

EMULATOR II 1Mbyte MEMORY EXPANSION

INSTALLATION INSTRUCTIONS

Overview:

The Emulator II ships with 512kbytes of memory. It is possible to upgrade an Emulator II to 1Mbyte of memory, by replacing the existing memory chips with 32 new ones. Whilst these chips are easy to locate, the upgrade is technically complicated with numerous wiring changes and some additional IC replacements. The correct replacement EPROM for the main Z80 processor is essential, as is the right software. This upgrade is therefore close to impossible unless you can locate these parts from a service centre, The Emulator Archive (www.emulatorarchiove.com) or a defunct EII+ or upgraded EII.

E-mu Systems have NO SPARE PARTS for the Emulator II.

Only attempt this upgrade if you are technically capable (e.g. you are an electronic service engineer), this is NOT a user modification. Remember this upgrade gives you two banks to swap, not contiguous sample memory.

Components Required:

Quantity	Item	E-mu Systems P/N
32	256K RAM	Generic 41256
1	74LS153	-
1	74S74	-
1	2764 MBMEM version	MAIN PROM
1	MBMEM software	?
A lot of	Kludge wire	-

Tools required:

- Screwdrivers
- Nut Driver for jack nuts
- Soldering iron and solder
- Cutters
- Strippers for kludge wire
- XACTO knife
- IC removal tools
- Glue gun with glue stick
- Blank Rev 0 digital board for reference
- MBMEM Memory Test Diskette
- Standard Software Diskette

Step 1: Power up the Emulator II and verify its functionality before attempting this modification. If the unit has problems, refer it to service or debug it yourself. BE SURE the unit functions properly before kludging, so as to isolate any problems produced by the kludge.

Step 2: Remove the Digital board from the unit.

Step 3: Remove the memory board and standoffs from the digital board.

Step 4: Remove the 32 memory chips. Remove IC 87 (74LS74). Make sure there is a socket for IC93; if not, install one. Remove IC42 (The Main PROM).

Step 5: Make the following CUTS:

Bottom trace between IC79 - 13 and IC79 - 15
Top trace between IC79 - 3 and IC20 - 3, cut near IC20
Top trace between IC79 - 5 and IC39 - 3, cut near IC39
Top trace between IC11 - 3 and IC10 - 6
Top trace between IC11 - 2 and IC10 - 5

Step 6: Remove the kludge wire connecting IC87 pins 10,11,and 12 to IC87 pins 13,14. Leave IC87 - 13 connected to IC87 - 14.

Step 7: Add the following "daisy-chained" kludge wires. These are best done by preparing a long wire with several stripped points by first stripping about 1 1/2 inches, then stripping 0.7" insulation segments along the length so that the wire can then be simply wrapped to the required pins:

IC13 thru IC20 pins 1 to IC79 pin 5
(can pick up at feedthru)
IC32 thru IC39 pins 1 to IC79 pin 5
(can pick up at feedthru)
IC51 thru IC58 pins 1 to IC79 pin 3
(can pick up at feedthru)
IC71 thru IC78 pins 1 to IC79 pin 3

Step 8: Add the following kludge wires on the bottom of the board:

IC71 - 3 to IC32 -3
IC51 - 3 to IC13 - 3
IC79 - 17 to IC87 - 8
IC87 - 10 to IC87 - 4
IC87 - 11 to IC 89 - 5
IC87 - 12 to IC93 - 7
IC93 - 1 to IC116 - 7
IC93 - 2 to IC116 - 2
IC93 - 15 to IC117 - 7
IC93 - 14 to IC139 - 9
IC93 - 10,11,12,13 to IC128 -24
IC93 - 3 to IC10 - 6
IC93 - 4 to IC10 - 5
IC93 - 5 to IC88 - 1
IC93 - 6 to IC88 - 3
IC93 - 9 to IC11 - 2
IC11 - 3 to IC11 - 4

Step 9: Install the following IC's:

256K RAM's at 32 memory locations

74LS153 at IC93

74S74 at IC87

The new main EPROM, a 2764 programmed for the MBMEM at IC42

Step 10: Buzz out the above connections on the top of the board. Be sure all indicated CUT's are actually open, and all indicated jumpers are actually connected.

Step 11: Use the glue gun to secure the kludge wires.

Step 12: Re-install the board into the Emulator II, but do not completely fix in place, so that board can be easily removed for error correction. Boot the Emulator II with the MBMEM software and test functionality. Boot the machine with the MBMEM Memory test disk and verify MBMEM integrity. Fix any errors using standard debugging techniques for kluged boards.

Step 13: Completely re-assemble the Emulator II and perform a final test of the unit.

Conclusions

You should now have an Emulator II with 1Mbyte of memory. It is time to down load the “Emulator II Double Memory Supplement” from The Emulator Archive (www.emulatorarchive.com). This will tell you how to use your new larger memory.

If you need the detailed circuit schematics, look in the Emulator II Service Manual.