

BA08
PERIPHERAL EXPANDER OPTION
FUNCTIONAL DESCRIPTION

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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

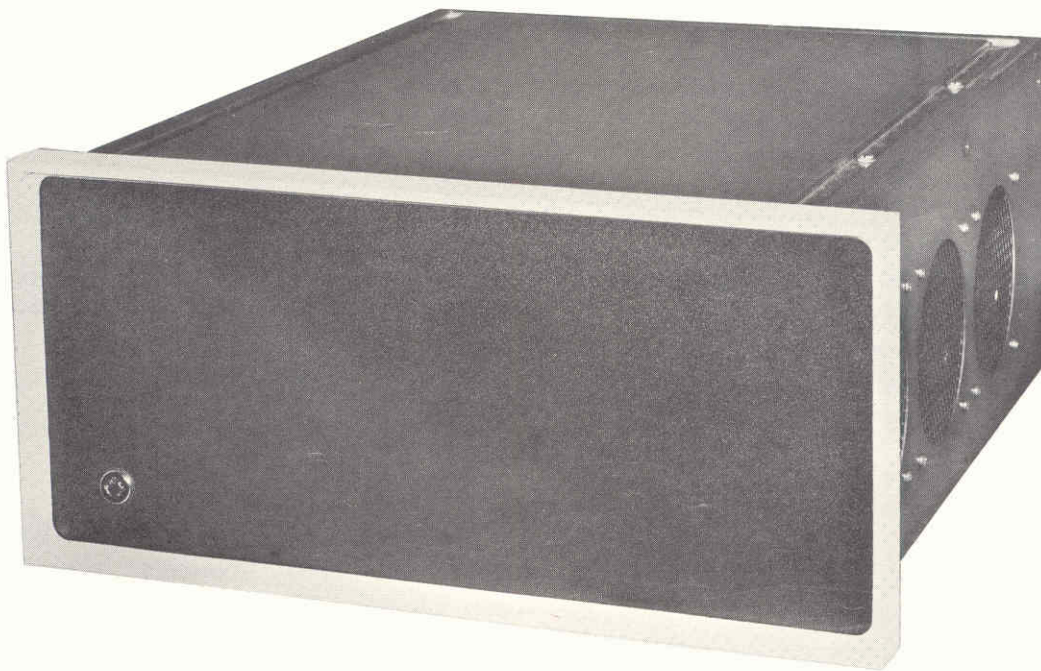


Figure 1 BA08 Peripheral Expander

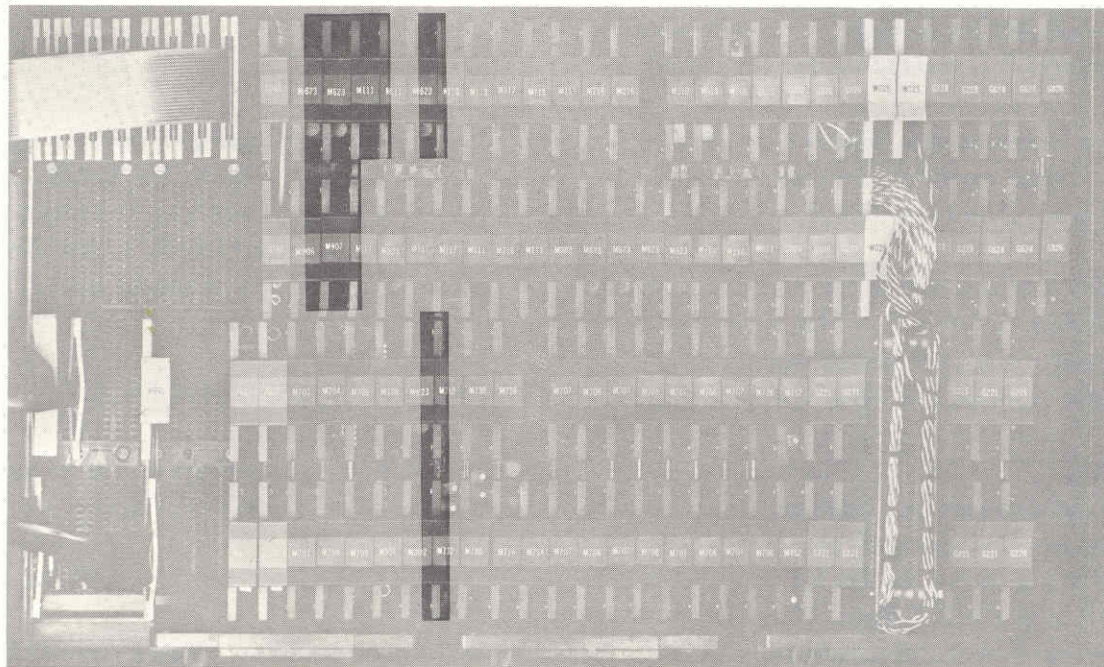


Figure 2 BA08 Modules

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
<p>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.</p>	M714	Control for CR	D	20
	M716	Control for CR	C	19
	W991	CR Cable Assembly	C	32
			D	32
<p>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.</p>				

