PDP-11/45, 11/70
HARDWARE INTRODUCTION
COURSE DRAWINGS

SECTION I
ASYNCHRONOUS LINE INTERFACE

FIELD MAINTENANCE PRINT SET

TABLE OF CONTENTS

UNIT VARIATIONS COVERED BY THIS PRINT SET
DL11-W
DL11-WA
DL11-WB
DL11-WC

DL11-W
Field Maintenance Print Set

Digital Equipment Corporation

PRINT SET ORDER NO.
MPØØ1Ø6

REVISIONS		
REV.	A	B
CHG. NO.	DL11W-1	DL11-W-2
DATE	NOV-76	8-77

USED ON OPTION/MODEL

SHEET 1 OF 1

DRN. D. Neal	DATE 26-MAR-76	digital
CHK'D D. Neal	DATE 26-MAR-76	TITLE: FIELD MAINTENANCE PRINT SET DL11-W
PROJ. ENG. R.E. Hatt	DATE 29-MAR-1976	SIZE B / CODE TC / NUMBER DL11-W-1 / REV. B
FIELD SERV. [illegible]	DATE 14-April-1976	DIST.

DEC 124

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY	D. HEALY	CHECKED	D. HEALY	SECTION	1
DATE	25 MAR 76	DATE	25 MAR 76		
ENG	R.E. BRATT	PROD	K. MACDONALD	ISSUED SECT.	1
DATE	1 APR 76	DATE	7-APR-76		

ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION DL11-W	DL11-WA	DL11-WB	DL11-WC
1	D-CS-M7856-Ø=1	SLU/RTC OPTION	1	1	1	1
2	D-1A-7008360-1-0	CABLE ASSY (KL8-E)	-	1	-	-
3	D-UA-BCØ5C-25-0	CABLE MODEM BCØ5C	-	-	1	-
4	D-UA-BC03L-10-0	CABLE ASSY	-	-	-	1
5	2376ØA9 *	BOOTSTRAP ROM	1	1	-	1
6	9906228 *	BOX ROM	1	1	-	1
7	D-CS-H315-0-1	MODEM TEST CONNECTOR (SEE NOTE 3.)	-	-	1	1

* 1. THE ROM AND ROM BOX WILL BE ADDED AT FA+T.

2. THE ROM AND ROM BOX ARE TO BE SHIPPED ONLY IF AN LT33 OPTION IS SHIPPED WITH A UNIBUS 11 SYSTEM.

3. ONE H315 PER PDP-11 SYS. OR ONE PER DL-11/WB OR WC LOOSE PIECE/ADD ON.

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV	ECO NO
SERIAL LINE/LINE CLOCK DL11-W	NONE	A	PL	DL11-W-Ø	D	DF11W MK005
	SHEET 1 OF 1	DIST				

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

MK

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

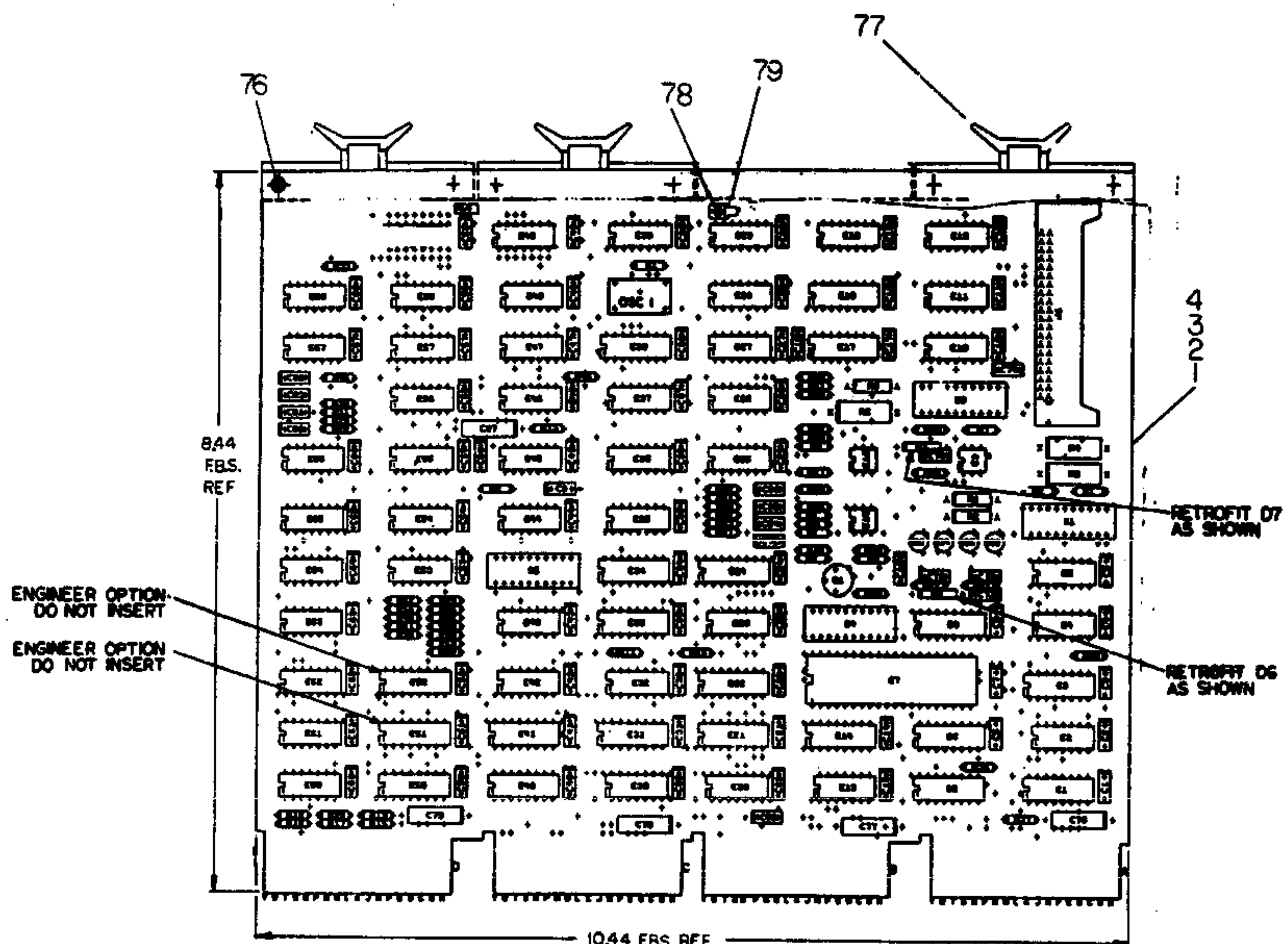
MADE BY D. HEALY	CHECKED D. HEALY	SECTION 1
DATE 25 MAR 76	DATE 25 MAR 76	
ENG R.B. Pratt	PROD K.N. MacDonald	ISSUED SECT. 1
DATE 1-APR-76	DATE 7 APR 76	

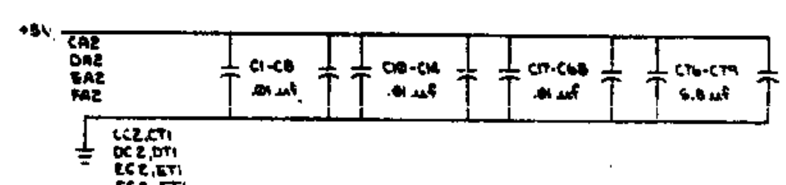
ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION DL11-W	DL11-WA	DL11-WB	DL11-WC
1	D-CS-M7856-Ø-1	SLU/RTC OPTION	1	1	1	1
2	D-IA-7008360-1-0	CABLE ASSY (KL8-E)	-	1	-	-
3	D-UA-BCØ5C-25-0	CABLE MODEM BCØ5C	-	-	1	-
4	D-UA-BC03L-10-0	CABLE ASSY	-	-	-	1

TITLE: SERIAL LINE/LINE CLOCK DL11-W	ASSY NO. NONE	SIZE A	CODE PL	NUMBER DL11-W-Ø	REV. A	ECO NO. DL11W 00001
	SHEET 1 OF 1	DIST.				

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

NOTES:





IC TYPE	GND	+5V
IC 384	1	8
IC 8837	8	16
IC 914A	1	6
IC 74123	8	16
IC 74157	8	16
IC 74163	8	16
IC 7493	10	5
IC 7492	10	5
IC 74151	8	16
IC 74175	8	16
IC UART	1	3
IC 8097	8	16
IC 8641	8	16

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

IC PIN LOCATIONS

PARTS LIST

QTY	REF. DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
REF		X-Y COORDINATE HOLE LOCATION	K-CO-M7856-0-4	1
REF		ASSY/DRILLING HOLE LAYOUT	D-AM-M7856-0-5	2
REF		MODULE ECO HISTORY	D-MM-M7856-0-6	3
1		ETCHED CIRCUIT BOARD	5011464	4
67	C1 THRU C8, C10 THRU C15, C17 THRU C68, C80	CAPACITOR, .01uf, 100V, 20%	1001610-01	5
7	C9, C69 THRU C74	CAPACITOR, 470pf, 100V, 5%	1000024	6
1	C75	CAPACITOR, 330pf, 100V, 5%	1000023	7
6	C80 THRU C85	CAPACITOR, 82pf, 100V, 5%	1000015	8
1	C86	CAPACITOR, 150pf, 100V, 5%	1000019	9
1	C87	CAPACITOR, 2.2uf, 20V, 10%	1002627	10
4	C70, C71, C78, C79	CAPACITOR, 6.8uf, 35V, 10%	1005306	11
1	C16	CAPACITOR, 5000pf, 100V, 20%	1001765	12
3	D1, D2, D3	DIODE, 1N4008	1105796	13
1	D4	DIODE, ZENER 1N4742	1109502	14
2	D6, D7	DIODE, CURRENT LIMITER MCL1301	1105610	15
1	D8	DIODE, D664	1100114	16
4	S1, S3, S4, S5	SWITCH, 10 POSITION	1211164-06	17
1	S2	SWITCH, 8 POSITION	1211164-04	18
				19
				20
1	J1	CONNECTOR, 40 PIN	1209941	21
1	R63	RESISTOR, 330, 1/4W, 5%	1300295	22
3	R1, R2, R3	RESISTOR, 100 OHM, 1/2W, 5%	1300286	23
3	R4, R5, R6	RESISTOR, 560 OHM, 1W, 5%	1303640	24
2	R7, R8	RESISTOR, 68K, 1/4W, 5%	1301327	25
1	R9	RESISTOR, 33 OHM, 1/4W, 5%	1300197	26
1	R10	RESISTOR, 120K, 1/4W, 5%	1300539	27
1	R12	RESISTOR, 680, 1/4W, 5%	1301424	28
1	R25	RESISTOR, 68 OHM, 1/4W, 5%	1300219	29
2	R13, R14	RESISTOR, 100 OHM, 1/4W, 5%	1300229	30
4	R15, R16, R17, R18	RESISTOR, 180 OHM, 1/4W, 5%	1301322	31
4	R19, R20, R21, R22	RESISTOR, 390 OHM, 1/4W, 5%	1300309	32
1	R23	RESISTOR, 7.5K, 1/4W, 5%	1301422	33
2	R27, R28	RESISTOR, 150 OHM, 1/4W, 5%	1300250	34
6	R28 THRU R33	RESISTOR, 270 OHM, 1/4W, 5%	1301072	35
27	R35, R36, R37, R39 THRU R62	RESISTOR, 10K, 1/4W, 5%	1300479	36
3	R11, R64, R38,	RESISTOR, 1K, 1/4W, 5%	1300385	37
1	R34	RESISTOR, 220 OHM, 1/4W, 5%	1300271	38
1	Q1	TRANSISTOR, DEC 6531B	1509330	39
2	Q3, Q4	TRANSISTOR, A05	1510705	40
2	Q2, Q5	TRANSISTOR, A55	1510106	41
2	E9, E16	OPTICALLY COUPLED ISOLATOR	1510727-1	42
1	OSC 1	OSCILLATOR 5068 MHZ	1011080-02	43
1	E15	I.C. DEC 4N25	1911998	44
3	E1, E8, E14	I.C. DEC 8641	1911579	45
6	E2, E13, E20, E60, E61, E49	I.C. DEC 8881	1909705	46
1	E3	I.C. DEC 8097	1911527	47
3	E4, E44, E64	I.C. DEC 7404	1910159	48
7	E5, E35, E37, E55, E57, E63, E66	I.C. DEC 7474	1905547	49
1	E7	I.C. DEC UART (1808)	1910450-01	50
1	E8	I.C. DEC 74175	1910651	51
1	E10	I.C. [illegible]C 1489L	1910323	52
1	E11	I.C. DEC 1488L	1910322	53
2	E17, E18	I.C. DEC 74151	1909936	54

FIRST USED ON OPTION MODEL

ETCH BOARD REV. 0

SEMICONDUCTOR CONVERSION CHART

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

REV.	CHANGE NO.	ORIG.	DATE
D	M7856-00001	R. Sherwood	2-3-76
E	M7856-00002	R.J. Alberico	2-10-76

DRN [signature] DATE 9/2/75
CHKD [signature] DATE 9-4-75
ENG [signature] DATE
PROD. ENG. [signature] DATE
NEXT HIGHER ASSY

digital

TITLE SLU/RTC OPTION

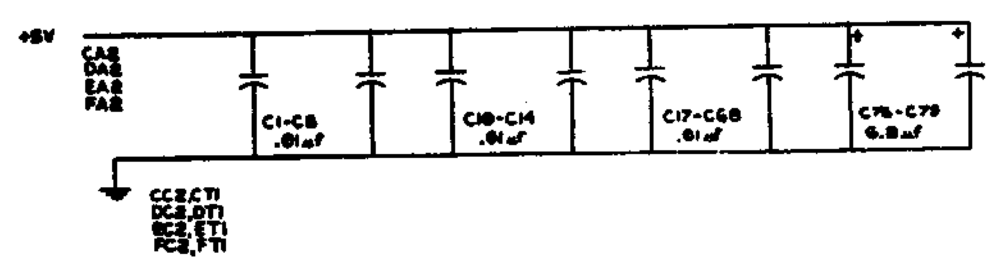
SIZE D CODE CS NUMBER M7856-0-1 REV E

SCALE

SHEET 1 OF 9

D CS M7856-0-1 E

NOTES:



IC TYPE	GND	+5V
IC 8641	8	16
IC 394	1	8
IC 8907	8	16
IC 314A	1	8
IC 74123	8	16
IC 74157	8	16
IC 74153	8	16
IC 7493	10	5
IC 7492	10	5
IC 74151	8	16
IC 74175	8	16
IC UART	1	3
IC 8097	8	16

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.

PARTS LIST

QTY	REF. DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

ETCH BOARD REV. E

FIRST USED ON OPTION MODEL

REVISIONS: R. HARRINGTON; M7856-N0095; B. CRANNA; CHANGE NO.; DATE; REV. J

DRN. D. Donaldson DATE 2/23/79

CHK'D. DATE

ENG. DATE

PROD. ENG. DATE

PROJ. DATE

NEXT HIGHER ASSY

SCALE

SHEET 1 OF 8

digital

TITLE SLU/RTC OPTION

SIZE	CODE	NUMBER	REV.
D	CS	M7856-0-1	J

D CS M7856-0-1 J

DL-1 RCVR INTR RQST H

DL-3 RCVR SEL H
DL-3 MASTER H
7486 E44
7474 E37
DL-4 SEC 6 H
RCSR CLR H
DL-4 B INIT L
DL-1 RCVR INTR ENB (1) H
DL-4 SEC 0 H
7474 E35
DL-1 RCVR INTR ENB (1) L
DL-1 RCVR BUSY (1) H
DL-4 SEL 2 L
7486 E46
7474 E5
7486 E4
DL-1 RCVR DONE H
+5V
R45 10 K
74157 E47
LD CLR CLKB CLK1
7402 E36
DL-4 B INIT H
+5V -12V
CLR R DONE
STB STATUS
STB RD
R CLK
SERIAL IN
U ART E7
DL-4 SEC 7 H
DL-4 SEC 6 H
DL-4 SEC 5 H
DL-4 SEC 4 H
DL-4 SEC 3 H
DL-4 SEC 2 H
DL-4 SEC 1 H
DL-4 SEC 0 H
DL-4 LD 1 SEL L
LD XD
X CLR
SERIAL OUT
R DONE
RD7
RD6
RD5
RD4
RD3
RD2
RD1
RD0
CR ERR
FR ERR
P ERR
EOC
X RDY
DL-1 RD8TB
DL-1 RD8A H
DL-1 RD8B H
DL-1 RD8A H
DL-1 RD8 3 H
DL-1 RD8 2 H
DL-1 RD8 1 H
DL-1 RD8B H
8T97 E3
DL-1 CR ERR H
DL-1 FR ERR H
DL-1 P ERR H
DL-1 XMIT RDY H
7486 E4
DL-1 ERROR H
7414 E39
7414 E45
7414 E45
R32 270
R33 270
C84 .02MF
C85 .02MF
R47 10 K
XMIT INTR ENB (1) L
7486 E36
7474 E5
DL-1 XMIT INTR RQST H
DL-6 XMIT CLK H
DL-6 RCVR CLK H
DL-5 TTL SERIAL DATA IN
DL-5 SERIAL OUT H
FR ERR H
RCVR DONE H
74157 E38
SO STB
7437 E25
7486 E46
TB-1
BOOT SW L
(FASTON TAB)
74175 E8
DL-6 SEC 6 H
DL-6 SEC 0 H
DL-6 SEC 2 H
DL-6 RCSR CLR H
DL-6 B INIT L
XMIT INTR ENB (1) L
DL-1 XMIT INTR ENB (1) H
S4-1
DL-1 MAINT (1) H
DL-1 MAINT (1) L
7486 E46
DL-1 SERIAL OUT L
7486 E46
DL-1 BREAK (1) H
+5V
R46 10 K
DL-3 MASTER H
DL-3 XMIT SEL H
7486 E46
DL-4 LD X SEL L
7486 E4
7474 E5
SPARE LOGIC
7414 E46
7414 E10
7414 E10
7414 E10
5837 E41
5837 E41
5837 E41
7402 E36
7402 E36
7402 E36

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
SLU/RTC OPTION (DL-1)	D	CS	M7856-0-1	J
SCALE	SHEET 2 OF 8	DIST.		

MK 1

D

C

B

A

+5V
R39 10 K
DL-4 BSD .6µ H
DL-2 LTC BIT .6µ H
DL-4 BM SYN DEL L
DL-4 LTC IN L
7402 E58
7474 E48
DL-4 B INIT L
DL-2 LTC BIT .9T H
7474 E57
+5V
D8 D666
BUS LTC L
CR5 R43 330
7414 E45
CB5 .01µF
CB7 2.2µF
DL-4 BSD TH H
7404 E46
7410 E52
7400 E67
7402 E58
DL-4 BSYN L
+5V
RIT 180
BUS 866 IN H
DMA
R28 390
9857 E50
9857 E58
BUS BUSY L
FDI
BUS SYN L
EJI
9857 E58
DL-2 B BUS BUSY H
DL-2 B BUS SYN H
7402 E53
7400 E64
7400 E64
7400 E64
DL-4 B INIT H
7402 E53
7400 E54
7400 E54
+5V
R36 270
7474 E55
CB2 82 PF
7414 E66
R31 270
CB3 82 PF
7414 E44
7400 E65
+5V
R48 10 K
7474 E63
7402 E62
8881 E68
BUS BR4 L
8881 E68
+5
R18 100
DN2
BUS 866 OUT H
8881 E68
FT2
BUS SACK L
8881 E68
FDI
BUS BUSY L
DL-2 RTC MASTER L
7404 E56
8881 E28
PMI
BUS INTR L
MASTER CLEAR H

BUS SSYN L EJI
BUS MR L
BUS 866 IN H
BUS 866 OUT H
BUS SACK L
DMA
FT2
8251
+5V
MASTER CLEAR H
DL-4 B INIT H
RTC MASTER L
BUS BUST L
DE2
BUS BR6 L
ENGR OPTION - DO NOT INSERT

DP2 BUS BG5 IN H
DR2 BUS BG5 OUT H
DM2 BUS BG7 IN H
DL2 BUS BG7 OUT H

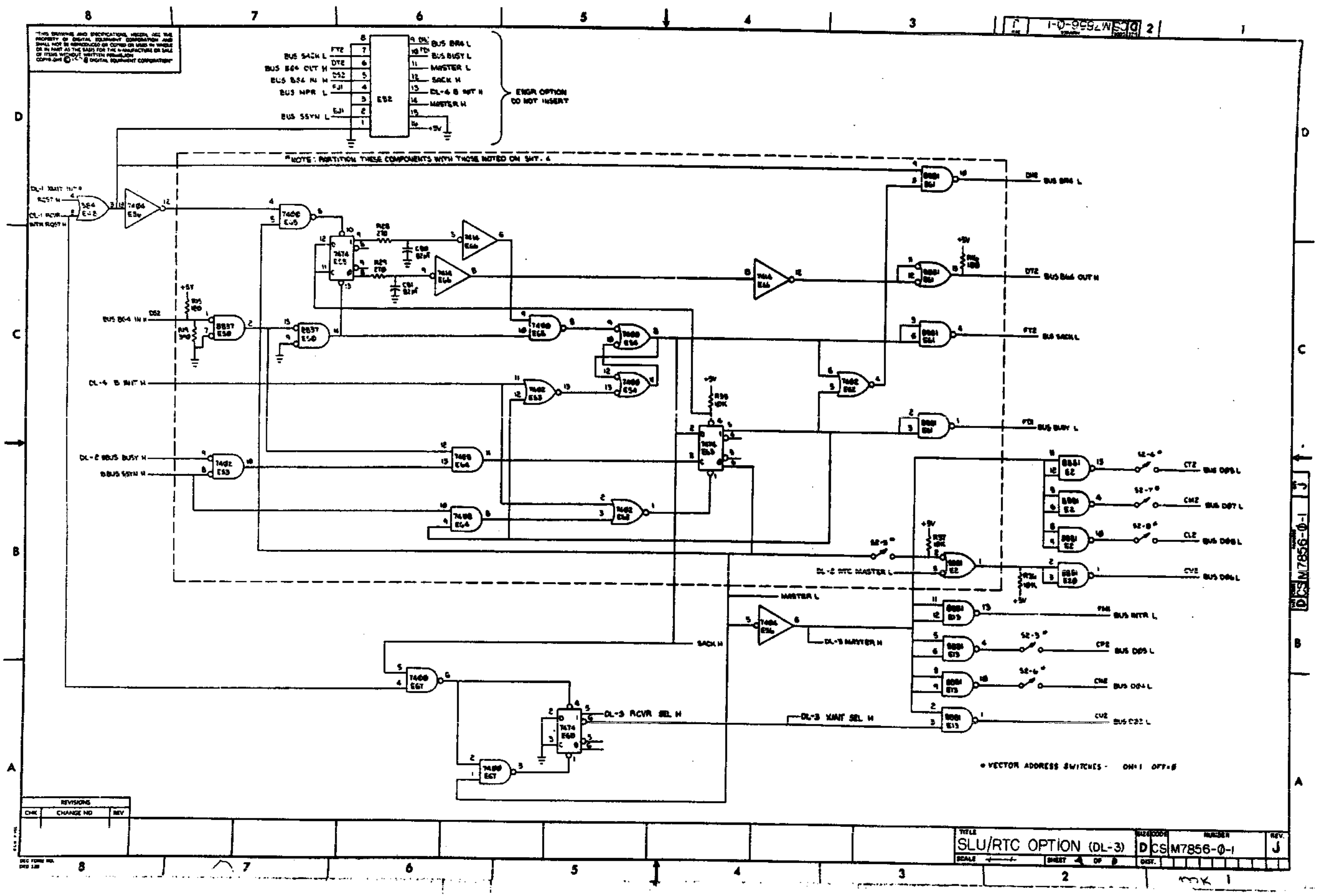
*NOTE: PARTITION THESE COMPONENTS WITH THOSE ON SHT 5

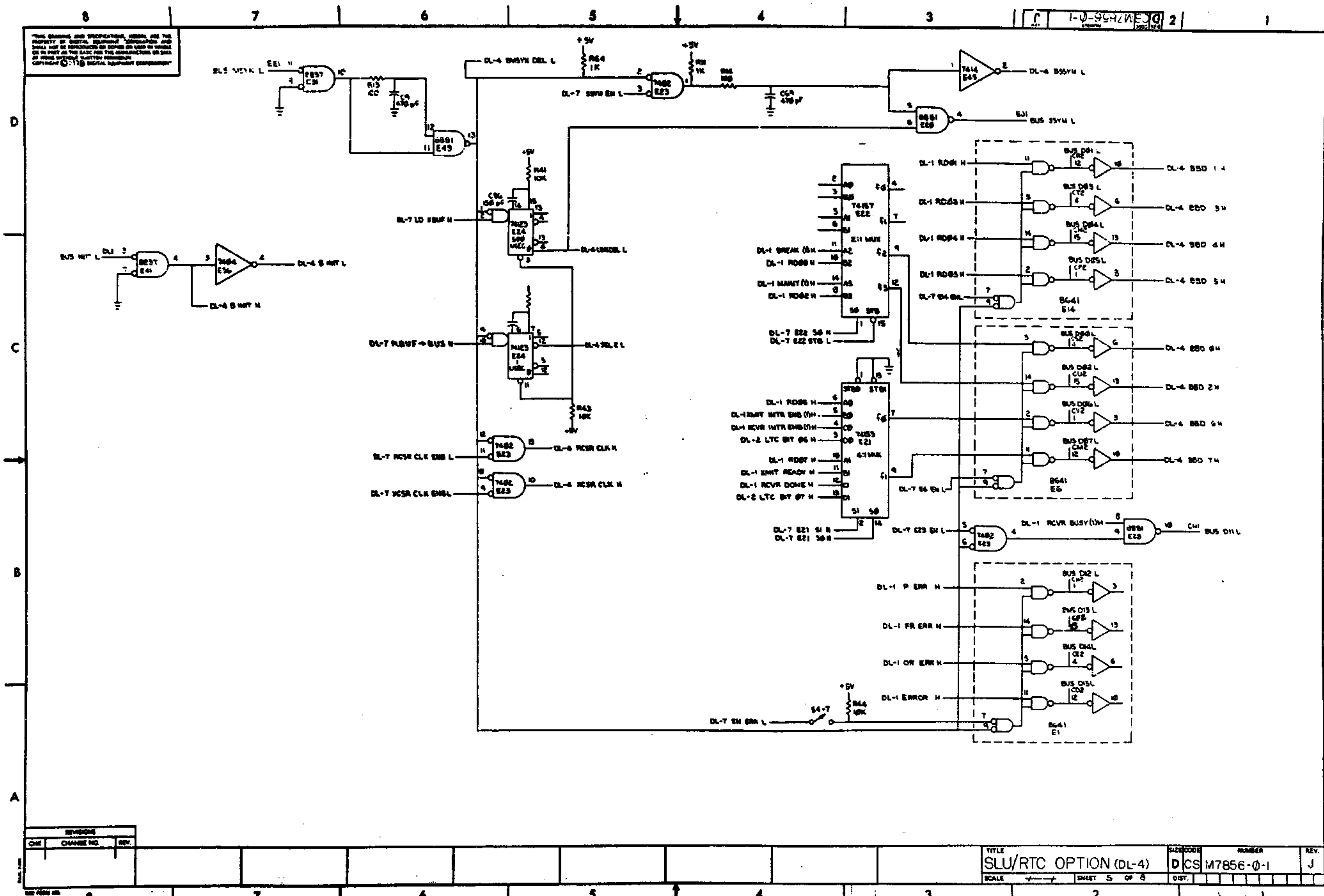
REVISIONS		
CHG	CHANGE NO	REV.

TITLE: SLU/RTC OPTION (DL-2)	SIZE: D	CODE: CS	NUMBER: M7856-0-1	REV: J
SCALE:	SHEET 3 OF 8	DIST:		

M7856-0-1 J

MK1


*NOTE: PARTITION THESE COMPONENTS WITH THOSE NOTED ON SHT. 4
ENGR OPTION
DO NOT INSERT
BUS SACK L
BUS BG4 OUT H
BUS BG4 IN H
BUS NPR L
BUS SSYN L
BUS BR4 L
BUS BUSY L
MASTER L
SACK H
DL-4 B INIT H
MASTER H
DL-1 XMIT INTR
RQST H
DL-1 RCVR INTR RQST H
BUS BG4 OUT H
BUS SACK L
DL-2 BBUS BUSY H
BBUS SSYN H
DL-2 RTC MASTER L
DL-3 MASTER H
DL-3 RCVR SEL H
DL-3 XMIT SEL H
BUS D08 L
BUS D07 L
BUS D06 L
BUS D05 L
BUS D04 L
BUS INTR L
BUS D02 L
* VECTOR ADDRESS SWITCHES - ON=1 OFF=0
REVISIONS
CHK
CHANGE NO
REV
TITLE
SLU/RTC OPTION (DL-3)
D CS M7856-0-1
J


BUS SSYN L
DL-4 BSSYN DEL L
DL-7 SSYN EN L
DL-4 BSSYN L
BUS SSYN L
BUS INIT L
DL-4 B INIT L
DL-4 B INIT H
DL-7 LD XBUF H
DL-7 RBUF→BUS H
DL-7 RCSR CLK ENB L
DL-4 RCSR CLK H
DL-7 XCSR CLK ENBL
DL-4 XCSR CLK H
DL-1 BREAK (1)H
DL-1 RD08 H
DL-1 MAINT (1)H
DL-1 RD02 H
DL-7 E22 S0 H
DL-7 E22 STB L
DL-1 RD01 H
DL-1 RD03 H
DL-1 RD04 H
DL-1 RD05 H
DL-7 E14 EN L
DL-4 BBD 1 H
DL-4 BBD 3 H
DL-4 BBD 4 H
DL-4 BBD 5 H
DL-4 BBD 6 H
DL-4 BBD 2 H
DL-4 BBD 7 H
DL-1 RD06 H
DL-1 RCVR DONE H
DL-1 XMIT READY H
DL-7 E21 S1 H
DL-7 E21 S0 H
DL-7 E6 EN L
DL-7 E23 EN L
DL-1 RCVR BUSY (1)H
BUS D11 L
DL-1 P ERR H
DL-1 FR ERR H
DL-1 OR ERR H
DL-1 ERROR H
DL-7 SN ERR L
BUS D12 L
BUS D13 L
BUS D14 L
BUS D15 L
8641
E14
E6
E1
REVISIONS
CHK
CHANGE NO.
REV.
TITLE
SLU/RTC OPTION (DL-4)
SIZE D
CODE CS
NUMBER M7856-0-1
REV. J
SCALE
SHEET 5 OF 8

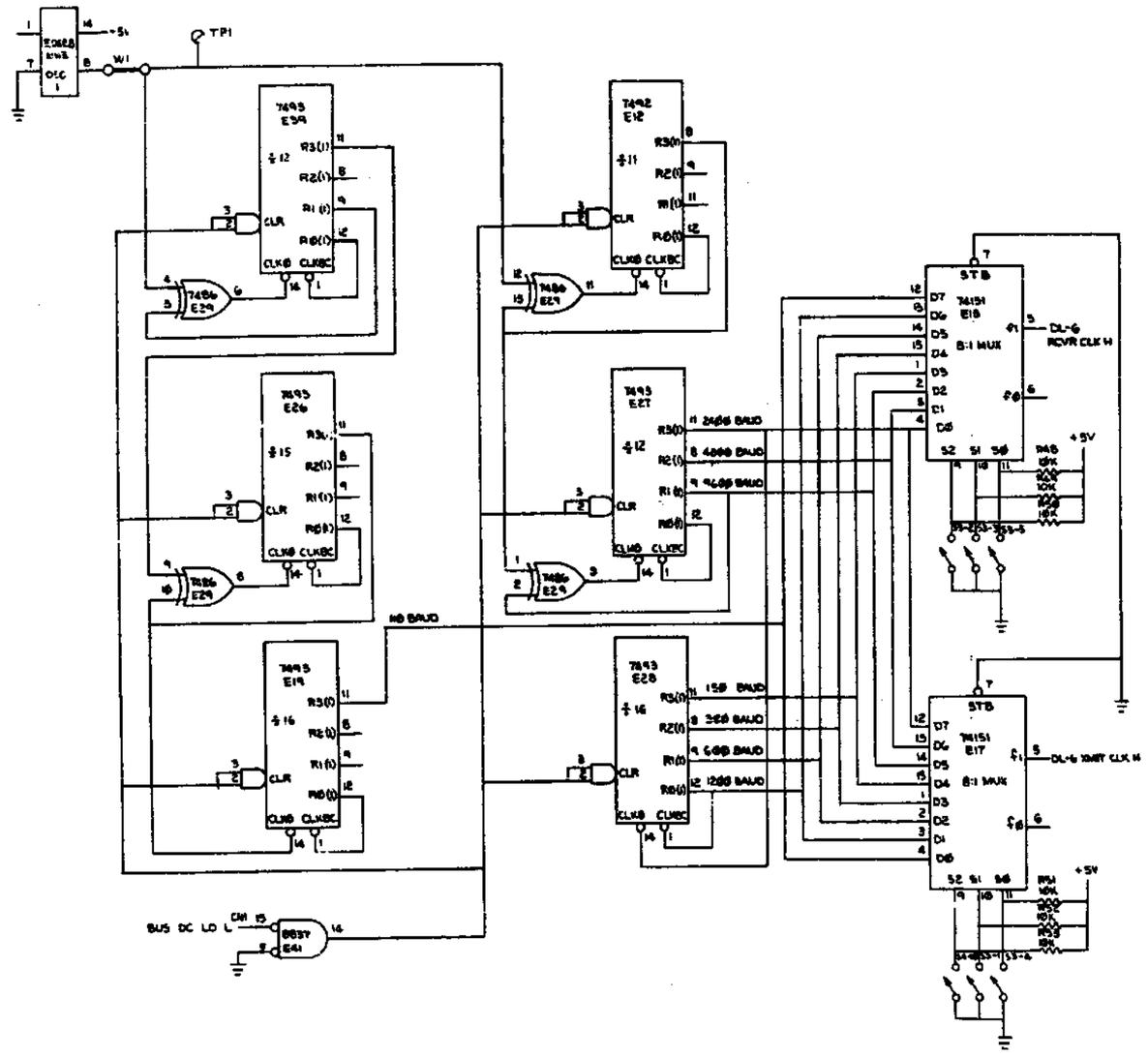
NOTE:
1. SWITCHES ARE SHOWN IN ACTIVE MODE.
2. D7, D6 ARE MCL136 1 MA CONSTANT CURRENT DIODES.

DL-1 RCR ENB (L)
DL-1 MAINT (L)
SERIAL OUT L
DL-5 SERIAL OUT H
DL-5 TTL SERIAL DATA IN
DATA TERMINAL READY
RQST TO SEND
+12/E11 PIN 14
+12/E11 PIN 1

REVISIONS		
CHK	CHANGE NO	REV.

TITLE	SLU/RTC OPTION (DL-5)	SIZE D	NUMBER DCS M7856-0-1
SCALE	SHEET 6 OF 8	DIST.	REV. J

MK 1

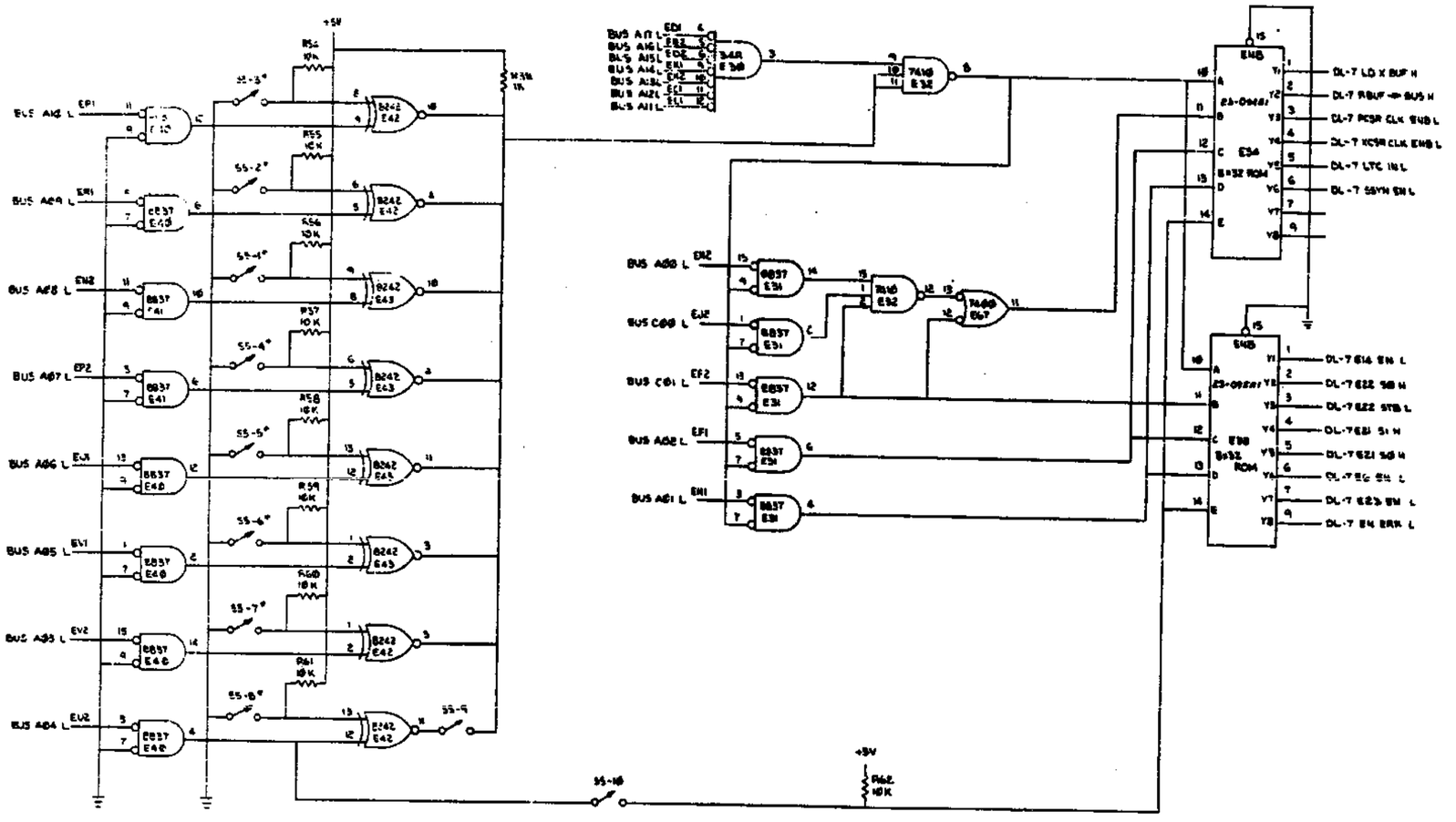


BAUD RATE	RCVR S3-2	RCVR S3-3	RCVR S3-5	XMIT S4-16	XMIT S3-1	XMIT S3-4
110	OFF	OFF	OFF	ON	ON	ON
150	ON	OFF	OFF	OFF	ON	ON
300	OFF	ON	ON	ON	OFF	OFF
600	OFF	ON	OFF	ON	OFF	ON
1200	OFF	OFF	ON	ON	ON	OFF
2400	ON	ON	ON	OFF	OFF	OFF
4800	ON	ON	OFF	OFF	OFF	ON
9600	ON	OFF	ON	OFF	ON	OFF

REVISIONS		
CHK	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV
SLU/RTC OPTION (DL-6)	D	CS	M7856-0-1	J
SCALE —	SHEET 7 OF 8		DIST.	

mk 1



*ADDRESS SELECTION SWITCHES * OFF=1 ON=0

REVISIONS		
CHK	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV.
SLU/RTC OPTION (DL-7)	D	CS	M7856-0-1	J
SCALE —	SHEET 8 OF 8	DIST		

DCS M7856-0-1

REV.	NUMBER	CODE	SIZE	
	M7856-0-9	CS	K	2

(FOR 23094AI-A07 & 23095AI-A07)

REVISIONS		
CHANGE NO.		
REV.		

