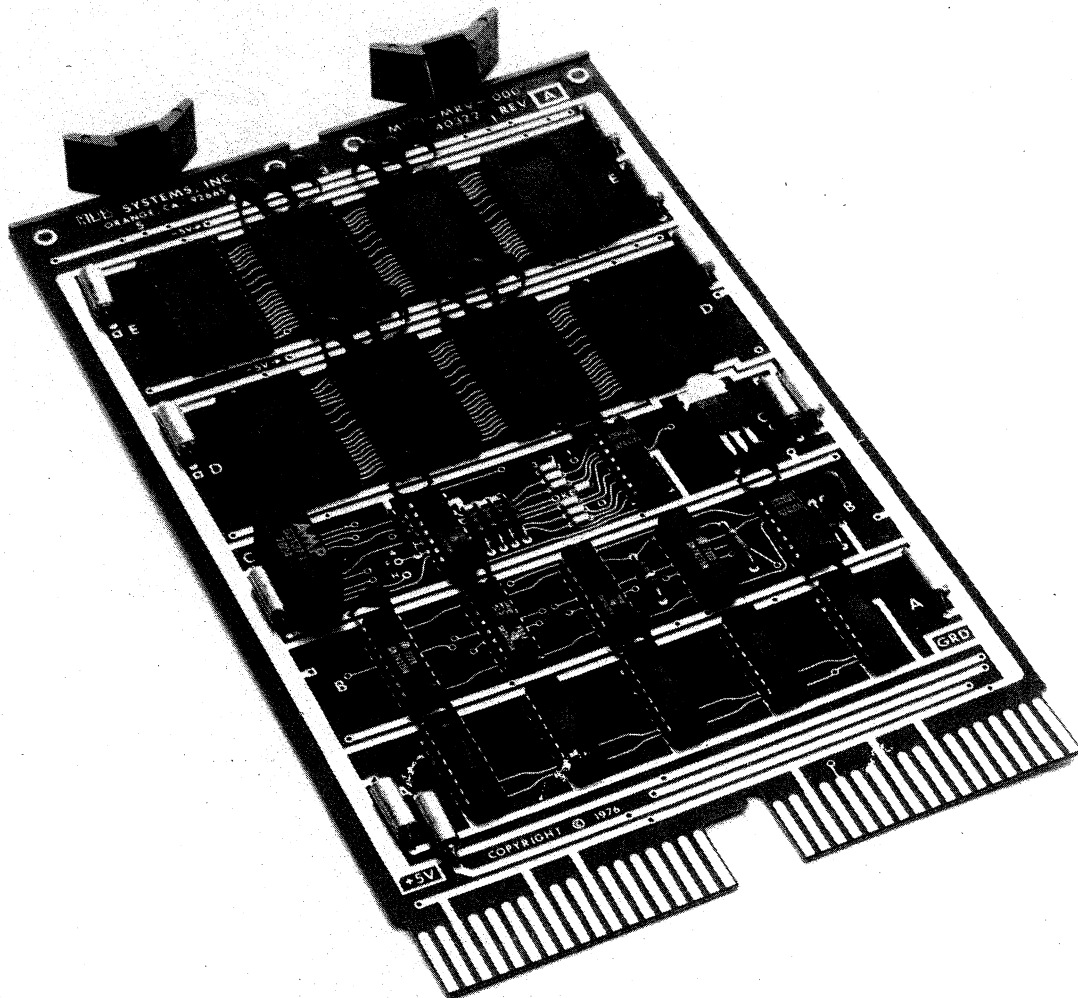


MDB

**MLSI-
MRV-000**
SEMICONDUCTOR MEMORY
MODULE

INSTRUCTION MANUAL



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MDB MLSI-MRV-000

SEMICONDUCTOR MEMORY MODULE

INTRODUCTION

The MDB MLSI-MRV-000 Semiconductor Memory Module provides PROM storage of up to 4k sixteen-bit words for a LSI-11 computer. PROM types accommodated by the module (in plug-in sockets) include 2704, 2708, 3624, and other equivalent ultraviolet-erasable PROM devices.

