

**DEC Datasystem 320 Family
Service Manual**

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**DEC Datasystem 320 Family
Service Manual**

1st Edition, August 1978

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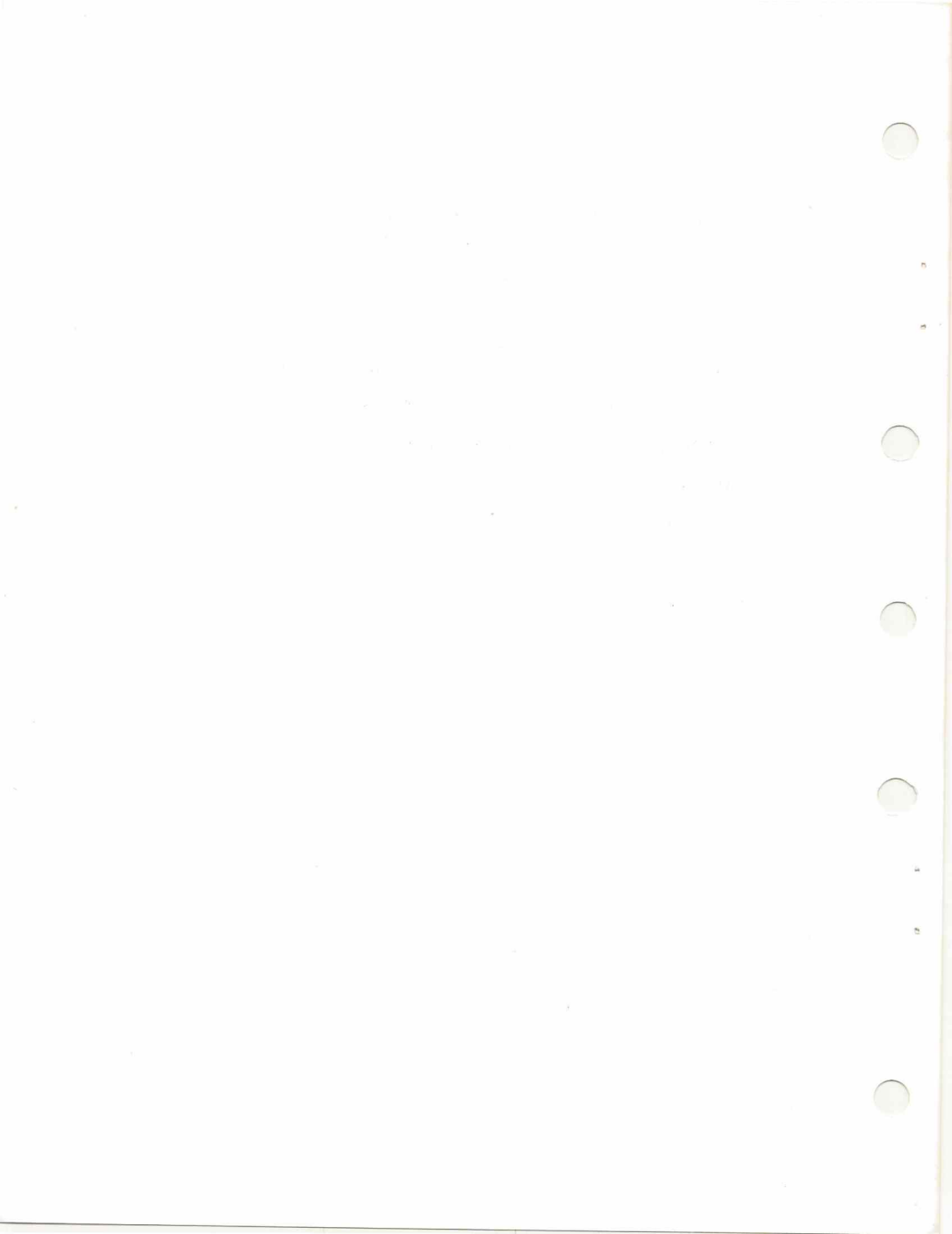
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1.1 INTRODUCTION

This manual contains service information for the 320 family of DEC Datasystems:

D322
D324
D325

Table 1-1 explains the packaged system nomenclature for these systems.

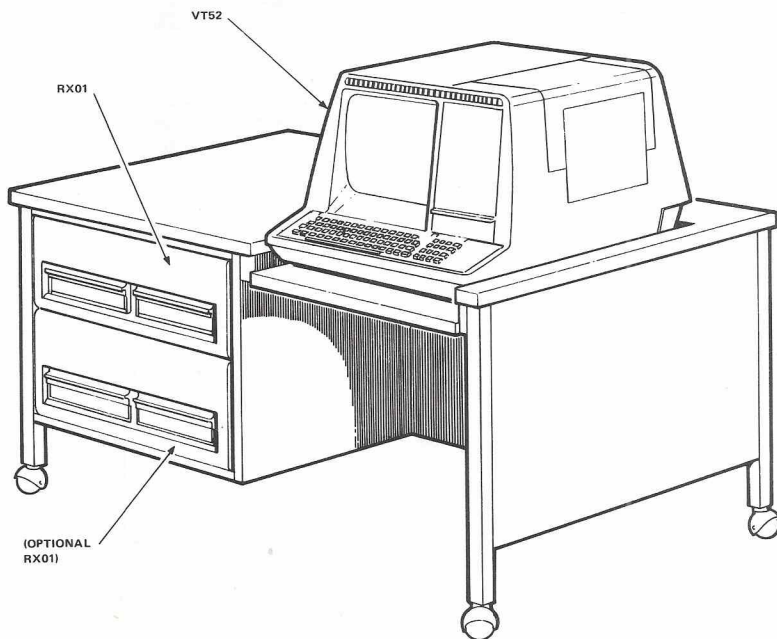
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Table 1-1

1.2 D322 SYSTEM

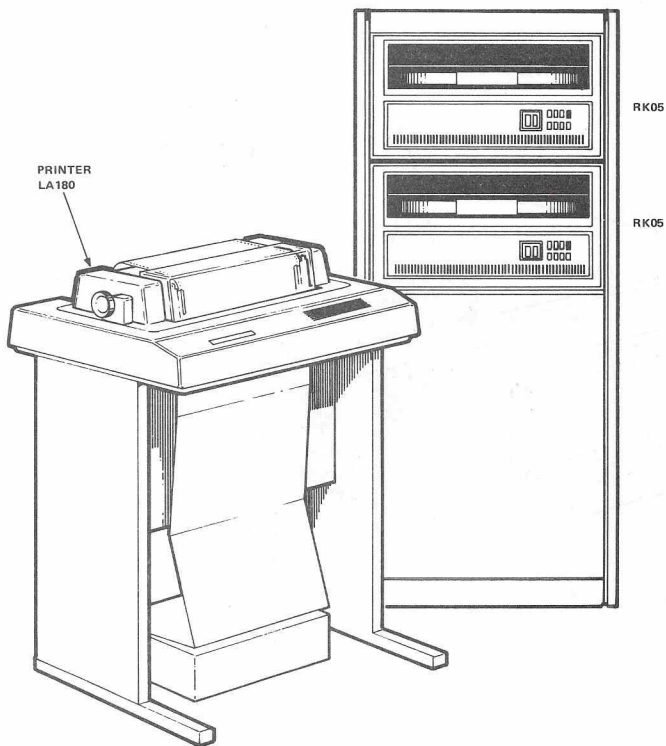
The D322 system, with DIGITAL'S fully supported CTS-300 software license and DIBOL Instruction Set, includes the PDP-11/03 central processor, 32K bytes of MOS memory, bootstrap loader, serial line interface and VT52 CRT console terminal. There is an RXV11 controller with dual 256K byte floppy disk drives for use as system device and as primary backup and load device. This configuration is arranged in a desk-like cabinet.

Space is reserved within this configuration for an additional 24K bytes of memory and a printer. Any four of the following may also be added: an RK05 subsystem with two cartridge disk drives and controller, a second printer, an additional dual floppy disk drive, and/or one synchronous line adapter.



MR-0779

Figure 1-1
Basic D322 System



MR 0781

Figure 1-2
Optional Cabinet and Printer

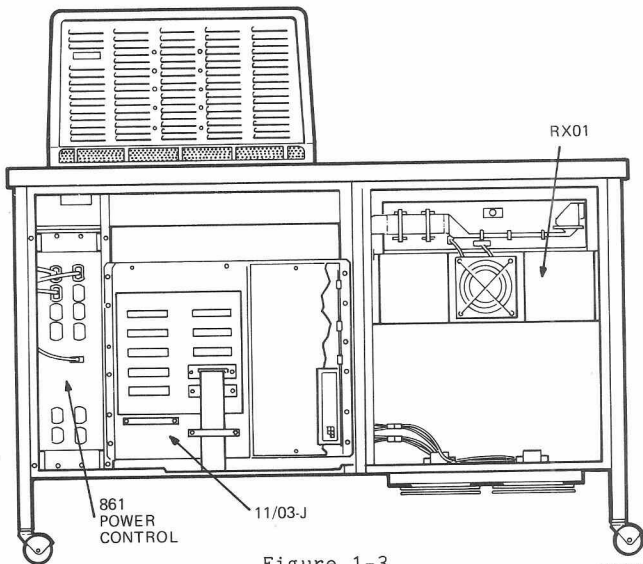


Figure 1-3

Rear View, with Door Removed

SYSTEM MODEL DESIGNATIONS

Model Designation

D322A	AA	AD
Input power/frequency	115/60	230/50
H9820	W	W
RXV11	DA	DD
11/03**	JA	JB
VT52	AE	AF
LAV11*	PA	PD
DS3RK	AA	AD
H967	HK	HL
RKV11	DA	DB

* Model AA + LAV11 = Model BA

* Model AD + LAV11 = Model BD

** In later versions, the 11/03-JC replaces the 11/03-JA
and the 11/03-JD replaces the 11/03-JB.

D322 SPECIFICATIONS* SEE D324 SPECS FOR PRINTER SPECS

	BASIC 322		OPTIONAL CABINET	
	115 V 60 HZ	230 V 50 HZ	115 V 60 HZ	230 V 50 HZ
				
POWER CONNECTOR	5-15P 90-08938	6-15P 90-08853	5-15P 90-08938	6-15P 90-08853
NEMA NO. DEC P/N				
AMPERAGE	12 AMPS	6 AMPS	12 AMPS	6 AMPS
BTU/HOUR	3400	3400	1400	1400
HEAT DISSIPATION	1000 W	1000 W	400 W	400 W
SHIPPING WEIGHT (APPROXIMATE)	400 LBS 182 KG	400 LBS 182 KG	300 LBS 136 KG	300 LBS 136 KG

*SPECIFICATIONS HAVE BEEN FIGURED ON THE MAXIMUM CONTAINED IN EACH UNIT.

MR-0782

Figure 1-4

D322 Specifications*

Modules Included in the Basic System

PROCESSOR

KD11-P (M7264-BB)

Resident memory addressed as Bank 0
CPU refresh disabled
Powers up to 173000

or

KD11-Q (M7264-YB)

No resident memory
CPU refresh disabled
Powers up to 173000

MEMORY

MSV11-B (M7944)

4K RAM
Three in basic system with KD11-P
Addresses start at Bank 1
Refreshed by REV11-C

or

MSV11-C (M7955-YD)

16K RAM
One in basic system with KD11-Q
Addresses start at Bank 0
Refreshed by REV11-C

SERIAL LINE INTERFACE

DLV11 (M7940)

Device address 177560
Vector 60
9600 baud
EIA
One stop bit, eight data bits, no parity

NOTE: For more detailed information, see Chapter 2.

RX01 FLOPPY DISK INTERFACE

RXV11 (M7946)

First device address (disk 0 and 1) 177170
First vector 264
Second device address (disk 2 and 3) 177150
Second vector 270

BOOTSTRAP/DIAGNOSTIC

REV11-C (M9400-YC)

Bootstrap enabled
Diagnostics enabled
Refresh enabled for MSV11-B and MSV11-C

TERMINATOR

TEV11 (M9400-YB)

120 ohm terminator

NOTE: For more detailed information, see Chapter 2.

Optional Modules for Recommended Expansion

LA180 PRINTER INTERFACE

LAV11 (M7949)
Device address 177514
Vector 200

or

LPV11 (M8027)
Device address 177514
Vector 200

RK05 DISK INTERFACE

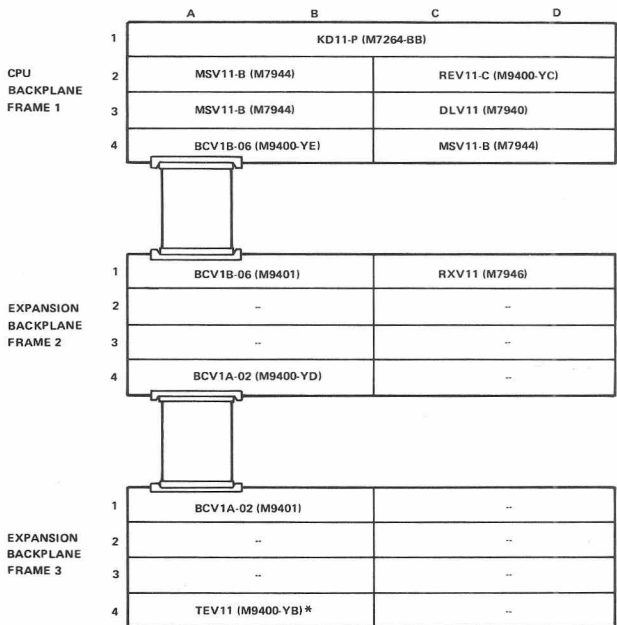
RKV11-D (M7269)
Device address 177400
Vector 220

COMMUNICATIONS INTERFACE

DUV11 (M7951)
Device address 160040
Vector floating (see Appendix B)

DLV11 (M7940)
Device address
 console 177560
 second terminal 176500
Vector
 console 60
 second terminal floating (see Appendix B)

NOTE: For more detailed information, see Chapter 2.



MR-0783

*IN MOST CASES M9400 MODULES ARE PLACED IMMEDIATELY FOLLOWING THE LAST MODULE IN THE SYSTEM. THE TEV11, HOWEVER, IS AN EXCEPTION TO THE GENERAL RULE. IN THE BUSINESS PRODUCTS SYSTEMS IT IS PLACED IN THE LAST SLOT OF THE LAST BACKPLANE IN ORDER TO MINIMIZE NOISE.

