digital

ME15

Engineering Drawings

Digital Equipment Corporation

EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS

DRAWING DIRECTORY

CUSTOMER PRINT SET INDEX

SEQUENCE	
MEMORY EXPANSION	B-DD-ME15-0
MEMORY EXPANSION 96K	A-PL-ME15-0-0
MEMORY EXPANSION 8K X 18 BIT	D-UA-ME15-A-0
MEMORY EXPANSION 8K X 18 BIT(PL)	A-PL-ME15-A-0
MEMORY EXPANSION 8K X 18 BIT(PL)	A-PL-ME15-B-0
MEMORY EXPANSION 8K X 18 BIT(PL)	A-PL-ME15-C-0
MEMORY EXPANSION 8K X 18 BIT	C-UA-ME15-D-0
OPTIONAL CONDIGURATION	D-AR-ME15-Ø-1
MODULE UTILIZATION	D-MU-ME15-Ø-2
INTERCONNECTING CABLE DIAGRAM	D-IC-ME15-Ø-3
POWER WIRING	D-IC-[illegible]-Ø-4
STACK SCHEMATIC	E-CS-H214-Ø-1
* PDP 11 MEMORY DRIVER	E-CS-G231-Ø-1
* CONTROL AND DATA LOOPS	D-CS-M[illegible]9-Ø-1
ME15 INTERFACE	D-CS-M1170-Ø-1
PDP15 MEMORY BUS TERMINATOR	C-CS-M966-Ø-1
BUS TERMINATOR	C-CS-M930-Ø-1
EDGE CONNECTOR	D-CS-[illegible]19-Ø-1
POWER SUPPLY	B-DD-H742-Ø
+5V REGULATOR	B-DD-H744-Ø
-5V REGULATOR	B-DD-H745-Ø
FAN HOUSING ASSY	D-AD-7008886-0-0
ME15 MEMORY	A-SP-ME15-Ø-5
ME15 CONFIGURATION SPEC	A-SP-ME15-Ø-6
ME15 CUSTOMER ACCEPTANCE PRO.	A-SP-ME15-Ø-7

* SPECIAL REVISION PRINTS ARE AVAILABLE ON "C" ETCH REV. MODULES.
CARE SHOULD BE TAKEN TO INSURE THAT PROPER PRINTS ARE ORDERED.

THIS IS PRINT SET

UNIT VARIATIONS

VARIATION	TITLE	PRINT SET TYPE ME15-0
ME15-AA	MEMORY EXPANSION 8K 18 BIT 115V	X
ME15-AB	MEMORY EXPANSION 8K 18 BIT 230V	X
ME15-B	MEMORY EXPANSION 8K 18 BIT	X
ME15-C	MEMORY EXPANSION 8K 16 BIT	X
ME15-D	MEMORY EXPANSION 8K 18 BIT	X

REVISIONS		
REV	CHG. NO.	DATE
A	ME15-1	5/72
B	ME15-7	11 72
C	MISC-00107	1/73
D	ME15-8	2/73
E	MISC-00112	2-73
F	MISC-00113	2-73
H	ME15-9	11 73

USED ON OPTION/MODEL
ME15

DRN.	P. J. LEBLANC	DATE 5-1-72
CHK'D.	J. Balogh	DATE 5-17-72
PROJ ENG.	[illegible]	DATE 5-19-72
PROD	[illegible]	DATE [illegible]
FIELD SERV.	[illegible]	DATE [illegible]

SHEET 1 OF 4

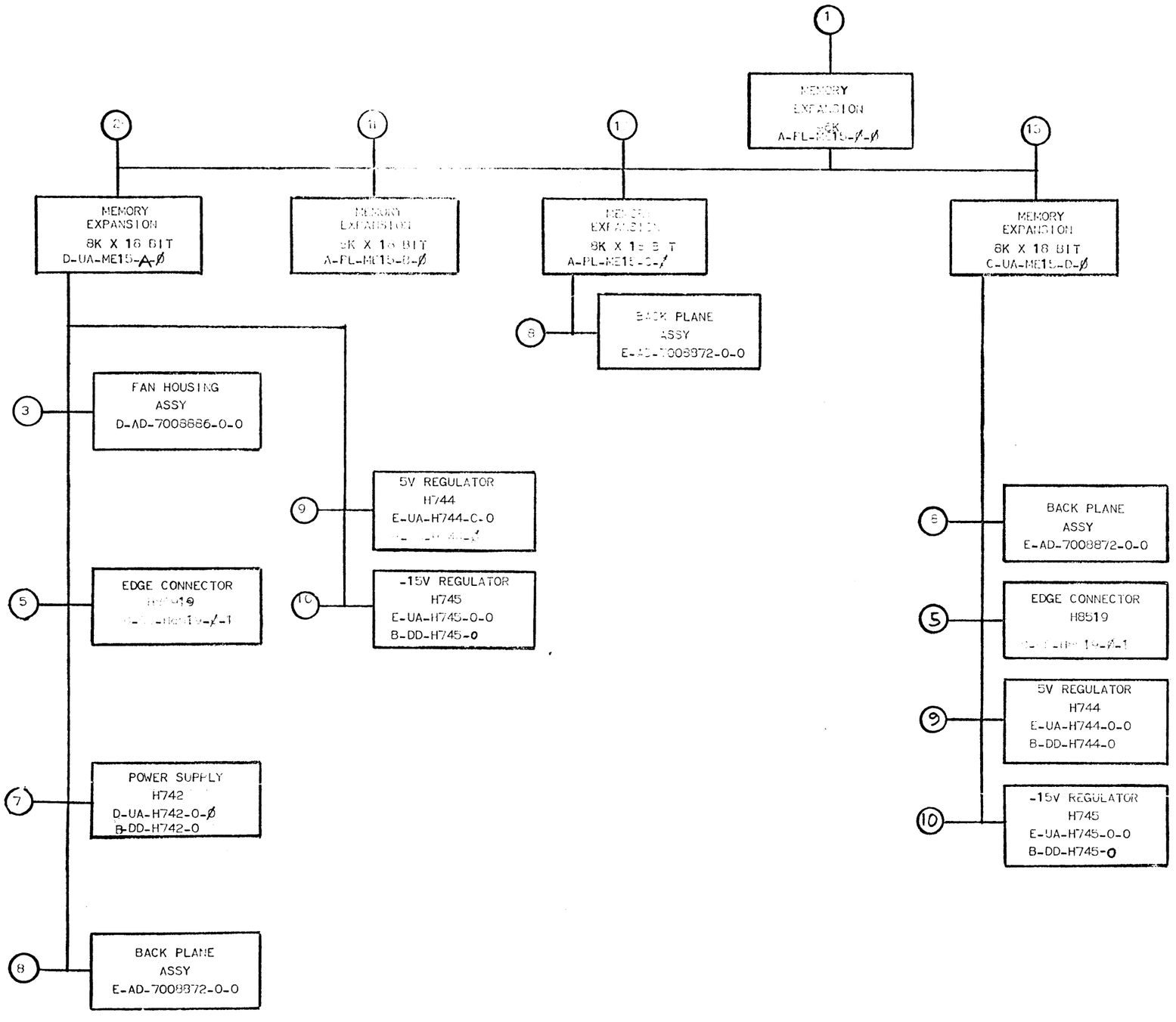
TITLE: MEMORY EXPANSION

SIZE	CODE	NUMBER	REV
B	DD	ME15-Ø	H

DIST

DRB 106

DEC 16—(325)—1062—1—N871



TITLE		SIZE	CODE	NUMBER	REV
MEMORY EXPANSION	SHEET 4 OF 4	B	DU	ME15-0	H

DRB 107
DEC 16-(325)-1062-3-N871

ELECTRICAL

CUSTOMER PRINT SET ME15-0	MFG. SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO.
X		1.	A-PL-ME15-0-0	*	1	MEMORY EXPANSION 96K	
X			D-MU-ME15-0-2	*	1	MODULE UTILIZATION	
X			D-IC-ME15-0-3	*	1	INTERCONNECTING CABLE DIAGRAM	
X			D-IC-ME15-0-4	B	1	POWER WIRING	
X			E-CS-H214-0-1	#	2	STACK SCHEMATIC	
X			E-CS-G231-0-1	#	5	PDP 11 MEMORY DRIVER	
X			E-CS-G100-0-1	#	5	CONTROL AND DATA LOOPS	
X			D-CS-M7170-0-1	#	3	ME15 INTERFACE	
X			C-CS-M966 0-1	#	1	PDP15 MEMORY BUS TERMINATOR	
X			C-CS-M930-0-1	#	1	BUS TERMINATOR	
			B MD-7411488-0-0	—	1	TOP LOGIC FRAME BRKT	
			B MD-7411489-0-0	—	1	BOTTOM LOGIC FRAME BRKT	
			B-MD-7411491-0-0	—	1	RET BRACKET	
X		3	D-AD-7008886-0-0	#	1	FAN HOUSING ASSY	
X		5	D-CS-H8519-0-1	#	1	EDGE CONNECTOR	
X		1	A-SP-ME15-0-5	*	18	ME15 MEMORY	
X			A-SP-ME15-0-6	*	16	ME15 CONFIGURATION SPECIFICATION	
X			A-SP-ME15-0-7	*	5	ME15 CUSTOMER ACCEPTANCE PROCEDURE	
			A-SP-ME15-0-8	*	5	IN HOUSE ME15 ACCEPTANCE PROCEDURE	
		1	E-PS-1211099-0-0	—	2	CARD GUIDE (RH)	
		1	C-MD 7411490-0-0		1	CARD GUIDE (LH)	

MECHANICAL

CUSTOMER PRINT SET ME15-0	MFG SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO.
		1.	A-PL-ME15-0-0	*	1	MEMORY EXPANSION 96K	
X		2.	D-UA-ME15-A-0	C	2	MEMORY EXPANSION 8K X 18 BIT	
X			A-PL-ME15-A-0	C	2	MEMORY EXPANSION 8K X 18 BIT (PL)	
			D-MD-7409724-0-0		1	PANEL, BLANK	
			D-IA-7409682-0-0		1	PANEL, MOUNTING	
			E-IA-7409681-0-0		1	BRACKET CARD GUIDE	
			D-MD-7409680-0-0		1	BAR, LOGIC MOUNTING	
			D-IA-7409699-0-0		2	DOOR EXP MEMORY	
			D-IA-7409697-0-0		1	PANEL MODULE HOLDER	
			D-MD-7409687-0-0		1	ENCLOSURE	
			C-MD-7409688-0-0		1	HINGE, DOOR	
			J-IA-7008950-0-0		1	HARNESS	
			D-MD-7409758-0-0		1	COVER	
X			D-AR-ME15-0-1	*	1	OPTIONAL CONFIGURATION	
			B-MD-7407789-0-0		1	SPACER	
		3.	D-AD-7008886-0-0		1	FAN HOUSING ASSY	
			A-DC-7407314-0-0		1	DECAL, FAN HOUSING	
			D-IA-7409684-0-0		1	FAN HOUSING	
		5.	D-CS-H8519-0-1		1	EDGE CONNECTOR	
			B-MD-5509071-0-0		1	RECEP 36 PIN REWORK	

TITLE	SHEET	SIZE	CODE	NUMBER	REV
MEMORY EXPANSION	3 OF 4	B	DD	ME15-0	H

DRB 108

DEC - 16- (325)-1062-2A-R272

CUSTOMER PRINT SET	MFG. SET	MECHANICAL FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO.
			E-UE-H744-0-/		3	POWER SUPPLY H742	11/45
C			B-DD-H742-0		3	POWER SUPPLY H742	11/45
		8.	E-AD-7009[illegible]-0-0		1	BACK PLANE ASSY	ME11
			E-SC-1210259-0-0		1	CONN BLOCK, 288 PIN	ME11
			D-SC-1210[illegible]4-0-0		1	CONN BLOCK,360 PIN	ME11
			E-PS-1211439-0-0		1	LOGIC FRAME	11/05
		9.	E-UA-H744-0-0		1	+5V REGULATOR	11/45
C			B-DD-H744-0	#	2	+5V REGULATOR	11/45
		10	E-UA-H745-0-0		1	-15V REGULATOR	11/45
C			B-DD-H745-0	#	2	-15V REGULATOR	11/45
X		11	A-PL-ME15-B-Ø	A	1	MEMORY EXPANSION 8K X 18 BIT	
X		12	A-PL-ME15-C-Ø	B	1	MEMORY EXPANSION 8K X 18 BIT	
X		13	C-UA-ME15-D-Ø	B	2	MEMORY EXPANSION 8K X 18 BIT	
			D-IA-7409682-0-0		1	PANEL, MOUNTING	
			D-MD-7409681-0-0		1	BRACKET CARD GUIDE	
			D-MD-7409680-0-0		1	BAR, LOGIC MOUNTING	
			D-MD-7409758-0-0		1	COVER	

CUSTOMER PRINT SET	MFG SET	MECHANICAL FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO.

TITLE	SHEET 4 OF 4	SIZE	CODE	NUMBER	REV
MEMORY EXPANSION		B	DD	ME15-Ø	H

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY P.J.LEBLANC	CHECKED L. Talagher	SECTION
DATE 3/18/72	DATE 5-9-72	1
ENG [illegible]	PROD [illegible]	ISSUED SECT.
DATE 5-15-72	DATE [illegible]	1

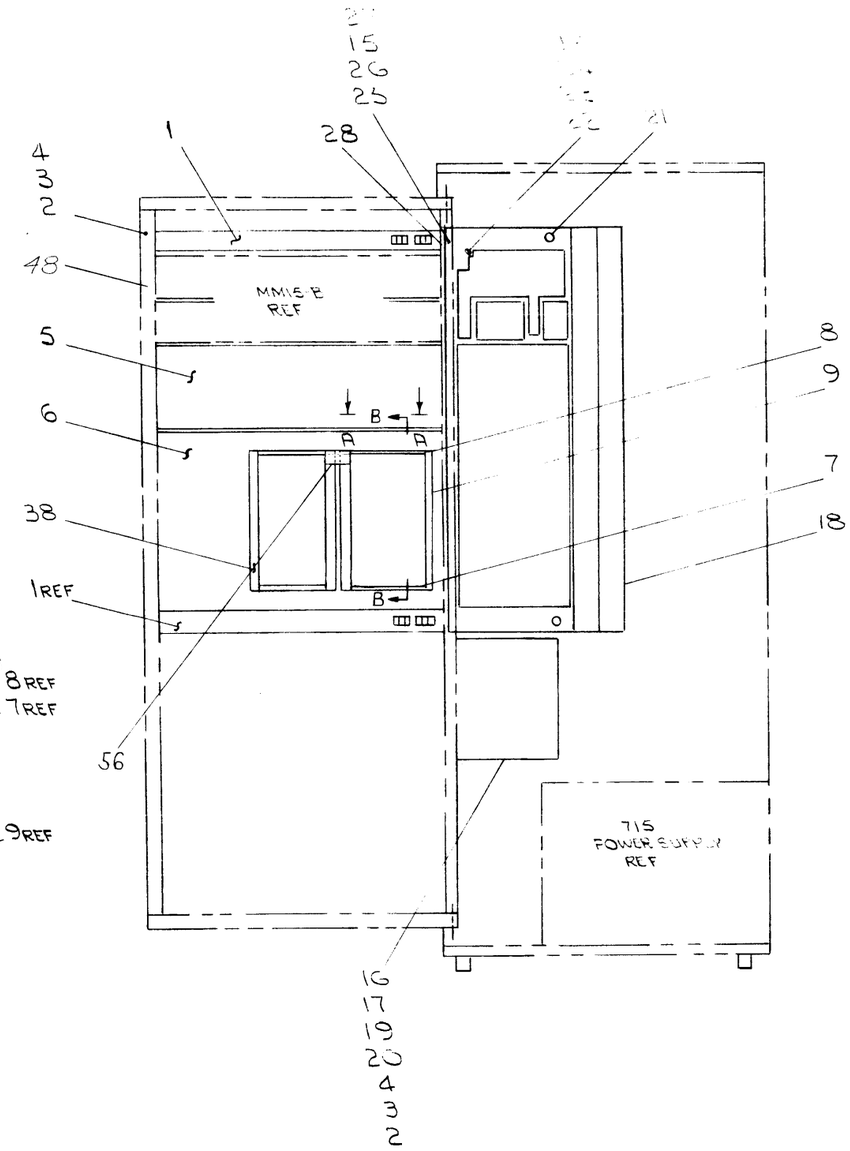
ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	QUANTITY / VARIATION
1	D-UA-ME15-A-Ø	MEMORY EXPANSION 8K X 18 BIT	REF
2	A-PL-ME15-B-Ø	MEMORY EXPANSION 8K X 18 BIT	REF
3	A-PL-ME15-C-Ø	MEMORY EXPANSION 8K X 18 BIT	REF
4	C-UA-ME15-D-Ø	MEMORY EXPANSION 8K X 18 BIT	REF

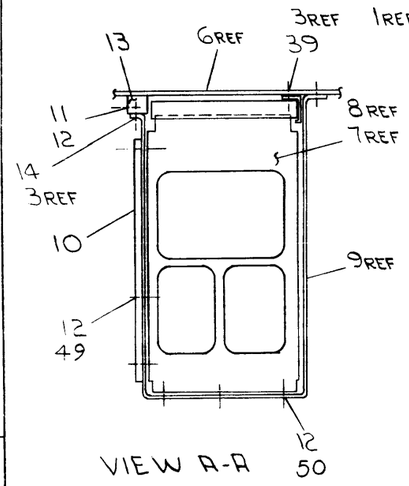
TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
MEMORY EXPANSION 96K	//	A	PL	ME15-Ø-Ø		
	SHEET 1 OF 1	DIST				

DEC FORM DEC 16 (325)-1031-N870
DRA 110

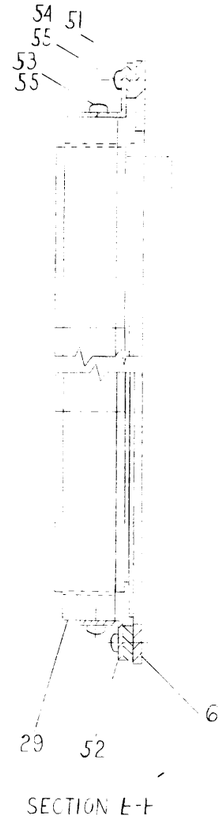
NOTES:

1. [illegible] IN ACCORDANCE WITH [illegible] DWG.
2. ITEM #29550 (THREAD CUTTING SCREWS) MUST BE ASSEMBLED USING A TORQUE SCREW DRIVER. SCREWS WILL BE ATTACHED USING 8 INCH POUNDS OF TORQUE





VIEW A-A



SECTION E-F

LOCATION OF SPEED NUTS ITEM NO. 4

LOCATE NUTS BY COUNTING HOLES DOWN FROM TOP OF FRAME TO BOTTOM.

DOOR FRAME (INSIDE OF CAB)	
LEFT SIDE	RIGHT SIDE
2,4,7,8,11,16,20,24,35,40 52,64,68,70	2,4,7,8,11,16,20,24,32,40 52,64,68,70

CABINET	
LOCATE NUTS BY COUNTING HOLES UP FROM BOTTOM OF CABINET TO TOP	
FRONT, RIGHT SIDE	RIGHT SIDE, REAR
25, 28, 31	25, 28, 31

REVISIONS				
CHK	CHANGE NO	REV		
[illegible]	ME15-00009	A		
[illegible]	ME15-00009	B	J.E. SHEE 11-3-72	
[illegible]	ME15-00009	C	J. ELSBREE 2-13-73	

FEED DOLL

PARTS LIST			
QTY	DESCRIPTION	PART NO	ITEM NO

FIRST USED ON OPTION / MODEL: ME15

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES [illegible]

DRN [illegible] DATE [illegible]
CHK'D [illegible] DATE [illegible]
ENG. DATE
PROJ ENG DATE
PGM DATE

NEXT HIGHER ASSY: A-PL-ME15-0-0

FINISH [illegible] QUAL NONE

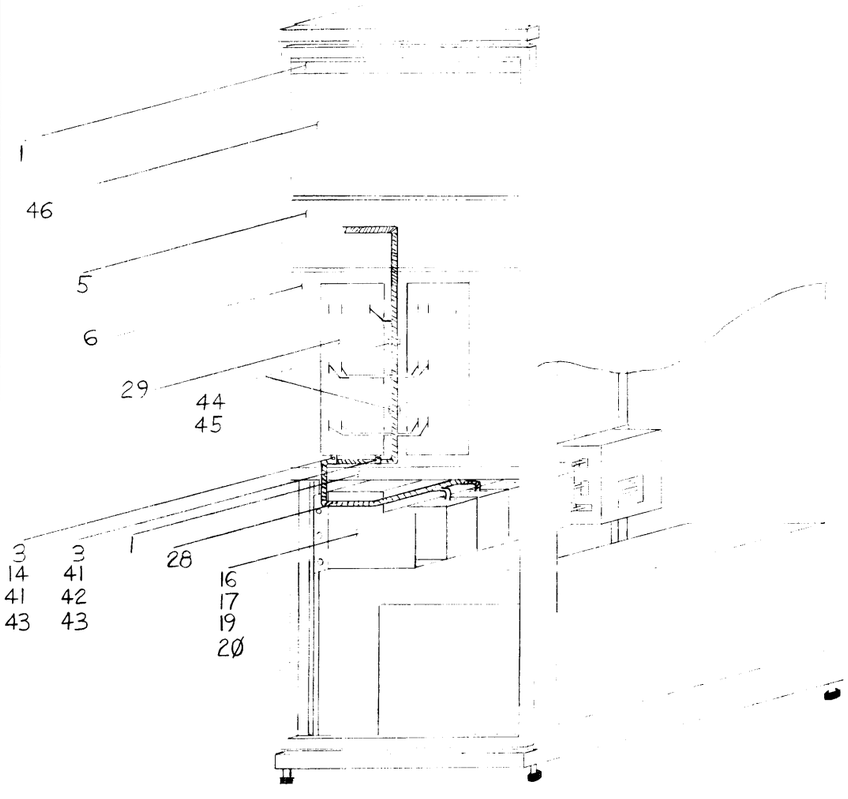
digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

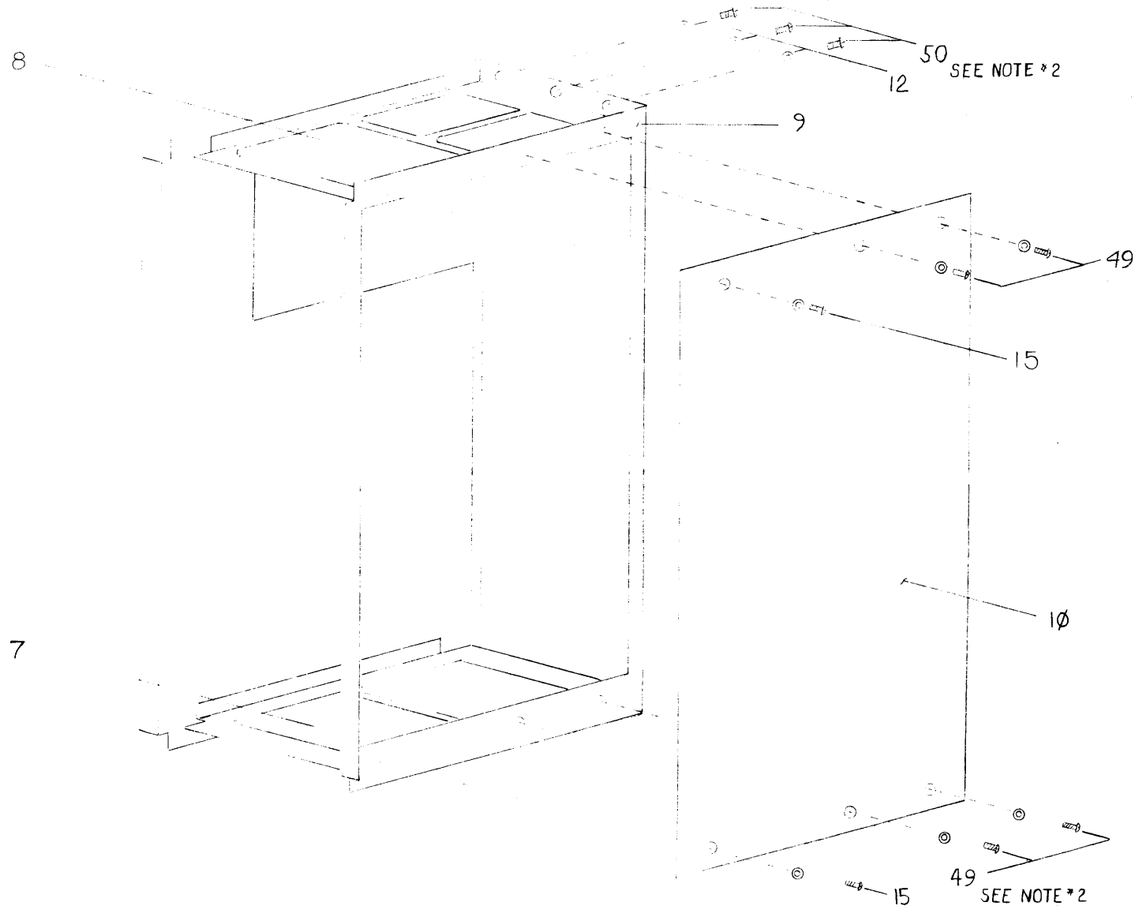
TITLE: MEMORY EXPANSION 8K

SIZE D | CODE [illegible] | NUMBER DUA ME15-A-0 | REV C

DIST

DEC FORM 50 DRD 100





QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

FIRST USED ON OPTION/MODEL: M7F

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSION IN INCHES
TOLERANCES
DECIMALS ± .005 | FRACTIONS ± 1/64 | ANGLES ± 0°30'
FINAL SURFACE QUALITY
REMOVE BURRS AND BREAK SHARP CORNERS

MATERIAL

FINISH

	DATE
DRN.	
CHK'D.	
ENG.	
PROJ. ENG.	
PROD.	

NEXT HIGHER ASSY: M7F-MEI5-0-U

SCALE: NONE

SHEET 2 OF 2

digital EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS

TITLE: MEMORY EXTANSION SK

SIZE	CODE	NUMBER	REV.
D	UA	MEI5-A-0	C

DIST.

REVISIONS

REV.	CHANGE NO.	CHK

DEC FORM NO. DRD 100

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY P.J. LEBLANC	CHECKED J. Kalagher	SECTION
DATE 4/4/72	DATE 5-9-72	1
ENG	PROD	ISSUED SECT.
DATE	DATE 6/12	1

ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	QUANTITY / VARIATION ME15-AA(115V)	ME15-AB(230V)
1	D-AD-7008886-0-0	FAN HOUSING ASSY	2	2
2	9006073-3	SCR,PHL HD TRUSS #10-32 x 1/2 LG	26	26
3	9006636	WASHER, INT. TOOTH LOCK #10	34	34
4	9007786	NUT, U-SHAPED #C-3/75B-032-27	34	34
5	D-MD-7409724-0-0	PANEL, BLANK	1	1
6	D-IA-7409682-0-0	PANEL, MOUNTING	1	1
7	E-PS-1211099	CARD GUIDE (R.H.)	1	1
8	C-MD-7411490-0-0	CARD GUIDE (UPPER)	1	1
9	E-MD-7409681-1	BRACKET CARD GUIDE	1	1
10	D-MD-7409758-0-0	COVER	1	1
11	9006027-1	SCR PHL HD PAN #6-32 x 7/8 LG	3	3
12	9006633	WASHER, INT. TOOTH LOCK #6	15	15
13	D-MD-7409680-0-0	BAR, LOGIC FRAME MOUNTING	1	1
14	9006077-1	SCR, PHL HD PAN #10-32 x 1" LG	2	2
15	9006020-1	SCR, PHL HD PAN #6-32 x 1/4 LG	14	14
16	D-UA-H742-C-Ø	POWER SUPPLY H742 (115v)	1	-
17	D-UA-H742-D-Ø	POWER SUPPLY H742 (230v)	-	1
18	D-IA-7409699-0-0	DOOR EXP MEMORY	1	1
19	E-UA-H744-0-0	5V REGULATOR	1	1
20	E-UA-H745-0-0	-15V REGULATOR	1	1
21	9008104	PAWL FASTENER #48-10-101-10 SOUTHCO	2	2
22	D-IA-7409697-0-0	PANEL, MODULE HOLDER	1	1

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
MEMORY EXPANSION 8K x 18 BIT	D-UA-ME15-A-Ø	A	PL	ME15-A-Ø	C	ME15-0009
	SHEET 1 OF 3	DIST.				

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY P.J.LEBLANC	CHECKED J. Kalagher	SECTION
DATE 3/4/72	DATE 5-9-72	1
ENG	PROD	ISSUED SECT.
DATE	DATE	1

ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	QUANTITY / VARIATION ME15-AA(115V)	ME15-AB(230V)
23	9006020-2	SCR, PHL. FLAT HEAD #6-32 x 1/4 LG	4	4
24	9007855	SPACER 1/4 AF x 3"LG #6-32 THD	4	4
25	D-MD-7409687-0-0	ENCLOSURE	1	1
26	C-MD-7409688-0-0	HINGE, DOOR	1	1
27	9006560	NUT, KEPS #6-32	8	8
28	J-IA-7008950-0-0	HARNESS	1	1
29	E-AD-7008872-0-0	BACK PLANE ASSY	1	1
30	B-DD-H215-Ø	MEMORY STACK 8K x 18 BIT	1	1
31	E-CS-G231-Ø-1	PDP 11 MEMORY DRIVER	1	1
32	D-CS-G1Ø9-Ø-1	CONTROL AND DATA LOOPS	1	1
33	D-CS-M717Ø-Ø-1	15 MEMORY TO 11 UNIBUS INTERFACE	1	1
34	C-CS-M966-Ø-1	PDP 15 MEMORY BUS TERMINATOR	2	2
35	D-UA-BCØ8A-6	I/O CABLE	2	2
36	D-CS-H8519-Ø-1	EDGE CONNECTOR H8519	1	1
37	C-CS-M930-Ø-1	BUS TERMINATOR M930	1	1
38	E-MD-7409681-2	BRACKET CARD GUIDE	-	-
39	9006071-1	SCR PHL HD PAN #10-32 x 3/8 LG	1	1
40	9006022-1	~~SCR. PHL. HD. PAN #6-32x3/8 LG.~~	~~4~~	~~4~~
41	9006064	NUTS, KEP #10-32	2	2
42	9006079-1	SCR PHL HD PAN #10-32 X 1 1/2 LG	1	1
43	9007087	CLAMP 5/8 NYLON	2	2
44	9008264	CABLE TIE MOUNT	2	2

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
MEMORY EXPANSION 8K X 18 BIT	D-UA-ME15-A-Ø	A	PL	ME15-A-Ø	C	
	SHEET 2 OF 3	DIST.				

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY	P.J. LEBLANC	CHECKED	J. KALAGHER	SECTION	1
DATE	4/4/72	DATE	5/9/72		
ENG	D. CRABBE	PROD	R.J. MASULLA	ISSUED SECT.	1
DATE	5/18/72	DATE	6/6/72		

ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION ME15-AA(115V)	ME15-AB(230V)
45	9007031	TIE WRAP SST 1M 3 3/4 X 3/32	2	2
46	7402027	PANEL, BLANK 10 7/16	1	1
47	7402016	PANEL, BLANK 5 1/4	2	2
48	7407789	SPACER	4	4
49	9009525-1	SCR PHL PAN HD TYPE F 6-32X .37 LG	4	4
50	9008181-1	SCR PHL PAN HD TYPE F 6-32X .50 LG	6	6
51	B-MD-7411488-0-0	TOP LOGIC FRAME BRKT	1	1
52	B-MD-7411489-0-0	BOTTOM LOGIC FRAME BRKT	1	1
53	9006037-1	SCR PHL PAN HD 8-32X .37	2	2
54	9006039-1	SCR PHL PAN HD 8-32X .50	2	2
55	9008072-0-0	EXT. TOOTH LOCK WASHERS	4	4
56	B-MD-7411491-0-0	RET BRACKET (PART OF ME15C)	REF	

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
MEMORY EXPANSION 8K X 18 BIT	D-UA-ME15-A-Ø	A	PL	ME15-A-Ø	C	
	SHEET 3 OF 3	DIST.				

DEC FORM NO.
DRA 110

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY P.J. LEBLANC DATE 3/20/72	CHECKED J Ralph DATE 5-9-72	SECTION 1
ENG DATE 5-15-72	PROD DATE	ISSUED SECT. 1

ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	QUANTITY VARIATION
1	D-CS-G-109-0-1	CONTROL AND DATA LOOPS	1
2	E-CS-G231-0-1	PDP 11 MEMORY DRIVER	1
3	B-DD-H215-0	MEMORY STACK	1

NOTE: FOR LOCATION OF MODULES REFER TO: D-MU-ME15-0-2.

TITLE MEMORY EXPANSION 8K X 18 BIT	ASSY NO. —	SIZE A	CODE PL	NUMBER ME15-B-0	REV. A	ECO NO. ME15 — 00004
	SHEET 1 OF 1	DIST 6				

DEC FORM DRA 110 DEC 16-(325)-1031-N870

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY P.J. LEBLANC	CHECKED J. Kalagher	SECTION
DATE 3/18/72	DATE 5-9-72	1
ENG [illegible]	PROD R. [illegible]	ISSUED SECT.
DATE 5-15-72	DATE [illegible]	1

ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	QUANTITY / VARIATION
1	D-AD-7008872-0-0	BACK PLANE ASSY	1
2	B-DD-H215-Ø	MEMORY STACK	1
3	E-CS-G231-Ø-1	PDP 11 MEMORY DRIVER	1
4	D-CS-G1Ø9-Ø-1	CONTROL AND DATA LOOPS	1
5	D-UA-BC11A-2	I/O CABLE	1
6	9006071-1	SCR PHL HD PAN #10-32 x 3/8 LG	2
7	9006077-1	SCR PHL HD PAN #10-32 x 1" LG	2
8	9006536	WASHER INT. TOOTH LOCK #10	4
9	9006022-1	SCR. PHL. HD. PAN # 6-32X 3/8 LG.	4
10	E-PS-1211099	CARD GUIDE (R.H.)	1
11	C-MD-7411490-0-0	CARD GUIDE (UPPER)	1
12	E-MD-7409681-2	BRACKET CARD GUIDE	1
13	D-MD-7409758-0-0	COVER	1
	NOTE: FOR LOCATION OF MODULES REFER TO D-MU-ME15-Ø-2.		
14	D-MD-7409680-0-0	BAR LOGIC FRAME MOUNTING	1
15	9006027-1	SCR PHL HD PAN #6-32 X 7/8 LG	3
16	9006633	WASHER, INT TOOTH LOCK #6	15
17	9006020-1	SCR PHL HD PAN #6-32 X 1/4 LG	2
18	9009525-1	SCR PHL PAN HD TYPE F 6-32X.37LG	4
19	9008181-1	SCR PHL PAN HD TYPE F 6-32X.50LG	6
	NOTE: FOR LOCATION OF ITEM #12 REFER TO D-UA-ME15-A-Ø		
	ITEM #38 AND D-UA-ME15-D-Ø ITEM #6		

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
MEMORY EXPANSION 8KX18 BIT	[illegible]	A	PL	ME15-C-Ø	B	MEI - 0009
	SHEET 1 OF 2	DIST.				

