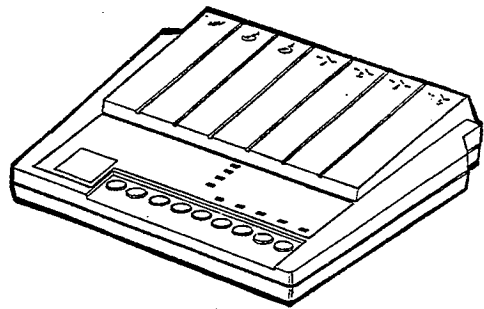


Perf/x

by

Oberheim.



MIDI PERFORMANCE EFFECTS

Navigator

OWNERS
MANUAL

Navigator

.....

OWNER'S MANUAL

Perf/x

MIDI Performance Effects

by **Oberheim**.

Preliminary Edition – January, 1989

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Welcome to the Navigator™

INTRODUCTION

Welcome to the Oberheim **Navigator**™ and congratulations on your purchase of one of the most exciting developments in MIDI technology to date. The **Navigator** is a high performance MIDI message mapper, designed for use in demanding studio and performance applications. In a nutshell, it allows you to change one kind of MIDI message into another. This can mean something as simple as changing a controller from one channel to another, or as complex as changing one note into several different patch changes on different channels. The **Navigator** can be used for a wide variety of purposes. Here are some examples:

- When you change patches on your master controller, have up to 16 different instruments change to different patches.
- Reverse your bend and effect wheels so pushing bends up and pulling bends down.
- Use a footswitch to chain through patch changes, changing all of your instruments to a different patch with each press.
- Use the last few keys of your keyboard to change patches quickly.
- Rescale the velocity or pressure of your keyboard to work better with one of your sound modules.
- Control several different drum machines so that playing one key fires different combinations of drums on the different drum machines, with a foot switch to step to a new "Kit".
- Transpose the bottom octave of your keyboard down an octave to let you play solo and bass from a four octave keyboard.

There are countless other possibilities, but these should give you a hint of what is in store.

HOW TO USE THIS MANUAL

The **Navigator** is a very straight-forward and easy-to-use product that will add greatly to the versatility of any MIDI system. But as simple as the **Navigator** is, there is some learning required especially if you intend to get the most out of it and the rest of your instruments. Therefore, we encourage you to read this manual in its entirety. The following outline will help you in understanding how the manual is arranged so that you will be able to learn the **Navigator** as quickly as possible.

Quick Starting the Navigator

If you're in a hurry, use the following outline to set your **Navigator** up. Detailed instructions on the use of your **Navigator** is in the remainder of the manual.

1. Before plugging the **Navigator** into an electrical outlet, take a standard MIDI cable and plug one end into your Master controller's MIDI OUT port and plug the other end into the MIDI IN port of the **Navigator**.

Take another MIDI cable and plug one end into the MIDI OUT port of the **Navigator** and plug the other end into the slave unit or, if you are using several MIDI instruments, plug the other end of the cable into the MIDI IN of the first slave in the system. If more than one slave is used, get yet another MIDI cable and plug one end into the first slave's MIDI THRU port and plug the other end into the MIDI IN of the second slave. Use this "MIDI THRU-to MIDI IN" chaining until all slaves have been connected. If more than 4 slave units will be used, you must use a MIDI THRU box (See section 1.2.1). You may use a closed loop by connecting the MIDI OUT of the **Navigator** to the MIDI IN of your master, but you must turn MIDI Local Control off on your master for this to work correctly.

2. If your Master controller has a MIDI ECHO control, turn it OFF.

3. Connect the **Navigator's** Power Pack to the unit's DC receptacle. It is located on the left rear panel as you are facing the **Navigator** from the front. Plug the Power Pack into a standard electrical wall outlet. Hold the ENTER button and turn the **Navigator** ON with the switch located adjacent to the DC receptacle on the Rear Panel. After power is on, release the ENTER button. The **Navigator** is now reset and the Factory Stock Programs have been loaded. Turn the other units in your system on.

4. Set each of your Slave Instruments to a different MIDI Channel. Turn OMNI Mode off for each of these Slaves.

5. Set your master's basic channel (the channel your master controller is transmitting on) to channel 1.

Your **Navigator's** display should read "00" and the LED above **SETUP** is on. This indicates that SETUP #00 has been selected and that the unit is in SETUP Select Mode.

While in SETUP Select Mode (the **SETUP #** LED will be lit), pressing the > button advances the display to the next SETUP (pressing < reverses) and a flashing dot in the display will appear indicating that a change has been made. Pressing ENTER confirms the selection and the dot disappears.

Factory Presets

<u>Setup</u>	<u>Description</u>
00	All the notes on the keyboard are inverted.
01	The keyboard is inverted from notes C3 to C4, all other notes on the keyboard have been turned off.
02	Notes C3, F3, G3 and A3 play chords instead of single notes. C3 = C Major chord (CEG) F3 = F Major chord (FAC) G3 = G Major chord (GBD) A3 = A Minor chord (ACE)
03	Rescales the velocity to respond more like a non-velocity sensitive keyboard.
04	Note to Patch Map. Notes C1 to B1 send patch change 00 - 11. Play one note at a time chromatically.
05	Continuous Controller 01 (Mod Wheel) sends a volume command (Controller 7) on MIDI channels 1 - 4.
06	Splits the Keyboard onto two MIDI channels: Notes below C3 are played on channel 1, while notes above C3 are played on channel 2. Mod wheel and pitch bend are mapped from the Basic Channel (the channel in which the master controller is transmitting on) to channels 1 & 2. The sustain pedal is mapped to channel 2.
07	The black keys between C3 and C4 are disabled (wrong note filter).

Chapter 1

Unpacking & Connections

1.1 Unpacking the Navigator

The **Navigator** is shipped from the Oberheim factory boxed in protective foam. Once you open the **Navigator's** carton, you should find a number of accessories that were shipped with the unit. The following checklist details the items that you should have when you first open the box. If any of these are missing, **contact the Oberheim Dealer that sold you the unit** and they will assist you in obtaining the missing items:

The Navigator
This Owner's Manual
AC Adaptor/Power Pack

Once you have unpacked the **Navigator**, place it on any solid surface near your MIDI setup. Before you turn anything on, refer to the following procedure for connecting the unit.

Incorporating the Navigator into your MIDI system is easy and straight-forward. Since the **Navigator** makes no sound of its own, there are no audio connections to worry about. All you need to do is connect the MIDI IN and MIDI OUT ports and plug the unit into an electrical AC outlet. The Oberheim FS-7 Pedals are optional and can be ordered from your Authorized Oberheim Dealer separately.

1.2 Rear Panel Connections & Power-on

1.2.1 MIDI

1) Connect the MIDI Out from your Master controller to the MIDI IN of the Navigator. The Master controller can be a MIDI keyboard, a MIDI Controller ("mother") keyboard, any MIDI synthesizer or a sampler that has a keyboard, or any other source of MIDI notes.

2) Connect the MIDI Out from the Navigator to MIDI In of your first Slave instrument. The first Slave can be another MIDI keyboard, a keyboard synthesizer or sampler, or a MIDI voice module or the Master controller keyboard itself.

If more than one slave is used, get another MIDI cable and plug one end into the first slave's MIDI THRU port and plug the other end into the MIDI IN of the second slave. Use this "MIDI THRU-to MIDI IN" chaining until all slaves have been connected.

An alternate method of connecting the system can also be accomplished if you want to use a MIDI THRU Device. A "THRU Box" as they are called is in many respects like a "Y" connector for MIDI signals. It is comprised simply of a MIDI IN port that divides the MIDI signal to two or more MIDI THRU ports. If you plan to use one of these units, plug the end of the MIDI cable from the Navigator's MIDI OUT port into the MIDI IN of the THRU box. Then connect the MIDI IN ports of the slaves to the THRU ports of the THRU box.

1.2.2 Pedals

The back panel of the **Navigator** also includes four 1/4" jacks which accept any "discrete" pedal (also known as a "footswitch"). A discrete pedal is a momentary (spring-loaded ON/OFF) footswitch type. Be sure not to use a "continuous" (rocker type) footpedal. The **Navigator** can be controlled from either Local pedals (plugged into any of the four inputs on the rear panel) or "External" pedals (pedal control coming in from your Master MIDI Controller). Plug any momentary SPST spring-loaded pedal into the desired pedal input on the rear panel (the Oberheim FS-7 is recommended); MIDI pedal control is discussed in Chapter 10.

There are two kinds of discrete pedals available. The **Navigator** can use either kind by automatically deciding which kind is in use when power is turned on. To make sure that the kind of pedal is correctly determined, plug in the pedals before turning on power and do not press the pedals while power is being turned on.

1.3 Powering Up

For starters...

Turn on your Master controller and set its MIDI Basic Channel.

Turn on all Slave units, and set their Basic Channels as well.

Then power on the Navigator...

Connect the provided Power Pack (Oberheim Part Number 400006 for 120V, 400007 for 220/240V) to the connector on the back of the Navigator and plug the pack into an AC outlet. Be sure that the Power Pack that came with the unit is correct for the AC power in your area. Turn the power on by lifting the power switch on the left rear panel.

The current software revision number will be briefly displayed and the Navigator will display the same setup number as when it was last turned off.

1.4 Resetting the Navigator

The Navigator can be initialized to the condition it left the factory by performing the "Hard Reset" function. This is accomplished by holding the ENTER button on the front panel while turning on the power. But be careful: the Hard Reset initializes the Navigator to the default factory settings. This erases all programmed data and replaces it with the Factory settings.

Chapter 2

OVERVIEW

2.1 Maps

The basic thing that the Navigator does is to receive MIDI messages, change them into other messages, and send them back out. These MIDI messages include Note On (and Off) messages, Controller Change messages, and Patch Changes. This manual will assume that you are familiar with MIDI and the meaning of these messages.

2.1.1 Function of a map

The Navigator uses a "Map" to change one kind of MIDI data into another. The maps contain all the information about what data will be coming in, how it should be changed, and where it will be going.

There are different ways to change the data. One way is to describe all the MIDI messages you might send to the Navigator and define what the Navigator should send when it receives each of those inputs. Another way is to use a mathematical function to change the values received.

2.1.1.1 *Table Maps*

Most of the time, you will want to do the first of these, that is change particular values into other particular values. This includes changing notes into other notes, changing patches into other patches, changing notes into patches and other similar kinds of operations. In these cases, you need to set up a "Table Map". The table defines for each input, what the output will be. For example, if you want to change patches, the table would contain several entries, each entry indicating what patch you expect to receive, and what patch should be sent when the input is received. See figure 1.

The tables are set up the same way no matter what the inputs are and what the outputs are, so a map that changes notes into patches is set up exactly the same way as one that changes patches into different patches. When the Navigator gets a MIDI message, it looks in the table to see if it can find any "Inputs" that match. If it can, it sends all of the corresponding outputs.

Table Map

In	Out
1	3
1	4
2	7
3	10
7	8

Figure 1.

One unusual thing about the Navigator is that, in order to best make use of the memory in each Map, the Navigator allows you to make tradeoffs in the number of entries and the number of MIDI channels you can send to at once, as well as some other information. This means that when you are mapping patches into other patches, you can select among different map configurations for the one that best suits your input, output and channel requirements. The exact combinations that are allowed will be described later in the manual. For now, all you need to remember is that you can't have as many inputs and outputs as you like – there are limits.

2.1.1.2 *Continuous Maps*

The other kind of Map is a "Continuous Map". This kind of map allows you to do some simple things to controllers to change their "curves". For example, if you find that your master controller requires too much force to play your sound module at its maximum volume, you can change the curve so that medium velocities are changed into loud velocities. The big difference between "Continuous Maps" and table maps is that you don't have to specify each of the possible input values. Instead you just tell the Navigator the range of input values and how you would like them processed and the Navigator will calculate an output for every input. If you wanted to try to change the velocities as described above using a "Table Map", you would have to have one entry for each possible input velocity (from 0 to 127) and you would have to hand-enter what output velocity you would like for each of those inputs. See figure 2.

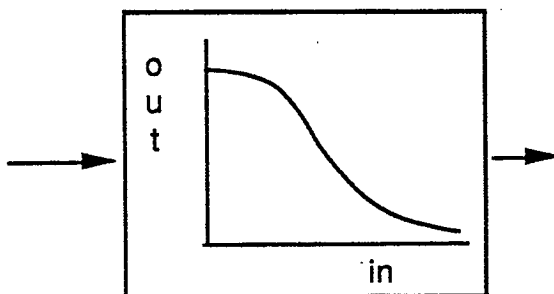


Figure 2.

