OB-8 MIDI KIT
User's Manual

INTRODUCTION

Thank you for purchasing an Encore product.
We hope you are as excited about analog synthesis as we are!

The OB-8MK allows your Oberheim OB-8 to receive MIDI data and perform as a MIDI controller. The functionality is very similar to the original MIDI interface produced by Oberheim Electronics. There are differences however. First, this one is in production and available! Second, the hardware has been designed around modern technology and therefore is less expensive and more reliable. Third, we have corrected some serious bugs in the Oberheim software. Last, we will support the OB-8MK with software updates which will offer even more features than OB-8s with the Oberheim MIDI kit.

All of the new features and additions are detailed in the sections that follow. For those of you that are replacing the original Oberheim MIDI board, you may see some duplicate information in this manual. The next section of this manual is a quick reference guide which gives you step-by-step instructions for performing the new procedures. Unless specified in this manual, all other functions of the OB-8 remain the same as outlined in the original operation manual.

Quick Reference Guide

Controls

The primary buttons you will use in conjunction with your OB-8 MIDI KIT are listed below.

PAGE 2 BUTTON is used to enter MIDI mode.

PROGRAM BUTTONS are used to select the MIDI function you wish to perform.

How to Enter MIDI Mode

o Press the [PAGE 2] button twice.
o The PAGE 2 LED will light, indicating that you are in MIDI mode.

How to Exit MIDI Mode

o Press the [PAGE 2] button.
o The PAGE 2 LED diminishes.

How to Change MIDI Channels

o Make sure that you are in MIDI mode.
o Press and hold the [GROUP D] button.One of the 8 patch LEDs will light showing the current MIDI channel. While holding the [GROUP D] button press a patch button to select a new MIDI channel.

How to Toggle Program Change and Program Dump Enable

o Make sure that you are in MIDI mode.
o Press [GROUP A] button. If the LED is on, then the OB8 will receive program change commands. If the LED is off, the OB-8 will ignore program change commands.

How to Toggle Pitch Bend and Modulation Enable

o Make sure that you are in MIDI mode.
o Press [GROUP B] button. If the LED is on, then the OB8 will receive pitch bend and modulation commands. If the LED is off, the OB-8 will ignore these commands.

Quick Reference, continued

How to Save a Patch via System Exclusive

- o Select the patch to be saved.
- o Enter MIDI mode.
- o Press [WRITE]. The OB8-MK will dump the selected patch to MIDI.

How to Check the Current Software Version

- o Enter MIDI mode but hold PAGE2 on the second press.
- o Press [SYNC] while holding the [PAGE 2] button. The patch LEDs will show the current software version. If the C LED is lit and the 1 LED is lit, then the software version is C1.

Installation Instructions

Note: Before performing these instructions, please read through them once. This will help prevent you from missing any notes that might apply to your specific requirement.

- o   Save the patches.

- o   Unplug the OB-8 from the AC line and any other audio/MIDI cables.

- o   Open the OB-8. There are a total of 4 screws you must remove: 2 on the top left wood edge, and 2 on the top right wood edge.

- o   Remove the 4 EPROMs from the CPU BOARD as shown in Figure 1.

- o   IF YOUR OB-8 ALREADY HAS THE OBERHEIM MIDI, TURN THE PAGE!

- o   Remove the 2 screws from the CPU BOARD as shown in Figure 1.

- o   Install the two included 1" spacers in the holes where the screws were.

- o   Remove the microprocessor from its socket. (It is U26)

- o   Carefully plug the 40 pin ribbon cable in socket U26 as shown in Figure 2. The cable routes under the OB8-MK.

- o   Position the OB8-MK over the two spacers and secure it with the two screws that were removed earlier.

- o   Install the microprocessor into the empty socket on the OB8MK.
     (It is socket U1)

- o   Mount the three MIDI jacks on the back panel. You will need to drill a 5/8" hole for each MIDI jack. Be sure to check for obstructions, wires, etc... behind the area you are planning to drill. **Do not mount the jacks in the way of the OB8MK**. Clean all loose metal before continuing on to the next step. The flanges of the MIDI jacks should go on the outside of the OB-8 to cover any imperfections in the holes. Use a 5/64" (.078") drill bit for the mounting holes. The supplied screws should thread right into the back panel.

- o   Solder the eight wires to the 3 MIDI jacks as shown in Figure 2. (Notice the orientation of the three "OUT" wires.)

- o   Close the OB-8 and secure the 4 outer screws. That's it!

Installation Instructions, continued

Note: If you are here, you are replacing the original Oberheim MIDI kit with the Encore OB8-MK.

