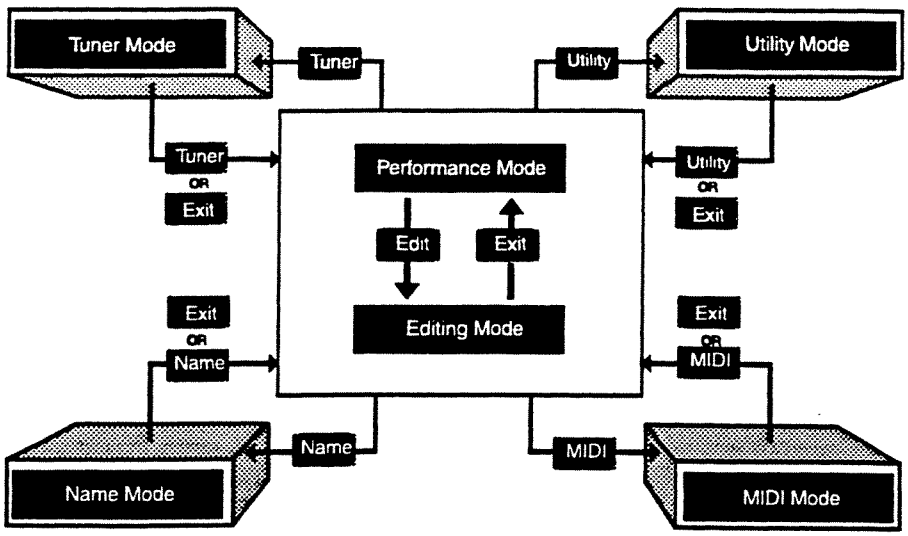
Just as your town or municipality is organized into neighborhoods, which are organized into streets, which are populated with houses, the DHP-55 operating sytem is organized into modes, which are organized into menus, which are made up of parameters.

DHP-55 Modes

The six modes of the DHP-55 operating system are as follows:

- **Performance Mode** - This is the power-up mode of the DHP-55: Use it to load and play programs, as well as to turn on and off the effects of the current configuration.
- **Edit Mode** - Enter this mode by pressing an FX Library key followed by the Edit, Mix or Mod key: Use this mode to edit all main, mixer and modulation Parameters of the currently loaded program.
- **Name Mode** - Enter this mode via the Name key. In this mode, you can change the name of the currently loaded program.
- **Utility Mode** - Enter this mode via the <UTILITY> key: Set preferences (such as Program Autoloading and whether you prefer sharps or flats) and create new programs here.
- **MIDI Mode** - This mode is where all MIDI settings for the DHP-55 are made. MIDI channel, program change and memory dump via MIDI parameters are accessible when you are in this mode. Enter MIDI mode via the <MIDI> key.
- **Tuner Mode** - Pressing the <TUNER> key will put the DHP-55 into tuner mode. The reference A pitch of the unit is also set here.

DHP-55 Menu Architecture



DHP-55 Menus

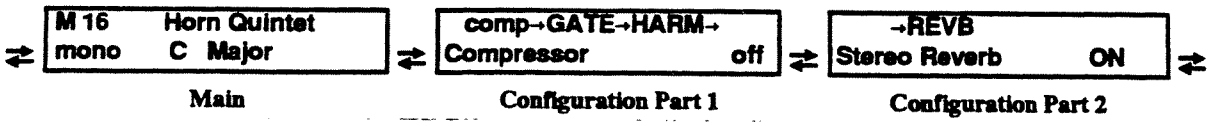
The next level of the DHP-55 operating system is its *menus*. Every Mode contains menus that allow the DHP-55 to offer you choices (just like a restaurant menu). Once you have made your choices in a menu, you can move on to the next menu in the mode via the Parameter <PREV> and Parameter <NEXT> keys, or you can leave the mode entirely by pressing the mode (<TUNER>, <NAME>, <UTILITY> or <MIDI>), or <EXIT> key. When you reach the end of a chain of menus, your next step will return you to the first menu.

The DHP-55 "remembers" the most recent menu of each effect or mode you used - this means that whenever you enter a new mode's menu, the DHP-55 marks your old mode and menu position in order to return you to your starting point when you exit the new mode. This "Menu memory" is kept until you load another program or turn off the DHP-55.

Performance Mode

When the DHP-55 is first turned on it is in Performance mode: The current program bank and number are displayed with the current program name on the top line of the LCD while the input mode (stereo or mono), along with any key and chordal information is displayed on the bottom line of the LCD.

PERFORMANCE MODE MENUS



In performance mode, you can:

- Select program banks with the BANK keys;
- Select programs with the Program <+> and Program <–> keys;
- Load and copy programs with the Program Load and Program Store keys;

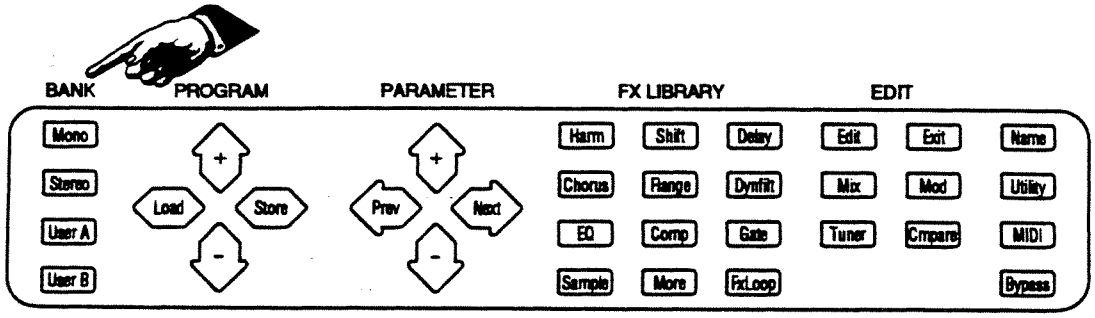
- View the configuration of the current program and edit the chain by stepping to a specific effect with the Parameter <PREV> and Parameter <NEXT> keys, and turning the effect on and off with the Parameter + and Parameter – keys or the DATA Wheel;

- Call the editing mode to reprogram any of the effects in the configuration by stepping to a specific effect with the Parameter <PREV> and Parameter <NEXT> keys, and then pressing the Edit key (see the next section: edit mode); and

- Step through the Harmony Key and Harmony Chord parameters in the Main Menu via the Parameter <PREV> and Parameter <NEXT> keys, and change their values with the Parameter <+> and Parameter <–> keys or the Data wheel (harmony effect programs only).

Please note that you can also use the FX Library keys to "jump" directly to the appropriate effect in the configuration if you find that stepping there with the Parameter <PREV> and Parameter <NEXT> keys becomes tedious. To return to the main Performance menu, press the <EXIT> key or step back to it with the Parameter <PREV> and Parameter <NEXT> keys.

The Program Banks



DHP-55 memory is organized into 4 Program Banks. The DHP-55's program banks are like a filing cabinet with 4 drawers: Just as you would use each drawer of a filing cabinet for storing different types of files, the DHP-55's program banks organize the programs in the following way:

Mono Bank

The Mono bank is a factory preset bank, which means you cannot erase or change the programs that came in it. The programs in the mono bank are designed to be used with mono (one output only) instruments such as guitar or horns.

Stereo Bank

The Stereo bank is also a factory preset bank, containing programs which are designed for stereo (left and right output) instruments such as keyboards and stereo recordings.

User A Bank

The User A bank is completely programmable, which means that you can erase and change the programs stored within it. When you purchase the DHP-55, this bank contains copies of the programs in the mono bank.

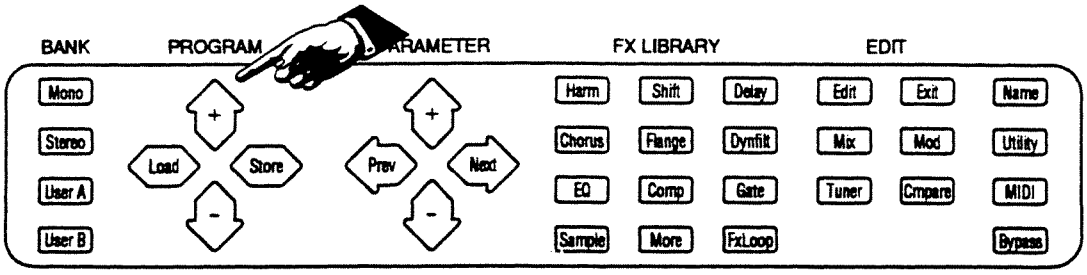
User B Bank

The User B bank is also completely programmable. When you purchase the DHP-55, this bank contains copies of the programs in the stereo bank.

If you intend to use your DHP-55 with both mono and stereo instruments, you may want to keep all your custom mono programs in the **User A** bank and your custom stereo programs in the **User B** bank in order to keep them separated.

> **REMEMBER**: Factory programs are found in the Mono and Stereo banks: You cannot change them, but you can edit and save them in the User A and User B banks!

The Program Keypad



Once you have selected a program bank using the Bank selectors, the DHP-55 will prompt you to select and load a program. This is done using the Program keypad.

Selecting a Program

The Program <+> and Program <–> keys (the up and down arrows) in the program keypad allow you to scroll through the contents of the current bank: Program <+> takes you higher until you reach the last program, and Program <–> takes you lower until you reach the first program. The Data wheel can be used to select programs as well as the Program + and Program <–> keys. Turning the Data wheel clockwise is up, counter-clockwise is down.

Loading a Program

The Program <LOAD> key causes the DHP-55 to load the selected program to temporary memory. Once the program is loaded, you can the change its parameters and listen to the results without changing the original version: This is because your changes are not saved into permanent memory until you Store the edited program.

```
[Load]  program:
A7  4-Part Harmony
```

Program Select Menu

Storing a Program

WARNING! This procedure will permanently erase the program which was previously at the selected memory location.

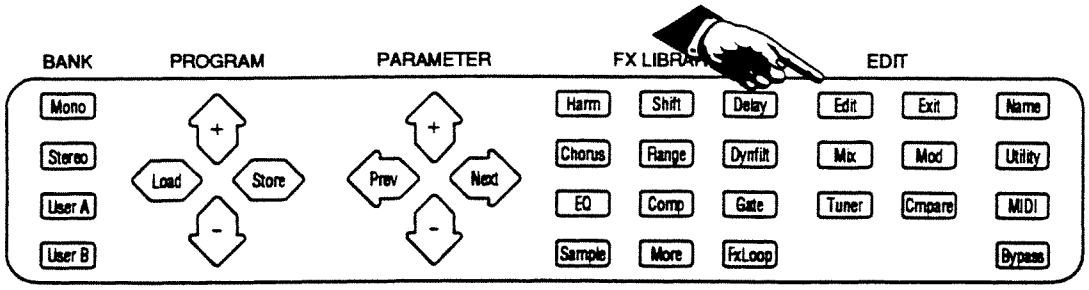
The <STORE> key saves the program to one of the permanent program positions in User A or User B banks. To store a Program:

- Press the <STORE> key to access the Store menu.
- Select the destination of the new Program via the Data wheel or the Program <+> and Program <–> keys.

• Press the <STORE> key again to Store the new program at the selected memory location.

Program Store Menu

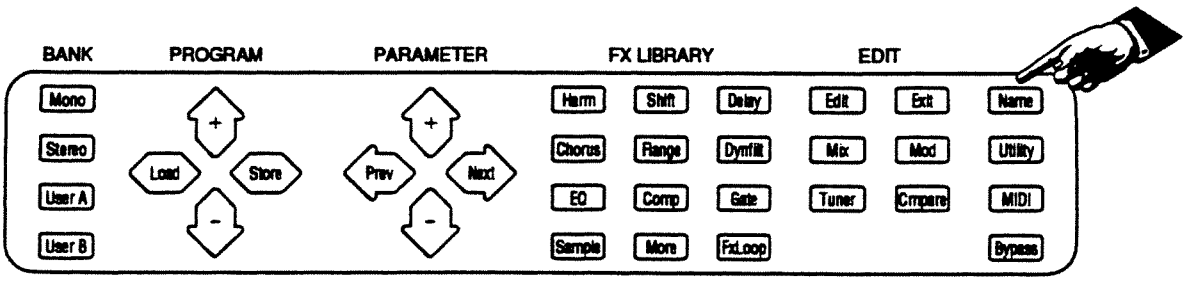
Edit Mode



To edit any effect in the current program configuration, select the desired effect from the configuration menu (it will flash when selected), and press the <EDIT> key (you can also push the appropriate FX Library key to jump to the effect you need). Since the configuration of every program is different, the edit menus available will depend on the Program. Use the Parameter <NEXT> and Parameter <PREV> keys to move to each effect parameter you wish to change, and adjust the value with the Parameter <+> and Parameter <–> keys or the Data wheel. To leave any Edit Mode menu, press the Exit key and you will be returned to the last Performance Mode menu you were using before calling Edit Mode.

Rather than show all the Edit Mode menus here, this manual includes them in the sections that explain the effects and parameters that they relate to *(see Section 3: Effects Guide)*.

Name Mode



After editing a program to your satisfaction, you may want to give it a custom name to distinguish it from the original. To give the Program a custom name, press the <NAME> key. You can then choose a name of up to 16 characters long. Step through the 16 character positions in the Name Mode menu using the Parameter <PREV> and Parameter <NEXT> keys, and then scroll through the possible characters for that position using the Parameter + and Parameter <–> keys or the Data wheel.

NAME MODE: MENU

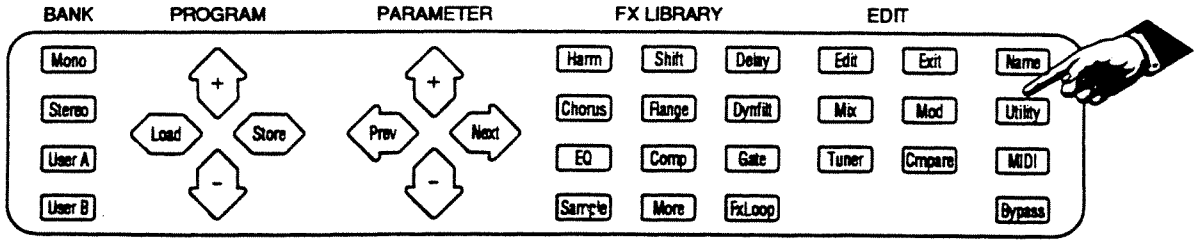
Name

NAME MODE: PARAMETERS

Name Parameter	Values	Description
Edit Program Name	16 Characters length	Sets the name of the current program

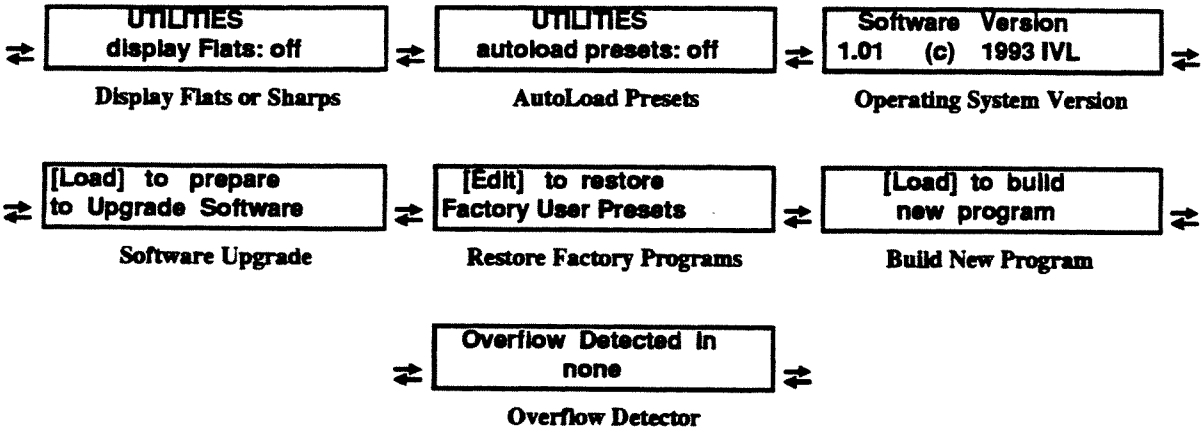
To leave the Name mode menu, press the <NAME> key a second time or press the <EXIT> key and you will be returned to the last menu you were using before you entered Name mode.

Utility Mode



The DHP-55's Utility Mode allows you to change universal (or system) settings and preferences. You enter Utility Mode by pressing the Utility key. Once you have stepped to a desired parameter in a Utility Mode Menu, you may change its value with the Parameter <+> and Parameter <–> keys or the Data Wheel.

UTILITY MODE: MENUS



UTILITY MODE: PARAMETERS

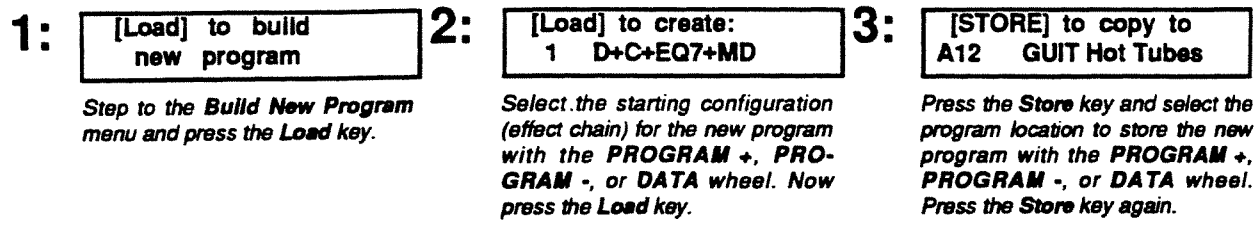
Utility Parameter	Values	Description
Display Flats or Sharps	off, ON	Sets whether the DHP-55 uses sharp or flat symbols to display semitone notes.
Autoload Presets	off, ON	When Off, selected programs are not loaded until the LOAD key is pressed
Software Version	1.00 and up	The version of DHP-55 Operating System software currently installed in the DHP-55.
Prepare to Upgrade Software	PRESS LOAD KEY	Prepares the DHP-55 so that User presets will run with new Operating System Software. (See the Software Upgrade section for more detail).
Restore Factory User Presets	PRESS EDIT THEN LOAD KEY to execute	Restores User presets to factory standards, **erasing** all customized programs in the User A and User B banks.
Build New Program	PRESS LOAD KEY TO EXECUTE	Creates a completely new program (see the section on building new programs).
Overflow Detector	Comp, Gate, Harm, Shift, Chorus, Flange, EQ, etc.	Serves as a diagnostic to show you the exact effect that is overflowing when an overflow occurs (when you overdrive an effect with your instrument)

Pressing the <EXIT> key or the <UTILITY> key a second time returns you from Utility mode.

NOTE: When upgrading from version 1.02 or later, press load and follow the instructions to ensure that the presets you have already developed are not lost in the upgrade. If you are upgrading from Version 1.00 you do not need to follow this procedure as it will be done automatically.

Building New Programs

Occasionally, you will want to create a completely new program for a sound totally unlike anything in the DHP-55's mono and stereo banks: this is called building a new program.



*Step to the **Build New Program** menu and press the **Load** key.*

*Select the starting configuration (effect chain) for the new program with the **PROGRAM +**, **PROGRAM -**, or **DATA** wheel. Now press the **Load** key.*

*Press the **Store** key and select the program location to store the new program with the **PROGRAM +**, **PROGRAM -**, or **DATA** wheel. Press the **Store** key again.*

The DHP-55 offers over 175 effects configurations (or effects chains) to choose from when building a new program: The starter configurations describe the effects chain they offer according to the following key:

BP2	Bass Pitch Shifter (2 Voice)	MD	Multitap Delay
C	Chorus	P2	2 voice Intelligent Pitch Shifter
CS	Chord Shifter	P4	4 voice Intelligent Pitch Shifter
D	Distortion & Speaker emulator	R	Reverb (mono)
DF	Dynamic Filter	S	Sampler
EQ5	5 band stereo Equalizer	SD	Stereo Delay
EQ7	7 band mono or stereo Equalizer	SP	String Pad
EQ15	15 band stereo Equalizer	SR	Stereo Reverb
EQ31	31 band mono Equalizer	S4R	Harmony 4 Shift with Regeneration
F	Flange		

Analog compressor and gate effects are part of *all* mono input configurations and are not shown when you are selecting starting configurations 1 to 94. Configurations 143–151 and 161 - 170 have digital stereo compressor and gate effects, and configurations 171–179 have a digital stereo compressor effect, which are not shown. Whenever a new configuration is loaded, all of the effects are turned off by default: This allows you to build the program effect by effect, gradually shaping the sound to your liking.

Overflow Detector

Besides the front panel's red Overflow LED, the DHP-55 is equipped with a "smart" Overflow detector, located in the <UTILITY> menus. When an overflow occurs (a hot signal overloads a DHP-55 effect) the Overflow detector reports which effects, if any, are overflowing. This will help you determine which effects in the current program require adjustment. The most recently detected overflow condition will be displayed.

There are several possible causes of overflow:

- The output mixer stage of an effect is too high for the next effect in the configuration.
- High feedback gains in effects such as flange and delay are present.
- Some effects, such as digital distortion or EQ, have an internal gain parameter that is set too high.

Software Upgrade

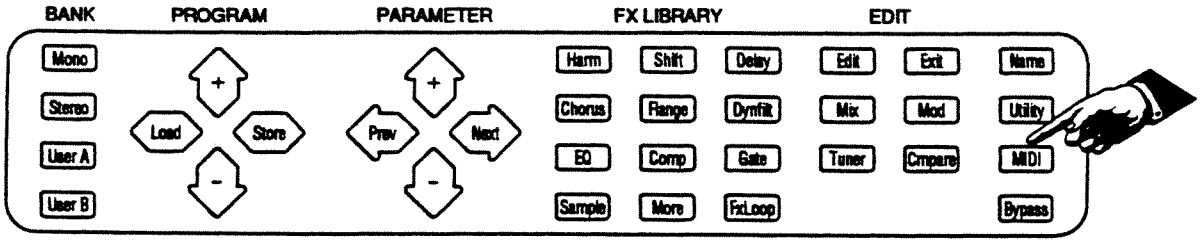
The DHP-55 Version 2 is capable of upgrading your old presets. This is a simple procedure that preserves the hard work you've spent developing your own sounds. There are 2 ways to use this feature. You can upgrade via the MIDI bank dump feature (see MIDI MODE following) but the simplest way is to use the "automatic upgrade" procedure.