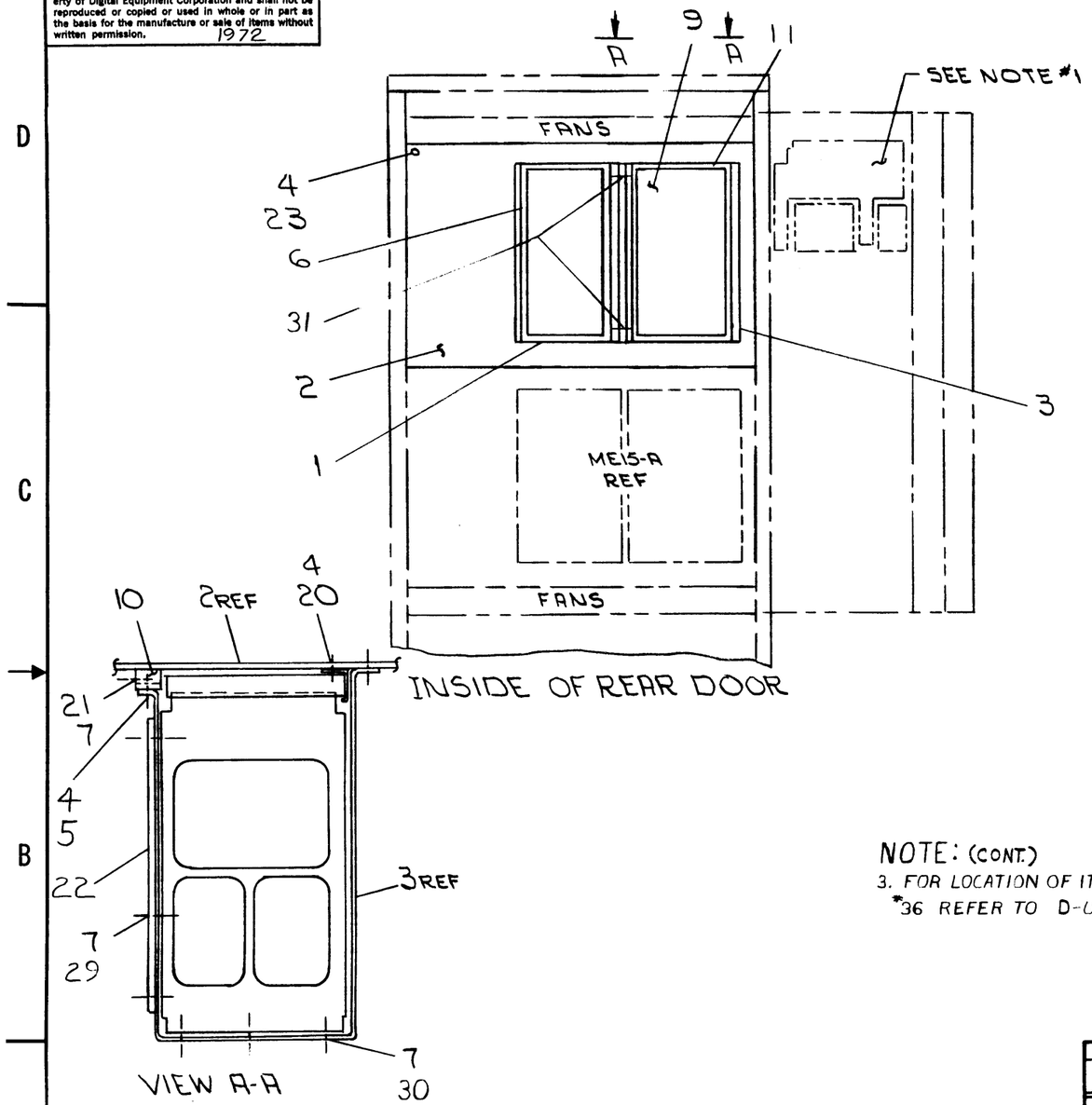
DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY P.J. LEBLANC	CHECKED J. KALAGHER	SECTION
DATE 3-18-72	DATE 5-9-72	1
ENG D. CRABBE	PROD R.J. MASULLA	ISSUED SECT.
DATE 5-18-72	DATE 6-6-72	1

ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	QUANTITY / VARIATION
20	B-MD-7411488-0-0	TOP LOGIC FRAME BRKT	1
21	B-MD-7411489-0-0	BOTTOM LOGIC FRAME BRKT	1
22	9006037-1	SCR PHL PAN HD 8-32X .37	2
23	9006039-1	SCR PHL PAN HD 8-32X .50	2
24	9008072	EXT. TOOTH LOCK WASHERS	4
25	B-MD-7411491-0-0	RET BRACKET	2
	NOTE: FOR LOCATION OF ITEM # 25 REFER TO D-UA-ME15A-Q ITEM #56 AND D-UA-ME15D-Ø ITEM #31		

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
		A	PL	ME15-C-Ø		



NOTES:
1. REMOVE AND DISCARD, PANEL MODULE HOLDER D-IA-7409697-0-0, FOR ADDITIONAL MEMORY.
2. FOR LOCATION OF MODULES, ITEMS #12 THRU 19, REFER TO: D-MU-ME15-Ø-2.

NOTE: (CONT.)
3. FOR LOCATION OF ITEMS #32 THRU #36 REFER TO D-UA-ME15-A-Ø.

ITEM NO.	DESCRIPTION	PART NO.	QTY.
36	SCR PHL PAN HD 8-32 X.50	9006039-1	2
35	SCR PHL PAN HD 8-32 X.37	9006037-1	2
34	EXT. TOOTH LOCK WASHER	3008072	4
33	BOTTOM LOGIC FRAME BRKT.	B-MD-7411489-0-0	1
32	TOP LOGIC FRAME BRKT.	B-MD-7411488-0-0	1
31	RET BRACKET (PART OF ME15-C)	B-MD-7411491-0-0	REF
30	SCR PHL PAN HD TYPE F 6-32X.50	9008181-1	6
29	SCR PHL PAN HD TYPE F 6-32X.37	9008182-1	4
28	TIE WRAP SST 1 M 3¾×3/32	9007031	3
27	CABLE TIE MOUNT	9008264	3
~~26~~	~~SCR PHL HD PAN #6-32 X 3/8~~	~~9006022-1~~	~~4~~
25	+5V REGULATOR	E-UA-H7805-Ø-Ø	1
24	-15V REGULATOR	E-UA-H7905-Ø-Ø	1
23	SCR PHL HD TRUSS #10-32×½	9006073-3	6
22	COVER	D-MD-7409758-0-0	1
21	SCR PHL HD PAN #6-32x 7/8	9006027-1	3
20	SCR PHL HD PAN #10-32x3/8	9006071-1	2
19	BUS TERMINATOR M930	C-CS-M930-Ø-1	1
18	EDGE CONNECTOR	D-CS-H8519-Ø-1	1
17	I/O CABLE	D-UA-BCØ8A3-Ø	2
~~16~~	~~PDP15 MEMORY BUS TERM.~~	~~C-CS-M966-Ø-1~~	~~2~~
15	15 MEMORY TO 11 INTERFACE	D-CS-M717Ø-Ø-1	1
14	CONTROL AND DATA LOOPS	D-CS-G109-Ø-1	1
13	PDP11 MEMORY DRIVER	E-CS-G231-Ø-1	1
12	MEMORY STACK 8K 18BIT	B-DD-H215-Ø	1
11	CARD GUIDE (UPPER)	C-MD-7411490-0-0	1
10	BAR LOGIC FRAME MTG.	D-MD-7409680-0-0	.1
9	BACK PLANE ASSY	E-AD-7008BT800	1
8	SCR PHL HD PAN #6-32 x 1/4	9006020-1	2
7	WASH. INT TOOTH LOCK #6	9006633	.15
6	BRACKET CARD GUIDE	D-IA-7409581-2-0	—
5	SCR PHL HD PAN #10-32x1	9006077-1	2
4	WASH. INT TOOTH LOCK #10	9006636	10
3	BRACKET CARD GUIDE	D-MD-7409681-1-0	1
2	PANEL, MOUTING	D-IA-7409682-0-0	1
1	CARD GUIDE (R.H.)	E-PS-1211099-0-0	1

PARTS LIST

REVISIONS	REV.	CHK	
CHANGE NO.			
ME15—00004	A		J. ELSBREE 10-9-72
ME15—00009	B		FRED DOLL 11-3-72

FIRST USED ON OPTION/MODEL: ME15

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES
DECIMALS: .XXX = .005, .XX = .02, .X = .1
ANGLES: ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL —
FINISH —

DRN. [illegible] DATE 10APR72
CHK'D. J. Kalagher DATE 5-17-72
ENG. DATE
PROJ. ENG. DATE
PROD. DATE
NEXT HIGHER ASSY. A-PL-ME15-Ø-Ø
SCALE NONE
SHEET 1 OF 2

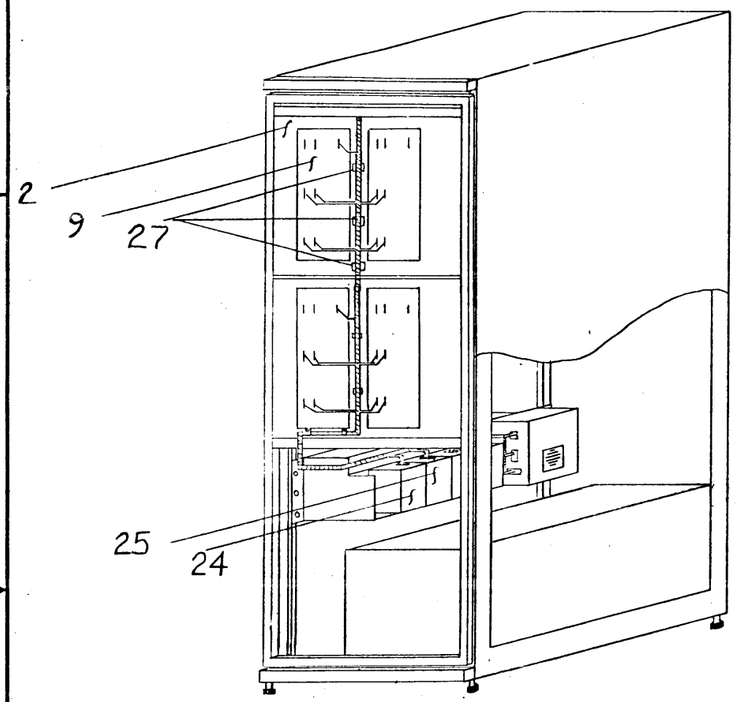
digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

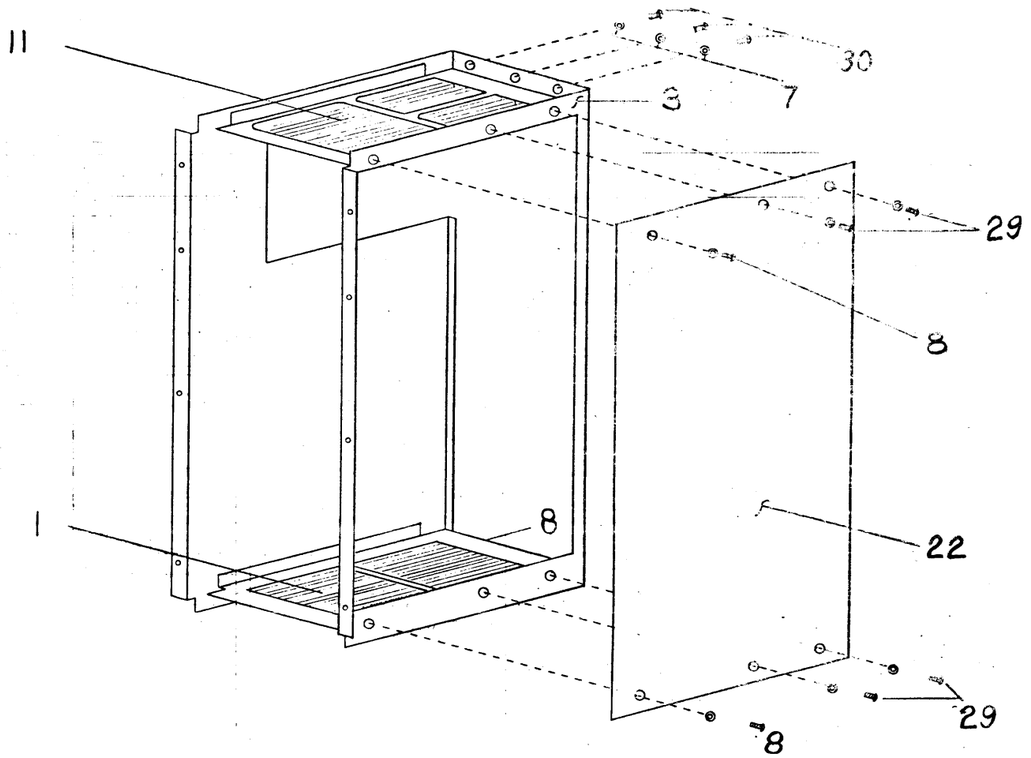
TITLE: MEMORY EXPANSION 8K

SIZE	CODE	NUMBER	REV.
C	UA	ME15-D-Ø	B

DIST.

DEC FORM NO. DRC 100-A





FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
ME15		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES

DECIMALS	ANGLES
.XXX = .005 .XX = .02 .X = .1	±0° 30'

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL //

FINISH //

DRN. P.J. LE BLANC	DATE 4-10-72	DIGITAL EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
CHK'D. J. KALAGHER	DATE 5-17-72	
ENG. D. CRABBE	DATE 5-18-72	TITLE MEMORY EXPANSION 8K
PROJ. ENG. J. ELSBREE	DATE 5-19-72	
PROD. R. MASULLA	DATE 6-6-72	

NEXT HIGHER ASSY. A-PL-ME15-φ-φ

SCALE N NF

SHEET 2 OF 2

SIZE	CODE	NUMBER	REV.
C	UA	ME15-D-φ	B

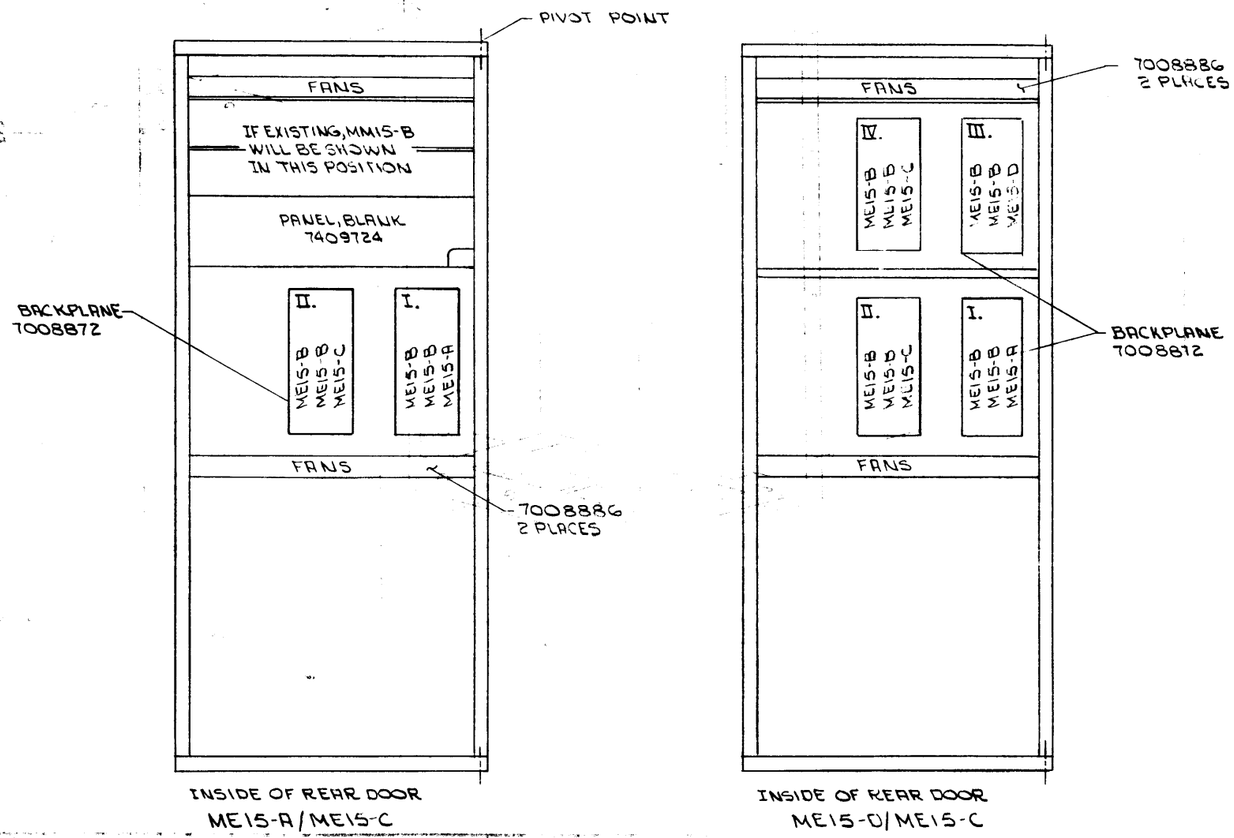
DIST.

REV.	REVISIONS	CHK
	CHANGE NO.	

BRUNING 40-107 15968

DEC FORM NO. DEC 100-A

SIZE C CODE UA NUMBER ME15-D-φ REV. B



96K TOTAL MEMORY

ME15-A ME15-B ME15-B	I	1ST 24K MEMORY
ME15-C ME15-B ME15-B	II	2ND 24K MEMORY
ME15-D ME15-B ME15-B	III	3RD 24K MEMORY
ME15-C ME15-B ME15-B	IV	4TH 24K MEMORY

FIRST USED ON OPTION/MODEL: ME15	QTY.	DESCRIPTION: PARTS LIST	PART NO. / ITEM NO.
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES DECIMALS: XXX = 005, XX = 02, X = 1 ANGLES: ±0° 30' REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓			
MATERIAL: //			
FINISH: //			

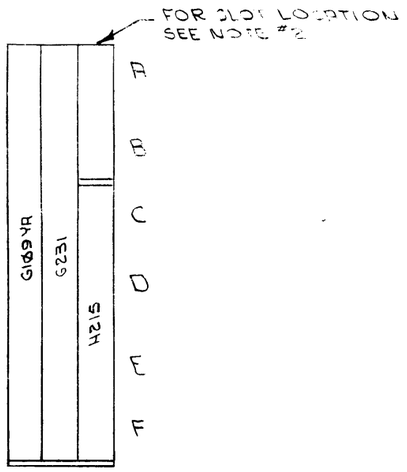
DRN: [illegible]	DATE: 5/17/72	digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
CHK'D: [illegible]	DATE: 5-17-72	
ENG.	DATE	
PROJ. ENG.	DATE	
PROD.	DATE	

NEXT HIGHER ASSY: B-DD-ME15-0
SCALE: NONE
SHEET: OF

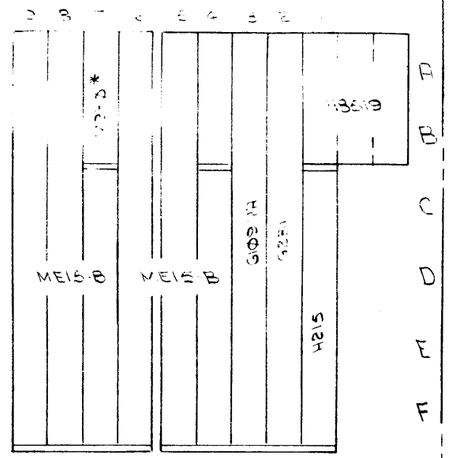
TITLE: OPTIONAL CONFIGURATION

SIZE	CODE	NUMBER	REV.
D	AR	ME15-0-1	

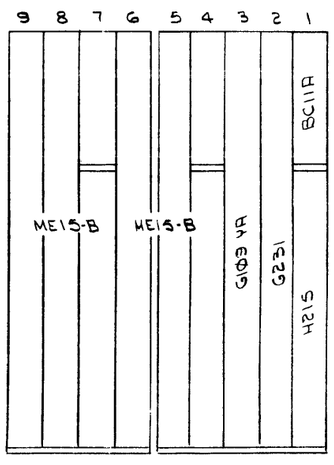
DIST.



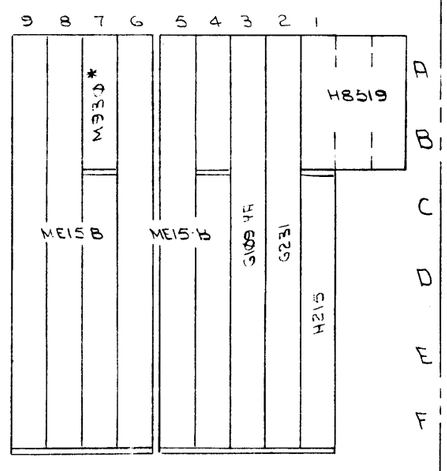
ME15-B



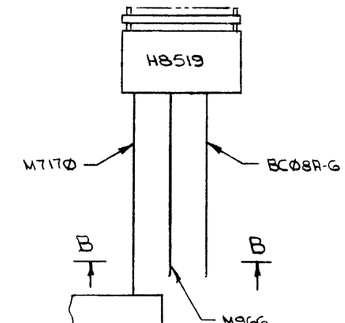
ME15-D



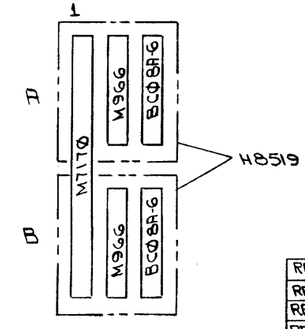
ME15-C



ME15-A



VIEW A-A
2 PLACES



VIEW B-B
2 PLACES

NOTES:

1. *INDICATES M930 MODULE IN SLOT THAT MAY BE MOVED TO PROVIDE FOR CABLING, WHEN ADDITIONAL MEMORYS ARE ADDED. SEE INTERCONNECTING CABLE DWG. D-IC-ME15-Ø-3
2. ME15-B TO BE PLACED IN ME15-A, ME15-C & ME15-D, IN SLOTS 4,5,6 AND/OR 7,8 & 9.
3. FOR QUANTITY OF MODULES REFER TO: D-UA-ME15-A-Ø, OR A-PL-ME15-B-Ø, OR A-PL-ME15-C-Ø, OR C-UA-ME15-D-Ø.

ITEM NO.	QTY.	DESCRIPTION	PART NO.
7	REF	MEMORY STACK 8K 18 BIT	B-DD-H215-Ø
6	REF	PDP 11 MEMORY DRIVER	E-CS-G231-Ø-1
5	REF	SELECT FF & ORTA LOAD PULSE PINS	E-CS-G109-YR-Ø
4	REF	15 MEMORY TO 11 UNIBUS INTERFACE	D-CS-M7170-Ø-1
3	REF	PDP15 MEMORY BUS TERM	C-SS-M966-Ø-1
2	REF	I/O CABLE	D-UA-BC08A-6-Ø
1	REF	BUS TERMINATORS	C-CS-M930-Ø-1

PARTS LIST

FIRST USED ON OPTION/MODEL: ME15

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES
TOLERANCES
DECIMALS: XXX = .005, XX = .02, X = .1
ANGLES: ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL
FINISH

DRN P.J. LEBlanc DATE 10 MAY 72
CHK'D [illegible] DATE 5-17-72
ENG. DATE
PROJ. ENG. DATE
PROD. DATE

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: MODULE UTILIZATION

NEXT HIGHER ASSY: B-DD-ME15-Ø
SCALE: NONE
SHEET 1 OF 1

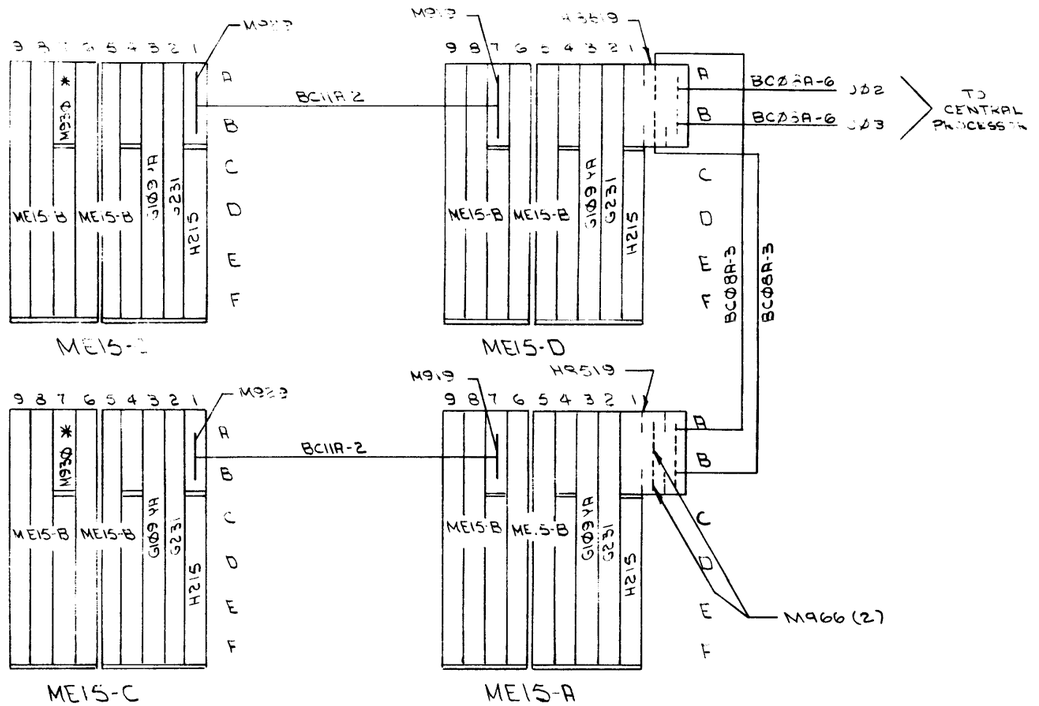
SIZE D | CODE MU | NUMBER ME15-Ø-2 | REV.
DIST

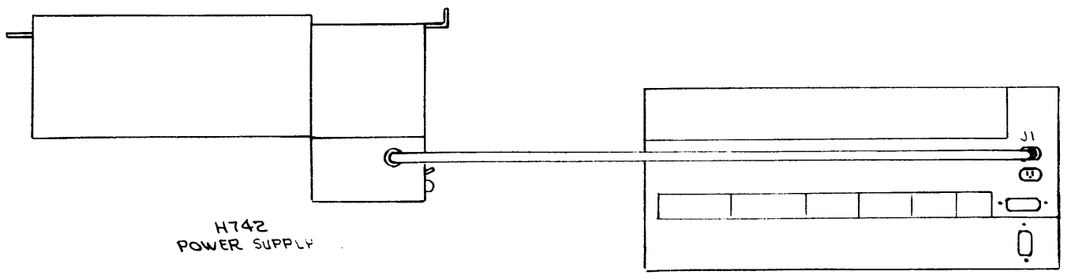
REVISIONS	REV	CHANGE NO	CHK

BRUNING 40-522 15840
DEC FORM NO ORD 102-B

NOTES

1. TO REMOVE M930 IN MEI5-A OR MEI5-C, SLOT 1, REMOVE THEM IN MEI5-B, SLOT 1, AND PLACE THEM IN MEI5-A OR MEI5-C, SLOT 1.
2. WHEN THERE IS NO MEI5-D, CABLES FROM THE CENTRAL PROCESSOR WILL GO INTO THE M8519 OF THE MEI5-A. WHEN THE MEI5-D IS PRESENT, THE CABLES FROM THE PROCESSOR WILL GO INTO THE M8519 OF THE MEI5-D.





FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
MEI5		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS: XXX = .005, .XX = .02, X = .1 | ANGLES: ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL —
FINISH —

DRN R.E. Stone 10 FEB 72 | CHK'D J. Sabadi 11-17-72 | ENG. | PROJ. ENG. | PROD.
NEXT HIGHER ASSY. B-DD-MEI5-Ø
SCALE NONE | SHEET 1 OF 1

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: INTERCONNECTING CABLE DIAGRAM

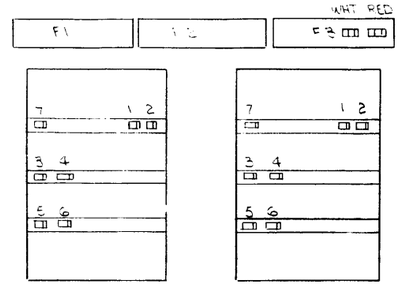
SIZE D | CODE IC | NUMBER MEI5-Ø-3 | REV. A | DIST.

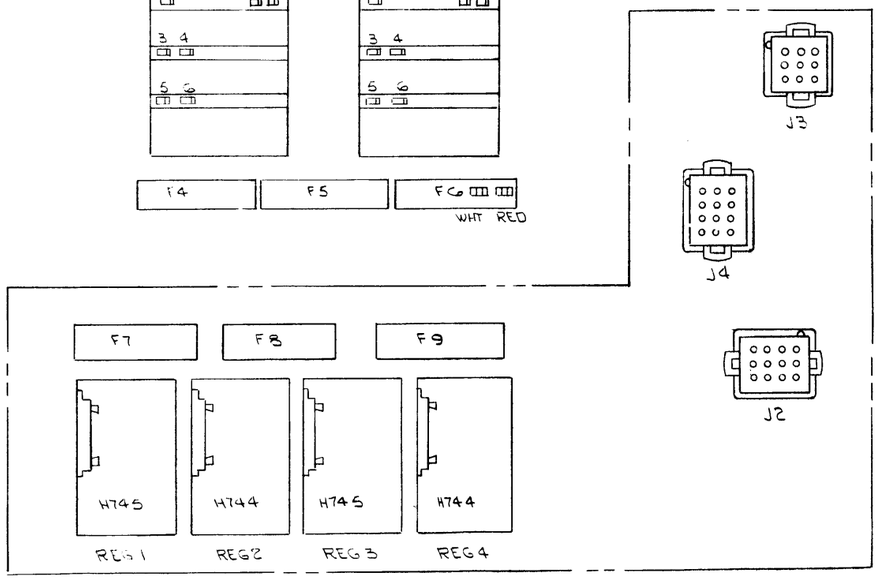
REVISIONS			
CHK	CHANGE NO.	REV	
PA	MEI5-00004	A	10-2-72
	J.ELSBREE		
			11-3-72

BRUNING 40-107 15968
DEC FORM NO DRD 100-A

FROM HARNESS CONNECTION	COLOR	PLUG	TO CONNECTION
1	RED		F3 (RED)
2	WHT		F3 (WHT)
3	BLU/BLU		MEM4-3
4	BLK/BLK		MEM4-4
5	GRN		MEM3-5
6	BLK		MEM3-6
7	BLK		MEM4-6
8	GRN		MEM4-5
9	(4) BLK		MEM2-4
10	BLU/BLU		MEM2-3
11	GRN		MEM2-5
12	BLK		MEM2-6
13 THRU 18		P1	REG 1
19 THRU 24		P2	REG 2
25 THRU 30		P3	REG 3
31 THRU 36		P4	REG 4
37 & 38		P5	J2
39 THRU 45		P6	J4
46 THRU 53		P7	J3
54	YEL		KP15 (KØ3T2)
55	WHT		FG (WHT)
56	RED		FG (RED)
57	RED		FG (RED)
58	WHT		FG (WHT)
59	GRN		MEM1-5
60	BLK		MEM1-6
61	BLU		MEM1-3
62	BLK		MEM1-4
63	RED/RED		MEM1-2
64	BLU		MEM3-3
65	BLK		MEM3-4
66	RED		MEM3-2
54 A	BLK		KP15 (KØ2T1)

CONNECTION	COLOR	FAN	TO CONNECTION
	RED	F9	J2-7
	WHT	F9	J2-8





REVISIONS			
	CHANGE NO	REV	
CHK	ME15-00044	A	11-22-72
DWN			
DES			
ENG	EL BRIE		11-3-72
DWG	ME15-00007	B	11-22-72
CHK	ELSBREE		11-22-72

BRUNING 40-107 15968
DEC FORM NO
DRD 100-A

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
ME15		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES
TOLERANCES
DECIMALS: XXX ± .005, XX ± .02, X ± .1
ANGLES: ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL
FINISH

DRN R.L. Blume DATE 11/30/72
CHK'D J. Finlay DATE 6-30-72
ENG. Elsbree DATE 6/30/72
PROJ ENG. Elsbree DATE 6/30/72
PROD DATE

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: POWER WIRING

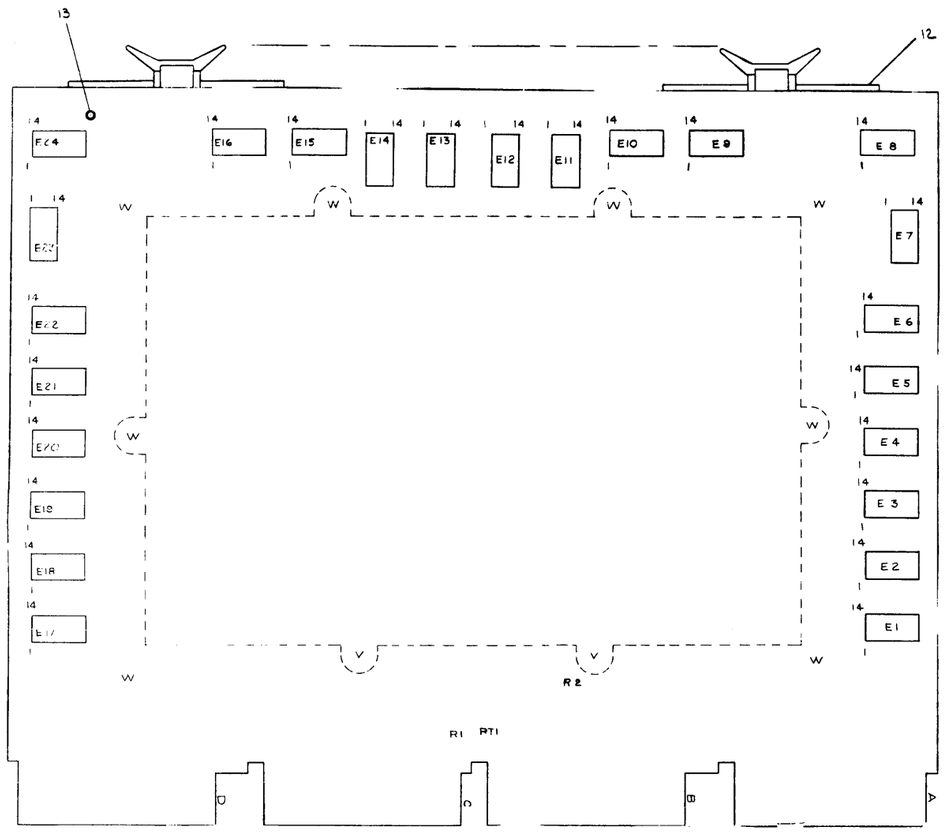
NEXT HIGHER ASSY. B-DD ME15-Ø
SCALE NONE
SHEET 1 OF 1
SIZE D | CODE IC | NUMBER ME15-Ø-4 | REV B
DIST.

REV	NUMBER	SIZE	CODE
B	ME15-Ø-4	D	IC

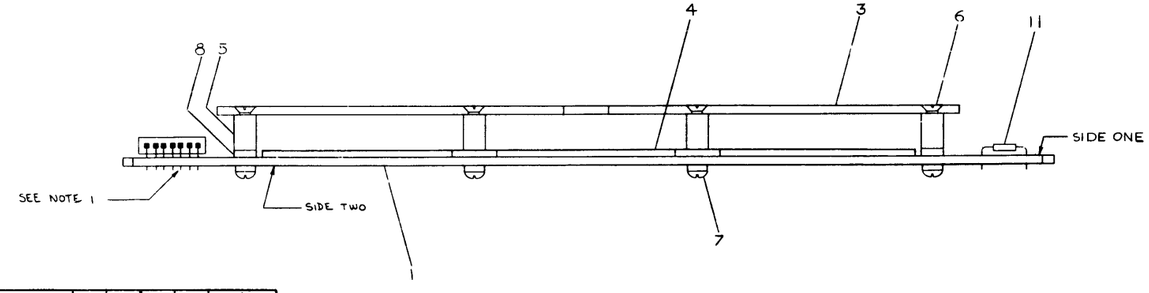
NOTES:
1. ALL COMPONENT LEADS TO BE LESS THAN 1/16 INCHES LONG ON SIDE TWO OF MODULE

MODULES	COMPONENT SUBSTITUTION LIST				
	ORIGINAL PART		SUBSTITUTE PART		
	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	QTY PER MODULE
H214, H215, H216	2501-00 - DIODE	19 10010-00	2501-01 DIODE	19 10010-01	2
H214, H215, H216	2501-00 - DIODE	19 10010-00	2501-02 DIODE	19 10010-02	2
H214	2501-00 - DIODE	19 10010-00	2501-03 DIODE	19 10010-03	2

2: FOR AMPEX STACKS H214, H215, AND H216 WITH CORE TYPE 324-1899, R1 SHOULD BE 121 OHMS.



