DL11
asynchronous
line interface
engineering drawings

digital equipment corporation · maynard. massachusetts

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

DRAWING DIRECTORY

CUSTOMER PRINT SET INDEX

THIS IS PRINT SET

PRINT SET #1

SEQUENCE		
DRAWING DIRECTORY		B-DD-DL11-Ø
ASYNCHRONOUS LINE INTERFACE		C-UA-DL11-Ø-Ø
ASYNCHRONOUS LINE INTERFACE	(PL)	A-PL-DL11-Ø-Ø
ASYNCHRONOUS LINE INTERFACE		E-CS-M78ØØ-YA-1
CABLE ASSEMBLY (KL8/E)		D-IA-7008360-Ø-Ø
SOFTWARE LIST		A-SL-DL11-Ø-4
ACCESSORY LIST		A-AL-DL11-Ø-5
INSTALLATION PROCEDURE		A-SP-DL11-Ø-2

PRINT SET #2

SEQUENCE		
DRAWING DIRECTORY		B-DD-DL11-Ø
ASYNCHRONOUS LINE INTERFACE		C-UA-DL11-Ø-Ø
ASYNCHRONOUS LINE INTERFACE	(PL)	A-PL-DL11-Ø-Ø
ASYNCHRONOUS LINE INTERFACE		E-CS-M78ØØ-Ø-1
CABLE, MODEM BCØ5C		D-UA-BCØ5C-Ø-Ø
FILTER NETWORK		B-CS-G8ØØØ-Ø-1
MODEM TEST CONN		D-CS-H315-Ø-1
SOFTWARE LIST		A-SL-DL11-Ø-4
ACCESSORY LIST		A-AL-DL11-Ø-5
INSTALLATION PROCEDURE		A-SP-DL11-Ø-2

PRINT SET #3

SEQUENCE		
DRAWING DIRECTORY		B-DD-DL11-Ø
ASYNCHRONOUS LINE INTERFACE		C-UA-DL11-Ø-Ø
ASYNCHRONOUS LINE INTERFACE	(PL)	A-PL-DL11-Ø-Ø
ASYNCHRONOUS LINE INTERFACE		E-CS-M78ØØ-Ø-1
CABLE, MODEM BCØ5C		D-UA-BCØ5C-Ø-Ø
CABLE ASSEMBLY (KL81E)		D-IA-7008360-Ø-Ø
MODEM TEST CONN.		D-CS-H315-Ø-1
INSTALLATION PROCEDURE		A-SP-DL11-Ø-2

UNIT VARIATIONS

VAR	TITLE	PRINT SET DL11-1	PRINT SET DL11-2		
DL11-A	ASYNC LINE INTERFACE, CURRENT LOOP	1	0		
DL11-B	ASYNC LINE INTERFACE, EIA	0	1		
DL11-C	ASYNC LINE INTERFACE, CURRENT LOOP	1	0		
DL11-D	ASYNC LINE INTERFACE, EIA	0	1		
DL11 E	ASYNC LINE INTERFACE, DATA SET	0	1		

REVISIONS			
DATE	CHG. NO.	REV	
2-76	REDRAWN DL11-00009	K	
3/7[illegible]	DL11-10	L	

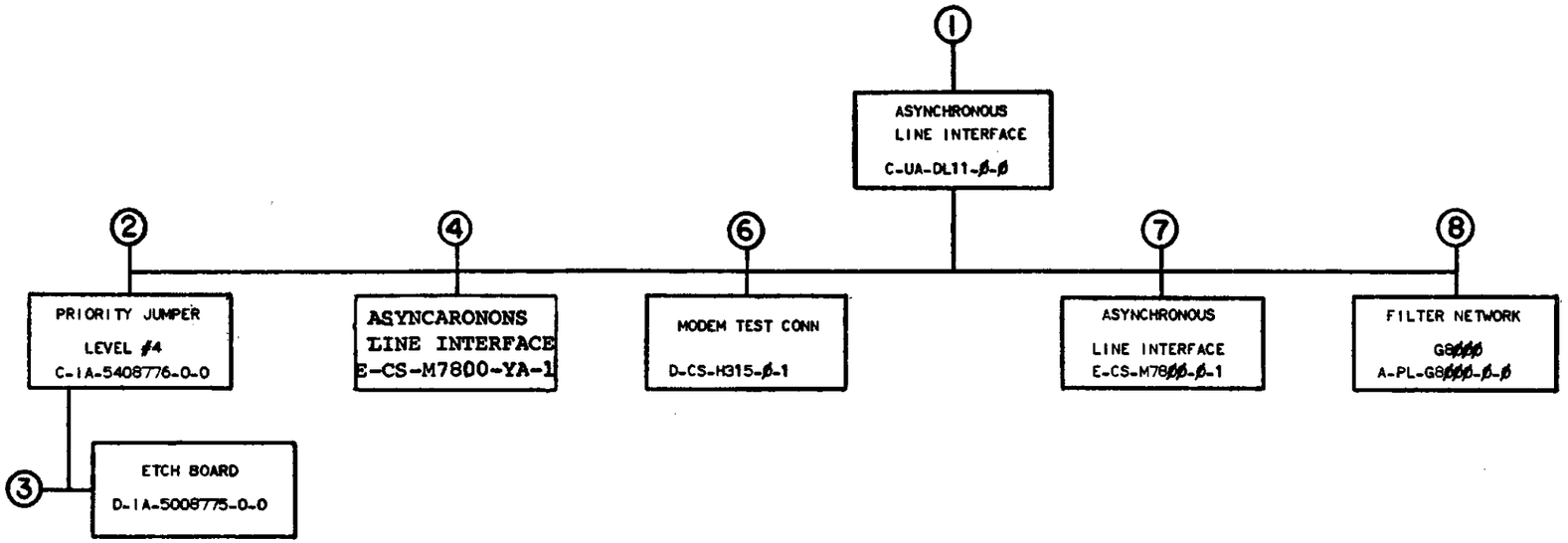
EN-01062-1A-16-R972-(325)

DRB 106

USED ON OPTION/MODEL

SHEET 1 OF 3

DRN. M. Pierce	DATE 4-28-72	TITLE: ASYNCHRONOUS LINE INTERFACE
CHK'D. R. Cook	DATE 5-9-72	
PROJ ENG. P.E.Janson	DATE 5-11-72	
PROD. J.McIntyre	DATE 5-15-72	SIZE B / CODE DD / NUMBER DL11-Ø / REV L
FIELD SERV. R. Evans	DATE 5-15-72	DIST



TITLE	SHEET	SIZE	CODE	NUMBER	REV
ASYNCHRONOUS LINE INTERFACE	2 OF 3	B	DD	DLII - Ø	L

ELECTRICAL

CUSTOMER PRINT SET DL11-1	DL11-2	DL11-3	DEPOT SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO.
X	X	X		1.	C-UA-DL11-Ø-Ø	F	1	ASYNCHRONOUS LINE INTERFACE	
X	X	X			A-PL-DL11-Ø-Ø	H	1	ASYNCHRONOUS LINE INTERFACE (PL)	
	X	X			D-UA-BCØ5C-Ø-Ø	#	1	CABEE, MODEM, BCØ5C	
X		X			D-1A-7008360-0-0	#	1	CABLE, ASSEMBLY (KL8/E)	
					A-SP-DL11-Ø-1	*	11	ENGINEERING SPECIFICATION	
X	X	X			A-SP-DL11-Ø-2	H	11	INSTALLATION PROCEDURE	
					A-SP-DL11-Ø-3	B	8	TEST PRODEDURE (TEST & ACCEPTANCE)	
X	X				A-SL-DL11-Ø-4	*	1	SOFTWARE LIST	
X	X				A-AL-DL11-Ø-5	D	1	ACCESSORY LIST	
				2.	C-1A-5408776-0-0		1	PRIORITY JUMPER LEVEL #4	
					B-CS-5408776-0-1		1	CIRCUIT SCHEMATIC	
					K-CO-5408776-0-4		1	X-Y COORDINATE HOLE LOC	
					B-MH-5408776-0-6		1	MODULE ECO HISTORY	
				3.	C-AH-5408776-0-5		1	ASSY/DRILLING HOLE LAYOUT	
X				4	E-CS-M7800-YA-1	#	6	ASYNCHRONOUS LINE INTERFACE	
					K-CO-M7800-YA-4		1	X-Y COORDINATE HOLE LOCATION	
					D-AH-M7800-YA-5		1	ASSY DRILLING HOLE LAYOUT	
					B-MH-M7800-YA-6		1	MODULE ECO HISTORY	
	X	X		6.	D-CS-H315-Ø-1	#	1	MODEM TEST CONN	
					K-CO-H315-Ø-4		1	X-Y COORDINATE HOLE LOC	
					D-AH-H315-Ø-5		1	ASSY DRILLING HOLE LAYOUT	
					B-MH-H315-Ø-6		1	MODULE ECO HISTORY	
X	X	X		7.	E-CS-M7800-Ø-1	#	7	ASYNCHRONOUS LINE INTERFACE	
					K-CO-M7800-Ø-4		1	X-Y COORDINATE HOLE LOC	
					D-AH-M7800-Ø-5		1	ASSY/DRILLING HOLE LAYOUT	
					B-MH-M7800-Ø-6		1	MODULE ECO HISTORY	
	X			8.	A-PL-G8000-Ø-Ø		1	FILTER NETWORK	
					B-CS-G8000-Ø-1	#	1	CIRCUIT SCHEMATIC	
					K-CO-G8000-Ø-4		1	X-Y COORINATE HOLE LOC	
					C-AH-G8000-Ø-5		1	ASSY/DRILLING HOLE LAYOUT	
					B-MH-G8000-Ø-6		1	MODULE ECO HISTORY	

MECHANICAL

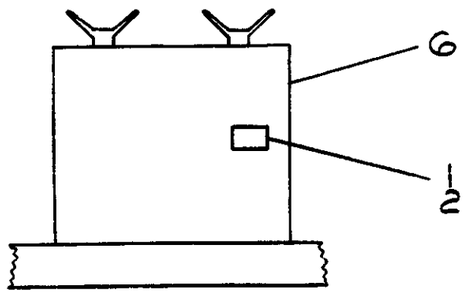
CUSTOMER PRINT SET DL11-1	DL11-2	DL11-3	DEPOT SET	FIND NO.	DRAWING NO.	REV	NO OF SHT	DESCRIPTION	OPTION NO.
				1.	C-UA-DL11-Ø-Ø	F	1	ASYNCHRONOUS LINE INTERFACE	
					A-PL-DL11-Ø-Ø	F	1	ASYNCHRONOUS LINE INTERFACE (PL)	
					D-UA-BCØ5C-Ø-Ø		1	CABLE, MODEM BCØ5C	
					D-1A-7008360-0-0		1	CABLE ASSEMBLY (KL8/E)	
				2.	C-1A-5408776-0-0		1	PRIORITY JUMPER LEVEL #4	
					K-CO-5408776-0-4		1	X-Y COORDINATE HOLE LOC	
					B-MH-5408776-0-6		1	ASSY/DRILLING HOLE LAYOUT	
				3.	D-1A-5008775-0-0		1	ETCH BOARD	
					C-AH-5408776-0-5		1	ASSY/DRILLING HOLE LAYOUT	
				6.	D-CS-H315-Ø-1		1	MODEM TEST CONN	
					K-CO-H315-Ø-4		1	X-Y COORDINATE HOLE LOC	
					C-AH-H315-Ø-5		1	ASSY/DRILLING HOLE LAYOUT	
					B-MH-H315-Ø-6		1	MODULE ECO HISTORY	
				7.	E-CS-M7800-Ø-1		7	ASYNCHRONOUS LINE INTERFACE	
					K-CO-M7800-Ø-4		1	X-Y COORDINATE HOLE LOC	
					D-AH-M7800-Ø-5		1	ASSY/DRILLING HOLE LAYOUT	
					B-MH-M7800-Ø-6		1	MODULE ECO HISTORY	
				8.	A-PL-G8000-Ø-Ø		1	FILTER NETWORK	
					K-CO-G8000-Ø-4		1	X-Y COORDINATE HOLE LOC	
					C-AH-G8000-Ø-5		1	ASSY/DRILLING HOLE LAYOUT	
					B-MH-G8000-Ø-6		1	MODULE ECO HISTORY	

TITLE	SHEET	SIZE	CODE	NUMBER	REV
ASYNCHRONOUS LINE INTERFACE	3 OF 3	B	DD	DL11-Ø	L

DRB 108

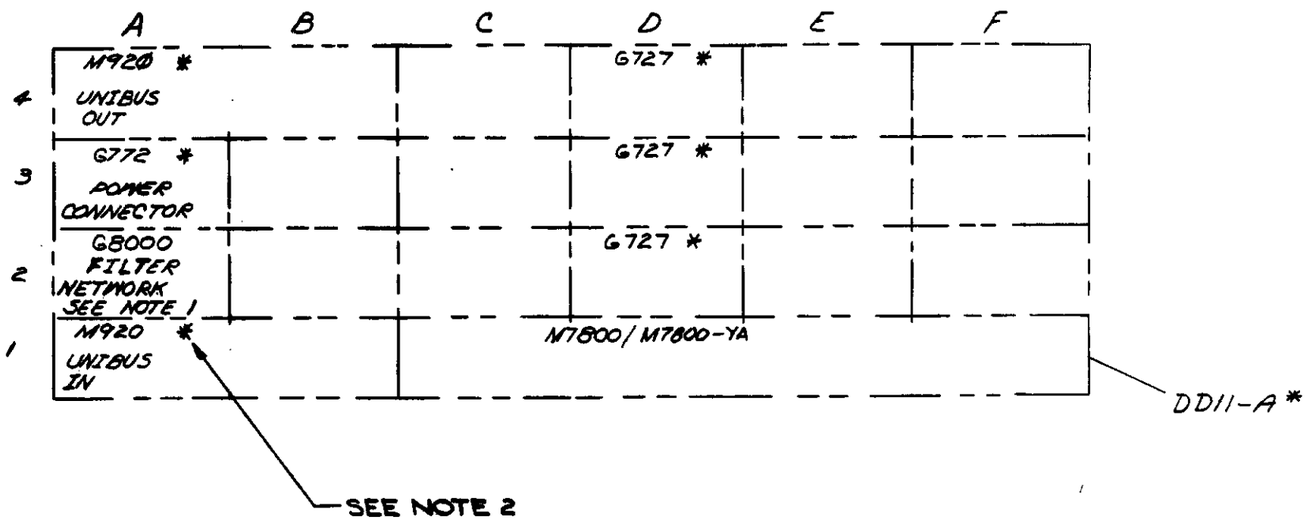
DEC 16-(325)-1062-2-N871

G



NOTES:

1. G 8000 IS REQUIRED ONLY IN PDP 11 SYSTEMS WHERE +15V IS NOT AVAILABLE. THE INSTALATION REQUIRES 2 WIRES TO BE ADDED.
   A03V2 - A02V2
   A02NE - CXXU1
   WHERE (XX) IS THE SLOT NUMBER CONTAINING THE DL11.
2. ITEMS INDICATED WITH ASTERISK (*) ARE SHOWN FOR REFERENCE ONLY AND ARE NOT PART OF THIS UNIT.



