

**digital**

**DBII-A**  
**Engineering Drawings**  
Digital Equipment Corporation

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# MASTER DRAWING LIST

DWG. NO.	REV. LET.	NO. OF SHEETS	TITLE
A-PL-DB11-A-0	D	1	DB11-A UA PL
D-AD-7009612-0-0	C	2	WIRED ASSY
A-WT-7009612-0	#	1	AWT REVISION STATUS
D-MU-DB11-A-01	C	1	MODULE UTILIZATION
A-PL-DB11-A-01	C	1	MODULE UTILIZATION PL
D-BS-DB11-A-02	A	1	BUS REPEATER DB11 UNIDIR LINES
D-BS-DB11-A-03	A	1	BUS REPEATER DATA LINES
D-IC-DB11-A-04	B	1	BUS AND POWER CONNECTIONS
D-BD-DB11-A-05	C	1	DB11 INTER CONNECTION DIAGRAM
K-WL-DB11-A-06	J	2	WIRE LIST (DB11-A) (COMPLETE)
A-SP-DB11-A-7	C	4	BUS REPEATER SPECIFICATION
A-AL-DB11-A-10		1	ACCESSORY LIST
E-IA-7009562-0-0	#	1	G772 SYS UNIT HARNESS
A-SP-DB11-A-8	REF	2	TEST PROCEDURE
A-SP-DB11-A-9	REF	2	IN HOUSE ACCEPTANCE TEST

REVISIONS				DRN. BISSONNETTE 2/23/71	 <b>digital</b> EQUIPMENT CORPORATION <small>MAYNARD, MASSACHUSETTS</small>
REV.	DATE	CHG. NO.	APP'D.	DATE	
A	5/71	DB11A-1	V.B.	3/3/71	
B	6/71	DB11A-2	V.B.	3/11/71	
C	9/71	DB11A-3	A.V.	3/11/71	
D	1/72	DB11A-4	V.B.	3/11/71	
E	6/72	DB11A-5	V.B.	3/11/71	
F	7-73	DB11A-6	V.B.	3/11/71	
H	10-73	DB11A-7	V.B.		
J	10-73	DB11A-8	T.R.		
K	12-73	DB11A-9	T.R.		
L	1-74	DB11A-10	V.B.		
M	1-74	DB11A-11	T.R.		
N	10-74	DB11A-12	V.B.		

FIRST USED ON		SIZE	CODE	NUMBER	S
PDP 11		A	ML	DB11-A	
SCALE					
SHEET 1 OF 2					

## ADDITIONAL CUSTOMER PRINTS

DB11-A

Drawing Number	Rev. Let.	Title
D-CS-M7212-0-1	#	A LINE REPEATER
D-CS-M7213-0-1	#	MASTER REPEATER
B-CS-M783-0-1	#	UNIBUS DRIVERS
B-CS-M784-0-1	#	UNIBUS RECEIVERS
B-CS-M785-0-1	#	UNIBUS TRANCEIVERS
C-CS-M930-1-1	#	BUS TERMINATOR
D-CS-M7248-0-1	#	UNIBUS REPEATER CARD

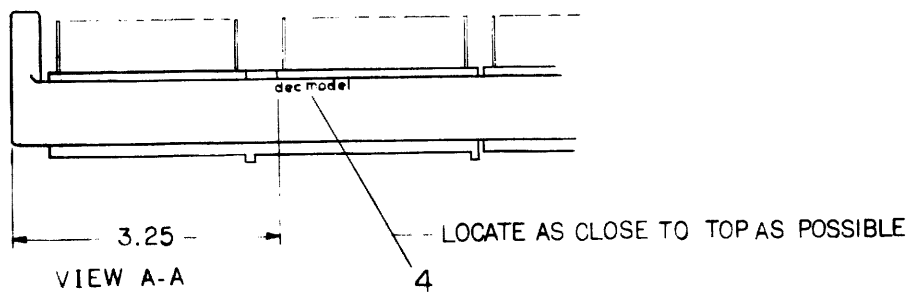
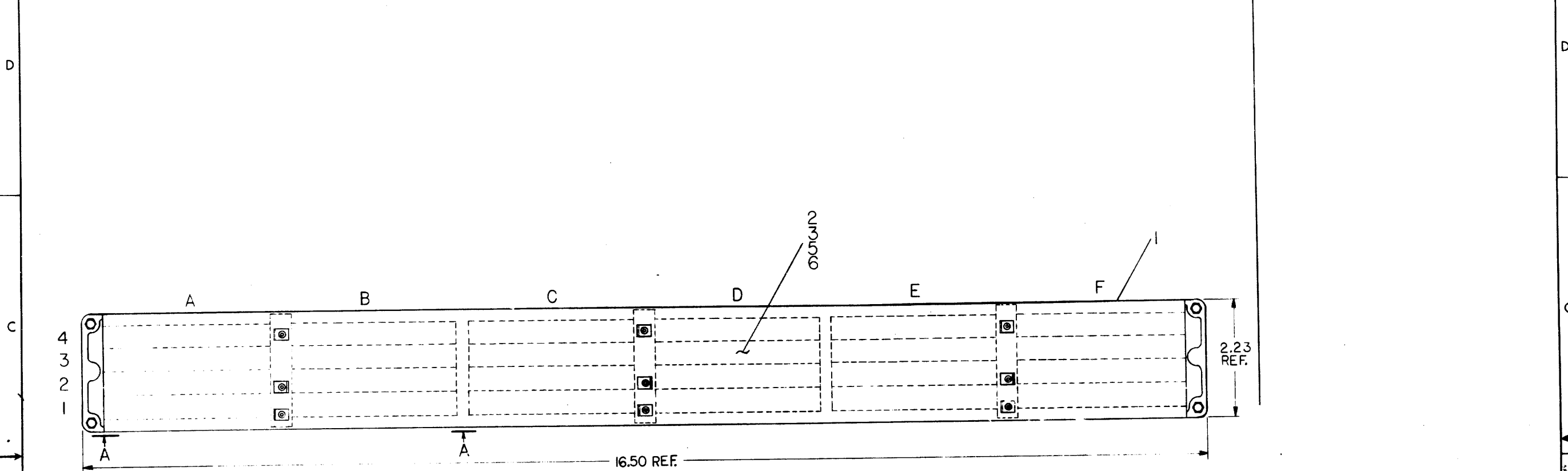
Rev.	Date	Change Number	
P	11-74	DB11A-00013	V. BISSONNETTE 2/23/71 Requested by _____ Date _____  Authorized by _____ Date 3/25/71
R	3-75	DB11A 00014	
S	1-76	DB11A-00015	

A-ML-DB11-A SHEET 2 OF 2



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NOTES:  
1. ALL VERTICAL HAND WIRING TO RUN OUTSIDE OF CONNECTOR BLOCK



REV	CHANGE NO	REVISIONS
1		ORIGINAL
2		DBIIA-00008
3		DBIIA-00009
4		DBIIA-00010
5		DBIIA-00011
6		DBIIA-00012
7		DBIIA-00013
8		DBIIA-00014

REF	AWT REVISION STATUS	A-WT-7009612-0	7
I	WIRE LIST	KWLDBIIA-06	REF
A/R	WIRE 30AWG TWP BLK/WHT	9107720-09	6
A/R	WIRE 24 AWG SOLID KYNARINS.BLK	9107688-00	5
A/R	LOGIC FRAME DECALS	A-DC-7406371-0-0	4
A/R	WIRE 24 AWG SOLID KYNARINS. RED	9107688-22	3
A/R	WIRE 30AWG SOLID KYNARINS. YEL	8105740-44	2
I	BACK PLANE ASSY	7009152	1

FIRST USED ON OPTION/MODEL		QTY.	DES. DESCRIPTION	PART NO.	ITEM NO.
DBII-A					
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES		DRN. <i>A. W. ...</i>	DATE 8-3-73	EQUIPMENT CORPORATION	
DECIMALS	ANGLES	CHK'D. <i>[Signature]</i>	DATE 10-30-73	TITLE	
XXX - 008	±0° 30'	ENG. <i>[Signature]</i>	DATE 10-31-73	WIRED ASS'Y (DBII-A)	
XX - 02		DRG. ENGR. <i>[Signature]</i>	DATE 10-31-73	PART NO. 7009612-0-0	
X - 1		PROD. <i>[Signature]</i>	DATE 10-31-73	REV. C	
MATERIAL		NEXT HIGHER ASSY		SCALE	
FINISH		SCALE 1 OF 2		SHEET	

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WIRE TABLE						
ITEM NO.	SIGNAL NAME	FROM PIN	TO PIN	COLOR	REMARKS	
3	+5V	A03 A2	C01 A2	RED	WIRES MUST PHYSICALLY RUN TO THE LEFT OF THE BLOCK AND PINS.	
		A03 J2	E01 A2			
		A03 K2	B03 A2	RED		WIRES MUST PHYSICALLY RUN TO THE RIGHT OF THE BLOCK AND PINS.
		A03 L2	D04 A2			
A03 M2	F04 A2					
5	GROUND	A03 D2	A03 E2	BLACK		
		A03 C2	A03 D2			
		A03 E2	A03 F2			
		A03 N1	A03 P1			
		A03 R1	A03 S1			
		A03 P1	A03 R1			
		A03 U1	A03 V1			
		A03 S1	A03 U1			
		A03 F2	A03 N1	BLACK		
		A03 C2	F01 T1			
		A03 V1	C01 C2			
		A03 T1	E01 C2			
		F02 T1	CHASSIS			
6	RIGHT B04	B04 E2	D04 E2	WHT	TWP	
	GROUND	B03 C2	D02 C2	BLK		
	RIGHT B04	D04 E2	F02 F2	WHT		
6	GROUND	D02 C2	F02 C2	BLK	TWP	
	RIGHT B05	B04 B1	D04 B1	WHT	TWP	
	GROUND	B03 C2	D01 C2	BLK		
RIGHT B05	D04 B1	F02 T2	WHT			
6	GROUND	D01 C2	F02 T1	BLK	TWP	
	RIGHT B06	B04 A1	D04 A1	WHT	TWP	
	GROUND	B02 C2	C04 T1	BLK		
RIGHT B06	D04 A1	F02 N2	WHT			
6	GROUND	C04 T1	F02 T1	BLK	TWP	
	RIGHT B07	A04 V1	C04 V1	WHT	TWP	
	GROUND	A04 T1	C02 T1	BLK		
RIGHT B07	C04 V1	F02 K1	WHT			
6	GROUND	C02 T1	F02 C2	BLK	TWP	

FIRST USED ON OPTION/MODEL DB11-A	QTY	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES	DRN R VOWLES	DATE 8-3-73	digital EQUIPMENT CORPORATION	
DECIMALS	CHKD R. Vowles	DATE 10-26-73	TITLE	
ANGLES	ENG R. Vowles	DATE 10-26-73	WIRED ASSY DB11A	
XXX - 006 XX - 02	PRD R. Vowles	DATE 10-26-73	SIZE CODE	
MOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROD R. Vowles	DATE 10-26-73	NUMBER	
MATERIAL	NEXT HIGHER ASSY	SCALE	DAD	7009612-0-0
FINISH	SCALE	SHEET 2 OF 2	REV	C