LEGEND	
MODULE CONN.	BACK PANEL LOCATION
A	C
B	D
C	E
D	F



H216	H215	H214				
1	1	1	RT1	THERMISTOR 300 2%	13097785	16
1	1	1	R2	RESISTOR 5.1 1/4W 5%	13096422	15
1	1	1	R1 (SEE NOTE 2)	RESISTOR 196 1/8W 1%	13029956	4
8	8	8		EYELET	9006738	13
4	4	4		HANDLE, GREEN	9008337-0-1	12
2	2	2		JUMPER,	9009239	11
1	1	1		NAME PLATE	9009238	10
19	18	16		8132-CORE MATS (STRUNG)	08 MI-75	9
						8
10	10	10		SCREW, NYLON FILISTER #4-40 X .187 LG	9009255	7
10	10	10		SCREW, FLAT HEAD NYLON #4-40 X .187 LG	9009254	6
10	10	10		STANDOFF, THREADED #4-40 X .437 X 1/4 LG	9009257	5
1	1	1		SUBSTRATE	50-10236	4
1	1	1		COVER PLATE	55-10201-02	3
24	24	24	E1 THRU E24	I.C. DIODE E501	19-10010	2
1	1	1		PLANER MEMORY BOARD	5009713	1
QTY	QTY	QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO

PARTS LIST

IC TYPE	GND	+5V
GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTIVELY EXCEPTIONS ARE STATED ABOVE		

IC PIN LOCATIONS

ITEM NO	AWG	FROM PT	TO PT

JUMPER LIST

DEC NO.	EIA NO.	DEC NO.	EIA NO.

SEMICONNECTOR CONVERSION CHART

FIRST USED ON ASSY NO. MM11-L

ETCH BOARD REV

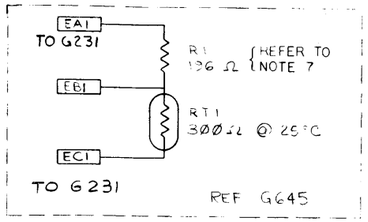
B-DD-MM11-L-0

[redacted] EQUIPMENT CORPORATION

TITLE: STACK SCHEMATIC (H214 8K X 16 BIT) (H215 8K X 18 BIT) (H216 8K X 19 BIT)

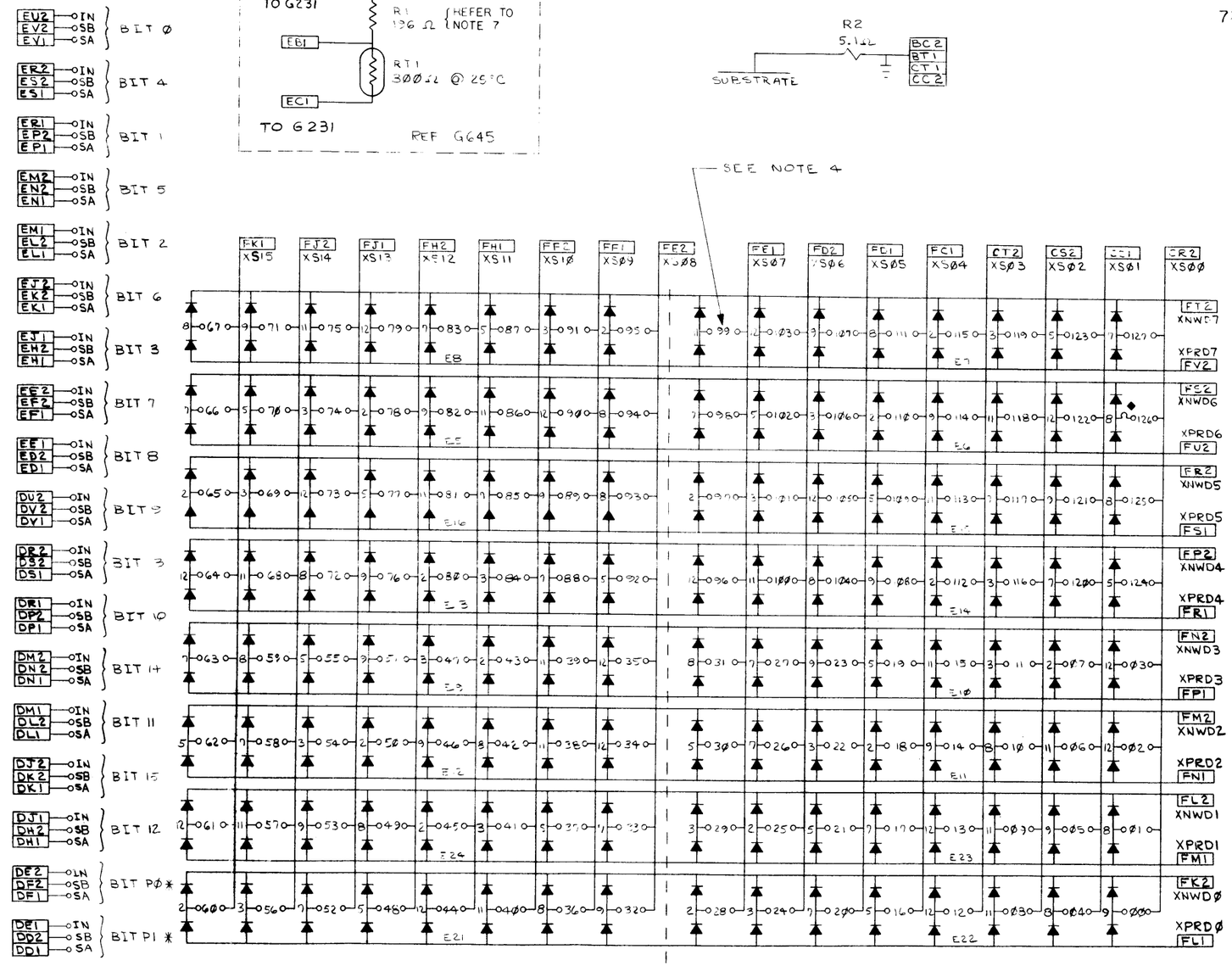
SIZE E | CS H214-0-1 | REV J

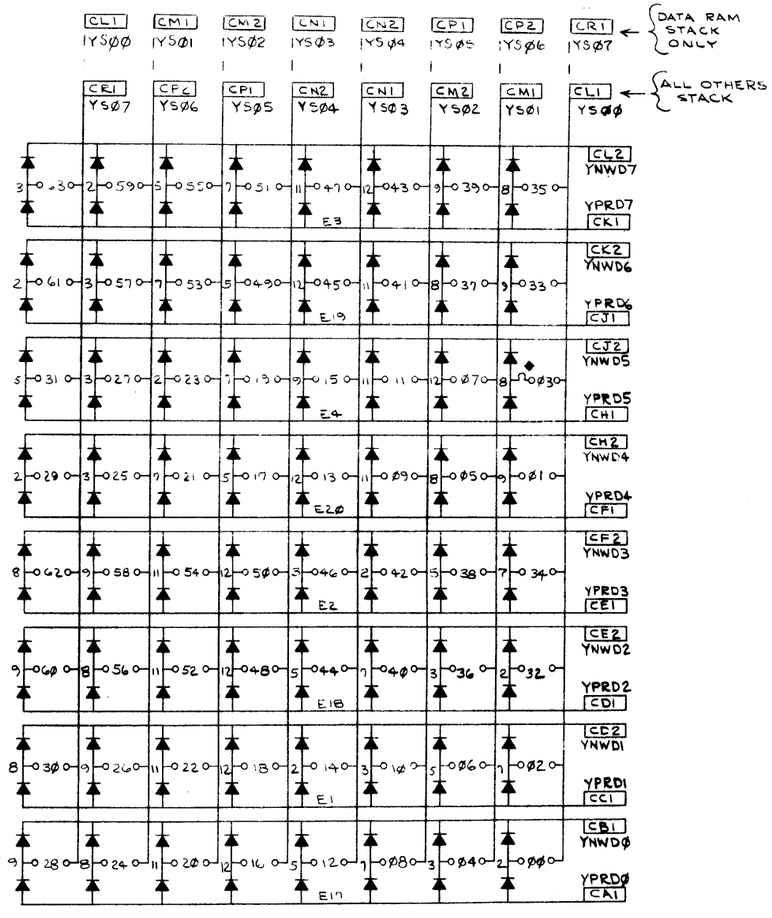
SHEET 1 OF 2



7: FOR AMPEX STACKS H214, H215, AND H216 WITH CORE TYPE 324-1-99, R1 SHOULD BE 121 OHMS.

NOTES:
UNLESS OTHERWISE SPECIFIED:
ICS E1-E24 ARE TO BE DEC PART # 1910010
2. INDICATES STACK LINE NUMBER. (TYP)
◆ 3. INDICATES CURRENT LOOP
—o 4. INDICATES MAGNET WIRE TERMINATION (SOLDERED TO P.C. PAD).
✳ 5. FOR H215 & H216 ONLY. PØ=PA, P1=PB
✳✳ 6. FOR H216 ONLY





FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
MM11-L		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES
DECIMALS: .XXX = .005, .XX = .02, .X = .1 — ANGLES: ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL
FINISH

DRN	R. Carberry	DATE 11/22/71
CHK'D	[illegible]	DATE 1-25-72
ENG.	[illegible]	DATE 12-1/72
PROJ. ENG.	[illegible]	DATE 1/2/72
PROD.	[illegible]	DATE 1-26-72

NEXT HIGHER ASSY. B-DD-MM11-L-Ø
SCALE
SHEET 2 OF 2

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: STACK SCHEMATIC (H214-8K X 16 BIT) (H215-8K X 18 BIT) (H216-8K X 19 BIT)

SIZE	CODE	NUMBER	REV.
D	CS	H214-Ø-1	J

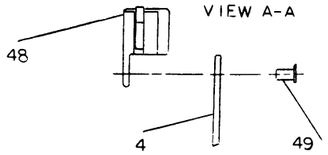
DIST.

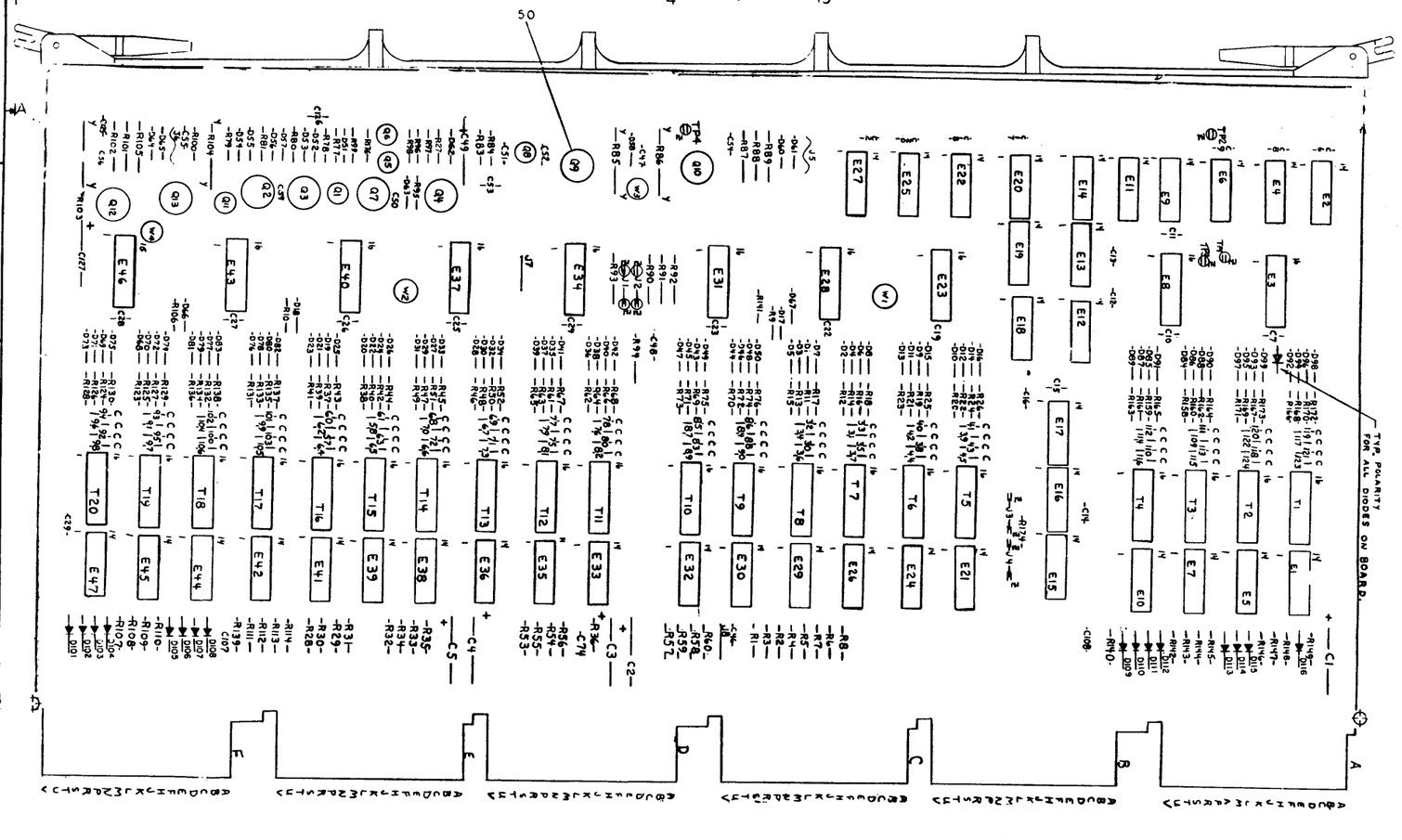
REV	REVISIONS	CHANGE NO	CHK

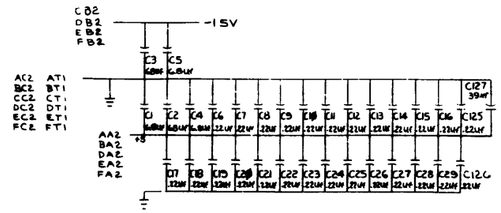
DRAWING 40-823 19A0
DEC FORM NO DRD 102-B

NOTE:
1. IC4008 TO BE MARKED 4008X OR 4008°—WHITE DOT

VIEW A-A







COMPONENT SUBSTITUTION LIST

ITEM NO.	ORIGINAL PART DESCRIPTION	ORIGINAL PART NO.	SUBSTITUTE PART DESCRIPTION	SUBSTITUTE PART NO.
SEE NOTE 2 36	IC 4011 QUAD TRANSISTOR	1511102	IC 4008 QUAD TRANSISTOR	3510015
42	IC 1074H00	1910462	IC 74H00	1909056
44	IC 1074H04	1910465	IC 74H04	1909931

2	J5-J6	#22 AWG STRANDED TEFLON INSULATED	1700035-00	61
1	R176	RES 4.7K 1/4W 5%	1300447	60
2	J7, J8	JUMPER MACH. INSERTED	9009185	59
1	C52	CAP 470 PF 100V 5%	1000024	58
1	C56	CAP 680 PF 100V 5%	1000026	57
1	C127	CAP 39UF 10V	1000076	56
4		SCREW, NYLON #6-32	9008212	55
4	W1-W4	STANDOFF, THREADED, INSULATED 1/4 X 3/8 LG	9008213	54
83	R11-26, R37-52, R61-76, R123-138, R158-173 R77, R81, R27	RES 100 1/4 W 5%	1300275	53
				52
4		TRANSIPAD	90C7000	51
12		EYELET #654-1 E.B. STIMPSON	9000732	50
1		HANDLE	1210711-04	49
12		SPLIT LUGS	9000735	48
4		HEAT SINK	1210001	47
7	E41-E44, E18, E18, E28	IC 74H74	1909667	46
1	E8	IC 1074H04	19-10463	45
10	E5, E6, E23, E29, E31, E34, E37, E40, E43, E46	IC 8251-1	1909854	44
3	E2, E4, E27	IC 1074H00	19-10462	43
2	E22, E25	IC 74H18	1909857	42
20	T1-T20	TRANSFORMER	1809996	41
4	E9, E15, E16, E19	IC MIC 8640	911469	40
20	E1, E7, E17, E18, E21, E24, E26, E27, E30, E33, E35, E38, E41, E42, E44, E47	IC 4011 QUAD TRANSISTOR	1511102	39
4	Q9, Q10, Q12, Q13	TRANSISTOR 2N3762	1509649	38
2	Q4, Q11	TRANSISTOR 2N4258	1505321	37
1	Q1	TRANSISTOR 8534 D	1503499	36
1	Q5	TRANSISTOR 3898 B	1503188	35
3	Q2, Q3, Q7	TRANSISTOR 1088	1502155	34
1	Q4	TRANSISTOR 2219	1501881	33
4	R85, R86, R183, R184	RES 18.9 OH 1%	1310832	32
1	R82	RES1.78K 1/8W 1%	1302962	31
1	R81	RES909 1/8W 1%	1302696	30
2	R88, R94	RES147 1/8W 1%	1303874	29
2	R89, R188	RES 2K 1/8 5%	1302807	28
4	R9, R99, R186, R141	RES 680 1/8 5%	1301424	27
1	R83	RES 750 1/8 5%	1301481	26
5	R98, R139, R148	RES 5J 1/8 5%	1309422	25
1	R87	RES 15K 1/8 5%	1309486	24
1	R174	RES 180 1/8 5%	1309479	23
1	R85	RES 2.2K 1/8 5%	1309417	22
4	R87, R88, R181, R182	RES 1.5K 1/8 5%	1309394	21
1	R78	RES 470 1/8 10%	1309317	20
3	R84, R88, R188	RES 1.5K 1/8 5%	1309381	19
1	R83	RES 470 1/8 5%	1309315	18
1	Q6	TRANS 6534C	1503409-2	17
3	R78, R88, R98	RES 330 1/8 5%	1309295	16
41	R1-R8, R28-R35, R53-R60 R96, R107-R116, R132-R149	RES 150 1/8 5%	1309258	15
				14
1	D88	DIODE 1N823 ZENER	1105588	13
25	D17, D18, D55, D88, D81 D84-D87, D91-D116	DIODE D672	1105275	12
88	D1-D16, D19-D54, D56, D57 D62, D63, D88-D90	DIODE D664	1100114	11
8	C1-C8, C49	CAP 6.5 MFD 35V 20%	1000087	10
36	C9-C29, C40, C47, C48, C58, C53, C54, C74, C187, C188, C125, C126 C58	CAP 22uf 50V -20% 80%	1810274	9
80	C30-C48, C57, C60, C88-C73, C75-C188, C188-C124	CAP 1000PF 100V 5% 88	1000062	8
A/R		WIRE JUMPER AWG #22 SOLID	9107560-01	7
2	C61, C56	CAP 39PF 100V 5% 88	1000010	6
1		ETCHED CIRCUIT BOARD	5002986	5
REF		HANDLE PCB ASSY	B-MM-G231-00	4
REF		DRILL/DRILLING HOLE LAYOUT	E-MM-G231-00	3
REF		X-Y COORDINATE HOLE LOCATION	E-CS-G231-00	2
QTY.	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM

PARTS LIST

IC TYPE	GND	+5V	JUMPER LIST		
				J6-A	J6-B
				J5-A	J5-B
				J4-A	J4-B
				J3-A	J3-B
				J2-A	J2-B
				J1-A	J1-B
4000 AND BY ARE USUALLY PIN 7 AND 14 RESPECTIVELY. EXCEPTIONS ARE STATED ABOVE					
	GND PIN	+5V PIN	FROM PT	TO PT.	

IC PIN LOCATIONS

FIRST USED ON OPTION/MODEL				
2N2218	SAME			
6543	NONE			
3689-B	2N 3646			
2219	2N22.19			
IN 823	NONE			
1N72	IN 3613	.508	NONE	
DG64	IN 3686	2N3762	SAME	
DEC NO.	ECA NO.	DEC NO.	ECA NO.	

SEMICONDUCTOR COMPARISON CHART

DRAWN		EQUIPMENT CORPORATION	
CHECKED			
ENGR APPROVED		SIZE	TITLE
MFG APPROVED		B	PDP-11 MEMORY DRIVER
QA APPROVED		B-DD-MMI-L	
SCALE 2/1		ECS	G231-0-1

	J3	J4
4K	IN	OUT
8K	OUT	IN

**

*** ALL INPUTS ARE FROM UNIBUS (BUS xxxL) OR G109 OR G111Ø (CDL2xxxL)

*** CDL2 TWID H CV1 — CDL2 READ H CV2 — CDL2 TNAR H CV2 — WRITE H → E2 (1Ø74HØØ, 3 CKTS.) → T.P.2 → MD2 TDR H

* THIS CIRCUIT IS ON STACK BOARD

REVISIONS	CHANGE NO	CHK
REV.		

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES		DRN.	DATE 9-24-71	digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
DECIMALS	ANGLES	CHK'D.	DATE 1-21-72	TITLE
XXX = .005 .XX = .02 X = .1	±0° 30'	ENG.	DATE 1-25-72	PDP-11 MEMORY DRIVER
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓		PROJ. ENG.	DATE	
MATERIAL		PROD.	DATE	
FINISH		NEXT HIGHER ASSY.		SIZE D CODE CS NUMBER G231-Ø-1 REV. R
		SCALE		SHEET 2 OF 4 DIST.

DEC FORM NO DRD 102-B

FROM CURRENT LOOP MOLIX — D18 — R10 630Ω — +5V READ SWITCHES — WRITE SWITCHES

MD2 XS3L — MD2 A11H — MD2A10H — E40 8251-1 D1 D2 D3 DØ

MD2 XS2L — MD2A11H — MD2A10H — E37 8251-1 D1 D2 D3 DØ

MD2 XS1L — MD2A11H — MD2A10H — E34 8251-1 D1 D2 D3 DØ

MD2 XSØL — MD2A11H — MD2A10H — E31 8251-1 D1 D2 D3 DØ

-15V — C74 .22 uf

FH1 XS11 — FH2 XS12 — FJ1 XS13 — FJ2 XS14 — FK1 XS15

FF1 XSØ9 — FF2 XS1Ø — FE2 XSØ8

FE1 XSØ7 — FD1 XSØ5 — FC1 XSØ4

CT2 XSØ3 — CS2 XSØ2 — CS1 XSØ1 — CR2 XSØØ

100Ω TYP — D664 TYP — 1000PF1 TYP — 150Ω TYP R35 — D672 TYP — R36

MD2SD STACK DISCHARGE — MD2 READ L — +5V

ALL INPUTS FROM G231 FUNCTION
ALL OUTPUTS GO TO MEMORY STACK

FROM CURRENT LOOP MOLIX — D22 — R106 680Ω — +5V

MD.A09H — MD2TDRH — E27 1074H/M — MD2A08H — MD2A07H — E46 8251-1 D1 D2 D3 DØ — E43 8251-1 D1 D2 D3 DØ

-15V — R107 — R108 — R109 — R110 — R111 — R112 — R113 — R114

FV2 XPRD7 — FT2 XNWD7 — FU2 XPRD6 — FS2 XNWD6 — FS1 XPRD5 — FR2 XNWD5 — FR1 XPRD4 — FP2 XNWD4 — FP1 XPRD3 — FN2 XNWD3 — FN1 XPRD2 — FM2 XNWD2 — FM1 XPED1 — FL2 XNWD1 — FL1 XPRDØ — FK2 XNWDØ

+5V — 5.1Ω R139 — DB2 — -15 — C107 .22 uf

D101 D102 D103 D104 D105 D106 D107 D108

100Ω TYP — D664 TYP — 1000PF1 TYP — D672 TYP — 150Ω TYP

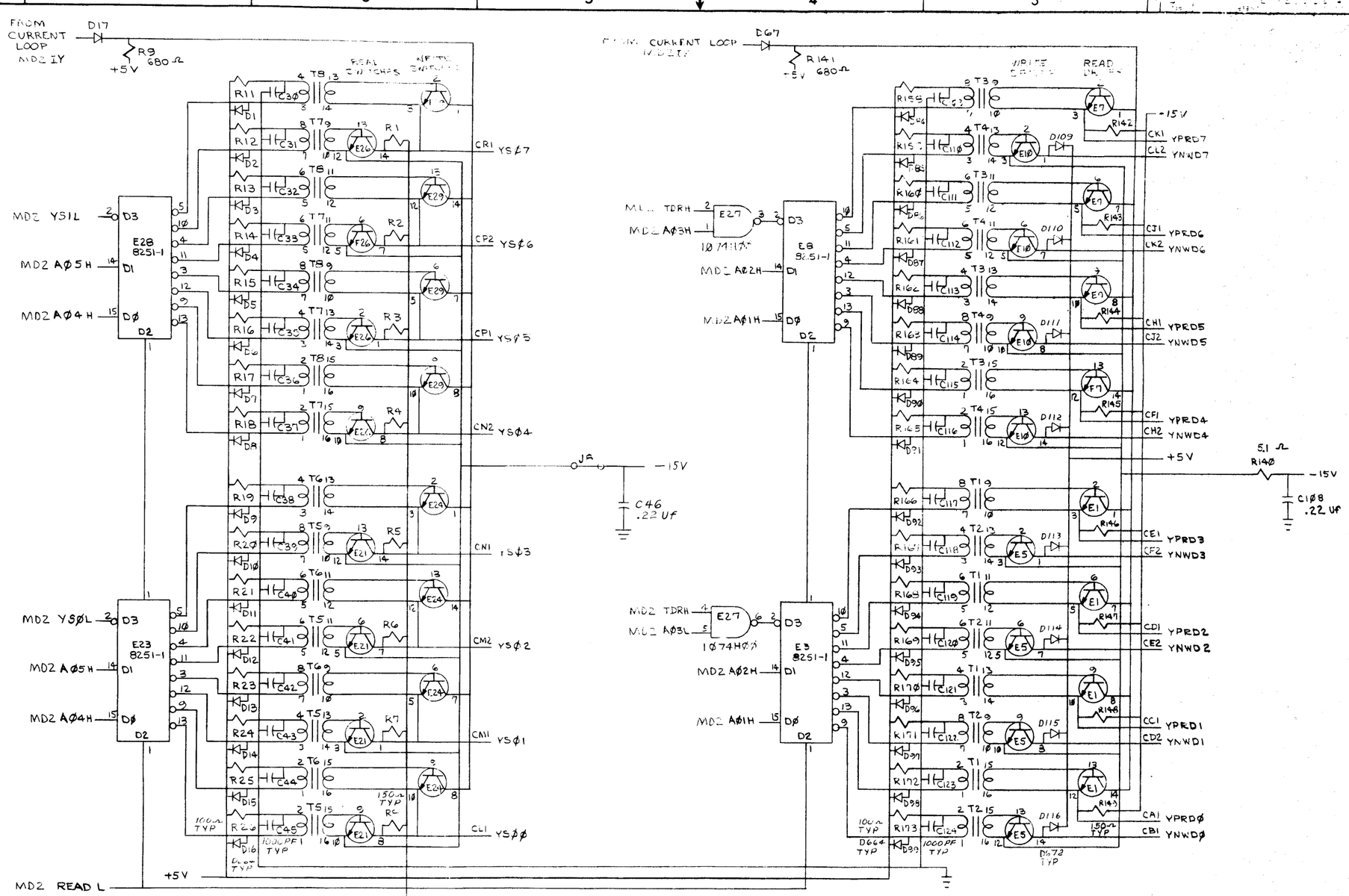
REVISIONS | REV | CHANGE NO | CHK

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO. / ITEM NO.
		PARTS LIST	

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS: .XXX ± .005, XX ± .02, X ± .1 — ANGLES: ± 0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL — FINISH

DRN. Z Cadeny	DATE 10-1-71	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D. L Shlaghe	DATE 1-21-72	
ENG. [illegible]	DATE 1-25-72	TITLE: PDP-11 MEMORY DRIVER
PROJ. ENG. [illegible]	DATE [illegible]	
PROD. [illegible]	DATE 1-26-72	
NEXT HIGHER ASSY.		SIZE D · CODE CS · NUMBER G231-0-1 · REV. R
SCALE		
SHEET 3 OF —		DIST.

DEC FORM NO DRD 102-B



FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES
DECIMALS .XXX = .005 .XX = .02 .X = .1 ANGLES ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL
FINISH

DRN. F. Carberry	DATE 10/5/71	digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
CHK'D	DATE 1-21-72	
ENG. P.D. Wright	DATE 1-25-72	
PROJ. ENG. P.D. Wright	DATE 1-25-72	
PROD.	DATE 1-26-72	
NEXT HIGHER ASSY.		
SCALE		
SHEET → OF →		

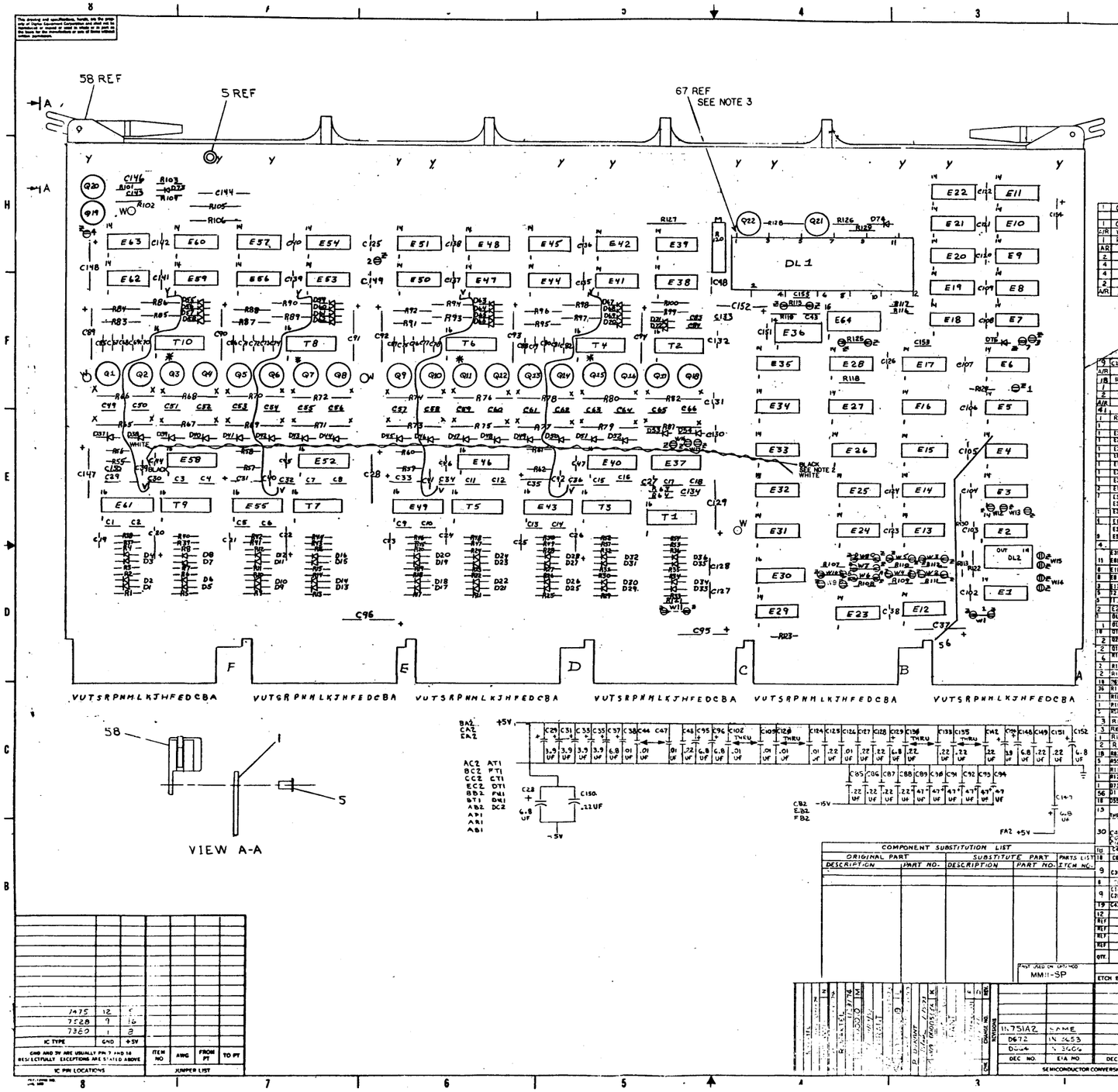
TITLE: PDP-11 MEMORY DRIVER

SIZE	CODE	NUMBER	REV.
D	CS	G231-Ø-1	R

DIST.

REVISIONS | REV. | CHANGE NO | CHK

DEC FORM NO DRD 102-B



NOTES:

1. R115 AND R125 MAY BE CHANGED AT FINAL TEST. RESISTANCE RANGE WILL BE FROM 5.11K TO 14.7K
2. #30 TWISTED WIRE PAIR WILL RUN UNDER THE THREE BLACK AND WHITE JUMPER WIRES. THE RUN SHOULD BE LAYED BETWEEN THE LINE OF DG72'S (E39-E22) AND THE LINE OF 4.99K RESISTORS (R56 R60 AND R61).
3. USE SLEEVING 9107278-00 OVER PIN 1 OF DL1

1	C155	CAP 18 PF 100 V	1002608	77
1	C153	CAP 27 PF 100 V	1001739	75
C/R	W1-W8,W10	WIRE #22AWG, INSULATED	9009185	74
1	R126	RES 820 1/4 W 5 %	1301775	73
AR		WIRE, INS. #30 AWG	9105740	72
2	E15, E35	IC DEC 74H04	1909331	71
4		STANDOFFS 1/4 X 3/8	9008213	70
4		SCREW, NYLON 6-32	9008212	69
2	R117, R129	RES 100 1/4W 5%	1300269	68
AR		SLEEVING	9107278-00	67

9	C16,23,24,26,29,31,33,35,154	CAP. 3.9UF 10V 10% S.TANT	1000048	66
A/R		#30 BLACK AND WHITE TWP	9107720-09	65
18	R30 THRU R54	RES 2K 1/4W 5%	1302388	64
1	E64	IC DEC 74123	1910236	63
2	R114, R118	RES 220R 1/4W 5%	1300271	62
A/R		WIRE, JUMPER #30 AWG BLK & WHITE	1700049	61
41		SPLIT LUG	9000139	60
1	R128	RES 1.5K 1/2W 2%	1300356	59
1		HANDLE REF	1218711-2	57
1	E33	IC DEC 74H40	1909388	57
1	E27	IC DEC 74H18	1909057	56
1	E30	IC DEC 7475	1909058	55
1	E9	IC DEC 3062P	1909349	54
1	E1	IC DEC 74H03	1909063	53
1	E26	IC DEC 7402	1909064	52
1	E36	IC DEC 74121	1910238	51
1	E13, E24	IC DEC 8242	1909712	50
7	C38, E41, E47, L53, E59, E16 E34	IC DEC 7437	1910081	49
1	E32	IC DEC 74H11	1909267	48
1	E18	IC DEC 74H53	1909062	47
1	E37, L48, E43, E48, E49, E52, E55, E58, E81	IC DEC 7520	1910087	46
4	E44, E58 E56, E62	IC DEC 3404	1908686	45
15	E38, E42, E45, E51, E54, E57 E60, E63, E3, E4, E48	IC DEC 74H74	1909067	44
6	E18-E22, E5	IC DEC 74H81-1	1909849	43
8	E8 THRU 12, E23, E7, E29	IC DEC 8440	1911459	42
3	E17, E28, E31	IC DEC 74H00	1909378	41
5	T2, T4, T6, T8, T10	8 PAIR 5 22 DUAL LINE	1609396	40
5	T1, T3, T5, T7, T9	XFMR (T1725)	1609478-1	39
1	C2, E28	IC DEC 7474	1905567	38
1	DL1	DELAY LINE DL5103	1609529	37
1	DL2	DELAY LINE DO130	1609427	36
10	Q7 THRU Q10	ESTR 2N3734	1510062	35
2	Q20, Q21	ESTR DEC 30898	1503108	34
2	Q19 Q22	ESTR 2N3762	1509849	33
6	R107 THRU R112	RES 4.7K 1/4 5%	1300441	32
2	R105, R106	RES 100 1/4 5%	1300232	31
2	R103, R113	RES 330 1/4 5%	1300280	30
18	R5 THRU R22	RES 13 0.69 1%	1310032-8-1	29
34	R1 THRU R34	RES 75 1/8W 1% MF	1303864	28
1	R101	RES 270 1/4 5%	1301872	27
1	R102	RES 560 1/4 5%	1301890	26
5	R56, R58, R60, R61, R64	RES 4.99 K 1 8W 1% MF	1305326	25
3	R124, R121, R122	RES 1K 1/4 5%	1300383	24
3	RG-1, R23, R130	RES 390 1/4 5%	1300309	23
1	R127	RES 150 1/4W 5%	1300249	22
2	R115, R125	RES 9.09K 1/8W 1% SEE NOTE 1	1304855	21
10	R83 THRU R108	RES 82.5Ω 5%	1301781	20
5	R55, R57 R59, R62 R63	RES 10.5 1 8W 1% MF	1303810	19
1	R119	RES 3.01K 1/2W 1% MF	1303049	18
1	R120	RES 5K TRIMPOT 1/2W 10%	1303143-09	17
1	D73	DIODE 6145 121	1105873	16
56	D1 THRU D54, D74, D75	DIODE D872	1105278	15
18	D55 THRU D72	DIODE D864	1108114	14
13	C99, C102 THRU C109 C120 THRU C124, C126, C44 - C47	CAP. .01 UF 100V 20% DISC	10-01618	13
30	C33 THRU C38 C40 THRU C43, C125, C127, C129 THRU C143, C146, C149, C151	CAP .22 UF 50V +50%-20% CERAMIC	1010274	12
16	C49-C64	CAP 3300 PF 50V 1.8% CERAMIC	1011078-0-0	11
18	C87 THRU C84	CAP 1000PF 100V 5% MICA	10-00842	10
9	C18, C21, C23, C25, C27 C30, C32, C34, C38.	CAP 120 PF 100V 5% DM	10-00018	9
8	C89 THRU C96	CAP 47UF 20V 10%	20-04814	8
9	C144, C128, C147, C148, C85, C32 C28, C96, C156.	CAP 68UF 35V 10% TANT	20-05306	7
19	C43, C1-C18	.47 39PF 100V 5% DM	1000018	6
12		SOCKET CS-4-7	9008732	5
REF		MODULE ECO HISTORY	B-MH-L109-D-6	4
REF		ASSY DRILLING HOLE LAYOUT	E-KK-L109-D-5	3
REF		X-Y COORDINATE HOLE LAYOUT	K-CD-L109-D-4	2
REF		ETCHED CKT BOARD	SC-9999	1
QTY.	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

ETCH BOARD REV H

1475	12	C		
7528	9	16		
7520	1	8		
IC TYPE	GND	+5V		

GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTFULLY EXCEPTIONS ARE STATED ABOVE

IC PIN LOCATIONS

ITEM NO	AWG	FROM PT	TO PT

JUMPER LIST

58 1 5

VIEW A-A

COMPONENT SUBSTITUTION LIST

ORIGINAL PART DESCRIPTION	ORIGINAL PART PART NO.	SUBSTITUTE PART DESCRIPTION	SUBSTITUTE PART PART NO.	PARTS LIST ITEM NO.