REVISIONS	REV.	CHK	
CHANGE NO.			
DLI1-00001	A	TM	
DLI1-00002	B	TM	
DLI1-00005	C	TM	
DLI1-00006	D	TM	
DLI1-00008	E	XD	
DLI1-00009	F	XD	
DLI1-00010	H	UA	

FIRST USED ON OPTION/MODEL	PDP-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. M. Price	DATE 5/8/72	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D. J. Emerson	DATE 9-24-72	
ENG. D E Jansen	DATE 5-11-72	TITLE: ASYNCHRONOUS LINE INTERFACE
PROJ ENG. D E Jansen	DATE 5-11-72	
PROD. J. McIntyre	DATE 5-15-72	
NEXT HIGHER ASSY. B-DD-DLI1-0		SIZE C, CODE UA, NUMBER DLI1-0-0, REV. H
SCALE NONE		
SHEET / OF /		DIST. G

REV. H, CODE UA, NUMBER DLI1-0-0

DEC FORM NO. 1001-A

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY M. PIERCE DATE 4/27/72	CHECKED J. FERGUSON DATE 4/27/72	SECTION 1
ENG P. E. JANSON DATE 5/11/72	PROD J. McIntyre DATE 5/15/72	ISSUED SECT. 1

ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION DL11-A	DL11-B	DL11-C	DL11-D	DL11-E
1	C-IA-5408776-0-0	PRIORITY JUMPER LEVEL #4	1	1	1	1	1
3	D-UA-BCØ5C-25	CABLE MODEM BCØ5C	-	1	-	1	1
4	D-IA-7008360-0-0	CABLE ASSEMBLY (KL8E)	1	-	1	-	-
~~5~~	~~D-CS-M315-Ø-1~~	~~MODEM TEST CONNECTOR~~	~~A/R See Note 2~~				
6	E-CS-M7800-Ø-1	ASYNCHRONOUS LINE INTERFACE	-	1	-	1	1
7	~~A-PL-G8ØØØ-Ø-Ø~~	~~FILTER NETWORK~~	~~- A/R - A/R A/R See Note 1~~				
8		CRYSTAL	A/R	A/R	A/R	A/R	A/R See Note 3
9	E-CS-M7800-YA-1	ASYNCHRONOUS LINE INTERFACE	1	-	1	-	-
10	9008269	TRANSPARENT VINYL TAPE	A/R				

NOTES:

1. G8000 IS REQUIRED ONLY IN PDP11 SYSTEMS WHERE +15V IS NOT AVAILABLE. ONE PER DD11-A
2. ~~ONE M315 PER PDP11 SYSTEM~~
3. CRYSTAL FREQUENCY DEFINED BY CUSTOMER SPECIFIED BAUD RATE OR BY THE DOCUMENTATION OF AN OPTION WHICH USES THE DL11.
4. APPLY TAPE TO TOP SURFACES OF CRYSTAL AND MOUNTING BRACKETS TO INSULATE FROM ADJACENT MODULES.
5. PRIORIY LEVELS 5,6, or 7 MAY BE SPECIFIED BY THE CUSTOMER OR THE DOCUMENTATION OF AN OPTION WHICH USES THE DL11.

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
ASYNCHRONOUS LINE INTERFACE	C-UA-DL11-Ø-Ø	A	PL	DL11-Ø-Ø	A	DL11-00010
	SHEET 1 OF 1	DIST.				

NOTES:

1.) PIN NOTATION THROUGHOUT IS ORDERED UPON MODULE PLACEMENT IN THE SYSTEM UNIT. MODULE REFERENCE ALONE IS OBTAINED BY CONVERTING THE FIRST LETTER ACCORDING TO THE PIN NOMENCLATURE CHART AT THE LEFT.

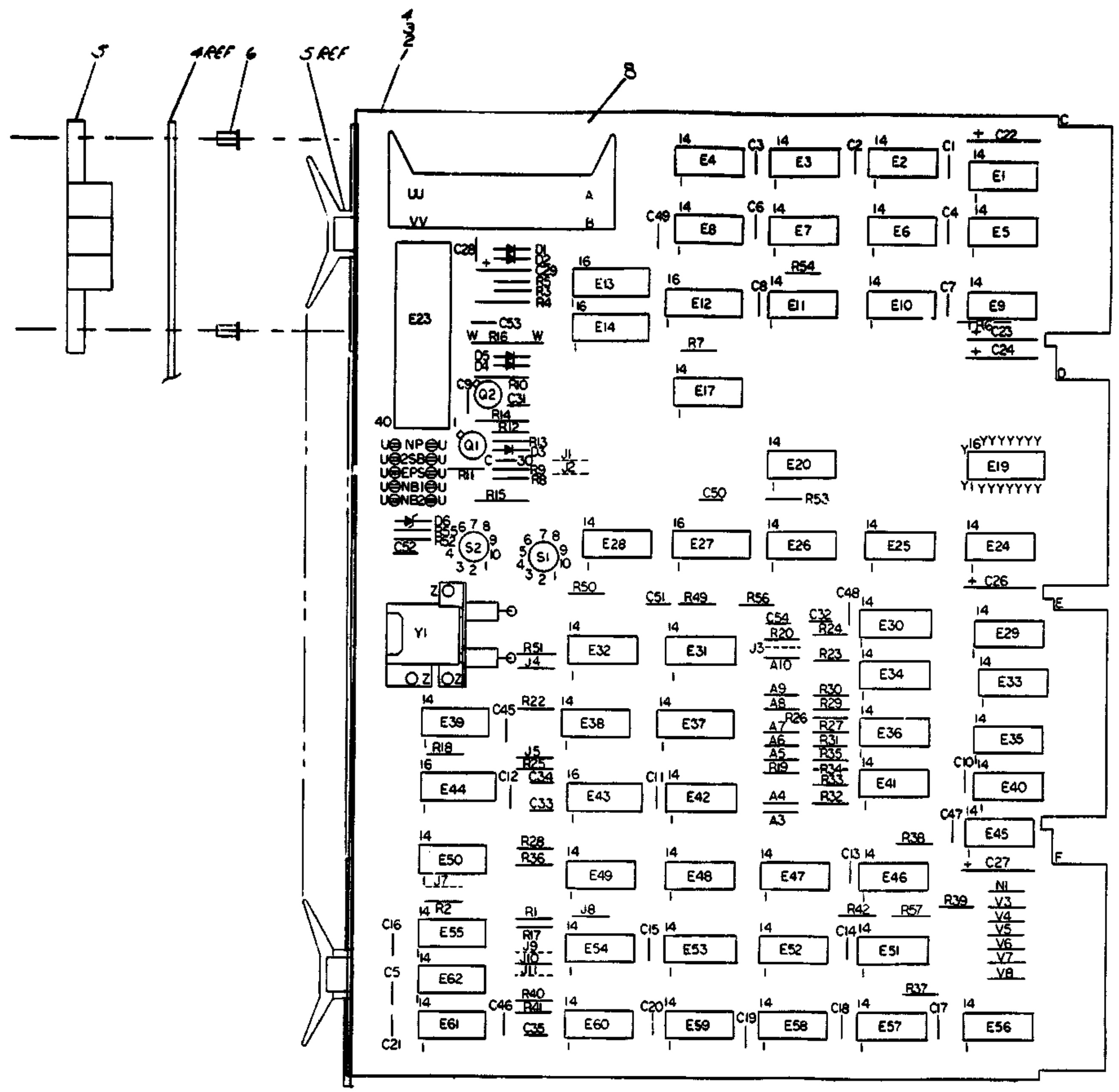
2.) JUMPERS TO BE USED AT CONNECTIONS A3-A10, J4-J5, J8, J10, V3-V8, AND N1.

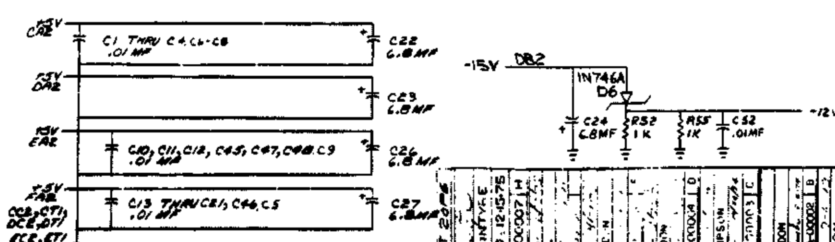
3.) LETTERS ENCLOSED IN PARENTHESIS REFER TO PINS ON THE BERG CONNECTOR. EXAMPLE: (X).

4.) DEC 8640's WERE PHASED IN AS 380 REPLACEMENTS ANY 380 FAILURES SHOULD BE REPLACED BY 8640's, EXCEPT E28. E28 MUST BE REPLACED WITH A 7380 CHIP.

PIN NOMENCLATURE

MODULE	SYSTEM UNIT
A	C
B	D
C	E
D	F





DEC 74161	8	16	—	—
DEC 7380	1	8	—	—
DEC UART	3	1	—	2
DEC 74175	8	16	—	—
DEC 8271	8	16	—	—
DEC 7442	8	16	—	—
DEC 314	1	8	—	—
DEC 7493	10	5	—	—
DEC 7492	10	5	—	—
DEC 74153	8	16	—	—
DEC 8640	1	8	—	—
DEC 7490	10	5	—	—
DEC 74123	8	16	—	—
IC TYPE	GND	+5V	+V	-12V

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

IC PIN LOCATIONS

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
3		WASHERS, INTERNAL TOOTH LOCK	9006631	70
1	E28	IC DEC 7380	1910390	69
19	J1 THRU J19	JUMPER, INSULATED	9009185	68
1	R3	RES 750Ω 1/4W 5%	1301401	67
1	R38	RES 390Ω 1/4W, 5	1300309	66
1	D6	DIODE 1N746A	1104860	65
2	Q1, Q2	TRANSISTOR G534D	1503409-00	64
1	C53	CAP 100PF 100V 5% DIPPED MICA	1000016	63
1	C54	CAP 560PF 100V 5% DIPPED MICA	1000025	62
2	C50, C51	CAP .047MF CERAMIC	1009678	61
1	E27	IC DEC 74161	1910650	60
2	C34, C35	CAP 330PF 100V 5% DIPPED MICA	1000023	59
1	C32	CAP 470PF 100V 5% DIPPED MICA	1000024	58
1	C31	CAP 1000PF 100V 5% DIPPED MICA	1000042	57
29	C1-C21, C28, C30, C45-C49, C52	CAP .01UF 100V 20% CERAMIC DISC	1001610	56
1	C29	CAP .47UF 35V 10% TANT	1005965	55
5	C22-C24, C26, C27	CAP 6.8UF 35V 20% TANT	1000067	54
1	C33	CAP 150PF 100V 5% DIPPED MICA	1000019	53
2	R14, R15	RES 1.5K 1/2W 5%	1300394	52
5	R23, R26, R40, R52, R55	RES 1K 1/4W 5%	1300365	51
1	R41	RES 47Ω 1/4W 5%	1300202	50
1	R10	RES 68Ω 1/2W 5%	1309405	49
1	R5	RES 82Ω 1/4W 5%	1301477	48
1	R24	RES 100Ω 1/4W 5%	1300229	47
1	R11	RES 150Ω 1/4W 5%	1300250	46
2	R42, R57	RES 180Ω 1/4W 5%	1301322	45
1	R53	RES 220Ω 1/4W 5%	1300271	44
5	D1-D5	DIODE D664 20, 100MA	1100114	43
3	R9, R13, R51	RES 470Ω 1/4W 5%	1300316	42
1	R4	RES 560Ω 1/2W 5%	1300398	41
3		NUT HEX #2-56	9006555	40
1	R16	RES 750Ω 1W 5%	1302385	39
26	R1, R2, R6, R7, R17-R21, R25, R27-R37, R39, R49, R50, R22, R54, R56	RES 10K 1/4W 5%	1900479	38
2	R8, R12	RES 1.5K 1/4W 5%	1300391	37
1	E23	IC UART	2119137-50	36
4	E32, E55, E61, E62	IC DEC 7474	1905547	35
2	E36, E41	IC DEC 8242	1909712	34
3	E3, E49, E59	IC DEC 7408	1910155	33
3		SCR PHIL HD PAN 2-56x.250	9006001-1	32
2	E20, E26	IC DEC 7490	1909037	31
11	E1, E2, E5, E7-E9, E11, E30, E47, E54, E56	IC DEC 8881	1909705	30
2		ALGAT 8002 PS-1	1202812	29
1	E43	IC DEC 74123	1910436	28
3	E48, E57, E52	IC DEC 74H74	1909667	27
3	E42, E59, E58	IC DEC 7400	1903575	26
1	E10	IC DEC 7413	1909989	25
2	E50, E53	IC DEC 7402	1909004	24
	E5, E9, E33, E35, E40, E45, E46	IC DEC 8640	1911469	23
1	E12	IC DEC 74153	1929937	22
1	E60	IC DEC 74H04	1909931	21
1	E25	IC DEC 7492	1909039	20
4	E6, E17, E38, E39	IC DEC 7404	1909686	19
1	E24	IC DEC 7493	1909034	18
1	E34	IC DEC 7410	1905576	17
1	E29	IC DEC 314	1909704	16
1	E37	IC DEC 7442	1910042	15
1	E44	IC DEC 8271	1909615	14
2	E13, E14	IC DEC 74175	1910631	13
1		BRACKET, CRYSTAL HOLDER	3302825	12
1		BRACKET, CRYSTAL HOLDER	5303154	11
1	E19	IC SOCKET	1209858	10
2	S1, S2	SWITCH, SINGLE POLE, 10 POS	1210042-1	9
1		40 PIN CONNECTOR BERG	1209941-02	8
10		SPLIT LUGS	9006755	7
8		EYELET #GS4-7 E.B.STIMPSON	9006732	6
4		HANDLE, FLIP-CHIP, MAGENTA	9008337-06	5
1		ETCHED CIRCUIT BOARD	5009978	4
REF		MODULE ECO HISTORY	5-AH-M7800-YA-6	3
REF		ASSY/DRILLING HOLE LAYOUT	D-AH-M7800-YA-5	2
REF		X-Y COORDINATE HOLE	K-CO-M7800-YA-4	1

