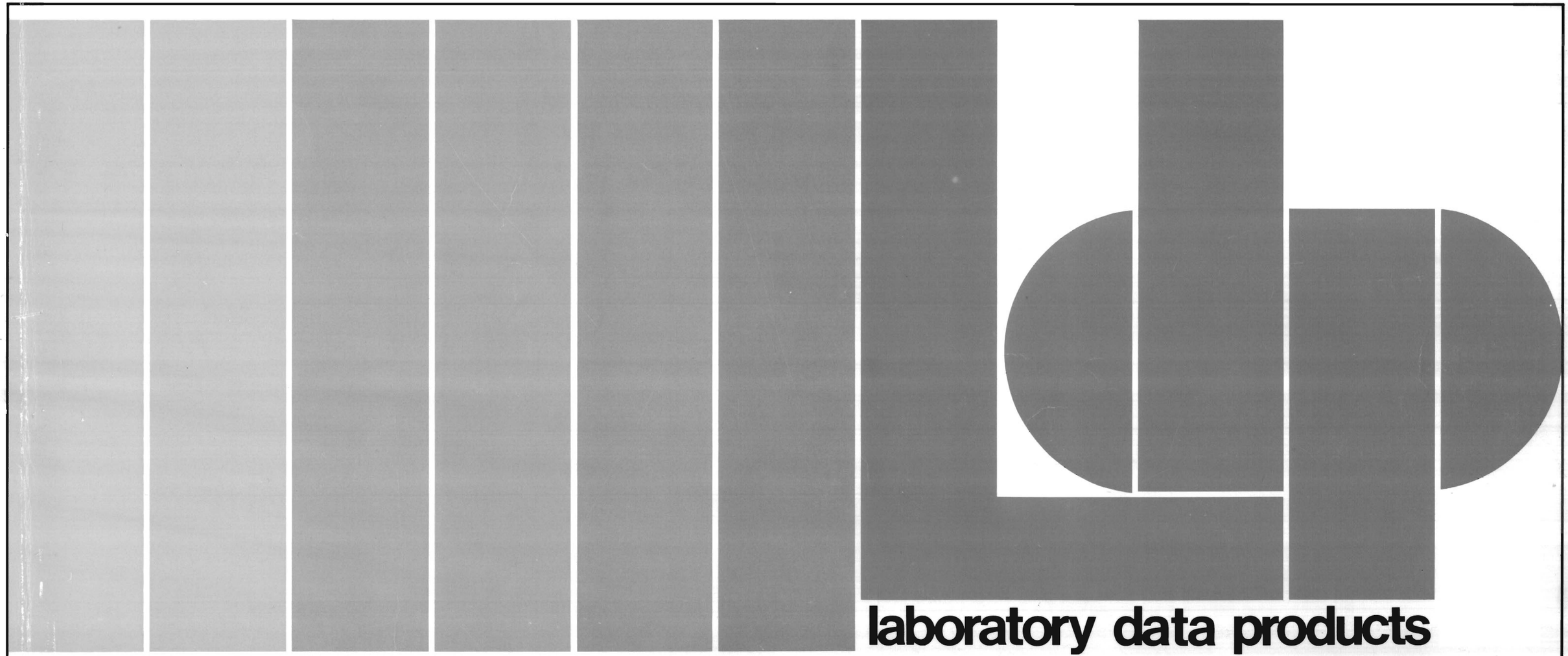
digital

Digital Equipment Corporation
Maynard, Massachusetts

LPS11-E
laboratory peripheral system
engineering drawings



laboratory data products

LPS11-E
laboratory peripheral system
engineering drawings

digital equipment corporation · maynard. massachusetts

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

DRAWING DIRECTORY

CUSTOMER PRINT SET INDEX

THIS IS PRINT SET [X]

SEQUENCE		SEQUENCE
LPS11 EXPANDER UNIT	B-DD-LPS11-E	
LPS11 EXPANDER UNIT	D-UA-LPS11-E-Ø	
WIRED ASSY. LPS EXP. UNIT	D-AD-7009770-0-0	
MODULE UTILIZATION	D-MU-LPS11-E-1	
LPS11-E BLOCK DIAGRAM	D-BD-LPS11-E-2	
LPSAM-E,LPSDA BLOCK DIAGRAM	D-BD-LPS11-E-3	
I/O BUS ADAPTER	C-CS-5409209-0-1	
LPSAG	A-PL-LPSAG-Ø-Ø	
4 CHAN. PREAMP.	D-CS-A242-Ø-1	
8 CHAN. MULTIPLEXER EXP.	A-PL-LPSAM-E-Ø	
8 CHAN. MULTIPLEXER	D-CS-A4Ø7-Ø-1	
JUMPER CARD	B-CS-G728-Ø-1	
CONN. MODULE	B-CS-M957-Ø-1	
EXTERNAL D-A CONVERTER	A-PL-LPSDA-Ø-Ø	
DUAL D-A CONVERTER MODULE	D-CS-A625-Ø-1	
ENG. SPEC.	A-SP-LPS11-E-4	
FIELD INSTALLATION/ACCEPTANCE	A-SP-LPS11-E-5	
ENG. SPEC.	A-SP-LPSAM-E-1	
ENG. SPEC.	A-SP-LPSDA-Ø-1	
WIRE LIST	K-WL-LPS11-E-WL	
LOGIC CABLE, LPS11-E	D-IA-7009790-0-0	
POWER HARNESS #1 LPS11-E	D-IA-7009788-0-0	
POWER HARNESS #2 LPS11-E	D-IA-7009789-0-0	
UNIBUS RECEIVER	D-CS-M784-Ø-1	

UNIT VARIATIONS

VAR	TITLE	PRINT SET LPS11-E
LPS11-E	LPS11 EXPANDER UNIT	X

REVISIONS	DATE	CHG. NO.	REV
	4-74	LPSIIE-1	A
	MC	RETYPTED	

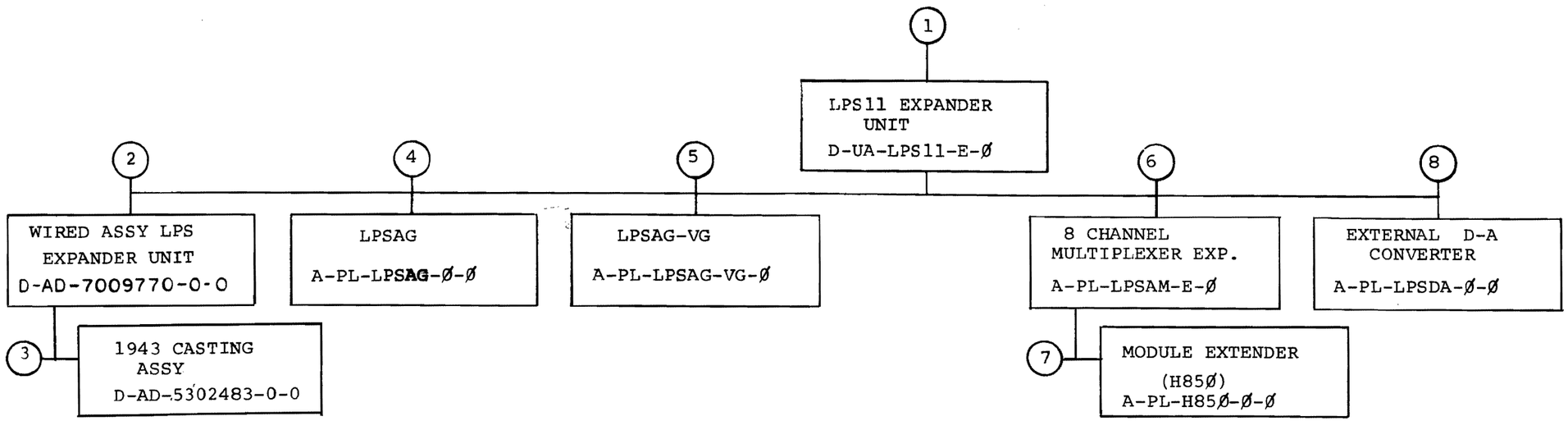
USED ON OPTION/MODEL

SHEET 1 OF 3

DRN. PHIL REED	DATE 3-7-74	TITLE LPS11 EXPANDER UNIT
CHK'D. PHIL REED	DATE 3-12-74	
PROJ ENG. A.H.SHIMER	DATE 3-12-74	
PROD. F.P.CORTAZZO	DATE 3-15-74	SIZE B / CODE DD / NUMBER LPS11-E / REV A
FIELD SERV. F.E.WYSCARVER	DATE 3-15-74	DIST

DEC 16-13251-1062-1A-R972

DRB 106



TITLE		SIZE	CODE	NUMBER	REV
LPS11 EXPANDER UNIT	SHEET 2 OF 3	B	DD	LPS11-E	A

ELECTRICAL

CUSTOMER PRINT SET LPS11-E	MFG. SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO./FILE DATE
X		1	D-UA-LPS11-E-Ø	*	1	LPS11 EXPANDER UNIT	
X			D-CS-M957-Ø-1	#	1	CONN. MODULE	
X			D-CS-M784-Ø-1	#	2	UNIBUS RECEIVER	
X			C-CS-5409209-0-1	#	1	I/O CABLE ADAPTER	
X			D-MU-LPS11-E-1	*	1	MODULE UTILIZATION	
X			D-BD-LPS11-E-2	*	1	LPS11-E BLOCK DIAGRAM	
X			D-BD-LPS11-E-3	*	1	LPS11AM-E, LPSDA BLOCK DIAGRAM	
X			A-SP-LPS11-E-4	*	4	ENGINEERING SPECIFICATION	
X			A-SP-LPS11-E-5	*	14	FIELD INSTALLATION/ACCEPTANCE	
	X		A-SP-LPS11-E-6	*	19	CHECKOUT/ACCEPTANCE PROC.	
X			A-SP-LPSAM-E-1	#	6	ENGINEERING SPECIFICATIONS	
X			A-SP-LPSDA-Ø-1	#	5	ENGINEERING SPECIFICATIONS	
X		2	D-AD-7009770-0-0	#	1	WIRED ASSY LPS EXPANDER UNIT	
			E-SC-1205348-0-0		4	288 PIN BLOCK TYPE H8Ø3	
			B-DC-5308753-0-0		1	21 POINT DECAL	
C			K-WL-LPS11-E-WL	*	1	WIRE LIST	
X		4	A-PL-LPSAG-Ø-Ø	#	1	LPSAG	
X			D-CS-A242-Ø-1	#	2	4 CHAN. PREAMP.	
		5	A-PL-LPSAG-VG-Ø		1	LPSAG-VG	
			D-CS-A241-Ø-1		2	MULTI-GAIN 4 CHAN PREAMP.	
X		6	A-PL-LPSAM-E-Ø	#	1	8 CHANNEL MULTIPLEXER EXP.	
X			D-CS-A4Ø7-Ø-1	#	2	8 CHAN. MULTIPLEXER	
X			B-CS-G728-Ø-1	#	1	JUMPER CARD	
X			B-CS-M957-Ø-1	#	1	CONN. MODULE	
X		8	A-PL-LPSDA-Ø-Ø	#	1	EXTERNAL D-A CONVERTER	
X			D-CS-A625-Ø-1	#	3	DUAL D-A CONVERTER MODULE	

MECHANICAL

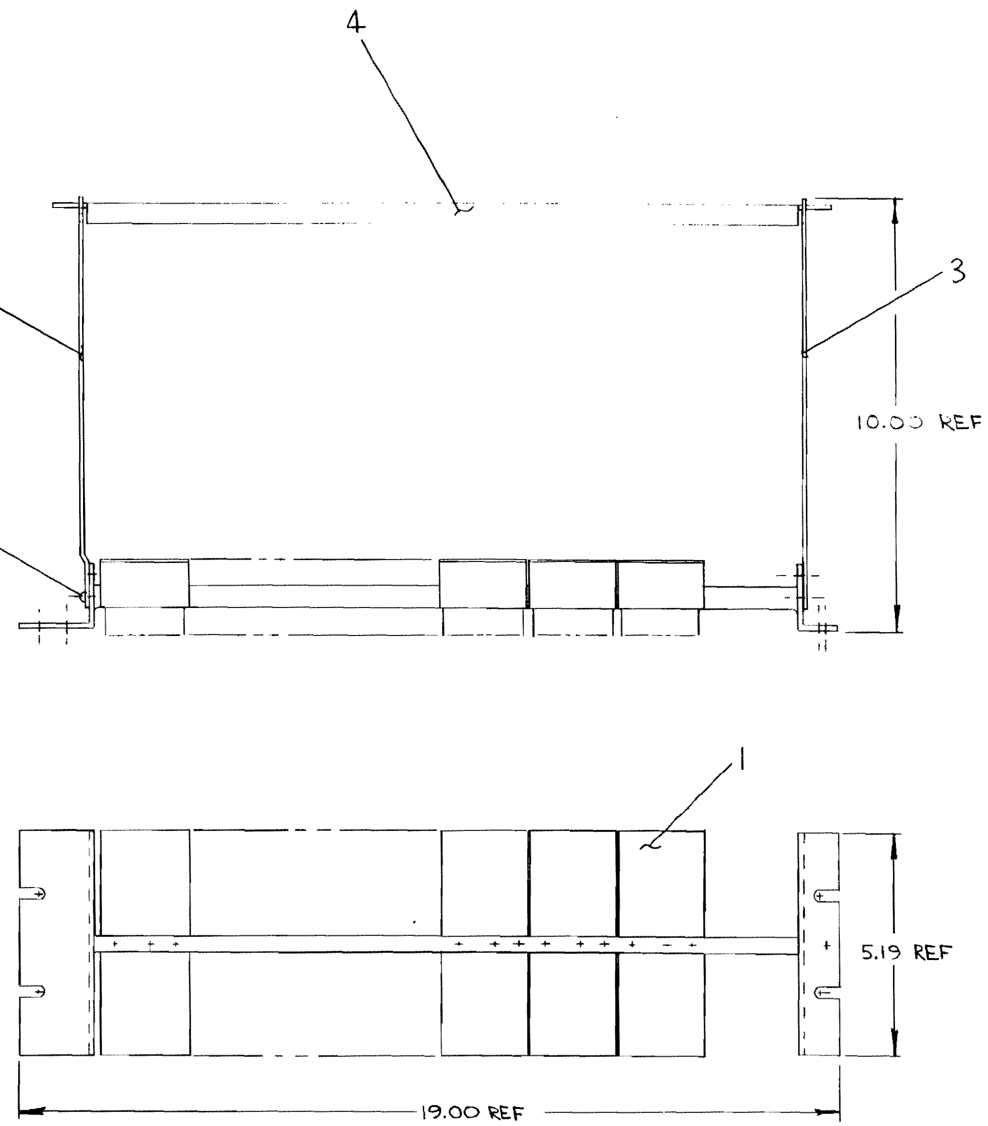
CUSTOMER PRINT SET LPS11-E	MFG SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO./FILE DATE
		1	D-UA-LPS11-E-Ø	*	1	LPS11 EXPANDER UNIT	
			C-MD-5308897-0-0		1	LEFT END PANEL	
			C-MD-5308898-0-0		1	RIGHT END PANEL	
			D-MAD-1945-19-1		1	1945 HOLD DOWN BAR	
X			D-IA-7009790-0-0	#	1	LOGIC CABLE, LPS11-E	
X			D-IA-7009788-0-0	#	1	POWER HARNESS #1 LPS11-E	
X			D-IA-7009789-0-0	#	1	POWER HARNESS #2 LPS11-E	
		3	D-AD-5302483-0-0		1	1943 CASTING ASSY	
			A-PL-5302483-0-0		1	1943 CASTING ASSY	
			E-MD-1202885-0-0		1	1943 FRAME CASTING	
		7	A-PL-H85Ø-Ø-Ø		1	MODULE EXTENDER (H85Ø)	
			D-SC-1209818-0-0		1	MODULE EXTENDER H85Ø	

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: LPS11 EXPANDER UNIT

SHEET 3 OF 3 | SIZE B | CODE DD | NUMBER LPS11-E | REV A

DRB 108



QTY.	DESCRIPTION	PART NO.	ITEM NO.
1	UNIBUS RECEIVER	M784	11
1	I/O CABLE ADAPTER	5409209-0-1	10
1	POWER HARNESS #2, LPS11-E	D-IA-7009789-0-0	9
1	POWER HARNESS #1, LPS11-E	D-IA-7009788-0-0	8
1	LOGIC CABLE, LPS11-E	D-IA-7009790-0-0	7
1	CONN. MODULE	M957	6
8	POP RIVET, #AD43ABS U.S.M.C.	9006509	5
1	1945 HOLD DOWN BAR	D-MAD-1945-19-1	4
1	RIGHT END PANEL	C-MD-5308898-0-0	3
1	LEFT END PANEL	C-MD-5308897-0-0	2
1	WIRED ASSY.	D-AD-7009770-0-0	1

PARTS LIST

FIRST USED ON OPTION/MODEL: LPS11-E

DIMENSIONAL TOLERANCE

DIMENSIONS ARE MILLIMETERS / INCHES UNLESS OTHERWISE SPECIFIED

MILLIMETERS	INCHES	ANGLES
X,XX = ±0,10 X,X = ±0,5 X = ±2,	.XXX = ±.005 .XX = ±.02 .X = ±.1	±0° 30'

THIRD ANGLE PROJECTION

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL

FINISH

DRN. DATE
CHK'D. DATE
ENG. DATE 3 11 74
PROJ. ENG. DATE
PROD. DATE

NEXT HIGHER ASSY.: B-DD-LPS11-E

SCALE

digital

TITLE: LPS11 EXPANDER UNIT

SIZE	CODE	NUMBER	REV.
D	UA	LPS11-E-Ø	

REVISIONS: REV. | CHANGE NO. | CHK

DEC FORM NO. DRD 200-8

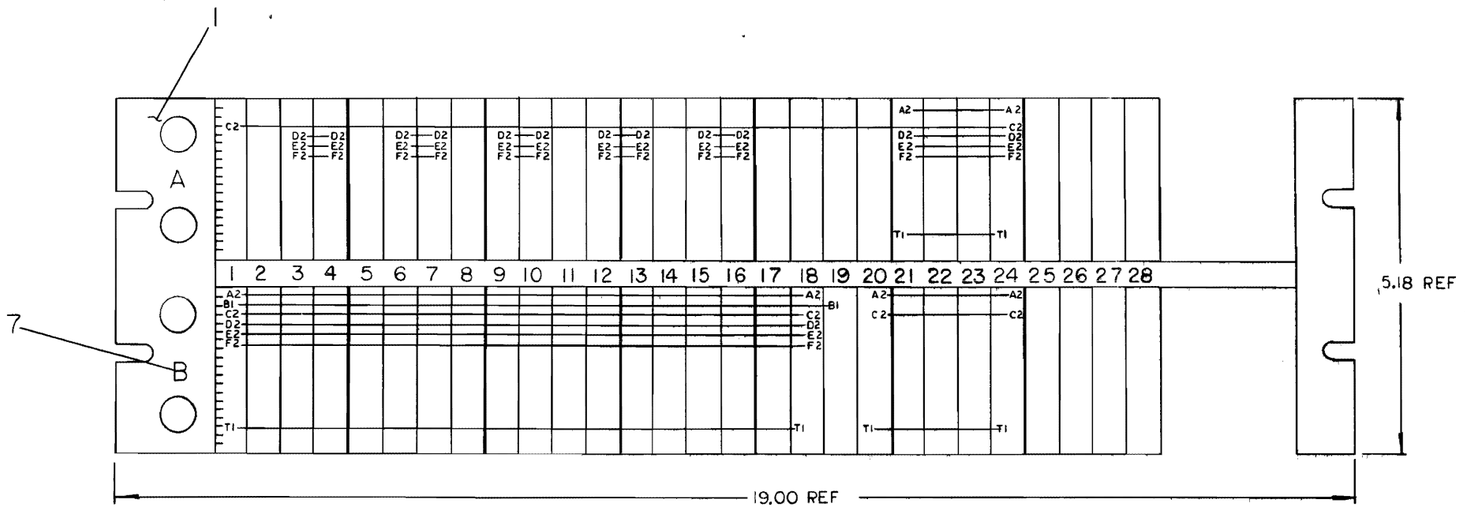
WIRE LIST

ITEM NO.	DESCRIPTION AWG	COLOR	SIGNAL	FROM PIN CONNECTION	TO PIN CONNECTION	REMARKS
12	24	WHT	ANA GND	A24 F2	A24 P2	WRAP
				A26 P2	B18 F2	
				B18 F2	A18 F2	
				A18 F2	A16 F2	
				A15 F2	A13 F2	
				A12 F2	A10 F2	
				A09 F2	A07 F2	
				A06 F2	A04 F2	
12		WHT	ANA GND	A03 F2	A01 F2	
11		ORN	+15V	A26 D1	A24 D2	
				A26 J1	B18 D2	
				A26 F1	A18 D2	
				A18 D2	A16 D2	
				A15 D2	A13 D2	
				A12 D2	A10 D2	
				A09 D2	A07 D2	
				A06 D2	A04 D2	
11		ORN	+15 V	A03 D2	A01 D2	
10		BLU	-15 V	A26 T2	A24 E2	
				A26 V2	B18 E2	
				A26 U2	A18 E2	
				A18 E2	A16 E2	
				A15 E2	A13 E2	
				A12 E2	A10 E2	
10	24	BLU	-15 V	A09 E2	A07 E2	WRAP

WIRE LIST

ITEM NO.	DESCRIPTION AWG	COLOR	SIGNAL	FROM PIN CONNECTION	TO PIN CONNECTION	REMARKS
10	24	BLU	-15V	A06 E2	A04 E2	WRAP
10		BLU	-15V	A03 E2	A01 E2	
8		RED	+5V	A26 H2	A24 A2	
8		RED	+5V	A26 J2	B24 A2	
8		RED	+5V	A26 K2	B18 A2	
9		BLK	GND	A24 T1	A24 C2	
		BLK	GND	A24 C2	A26 C2	
		BLK	GND	B24 T1	B24 C2	
		BLK	GND	B24 C2	A26 U1	
		BLK	GND	B18 T1	B18 C2	
		BLK	GND	B18 C2	A26 T1	
9	24	BLK	SIG GND	B19 B1	A26 N2	WRAP

NOTES:
1. BUSSING ON PINS BB1 & BF2 ARE DOUBLE LAYERED FOR LOWER RESISTANCE.



REF	WIRE LIST	K-WL-LPS11-E-WL	
A/R	WIRE, #24 AWG SOLID (WHT)	9107470-99	12
A/R	WIRE, #24 AWG SOLID (ORN)	9107470-33	11
A/R	WIRE, #24 AWG SOLID (BLU)	9107470-66	10
A/R	WIRE, #24 AWG SOLID (BLK)	9107470-00	9
A/R	WIRE, #24 AWG SOLID (RED)	9107470-22	8
A/R	21 POINT DECAL	B-DC-5308753-0-0	7
14	SCR PHL HD, FIL #8-32 x 5/8 LG	9006210	6
7	288 PIN BLOCK TYPE HB03	E-SC-1205348-0-0	5
A/R	BUSS STRIP	1205541	4
A/R	WIRE, #30 AWG SOLID (BLU)	9105740-66	3
A/R	WIRE, #30 AWG SOLID (YEL)	9105740-44	2
1	1943 CASTING ASSY.	D-AD-5302483-0-0	1
QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

FIRST USED ON OPTION/MODEL: LPS11-E

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: SEE PARTS LIST
FINISH

DRN. E. Chard DATE 3/1/74
CHK'D. DATE
ENG. DATE 3-11-74
PROJ. ENG. DATE
PROD. DATE

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: WIRED ASS'Y LPS EXPANDER UNIT

NEXT HIGHER ASSY.: F-M LPS11-E
SCALE
SHEET OF
SIZE D | CODE AD | NUMBER 7009770-0-0 | REV.
DIST.