PART MARKING METHOD MM11-SP

11.7512	SAME		
DG72	74S453		
DG64	74S64		
DEC NO.	EIA NO	DEC NO	EIA NO

SEMICONDUCTOR CONVERSION CHART

DES		DATE
CHKD		DATE
ENG		DATE
PROJ ENG		DATE
MGR		DATE

B-DD-MH11-S

SIZE C/1 SHEET 1 OF 1

EQUIPMENT CORPORATION

TITLE: CONTROL & DATA LOOPS (CDLI) G109

SIZE	CODE	NUMBER	REV
C	09	109-0-1	N

DIST

CS-109-0-1

W'S 2,3,4,5,6 PROGRAM MEMORY BANK LOCATION. CUT JUMPER FOR BUS A LINE LOW (ASSERTED) WHEN BANK IS SELECTED. W5 MUST BE IN WHEN USED AS 8K BANK

	W9	W10
4K	IN	OUT
8K	OUT	IN

MEMORY BANK SIZE

BUS A13 L BP1 · BUS A16 L BG2 · BUS A15 L BR1 · BUS A17 L BS1 · BUS A01 L BH1 · BUS A14 L BR2

DEVICE SELECT CIRCUIT (DSEL)

BUS DCLO L BF2

DAI AGIN

HIGH WHEN MEMORY BANK IS SELECTED

* USE INSULATED JUMPERS IN POSITIONS SHOWN BY DOTTED LINES WHEN INTERLEAVING.

-5 V SUPPLY

CDL2 -5V TO SENSE AMPS

SPLIT LUG T.P.4

-15V

BUS MSYN L BV1 · MSYN A L CU1

MSEL TEST POINT

WRITE RESTART L

CLK 2 H

SSYN RESET

250 NS TOTAL DELAY 25 NS/TAP

DELAY RF RESET

READ H

CDL2 TWID CV1

TNAR CV2 CDL2

CLK2H

30 NS

READ H CU2

AU1

TO IN DRIVERS TINHØH TINH1H

BUS INIT L AA1

SSYN RESET

MSEL RESET

STROBE OS

WRITE RESTART ONE SHOT CKT

INIT L

SPLIT LUG T.P.1

BUS A ØØ L BH2 · BUS CØØ L BU2 · BUS CØ1 L BT2

CLK 1 H

LOAD ØH TO DATA 74H74 FF

LOAD 1H

11 WR LOAD L AV1

PROTECT LOW

A Ø LATCH · CØ LATCH · C1 LATCH

RESET 1L CDL2 TO DATA 74H74 FF

RESET ØL CDL2

STROBE 1H CDL2 TO SENSE AMPS (152B)

STROBE ØH CDL2 (#30 TWP)

BUS SSYN L · DATA OUT H TO BUS DRIVERS

From M7176 SH 2 of 3

AV1 — TP5

AU1 — TP6

WR LOAD CONTROL

	W12	W13	W14	W15	W16	W17
MODULE TEST	OUT	IN	IN	OUT	OUT	OUT
COMPUTER OPERATION	IN	OUT	IN	OUT	OUT	OUT

REVISIONS	REV	CHANGE NO.	CHK

DEC FORM NO DRD 102-B

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
MMII-SP		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES

DECIMALS	ANGLES
XXX ± .005	±0° 30'
XX ± .02	
X ± .1	

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL

FINISH

DBN Robert DATE 11-3-71
CHKD Ralph DATE 2-16-72
ENG. Dumont DATE 3-30-72
PROJ. ENG. [illegible] DATE 2-2-72
BROD. [illegible] DATE 7-31-72

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: CONTROL & DATA LOOPS (CDL2) G109-YA

NEXT HIGHER ASSY. B-DD-MMII-S

SCALE

SIZE D · CODE CS · NUMBER G109-YA-1 · REV. P

SHEET 2 OF 4 · DIST.

	W9	W10
4K	IN	OUT
8K	OUT	IN

MEMORY BANK SIZE

W'S 2,3,4,5,6 PROGRAM MEMORY BANK LOCATION. CUT JUMPER FOR BUS A LINE LOW (ASSERTED) WHEN BANK IS SELECTED. W5 MUST BE IN WHEN USED AS 8K BANK

BUS A13 L BP1 · BUS A16 L BG2 · BUS A15 L BR1 · BUS A17 L BS1 · BUS A01 L BH1 · BUS A14 L BR2

HIGH WHEN MEMORY BANK IS SELECTED

DEVICE SELECT CIRCUIT (DSELH)

BUS DCLOL BF2

* USE INSULATED JUMPERS IN POSITIONS SHOWN BY DOTTED LINES WHEN INTERLEAVING.

-5V SUPPLY

CDL2 -5V TO SENSE AMPS

SPLIT LUG T.P.4

-15V

T.P.2 T.P.7

+3V

AV1 TP5

AU1 TP6

BUS A00 L BH2 · BUS C00 L BU2 · BUS C01 L BT2

PROTECT LOW

BYTE MASKING LOGIC

CLK 1 H

LOAD 0 H TO DATA 74174 FF

LOAD 1 H

A0 LATCH

C0 LATCH

C1 LATCH

MSEL RESET

DELAY FF RESET

READ H

WRITE RESTART ONE SHOT CKT

INIT L

SPLIT LUG T.P.1

DATIP CLR PAUSE L AV1

RESET 1 L CDL2 TO DATA 74H74 FF

RESET 0 L CDL2

STROBE 1H CDL2 TO SENSE AMPS (7528)

ST ROBE 0 H CDL2 (#30 TWP)

BUS SSYN L

DATA OUT H TO BUS DRIVERS

	W12	W13	W14	W15	W16	W17
G109	OUT	OUT	OUT	OUT	OUT	OUT

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
MM11-SP		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES

DECIMALS: XXX = .005, .XX = .02, .X = .1 · ANGLES: ±0° 30'

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL

FINISH

DRN. [signature] DATE 11-3-71

CHK'D [signature] DATE 2-16-72

ENG. [signature] DATE 2-16-72

PROJ. ENG. [signature] DATE 3-2-72

PROD. [signature] DATE 3-2-72

NEXT HIGHER ASSY. B-DD-MM11-S

SCALE

SHEET 2 OF 4

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: CONTROL & DATA LOOPS (CDL2) G109

SIZE	CODE	NUMBER	REV.
D	CS	G109-0-1	N

DIST.

REVISIONS: REV. · CHANGE NO · C'HK

DEC FORM NO DRD 102-B

8 7 6 5 4 3 2 1

ALL THESE INPUTS FROM MEMORY STACK

Ø ØSB EV2 D4 2K R38 T3 R4 75Ω C1 39PF E61 7528
Ø ØSA EV1 D3 T3 R3 75Ω
Ø 4SB ES2 D2 2K R37 T9 R2 75Ω C2 39PF E61 7528 C19
Ø 4SA ES1 D1 T9 R1 75Ω
Ø 1SB EP2 D8 2K R40 T9 R8 75Ω C3 39PF E58 7528
Ø 1SA EP1 D7 T9 R7 75Ω
Ø 5SB EN2 D6 2K R39 T9 R6 75Ω C4 39PF E58 7529 C30
Ø 5SA EN1 D5 T9 R5 75Ω
Ø 2SB EL2 D12 2K R42 T7 R12 75Ω C5 39PF E55 7528
Ø 2SA EL1 D11 T7 R11 75Ω
Ø 6SB EK2 D10 2K R41 T7 R10 75Ω C6 39PF E55 7528 C21
Ø 6SA EK1 D9 T7 R9 75Ω
Ø 3SB EH2 D16 2K R44 T7 R16 75Ω C7 39PF E52 7528 C32
Ø 3SA EH1 D15 T7 R15 75Ω
Ø 7SB EF2 D14 2K R43 T7 R14 75Ω C8 39PF E52 7528
Ø 7SA EF1 D13 T7 R13 75Ω
PA5B DF2 D36 2K R54 T1 R36 75Ω C17 39PF E37 7528 C27
PA5A DF1 D35 T1 R35 75Ω

E56 7404 E62 7404 E62 7404

SENSE TERMINATING (FROM CORES)
SENSE AMPS
CDL2 STROBE Ø 11 (#30 TWP)
+5V REF FA2
W16

CDL2 TIMING

E11 8640 E11 8640 E10 8640 E11 8640 E10 8640 E10 8640 E7 8640
E22 74H11-1 E22 74H11-1 E22 74H11-1 E21 74H01-1 E21 74H01-1 E21 74H01-1 E21 74H01-1 E19 74H01-1
E54 74H74 E54 74H74 E54 74H74 E54 74H74 E54 74H74 E33 74H74
E56 7404 E56 7404 E56 7404 E56 7404 E56 7404 E56 7404 E56 7404 E35 74H04
19.6Ω R56 4.99K C39 .22 UF
19.6Ω R57 .22 UF
19.6Ω R63 4.99K R64 .22 UF

Ø ØIN EU2 R66 13.0Ω Q1 T10 C67 1000PF R84 D51 D64 E50 7432 C45 3300PF
Ø 4IN ER2 R65 13.0Ω Q2 T10 C66 1000PF R85 D52 D64 E57 7432 C52 3300PF
Ø 1IN ER1 R67 13.0Ω Q4 T10 C68 1000PF R87 D58 D64 E59 7437 C52 3300PF
Ø 5IN EM2 R68 13.0Ω Q3 T10 C70 1000PF R83 D39 D64 E57 7437 C51 3300PF
Ø 2IN EM1 R70 13.0Ω Q5 T8 C71 1000PF R90 D41 D61 E53 7437 C57 3300PF
Ø 6IN EJ2 R62 13.0Ω Q6 T8 C73 1000PF R89 D47 D62 E53 7437 C54 3300PF
Ø 3IN EJ1 R71 13.0Ω Q8 T8 C72 1000PF R88 D44 D60 E53 7437 C56 3300PF
Ø 7IN EE2 R72 13.0Ω Q7 T8 C74 1000PF R87 D43 D55 E53 7437 C55 3300PF
PA IN DE2 R61 13.0Ω Q10 T2 C63 1000PF R93 D54 D52 E36 7437 C66 3300PF

-15V +5V

AC AE1 AD AF2 AD AF1 AE2 AH2

1609996 D664

AMI BUS PAL

INVERTERS BUS RECEIVERS DATA LATCHES BUS DRIVERS INH BASE DRIVERS INHIBIT DRIVERS

CDL2 DATA D. T H

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
MMII-SP		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES
DECIMALS .XXX = .005 .XX = .02 .X = 1 ANGLES ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL —"—
FINISH —"—

DRN. R. Cadbury DATE 11-5-71
CHK'D. F. Raleigh DATE 2-16-72
ENG. DATE
PROJ. ENG. DATE
PROD. DATE
NEXT HIGHER ASSY. B-DD-MMII-S
SCALE —"—
SHEET 3 OF 4

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE CONTROL & DATA LOOPS (CDL3) GIØ9

SIZE D CODE CS NUMBER GIØ9-Ø-1 REV. N
DIST.

REVISIONS REV. CHANGE NO. CHK

DEC FORM NO. DRD 102-B

CDL 2 −5V +5V

CDL 2 LOAD I H

CDL 2 RESET I H

CDL 2 TINH I H

ØSSB ED2 D28 2K R45 T5 R18 75Ω C9 39PF F49 7528

ØSSA ED1 D19 R46 R19 75Ω

ØSSB DV2 D18 T5 R19 C10 39PF F49 7528 C23

ØSSA DV1 D17 R47 R17

13SB DS2 D24 2K R48 T5 R24 C11 39PF E46 7528 C34

13SA DS1 D23 R23

1ØSB DP2 D22 T5 R22 C12 39PF E46 7528

1ØSA DP1 D21 R21

14SB DN2 D28 2K R50 T3 R24 C13 39PF F43 7528 C26

14SA DN1 D27 R49 R27

11SB DL2 D26 2K R44 T3 R26 C14 39PF E43 7528 C25

11SA DL1 D25 R43 R25

15SB DK2 D32 2K R52 T3 R32 C15 39PF E40 7528 C36

15SA DK1 D31 R51 R31

12SB DH2 D30 2K R51 T3 R30 C16 39PF E40 7528

12SA DH1 D29 R29

PBSB DD2 D34 2K R53 T1 R34 C18 39PF E37 7528

PBSA DD1 D33 R33

75Ω

ALL THESE INPUTS FROM MEMORY STACK

E44 7404 E50 7404

SENSE TERMINATION (FROM CORES)

SENSE AMPS

CDL 2 STROBE I H

+5V REF FA2

+5V REF

136Ω R64 .22 UF C41

196Ω R61 .22 UF R64 C42

INVERTERS

F9 8640 F8 8640 F7 8640

F8 7474 E5Ø 7404 E5Ø 7404 F5Ø 7474 E44 7404 E44 7404 E44 7404 E35 7404

BUS RECEIVERS

F9 8640 F8 8640 F7 8640

DATA LATCHES

F9 74H74 E42 74H74 F42 74H74 F42 74H74 F42 74H74 F42 74H74 F42 74H74 F42 74H74

CDL 2 DATA OUT H

BUS DRIVERS

E27 74HØ1-1 E27 74HØ1-1 E27 74HØ1-1 E27 74HØ1-1 E19 74HØ1-1 E19 74HØ1-1 E19 74HØ1-1 E18 74HØ1-1

INH BASE DRIVERS

ØBIN EE1 R74 13.0Ω CE1 3300PF E47 7437 Q9 TG T6 C75 1000PF R74 D45 D46

9IN DV2 R73 CE2 E47 Q10 C77 R93 D47

13IN DN2 R75 CE0 Q12 C76 R92 D44

10IN DP1 R76 CE9 Q11 C78 R91 D43

14IN DN1 R78 CE1 Q13 C79 R95 D49

11 IN DM1 R77 CE2 Q19 CB1 R97 D50

15IN DJ2 R79 CE4 Q16 CB3 R96 D52

12IN DS1 R80 CE0 Q15 CB2 R95 D51

PBIN DE1 R82 CE5 Q17 CB4 R100 D53

AN2 PBL

AL1 BUS DIS L R72 D71

1609996 DG64 DG65 DG66 DG67 DG69 DG70 DG71

−15V

+5V

INHIBIT DRIVERS (TO CORES)

REVISIONS		
REV.	CHANGE NO	C'HK

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
MM11-SP		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES

DECIMALS	ANGLES
XXX = .005 XX = .02 X = .1	±0° 30'

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL —

FINISH —

DRN. R. Cardoza DATE 11/5/71

CHK'D J. Kalyk DATE 2-16-72

ENG. DATE

PROJ. ENG. DATE

PROD. DATE

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE CONTROL & DATA LOOPS (CDL4)

G109

NEXT HIGHER ASSY. B-DD-MM11-S

SCALE —

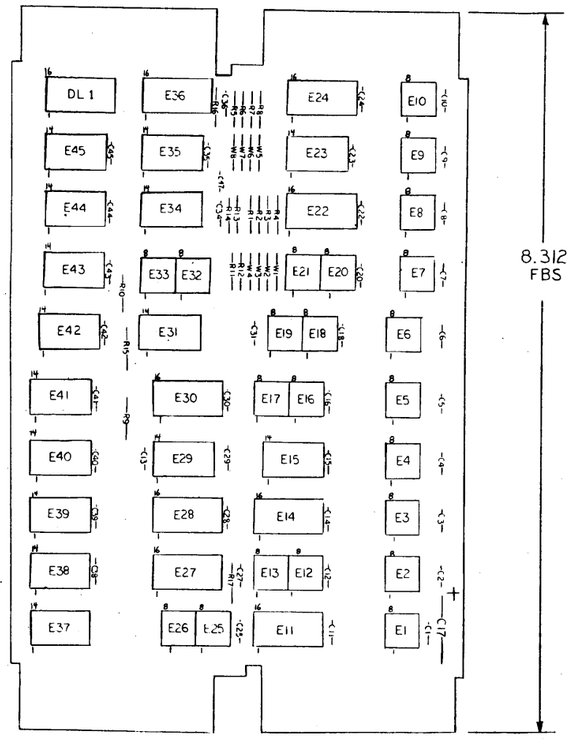
SHEET + OF 4

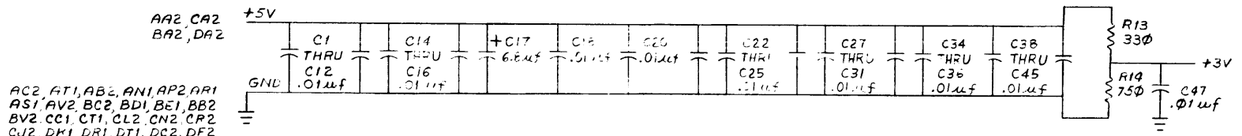
SIZE D | CODE CS | NUMBER G109-0-1 | REV. N

DIST.

DEC FORM NO DRD 102-B

NOTES:





QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
8	W1 THRU W8	INSULATED JUMPERS	9009185	27
22	E1 THRU E10, E12, E13, E25 E16 THRU E21, E26, E32, E33	I.C. DEC. 75453	1911036	26
1	E30	I.C. DEC. 2602	1910257	25
2	E22, E24	I.C. DEC. 7485	1910224	24
1	E44	I.C. DEC. 7408	1910155	23
1	E37	I.C. DEC. 74H01-1	1909849	22
1	E40	IC. DEC. 8242	1909712	21
4	E15, E29, E39, E38	IC. DEC. 74H74	1909667	20
1	E41	IC. DEC. 74H11	1909267	19
1	E31	IC. DEC. 74H50	1909060	18
4	E23, E33, E42, E43	IC. DEC. 74H00	1909056	17
5	E11, E14, E27, E28, E36	IC. DEC. 7475	1909050	16
2	E35, E45	I.C. DEC. 74H40	1905586	15
1	DL1	DELAY 100nS, 10nS/TAP	1610033	14
1	R14	RES. 750, 5%, 1/4 W	1301401	13
1	R10	RES. 180, 5%, 1/4 W	1301322	12
11	R1 THRU R9, R11, R15	RES. 4.7K, 5%, 1/4 W	1300947	11
1	R17	RES. 390, 5%, 1/4 W	1300309	10
1	R13	RES. 330, 5%, 1/4 W	1300295	9
2	R12, R16	RES. 220, 5%, 1/4 W	1300271	8
1	C17	CAP. 6.8 uf, 10%, 35V	1005306	7
38	C1 THRU C12, C14 THRU C16 C18, C20, C22 THRU C25 C27 THRU C31, C34 THRU C36 C38 THRU C45, C47	CAP. .01uf, 20%, 100V	1001610-01	6
1	C13	CAP. 100pf, 5%, 100 V	1000016	5
1		ETCHED CIRCUIT BOARD	5010024	4
REF		MODULE ECO HISTORY	B-MH-M7170-0-6	3
REF		ASSY/DRILLING HOLE LAYOUT	D-AH-M7170-0-5	2
REF		X-Y COORDINATE HOLE LOCATION	K-CO-M7170-0-4	1

PARTS LIST

DEC 75453	4	8
DEC 7485	8	16
DEC 7475	12	5
DEC 2602	8	16
IC TYPE	GND	+ 5V

GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTIVELY EXCEPTIONS ARE STATED ABOVE

IC PIN LOCATIONS

DEC NO.	EIA NO.	DEC NO.	EIA NO.

SEMICONDUCTOR CONVERSION CHART

FIRST USED ON OPTION MODEL: ME15

ETCH BOARD REV: E

REV	CHANGE NO.	CHK	ORIGINATED
E	1	J.ELSBREE	11-6-73
F	3	J.ELSBREE	5-18-73
D	1	JOHN ELSBREE	5-17-73
C	2	M7170-00032	5-17-73

M7170-00003

DRN. J. Vincent 12-6-72
CHK'D. J. LeBlanc 12-6-72
ENG. J. Abbruzzese 12-18-72
PROJ. ENG. J. Abbruzzese 12-18-72
PROD. J. Abbruzzese 12-19-72
NEXT HIGHER ASSY

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: ME15 INTERFACE

SIZE D | CODE CS | NUMBER M7170-0-1 | REV. F

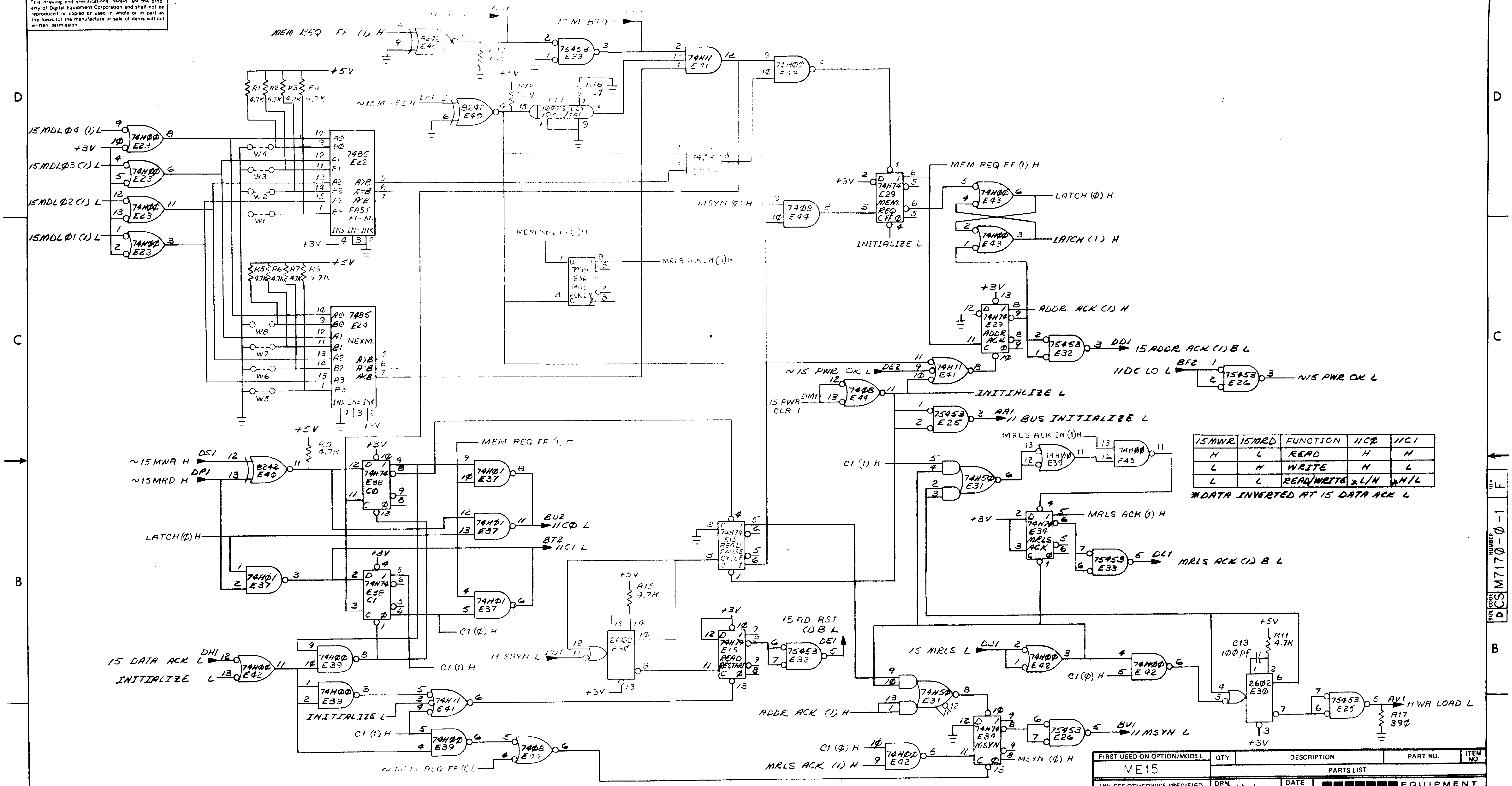
SCALE

SHEET 1 OF 3

DIST.

DEC FORM NO. DRD-135A

BRUNING 40-522 16899



15MWR	15MRD	FUNCTION	11C0	11C1
H	L	READ	H	H
L	H	WRITE	H	L
L	L	READ/WRITE	*L/H	*H/L

*DATA INVERTED AT 15 DATA ACK L

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
ME15		PARTS LIST		

UNLESS OTHERWISE SPECIFIED
DIMENSION IN INCHES
TOLERANCES

DECIMALS	ANGLES
.XXX = .005 .XX = .02 .X = .1	±0° 30′

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL —//—

FINISH —//—

DRN. AKilort	DATE 4-12-72
CHK'D. R.J. LeBlanc	DATE 8 Dec 72
ENG. J. Colebree	DATE 12-18-72
PROJ. ENG. J. Colebree	DATE 12-18-72
PROD. J. Colebree	DATE 12-18-72

NEXT HIGHER ASSY.

SCALE —//—
SHEET 2 OF 3

digital EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS

TITLE
ME15
INTERFACE

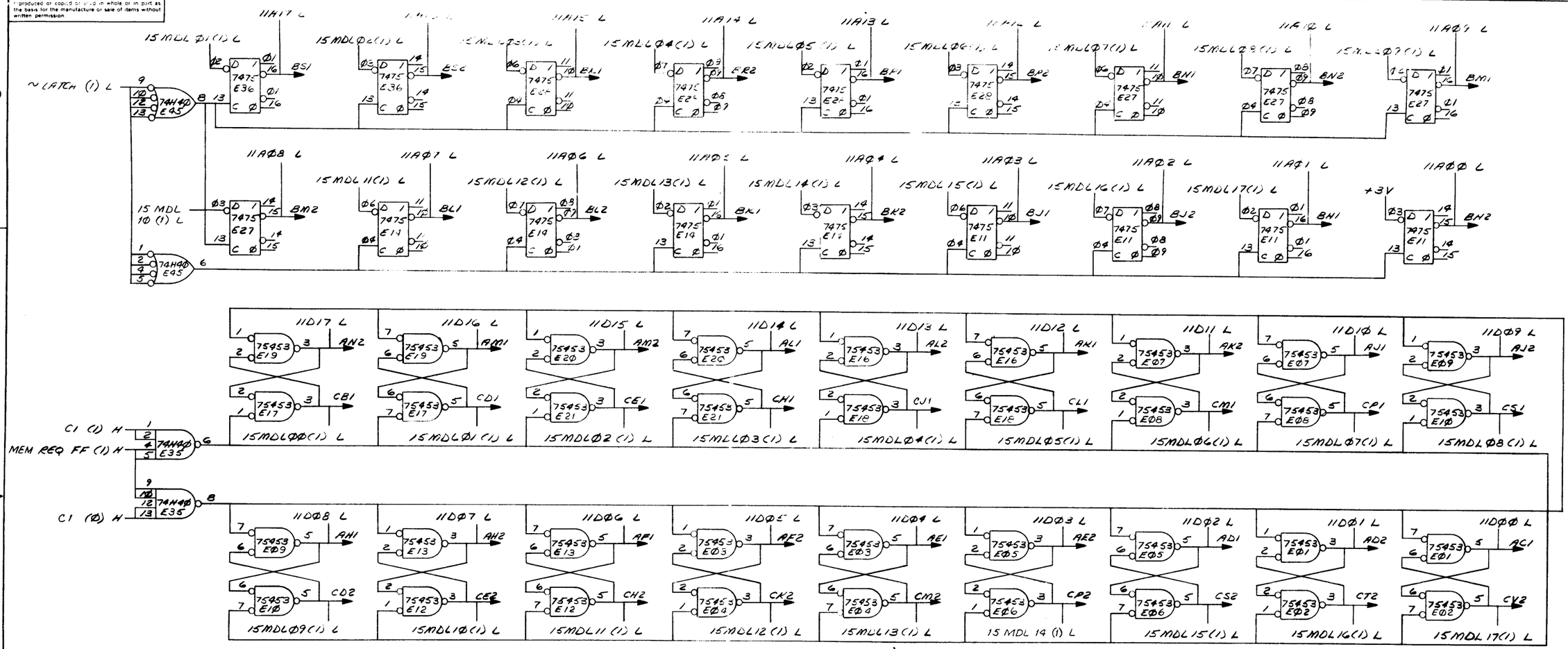
SIZE	CODE	NUMBER	REV
D	CS	M7170-0-1	F

DIST.

D CS M7170-0-1 F

BRUNING 40-522 15840
REVISIONS
CHK | CHANGE NO | REV

DEC FORM NO
DRD 102-B



FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
ME15		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES
DECIMALS: XXX = .005, .XX = .02, .X = .1 — ANGLES: ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

DRN. Wilbert	DATE 4-5-72	digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
CHK'D. [illegible]	DATE 12-12-72	
ENG. [illegible]	DATE 12-18-72	
PROJ ENG. [illegible]	DATE 12-18-72	
PROD. [illegible]	DATE 12-11-72	

MATERIAL —
FINISH —
NEXT HIGHER ASSY.
SCALE —
SHEET 3 OF 3

TITLE: ME15 INTERFACE

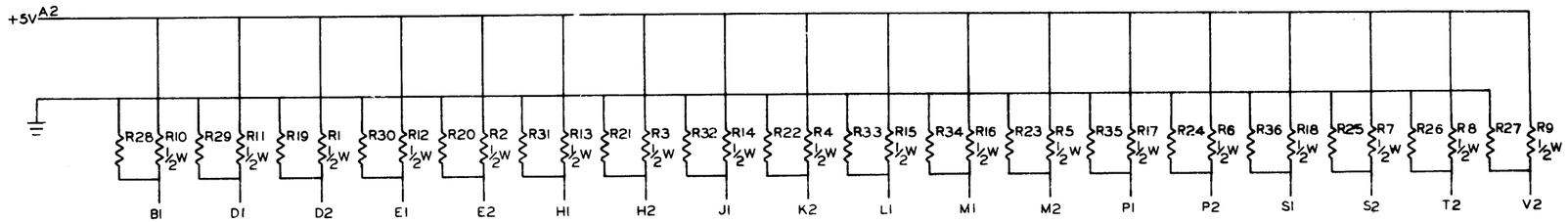
SIZE	CODE	NUMBER	REV
D	CS	M7170-0-1	F

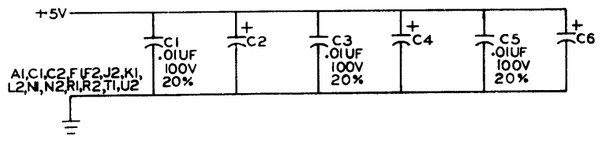
DIST.

REVISIONS

REV	CHANGE NO.	CHK

BRUNING 40-522 15840
DEC FORM NO. DRD 102-8





UNLESS OTHERWISE INDICATED:
CAPACITORS ARE 6.8UF 35V 10%
RESISTORS ARE 120.1/4W, 5%

REVISIONS | REV. | CHK | CHG NO.

DRN G.E.D'Amelia DATE 3/8/71
CHKD DATE 3-12-71
ENG A.Lavoie DATE 3/15/71
PROD DATE

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA

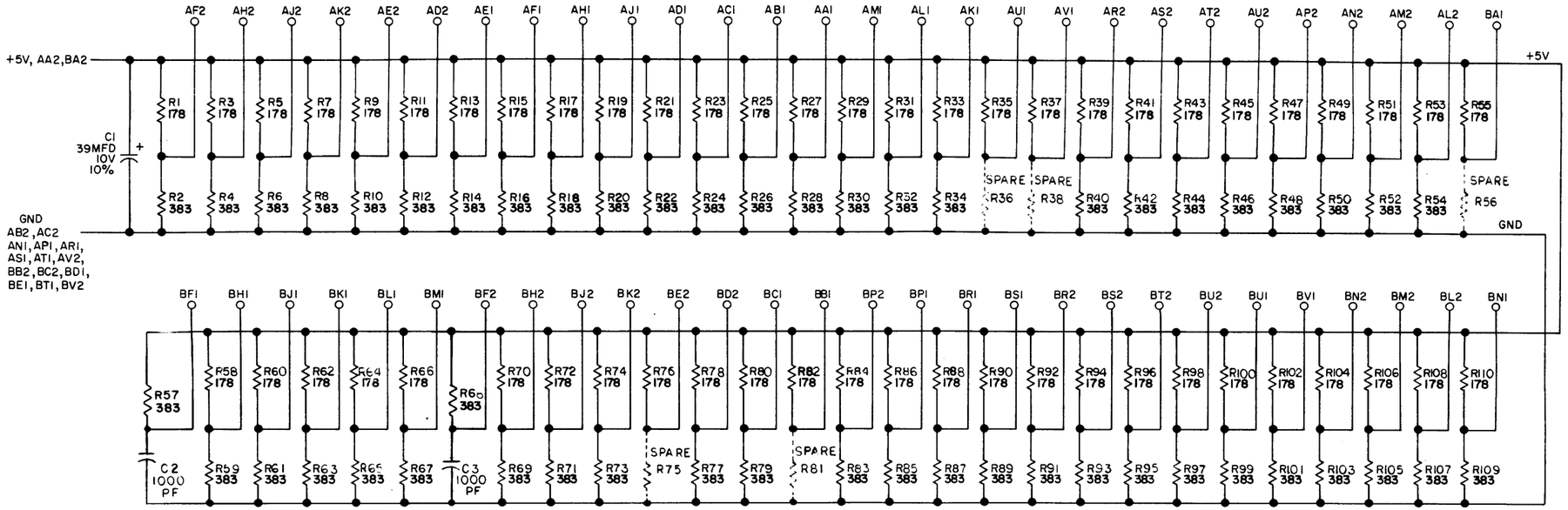
[redacted]
EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE PDP 15 MEMORY BUS TERMINATOR
SIZE C | CODE CS | NUMBER M966-0-1 | REV.
PRINTED CIRCUIT REV. A

SIZE C | CODE CS | NUMBER M966-0-1 | REV.