- o If you have the original Oberheim MIDI interface, you will need to remove it before continuing. Unscrew the 4 screws that hold the MIDI board in place. Carefully remove the board and the two ribbon cables.

- o Remove IC5 from the MIDI board. (It is a 74LS139) Carefully install the chip where the 16 pin ribbon cable was plugged in to the CPU board. (The location is marked U41 in Figure 1)

- o Remove the Z80 microprocessor from the Oberheim MIDI board. (It is marked U8)

- o Install the Z80 microprocessor in the OB8-MK board. (It is marked U1)

- o Carefully plug the OB8-MK 40 pin ribbon cable in socket U26 as shown in Diagram B.

- o Position the OB8-MK over the two spacers near the plugged in ribbon cable and secure it with the two of the screws that were removed earlier.

- o Solder the eight wires to the 3 MIDI jacks as shown in Diagram C.

- o Close the OB-8 and secure the 4 outer screws. That's it!
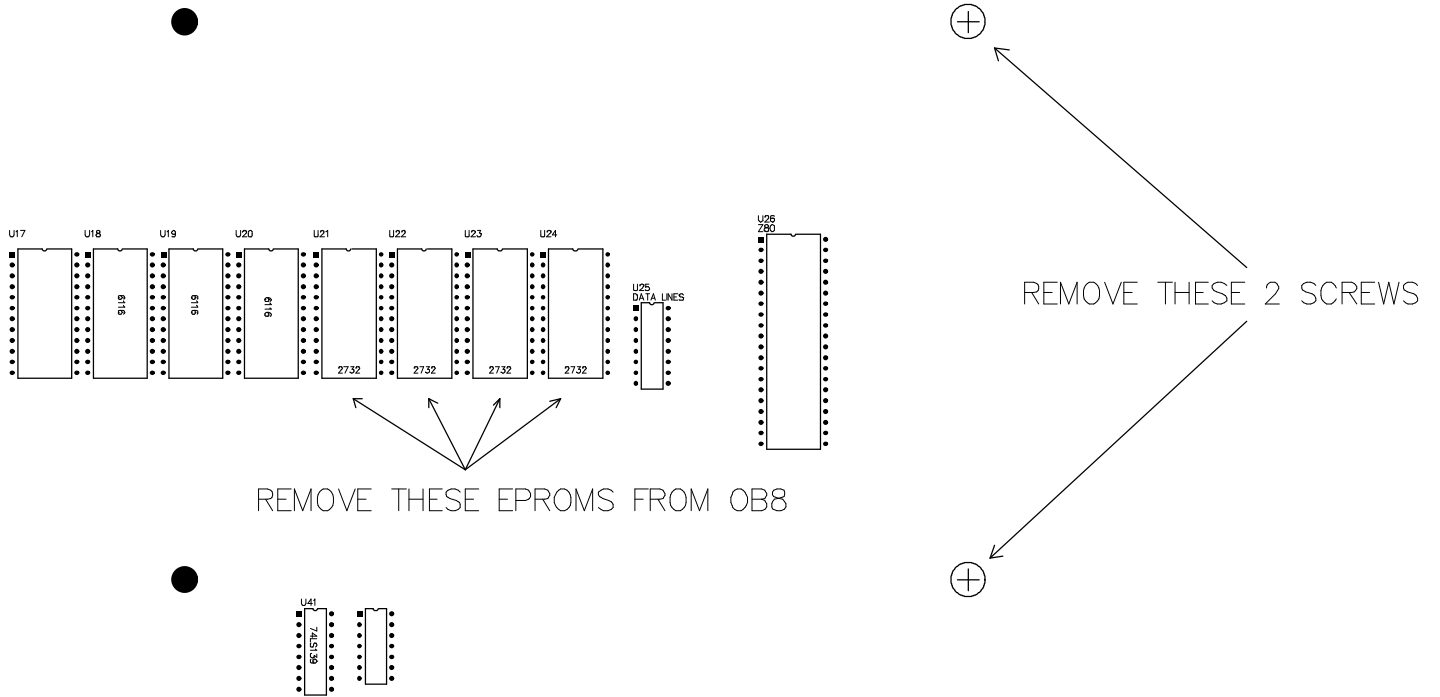
OB8 PROCESSOR BOARD

U17 U18 U19 U20 U21 U22 U23 U24

6116 6116 6116

2732 2732 2732 2732

U25
DATA LINES

U25
Z80

REMOVE THESE 2 SCREWS

REMOVE THESE EPROMS FROM OB8

U41
74LS139

FIGURE 1

Inside view of OB8

(Backside of jacks)

