Matrix-1000

OWNER'S MANUAL

Oberheim

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Matrix-1000

Analog Sound Module

OWNER'S MANUAL

Second Edition – July, 1988

CAUTION:
To prevent fire or shock hazard, do not expose this appliance to rain or moisture. Do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

WARNING:
This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Congratulations on your purchase of the Oberheim Matrix-1000 Analog Sound Module. The Matrix-1000 is a 6-voice polyphonic instrument that is fast and easy to use. It is specifically designed to allow the musician to play the best 1000 sounds of the famous Oberheim Matrix-6.

Musicians at all levels will love the Matrix-1000's simplicity of operation – just select the Bank & Patch Number and play . But its simplicity is really quite misleading. The heart of the Matrix-1000 — its one thousand outstanding sound Patches — is a compilation of the finest Matrix sounds collected over the past three years from synthesizer enthusiasts around the world.

The Matrix-1000 provides you with the largest on-board library of rich, warm analog synthesizer sounds of any instrument.The first 200 patches can be customized via MIDI from a Matrix-6 keyboard, a Matrix-6R rack mount synthesizer, or a computer equipped with a MIDI interface and Matrix-6/6R editing or librarian software.

The Matrix-1000 introduces Group Mode, a new feature which allows up to 6 Matrix-1000s to be played together as a single instrument. The Matrix-1000 has a complete MIDI implementation, including Patch loading/Patch saving via MIDI System Exclusive. And all of this is packaged in a 1-rack space unit, an ideal addition to any instrument system.
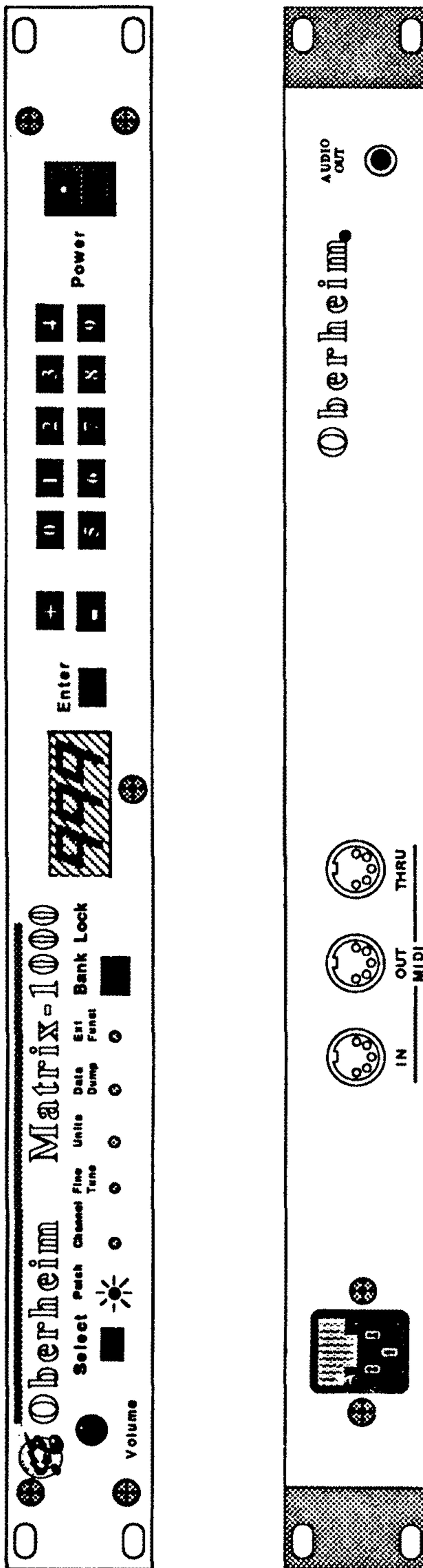
This manual will provide you with some very valuable information, and we recommend that you read this book **in its entirety**. It was written to provide you with all the information you will need to operate and interface your Matrix-1000. We encourage you to experiment and, above all, have fun.

Thank you for your investment in the State of the Art.

Oberheim
A Division of ECC Development Corporation
Los Angeles, California
USA

Front &
Back Panel

Matrix-1000 Quick-Start Procedure

1. **INITIAL SET UP –**
    Place the Matrix-1000 on any level surface, or mount it in a rack cabinet.

    •   When rack-mounting the Matrix-1000, be sure to leave space above and below the unit to insure proper ventilation.

2. **HOOK IT UP –**
    Connect the MIDI OUT of your Master instrument — keyboard, MIDI guitar, wind controller, computer, etc.— to the MIDI IN of the Matrix-1000. Refer to the Back Panel Layout diagram shown on Page 6 for descriptions of the Matrix-1000's inputs and outputs.

3. **TURN IT ON –**
    Make all your connections **before powering the instrument on**.

    •   When the Matrix-1000 is powered on, does the front panel display light up? If not, check your connections.

4. **SELECT MODE –**
    Press the **Select** key repeatedly. The lights will "loop" around the six headings: **Patch**, **Channel**, **Fine Tune**, **Units**, **Data Dump**, and **Ext. Funct.**

    a. **Patch** lets you select a patch. Use the Number Keys to enter a **three**-digit number from *000* through *999*, or use the **+** and **–** keys to advance or reverse the patch number. Or, select a patch from MIDI.

    b. **Channel** lets you select the MIDI transmit and receive channel . Use the **+** and **–** keys to select from MIDI Channels 1 through 16 or OMNI mode (displayed as *on*).

- Guitar Controller users (and some others) may wish to select MONO mode (MIDI mode 4). This provides independent pitch bend on each string. When the display reads *G1*, the Matrix–1000 plays in MONO mode on basic channel 1.

c. Select **Fine Tune**, and use the **+** and **–** keys to fine tune your Matrix-1000 to the other instruments in your system. A display value of 0 is the center of the range (A=440 Hz).

The remaining modes are described in Chapter 4.

5. BANK LOCK –
The Matrix-1000's patches are grouped in ten banks of 100 patches each. The first digit of a patch number is the bank (0 through 9), and the last two digits are the location of the patch within that bank (00 through 99).

Bank Lock lets you change patches within a bank by typing **two** digits instead of three. Select **Patch** mode, and press **Bank Lock**. A dot appears between the first and second display digits. Now, enter two digits to choose any patch in the bank. Change banks by entering a digit from 0 through 9 **while holding down Bank Lock.** Press **Bank Lock** again to return to three-digit patch selection. The display dot disappears.

6. ADJUST THE VOLUME –
The **Volume** knob controls the volume level output of the Matrix-1000.

These brief procedures are explained in detail throughout the rest of the manual. We encourage you to read the manual in its entirety if you would like to learn more about the Matrix-1000.

Unpacking

ACCESSORIES

The following items should be in the box when you open it:

- The Matrix-1000 Analog Sound Module
- This Owner's Manual
- Warranty Card
- AC Cord
- MIDI Cable
- ECC/Oberheim Authorized Service Centers Directory

If any of these items is missing, **contact the Oberheim Dealer where your Matrix-1000 was purchased.**

RACK MOUNTING

The Matrix-1000 may be mounted in a standard 19-inch rack mount cabinet. To do this, you will need a Phillips-Head screwdriver and four mounting bolts with washers.

The Matrix-1000 uses one standard rack space (1-3/4 inches). We recommend leaving an air space of approximately 1/2-inch between the Matrix-1000 and other units in the rack, to prevent overheating. This is especially important if the Matrix-1000 will be left powered on for long periods of time. We also recommend that the Matrix-1000 not be mounted adjacent to a power amplifier, or any other device that produces heat.

Hookup

AC POWER

The Matrix-1000 runs on AC power between 95-130 volts or 200-240 volts. It is set for the AC voltage of the country to which it has been shipped from the factory. The voltage may, if necessary, be changed by a switch accessible through the bottom of the unit.

- The AC receptacle on the back panel is protected by a paper strip identifying the Matrix-1000's factory AC voltage setting. Check that your Matrix-1000 is set for the proper AC voltage. Then remove this strip, plug the female end of the AC cord into the Matrix-1000 and the male end into your wall outlet.

Warning: When the voltage is changed, the fuse must also be changed for continued protection against fire. See the information on the Matrix-1000 case or in the Specifications section of this manual for further information on the correct fuse type and rating for each AC voltage setting.

AUDIO and MIDI CONNECTIONS

Connect the AUDIO OUTPUT jack of the Matrix-1000 to a mixing board, hi-fi system, instrument amplifier, or a sound system, using a standard audio cable (guitar cord) with a 1/4-inch plug . The Matrix-1000 can be plugged into a Line Input, or an attenuated Microphone Input. Connect the Matrix-1000 to your sound system **before** powering on the Matrix-1000.

Connect the MIDI OUT of your Master instrument — keyboard, MIDI guitar, wind controller, computer, etc.— to the MIDI IN of the Matrix-1000, using a standard MIDI interface cable. The MIDI Channel must be the same for both your Master instrument and the Matrix-1000, or else the Matrix-1000 must be in OMNI or MONO Mode. MIDI Channel selection is described under **Channel** mode in Chapter 2.

- Note that a MIDI cable is slightly different from the generic '5-pin DIN' cable available from some electronics retailers. Use of this generic cable may result in 'ground-loop hum', which does not occur with MIDI standard cables.

- Up to four MIDI instruments may be chained together by using MIDI THRU, assuming that you are not using very long MIDI cables (maximum total length for the entire rig is about 50 feet).

The order in which you power on your instruments is important. First, turn on the Matrix-1000, with its volume control set to its minimum (Volume knob all the way counter-clockwise). Next, turn on your Master instrument. Then turn on the sound system — mixer first, then the power amplifier. Powering on in this order will make sure that your Matrix-1000 sees all the MIDI information sent by the Master, and prevent a possible audio "thump" from harming your speaker(s). When shutting down your system, reverse the order: turn off the power amplifier, then the mixer, then the Matrix-1000 and the rest of your instruments.

The Matrix-1000 Back Panel Layout diagram on the Page 6 will assist you in setting up the Matrix-1000, showing the different connections that are possible with the back panel jacks.

CARE & MAINTENANCE

For proper care and handling, do not expose your Matrix-1000 to direct sunlight or to temperatures above 120° F (48.9° C).

Be careful not to spill any liquids on or into the Matrix-1000. Do not expose the Matrix-1000 to moisture or store it in an area that is damp or has high levels of humidity.