Features of the dual-height module include:

- capacity from 512 to 4k 16-bit words.
- memory area allocated by switch selection.
- on-board regulated -5VDC supply.
- standard LSI-11 supply voltages.

PHYSICAL DESCRIPTION

The MRV-000 is built on a single DEC-type dual module which is easily plugged into any of the 16 dual slots in an MDB BPA-84 Backplane/Cardguide Assembly. Power is received through backplane connectors at the designated post on the backplane terminal strip.

Power required from the backplane is:

- -12VDC, as required by memory devices.
- +5VDC at 400 ma, plus memory device requirements.

INSTALLATION

The following paragraphs contain instructions and information for connecting jumpers and setting switches that configure the module for its particular application, and instructions for installing the module.

CONNECTING JUMPERS

Jumpers are used to configure the module for the specific type of PROM device installed on the module. Tables 1, 2, and 3 list jumper connections required for Type 2704-, 2708-, and 3624-type devices, respectively.

Table 1 Jumper Connections for 2704-Type PROMs

Chip Select	Device Location	Decimal Range	Install Jumper
CS0	E5 & D5	0 – 511	2M-3M
CS1	E4 & D4	512 – 1023	2L-3L
CS2	E2 & D2	1024 – 1545	2J-3J
CS3	E1 & D1	1546 – 2047	2F-3F
			4F-4H 2K-3K 1H-2H 1N-2N

Table 2 Jumper Connections for 2708-Type PROMs

Chip Select	Device Location	Decimal Range	Install Jumper	Remove Jumper
CS0	E5 & D5	0 – 1023	2M-3M	
CS1	E4 & D4	1024 – 2047	2L-3L	
CS2	E2 & D2	2048 – 3071	2J-3J	
CS3	E1 & D1	3072 – 4095	2F-3F	
			1K-2K 2H-3H 2N-3N	4F-4H

Table 3 Jumper Connections for 3624-Type PROMs

Chip Select	Device Location	Decimal Range	Install Jumper	Remove Jumper
CS0	E5 & D5	0 – 511	2M-3M	
CS1	E4 & D4	512 – 1023	2L-3L	
CS2	E2 & D2	1024 – 1545	2J-3J	
CS3	E1 & D1	1546 – 2047	2F-3F	
Remove LM320T regulator IC1 Remove capacitor C4 and connect jumper across its pads.			1N-2M C4 pads 5L-5K 5H-5J	5M-5L 5F-5H

ALLOCATING MEMORY AREAS

Table 4 gives settings of the Hexidecimal-coded switch used to allocate memory areas. Set the switch to allocate memory to fit your system. Settings are the same for 2704-, 2708- and 3624-type devices, except where noted for 2704-type devices.

Table 4 Switch Settings for Memory Allocation

Switch Position	4K Range	Address Range
0	0 – 4K	000000 – 017776
1	4K – 8K	020000 – 037776
2	8K – 12K	040000 – 057776
3	12K – 16K	060000 – 077776
4	16K – 20K	100000 – 117776
5	20K – 24K	120000 – 137776
6	24K – 28K	140000 – 157776
7	28K – 32K	160000 – 177776
8	0 – 4K	010000 – 027776
9	4K – 8K	030000 – 047776
A	8K – 12K	050000 – 067776
B	12K – 16K	070000 – 107776
C	16K – 20K	110000 – 127776
D	20K – 24K	130000 – 147776
E	24K – 28K	150000 – 167776
F	28K – 32K	170000 – 177776





For 2704-type devices only, switch positions 0-7 select *lower* 512 address for each 1K block. Positions 8-F select *upper* 512 address for each 1K block.

INSTALLING THE MODULE

After the module has been prepared for its application (that is, jumpers have been prepared and memory has been allocated), plug the module into any dual slot in the BPA-84 Backplane/Cardguide Assembly. The module is then ready for operation.

