

USER'S MANUAL

**8K STATIC
RAM MEMORY BOARD**

JADE

Computer Products

INTRODUCTION

Your new 8K static memory card has been designed to give you high quality memory at low cost. The chips are low power, static memory chips allowing the memory card to run at full speed with IMSAI, ALTAIR, POLY88 and other computers.

Memory protect and PHANTOM features are included on the card. Address lines and data in lines are buffered for minimum loading.

Address selection is provided by a dip switch allowing the card to be selected to any location in memory at 4K or 8K boundaries.

Although some manufacturers claim current requirements as low as 1.3 amps for an 8K card, this figure does not indicate the true state of affairs. 8K memory cards using 21L02 type chips should be allowed 2 amps per card and (including regulator dissipation) they should have fan or cooling capacity for 20 watts of power.

ASSEMBLY INSTRUCTIONS

Assembly (for those choosing a kit) is quite simple.

Install the 14 and 16 pin sockets. With the top of the board away from you and the component side (silk-screened side) up, all sockets and chips are oriented with pin one to the left.

Install the 4.7K resistors as indicated on the circuit board.

Install capacitors as indicated on the circuit board. The two tantalum capacitors are polarized and the positive leads should be located as indicated.

Install the four regulators. Measure and bend the leads as required to fit in the appropriate holes. Install each regulator with a heat sink under it. Tighten the screws after aligning the regulators and heat sinks.

Solder the components, including the regulators, then install the card without chips in a computer mainframe and check the regulator output. The output should be in the range of 4.8 to 5.2 volts although figures outside of these by a small amount are not critical.

After testing the regulators, carefully inspect all work. Install the memory chips, auxiliary logic, and the dip switch.

After appropriate address selection, install and test the card with a good memory test routine.

PARTS LIST

U1	74LS367
U2	74LS42
U3	74LS04
U4	74LS04
U5	74LS367
U6	74LS00
U7	74LS30
U8	74LS86
64	21L02 type memory chips
5	14 pin sockets
67	16 pin sockets
8	4.7K, 1/4 watt resistors
36	0.1mfd capacitors
2	10mfd, 16 volt tantalum capacitors
4	7805 regulators (or equal)
4	heat sinks
4	sets of hardware
1	5 position dip switch or equal

ADDRESS SELECTION

This board uses a 5-position DIP switch for address selection and hardware memory protect. The rightmost switch (#5) should be in the ON position for normal memory operation. Switching it off disables the WRITE line thus protecting the memory contents from any write operations. The remaining four switch positions correspond to the upper 4 bits of address information. (A15, A14, A13, and A12).

Depending on the jumper configuration, the board may be addressed as either an 8K board or a 4K ("half-populated") board. For the 8K configuration, jumper E6 to E8. The DIP switch settings below will result in the address range specified:

<u>Board Address Range</u>	<u>Switch 1</u>	<u>Switch 2</u>	<u>Switch 3</u>	<u>Switch 4</u>
0000-1FFF	ON	OFF	OFF	OFF
2000 - 3FFF	ON	OFF	OFF	ON
4000 - 5FFF	ON	OFF	ON	OFF
6000 - 7FFF	ON	OFF	ON	ON
8000 - 9FFF	ON	ON	OFF	OFF
A000 - BFFF	ON	ON	OFF	ON
C000 - DFFF	ON	ON	ON	OFF
E000 - FFFF	ON	ON	ON	ON

If you wish to fill up a 4K space in your memory map, you may do so by placing 32 chips in the lower 4K of the board memory space (this is the top four rows of sockets on the board) and jumper E7 to E9 and E8 to E10. The addressing in this mode is set according to the chart below:

