

## COEX MEMORIES

### FULL FEATURES INCLUDE:

Fully static operation.

Supports S-100 IEEE-696 standard.

Uses popular 2716 pinout type static rams.

Board access time under 200 ns.

150 ns.rams standard

No wait states needed at 6.000 Mhz.

High quality FR-4 type pc board.

Gold plated contact fingers for low contact resistance and long life.

All data,status,and address lines fully buffered.

Extreme low power dissipation (<500 ma typical.)

Top 8k may be switch disabled and/or interchangeable with 2716 type eproms.

Switch selectable phantom line.

Switch selectable extended address lines for up to 16 mbytes.

BILL OF MATERIALS

QTY.	DESCRIPTION
32	24 pin sockets
6	14 pin sockets
4	16 pin sockets
4	20 pin sockets
24	.1 mfd bypass capacitors
2	4.7 mfd capacitors *
1	680 ohm resistor *
5	2.2k 10 pin sip resistor *
1	2.2k 6 pin sip resistor *
1	7805 5 volt regulator (TO-3)
2	8 position dip switches
1	74LS00-(U-22)
1	74LS04-(U-21)
1	74LS20-(U-20)
3	74LS266-(U11,13,18)
4	74LS244-(U-14,15,16,17)
4	74LS138-(U-2,4,6,7)
1	LED
32	HM 6116 or TMM 2016 RAMS

\* note value supplied may differ.

COEX MEMORIES warranty  
memory board kit for a period of 90 days from date of purchase by the end user. In the event that the product was purchased as a blank pc board, only the blank pc board is covered by such warranty.

COEX MEMORIES will assume absolutely no liability for products that, in our opinion, that have been misused, abused, or assembled in other than standard good workmanship practices.

### GENERAL CONSTRUCTION HINTS

We recommend a low watt (27-32) soldering iron for best results. Use only good quality rosin core solder.

Always keep soldering iron clean with wet cloth or sponge.

Observe correct polarity on all capacitors, IC's, and LED's.

If bought as a kit or bare pc board, remember that a few moments spent going over the board before assembly could save hours of trouble shooting later.

Remember, those leads that you clip off fly fast and far and eyes tend to come in matched sets only so take proper precautions.

COEX MEMORIES believes that this product represents the best dollar for dollar memory bargain being sold today.

## GENERAL ASSEMBLY INSTRUCTIONS

These instructions are presented with the assumption that the builder has some general knowledge of printed circuit board assembly and is familiar with good workmanship practices.

[] Give the pc board a good visual going over to check for any obvious shorts or opens. There should be none, but a few minutes spent here could save hours of trouble shooting later.

[] Using an ohmmeter, check for shorts between bus pins 1 and 50.

[] Install the 24 pin sockets at locations X-1 thru X-32. Do not solder yet, we will solder all sockets at one time.

[] Install the 16 pin sockets at locations U-2,4,6,7.

[] Install the 14 pin sockets at locations U-11,13,18,20,21,22.

[] Install the 20 pin sockets at locations U-14,15,16,17.

[] Double check that all 24 pin sockets are oriented with pin 1 to the left, and all other sockets with pin 1 towards the top of the pc board.

[] Using a book or a piece of stiff cardboard on the component side of the board to hold in the sockets, carefully flip the whole mess over so you are looking at all those solder connections you are going to make.

[] Solder 2 diagonal pins on each socket only at this time.

[] With one hand, reheat the solder connections while pressing in with the other hand, this will insure that all the sockets are sitting flush with the pc board.

[] Solder all the remaining pins.

[] Install and solder the 8 position dip switches at locations S-1 and S-2.

[] Install and solder the 10 pin sip resistors at locations U-1,3,5,12,19 remember that pin 1 is oriented towards the top of the pc board.

[] Install and solder the 6 pin sip resistor at location U-10 pin 1 is oriented towards the right side of the pc board.

[] Install and solder the 680 ohm resistor at location R-1.

- [] Install and solder the led at location DS-1. The cathode, or flat side is oriented towards the left side of the pc board.
- [] Install and solder the .1mfd bypass capacitors.
- [] Install and solder the 7805k 5 volt regulator at location Q-1
- [] Install the 4.7 mfd capacitors at locations C-6,7. Observe correct polarity !
- [] Using a good stiff brush and a flux solvent such as alcohol give the back side of the board a thorough scrubbing to remove all traces of flux and possible lead snippings that might have stuck to the back of the board.
- [] Give the back side of the board a good visual inspection, looking especially for solder shorts and unsoldered pins.
- [] Install circuit board in computer, and using a voltmeter check for 5 volts using any pin 24 of a memory socket and ground. do not proceed any further if voltages are out of recommended limits 4.75 to 5.25 volts.
- [] Install 74LS138 at locations U-2,4,6,7 pin 1 should be oriented towards the top of pc board.
- [] Install 74LS266 at location U-11,13,18 pin 1 should be oriented towards the top of pc board.
- [] Install 74LS244 at locations U-14,15,16,17 pin 1 should be oriented towards the top of pc board.
- [] Install 74LS20 at location U-20 pin 1 should be oriented towards the top of pc board.
- [] Install 74LS04 at location U-21 pin 1 should be oriented towards the top of pc board.
- [] Install 74LS00 at location U-22 pin 1 should be oriented towards top of pc board.
- [] Install pc board in computer and remeasure voltages, do not continue if voltages are not correct. Remember those ram chips are expensive.
- [] Install HMM 6116 rams at locations X-1 thru X-32 pin 1 should be oriented to the left.

[] Install Berg jumpers at locations X29-X32. Jumper center to right for ram or jumper center to left for rom.

## SET UP AND USE

The switches at location S-1 are for extended addressing and are pretty much self explanatory. They should be addressed in binary as designated by the silkscreen on the pc board. If using extended addressing, switch S-2 position 5 must be on.

Switch 2 positions 1,2,3,4 are used to disable 2k holes in memory to avoid possible conflicts with other memory devices such as system monitors, memory mapped video boards, or memory mapped disk controllers. Turning the appropriate switch on will disable that 2k block of memory, off will enable that 2k block.

Switch 2 position 5 enables the extended addressing option.

Switch 2 position 6,7 enables the phantom line option required by several disk controller boards to boot up the system. position 6 will phantom out the entire 64k of memory, position 7 will phantom out only the lower 32k of memory when buss pin 67 is pulled low.

Jumpers at locations X29,30,31,32 are for selection of either ram or rom. Jumper center to right for ram, or jumper center to left for rom. Remember, compatible rom chips are the 5 volt only Intel type memories.

While this memory board can be populated in 2k increments, it was primarily designed to be used fully populated or with a minimum of 56k. Just remember that any unused address space between the top of memory and 56k cannot be used by any other memory device in the system or an address conflict will occur.

## GENERAL THEORY OF OPERATION

The 4 74LS244 octal tristate buffers are used to buffer the 8 data in lines, the 8 data out lines, and the 16 address lines respectively. Data out buffers are enabled by the condition MWRITE, Data in buffers are enabled by the condition of combined SMER-PDBIN-BDEN generated by 1/2 of the 74LS20.

The individual 32 chip select lines to the memory chips are controlled by the 74LS138 3 of 8 decoders with address lines 14 and 15 determining whether the upper 32k or the lower 32k being selected by going thru 74LS04 inverters.

The 74LS266 XNOR gates at locations U11,13 control the extended address options while the 74LS266 at location U18 board enable BDEN.

If additional 2k holes are required in the memory map they may be enabled by piggybacking an additional 74LS20 and connecting the output pin 8. The appropriate input pins then being connected to the chip select lined desired at the proper addresses.

