DEC-8L-H8AA-D

BA08
PERIPHERAL EXPANDER OPTION FUNCTIONAL DESCRIPTION

DIGITAL EQUIPMENT CORPORATION ▫ MAYNARD, MASSACHUSETTS

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BA08
PERIPHERAL EXPANDER

INTRODUCTION

The BA08 Peripheral Expander option (Figure 1) is used with the PDP-8/L Programmed Data Processor for installation of one or more of a group of PDP-8/L options that cannot be installed directly in the PDP-8/L.

DESCRIPTION

Physical

The BA08 is the same size as the PDP-8/L and is similar in appearance except for a blank front panel. A power switch is the only control on the BA08 front panel. Installation can be in the same rack with the PDP-8/L or, when table-top installation is used, a cover (Super Chassis Assembly) is available for the BA08.

A number of modules are required as part of the BA08. These modules are shown in bold relief in Figure 2 and are listed in Table 1.

The PDP-8/L options requiring the use of the BA08 are listed in Table 2. The types, quantities and locations of modules required for each of these options are also listed in this table.

The listed options can be installed in the BA08 at the same time, except where variations of a major option are mutually exclusive. For example, only one KW8/L Real-Time Clock option can be used at a time, and only one MC8/L Memory Extension option can be installed at a time. Similarly, the VC8/L and KV8/L option are mutually exclusive.

The BA08 provides interface connections to the PDP-8/L and power for the modules used the applicable options. A power supply identical to the power supply of the PDP-8/L is contained in the BA08.

Logic

The logic circuits of the BA08 are limited to bus driver circuits, inverters, loads, and diode clamps. Signal amplification for interfacing signals is provided by the bus driver circuits shown on engineering drawing D-MU-BA08-0-2. Descriptions of the logic circuits used by the various options that plug into the BA08 can be found in the Functional Descriptions for the respective options.

MAINTENANCE

Maintenance procedures pertaining to the PDP-8/L also apply to the BA08. When routine preventive maintenance procedures are performed for the PDP-8/L, the BA08 should be included in the procedures.

ENGINEERING DRAWINGS

The following drawings concerning the BA08 are included in this section.

Drawing Number	Title
D-IC-BA08-0-2	I/O Connectors BA08
D-MU-BA08-0-4	Module Utilization BA08
D-CS-M002-0-1	15 Loads
B-CS-M111-0-1	Inverter
C-CS-M623-0-1	Bus Driver
B-CS-M906-0-1	Cable Terminator
B-CS-M907-0-1	Diode Clamp