Refer to table 5 for backplane bus pin assignments.

Table 3 Backplane Bus Pin Assignments

Pin	Signal	Pin	Signal
AJ2	BSYNCL	BR2	DAL11L
AH2	BDINL	BS2	DAL12L
AF2	BRPLYL	BT2	DAL13L
AR1	BREFL	BU2	DAL14L
AR2		BV2	DAL15L
AS2		BB2	-12VDC
AM2		AB2	-12VDC
AN2		AD2	+12VDC
AU2	DAL00L	BD2	+12VDC
AV2	DAL01L	BA2	+5VDC
BE2	DAL02L	AA2	+5VDC
BF2	DAL03L	BC2	GRD
BH2	DAL04L	BT1	GRD
BJ2	DAL05L	BM1	GRD
BK2	DAL06L	BJ1	GRD
BL2	DAL07L	AT1	GRD
BM2	DAL08L	AM1	GRD
BN2	DAL09L	AJ1	GRD
BP2	DAL10L	AC2	GRD

OPERATION

Bit assignments for using PROM devices are as follows:

- For 2708-type devices –

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
BANK SELECT			CHIP SELECT		CHIP ADDRESS										NOT USED

- For 2704- and 3624-type devices –

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
BANK SELECT (0-F)			UPPER/ LOWER (8-F)	CHIP SELECT		CHIP ADDRESS									NOT USED

Figure 1 shows the general organization of logic on the MRV-000 Semiconductor Memory Module.

