

DEC-15-H2XB-D

PDP-15 SYSTEMS
MX15
MEMORY BUS MULTIPLEXER
MAINTENANCE MANUAL
VOLUME 2

DIGITAL EQUIPMENT CORPORATION • MAYNARD, MASSACHUSETTS

1st Printing September 1971

Copyright © 1971 by Digital Equipment Corporation

The material in this manual is for informational purposes and is subject to change without notice.

The following are trademarks of Digital Equipment Corporation, Maynard, Massachusetts:

DEC	PDP
FLIP CHIP	FOCAL
DIGITAL	COMPUTER LAB

ENGINEERING DRAWINGS

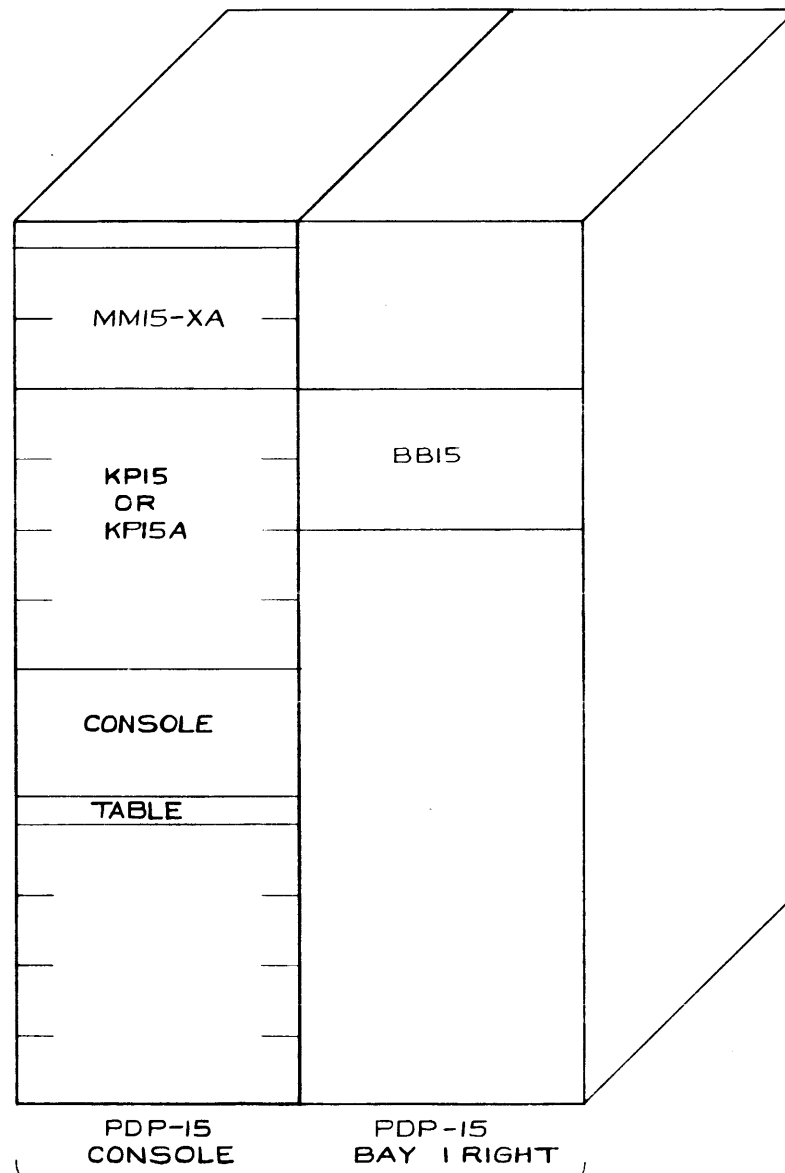
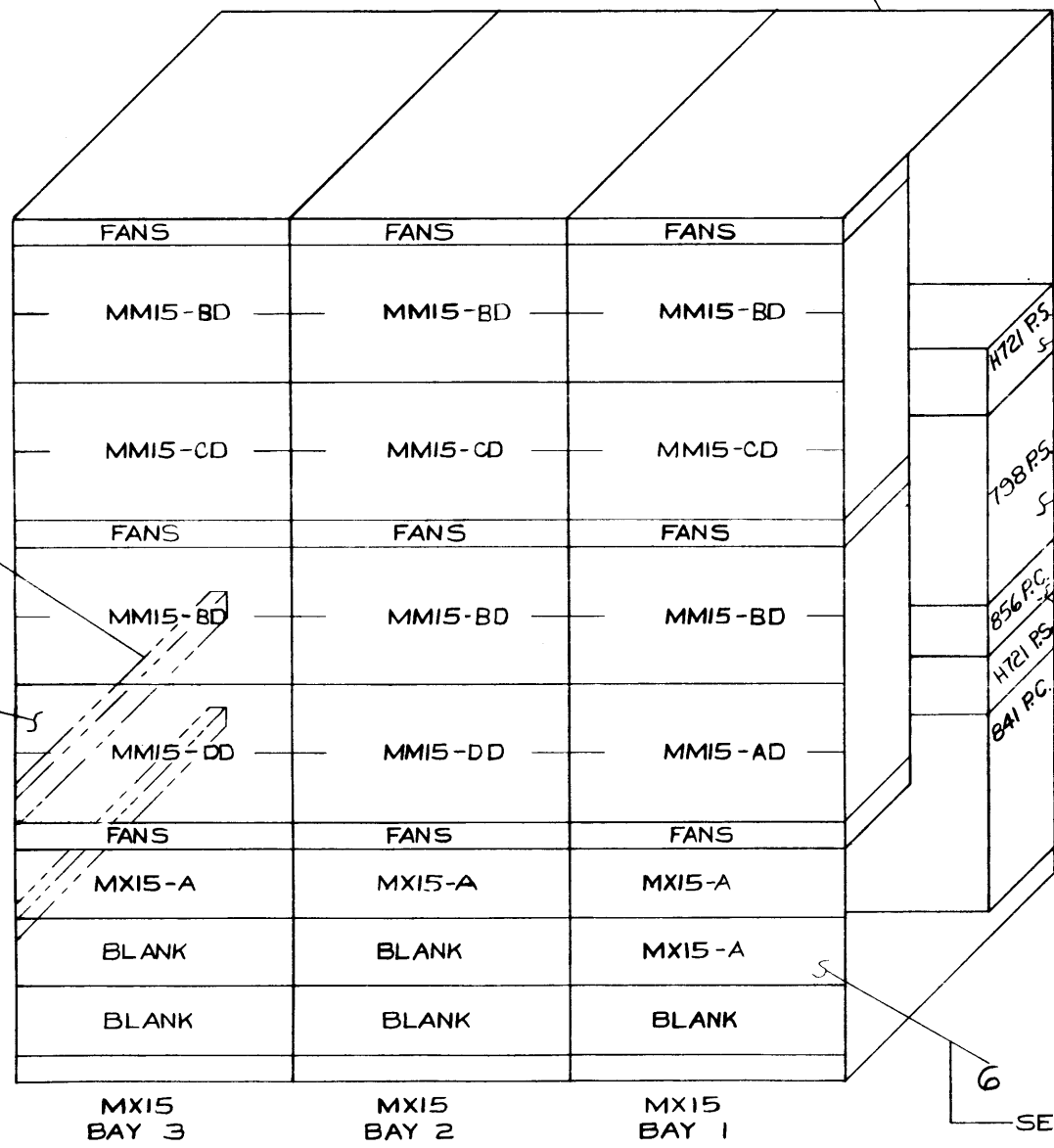
Engineering Drawing List

Drawing No.	Title
D-AD-7006863-0-0	MX15 Maximum Configuration
D-UA-MX15-0-0	MX15 Assembly
D-BS-MX15-A-12	Priority Logic Input Port 1
D-BS-MX15-A-13	Priority Logic Input Port 2
D-BS-MX15-A-14	Priority Logic Input Port 3
D-BS-MX15-A-15	MDL 03, 04 Drivers, M REQ Logic
D-BS-MX15-A-16	Control Lines
D-BS-MX15-A-17	MDL 0-8
D-BS-MX15-A-18	MDL 9-17, Parity
D-BS-MX15-A-19	Inhibit Logic
D-IC-MX15-A-20	Memory Port Out
D-IC-MX15-A-21	Memory Port 1
D-IC-MX15-A-22	Memory Port 2
D-IC-MX15-A-23	Memory Port 3
D-AD-7006862-0-0	Wired Assembly (MX15-A)
D-UA-841-B-0	Power Control 841-B, 841-C
D-CS-H721-0-1	H721 Power Supply Circuit Schematic
B-CS-798-0-1	798 Dual 15-Volt Power Supply Schematic
15-0409	856 Power Control

This drawing and specifications herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

NOTES:

1. WHEN A MM15 IS INCLUDED IN A BAY, THE ADDITION OF A 798 P.S. AND AN 856 P.C. IS REQUIRED. WHEN ADDING A SECOND MM15 TO THE BAY, THE ADDITION OF A SECOND H721 P.S. AND A SECOND POWER DISTRIBUTION BAR IS REQUIRED.
2. ONLY BAY 1 CAN HAVE 2 MX15-A WIRED ASSEMBLIES.
3. FOR DRAWING INDEX LIST, REFER TO: D-DI-7006863-0-1.



SHOWN FOR REFERENCE ONLY

REV	DATE	DESCRIPTION
1	5/15/70	INITIAL BAY
2	5/15/70	ADD BAY
3	5/15/70	ADD BAY

FIRST USED ON OPTION/MODEL
MX15

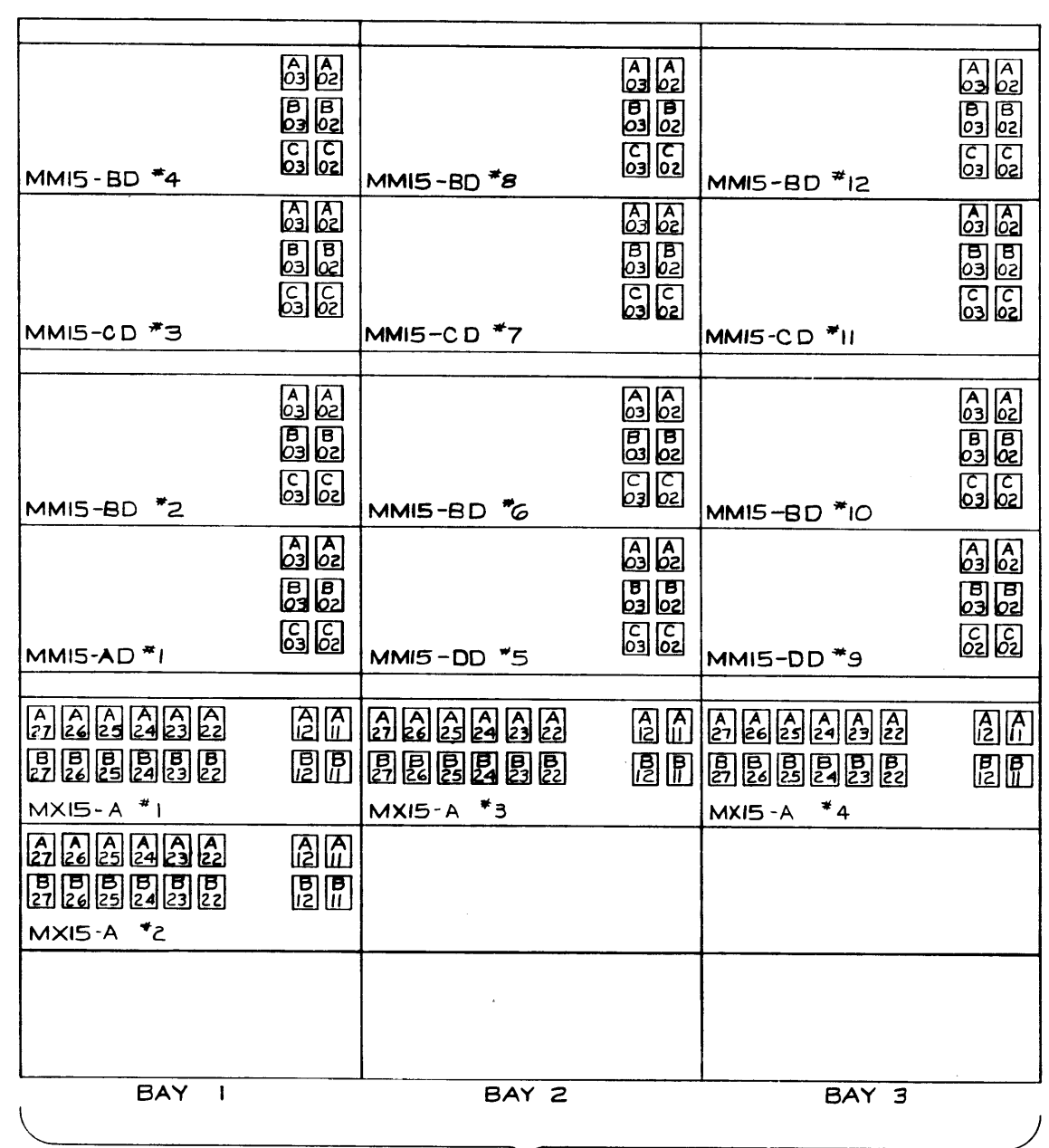
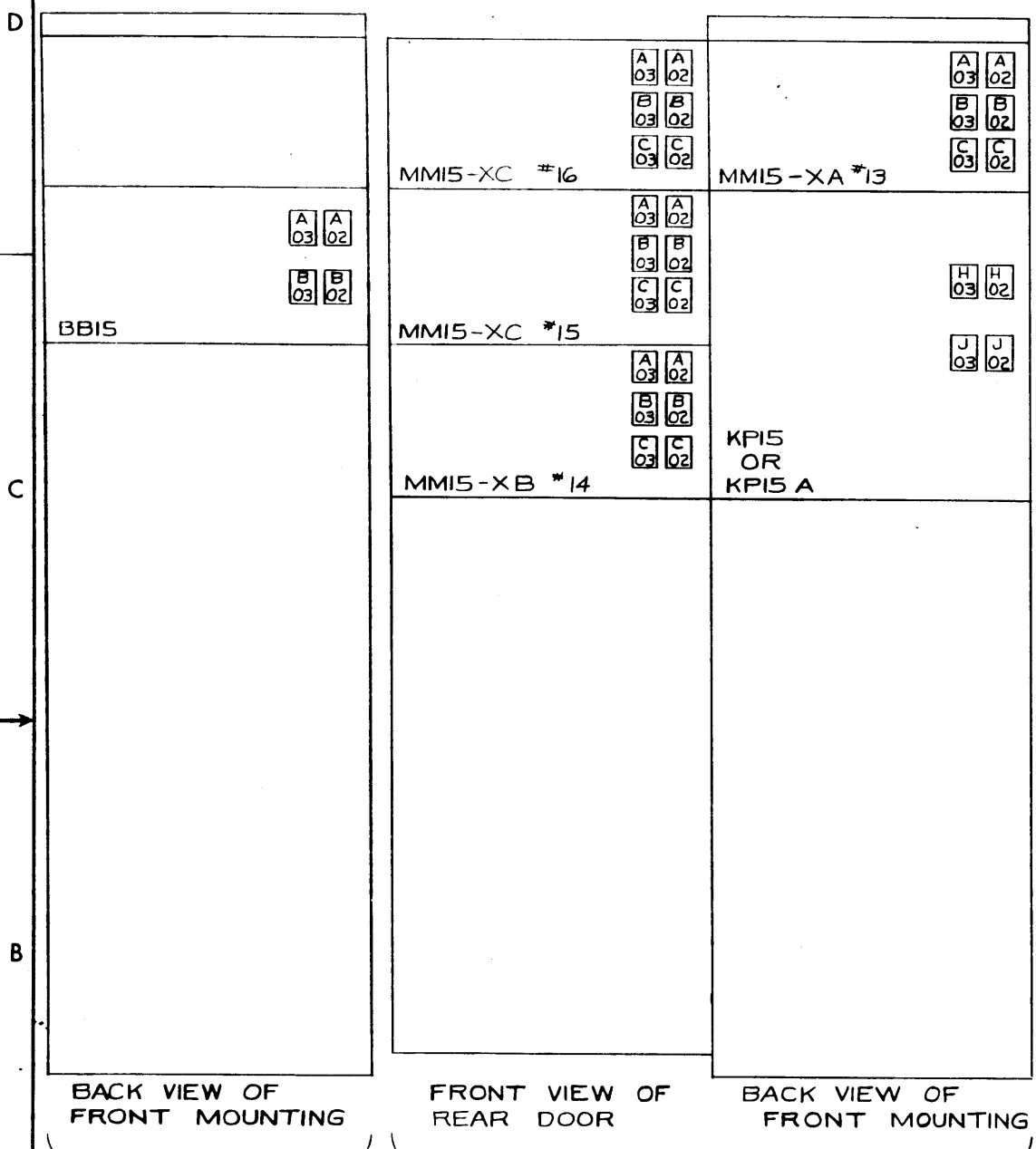
DO NOT SCALE DRAWING	UNLESS OTHERWISE SPECIFIED
DIMENSION IN INCHES	TOLERANCES
DECIMALS ± .005	FRACTIONS ± 1/64
ANGLES ± 0°30'	FINAL SURFACE QUALITY
REMOVE BURRS AND BREAK SHARP CORNERS	MATERIAL
SEE PARTS LIST	FINISH

