

Sound Designer/Emulator II System Troubleshooting

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Section 1 Macintosh Setup

1. Make sure the Mac is a 512K version. Add-on memory beyond the 512K may or may not work properly.
2. Boot the Mac using one of the Sound Designer Master Disks.
3. Make sure that NONE of the following items are installed in the Mac's RAM at this point:
 - a. RAM Disks
 - b. Turbochargers or RAM cache systems
 - c. RAM-resident debuggers such as Macsbug
 - d. Anything else co-resident in RAM besides the System and Finder
4. Double click on the Sound Designer program icon. The program should boot and come up with an Untitled wave window.
5. Proceed to the Emulator II Setup section.

Section 2 Emulator II Setup

1. Open up the Emulator by removing the 8 screws on the bottom of the unit around the periphery and remove the 4 screws at the top of the back panel. Then gingerly slide the top of the Emulator around and over the keyboard, exposing the circuitry inside.
2. DO NOT TOUCH THE POWER SUPPLY EVER!!
3. Determine if the Logic Board is a Rev. 0 or a Rev. 1 board as follows:

The logic board is the large circuit board bolted to the bottom of the E2 on the Right-hand side. It has a smaller Memory Option circuit board mounted ON TOP of it. The Rev, number of the Logic Board is silk screened in WHITE on the portion of the logic board which is closest to the keyboard, and directly under the Memory Option board. You will have to lower your neck and head to see it. It will say something like "Rev. 0" or "Artwork Rev. 1".

IF THE LOGIC BOARD IS REV. 0, read the next section, titled "For Emulators with Rev. 0 Logic Boards".

IF THE LOGIC BOARD IS REV. 1, go to the section titled "For Emulators with Rev. 1 Logic Boards"

For Emulators with Rev. 0 Logic Boards

An RS422 interface board must be installed on Rev. 0 logic boards to permit the Macintosh and Emulator II to communicate. This board converts the serial port on the Emulator to run using RS422 protocol instead of RS232 protocol, which is slower. The interface board merely replaces the RS232 driver chip and receiver chip with the corresponding RS422 driver chip and receiver chip.

Check to see if a RS422 interface board has been installed on the Rev. 0 logic board:

The interface board is roughly 1.5" X 2.0" and plugs into the IC sockets vacated by IC132 and IC108 via DIP plugs. If this board is not present, then remove the RS232 drivers (1488 and 1489) at 10132 and 10108 and obtain an RS422 interface board from E-MU and install it following the installation instructions that come with it.

Verify that there are 4 resistors, 1 capacitor and 2 IC's on this board. You may want to remove the board and spray Cramolin into the sockets at IC132 and IC108, then re-insert the board carefully and secure it with tie-wraps.

A recommended modification to boost data integrity is to change resistor R1 on the RS422 interface board from 10K ohms 1/4 watt 5% to 1K ohms, 1/4 watt 5%. This will cause the bipolar 500KHz clock at TP1 to transition at least 1.0 volts negative, as opposed to 0.5 volts negative when R1 is 10K ohms.

Using a good scope probe with a short ground lead, verify that the clock signal at TP1 is 500KHz, and that it transitions at least 0.5 volts negative and 2.0 volts positive while the Emulator is connected to the Macintosh.

The board should be installed as follows:

- TP1 (gray wire) should be soldered to connector CN1 2, pin 9
- TP2 (violet wire) should be soldered DIRECTLY to 10107, pin 25.
- TP3 (blue wire) should be soldered to connector CN12, pin 11
- TP4 (orange wire) should be soldered to connector CN1 2, pin 10

The installation instructions for the interface board recommend that you install an included capacitor at C89 in order to provide something to tie down one end of the interface board to with a tie-wrap. The problem with this installation is that if the capacitor is soldered onto the logic board without removing the logic board first, it is possible that one or both of the cap's leads might intermittently short out against the Emulator's chassis. Use a good light and look underneath the logic board from the side and make SURE this is not even close to happening.

Make sure that the interface board IS secured via a tie-wrap to a capacitor on AT LEAST one end of the board. They will probably pop out of the logic board sockets if they are not secured.

Verify that the two internal EPROMs in the Emulator (MAIN and SCANNER) are AT LEAST Rev. 2.1. Verify that the Emulator disk software being used is at least Rev. 2.2.

Go to the Section titled "System Testing"

For Emulators with Rev. 1 Logic Boards

Emulator II's with Rev. 1 logic boards have the RS-422 drivers installed at the factory. Rev 1 boards *do not* require the installation of an additional RS-422 interface board. However, due to E-mu design changes several modifications are made at the factory to allow the Mac and Emulator to communicate. Unfortunately, these mods were not made at the factory to a number of Rev. 1 Emulators. Check to be sure that the following mods have been made to the logic board:

1. The trace leading to the end of R48 closest to the back panel has been CUT. R48 is immediately to the left of CN12, the 25-pin computer connector.
2. The trace going to IC132, pin 10 has been cut. This may be difficult to see. The trace runs right next to the body of the IC socket of IC1 32, on the right side of the chip, between the middle and the bottom of the chip (quite near pin 10). If it has not been cut, or you are not sure, then lift pini 0 of 10132 up out of the IC socket so that nothing contacts it. Do this by removing the entire chip from the socket, then bending pin 10 up and re-inserting the chip into the socket. Pin 10 should not go into the socket.
3. If you do not have AT LEAST VERSION 2.3 of Emulator II OS software, then the following mod must be performed: Lift pin 22 of IC107 and solder one end of a 1Kohm 1/4watt 5% resistor to it. Solder the other end of the resistor to +5 volts DC anywhere nearby.
4. To improve data integrity, change resistor R47 on the logic board from 10K ohms 1/4W 5% to 1K ohms 1/4W 5%. Soldering a 1K ohm resistor in parallel with the existing 10K ohm resistor at R47 will also work.
5. Verify that the two internal EPROM's in the Emulator (MAIN and SCANNER) are AT LEAST Rev. 2.1. Verify that the Emulator II OS software being used is at least Rev. 2.2.

System Troubleshooting

Verify that the Mac and Emulator are connected using the cable included with Sound Designer, and that the serial port on the Mac to which it is attached matches the port shown by selecting "Serial Port" from the Sound Designer's Calibrate pull-down menu.

Boot up the Emulator with at least Rev. 2.2 software and verify that the current preset (and ANY preset being used with Sound Designer) has MIDI ENABLED (either OMNI or POLY) and that MIDI is set to CHANNEL 1 (this is all found in Preset Definition 30 on the Emulator).

Verify that NO MIDI CABLES whatsoever are attached to the Emulator while the Emulator is attached to the Macintosh.

If you suspect that a ground loop or differential might exist between the Emulator and Mac, then lift the ground pin on the power cord of either or both machines.

If all is well, you should be able to select any function in Sound Designer which communicates with the Emulator, and it should function properly without any error messages. Try selecting "Current Voices" from the Extras pull-down menu.

If communication problems still exist after the RS-422 port has been diagnosed as working properly, try connecting the Emulator II to a different Mac and run Sound Designer. If the program runs, the original Mac probably has a bad serial port.

If Sound Designer displays the message "I can't communicate with the E2", repeat the troubleshooting procedures or call the E-mu Systems service department at (408) 476-4424 or Digidesign at (415) 494-8811.