REVISIONS: REV. | CHANGE NO. | CHK

DEC FORM NO. DRD 100 B

Slot	Module	Function	Lower module	Lower function	Channels
1	G728*	JUMPR MOD			CH 70-77
2	M957	INPUT CONN	A407	MUX	
3	G728*	JUMPR MOD			
4	G728*	JUMPR MOD			CH 60-67
5	M957	INPUT CONN	A407	MUX	
6	G728*	JUMPR MOD			
7	G728*	JUMPR MOD			CH 50-57
8	M957	INPUT CONN	A407	MUX	
9	G728*	JUMPR MOD			
10	G728*	JUMPR MOD			CH 40-47
11	M957	INPUT CONN	A407	MUX	
12	G728*	JUMPR MOD			
13	G728*	JUMPR MOD			CH 30-37
14	M957	INPUT CONN	A407	MUX	
15	G728*	JUMPR MOD			
16	G728*	JUMPR MOD			CH 20-27
17	M957	INPUT CONN	A407	MUX	
18	G728*	JUMPR MOD			
19			**	I/O BUS ADPT	
20	M957	OUTPUT CONN	M784	BUS RCVR	
21	[illegible]	DUAL D-A CONV			CH 0-1
22	[illegible]	DUAL D-A CONV			CH 2-3
23	[illegible]	DUAL D-A CONV			CH 4-5
24	A625	DUAL D-A CONV			CH 6-7
25					
26	G772	POWER CONN MOD			
27					
28					
29					
30					
31					
32					

* G728 MAY BE REPLACED WITH LPSAG OR LPSAG-VG OPTIONS

** 5409209-0-1

DO NOT USE PARTS LIST TO ORDER PARTS

QTY.	DESCRIPTION	PART NO.	ITEM NO.
6	8 CH MULTIPLEXER	A407	9
12	JUMPER	G728	8
7	CONN MODULE	M957	7
1	BUS RECIVER	M784	6
1	POWER CONN MODULE	G772	5
4	DUAL D-A CONVERTER	A625	4
1	I/O BUS ADAPTER	5409209-0-1	3
A/R	4 CH PREAMP	A242	2
A/R	MULTI GAIN 4 CH PREAMP	A241	1

PARTS LIST

FIRST USED ON OPTION/MODEL: LPS11-E

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. A. Kebort DATE 3-4-74
CHK'D. DATE
ENG. DATE
PROJ. ENG. DATE
PROD. DATE
NEXT HIGHER ASSY. [illegible]
SCALE NONE
SHEET 1 OF 1

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: MODULE UTILIZATION

SIZE D CODE MU NUMBER LPS11-E-1 REV.
DIST.

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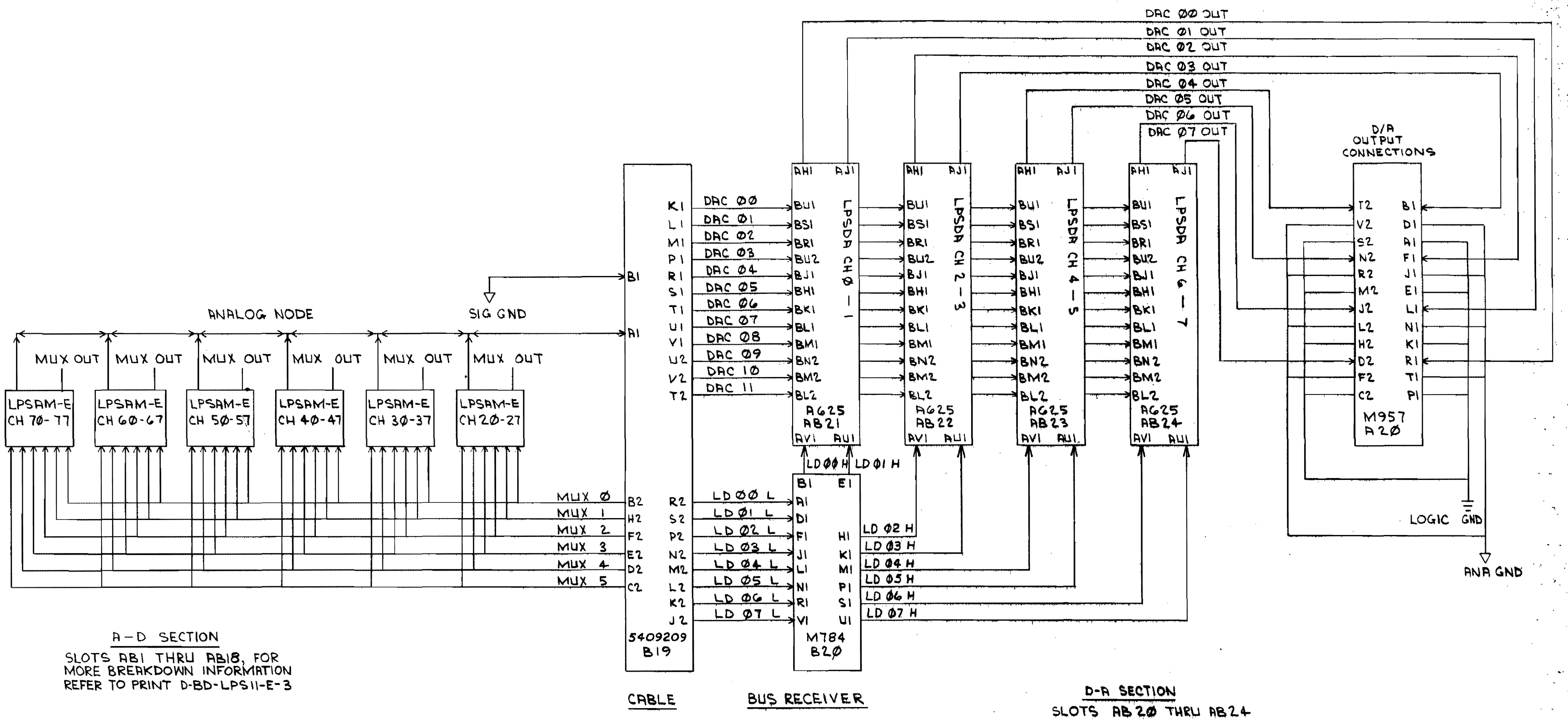


FIRST USED ON OPTION/MODEL: LPS11-E

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

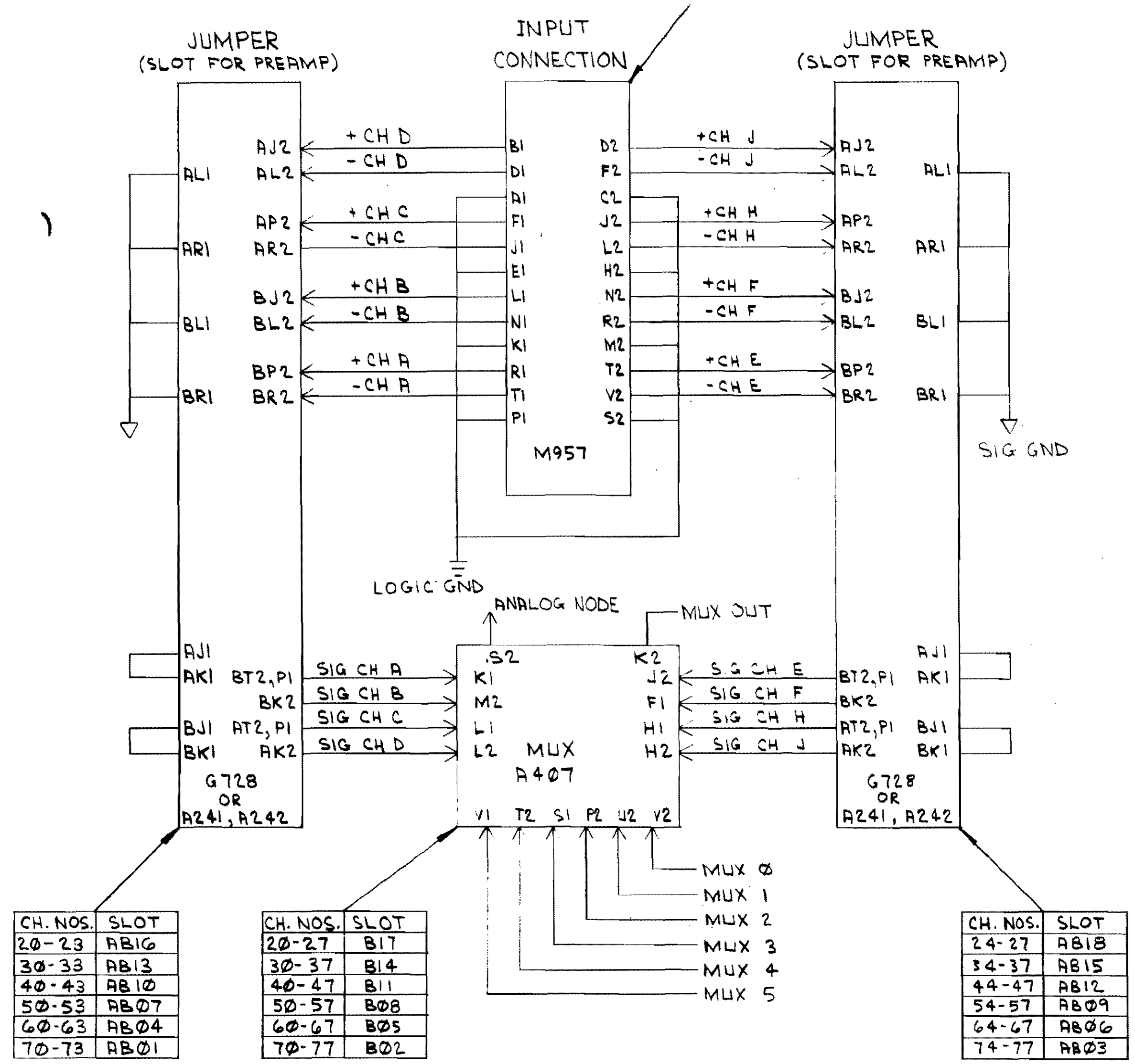
DRN. DATE 2/13/74
CHK'D. DATE
ENG. DATE 3-12-74
PROJ. ENG. DATE 3-12-74
PROD. DATE

NEXT HIGHER ASSY. B-DD-LPS11-E

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE
LPS11-E
BLOCK DIAGRAM

SIZE D CODE BD NUMBER LPS11-E-2 REV.
SCALE
SHEET 1 OF 1
DIST.



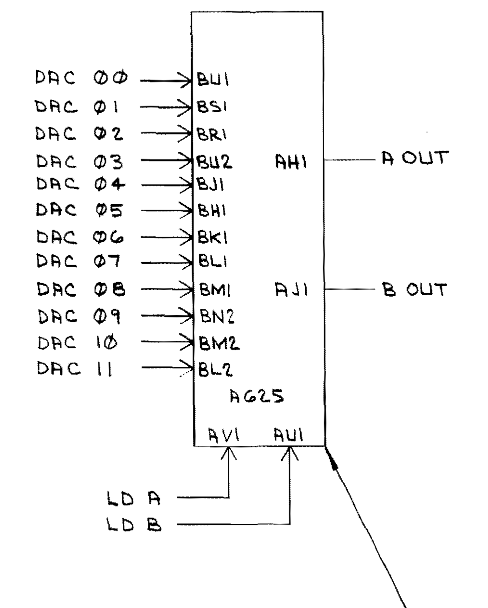
CH. NOS.	SLOT
2Ø-27	A17
3Ø-37	A14
4Ø-47	A11
5Ø-57	AØ8
6Ø-67	AØ5
7Ø-77	AØ2

CH. NOS.	SLOT
2Ø-23	AB16
3Ø-33	AB13
4Ø-43	AB1Ø
5Ø-53	ABØ7
6Ø-63	ABØ4
7Ø-73	ABØ1

CH. NOS.	SLOT
2Ø-27	B17
3Ø-37	B14
4Ø-47	B11
5Ø-57	BØ8
6Ø-67	BØ5
7Ø-77	BØ2

CH. NOS.	SLOT
24-27	AB18
34-37	AB15
44-47	AB12
54-57	ABØ9
64-67	ABØ6
74-77	ABØ3

LPSAM-E



DAC NOS	SLOT
ØØ-Ø1	AB21
Ø2-Ø3	AB22
Ø4-Ø5	AB23
Ø6-Ø7	AB24

LPSDA

FIRST USED ON OPTION/MODEL: LPS11-E

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

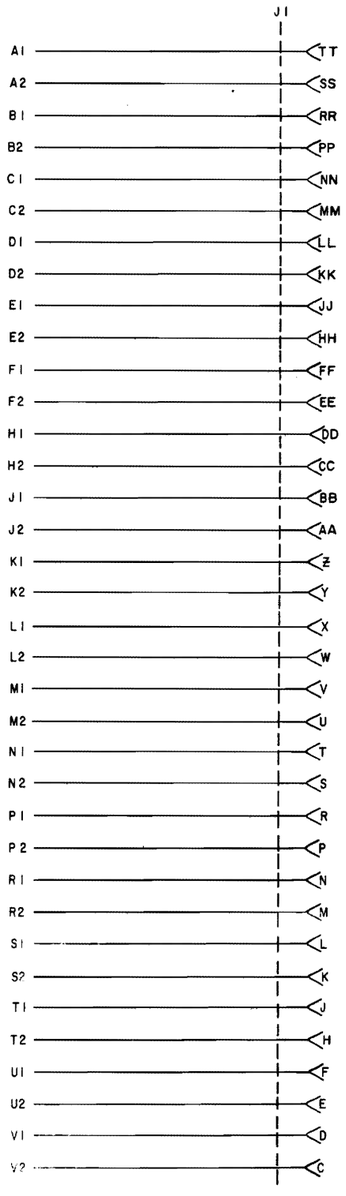
NEXT HIGHER ASSY.: B-DD-LPS11-E

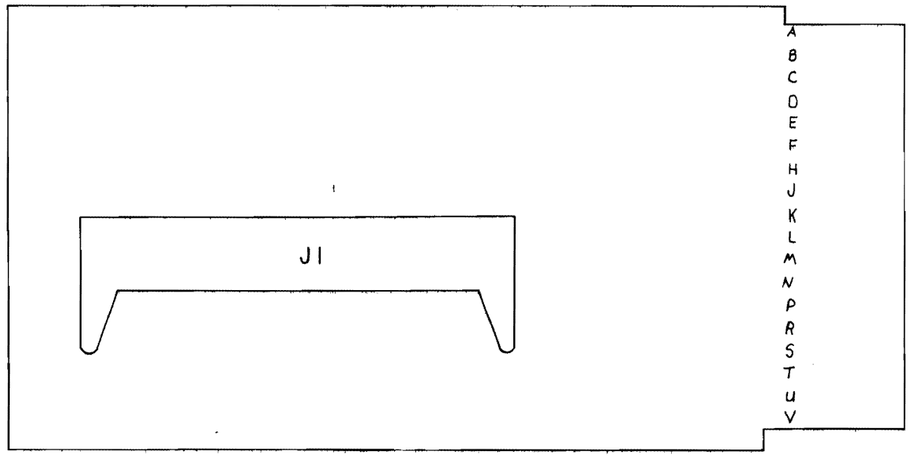
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: LPSAM-E, LPSDA BLOCK DIAGRAM

SIZE: D CODE: BD NUMBER: LPS11-E-3

SHEET 1 OF 1





A/R				
		GRIPLETS	12102144-0	6
1	J1	RIGHT ANGLE HEADER	1209941	5
1		ETCHED CIRCUIT BOARD	5009208	4
		MODULE ECO HISTORY	B-MH-5409209-0-4	3
		ASSY/DRILLING HOLE LAYOUT	C-AH-5409209-0-5	2
		X-Y COORDINATE HOLE LOCATION	K-CO-5409209-0-4	1
QTY.	REF. DESIGNATION	DESCRIPTION	DEC PART NO.	ITEM NO.
		PARTS LIST		

REVISIONS			
CHK	CHG NO	REV.	

DRN. S. Cooper	DATE 11/23/71	
CHK'D J. Miller	DATE 11/23/71	
ENG.	DATE 1-12-72	
PROD.	DATE	

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: I/O CABLE ADAPTER

SIZE	CODE	NUMBER	REV.
C	CS	5409209-0-1	A

PRINTED CIRCUIT REV. B

SIZE C | CODE CS | NUMBER 5409209-0-1 | REV. A

M 11/26

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY	CARL MCCOY	CHECKED	SECTION
DATE	11-13-72	DATE 11-30-72	
ENG	OK	PROD R Davis	ISSUED SECT.
DATE	11-30-72	DATE 12/4/72	

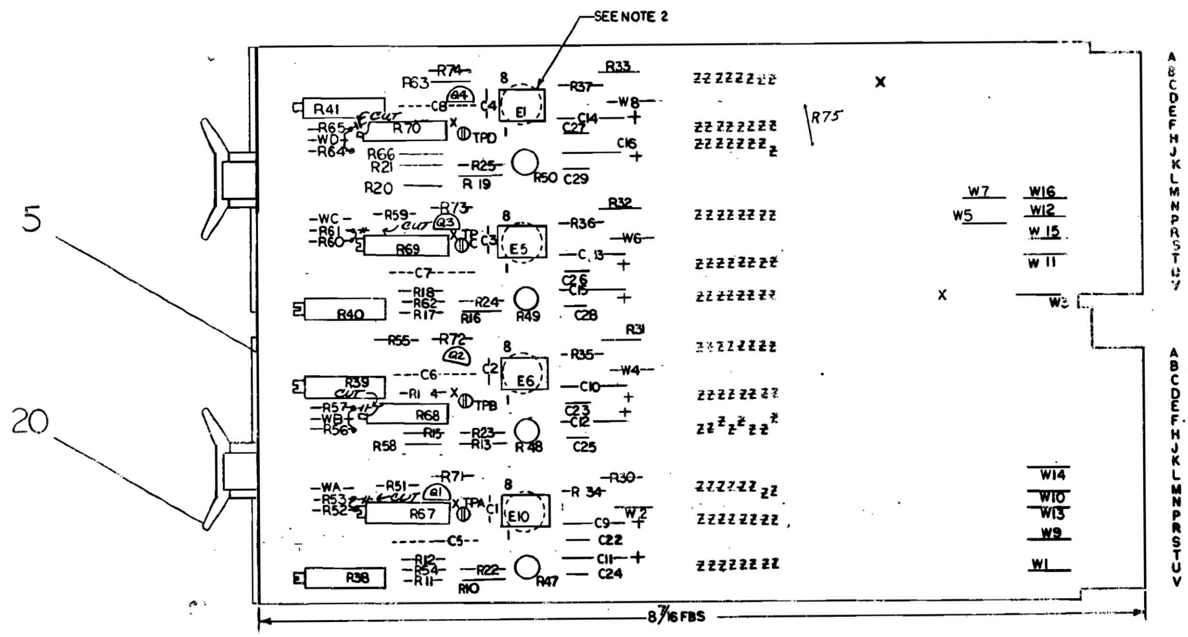
ITEM NO.	DWG NO./ PART NO.	DESCRIPTION	QUANTITY/VARIATION LPSAG-Ø	LPSAG-VG
1	A242	4 CHAN. PREAMP.	1	-
2	A241	MULTI-GAIN 4 CHAN. PREAMP.	-	1
	D-UA-LPS11-S-Ø	LAB PERIPHERAL SYSTEM (LPS11-S)	REF	REF
	B-DD-LPS11-S	DRAWING DIRECTORY	REF	REF

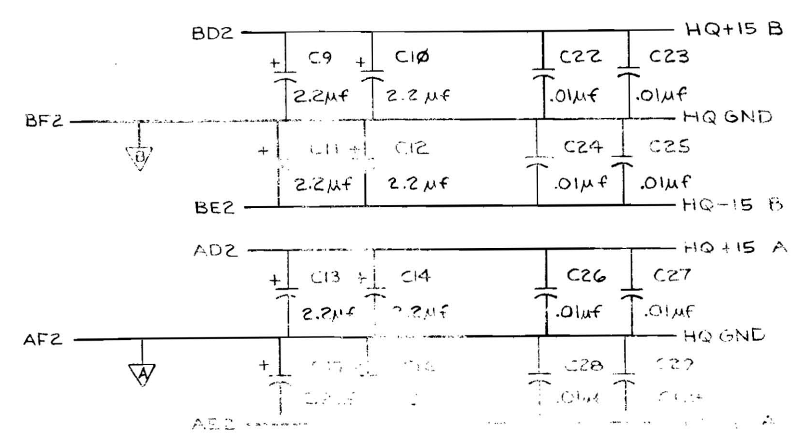
TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
LPSAG	SHEET 1 OF 1	A	PL	LPSAG-Ø-Ø		
		DIST.				