DEC FORM NO. DRC 102

PINK



UNLESS OTHERWISE INDICATED:
RESISTORS ARE 1/4W, 1%
CAPACITORS ARE .001UF, 250V, 20%

REVISIONS			
CHK	CHG NO.	REV.	
Final	00001	A	
	00002	B	
	00003	C	
b.j. haile	1-29-73		
P. JANSON	6-5-73		
	00004	D	
P. JANSON			

DRN.	BOTLER	DATE 11-21-69
CHK'D		DATE
ENG.		DATE
PROD.		DATE

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: BUS TERMINATOR M930

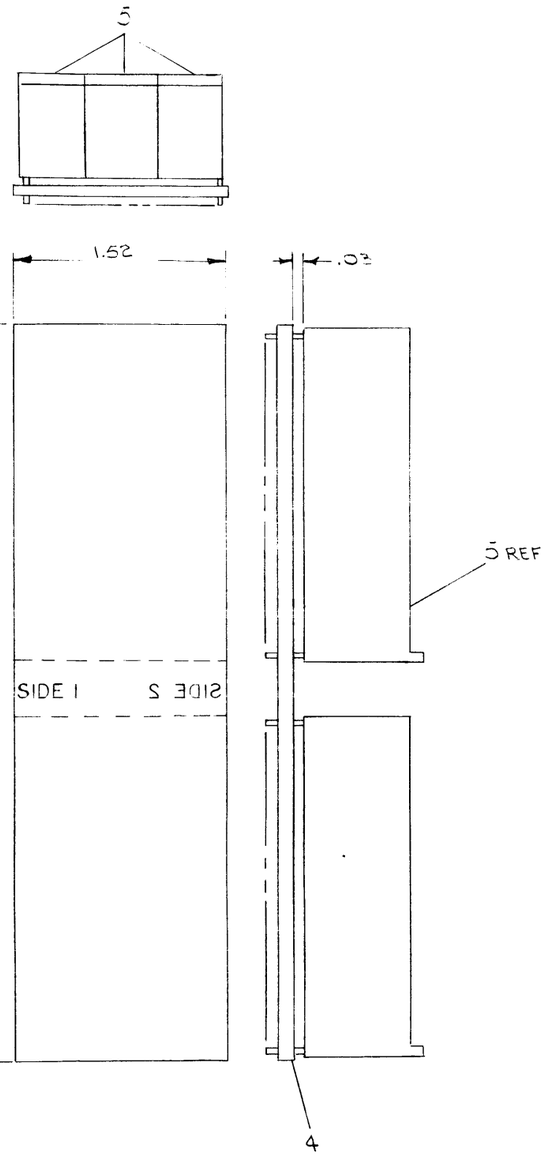
SIZE	CODE	NUMBER	REV.
C	CS	M930-0-1	D

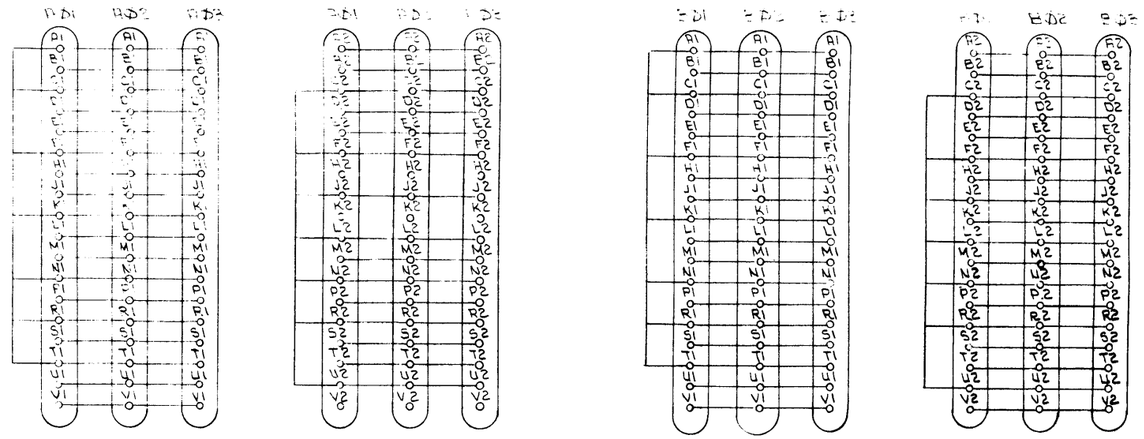
PRINTED CIRCUIT REV. D

SIZE	CODE	NUMBER	REV.
C	CS	M930-0-1	D

DEC FORM NO. DRC 102

NOTES:





IC TYPE	GND	+ 5V

GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTIVELY EXCEPTIONS ARE STATED ABOVE

IC PIN LOCATIONS

ITEM NO.	QTY	REF DESIGNATION	DESCRIPTION	PART NO.
5	6		RECEP 36 PIN REWORK	B-MD-5509011-1-0
4	1		ETCHED CIRCUIT BOARD	5010169
3	REF		MODULE ECO HISTORY	B-MH-H8519-0-6
2	REF		ASSY/DRILLING HOLE LAYOUT	D-AH-H8519-0-5
1	REF		X-Y COORDINATE HOLE LOCATION	X-CO-H8519-0-4

PARTS LIST

FIRST USED ON OPTION MODEL: MEI5

ETCH BOARD REV: B

REV	ORIGINATED	CHANGE NO.	DEC NO.	EIA NO.	DEC NO.	EIA NO.
A						

SEMICONDUCTOR CONVERSION CHART

DRN: J. Wilson DATE
CHK'D. DATE
ENG. J. Colaluca DATE 6/28/72
PROJ. ENG. D. Malone DATE 6/30/72
PROD. DATE

NEXT HIGHER ASSY: A-PL-MEI5-A-0

SCALE: NONE

SHEET 1 OF 1

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: EDGE CONNECTOR

SIZE D | CODE CS | NUMBER H8519-0-1 | REV. A

DIST.

BRUNING 40-522 16699

DEC FORM NO DRD 135A

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

DRAWING DIRECTORY

CUSTOMER PRINT SET INDEX

THIS IS PRINT SET

	SEQUENCE
DRAWING DIRECTORY	B-DD-H742-Ø
CIRCUIT SCHEMATIC	D-CS H742-Ø-1
PWR CONTROL BOARD	E-1A 5409730-0-0
CIRCUIT SCHEMATIC	C-CS 5409730-0-1
UNIT ASSEMBLY H742	E-UA-H742-Ø-Ø
UNIT ASSEMBLY (PL)	A-PL-H742-Ø-Ø

	MFG SET
TEST PROCEDURE	A-SP-H742 Ø-3
MFG SPEC.	A-SP-H742-Ø-8
PACKAGING INSTRUCTION	A-PI-37C0073-0-0

UNIT VARIATIONS

VARIATION	TITLE	PRINT SET TYPE: H742-1
H742-A	CHASSIS ASSY (115V)	X
H742-B	CHASSIS ASSY (230V)	X
H742-C	CHASSIS ASSY (115V)	X
H742-D	CHASSIS ASSY (230V)	X

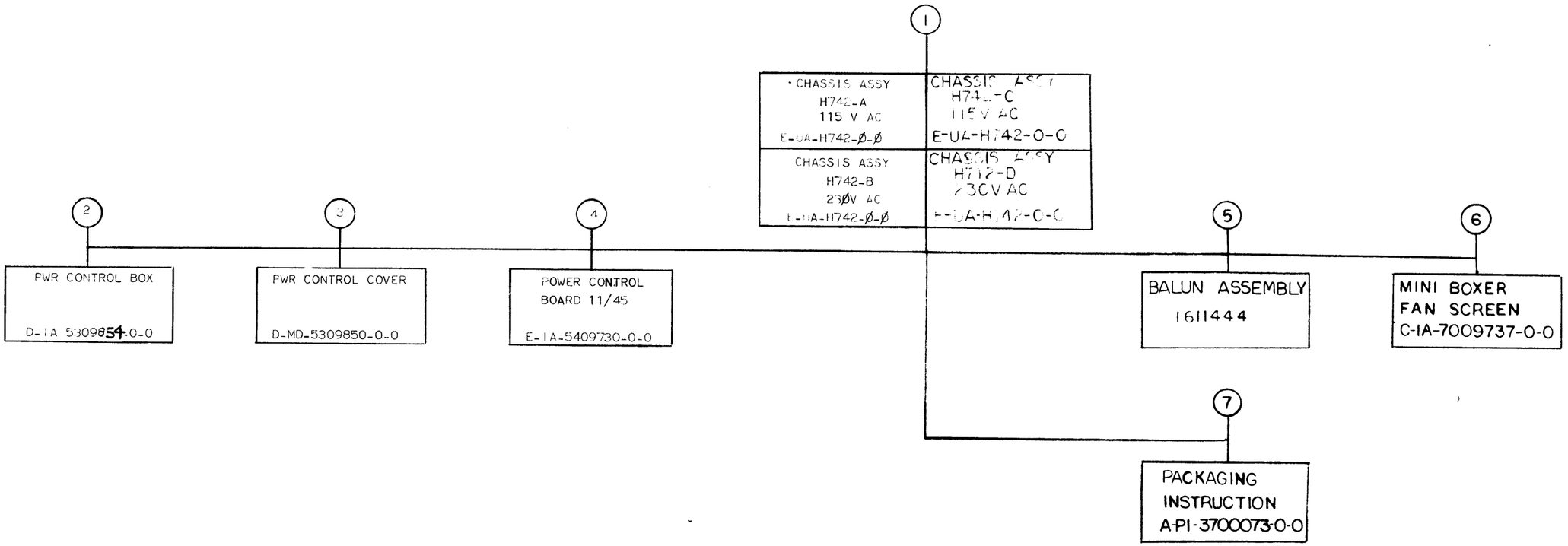
REVISIONS		
DATE	CHG. NO.	REV
7/72	H742-2	A
7/72	H742-3	B
[illegible]	[illegible]	C
8/72	H742-5	D
10/72	H742-7	E
11/72	H742-8	F
12/72	H742-11	H
2/73	H742-12	J
2/73	H742-13	K
2-73	H742-14	L
4-73	H742-15	M
4-73	H742-16	N
5-73	H742-17	P
6-73	H742-18	R
12-73	H742-19	S
3-74	H742-20	T
4-74	H742-21	U
5-75	H742-22	V

USED ON OPTION/MODEL
11/4-5

DRN. J.FONTAINE	DATE 13172	TITLE CHASSIS ASSY H742	
CHK'D. [signature]	DATE 2-6-72		
PROJ ENG. [signature]	DATE 2-4-72		
PROD. [signature]	DATE 2-21-72	SIZE B	CODE DD
FIELD SERV. [signature]	DATE 2-7-72	NUMBER H742-Ø	REV V
SHEET 1 OF 3		DIST	

DRB 106

DEC 16-(325)-1062-1-N871



TITLE		SIZE	CODE	NUMBER	REV
CHASSIS ASSY H742	SHEET OF 3	B	DD	H742-X	V

ELECTRICAL

CUSTOMER PRINT SET H742-1	MFG. SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO./FILE DATE
X		1	D-CS-H742-Ø-1	E	1	CIRCUIT SCHEMATIC	H742
	X		A-SP-H742-Ø-3			TEST PROCUDERE	H742
	X		A-SP-H742-Ø-8			MFG SPECIFICATION	H742
X		4	C-CS-5409730-0-1	#	1	CIRCIUT SCHEMATIC	H742

MECHANICAL

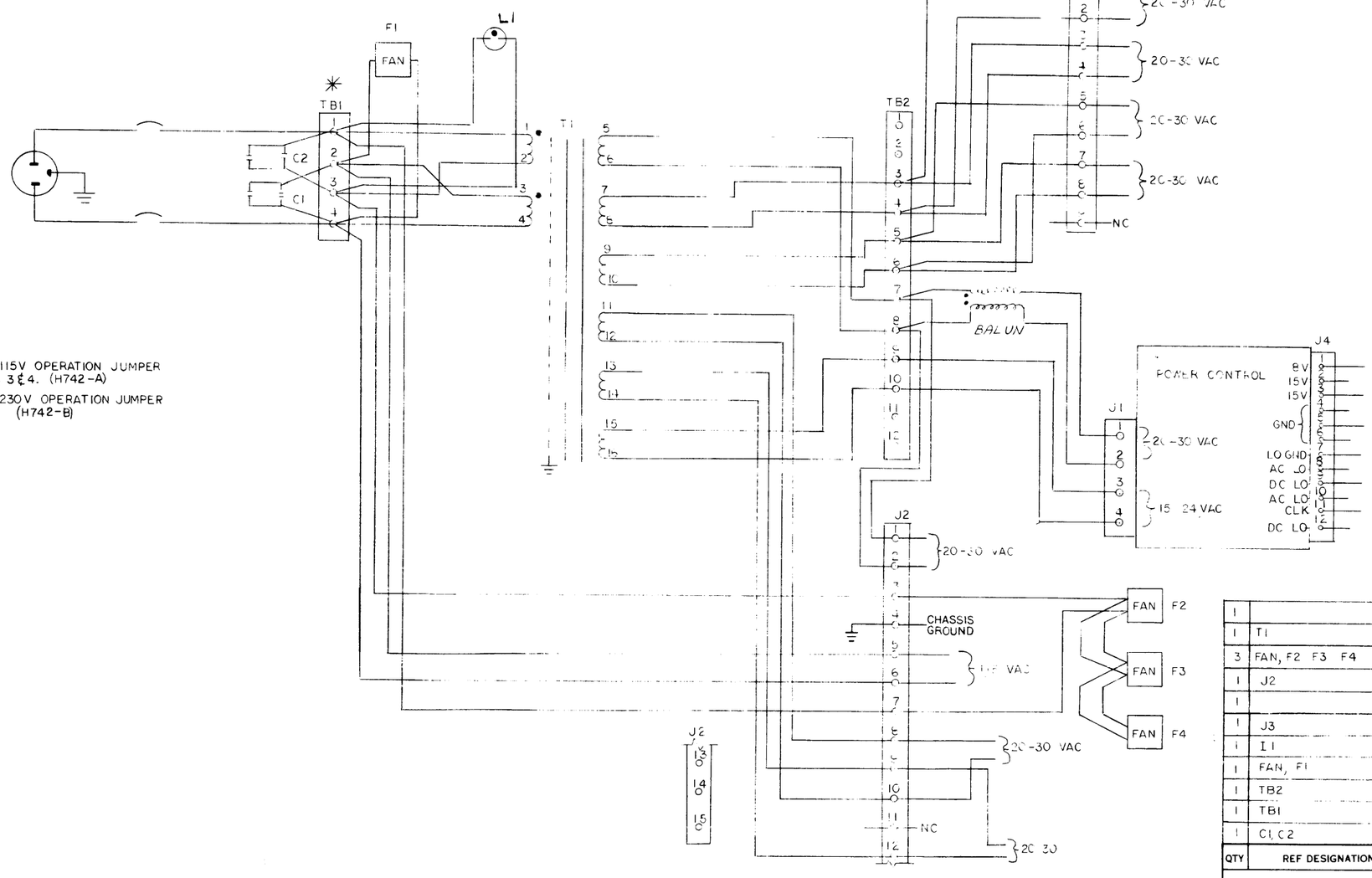
CUSTOMER PRINT SET H742-1	MFG SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO./FILE DATE
X		1	E-UA-H742-Ø-Ø	V	3	CHASSIS ALLY H742	H742
X			A-PL-H742-Ø-Ø	V	4	CHASSIS ASSY H742	H742
			E-IA-5309755-0-0		3	CHASSIS H742	H742
			D-IA-7409701-0-0		1	BRACKET, POWER SUPPLY	H742
			C-MD-7409702-0-0		1	COVER POWER SUPPLY	H742
			A-DC-5310459-0-0		1	DECAL, H742A	H742
			A-DC-5310460-0-0		1	DECAL, H742B	H742
			A-DC-5310461-0-0		1	DECAL, H742C	H742
			A-DC-5310462-0-0		1	DECAL, H742D	H742
		2	D-IA-5309854-0-0		1	POWER CONTROL BOX	H742
			A-SS-5309854-0-1		1	SILK SCREEN (H742)	H742
		3	D-MD-5309850-0-0		1	POWER CONTROL COVER	H742
			A-SS-5309850-0-1		1	SILK SCREEN	H742
X		4	E-IA-5409730-0-0	#	1	PWR CONTROL BD ASSY	H742
			5009729-0-0	#	1	PWR CONTROL BD	H742
		5	1611444		1	BALUN ASSEMBLY	H742
		6	C-IA-7009737-0-0		1	MINI BOXER FAN SCREEN	
			B-MD-7411626-0-0		1	FAN SCREEN	
			B-MD-7411627-0-0		1	FAN PLATE	
	X	7	A-PI-3700073-C-O	#	2	PACKAGING INSTRUCTION	
			A-PS-9905205-C-O		2	REGULAR SLOTTED CARTON	
			A-PS-9905206-C-C		2	DIE-CUT SHEET	
			A-PS-9905207-C-C		2	LAMINATED BASE	

CUSTOMER PRINT SET CODES

X = PRINT OF DOCUMENT INCLUDED IN PRINT SET
C = INCLUDES ALL PRINTS INDICATED ON DOCUMENT
S = CONFIDENTIAL AUTHORIZED SIGNATURE REQUIRED

TITLE	SHEET	SIZE	CODE	NUMBER	REV
CHASSIS ASSY H742	SHEET 3 OF 3	B	DD	H742-Ø	V

DRB 108



NOTE

✳ FOR 115V OPERATION JUMPER 1&2, 3&4. (H742-A)

FOR 230V OPERATION JUMPER 2&3. (H742-B)

ITEM NO.	QTY	REF DESIGNATION	DESCRIPTION	PART NO.
11	1		POWER CONTROL	5409730
10	1	T1	XMFR	1610857
9	3	FAN, F2 F3 F4	FAN SUPER BOXER	1209403-1
8	1	J2	MATE-N-LOCK	1209350-15
7	1		BALUN ASSY	1611444
6	1	J3	MATE-N-LOCK	1209350-9
5	1	I1	LIGHT PILOT	1201280
4	1	FAN, F1	FAN PEWEE	1210719
3	1	TB2	JONES STRIP	9006917
2	1	TB1	JONES STRIP	9006902
1	1	C1, C2	CAPACITOR 2 X .1 UF 1000V	1010193

PARTS LIST

ETCH BOARD REV

REV	CHK	CHANGE NO.	DATE	
A		H742-00001	6-21-73	G POTTER
B		H742-00004	6-27-73	G POTTER
C		H742-00017	6-27-73	R. WOLF
D		H742-00018	6-27-73	R. WOLF
E		H742-00019	11-3-74	R. WOLF

REVISIONS

SEMICONDUCTOR CONVERSION CHART

DEC NO.	EIA NO.	DEC NO.	EIA NO.

DRN. H. Hopkins DATE 2-3-72
CHK'D. DATE 2-7-72
ENG. DATE 2-7-72
PROJ. ENG. DATE 2-7-72
PROD. DATE 2-7-72
NEXT HIGHER ASSY H-LO-H742-0

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE CIRCUIT SCHEMATIC H742

SIZE D CODE CS NUMBER H742-0-1 REV. E

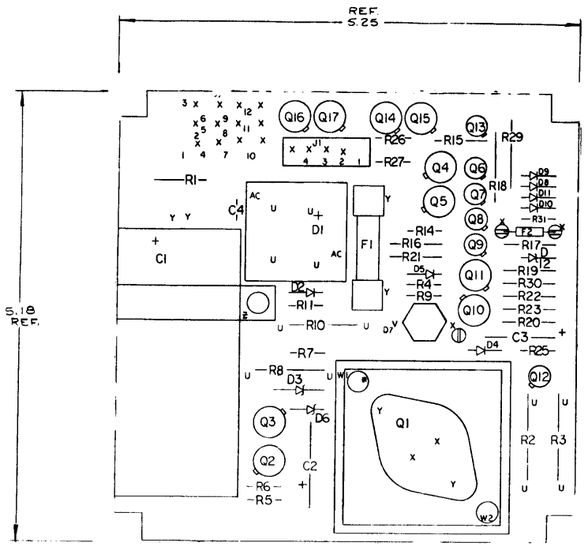
SCALE

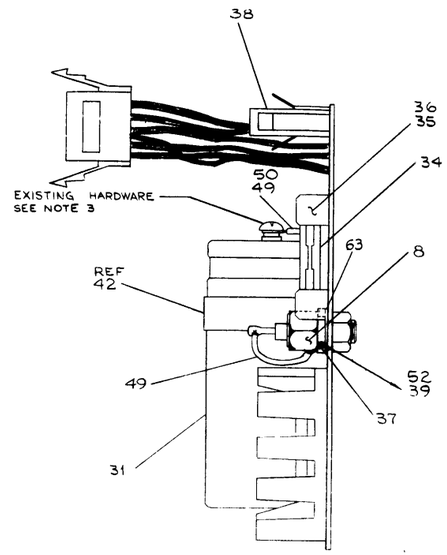
SHEET OF

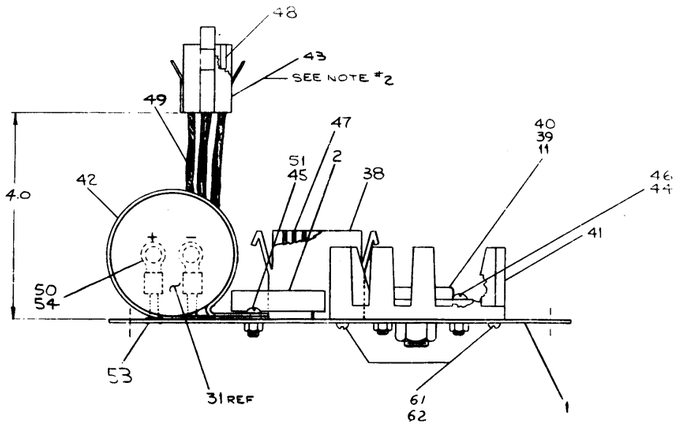
DIST.

DEC FORM NO. DRD-135

NOTES:
1. APPLY ITEM #39 (COMPOUND) BETWEEN TRANSISTOR (Q1) AND ITEM #40 (WASHER) ALSO BETWEEN WASHER & HEAT SINK ITEM #41, ALSO BETWEEN HEATSINK AND ETCHED BOARD ITEM #1.
2. CONNECTIONS BETWEEN P.C. BOARD AND MATE-N-LOCK CONNECTOR (ITEMS #43 & 48) ARE TO BE MADE POINT TO POINT.
3. HARDWARE FOR ITEMS 8 & 31 IS SUPPLIED UNLESS OTHERWISE SPECIFIED.







QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
1	R8	1K 2W 10%	1300369	65
1	F2	FUSE, PICO 1/4AMP	1210929-4	64
1		FLAT WASHER	9006664	63
2		NUT, KEPS #6-32	9006185	62
2		SCR, PPH #6-32 X 7/16LG	9006023-1	61
1	C4	CAP .22 uf 50V	1010274	60
1	R29	RESISTOR 2K, 1/2W, 1%	1302329	59
1	R17	RESISTOR 3.48K, 1/8W, 1%	1305114	58
1	R19	RESISTOR 3.16K, 1/8W, 1%	1303065	57
1	R31	RESISTOR 10 1/4W, 5%	1301317	56
1	R20	RESISTOR 4.64K, 1/8W, 1%	1304856	55
A/R		#18 AWG BUS WIRE	9107860-03	54
2		EYELET GS-4-3	9007836	53
1		SPACER #10	9008823	52
2		HEXNUT #6-32	9006563	51
2		TERMINAL RING	9007980	50
A/R		#18 AWG (STRIP, TIN, BLK)	9107860-00	49
12		CONTACTS FEMALE (CRIMP)	1209379	48
4		CONTACTS FEMALE (BOARD)	1209456	47
3		SCR, PHP PAN HD #4-40 X 1/2 LG	9006018-1	46
1		SCR, PHP PAN HD #6-32 X 3/8 LG	9006037-1	45
2		NUT, KEPS #4-40	9006557	44
1		MATE-N-LOCK (12 PIN)	1209353-2	43
1		IC CLAMP 1.48	9007095-1	42
1		HEAT SINK	1205817	41
1		INSULATOR, WASHER	9006721	40
A/R		COMPOUND THERMAL JOINT	9008668	39
1		[illegible]	[illegible]	38
3		SPLIT LUG M-1033	9006735	37
2		EYELET GS-4-7	9006732	36
2		FUSE CLIP	9007203	35
1	F1	FUSE AGC 5	9007221	34
1	C3	CAP 20 uf @ 60V 5%	1010716	33
1	C2	CAP 33 uf @ 25V	1001796	32
1	C1	CAP 5.8K uf @ 40V.	1010860	31
1	R23	RESISTOR 2.0 K 1/8W 1%	3027115	30
1	R18	RESISTOR 2.49K 1/2 W 1%	1300424	29
3	R16, R21, R22	RESISTOR 10 K 1/8W 1%	1303312	28
1	R13	RESISTOR 27.4 K 1/8W 1%	1309417	27
1	R30	RESISTOR 24.3K 1/8W 1%	1309418	26
4	R14, R25, R26, R27	RESISTOR 470 Ω 1/4 W, 5%	1300316	25
1	R11	RESISTOR 560 1/4 W, 5%	1301890	24
1	R10	RESISTOR 390 Ω 2W, 10%	1301880	23
~~1~~	~~R9~~	~~RESISTOR 1.5K 1W, 10%~~	~~1300393~~	~~22~~
1	R7	RESISTOR 270 1/4W 5%	3011972	21
2	R6, R9	RESISTOR 1K 1/4W 5%	1300365	20
1	R5	RESISTOR 5.1Ω 1/4, 5%	1309422	19
1	R4	RESISTOR 390 1/4W 5%	1300309	18
2	R2, R3	RESISTOR 200 Ω 5W 5%	1309439	17
1	R1	RESISTOR 39K 1/2 W 5%	1300443	16
4	Q5, Q11, Q13, Q17	TRANSISTOR 2N1309	1501511	15
4	Q4, Q10, Q14, Q16	TRANSISTOR 2N1308	1500583	14
7	Q3, Q6, Q8, Q9, Q12, Q15	TRANSISTOR MPSA55	1510706	13
1	Q2	TRANSISTOR DEC 2214	1501881	12
1	Q1	TRANSISTOR MJ3000	1511349	11
1	D12	DIODE 5.1 V 1MA	1110925	10
4	D8 THRU D11	DIODE IN4002	1104861	9
1	D7	DIODE IN2970B	1120134	8
1	D6	DIODE IN746A	1104860	7
1	D5	DIODE D664	1120114	6
1	D4	DIODE IN4001	1102942	5
1	D3	DIODE IN5353B	1110854	4
1	D2	DIODE 1.4MS.121 5.1V 1%	1125973	3
1	D1	DIODE BRIDGE NSS 3514	1107-9	2
		POWER CONTROL BOARD	D-EA-5009729-00	1
		MODULE ECO HISTORY	A-MH-5409730-0	REF
		X-Y COORDINATE HOLE LOCATION	X-CC-5409730-0-3	REF
		CIRCUIT SCHEMATIC	C-CS-5409730-0-1	REF

PARTS LIST

ETCH BOARD REV E

FIRST USED ON OPT/MOD. H742

D664 IN3606

SEMICONDUCTOR CONVERSION CHART

IC TYPE | GND | +5V

IC PIN LOCATIONS

JUMPER LIST

EQUIPMENT CORPORATION

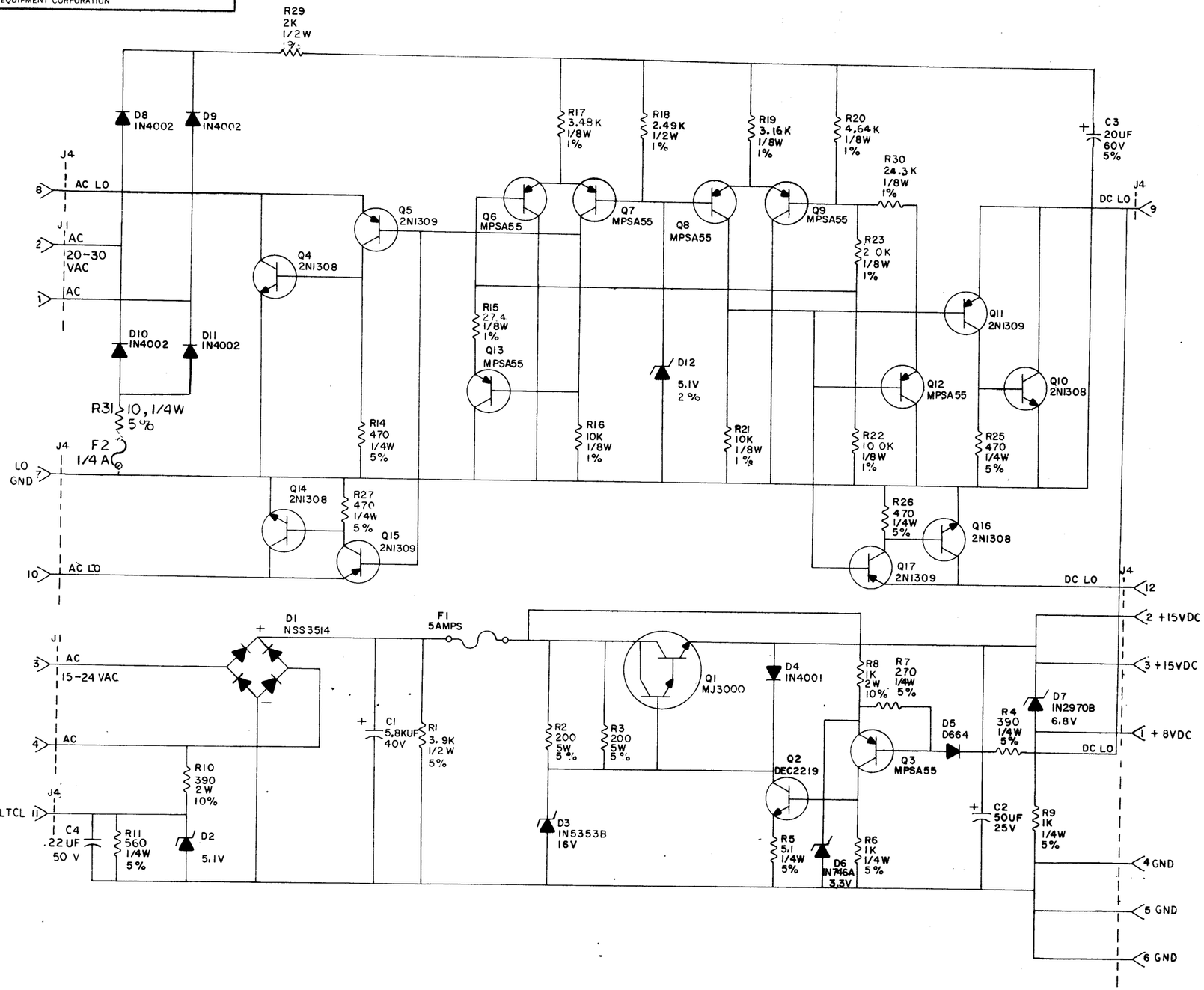
TITLE: POWER CONTROL BOARD 11/45

EUA-H742-0-0

SIZE A | 5409730-0-0 | REV R

SHEET 1 OF 1

5409730-00



REVISIONS						
CHK	CHG NO	REV				
	00001	C				
B.J. Wade 3-14-72						
G.POTTER						
Z. Tate 3-22-72						
	00002	D				
B.J. Wade 3-29-72						
L.POTTER						
	00003	E				
N. Mercer 4-18						
G. POTTER						
	00004	F				
B.J. Wade 6-2-72						
G. POTTER						
	00005	G				
G. POTTER						
	00006	J				
G.POTTER						
	00007	K				
R. WOLF						
	00008	L				
R. WOLF						
	00009	M				
R. WOLF						
	00010	N				
R.WOLF						
	00012	P				
F. LOYA						
	00013	R				
J. BARON						

DRN. S. Cooper	DATE	2/24/72
CHK'D	DATE	3-1-72
ENG.	DATE	3-1-72
PROJ.	DATE	3-1-72

TRANSISTOR & DIODE CONVERSION CHART			
DEC2219	2N2219	IN5231	
2N1308	SAME	IN5353B	
MPSA55		IN751A	SAME
MJ3000		IN4001	SAME
2N1309	SAME	IN2970B	
IN4002		IN746A	
D664	IN3606		

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

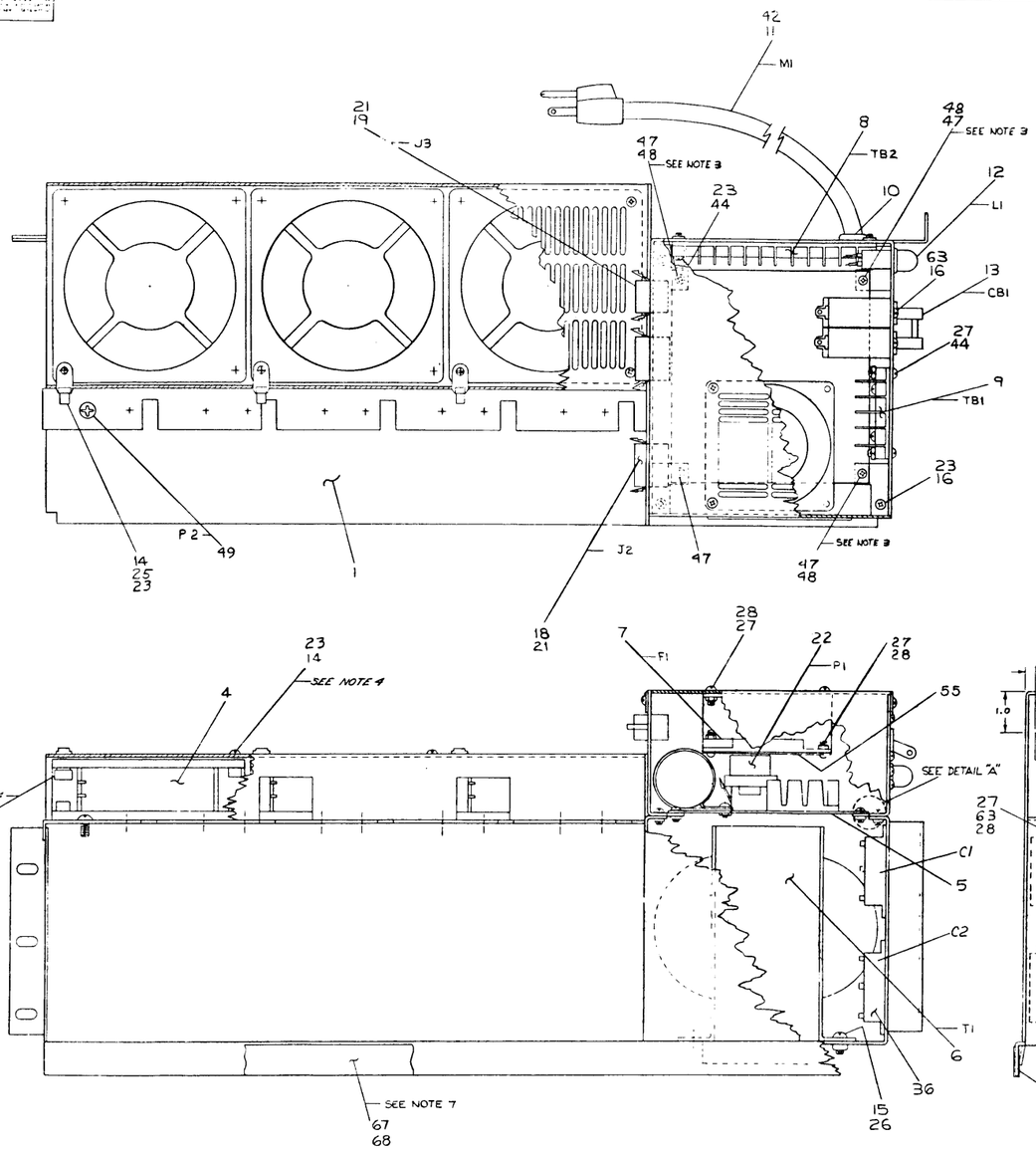
TITLE: POWER CONTROL BD.

