



# **Oberheim**

# Matrix-12

## **PRELIMINARY OPERATION GUIDE**

**PRELIMINARY EDITION • FEBRUARY 1985**

For use with the Oberheim Xpander Owner's Manual

### **Oberheim**

A Division of ECC Development Corporation  
2230 South Barrington Avenue  
Los Angeles, CA 90064 USA

Part Number: 950039

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## **Congratulations!**

You are one of the very first owners of a revolutionary new keyboard synthesizer:

### **The Oberheim Matrix-12**

The Oberheim Matrix-12 features twelve individually programmable voices and a sophisticated system for controlling them, via the internal velocity keyboard or from other external MIDI controllers.

We are currently preparing a new manual for the Matrix-12. Until it is completed, please use the enclosed Oberheim Xpander Owner's Manual and Matrix-12 preliminary Operation Guide.

Each of the twelve voices as well as many other features of the Oberheim Matrix-12 are the same as in the Oberheim Xpander, our six voice synthesizer component. Besides the addition of six voices and keyboard, several features have been added or changed in the Matrix-12. These changes and supplementary functions are described in the Matrix-12 Operation Guide.

If you would like to receive a Matrix-12 Owner's Manual, please fill out the form below and return it to us. We will send you a copy at no charge when it is completed.

Thank you for your investment in the state of the art.

**Oberheim, A Division of ECC Development Corporation**

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*SEND THIS FORM TO:*

**Oberheim Customer Service, Dept. M  
2230 S. Barrington Avenue  
Los Angeles, California 90064 USA**

Dear Obie:

Please send me a copy of the new Matrix-12 Owners Manual.

Name: \_\_\_\_\_

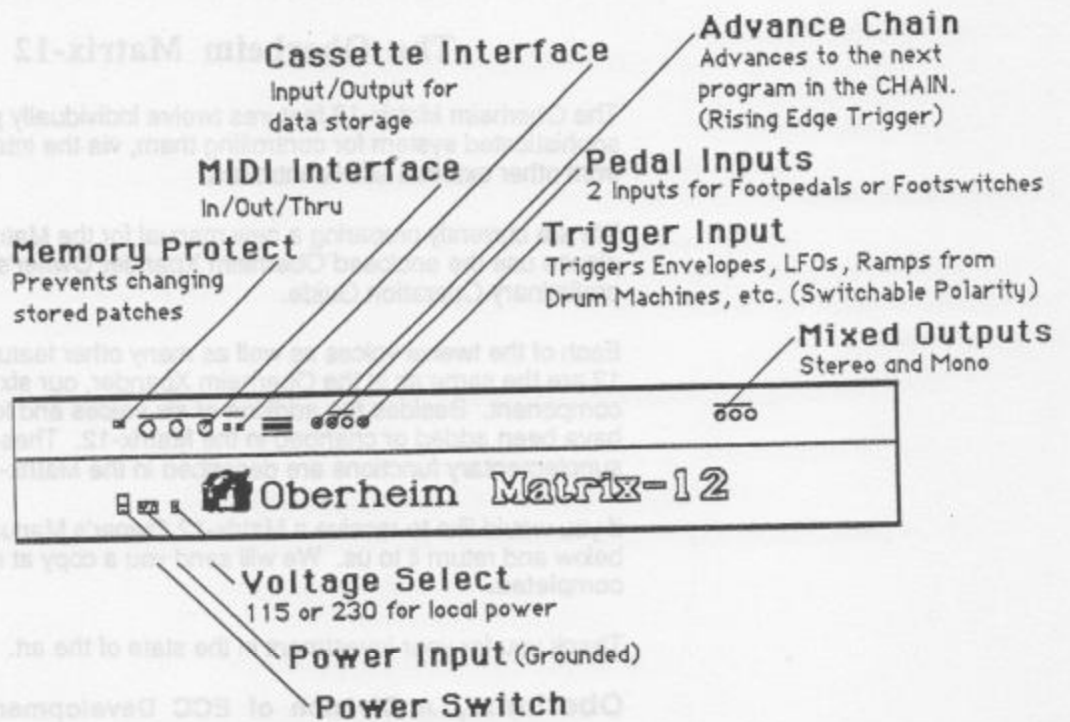
Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Serial#: \_\_\_\_\_ Dealer Name: \_\_\_\_\_

# Getting Around

## HOOK UP



You only need two things to get sound out of your Matrix-12:

### Power

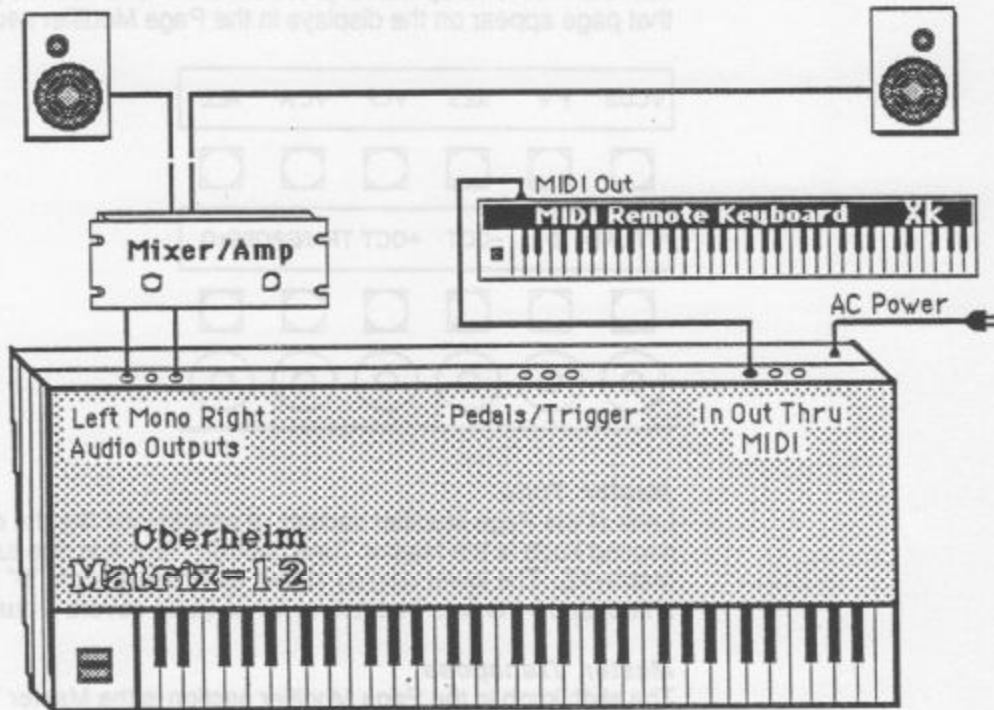
The Matrix-12 can operate on AC power between 95-130 volts or 200-240 volts, depending upon the setting of the recessed power selector switch.