DEC FORM NO.16-1031
DRA 110

NOTES:

1. [illegible] C8 ARE OPTIONAL CAPACITORS TO BE INSTALLED WHEN NEEDED. SEE MAINTENANCE MANUAL FOR PROPER USAGE.
2. E1, E5, E6 & E10 MAY BE DIP'S OR TØ5 CAN'S.
3. JUMPERS W1 THRU [illegible] ARE NOT OPTIONAL THEY ARE ALWAYS INSTALLED.
4. JUMPERS WA, WB, WC, OR WD MAY BE REMOVED DURING CALIBRATION. THEY MUST BE REINSTALLED IF E1, E5, E6, OR E1Ø IS REPLACED BEFORE CALIBRATION.
5. ALLOWABLE COMPONENT SUBSTITUTIONS:
   ITEM 14 CAN BE 1K, .01%, 1305509
   ITEM 15 CAN BE 4K, .01%, 1305511
   ITEM 13 CAN BE 63.4K .1% 1309289 (MUST SUBSTITUTE ALL 4/CHANNEL)





QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO
1	R75	RES. 20K 5% 1/4W	1302391	23
4	Q1 THRU Q4	TRANSISTOR, PNP DEC6534D	1503409	22
20		JUMPER, WHITE BODY INSULATED	9009185	21
2		HANDLE, FLIP-CHIP, AMBER	9008337-0	2Ø
4		SPLIT LUG	9006735	19
4	R54, R58, R62, R66	RES. 4.7M 5% 1/4W	1309341	18
4	R47 THRU R5Ø	RES. 200 10% 1/2W 62PR	1309150-10	17
4	R38 THRU R41	RES. 500 10% 3/4W 76 PR	1309143-06	16
4	R34 THRU R37	RES. 4K .1% 1/8W MF	1305354	15
4	R3Ø THRU R33	RES. 1K .1% 1/8W MF	1304865	14
16	R1Ø THRU R25	RES. 64K .1% 1/8W MF	1305515	13
4	E1, E5, E6, E10	OPER. AMPLIFIER-201A	1911143	12
4	R67 THRU R70	RES. 20K 10% 3/4W 76 PR	1309143-11	11
12	R51 THRU R53, R59 THRU R61, R55 THRU R57, R63 THRU R65	RES. 10M 5% 1/4W	1302666	1Ø
4	R71 THRU R74	RES. 3K 5% 1/4W	1300432	9
8	C22 THRU C29	CAP. .01µf 10% 100V DISC	1001610-01	8
8	C9 THRU C16	CAP. 2.2µf 10% 20V	1002627	7
4	C1, C2, C3, C4	CAP. 10PF 5% 100V D.M.	1000006	6
4		EYELET	9006732	5
1		ETCHED CIRCUIT BOARD	5010192	4
REF		MODULE ECO HISTORY	B-MH-A242-Ø-6	3
REF		ASSY/DRILLING HOLE LAYOUT	D-AH-A242-Ø-5	2
REF		X-Y COORDINATE HOLE LOCATION	K-CO-A242-Ø-4	1

PARTS LIST

FIRST USED ON OPTION MODEL: LPS11-S

ETCH BOARD REV: B

IC TYPE	GND	+5V

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

IC PIN LOCATIONS

SEMICONDUCTOR CONVERSION CHART

DEC NO.	EIA NO.	DEC NO.	EIA NO.
1N752A	SAME		

REVISIONS

REV	CHANGE NO.	CHK
B	A242-00001 S. Blake 1-3	
C	A242-00002 B. LIPCON 3-23-73	

DRN: [illegible] DATE 9-6-72
CHK'D: [illegible] DATE 11-1-72
ENG: [illegible] DATE 11-14-72
PROJ. ENG.: [illegible] DATE 11-14-72
PROD: [illegible] DATE 11/14/72

NEXT HIGHER ASSY: LPS11-

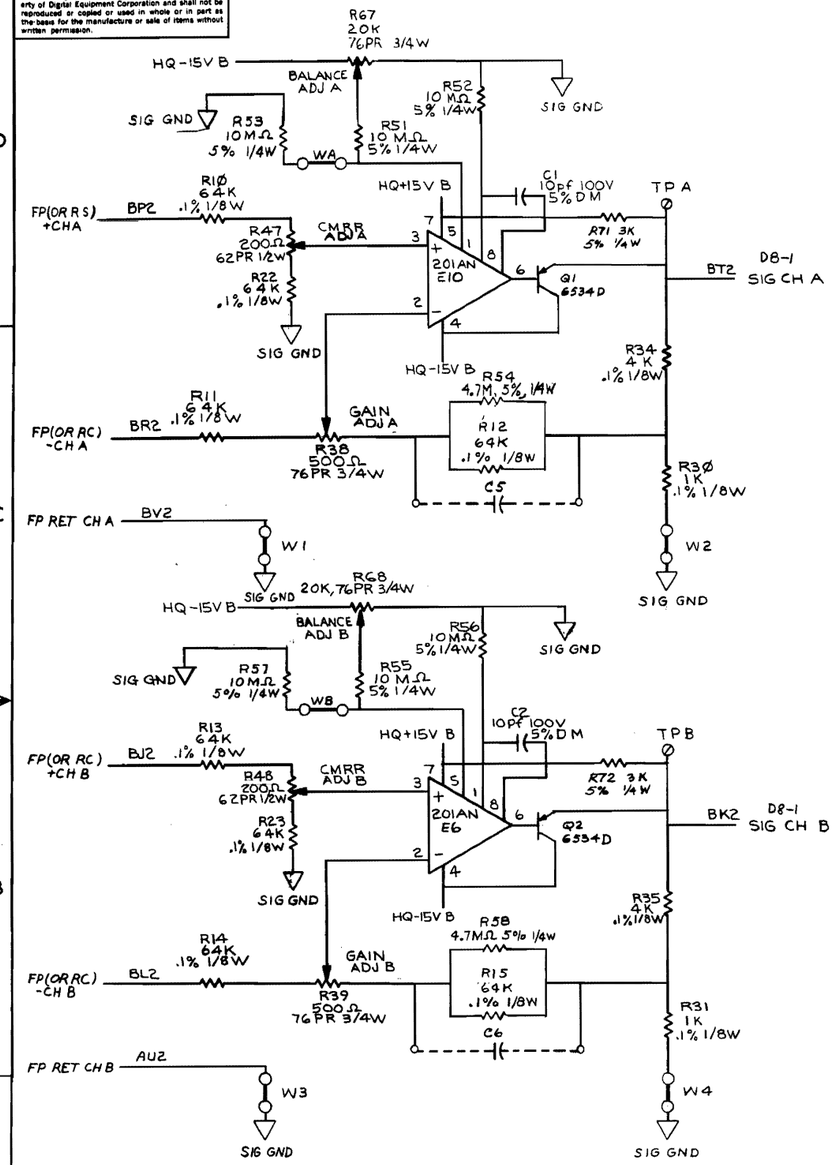
DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

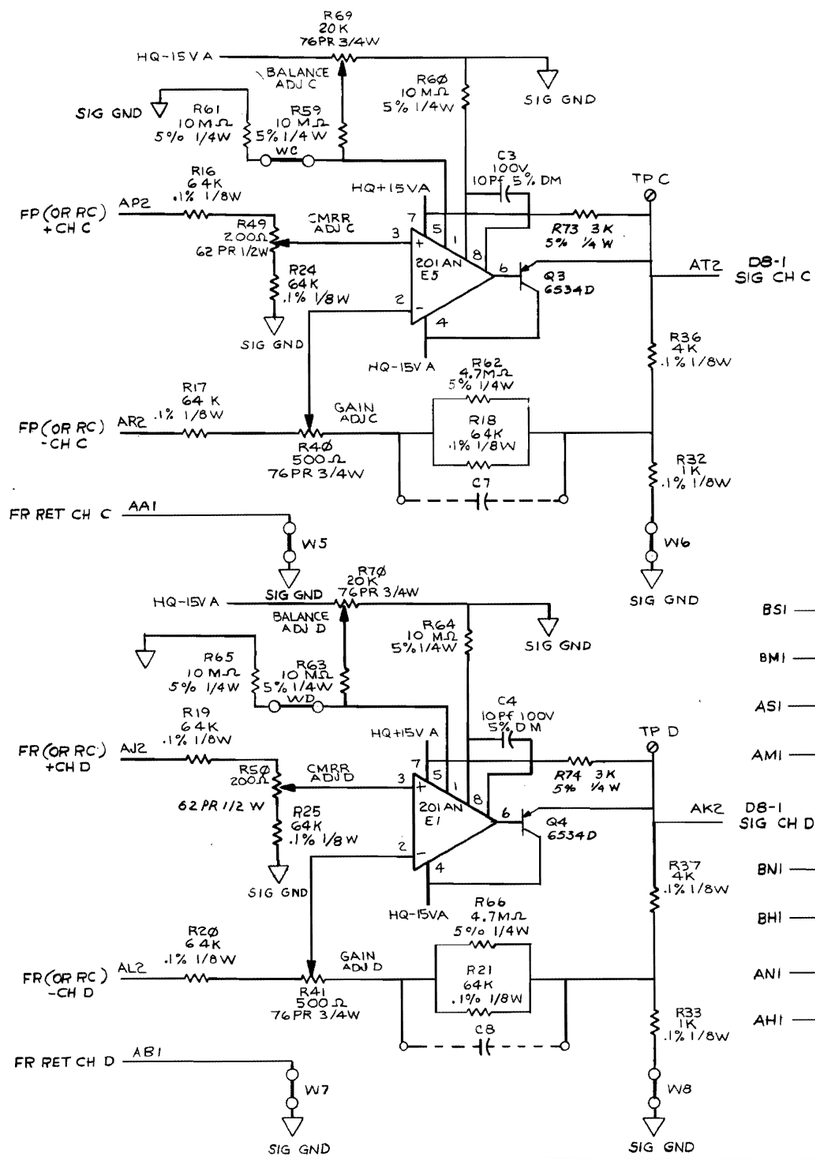
TITLE: 4 CHANNEL ±1V IN ±5V OUT PREAMP

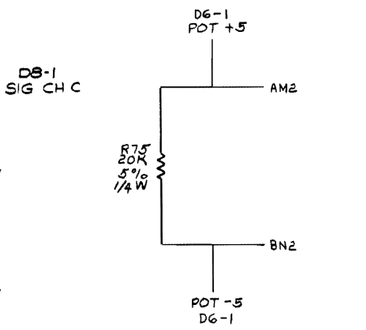
SIZE: D CODE: CS NUMBER: A242-Ø-1 REV.: C

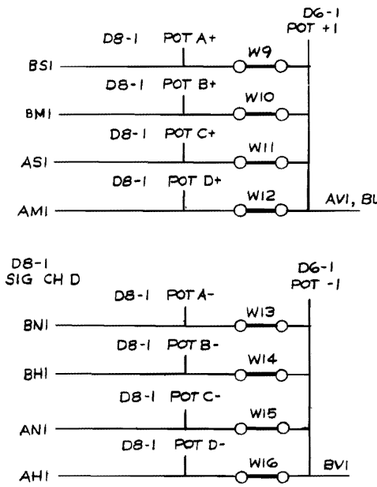
SCALE: NONE SHEET 1 OF 2

DIST.









SIG GND — BA1, BB1, BC1

REVISIONS	REV	CHK
CHANGE NO.		

BRUNING 40-522 15M0

DEC FORM NO DRD 102-B

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
LPS11-S		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 —"—

		DATE
DRN.		9-7-72
CHK'D.	NANCY MOORE	11-1-72
ENG.		11-14-72
PROJ. ENG.		11-16
PROD.		11/17/72

NEXT HIGHER ASSY. LPSAG

SCALE —"—

SHEET 2 OF 2

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE

4 CHANNEL ±1V IN ±5V OUT PREAMP (D8-1)

SIZE	CODE	NUMBER	REV.
D	CS	A242-0-1	C

DIST.

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

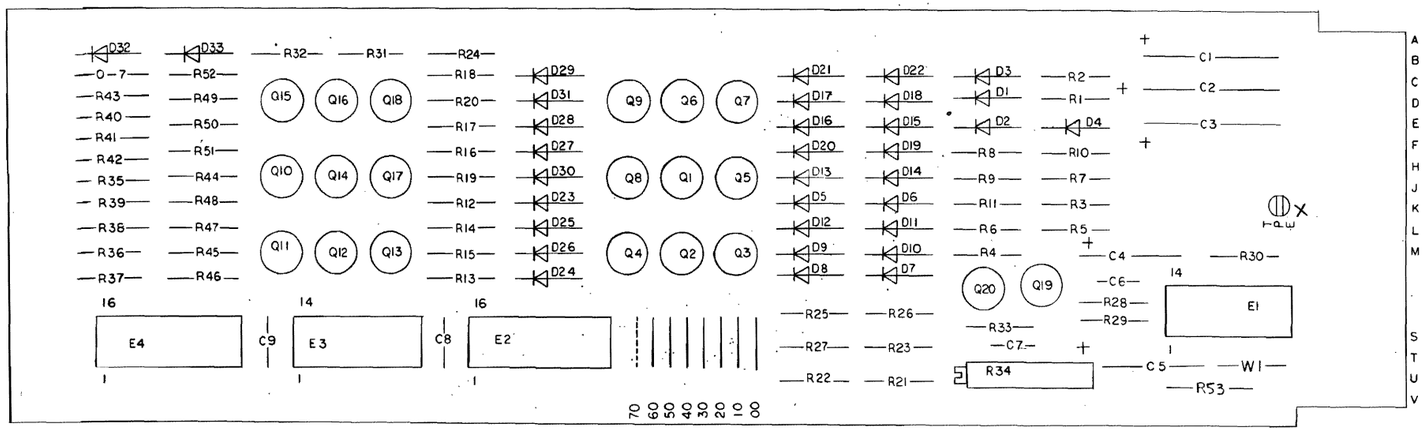
MADE BY P.REED DATE 3-5-74	CHECKED [signature] DATE 3-5-74	SECTION 1	
ENG [signature] DATE 3-5-74	PROD [signature] DATE 3-13-74	ISSUED SECT. 1	

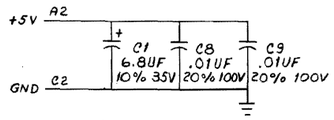
ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION											
1	A407	8 CHAN. MULTIPLEXER	1											
2	G728	JUMPER CARD	2											
3	A-PL-H85Ø-Ø-Ø	MODULE EXTENDER (H850)	2											
4	M957	CONN. MODULE	1											

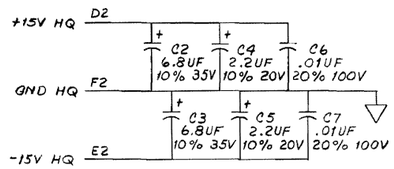
TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
8 CHANNEL MULTIPLEXER EXP.	—	A	PL	LPSAM-E-Ø		
	SHEET 1 OF 1	DIST.				

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

NOTES:







REF				
REF		X-Y COORDINATE HOLE LOCATION	K-CO-A407-0-4	1
REF		ASSY/DRILLING HOLE LAYOUT	D-AH-A407-0-5	2
REF		MODULE ECO HISTORY	B-MH-A407-0-6	3
1		ETCHED CKT BOARD	5010217	4
4	C6 THRU C9	CAP. .01UF 20% 100V DISC.	1001610-01	5
2	C4, C5	CAP. 2.2UF 10% 20V TANT	1002627	6
3	C1, C2, C3	CAP. 6.8UF 10% 35V TANT	1003306	7
18	D5 THRU D22	DIODE IN4004	1105796	8
4	D1 THRU D4	DIODE IN4732A	1105138	9
11	D23 THRU D33	DIODE D664	1100114	10
9	R35 THRU R43	RES. 1.5K 5% 1/4W	1300391	11
9	R21 THRU R29	RES. 3.3K 5% 1/4W	1300439	12
9	R12 THRU R20	RES. 4.7K 5% 1/4W	1300447	13
1	R33	RES. 1.2K 5% 1/4W	1301320	14
5	R1, R2, R30 THRU R32	RES. 180 5% 1/4W	1301322	15
9	R44 THRU R52	RES. 560 5% 1/4W	1301890	16
1	R34	RES. 1K 10% 3/4W 76 PR.	1309143-07	17
9	R3 THRU R11	RES. 47 1% 1/4W FUSIBLE	1310881-2	18
9	Q10 THRU Q18	TRANS. DEC 6534D	1503909-00	19
2	Q19, Q20	TRANS. DEC 6531	1509338	20
9	Q1 THRU Q9	TRANS. 2N5245	1509681	21
1	E2	IC DEC 8251	1909594	22
1	E3	IC DEC 7417	1909929	23
1	E4	IC DEC 74145	1910047	24
1	E1	IC LM 310-D	1910235	25
2		EYELET #GS-4-7 STIMPSON	9006732	26
1		SPLIT LUG #M-1033	9006735	27
1		HANDLE, FLIPCHIP-AMBER	9008337-0	28
10		INSULATED JUMPER L-2007-1	9009185	29
1	R53	RES. 20K 5% 1/4W	1302391	30

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

ETCH BOARD REV C

74145	8	16
8251	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.
		2N5245	NONE
		IN4732A	NONE
		IN4004	NONE
		DEC 6534D	MPS6534
		DEC 6531	MPS6531
		D664	IN3606

SEMICONDUCTOR CONVERSION CHART

REV	CHANGE NO.	REVISIONS
B	ORIGINATED	1/24/73 J. LIPCON
C	A407-00001	1/8/73

FIRST USED ON OPTION MODEL

NEXT HIGHER ASSY

SCALE

SHEET 1 OF 2

DRN. J. Lipcon DATE 10-18-72
CHK'D DATE 11/2/72
ENG. DATE 11/2/72
PROJ. ENG. DATE 11/2/72
PROJ. DATE 11/2/72

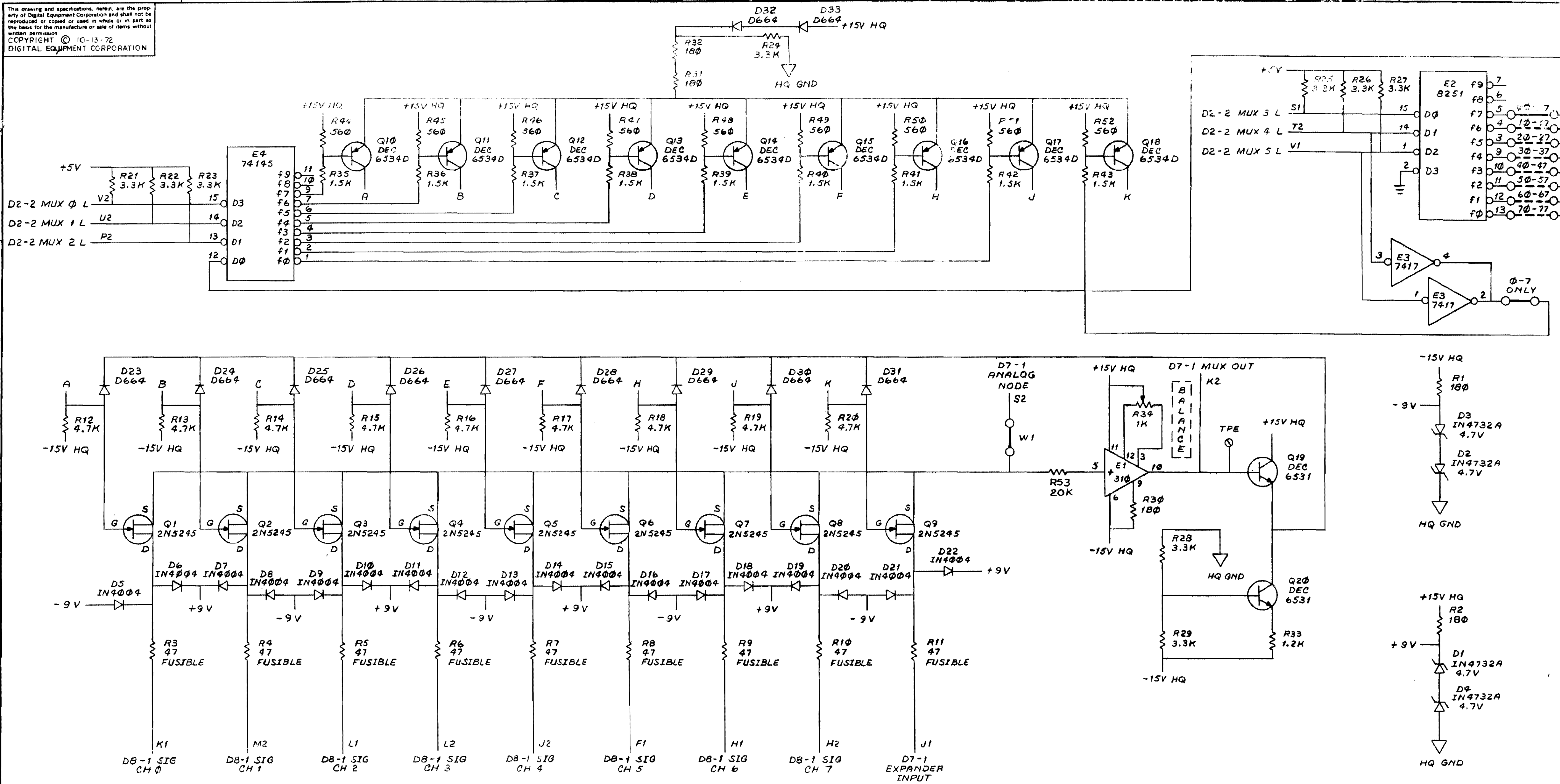
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE 8 CHANNEL MULTIPLEXER

SIZE D CODE DCS NUMBER A407-0-1 REV C

DEC FORM NO. DRD-135A

BRUNING 40-522 16699


D32 D664
D33 D664
+15V HQ
R32 18Ø
R31 18Ø
R24 3.3K
HQ GND
E4 74145
+5V
R21 3.3K
R22 3.3K
R23 3.3K
D2-2 MUX Ø L
D2-2 MUX 1 L
D2-2 MUX 2 L
Q1Ø DEC 6534D
Q11 DEC 6534D
Q12 DEC 6534D
Q13 DEC 6534D
Q14 DEC 6534D
Q15 DEC 6534D
Q16 DEC 6534D
Q17 DEC 6534D
Q18 DEC 6534D
R44 56Ø
R45 56Ø
R46 56Ø
R47 56Ø
R48 56Ø
R49 56Ø
R5Ø 56Ø
R52 56Ø
R35 1.5K
R36 1.5K
R37 1.5K
R38 1.5K
R39 1.5K
R4Ø 1.5K
R41 1.5K
R42 1.5K
R43 1.5K
E2 8251
R26 3.3K
R27 3.3K
D2-2 MUX 3 L
D2-2 MUX 4 L
D2-2 MUX 5 L
E3 7417
Ø-7 ONLY
D23 D664
D24 D664
D25 D664
D26 D664
D27 D664
D28 D664
D29 D664
D3Ø D664
D31 D664
R12 4.7K
R13 4.7K
R14 4.7K
R15 4.7K
R16 4.7K
R17 4.7K
R18 4.7K
R19 4.7K
R2Ø 4.7K
-15V HQ
Q1 2N5245
Q2 2N5245
Q3 2N5245
Q4 2N5245
Q5 2N5245
Q6 2N5245
Q7 2N5245
Q8 2N5245
Q9 2N5245
D5 IN4ØØ4
D22 IN4ØØ4
+9V
-9V
R3 47 FUSIBLE
R4 47 FUSIBLE
R5 47 FUSIBLE
R6 47 FUSIBLE
R7 47 FUSIBLE
R8 47 FUSIBLE
R9 47 FUSIBLE
R1Ø 47 FUSIBLE
R11 47 FUSIBLE
D8-1 SIG CH Ø
D8-1 SIG CH 1
D8-1 SIG CH 2
D8-1 SIG CH 3
D8-1 SIG CH 4
D8-1 SIG CH 5
D8-1 SIG CH 6
D8-1 SIG CH 7
D7-1 EXPANDER INPUT
D7-1 ANALOG NODE
S2
W1
R53 20K
E1 31Ø
R34 1K
BALANCE
D7-1 MUX OUT
K2
TPE
Q19 DEC 6531
Q2Ø DEC 6531
R3Ø 18Ø
R28 3.3K
R29 3.3K
R33 1.2K
HQ GND
R1 18Ø
D3 IN4732A 4.7V
D2 IN4732A 4.7V
R2 18Ø
D1 IN4732A 4.7V
D4 IN4732A 4.7V

NOTES:

1. CLIP JUMPERS "ØØ-7," "1Ø-17," ···, ETC NOT IN USE.
   e.g. - IF MODULE IS ASSIGNED TO CHANNELS Ø-7, REMOVE JUMPERS "1Ø-17," "2Ø-27," "3Ø-37," "4Ø-47," "5Ø-57," "6Ø-67" AND "7Ø-77."
2. IF MODULE IS ASSIGNED TO CHANNELS Ø-7, LEAVE JUMPER "Ø TO 7 ONLY" INTACT. IF MODULE IS ASSIGNED TO CHANNELS 1Ø TO 17 OR HIGHER, JUMPER "Ø-7 ONLY" MUST BE REMOVED.
3. JUMPER "W1" MUST BE REMOVED ON CHANNEL Ø-7 MULTIPLEXER IF DUAL SAMPLE AND HOLD (LPSSH) IS INSTALLED.
4. FUSIBLE RESISTORS, R3 - R11, WILL BLOW OPEN WHEN AN OVERVOLTAGE IS APPLIED TO CH Ø, CH1, ··· ETC.