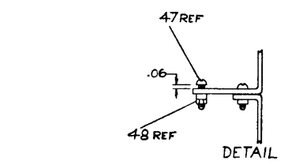
SIZE	CODE	NUMBER	REV.
C	CS	5409730-0-1	R

PRINTED CIRCUIT REV. E

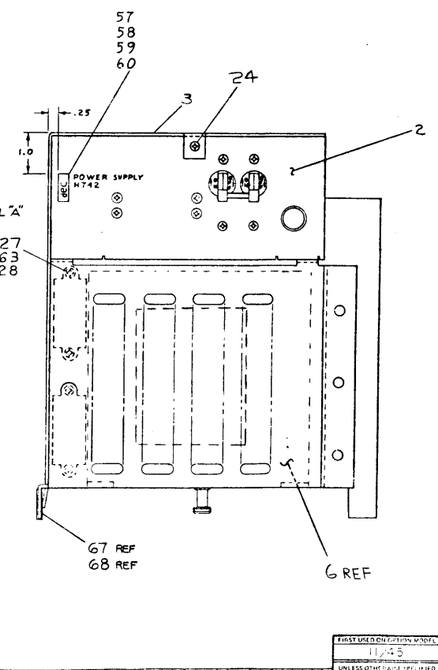
DEC FORM NO. DRC 102

SIZE C CODE CS NUMBER 5409730-0-1 REV. R





SEE SHT. #2 FOR WIRING INFORMATION



SEE SHEET #3

LEGEND	
VERSION	NUMBER
115 VAC	H742-A
230 VAC	H742-B
115 VAC	H742-C
230 VAC	H742-D

NOTES:

1. # ITEM #22 (MALE CONTACTS) ARE TO BE INSERTED INTO MALE CONNECTING BLOCK IN APPROPRIATE CABLE TO J2.
2. ITEM #49 WILL BE INSTALLED DURING FINAL ASSEMBLY.
3. ITEMS # 47 & 48 SHOULD BE TIGHTENED AS SHOWN TO ALLOW 1/16 CLEARANCE FOR INSERTION AND REMOVAL OF 5409730.
4. FOR IMC FAN WS 2107F-110-01 USE ITEMS 14 & 33. FOR ROT-GT FAN 3A2 AND HOWARD FAN 9-30-8120 USE ITEMS 64 & 65.
5. TO ALLOW PROPER SERVICE LOOP, WIRES TO C-1 SHOULD BE 6 INCHES LONG AND WIRES TO C-2 SHOULD BE 9 INCHES LONG.
6. ROUTE ALL AC WIRING (ESPECIALLY TRANSFORMER LEADS 1,2,3 & 4) AS FAR AWAY AS POSSIBLE FROM 5409730 CONTROL BOARD.
7. ITEM #67 SHOULD BE CUT TO A LENGTH OF 20.38 INCHES AND SECURED TO BOTTOM FLANGE OF CHASSIS AS SHOWN WITH ITEM #68. ITEM# 67 SHOULD EXTEND BEYOND END OF FLANGE 1/4" ± 1/16 ON BOTH ENDS.

FIRST USED ON	QTY	DESCRIPTION	PART NO	ITEM NO
11245		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES: DECIMALS ±.005, ANGLES ±0° 30'. FINISH: NEXT HIGHER ASSY. MATERIAL: SEE PARTS LIST. FINISH.

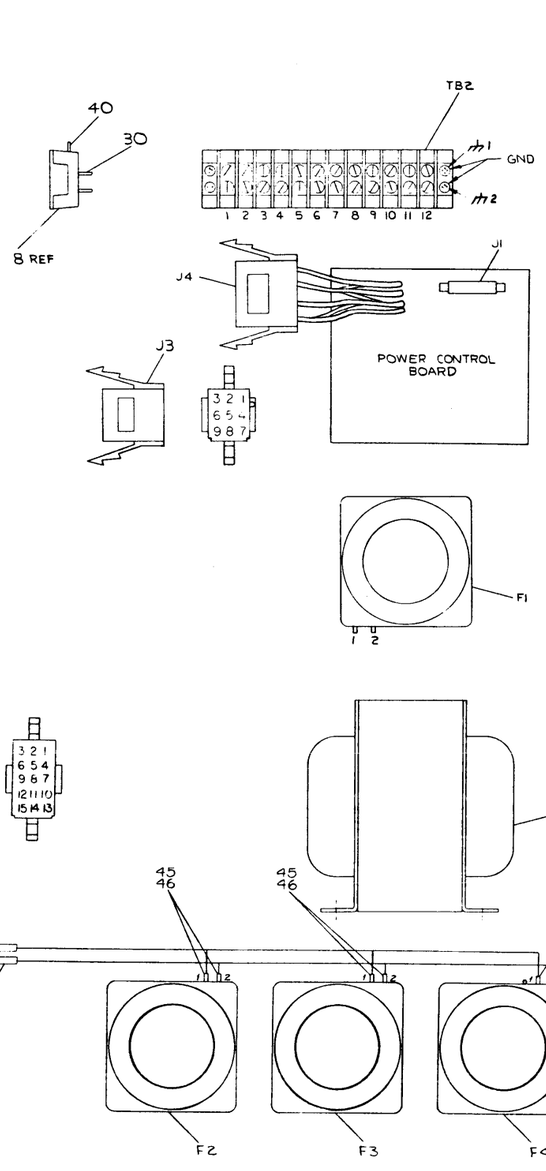
EQUIPMENT CORPORATION

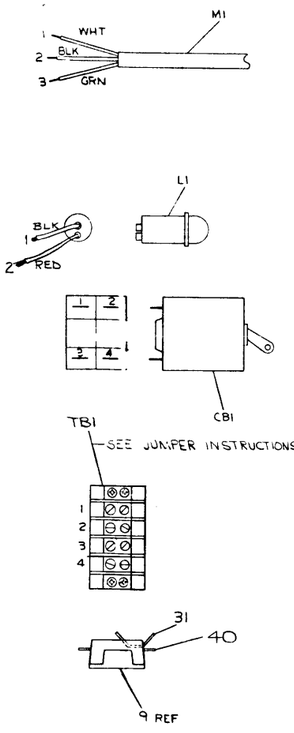
TITLE: POWER SUPPLY H742

SIZE E | CODE UA | NUMBER H742-0-0 | REV V

SCALE | SHEET 1 OF 2 | DIST

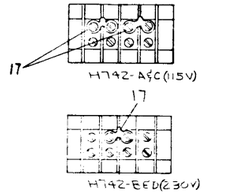
E UA H742-0-0

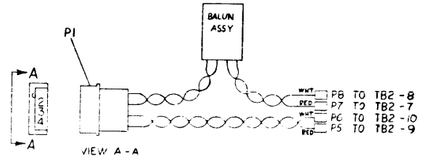




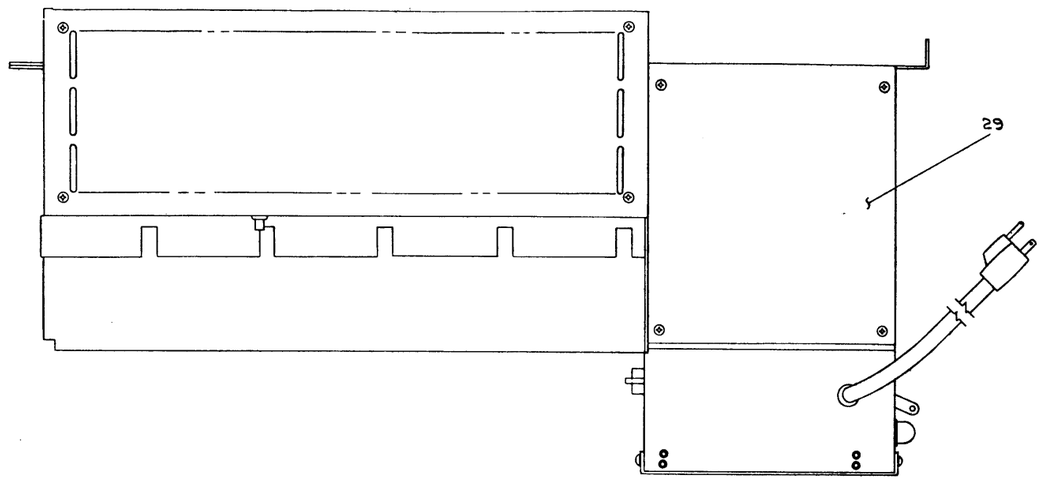
WIRE TABLE

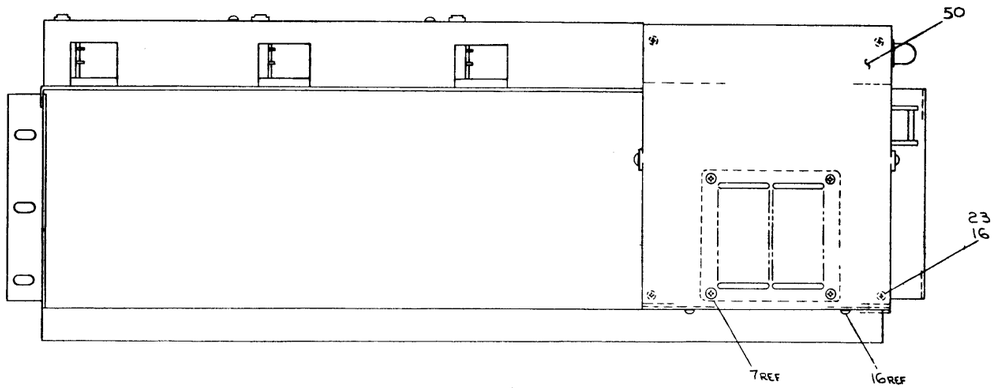
ITEM NO	DESCRIPTION AWG	COLOR	FROM CONN	WITH	TO CONN	WITH	REMARKS
34	18	WHT	C2-1	SOLDER	TB1-3	35	
34	2	WHT	J2-3	18,21			SEE
34	2	WHT	J2-7	18,21	TB1-1	35	NOTE "E
34	18	RED	C2-3	SOLDER			
6		BLK	T1-5		TB2-7	35	
			T1-6		TB2-8		
			T1-7		TB2-3		
			T1-8		TB2-4		
			T1-9		TB2-5		
			T1-10		TB2-6	35	
			T1-11		J2-8	21,18	
			T1-12		J2-10	21,15	
			T1-13		J2-9	21,18	
			T1-14		J2-12	21,18	
			T1-15		TB2-9	35	
6		BLK	T1-16		TB2-10	35	
12		BLK	L1-1		TB1-1	39	
12		RED	L1-2		TB1 3	39	
34	18	RED	TB1-2	39	F1-1	SOLDER	TWISTED
		WHT	TB1-4	39	F1-2	SOLDER	PAIR
43	18	RED	C2-2	SOLDER	C2-3	SOLDER	
43	18	RED	C1-2	SOLDER	C1-3	SOLDER	
11	16	WHT	M1-1		CB1-3	35	POWER
11	16	BLK	M1-2		CB1-4	35	CORD
11	16	GRN	M1-3		TB2-#1	23,38	
32	14	RED	TB2-3	35	J3-1	19,21	
			TB2-3		J3-3		
			TB2-4		J3-2		
			TB2-4		J3-4		
			TB2-5		J3-5		
			TB2-5		J3-7		
			TB2-6		J3-6		
			TB2-6		J3-8	19,21	
32	14	RED	TB2-7	35	J2-1	8,21	
32	14	RED	TB2-8	35	J2-2	18,21	
6		BLK	TB1-3	35	T1-2		
6		BLK	TB1-1	35	T1-1		
6		BLK	TB1-4	35	T1-4		
6		BLK	TB1-2	35	T1-3		
34	18	RED	J2-5	18,21			
34	18	RED	C1-3	SOLDER	TB1-2	35	SEE
34	18	WHT	J2-6	18,21			NOTE "5
34	18	WHT	C1-1	SOLDER	TB1-4	35	
34	18	RED	F4-1	45,46	F3-1	45,46	TWISTED
34	18	WHT	F4-2	45,46	F3-2	45,46	PAIR
34	18	RED	F3-1	45,46	F2-1	45,46	TWISTED
34	18	WHT	F3-2	45,46	F2-2	45,46	PAIR
34	18	RED	F2-1	45,46	P2-7 *	22	TWISTED
34	18	WHT	F2-2	45,46	P2-3 *	22	PAIR
32	14	WHT	CB1-1	35	TB1-4	35	
32	14	RED	CB1-2	35	TB1-1	35	
62	14	GRN	J2-9	21	TB2-#2	23,38	





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES FRACTIONS ± DECIMALS ± ANGLES ±			DIGITAL EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS		
NEXT ASSY	USED ON	APPLICATION	DRAWN		
PROPRIETARY INFORMATION			TRACED		
			DESIGNED		
			TITLE	POWER SUPPLY H742	
			DATE		
MATERIAL	SEE PARTS LIST		APPROVED		
FINISH			SIZE	E	
			SCALE		
			DWG NO	H742-*-C	REV V





FOR VARIATIONS H742-C & D, ITEMS ARE SAME AS A & B WITH EXCEPTIONS SHOWN

SEE SHEET #2 FOR WIRING INFORMATION

FIRST USED ON OPTION MODEL	QTY	DESCRIPTION	PART NO	ITEM NO
11145		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS .XXX ± .005, .XX ± .02, .X ± .1
ANGLES ± 30'
REMOVE BURRS AND BREAK SHARP EDGES
SURFACE FINISH ✓

MATERIAL: SEE PARTS LIST
FINISH:

DRN	T. QUILLIN	DATE 1/9/72
CHK'D	D. FONTAINE	DATE 2/4/72
ENG	J. MORRIS	DATE 2/24/72
PROJ ENG	C. POTTER	DATE 2/24/72
PROD	A. NIPSCH	DATE 11/24/72

NEXT HIGHER ASSY.

EQUIPMENT CORPORATION
WESTFORD, MASSACHUSETTS

TITLE: POWER SUPPLY H742

SIZE E | CODE UA | NUMBER H742-0-0 | REV. V

SCALE 1/1 | SHEET 3 OF 3 | DIST

UA H742-0-0 V

DRAWING NO. 0742-0-0

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY T. QUILLIN	CHECKED D. FONTAINE	SECTION
DATE 1/19/72	DATE 1/26/72	1
ENG [illegible] 2/1/72	PROD [illegible]	ISSUED SECT.
DATE	DATE 2-24-72	1

ITEM NO	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION H742-A (115V)	H742-B (230V)	H742-C (115V)	H742-D (230V)
1	E-IA-5309755-0-0	CHASSIS	1	1	1	1
2	D-IA-5309854-0-0	CONTROL BOX POWER	1	1	1	1
3	D-MD-5309850-0-0	POWER CONTROL COVER	1	1	-	-
* 4	1209403-1	FAN, BOXER	3	3	3	3
5	5409730-0-0	POWER CONTROL BOARD	1	1	1	1
6	10-10357	XMFR	1	1	1	1
7	1210719	FAN PEWEE, BOXER	1	1	1	1
8	9006916	JONES STRIP (12 CONN) 540	1	1	1	1
9	9006903	JONES STRIP (4 CONN) 540	1	1	1	1
10	9008509	STRAIN RELIEF	1	1	1	1
11	3700006-6	CORD, POWER (115V)	1	-	1	1
12	1211263	LIGHT, PILOT	1	1	1	1
13	1210191-3	CIRCUIT BREAKER 15 AMP	1	1	1	1
* 14	9006025-1	SCR. PHL PAN HD #6 X 32 X 5/8 LG	12	12	12	12
15	9006071-3	SCR. PHL TRUSS HD #10-32 X 3/8 LG	4	4	4	4
16	9006020-1	SCR. PHL PAN HD #6-32 X 1/4 LG	8	8	14	14
17	9009002	MECHANICAL JUMPER	2	1	2	1
18	1209350-15	MATE-N-LOCK 15 PIN (FEMALE)	1	1	1	1
19	1209350-09	MATE-N-LOCK 9 PIN (FEMALE)	1	1	1	1
~~20~~	~~1209351-04~~	~~MATE-N-LOCK 4 PIN (MALE)~~	~~1~~	~~1~~	~~1~~	~~1~~
21	1209379-01	CONTACTS (FEMALE)	19	19	19	19
22	1209378-01	CONTACTS (MALE)	6	6	16	16

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV	ECO NO.
H742, POWER CONTROL	E-UA-H742-0-0	A	PL	H742-0-0	V	H742 00022
	SHEET 1 OF 4	DIST.	G			

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY T. QUILLIN	CHECKED D. FONTAINE	SECTION
DATE 1-19-72	DATE 1-26-72	1
ENG	PROD	ISSUED SECT.
DATE 2-[illegible]-72	DATE 2-24-72	1

ITEM NO	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION H742-A (115V)	H742-B (230V)	H742-C (115V)	H742-D (230V)
23	9007649	L'WASH #6 EXT	20	20	12	12
24	9006453	#6-32 SEMS X 3/8 LG	2	2	6	6
25	9007033	TY WRAP HOLDER	3	3	3	3
26	9007651	L'WASH #10 EXT	4	4	4	4
27	9006560	KEPS NUT #6-32	16	16	16	16
28	9006022-1	SCR. PHL HD PAN #6-32 X .38	12	12	12	12
29	D-IA-7409701-0-0	BRACKET, POWER SUPPLY	-	-	1	1
30	9007113	DOUBLE UPRIGHT 90	8	8	8	8
31	9007269	DOUBLE 45°	4	4	4	4
32	9107370-22	#14 AWG 19 STRAND PVC. INS. (RED)	A/R	A/R	A/R	A/R
* 33	9009165	FAN MTG CLIP	12	12	12	12
34	9107530-29	#18 AWG 19 STRAND PVC. INS. (RED/WHT) TWP	A/R	A/R	A/R	A/R
35	9007919	FASTON TAB (.250 SERIES) BLU	32	32	32	32
36	10-10193	CAPACITOR 2 X .1 uf @ 1ØØØV	2	2	2	2
37	~~9007920~~	~~FASTON TAB (.250 SERIES) YEL~~	~~4~~	~~4~~	~~4~~	~~4~~
38	9007927	RING TERMINAL BLU	2	2	2	2
39	9007917	FASTON TAB (.250 SERIES) RED	8	8	8	8
40	9007112	SINGLE FLAT	16	16	16	16
~~41~~	~~D-IA-5309854-2~~	~~POWER CONTROL BOX~~	~~-~~	~~1~~	~~-~~	~~-~~
42	1700016-6	CORD POWER (230V)	-	1	-	-
43	9107360-22	#18 AWG 19 STRAND PVC. INS. (RED)	A/R	A/R	A/R	A/R
44	9007793-1	SCR PHL PAN HD #6-32 X 9/16 LG	8	8	8	8

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV	ECO NO.
H742 POWER CONTROL	E-UA-H742-Ø-Ø	A	PL	H742-Ø-Ø	V	
	SHEET 2 OF 4	DIST.	G			

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY T. Quillin	CHECKED D. Fontaine	SECTION
DATE 1/19/72	DATE 1/26/72	1
ENG G.POTTER	PROD A.HIRSCH	ISSUED SECT.
DATE 2-14-72	DATE 2-24-72	1

ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	QUANTITY / VARIATION H742-A (115V)	H742-B (230V)	H742-C (115V)	H742-D (230V)
45	12-10820-1	CONNECTOR, HOUSING	6	6	6	6
46	12-10820-2	CONNECTOR, PIN	6	6	6	6
47	9006022-3	SCR, PHL, TRUSS HD. #6-32 X 3/8 LG.	4	4	4	4
48	9006558	NUT, HEX #6-32 X 5/16 X 1/8	3	3	3	3
49	9009228	SCR PHL PAN HD. 10-32 X 3/8 SEMS	10	10	10	10
50	C-MD-7409702-0-0	COVER, POWER CONTROL	-	-	-	-
~~51~~	~~D-IA-5309654-3-0~~	~~POWER CONTROL BOX~~	~~-~~	~~-~~	~~1~~	~~-~~
~~52~~	~~D-IA-5309654-4-0~~	~~"~~ ~~"~~	~~=~~	~~=~~	~~=~~	~~=~~
53	9006796	SPACER #6-32X 3/16LG SST	-	-	4	4
54	A-PI-3700073-0-0	H742 POWER SUPPLY INTERPLANT PACKAGE	1	1	1	1
* 55	C-IA-7009737-0-0	MINI BOXER FAN SCREEN	1	1	1	1
~~56~~	~~9006024-1~~	~~SCR, PHL, PAN HD. #6-32 X 1/2 LG~~	~~12~~	~~12~~	~~12~~	~~12~~
57	A-DC-5310459-0-0	DECAL, H742A	1	-	-	-
58	A-DC-5310460-0-0	DECAL, H742B	-	1	-	-
59	A-DC-5310461-0-0	DECAL, H742C	-	-	1	-
60	A-DC-5310462-0-0	DECAL, H742D	-	-	-	1
61	1611444	BALUN ASSEMBLY	1	1	1	1
62	9107370-55	#14 AWG IPVC STRANDED, GREEN	A/R	A/R	A/R	A/R
63	9006633	LOCK WASHER, #6 INT. TOOTH	8	8	8	8
* 64	9007993-1	SCR. PHL. PAN HD. 6-32 X 9/16LG	12	12	12	12
* 65	9008208	FAN MTG. CLIP	12	12	12	12
		* SEE NOTE 4 ON E-UA-H742-0-0				

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
H742 POWER CONTROL	E-UA-H742-0-0	A	PL	H742-0-0	V	
	SHEET 3 OF 4	DIST.				

m

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY T. QUILLIN	CHECKED D. FONTAINE	SECTION
DATE 1-19-72	DATE 1-26-72	1
ENG G. POTTER	PROD A. HIRSCH	ISSUED SECT.
DATE 2-14-72	DATE 2-24-72	1

ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	QUANTITY / VARIATION H742-A (115V)	H742-B (230V)	H742-C (115V)	H742-D (230V)
66	A-PI-3700073-0-0	PACKAGING INSTRUCTIONS	1	1	1	1
67	9007966	STRIP, EXTRUDED NEOPRENE	A/R	A/R	A/R	A/R
68	9007594	HYBAND, 80 ADHESIVE	A/R	A/R	A/R	A/R

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
H742 POWER CONTROL	E-UA-H742-0-0	A	PL	H742-0-0	V	

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

DRAWING DIRECTORY

CUSTOMER PRINT SET INDEX

THIS IS PRINT SET

SEQUENCE		SEQUENCE	
DRAWING DIRECTORY	TB-DD-H744-$		
CIRCUIT SCHEMATIC	D-CS-H744-$-1		
UNIT ASS'Y	E-UA-H744-0-0	MFG. SET	
		TEST PROCEDURE	A-SP-H744-$-3
		MFG. SPE	A-SP-H744-$-0
		PACKAGING INSTRUCTIONS	A-PI-3700074-0-0

UNIT VARIATIONS		PRINT SET TYPE
VARIATION	TITLE	H744-1
H744	+5V REGULATOR	X

REVISIONS			
DATE	CHG. NO.	REV	
4-10-72	00005	A	S. Rak
4-11-72			J. W. LAWRENCE
4-11-72	00007	B	R. WOLF
4-24-72	00008	C	D. MARTEL
10-14-72	00009	D	D. MARTEL
1-17-75	00010	E	D. MARTEL
10-13-75	00011	F	

USED ON OPTION/MODEL
11/45

DRN. D FONTAINE	DATE 2-4-72	TITLE +5V REGULATOR
CHK'D. D FONTAINE	DATE 2-4-72	
PROJ ENG.	DATE 2-25-72	
PROD.	DATE 2-29-72	SIZE B / CODE DD / NUMBER H744-$ / REV F
FIELD SERV.	DATE 9-25-72	
SHEET 1 OF 2		DIST

DRB 106

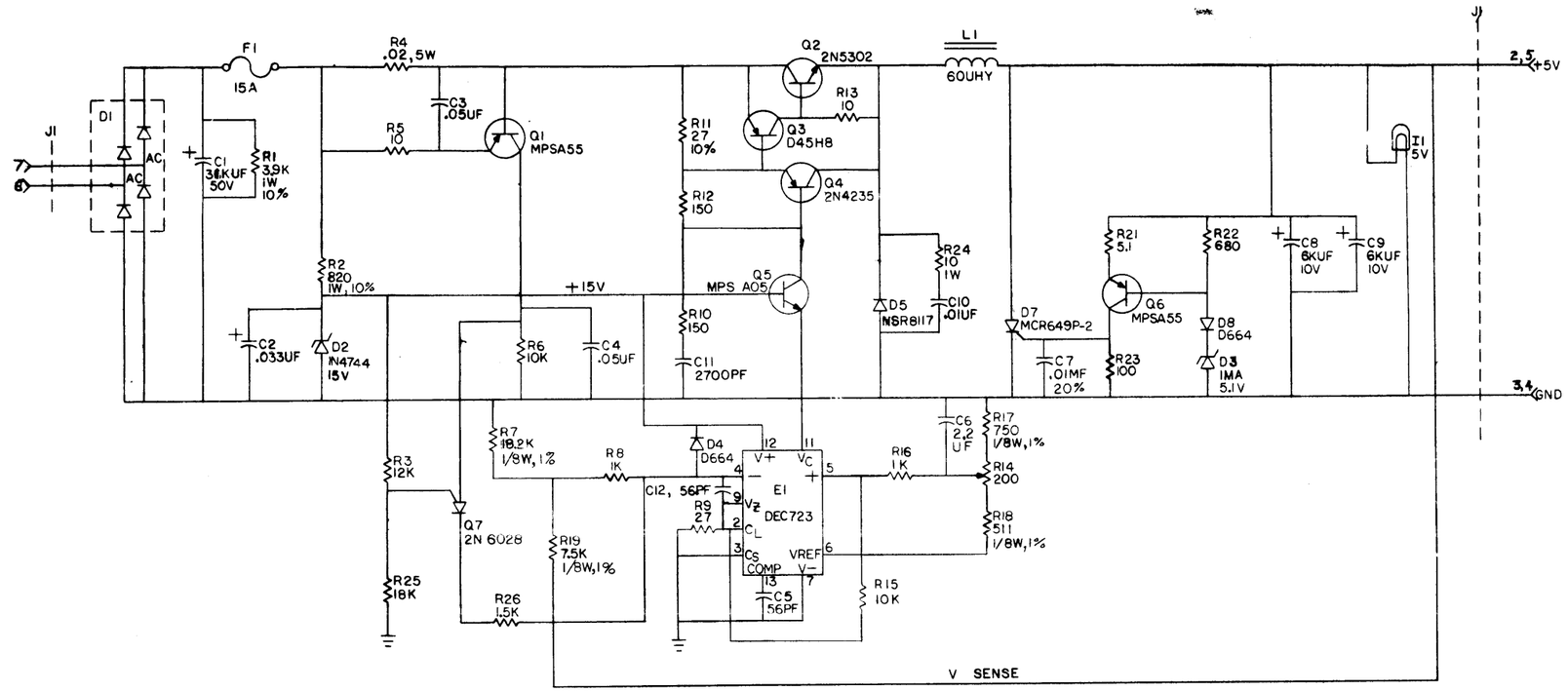
ELECTRICAL

CUSTOMER PRINT SET H744-1	MFG SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO.
X		1	D-CS-H744-Ø-1	R	1	CIRCUIT SCHEMATIC	H744
	X		A-SP-H744-Ø-3			TEST PROCEDURE	H744
	X		A-SP-H744-Ø-8			MFG. SPEC	H744

MECHANICAL

CUSTOMER PRINT SET H744-1	MFG SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO.
X		1	E-MA-H744-Ø-Ø	R	1	UNIT ASSY	H744
			D-PS-1210737-0-0		1	HEAT SINK	H744
			D-IA-5309756-0-0		1	REGULATOR BRKT	H744
			~~C-IA-5309761-0-0~~		1	~~H744~~
			C-IA-5309760-0-0		1	COMPONENT COVER	H744
			C-MS-5309759-0-0		1	CAPACITOR STRAP	H744
		2	A-PI-3700074-0-0	-	2	PACKAGING INSTRUCTION	H744
			A-PS-9905211-0-0	-	2	OUTER CARTON	
			A-PS-9905212-0-0		2	INNER PACKAGE	
			C-IA-7412388-0			2.5 AP HOLDER	H744

TITLE	SHEET 2 OF 2	SIZE	CODE	NUMBER	REV
450 REGULATOR		B	DD	H744-Ø	F



UNLESS OTHERWISE INDICATED:

RESISTORS ARE 1/4W, 5%

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
		PARTS LIST		
	ETCH BOARD REV	F H		

REVISIONS				
REV	CHANGE NO.	CHK		
P	H744-00010	D.MARTEL	1-7-75	
N	H744-00009	D.MARTEL	11-13-74	
M	H744-00008	D.MARTEL	10/24/74	
L	H744-00006	R.WOLF	11-24-73	
K	H744-00005	G.POTTER	8-24-73	
H	H744-00003	G.POTTER	5-8-72	
F	H744-00002	G.POTTER	2-24-72	
E	H744-00001	G.POTTER	1-14-72	

SEMICONDUCTOR CONVERSION CHART			
DEC NO.	EIA NO.	DEC NO.	EIA NO.
D664	IN3606	2N5302	
MCR649P-2		D45H8	
IN751A	SAME	MPSA05	
IN4744	SAME		
NSR8117			
2N6028			
IN964A	SAME	MPSA55	

DRN. Tyson V — DATE 11-2-71
CHK'D. Valley Moore — DATE 1-3-71
ENG. — DATE 1/3/72
PROJ. — DATE 1/3/72
PROG. — DATE 1/3/72
NEXT HIGHER ASSY
SCALE
SHEET 1 OF 1

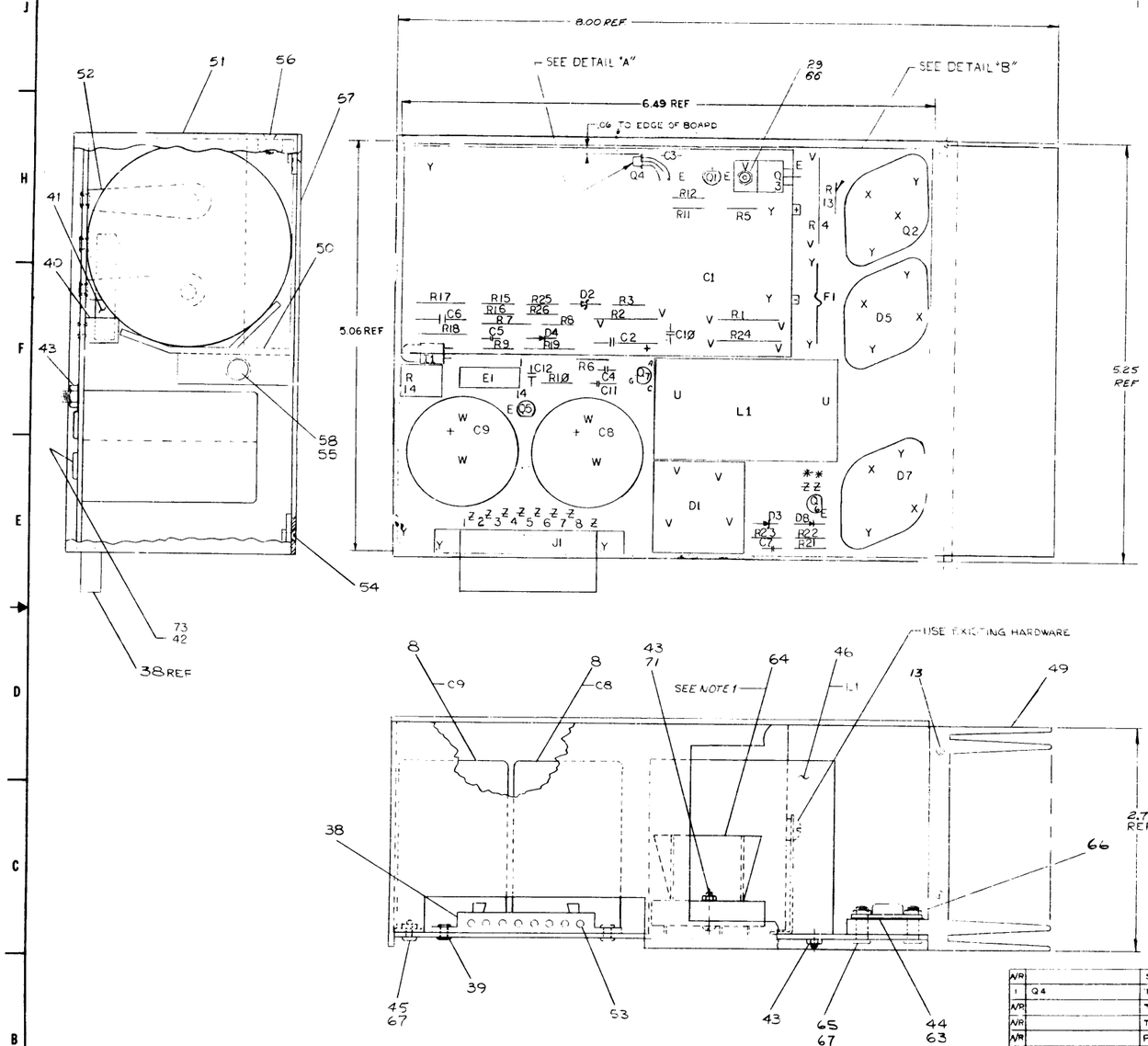
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: 5V REGULATOR

SIZE CODE D CS — NUMBER H744-0-1 — REV. R

DIST.

DEC FORM NO. BRD-135



NOTES:

1. APPLY ITEM #63 (COMPOUND) BETWEEN TRANSISTOR (#2), DIODES (D5, D7) AND ITEM #44 (WASHER) ALSO BETWEEN ITEM #44 (WASHER) AND HEAT SINK (ITEM #49). ALSO APPLY ITEM #63 (COMPOUND) BETWEEN ITEM #9 (DIODE BRIDGE) AND ITEM #64 (HEAT SINK BRIDGE).

	J1	3 POS / LATCH	12-09239-1	68
8		L WASHER #4	9006632	67
7		NUT KEPS #4-40	9006557	66
6		SCR PHL PAN HD #4-40 x 3/16 LG	9008033-1	65
1		HEAT SINK BRIDGE	1210907	64
A/R		COMPOUND THERMAL JOINT	9003258	63
1	R26	RESISTOR 1.5K 1/4 W 5%	1300381	62
1	R19	RESISTOR 7.5K 1/8 W 1%	1305362	61
1	R3	RESISTOR 12K 1/4W 5%	1300488	60
1	Q7	TRANSISTOR, UNIJUNCTION 2N6028	1510877	59
1		SCR PHL PAN HD #6-32 X 1/4 LG	9006220-1	58
1		COVER	CMD 5309760-0	57
1		SCR PHL FLT HD #6-32 x 3/16 LG	9006220-2	56
1		WASHER LOCK #6	9006633	55
4		SCR PHL FLT HD #4-40 x 1/4 LG	9004039-2	54
8		CONTACT FEMALE	1209456	53
2		STRAP, CAPACITOR	CMD-5309759-0	52
1		BRACKET, REGULATOR	DIA 5309756-0	51
1		HOLDER, CAPACITOR 2.5	CIA-12398-0	50
1		HEAT SINK REGULATOR	DPS-1210737-0	49
2	C5, C12	CAP 56 PF	1000012	48
1	R24	RESISTOR 10 1W	1300171	47
1	L1	REACTOR 60 MHY MMC 4347	1610350	46
2		SCR, PHL PAN HD #4-40 1/4 LG	9008301-1	45
3		WASHER, INSULATOR	9006721	44
3		NUT, KEPS #6-32	9006585	43
-		SCR #10-32 X.31 SLOTTED PAN HD	9009661-01	42
1	F1	FUSE 15 AMP	9007226	41
2		FUSE CLIP	9007203	40
6		EYELET 6S-4-5	9004000	39
1	J1	MATE-N-LOCK CONN. 6 PIN	1209340	38
1	E1	INTEGRATED CIRCUIT DEC #230	1910415	37
1	Q5	TRANSISTOR A05	1510705	36
1	Q3	TRANSISTOR D42H5	1510709	35
2	Q1, Q6	TRANSISTOR MPSA55 MOT	1510706	34
1	Q2	TRANSISTOR 2N6302	1510196	33
1	R14	RES VARIABLE 200	1310342	32
1	R21	RES 5.1 1/4W 5%	1309422	31
1	R23	RES 100 1/4W 5%	1300229	30
1		SCR, PHL PAN HD #4-40 x 5/16 LG	9006010	29
1	R11	RES 27 1/4W 10%	1301420	28
1	R17	RES 750 1/8W, 1%	1302955	27
1	R9	RES 27 1/4W 5%	1301522	26
1	R7	RES 16.2K 1/8W, 1%	1309412	25
2	R8, R16	RES 1K 1/4W 5%	1300365	24
1	R18	RES 511 1/8W 1%	1302411	23
1	R25	RES 18 K 1/4W 5%	1302465	22
2	R6, R15	RES 10 K 1/4W 5%	1300479	21
1	R4	RES .02 5W 3%	1310 876	20
1	R2	RES 820 1W 10%	1300358	19
1	R1	RES 3.9K 1W 10%	1302927	18
2	R5, R13	RES 10 1/4W 5%	1301317	17
2	R12, R10	RES 150 1/4W 5%	1300250	16
1	D3	DIODE ZENER 1 MA 5.1V	1110925	15
1	D7	SCR MCR 2649P-2	1109465	14
4		SCR, PHM 4-3.5/8-16 SELFTAP	3019142	13
1	D5	DIODE PWR NSR 3117	1110715	12
2	D4, D6	DIODE PWR D669	1100114	11
1	D2	DIODE ZENER 1N-744	110 5666	10
1	D1	DIODE BRIDGE	1110714	9
2	C8, C9	CAP 2K MF 10V	1000704	8
1	C1	CAP 31 K MF 50V	1010858	7
2	C4, C3	CAP .05 MF 25 V	1001774	6
1	C2	CAP .033 MF 100 V 10%	1000060	5
1	C11	CAP 2700PF 100V 5% DM	1001837	4
2	C7, C10	CAP .01 MF 100V 20% DISC	1001010	3
1	C6	CAP 2.2 UF, 20, 10%	1002627	2
1		ETCHED CIRCUIT BOARD	5009725	1
		ASS'Y/DRILLING HOLE LAYOUT	D AH H744 B-5	
		X-Y COORDINATE HOLE LOCATION	A CD H744-2-4	REF
		MODULE ECO HISTORY	D MH-H744-2-6	REF
		CIRCUIT SCHEMATIC	D SCH-H744-2	REF

QTY.	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM

PARTS LIST

N/R		SHRINK SLEEVING	9107252-09	78
1	Q4	TRANSISTOR 2N4235	1505555	77
N/R		TEF TUBING	9107278-11	76
N/R		TEF TUBING	9107302-11	75
N/R		PERMABOND 101 CEMENT	9009157	74
4		LOCKWASHER #10 INT	9006635	73
				72
1		SCR, PHL PAN HD #6-32 5/8 LG.	9006025-1	71
1		PACKING INSTRUCTIONS	API-3700074-0-0	70
1	R22	RES 680 1/4W 5%	1301429	69

MA 723C	7	12		

IC TYPE	GND	+5V
GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTIVELY. EXCEPTIONS ARE STATED ABOVE		

IC PIN LOCATIONS

ITEM NO	AWG	FROM PT	TO PT

JUMPER LIST

FIRST USED ON OPTIMOD	
D/A H744A 0-0	
D669	IN3606
IN4744	

DEC NO.	EIA NO.