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
DRN: <i>W.F. McCall</i>		DATE: 3/10/70	<p>digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS</p>
CHKD: <i>W.F. McCall</i>		DATE: 5/15/70	
ENG: <i>W.F. McCall</i>		DATE: 5/15/70	
PROJ. ENG: <i>W.F. McCall</i>		DATE: 5/15/70	
MATERIAL: NEXT HIGHER ASSY		DATE: 5/15/70	TITLE: MX15 MAXIMUM CONFIGURATION
SCALE: 1 OF 4	SHEET: 1 OF 4	SIZE CODE: DAD	NUMBER: 7006863-0-0
		DIST.:	REV: A

SIZE CODE: DAD NUMBER: 7006863-0-0 REV: A

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

NOTES FOR CABLING:
 1. IN MXIS PORT LOCATIONS ARE AS FOLLOWS:
 PORT 1 (HIGHEST PRIORITY)
 A26-A27
 B26-B27
 PORT 2 (MIDDLE PRIORITY)
 A24-A25
 B24-B25
 PORT 3 (LOWEST PRIORITY)
 A22-A23
 B22-B23



PDP-15 BAY 1 RIGHT (SHOWN FOR REFERENCE ONLY)
 PDP-15 CONSOLE (SHOWN FOR REFERENCE ONLY)

MXIS BACK VIEW OF FRONT MOUNTING

REV	CHANGE NO

FIRST USED ON OPTION/MODEL
 MX15

DO NOT SCALE DRAWING
 UNLESS OTHERWISE SPECIFIED
 DIMENSION IN INCHES
 TOLERANCES
 DECIMALS FRACTIONS ANGLES
 ± .005 ± 1/64 ± 0°30'
 FINAL SURFACE QUALITY
 REMOVE BURRS AND BREAK SHARP CORNERS

DRN: *W. McCarthy* DATE: 3/3/70
 CHK'D: *W. McCarthy* DATE: 3/3/70
 ENG. DATE: 3/3/70
 PROJ. ENG. DATE: 3/3/70
 PROP. DATE: 3/3/70

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS			
TITLE MX15 MAXIMUM CONFIGURATION			
SIZE CODE	NUMBER	REV.	
DAD	0006863-0-0	A	
SCALE	SHEET	OF	
	2	4	

PART NUMBER 0006863-0-0
 DRAWING NO. 0006863-0-0
 REV. A

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

CABLE CONNECTION LOCATIONS

CABLE NUMBERS		
ITEM NO	CABLE	DEC PART NO
7	A	7006094-1
8	B	BC088-1
9	C	BC088-2
10	D	BC088-3
11	E	BC088-7
12	F	7006414-1
13	H	7006414-2
14	J	7006437-2
15	K	7006437-6
16	L	7006437-10
-	M	BC088-6
-	N	7005890

FROM		TO		CABLE	REMARKS	FROM		TO		CABLE	REMARKS
DEVICE	LOCATION	DEVICE	LOCATION			DEVICE	LOCATION	DEVICE	LOCATION		
MM15 #1	A02	MM15 #2	B02	A		MX15A#2	B22	MX15A#3	B22		
MM15 #1	A03	MM15 #2	B03	A		MX15A#2	B23	MX15A#3	B23		
MM15 #1	B02	MX15A#2	A11	C		MX15A#2	B24	MX15A#3	B24		
MM15 #1	B03	MX15A#2	A12	C		MX15A#2	B25	MX15A#3	B25		
MM15 #1	C02	MM15 #2	C02	F		MX15A#2	B26	MX15A#3	B26		
MM15 #1	C03	MM15 #14	C03	L OR K		MX15A#2	B27	MX15A#3	B27		
MM15 #2	A02	MM15 #3	B02	L		MX15A#2	A22	MX15A#4	B22		
MM15 #2	A03	MM15 #3	B03	C		MX15A#3	A23	MX15A#4	B23		
MM15 #2	C03	MM15 #3	C03	J		MX15A#3	A24	MX15A#4	B24		
MM15 #3	A02	MM15 #4	B02	A		MX15A#3	A25	MX15A#4	B25		
MM15 #3	A03	MM15 #4	B03	A		MX15A#3	A26	MX15A#4	B26		
MM15 #3	C02	MM15 #4	C02	F		MX15A#3	A27	MX15A#4	B27		
MM15 #4	C03	MM15 #5	C03	L OR K							
MM15 #5	A02	MM15 #6	B02	A							
MM15 #5	A03	MM15 #6	B03	A							
MM15 #5	B02	MX15A#3	A11	A		KP15	H02	MM15 #13	C02	F	
MM15 #5	B03	MX15A#3	A12	C		KP15	J02	BB15	A02	M	
MM15 #5	C02	MM15 #9	C02	F		KP15	J03	BB15	A03	M	
MM15 #8	C03	MM15 #9	C03	L OR K		MM15 #13	A02	MM15 #16	A02	N	
MM15 #6	A02	MM15 #7	B02	C		MM15 #13	A03	MM15 #16	A03	N	
MM15 #6	A03	MM15 #7	B03	C		MM15 #13	C03	MM15 #16	C02	N	
MM15 #6	C03	MM15 #7	C03	J		MM15 #14	A02	MM15 #15	B02	N	
MM15 #7	A02	MM15 #8	B02	A		MM15 #14	A03	MM15 #15	B03	A	
MM15 #7	A03	MM15 #8	B03	A		MM15 #14	C02	MM15 #15	C02	A	
MM15 #7	C02	MM15 #8	C02	F		MM15 #15	A02	MM15 #16	B02	A	
MM15 #9	A02	MM15 #10	B02	A		MM15 #15	A03	MM15 #16	B02	A	
MM15 #9	A03	MM15 #10	B03	A		MM15 #15	C03	MM15 #16	C03	F	
MM15 #9	B02	MX15A#4	A11	C							
MM15 #9	B03	MX15A#4	A12	C							
MM15 #9	C02	MM15 #10	C02	F							
MM15 #9	C03	MM15 #10	C03	J							
MM15 #10	A02	MM15 #11	B02	A							
MM15 #10	A03	MM15 #11	B03	A							
MM15 #10	C03	MM15 #11	C03	J							
MM15 #11	A02	MM15 #12	B02	A							
MM15 #11	A03	MM15 #12	B03	A							
MM15 #11	C02	MM15 #12	C02	F							
MX15A#1	A11	MM15 #13	B02	E							
MX15A#1	A12	MM15 #13	B03	E							
MX15A#1	A22	BB15	B02	E							
MX15A#1	A23	BB15	B03	E							
MM15 #1	B22	MM15 #2	A22	B							
MM15 #1	B23	MM15 #2	A23	B							
MM15 #1	B24	MM15 #2	A24	B							
MM15 #1	B25	MM15 #2	A25	B							
MM15 #1	B26	MM15 #2	A26	B							
MM15 #1	B27	MM15 #2	A27	B							

ALREADY SUPPLIED WITH PDP15 (LISTED FOR REFERENCE ONLY)

REV	
CHANGE NO.	
CHK	

FIRST USED ON OPTION / MODEL
MX15

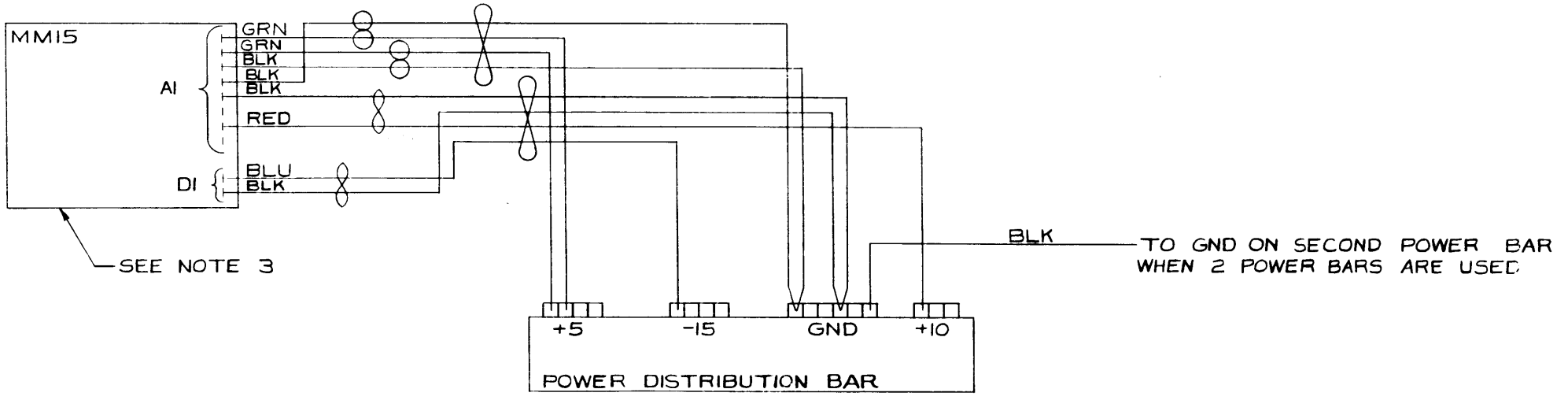
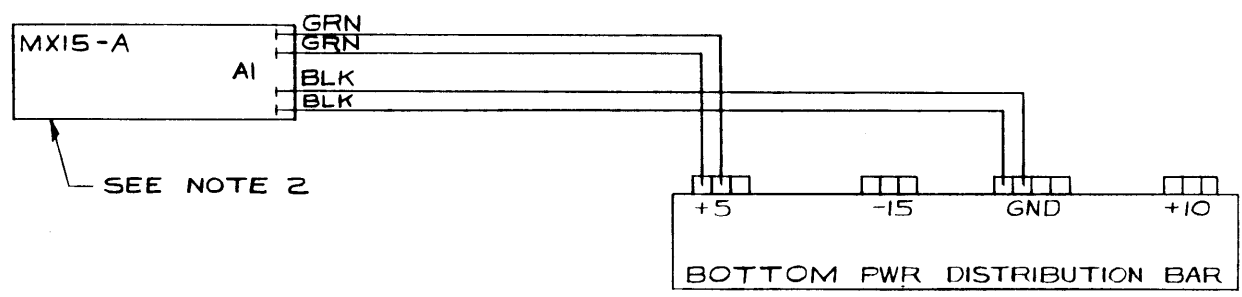
DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED	
DIMENSION IN INCHES	
TOLERANCES	
DECIMALS	FRACTIONS
± .005	± 1/64
FINAL SURFACE QUALITY	
REMOVE BURRS AND BREAK SHARP CORNERS	
MATERIAL	
FINISH	

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS			
TITLE MX15 MAXIMUM CONFIGURATION			
SCALE	SHEET 3 OF 4	SIZE CODE DAD	NUMBER 7006863-0-0
NEXT HIGHER ASSY		REV. A	

REV. A
DAD7006863-0-0

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

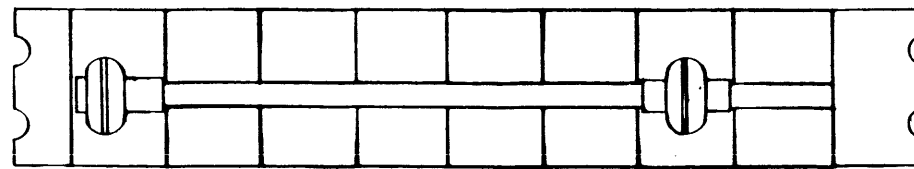
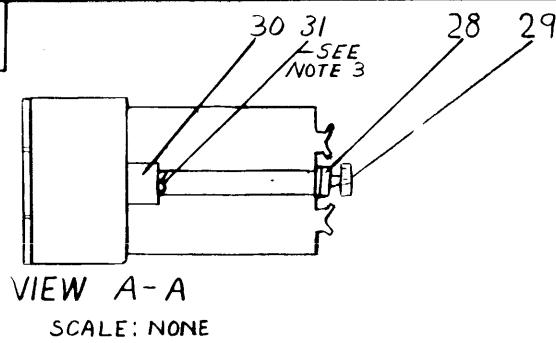
- NOTES FOR PWR WIRING:**
1. ALL WIRING IS #14 GAUGE EXCEPT WHERE SPECIFIED.
 2. THIS WIRING IS FOR THE FIRST BAY, THE SECOND MX15.
 3. EACH BAY CAN HAVE UP TO 4 MM15'S AND 2 POWER DISTRIBUTION BARS. THE FIRST MM15 SHOULD BE WIRED TO THE BOTTOM POWER DISTRIBUTION BAR. WHEN INSTALLING A SECOND MM15, THE ADDITION OF A SECOND POWER DISTRIBUTION BAR IS REQUIRED. THE SECOND, THIRD, AND FOURTH MM15'S WILL BE WIRED TO THE TOP (SECOND) POWER DISTRIBUTION BAR. THE WIRING FROM EACH MM15 TO ITS APPROPRIATE POWER DISTRIBUTION BAR IS IDENTICAL.



DC WIRING

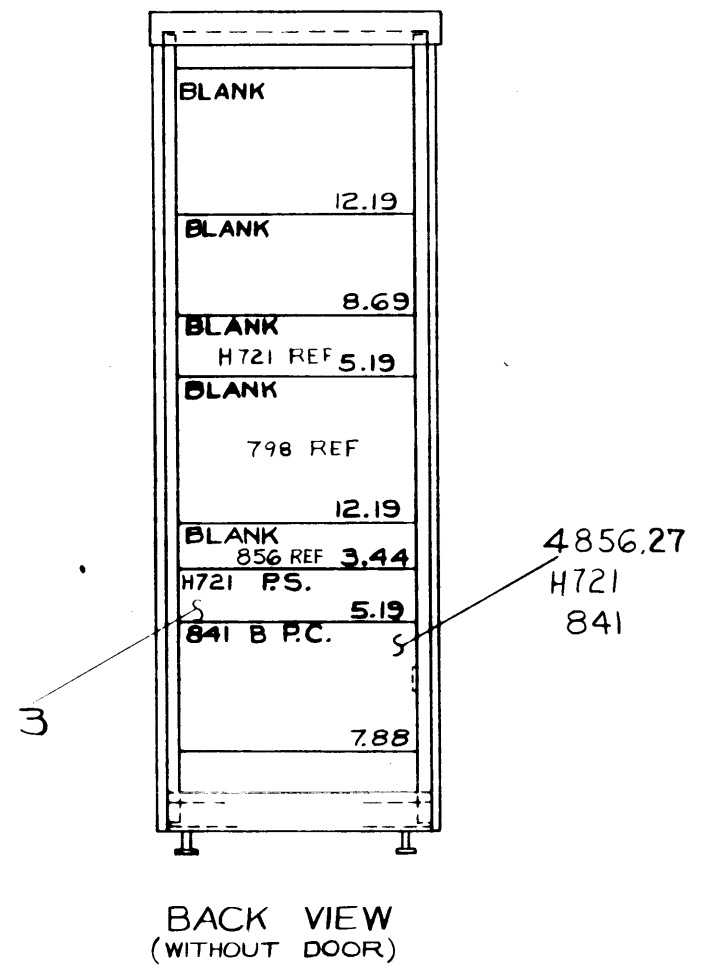
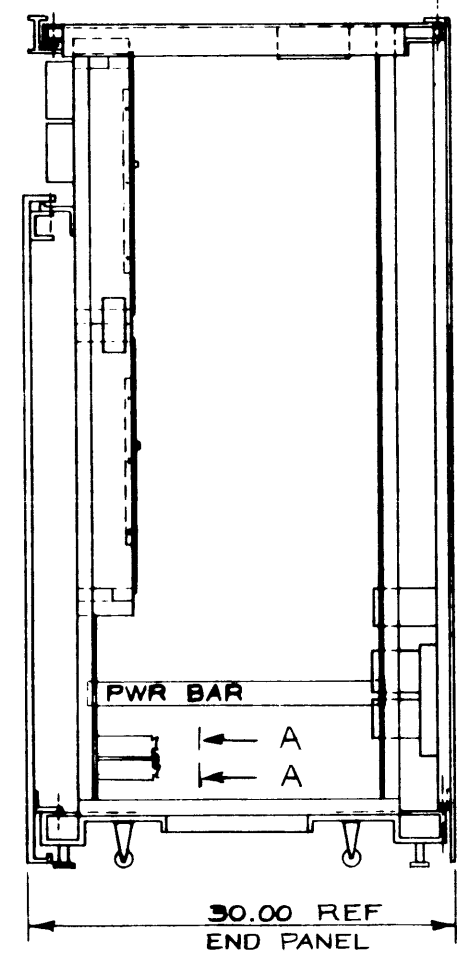
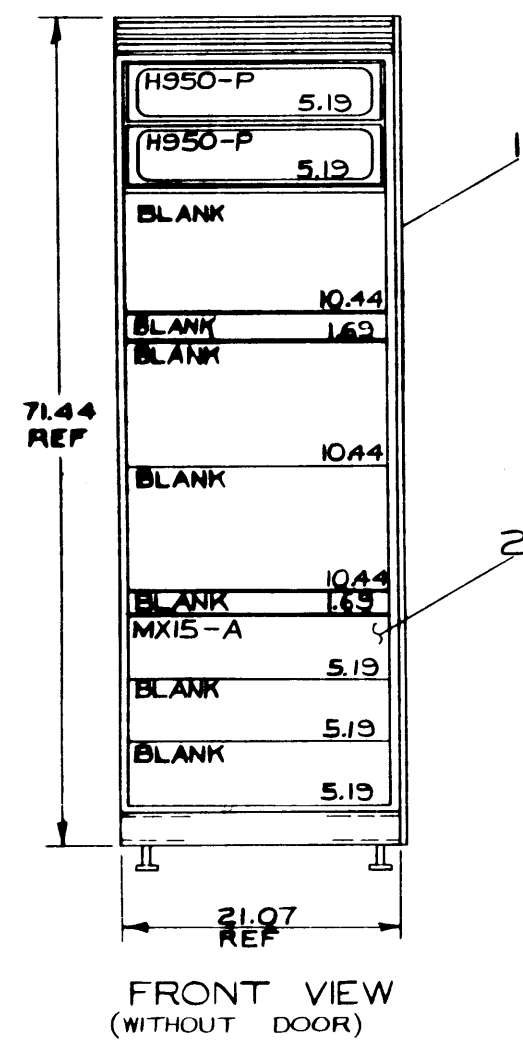
FIRST USED ON OPTION/MODEL MX15	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST				
UNLESS OTHERWISE SPECIFIED	DRN	DATE	digital EQUIPMENT CORPORATION	
UNLESS OTHERWISE SPECIFIED	CHK'D	DATE	CORPORATION	
DIMENSION IN INCHES	ENG	DATE	TITLE	
TOLERANCES	PROJ ENG	DATE	MX15	
DECIMALS FRACTIONS ANGLES	PROD	DATE	MAXIMUM	
+ .005 ± .001 ± .010			CONFIGURATION	
FINAL SURFACE QUALITY /			NUMBER	
REMOVE BURS AND BREAK SHARP CORNERS			SIZE CODE NUMBER	
MATERIAL			SCALE	
			SHEET OF	
FINISH			DIST.	