2.1.2 Two Maps Active all the time

There are many cases when you actually need to do a couple of different things at once, like reversing the bender direction, scaling the velocity and changing patch changes from your controller into separate patch changes for each of your slaves. To make this easier, the Navigator allows you to have two maps active at once. One of the maps will generally handle note and controller mapping, while the other handles patch maps.

You must set a Map Type for each of these maps. This tells the Navigator exactly what kind of data it will be receiving, and what it should send.

2.1.2.1 Note/Controller Map

A Note/Controller Map is used to change notes or controllers into something else, either into other notes or controllers, or into patches. In general, the Navigator assumes that there will be relatively few notes or controllers which will be processed.

The idea behind having one map to handle notes and controllers is that generally note maps will be used by drummers to map pads to drum sounds (and drummers don't need much controller mapping), while controller maps will be used primarily by keyboardists (who don't usually need much note mapping).

2.1.2.2 Patch/Chain Map

The Patch/Chain Map should be used to change patch select messages into other patch selects. It is designed with more entries than the Note/Controller Map so you can have more inputs and outputs. In addition, when the map type is set to one of the "Chain" settings, a footswitch can be used to step from entry to entry, sending several patch changes with each step.

2.2.1 Setups

All of the information in the tables and the settings for the calculation maps, as well as the map types can be stored in one of the Navigator's 17 Setups. To select the maps for a particular song, for example, you need only chose the Setup you have created for that song.

Chapter 3

GENERAL ORGANIZATION

The front panel is organized into five sections. Most of the sections interact with the other sections in different ways depending on the type of functions being performed. Here is a brief description of each of the sections.

3.1 Setup

The SETUP section is used to select the current setup number being used or edited. It also chooses which type of maps are in the current setup. Pedals 3 & 4, which are programmable per setup, are assigned here. The section marked Patch Channels has been reserved for a future enhancement and displays "--" to indicate it is not applicable yet.

3.1.1 Bypass

In the "Setup" state, pressing the Enter key with no new Setup pending causes the Navigator to enter Bypass mode. Two dashes ("--") are displayed, and all mappings are turned off. The Navigator becomes a MIDI THRU box. Pressing Enter again restores mapping.

3.2 Map

In the MAP section you choose which one of the two current maps you want to edit and then the Entry Number (#) within the chosen map. The Input, Output, and Output Channels are assigned for each of the map's entry numbers.

3.3 Control

The CONTROL section is used when working with Controller type maps and is used to define how the controller selected is going to be altered or processed.

3.4 Patch

The PATCH section is used when you are editing a patch map within a setup that allows assignment of Bank Number and MIDI Volume per map entry. This section is also used for editing the volume threshold assignment for output notes in a Drum Patch map.

3.5 Master

The MASTER section is where all the parameters that are not programmable per Setup are accessed. These include: STORE/COPY, MIDI functions, PEDALS 1 & 2 Functions, and the LOAD/DUMP functions.

Chapter 4

SELECTING SETUPS AND MAP TYPES

Here we will show you how to select the user programmable SETUPS and the selection of map types to be used.

4.1 Selecting a SETUP

The Navigator has 17 user programmable SETUPS. These are numbered 00 through 16. In addition to these 17, there is one user programmable Global setup, which will be discussed in chapter 8. The Global setup is selected from setup #0 by pressing the left arrow button (< button).

To select a setup:

- Press the MODE button until the LED below SETUP is lit. Now you are in SETUP Mode.
- The arrow buttons can now be used to step or scroll through the available setups. The MODE LED will flash in the display (except if the same setup number you began with is displayed).
- With the MODE LED flashing, press the ENTER button; the MODE LED will go out indicating the setup number has been selected.

4.2 Selecting the map types

Within each one of the Setups there are two maps available for use at one time. One of the maps is a "Patch Map" and the other map is user selectable. The options available for the selectable map are: Controller To Controller, Note To Note, Note To Patch, and Drum Patch.

Choosing the Note/Controller Map Type:

- With just the SETUP LED lit, press the button under the NOTE/CTRL MAP TYPE in the SETUP section so the LED above the button will light. The display now shows the current map selected.

Display	Map Type
CC	Controller to Controller map
nn	Note to Note map
nP	Note to Patch map
dP	Drum Patch map

- Select a map by using the arrow buttons to step through the options. Once the proper map type is displayed press the ENTER button and the flashing MODE LED will go out. You have now selected the map type.

4.3 Selecting the Patch map type

One of the two maps in a Setup must be Patch Map. There are, however, several options available to specify what its exact format will be. They are:

	Display	Map name	Description
1)	AL	ALL Channel type	This type map can have 16 input patches. Each entry can map to 16 output patches: one on each of the 16 MIDI channels.
2)	Fi	Fill in type	This type map can have up to 100 input patches that map to 100 output patches on any of the 16 MIDI channels.
3)	Ub	Volume & Bank type	This type map can have up to 64 input patches that map to 64 output patches on any of the 16 MIDI channels. In addition, Volume (0 to 127) and Bank Change (0 to 15) can be sent for each entry.

To select the Patch Map format:

- Press the button under PATCH/ CHAIN MAP TYPE in the SETUP section; the LED above the button should be lit and the display should read "P.t" or "C.t".
- If the display reads "C.t" use the < button to change it to "P.t".
- "P.t" stands for Patch Type. Now Press the enter button to select any of the three options available. Use the arrow buttons to step through the map types (AL, Fi, Ub). Once the display shows the proper map type press the enter button and the flashing MODE LED will go out. Your selection is made.

After choosing the map you may also specify whether the Patch Map is a Chain Map. A Chain Map is one in which the input section of the map is ignored and a pedal is used to step through the map.

The Chain Mode is turned on and off here. To assign Chain Mode to a pedal see the section on pedals in Chapter 10.3.

To turn Chain Mode on or off:

- Press the button under the PATCH/CHAIN MAP TYPE until the display reads "P.t" or "C.t"; the LED above the button will now be lit.
- If the display shows "P.t" use the > button to get to "C.t".

-Now Press the ENTER button to enter the CHAIN MODE.

-Use the arrow buttons to select Chain ON (on) or Chain Off (oF), then press the enter button and the flashing MODE LED will go out, which indicates your selection has been made.

4.4 Pedals 3 & 4

Pedals 3 & 4 are programmable per setup, See the Pedals section in Chapter 10.3. Now that you have selected the Setup number and the map types you can go on to programming each of the two chosen maps. Read on in the next chapter, but...

4.5 Before we proceed...

A few of the maps you are about to learn will let you select values throughout the entire MIDI data value range, that is, 0 through 127. MIDI values 00 through 99 are displayed normally. Since the display cannot show three characters, MIDI Numbers 100 through 127 are displayed as follows:

MIDI Number	Number Display	MIDI Number	Number Display
100	<i>A 0</i>	110	<i>b 0</i>
101	<i>A 1</i>	111	<i>b 1</i>
102	<i>A 2</i>	112	<i>b 2</i>
103	<i>A 3</i>	113	<i>b 3</i>
104	<i>A 4</i>	114	<i>b 4</i>
105	<i>A 5</i>	115	<i>b 5</i>
106	<i>A 6</i>	116	<i>b 6</i>
107	<i>A 7</i>	117	<i>b 7</i>
108	<i>A 8</i>	118	<i>b 8</i>
109	<i>A 9</i>	119	<i>b 9</i>
120	<i>C 0</i>		
121	<i>C 1</i>		
122	<i>C 2</i>		
123	<i>C 3</i>		
124	<i>C 4</i>		
125	<i>C 5</i>		
126	<i>C 6</i>		
127	<i>C 7</i>		

Chapter 5

PROGRAMMING PATCH MAPS

This chapter will cover the programming of the three different forms of patch maps available in each of the setups. How to select one of the three maps is covered in the previous chapter.

5.1 All Channels Map

The ALL CHANNELS map has a total of sixteen entry numbers. Each entry number has a input patch number, and may send out the same or a different patch number on each one of the sixteen MIDI channels. See figure 3.

Patch Maps

All Channels Type

Entry #	Patch # In	Patch # Out															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	

← MIDI Channel

Figure 3.

To program an ALL CHANNELS map:

- Make sure you have selected the "AL" type map under "Patch/Chain Map Type".
- Press the MODE button until the MAP LED is on; the display will indicate which of the two maps is being edited. Press the right arrow button. The display will now read "PP" to indicate the patch to patch map.
- Press the button under ENTRY # so that the LED under it lights up and the display reads "01". You are now in entry selection mode. The "01" being displayed means that you are about to enter table values for entry # 01 in the patch map table. You may use the arrow buttons to select a different entry number (01 to 16). Notice that when you select a different entry # than the original one, a flashing dot will appear. This should help you remember that you are changing the selected value. Once the desired entry # is showing, press the ENTER button. Notice that as soon as you pressed the ENTER button, the LED under ENTRY # went out and the LED under INPUT lit up. This is the Navigator's way of letting you know that the desired entry # has been stored and it is ready to accept values for the input side of the table map. If you press the button under ENTRY #, the selected entry # will appear again (with the corresponding LED lit).
- Let's select and input value now. Make sure that the LED under INPUT is lit. Use the arrow buttons to select the input patch number (0 to 127) desired, then press the ENTER button. The Navigator will now store the input value you just selected and automatically step you to the next selection mode, which is the output selection mode. Thus, you will see that the INPUT LED will go out and the OUTPUT LED will light.
- Use the arrow buttons to select the output patch number (0 to 127 or "oF"). An output value of "oF" means that no value will be output for this particular entry. Once you have made your selection, press the ENTER button. Again, this output value is stored and the Navigator will step you to the next selection mode. The OUTPUT LED will go out and the OUTPUT CHANNEL LED will light. The display will read "01".

Note: If you would like to speed up the input/output entry process please refer to section 5.5 (Speeding Up Data Entry).

- Now use the arrow buttons to select the desired MIDI channel you would like this output patch to be sent on. Press the ENTER button to store your selection. Once again, the Navigator will step you to the next selection. In this case, the selection will be the output patch selection for the next MIDI channel. The OUTPUT CHANNEL LED will go out and the OUTPUT LED will light.

Note: the Navigator will remember the last MIDI channel you selected and automatically increment the MIDI channel for your next selection. For example, if you do not want to select any values for the first two channels, simply select channel 3 and press the ENTER button. For your next selection, the Navigator will display channel # 4.

- Use the arrow buttons to select the next patch you would like for this entry number and press ENTER. The Navigator will now step you to output channel selection mode. The OUTPUT CHANNEL LED will light again. Notice that the channel number is automatically incremented.
- Use arrow buttons to select the MIDI channel you would like this next patch number sent out on. Press the ENTER button and the OUTPUT LED will light again. This will continue until you have entered a patch number for each of the MIDI channels. Note that whenever

you exit this 'value entering' loop and re-enter, the Navigator will start displaying values again from channel 1. **Pay close attention to this, your data is not lost, it is just displayed in its proper channel.**

- After you have made a selection on channel 16, the Navigator will step you to entry number selection mode for the next entry in the map. At this point, continue as before.

NOTE: You may want to enter the patch you want sent out on channel 16 last because after ENTER has been pressed with channel 16 displayed, the next entry number in the map will be displayed. Also, if you do not want to send a patch out on each of the 16 channels press the ENTRY # button and use the right arrow button to advance to the next entry number (press ENTER) after the last channel number desired has been entered for the current entry number.

You can set the output patch value in any of the channels to OF. This means that no output patch will be sent on that channel. Output values not specified default to OF.

- Continue until you have entered data for all the entry numbers (up to 16) you wish to fill.

5.2 Fill-In Map

The "Fill In Map" has a total of 100 entries. Each entry has an input patch number, an output patch number and one MIDI output channel. The MIDI channel may be any one of the sixteen channels for each entry. See figure 4. The Fill-In map is simply a version of the Table Map we described in section 2.1.1. The same input patch number may appear several times in the map. For every match found, its corresponding output patch will be sent.

Fill-In Type

Entry #	Patch # In	Patch # Out	MIDI Channel
1			
2			
3			
⋮	⋮	⋮	⋮
98			
99			
100			

Figure 4.

