

Moog Source MIDI KIT User's Manual Version 4.10

INTRODUCTION

Now that you are equipped with your SOURCE MIDI KIT memory expansion, your SOURCE is no longer obsolete. The new additions to your instrument: MIDI response, sixteen times more memory, MIDI to CV converter, and sysex patch storage, will allow you to utilize the unique sound of the SOURCE while at the same time incorporating it into your total sound system.

This user's guide has been split into four sections. It will be brief and painless so please read it. In the first section, you will find step-by-step instructions on the new functions of the SMK. (A quick reference, if you will) This will be followed by a summary of the newly added features. Next, you will find a section on System Characteristics that may answer some question as to why things are the way they are. And finally, the installation and calibration instructions. Aside from the modifications covered in this manual, the operation of the SOURCE remains the same.

This version of the manual is specifically for revision 4.10 and later. It addresses an issue which required a modified installation procedure and also contains various clean-ups related to the firmware changes.

Quick Reference Guide

Keys and Controls

All of the new functions can be accessed by the orange buttons with one exception: The MIDI channel select has been incorporated into the incremental controller. This was done because there are seventeen parameters, 1-16 for channels and 0 for Omni On.

Manually Disable The Octave Buttons For Octave Enable

Press [LEVEL 2]

Press [6]

Select A New Bank

Press and hold [LEVEL 1]

While holding, you will see the current bank displayed in the edit LEDs

- Now select a bank by pressing one of the 16 orange program buttons. You will see the new bank number when you release the program button.

Change MIDI Channels

Press [LEVEL 2]

Press [1] The current channel (or Omni) will be displayed on the edit LEDs.

- Now turn the incremental controller to change channels. After selecting a channel, either press a different yellow button to edit, or select an orange patch button. This will lock the most recently selected channel into memory.

NOTE: Use caution when performing the channel selection parameter. As with any other incremental controller parameter, the SOURCE will edit the current parameter until a new parameter or a new patch is accessed.

Perform a SYSEX Dump

Press [LEVEL 2]

Press [14] The 256 patches will be saved to MIDI.

Perform a Soft Reset

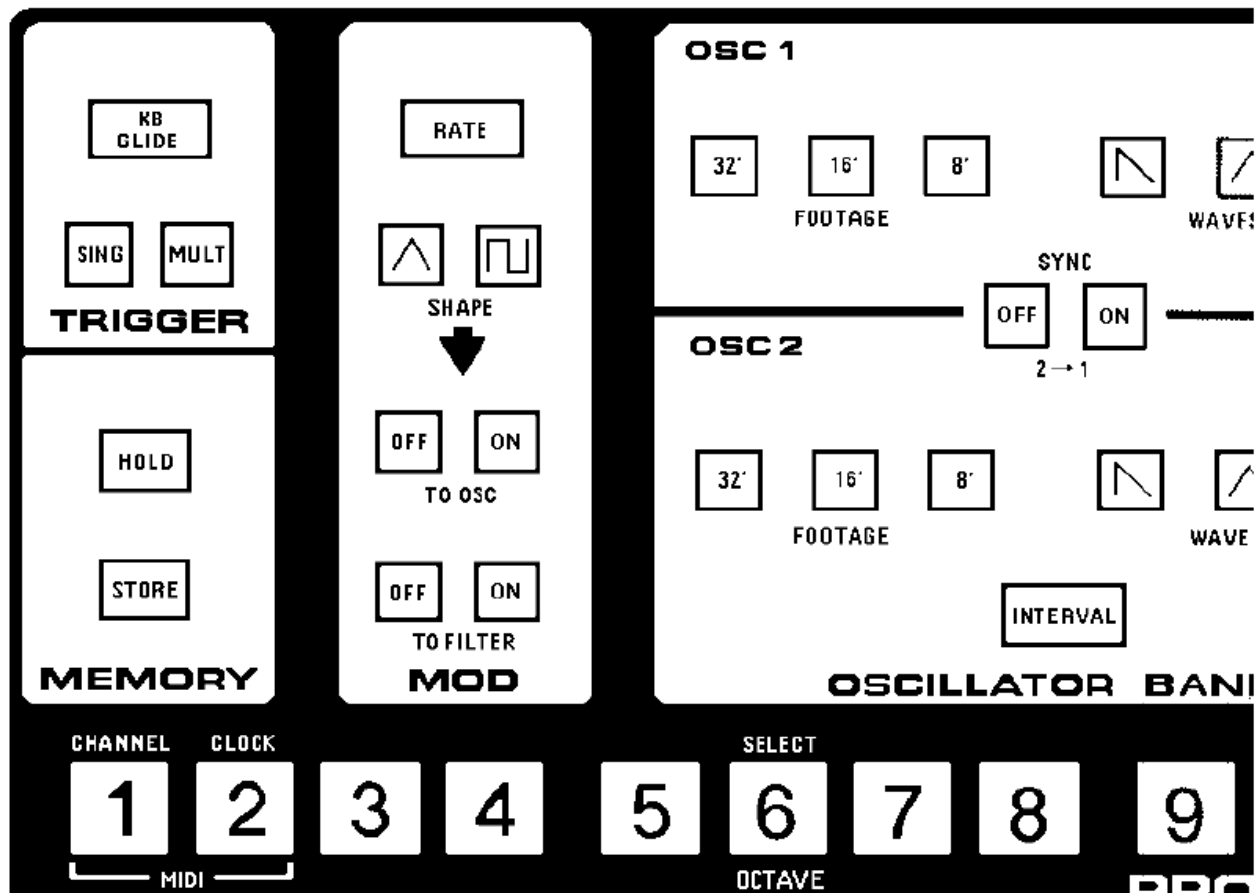
Turn off the power.