DESCRIPTION	DWG./PART NO.	ITEM NO.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		

ANGLES ±0° 30'	CLASS OF ACCURACY (CHECK ONE)	NOMINAL DIMENSION RANGE INCHES					
		OVER 0 TO 0.2	OVER 0.2 TO 1.2	OVER 1.2 TO 4.0	OVER 4.0 TO 12.0	OVER 12.0 TO 40.0	OVER 40.0 TO 80.0
SURFACE QUALITY IN ✓ MICROINCHES	MEDIUM ☐	±.004	±.008	±.012	±.016	±.024	±.04
	PREFERRED ☐	±.012	±.016	±.025	±.04	±.063	±0.1

QUANTITY & VARIATION

THIRD ANGLE PROJECTION

REMOVE BURRS AND BREAK SHARP CORNERS

DO NOT SCALE DWG

MATERIAL —

FINISH —

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

NEXT HIGHER ASSY.
D-CS-M7856-0-1
SCALE —
SHEET 1 OF 3

FIRST USED ON
DL11-W

digital

TITLE
ROM LISTING

SITE	CODE	NUMBER	REV.
K	CS	M7856-0-9	

DIST.

DEC PART NUMB: 23094A1-A07
ORIGINATOR: BOB PRATT
DATE OF ORIGIN: 2/28/75

DECIMAL LOC	OCTAL LOC	BINARY DATA	OCTAL DATA
0	00	00111100	074
1	01	00111100	074
2	02	00111100	074
3	03	00111100	074
4	04	00111100	074
5	05	00111100	074
6	06	00111100	074
7	07	00111100	074
8	10	00111100	074
9	11	00111100	074
10	12	00111100	074
11	13	00111100	074
12	14	00001100	014
13	15	00111100	074
14	16	00011100	034
15	17	00111100	074
16	20	00011000	030
17	21	00111100	074
18	22	00011100	034
19	23	00111100	074
20	24	00010100	024
21	25	00111100	074
22	26	00011100	034
23	27	00111100	074
24	30	00011100	034
25	31	00111100	074
26	32	00011110	036
27	33	00111100	074
28	34	00011101	035
29	35	00111100	074
30	36	00011100	034
31	37	00111100	074

DEC PART NUMB: 23-095A1-A07
ORIGINATOR: BOB PRATT
DATE OF ORIGIN: 2/28/75

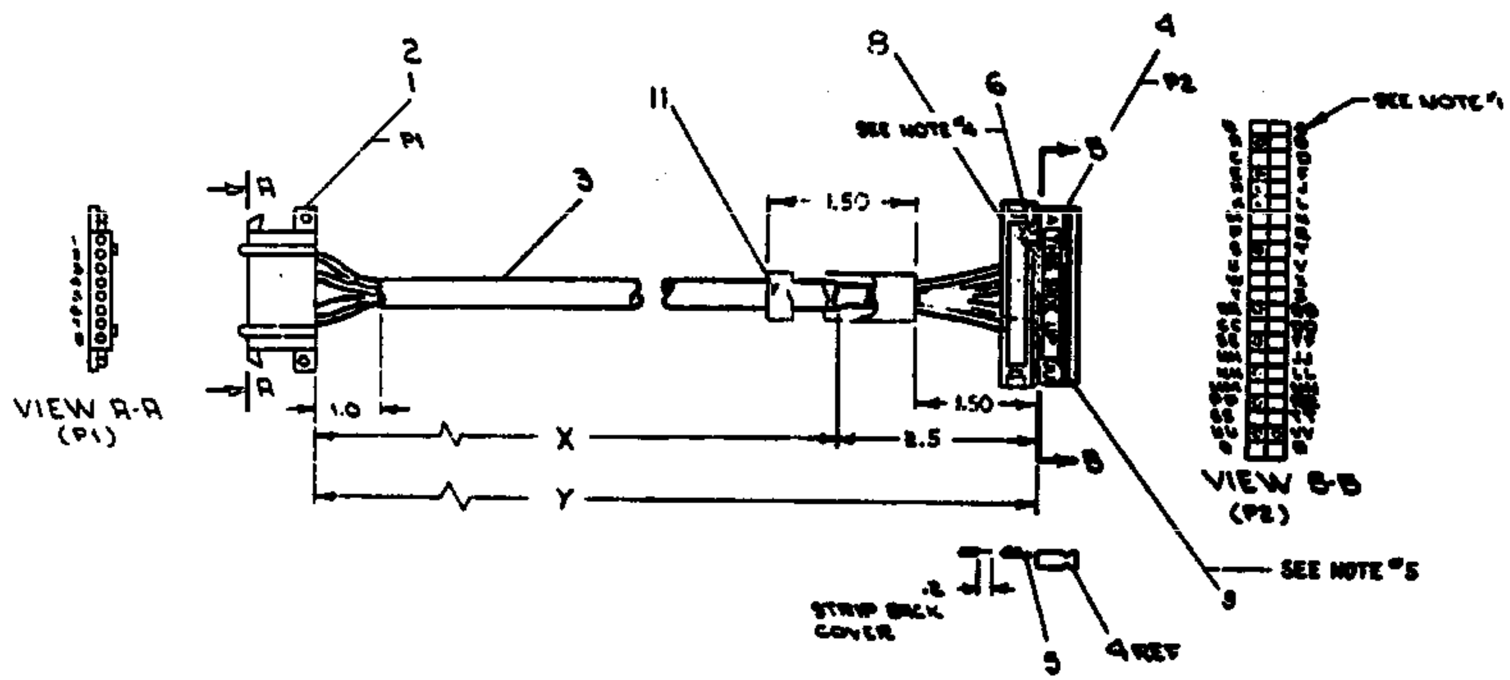
DECIMAL LOC	OCTAL LOC	BINARY DATA	OCTAL DATA
0	00	11111111	377
1	01	11111111	377
2	02	11111111	377
3	03	11111111	377
4	04	11111111	377
5	05	11111111	377
6	06	11111111	377
7	07	11111111	377
8	10	11111111	377
9	11	11111111	377
10	12	11111111	377
11	13	11111111	377
12	14	11011111	337
13	15	11111111	377
14	16	11111111	377
15	17	11111111	377
16	20	10001111	217
17	21	11111111	377
18	22	11111111	377
19	23	11111111	377
20	24	11010001	321
21	25	11111111	377
22	26	11111111	377
23	27	11111111	377
24	30	01000010	102
25	31	11111111	377
26	32	11111111	377
27	33	11111111	377
28	34	11111111	377
29	35	11111111	377
30	36	11111111	377
31	37	11111111	377

WIRE TABLE							
ITEM NO.	DESCRIPTION AWG	DESCRIPTION COLOR	PAIR NO.	FROM CONNECTION	FROM WITH	TO CONNECTION	TO WITH
3	22	[illegible]	1	P1-2	2	P2-KK	5
3		RED		P1-3	2	P2-5	
3,7		SHIELD		SEE NOTE #2	—	P2-N(NOTE #3)	
3		BLK	2	P1-4	2	P2-EE	
3		WHT		P1-5	2	P2-AA	
3,7		SHIELD		SEE NOTE #2	—	P2-[illegible]	
3		BLK	3	P1-6	2	P2-[illegible]	
3		GRN		P1-7	2	P2-[illegible]	
3,7		SHIELD		SEE NOTE #2	—	P2-VV(NOTE #3)	
6	22	BLK	—	P2-[illegible]	5	P2-H	5

LEGEND		
VARIATION	LENGTH X	LENGTH Y
7008360-0	45 IN ±1.0	27 IN ±1.0
7008360-1	[illegible]	48 IN ±1.0
7008360-9	[illegible]	[illegible]

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 #8 ("THIS SIDE UP" STICKER) ON LETTERED SIDE OF ITEM #4 (BERG HOUSING) AS SHOWN.



QTY.	DESCRIPTION	PART NO.	ITEM NO.
1	LABEL, CABLE IDENT	3616073	11
A/R	TUBING, SHRINK	9107252-00	10
1	LABEL, THIS SIDE UP	3611567	9
1	STRAIN RELIEF	1211166	8
A/R	TUB. THINWALL, NAT	9107267-11	7
A/R	WIRE, #22 AWG STRD TEF BLK	9107350-00	6
11	SOCKET, CRIMP # 47216	1210089-07	5
1	HOUSING BERG #45043-[illegible]	[illegible]	4
A/R	CABLE, [illegible] SHLD	9107723-0	3
6	CONTACT MATE-N-LOCK (FEMALE)	1209379-03	2
1	CONN. MATE-N-LOCK (FEMALE)	1209340-00	1

PARTS LIST

PDP-8E

SEE PARTS LIST

NEXT HIGHER ASSY: A ML-KL8-E-0

SCALE: NONE

SHEET 1 OF 1

EQUIPMENT CORPORATION

TITLE: CABLE ASSEMBLY (KL8E)

D IA 7008360-0-0 REV J

WIRE TABLE

ITEM NO.	AWG	COLOR	FROM CONNECTION	FROM WITH	TO CONNECTION	TO WITH
1	26	BLU/WHT	P1-1 *	12	J1-VV	7
		WHT/BLU	P1-2	8	J1-F	
		ORN/WHT	P1-3		J1-J	
		WHT/ORN	P1-4		J1-V	
		GRN/WHT	P1-5		J1-T	
		WHT/GRN	P1-6	8	J1-Z	
		BRN/WHT	P1-7 **	12	J1-UU	
		WHT/BRN	P1-8	8	J1-BB	
		SLA/WHT	P1-9		J1-Y	
		WHT/SLA	P1-10		J1-W	
		BLU/RED	P1-11		J1-FF	
		RED/BLU	P1-12		J1-JJ	
		ORN/RED	P1-13		J1-D	
		SLA/RED	P1-14		J1-LL	
1	26	BLA/GRN	P1-15		J1-N	7

ITEM NO.	AWG	COLOR	FROM CONNECTION	FROM WITH	TO CONNECTION	TO WITH
1	26	RED/BRN	P1-16	8	J1-NN	7
		SLA	P1-17		J1-R	
		RED/SLA	P1-18		J1-U	
		BLU/BLK	P1-19		J1-P	
		BLK/BLU	P1-20		J1-DD	
		ORN/BLK	P1-21		J1-MM	
		BLK/ORN	P1-22		J1-X	
		GRN/BLK	P1-23		J1-RR	
		BRN/RED	P1-24		J1-L	
		RED/ORN	P1-25	8	J1-C	
		SHIELD	P1-1 *	12	J1-A	
1		SHIELD	P1-7 **	12	J1-B	7
3		BLK	P1-1 *	12	P1-7 **	12
2	26	RED	J1-E	7	J1-M	7

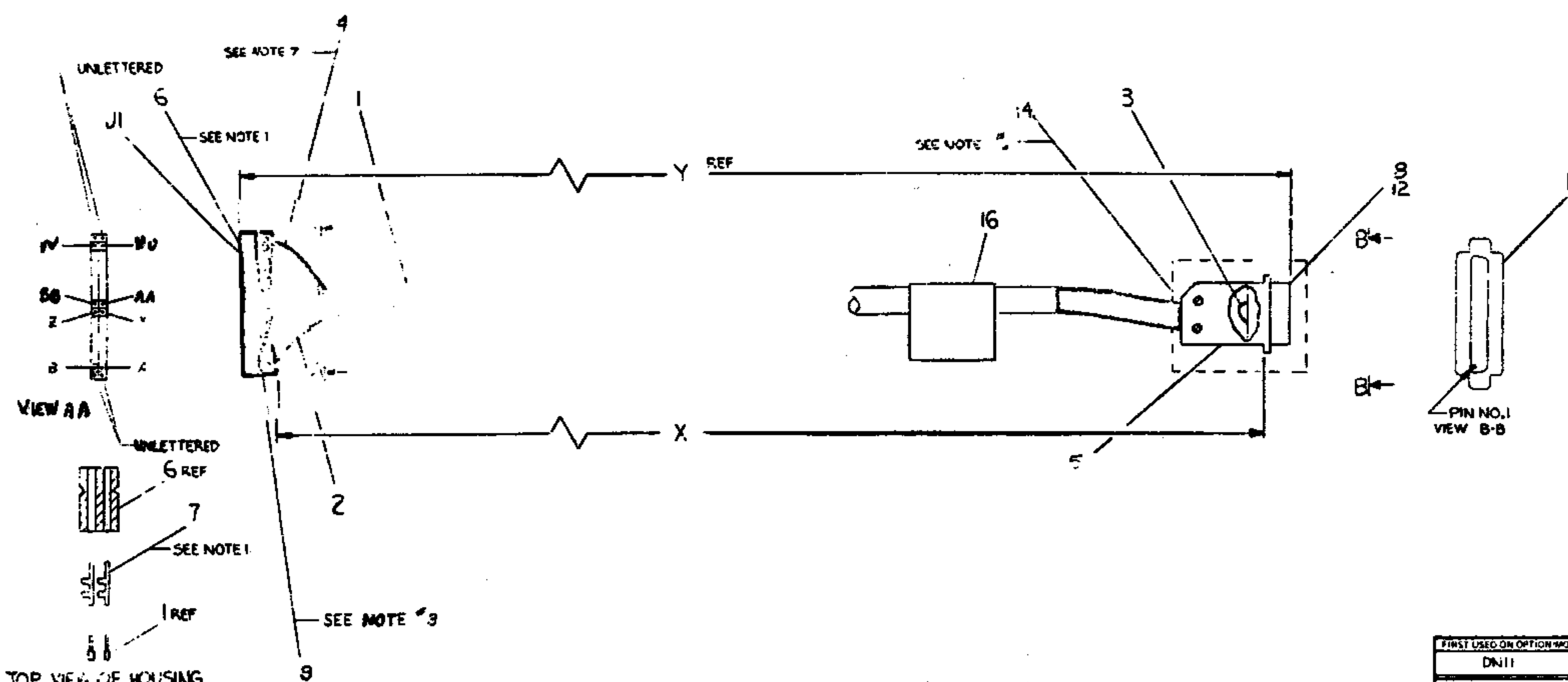
NB
* DENOTES THREE WIRES ARE SOLDERED INTO THE P1-1 SOLDER CUP
** DENOTES THREE WIRES ARE SOLDERED INTO THE P1-7 SOLDER CUP

LEGEND

NUMBER	VARIATION DIM X	VARIATION DIM Y (PRECUT)
BC05C-25	25'±3"	25' 1.8"
BC05C-50	50'±2%	50' 1.8"
BC05C-09	9'±3"	9' 1.8"
BC05C-1F	18'±1	19 8'
BC05C-2F	30'±1"	31.8"

NOTES:

1. MANUFACTURING SHOULD USE MACHINE CRIMPER TOOL FOR CRIMPING PINS (ITEM #7) MUST BE HT58 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. [illegible]
5. USE ITEM #12 (9107295) 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 #14 (9107834) AT JUNCTION OF CABLE AND HOOD
7. PLACE ITEM #4 (9107256) OVER SHIELD WIRE J1-A J1-B, P1-1, P1-7



PARTS LIST

QTY	DESCRIPTION	PART NO.	ITEM NO.
1	LABEL, CABLE IDENTIFICATION	3616073-00	16
1	HOOD	1210493 50	15
A/R	TAPE, DOUBLE SIDED	9007834	14
1	MALE SCREW	1210493-51	13
2	PIN CONTACT	1212241	12
~~2~~	~~[illegible]~~	~~9007031~~	~~11~~
~~1~~	~~CABLE LABEL~~	~~9009532~~	~~10~~
1	LABEL, THIS SIDE UP	3611567	9
23	PIN 24-20 AWG	1210493-43	8
29	SOCKET, #HT-68	1210089-5	7
1	HOUSING, #20383 BERG	1210918-15	6
1	SHELL AND INSERT MALE	1210493-31	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 #26 AWG	9107736	1

FIRST USED ON OPTION/MODEL: DN11

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES

DECIMALS | ANGLES

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL —//—

FINISH —//—

NEXT HIGHER ASSY —//—

SCALE NONE

SHEET 1 OF 1

EQUIPMENT CORPORATION

TITLE: CABLE, MODEM BC05C

SIZE D | CODE UA | NUMBER BC05C-0-0

WIRE TABLE

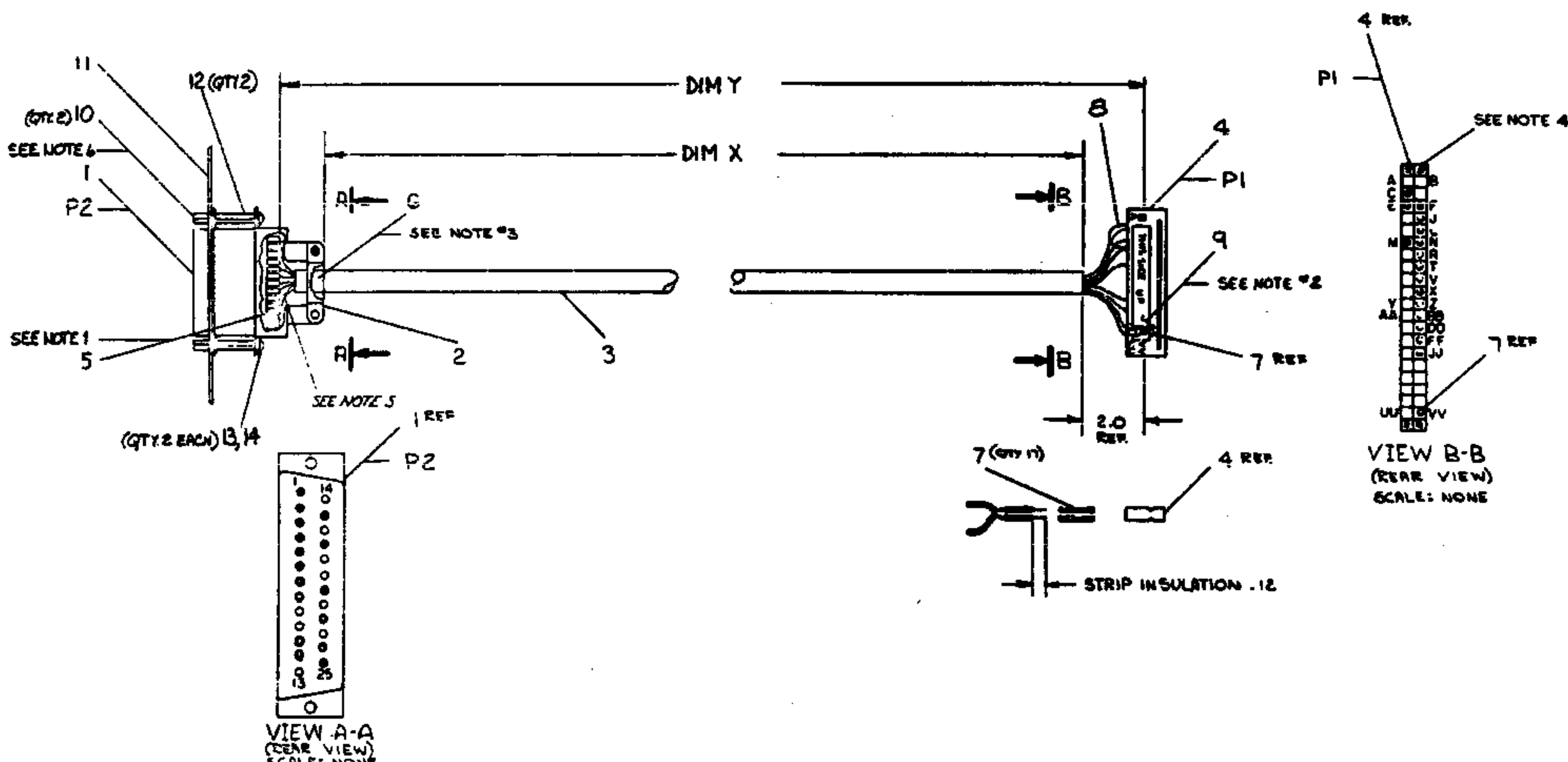
ITEM NO	DESCRIPTION AWG	DESCRIPTION COLOR	FROM CONNECTION	FROM WITH	TO CONNECTION	TO WITH
3	22	BLK	P1-VV	7	P2-7	SOLDER
↓	↓	GRN/WHT	P1-C	↓	P2-25	↓
		GRN/BLK	P1-JJ		P2-12	
		ORN/BLK	P1-FF		P2-11	
		RED	P1-DD		P2-20	
		GRN	P1-BB		P2-8	
		YELLOW/WHT	P1-Z		P2-6	
		ORN	P1-X		P2-22	
		BLU	P1-V		P2-4	
		WHT	P1-T		P2-5	
		BLU/BLK	P1-R		P2-17	
		BLK/WHT	P1-N		P2-15	
		RED/WHT	P1-L		P2-24	
		WHT/BLK	P1-J		P2-3	
3		RED/BLK	P1-F		P2-2	SOLDER
8		BLK	P1-E	7	P1-M	7
8	22	BLK	P2-1	SOLDER	P2-7	SOLDER

LEGEND

NUMBER	VARIATION DIM "X"	VARIATION DIM "Y" PRECUT
BCØ3L-1Ø	10FT ± 2IN	10FT, 5IN
BCØ3L-5	5FT ± 2IN	5FT, 5IN
BCØ3L-1K	1FT 9IN ± 1IN	2FT
BCØ3L-Ø1	1FT ± 1IN	1FT, 3IN

NOTES

1. EACH SOLDERED CONN ON P2 SHALL BE INSULATED WITH A .25 PIECE OF SHRINK TUBING (ITEM #5)
2. PLACE ITEM #9 (THIS SIDE UP STICKER) ON LETTERED SIDE OF ITEM #4 (CONN HOUSING) AS SHOWN.
3. FOR STRAIN RELIEF WRAP 2 TURNS OF TAPE (ITEM #6) AROUND CABLE (ITEM #3) AS SHOWN.
4. PINS MARKED * IN VIEW B-B ARE NOT USEABLE
5. *WIRES COMING FROM CENTER OF PLUG CONN SHOULD BE 5/8 LG. ALL OTHERS SHOULD BE CONFINED INTO HOOD OF CONN. SO THAT THEY'RE NOT BUNCHED.*
6. PLACE LOCKWASHER (SUPPLIED WITH ITEM #10) BETWEEN SPACER AND CONNECTOR FLANGE. DISCARD NUT (QTY 2) SUPPLIED WITH ITEM #10.



QTY	DESCRIPTION	DWG/PART NO	ITEM NO.
2	WASHER, LOCK #4	9006688	14
2	SCR, PH, PAN HD #4-40 X .25	9008501-1	13
2	SPACER, THREADED, HEX	9008833	12
1	PLATE, CONN. MTG.	B-MD-[illegible]-00	11
2	SCREW LOCK ASSY	9008451-00	10
1	LABEL (THIS SIDE UP)	3611567	9
3IN	WIRE, STRANDED #22 AWG TPVC (BLK)	9107350-00	8
17	SOCKET, CRIMP	1210089-07	7
A/R	TAPE, DOUBLE SIDED .50 WD.	9007834	6
16	TUBING, HEAT SHRINK .12	9107255-09	5
1	CONN, 44 POS, HSG.	1210918-15	4
A/R	CABLE, 15 COND, 22 AWG.	9107672-00	3
1	HOOD, CONN.	1212516-00	2
1	CONNECTOR, PLUG, FILTERED	1214031-00	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

DO NOT SCALE DWG

SEE PARTS LIST

TITLE: FILTERED CABLE ASSY BCØ3L

SIZE: D | CODE: UA | NUMBER: BCØ3L-Ø Ø | REV: F

SCALE: 1/1 | SHEET 1 OF

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION DATE 2-28-77

TITLE DL11-W Installation Procedure

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
A	ECO CHANGE	00002	B. CRAMM	8-77	B. Pratt	8-77

ENG	APPD	SIZE	CODE	NUMBER	REV
Bob Pratt		A	SP	DL11-W-2	A

DEC 16-12991-1070-N971
DRA 107

ENGINEERING SPECIFICATION CONTINUATION SHEET

TITLE DL11-W Installation Procedure

DL11-W Installation Procedure

Installation of the M7856 module consists of the following preparations:

1) Switch selection of the address mode and register addresses.

2) Switch selection of vector address.

3) Switch selection of data format.

4) Switch selection of receiver and transmitter baud rates.

5) Switch selection of operation mode for the current loops.

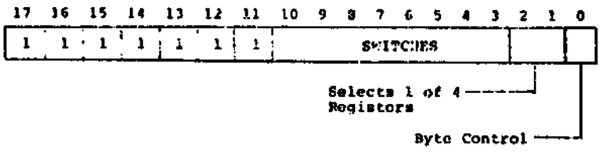
6) Additional switch selections for compatability.

7) Installation of G9000 in systems where +15V is not available.

NOTE: The notation used to indicate a particular switch is as follows: SX-Y where X denotes the particular switch pack and Y denotes the individual switch in the pack. The switch pack is labeled on the P. C. board with an SX(#S2) and the individual switches are labeled on the switch pack as are the on-off positions.

A. Register Address Assignments:

The DL11-W can respond to addresses with the following format:



The DL11-W can be operated in one of three different address selection modes. Normally, a DL11-W used as console terminal control would operate in the first mode, whereas additional DL11-W's would be operated in the second mode. The third mode is not normally used, but is included here for completeness.

	SIZE	CODE	NUMBER	REV
	A	SP	DL11-W-2	A

DEC FORM NO DEC 16 (1981) 1022 N370
DRA 108

ENGINEERING SPECIFICATION CONTINUATION SHEET

TITLE DL11-W Installation Procedure

Mode 1: Both the serial line unit and the real-time clock sections can be addressed. Due to common address selection logic, operation in this mode requires that the serial line unit addresses be restricted to 77756X. The line clock address is 777546.

Mode 2: Only the serial line unit section can be addressed. Address selection ranges from 74000 to 777777. Line clock is disabled and does not respond to address 777546.

Mode 3: Only the line clock section can be addressed at 777546. The serial line unit section does not respond to any address.

ADDRESS AND MODE SELECTION

Address Bit	A10	A09	A08	A07	A06	A05	A04	A03	N/A	N/A
Switch	S5-3	S5-2	S5-1	S5-4	S5-5	S5-6	S5-8	S5-7	S5-9	S5-10
Mode 1	Off	Off	Off	On	Off	Off	Off	On	Off	On
Mode 2*	Off	Off	Off	On	Off	Off	Off	On	On	Off
Mode 3	Off	Off	Off	On	Off	Off	On	On	On	On

*Address 77756X selected for serial line interface. Other addresses may be selected using SWITCH-OFF = 1 and SWITCH-ON = 0.

Note: Remove R63 from DL11-W's operated in Mode 2 to allow proper operation of a line frequency clock or DL11-W operated in Mode 1 or Mode 3.

Address assignments for serial lines are normally made in the ranges from 77650X to 77667X and from 77561X to 77617X.

B. Vector Address Assignments:

The line clock, if enabled, has a fixed vector address of 100 and cannot be changed. The serial line assignments are to floating vectors produced in the form XX0 (Receiver) and XX4 (Transmitter) where XX ranges from 00 to 77.

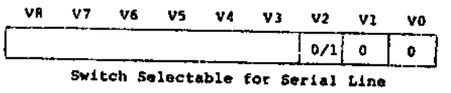
For a DL11-W used as the console device, the vector is 060/064. Additional DL11-W's vector addresses are floating.

	SIZE	CODE	NUMBER	REV
	A	SP	DL11-W-2	A

DEC FORM NO DEC 16 (1981) 1022 N370
DRA 108

ENGINEERING SPECIFICATION CONTINUATION SHEET

TITLE DL11-W Installation Procedure



Switch Selectable for Serial Line

Vector Bit	V8	V7	V6	V5	V4	V3
Switch	S2-8	S2-7	S2-5	S2-3	S2-6	S2-4
060/064	Off	Off	Off	On	On	Off

On = 1, Off = 0

C. Selection of Data Format:

1. Data Bits

Switches S4-3 and S4-4 control the number of data bits in the serial character as follows:

S4-4	S4-3	# of Data Bits
On	On	5
On	Off	6
Off	On	7
Off	Off	8

2. Parity

Parity is controlled by switches S4-2 and S4-6 as follows:

S4-2	S4-6	Parity
Off	Off	Off
On	Off	Off
Off	On	Even
On	On	Odd

3. Stop Bits

Switch S4-5 controls the number of stop bits selected in the serial character as follows:

	SIZE	CODE	NUMBER	REV
	A	SP	DL11-W-2	A

DEC FORM NO DEC 16 (1981) 1022 N370
DRA 108

S4-5	# of Stop Bits
On	1
Off	2 (or 1.5 if 5 data bits are selected)

D. Baud Rate Selection:

Receiver and Transmitter baud rates are independent, so any combination may be selected.

Baud Rate Switch Selections

Baud Rate	Receiver			Transmitter		
	S3-2	S3-3	S3-5	S4-10	S3-1	S3-4
110	Off	Off	Off	On	On	On
150	On	Off	Off	Off	On	On
300	Off	On	On	On	Off	Off
600	Off	On	Off	On	Off	On
1200	Off	Off	On	On	On	Off
2400	On	On	On	Off	Off	Off
4800	On	On	Off	Off	Off	On
9600	On	Off	On	Off	On	Off

E. Current Loop Operation Mode:

Normally, current loops should be in active mode, unless interfaced to another active loop, such as to another DL11.

Active - Passive Mode Selection

Transmitter	S1-1	S1-2	S1-3	S1-6	S1-7
Active	On	On	Off	Off	On
Passive	Off	Off	On	On	Off
Receiver	S3-6	S3-7	S3-8	S3-9	S3-10
Active	On	Off	On	Off	On
Passive	Off	On	Off	On	Off
Reader Enable	S1-4	S1-5	S1-8	S1-9	S1-10
Active	On	Off	On	Off	On
Passive	Off	On	Off	On	Off

F. Compatability Selection:

Switches S4-1 and S4-7 allow the DL11-W to be configured to replace DL11-A, B, C, and D options in most applications.

DL11-W Compatability Switches

Selectable	Switch	Description
Break Bit	S4-1	Enabled in the ON position. Should be disabled (switch OFF) if replacing a DL11-A, or DL11-B should be enabled (switch ON) if replacing a DL11-C or DL11-D.
Error Bits	S4-7	Error bit reporting is enabled in the ON position. Should be disabled if replacing DL11-A or DL11-B, and should be enabled if replacing DL11-C or DL11-D.

Note: Both EIA level and current loop signals are available at the berg connector on the module. No selection is necessary. The proper cable will pick up the correct signals.

G. G8000 Installation:

For DL11-W EIA operation, 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 A02 or DD11-A.
2. Wire A03V2 to A02V2.
3. Wire A02N2 to CXXU1 where XX is the slot location of the M7856.

H. DL11-W Systems with +15V Available Using DD11-A

There is a special situation of using a DD11-A to mount a DL11-W in systems with +15V available. These systems have +15V available, and it appears at pin A03V2 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 A03V2 to CXXU1, where XX is the slot number of the DL11.

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

J. INSTALLATION

The DL11-W module plugs into an SPC slot. A wire must be installed to pick up the LTC L signal from the power supply and apply it to the line frequency input of the DL11-W.

When installed, the LTC L input to the DL11-W is located on pin CD1. Connect a length of 30 AWG wire from pin CD1 on the backplane to the pin on the backplane, as designated in Table 1-1, for each application.

Table 1-1 LTC L Connection

PDP Computer	Processor	Pin Number
11/04	KD11-D (4 slot)	C02D1,C03D1,C04D1
11/04	KD11-D (9 slot)	C02D1,C03D1,C04D1,C05D1, C06D1,C07D1,C08D1, or C09D1
11/05	KA11-A w/8K memory	C01D1,C02D1,C03D1,C04D1, or F08V2
11/05	KD11-A w/16K memory	C01D1 or F08V2
11/20	KA11	A13P2 or B12R1
11/34	KD11-E	C03D1,C04D1,C05D1,C06D1, C07D1,C08D1, or C09D1
11/35	KD11-A	F03R1 or C09D1
11/40	KD11-A	F03R1 or C09D1
11/45	KB11-A	C26D1,C27D1, or C28D1
11/55	KB11-D	C26D1,C27D1, or C28D1
11/70	KB11-B	C40D1,C41D1,C42D1,C43D1, or C44D1
11/70	KB11-C	C40D1, C41D1,C42D1,C43D1, or C44D1
DD11-B Peripheral Mounting Panel		C01D1,C02D1,C03D1, or C04D1
DD11-D Peripheral Mounting Panel		C01D1,C02D1,C03D1,C04D1, C05D1,C06D1,C07D1,C08D1,C09D1
DD11-A Peripheral Mounting Panel		A03P2

NOTE: A wire connection is not necessary for backplane pin numbers ending in D1. LTC L is already connected to the line frequency input of the DL11-W.

K. Installation

The DL11-W module plugs into an SPC slot. A wire must be installed to pick up the DCLOL signal from the power supply and apply it to the DCLOL input of the DL11-W.

When installed, the DCLOL input to the DL11-W is located on pin CN1. Connect a length of 30 AWG wire from pin CN1 on the backplane to the pin on the backplane, as designated in Table 1-2 for each application.

Table 1-2 DCLOL Connection

PDP Computer	Processor	Pin Number
11/04*	KD11-D (4 slot)	C03N1, C04N1
11/04*	KD11-D (9 slot)	C03N1 thru C09N1
11/05*	KA11-A w/8K Memory	C01N1, C02N1, C03N1, C04N1
11/05*	KD11-A w/16K Memory	C01N1
11/20	KA11	B11F2, B14F2, A13S2, A08S2, A03S2, B04D2, F06B2
11/34*	KD11-E	C03N1 thru C09N1
11/35	KD11-A	C09F2
11/40	KD11-A	C09F2
11/45*	KB11-A	C26N1, C26N1, C28N1
11/55*	KB11-D	C26N1, C26N1, C28N1
11/70*	KB11-B	C40N1, C41N1, C42N1, C43N1, C44N1
11/70*	KB11-C	C40N1, C41N1, C42N1, C43N1, C44N1
DD11-B Peripheral Mounting Panel		C01N1 thru C04N1
DD11-D Peripheral Mounting Panel		C01N1 thru C09N1
DD11-A Peripheral Mounting Panel		B01F2, B04F2, A03S2

*NOTE: A wire connection is not necessary for backplane pin numbers ending in N1 DCLOL. Is already connected to the input of the DL11-W.