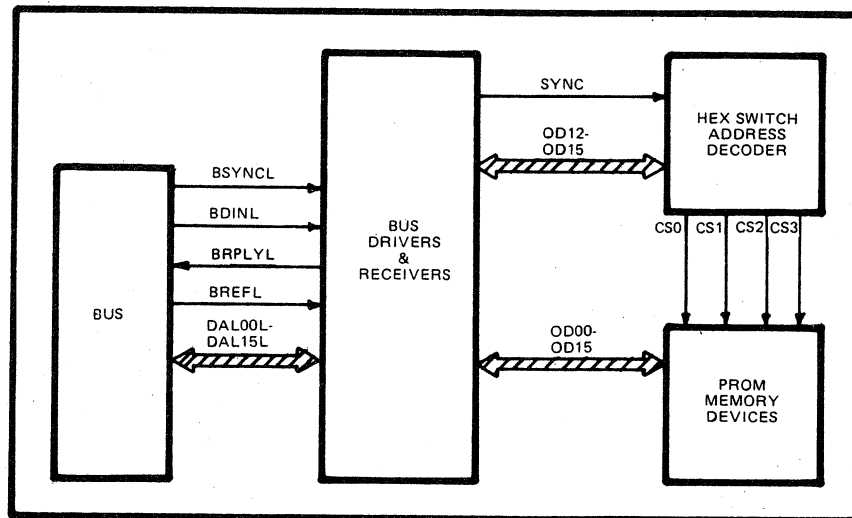
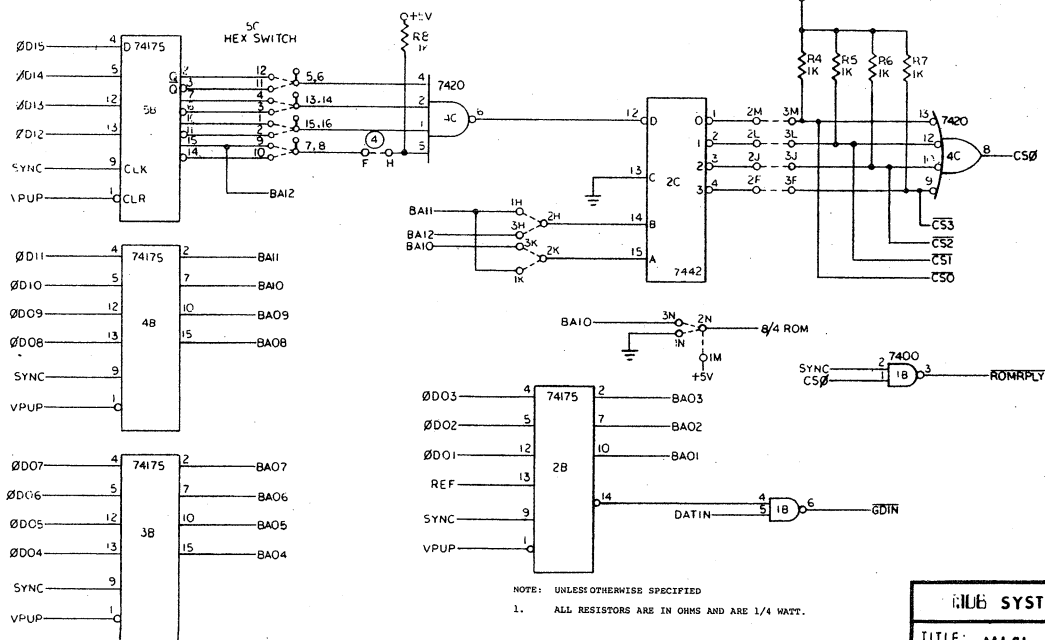
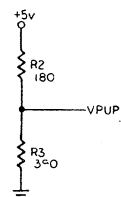
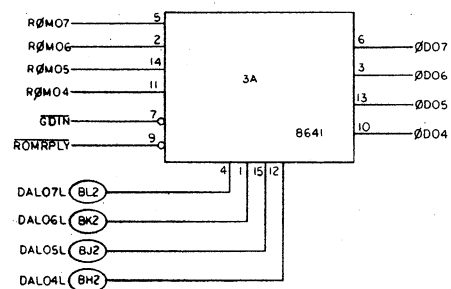
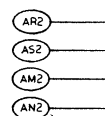
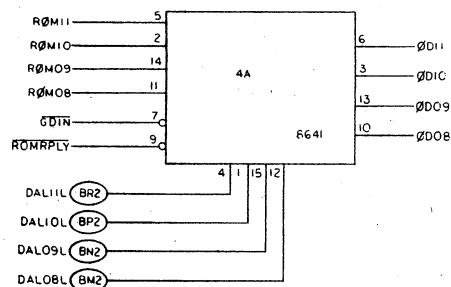
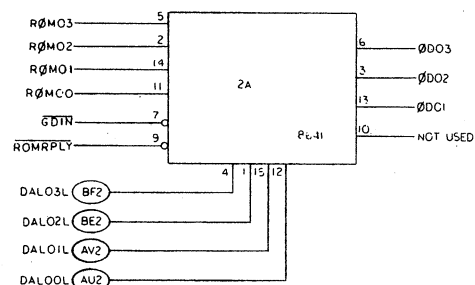


Figure 1 MLSI-DRV-000 Semiconductor Memory Module,
Functional Block Diagram

MAINTENANCE

The Semiconductor Memory Module is easily checked-out and diagnosed using system diagnostic software. For troubleshooting, refer to the assembly and logic diagrams contained in this Instruction Manual.

Repair the module using appropriate skills, techniques, and materials. If you wish MDB Systems to repair the module, first notify MDB Systems' Customer Service. Then pack the module carefully, along with your best evaluation of trouble symptoms, and ship it prepaid to MDB Systems.



NOTE: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE IN OHMS AND ARE 1/4 WATT