To clean your Matrix-1000, use a soft cloth with mild soap (such as dishwashing liquid) and luke-warm water. Spray-type window cleaners are acceptable, but spray the cloth, not the Matrix-1000. Do not use harsh or abrasive detergents or solvents. We do not recommend vinyl-treatment products, which leave a residue.

SERVICING

If your Matrix-1000 needs servicing, do not attempt repairs yourself. Refer to the section in the back of this manual titled IF YOU HAVE A PROBLEM, and contact your nearest ECC/ Oberheim Authorized Service Center. A current list of Service Centers is included in the Owner's Packet along with this manual.

We encourage you to familiarize yourself with the Warranty Policy in the back of the manual. It outlines your rights and responsibilities under the ECC/Oberheim Limited Warranty, and lists several important exclusions.

Specifications

Description

 Polyphonic MIDI Synthesizer Module

 1000 Resident Patches

 6 Analog Voices

Modes

 Patch select

  Polyphonic Playback of Pre-programmed Analog Sounds:

   200 RAM Patches; 800 ROM Patches

 MIDI Channel 1 – 16 Select plus OMNI and MONO Modes

 Fine Tune

 Units select (multiple device cascade mode)

 Data Dump

 Extended Functions

Front Panel

 Select Mode Key

 Bank Lock Key

 Enter Key

 Numeric Keypad with +and – keys

 3-character Numeric Display

 Volume Control

 Power Switch

Rear Panel

 Monophonic Audio Out Jack

 MIDI IN, OUT and THRU Ports

 AC Receptacle

Power Requirements (user selectable):

 North America and Japan: 95 – 120v AC, 50 – 60 Hz, 55 watts max.

 Europe: 200 – 230v AC, 50 – 60 Hz, 55 watts max.

Fuse Requirements

100V	500mA	Fast Acting
120V	500mA	Fast Acting
220V	250mA	Fast Acting
240V	250mA	Fast Acting

Dimensions

Width (side-to-side)	18.97 in. (48.18 cm.)	Standard Rack
Depth (front-to-back)	10.94 in. (27.79 cm.)	
Height (top-to-bottom)	1.75 in. (4.45 cm.)	1 Rack Space
including feet	2.03 in. (5.16 cm.)	
Net Weight	9 lbs., 4 oz. (4.20 kg.)	
Shipping Weight	13 lbs. (5.90 kg.)	
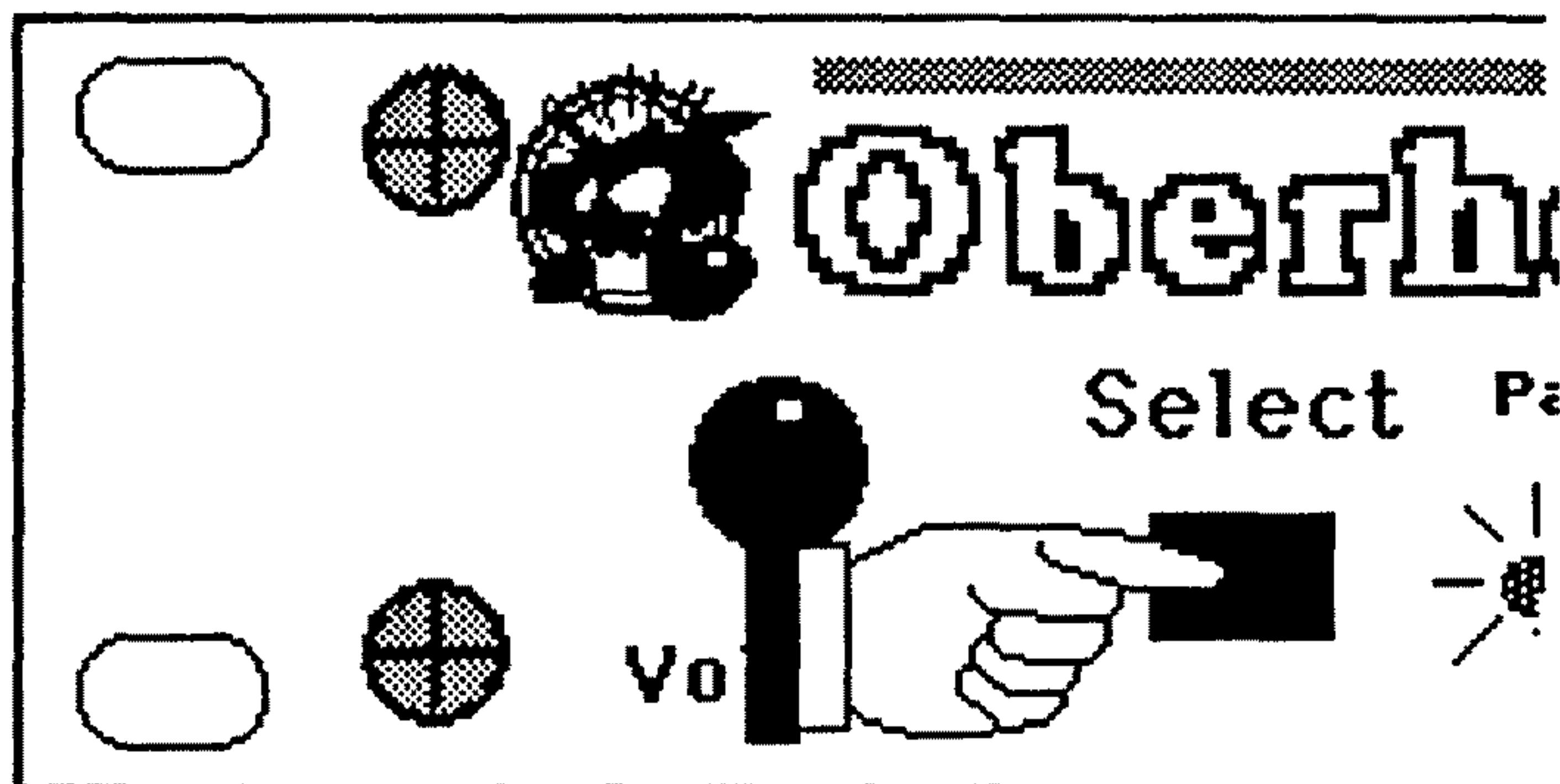
Specifications are subject to change without notice.

Front Panel Keys

SELECT Key

The **Select** key accesses, one at a time, the six operating modes of the Matrix-1000: **Patch, Channel, Fine Tune, Units, Dump** and **Ext. Funct.** Press **Select** repeatedly. The indicator lights will "loop" around the six modes. The numeric display changes to correspond to the selected mode.

BANK LOCK Key

In **Patch** mode, press the **Bank Lock** key to turn **bank lock** on and off. Hold down **Bank Lock** while pressing a Number key to change the bank.
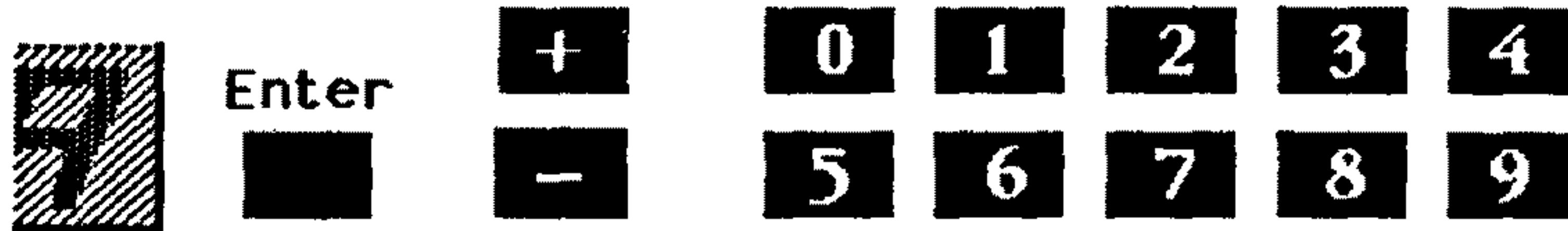
In any other mode, press **Bank Lock** to jump immediately back to **Patch** mode.

The **Bank Lock** key also acts as a mute switch. Pressing **Bank Lock** at any time immediately silences the Matrix-1000.

ENTER, + and − Keys and Number Keys

Enter

Enter is used as a store key for the **Patch Copy** feature and for storing programmable **group mode**. It may be used as an on/off switch for some functions, such as **MIDI echo**. Finally, the **Enter** key is used to start data dumps and calibration routines.

	Enter	+		0	1	2	3	4
▨	■	−		5	6	7	8	9

+ and − Keys

The + and − keys change values up and down by 1. For instance, in **Patch** mode, + selects the next patch, and − selects the previous patch. When held down, + and − repeat automatically. + and − may also act as on and off switches in **Ext. Funct.** mode.

Number Keys

The Number keys are used to type values directly. For instance, in **Patch** mode, the Number keys are to enter patch and bank numbers. With the exception of **Ext. Funct.** mode, values may be changed using either + and − or the Number keys. In **Ext. Funct.**, the Number keys select the different Extended functions, and only the + and − keys may be used to change values.

Basic Modes

PATCH

This is the mode you will use most often. In this mode, the display shows which of the 1000 sounds you are playing. Patches are numbered *000* through *999*. You can change patches either from the Matrix-1000 front panel or from MIDI.