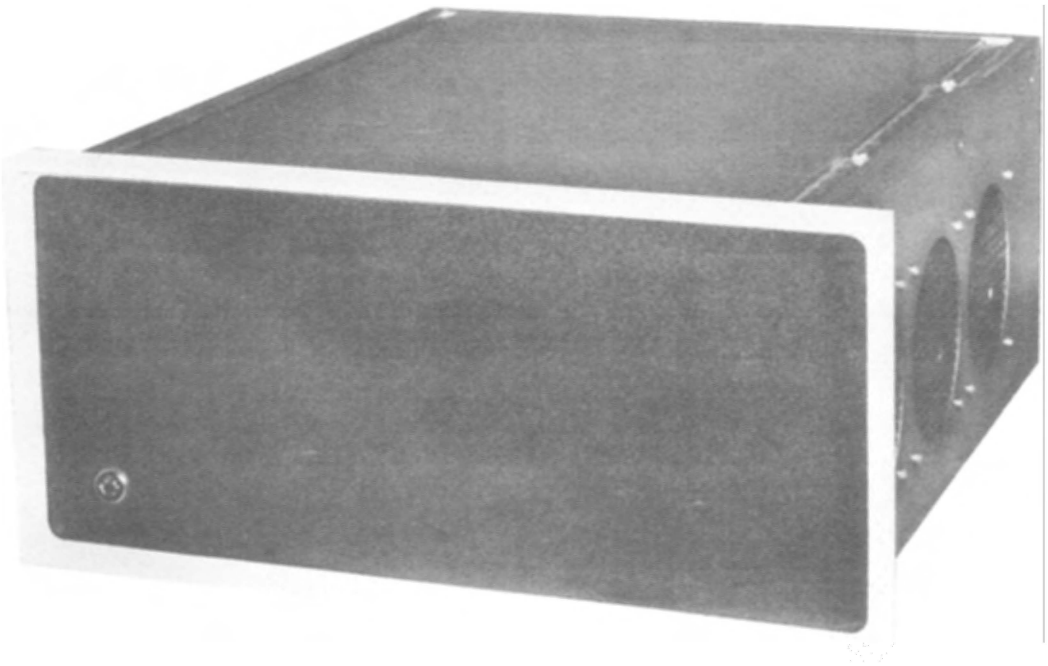


Figure 1 BA08 Peripheral Expander

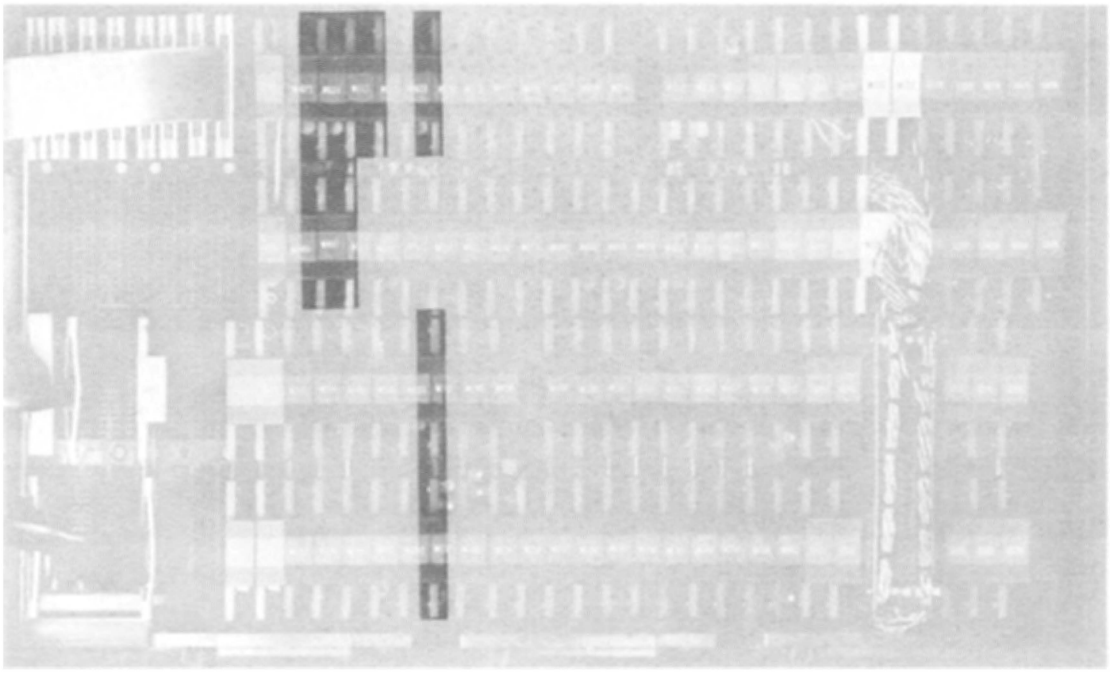


Figure 2 BA08 Modules

Table 1
BA08 Peripheral Expander Modules

Quantity	Module Type Number	Use	Location	
			Row	Slot
1	M002	15 Loads	D	23
1	M111	Inverter	A	25
4	M623	Bus Driver	A	23
			A	26
			A	27
			C	23
1	M906	Cable Terminator	B	27
1	M907	Diode Clamp	B	26

Table 2
List of Options and Control Logic Modules Used in the BA08

Option	Module	Use	Location	
			Row	Slot
CR8/L Card Reader and Control This option allows the PDP-8/L to read 12 row, 80 column punched cards at a nominal rate of 200 cards per minute.	M714	Control for CR	D	20
	M716	Control for CR	C	19
	W991	CR Cable Assembly	C	32
			D	32
DC02 Multiple Teletype Controls This option allows the PDP-8/L user to add from one to four Teletype-writers or other serial data stations. This option consists of a DC02-A Multiple Control and from one to four DC02-D Data Stations.				

Table 2 (Cont)

Option	Module		Location	
			Row	Slot
DC02-A Multiple Control				
TheDC02-A selects each DC02-D	M002	15 Loads	B	18
Data Station and controls its opera-	M111	Inverter	B	21
tion. Its logic accepts input/output	M113	10 2-input NAND	B	19
and station selection instructions		Gates		
from the PDP-8/L and returns DC02-D	M117	6 2-input NAND	B	22
data and status information to the		Gates		
computer.			B	23
			B	25
	M216	Six Flip-Flops	B	20
	M452	Variable Clock	C	10
			D	10
	M623	Bus Driver	B	24
DC02-D Data Station				
The DC02-D assembles serial data	M623	Bus Driver	B	14
from an ASR 33 Teletype keyboard			B	15
or perforated tape reader into paral-			B	16
lel form for transmission to the			B	17
Computer.	M706	Teletype Receiver	CD	11
			CD	13
			CD	15
			CD	17
	M707	Teletype Transmitter	CD	12
			CD	14
			CD	16
			CD	17
	W076	Teletype Connector	D	33
			D	34
			D	35
			D	36
KV8/LA Storage Tube Display Control Logic only (required for VT01 Storage Tube Display)				

Table 2 (Cont)

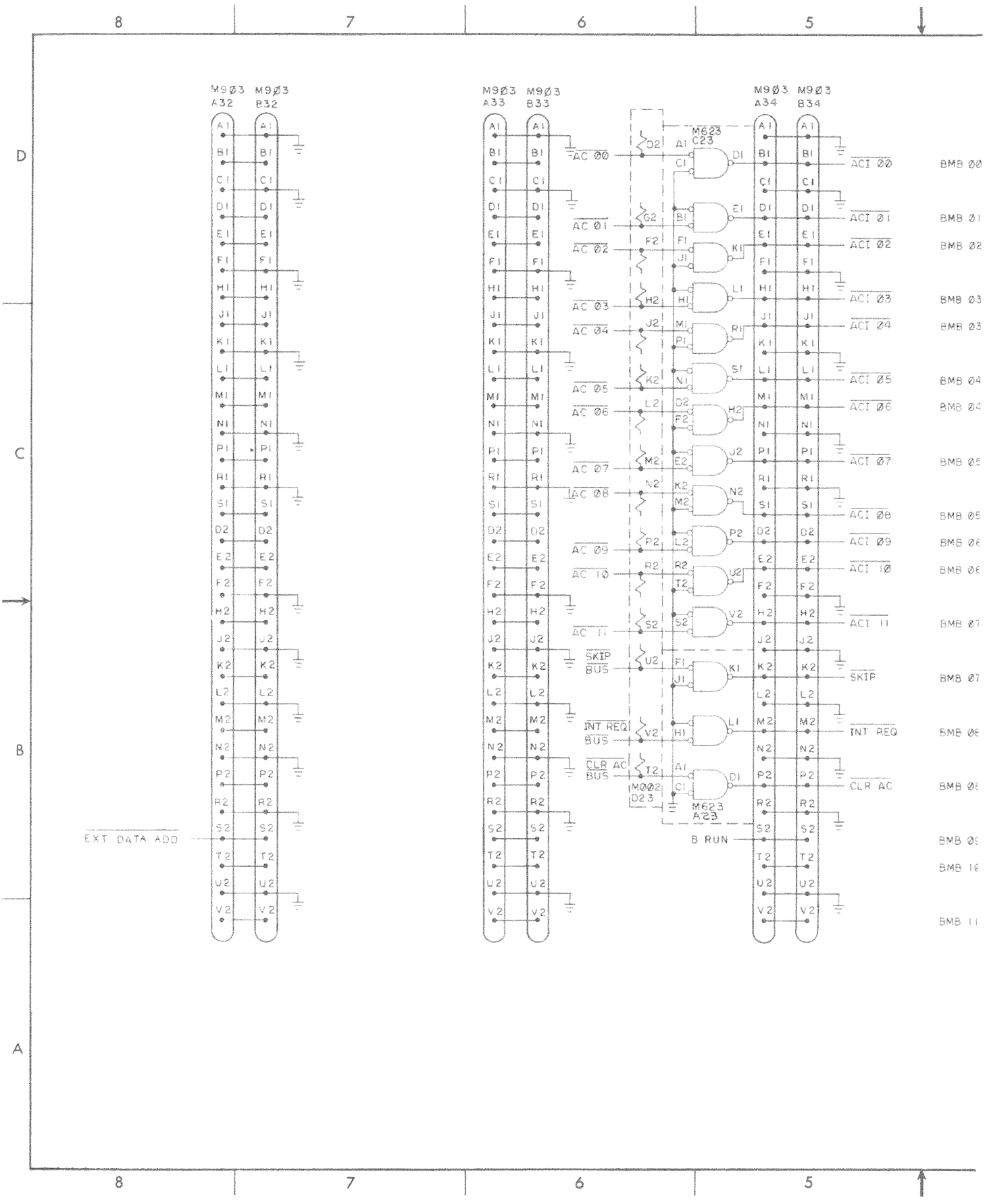
Option	Module		Location	
			Row	Slot
KW8/LA Real-Time Clock Fixed-Interval Line-Frequency This option allows the PDP-8/L to establish a reference time to be used to associate data with real time.	M501 M708	Schmitt Trigger Clock Control	D C	24 24
KW8/LB Real-Time Clock Fixed-Interval Variable-Frequency	M401 M708	Clock Clock Control	D C	24 24
KW8/LC Real-Time Clock Fixed-Interval Crystal-Frequency	M405 M708	Crystal Clock Clock Control	D C	24 24
KW8/LD Real-Time Clock Programable Interval Line-Frequency	M501 M708 M709	Schmitt Trigger Clock Control Clock Counter	D C CD	24 24 25
KW8/LE Real-Time Clock Programable Interval Variable-Frequency	M401 M708 M709	Clock Clock Control Clock Counter	D C CD	24 24 25
KW8/LF Real-Time Clock Programable Interval Crystal-Frequency	M405 M708 M709	Crystal Clock Clock Control Clock Counter	D C CD	24 24 36
MC8/LA Memory Extension Control and 4096 Words of Memory Without Memory Parity This option provides the PDP-8/L with an additional 4096 (4K) memory without parity.	G020*	Sense Amplifier	A A A B B B	8 9 10 8 9 10
	G221*	Memory Selector	C C C C D D D D	3 4 8 9 3 4 8 9