If you have DHP-55 software version 1.00, the preset upgrade will happen automatically when you replace your old EPROMs with the new ones. When you power up the DHP-55 for the first time after you have replaced the old chips, the display will read PRESET UPGRADE IN PROGRESS. Once this is complete, the presets you have saved in the User A and User B bank will have been upgraded to run with the new software.

If you have DHP-55 software version 1.02 or later, the automatic upgrade can be used by pressing the <LOAD> button in the utility screen which prompts, [LOAD] TO PREPARE TO UPGRADE SOFTWARE. When you do this, your unit will respond with the message, READY FOR UPGRADE (POWER OFF NOW).

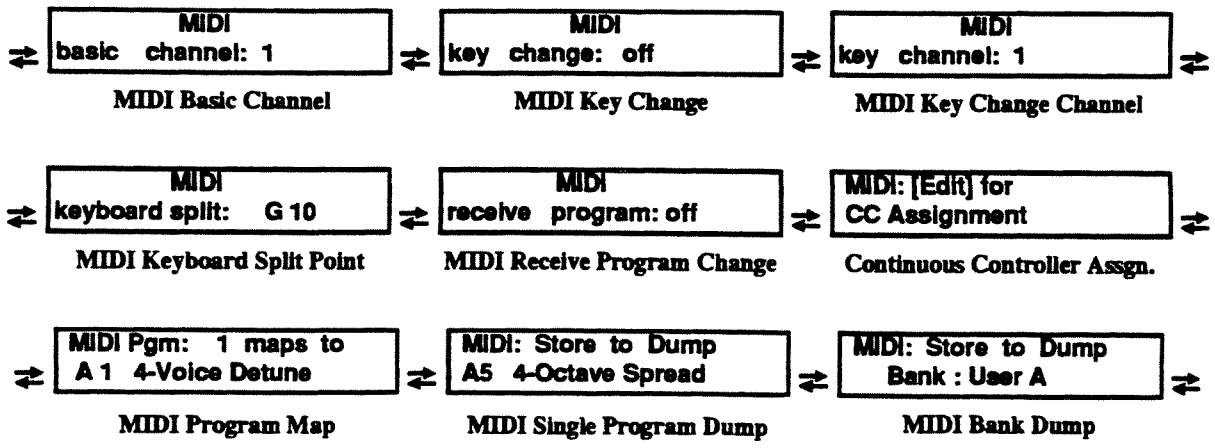
If for any reason you decide at this point that you don't want to upgrade, there is absolutely no harm in turning the power back on with your old software still installed.. However, to proceed with the preset upgrade, you should turn the power off, replace your old chips with the new ones, and the upgrade will take place the next time you turn the power on.

MIDI Mode



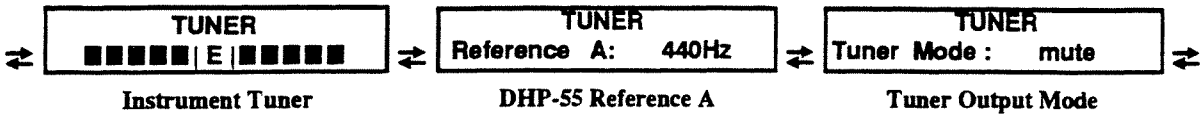
The DHP-55's MIDI mode is where all MIDI parameters are set; it is entered by pressing the <MIDI> key. Once you have stepped to a desired parameter in a MIDI Mode Menu, you may change its value with the Parameter <+> and Parameter <-> keys or the Data wheel.

MIDI MODE: MENUS



When the <TUNER> key in the Edit keypad is pressed, the DHP-55 enters Tuner mode. In Tuner mode, you can tune your instrument, the DHP-55, and set the mode of the tuner's output. It is important that your instrument be in tune with the selected reference note. If it isn't, harmonies generated by the DHP-55 may sound out of tune with the original note.

TUNER MODE: MENUS



Instrument Tuner | **DHP-55 Reference A** | **Tuner Output Mode**

TUNER MODE: PARAMETERS

Tuner Parameter	*Values*	*Description*
Instrument Tuner	*C - B*	*Musical instrument "Strobe" tuner which uses moving blocks to show tuning accuracy - adjust your tuning until the appropriate musical note is displayed and the blocks stop.*
DHP-55 Reference A	*420 - 460 Hz*	*Sets the master tuning of the DHP-55 for all Harmony & Tuner functions*
Tuner Output Mode	*easy, through, mute*	*Sets the routing of audio signals while the Tuner is in use*

The Digital Strobe Tuner

The DHP-55's onboard tuner is a digital version of a mechanical strobe tuner: Unlike conventional digital tuners, it uses a "strobing" display effect combined with intelligent pitch correction to make tuning an instrument fast and accurate. The digital strobe tuner display is designed to be easily read, even from across a stage or studio.

Whenever the Tuner feature is active, the DHP-55 display shows the user the most dominant fundamental pitch it "hears" to the nearest semitone; the closeness of the pitch to this semitone is reflected in the speed and direction of the moving (or strobing) blocks as they cross the display.

The speed of the strobe blocks shows how close the instrument's pitch is to the actual note shown on the DHP-55's display: closer is slower, and farther is faster. The direction of the strobe blocks shows the relative sharpness or flatness of the instrument pitch: the blocks strobe right to left for flat pitches and strobe left to right for sharp ones.

Easy Mode

When the Tuner is set to this mode, the sound of your instrument is passed through the output of the DHP-55 along with a pitch-corrected copy of itself: the resulting "beating" effect between the two output signals will indicate how accurately tuned the instrument is.

Through Mode

The through mode of the Tuner feature is the most like a standard electronic tuner: the sound of your instrument is passed through the output of the DHP-55 without any effects or shifting.

Mute Mode

When the Tuner is activated in mute mode, all output stops while you tune your instrument through the strobing display; normal output resumes when you leave the Tuner function. This mode is ideal for live performances.

NOTE: You must match the Reference A of the DHP-55 to that of your instrument or recording in order for the Intelligent Harmony effects to be in tune. Normally, your instrument would be tuned to A = 440, but if you are tuning your instrument to a different reference, or if you are using a recorded source that is not tuned to A = 440, you must adjust the **DHP-55 Reference A** setting.

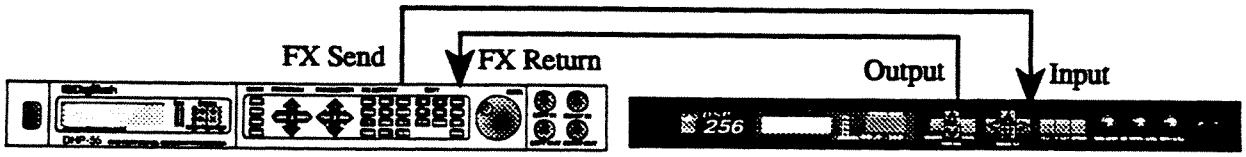
The following table shows the appropriate values for each tuning:

Tuning Adjustment	Reference A
Half-Step (semitone) up	466 Hz (out of adjustment range)
Quarter-Step (1/2 semitone) up	453 Hz
None	440 Hz
Quarter-Step (1/2 semitone) down	427 Hz
Half-Step (semitone) down	415 Hz (out of adjustment range)

The Effects Loop

An effects loop is built into the DHP-55 to allow the use of harmonic exciters, distortion boxes, special pre-amps, or any other effects devices. When the effects loop is used, the DHP-55 can perform intelligent pitch detection and shifting on a *clean input signal* and then pass the input and harmonies on to the FX Looped devices for further enhancement. Remember that the FXLoop can only be used with mono input signals since the Left Input jack doubles as the FX return jack. To use this feature, you must:

- Connect the effects unit to the FX Send & FX Return (Left Input) jacks of the DHP-55 (see diagram).
- Activate the FX Loop by pressing the <FXLOOP> key (the Fx Loop LED indicator will light).
- Adjust the amount of external effects the DHP-55 will process with the Left Input control on the front panel (when the Fx Loop is in use, this knob acts as the FX Return level control)



Effects Loop Connections

For more detailed information on the FX Loop feature, see page 52, Effects Guide: FX Loop.

Using the Footswitch

The Digitech FS300 is an optional footswitch controller that can be used with the DHP-55 for hands-free control of its many features during live or studio performances. The functions of the three pedal switches on the FS300 depend on the settings of the Utility Autoload parameters, which are located in the UTILITY Mode menus.

When the DHP-55's Autoload feature is disabled, the footswitch functions are as follows:

- Switch 1 increments through Programs in memory, Switch 2 decrements through Programs in memory, and Switch 3 doubles as the Load and Bypass switch.

Once you have loaded a program with the third switch, it functions as a bypass switch (it turns the DHP-55's effected output off and on).

When the Utility Autoload parameter is enabled, the function of Switch 3 changes to function as a full-time Bypass switch.

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Section 3 - The DHP-55 EFFECTS GUIDE

The heart of your DHP-55's processing power lies within the digital effects in the FX LIBRARY. This section of the Reference Guide explains the menus and parameters of each member of this library.

EFFECT & APPLICATION PARAGRAPH

The effect to be explained is described in this paragraph: This effect's concepts and common uses are found here.

CONFIGURATION MENU ILLUSTRATION

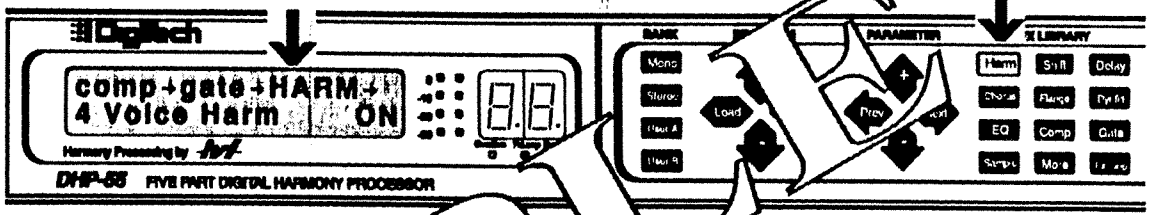
This illustration shows a typical configuration menu containing this effect. It is displayed by the DHP-55 when you press the FX Library key highlighted in the FX LIBRARY Illustration.

FX LIBRARY ILLUSTRATION

The key you must press in order to access this effect's Menus and Parameters is highlighted in picture of the FX LIBRARY keypad.

4 Voice Intelligent Harmony Pitch Shifter

The Intelligent Pitch Shifter Effect of the DHP-55 is musically aware of most chord types and scales. There are two Types of intelligent harmonies: Chordal and Scalic. When you are programming the Intelligent Pitch Shifter, the following information is necessary:
CHORDAL: Key, Chord Type (major, minor, etc.) & Voicing



EFFECT EDIT & MIX MENUS

Every single EDIT and MIX menu that make up the effect are illustrated here, giving you a clear understanding of where every parameter is located.

Edit 4 VOICE HARMONY : EDIT MENUS Edit

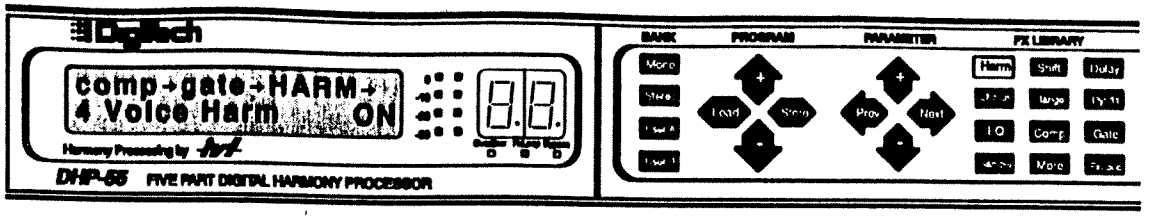
Edit & Mix 4 VOICE HARMONY : PARAMETERS Edit & Mix

Edit Parameter	Values	Description
rate	0-64	Sets the rate (speed) of the flange effect.
depth	1-16	Sets the depth of the flange effect.
INPUT level	-40 0 dB	Sets the level of the input signal.
delay	1 - 16	Sets the delay in milliseconds before the flange effects is applied to any audio signal.
feedback	0-99 %	Sets the percentage of flange effect feedback.

EFFECT EDIT AND MIX PARAMETERS

Every single EDIT and MIX parameter that makes up the effect is listed in this table, along with the possible values that you can set for them, and a brief description of their purpose.

4 & 2 Voice Intelligent Harmony Pitch Shifter



The Intelligent Pitch Shifter Effect of the DHP-55 is musically aware of most chord types and scales. There are two Types of intelligent harmonies: Chordal and Scalic. When you are programming the Intelligent Pitch Shifter, the following information is necessary:
CHORDAL: Key, Chord Type (major, minor, etc.) & Voicing
SCALIC: Key, Scale (major, minor, etc.), Voice Intervals and Non-scale note handling. All Pitch Shifter Effects (accessible through the **Harm** key) are meant for monophonic (one-note at a time) lead playing; octaves and fifths also work with some Pitch Shifter Effects, but it is recommended that you use Chord Shifter Effects for polyphonic (chord) input signals.

4 VOICE HARMONY: EDIT MENUS

Edit

- 4 Voice Harm / harmony: scalic — Harmony Type
- 4 Voice Harm / scale: C Major — Harmony Key and Scale
- 4 Voice Harm C Major / C ↑E ↑G ↓C — Harmony Intervals
- 4 Voice Harm / NST: Par + ptch corr — Nonscale Note
- 4 Voice Harm [Edit] / to customize harmony — Custom Harmony
- 4 Voice Harm [Edit] / for VIBRATO menu — Vibrato
- 4 Voice Harm [Edit] / for PBEND menu — Pitch Bend
- 4 Voice Harm [Edit] / for VOLUME menu — Volume
- 4 Voice Harm [Edit] / for DETUNE menu — Detune
- 4 Voice Harm / enable: ON — 4 Voice Harmony Enable

Edit

Custom Harmony Sub-Menus

4 Voice Harm [Edit] / to customize harmony — Custom Harmony

Edit → Customize Harmony / Scale:Major — Original Scale → Input=C C Major / C ↑E ↑G ↓C — Custom Intervals → Customize Harmony / Reference Key : C — Reference Key → Customize Harmony / Note Entry by:Keypad — Note Entry By → Exit

VIBRATO Sub-Menus

4 Voice Harm [Edit] / for VIBRATO menu — Vibrato

Edit → 4 Voice Harm VIBRATO / depth: 0 — Vibrato Depth → 4 Voice Harm VIBRATO / depth mod by: none + — Vibrato Depth Modulation → 4 Voice Harm VIBRATO / rate: 0 — Vibrato Rate → 4 Voice Harm VIBRATO / rate mod by: none + — Vibrato Rate Modulation → Exit

PBEND Sub-Menus

4 Voice Harm [Edit] / for PBEND menu — Pitch Bend

Edit → 4 Voice Harm PBEND / pitch bend key:C — Pitch bend Key → 4 Voice Harm PBEND / bend: unison — Pitch Bend Range → 4 Voice Harm PBEND / mod by: none + — Pitch Bend Modulation → Exit

VOLUME Sub-Menus

4 Voice Harm [Edit] / for VOLUME menu — Volume

Edit → 4 Voice Harm VOLUME / mod type: panning — Modulation Type → 4 Voice Harm VOLUME / mod by: none + — Volume Modulation → 4 Voice Harm VOLUME / min: off max: 0dB — Volume Max and Min → Exit

DETUNE Sub-Menus

4 Voice Harm [Edit] / for DETUNE menu — Detune

Edit → 4 Voice Harm HARM1 / detune: 0 cents — Harmony 1 Detune → 4 Voice Harm HARM2 / detune: 0 cents — Harmony 2 Detune → 4 Voice Harm HARM3 / detune: 0 cents — Harmony 3 Detune → 4 Voice Harm HARM4 / detune: 0 cents — Harmony 4 Detune → 4 Voice Harm DETUNE / modulate by: none + — Detune Modulation → Exit

4 VOICE HARMONY: MIX MENUS

Mix

- 4 Voice Harm DRY / lvl: 0dB pan:Centre — Dry Level & Pan
- 4 Voice Harm HARM1 / lvl: 0dB pan:Centre — Harmony 1 Level & Pan
- 4 Voice Harm HARM2 / lvl: 0dB pan:Centre — Harmony 2 Level & Pan
- 4 Voice Harm HARM3 / lvl: 0dB pan:Centre — Harmony 3 Level & Pan
- 4 Voice Harm HARM4 / lvl: 0dB pan:Centre — Harmony 4 Level & Pan

Edit & Mix 4 VOICE HARMONY: PARAMETERS Edit & Mix

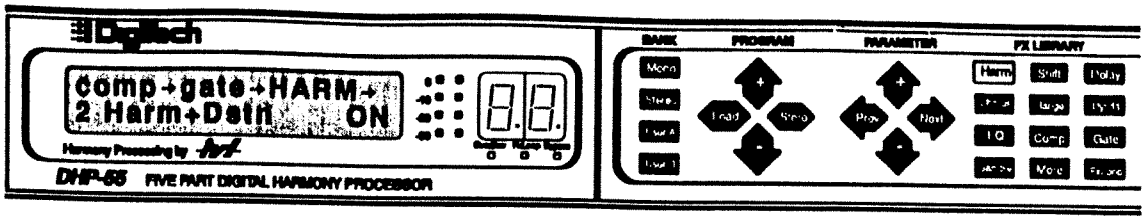
Effect Parameter	Values	Description
Harmony Type	Chordal, Scalic	Selects harmony type.
Key & Chord (Chordal Harmony)	key, maj, maj7, min, min7, dom7, m7b5, dim7, aug7, sus, sus7	Selects the key, and the type of chord used in the harmony.
Key & Scale (Scalic Harmony)	key, chromatic, major, minor, wholetone, diminished	Selects the key, and the type of scale interval to be used in the harmony.
Voicing (2 Voice Chordal Harmony)	2up close, 1up 1down close, 2down close, 1up 1down open, 2up open, 2down open, 1up open 1down close, 1up close 1down open	Selects the type of voicing to be used in the harmonies. In 4 voice harmony, similar voicings with 4 voices are available.
Interval (Scalic Harmony)	note for each voice	Shows a note for each voice, allowing adjustment of individual voices for specific harmonies.
Nonscale Note	Diat, Par, Dimin, Modal, Altrd, with or without pitch correction, n/c (no change), slur	Sets the way that notes outside the selected key are treated.
Custom Harmony Reference Key	C, C#, D, D#, E, F, F#, G, G#, A, A#, B	Sets the reference key for the harmony that you are customizing.
Note Entry by:	Keypad, Notes	Selects the way in which the input note is selected in the main Custom Harmony screen. For Keypad, the input note is selected using the DHP-55's keypad, and the note you play adjusts whichever voice you have selected using the keypad. For Notes, the note you play always adjusts the input note.
Custom Harmony Input=	C, C#, D, D#, E, F, F#, G, G#, A, A#, B	The unshifted input pitch.
Custom Harmony Output Note	↓↓B - ↑↑B, Slur, n/c	The note to shift the input to, or whether to slur or ignore (n/c=no change) the input pitch.
VIBRATO depth	0 - 255	Sets amount of vibrato.
VIBRATO depth mod by	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets the source of vibrato depth modulation and its polarity.
VIBRATO rate	0 - 255	Sets speed of vibrato.
VIBRATO rate mod by	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets the source of vibrato rate modulation and its polarity.
PBEND Pitch bend key	any key	Sets the key of the bent notes in a harmony.
PBEND bend (scalic)	unison, +/- 2 octaves	Sets interval above/below the original for the bent notes.
PBEND bend to (chordal)	maj, maj7, min, min7, dom7, m7b5, dim7, aug7, sus, sus7	Sets the type of chord that the bent notes will bend to.
PBEND mod by	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets the source of pitch bend modulation and its polarity.
VOLUME mod type	normal, panning	Sets volume mod for tremolo/swell effects or panning effects.
VOLUME mod by	none, Expr 1-8, EnvGen, LFO 1-2; +,-	Sets the source of volume modulation and its polarity.
VOLUME min & max	off, -40dB to 0dB	Sets the minimum and maximum levels of volume modulation.
DETUNE (HARM1-4)	+/- 100 cents	Sets the amount of variation from the root note for each harmony voice.
DETUNE mod by	none, Expr 1-16, EnvGen, LFO 1-2, MIDI PB; +,-	Sets the source of detune modulation and its polarity.
enable	on, off	Enables 4 voice harmony effect.
Mix Parameter	**Values**	**Description**
dry level	off, -40dB to 0dB	Sets the level of the dry signal.
dry pan (Not available in Stereo Input Pitch Shifter)	L100% - L55%, Centre, R55% - R100%	Sets pan of dry signal.
level (HARM1-4) or (1-2)	off, -40dB to 0dB	Sets the level of the each harmony signal.
pan (HARM1-4) or (1-2)	L100% - L55%, Centre, R55% - R100%	Sets pan of each harmony signal.

Notes on 4 Voice Harmony Effects:

- Stereo Input Intelligent Harmony effects (Found in the stereo bank) take a left and right input signal and process them separately:
  - 2 voice harmony - Harmony 1 is processed from the **Left input**, while Harmony 2 is processed from the **Right input**
  - 4 voice harmony - Harmonies 1 & 3 are processed from the **Left input**, while Harmonies 2 & 4 are processed from the **Right input**
- For Stereo Pitch Shifters, the **Right input** is the one used for all pitch recognition and analysis: send the strongest and cleanest signal to this input if there is any wide variation between your left and right channels.
- When you customize a scalic harmony, the *interval*, *non-scale tone* and *pitch bend range* parameters will not be available for programming. Similarly, when you customize a chordal harmony, the *voicing* parameter will not be available, although the *bend* parameter is still available.
- 4-Voice Pitch Shifters can only shift voices 1 & 2 down by 2 octaves. Voices 3 & 4 are limited to 1 octave down.
- Stereo Pitch Shifters have no dry pan.

2 Voice Harmony with Distortion

This is a combined 2 voice intelligent pitch shifter and distortion effect that is particularly useful with guitar and keyboard sounds. All Pitch Shifter Effects (accessible through the Harm key) are meant for monophonic (one-note at a time) lead playing; octaves and fifths also work with some Pitch Shifter Effects, but it is recommended that you use Chord Shifter Effects for multi-note input signals.