Remove the red foil cover from the power socket and plug in the power cord to the Matrix-12 and the AC power source.

Turn on the Matrix-12 with the power switch next to the power socket on the back panel. Does the power switch light up? Do the front panel displays light up? If not check your connections.

### Sound System

Connect the Matrix-12 to a mixing board, hi-fi system, instrument amplifier, other sound system using the stereo or mono mixed outputs. The Matrix-12's Outputs can be plugged into a Line Input, or an attenuated Microphone Input. Each of the twelve voices can be panned anywhere in the stereo mix, *in each patch* (see the PAN Multi Patch Page section.)

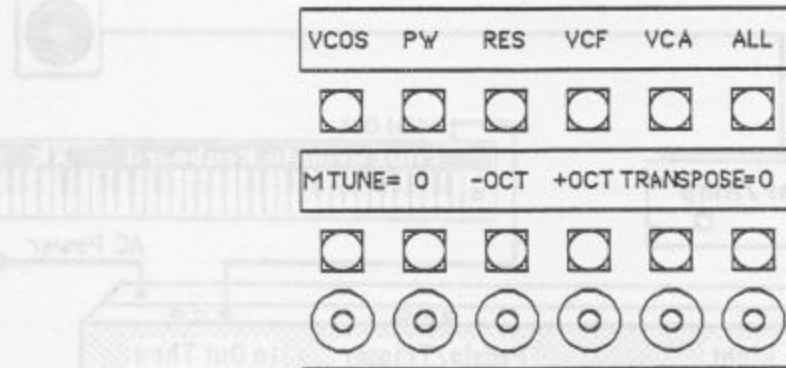


## Check It Out

### STAY TUNED

Now that you've got the Matrix-12 turned on, let's tune it. Here's how:

Press TUNE PAGE (in the Master Section) to access the tuning controls. (This is how the Matrix-12 operates: press a button for a desired page and the controls for that page appear on the displays in the Page Modifier section.)



#### **Master Tune**

Look at the Page Modifier section. It should look like the diagram above. The second knob is the Master Tune control. Turn it to fine tune the pitch of the Matrix-12. The lower display shows the master pitch: "0" equals A=440Hz, "+" is sharp, and "-" is flat. The tuning range ( $\pm 63$ ) covers a quarter-tone up to down.

#### **Master Transpose**

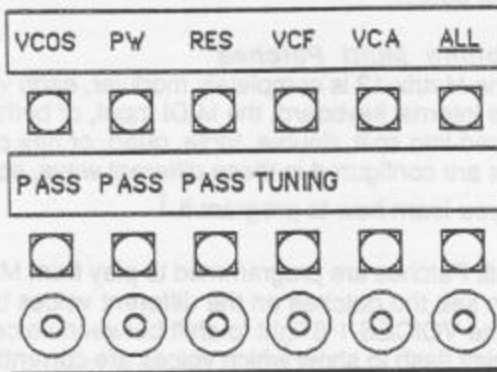
The sixth knob in the Page Modifier section is the Master Transpose. Turn it to transpose the entire Matrix-12 up and down in semitone steps. You can transpose the Matrix-12 two octaves up or three octaves down.

#### **Master Octave**

The buttons just above the third and fourth knobs transpose the Matrix-12 up and down by octaves. Pressing the +OCT or -OCT buttons add or subtract 12 from the Master Transpose setting.

#### **Autotune Calibration**

The expanded Auto-Tune capabilities of the Matrix-12 are shown on the upper display. Press the button under "ALL" to tune all of the Matrix-12 functions. Besides the normal oscillator tuning, you'll notice things that have never been tuned on a synthesizer before: Pulse Width, Filter Frequency and Resonance, and the output VCAs. These automatic calibrations keep the filters as well as the oscillators in perfect tune, the resonance reliable, and the square waves square.

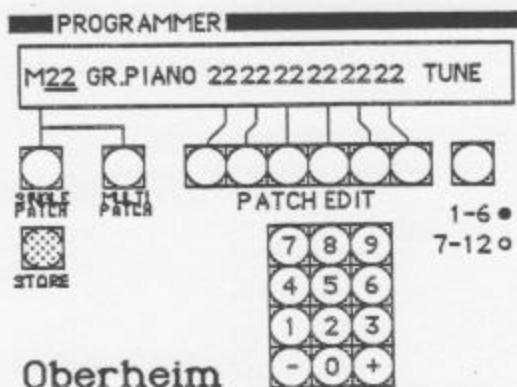


Tuning isn't something you should have to do often: once when you turn on the Matrix-12, and then maybe once more a bit later after it warms up. Tuning everything on the Matrix-12 takes almost a minute to complete, so you can tune just one function instead. Tune just the oscillators, for example, by pressing "VCOS" instead of "ALL".

## LISTEN CLOSELY

there are two different kinds of sound programs in the Matrix-12: Single Patches and Multi Patches. Single Patches store the settings for each sound, while Multi Patches combine twelve individual Single Patches, along with mix, pan, transposition, and detune into a programmed combination. Let's explore some of the Multi Patches and listen to some of the sounds that are possible on the Matrix-12.

### Selecting Patches



Programs are selected in the Programmer section of the Matrix-12. On the Programmer display, the left most digit will show "M" (as above) for Multi Patches or "S" for Single Patches, the next digits show the patch number (underlined) and name. If the display shows that you are in Single Patch mode, press the MULTI PATCH button.

Once in the desired mode (Multi), pressing two digits on the programmer keypad selects a new patch. The "+" and "-" keys can be used to select the next highest or lowest patch.

#### **Auditioning Multi Patches**

Since the Matrix-12 is completely modular, each voice can be instructed to play from the internal keyboard, the MIDI Input, or both. The twelve voices can be configured into split, double, triple, quad, or hex combinations. The 100 Multi Patches are configured in these different ways, so that you can play the Matrix-12 before you learn how to program it.<sup>1</sup>

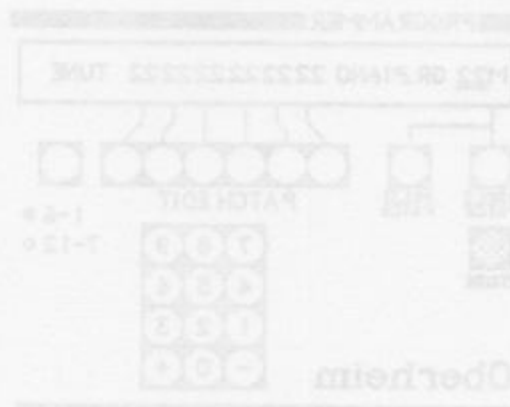
The Multi Patches are programmed to play from MIDI and the Internal Keyboard. You can see the patches on the different voices by pressing the bank shift button above the VOICES 1-6 light to shift between voices 1-6 and 7-12. The dots in the display flash to show which voices are currently playing.