Table 2 (Cont)

Option	Module		Location		
			Row	Slot	
DC02-A Multiple Control The DC02-A selects each DC02-D Data Station and controls its operation. Its logic accepts input/output and station selection instructions from the PDP-8/L and returns DC02-D data and status information to the computer.	M002	15 Loads	B	18	
	M111	Inverter	B	21	
	M113	10 2-input NAND Gates	B	19	
	M117	6 2-input NAND Gates	B	22	
				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 from an ASR 33 Teletype keyboard or perforated tape reader into parallel form for transmission to the Computer.	M623	Bus Driver	B	14	
			B	15	
			B	16	
			B	17	
	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)

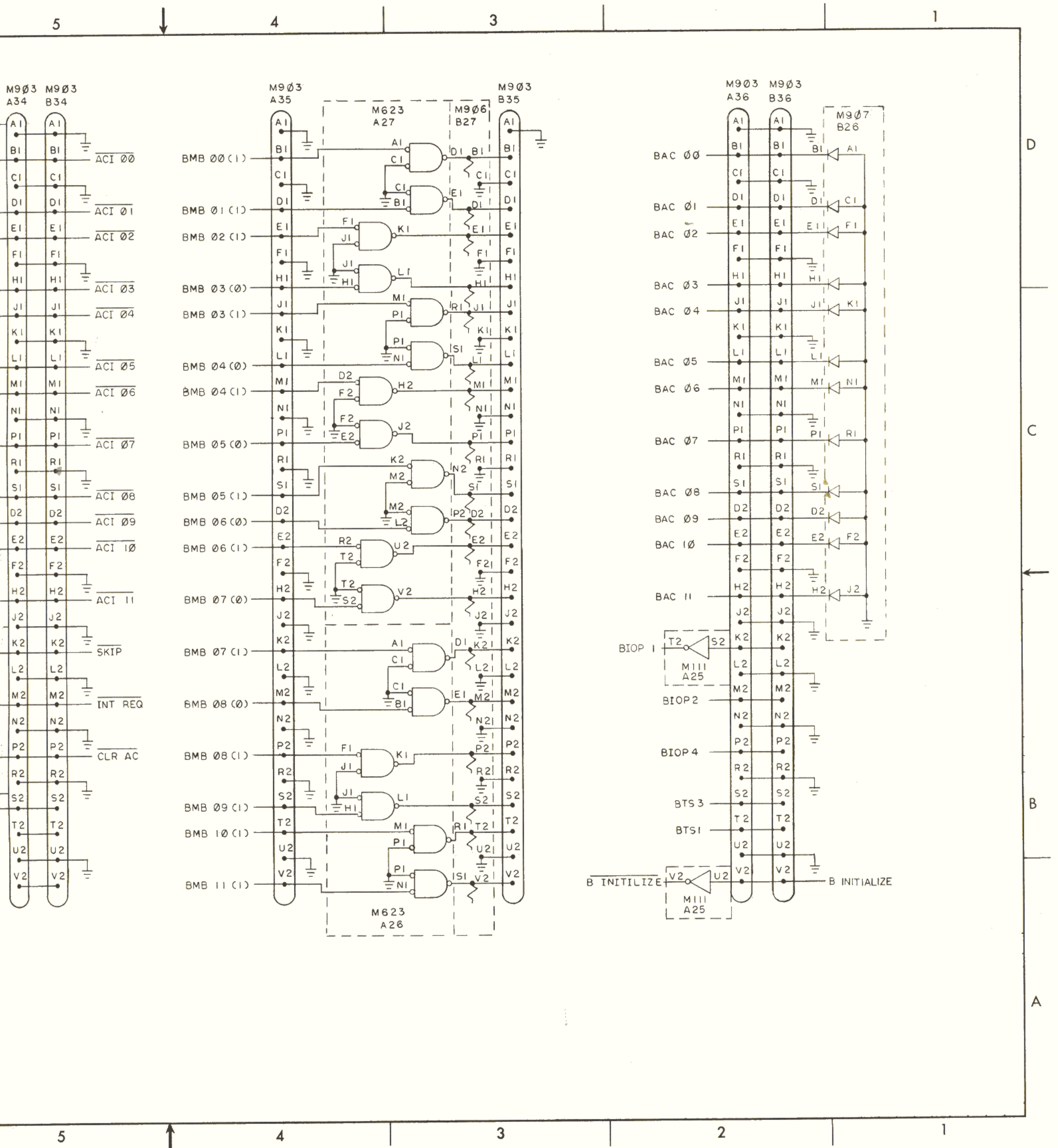
Option	Module		Location	
			Row	Slot
KW8/LA Real-Time Clock Fixed-Interval Line-Frequency This option allows the PDP-8/L to establish a reference time to be used to associate data with real time.	M501 M708	Schmitt Trigger Clock Control	D	24
			C	24
KW8/LB Real-Time Clock Fixed-Interval Variable-Frequency	M401 M708	Clock Clock Control	D	24
			C	24
KW8/LC Real-Time Clock Fixed-Interval Crystal-Frequency	M405 M708	Crystal Clock Clock Control	D	24
			C	24
KW8/LD Real-Time Clock Programmable Interval Line-Frequency	M501 M708 M709	Schmitt Trigger Clock Control Clock Counter	D	24
			C	24
			CD	25
KW8/LE Real-Time Clock Programmable Interval Variable-Frequency	M401 M708 M709	Clock Clock Control Clock Counter	D	24
			C	24
			CD	25
KW8/LF Real-Time Clock Programmable Interval Crystal-Frequency	M405 M708 M709	Crystal Clock Clock Control Clock Counter	D	24
			C	24
			CD	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	8
			A	9
			A	10
			B	8
			B	9
			B	10
	G221*	Memory Selector	C	3
			C	4
			C	8
			C	9
			D	3
			D	4
			D	8
D	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
	G785*	Power Connector	B	3
			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 Central Processor	AB	29	
		AB	30	
		AB	31	
W025*	Cable Connector for Memory Stack	AB	6	
		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	A	11
		Inhibit Driver	A	4
		13-Bit Memory Stack	CD	6
		The modules marked with an asterisk are also used in the MC8/LB in the same locations.		
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	CD	28
		Display Control	CD	29
		Indicator Cable Connec- tor	CD	27
			C	36
VC8/LB Oscilloscope Display Control (without display)	M701 W020	Display Control	CD	27
		Indicator Cable Connec- tor	C	36
VP8/L Incremental Plotter Control This option allows the PDP-8/L to plot and display data on an Incremental Recorder.	M023 M704		C	35
		Plotter Control	CD	26