2 VOICE HARMONY+DISTORTION: EDIT MENUS

Edit

2 Harm+Dstn harmony: scalic — Harmony Type

2 Harm+Dstn scale: C Major — Harmony Key and Scale

2 Harm+Dstn C Major ↑E ↑G — Harmony Intervals

2 Harm+Dstn NST: Par + ptch corr — Nonscale Note

2 Harm+Dstn [Edit] to customize harmony — Custom Harmony

2 Harm+Dstn [Edit] for VIBRATO menu — Vibrato

2 Harm+Dstn [Edit] for PBEND menu — Pitch Bend

2 Harm+Dstn [Edit] for VOLUME menu — Volume

2 Harm+Dstn [Edit] for DETUNE menu — Detune

2 Harm+Dstn DIST enable: ON — Distortion Amp Enable

2 Harm+Dstn DIST type: Smokin — Distortion type

2 Harm+Dstn DIST preamp drive: 28 dB — Preamp Drive

2 Harm+Dstn DIST pwramp drive: 38 dB — Poweramp Drive

2 Harm+Dstn DIST bass contour: off — Bass Contour

2 Harm+Dstn enable: ON — 2 Harm+Dstn Enable

Custom Harmony Sub-Menus

2 Harm+Dstn [Edit] to customize harmony (Custom Harmony)

Edit → Customize Harmony Scale:Major — Original Scale → Input:C C Major C ↑E ↑G ↓C — Custom Intervals → Customize Harmony Reference Key : C — Reference Key → Customize Harmony Note Entry by:Keypad — Note Entry By → Exit

VIBRATO Sub-Menus

2 Harm+Dstn [Edit] for VIBRATO menu (Vibrato)

Edit → 2 Harm+Dstn VIBRATO depth: 0 — Vibrato Depth → 2 Harm+Dstn VIBRATO depth mod by: none + — Vibrato Depth Modulation → 2 Harm+Dstn VIBRATO rate: 0 — Vibrato Rate → 2 Harm+Dstn VIBRATO rate mod by: none + — Vibrato Rate Modulation → Exit

PBEND Sub-Menus

2 Harm+Dstn [Edit] for PBEND menu (Pitch Bend)

Edit → 2 Harm+Dstn PBEND pitch bend key:C — Pitch bend Key → 2 Harm+Dstn PBEND bend: unison — Pitch Bend Range → 2 Harm+Dstn PBEND mod by: none + — Pitch Bend Modulation → Exit

VOLUME Sub-Menus

2 Harm+Dstn [Edit] for VOLUME menu (Volume)

Edit → 2 Harm+Dstn VOLUME mod type: panning — Modulation Type → 2 Harm+Dstn VOLUME mod by: none + — Volume Modulation → 2 Harm+Dstn VOLUME min: off max: 0dB — Volume Max and Min → Exit

DETUNE Sub-Menus

2 Harm+Dstn [Edit] for DETUNE menu (Detune)

Edit → 2 Harm+Dstn HARM1 detune: 0 cents — Harmony 1 Detune → 2 Harm+Dstn HARM2 detune: 0 cents — Harmony 2 Detune → 2 Harm+Dstn DETUNE modulate by: none + — Detune Modulation → Exit

2 VOICE HARMONY+DISTORTION: MIX MENUS

Mix

2 Harm+Dstn DIST output level: 0dB — Distortion Output Level

2 Harm+Dstn DRY lvl: -20dB pan:Centre — DRY Level & Pan

2 Harm+Dstn HARM1 lvl: 0dB pan:Centre — Harmony 1 Level & Pan

2 Harm+Dstn HARM2 lvl: 0dB pan:Centre — Harmony 2 Level & Pan

Edit & Mix 2 VOICE HARMONY+DISTORTION: PARAMETERS Edit & Mix

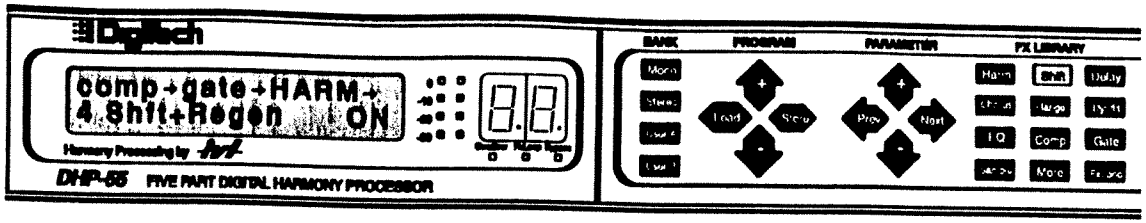
Edit Parameter	Values	Description
Harmony Type	Chordal, Scalic	Selects harmony type.
Key & Chord (Chordal Harmony)	key, maj, maj7, min, min7, dom7, m7b5, dim7, aug7, sus, sus7	Selects the key, and the type of chord used in the harmony.
Key & Scale (Scalic Harmony)	key, chromatic, major, minor, wholetone, diminished	Selects the key, and the type of scale interval to be used in the harmony.
Voicing (2 Voice Chordal Harmony)	2up close, 1up 1down close, 2down close, 1up 1down open, 2up open, 2down open, 1up open 1down close, 1up close 1down open	Selects the type of voicing to be used in the harmonies.
Interval (Scalic Harmony)	note for each voice	Shows a note for each voice, allowing adjustment of individual voices for specific harmonies.
Nonscale Note	Diat, Par, Dimin, Modal, Altrd, with or without pitch correction, n/c (no change), slur	Sets the way that notes outside the selected key are treated.
Custom Harmony Reference Key	C, C#, D, D#, E, F, F#, G, G#, A, A#, B	Sets the reference key for the harmony that you are customizing.
Note Entry by:	Keypad, Notes	Selects the way in which the input note is selected in the main Custom Harmony screen. For Keypad, the input note is selected using the DHP-55's keypad, and the note you play adjusts whichever voice you have selected using the keypad. For Notes, the note you play always adjusts the input note.
Custom Harmony Input=	C, C#, D, D#, E, F, F#, G, G#, A, A#, B	The unshifted input pitch.
Custom Harmony Output Note	↓↓B - ↑↑B, Slur, n/c	The note to shift the input to, or whether to slur or ignore (n/c=no change) the input pitch.
VIBRATO depth	0 - 255	Sets amount of vibrato.
VIBRATO depth mod by	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets the source of vibrato depth modulation and its polarity.
VIBRATO rate	0 - 255	Sets speed of vibrato.
VIBRATO rate mod by	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets the source of vibrato rate modulation and its polarity.
PBEND pitch bend key	any key	Sets the key of the bent notes in a harmony.
PBEND bend (scalic)	unison, - 1 octave to + 2 octaves	Sets interval above/below the original for the bent notes.
PBEND bend to (chordal)	maj, maj7, min, min7, dom7, m7b5, dim7, aug7, sus, sus7	Sets the type of chord that the bent notes will bend to.
PBEND mod by	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets the source of pitch bend modulation and its polarity.
VOLUME mod type	normal, panning	Sets volume mod for tremolo/swell effects or panning effects.
VOLUME mod by	none, Expr 1-8, EnvGen, LFO 1-2; +,-	Sets the source of volume modulation and its polarity.
VOLUME min & max	0dB - -40dB, off	Sets the minimum and maximum levels of volume modulation.
DETUNE (HARM1-4)	+/- 100 cents	Sets the amount of variation from the root note for each harmony voice.
DETUNE modulate by	none, Expr 1-16, EnvGen, LFO 1-2, MIDI PB; +,-	Sets the source of detune modulation and its polarity.
distortion enable	off, ON	Toggles the distortion effect.
distortion type	Smokin, Rockin, Grungy, Mellow	Sets different types of distortion.
distortion preamp drive	0 - 42 dB	Sets the level of signal going into the first distortion amp section.
distortion power amp drive	0 - 42 dB	Sets the level of signal going into the second distortion amp section.
distortion bass contour	off, low, med, high	Sets the bass contour: this bass filtering system eliminates "muddiness" from the distorted signal for low end signals.
enable	on, off	Enables the two voice harmony + distortion.
Mix Parameter	**Values**	**Description**
distortion level	off, -40db to 0db	Sets the level of the distorted signal.
level (DRY, HARM1-2)	off, -40db to 0db	Sets the level of the DRY signal & each harmony signal.
pan (DRY, HARM1-2)	L100% - L55%, Centre, R55% - R100%	Sets pan of the DRY signal & each harmony signal.

Notes on 2 Voice Harmony + Distortion Effects:

- When you customize a scalic harmony, the *interval*, *non-scale tone* and *pitch bend range* parameters will not be available for programming. Similarly, when you customize a chordal harmony, the *voicing* parameter will not be available, although the *bend* parameter is still available.
- Both voices in this effect are limited to a downward shift of one octave.

4 Voice Pitch Shift with Regeneration

This unique harmony effect combines digital delay with 4 voice unintelligent (or "dumb") pitch shifting to build regenerative shifting effects. Applications of this effects include Strumming effects, Autoharp simulation, Arpeggiation, Drum effects, and general audio "sweetening".



4 VOICE PITCH SHIFT WITH REGENERATION: EDIT MENUS

Edit

4 Shft+Regen VOICING unis +5 +7 +12 — Voicing

4 Shft+Regen [Edit] for VIBRATO menu — Vibrato

4 Shft+Regen [Edit] for PBEND menu — Pitch Bend

4 Shft+Regen [Edit] for VOLUME menu — Volume

4 Shft+Regen [Edit] for DETUNE menu — Detune

4 Shft+Regen type:PreDelay — 4 Shft+Regen Type

4 Shft+Regen splicing: C 1 — Splicing Point

4 Shft+Regen HARM1 splic 001 ms — HARM1 Delay

4 Shft+Regen HARM1 feedback: 0 % — HARM1 Feedback

4 Shft+Regen HARM1 rolloff: 2.0 KHz — HARM1 Rolloff Freq.

4 Shft+Regen HARM2 splic 001 ms — HARM2 Delay

4 Shft+Regen HARM2 feedback: 0 % — HARM2 Feedback

4 Shft+Regen HARM2 rolloff: 2.0 KHz — HARM2 Rolloff Freq.

4 Shft+Regen HARM3 splic 001 ms — HARM3 Delay

4 Shft+Regen HARM3 feedback: 0 % — HARM3 Feedback

4 Shft+Regen HARM3 rolloff: 2.0 KHz — HARM3 Rolloff Freq.

4 Shft+Regen HARM4 splic 001 ms — HARM4 Delay

4 Shft+Regen HARM4 feedback: 0 % — HARM4 Feedback

4 Shft+Regen HARM4 rolloff: 2.0 KHz — HARM4 Rolloff Freq.

4 Shft+Regen enable: ON — Enable

VIBRATO Sub-Menus

4 Shft+Regen [Edit] for VIBRATO menu (Vibrato) → Edit →

4 Shft+Regen VIBRATO depth: 0 — Vibrato Depth

4 Shft+Regen VIBRATO depth mod by: none + — Vibrato Depth Modulation

4 Shft+Regen VIBRATO rate: 0 — Vibrato Rate

4 Shft+Regen VIBRATO rate mod by: none + — Vibrato Rate Modulation

→ Exit

PBEND Sub-Menus

4 Shft+Regen [Edit] for PBEND menu (Pitch Bend) → Edit →

4 Shft+Regen PBEND pitch bend key:C — Pitch bend Key

4 Shft+Regen PBEND bend: unison — Pitch Bend Range

4 Shft+Regen PBEND mod by: none + — Pitch Bend Modulation

→ Exit

VOLUME Sub-Menus

4 Shft+Regen [Edit] for VOLUME menu (Volume) → Edit →

4 Shft+Regen VOLUME mod type: panning — Modulation Type

4 Shft+Regen VOLUME mod by: none + — Volume Modulation

4 Shft+Regen VOLUME min: off max: 0dB — Volume Max and Min

→ Exit

DETUNE Sub-Menus

4 Shft+Regen [Edit] for DETUNE menu (Detune) → Edit →

4 Shft+Regen HARM1 detune: 0 cents — Harmony 1 Detune

4 Shft+Regen HARM2 detune: 0 cents — Harmony 2 Detune

4 Shft+Regen HARM3 detune: 0 cents — Harmony 3 Detune

4 Shft+Regen HARM4 detune: 0 cents — Harmony 4 Detune

4 Shft+Regen DETUNE modulate by: none + — Detune Modulation

→ Exit

4 VOICE PITCH SHIFT WITH REGENERATION: MIX MENUS

Mix

4 Shft+Regen DRY lvl: 0dB pan:Centre — Dry Level & Pan

4 Shft+Regen HARM1 lvl: 0dB pan:Centre — Harmony 1 Level & Pan

4 Shft+Regen HARM2 lvl: 0dB pan:Centre — Harmony 2 Level & Pan

4 Shft+Regen HARM3 lvl: 0dB pan:Centre — Harmony 3 Level & Pan

4 Shft+Regen HARM4 lvl: 0dB pan:Centre — Harmony 4 Level & Pan

Edit & Mix 4 VOICE PITCH SHIFT WITH REGENERATION: PARAMETERS Edit & Mix

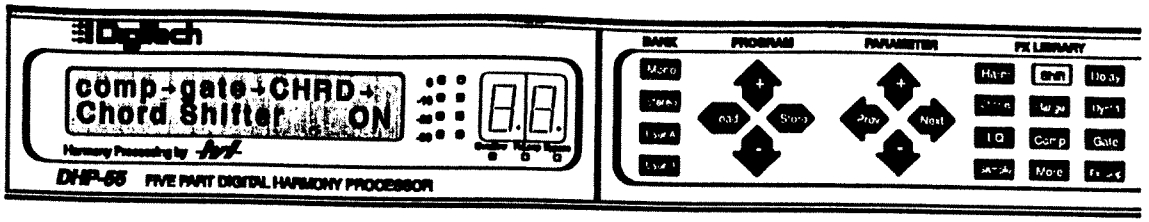
Edit Parameter	Values	Description
Harmony Voicing	(-24 - -1,unis,1 - 24) x 4	Defines the voicing of the shifted harmony.
VIBRATO depth	0 - 255	Sets amount of vibrato.
VIBRATO depth mod by	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets the source of vibrato depth modulation and its polarity.
VIBRATO rate	0 - 255	Sets speed of vibrato.
VIBRATO rate mod by	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets the source of vibrato rate modulation and its polarity.
PBEND pitch bend key	any key	Sets the key of the bent notes in a harmony.
PBEND bend (scalic)	unison, +/- 2 octaves	Sets interval above/below the original for the bent notes.
PBEND mod by	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets the source of pitch bend modulation and its polarity.
VOLUME mod type	normal, panning	Sets volume mod for tremolo/swell effects or panning effects.
VOLUME mod by	none, Expr 1-8, EnvGen, LFO 1-2; +,-	Sets the source of volume modulation and its polarity.
VOLUME min & max	off,-40dB to 0dB	Sets the minimum and maximum levels of volume modulation.
DETUNE	+/- 100 cents	Sets the amount of variation from the root note for each harmony voice.
DETUNE modulate by	none, Expr 1-16, EnvGen, LFO 1-2, MIDI PB; +,-	Sets the source of detune modulation and its polarity.
type	Pre Delay, Post Delay	Selects whether the Filtered Delay line for each voice occurs before (Pre) or after (Post) the tap for the output mixer.
splicing	C0 - C2 (MIDI Note #)	Selects the lowest note the effect will be able to shift. (Lower splice points may result in slightly longer delays in tracking the input).
Harm 1 - 4 delay time	0 - 1500 ms.	Selects the length of the delay line for each voice.
Harm 1 - 4 feedback	0 - 99%	Selects the attenuation (volume cut) applied to the delayed signal before it is fed back to the pitch shifter
Harm 1 - 4 rolloff	100 Hz, 200 Hz,400 Hz,600 Hz,800 Hz,1.0 kHz,1.3 kHz,1.6 kHz,2.0 kHz,2.5 kHz, 3.2 kHz,4.0 kHz,5.0 kHz,6.3 kHz,8.0 kHz,10.0 kHz,12.5 kHz,16.0 kHz,20.0 kHz,flat	Selects the cutoff frequency for the filter, which is applied before each voice enters its delay line.
enable	on, off	Enables 4 Voice Pitch Shift with Regeneration effect.
Mix Parameter	**Values**	**Description**
dry level	off,-40dB to 0dB	Sets the level of the dry signal.
dry pan	L100% - L55%, Centre, R55% - R100%	Sets pan of dry signal.
level (HARM1-4)	off,-40dB to 0dB	Sets the level of the each harmony signal.
pan (HARM1-4)	L100% - L55%, Centre, R55% - R100%	Sets pan of each harmony signal.

Notes on 4 Voice Pitch Shift with Regeneration Effects:

- Stereo 4 - Voice Pitch Shift with Regeneration (Found in the stereo bank) takes a left and right input signal and process them separately: Voice 1 & 3 are processed from the **Left Input**, while Voice 2 & 4 are processed from the **Right Input.**
- For Stereo Pitch Shifters, the **Right Input** is the one used for all pitch recognition and analysis: send the strongest and cleanest signal to this input if there is any wide variation between your left and right channels.
- Stereo 4 - Voice Pitch Shift with Regeneration has no dry pan.

Chord Shifter

The DHP-55 is the only signal processor that cleanly shifts multi-note, or chordal input. Chord Shifting may be used to thicken recorded sounds, keyboard or guitar signals. Depending on the settings, subtle to dramatic effects are possible. Chord Shifter Effects are designed to process polyphonic input such as guitar and keyboard chords.



Edit CHORD SHIFTER: EDIT MENUS Edit

Chord Shifter algorithm: Lush — Shifter Algorithm

Chord Shifter semitones: +7 — Semitone Shift

Chord Shifter cents: 0 — Cents Shift

Chord Shifter [Edit] for VOLUME menu — Volume

Chord Shifter enable: ON — Enable

Chord Shifter [Edit] for VOLUME menu — Volume

VOLUME Sub-Menus

Edit

Chord Shifter VOLUME mod type: panning — Modulation Type

Chord Shifter VOLUME mod by: none + — Volume Modulation

Chord Shifter VOLUME min: off max: 0dB — Volume Max and Min

Exit

Mix CHORD SHIFTER: MIX MENUS Mix

Chord Shifter DRY lvl: 0dB pan:Centre — Dry Level & Pan

Chord Shifter WET lvl: 0dB pan:Centre — Wet Level & Pan

Edit & Mix CHORD SHIFTER: PARAMETERS Edit & Mix

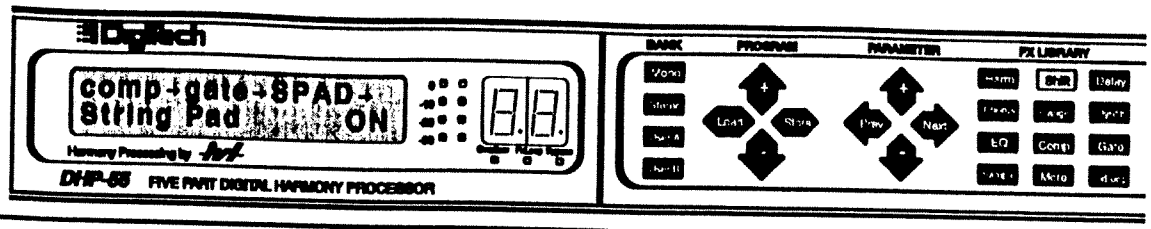
Edit Parameter	***Values***	***Description***
algorithm	*fast, smooth, lush*	*Sets the responsiveness of the chord shifter to fit your intended use. The Fast setting responds more quickly to changing inputs, but is not quite as full sounding. The Lush setting is fuller, but sacrifices some responsiveness.*
semitones	*0 to +12*	*The number of semitones the polyphonic or chordal input will be shifted.*
cents	*-50 to +50*	*Fine adjustment of the chord shifter. 1 cent is 1/100th of a semitone.*
***VOLUME** mod Type*	*normal, panning*	*Sets volume mod for tremolo/swell effects or panning effects.*
***VOLUME** mod by*	*none, Expr 1-8, EnvGen, LFO 1-2; +,-*	*Sets the source of volume modulation and its polarity.*
***VOLUME** min & max*	*off, -40 dB to 0dB*	*Sets the minimum and maximum levels of volume modulation.*
enable	*off, ON*	*Enables the chord shifter.*
Mix Parameter	***Values***	***Description***
Dry level	*off, -40 dB to 0dB*	*Sets the dry signal level.*
Dry pan	*L100% - L55%, Centre, R55% - R100%*	*Sets the panning of the dry signal in the stereo image.*
Wet level	*off, -40 dB to 0dB*	*Sets the wet signal level.*
Pan	*L100% - L55%, Centre, R55% - R100%*	*Sets the panning of the wet signal in the stereo image.*

Notes on Chord Shifter Effects:

- The Stereo Chord Shifter has no dry pan.

String Pad

String pad is a special effect unique to the DHP-55, and IPS-33B. Sounding like a new age mellotron and analog synth-strings combination, String Pad can be faded in and out of the DHP-55's output with the expression pedal and other Expression Controllers, or swelled in and out with the Envelope Generator or LFO's.



STRING PAD: EDIT MENUS

Edit

String Pad LEFT tone: 15 — Left Tone

String Pad RIGHT tone: 17 — Right Tone

String Pad [Edit] for DETUNE menu — Detune

String Pad [Edit] for VIBRATO menu — Vibrato

String Pad splicing: C 0 — String Pad Splicing

String Pad SWELL type: wet+dry — Swell Type

String Pad SWELL mod by: none + — Swell Modulation

String Pad enable: ON — String Pad Enable

DETUNE Sub-Menus

String Pad [Edit] for DETUNE menu — Detune

Edit

String Pad DETUNE1 left: 0 cents — Harmony 1 Detune

String Pad DETUNE 2 right: 0 cents — Harmony 2 Detune

String Pad DETUNE modulate by: none + — Detune Modulation

Exit

VIBRATO Sub-Menus

String Pad [Edit] for VIBRATO menu — Vibrato

Edit

String Pad VIBRATO depth: 0 — Vibrato Depth

String Pad VIBRATO depth mod by: none + — Vibrato Depth Modulation

String Pad VIBRATO rate: 0 — Vibrato Rate

String Pad VIBRATO rate mod by: none + — Vibrato Rate Modulation

Exit

STRING PAD: MIX MENUS

Mix

String Pad SWELL level: -5dB — Swell Level

String Pad DRY level: 0dB — Dry Level

String Pad WET level: 0dB — Wet Level

Mix

Notes on String Pad:

- The splicing parameter can be adjusted to improve the tonal quality of the effect, depending on the key you are playing in. For instance, choose C if you are playing in the key of C. Adjusting to lower splicing values, such as C0 rather than C1, will improve the sound when lower notes are being played.