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Select	Patch	Channel	Fine Tune	Units	Data Dump	Ex· Fui
■	☀	⊕	⊕	⊕	⊕	⊕

Patches are grouped in ten banks of 100 patches each. The first digit of a patch number is the bank (0 through 9), and the last two digits are the location of the patch within the bank (00 through 99). For instance, patch *427* is bank 4, location 27.
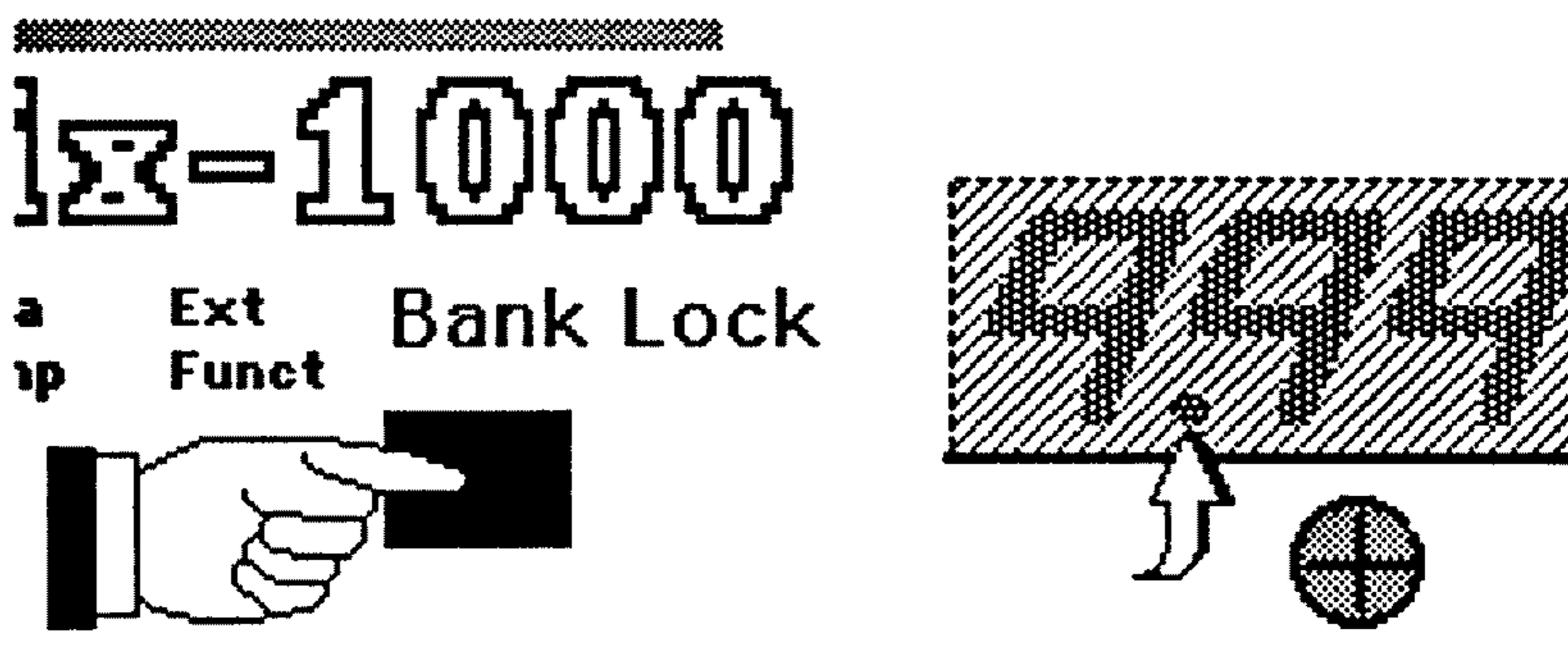
Selecting a Patch From the Front Panel

- Press the **Bank Lock** key to turn **bank lock** on and off. The decimal point between the first and second display digits turns on and off. Turning on **bank lock** freezes the bank number.

- When **bank lock** is off, use the Number keys to type in the **three**-digit number (000 through 999) of the desired patch. Or, press + or – until the desired patch is displayed.

- When **bank lock** is on, type the **two**-digit number (00 through 99) of the desired patch in the current Bank. Or, press **+** or **−** until the desired patch in the current Bank is displayed. To change Banks, **hold down Bank Lock** and type the digit of the desired Bank (0 through 9).

Selecting a Patch From MIDI
How do you enter a 3-digit patch number if your Master instrument has only 2-digit patches? This is where **bank lock** comes

in especially handy.

- Press the **Bank Lock** key to turn on bank lock. The decimal point between the first and second display digits will light. Do a patch change on your Master instrument, and the Matrix-1000 recalls the corresponding patch in the current Bank. For instance, suppose patch *309* is selected on the Matrix-1000. Press **Bank Lock**, and then select patch 22 on your Master instrument. The Matrix-1000 selects patch *322*.

  If your Master instrument has patch numbers which start at 1 rather than 0, then patch 01 on the Master selects patch 00 of the selected bank on the Matrix-1000, patch 02 on the Master selects patch 01, etc.

- To change banks from MIDI, push (or pull) the Master controller's Vibrato or Modulation wheel, lever or joystick (MIDI controller #1) to its maximum position. **While holding** the Master's Vibrato control at its maximum, select a patch from 0 through 9 on the Master. The bank of the same number is recalled on the Matrix-1000. For instance, suppose patch *322* is selected on the Matrix-1000. Hold the Vibrato control and select patch 4 on the Master. The Matrix-1000 selects bank 4, so the patch changes from *322* to *422.*
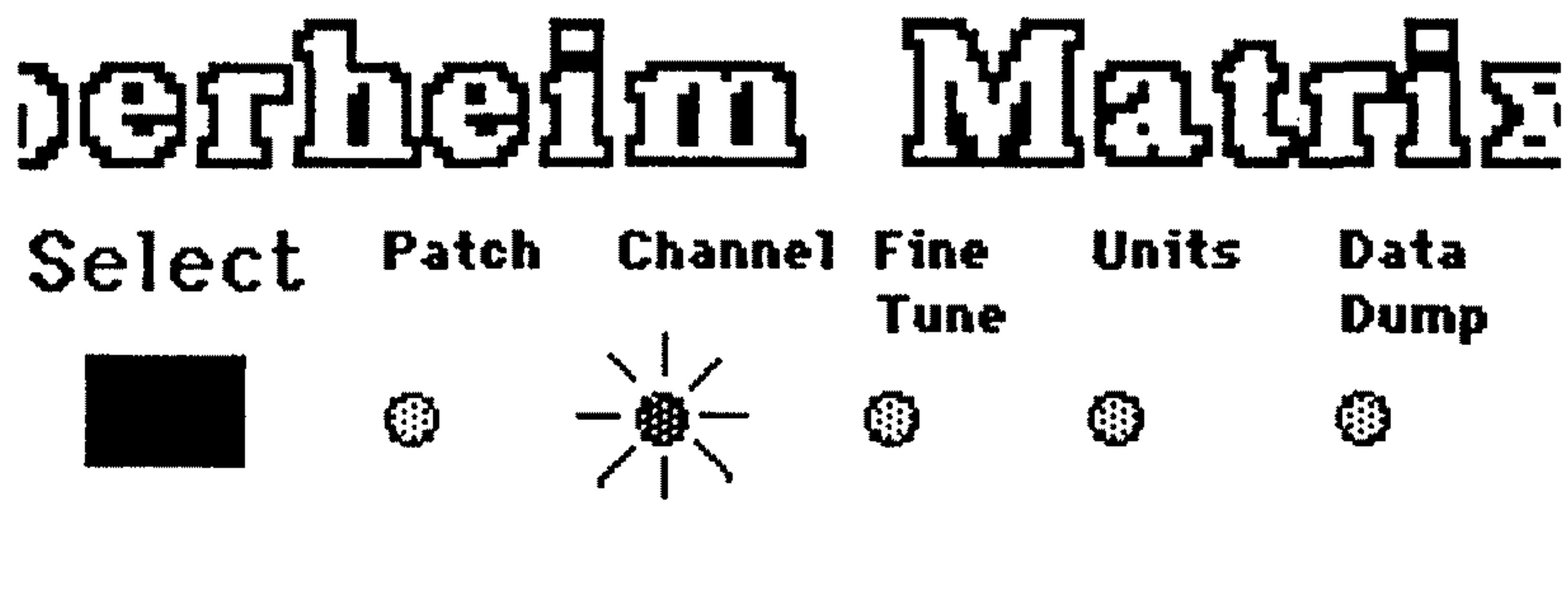
  If your Master has patch numbers which start at 1 rather than 0, then patch 1 selects bank 0, patch 2 selects bank 1, etc.

- In short, whenever the Matrix-1000 sees a MIDI Patch Change when the Vibrato or Modulation (MIDI controller #1) is more than half way on, it uses the patch number as a **bank** number. So be careful — if you're playing notes with your Vibrato on, and you make a Patch change, the Matrix-1000 understands that as a bank change command. To allow bank changing without using Vibrato, MIDI controller #31 performs the same function. This mode is the same as that found in the Oberheim DPX–1 and some other instruments.

- If **bank lock** is turned off, the Matrix-1000 will receive patches *000* through *127* over MIDI. If a bank change is sent from MIDI, using either the Vibrato or MIDI controller #31, the Matrix-1000 turns on **bank lock** automatically.

MIDI patch changes are transmitted and received by the Matrix-1000 on its Basic Channel. Patch changes and bank changes are received by the Matrix-1000 in **all** front panel modes, not just **Patch.**

CHANNEL

This mode controls the MIDI channels used by the Matrix-1000 to send and receive MIDI messages such as notes, patch changes and pitch bends. It's important to make sure the Matrix-1000 is listening to the channel or channels being sent by your Master instrument. When **Channel** mode is selected, you can set the Matrix-1000 into any of these receive modes, using the **+** and **–** and Number keys:

Select   Patch   Channel   Fine Tune   Units   Data Dump

- A number from **1** to **16** indicates the channel on which messages are transmitted and received.

- **on** indicates that OMNI mode is active. In this mode, the Matrix-1000 receives messages on all channels, and transmits on channel 1.

- Displays from **G1** to **G9** mean that the Matrix-1000 is in MONO mode (MIDI mode 4), with basic channels 1 through 9. The **G** here stands for **guitar**, since MONO mode is usually used with guitar controllers to allow independent pitch bend on each string.

When *G1* is selected, the Matrix-1000 is in MONO mode with MIDI Channel 1 as the Basic Channel. MIDI Patch Change commands are recognized on Channel 1, and the Voices respond to Notes and Controllers (Pitch Bend, Volume Pedal and Pressure/After-Touch) independently on the first six MIDI Channels: Voice 1 on Channel 1, Voice 2 on Channel 2, Voice 3 on Channel 3, etc. When *G2* is selected, the same thing happens, except that MIDI Channel 2 is now the Basic Channel, and Voice 1 plays on Channel 2, Voice 2 on Channel 3, Voice 3 on Channel 4, etc. See the chart below for the exact channels that are used in MONO mode. Vibrato and Sustain Pedal are received on the lowest channel number and used for all voices when in MONO mode.

When proper MIDI communication is occurring, the Matrix-1000 lights a dot in the lower right-hand corner of the display any time a note is playing. If the dot does not appear while you are playing, check both your MIDI Channel selections and your MIDI cable connections.