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.



NOTES:

1. REFER TO D-AD-7006863-0-0 FOR INFORMATION ON CABLING, AND MAXIMUM CONFIGURATION.
2. FOR DRAWING INDEX LIST REFER TO: D-DI-MX15-0-1
3. REMOVE EXISTING SCREWS AT SLOTS 32 & 8 & INSTALL ITEM # 30 (BLOCK) WITH (SCREW) ITEM # 31. BLOCKS WILL COVER SLOTS 32-29 & SLOTS 8-5. SCREW, ITEM # 28 ATTACHES NEXT TO SCREW ITEM # 30.



REV.	CHANGE NO.	BY	DATE
A	MISC-00073	T. QUINN	8-14-70
B		HALLO	8-18-70
C		R. GRAY	11-3-70

FIRST USED ON OPTION/MODEL
MX15

DO NOT SCALE DRAWING	UNLESS OTHERWISE SPECIFIED
DIMENSION IN INCHES	
TOLERANCES	
DECIMALS	FRACTIONS
± .008	± 1/64
FINAL SURFACE QUALITY	
REMOVE BURRS AND BREAK SHARP CORNERS	
MATERIAL	SEE PARTS LIST
FINISH	/ /

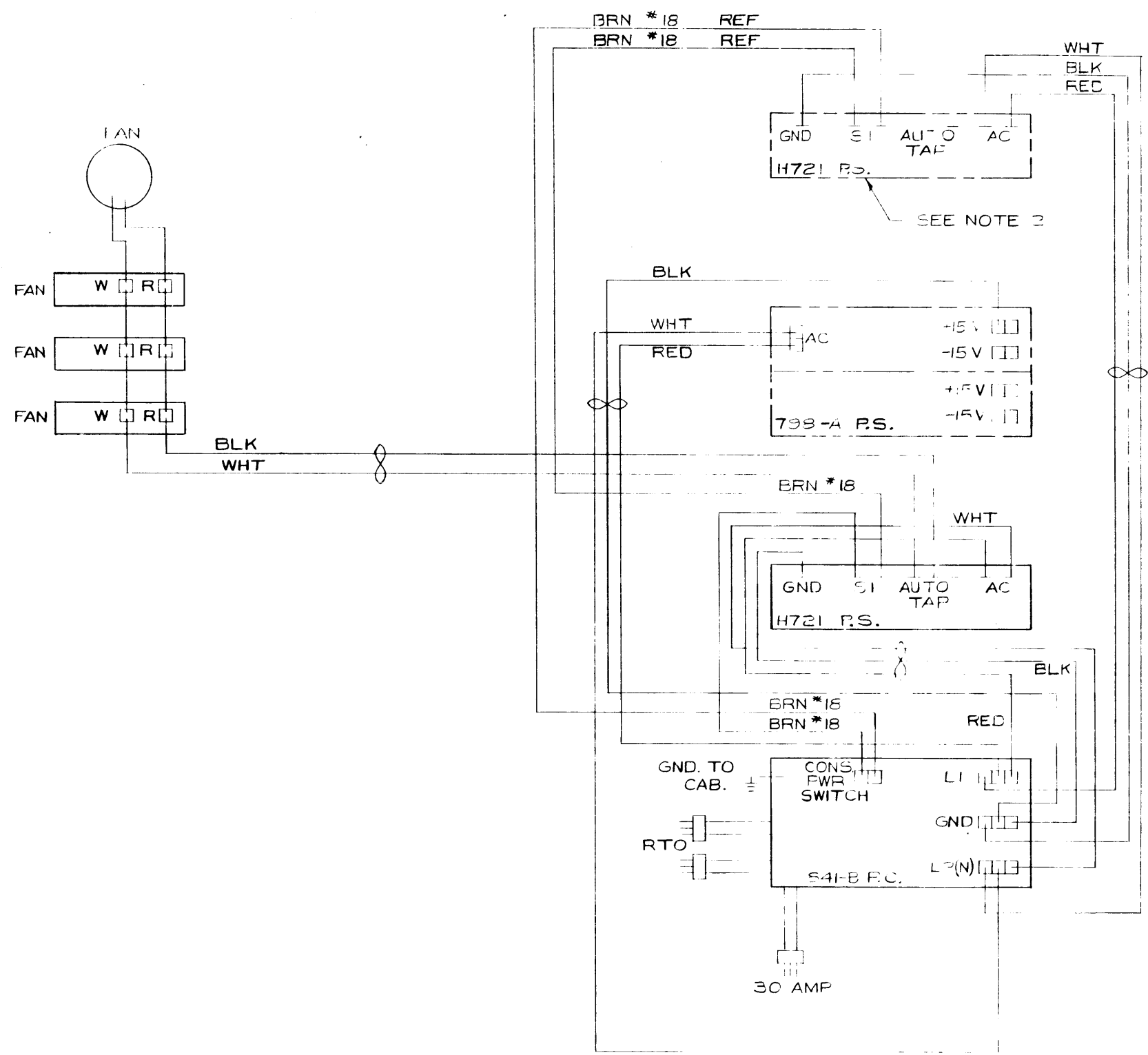
DATE	DATE	DATE	DATE	DATE
9/11/70	9/11/70	9/11/70	9/11/70	9/11/70

DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST		
digital EQUIPMENT CORPORATION		
TITLE		
MX15 ASSEMBLY		
SCALE	NONE	
SHEET	1 OF 4	
SIZE CODE	DUA	
NUMBER	MX15-0-0	
REV.	B	

These drawings and specifications herein are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

NOTES FOR AC-DC PWR WIRING

1. ALL WIRING IS #14 GAUGE EXCEPT WHERE SPECIFIED.
2. IF TOPHT21 POWER SUPPLY IS NOT USED, JUMP S1 TOGETHER WITH MALE FASTON CONNECTOR (ITEM #10).
3. * TWIST GRN/BLK TWP WITH GRN/BLK TWP.
** TWIST WITH RED/BLU TWP.
4. ALL POWER SUPPLY WIRING (AC-DC) WILL BE WIRED TO MAXIMUM CONFIGURATION.
5. FOR LOCATION OF UNITS SHOWN IN PHANTOM LINES REFER TO D-AD-7006863-0-0.
6. ADD ALL -30 V DC WIRING AT ONE TIME.

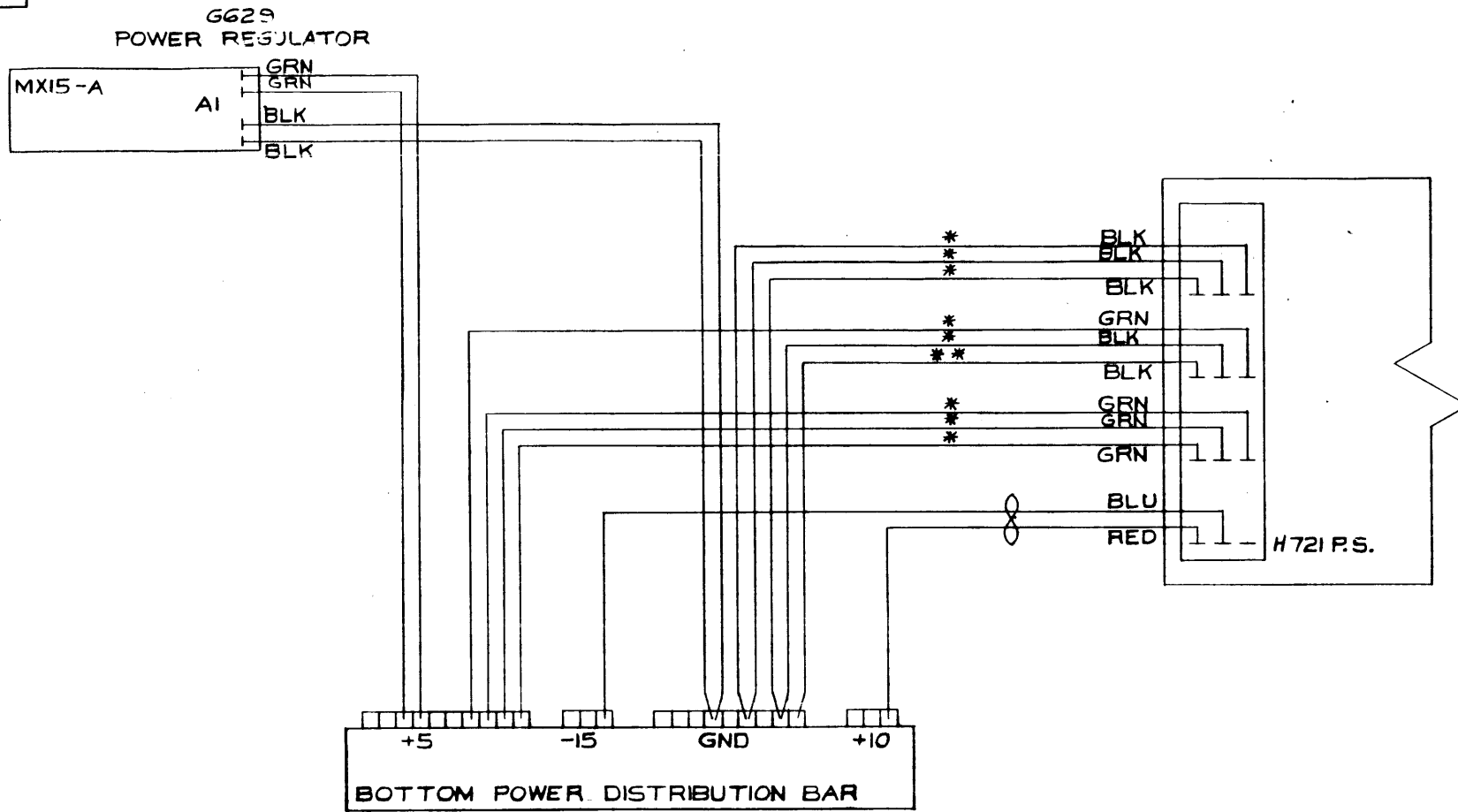


AC WIRING

REV.	CHANGE NO.	REVISIONS

FIRST USED ON	QTY.	DESCRIPTION	PART NO.	ITEM NO.
MX15				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED	DRN. <i>W.E. McCarthy</i>	DATE <i>3/20/70</i>	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	
UNLESS OTHERWISE SPECIFIED	CH'D.	DATE	TITLE	
TOLERANCES	ENG. <i>W.E. McCarthy</i>	DATE	MX15 ASSEMBLY	
DECIMALS ± .005	PROJ. ENG.	DATE	SIZE CODE	
FRACTIONS ± 1/64	PROD.	DATE	NUMBER	
ANGLES ± 0°30'			DJA MX15 C C	
FINAL SURFACE QUALITY			REV. B	
REMOVE BURRS AND BREAK SHARP CORNERS			SCALE	
			SHEET OF 4	
			DIST. C	

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

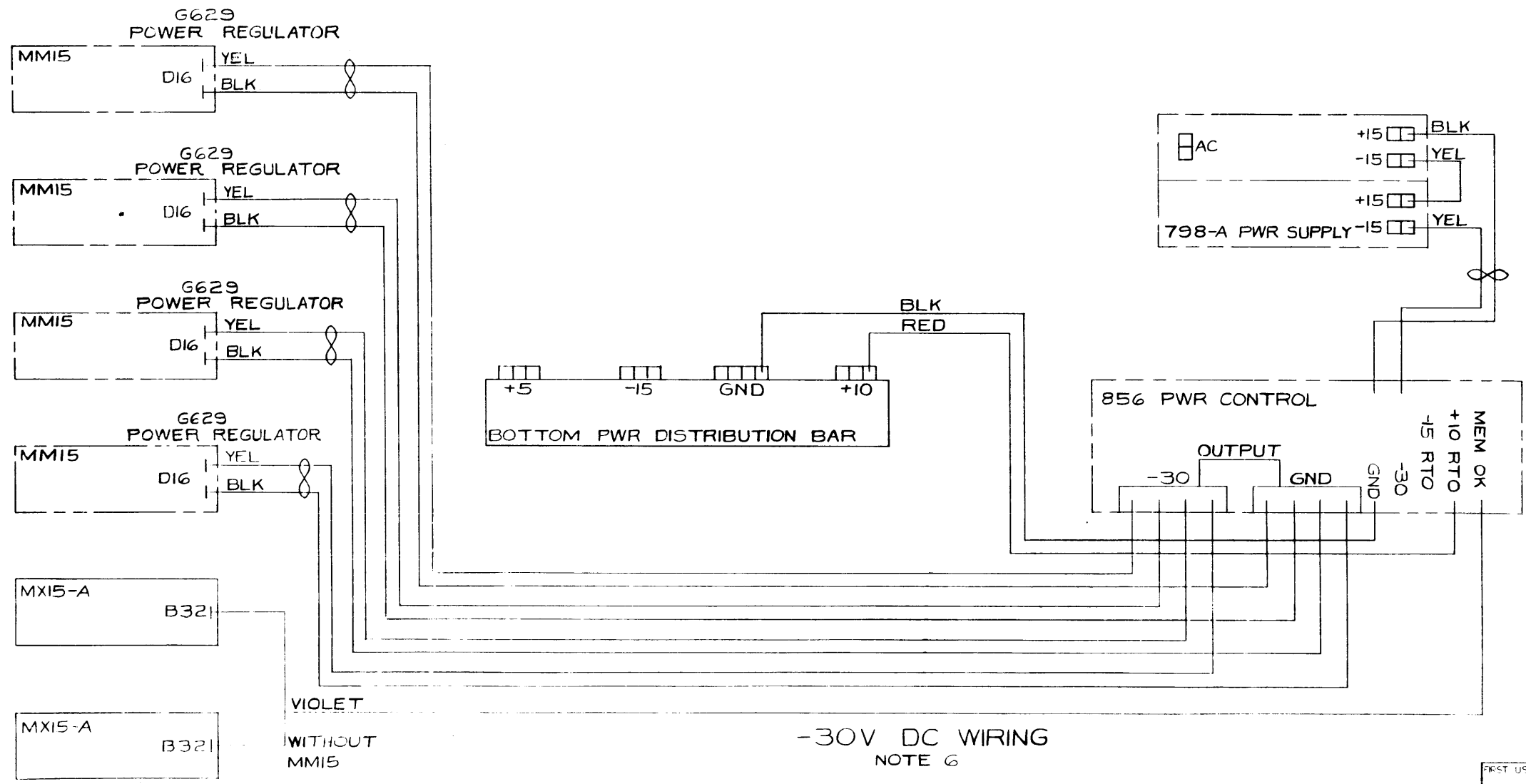


DC WIRING

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
MX15				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED		DRN <i>W.F. McCarthy</i>	DATE <i>4/1/70</i>	digital EQUIPMENT CORPORATION <small>WAYNARD MASSACHUSETTS</small> MX15 ASSEMBLY
UNLESS OTHERWISE SPECIFIED		CHKD <i>W. Lamberson</i>	DATE <i>5/12/70</i>	
UNLESS OTHERWISE SPECIFIED		ENG <i>R.J. Bennett</i>	DATE <i>5/14/70</i>	
UNLESS OTHERWISE SPECIFIED		PROV <i>R.C. Gray</i>	DATE <i>5/13/70</i>	
UNLESS OTHERWISE SPECIFIED		PROD <i>R. Bennett</i>	DATE <i>5-14-70</i>	
MATERIAL		NEXT HIGHER ASSY		
FINISH		D-AD-7006863-0-0		
SCALE		SHEET 3 OF 4		
SHEET		SIZE CODE		
DUA		NUMBER		
MX15-0-0		REV		
B		DIST.		