DEC FORM NO. 002 100-A  
REVISIONS  
CHG  
REV



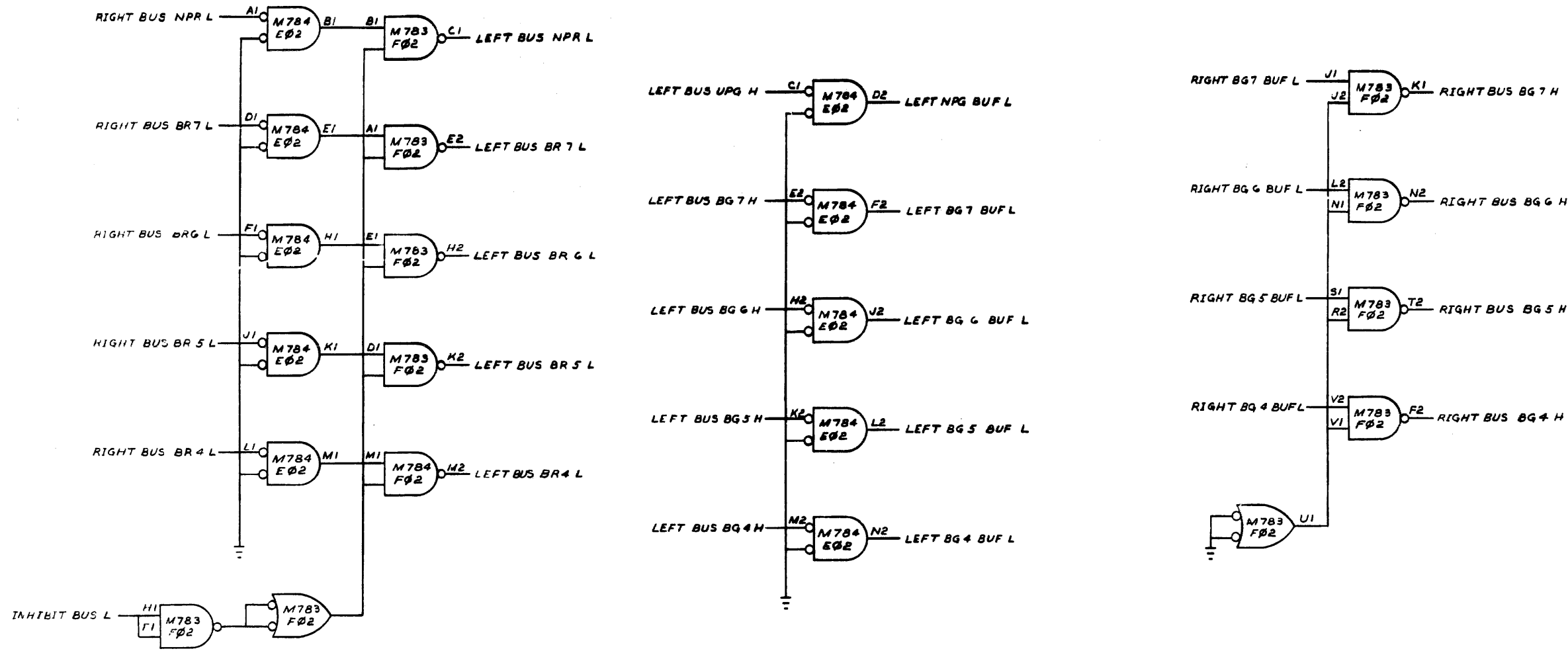






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DBS DB11-A-02



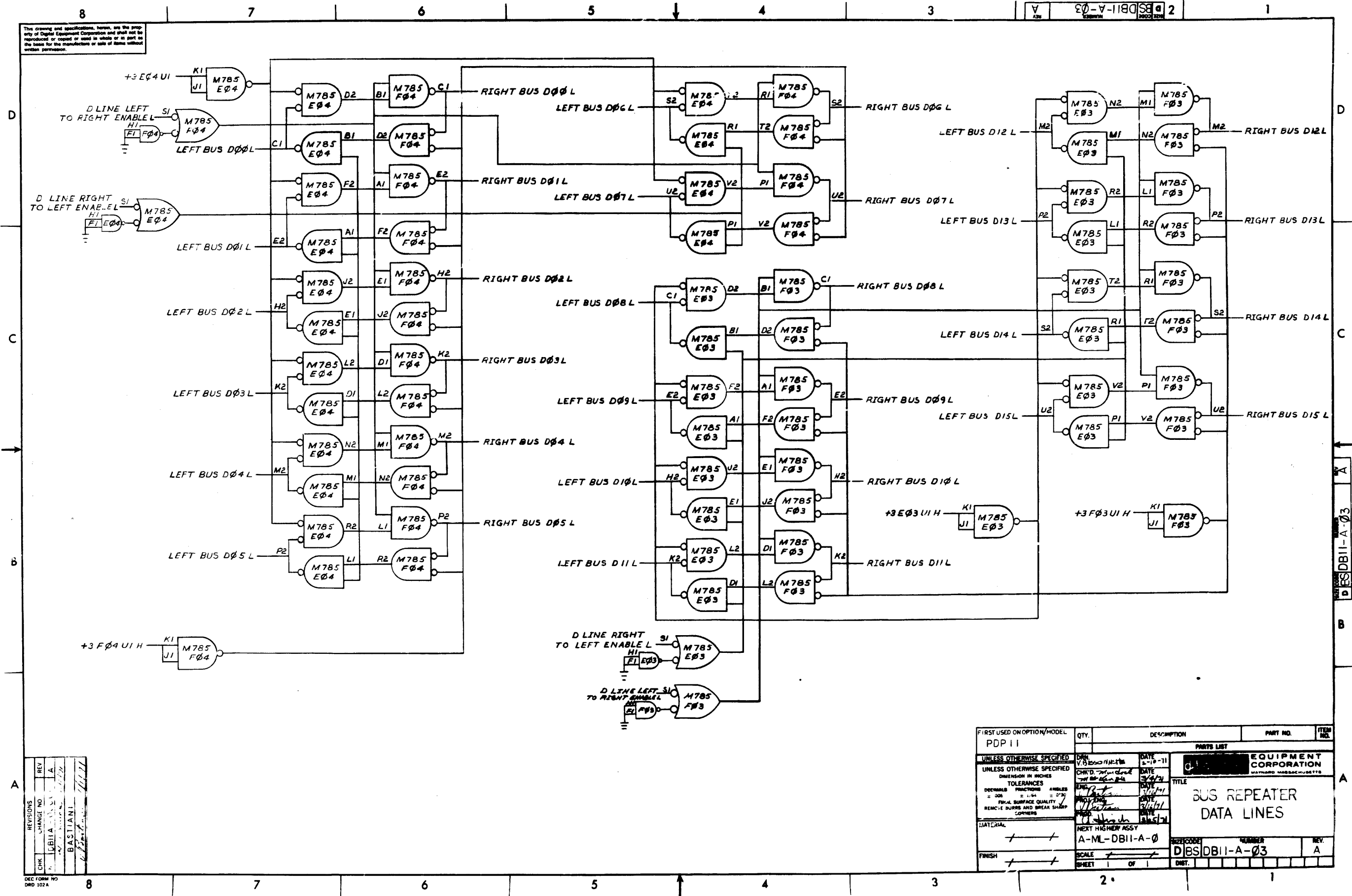
RELISONS	REV.
CHANGE NO.	A
DB11A-00001	
BASTIANI	
1/17	

QTY.	DESCRIPTION	PART NO.	ITEM NO.
	PARTS LIST		
	UNLESS OTHERWISE SPECIFIED		
	DIMENSION IN INCHES		
	TOLERANCES		
	DECIMALS FRACTIONS ANGLES		
	± 0.01 ± 1/64 ± 0°30'		
	FINISH SURFACE QUALITY		
	REMOVE BURRS AND BREAK SHARP CORNERS		
	MATERIAL		
	NEXT HIGHER ASSY		
	A-ML-DB11-A-0		
	FINISH		
	SCALE		
	SHEET OF		
	DISTR.		

**Digital Equipment Corporation**  
**BUS REPEATER**  
**DB 11**  
**UNIDIR. LINES**

SIZE CODE: DBS DB11-A-02  
 NUMBER: A  
 REV. A

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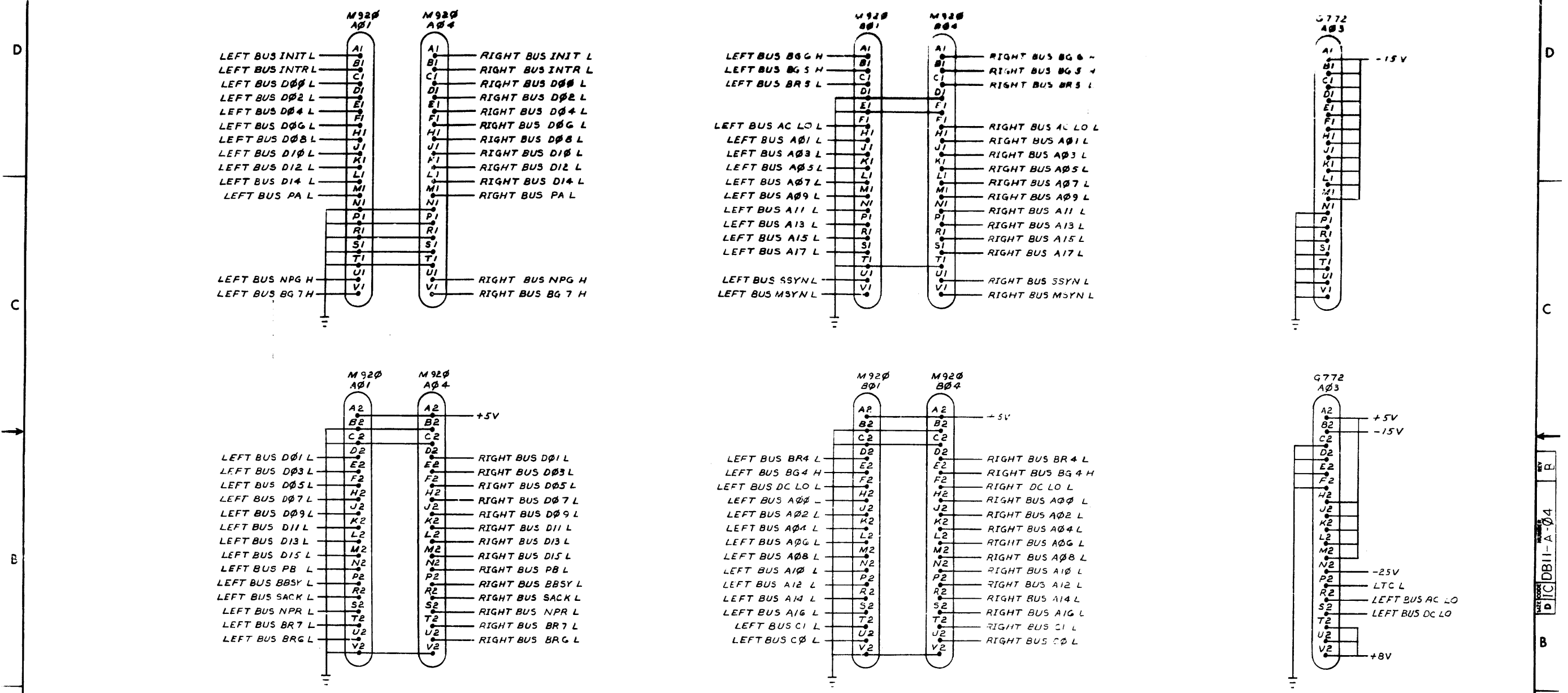
REV	NO	DATE	BY	CHKD
1	1	11/11/71	BASTIANI	

DEC FORM NO 102A

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PDP 11				
UNLESS OTHERWISE SPECIFIED				
DIMENSIONS IN INCHES		DATE	EQUIPMENT CORPORATION	
TOLERANCES		DATE	MAYNARD MASSACHUSETTS	
DECIMALS FRACTIONS ANGLES		DATE	TITLE	
= .005 ± .010 ± .030		DATE	BUS REPEATER	
FINISH		DATE	DATA LINES	
SCALE		DATE	SIZE CODE NUMBER	
SHEET		DATE	DIBS DB11-A-03	
OF		DATE	REV.	
		DATE	A	

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8 7 6 5 4 3 2 1



REV	NO	DATE	BY
1	0001	1/17/71	BASTIANI
2	0002	1/17/71	BASTIANI

FIRST USED ON OPTION/ MODEL PDPII	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES	DRN V. BISSONNETTE	DATE 2-12-71	EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	
TOLERANCES DECIMALS FRACTIONS ANGLES	CHK'D. J. Bastiani	DATE 3/11/71	TITLE BUS AND POWER CONNECTIONS	
± .005 ± 1/64 ± 0°30'	ENG. J. Bastiani	DATE 3/11/71	DRAWN BY J. Bastiani	
FINAL SURFACE QUALITY / REMOVE BURRS AND BREAK SHARP EDGES	PROV. ENG. J. Bastiani	DATE 3/11/71	SCALE A-ML-DB11-A-0	
MATERIAL	NEXT HIGHER ASSY	DATE 5/25/71	REV. B	
FINISH	SCALE	DIST.	D I C DB11-A-04	
	SHFET	OF		

D I C DB11-A-04



DRWG NO	REV LTR
K-WL-DBII-A-06	H

REVISIONS			
REV LTR	ECO NO	DATE	ENG
A	DBIIA-00001	6-1-71	VBS
B	DBIIA-00003	9-10-71	VBS
C	DBIIA-00004	1-26-72	VBS
D	DBIIA-00005	6-14-72	VBS
E	DBIIA-00006	8-3-73	MAN
F	DBIIA-00007	10-17-73	Jul
H	DBIIA-00009	12-17-73	

DRAWN <i>Murdoch</i> <i>M. Kenzie</i>	DATE 3/3/71	<b>digital</b> EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	TITLE WIRE LIST		
CHECKED <i>A. Hoppa</i>	DATE 3/4/71		FOR TAPE* FILE*		
ENG <i>V. Postain</i>	DATE 3/16/71		ASSY NO D-AD-7008311-0-0	SIZE CODE K WL	DRG NO DBII-A-06
PROJ ENG <i>V. Postain</i>	DATE 3/16/71		SCALE $\frac{1}{1}$	SHEET 1 OF 1	REV LTR H
PROD <i>A. Hirsch</i>	DATE 3/24/71		DIST.		



DB11A.H  
RUN NAME

HND288.V22(22) 11/06/73  
A/P PIN ORDER BAY - Q DRAW RV PG Y X Z REMARKS

19-DEC-73 9:49 PAGE 2  
LENGTH EXCEPTIONS RUN NUMBER

DB11A.H RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	19-DEC-73 LENGTH	9:49 EXCEPTIONS	PAGE 2 RUN NUMBER
AR1		A01R1		1-01 *							1				8
AR1		A02R1	A04R1	1-02 *							2				8
AR1		A04R1		1-03 *							1		3-6		8
AR1		C04R1		1-04 *											8
AR1				1									14-1/8		8
AS1		A01S1		1-01 *							1				9
AS1		A02S1	A04S1	1-02 *							2				9
AS1		A04S1		1-03 *							1		3-7		9
AS1		C04S1		1-04 *											9
AS1				1									14-3/8		9
AV2		A01V2		1-01 *							1				10
AV2		A02V2		1-02 *							2				10
AV2		A04V2		1-03 *							1				10
AV2		C04V2		1-04 *											10
AV2				1									13-4/8		10
R INIT		C03J1												1-PIN RUN	11
RB2		R01B2		1-01 *							1				12
RB2		R02B2		1-02 *							2				12
RB2		R04B2		1-03 *							1				12
RB2		D04B2		1-04 *											12
RB2				1									13-4/8		12
RD1		R01D1		1-01 *							1				13
RD1		R02D1	B04D1	1-02 *							2				13
RD1		R04D1		1-03 *							1		3-6		13
RD1		D04D1		1-04 *											13
RD1				1									14-1/8		13
RE1		R01E1		1-01 *							1				14
RE1		R02E1	R04E1	1-02 *							2				14
RE1		R04E1		1-03 *							1		3-7		14
RE1		D04E1		1-04 *											14
RE1				1									14-3/8		14
RV2		A01C2		1-01 *							2				15
RV2		A01T1		1-02 *							1				15
RV2		A01C2		1-03 *							2				15
RV2		R01T1		1-04 *							1				15
RV2		R01V2		1-05 *							2				15
RV2		R02V2		1-06 *							1				15
RV2		R04V2		1-07 *							2				15
RV2		D04V2		1-08 *											15
RV2				1									27-6/8		15