The MIDI channel and MIDI Mode (OMNI/POLY/MONO) are stored in memory, so that you do not have to set up the mode and channel when you turn on the power. While the MIDI channel can be changed only from the front panel, the MIDI mode can be changed remotely from MIDI. If the **Channel** display seems to change mysteriously, make sure that your Master instrument is not sending Mode Change Messages.

Refer to the following chart to determine the Voice-to-Channel assignments of the nine MIDI MONO modes of the Matrix-1000. Notice that *G9* is the top MIDI Channel represented. The Matrix-1000 does not operate in MIDI MONO for Channels 10 through 16.
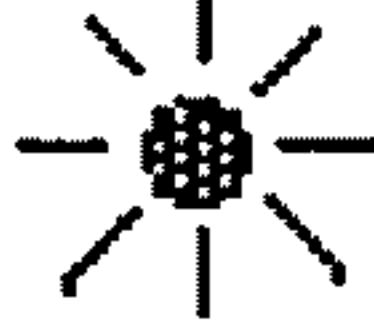
Display	Basic Channel	Voice 1 Channel	Voice 2 Channel	Voice 3 Channel	Voice 4 Channel	Voice 5 Channel	Voice 6 Channel
G1	1	1	2	3	4	5	6
G2	2	2	3	4	5	6	7
G3	3	3	4	5	6	7	8
G4	4	4	5	6	7	8	9
G5	5	5	6	7	8	9	10
G6	6	6	7	8	9	10	11
G7	7	7	8	9	10	11	12
G8	8	8	9	10	11	12	13
G9	9	9	10	11	12	13	14

FINE TUNE

The Matrix-1000 is normally tuned to Standard Pitch of A = 440 Hz, but it can be adjusted to match the tuning of other instruments in your system.
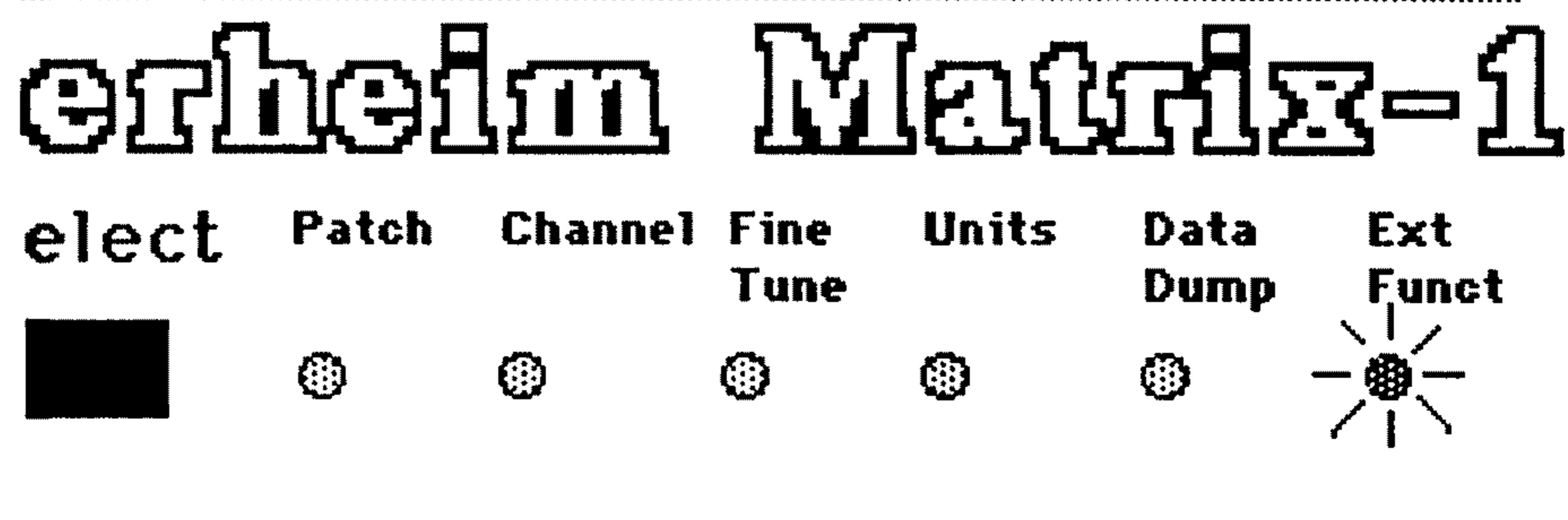
When **Fine Tune** is selected, the Display reads the current Fine Tune value. This value is stored in memory until it is changed. Change the value by using the **+** and **−** keys or the Number keys.

The range of **Fine Tune** is ± a 1/4-tone, represented on the display as a number from **+31** to **-31**. When the display reads **0,** A = 440 Hz. Positive numbers indicate sharp tunings, and negative numbers indicate flat tunings.

TRANSPOSE, UNISON, MIDI ECHO

The **Ext. Funct.** mode of the Matrix-1000 contains Extended Functions. There are presently eight of these functions, numbered 0 through 7 and they are not saved with each patch, although they are saved when you turn the power off. Numbers 0 through 2 are the ones you will need most often.

In **Ext. Funct.** mode, the Number keys select the function, while the **+** and **−** keys change the *on* or *off* status or number value. What's important to remember is that the function number is not displayed. Instead, each Extended Function has its own unique display:

Common Extended Functions

Press Number Key:	Display Reads:	Definition:
0	*Uon* or *Uof*	Unison mode is ON. Unison mode is OFF.
1	*trn*	Transpose mode.
2	*Eon* or *Eof*	MIDI Echo is ON. MIDI Echo is OFF.

0   Unison

Unison mode causes the Matrix-1000 to play all six Voices with one key depression. This is effective for fattening up certain sounds like basses and leads.

Some patches are pre-programmed to be in Unison. Most are not. The front-panel **Unison** overrides the pre-programmed Unison.

- Use the **+** key to turn **Unison** on and the **−** key to turn it off, or press **Enter** to switch between on and off.

- In Unison, if more than one note is played, only the lowest note held will be heard.

Unison is not the same as the "Mono keyboard mode" found on some instruments. Mono keyboard mode allows you to play only **one** Voice monophonically. Unison plays **all six** Voices together as a single note. This is why the Matrix-1000 sounds richer and louder in Unison mode.

When you play legato, the sound may or may not retrigger. This is programmed as appropriate for each patch.

1   Transpose
You can transpose the pitch of the Matrix-1000 up or down as much as two octaves.

- Press **Select** until you reach **Ext. Funct.** Press 1 to choose the **Transpose** function. The display reads *trn*.

- Press **Enter** to display the transpose amount.

- Use the **+** and **−** keys to change the transposition amount. You can play as you change the value, to hear how the transpose sounds.

The transposition is displayed in semitones. *0* indicates standard pitch. To transpose up an octave, set the transpose value to *12*. To transpose up two octaves, set the value to *24*, etc.

2   MIDI Echo
When **MIDI echo** is on, all MIDI IN data received by the Matrix-1000 is sent back out the MIDI OUT port. In other words, **MIDI echo** makes the MIDI OUT port act like a MIDI THRU port, but with the advantage that you can switch it on and off without unplugging any cables.

- Use the **+** key to turn **MIDI echo** on and the **–** key to turn it off, or press **Enter** to switch between on and off.

Use **MIDI echo** to layer sounds from several Matrix-1000s, or from a Matrix-1000 and another synthesizer. For example, to layer three Matrix-1000s:

- Connect the MIDI OUT (not THRU) of the first Matrix-1000 to the MIDI IN of the second. Connect the MIDI OUT of the second to the MIDI IN of the third.

- Set your Master instrument and all the Matrix-1000s to MIDI channel 1, as described under **Channel**.

- On the first Matrix-1000, press **Select** until you reach **Ext. Funct.** Press 2 to choose the **MIDI echo** function. Press **+** to turn **MIDI echo** on. Now do the same on the second Matrix-1000. Since the third Matrix-1000 is the last in line, you do not need to turn on its **MIDI echo**.

- That's it! Now when you play a note on your Master instrument, you'll hear all three Matrix-1000s play.

Layer several different Matrix-1000 patches for orchestral effects. Or, set each Matrix-1000 to a different **Fine Tune** value, and layer the same patch to get super-fat pads and unisons.

MIDI echo is also used in conjunction with **group mode**, as described in Chapter 4.

With the exception of MIDI Active Sensing, all MIDI data is echoed, even System Exclusive messages. However, use of **MIDI echo** for MIDI Real Time information, such as drum machine clocks, is not recommended.

Hints for playing the Patches

• Use the controllers. The Matrix-1000 can use Pitch Bend, Pressure, Mod Wheel (Controller #1), Breath Control (#2), Pedal Control (#4), and Sustain (#64). Although they may not all be used in every patch, you may find some interesting effects.

• Hold notes for a long time, and let them release for a long time. Lots of things are controlled by envelopes. Playing staccato is good for other patches.

• Play clusters of notes. This is good for many sound effects.

• Play the sound at different places on the keyboard.

The bottom line is *Experiment*. The Matrix-1000 is one of the world's most dynamic synthesizers and can do some very unusual things. Programmers have taken advantage of this, so all the patches may not be what you expect. If a sound is uninteresting, you are probably playing it wrong!

At the heart of the Matrix-1000 is the same circuitry used to produce the sounds in the Oberheim Matrix-6 keyboard and the Matrix-6R rack mount synthesizer. Recent advances in technology have permitted the same rich sounds to be packaged in a 1-rack space unit at a considerably lower cost.

The Matrix-1000 contains sounds that have been compiled over that last several years from Matrix-6 and Matrix-6R owners from all over the world. Just recently, Oberheim released a cassette data tape with these sounds to Matrix-6/6R owners so that they will be able to enjoy the tremendous flexibility of having one thousand synthesizer sounds on one cassette.

The Matrix-6 and Matrix-6R, however, can store only 100 of the Patches from the tape at a time. With the Matrix-1000, you have **immediate** access to **all** 1000 Patch sounds because they are all stored inside the Matrix-1000.

But it doesn't stop there. In Chapter 4, under the **Data Dump** mode, we'll tell you how you can customize your patches via MIDI. Right now, we'll cover another way to customize the Matrix-1000.

Copying Patches Within the Matrix-1000

After playing the Matrix-1000 for a period of time, you may want to move certain sounds to new memory locations. The **Patch Copy** function lets do just that. You can copy FROM any patch from *000* through *999* TO any patch from *000* through *199*. You cannot copy TO patches *200* through *999*; they are permanent.