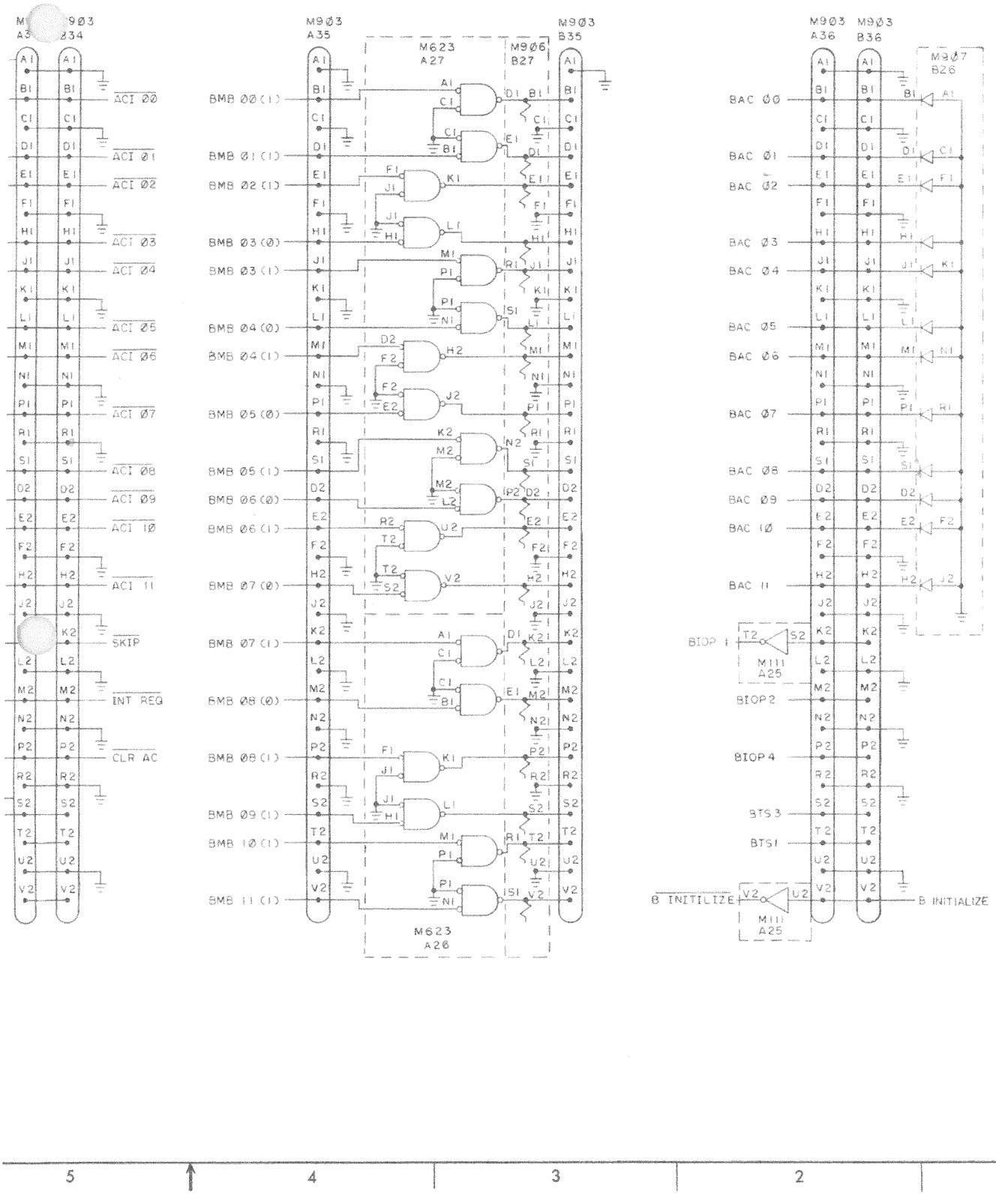
Table 2 (Cont)