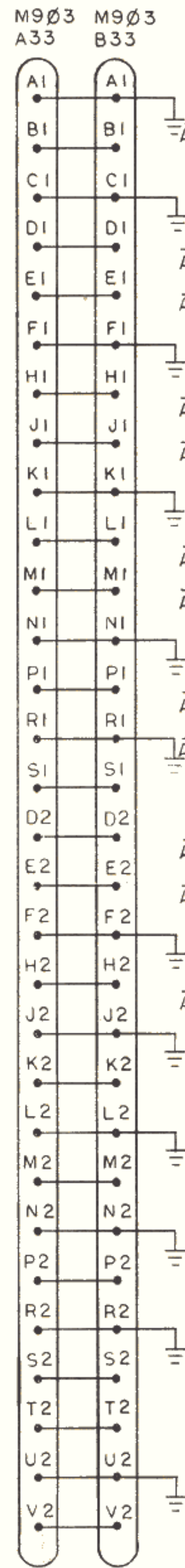
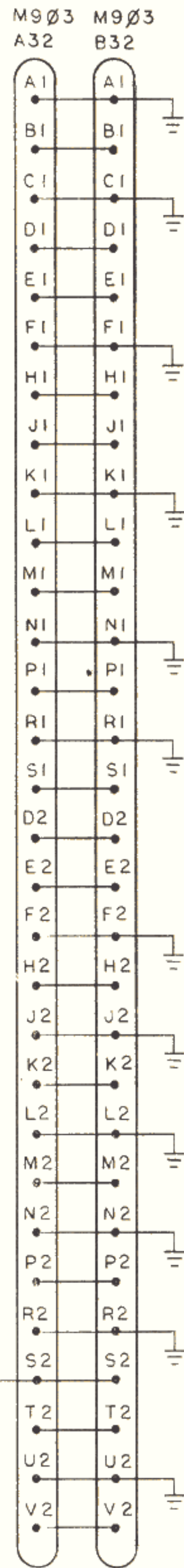
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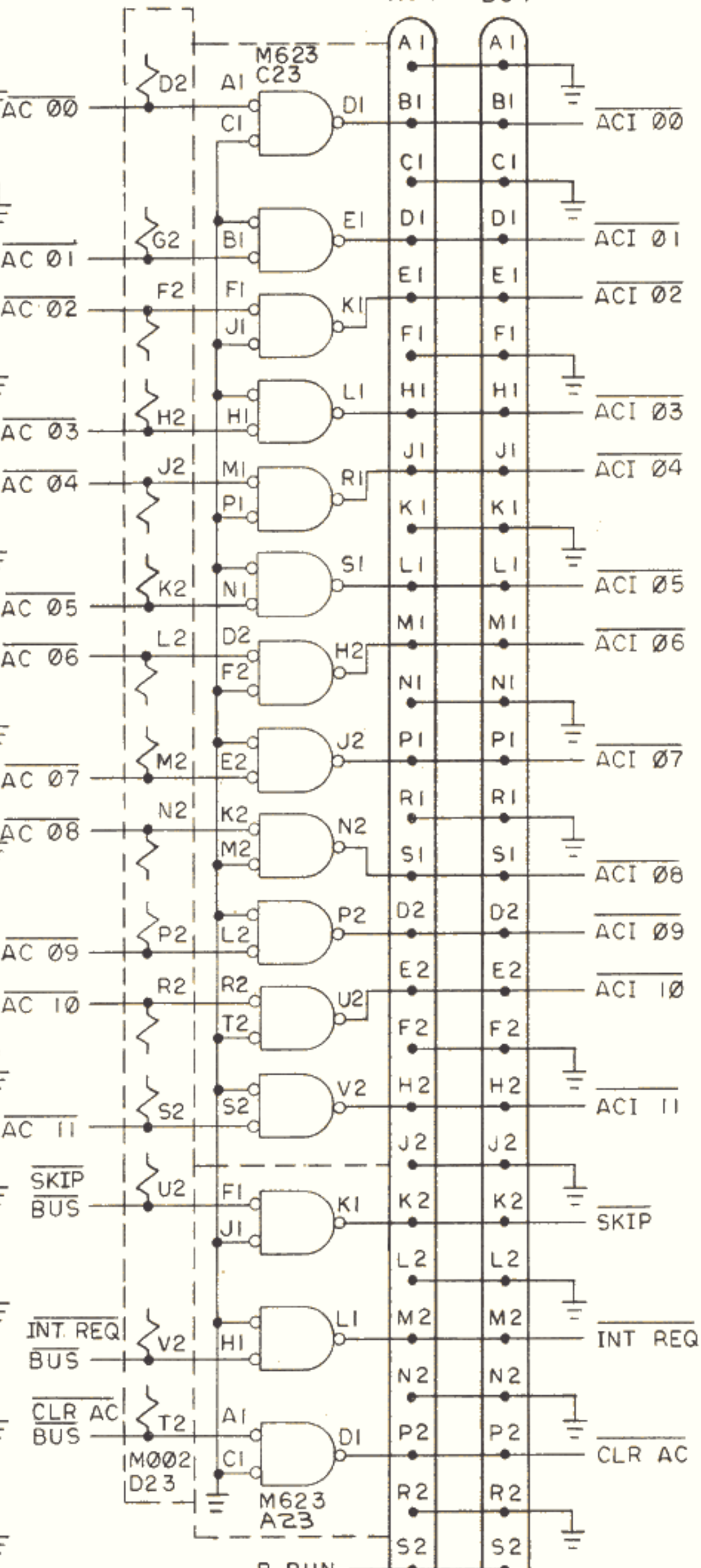
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D