Press and hold the [HOLD] button.

While pressing the [HOLD] button, turn on the power.

As mentioned before, any further questions may be directed to the original SOURCE owner's manual. All other operations are as normal.

The next page shows a picture to help you in memorizing the new functions:



SMK Level 2 Functions

This page shows a modified picture of the front panel to help you with memorizing the new functions.

WHAT'S NEW

MIDI

Now your SOURCE is able to respond to MIDI messages. Specifically, this includes the Note on and off, Pitch Bend, Program Change, Bank Select, and System Exclusive commands. In essence, your SOURCE is now able to communicate with your other instruments.

PATCHES

The memory of the SOURCE has been expanded in such a way that it is no longer necessary to use the cassette save functions. Instead, the SOURCE now has 256 patch (program) locations to which sounds may be saved. This has been accomplished through the use of banks. Currently there are sixteen banks of sixteen patches. To select a program, first select a bank. Once a bank is chosen then chose a patch (1-16) within the bank. (Selection of the patch is done as usual). The edit buffer (the sound currently playing) can also be saved to any of the 256 patch locations. To save the edit buffer to a different bank, first select the desired bank, then save the patch in the same way as usual.

MIDI to CV CONVERTER

The SOURCE now has the ability to be used as a MIDI to control voltage converter. This is useful if a second non-MIDI synthesizer needs to be connected to the CV and S-trigger out. The second synthesizer will follow exactly with the Source as it is played from MIDI.

WHAT'S NEW, cont

System Exclusive Commands

01 - Request All Data

F0 00 00 2F 01 01 F7

NOTE: When you request all 256 patches, the patches are not sent individually, but rather as one big bulk dump

02 – Load All Patches

F0 00 00 2F 01 02 <all patch data> F7
<all patch data> 12800 bytes of patch data

03 – Request Edit Buffer

F0 00 00 2F 01 03 F7

04 – Load Edit Buffer

F0 00 00 2F 01 04 <patch data> F7
<patch data> 50 bytes of patch data

05 – Request A Patch From The Current Bank

F0 00 00 2F 01 05 <pp> F7

06 - Single Patch Load

F0 00 00 2F 01 06 <pp> <patch data> F7
<number> Patch number to load sysex data (1d to 16d)
<patch data> 50 bytes of patch data

pp = 0x01 to 0x10 (in hex) for patches 1 through 16

SYSTEM CHARACTERISTICS

NOTES AND PITCH BEND

The notes coming in from MIDI have priority over those played from the instrument's keyboard. Accordingly, MIDI pitch bend does not effect the notes played from the instrument, only the ones that come from MIDI. The SOURCE responds to a 4 octave range. The MIDI note numbers in decimal are: 36 to 84 inclusive.

OCTAVE ENABLE

When the SOURCE is playing from its own keyboard instead of from MIDI, it will scan the keyboard and the two octave buttons for information. When the SOURCE is playing from MIDI, it instead derives the proper octave from the MIDI note number. However, when the SOURCE releases a MIDI note, it will revert back to the octave information set by the octave buttons. This will cause an octave jump each time a MIDI note is released. The octave enable function allows the SOURCE to be played from MIDI with a 4 octave range without any such side effects. In order to do this, the octave buttons must be manually disabled. This is done by using the [LEVEL 2],[6] function. This parameter will be remembered at power down.