PARTS LIST

ETCH BOARD REV H

SEMICONDUCTOR CONVERSION CHART

DEC NO.	EIA NO.
G534D	MPS6534
1N746A	1/4M3.3AZ
D664	1N3606

DIGITAL EQUIPMENT CORPORATION

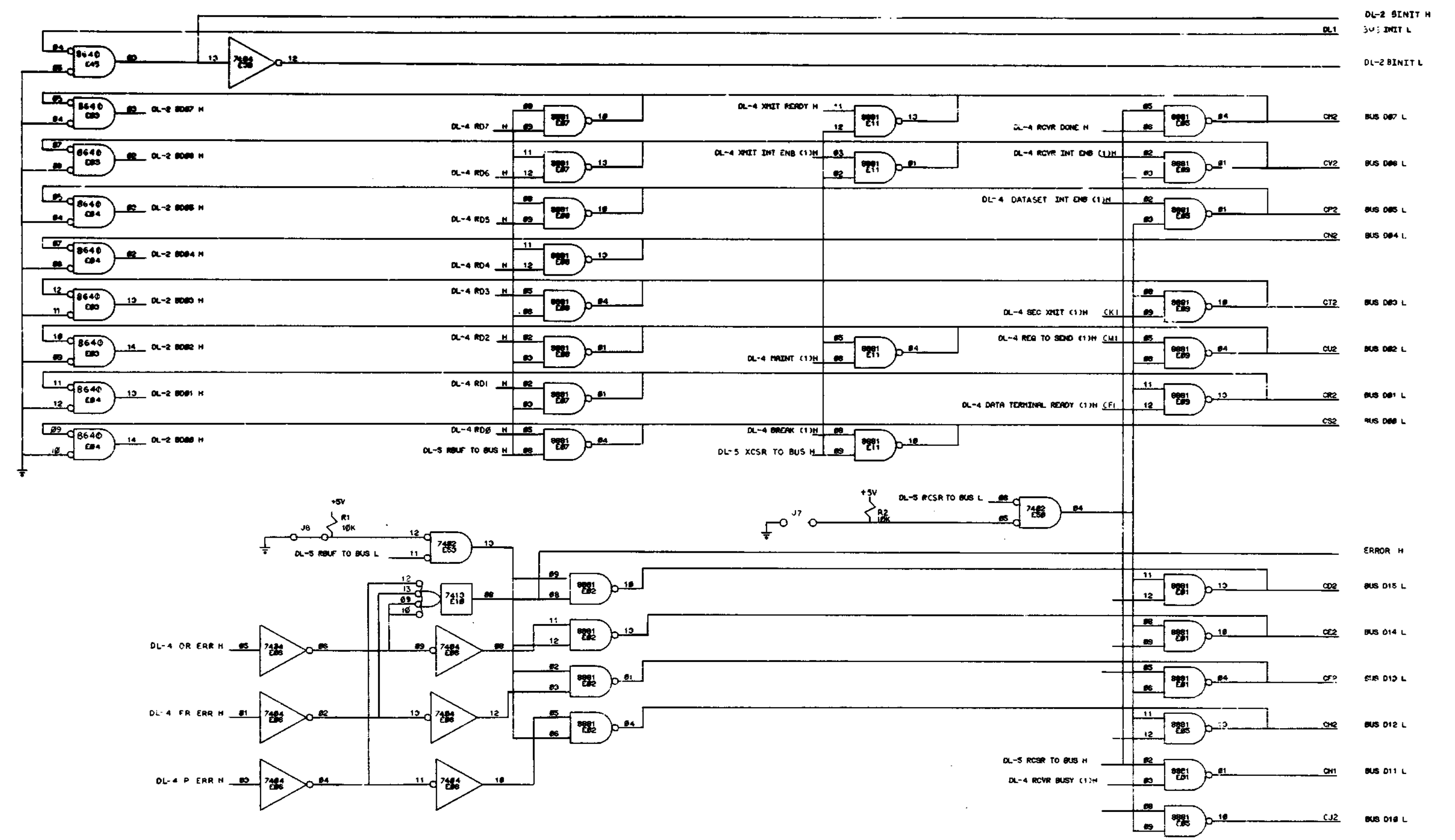
TITLE: ASYNCHRONOUS LINE INTERFACE

SIZE E CODE CS NUMBER M7800-YA-1 REV. K

SHEET 1 OF 6

SEE SHEET 2

MK



REVISIONS		
ECO NO.		REV.
M7800-YA-00005		J
18 OCT-76		
S. MASAND		
11/7/76		
M7800VA-MK005		K
R HARRINGTON		
2 AUG 76		

FIRST USED ON OPTION/MODEL	DL11
UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES. TOLERANCES	
DECIMALS .XXX = .005 .XX = .02 .X = .1	ANGLES ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓	
MATERIAL	—
FINISH	—

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE ASYNCHRONOUS LINE INTERFACE (BUS RECEIVERS & DRIVERS) DL-2

SIZE	CODE	NUMBER	REV.
D	CS	M7800-YA-1	K

SHEET 2 OF 6

MK

SEE NOTE 3

Y1	844.8 KHZ		103296 MHZ		1.152 MHZ		460.8MHZ	
	BAUD	μSEC	BAUD	μSEC	BAUD	μSEC	BAUD	μSEC
1	36.7	1700	448	1342	50	1250	200	312
2	55	1135	67.3	928	75	833	300	208
3	110	567	134.5	464	150	417	600	104
4	220	284	269	232	300	208	1200	52
5	440	142	538	116	600	104	2400	26
6	880	71	1076	58	1200	52	4800	13
7	1320	47.4	1614	38.7	1800	34.6	7200	8.7
8	1760	35.5	2152	29	2400	26	9600	6.5
9	BERG CLOCK INPUT - COMMON TO RCVR AND XMIT							
10	EXTERNAL CLOCK INPUT - RCVR; DSI (XMIT DRI							

SWITCH POS.

DL-3 BR IN H — BUS BR7 L
DL-3 BR OUT H — BUS BR6 L
BUS BG4 OUT H — BUS BR5 L
BUS BG4 IN H — BUS BR4 L
BUS BG5 OUT H — C O REQUEST L
BUS BG5 IN H — BUS BR7 IN H
BUS BG6 IN H — BUS BR7 OUT H
BUS BG6 OUT H — BUS BR6 IN H

PRIORITY PLUG E19

DR1 EXT XMIT INPUT
DL-3 XMIT CLK H
(CC) BERG CLOCK INPUT
DSI EXT RCVR INPUT
DL-3 RCVR CLK H
DB1 TTL BDR ENB L
DC1 TTL SERIAL OUT L
20 MA RECEIVE
20 MA TRANSMIT
READER RELAY
BERG CLOCK INPUT(CC)
BERG SERIAL IN L (E)
TTL SERIAL IN L
DL-4 MAINT (I) H
BERG CLK ENB L (HH)
DL-4 SERIAL OUT H
DL-4 BDR ENB (1) H
-15V
+5V
+5

NOTES:
1. LETTERS ENCLOSED IN PARENTHESIS REFER TO PINS ON THE BERG CONNECTOR. EXAMPLE (X)
2. NUMBERS WITHIN TRIANGLES REFER TO PINS ON THE FEMALE MATE-N-LOCK CONNECTOR WHEN USING THE 7008360 CABLE. THIS CABLE ALSO CONNECTS BERG PINS H TO E.
3. ALTHOUGH THE ABOVE TABLE INCLUDES ONLY THE STANDARD DL11 CRYSTALS OTHER VALUES MAY BE SPECIFIED BY THE CUSTOMER OR BY OTHER DOCUMENTATION OF AN OPTION WHICH USES THE DL11.
4. REMOVE C29 AND C31 FOR OPERATION AT FREQUENCIES ABOVE 150 BAUD

REVISIONS		
DR#	CHANGE NO.	REV.

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.
DL11		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
NEXT HIGHER ASSY.
SCALE
SHEET 2 OF 6

DRAWN
CHECKED
ENGR
MFG
QA

EQUIPMENT CORPORATION

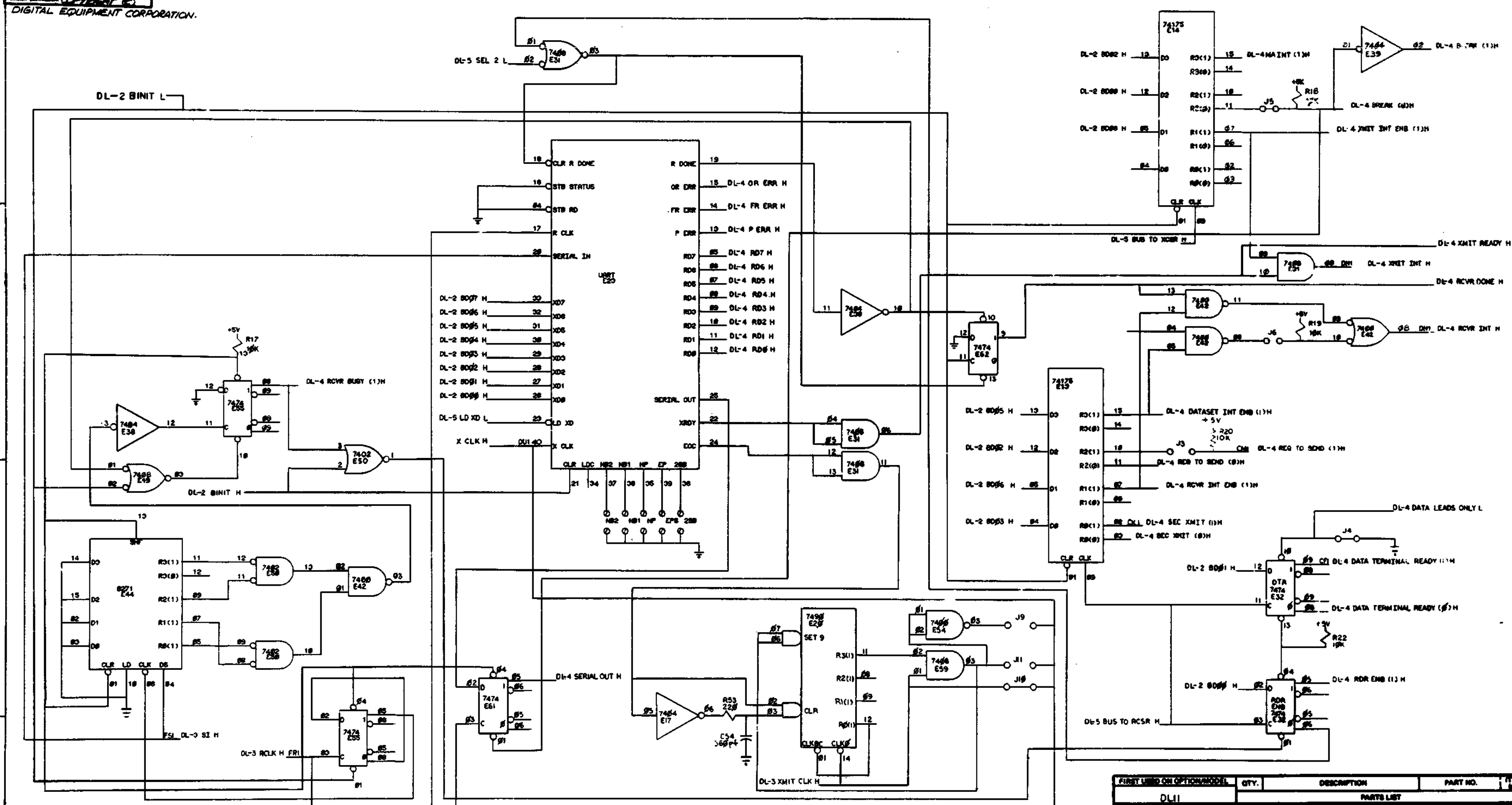
TITLE: ASYNCHRONOUS LINE INTERFACE (CLOCK & CURRENT LOOPS) DL-3

REVISION	NUMBER	REV.
D CS	M7800-YA-I	K

DIST.

MK

DIGITAL EQUIPMENT CORPORATION.



FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
DL11		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES. TOLERANCES

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

REMOVE BURRS AND BREAK SHARP CORNERS. SURFACE QUALITY ✓

MATERIAL —/—

FINISH —/—

NEXT HIGHER ASSY. —/—

EQUIPMENT CORPORATION

TITLE ASYNCHRONOUS LINE INTERFACE (UART & STATUS) DL-4

SIZE	CODE	NUMBER	REV.
D	CS	M7800-YA-1	K

SCALE —/— SHEET 4 OF 6

REVISIONS		
CHG.	CHANGE NO.	REV.

DIGITAL EQUIPMENT CORPORATION

NOTE I: THE 'A' LINES ARE TO BE JUMPERED FOR A 0.

REVISIONS		
DSR.	CHANGE NO.	REV.

PARTS LIST			
QTY.	DESCRIPTION	PART NO.	ITEM

PRINT USED ON OPTION MODEL: DL11

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES

DECIMALS	ANGLES
.XXX = ±.005	±0° 30'
.XX = ±.01	
.X = ±.1	

REMOVE BURRS AND BREAK SHARP CORNERS. SURFACE QUALITY ✓

MATERIAL

FINISH

NEXT HIGHER ASSY.

SCALE

SHEET 5 OF 6

EQUIPMENT CORPORATION

TITLE: ASYNCHRONOUS LINE INTERFACE (ADDRESS SELECTION) DL-5

SIZE	NUMBER	REV.
D	CS M7800-YA-1	K

DIST.

MK

NOTE: THE 'V' LINES ARE TO BE JUMPERED FOR A L

REVISIONS		
SYM.	ORDER NO.	REV.

FIRST USED ON OPTION NUMBER: DL11	QTY.	DESCRIPTION	PART NO.	FIND NO.
		PARTS LIST		

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

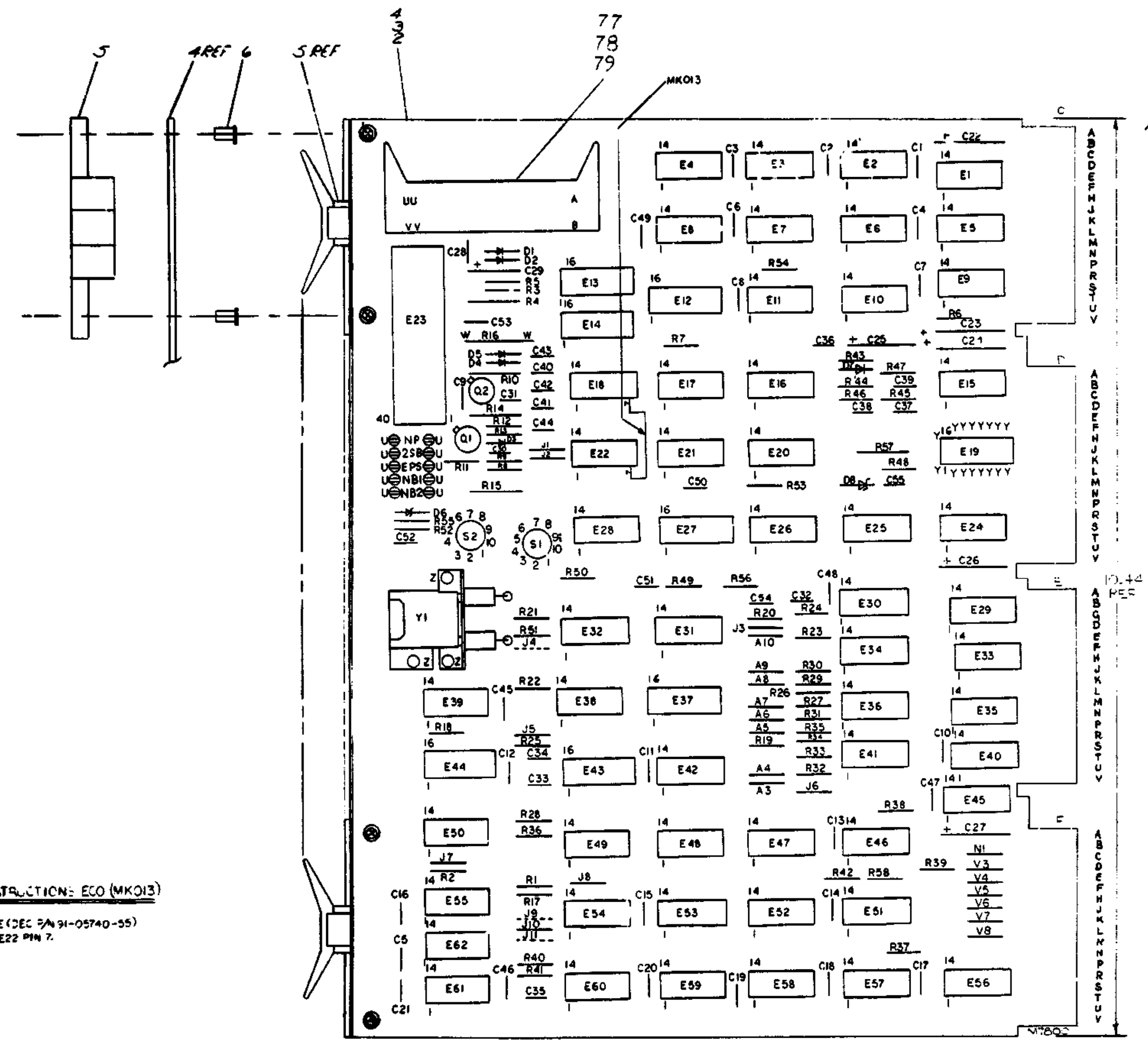
DRAWN — DATE
CHECK — DATE
ENGR — DATE
PROJ — DATE
NEXT HIGHER ASSY.
SCALE
SHEET 6 OF 6

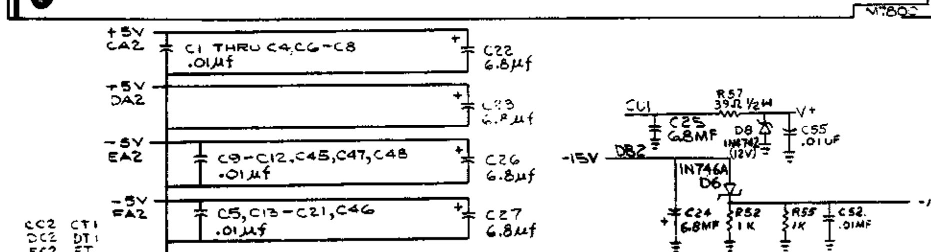
EQUIPMENT CORPORATION
[redacted]

TITLE: ASYNCHRONOUS LINE INTERFACE (INTERRUPT CONTROL) DL-6

SIZE: D | CAGE CODE: CS | NUMBER: M7800-YA-I | REV.: K

DIST.