EXT DATA ADD



BMB 00
BMB 01
BMB 02
BMB 03
BMB 03
BMB 04
BMB 04
BMB 05
BMB 05
BMB 06
BMB 06
BMB 07
BMB 08
BMB 08
BMB 09
BMB 10
BMB 11

C

B

A

8

7

6

5

8

7

6

5

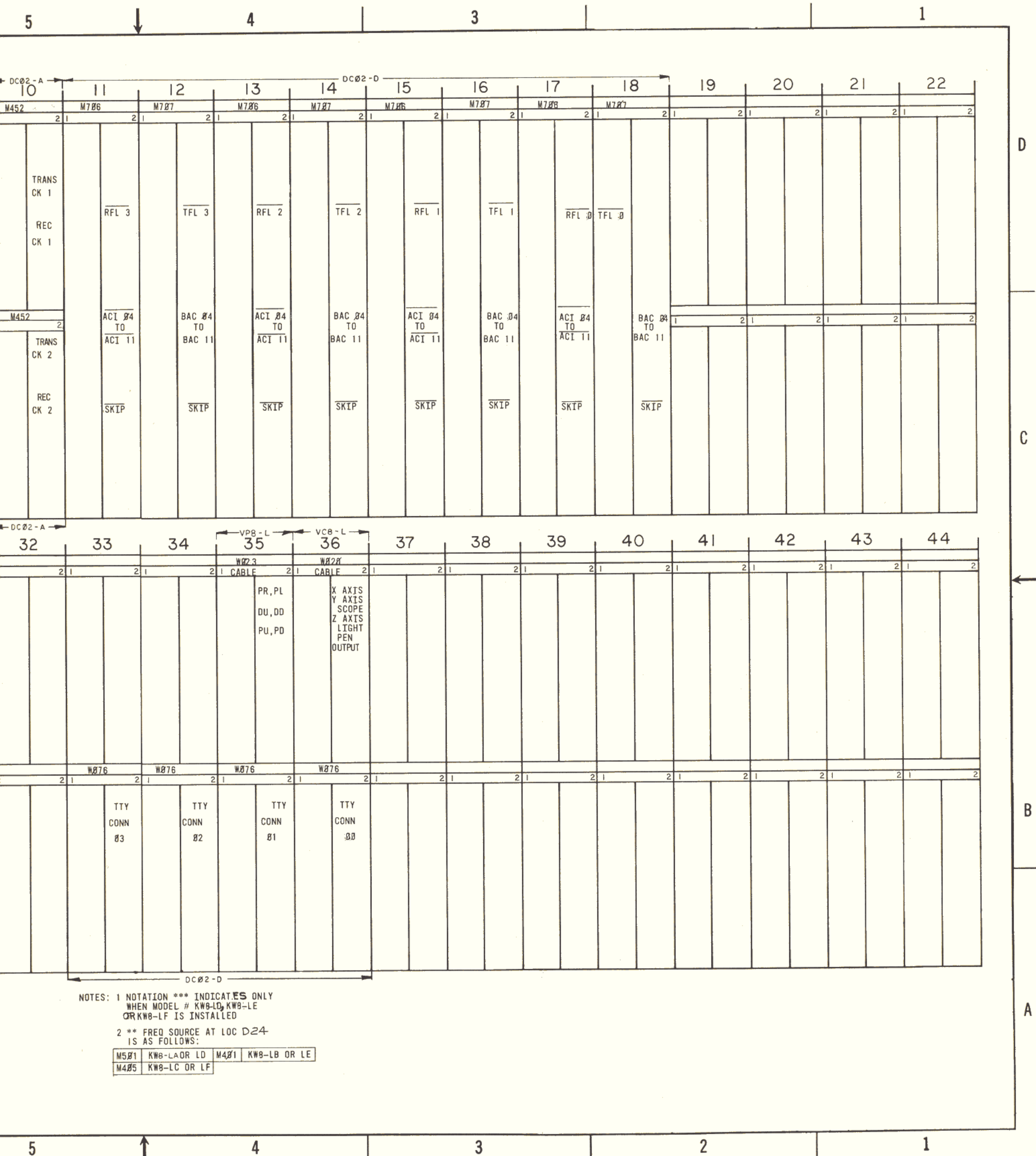


		1		2		3		4		5		6		7		8		9		10		11		12	
		G826		G624		G624		* G228		G228		W025		W025		G020		G020		G020		* G020		M360	
USAGE		2		2		2		2		2		2		2		2		2		2		2		2	
D	A	REGULATOR AND PWR DETECTOR	NEG CLAMP					INHIB DRIVER P	INHIB DRIVER I	INHIB DRIVER 0			INHIB DRIVER 0			MEM 00		MEM 02		MEM 04		MEM P			MEM DONE
C	B																								

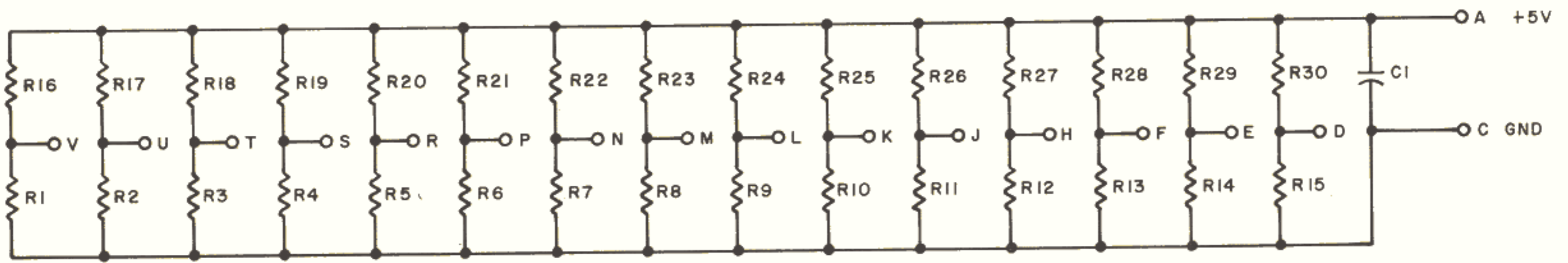
		23		24		25		26		27		28		29		30		31		32		33		34	
		M623		M111		M111		M623		M623		G795		M903		M903		M903		M903		M903		M903	
USAGE		2		2		2		2		2		2		2		2		2		2		2		2	
A	B	CLEAR AC	IF	EA	BMA 00	BMA 03	BMB 07		BMB 00 (1)	BMB 04 (1)			EA	BMA 08			DF ENAB	KEY OF							
			CRL IB	RMF	BMA 06	BMA 11 (0)	TO BMB 11 (1)	ACI 08	TO BMB 04 (0)	TO BMB 07 (0)				BMA 00	TO BMA 11			SP CYC NEXT	E SET+ F SET						
B	A	SKIP		EA	BMA 09	BMB 00 (0)		ACI 08					TO BMA 07	MEM START			BF ENAB	JMP JMS							
		INT REQ	INT	INT	BMB 01 (0)									MEM 00	STROBE			KEY CLR	KEY LOAD						
			SET IB	EA	BMB 02 (0)			ACI 08						MEM 08			INT INHIB	KEY LOAD							
			SET DF		BMB 09 (0)	BIOP		ACI 11						MEM 11			LOAD SF	LINE							
			SET DF		BMB 10 (0)	B								MEM 07			KEY IF	LOW							
						INITIAL								MEM P											