SOFT RESET

Upon performing a soft reset, the instrument will default to the following parameters: Omni on, bank 1, octave buttons enabled. All patch data will be retained.

SYSEX DUMP

When you initiate a sysex dump, the 256 patches are saved to MIDI. It dumps nearly 13KB of data. The data is not transmitted at full MIDI bandwidth. This prevents the target input buffer from overflowing (as in the MPU401).

MIDI to CV CONVERTER

The conversion allows a second non-MIDI synthesizer to be controlled by the MIDI SOURCE. However, the pitch tracking is only as good as the calibration of each unit. If the SOURCE is perfect at 1V/octave and the second synth has drifted to 1.2V/octave, the synths will not be in tune across the range.

CHANGES IN ORIGINAL FEATURES

Due to functionality, program space and user access considerations, all of the sequencer, arpeggio, and cassette functions have been removed. PC based sequencers are now available through the MIDI expansion and may be used with added accuracy.

INSTALLATION INSTRUCTIONS

Note: Before performing these instructions, please read through them once. This will help you become familiar with the procedure and possibly prevent mistakes.

The SMK should require between 1 to 2 hours to install. Depending on the particular firmware revision, you will either receive a 24 pin ROM (P#2532) or a 28 pin ROM (P# 27256). The Source microprocessor board has the original 24 pin socket. We've included a 28 pin ROM socket on the SMK for future firmware updates. Whichever ROM you receive, plug it in the socket with the same number of pins as the IC. Also, pay attention to the orientation. If you have any questions, email us. The factory update that allowed the sequencer transpose function (ROM Version 2.2) is required to allow pitch bend in the SMK. There is a slight modification that the SMK requires. The two resistor values have been modified: 332k is now 665k and the 110k is now 221k. Since the majority of Sources have the transpose update, we do not supply the 10k potentiometer. It can be found at local electronic stores. If you want the overall pitchbend range to be something other than one octave, there is a table of resistors included in this manual to choose any semitone interval up to one octave. They are standard 1% resistors and can also be located in any decent electronic store. After the main installation instructions, follow the calibration instruction in order to set the scaling of the oscillators. You will need a 5/8" chassis punch or equivalent hole cutting device and a 5/64" drill bit for the installation.

STEPS

- 1) Previous versions of this software (4.10) allowed the reload of tape patches. This version will not allow the MIDI kit to load the user's patches.
- 2) Open the case and remove the keyboard. 4 woodscrews + 2 screws on back for case. 5 screws for the keyboard.
- 3) Mount MIDI jacks.
If your unit has the separate 1/4" jacks for S-trigger in and out, you are in luck. Remove these and use the existing holes for the chassis punch. MIDI out should go in the S-TRIG OUT hole. Any other location will need to be drilled between the rear panel SOURCE logo and the power receptacle, and cleaned (loose metal) before using the chassis punch. Be sure to check for wires, etc. behind the area you are planning to drill. The flanges of the MIDI jacks should go on the outside of the Source to cover any imperfections in the holes. Use a 5/64" (.078) drill bit for the four mounting holes. The supplied screws should thread right into the aluminum back panel. You may optionally install the THRU jack. We added this in 1998 because a small percentage of our customers requested it.

Note: If you want to retain the MIDI/CV function, you will need to keep the S-TRIG out jack intact. Either remount the S-TRIG jack, or mount the MIDI jacks somewhere other than the previously mentioned location.

INSTALLATION INSTRUCTIONS, continued

- 4) Remove the digital board from the Source. Most of the connectors are different sizes and therefore should be easy to re-assemble. However, there are always exceptions! The two ribbon cables that connect the analog board can easily be mixed up. The long one connects to S33, or the dip socket further from the battery. The short cable connects to S32, or the one closest to the battery.
- 5) Remove the two RAM chips (hopefully socketed in your instrument) and the program ROM.
- 6) Remove the RAM sockets and replace with the sockets provided in the kit. This will allow for an easy and secure insertion of the SMK.
- 7) Plug the MIDI board in the RAM sockets. Be careful not to bend the pins.
- 8) Solder the 18 wires to the places shown on the following pages.
The last three wires {A12/A11/A10} are soldered to the bottom of the board.
- 9) Remount the digital board.
- 10) Solder the MIDI jack wires to the board as shown in the picture on the next page.
Note: The output jack's text on the PCB is wrong. 4 and 5 are swapped.
- 11) Install the new program ROM. (Remember to position the ROM in the correct orientation!) If we included the 28 pin ROM, it will already be installed for you.
- 12) Remount the keyboard.