STRING PAD: PARAMETERS

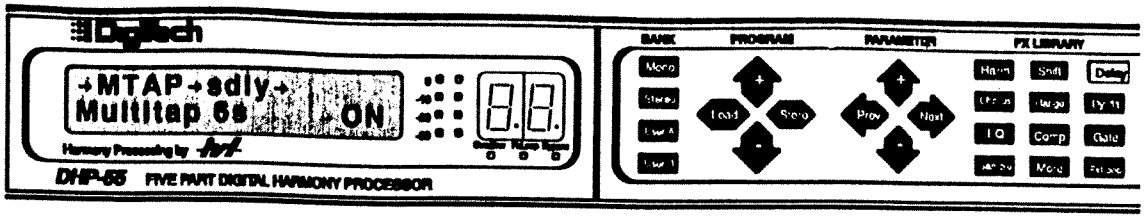
Edit & Mix

Edit Parameter	Values	Description
Left tone	0 - 63	Sets the frequency band where overtones are boosted in the string pad sound's left channel output.
Right tone	0 - 63	Sets the frequency band where overtones are boosted in the string pad sound's right channel output.
Left detune	-100 to +100 Cents	Sets the detuning of the left channel.
Right detune	-100 to +100 Cents	Sets the detuning of the right channel.
Vibrato depth	0 - 255	Sets the depth of the string pad vibrato.
Vibrato depth mod by:	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets which source (LFO, Pedal, etc.) modulates the String Pad's vibrato depth.
Vibrato rate	0 - 255	Sets the rate of the string pad vibrato.
Vibrato rate mod by:	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets which source (LFO, Pedal, etc.) modulates the String Pad's vibrato rate.
splicing	C 1 to C 3 (MIDI note #)	Selects the lowest note the effect will shift.
Swell Type	wet+dry, wet only	Selects whether the dry signal will be swelled along with the wet.
Swell Modulation	none, Expr 1-16, EnvGen, LFO 1-2; +,-	Sets which source (LFO, Pedal, etc.) modulates the String Pad's swell.
Swell Level	off, -40dB to 0dB	Sets the output level of the swelled string pad signal.
String Pad Enable	off, ON	Enables the String Pad.
Mix Parameter	**Values**	**Description**
Swell, Dry, Wet level	off, -40 - 0dB	Sets the Swell, Dry and Wet signal levels.

Multitap Delay

Multi-Tap Digital Delay is a flexible delay effect with six individual output taps and a single feedback echo. Each of the output taps, as well as the feedback echo can be set to have independent delay times, levels and pan positions. Possible applications of these capabilities are

* 6 early reflections to simulate complex room ambiences
* the creation of up to 6 precisely timed echoes



Edit MULTITAP DELAY: EDIT MENUS Edit

Multitap 6s fdback delay: 000 ms	Multitap 6s feedback: 0 %	Multitap 6s rolloff: 100 Hz	Multitap 6s TAP1 delay time: 000 ms	Multitap 6s TAP2 delay time: 000 ms	Multitap 6s TAP3 delay time: 000 ms
Feedback Delay	Feedback %	Rolloff Frequency	TAP 1 Delay Time	TAP2 Delay Time	TAP 3 Delay Time
Multitap 6s TAP4 delay time: 000 ms	Multitap 6s TAP5 delay time: 000 ms	Multitap 6s TAP6 delay time: 000 ms	Multitap 6s enable: ON		
TAP 4 Delay Time	TAP 5 Delay Time	TAP 6 Delay Time	MultiTap Enable		

Mix MULTITAP DELAY: MIX MENUS Mix

Multitap 6s DRY level: 0dB	Multitap 6s TAP1 lvl: 0dB pan:Centre	Multitap 6s TAP2 lvl: 0dB pan:Centre	Multitap 6s TAP3 lvl: 0dB pan:Centre	Multitap 6s TAP4 lvl: 0dB pan:Centre	Multitap 6s TAP5 lvl: 0dB pan:Centre
Dry Level & Pan	Tap 1 Level & Pan	Tap 2 Level & Pan	Tap 3 Level & Pan	Tap 4 Level & Pan	Tap 5 Level & Pan
Multitap 6s TAP6 lvl: 0dB pan:Centre					
Tap 6 Level & Pan					

Edit & Mix MULTITAP DELAY: PARAMETERS Edit & Mix

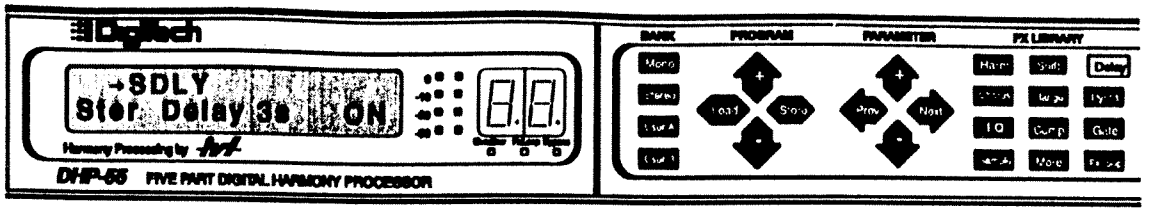
Edit Parameter	Values	Description
feedback delay	000 ms to 3000 ms or 6000 ms *	The length of time between the original signal and a feedback of the original signal into the chain of taps.
feedback	0-99%	Sets the percentage of the original signal level fed back to the beginning of the chain of taps.
rolloff	100Hz - 20kHz, Flat	Rolloff filter causes the higher frequencies in the delay network to die away quicker just as with echoes in nature. The rolloff setting determines the frequency at which this attenuation begins to occur.
TAP 1 delay time	000ms - 3000 or 6000 ms*	The length of time between the original signal and the first delay tap.
TAP 2 delay time	000ms - 3000 or 6000 ms*	The length of time between the original signal and the second delay tap.
TAP 3 delay time	000ms - 3000 or 6000 ms*	The length of time between the original signal and the third delay tap.
TAP 4 delay time	000ms - 3000 or 6000 ms*	The length of time between the original signal and the fourth delay tap.
TAP 5 delay time	000ms - 3000 or 6000 ms*	The length of time between the original signal and the fifth delay tap.
TAP 6 delay time	000ms - 3000 or 6000 ms*	The length of time between the original signal and the sixth delay tap.
enable	off, ON	Enables the multitap delay.
Mix Parameter	**Values**	**Description**
DRY level	off, -40db to 0dB	Sets the amount of dry signal mixed with the 6 delay taps.
TAP 1 lvl	off, -40db to 0dB	Sets the output level of delay tap 1.
TAP 1 pan	L100% - R100%	Sets the position of the tap's output in the stereo image.
TAP 2 lvl	off, -40db to 0dB	Sets the output level of delay tap 2.
TAP 2 pan	L100% - R100%	Sets the position of the tap's output in the stereo image.
TAP 3 lvl	off, -40db to 0dB	Sets the output level of delay tap 3.
TAP 3 pan	L100% - R100%	Sets the position of the tap's output in the stereo image.
TAP 4 lvl	off, -40db to 0dB	Sets the output level of delay tap 4.
TAP 4 pan	L100% - R100%	Sets the position of the tap's output in the stereo image.
TAP 5 lvl	off, -40db to 0dB	Sets the output level of delay tap 5.
TAP 5 pan	L100% - R100%	Sets the position of the tap's output in the stereo image.
TAP 6 lvl	off, -40db to 0dB	Sets the output level of delay tap 6.
TAP 6 pan	L100% - R100%	Sets the position of the tap's output in the stereo image.

Notes on Multitap Delay Effects:

- When high ***feedback*** parameter settings (ie. 99%) are programmed in any delay effects, input hum and noise can build up in the delay lines. Proper use of the Noise Gate effects (see P. 46) will help remedy the situation by eliminating this noise when you are not playing.
- * Certain Multitap Delay programs are limited to 3 seconds (3000 ms.) of delay. These programs are identified by "3 s" appearing in the Configuration menus.

Stereo Delay

Digital Stereo Delay is an effect that creates an echo of a stereo signal, simulating the effect of a large surface reflecting back the original sound. In Normal mode, the controls of the left and right delay lines are completely independent. In Ping/Pong mode the echoed signal bounces back and forth between the left and right delay lines.



Also included in the Stereo Delay effect is a Ducker effect. One way to view the ducker is as an inverse noise gate acting on the delayed stereo signal. The ducker function monitors the input level to the DHP-55. When the input level is below the ducker threshold, the ducker has no effect on the delay levels. When the input level is above the ducker threshold, the ducker attenuates the level of the delay outputs by the ducked level. The ducker provides a means for using dense delay patterns at the end of musical phrases without the delays cluttering up the middle of the phrase.

Edit STEREO DELAY: EDIT MENUS Edit

Ster Delay 3s type: Ping/Pong	Ster Delay 3s LEFT delay time: 000 ms	Ster Delay 3s LEFT feedback: 0 %	Ster Delay 3s LEFT rolloff: Flat	Ster Delay 3s RIGHT delay time: 000 ms	Ster Delay 3s RIGHT feedback: 0 %
Stereo Delay Type	Left Delay Time	Left Feedback	Left Rolloff Frequency	Right Delay Time	Right Feedback
Ster Delay 3s RIGHT rolloff: Flat	Ster Delay 3s DUCKER enable: ON	Ster Delay 3s DUCKER threshold: -30 dB	Ster Delay 3s DUCKER attack: 10 ms	Ster Delay 3s DUCKER release: 5 sec	Ster Delay 3s DUCKER ducked level: -30 dB
Right Rolloff Frequency	Ducker Enable	Ducker Threshold	Ducker Attack Time	Ducker Release Time	Ducker Level
Ster Delay 3s enable: ON					
Enable					

Mix STEREO DELAY: MIX MENUS Mix

Ster Delay 3s DRY level: 0dB	Ster Delay 3s LEFT lvl: 0dB pan:Centre	Ster Delay 3s RIGHT lvl: 0dB pan:Centre
Dry Level	Left Level & Pan	Right Level & Pan

Edit & Mix STEREO DELAY: PARAMETERS Edit & Mix

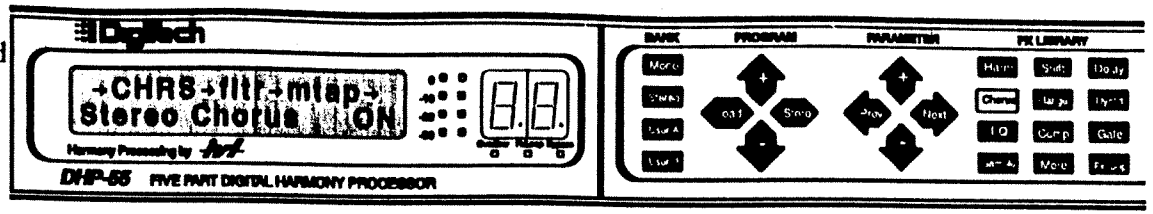
Edit Parameter	Values	Description
type	Normal, Ping/Pong	Determines whether the signal content on each channel remains in the same place (normal), or if it alternates between left and right outputs.
LEFT delay time	0 - 1500 or 3000 milliseconds *	Sets left channel delay time.
LEFT feedback	0 - 99%	Sets left channel delay regeneration or feedback.
LEFT rolloff	100Hz - 20kHz, flat	Rolloff filter causes the higher frequencies in the delay network to die away quicker just as with echoes in nature. The rolloff setting determines the frequency at which this attenuation begins to occur.
RIGHT delay time	0 - 1500 or 3000 milliseconds *	Sets right channel delay time.
RIGHT feedback	0 - 99%	Sets right channel delay regeneration or feedback.
RIGHT rolloff	100Hz - 20kHz, flat	Rolloff filter causes the higher frequencies in the delay network to die away quicker just as with echoes in nature. The rolloff setting determines the frequency at which this attenuation begins to occur.
DUCKER enable	off, ON	Enables the ducker function for stereo delay.
DUCKER threshold	-70dB to 0dB	Sets the input level threshold above which the ducker reduces the delay levels.
DUCKER attack	1 ms - 10 sec	Sets the time for the ducker to fully reduce the delay levels.
DUCKER release	1 ms - 10 sec	Sets the time for the ducker to fully restore the delay levels.
DUCKER ducked level	-70dB to 0dB	Sets the amount of level reduction to apply to the delay levels when ducking.
enable	off, On	Enables the stereo delay.
Mix Parameter	**Values**	**Description**
Dry Level	off, -40dB to 0dB	Sets the amount of dry signal mixed with the Left and Right delay outputs.
LEFT lvl	off, -40dB to 0dB	Left channel level control.
LEFT pan	L100% - R100%	Left channel pan control.
RIGHT lvl	off, -40dB to 0dB	Right channel level control.
RIGHT pan	L100% - R100%	Right channel pan control.

Notes on Stereo Delay Effects:

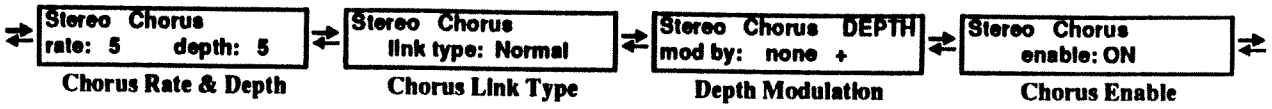
- When high ***feedback*** parameter settings (ie. 99%) are programmed in any delay effects, input hum and noise can build up in the delay lines. Proper use of the Noise Gate effects (see P. 46) will help remedy the situation by eliminating this noise when you are not playing.
- * Certain Stereo Delay programs are limited to 1.5 seconds (1500 ms) of delay. These programs are identified by "1.5" appearing in the Configuration menus.

Stereo Chorus

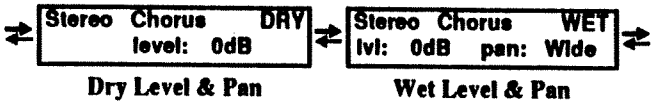
The DHP-55's Stereo Chorus effect creates multiple, slightly delayed copies of the input signal and recombines them producing the sense of multiple input signals playing in unison: The resulting sound is wider and more pleasant than the source.



Edit STEREO CHORUS: EDIT MENUS Edit



Mix STEREO CHORUS: MIX MENUS Mix

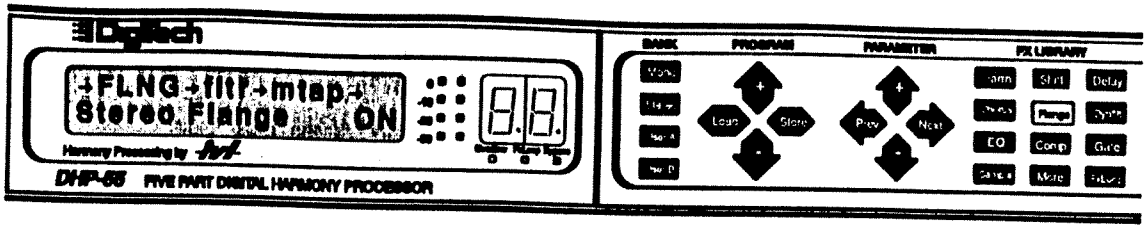


Edit & Mix STEREO CHORUS: PARAMETERS Edit & Mix

Edit Parameter	*Values*	*Description*
rate	*0-15*	*Sets the speed of chorusing.*
depth	*0-15*	*Sets the depth of chorusing*
link type	*Normal, Reverse*	*Reverse makes the direction of the chorusing in the left and right channels exactly opposite. This setting allows deeper chorusing while maintaining a more "in tune" signal, and also makes gives monophonic signals a bigger sound.*
DEPTH mod by	*none, Expr 1-8, EnvGen, LFO 1-2; +,-*	*Sets the source of modulation for the stereo chorus depth.*
enable	*off, ON*	*Enables the stereo chorus.*
Mix Parameter	*Values*	*Description*
DRY level	*off, -40dB to 0dB*	*Sets the level of the dry signal.*
WET lvl	*off, -40dB to 0dB*	*Sets the level of the chorused signal*
WET pan	*Narrow, Wide*	*Determines the amount of stereo separation of the chorused signal.*

Stereo Flange

The DHP-55's Digital Flange effect simulates the sound of two identical analog reel to reel tapes playing back while the flange of one of the tape reels is under pressure from the studio engineer's hand to slow it down: The resulting phasing effect between the two tapes is known as flanging. Flange is traditionally used to create "spacey" sounding vocals, guitar lines, drums and background pad drones.



Edit STEREO FLANGE: EDIT MENUS Edit

Stereo Flange rate: 0 depth: 0	Stereo Flange delay: 1 ms	Stereo Flange level: INPUT 0dB	Stereo Flange feedback: 0%	Stereo Flange feedback type: pos	Stereo Flange enable: ON
Flange Rate & Depth	Flange Delay	Flange Input Level	Flange Feedback %	Flange Feedback Type	Flange Enable

Mix STEREO FLANGE: MIX MENUS Mix

Stereo Flange level: DRY 0dB	Stereo Flange level: WET 0dB
Dry Level	Wet Level

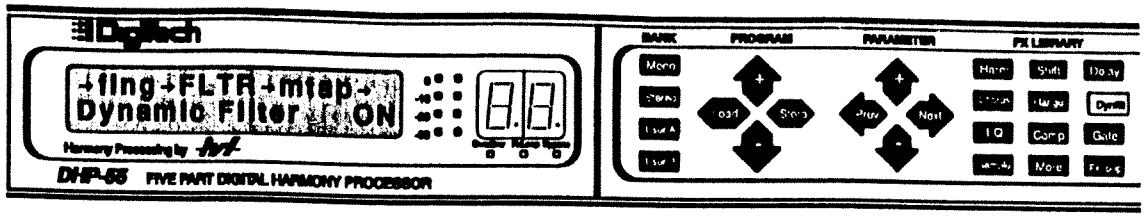
Edit & Mix STEREO FLANGE: PARAMETERS Edit & Mix

Edit Parameter	*Values*	*Description*
rate	*0 - 16*	*Sets the speed of flanging.*
depth	*1 - 16*	*Sets the depth of flanging.*
delay	*1 - 16 ms*	*Controls the flanger delay line length. Longer delays settings lower the perceived pitch of flanging.*
INPUT level	*off, -40dB to 0dB*	*Sets the level of the input signal.*
feedback	*0 - 99 %*	*Sets the percentage of flange feedback. Higher settings increase the perceived depth of flanging.*
feedback type	*pos / neg*	*Sets the polarity of the flange feedback (positive or negative).*
stereo flange enable	*off, ON*	*Enables the Stereo Flanger.*
Mix Parameter	*Values*	*Description*
DRY level	*off, -40 - 0 dB*	*Sets the level of the dry signal*
WET level	*off, -40 - 0 dB*	*Sets the level of the flanged signal*

Dynamic Filter

The Dynamic Digital Filter allows for a range of real-time Bandpass and Lowpass filter effects, from wah-wah to subtle timbre variations. Dynamic filter sweeping can be controlled by any of the 8 DHP-55 expression controllers, the envelope generator or one of the 2 LFOs, providing effects such as:

* pedal wah (expression pedal controlled)
* touch wah (envelope generator controlled)
* swept wah (LFO controlled)



DYNAMIC FILTER: EDIT MENUS

Edit

Dynamic Filter type: bandpass	Dynamic Filter resonance: 7	Dynamic Filter lowest freq: 770 Hz	Dynamic Filter freq range: 1/4 oct	Dynamic Filter mod by: none +	Dynamic Filter enable: off
Filter Type	Filter Resonance	Filter Lowest Frequency	Frequency Range	Filter Sweep Modulation	Filter Enable

Edit

DYNAMIC FILTER: MIX MENUS

Mix

Dynamic Filter DRY lvl: 0dB	Dynamic Filter WET lvl: 0dB
Dry Level & Pan	Wet Level & Pan

Mix

DYNAMIC FILTER: PARAMETERS

Edit & Mix

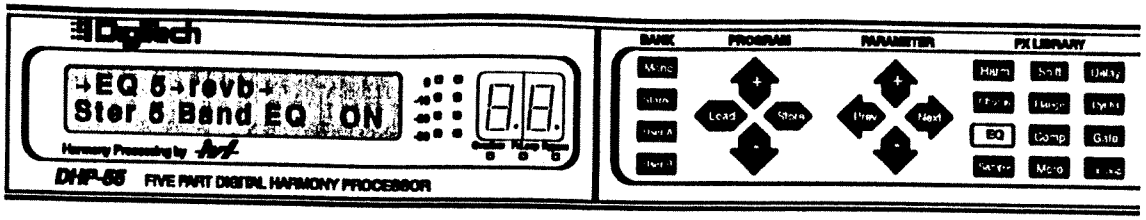
Edit Parameter	*Values*	*Description*
type	*bandpass, lowpass*	*Sets the type of digital filter to dynamically control: Bandpass allows only a midrange frequency band to pass through the filter, while Lowpass also allows low frequencies to pass through.*
resonance	*1-7*	*Sets the "sharpness" of the filtering: higher values provide sharper filtering along with a greater emphasis at the resonant frequency.*
lowest freq	*250 - 1000 Hz*	*Sets the reference frequency above which the filter resonant frequency is modulated.*
freq range	*1/4 oct, 1/2 oct, 1 oct, 2 oct*	*Sets the range of resonant frequency modulation.*
SWEEP Mod by	*none, Expr 1-8, EnvGen, LFO 1-2; +,-*	*Sets the source of filter modulation.*
enable	*off, ON*	*Enables the Dynamic Filter.*
Mix Parameter	*Values*	*Description*
DRY level	*off, -40dB to 0dB*	*Sets the dry signal level.*
WET level	*off, -40dB to 0dB*	*Sets the filtered signal level.*

Notes on Dynamic Filter Effects:

- The Dynamic Filter can also be used as a fixed frequency Notch Filter to create resonance: Simply set up the Dynamic Filter with no modulation source.

Graphic Equalizer: Stereo 5 Band

This stereo equalizer configuration consists of 5 sliders per channel, each of which controls the gain of one of these frequencies:
100 Hz, 320 Hz, 1 kHz, 3.2 kHz & 10 kHz.



STEREO 5 BAND EQ: EDIT MENUS

Edit

L 400KHz +2dB — Left Channel Equalizer

R 400KHz -2dB — Right Channel Equalizer

Ster 5 Band EQ enable: off — Stereo 5 Band EQ Enable

Edit

STEREO 5 BAND EQ: MIX MENUS

Mix

Ster 5 Band EQ LEFT level: 0dB — Left Level

Ster 5 Band EQ RIGHT level: 0dB — Right Level

Mix

STEREO 5 BAND EQ: PARAMETERS

Edit & Mix

Edit Parameter	Values	Description
frequencies 100 Hz to 10 KHz (L&R)	-12 to +12 dB	Sets the cut/gain in the frequency band being edited.
enable	off, ON	Enables the 5 band Equalizer.
Mix Parameter	**Values**	**Description**
LEFT level	off, -40dB to 0dB	Sets the Left equalized signal level.
RIGHT level	off, -40dB to 0dB	Sets the Right equalized signal level.