Option	Module		Location	
			Row	Slot
MC8/LA (Cont)	G228*	Inhibit Driver		
			A	5
			B	4
			B	5
			C	2
			D	2
	G610*	A-Diode Board	CD	5
	G611*	B-Diode Board	CD	7
	G624	Resistor Board	A	2
			A	3
			B	2
			B	3
	G785*	Power Connector	AB	28
	G826*	Regulator Control	AB	1
	M111*	Inverter	A	24
			A	25
	M113*	10-2-Input NAND Gates	A	21
			A	22
			B	13
	M115*	8 3-Input NAND Gates	A	19
	M117*	6 4-Input NAND Gates	A	18
			A	20
	M216*	Six Flip-Flops	A	16
			A	17
			B	12
	M310*	Delay Line	A	13
			A	14
	M360*	Variable Delay	A	12
	M617*	6 4-Input NOR Buffer	B	11
	M903*	Cable Connector to	AB	29
		Central Processor	AB	30
			AB	31
	W025*	Cable Connector for	AB	6
		Memory Stack	AB	7
	30005256-1	12-Bit Memory Stack	CD	6

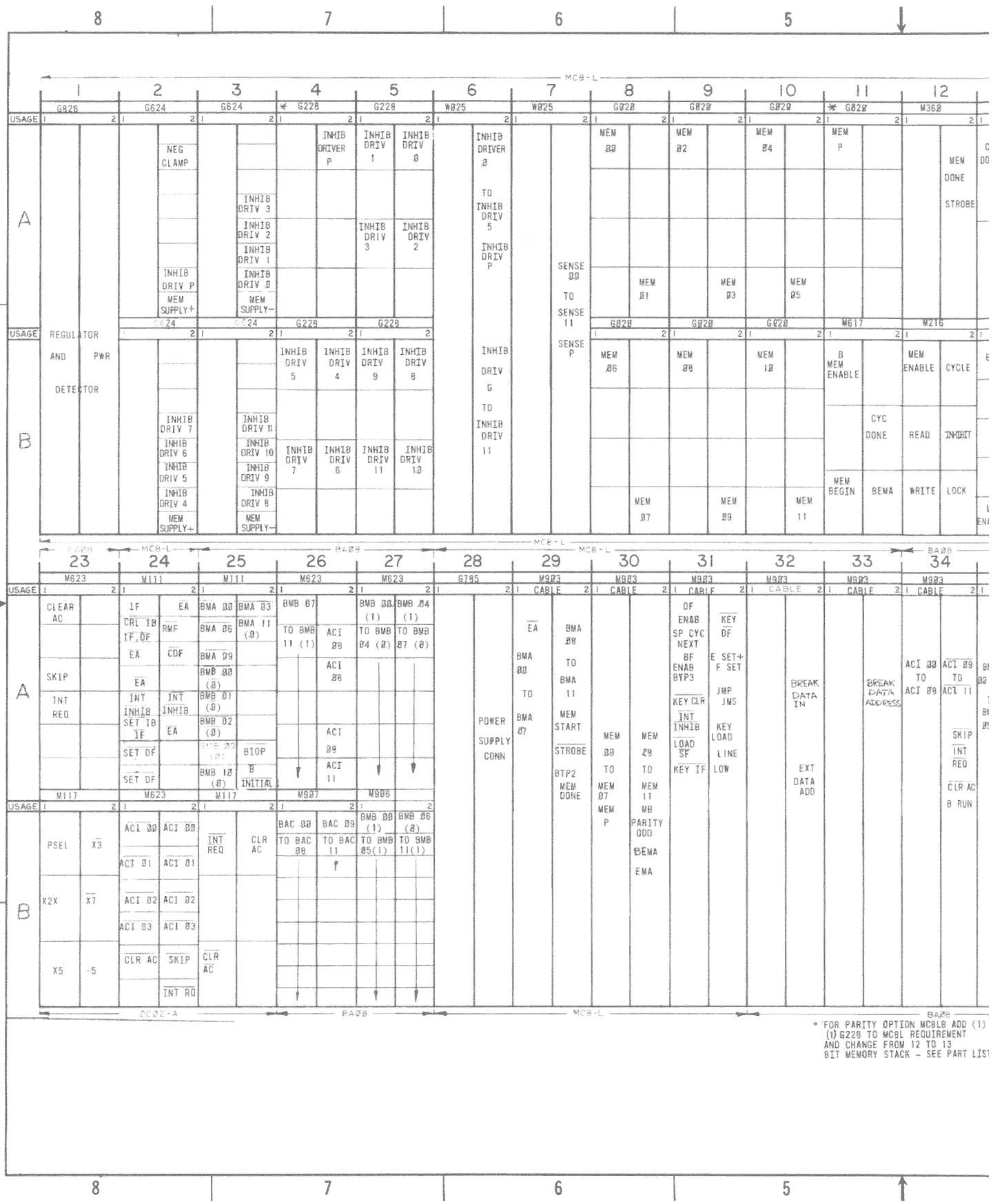
Table 2 (Cont)