#### **Using MIDI and the Keyboard Independently**

Each voice of the Matrix-12 is completely independent. This way each voice can play with a different sound at the same time. The keyboard, the levers and pedals, and the MIDI Input and Output are also completely independent. The keyboard does not *have* to play any of the voices in the instrument. Similarly, the voices can be controlled by the keyboard, MIDI, the levers, the pedals, or any combination.

#### **Auditioning Single Patches**

Press the Single Patch button to select single patch mode. Notice the "S" on the left side of the programmer display. In single patch mode all 12 voices play with the same sound.



<sup>1</sup>Programming the keyboard or MIDI is done from the V.ASSIGN and ZONE pages (see the V.ASSIGN and ZONE Multi Patch Page sections.)



## Matrix Theory

The next sections of this guide elaborate on Xpander operation as explained in the Xpander Owner's Manual. Use this guide in conjunction with the Xpander Manual.

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### WORKING WITH TWELVE VOICES

#### ***Six + Six = Twelve Voices***

Often, functions for only six of the voices are shown in the Matrix-12's displays. To get to the other six voices, press the bank select button above the VOICES 1-6 and VOICES 7-12 lights. You can switch back and forth at any time.

#### ***Lights On***

In the programmer display are twelve points one for each voice, that light up when that voice is playing. These twelve "Note On" lights can be seen at all times.

---

### PROGRAMMER: EDITING PATCHES WHILE IN MULTI PATCH MODE

Please read the Xpander Owner's Manual, pages 18-19, first.

#### ***Copying A Patch From One Voice To Another***

Copying patches from one voice to another works the same as on the Xpander (Manual, Page 19). Patches can also be copied from one bank of the synthesizer to the other:

Press the PATCH EDIT button of the voice with the patch you want to copy, so it becomes underlined. Then hold the STORE button, and while holding, press the bank switch button and then the PATCH EDIT button of the voice you want to copy the patch to.

#### ***Editing Several Voices Simultaneously***

You can edit several voices at once within a multi patch by underline the desired voices, the same as on an Xpander (Xpander Manual, Pg.19.) However, the selected patches must be in the same half of the synthesizer. Switching banks causes the complimentary voice<sup>1</sup> to be underlined and in edit.

### ***The Matrix Voice***

The Matrix-12 contains twelve of the same voices that are in Oberheim's synthesizer component, the Xpander. These are the most sophisticated voices ever developed for a programmable polyphonic synthesizer, and are the secret to the Matrix-12's rich, warm sound.

Since the Matrix-12 voices are almost identical to those of the Xpander, please refer to the Xpander Owner's Manual (starting on page 21) to learn how to program them.

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<sup>1</sup>For example, if Voices 1 and 2 are selected, changing banks selects Voices 7 and 8 instead. Voices 1 and 2 retain their current settings, but are deselected.

## MODULATION ROUTINGS

Another feature has been added to the Single Patch MISC. page (now called the NAME page). This is called MODULATION ROUTINGS.

Modulation routing enables viewing all the modulations of a particular voice (up to twenty on each patch) as a *list*, showing the modulation source and destination, and the modulation amount for each of these modulation busses.

MOD	SOURCE	AMOUNT	DEST		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	R VEL	-54	ENV2	REL	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The destination and amount of modulation from a particular source can be changed as well. This is especially useful for making continual adjustments to several modulations within a patch. A modulation can be removed by holding the button under the modulation source, and pressing CLEAR.

## Putting It All Together: The 12-Voice Multi Patch

Besides the 100 Single Patches, there are 100 Multi Patches in the Matrix-12. These Multi Patches store the sound for each of the twelve voices, as well as panning in the stereo mix, volume, transposition, detune, and keyboard assignments in the six zones.

This section describes the operation of each of the Multi Patch pages, which are somewhat different than those of the Xpander.

---

### TRANSCOPE

This page enables transposing of each individual voice in a patch, in semitone steps.

VOICE1	2	3	4	5	6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-12	-12	-12	-12	0	0
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To access the controls for Voices 7-12, press the bank select button above the VOICE 1-6 led.

---

### VOLUME

The VOLUME page of the Matrix-12 is the mixer for the Matrix-12. On this page, each voice has a volume control (0-63) to adjust the balance between the twelve voices to your taste.

VOICE7	8	9	10	11	12
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63	63	63	63	63	63
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## PAN

The PAN page adjusts the left-right position of each voice in the stereo mix.

VOICE7	8	9	10	11	12
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LEFT	LF2	LF1	MID	RT2	RIGHT
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The PAN page of the Matrix-12 is the same as the Xpander with one change: besides the left to right stereo spread of the mixed audio outputs, there is another position- OFF. This removes the voice from the mixed outputs (on the Xpander this position routes the voice to the direct output.)

## VIB

The VIBrato page contains one LFO that can be used for *all* of the voices; for vibrato, tremolo, and other effects. The VIB on the Matrix-12 is the same as that on the Xpander.

<i>PAGE 1</i>			<i>PAGE 2</i>		
SPEED WAVE		AMP	LAG		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56 TRIANGLE		0	SPEED= OFF 0 / AMP= LEV2 63		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Programming Lever 2 for Vibrato is easily done by setting the VIB controls as shown above. In the lower display of Page 2 LEVer2 is used to modulate the AMPlitude. This process assigns the Lever to modulate the VIBrato LFO.

To modulate the VCOs or the filter with vibrato, press the button under "VIB", on Page 2 of the VCO or VCF (see Xpander Owner's Manual, Pages 24 & 26.)

## V.ASSIGN

The Voice Assign page of the Matrix-12 selects the control channel for each voice. Generally, each voice is assigned to one of the six Zones, which in turn enable the keyboard or MIDI to play them polyphonically. In addition, each of the twelve voices can be controlled independently (monophonically) from any MIDI channel.

VOICE1	2	3	4	5	6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ZONE1	ZONE1	ZONE1	ZONE4	ZONE5	CH16
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To access the controls for Voices 7-12, press the bank select button above the VOICE 1-6 led.

## DETUNE

This page enables fine tuning of each individual voice. Especially with twelve voices, detuning all the voices slightly creates an extremely rich sound.