SECTION II
POWER SYSTEM ENGINEERING DRAWINGS

LEGEND			
DWG. NO.	VARIATION		
	VAC OUT	PHASES	AMP OUT
861-A	120	2	32
861-B	240	1	16
861-C	120	1	24
861-F	120	1	12

NOTES SEE SHEET 2

861-F QTY	861-C QTY	861-B QTY	861-A QTY	DESCRIPTION	PART NO	ITEM
6	6	6	6	WASHER [illegible]	[illegible]	[illegible]
A/R	A/R	A/R	A/R	GREASE CONTACT [illegible]	[illegible]	[illegible]
	1	1	1	DECAL SAFETY GND	36-12680-[illegible]	[illegible]
1	1	1	1	DECAL DANGER HV	36-12617	[illegible]
		1	1	WASHER LOCK TOOTH [illegible]	9007631	[illegible]
-	-		-	MOV ASSY 275V	7011052-[illegible]	[illegible]
1	1	-	1	MOV ASSY 150V	7011052-[illegible]	[illegible]
5	[illegible]	[illegible]	-	[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	3 [illegible]	
1				NAME PLATE [illegible]	[illegible]	[illegible]
1	—		—	[illegible] DECAL	[illegible]	[illegible]
	—			CIRCUIT BREAKER	121196-[illegible]	
-	12	1	1	CONN SOLDERLESS (YEL)	9007920	6[illegible]
~~[illegible]~~				~~[illegible]~~	~~[illegible]~~	~~[illegible]~~
~~[illegible]~~				~~[illegible]~~	~~[illegible]~~	~~[illegible]~~
~~[illegible]~~				~~[illegible]~~	~~[illegible]~~	~~62~~
~~[illegible]~~				~~[illegible]~~	~~[illegible]~~	~~[illegible]~~
[illegible]	[illegible]	[illegible]		WIRE [illegible] AWG [illegible] GRN	9117380-5[illegible]	60
[illegible]	[illegible]	[illegible]		NUT KEP [illegible]-32	[illegible]	59
~~[illegible]~~				~~[illegible]~~	~~[illegible]~~	~~58~~
-	3	-	-	CLAMP TERMINAL	1211223-01	57
[illegible]	1	1	1	LOCKNUT	9003309	56
18	18	—	—	CONN, SOLDERLESS (BLU)	[illegible]	55
—	A/R	—	—	WIRE #14 AWG 3 PVC (WHT)	9107380-99	54
1	—	1	—	STRAIN RELIEF (BLU)	1211198-00	53
	1	—	—	MALE PLUG 125V 30A	1211192	52
	—	1	—	MALE PLUG, 250V 20A	1211182	51
	1	—	—	POWER CORD 15 FT 10/3	1700025	50
	—	4	5	CLAMP TERMINAL	1211223-01	49
	1	—	—	FILTER 2 POLE 3 WIRE	1211199	48
[illegible]	A/R	A/R	A/R	GROMMET, CATERPILLAR	9007035	47
	—	1	—	CONTACTOR, 230V	1211197-1	46
	—	6	—	RECEPTACLE, 15A 250VAC	1211204	45
	1	—	—	CIRCUIT BREAKER 20 30	1211196	44
-	-	A/R	-	POWER CORD 15 FT 14/3	1700027	43
2	1	1	1	[illegible]	9007086-01	42
[illegible]	2	2	2	NUT KEP #4-40	9006557	41
2	2	2	_	SCREW, PH PAN HD #4-40 x 3/8 LG	9006301-1	40
[illegible]	1	—	—	NAME PLATE, 861-[illegible]	[illegible]	39
4	4	4	4	CONN, [illegible]	9007925	38
39	[illegible]	38	40	CONN, SOLDERLESS (BLU)	9007918	37
[illegible]	4	4	[illegible]	CONN, SOLDERLESS (RED)	9007917	36
[illegible]	A/R	A/R	A/R	WIRE, #18 AWG 3 PVC (GRN)	[illegible]	35
[illegible]	A/R	A/R	A/R	WIRE #18 AWG 3 PVC (BRN)	[illegible]	34
[illegible]	A/R	A/R	A/F	WIRE, #18 AWG 3 PVC (BLK)	9107360-00	33
[illegible]	A/R	A/R	A/R	WIRE, #18 AWG 3 PVC (WHT)	9107360-99	[illegible]
[illegible]	A/R	—	A/R	WIRE, #18 AWG 3 PVC (RED)	9107360-22	31
~~[illegible]~~				~~[illegible]~~	~~[illegible]~~	~~30~~
A/R	A/R	A/R	A/R	WIRE, #14 AWG 3 PVC (BLK)	9107370-00	29
—	—	A/R	A/R	WIRE, #14 AWG 3 PVC (WHT)	9107370-99	28
A/R	A/R	—	A/R	WIRE, #14 AWG 3 PVC (RED)	9107370-22	27
4	4	4	4	NUT, KEP #8-32	9006563	26
4	4	4	4	SCREW, PH PAN HD #8-32 x 1/2 LG	9006[illegible]	25
4	14	14	14	NUT KEP #6-32	9006560	24
[illegible]	18	18	18	SCREW PH PAN HD #6-32 x 3/8 LG	9006011-1	23
~~[illegible]~~				~~[illegible] INT TOOTH~~	~~[illegible]~~	~~22~~
6	4	[illegible]	2	LOCKWASHER #4 INT TOOTH	9006654	21
—	—	1	—	NAME PLATE, 861-B	[illegible]	20
6	2	2	2	LOCKWASHER, #6 INT TOOTH	9006633	19
—	—	—	1	NAME PLATE, 861 A	[illegible]	18
2	2	2	2	PIN, MALE	1209378-01	17
1	1	1	1	HOUSING 7 PIN MALE	1210022-2	16
3	3	3	3	PIN, FEMALE	1209379-01	15
1	1	1	1	HOUSING, 6 PIN FEMALE	1210021-9	14
1	1	1	1	PC BOARD ASSY	[illegible]-0-1	13
-	—	—	1	MALE PLUG, 125/250V 20A	[illegible]	12
—	—	—	A/R	POWER CORD 15FT. 12/4	1700026	11
1	1	1	1	THERMOSTAT	1211158	10
—	1	—	1	STRAIN RELIEF (GRN)	1211198-01	9
—	—	1	1	FILTER 3 POLE 4 WIRE	1211157	8
1	1	1	1	CAPACITOR	[illegible]	7
1	[illegible]	—	1	CONTACTOR 115V	1211197-0	6
2	2	2	2	LAMP POWER 115V	[illegible]	5
6	6	—	6	RECEPTACLE 15A, 115VAC	1205957	4
—	—	1	1	CIRCUIT BREAKER, [illegible]	1211172	3
1	1	1	1	COVER, 861 PC.	D-AD-[illegible]	2
1	1	1	1	CHASSIS, 861 PC	E-CD-[illegible]	1

PARTS LIST

861 PC.

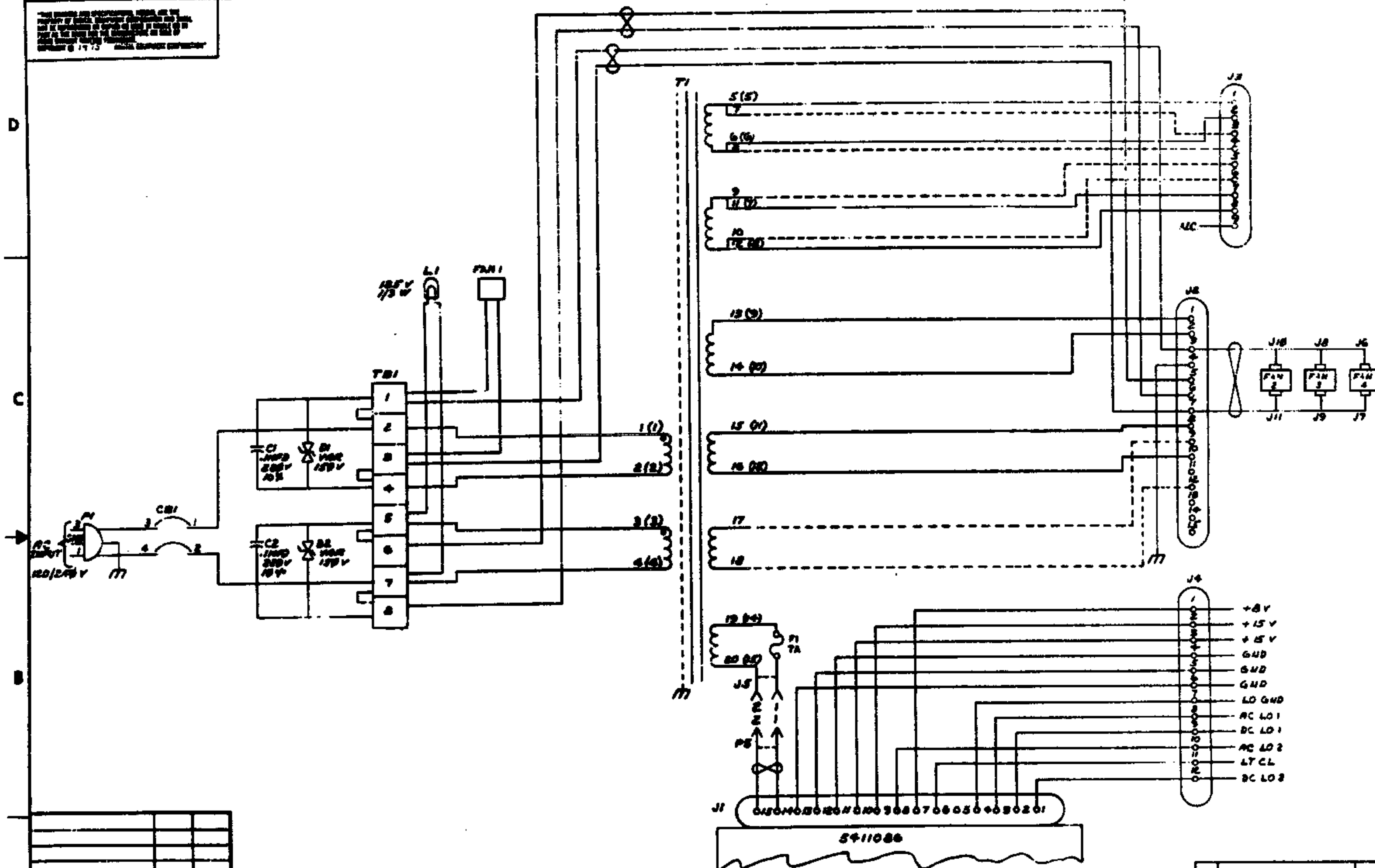
EQUIPMENT CORPORATION

TITLE
POWER CONTROL,
861

SEE PARTS LIST

B-CD-861-0

B UA 861-0-0 F



NOTES:

1. DOTTED LINES INDICATED WINDINGS OMITTED IN E AND F VERSIONS.

2.

VERSION	TB1 JUMPERS	CB1
A	2+6, 4+8	20 A
B	4+6	15
E	2+6, 4+8	--
F	4+6	5

3. NUMBERS IN ( ) INDICATE XFORMER LEAD NUMBERS ON E&F VERSION.

~~4. ... CONNECTIONS~~

FIRST USED ON OPTION MODEL: H7420

PARTS LIST

QTY	REF. DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

SEMICONDUCTOR CONVERSION CHART

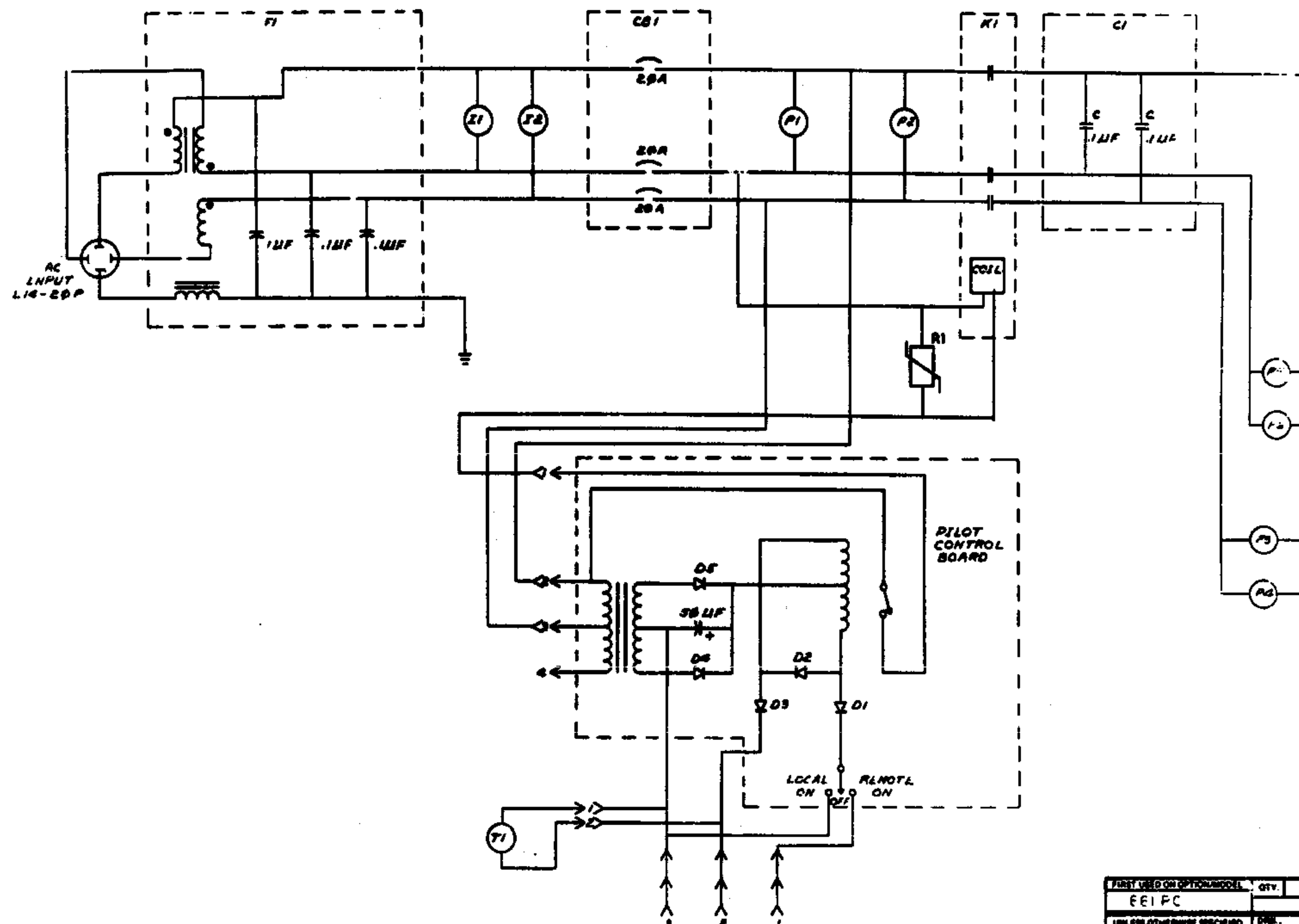
DEC NO.	EIA NO.	DEC NO.	EIA NO.

digital

TITLE: WIRING DIAGRAM

D CS H7420-0-1 REV. A

SHEET 1 OF 1



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

NEXT HIGHER ASSY. B-DD-661-C

SCALE —

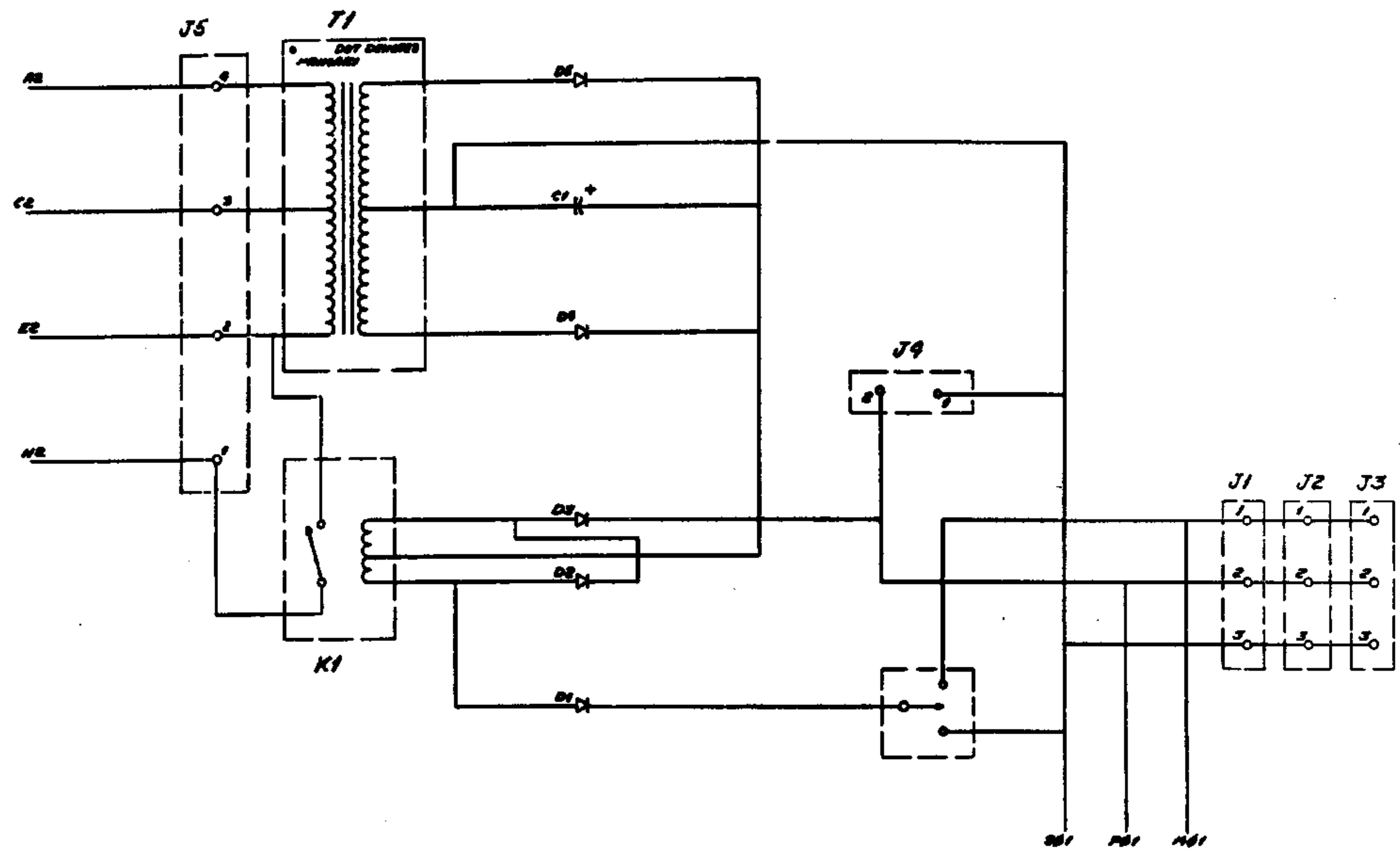
SHEET 1 OF 1

EQUIPMENT CORPORATION

TITLE

CIRCUIT SCHEMATIC (661-A PC)

SIZE	CODE	NUMBER	REV.
D	CS	861-A-1	B



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

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL

FINISH

NEXT HIGHER ASSY.

SCALE NONE

SHEET 2 OF 2

digital EQUIPMENT CORPORATION

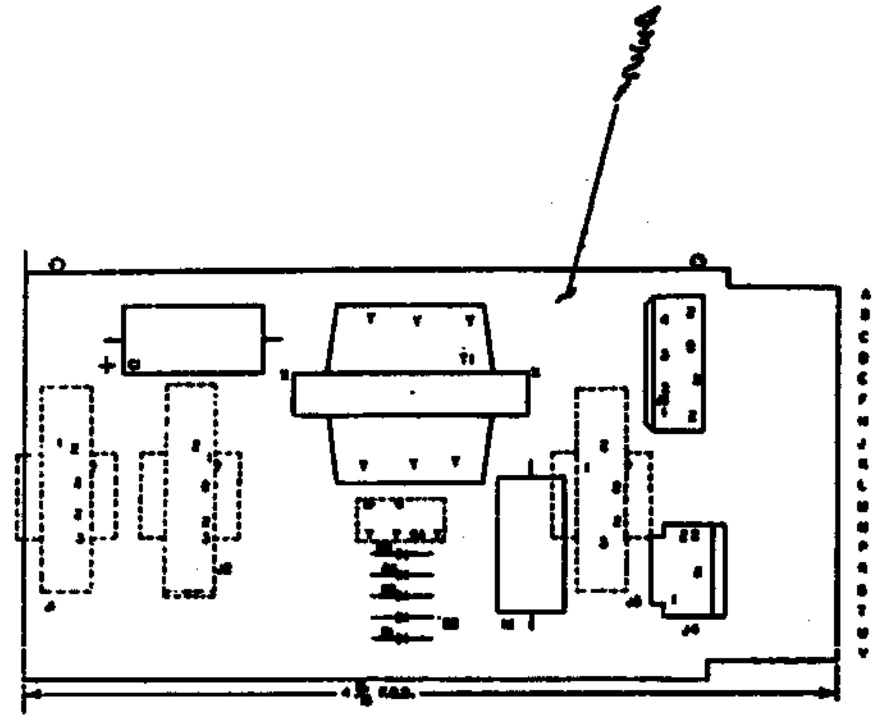
TITLE

PILOT CONTROL

SIZE	CODE	NUMBER	REV.
D	CS	5410206-0-1	B

14

NOTES:



QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
		PACKAGING INSTRUCTION	A-PI-3700163-0-0	15
1	S1	SWITCH, 3-POS.	12-11190	14
1	K1	RELAY, REED	12-11179	13
1	T1	PC TRANSFORMER	16-11173	12
4	FOR USE ON J5	PIN, PC MALE MATE-N-LOCK	1210823	11
1	J4	SOCKET, 2 PIN MATE-N-LOCK	1210827-02	10
11	FOR USE ON J1-J4	PIN, PC FEMALE MATE-N-LOCK	1209456	9
1	J5	PLUG, 4 PIN MATE-N-LOCK	1209351-04	8
3	J1, J2, J3	SOCKET, [illegible] MATE-N-LOCK	1209350-03	7
5	D1 - D5	DIODE 1N 4004	1105796	6
1	C1	CAP, 50UF, 50V [illegible]	1000280	5
REF		MODULE ECO HISTORY	B-MH-5410206-0-6	4
REF		ASSY DRILLING HOLE LAYOUT	DMH-5410206-0-5	3
REF		X-Y COORDINATE HOLE LOCN.	XCO-5410206-0-4	2
1		ETC CKT BOARD	5010205	1

PARTS LIST

ETCH BOARD REV B

FIRST USED ON OPTION MODEL: 861 PC

SEMICONDUCTOR CONVERSION CHART

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

IC PIN LOCATIONS

IC TYPE	GND	+5V

EQUIPMENT CORPORATION

TITLE: PILOT CONTROL

NEXT HIGHER ASSY

SIZE D CODE CS NUMBER 5410206-0-1 REV B

SCALE 2/1 SHEET 1 OF 2

15

WIRE TABLE 861-A

ITEM NO.	DESCRIPTION COLOR	DESCRIPTION AWG	FROM CONN	FROM POINT	FROM WITH	TO CONN	TO POINT	TO WITH	REMARKS SEE DETAIL "A"
29	BLK	14	P1-B2		37	K1-A3		37	12.0
[illegible]									
28	WHT	14	P1-S1		37	P2-S1		37	4.0
28	WHT	14	P1-S2		37	K1-A2		37	12.0
32	WHT	18	P2-S2		36	P7-2		15	10.0
31	RED	18	P2-B2		36	P7-3		15	10.0
27	RED	14	P2-B1		37	K1-A1		37	12.0
28	WHT	14	P3-S1		37	P4-S2		37	6.0
28	WHT	14	P3-S2		37	C1-A3		37	6.0
27	RED	14	P3-B1		37	C1-A1		37	6.0
27	RED	14	P3-B2		37	P4-B1		37	4.0
28	WHT	14	P4-S1		37	P5-S2		37	4.0
28	WHT	14	P5-S1		37	P6-S2		37	6.0
29	BLK	14	P5-B1		37	C1-A2		37	6.0
29	BLK	14	P5-B2		37	P6-B1		37	4.0
29	BLK	14	K1-B3		37	C1-B2		37	4.0
28	WHT	14	K1-B2		37	C1-B3	C	37	4.0
27	RED	14	K1-B1		37	C1-B1		37	4.0
5	BLK	14	Z1-A		—	CB1-B1	LINE+	38	—
5	BLK	14	Z1-B		—	CB1-A1	LINE+	38	—
5	BLK	14	Z2-A		—	CB1-B1	LINE+	38	—
5	BLK	14	Z2-B		—	CB1-C1	LINE+	38	—
29	BLK	14	F1-C	OUTPUT	37	CB1-A1	LINE+	37	6.0
28	WHT	14	F1-B	OUTPUT	37	CB1-B1	LINE+	37	6.0
27	RED	14	F1-A	OUTPUT	37	CB1-C1	LINE+	37	6.0
27	RED	14	K1-A1		37	CB1-C2	LOAD-	37	6.0
28	WHT	14	K1-A2		37	CB1-B2	LOAD-	37	6.0
29	BLK	14	K1-A3		37	CB1-A2	LOAD-	37	6.0
60	GRN	12	F1-G	OUTPUT	49	GND		65	6.0
[illegible]									
35	ORN	18	P8-1		17	T1		36	10.0
35	ORN	18	P8-2		17	T1		36	10.0
11	BLK	12	P9-Y		—	F1-C	INPUT	49	
11	RED	12	P9-X		—	F1-A	INPUT	49	
11	WHT	12	P9-5		—	F1-B	INPUT	49	
11	GRN	12	P9-G		—	F1-G	INPUT	49	
[illegible]									
[illegible]									
[illegible]									
[illegible]									
33	BLK	18	P1-B1		36	K1-5		37	12.0
[illegible]									
34	BRN	18	P7-1		36	K1-4		37	10.0
71	—	—	R1-1	—	—	K1-4	—	—	—
71	—	—	R1-2	—	—	K1-5	—	—	—

WIRE TABLE 861-B

ITEM NO	DESCRIPTION COLOR	DESCRIPTION AWG	FROM CONN	FROM POINT	FROM WITH	TO CONN	TO POINT	TO WITH	REMARKS SEE DETAIL A
29	BLK	14	P1-B2		37	K1-A3		37	12.0
29	BLK	14	P1-B1		37	P2-B2		37	[illegible]
28	WHT	14	P1-S1		37	P2-S1		37	4.0
28	WHT	14	P1-S2		37	K1-A2		37	12.0
32	WHT	18	P2-S2		36	P7-2		15	10.0
28	WHT	14	P3-S1		37	P4-S2		37	6.0
28	WHT	14	P3-S2		37	C1-A3		37	6.0
29	BLK	14	P3-B2		37	P4-B1		37	4.0
28	WHT	14	P4-S1		37	P5-S2		37	4.0
28	WHT	14	P5-S1		37	P6-S2		37	6.0
29	BLK	14	P5-B1		37	C1-A2		37	6.0
29	BLK	14	P5-B2		37	P6-B1		37	4.0
29	BLK	14	K1-B3		37	C1-B2		37	4.0
28	WHT	14	K1-B2		37	C1-B3	C	37	4.0
5	BLK	14	Z1-A		—	CB1-B1	LINE+	38	—
5	BLK	14	Z1-B		—	CB1-A1	LINE+	38	—
5	BLK	14	Z2-A		—	CB1-B1	LINE+	38	—
5	BLK	14	Z2-B		—	CB1-C1	LINE+	38	—
29	BLK	14	F1-C	OUTPUT	37	CB1-A1	LINE+	37	6.0
28	WHT	14	F1-B	OUTPUT	37	CB1-C1	LINE+	37	6.0
28	WHT	14	K1-A2		37	CB1-C2	LOAD-	37	6.0
29	BLK	14	K1-A3		37	CB1-A2	LOAD-	37	6.0
60	GRN	12	F1-G	OUTPUT	49	GND		65	6.0
[illegible]									
35	ORN	18	P8-1		17	T1		36	10.0
35	ORN	18	P8-2		17	T1		36	10.0
[illegible]									
[illegible]									
43	GRN	14	P9-G		—	F1-G	INPUT	49	—
43	BLK	14	P9-Y		—	F1-C	INPUT	49	—
43	WHT	14	P9-X		—	F1-B	INPUT	49	—
29	BLK	14	P6-B2		37	P6-B2		37	6.0
[illegible]									
[illegible]									
[illegible]									
[illegible]									
33	BLK	18	P7-4		15	K1-5		37	10.0
33	BLK	18	P7-4		15	P2-B1		36	10.0
[illegible]									
30	BRN	14	P7-1		15	K1-4		37	10.0
72	—	—	R1-1	—	—	K1-4	—	—	—
72	—	—	R1-2	—	—	K1-5	—	—	—

WIRE TABLE 861-C, 861-F

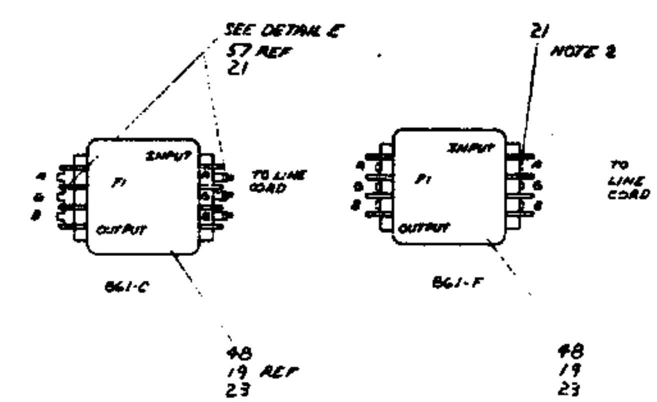
ITEM NO	DESCRIPTION COLOR	DESCRIPTION AWG	FROM CONN	FROM POINT	FROM WITH	TO CONN	TO POINT	TO WITH	REMARKS SEE DETAIL A
29	BLK	14	P1-B2		37	K1-A3		37	12.0
[illegible]									
54	WHT	10	P1-S1		65	P2-S1		65	4.0
54	WHT	10	P1-S2		65	K1-A2		65	12.0
32	WHT	18	P2-S2		36	P7-2		15	10.0
31	RED	18	P2-B2		36	P7-3		15	10.0
27	RED	14	P2-B1		37	K1-A1		37	12.0
54	WHT	10	P3-S1		65	P4-S2		65	6.0
54	WHT	10	P3-S2		65	C1-A3		65	6.0
27	RED	14	P3-B1		37	C1-A1		37	6.0
27	RED	14	P3-B2		37	P4-B1		37	4.0
54	WHT	10	P4-S1		65	P5-S2		65	4.0
54	WHT	10	P5-S1		65	P6-S2		65	6.0
29	BLK	14	P5-B1		37	C1-A2		37	6.0
29	BLK	14	P5-B2		37	P6-B1		37	4.0
29	BLK	14	K1-B3		37	C1-B2		37	4.0
54	WHT	10	K1-B2		65	C1-B3	C	65	4.0
27	RED	14	K1-B1		37	C1-B1		37	4.0
5	BLK	14	Z1-A		—	CB1-A1	LINE+	38	—
5	BLK	14	Z1-B		—	CB1-B1	LINE+	38	—
5	BLK	14	Z2-A		—	CB1-A1	LINE-	38	—
5	BLK	14	Z2-B		—	CB1-C1	LINE+	38	—
29	BLK	14	F1-B	OUTPUT	37	CB1-B1	LINE+	37	6.0
54	WHT	10	F1-A	OUTPUT	65	CB1-A1	LINE+	65	6.0
27	RED	14	F1-B	OUTPUT	37	CB1-C1	LINE+	37	6.0
27	RED	14	K1-A1		37	CB1-C2	LOAD-	37	6.0
54	WHT	10	K1-A2		65	CB1-A2	LOAD-	65	6.0
29	BLK	14	K1-A3		37	CB1-B2	LOAD-	37	6.0
60	GRN	12	F1-G	OUTPUT	57	GND		42	6.0
35	ORN	18	P8-1		17	T1		36	10.0
35	ORN	18	P8-2		17	T1		36	10.0
[illegible]									
50	GRN	12	P9-G		—	F1-G	INPUT	49	
50	BLK	12	P9-B		—	F1-B	INPUT	49	
50	WHT	12	P9-S		—	F1-A	INPUT	49	
[illegible]									
[illegible]									
[illegible]									
[illegible]									
33	BLK	18	C1-B1		36	K1-5		37	12.0
[illegible]									
34	BRN	18	P7-1		15	K1-4		37	10.0
71	—	—	R1-1	—	—	K1-4	—	—	—
71	—	—	R1-2	—	—	K1-5	—	—	—

NOTE:

1. ITEM 77 (P6 EXT TOOTH WASHER MUST BE BETWEEN CHASSIS AND MOUNTING TAB OF RECEPTACLE P1-P6).
2. REMOVE FASTON TABS FOR 861F.
3. LOCKWASHER (ITEM 19 OR 21) MUST BE PLACED BETWEEN FILTER (ITEM 8) AND TERM. CLAMP (ITEM 49).
4. REMOVE PAINT MASK AROUND 10-32 GROUND STUD AND COAT EXPOSED SURFACE WITH CONDUCTIVE GREASE, (ITEM 76) PLACE EXTERNAL TOOTH LOCKWASHER (ITEM 73) ON STUD FIRST, THEN CRIMP LUG (ITEM 42) AND KEP NUT (ITEM 33) LAST. SEE DETAIL "H"

WIRE TABLE 861-F

ITEM NO	DESCRIPTION COLOR	DESCRIPTION AWG	FROM CONN	FROM POINT	FROM WITH	TO CONN	TO POINT	TO WITH	REMARKS SEE DETAIL A
29	BLK	14	P1-B2		37	K1-A3		37	12.0
28	WHT	14	P1-S1		37	P2-S1		37	4.0
28	WHT	14	P1-S2		37	K1-A2		37	12.0
32	WHT	18	P2-S2		36	P7-2		15	10.0
31	RED	18	P2-B2		36	P7-3		15	10.0
27	RED	14	P2-B1		37	K1-A1		57	10.0
28	WHT	14	P3-S1		37	P4-S2		37	6.0
28	WHT	14	P3-S2		37	C1-A3		37	6.0
27	RED	14	P3-B1		37	C1-A1		37	6.0
27	RED	14	P3-B2		37	P4-B1		37	4.0
28	WHT	14	P4-S1		37	P5-S2		37	4.0
28	WHT	14	P5-S1		37	P6-S2		37	6.0
29	BLK	14	P5-B1		37	C1-A2		37	6.0
29	BLK	14	P5-B2		37	P6-B1		37	4.0
29	BLK	14	K1-B3		37	C1-B2		37	4.0
28	WHT	14	K1-B2		37	C1-	C	37	4.0
27	RED	14	K1-B1		37	C1-B1		37	4.0
29	BLK	14	F1-B	OUTPUT	70	CB1-B1	LINE+	37	6.0
28	WHT	14	F1-A	OUTPUT	70	CB1-A1	LINE+	38	6.0
27	RED	14	F1-B	OUTPUT	70	CB1-C1	LINE+	37	6.0
5	BLK	18	Z1-A		—	CB1-A1	LINE+	38	—
5	BLK	18	Z1-B		—	CB1-B1	LINE+	38	—
5	BLK	18	Z2-A		—	CB1-A1	LINE+	36	—
5	BLK	18	Z2-B		—	CB1-C1	LINE+	38	—
27	RED	14	K1-A1		37	CB1-C2	LOAD-	37	6.0
28	WHT	14	K1-A2		37	CB1-A2	LOAD-	37	6.0
29	BLK	14	K1-A3		37	CB1-B2	LOAD-	37	6.0
60	GRN	12	F1-G	OUTPUT	42	GND		42	6.0
35	ORN	18	P8-1		17	T1		36	10.0
35	ORN	18	P8-2		17	T1		36	10.0
67	GRN	16	P9		—	F1-G	INPUT	—	SEE
67	BLK	16	P9		—	F1-B	INPUT	70	NOTE
67	WHT	16	P9		—	F1-A	INPUT	70	5
[illegible]									
[illegible]									
[illegible]									
34	BRN	18	P7-1		15	K1-4		37	10.0
[illegible]									
33	BLK	18	P1-B1		36	K1-5		37	12.0
71	—	—	R1-1	—	—	K1-4	—	—	—
71	—	—	R1-2	—	—	K1-5	—	—	—



DETAIL F
SCALE: NONE

POWER CONTROL 861

861-PC

LA 861-0-0

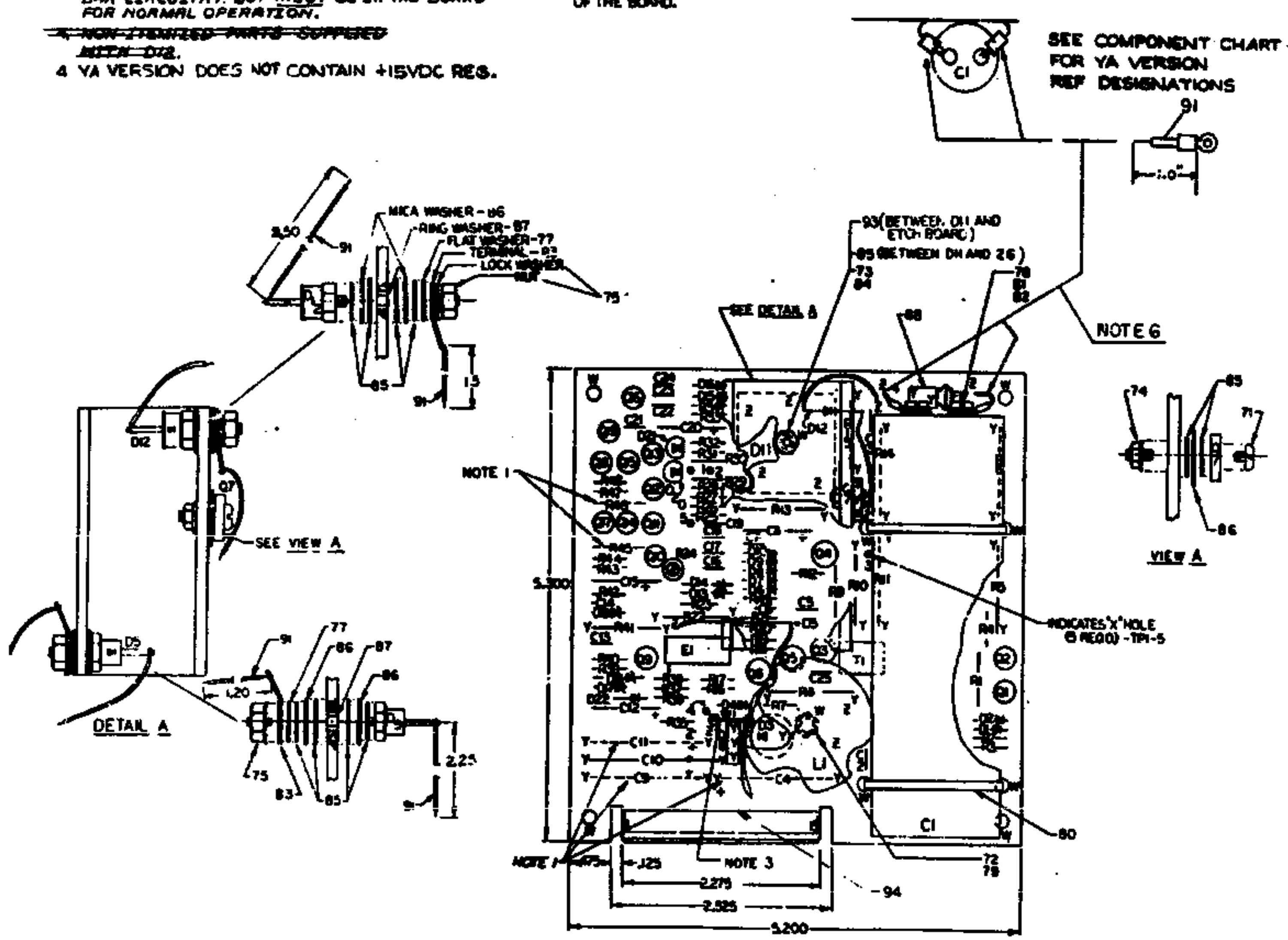
16

NOTES:

1. R45, R46, C4, C9, & C11 ARE NOT USED ON BASIC [illegible] BUT ARE RESERVED FOR PLANNED FUTURE MODULE VARIATIONS.
2. ** TOTAL +15V AND +8V CURRENT NOT TO EXCEED 4.0 AMPERES.
3. W1 (TEST JUMPER) MAYBE TEMPORARILY REMOVED WHILE TROUBLE-SHOOTING TO DETERMINE IF LOSS OF 15V IS DUE TO CROW-BAR CIRCUITRY. BUT MUST BE IN THE BOARD FOR NORMAL OPERATION.

~~4. NON-ITEMIZED PARTS SUPPLIED WITH D12.~~

4. YA VERSION DOES NOT CONTAIN +15VDC REG.
5. A) FOR STANDARD VERSION USE SHEETS 1,2,3, & 4 OF THIS DWG.
   B) FOR YA VERSION USE SHEETS 1,2, & 3 OF THIS DWG.
6. WIRES MUST NOT EXTEND BEYOND THE DIMENSIONS OF THE BOARD.



COMPONENT CHART - YA VERSION		
3	C19, C22, C23	7
1	C8	8
1	D19	14
7	D6, D7, D8, D9, D15, D16, D22	17
1	D10	18
1	R49	30
2	R44, R48	40
1	R28	50
4	Q5, Q6, Q10, Q19	63
4	Q11, Q12, Q13, Q16	66
QTY	REF. DESIGNATION	ITEM

IC TYPE | GND | +5V

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

IC PIN LOCATIONS

PARTS LIST

YA	QTY	REF. DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
REF	REF		X-Y COORDINATE HOLE LOCATION	K-CD-5411086-0-4	1
REF	REF		ASSY/DRILLING HOLE LAYOUT	D-AH-5411086-0-5	2
REF	REF		MODULE ECO HISTORY	B-AH-5411086-0-6	3
.	1		ETCHED CIRCUIT BOARD	5011085	4
0	1	C2	CAPACITOR 56PF 100V 5%	1000012	5
4	4	C10, C17, C18, C21	CAPACITOR 330PF 100V 5%	1000023	6
3	5	C3, C13, C19, C22, C23	CAPACITOR .01uF 100V 20%	1001610-01	7
1	3	C8, C12, C15	CAPACITOR 2.2uF 35V 10%	1002431	8
2	2	C6, C25	CAPACITOR 10PF 100V 5%	1002600	9
1	1	C20	CAPACITOR 1.5uF 35V 10	1008725	10
4	4	C5, C7, C14, C24	CAPACITOR .22uF 50V -20% +80%	1010274-01	11
0	1	C16	CAPACITOR 500uF 25V -10% +75%	1010509-01	12
1	1	C1	CAPACITOR 6400uF 50V -10% +75%	1010851	13
1	2	D2, D19	DIODE 1N748A	1100122	14
0	1	D5	DIODE 1N2970B	1100134	15
0	1	D3	DIODE MP1033B	1103341	16
7	8	D1, D6, D7, D8, D9, D15, D16, D22	DIODE D672	1105275	17
1	2	D10, D17	DIODE 1N4744	1105840	18
0	1	D4	DIODE 1N4004	1105796	19
0	1	D12	DIODE 1N3080	1109440	20
0	1	D18	DIODE 1N9674	1110068	21
2	2	D20, D21	DIODE MV5054-1 (LIGHT EMITTING)	1110324	22
1	1	D11	DIODE BRIDGE 200V 22A	1110714	23
2	2	D13, D14	DIODE 1TT2429	1110925	24
0	1	F1	FUSE PICO 5A	1205747	25
0	1		HEAT SINK	1211586	26
0	1	R23	RESISTOR 47 1/4W 5%	1300202	27
0	2	R7, R40	RESISTOR 100 1/4W 5%	1300229	28
0	1	R41	RESISTOR 100 1W 5%	1300232	29
1	3	R4, R12, R49	RESISTOR 220 1/4W 5%	1300271	30
0	1	R14	RESISTOR 220 2W 10	1300278	31
0	1	R11	RESISTOR 680 2W 5%	1300348	32
2	2	R10, R28	RESISTOR 1K 1/4W 5%	1300365	33
0	1	R1	RESISTOR 1.5K 1/2W 5%	1300394	34
0	1	R18	RESISTOR 2.2K 1W 10%	1300428	35
1	1	R15	RESISTOR 3.3K 1W 10%	1300437	36
0	1	R3	RESISTOR 3.3K 1/4W 5%	1300439	37
2	2	R43, R47	RESISTOR 10K 1/4W 5%	1300479	38
0	1	R37	RESISTOR 10 1/4W 5%	1301317	39
2	3	R2, R44, R48	RESISTOR 750 1/4W 5%	1301401	40
0	1	R39	RESISTOR 680 1/4W 5%	1301424	41
0	1	R16	RESISTOR 22K 1/4W 5%	1301808	42
1	1	R13	RESISTOR 1K 2W 5%	1301952	43
0	1	R9	RESISTOR 27 1/2W 5%	1302253	44
2	2	R19, R21	RESISTOR 30K 1/4W 5%	1302394	45
0	1	R36	RESISTOR 511 1/4W 1%	1302411	46
0	1	R39	RESISTOR 909 1/4W 1%	1302685	47
1	1	R25	RESISTOR 3.16K 1/4W 1%	1303045	48
1	1	R8	RESISTOR 470 2W 5%	1303082	49
1	2	R17, R29	RESISTOR 1K 1/4W 1%	1303114	50
1	1	R31	RESISTOR 2.61K 1/4W 1%	1303303	51
0	1	R42	RESISTOR 10K 1/4W 1%	1303312	52
2	2	R33, R34	RESISTOR 5.11K 1/4W 1%	1304054	53
1	1	R38	RESISTOR 9.09K 1/4W 1%	1304055	54

FIRST USED ON OPTION MODEL

ETCH BOARD REV

SEMICONDUCTOR CONVERSION CHART

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

CHANGE NO. | ORIGINATOR | REVISIONS | REV.

digital

TITLE: PWR. LINE MONITOR/15V REG.