		23		24		25		26		27		28		29		30		31		32		33		34	
		M623		M111		M111		M623		M623		G795		M903		M903		M903		M903		M903		M903	
USAGE		2		2		2		2		2		2		2		2		2		2		2		2	
A	B	PSEL	X3	ACI 00	ACI 00	INT REQ	CLR AC	BAC 00	BAC 09	BMB 00 (1)	BMB 06 (0)														
				ACI 01	ACI 01			TO BAC 08	TO BAC 11	TO BMB 05(1)	TO BMB 11(1)														
		X2X	X7	ACI 02	ACI 02																				
				ACI 03	ACI 03																				
		X5	+5	CLR AC	SKIP	CLR AC																			
						INT REQ																			

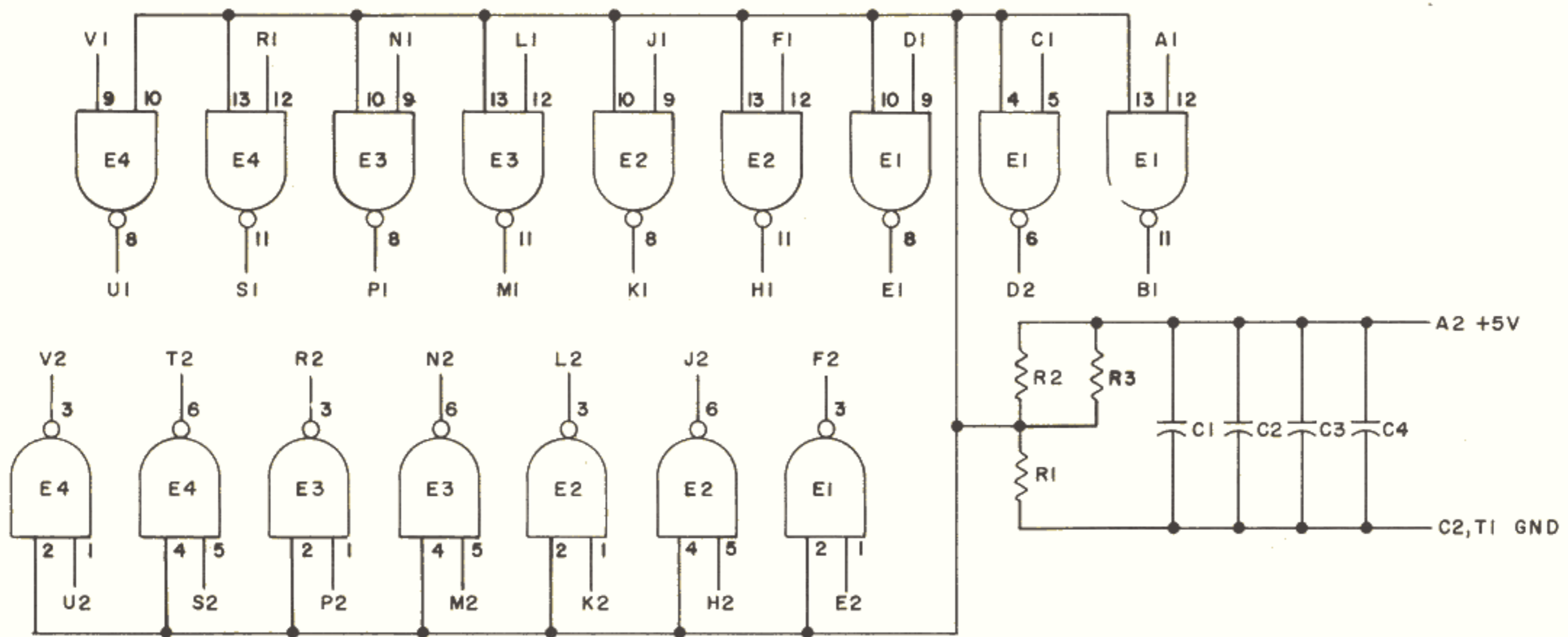
* FOR PARITY OPTION MC8LB ADD (1) G (1) G228 TO MC8L REQUIREMENT AND CHANGE FROM 12 TO 13 BIT MEMORY STACK - SEE PART LIST