REV	
CHANGE NO.	
CHK	

This drawing and specifications herein are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.



-30V DC WIRING
 NOTE 6

FIRST USED ON	QTY.	DESCRIPTION	PART NO.	ITEM NO.
MX15				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED	DRN	DATE	digital EQUIPMENT CORPORATION <small>MAYNARD, MASSACHUSETTS</small>	
UNLESS OTHERWISE SPECIFIED	CHK'D	DATE		
TOLERANCES	ENG	DATE		
DECIMALS FRACTIONS ANGLES	PROJ. ENG.	DATE		
= .005 = 1/64 = 0°30'	PROD.	DATE	TITLE MX15 ASSEMBLY	
FINAL SURFACE QUALITY				
REMOVE BURRS AND BREAK SHARP CORNERS				
MATERIAL			SIZE	REV
FINISH			SCALE	
			SHEET	

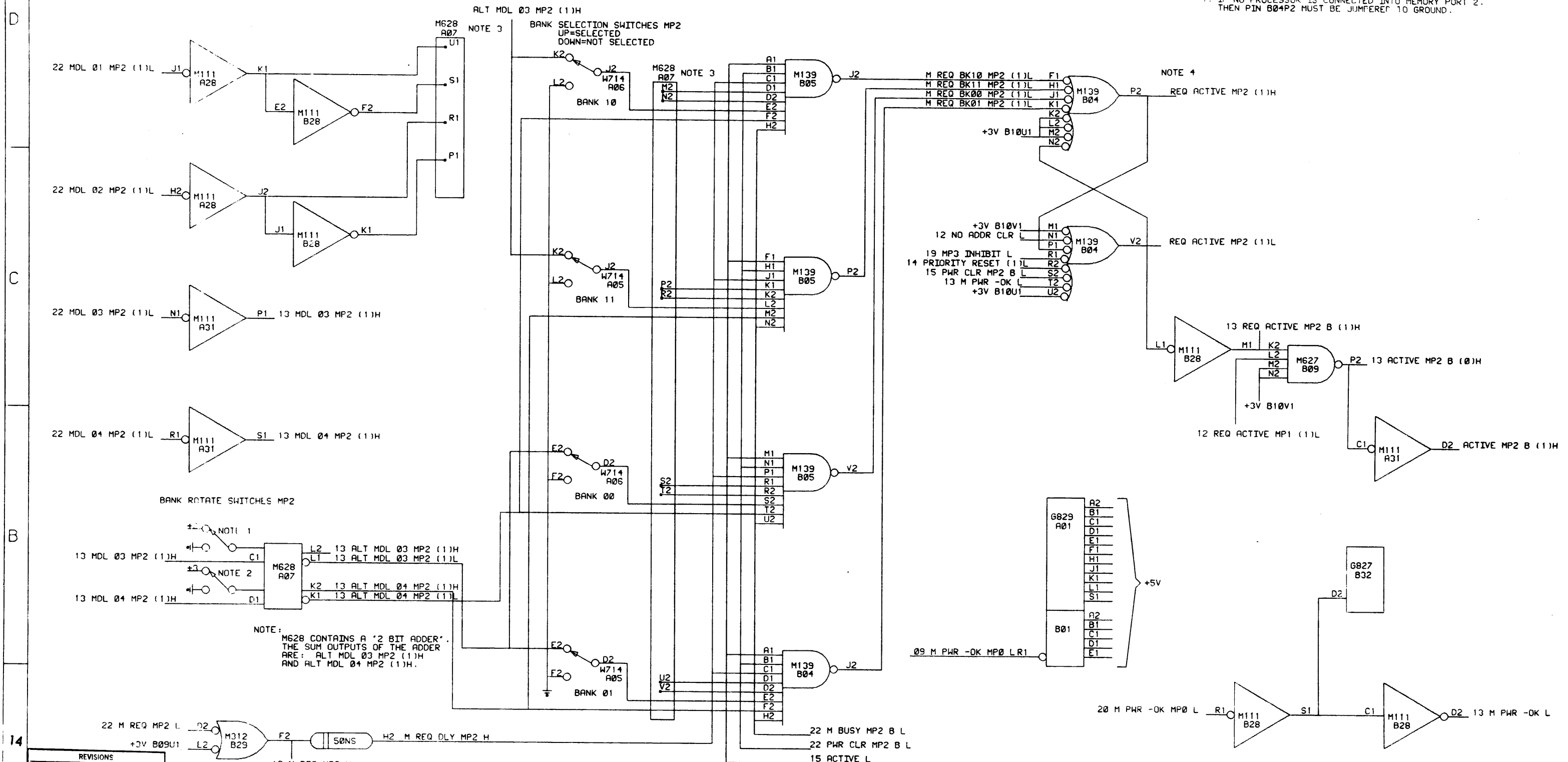
D
C
B
12
A

D
C
B
12
A

REV. 1
 NUMBER 0-0-91XW/110/2
 SIZE CODE 2

This drawing and specifications herein are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

- NOTES:
1. IN UP POSITION THIS ADDS (1) TO ADDRESS BIT 03 (16K).
 2. IN UP POSITION THIS ADDS (1) TO ADDRESS BIT 04 (8K).
 3. JUMPERS IN THE M628 MODULE CONNECT THE PROPER POLARITY OF BLOCK ADDRESS BITS (MDL01 AND MDL02) TO THE M139 ADDRESS DECODE GATES.
 4. IF NO PROCESSOR IS CONNECTED INTO MEMORY PORT 2, THEN PIN B04P2 MUST BE JUMPERED TO GROUND.

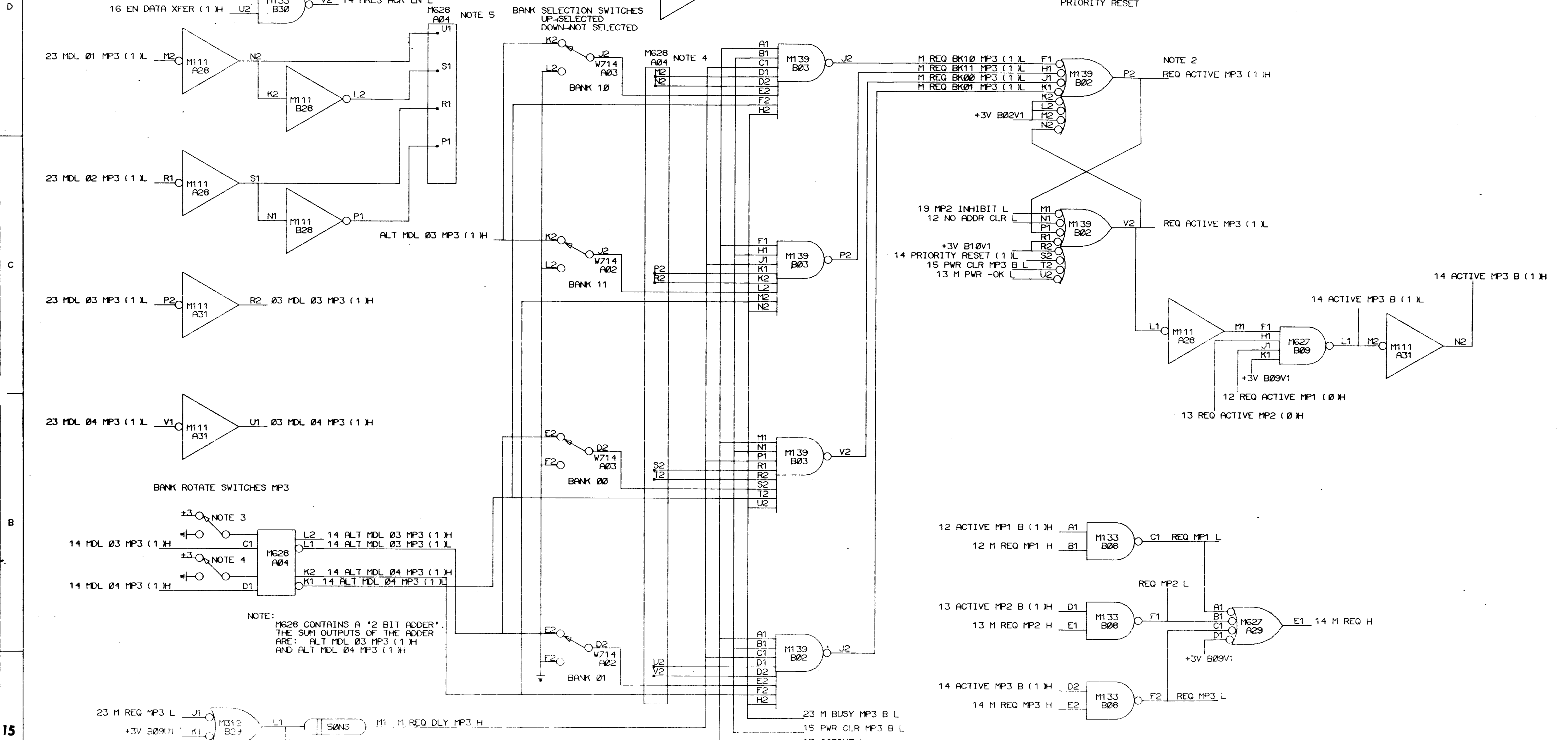


REVISIONS		
CHK	CHANGE NO.	REV.
	MX15A-00001	00
	ORIGINATED	

DRN	DATE	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D	DATE	
ENG	DATE	TITLE
PROJ. ENG.	DATE	PRIORITY LOGIC INPUT PORT 2
PROD.	DATE	
FIRST USED ON		
MX15		
SCALE	D 1/32	NUMBER MX15-A-13
SHEET 1 of 1	DIST	REV. 00

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part on the basis for the manufacture or sale of items without written permission.

- NOTES:
1. FOR EQUAL PRIORITY JUMPER A28V2 TO A30H2
 2. IF NO PROCESSOR IS CONNECTED TO MEMORY PORT 3 FIN B02P2 MUST BE GROUNDING WITH A JUMPER.
 3. IN UP POSITION THIS ADDS (1) TO ADDRESS BIT 03 [16K].
 4. IN UP POSITION THIS ADDS (1) TO ADDRESS BIT 04 [8K].
 5. JUMPERS IN THE M628 MODULE CONNECTS THE PROPER POLARITY OF BLOCK ADDRESS BITS [MDL01 AND MDL02] TO THE M139 ADDRESS DECODE GATES.



NOTE: M628 CONTAINS A *2 BIT ADDER*. THE SUM OUTPUTS OF THE ADDER ARE: ALT MDL 03 MP3 (1)H AND ALT MDL 04 MP3 (1)H

REVISIONS		
CHK	CHANGE NO.	REV.
	MX15A-00001	00
ADS	ORIGINATED	
JHN	MX15A-00004	A
	L.C. 12/24/71	

DRN. K. WALSH	DATE 10-29-70	digital CORPORATION MAYNARD, MASSACHUSETTS
CHK'D. G. HAVILLAND	DATE 10-30-70	
ENG. R. C. GRAY	DATE 10-30-70	PRIORITY LOGIC INPUT PORT 3
PROJ. ENG. B. J. BUNNY	DATE 10-30-70	
PROD. J. BUNNY	DATE 10-30-70	
FIRST USED ON		
NX11	SIZE CODE	NUMBER
SCALE	D BS	MX15A-14
SHEET 1 OF 1	DIST.	REV. A

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

D

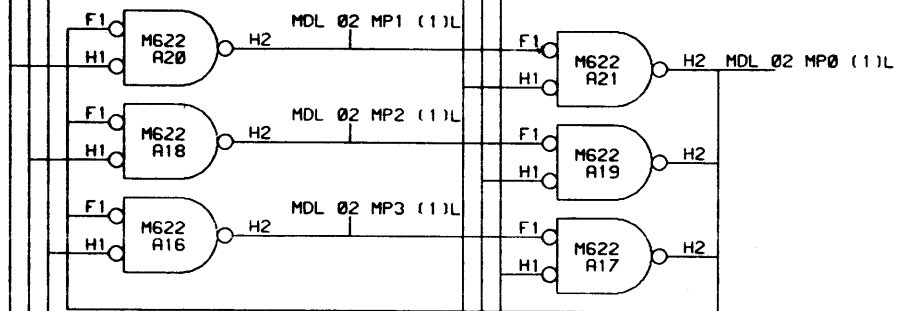
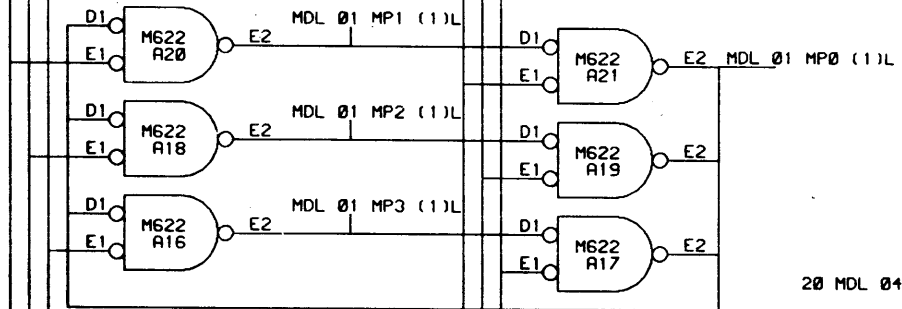
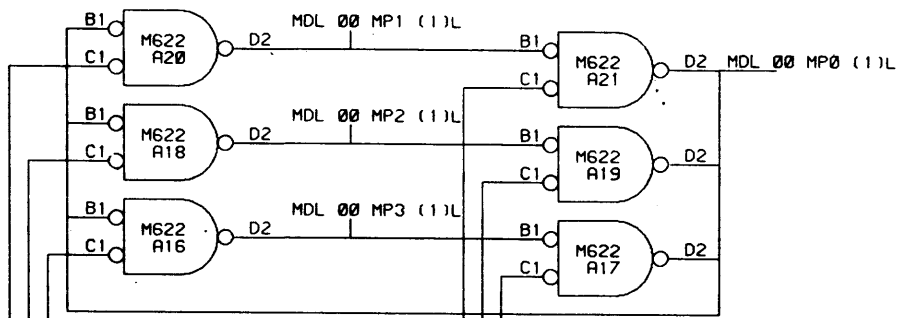
C

B

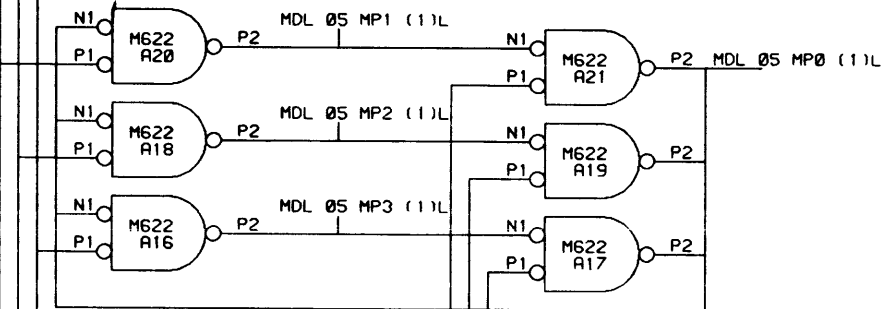
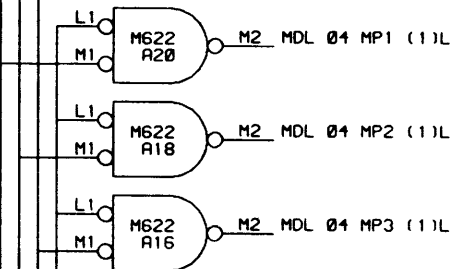
18

