

**MEMORY EXPANSION BOARD
ASSEMBLY MANUAL**

BY

**J & R ELECTRONICS
P.O. BOX 2572
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May 1, 1986

*** * * CAUTION * * ***

*** * * READ BEFORE CONTINUING * * ***

Although most SAMS(74LS785) and memory devices(41256) have built-in protection diode networks which protects the device against damage due to static electric discharge, additional precaution should be followed to assure trouble-free performance after assembly or installation.

1. Use a conductive, grounded work surface (aluminum foil works well).

2. Keep yourself at ground potential (use conductive wrist bands or keep in constant contact with aluminum foil when handling components). If you have a metal work surface ground it through a 1 Megohm resistor.

3. Don't wear nylon or other clothing which will generate a static charge. (Beware of waxed floor and nylon carpet)

4. Ground soldering iron (preferably use a low-voltage type)

5. Do not insert or remove chips from sockets with power applied.

6. Metallic tools should be grounded permanently or by repeated discharge on the work surface.

7. Avoid touching the leads of static sensitive components. Leave in its conductive mount until ready to use

J & R Electronics will not be held responsible for damage to components as a results of improper handling.

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Welcome to the world of J&R Electronics. We would like to thank you for choosing our product. Before starting, ensure that you have the necessary parts.

- (✓) C1 thru C17 - .1uf or .01uf Capacitor
- (✓) R1 thru R3 - 33 Ohm resistor
- (✓) 16 - 16 pin IC socket
- (✓) U1 thru U16 - IC 41256 or equivalent
- (✓) Approximately 24 inches of 24 gauge insulated wire

The following additional parts are required if you have the eight (8) memory chip version COCO:

- (✓) 3 - 16 pin IC sockets
- (✓) 11 - 16 pin ribbon cable dip plugs
- (✓) Approximately 24 inches of 16 contact ribbon cable

If you have the two (2) memory chips version, the following additional parts are required:

- () 2 - 18 pin IC sockets
- () 4 - 18 pin ribbon cable dip plugs
- () Approximately 24 inches of 18 contact ribbon cable

I. Refer to Figure 1 and perform the following:

- NO (✓) If the Memory Expansion Board will be used as 256K system, add a jumper, W1 if not, procede to the next step
- NO (✓) If the Memory Expansion Board will be used with the two (2) memory chips version COCO add jumpers W2 thru W8.

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- ✓ Install and solder two (2) 1K Ohm SIP resistor packs in positions labeled R4 and R5. Ensure that pins one are connected to pins 8 and 9 on U9.
- ✓ Install and solder a 16 pin IC socket in each location, U1 thru U16.
- ✓ If you have the eight (8) memory chip version COCO, install a 16 pin IC socket in locations J1, J2 and J3. If you are using the two (2) memory chips version COCO, install an 18 pin IC socket in locations J4 and J5.
- ✓ Install and solder 33 Ohm resistors in locations R1, R2 and R3.
- () Install and solder .1uF or .01uf capacitors in locations C1 thru C17
- ✓ Using a good light and a magnifier check you work carefully for any solder bridges or missed solder points. CAUTION: A "solder bridge" is when the solder from the foil pad on which you are soldering produces a bridge of solder to an adjacent pad or land. A solder bridge can sometimes be disastrous by damaging more inside the computer than just the chip or component which it shorts.

If all looks well set the board aside and procede to next step.

- II. If you are using the eight (8) chips version CoCo, proceed to Step A and refer to Figures 2 and 3 to prepare cables. If you are using the two (2) memory chips version of CoCo, proceed to Step B.

Step A: Eight (8) memory chip versions only

- ✓ Prepare cable W10 using approximately six (6) inches of ribbon cable. Terminate an end with a 16 pin ribbon cable dip plug. Label this plug P2. On the other end of the cable separate the cable as shown and terminate to pin 2 and 14 of another ribbon cable dip plug. Cut off unused wires. Label this P5. Prepare two more dip plugs as shown on Figure 2 or Table 1 and label as P6 and P7.
- ✓ Refer to Figure 3 and prepare as above, cable W11 connecting P3 to P8, P9, P10 and P11.