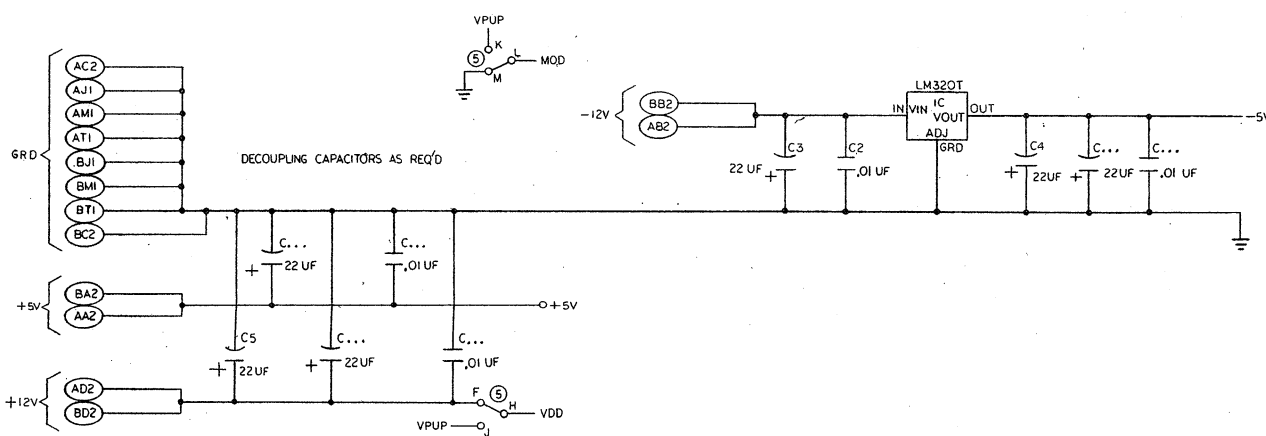
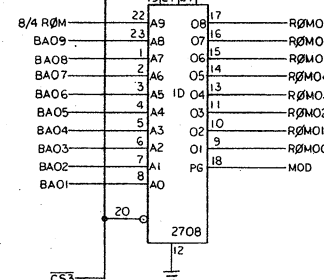
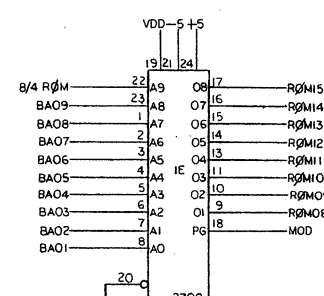
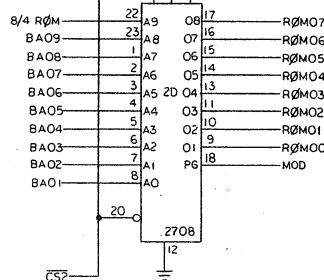
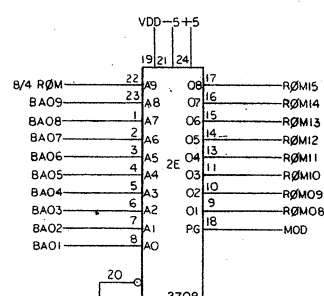
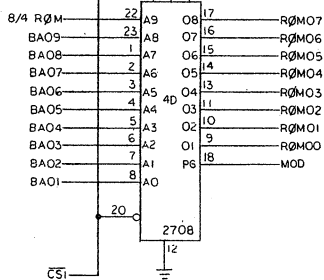
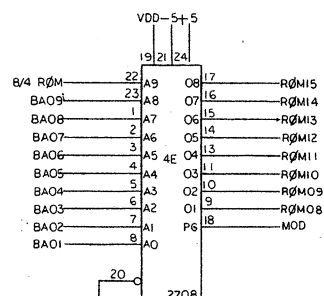
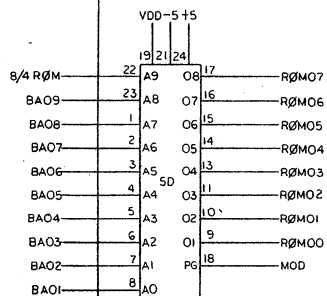