VOICE1	2	3	4	5	6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0	+5	+12	0	-2	-7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## ZONE X

There are six Zones in the Matrix-12. A Zone receives notes to be played and assigns them to the individual voices to be played. Splits, doubles, triples, etc. are achieved by employing several Zones together. Zones operate in conjunction with the keyboard and/or the MIDI Input and Output.

The Zones in the Matrix-12 operate a bit differently than those in the Xpander. Pressing the ZONE X button shows the display:

SELECT ZONE FROM 1 TO 6

Pressing an X SELECT button from 1 to 6 will select that zone, or pressing the ZONE X button *again* will select the Zone that was selected previously. You can switch between Zones with the X SELECT buttons.

There are several attributes to each zone, that appear on two pages.

PAGE 1			PAGE 2		
MODE	LIMITS	INPUT	MIDI IN	MIDI OUT	VOICE ROB
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ROTATE	0 TO 127	OMNI	KEYBD	CONTROLLERS	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Mode

This specifies the process for assigning voices:

**Rotate** gives every new note to a new voice, as with an OB-8. In this mode, every long-sustain note will ring out.

**Reassign** mode is similar to Rotate, except that notes with the same pitch get reassigned to the same voice, as with a Prophet 5 or Oberheim Modular 4-Voice. In this mode, long-sustain notes will ring out until another note plays the same pitch, much like a piano.

**Reset** is another scheme from the 4-Voice: the first voice played will always go to the lowest number voice assigned to the voice, i.e. Voice 1. The second note played will always go to the second voice in the zone, etc. In this mode, a new note will cut off a just released one.

**Uni-High, Uni-Low, & Uni-Last** are unison modes with highest, lowest, or last note priority, respectively. Uni-Low is the unison mode of an OB-8.

### Limits

This specifies the range of notes that the zone will play. The upper and lower limits can be programmed by holding the button under the desired limit and playing a note on the keyboard. Zone limits can also be set by turning the appropriate control. The display shows the MIDI note number. See the chart in the Xpander manual (page 47) for keyboard equivalents.

### ***Input***

This specifies the MIDI channel for the zone. If MIDI IN is on, then this is the channel the zone will receive on. If MIDI OUT is on, then this is the channel the zone will transmit on. If set to OMNI, the zone will receive on all sixteen channels and transmit on the Basic Channel.<sup>1</sup>

### ***MIDI In***

If MIDI IN is underlined, the zone will play notes (and respond to controllers<sup>2</sup>) received on the selected MIDI channel.

### ***Keyboard***

If KEYBOARD is underlined, the zone will play notes from the Matrix-12's keyboard and respond to the Matrix-12's levers and pedals<sup>3</sup>.

### ***MIDI Out***

If MIDI OUT is underlined, notes received by the zone (from MIDI IN or the keyboard) will also be transmitted to the MIDI Output, on the selected MIDI channel.

### ***Controllers***

If MIDI OUT is on, turning on CONTROLLERS sends controllers to the MIDI Output as well.

### ***Voice Rob***

If a zone is asked to play more notes than there are voices assigned to it, should it ignore the extra notes or should it rob voices to play them? This is another parameter that is selectable for each zone.

Turning on VOICE ROB assures that every new note will be played. The oldest note will be removed to make room for the new one.

Turning off VOICE ROB assures that voices will not jump to other notes when a playing note is let go. This is a very useful option when using any of the unison modes.

### ***Restoring The Default Zone Settings***

Turn the power off, hold the CLEAR button, and while holding, turn the power on again. The message "RESET MEMORY? -- DOESN'T AFFECT PATCHES" will appear. Press "YES". This is a quick way to get the Matrix-12 back to its default keyboard condition, shown in the page modifier settings, above.

Note: MIDI OUT is disabled on Zones 2-6, so that the proper amount of notes are transmitted to the MIDI Output.

<sup>1</sup> See the Xpander Manual, page 49.

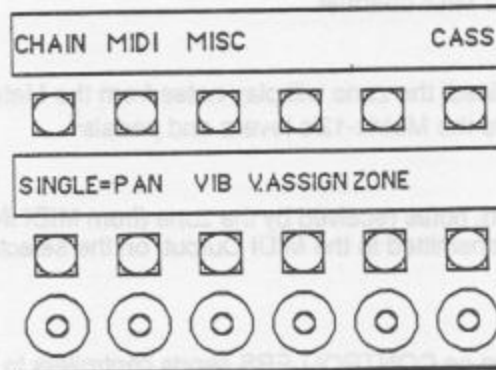
<sup>2</sup> Lever2 and Pedal2 are global controllers, received on the basic MIDI channel. They are *always* active.

<sup>3</sup> Lever2 and Pedal2 are global controllers. The local Lever2 & Pedal2 mix with the MIDI Lever2 & Pedal2, and are *always* active.

## Master Pages

The Master Page button access functions that are not remembered as part of any patch, but are used *globally* (that is, in all modes) by the Matrix-12. The settings of these functions are stored and recalled on tape or via MIDI as GLOBAL data, except for the Chain which is stored separately.

Pressing the Master Page button brings up the following display:



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### MASTER MULTI PATCH (SINGLE= PAN VIB V.ASSIGN ZONE)

The bottom functions will only appear when the Matrix-12 is in Single Patch mode. This is the Master Multi Patch, used by the Matrix-12 when playing Single Patches. This "extra" Multi Patch functions like the others. See the sections on these functions in the Multi Patch section of this operation guide for more information.

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### CHAIN

Chain is a scheme that allows a series of patches to be accessed in programmed succession. See the Xpander Manual, Page 49.

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### MIDI

#### **Channel**

This selects the *basic* MIDI channel, used to address the machine as a whole. The basic channel is used for a few Matrix-12 functions, such as sending and receiving PEDAL 2 and LEVER 2, patch changes, and transmitting MIDI notes from a zone that is set to OMNI mode.

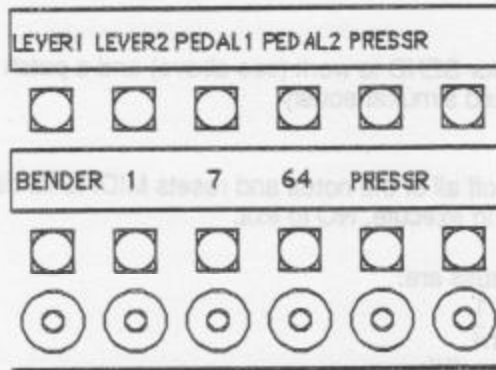


### Controls

This page is essentially a "patch bay", that is used to connect MIDI controllers and the local controllers of the Matrix-12. Individual MIDI signals can be selected and routed from this page.