Figure 1-5

D322 Module Utilization
For Basic System
Using 11/03-JA or -JB CPU Box

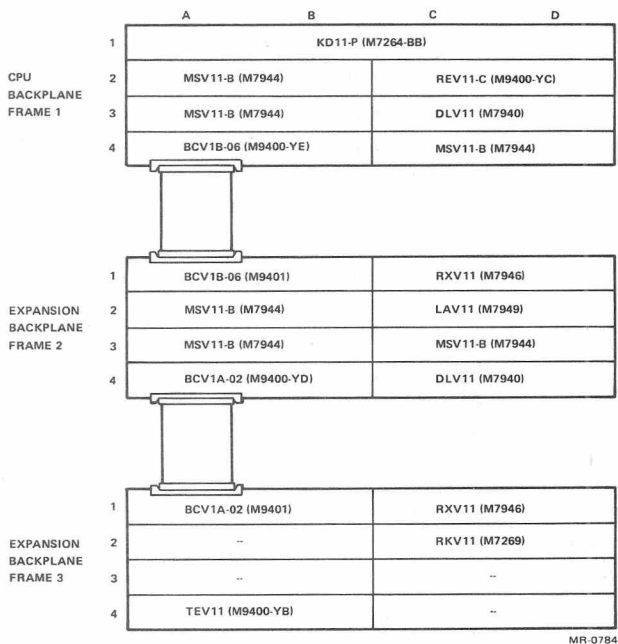


Figure 1-6

D322 Module Utilization
For Recommended Expanded Systems
Using 11/03-JA or -JB CPU Box

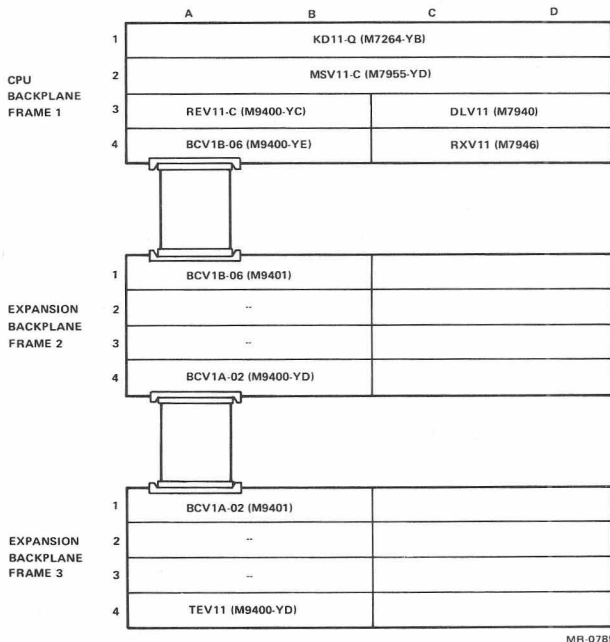


Figure 1-7

D322 Module Utilization
For Basic System
Using 11/03-JC or -JD CPU Box

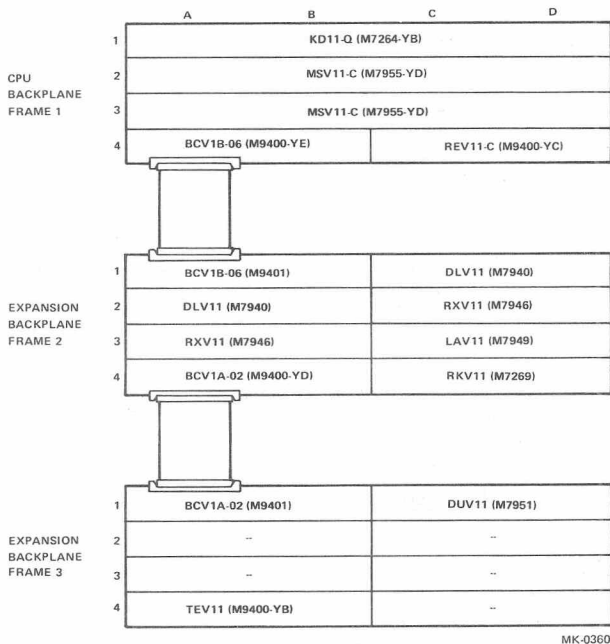


Figure 1-8

D322 Module Utilization
For Recommended Expanded Systems
Using 11/03-JC or -JD CPU Box

1.3 D324 SYSTEM

The D324 system, with DIGITAL'S fully supported CTS-300 software license and DIBOL Instruction Set, includes the PDP-11/03 central processor, 32K bytes of MOS memory, bootstrap loader, serial line interface, VT52 CRT console terminal, and an RK11J controller. A removable (2.5 megabyte) disk cartridge drive (RK05J) is used as primary backup and load device, and an RK05F (5.0 megabyte) non-removable disk drive is used as system device. This configuration is arranged in an H9602 cabinet and an H970-DA desk.

Space is reserved in this configuration for an additional 24K bytes of memory and a printer. Any four of the following may also be added: a dual floppy disk plus cabinet, a second printer, a synchronous line adapter, and up to three terminals. Additional RK05 drives may be added to a total of eight units (an RK05F counts as two units). Each additional pair of RK05 drives requires an H9602 cabinet for mounting.

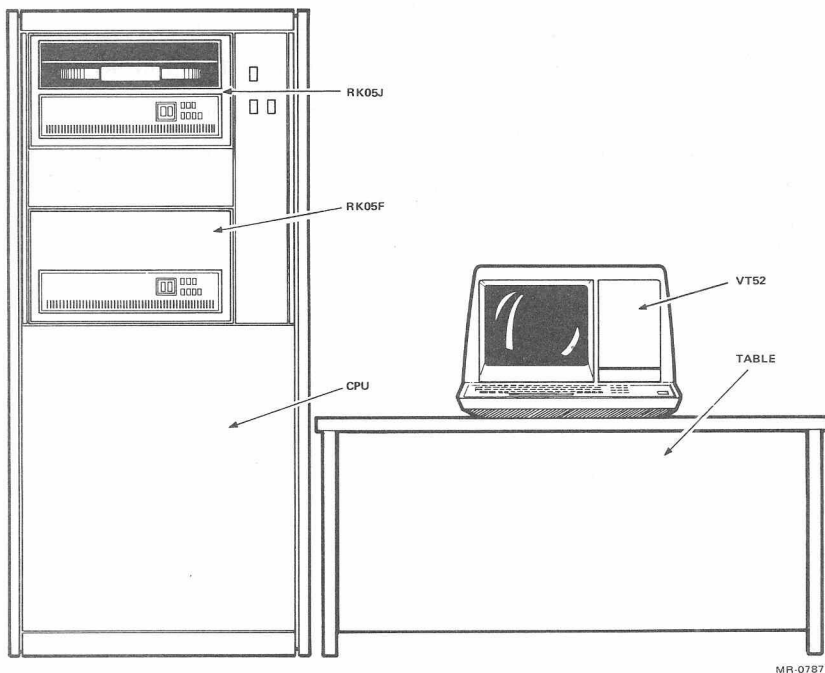
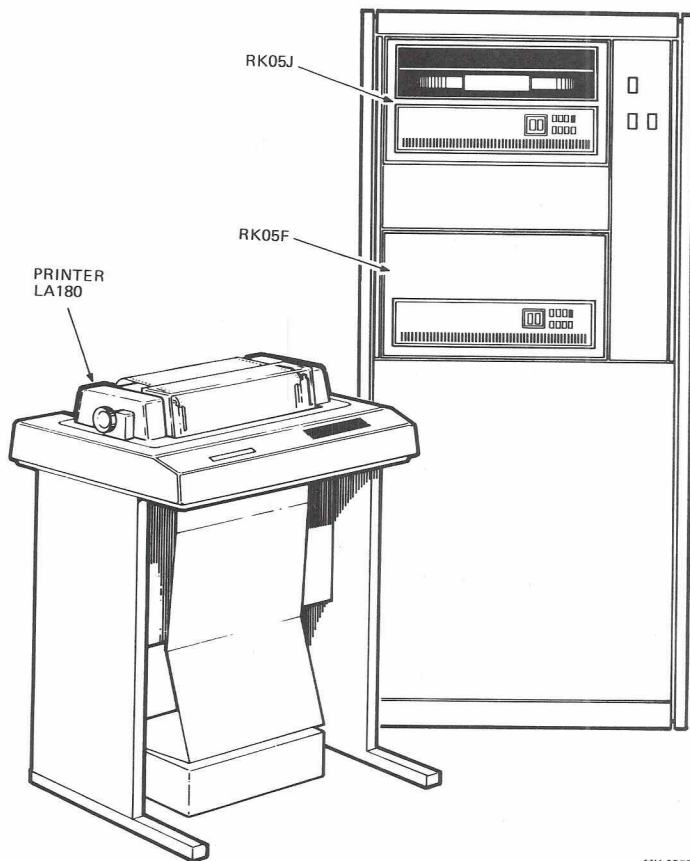
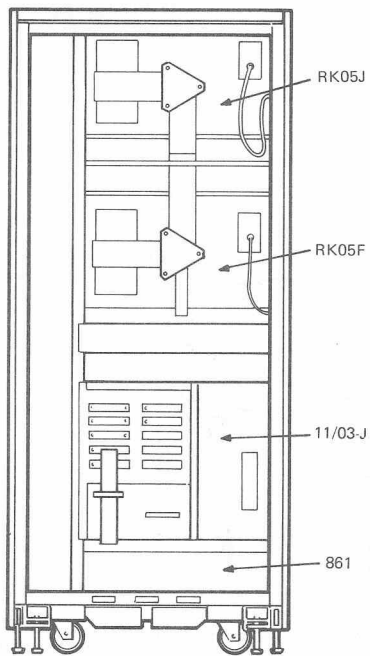


Figure 1-9
Basic D324 System



MK-0359

Figure 1-10
Optional Cabinet and Printer



MK-0358

Figure 1-11
Rear View

SYSTEM MODEL DESIGNATIONS

	<u>Model Designation</u>	
D324A	AA	AD
Input power/frequency	115/60	230/50
H9602	CC	CD
RKV11	DA	DB
11/03**	JA	JB
H970	DA	DA
VT52	AE	AF
LAV11*	PA	PD
RXV11	DA	DD

* Model AA + LAV11 = Model BA
Model AD + LAV11 = Model BD

** In later versions, the 11/03-JC replaces
the 11/03-JA and the 11/03-JD replaces the
11/03-JB.

D324 SPECIFICATIONS*

POWER CONNECTOR	PRINTER LA180		RK05 CABINET		CPU CABINET		VT52 DESK	
	115 V, 60 HZ	230 V, 50 HZ	115 V, 60 HZ	230 V, 50 HZ	115 V, 60 HZ	230 V, 50 HZ	115 V, 60 HZ	230 V, 50 HZ
	15 A	15 A	30 A W	30 A W	30 A W	20 A X	15 A	15 A
								
NEMA NO. DEC P/N	5-15 P 90-08938	6-15 P 90-08853	15-30 P 12-11193	15-30 P 12-11193	15-30 P 12-11193	66-20 P 12-11192	5-15 P 90-08938	6-15 P 90-08853
AMPERAGE	3 A	1.5 A	24 A	6 A	24 A	6 A	1 A	.5 A
BTU/HOUR	1023	1023	1400	1400	3400	3400	400	400
HEAT DISSIPATION	300 W	300 W	400 W	400 W	1000 W	1000 W	118 W	118 W
SHIPPING WEIGHT (APPROXIMATE)	120 LBS 55 KG	120 LBS 55 KG	300 LBS 136 KG	300 LBS 136 KG	400 LBS 182 KG	400 LBS 182 KG	225 LBS 102 KG	225 LBS 102 KG

*SPECIFICATIONS HAVE BEEN FIGURED ON THE MAXIMUM CONTAINED IN EACH UNIT.

MR-0750

Figure 1-12

D324 Specifications*

Modules Included in the Basic System

PROCESSOR

KD11-P (M7264-BB)

Resident memory addressed as Bank 0
CPU refresh disabled
Powers up to 173000

or

KD11-Q (M7264-YB)

No resident memory
CPU refresh disabled
Powers up to 173000

MEMORY

MSV11-B (M7944)

4K RAM
Three in basic system with KD11-P
Addresses start at Bank 1
Refreshed by REV11-C

or

MSV11-C (M7955-YD)

16K RAM
One in basic system with KD11-Q
Addresses start at Bank 0
Refreshed by REV11-C

SERIAL LINE INTERFACE

DLV11 (M7940)

Device address 177560
Vector 60
9600 baud
EIA
One stop bit, eight data bits, no parity

DISK DRIVE INTERFACE

RKV11-D (M7269)

Device address 177400
Vector 220

NOTE: For more detailed information, see Chapter 2.

BOOTSTRAP/DIAGNOSTIC

REV11-C (M9400-YC)
 Bootstrap enabled
 Diagnostic enabled
 Refresh enabled for MSV11-B and MSV11-C

TERMINATOR

TEV11 (M9400-YB)
 120-ohm terminator

NOTE: For more detailed information, see Chapter 2.

Optional Modules for Recommended Expansion

LA180 PRINTER INTERFACE

LAV11 (M7949)
Device address 177514
Vector 200

or

LPV11 (M8027)
Device address 177514
Vector 200

RX01 FLOPPY DISK INTERFACE

RXV11 (M7946)
First device address (disk 0 and 1) 177170
First vector 264
Second device address (disk 2 and 3) 177150
Second vector 270

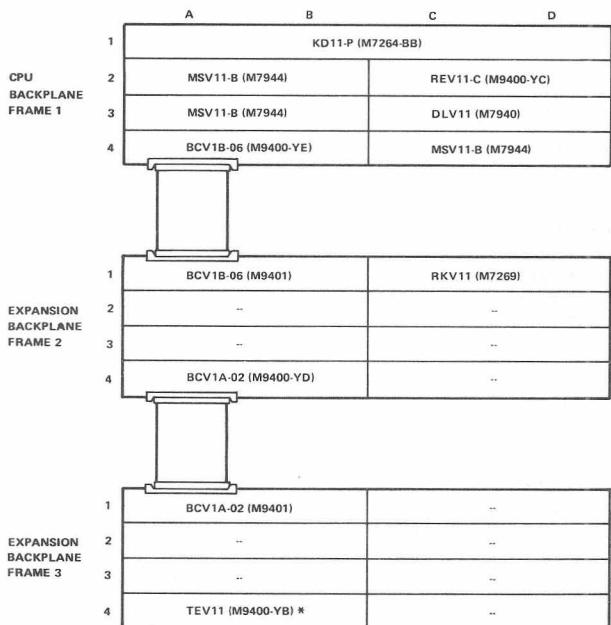
COMMUNICATIONS INTERFACE

DUV11 (M7951)
Device address 160040
Vector floating (see Appendix B)

DLV11 (M7940)
Device address
 console 177560
 second terminal 176500

Vector
 console 60
 second terminal floating (see Appendix B)

NOTE: For more detailed information, see Chapter 2.

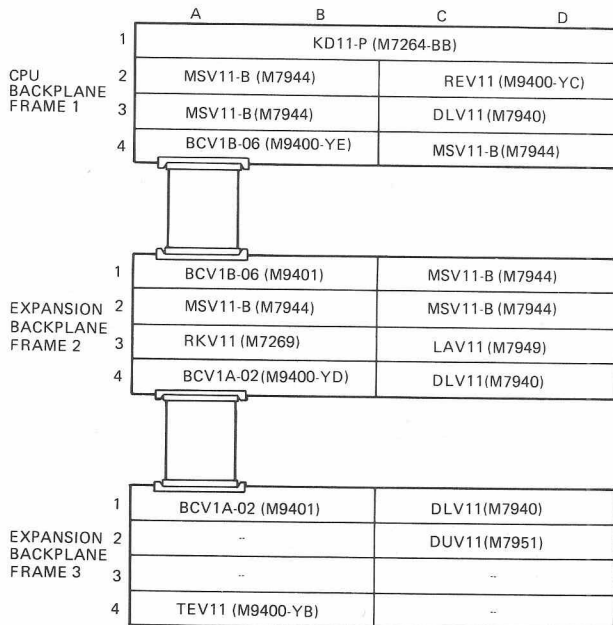


MR-0791

*IN MOST CASES M9400 MODULES ARE PLACED IMMEDIATELY FOLLOWING THE LAST MODULE IN THE SYSTEM. THE TEV11, HOWEVER, IS AN EXCEPTION TO THE GENERAL RULE. IN THE BUSINESS PRODUCTS SYSTEMS IT IS PLACED IN THE LAST SLOT OF THE LAST BACKPLANE IN ORDER TO MINIMIZE NOISE.

Figure 1-13

D324 Module Utilization
For Basic System
Using 11/03-JA or -JB CPU Box

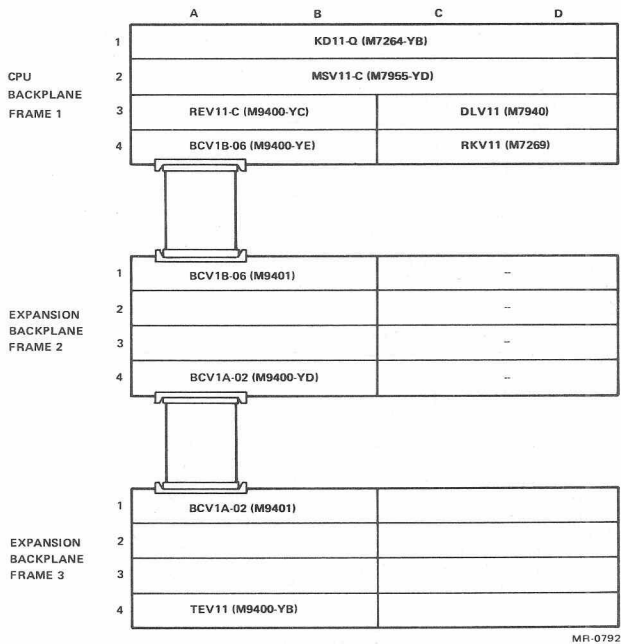


NOTE: The KD11-P answers to memory refresh.
The REV11 module must be in slot 2CD
regardless of the type or amount of
memory.