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. J. Vincent — DATE 10-13-72
CHK'D — DATE [illegible]
ENG. — DATE 11/2/72
PROD. ENG. — DATE 11/2/72
PROD. — DATE 11/2/72
NEXT HIGHER ASSY.
SCALE —
SHEET 2 OF 2

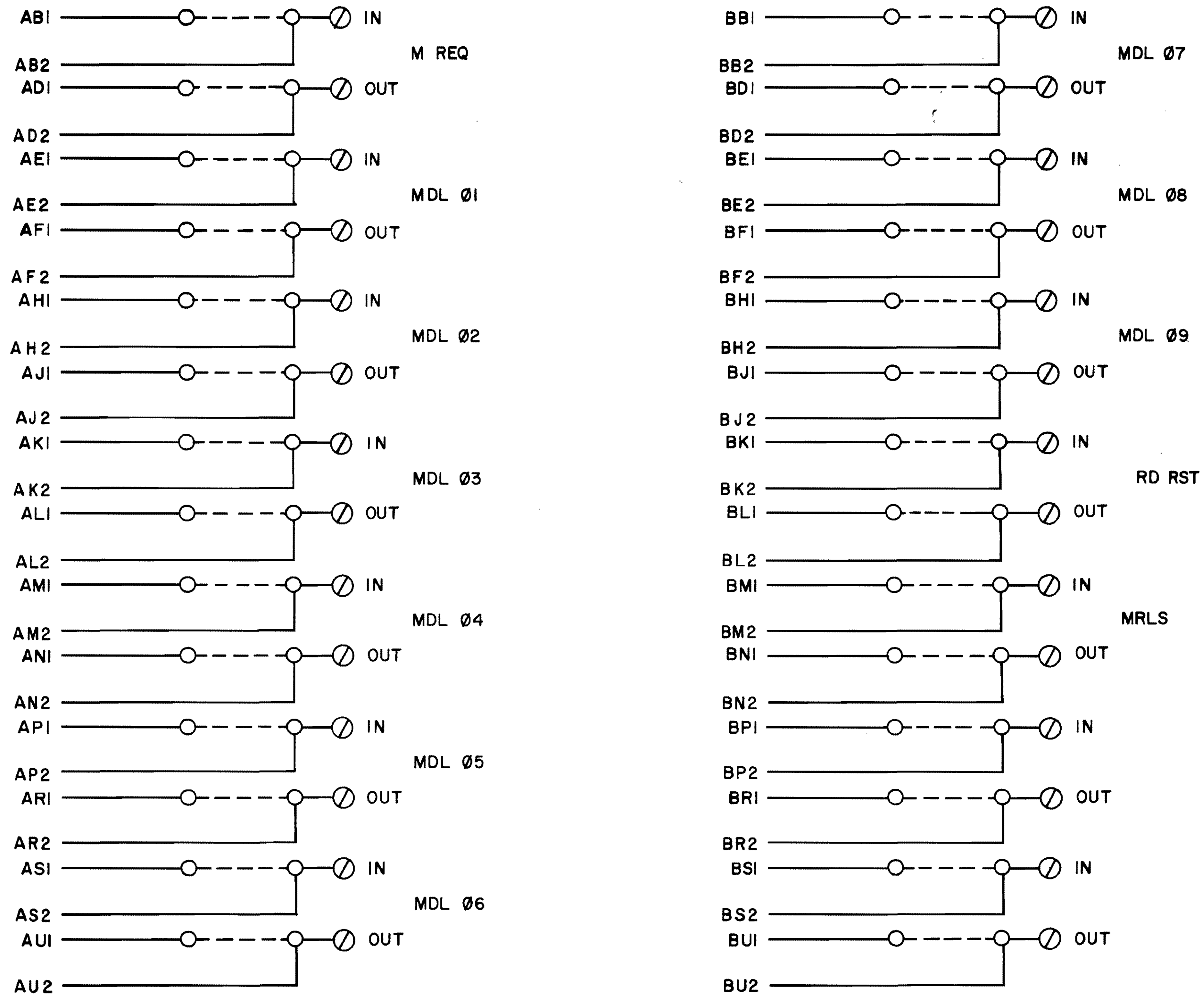
DIGITAL EQUIPMENT CORPORATION, MAYNARD MASSACHUSETTS

TITLE
8 CHANNEL MULTIPLEXER (D7-1)

SIZE D — CODE CS — NUMBER A4Ø7-Ø-1 — REV C

REVISIONS — REV — CHANGE NO — CHK

DEC FORM NO DRD 102-B



UNLESS OTHERWISE INDICATED:
O- - -O INDICATES JUMPERS
Ø INDICATES SPLIT LUGS

REVISIONS		
REV.	CHG NO.	CHK

DRN. ALLAN RITCEY	DATE 1-21-70
CHK'D [signature]	DATE 2-9-70
ENG. [signature]	DATE 3-11-70
PROD. [signature]	DATE 9/22/70

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE JUMPER CARD G728

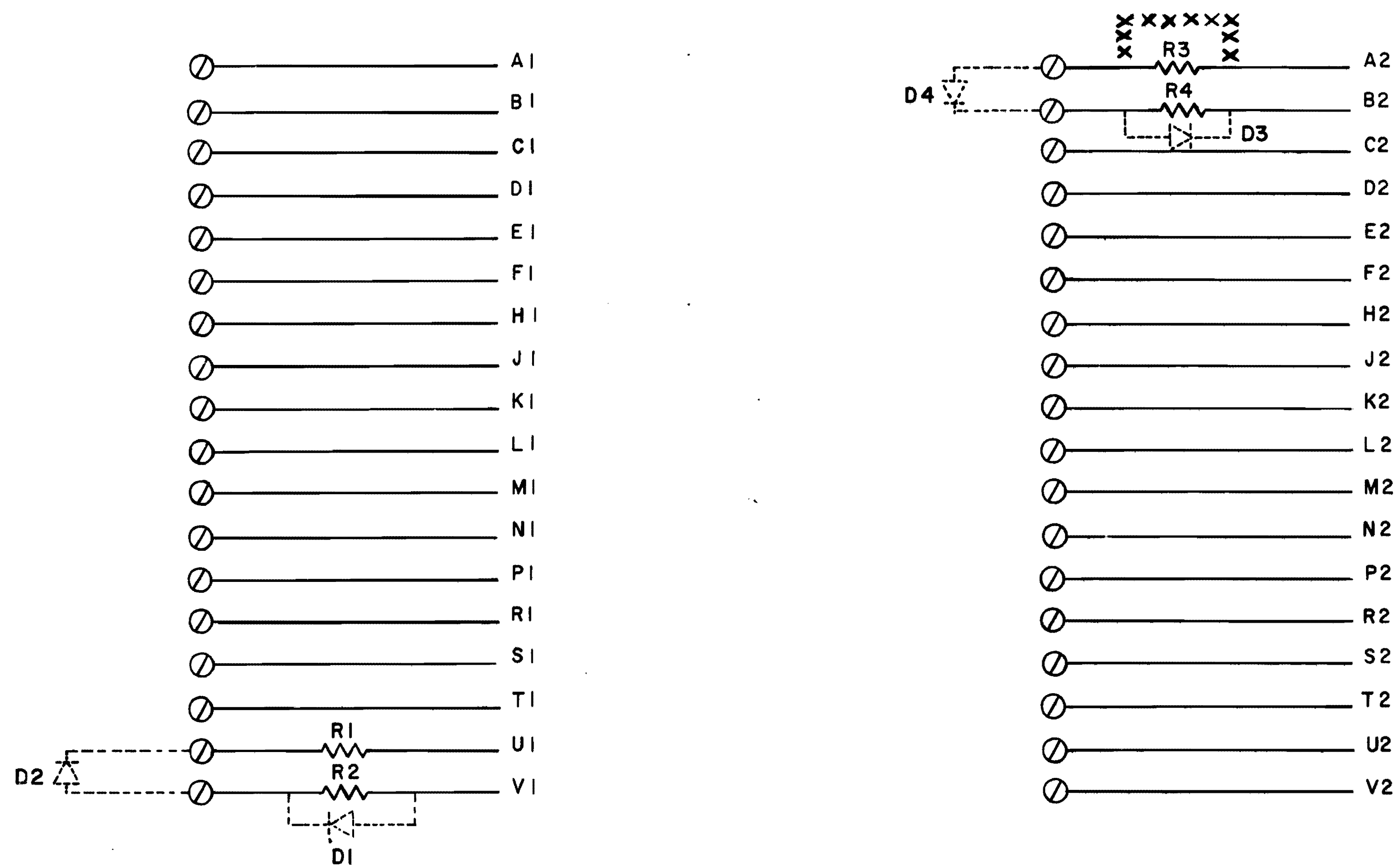
SIZE	CODE	NUMBER	REV.
B	CS	G728-0-1	

PRINTED CIRCUIT REV. A

DEC FORM NO. DRB 102

MS744-P1

5



NOTE:

1. DOTTED LINES INDICATE YA VERSION ONLY.
   R4 & R2 ARE DELETED IN THE YA VERSION.
2. X LINES INDICATE YB VERSION ONLY.
   R3 IS REPLACED BY JUMPER.

M957-YB	R3=0 Ω R1=10 Ω 1/4W 5%	10 1/4W 5%
M957-YA	1K 1/8W .1%MF	D664
M957	10 1/4W 5%	10 1/4W 5%
VARIATION	R1 & R3	D1, D2, D3, D4 R2 & R4

REVISIONS		
REV.	CHG NO.	CHK
A	00001	
B	00002	
C	00003	
D	00004	
E	00005	

DRN.	DATE 10/21/70
CHK'D	DATE 10/27/70
ENG.	DATE 11/20/70
PROD.	DATE

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE CABLE CONNECTOR M957

SIZE B | CODE CS | NUMBER M957-0-1 | E

PRINTED CIRCUIT REV. C

DEC FORM NO. DRB 102

4 PINK

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY P.REED DATE 3-5-74	CHECKED R K Gallo DATE 3-5-74	SECTION 1
ENG R K Gallo DATE 3-5-74	PROD [illegible] DATE [illegible]	ISSUED SECT. 1

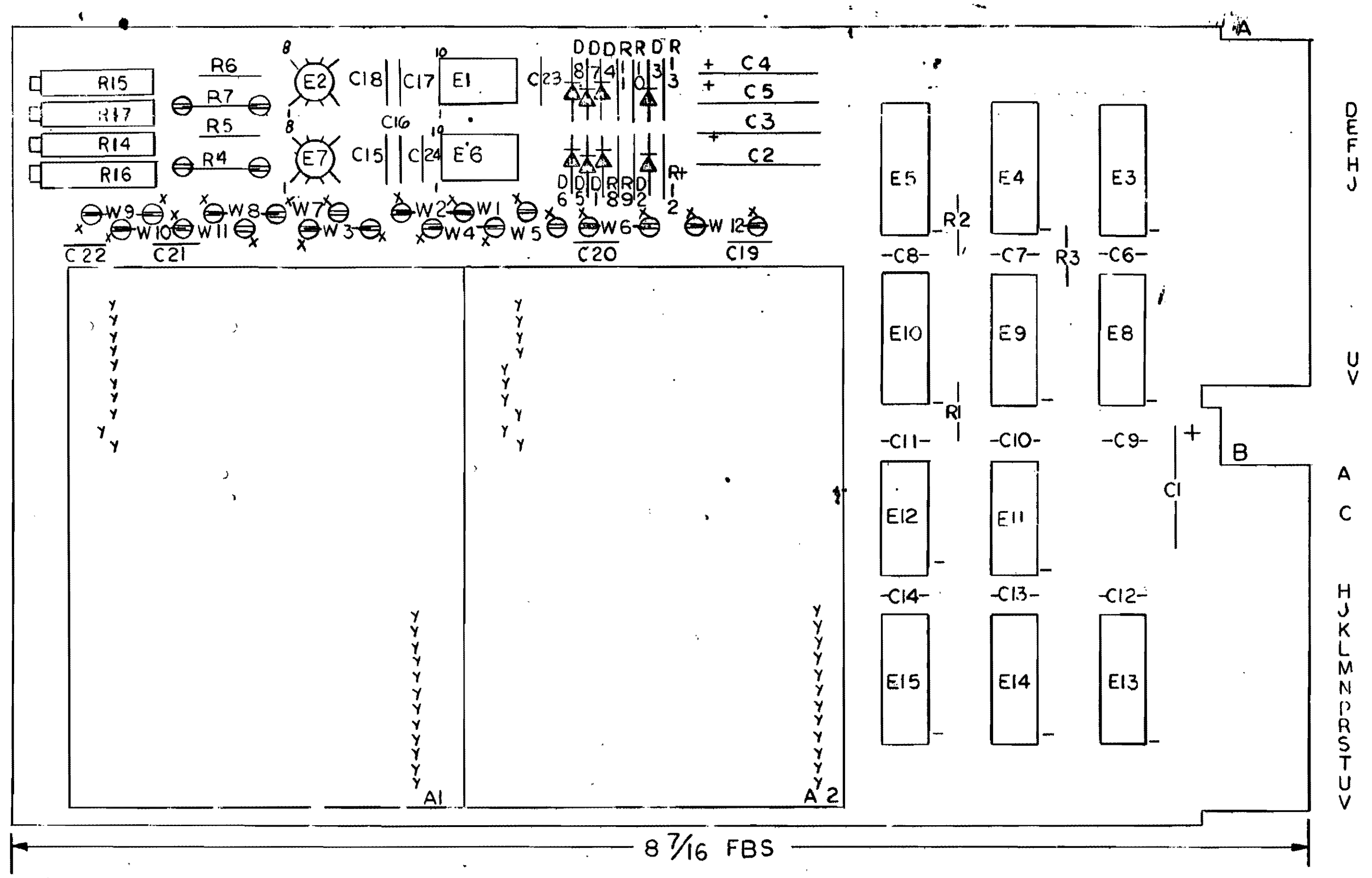
ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION
1	A625	DUAL D-A CONVERTER MODULE	1

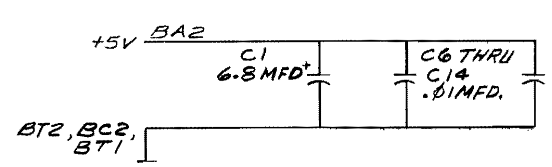
TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
EXTERNAL D-A CONVERTER	/	A	PL	LPSDA-Ø-Ø		
	SHEET 1 OF 1	DIST.				

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

NOTES:

1. FOR STD CONFIGURATION USE JUMPERS W2, W3, W4, W5, W8, W9, W10 & W12.





A/R		#22 WIRE, AWG	9107560-01	27
2	R4, R7	RES. 820, 5%, 1/4W	13-01775	26
				25
2	C23, C24	CAP. 27pf, 100V, 5% DM	10-01739	24
24		SPLIT LUG	9006735	23
2		EYELET	9006732	22
1		HANDLE FLIP CHIP AMBER	9008337-0	21
2	A1, A2	DEC DAC	A6ØØØ	20
2	E2, E7	I.C. DEC. 2505	1911144	19
6	E4, E5, E9, E10, E14, E15	I.C. DEC. 74175	1910651	18
2	E1, E6	I.C. DEC. 0002	1910446	17
3	E3, E8, E13	I.C. DEC. 8235	1909935	16
2	E11, E12	I.C. DEC 7404	1909686	15
2	R12, R13	RES. 47, 1%, 1/4W	1310881-02	14
2	R14, R15	RES. 20K, 10%, 3/4W, 76 PR	1309143-11	13
2	R16, R17	RES. 500, 10%, 3/4W, 76 PR	1309143-06	12
2	R5, R6	RES. 909, 1%, 1/8W	1302685	11
3	R1 THRU R3	RES. 1K, 5%, 1/4W	1300365	10
4	R8 THRU R11	RES. 390, 5%, 1/4W	1300309	9
4	D1 THRU D4	DIODE 1N4004	1105796	8
4	D5 THRU D8	DIODE 1N752A, 5%, .40W	1102808	7
17	C6 THRU C22	CAP. .01 MFD., 20%, 100V	1001610-01	6
5	C1 THRU C5	CAP. 6.8 MFD., 10%, 35V	1005306	5
1		ETCHED CIRCUIT BOARD	5010274	4
REF.		MODULE ECO HISTORY	B-MH-A625-Ø-6	3
REF.		ASSY./DRILLING HOLE LAYOUT	D-AH-A625-Ø-5	2
REF.		X-Y COORDINATE HOLE LOC.	K-CO-A625-Ø-4	1
QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

FIRST USED ON OPTION MODEL: LPS11

ETCH BOARD REV: C

IC TYPE	GND	+5V
DEC 8235	8	16
DEC 74175	8	16

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

IC PIN LOCATIONS

DEC NO.	EIA NO.
1N4004	NONE
1N752A	NONE

SEMICONDUCTOR CONVERSION CHART

REV	CHANGE NO.	
C	A625-00001	E. KING 2/5/73

REVISIONS

DRN. P. M. Poirier — DATE 12/27/72
CHK'D — DATE 1/11/73
ENG. — DATE 2-5-73
PROJ. ENG. Al Wallack — DATE 2-5-73
PROD. — DATE 2-5-73

NEXT HIGHER ASSY

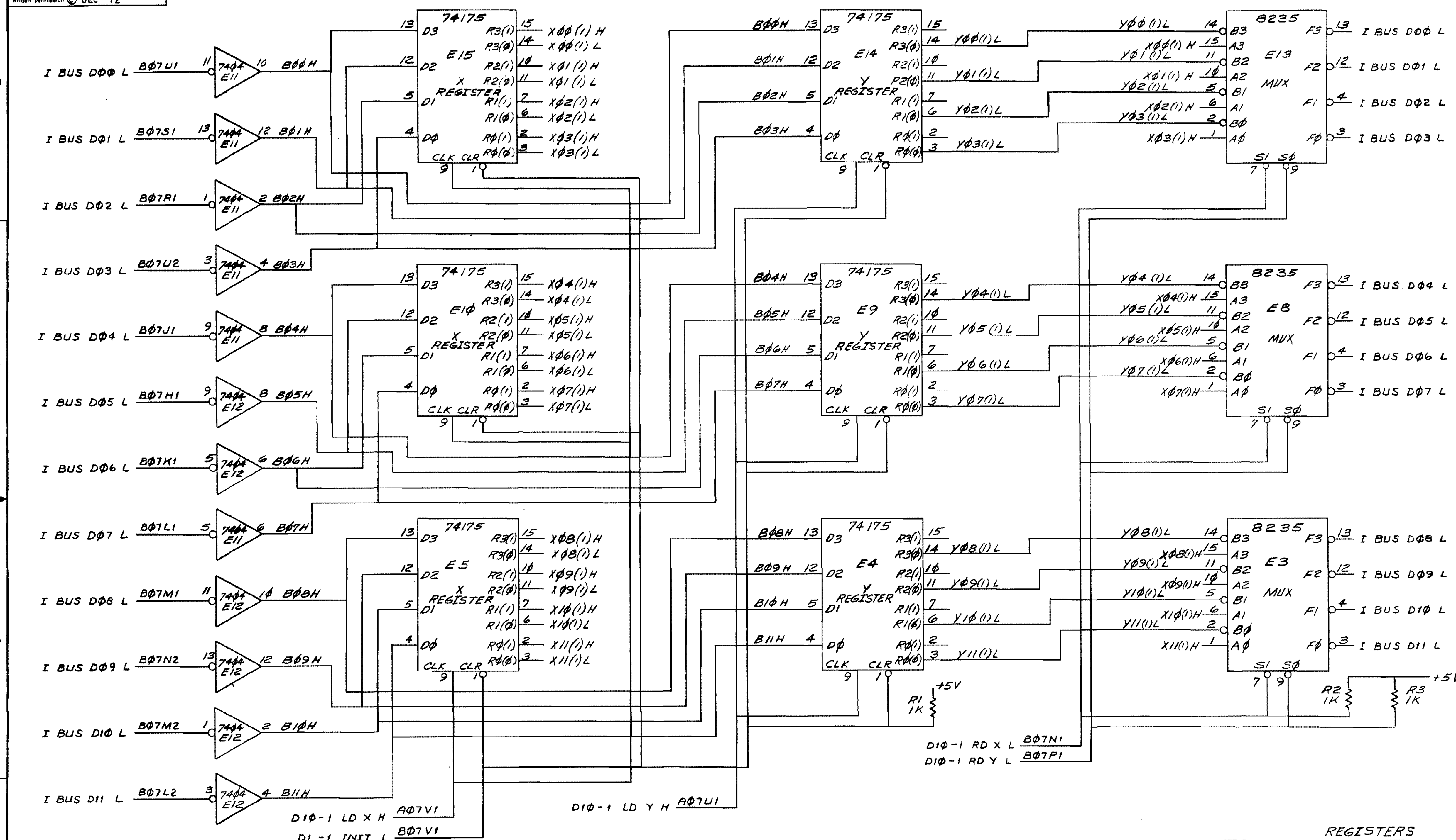
digital EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS

TITLE: DUAL DAC (A625) .D11-Ø

SIZE D, CODE CS, NUMBER A625-Ø-1, REV. C

SCALE 1/1 — SHEET 1 OF 3

DEC FORM NO. DRD-135A



REGISTERS

FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO.	ITEM NO.
LPS11		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 —

		DATE
DRN.	F. Flavin	12/12/72
CHK'D		1/11/73
ENG.	Bus. Johnson	2-5-73
PROJ. ENG.	Al Wallack	2-5-73
PROD.		2-5-73

NEXT HIGHER ASSY.

SCALE —

SHEET 2 OF 3

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE DUAL DAC (A625)

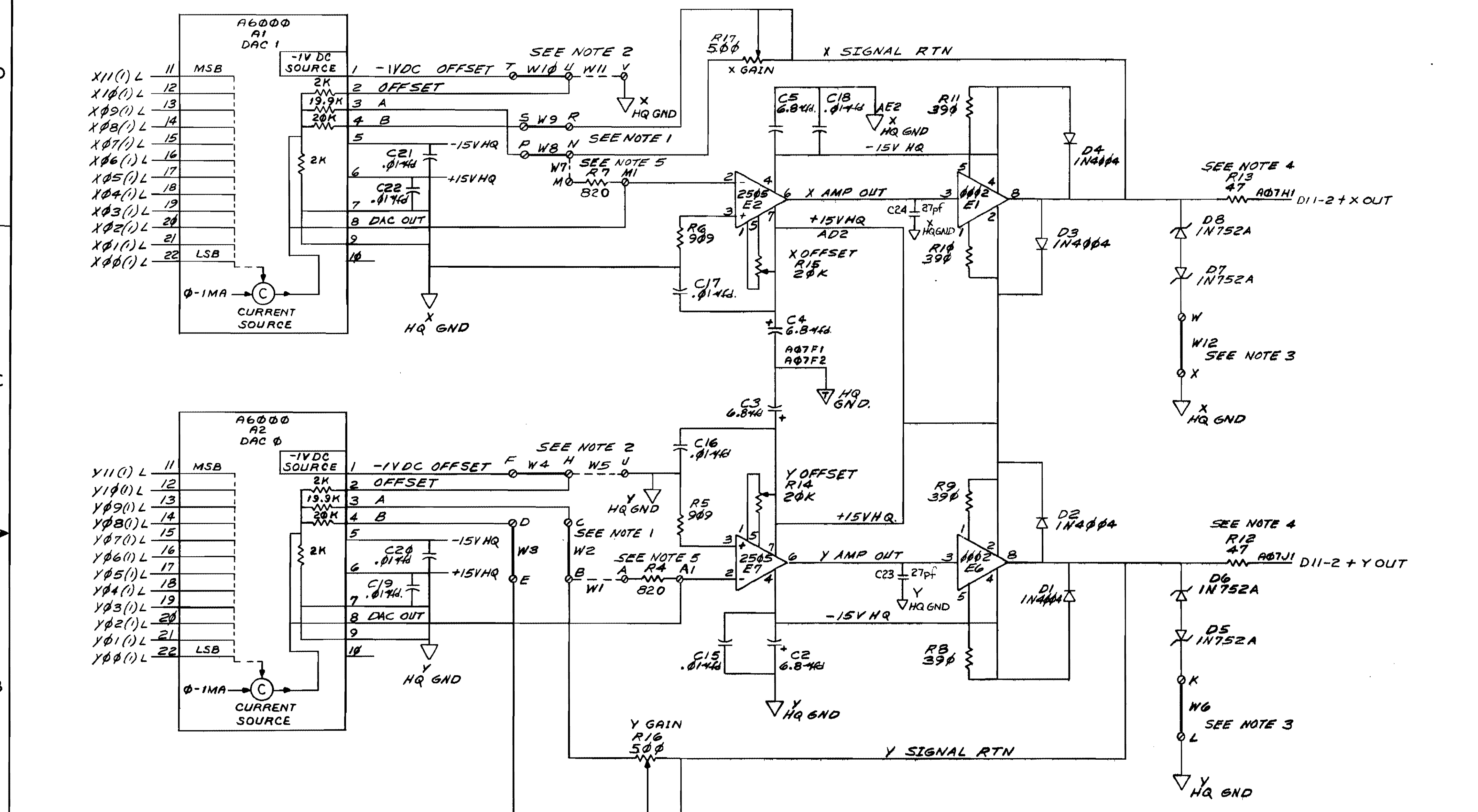
D11-1

SIZE	CODE	NUMBER	REV.
D	CS	A625-Ø-1	C

DIST.