DB11A.H  
RUN NAME

HND288.V22(22) 11/06/73  
A/P PIN ORDER BAY - Q DRAW RV PG Y X Z REMARKS

19-DEC-73 9:49 PAGE 3  
LENGTH EXCEPTIONS RUN NUMBER

DB11A.H RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	19-DEC-73 LENGTH	9:49 EXCEPTIONS	PAGE 3 RUN NUMBER
CA2		A04A2		1-01 *	1						1		2-3		16
CA2		R04A2	C04A2	1-02 *							2				16
CA2		C04A2		1-03 *							1		2-3		16
CA2		D04A2		1-04 *											16
CA2				1									15-4/8		16
D LEFT TO RIGHT EN		D03I2		1-01 *							1		3-7		17
D LEFT TO RIGHT EN		F04S1		1-02 *							2				17
D LEFT TO RIGHT EN		F03S1		1-03 *											17
D LEFT TO RIGHT EN				1									11-1/8		17
D RIGHT TO LEFT EN		C03A1		1-01 *							1				18
D RIGHT TO LEFT EN		F03S1		1-02 *							2				18
D RIGHT TO LEFT EN		F04S1		1-03 *											18
D RIGHT TO LEFT EN				1									12-0/8		18
E2R1		F02B1		1-01 *							1		2-7		19
E2R1		F02B1		1-02 *											19
E2R1				1									6-3/8		19
E2E1		F02E1		1-01 *							1		2-5		20
E2E1		F02A1		1-02 *											20
E2E1				1									5-7/8		20
E2H1		F02H1		1-01 *							1		2-5		21
E2H1		F02E1		1-02 *											21
E2H1				1									5-7/8		21
E2K1		F02K1		1-01 *							1		2-4		22
E2K1		F02D1		1-02 *											22
E2K1				1									5-5/8		22
E2M1		F02M1		1-01 *							1		2-5		23
E2M1		F02M1		1-02 *											23
E2M1				1									5-7/8		23
E3		F03J1		1-01 *							1				24
E3		F03K1		1-02 *							2				24
E3		F03U1	D03B1	1-03 *							1				24
E3		D03B1		1-04 *											24
E3				1									12-4/8		24
E3A1		F03A1		1-01 *							1		3-2		25
E3A1		F03F2		1-02 *											25
E3A1				1									7-1/8		25

DB11A,H		HND288.V22(22) 11/06/73										19-DEC-73	9:49	PAGE 4		
RUN NAME		A/P	PIN NAME	ORDER PIN	BAY - ORDER	J	DRW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
E3R1			F03M1		1-01 *							1		2-7		26
E3R1			F03U2		1-02 *											26
E3R1					1									6-3/8		26
E3D1			F03U1		1-01 *							1		3-2		27
E3D1			F03L2		1-02 *											27
E3D1					1									7-1/8		27
E3D2			E03D2		1-01 *							1				28
E3D2			F03B1		1-02 *											28
E3D2					1									5-0/8		28
E3E1			F03E1		1-01 *							1		3-1		29
E3E1			F03J2		1-02 *											29
E3E1					1									6-7/8		29
E3F2			F03F2		1-01 *							1				30
E3F2			F03A1		1-02 *											30
E3F2					1									4-6/8		30
E3J2			F03J2		1-01 *							1				31
E3J2			F03E1		1-02 *											31
E3J2					1									5-0/8		31
E3L1			F03L1		1-01 *							1		3-1		32
E3L1			F03R2		1-02 *											32
E3L1					1									6-7/8		32
E3L2			F03L2		1-01 *							1				33
E3L2			F03U1		1-02 *											33
E3L2					1									4-4/8		33
E3M1			F03M1		1-01 *							1		3-0		34
E3M1			F03N2		1-02 *											34
E3M1					1									6-5/8		34
E3N2			F03N2		1-01 *							1				35
E3N2			F03M1		1-02 *											35
E3N2					1									5-2/8		35
E3P1			F03P1		1-01 *							1		3-2		36
E3P1			F03V2		1-02 *											36
E3P1					1									7-1/8		36
E3R1			E03R1		1-01 *							1		2-7		37
E3R1			F03T2		1-02 *											37
E3R1					1									6-3/8		37

DB11A,H		HND288.V22(22) 11/06/73										19-DEC-73	9:49	PAGE 5		
RUN NAME		A/P	PIN NAME	ORDER PIN	BAY - ORDER	O	DRW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
E3P2			F03R2		1-01 *							1				38
E3P2			F03L1		1-02 *											38
E3P2					1									4-6/8		38
E3T2			F03T2		1-01 *							1				39
E3T2			F03R1		1-02 *											39
E3T2					1									5-0/8		39
E3V2			F03V2		1-01 *							1				40
E3V2			F03P1		1-02 *											40
E3V2					1									4-6/8		40
E4			F04D2		1-01 *							1				41
E4			F04B1		1-02 *											41
E4					1									5-0/8		41
E4P1			F04P1		1-01 *							1				42
E4P1			F04V2		1-02 *											42
E4P1					1									6-0/8		42
F4P1			F04R1		1-01 *							1				43
F4P1			F04T2		1-02 *											43
F4P1					1									5-4/8		43
F4U1			F04J1		1-01 *							1				44
F4U1			E04K1		1-02 *							2				44
F4U1			E04U1	D03C1	1-03 *							1				44
F4U1			D03C1		1-04 *											44
F4U1					1									12-4/8		44
F4V2			F04V2		1-01 *							1				45
F4V2			F04P1		1-02 *											45
F4V2					1									4-6/8		45
FA			E04A1		1-01 *							1				46
FA			F04F2		1-02 *											46
FA					1									6-0/8		46
FB			F04B1		1-01 *							1				47
FB			F04D2		1-02 *											47
FB					1									5-4/8		47
FD			E04D1		1-01 *							1				48
FD			F04L2		1-02 *											48
FD					1									6-0/8		48





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RUN NAME		A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
L R	D03		A01E2	A02E2	1-01 *							2				68
L B	D03		A02E2		1-02 *							1		6-6		68
L B	D03		F04K2		1-03 *											68
L B	D03				1									16-7/8		68
L B	D04		A01E1		1-01 *							2				69
L B	D04		A02E1		1-02 *							1				69
L B	D04		F04M2		1-03 *									17-0/8		69
L B	D04				1											69
L R	D05		A01F2	A02F2	1-01 *							2				70
L B	D05		A02F2		1-02 *							1		6-7		70
L B	D05		F04P2		1-03 *											70
L B	D05				1									17-1/8		70
L B	D06		A01F1		1-01 *							2				71
L B	D06		A02F1		1-02 *							1				71
L B	D06		F04S2		1-03 *											71
L B	D06				1									17-2/8		71
L B	D07		A01H2		1-01 *							2				72
L B	D07		A02H2		1-02 *							1				72
L B	D07		F04U2		1-03 *											72
L B	D07				1									17-2/8		72
L B	D08		A01H1		1-01 *							2				73
L B	D08		A02H1		1-02 *							1				73
L B	D08		F03C1		1-03 *											73
L B	D08				1									15-2/8		73
L P	D09		A01J2		1-01 *							2				74
L B	D09		A02J2		1-02 *							1				74
L B	D09		F03E2		1-03 *											74
L B	D09				1									15-4/8		74
L B	D10		A01J1		1-01 *							2				75
L B	D10		A02J1		1-02 *							1				75
L B	D10		F03H2		1-03 *											75
L B	D10				1									15-6/8		75
L B	D11		A01K2		1-01 *							2				76
L B	D11		A02K2		1-02 *							1				76
L B	D11		F03K2		1-03 *											76
L B	D11				1									15-6/8		76

DB11A.H		HND288.V22(22) 11/06/73				19-DEC-73		9:49		PAGE 9						
RUN NAME		A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
L B	D12		A01K1		1-01 *							2				77
L B	D12		A02K1		1-02 *							1				77
L B	D12		F03M2		1-03 *											77
L B	D12				1									16-2/8		77
L B	D13		A01L2		1-01 *							2				78
L B	D13		A02L2		1-02 *							1				78
L B	D13		F03P2		1-03 *											78
L B	D13				1									16-2/8		78
L B	D14		A01L1		1-01 *							2				79
L B	D14		A02L1		1-02 *							1				79
L B	D14		F03S2		1-03 *											79
L B	D14				1									16-4/8		79
L B	D15		A01M2		1-01 *							2				80
L B	D15		A02M2		1-02 *							1				80
L B	D15		F03U2		1-03 *											80
L B	D15				1									16-4/8		80
LEFT	A00		B02H2	B01H2	1-01 *							2				81
LEFT	A00		F01H2		1-02 *							1		4-1		81
LEFT	A00		D01P2		1-03 *											81
LEFT	A00				1									11-5/8		81
LEFT	A01		B02H1		1-01 *							2				82
LEFT	A01		B01H1		1-02 *							1				82
LEFT	A01		D01B1		1-03 *											82
LEFT	A01				1									9-6/8		82
LEFT	A02		B02J2		1-01 *							2				83
LEFT	A02		B01J2		1-02 *							1				83
LEFT	A02		D01S2		1-03 *											83
LEFT	A02				1									11-2/8		83
LEFT	A03		B02J1		1-01 *							2				84
LEFT	A03		B01J1		1-02 *							1				84
LEFT	A03		D01P1		1-03 *											84
LEFT	A03				1									11-0/8		84
LEFT	A04		B02K2		1-01 *							2				85
LEFT	A04		B01K2		1-02 *							1				85
LEFT	A04		D01U2		1-03 *											85
LEFT	A04				1									11-2/8		85

DB11A.H  
RUN NAME

HND288.V22(22) 11/06/73

19-DEC-73 9149 PAGE 10  
LENGTH EXCEPTIONS RUN NUMBER

A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	19-DEC-73 LENGTH	9149 EXCEPTIONS	PAGE 10 RUN NUMBER
	LEFT A05	R02K1	1-01 *							2				86
	LEFT A05	R01K1	1-02 *							1				86
	LEFT A05	D01U1	1-03 *											86
	LEFT A05		1									11-2/8		86
	LEFT A06	R02L2	1-01 *							2				87
	LEFT A06	R01L2	1-02 *							1				87
	LEFT A06	F01P2	1-03 *											87
	LEFT A06		1									13-2/8		87
	LEFT A07	R02L1	1-01 *	R01L1						2				88
	LEFT A07	R01L1	1-02 *							1		4-3		88
	LEFT A07	F01B1	1-03 *											88
	LEFT A07		1									12-1/8		88
	LEFT A08	R02M2	1-01 *							2				89
	LEFT A08	R01M2	1-02 *							1				89
	LEFT A08	F01S2	1-03 *											89
	LEFT A08		1									13-2/8		89
	LEFT A09	R02M1	1-01 *							2				90
	LEFT A09	R01M1	1-02 *							1				90
	LEFT A09	F01P1	1-03 *											90
	LEFT A09		1									13-0/8		90
	LEFT A10	R02N2	1-01 *							2				91
	LEFT A10	R01N2	1-02 *							1				91
	LEFT A10	F01U2	1-03 *											91
	LEFT A10		1									13-4/8		91
	LEFT A11	R02N1	1-01 *							2				92
	LEFT A11	R01N1	1-02 *							1				92
	LEFT A11	F01U1	1-03 *											92
	LEFT A11		1									13-4/8		92
	LEFT A12	R02P2	1-01 *	R01P2						2				93
	LEFT A12	R01P2	1-02 *							1		6-3		93
	LEFT A12	F01P2	1-03 *											93
	LEFT A12		1									16-1/8		93
	LEFT A13	R02P1	1-01 *							2				94
	LEFT A13	R01P1	1-02 *							1				94
	LEFT A13	F01B1	1-03 *											94
	LEFT A13		1									14-2/8		94

DB11A.H  
RUN NAME

HND288.V22(22) 11/06/73

19-DEC-73 9149 PAGE 11  
LENGTH EXCEPTIONS RUN NUMBER

A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	19-DEC-73 LENGTH	9149 EXCEPTIONS	PAGE 11 RUN NUMBER
	LEFT A14	R02R2	1-01 *	B01R2						2				95
	LEFT A14	R01R2	1-02 *							1		6-4		95
	LEFT A14	F01S2	1-03 *											95
	LEFT A14		1									16-3/8		95
	LEFT A15	R02R1	1-01 *							2				96
	LEFT A15	R01R1	1-02 *							1				96
	LEFT A15	F01P1	1-03 *											96
	LEFT A15		1									15-4/8		96
	LEFT A16	R02S2	1-01 *	R01S2						2				97
	LEFT A16	R01S2	1-02 *							1		6-4		97
	LEFT A16	F01U2	1-03 *											97
	LEFT A16		1									16-3/8		97
	LEFT A17	R02S1	1-01 *	R01S1						2				98
	LEFT A17	R01S1	1-02 *							1		6-3		98
	LEFT A17	F01U1	1-03 *											98
	LEFT A17		1									16-1/8		98
	LEFT B04	R01E2	1-01 *							2				99
	LEFT B04	R02E2	1-02 *							1				99
	LEFT B04	F02M2	1-03 *											99
	LEFT B04		1									13-4/8		99
	LEFT B04 BUF	C03J2	1-01 *							1				100
	LEFT B04 BUF	E02N2	1-02 *											100
	LEFT B04 BUF		1									8-2/8		100
	LEFT B05	R01B1	1-01 *							2				101
	LEFT B05	R02B1	1-02 *							1				101
	LEFT B05	F02K2	1-03 *											101
	LEFT B05		1									13-6/8		101
	LEFT B05 BUF	C03F2	1-01 *							1				102
	LEFT B05 BUF	E02L2	1-02 *											102
	LEFT B05 BUF		1									8-2/8		102
	LEFT B06	R01A1	1-01 *							2				103
	LEFT B06	R02A1	1-02 *							1				103
	LEFT B06	E02H2	1-03 *											103
	LEFT B06		1									13-6/8		103
	LEFT B06 BUF	C03H2	1-01 *							1				104
	LEFT B06 BUF	E02J2	1-02 *											104
	LEFT B06 BUF		1									8-0/8		104

DB11A.H		HND288.V22(22) 11/06/73				19-DEC-73		9149	PAGE 12			
RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
LEFT BG7		A01V1	A02V1	1-01 *								105
LEFT BG7		A02V1		1-02 *						6-0		105
LEFT BG7		E02E2		1-03 *								105
LEFT BG7				1						15-3/8		105
LEFT BG7 BUF		C03E2		1-01 *								106
LEFT BG7 BUF		E02F2		1-02 *						8-0/8		106
LEFT BG7 BUF				1								106
LEFT BR4		R01D2		1-01 *								107
LEFT BR4		R02D2		1-02 *								107
LEFT BR4		F02M2		1-03 *						16-4/8		107
LEFT BR4				1								107
LEFT BR5		R01C1		1-01 *								108
LEFT BR5		R02C1		1-02 *								108
LEFT BR5		F02K2		1-03 *						16-4/8		108
LEFT BR5				1								108
LEFT BR6		A01U2	A02U2	1-01 *								109
LEFT BR6		A02U2		1-02 *						7-5		109
LEFT BR6		F02H2		1-03 *								109
LEFT BR6				1						18-5/8		109
LEFT BR7		A01T2		1-01 *								110
LEFT BR7		A02T2		1-02 *								110
LEFT BR7		F02E2		1-03 *								110
LEFT BR7				1						17-0/8		110
LEFT BUF BRSY		D03A1									1-PIN RUN	111
LEFT BUF C00		D03P2									1-PIN RUN	112
LEFT BUF C01		D03M2									1-PIN RUN	113
LEFT BUF DCLO		C03R1									1-PIN RUN	114
LEFT BUF MSYN		D03H1									1-PIN RUN	115
LEFT BUF SSYN		D03F2									1-PIN RUN	116
LEFT BUS ACLO		R01F1		1-01 *								117
LEFT BUS ACLO		R02F1		1-02 *								117
LEFT BUS ACLO		C03M2	A03R2	1-03 *								117
LEFT BUS ACLO		A03R2		1-04 *								117
LEFT BUS ACLO				1						15-6/8		117