The top row of the display shows the Matrix-12's internal controllers. The bottom row shows the MIDI controllers that are associated with them. Levers and pedals are received and transmitted via the same MIDI controller.

MIDI provides for 122 separate MIDI controllers, plus dedicated controllers for pitch bend (BENDER) and after-touch pressure (PRESSR). On most other MIDI instruments these controllers are fixed, however most manufacturers utilize common controller assignments for particular functions. The settings in the display below are the defaults, and correspond to bend lever, mod lever, volume pedal, sustain pedal, and after-touch pressure, respectively, on most other synthesizers. Check the MIDI Controllers list on page 70 of the Xpander Owner's Manual and the owner manuals of your other equipment for more details.



Pitch Bend  
Modulation  
Volume  
Sustain  
After-Touch Pressure

### Enables

This page contains other MIDI options. (SYSTEMX, CONTROL, and PATCH must be turned on on *both* master and slave machines for these functions to operate.)

**SYSTEMX**clusive enables complete control of another Matrix-12 or Xpander: page selects, editing, in other words *everything* that you do on one machine will be mimicked by the slave machine. SYSTEMX must be on to send patches across MIDI.

**PATCH** turns on MIDI patch changes. When on, changing a particular patch on the master machine will select the same numbered patch on the slave unit.

**CONTROL** turns on MIDI IN<sup>1</sup> controllers, such as levers and pedals. When CONTROL is off, MIDI controllers will be ignored, although MIDI notes will still play.

<sup>1</sup> MIDI OUT Controls are enabled on Page 2 of each Zone. (See ZONE X)

**ECHO** mixes the Matrix-12's own information (notes, patch changes, system exclusive, etc.) with the information coming in on MIDI, and sends them both to the MIDI OUT.

**VELOCITY** sets the response to Velocity and Release Velocity data received from MIDI. The response can be linear or exponential; the EXPO2 and EXPO3 settings compress the response to achieve a more useful middle range, similar to the scales used for the internal keyboard. See the "Using Velocity and Pressure" section of this guide for more information.

### **Send**

You can send actual single or multi patches (not just patch numbers) to another Matrix-12 or other MIDI peripheral from this page. The currently underlined patch is sent in its current edited state (this includes a single patch within a multi patch.) Select the destination patch number of your choice and press START. See MIDI DATA TRANSFER in the Data Storage section of this Operation Guide for more information.

SYSTEMX must be on for SEND to work (see above) and a patch cannot be sent if *several* are being edited simultaneously.

### **Reset**

Pressing RESET turns off all of the notes and resets MIDI to its default condition. You sure? Touch YES to execute, NO to exit.

The Matrix-12 MIDI defaults are:

Basic Channel: 1  
Omni Mode: On<sup>2</sup>  
System Xclusive: Off  
Echo: Off  
Controls: On  
Patch Changes: On  
Velocity: Expo 1  
Lever1: Bender  
Lever2: 1  
Pedal1: 7  
Pedal2: 64  
Pressure: Pressr

### **Mute**

This turns off all notes. Once a voice gets a **note on** command from MIDI, it stays on until it receives a **note off** command. There are any number of reasons why a **note off** command would not be received (disconnecting your MIDI cable, for example), so the MUTE provides a way to manually turn off notes.

The TUNE PAGE button on the front panel also turns off notes. It also cuts off envelope generators with long release times.

<sup>2</sup> Omni mode is turned on, on all six zones currently active. See ZONE X for more information.

## MASTER MISC

There are two functions accessed from this MISC page. On page 1 are the settings for internal velocity scales and sensitivity. On page 2 are polarity switches for the pedals, levers, and the external trigger input.

PAGE 1						PAGE 2					
VELOCITY SCALE SENSITIVITY						LEVER1 LEVER2 PEDAL1 PEDAL2 EXTRIG					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SCALE 5			63			+		+		-	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### **Keyboard Scale & Sensitivity**

The Matrix-12 internal keyboard has five different scales for velocity and release velocity, to tailor the keyboard response to your playing style. See the "Using Velocity and Pressure" section of this guide for more information.

### **Polarity Switches**

The Polarity Switches on page 2 are used to change the response of the internal levers, pedals, and external trigger input.

**PEDAL** inputs turn on when a cable is connected and off again when disconnected. Set the inputs to "-" when using momentary on footswitches (such as Oberheim's) and "+" for momentary off footswitches. With footpedals, "+" will usually cause the signal to increase as the pedal is depressed. The inputs turn on to their previous polarity setting.

**LEVERS** set to "+" will increase in value (higher pitch or more modulation) when pulled toward the front of the unit. When set to "-", they will increase when pushed away from the front.

**EXTRIG** looks for a positive pulse (rising edge) when set to "+", and a negative going pulse (falling edge) when set to "-".

## CASS

This accesses the cassette interface, for tape data storage. The Matrix-12 cassette interface operates the same as the Xpander's, and tapes are compatible between the two synthesizers. See the Data Transfer section below, and the Cassette Interface section of the Xpander Owner's Manual (Page 56).

## Data Transfer

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### MORE ABOUT THE TAPE INTERFACE

The Matrix-12 tape interface operates the same as on the Xpander. See the "Save It" section of the Xpander Manual, starting on page 55.

#### **Tape Speed**

The Matrix-12's tape data storage system now has a selectable baud rate, so that you can record data at a higher rate that reduces the transfer time by 1/3. To set the Matrix-12 to the higher rate, hold the "+" key (in the X SELECT section above the Page Modifier) while pressing "TO CASS".

During CHECK or PLAY modes, the interface adjusts itself to the speed of the tape being played.

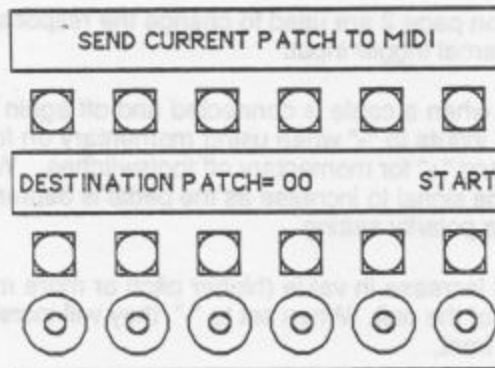
---

### MIDI DATA TRANSFER

Patches can also be transferred via MIDI, to another Matrix-12, Xpander, or other MIDI peripheral.

To transfer patches, both PATCH and SYSTEMXclusive must be underlined on both machines (on the MASTER MIDI ENABLES page.)