SIZE D | CODE CS | NUMBER 5411086-0-1 | REV. J

SCALE | SHEET 1 OF 4

NEXT HIGHER ASSY

17

DCS 5411086-0-1 J

NOTES:

YA	QTY	REF DESIGNATION	DESCRIPTION	PART NO	ITEM NO
1	1	R20	RESISTOR 3.40K 1/4W 1%	1305114	55
1	1	R26	RESISTOR 5.62K 1/4W 1%	1305120	56
1	1	R27	RESISTOR 4.99K 1/4W 1%	1305324	57
0	1	R28	RESISTOR 24.0K 1/4W 1%	1305405	58
0	1	R24	RESISTOR 200 20% 02PR	1302150-10	59
1	1	R32	RESISTOR 12.1K 1/4W 1%	1302412	60
0	2	R8, R9	RESISTOR .2 5W 5% WW	1300864	61
0	1	Q7	TRANSISTOR MJE3055	1510555	62
4	6	Q2, Q3, Q5, Q8, Q10, Q19	TRANSISTOR MPSA05	1510705	63
0	2	Q4, Q9	TRANSISTOR MPS A55	1510706	64
0	1	Q6	TRANSISTOR 2N 4441	1505887	65
4	5	Q1, Q11, Q12, Q13, Q16	TRANSISTOR 2N 4258	1509142	66
4	4	Q14, Q15, Q17, Q18	TRANSISTOR 2N 5433	1511606	67
0	1	L1	INDUCTOR, 500 uh	1611000	68
1	1	T1	TRANSFORMER	1612026	69
0	1	E1	I.C. DEC 723	1910415	70
0	1		SCREW, PHM #4-40 X 7/16 LG.	9006012-1	71
0	1		SCREW, PHM #6-32 X 1/4 LG	9006020-1	72
0	1		SCREW, PHM #6-32 X 7/16 LG	9006027-1	73
0	1		KEP NUT #4-40	9006557	74
0	2		KEP NUT #10-32	9006566	75
2	2		WASHER, ITTLKWR #10	9006635	76
0	2		WASHER, FLAT	9006680	77
0	2	(W1)	SPLIT LUG	9006951	78
0	1		SPACER, 1/4AF X 1/2	9056044	79
4	4		CABLE TIE	9007080	80
2	2		TERMINAL	9007930	81
2	2		SCREW, PHM #10-32 X 1/4 LG.	9008007-1	82
0	2		TERMINAL	9008150	83
0	1		KEP NUT #6-32	9008185	84
0	A/R		COMPOUND, THERMAL JOINT	9008268	85
0	5		WASHER, MICA	9008424	86
0	2		WASHER, RING	9008440	87
0	1		FUSE HOLDER	9005141	88
1	1	R22	RESISTOR, 390, 2W 10%	1301880	89
0	1	W1	JUMPER	9009185	90
2	12		WIRE #18 STRANDED BLK	9107360-0-0	91
REF	REF		MODULE TEST PROCEDURE	A-SP-1V45-34-2	92
1	1		WASHER, RING	9006713	93
1	1		.010 INCH SHIM	7413721-0-0	94
REF	REF		ENG. SPEC-AND TEST PROC.	A-SP-5411086-0-3	95

PARTS LIST

FIRST USED ON OPTION MODEL

ETCH BOARD REV D

IC TYPE	GND	+5V

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

IC PIN LOCATIONS

DEC NO	EIA NO	DEC NO	EIA NO

SEMICONDUCTOR CONVERSION CHART

REV | CHANGE NO | REVISIONS | CHKL

DRN | DATE
CHK'D | DATE
ENG | DATE
PROJ ENG | DATE
PROD | DATE
NEXT HIGHER ASSY

digital EQUIPMENT CORPORATION

TITLE: PWR. LINE MONITOR/15V REG.

SIZE: D | CODE: CS | NUMBER: 5411086-0-1 | REV: J

SCALE

SHEET 2 OF 4

DIST

DCS 5411086-0-1 J

+25 TO +45 VDC

R8 470 2W

C25 18 pf

R21 30K

Q3 MPS A93

R20 1K

R18 1K

Q5 MPS A93

R19 30K

C4 18 pf

C5 .22 uf 50V

C6 2.2 uf 35V

T1

D22 D672

D8 D672

D9 D672

D4 D672

D7 D672

C7 .22 uf 50V

D10 1N6746 13V

R48 750

Q19 MPS A93

5 -18V TO -15V (TEST POINT)

R49 220

R47 10K

R43 10K

(ENG OPTION SEE NOTE 1) R46 1/2W

Q15 2N5433

Q16 2N5433

3 AC LO 1

8 AC LO 2

4 LO GND

R44 750

Q13 MPS A93

Q17 2N5433

Q14 2N5433

1 DC LO 2

2 DC LO 1

R45 1/2 W (SEE NOTE 1 (ENG. OPTION))

R13 1K 2W

TP3

R25 3.48K 1%

R26 5.62K 1%

TP5

R27 4.99K 1%

D15 D672

D16 D672

AC-2

AC-1

20V TO 33V RMS AC INPUT

R34 5.11K 1%

R33 5.11K 1%

C24 .22 uf 50V

C25 1.5 uf 35V

TP1

R32 18.2 K 1%

Q16 2N4250

Q13 2N4250

Q12 2N4250

Q11 2N4250

C21 330 pf

C18 330 pf

C17 330 pf

C16 330 pf

TP2

R31 2.61 K 1%

R30 5.89K 1%

R25 3.16K 1%

ACOK

D20 MV5054-1

C21 MV3654

DCOK

D14 ITT2429 5.1V

D13 ITT2429 5.1V

C22 .01 uf 100V

C23 .01 uf 100V

R28 1K 1%

C19 .01 uf 100V

RETURN

+25 TO +45VDC

TO 20V TO 33V RMS AC INPUT

AC-1 15

AC-2 14

L1 BRC744 .22 uH

R15 3.3 K 1W

D17

6 LINE CLK L

R22 390 ~ 2W

D19 3.3V 1N748A

C40 .22 uF 50V

POWER FAIL CIRCUIT

REVISIONS		
ENG	CHANGE NO	REV.

TITLE PWR. LINE MONITOR/15V REG.

DCS 5411086-0-1

SCALE — SHEET 3 OF 4 — DIST.

+25 TO +45 VDC

F1

25 - 45 VDC

C3 .01uf

R14 220 2W, 10%

D12 IN3606

L1 560uH

Q7 MJE 3055

R9 27 1/2W

Q4 MPS A55

R13 220

R10 2.2K 1W, 10%

TP4

+15V

R11 600 5W

D17 IN4744 15V ± 5%

C12 2.2uf 35V

1/2 723C E1

REF

R34 511 1%

R24 249 1%

R39 909 1%

C15 2.2uf 35V

R17 1K 1%

R16 22K 1%

1/2 723C E1

COMP

R23 47

Q6 MPS A65

R7 100

D1 D472

C2 50pf

R35 24.9K 1%

4.28V

D4 IN4004

R2 750

D2 IN750A 4.3V

R3 3.3K

Q1 2N4250

R1 1.8K 1/2W

R42 10K 1%

Q2 MPS A65

R4 220

R6 .2 5W

R5 .2 5W

RETURN

D3 MR1030B

W1 (SEE NOTE 3)

R38 680

R37 10

Q9 MPS A55

Q8 2N4441

C13 .01uf

R40 100

D18 IN962A 18V

D5 IN2970B 6.8V

R41 100 1W

9 10 +15VDC ± 5% @ 4A MAX (SEE NOTE 2)

7 +8VDC ± 10% @ 1A MAX (SEE NOTE 2)

C10 500uf 25V

C4 50uf 50V

C9 50uf 50V

C11 50uf 50V

SEE NOTE #1

11 GND

12 GND

13 GND

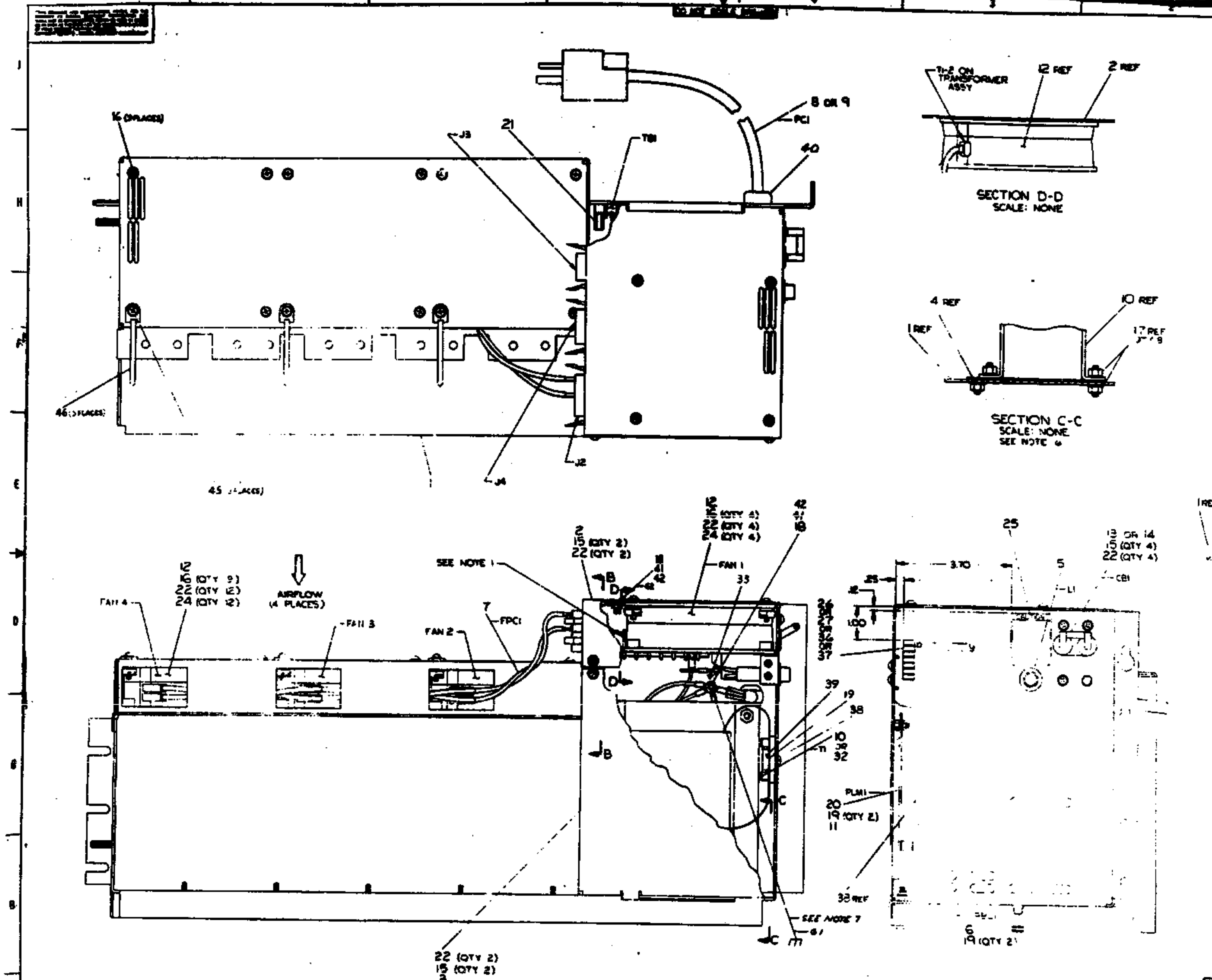
15V REGULATOR
(SEE NOTE #4)

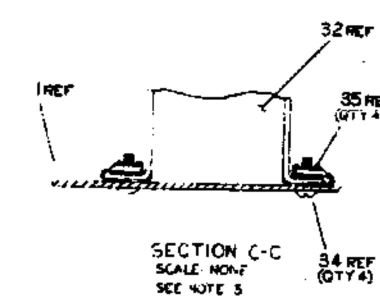
REVISIONS		
CHK	CHANGE NO.	REV.

TITLE PWR. LINE MONITOR/15V REG.

SCALE —H— SHEET 4 OF 4

DCS 5411086-0-1





NOTES.

1. AFTER TERMINAL BLOCK (PART OF TRANSFORMER ASSEMBLY) IS MOUNTED TO CHASSIS, CAPACITOR AND VARISTOR SHOULD BE BENT FORWARD TO ALLOW CLEARANCE FOR COVER.
2. REV. D AND EARLIER TRANSFORMERS DO NOT HAVE THIS WIRE. H7420 E+F ONLY
3. FILLER PANELS (D-IA-7413405-0-0) MAY BE USED IN UNFILLED REGULATOR SLOTS (REF).
4. CABLE TIE MOUNTS TO BE MOUNTED AFTER TRANSFORMER ASSEMBLY IS INSTALLED.
5. H7420 A+B ONLY.
6. H7420 E+F ONLY.
7. REMOVE PAINT MASK, APPLY CONDUCTIVE GREASE ITEM 42, PLACE ITEM 41 8-32 EXT TOOTH WASHER NEXT TO CHASSIS BEFORE INSTALLING REMAINING HARDWARE. DO THIS AT G1 AND G2.

FOR PARTS LIST REFER TO A-PL-[illegible]

H7420

SEE PARTS LIST

H7420
POWER SUPPLY

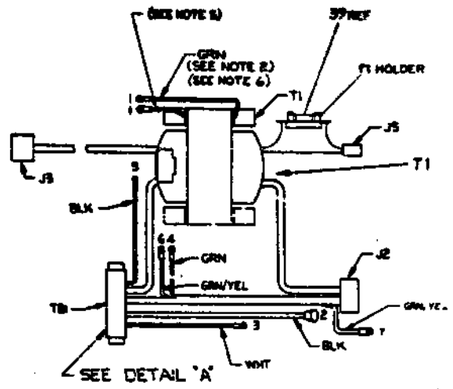
D

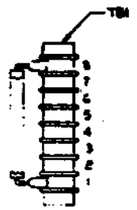
WIRE TABLE

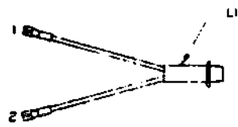
ITEM NO	DESCRIPTION AWG	COLOR	FROM CONNECTION	TO CONNECTION	REMARKS
10	⟷	⟷	T1-35	RBC1-P5	
1	14	GRN	T1-1	67	SEE NOTE 2,11
2	⟷	BLK	T1-2	FAN 1-E 2	
3	14	WHT	T1-3	CB1-1	
4	14	GRN	T1-4	67	SEE NOTE 7
10	14	BLK	T1-5	CB1-2	
5	22	BLK	L1-1	TB1-5	
6	22	BLK	L1-2	TB1-7	
7	18	RED	FPC1-J6	FAN 4-1	
8	18	WHT	FPC1-J7	FAN 4-2	
		RED	FPC1-J8	FAN 3-1	
		WHT	FPC1-J9	FAN 3-2	
		RED	FPC1-J10	FAN 2-1	
		WHT	FPC1-J11	FAN 2-2	
9	9	RED	FPC1-1	J2-3	
7	18	WHT	FPC1-2	J2-1	
8/9	14	BLK	PC1-1	CB1-4	
8/9	14	GRN	PC1-2		SEE NOTE 7
8/9	14	WHT	PC1-3	CB1-3	
11	⟷	⟷	BLK		
10	14	GRN/YEL	T1-6		SEE NOTE 7
10	14	GRN/YEL	T1-7	J2	SEE NOTE 7

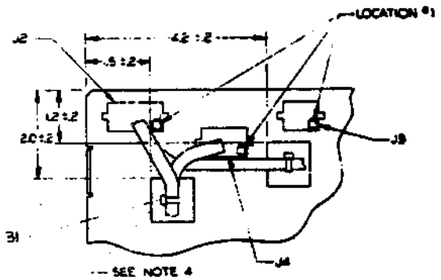
JUMPER TABLE

ITEM NO	DESCRIPTION AWG	COLOR	FROM CONNECTION	WITH	TO CONNECTION	WITH	WIRE LENGTH	VARIATION
2A	14	BLK	TB1-2	ITEM 2B	TB1-4	ITEM 2B	3.0	H7420E1A
2B	14	BLK	TB1-4	ITEM 2B	TB1-6	ITEM 2B	3.0	
2A	14	BLK	TB1-6	ITEM 2B	TB1-5	ITEM 2B	3.0	H7420E1B

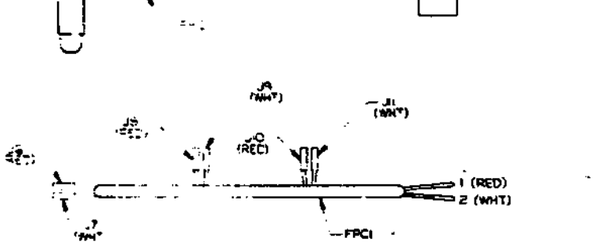


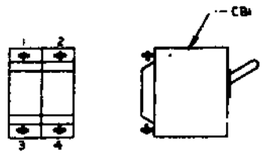




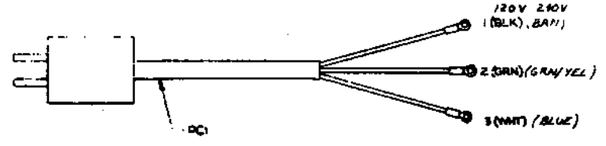


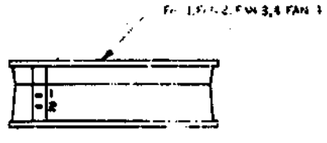
SECTION E-E
SCALE: NONE



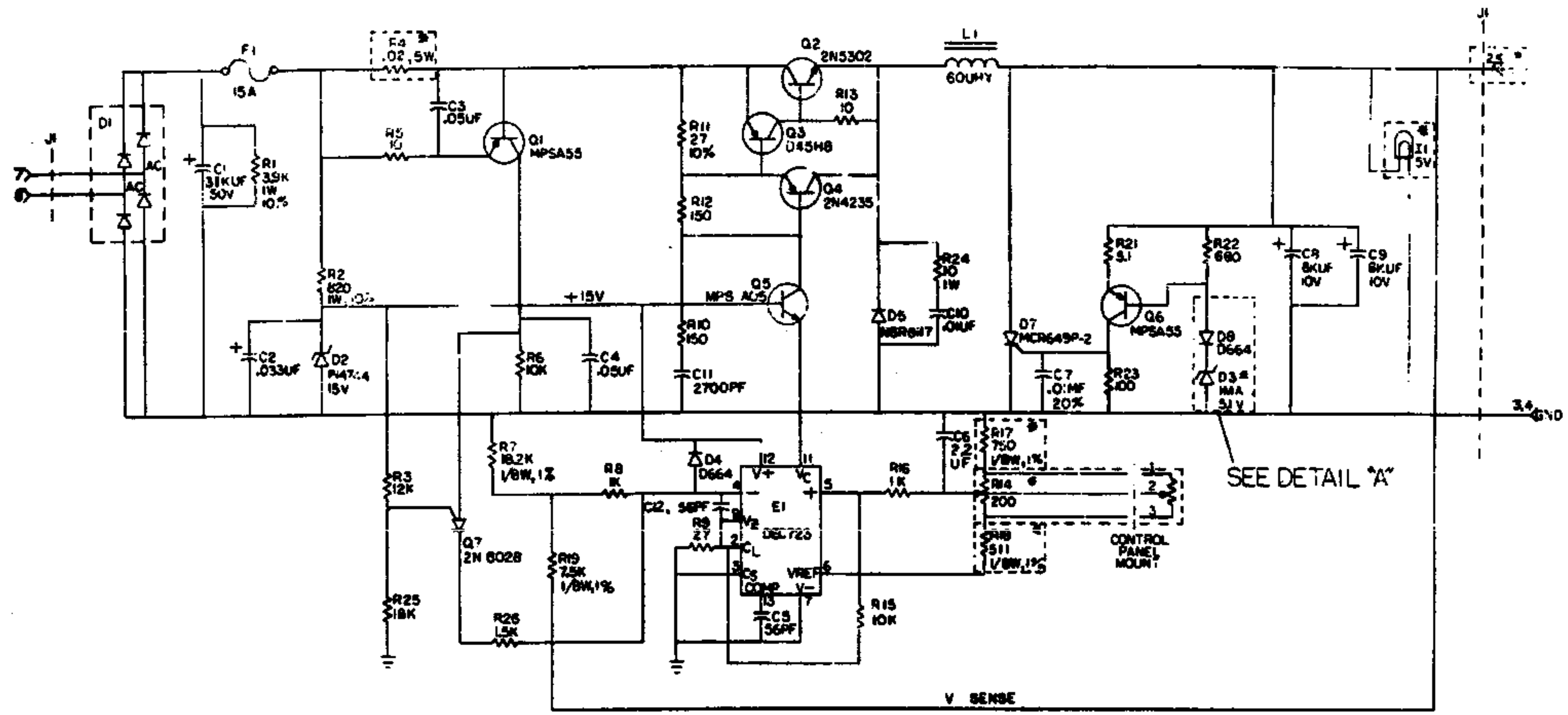


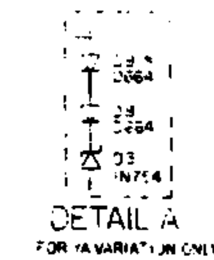
PLMI (SHOWN)





H7420 POWER SUPPLY





[ ] FOR YA VARIATION COMPONENT VALUES ARE AS FOLLOWS:

R4 - .06 5W
R14 - 1K 10 TURN
R17 - 300 1/8W 1%
R18 - 150 1/4W 5%
D3 - 1N754
I1 - 15V
J1-2,5 - +2.0-8.0V

D9 - D664 ADDED FOR YA VARIATION ONLY

UNLESS OTHERWISE INDICATED:

RESISTORS ARE 1/4W, 5%

SEMICONDUCTOR CONVERSION CHART

DEC NO.	EIA NO.	DEC NO.	EIA NO.
1N964A	SAME	MPSA55	
D664	1N3605	2N5302	
MCR649P-2		D45H8	
1175A	SAME	MPSA05	
1N4744	SAME		
NSR8117			
2N6028			

PARTS LIST

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

ETCH BOARD REV F H

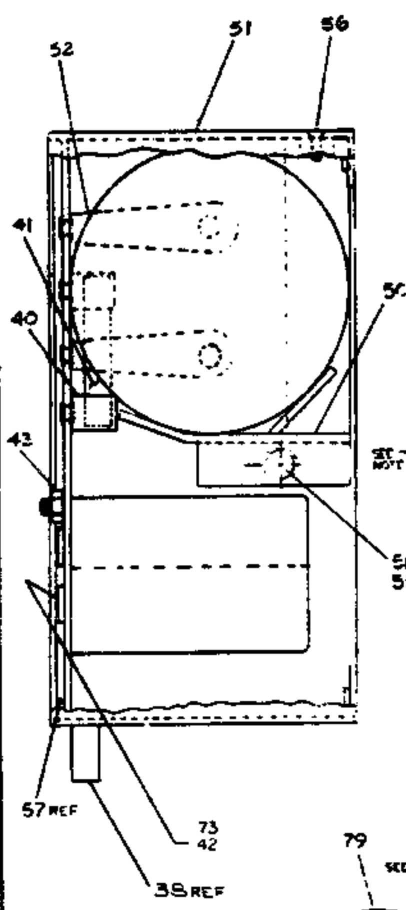
EQUIPMENT CORPORATION

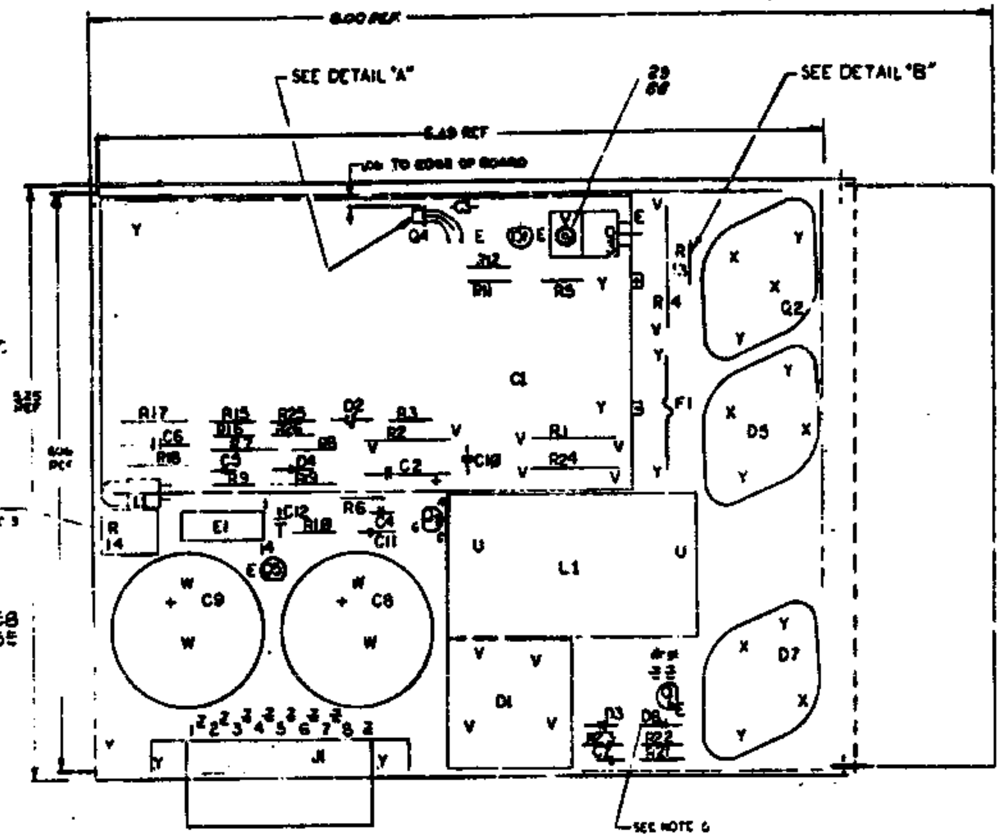
TITLE: 5V REGULATOR

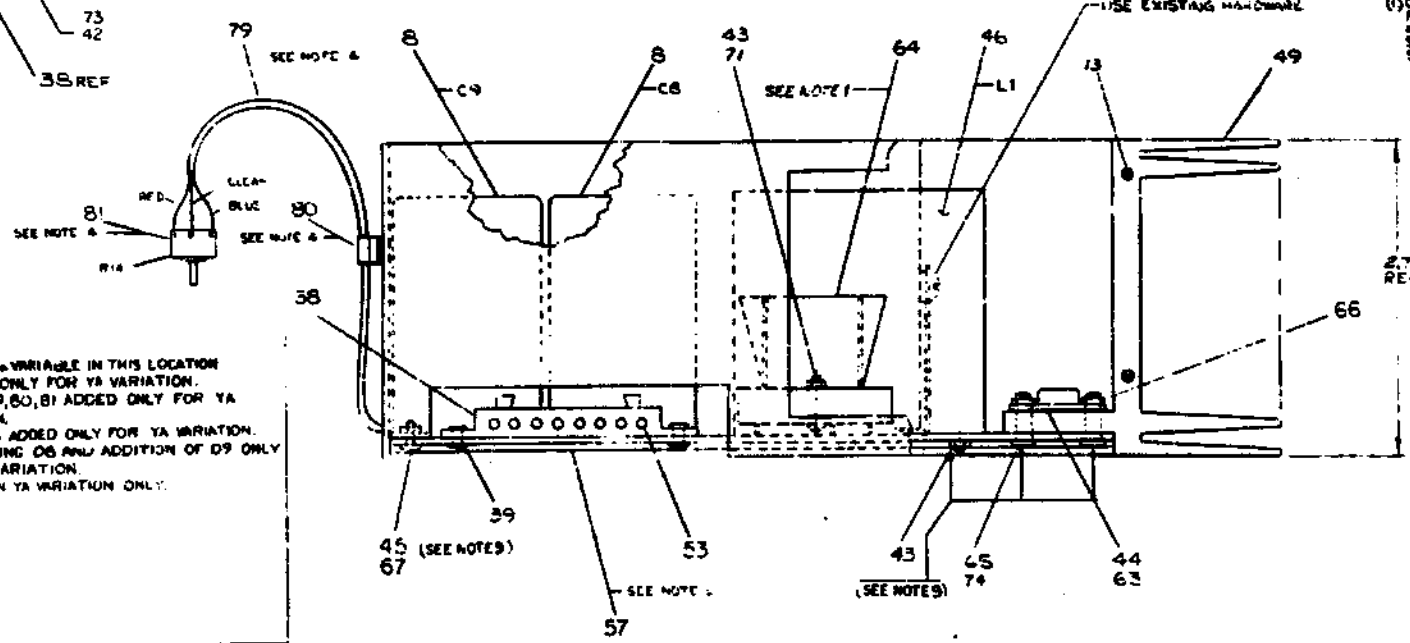
NEXT HIGHER ASSY

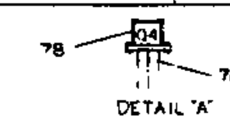
SIZE D CODE CS NUMBER H744-Ø-1

SHEET 1 OF 1

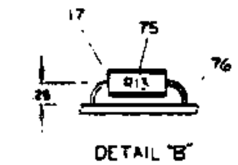








DETAIL "A"



DETAIL "B"

(SEE NOTE 8)

NOTE 8:
(1) Q3 SCREW HEAD SHOULD BE ON TOP OF FLAT RECTANGULAR WASHER AS SHOWN. APPLY 6 INCH LBS. OF TORQUE WHEN SECURING Q3 TO CKT. BOARD BEFORE SOLDERING.

NOTE 9: TORQUE APPLICATION
(1) APPLY 12 INCH LBS. OF TORQUE TO ALL #4 HARDWARE EXCEPT Q3.
(2) APPLY 16 INCH LBS. OF TORQUE TO ALL #6 AND #10 HARDWARE.
(3) ALL HARDWARE TO BE TORQUED BEFORE SOLDERING.

NOTES:
3. R14-200Ω VARIABLE IN THIS LOCATION DELETED ONLY FOR YA VARIATION.
4. ITEMS #79,80,81 ADDED ONLY FOR YA VARIATION.
5. ITEM #57A ADDED ONLY FOR YA VARIATION.
6. RELOCATING D8 AND ADDITION OF D9 ONLY FOR YA VARIATION.
7. USE D9 IN YA VARIATION ONLY.

8. SECURE Q4 TO CKT BOARD WITH PERMABOND 101 CONTACT CEMENT - THEN CONNECT LEADS AS SHOWN.

NOTES:
1. APPLY ITEM #63 (COMPOUND) BETWEEN TRANSISTOR (Q2), DIODES (D5, D7) AND ITEM #44 (WASHER) ALSO BETWEEN ITEM #44 (WASHER) AND HEAT SINK (ITEM #49). ALSO APPLY ITEM #63 (COMPOUND) BETWEEN ITEM #9 (DIODE BRIDGE) AND ITEM #64 (HEAT SINK BRIDGE).

QTY 744-YA	QTY 744-0	REF DESIGNATION	DESIGNATION	PART NO.	ITEM NO.
1	1	R22	RES 680 1/4W 5%	1301424	69
1	1		PACKING INSTRUCTIONS	AP-3700074-00	70
1	1		SCR, PHL PAN HD #6-32 × 5/8 LG	9006085-1	71
1	0	I1	15 VOLT LAMP	1209169	72
4	4		LOCKWASHER #10 INT	9006645	73
AR	AR		PERMABOND 101 CEMENT	9009157	74
AR	AR		TEF TUBING	9107302-11	75
AR	AR		TEF TUBING	9107278-11	76
1	1	Q4	TRANSISTOR 2N4235	1508935	77
AR	AR		SHRINK SLEEVING	9107292-09	78
1	0	2 W1	WIRE, MICRODOT	1700014	79
1	0		CLAMP, CABLE	9007079	80
1	0	R14	POT, 10 TURN, 1KΩ	1309532-04	81
1	0	R17	RES, 300Ω 1/4W 5%	1301429	82
1	0	R16	RES, 150Ω 1/4W 5%	1300250	83
1	0	R4	RES, .06Ω 5W 3%	1310876-02	84
1	0	D9	DIODE ZENER 1N754	1109991	85
6	6		FLAT WASHER #4	9006655	86

QTY 744-YA	QTY 744-0	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
0	1	I1	5 VOLT LAMP	2-09219-1	68
2	2		L WASHER #4	9006638	67
7	7		NUT KEPS #4-40	9006657	66
6	6		SCR PHL PAN HD #4-40 × 3/16 LG	9008033-[illegible]	65
1	1		HEAT SINK [illegible]	1210907	64
AR	AR		COMPOUND THERMAL JOINT	9008888	63
1	1	R26	RESISTOR [illegible] 1/4W 5%	[illegible]	62
1	1	R10	RESISTOR [illegible] 1/4W 1%	1305322	61
1	1	R8	RESISTOR 18K 1/4W 5%	1300485	60
1	1	Q7	TRANSISTOR, UNIJUNCTION [illegible]	1510877	59
1	1		SCR, PHL PAN HD #6-32 × 1/4 LG	9006020-1	58
[illegible]	[illegible]		COVER [illegible]	C-HD-[illegible]	57
1	1		SCR, PHL FLT HD #6-32 × 1/4 LG	9006020-8	56
1	1		WASHER, [illegible] #6	9006033	55
[illegible]	[illegible]		SCR PHL [illegible]	[illegible]	54
8	8		CONTACT FEMALE	1209956	53
2	2		STRAP, CAPACITOR	C-MD-5309759-[illegible]	52
1	1		BRACKET, REGULATOR	D-IA-5309756-[illegible]	51
1	1		HOLDER, CAPACITOR 2.5	C-IA-12346-[illegible]	50
1	1		HEAT SINK REGULATOR	D-PS-1201376-[illegible]	49
2	2	C5, C12	CAP 56 PF	1000012	48
1	1	R24	RESISTOR 10 1W	1300171	47
1	1	L1	REACTOR [illegible]	1610850	46
2	2		SCR, PHL PAN HD #4-40 1/4 LG	9008[illegible]-7	45
3	3		WASHER, INSULATOR	9006721	44
3	3		NUT, KEPS #6-32	9008195	43
4	4		SCR #10-32 (2) SLOTTED PAN HD	9009549	42
1	1	F1	FUSE 15 AMP	9007226	41
2	2		FUSE CLIP	9007801	40
6	6		EYELET 55-4-8	9001000	39
1	1	J1	MATE N [illegible]	1209340	38
1	1	E1	INTEGRATED CIRCUIT [illegible]	1910415	37
1	1	Q5	TRANSISTOR AC5	1510705	36
1	1	Q3	TRANSISTOR D45H8	1510708-1	35
2	2	Q1, Q6	TRANSISTOR MPSA55 MOT	1510708	34
1	1	Q2	TRANSISTOR 2N6302	1510196	33
0	1	R14	RES VARIABLE 200	[illegible]	32
1	1	R21	RES 51 1/4W 5%	1309422	31
1	1	R23	RES 100 1/4W 5%	1300229	30
1	1		SCR, [illegible]	9006011-1	29
1	1	R11	RES 27 1/4W 10%	1301420	28
0	1	R17	RES 750 1/4W 1%	1302955	27
1	1	R9	RES 27 1/4W 5%	1301522	26
1	1	R7	RES 16.2K 1/4W 1%	[illegible]	25
2	2	R6, R16	RES 1K 1/4W 5%	1300305	24
0	1	R18	RES 511 1/8W 1%	1302411	23
1	1	R15	RES 18K 1/4W 5%	1302465	22
2	2	R6, R15	RES 10K 1/4W 5%	1300474	21
0	1	R4	RES .02 5W 3%	1310876	20
1	1	R2	RES 820 1W 10%	1300538	19
1	1	R1	RES 3.9K 1W 10%	1302927	18
2	2	R5, R13	RES 10 1/4W 5%	1301517	17
2	2	R12, R16	RES 150 1/4W 5%	1300250	16
0	1	D3	DIODE ZENER [illegible]	1110925	15
1	1	D7	SCR MCR 649P-2	1109465	14
4	4		SCR, FLT #4 3/16 [illegible]	9009142	13
1	1	D5	DIODE [illegible] B[illegible]	1110715	12
3	2	D4 D6 D7	DIODE [illegible]	1100114	11
1	1	D2	DIODE ZENER 1N4744	1105648	10
1	1	D1	DIODE BRIDGE	1110714	9
2	2	C8, C9	CAP [illegible] 10V	1010704	8
1	1	C1	CAP 31 K[illegible] 50V	[illegible]	7
2	2	C4, C3	CAP .068µF 35V	1001774	6
1	1	C2	CAP .033µF [illegible]	1000050	5
1	1	C11	CAP 2700PF 100V 5% DM	1001657	4
2	2	C7, C10	CAP .01MF 100V 20% DISC	1001610	3
	1	C6	[illegible]	1002627	2
1	1		ETCHED CIRCUIT BOARD	5009729	1
			ASSY/DRILLING HOLE LAYOUT	D-AH-H744-0-5	
			X-Y COORDINATE HOLE LOCATION	[illegible] H744-0-4	REF
			MODULE ECO HISTORY	[illegible] H744-0-6	REF
			CIRCUIT SCHEMATIC	[illegible] H744-0-1	REF