DB11A.H		HND288.V22(22) 11/06/73				19-DEC-73		9149	PAGE 13			
RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
LEFT BUS BRSY		A01P2	A02P2	1-01 *								118
LEFT BUS BRSY		A02P2	C01C1	1-02 *						3-2		118
LEFT BUS BRSY		C01C1		1-03 *								118
LEFT BUS BRSY				1						9-7/8		118
LEFT BUS C00		R01U2		1-01 *								119
LEFT BUS C00		R02U2		1-02 *								119
LEFT BUS C00		D03R2		1-03 *						10-2/8		119
LEFT BUS C00				1								119
LEFT BUS C01		R02T2		1-01 *								120
LEFT BUS C01		R01T2	D03S1	1-02 *								120
LEFT BUS C01		D03S1		1-03 *								120
LEFT BUS C01				1						10-4/8		120
LEFT BUS DCLO		R01F2		1-01 *								121
LEFT BUS DCLO		R02F2		1-02 *								121
LEFT BUS DCLO		C03U2	A03S2	1-03 *								121
LEFT BUS DCLO		A03S2		1-04 *						17-0/8		121
LEFT BUS DCLO				1								121
LEFT BUS INIT		A01A1		1-01 *								122
LEFT BUS INIT		A02A1		1-02 *								122
LEFT BUS INIT		C03K2		1-03 *						11-6/8		122
LEFT BUS INIT				1								122
LEFT BUS INTR		A01B1		1-01 *								123
LEFT BUS INTR		A02B1		1-02 *								123
LEFT BUS INTR		C03P1		1-03 *								123
LEFT BUS INTR				1						12-0/8		123
LEFT BUS MSYN		R01V1		1-01 *								124
LEFT BUS MSYN		R02V1		1-02 *								124
LEFT BUS MSYN		D03L2		1-03 *						9-6/8		124
LEFT BUS MSYN				1								124
LEFT BUS NPG		A01U1	A02U1	1-01 *								125
LEFT BUS NPG		A02U1		1-02 *						5-5		125
LEFT BUS NPG		E02C1		1-03 *								125
LEFT BUS NPG				1						14-5/8		125
LEFT BUS PA		A01M1		1-01 *								126
LEFT BUS PA		A02M1		1-02 *								126
LEFT BUS PA		D03D1		1-03 *								126
LEFT BUS PA				1						12-4/8		126

DB11A.H RUN NAME	HND288.V22(22) 11/06/73				Q	DRAW	RV	PG	Y	X	Z	REMARKS	19-DEC-73 LENGTH	9149 EXCEPTIONS	PAGE 14 RUN NUMBER
	A/P	PTN NAME	ORDER PIN	BAY - ORDER											
LEFT BUS PB		A01N2		1-01 *							2				127
LEFT BUS PB		A02N2		1-02 *							1				127
LEFT BUS PB		D03D2		1-03 *											127
LEFT BUS PB				1									12-2/8		127
LEFT BUS SACK		A01R2		1-01 *							2				128
LEFT BUS SACK		AG2R2		1-02 *							1				128
LEFT BUS SACK		C03R2		1-03 *											128
LEFT BUS SACK				1									10-4/8		128
LEFT BUS SBYN		R01U1		1-01 *							2				129
LEFT BUS SBYN		R02U1		1-02 *							1				129
LEFT BUS SBYN		D03J2		1-03 *											129
LEFT BUS SBYN				1									9-4/8		129
LEFT NPG BUF		C03D1		1-01 *							1				130
LEFT NPG BUF		F02D2		1-02 *											130
LEFT NPG BUF				1									7-6/8		130
LEFT NPR		A02S2	A01S2	1-01 *							2				131
LEFT NPR		A01S2		1-02 *							1		7-0		131
LEFT NPR		F02C1		1-03 *											131
LEFT NPR				1									17-3/8		131
RB D00		A04C1	C04C1	1-01 *	2						2		3-7		132
RB D00		C04C1		1-02 *							1		5-2		132
RB D00		F04C1		1-03 *											132
RB D00				1									19-4/8		132
RB D01		A04D2		1-01 *							2				133
RB D01		C04D2		1-02 *							1				133
RB D01		F04E2		1-03 *											133
RB D01				1									18-0/8		133
RB D02		A04D1	C04D1	1-01 *	2						2		3-6		134
RB D02		C04D1		1-02 *							1		5-2		134
RB D02		F04H2		1-03 *											134
RB D02				1									19-2/8		134
RB D03		A04E2	C04E2	1-01 *							2				135
RB D03		C04E2		1-02 *							1		5-2		135
RB D03		F04K2		1-03 *											135
RB D03				1									18-5/8		135

DB11A.H RUN NAME	HND288.V22(22) 11/06/73				Q	DRAW	RV	PG	Y	X	Z	REMARKS	19-DEC-73 LENGTH	9149 EXCEPTIONS	PAGE 15 RUN NUMBER
	A/P	PTN NAME	ORDER PIN	BAY - ORDER											
RB D04		A04E1	C04E1	1-01 *	2						2		3-6		136
RB D04		C04E1		1-02 *							1		5-4		136
RB D04		F04M2		1-03 *											136
RB D04				1									19-6/8		136
RB D05		A04F2		1-01 *							2				137
RB D05		C04F2		1-02 *							1				137
RB D05		F04P2		1-03 *											137
RB D05				1									18-6/8		137
RB D06		A04F1	C04F1	1-01 *	2						2		3-6		138
RB D06		C04F1		1-02 *							1		5-5		138
RB D06		F04S2		1-03 *											138
RB D06				1									20-0/8		138
RB D07		A04H2	C04H2	1-01 *							2				139
RB D07		C04H2		1-02 *							1		5-5		139
RB D07		F04U2		1-03 *											139
RB D07				1									19-3/8		139
RB D08		A04H1		1-01 *							2		3-7		140
RB D08		C04H1		1-02 *							1				140
RB D08		F03C1		1-03 *											140
RB D08				1									18-3/8		140
RB D09		A04J2		1-01 *							2				141
RB D09		C04J2		1-02 *							1				141
RB D09		F03E2		1-03 *											141
RB D09				1									17-6/8		141
RB D10		A04J1		1-01 *	2						2		3-6		142
RB D10		C04J1		1-02 *							1				142
RB D10		F03H2		1-03 *											142
RB D10				1									18-5/8		142
RB D11		A04K2		1-01 *							2				143
RB D11		C04K2		1-02 *							1				143
RB D11		F03K2		1-03 *											143
RB D11				1									18-0/8		143
RB D12		A04K1		1-01 *	2						2		3-7		144
RB D12		C04K1		1-02 *							1				144
RB D12		F03M2		1-03 *											144
RB D12				1									19-1/8		144

DB11A.H  
RUN NAME

HND288.V22(22) 11/06/73  
A/P PIN ORDER BAY - U DRAW RV PG Y X Z REMARKS  
NAME PIN ORDER

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LENGTH EXCEPTIONS RUN  
NUMBER

RB D13  
RB D13  
DR D13

A04L2 1-01 \*  
C04L2 1-02 \*  
F03P2 1-03 \*

2  
1

145  
145  
145

DB11A.H  
RUN NAME

HND288.V22(22) 11/06/73  
A/P PIN ORDER BAY - U DRAW RV PG Y X Z REMARKS  
NAME PIN ORDER

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LENGTH EXCEPTIONS RUN  
NUMBER

RIGHT BUS C00  
RIGHT BUS C00  
RIGHT BUS C00  
RIGHT BUS C00

R04U2 1-01 \*  
D04U2 1-02 \*  
D03S2 1-03 \*  
1

1  
2

10-4/8

186  
186  
186  
186

RIGHT BUS C01  
RIGHT BUS C01  
RIGHT BUS C01  
RIGHT BUS C01

R04I2 1-01 \*  
D03H2 1-02 \*  
D04T2 1-03 \*  
1

1

1  
2

3-3

10-3/8

187  
187  
187  
187

RIGHT BUS DCLO  
RIGHT BUS DCLO  
RIGHT BUS DCLO  
RIGHT BUS DCLO

R04F2 C03T2 1-01 \*  
C03T2 1-02 \*  
D04F2 1-03 \*  
1

1  
2

7-0

20-7/8

188  
188  
188  
188

RIGHT BUS INIT  
RIGHT BUS INIT  
RIGHT BUS INIT  
RIGHT BUS INIT

A04A1 1-01 \*  
C04A1 1-02 \*  
C03L1 1-03 \*  
1

1  
2

3-7

12-1/8

189  
189  
189  
189

RIGHT BUS INTR  
RIGHT BUS INTR  
RIGHT BUS INTR  
RIGHT BUS INTR

A04B1 1-01 \*  
C04B1 1-02 \*  
C03N1 1-03 \*  
1

1  
2

3-0

11-7/8

190  
190  
190  
190

RIGHT BUS MSYN  
RIGHT BUS MSYN  
RIGHT BUS MSYN  
RIGHT BUS MSYN

R04V1 1-01 \*  
D03K1 1-02 \*  
D04V1 1-03 \*  
1

1  
2

10-4/8

191  
191  
191  
191

RIGHT BUS NPG  
RIGHT BUS NPG  
RIGHT BUS NPG  
RIGHT BUS NPG

A04U1 1-01 \*  
C03B1 1-02 \*  
C04U1 1-03 \*  
1

1  
2

10-6/8

192  
192  
192  
192

RIGHT BUS PA  
RIGHT BUS PA  
RIGHT BUS PA  
RIGHT BUS PA

A04M1 1-01 \*  
C04M1 1-02 \*  
D03E1 1-03 \*  
1

1  
2

3-7

12-1/8

193  
193  
193  
193

RIGHT BUS PB  
RIGHT BUS PB  
RIGHT BUS PB  
RIGHT BUS PB

A04N2 1-01 \*  
C04N2 1-02 \*  
D03E2 1-03 \*  
1

1  
2

12-0/8

194  
194  
194  
194

DB11A.H  
RUN NAME

HND288.V22(22) 11/06/73  
A/P PIN ORDER BAY - U DRAW RV PG Y X Z REMARKS  
NAME PIN ORDER

19-DEC-73 9149 PAGE 21  
LENGTH EXCEPTIONS RUN  
NUMBER

RIGHT BUS SACK  
RIGHT BUS SACK  
RIGHT BUS SACK  
RIGHT BUS SACK

A04R2 1-01 \*  
C04R2 1-02 \*  
C03N2 1-03 \*  
1

1  
2

10-4/8

195  
195  
195  
195

RIGHT BUS SSYN  
RIGHT BUS SSYN  
RIGHT BUS SSYN  
RIGHT BUS SSYN

R04U1 1-01 \*  
D03H2 1-02 \*  
D04U1 1-03 \*  
1

1  
2

10-2/8

196  
196  
196  
196

RIGHT NPR  
RIGHT NPR  
RIGHT NPR  
RIGHT NPR

A04S2 1-01 \*  
C04S2 1-02 \*  
F02A1 1-03 \*  
1

2  
1

14-0/8

197  
197  
197  
197

DB11A,H		HND288.V22(22) 11/06/73				19-DEC-73		9:49		PAGE 18		
RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
RIGHT A15		R04R1		1-01 *				2		3-6		163
RIGHT A15		D04R1		1-02 *				1				163
RIGHT A15		F01E1		1-03 *								163
RIGHT A15				1						15-3/8		163
RIGHT A16		R04S2		1-01 *				2				164
RIGHT A16		D04S2		1-02 *				1				164
RIGHT A16		F01L1		1-03 *								164
RIGHT A16				1						15-2/8		164
RIGHT A17		R04S1		1-01 *				2		3-6		165
RIGHT A17		D04S1		1-02 *				1				165
RIGHT A17		F01K1		1-03 *								165
RIGHT A17				1						15-5/8		165
RIGHT RG4		R04E2	D04E2	1-01 *	H			2	TWP		HAND WIRE	166
RIGHT RG4		D04E2	F02F2	1-02 *	H			1	TWP		HAND WIRE	166
RIGHT RG4		F02F2		1-03 *							TO HERE	166
RIGHT RG4				1						15-4/8		166
RIGHT RG4 RUF		C03F1		1-01 *				1				167
RIGHT RG4 RUF		F02V2		1-02 *								167
RIGHT RG4 RUF				1						12-0/8		167
RIGHT RG5		R04B1	D04B1	1-01 *	H			2	TWP		HAND WIRE	168
RIGHT RG5		D04B1	F02T2	1-02 *	H			1	TWP		HAND WIRE	168
RIGHT RG5		F02T2		1-03 *							TO HERE	168
RIGHT RG5				1						17-2/8		168
RIGHT RG5 RUF		C03C1		1-01 *	1			1		6-3		169
RIGHT RG5 RUF		F02S1		1-02 *								169
RIGHT RG5 RUF				1						13-3/8		169
RIGHT RG6		R04A1	D04A1	1-01 *	H			2	TWP		HAND WIRE	170
RIGHT RG6		D04A1	F02N2	1-02 *	H			1	TWP		HAND WIRE	170
RIGHT RG6		F02N2		1-03 *							TO HERE	170
RIGHT RG6				1						16-6/8		170
RIGHT RG6 RUF		C03H1		1-01 *				1				171
RIGHT RG6 RUF		F02L2		1-02 *								171
RIGHT RG6 RUF				1						10-6/8		171
RIGHT RG7		A04V1	C04V1	1-01 *	H			2	TWP		HAND WIRE	172
RIGHT RG7		C04V1	F02K1	1-02 *	H			1	TWP		HAND WIRE	172
RIGHT RG7		F02K1		1-03 *							TO HERE	172
RIGHT RG7				1						17-2/8		172