The patch you copy FROM is called the source patch. The patch you copy TO is the destination patch. When you copy a patch, the old contents of the destination patch is ERASED and replaced with the source patch. Be sure to copy only TO a patch which you don't need to save.
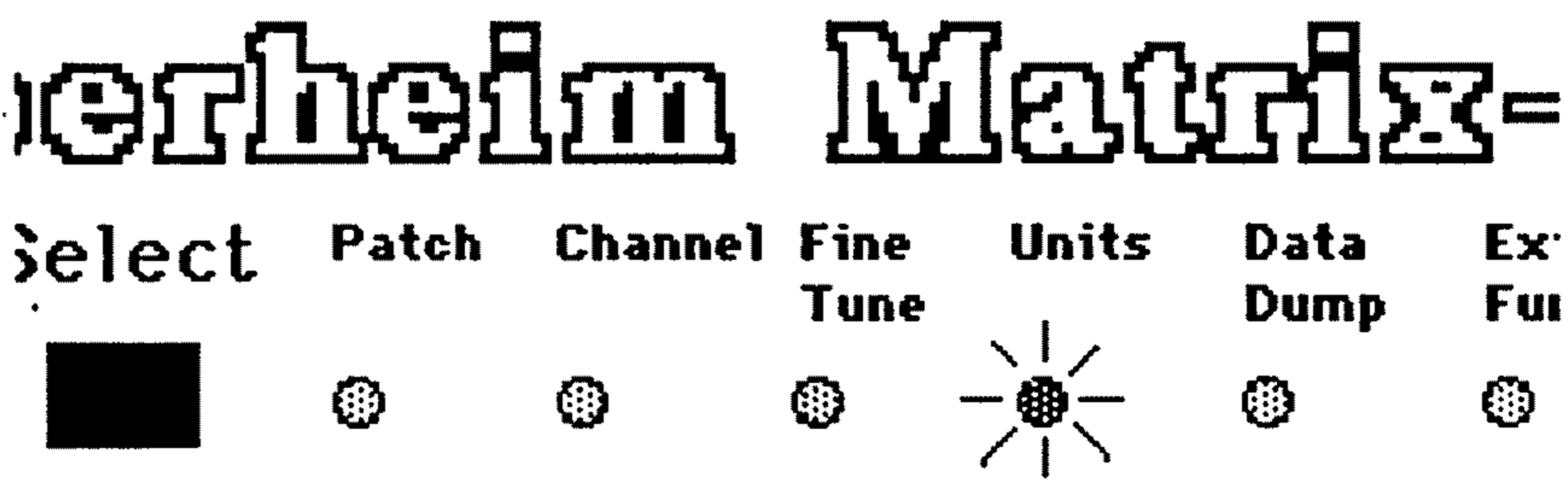
- Press **Select** until you reach **Patch** mode. Select the patch that you want to copy FROM.

- Press and hold down the **Enter** key. The Display changes to read *sto* for "store".

- While still holding **Enter**, type the **three**-digit number of the patch you want to copy TO.

- When the third digit is pressed, the new patch number is displayed, and the copy is complete. The old patch at that number is ERASED and replaced with the copied patch.

- If you make a mistake before the third digit is pressed, let go of **Enter** and start over.

If the display shows *Pro* instead of *sto* when you press **Enter**, the memory has been protected. Memory Protect must be turned off before any patches can be copied or stored. See Chapter 4 under **Ext. Funct. #6**.

SPECIAL MODES

UNITS

Units controls **group mode**, an exciting new feature that lets you play several Matrix-1000's together as if they were one self-contained instrument. Two Matrix-1000s in **group mode** become a single 12-voice synthesizer. Three Matrix-1000s become an 18-voice synthesizer. **Group mode** supports as many as **six** Matrix-1000s, for up to 36-voice polyphony.

)erheim	Matrix=					
)elect	Patch	Channel	Fine Tune	Units	Data Dump	Ex· Fu⸱
■	⊛	⊛	⊛	⊛	⊛	⊛

Here is how to set up **group mode** for two Matrix-1000s. The procedure is basically the same when more units are added. The first Matrix-1000 is considered the Group Master. The other Matrix-1000s are slaves. All operations in the setup procedure **are performed on the Group Master only**. The slave Matrix-1000s are configured automatically by the Group Master.

- Connect the MIDI OUT (not the THRU) of the first Matrix-1000 to the MIDI IN of the second Matrix-1000.

- Press **Select** until **Channel** is lit. Set the Matrix-1000 to OMNI Mode, or to the MIDI Channel of your keyboard, MIDI guitar, etc. Make sure that MIDI MONO Mode (*G1* through *G9*) is not selected, since MIDI MONO does not work with **group mode**.

- Press **Select** until **Units** is lit. The display reads *off*.

- Use the **+** key to select the total number of Matrix-1000s that you want to group together. Since there are two units in this case, the number *2* should be displayed. Also, the dot between the second and third display digits lights up. This dot remains lit whenever your are in **group mode**.

- Now for the fun part...playing! When you play in **group mode**, the first note plays on the first Matrix-1000, the second note plays on the second Matrix-1000, the third note plays back on the first, the fourth note goes to the second, etc. We call this note assignment "Alternating Rotate". Achieve stereo effects by panning the output of each Matrix-1000 to a different stereo position on your mixer, and multitimbral effects by setting each Matrix-1000 in a Group to a different patch.

- Select **Patch** mode, and choose a new patch. Patch and bank changes on the Group Master are transferred automatically to the rest of the Group. (Other changes, like **Fine Tune**, must be made on each unit individually.)

- To leave **group mode**, return to **Units**, and reset the number of units to *off*.

Group mode works together with **MIDI echo** to make it easy to switch between layered and many-voiced polyphonic textures. Set up **group mode** as above, and then do the following:

- Press **Select** until **Units** is displayed. Notice that the dot between the second and third display digits is lit, to indicate **group mode**.

- Press **Enter**. The dot disappears. The current patch will now ignore **group mode.** Press **Enter** again to turn **group mode** back on for this patch. The dot reappears.

- Turn on **MIDI echo** on both Matrix-1000s, as described in Chapter 2. This must be done on each unit separately.

- Return to **Units** mode. Now both **group mode** and **MIDI echo** are on.

- Play some music! Notice that **group mode** takes precedence over **MIDI echo.** With **group mode** on (display dot lit), the two Matrix-1000s play together as a 12-voice instrument. With **group mode** off (no dot), they become a layered six-voice instrument. Press **Enter** in **Units** mode to switch back and forth.

For even greater flexibility, you can program each patch on the Group Master to use or ignore **group mode.** The Matrix-1000 is shipped from the factory with all patches programmed to use **group mode.** If you want to use a particular patch as a layer, program it to ignore **group mode.** Doing this is very similar to Patch copy. In fact, it's like copying a patch to itself.

- Press **Select** until **Units** is displayed. Use **Enter** to turn **group mode** off for the patch.

- Press **Select** until **Patch** is displayed. Press and hold **Enter.** The display reads *sto* , for "store". As with Patch Copy, Memory Protect must be off when storing the **group mode** setting for a patch.

- Type the three-digit patch number of the current patch. The patch will now ignore **group mode.** All patches, even the ROM patches *200* through *999*, may be programmed to ignore **group mode**.

- To turn **group mode** back on for a patch, go to **Units**, use **Enter** to turn **group mode** back on, and copy the patch to itself again.

You can use **group mode** to combine a Matrix-1000 with a Matrix-6 or Matrix-6R to make a 12-voice instrument:
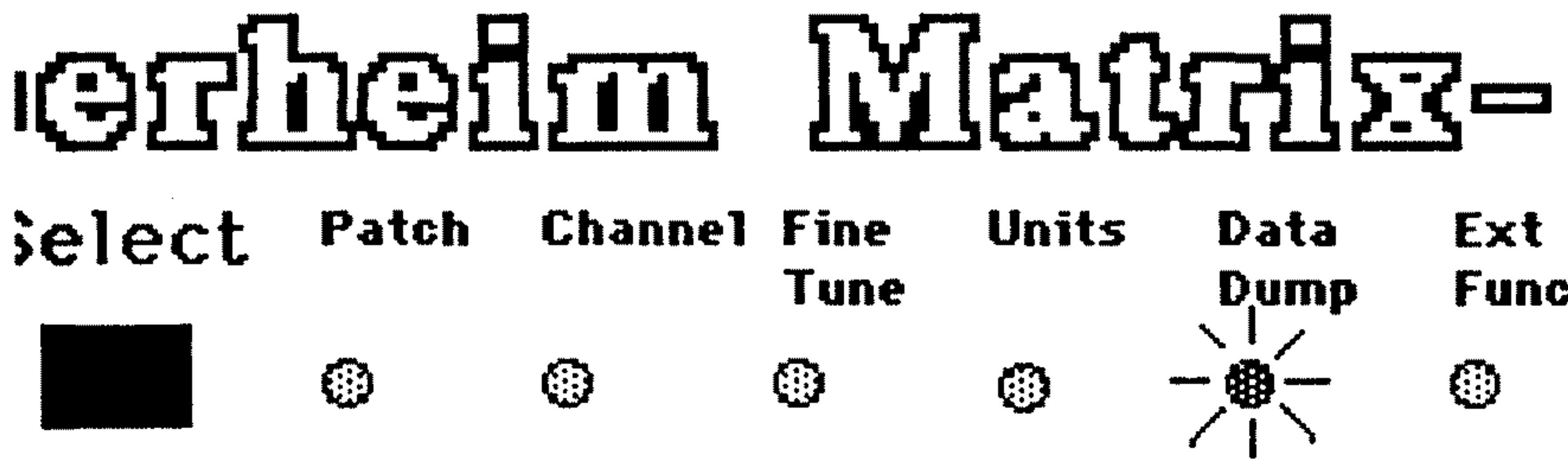
- You must have Matrix-6/6R software revision 2.13 or later.
- Connect Matrix-6 MIDI OUT to Matrix-1000 MIDI IN, and Matrix-1000 MIDI Out to Matrix-6 MIDI IN. **OR,** Connect Master to Matrix-1000 MIDI IN, and Matrix-1000 MIDI OUT to Matrix-6R MIDI IN.
- Set Matrix-6/6R Master Parameter 00 BASIC CHAN 01.
- Set Matrix-6/6R Master Parameter 01 OMNI ON.
- Set Matrix-6/6R Master Parameter 05 LOCAL CTL OFF.
- Set Matrix-6/6R Master Parameter 13 SPILLOVER OFF.
- Set Matrix-1000 **Channel** to *on.*
- Set Matrix-1000 **Units** to 2 to turn on **group mode**.