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TABLE ONE

Cable W10

P2 (pins #)	P5 (pins #)	P6 (pins #)	P7 (pins #)
1	2		
15	14		
3		2	
13		14	
5			2
11			14

Cable W11

P3(pins #)	P8(pin #)	P9(pins #)	P10(pins #)	P11(pins #)
1	2			
15	14			
3		2		
13		14		
5			2	
11			14	
7				2
9				14

Cables W12, W13, and W14

P1 (pins #)	P4 (pins #)
1	1
2	2
3	3
"	"
"	"
15	15
16	16

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- (✓) Using approximately eight inches of ribbon cable prepare cable W12 as shown in Table 1. Set cables aside and continue to Step C.

STEP B: Two (2) memory chip version only

- () Using two (2) pieces of approximately ten (10) to twelve (12) inches of ribbon cable prepare cables W13 and W14 as shown in Table 1. Set cables aside and proceed to Step C.

STEP C

- () Using one of the methods below connect the Banker II board to the Memory Expansion board.
- A. Place the unterminated ends of the 6 inch wires through the proper holes on the board and solder them.
 - B. Solder the wires to the 33 Ohm resistor leads on top of the board which connect to the pads.
 - C. Purchase three micro test clips (Radio Shack part number 270-370). Solder one end of each of the 3 wires and solder the other ends of the wires to the Memory Expansion Board. After the "Banker" is in place, attach the clips to the resistor leads on top of the board.
- () After determining which of the above methods or possibly one of your own, connect three (3) wires as follow:
- A. One wire from pad labeled AB on the Memory Expansion Board to pad labeled AB on the Banker board.
 - B. One wire from pad labeled CAS 0 on the Memory Expansion Board to pad labeled A0 on the Banker board. (not required for 256K)
 - C. One wire from pad labeled CAS 1 on the Memory Expansion Board to pad labeled A1 on the Banker board. (not required for 256K)

NOTE: Read the CAUTION page in the front of this manual before installing the memory chips.

- () Install memory chips in sockets U1-U16 for 512K or U1-U8 for 256K.
- () Carefully install cables W10, W11 and W12 as shown on Figure 4. Placement of cables in the CoCo where the memory chips that are not in a straight line is not critical. However, the black dot on the header must be in the pin one

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position.

- () Install the "Banker" in the SAM (74LS785) socket.
- () At this time, apply AC power to the computer and check that it comes up normally.

If all is well then refer to the User's Manual and perform the "Banktest". This program checks all 256K or 512K of memory.

If things are not well, refer to the troubleshooting section.

TROUBLESHOOTING PROCEDURES

I. Inoperable Computer

- A. Symptoms: System hangs up at power-on or garbage on screen
- B. Possible Cause:
 - 1. Faulty connection to SAM socket
 - 2. Faulty wiring to memory chips
 - 3. Bad SAM or memory chips
- C. Procedure: (Turn off power when handling the circuitry)
 - 1. Remove AB wire between Banker and pin 1 of memory and ground pin 1 of the memory chips.

If the computer is now operable, the problem is in the memory or the AB wire or AB circuitry on Banker.

If not operable, proceed to step 2.

- 2. Remove the Banker. Remove the SAM from the Banker and place it in the SAM socket of the computer.

If the computer is now operable, problem is in the Banker board. Visually inspect the board for unsoldered connections, solder splashes, bent pins on bottom socket, etc.

If not operable, proceed to step 3.

- 3. Remove the ground from pin 1 of the memory chips and tie it to +5V. Repeat step 2.

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If the computer is now operable the problem is in the memory chips.

If not operable and you have 512K, procede to Step 4. If you have 256K, the SAM is probably bad.

4. Swap A0 & A1.

If operable, the problem is in the memory.
If not operable, the SAM is probably bad.