REVISIONS · REV · CHANGE NO · CHK

DEC FORM NO 103-B



NOTES:

1. SETUP GAINS

GAIN	JUMPERS Y	JUMPERS X	BIPOLAR OUTPUT	UNIPOLAR OUTPUT
20	W2	W8	±10V	DO NOT USE
10	W2,W3	W8,W9	± 5V	0→10V
1	W1	W7	± ½V	0→1V

2. SETUP POLARITY

POLARITY	JUMPERS Y	JUMPERS X
UNIPOLAR	W5	W11
BIPOLAR	W4	W10

3. W6 AND W12 MUST BE INSTALLED WHEN A VR14 OR VR20 IS USED. FOR OTHER APPLICATIONS, W6 AND W12 SHOULD BE INSTALLED WHEN OUTPUT DOES NOT EXCEED ±6.3V.
4. FUSABLE RESISTORS, ¼W, 1%.
5. THE 820 OHM, R4 AND R7 MAY BE REMOVED AND THE GAIN RATES CHANGED BY INSERTING DIFFERENT VALUES OF RESISTANCE BETWEEN SPLIT LUGS A-A1 AND M-M1.
6. ALL JUMPERS SHOWN IN PLACE ARE FOR VR14 OR VR20 USAGE (BIPOLAR GAIN OF 10).

AMPS & DRIVERS

FIRST USED ON OPTION/MODEL: LPS 11

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 —

QTY. | DESCRIPTION | PART NO. | ITEM NO. — PARTS LIST

DRN. — DATE 1/4/72; CHK'D — DATE 1/11/72; ENG. — DATE 2-5-73; PROJ. ENG. Al Wallack DATE 2-5-73; PROD. — DATE 2-5-73

NEXT HIGHER ASSY.

digital EQUIPMENT CORPORATION, MAYNARD MASSACHUSETTS

TITLE: DUAL DAC (A625) D11-2

SIZE D CODE CS NUMBER A625-0-1 REV. C

SCALE — SHEET 3 OF 3

DEC FORM NO DRD 102-B

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION

DATE 3/5/74

TITLE Specifications - LPS11-E - Expander Assembly for the LPS

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE

ENG	APPD	SIZE	CODE	NUMBER	REV
		A	SP	LPS11-E-4	

ENGINEERING SPECIFICATION

CONTINUATION SHEET

TITLE Specification - LPS11-E - Expander Assembly for the LPS

I. OVERALL DESCRIPTION

The LPS11-E Expander Box provides the necessary power, backplane wiring, and cabling for adding on the LPSAM-E (8 channel multiplexer) and LPSDA (External D-A converters) Expander options to an LPS.

It can house a maximum of (6) LPSAM-E's and (4) LPSDA's thus making the LPS System expandable to a total of 64 A-D channels with preamplifier capabilities and 8 EXTERNAL D-A converters over and above the LPSVC scope control. Additionally, output connections for the D-A converters are included. The LPS11-E is designed for use with a rack-mounted LPS and installed in the same cabinet immediately above or below the basic LPS. An interconnecting logic cable is provided which plugs into the expansion berg connector on the M996 module in the LPS. Two power harnesses provide the LPS11-E with logic and analog power from the LPS rear panel.

II. GENERAL SPECIFICATIONS

The LPS11-E is made up of:

A. Wired backplane consisting of:

1) (1) 1943 casting
2) (7) H803 288 pin blocks
3) Backplane wires, mtg. hardware & end panels

B. (2) Power harnesses - routing +5 VDC and ± 15 VDC and associated grounds from the basic LPS to the LPS11-E.

C. Connector module, M957 - providing output connections for

	SIZE	CODE	NUMBER	REV
	A	SP	LPS11-E-4	

(4) LPSDA's.

D. Interconnecting cable - provides routing for 12 data lines, 8 load DAC lines, 6 Mux selection lines, analog input and required grounds between the basic LPS and the LPS11-E.

E. Bus receiver, M784 - buffering and inverting the LD DAC lines.

III. POWER REQUIREMENTS

LPSAM-E

+5 VDC	150 ma	Max.
+15 VDC	60 ma	
-15 VDC	60 ma	

LPSDA

+5 VDC	100 ma
+15 VDC	100 ma
-15 VDC	100 ma

LPSAG-VG

+5 VDC	none
+15 VDC	60 ma
-15 VDC	45 ma

IV. MAXIMUM CONFIGURATION

	+5V	+15V	-15V
(6) LPSAM-E's	.9	.36	.36
(4) LPSDA's	.4	.40	.4
(12) LPSAG-VG's	0	.72	.54
Maximum Total Amps	1.3	1.48	1.30

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION DATE 4/17/74

TITLE Field Installation/Acceptance

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE

ENG	APPD	SIZE	CODE	NUMBER	REV
		A	SP	LPS11-E-5	

DEC 16-(392)-1079-N971
DRA 107

1.0 SCOPE

Section 2. Introduction
Section 3. LPS11-E Field Installation
Section 4. LPSAM-E Field Checkout/Acceptance
Section 5. LPSDA Field Checkout/Acceptance

The LPS11-E may contain any configuration of from Ø to 6 LPSAM-E's and from Ø to 4 LPSDA's. This document can be used for Field Installation/Acceptance of any combination of these options by simply using the sections that pertain and ignoring the sections that deal with options not installed in the particular configuration.

2.0 INTRODUCTION

2.1 LPS11-E OVERVIEW

The LPS11-E is basically a backplane into which LPSDA and LPSAM-E options may be plugged. It also contains an M784 Bus Receiver for digital signals from the LPS, M957 Connector Module for LPSDA output connections, and (3) three cables for connecting the LPS11-E to an LPS11. All power and signals are derived from the basic LPS via these cables. A basic LPS11-S therefore, is a prerequisite for an LPS11-E.

2.2 LPSAM-E OVERVIEW

The LPSAM-E is a (4) four module option. It provides for (8) eight analog input connections and circuitry for selecting one of those (8) eight inputs and routing the selected signal to the output of the LPS11-E. This output is in turn routed to the basic

LPS where the signal is converted by the LPSAD-12.

It may be seen, therefore, that an LPSAD-12 and LPS11-E are a prerequisite for an LPSAM-E.

The (4) four modules that make up an LPSAM-E follow:

(1) M957 Connector module
(2) G728 Jumper modules
(1) A407 8 channel multiplexer

One further explanation is necessary. Up to (2) two LPSAG's or LPSAG-VG's Preamplifier options may replace either or both of the G728 jumper modules in an LPSAM-E. In this case, an A242 or A241 module will ship installed in the unit and the G728 jumper modules which are removed will ship as loose pieces.

2.3 LPSDA OVERVIEW

The LPSDA is a (1) one module option. It converts digital signals, from the LPSVC option in the basic LPS, into analog and routes the analog to the output connector provided in the LPS11-E. Each LPSDA has 2 channels. The prerequisites for an LPSDA are an LPS11-E and LPSVC.

The (1) one module that makes up an LPSDA is:

(1) A625 Dual D-A converter.

3.0 LPS11-E FIELD INSTALLATION

3.1 CABINET MOUNTING

Since analog cable lengths must be kept to a minimum, two

restrictions are made on system configurations:

1) The basic LPS11 must be rack mounted.

2) The LPS11-E must be mounted in the same rack immediately above or below the basic LPS.

3.2 BASIC LPS PREPARATION

NOTE: If the LPS11-E is not an add on to an existing LPS, then skip to section 3.4.

3.2.1 For access, remove top and left side covers to the basic LPS.

3.2.2 If an LPSVC (M7019 module) is present, then ECO #M7019-00002 (Scope Control Module) is required to invert the LDØØ-Ø7 lines to low going signals for bussing to the LPS11-E.

Identify this ECO by checking that E1 on the M7019 is a 7417 IC and not a 7416.

3.2,3 If an LPSAD-12 is present, then ECO #M7018-00003 (A/D Control Module) is required to provide for an increased settling interval.

Identify by checking that C43 is 4700 pf and C53 is 3300 pf on the M7018.

3.2.4 If one or more LPSAM-E's are included in the particular configuration being installed, then the settling interval must be increased to 15 μsec. by moving two jumpers on the M7018.

a) The PST Delay (E39) jumper must be moved from the split lug associated with C52 to the split lug associated with C43.

b) The MC Delay (E33) jumper must be moved from the split lug associated with C44 to the split lug associated with C53.

3.2.5 Install LPS11-E Power Harness #2, PN 7009789 in the basic LPS11 as follows:

STEP 1: Remove the LPS Power Supply for access to backplane. (4 screws, bottom of chassis)

STEP 2: Pull off the following power wires from backplane (solderless connectors). (Refer to drawing D-AD-7009110 in the back of the LPS print set for a rear view of the backplane):

1) WHT wire from FT 6-1.
2) ORN wire from FT 8-1.
3) BLU wire from FT 9-1.

STEP 3: Connect harness (7009289) and reconnect LPS wires as follows. (Care must be taken not to pinch machine wrapped wires):

1) BLK wire (Qty. 1) to FT 15-1.
2) RED wire (Qty. 1) to FT 11-1.
3) BLU wires (Qty 2) to FT 9-1 (Piggy Back).
4) ORN wires (Qty 2) to FT 8-1 (Piggy Back).
5) WHT wires (Qty 2) to FT 6-1 (Piggy Back).

STEP 4: Install mate n' locks in precut holes at right rear of LPS with J2 at right (nearest corner) and J1 to left as viewed from front of LPS.

STEP 5: Dress wires near backplane and rear panel and replace the LPS Power Supply (4 screws).

3.2.6 Connect LPS11-E Logic Cable (7009790) to basic LPS as follows:

STEP 1: Remove all modules above row 6 for access to M996 berg connector board.

STEP 2: Remove rear mounting panel (panel under Unibus slot) (5 screws).

STEP 3: Route the end of logic cable marked J1 through rear access underneath unibus, between rear module guides for rows 5 and 6 and connect to Expansion Berg (third connector from rear) on M996, A to A and VV to VV. Dress shielded TWP cable against PC board between berg connectors.

STEP 4: Replace modules (refer to D-MU-LPS11-S-1 Module Utilization). If Digital I/O Option is present, care must be taken not to dislodge any of the berg connectors

when replacing the module in row 5. One of the Mylar Electro-magnetic Shields may be used as a shoehorn.

STEP 5: Replace rear mounting panel (5 screws).

3.3 LPS11-E Hook-up

3.3.1 Install LPS11-E Power Harness #1 (7009788).

STEP 1: Plug mate n' locks (at the opposite end) P2 to J2 (located at left rear of basic LPS as viewed from the back - it is the jack nearest the corner) and P1 to J1.

NOTE: Since plugs are identical care must be taken not to swap them as they are power connections.

3.3.2 Connect the 'J2' end of the logic cable to the I/O Adaptor module 5409209 (A to A and VV to VV) and plug module into B19.

3.4 POWER CHECK

Power up basic LPS and take the following voltage checks in the LPS11-E.

SCOPE POINT	VOLTAGE
B1D2	+15 VDC
B1E2	-15 VDC
B2A2	+ 5 VDC

4.0 LPSAM-E FIELD CHECKOUT/ACCEPTANCE

4.1 Equipment and documents required.

4.1.1 EDC VS-11 N or equivalent.

4.2.1 LPS Test 1, (MAINDEC-11-DAPSA, D & PB).

4.2 Determine whether or not the LPSAM-E channels to be tested have pre-amplifiers or not by examining the following module slots for A242 or A241 preamps and correlating with the key sheet.

SLOT	CHANNEL #'s
AB18	24 - 27
AB16	20 - 23
AB15	34 - 37
AB13	30 - 33
AB12	44 - 47
AB1Ø	40 - 43
ABØ9	54 - 57
ABØ7	50 - 53
ABØ6	64 - 67
ABØ4	60 - 63
ABØ3	74 - 77
ABØ1	70 - 73

1) For all channels without preamps, follow the procedure detailed in Section 4.3 of this document for a functional test of the LPSAM-E.

2) For all channels with preamps, follow the procedure detailed in Section 4.4 of this document for a functional test of the LPSAM-E.

4.3 FUNCTIONAL CHECK WITHOUT PREAMPS

4.3.1 Load LPS Test I and run 'C' Calibration routine, internal mode, as described in the diagnostic listing.

4.3.2 Set the EDC for 4.98047 volts with the polarity switch in + position, and connect '+' output to A17R1, '-' output to B10B1 and EDC ground to B10C2. To alleviate noise and offset due to ground loops, the EDC must be floated from

power line to ground. Set SR0-5 to 20_8, and perform the following steps in a loop until all existing channels have been checked.

STEP 1: CHECK for 7770 ±2 LSB in the LED display.

STEP 2: Set the EDC polarity switch to 'Ø' position. CHECK for 4ØØØ ±2 LSB in the LED display.

STEP 3: Set the EDC polarity switch to '-' position. CHECK for 0010 ±2 LSB in the LED display.

STEP 4: Change SR Ø-5 setting so as to add 1 to the present number (select next channel in sequence).

STEP 5: While observing the LED display, change the EDC polarity switch from '-' to 'Ø' to '+' position and leave it in '+' position.

CHECK that there was no significant change in the LED display while switching the EDC.*

STEP 6: Move the wire coming from the '+' EDC output to the next pin number in the chart below (apply voltage to next channel input in sequence).

CHECK to see if this new channel is present in the configuration. If not, all channels have been checked out (proceed to the next section). If the new channel is present in the configuration then GO TO STEP 1.

*Since the channel selected by SR Ø-5 at this point has a floating input the number in the LED display is indeterminable. But, whatever the reading may be, it should not change with the input voltage of another channel (i.e. from 0010 to 4000 to 7770).

	CH 20-27	CH 30-37	CH 40-47	CH 50-57	CH 60-67	CH 70-77
	LOC A17	LOC A14	LOC A11	LOC A8	LOC A5	LOC A2
X0	R1	R1	R1	R1	R1	R1
X1	L1	L1	L1	L1	L1	L1
X2	F1	F1	F1	F1	F1	F1
X3	B1	B1	B1	B1	B1	B1
X4	T2	T2	T2	T2	T2	T2
X5	N2	N2	N2	N2	N2	N2
X6	J2	J2	J2	J2	J2	J2
X7	D2	D2	D2	D2	D2	D2

CHART OF INPUT PINS

NOTE: The offset adjustment on the A4Ø7 multiplexer in LPSAM-E's is bypassed so that no gain or offset adjustment can be made in LPSAM-E's without preamps. Therefore, if the above checkout fails, a determination should be made as to whether all channels fail in the same manner or just a group of eight or just one.

1) If all channels are out slightly, the LPS Analog System Calibration Procedure (A-SP-LPS11-S-13) should be performed, and the above checkout repeated.

2) If all channels are completely out of the acceptable

range, then a more basic fault such as power or signal wiring should ...

3) If a group ... (1) One channel fails, then the A407 Multiplexer is suspect.

4.4 FUNCTIONAL CHECK WITH ...

This section pertains to LPSAM-E's that include A241 or A242 pre-amp options LPSAG or LPSAG-AG.

4.4.1 Connect EDC ground to pin B10C2 and make sure the EDC is floated from power line ground. Apply EDC voltages to the "+" and "-" inputs of each channel according to the tables below. Compare the readings in the voltage chart below. Converted values must be within ±2 LSB to be acceptable. As in Section 4.3 use the Calibration Routine of LPS Test I, and select the channel under test in SR Ø-5.

LED READINGS	EDC VOLTAGE
0000	-1V
1000	-0.750V
2000	-0.500V
3000	-0.250V
4000	0.000V
5000	+0.250V
6000	+0.500V
7000	+0.750V
7777	+1.000V

VOLTAGE CHART

CH	"+" Pin	"-" Pin
A	R1	T1
B	L1	N1
C	F1	J1
D	B1	D1
E	T2	V2
F	N2	R2
H	J2	L2
J	D2	F2

CH	SLOT	A17	A14	A11	A8	A5	A2
A		10	20	30	40	50	60
B		11	21	31	41	51	61
C		12	22	32	42	52	62
D		13	23	33	43	53	63
E		14	24	34	44	54	64
F		15	25	35	45	55	65
H		16	26	36	46	56	66
J		17	27	37	47	57	67

4.4.2 If checkout fails, it may be helpful in isolating the problem to replace the preamps with G728 jumpers and perform section 4.3 of this document.

5.0 LPSDA FIELD CHECKOUT/ACCEPTANCE

5.1 Equipment required

DVM capable of measuring 1 MV accuracy.

5.2 Calibration Check

5.2.1 LPSDA's are installed in LPS11-E slots as follows:

OPTION	CHANNELS	LOCATION
LPSDA #1	0 - 1	AB21
LPSDA #2	2 - 3	AB22
LPSDA #3	4 - 5	AB23

OPTION	CHANNELS	LOCATION
LPSDA #4	6 - 7	AB24

5.2.2 TOGGLE the following program into memory.

LOCATION	CONTENTS	COMMENT
30000	013737	Move
2	177570	SR Contents
4	170424	to EXT DAC REG
6	000774	Jump to Start

The number in the SR will be loaded into the EXT DAC register which has the following format.

15 - 13	12	11 - 0
CH #	UNUSED	DATA

*If the basic LPS has a starting address block other than 170400, this location must be changed accordingly.

5.2.3 Using the DVM and the above program, check the D-A outputs for as many channels as are configured. The SR settings, DVM readings and output pins are given below. Connect DVM ground lead to A21F2.

STEP NO.	CH. NO.	SR SETTING	OUTPUT PIN	DVM READING	ACTION IF OUT OF TOLERANCE
1		004000		0V ±1 MV	adj. top pot AB21
2	0	000000	A 20 R1	-5V ±1 MV	adj. 2nd pot AB21
3		007777		±4.997V ±2.5MV	go to step 1.
4		024000		0V ±1 MV	adj. 3rd pot AB21
5	1	020000	A 20 L1	-5V ±1 MV	adj. bottom pot AB21
6		027777		±4.997V ±2.5MV	go to step 4.
7		044000		0V ±1 MV	adj. top pot AB22
8	2	040000	A 20 F1	-5V ±1 MV	adj. 2nd pot AB22
9		047777		±4.997V ±2.5MV	go to step 7.
10		064000		0V ±1 MV	adj. 3rd pot AB22
11	3	060000	A 20 B1	-5V ±1MV	adj. bottom pot AB22
12		067777		±4.997V ±2.5MV	go to step 10.
13		104000		0V ±1 MV	adj. top pot AB23
14	4	100000	A 20 T2	-5V ±1 MV	adj. 2nd pot AB23
15		107777		±4.997V ±2.5MV	go to step 13.
16		124000		0V ±1 MV	adj. 3rd pot AB23
17	5	120000	A 20 N2	-5V ±1 MV	adj. bottom pot AB23
18		127777		±4.997V ±2.5MV	go to step 16.
19		144000		0V ±1 MV	adj. top pot AB24
20	6	140000	A 20 J2	-5V ±1 MV	adj. 2nd pot AB24
21		147777		±4.997V ±2.5MV	go to step 19.
22		164000		0V ±1 MV	adj. 3rd pot AB24
23	7	160000	A 20 D2	-5V ±1 MV	adj. bottom pot AB24
24		167777		±4.997V ±2.5MV	go to step 22.

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MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION DATE 3/6/74

TITLE LPSAM-E Engineering Specification

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE

ENG	APPD	SIZE	CODE	NUMBER	REV
		A	SP	LPSAM-E-1	

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DRA 107

ENGINEERING SPECIFICATION digital CONTINUATION SHEET

TITLE LPSAM-E Engineering Specification

I. OVERALL DESCRIPTION

The LPSAM-E eight channel multiplexer expander is designed as an add-on to the LPS11-E and provides additional A/D channels beyond the 16 channels that can be accommodated in the LPSAD-12. Each LPSAM-E provides an additional eight ± 5 volt Analog Input to the A/D converter system. A maximum of six LPSAM-E's may be added to expand the total number of analog channels to 64.

Provisions are made in each LPSAM-E for the addition of (2) LPSAG's or (2) LPSAG-VG's preamplifiers. Analog inputs are made on an M957 connector module. The multiplexer is protected against over-voltage from these inputs.

II. GENERAL SPECIFICATIONS

A. The LPSAM-E is made up of the following components:

1. (1) A407 eight channel multiplexer - contains an 8 channel single ended, FET multiplexer and associated digital decoding and control lines from the LPSAD-12, one channel of eight is actuated and fed to the analog node. The input to each channel contains a fuseable resistor which blows open when an over-voltage condition, dangerous to the circuitry, appears on the channel input. The module is contained on an 8½" x 2 7/16" single sized board.

2. (2) G728 jumper modules - installed in place of the A241 or A242 (LPSAG or LPSAG-VG) preamplifiers. When the preampli-

SIZE	CODE	NUMBER	REV
A	SP	LPSAM-E-1	

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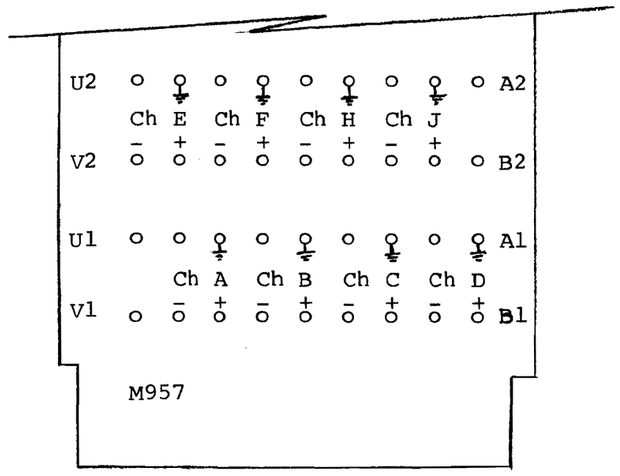
fiers are not installed, this jumper bypasses the module slot so that the analog inputs are routed directly to the multiplexer. This module is to be removed from the system when an A241 or A242 is added in the field.

3. (1) M957 connector module - provides access to the analog inputs and appropriate grounds for interfacing to external signals. Split lugs mounted on the module provide the points where these connections can be made. The drawings below show the channel assignments.



Slot	A17	A14	A11	AØ8	AØ5	AØ2
ch	Channel Numbers					
A	20	30	40	50	60	70
B	21	31	41	51	61	71
C	22	32	42	52	62	72
D	23	33	43	53	63	73
E	24	34	44	54	64	74
F	25	35	45	55	65	75
H	26	36	46	56	66	76
J	27	37	47	57	67	77

B. LPS11-E expander box - is a prerequisite for the LPSAM-E. This option furnishes the power, cabling, and prewired backplane needed for the operation of up to six LPSAM-E's.

C. Configuration - Each LPSAM-E takes up 3 double height slots in the LPS11-E and are cut for the appropriate channel assignment according to the following allocation table.