A

20 MDL 03 MP0 (1)L



12 MP3 DATA TO MEM (1)L
 12 MP2 DATA TO MEM (1)L
 12 MP1 DATA TO MEM (1)L



NOTE:
 1. ALL SIGNALS WITH NAMES
 "MDL** MP*" ARE BI-DIRECTIONAL

REVISIONS		
CHK	CHANGE NO.	REV.
	MX15A-00001	00
	ORIGINATED	

DRN.	DATE	 digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHN'D.	DATE	
ENG.	DATE	
PROJ. ENG.	DATE	
PROG.	DATE	
TITLE		MDL 0 THROUGH 8
FIRST USED ON		
MX15	SIZE CODE	NUMBER
SCALE	D BS	MX15-A-17
SHEET 1 OF 1	DIST.	REV. 00

8

7

6

5

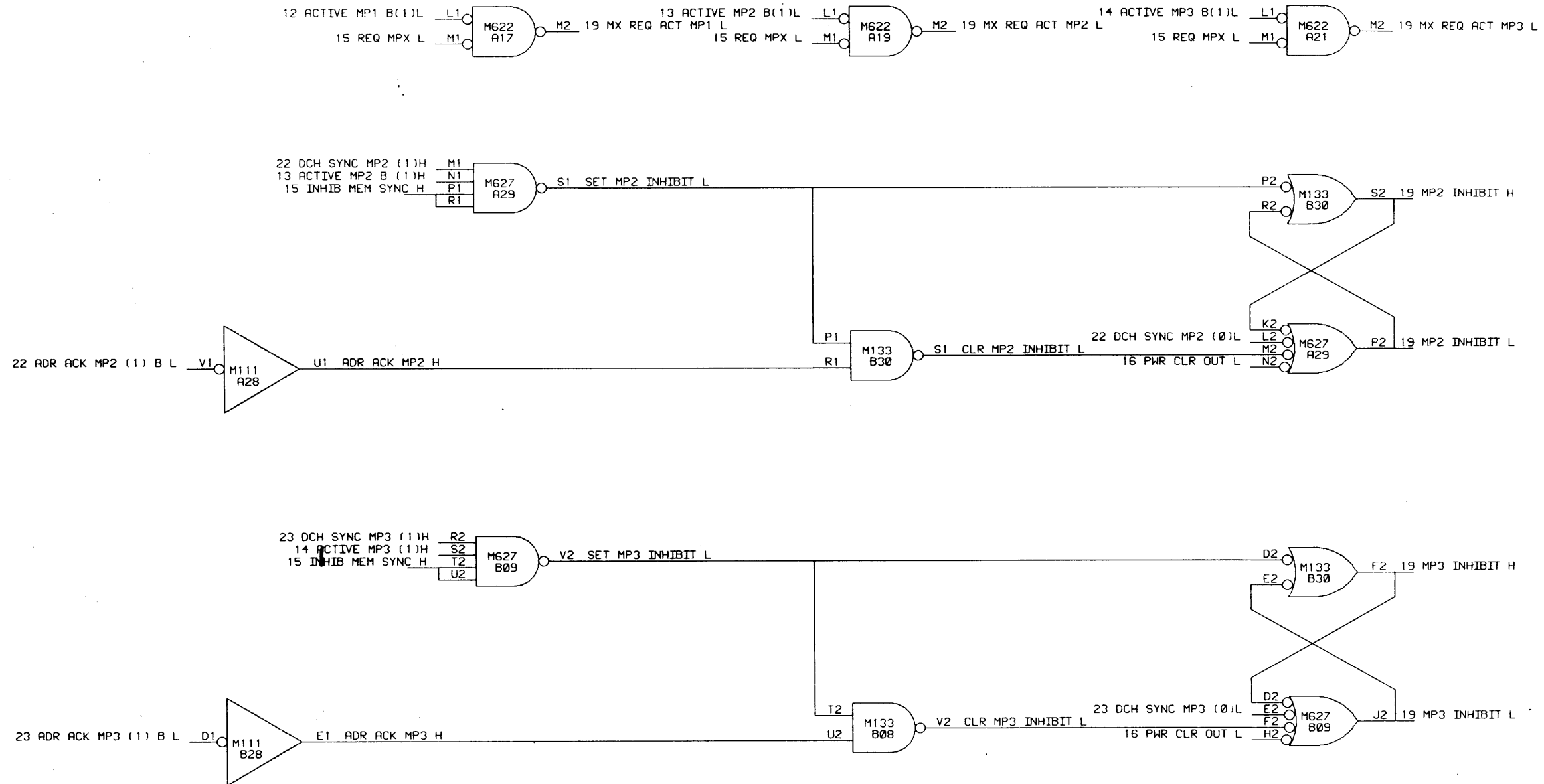
4

3

2

1

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.



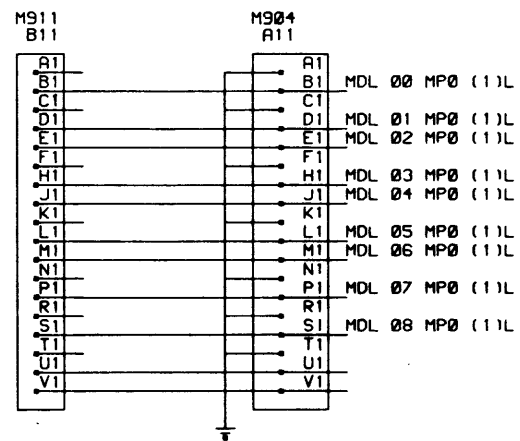
20

REVISIONS		
CHK	CHANGE NO.	REV.
	MX15A-00001	00
	ORIGINATED	
TC	MX15A-00003	A

DRN.	DATE	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS		
CHK'D.	DATE			
ENG.	DATE	TITLE INHIBIT LOGIC		
PROJ. ENG.	DATE			
PROD.	DATE			
FIRST USED ON	DATE			
MX15		SIZE CODE	NUMBER	REV.
SCALE	D BS	MX15-A-19	A	
SHEET	OF	DIST.		

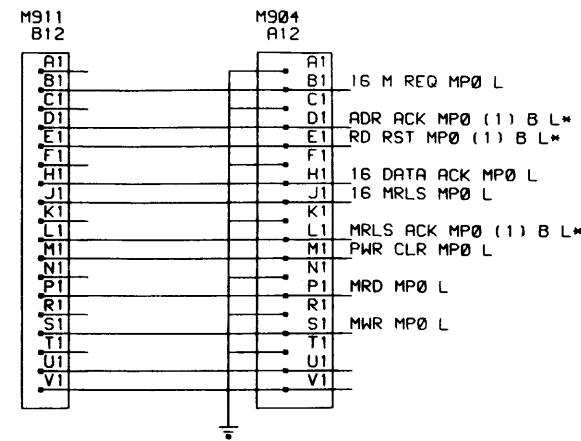
This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

TO MM15
MODULE SLOT
A02 OR B02



CORRESPONDING MM15 SIGNAL NAMES

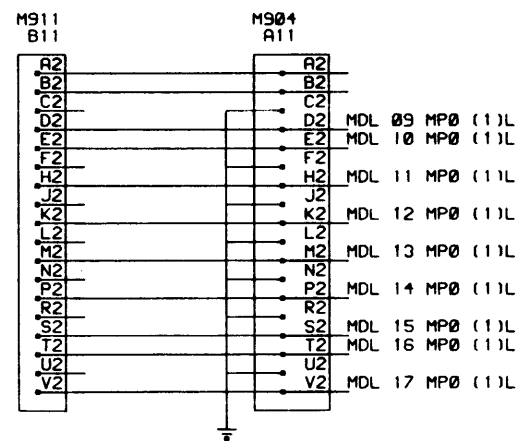
TO MM15
MODULE SLOT
A03 OR B03



CORRESPONDING MM15 SIGNAL NAMES

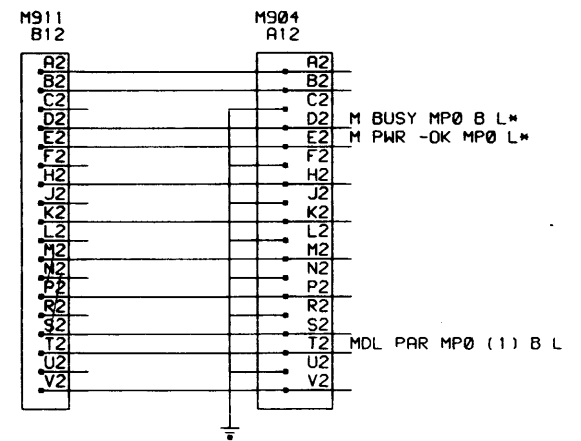
- NOTE:
- UP TO FOUR MM15'S MAY BE DAISY-CHAINED TO THE "MEMORY PORT OUT".
 - ALL "MDL" SIGNALS ARE BI-DIRECTIONAL.
 - SIGNALS WITH AN "*" FOLLOWING THE NAME ORIGINATE IN THE MM15 MEMORY SYSTEM.
 - ACTUAL CABLE GROUND WIRES ARE CONFIGURED FOR MINIMUM NOISE PICKUP AND HENCE DEVIATE FROM THIS DIAGRAM. FOR ACTUAL GROUND RUNS, SEE "MX15 WIRE LIST".

TO MM15
MODULE SLOT
A02 OR B02



CORRESPONDING MM15 SIGNAL NAMES

TO MM15
MODULE SLOT
A03 OR B03



CORRESPONDING MM15 SIGNAL NAMES

REVISIONS		
CHK	CHANGE NO.	REV.
	MX15A-00001	00
	ORIGINATED	

DRN.	DATE	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D.	DATE	
ENG.	DATE	TITLE
PROJ. ENG.	DATE	MEMORY PORT OUT
PROD.	DATE	
FIRST USED ON		
MX15	SIZE CODE	NUMBER
SCALE	D IC	MX15-R-20
SHEET 1 OF 1	DIST.	REV. 00

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the construction or sale of items without written permission.

D

C

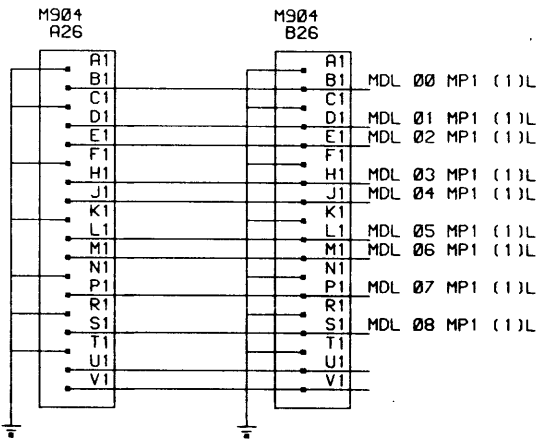
B

22

A

TO KP15
MODULE SLOT
J02 OR TO
PREVIOUS MX15

TO NEXT MX15
OR TERMINATE
WITH M902

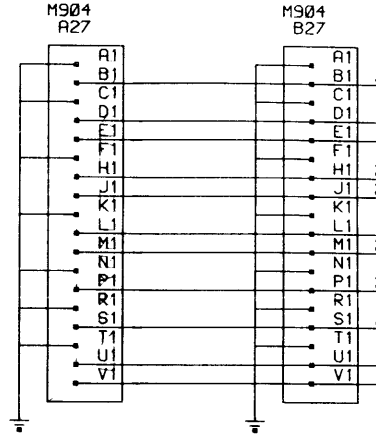


CORRESPONDING KP15 SIGNALS

- (KP27 MDL 00 L)
- (KP27 MDL 01 L)
- (KP27 MDL 02 L)
- (KP27 MDL 03 L)
- (KP27 MDL 04 L)
- (KP27 MDL 05 L)
- (KP27 MDL 06 L)
- (KP27 MDL 07 L)
- (KP27 MDL 08 L)

TO KP15
MODULE SLOT
J03 OR TO
PREVIOUS MX15

TO NEXT MX15
OR TERMINATE
WITH M902

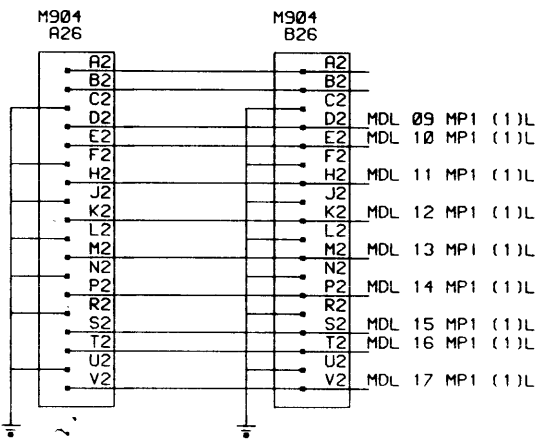


CORRESPONDING KP15 SIGNALS

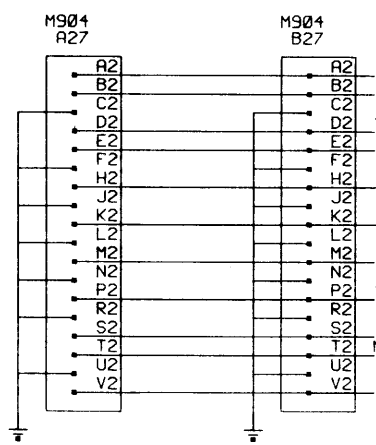
- (KP32 MREQ L)
- (KP27 ADR ACK B (1)L)
- (KP27 RD RST B (1)L)
- (KP32 DATA ACK L)
- (KP32 MRLS L)
- (KP27 MRLS ACK (B) L)
- (KP20 PWR CLR L)
- (KP32 MRD L)
- (KP32 MWR L)

NOTE:

1. 'MEMORY PORT 1' IS THE HIGHEST PRIORITY PORT INPUT. IT WILL NORMALLY BE CONNECTED TO THE KP15-A I/O PROCESSOR MEMORY BUS IF A KP15-A IS USED. IF A DMA CHANNEL (DIRECT MEMORY ACCESS) IS PROVIDED, IT WOULD BE CONNECTED TO MEMORY PORT 1.
2. ALL 'MDL' SIGNALS ARE BI-DIRECTIONAL.
3. SIGNALS WITH AN '*' FOLLOWING THE NAME ORIGINATE IN THE MM15 MEMORY SYSTEM.
4. ACTUAL CABLE GROUND WIRES ARE CONFIGURED FOR MINIMUM NOISE PICKUP AND HENCE DEVIATE FROM THIS DIAGRAM. FOR ACTUAL GROUND RUNS, SEE 'MX15 WIRE LIST'.