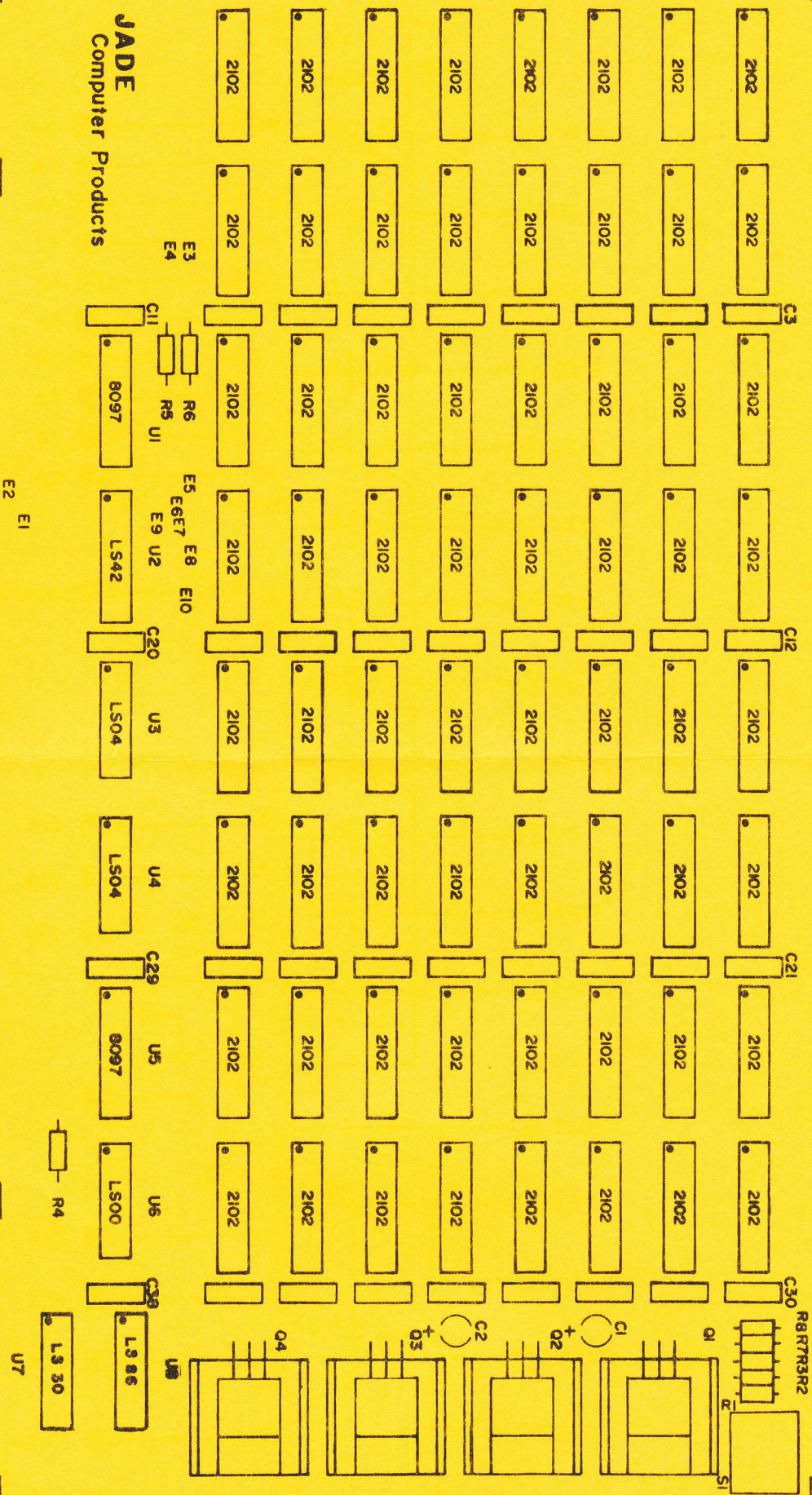
<u>Board Address Range</u>	<u>Switch 1</u>	<u>Switch 2</u>	<u>Switch 3</u>	<u>Switch 4</u>
0000 - 0FFF	OFF	OFF	OFF	OFF
1000 - 1FFF	ON	OFF	OFF	OFF
2000 - 2FFF	OFF	OFF	OFF	ON
3000 - 3FFF	ON	OFF	OFF	ON
4000 - 4FFF	OFF	OFF	ON	OFF
5000 - 5FFF	ON	OFF	ON	OFF
6000 - 6FFF	OFF	OFF	ON	ON
7000 - 7FFF	ON	OFF	ON	ON
8000 - 8FFF	OFF	ON	OFF	OFF
9000 - 9FFF	ON	ON	OFF	OFF
A000 - AFFF	OFF	ON	OFF	ON
B000 - BFFF	ON	ON	OFF	ON
C000 - CFFF	OFF	ON	ON	OFF
D000 - DFFF	ON	ON	ON	OFF
E000 - EFFF	OFF	ON	ON	ON
F000 - FFFF	ON	ON	ON	ON

PHANTOM

In those systems using the PHANTOM feature, pin 67 on the mother board is used to disable other memory while an artificial jump is executed to the beginning of a loader or monitor in the system. Once the system is running, pin 67 is allowed to return high enabling system memory.