The following pages show a pictorial installation approach.

Color codes:

665K = Blue, Blue, Green, Orange

332K = Orange, Orange, Red, Orange

221K = Red, Red, Brown, Orange

110K = Brown, Brown, Black, Orange

INTERVAL in semitones	110K replacement	332K replacement
1	2.43M	4.32M
2	1.47M	3.01M
3	976K	2.26M
4	698K	1.69M
5	562K	1.47M
6	464K	1.27M
7	402K	1.07M
8	348K	976K
9	309K	866K
10	280K	787K
11	255K	732K
12	221K	665K

Figure 1

Please note: The silkscreen for the OUT jack is marked incorrectly
Connect as show in this diagram by swapping pins 4 and 5

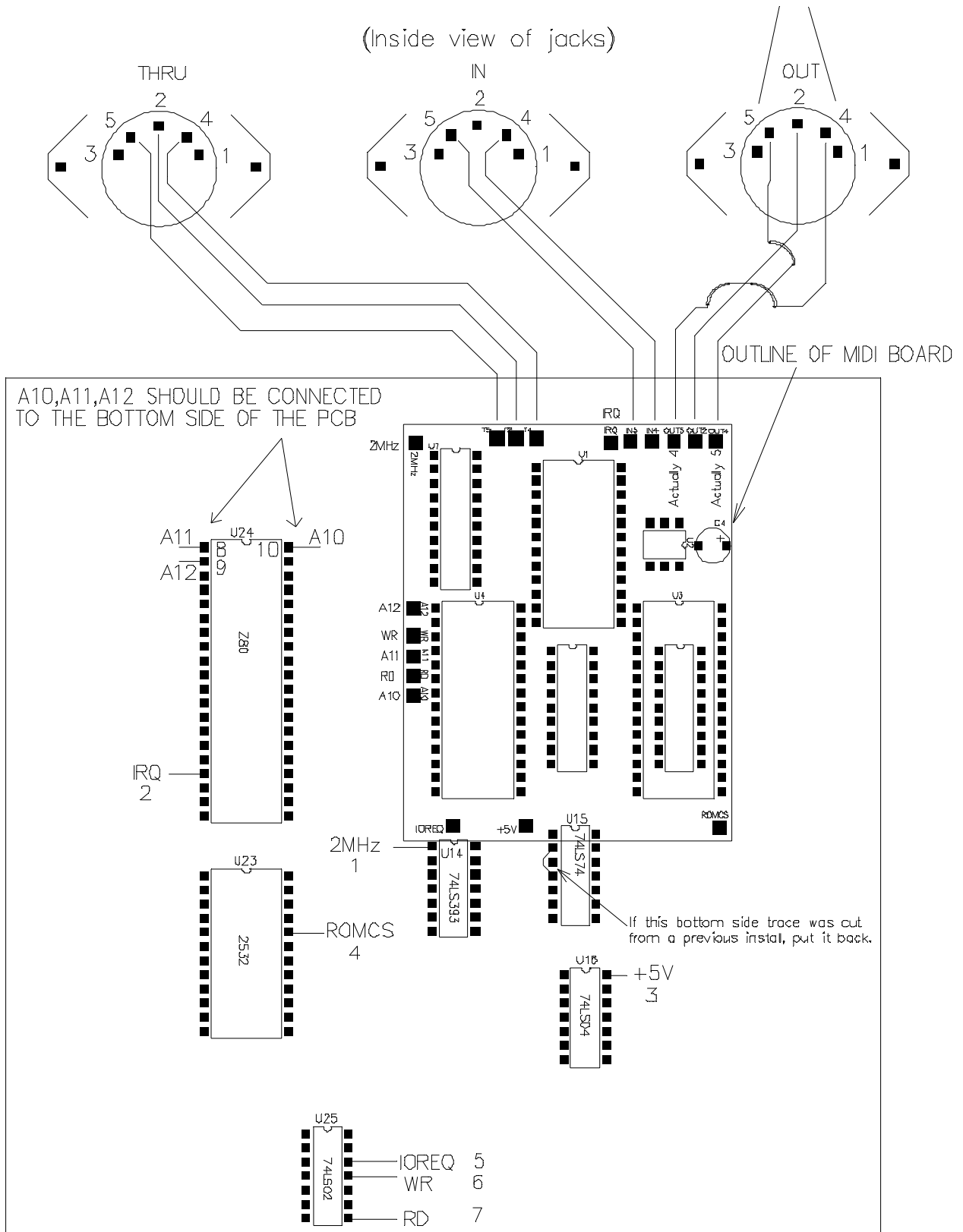
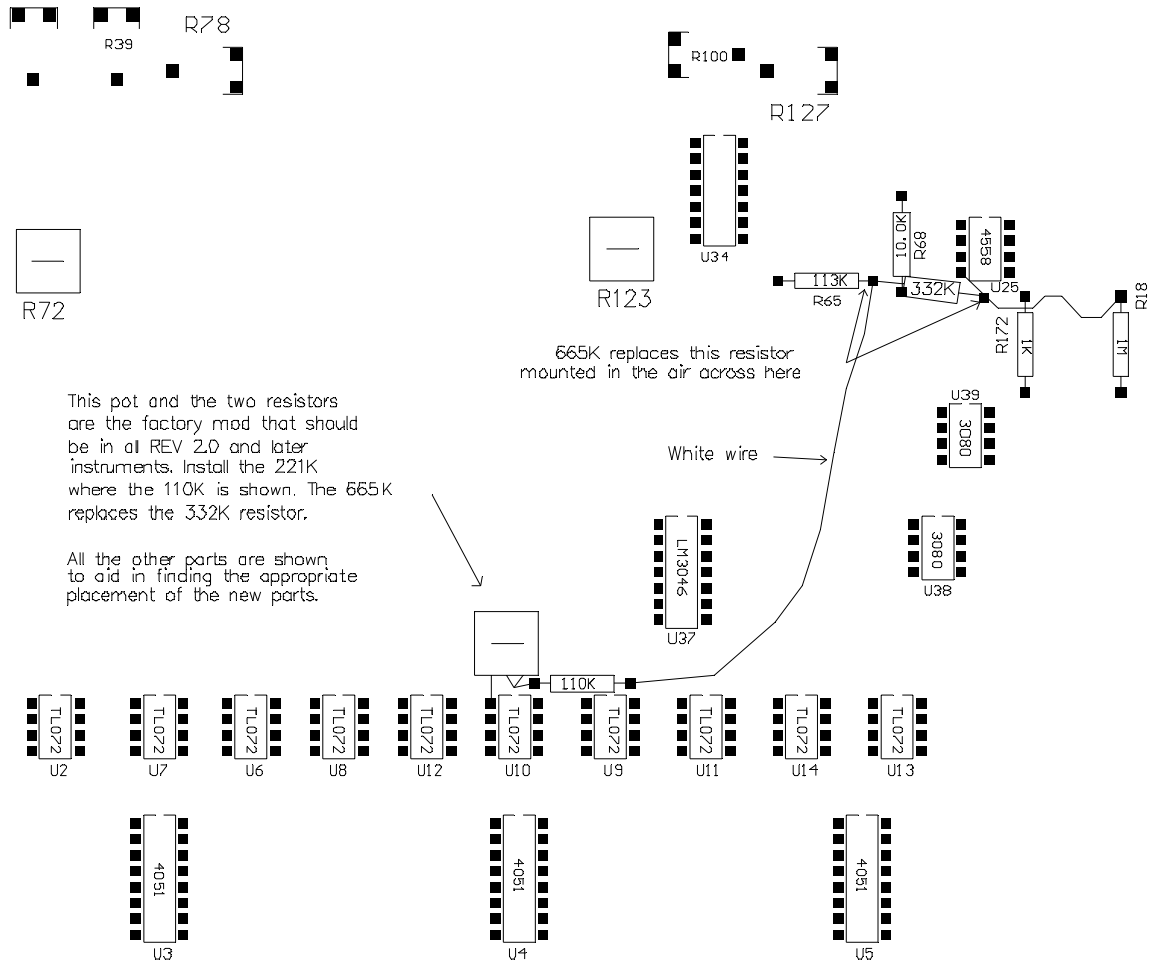


Figure 2



CALIBRATION INSTRUCTIONS

Overview

The SMK takes advantage of the sequence transpose function to implement MIDI pitch bend. The two resistor and the 10K variable resistor (potentiometer or pot) are used to control the MIDI pitchbend range. The resistor located closest to the pot is used to scale the maximum amount of pitch bend. The pot is used to fine tune this adjustment. The other resistor (332K from Moog, or 665K from Encore), is used to bring the rear panel tune control into range. After the installation, the Source may require oscillator scale adjustments. This is well documented in the Source technical service information that was supplied with the instrument. As a convenience, we have included it in this manual.