NOTES:

1.) PIN NOTATION THROUGHOUT IS ORDERED UPON MODULE PLACEMENT IN THE SYSTEM UNIT. MODULE REFERENCE ALONE IS OBTAINED BY CONVERTING THE FIRST LETTER ACCORDING TO THE PIN NOMENCLATURE CHART AT THE LEFT.
2.) JUMPERS TO BE USED AT CONNECTIONS A3-A10, J1-J10, V3-V8, AND N1.
3.) LETTERS ENCLOSED IN PARENTHESIS REFER TO PINS ON THE BERG CONNECTOR. EXAMPLE: (X).
4. DEC 8640'S WERE PHASED IN AS DEC 380 REPLACEMENTS ANY 380 FAILURES SHOULD BE REPLACED BY 8640'S EXCEPT E28. E28 MUST BE REPLACED WITH A 7380.
5. FOR YC VERSION, C36 VALUE IS 1200PF.

PIN NOMENCLATURE

MODULE	SYSTEM UNIT
A	C
B	D
C	E
D	F

REWORK INSTRUCTIONS ECO (MK013)

WIREADD:
ADD 30 GAUGE WIRE (DEC P/N 91-05740-55) FROM E18 PIN 7 TO E22 PIN 7.

PARTS LIST

QTY (YC)	QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
1	1	E28	IC DEC 7380	1910390	80
1	1		LATCH RIGHT	1209941-04	79
1	1		LATCH LEFT	1209941-03	78
1	1		CONNECTOR BERG	1209941-08	77
1	1		INSULATED JUMPER	9009185	76
1	0	C36	CAP 1200 PF, 100V, 5%	1002424	75
A/R	A/R		WIRE #22 SOLID BUS	9107560-01	74
1	1	R57	RES 39, 1/2W, 5%	1302336	73
1	1	D8	DIODE, 4742, 12V, 10%, 1W, ZENER	1109502	72
3	3		INT. WASHER #2	9006631	71
1	1	E27	IC DEC 74161	1910650	70
3	3		NUT, HEX #2	9006555	69
3	3		SCR PHL PAN HD #2-56 X 1/4 LG	9006001-1	68
2	2		AUGAT 8000 PG-1	1202812	67
6	6	D1-D5, D7	DIODE D664 20V 100MA	1100114	66
1		D6	DIODE 1N746A	1104860	65
2	2	Q1 Q2	TRANSISTOR GE340	1503409-00	64
1	1	C53	CAP 100PF 100V 5% [illegible]	1000016	63
1	1	C54	CAP 560PF 100V 5% [illegible]	100002[illegible]	62
2	2	C50, C51	CAP .047MF CERAMIC	1009678	61
1	1	C36	CAP 220 PF 100V 5% DIPPED MICA	1000021	60
2	2	C34, C35	CAP 330PF 100V 5% DIPPED MICA	1000023	59
9	9	C32, C37-C44	CAP 470PF 100V 5% DIPPED MICA	1000024	58
1	1	C31	CAP 1000PF 100V 5% DIPPED MICA	1000042	57
30	30	C1-21, 23, 30, 45-49, 52, 55	CAP .01UF 100V 20% CERAMIC DISC	1001610-01	56
1	1	C29	CAP .47UF 35V 10% TANT	1005965	55
6	6	C22-C27	CAP 6.8 UF 35V 10% TANT	1005306	54
1	1	C33	CAP 150PF 100V 5% DIPPED MICA	1000019	53
2	2	R14, R15	RES 1.5K 1/2W 5%	1300594	52
6	6	R23, R26, R40, R48, R52, R55	RES 1K 1/4W 5%	1300365	51
1	1	R41	RES 47Ω 1/4W 5%	1300202	50
1	1	R10	RES 68Ω 1/2W 5%	1309405	49
1	1	R3	RES 82Ω 1/4W 5%	1301277	48
4	4	R24, R45, R46, R47	RES 100Ω 1/4W 5%	1300229	47
1	1	R11	RES 150Ω 1/4W 5%	1300230	46
2	2	R42, R58	RES 180Ω 1/4W 5%	1301322	45
2	2	R44, R53	RES 220Ω 1/4W 5%	1300271	44
1	1	R38	RES 390Ω 1/4W 5%	1300309	43
4	4	R9, R13, R43, R51	RES 470Ω 1/4W 5%	1300316	42
1	1	R4	RES 560Ω 1/2W 5%	1300338	41
1	1	R5	RES 750Ω 1/4W	1304501	40
1	1	R16	RES 750Ω 1W 5%	1302385	39
21	27	R1, R2, R6, R7, R17-R22, R25, R27-R37, R39, R49, R50, R54, R56	RES 10K 1/4W 5%	1300479	38
2	2	R8, R12	RES 1.3K 1/4W 5%	1300391	37
1	1	E23	IC DEC UART	1910437	36
4	4	E32, E55, E61, E62	IC DEC 7474	1905547	35
3	3	E15, E36, E41	IC DEC 8242	1909712	34
3	3	E31, E49, E59	IC DEC 7406	1910135	33
2	2	E18, E21	IC MC1489	1910323	32
2	2	E20, E26	IC DEC 7490	1909037	31
11	11	E1, E2, E5, E7-E9, E11, E30, E47, E54, E56	IC DEC 8881	1909705	30
1	1	E22	IC MC1488	1910322	29
1	1	E43	IC DEC 74123	1910436	28
3	3	E48, E57, E52	IC DEC 74H74	1909667	27
3	3	E42, E34, E58	IC DEC 7400	1903575	26
1	1	E10	IC DEC 7413	1909989	25
2	2	E50, E53	IC DEC 7402	1909004	24
7	7	E3, E4, E33, E35, E40, E45, E46	IC DEC 8640	1911469	23
1	1	E12	IC DEC 74153	1909937	22
1	1	E60	IC DEC 74H04	1909737	21
1	1	E25	IC DEC 7472	1909033	20
5	5	E6, E16, E17, E38, E39	IC DEC 7404	1909[illegible]	19
1	1	E24	IC DEC 7493	[illegible]	18
1	1	E34	IC DEC 7410	[illegible]	17
1	1	E29	IC DEC 314	1909706	16
1	1	E37	IC DEC 7442	[illegible]	15
1	1	E44	IC DEC 8271	1909613	14
2	2	E13, E14	IC DEC 7475	[illegible]	13
1	1		BRACKET, CRYSTAL HOLDER	[illegible]	12
1	1		BRACKET, CRYSTAL HOLDER	[illegible]	11
1	1	E19	IC SOCKET	[illegible]	10
2	2	S1, S2	SWITCH, SINGLE POLE, 10 POS	[illegible]	9
[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
10	10		SPLIT LUGS	[illegible]	7
8	8		EYELET #GS4-7 E.B.STIMPSON	[illegible]	6
4	4		HANDLE, FLIP-CHIP, MAGENTA	[illegible]	5
1	1		ETCHED CIRCUIT BOARD	[illegible]	4
REF	REF		MODULE ECO HISTORY	A-[illegible]	3
REF	REF		ASSY/DRILLING HOLE LAYOUT	D-[illegible]	2
REF	REF		X-Y COORDINATE HOLE	K-[illegible]	1

ETCH BOARD REV M

IC PIN LOCATIONS

IC TYPE	GND	+5V	+V	-12V
DEC 74161	8	16	—	—
DEC 1488	7	—	14	1
DEC UART	3	1	—	2
DEC 74175	8	16	—	—
DEC 8271	8	16	—	—
DEC 7442	8	16	—	—
DEC 314	1	8	—	—
DEC 7493	10	5	—	—
DEC 7492	10	5	—	—
DEC 74153	8	16	—	—
DEC 8640	1	8	—	—
DEC 7490	10	5	—	—
DEC 74123	8	16	—	—

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

SEMICONDUCTOR CONVERSION CHART

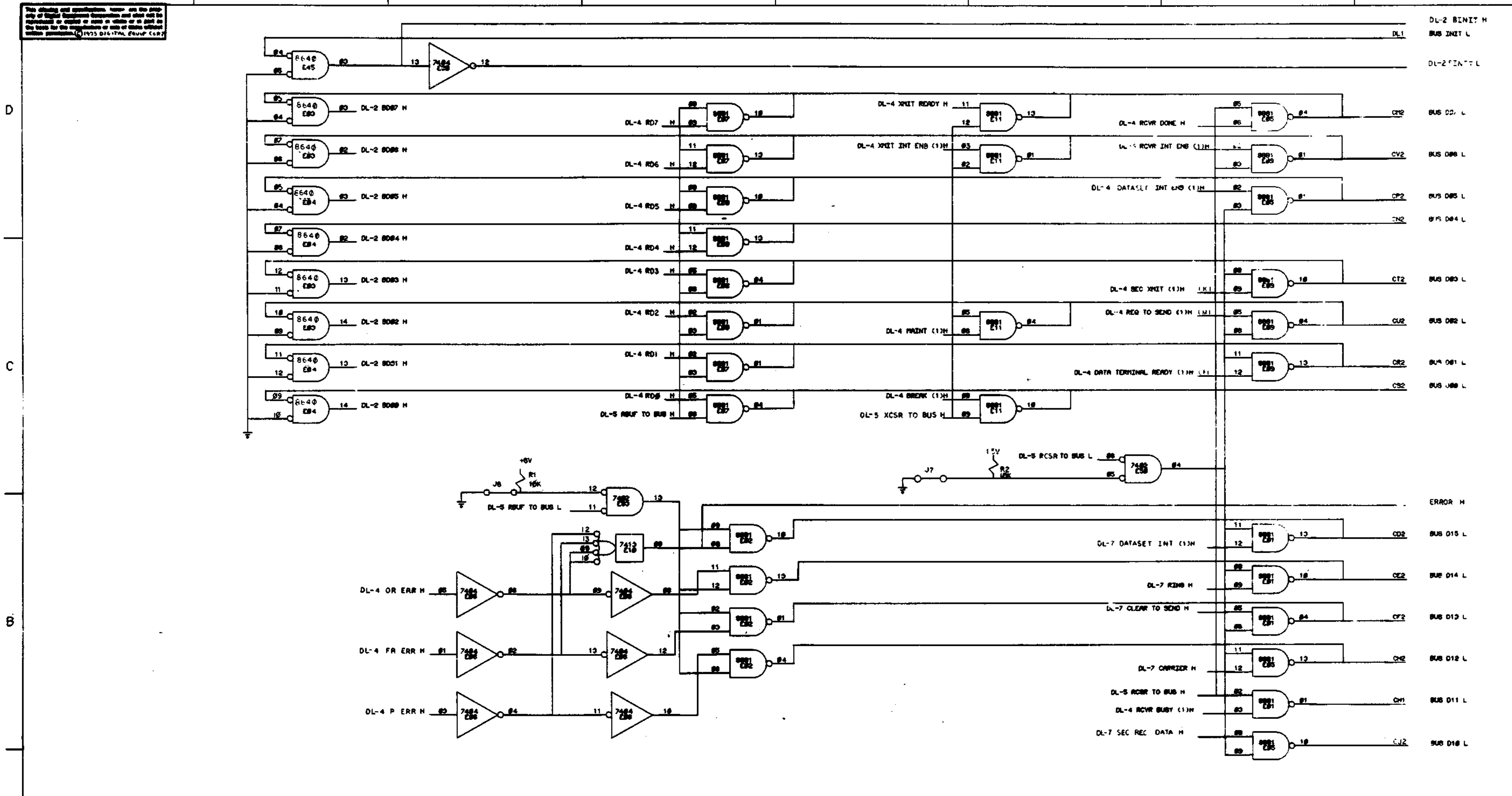
DEC NO.	EIA NO.	DEC NO.	EIA NO.
		GE340	MPS6530
		1N746A	1N4733A
		D664	1N3606

EQUIPMENT CORPORATION

TITLE: ASYNCHRONOUS LINE INTERFACE

SIZE: B CS NUMBER: M7800-0-1 REV: R

SHEET 1 OF 7



FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.
DL11		PARTS LIST	

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES. TOLERANCES

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

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL —/—/—

FINISH —/—/—

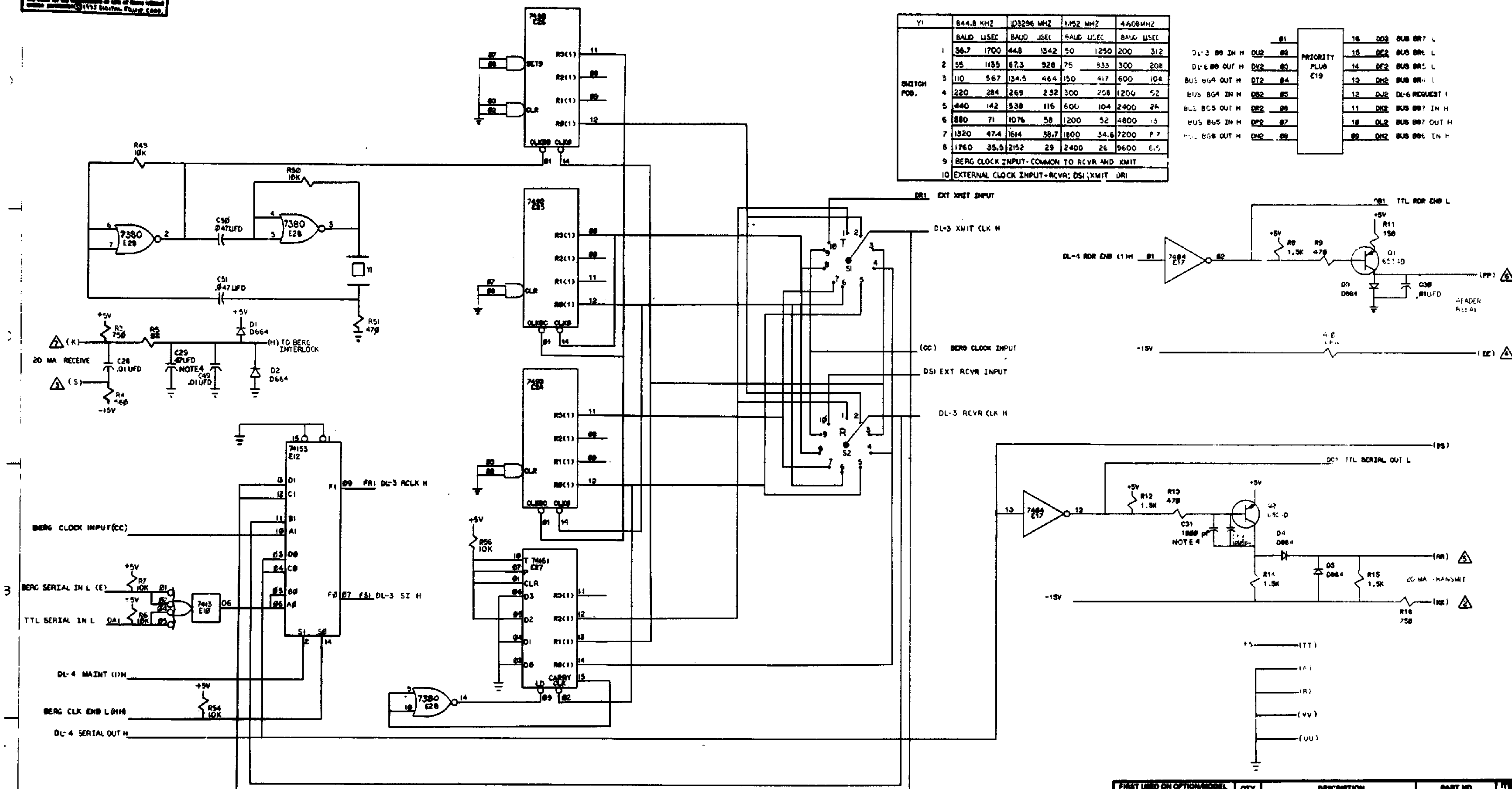
DRN. B. Pisk... DATE 3-20-72
CHKD. ... DATE 4-3-72