PARTS LIST

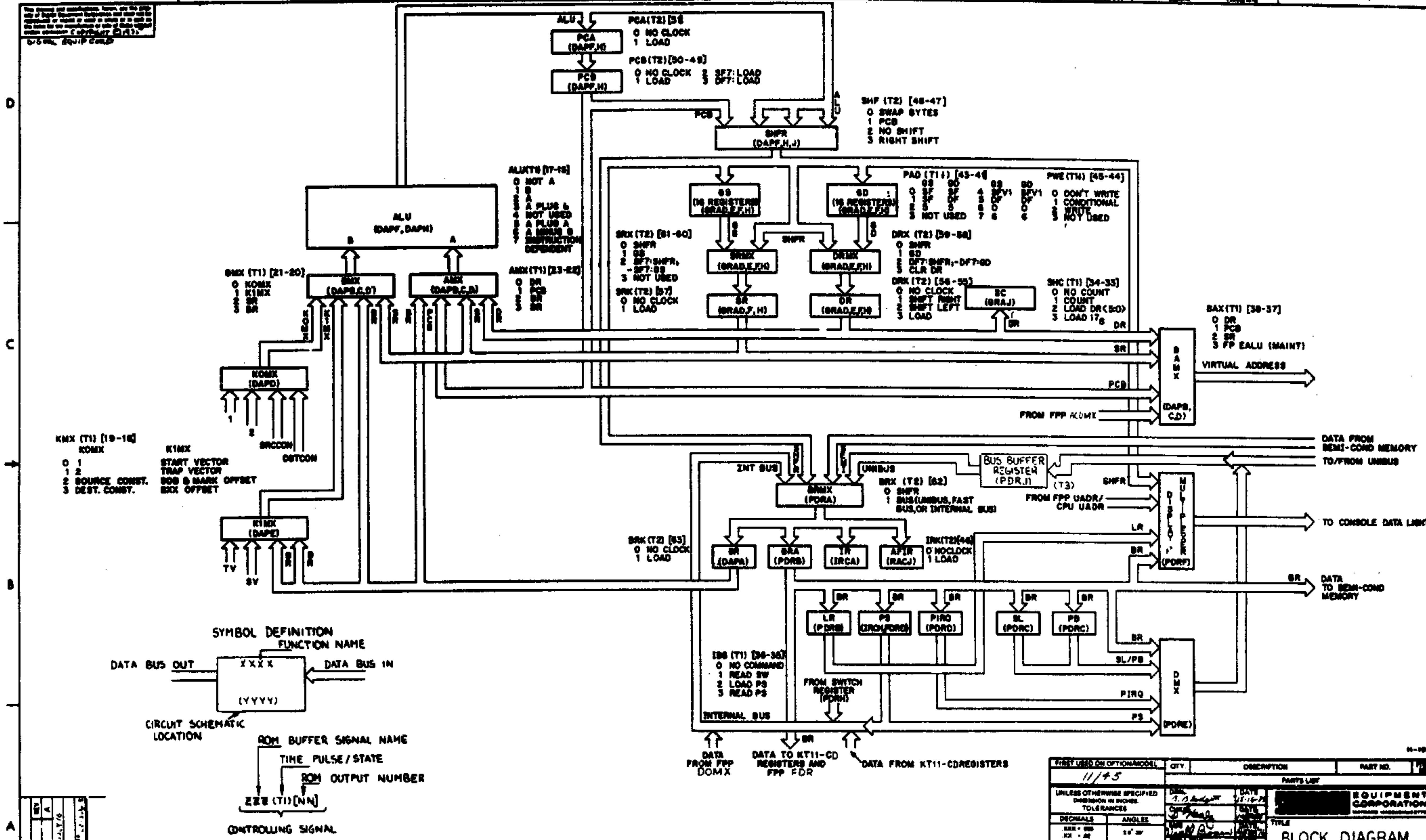
FIRST USED ON OPTION: D-UA-H742A-0-0

ETCH BOARD REV H

5V REGULATOR

E-UA-H744-0-0

SECTION III
KB11-C/D BLOCK DIAGRAMS



PCA (DAPF,H)
PCA(T2) [58] 0 NO CLOCK 1 LOAD
PCB (DAPF,H)
PCB(T2) [50-49] 0 NO CLOCK 1 LOAD 2 SF7:LOAD 3 DF7:LOAD
SHFR (DAPF,H,J)
SHF (T2) [46-47] 0 SWAP BYTES 1 PCB 2 NO SHIFT 3 RIGHT SHIFT
ALU (DAPF,DAPH)
ALUS [17-13] 0 NOT A 1 B 2 A 3 A PLUS B 4 NOT USED 5 A PLUS A 6 A MINUS B 7 INSTRUCTION DEPENDENT
BMX (T1) [21-20] 0 KOMX 1 K1MX 2 SR 3 BR
AMX (T1) [23-22] 0 DR 1 PCB 2 BR 3 SR
BMX (DAPB,C,D)
AMX (DAPB,C,B)
GS (16 REGISTERS) (GRAD,E,F,H)
GD (16 REGISTERS) (GRAD,E,F,H)
PAD (T1) [43-41]
PWE (T1) [45-44] 0 DON'T WRITE 1 CONDITIONAL 2 WRITE 3 NOT USED
SRX (T2) [61-60] 0 SHFR 1 GS 2 SF7:SHFR, -SF7:GS 3 NOT USED
SRMX (GRAD,E,F,H)
DRMX (GRAD,E,F,H)
DRX (T2) [59-58] 0 SHFR 1 GD 2 DF7:SHFR, -DF7:GD 3 CLR DR
SRK (T2) [57] 0 NO CLOCK 1 LOAD
SR (GRAD,F,H)
DR (GRAD,E,F,H)
DRK (T2) [56-55] 0 NO CLOCK 1 SHIFT RIGHT 2 SHIFT LEFT 3 LOAD
SC (GRAJ)
SHC (T1) [34-33] 0 NO COUNT 1 COUNT 2 LOAD DR(5:0) 3 LOAD 17₈
BAX (T1) [38-37] 0 DR 1 PCB 2 SR 3 FP EALU (MAINT)
BAMX (DAPB,C,D)
VIRTUAL ADDRESS
FROM FPP ACOMX
KOMX (DAPD)
KMX (T1) [19-18]
KOMX 0 1 1 2 2 SOURCE CONST. 3 DEST. CONST.
K1MX START VECTOR TRAP VECTOR SOB & MARK OFFSET EXX OFFSET
SRCCON DSTCON
K1MX (DAPE)
TV SV
DATA FROM SEMI-COND MEMORY
TO/FROM UNIBUS
BUS BUFFER REGISTER (PDR,I) (T3)
INT BUS
UNIBUS
BRMX (PDRA)
BRX (T2) [62] 0 SHFR 1 BUS(UNIBUS,FAST BUS,OR INTERNAL BUS)
FROM FPP UADR/ CPU UADR
DISPLAY MULTIPLEXOR (PDRF)
TO CONSOLE DATA LIGHTS
BRK (T2) [63] 0 NO CLOCK 1 LOAD
BR (DAPA)
BRA (PDRB)
IR (IRCA)
AFIR (RACJ)
IRK(T2)[40] 0 NOCLOCK 1 LOAD
DATA TO SEMI-COND MEMORY
LR (PDRB)
PS (DRCH,PDRD)
PIRQ (PDRD)
SL (PDRC)
PB (PDRC)
IBS (T1) [36-35] 0 NO COMMAND 1 READ SW 2 LOAD PS 3 READ PS
FROM SWITCH REGISTER (PDRH)
INTERNAL BUS
DMX (PDRE)
DATA FROM FPP DDMX
DATA TO KT11-CD REGISTERS AND FPP FDR
DATA FROM KT11-CDREGISTERS
SYMBOL DEFINITION
FUNCTION NAME
DATA BUS OUT
XXXX
DATA BUS IN
(YYYY)
CIRCUIT SCHEMATIC LOCATION
ROM BUFFER SIGNAL NAME
TIME PULSE/STATE
ROM OUTPUT NUMBER
ZZZ (T1) [NN]
CONTROLLING SIGNAL

FIRST USED ON OPTION/MODEL: 11/45

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES

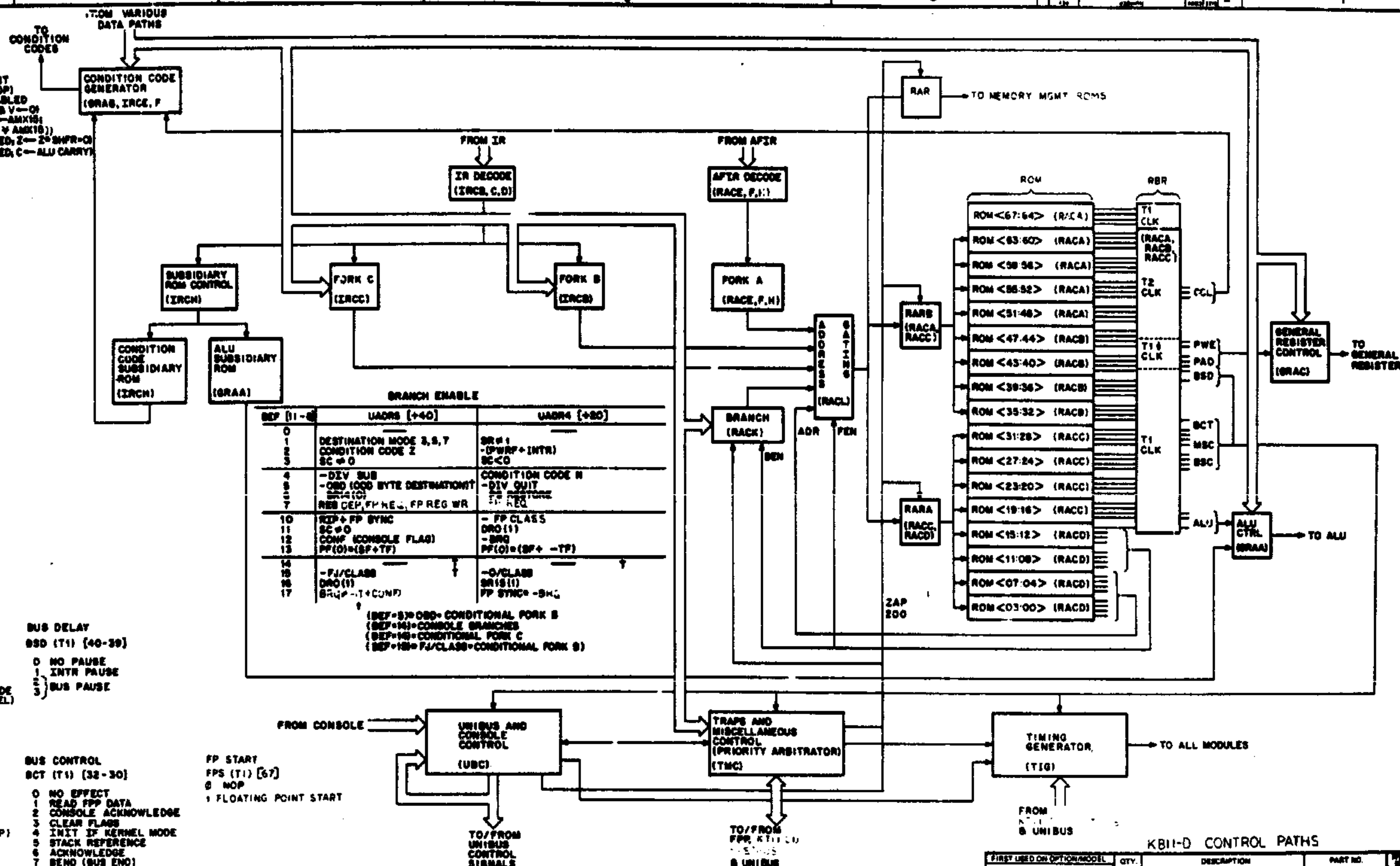
[redacted] EQUIPMENT CORPORATION

TITLE: BLOCK DIAGRAM KB11-D

D BD KB11-C-2 REV. A

NEXT HIGHER ASSY: B-DD-KB11-D

SHEET 1 OF 2



CONDITION CODE LOAD
CCL (T2) [54-52]

0 NO CHANGE
1 INSTRUCTION DEPENDENT
2 SET/CLR FROM IR (CCOP)
3 LOAD FROM FPP IF ENABLED
4 CCLD4(Z & N ACC SHFR, C & V ← 0)
5 CCLD5(Z & N ACC SHFR, C ← AMX16; V ← V_{old} ⊕ (SHFR15 ⊕ AMX15))
6 CCLD6(N, C, & V UNAFFECTED; Z ← Z* SHFR=0)
7 CCLD7(Z, N, & V UNAFFECTED; C ← ALU CARRY)

FORK ENABLE
FEN [14-12]

0 NO FORK
1 FORK A
2 FORK B
4 FORK C

MICRO ADDRESS FIELD
UAD[07-00]
TO ADDRESS GATING

BRANCH ENABLE

BEF [11-8]	UADR5 [+40]	UADR4 [+20]
0	—	—
1	DESTINATION MODE 3,5,7	SR≠1
2	CONDITION CODE Z	-(PWRF+INTR)
3	SC≠0	SC<0
4	-DIV SUB	CONDITION CODE N
5	-OBD (ODD BYTE DESTINATION)†	-DIV QUIT
6	SR(C)	FP RESTORE
7	RES DEP, FP REG, FP REG WR	FP REQ
10	RIP+FP SYNC	- FP CLASS
11	SC≠0	DRO(1)
12	CONF (CONSOLE FLAG)	-BRQ
13	PF(0)=(SF+TF)	PF(0)=(SF+ -TF)
14	— †	— †
15	-FJ/CLASS	-O/CLASS
16	DRO(1)	SR15(1)
17	BRQ+-T+CONF	FP SYNC+ -BRQ

†
(BEF=5)*OBD=CONDITIONAL FORK B
(BEF=14)=CONSOLE BRANCHES
(BEF=14)=CONDITIONAL FORK C
(BEF=15)=FJ/CLASS=CONDITIONAL FORK B)

MISCELLANEOUS
MSC (T1) [29-27]

0 NO EFFECT
1 FP ATTN
2 NOT USED
3 SET CONF IF KERNEL MODE
4 SPL (SET PRIORITY LEVEL)
5 CONDITIONAL BUST
6 BRQ STROBE
7 BUST (BUS START)

BUS DELAY
BSD (T1) [40-39]

0 NO PAUSE
1 INTR PAUSE
2, 3 } BUS PAUSE

BUS CONDITION
BSC (T1) [28-24]

0 DATI
1 SRC1 DATI
2 KERNEL DATI
3 SRC2 DATI
4 FC (CONTROLLED BY FPP)
5 DATO
6 BSOP1
7 BSOP2

BUS CONTROL
BCT (T1) [32-30]

0 NO EFFECT
1 READ FPP DATA
2 CONSOLE ACKNOWLEDGE
3 CLEAR FLAGS
4 INIT IF KERNEL MODE
5 STACK REFERENCE
6 ACKNOWLEDGE
7 BEND (BUS END)

FP START
FPS (T1) [67]
0 NOP
1 FLOATING POINT START

FLOATING POINT CONTROL
FPC (T1) [65-64]

0 NOP
1 LD FGR
2 LD FIR
3 LD FPA
4 READ DATA
5 READ FPS
6 READ FOR
7 READ FPA

* BCT = 1 IS HIGH ORDER BIT OF FPC

CLEAR SYNC
CLS (T1) [66]

0 NOP
1 INITIALIZE SYNCHRONIZER

KB11-D CONTROL PATHS

FIRST USED ON OPTION/MODEL: KB11-D
NEXT HIGHER ASSY: B-DD-KB11-D

[redacted] EQUIPMENT CORPORATION

TITLE: BLOCK DIAGRAM KB11-D

SIZE: D | CODE: BD | NUMBER: KB11-D-2 | REV: A

SHEET 2 OF 2

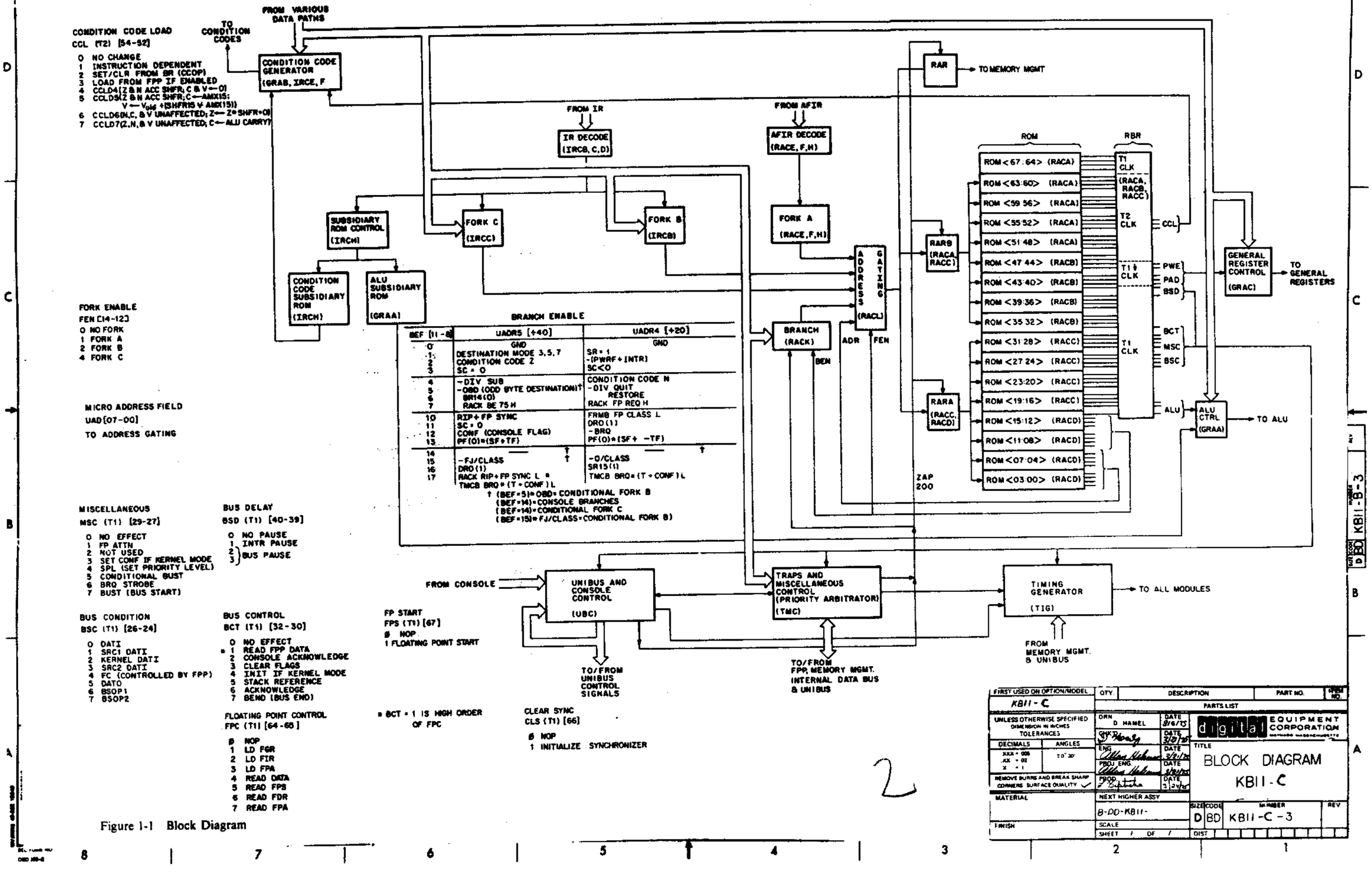
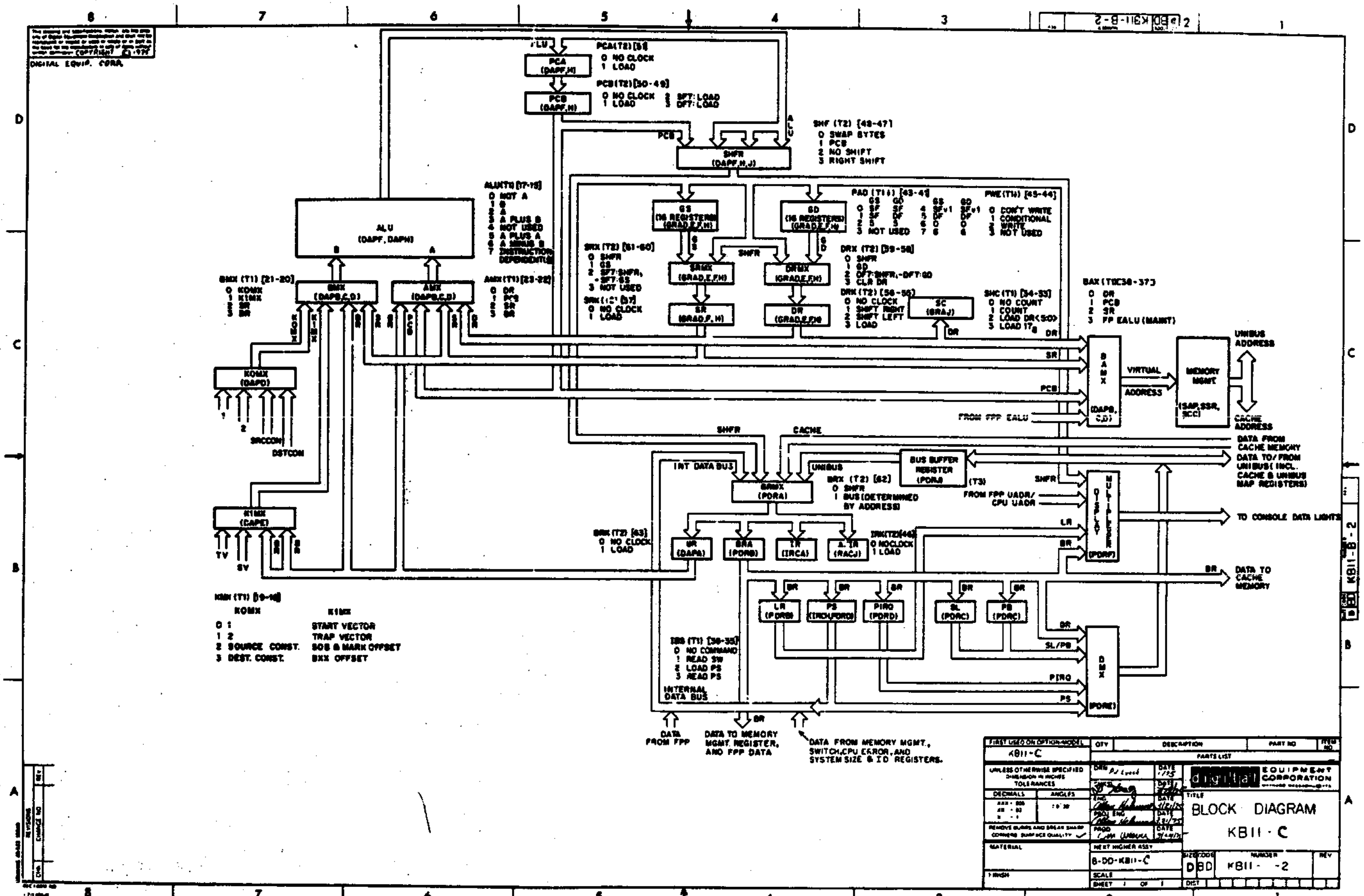
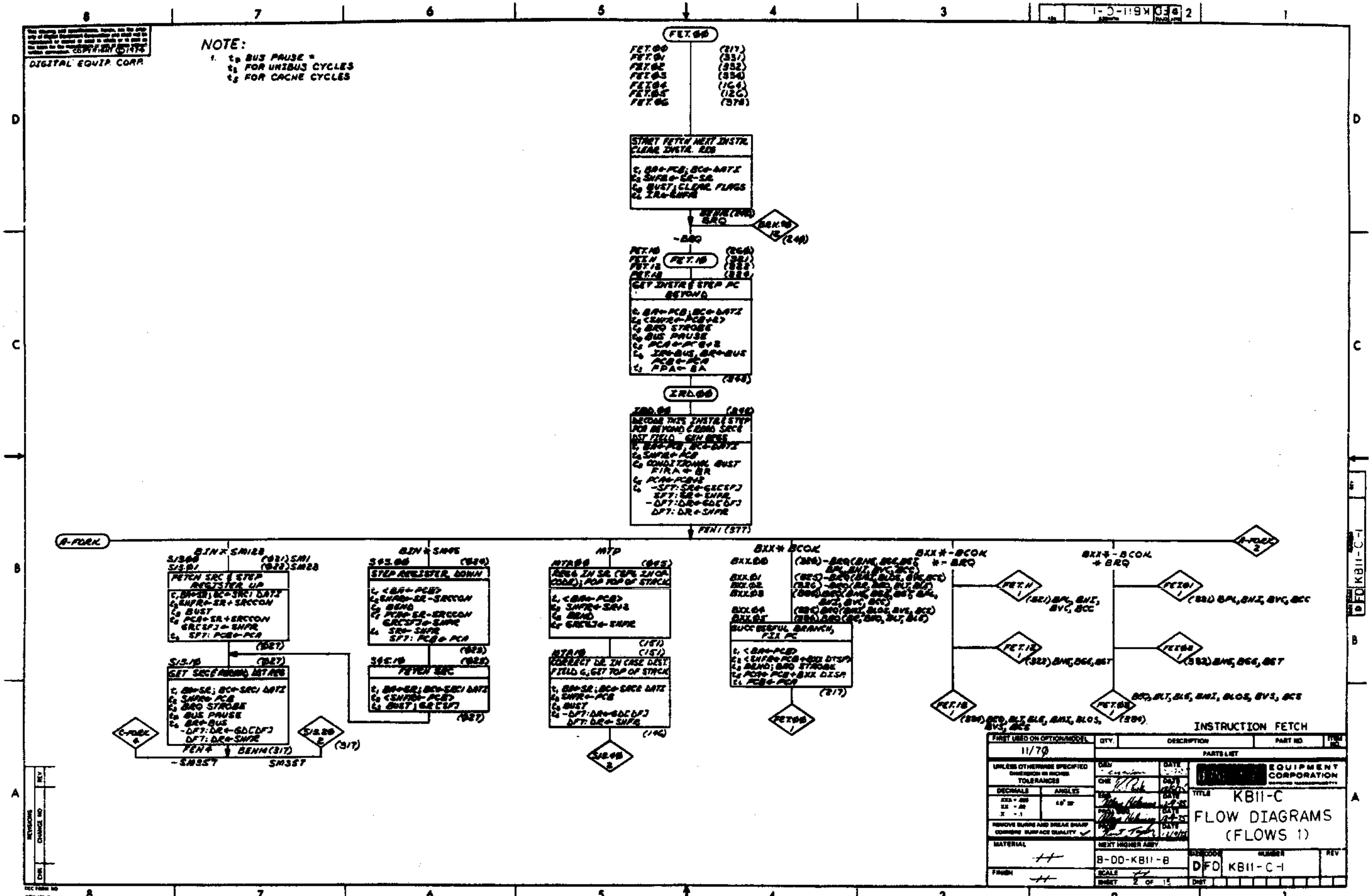


Figure 1-1 Block Diagram


DIGITAL EQUIP. CORP.
PCA (DAPF,H)
PCA(T2) [55]
0 NO CLOCK
1 LOAD
PCB (DAPF,H)
PCB(T2) [50-49]
0 NO CLOCK
1 LOAD
2 SFT: LOAD
3 DFT: LOAD
SHFR (DAPF,H,J)
SHF (T2) [48-47]
0 SWAP BYTES
1 PCB
2 NO SHIFT
3 RIGHT SHIFT
ALU (DAPF, DAPH)
ALU(T1) [17-15]
0 NOT A
1 B
2 A
3 A PLUS B
4 NOT USED
5 A PLUS A
6 A MINUS B
7 INSTRUCTION DEPENDENT
BMX (T1) [21-20]
0 KOMX
1 K1MX
2 SR
3 BR
BMX (DAPB,C,D)
AMX (DAPB,C,D)
AMX (T1) [23-22]
0 DR
1 PCB
2 SR
3 BR
GS (16 REGISTERS) (GRAD,E,F,H)
GD (16 REGISTERS) (GRAD,E,F,H)
SRMX (GRAD,E,F,H)
DRMX (GRAD,E,F,H)
SRX (T2) [61-60]
0 SHFR
1 GS
2 SFT:SHFR, DFT:GS
3 NOT USED
SRK (T2) [57]
0 NO CLOCK
1 LOAD
SR (GRAD,F,H)
DR (GRAD,E,F,H)
SC (GRAJ)
PAD (T1) [43-41]
DRX (T2) [59-58]
0 SHFR
1 GD
2 DFT:SHFR, DFT:GD
3 CLR DR
DRK (T2) [56-55]
0 NO CLOCK
1 SHIFT RIGHT
2 SHIFT LEFT
3 LOAD
SHC (T1) [34-33]
0 NO COUNT
1 COUNT
2 LOAD DR<5:0>
3 LOAD 17
PWE (T1) [45-44]
0 DON'T WRITE
1 CONDITIONAL
2 WRITE
3 NOT USED
BAX (T1) [38-37]
0 DR
1 PCB
2 SR
3 FP EALU (MANT)
KOMX (DAPD)
SRCCON
DSTCON
K1MX (CAPE)
TV
SV
KMX (T1) [9-10]
KOMX
K1MX
0 1
1 2
2 SOURCE CONST.
3 DEST. CONST.
START VECTOR
TRAP VECTOR
SOB & MARK OFFSET
BXX OFFSET
BAMX (DAPB, C,D)
VIRTUAL ADDRESS
MEMORY MGMT (SAP,SSR, SCC)
UNIBUS ADDRESS
CACHE ADDRESS
FROM FPP EALU
DATA FROM CACHE MEMORY
DATA TO/FROM UNIBUS (INCL. CACHE & UNIBUS MAP REGISTERS)
BUS BUFFER REGISTER (PDRB)
INT DATA BUS
UNIBUS
CACHE
BRMX (PDRA)
BRX (T2) [62]
0 SHFR
1 BUS (DETERMINED BY ADDRESS)
FROM FPP UADR/ CPU UADR
DISPLAY MULTIPLEXER (PDRF)
TO CONSOLE DATA LIGHTS
BRK (T2) [63]
0 NO CLOCK
1 LOAD
UR (DAPA)
BRA (PDRB)
IR (IRCA)
A. IR (RACJ)
IRK (T2) [44]
0 NO CLOCK
1 LOAD
DATA TO CACHE MEMORY
LR (PDRB)
PS (IRCH,PDRD)
PIRQ (PDRD)
SL (PDRC)
PB (PDRC)
SL/PB
DMX (PDRE)
SBS (T1) [36-35]
0 NO COMMAND
1 READ SW
2 LOAD PS
3 READ PS
INTERNAL DATA BUS
DATA FROM FPP
DATA TO MEMORY MGMT. REGISTER, AND FPP DATA
DATA FROM MEMORY MGMT., SWITCH,CPU ERROR, AND SYSTEM SIZE & ID REGISTERS.
KB11-C
digital EQUIPMENT CORPORATION
BLOCK DIAGRAM KB11-C
B-DD-KB11-C
D BD KB11- -2

SECTION IV
KB11-C FLOW DIAGRAMS



DIGITAL EQUIP. CORP.
NOTE:
INSTRUCTION FETCH
11/70
KB11-C
FLOW DIAGRAMS
(FLOWS 1)
B-DD-KB11-B
D FD KB11-C-1

A-FORK

BIN# SING7

S47.00 (304)
SHIFT INDEX WORD; SETUP SR, BA TO POINT AT INDEX WORD, INDEX WORD IF SP? OR DF?
t, BA←PCB; BC←DATI
t₂ SHFR←PCB+2
t₃ BUS PAUSE
t₄ BRQ←BUS
-SP?: SR←GSC[5:3]
SP?: SR← SHFR
-DF?: DR←GDF DF?
DF?: DR← SHFR

S47.10 (305)
DO INDEXING; FIX UP PC TO POINT BEYOND INDEX WORD
t, PCB←PCB?
t₂ SHFR← SR+6R
t₃ SR←SHFR
PCB←PCA
(141) (141)

S47.20 (306)
FETCH SRC; NO SI CHECK
t, BA←SR; BC← SRC! DATI
t₂ <SHFR← PCB>
t₃ BUST; GRC[0:7]
(142) (142)

S47.30
GET SRC
t, BA←SR; BC← SRC! DATI
t₂ <SHFR← PCB>
t₃ BRQ STROBE
t₄ BUS PAUSE
t₅ BA←BUS
FEN4 BEN#(KNI) -SM355?
C-FORK 4

S/S.20
S13.20 (147)
SRC ADDRS TO SR (INDIRECT)
t, <BA←PCB>
t₂ SHFR← BA
t₃ SR←SHFR
(148) (148)

S13.30
FETCH SRC OPERAND; NO SI CHECK
t, BA←SR; BC←SRC# DATI
t₂ <SHFR←PCB>
t₃ BUST; GRC[0:7]
(149) (149)

S/S.40
S13.40 (150)
GET SRC OPERAND
t, BA←SR; BC←SRC# DATI
t₂ <SHFR←PCB>
t₃ BRQ STROBE
t₄ BUS PAUSE
t₅ BA←BUS
FEN4 (377)
C-FORK 4

FP CLASS
FOP,00 (101)
MOVE SA TO BR
START FPU
t, <SA← PCB>
t₂ SHFR← DR
t₃ BEND
t₄ FP START
BR← SHFR
(316)

FOP,10 (314)
LD GRCDF3 TO FPU
t₃ FDR← BR
t₄ <BA ← PCB>
<SHFR ←BR>
FEN4 (377)
C-FORK 4

RTI+RTT
RTI.00 (316) RTI
RTT.00 (315) RTT
GET STACK POINTER (SP)
t, <BA← PCB>
t₂ SHFR← BA
t₃ BEND
t₄ SA←GSC[6]
(180) (180)

RTI.10 (181)
FETCH TOP OF STACK (NEW PC)
t, BA←SR; BC← DATI
t₂ <SHFR← BR>
t₃ BUST; GRC[6]
(182) (182)

RTI.20 (183)
STEP STACK POINTER (POP); ADDR OF NEXT WORD TO BR, GET NEW PC
t, BA←SR; BC← DATI
t₂ SHFR← SR+2
t₃ BUS PAUSE
t₄ GRC[6]← SHFR
t₅ BR← BUS
DR← SHFR
(184) (184)

RTI.30 (185)
FETCH TOP OF STACK (NEW PS)
t, BA←DR; BC← DATI
t₂ <SHFR← PCB>
t₃ BUST; GRC[7]
t₄ PDR← BR
t₅ PCB← PCA
(186) (186)

RTI.40 (187)
STEP STACK POINTER; GET NEW PS
t, BA←DR; BC← DATI
t₂ SHFR← DR+2
t₃ BUS PAUSE
t₄ GRC[6]← SHFR
t₅ BR← BUS
(188)

RTI.50
RTI.50 (216)
NEW PS TO PS
t, <BR← DR>
t₂ <SHFR← PCB>
t₃ PDR← BR
(198)

RTI.60
RTI.60 (199)
CLOCK BREAKS
t, <BA← DR>
t₂ <SHFR← PCB>
t₃ BRQ STROBE
t₄ CONS ACKN
(217)
PE.BUS J

RTS
RTS.00 (189)
DST FIELD REG TO PC, GET STACK POINTER (SP)
t, <BA←PCB>
t₂ <SHFR← DR>
t₃ BEND
t₄ PDR← BR
t₅ SA←GSC[6]
PCB← PCA

RTS.10 (200)
FETCH TOP OF STACK AND STEP SP
t, BA←SR; BC← DATI
t₂ SHFR← SR+2
t₃ BUST
t₄ GRC[6]← SHFR

RTS.20 (201)
GET TOP OF STACK TO BR
t, BA←SR; BC← DATI
t₂ <SHFR← PCB>
t₃ BUS PAUSE
t₄ BA←BUS
(375) (375)

RTS.30 (376)
BR (TOP OF STACK) TO DST FIELD REG;
t, <BA← SP>
t₂ SHFR← BR
t₃ BRQ STROBE
t₄ PCB← BR
GRC[DF]← SHFR
t₅ DFT: PCB← PCA
(317)
PE.BUS 1

SOB
SOB.00 (357)
OLD PC TO BR & PC← OFFSET TO PC
t, <BA← PCB>
t₂ SHFR← PCB
t₃ BEND
BRQ STROBE
t₄ PCB← PCB - SOB OFFSET
t₅ BR← SHFR
PCB← PCA
BENW# (343)
SA=1

SA=1
SOB.10 (242)
FULL THRU SOB COLD PC TO PC
t, <BA← SP>
t₂ <SHFR← BR>
t₃ BRQ STROBE
t₄ PCB← BR
PCB← PCA
(362)

SOB.20 (363)
DECREMENT SRC FIELD REG (LOOP COUNT) & START NEXT INSTR FETCH
t, BA←PCB; BC← DATI
t₂ SHFR← SR-1
t₃ BUST
t₄ GRC[SF]← SHFR
BENW (344)
BRK.30 (244)
BRQ
-BRQ
FET.10 (266)
1

MARK
MRK.00 (340)
PC+OFFSET TO BR & SP TO SR
t, <BA← PCB>
t₂ SHFR← PCB+MARK OFFSET
t₃ BEND
t₄ SA←GSC[5]
DR← SHFR
(358)

MRK.10 (359)
SET TO PC; DR POINTS TO TOP OF STACK
t, BA←DR; BC← DATI
t₂ <SHFR← SR>
t₃ BUST
t₄ PDR← SR
t₅ PCB← PCA
(360) (245)

MRK.20 (246)
GET TOP OF STACK, STEP SP
t, BA←DR; BC← DATI
t₂ SHFR← DR+2
t₃ BRQ STROBE
t₄ BUS PAUSE
t₅ GRC[6]← SHFR
(247) (247)

MRK.30
START FETCH NEXT INSTR @ TOP OF STACK TO IRS
t, BA←PCB; BC← DATI
t₂ SHFR← BR
t₃ BUST
t₄ GRC[IRS]← SHFR
BENW (248)
BRQ
-BRQ
BRK.30 (248)
FET.10 (266)
1

B-FORK 3

CONTROL; FLOATING; INDEXED SOURCE

ITEM	QTY	DESCRIPTION	PART NO.
NEXT USED ON OPTION/MODEL 11/70		PARTS LIST	

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

	NAME	DATE
DRAWN		
CHK'D	T Clark	11/70
ENG		12-9-75
PROJ ENG		12-9-75
PROD		12-9-75

EQUIPMENT CORPORATION

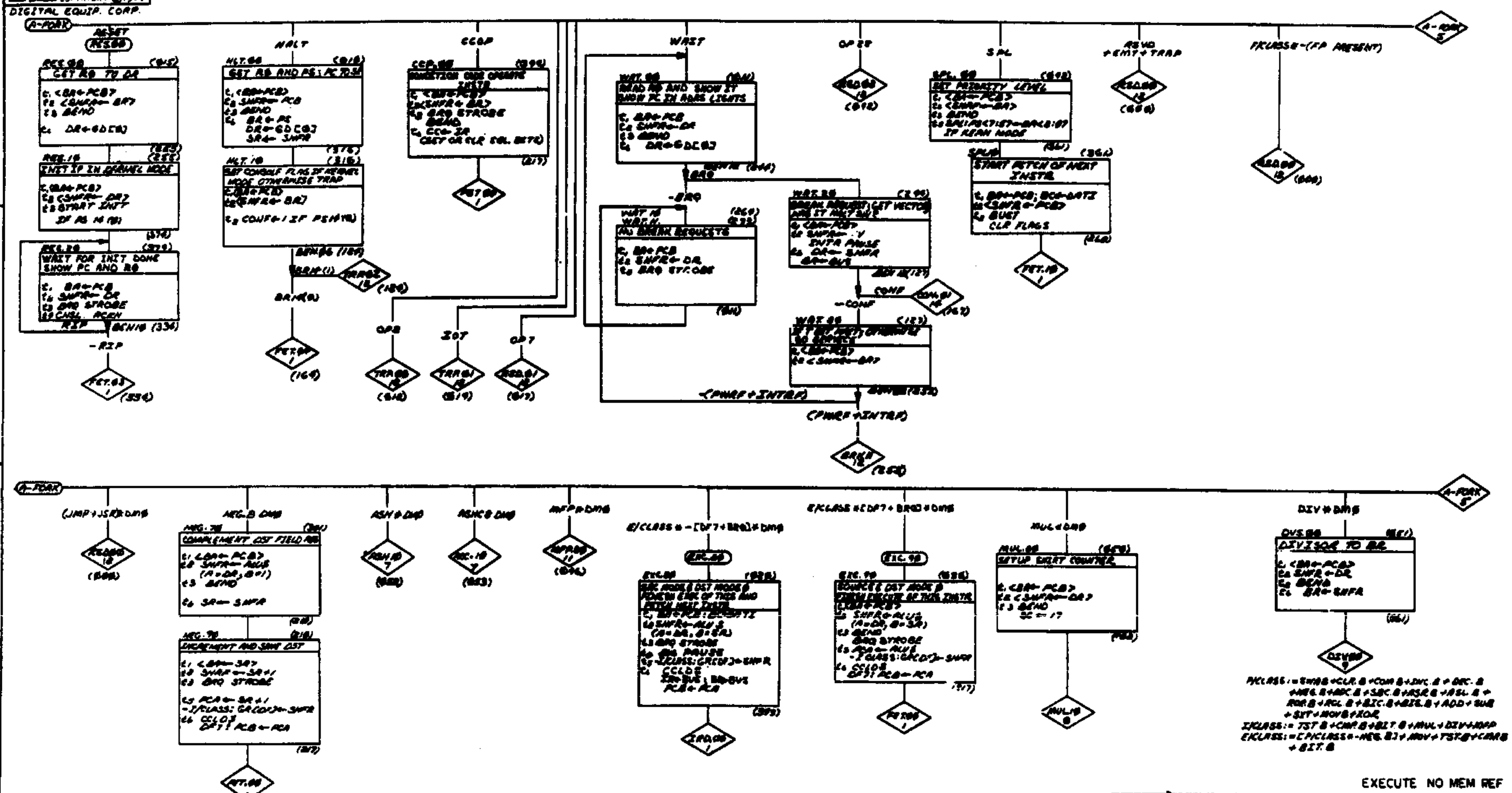
TITLE: KB11-C FLOW DIAGRAMS (FLOWS 2)