- (KP27 MDL 09 L)
- (KP27 MDL 10 L)
- (KP27 MDL 11 L)
- (KP27 MDL 12 L)
- (KP27 MDL 13 L)
- (KP27 MDL 14 L)
- (KP27 MDL 15 L)
- (KP27 MDL 16 L)
- (KP27 MDL 17 L)



- (KP27 SEQ (1)L)
- (KP57 POWER OK H)
- (KP27 TRAP L)
- (KP31 DEFER H)

REVISIONS		
CHK	CHANGE NO.	REV.
	MX15A-00001	00
	ORIGINATED	
7C	MX15A-00003	A
	RC Gray	2/78

DRN K. WASH	DATE 10-29-0	<p>digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS</p>
CHK'D C. HILLMAN	DATE 10-27-0	
ENG. H. CRAY	DATE 10-17-0	
PROJ. ENG. H. CRAY	DATE 10-31-0	
PROD. C. BURR	DATE 10-31-0	
FIRST USED ON		TITLE MEMORY PORT 1
MX15	SCALE D IC	NUMBER MX15-A-21
SHEET 1	OF 1	REV. A

8

7

6

5

4

3

2

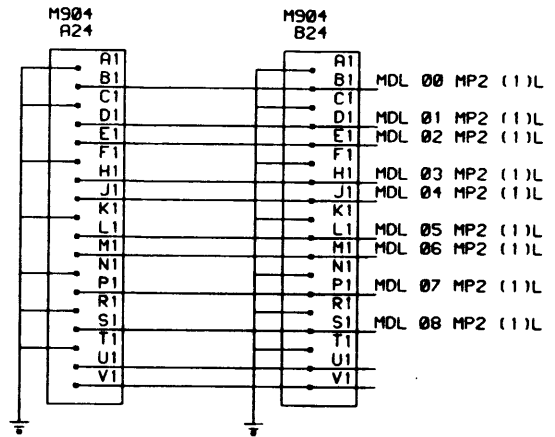
1

11/78

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

TO KP15
MODULE SLOT
J02 OR TO
PREVIOUS MX15

TO NEXT MX15
OR TERMINATE
WITH M902

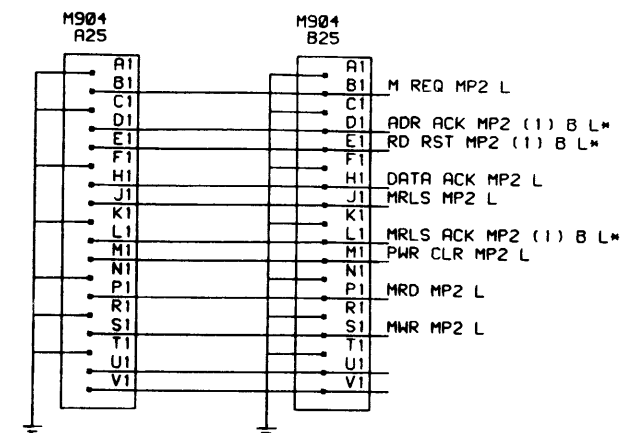


CORRESPONDING KP15 SIGNALS

- (KP27 MDL 00 L)
- (KP27 MDL 01 L)
- (KP27 MDL 02 L)
- (KP27 MDL 03 L)
- (KP27 MDL 04 L)
- (KP27 MDL 05 L)
- (KP27 MDL 06 L)
- (KP27 MDL 07 L)
- (KP27 MDL 08 L)

TO KP15
MODULE SLOT
J03 OR TO
PREVIOUS MX15

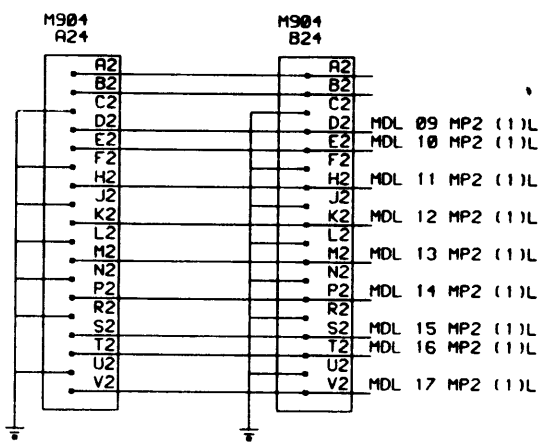
TO NEXT MX15
OR TERMINATE
WITH M902



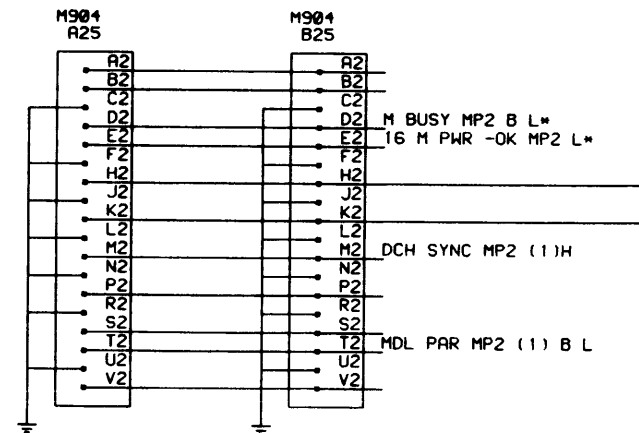
CORRESPONDING KP15 SIGNALS

- (KP32 MREQ L)
- (KP27 ADR ACK B (1)L)
- (KP27 RD RST B (1)L)
- (KP32 DATA ACK L)
- (KP32 MRLS L)
- (KP27 MRLS ACK (B) L)
- (KP20 PWR CLR L)
- (KP32 MRD L)
- (KP32 MWR L)

- NOTE:
1. "MEMORY PORT 2" IS THE SECOND HIGHEST PRIORITY INPUT PORT.
 2. ALL "MDL" SIGNALS ARE BI-DIRECTIONAL.
 3. SIGNALS WITH AN "M" FOLLOWING THE NAME ORIGINATE IN THE MM15 MEMORY SYSTEM.
 4. ACTUAL CABLE GROUND WIRES ARE CONFIGURED FOR MINIMUM NOISE PICKUP AND HENCE DEVIATE FROM THIS DIAGRAM. FOR ACTUAL GROUND RUNS, SEE "MX15 WIRE LIST".



- (KP27 MDL 09 L)
- (KP27 MDL 10 L)
- (KP27 MDL 11 L)
- (KP27 MDL 12 L)
- (KP27 MDL 13 L)
- (KP27 MDL 14 L)
- (KP27 MDL 15 L)
- (KP27 MDL 16 L)
- (KP27 MDL 17 L)



- (KP27 SEQ (1)L)
- (KP57 POWER OK H)
- (KP27 TRAP L)
- (KP31 DEFER H)
- (KP51 DCH SYNC B L)

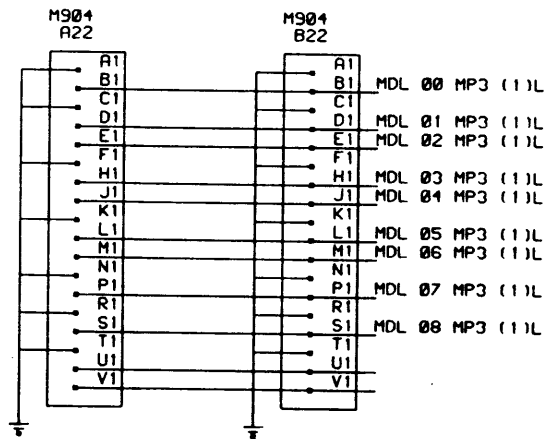
REVISIONS		
PK	CHANGE NO.	REV.
	MX15A-00001	00
	ORIGINATED	

DRN.	DATE	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D.	DATE	
ENG.	DATE	TITLE
PROJ. ENG.	DATE	MEMORY PORT 2
PROB.	DATE	
FIRST USED ON		
MX15		
SCALE	D IC	NUMBER
SHEET 1 OF 1	DIST.	REV. 00

The drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or used in whole or in part on any basis for the manufacture or sale of items without written permission.

TO KP15
MODULE SLOT
J02 OR TO
PREVIOUS MX15

TO NEXT MX15
OR TERMINATE
WITH M902

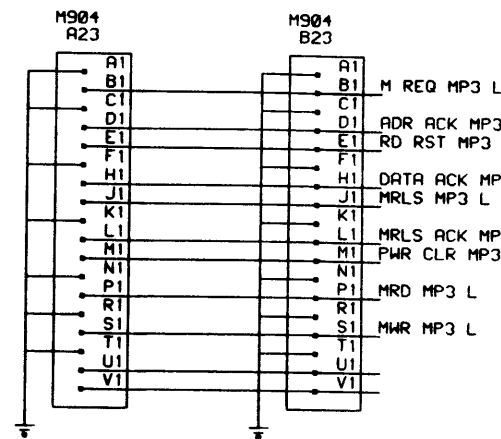


CORRESPONDING KP15 SIGNALS

- (KP27 MDL 00 L)
- (KP27 MDL 01 L)
- (KP27 MDL 02 L)
- (KP27 MDL 03 L)
- (KP27 MDL 04 L)
- (KP27 MDL 05 L)
- (KP27 MDL 06 L)
- (KP27 MDL 07 L)
- (KP27 MDL 08 L)

TO KP15
MODULE SLOT
J03 OR TO
PREVIOUS MX15

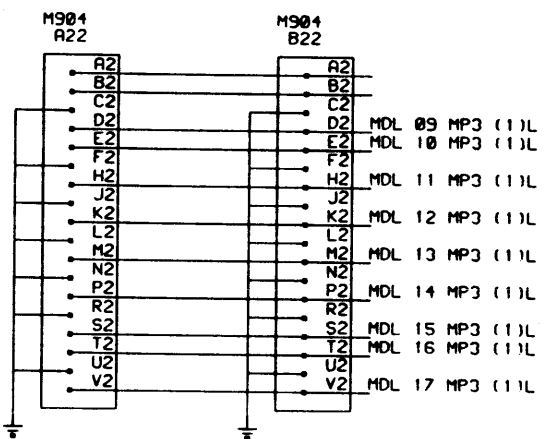
TO NEXT MX15
OR TERMINATE
WITH M902



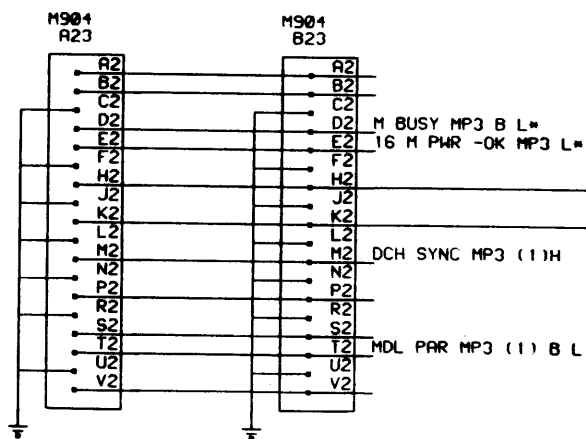
CORRESPONDING KP15 SIGNALS

- (KP32 MREQ L)
- (KP27 ADR ACK B (1) L)
- (KP27 RD RST B (1) L)
- (KP32 DATA ACK L)
- (KP32 MRLS L)
- (KP27 MRLS ACK (B) L)
- (KP20 PWR CLR L)
- (KP32 MRD L)
- (KP32 MWR L)

- NOTE:
1. MEMORY PORT 3 IS THE LOWEST PRIORITY INPUT PORT.
 2. ALL "MDL" SIGNALS ARE BI-DIRECTIONAL.
 3. SIGNAL WITH AN "*" FOLLOWING THE NAME ORIGINATE IN THE MM15 MEMORY SYSTEM.
 4. ACTUAL CABLE GROUND WIRES ARE CONFIGURED FOR MINIMUM NOISE PICKUP AND HENCE DEVIATE FROM THIS DIAGRAM. FOR ACTUAL GROUND RUNS, SEE "MX15 WIRE LIST".



- (KP27 MDL 09 L)
- (KP27 MDL 10 L)
- (KP27 MDL 11 L)
- (KP27 MDL 12 L)
- (KP27 MDL 13 L)
- (KP27 MDL 14 L)
- (KP27 MDL 15 L)
- (KP27 MDL 16 L)
- (KP27 MDL 17 L)



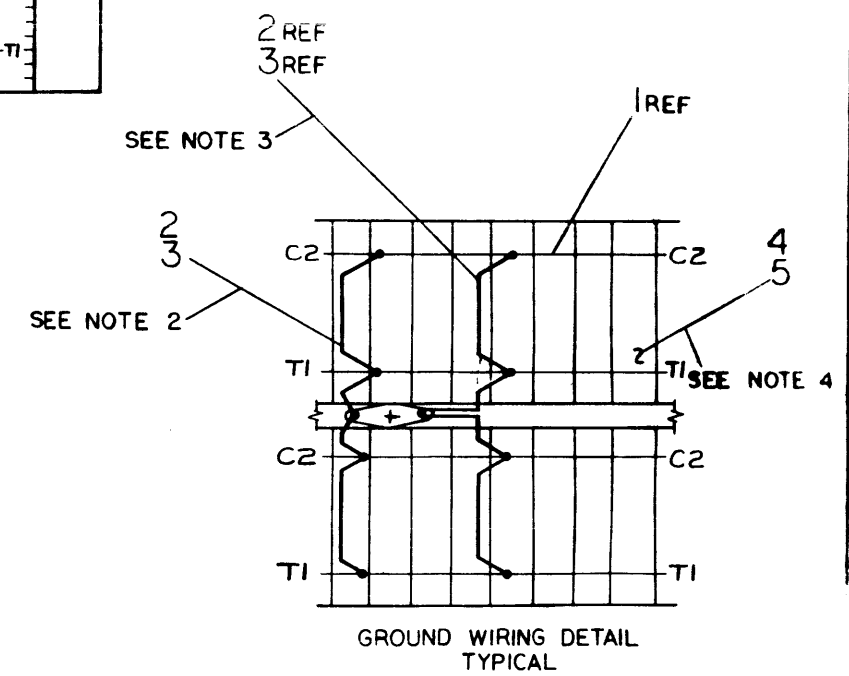
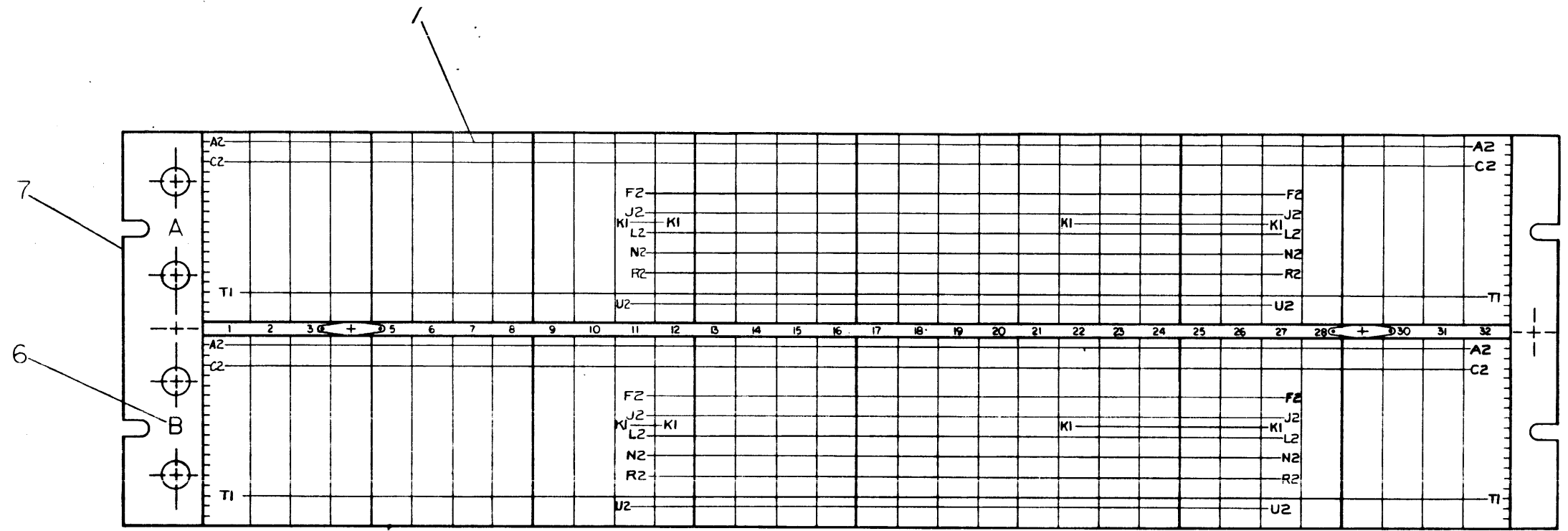
- (KP27 SEQ (1) L)
- (KP57 POWER OK H)
- (KP27 TRAP L)
- (KP31 DEFER H)
- (KP51 DCH SYNC B L)

REVISIONS		
CHK	CHANGE NO.	REV.
--	MX15A-00001	00
	ORIGINATED	

DRN. <i>John Wiley</i>	DATE <i>10/20/70</i>		TITLE
CHFD. <i>W. H. ...</i>	DATE <i>10/20/70</i>		MEMORY PORT 3
ENR. <i>...</i>	DATE <i>10/20/70</i>		
PROJ. ENR. <i>...</i>	DATE <i>10/20/70</i>		
PROJ. <i>...</i>	DATE <i>10/20/70</i>		
FIRST USED ON		SIZE CODE	NUMBER
MX15		D IC	MX15-A-23
SCALE		DIST.	REV.
SHEET 1 OF 1			00

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

- NOTES:
1. CONNECTIONS ON ITEM NUMBER 1 & 2 TO BE LOCATED AND SOLDERED AT MINIMUM PRACTICAL HEIGHT ABOVE BLOCKS.
 2. ALL CONNECTOR BLOCKS TO BE GROUNDED TO GROUND LUGS AS SHOWN, 2 PLACES.
 3. JUMPER GROUND BUSSING AS SHOWN, 8 PLACES.
 4. USE YELLOW WIRE (ITEM #4) FOR MACHINE WRAPPED AND BLUE WIRE (ITEM #5) FOR HAND WRAPPED WIRING.