To program a Fill In Map:

- Make sure you have selected the "Fi" type map under "Patch/Chain Map Type".
 - Press the Mode button until the LED below MAP is on. Press the right arrow button until the display reads "PP", which means the Patch to Patch map is the current map being displayed and is ready for editing.
 - Press the button under ENTRY # in the MAP section. The display will now read "01" (entry number 01 is ready to be edited). At this point, if another entry number is desired use the arrow buttons to select the number wanted, then press the ENTER button and the Navigator will step you to the input selection mode (the ENTRY # LED will go out and the INPUT LED will light).
 - The display will read "oF" or a number from 0 to 127. Now use the arrow buttons to select the input patch number desired. Press the ENTER button to store your selection. The Navigator will step you to output selection mode (the flashing MODE LED will go out, the INPUT LED will go out, and the OUTPUT LED will light). Note that an input value of "oF" means that no output patch will be output for this entry.
 - The display will read "oF" or a number from 0 to 127. An output value of "oF" means that no value will be output for that particular entry. Now use the arrow buttons to select the patch number (0 to 127) to be sent out for this entry. Press the ENTER button; the MODE LED will go out, the OUTPUT LED will go out, and the OUTPUT CHANNEL LED will light.
- Note: If you would like to speed up the input/output entry process please refer to section 5.5 (Speeding Up Data Entry).
- Use the arrow button to select the MIDI Channel (1 to 16) the patch should be sent out on. Press the ENTER button to store your selection and advance to entry selection mode. The OUTPUT CHANNEL LED will go out, and the ENTRY # LED will light. Now the display will read "02" and the next entry is ready to be entered.
 - From this point on you may use the ENTER button to step through each of the entry numbers, up to 100 (A0), while entering the desired numbers at each of the entry points described above.
 - You can verify the values you have entered by selecting entry # 01 and stepping through all the selections by pressing ENTER. The currently selected value for each selection in the map will be displayed.

5.3 Volume and Bank Map

The VOLUME AND BANK map has a total of 64 entries. Each entry number has an input patch number, an output patch number, a MIDI channel out number, and can send out a bank select number (0 to 15) and a MIDI Volume level (0 to 127). Bank number, if not changed, defaults to bank 0. MIDI volume is sent on controller number 07. See figure 5. An input patch number may be mapped more than once. For every match found, each of the corresponding output patches will be sent.

Volume & Bank Type

Entry #	Patch # In	Patch # Out	MIDI Channel	Bank # 0 - 15	Volume 0-127
1					
2					
3					
⋮	⋮	⋮	⋮	⋮	⋮
62					
63					
64					

Figure 5.

Programming a VOLUME AND BANK map:

- Press the MODE button until the MAP LED is on; press the right arrow button until the display reads "PP".
- Press the ENTRY # button; the LED below it will light and the display will read "01". You can use the arrow buttons to select a different entry number if desired; press the ENTER button after the number desired is selected. The Navigator will store your selection and step you to the input selection mode (the LED below INPUT will light).
- Now use the arrows to select the input patch number desired. Press ENTER; your selection will be stored and the Navigator will step you to output selection mode (the INPUT LED will go out and the OUTPUT LED will light).
- Use the arrow buttons to select the output patch number and press ENTER. Your selection will be stored and the Navigator will step you to output selection mode (the OUTPUT LED will go out and the OUTPUT CHANNEL LED will light).

Note: If you would like to speed up the input/output entry process please refer to section 5.5 (Speeding Up Data Entry).

- Use the arrow buttons to select the desired MIDI output channel and press ENTER. Your channel selection will be stored and the Navigator will step you to bank selection mode (the OUTPUT CHANNEL LED will go out, the PATCH LED will light, and the LED below BANK will light up).

- Now use the arrow buttons to select the bank number (0 to 15) desired and press ENTER. Your bank selection will be stored and the Navigator will step you to volume selection mode (the BANK LED will go out, the VOLUME LED will light up).

- The display will read "oF". Use the arrow buttons to select desired volume level (0 to 127 or "oF") and press ENTER. An output value of "oF" means that no volume will be output for this particular entry. Once again, the selected value will be stored and the Navigator will step you to entry selection mode (the VOLUME and BANK LED will go out, the ENTRY # LED will light, and the display will show the next entry number).

NOTE: If MIDI volume is left OFF, then no volume level will be sent out for that entry number.

- Continue on with the next entry number by pressing the ENTER button to advance on to the INPUT location and enter the data as described above until all the desired entry numbers (up to 64) have been edited.

5.4 Chain Type Maps

If the patch map you have selected has CHAIN enabled, then the input patch number is ignored, and the INPUT section of the map will display "CH". A chain patch map allows you to send the patch output values entry by entry by pressing a pedal. Thus, inputs are ignored for a chain patch map.

5.5 Speeding Up Data Entry

On patch maps there are two ways to help speed up the entry of the input and output patch number. This will work only for the patch number, not any of the other parameters.

1) When entering the input or output patch number, you may use the keyboard patch number to enter a patch number by pressing and holding the ENTER button. Send a MIDI patch number from your keyboard. After the display changes to the number sent release the enter button, then press the ENTER button once more to advance to the next parameter to be entered. Make sure that you are pressing ENTER when doing this, otherwise the Navigator might interpret the patch change message as a Setup Change message and switch to a different setup unexpectedly.

2) A note number sent to the unit may also be used to enter the data. This is done the same as above, except that the note number is taken as a patch number.

Chapter 6

PROGRAMMING NOTE-TO-NOTE AND NOTE-TO-PATCH MAPS

This Chapter will cover programming note-to-note and note-to-patch maps. Selection of available maps is covered in chapter 4.

6.1 Programming NOTE-to-NOTE maps

A NOTE-to-NOTE map has a total of 32 entries. Each entry number has an input note name, an output note name, and a MIDI output channel specified. (See figure 6.) The same input note may be mapped to different output notes.

NOTE: In the note maps, note names are used instead of note numbers. A note name will display a letter (A, B, C, D, E, F, G) in the first digit, then the octave in the second digit (=, -, 0, 1, 2, 3, 4, 5, 6, 7). Sharps are indicated by the lit MODE LED in the display. See Appendix A.

To program a Note-to-Note map:

- Make sure you have selected the "nn" type map under "Note/Ctrl Map Type".
- Press the MODE button until the MAP LED is on; the display should read "nn". If it doesn't, press the left arrow once, the display will read "nn". The note to note map is now ready to be edited.
- Press the ENTRY # button; the LED below it will light and the display will read "01". Select the entry number you would like to edit. Press ENTER. Your selection will be stored and the Navigator will step you to input selection mode (the ENTRY # LED will go out and the INPUT LED will light). Now the selected entry number is ready to be edited.
- The display will read "oF" or show a note name.
- Use the arrow buttons to select the note name you want as the input note and press ENTER. Your input selection is now stored and the Navigator will step you to output selection mode (the OUTPUT LED will light).

Note: You can enter the desired note name via MIDI by pressing and holding the ENTER button, press the desired key in your master controller, then release the ENTER button when you have selected the desired note. Notice that the display will show any keys you press as long as the ENTER button is held down.

- The display will read "c=". A note can be mapped to "oF". An output value of "oF" means that no value will be output for this particular entry. Use the arrow buttons to select the desired output note name and press ENTER. Your output selection is stored and the Navigator steps to the output channel selection mode (the OUTPUT CHANNEL LED will light and the display will read "bC").

NOTE: "bC" stands for "basic channel." This means that the output note will be sent on the channel on which the input note is received (whichever one your master is transmitting at the time the mapping takes place). Note that this is the same as the Basic Channel number selected in the MASTER section. If your master controller is sending MIDI information on a different channel than the Navigator's basic channel, the data is ignored and no mappings will take place (unless your Navigator is set for Omni mode).

- Use the arrow buttons to select the desired MIDI channel for the output note. Notice that "bC" is selected by pressing the left arrow button beyond channel 0. Once you've made a selection press ENTER. The output note selection is stored and the Navigator steps to entry selection mode.

Note: If you would like to speed up the input/output entry process please refer to section 6.3 (Speeding up programming Note maps).

A note may be mapped more than one time. For each match found in the table, each corresponding output note will be sent. Notice that this allows you to map notes to chords on any of the MIDI channels.

- The next entry number will be displayed. Continue entering as described above until you have entered all the mappings you want or have filled the map (32 entries).

Note to Note

Entry #	Note # In	Note # Out	MIDI Channel
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

Figure 6.

6.2 Programming Note-to-Patch maps

NOTE-to-PATCH maps have a total of 32 entries. Each entry has an input note name, an output patch number, and a MIDI output channel specified (See figure 7). The same input note may be mapped to different output patches.

To program a note-to-patch map:

- Make sure you have selected the "nP" type map under "Note/Ctrl Map Type".
- Press the MODE button until the MAP LED is on; the display will read "PP". If it doesn't, press the left arrow once; the display will read "nP". The note to patch map is ready to be edited.
- Press the ENTRY # button; the ENTRY # LED will go on, and the display will read "01". Now entry number 01 is ready to be edited.
- Press the ENTER button; your entry selection will be stored and the Navigator will step you to input selection mode (the INPUT LED will light).
- The display will read "oF" or show a note name. Use the arrow buttons to select the desired input note name and press ENTER. The input note selection will be stored and the Navigator will step to the output selection mode (the OUTPUT LED will light).
- The display will now show "00". Use the arrow buttons to select the desired patch number to be sent out and press ENTER. The output patch selection will be stored and the Navigator will step to the output channel selection mode (the OUTPUT CHANNEL LED will light up).

Note: You can enter the desired note name or patch via MIDI by pressing and holding the ENTER button, press the desired key or patch in your master controller, then release the ENTER button when you have selected the desired note or patch. Notice that the display will show any keys or patches you press as long as the ENTER button is held down.

- The display will show "1". Use the arrow buttons to select the desired MIDI output channel and press ENTER. The output channel selection will be stored and the Navigator will step to the entry selection mode. The next entry number to be edited will be displayed.

Note: If you would like to speed up the input/output entry process please refer to section 6.3 (Speeding up programming Note maps).

- Continue on entering data as described above until you have entered all the desired data or have filled the map (32 entries).

Note to Patch

Entry #	Note # In	Patch# Out	MIDI Channel
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

Figure 7.

6.3 Speeding up programming Note maps

If you are just entering the input and output names or numbers on the note maps, and you are not changing the MIDI channel, you can save time by entering all the data directly from the keyboard.

To enter data from the keyboard:

- With the entry number showing in the display, press the key you would like as the "note in". The Navigator will automatically step to input selection mode and display the note name for the key just entered (note that the INPUT LED will light).
- Press the key you would like as the output note; the Navigator will automatically step to output selection mode and display the note name for the key just entered (note that the OUTPUT LED will light).
- Next press any one key on the keyboard and the next entry number will be displayed.
- Continue on entering data as described above.
- If you make a mistake, select the entry you wish to correct by pressing the ENTRY # button and using the arrow buttons until the desired number is showing. Press the ENTER button. At this point, the Navigator assumes you are reviewing the entries made and advances to the INPUT selection. In order to change the selection directly from the keyboard, go back to ENTRY # selection by pressing the ENTRY # button. You can now enter the desired input note by pressing the desired key on your master keyboard. **Remember, in order to enter the input note, the Navigator must be showing an entry selection number!**

You can also correct mistakes "on the spot" by pressing and holding the ENTER button and pressing the new key that you would like to substitute for the incorrect one.

NOTE: In the case of a Note to Patch map, programming of the out portion of the map will take the note number played and use it as a patch number. You can also select the output patch value by sending the Navigator the patch number you desire from your master keyboard.

Chapter 7

PROGRAMMING DRUM SETUPS

This chapter will cover the programming of Drum setups and the various options available with them.

7.1 Drum Setup maps

The Drum Setups, like the other setups, consist of two maps: a patch map and a multiple notes map. The Drum Setup patch map consists of 32 entries, each with an input patch number, an output patch number and an output channel number defined (See Figure 8). The other map is a note map which has 16 entries, each with an input note number mapped to a maximum of six output note numbers. Each one of the output notes may be assigned to the same or different MIDI channels. Each output note also has an independently assigned maximum velocity threshold value (See Figure 9). The Drum Setup is designed for Drum applications where multiple one-to-many note maps are essential to controlling several sound modules and changing drum kit configurations. It can be used however, by keyboardists who need intensive note-to-note mapping and not as much patch mapping. Notice that because this is a special kind of setup, you cannot select any other type of patch map than this modified fill-in type.

Drum Patch Patch to Patch

Entry #	Patch# # In	Patch# Out	MIDI Channel
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

Figure 8.