NEXT HIGHER ASSY: B-DD-KB11-B
SCALE
SHEET 3 OF 15
SIZE DFD CODE IDENT NO. KB11-C-1 REV
DIST

KB11-C-1

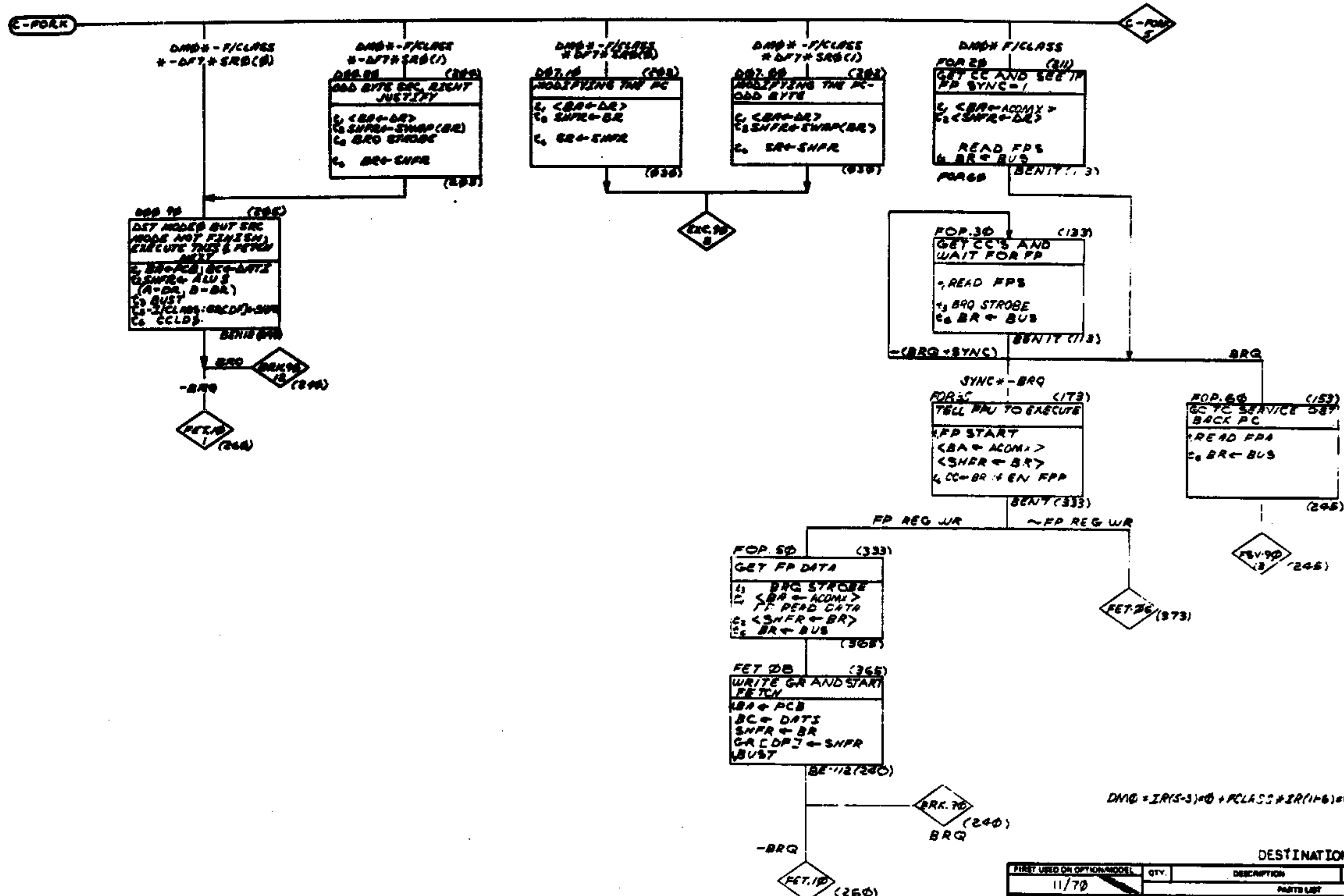
DISTRIBUTION: REV | ZONE | CHANGE NO | DESCRIPTION

DIGITAL EQUIP. CORP.



FIRST USED ON	11/70
NEXT HIGHER ASSY	B-DD-KB11-B
TITLE	KB11-C FLOW DIAGRAMS (FLOWS 3)
NUMBER	DFD KB11-C-1
SHEET	4 OF 15

EQUIPMENT CORPORATION



FIRST USED ON OPTION/MODEL	
11/70	

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES

[redacted] EQUIPMENT CORPORATION

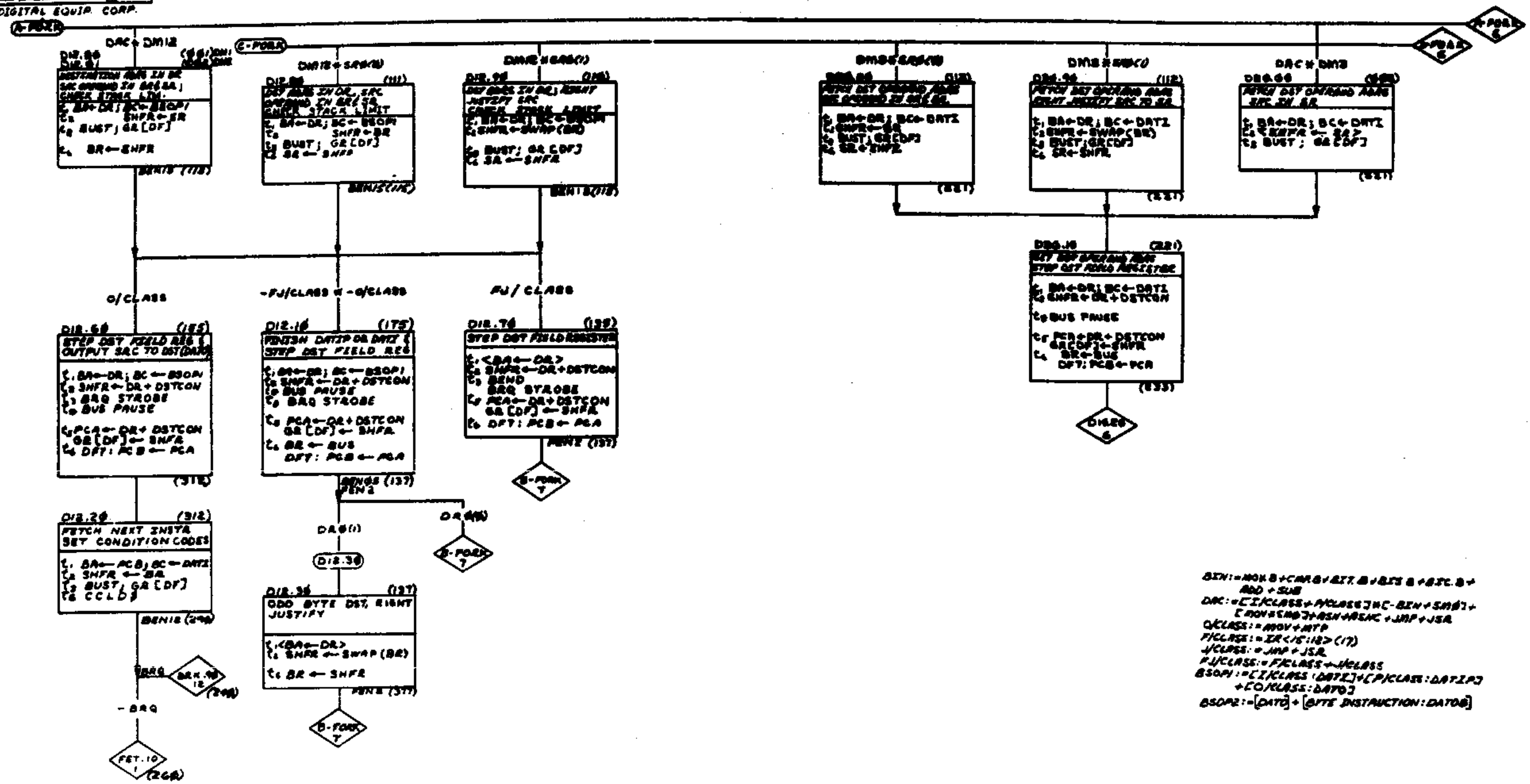
TITLE KB11-C FLOW DIAGRAMS (FLOWS 4)

NEXT HIGHER ASSY. B-DO-KB11-B

D FD KB11-C-1

SHEET 5 OF 15

DIGITAL EQUIP. CORP.



BIN: = MOV B + CMP B + BIT B + BIS B + BIC B + ADD + SUB
DAC: = [I/CLASS + P/CLASS] ∗ [-BIN + SWB] + [MOV + CMP] + ASH + ASHC + JMP + JSR
O/CLASS: = MOV + MTP
F/CLASS: = IR<15:12>(17)
J/CLASS: = JMP + JSR
FJ/CLASS: = F/CLASS + J/CLASS
BSOP1: = [I/CLASS: DATI] + [P/CLASS: DATIP] + [O/CLASS: DATO]
BSOP2: = [DATO] + [BYTE INSTRUCTION: DATOB]

DESTINATION MODES 1-3

FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO.	ITEM NO.
11/70		PARTS LIST		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES

DIGITAL EQUIPMENT CORPORATION

TITLE: KB11-C FLOW DIAGRAMS (FLOWS 5)

NEXT HIGHER ASSY: B-DD-KB11-B

DFD KB11-C-1

SHEET 6 OF 15

A FORK

C - FORK

DM45* SAB(8)

D45.0B (115)
STRIP DST FIELD ADDRESS
t, <BA← DR>
t2 SWR← DR - DSTCON
t3 ACB← DR - DSTCON
t4 GRC DF3← SWR
t5 DR← SWR
DF7: PCB← PCA

BENIS(151) PENE

-DM357

DM357

D45.2B (116)
DATIA DATI, DATO DST SRC OPERAND TO SR; CHECK STACK LIMIT
t, BA← DR; BC← BSOP1
t2 SWR← SR
t3 BUST; GRC DF3
t4 SR← SWR

D45.3B (116)
FETCH DST OPERAND ADDR; SRC OPERAND TO SR
t, BA← DR; BC← DATI
t2 SWR← SR
t3 BUST; GRC DF3
t4 SR← SWR

(181)

D/B.0B 6

DM46* SRB(1)

D46.9B (118)
STRIP DST FIELD ADDRESS; BYTE-WORD/ODD BYTE SOURCE
t, <BA← DR>
t2 SWR← DR - DSTCON
t3 BRQ STROBE
t4 ACB← DR - DSTCON
GRC DF3← SWR
t5 DR← SWR
DF1: PCB← PCA

BENBI(130)

-DM357

DM357

D46.8B (131)
DATIB DATI, DATO DST; EIGHT JUSTIFY SRC TO SR; CHECK STACK LIMIT
t, BA← DR; BC← BSOP1
t2 SWR← SWAP(SR)
t3 BUST; GRC DF3
t4 SR← SWR

BENIS(170) PENE

-PJ/CLASS

D/B.6B 6 (177)

PJ/CLASS

B-FORK 7

DM357

D47.2B (171)
FETCH DST OPERAND ADDR; EIGHT JUSTIFY SRC TO SR
t, BA← DR; BC← DATI
t2 SWR← SWAP(SR)
t3 BUST; GRC DF3
t4 SR← SWR

(231)

D/B.1B

D/B.1B (231)
GET DST OPERAND ADDR
t, BA← DR; BC← DATI
t2 <SWR← DR>
t3 BUS PAUSE
t4 BA← BUS

(288)

D/B.2B

D/B.2B (288)
GET OPERAND ADDR TO DR
t, <BA← DR>
t2 SWR← BR
t3 BRQ STROBE
t4 DR← SWR

(311) (311)

D/B.5B
DATIA DATI, DATO DST SRC OPERAND TO BR
t, BA← DR; BC← BSOP1
t2 SWR← BR
t3 BUST; GRC DF3
t4 DR← SWR

BENIS(157) PENE

DAC* DM45

D45.6B (1001) DM4
ASSEM (1002) DM5
STRIP DST FIELD REG-ISTER
t, <BA← PCB>
t2 SWR← DR - DSTCON
t3 BEND
t4 PCB← DR - DSTCON
GRC DF3← SWR
t5 DR← SWR
DF7: PCB← P.S

BENBI(128)

DM357

D/B.5B

D/B.6B (162)
FETCH DST OPERAND ADDR
t, BA← DR; BC← DATI
t2 <SWR← PCB>
t3 BUST; GR DF3

(281)

-DM357

D/B.3B (185)
DATIA DATI, DATO SRC OPERAND TO BR; CHECK STACK LIMIT
t, BA← DR; BC← BSOP1
t2 SWR← SR
t3 BUST; GRC DF3
t4 BR← SWR

BENIS(157) PENE

DM67* SRB(8)

D47.8B (117)
FETCH INDEX WORD; SRC TO SR
t, BA← PCB; BC← DATI
t2 SWR← BA
t3 BUST; GR(8)
t4 SR← SWR

(186)

DM67* SRB(1)

D47.9B (116)
FETCH INDEX WORD; EIGHT JUSTIFY SRC TO SR
t, BA← PCB; BC← DATI
t2 SWR← SWAP(BA)
t3 BUST; GR(8)
t4 SR← SWR

(186)

DAC* DM67

D47.0B (1004) DM6
D47.8I (1007) DM7

GET INDEX WORD; ADJUST DST IF DST FIELD PC

t, BA← PCB; BC← DATI
t2 SWR← PS #2
t3 BUS PAUSE
t4 ACB← PCB + 2
t5 BA← BUS
- DF7: DR← GRC DF3
DF7: DR← SWR

(857)

D47.1B (85)
DO INDEXING, STEP PC;

t, <BA← PCB>
t2 SWR← BA + DR
t3 BRQ STROBE
t4 DR← SWR
PCB← PCA

BENBI(182)

-DM357

DM357

D/B.6B 6 (162)

D/B.3B (137)

-O/CLASS + -PJ/CLASS

D/B.6B (177)
FINISH DATIA DATI DST
t, BA← DR; BC← BSOP
t2 < SWR← BR >
t3 BUS PAUSE
t4 BRQ STROBE
t5 BC← BUS

DEC(1) DBENIS(157) PENE DBENIS(158)

B-FORK 7

O/CLASS

D/B.9B (157)
FINISH DATO DST; LOAD PCSE
t, BA← DR; BC← BSOP
t2 SWR← BR
t3 BRQ STROBE
t4 BUS PAUSE
t5 CCLOE

(851)

FETCH 1

PJ/CLASS

B-FORK 7

DESTINATION MODES 4-7

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO	ITEM NO.
11/70		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS .XXX ± .010 .XX ± .1 X ± 1
ANGLES ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS/ SURFACE QUALITY ✓

DRN
CHKD
ENGR
PROJ
DATE 12/69

MATERIAL
FINISH

NEXT HIGHER ASSY
B-DD-KBII-B

SCALE
SHEET 7 OF 15

DIGITAL EQUIPMENT CORPORATION

TITLE
KBII-C
FLOW DIAGRAMS
(FLOWS 6)

SIZE/CODE DFD
NUMBER KBII-C-1
REV.
DWG

KBII-C-1

REVISIONS: REV | CHANGE NO | DRN

B-FORK

ASH

ASH.00 (166)
SHIFT COUNT TO DR;
t1: <BA ← DR>
t2: SHFR ← BA
t3: QR ← SHFR
(167)

ASH.10

ASH.10 (168)
LOAD STEP COUNTER WITH SHIFT COUNT
t1: <BA ← PCS>
t2: <ENFR ← SR>
t3: BRND
SC ← QR
(169)

ASH.20 (170)
STEP SC; SET COND CODES & SKIP IF NO SHIFT
t1: <BA ← QR>
t2: SHFR ← SR
t3: ARO STROBE
SC ← SC-1
t4: CCLDA
CLEAN ACC SHFR; C ← V ← 0
BRNCH(217)

SC>0

ASH.40 (171)
ASHR1
SHIFT LEFT (ZERO INSERTION) CC'S NEPT CURRENT
t1: <BA ← PCS>
t2: SHFR ← SHL(SR)
t3: ARO STROBE
SC ← SC-1
t4: (ACSF) ← SHFR
t5: SR ← SHFR
CCLDS
CLEAN ACC SHFR; C ← MSB OF VALUE; V ← MSB XOR MSB-1
BRNCH(172)
SC>0

SC<0

ASH.30 (177)
SHIFT RIGHT SIGN EXTENDED; CC'S NEPT CURRENT
t1: <BA ← PCS>
t2: SHFR ← SHR(SR)
t3: ARO STROBE
SC ← SC-1
t4: (ACSF) ← SHFR
t5: SR ← SHFR
CCLDS
BRNCH(177)
SC≠0

SC=0

FETCH 1 (217)

SC>0

FETCH 1 (172)

SC<0

FETCH 1 (177)

ASHC

ASC.00 (186)
SHIFT COUNT TO DR
t1: <BA ← DR>
t2: SHFR ← BA
t3: QR ← SHFR
(187)

ASC.10

ASC.10 (188)
LOAD STEP COUNTER, READ AC-MSER, CARRY AND TO DR
t1: <BA ← PCS>
t2: <SHFR ← SR>
t3: BRND
SC ← QR
t4: QR ← SC OF (-1)
(189)

ASC.20 (190)
STEP SC; SET COND CODES & SKIP IF NO SHIFT
t1: <BA ← DR>
t2: SHFR ← SR
t3: ARO STROBE
SC ← SC-1
t4: BA ← SHFR
CCLDA
CLEAN ACC SHFR; C ← V ← 0
BRNCH(287)

SC<0

ASC.40 (196)
SHIFT RIGHT; SIGN NOT EXT; DR ← LO; SET COND CODES ON ACC
t1: <BA ← DR>
t2: SHFR ← SHR(SR)
t3: ARO STROBE
SC ← SC-1
t4: (ACSF) ← SHFR
t5: DR ← SHFR
DR ← SETUP(CC)
C ← LO, INSERTED
CCLDS
CLEAN ACC SHFR; C ← LOAD V ← 0
BRNCH(197)
SC≠0

SC>0

ASC.30 (241)
ASC.31 (178)
SHIFT LEFT; STRAIGHT; DR ← LO; SET COND CODES ON DR
t1: <BA ← DR>
t2: SHFR ← ALU(DP=SR, B=1) C ← SHL(SR) ← DR<15>
t3: ARO STROBE
SC ← SC-1
t4: (ACSF) ← SHFR
t5: DR ← SHFR
DR ← LEFT(DR)
(0 INSERTED)
CCLDS
CLEAN ACC SHFR; C ← MSB XOR MSB-1; V ← ALU ± (SHIFT ERROR)
BRNCH(178)
SC≠0

SC=0

ASC.00 (287)
NO SHIFT; SET COND CODES ON LO; START FETCH NEXT INSTR.
t1: BUS ← PCS; BCS ← DATI
t2: SHFR ← DR
t3: BUST
t4: CCLDL
CLEAR V AND C; Z ← Z OF LO SHFR=0
BENIE(288)

SC=0

FETCH 1 (197)

SC>0

FETCH 1 (178)

SC<0

FETCH 1 (198)

SC=0

ASCLO
ASC.90 (198)
SHIFT DONE; SAVE 16 BARREL SET COND CODES ON LO; START FETCH NEXT INSTR.
t1: BUS ← PCS; BCS ← DATI
t2: SHFR ← DR
t3: BUST
t4: (ACSF) ← SHFR
t5: CCLDS
CLEAR V AND C; Z ← Z OF LO SHFR=0
BENIE(288)

FXCLASS

FXA 78 (284)
DST ADDR TO BE ENABLE FP ATTN
t1: <BA ← DA>
t2: SHFR ← DR
t3: BRND
t4: BUS ← SHFR
FP ATTN
(285)

DEFER (DST)

-(SYNC + BRQ)

BRQ

SYNC ← BRQ

PSV ← 60 /3 (346)

PSV ← 70 /3 (347)

PSV ← 80 /3 (350)

-BEQ

FETCH 1 (208)

BEQ

BEQ 98 12 (248)

ASH & ASC

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	FIND NO.
11/70		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES: DECIMALS XXX ± .005, XX ± .02, X ± .1; ANGLES ±

REMOVE BURRS AND BREAK SHARP EDGES. DENOTES SURFACE QUALITY ✓

MATERIAL

FINISH

DRWN [redacted] DATE 1-20-71
CHECK DATE 1-20-71
ENG DATE 1-20-71
MFG DATE 1-20-71
PROJ DATE 11/4/71

DIGITAL EQUIPMENT CORPORATION [redacted]

TITLE: KB11-C FLOW DIAGRAMS (FLOWS 7)

NEXT HIGHER ASSY: B-00-KB11-B

SCALE

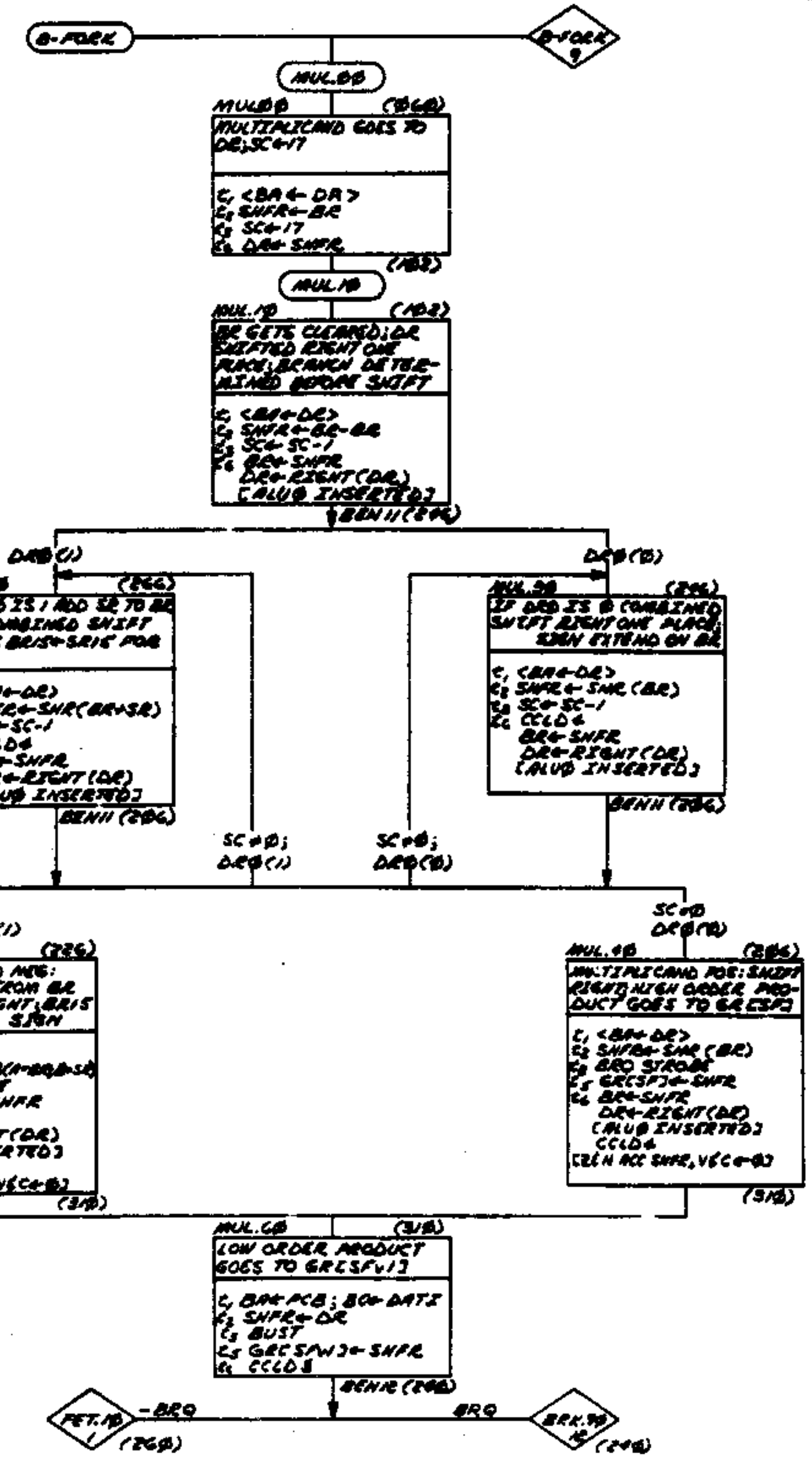
SHEET 8 OF 15

SIZE D | CODE FD | NUMBER KB11-C-1 | REV

CHGT

REVISIONS: REV | CHANGE NO | CHK

DIGITAL EQUIP. CORP.



MULTIPLY

FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO	ITEM NO
11/70		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES

DECIMALS / ANGLES

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL —

FINISH —

NEXT HIGHER ASSY: B-DD-KB11-B

SCALE —

SHEET 9 OF 15

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: KB11-C FLOW DIAGRAMS (FLOWS 8)

SIZE D | CODE FD | NUMBER KB11-C-1 | REV

B-FORK

B-FORK N

DIVIDE

DIV.00 (186)
DIVIDE GOES TO SR, LOAD CONDITION CODE TO SEE IF IT IS ZERO; HIGH ORDER DIVIDEND GOES TO DR
t, <BA←DR>
t2 SHFR←BR
t3 SR←SHFR
DR←GDCSF)
CCLD4
(ANDR ARE SAME; V←C←0)

DIV.10 (254)
BRANCH ON DIVISOR 0; LOAD CONDITION CODE TO TEST THE SIGN OF DIVIDEND
t, <BA←SR>
t2 SHFR←DR
t3 CCLD4
(ANDR ARE SAME; V←C←0)
BEN=02 (282)

DVK.00 (272)
DIVISOR IS ZERO, ABORT DIVIDE; SET C AND V @27; GO FETCH NEXT INSTRUCTION
t, <BA←DR>
t2 <SHFR←SR>
t3 BRO STROBE
t4 CCLD3
(16@)
FETCH 1

DIV.20 (282)
DIVISOR IS NON ZERO; BRANCH ON DIVIDEND NEG; SR HAS DIVISOR; DR HAS HIGH ORDER DIVIDEND
t, <BA←DR>
t2 <SHFR←SR>
BEN=04 (291)

N
DVK.08 (264)
DIVIDEND IS NEGATIVE, GOT TO MAKE IT POSITIVE. GET LOW ORDER DIVIDEND IN SR; BR HAS DIVISOR, SAVED
t, <BA←DR>
t2 <SHFR←SR>
t3 CLEAR DR
t4 SR←GSCSF v12
(188)
(189)
DVN.18 (189)
FIND TWO'S COMPLEMENT OF LOW ORDER AND WRITE IT BACK; DR IS 0
t, <BA←DR>
t2 SHFR←DR-SR
t3 GRCSF v12← SHFR
(185)
(185)
DVN.28 (185)
TEST IF THERE WAS A CARRY OUT OF THE LOW ORDER DIVIDEND; PUT IT IN DR
t, <BA←DR>
t2 SHFR←DR-SR
t3 DR←LEFT(DR)
CALU CARRY INSERTED
(186)
DVN.30

-N
DVR.08

DVN.32 (196)
MAKE DR 0 IF THERE WAS A CARRY OR A -1 IF NOT; GET THE ALIGN ORDER DIVIDEND TO SR
t, <BA←DR>
t2 SHFR←DR-1
t3 BRA←GSCSF]
DR←SHFR
(197)
(185)
DVN.48 (185)
FIND TWO'S COMPLEMENT OF HIGH ORDER DIVIDEND IF THERE WAS A CARRY FROM LOW ORDER, ELSE ONE'S COMPLEMENT; NOTE IT BACK; LOAD COND CODES
t, <BA←DR>
t2 SHFR←DR-SR
t3 GRCSF]4←SHFR
t4 DR←SHFR
CCLD4
(ANDR ARE SAME; V←C←0)
(196)
(195)
DVN.58 (195)
SR GETS DIVISOR; BRANCH ON SIGN OF DIVIDEND
t, <BA←DR>
t2 SHFR←BR
t3 SR←SHFR
BEN=0 (296)

N
DVK.18 (268)
THE TWO'S COMPLEMENT OF A NEGATIVE NUMBER IS STILL NEGATIVE; MUST BE MOST NEG. NO. ABORT DIVIDE; SET V & C BITS
t, <BA←DR>
t2 <SHFR←BR>
t3 CCLD3
(19@)
DVK.28
9

-N
DVN.68 (248)
HIGH ORDER DIVIDEND GOES TO BR; SR HAS DIVISOR
t, <BA←DR>
t2 SHFR←DR
t3 BA←SHFR
(187)
(186)
DVN.78 (186)
DR GETS LOW ORDER DIVIDEND; SC GETS THE COUNT, SET N TO SHOW DIVIDEND WAS NEG
t, <BA←DR>
t2 SHFR←-DR
t3 SC←17
t4 DR←GDCSF v12
CCLD4
(ANDR ARE SAME; V←C←0)
(197)
DIV.30
9

DVR.00 (241)
DIVIDEND IS POSITIVE; BR GETS THE HIGH ORDER DIVIDEND; SR HAS DIVISOR
t, <BA←SR>
t2 SHFR←DR
t3 BR←SHFR
(183)
(182)
DVR.10 (182)
DR GETS THE LOW ORDER DIVIDEND; SC GETS THE COUNT
t, <BA←SR>
t2 <SHFR←DR>
t3 BRO←17
t4 DR←GD[SFV]
(187)

DIV.30 (197)
START FIRST DIVISION; SHIFT BR LEFT INSERT DR; SET V BIT
t, <BA←DR>
t2 SHFR←ALU(A+BR,B+)
t3 BR←SHFR
CCLD8
(N←N, C, V←0←1)
BEN=G (346)

SR15(0)
DIV.60 (346)
DIVISOR POSITIVE DO A SUBTRACTION TO FIND BITS OF QUOTIENT
t, <BA←DR>
t2 SHFR←BR-SR
t3 SC←SC-1
t4 BR←SHFR
DR←LEFT(DR)
CALU CARRY INSERTED
CCLD6
(IF←ZERO # SHFR=0)
(313)

SR15(1)
DIV.50 (366)
DIVISOR IS NEGATIVE, DO AN ADDITION TO FIND BITS OF QUOTIENT
t, <BA←DR>
t2 SHFR←BR+SR
t3 SC←SC-1
t4 BR←SHFR
DR←LEFT(DR)
CALU CARRY INSERTED
CCLD6
(IF←ZERO # SHFR=0)
(318)

DIV.68 (318)
CONTINUE DIVIDE IF QUOTIENT WILL BE POS BUT ALLOW FOR MOST NEG NO. IF QUOT IS TO BE NEG.
t, <BA←DR>
t2 <SHFR←BR>
BEN=5 (145)

DIV QUIT
DVE.20
DVE.60 (145)
DIVISION OVERFLOW, RESULTS WON'T FIT IN 16 BITS; V BIT IS SET; GO FETCH NEXT INSTR.
t, <BA←SR>
t2 SHFR←DR
t3 BRO STROBE
t4 CCLD7
CC←ALU CARRY)
(164)
FETCH 1

-DIV QUIT
DIV.78 (165)
FINISH DIVISION; SHIFT BR LEFT INSERT DR; SC IS FORMING QUOTIENT BR IS REMAINDER
t, <BA←DR>
t2 SHFR←ALU(A+BR,B+)
t3 BR←SHFR
(BEN=@ (328)

DIV SUB
DIV.88 (328)
SIGNS OF DIVISOR & PART REMAINDER ARE SAME SUBTRACT; OTH IS +SIGN OF REMAINDER
t, <BA←DR>
t2 SHFR←BR-SR
t3 SC←SC-1
t4 BR←SHFR
DR←LEFT(DR)
CALU CARRY INSERTED
BEN=5 (18@)

-DIV SUB
DIV.98 (36@)
SIGNS OF DIVISOR & PARTIAL REMAINDER ARE DIFFERENT ADD; OTH IS -SIGN OF REMAINDER
t, <BA←DR>
t2 SHFR←BR+SR
t3 SC←SC-1
t4 BR←SHFR
DR←LEFT(DR)
CALU CARRY INSERTED
BEN=5 (18@)

SC#0

SC=0
DVC.00
(185)

FIRST USED ON OPTION/MODEL: 11/70	QTY	DESCRIPTION	PART 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 ✓	DRN	DATE 3-9-70	digital EQUIPMENT CORPORATION
	CHK	DATE 12-11-70	
	ENG	DATE 12-9-70	TITLE KB11-C FLOW DIAGRAMS (FLOWS 9)
	PROJ MGR	DATE 12-9-70	
	APVD	DATE 12/9/70	
MATERIAL —	NEXT HIGHER ASSY B-00-KB11-B		SIZE D CODE FD NUMBER KB11-C-1 REV
FINISH —	SCALE —	SHEET 10 OF 15	DIST

DIVIDE

DIGITAL EQUIP. CORP.

DVC.0A

DVC.0A (185)
DIVIDE COMPLEMENTS WHERE REMAINDER INTO GR15F.0 MAY BE MODIFIED LATER
c, <BA←DR>
c₂ SHIFT←BR
c₃ GR15F.0←SHIFT

BRANCH (216)

DR0(1) # SR15(1)

DVC.2B (355)
LAST DIVISION WASN'T WRONG (REMAINDER CORRECT) SO DON'T COMPLEMENT IN CASE DIVIDEND STARTED NEG.
c, <BR←DR>
c₂ SHIFT←-BR
c₃ BA←SHIFT

BRANCH (356)

-N

DVC.7B (358)
DIVIDEND STARTED POS. DON'T CHANGE REMAINDER. INSERT 1 STORE QUOTIENT IN GR3F.0 & RECORD ITS SIGN. CODES
c, <BR←DR>
c₂ SHIFT←DR
c₃ ADD STROBE
c₄ GR3F.0←SHIFT
c₅ CCL 0
CHK'E BCC SHIFT; VECT←(B)

(166)

PETBR
1

N

DVC.5B (370)
DIVIDEND STARTED NEG. FIND TWO'S COMPLEMENT OF REMAIN. DON'T WASTE IT AWAY
c, <BA←DR>
c₂ SHIFT←BR+1
c₃ GR15F.0←SHIFT

(367)

DR0(0) # SR15(0)

DVC.2A (216)
LAST DIVISION WASN'T WRONG (REMAINDER CORRECT) BY ADDING DIVISOR & WASTE IT AWAY
c, <BA←DR>
c₂ SHIFT←BA+SR
c₃ GR15F.0←SHIFT
c₄ BA←SHIFT

(356)

DR0(1) # SR15(1)

DVC.2A (226)
LAST DIVISION DIDN'T WORK AND ABSOLUTE VALUE OF REMAINDER IS LESS THAN DIVISOR. TRY TO ADD DIVISOR TO REMAINDER & WASTE IT AWAY
c, <BA←DR>
c₂ SHIFT←BA+SR
c₃ GR15F.0←SHIFT
c₄ BA←SHIFT

(367)

DR0(1) ≠ SR15(1)

DVC.4B (276)
LAST DIVISION WENT BUT DIVISOR IS NEG.; MAGNITUDE OF REMAINDER CORRECT; DO ONE COMPLEMENT IN CASE DIVIDEND STARTED NEG.
c, <BA←DR>
c₂ SHIFT←-BR
c₃ BA←SHIFT

BRANCH (351)

-N

DVC.8A (351)
DIVIDEND AND DIVISOR HAD DIFFERENT SIGNS; FIND ONE'S COMPLEMENT OF QUOTIENT
c, <BA←DR>
c₂ SHIFT←-BR
c₃ DR←SHIFT
SR←GR3F.SF3
CCL 0
CHK'E BCC SHIFT; VECT←(B)

(286)

DVC.9B (286)
FORM TWO'S COMPLEMENT OF QUOTIENT & WASTE IT AWAY; RECORD IT'S SIGN. CODES
c, <BA←DR>
c₂ SHIFT←DR+1
c₃ ADD STROBE
c₄ GR.F.SF3←SHIFT
c₅ CCL 0
CHK'E BCC SHIFT; VECT←(B)

BRANCH (166)

-N

DVC.0B (166)
TEST FOR QUOTIENT BEING THE MOST NEGATIVE NUMBER
c, <BA←DR>
c₂ <SHIFT←SR>

BRANCH (352)

-N

DVD.1B (352)
QUOTIENT CAME OUT TO BE POSITIVE AFTER TWO'S COMPLEMENT; SET V BIT TO INDICATE OVERFLOW
c, <BA←DR>
c₂ <SHIFT←SR>
c₃ CCL 0S

(195)

DVC.8B
9

N

PET.0C
1

(164)

N

PET.0C
1

(373)

N

DVC.6B (371)
DIVIDEND STARTED NEG. FIND TWO'S COMPLEMENT OF REMAINDER & WASTE IT AWAY
c, <BA←DR>
c₂ SHIFT←BR+1
c₃ GR15F.0←SHIFT

(368)

DVC.7B
1

DIVIDE

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/70		PARTS LIST		

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

DRN.		DATE 7-71
CHK'D		DATE 7-71
ENG		DATE 11-71
PROJ		DATE 11-71
APPD		DATE 1-19-72

MATERIAL
FINISH
NEXT HIGHER ASSY. B-DO-KB11-B
SCALE
SHEET 11 OF 15

EQUIPMENT CORPORATION

TITLE KB11-C
FLOW DIAGRAMS
(FLOWS 10)

SIZE D | CODE FD | NUMBER KB11-C-1 | REV.