LPS11-E Slot Locations	LPSAM-E Ch. Assignement
AB1 - AB3	70 - 77
AB4 - AB6	60 - 67
AB7 - AB9	50 - 57
AB10-AB12	40 - 47
AB13-AB15	30 - 37
AB16-AB18	20 - 27

D. Environmental Specifications

Temperature (Operating)	40° to 100° F Ambient
Humidity (Operating)	20% to 80% non-condensing
Temperature (Storage)	0° to 135° F
Humidity (Storage)	5% to 95% non-condensing

E. Power Requirements

Voltage	Current (Maximum)
+5 VDC ±5%	150 ma.
+15 VDC ±.1%, .05% regulation	60 ma.
-15 VDC ±.1% .05% regulation	60 ma.

F. Electrical Specification

1. Analog Parameters

Analog Input Voltage Range	±5 Volts single-ended
# of channels	8 plus a ninth channel not utilized in the LPSAM-E.
Input Impedance	10^9 in parallel with 100 PF (measured at connector module)
Input Bias Current	
a. Channel on (±10 volts input)	15 na maximum
b. Channel on (input greater than ±10 volts)	Input clamps to ±10 volts through 47Ω (due to protection circuits)
c. Channel off	-1 na maximum
d. Channel transition from off to on	-5 na maximum
Input Protection	Fuseable resistors on each input will blow out when input exceeds approximately +25 or -25 volts. Fuseable resistors must be replaced in this case.
Analog Output Voltage Range	± 5 volts
Output Impedance	2.5Ω maximum
Interchannel Crosstalk	Spec. is 8 DB minimum at 1 KHZ rolling off at 20 DB/Decade at higher frequencies.
Multiplexer gain	.999 Gain 1.000.
Temperature Coefficient of Output Voltage	10 μV/°C average drift

2. Digital Parameters

Input Format	6 bit parallel binary for decoding channel selection. The bank of 8 channels to be selected is jumper selectable on module.
Input Voltage	TTL compatible - each input represents 2 unit loads. ØV = True. Pull up provided for open collector drivers.

III. PROGRAMMING

REFER to LPSAD-12 ENGINEERING SPECIFICATIONS.

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION DATE 3/5/74

TITLE LPSDA Specifications

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE

ENG	APPD	SIZE	CODE	NUMBER	REV
		A	SP	LPSDA-Ø-1	

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ENGINEERING SPECIFICATION digital CONTINUATION SHEET

TITLE LPSDA Specifications

I. OVERALL DESCRIPTION

The LPSDA - External converter option consists of one A625 Dual D-A converter module. It provides add-on capability to the LPS of up to 8 external D-A converters for general purpose use.

II. GENERAL SPECIFICATIONS

Prerequisites to the LPSDA are the LPS11-E and LPSVC. The LPS11-E provides the power, cabling, backplane wiring and output connections for a maximum of four (4) LPSDA's. The LPSVC provides the select and data signals necessary to load any of the 8 possible converters.

The LPSDA is designed as a general purpose DAC that may be used in a wide variety of applications. Therefore, the special functions of ready flags, interrupt control and initialize are not an integral part of this option. To output an analog signal or preset a DAC to a given value, the user simply loads a 16-bit word containing the digital data and channel number into the LPSVC EXT. D/A register.

LPSVC EXT D/A Register (Write only)

15 - 13	12	11	DATA	0
D/A pointer	unused			

SIZE	CODE	NUMBER	REV
A	SP	LPSDA-Ø-1	

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III. DAC CONVERTER SPECIFICATIONS

Output Voltage	± 5 Volts. Jumpers for other ranges.
Resolution	1 part in 4096 (.025% FS)
Absolute Accuracy	.1%
Slew Speed	10 Volts/.5 µsec.
Settling time to .03%	4 µsec.
Drive capability	300 feet at 50 pf/ft. cable
Offset Adjustment	200 MV
Gain Adjustment	20 MV

IV. CONFIGURATION

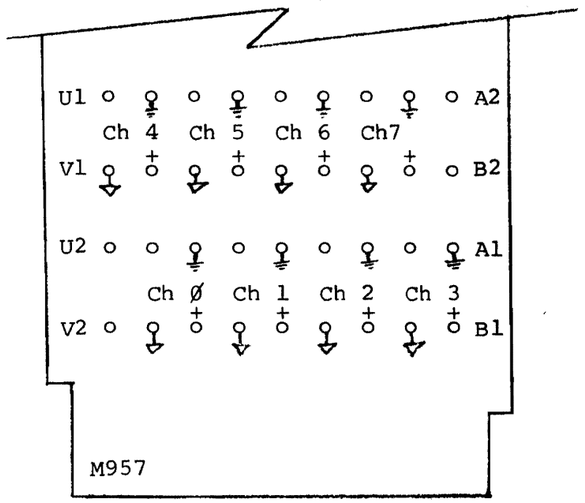
A. Output voltage range may be changed according to the following jumper charts.

Jumper Placement DAC A	Jumper Placement DAC B	Gain	Output Voltage Bipolar	Output Voltage Unipolar
W2	W8	2Ø	± 1ØV	NA
W2 & W3	W8 & W9	1Ø	± 5V	Ø to -1ØV
W1	W7	1	± ½V	Ø to - 1V

Jumper placement for various voltage outputs.

A625 Polarity Output	Jumper Placement DAC A	Jumper Placement DAC B
Unipolar	W5	W11
Bipolar	W4	W1Ø

B. Output connections are made on an M957 connector module as shown below.



V. PROGRAMMING EXAMPLES

A. Preset all DAC's to Ø volts output.

Location	Instruction	Comment
INIT:	MOV #4000,RØ	Setup for Ø Volts.
	MOV #170424,R1	Pointer to R1.
LDAC:	MOV RØ,@R1	Load DAC.
	ADD #20000,RØ	Next DAC.
	BVC LDAC	Last DAC?
CONT:		Yes, continue.

B. Increment DAC #7 by 10.

```
Location        Instruction          Comment

START:          MOV #7,R1            Setup indexing
                MOV #10,R2           Setup constant
                ADD DACT(R1),R2      Trial addition
                BIC #167777,R2       Isolate bit 12
                BNE ERROR            Bit 12 was set, error.
                ADD #1Ø,DACT(R1)     No error, add.
                MOV DACT(R1),EXT DAC Load DAC.
CONT:                                Continue.

DACT:           00xxxx               DAC registers.
                02xxxx
                04xxxx
                06xxxx
                10xxxx
                12xxxx
                14xxxx
                16xxxx
```

FIRST USED ON OPTION MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
LPS11-E		PARTS LIST		

DRN. Earl Reed	DATE 2/8/74	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D. Earl Reed	DATE 3-6-74	
ENG. A. L. Thomas	DATE 3-11-74	TITLE LPS11-E WIRE LIST
PROJ. ENG. A. L. Thomas	DATE 3-11-74	
PROD. [illegible]	DATE 3-13-74	
NEXT HIGHER ASSEMBLY B-DD-LPS11-E		SIZE K · CODE WL · NUMBER LPS11-E-WL · REV.
SCALE —		DIST.
SHEET 1 OF 1		

REVISIONS	CHANGE NO.	CHK
REV.		

DEC FORM NO. CPB 109

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
+CH 20		A17R1		1-01							1				1
+CH 20		B16P2		1-02											1
+CH 20				1									5-2/8		1
+CH 21		A17L1		1-01							1				2
+CH 21		B16J2		1-02											2
+CH 21				1									5-0/8		2
+CH 22		A16P2		1-01							1				3
+CH 22		A17F1		1-02											3
+CH 22				1									3-4/8		3
+CH 23		A16J2		1-01							1				4
+CH 23		A17B1		1-02											4
+CH 23				1									3-2/8		4
+CH 24		A17T2		1-01							1				5
+CH 24		B18P2		1-02											5
+CH 24				1									5-0/8		5
+CH 25		A17N2		1-01							1				6
+CH 25		B18J2		1-02											6
+CH 25				1									4-6/8		6
+CH 26		A17J2		1-01							1				7
+CH 26		A18P2		1-02											7
+CH 26				1									3-2/8		7
+CH 27		A17D2		1-01							1				8
+CH 27		A18J2		1-02											8
+CH 27				1									3-0/8		8
+CH 30		A14R1		1-01							1				9
+CH 30		B13P2		1-02											9
+CH 30				1									5-2/8		9
+CH 31		A14L1		1-01							1				10
+CH 31		B13J2		1-02											10
+CH 31				1									5-0/8		10
+CH 32		A13P2		1-01							1				11
+CH 32		A14F1		1-02											11
+CH 32				1									3-4/8		11
+CH 33		A13J2		1-01							1				12
+CH 33		A14B1		1-02											12
+CH 33				1									3-2/8		12

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
+CH 34		A14T2		1-01							1				13
+CH 34		B15P2		1-02											13
+CH 34				1									5-0/8		13
+CH 35		A14N2		1-01							1				14
+CH 35		B15J2		1-02											14
+CH 35				1									4-6/8		14
+CH 36		A14J2		1-01							1				15
+CH 36		A15P2		1-02											15
+CH 36				1									3-2/8		15
+CH 37		A14D2		1-01							1				16
+CH 37		A15J2		1-02											16
+CH 37				1									3-0/8		16
+CH 40		A11R1		1-01							1				17
+CH 40		B10P2		1-02											17
+CH 40				1									5-2/8		17
+CH 41		A11L1		1-01							1				18
+CH 41		B10J2		1-02											18
+CH 41				1									5-0/8		18
+CH 42		A10P2		1-01							1				19
+CH 42		A11F1		1-02											19
+CH 42				1									3-4/8		19
+CH 43		A10J2		1-01							1				20
+CH 43		A11B1		1-02											20
+CH 43				1									3-2/8		20
+CH 44		A11T2		1-01							1				21
+CH 44		B12P2		1-02											21
+CH 44				1									5-0/8		21
+CH 45		A11N2		1-01							1				22
+CH 45		B12J2		1-02											22
+CH 45				1									4-6/8		22
+CH 46		A11J2		1-01							1				23
+CH 46		A12P2		1-02											23
+CH 46				1									3-2/8		23
+CH 47		A11D2		1-01							1				24
+CH 47		A12J2		1-02											24
+CH 47				1									3-0/8		24

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
+CH 50		A08R1		1-01							1				25
+CH 50		B07P2		1-02											25
+CH 50				1									5-2/8		25
+CH 51		A08L1		1-01							1				26
+CH 51		B07J2		1-02											26
+CH 51				1									5-0/8		26
+CH 52		A07P2		1-01							1				27
+CH 52		A08F1		1-02											27
+CH 52				1									3-4/8		27
+CH 53		A07J2		1-01							1				28
+CH 53		A08B1		1-02											28
+CH 53				1									3-2/8		28
+CH 54		A08T2		1-01							1				29
+CH 54		B09P2		1-02											29
+CH 54				1									5-0/8		29
+CH 55		A08N2		1-01							1				30
+CH 55		B09J2		1-02											30
+CH 55				1									4-6/8		30
+CH 56		A08J2		1-01							1				31
+CH 56		A09P2		1-02											31
+CH 56				1									3-2/8		31
+CH 57		A08D2		1-01							1				32
+CH 57		A09J2		1-02											32
+CH 57				1									3-0/8		32
+CH 60		A05R1		1-01							1				33
+CH 60		B04P2		1-02											33
+CH 60				1									5-2/8		33
+CH 61		A05L1		1-01							1				34
+CH 61		B04J2		1-02											34
+CH 61				1									5-0/8		34
+CH 62		A04P2		1-01							1				35
+CH 62		A05F1		1-02											35
+CH 62				1									3-4/8		35
+CH 63		A04J2		1-01							1				36
+CH 63		A05B1		1-02											36
+CH 63				1									3-2/8		36

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
+CH 64		A05T2		1-01							1				37
+CH 64		B06P2		1-02											37
+CH 64				1									5-0/8		37
+CH 65		A05N2		1-01							1				38
+CH 65		B06J2		1-02											38
+CH 65				1									4-6/8		38
+CH 66		A05J2		1-01							1				39
+CH 66		A06P2		1-02											39
+CH 66				1									3-2/8		39
+CH 67		A05D2		1-01							1				40
+CH 67		A06J2		1-02											40
+CH 67				1									3-0/8		40
+CH 70		A02R1		1-01							1				41
+CH 70		B01P2		1-02											41
+CH 70				1									5-2/8		41
+CH 71		A02L1		1-01							1				42
+CH 71		B01J2		1-02											42
+CH 71				1									5-0/8		42
+CH 72		A01P2		1-01							1				43
+CH 72		A02F1		1-02											43
+CH 72				1									3-4/8		43
+CH 73		A01J2		1-01							1				44
+CH 73		A02B1		1-02											44
+CH 73				1									3-2/8		44
+CH 74		A02T2		1-01							1				45
+CH 74		B03P2		1-02											45
+CH 74				1									5-0/8		45
+CH 75		A02N2		1-01							1				46
+CH 75		B03J2		1-02											46
+CH 75				1									4-6/8		46
+CH 76		A02J2		1-01							1				47
+CH 76		A03P2		1-02											47
+CH 76				1									3-2/8		47
+CH 77		A02D2		1-01							1				48
+CH 77		A03J2		1-02											48
+CH 77				1									3-0/8		48

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
-CH 20		A17T1		1-01							1				49
-CH 20		B16R2		1-02											49
-CH 20				1									5-0/8		49
-CH 21		A17N1		1-01							1				50
-CH 21		B16L2		1-02											50
-CH 21				1									5-0/8		50
-CH 22		A16R2		1-01							1				51
-CH 22		A17J1		1-02											51
-CH 22				1									3-2/8		51
-CH 23		A16L2		1-01							1				52
-CH 23		A17D1		1-02											52
-CH 23				1									3-2/8		52
-CH 24		A17V2		1-01							1				53
-CH 24		B18R2		1-02											53
-CH 24				1									4-6/8		53
-CH 25		A17R2		1-01							1				54
-CH 25		B18L2		1-02											54
-CH 25				1									4-6/8		54
-CH 26		A17L2		1-01							1				55
-CH 26		A18R2		1-02											55
-CH 26				1									3-0/8		55
-CH 27		A17F2		1-01							1				56
-CH 27		A18L2		1-02											56
-CH 27				1									3-0/8		56
-CH 30		A14T1		1-01							1				57
-CH 30		B13R2		1-02											57
-CH 30				1									5-0/8		57
-CH 31		A14N1		1-01							1				58
-CH 31		B13L2		1-02											58
-CH 31				1									5-0/8		58
-CH 32		A13R2		1-01							1				59
-CH 32		A14J1		1-02											59
-CH 32				1									3-2/8		59
-CH 33		A13L2		1-01							1				60
-CH 33		A14D1		1-02											60
-CH 33				1									3-2/8		60

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
-CH 34		A14V2		1-01							1				61
-CH 34		B15R2		1-02											61
-CH 34				1									4-6/8		61
-CH 35		A14R2		1-01							1				62
-CH 35		B15L2		1-02											62
-CH 35				1									4-6/8		62
-CH 36		A14L2		1-01							1				63
-CH 36		A15R2		1-02											63
-CH 36				1									3-0/8		63
-CH 37		A14F2		1-01							1				64
-CH 37		A15L2		1-02											64
-CH 37				1									3-0/8		64
-CH 40		A11T1		1-01							1				65
-CH 40		B10R2		1-02											65
-CH 40				1									5-0/8		65
-CH 41		A11N1		1-01							1				66
-CH 41		B10L2		1-02											66
-CH 41				1									5-0/8		66
-CH 42		A10R2		1-01							1				67
-CH 42		A11J1		1-02											67
-CH 42				1									3-2/8		67
-CH 43		A10L2		1-01							1				68
-CH 43		A11D1		1-02											68
-CH 43				1									3-2/8		68
-CH 44		A11V2		1-01							1				69
-CH 44		B12R2		1-02											69
-CH 44				1									4-6/8		69
-CH 45		A11R2		1-01							1				70
-CH 45		B12L2		1-02											70
-CH 45				1									4-6/8		70
-CH 46		A11L2		1-01							1				71
-CH 46		A12R2		1-02											71
-CH 46				1									3-0/8		71
-CH 47		A11F2		1-01							1				72
-CH 47		A12L2		1-02											72
-CH 47				1									3-0/8		72

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
-CH 50		A08T1		1-01							1				73
-CH 50		B07R2		1-02											73
-CH 50				1									5-0/8		73
-CH 51		A08N1		1-01							1				74
-CH 51		B07L2		1-02											74
-CH 51				1									5-0/8		74
-CH 52		A07R2		1-01							1				75
-CH 52		A08J1		1-02											75
-CH 52				1									3-2/8		75
-CH 53		A07L2		1-01							1				76
-CH 53		A08D1		1-02											76
-CH 53				1									3-2/8		76
-CH 54		A08V2		1-01							1				77
-CH 54		B09R2		1-02											77
-CH 54				1									4-6/8		77
-CH 55		A08R2		1-01							1				78
-CH 55		B09L2		1-02											78
-CH 55				1									4-6/8		78
-CH 56		A08L2		1-01							1				79
-CH 56		A09R2		1-02											79
-CH 56				1									3-0/8		79
-CH 57		A08F2		1-01							1				80
-CH 57		A09L2		1-02											80
-CH 57				1									3-0/8		80
-CH 60		A05T1		1-01							1				81
-CH 60		B04R2		1-02											81
-CH 60				1									5-0/8		81
-CH 61		A05N1		1-01							1				82
-CH 61		B04L2		1-02											82
-CH 61				1									5-0/8		82
-CH 62		A04R2		1-01							1				83
-CH 62		A05J1		1-02											83
-CH 62				1									3-2/8		83
-CH 63		A04L2		1-01							1				84
-CH 63		A05D1		1-02											84
-CH 63				1									3-2/8		84

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
-CH 64		A05V2		1-01							1				85
-CH 64		B06R2		1-02											85
-CH 64				1									4-6/8		85
-CH 65		A05R2		1-01							1				86
-CH 65		B06L2		1-02											86
-CH 65				1									4-6/8		86
-CH 66		A05L2		1-01							1				87
-CH 66		A06R2		1-02											87
-CH 66				1									3-0/8		87
-CH 67		A05F2		1-01							1				88
-CH 67		A06L2		1-02											88
-CH 67				1									3-0/8		88
-CH 70		A02T1		1-01							1				89
-CH 70		B01R2		1-02											89
-CH 70				1									5-0/8		89
-CH 71		A02N1		1-01							1				90
-CH 71		B01L2		1-02											90
-CH 71				1									5-0/8		90
-CH 72		A01R2		1-01							1				91
-CH 72		A02J1		1-02											91
-CH 72				1									3-2/8		91
-CH 73		A01L2		1-01							1				92
-CH 73		A02D1		1-02											92
-CH 73				1									3-2/8		92
-CH 74		A02V2		1-01							1				93
-CH 74		B03R2		1-02											93
-CH 74				1									4-6/8		93
-CH 75		A02R2		1-01							1				94
-CH 75		B03L2		1-02											94
-CH 75				1									4-6/8		94
-CH 76		A02L2		1-01							1				95
-CH 76		A03R2		1-02											95
-CH 76				1									3-0/8		95
-CH 77		A02F2		1-01							1				96
-CH 77		A03L2		1-02											96
-CH 77				1									3-0/8		96

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
A01J1		A01J1		1-01							1				97
A01J1		A01K1		1-02											97
A01J1				1									2-4/8		97
A01L1		A01L1		1-01							2				98
A01L1		A01R1		1-02							1				98
A01L1		B01A1		1-03							2				98
A01L1		B01B1		1-04							1				98
A01L1		B01C1		1-05							2				98
A01L1		B01L1		1-06							1				98
A01L1		B01R1		1-07											98
A01L1				1									17-2/8		98
A03J1		A03J1		1-01							1				99
A03J1		A03K1		1-02											99
A03J1				1									2-4/8		99
A03L1		A03L1		1-01							2				100
A03L1		A03R1		1-02							1				100
A03L1		B03A1		1-03							2				100
A03L1		B03B1		1-04							1				100
A03L1		B03C1		1-05							2				100
A03L1		B03L1		1-06							1				100
A03L1		B03R1		1-07											100
A03L1				1									17-2/8		100
A04J1		A04J1		1-01							1				101
A04J1		A04K1		1-02											101
A04J1				1									2-4/8		101
A04L1		A04L1		1-01							2				102
A04L1		A04R1		1-02							1				102
A04L1		B04A1		1-03							2				102
A04L1		B04B1		1-04							1				102
A04L1		B04C1		1-05							2				102
A04L1		B04L1		1-06							1				102
A04L1		B04R1		1-07											102
A04L1				1									17-2/8		102
A06J1		A06J1		1-01							1				103
A06J1		A06K1		1-02											103
A06J1				1									2-4/8		103

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
A06L1		A06L1		1-01							2				104
A06L1		A06R1		1-02							1				104
A06L1		B06A1		1-03							2				104
A06L1		B06B1		1-04							1				104
A06L1		B06C1		1-05							2				104
A06L1		B06L1		1-06							1				104
A06L1		B06R1		1-07											104
A06L1				1									17-2/8		104
A07J1		A07J1		1-01							1				105
A07J1		A07K1		1-02											105
A07J1				1									2-4/8		105
A07L1		A07L1		1-01							2				106
A07L1		A07R1		1-02							1				106
A07L1		B07A1		1-03							2				106
A07L1		B07B1		1-04							1				106
A07L1		B07C1		1-05							2				106
A07L1		B07L1		1-06							1				106
A07L1		B07R1		1-07											106
A07L1				1									17-2/8		106
A09J1		A09J1		1-01							1				107
A09J1		A09K1		1-02											107
A09J1				1									2-4/8		107
A09L1		A09L1		1-01							2				108
A09L1		A09R1		1-02							1				108
A09L1		B09A1		1-03							2				108
A09L1		B09B1		1-04							1				108
A09L1		B09C1		1-05							2				108
A09L1		B09L1		1-06							1				108
A09L1		B09R1		1-07											108
A09L1				1									17-2/8		108
A10J1		A10J1		1-01							1				109
A10J1		A10K1		1-02											109
A10J1				1									2-4/8		109
A10L1		A10L1		1-01							2				110
A10L1		A10R1		1-02							1				110
A10L1		B10A1		1-03							2				110
A10L1		B10B1		1-04							1				110
A10L1		B10C1		1-05							2				110
A10L1		B10L1		1-06							1				110
A10L1		B10R1		1-07											110
A10L1				1									17-2/8		110

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
A12J1		A12J1		1-01							1				111
A12J1		A12K1		1-02											111
A12J1				1									2-4/8		111
A12L1		A12L1		1-01							2				112
A12L1		A12R1		1-02							1				112
A12L1		B12A1		1-03							2				112
A12L1		B12B1		1-04							1				112
A12L1		B12C1		1-05							2				112
A12L1		B12L1		1-06							1				112
A12L1		B12R1		1-07											112
A12L1				1									17-2/8		112
A13J1		A13J1		1-01							1				113
A13J1		A13K1		1-02											113
A13J1				1									2-4/8		113
A13L1		A13L1		1-01							2				114
A13L1		A13R1		1-02							1				114
A13L1		B13A1		1-03							2				114
A13L1		B13B1		1-04							1				114
A13L1		B13C1		1-05							2				114
A13L1		B13L1		1-06							1				114
A13L1		B13R1		1-07											114
A13L1				1									17-2/8		114
A15J1		A15J1		1-01							1				115
A15J1		A15K1		1-02											115
A15J1				1									2-4/8		115
A15L1		A15L1		1-01							2				116
A15L1		A15R1		1-02							1				116
A15L1		B15A1		1-03							2				116
A15L1		B15B1		1-04							1				116
A15L1		B15C1		1-05							2				116
A15L1		B15L1		1-06							1				116
A15L1		B15R1		1-07											116
A15L1				1									17-2/8		116
A16J1		A16J1		1-01							1				117
A16J1		A16K1		1-02											117
A16J1				1									2-4/8		117