DB11A,H		HND288.V22(22) 11/06/73				19-DEC-73		9:49		PAGE 19		
RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
RIGHT RG7 RUF		C03D2		1-01 *				1		6-0		173
RIGHT RG7 RUF		F02J1		1-02 *								173
RIGHT RG7 RUF				1						12-5/8		173
RIGHT RH4		R04D2		1-01 *				1				174
RIGHT RH4		D04D2		1-02 *				2				174
RIGHT RH4		F02L1		1-03 *								174
RIGHT RH4				1						13-6/8		174
RIGHT RH5		R04C1		1-01 *	1			1		3-7		175
RIGHT RH5		D04C1	F02J1	1-02 *				2				175
RIGHT RH5		F02J1		1-03 *								175
RIGHT RH5				1						14-1/8		175
RIGHT RH6		A04U2		1-01 *				2				176
RIGHT RH6		C04U2		1-02 *				1				176
RIGHT RH6		F02F1		1-03 *								176
RIGHT RH6				1						14-2/8		176
RIGHT RH7		C04I2		1-01 *				2				177
RIGHT RH7		F02D1	A04I2	1-02 *				1				177
RIGHT RH7		A04I2		1-03 *								177
RIGHT RH7				1						18-6/8		177
RIGHT RUF ACLO		C03L2									1-PIN RUN	178
RIGHT RUF BBSY		C03V1									1-PIN RUN	179
RIGHT RUF DCLU		C03S2									1-PIN RUN	180
RIGHT RUF MSYN		D03J1									1-PIN RUN	181
RIGHT RUF SACK		C03P2									1-PIN RUN	182
RIGHT RUF SSYN		D03K2									1-PIN RUN	183
RIGHT BUS ACLO		R04F1	C03K1	1-01 *				1				184
RIGHT BUS ACLO		C03K1		1-02 *				2		2-4		184
RIGHT BUS ACLO		D04F1		1-03 *								184
RIGHT BUS ACLO				1						11-1/8		184
RIGHT BUS BBSY		A04P2		1-01 *				1				185
RIGHT BUS BBSY		C04P2	C01U2	1-02 *				2				185
RIGHT BUS BBSY		C01U2		1-03 *								185
RIGHT BUS BBSY				1						11-4/8		185

DB11A.H		HND288.V22(22) 11/06/73				19-DFC-73		9149		PAGE 20					
RUN NAME	A/P	PIN NAME	ORDER PIN	RAY - ORDER	U	DRAW	KV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
RIGHT BUS CU0		R04U2		1-01 *							1				186
RIGHT BUS CU0		D04U2		1-02 *							2				186
RIGHT BUS CU0		D03S2		1-03 *											186
RIGHT BUS CU0				1									10-4/8		186
RIGHT BUS CU1		R04I2		1-01 *	1						1		3-3		187
RIGHT BUS CU1		D03N2		1-02 *							2				187
RIGHT BUS CU1		D04I2		1-03 *											187
RIGHT BUS CU1				1									10-3/8		187
RIGHT BUS DCLO		R04F2	C03T2	1-01 *							1				186
RIGHT BUS DCLO		C03T2		1-02 *							2		7-0		186
RIGHT BUS DCLO		D04F2		1-03 *											186
RIGHT BUS DCLO				1									20-7/8		186
RIGHT BUS INIT		A04A1		1-01 *							1		3-7		189
RIGHT BUS INIT		C04A1		1-02 *							2				189
RIGHT BUS INIT		C03L1		1-03 *											189
RIGHT BUS INIT				1									12-1/8		189
RIGHT BUS INTR		A04B1		1-01 *							1		3-6		190
RIGHT BUS INTR		C04B1		1-02 *							2				190
RIGHT BUS INTR		C03N1		1-03 *											190
RIGHT BUS INTR				1									11-7/8		190
RIGHT BUS MSYN		R04V1		1-01 *							1				191
RIGHT BUS MSYN		D03K1		1-02 *							2				191
RIGHT BUS MSYN		D04V1		1-03 *											191
RIGHT BUS MSYN				1									10-4/8		191
RIGHT BUS NPG		A04U1		1-01 *							1				192
RIGHT BUS NPG		C03B1		1-02 *							2				192
RIGHT BUS NPG		C04U1		1-03 *											192
RIGHT BUS NPG				1									10-4/8		192
RIGHT BUS PA		A04M1		1-01 *							1		3-7		193
RIGHT BUS PA		C04M1		1-02 *							2				193
RIGHT BUS PA		D03E1		1-03 *											193
RIGHT BUS PA				1									12-1/8		193
RIGHT BUS PB		A04N2		1-01 *							1				194
RIGHT BUS PB		C04N2		1-02 *							2				194
RIGHT BUS PB		D03E2		1-03 *											194
RIGHT BUS PB				1									12-0/8		194

DB11A.H		HND288.V22(22) 11/06/73				19-DFC-73		9149		PAGE 21					
RUN NAME	A/P	PIN NAME	ORDER PIN	RAY - ORDER	U	DRAW	KV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
RIGHT BUS SACK		A04R2		1-01 *							1				195
RIGHT BUS SACK		C04R2		1-02 *							2				195
RIGHT BUS SACK		C03N2		1-03 *											195
RIGHT BUS SACK				1									10-4/8		195
RIGHT BUS SSYN		R04U1		1-01 *							1				196
RIGHT BUS SSYN		D03H2		1-02 *							2				196
RIGHT BUS SSYN		D04U1		1-03 *											196
RIGHT BUS SSYN				1									10-2/8		196
RIGHT NPR		A04S2		1-01 *							2				197
RIGHT NPR		C04S2		1-02 *							1				197
RIGHT NPR		F02A1		1-03 *											197
RIGHT NPR				1									14-0/8		197



ERROR LISTING

WIPE WRAP RUN NAME	A/P	PIN NAME	ORDER PIN	DAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	19-DEC-73 LENGTH	9:49 EXCEPTIONS	PAGE 1 RUN NUMBER
B INTY		C03J1												1-PIN RUN	11
LEFT BUF BRSY		D03A1												1-PIN RUN	111
LEFT BUF C00		D03P2												1-PIN RUN	112
LEFT BUF C01		D03M2												1-PIN RUN	113
LEFT BUF DCLO		C03R1												1-PIN RUN	114
LEFT BUF MSYN		D03H1												1-PIN RUN	115
LEFT BUF SSYN		D03F2												1-PIN RUN	116
RIGHT RG4		R04E2	D04E2	1-01 *	H						2	IWP		HAND WIRE	166
RIGHT BG4		D04E2	F02F2	1-02 *	H						1	IWP		HAND WIRE	166
RIGHT RG4		F02F2		1-03 *										TO HERE	166
RIGHT RG5		R04B1	D04B1	1-01 *	H						2	TWP		HAND WIRE	168
RIGHT BG5		D04B1	F02T2	1-02 *	H						1	IWP		HAND WIRE	168
RIGHT RG5		F02T2		1-03 *										TO HERE	168
RIGHT RG6		R04A1	D04A1	1-01 *	H						2	TWP		HAND WIRE	170
RIGHT RG6		D04A1	F02N2	1-02 *	H						1	TWP		HAND WIRE	170
RIGHT RG6		F02N2		1-03 *										TO HERE	170
RIGHT RG7		A04V1	C04V1	1-01 *	H						2	TWP		HAND WIRE	172
RIGHT RG7		C04V1	F02K1	1-02 *	H						1	TWP		HAND WIRE	172
RIGHT RG7		F02K1		1-03 *										TO HERE	172
RIGHT RUF ACTO		C03L2												1-PIN RUN	178
RIGHT RUF RBSY		C03V1												1-PIN RUN	179
RIGHT RUF DCLO		C03S2												1-PIN RUN	180
RIGHT RUF MSYN		D03J1												1-PIN RUN	181
RIGHT RUF SACK		C03P2												1-PIN RUN	182
RIGHT RUF SSYN		D03K2												1-PIN RUN	183

**DIGITAL EQUIPMENT CORPORATION**  
MAYNARD, MASSACHUSETTS

**ENGINEERING SPECIFICATION**

DATE 1/3/71

TITLE DB11-A Bus Repeater

**REVISIONS**

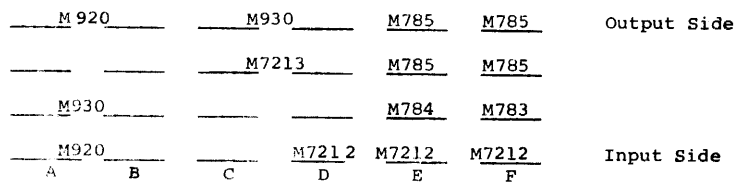
REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
A	REVISED PER ECO 00002	00002			V. Boston	7/9/71
B	ECO CHANGE	00005	PASTIANI	6-14-72	V. Boston	1/2/73
C	CHANGE PER ECO	DB11A-00008	REILLY	10-73	Skully	10/31/73

The bus repeater will allow the extension of the Unibus beyond 18 unit loads. The bus repeater will not degrade the bus cycle time of any device before the bus repeater, and will add a maximum 375ns to cycle time of devices addressed beyond the bus repeater. The repeater will allow 18 more loads to be hung on the Unibus.

1.1 The bus repeater DB11 will be contained in a single system unit with an input and output unibus connection. The modules required are:

- a. 4 - M785 Transceiver
- b. 1 - M783 Drivers
- c. 1 - M784 Receivers
- d. 3 - M7212 Address Buffer Cards
- e. 1 - M7213 Buffer Master Card
- f. 2 - M730 Resistor Termination Cards
- g. 1 - M7248 UNIBUS REPEATER BUS BUSY

A layout of the modules is shown below:



NOTE:1 The Unibus is Bidirectional, but the bus repeater is not symmetrical i.e. the processor must be on the input side of the bus repeater. This is because certain one-direction unibus signals are implemented in only one direction. All signals which must be bidirectional are so implemented.

ENG	APPD	SIZE	CODE	NUMBER	REV
		A	SP	DB11-A-7	C

SHEET 1 OF 4

CONTINUATION SHEET

TITLE DB11-A Bus Repeater

**Power Used:**

+5 Volts @ 2.2 Amps

1.2 Unit will operate from +40°F to 120°F with relative humidity of 95%.

1.3 Unit will add zero time to bus cycles before the repeater, and 375ns worst case to bus cycles of units addressed beyond the bus repeater. All guaranteed timing on the primary unibus in terms of delay for deskewing etc., are preserved on the buffered section of the bus.

These guaranteed timings are:

- a. A lines good at device 75ns before MSYN;
- b. A lines do not change at device before MSYN drops;
- c. SSYN will arrive at device no more than 75ns before data is good;
- d. INTR will arrive at processor no more than 75ns before data is good.

The repeater represents one unit load to the primary bus.

**1.4 Operation of the Repeater**

The Repeater uses the BBSY circuit as a master controlling signal. The BBSY buffering circuit is a truly bidirectional circuit. From BBSY is determined the direction to enable the A-line circuits. Since the master is always asserting the A lines then by looking at BBSY the enabling signal for the A lines can be determined.

Next the direction of the D lines must be determined. This is determined from BBSY, Cl, INTR signals. For DATI the D lines are enabled to the master, and for INTR the D lines are enabled to the Processor. The SSYN circuit direction is determined from the same three circuit, BBSY, Cl and INTR, but is determined differently than the D line circuits.

All one direction circuits require no gating to determine direction. These include INIT, INTR, all Grant; all B requests, SACK and ACLO.

The signal DCLO uses the identical circuit as BBSY since it must also be truly bidirectional because the power fail signal could be coming from either side of the buffer. The operations of the DCLO circuit is delayed an turn on so that a multi box system will turn on.

SIZE	CODE	NUMBER	REV
A	SP	DB11-A-7	C

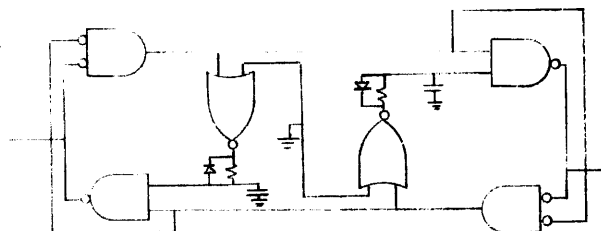
SHEET 2 OF 4

CONTINUATION SHEET

TITLE DB11-A Bus Repeater

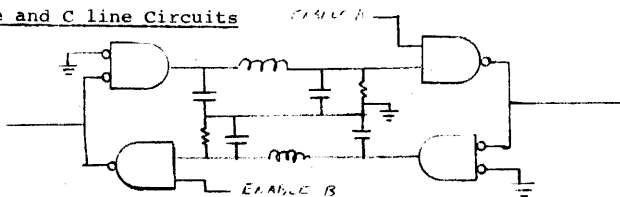
**Types of Circuits**

BBSY, DCLO



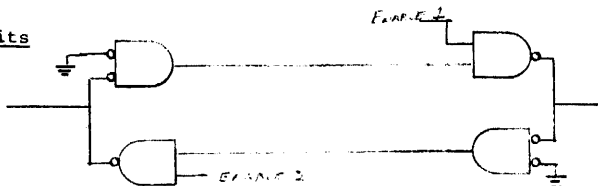
The BBSY circuit provides the A line gating depending on what side the master is on.

**A line and C line Circuits**



The above LC networks are a linear phase filter which provides an equal 75ns delay to assertion and negation of the A lines. These delays are required to preserve the Unibus guaranteed timing (deskewing etc).

**D line Circuits**



The D line circuits are made up of M785 transceiver modules.

**Unidirectional Lines**

All unidirectional lines are made up of M783 and M784 modules connected together.

**Programming**

None, the unit is transparent to any programs.

SIZE	CODE	NUMBER	REV
A	SP	DB11-A-7	C

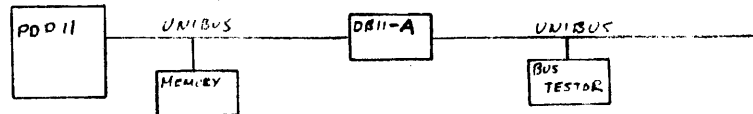
SHEET 3 OF 4

CONTINUATION SHEET

TITLE DB11-A Bus Repeater

**Testing**

Unit should be tested by placing it in series with the Unibus as shown in the fig



The above configuration should run ETP-2 for one hour with no errors.