Drum Patch Note Map Type

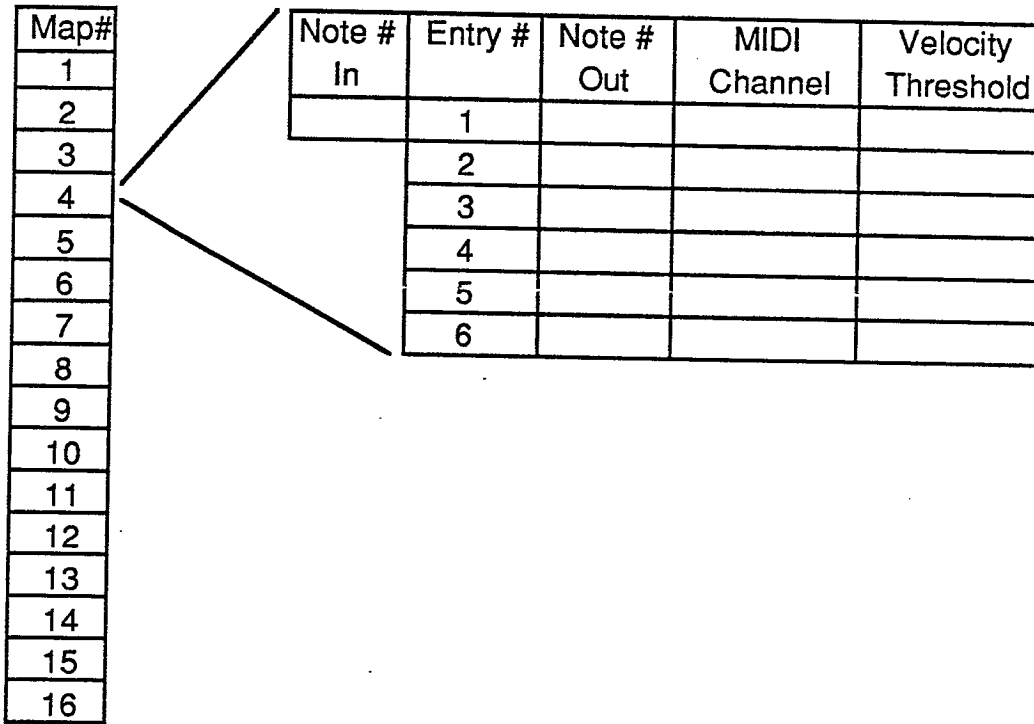


Figure 9.

The maximum velocity threshold value is the highest velocity value that will be transmitted for any given output note on its assigned MIDI channel. Any value below this threshold will be transmitted as received. This feature allows for limiting the velocity output of any of the sounds in your drum kit.

The Drum Setup is programmed differently than other setups in a number of ways. After selecting the Drum Patch mode under the Note/Ctrl Map Type section, use the Mode button to select the MAP you want to edit. Now, instead of selecting between the usual two map types, you will use the arrow buttons to select the desired entry number ("01" thru "16") for the note map and the patch map ("PP"). Notice that the display sequence goes "01", "02", "03"...."16", "PP".

The patch map in Drum Setup mode is programmed the same way as the Fill-In Type map in the other patch map modes. The only difference between the two types is that the Drum Setup patch map allows a maximum of 32 entries. This map can also be a chain type map, in which a pedal can be assigned to advance to the next Entry number (See sections 5.4 and 10.3). To program the patch map, press the right arrow button until the display shows "PP" , then proceed as you would with the Fill-In Type patch map.

7.2 Programming Drum Setup Note-to-Note maps

To program the Drum Setup note map, select the desired entry number under MAP. Once the entry number has been selected, press the button under Entry #; the LED under it will light. Now use the arrows to select which one of the output note entries (01 to 06) is to be programmed. Let's take a moment to keep the terminology straight. In this discussion, the term 'entry' by itself means one of the one-input-to-six-output maps. The term 'output-entry' will be used to designate one of the six outputs. From this point, you may step through all the selection modes by pressing the Enter button after the desired values have been entered at each selection point. Although there can be six output notes assigned per entry, only one input note may be assigned. After the input note has been assigned for an entry, the input section will be skipped for the rest of the five output entries being programmed (got that?). If you wish to change the input note value, you can press the button under the INPUT LED and make a new selection.

To program the Drum note map:

- Make sure you have selected the "dP" type map under "Note/Ctrl Map Type".
- Select the entry number desired under MAP, then press button under Entry#; The LED under it will light and the display will read "01". You are now selecting one of the output entries.
- Press Enter; your output entry selection is stored and the Navigator will automatically step you to the input selection mode (if you selected output entry # 1). The Input LED will light.
- The Display will read "oF". Use the arrows to select an input note number (0 to 127). Press Enter; your input selection is store and the Navigator will automatically step you to the output selection mode. The LED under Output will light.
- Use the arrows to select the output note number (0 to 127) for this output entry number.

Note: You can enter the desired note name via MIDI by pressing and holding the ENTER button, press the desired key in your master controller, then release the ENTER button when you have selected the desired note. Notice that the display will show any keys you press as long as the ENTER button is held down.

- Press Enter; your output selection is stored and the Navigator will step you to the output channel selection mode. The LED below Output Channel will light.
- Use the arrows to select the MIDI output channel (1 to 16). Once you have selected a channel, press Enter. The Navigator will store your channel selection and automatically step you to the velocity threshold selection mode. The LEDs to the left and below Volume in the MAP section will light.

Note: If you would like to speed up the input/output entry process please refer to the next section (7.3 Speeding up programming Drum Setup Note maps).

- Use the arrows to select the maximum output velocity (0 to 127) that will be transmitted for the current output note. This value defaults to 127 (C7) if not changed. Once you have made a selection, press Enter. The Navigator will store your velocity selection and step on to the output entry selection mode. The LED under Entry# will light.

- The next output entry number will be displayed. In this example it would be "02". Press Enter; your output entry selection is stored. In this case notice that the Navigator will bypass the input selection mode and step to the output selection mode. The LED below Output will light.
- The next output note number can now be entered.
- Continue this until all six output entries have been entered. Once all six have been entered the LED below MAP will light again and the next mapping entry number (01 to 16) can be selected. Then continue on as described above.

7.3 Speeding up programming Drum Setup Note maps

If you want to just enter the input and output note numbers, while leaving the MIDI channel and volume level the same for each output entry, there is a quicker way to enter the data.

To do this, first select the desired Entry number under MAP, then step to Entry #.

- Then send a MIDI note Number to the Navigator; the note number sent will be displayed and the Navigator will automatically step to the input selection mode (the Input LED will light). The displayed number will be the input note number.
- Send another MIDI note; the number sent will be displayed and the Navigator will automatically step to the output selection mode (the Output LED will light). This number will be used as the output note number.
- Now send any note number; the Navigator will step to the output entry selection mode (the Entry # LED will light) and the next output entry number will be displayed.
- The next note sent will be used as the next output note number. The next note sent will advance to the next entry number. This will continue until the six output notes are entered, then the display will read "FL" (full). Then go to MAP and select the next entry number under MAP and continue on with the next entry.

Chapter 8

GLOBAL SETUP

The Global Setup is independent of the other 17 setup numbers and is designed to run concurrently with the current setup number selected. The Global Setup consists of two maps: a Note/Controller map and a Setup map. The Note/Controller map provides a way for the user to set certain mappings that he would like active all the time, independent of the setup, or to have a note map and a controller map active simultaneously. The Global setup is selected by scrolling all the way down past setup #0.

8.1 Setup Maps

Instead of a Patch map ("PP") the Global Setup has a Setup map. This map determines which setup number the Navigator will switch to when a certain patch number is received on the Basic Channel. The Setup map has 128 entries. Each one of the entries consists of an input patch number and a setup number to switch to. The input patch number is entered under Input. The setup number is entered under Output. No MIDI channel is selected, so two dashes are displayed under Output Channel.

The Setup map can be one of two types. The first type is Setup ("S"). In this type, a patch number sent on the Basic Channel determines what setup number will be selected. The second is Chain type ("SC"). In this type, a pedal is used to advance to the next mapped Setup number. These two modes are selected under "Pt" in the Patch/Chain Map Type section. In Global Setup mode "Ct" is inoperative.

If Setup Change Receive on/off ("Sr") is turned off, the Setup map is ignored in Global Setup. When you reset the Navigator, the Setups map in the Global Setup is filled up with a one-to-one patch to setup map, depending on the memory size of your unit. For example, in a standard unit, patch 0 is mapped to setup 0, patch 1 to setup 1, patch 2 to setup 2 and so on until patch 16. In a unit with expanded memory, the last patch mapped is patch #80.

8.2 Selectable Map

In the Global Setup, the selectable maps are programmed the same as in any other of the Setup numbers. The selectable maps available in the Global Setup are: Controller to Controller, Note to Note, and Note to Patch maps. The Drum Patch type is not available under the Global Setup. Notice that the current setup takes precedence over the Global setup. That is, if the same input note or controller is mapped both in the current setup and in the Global setup, only the mapping in the current setup will take place.

If Global Setup on/off ("GL") is turned off (under MIDI/Misc), the selectable map is ignored in the Global Setup.

Chapter 9

PROGRAMMING CONTROLLER MAPS

This chapter covers the programming of Controller maps and the various controller processing functions available within the maps.

This chapter will be divided into two sections. The first will cover the Controller map Entry #, Input, Output, and Output Channel sections. The second part will cover the various processing functions available for each one of the Controller maps entry numbers.

9.1 Controller to Controller Maps

The Controller maps have up to ten entries. Each one of these entry numbers contains an input controller number, an output controller number, and the output channel the controller is sent on.

Controller numbers may be entered in the Input section more than once. If the same controller appears more than once as an input, it is mapped as many times as it appears. Thus one controller can be mapped to several different controllers. If a controller is mapped several times to the same output controller on the same channel, you might not get the results you expect. In this case, the mapping with the highest entry number will probably be the one you notice is taking place.

9.1.1 Controller types

Controllers available for input and output include, in addition to controllers 0 through 127, the following:

" n" - Note number

The note number is interpreted as a controller value. This is used for things like inverting the keyboard and other mappings of the keyboard, as opposed to the one-note-at-a-time mappings provided under note maps. This input is a special case for mapping the keyboard to itself. Other inputs are used for mapping the keyboard to other controllers (see below).

"nn" - Note-on note number

The note-on note number is used as a controller value. This can be used, for instance, to simulate increased channel pressure as you play higher notes on the keyboard.

"nF" - Note-off note number

The note-off note number is used as a controller value. This can be used, for example, to map the note-off note number to release velocity to modify release velocity across the keyboard.

"nP" - Poly Pressure note number

The Poly Pressure note number is used as a controller value. The note number can be used for range checking. See Lo Range and High Range in section 9.2.1.

"Un" - Velocity, using note-on note number for range checking.
See Lo Range and High Range in section 9.2.1.

"rn" - Release velocity, using note-off note number for range checking.
See Lo Range and High Range in section 9.2.1.

"Pn" - Poly Pressure, using note number for range checking.
See Lo Range and High Range in section 9.2.1.

" U" - Velocity

" r" - Release Velocity.

" P" - Poly pressure

" C" - Channel pressure

" b" - Pitch bend

Remember when using this that the center position of pitch bend is a value of 64 not 0, so you may get some strange results.

"bU" - Pitch bend up

"bd" - Pitch bend down

When using these various options as inputs, the output options available are restricted to be compatible with the selected input. Only the compatible options will be displayed under Output. For a complete list of available mappings please refer to figure 10.

Available Controller Mappings:

Output

Input	Output															
	n	nn	nF	nP	Un	rn	Pn	U	r	P	C	b	bU	bd	#	
n	•	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
nn	--	--	--	--	--	--	--	•	--	•	•	•	•	•	•	
nF	--	--	--	--	--	--	--	--	•	•	•	•	•	•	•	
nP	--	--	--	•	--	--	--	--	--	•	•	•	•	•	•	
Un	--	--	--	--	--	--	--	•	--	•	•	•	•	•	•	
rn	--	--	--	--	--	--	--	--	•	•	•	•	•	•	•	
Pn	--	--	--	--	--	--	--	--	--	•	•	•	•	•	•	
U	--	--	--	--	--	--	--	•	--	•	•	•	•	•	•	
r	--	--	--	--	--	--	--	--	•	•	•	•	•	•	•	
P	--	--	--	--	--	--	--	--	--	•	•	•	•	•	•	
C	--	--	--	--	--	--	--	--	--	--	•	•	•	•	•	
b	--	--	--	--	--	--	--	--	--	--	•	•	•	•	•	
bU	--	--	--	--	--	--	--	--	--	--	•	•	•	•	•	
bd	--	--	--	--	--	--	--	--	--	--	•	•	•	•	•	
#	--	--	--	--	--	--	--	--	--	--	•	•	•	•	•	

Figure 10.

Note: In this figure, # refers to Controller numbers 0-127.

9.1.2 Programming Controller Entries

To program controller entries:

- First select the "CC" type map, as described in chapter 4, Setups and Map types.
- Press the Mode button until the MAP section is selected. Use the arrow buttons to select "CC" in the display. The Controller map is the current and ready to be edited.

- Press the button under Entry#; the display will show the current entry number. Use the arrow buttons to select the desired entry number (1 to 10).
- Press the Enter button; the LED below Input will light. Use the arrow buttons to select the desired input controller.
- Press the Enter button; the LED below output will light. Use the arrow buttons to select the desired output controller.
- Press Enter; the LED below Output Channel will light. Use the arrow buttons to select the desired MIDI channel (1 to 16 and bC).