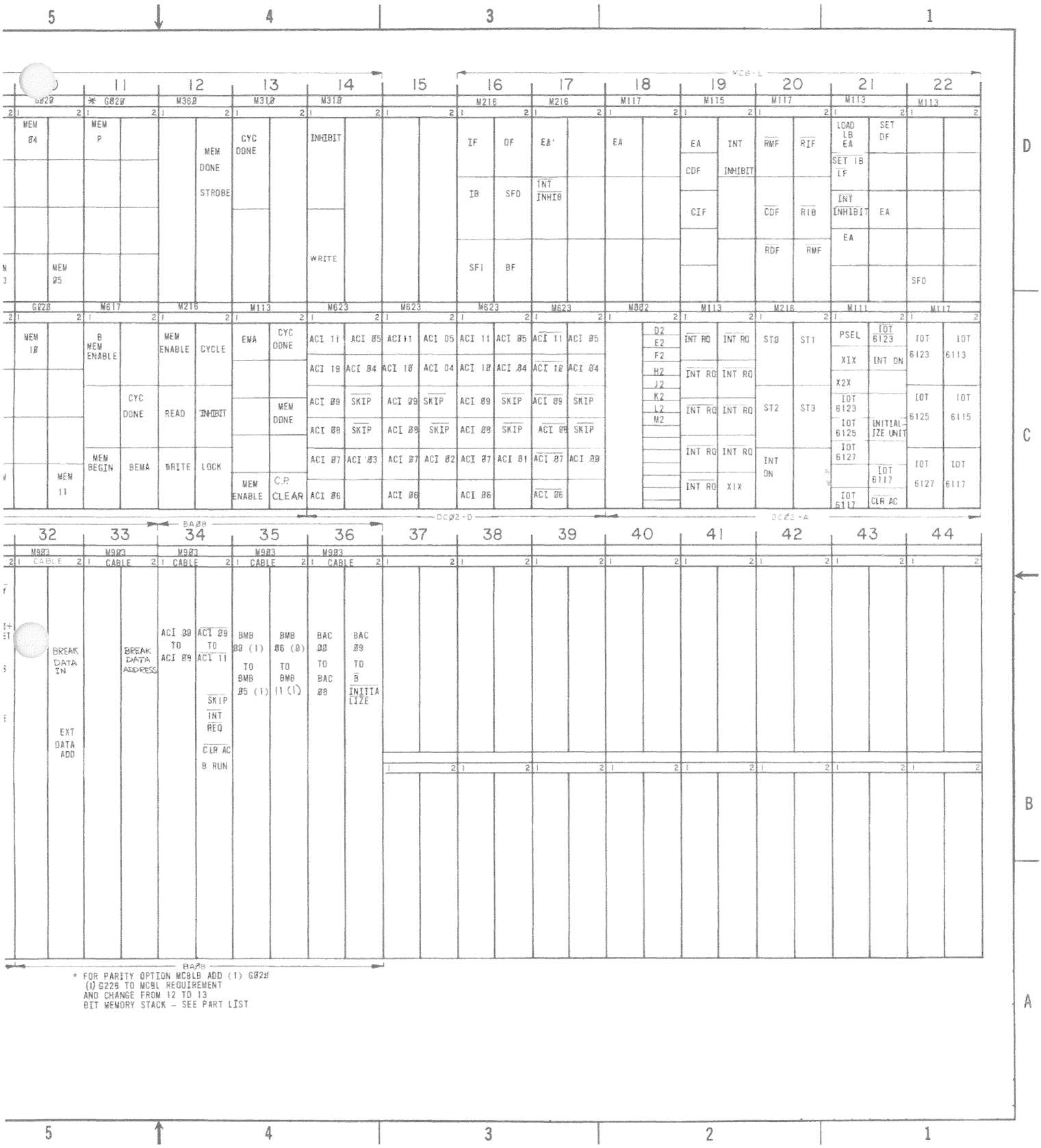
Option	Module		Location	
			Row	Slot
MC8/LB Memory Extension Control and 4096 Words of Memory with Memory Parity This option provides the PDP-8/L with an additional 4096 (4K) memory with Parity.	G020 G228 30005256-1 *	Sense Amplifier Inhibit Driver 13-Bit Memory Stack The modules marked with an asterisk are also used in the MC8/LB in the same locations.	A A CD	11 4 6
VC8/LA Oscilloscope Display and Control This option allows the PDP-8/L to display and plot data on an oscilloscope Display.	A607 M701 W020	10-Bit D-A Converter Display Control Indicator Cable Connector	CD CD CD C	28 29 27 36
VC8/LB Oscilloscope Display Control (without display)	M701 W020	Display Control Indicator Cable Connector	CD C	27 36
VP8/L Incremental Plotter Control This option allows the PDP-8/L to plot and display data on an Incremental Recorder.	M023 M704	 Plotter Control	C CD	35 26


8
7
6
5
D
C
B
A
M9Ø3 A32
M9Ø3 B32
M9Ø3 A33
M9Ø3 B33
M9Ø3 A34
M9Ø3 B34
EXT DATA ADD
AC Ø0
AC Ø1
AC Ø2
AC Ø3
AC Ø4
AC Ø5
AC Ø6
AC Ø7
AC Ø8
AC Ø9
AC 10
AC 11
SKIP BUS
INT REQ BUS
CLR AC BUS
M623 C23
M623 A23
M002 D23
B RUN
ACI Ø0
ACI Ø1
ACI Ø2
ACI Ø3
ACI Ø4
ACI Ø5
ACI Ø6
ACI Ø7
ACI Ø8
ACI Ø9
ACI 10
ACI 11
SKIP
INT REQ
CLR AC
BMB Ø0
BMB Ø1
BMB Ø2
BMB Ø3
BMB Ø3
BMB Ø4
BMB Ø4
BMB Ø5
BMB Ø5
BMB Ø6
BMB Ø6
BMB Ø7
BMB Ø7
BMB Ø8
BMB Ø8
BMB Ø9
BMB 10
BMB 11