[redacted] EQUIPMENT CORPORATION

TITLE ASYNCHRONOUS LINE INTERFACE (BUS RECEIVERS & DRIVERS)

D CS M7800-0-1

SCALE — SHEET 2 OF 7



SEE NOTE 3

Y1		844.8 KHZ		1.03296 MHZ		1.152 MHZ		4.608 MHZ	
		BAUD	µSEC	BAUD	µSEC	BAUD	µSEC	BAUD	µSEC
SWITCH POS.	1	36.7	1700	44.8	1342	50	1250	200	312
	2	55	1135	67.3	928	75	833	300	208
	3	110	567	134.5	464	150	417	600	104
	4	220	284	269	232	300	208	1200	52
	5	440	142	538	116	600	104	2400	26
	6	880	71	1076	58	1200	52	4800	13
	7	1320	47.4	1614	38.7	1800	34.6	7200	[illegible]
	8	1760	35.5	2152	29	2400	26	9600	6.5
	9	BERG CLOCK INPUT- COMMON TO RCVR AND XMIT							
	10	EXTERNAL CLOCK INPUT-RCVR; DSI ;XMIT DRI							

NOTES:
1. LETTERS ENCLOSED IN PARENTHESIS REFER TO PINS ON THE BERG CONNECTOR. EXAMPLE: (X)
2. NUMBERS WITHIN TRIANGLES REFER TO PINS ON THE FEMALE MATE-N-LOCK CONNECTOR WHEN USING THE 7008360 CABLE. THIS CABLE ALSO CONNECTS BERG PINS H TO E.
3. ALTHOUGH THE ABOVE TABLE INCLUDES ONLY THE STANDARD DL11 CRYSTALS OTHER VALUES MAY BE SPECIFIED BY THE CUSTOMER OR BY OTHER DOCUMENTATION OF AN OPTION WHICH USES THE DL11.
4. C29 AND C31 ARE REQUIRED ONLY FOR 20MA. OPERATION AT 150BAUD OR LESS, DL11-A OR C.

FIRST USED ON OPTION/MODEL: DL11

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES

DECIMALS: .XXX ± .005, .XX ± .01, .X ± .1 — ANGLES: ±0° 30'

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL —/—/—

FINISH —/—/—

QTY. | DESCRIPTION | PART NO. | ITEM NO.

PARTS LIST

DATE 2-20-72 · DATE 4-5-72 · DATE 4-27-72 · DATE 4-27-72 · DATE 4-27-72

[redacted] EQUIPMENT CORPORATION

TITLE: ASYNCHRONOUS LINE INTERFACE (CLOCK & CURRENT LOOPS) DL-3

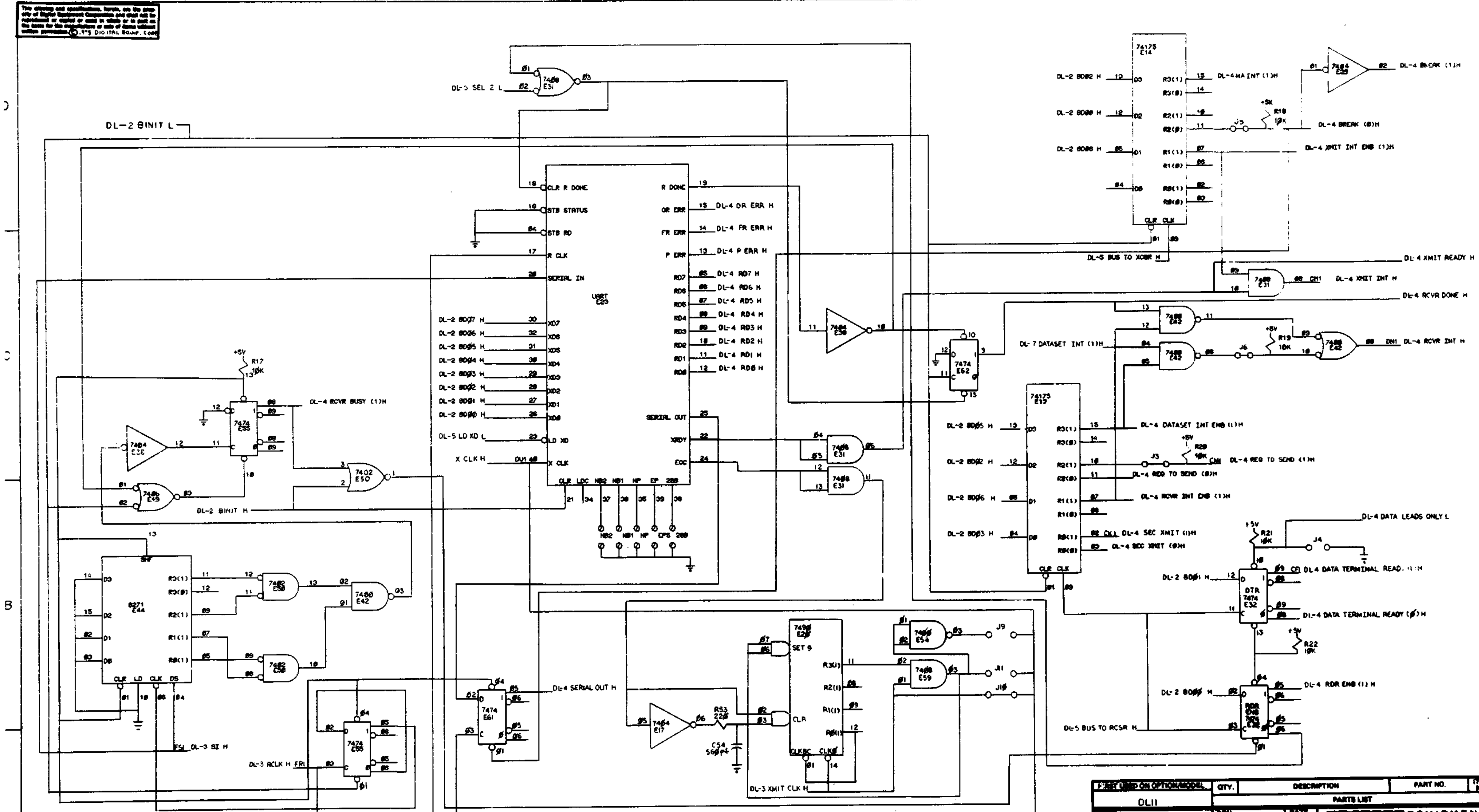
NEXT HIGHER ASSY.

SIZE: D · CODE: CS · NUMBER: M78ØØ-Ø-1 · REV.: R

SCALE

SHEET 3 OF 7

DIST.



FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
DL11		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. B. Pinar DATE 3-20-72
CHK'D. DATE 4-11-72
ENG. DATE
PROJ. ENG. DATE 4-27-72
PROD. DATE 4-?-72

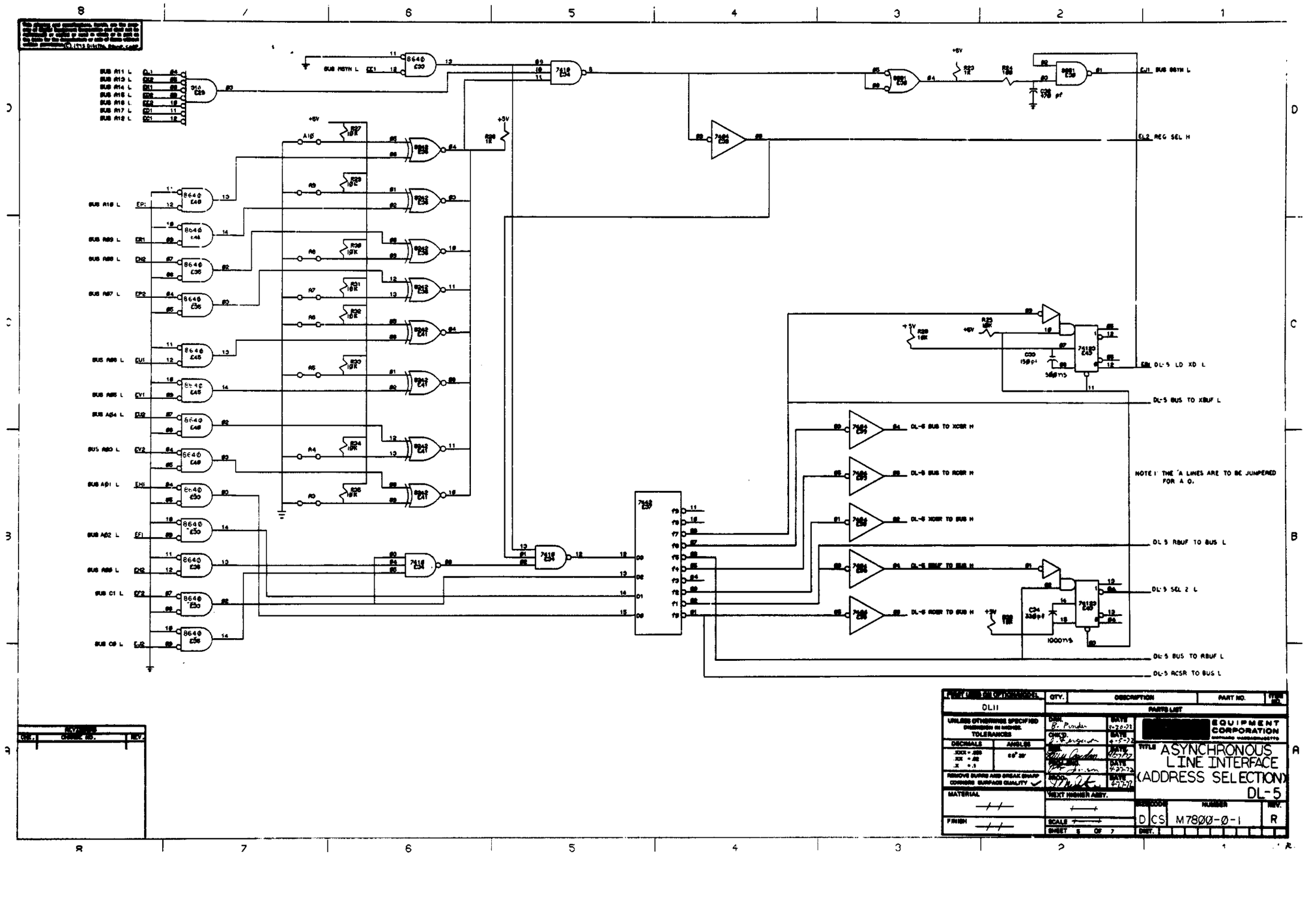
NEXT HIGHER ASSY. SCALE SHEET 4 OF 7

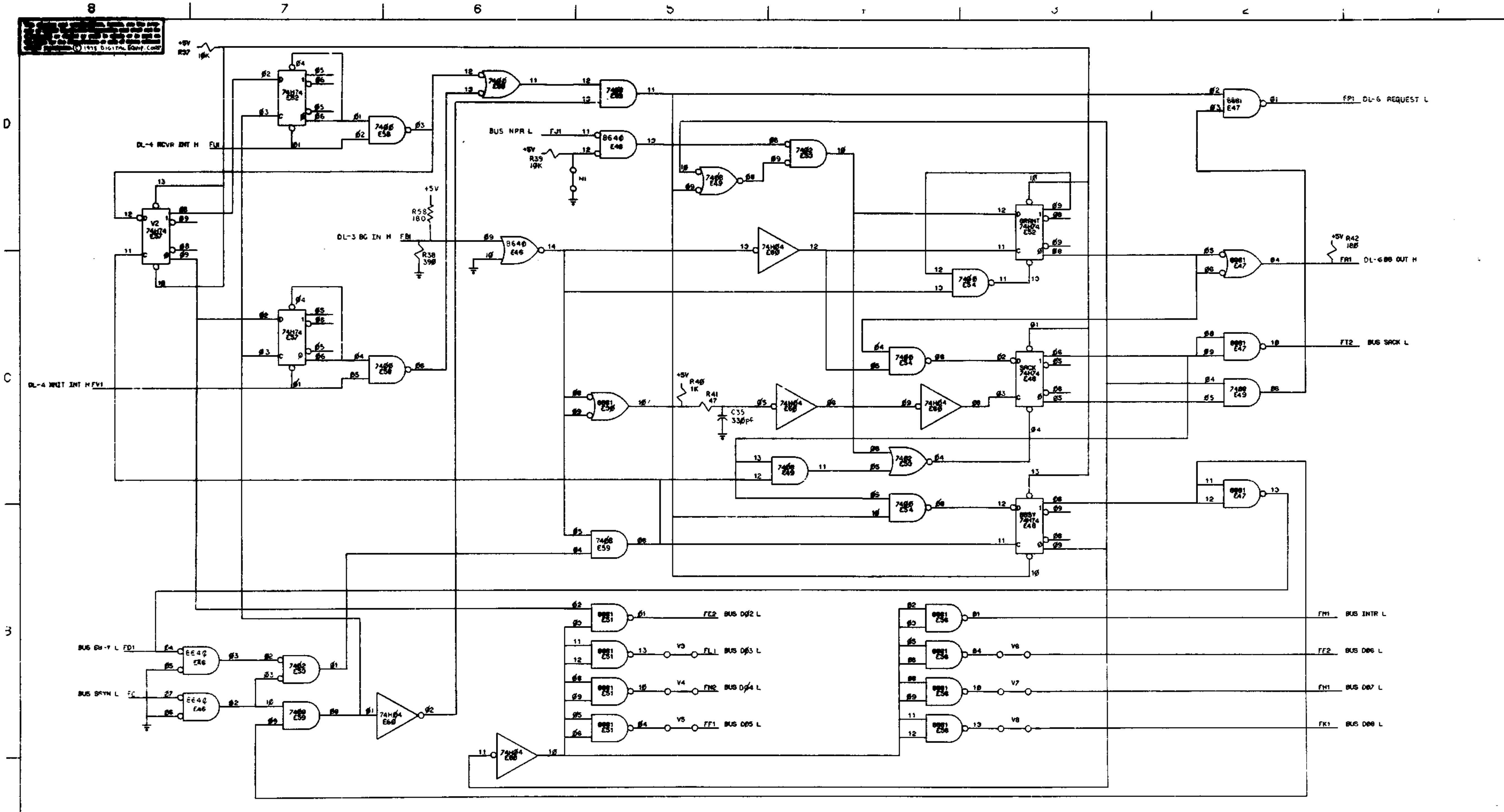
EQUIPMENT CORPORATION

TITLE ASYNCHRONOUS LINE INTERFACE (UART & STATUS) DL-4

SIZE D CODE CS NUMBER M7800-0-1 REV. R

REVISIONS: CHG. | CHANGE NO. | REV.