IN THRU OUT

This ribbon cable folds under
the OB8-MK and plugs into U26

REMOVE THESE EPROMS FROM OB8

U17 6116 U18 6116 U19 6116 U20 6116 U21 2732 U22 2732 U23 2732 U24 2732

U25 DATA LINES

U26

Microprocessor
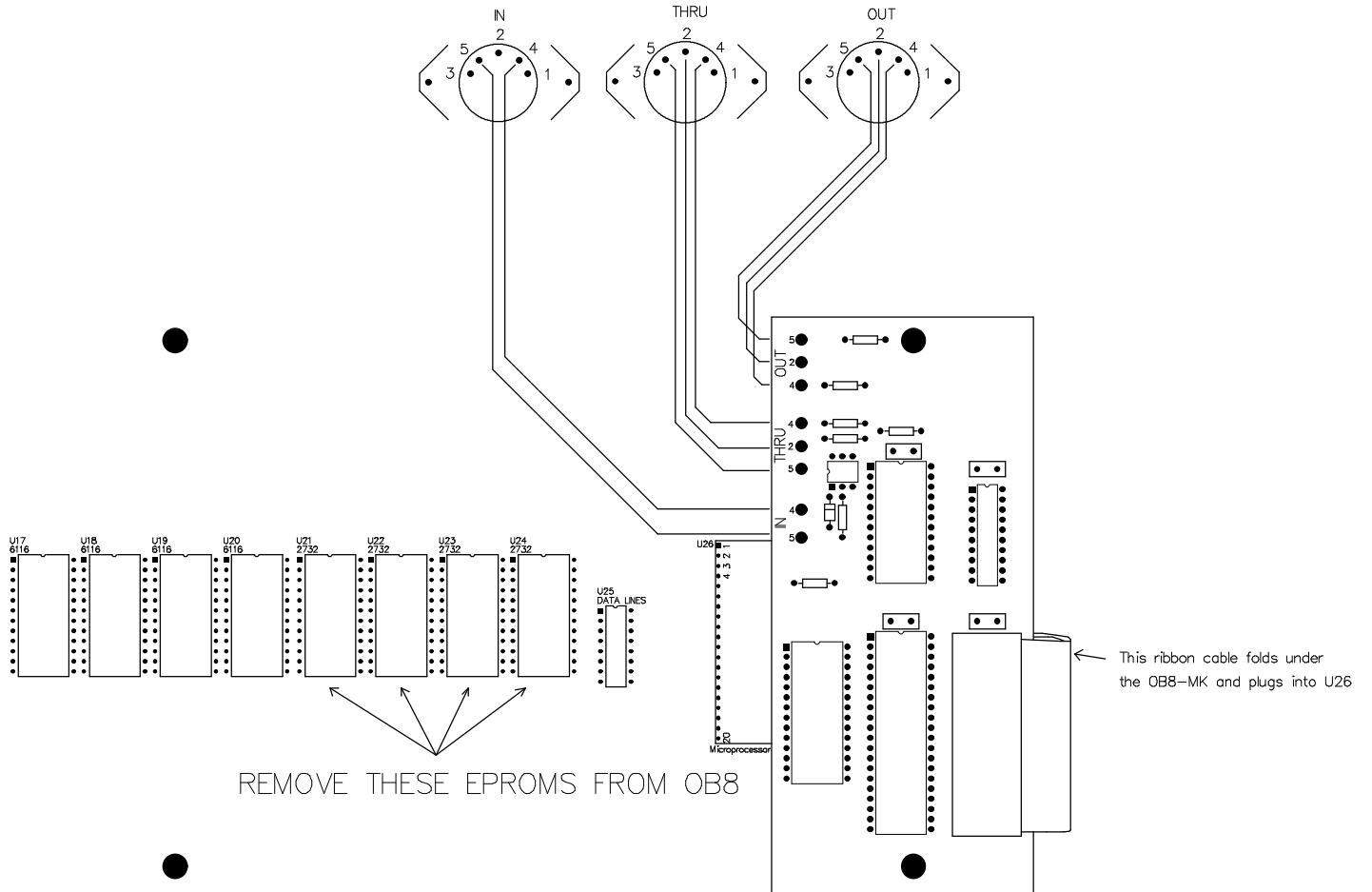
FIGURE 2

MIDI

0B-8MK MIDI IMPLEMENTATION VERSION C-2

CHANNEL VOICE MESSAGES

STATUS	Data Bytes	Description
1000 xxxx	0kkk kkkk	Note off.
	0vvv vvvv	0vvv vvvv = note off
1001 xxxx	0kkk kkkk	Note on.
	0vvv vvvv	0vvv vvvv = 7FH
1011 xxxx	0ccc cccc	Control Change. (if enabled).
	0vvv v000	0ccc cccc = Control number (01 = Mod lever)
		0vvv v000 Control value. (range 0-78H. Lowest 3 bits are ignored).
1011 xxxx	0ccc cccc	Control Change. (if enabled).
	0vvv vvvv	0ccc cccc = Control number (40h = Sustain footswitch)
		0vvv vvvv = Control value. (0 = off, 7Fh = on).
1100 xxxx	0nnn nnnn	Program select. (if enabled)
		0nnn nnnn = 0 through 77h
1110 xxxx	0vvv vvvv	Pitch Bend change LSB (See note 1)
	0vvv vvvv	Pitch Bend change MSB