II. Operable Computer - Can't switch BANKS

A. Possible Cause:

1. 64K switch ON
2. AB line from Banker tied to +5V or ground
(On most computers, pin 1 MUST NOT be re-inserted in the memory socket)
3. Electrolytic capacitor installed backwards (33uf or 47uf).
4. Unsoldered connections on Banker board or solder splashes shorting traces.

NOTE: J&R repair policy - minimum \$20 service charge plus \$3.00 shipping and handling charge and actual cost of parts for repairs not covered under warranty.

MEMORY EXPANSION BOARD
J & R ELECTRONICS
P/N 1006

AB	CBB	CBB	
8	1	0	TP1 TP2
PT	RB	RB	

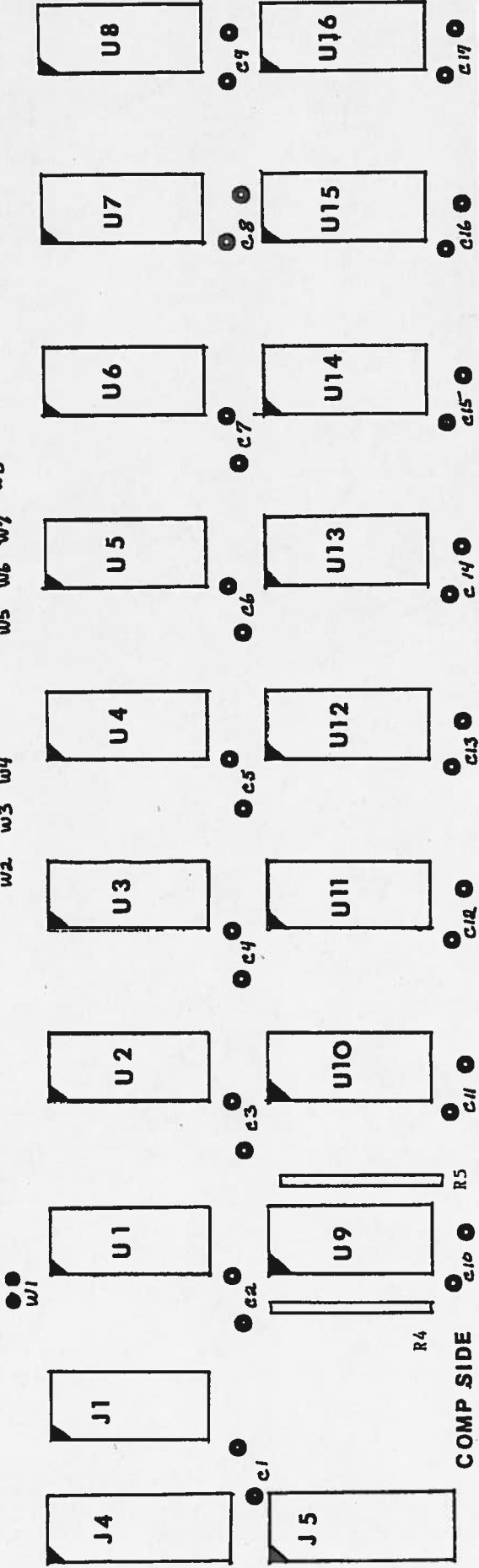
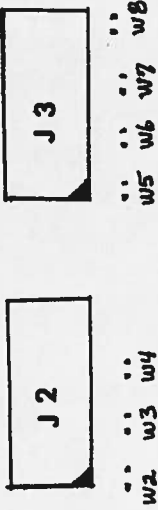
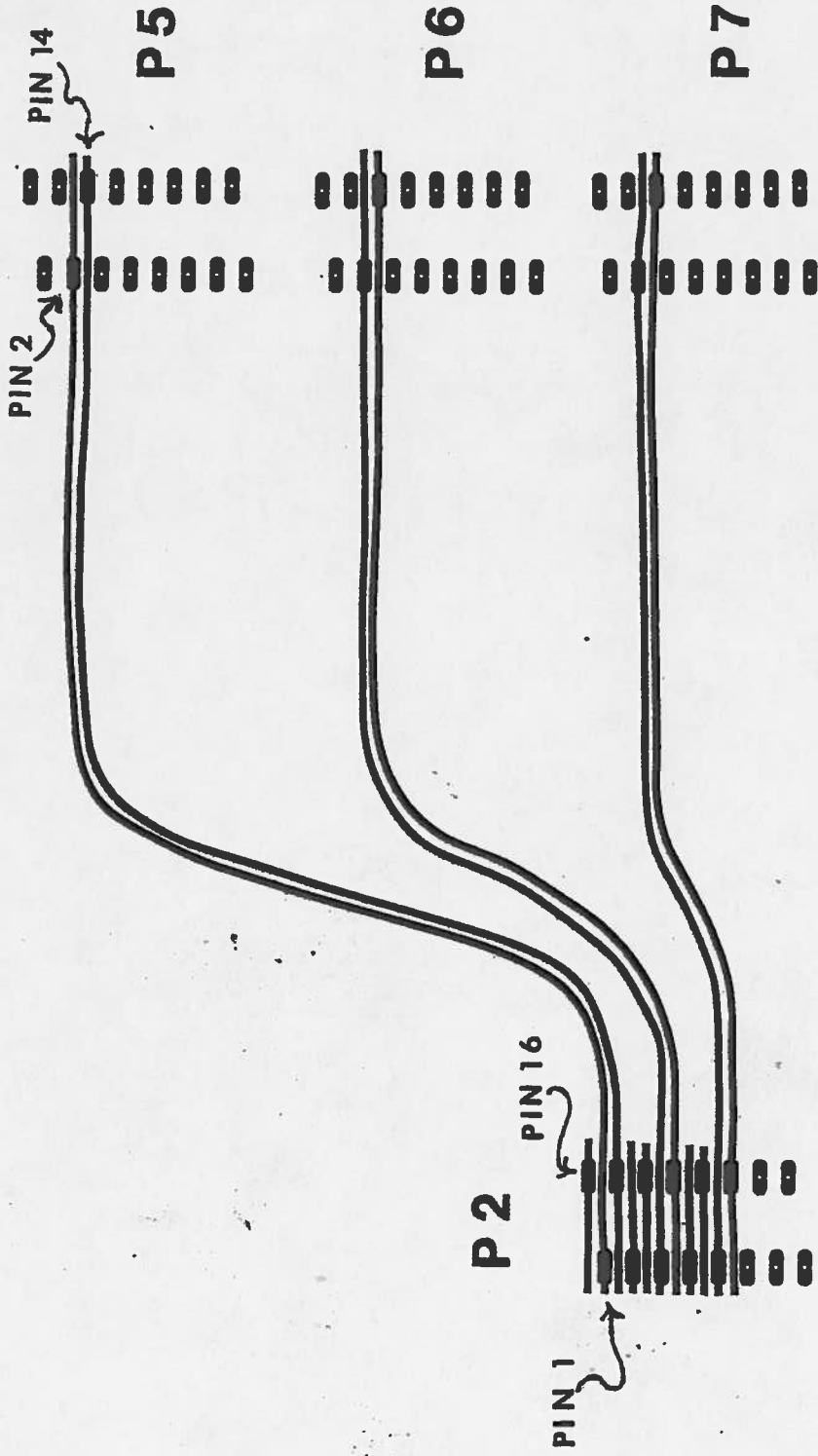
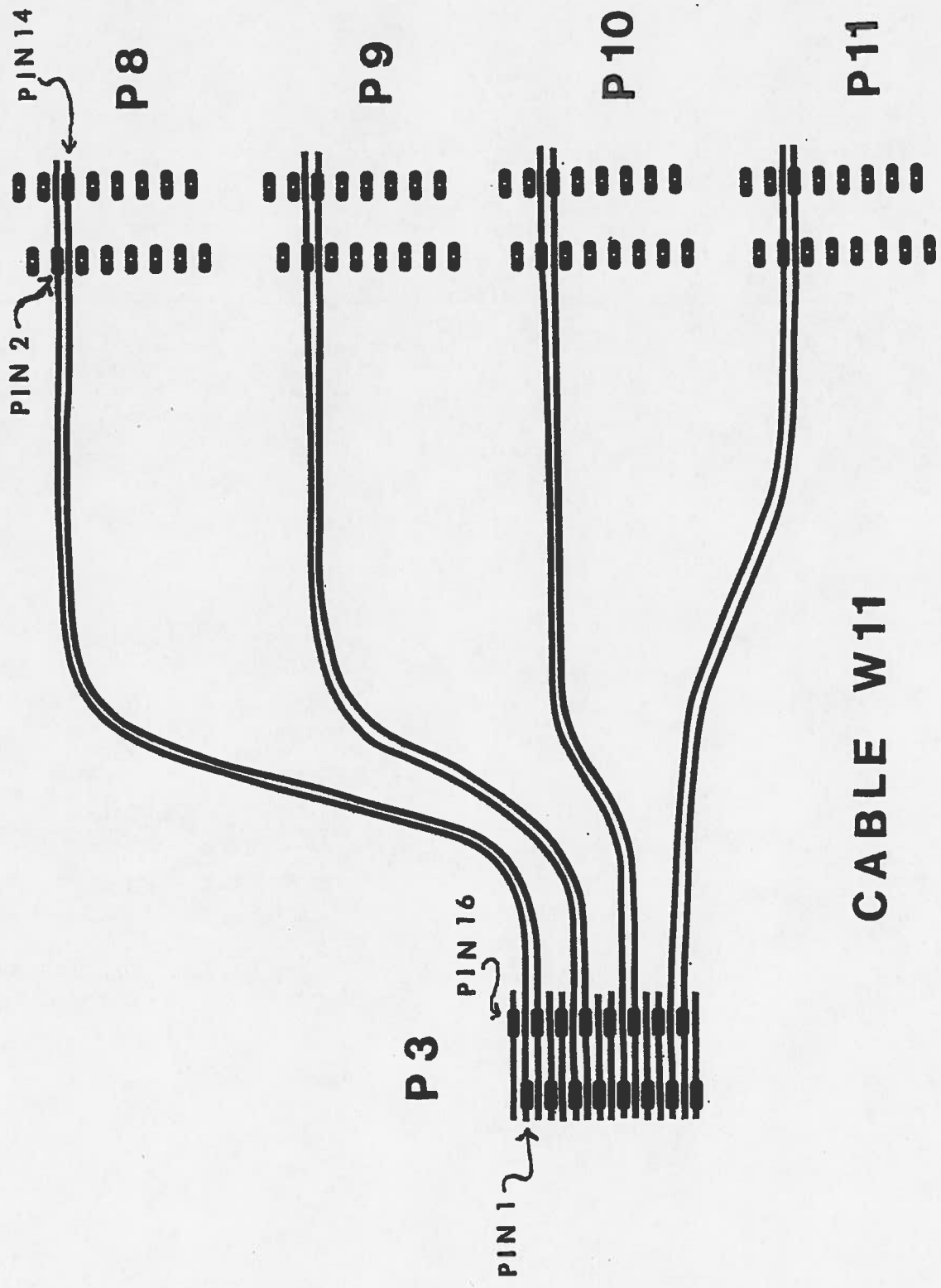