If your system uses this feature, it is simply implemented by typing a jumper between pin E1 and E2 on the circuit board. This applies the PHANTOM signal to one of the BOARD ENABLE NAND gate inputs and deselected the board while PHANTOM is low.

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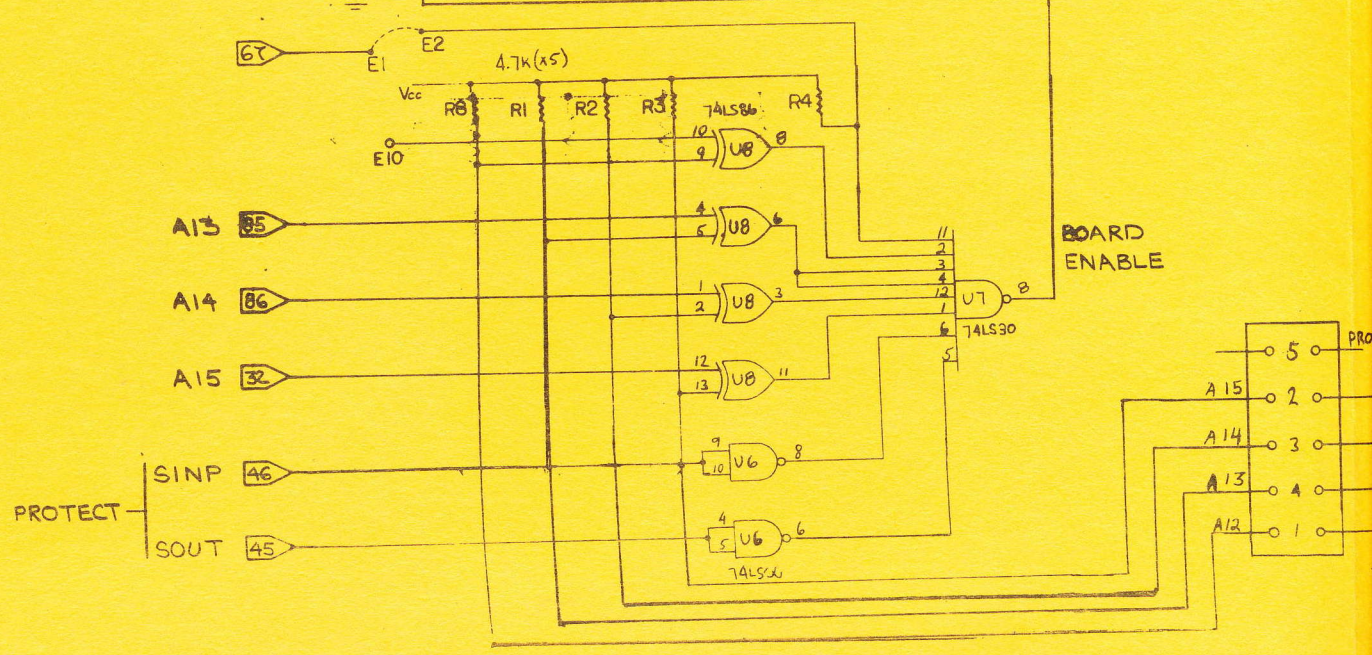
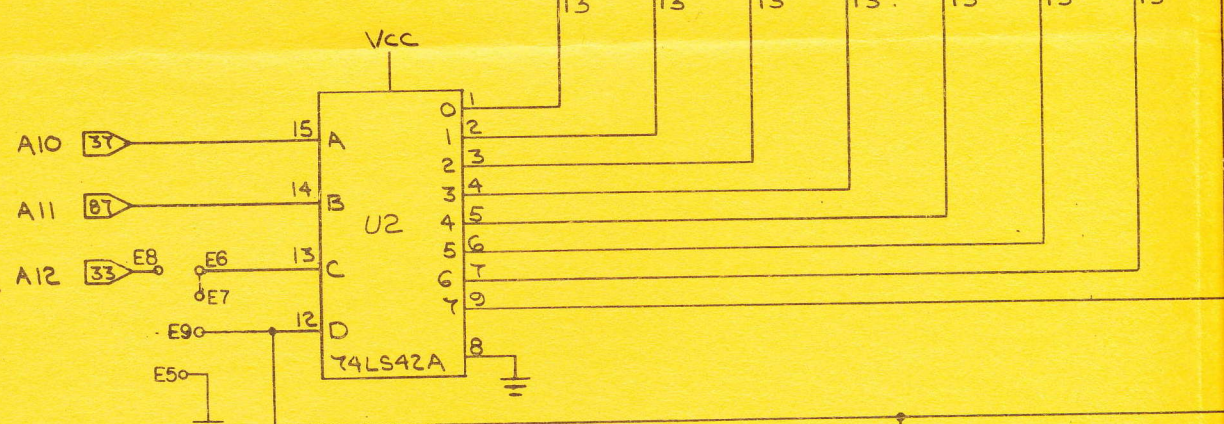
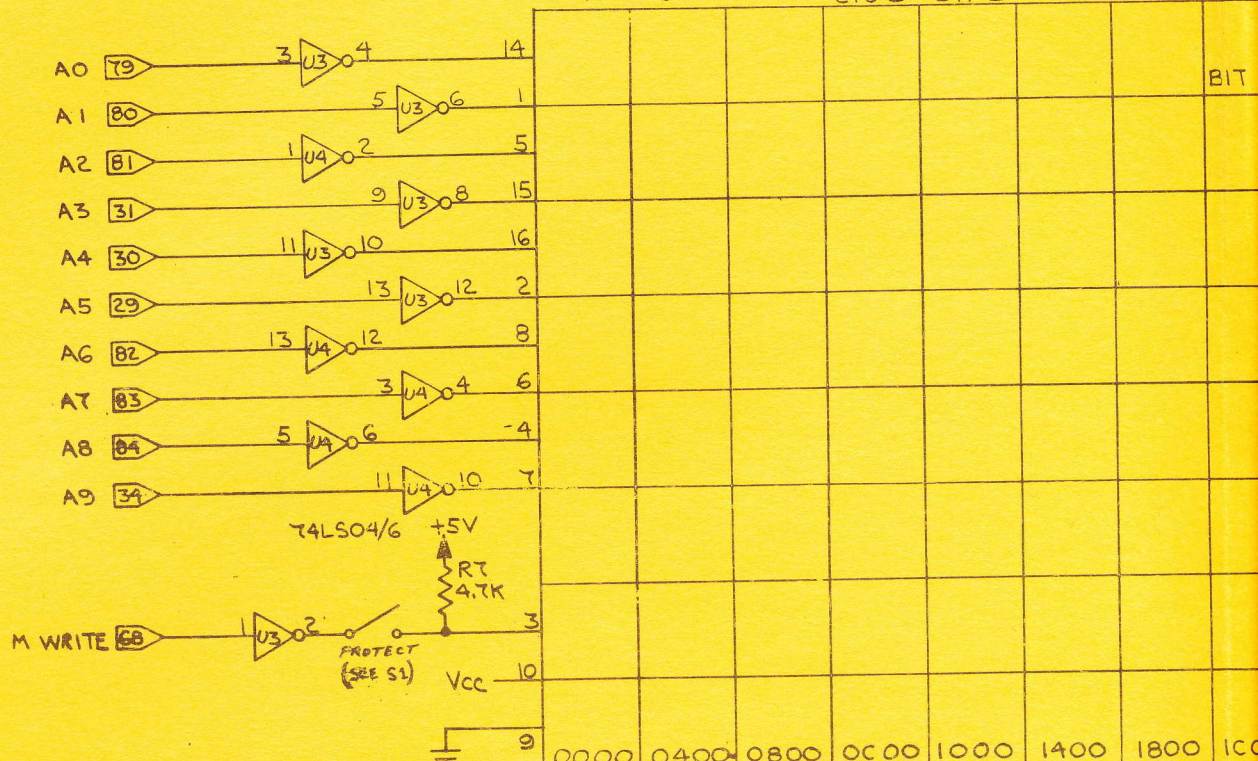