NOTE 1: THE 'A' LINES ARE TO BE JUMPERED FOR A 0.
DL-5 BUS TO XBUF L
DL-5 BUS TO RBUF L
DL-5 RCSR TO BUS L
DL-5 SEL 2 L
DL-5 LD XD L
DL-5 BUS TO XCSR H
DL-5 BUS TO RCSR H
DL-5 XCSR TO BUS H
DL-5 RBUF TO BUS H
DL-5 RCSR TO BUS H
REG SEL H
BUS BSYN L
ASYNCHRONOUS LINE INTERFACE (ADDRESS SELECTION)
DL-5
DL11
M7800-0-1
EQUIPMENT CORPORATION



FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
DL11	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. B. P. — DATE 3-20-72
CHK'D. — DATE 4-6-72
ENG. — DATE
PROJ. ENG. — DATE 4-27-72
PROD. — DATE

NEXT HIGHER ASSY.

SCALE

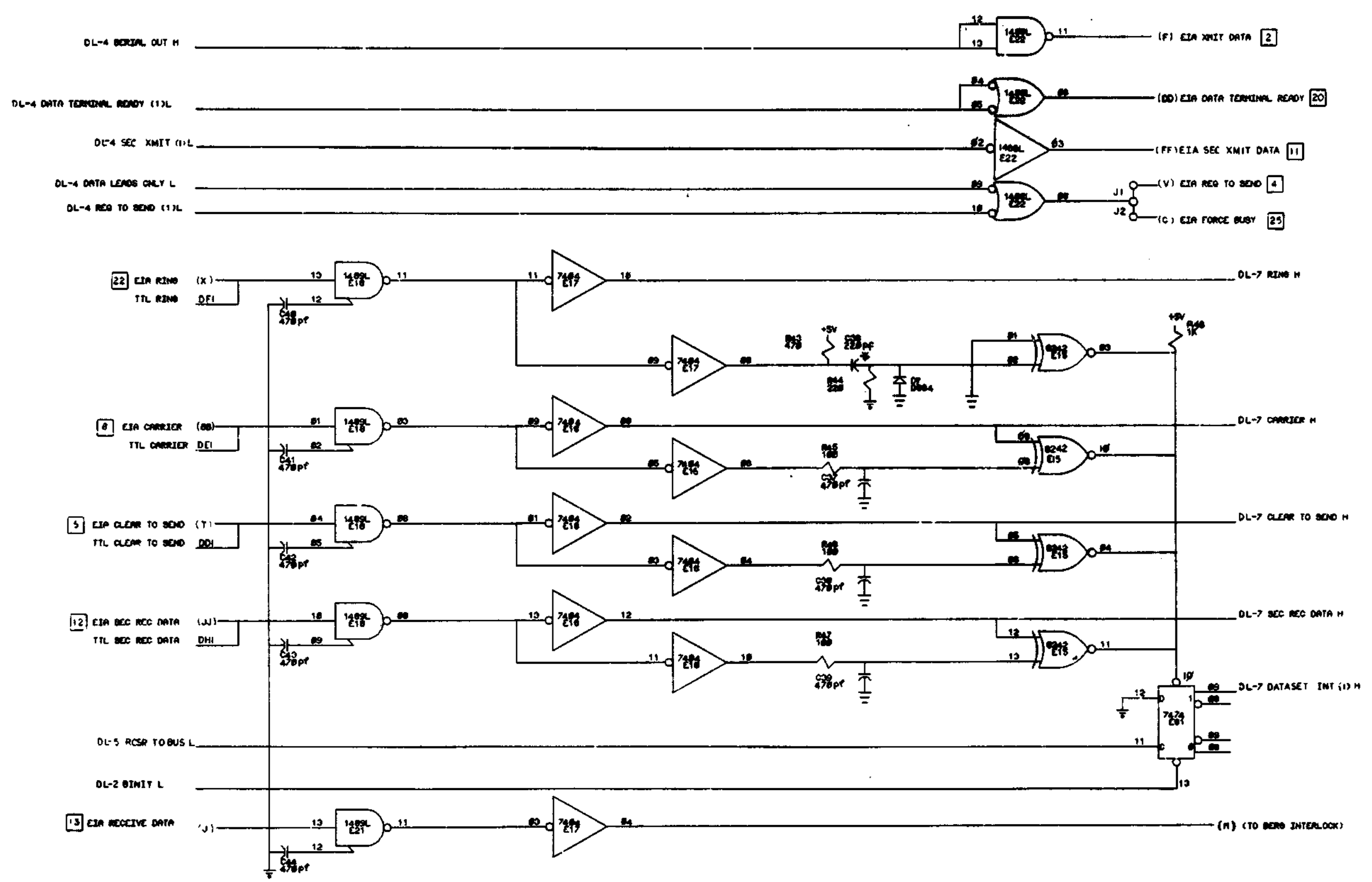
SHEET OF

EQUIPMENT CORPORATION

TITLE ASYNCHRONOUS LINE INTERFACE (INTERRUPT CONTROL) DL-6

SIZE D — CODE CS — NUMBER M7800-0-1 — REV. R

DIST.



NOTES;

1. LETTERS ENCLOSED - EXAMPLE (M) REFER TO PINS ON THE BERG CONNECTOR.
2. NUMBERS WITHIN BOXES REFER TO PINS ON THE MALE CINCH CONNECTOR WHEN USING THE BC05-C CABLE, THIS CABLE ALSO CONNECTS BERG PINS M TO E.

* FOR YC VERSION, C36 VALUE CHANGES TO 1200PF

REVISIONS		
REV.	CHANGE NO.	REV.

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

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES

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

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL —//—

FINISH —//—

DRN. B. Pinder	DATE 3-20-72
CHK'D. J. Ferguson	DATE 9-5-72
ENG.	DATE
PROD. ENG.	DATE 9-22-72
PROD.	DATE 9-22-72

NEXT HIGHER ASSY.

SCALE

SHEET 7 OF 7

[redacted] EQUIPMENT CORPORATION

TITLE ASYNCHRONOUS LINE INTERFACE (EIA DRIVERS & RECEIVERS) DL-7

SIZE	CODE	NUMBER	REV.
D	CS	M7800-0-1	R

DIST.

WIRE TABLE

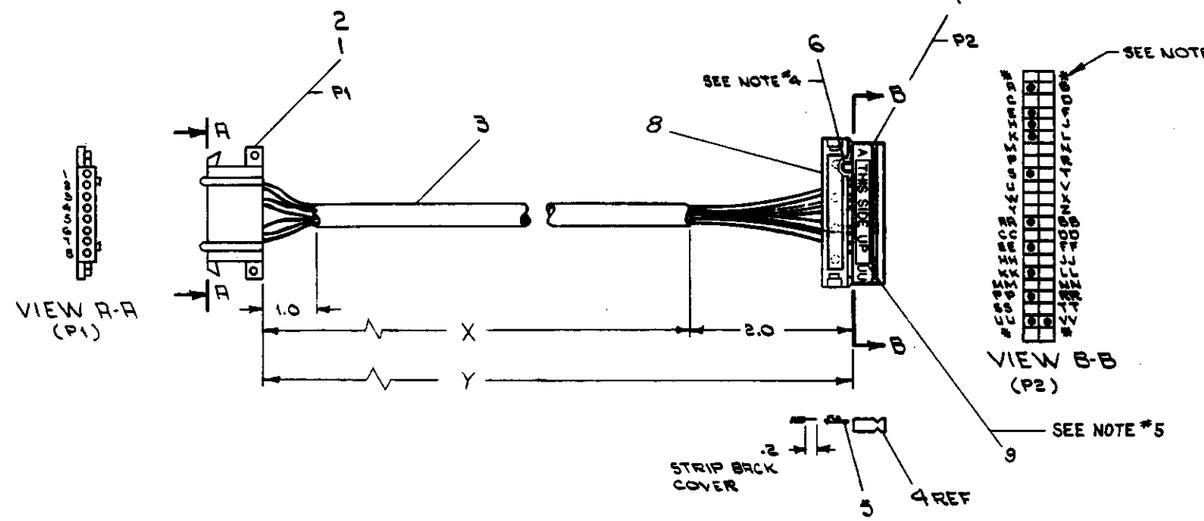
ITEM NO.	DESCRIPTION AWG	COLOR	PAIR NO.	FROM CONNECTION	FROM WITH	TO CONNECTION	TO WITH
3	22	BLK	1	P1-2	2	P2-KK	5
3		RED		P1-3	2	P2-S	
3,7		SHIELD		SEE NOTE #2	—	P2-A(NOTE #3)	
3		BLK	2	P1-4	2	P2-EE	
3		WHT		P1-5	2	P2-RR	
3,7		SHIELD		SEE NOTE #2	—	P2-LL(NOTE #3)	
3		BLK	3	P1-6	2	P2-PP	
3		GRN		P1-7	2	P2-K	
3,7		SHIELD		SEE NOTE #2	—	P2-VV(NOTE #3)	
6	22	BLK	—	P2-E	5	P2-H	5

LEGEND

VARIATION	LENGTH X	LENGTH Y
7008360-0	25IN±1.0	27IN±1.0
7008360-1	46IN±1.0	48IN±1.0
7008360-9	9FT±2IN	9FT 2IN ± 2IN

NOTES:

1. * ASTERISKS INDICATE CAVITIES NOT USED OR DESIGNATED BY LETTERS.
2. DRAIN WIRES TO BE CUT BACK TO OUTER INSULATION ON P1 END OF CABLE ONLY. SHIELDS TO BE CUT BACK TO OUTER INSULATION ON BOTH ENDS OF CABLES.
3. DRAIN WIRES ON P2 END OF CABLE TO BE EACH ENCLOSED WITH ITEM #7 (TUBING) FROM END OF CABLE JACKET TO POINT WHERE THEY ENTER P2 CONNECTOR.
4. ITEM #6 (WIRE) TO BE APPROXIMATELY ONE(1) INCH LONG.
5. PLACE ITEM #9 ("THIS SIDE UP" STICKER) ON LETTERED SIDE OF ITEM #4 (BERG HOUSING) AS SHOWN.



ITEM NO.	QTY.	DESCRIPTION	PART NO.
9	1	LABEL, THIS SIDE UP	3611567
8	1	STRAIN RELIEF	1211166
7	R/R	TUB. #18 TEF. THINWALL WHT	9107E18-11
6	R/R	WIRE, #22 AWG STRD TEF BLK	9107S22-00
5	11	SOCKET, CRIMP # 47216	1810089-07
4	1	HOUSING, BERG. #65043-015	1210918-15
3	R/R	CABLE, BELDEN #8777 3PR. SHLD	9107T23-0
2	6	CONTACT MATE-N-LOCK (FEMALE)	1209879-03
1	1	CONN. MATE-N-LOCK (FEMALE)	1209840-00

PARTS LIST

REVISIONS			
SYM.	CHANGE NO	REV.	
	KL8-E-00002	A	
	KL8E-00006	B	
	7008360-00001	C	
	7008360-00002	D	
	7008360-0001	E	
	7008360-0002	F	
	7008360-0003	G	
	7008360-0004	H	

DRAWN	E. CLARK	1-17-73
TRACED		
CHECKED	B. REGAN	10-28-72
ENG. APPR.	B. REGAN	
MFG. APPR.		
T.P.	7008360-00001	D
REGAN		
NEXT ASSY	7008360-0001	E
USED ON	BCDSM-XXXXI	F
APPLICATION		
DUP.	M.C. LEWANDOWSKI	
RELEASED	7008360-0004	H
	J. MCNAMARA	

FIRST USED ON OPTION/MODEL: PDP-8E

DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED
DIMENSION IN INCHES
TOLERANCES
FRACTIONS ± 1/32
ANGLES ± 0°30'
FINAL SURFACE QUALITY
REMOVE BURRS AND BREAK SHARP CORNERS

MATERIAL: SEE PARTS LIST
FINISH:

DRWN	E. CLARK	1-17-73
CHKD	B. REGAN	10-28-72
ENG. APPR.	B. REGAN	10-28-72
MFG. APPR.		
T.P.	J. MCNAMARA	1-19-73

[redacted] EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE: CABLE ASSEMBLY (KL8E)

NEXT ASSY: A-ML-KL8-E-0
SCALE: NONE
SHEET: 1 OF 1

SIZE CODE: D | NUMBER: DIA 7008360-0-0 | REV: H

WIRE TABLE

ITEM NO.	DESCRIPTION AWG	COLOR	FROM CONNECTION	WITH	TO CONNECTION	WITH
1	26	BLU/WHT	PI-1 *	12	J1-VV	7
		WHT/BLU	PI-2	8	J1-F	
		ORN/WHT	PI-3		J1-J	
		WHT/ORN	PI-4		J1-V	
		GRN/WHT	PI-5		J1-T	
		WHT/GRN	PI-6	8	J1-Z	
		BRN/WHT	PI-7 **	12	J1-UU	
		WHT/BRN	PI-8	8	J1-BB	
		SLA/WHT	PI-9		J1-Y	
		WHT/SLA	PI-10		J1-W	
		BLU/RED	PI-11		J1-FF	
		RED/BLU	PI-12		J1-JJ	
		ORN/RED	PI-13		J1-D	
		SLA/RED	PI-14		J1-LL	
1	26	SLA/GRN	PI-15	8	J1-N	7

ITEM NO.	DESCRIPTION AWG	COLOR	FROM CONNECTION	WITH	TO CONNECTION	WITH
1	26	RED/BRN	PI-16	8	J1-NN	7
		SLA	PI-17		J1-R	
		RED/SLA	PI-18		J1-U	
		BLU/BLK	PI-19		J1-P	
		BLK/BLU	PI-20		J1-DD	
		ORN/BLK	PI-21		J1-MM	
		BLK/ORN	PI-22		J1-X	
		GRN/BLK	PI-23		J1-RR	
		BRN/RED	PI-24		J1-L	
		RED/ORN	PI-25	8	J1-C	
		SHIELD	PI-1 *	12	J1-A	
1		SHIELD	PI-7 **	12	J1-B	7
3		BLK	PI-1 *	12	PI-7 **	12
2	26	RED	J1-E	7	J1-M	7

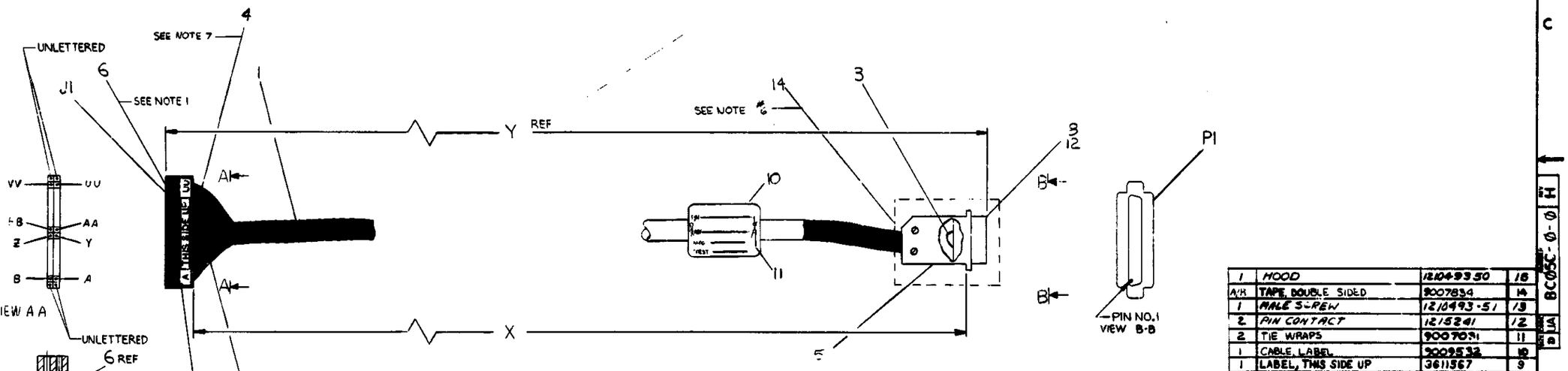
NB
* DENOTES THREE WIRES ARE SOLDERED INTO THE PI-1 SOLDER CUP
** DENOTES THREE WIRES ARE SOLDERED INTO THE PI-7 SOLDER CUP