In fact, **group mode** can actually be used between a Matrix-1000 and any other single synthesizer. The Matrix-1000 must be the Group Master, and the other synthesizer will be assumed to have only six voices. The other machine must be set to Basic Channel 1.

DATA DUMP

Data Dump is used to send patches between the Matrix-1000 and another device: a second Matrix-1000, a Matrix-6 Keyboard, the Matrix-6R rack mount or a computer equipped with a MIDI interface and Matrix-6/6R patch librarian or editor program. You can use **Data Dump** to back up your patches, load in new patches, or even to edit sounds from a computer.

You should know that the Matrix-1000 uses two different kinds of memory for patches. The first 200 Matrix-1000 sounds (Patch numbers *000* through *199*) stored in RAM (Random Access Memory). This means you can edit, change, overwrite or otherwise customize them. The remaining 800 sounds (Patch numbers 200 through 999) are in permanent ROM (Read Only Memory) and cannot be changed. Patch backups are unnecessary for ROM sounds, but are highly recommended for the RAM sounds.

Saving Patches: Dumping FROM the Matrix-1000

- Connect the MIDI OUT of the Matrix-1000 to the MIDI IN of the receiving device.

- Make sure that MIDI System Exclusive is enabled on the receiving device.

- Press **Select** on the Matrix-1000's front panel until **Data Dump** is lit.

- Use the **+** and **–** keys or the Number keys to choose from the three **Data Dump** options:

Press Display Number Key:	Reads:	Definition:
0	*0db*	**Dump bank:** Send the 100 patches in the currently selected bank.
1	*1do*	**Dump one:** Send the current patch.
2	*2dA*	**Dump all:** Send the entire contents of RAM, patches *000* through *199.*

- Press **Enter**. The selected data is sent to the receiver.

If **Dump all** is used to send the RAM patches to another Matrix-1000, the receiving unit will be left with **bank lock** enabled and and bank 1 selected.

Loading Patches: Dumping TO the Matrix-1000

- Connect the MIDI OUT from the transmitting device to the MIDI IN of the Matrix-1000.

- Make sure that MIDI System Exclusive is enabled on the transmitting device.

- Make sure that Memory Protect (**Ext. Funct.** #6) is turned off on the Matrix-1000. If Memory Protect is on when the Matrix-1000 receives a patch dump, it will ignore the dump.

- Execute the desired function from the transmitting device, and the Matrix-1000 automatically saves the new patches. The Matrix-1000 does not need to be in any special mode to receive a patch dump.

- When the dump is completed, select **Patch** mode on the Matrix-1000. The received patches are now available.

Note that Matrix-6 and 6R units with software version 2.13 or earlier may transmit patches faster than the Matrix-1000 can receive them during a SEND ALL. The result may be that some patches are not successfully transferred. These patches can be sent using the Matrix-6 SEND ONE function. Also note that the Matrix-6 will send Split and Master information during a SEND ALL. This extra information will be ignored.

ADVANCED EXTENDED FUNCTIONS

Here are the remaining Extended Functions not described in Chapter 2.

heim Matrix-1

t	Patch	Channel	Fine Tune	Units	Data Dump	Ext Funct
	⊛	⊛	⊛	⊛	⊛	✦

Advanced Extended Functions

Press Number Key:	Display Reads:	Definition:
3	*ion* or *iof*	Invert MIDI Volume is ON. Invert MIDI Volume is OFF.
4	*PEd*	Pedal 1 MIDI controller select.
5	*G00*	Displays the Unit Number used in **group mode**.
6	*Pon* or *Pof*	Memory Protect is ON. Memory Protect is OFF.
7	*tst*	Test mode.
8	*bnd*	Bend Range.

3   Invert MIDI Volume

The Matrix-1000 normally gets louder as MIDI Volume (Controller #7) is increased. When **Invert MIDI Volume** is on, the Matrix-1000 gets softer as MIDI Volume is increased. This may seem rather strange, but it allows two rather nice effects:

- **Whammy bar.** Certain controllers, notably the whammy bar on a MIDI guitar, transmit a 0 in the rest position. If you use the whammy bar to control MIDI Volume, you must hold the whammy bar down to get any sound at all. By inverting Volume, you get maximum volume when you're not using the whammy bar, and softer volume as you press the bar down.

- **Cross-fade.** When used with a synthesizer which responds normally to MIDI Volume, inverting the volume on the Matrix-1000 creates a cross-fade. As the volume increases on the other synthesizer, it decreases on the Matrix-1000, and vice-versa.

Use the **+** key to turn **MIDI Volume Invert** on and the **−** key to turn it off, or press **Enter** to switch between on and off.

4   Pedal 1 MIDI Controller Select

The Pedal 1 select function is used primarily to provide compatibility with Matrix-6 and 6R synthesizers. Pedal 1 can be programmed to allow a wide variety of.effects on the Matrix series synthesizers. As a result, many of the sounds in the Matrix-1000 have special effects programmed on the Pedal 1 function. On the Matrix-6, Pedal 1 is assignable to any MIDI.controller, but defaults to MIDI controller #7. On the Matrix-1000, Controller #7 is dedicated to the volume function.   To provide compatibility with systems where a Matrix-6 is presently being used, the Matrix-1000 allows the Pedal 1 function to be controlled by any standard MIDI controller. The Pedal 1 function defaults to MIDI controller #4, but can be reset to any controller in the range 0-121. A special case is when the Pedal 1 is assigned to controller #7. In this case, the MIDI Volume function is defeated, and the controller will be routed exclusively to the Pedal 1 function.

Select **Ext. Funct. #4**. The display reads *PEd*. Press **Enter** to display the current Pedal 1 MIDI controller. Use the **+** and **–** keys to change the controller number from 0 through 121.

5   Display Group Mode Unit Number

In **group mode**, the Group Master is considered unit 0, the first slave Matrix-1000 in the Group is unit 1, the next is unit 2, etc. The Group Master transmits notes to each slave on the MIDI channel number corresponding to the slave's unit number. For instance, notes for slave unit 1 are transmitted on channel 1. At the same time, the slave unit receives notes on this new channel, instead of its originally selected channel.

Display Group Mode Unit Number lets you view and modify the unit number of a particular Matrix-1000. Entering **group mode** on the Group Master resets this value on all slaves automatically. By changing this value after **group mode** has been turned on, you can achieve certain special effects. Any instrument with a unit number of 0 will act like a master, while any non-zero unit number will act like a slave. Given this, it is actually possible to use Matrix-1000's in combination with any other synths, although each synth will play only six voices.

6   Memory Protect

When on, this function protects the first 200 patches from being overwritten. Use the **+** key to turn Memory Protect on and the **–** key to turn it off, or press **Enter** to switch between on and off.

When Memory Protect is on, pressing the **Enter** key while in **Patch** mode causes the display to read *Pro* instead of the usual *sto* . Memory Protect prevents Patch Copy and Data Dump receives (though not transmits). You cannot program a patch to use or ignore **group mode** while Memory Protect is on.

7 Test Mode

The Matrix-1000 software includes a number of test routines used during manufacture and servicing. To access these functions, select **Ext. Funct. #7** and press **Enter**. The display will then show the test number. The **+** and **−** keys change the test number.

Test 0 is an auto-calibrate function, a comprehensive internal routine that auto-tunes the instrument's Oscillators, Filters, Voltage Controlled Amplifiers (VCAs) and other related circuits. Press **Enter** to start calibration. The display reads *CAL*. Calibration takes several seconds to complete.

The remaining test functions are useful only to service centers:

NOTE: The Matrix-1000 must only be opened and adjusted by qualified service personnel. Unauthorized adjustments may void your warranty.

1   Voice display. Press **Enter** to toggle display mode. When active, display shows highest gated voice number, or 0 if no voices are gated. This test remains active during all modes until calibration test 1 is re-selected and **Enter** is pressed, or until power is cycled.

2   DAC Zero. Press **Enter** to start. Adjust VR701 for 0V±1 mV at DACOUT test point. Press any key to end test.

8 Bend Range

You can set the range used by the pitch bend control to be as much as two octaves.

- Press **Select** until you reach **Ext. Funct.** Press 8 to choose the **Bend Range** function. The display reads *bnd*

- Press **Enter** to display the bend range amount.

- Use the **+** and **−** keys to change the bend range amount. You can play as you change the value, to hear how the bend sounds.

The bend range is displayed in semitones. The normal value is 2 which means that the full bend range is up 2 semitones and down 2 semitones. For a one octave up and one octace down range, set the value to 12.

RE-INITIALIZATION

In the unlikely event that your Matrix-1000 starts to behave strangely, you may wish to perform a complete re-initialization of the memory. This can be accomplished by holding the **Enter** button while turning the power on. This does not affect the stored patches, but does reset all of the data used in normal operation by the Matrix-1000:

- Patch *000* is displayed, but the sound heard when notes are received from MIDI is a test tone.
- MIDI is set to Basic Channel 1, Poly Mode, OMNI ON.
- Fine Tune is set to 0.
- The number of units is set *off*.
- **Group mode** is enabled on all patches when the number of units is 2 or more.
- Unison is set *off*.
- Transpose is set to 0.
- **MIDI Echo** is disabled.
- Volume is received normally on controller #7.
- Pedal 1 is received on MIDI controller #4.
- Memory Protect is turned off.

Recognized Messages

Channel Voice Messages

Status	Data Bytes	Description
1000 xxxx	0nnn nnnn 0vvv vvvv	Note Off (Release Velocity = 1 – 127)
1001 xxxx	0nnn nnnn 0vvv vvvv	Note On (Velocity = 1 – 127, 0 = Note Off)
1011 xxxx	0ccc cccc 0nnn nnnn	Controller Change Any controller 0 – 121 can be used; 7 bits only
1100 xxxx	0nnn nnnn	Program Select
1110 xxxx	0000 000n 0nnn nnnn	Pitch Bend (LSB) Pitch Bend (MSB)

Channel Mode Messages

Status	Data Bytes	Description
1011 xxxx	79H 00H	Reset All Controllers
1011 xxxx	7BH 00H	All Notes Off
1011 xxxx	7CH 00H	OMNI Mode Off
1011 xxxx	7DH 00H	OMNI Mode On (OMNI is assumed off in MONO ON)
1011 xxxx	7EH 06H	Mono Mode On
1011 xxxx	7FH 00H	Mono Mode Off

System Common Messages

1111 0000	10H	System Exclusive – Oberheim ID
	06H	Matrix-6/6R/1000 Device ID
	\<opcode\>	
	\<data bytes\>	
	0F7H	End of System Exclusive

1111 0111   End of System Exclusive

System Real Time Messages

1111 1110   Active Sensing

Matrix-1000 System Exclusive Data Format

All "data" in patch and parameter dumps is unpacked for transmission.
The general algorithm for transmission is:
1. Transmit header and message code(s).
2. Clear checksum.
3. Fetch next data byte to be transmitted.
4. Add byte to checksum.
5. Transmit (data & 0FH).
6. Transmit (data/16 & 0FH).
7. Repeat 3 - 6 for all data bytes.
8. Transmit (checksum & 07FH).
9. Transmit F7H.