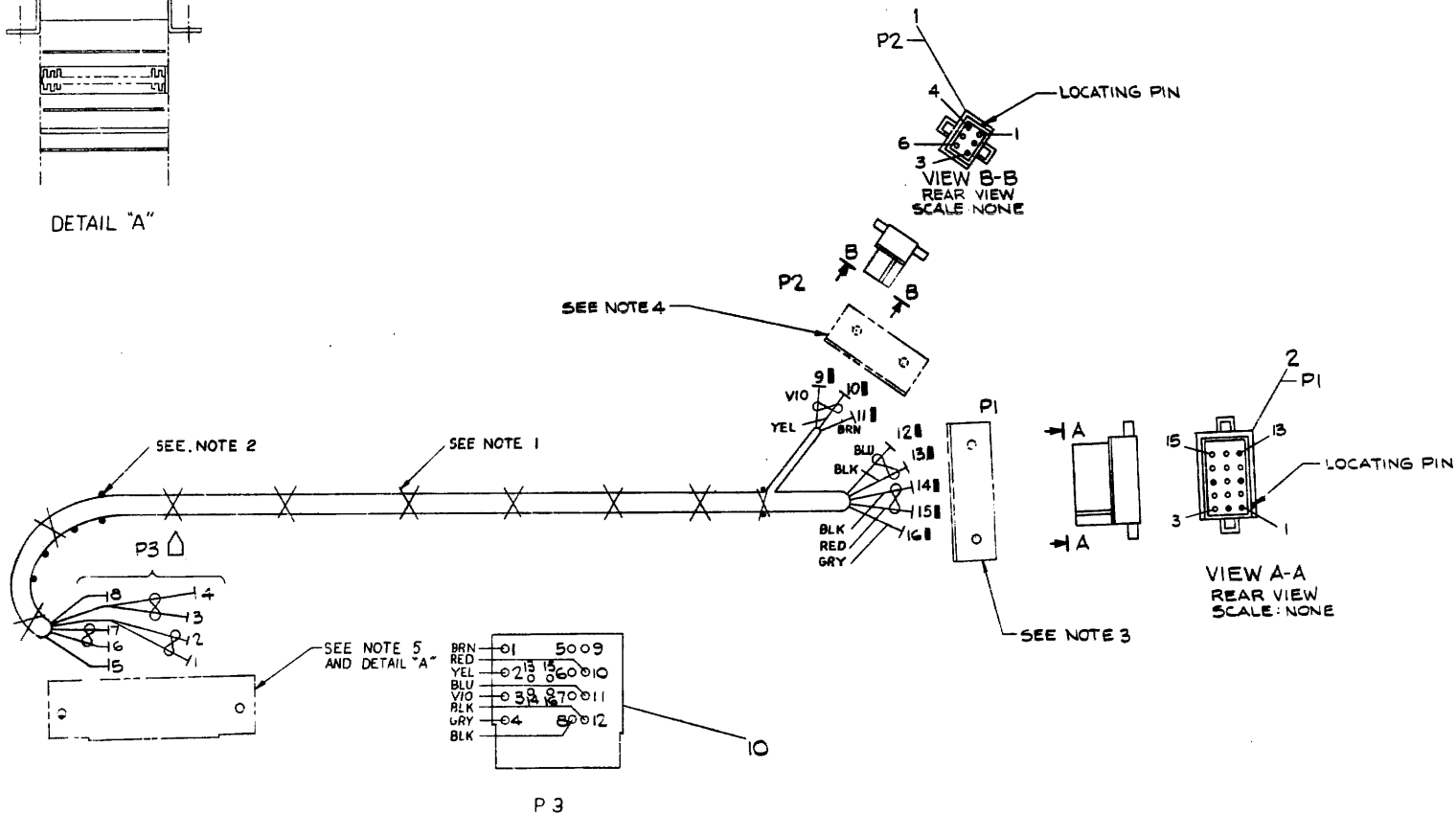
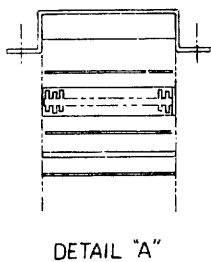
SIZE	CODE	NUMBER	REV
A	SP	DB11-A-7	C

SHEET 4 OF 4



WIRE TABLE										
ITEM NO.	DESCRIPTION	COLOR	POINT	FROM			TO			SIGNAL
				CONNECTION	TERM	POINT	CONNECTION	TERM		
5	14	RED	3	P3-10	SOLD	15	P1-1	3	+5V	
	TWP	BLK	4	P3-8	SOLD	14	P1-7	3	GND	
9	14	GRY	5	P3-4	SOLD	16	P1-2	3	+15V	
6	14	BLK	1	P3-12	SOLD	13	P1-9	3	GND	
	TWP	BLU	2	P3-11	SOLD	12	P1-13	3	-15V	
8	18	BRN	8	P3-1	SOLD	11	P2-2	3	LTc	
7	18	VIO	6	P3-3	SOLD	9	P2-3	3	DcLo	
	TWP	YEL	7	P3-2	SOLD	10	P2-4	3	AcLo	
11	22	-	-	P3-13	SOLD	-	P3-14	SOLD	DcLo	
11	22	-	-	P3-15	SOLD	-	P3-16	SOLD	AcLo	

- NOTES:**
- USE TIE WRAPS (X) ITEM #4 APPROXIMATELY EVERY THREE (3) INCHES WHEN NECESSARY AND AT EVERY BREAKOUT POINT.
  - DOT (•) INDICATES NAIL LOCATIONS FOR ASSEMBLY USE ONLY. COVER NAILS WITH SHRINK TUBING TO PREVENT CUTTING HARNESS.
  - USE CONN BRKT C-MD-930576-0 MOUNT WITH WOOD SCREWS. USE MATING CONN 1209350-15.
  - USE CONN BRKT C-MD-930576-H6-0 MOUNT WITH WOOD SCREWS. USE MATING CONN 1209350-06.
  - USE CONN. HOLD DOWN B-MD-930576-00 WITH PLATE B-MD-930576-0-1. USE TAPE DEC #9008734 & CONN H807 DEC# (1209123) REMOVE PINS & FLANGES AS SHOWN IN DETAIL "A". MOUNT WITH WOOD SCREWS.



SYM	DESCRIPTION	QTY.	PART NO.	REV. NO.
	A/R BUSS WIRE #22AWG		9107560-01	11
	1 POWER CONN		6772	10
	A/R WIRE #14AWG GRN		9107370-88	9
	A/R WIRE #18AWG BRN		9107360-11	8
	A/R WIRE #18TWP YEL/VIO		9107430-47	7
	A/R WIRE #2TWP BLK/BLU		9107440-06	6
	A/R WIRE #14TWP BLK/RED		9107440-02	5
X	A/R WRAP TIE		9007031	4
	6 PIN MALE		1209378-C0	3
	1 HOUSING CONN. 15 PIN		1209351-15	2
	1 HOUSING CONN. 6 PIN		1209351-06	1

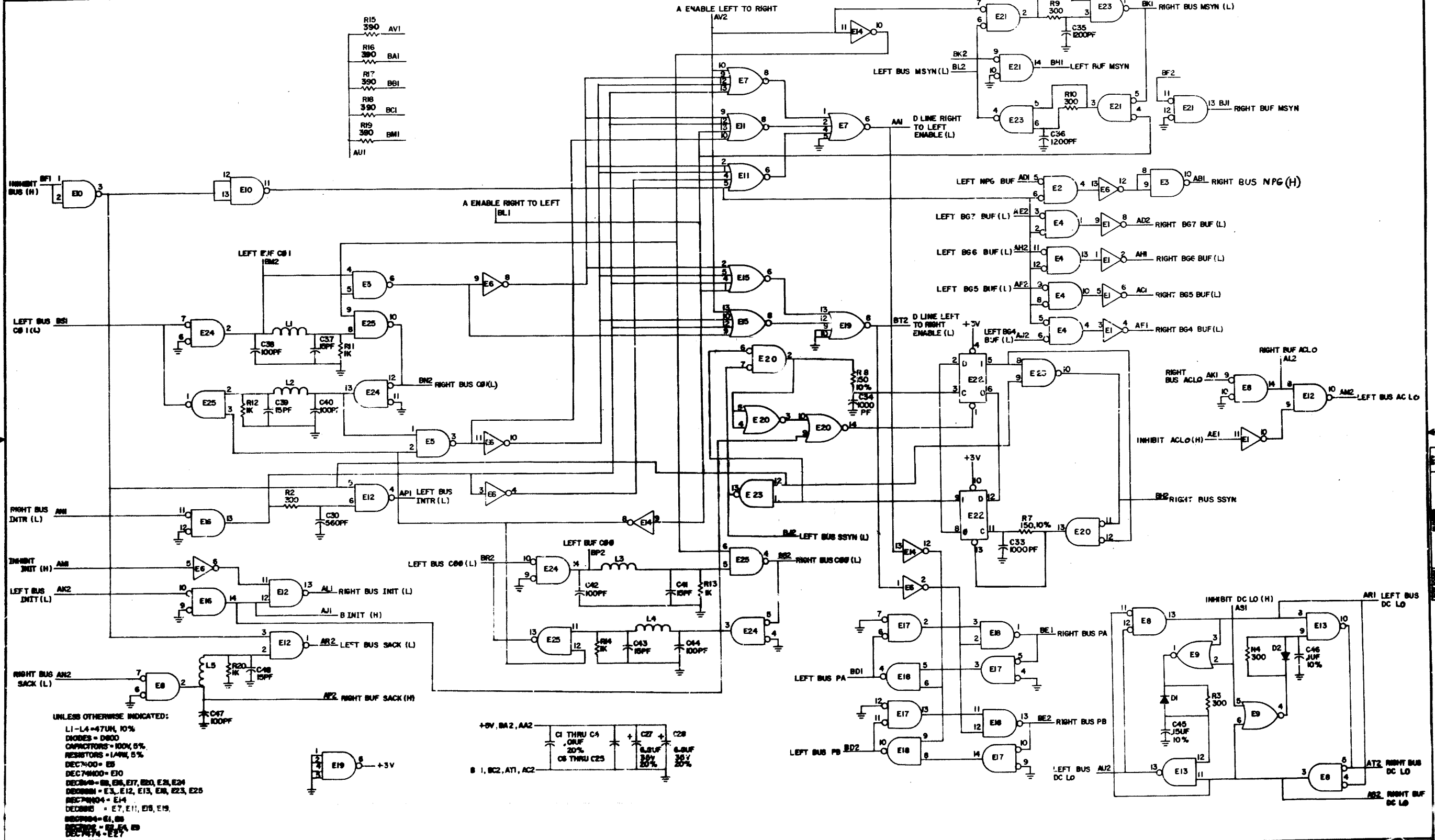
DATE	BY	REVISION	REVISION
JUN - 68		1	
JUL - 68		2	
AUG - 68		3	
SEP - 68		4	
OCT - 68		5	
NOV - 68		6	
DEC - 68		7	
JAN - 69		8	
FEB - 69		9	
MAR - 69		10	
APR - 69		11	
MAY - 69		12	
JUN - 69		13	
JUL - 69		14	
AUG - 69		15	
SEP - 69		16	
OCT - 69		17	
NOV - 69		18	
DEC - 69		19	
JAN - 70		20	

TITLE: G772 SYSTEM UNIT HARNESS  
 PART NO.: 7009562-0-0  
 SCALE: 1/1  
 DRAWN BY: [Signature]  
 CHECKED BY: [Signature]  
 APPROVED BY: [Signature]

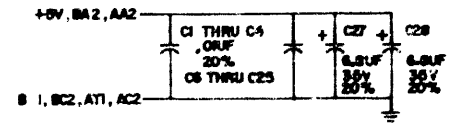




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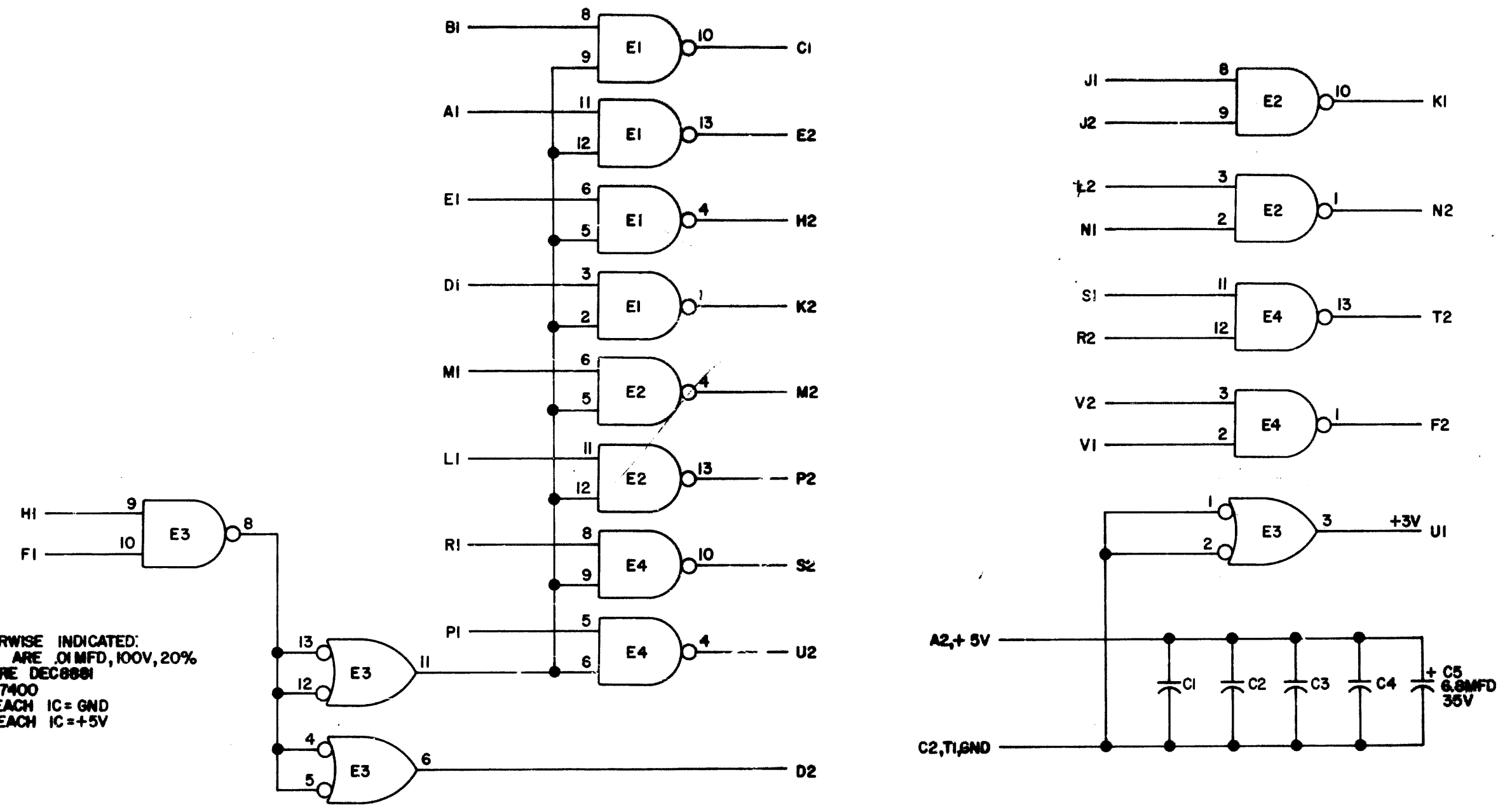