SEMICONDUCTOR CONVERSION CHART

ETCH BOARD REV H

DEC NO	EIA NO

EQUIPMENT CORPORATION

TITLE: 5V REGULATOR

SIZE D | DWG NO H744-0-0 | REV D

SCALE 2/1 | SHEET 1 OF 1

digital EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS

DRAWING DIRECTORY

CUSTOMER PRINT SET INDEX

THIS IS PRINT SET

	SEQUENCE		SEQUENCE
DRAWING DIRECTORY	B-DD-H745-Ø		
CIRCUIT SCHEMATIC	D-CS-H745-Ø-1		
UNIT ASSY	E-UA-H745-Ø-Ø	MFG. SET	
		TEST PROCEDURE	A-SP-H745-TA-2
		MFG. SPEC.	A-SF-H745-Ø-3
		PACKAGING INSTRUCTION	A-PI-3700074-0-0

UNIT VARIATIONS		PRINT SET TYPE
VARIATION	TITLE	MFG. SET
H745	-15V REGULATOR	X

REVISIONS			
DATE	CHG. NO.	REV	
	00004	A	G. PETTER
10-6-72	00005	B	S. Blake / J. W. LAWRENCE
	00006	C	G. POTTER
2-15-73	00007	D	G. POTTER
4-11-73	00010	E	R. WOLF
	00011	F	
	00012	H	D. MARTEL
6-6-75	00013	J	D. MARTEL

USED ON OPTION/MODEL	
11/44	

DRN. D. FONTAINE	DATE 2-7-72	TITLE -15V REGULATOR
CHK'D.	DATE 2-17-72	
PROJ. ENG.	DATE 2-25-72	
PROD.	DATE 2-25-72	SIZE B / CODE DD / NUMBER H745-A / REV J
FIELD SERV.	DATE	
SHEET 1 OF		DIST

DRB 106

ELECTRICAL

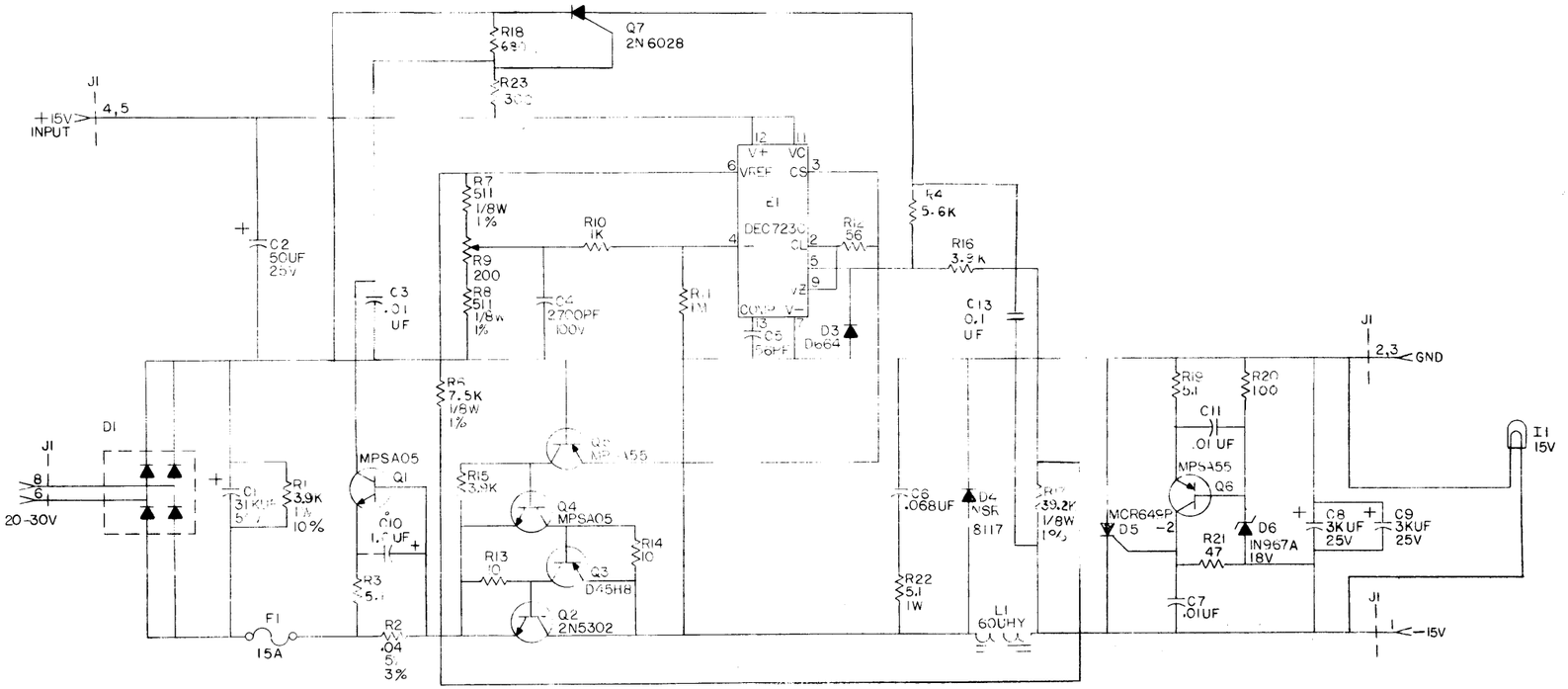
CUSTOMER PRINT SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO.
X	1	D-CS-H745-Ø-1	P	1	CIRCUIT SCHEMATIC	H745
	X	B-SE-[illegible]-A-2			TEST PROCEDURE	H745
	X	A-SP-H745-Ø-8			MFG SPEC	H745

MECHANICAL

CUSTOMER PRINT SET	MFG SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO.
X		1	C-CA-H745-Ø-Ø	P	1	UNIT ASSY	H745
			D-[illegible]-1 [illegible]-C-0		1	HEAT SINK	H745
			C-IA-5309760-0-0		1	REGULATOR BRKT	H745
			C-IA-5309761-0-0		1	[illegible] CAP BRKT	H745
			C-IA-5309760-0-0		1	COMPONENT COVER	H745
			C-MD-5309759-0-0		1	CAPACITOR STRAP	H745
		2	A-PI-3700074-C-0	-	2	PACKAGING INSTRUCTIONS	H745
			A-PS-9905211-0-0	-	2	OUTER CARTON	H745
			A-PS-9905212-0-0	-	2	INNER PACKAGE	H745

TITLE	SHEET 2 OF 2	SIZE	CODE	NUMBER	REV
[illegible] DIAGRAM		B	DD	[illegible]	J

DRB 108



UNLESS OTHERWISE INDICATED:

RESISTORS = 1/4W, 5%

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

ETCH BOARD REV E

DEC NO.	EIA NO.	DEC NO.	EIA NO.
D664	IN 3606	D45H8	
NSR 8117		2N 6028	
MCR 649P – 2			
IN 967A	SAME		
2N 5302			
MPS A05			
MPS A55			

SEMICONDUCTOR CONVERSION CHART

REV	CHANGE NO.	CHK	DATE
C	H745-00001	G. POTTER	3-27-72
D	H745-00002	G. POTTER	5-11-72
E	H745-00003	G. POTTER	5-26-72
F	H745-00004	G. POTTER	6-2-72
H	H745-00005	S. Black	6-15-72
J	H745-00006	J. W. LAWRENCE	6/16/72
K	H745-00007	G. POTTER	
L	H745-00009	R.D. Wolf	8/10/72
N	H745-00012	D. MARTEL	9-6-72
P	H745-00013	D. MARTEL	9-20-72
R	H745-00014	D. MARTEL	10-5-72
S	H745-00015	A. BARON	11-15-72

DRN.		DATE	1-4-71
CHK'D.		DATE	1-5-71
ENG.		DATE	1/11/72
PROJ. ENG.		DATE	1/11/72
PROD.		DATE	1/13/72

NEXT HIGHER ASSY

SCALE

SHEET OF 1

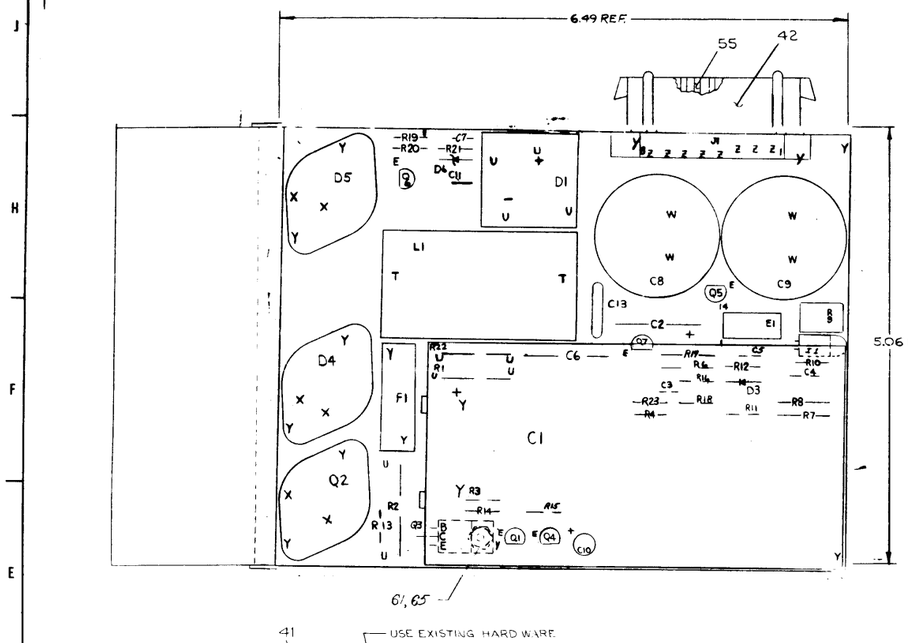
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

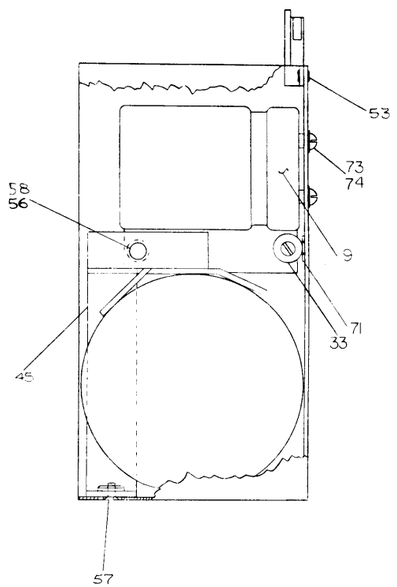
TITLE: –15V REG.

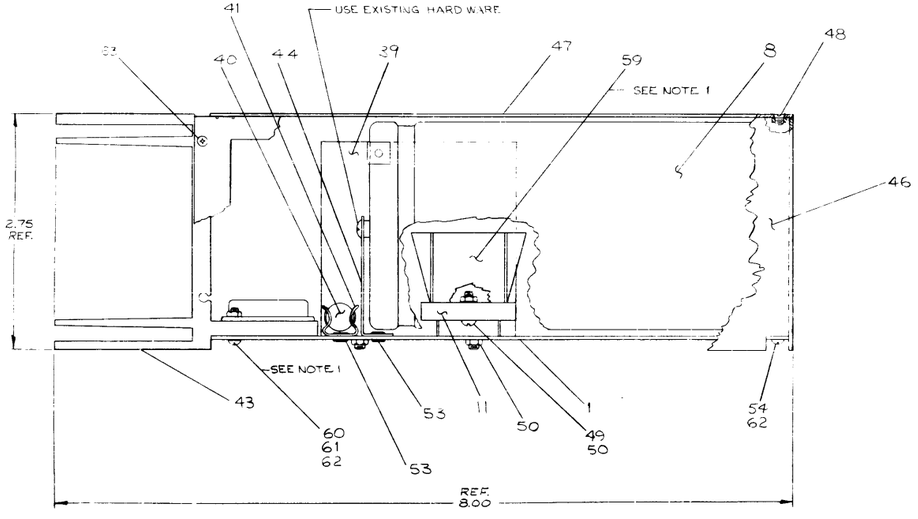
SIZE D | CODE CS | NUMBER H745 –0–1 | REV. S

DIST.

DEC FORM NO DRD-135







NOTE:
1. APPLY ITEM=51 (THERMAL COMPOUND) BETWEEN TRANSISTOR AND INSULATOR, WASHER (ITEM=52 ALSO BETWEEN WASHER & HEAT SINK FOR Q2 Q4& D5 ALSO APPLY ITEM=51 (COMPOUND) BETWEEN ITEM #11 (DIODE BRIDGE AND ITEM=59 (HEAT SINK).
2. 1010621 MAY BE SUBSTITUTED FOR C13 (1000030).

		ASSY/DRILLING HOLE LAYOUT	D-AH-H745-0-5	70
1		PACKING INSTRUCTIONS	API-3700074-0-0	69
1	R18	RES 68Ω ¼W 5%	1301424	68
1	R23	RES 360 ¼W 5%	1301425	67
1	C13 (SEE NOTE 2)	CAP 0.1UF 100V 20%	1000030	66
3		SCR PH #4-40 X 5/16 LG	9006010-1	65
1	I1	LAMP 15V	1209169	64
4		SCR, PFH #4 X 5/16 LG, SELF TAPPING	9009142	63
=		L WASHER #4	9006632	62
4		NUT KEPS #4-40	9005567	61
6		SCR PHL PAN HD #4-40 X 1/4 LG	9006033-1	60
1		HEAT SINK BRIDGE RECT	1210907	59
1		SCR PHL PAN HD #6-32 X 1/4 LG	9008020-1	58
1		SCR PHL FLT HD #6-32 X 3/16 LG	9008322-4	57
1		WASHER LOCK #6	9004633	56
8		CONTACT FEMALE	1209456	55
2		SCR PHL PAN HD#4-40 X 1/4 LG	9006033-1	54
6		EYELET GS-4-1	9006500	53
3		INSULATOR WASHER	9008721	52
A/R		THERMAL COMPOUND	9008268	51
3		NUT KEPS 6-32	9008185	50
1		SCREW PHL PAN HD 6-32 X 1/2 LG	9008024-1	49
4		SCREW PHL FLT HD 4-40 X 1/4 LG	9006004-2	48
1		COVER/COMPONENT	C-MD-5309760-0-0	47
1		REGULATOR PRT	D-IA-5306756-0-2	46
1		2.5 HOLLER CAPACITOR	C-IA-7412.3E5-10	45
2		STRAP CAPACITOR	C-MD-5309759-0-0	44
1		HEAT SINK	D-PS-1210737-0-0	43
1	J1	CONN. MATE-N-LOK 3 PIN	1209340	42
2		FUSE CLIP	9001202	41
1	F1	FUSE AGC 1½	9001226	40
1	L1	REACTOR 80 UHY	1510850	39
1	E1	INTEGRATED CIRCUIT UA723C	1910413	38
1	Q3	TRANSISTOR D45H8	1510708	37
2	Q5 Q6	TRANSISTOR A95	1510706	36
2	Q1 Q4	TRANSISTOR A85	1510705	35
1	Q2	TRANSISTOR 2N5302	1510596	34
1	R9	RES VARIABLE 200 Ω 20%	1310852	33
1	R10	RES 100Ω ½W 5%	1306229	32
1	R11	RES 1 MEG ¼W 5%	1309595	31
1	R4	RES 5.6 K ¼W 5%	1306274	30
2	R15, R16	RES 3.9K ¼W 5%	1300444	29
2	R19, R3	RES 5.1 ¼W 5%	1306422	28
1	R12	RES 56 ¼W 5%	1302602	27
1	R21	RES 47 ¼W 5%	1300202	26
1	R17	RES 39.2K ¼W 1%	1305262	25
1	R10	RES 1K ¼W 5%	1300265	24
2	R13 R14	RES 10 ¼W 5%	1301317	23
1	R6	RES 7.5K 1/8W 1%	1305322	22
2	R7 R8	RES 5K1 1/8W 1%	1305241	21
1	R22	RES 5.1 1% 5%	1302136	20
1	R24	RES 10K ¼W 5%	1300429	19
1	R2	RES .04Ω 2W 2%	1311762-00	18
1	R1	RES 3.9K 1% 10%	1302921	17
1	D6	DIODE IN967	1110068	16
1	D5	SCR MCR649P-2	1109465	15
1	D4	DIODE MSR1117	1110715	14
2	D2	DIODE D664	1100114	13
1	D7	TRANSISTOR UNI JUNCTION 2N6028	1510877	12
1	D1	DIODE BRIDGE	1110714	11
1	C12	CAP 150UF 20V 10%	1004412	10
2	C8 C9	CAP 3.0K UF 25V	1010703	9
1	C1	CAP 31K UF 50V	1010858	8
1	C10	CAP 1.0 UF 25V	1010866-01	7
1	C2	CAP 50 UF 25V -10+75%	1001296	6
1	C6	CAP .068 UF 100V 10%	1000052	5
1	C4	CAP 2700PF 100V 5%	1001637	4
3	C7 C11 C3	CAP .01UF 100V 20%	1001610	3
1	C5	CAP 56PF 100V 5%	1000412	2
1		PRINTED CIRCUIT BOARD	2009732	1
1		INSERT TEST SYSTEM	D-BC-8745-0-5	REF
1		CIRCUIT SCHEMATIC	SC-8745-0-1	REF
		ET CONFIGURATION TABLE LOCATION	C-AH-H745-0-4	REF
QTY.	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

4		LOCKWASHER #10 INT	9006635	74
4		SCR #10-32 X.31 SLOTTED PAN HD.	9009669-01	73
				72
1		TRANSIPAD	9008206	71

ETCH BOARD REV E

D66-IN3606

DEC NO. EIA NO DEC NO. EIA NO

SEMICONDUCTOR CONVERSION CHART

IC TYPE	GND	+5V
GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTIVELY EXCEPTIONS ARE STATED ABOVE		
IC PIN LOCATIONS		

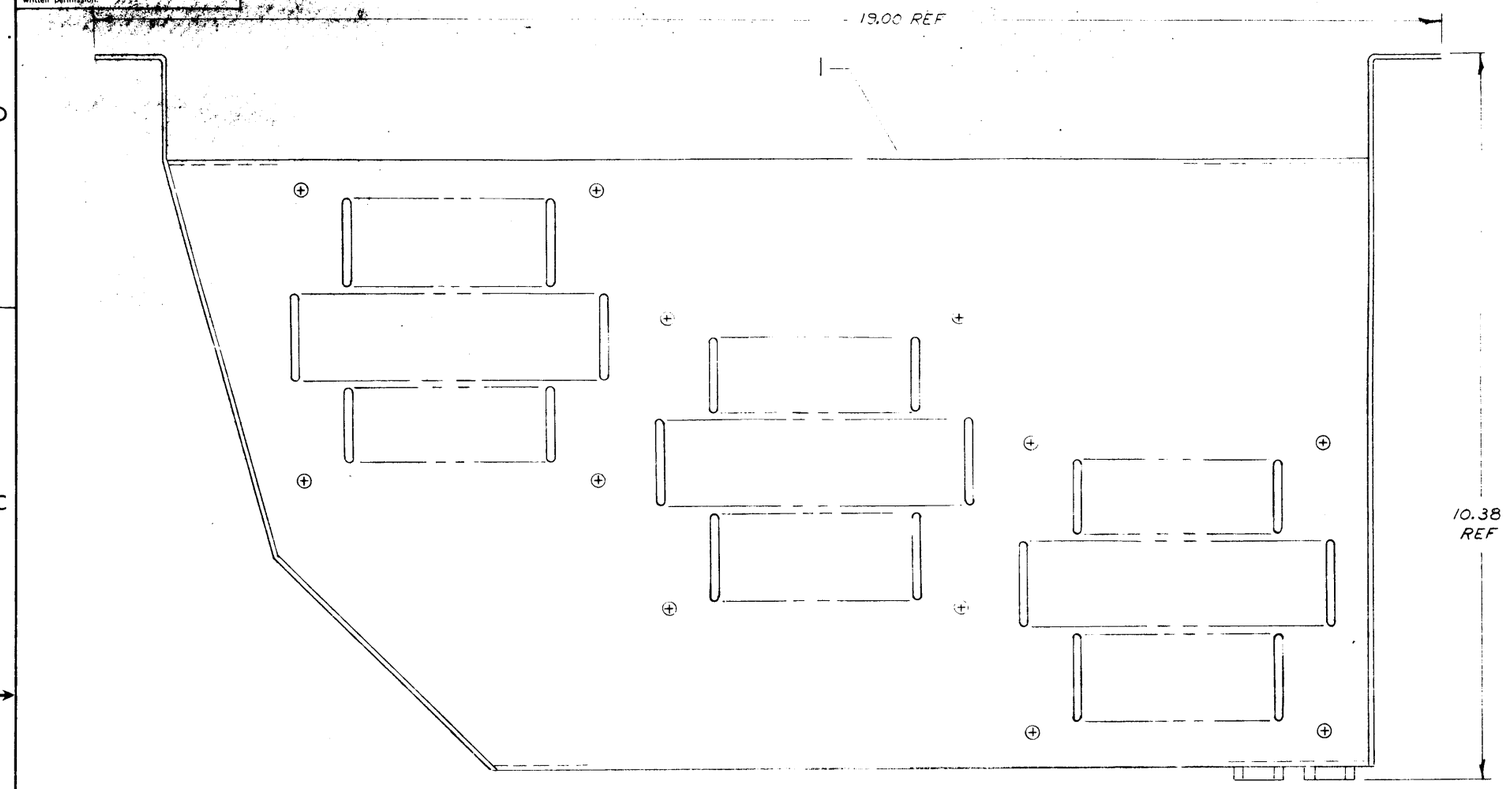
ITEM NO	AWG	FROM PT	TO PT
JUMPER LIST			

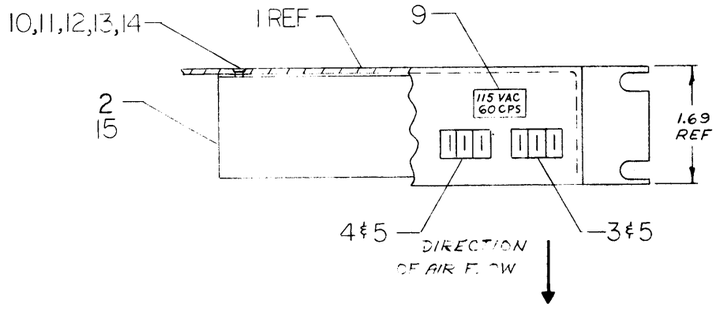
EQUIPMENT CORPORATION. MAYNARD, MASSACHUSETTS

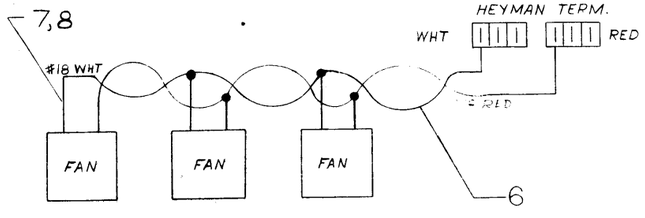
TITLE: -15 REGULATOR

SIZE E | CAGE CODE EUA | NUMBER 8745-0-0 | REV S

SHEET 1 OF 1







WIRING DIAGRAM

* NOTES:

1. FOR IMC BS2107-110-00 USE ITEMS 10 & 11. FOR ROT. CT3132 USE ITEMS 13 & 14.

	12	WASHER, FLAT #6	9006656	17
	12	SCR, PH HD, PAN 6-32 × 5/8	9006025-1	16
	3	SCREEN FAN	C-MD-7404881-00	15
*	24	NUT, KEP #6-32	9006560	14
*	12	SCR, PHL FLAT HEAD #6-32 X 1/2	9006024-2	13
	12	WASHER, EXT. TOOTH CS #6	9008270-0	12
*	12	SCR, PHL FLAT HEAD #6-32 × 5/8	9006025-2	11
*	12	FAN CLIP	9009165	10
	1	DECAL, FAN HOUSING	A-DC-7407314-0-0	9
	6	CONNECTOR, PIN	1210820-2	8
	6	CONNECTOR, HOUSING	1210820-1	7
	A/R	#18 AWG STRD 1PVC TWR RED, WHT	9107430-29	6
	6	TAB, SOLDER #T-202-S HEYMAN	9007238	5
	3	BUSH, JUNC TERM WHT #DC-202-3	9007235	4
	3	BUSH, JUNC TERM RED #DC-202-3	9007231	3
*	3	FAN	1209403-00	2
	1	FAN HOUSING	DIA-7409684-0-0	1

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

FIRST USED ON OPTION/MODEL: ME15

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES

DECIMALS	ANGLES
.XXX = .005 .XX = .02 .X = .1	±0° 30'

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL —//—

FINISH —//—

		DATE
DRN		3-20-72
CHK'D		5-17-72
ENG.		5-25-72
PROJ. ENG.		
PROD.		

NEXT HIGHER ASSY. D-UA-ME15-A-0

SCALE —//—

SHEET / OF /

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: FAN HOUSING ASS'Y

SIZE D | CODE AD | NUMBER 7008886-Ø-Ø | REV. D

DIST. G

REVISIONS					
REV.	CHANGE NO.	C.HK			
A	7006866-00001	DM	Change 7-25-72	J.ELSBREE	7/27/72
B	ME15-00005	DM	Change 10-12-72	J.ELSBREE	10/16/72
C	7008896-00002	DM	Change 12-3-72	F.DOLL	12/6/72
D	7003886-00003	DM	Change 2-23-73	F.DOLL	2/26/73

DEC FORM NO. DRD 100-A

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

DATE 8/29/72

TITLE ME15 MEMORY

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
A	Change per ECO	ME15-00008	ELSBREE	2/1	J. Elsbree	2/13/73

Table of Contents

ENG	APPD	SIZE	CODE	NUMBER	REV
John Elsbree		A	SP	ME15-0-5	A

ENGINEERING SPECIFICATION — CONTINUATION SHEET

TITLE ME15 MEMORY

	SIZE	CODE	NUMBER	REV
	A	SP	ME15-0-5	A

1. General Description

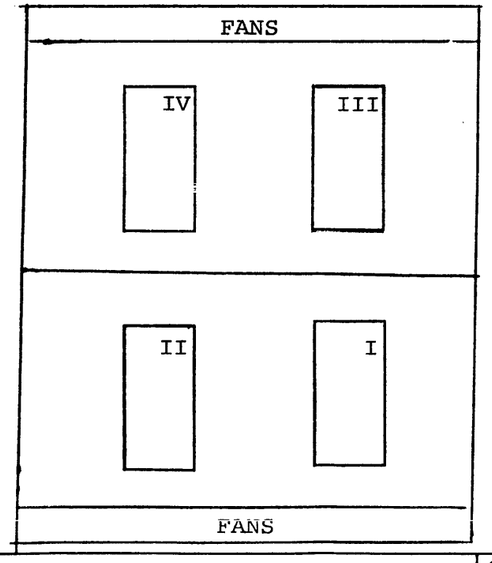
The ME15 memory provides the PDP-15 with a new compact, low cost memory. The capability now exists of putting 96K of memory on the back door of the central processor cabinet. It does not require the MX15. The ME15 may be used on systems already using MM15 type memory.

The ME15 consists of a G109-YA, a G231, an H215, and an M7170. The G109-YA has on it the memory control, sense amplifier, and inhibit drivers. The G231 provides the address register, matrix decoders, and current drivers. The H215 is an 18 mil., 18 bit, 8K planar core memory. The M7170 is the interface card which allows the PDP-15 to operate with this particular memory system.

2. System Specification

2.1 Physical Specification

The ME15 is mounted on the rear door of the CP cabinet. The entire memory system is enclosed in a cooling box with fans at both the top and bottom. Each logic panel is 6 module slots high by 9 module slots wide. The logic panel assembly number is 70-8872. Figure 1 shows the locations of the panels in their order of installation.



View from inside door.

The power supply for the ME15 is the H742. It is mounted on the right side of the CP cabinet immediately above the H715.

2.2 Environmental Specification

Temperature range	0°C - 50°C
Humidity	0-90% (non-condensing)

2.3 Power Requirements

The ME15 requires +5V DC at 7.0 amps and -15V at 7.0 amps.

The H742C power supply with two H744 and two H745 regulators requires 110V AC at 15 amps.

The H742D with the same regulators as above requires 240V AC at 7.5 amps.

2.4 Performance Specification

The cycle time for a read/restore is no greater than 1 us.

The cycle time for a write cycle is no greater than 1 us.

The cycle time for a read/modify/write is no greater than 1.6 us.

These are maximum times. Typically, the read/restore and write cycle times are 980 ns. The read/modify/write cycle time is typically 1.56 us.

3. Check Out Specification

3.1 Test Philosophy

In keeping with the PDP-15 testing philosophy, the ME15 will be thoroughly tested prior to mating it with its final system.

The ME15B, which is a G231, G109-YA, and H215 will come from the 11 Memory Test line completely tested. The testing includes margins, heat, strobe adjustment and even a mating with a PDP-15 to insure that the different patterns and speed of the 15 do not affect it.

The M7170 interface module will come from module test having been tested on the 2335 tester. It will not have been heat tested.

3.2 Test Procedure

The PDP-15 test area will receive the ME15B's and the M7170's, therefore, already tested. Thus, the need to run them on the PDP-15 memory exerciser is non-existent. However, to test the mating of the M7170 and the ME15B prior to final installation in a system, the two should be mated in the CP test stations which have been modified for this purpose.

The modified test stations have all the hardware necessary for testing ME15B's and M7170's including the ME11L backpanel assembly DEC #70-8872. The ME15-B's and M7170's be installed according to the ME15 print set. The ME15B and M7170 will will be considered good when a "Quick Verify" has been obtained.

After obtaining a "Quick Verify" the memory and interface are ready for system installation.

4.0 Acceptance Test Procedure

See ME15 Customer Acceptance Procedure, A-SP-ME15-0-7.

5. Shipping Instructions

5.1 Crating

If the ME15 is being shipped with a PDP-15 system, there are no special instructions for crating it. The normal method of crating a PDP-15 will suffice.

If the ME15 is being sent to field as an add-on to a PDP-15 having only 8K of MM15 memory, the entire backdoor assembly including the door should be crated in its assembled form. The H742 power supply should be crated separately to prevent damage to the memory system during shipment.

If the ME15 is being sent to the field as an add-on to a PDP-15 having 16K of MM15 memory, the entire back door should not be sent. Only the hardware, memory, and power supply should be sent in this case. The power supply should be crated separately to prevent damage to the memory system during shipment.

If the ME15 is being sent to the field as an add-on to a PDP-15 having 24K of MM15 memory, the ME15 will be shipped mounted in the H963-U ME15 Expander Cab. The H742 supply will also be shipped mounted in this cabinet.

5.2 Shipping List

The parts list for the configurations being shipped should be checked thoroughly to ensure that all parts required are shipped. In addition, a complete print set, diagnostic and write-up, and manual should be included with the shipment.

6. Installation Instructions

6.1 Uncrating and Inspection

Upon arrival at the customer's site, the ME15 should be carefully inspected for any damage. Damage should be reported at once.

Inspect backplane for bent pins and carefully straighten them.

Check proper seating of all modules and cables.

6.2 Installation

6.2.1 Systems with no MM15's on the backdoor of the CP cabinet merely require the new backdoor to be attached to the cabinet. The H742 power supply should be placed in the cabinet with the breaker switch facing the front. It is bolted to the cabinet frame so that it sits just above the H715 on the right side of the cabinet. The H742 will plug into the AC outlet on the H715 or into the power control in the next cabinet. The power harness should then be connected and dressed in neatly. Cables should be plugged into the front 8K of memory after removing the M966 terminators and placing them in the H8519 connector block. Jumpers on the M7170 and G109-YA's should be checked to see that they are cut properly. See the prints on the G109-YA and M7170 for instructions.

6.2.2 Systems with 8K of MM15 memory on the backdoor require removal of the old fan housings, door, and side panel. The new fan housing, door, and side panel should be installed in place of the old. The new memory should then be bolted to the back door. Power supply installation is the same as in section 6.2.1. Note that the power harness for the MM14 must be retained. Cables should run from the MM15 to the H8519 and the M966 terminators removed from the MM15 should be also inserted into the H8519.

6.2.3 Systems with 16K of MM15 memory on the backdoor will receive the ME15 all mounted in the H963-U ME15 Expander Cab. This cabinet bolts to the left side of the CP cab in position BAY 1L. (See D-AR-PDP15-0-2.)

6.2.4 Cabling of systems with ME15 memory is specified in the ME15 Configuration Specification (A-SP-ME15-0-6).

6.2.5 The yellow wire in the H742 power harness which has the termi point on it should be threaded out under the KP15 frame and attached to the KP15 logic on pin K03T2.

7. Operation Instructions

7.1 Controls

The ME15 has jumper wires on the M7170 and G109-YA modules which determine the back addresses. The following are charts and instructions for the proper cutting of these jumpers.

7.1.1 M7170.

Bank	Address Bits 1	2	3	4
0-8K	0	0	0	0
8-16K	0	0	0	1
16-24K	0	0	1	0
24-32K	0	0	1	1
32-40K	0	1	0	0
40-48K	0	1	0	1
48-56K	0	1	1	0
56-64K	0	1	1	1
64-72K	1	0	0	0
72-80K	1	0	0	1
80-88K	1	0	1	0
88-96K	1	0	1	1
96-104K	1	1	0	0
104-112K	1	1	0	1
112-120K	1	1	1	0
120-128K	1	1	1	1

Figure 7.1

Figure 7.2 is a view of the jumpers on the M7170 from the component side.

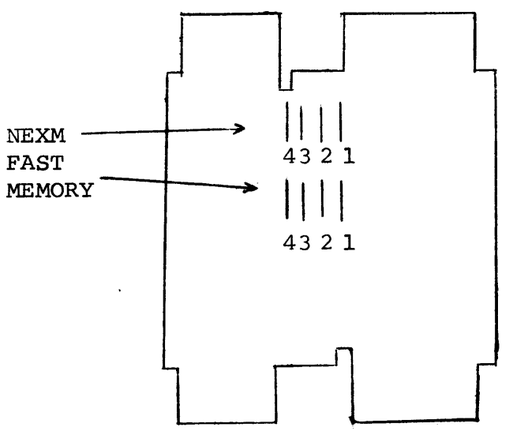


Figure 7.2

To determine what jumpers to cut on the M7170:

FAST MEM

1. Determine the first address of the ME15 memory to be controlled by the M7170 in question.
2. Match it to the bits in figure 7.1.
3. Cut the jumpers for which one appears in figure 7.1 for that address.