ADDRESS LINES TO ALL CHIPS IN PARALLEL

MEMORY ARRAY
8K x 8
2102 LIPC

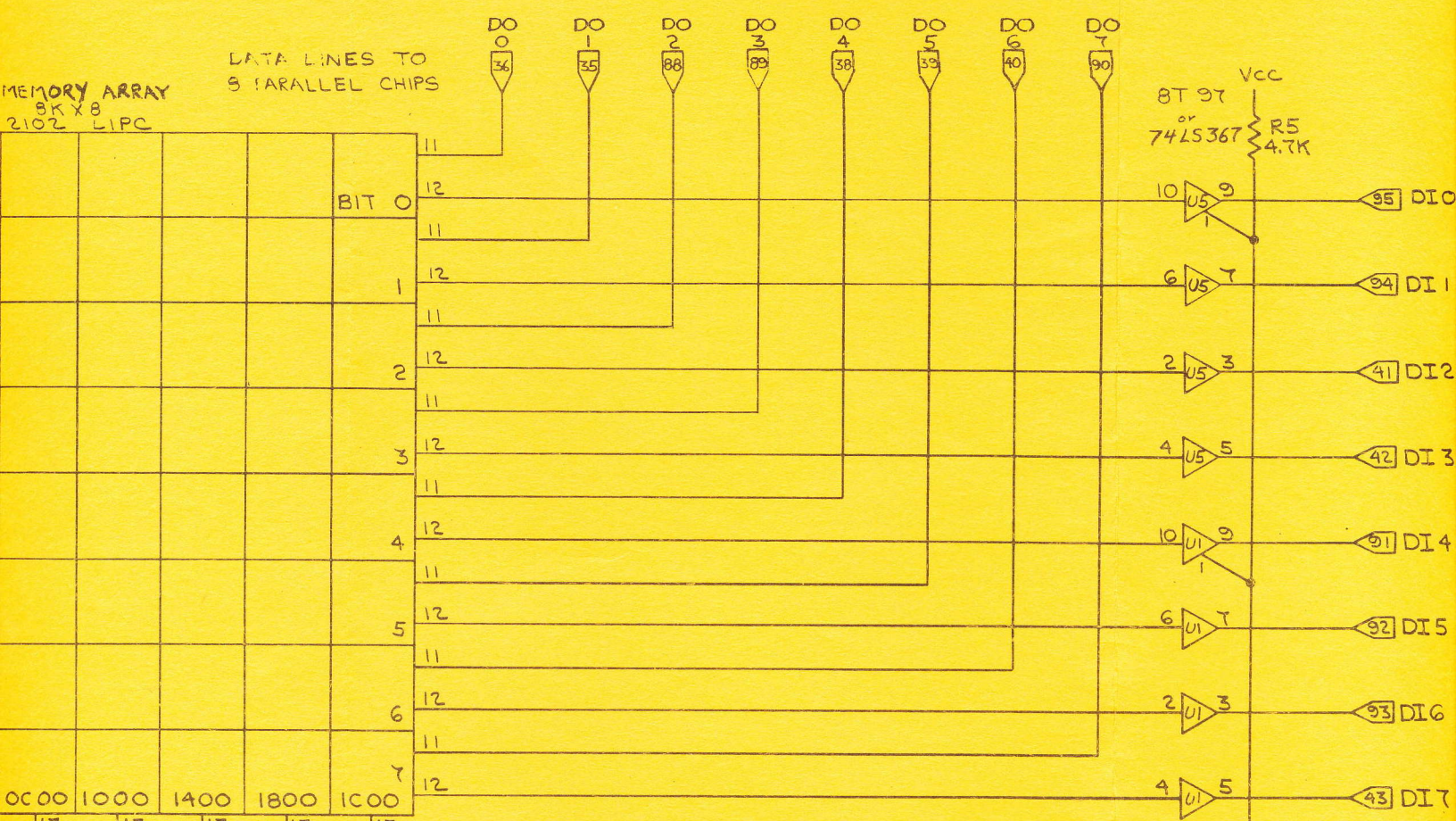
DATA LINES
8 PARALLEL

← TOP OF BOARD

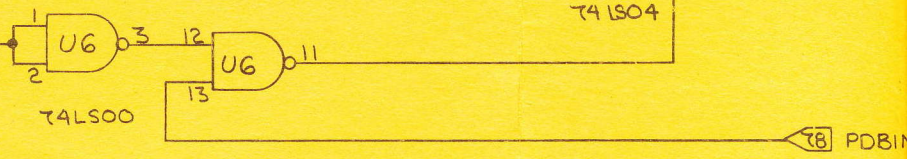
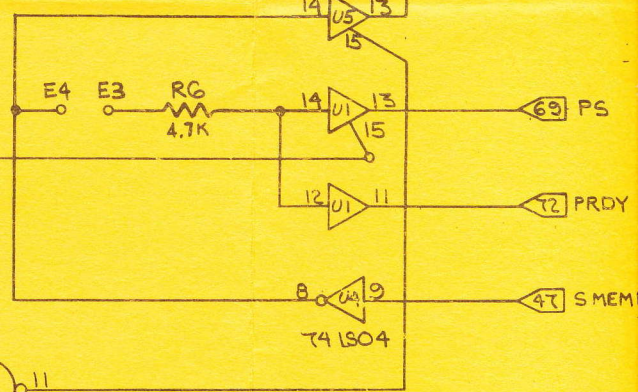
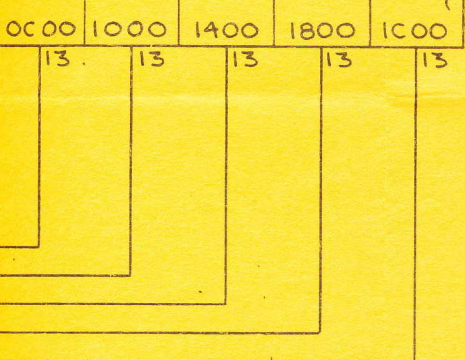