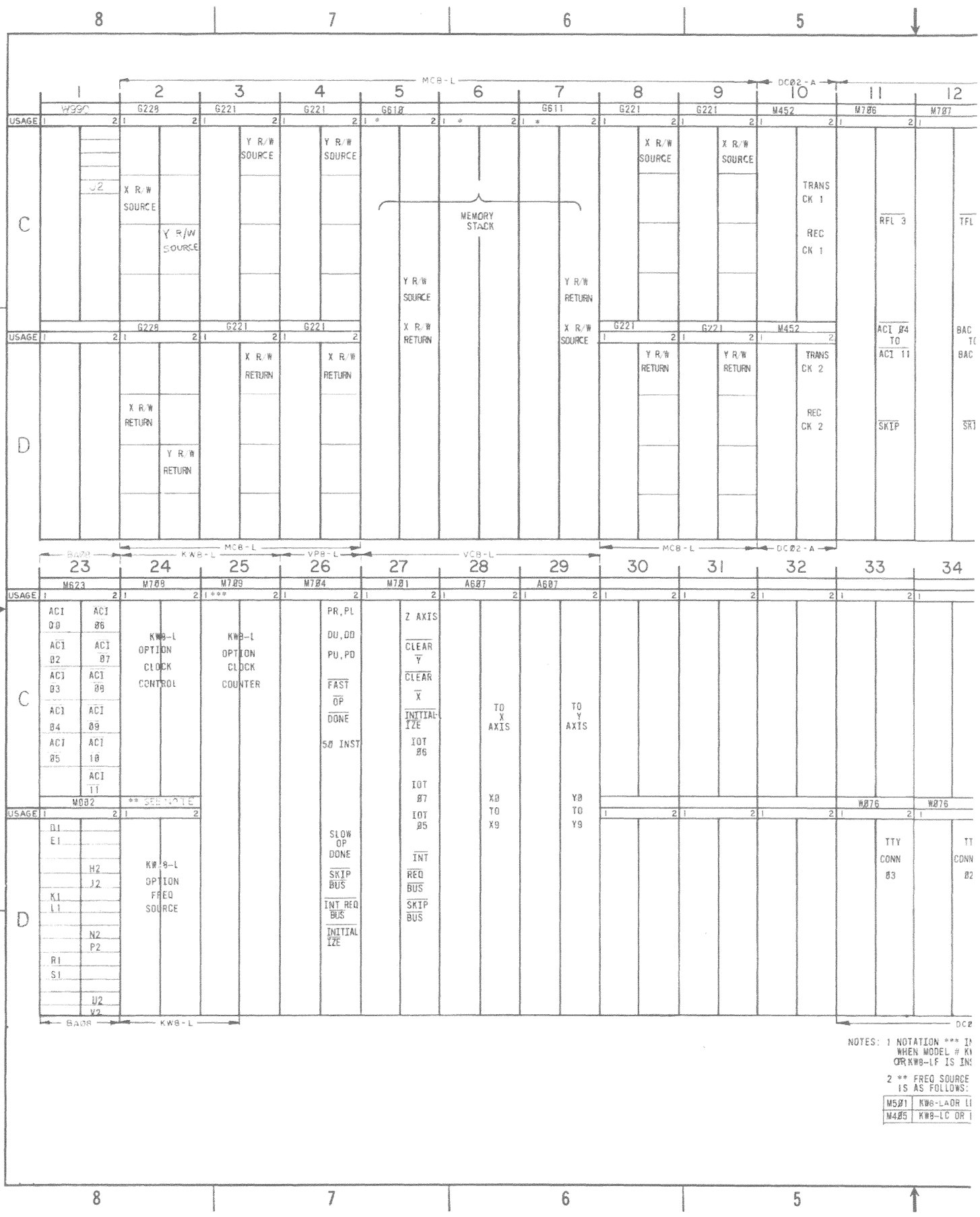


D-IC-BA08-0-2 I/O Connectors BA08


MCB-L
1 G826
2 G624
3 G624
4 * G228
5 G228
6 W025
7 W025
8 G020
9 G020
10 G020
11 * G020
12 M360
USAGE
NEG CLAMP
INHIB DRIV P
MEM SUPPLY+
INHIB DRIV 3
INHIB DRIV 2
INHIB DRIV 1
INHIB DRIV 0
MEM SUPPLY−
INHIB DRIVER P
INHIB DRIV 1
INHIB DRIV 3
INHIB DRIV 2
INHIB DRIVER 0
TO INHIB DRIV 5
INHIB DRIV P
SENSE 00 TO SENSE 11
SENSE P
MEM 00
MEM 01
MEM 02
MEM 03
MEM 04
MEM 05
MEM P
MEM DONE
STROBE
REGULATOR AND PWR DETECTOR
INHIB DRIV 7
INHIB DRIV 6
INHIB DRIV 5
INHIB DRIV 4
INHIB DRIV 11
INHIB DRIV 10
INHIB DRIV 9
INHIB DRIV 8
INHIB DRIV 5
INHIB DRIV 4
INHIB DRIV 9
INHIB DRIV 8
INHIB DRIV 7
INHIB DRIV 6
INHIB DRIV 11
INHIB DRIV 10
INHIB DRIVER G TO INHIB DRIV 11
MEM 06
MEM 07
MEM 08
MEM 09
MEM 10
MEM 11
B MEM ENABLE
CYC DONE
MEM BEGIN
MEM ENABLE
CYCLE
READ
INHIBIT
BEMA
WRITE
LOCK
MCB-L
BA08
13 M623
14 M111
15 M111
16 M623
17 M623
18 G785
19 M903 CABLE
20 M903 CABLE
21 M903 CABLE
22 M903 CABLE
23 M903 CABLE
24 M903 CABLE
CLEAR AC
SKIP
INT REQ
IF
CRL IB IF, DF
EA
INT INHIB
SET IB IF
SET DF
RMF
CDF
INT INHIB
EA
BIOP
B INITIAL
BMA 00
BMA 06
BMA 09
BMB 00 (0)
BMB 01 (0)
BMB 02 (0)
BMB 03 (0)
BMB 10 (0)
BMA 03
BMA 11 (0)
BMB 07
TO BMB 11 (1)
BMB 00 (1)
TO BMB 04 (0)
BMB 04 (1)
TO BMB 07 (0)
ACI 08
ACI 09
ACI 10
ACI 11
POWER SUPPLY CONN
EA
BMA 00
TO BMA 07
BMA 08
TO BMA 11
MEM START
STROBE
BTP2
MEM DONE
MEM 00 TO MEM 07
MEM P
MEM 08 TO MEM 11
MB PARITY ODD
BEMA
EMA
DF ENAB
SP CYC NEXT
BF ENAB BTP3
KEY CLR
INT INHIB
LOAD SF
KEY IF
KEY DF
E SET+F SET
JMP JMS
KEY LOAD
LINE LOW
BREAK DATA IN
EXT DATA ADD
BREAK DATA ADDRESS
ACI 00 TO ACI 09
ACI 09 TO ACI 11
SKIP
INT REQ
CLR AC
B RUN
PSEL
X3
X2X
X7
X5
X5
ACI 00
ACI 01
ACI 02
ACI 03
CLR AC
SKIP
INT RQ
INT REQ
CLR AC
BAC 00 TO BAC 08
BAC 09 TO BAC 11
BMB 00 (1) TO BMB 05 (1)
BMB 06 (0) TO BMB 11 (1)
DC02-A
BA08
MCB-L
BA08
* FOR PARITY OPTION MC8LB ADD (1)
(1) G228 TO MC8L REQUIREMENT
AND CHANGE FROM 12 TO 13
BIT MEMORY STACK - SEE PART LIST