MK-0347

Figure 1-14

D324 Module Utilization
For Recommended Expanded Systems
Using 11/03-JA or -JB CPU Box



MR-0792

Figure 1-15

D324 Module Utilization
For Basic System
Using 11/03-JC or -JD CPU Box

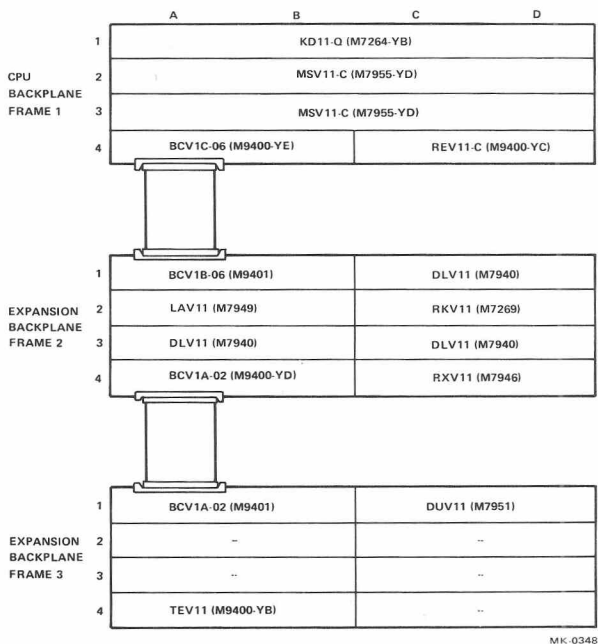
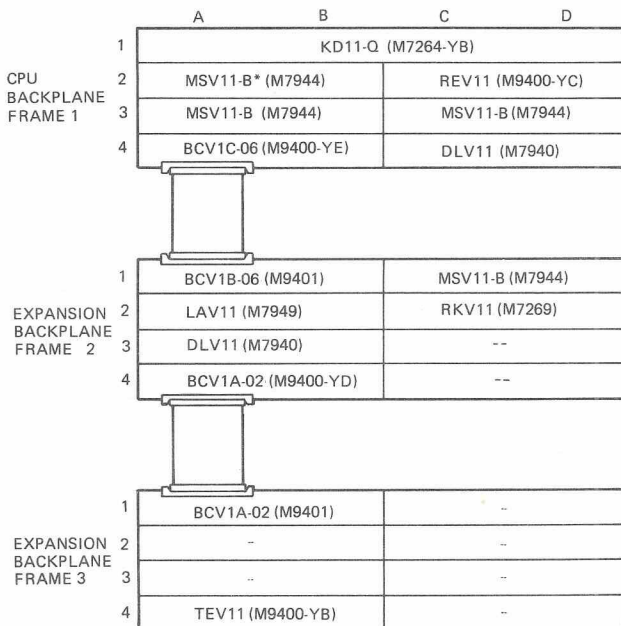


Figure 1-16

D324 Module Utilization
For Recommended Expanded Systems
Using 11/03-JC or -JD CPU Box



*The MSV11-B closest to the REV11 must reply on refresh. Therefore, remove jumper W4 on the MSV11-B module in slot 2AB and install it on all other MSV11-B's on the system.

MK-0349

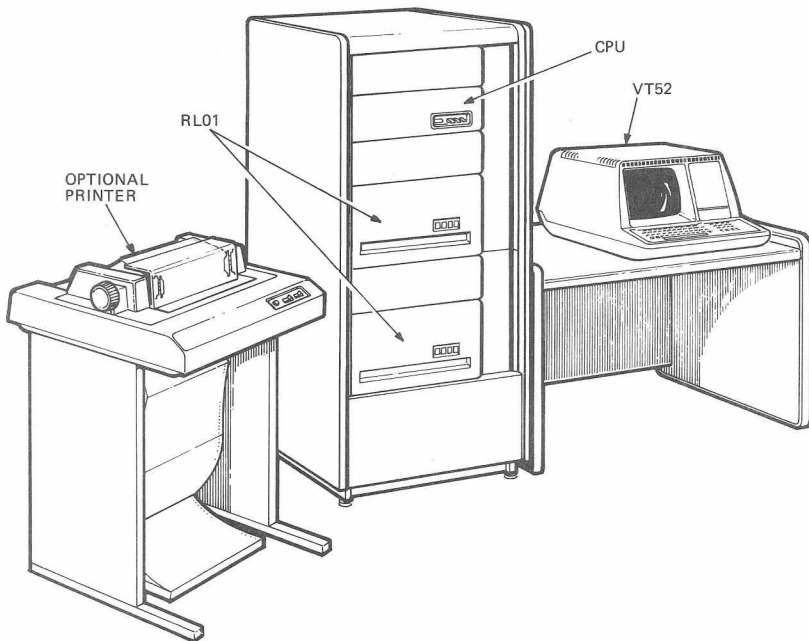
Figure 1-17

Module Utilization
When Replacing a KD11-P
With a KD11-Q

1.4 D325 SYSTEM

The D325 system, with DIGITAL's fully supported CTS-300 software license and DIBOL Instruction Set, includes the PDP-11/03 central processor, 64K bytes of MOS memory, bootstrap loader, serial line interface, and VT52 CRT console terminal. There is an RLV11 controller with dual 5 megabyte removable disk drives (RL01) for use as a system device and as a primary backup and load device. This configuration is arranged in an H9602 cabinet and an H9532-AA desk.

Space is reserved in this configuration for a printer. Any four of the following may also be added: additional RL01 disk drives plus cabinet, dual floppy disk unit, choice of four printers, up to three video or hard-copy terminals and/or a 2780 communication package and CTS-300 DICAM.



MK-0350

Figure 1-18

D325 System

SYSTEM MODEL DESIGNATIONS

Model Designation

D325A	AA	AD
Input power/frequency	115/60	230/50
H9602	CM	CN
11/03	NC	ND
RL01	AK	AK
H9532	AA	AA
VT52	NE	NF
LA180*	PA	PD

* Model AA + LA180 = Model BA
Model AD + LA180 = Model BD

D32E SPECIFICATIONS

POWER CONNECTOR	PRINTER LA180		RL01 CABINET		CPU CABINET		VT52 DESK	
	115 V, 60 HZ	230 V, 50 HZ	115 V, 60 HZ	230 V, 50 HZ	115 V, 60 HZ	230 V, 50 HZ	115 V, 60 HZ	230 V, 50 HZ
	15 A 	15 A 	30 A W 	30 A W 	30 A W 	20 A X 	15 A 	15 A 
NEMA NO. DEC P/N	5-15 P 90-08938	6-15 P 90-08853	15-30 P 12-11193	15-30 P 12-11193	15-30 P 12-11193	66-20 P 12-11192	5-15 P 90-08938	6-15 P 90-08853
AMPERAGE	3 A	1.5 A	2.6A	1.3A	8A	4A	1 A	.5A
BTU/HOUR	1023	1023	1100	1100	3400	3400	400	400
HEAT DISSIPATION	300 W	300 W	300W	300 W	960 W	960 W	118 W	118 W
SHIPPING WEIGHT (APPROXIMATE)	120 LBS 55 KG	120 LBS 55 KG	275 LBS 125 KG	275 LBS 125 KG	350 LBS 159 KG	350 LBS 159 KG	225 LBS 102 KG	225 LBS 102 KG

MK-0351

Figure 1-19

D325 Specifications

Modules Included in the Basic System

PROCESSOR

KD11-Q (M7264-YB)
No resident memory
CPU refresh disabled
Powers up to 173000

MEMORY

MSV11-DD (M8044)
32K RAM
One in basic system
Addresses start at Bank 0
Internal refresh

SERIAL LINE INTERFACE

DLV11 (M7940)
Device address 177560
Vector 60
9600 baud
EIA
One stop bit, eight data bits, no parity

NOTE: For more detailed information, see Chapter 2.

DISK DRIVE INTERFACE

RLV11 (M8013 and M8014)
Device address 174400
Vector 160

BOOTSTRAP

BDV11-AA (M8012)
Bootstrap enabled
Real time clock enabled

LA180 PRINTER INTERFACE

LPV11 (M8027)
Device address 117514
Vector 200

For more detailed information, see Chapter 2.

	A	B	C	D
1	KD11-Q (M7264-YB)			
2	MSV11-DD(M8044-DA)			
3	RLV11 (M8013)			
4	RLV11 (M8014)			
5	DLV11 (M7940)			
6	LPV11 (M8027)			
7				
8				
9	BDV11-AA (M8012-VA)			

MK-0352

Figure 1-20

D325 Module Utilization
Using 11/03-NC, or 11/03-ND Box

CHAPTER 2 DETAILED MODULE DESCRIPTIONS

2.1 PROCESSOR MODULES

When replacing chip sets, check both the number on the handle and etch rev. on the board. The jumpers are defined in this section. For details of differences between various revisions of the processor modules refer to Appendix D of the 1977-78 Microcomputer Handbook (EB 0794853/77).

Processor Model Designations

KD11-P

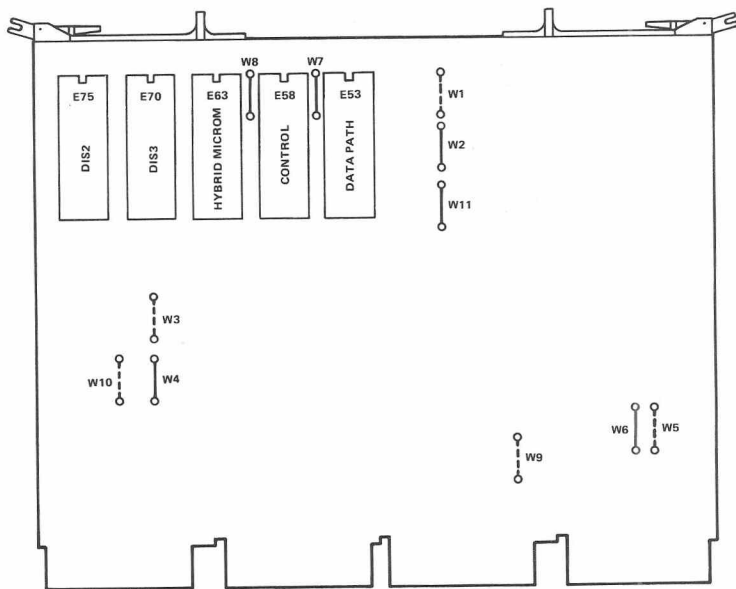
Processor with on-board 4K RAM and with DIS:
Etch REV E or F M7264-BB plus KEV11-CA

KD11-Q

Processor without on-board 4K RAM and with DIS:
Etch REV E or F M7264-YB plus KEV11-CA

KD11-P, KD11-Q
PROCESSOR MODULE JUMPERS

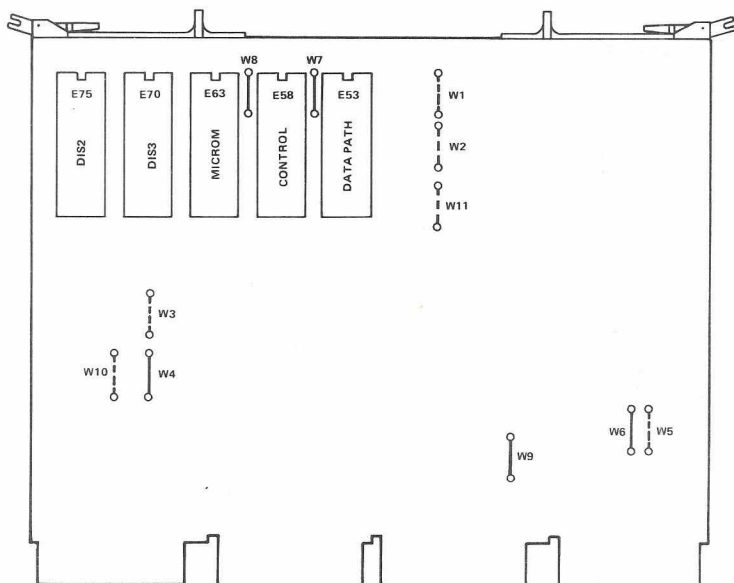
JUMPER	KD11-P	KD11-Q	FUNCTION
W1	R	R	Insert to select resident memory Bank 1
W2	I	R	Insert to select resident memory Bank 0
W3	R	R	Remove to enable event line (LTC) interrupt
W4	I	I	Remove to enable processor controlled memory refresh
W5	R	R	Mode 2, PC at 173000 for user bootstrap
W6	I	I	Mode 2, PC at 173000 for user bootstrap
W7	I	I	Factory selected biasing voltage. Installed for VDATA = VROM.
W8	I	I	Factory selected biasing voltage. Installed for VCTL = VROM.
W9	R	I	Remove to enable reply from resident memory
W10	R	R	Insert to enable reply from resident memory during refresh
W11	I	R	Enable on-board memory select



MR-0797

Figure 2-1

M7264 Module
Configured as KD11-P



MK-0356

Figure 2-2
M7264 Module
Configured as KD11-Q

Diagnostic Programs

The following diagnostic programs are for use with LSI-11 processors except for the limitations noted.

MAINDEC-11-DVKAA
MAINDEC-11-VKAAAO

LSI-11 Basic Instruction Test

MAINDEC-11-DVKAB
MAINDEC-11-VKABAO

LSI-11 Extended Instruction Set (EIS) Test. This program can only be run on LSI-11 CPUs with the KEV11 (EIS/FIS) or KEV11-CA (DIBOL instruction set) options installed.

MAINDEC-11-DVKAD
MAINDEC-11-VKADBO

LSI-11 Traps Tests. This diagnostic must have a bit set in the software switch register if it is run on a LSI-CPU that has the EIS option (KEV11 or KEV11-CA).

Note: Because of the new DIS instructions the Traps Test (MAINDEC-11-VKADBOO) had to be revised. REV A diagnostic (VKADAO) will not run on D322, D324, or D325.

MAINDEC-11-DVKAE
MAINDEC-11-VKAE0

DLV11 Test. This test checks the console serial line unit and can check other DLV11's by entering appropriate addresses and vectors in program locations.

MAINDEC-11-DVKAH
MAINDEC-11-VKAHA0

Basic System Exercisor. Tests serial line unit, memory, processor, EIS/FIS, clock and both floppy disks under dynamic conditions. Software switch register must be set for options.

MAINDEC-11-DVKAI
MAINDEC-11-DVKAIAO

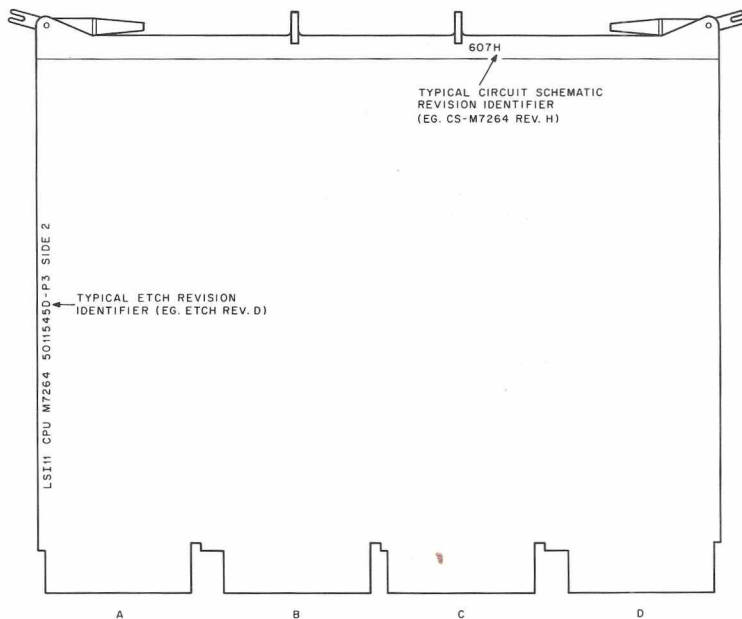
DIS Move and String Instruction Tests. This diagnostic tests the DIBOL instruction set. The CPU must have KEV11-CA (DIS) option installed.