NOTE: "bC" stands for basic channel . Controllers will be sent out on the channel they were received on.

- Press Enter; the LED below Entry # will light and the next entry number will be displayed.
- Continue on as described above.

NOTE: If you are mapping a controller in the 0-127 range, you can assign both the input or output values by pressing and holding ENTER and activating the desired controller in your master keyboard.

The table below lists the common MIDI Controllers and their corresponding Controller Numbers for your convenience:

MIDI Controller	Controller Type	MIDI Controller #
Modulation Wheel or Lever	Continuous	1
Breath Controller	"	2
Foot Controller	"	4
Portamento Time	"	5
Data Entry Slider or Knob	"	6
Volume Pedal	"	7
Balance Control	"	8
Pan Control	"	10
Expression Pedal	"	11
Sustain Pedal	Discrete	64
Portamento On/Off	"	65
Sostenuto Pedal	"	66
Soft Pedal	"	67
Hold 2 Pedal	"	69
External Effects Depth	"	91
Tremolo Depth	"	92
Chorus Depth	"	93
Celeste (Detune) Depth	"	94
Phaser Depth	"	95

For a complete listing of all MIDI Controller Numbers please refer to Appendix C.

9.2 Processing the Controllers

This section will describe the processing options available to each one of the ten entries in the Controller maps and how to program them.

When programming the processing function first make sure that the correct entry number to be processed is displayed in the MAP section. Then use the Mode button to step up to the CONTROL section of the front panel. Once in the CONTROL section use the buttons to select the appropriate column.

9.2.1 Lo Range and Hi Range

Controllers can be restricted to be mapped only when their values are within a certain range. The boundaries of this range for the current controller map entry are set by the Lo and High Range parameters. The Lo Range is restricted to be less than or equal to the High Range. Controller messages with values outside the prescribed range may be filtered or echoed; see under Parameter.

To set the Lo & Hi Range:

- Press the button under the range you are setting (Lo or High). Now use the arrows to select the proper value. You may also enter the value by pressing and holding Enter button; then sending a note number (0 to 127) by pressing a key on the keyboard.

9.2.2 Function

This mode selects the type of mathematical function to be applied to the controller value for the current controller map entry. To select a Function, make sure that the LED under CONTROL is lit and press the button under FUNCTION.

The functions available:

"CH" - Channelize

The input controller value is retransmitted unaltered. No math is performed other than range checking. This function is to provide an easy way to send controllers out on different channels from the channel received.

"So" - Scale/Offset

The input controller value is scaled and offset. An application of this: Set the pitch bend interval on the slave unit to a major third. Set up a controller map entry with input = bend down, output = bend up, function = scale/offset, and scale = 32(a factor of 1/2). The bend lever will now bend up a major third in one direction and up a major second in the other.

"tG" - Toggle

The input value is compared against a threshold. If it is below the threshold, the low output value is transmitted. If it is equal to or above the threshold, the high value is transmitted. This may be used to convert continuous controllers into switches, or to allow switch controllers to send values normally accessible only to continuous controllers. Note however, that if you set the toggle point to 0, the Navigator will never re-transmit the low

output value. If you happen to be mapping mod wheels or pitch bend levers, you might get unexpected results if you are not careful.

To set the threshold value for the Toggle function refer to section 9.2.3 (Parameter). To set the low and high output values for the Toggle function refer to section 9.2.4.2 (Offset).

"CL" - Clip

The input value is offset and scaled. The result is divided by a constant, the remainder is discarded, and the quotient multiplied by the constant again. The effect of this is to quantize the output value to integer multiples of the constant. For example, if the constant is set to a value of 3, a sequence of input values of 0, 1, 2, 3, 4, 5, 6 will produce a sequence of output values of 0, 0, 0, 1, 1, 1, 2.

"tb" - Table

The input value is offset and scaled, and the result is fed into a nonlinear function, which is computed via a ROM lookup table. There are eleven tables available. The tables are shown below with a graph showing what each one looks like. The tables are selected under the Parameter function.

- | | |
|-------------------------|--------------------|
| 1 - Parabola | 7 - S-curve 2 |
| 2 - Gradual exponential | 8 - Plateau |
| 3 - Steep exponential | 9 - Shelving curve |
| 4 - Gradual logarithm | 10 - Reverse curve |
| 5 - Steep logarithm | 11 - Invert |
| 6 - S-curve 1 | |

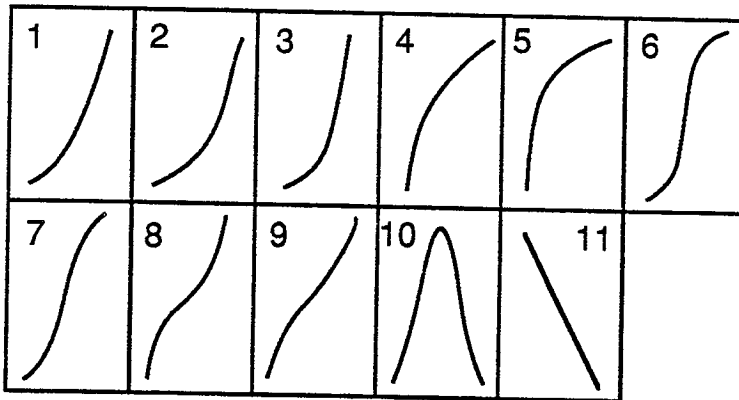


Figure 11.

"nS" - Note scale

The input is offset and scaled. The result is then scaled again by the most-recently-received note number. This could be used, for example, to vary the amount of pitch bend across the keyboard. Since only the most recent note is used for scaling, this function is useful primarily for playing monophonic lead or bass lines.

9.2.3 Parameter

This section has two parameters, Parameter ("PA") and Filter/Passthru ("FP"). To select this section, make sure that the LED under Function and the LED under CONTROL are lit. Then press the LED under function again. The LED under PATCH will light, indicating you are now in the Parameter section.

Parameter ("PA") specifies the parameter, if any, associated with the selection made in the Function section.

- For Toggle, the parameter is the value at which the controller output value switches from low to high.
- For Clip, it is the quantization divisor.
- For Table, it is the number of the nonlinear scaling table to be used.
- For Note Scale, it is the scale factor, in 64ths (same as for Scale, but incrementing by 2s).
- For Channelize and Scale/Offset, this parameter does not apply. The display will show two dashes in the display.

Filter/Passthru ("FP") determines what happens to the controller messages whose values fall outside the range specified by Lo Range and High Range.

" F" - Filter

If filter is selected, out-of-range controller values are ignored and not retransmitted. It is possible to completely remove a controller from being sent out, by selecting Filter and setting both Lo and Hi Range to 0.

" P" - Passthru

If Passthru is selected, out-of-range controller messages are retransmitted as received, as though the Navigator were a MIDI THRU box.

The Parameter section can only be accessed when you are in the Function section. This is done by pressing the button under Function; the unit will step up to the parameter section. The arrows are used to select between "PA" and "FP" parameters. Then press the Enter button to get to the options available; make your selection with the arrow buttons.

9.2.4 Scale and Offset

Except for Channelize and Toggle, all Controller Functions include a linear mapping, in which the controller value is offset by a constant from -128 to +127, and the offset result scaled by a factor from -2 to 2. The linear mapping result is then fed into any selected nonlinear mapping.

The Offset state specifies the offset amount for the current controller map entry. Again, the right decimal point lights for negative values.

9.2.4.1 *Scale*

The Scale section specifies the rescaling factor for the current controller map entry. The factor is displayed in 64ths, so that a value of 64 means a scale factor of 1. The right decimal point lights for negative values. Negative scaling means inversion, so that 0 maps to 127 and viceversa.

9.2.4.2 Offset

The Offset section specifies the offset amount for the current controller map entry. Again, the right decimal point lights for negative values. Offsets are added to the input value.

It is almost inevitable that scaling and offset will lead to values greater than 127 or less than 0, which is to say, values that MIDI's range is not equipped to handle. The Navigator clamps out-of-range values, so that negative values become 0 and large positive values become 127. The clamping takes place at the offset and scaling independently. If an input value of 100 is offset by 100 and then rescaled by 1/2 (displayed Scale=32), the result is 63 not 100.

When the selected Function is Toggle, no linear mapping takes place. Instead, the Scale and Offset sections are used for the low and high toggle output values, respectively.

When the selected Function is Channelize, The Scale and Offset sections do not apply, and the display will show two dashes.

In order to enter the Scale section press the button below Scale and use the arrows to select the desired value. To enter Offset press the button under Scale once more and the unit will step up into Offset. Use the arrows to enter the desired value.

Chapter 10

MASTER SECTION

This chapter covers the various options available in the Master section and how to access them.

10.1 Store/Copy

The Store/copy function is used to save or make a copy of the currently selected setup.

The Store/Copy function can be accessed from any mode on the front panel, by pressing the button directly below the MASTER section until the LED to the left of Store/copy is on.

To Store or Copy:

- With the LED to the left of Store/Copy on, the MODE LED will be flashing.
- Press the ENTER button to enter the Store/ copy function; the present setup number will be displayed. The SETUP and MODE LEDs will be flashing.
- Now use the arrows to select the number of the location you want the setup stored in. You may store it in the currently displayed location or in any of the other setup numbers.
- Press ENTER; the display will read "Go" and the MODE LED will be flashing.
- Press ENTER; the display will change to the setup number selected. The setup is now stored or copied.

10.2 MIDI/Misc

The MIDI/Misc. section has the parameters available to setup the MIDI functions and a few other miscellaneous functions.

The MIDI/Misc. section is accessed by pressing the button below the MASTER section until the LED to the left of MIDI/Misc is on. The arrow buttons are used to select one of the ten parameters available. Once the desired parameter is displayed, press the Enter button to get to the options available. Then use the arrow buttons to view all the options.

"CL" - Clear current setup

This function will clear both the maps active in the current setup number. After ENTER has been pressed, the display will read "Go" and the MODE LED will be flashing. Press enter once more; the setup will clear. Pressing any other button will abort this function.

"bC" - MIDI Basic Channel

This is for selecting the MIDI channel the instrument will receive on. After using the arrows to select the desired channel, the ENTER button must be pressed to enter the selection in memory.

"on" - OMNI on/off

When turned On, the Navigator will receive MIDI data on all Channels. When turned Off, the Navigator will receive MIDI data on the MIDI Channel selected in the BASIC CHANNEL function.

"GL" - Global Setup on/off

Ordinarily, the Global setup operates concurrently with the current setup. Turning the Global Setup off means that only the current setup number is in effect.

"EC" - Echo on/off

If OMNI is on, Echo has no effect. If OMNI is off and Echo is on, MIDI messages received on channels other than the Basic Channel are retransmitted, as though the Navigator were a MIDI THRU box. If OMNI and ECHO are both off, MIDI messages received on channels other than the Basic Channel are ignored by the Navigator, and are not retransmitted.

"Sr" - Setup change receive on/off

Ordinarily, patch changes received on the Basic Channel are taken to be inputs to the patch map of the current setup. When Setup Change Receive is on, patch changes on the Basic Channel are taken to be inputs to the Setup map, which is the patch map ("PP") of the global setup. Receiving a patch change on the Basic Channel causes the current setup to change.

"CS" - Controller switch conversion on/off

With conversion on, "old" switch controllers, such as those on old DX7s, are converted to be compatible with current common MIDI practice, so that OFF is 0 and ON is 127.

"CF" - Controller noise filter on/off

The filter removes low-level controller fluctuations near 0, to reduce the volume of data fed to a sequencer.

"SL" - Selects the channel to be edited under Patch Number Offsets.

"oP" - Patch number offsets on/off.

On the currently selected channel (see "SL" above) patch numbers are converted from 0-based to 1-based. That is, patch numbers on a channel set to "on" are offset by 1.

10.3 Pedals

One of the most exciting performance features of the **Navigator** is its programmable pedals. In all there are eight pedals, four local pedals and four externally controlled pedals via MIDI. These eight pedals can be assigned to any parameter or switch on the **Navigator's** front panel. Of the eight, the four specified as internal pedals 3 and 4 are programmable with each setup, so their functions can be set to whatever is useful for the particular program. The other six, internal pedals 1 & 2, external pedals 1, 2, 3 & 4 are set once for all Setups and are always active.

Note: All internal pedal jacks are for switch type pedals. Pedal polarity is detected at power on time. Make sure all the pedals you intend to use are installed before power is applied.