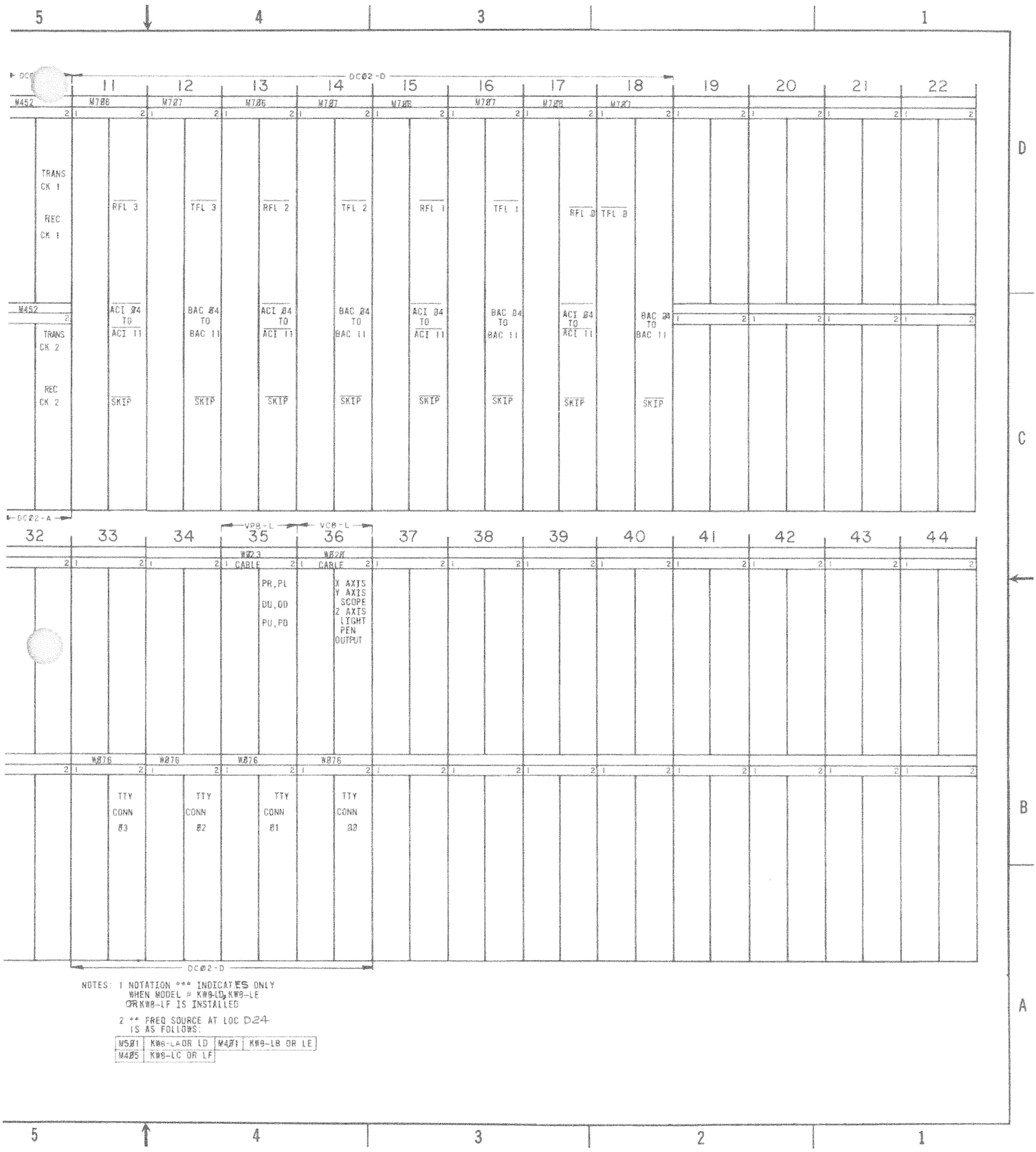
D-MU-BA08-0-4 Module Utilization BA08
Sheet 1



NOTES: 1 NOTATION *** IN
WHEN MODEL # KW
OR KW8-LF IS INS

2 ** FREQ SOURCE
IS AS FOLLOWS:

M5Ø1	KW8-LA OR L
M4Ø5	KW8-LC OR

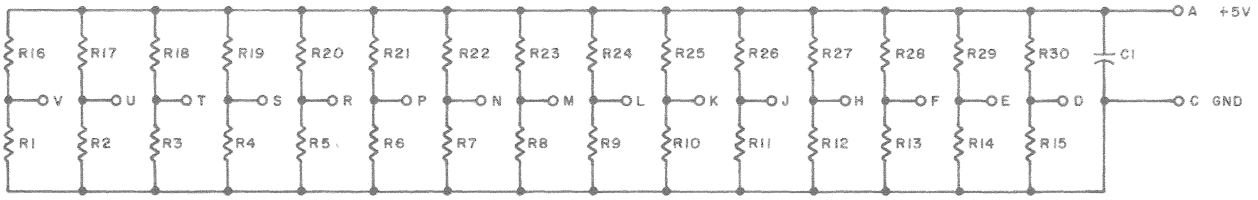


NOTES: 1 NOTATION *** INDICATES ONLY WHEN MODEL # KW8-LD, KW8-LE OR KW8-LF IS INSTALLED

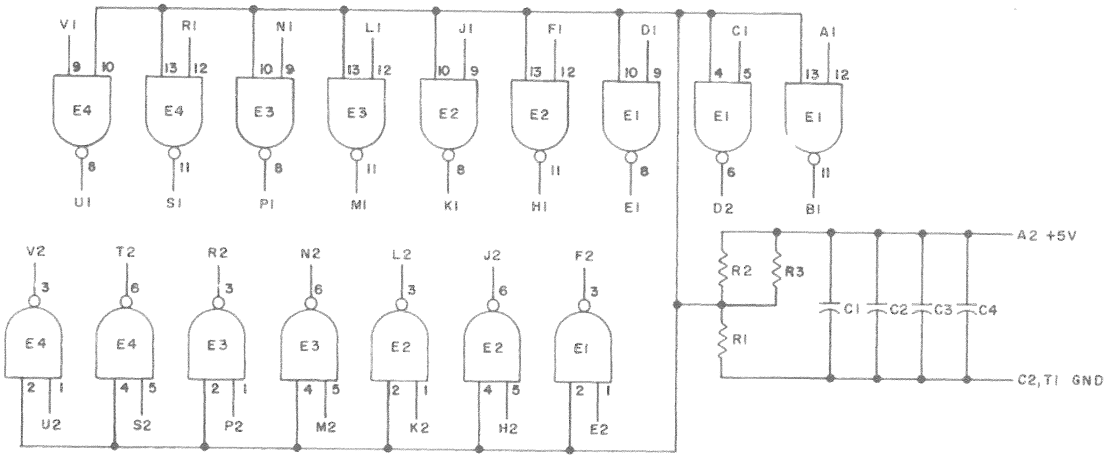
2 ** FREQ SOURCE AT LOC D24 IS AS FOLLOWS:

M501	KW8-LA OR LD	M401	KW8-LB OR LE
M405	KW8-LC OR LF		

D-MU-BA08-0-4 Module Utilization BA08
Sheet 2

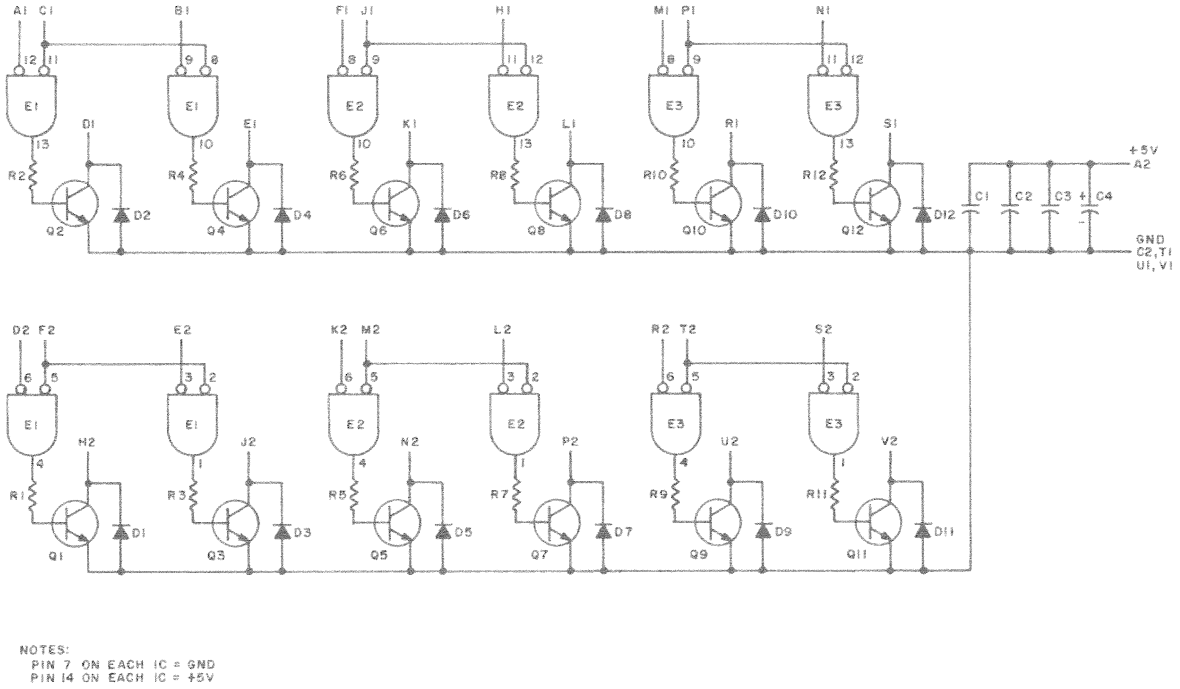


D-CS-M002-0-1 15 Loads



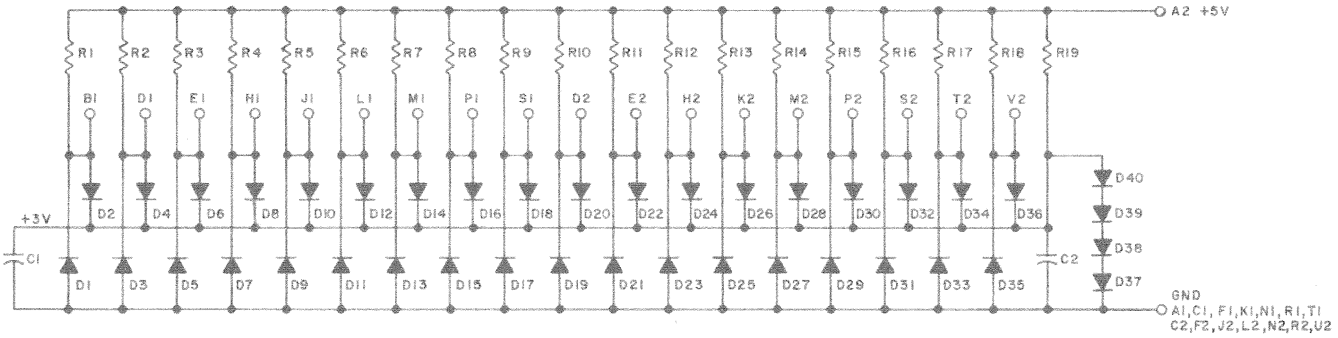
NOTES:
PIN 7 ON EACH IC = GND
PIN 14 ON EACH IC = +5V

B-CS-M111-0-1 Inverter

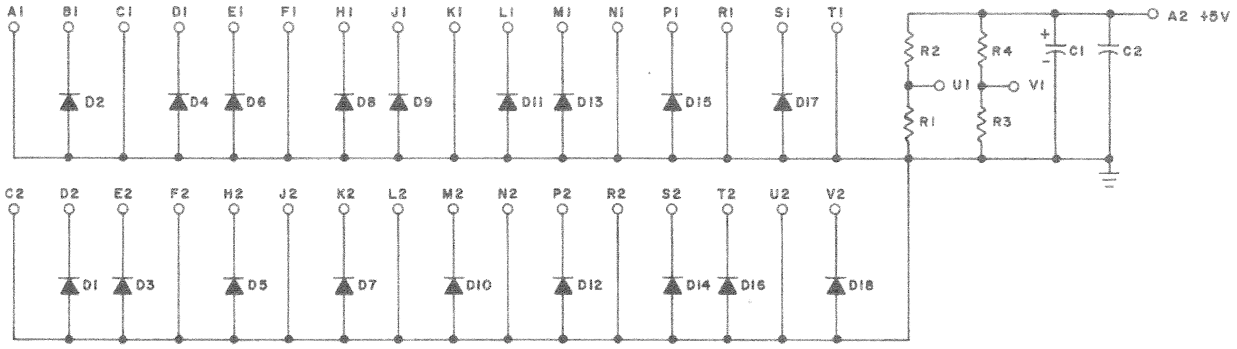


NOTES:
PIN 7 ON EACH IC = GND
PIN 14 ON EACH IC = +5V

C-CS-M623-0-1 Bus Driver



B-CS-M906-0-1 Cable Terminator



B-CS-M907-0-1 Diode Clamp