01H – Single Patch Data
F0H 10H 06H 01H \<num\> \<patch data\> \<checksum\> F7H

\<num\>   = destination patch number (0 - 99)
\< data\>   = patch data unpacked to two nibbles per byte
                        see patch format listing
\<checksum\> = sum of packed (not transmitted) \<data\>

> Note: On receipt, this data will be stored into the specified
> patch location in the current bank. If this patch is currently
> selected in the Matrix-1000, the newly stored sound will be
> recalled into the edit buffer.
>
> Note: A gap of at least ten msec should be allowed between
> patches when sending multiple patches to the Matrix-1000.

03H – Master Parameter Data

> F0H 10H 06H 03H <version> <data> <checksum> F7H

> <version>   = 03H for Matrix-1000

> <data>   = master data unpacked to two nibbles per byte
>   see master parameter format listing
> <checksum> = checksum of packed <data>

04H – Request Data

> F0H 10H 06H 04H <type> <number> F7H

> <type>   = 0 to request all patches in current bank and master
>   parameters.
>   = 1 to request a single patch from the current bank.
>   = 3 to request master parameters.
>   = 4 to request edit buffer.
> <number>= 0 when <type> = 0 or 3
>   = Number of patch requested when <type> = 1

> Note: When all patches are requested, 100 patches from the current
> bank are transmitted in ascending order using individual Single Patch
> messages (code 01 above). This is followed by 50 dummy "split"
> patches for compatibility with the "Request All" function of the Matrix-6.
> Each of these splits has the form F0H 10H 06H 02H <36 bytes of data>
> F7H. For further information on this format, see the Matrix-6 MIDI
> Specification.
> All Patches are transmitted with ten msec between patches.

06H – Remote Parameter Edit

> F0H 10H 06H 06H <parm> <val> F7H

> <parm> = Matrix-1000 parameter number (see patch
> format) 0-99
> <value> = the value to which that parm should be set.

> Note: All values are sign extended from bit 6 into bit 7 except for
> parameter 121 (VCF frequency). Range checking should be done on
> the value of each parameter before it is sent.

07H – Set Group Mode

    F0H 10H 06H 07H <num> <ID> F7H

    <num> = Total number of units in group (2 - 6)
    <ID>   = 0 to set the first unit to be the master
               = 1 - 5 to set the unit to be a slave

    Note: The value received for <ID> is used as the unit ID for certain SYSX messages. It is also accessable from the front panel as extended function 5.

    Note: On receipt of this message, the unit enters group mode with its unit number set to <ID>. It then re-transmits this message with the ID incremented.

0AH – Set Bank

    F0H 10H 06H 0AH <bank> F7H

    <bank> = bank number to select (0 - 9).

    Note: On receipt of this message, the unit will change banks and enable the bank lock.

0BH – Remote Parameter Edit

    F0H 10H 06H 0BH <path> <source> <val> <dest> F7H

    <path> = Matrix Modulation path number (0 - 9).
    <source>= 0 to delete this path
               = 1 - 20 to specify modulation source (see table 2)
    <value> = Modulation Amount <dest>
               = 0 to delete this path
               = 1-32 to specify modulation destination (table 3)

    Note: The value is sign extended from bit 6 into bit 7. Range checking should be done on all data <u>before</u> it is sent.

0CH – Unlock Bank

    F0H 10H 06H 0CH F7H

    On receipt of this message, Bank Lock will be disabled.

0DH – Single Patch Data to Edit Buffer

F0H 10H 06H 0DH 0 <patch data> <checksum> F7H

< data> = patch data unpacked to two nibbles per byte
         see patch format listing
<checksum> = sum of packed (<u>not</u> transmitted) <data>

Note: On receipt, this data will be stored into the edit buffer.

Note: Wait at least ten msec after sending a patch to the Matrix-1000.

0EH – Store Edit Buffer

F0H 10H 06H 0EH <num> <bank> <ID> F7H

<num> = patch number within bank (0 - 99)
<bank> = bank number (0 - 9)
<ID> = 0 if Group Mode is off
         = Unit ID for target M-1000 in Group Mode
         = 7FH for any unit in Group Mode
         = 268 nybbles transmitted + 5 bytes Header + 1 byte

Matrix-1000 Single Patch Data Format

Statistics: 134 Bytes/Single Patch

Checksum   + 1 byte EOX

                       = 275 total transmitted bytes/Single Patch

Byte	Parameter	# Bits	Description
0 - 7		6 each	Patch Name Each character is represented by the lower 6 bits of it's ASCII representation.
8	48	2	Keyboard Mode 0 = Reassign 1 = Rotate 2 = Unison 3 = Reassign w/ Rob
9	00	6	DCO 1 Initial Frequency LSB = 1 Semitone
10	05	6	DCO 1 Initial Waveshape 0 = Sawtooth 31 = Triangle
11	03	6	DCO 1 Initial Pulse Width
12	07	2	DCO 1 Fixed Modulations Bit 0 = Lever 1 Bit 1 = Vibrato
13	06	2	DCO 1 Waveform Enable Bit 0 = Pulse Bit 1 = Wave
14	10	6	DCO 2 Initial Frequency LSB = 1 Semitone
15	15	6	DCO 2 Initial Waveshape 0 = Sawtooth 31 = Triangle
16	13	6	DCO 2 Initial Pulse Width
17	17	2	DCO 2 Fixed Modulations Bit 0 = Lever 1 Bit 1 = Vibrato
18	16	3	DCO 1 Waveform Enable Bit 0 = Pulse Bit 1 = Wave Bit 2 = Noise
19	12	6 (signed)	DCO 2 Detune
20	20	6	Mix

Byte	Parameter	# Bits	Description
21	08	2	DCO 1 Fixed Modulations
			Bit 0 = Portamento
			Bit 1 = Not used
22	09	1	DCO 1 Click
23	18	2	DCO 2 Fixed Modulations
			Bit 0 = Portamento
			Bit 1 = Keyboard Tracking
			Enable
24	19	1	DCO 2 Click
25	02	2	DCO Sync Mode
26	21	7	VCF Initial Frequency
			LSB = 1 Semitone
27	24	6	VCF Initial Resonance
28	25	2	VCF Fixed Modulations
			Bit 0 = Lever 1
			Bit 1 = Vibrato
29	26	2	VCF Keyboard Modulation
			Bit 0 = Portamento
			Bit 1 = Keyboard
30	30	6	VCF FM Initial Amount
31	27	6	VCA 1 (Exponential) Initial Amount
32	44	6	Portamento Initial Rate
33	46	2	Lag Mode
			0 = Constant Speed
			1 = Constant Time
			2 = Exponential
			3 = Exponential
34	47	1	Legato Portamento Enable
35	80	6	LFO 1 Initial Speed
36	86	2	LFO 1 Trigger
			0 = No Trigger
			1 = Single Trigger
			2 = Multi Trigger
			3 = External Trigger
37	87	1	LFO 1 Lag Enable
38	82	3	LFO 1 Waveshape
			(see Table 1)
39	83	5	LFO 1 Retrigger point
40	88	5	LFO 1 Sampled Source
			Number
41	84	6	LFO 1 Initial Amplitude
42	90	6	LFO 2 Initial Speed

Byte	Parameter	# Bits	Description
43	96	2	LFO 2 Trigger
			See LFO 1 Triggers
			above
44	97	1	LFO 2 Lag Enable
45	92	3	LFO 2 Waveshape
			(see Table 1)
46	93	5	LFO 2 Retrigger point
47	98	5	LFO 2 Sampled Source
			Number
48	94	6	LFO 2 Initial Amplitude
49	57	3	Env 1 Trigger Mode
			Bit 0 = Reset
			Bit 1 = Multi Trigger
			Bit 2 = External Trigger
50	50	6	Env 1 Initial Delay Time
51	51	6	Env 1 Initial Attack Time
52	52	6	Env 1 Initial Decay Time
53	53	6	Env 1 Sustain Level
54	54	6	Env 1 Initial Release Time
55	55	6	Env 1 Initial Amplitude
56	59	2	Env 1 LFO Trigger Mode
			Bit 0 = Gated
			Bit 1 = LFO Trigger
57	58	2	Env 1 Mode
			Bit 0 = DADR Mode
			Bit 1 = Free Run
58	67	3	Env 2 Trigger Mode
			See Env 1 Trigger
			Mode above
59	60	6	Env 2 Initial Delay Time
60	61	6	Env 2 Initial Attack Time
61	62	6	Env 2 Initial Decay Time
62	63	6	Env 2 Sustain Level
63	64	6	Env 2 Initial Release Time
64	65	6	Env 2 Initial Amplitude
65	69	2	Env 2 LFO Trigger Mode
			See Env 1 LFO Trigger
			Mode above
66	68	2	Env 2 Mode
			See Env 1 Mode
			above