MIDI data transfer is done on the MASTER MIDI SEND page. Press MASTER, then MIDI, then SEND. The following display will appear in the Page Modifier section:



The current patch can be transferred to any patch in the destination machine by dialing in the desired patch number. If the destination patch knob is turned counter-clockwise from 00, the display changes to read "SEND ALL PATCHES TO MIDI". Press START to initiate the process.

---

## DATA COMPATIBILITY WITH OBERHEIM XPANDERS

Matrix-12 and Xpander data are compatible with each other. Data can be transferred via tape interface or MIDI. However, some changes are necessary because of the differences between the two machines.

### **Xpander > Matrix-12**

Single Patches are transferred exactly.

Multi Patches are transferred and converted as follows:

The VOLUME, PAN, TRANSPOSITION, PATCH NUMBER, and VOICE ASSIGNMENT of Voices 1-6 are duplicated to Voices 7-12. If Xpander Voice 1 is set to Patch 22, then Matrix-12 Voices 1 and 7 will also be set to Patch 22.

Any Xpander Voices assigned to CV's will be reassigned to ZONE 6. Any Xpander Voices panned **DIR**ect will be panned **OFF**.

ZONES 1-3 are transferred exactly, except that they will be set to play from both the **KEYBOARD** and the **MIDI IN**. **VOICE ROB** will be turned on. **MIDI OUT** will be turned on *only* in ZONE 1.

ZONES 4-6 are set to their default settings (**OMNI**, **ROTATE**, Limits 0 TO 127, **MIDI IN** and **KEYBOARD** on, **MIDI OUT** off, **VOICE ROB** on.)

**VIB**rato is transferred exactly. **DETUNE** (Multi Patch) is set to 0 for all 12 Voices.

Global parameters that exist in the Xpander are transferred. Those that exist only in the Matrix-12 are not changed.

The Chain is transferred exactly.

### **Matrix-12 > Xpander**

Xpanders with Software Revisions 1.3 (available March 1985) or later will accept patches from a Matrix-12. The original Xpander software (Rev. 1.0) will not.<sup>1</sup>

Single Patches are transferred exactly.

The Chain is transferred exactly.

Multi Patch and Global data are ignored (existing data will not be changed.)

If a Multi Patch or Global data transfer is attempted, the Xpander will read "DATA COMPLETED" but will not actually load any information.

All Xpanders can read tapes recorded at high speed.

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<sup>1</sup>Any Xpander can be retrofitted with the new software revision. Contact your nearest authorized Oberheim Service Center for details.

## Using Velocity And Pressure

**Modulation:** Control of one aspect of the sound by another aspect. The Matrix-12 provides unprecedented flexibility and variety of modulation capability. This is the secret of its rich sound. Combining Velocity, Release Velocity, and After Touch Pressure with the Matrix-12's patching flexibility, puts a vast amount of musical expression at your fingertips. This section illustrates some possibilities.

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### VELOCITY

Velocity is a measure of speed: how fast a key on the keyboard is depressed, and how fast it is let go. The speed at which the keys are played is measured and converted respectively, into Attack and Release Velocity values, which can then be used to control almost any parameter of a Matrix-12 voice.

These Velocity parameters are best utilized to control the dynamics of sound, since it is the dynamics of your playing that controls these parameters.

#### **Attack Velocity**

Using Velocity to control the volume of the sound is a natural. Modulating VCA1 (in the VCF/VCA page) with VELOCITY will achieve this effect. Many of the Matrix-12 patches use this modulation.

Utilizing Velocity only to control a sound's volume is a rather crude use of dynamics. When an acoustic sound plays louder, it often sounds brighter as well. Modulating the Filter FREQUENCY with VELOCITY will achieve this.

Very effective and natural dynamic control is created by velocity modulation of the output (AMP) of the *envelope generators* that are being used in the sound.

Modulating the ATTACK time of one or several Envelope Generators can cause radical sound changes, controlled simply by the way your fingers touch the keys. To make the attack time shorter when you play faster, use a negative amount of modulation. The STRIANOV patch utilizes this modulation. Play slowly, and the sound gently swells up; play fast, and it instantly springs to life.

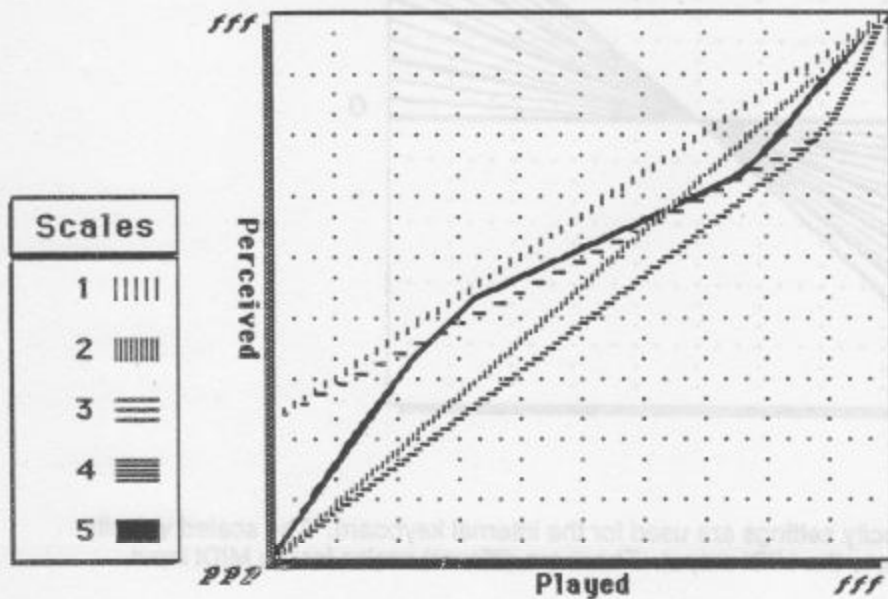
Remember that there can be up to 20 modulations in a voice at one time, so try using the velocity to modulate several parameters at the same time.

#### **Release Velocity**

Since Release Velocity is not determined until the key is released, one of the most natural uses is control of the RELEASE time of one or several envelope generators. The VSTRING patch utilizes this modulation. The slower the keys are released, the longer the sound takes to die out.