UNLESS OTHERWISE INDICATED:  
 L1-L4 - 47UH, 10%  
 DIODES - D800  
 CAPACITORS - 100V, 5%  
 RESISTORS - 1/4W, 5%  
 DEC7400 - E5  
 DEC74000 - E10  
 DEC7404 - E6, E7, E20, E21, E24  
 DEC7408 - E3, E12, E13, E18, E23, E25  
 DEC74104 - E4  
 DEC74105 - E7, E11, E16, E19  
 DEC74106 - E1, E8  
 DEC74107 - E2, E5, E9  
 DEC74109 - E17  
 PIN 1 - GND ON DEC7400  
 PIN 8 - +5V ON DEC74040  
 PIN 7 - GND ON ALL OTHER IC'S  
 PIN 14 - +5V



TRANSISTOR & DIODE CONVERSION CHART		EQUIPMENT CORPORATION		BUS REPEATER CARD	
DEC	SA	DEC	SA	REV	DATE

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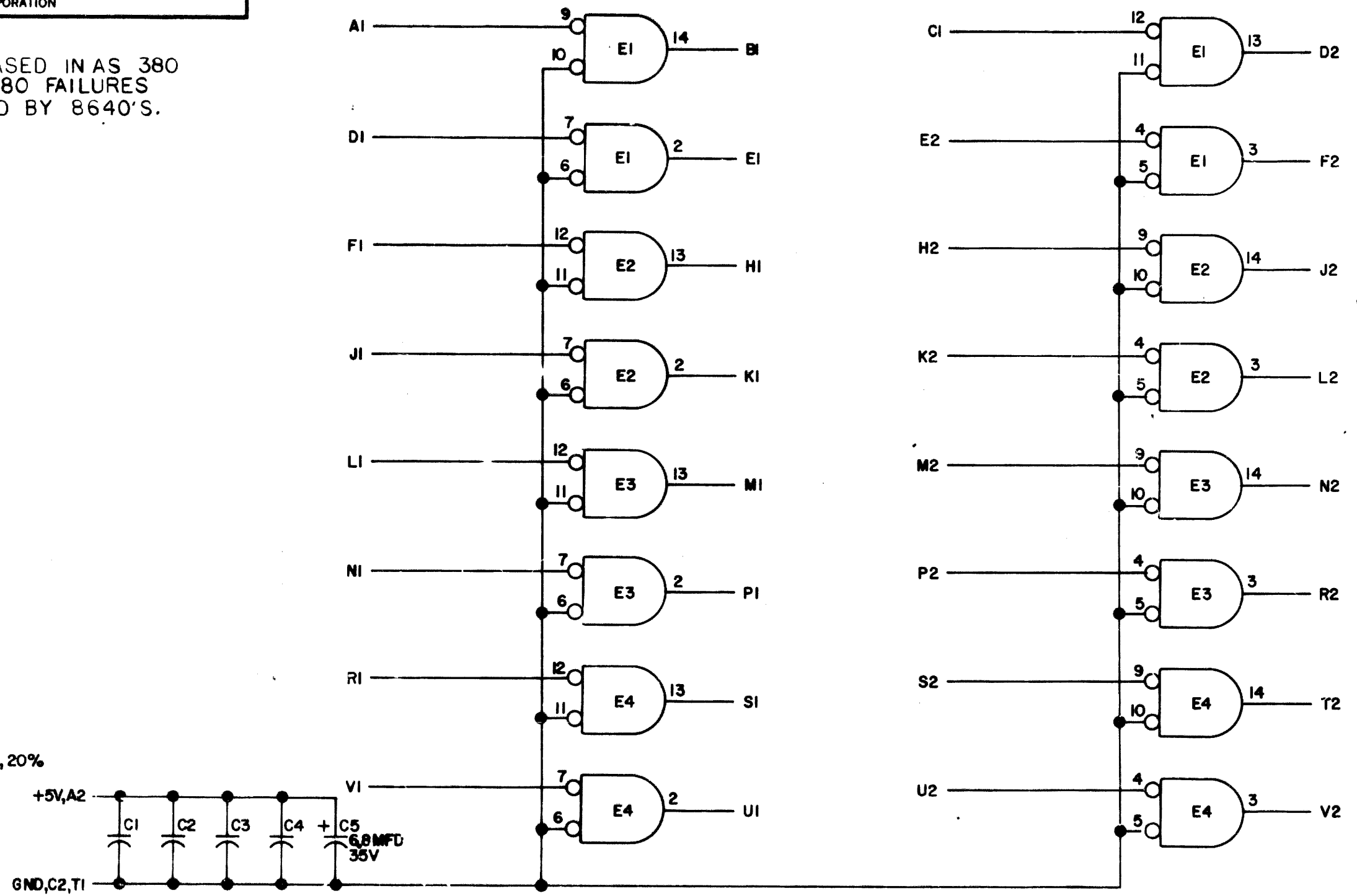
UNLESS OTHERWISE INDICATED:  
 CAPACITORS ARE .01MFD, 100V, 20%  
 E1, E2, E4 ARE DEC8881  
 E3 IS DEC7400  
 PIN 7 ON EACH IC = GND  
 PIN 14 ON EACH IC = +5V

REVISIONS CHG NO   REV	DRN	DATE	TRANSISTOR & DIODE CONVERSION CHART				TITLE			
	CHK'D	DATE	DEC	EIA	DEC	EIA	UNIBUS DRIVERS M783			
	ENG	DATE	EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS				SIZE	CODE	NUMBER	REV.
	PROD	DATE					B	CS	M783-0-1	



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NOTE:  
 DEC 8640'S WERE PHASED IN AS 380 REPLACEMENTS. ANY 380 FAILURES SHOULD BE REPLACED BY 8640'S.



UNLESS OTHERWISE INDICATED:  
 CAPACITORS ARE .01MFD, 100V, 20%  
 IC'S ARE DEC 8640  
 PIN 1 ON EACH IC=GND  
 PIN 8 ON EACH IC=+5V

REV	CHG	NO	REV
A	00001		
B	00002		
C	00003		

DRN	DATE
CHK	DATE
PRD	DATE

TRANSISTOR & DIODE CONVERSION CHART			
DEC		EIA	

**digital**  
 EQUIPMENT CORPORATION  
 MAYNARD MASSACHUSETTS

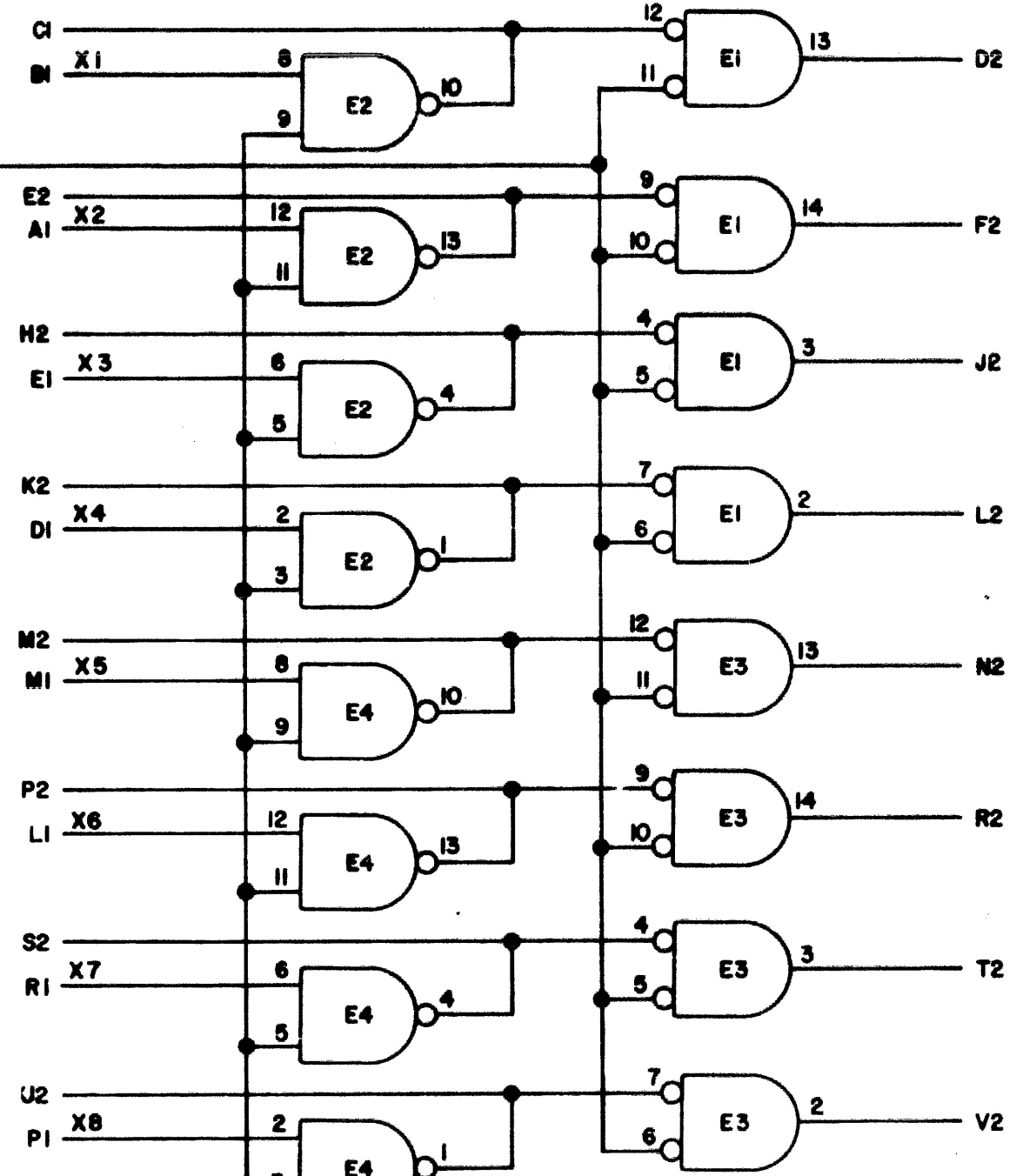
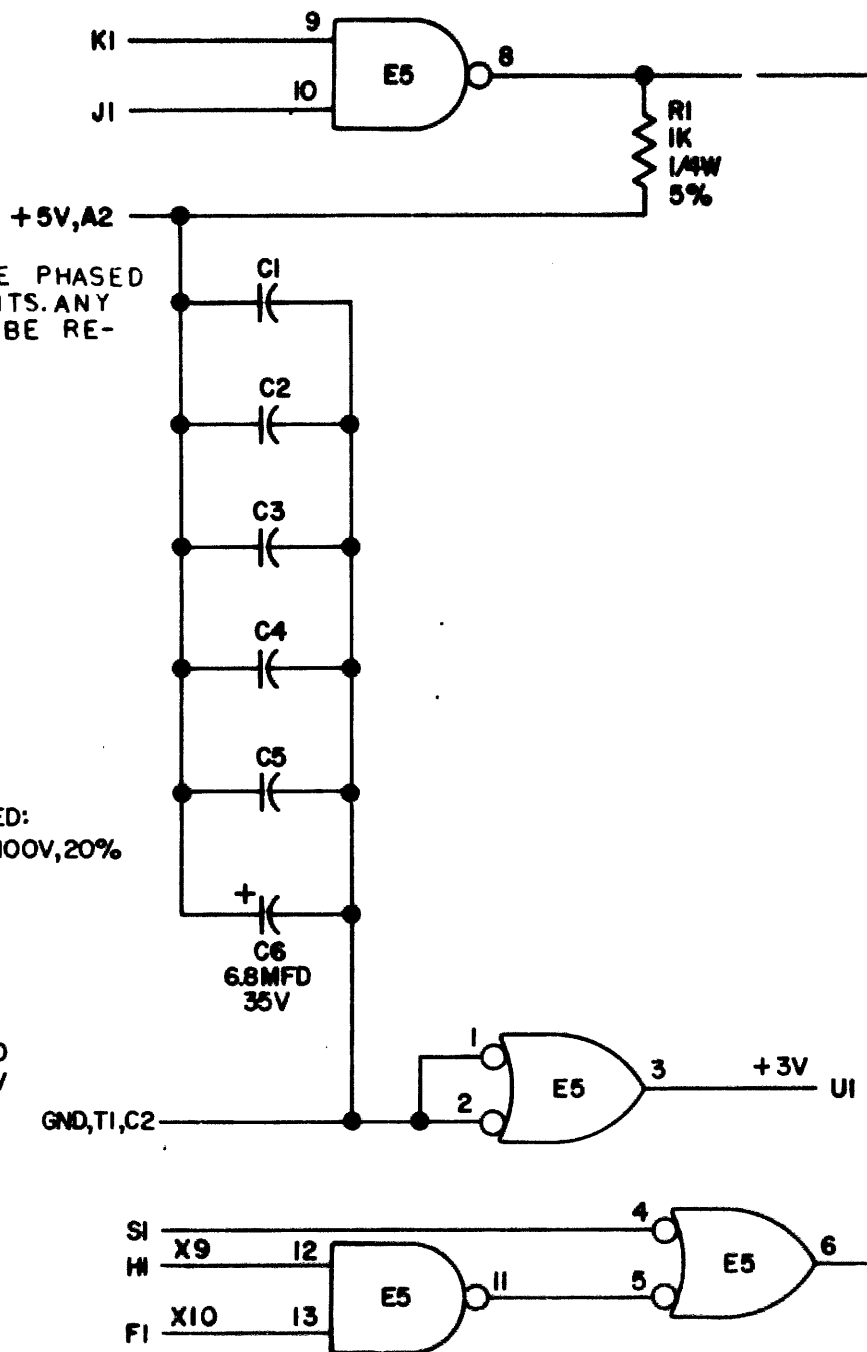
TITLE UNIBUS RECEIVERS M784			
SIZE B	CODE CS	NUMBER M784-0-1	REV C
PRINTED CIRCUIT REV			A B C

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REV. A B  
NUMBER M785-0-1  
SIZE CODE B CS B 37'S

NOTE:  
DEC 8640'S WERE PHASED IN AS 380 REPLACEMENTS. ANY 380 FAILURES SHOULD BE REPLACED BY 8640'S.