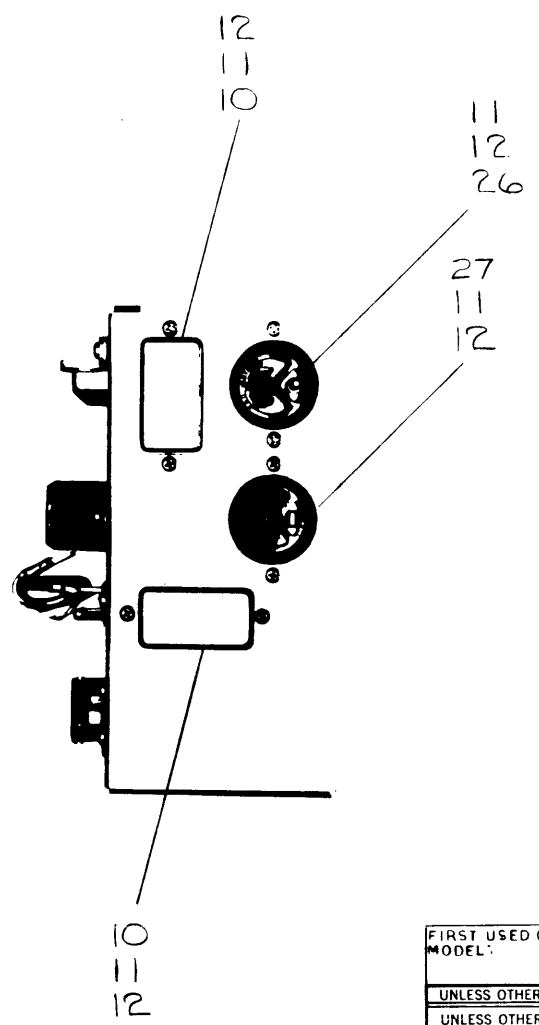
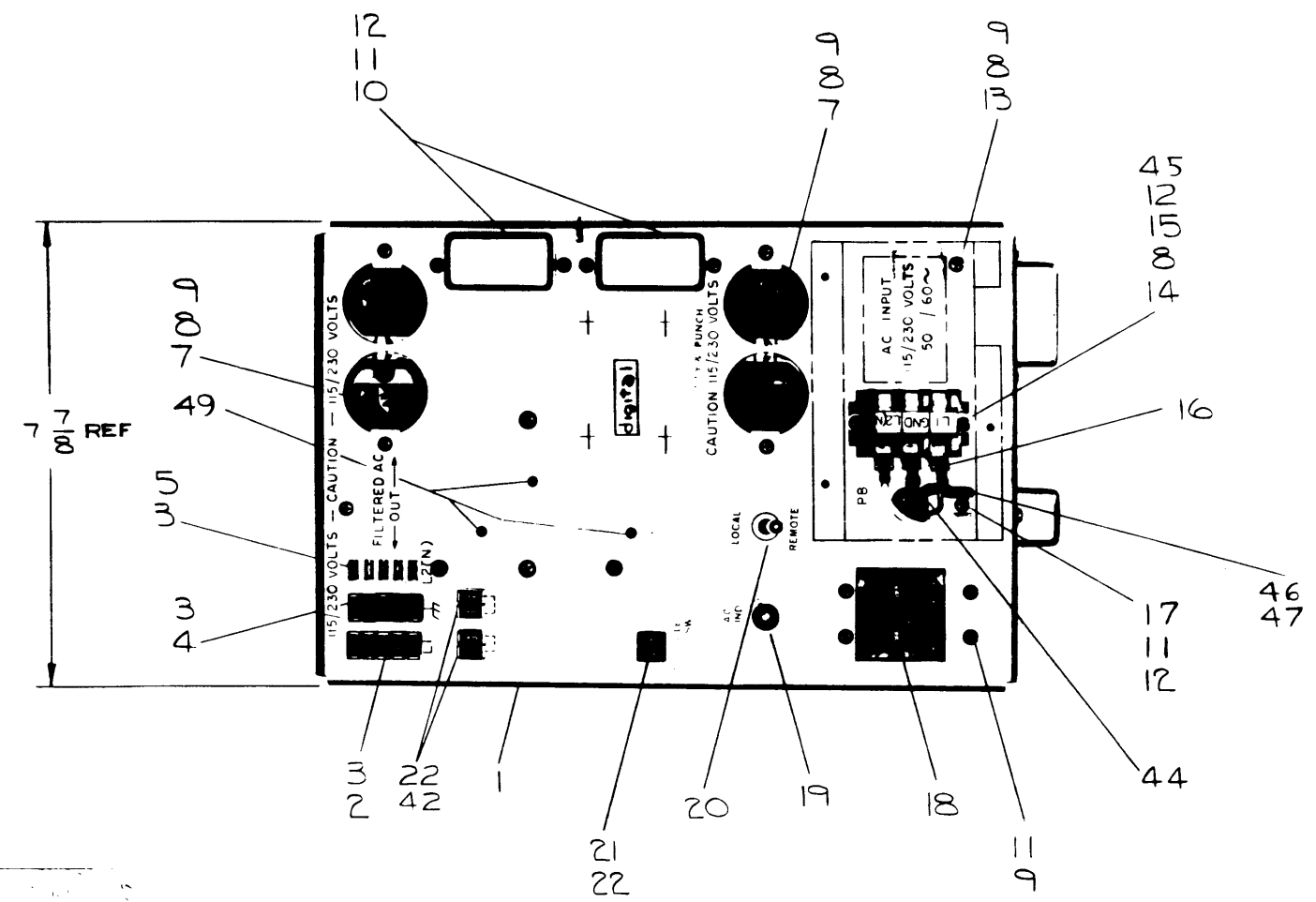
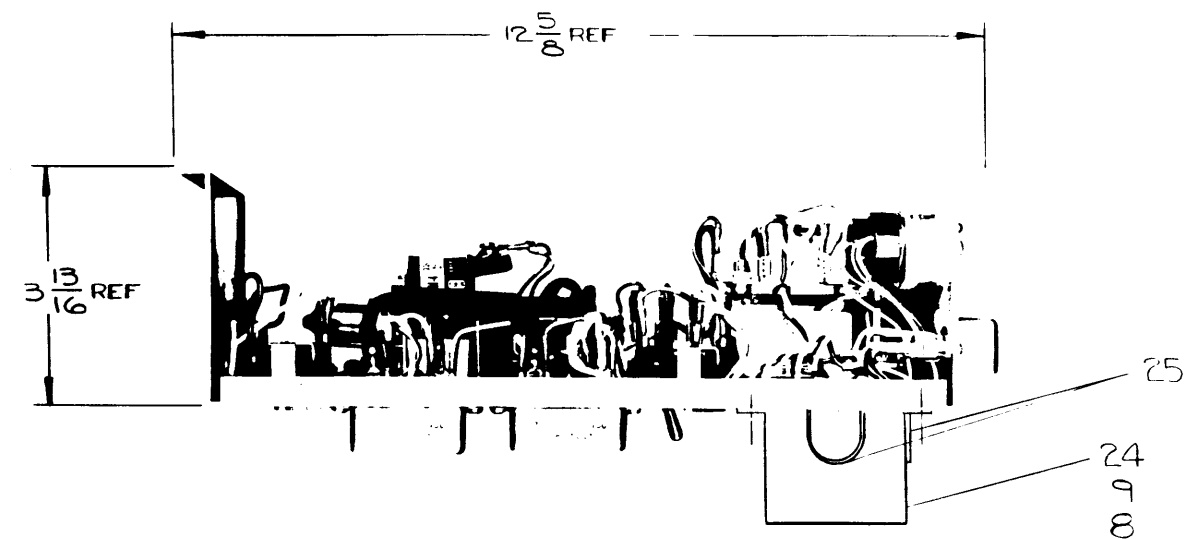


FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.
MX15 - A			
PARTS LIST			
DO NOT SCALE DRAWING	DRN. <i>W.F. McCarthy</i>	DATE <i>9/28/70</i>	 digital EQUIPMENT CORPORATION <small>MAYNARD, MASSACHUSETTS</small>
UNLESS OTHERWISE SPECIFIED	CHK'D. <i>W.F. McCarthy</i>	DATE <i>5/12/70</i>	
DIMENSION IN INCHES	ENG. <i>Cheney</i>	DATE <i>4/1/70</i>	
TOLERANCES	PROJ. ENG. <i>W.F. McCarthy</i>	DATE <i>7/1/70</i>	
DECIMALS ± .005	PROP. <i>W.F. McCarthy</i>	DATE <i>5/12/70</i>	
FRACTIONS ± 1/64			TITLE
ANGLES ± 0°30'			WIRED ASS'Y (MX15 - A)
FINAL SURFACE QUALITY			NUMBER
REMOVE BURRS AND BREAK SHARP CORNERS			D AD 7006862-0-0
MATERIAL	NEXT HIGHER ASSY		REV.
	D-UA-MX15-0-0		
FINISH	SCALE NONE		
	SHEET 1 OF 1		

116
 116
 116

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced, stored in a retrieval system, or used in whole or in part as the basis for the manufacture or sale of items similar to those herein.

LEGEND	
NUMBER	VARIATION
841-B	MERCURY RELAY
841-C	DRY CONTACT RELAY

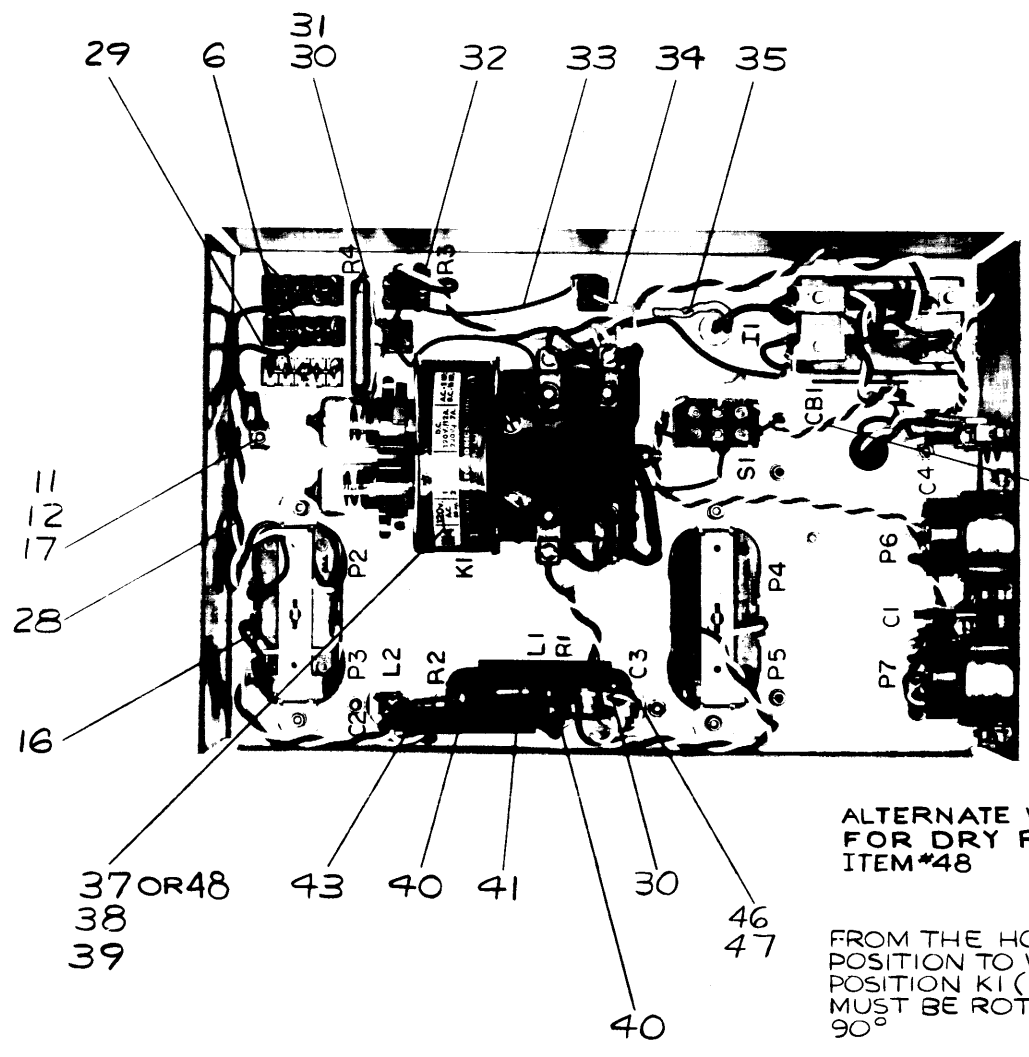


REV	CHANGE NO.	DATE

FIRST USED ON OPTION/ MODEL	QTY	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST				
UNLESS OTHERWISE SPECIFIED	DRN	DATE	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	
UNLESS OTHERWISE SPECIFIED	CHK'D	DATE	TITLE	
TOLERANCES	ENG	DATE	POWER CONTROL	
DECIMALS ± .005	FRAC'TIONS ± 1/64	ANGLES 0-90	841-B	
FINAL SURFACE QUALITY			841-C	
REMOVE BURRS AND BREAK SHARP CORNERS			NUMBER	
MATERIAL	FINISH	SCALE	REV.	
			DUA 841 B Ø	
SHEET 1 OF 1				

REV. B
NUMBER UA 841-B-Ø

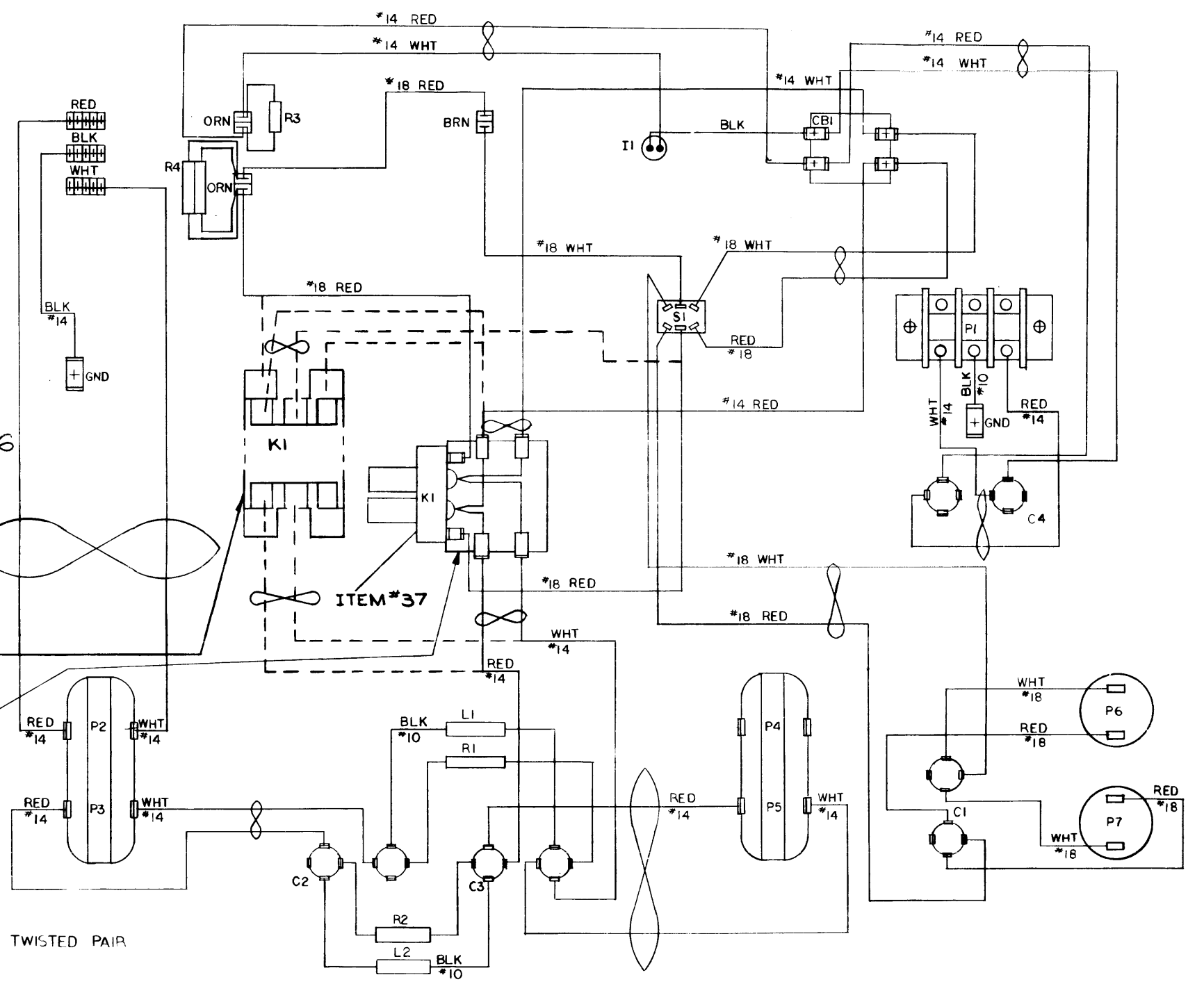
This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.