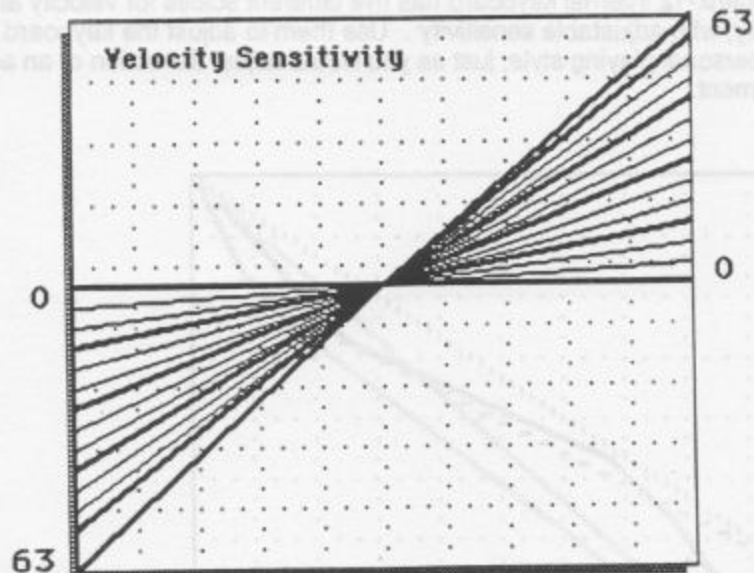
## KEYBOARD VELOCITY SCALES

The Matrix-12 internal keyboard has five different scales for velocity and release velocity, with adjustable sensitivity. Use them to adjust the keyboard response to your personal playing style, just as you would adjust the action of an acoustic instrument.



- 1 - LOUD This scale is straight from about 1/3 to top. This results in a fairly loud response, even with soft (slow) playing.
- 2 - LOUDER This scale is straight from bottom to top, and appears louder in comparison with SCALE1.
- 3 - SOFT Most of this scale's range is in the middle, reaching maximum output only at the hardest playing, and never reaching minimum.
- 4 - SOFTER This scale is shifted so that its output range is the lowest of all.
- 5 - ADJUSTED The top and bottom of this scale angle sharply for wide dynamic range, while the middle range has a gradual slope for more consistency of medium dynamics.

The dynamic range of velocity scales can be adjusted with the sensitivity control. The sensitivity is adjustable from the center of the scale, as shown:



These velocity settings are used for the internal keyboard. The scaled velocity data is sent to the MIDI output. There are different scales for the MIDI input, below.

## MIDI VELOCITY SCALES

There is a separate set of velocity scales for MIDI, which does not affect the Matrix-12's own keyboard. Velocity information received from the MIDI Interface is usually scaled at the source. Therefore, a simpler response system is utilized.

Setting the MIDI velocity is done on the MIDI enables page: press MASTER, then MIDI, then ENABLES to get there. The Matrix-12 can be set for linear response or one of three exponential settings.

**LINEAR** response has more effect while playing more softly.

**EXPO1** is a normal exponential curve, which gives the most dynamic range.

**EXPO2** utilizes a curve that is compressed to give more resolution in the middle range, similar to the scales used for the internal keyboard.

**EXPO3's** range is further compressed, for the most gradual response, with less dynamic range.

Try the different settings to find which is the best for your particular MIDI instruments and style of playing.



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## PRESSURE

After-touch pressure is controlled by pushing down on a key while it is depressed. Naturally, the more pressure on the key, the higher the PRESSURE value. Pressure is a continuously variable parameter, which means that it keeps changing in response to the changing force on the key.

The Matrix-12 responds to channel pressure from MIDI (if MIDI CONTROLS are enabled on the Master MIDI Enables page), and will soon be able to read pressure information from its own keyboard.<sup>1</sup>

### ***Modulation Ideas***

Because of its variable nature, pressure is useful for controlling aspects of the sound that continually change, such as vibrato amount or speed, detune of the VCOs, or filter frequency and resonance. The PGUITAR patch uses pressure to slightly control the pitch of VCO2, which results in a chorusing effect controlled by finger pressure. The FUNKBASS patch uses pressure (and lever 2) to control the amount of vibrato.

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<sup>1</sup> Pressure sensor retrofit at no charge available spring 85.

# Oberheim Matrix-12

## FACTORY STOCK PATCHES

The Matrix-12 Factory Stock Patches showcase the sonic sophistication of the Oberheim Matrix-12.

These patches are designed to be played from the Matrix-12's keyboard or from a MIDI keyboard with **Attack and Release Velocity, After-Touch Pressure**, and a **Sustain Pedal Footswitch** connected to the PEDAL2 input on the rear panel. Velocity and Pressure vastly enhance the richness and playability of these sounds.

### LOADING IN

Use your cassette recorder to load these patches into your Matrix-12, following the procedure described in the Oberheim Xpander Owner's Manual enclosed with your Matrix-12 (page 58, load "ALL".)

### PLAYING THE PATCHES

Loading the cassette tape into the Matrix-12 makes the proper settings, but for reference, here's how everything should be set:

#### Single Patches

The best results from Single Patches are obtained by setting the MASTER MULTI PATCH settings as follows:

V. ASSIGN PAGE: All voices to ZONE 1

ZONE PAGE (ZONE1): INPUT= OMNI  
LIMITS= 0 TO 127  
MODE= depends upon the patch

VIB PAGE: As shown:

PAGE 1	PAGE 2
SPEED WAVE AMP	LAG
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
56 TRIANGLE 0	SPEED= OFF 0 / AMP= LEV2 +63
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>

#### Multi Patches

Most of the important settings are programmed into each Multi Patch. If you are controlling the Matrix-12 from a separate MIDI keyboard, make sure that it is transmitting MIDI information on **Channel 1**.

## MAKING THE MOST OF MATRIX CONTROL

Velocity, Pressure, Pedals, and Levers are used to control a wide range of parameters of many of these patches. Listen carefully, and you will hear many timbral subtleties within each patch. Look at the settings of the patches and you will see how these effects are achieved. For example:

### **S00 TOTAHORN**

Velocity is used to control the Filter Frequency and VCA1. LEVER2 (Modulation Lever) increases the amplitude of the VIBrato LFO. PEDAL2 (Footswitch) increases the RELEASE time of several envelopes, for a sustain effect when the pedal is depressed.

### **S03 STRIANO**

Velocity is used to modulate the Attack time of ENV2: play soft and there is a slow attack, play hard and there is a fast attack.

ENVelope5 is used to control the AMPlitude of LFO1 modulating the Pulse Width, which results in chorusing and an apparent drop in octave while the sound is sustaining.

PEDAL2 (Footswitch) increases the RELEASE time of several envelopes.

### **S07 ELECTRIK**

Velocity controls many functions of this patch: volume (VCA1), brightness (Filter Frequency), "snappiness" (Decay of ENV1, AMPlitude of ENV1 &2), and detuning of VCO1.