MAINDEC-11-DVKAJ
MAINDEC-11-DVKAJAO

DIS Decimal Instruction Tests. This diagnostic tests the DIBOL instruction set. The CPU must have the KEV11-CA (DIS) option installed.

Note: The KD11-P (or Q) supports DIS (DIBOL Instruction Set) and EIS (Extended Instruction Set) but not FIS (Floating Instruction Set). Therefore, FIS test (MAINDEC-11-VKACAO) will not run on a D322, D324, or D325.

Caution: Because of the complexity of chip set variations, incompatibilities may not be immediately apparent. Therefore, chips should not be swapped or replaced in the field.



11-4693

Figure 2-3

Module Etch and Circuit
Schematic Revision Identifiers
(Module Side 2 Shown)

2.2 OPTION MODULES

This section lists modules alphanumerically by module number. Tables 2-2 and 2-3 list modules by option designation for cross-referencing. All modules are (or will be) covered in Micro-computer Handbook (EB07948 53/77) and/or the LSI-11 Field Service Manual (EK-LSIFS-SV).

Diagnostic Programs

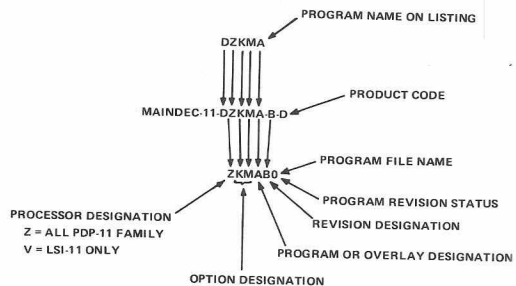
On current systems, diagnostic program files are named after their product codes. For example, the program file name for MAINDEC-11-DZKMA-B is DZKMAB. The program is started by typing R DZKMAB and a carriage return. Earlier systems may have diagnostic file names following the convention shown in Figure 2-4. When in doubt print a directory listing.

Some diagnostics don't support LTC and consequently trap to 100, halt and enter ODT with the following indication on the VT52:

104 - carriage return

@

On D322 and D324 systems, disable LTC via switch on H780 power supply console if this is the case. Nothing needs to be done on D325 Systems.



MR-0134

Figure 2-4
Diagnostic File Names

TABLE 2-2

<u>OPTION DESIGNATION</u>	<u>MODULE NUMBER</u>
BDV11-AA	M8012-YA
DLV11	M7940
DLV11-E	M8017
DUV11-DA	M7951
LAV11	M7949
LPV11	M8027
MSV11-B	M7944
MSV11-C	M7955-YD
MSV11-DD	M8044-DA
REV11-A	M9400-YA
REV11-C	M9400-YC
RKV11-D	M7269
RLV11	M8013 and M8014
RXV11	M7946
TEV11	M9400-YB

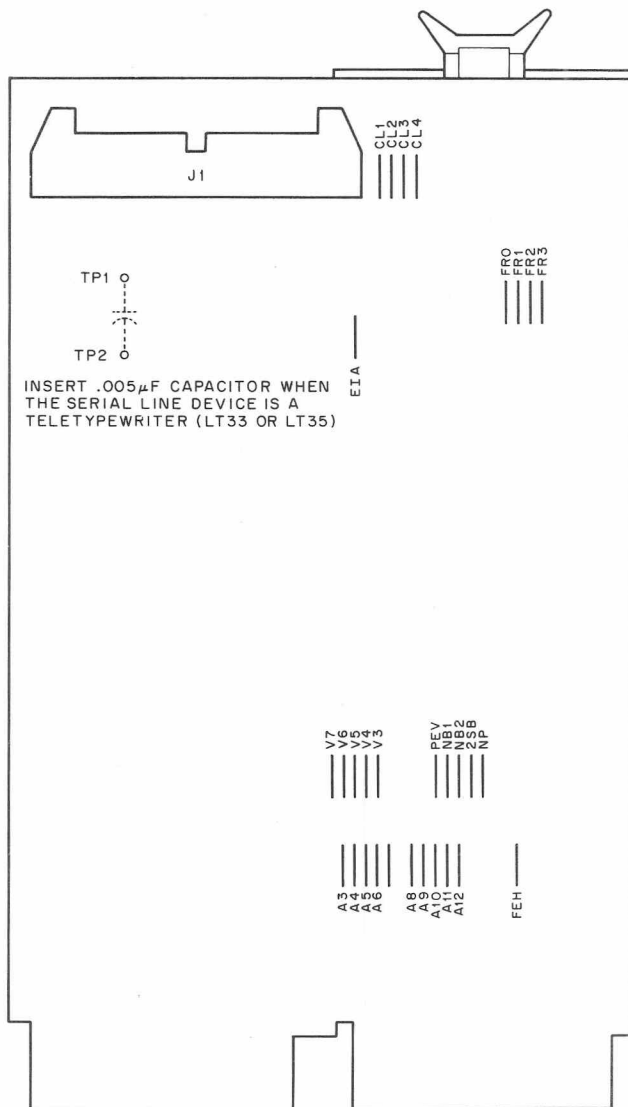


Figure 2-11
M7940 Module

CP - 1801

Standard Addresses

Module ships with all jumpers installed, selecting Bank 0 (0-017776).

Vectors

None

XXDP Diagnostic Program

Program Designation: DZKMA

Program Title: MDS/COR Mem Exer 0-1 24K W/W-O Bits

DEC/X11 Exerciser Program

None

Related Documentaion

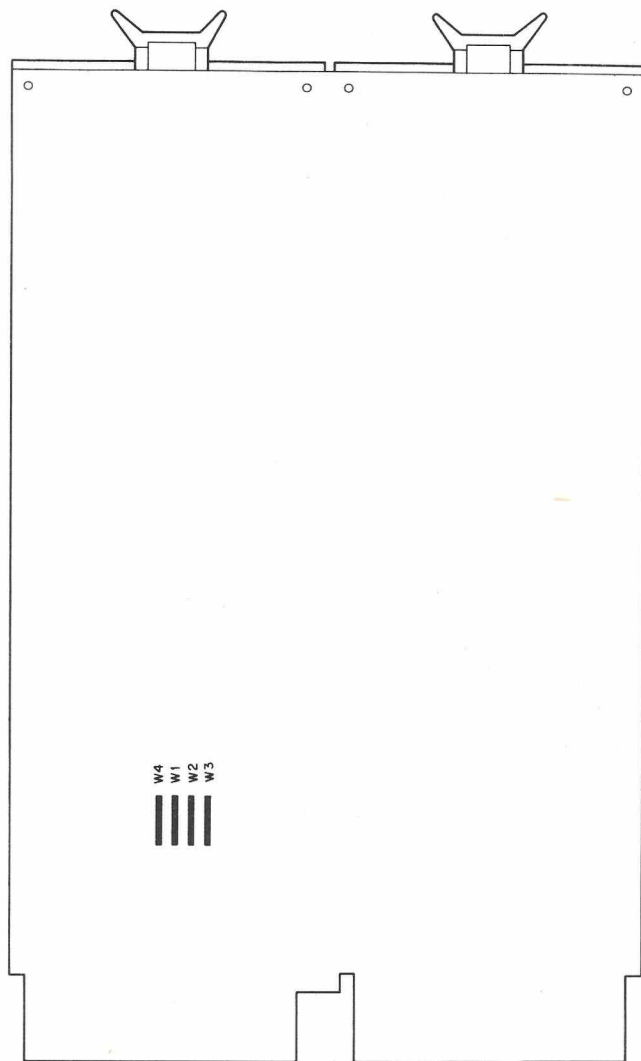
Field Maintenance Print Set (MP00067)

MSV11-B Address Format/Jumpers

Bank No.	Address	Octal Address	Jumpers		
	Range	Range	W1	W2	W3
0	0-4K	000000-017776	I	I	I
1	4-8K	020000-037776	I	I	R
2	8-12K	040000-057776	I	R	I
3	12-16K	060000-077776	I	R	R
4	16-20K	100000-117776	R	I	I
5	20-24K	120000-137776	R	I	R
6	24-28K	140000-157776	R	R	I

NOTE: I=installed R=removed

Remove W4 on the MSV11-C closest to the REV11-C, install W4 on all other MSV11-C'S.



M7944 ETCH REV B

CP-1749

Figure 2-12

M7944 Module

Standard Addresses

First Device (Drives 0 and 1)

RXCS	177170
RXDB	177172

Second Device (Drives 2 and 3)

RXCS	177150
RXDB	177152

Vectors

First device	264
Second device	270

XXDP Diagnostic Program

<u>Program Designation</u>	<u>Program Title</u>
DZRXA	RX11 System Reliability Test
DZRXB	RX11 Interface Diagnostic

Note: Run DZRXB before DZRXA

DEC/X11 Exerciser Program

Program Module:	RXAB
Program Title:	DEC/X11 RX01 Floppy Disk Module

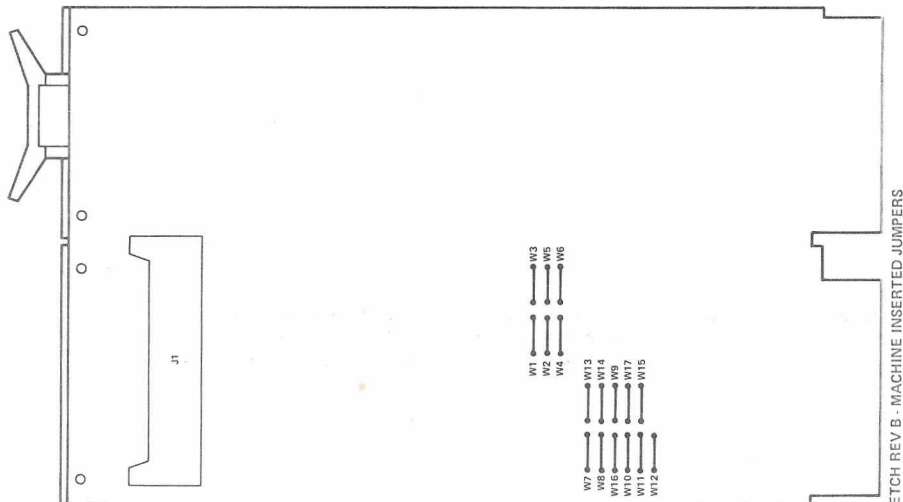
Related Documentation

RXV11 User's Manual (EK-RXV11-OP-001)
Field Maintenance Print Set (MP00024)

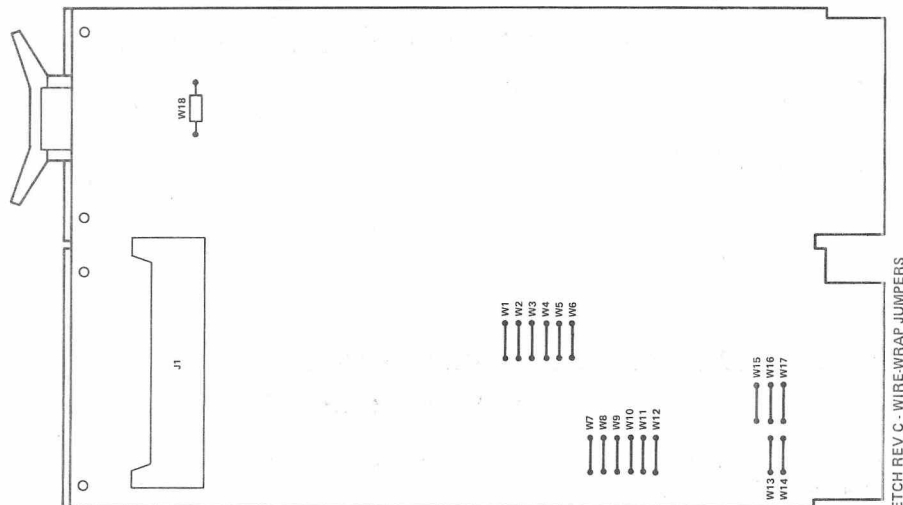
UNIT	ADDRESS	ADDRESS JUMPERS										
		W17	W16	W15	W14	W13	W12	W11	W10	W9	W8	W7
First (Drives 0&1)	177170	R	R	R	R	I	I	R	R	R	R	I
Second (Drives 2&3)	177150	R	R	R	R	I	I	R	R	I	R	I

UNIT	VECTOR	VECTOR JUMPERS					
		W6	W5	W4	W3	W2	W1
First (Drives 0 & 1)	264	R	I	R	R	I	R
Second (Drives 2 & 3)	270	R	I	R	R	R	I

Note: When inserting the cable in the RXV11 interface module, the red edge of the cable should be at the center of the module (near the pin A end of J1).



ETCH REV B - MACHINE INSERTED JUMPERS



ETCH REV C - WIRE-WRAP JUMPERS

11-3494

Figure 2-13
M7946 Module

Standard Addresses

LACS	177514
LADB	177516

Vectors

200

XXDP Diagnostic Program

Program Designation:	DZLAE
Program Title:	LA180 Printer Diagnostic

DEC/X11 Exerciser Program

Program Module:	LPAE
Program Title:	DEC/X11 LP11 Module

Related Documentation

LA11 User's Manual (EK-LA11-OP-001)
Field Maintenance Print Set (MP00306)
LA180 DECprinter I Maintenance Manual EK-LA180-MM-001

NOTES

1. Switching
Switching the LA180 off-line while the operating system is running a program may result in the computer hanging and crashing the program. If this occurs, type P to continue. This problem does not occur if the LPV11 is used in place of the LAV11.
2. LA180 to LAV11 Cable
The only acceptable cable for use between the LA180 and the LAV11 is the BC11S. The end labeled P2 must attach to the LA180. The end labeled P1 must attach to the LAV11.

3. LA180 Modifications

On the LA180 logic board (54-11023), jumper W6 must be inserted. This ensures +5 Vdc SENSE will read the LAV11. Failure to do so will result in a continued error condition in the LAV11 LACS buffer.

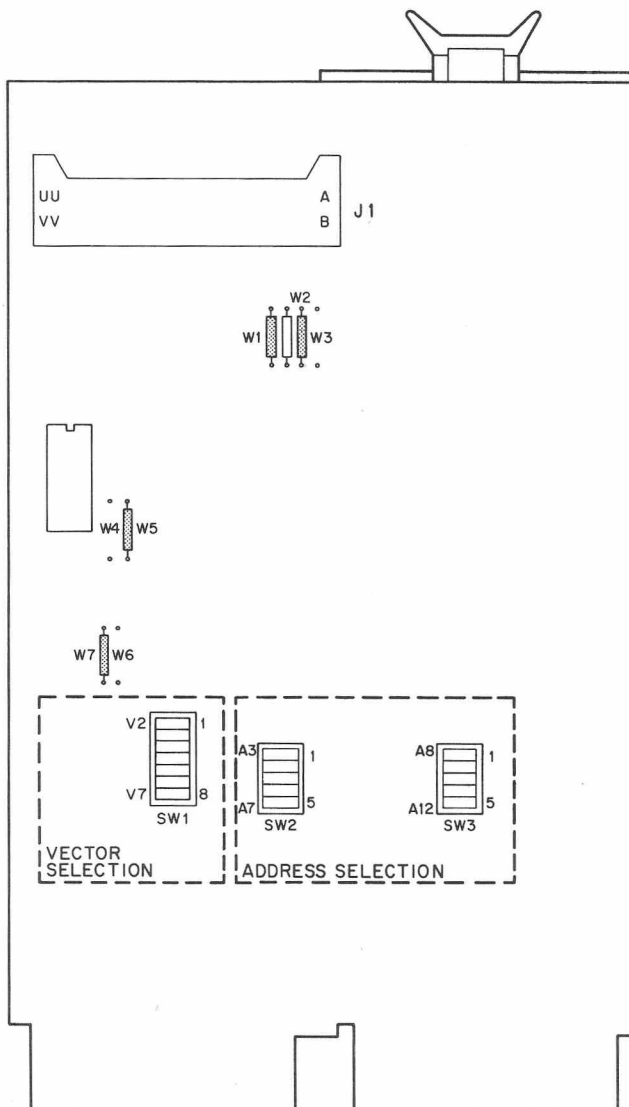
4. Miscellaneous Jumpers

For an LA180, the following jumper configuration must be maintained.