DWG

B-FORK

NEG. B (047)
COMPLEMENT DST OPERAND
t1 <BA ← DR>
t2 SHFR ← $ALU (A=BR, B=1)
t4 BR ← SHFR
(271)

NEG. 1Ø (271)
AND THEN INCREMENT, SET CC'S, SEE IF DST IS ODD BYTE
t1 <BA ← DR>
t2 SHFR ← BR+1
t4 CCLD $
BA ← SHFR
BENIØS (125)

BRQ (1)
DRØ (Ø)

NEG.2Ø (163)
EVEN BYTE OR WORD-OUTPUT RESULTS; CHECK STACK LIMIT
t1 BA←DR; BC←BSOPE
t2 <SHFR ← BR>
t3 BUST; GO CDF3
(132)

CASRB + R3RB3 ← DRØ(1) (044)
SHR.ØØ (044)
SHIFT OR ROTATE RIGHT ODD BYTE; SET CCS
t1 <BA ← DR>
t2 SHFR ← $ALU (A=BR, B=1)
t4 CCLD $
BR ← SHFR
(125)

SHR.1Ø (122)
ODD BYTE-HI. ORDER BYTE POSITIONED & OUTPUT CHECK STACK LIMIT
t1 BA←DR; BC←BSOPE
t2 SHFR ← SWAP (BR)
t3 BUST; GO CDF3
t4 BR ← SHFR
(132)

EXEC.16 (132)
FINISH BUS OPERATION
t1 BA←DR; BC←BSOPE
t2 <SHFR←BR>
t3 BRQ STROBE
t4 BUS PAUSE
(217)
RET. ØØ

P/CLAST ← C(BASRB + RCRB) & DRØ (1) → NEG. B3

EXC. ØØ (031)
DO THE OPERATION; START BUS OPERATION
t1 BA ← DR; BC ← BSOPE
t2 SHFR ← $ALU (A=BR, B=SHFR)
t3 BUST; GO EB3
t4 CCLD $
BR ← SHFR
(132)

CTST.8 + BIT.8 + CMP. B3

TST.16 (033)
NO MORE BUS OPS: SET CC'S & START FETCH NEXT INSTR
t1 BA←PCB; BC← DATI
t2 SHFR←$ALU(A=BA, B=BR)
t3 BUST; GO CDF3
t4 CCLD $
BENIE (240)

-BRQ
RET. ØØ (046)
BRQ
BRH.Ø6 (240)

JMP

JMP.ØØ (035)
LOAD NEW PC FROM DST ADRS
t1 <BA ← DR>
t2 <SHFR ← PCB>
t3 BEND
BRQ STROBE
t4 PCA ← DR
t5 PCB ← PCA
(217)
RET. ØØ

JSR

JSR.ØØ (034)
SAVE DST ADRS IN PC(IGNORE MODIFIED SRC FIELD REG TO JR
t1 <BA ← DR>
t2 SHFR ← PCB
t3 BEND
t4 PCA ← DR
t5 - SFT: SR ← GS C6 SF3
SFT: SR ← SHFR
(201)

JSR.1Ø (201)
GET SP AND PUT SRC FIELD REG IN BA FOR PUSHING OLD CONTENTS ON STACK
t1 <BA ← PCB>
t2 SHFR ← SR
t3 BRQ STROBE
t4 DR ← GD C67
BA ← SHFR
(274)

JSR.2Ø (274)
STEP SP BACK FOR PUSH
t1 <BA ← DR>
t2 SHFR ← DR-2
t3 GR C67 ← SHFR
t4 DR ← SHFR
(275)

JSR.3Ø (275)
WRITE OLD SRC FIELD REG ON STACK, CHECK STACK LIMIT
t1 BA←DR; BC← DATO
t2 <SHFR ← BR>
t3 BUST; STACK REF
(Ø32)

JSR.4Ø (Ø32)
FINISH PUSH; OLD PC GOES TO SRC FIELD REG AND DST ADRS TO PC
t1 BA←DR; BC←DATO
t2 SHFR ← PCB
t4 BUS PAUSE
t3 BRQ STROBE
t5 GR C5F3 ← SHFR
t6 PCB ← PCA
(217)
RET. ØØ

MFP

MFP.ØØ (Ø66)
PREVIOUS MODE DATA IN BA; GET CURRENT MODE SP; SET CC'S.
t1 <BA ← DR>
t2 SHFR ← BR
t4 CCLD $
SR ← GS C67
(283)

MFP.1Ø (258)
STEP STACK POINTER BACK FOR PUSH
t1 <BA ← DR>
t2 SHFR ← SR-2
t3 BEND
t4 GR C67 ← SHFR
t5 DR ← SHFR
(228)
SYC.ØØ /3

MFP.ØØ

MFP.ØØ (Ø46)
PREVIOUS MODE DATA IN GR'S; IF R6 USE PREV MODE SP; R0-R5 SET DETERMINED BY REG. SET BIT (PS11)
t1 <BA ← PCB>
t2 SHFR ← PCB
t3 BEND
t4 -I/CLASS: GR C0F3 ← SHFR
t5 -DF7: DR ← GD CDF3
DF7: DR ← $HFR
(3Ø4)

MFP.9Ø (3Ø4)
PUT DATA IN BR & SET CC'S; GET CURRENT MODE SP
t1 <BA ← DR>
t2 SHFR ← DR
t4 CCLD $
BA ← SHFR
SR ← GS C67
(258)

EXECUTE - MEM REF

FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO.	ITEM NO.
11/70		PARTS LIST		

DIMENSIONAL TOLERANCE
DIMENSIONS ARE IN MILLIMETERS / INCHES
UNLESS OTHERWISE SPECIFIED
MILLIMETERS: XXX ±0.10, YX ±0.5, X ±1.
INCHES: XXX ±.005, .YX ±.02, X ±.1
THIRD ANGLE PROJECTION
REMOVE BURRS AND BREAK SHARP CORNERS
SURFACE QUALITY
MATERIAL
FINISH

	NAME	DATE
DRN.		
CHK'D		
ENG		
PROJECT		
MFG		

NEXT HIGHER ASSY.
B-DD-KB11-B
SCALE NONE
SHEET 12 OF 15

digital

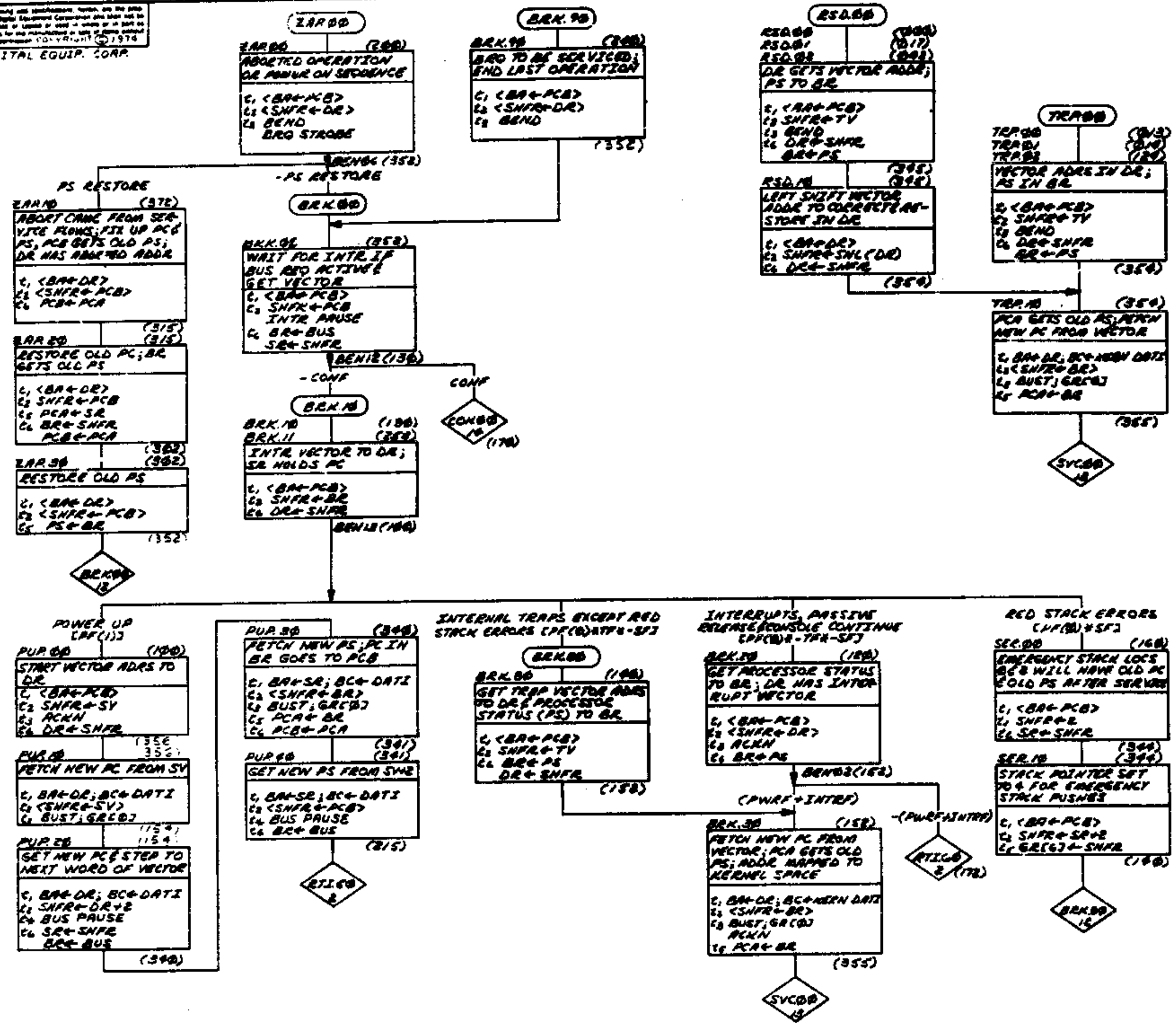
TITLE: KB11-C FLOW DIAGRAMS (FLOWS 11)

SIZE	CODE	NUMBER	REV.
D	FD	KB11-C-1	

DIST

REVISIONS		
ZONE	CHANGE NO.	REV.

KB11-C-1



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BREAK CONDITIONS

FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO.	ITEM NO.
11/70		PARTS LIST		

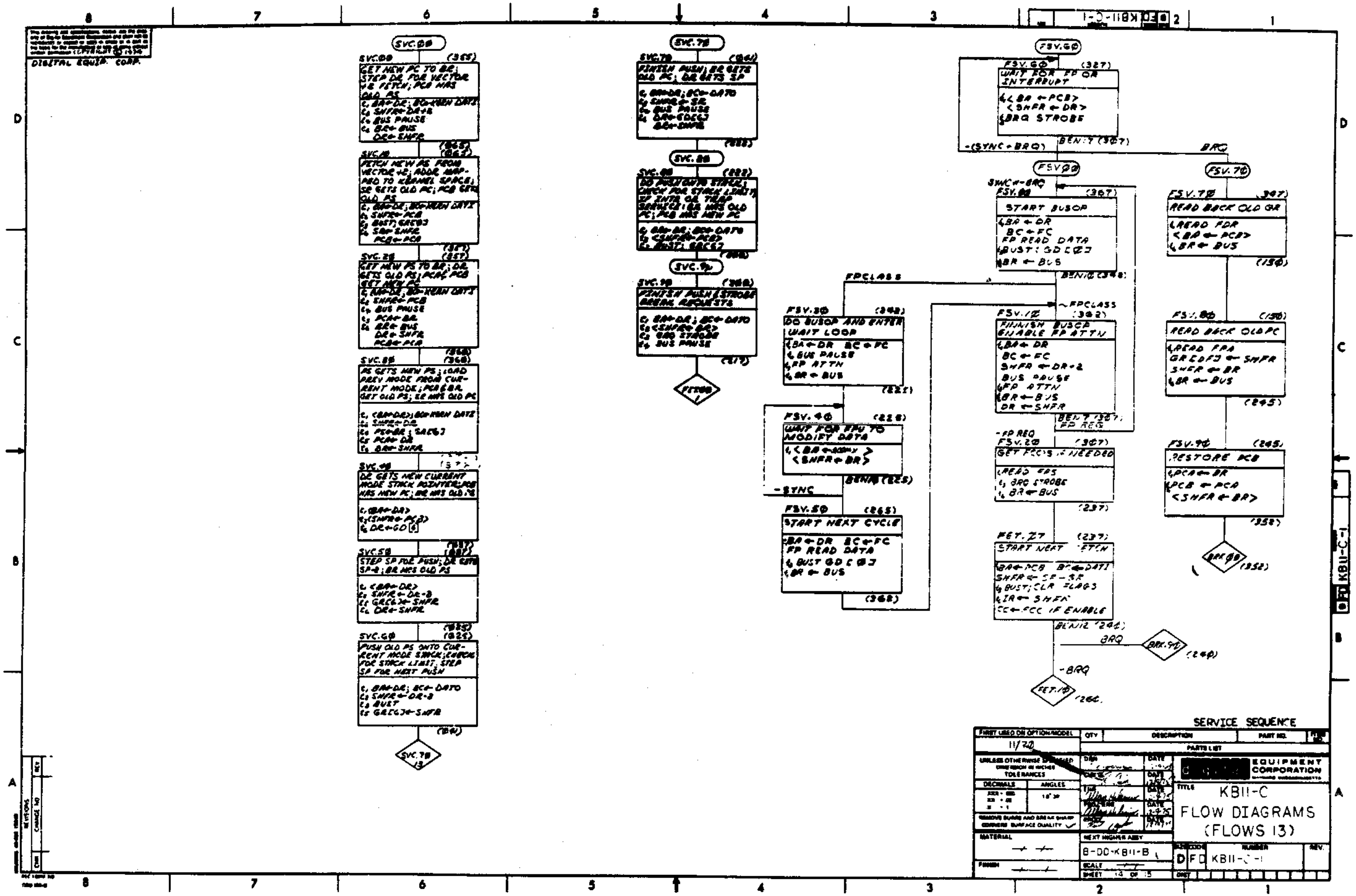
digital EQUIPMENT CORPORATION

TITLE KB11-C FLOW DIAGRAMS (FLOWS 12)

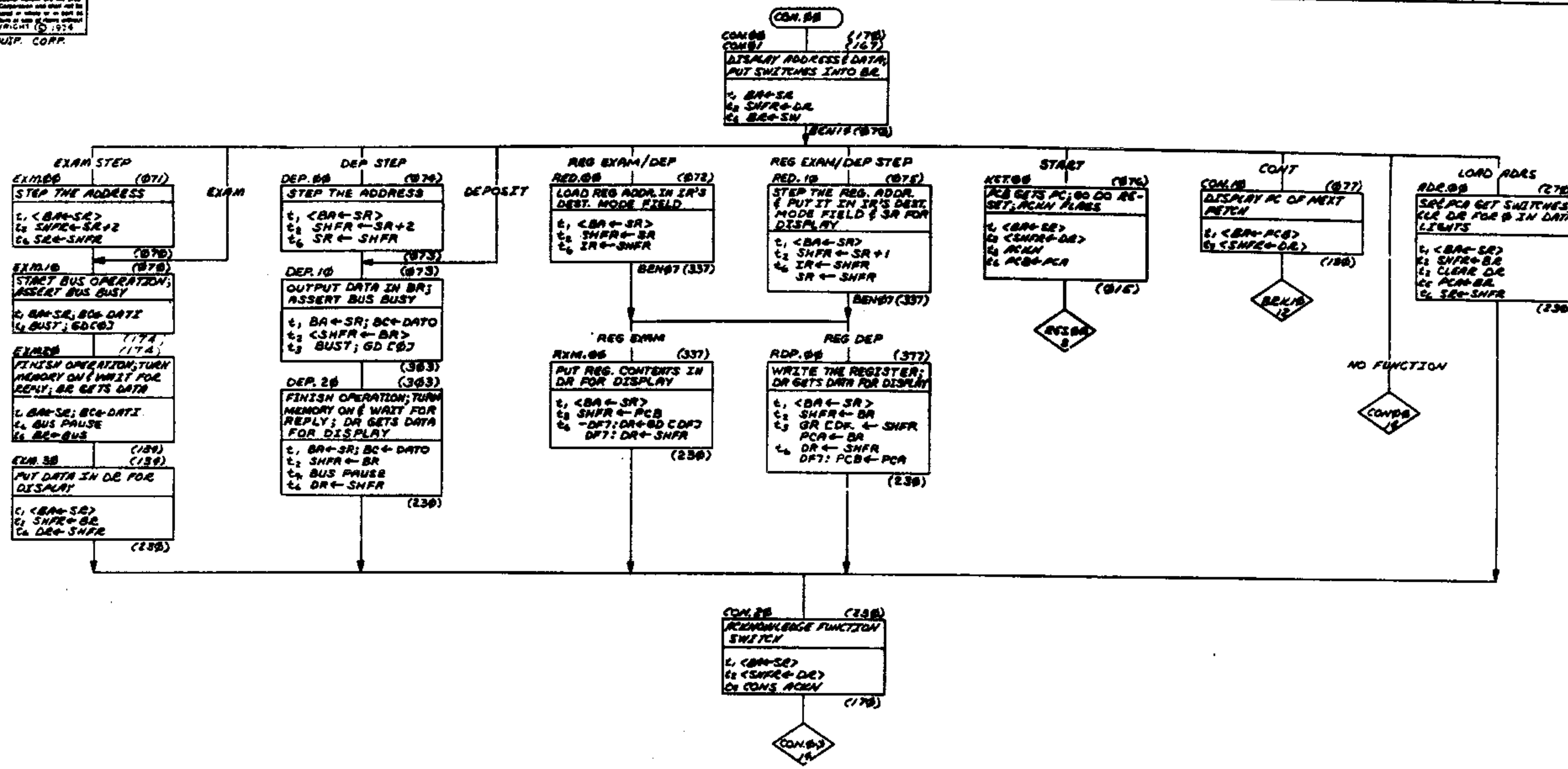
NEXT HIGHER ASSY B-DD-KB11-B

SIZE D CODE FD NUMBER KB11-C-1

SHEET 13 OF 15



SERVICE SEQUENCE
KB11-C
FLOW DIAGRAMS
(FLOWS 13)
EQUIPMENT CORPORATION
D FD KB11-C-1
B-DD-KB11-B
DIGITAL EQUIP. CORP.



CONSOLE

FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO	ITEM NO
11/70		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 —

DIGITAL EQUIPMENT CORPORATION

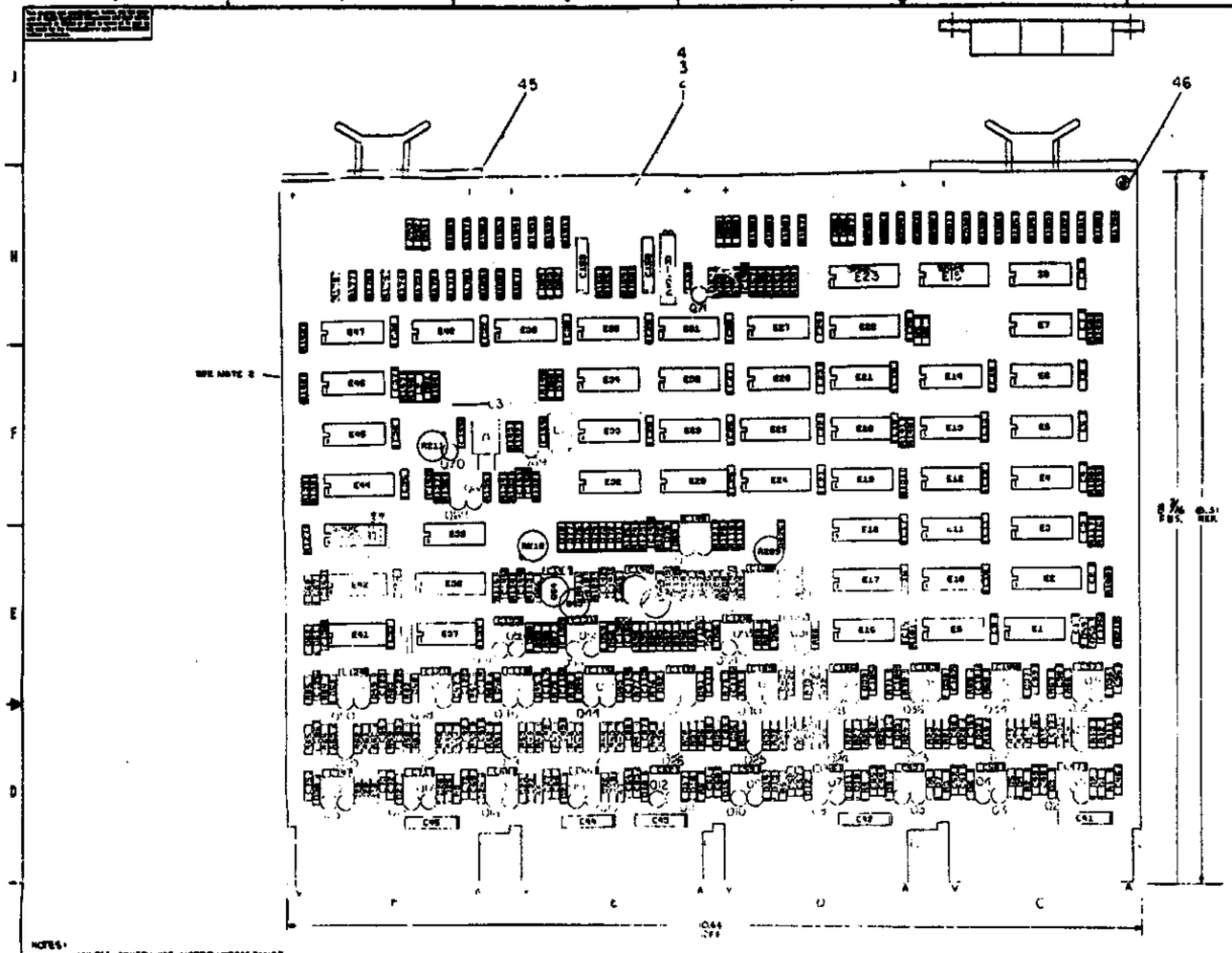
TITLE: KB11-C FLOW DIAGRAMS (FLOWS 14)

NEXT HIGHER ASSY: B-DD-KB11-B

SIZE D — CODE FD — NUMBER KB11-C-1 — REV

SCALE — SHEET 15 OF 15

SECTION V
KB11-D TIMING LOGIC



NOTES:
1. UNLESS OTHERWISE NOTED: RESISTANCE IS IN Ω, CAPACITANCE IS IN PICOFARADS. CAPS WITHOUT VALUE NOTED ARE .22 MFD 50V. DIODES ARE TYPE FD777 & ALL NPN TRANSISTORS ARE DEC 3009B & PNP TRANSISTORS ARE DEC 4258.
2. BOND L1 TO ETCHED BOARD

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
2	R209, R210	POT. 2K 1/2 W	13-09150-07	51
1	R211	POT. 100 1/2 W	13-09150-05	50
1	R136	RES. 120 1/4 W 5%	13-00247	49
1	R212	RES 33 1/4 W 5%	1500197-06	48
2	W8, W9	JUMPER UNINSULATED	9009185	47
8		EYELET #G44-1	9006132	46
4		HANDLE FLIP-CHIP MAGENTA	1008337-06	45
1	Y1	CRYSTAL 33.333MHZ	1810694-1	44
1	L2	INDUCTOR 47µh NYTRONICS WEE-WEE-.047	1610999	43
1	L1	INDUCTOR .22µh VARIABLE NYTRONICS WEE VL .22	1611000	42
1	L3	INDUCTOR RFCS 33µh	1601759	41

PARTS LIST

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
35	Q1-Q3,Q5,Q7,Q9,Q11, Q13,Q15,Q17,Q19,Q21, THRU Q23,Q31 THRU Q40 Q51,Q54,Q56,Q58,Q59 Q61,Q63,Q66,Q69,Q70	TRANSISTOR DEC 4258	1506321	40
36	Q2,Q4,Q6,Q8,Q10,Q12, Q14,Q16,Q18,Q20 Q26 THRU Q30 Q41 THRU Q50, Q52,Q53,Q57,Q60,Q61 Q62,Q64,Q65, Q68, Q11, Q55	TRANSISTOR DEC 3009 B	1503100	39
1	E38	I.C. DEC 74S140	1910846	38
8	E2,E17,E18,E22,E24 E25,E28,E44	I.C. DEC 74S112	1910545	37
8	E5,E6,E19,E29,E33 E6,E46,E47	I.C. DEC 74S74	1910544	36
4	E11,E12,E13,E20	I.C DEC 74S65	1910543	35
1	E32	I.C DEC 74S64	1910542	34
6	E1,E9,E14,E16,E37,E41	I.C. DEC 74 [illegible]	1910541	33
2	E40, E46	I.C DEC [illegible]	1910539	32
3	E3, E34, E47	I.C DEC 74S11	1910537	31
5	E4,E15,E21,E30,E45	I.C DEC 74S04	1910534	30
4	E10,E31,E36,E48	I.C DEC 74S00	1910532	29
1	R162	POT 1K 3/4W KIT	1309145-07	28
9	R117,R150,R151,R140, R147,R156,R157,R163,R166	RES 680 1/4W 5%	1301424	27
1	R142	RES 750 1/4W 5%	1301401	26
13	R66,R68,R70,R72,R74, R76,R78,R80,R82,R84 R118 R119 R120	RES. 1.2K 1/4W 5%	1301320	25
26	[illegible] R28,R30,[illegible] R35,R38, R41 R44,R47,R50,R53 R56,R59,R62,R65,R162, R164 R111 R115 R132,R158	RES. 10 1/4W 5%	1301311	24
5	R16 R17 R22 R21 R32	RES. 15K 1/4 5%	1300496	23
17	[illegible] R58 R64 R67 R69 R71 R73 R75 R111 R113	RES. 4.7K 1/4 5%	1300447	22
12	[illegible] R83,R85,R86 R113	RES. 3K 1/4 5%	1300436	21
6	[illegible] R145	RES 1.5K 1/4 5%	1300391	20
76	R36,R37 R42 R45 R48, R49 R54,R55,R60 R61 R83 THRU R94, R95 THRU R[illegible] R122,R123,R125,R126 R104,R138,R139,R148 R155,R167 THRU R209	RES. 1K 1/4 5%	1300365	19
10	[illegible]	RES. 330 1/4W 5%	1300295	18
1	R146	RES. 220 1/4W 5%	1300277	17
8	[illegible]	RES. 150 1/4W 5%	1300250	16
11	[illegible] R45 R51 R57 R63 R121	RES. 100 1/4W 5%	1300229	15
2	R133, R137	RES 68 1/4W 5%	1300219	14
7	R87, R88, R93, R134, R135,R144,R98	RES. 47 1/4W 5%	1300202	13
52	D1,D2 D4 D6,D7,D9,D10,D12 D13,D15 D16,D18,D19,D21 D22 D24,D25 D27,D28,D30, D31 THRU D50,D53,D54,D57 D58,D61,D62,D64,D65 D67 D68,D69,D70	DIODE FD777	1103041	12
29	D3,D5,D8,D11,D14,D17, D20,D23,D26,D29,D35, D56,D59,D60,D63,D66, D71 THRU D73	DIODE D662	1100114	11
96	C46 THRU C97,C99,C100,C102, C103,C105,C106,C108, C109,C111,C112,C114,C115 C117,C118,C120,C121,C123 C124,C126,C127 THRU C145 C147,C148,C149,C151,C152	CAP .22 µF 50V MONO.	1010274-1	10
8	C41 THRU C45,C46,C158,C159	CAP 6.8µF 35V 10% S TANT	1008306	9
42	C1 THRU C39,C150 C155, C156,	CAP .01µF 100V 20% DISC	1001610	8
1	C154	CAP 100 PF 100V 5% DM.	1000016	7
1	C157	CAP 47 PF 100V 5% DM	1000014	6
10	C98,C101,C104,C107,C110, C113,C116,C119,C122,C125	CAP 33 PF 100V 5% DM	1000009	5
1		ETCHED CIRCUIT BOARD	5008799	4
REF		MODULE ECO HISTORY	B-HH-M8109-0-0	3
REF		ASSY/DRILL HOLE LAYOUT	D-AW-M8109-0-0	2
REF		X-Y COORDINATE HOLE LOCATION	K-LO-M8109-0-0	1

PARTS LIST

ETCH BOARD REV F

DEC NO.	EIA NO.	DEC NO.	EIA NO.
DEC 4258	NONE		
DEC 3009 B	2N3646		
DEC FD777	1103041		
DEC 662	1N645		

SEMICONDUCTOR CONVERSION CHART

DEC 74S112	8	16				
IC TYPE	GND	+5V				

IC PIN LOCATIONS

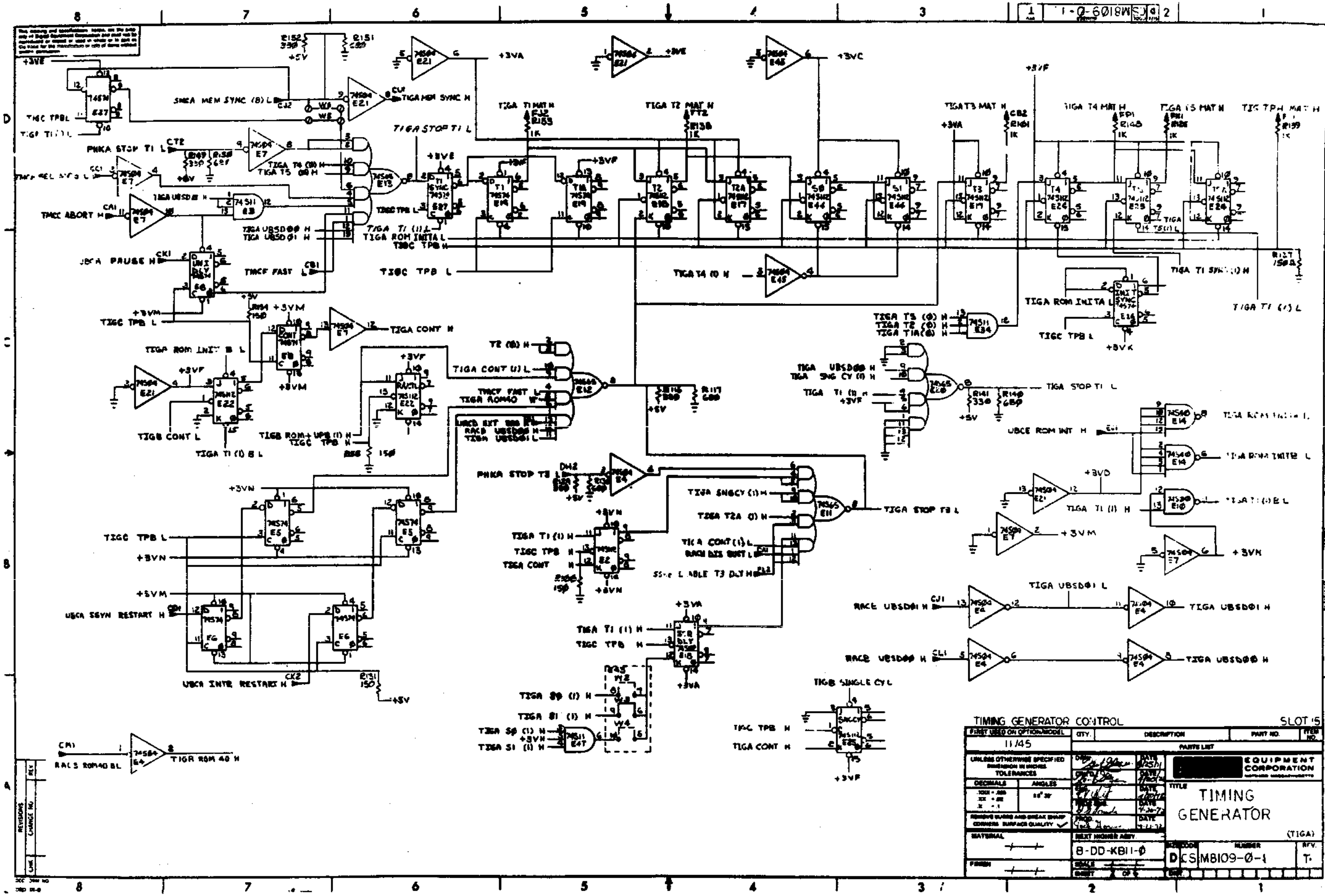
JUMPER LIST

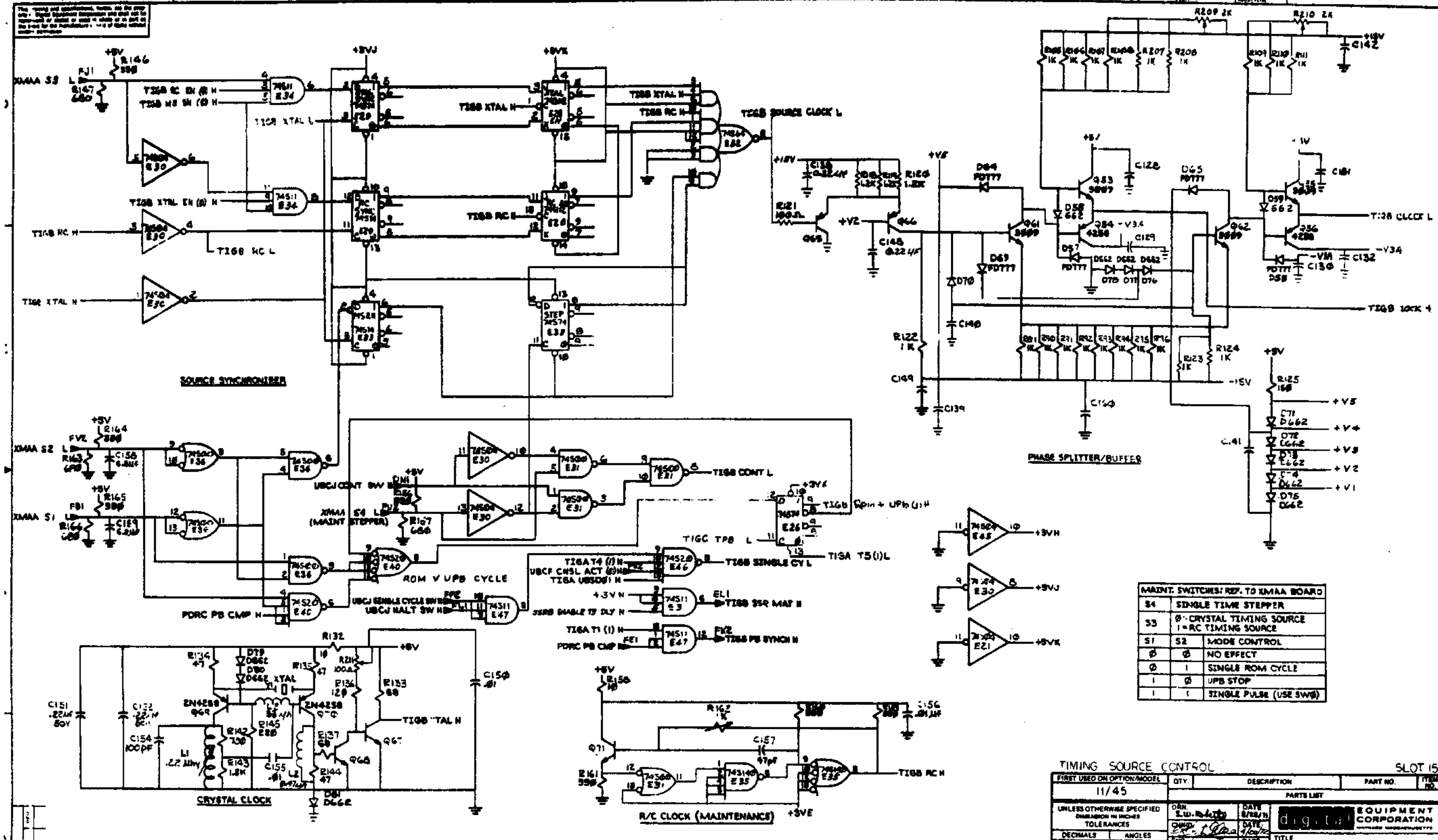
ETCH BOARD: B-DO-K811-0

DIGITAL EQUIPMENT CORPORATION

TIMING GENERATOR

D-CS-M8109-0-1


TIMING GENERATOR CONTROL
SLOT 15
11/45
EQUIPMENT CORPORATION
TIMING
GENERATOR
(TIGA)
B-DD-KB11-Ø
D CS MB109-Ø-1



MAINT. SWITCHES: REF. TO XMAA BOARD		
S4	SINGLE TIME STEPPER	
S3	Ø - CRYSTAL TIMING SOURCE 1 = RC TIMING SOURCE	
S1	S2	MODE CONTROL
Ø	Ø	NO EFFECT
Ø	1	SINGLE ROM CYCLE
1	Ø	UPB STOP
1	1	SINGLE PULSE (USE SWØ)

TIMING SOURCE CONTROL

SLOT 15

FIRST USED ON OPTION/MODEL	11/45
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.W. Roberts, DATE 6/22/71
CHKD.	DATE 4/20/72
ENG.	DATE 4/21/72
PROJ. ENG.	DATE 4-20-72
PROD.	DATE 4-21-72
NEXT HIGHER ASSY.	B-DD-KB11-Ø
SCALE	—//—
SHEET	3 OF 6

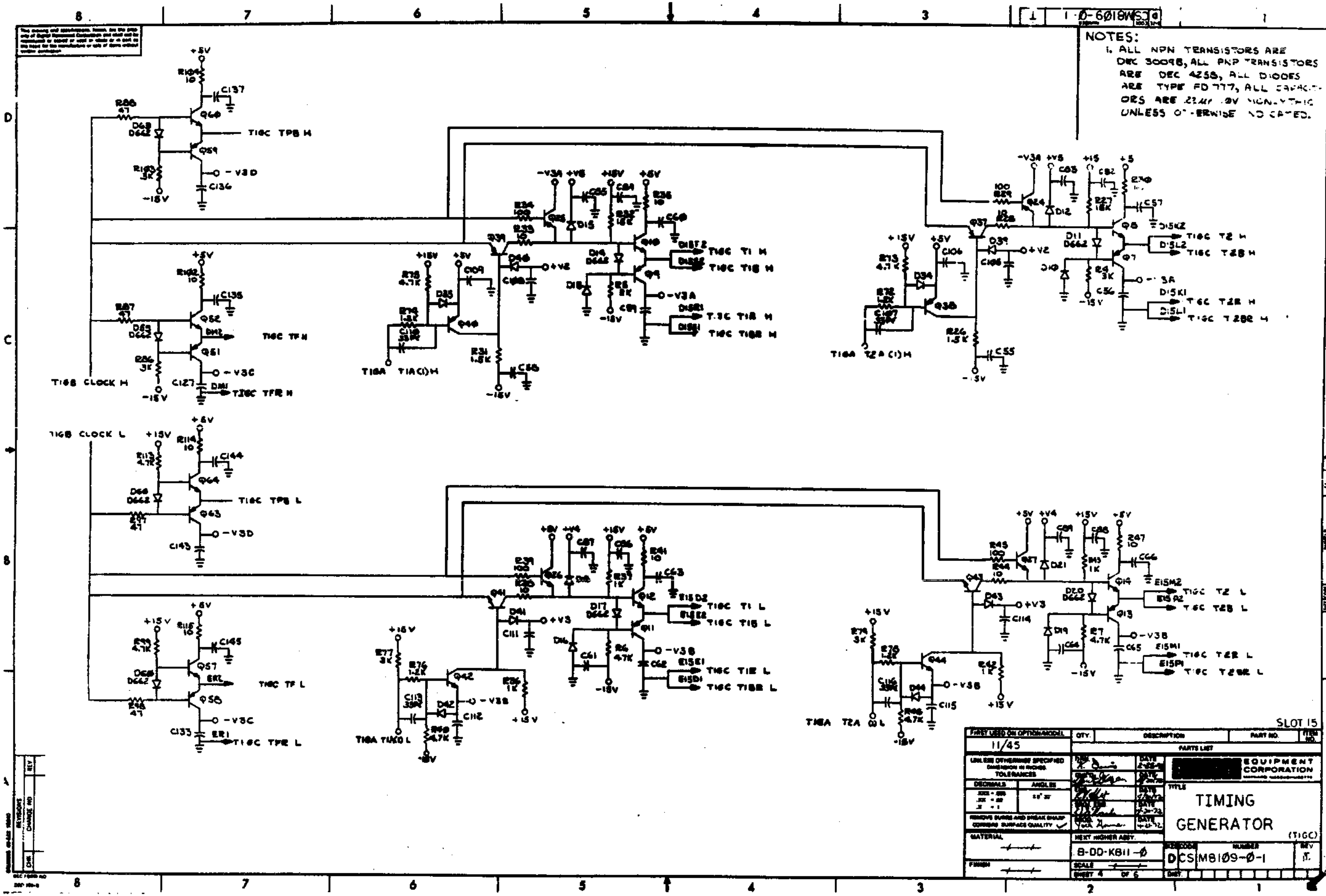
QTY.	DESCRIPTION	PART NO.	ITEM NO.