Release Velocity controls the release time of the sound: release the keys fast and the sound stops immediately, release slowly and the sound slowly fades away.

### **S78 D'AMMOND**

Velocity is used to control how loud the percussive effect becomes.

LEVER2 (Modulation Lever) controls the speed of LFO1, which causes the chorus effect.

The patch is set up so that PEDAL2 (Sustain Pedal) can alternately be used to control the chorusing speed. However, stepping on the Sustain Pedal causes the chorusing to *gradually* speed up. How? PEDAL2 is routed to the Lag Processor, which is then routed to the Speed of LFO1. Pressing the Pedal causes the value of PEDAL2 to instantly change from 0 to 63. The Lag Processor slows down the rate of change, so that the result is a gradual (rather than sudden) increase. This is also why the chorusing gradually slows down when the Pedal is released.

In addition, exactly *how slow* the chorusing speeds up and slows down is modulated by the KEYBD (negatively modulating the LAG RATE) so that higher pitched notes speed up faster than lower ones.

# Oberheim Matrix-12

## Factory Stock Patches SINGLE PATCHES

### First Imression

- 00 TOTAHORN
- 01 STRANGS1
- 02 2001
- 03 STRIANO
- 04 PA-ANO 2
- 05 BIG SYN2
- 06 FM SLAP
- 07 ELECTRIK
- 08 LIMUIDZ
- 09 POLYPHON

### Brass

- 10 BRAZZ
- 11 BRAZZMLT
- 12 VSYNBRAZ
- 13 SECTION
- 14 SYN HORN
- 15 RUBBER T
- 16 MONSTER
- 17 VELENSEM
- 18 TINGO
- 19 blank

### Strings

- 20 STRINGER
- 21 STRANREZ
- 22 FAMOUS \$
- 23 STRNGENT
- 24 VIAL'N
- 25 CHILLO
- 26 BOWEDVIO
- 27 STRGWILD
- 28 FLINGS
- 29 blank

### Pianos

- 30 PRS-KOTO
- 31 FORTE -
- 32 FORTE #
- 33 FORTE +
- 34 FUZZCLAV
- 35 REZKEEZ
- 36 TANGENT
- 37 PIAMBA
- 38 GROWL EP
- 39 blank

### Rythum Comps

- 40 PURZCLAV
- 41 ZERIOUS
- 42 KLAVETTA
- 43 POGNOOT
- 44 OVERDRIV
- 45 SQUEEZER
- 46 VEL SYMN
- 47 CALLIOPE
- 48 AUTOMAT
- 49 blank

### Symphonic Ensemble

- 50 <TUNNEL>
- 51 VIOGUITAR
- 52 S. GENVIV
- 53 LIQUID
- 54 COPELAND
- 55 WASTLAND
- 56 SAGAN'Z
- 57 PHASEPAD
- 58 V-PHASE 1
- 59 AMS II

### Pitched Percussion

- 60 QUADBELL
- 61 EARDRILL
- 62 BELLO.
- 63 CARRILON
- 64 ROOMBELZ
- 65 ISLANDS
- 66 KARIMBA
- 67 WOODPERC
- 68 ST.HAPPI
- 69 VIBES

### Basses & Leads

- 70 V BASS
- 71 BASSITY
- 72 OBASSITY
- 73 SNBASS 2
- 74 SYNCBASS
- 75 SLEADWAH
- 76 GLASSVOX
- 77 RES SYN2
- 78 D'HAMMND
- 79 blank

### Percussion

- 80 KICKDRM1
- 81 ACOU-SNR
- 82 "E"-TOM
- 83 TRIGOID
- 84 "E" RIDE
- 85 V-TIMP
- 86 PLUKNOIZ
- 87 THUNDER
- 88 THUNDER2
- 89 TUNEVERB

### Effects

- 90 SS.N.J.
- 91 EKONOISE
- 92 1.5 WISS
- 93 DOWN-UP
- 94 LONGRISE
- 95 JUNK JAM
- 96 NOISENCH
- 97 RISCHIME
- 98 INCOMING
- 99 blank

# Oberheim Matrix-12

## Factory Stock Patches MULTI PATCHES

### First Impression

00 VOICE OF  
01 SUSTRING  
02 TOTAHNRNS  
03 PNO HRN  
04 THE WALL  
05 SOLOBASS  
06 E GRAND  
07 FAT HAM\*  
08 ZONEBELL  
09 BRS-ORCH

### Doubles

20 DBLBRAZZ  
21 VIOLINT  
22 HORNSTRG  
23 DB MARIM  
24 BASS+GTR  
25 BASSHORN  
26 LIM+CARI  
27 OCTAHORN  
28 CHOIR  
29 GUIT+PNO

### Zones

60 ZONEBELL  
61 BASS+2GT  
62 DRUMZONE  
63 TROPICO  
64 JAZZTRIO  
65 SUPRSPLIT  
66 ZONEFOUR  
67 BASS+PNO  
68 RIDMSPLT  
69 blank zone

### Basses

10 UNIPHON  
11 SOLOBASS  
12 OCTAVE B  
13 OCT B/B  
14 BELLBASS  
15 FAT FITH  
16 HARMONIC  
17 LEFTHAND  
18 WOODBASS  
19 blank unison

30 TWINGUIT  
31 5THBRASS  
32 NEW AGE  
33 ODE 2JOY  
34 PIANOSTR  
35 GLAZFLUT  
36 2 PIANOZ  
37 DUOGROWL  
38 POLYELEC  
39 blank double

70 ZONE +0  
71 ZONE +1  
72 ZONE +2  
73 ZONE+3  
74 ZONE+4  
75 MIDISPLT  
76 QUADSEX  
77 QUADSTRG  
78 BA-RIMBA  
79 blank zone

### Leads

40 LEAD WAH  
41 UNIHORN  
42 UNI ORG  
43 SATURATE  
44 AARON 9  
45 MADGROWL  
46 THE WALL  
47 WARRIOR  
48 NO ANGEL  
49 blank unison

### Programmed Detune & Pan

80  
81 POLYGRAN  
82 STEREO  
83 STEREANA  
84 FAT HAM\*  
85 BRS-ORCH  
86 SOUNTRAK  
87 SUSTRING  
88  
89 blank poly

### Triples

50 TPLCELLO  
51 COZMOS  
52 JAWS  
53 KIEVGATE  
54 3WAY STR  
55 OCTAVIA+  
56 PANABLOK  
57 DBL+STRG  
58 LAYERED  
59 blank triple

### Stacked Multi Effects

90 FLAME ON  
91 JUNK JAM  
92  
93  
94  
95  
96  
97  
98  
99 blank