Byte	Parameter	# Bits	Description
67	77	3	Env 3 Trigger Mode See Env 1 Trigger Mode above
68	70	6	Env 3 Initial Delay Time
69	71	6	Env 3 Initial Attack Time
70	72	6	Env 3 Initial Decay Time
71	73	6	Env 3 Sustain Level
72	74	6	Env 3 Initial Release Time
73	75	6	Env 3 Initial Amplitude
74	79	2	Env 3 LFO Trigger Mode (See Env 1 LFO Trigger Mode)
75	78	2	Env 3 Mode (See Env 1 Mode)
76	33	5	Tracking Generator Input Source Code (See Table 2)
77	34	6	Tracking Point 1
78	35	6	Tracking Point 2
79	36	6	Tracking Point 3
80	37	6	Tracking Point 4
81	38	6	Tracking Point 5
82	40	6	Ramp 1 Rate
83	41	2	Ramp 1 Mode 0 = Single Trigger 1 = Multi Trigger 2 = External Trigger 3 = External Gated
84	42	6	Ramp 2 Rate
85	43	2	Ramp 2 Mode (See Ramp 1 Mode)
86	01	7 (Signed)	DCO 1 Freq. by LFO 1 Amount
87	04	7 (Signed)	DCO 1 PW by LFO 2 Amount
88	11	7 (Signed)	DCO 2 Freq. by LFO 1 Amount
89	14	7 (Signed)	DCO 2 PW by LFO 2 Amount
90	22	7 (Signed)	VCF Freq. by Env 1 Amount
91	23	7 (Signed)	VCF Freq. by Pressure Amount
92	28	7 (Signed)	VCA 1 by Velocity Amount
93	29	7 (Signed)	VCA 2 by Env 2 Amount
94	56	7 (Signed)	Env 1 Amplitude by Velocity Amount
95	66	7 (Signed)	Env 2 Amplitude by Velocity Amount
96	76	7 (Signed)	Env 3 Amplitude by Velocity Amount

Byte	Parameter	# Bits	Description
97	85	7 (Signed)	LFO 1 Amp. by Ramp 1 Amount
98	95	7 (Signed)	LFO 2 Amp. by Ramp 2 Amount
99	45	7 (Signed)	Portamento Rate by Velocity Amount
100	31	7 (Signed)	VCF FM Amount by Env 3 Amount
101	32	7 (Signed)	VCF FM Amount by Pressure Amount
102	81	7 (Signed)	LFO 1 Speed by Pressure Amount
103	91	7 (Signed)	LFO 2 Speed by Keyboard Amount
104		5	Matrix Modulation Bus 0 Source Code (see Table 2)
105		7 (Signed)	MM Bus 0 Amount
106		5	MM Bus 0 Destination code (see Table 3)
107		5	Matrix Modulation Bus 1 Source Code (see Table 2)
108		7 (Signed)	MM Bus 1 Amount
109		5	MM Bus 1 Destination code (see Table 3)
110		5	Matrix Modulation Bus 2 Source Code (see Table 2)
111		7 (Signed)	MM Bus 2 Amount
112		5	MM Bus 2 Destination code (see Table 3)
113		5	Matrix Modulation Bus 3 Source Code (see Table 2)
114		7 (Signed)	MM Bus 3 Amount
115		5	MM Bus 3 Destination code (see Table 3)
116		5	Matrix Modulation Bus 4 Source Code (see Table 2)
117		7 (Signed)	MM Bus 4 Amount

Byte	Parameter	# Bits	Description
118		5	MM Bus 4 Destination Code (see Table 3)
119		5	Matrix Modulation Bus 5 Source Code (see Table 2)
120		7 (Signed)	MM Bus 5 Amount
121		5	MM Bus 5 Destination code (see Table 3)
122		5	Matrix Modulation Bus 6 Source Code (see Table 2)
123		7 (Signed)	MM Bus 6 Amount
124		5	MM Bus 6 Destination code (see Table 3)
125		5	Matrix Modulation Bus 7 Source Code (see Table 2)
126		7 (Signed)	MM Bus 7 Amount
127		5	MM Bus 7 Destination code (see Table 3)
128		5	Matrix Modulation Bus 8 Source Code (see Table 2)
129		7 (Signed)	MM Bus 8 Amount
130		5	MM Bus 8 Destination code (see Table 3)
131		5	Matrix Modulation Bus 9 Source Code (see Table 2)
132		7 (Signed)	MM Bus 9 Amount
133		5	MM Bus 9 Destination code (see Table 3)

Table 1

LFO Wave Codes

0 = Triangle	4 = Random
1 = Up Sawtooth	5 = Noise
2 = Down Sawtooth	6 = Sampled Modulation
3 = Square	7 = Not Used

Table 2

Modulation Source Codes
Tracking Generator Inputs

Unused Modulations must have their Sources
and Destinations set to 0.

0 = Unused Modulation*

1 = Envelope 1	11 = Tracking Generator
2 = Envelope 2	12 = Keyboard Gate
3 = Envelope 3	13 = Velocity
4 = LFO 1	14 = Release Velocity
5 = LFO 2	15 = Pressure
6 = Vibrato	16 = Pedal 1
7 = Ramp 1	17 = Pedal 2
8 = Ramp 2	18 = Lever 1
9 = Keyboard	19 = Lever 2
10 = Portamento	20 = Lever 3

* The "0 = Unused Modulation" parameter in this
Table is found in the Modulation Source list only. This
parameter is not a Tracking Generator input and thus
will not be displayed in parameter 33 TRACK INPUT.

Table 3

Modulation Destination Codes

Unused Modulations must have their Sources and Destinations set to 0.

0 = Unused Modulation

1 = DCO 1 Frequency	17 = Envelope 1 Amplitude
2 = DCO 1 Pulse Width	18 = Envelope 2 Delay
3 = DCO 1 Waveshape	19 = Envelope 2 Attack
4 = DCO 2 Frequency	20 = Envelope 2 Decay
5 = DCO 2 Pulse Width	21 = Envelope 2 Release
6 = DCO 2 Waveshape	22 = Envelope 2 Amplitude
7 = Mix Level	23 = Envelope 3 Delay
8 = VCF FM Amount	24 = Envelope 3 Attack
9 = VCF Frequency	25 = Envelope 3 Decay
10 = VCF Resonance	26 = Envelope 3 Release
11 = VCA 1 Level	27 = Envelope 3 Amplitude
12 = VCA 2 Level	28 = LFO 1 Speed
13 = Envelope 1 Delay	29 = LFO 1 Amplitude
14 = Envelope 1 Attack	30 = LFO 2 Speed
15 = Envelope 1 Decay	31 = LFO 2 Amplitude
16 = Envelope 1 Release	32 = Portamento Time

Matrix-1000 Global Parameters Data Format

Statistics: 172 bytes/Global Parameters
= 344 nybbles transmitted + 5 bytes Header
+ 1 byte Checksum + 1 byte EOX
= 351 total transmitted bytes/Global parameters

Byte	# Bits	Description
0		Not Used
1	6	Vibrato Speed
2	2	Vibrato Speed Mod Source Code
3	6	Vibrato Speed Modulation Amount
4	3	Vibrato Waveform
5	6	Vibrato Amplitude
6	2	Vibrato Amp Mod Source Code
7	6	Vibrato Amp Modulation Amount
8	6 (Signed)	Master Tune
9		Not Used
10		Not Used
11	4	MIDI Basic Channel
12	1	MIDI OMNI Mode Enable
13	1	MIDI Controllers Enable
14	1	MIDI Patch Changes Enable
15		Not Used
16		Not Used
17	7	MIDI Pedal 1 Controller
18	7	MIDI Pedal 2 Controller
19	7	MIDI Lever 2 Controller
20	7	MIDI Lever 3 Controller
21-31		Not Used
32	1	MIDI Echo Enable
34	6(signed)	Master Transpose
35	1	MIDI Mono Mode Enable
36-161	1 each	Group Enables (One bit per patch, LS bit first)
162-163		Not Used
164	1	Bend Range
165	1	Bank Lock Enable (In MSB only)
166	1	Number of Units (Group Mode)
167	1	Current Unit Number (Group Mode)
168	1	Group Mode Enable (In MSB only)
169	1	Unison Enable
170	1	Volume Invert Enable
171	1	Memory Protect Enable

Miscellaneous Matrix-1000 Commands

Bank Select

    F0H 7FH <id> 02H 01H <chan> <disc-lo> <disc-hi>
    <dir-lo> <dir-hi> <bank-lo> <bank-hi> F7H

<id>	= 7FH for all devices (including this one)
	= (0 - 5) must match unit's ID
<disc-lo>	= Don't Care
<disc-hi>	= Don't Care
<dir-lo>	= Don't Care
<dir-hi>	= Don't Care
<bank-lo>	= bank to select (0 - 9)
<bank-hi>	= 0

Device Inquiry

    F0H 7EH <chan> 06H 01H F7H

<chan>	= 7FH for any device (including this one)
	= (0 - 15) must match unit's basic channel

Device ID

    F0H 7EH <chan> 06H 02H <mfg> <fam-lo> <fam-hi>

    <memb-lo> <memb-hi> <rev-0> <rev-1> <rev-2> <rev-3> F7H

<chan>	= Transmitting device's Basic Channel
<mfg>	= 10H (Oberheim)
<fam-lo>	= 6H (Matrix-6/6R/1000)
<fam-hi>	= 0H
<memb-lo>	= 2H (Matrix-1000)
<memb-hi>	= 0H
<rev-0> thru	
<rev-3>	= Four ASCII Characters of the version number, right justified.

        E.g., version 1.10 is represented by:
            <rev-0> = 20H (' ')
            <rev-1> = 31H ('1')
            <rev-2> = 31H ('1')
            <rev-3> = 31H ('0')

Active Controllers

01	**Vibrato Amount (Lever 2)**
02	**Breath Control (Lever 3)**
04	Foot Pedal (Pedal 1)
06	Data Entry
07	Volume
31	Bank Change Enable
64	Sustain (Pedal 2)
96	Increment
97	Decrement
98	Non-Reg Parm LSB
99	Non-Reg Parm MSB
100	Reg Parm LSB
101	Reg Parm MSB

Registered Parameters

00	**Pitch Bend Range (in semitones)**
01	**Fine Tune (in 128ths of a semitone)**
02	**Transpose (in semitones)**

Non-registered parameters may be used to control any parameter by using the front panel parameter number. Matrix modulations must be controlled by use of the System Exclusive message. When using registered or non-registered parameter editing, all received data entry controller values are offset by 40H, except when the currently selected parameter is the registered pitch bend range. Thus, a data entry value of 40H will update the selected parameter to be 0, while 3EH is interpreted as -2. This allows for transmission of negative numbers.

If You Have A Problem

The staff at ECC/Oberheim wish to thank you for purchasing an Oberheim product, and we 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 12 months 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 either the Warranty Registration Sticker applied to the unit itself, or 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 12 months 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. If you have returned your Warranty Card, the Warranty Verification Sticker affixed to the bottom panel of your unit is sufficient to prove warranty status.

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 salesperson who sold you the instrument. By making the salesperson aware of your situation, he or she 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.