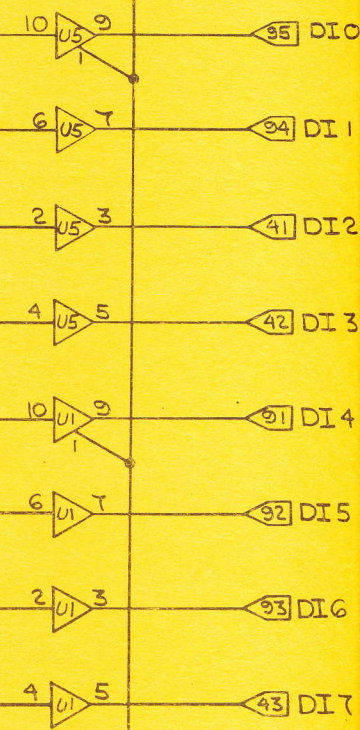


MEMORY ARRAY
8K X 8
2102 LIPC

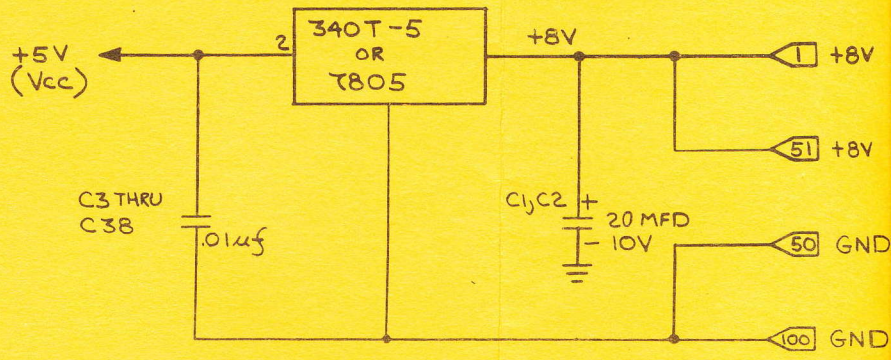
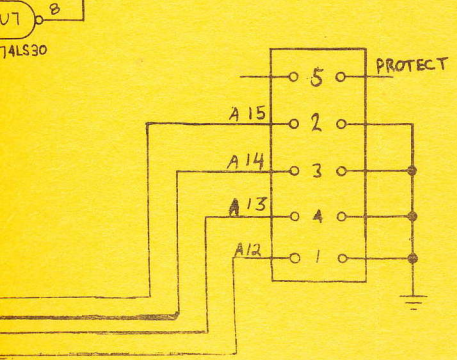
DATA LINES TO
8 PARALLEL CHIPS



VCC
8T 9T
or
74LS367
R5
4.7K



BOARD
ENABLE



REGULATOR 1 of 4