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
A16L1		A16L1		1-01							2				118
A16L1		A16R1		1-02							1				118
A16L1		B16A1		1-03							2				118
A16L1		B16B1		1-04							1				118
A16L1		B16C1		1-05							2				118
A16L1		B16L1		1-06							1				118
A16L1		B16R1		1-07											118
A16L1				1									17-2/8		118
A18J1		A18J1		1-01							1				119
A18J1		A18K1		1-02											119
A18J1				1									2-4/8		119
A18L1		A18L1		1-01							2				120
A18L1		A18R1		1-02							1				120
A18L1		B18A1		1-03							2				120
A18L1		B18B1		1-04							1				120
A18L1		B18C1		1-05							2				120
A18L1		B18L1		1-06							1				120
A18L1		B18R1		1-07											120
A18L1				1									17-2/8		120
ANA NODE		B02S2		1-01							2				121
ANA NODE		B05S2		1-02							1				121
ANA NODE		B08S2		1-03							2				121
ANA NODE		B11S2		1-04							1				121
ANA NODE		B14S2		1-05							2				121
ANA NODE		B17S2		1-06							1				121
ANA NODE		B19A1		1-07											121
ANA NODE				1									23-2/8		121
B01J1		B01J1		1-01							1				122
B01J1		B01K1		1-02											122
B01J1				1									2-4/8		122
B03J1		B03J1		1-01							1				123
B03J1		B03K1		1-02											123
B03J1				1									2-4/8		123
B04J1		B04J1		1-01							1				124
B04J1		B04K1		1-02											124
B04J1				1									2-4/8		124
B06J1		B06J1		1-01							1				125
B06J1		B06K1		1-02											125
B06J1				1									2-4/8		125

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
B07J1		B07J1		1-01							1				126
B07J1		B07K1		1-02											126
B07J1				1									2-4/8		126
B09J1		B09J1		1-01							1				127
B09J1		B09K1		1-02											127
B09J1				1									2-4/8		127
B10J1		B10J1		1-01							1				128
B10J1		B10K1		1-02											128
B10J1				1									2-4/8		128
B12J1		B12J1		1-01							1				129
B12J1		B12K1		1-02											129
B12J1				1									2-4/8		129
B13J1		B13J1		1-01							1				130
B13J1		B13K1		1-02											130
B13J1				1									2-4/8		130
B15J1		B15J1		1-01							1				131
B15J1		B15K1		1-02											131
B15J1				1									2-4/8		131
B16J1		B16J1		1-01							1				132
B16J1		B16K1		1-02											132
B16J1				1									2-4/8		132
B18J1		B18J1		1-01							1				133
B18J1		B18K1		1-02											133
B18J1				1									2-4/8		133
DAC 00 L		B19K1		1-01							1				134
DAC 00 L		B21U1		1-02							2				134
DAC 00 L		B22U1		1-03							1				134
DAC 00 L		B23U1		1-04							2				134
DAC 00 L		B24U1		1-05											134
DAC 00 L				1									12-0/8		134
DAC 00 OUT		A20R1		1-01							1				135
DAC 00 OUT		A21H1		1-02											135
DAC 00 OUT				1									3-4/8		135

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
DAC 01 L		B19L1		1-01							1				136
DAC 01 L		B21S1		1-02							2				136
DAC 01 L		B22S1		1-03							1				136
DAC 01 L		B23S1		1-04							2				136
DAC 01 L		B24S1		1-05											136
DAC 01 L				1									11-6/8		136
DAC 01 OUT		A20L1		1-01							1				137
DAC 01 OUT		A21J1		1-02											137
DAC 01 OUT				1									3-0/8		137
DAC 02 L		B19M1		1-01							1				138
DAC 02 L		B21R1		1-02							2				138
DAC 02 L		B22R1		1-03							1				138
DAC 02 L		B23R1		1-04							2				138
DAC 02 L		B24R1		1-05											138
DAC 02 L				1									12-0/8		138
DAC 02 OUT		A20F1		1-01							1				139
DAC 02 OUT		A22H1		1-02											139
DAC 02 OUT				1									3-2/8		139
DAC 03 L		B19P1		1-01							1				140
DAC 03 L		B21U2		1-02							2				140
DAC 03 L		B22U2		1-03							1				140
DAC 03 L		B23U2		1-04							2				140
DAC 03 L		B24U2		1-05											140
DAC 03 L				1									12-0/8		140
DAC 03 OUT		A20B1		1-01							1				141
DAC 03 OUT		A22J1		1-02											141
DAC 03 OUT				1									3-6/8		141
DAC 04 L		B19R1		1-01							1				142
DAC 04 L		B21J1		1-02							2				142
DAC 04 L		B22J1		1-03							1				142
DAC 04 L		B23J1		1-04							2				142
DAC 04 L		B24J1		1-05											142
DAC 04 L				1									12-0/8		142
DAC 04 OUT		A20T2		1-01							1				143
DAC 04 OUT		A23H1		1-02											143
DAC 04 OUT				1									4-0/8		143

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
DAC 05 L		B19S1		1-01							1				144
DAC 05 L		B21H1		1-02							2				144
DAC 05 L		B22H1		1-03							1				144
DAC 05 L		B23H1		1-04							2				144
DAC 05 L		B24H1		1-05											144
DAC 05 L				1									12-0/8		144
DAC 05 OUT		A20N2		1-01							1				145
DAC 05 OUT		A23J1		1-02											145
DAC 05 OUT				1									3-6/8		145
DAC 06 L		B19T1		1-01							1				146
DAC 06 L		B21K1		1-02							2				146
DAC 06 L		B22K1		1-03							1				146
DAC 06 L		B23K1		1-04							2				146
DAC 06 L		B24K1		1-05											146
DAC 06 L				1									11-6/8		146
DAC 06 OUT		A20J2		1-01							1				147
DAC 06 OUT		A24H1		1-02											147
DAC 06 OUT				1									4-0/8		147
DAC 07 L		B19U1		1-01							1				148
DAC 07 L		B21L1		1-02							2				148
DAC 07 L		B22L1		1-03							1				148
DAC 07 L		B23L1		1-04							2				148
DAC 07 L		B24L1		1-05											148
DAC 07 L				1									12-0/8		148
DAC 07 OUT		A20D2		1-01							1				149
DAC 07 OUT		A24J1		1-02											149
DAC 07 OUT				1									4-2/8		149
DAC 08 L		B19V1		1-01							1				150
DAC 08 L		B21M1		1-02							2				150
DAC 08 L		B22M1		1-03							1				150
DAC 08 L		B23M1		1-04							2				150
DAC 08 L		B24M1		1-05											150
DAC 08 L				1									11-6/8		150
DAC 09 L		B19U2		1-01							1				151
DAC 09 L		B21N2		1-02							2				151
DAC 09 L		B22N2		1-03							1				151
DAC 09 L		B23N2		1-04							2				151
DAC 09 L		B24N2		1-05											151
DAC 09 L				1									12-0/8		151

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
DAC 10 L		B19V2		1-01							1				152
DAC 10 L		B21M2		1-02							2				152
DAC 10 L		B22M2		1-03							1				152
DAC 10 L		B23M2		1-04							2				152
DAC 10 L		B24M2		1-05											152
DAC 10 L				1									11-6/8		152
DAC 11 L		B19T2		1-01							1				153
DAC 11 L		B21L2		1-02							2				153
DAC 11 L		B22L2		1-03							1				153
DAC 11 L		B23L2		1-04							2				153
DAC 11 L		B24L2		1-05											153
DAC 11 L				1									12-0/8		153
GND 01		A02A1		1-01							2				154
GND 01		A02C2		1-02							1				154
GND 01		A02E1		1-03							2				154
GND 01		A02H2		1-04							1				154
GND 01		A02K1		1-05							2				154
GND 01		A02M2		1-06							1				154
GND 01		A02P1		1-07							2				154
GND 01		A02S2		1-08											154
GND 01				1									19-2/8		154
GND 02		A05A1		1-01							2				155
GND 02		A05C2		1-02							1				155
GND 02		A05E1		1-03							2				155
GND 02		A05H2		1-04							1				155
GND 02		A05K1		1-05							2				155
GND 02		A05M2		1-06							1				155
GND 02		A05P1		1-07							2				155
GND 02		A05S2		1-08											155
GND 02				1									19-2/8		155
GND 03		A08A1		1-01							2				156
GND 03		A08C2		1-02							1				156
GND 03		A08E1		1-03							2				156
GND 03		A08H2		1-04							1				156
GND 03		A08K1		1-05							2				156
GND 03		A08M2		1-06							1				156
GND 03		A08P1		1-07							2				156
GND 03		A08S2		1-08											156
GND 03				1									19-2/8		156

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
GND 04		A11A1		1-01							2				157
GND 04		A11C2		1-02							1				157
GND 04		A11E1		1-03							2				157
GND 04		A11H2		1-04							1				157
GND 04		A11K1		1-05							2				157
GND 04		A11M2		1-06							1				157
GND 04		A11P1		1-07							2				157
GND 04		A11S2		1-08											157
GND 04				1									19-2/8		157
GND 05		A14A1		1-01							2				158
GND 05		A14C2		1-02							1				158
GND 05		A14E1		1-03							2				158
GND 05		A14H2		1-04							1				158
GND 05		A14K1		1-05							2				158
GND 05		A14M2		1-06							1				158
GND 05		A14P1		1-07							2				158
GND 05		A14S2		1-08											158
GND 05				1									19-2/8		158
GND 06		A17A1		1-01							2				159
GND 06		A17C2		1-02							1				159
GND 06		A17E1		1-03							2				159
GND 06		A17H2		1-04							1				159
GND 06		A17K1		1-05							2				159
GND 06		A17M2		1-06							1				159
GND 06		A17P1		1-07							2				159
GND 06		A17S2		1-08											159
GND 06				1									19-2/8		159
GND 07		A20A1		1-01							2				160
GND 07		A20C2		1-02							1				160
GND 07		A20E1		1-03							2				160
GND 07		A20H2		1-04							1				160
GND 07		A20K1		1-05							2				160
GND 07		A20M2		1-06							1				160
GND 07		A20P1		1-07							2				160
GND 07		A20S2		1-08											160
GND 07				1									19-2/8		160

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
GND 08		B19C1		1-01							1				161
GND 08		B19D1		1-02							2				161
GND 08		B19E1		1-03							1				161
GND 08		B19F1		1-04							2				161
GND 08		B19J1		1-05							1				161
GND 08		B19N1		1-06							2				161
GND 08		B21T1		1-07											161
GND 08				1									16-2/8		161
GND 09		A20V2		1-01							1				162
GND 09		A20T1		1-02							2				162
GND 09		A20R2		1-03							1				162
GND 09		A20N1		1-04							2				162
GND 09		A20L2		1-05							1				162
GND 09		A20J1		1-06							2				162
GND 09		A20F2		1-07							1				162
GND 09		A20D1		1-08							2				162
GND 09		A23F2		1-09											162
GND 09				1									23-4/8		162
LD 00 H		B19R2		1-01							1				163
LD 00 H		B20A1		1-02											163
LD 00 H				1									4-0/8		163
LD 00 L		A21V1		1-01							1				164
LD 00 L		B20B1		1-02											164
LD 00 L				1									3-2/8		164
LD 01 H		B19S2		1-01							1				165
LD 01 H		B20D1		1-02											165
LD 01 H				1									4-0/8		165
LD 01 L		A21U1		1-01							1				166
LD 01 L		B20E1		1-02											166
LD 01 L				1									3-6/8		166
LD 02 H		B19P2		1-01							1				167
LD 02 H		B20F1		1-02											167
LD 02 H				1									3-4/8		167
LD 02 L		A22V1		1-01							1				168
LD 02 L		B20H1		1-02											168
LD 02 L				1									4-2/8		168
LD 03 H		B19N2		1-01							1				169
LD 03 H		B20J1		1-02											169
LD 03 H				1									3-0/8		169

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
LD 03 L		A22U1		1-01							1				170
LD 03 L		B20K1		1-02											170
LD 03 L				1									4-4/8		170
LD 04 H		B19M2		1-01							1				171
LD 04 H		B20L1		1-02											171
LD 04 H				1									2-6/8		171
LD 04 L		A23V1		1-01							1				172
LD 04 L		B20M1		1-02											172
LD 04 L				1									5-0/8		172
LD 05 H		B19L2		1-01							1				173
LD 05 H		B20N1		1-02											173
LD 05 H				1									2-6/8		173
LD 05 L		A23U1		1-01							1				174
LD 05 L		B20P1		1-02											174
LD 05 L				1									5-2/8		174
LD 06 H		B19K2		1-01							1				175
LD 06 H		B20R1		1-02											175
LD 06 H				1									3-2/8		175
LD 06 L		A24V1		1-01							1				176
LD 06 L		B20S1		1-02											176
LD 06 L				1									5-6/8		176
LD 07 H		B19J2		1-01							1				177
LD 07 H		B20V1		1-02											177
LD 07 H				1									3-6/8		177
LD 07 L		A24U1		1-01							1				178
LD 07 L		B20U1		1-02											178
LD 07 L				1									6-0/8		178
MUX 00 L		B02V2		1-01							2				179
MUX 00 L		B05V2		1-02							1				179
MUX 00 L		B08V2		1-03							2				179
MUX 00 L		B11V2		1-04							1				179
MUX 00 L		B14V2		1-05							2				179
MUX 00 L		B17V2		1-06							1				179
MUX 00 L		B19B2		1-07											179
MUX 00 L				1									23-4/8		179

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
MUX 01 L		B02U2		1-01							2				180
MUX 01 L		B05U2		1-02							1				180
MUX 01 L		B08U2		1-03							2				180
MUX 01 L		B11U2		1-04							1				180
MUX 01 L		B14U2		1-05							2				180
MUX 01 L		B17U2		1-06							1				180
MUX 01 L		B19H2		1-07											180
MUX 01 L				1									22-6/8		180
MUX 02 L		B02P2		1-01							1				181
MUX 02 L		B05P2		1-02							2				181
MUX 02 L		B08P2		1-03							1				181
MUX 02 L		B11P2		1-04							2				181
MUX 02 L		B14P2		1-05							1				181
MUX 02 L		B17P2		1-06							2				181
MUX 02 L		B19F2		1-07											181
MUX 02 L				1									22-4/8		181
MUX 03 L		B02S1		1-01							2				182
MUX 03 L		B05S1		1-02							1				182
MUX 03 L		B08S1		1-03							2				182
MUX 03 L		B11S1		1-04							1				182
MUX 03 L		B14S1		1-05							2				182
MUX 03 L		B17S1		1-06							1				182
MUX 03 L		B19E2		1-07											182
MUX 03 L				1									23-0/8		182
MUX 04 L		B02T2		1-01							2				183
MUX 04 L		B05T2		1-02							1				183
MUX 04 L		B08T2		1-03							2				183
MUX 04 L		B11T2		1-04							1				183
MUX 04 L		B14T2		1-05							2				183
MUX 04 L		B17T2		1-06							1				183
MUX 04 L		B19D2		1-07											183
MUX 04 L				1									23-0/8		183
MUX 05 L		B02V1		1-01							2				184
MUX 05 L		B05V1		1-02							1				184
MUX 05 L		B08V1		1-03							2				184
MUX 05 L		B11V1		1-04							1				184
MUX 05 L		B14V1		1-05							2				184
MUX 05 L		B17V1		1-06							1				184
MUX 05 L		B19C2		1-07											184
MUX 05 L				1									23-4/8		184

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
SIG CH 20		B16T2		1-01							1				185
SIG CH 20		B16P1		1-02							2				185
SIG CH 20		B17K1		1-03											185
SIG CH 20				1									6-0/8		185
SIG CH 21		B16K2		1-01							1				186
SIG CH 21		B17M2		1-02											186
SIG CH 21				1									3-0/8		186
SIG CH 22		A16P1		1-01							1				187
SIG CH 22		A16T2		1-02							2				187
SIG CH 22		B17L1		1-03											187
SIG CH 22				1									7-4/8		187
SIG CH 23		A16K2		1-01							1				188
SIG CH 23		B17L2		1-02											188
SIG CH 23				1									5-4/8		188
SIG CH 24		B17J2		1-01							2				189
SIG CH 24		B18P1		1-02							1				189
SIG CH 24		B18T2		1-03											189
SIG CH 24				1									6-0/8		189
SIG CH 25		B17F1		1-01							1				190
SIG CH 25		B18K2		1-02											190
SIG CH 25				1									3-2/8		190
SIG CH 26		A18P1		1-01							1				191
SIG CH 26		A18T2		1-02							2				191
SIG CH 26		B17H1		1-03											191
SIG CH 26				1									7-2/8		191
SIG CH 27		A18K2		1-01							1				192
SIG CH 27		B17H2		1-02											192
SIG CH 27				1									5-0/8		192
SIG CH 30		B13T2		1-01							1				193
SIG CH 30		B13P1		1-02							2				193
SIG CH 30		B14K1		1-03											193
SIG CH 30				1									6-0/8		193
SIG CH 31		B13K2		1-01							1				194
SIG CH 31		B14M2		1-02											194
SIG CH 31				1									3-0/8		194

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
SIG CH 32		A13P1		1-01							1				195
SIG CH 32		A13T2		1-02							2				195
SIG CH 32		B14L1		1-03											195
SIG CH 32				1									7-4/8		195
SIG CH 33		A13K2		1-01							1				196
SIG CH 33		B14L2		1-02											196
SIG CH 33				1									5-4/8		196
SIG CH 34		B14J2		1-01							2				197
SIG CH 34		B15P1		1-02							1				197
SIG CH 34		B15T2		1-03											197
SIG CH 34				1									6-0/8		197
SIG CH 35		B14F1		1-01							1				198
SIG CH 35		B15K2		1-02											198
SIG CH 35				1									3-2/8		198
SIG CH 36		A15P1		1-01							1				199
SIG CH 36		A15T2		1-02							2				199
SIG CH 36		B14H1		1-03											199
SIG CH 36				1									7-2/8		199
SIG CH 37		A15K2		1-01							1				200
SIG CH 37		B14H2		1-02											200
SIG CH 37				1									5-0/8		200
SIG CH 40		B10T2		1-01							1				201
SIG CH 40		B10P1		1-02							2				201
SIG CH 40		B11K1		1-03											201
SIG CH 40				1									6-0/8		201
SIG CH 41		B10K2		1-01							1				202
SIG CH 41		B11M2		1-02											202
SIG CH 41				1									3-0/8		202
SIG CH 42		A10P1		1-01							1				203
SIG CH 42		A10T2		1-02							2				203
SIG CH 42		B11L1		1-03											203
SIG CH 42				1									7-4/8		203
SIG CH 43		A10K2		1-01							1				204
SIG CH 43		B11L2		1-02											204
SIG CH 43				1									5-4/8		204

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
SIG CH 44		B11J2		1-01							2				205
SIG CH 44		B12P1		1-02							1				205
SIG CH 44		B12T2		1-03											205
SIG CH 44				1									6-0/8		205
SIG CH 45		B11F1		1-01							1				206
SIG CH 45		B12K2		1-02											206
SIG CH 45				1									3-2/8		206
SIG CH 46		A12P1		1-01							1				207
SIG CH 46		A12T2		1-02							2				207
SIG CH 46		B11H1		1-03											207
SIG CH 46				1									7-2/8		207
SIG CH 47		A12K2		1-01							1				208
SIG CH 47		B11H2		1-02											208
SIG CH 47				1									5-0/8		208
SIG CH 50		B07T2		1-01							1				209
SIG CH 50		B07P1		1-02							2				209
SIG CH 50		B08K1		1-03											209
SIG CH 50				1									6-0/8		209
SIG CH 51		B07K2		1-01							1				210
SIG CH 51		B08M2		1-02											210
SIG CH 51				1									3-0/8		210
SIG CH 52		A07P1		1-01							1				211
SIG CH 52		A07T2		1-02							2				211
SIG CH 52		B08L1		1-03											211
SIG CH 52				1									7-4/8		211
SIG CH 53		A07K2		1-01							1				212
SIG CH 53		B08L2		1-02											212
SIG CH 53				1									5-4/8		212
SIG CH 54		B08J2		1-01							2				213
SIG CH 54		B09P1		1-02							1				213
SIG CH 54		B09T2		1-03											213
SIG CH 54				1									6-0/8		213
SIG CH 55		B08F1		1-01							1				214
SIG CH 55		B09K2		1-02											214
SIG CH 55				1									3-2/8		214

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
SIG CH 56		A09P1		1-01							1				215
SIG CH 56		A09T2		1-02							2				215
SIG CH 56		B08H1		1-03											215
SIG CH 56				1									7-2/8		215
SIG CH 57		A09K2		1-01							1				216
SIG CH 57		B08H2		1-02											216
SIG CH 57				1									5-0/8		216
SIG CH 60		B04T2		1-01							1				217
SIG CH 60		B04P1		1-02							2				217
SIG CH 60		B05K1		1-03											217
SIG CH 60				1									6-0/8		217
SIG CH 61		B04K2		1-01							1				218
SIG CH 61		B05M2		1-02											218
SIG CH 61				1									3-0/8		218
SIG CH 62		A04P1		1-01							1				219
SIG CH 62		A04T2		1-02							2				219
SIG CH 62		B05L1		1-03											219
SIG CH 62				1									7-4/8		219
SIG CH 63		A04K2		1-01							1				220
SIG CH 63		B05L2		1-02											220
SIG CH 63				1									5-4/8		220
SIG CH 64		B05J2		1-01							2				221
SIG CH 64		B06P1		1-02							1				221
SIG CH 64		B06T2		1-03											221
SIG CH 64				1									6-0/8		221
SIG CH 65		B05F1		1-01							1				222
SIG CH 65		B06K2		1-02											222
SIG CH 65				1									3-2/8		222
SIG CH 66		A06P1		1-01							1				223
SIG CH 66		A06T2		1-02							2				223
SIG CH 66		B05H1		1-03											223
SIG CH 66				1									7-2/8		223
SIG CH 67		A06K2		1-01							1				224
SIG CH 67		B05H2		1-02											224
SIG CH 67				1									5-0/8		224

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
SIG CH 70		B01T2		1-01							1				225
SIG CH 70		B01P1		1-02							2				225
SIG CH 70		B02K1		1-03											225
SIG CH 70				1									6-0/8		225
SIG CH 71		B01K2		1-01							1				226
SIG CH 71		B02M2		1-02											226
SIG CH 71				1									3-0/8		226
SIG CH 72		A01P1		1-01							1				227
SIG CH 72		A01T2		1-02							2				227
SIG CH 72		B02L1		1-03											227
SIG CH 72				1									7-4/8		227
SIG CH 73		A01K2		1-01							1				228
SIG CH 73		B02L2		1-02											228
SIG CH 73				1									5-4/8		228
SIG CH 74		B02J2		1-01							2				229
SIG CH 74		B03P1		1-02							1				229
SIG CH 74		B03T2		1-03											229
SIG CH 74				1									6-0/8		229
SIG CH 75		B02F1		1-01							1				230
SIG CH 75		B03K2		1-02											230
SIG CH 75				1									3-2/8		230
SIG CH 76		A03P1		1-01							1				231
SIG CH 76		A03T2		1-02							2				231
SIG CH 76		B02H1		1-03											231
SIG CH 76				1									7-2/8		231
SIG CH 77		A03K2		1-01							1				232
SIG CH 77		B02H2		1-02											232
SIG CH 77				1									5-0/8		232