Because Pedals 3 & 4 are programmable per each Setup, they are accessed in the SETUP section under the "Pedals 3 & 4...", while Pedals 1 & 2 are accessed through the "Pedals..." page in the MASTER section. In addition, the assignment of MIDI controllers to External Pedals is done in the "Pedals..." page.

In the "Pedals..." page, the parameters are:

- P.1 Programmable Local Pedal 1
- P.2 Programmable Local Pedal 2
- E.1 Programmable External Pedal 1
- E.2 Programmable External Pedal 2
- E.3 Programmable External Pedal 3
- E.4 Programmable External Pedal 4
- C.1 Controller number assigned to External Pedal #1 (00-95)
- C.2 Controller number assigned to External Pedal #2 (00-95)
- C.3 Controller number assigned to External Pedal #3 (00-95)
- C.4 Controller number assigned to external Pedal #4 (00-95)

In the "Pedals 3 & 4..." page, the parameters are:

- P.3 Programmable Local Pedal 3
- P.4 Programmable Local Pedal 4

The functions that the pedal can perform include:

- Editing any parameter
- Simulating any front panel switch
- Program chaining

Operation:

Select Factory preset setup #0.

Make sure you have a correct pedal plugged in the Pedal 1 jack.

Press the button under MASTER until you reach Pedals... *P.1* shows in display. *P.1* means we are working Pedal 1 now. Use < or > buttons to choose Pedals other than *P.1*.

Press the ENTER button. For this example use < or > to select *LE* in the display.

Press and hold the pedal down. Select which function you wish to assign the pedal to. Lets use an example of modifying the low range value for the keyboard inversion in preset setup #0. While still holding the pedal down, press the MODE button. You are now in SETUP # instead of Pedals... Press the MODE button two more times to reach CONTROL. Now press the button to the right of MODE to place us into the Lo Range selection option. Use the < or > buttons to go to *60* which is Middle C. Now lift up on the pedal. The display will show "*LE*", indicating that Pedal 1 is now defined. Pedal 1 has been assigned to invert only the top half of the keyboard. Press the MODE button and use the < or > buttons to go back to the original value (*0*).

Press the pedal. You will notice that with each depression on the pedal the low range value of the keyboard inversion changes from *0* (invert the whole keyboard) to *60* (invert the top half).

CH Chain The patch map in the Global Setup of your Navigator functions as a Setup Map. You can assign this map as a **Setups Chain map (SC)**. This allows you to assign each setup to an alternate setup that the Navigator will switch to with each press of a pedal. This feature gives the flexibility of being able to switch to different **SETUP #'s** instead of having to program all your **SETUPS** in the order in which you want to use them.

Operation:

First let's assign the Global Setup as a chain setup. Use the < or > buttons to reach **SETUP #GL**. Press **ENTER** to select this setup. Now select the "SC" type map under "Patch/Chain Map Type" to assign this setup as a chain setups map.

Second, let's set a setups chain. With "GL" showing in the display, press the **MODE** button. Now press the > button to select the setups map. Press the button under **ENTRY #**. Press the **ENTER** button. The display will show "CH", signifying we are in chain mode. Press the **ENTER** button again. Now we can assign an alternate setup for setup #0. All this means is that the number we select here will be the setup that the Navigator will switch to from setup #0 when the pedal is pressed. Input a value of 2 (for example). Press the **ENTER** button. Now the display will show a "2" (for entry # 2). Press the **ENTER** button 3 times. The display will show entry # 3. Press the **ENTER** button 2 times. Now enter an output value of 4.

We have now created a small chain from setup 0 to setup 2 to setup 4. Notice that the alternate setup for setup # 0 is selected under entry #1, that for setup # 1 under entry # 2 and so on and so forth.

Now save the newly created chain by storing the Global Setup.

Next, we need to assign one of the eight pedals to **CHAIN MODE**. Lets use Pedal 1 (**P.1**)

Press the button under **MASTER** until you reach **PEDALS...** Let's use Pedal 1 (**P.1**). Use the < or > buttons until you reach **P.1**.

Press **ENTER**. Use the < or > buttons to select **CH** in the display.

Press **ENTER**. Pedal #1 is now assigned to **CHAIN SELECT**.

Now select setup #0. Press Pedal 1. Your Navigator will switch to setup #2. Press Pedal 1 again. Now your Navigator will switch to setup # 4.

How It Works:

Everytime the pedal (Pedal 1) is depressed the alternate **SETUP #** in the Global Setup Patch map corresponding to the current setup is selected. In the example above, setup # 4 has an alternate setup of 4, so once you've reached setup # 4, pressing Pedal 1 will not advance to another setup.

Now let's try chaining patch outputs. Leave Pedal 1 as is. Set the Global Setups map as a setups map instead of a chain setups map (S instead of SC). Select setup #0 (for example). Now select a fill-in (Fi) type map under "Patch/Chain Map Type" (P.t). Turn

chaining on (turn C.t "on"). Now fill up the map with outputs 1-3 in output channel 1 (refer to section 5.2) . Store your setup. Press Pedal 1. Patch #1 is sent on channel 1. Press the pedal again. Patch #2 is sent on channel 1. In this fashion, you can send the patches in your patch map entry by entry. Remember, in order for this to work, you must make sure that a pedal has been assigned to CHAIN SELECT and that the Global Setup patch map is **not** assigned to chain setups.

SS Single Switch Used to control any button on the **Navigator's** front panel in other words instead of control buttons from the keypad, a pedal can be assigned to act as the button. When the pedal is depressed, the simulation of the button it was assigned to occurs. Nothing occurs when the pedal is released.

DS Double Switch Used to control any button on the **Navigator's** front panel. Similar to Single Switch except when a pedal is depressed simulation of the button occurs and when the pedal is released simulation of the button occurs.

Operation:

Press the button under MASTER to get to PEDALS... Use the < or > buttons to select which pedal you want to use.

Press ENTER. Use the < or > button to select either **SS** (Single Switch) or **DS** (Double Switch).

Depress and hold the pedal down. Now press and hold the button you want the pedal to simulate.

Release the pedal (display will show **SS** or **DS** depending on which one you selected). Release the button. The pedal is now assigned to the button.

Pedal Function Listing:

CH - Chain

SS - Single Switch
Used to simulate any button on the front panel, as though the button is tapped when the pedal is pressed. Nothing occurs when the pedal is released.

dS - Double Switch
Used to simulate any button on the front panel. Similar to the Single Switch except when a pedal is depressed simulation of the button being pressed occurs and when the pedal is released simulation of the button being released occurs.

IC - Increment
Used to increment the value of the parameter selected.

dC - Decrement
Used to decrement the value of the parameter selected.

OE - One-Shot Edit
Depressing the pedal causes the selected parameter to change to a new value. Releasing the pedal has no effect.

LE - Latched Edit

Depressing the pedal causes the selected parameter to change to a new value. Depressing the pedal again causes the parameter to change back to its original value.

HE - Hold Edit

Depressing the pedal causes the selected parameter to change to a new value, while releasing the pedal causes the parameter to change back to its original value.

Note: All internal pedal jacks are for switch type pedals. Polarity of pedal does not matter.

10.4 Load/dump

The Navigator allows you to save its memory externally. This means you are able to dump the contents of the unit's 17 Setups (and the Global Setup) to a computer equipped with a MIDI interface and Oberheim Navigator System Exclusive data, or another Navigator. The MIDI implementation codes for the unit are printed in the back of this manual.

You are also able to load programs from an external source into the Navigator. This Load/Dump capability provides a way of backing up your work in the likely event that you create more than 17 Setups or in the unlikely event of a malfunction.

To Load/Dump:

- Press the button under MASTER until the LED to the left of Load/Dump is lit. This usually requires four button presses. You are now in Load/Dump mode.
- Use the arrow buttons to select the desired function.
- Press ENTER. The display will switch to read "**Go**" with a flashing dot.
- Press ENTER again to execute the selected function. During the time it takes to complete the routine, the display will continue to read "**Go**" but the flashing dot will disappear. Note that some functions take less than one second. When the process is completed, the display will revert back to the selected function.

Load/Dump functions:

SO - Send One

The Navigator will transmit the last selected Setup to the receiving device.

SG - Send Global

The Navigator will transmit the data stored in the MASTER section to the receiving device.

SA - Send All

The Navigator will transmit all Setups and MASTER data to the receiving device.

SE - Send Edit

The Navigator will transmit any edits made to the last selected Setup to the receiving device.

NOTE: The Navigator will receive any MIDI data sent to it regardless of what operating mode it is in.

dC - Dump to Card

The Navigator will save all SETUPS and MASTER data to the optional Data Card.

LC - Load from Card

The Navigator will load all SETUPS and MASTER data from the optional Data Card.

FC - Format Card

The Navigator will format the Data Card. This must be done before a new card can be used to save data, or can be executed to erase a card.

Note: The optional Data Card requires the internal installation of a receptacle and is available from your nearest Oberheim Authorized Service Center. Contact your nearest Service Center for prices and availability.

10.5 MUTE

In the event that MIDI notes get locked on (one or more of the slave instruments do not receive a Note off command for one reason or another), pressing and holding the MASTER column button for three seconds will mute any slaves that are locked on.

The muting function takes advantage of the MIDI Specification's "All Notes Off" provision. During the time the MASTER button is held, the following MIDI messages are transmitted from the Navigator on each channel in this order:

- 1) All Notes Off
- 2) Sustain Pedal Off
- 3) 128 Individual Notes Off

Chapter 11

Summary of Functions and Display Abbreviations

Setups

GL Global

0-16 # (0-80 32K)

Note/Cntrl Map (Lower) (entries, inputs, outputs)

C - Controllers 10 1 1 n - Notes 32 32 32

nP - Notes -> pat 32 32 32

dP - Drum Patch (+ vel. thres.) 16 1 6

Patch/Chain Map (Upper)

Pt - (entries, inputs, outputs, bank sel, initial vol)

Fi - 100 100 100 no no

AL - 16 1 16 no no

Ub - 64 64 64 yes yes

dP - 32 32 32 no no

Ct -

Fi, AL, Ub or dP Chain Only

Global types:

S 128 128 128 no no

SC 128 no 128 no no

Pedals 3 & 4 (per Setup, see Pedals)

Map Types: PP - Patch to Patch nn - note to note
CC - Cntrlr to Cntrlr nP - note to Patch
01-16 - drum Patch note map

Entry

Edit entry

Input

oF OFF

0-127 Cntrl, Note, Pat #

Virtual Cntrls:

n	Note #	nn	Note-on note #
nF	Note-off note #	nP	Note from P press
Un	Vel (rngc chk)	rn	R vel (rngc chk)
Pn	P press (rngc chk)	U	Velocity
r	Release vel	P	P press
C	Ch press	b	P bend
bU	P bend up	bd	P bend dn

Output

Output #, Cntrl for Input

Output Channel

1-16 = channel

bC = basic Channel

Control

Lo & Hi Range

Cntrl range

Function

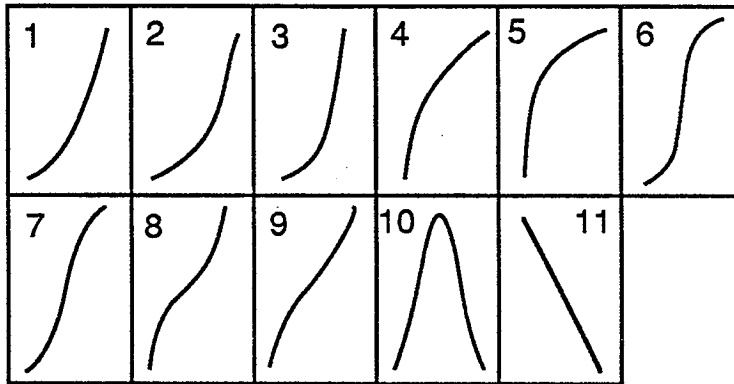
CH Channelize **So** Scale / Offset
tG Toggle **CL** Clip
tb Table **nS** Note Scale (Cntrl only)

Parameter

PA - Parameter
 # value

(Table)

01 Parabola	02 Gradual exponential
03 Steep exponential	04 Gradual logarithm
05 Steep logarithm	06 S-curve 1
07 S-curve 2	08 Plateau curve
09 Shelving curve	10 Reverse curve
11 Invert	



FP Filter/Passthru range (cntrl only)
F Filter **P** Transmit

Scale

Scale, Low Toggle

Offset

Offset, High Toggle

Patch

Bank (Patch map only)

bA Patch Bnk #

Volume (Patch map only)

Patch intl vol
Velocity threshold (dP only)

Master

Store/Copy

St Store edit buffer to...

Pedals...