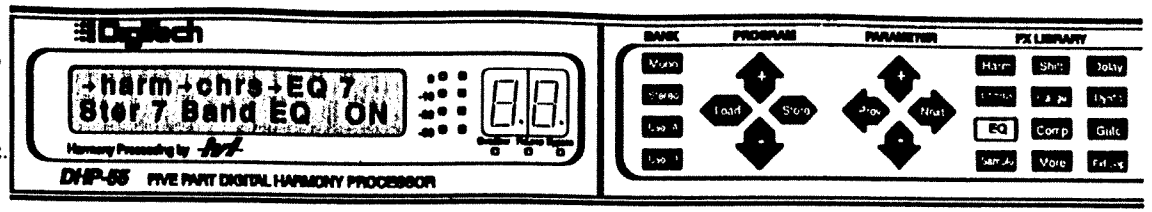
Notes on 5 Band Equalizer Effects:

- As with all Equalizer effects, it is better to cut frequencies than to boost them, since boosting of frequencies tends to introduce subtle phase shifts to the input signal, unintentionally changing your sound.

Graphic Equalizer: Mono & Stereo 7 Band

This 7 band EQ effect is available as a mono or ***stereo*** configuration, consisting of 7 sliders (per channel for stereo), each of which controls the gain of one of these frequencies:

63 Hz, 160 Hz, 400 Hz, 1 kHz, 2.5 kHz, 6.3 kHz and 16 kHz.



Edit STEREO 7 BAND EQ: EDIT MENUS **Edit**

L 63Hz +5dB	R 16KHz -2dB	Ster 7 Band EQ enable: off
Left Channel Equalizer	Right Channel Equalizer	Stereo 7 Band EQ Enable

Mix STEREO 7 BAND EQ: MIX MENUS **Mix**

Ster 7 Band EQ LEFT level: 0dB	Ster 7 Band EQ RIGHT level: 0dB
Left Level	Right Level

Edit & **Mix** STEREO 7 BAND EQ: PARAMETERS **Edit** & **Mix**

Edit Parameter	***Values***	***Description***
frequencies 63 Hz to 16 KHz	*-12 to +12 dB*	*Sets the cut/gain in the frequency band being edited.*
enable	*off, ON*	*Enables the 7 band Equalizer.*
Mix Parameter	***Values***	***Description***
LEFT level	*off, -40dB to 0dB*	*Sets the Left equalized signal level.*
RIGHT level	*off, -40dB to 0dB*	*Sets the Right equalized signal level.*

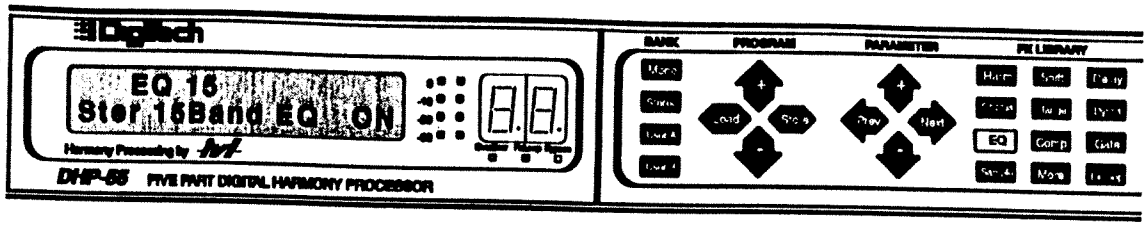
Notes on 7 Band Equalizer Effects:

- Mono 7 band equalizer effects do not have a "L" or "R" EQ menu: There is only one (mono) slider for each frequency.
- As with all Equalizer effects, it is better to cut frequencies than to boost them, since boosting of frequencies tends to introduce subtle phase shifts to the input signal, unintentionally changing your sound.

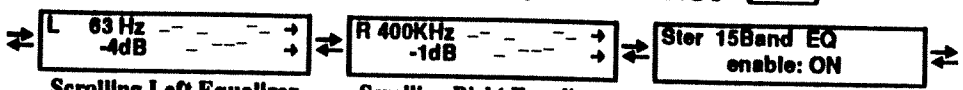
Graphic Equalizer: Stereo 15 Band

This stereo equalizer configuration consists of 15 sliders per channel, each of which controls the gain of one of these frequencies:

25 Hz, 40 Hz, 63 Hz, 100 Hz, 160 Hz, 250 Hz, 400 Hz, 630 Hz, 1 kHz, 1.6 kHz, 2.5 kHz, 4 kHz, 6.3 kHz, 10 kHz & 16 kHz

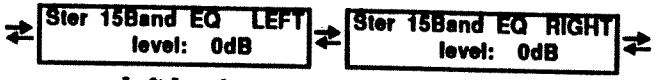


Edit STEREO 15 BAND EQ: EDIT MENUS **Edit**



Scrolling Left Equalizer | Scrolling Right Equalizer | Stereo 5 Band EQ Enable

Mix STEREO 15 BAND EQ: MIX MENUS **Mix**



Left Level | Right Level

Edit & **Mix** STEREO 15 BAND EQ: PARAMETERS **Edit** & **Mix**

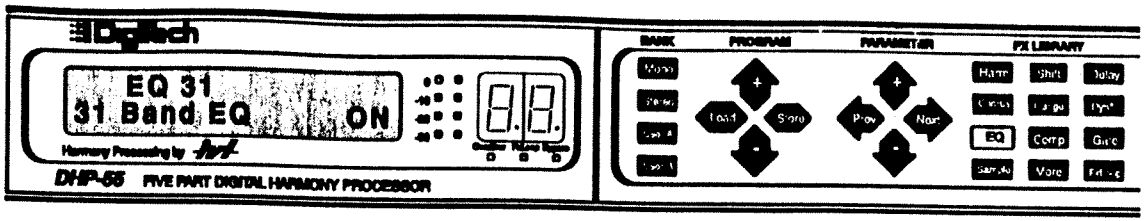
Edit Parameter	***Values***	***Description***
frequencies 25 Hz to 16 KHz (L&R)	*-12 to +12 dB*	*Sets the cut/gain in the frequency band being edited.*
enable	*off, ON*	*Enables the 15 band Equalizer.*
Mix Parameter	***Values***	***Description***
LEFT level	*off, -40dB to 0dB*	*Sets the Left equalized signal level.*
RIGHT level	*off, -40dB to 0dB*	*Sets the Right equalized signal level.*

Notes on 15 Band Equalizer Effects:

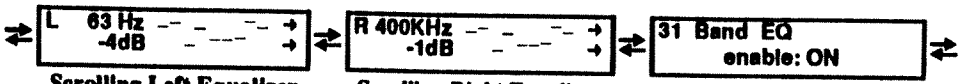
- As with all Equalizer effects, it is better to cut frequencies than to boost them, since boosting of frequencies tends to introduce subtle phase shifts to the input signal, unintentionally changing your sound.

Graphic Equalizer: Mono 31 Band

This mono equalizer configuration consists of 31 sliders, each of which controls the gain of one of these frequencies:
20 Hz, 25 Hz, 31.5 Hz, 40 Hz, 50 Hz, 63 Hz, 80 Hz, 100 Hz, 125 Hz, 160 Hz, 200 Hz, 250 Hz, 315 Hz, 400 Hz, 500 Hz, 630 Hz, 800 Hz, 1 kHz, 1.25 kHz, 1.6 kHz, 2 kHz, 2.5 kHz, 3.15 kHz, 4 kHz, 5 kHz, 6.3 kHz, 8 kHz, 10 kHz, 12.5 kHz, 16 kHz & 20 kHz.



Edit MONO 31 BAND EQ: EDIT MENUS Edit



Scrolling Left Equalizer | Scrolling Right Equalizer | 31 Band EQ Enable

Mix MONO 31 BAND EQ: MIX MENUS Mix

Level

Edit & Mix MONO 31 BAND EQ: PARAMETERS Edit & Mix

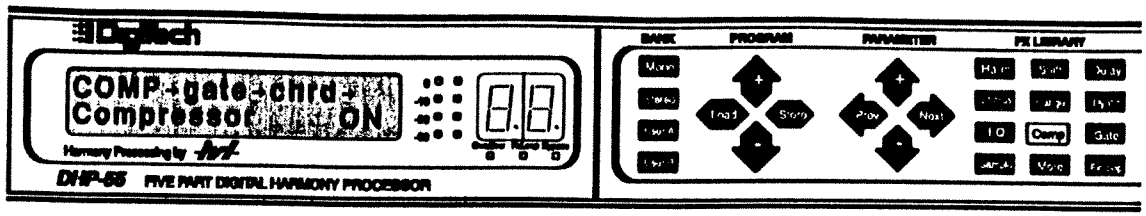
Edit Parameter	***Values***	***Description***
frequencies 20 Hz to 20 KHz	*-12 to +12 dB*	*Sets the cut/gain in the frequency band being edited.*
enable	*off, ON*	*Enables the 31 band Equalizer.*
Mix Parameter	***Values***	***Description***
Level	*off, -40dB to 0dB*	*Sets the level of the 31 band Equalizer.*

Notes on 31 Band Equalizer Effects:

- As with all Equalizer effects, it is better to cut frequencies than to boost them, since boosting of frequencies tends to introduce subtle phase shifts to the input signal, unintentionally changing your sound.

Analog and Digital Compressor

Compression is an effect that reduces the source signal's dynamic range: The compressor will make loud signals softer and soft signals louder, thereby compressing the dynamic range of the instrument. The resulting sound is tighter and more uniform, allowing for longer sustaining notes and a more consistent signal level.



Edit COMPRESSOR: EDIT MENUS **Edit**

Compressor max output: 1 dB	Compressor threshold: -50 dB	Compressor ratio: 20:1	Compressor release: 1.0 sec	Compressor enable: ON
Output	Threshold	Ratio	Release Time	Compressor Enable

Edit & **Mix** COMPRESSOR: PARAMETERS **Edit** & **Mix**

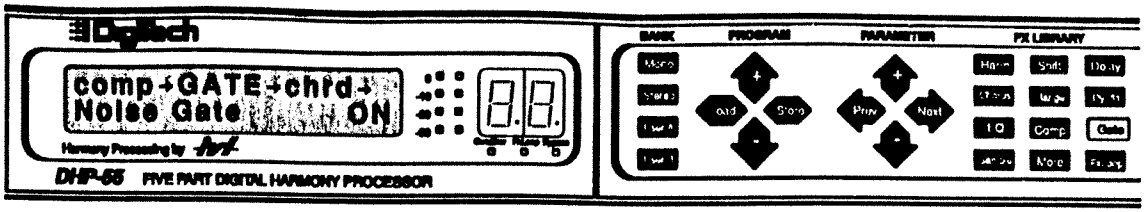
Edit Parameter	Values	Description
max output	*-12dB to +12 dB (analog) or off, -40dB to 0dB (digital)*	*Adjusts the overall output level from the compressor.*
threshold	*-60dB - 0dB*	*Sets the minimum level that the input signal must reach before the compressor starts to work. Setting it to -60dB means the compressor operates all the time. Higher settings give more dynamic range.*
ratio	*1:1 - Inf:1*	*Sets the amount of overall compression once threshold level is passed. Ratio is the ratio of output level to input level beyond the threshold. 1:1 means that the output will exactly mirror changes in the input level. At 2:1, for any increase in the input level you will get a 1/2 increase in the output level. At Inf:1 (infinite), the output level is fixed regardless of the input level.*
release	*.2 sec - 5.0 sec*	*Sets the amount of time it takes for the compressor to shut down after the signal falls below the threshold level.*
enable	*off, ON*	*Enables the compressor.*

Notes on Compressor Effects:

- The DHP-55's Compressor effect is an *Analog* effect available in ***mono input*** programs (like those found in the Mono bank). Since this analog effect can only handle a mono signal, it is not available in the ***stereo input*** programs (like those found in the Stereo bank): Instead, certain stereo input programs feature a *Digital* Compressor effect that features the same menus and parameters as its mono analog counterpart while being capable of handling stereo input signals.

Analog and Digital Noise Gate

The noise gate shuts off (or gates) the output when the input signal falls below the threshold level. This effect can be used to eliminate noise such as pick-up hum and tape hiss; additionally, the noise gate effect can be used to add emphasis to percussive playing and drum sounds.



Edit NOISE GATE: EDIT MENUS **Edit**

Noise Gate threshold: 50 dB	Noise Gate attack: 5 ms	Noise Gate release: .5 sec	Noise Gate enable: ON
Threshold	Attack Time	Release Time	Noise Gate Enable

Edit & **Mix** NOISE GATE: PARAMETERS **Edit** & **Mix**

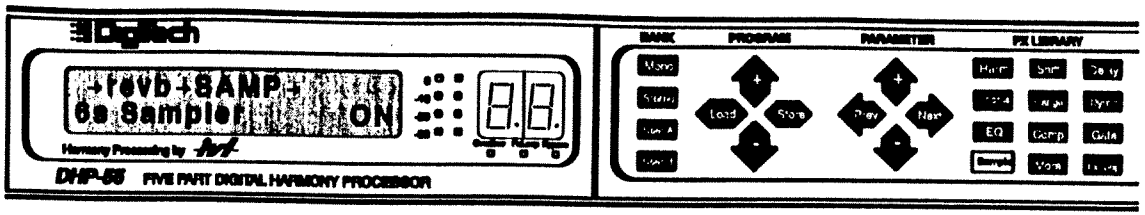
Edit Parameter	Values	Description
threshold	*-70dB to 0dB*	*Sets the threshold (signal level) below which the noise gate kicks in and attenuates the signal. The lower the threshold, the longer sustained passages will hold, but the more noise will get through during quiet passages.*
attack	*1ms - 100ms*	*Sets the amount of time it takes for the noise gate to stop attenuating the input signal after the input level rises above the threshold.*
release	*.2 - 5.0 seconds*	*Sets the amount of time it takes for the noise gate to completely attenuate the input signal when the input level falls below the threshold.*
noise gate enable	*off, ON*	*Enables the noise gate.*

Notes on Noise Gate Effects:

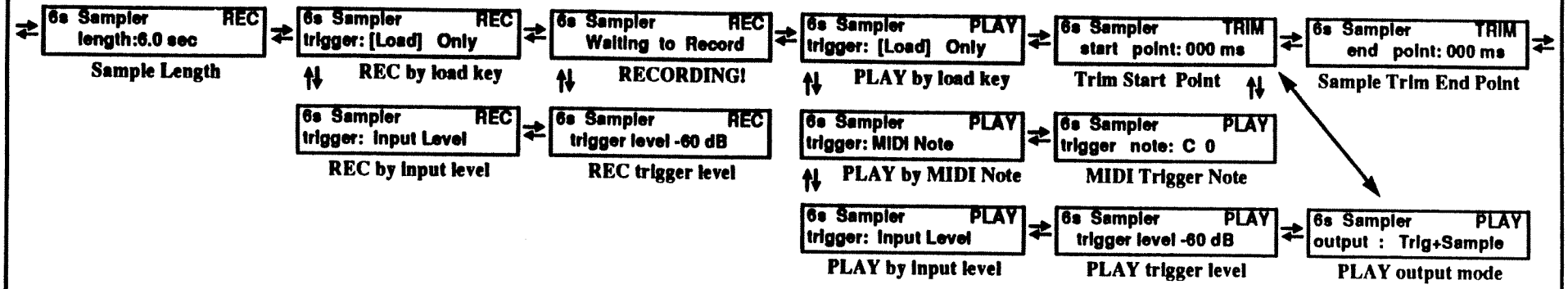
- The DHP-55's Noise Gate effect is an *Analog* effect available in ***mono input*** programs (like those found in the **Mono** bank). Since this analog effect can only handle a mono signal, it is not available in the ***stereo input*** programs (like those found in the **Stereo** bank): Instead, certain stereo input programs feature a *Digital* Noise Gate effect that features the same menus and parameters as its mono analog counterpart while being capable of handling stereo input signals.

Digital Sampler

Live performers and studio artists alike can make use of the DHP-55's sampler feature, which allows the recording and playback of a digital recording (or sample) of up to six seconds length. Once a sound has been sampled, the user can then edit its length and trigger its playback via an input signal, MIDI note or key-press.



Edit DIGITAL SAMPLER: EDIT MENUS Edit



Edit DIGITAL SAMPLER: PARAMETERS Edit

Edit Parameter	Values	Description
REC length	0.1 - 6.0 sec (mono) 0.1 - 3.0 sec (stereo)	Sets length of sample record time
REC trigger	Load / Input level	Sets whether the load key or the input signal triggers the start of sample recording.
REC trigger level	-72 to -1 dB	Sets the level above which an audio signal triggers sample recording, in input level record trigger mode.
PLAY trigger	Load, MIDI Note, Input level	Sets which event triggers sample playback: the load key, a note received through MIDI, or an input signal.
PLAY trigger note	C0 - G10, any	Sets which MIDI note triggers sample playback, in MIDI note play trigger mode.
PLAY trigger level	-72 to -1 dB	Sets the level at which the input signal triggers sample playback, in input level record trigger mode.
PLAY output mode	Trig + Sample / Sample only	Sets whether the triggering signal is to be mixed with sample playback or not, in input level record trigger mode.
TRIM start point	000 ms - 6000 ms (mono) 000 ms - 3000 ms (stereo)	Sets the point in the sample to start playback from.
TRIM end point	0 ms - 6000 ms 000 ms - 3000 ms (stereo)	Sets the point in the sample where playback stops.
enable	off, ON	Enables the sampler.

- Up to six seconds of mono or three seconds of stereo signal can be recorded at any one time; the user is then free to set start and end points within the sample for playback. This editing is non-destructive, which means that any sample data outside the start and end points is not erased, and can be used later.

- The DHP-55's sampler is positioned in the effects chain right after the Compressor, Noise Gate, and external Effects Loop (see the figure below): this means that all input signals will be compressed, gated and processed by any in the effects loop before they are sampled by the DHP-55. All of the internal DHP-55 effects in the current program will be applied to the sample when it is played back so any sample can be processed in a variety of ways after it has been recorded.

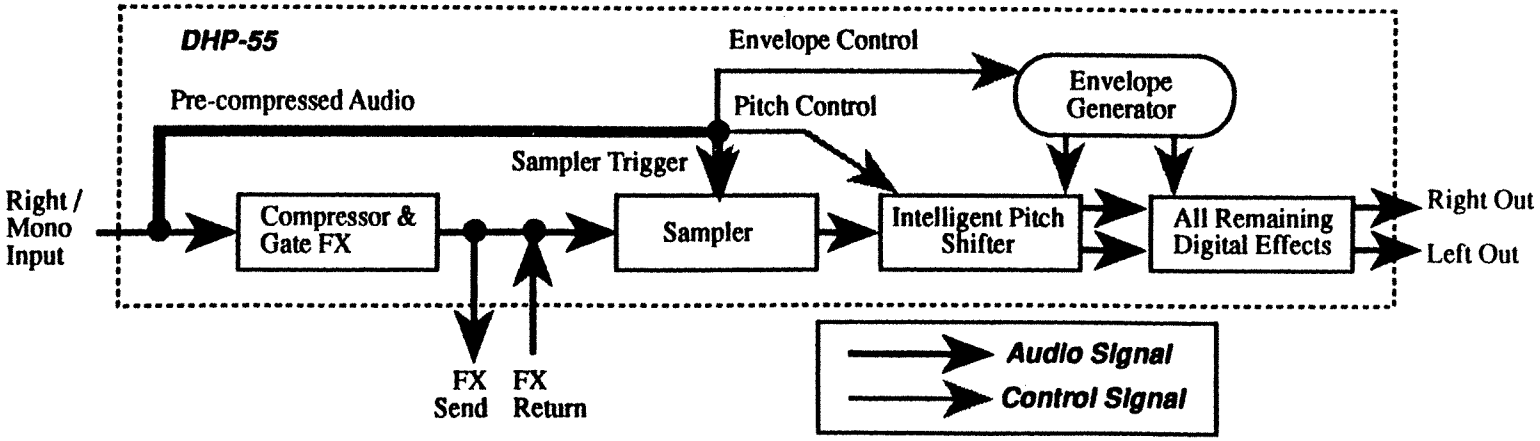
- The triggering modes of the DHP-55's Sampler are designed to make the sampling and playback process quick and easy. For sample recording, the user may initiate sampling manually or by setting the sampler to record whenever it detects an input signal above the trigger level (this is called signal level triggering). For sample playback, the DHP-55 can be triggered manually, by signal level, or by a MIDI note event from a keyboard, sequencer or drum machine. Manual triggering on the DHP-55 is performed with the unit's front panel **Load** key. Manual triggering is available in all triggering modes.

- Once recorded into memory, a sample is available for playback until the user records a new sample, changes to a new program or turns off the DHP-55.

- When you are trimming a sample, trim the end first: Since the DHP-55 replays the sample every time it is trimmed, this will save you a lot of replay time as you edit.
  1. Set the TRIM start to a point shortly before where you'll place the TRIM end point.
  2. Place the TRIM end point to its exact location.
  3. Adjust the START point to where it belongs at the beginning of the sample.

DIGITAL SAMPLER RECORD AND PLAYBACK ROUTING

The diagram shown below illustrates the way the DHP-55 Sampler trigger parameters affect the signal path: Trigger signals for sampler playback can be mixed with the



Notes on Digital Sampler Effects:

- Up to six seconds of mono or three seconds of stereo signal can be recorded at any one time; the user is then free to set start and end points within the sample for playback. This editing is non-destructive, which means that any sample data outside the start and end points is not erased, and can be used later.

- The DHP-55's sampler is positioned in the effects chain right after the Compressor, Noise Gate, and external Effects Loop (see the figure below): this means that all input signals will be compressed, gated and processed by any in the effects loop before they are sampled by the DHP-55. All of the internal DHP-55 effects in the current program will be applied to the sample when it is played back so any sample can be processed in a variety of ways after it has been recorded.