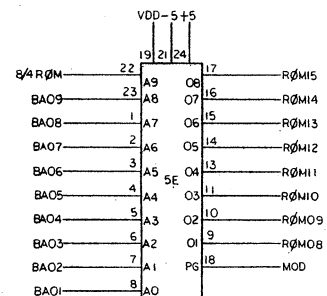
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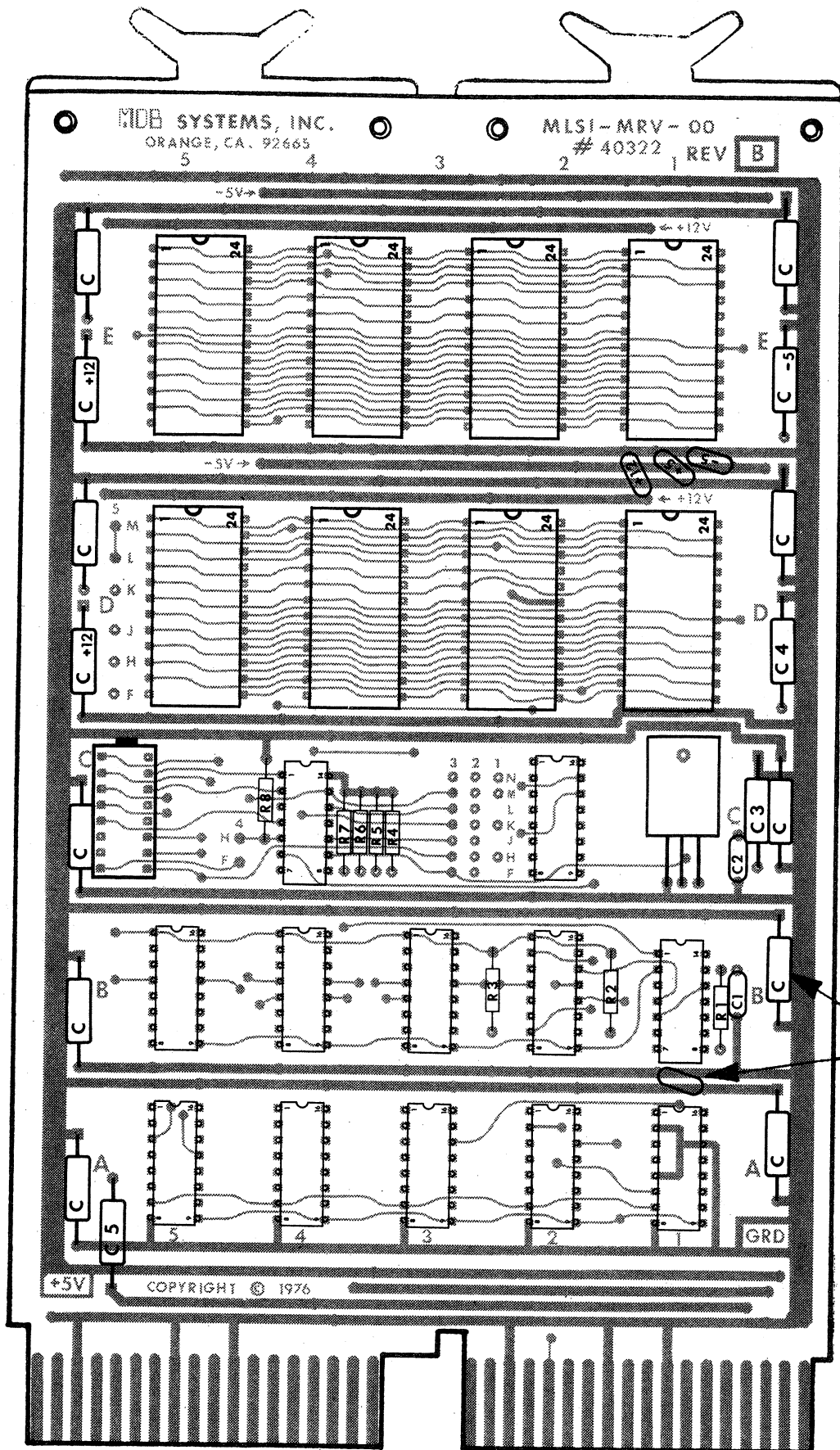
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2708:
PIN 12 = VSS
PIN 19 = VDD
PIN 21 = VBB
PIN 24 = VCC

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