Jumper	Condition	Function if Inserted
W1	I	Transmit parity on line
W2	I	+5 Vdc sense from LA180
W3	R	+5 Vdc sense from LAV11
W4	R	DEMAND is asserted low
W5	I	DEMAND is asserted high
W6	R	P STROBE is asserted low
W7	I	P STROBE is asserted high

LAV11 (M7949)

SWITCH	POSITION							
NO.	1	2	3	4	5	6	7	8
S1	ON	ON	ON	ON	ON	OFF	ON	ON
S2	OFF	ON	ON	OFF	ON			
S3	OFF	OFF	OFF	OFF	OFF			



MM 0353

Figure 2-14
M7949 Module

M7951

DUV11-DA SYNCHRONOUS SERIAL LINE INTERFACE

The following information applies to the DUV11-DA option independent of the communication package sold with the system (either (a) DS3CF-AE, -AY, or -DZ (COS-320 2780 RDCP) or (b) DS3CD-AE, -AY, or -DZ (CTS-320 DICAM)).

Standard Addresses

RXCSR	160040
RXDBUF	160042
PARCSR	160042
TXCSR	160044
TXDBUF	160046

Vector

Receiver Interrupt Floating (see Appendix B)
Transmitter Interrupt Floating (see Appendix B)

XXDP Diagnostic Programs

Program Designation	Program Title
DZDUQ	DUV11 Offline Logic Test
DZDUR	DUV11 Offline Receiver Test
DZDUS	DUV11 Offline Receiver Timing Test
DZDUT	DUV11 Offline Transmitter Test
DZDUU	DUV11 Offline Timing and Interrupt Tests
DZDUV	DUV11 Offline Combined Tests

DEC/X11 Exerciser Program

Program Module: DUAH

Related Documentation

DUV11 Line Interface Technical Manual (EK-DUV11-TM-001)
A-SP-DUV11-0-2
Field Maintenance Print Set (MP00297)

Guide for Setting Switches to Select Device Address

Module	E38								E39		Device Address
Switch No.	1	2	3	4	5	6	7	8	1	2	
Bit No.	12	11	10	9	8	7	6	5	4	3	

ON

160040

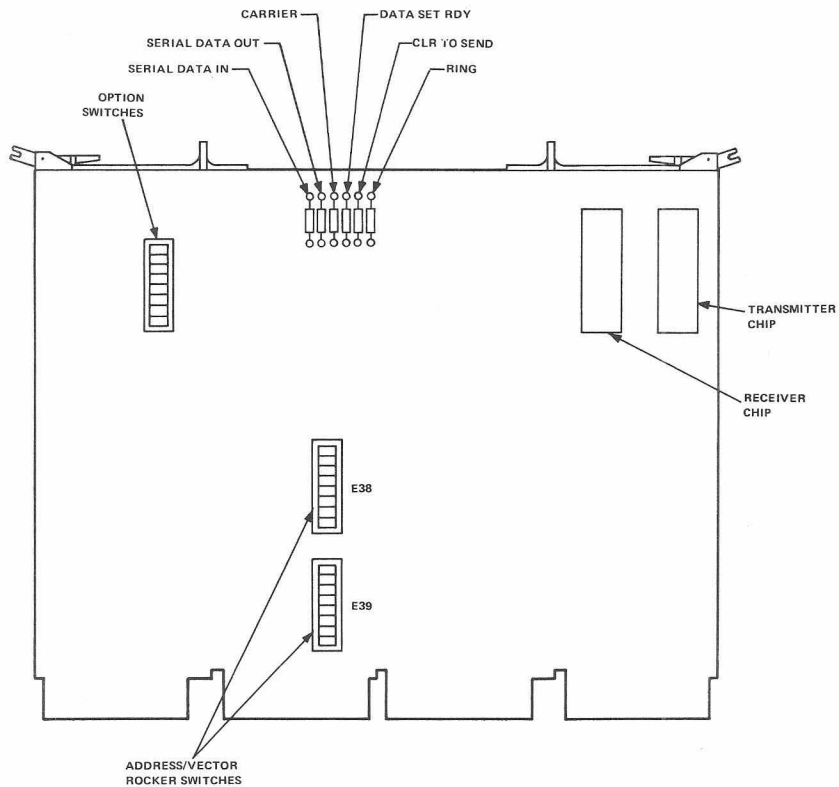
- NOTES:
1. ON means switch closed to respond to logical 1 on the BUS.
 2. Switch numbers are physically on the switch package at E38 and E39.

Guide for Setting Switches to Select Vector Address
(Refer to Appendix B to determine the vector address)

		E39						Vector Address
Switch No.	3	4	5	6	7	8		
Bit No.	8	7	6	5	4	3		
								300
		ON	ON					310
		ON	ON			ON		320
		ON	ON		ON	ON		330
		ON	ON	ON				340
		ON	ON	ON		ON		350
		ON	ON	ON	ON			360
		ON	ON	ON	ON	ON		370
ON								400

Guide for Setting Option Switches

Switch		Function
SW1	on	Optional Clear - Switch ON enables CLR OPT, which is used to clear RXCSR bits 03, 02, and 01.
SW2	off	Secondary Transmit - Switch ON enables secondary data channel between the modem and DUV11.
SW3	off	Secondary Receive - Switch ON enables secondary data channel between the modem and DUV11.
SW4	off	Sync Characters - Switch ON enables the receiver to synchronize internally upon receiving one sync character. The normal condition of receiving two sync characters exists when SW4 is off.
SW5	off	Special Feature - Switch ON allows external clock to be internally generated, used when a modem is not being utilized.
SW6	off	Special Feature - Optional feature is switched ON for program control of data rate selector.
SW7	off	Maintenance Clock - Switch On enables the clock that is used for maintenance purposes only.
SW8	off	Not used.



MK-0357

Figure 2-15
M7951 Module

Standard Addresses

Module ships configured to start at Bank 0.

Vectors

None

XXDP Diagnostic Program

Program Designation: DZKMA

Program Title: MDS/COR Mem Exer 0-1 24K W/W-O Bits

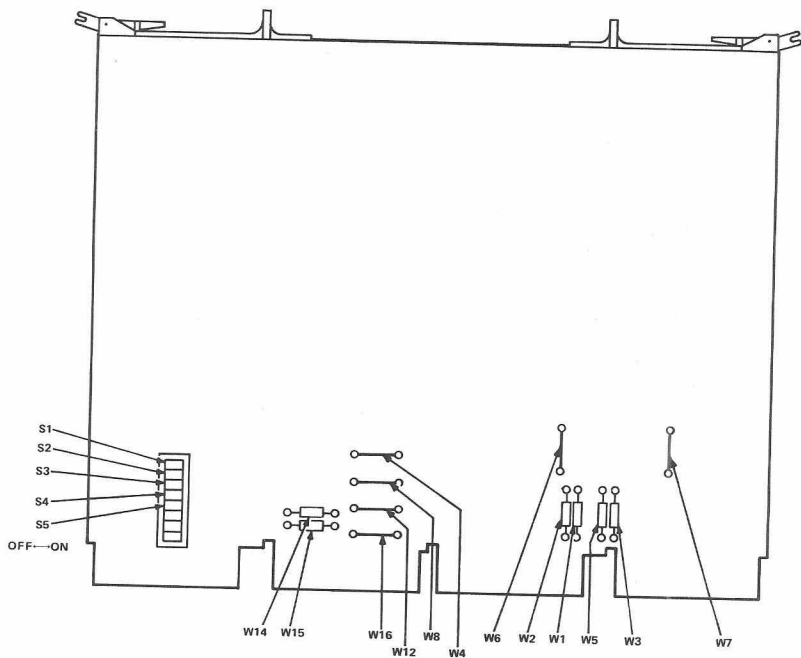
DEC/X11 Exerciser Program

None

Related Documentation

MSV11-C User's Manual(EK-MSV11-OP-001)

Field Maintenance Print Set (MP00259)



MR-0821

Figure 2-16
M7955 Module

Module	Option	Size	W4	Jumpers		
				W8	W12	W16
M7955-YD	MSV11-CD	16K	I	I	I	I
M7955-YC	MSV11-CC	12K	I	I	I	R

MSV11-C JUMPER SETTINGS

Jumper No.	Description	First	Second
		16K	16K
W1	Disable battery backup when installed	I	I
W2	Disable battery backup when removed	R	R
W3	Disable battery backup when removed	R	R
W4	Enable memory bank 0 select	I	I
W5	Disable battery backup when installed	I	I
W6	On board refresh	I	I
W7	On board refresh	I	I
W8	Memory bank 1 select	I	I
W12	Memory bank 2 select	I	I
W14	Bus grant	I	I
W15	Bus grant	I	I
W16	Memory bank 3 select	I	R

MSV11-C SWITCH SETTINGS

SWITCH	FIRST 16K	SECOND 16K
1	ON	ON
2	ON	ON
3	ON	OFF
4	ON	ON
5	ON	ON
6	NOT USED	NOT USED
7	NOT USED	NOT USED
8	NOT USED	NOT USED

SWITCH SETTINGS

A1	on	CPU Test
A2	on	Memory Test
A3	off	SLU Boot
A4	on	Console Terminal Test
A5	off	ROM Boot
A6	off	Floppy Boot
A7	on	RL01 Boot
A8	off	RK11 Boot
B1	off	Loop on test
B2	off	Prom
B3	off	Sys ROM
B4	off	ROM = 1K
B5	on	Real time clock

S1 asserts B halt.

Normal position is when its
lever is closest to the led display

S2 normal position is when its lever
is closest to the LED display. Cycle
S2 back and forth once to reboot the
system.

M8013 and M8014
RL01 DISK DRIVE INTERFACE

Note: The RLV11 has two boards, the M8013 and M8014. The (7012405) cable connects (J1) on the M8013 to (J8) on the 11/03-N CPU box.

RLV11 SWITCH SETTINGS

Switch S1 is used for the vector address of 160*

S1-1	off
S1-2	off
S1-3	on
S1-4	on
S1-5	on
S1-6	off
S1-7	off

Switch S2 is used for the standard device address of 174400

S2-1	on
S2-2	on
S2-3	off
S2-4	off
S2-5	on
S2-6	off
S2-7	off
S2-8	off
S2-9	off
S2-10	off

*Some RLV11's may have shipped with a vector address of 330

S1-1	off
S1-2	on
S1-3	on
S1-4	off
S1-5	on
S1-6	on
S1-7	off

2

M8017

DLV11-E ASYNCHRONOUS SERIAL LINE INTERFACE

Standard Addresses

RCSR	175610
RBUF	175612
XCSR	175614
XBUF	175616

Note: The DLV11-E is shipped configured for use with a modem.

Vectors

Receiver Interrupt floating (see Appendix B)
Transmitter Interrupt floating (see Appendix B)

XXDP Diagnostic Program

Program Designation:	DVDVA
Program Title:	DLV11-E Offline Test

DEC/X11 Exerciser Program

Program Module:	DLAH
Program Title:	DL11 DEC/X11 Exerciser Module

Related Documentation

DLV11-E and DLV11-F Asynchronous Line Interface User's Manual
(EK-DLV11-OP-001)
Field Maintenance Print Set (MP00460)

UNIT	ADDRESS	ADDRESS JUMPERS									
		A12	A11	A10	A9	A8	A7	A6	A5	A4	A3
First Remote	175610	I	I	R	I	I	I	R	R	R	I
Second Remote	175620	I	I	R	I	I	I	R	R	I	R
Third Remote	175630	I	I	R	I	I	I	R	R	I	I
Fourth Remote	175640	I	I	R	I	I	I	R	I	R	R

UNIT	VECTOR	VECTOR JUMPERS					
		V8	V7	V6	V5	V4	V3
First Remote	300	R	I	I	R	R	R
Second Remote	310	R	I	I	R	R	I
Third Remote	320	R	I	I	R	I	R
Fourth Remote	330	R	I	I	R	I	I

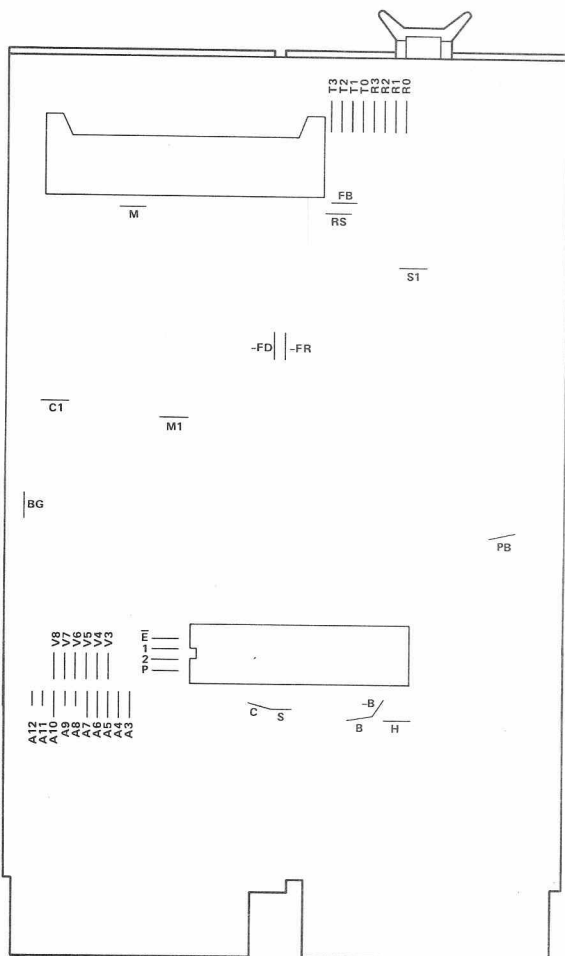
Baud Rate Selections

	Bit	Bit	Bit	Bit	Bit	Baud Rate
Program Control	15	14	13	12	11	
Receive Jumpers	R3	R2	R1	R0		
Transit Jumpers	T3	T2	T1	T0		
	I	R	I	R	I	300
	I	R	R	I	I	600
	I	R	R	R	I	1200
	R	I	R	I	I	2400
	R	R	I	I	I	4800
	R	R	R	I	I	9600

I = Jumper Inserted = Program Bit Cleared.

R = Jumper Removed = Program Bit Set.

Jumper Designation	Jumper State	Function Implemented
BG	R	Break generation is enabled.
P	R	Parity bit is disabled.
E	R	Parity type is not applicable when P is removed.
1	R	Operation with 8 data bits per
2	R	character.
PB	R	Programmable baud rate function disabled.
C	I	Programmable baud rate function disabled.
C1	I	Common speed operation enabled.
S	R	Split speed operation disabled.
S1	R	
H	R	Halt on framing error disabled.
B	R	Boot on framing error disabled.
-B	I	
-FD	I	The DATA TERMINAL READY signal is not forced continuously True.
-FR	I	The REQUEST TO SEND signal is not forced continuous True.
RS	I	The circuitry controlling the REQUEST TO SEND signal is enabled.
FB	R	The FORCE BUSY signal is disabled.
M	R	Factory test jumpers. Not defined for
M1	R	field use.