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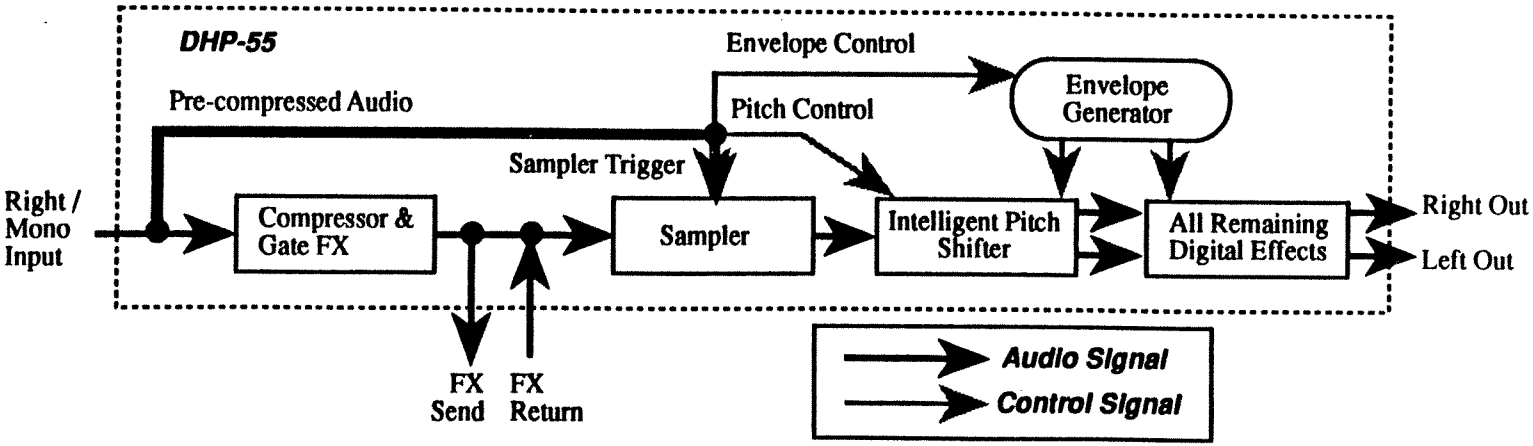
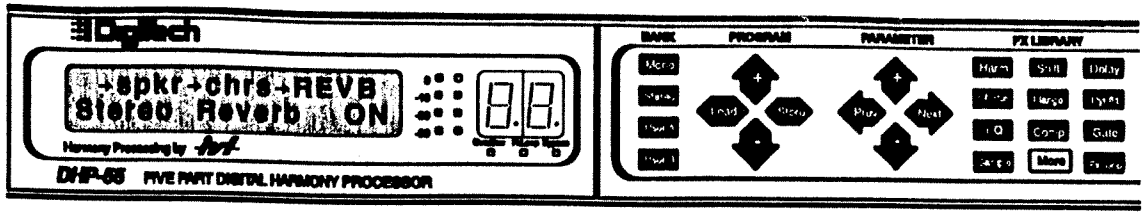
  1. Set the TRIM start to a point shortly before where you'll place the TRIM end point.
  2. Place the TRIM end point to its exact location.
  3. Adjust the START point to where it belongs at the beginning of the sample.

DIGITAL SAMPLER RECORD AND PLAYBACK ROUTING

The diagram shown below illustrates the way the DHP-55 Sampler trigger parameters affect the signal path: Trigger signals for sampler playback can be mixed with the



Stereo Reverb



Reverb replicates the effect of playing music in a room or concert hall. When listening to music played in a room or hall, the sound heard not only comes directly from the musical source, but also comes from thousands of repeated reflections off walls, ceilings and other surfaces. This reflected sound thickens and enhances the music, providing a sense of space. In contrast, unreverberated music typically sounds flat, thin and unrealistic. The DHP-55 reverb provides 5 room types from the subtle ambience of a small studio to an arena with as much as 50 seconds of decay time. The reverb comes in two flavours: basic reverb and full stereo reverb. The full stereo reverb provides independent reverberation images for the left and right channels.

Edit STEREO REVERB: EDIT MENUS **Edit**

Stereo Reverb room type: Hall	Stereo Reverb decay time: 2.2 sec	Stereo Reverb brightness: 10	Stereo Reverb HF rolloff: 3.2 KHz	Stereo Reverb enable: ON
Room Type	Decay Time	Brightness	High Freq. Rolloff	Enable

Mix STEREO REVERB: MIX MENUS **Mix**

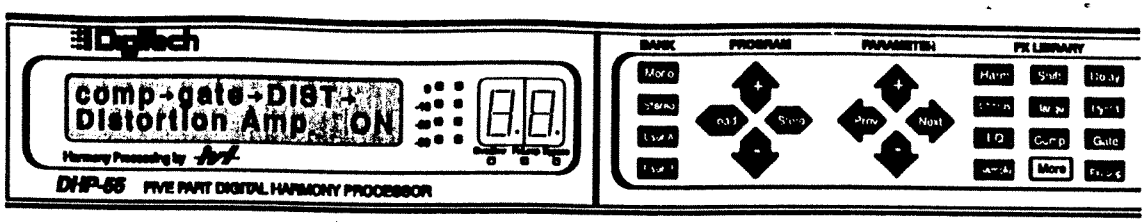
Stereo Reverb DRY level: 0dB	Stereo Reverb WET lvl: 0dB pan:Centre
Dry Level	WET Level & Pan

Edit & **Mix** STEREO REVERB: PARAMETERS **Edit** & **Mix**

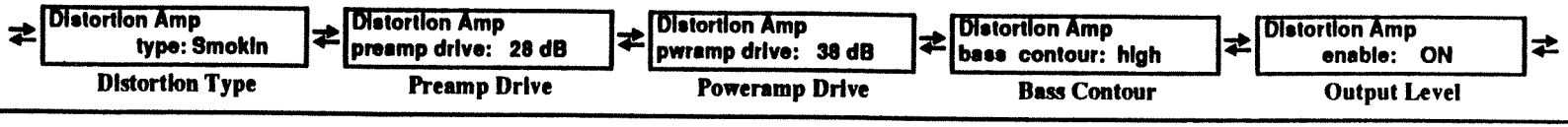
Edit Parameter	***Values***	***Description***
room type	*Studio, Chamber, Club, Hall, Arena*	*Sets the type of room the reverb is replicating.*
decay time	*.1 - 2 sec, .5 - 3 sec, 1.0 - 4 sec, 1.6 - 6 sec, 4 - 50 sec*	*Sets the time for the reverb level to decrease by 60 dB, with each room type having a different range of times.*
brightness	*1 - 16*	*Sets the brightness of the reverberant signal by controlling how much faster high frequencies die away than low frequencies.*
HF rolloff	*600 Hz - 20 KHz, Flat*	*Sets the cutoff frequency of a rolloff filter applied to the overall reverberation.*
enable	*off, ON*	*Enables the reverb.*
Mix Parameter	***Values***	***Description***
DRY level	*off, -40dB to 0dB*	*Sets the level of the dry signal.*
WET level	*off, -40dB to 0dB*	*Sets the level of the wet reverberant signal.*
WET pan (Stereo Reverb)	*Narrow, 1, 2, 3, Wide*	*Sets the separation of the independent left and right reverberant signals.*

Distortion Amplifier

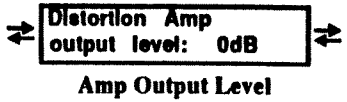
The Distortion Amplifier Effect of the DHP-55 duplicates the sound of a distorting guitar amplifier: singing sweet to heavy metal distortion are possible. When used in conjunction with the Speaker & Cabinet Emulators (see next effect), various guitar amps from small combo amps to Marshall stacks can be simulated.



Edit DISTORTION AMPLIFIER: EDIT MENUS **Edit**



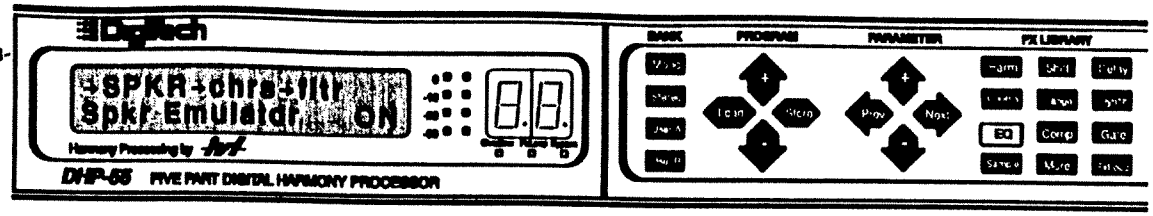
Mix DISTORTION AMPLIFIER: MIX MENUS **Mix**



Edit & **Mix** DISTORTION AMPLIFIER: PARAMETERS **Edit** & **Mix**

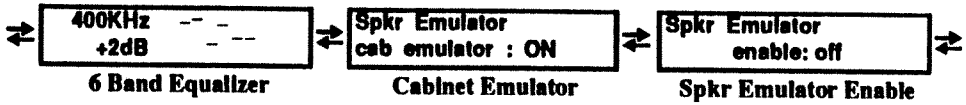
Edit Parameter	*Values*	*Description*
type	*Smokin, Rockin, Grungy, Mellow*	*Sets different types of distortion.*
preamp drive	*0 - 42 dB*	*Sets the level of signal going into the first distortion amp section.*
power amp drive	*0 - 42 dB*	*Sets the level of signal going into the second distortion amp section.*
bass contour	*off, low, med, high*	*Sets the bass contour: This bass filtering system eliminates "muddiness" from the distorted signal for low end signals.*
enable	*off, ON*	*Enables the Distortion.*
Mix Parameter	*Values*	*Description*
output level	*off, -40dB to 0 dB*	*Sets the output signal level leaving the effect.*

Speaker and Cabinet Emulator



One problem of many distortion effect devices is often their unrealistic sound when plugged directly into a P.A. or mixing console. This lack or realism is because a real guitar amplifier is more than a collection of circuitry: it is also a set of speakers mounted in a cabinet, both of which have acoustic properties of their own. Without the acoustic contributions of the speakers and cabinet, the distortion effect can be thin and unpleasant. The DHP-55 Speaker and Cabinet Emulator effects are based around a 6 band equalizer that has been preset to emulate a speaker and cabinet configuration.

Edit SPEAKER & CABINET EMULATOR: EDIT MENUS **Edit**



Mix SPEAKER & CABINET EMULATOR: MIX MENUS **Mix**

Edit & **Mix** SPEAKER & CABINET EMULATOR: PARAMETERS **Edit** & **Mix**

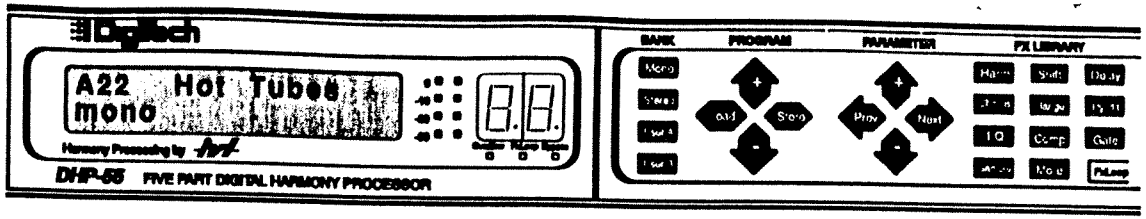
Edit Parameter	Values	Description
100Hz	-12 to +12 dB	Sets the cut/gain of the 100Hz frequencies.
160Hz	-12 to +12 dB	Sets the cut/gain of the 160Hz frequencies.
400Hz	-12 to +12 dB	Sets the cut/gain of the 400Hz frequencies.
1 KHz	-12 to +12 dB	Sets the cut/gain of the 1 KHz frequencies.
2.5KHz	-12 to +12 dB	Sets the cut/gain of the 2.5KHz frequencies.
6.3KHz	-12 to +12 dB	Sets the cut/gain of the 6.3KHz frequencies.
cabinet emulator	off, ON	Turns the cabinet emulator on and off.
enable	off, ON	Enables the speaker emulator.
Mix Parameter	**Values**	**Description**
speaker emulator Level	off, -40dB - 0 dB	Sets the output level of the Speaker Emulator Effect.

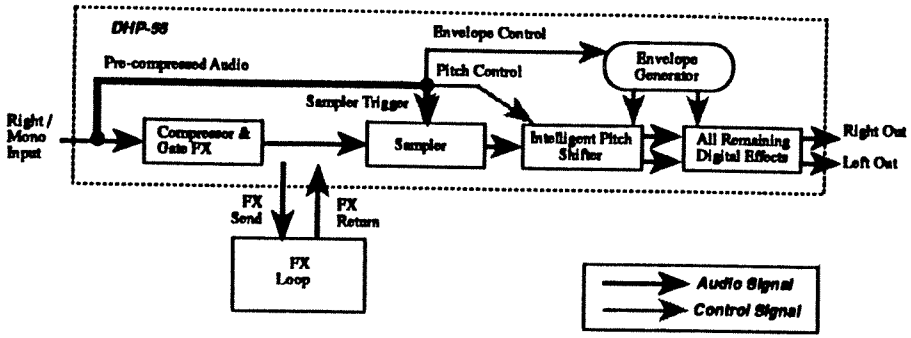
Notes on Speaker and Cabinet Emulator Effects:

- The speaker and cabinet emulator effect is accessed via the EQ key in the FX Library.

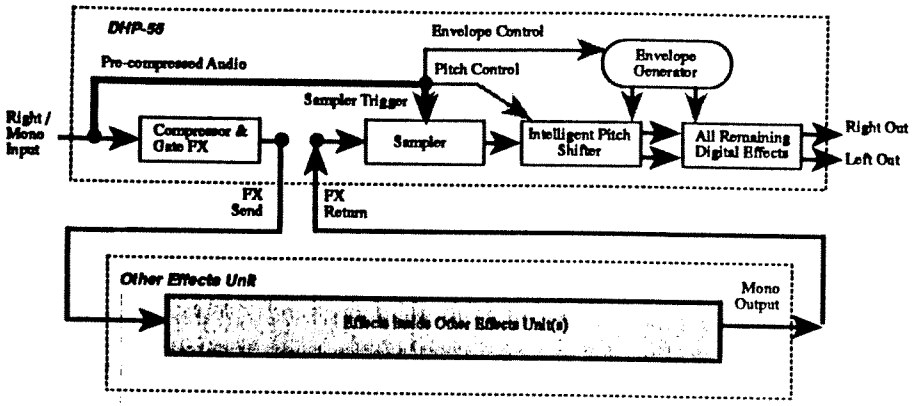
FX Loop

The FX Loop of the DHP-55 lets you connect external effects devices to the unit and use them as part of your effects chain while providing the DHP-55's pitch detection circuitry the clean signal required for harmony and shifting effects. This feature is only available when the DHP-55 is used in mono input mode, since the FX return jack doubles as the left stereo channel input for stereo mode. The FX loop is toggled by the FxLoop key: The FxLoop LED indicator on the DHP-55 display indicates whether the FX Loop is enabled or disabled.





DHP-55 SIGNAL PATH: FX LOOP DISABLED



DHP-55 SIGNAL PATH: FX LOOP ENABLED

Notes on the FX Loop Feature:

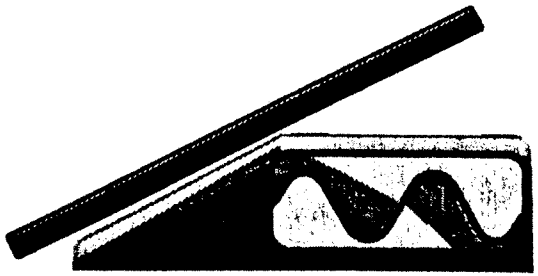
- When setting up your unit to use another effects device through the DHP-55's FX Loop, follow these steps:
  1. connect the DHP-55 effect send to the other effect's mono input
  2. connect the DHP-55 effect return to the other effect's mono output
  3. turn down the DHP-55's Right In (acting as the FX Return level) control to zero
  4. set the output level of the other effect to your usual playing level
  5. gradually turn up the DHP-55's Right In (acting as the FX Return level) control to the desired volume

- To avoid overdriving the DHP-55's internal effects with too much signal, toggle the FX Loop key as you perform the last step to compare the straight DHP-55 output level with the combined FX returned signal: The two signals should be about the same volume to ensure correct operation.

- For examples of audio set-ups using the FX Loop feature of the DHP-55, please refer to section 1 - Startup: Audio Routings.

Modulation

When you change the parameter of an effect while it is processing a signal, you are modulating the sound: The mechanism changing the parameter (your finger on the data wheel) is called the modulation source, while the parameter being changed is said to be modulated. Usually, modulation sources are not manual, but are real-time controllers of some kind (expression pedal, envelope generator, LFOs or MIDI messages) which allow you to vary parameter values while you play.



External Modulation Sources

In the DHP-55, there are 4 basic types of real-time controller:

1. The Expression Foot-Pedal
2. MIDI Channel Pressure (Monophonic After-touch) Messages
3. MIDI Pitch Bend (PB) Messages
4. MIDI Continuous Controller (CC) 0-119 Messages

The DHP-55 will support up to 8 external DHP-55 Expression Controllers: Each of these controllers allow you to manipulate certain parameters of your DHP-55 programs as you are playing your instrument. Expression assignments are made in the EXPRESSION ASSIGN sub-menus of the Modulation Menu (see the following page).

Calibrating the Expression Pedal

If you have chosen the Expression Pedal as one of the DHP-55 Expression Controllers, you need to calibrate your foot pedal before it will function properly: You must select whether your pedal has a linear or logarithmic response, and then "record" the lowest and highest pedal positions in the DHP-55's memory (this is called *calibrating* the pedal). The pedal response type setting and calibration routine are accessed in the EXPRESSION PEDAL sub-menu of the Modulation Menu (see the following page).

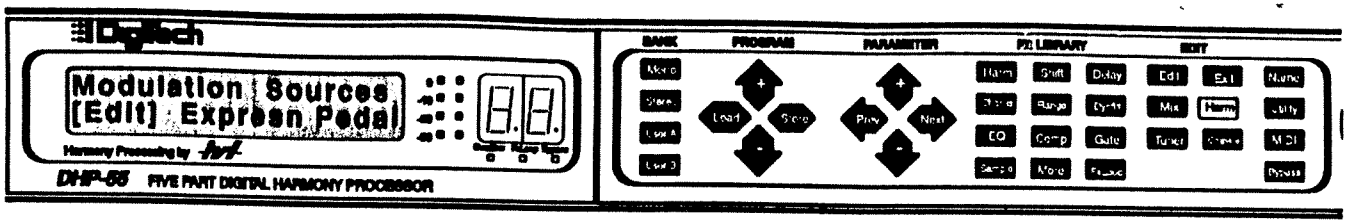
Internal Modulation Sources

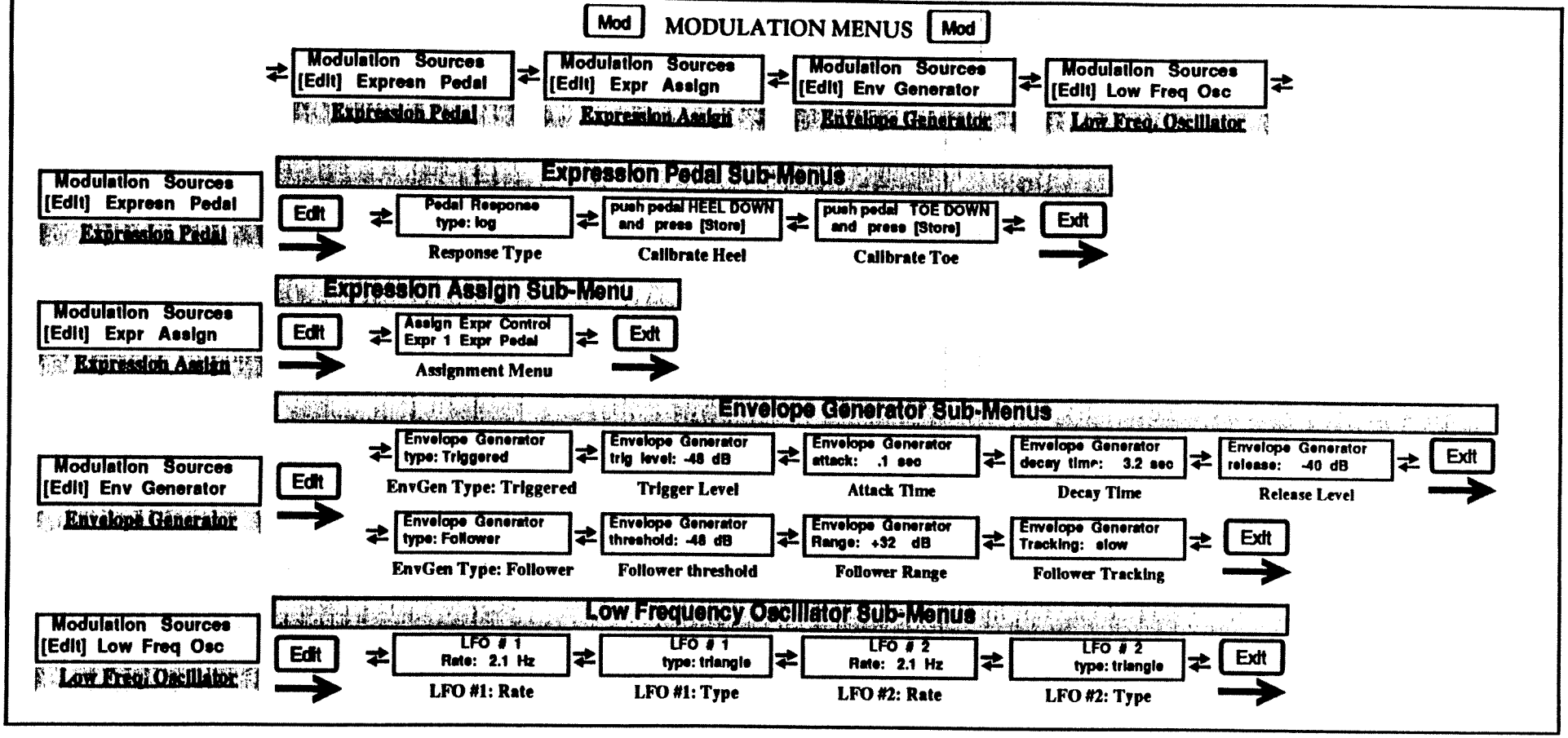
In addition to the 8 expression controllers available as external modulation sources, the DHP-55 comes equipped with an Envelope Generator (EnvGen) and two Low Frequency Oscillators (LFOs) which function as built-in automatic modulation sources. These *internal* modulation sources are programmed via the ENVELOPE GENERATOR and LOW FREQUENCY OSCILLATOR sub-menus of the Modulation Menu (see the following page).