UNLESS OTHERWISE INDICATED:  
CAPACITORS ARE .01MFD, 100V, 20%  
E1, E3 ARE DEC 8640  
E2, E4 ARE DEC8881  
E5 IS DEC7400  
PIN 1 ON E1, E3 = GND  
PIN 8 ON E1, E3 = +5V  
PIN 7 ON E2, E4, E5 = GND  
PIN 14 ON E2, E4, E5 = +5V



REV	NO.	CHG	NO.
A	00001		
B	00003		

DRN <i>R. Foley</i>	DATE 11-19-69
CHK'D <i>J. H. ...</i>	DATE 1-7-70
ENG <i>P. E. ...</i>	DATE 3/11/70
PROD	DATE

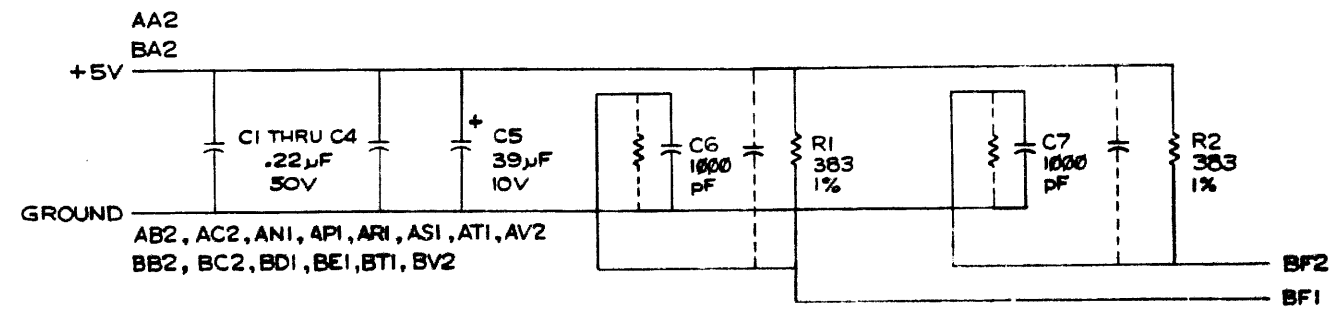
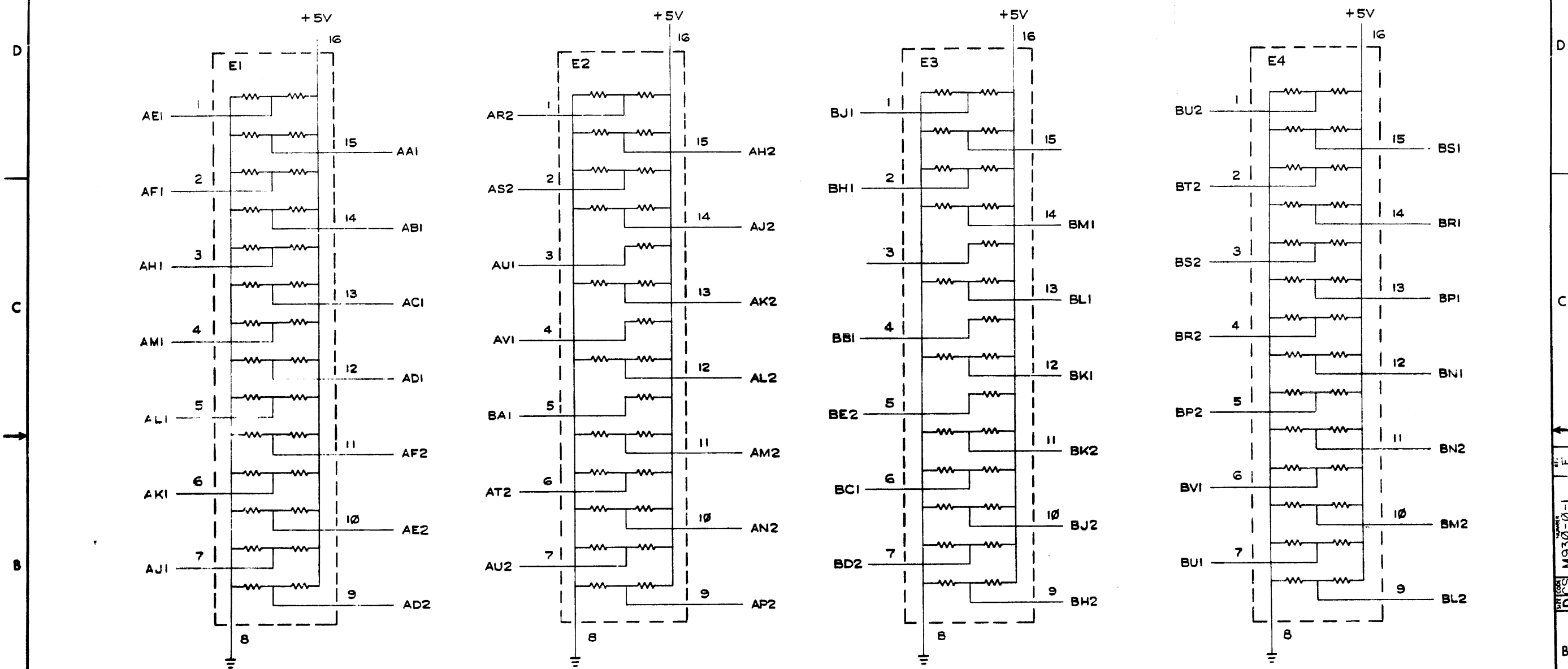
TRANSISTOR & DIODE CONVERSION CHART			
DEC	EIA	DEC	EIA

**digital**  
EQUIPMENT CORPORATION  
MAYNARD, MASSACHUSETTS

TITLE UNIBUS TRANCEIVERS			
M785			
SIZE B	CODE CS	NUMBER M785-0-1	REV. B
PRINTED CIRCUIT REV.			A B



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REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	NUMBER	REV.
BUS TERMINATOR	DCS M930-0-1	E
SCALE	SHEET 2 OF 2	DIST.

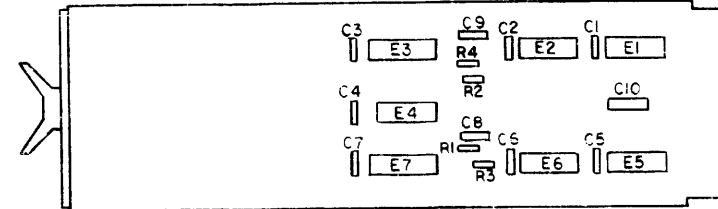
DCS M930-0-1

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PARTS REFERENCE

ITEM NO	DRAWING REFERENCE	DESCRIPTION	PART NUMBER	QUANTITY
1	E5	IC DEC 7404	1909686	1
2	E6	IC DEC 314	1909704	2
3		IC DEC 9881	1909703	1
4		IC DEC 7403	1909930	1
5	E7	IC DEC 74123	1910436	2
6	C10	CAP 6.8UF 35V20% S TANT	1000087	1
7	C1-C7	CAP 01UF 100V 20% DISC	1001610	7
8	C5-C9	CAP 27PF 100V 5% MICA	1001739	2
9	R2-R3	RES 5.6K 1/8W 5%	101874	2
10	R1-R4	RES 5.1K 1/8W 5%	1024854	2
11		SPLIT LUGS	9005735	8

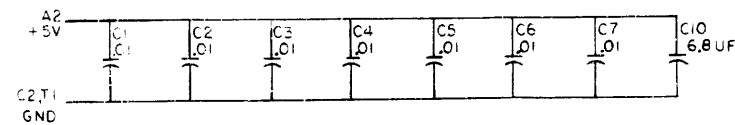
COMPONENT PLACEMENT



NOTES:

1. DETAILS ON COMPONENTS ARE NOTED IN THE PARTS REFERENCE, PLACEMENT IS NOTED IN THE COMPONENT PLACEMENT DIAGRAM. CAPACITORS WITHOUT NOTED VALUES ARE 01 MFD.
2. GND AND +5V ARE USUALLY PIN 7 AND PIN 14, RESPECTIVELY. EXCEPTIONS ARE:

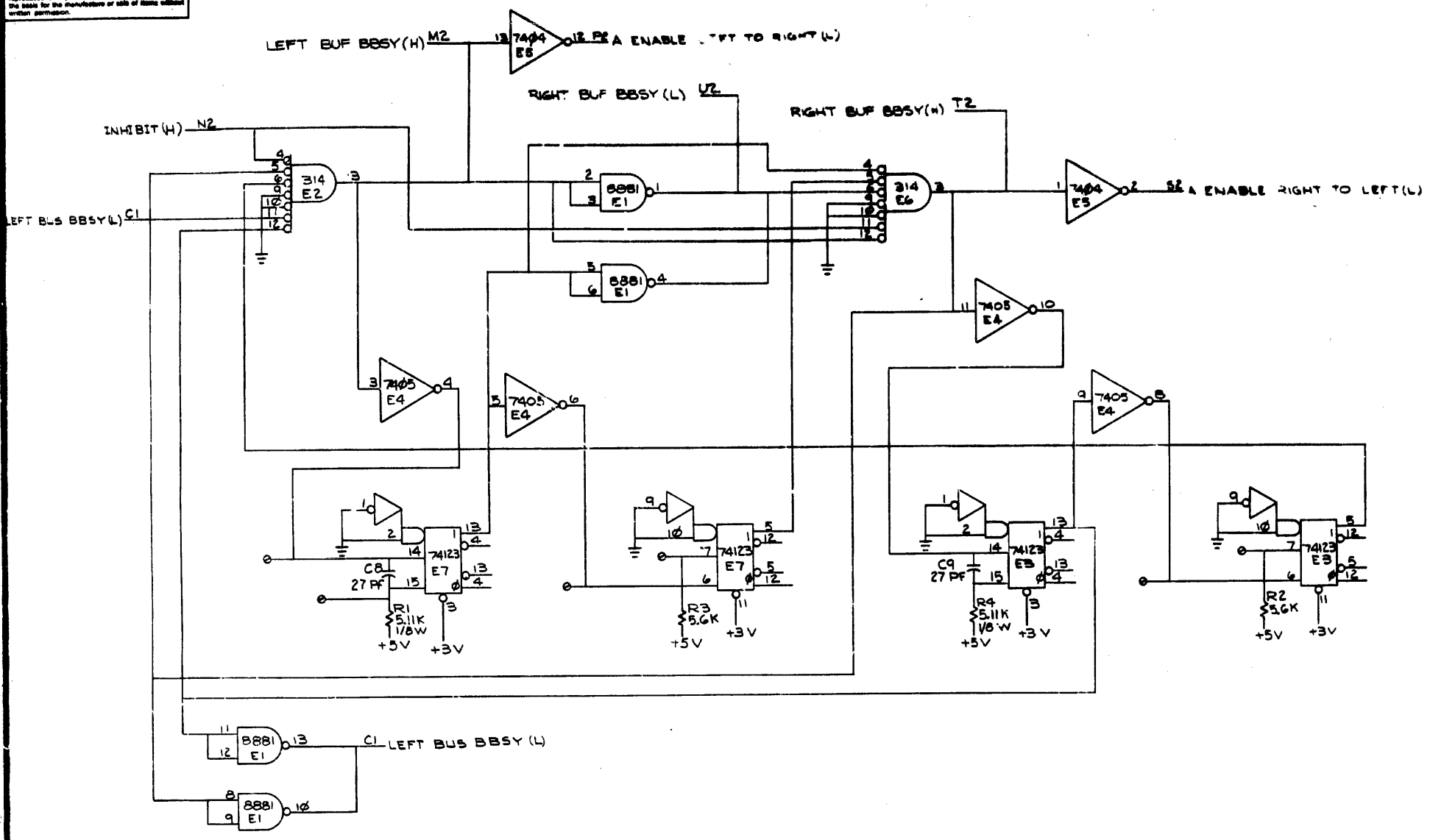
IC TYPE	GND	+5V
DEC 74123	PIN 8	PIN 16
DEC 314	PIN 1	PIN 8



REV	CHANGE NO	REVISIONS

QTY	DESCRIPTION	PART NO	UNIT
<p>UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES DECIMALS FRACTIONS ANGLES ± .005 ± .010 ± .015 FINISH SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS</p>			
MATERIAL		EQUIPMENT CORPORATION	
SEE PARTS LIST		UNIBUS REPEATER BBSY	
FINISH		DCS M7248-0-1	
SCALE 1/1"		B	
SHEET 1 OF 2			

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REVISIONS	REV
CHK	CHANGE NO
EC FORM NO	WD 102-B

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES	DWG. <i>[Signature]</i>	DATE <i>[Date]</i>	EQUIPMENT CORPORATION MILFORD, MASSACHUSETTS
DECIMALS	CHK'D <i>[Signature]</i>	DATE <i>[Date]</i>	
.XXX - .008	ENG. <i>[Signature]</i>	DATE <i>[Date]</i>	TITLE UNIBUS REPEATER BBSY
.XX - .02	PROJ. ENGR. <i>[Signature]</i>	DATE <i>[Date]</i>	
.X - .1	PROJ. MGR. <i>[Signature]</i>	DATE <i>[Date]</i>	
REMOVES BURRS AND BREAK SHARP CORNERS. SURFACE QUALITY	✓		
MATERIAL	NEXT HIGHER ASSY.	REV. CODE	REVISION
FINISH	SCALE	DCS M7248-0-1	B
	SHEET 2 OF 2	DIST.	