LEGEND

NUMBER	VARIATION DIM X	DIM Y (PRECUT)
BCØ5C-25	25'±3"	25'1.8"
BCØ5C-5Ø	5Ø'±2%	5Ø'1.8"
BCØ5C-Ø9	9'±3"	9'1.8"
BCØ5C-1F	18"±1"	19.8"

NOTES:

1. MANUFACTURING SHOULD USE MACHINE CRIMPER TOOL FOR CRIMPING PINS (ITEM #7) MUST BE HTG8 FROM BERG ELECT
2. ONLY DEC PART #1210918-15 MAY BE USED AS J1.
3. PLACE ITEM #9("THIS SIDE UP" STICKER) ON LETTERED SIDE OF ITEM #6 (BERG HOUSING) AS SHOWN.
4. ~~USE ITEM #8 (9O7304-11) IN TWO PLACES (PI-1, PI-7) TO PREVENT SHORTING~~
5. ~~USE ITEM #2 (9O7834-11) ON ALL REMAINING SOLDER CUPS TO PREVENT SHORTING~~
6. DUE TO ± TOLERANCES WITH DIFFERENT VENDORS THE HOOD (ITEM #5) MAY VARY IN OUTSIDE DIAMETER CAUSING POTENTIAL STRAIN RELIEF GRIPPING PROBLEM. SHOULD THIS CONDITION BE PRESENT USE ITEM #4 (9O7834) AT JUNCTION OF CABLE AND HOOD.
7. PLACE ITEM #4 (9O7256) OVER SHIELD WIRE J1-A, J1-B, PI-1, PI-7.



1	HOOD	12104933Ø	18
A/R	TAPE, DOUBLE SIDED	9007834	14
1	MALE SCREW	1210493-51	13
2	PIN CONTACT	1215241	12
2	TIE WRAPS	9007091	11
1	CABLE, LABEL	9009532	10
1	LABEL, THIS SIDE UP	3611567	9
23	PW 28-3Ø AWG	1210933-43	8
23	SOCKET, #MT-GB	1210889-5	7
1	HOUSING, #28383 BERG	1210918-15	6
1	SHELL AND INSERT MALE	1210933-31	5
A/R	TUBING, #22 AWG TEF BLK	9107256-00	4
A/R	WIRE, #26 AWG STRD TEF BLK	9107636-00	3
A/R	WIRE, #26 AWG STRD TEF RED	9107636-22	2
A/R	CABLE, 25 CONDUCTOR #28 AWG	9107756	1

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

FIRST USED ON OPTION/MODEL: DN11

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. S Roberts 11/1/78
CHK. [illegible] 11/8/78
ENG. [illegible] 11/8/78
PROJ. [illegible] 11/8/78
PROD. [illegible] 11/21/78
NEXT HIGHER ASSY.
SCALE NONE
SHEET 1 OF 1

[redacted] EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS

TITLE: CABLE, MODEM BCØ5C

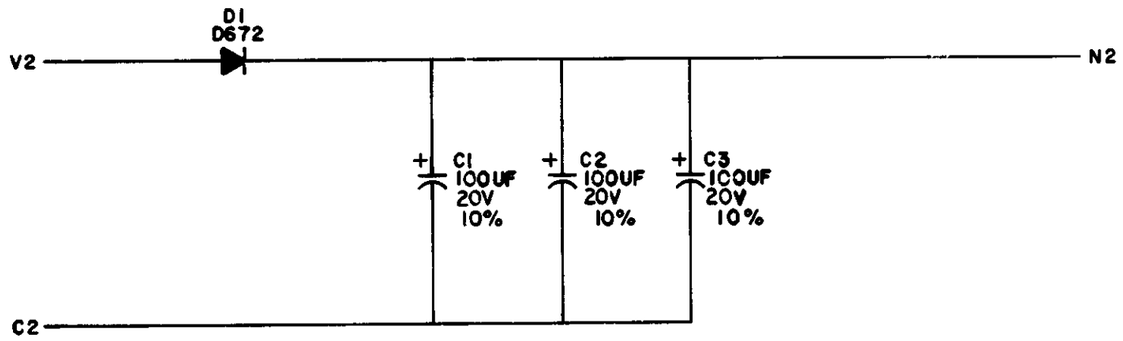
SIZE CODE: D | UA | NUMBER: BCØ5C-Ø-Ø | REV: H

REVISIONS	CHNG NO	REV
DWN	BCØ5C-00001	A
DWN	BCØ5C-00002	B
DWN	BCØ5C-00003	C
DWN	BCØ5C-00004	D
DWN	BCØ5C-00005	E
DWN	BCØ5C-00006	F
DWN	BCØ5C-MK007	H

DEC FORM NO DRD 100-A

MK

SIZE	CODE	NUMBER	REV.
B	CS	G8000-0-1	A



REVISIONS					
CHK	CHG NO.	REV			
[illegible]	[illegible]				
S. SHAMMAS					

DRN. S. Cooper	DATE 1/19/71	
CHK'D [signature]	DATE 2/13/71	
ENG. R. Sisco	DATE 3/11/71	
PROD.	DATE	

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA
D672	IN3653		

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE: FILTER NETWORK G8000

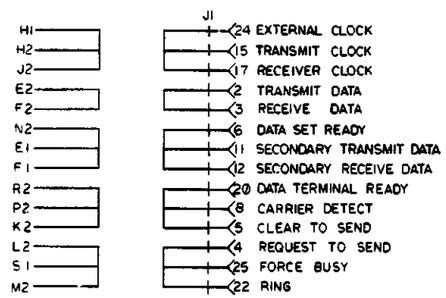
SIZE	CODE	NUMBER	REV.
B	CS	G8000-0-1	A

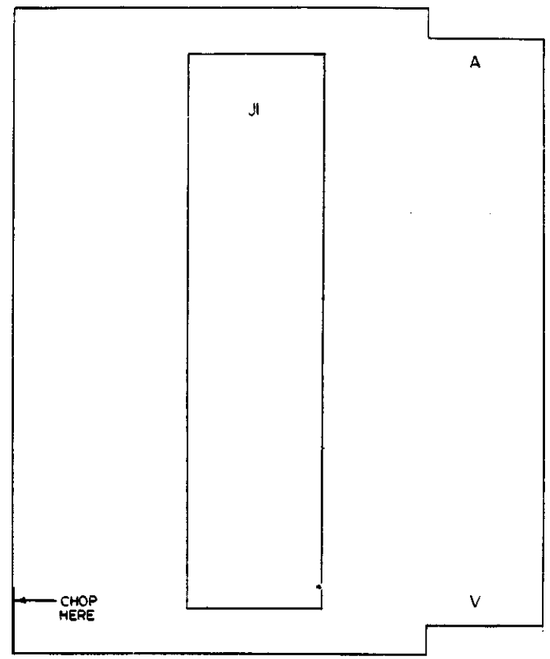
PRINTED CIRCUIT REV. A

DEC FORM NO
DRB 102

DIST. 324, 434, 435 2

4 PINK





QTY	REF DESIGNATION	DESCRIPTION	PART NO	ITEM NO
?		EYELET FEED THRU	5000731	6
1	J1	CONN CINCH DB 255 3	1210247	5
1		ETCHED CIRCUIT BOARD	5010020	4
		MODULE ECO HISTORY	B-MH-H315-0-6	3
		ASSY/DRILLING HOLE LAYOUT	C-AH-H315-0-5	2
		X-Y COORDINATE HOLE LOCATION	K-CO-H315-0-4	1

PARTS LIST

ETCH BOARD REV | A | B

DRN.		3-9-72
CHK'D		3-10-72
ENG.		3/13/72
PROJ. MGR.		3/22/72
PROD.		3/24/72
NEXT HIGHER ASSY.		
SCALE		
SHEET 1 OF 1		

FIRST USED ON: 30 Dtd

TITLE: MODEM TEST CONNECTOR

SIZE	CODE	NUMBER	REV.
D	CS	H315-0-1	A

DIST.

REV	DESCRIPTION	DATE	APPROVED
A	H315-0001		R. HARRINGTON

H315-0-1 A

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

SOFTWARE LIST

MADE BY EMPellegrini DATE 8/29/72	CHECKED P. Janson DATE 8-30-72	SECTION
ENG P. Janson DATE 8/29/72	PROD J. Mullig DATE 8-31-72	ISSUED SECT.

LEGEND

D	DOCUMENT
DN	DOCUMENT CHANGE NOTICE
PA	PAPER TAPE ASCII
PB	PAPER TAPE BINARY
PM	PAPER TAPE READ-IN-MODE

ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION DL11-A	DL11-B	DL11-C	DL11-D	DL11-E			KIT CHECK BY ____ DATE ____	INSTALLATION CHECK BY ____ DATE ____
1	LIBKIT-11-KL11-04	KL11 MAINDEC	1	1	0	0	0				
2	LIBKIT-11-DL11C-A-K	DL11 MAINDEC	0	0	1	1	0				
3	LIBKIT-11-DL11E-A-K	DL11 MAINDEC	0	0	0	0	1				

TITLE	ASSY. NO.	SIZE	CODE	NUMBER	REV.	ECO NO
DL11 SOFTWARE LIST	SHEET 1 OF 1	A	SL	DL11-0-4		
		DIST.				

DEC FORM NO. DEC 16-(327)-1049 N471
DRA 120

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ACCESSORY LIST

MADE BY E.PELLEGRINI DATE JUNE 26, 1972	CHECKED P.JANSON DATE 8-8-72	SECTION
ENG PAUL JANSON DATE JUNE 26, 1972	PROD DATE 8-8-72	ISSUED SECT.

LEGEND

D DOCUMENT
DN DOCUMENT CHANGE NOTICE
PA PAPER TAPE ASCII
PB PAPER TAPE BINARY
PM PAPER TAPE READ-IN-MODE

ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION DL11-A	DL11-B	DL11-C	DL11-D	DL11-E			KIT CHECK BY ____ DATE ____	INSTALLATION CHECK BY ____ DATE ____
1	M78ØØ	ASYNCHRONOUS LINE INTERFACE (EIA)	-	1	-	1	1				
2	G8ØØØ	FILTER NETWORK	0	A/R	0	A/R	A/R				
3	M78ØØ-YA	ASYNCHRONOUS LINE INTERFACE (CURRENT LOOP)	1	0	1	0	0				
4	5408776	PRIORITY JUMPER LEVEL #4	1	1	1	1	1				
5	BCØ5-C-25	MODEM CABLE	0	1	0	1	1				
6	7008360	TTY CABLE	1	0	1	0	0				
7		CRYSTAL	1	1	1	1	1				
8		DL11 ENGINEERING DRAWINGS	1	1	1	1	1				
9	DEC-11-HDLAA-A-D	DL11 ASYNCHRONOUS LINE INTERFACE MANUAL	1	1	1	1	1				
10	LIBKIT-11-KL11-Ø4	KL11 MAINDEC	1	1	0	0	0				
11	LIBKIT-11-DL11C-A-K	DL11 MAINDEC	0	0	1	1	0				
12	LIBKIT-11-DL11E-A-K	DL11 MAINDEC	0	0	0	0	1				
13	H315	MODEM TEST CONNECTOR	0	A/R	0	A/R	A/R	SEE	NOTE #3		
	NOTES: 1. G8ØØØ IS	REQUIRED ONLY IN PDP-11 SYSTEMS									
	WHERE +15V	IS NOT AVAILABLE. ONE PER DD11-A.									
	2. CRYSTAL	FREQUENCY DEFINED BY CUSTOMER SPECIFIED BAUD RATE.									
	3. ONE H315	PER PDP11 SYS. OR ONE PER DL11 B D OR E LOOSE PIECE/ADD ON.									
	4. INSURE THAT	TRANSPARENT VINYL TAPE HAS BEEN APPLIED TO THE									
	TOP SURFACE	OF THE CRYSTAL AND MOUNTING BRACKET.									

TITLE	ASSY. NO.	SIZE	CODE	NUMBER	REV.	ECO NO
DL11 CHECK LIST	SHEET 1 OF 1	A	AL	DL11-Ø-5	D	DL11-CCØ1Ø
		DIST.				

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

DATE 6-21-72

TITLE DL11 INSTALLATION PROCEDURE

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
C	CHANGE PER ECO	DL11-4	JANSON	3/73	P. Janson	4-6-73
D	CHANGE PER ECO	DL11-5	CONDON	7/73	P. Condon	8/1/73
E	CHANGE PER ECO	DL11-7	CONDON	8/74	P. Condon	8/21/74
F	CHANGE PER ECO	DL11-8	CONDON	4-75	P. Condon	4/8/75
H	CHANGE PER ECO	DL11-10	HARRINGTON	3-78	R. Harrington	25APR78

ENG	APPD	SIZE	CODE	NUMBER	REV
Paul E. Janson	Paul E. Janson	A	SP	DL11-0-2	H

DEC FORM NO. DRA 107A

MK

SHEET 1 OF 11

ENGINEERING SPECIFICATION [redacted] CONTINUATION SHEET

TITLE DL11 INSTALLATION PROCEDURE

DL11 INSTALLATION PROCEDURE:

Installation of the M7800 module or its variation as a DL11-A through DL11-E option consists of the following preparations:

1. Jumper insertion/deletion for selection of operation mode (A, B, C, D, or E, TO MEET CUSTOMER'S REQUIREMENTS).
2. Register address assignment.
3. Vector address assignment.
4. Priority assignment.
5. Special NPR jumper insertion/deletion.
6. Selection of data format (data bits, stop bits, parity).
7. Selection of crystal for baud rate.
8. Installation of G8000 in systems where +15v is not available.
9. Filter capacitor selection for high baud rate current-loop.
A. OPERATION MODE:

The following describes the jumpers associated with controlling the mode of operation (A,B,C,D, or E):

J1. Ties EIA driver to REQUEST-TO-SEND lead (pin 4) of dataset cable. IN for DL11-B,D, and E; does not affect DL11-A and C. Drawing DL-7.

J2. Ties EIA driver, normally used for the REQUEST-TO-SEND lead, to FORCE BUSY lead (pin 25) for use with Bell 103E. This is a customer option. If not specified, jumper is OUT for all DL11's. Drawing DL-7.

J3. When inserted, allows REQUEST-TO-SEND lead (pin 4) to be controlled by bit 2 of the receiver status register. OUT for DL11-B and D; IN for DL11-E; does not affect DL11-A and C. Drawing DL-4.

J4. When inserted, forces "DATA LEADS ONLY" mode of EIA operation. Turns DATA TERMINAL READY (pin 20) and REQUEST-TO-SEND (pin 4) on. IN for DL11-B and D; OUT for DL11-E; does not affect DL11-A and C. Drawing DL-4.