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

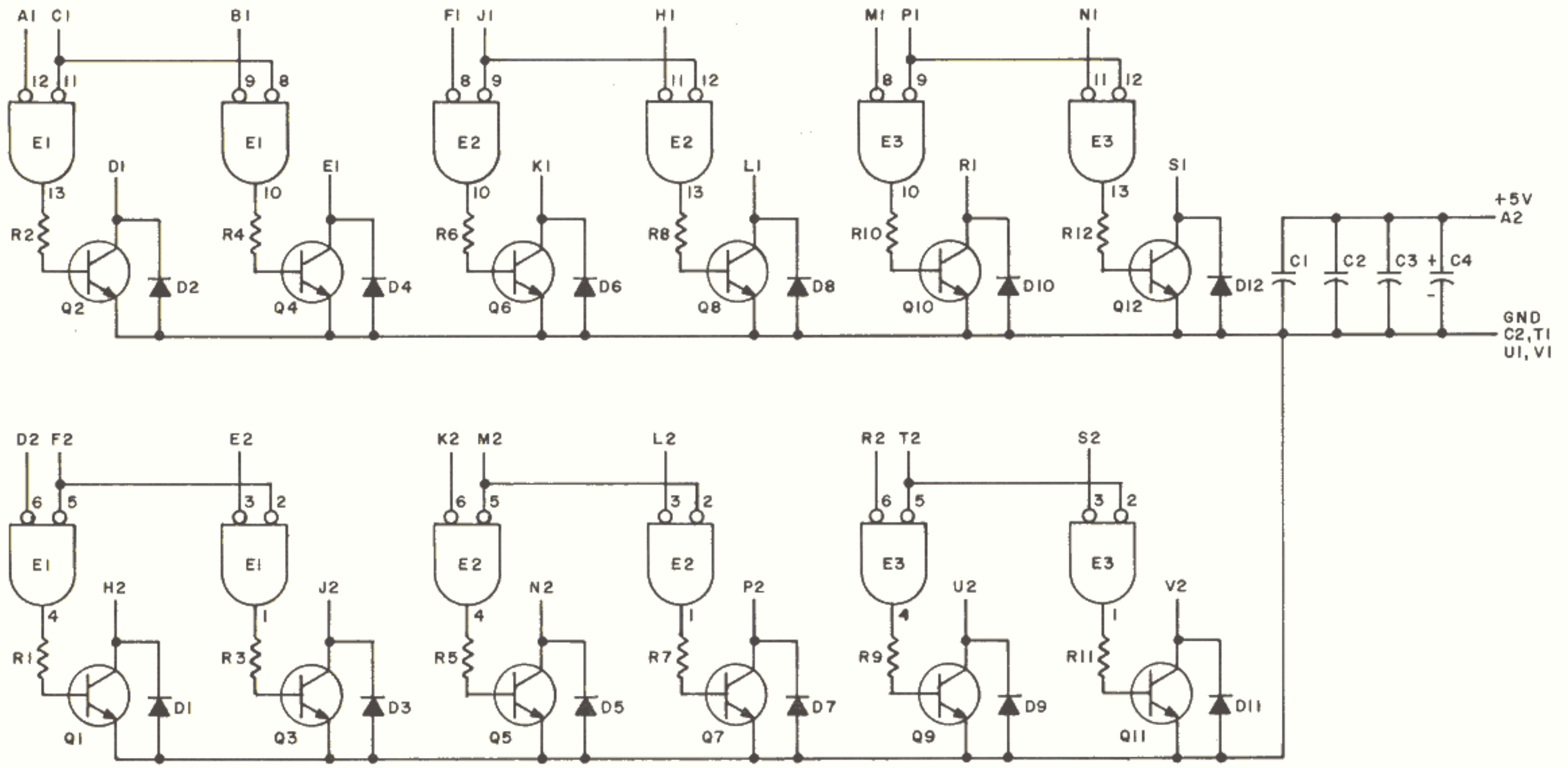


D-CS-M002-0-1 15 Loads



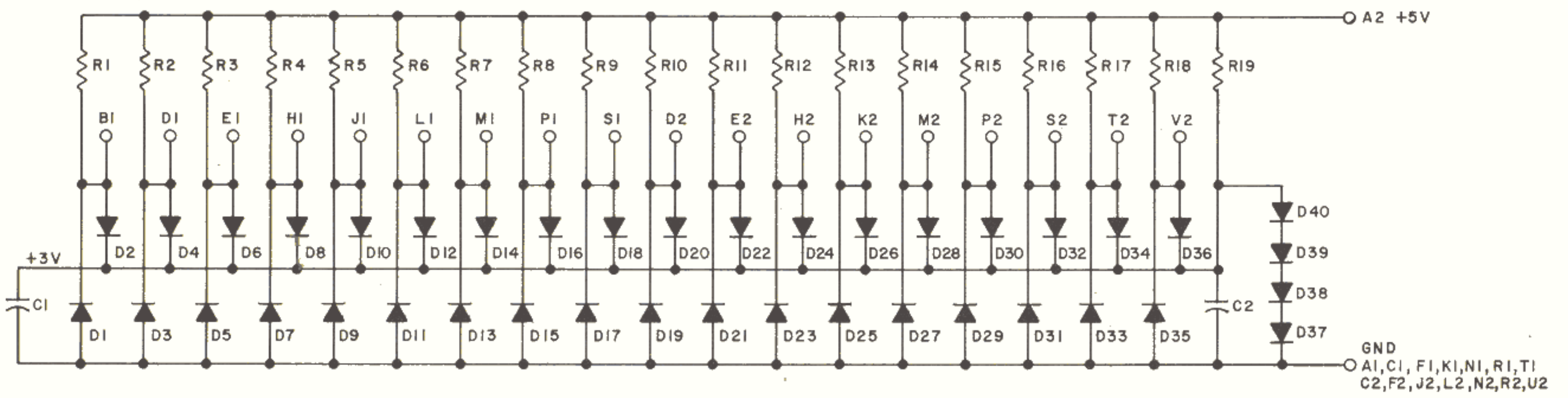
NOTES:
 PIN 7 ON EACH IC = GND
 PIN 14 ON EACH IC = +5V