CHANNEL MODE MESSAGES

1011 xxxx	0111 1011	All Notes Off. The OB8-MK turns off all notes that were turned on by MIDI.
1011 xxxx	0111 1100	OMNI Mode OFF. The OB8-MK turns OMNI Mode Off and all notes that were turned on by MIDI.
1011 xxxx	0111 1101	OMNI Mode ON. The OB8-MK turns OMNI Mode On and turns off all notes that were turned on by MIDI.
1011 xxxx	0111 1110	MONO Mode ON. The OB8-MK doesn't have a MONO mode.The OB8-MK responds by switching to OMNI ON/POLY mode, and it turns off all notes that were turned on by MIDI.
1011 xxxx	0111 1111	POLY Mode ON. The OB8-MK is always in POLY mode so there is no mode change.The OB8-MK turns off all notes that were turned on by MIDI.

MIDI, continued

System Exclusive Commands

Dump One Patch

F0 00 00 2F 04 00 <number> F7

Single Patch Load

F0 00 00 2F 04 01 <number> <patch data> F7
 <number> Patch number to load sysex data

<u>NOTE</u>: The OB8MK will also load original OB8 sysex data.

Dump All Patches

F0 00 00 2F 04 02 F7

<u>NOTE</u>: When you request all 120 patches, each patch is sent individually in ascending order.

Note 1: The 6 LSBs are ignored by the OB8-MK.

The following page shows a patch map describing the data format for a system exclusive patch dump. It is sent as 4 bit nibbles, right justified, LS nibble sent first.

	BIT7 BIT6 BIT5 BIT4 BIT3 BIT2	BIT 1	BIT 0
BYTE 0	VCF RELEASE (6 BITS)	LFO 2	WAVE 1
BYTE 1	VCA RELEASE (6 BITS)	0	UNISON
BYTE 2	VCF DECAY (6 BITS)	FILTER FM	OSC 2 FM
BYTE 3	VCA DECAY (6 BITS)	OSC 2 WAVEFORM 1	0
BYTE 4	VCF ATTACK (6 BITS)	OSC 1WAVEFORM 1	0
BYTE 5	VCA ATTACK (6 BITS)	OSC2 PWM	OSC 1 PWM
BYTE 6	VCF SUSTAIN (6 BITS)	NOISE	4 POLE
BYTE 7	VCA SUSTAIN (6 BITS)	OSC 2 ON	OSC 2 HALF
BYTE 8	VCF MODULATION (6 BITS)	OSC 1 ON	TRACK
BYTE 9	VCF RESONANCE (6 BITS)	PW1 180	VCO1 180
BYTE 10	VCO 1 PULSE WIDTH (6 BITS)	VCA MOD	F-ENV
BYTE 11	LFO FREQUENCY (6 BITS)	SYNC	OSC 1FM
BYTE 12	FM AMOUNT (6 BITS)	5 VOLUME	4
BYTE 13	PWM AMOUNT (6 BITS)	3	2
BYTE 14	PORT AMOUNT (6 BITS)	1	0
BYTE 15	VCO2 DETUNE (6 BITS)	5 VCO2 PW	4
BYTE 16	VCF FREQUENCY (6 BITS)	3	2
BYTE 17	VCO2 FREQUENCY (6 BITS)	1	0
BYTE 18	VCO1 FREQUENCY (6 BITS)	SPARE	LEGATO PORT
BYTE 19	RETRIG POINT (6 BITS)	RETRIG	LFO WAVE
BYTE 20	PEDAL SUSTAIN (6 BITS)	PORT	BEND
BYTE 21	FM VIBRATO RAISE (6 BITS)	LFO TRACK	FM DELAY INVERT
BYTE 22	PWM VIBRATO RAISE (6 BITS)	PORT QUANT	PORT MATCH
BYTE 23	FM VIB DELAY (6 BITS)	180	90
BYTE 24	PWM VIB DELAY (6 BITS)	PWM DELAY INVERT	PWM QUANT
BYTE 25	VOICE DETUNE (6 BITS)	EXPO PORT	CONST PORT
BYTE 26	BEND AMOUNT (6 BITS)	LFO RATE DELAY	FM QUANT