Global and Local Modulation Parameters

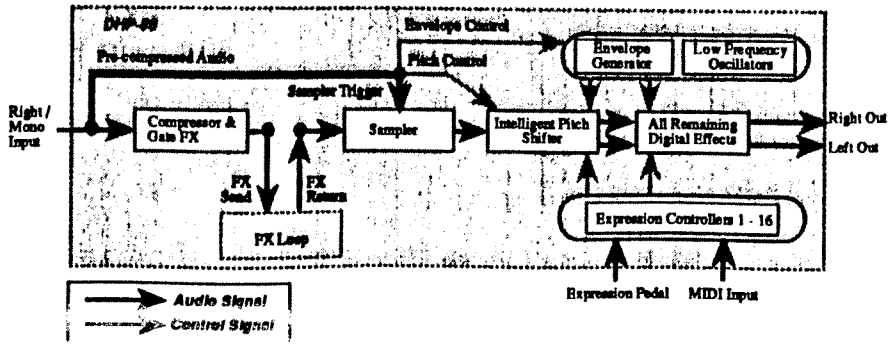
Global parameters, such as the Utility and MIDI parameters are called global because their settings apply to every program in the DHP-55. Local parameters are parameters that are set for each program independently (such as Compressor and Gate parameters). In the Modulation Menus, the Expression assignments and pedal calibrations are global parameters, while the EnvGen, LFO 1 and LFO 2 are local parameters, allowing you to set them *differently* for each program in the DHP-55's memory.

The Modulation menus can be accessed via the **Mod** key in the EDIT keypad. Each of the Modulation menus allows you to enter a sub-menu by pressing the **Edit** key.





HOW MODULATION CONTROLS THE DHP-55

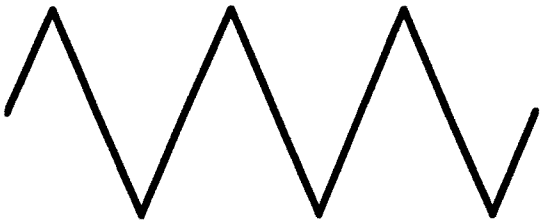


Mod MODULATION PARAMETERS Mod

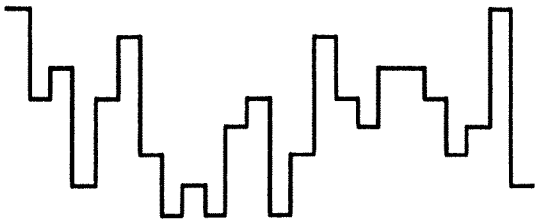
Expression Pedal Parameter	Values	Description
Pedal Response Type	Linear, Logarithmic	Sets whether the Expression pedal has a linear or logarithmic response
Expression Assign Parameter	**Values**	**Description**
Expr	Expr 1 - 8	Indicates which Expression Controller is being assigned
Real Time Controller	None, Expr Pedal, Chan Press, Pitch Bend MIDI Continuous Controller 0 to 119	Sets which External Continuous Controller is assigned to the displayed Expression Controller
Envelope Generator Parameter	**Values**	**Description**
Envelope Generator Type	Triggered, Follower	Sets whether the Envelope Generator will act as a Triggered EnvGen, or a Follower EnvGen
Trigger Level (Triggered EG)	-60 - 0 dB	Sets the signal level that will trigger the Envelope Generator
Attack Time (Triggered EG)	0 - 9.9 sec	Sets the attack time of the Envelope Generator
Decay Time (Triggered EG)	0 - 9.9 sec, Infinite	Sets the decay time of the Envelope Generator (Infinite means the Envelope never decays)
Release (Triggered EG)	-60 - -30 dB	Sets the signal level that will cause the Envelope Generator to "release" the waveform
Threshold (Follower EG)	-60 - 0 dB	Sets the signal level that will activate the Envelope Follower
Range (Follower EG)	0 - +60 dB	Sets the range over which the Envelope Follower will be active
Tracking (Follower EG)	slow, med, fast	Sets the speed at which the Envelope Follower will track changes in signal level
LFO Parameter	**Values**	**Description**
LFO # 1: Rate	.0 - 5.0 Hz	Sets the rate of LFO #1 in Hertz (the number of times the LFO cycles in one second)
LFO # 1: Type	triangle, random	Sets the type of waveform for LFO #1
LFO # 2: Rate	0 - 42 dB	Sets the rate of LFO #2 in Hertz (the number of times the LFO cycles in one second)
LFO # 2: Type	off, low, med, high	Sets the type of waveform for LFO #2

The Low Frequency Oscillators

The DHP-55 has two internal Low Frequency Oscillators (or LFOs) which are Expression-Controllers that sweep through the same values over and over again at a programmable rate . The LFOs of the DHP-55 can be set to produce any of these 3 waveforms:



TRIANGLE WAVE
a straight rise and decline with sharp peaks and valleys



RANDOM SAMPLE HOLD
random values for all levels which never repeat

SINE WAVE
similar to a triangle, but with smoother peaks and valleys

The Expression Pedal

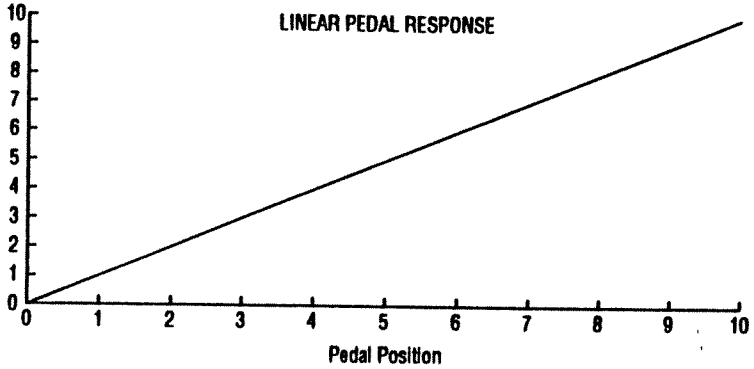
One of the more exciting features of the DHP-55 is its ability to use an inexpensive volume pedal as a foot controller. Since there are many types of volume pedals available today, your DHP-55 must be calibrated to properly work with your particular pedal. You can also use a standard control voltage (or CV) pedal.

Pedal Response

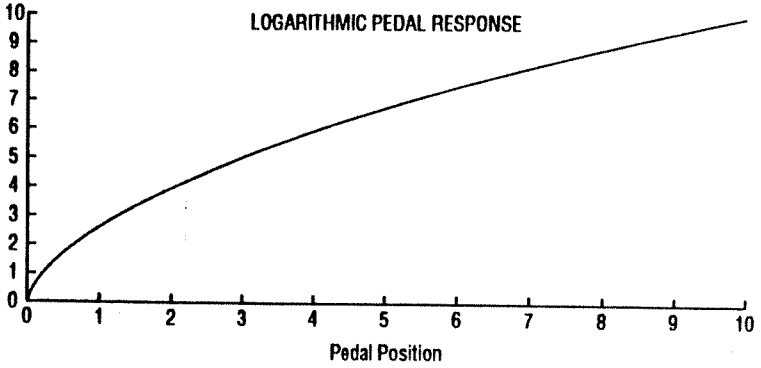
All volume pedals are floor mounted boxes that contain a potentiometer (or pot) which regulates the flow of signal through the pedal unit: Every position of the pedal corresponds to a position of this pot, which in turn corresponds to a particular output volume.

Ideally, you would expect the relationship between pedal position and output volume to be totally consistent: some pedal movement would give the same volume increase or decrease at the bottom of the pedal's swing as it would at the top of the pedal's swing. If your volume pedal behaves this way, its pedal response is said to be Linear.
Very few volume pedals actually have a linear response- most pedals are more sensitive to pedal movements at the bottom of their swing then they are at the top of their swing. This popular pedal response is called *Logarithmic*: it is more expressive than a linear pedal response, but is also less consistent.

LINEAR PEDAL RESPONSE



LOGARITHMIC PEDAL RESPONSE



You will have to experiment with your volume pedal and instrument to determine the response type of your pedal: If you cannot tell by listening to the pedal's output, just assume your pedal is logarithmic. Once you have decided which pedal resonse best describes your volume pedal, set the Pedal Response type parameter on your DHP-55 accordingly. Besides exhibiting different responses (linear or log), different volume pedals have different ranges of operation: Your DHP-55 requires that you calibrate its sensitivity to your volume pedal by taking a "snapshot" of the pedal completely off, and then of the pedal completely on. Once these start and end points for your pedal's swing have been stored by the DHP-55, it will be able to accurately map pedal positions to controller values based on the pedal resonse type you have set.

Assigning the Expression Controllers

As mentioned previously, the DHP-55 deals with 4 basic types of real-time controllers:

1. The Expression Foot-Pedal
2. MIDI Channel Pressure (Monophonic After-touch) Messages
3. MIDI Pitch Bend (PB) Messages
4. MIDI Continuous Controller (CC) 0-119 Messages

Any of these 126 different controllers is mappable to one of the 8 DHP-55 Expression controllers (Expr 1 to Expr 8).

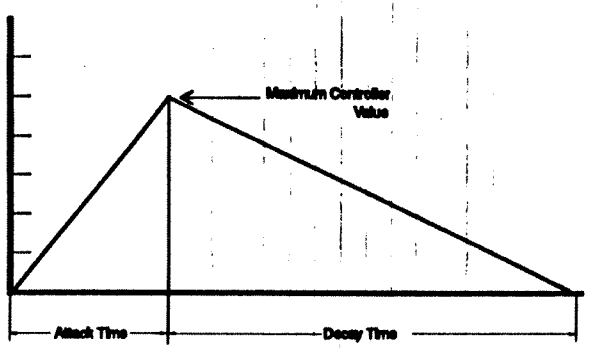
The Envelope Generators

The DHP-55 has an internal Envelope Generator (EG), which allows you to define an "envelope" of control that you can trigger with incoming signals. The Envelope generator has two types of operation, Triggered and Follower.

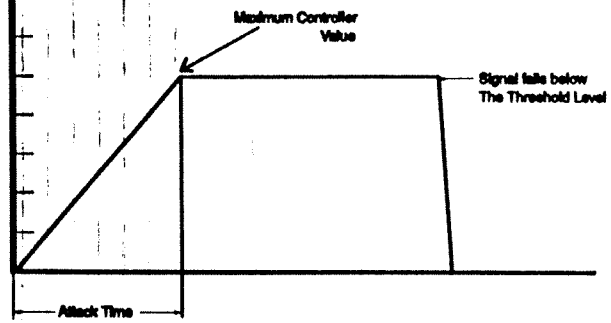
Triggered Envelope Generator

The two main parameters of the triggered envelope generator are Attack Time and Decay Time, both of which define the "envelope" to be generated. When the input signal exceeds the threshold volume, the envelope generator is triggered: The EG generates an upward sweep of controller values from zero to the maximum value over the attack time, following which the EG generates a downward sweep of controller values from the maximum value to zero over the decay time. The DHP-55 envelope generator can also be set to have an infinite decay time: this means that the EG generates an upward sweep of controller values over the attack time, and then holds the maximum value. In both cases, the triggered EG will generate the envelope until the input signal falls below the threshold level: The EG will then sweep to zero (or release) and wait until the signal crosses the threshold level once again to re-trigger at the start of the envelope.

TRIGGERED ENVELOPE GENERATOR
ATTACK & DECAY TIME



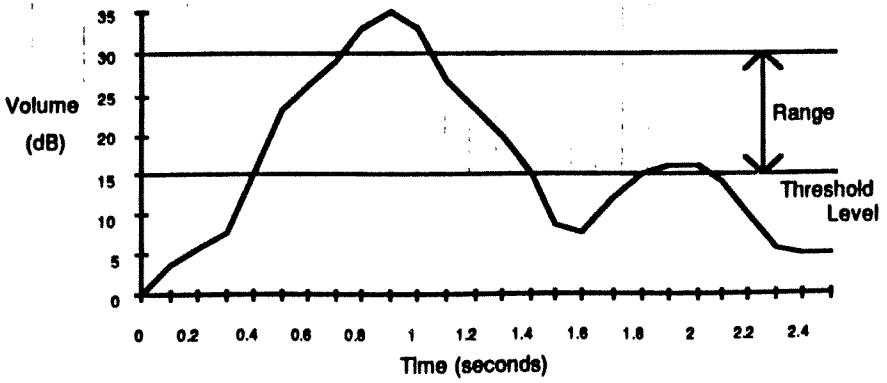
TRIGGERED ENVELOPE GENERATOR
ATTACK TIME & INFINITE DECAY



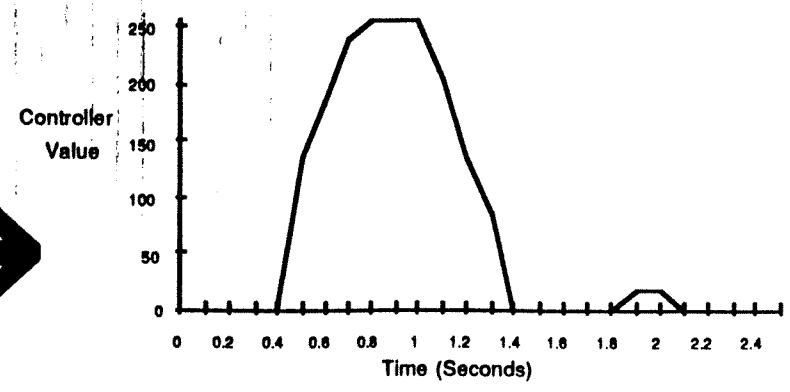
Follower Envelope Generator

When the envelope generator is in follower mode, it tracks the volume contour of your input signal (ie. low input level * low controller value, and high input level * high controller value). When the input signal level crosses the threshold level, the EG begins sending out controller values that correspond to the range of volumes set by the follower EG range parameter. Volumes outside the range cause the follower EG to send either 0 or 255 (the maximum), depending on whether they are below threshold or above the threshold + range level. The tracking parameter adjusts the speed at which the EG responds to changes in the input signal volume.

FOLLOWER ENVELOPE GENERATOR
INPUT SIGNAL AND THE RESULTING CONTROLLER OUTPUT



INPUT SIGNAL LEVELS VS. TIME



OUTPUT CONTROLLER VALUES VS. TIME

DHP-55 MIDI IMPLEMENTATION CHART

Digitech DHP-55 Five Part Digital Harmony Processor

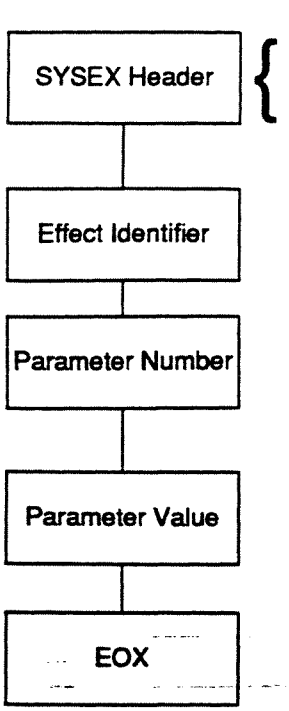
Date: June 1993
Version: 1.0

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default	1 – 16	1 – 16	Memorized
	Changed	1 – 16	1 – 16	
Mode	Default	Mode 3	Mode 3	Omni Off
	Messages	x	x	
	Altered			
Note Number	True Voice	o	o	May be used to select Key and Chord
Velocity	Note ON	x	x	
	Note OFF	x	x	
After Touch	Key's	x	x	
	Ch's	x	x	
Pitch Bender		x	o	
Control Change		x	o	
Prog Change	True #	x	0 – 127 1 – 128	Internally mappable
System Exclusive		o	o	
System Common	:Song Pos	x	x	
	:Song Sel	x	x	
	:Tune	x	x	
System Real Time	:Clock	x	x	
	:Commands	x	x	
Aux Mes-sages	:Local ON/OFF	x	x	
	:All Notes Off	x	x	
	:Active Sense	x	x	
	:Reset	x	x	
Notes				

Mode 1 : OMNI ON, POLY
Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY
Mode 4 : OMNI OFF, MONO

O : Yes
X : No

MIDI SYSEX Parameter Editing Format:



0F0h - SYSEX
00h 00h 10h - IVL Identifier
Channel #
22h - DHP-55 Device Type
60h - Receive Parm Edit Command

One byte

One byte

Two bytes, since MIDI only allows a 7 bit data byte. The first byte contains only the most significant bit of the parameter value. The second byte contains the least significant 7.

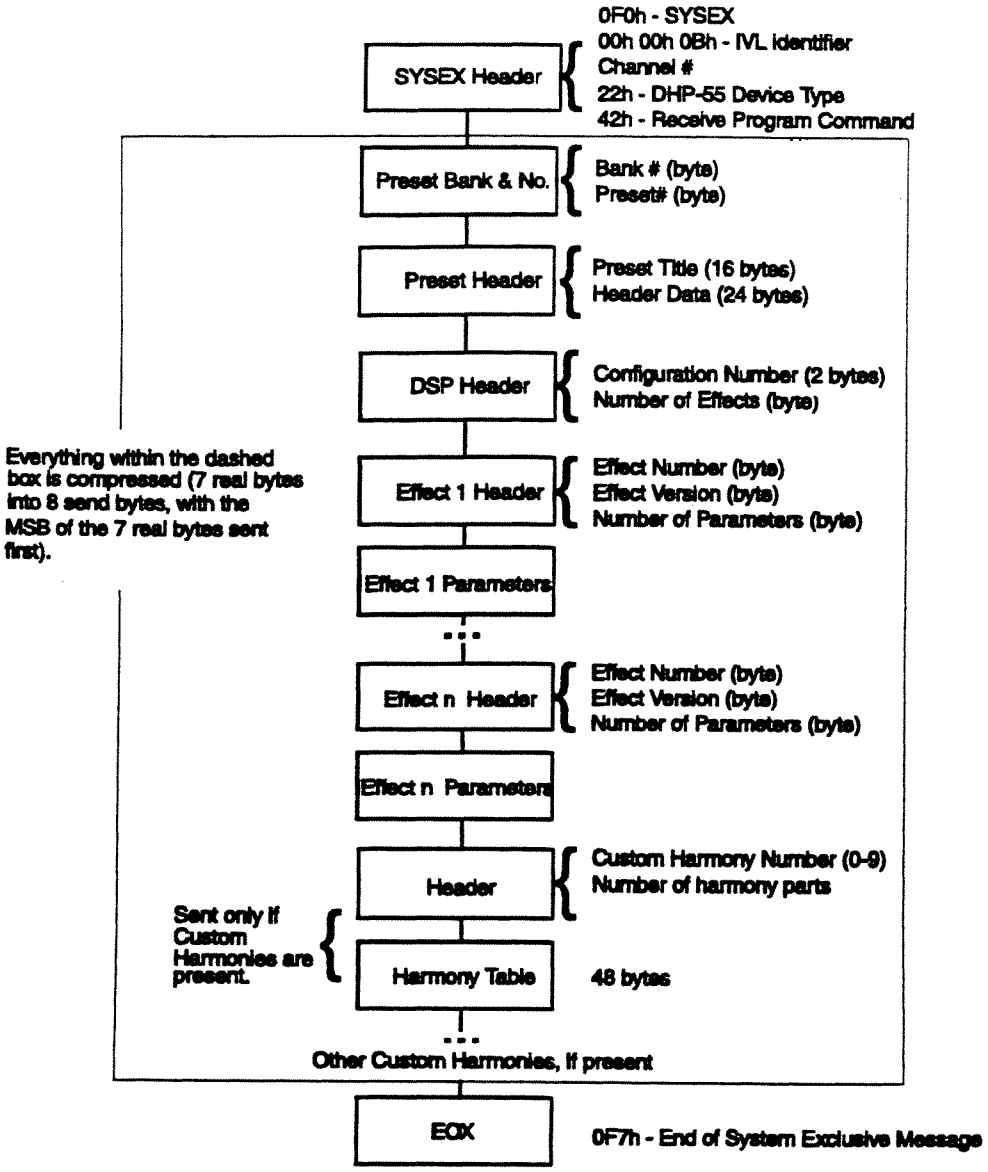
0F7h - End of System Exclusive Message

Each effect the DHP-55 performs has a unique effect identifier. This is the same number which is dumped as the Effect number when dumping a preset over MIDI.
The list of effect ID's is:

Effect Name	*Effect ID*
compressor	*0*
stereo compressor	*1*
noise gate	*2*
stereo noise gate	*3*
stereo chorus	*4*
chorus	*5*
stereo flange	*6*
flange	*7*
stereo delay_3s	*8*
stereo delay_6s	*9*
multitap delay_3s	*10*
multitap delay_6s	*11*
pshift 4	*12*
pshift 4 stereo	*13*
pshift 4 +regen	*14*
pshift 4 + regen stereo	*15*
pshift 2	*16*
pshift 2 stereo	*17*
pshift 2 + distortion	*18*

Effect Name	*Effect ID*
string pad	*19*
chord shift	*21*
chord shift stereo	*22*
eq 5 stereo	*23*
eq 7 stereo	*24*
eq 7	*25*
eq 15	*29*
eq 31	*30*
eq 15 stereo	*31*
sampler mono_3s	*32*
sampler mono_6s	*33*
sampler stereo_3s	*34*
sampler stereo_6s	*35*
distortion	*36*
speaker emulator	*37*
dyanmic filter	*38*
cabinet emulator	*39*
stereo reverb	*40*
mono reverb	*41*

MIDI SYSEX Dump Format for Presets:



Format for Packing of MIDI information:

Data to be sent : b1, b2, b3, b4, b5, b6, b7.