Symptom

The source may be in tune at one end of its range, but as it reaches the other end, the tuning drifts.

Procedure

First set the control panel to the following:

Glide	0
Mod	Off
Osc 1	32'
Waveshape	Sawtooth
Sync	Off
Osc 1 Mixer	99
Noise	0
Osc 2 Mixer	0
Filter Cutoff	0
Emphasis	0
Contour Amount	99
Both Sustains	99
All other contour functions	0
Octave transpose	0

Center the pitch wheel
Center the rear panel tune control

CALIBRATION INSTRUCTIONS, continued

Play low C while playing low C on another synthesizer.
(Or have the MIDI output from the controller synth play theSource.)

Adjust trimmer pot R127 until the two oscillators zero beat.

Now play C3, and adjust pot R123 to zero beat the oscillators again.

Check the above two steps until the Source oscillator 1 zero beats with the external oscillator.

Now modify the front panel setting so oscillator 2 mix is also set to 99, oscillator 2 footage is 32', and the interval is set to 1.

Play C0 and zero beat the two internal oscillators by adjusting R78.

Now play C3 and zero beat the oscillators by adjusting R72.

That's it!!

**Encore Electronics
Recognized Receive Data**

SMK MIDI Specification 2008

STATUS	2 nd data byte	3 rd data byte	Description
1000	nnnn	0kkk kkkk	0xxx xxxx Note OFF. Note2 kkkkkkk=24h to 54h
1001	nnnn	0kkk kkkk	0vvv vvvv Note ON. Note1 kkkkkkk=24h to 54h
1011	nnnn	0ccc cccc	0vvv v000 Control Change. 0ccc cccc = Control #(for bank select) 0vvv vvvv Control value
1100	nnnn	0vvv vvvv	Program select. 0vvv vvvv= 1 to 10h
1110	nnnn	0vvv vvvv	0vxx xxxx Pitch Bend

*1 Does not respond to velocity, except for v=0 being a running status NOTE OFF.

*2 Does not respond to velocity

0xxxxxxx SMK ignores these bits

SYSTEM MESSAGES

F0	00 00 2Fh	System Exclusive, Encore ID number
	01	Device number SMK = 01h
	pph	Command Byte1 : See description of command byte.
	qqh	Command Byte2 : Program number.
	data	Program Data
	F7h	End of System Exclusive Status Byte.

Command Byte Description:

SEE PAGE 6

Example: To command the Source to dump its memory to MIDI:

F0 00 00 2F 01 01 F7

To command the Source to receive the following system exclusive data stream:

F0 00 00 2F 01 02 [dd dd dd (sysex data)] F7

SYSTEM EXCLUSIVE PATCH DESCRIPTION - MOOG SOURCE

Each patch consists of 25 bytes, and 256 patches are transferred end to end.

00	GLIDE	00-FF
01	RATE	00-FF
02	INTERVAL	00-FF LSB
03	INTERVAL	00-0F MSB
04	OSC1 P.W.	0D-F2
05	OSC2 P.W.	0D-F2
06	OSC1 MIX	00-FF
07	NOISE MIX	00-FF
08	OSC2 MIX	00-FF
09	CONTOUR AMT.	00-FF
0A	FILTER CUTOFF	00-FF LSB
0B	FILTER CUTOFF	00-0F MSB
0C	EMPHASIS	00-FF
0D	VCF RELEASE	00-FF
0E	ATTACK	00-FF
0F	SUSTAIN	00-FF
10	DECAY	00-FF
11	VCA RELEASE	00-FF
12	ATTACK	00-FF
13	SUSTAIN	00-FF
14	DECAY	00-FF
15	OSC1:	32' = 00, 16' = 7F, 8' = FE
16	OSC2:	32' = 00, 16' = 7F, 8' = FE
17	WAVE SELECT / FILTER TRACKING	0,0,c,d,e,f,0,h :

Filter tracking g,h: Off = 00, 1/2 = 01, Full = 10

OSC 2 wave select e,f: Ramp = 00, Tri = 01, Pulse = 10

OSC 1 wave select c,d: Ramp = 00, Tri = 01, Pulse = 10

18	MOD / TRIGGER	0,0,c,d,e,f,g,h :
	h:	Sync On = 1, Sync Off = 0
	f:	Trigger multi = 1, Trigger single = 0
	e:	Mod to filter ON = 1, OFF = 0
	d:	Mod to OSC ON = 1, OFF = 0
	c:	LFO Triangle = 1, LFO Square = 0