11-5172

Figure 2-17

M8017 Module

Standard Addresses

LPCS	177514
LPDB	177516

Vector

DONE or ERROR Interrupt 200

XXDP Diagnostic Programs

<u>Program Designation</u>	<u>Program Title</u>
DZLAE	LA180 Printer Diagnostic
DZLPK	LP11/LP05 Line Printer Test

DEC/X11 Exerciser Program

Program Module: LPAE
Program Title: DEC/X11 LP11 Module

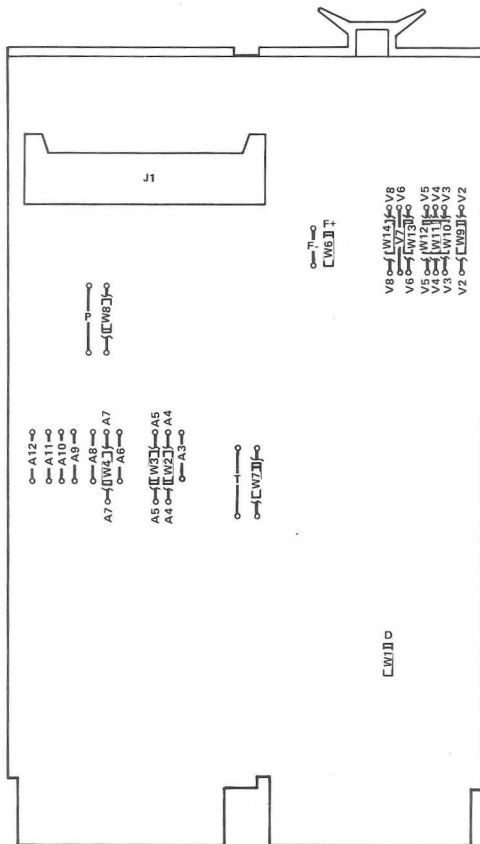
Related Documentation

LPV11 Printer User's Manual (EK-LPV11-OP-001)
LA180 DECprinter I User's Manual (EK-LA180-OP-002)
LA180 DECprinter I Maintenance Manual (EK-LA180-MM-001)
Technical Manual, Model 2230 Line Printer (Dataproducts Corporation)
Field Maintenance Print Set (MP00467)

LPV11 Jumper Definitions

M8027

Jumper Designation	Jumper State	Function
A12	R	Jumper wires W2, W3, and W4 are factory-installed to negate address bits 4, 5, and 7 respectively.
A11	R	
A10	R	
A9	R	This sets 177514 as the base address.
A8	R	
A7	I	
A6	R	
A5	I	
A4	I	Jumper wires W9 through W14 are factory-installed to negate vector bits 2, 3, 4, 5, 6 and 8.
A3	R	
V8	I	
V7	R	
V6	I	
V5	I	This sets 200 as the interrupt vector.
V4	I	
V3	I	
V2	I	W1 installed to delay BRPLY L.
D	I	
T	R	
W7	I	Supports both upper and lower case printing.
P	R	Configured to transmit parity (bit 07) to printer.
W8	I	
F-	R	W6 is installed at F+ to enable error filter operation with the LP05.
F+	I	
		The LA180 automatically enables the error filter circuit regardless of jumper configuration.



NOTE:



= JUMPERS BROKEN
FOR CLARITY ON
THIS FIGURE.

THESE WIRE-WRAP
JUMPERS WOULD
NORMALLY BE USED
TO REPLACE
PREVIOUSLY REMOVED
FACTORY INSTALLED
(W) JUMPERS
(SHOWN INSTALLED).

o = WIRE WRAP PIN.

Figure 2-18
M8027 Module

MR-0863

JUMPER CONFIGURATION

Jumpers

W1 - out	Memory size
R3 - in	equals 28K of user memory
W2 - in	
W3 - in	Non battery
W4 - out	back-up
W5 - out	

Jumpers on wire wrap pins

Pin	wired to pin	Description
5	7	Non parity
15	16	Memory size
10	14	equals 28K

M9400
-YB, -YC, -YD, -YE
REV11-C/TEV11/BCV1A/BCV1B

MODULE	OPTION	DESCRIPTION
M9400-YB	TEV11	120 ohm terminator
M9400-YC	REV11-C	Bootstrap and diagnostic ROM's, DMA refresh
M9400-YD	BCV1A-XX	Cable connector*
M9400-YE	BCV1B-XX	250 ohm terminator and cable connector*

* Connects two BC05-L cables

Related Documentation

REV11-A,C	Field Maintenance Print Set (MP00073)
REV11-H	Field Maintenance Print Set (MP00331)
TEV11	Field Maintenance Print Set (MP00074)

JUMPER SETTINGS

Module	W1	W2	W3	W4
M9400-YB	I	R	I	R
M9400-YC	R	I	I	I
M9400-YD	I	R	I	R
M9400-YE	I	R	I	R

I= jumper installed

R= jumper removed

- W1 Installed to enable BDMG Arbitration.
- W2 Install to enable DMA refresh.
- W3 Always installed.
- W4 Install to enable bootstrap ROMs.

Notes:

1. If no memory replies to REV11 refresh, the REV11 may hang the processor. The problem will appear to be a nonfunctioning CPU.
2. If the REV11 is not up to EC05 level or greater, the same symptoms may occur if a DRV11 is present that has an external capacitor to extend NEW DATA READY to greater than 1.8 us.

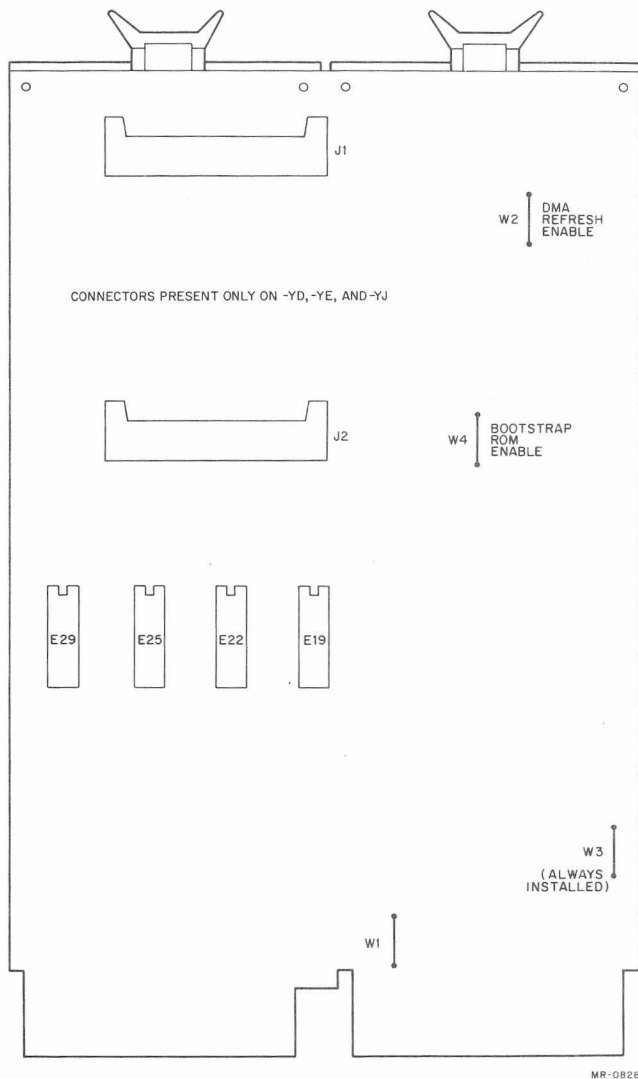
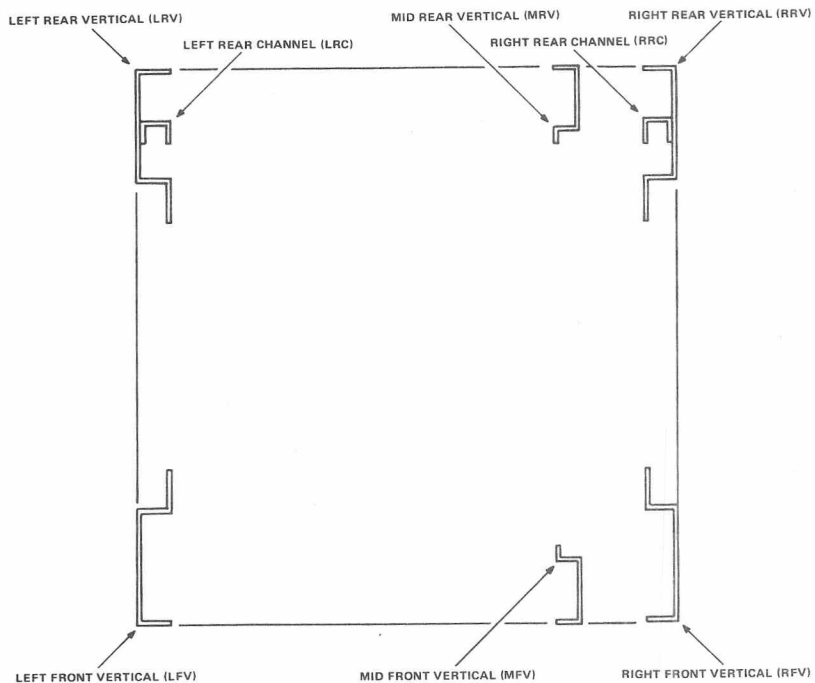


Figure 2-19
M9400 Module

APPENDIX A
FIELD REPLACEABLE PARTS

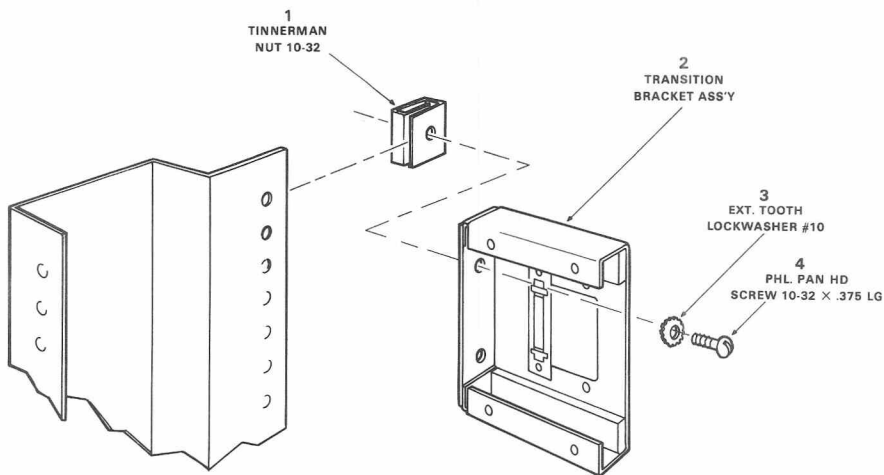
<u>FIGURE #</u>	<u>FIGURE TITLE</u>
A-1	H9500 Cabinet-Top View
A-2	Transition Bracket
A-3	Counterweight Bracket for H9602 Cabinet
A-4	Roll Bar
A-5	Shipping Bracket for RK05 Disk Drive
A-6	Vertical Panel for Single Width Hiboy Cabinet (H9602)
A-7	RL01 Safety Strap



MA-0362

Use with the unit hole location charts on the following drawings. The hole numbers on each chart are counted from the bottom to the top.

Figure A-1
H9500 Cabinet - Top View



UNIT HOLE LOCATION									
PRIM. LOC.	SEC. LOC.	LRV	LRC	LFV	MRV	MFV	RRV	RRC	RFV
1							63		
							69		

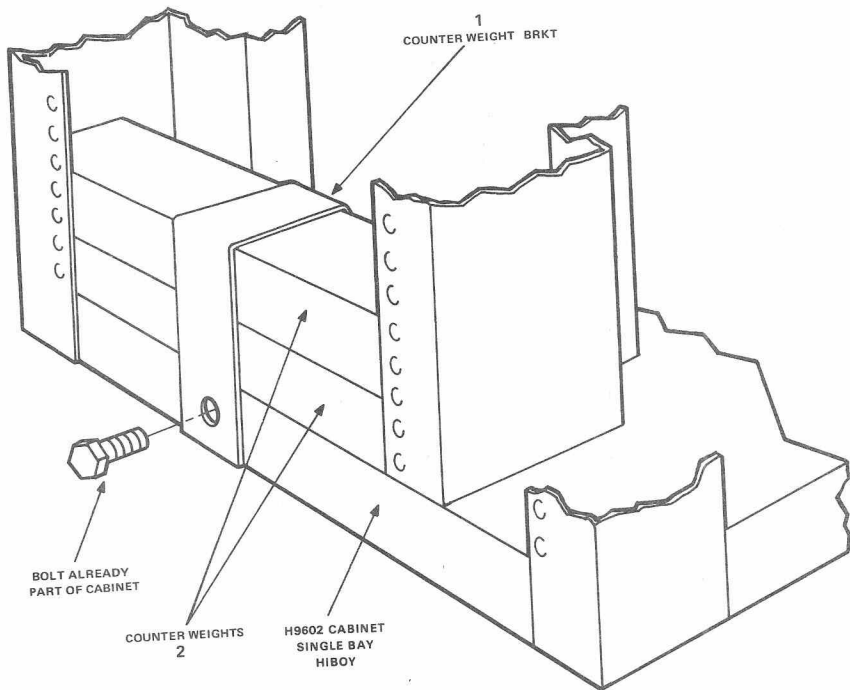
REFER TO FIGURE A-1

4	PHL. PAN HD SCREW	9006071-01	2
3	EXT. TOOTH LOCKWASHER	9007661	2
2	TRANSITION BRACKET ASS'Y	C-AD-7012415-0-0	1
1	TINNERMAN NUT	9007786	2
ITEM	DESCRIPTION	DWG PART NO.	QTY

MK-0337

Figure A-2
Transition Bracket

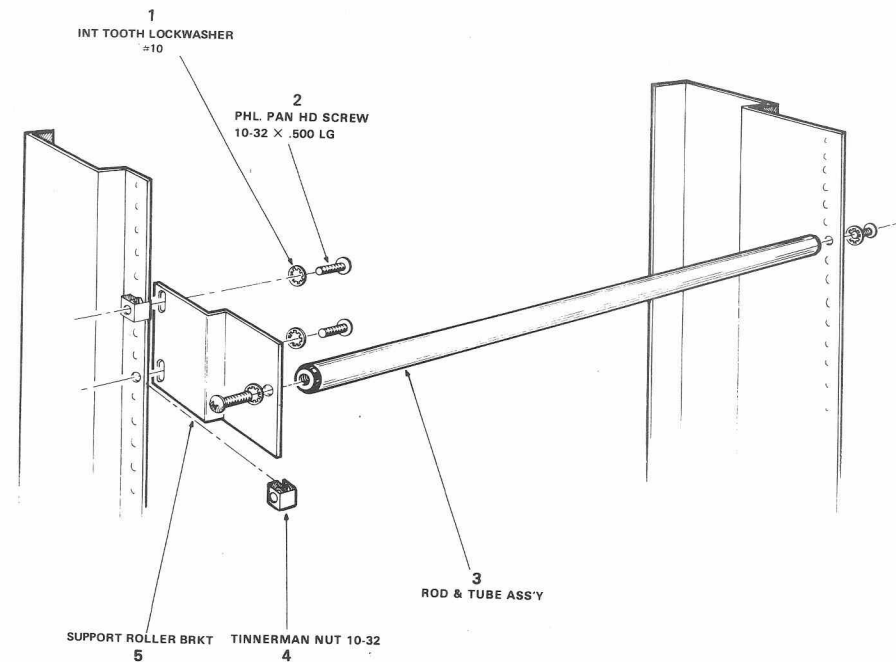
Example: Used with RK06
Disk Drives



2	COUNTERWEIGHT	1211442-0	A/R	
1	BRKT, COUNTERWEIGHT	C-MD-7417608-02	A/R	2-WEIGHTS
1	BRKT, COUNTERWEIGHT	C-MD-7417608-01	A/R	1-WEIGHT
1	BRKT, COUNTERWEIGHT	C-MD-7417608-00	A/R	3-WEIGHTS
ITEM	DESCRIPTION	DWG/PART NO.	QTY	USED WITH

MA-0406

Figure A-3
Counterweight Bracket for
H9602 Cabinet



UNIT HOLE LOCATION									
PRIM. LOC.	SEC. LOC.	LRV	LRC	LFV	MRV	MFV	RRV	RRC	RFV
1				42		41			
						43			
	2			69		68			
						70			

REFER TO FIGURE A-1

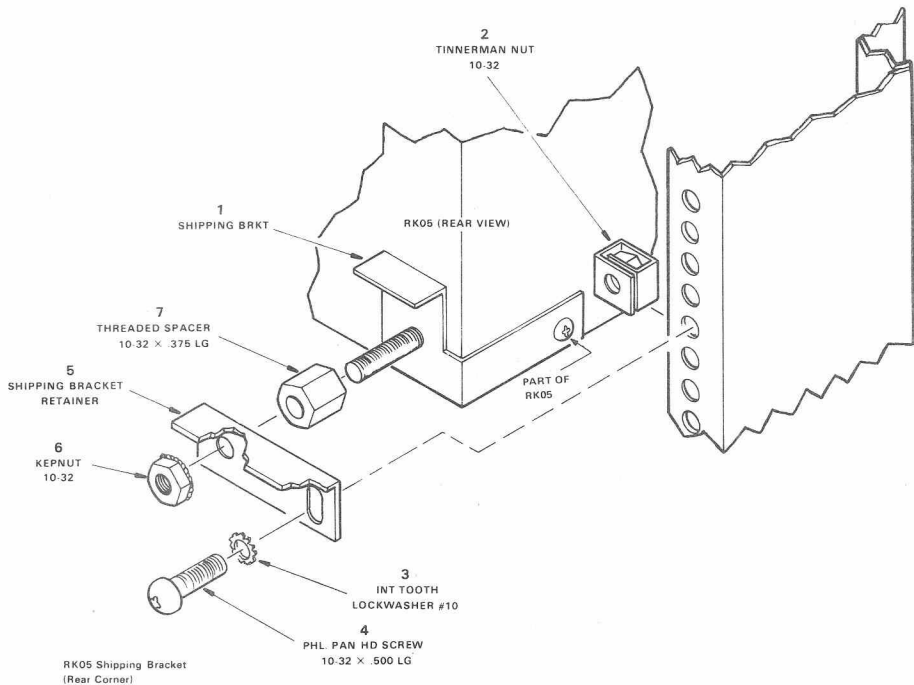
5	SUPPORT ROLLER	C-MD-7415654-0-0	1
4	TINNEMAN NUT	9007786	2
3	ROD & TUBE ASSY	1212173	1
2	PHL PAN HD SCREW	9006073-01	4
1	INT TOOTH LCK WASHER	9006636	4
ITEM	DESCRIPTION	DWG PART NO	QTY

MK-0354

Refer to the DECDATASYSTEM
Installation Manual (EK-DASYS-IN)
for the use of this roll bar.