P1, P2, E1, E2, E3, E4 = Global

P3, P4 = per Setup

CH = Chain Patch

SS = Single Switch

dS = Double Switch

IC = Increment

dC = Decrement

OE = One-Shot Edit

LE = Latched Edit

HE = Held Edit

C1, C2, C3, C4: 0...95

MIDI / Misc

CL Clear setup

bC Basic Channel 1...16

on OMNI on/off
EC Echo on/off.
CS Cntrl switch convert.
SL Patch # offsets channel.
oP Patch # offsets
on 0 -> 1 base patches
oF no offsetting

GL Global Setup on/off.
Sr Setup change on/off.
CF Cntrl noise filter on/off.

Load/Dump

So Send One
SA Send All
dC Dump Card
FC Format Card

SG Send Global
SE Send Edit buffer
LC Load Card

Appendix A

Note Value Displays

Display Symbol	Musical Notation	Octave Number	MIDI Note Value	Display Symbol	Musical Notation	Octave Number	MIDI Note Value
C=	C	0	00	C1	C	3	36
C=.	C# / Db	0	01	C1.	C# / Db	3	37
d=	D	0	02	d1	D	3	38
d=.	D# / Eb	0	03	d1.	D# / Eb	3	39
E=	E	0	04	E1	E	3	40
F=	F	0	05	F1	F	3	41
F=.	F# / Gb	0	06	F1.	F# / Gb	3	42
G=	G	0	07	G1	G	3	43
G=.	G# / Ab	0	08	G1.	G# / Ab	3	44
A=	A	0	09	A1	A	3	45
A=.	A# / Bb	0	10	A1.	A# / Bb	3	46
b=	B	0	11	b1	B	3	47
C-	C	1	12	C2	C	4	48
C-.	C# / Db	1	13	C2.	C# / Db	4	49
d-	D	1	14	d2	D	4	50
d-.	D# / Eb	1	15	d2.	D# / Eb	4	51
E-	E	1	16	E2	E	4	52
F-	F	1	17	F2	F	4	53
F-.	F# / Gb	1	18	F2.	F# / Gb	4	54
G-	G	1	19	G2	G	4	55
G-.	G# / Ab	1	20	G2.	G# / Ab	4	56
A-	A	1	21	A2	A	4	57
A-.	A# / Bb	1	22	A2.	A# / Bb	4	58
b-	B	1	23	b2	B	4	59
C0	C	2	24	C3	Middle C	5	60
C0.	C# / Db	2	25	C3.	C# / Db	5	61
d0	D	2	26	d3	D	5	62
d0.	D# / Eb	2	27	d3.	D# / Eb	5	63
E0	E	2	28	E3	E	5	64
F0	F	2	29	F3	F	5	65
F0.	F# / Gb	2	30	F3.	F# / Gb	5	66
G0	G	2	31	G3	G	5	67
G0.	G# / Ab	2	32	G3.	G# / Ab	5	68
A0	A	2	33	A3	A	5	69
A0.	A# / Bb	2	34	A3.	A# / Bb	5	70
b0	B	2	35	b3	B	5	71

Display Symbol	Musical Notation	Octave Number	MIDI Note Value	Display Symbol	Musical Notation	Octave Number	MIDI Note Value
C4	C	6	72	C7	C	9	108
C4.	C#/Db	6	73	C7.	C#/Db	9	109
d4	D	6	74	d7	D	9	110
d4.	D#/Eb	6	75	d7.	D#/Eb	9	111
E4	E	6	76	E7	E	9	112
F4	F	6	77	F7	F	9	113
F4.	F#/Gb	6	78	F7.	F#/Gb	9	114
G4	G	6	79	G7	G	9	115
G4.	G#/Ab	6	80	G7.	G#/Ab	9	116
A4	A	6	81	A7	A	9	117
A4.	A#/Bb	6	82	A7.	A#/Bb	9	118
b4	B	6	83	b7	B	9	119
C5	C	7	84	C8	C	10	120
C5.	C#/Db	7	85	C8.	C#/Db	10	121
d5	D	7	86	d8	D	10	122
d5.	D#/Eb	7	87	d8.	D#/Eb	10	123
E5	E	7	88	E8	E	10	124
F5	F	7	89	F8	F	10	125
F5.	F#/Gb	7	90	F8.	F#/Gb	10	126
G5	G	7	91	G8	G	10	127
G5.	G#/Ab	7	92				
A5	A	7	93				
A5.	A#/Bb	7	94				
b5	B	7	95				
C6	C	8	96				
C6.	C#/Db	8	97				
d6	D	8	98				
D6.	D#/Eb	8	99				
E6	E	8	100				
F6	F	8	101				
F6.	F#/Gb	8	102				
G6	G	8	103				
G6.	G#/Ab	8	104				
A6	A	8	105				
A6.	A#/Bb	8	106				
b6	B	8	107				

Appendix B

MAP CHARTS

Fill-In Type

Entry #	Patch # In	Patch # Out	MIDI Channel
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Fill-In Type

Entry #	Patch # In	Patch # Out	MIDI Channel
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			

Fill-In Type

Entry #	Patch # In	Patch # Out	MIDI Channel
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
54			
55			
56			
57			
58			
59			
60			

Fill-In Type

Entry #	Patch # In	Patch # Out	MIDI Channel
61			
62			
63			
64			
65			
66			
67			
68			
69			
70			
71			
72			
73			
74			
75			
76			
77			
78			
79			
80			

Fill-In Type

Entry #	Patch # In	Patch # Out	MIDI Channel
81			
82			
83			
84			
85			
86			
87			
88			
89			
90			
91			
92			
93			
94			
95			
96			
97			
98			
99			
A0			

All Channels Type

Entry #	Patch # In	Patch # Out															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	

MIDI Channel
←

Volume & Bank Type

Entry #	Patch # In	Patch # Out	MIDI Channel	Bank # 0 - 15	Volume 0-127
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Volume & Bank Type

Entry #	Patch # In	Patch # Out	MIDI Channel	Bank # 0 - 15	Volume 0-127
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

Volume & Bank Type

Entry #	Patch # In	Patch # Out	MIDI Channel	Bank # 0 - 15	Volume 0-127
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					

Volume & Bank Type

Entry #	Patch # In	Patch # Out	MIDI Channel	Bank # 0 - 15	Volume 0-127
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					
64					

Note to Note

Entry #	Note # In	Note # Out	MIDI Channel
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

Note to Patch

Entry #	Note # In	Patch# Out	MIDI Channel
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

Drum Patch Patch to Patch

Entry #	Patch# # In	Patch# Out	MIDI Channel
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

Drum Patch Note Map Type

1	Note #	Entry #	Note #	MIDI	Velocity	2
	In	1	Out	Channel	Threshold	
		2				
		3				
		4				
		5				
		6				
3	Note #	Entry #	Note #	MIDI	Velocity	4
	In	1	Out	Channel	Threshold	
		2				
		3				
		4				
		5				
		6				
5	Note #	Entry #	Note #	MIDI	Velocity	6
	In	1	Out	Channel	Threshold	
		2				
		3				
		4				
		5				
		6				
7	Note #	Entry #	Note #	MIDI	Velocity	8
	In	1	Out	Channel	Threshold	
		2				
		3				
		4				
		5				
		6				
9	Note #	Entry #	Note #	MIDI	Velocity	10
	In	1	Out	Channel	Threshold	
		2				
		3				
		4				
		5				
		6				
11	Note #	Entry #	Note #	MIDI	Velocity	12
	In	1	Out	Channel	Threshold	
		2				
		3				
		4				
		5				
		6				
13	Note #	Entry #	Note #	MIDI	Velocity	14
	In	1	Out	Channel	Threshold	
		2				
		3				
		4				
		5				
		6				
15	Note #	Entry #	Note #	MIDI	Velocity	16
	In	1	Out	Channel	Threshold	
		2				
		3				
		4				
		5				
		6				

Appendix C

MIDI CONTROLLER NUMBERS

Control Number		Control Function
Decimal	Hex	
0	00H	Undefined
1	01H	Modulation wheel or lever
2	02H	Breath controller
3	03H	Undefined
4	04H	Foot controller
5	05H	Portamento time
6	06H	Data entry MSB
7	07H	Main volume
8	08H	Balance
9	09H	Undefined
10	0AH	Pan
11	0BH	Expression controller
12-15	0C-0FH	Undefined
16-19	10-13H	General Purpose Controllers (#'s 1-4)
20-31	14-1FH	Undefined
32-63	20-3FH	LSB for values 0-31
64	40H	Damper pedal (sustain)
65	41H	Portamento
66	42H	Sostenuto
67	43H	Soft pedal
68	40H	Undefined
69	45H	Hold 2
70-79	46-4FH	Undefined
80-83	50-53H	General Purpose Controllers (#'s 5-8)
84-90	54-5AH	Undefined
91	5BH	External Effects Depth
92	5CH	Tremelo Depth
93	5DH	Chorus Depth
94	5EH	Celeste (Detune) Depth
95	5FH	Phaser Depth
96	60H	Data increment
97	61H	Data decrement
98	62H	Non-Registered Parameter Number LSB
99	63H	Non-Registered Parameter Number MSB
100	64H	Registered Parameter Number LSB
101	65H	Registered Parameter Number MSB
102-120	66-78H	Undefined
121-127	79-7FH	Reserved for Channel Mode Messages

Appendix D

Navigator MIDI Implementation

SYSEX MESSAGES

F0H	Sysex Status
10H	Oberheim ID
08H	Perf/X ID
<prod id>	0 = Systemizer, 1 = Cyclone, 2 = Navigator,
etc.	
<opcode>	
<data bytes>	sent: lo nibble, hi nibble
<checksum>	sum of all data bytes
F7	EOX

OPCODE

01H	Single Patch
form)	(directly from/to Patch Storage — packed

F0H
10H
08H
<prod id>
01H
<dest Patch>
<data bytes>
<checksum>
F7

02H	Global Parameters
-----	-------------------

F0H
10H
08H
<prod id>
02H
<data bytes>
<checksum>
F7

03H	All data (all Patches + Global parameters)
-----	---

F0H
10H
08H
<prod id>
03H
<mem type>
 0 = 8k
 1 = 32k
<data bytes>

	<checksum> F7
04H	Single Edit Buffer Patch (from/to edit buffer — unpacked form) F0H 10H 08H <prod id> 04H <data bytes> <checksum> F7
05H	Store Edit Buffer F0H 10H 08H <prod id> 05H <dest Patch> <data bytes> <checksum> F7
06H	Remote Edit (to edit buffer) F0H 10H 08H <prod id> 06H <parm #> (See MIDI Editing Parameters Chart) <zone #> <inst #> <value> F7
07H	Request Data F0H 10H 08H <prod id> 07H <type> 0 = Single Patch 1 = Global Parameters 2 = All data 3 = Edit Buffer Patch <dest Patch> F7

MIDI Editing Parameters

Parameter

Value Range

Setup block:

00H: Setup #	0..n where n=17 for 8k or n=81 for 32k
01H: Note/Ctrl Map type	0 = Global 0 = CC 1 = nn 2 = nP 3 = dP
02H: Patch Map type	0 = AL 1 = Fi 2 = Ub
03H: Chain set	0 = off 1 = on
04H: Pedal 3	0 = CH 1 = SS 1 = dS 1 = IC 1 = dC 1 = OE 1 = HE 1 = LE
05H: Pedal 4	0 = CH 1 = SS 1 = dS 1 = IC 1 = dC 1 = OE 1 = HE 1 = LE

Map Select block:

06H: Map select	0 = Note/Ctrl map 1 = Patch map
	0..15 dP note map, 16 = dP Patch map

Note Map block:

07H: Edit current map	0 = nn 1 = PP
08H: Edit entry #	0..1FH
09H: Input note #	FF= off 0..7FH (MIDI note #)
0AH: Output note #	FF= off 0..7FH (MIDI note #)
0BH: Output channel	FF = bC
0CH: Velocity threshold	0..0FH FF= off 0..7FH

Control Map block:

0DH: Edit current map	0 = CC 1 = PP
0EH: Edit entry #	0..9H
0FH: Input control #	0..7FH FFH = off F1H = n F2H = nn F3H = nF F4H = nP F5H = Un F6H = rn F7H = Pn F8H = U F9H = r FAH = P FBH = C

FCH = b
FDH = bU
FEH = bd

10H:	Output control #	0..7FH
11H:	Output channel	FF = bC 0..0FH
12H:	Low range	0..7FH
13H:	High range	0..7FH
14H:	Mapping function	0 = CH 1 = So 2 = tG 3 = CL 4 = tB 5 = nS
15H:	Scale	0..0FFH (0FFH = --128)
16H:	Parameter	0..10 (tB) 0..7FH
17H:	Filter/Passthru	0 = Passthru 1 = Filter
18H:	Offset	0..0FFH (0FFH = --128)
Patch Map block:		
19H:	Edit current map	0 = Note/Ctrl map 1 = Patch map
1AH:	Edit entry #	0..15 (AL) 0..99 (Ft) 0..63 (Ub) 0..31 (dP) 0..7FH (S)
1BH:	Input patch #	FF= off 0..7FH
1CH:	Output patch #	FF= off 0..7FH
1DH:	Output channel	0..0FH
1EH:	Bank #	0..0FH
1FH:	Initial volume	FF= off 0..7FH
Master Block:		
20H:	Clear setup	0 = Go
21H:	Basic channel	0..0FH
22H:	Omni on/off	0 = off 1 = on
23H:	Globals on/off	0 = off 1 = on
24H:	Echo on/off	0 = echo on 1 = bypass
25H:	Setup change receive on/off	0 = off 1 = on
26H:	Control switch style	0 = off 1 = on
27H:	Control noise filter	0 = off 1 = on
28H:	Select patch offsets	0..0FH
29H:	Edit patch offsets	0 = off 1 = on

Warranty

IF YOU HAVE A PROBLEM

The staff at ECC/Oberheim wish to thank-you for purchasing an Oberheim product and hope that you will remain a long-time Oberheim player. We are confident that your instrument will provide you with years of excellent service as each unit is thoroughly tested and inspected before it leaves the factory. The Owner's Manual was written to be logical and comprehensive so that you will be able to get the most out of your Oberheim.