   Note: Figure 7.2 should be used to determine which jumper corresponds to which bit.

NEXM

1. Determine the first address of the last 8K bank to be controlled by the M7170 in question.
2. Match it to the bits in figure 7.1.
3. Cut the jumpers for which one appears in figure 7.1 for that address.

   Note: Figure 7.2 should be used to determine which jumper corresponds to which bit.

7.1.2 G109-YA

Bank	Address Bits 1	2	3	4
0-8K	0	0	0	0
8-16K	0	0	0	1
16-24K	0	0	1	0
24-32K	0	0	1	1
32-40K	0	1	0	0
40-48K	0	1	0	1
48-56K	0	1	1	0
56-64K	0	1	1	1
64-72K	1	0	0	0
72-80K	1	0	0	1
80-88K	1	0	1	0
88-96K	1	0	1	1
96-104K	1	1	0	0

104-112K	1	1	0	1
112-120K	1	1	1	0
120-128K	1	1	1	1
	2	3	4	6

Jumpers

Figure 7.3

To determine which jumpers to cut on the G109-YA:

1. Determine the first address of the 8K bank to be controlled by the G109-YA in question.

2. Match it to the bits in figure 7.3.

3. Cut the jumpers for which one appears in figure 7.3 for that address.

Note: Use figure 7.4 to locate the jumpers to be cut.

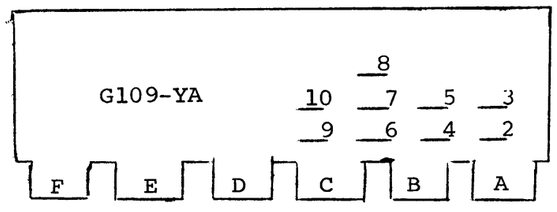


Figure 7.4

Figure 7.4 shows the jumper locations on the component side of the G109-YA.

7.2 Indicators

The ME15 does not have any provisions for the I Bus.

7.3 Operating Instructions

The ME15 memory operates the same as the MM15 as far as the

programmer is concerned. All programs for MM15's should run in ME15 memories.

8. Principles of Operation

8.1 Overview of ME15 Operation

The M7170 allows the PDP-15 to operate with this particular memory system. It is the interface between the PDP-15 memory bus and the Unibus. One section does the hand shaking with the memory. And one section provides address and data paths between the PDP-15 memory bus and the bus of the ME15 memory.

All signals on the 15 memory bus occur in their normal sequence. All signals on the ME15 Unibus occur in their normal sequence.

8.2 Detailed Description of ME15 Operation

The address is placed on the bus prior to issuing the memory request. Address bits 01 through 04 go into two different decoders which determine if that M7170 will allow the Memory Request to get through and start memory into operation. The decoder labeled "FAST MEM" indicates the first address of the first bank of ME15 memory. If the address on the address lines is greater than or equal to that which is cut in the jumpers the decoder will put out a high level and enable the M. Req. to proceed. If the MDL address is less than the jumper address a low will be output and the M7170 will remain inactive for that memory cycle. The second decoder, labeled "NEXM", determines the high range of the M7170. This decoder outputs a high when the MDL address is less than or equal to the address cut in the jumpers. This also enables the M. Req. to start the operations. Any address greater, however, will diasble the M7170 preventing it from starting up.

The addresses also go to the address register Latches. These Latches are left with an open input as long as the latch flip-flop is on a 0. When the MEM REQ is allowed to proceed into the M7170, the memory request flip-flop is set. This, sets ADDR ACK, which in turn sets the latch flip-flop to a 1 and Latches into the address flip-flops whatever was on its inputs at that time.

At the same time the address is being placed on the bus, two other very important signals are also being sent from the Central processor. These are MWR (Memory Write), and MRD (Memory Read). These signals tell the memory what function it is to perform; a READ, WRITE, or READ PAUSE WRITE. The MWR and MRD signals are exclusive ored to produce the data input to the C0 flip-flop. This also goes to a 74H01 gate with the other input to the 74H01 going to Latch (0) H. The output of this gate goes to the 11 Bus; signal named 11 C0 L. This allows the C0 output to appear on the 11 bus before the C0 flip-flop is actually clocked. At the same time the MRD signal goes through another 74H01 gate, also anded with Latch (0) H, which goes to the C1 flip-flop data input and to the 11 bus; signal name 11 C1 L. At the time the mem. req. flip-flop is being set the C0, and C1 flip-flops are being clocked. Now the information is being retained by the C0 and C1 flip-flops. The MRD and MWR signal will soon leave the bus. The Latch flip-flop, set by ADDR ACK setting, is set some small period of time after the Mem Req. flip-flop is set which disables the 74H01 gates from the 11 Bus. However, since the C0 and C1 flip-flops are now set and gated out to the 11 Bus by two new 74H01 gates which are controlled on by Mem. Req. flip-flop (1) H, no information is lost.

As can be seen, the Mem. Req. from the PDP-15 Central processor, is the signal that makes everything happen. The Mem. Req. is sent by the central processor some period of time after the address, MWR, and MRD signals are placed on the bus. This does not allow time for the M7170 to decode the address and determine if it is legal or not. The addition of the 7485 decoders made it necessary to delay the Mem. Req. an additional period of time before actually setting the Mem. Req. flip-flop. This delay was accomplished by a tapped delay line. The delay line is tapped to allow an additional 60 ns. Now that the Mem. Req. has been sent by the central processor and proven to be valid by the FAST MEM and NEXM decoders only one more condition must be kept before the Mem. Req. flip-flop can be set. This is that no memory can be busy. The signal that determines this condition is 15 M BUS L. It is produced by the MEM REQ flip-flop of this or any other M7170 already being set, or by 11 M SEL L of any memory being set. If no memories are busy, the address is OK, and the Mem. Req. is on the bus and enough time has passed for it to get through the 60 ns

of delay line, the Mem. Req. flip-flop will set. When the Mem. Req. flip-flop sets, numerous other events, some of which have already been covered, will take place. The ADDR ACK flip-flop will set. This sends a signal to the central processor telling it that it is alright to remove the address from the bus. The ADDR ACK flip-flop setting sets the Latch flip-flop which Latches the address into the Address Register before the address is removed. The C0 and C1 flip-flops are clocked and gated onto the 11 Bus. And probably most important of all, the MSYN (Master Sync) flip-flop is direct set. The MSYN is the Mem. Req. for the memory; it can now perform its function. Some small period of time after MSYN set 11 M SEL will go low and keep the 15 M BUSY line low until the 11 memory has completed its operation. Now the point has been reached where it is necessary to determine what type of operation is to take place. This is done by looking at the signals 11 C0 L and 11 C1 L. These signals were previsouly set up by the PDP-15 signals 15 MWR and 15 MRD. Figure 8.1 shows what is set by the 15 processor and what is required by the 11 memory to produce the proper conditions for the various states:

15 MWR	15 MRD	Operation	11 C 0	11 C 1
H	L	Read	H	H
L	H	Write	H	L
L	L	Read Pause Write	*L/H	*H/L

* Note: These levels are inverted at 15 DATA ACK L time.

Figure 8.1

During the read cycle the C0 flip-flop remains clear causing 11 C0 to be high and the C1 flip-flop is clocked set causing 11 C 1 also to be high. This tells the 11 memory that a read operation is to take place. The Slave Sync (SSYN) is set just prior to placing the Data on the 11 bus. It is then placed on the 15 bus after passing through the 75453 bus gates. Slave sync comes from the 11 memory into the M7170. It is then delayed for 60 ns and clocks the Read Restart flip-flop set. Read Restart is then buffered and placed on the 15 memory lines. 15 DATA ACK and 15 MRLS are then returned by the processor. DATA ACK and C 1 (1) H produce

the proper combinations to direct clear MSYN flip-flop. This starts the process of turning off the 11 memory. When the MSYN flip-flop is cleared the path is opened to clear the Mem. Req. flip-flop by means of the clock input. With the READ PAUSE WRITE flip-flop clear and MSYN going away, a High will be placed on the clock input to the Mem. Req. flip-flop causing it to clear since the data input is tied false. The 15 MRLS signal comes into the arbitrating logic through a 74H00. Since C1 is not clear, MRLS can not proceed through the 200 ns PA. Instead, it proceeds directly to the 74H50 where it is anded with C1 (1) H. This condition does exist and MRLS ACK flip-flop is direct set. MRLS ACK is then buffered onto the 15 bus and transmitted to the central processor releasing it to set up the next memory transfer. However, all has not yet been completed in the memory. The 11 memory has not yet reinitialized itself. Therefore, it can not be permitted to be accessed again. 11 M SEL L is the saving signal in this case. It ored with Mem. Req. flip-flop, produce 15 M Busy. 15 M Busy will prevent any Mem. Req. from proceeding into the M7170 to start a new cycle as long as it is set. When the memory has rewritten the information it reads, 11 M SEL L will go high allowing the next cycle to take place. SSYN was cleared out by MSYN being cleared. MRLS ACK was clear when 15 MRLS was removed from the bus.

The write cycle has very much the same format. The C0 and C1 flip-flops are set the very same way. This time, however, C1 is clear making the 11 C 1 L signal low. This tells the memory a write operation is to take place. The address is placed on the bus and latched into the Address Register the same as for a read. The Data, however, is now being sent by the processor and must be placed onto the 11 Data lines. The multiplexer logic is switched from an 11-to-15 path to a 15-to-11 path by the conditions of the C0 and C1 flip-flops. The data sent by the processor is then routed to the 11 data lines.

The MSYN flip-flop is again set to a one by ADDR ACK flip-flop setting, and the memory is placed into operation. SSYN is then set much sooner than it had for a read cycle but does not produce a read Restart since it is direct cleared by C1 (0) L. 15 MRLS is returned by the processor. 15 MRLS and C1 (0) H causes the 200 ns PA to be placed into operation. An 11 WR LOAD L pulse is sent to the 11 memory causing that memory to write into its data buffer the data on the data lines.

MRLS ACK is also set but cleared by MRLS when it is removed from the bus. MSYN is then cleared by MRLS ACK (1) H and C1 (0) H. SSYN is clear by MSYN going away. When all has been completed in the 11 memory, 11 M SEL L is removed from the bus allowing the next cycle to take place.

The last type of memory reference that can take place is the Read Pause Write cycle. This is only performed by the PDP-15's I/O. It consists of a read and then a write during the same memory reference. It starts by reading data from memory, modifying it, and then writing it back into the same memory location. Here again, the memory request starts the operation. The address is Latched into the Address Register. The C0 and C1 flip-flops are set up with the C0 and C1 flip-flops set to a 1. With C0 set to a 1, (the first and only cycle where C0 is set), the READ PAUSE CYCLE flip-flop will set also. The READ PAUSE CYCLE flip-flop setting will prevent Mem Req. flip-flop from being cleared by MSYN (0) H. At this point a normal Read Cycle takes place. ADDR ACK sets removing the address from the 15 bus and setting MSYN. MSYN starts the read cycle. When the data is ready to be put onto the bus 11 SSYN L will come true setting READ RESTART. READ RESTART goes to the processor causing the data to be strobed from the data lines. DATA ACK is sent to the M7170 causing MSYN flip-flop to be cleared and also inverting the conditions of the C0 and C1 flip-flops. MRLS follows some time after DATA ACK. MRLS sets MRLS ACK and also sets MSYN again. By this time, SSYN will be clear. The WRITE portion of the cycle is now going to take place. The address has been kept in the address registers by Mem. Req. flip-flop remaining set and consequently, Latch remaining on a 1. The memory data line multiplexer has changed conditions since C0 and C1 flip-flops changed condition. By now, SSYN has reset, but, since C1 is no longer set, READ RESTART cannot be set. However, SSYN through the 60 ns PA will now clear READ PAUSE CYCLE flip-flop. Mem. Req. can now be cleared when MSYN goes away. The data is placed on the bus by the I/O processor and a MRLS is issued. The data is strobed into the Memory's data buffer by a WR LOAD pulse and MRLS ACK is set. MRLS ACK setting causes the I/O processor to clear MRLS which clears MRLS ACK. MRLS ACK (1) H and C1 (0) H allows MSYN to clear which in turn clears Mem. Req. MSYN clearing removes SSYN and as soon as 11 M SEL L goes away a new cycle can take place.

8.3 Module Descriptions

8.3.1 M7170

The M7170 is the interface between the PDP-15 memory bus and the ME15 Unibus. It is a double height, 8½" long module with fingers at both ends. It has on it the control logic necessary for handshaking on both busses. It also has a 17 bit address register for saving the address and drivers for sending 18 bits of data in either direction on the busses.

8.3.2 H215

The H215 is an 8K, 18 bit, 3 wire, 3 D memory stack.

8.3.3 G231

The G231 contains the address latches, XY selection decoders and current source for 8K of memory. The module is a hex by 8½" module.

8.3.4 G109-YA

The G109-YA contains the control logic for the memory. It also has on it the sense amplifiers and inhibit drivers. It is a hex by 8½" module.

9. Maintenance

9.1 Equipment

The following equipment is helpful in troubleshooting problems in the ME15 memory system.

1 Tektronix 453 or equivalent.
1 Tektronix current probe.
3 Tektronix voltage probes.
Extender boards.

9.2 The ME15 has no mechanical parts requiring regular service. Therefore, only standard processor maintenance procedures are necessary to insure reliable operation of the memory.

9.3 Adjustments

Strobe delay is factory adjusted and should be adjusted only when one of the three modules is replaced. It is a critical adjustment and must be done carefully.

Strobe must be set while cycling the worst case pattern of Maindec . The proper setting is midway between the two end points where the memory starts to error as strobe time is moved from earliest to latest. As strobe time is varied allow adequate time to cycle completely through the test at each strobe position. Figure 9.1 shows the strobe pulse wave form and the READ pulse waveform and the points at which they are picked off for display.

9.4 Special Troubleshooting Techniques

The ME15 mounting panel is 9 slots wide. It is broken down into 3 identical groups of 3 slots each. The accessible side of the mounting box has an access plate which may be removed easily. This exposes the etch side of the module. With the use of the chip layout for that module it becomes relatively easy to find the points which one wants to observe with a scope. The M7170 is not so easy to get at and requires the use of extenders to get at it.

9.5 Recommended Spares

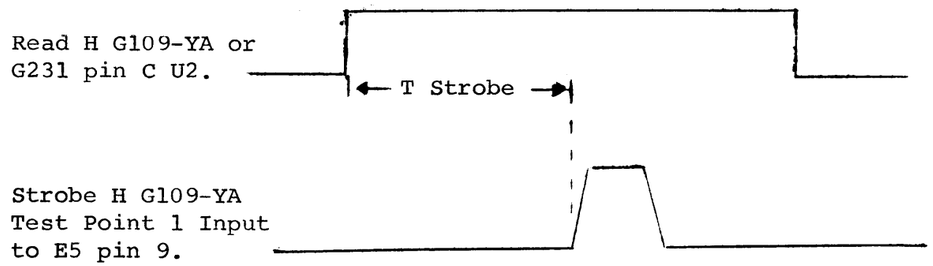


Figure 9.1

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION

DATE 10/10/72

TITLE ME15 CONFIGURATION SPECIFICATION

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE

ENG	APPD	SIZE	CODE	NUMBER	REV
John Elsbree	John Elsbree	A	SP	ME15-0-6	

DEC FORM NO. DRA 107

ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE ME15 CONFIGURATION SPECIFICATION

Table of Contents

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	A	SP	ME15-0-6	

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DRA 108

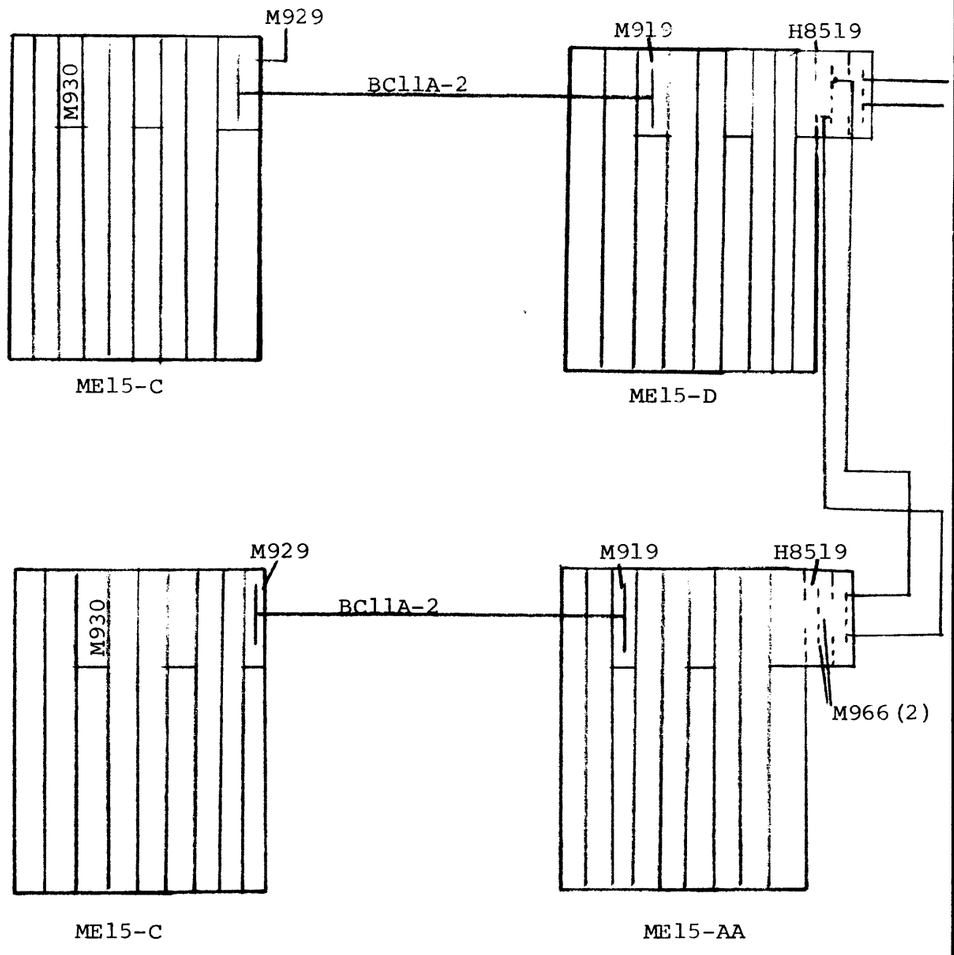

Figure 2.2

1. General Description

The ME15 configuration specification is designed to be an aid in determining where and how to place the ME15 in the various systems in which it may be installed. Under no circumstances should the memory bus length exceed 28 feet excluding cabling on the output of the MX15-A.

2. Configurations

This section gives a breakdown of the various configurations starting with the most basic and working up to the most complicated. The cables are listed in the order in which they must be run in the system. All cables are BC08A's unless otherwise noted. Figure 2.1 shows the designations used when referring to the cable connector block H8519 used in the ME15 memory. Figure 2.2 shows the cabling between the ME15-AA and ME15-D as well as the cabling between the ME15-AA and ME15-C and the cabling between the ME15-D and the ME15-C.

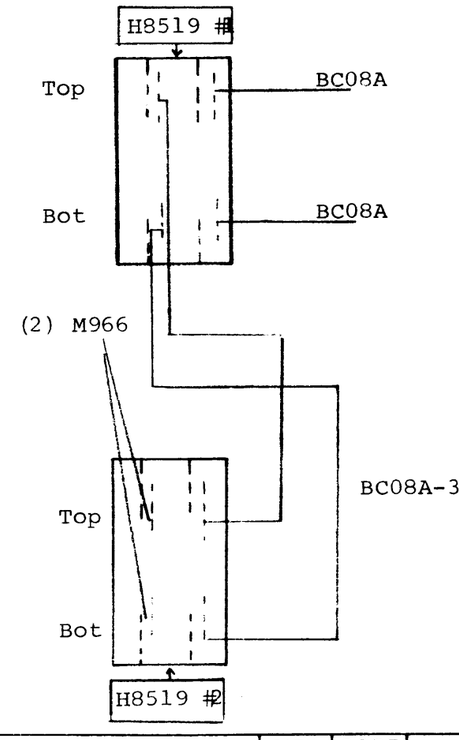

Figure 2.1

2.1.0 ME15 up to 48K without MM15, KM/KT15, or FP15.

From Device	From Loc.	To Device	To Loc.	Cable Length
KP15	J02	H8519	Top	6'
KP15	J03	H8519	Bot	6'

2.1.1 ME15 up to 48K with KM/KT15.

From Device	From Loc.	To Device	To Loc.	Cable Length
KP15	J02	BB15	B02	5'
KP15	J03	BB15	B03	5'
BB15	A02	H8519 #2	Top	6'
BB15	A03	H8519 #2	Bot	6'

2.1.2 ME15 up to 48K with FP15.

From Device	From Loc.	To Device	To Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	H8519 #2	Top	6'
FP15	J30	H8519 #2	Bot	6'

2.1.3 ME15 up to 48K with KM/KT15 and FP15.

From Device	From Loc.	To Device	To Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	BB15	B02	3'
FP15	J30	BB15	B03	3'
BB15	A02	H8519 #2	Top	6'
BB15	A[illegible]	H8519 #2	Bot	6'

2.2.0 ME15 48K to 96K without MM15, KM/KT15, or FP15.

From Device	From Loc.	To Device	To Loc.	Cable Length
KP15	J02	H8519 #1	Top	5'
KP15	J03	H8519 #1	Bot	5'
H8519 #1	Top	H8519 #2	Top	3'
H8519 #1	Bot	H8519 #2	Bot	3'

2.2.1 ME15 48K to 96K with KM/KT15.

From Device	From Loc.	To Device	To Loc.	Cable Length
KP15	J02	BB15	B02	5'
KP15	J03	BB15	B03	5'
BB15	A02	H8519 #1	Top	5'
BB15	A03	H8519 #1	Bot	5'
H8519 #1	Top	H8519 #2	Top	3'
H8519 #1	Bot	H8519 #2	Bot	3'

2.2.2 ME15 48K to 96K with FP15.

From Device	From Loc.	TO Device	TO Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	H8519 #1	Top	5'
FP15	J30	H8519 #1	Bot	5'
H8519 #1	Top	H8519 #2	Top	3'
H8519 #1	Bot	H8519 #2	Bot	3'

2.2.3 ME15 48K to 96K with KM/KT15 and FP15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	BB15	B02	3'
FP15	J30	BB15	B03	3'
BB15	A02	H8519 #1 Top		5'
BB15	A03	H8519 #1 Bot		5'
H8519 #1 Top		H8519 #2 Top		3'
H8519 #1 Bot		H8519 #2 Bot		3'

2.3.0 ME15 up to 48K with 1 MM15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	MM15-A	B02	1'1¼" (7006907-YA)
KP15	J03	MM15-A	B03	1'1¼" (7006907-YA)
MM15-A	A02	H8519 #2 Top		6'
MM15-A	A03	H8519 #2 Bot		6'

2.3.1 ME15 up to 48K with 1 MM15 and KM/KT15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	BB15	B02	5'
KP15	J03	BB15	B03	5'
BB15	A02	MM15-A	B02	5'
BB15	A03	MM15-A	B03	5'
MM15-A	A02	H8519 #2 Top		6'
MM15-A	A03	H8519 #2 Bot		6'

2.3.2 ME15 up to 48K with 1 MM15 and FP15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	MM15-A	B02	6'
FP15	J30	MM15-A	B03	6'
MM15-A	A02	H8519 #2 Top		6'
MM15-A	A03	H8519 #2 Bot		6'

2.3.3 ME15 up to 48K with 1 MM15, KM/KT15, and FP15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	BB15	B02	3'
FP15	J30	BB15	B03	3'
BB15	A02	MM15-A	B02	5'
BB15	A03	MM15-A	B03	5'
MM15-A	A02	H8519 #2 Top		6'
MM15-A	A03	H8519 #2 Bot		6'

2.4.0 ME15 48K to 96K with 1 MM15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	MM15-A	B02	1'1¼" (7006907-YA)
KP15	J03	MM15-A	B03	1'1¼" (7006907-YA)
MM15-A	A02	H8519 #1 Top		3'
MM15-A	A03	H8519 #1 Bot		3'
H8519 #1 Top		H8519 #2 Top		3'
H8519 #1 Bot		H8519 #2 Bot		3'

2.4.1 ME15 48K to 96K with 1 MM15 and KM/KT15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	BB15	B02	5'
KP15	J03	BB15	B03	5'
BB15	A02	MM15-A	B02	5'
BB15	A03	MM15-A	B03	5'
MM15-A	A02	H8519 #1 Top		3'
MM15-A	A03	H8519 #1 Bot		3'
H8519 #1 Top		H8519 #2 Top		3'
H8519 #1 Bot		H8519 #2 Bot		3'

2.4.2 ME15 48K to 96K with 1 MM15 and FP15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	MM15-A	B02	6'
FP15	J30	MM15-A	B03	6'
MM15-A	A02	H8519 #1 Top		3'
MM15-A	A03	H8519 #1 Bot		3'
H8519 #1 Top		H8519 #2 Top		3'
H8519 #1 Bot		H8519 #2 Bot		3'

2.4.3 ME15 48K to 96K with 1 MM15, KM/KT15, and FP15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	BB15	B02	3'
FP15	J30	BB15	B03	3'
BB15	A02	MM15-A	B02	5'

BB15	A03	MM15-A	B03	5'
MM15-A	A02	H8519 #1 Top		3'
MM15-A	A03	H8519 #1 Bot		3'
H8519 #1 Top		H8519 #2 Top		3'
H8519 #1 Bot		H8519 #2 Bot		3'

2.5.0 ME15 up to 48K with 2 MM15's.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	MM15-A	B02	1'1¼" (7006907-YA)
KP15	J03	MM15-A	B03	1'1¼" (7006907-YA)
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	H8519 #2 Top		3'
MM15-B	B03	H8519 #2 Bot		3'

2.5.1 ME15 up to 48K with 2 MM15's and KM/KT15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	BB15	B02	5'
KP15	J03	BB15	B03	5'
BB15	A02	MM15-A	B02	5'
BB15	A03	MM15-A	B03	5'
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	H8519 #2 Top		3'
MM15-B	B03	H8519 #2 Bot		3'

2.5.2 ME15 up to 48K with 2 MM15's and FP15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	MM15-A	B02	6'
FP15	J30	MM15-A	B03	6'
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	H8519 #2	Top	3'
MM15-B	B03	H8519 #2	Bot	3'

2.5.3 ME15 up to 48K with 2 MM15's, KM.KT15, and FP15.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	BB15	B02	3'
FP15	J30	BB15	B03	3'
BB15	A02	MM15-A	B02	5'
BB15	A03	MM15-A	B03	5'
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	H8519 #2	Top	3'
MM15-B	B03	H8519 #2	Bot	3'

2.6.0 ME15 48K to 96K with 2 MM15's.

This configuration requires the ME15 to be mounted in the H963-U cab which is the ME15 Expander Cab. See the H963-U print set for cab assembly. H963-U cab will be bolted directly to the left of the CP cab. (See D-AR-PDP15-0-2.)

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	MM15-A	B02	1'1¼" (7006907-YA)
KP15	J03	MM15-A	B03	1'1¼" (7006907-YA)
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	H8519 #1	Top	5'
MM15-B	B03	H8519 #1	Bot	5'
H8519 #1	Top	H8519 #2	Top	3'
H8519 #1	Bot	H8519 #2	Bot	3'

2.6.1 ME15 48K to 96K with 2 MM15's and KM/KT15.

This configuration requires the ME15 to be mounted in the H963-U cab which is the ME15 Expander cab.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	BB15	B02	5'
KP15	J03	BB15	B03	5'
BB15	A02	MM15-A	B02	5'
BB15	A03	MM15-A	B03	5'
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	H8519 #1	Top	5'
MM15-B	B03	H8519 #1	Bot	5'
H8519 #1	Top	H8519 #2	Top	3'
H8519 #1	Bot	H8519 #2	Bot	3'

2.6.2 ME15 48K to 96K with 2 MM15's and FP15.

This configuration requires the ME15 to be mounted in the H963-U cab which is the ME15 Expander cab.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	MM15-A	B02	6'
FP15	J30	MM15-A	B03	6'
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	H8519 #1 Top		5'
MM15-B	B03	H8519 #1 Bot		5'
H8519 #1 Top		H8519 #2 Top		3'
H8519 #1 Bot		H8519 #2 Bot		3'

2.6.3 ME15 48K to 96K with 2 MM15's, KM/KT15, and FP15.

This configuration requires the ME15 to be mounted in the H963-U cab which is the ME15 Expander cab.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	BB15	B02	3'
FP15	J30	BB15	B03	3'
BB15	A02	MM15-A	B02	5'
BB15	A03	MM15-A	B03	5'
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	H8519 #1 Top		5'
MM15-B	B03	H8519 #1 Bot		5'
H8519 #1 Top		H8519 #2 Top		3'
H8519 #1 Bot		H8519 #2 Bot		3'

2.7.0 ME15 up to 48K with 3 MM15's.

This configuration requires the ME15 to be mounted in the H963-U cab which is the ME15 Expander cab.

From Device	Loc.	To Device	Loc.	Cable Length
KP15	J02	MM15-A	B02	1'1¼" (7006907-YA)
KP15	J03	MM15-A	B03	1'1¼" (7006907-YA)
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	MM15-C	A02	5¼" (7006907-0F)
MM15-B	B03	MM15-C	A03	5¼" (7006907-0F)
MM15-C	B02	H8519 #2 Top		7'
MM15-C	B03	H8519 #2 Bot		7'

2.7.1 ME15 up to 48K with 3 MM15's and KM/KT15.

This configuration requires the ME15 to be mounted in the H963-U cab which is the ME15 Expander cab.

From Device	Loc.	TO Device	Loc.	Cable Length
KP15	J02	BB15	B02	5'
KP15	J03	BB15	B03	5'
BB15	A02	MM15-A	B02	5'
BB15	A03	MM15-A	B03	5'
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	MM15-C	A02	5¼" (7006907-0F)
MM15-B	B03	MM15-C	A03	5¼" (7006907-0F)
MM15-C	B02	H8519 #2 Top		7'
MM15-C	B03	H8519 #2 Bot		7'

2.7.2 ME15 up to 48K with 3 MM15's and FP15.

This configuration requires the ME15 to be mounted in the H963-U cab which is the ME15 Expander cab.

From Device	From Loc.	To Device	To Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	MM15-A	B02	6'
FP15	J30	MM15-A	B03	6'
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	MM15-C	A02	5¼" (7006907-0F)
MM15-B	B03	MM15-C	A03	5¼" (7006907-0F)
MM15-C	B02	H8519 #2 Top		7'
MM15-C	B03	H8519 #2 Bot		7'

2.7.3 ME15 up to 48K with 3 MM15's, KM/KT15, and FP15.

This configuration requires the ME15 to be mounted in the H963-U cab which is the ME15 Expander cab.

From Device	From Loc.	To Device	To Loc.	Cable Length
KP15	J02	FP15	H29	6'
KP15	J03	FP15	H30	6'
FP15	J29	BB15	B02	3'
FP15	J30	BB15	B03	3'
BB15	A02	MM15-A	B02	5'
BB15	A03	MM15-A	B03	5'
MM15-A	A02	MM15-B	A02	3'
MM15-A	A03	MM15-B	A03	3'
MM15-B	B02	MM15-C	A02	5¼" (7006907-0F)
MM15-B	B03	MM15-C	A03	5¼" (7006907-0F)

MM15-C	B02	H8519 #2 Top	7'
MM15-C	B03	H8519 #2 Bot	7'

2.8.0 ME15 Configurations with MX15-A.

Configurations with MX15's are so many and so varied that it is impossible to break them down into a list such as the preceding sections. However, there are some general guidelines which may help in configuring the system. Cable length should be kept to a minimum. In no case should it exceed 28 feet excluding cabling on the output of the MX15-A. To keep the cabling as short as possible it might help if the ME15 is mounted in the CP cab and MM type memory put into the MX cab. The output ports of the MX15-A are capable of addressing only 32K while the ME15 is configured for up to 48K per interface card. Therefore, the full capabilities of the ME15 can not be utilized if it is placed on the output of an MX15-A.

2.9.0 Non-Standard Configurations - 4K of MM15

Systems having an odd number of 4K banks of MM15 memory may run into problems when adding on ME15 type memory. ME15 memory is addressable in 8K increments, i.e., 0-8K, 8-16K, etc. It can not be addressed in the following fashions: 4-12K, 12-20K, etc. Therefore, any MM15 type memory to be placed logically in front of the ME15 must be an 8K bank. Any odd 4K bank must be logically the last memory on the bus. Thus allowing contiguous addressing. However, this then limits the total amount of core to 28K without an MX15-A.

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION

DATE 10/10/72

TITLE MF15 CUSTOMER ACCEPTANCE PROCEDURE

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE

ENG	APPD	SIZE	CODE	NUMBER	REV
John Elsbree	John Elsbree	A	SP	ME15-0-7	

DEC FORM NO. DRA 107

I. SCOPE:

The following steps will be followed to accept and insure that all necessary paperwork, diagnostics, etc., are included with the MF15.

II. SHIPPING HARDWARE AND SOFTWARE:

Refer to Appendix I for a list of necessary hardware and software.

III. TEST SOFTWARE:

A. Extended Memory Test Maindec 15-D1CA.

B. Extended Memory Checkerboard Maindec 15-DAMXA.

C. Extended Memory Address Test Maindec 15-D1FA.

D. Memory Address Timing Test Maindec 15-D1GA.

IV. PROCEDURE:

The following procedure should be followed step by step to insure the quality of the option.

A. Make a visual check of the MF15 to insure the following:

1. There are no loose wires or connections.

2. All modules and cables are in their proper slots and well seated.

B. Load and run the diagnostic programs in the following procedure.

1. Extended Memory Checkerboard should run error free 2 passes of the entire memory system.

2. Extended Memory Address Test should run error free 2 passes of the entire memory system.

3. Extended Memory Test should run error free for 2 passes.

B. Load and run the diagnostic programs in the following procedure. (continued)

4. Memory Address Timing Test should run error free for five minutes.

5. Hot Memory Test should run error free for 2 passes.

C. Run System Exerciser with all possible options for fifteen minutes.

D. At the completion of these steps the acceptance of the ME15 will be complete.

Appendix I

Accessory list for ME15.

A. Diagnostic Paper Tapes

1. Extended Memory Test Maindec 15-D1CA-PB.

2. Extended Memory Checkerboard Miandec 15-DAXMA-PD.

3. Extended Memory Address Test Maindec 15-D1FA-PB.

4. Hot Memory Test Maindec 15-D1HA-PB.

5. Memory Address Timing Test Maindec 15-D1GA-PB.

B. Diagnostic Writeups

1. Extended Memory Test Minadec 15-D1CD-D.

2. Extended Memory Checkerboard Maindec 15-DAMXA-A-D.

3. Extended Memory Address Test Maindec 15-D1FA-D.

4. Hot Memory Test Maindec 15-D1HA-D.

5. Memory Address Timing Test Maindec 15-D1GA-D.

C. Manuals

1. ME15 Maintenance Manual Vol. I.

2. MF 15 Maintenance Manual Vol. II.

D. Fuses

1. Five 5 amp ACG DEC # 90-07221.

2. Five 15 amp ACG DEC # 90-07226.

The preceding items will be shipped with all ME15s. The following items will be shipped as the configuration requires.

E. Systems with 8K existing MM15.

1. Back door assembly.
2. H742 C or D power supply.
3. 6 - Nut, U-shaped # C-3/750 - C32 - 27 Dec # 9007786.
4. 6 - SCR, PHL HD TRUSS # 10-32 x 1/2 LG Dec # 9006073-3.
5. H744 - 1 for up to 48K, 2 for up to 96K.
6. H745 - 1 for up to 48Km 2 for up to 96K.
7. Cables - for sytems up to 48K of MF15 - 2 - BC08-6.

F. Systems with 16K existing MM15 and addition of up to 6 48K of MF15.

1. See appropriate parts lists for the MF15 variations being shipped.

2. Cables - 2 - BC08-3s.

G. System with 16K existing mM15 and addition of over 48K of ME15.

1. H963-U cab with MF15 assembly and power supply.

2. Cable - 2- BC08-5
2- BC08-3

H. Systems with 24K existing MM15 and addition of up to 48K of ME15.

1. H963-U cab with ME15 assembly and power supply.

2. Cables - 2 - BC08-7.