Figure A-4

Roll Bar



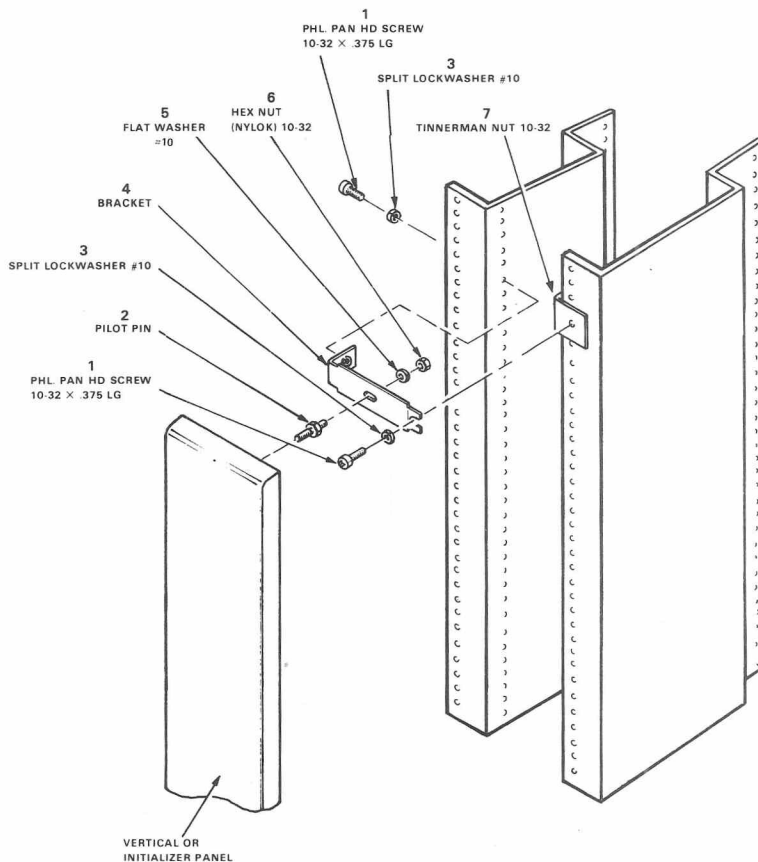
7	THREADED SPACER	9008436	1
6	KEPNUT	9006565	1
5	SHIPPING BRKT RET.	C-MD-7419938-0-0	1
4	PHL PAN HD SCREW	9006073-01	1
3	INT TOOTH LCK WASHER	9006636	1
2	TINNEMAN NUT	9007786	1
1	SHIPPING BRKT	C-MD-7419937-0-0	1
ITEM	DESCRIPTION	DWG PART NO	QTY

UNIT HOLE LOCATION									
PRIM. LOC.	SEC. LOC.	LRV	LRC	LFV	MRV	MFV	RRV	RRC	RFV
1		48		48	48	48			
		50		50	50	50			
		51		51	51	51			
2		75		75	75	75			
		77		77	77	77			
		78		78	78	78			

REFER TO FIGURE A-1

MK-0339

Figure A-5
Shipping Bracket for RK05
Disk Drive



UNIT HOLE LOCATION

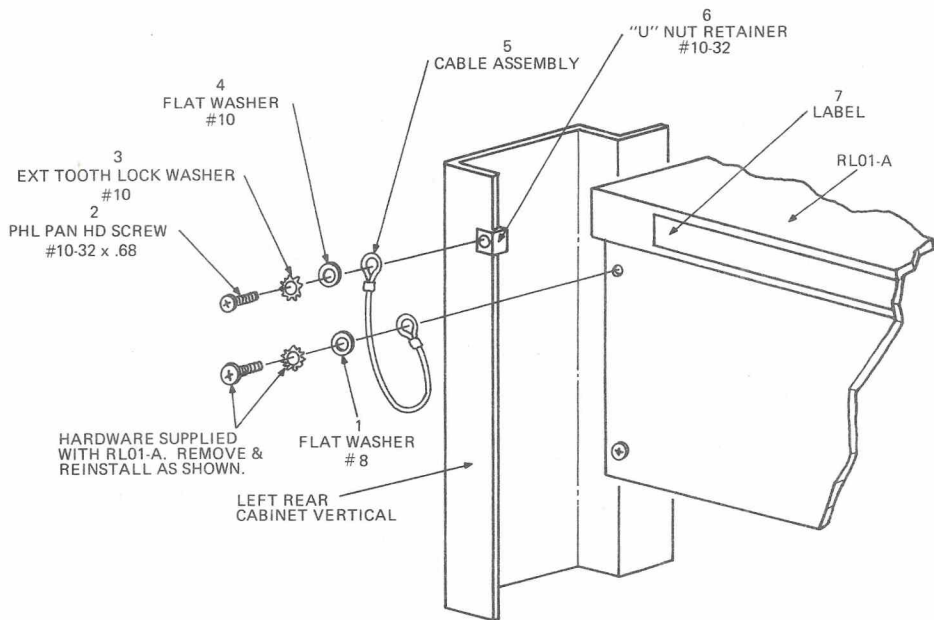
PRIM. LOC.	SEC. LOC.	LRV	LRC	LFV	MRV	MFV	RRV	RRC	RFV
1						48			48
						88			88

REFER TO FIGURE A-1

7	TINNEMAN NUT	9007786-00	2
6	HEX NUT (NYLOK)	9008059-00	2
5	FLAT WASHER	9006664-00	2
4	BRACKET, MTG.	C-1A-7415797-01	2
3	LOCKWASHER	9007906-00	4
2	PIN, PILOT	B-MD-7415711-0-0	2
1	PHL PAN HD SCREW	9006071-01	4
ITEM	DESCRIPTION	DWG PART NO	QTY

MK 0341

Figure A-6
Vertical Panel for Single-
Width Hiboy Cabinet (H9602)



7	LABEL	3615745-00	1
6	U NUT RETAINER	9007786-00	1
5	CABLE ASSEMBLY	1215700-00	1
4	FLAT WASHER	9006664-00	1
3	EXT. TOOTH LOCK WASHER	9007651-00	1
2	PHL. PAN HD. SCREW	9008909-01	1
1	FLAT WASHER	9006662-00	1
ITEM	DESCRIPTION	DWG PART NO	QTY

NOTE:
THIS SAFETY STRAP IS USED WHEN THE RL01 IS NOT INTERLOCKED. REMOVE THE STRAP WHEN SERVICING THE RL01.

MK-0346

Figure A-7
RL01 Safety Strap

APPENDIX B
FLOATING ADDRESSES

B.1 FLOATING VECTORS

Floating vector addresses are assigned in order starting at 300 and proceeding upwards to 777. The table below shows the assigned sequence for options usually available on D320 systems. For more detail, refer to the PDP-11 Peripherals Handbook (EB-05961-76).

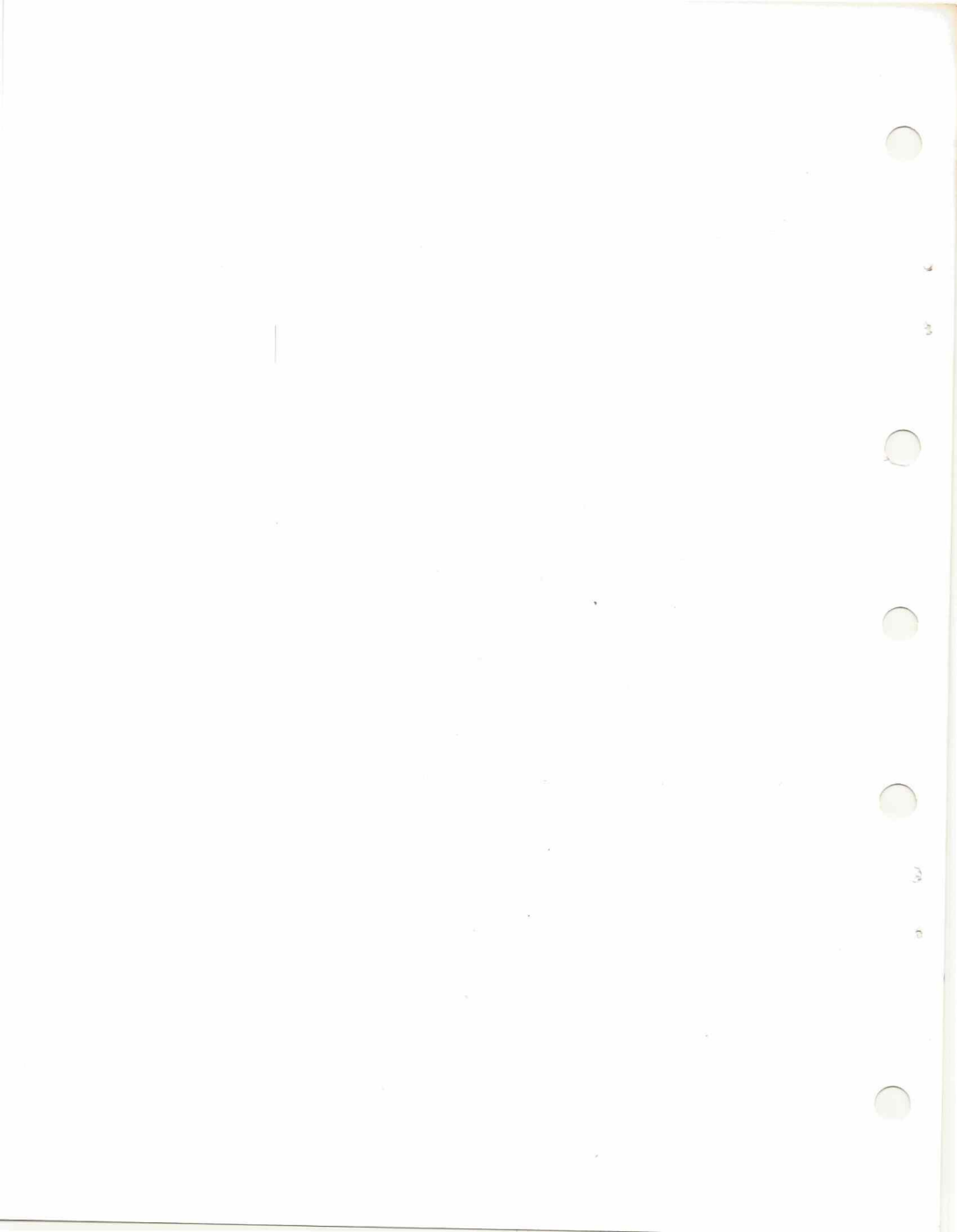
RANK	OPTION	VECTOR SIZE (in octal)
1	DLV11 (local)	10
14	DLV11-E (remote)	10
21	DUV11	10
27	DZV11	10

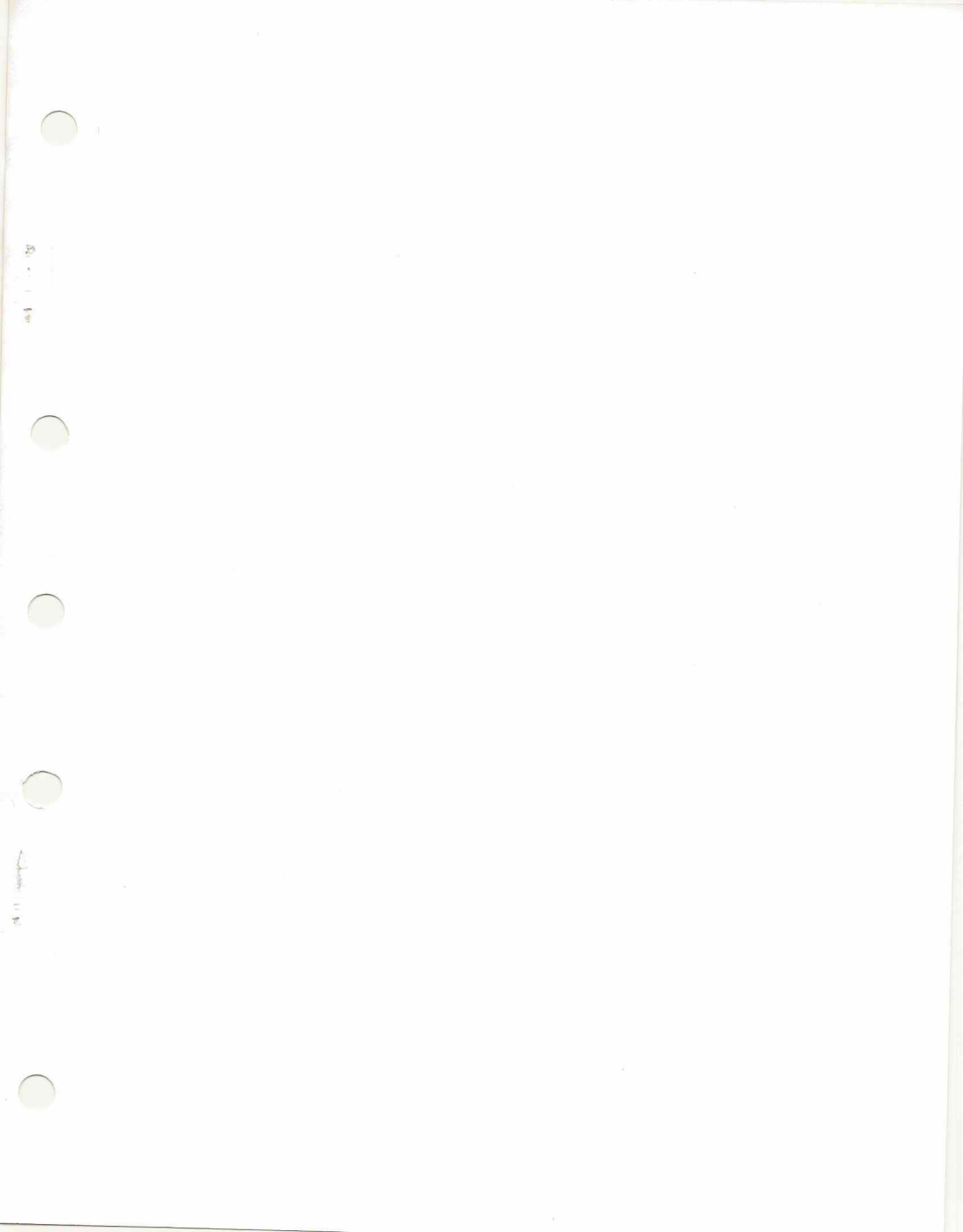
B.2 FLOATING CSR ADDRESSES

Floating CSR addresses are assigned in order starting at 160010 and proceeding upwards to 163776. The table below shows the assigned first addresses for options usually found on D320 systems. For more detail, refer to the PDP-11 Peripherals Handbook (EB-05961-76).