FIGURE 1



CABLE W10

FIGURE 2

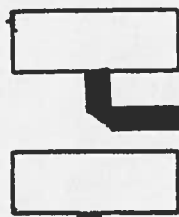


CABLE W11

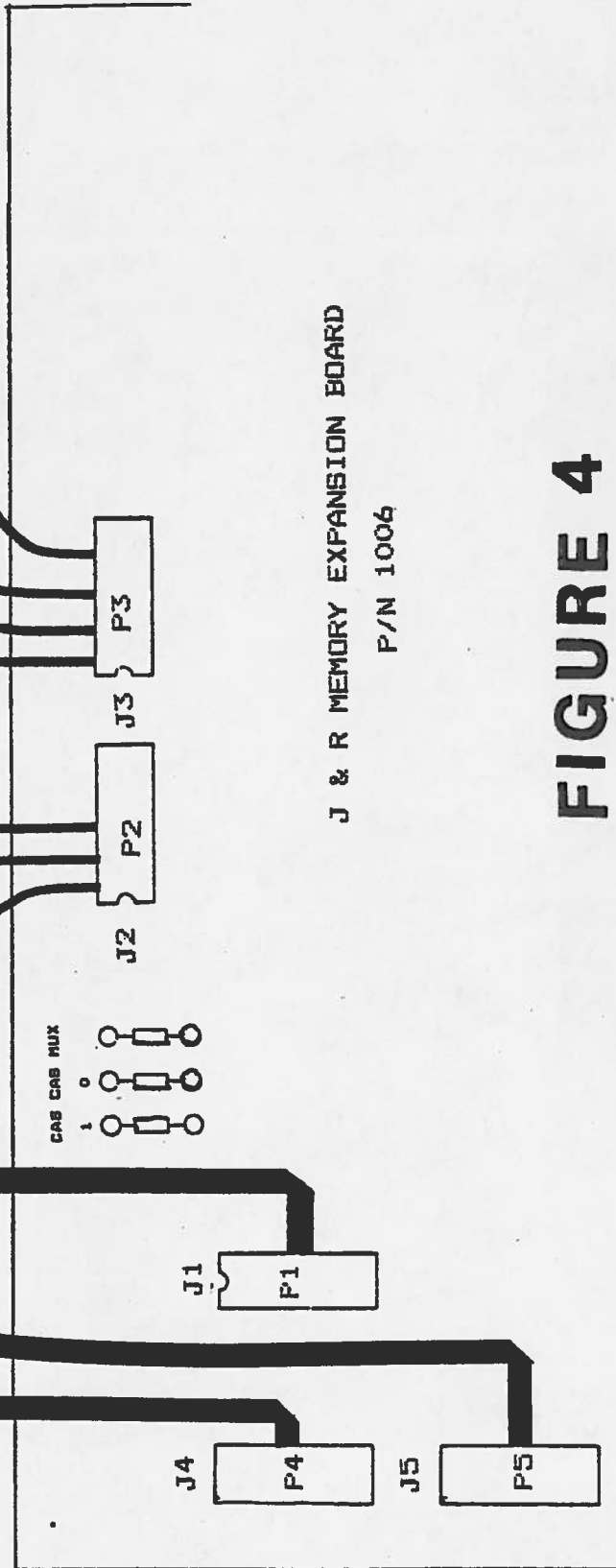
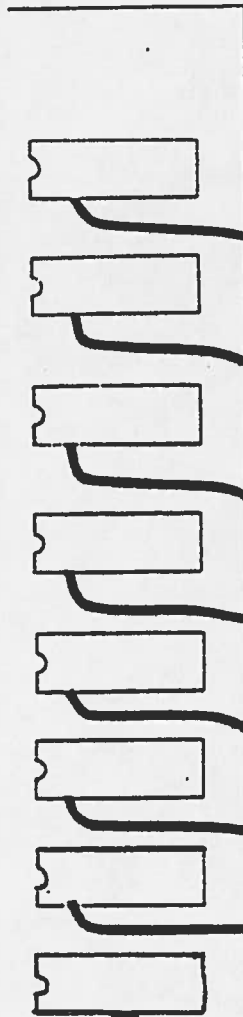
FIGURE 3

MEMORY CHIP SOCKETS LOCATED IN COMPUTER

2 MEMORY CHIP VERSION



8 MEMORY CHIP VERSION



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FIGURE 4