J5. When inserted, allows the BREAK bit to function. OUT for DL11-A and B; IN for DL11-C,D, and E. Drawing DL-4.

J6. When inserted, allows DSET INT to cause interrupts. OUT for DL11-A,B,C and D; IN for DL11-E. Drawing DL-4.

J7. When inserted, allows dataset control bits to be read as part of the receiver status register.

SIZE	CODE	NUMBER	REV
A	SP	DL11-0-2	H

DEC FORM NO DEC 16-(381)-1022-N370 DRA 108

MK

SHEET 2 OF 11

ENGINEERING SPECIFICATION [redacted] CONTINUATION SHEET

TITLE DL11 INSTALLATION PROCEDURE

J7. (con't)

OUT for DL11-A,B,C and D; IN for DL11-E. Drawing DL-2.

J8. When inserted, allows error bits to be read as part of the receiver data register. OUT for DL11-A and B; IN for DL11-C,D and E. Drawing DL-2.

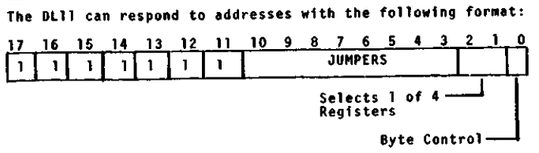
Summary of mode control jumpers:

JUMPER	A	B	C	D	E	DRAWING
J1	*	IN	*	IN	IN	DL-7
J2	OUT	OUT	OUT	OUT	OUT	DL-7
J3	*	OUT	*	OUT	IN	DL-4
J4	*	IN	*	IN	OUT	DL-4
J5	OUT	OUT	IN	IN	IN	DL-4
J6	OUT	OUT	OUT	OUT	IN	DL-4
J7	OUT	OUT	OUT	OUT	IN	DL-2
J8	OUT	OUT	IN	IN	IN	DL-2

*= don't care

B. REGISTER ADDRESS ASSIGNMENTS:

The DL11 can respond to addresses with the following format:



Bits 10 through 3 are controlled by jumpers A10 to A3. A jumper inserted indicates a zero.

For the DL11-A and B used as the console device, address 777560 is assigned. For additional units, assign 776XX0, where XX=50 for the first additional unit and XX=67 for the 16th unit.

For the DL11-C,D and E assign address 77XXX0, where XXX=561 for the first line, and XXX=617 for the 31st line. Assign all C's first, then D's, and then E's.

SIZE	CODE	NUMBER	REV
A	SP	DL11-0-2	H

DEC FORM NO DEC 16-(381)-1022-N370

MK

SHEET 3 OF 11

ENGINEERING SPECIFICATION [redacted] CONTINUATION SHEET

TITLE DL11 INSTALLATION PROCEDURE

C. VECTOR ADDRESS ASSIGNMENT:

Jumpers V8 through V3 control the interrupt vector. A jumper inserted provides a vector bit of one. Vectors can be produced in the form XX0 and XX4 where XX ranges from 00 to 77.

For the DL11-A and B used as a console device the vector address is 060/064. For additional units vectors are floating.

For the DL11-C,D, and E vector addresses are floating. Assign all C's first. then D's. then E's.

D. PRIORITY ASSIGNMENT:

Interrupt priority is established by inserting a "priority plug" in the socket at IC location E19. For DL11-A B,C,D and E use level 4, for the standard assignment or level 5-7 as specified by the customer or the documentation of an option which uses the DL11.

SUMMARY OF REGISTER, VECTOR AND PRIORITY ASSIGNMENTS:

	ADDRESS	VECTOR	PRIORITY
DL11-A,B CONSOLE	777560 777562 777564 777566	60/64	BR4
DL11-A,B ADDITIONAL UNITS	776XX0 776XX2 776XX4 776XX6	FLOATING	BR4

Where XX= 50 for line #1
and XX= 67 for line #16

	ADDRESS	VECTOR	PRIORITY
DL11-C,D,E	77XXX0 77XXX2 77XXX4 77XXX6	Floating	4

Where XXX= 561 for line #1
and XXX= 617 for line #31

SIZE	CODE	NUMBER	REV
A	SP	DL11-0-2	H

DEC FORM NO DEC 16-(381)-1022-N370 DRA 108

MK

SHEET 4 OF 11

E. SPECIAL NPR JUMPER:

Jumper N1, shown on drawing DL-6, controls the response of the interrupt circuit to an NPR request. The jumper should normally be IN, except for 11/20 and 11/15 systems without the KH11 option.

F. SELECTION OF DATA FORMAT:

1. Data Bits

Split lug pairs NB2 and NB1 control the number of data bits in the serial character as follows:

NB2	NB1	# OF DATA BITS
OUT	OUT	8
OUT	IN	7
IN	OUT	6
IN	IN	5

2. Parity

Parity is controlled by split lug pairs NP and EPS as follows:

NP	EPS	PARITY
OUT	OUT	OFF
OUT	IN	OFF
IN	OUT	EVEN
IN	IN	ODD

3. Stop Bits

Split lug pair 2SB and jumpers J9, J10 and J11 control the number of stop bits in the serial character as follows:

2SB	J9	J10	J11	# OF STOP BITS
OUT	OUT	IN	OUT	2
IN	OUT	IN	OUT	1
IN	OUT	OUT	IN	1.5 for TI, GI, and SMC UARTS } SEE FIGURE 1 PAGE 11
IN	IN	OUT	OUT	1.5 for WD UARTS }

G. CRYSTAL SELECTION:

The clocking scheme of the DL11 consists of a single crystal oscillator feeding a divider network, with two 10-position switches tapping various points to feed into the UART's

G. Con't

transmitter and receiver sections. Thus, for a given crystal frequency, 8 baud rates are independently selectable for transmit and receive. The two addition switch positions select external clocks.

SPEED GROUP		1	2	3	4
		CRYSTAL (HZ)			
POSITION	FACTOR	844.8K	1.03296M	1.152M	4.608M
1*	23040	36.7	44.8	50	200
2	15360	55	67.3	75	300
3	7680	110	134.5	150	600
4	3840	220	269	300	1200
5	1920	440	538	600	2400
6	960	880	1076	1200	4800
7	640	1320	1614	1800	7200
8	480	1760	2152	2400	9600

*Most counter-clock wise position.

To determine a crystal frequency for a non-standard baud rate, pick the position of the closest baud rate in the 1.152MHz column, and then multiply the non-standard baud rate by the factor for that position. For example, if the customer specifies 1050 baud, this is closest to 1200 baud, position 6.

1050 X 960 = 10080000 = 1.008MHz.

The crystal frequency should not fall outside the range of the standard crystals. Although the above table included only the standard DL11 crystals other values may be specified by the customer or by other documentation of an option which uses the DL11.

DEC part number for the standard crystals are as follows:

844.8 KHz	18-10245-1*
1.03296 MHz	18-05501-6
1.152 MHz	18-05501-5
4.608 MHz	18-05501-7

*Use A or C cut crystals only. Do not use crystals marked NE-6D.

When ordering a special crystal, refer to purchase specification 18-05501 for crystal specification.

Insure that transparent vinyl tape (9008269) is applied to the top surfaces of the crystal and mounting brackets to insulate from adjacent modules.

H. G8000 INSTALLATION:

For DL11-B, D, and E a positive voltage is required between 9 and 15 volts to operate the EIA drivers. For PDP-11/20 and PDP-11/15 systems with the H720 power supply, a G8000 module must be installed to provide this voltage. Using a filter network, this module converts the full-wave rectified "+8V" signal to a positive DC voltage.

1. Install G8000 into slot AØ2 of DD11-A.
2. Wire AØ3V2 to AØ2V2.
3. Wire AØ2N2 to CXXU1 where XX is the slot location of the M7800.

Refer to diagram 1.

I. FILTER CAPACITOR SELECTION:

For DL11-A's and DL11-C's, which operate with 20ma current loops, capacitors are used to filter the receive line and slow the switching time of the transmit line. To avoid excessive distortion above 150 baud, the capacitance in each of these two circuits must be reduced. This is accomplished by clipping C29 (.47 mfd) and C31 (1000 pf), both shown on drawing DL-3.

J. DL11-B,D,E in Systems with +15V available using DD11-A

There is a special situation of using a DD11-A to mount a DL11-B, D, Or E in systems with +15V available. These systems have +15V available and it appears at pin AØ3V2 of the DD11-A when using power harness such as 7009177, 7008855, or 7008909. In this situation, no G8000 is necessary, and +15V can be wired directly from AØ3V2 to CXXU1, where XX is the slot number of the DL11. NOTE: this does not apply to DL11-A or C or DD11-B.

K. When using the DL11-B,D,E in an 11/05 processor pin CXXU1 has +15V available on it so no G8000 or no jumpers are required.

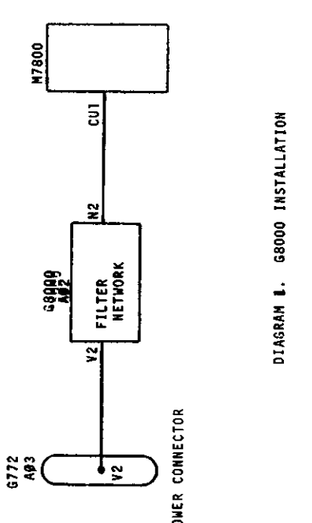


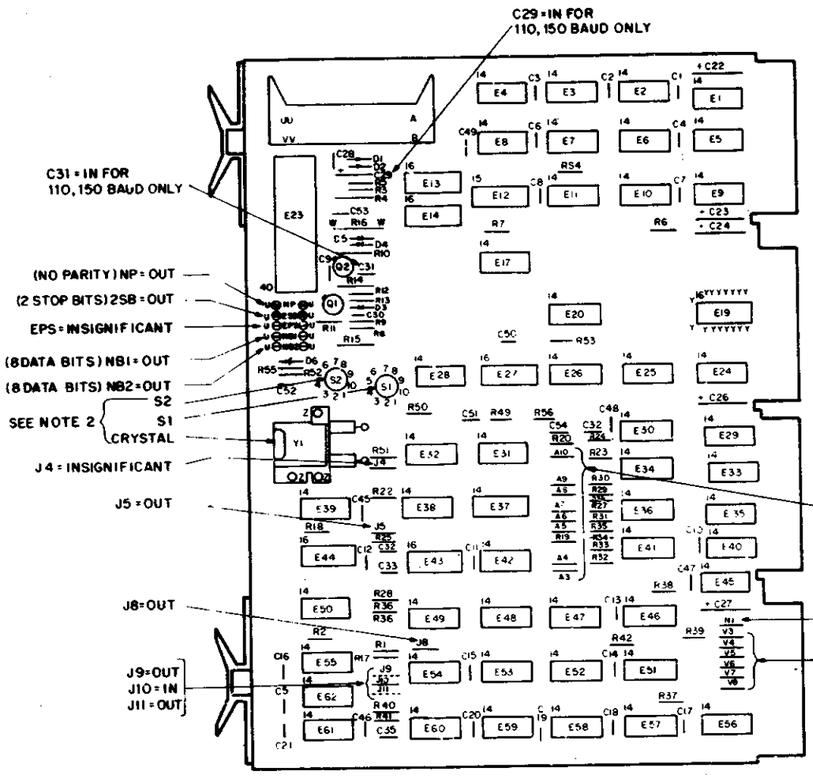
DIAGRAM 1. G8000 INSTALLATION

ENGINEERING SPECIFICATION

CONTINUATION SHEET

TITLE DL11 INSTALLATION PROCEDURE

DL11—A



NOTES:

1. For further information on the DL11-A configuration or the installation of DL11-B, DL11-C, DL11-D or DL11-E refer to
   a. DL11 Asychronous Line Interface Manual
   b. A-SP-DL11-0-2 (DL11 installation procedure) in the DL11 Engineering Drawings.
2.

SPEED GROUP	1	2	3	4
CRYSTAL FREQ (HZ)	844.8K	1.03296M	1.152M	4.608M
S1, S2 POS.	BAUD RATE			
1	36.7	44.8	50	200
2	55	67.3	75	300
3	110	134.5	150	600
4	220	269	300	1200
5	440	538	600	2400
6	880	1076	1200	4800
7	1320	1614	1800	7200
8	1760	2152	2400	9600

Position 1 is most counter-clockwise position.

SIZE A | CODE SP | NUMBER DL11-0-2 | REV H

SHEET 9 OF 11

MK

DEC FORM NO DRA 108 DEC 16-(381)-1022-N370

DL11-B/D/E
(M7800)

NOTE: For jumper configuration of DL11-B/D/E refer to page 3&5.

C29 and C31 are required for DL11-A and C at 150 BAUD or less, DL11-B,D&E don't care.

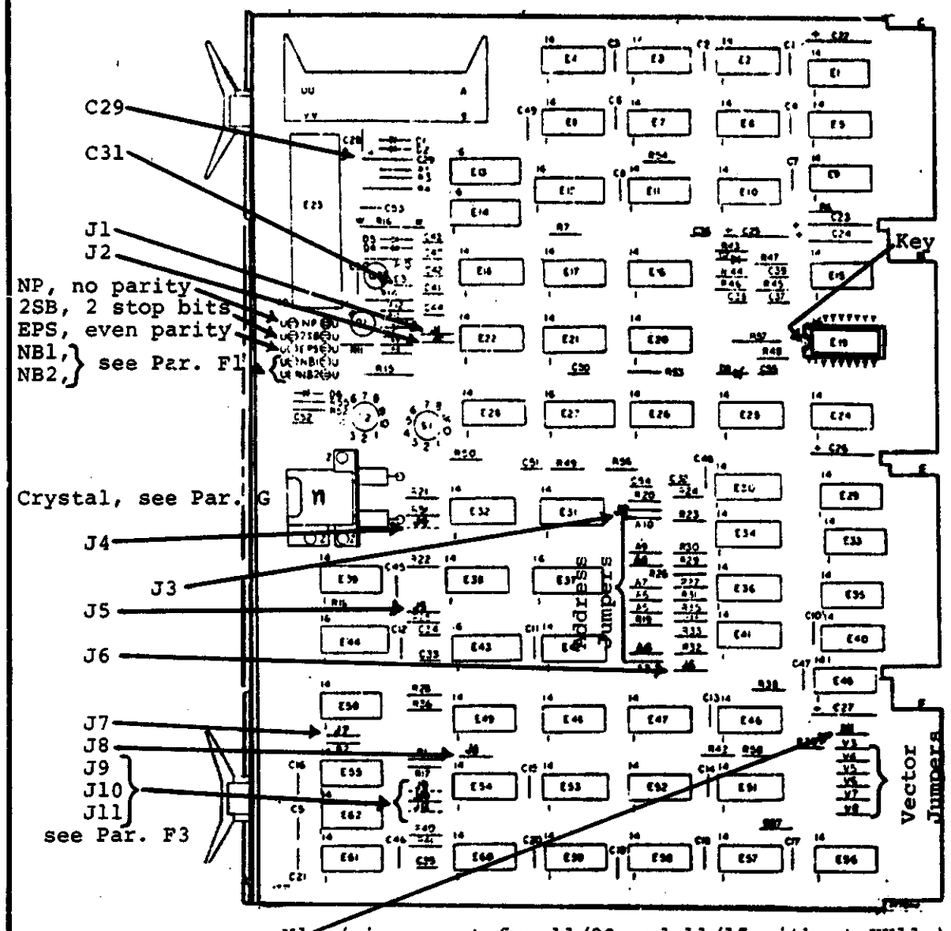


Figure 1
Identifying Marks for UART (19 10459) Vendors

STANDARD MICROSYSTEMS

GENERAL INSTRUMENT

TEXAS INSTRUMENTS

ADVANCED MICRO DEVICES

WESTERN DIGITAL