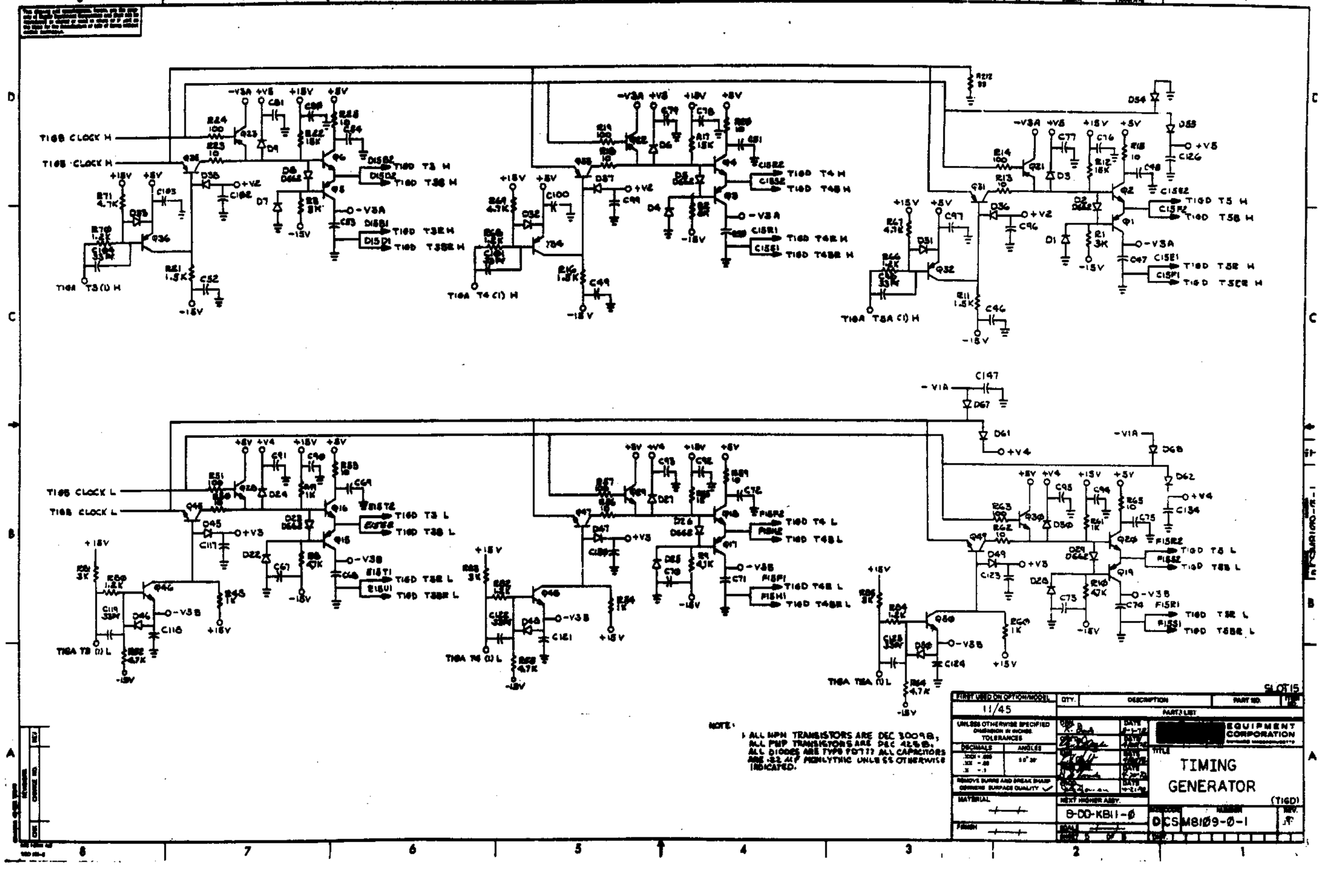
PARTS LIST

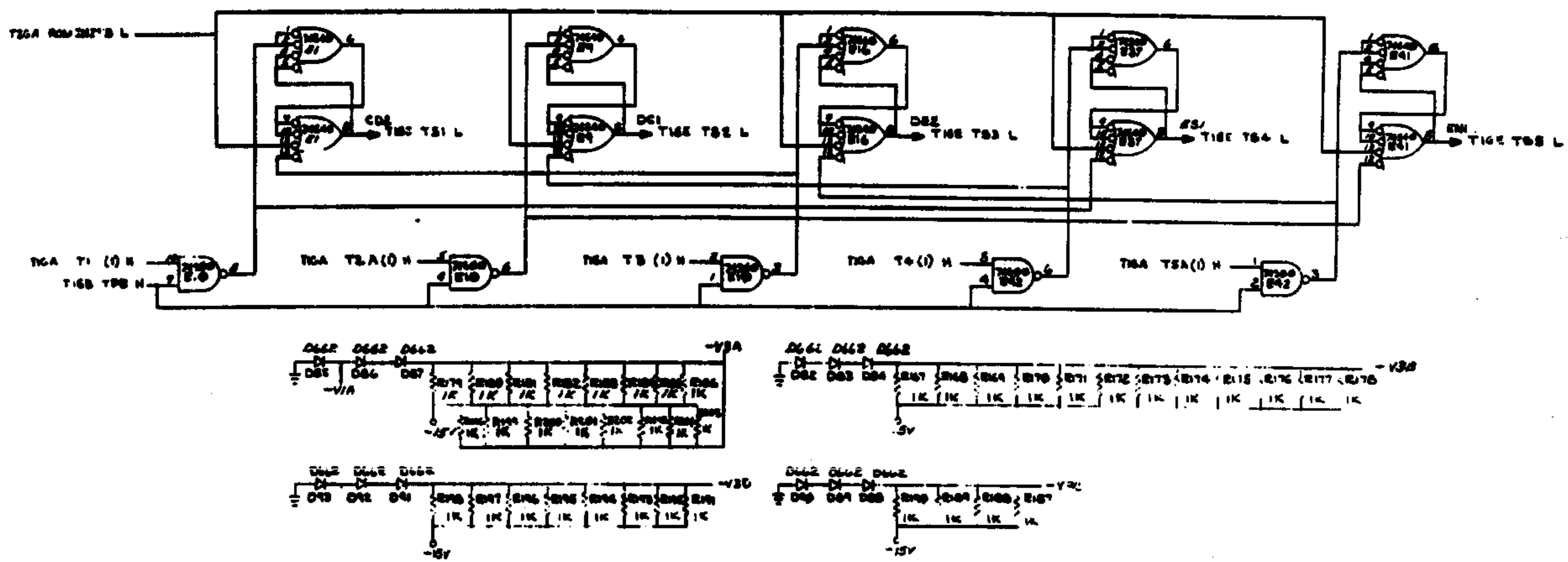
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: TIMING GENERATOR (TIGB)

SIZE	CODE	NUMBER	REV
D	CS	M8109-Ø-1	T


NOTES:
1. ALL NPN TRANSISTORS ARE DEC 3009B, ALL PNP TRANSISTORS ARE DEC 4258, ALL DIODES ARE TYPE FD 777,
UNLESS OTHERWISE NOTED.
T16C TP8 H
T16C TF H
T16C TFR H
T16B CLOCK H
T16B CLOCK L
T16C TP8 L
T16C TF L
T16C TFR L
T16C T1 H
T16C T1B H
T16C T1R H
T16C T1BR H
T16C T2 H
T16C T2B H
T16C T2R H
T16C T2BR H
T16C T1 L
T16C T1B L
T16C T1R L
T16C T1BR L
T16C T2 L
T16C T2B L
T16C T2R L
T16C T2BR L
SLOT 15
11/45
EQUIPMENT CORPORATION
TIMING GENERATOR (T16C)
B-DD-K811-Ø
D CS M81Ø9-Ø-1


T16B CLOCK H
T16B CLOCK L
T16A T3 (1) H
T16A T4 (1) H
T16A T5 (1) H
T16B CLOCK L
T16B CLOCK L
T16A T3 (1) L
T16A T4 (1) L
T16A T5 (1) L
T16D T3 H
T16D T3B H
T16D T3E H
T16D T3EB H
T16D T4 H
T16D T4B H
T16D T4E H
T16D T4EB H
T16D T5 H
T16D T5B H
T16D T5E H
T16D T5EB H
T16D T3 L
T16D T3B L
T16D T3E L
T16D T3EB L
T16D T4 L
T16D T4B L
T16D T4E L
T16D T4EB L
T16D T5 L
T16D T5B L
T16D T5E L
T16D T5EB L
-V3A
-V3B
+V2
+V3
+V4
-V1A
+15V
-15V
+8V
+5V
NOTE:
1. ALL NPN TRANSISTORS ARE DEC 3009B;
ALL PNP TRANSISTORS ARE DEC 4259;
ALL DIODES ARE TYPE FDH77. ALL CAPACITORS
ARE ±2.5% MONOLYTHIC UNLESS OTHERWISE
INDICATED.
SLOT 15
FIRST USED ON OPTION/MODEL
11/45
QTY.
DESCRIPTION
PART NO.
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSION IS INCHES TOLERANCES
DECIMALS
ANGLES
REMOVE BURRS AND BREAK SHARP
MATERIAL
FINISH
NEXT HIGHER ASSY.
8-00-KB11-0
EQUIPMENT CORPORATION
TITLE
TIMING GENERATOR
(T16D)
SIZE
NUMBER
REV.
D
CS M8109-0-1
A



TIMING STATE DRIVERS

SLOT 15

11/45

[redacted] EQUIPMENT CORPORATION

TIMING GENERATOR

(T16E)

8-DD-K811-0

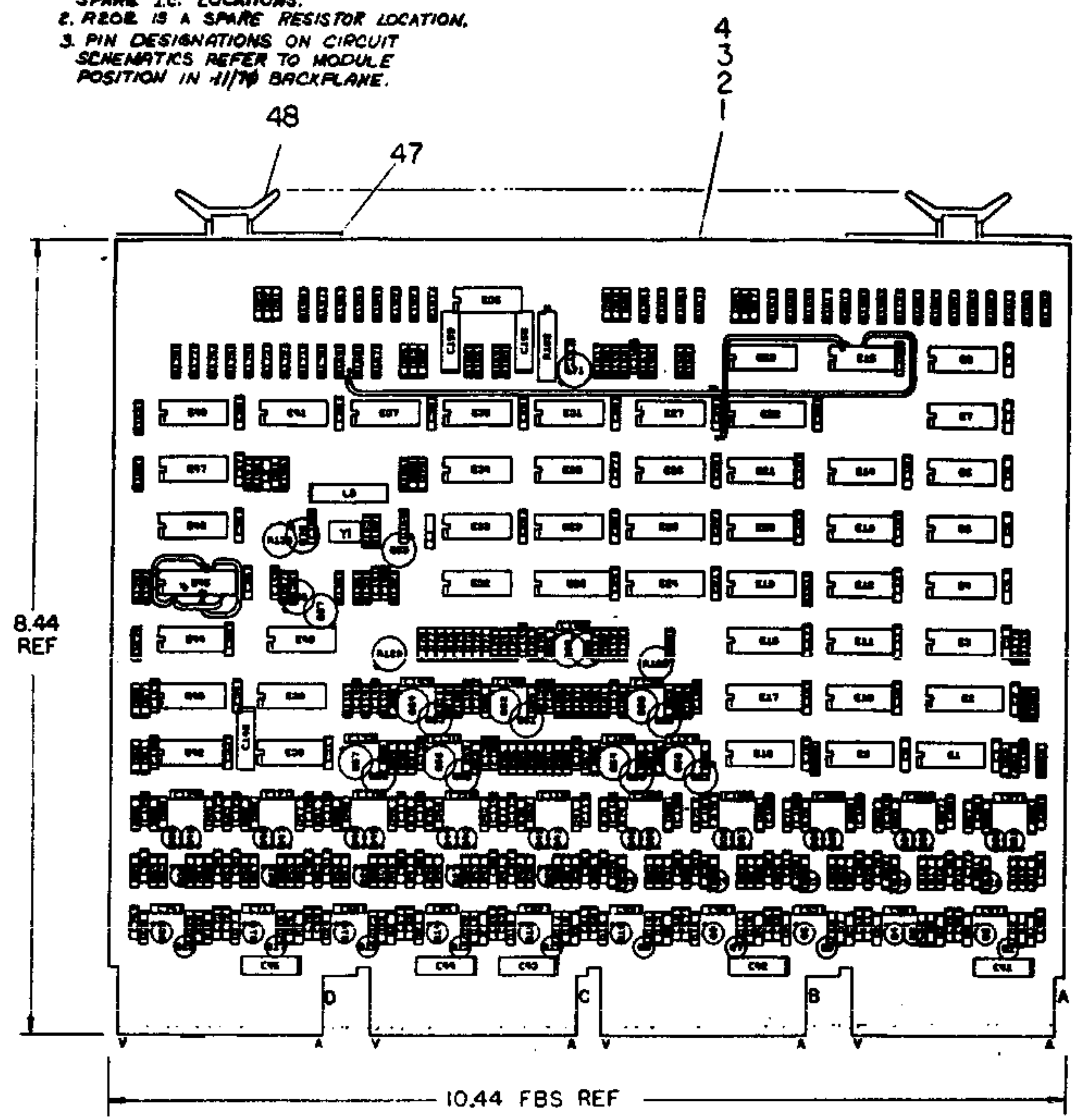
D CS M8109-0-1 D

SECTION VII
KB11-C TIMING LOGIC

B | D CS M8139-Ø-1

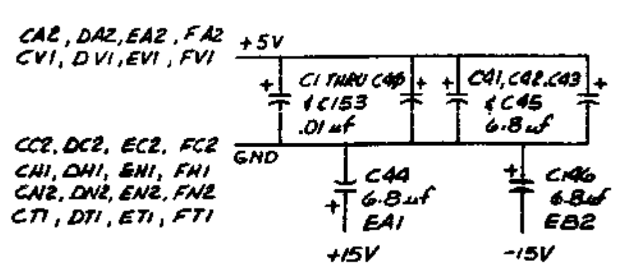
NOTES:

1. E3, E27, E36, E40, E44, AND E49 ARE SPARE I.C. LOCATIONS.
2. R202 IS A SPARE RESISTOR LOCATION.
3. PIN DESIGNATIONS ON CIRCUIT SCHEMATICS REFER TO MODULE POSITION IN 11/70 BACKPLANE.



PIN NOMENCLATURE

MODULE PIN	BACKPLANE PIN
A	C
B	D
C	E
D	F



IC DEC 74S112	8	16
IC TYPE	GND	+5V

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
REF		X Y COORDINATE HOLE LOCATION	K-CD-M8139-0-4	1
REF		ASSY/DRILLING HOLE LAYOUT	D-AW-M8139-0-5	2
REF		MODULE ECO HISTORY	B-MH-M8139-0-0	3
1		ETCHED CIRCUIT BOARD	5011344	4
44	C1 THRU C40, C150, C153, C155, C156	CAP, .01uf, 100V	1001610-01	5
8	C41, C42, C43, C44, C45, C146, C158, C159	CAP, 6.8uf, 35V, 10%	1005300	6
90	C46 THRU C97, C99, C100, C102, C103, C105, C106, C108, C109, C111, C114, C115, C117, C118, C120, C121, C123, C124, C126 THRU C145, C147, C148, C149, C151, C152, C160, C112	CAP, .22uf, 50V, 80-20%	1010274-01	7
10	C98, C101, C104, C107, C110, C113, C116, C119, C122, C125	CAP, 33pf, 100V 5%	1000809	8
1	C157	CAP, 47pf, 100V, 5%	1000811	9
1	C154	CAP, 100pf, 100V 5%	1000810	10
52	D1, D3, D4, D6, D7, D9, D10, D12, D13, D15, D16, D18, D19, D21, D22, D24, D25, D27, D28, D30 THRU D50, D57, D58, D61, D62, D64, D65, D67, D68, D69, D70, D53, D54	DIODE DEC 777	1103841	11
39	D2, D5, D8, D11, D14, D17, D20, D23, D26, D29, D55, D56, D59, D60, D63, D66, D71 THRU D93	DIODE D662	1100113	12
17	R6 THRU R10, R40, R46, R52, R58, R64, R67, R71, R73, R75, R89, R113, R69	RESISTOR, 4.7K, 1/4W, 5%	1300447	13
6	R11, R16, R21, R26, R31, R143	RESISTOR, 1.5K, 1/4W, 5%	1300391	14
5	R12, R17, R22, R27, R32	RESISTOR, 15K, 1/4W, 5%	1300490	15
20	R13, R15, R18, R20, R23, R25, R28, R30, R33, R35, R38, R41, R47, R50, R53, R56, R59, R62, R65, R102, R104, R114, R115, R132, R156, R44	RESISTOR, 10 OHM, 1/4W, 5%	1301317	16
11	R14, R19, R24, R29, R34, R39, R49, R51, R57, R63, R121	RESISTOR, 100 OHM, 1/4W, 5%	1300229	17
76	R36, R37, R42, R43, R48, R45, R54, R55, R60, R61, R89 THRU R98, R101, R105 THRU R112, R123, R124, R126, R136, R139, R140, R141, R148 THRU R153, R167 THRU R200, R122, R201	RESISTOR, 1K, 1/4W, 5%	1300365	18
13	R66, R68, R70, R72, R76, R74, R78, R80, R82, R84, R118, R119, R120	RESISTOR, 1.2K, 1/4W, 5%	1301320	19
12	R77, R79, R81, R83, R85, R86, R103, R1 THRU R5	RESISTOR, 3K, 1/4W, 5%	1300432	20
7	R87, R88, R97, R98, R134, R135, R144	RESISTOR, 47 OHM, 1/4W, 5%	1300202	21
6	R100, R125, R127, R131, R154, R155	RESISTOR, 150 OHM, 1/4W, 5%	1300256	22
8	R116, R146, R158, R159, R160, R161, R164, R165	RESISTOR, 330 OHM, 1/4W, 5%	1300293	23
5	R117, R147, R157, R163, R166	RESISTOR, 680 OHM, 1/4W, 5%	1301424	24
2	R128, R129	RESISTOR, 2K, 1/2W, 10%, POT	1309150-07	25
1	R130	RESISTOR, 100 OHM, 1/2W, 10%, POT	1309150-05	26
2	R133, R137	RESISTOR, 68 OHM, 1/4W, 5%	1300219	27
1	R142	RESISTOR, 750 OHM, 1/4W, 5%	1301401	28
1	R145	RESISTOR, 220 OHM, 1/4W, 5%	1300271	29
1	R162	RESISTOR, 1K, 3/4W, POT	1309143-07	30
35	Q1, Q3, Q5, Q7, Q9, Q11, Q13, Q17, Q19, Q21 THRU Q25, Q31 THRU Q48, Q51, Q54, Q56, Q58, Q59, Q63, Q65, Q68, Q69, Q70, Q15	TRANSISTOR DEC 4258	1505321	31

PARTS LIST

FIRST USED ON OPTION MODEL: 11/70

ETCH BOARD REV: B

REVISIONS: B | M8139-00001 | A. HELENIUS 4-15-75

SEMICONDUCTOR CONVERSION CHART (DEC NO. | EIA NO. | DEC NO. | EIA NO.)

DRN: F. Lindman, 12/9/74
CHK'D: L. Kandrisi
ENG: Allan Helenius, 1-5-75
PROD. ENG: Allan Helenius, 1-6-75
PROD: R. Taylor, 1/15/75

NEXT HIGHER ASSY: B-DD-K811-Ø

SCALE: 1/1

digital EQUIPMENT CORPORATION

TITLE: TIMING GENERATOR

SIZE: D | CODE: CS | NUMBER: M8139-Ø-1 | REV: B

D CS M8139-Ø-1 B

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NOTES:

PARTS LIST

QTY	REF DESIGNATION	DESCRIPTION	PART NO	ITEM NO
38	Q2,Q4,Q6,Q8,Q10,Q12,Q14, Q16,Q18,Q20,Q26 THRU Q30, Q41 THRU Q50,Q52,Q53,Q55, Q57,Q60,Q61,Q62,Q64,Q67, Q69,Q71	TRANSISTOR DEC 3009B	1503100	32
1	L1	INDUCTOR .22 UH	1611000	33
1	L2	INDUCTOR .47 UH	1610999	34
1	L3	INDUCTOR 33 MH	1601759	35
6	E1,E9,E14,E16,E38,E42	IC 74S40	1910541	36
8	E2,E17,E18,E22,E24,E25,E26 E45	IC DEC 74S112	1910545	37
5	E4,E7,E21,E46,E30	IC 74S04	1910534	38
7	E5,E8,E19,E28,E29,E33,E0..	IC 74S74	1910544	39
5	E10,E15,E31,E37,E43	IC 74S00	1910532	40
2	E11,E12	IC 74S65	1910543	41
4	E20,E23,E32,E13	IC 74S64	1910542	42
2	E34,E40	IC 74S11	1910537	43
2	E35,E39	IC 74S140	1910548	44
2	E41,E47	IC 74S20	1910539	45
1	Y1	CRYSTAL 33.333 MHZ	1610894-01	46
8		EYELET	9006732	47
4		HANDLE FLIP CHIP MAGENTA	9008337-06	48
A/R		TAPE,2 SIDED	9007834	49
12"		WIRE, #30 AWG BUSS(RETROFIT)	9105740-55	50
A/R		PERMA-BOND	9009157	51
1	R136	RESISTOR 120 OHM 1/4W 5%	1300247	52
1	R203	RESISTOR 33 OHM 1/4W 5%	1300197	53

IC TYPE	GND	+ 5V

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

IC PIN LOCATIONS

FIRST USED ON OPTION MODEL: 11/70

ETCH BOARD REV: B

DEC NO.	EIA NO.	DEC NO.	EIA NO

SEMICONDUCTOR CONVERSION CHART

REVISIONS — REV / CHANGE NO. / CHK

DRN: [signature] DATE: 12/9/74
CHK'D: [signature] DATE: 12/9/74
ENG: [signature] DATE: 1-15-75
PROJ. ENG: [signature] DATE: 1-15-75
PROD: [signature] DATE: 1/15/75

NEXT HIGHER ASSY: B-DD-KB11-Ø

SCALE: —
SHEET 2 OF 7

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: TIMING GENERATOR

SIZE: D CODE: CS NUMBER: M8139-Ø-1 REV: B

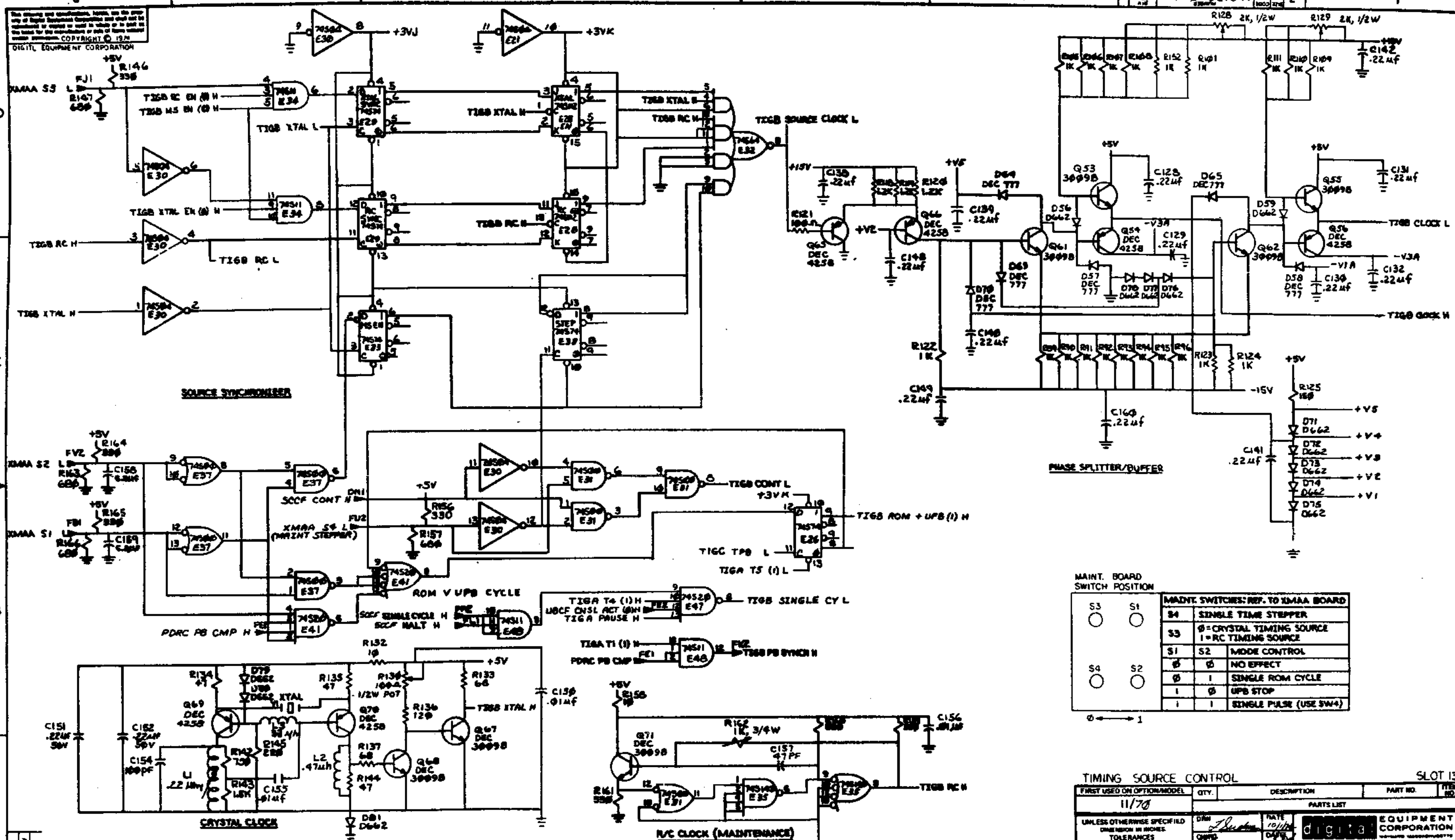
DIST

TIMING CONTROL SLOT 13

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
TIMING GENERATOR (TIGA)	D	CS	M8139-0-1	B

SCALE — SHEET 3 OF 9



MAINT. BOARD SWITCH POSITION

S3 S1
S4 S2

Ø ⟷ 1

MAINT. SWITCHES: REF. TO XMAA BOARD		
S4	SINGLE TIME STEPPER	
S3	Ø = CRYSTAL TIMING SOURCE 1 = RC TIMING SOURCE	
S1	S2	MODE CONTROL
Ø	Ø	NO EFFECT
Ø	1	SINGLE ROM CYCLE
1	Ø	UPB STOP
1	1	SINGLE PULSE (USE SW4)

TIMING SOURCE CONTROL

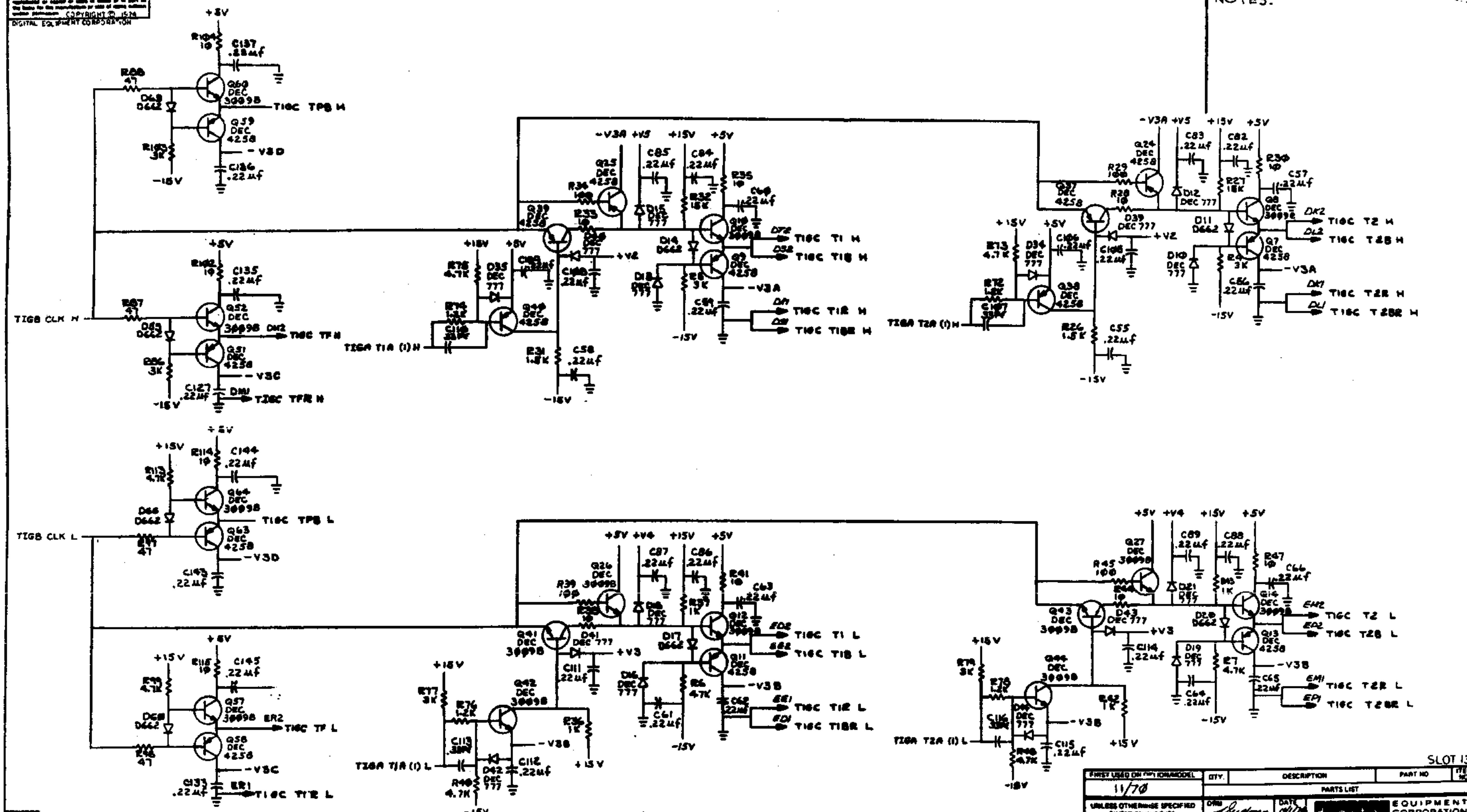
SLOT 13

FIRST USED ON OPTION/MODEL	11/7Ø
TITLE	TIMING GENERATOR (TIGB)
NEXT HIGHER ASSY	B-DD-KB11-Ø
SIZE	D
CODE	CS
NUMBER	M8139-Ø-1
REV	B
SCALE	//
SHEET	4 OF 7
MATERIAL	//
FINISH	//

DIGITAL EQUIPMENT CORPORATION

D CS M8139-Ø-1 B

NOTES:



SLOT 13

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO	ITEM NO
11/70		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL

FINISH

NEXT HIGHER ASSY: B-DD-K811-Ø

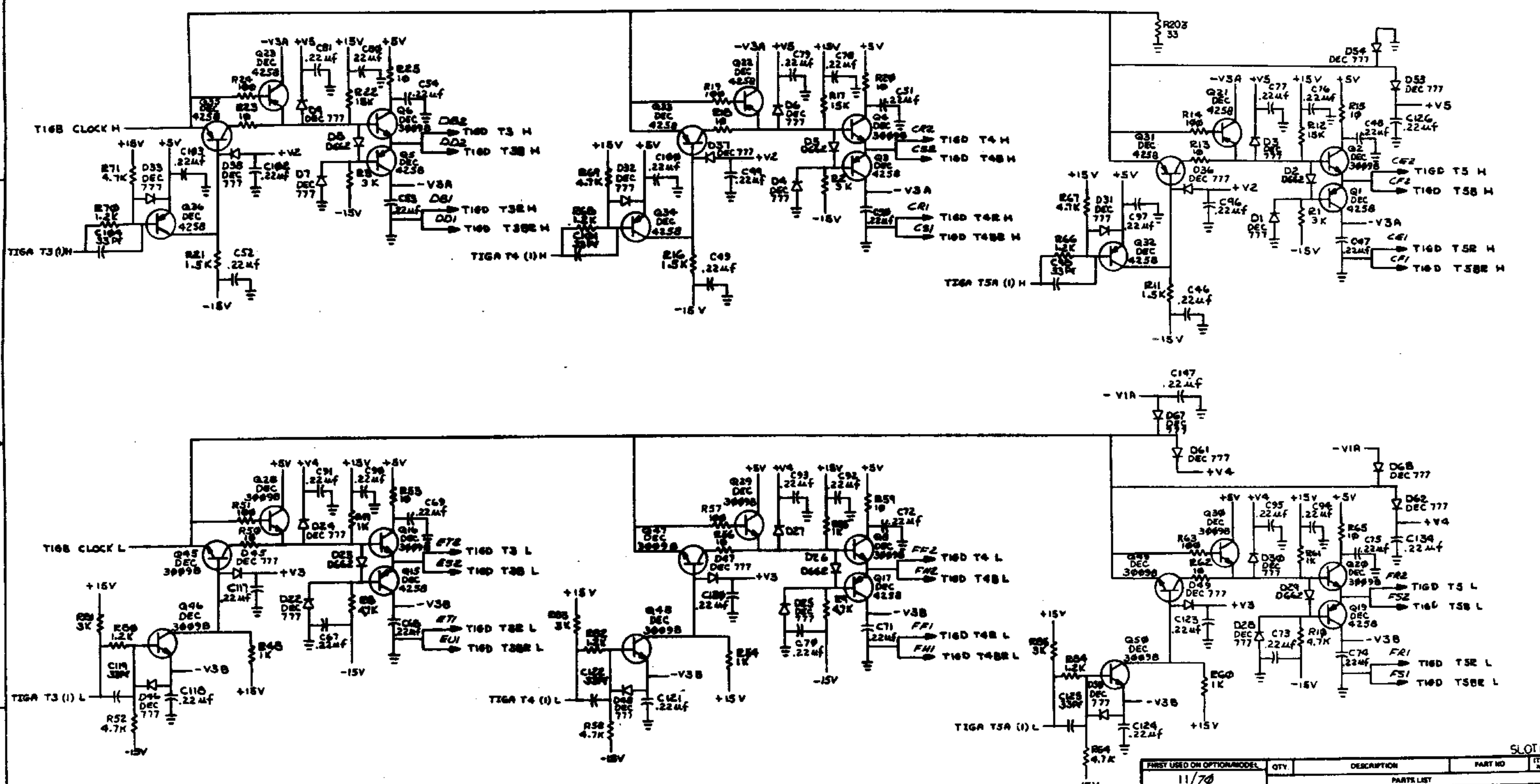
digital EQUIPMENT CORPORATION

TITLE: TIMING GENERATOR (TIGC)

SIZE D CODE CS NUMBER M8139-Ø-1 REV B

SHEET 5 OF 7

B M8139-Ø-1



FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO	ITEM NO
11/70		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES

DECIMALS / ANGLES

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL —

FINISH —

DRN / CHKD / ENG / PROD — DATE

digital EQUIPMENT CORPORATION

TITLE

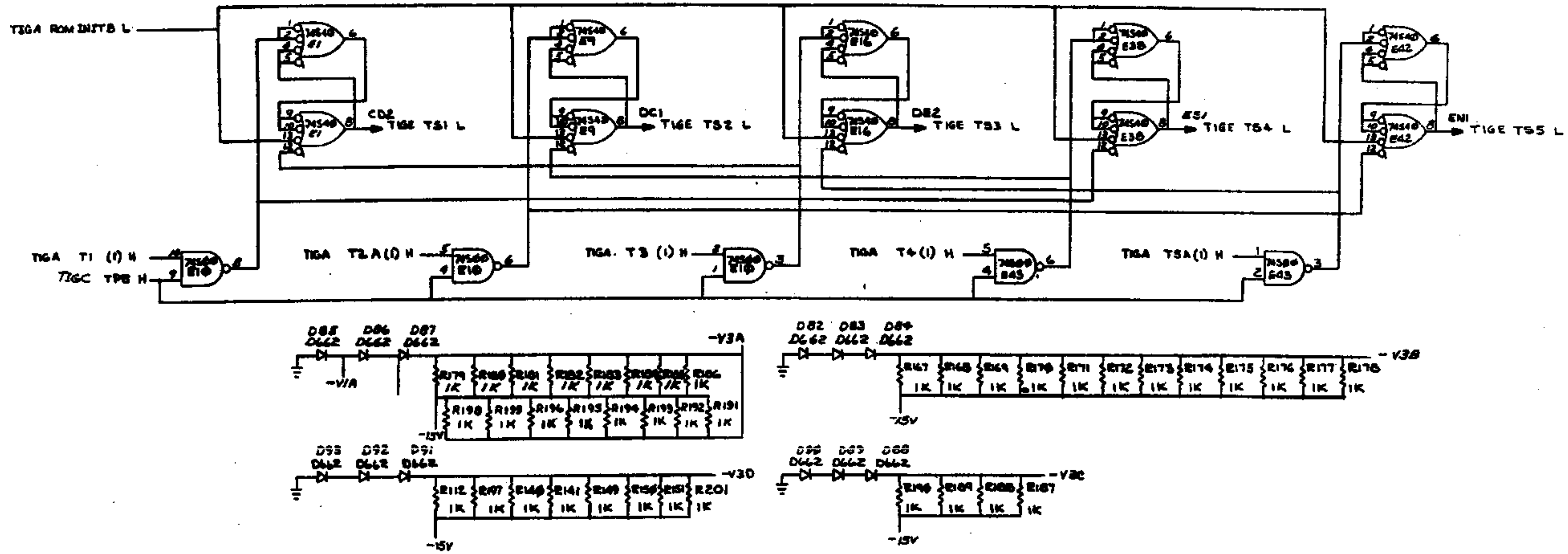
TIMING GENERATOR

(TIGD)

NEXT HIGHER ASSY: B-DD-KB11-Ø

SIZE D CODE CS NUMBER M8139-Ø-1 REV B

SCALE — SHEET 6 OF 7



TIMING STATE DRIVERS

SLOT 13

FIRST USED ON OPTION/MODEL
11/70

DIGITAL EQUIPMENT CORPORATION

TITLE: TIMING GENERATOR (TIGE)

NEXT HIGHER ASSY: B-DD-KB11-Ø

SIZE D CODE CS NUMBER M 8139-Ø-1 REV B

SHEET 7 OF 7