B-CS-M111-0-1 Inverter

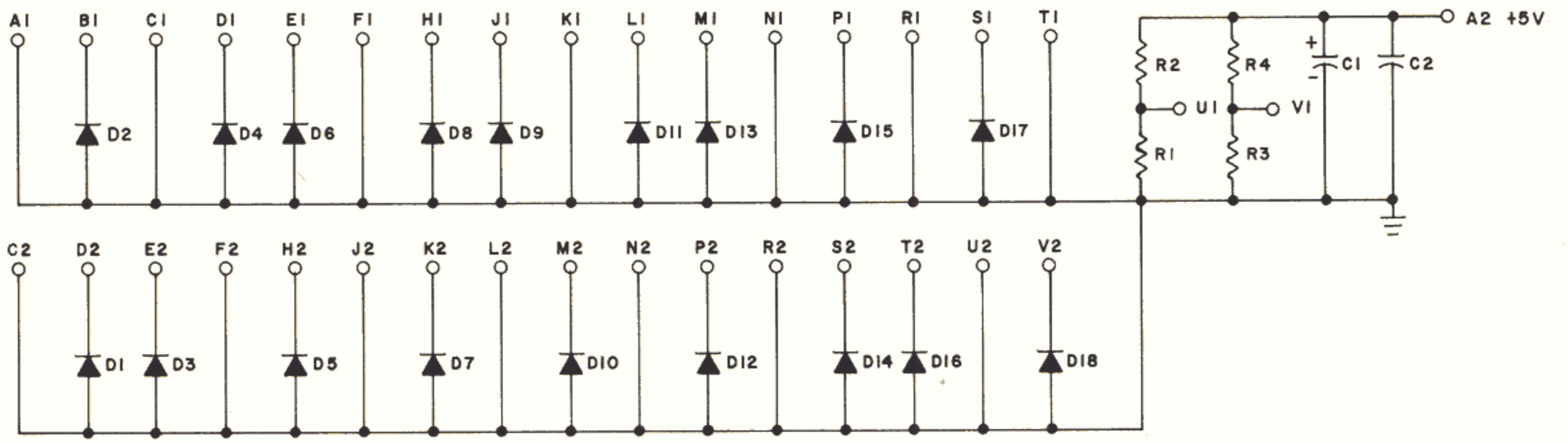


NOTES:
 PIN 7 ON EACH IC = GND
 PIN 14 ON EACH IC = +5V

C-CS-M623-0-1 Bus Driver



B-CS-M906-0-1 Cable Terminator



B-CS-M907-0-1 Diode Clamp