ALTERNATE WIRING FOR DRY RELAY ITEM #48

FROM THE HORIZ POSITION TO VERT POSITION KI (EM-4) MUST BE ROTATED 90°

INDICATES TWISTED PAIR



WIRING DIAGRAM

REV.	
CHANGE NO.	
CHK	

FIRST USED ON OPTION / MODEL:	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST				
UNLESS OTHERWISE SPECIFIED	DRN	DATE	digital EQUIPMENT CORPORATION MAINARD, MASSACHUSETTS	
UNLESS OTHERWISE SPECIFIED	CHK'D	DATE		
TOLERANCES	ENG	DATE		
DECIMALS FRACTIONS ANGLES	PRD'G	DATE		
FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS	PRD	DATE		
MATERIAL	NET	ASSEMBLY	TITLE POWER CONTROL 841-B 841-C	
FINISH	SCALE	OF	SIZL CODE	NUMBER
	SHEET	OF	D J A 8 4 1 B 0	REV.

REV. B
PART NUMBER
DUA841-B-0

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

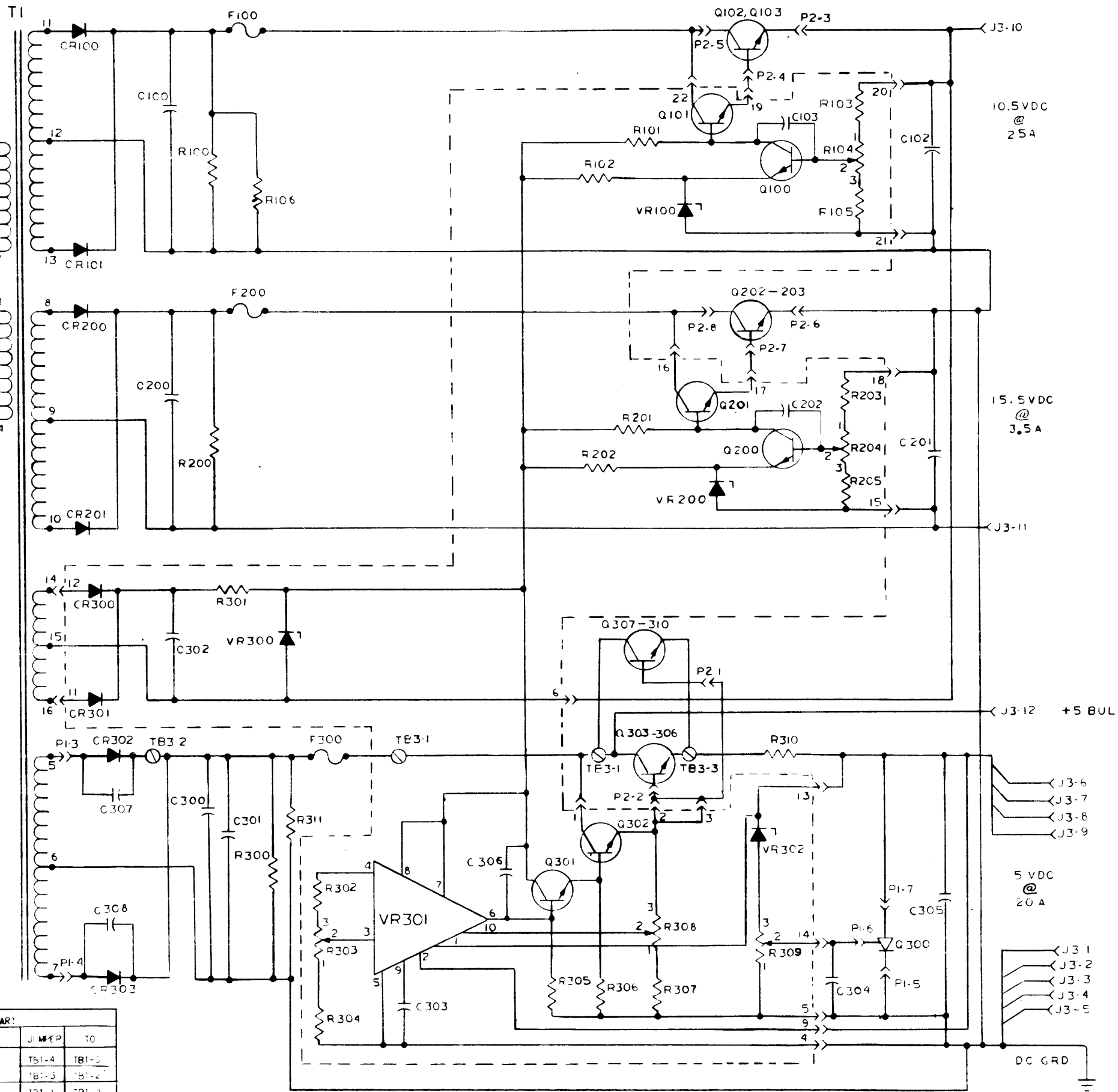
D

C

B

28

A



INPUT	CONNECTION	JUMPER	TO
220 VAC	TB2-1 AND TB2-2	TB1-4	TB1-5
		TB1-3	TB1-2
110 VAC	TB2-1 AND TB2-4	TB1-1	TB1-3
		TB1-2	TB1-4
		TB1-5	TB1-5

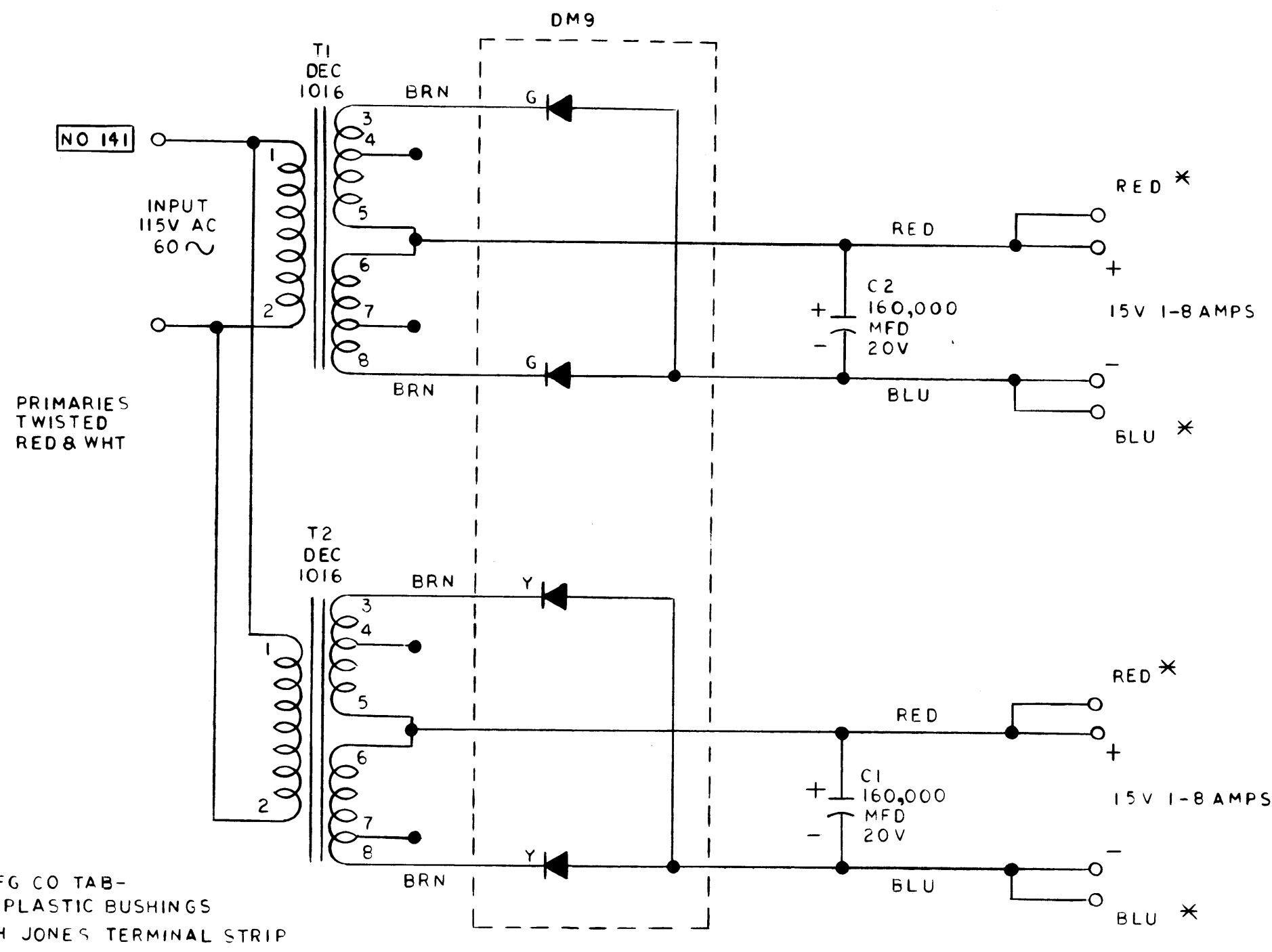
(NORTH ELECTRIC)

COMPONENT CHART

CKT. REF.	DESCRIPTION	PART NO.	VENDOR
A1	P. C. CARD ASS'Y.	618 1979	
B1	FAN	312 0020	
C100	CAPACITOR 12,000 MFD @ 30 VDC	304 2159	
Q102, 201	CAPACITOR 100 MFD @ 25 VDC	304 1282	
Q103, 202	CAPACITOR 0.0068 MFD @ 100 VDC	304 0992	
C200	CAPACITOR 19,000 MFD @ 40 VDC	304 2170	
C307, 308	CAPACITOR 1.0 MFD @ 50 VDC	304 1106	
C306	CAPACITOR 0.001 MFD @ 100 VDC	304 0714	
C300, 301	CAPACITOR 50,000 MFD @ 25 VDC	304 2153	
C302	CAPACITOR 500 MFD @ 25 VDC	304 1363	
C303	CAPACITOR 0.0022 MFD @ 100 VDC	304 1048	
C304	CAPACITOR 0.68 MFD @ 35 VDC	304 1332	
C305	CAPACITOR 390 MFD @ 10VDC	304 1397	
T1	TRANSFORMER	602 2264	
CR100, 101	DIODE BRIDGE	337 1558	
CR200, 201	"	"	
CR300, 301	DIODE 1N645	337 1363	
CR302, 303	DIODE 1N1185A	337 1329	
F100	FUSE 3A AGC	315 0049	
F200	FUSE 5A AGC	315 0242	
F300	FUSE 25A AGC	315 0093	
F400	FUSE 12A ABC	315 0218	
Q302	TRANSISTOR 2N3055	370 0202	
Q100, 200	TRANSISTOR 2N1613	370 0072	
Q301	"	"	
Q101, 201	TRANSISTOR 2N3054	370 0223	
Q303-310	TRANSISTOR 2N3055	370 0219	
Q102, 103	"	"	
Q202, 203	"	"	
Q300	S. C. R. C30U	337 1560	
R100, 106	RESISTOR 2600 5 W. 1%	340 1732	
R101	RESISTOR 5600 1 W. 5%	340 0619	
R102, 201	RESISTOR 15000 1 W. 5%	340 0629	
R103	RESISTOR 6800 1/2 W. 1%	340 6111	
R104, 204	POT. 5000 3/4 W. ±10%	341 0656	
R303, 308	"	"	
R105, 205	RESISTOR 9090 1/2 W. 1%	340 6279	
R200	RESISTOR 3000 10 W. 5%	340 1902	
R202	RESISTOR 2.7K 1 W. 5%	340 0635	
R203	RESISTOR 16900 1/2 W. 1%	340 6278	
R300, 311	RESISTOR 1000 10 W. 5%	340 1900	
R301	RESISTOR 620 2 W. 5%	340 0819	
R302	RESISTOR 7500 1/2 W. 1%	340 6113	
R304	RESISTOR 22100 1/2 W. 1%	340 6236	
R305	RESISTOR 2K 1/2 W. 5%	340 0160	
R306	RESISTOR 1K 1/2 W. 5%	340 0153	
R307	RESISTOR 6800 1/2 W. 5%	340 0149	
R309	POT. 500 3/4 W. ±20%	341 0657	
R310	RESISTOR 0.0250 25 W. ±3%	340 2966	
S1	THERMOSTAT	366 0430	
VR100, 200	ZENER 1N751A	337 1072	
VR300	"	"	
VR301	I.C. RES. UA723C	371 3001	
VR302	ZENER 1N749A	337 1241	

FIRST USED ON OPTION/MOD	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PDP-15				
UNLESS OTHERWISE SPECIFIED				
DIMENSION IN INCHES				
TOLERANCES				
DECIMALS	FRACTIONS	ANGLES		
±.005	± 1/64	± 0°30'		
FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS				
MATERIAL	NI AT HIGHER ASSY			
FINISH	SCALE			
SHEET OF				
PARTS LIST				
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS				
TITLE				
H721				
CIRCUIT SCHEMATIC				
SIZE CODE NUMBER				
D/C S H721-0-1				
REV.				
DIST.				

THIS SCHEMATIC IS FURNISHED ONLY FOR TEST AND MAINTENANCE PURPOSES. THE CIRCUITS ARE PROPRIETARY IN NATURE AND SHOULD BE TREATED ACCORDINGLY. COPYRIGHT 1968 BY DIGITAL EQUIPMENT CORPORATION



NOTE:
LETTERS INSIDE THE DASHES
CORRESPONDS TO THE COLOR
DOTS ON THE DM9

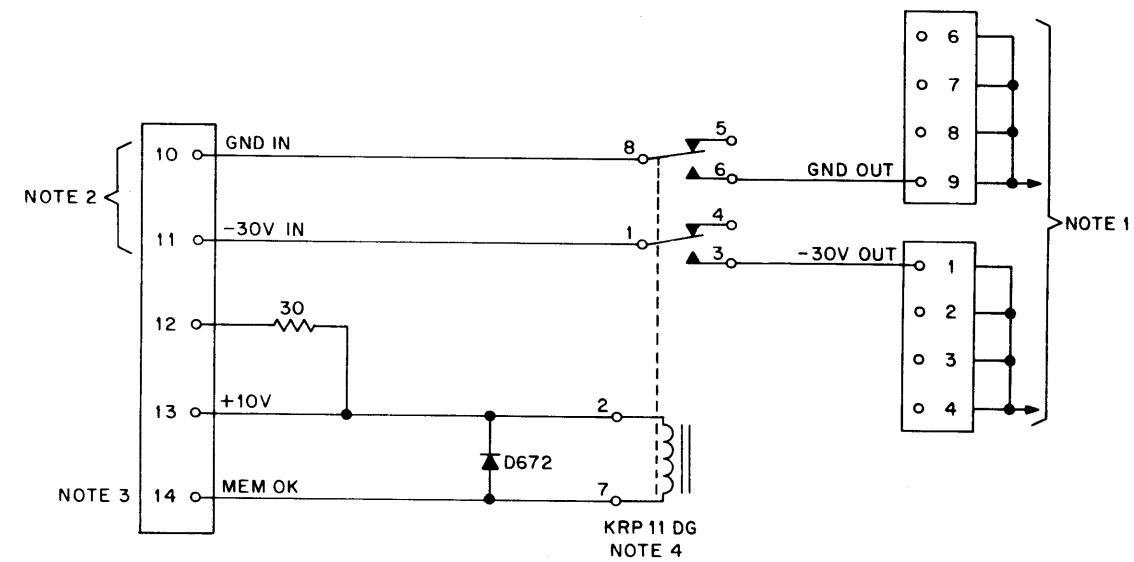
* HEYMAN MFG CO TAB-
TERMINAL IN PLASTIC BUSHINGS
CINCH JONES TERMINAL STRIP



(29)

REVISIONS CHK CHG NO REV 798-00001 A S. S. SEP 21 1968		DRN. P. LoBlanc DATE 10-1-68	DATE 10-1-68	TRANSISTOR & DIODE CONVERSION CHART DEC EIA DEC EIA				digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	TITLE DUAL 15 VOLT POWER SUPPLY 798		
		CHK'D EA Milroy DATE 10-16-68	DATE 10-22-68				SIZE CODE NUMBER REV. B CS 798-0-1 A				
		ENG. DATE 10-22-68	DATE 10-22-68				PRINTED CIRCUIT REV.				





- NOTES:
1. -30V GOES TO G825 OF MEMORY GND ALSO GOES TO MEMORY
 2. THE SOURCE COMES FROM 798 POWER SUPPLY.
 3. WHEN THIS POINT IS SWITCHED FROM GND - THERE IS A PROBLEM IN MEM WHICH THIS GUARDS.
 4. KRP 11 DG - THE RELAY IS A DPDT WITH A COIL VOLTAGE OF 12 VDC. THE SUFFIX (G) MEANS SILVER-CADMIUM CONTACTS RATED 10 AMPS.