MIDI output: [0 b7.7 b6.7 b5.7 b4.7 b3.7 b2.7 b1.7],
[0 b1.0-6],
[0 b2.0-6],
[0 b3.0-6],
[0 b4.0-6],
[0 b5.0-6],
[0 b6.0-6],
[0 b7.0-6]

Effects in Presets for DHP-55 Version 2.00 Mono Bank

Notes:

All Mono presets contain a compressor and noise gate first in the effects chain.
Effects listed in brackets, i.e., (Stereo Delay 6s), are not turned on in the listed preset

#	Preset Name	Effect 1	Effect 2	Effect 3	Effect 4	Effect 5	Effect 6
1	4 Voice Detune	Pitch shift 4	Stereo Delay 6s	Mono Reverb			
2	Lush Chord Shift	Chord shift	Stereo Chorus	(Stereo Delay 6s)	Mono Reverb		
3	Celestial Clouds	Chord shift	Chord shift	Stereo Chorus	(Stereo Delay 6s)	Mono Reverb	
4	String Pad	String Pad	Stereo Chorus	(DynFilt)	Mult Delay 3s	Stereo Delay 3s	
5	4-Octave Spread	Pitch shift 4	(DynFilt)	(Mult Delay 3s)	Stereo Delay 3s		
6	2-Part Harmony	Pitch shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		
7	4-Part Harmony	Pitch shift 4	Stereo Reverb				
8	Killer Queen	Pitch shift 2d	Cabinet Emu.	Mono Reverb			
9	Triggered Wah	Pitch shift 2	Stereo Chorus	DynFilt	Mono Reverb	(Mono Samp 6s)	
10	Stereo Auto-Pan	Pitch shift 2	Stereo Flange	(DynFilt)	(Mult Delay 3s)	Stereo Delay 3s	
11	GUIT Clean Strat	Pitch shift 2d	Stereo Eq 5	Stereo Delay 6s			
12	GUIT Hot Tubes	Ultr Dist	Speaker	Chorus	Stereo Delay 6s	Mono Reverb	
13	GUIT Fat Solo	Pitch shift 2d	Cabinet Emu.	Mono Reverb			
14	GUIT Solo Flange	Pitch shift 2	Stereo Flange	Stereo Delay 6s	(Mono Reverb)		
15	GUIT Voodoo Wah	Ultr Dist	Speaker	(Chorus)	DynFilt	(Mult Delay 3s)	Stereo Delay 3s
16	HORN Quintet	Pitch shift 4	Stereo Reverb				
17	HORN Fanfare	Pitch shift 2	Stereo Flange	(DynFilt)	Mult Delay 3s	Stereo Delay 3s	
18	HORN String Pad	String Pad	Stereo Chorus	(DynFilt)	(Mult Delay 3s)	Stereo Delay 3s	
19	HORN Chorus	Chord shift	Stereo Chorus	(DynFilt)	Mult Delay 3s	Stereo Delay 3s	
20	HORN Trpt Mute	Pitch shift 2	(Stereo Chorus)	DynFilt	Mono Reverb	(Mono Samp 6s)	
21	KYBD Brite Piano	Pitch shift 2	Stereo Chorus	(Eq 7)	Mono Reverb		
22	KYBD Chord Shift	Chord shift	Stereo Chorus	(DynFilt)	(Mult Delay 3s)	Stereo Delay 3s	
23	KYBD Aqua Chorus	Pitch shift 2	Stereo Chorus	(Mult Delay 3s)	Stereo Delay 3s	DynFilt	
24	KYBD Fat Solo	Pitch shift 2d	Stereo Eq 5	Stereo Delay 6s			
25	KYBD Auto-Wah	Chord shift	Stereo Chorus	DynFilt	Mono Reverb	(Mono Samp 6s)	
26	BASS Detune	Pitch shift 2	(Stereo Chorus)	Mult Delay 6s	Mono Reverb		
27	BASS Octaver	Pitch shift 2	Stereo Chorus	(DynFilt)	(Mult Delay 3s)	(Stereo Delay 3s)	
28	BASS Fuzz	Ultr Dist	Speaker	Chorus	(Stereo Delay 6s)	(Mono Reverb)	
29	BASS Flange	Pitch shift 2	Stereo Flange	(Stereo Delay 6s)	Mono Reverb		
30	BASS String Pad	String Pad	Stereo Chorus	(DynFilt)	Mult Delay 3s	Stereo Delay 3s	
31	DRUM Snare Drops	Pitch shift 2	(Stereo Chorus)	(DynFilt)	(Mono Reverb)	(Mono Samp 6s)	
32	DRUM Flange	(Pitch shift 2)	Stereo Flange	(DynFilt)	(Mult Delay 3s)	Stereo Delay 3s	
33	DRUM Flam	(Pitch shift 2)	(Stereo Chorus)	Stereo Delay 6s	Mono Reverb		
34	DRUM Regen	Pitch shift 4regen					
35	DRUM Duck	(Pitch shift 2)	(Stereo Chorus)	Stereo Delay 6s	Mono Reverb		
36	VOX Chorus	Pitch shift 4	Stereo Reverb				
37	VOX Mr. Vader	Pitch shift 2	Stereo Flange	(DynFilt)	(Mult Delay 3s)	Stereo Delay 3s	
38	VOX Sing.Alvin!	Pitch shift 2	(Stereo Flange)	(DynFilt)	(Mult Delay 3s)	(Stereo Delay 3s)	
39	VOX Sample+Shift	Pitch shift 2	Stereo Chorus	(DynFilt)	Mono Reverb	Mono Samp 6s	
40	VOX Pitch Correct	Pitch shift 2	(Stereo Chorus)	(Eq 7 Stereo)			
41	SF/X 1-3-5 Arpeg						
42	SF/X Twilight	Pitch shift 4 regen					
43	SF/X Far-n-Away	Pitch shift 2	Stereo Chorus	Mult Delay 3s	Stereo Delay 3s	DynFilt	
44	SF/X Jurassic	Pitch shift 4 regen					
45	SF/X PolyRhythm	(Pitch shift 2)	Stereo Chorus	(DynFilt)	Mult Delay 3s	Stereo Delay 3s	
46	UTIL Pitch Corr.	Pitch shift 2	(Stereo Chorus)	(Stereo Eq 5)	(Stereo Delay 6s)		
47	UTIL Gate	(Pitch shift 4)	(Eq 7 Stereo)				
48	UTIL Comp	(Pitch shift 4)	(Eq 7 Stereo)				
49	UTIL Flange	(Pitch shift 2)	Stereo Flange	(Stereo Reverb)			
50	UTIL Chorus	(Pitch shift 2)	Stereo Chorus	(Stereo Reverb)			
51	UTIL Eq 31	Eq 31					
52	UTIL Arena	(Pitch shift 4)	Stereo Reverb				
53	UTIL Hall	(Pitch shift 4)	Stereo Reverb				
54	UTIL Club	(Pitch shift 4)	Stereo Reverb				
55	UTIL Chamber	(Pitch shift 4)	Stereo Reverb				
56	UTIL Studio	(Pitch shift 4)	Stereo Reverb				
57	UTIL Multitap	(Pitch shift 4)	Mult Delay 6s	(Mono Reverb)			
58	UTIL Ster Delay	(Pitch shift 4)	Stereo Delay 6s	(Mono Reverb)			
59	UTIL Detune	Pitch shift 4	(Stereo Delay 6s)	(Mono Reverb			
60	UTIL Octaves	Pitch shift 2	(Stereo Chorus)	(Stereo Eq 5)	(Stereo Delay 6s)		
61	HARM +3rd	Pitch shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		
62	HARM -6th	Pitch shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		

#	Preset Name	Effect 1	Effect 2	Effect 3	Effect 4	Effect 5	Effect 6
63	HARM +5th	Pitch shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		
64	HARM -4th	Pitch shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		
65	HARM +7th	Pitch shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		
66	HARM -2nd	Pitch shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		
67	HARM Maj 351	Pitch shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		
68	HARM Maj 8351	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
69	HARM Maj 83513	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
70	HARM Maj 83561	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
71	HARM Min 351	Pitch shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		
72	HARM Min 8351	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
73	HARM Min 83513	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
74	HARM Min 85137	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
75	HARM 81357	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
76	HARM major	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
77	HARM minor	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
78	HARM minor7	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
79	HARM dom7	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			
80	HARM 7sus4	Pitch shift 4	(Stereo Delay 6s)	Mono Reverb			

Effects in Presets for DHP-55 Version 2.00 Stereo Bank

#	Preset Name	Effect 1	Effect 2	Effect 3	Effect 4	Effect 5	Effect 6
1	MIX Imager 1	ST P. Shift 4	Eq 7 Stereo				
2	MIX Imager 2	ST P. Shift 4	Eq 7 Stereo				
3	MIX Imager 3	ST P. Shift 2	Stereo Chorus	Stereo Reverb			
4	MIX Imager 4	ST P. Shift 4 Regen					
5	MIX Imager 5	ST P. Shift 4 Regen					
6	MIX Imager 6	ST P. Shift 4 Regen					
7	HARM Solo 4Part	ST P. Shift 4	Stereo Reverb				
8	HARM Solo Scalic	ST P. Shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		
9	HARM Solo Chrdal	ST P. Shift 2	(Stereo Chorus)	(Stereo Delay 6s)	Mono Reverb		
10	KYBD 8ve Swell	ST Chrd Shft	Stereo Chorus	Stereo Delay 6s	Mono Reverb		
11	KYBD 5th Swell	ST Chrd Shft	Stereo Chorus	Stereo Delay 6s	Mono Reverb		
12	KYBD Juno Keys	ST P. Shift 2	Stereo Flange	Stereo Eq 5	Stereo Delay 6s		
13	KYBD Piano Hall	(ST Comp)	ST N. Gate	Stereo Chorus	Stereo Eq 5	Stereo Reverb	
14	KYBD Leslie	ST P. Shift 2	Stereo Chorus	(DynFilt)	(Mult Delay 3s)	(Stereo Delay 3s)	
15	DRUM Snare Drop	ST P. Shift 2	(Stereo Flange)	Stereo Reverb			
16	DRUM Snare Rise	ST P. Shift 2	(Stereo Flange)	Stereo Reverb			
17	DRUM Deep Snare	ST P. Shift 2	(Stereo Chorus)	DynFilt	Mono Reverb		
18	DRUM Bright Kit	(ST Comp)	Eq 7 Stereo	Stereo Reverb			
19	DRUM Big Toms	ST P. Shift 2	Stereo Chorus	Stereo Reverb			
20	SF/X Way Down	ST P. Shift 2	(Stereo Flange)	Stereo Delay 6s	Mono Reverb		
21	SF/X Way Up	ST P. Shift 2	(Stereo Flange)	Stereo Delay 6s	Mono Reverb		
22	SF/X Crop Circle	ST P. Shift 4 Regen					
23	SF/X Jurassic	ST P. Shift 4 Regen					
24	SF/X Taj Mahal	ST Comp	Eq 7 Stereo	Stereo Delay 6s	Mono Reverb		
25	SF/X Thick Rhyth	(ST P. Shift 2)	Stereo Chorus	Mult Delay 3s	(Stereo Delay 3s)	DynFilt	
26	UTIL Airwaves	(ST P. Shift 2)	Stereo Chorus	Eq 7 Stereo			
27	UTIL 60 Hz Cut	Eq 15 Stereo					
28	UTIL Lo/Hi Gain	Eq 15 Stereo					
29	UTIL Stereo Comp	ST Comp	ST N. Gate	(Stereo Chorus)	(Stereo Eq 5)	(Stereo Delay 6s)	(Mono Reverb)
30	UTIL Stereo Gate	(ST Comp)	ST N. Gate	(Stereo Flange)	(Eq 7 Stereo)		

Configurations available for building new programs - DHP-55 Version 2.00

#	Configuration
1	D+C+EQ7+MD
2	D+C+EQ7+SD
3	D+C+DF+MD+SD
4	D+C+EQ7&S
5	D+C+MD+SD+DF
6	D+C+SR
7	D+C+DF+R&S
8	D+C+SD+R
9	D+C+MD+R
10	D+C+EQ7+R
11	D+F+EQ7+MD
12	D+F+EQ7+SD
13	D+F+DF+MD+SD
14	D+F+EQ7&S
15	D+F+MD+SD+DF
16	D+F+SR
17	D+F+DF+R&S
18	D+F+SD+R
19	D+F+MD+R
20	D+F+EQ7+R
21	P4+EQ7
22	P4+EQ5+SD
23	P4+DF+MD+SD
24	P4+EQ5+S
25	P4+MD+SD+DF
26	P4+SR
27	P4+DF+R&S
28	P4+SD+R
29	P4+MD+R
30	P2+C+EQ7
31	P2+C+EQ5+SD
32	P2+C+DF+MD+SD
33	P2+C+EQ5+S
34	P2+C+MD+SD+DF
35	P2+C+SR
36	P2+C+DF+R&S
37	P2+C+SD+R
38	P2+C+MD+R
39	P2+F+EQ7
40	P2+F+EQ5+SD
41	P2+F+DF+MD+SD
42	P2+F+EQ5+S
43	P2+F+MD+SD+DF
44	P2+F+SR
45	P2+F+DF+R&S
46	P2+F+SD+R
47	P2+F+MD+R
48	P2D+EQ7
49	P2D+EQ5+SD
50	P2D+DF+MD+SD
51	P2D+EQ5&S
52	P2D+MD+SD+DF
53	P2D+EQ5+CE
54	P2D+CE+MD+SD
55	P2D+R
56	P2D+CE+R
57	SP+C+EQ7
58	SP+C+EQ5+SD
59	SP+C+DF+MD+SD
60	SP+C+EQ5+S
61	SP+C+MD+SD+DF
62	SP+C+SR
63	SP+C+DF+R&S
64	SP+C+SD+R
65	SP+C+MD+R
66	CS+C+EQ7
67	CS+C+EQ5+SD
68	CS+C+DF+MD+SD
69	CS+C+EQ5+S
70	CS+C+MD+SD+DF
71	CS+C+SR
72	CS+C+DF+R&S
73	CS+C+SD+R
74	CS+C+MD+R
75	BP2+C+EQ7
76	BP2+C+EQ5+SD
77	BP2+C+DF+MD+SD
78	BP2+C+EQ5+S
79	BP2+C+MD+SD+DF
80	BP2+C+SR
81	BP2+C+DF+R&S
82	BP2+C+SD+R
83	BP2+C+MD+R
84	BP2+F+EQ7
85	BP2+F+EQ5+SD
86	BP2+F+DF+MD+SD
87	BP2+F+EQ5+S
88	BP2+F+MD+SD+DF
89	BP2+F+SR
90	BP2+F+DF+R&S
91	BP2+F+SD+R
92	BP2+F+MD+R
93	EQ31
94	S4R
95	S P4+EQ7
96	S P4+EQ5+SD
97	S P4+EQ5&S
98	S P4+MD+SD+DF
99	S P4+SR
100	S P4+DF+R
101	S P4+SD+R
102	S P4+MD+R
103	S P4+R&S
104	S P2+C+EQ7
105	S P2+C+EQ5+SD
106	S P2+C+DF+MD+SD
107	S P2+C+EQ5&S
108	S P2+C+MD+SD+DF
109	S P2+C+SR
110	S P2+C+SD+R
111	S P2+C+DF+R
112	S P2+C+MD+R
113	S P2+C+R&S
114	S P2+F+EQ7
115	S P2+F+EQ5+SD
116	S P2+F+DF+MD+SD
117	S P2+F+EQ5&S
118	S P2+F+MD+SD+DF
119	S P2+F+SR
120	S P2+F+DF+R
121	S P2+F+SD+R
122	S P2+F+MD+R
123	S P2+F+R&S
124	S CS+C+EQ7
125	S CS+C+EQ5+SD
126	S CS+C+DF+MD+SD
127	S CS+C+EQ5&S
128	S CS+C+MD+SD+DF
129	S CS+C+SR
130	S CS+C+DF+R
131	S CS+C+SD+R
132	S CS+C+MD+R
133	S CS+C+R&S
134	S C+EQ7+EQ7
135	S C+EQ7+EQ5+SD
136	S C+EQ7+DF+MD+SD
137	S C+EQ7+MD+SD+DF
138	S C+EQ7+SR
139	S C+EQ7+DF+R
140	S C+EQ7+SD+R
141	S C+EQ7+MD+R
142	S C+EQ7+R&S
143	S C+EQ5+EQ7
144	S C+EQ5+EQ5+SD
145	S C+EQ5+DF+MD+SD
146	S C+EQ5+MD+SD+DF
147	S C+EQ5+SR
148	S C+EQ5+DF+R
149	S C+EQ5+SD+R
150	S C+EQ5+MD+R
151	S C+EQ5+R&S
152	S F+EQ7+EQ7
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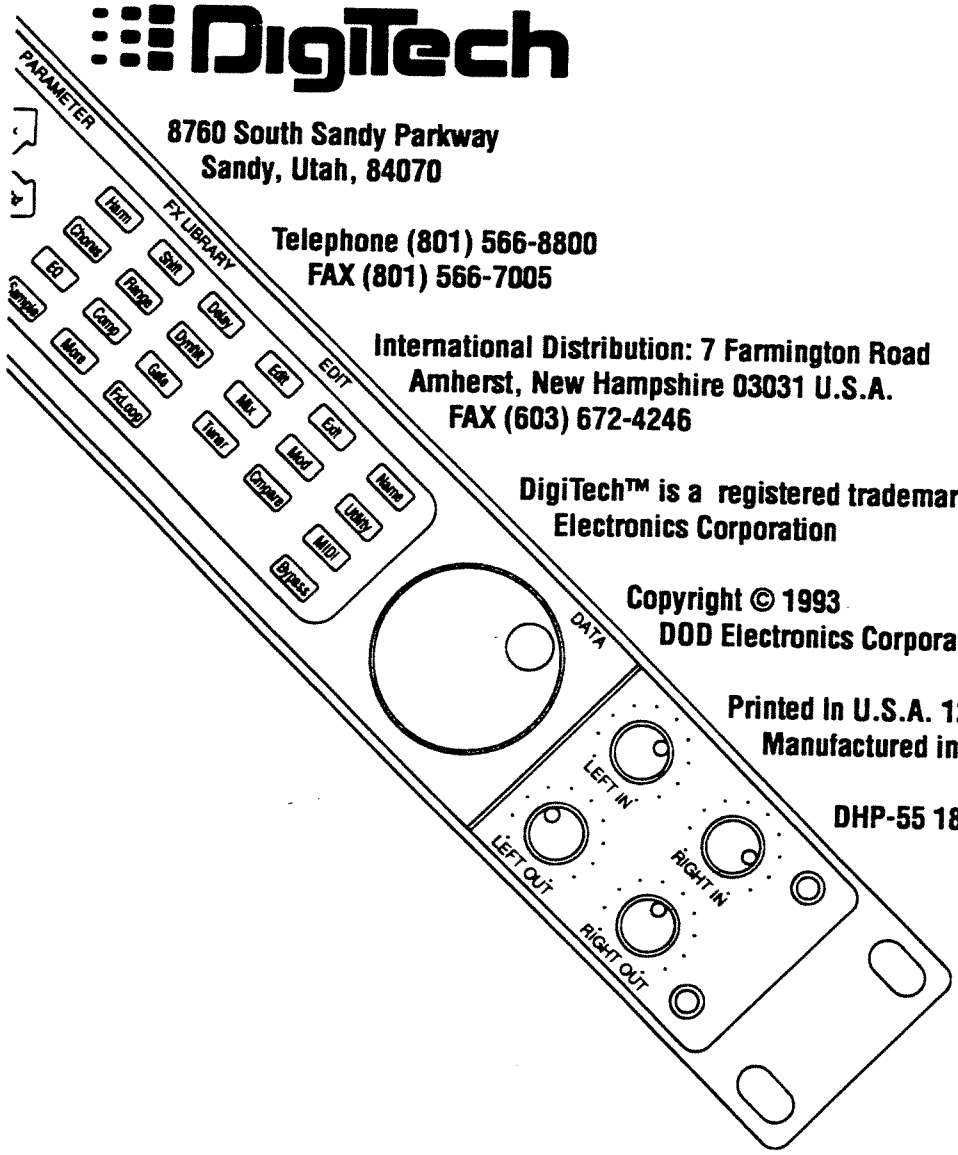
156	S F+EQ7+SR
157	S F+EQ7+DF+R
158	S F+EQ7+SD+R
159	S F+EQ7+MD+R
160	S F+EQ7+R&S
161	S F+EQ7
162	S F+EQ5+SD
163	S F+DF+MD+SD
164	S F+EQ5&S
165	S F+MD+SD+DF
166	S F+SR
167	S F+DF+R
168	S F+SD+R
169	S F+MD+R
170	S F+R&S
171	S EQ7+EQ7
172	S EQ7+EQ5+SD
173	S EQ7+DF+MD+SD
174	S EQ7+MD+SD+DF
175	S EQ7+SR
176	S EQ7+DF+R
177	S EQ7+SD+R
178	S EQ7+MD+R
179	S EQ7+R&S
180	S EQ15
181	S S4R

HARDWARE

Inputs	Instrument /Line In: 470k Ohms impedance ; Effects Return: 10k Ohms impedance
Max Input:	+16 dBV (0 dBV = 0.775 Vrms)
Outputs	Left out, Right out, Effects Send, 100k Ohms impedance
Max Output:	+16 dBV (0 dBV = 0.775 Vrms)
MIDI	IN, Out, Thru
Effects Loop	Allows multi-device effects processing
Remote Controllers	Expression Pedal, Optional foot controller: Digitech FS300
LCD Display	2 row x 20 character supertwist type, backlit
A/D converters	16 bit, 64x oversampling
D/A converters	16 bit linear
Sample Rate	41.667 kHz
Bandwidth	20 Hz to 20 kHz +/- 3 dB
Dynamic Range	92 dB A weighted, > 94 dB with Digital Gate
Distortion and Noise	< 0.02%
DSP Integrated Circuits	Dual 10 MIPS digital signal processors in parallel (20 MIPS total)
Programs	140 user programmable, 110 factory preset programs, 181 raw configurations
Mix	Fully programmable
Instrument tuner	Digital LCD strobe tuner accurate to +/- 1 cent, selectable audio feedback: Mix, Mute & Easy

EFFECTS

Pitch Shifter	Up to 5 parts intelligent harmony using IVL pitch recognition, Independent post harmony digital distortions, +/- 2 octave range
Chord Shifter	Exclusive smooth polyphonic shifting algorithm, +1 octave range
Shifting Effects	Normal, reverse, 4 voice with delay regeneration, whammy, pedal steel, detune, string pads, leslie simulator
Digital Delay	3 second Stereo, 6 second Multitap, Ping Pong, polyrhythm
	Up to 6 second delay time
Chorus	Normal, Reverse, Stereo
Flange	Normal, Stereo
Distortion	Simulated 2 stage tube amplifier distortion with a variety of tonal characteristics.
Digital Graphic Equalizer	5 band stereo, 7 band mono or stereo, 15 band stereo, 31 band mono, speaker cabinet emulation
Dynamic Filter	Lowpass and bandpass filters: wah, frequency, sweep, resonance - controller modulated
Compression	Digitally controlled analog compression, digital stereo compression
Noise Gate	Analog and digital noise gate
Digital Sampling	Audio signal level & manually triggered sampling & playback, up to 6 seconds sampling time, programmable non-destructive start and end trim points
Reverb	Stereo programmable reverberation effect
LFOs (2)	Triangle, Random and Sine waveforms: programmable rate, available as modulation sources
Envelope Generator	Triggered & Follower mode: programmable and available as modulation sources



8760 South Sandy Parkway
Sandy, Utah, 84070

Telephone (801) 566-8800
FAX (801) 566-7005

International Distribution: 7 Farmington Road
Amherst, New Hampshire 03031 U.S.A.
FAX (603) 672-4246

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