RANK	OPTION	FIRST ADDRESS*
4	DUV11	160040
8	DZV11	160100

* If it is the only floating option on the system.





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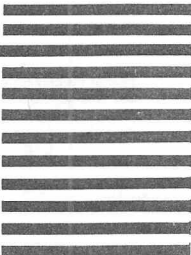


TABLE 2-3 MODULE NUMBERS

MODULE NUMBER	OPTION DESIGNATION	DIAGNOSTIC PROGRAM	EXERCISOR MODULE	EXERCISOR LIBRARY
M7269	RKV11-D	DZRKH DZRKI DZRKJ DZRKK DZRKL	RKAF	DXQLB
M7940	DLV11	DVKAE	DLAH	DXQLD
M7944	MSV11-B	DZKMA		
M7946	RXV11	DZRXA DZRXB	RXAB	DXQLI
M7949	LAV11	DZLAE	LPAE	DXQLB
M7951	DUV11-DA	DZDUQ DZDUR DZDUS DZDUT DZDUU DZDUV	DUAH	
M7955	MSV11-C	DZKMA		
M8017	DLV11-E	DVDVA	DLAH	DXQLD
M8027	LPV11		LPAE	DXQLB
M8028	DLV11-F	DVDVC		
M9400-YA	REV11-A			
M9400-YB	TEV11			
M9400-YC	REV11-C			
M9400-YD	BCV1A			
M9400-YE	BCV1B			



Related Documentation

RKV11-D Disk Drive Controller User's Manual
(EK-RKV11-OP-001)
RKV11-Disk Drive Controller Technical Manual
(EK-RKV11-TM-001)
Field Maintenance Print Set (MP00223)
RK05/RK05J/RK05F Disk Drive Maintenance Manual
(EK-RK5JF-MM-001)
RK05/RK05J Disk Drive Preventive Maintenance Manual
(EK-RK05J-PM-001)
RK05F DEC Disk Drive Preventive Maintenance Procedure
(EK-RK05F-PM-001)

M7269

BUS INTERFACE FOR RKV11-D DISK DRIVE CONTROLLER

Standard Address

RKDS	(Drive Status)	177400
RKER	(Error)	177402
RKCS	(Control/Status)	177404
RKWC	(Word Count)	177406
RKBA	(Bus Address)	177410
RKDA	(Disk Address)	177412
RKDB	(Data Buffer)	177416

Vector 220

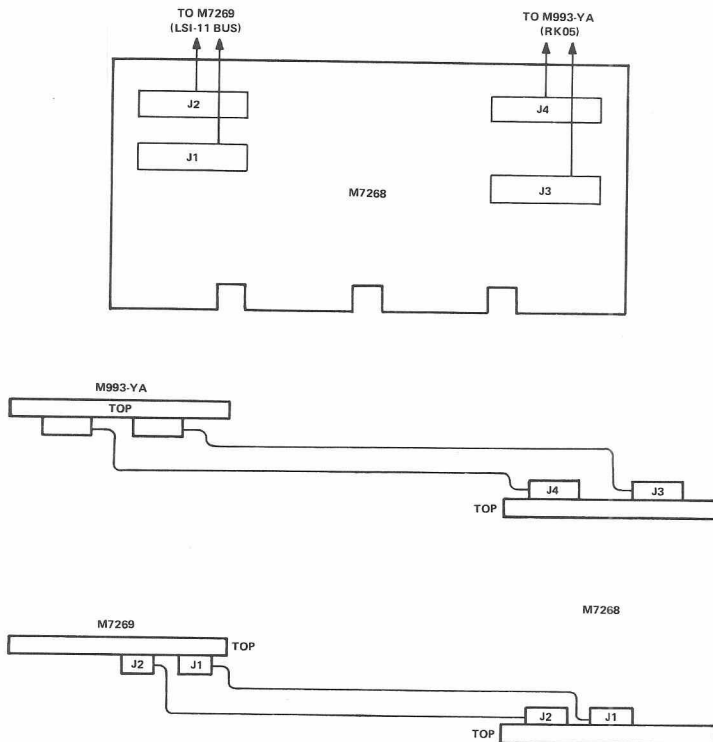
XXDP Diagnostic Programs

DZRKH	RK11-RK05 Performance Exerciser
DZRKI	RK11-RK05 Utility Package
DZRKJ	RK11 Basic Logic Test 1
DZRKK	RK11 Basic Logic Test 2
DZRKL	RK11/RK05 Dynamic Test

Note: The Logic Test programs should be run before
 the Performance Exerciser.

DEC/X11 Exerciser Program

Program Module: RKAF
Program Title: DEC/X11 RK11 Module



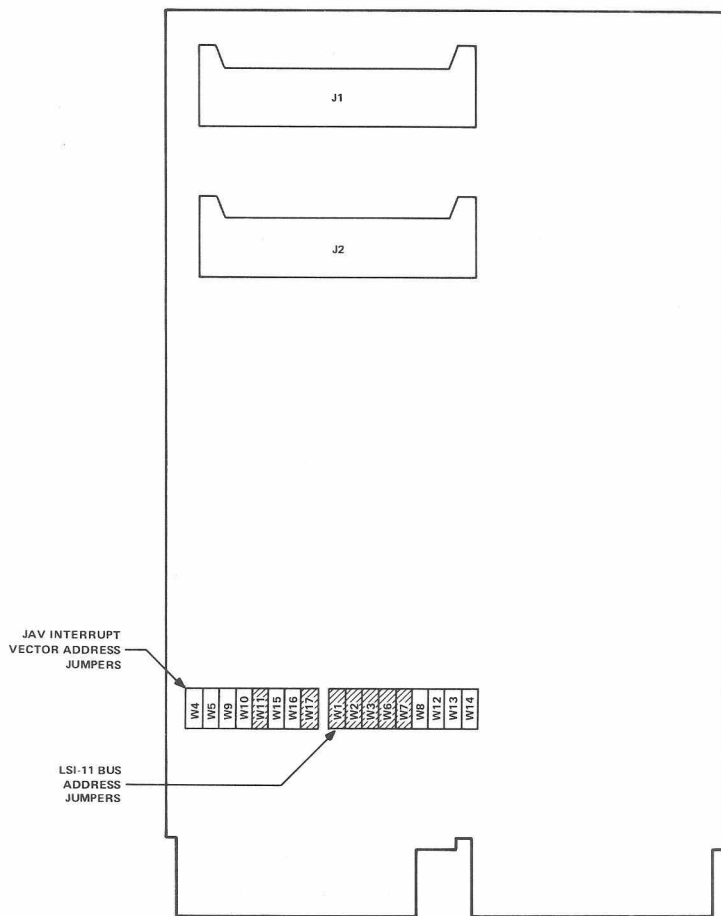
MR-0763

Figure 2-6
Cable Connection
Between M7268 Module and
M7269 Module

M7254	STATUS CONTROL	H780 POWER SUPPLY
M7255	DISK CONTROL	
M7256	DATA PATHS	
M7268	BUS ADAPTER	

MR-0762

Figure 2-5
RKV11-D Module Utilization



MR-0857

Figure 2-7
M7269 Module

M7269 JUMPER SETTING

INSTALLED - W1,W2,W3,W6,W7,W11,W17
REMOVED - W4,W5,W8,W9,W10,W12,W13,W14,W15,W16

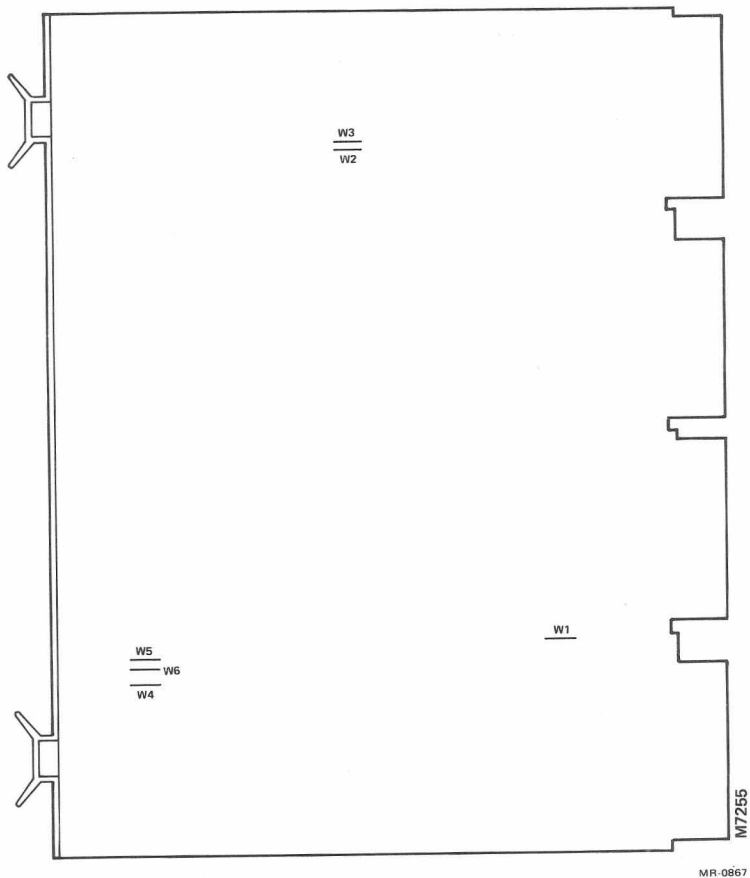
Jumper settings on the three RKV11-D modules are identical to those in the standard RK11-D configuration. A breakdown is given below for reference.

MODULE	INSTALLED	REMOVED
M7254*	W1, W4, W6, W7	W2, W3, W5
M7255**	W1, W2, W6	W3, W4, W5
M7256	W2, W5, W7	W1, W3, W4, W6, W8

* Interrupt priority jumper (BR4-7) in E8 is not required since this has only single-line interrupt scheme.

** 2.88 MH2 crystal used DEC P/N 18-10694-3

There are no jumpers on M7268.



MR-0867

Figure 2-9
M7255 Module

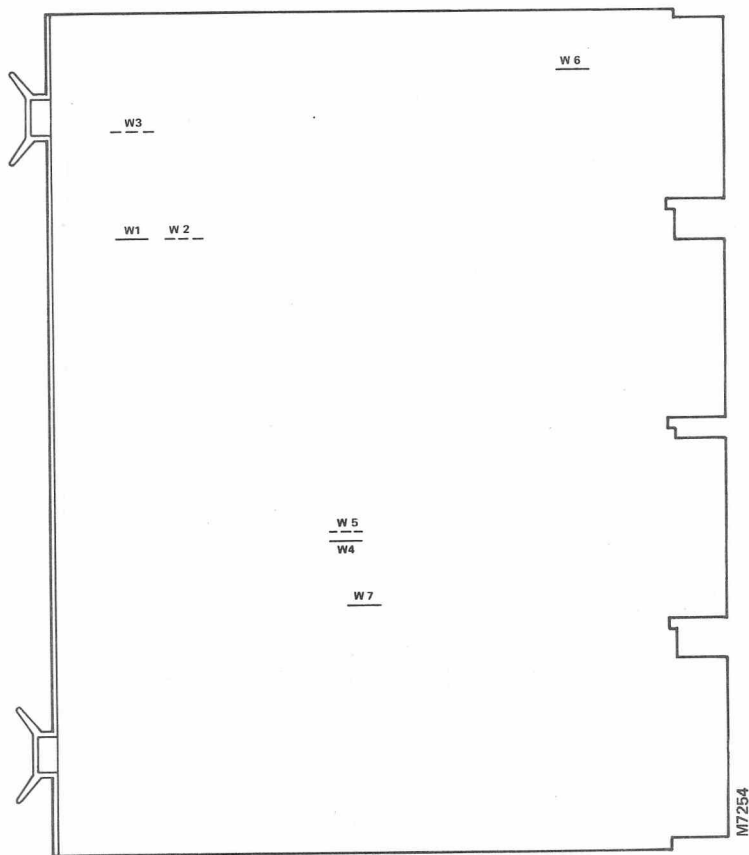


Figure 2-8
M7254 Module

Standard Addresses

	Console	Second Terminal	Modem (Auto mode)
RCSR	177560	176500	175610
RBUF	177562	176502	175612
XCSR	177564	176504	175614
XBUF	177566	176506	175616

Vectors

	Console	Second Terminal	Modem
Receiver Interrupt	60	300	300
Transmitter Interrupt	64	304	304

XXDP Diagnostic Program

Program Designation: DVKAE

Program Title: DLVAA Test

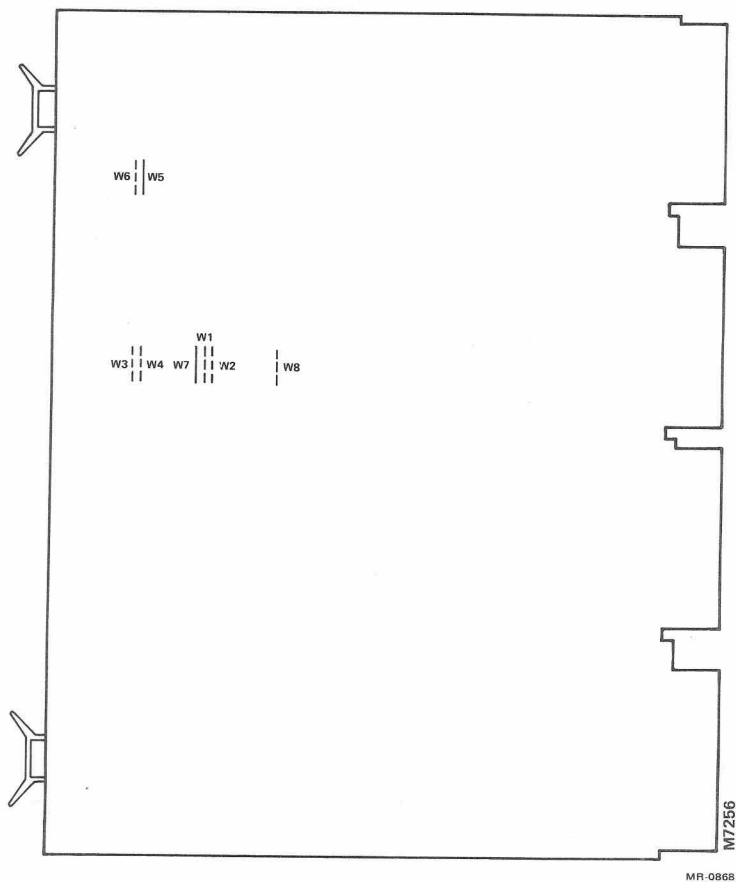
DEC/X11 Exerciser Program

Program Module: DLAH

Program Title: DL11 DEC/X11 Exerciser
Module

Related Documentation

Field Maintenance Print Set (MP00055)



MR-0868

Figure 2-10
M7256 Module

JUMPER CONFIGURATIONS

UNIT	ADDRESS	ADDRESS JUMPERS									
		A12	A11	A10	A9	A8	A7	A6	A5	A4	A3
Console	177560	R	R	R	R	R	I	R	R	R	I
First Option	176500	R	R	R	I	R	I	R	I	I	I
Second Option	176510	R	R	R	I	R	I	R	I	I	R
Third Option	176520	R	R	R	I	R	I	R	I	R	I

UNIT	VECTOR	VECTOR JUMPERS				
		V7	V6	V5	V4	V3
Console	60	I	I	R	R	I
First Option	300	R	R	I	I	I
Second Option	310	R	R	I	I	R
Third Option	320	R	R	I	R	I

BAUD RATE	BAUD RATE		JUMPERS		CAPACITOR
	FR3	FR2	FR1	FRO	C44
300	R	R	I	R	R
600	I	R	R	I	R
1200	R	I	R	R	R
1800	R	I	R	I	R
2400	R	R	I	I	R
4800	R	I	I	R	R
9600	R	I	I	I	R

FORMAT JUMPERS

<u>Install</u>	<u>Remove</u>
CL1	NP
CL2	FEH
CL3	B1
CL4	B2
EIA	PE
SB	