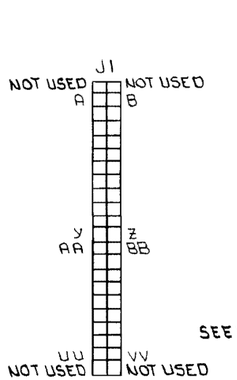
WIRE TABLE

ITEM NO	DESCRIPTION AWG	COLOR	FROM CONNECTION	WITH ITEM	TO CONNECTION	WITH ITEM	REMARKS
2			J1-B		J2-C		SEE NOTE #2
			J1-C		J2-F		
			J1-D		J2-E		
			J1-E		J2-J		
			J1-F		J2-H		
			J1-H		J2-L		
			J1-J		J2-K		
			J1-K		J2-N		
			J1-L		J2-M		
			J1-M		J2-R		
			J1-N		J2-P		
			J1-P		J2-T		
			J1-R		J2-S		
			J1-S		J2-V		
			J1-T		J2-U		
			J1-U		J2-X		
			J1-V	4	J2-W	4	

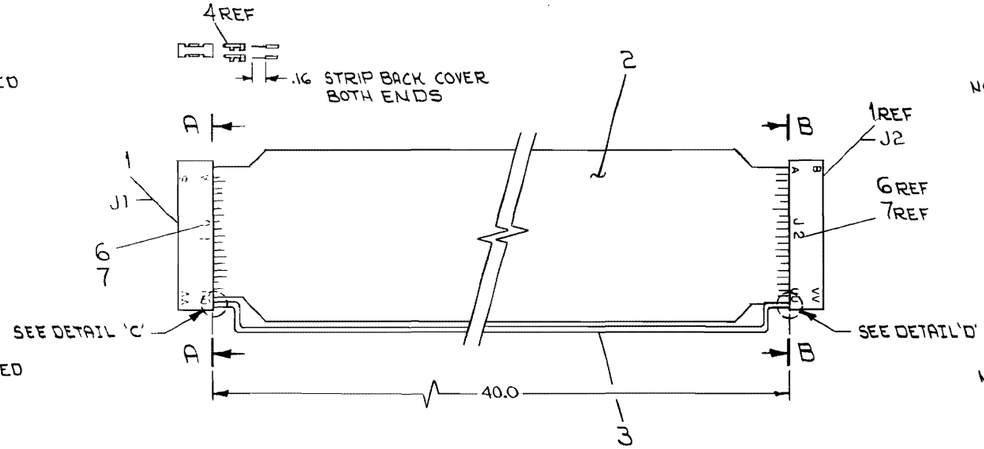
WIRE TABLE

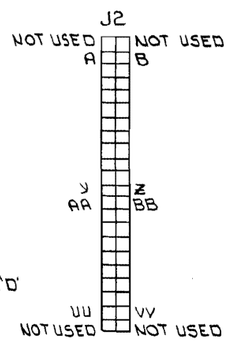
ITEM NO.	DESCRIPTION AWG	COLOR	FROM CONNECTION	WITH ITEM	TO CONNECTION	WITH ITEM	REMARKS
2			J1-W	4	J2-Z	4	SEE NOTE #2
			J1-X		J2-Y		
			J1-Y		J2-BB		
			J1-Z		J2-AA		
			J1-AA		J2-DD		
			J1-BB		J2-CC		
			J1-CC		J2-FF		
			J1-DD		J2-EE		
			J1-EE		J2-JJ		
			J1-FF		J2-HH		
			J1-HH		J2-LL		
			J1-JJ		J2-KK		
			J1-KK		J2-NN		
			J1-LL		J2-MM		
			J1-NN		J2-PP		
			J1-RR		J2-SS		
3	22	RED	J1-TT	4	J2-TT	4	SEE DETAILS 'C' & 'D', AND NOTE #1
	22	BLK/SHLD	—	—	J2-RR	4	

NOTES
1. SOLDER BLK WIRE OF CABLE (ITEM # 3) TO SHIELD WIRE APPROXIMATELY .4 IN FROM END. INSULATE SHIELD WIRE WITH TUBING (ITEM #5) AND CRIMP PIN (ITEM #4) TO SHIELD WIRE, CLIP OFF EXCESS.
2. CABLE (ITEM #2) WILL HAVE SIX (6) UNUSED WIRES. CLIP OFF EXCESS LENGTH ON UNUSED WIRES BOTH ENDS.
3. MANUFACTURING SHOULD USE MACHINE CRIMPER TOOL FOR CRIMPING PINS (ITEM #4) MUST BE HTG6/HTG8 FROM BERG OR EQUIVALENT.

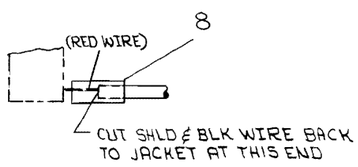


VIEW A-A
REAR VIEW
SCALE: NONE

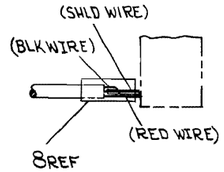




VIEW B-B
REAR VIEW
SCALE: NONE



DETAIL-'C'



DETAIL-'D'
SEE NOTE #1

QTY.	DESCRIPTION	PART NO.	ITEM NO.
A/R	TUBING, SHRINK RED 3/16	9107254-02	8
A/R	DECAL, BLK ON CLR '1', '2'	5308754-0-0	7
A/R	DECAL, BLK ON CLR 'J'	5308753-0-0	6
A/R	TUBING #18 NATURAL	9107278-11	5
71	SOCKET, CRIMP	12100089-04	4
A/R	CABLE, 2 COND SHLD/TWP	9107703	3
A/R	CABLE, 40 COND FLAT W/SHLD	1700004	2
2	HOUSING, 40 PIN	1210918-15	1

PARTS LIST

FIRST USED ON OPTION/MODEL: LPSII-E

DIMENSIONAL TOLERANCE
DIMENSIONS ARE MILLIMETERS / INCHES
UNLESS OTHERWISE SPECIFIED

MILLIMETERS	INCHES	ANGLES
X.XX = ±0.10	.XXX = ±.005	±0° 30'
.XX = ±0.5	.XX = ±.02	
X = ±2,	.X = ±.1	

THIRD ANGLE PROJECTION
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL: SEE PARTS LIST
FINISH: #

		DATE
DRN.	D.J. LeBlanc	1/74
CHK'D.		TE
ENG.		TE
PROJ. ENG.		TE
PROD.		ATE

NEXT HIGHER ASSY.: B-DD-LPSII-E
SCALE: NONE
SHEET | OF | DIST.

digital

TITLE: LOGIC CABLE

SIZE	CODE	NUMBER	REV.
D	IA	7009790-0-0	

REVISIONS: REV. | CHANGE NO. | CHK.

DEC FORM NO. DRD 107 C

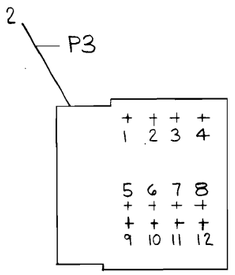
WIRE TABLE

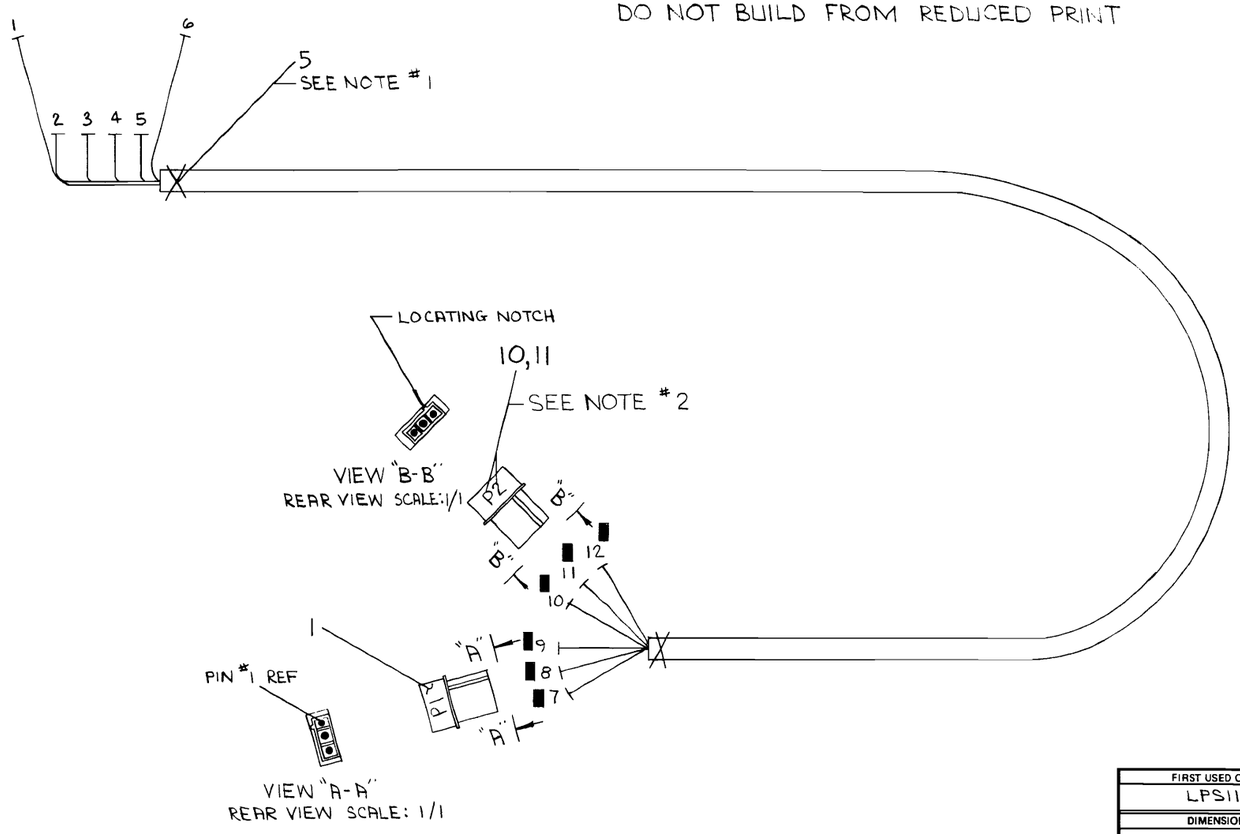
ITEM NO.	DESCRIPTION AWG	COLOR	FROM POINT	FROM CONNECTION	FROM TERM	TO POINT	TO CONNECTION	TO TERM	REMARKS
6	#18 TWP	RED	9	P1-1	4	4	P3-11	SOLD.	
		BLK	12	P2-1	4	2	P3-9	SOLD.	
7	#18	BLU	7	P1-3	4	1	P3-1	SOLD.	
8	TRIPLE	ORN	8	P1-2	4	3	P3-10	SOLD.	SEE NOTE #3
9	TWIST	WHT	10	P2-3	4	6	P3-4	SOLD.	
9	#18	WHT	11	P2-2	4	5	P3-12	SOLD.	

NOTES:
1. USE TIE WRAPS (X) ITEM #5 APPROXIMATELY EVERY THREE (3) INCHES WHEN NECESSARY, AND AT EVERY BREAKOUT POINT.
2. COMPONENTS TO BE LABELED WITH COMPONENT IDENTIFIERS, USING ITEMS 10 & 11
3. MAKE TRIPLE TWIST USING ITEMS 7, 8 & 9

SCALE
0 IN. 6 IN. 12 IN.

DO NOT REDUCE
DO NOT BUILD FROM REDUCED PRINT





	A/R	DECAL, BLK ON CLR "2"	5308754-00	11
	A/R	DECAL, BLK ON CLR "P"	5308753-00	10
	A/R	WIRE, #18 AWG STRD (WHT)	9107360-99	9
	A/R	WIRE, #18 AWG STRD (ORN)	9107360-33	8
	A/R	WIRE, #18 AWG STRD (BLU)	9107360-66	7
	A/R	WIRE, #18 AWG TWP RED/BLK	9107360-20	6
X	A/R	TIE WRAP	9007032	5
	6	PIN, MALE	1209378-01	4
	A/R	3/8" EXTRUDED TUBING (BLK)	9107245	3
	1	MODULE, CONN.	G772	2
	2	CONN., HOUSING	1209351-03	1

FIRST USED ON OPTION/MODEL	SYM.	QTY.	DESCRIPTION	PART NO.	ITEM NO.
LPS11-E			PARTS LIST		

DIMENSIONAL TOLERANCE
DIMENSIONS ARE MILLIMETERS / INCHES
UNLESS OTHERWISE SPECIFIED

MILLIMETERS	INCHES	ANGLES
X.XX = ±0,10	.XXX = ±.005	±0° 30'
X.X = ±0,5	.XX = ±.02	
X = ±2,	.X = ±.1	

THIRD ANGLE PROJECTION
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL SEE PARTS LIST
FINISH + +

DRN.	DATE	2-27-74
CHK'D.	DATE	3-6-74
ENG.	DATE	3-12-74
PROJ. ENG.	DATE	3-12-74
PROD.	DATE	3-12-74
NEXT HIGHER ASSY.	D-UA-LPS11-E-0	
SCALE	1/1	
SHEET	OF 1	

digital

TITLE: POWER HARNESS #1

SIZE	CODE	NUMBER	REV.
D	A	7009788-0-0	

DIST.

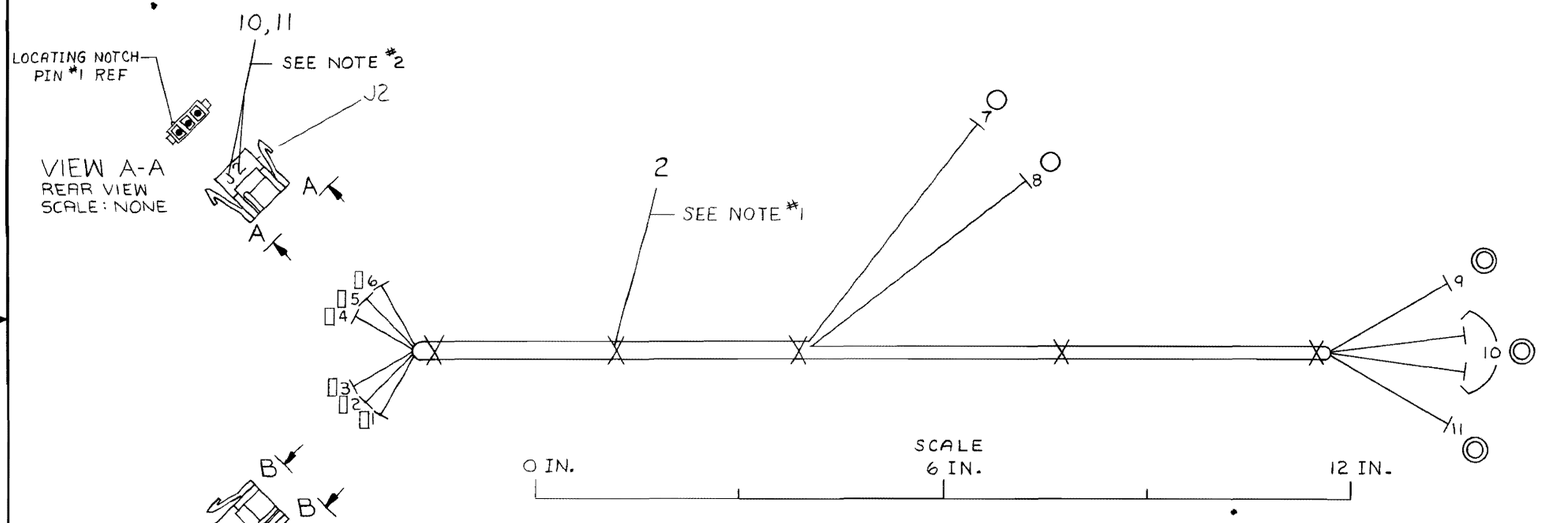
REVISIONS	CHANGE NO.	CHK
REV.		

DEC FORM NO. ORD 100-8

WIRE TABLE

ITEM NO.	DESCRIPTION AWG	CO	FROM			TO		REMARKS
						SECTION	TERM	
6	#18 RED						ITEM #4	
	TWP	BLK	4	J2-1		8	ITEM #4	
7	#18	ORN	2	J1-2		9	ITEM 5&12	
8	TWISTED	BLU	3	J1-3		11	ITEM 5&12	SEE NOTE #3
9	TRIPLE	WHT	6	J2-3		10	ITEM 5&12	
9	#18	WHT	5	J2-2	ITEM #3			

NOTES:
1. USE TIE WRAP (X) ITEM #2 APPROX EVERY THREE (3) INCHES WHEN NECESSARY, AND AT EVERY BREAKOUT POINT.
2. COMPONENTS TO BE LABLED WITH COMPONENT IDENTIFIERS, USING ITEMS 10, 11.
3. MAKE A TRIPLE TWIST USING ITEMS #7, 8 & 9.



DO NOT REDUCE
DO NOT BUILD FROM REDUCED PRINT

	SYM	QTY.	DESCRIPTION	PART NO.	ITEM NO.
		3	TUBING SHRINKABLE (RED)	9107305-22	12
		2	DECAL, BLK ON CLR "1" & "2"	5308754-00	11
		2	DECAL, BLK ON CLR "J"	5308753-00	10
		A/R	WIRE #18 AWG STRD (WHT)	9107360-99	9
		A/R	WIRE #18 AWG STRD (BLU)	9107360-66	8
		A/R	WIRE #18 AWG STRD (ORN)	9107360-33	7
		A/R	WIRE #18 AWG TWP RED/BLK	9107360-20	6
◎		3	TERM. SOLDERLESS	9007925	5
○		2	TERM. SOLDERLESS	9007917	4
□		6	SOCKET, FAMALE	1209379-00	3
X		A/R	TIE WRAP	9007032	2
		2	CONN. HOUSING	1209350-03	1

PARTS LIST

FIRST USED ON OPTION/MODEL	LPS11-E
DIMENSIONAL TOLERANCE	DIMENSIONS ARE MILLIMETERS / INCHES UNLESS OTHERWISE SPECIFIED
MILLIMETERS	X,XX = ±0,10; X,X = ±0,5; X = ±2,
INCHES	.XXX = ±.005; .XX = ±.02; .X = ±.1
ANGLES	±0° 30'
THIRD ANGLE PROJECTION	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓	
MATERIAL	SEE PARTS LIST
FINISH	--
DRN.	R Courter 3/1/74
CHK'D	3-6-74
ENG.	3-12-74
PROJ. ENG.	3-12-74
PROD.	3-12-74
NEXT HIGHER ASSY.	D-UA-LPS11-E-0
SCALE	1/1
SHEET	1 OF 1

digital

TITLE: POWER HARNESS #2

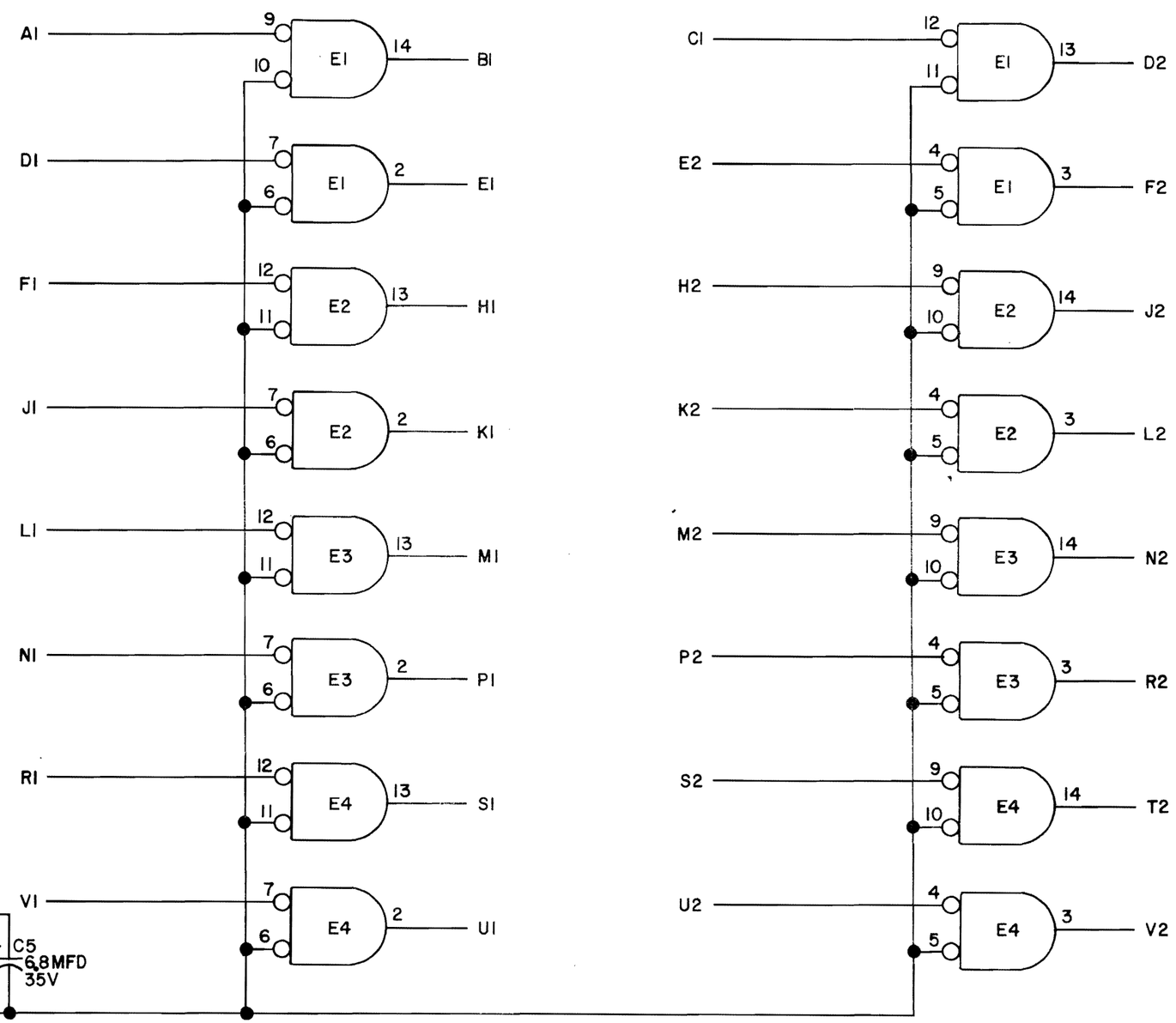
SIZE	CODE	NUMBER	REV.
D	IA	7009789-0-0	

DIST.

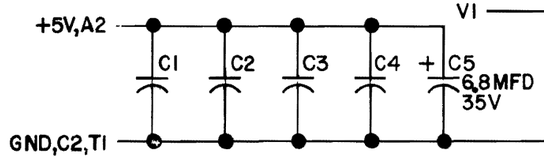
REVISIONS	REV.
CHANGE NO.	
CHK	

DEC FORM NO. DRD 100-B

SIZE	CODE	NUMBER	REV.
B	CS	M784-0-1	B



UNLESS OTHERWISE INDICATED:
CAPACITORS ARE .01MFD,100V, 20%
IC'S ARE DEC380
PIN 1 ON EACH IC=GND
PIN 8 ON EACH IC=+5V



REVISIONS			
REV.	A	B	
CHG NO	00001	00002	
CHK			

DRN.	DATE	11-18-69
CHK'D.	DATE	1-7-70
ENG.	DATE	3/11/70
PROD.	DATE	

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE UNIBUS RECEIVERS
M784

SIZE	CODE	NUMBER	REV.
B	CS	M784-0-1	B

PRINTED CIRCUIT REV. A B C

DEC FORM NO.
DRB 102

MC641-P4

5

DIST. 324.434.42