Although we have taken great care in manufacturing your Oberheim instrument and preparing thorough documentation in the manual, products at this level of technology may require servicing. The following Warranty Policy outlines your rights and responsibilities, and also lists several limitations of coverage and important exclusions. We strongly recommend that you read the following policy statements carefully and refer to the procedure at the end in obtaining service for your Oberheim product should it ever be needed.

OBERHEIM LIMITED CUSTOMER WARRANTY (Non-Transferable)

Oberheim, a Division of ECC Development Corporation, warrants its products, when purchased in the United States of America from an Authorized Oberheim Dealer, to be free from defects in materials or workmanship for a period of 90 days from the date of purchase. Warranty service is effective and available to the original purchaser **ONLY**, and only upon completion and return of the Oberheim Warranty Registration card within 14 days of the date of purchase.

Warranty coverage is valid for Factory-Authorized updates to Oberheim products when their installation is performed by an ECC/Oberheim Authorized Service Center and a properly completed Warranty Certificate is returned to the factory within 14 days of installation.

To obtain service under this Warranty, the product must, upon discovery of the defect, be properly packed and shipped to the nearest Oberheim Authorized Service Center. The party requesting Warranty service must provide proof of original ownership and date of purchase of the product, or date of installation of the update, by supplying to the Oberheim Authorized Service Center the sales receipt/ installation receipt. In the event that both have been lost or misplaced, the Service Center shall, at the Service Center's or owner's expense, contact Oberheim to verify the Warranty status of the product.

If the Warranty has been verified, Oberheim will, without charge for parts or labor, either repair or replace the defective part(s). If the Warranty cannot be verified, the entire cost of the repair in parts and labor is the responsibility of the product's owner.

PRICES AND SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

WHAT IS COVERED

ECC/Oberheim warrants that it will make all necessary adjustments, repairs or replacements at no cost to the original owner within the first 90 days from the purchase date if:

1. The product fails to perform its specified functions due to failure of one or more of its components.
2. The product fails to perform its specified functions due to defects in workmanship.
3. The product is maintained and operated by the owner in strict accordance with the written instructions for proper maintenance and use as specified in the Owner's Manual.

WHAT IS NOT COVERED

Before purchasing and using, the owner shall determine the suitability of the product for his/her intended use, and the owner assumes all risk and liability whatsoever in connection therewith. Oberheim shall not be liable for any injury, loss or damage, direct or consequential, arising out of the product owner's use or inability to use the product.

The Warranty provides only the benefits specified and does not cover defects or repairs needed as a result of acts beyond the control of Oberheim including but not limited to:

1. Damage caused by abuse, accident or negligence.
2. Any tampering, alteration or modification of the product's mechanical or electronic components.

3. Failure to operate the product in strict accordance with the procedures written in the Owner's Manual.
4. Repairs performed by unauthorized persons.
5. Damage caused by fire, smoke, falling objects, water or liquids etc. or natural events such as rain, earthquakes, floods, lightning, tornadoes, storms, etc.
6. Damage caused by operation on improper voltages.

IMPORTANT NOTICE: The warranty is VOID if the product is electronically or mechanically modified, altered or tampered with in any way.

Oberheim shall not be liable for costs involved in packing or preparing the product for shipping with regards to time, telephone call charges, labor or materials, shipping and freight costs, or time and expenses involved in transporting the product to and from an Oberheim Authorized Service Center, an Oberheim Authorized Dealer or the Oberheim Factory. If a suitable shipping container is unavailable, a replacement carton may be purchased from Oberheim.

ECC/Oberheim will not cover under Warranty an apparent malfunction that is determined to be in fact user error, or the owner's inability to use the product.

ECC/Oberheim will not cover under Warranty an apparent malfunction that is inaccurately or inadequately described by the owner to the Service Center at the time of repair.

THE DURATION OF ANY OTHER WARRANTIES, WHETHER IMPLIED OR EXPRESS, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN.

ECC/Oberheim hereby excludes incidental and consequential damages, including but not limited to:

1. Loss of time
2. Inconvenience
3. Delay in performance of the Warranty
4. The loss of use of the product
5. Commercial loss
6. Breach of any express or implied warranty, including the Implied Warranty of Merchantability, applicable to this product.

Oberheim shall not be liable for damage or loss resulting from the negligent or intentional acts of the shipper or his contract affiliates. The owner of the product should contact the shipper for proper claims procedures in the event of damage or loss resulting from shipment.

HOW TO OBTAIN WARRANTY SERVICE

If you have reason to believe that your Oberheim product is malfunctioning or otherwise not operating properly, do the following:

STEP 1: CONTACT YOUR NEAREST ECC/OBERHEIM AUTHORIZED SERVICE CENTER

Telephone them as soon as the problem is discovered. Be prepared to discuss the problem as completely and accurately as possible. A current roster of Authorized Service Centers is included with the Owner's Manual.

The Service Center will let you know when the repair can be scheduled, the approximate number of days it will take to complete the repair and if the required parts are in stock or if they need to be ordered.

Take the failed unit to the Service Center along with the sales receipt as the Service Center will need to verify the Warranty.

The Service Center will then inspect the product and take the necessary steps to complete the repair.

If the product continues to malfunction or another problem different from the original problem occurs, contact the service center IMMEDIATELY so that the problem can be resolved without delay or further complications.

STEP 2. CONTACT YOUR ECC/OBERHEIM DEALER

If you feel that your problem has not been resolved, contact the Oberheim Dealer where the product was purchased. It will be most expedient if you discuss the matter personally with the sales person who sold you the instrument. By making the sales person aware of your situation, they will be in a better position to assist you in getting the problem resolved.

STEP 3: WRITE TO THE ECC/OBERHEIM NATIONAL OFFICES

If you believe that the problem is still unresolved after you have contacted the Service Center and Dealer, contact the ECC/Oberheim National Offices. In an attempt to resolve your problem, we will work with your local Service Center or Dealer to review and verify the information and facts. Based on these facts, we will advise or consult with the Service Center or Dealer as appropriate.

Written correspondence should be addressed to:

OBERHEIM
A Division of ECC Development Corporation
Customer Services Department
2015 Davie Ave.
City of Commerce, CA 90040-1704

Every attempt will be made to respond to your letter as quickly as possible.

For your records.

Model: _____
Date of Purchase: _____
Date Warranty Sent In: _____
Dealer Name: _____
Dealer Address: _____
City: _____ State: _____ Zip: _____

Why it's important to send in your warranty card.

Oberheim is proud of its research and development effort and we feel it is both innovative and the technological leader in its field. We are continually working to develop new products as well as improve and update our present products.

Every Oberheim product is subjected to rigorous testing and inspection to insure the highest quality and reliability. Nevertheless, products as complex and sophisticated as ours may incur problems. Therefore, you must return your warranty card to insure prompt service and to be advised of the latest improvements and updates. To be sure of your coverage, see the "Limited Customer Warranty" on the back of this sheet.

Warranty is valid only if the Warranty Registration Form is returned. Please complete this form, printing one character per box. Cut out and return within 14 days of purchase.

Limited Customer Warranty (Non-Transferable)

Oberheim, A Division of ECC Development Corporation warrants this Product, when purchased at an Authorized Oberheim Dealer, to be free of defects in materials or workmanship for a period of 90 days from the date of purchase. Warranty service is effective and available to the original purchaser only upon completion and return of the Oberheim Warranty Registration form within 14 days from the date of purchase. To obtain service under this Warranty, the product must, upon discovery of the defect, be properly packed and shipped to the nearest Oberheim Authorized Service Center. Oberheim will without charge for parts or labor either repair or replace the defective part(s). Shipping costs are not covered by this warranty.

This Warranty provides only the benefits specified and does not cover defects or repairs needed as a result of acts beyond the control of Oberheim including but not limited to: abuse, damage by accident, negligence, modification, alteration, improper use, unauthorized servicing, tampering, or failure to operate in accordance with the procedures outlined in the Owner's Manual; nor for acts of God such as flooding, lightning, tornados, etc...

The duration of any other warranties, whether implied or express, including but not limited to the implied warranty of merchantability, is limited to the duration of the express warranty herein. Oberheim hereby excludes incidental and consequential damages, including but not limited to: loss of time, inconvenience, delay in performance of the warranty, the loss of use of the product or commercial loss, and for breach of any express or implied warranty, including the implied warranty of merchantability, applicable to this product.

The party requesting warranty service must provide proof of the date of purchase of the product, by supplying the Oberheim Authorized Service Center either the warranty card or sales receipt. In the event both have been misplaced, the service center shall contact Oberheim to verify the warranty status of the product.

Oberheim shall not be liable for damage or loss resulting from the negligent or intentional act of the shipper or his contract affiliates. The customer should contact the shipper for proper claims procedures in the event of damage or loss resulting from shipment.

Warranty Card

Model: _____

Serial No: _____ Date of Purchase: _____

Your Name: _____

Your Address: _____

City: _____ State: _____ Zip: _____

Dealer Name (Name of Business): _____

Dealer Address: _____

City: _____ State: _____ Zip: _____

Optional information for our marketing and research department

1. Male Female
2. Your Age: 18 and under 19-24 25-29 30-40 40 and over
3. Marital Status: Single Married
4. Education Completed: High School Jr. College College Graduate
5. What kind of music do you play? Rock Heavy Metal Jazz R&B/Soul
 Top 40/Pop Gospel Country New Age Classical Other _____
6. How many years have you been playing?
 1 year or less 1-4 years 5-9 years More than 10 years
7. Is music your primary source of income? Yes No
8. Employment: Pro musician Engineer Technician Sales
 Semi-Pro musician Producer Music Educator Other _____
9. Do you own a computer? Yes No
10. What type? Macintosh IBM Atari Amiga
 Apple II Commodore 64 Other _____
11. What magazines do you regularly read?
 BAM _____ Music, Computers & Software _____ Billboard _____
 Keyboard _____ Electronic Musician _____ Musician _____
 International Musician _____ Music & Sound Output _____ Rolling Stone _____
 Music Technology _____ Mix _____ Other _____
12. In the space provided to the right of the magazine please rank the magazines you read regularly which you like the most as #1, second most as #2 and so on.
13. Where do you most often use your Oberheim equipment? Club Concert
 Home Home Recording Recording Studio Other _____
14. Why did you choose this product? (Check all that apply)
 Features Sound Price Salesperson Other _____
15. How much do you expect to spend on electronic musical equipment this year?
 \$100 or less \$100-\$300 \$300-\$500 \$500-\$1,000 \$1,000-\$2,000
 \$2,000-\$5,000 \$5,000 to \$10,000 \$10,000 or more
16. What is your next musical purchase going to be?
 Keyboard Synthesizer Signal Processing MIDI Processing
 Rack Synthesizer Recording Equipment Computer
 Sequencer Drum Machine Software
 Other _____
17. In the space provided to the right of the piece of equipment please write how much you expect it to cost? _____
18. How much do you have invested in musical equipment?
 \$1,000 or less \$1,000-\$2,000 \$2,000-\$5,000 \$5,000-\$10,000 \$10,000-\$20,000
 \$20,000-\$50,000 \$50,000 or more
19. What products would you like to see Oberheim produce in the future? _____
20. Remarks _____

(Fold)

(Fold)

(Remove Warranty Card from manual, fold in half, tape closed and mail.)

(Remove from manual, fold, tape and mail)



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Box 91-1142
Commerce, CA 90091