11 SYSTEMS COURSE

TRAINING DRAWINGS

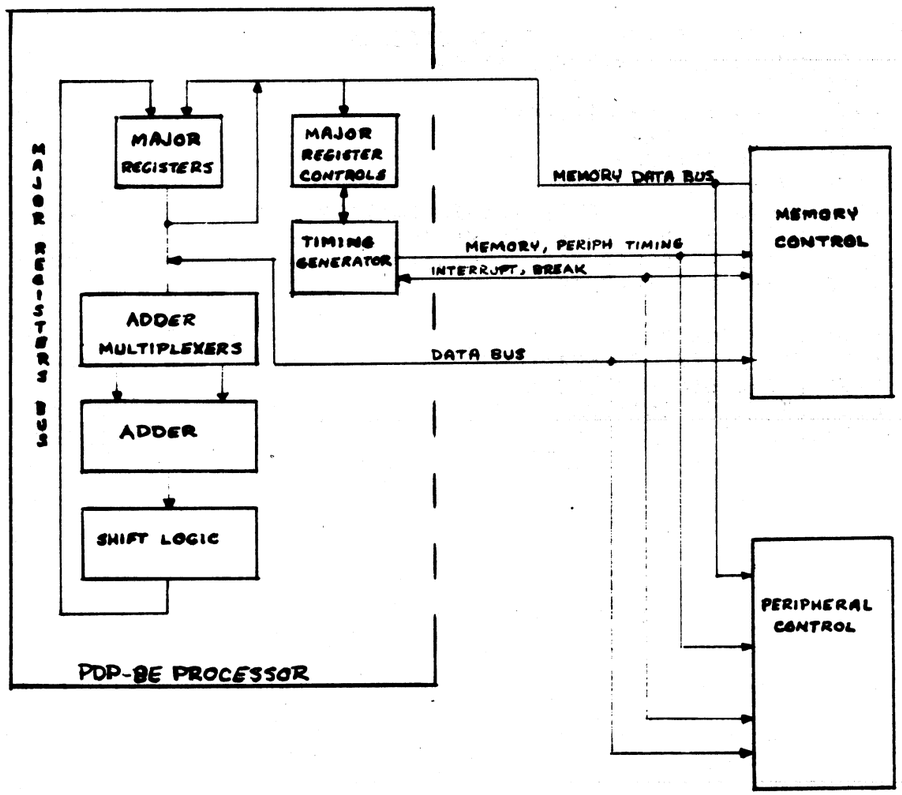


Fig 1. PDP8E CPU/MEMORY/PERIPHERAL BLOCK DIAGRAM

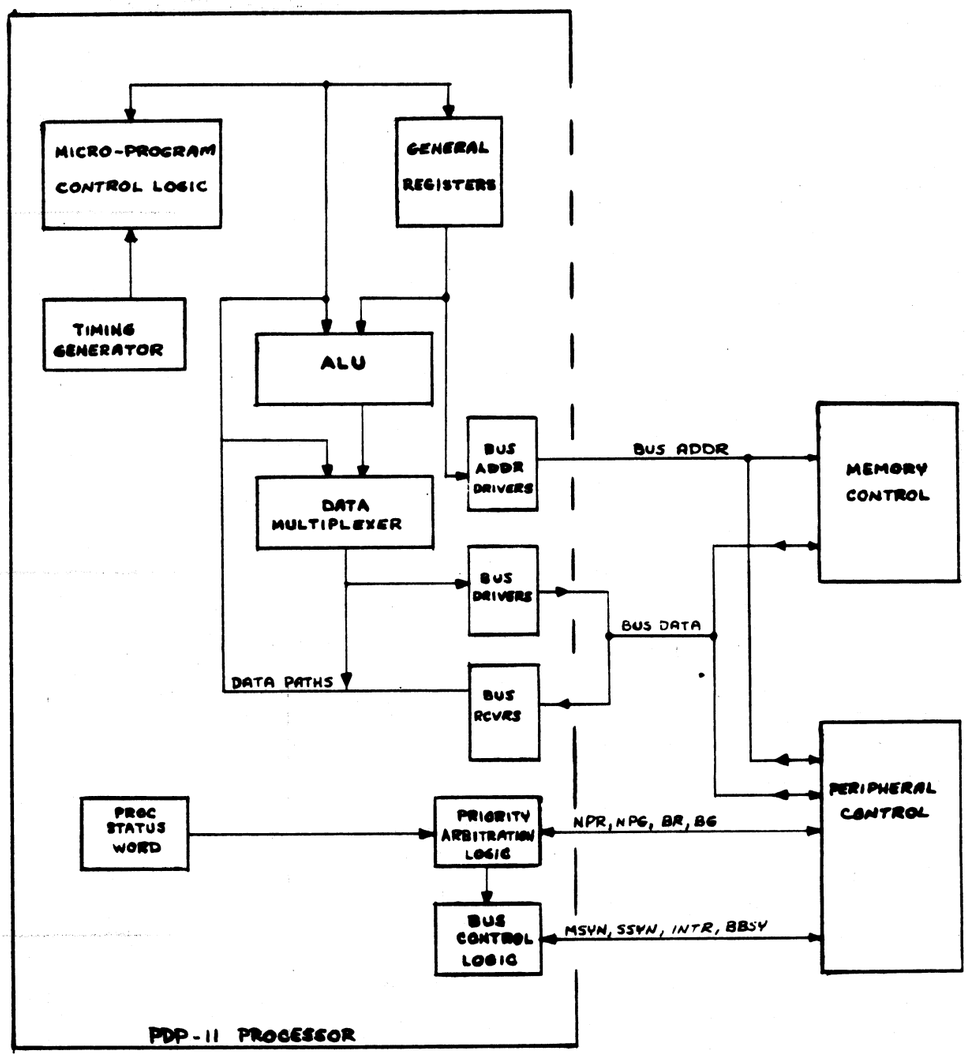


Fig. 2. PDP11 CPU/MEMORY/PERIPHERAL BLOCK DIAGRAM

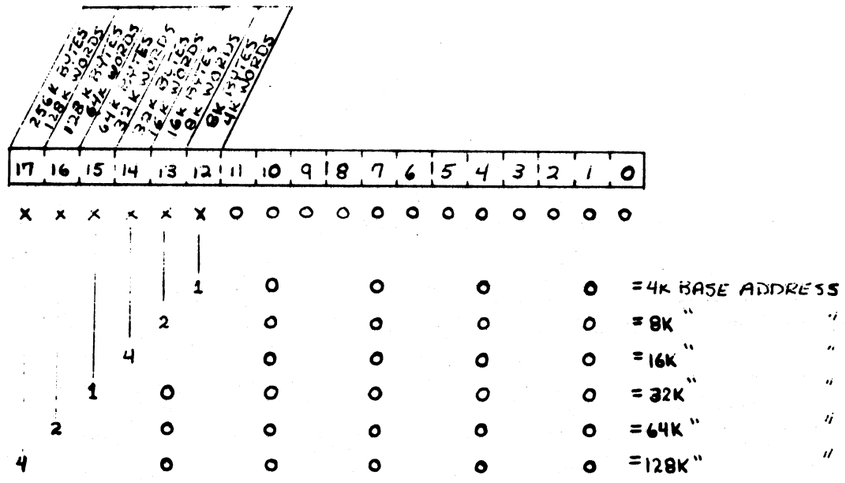


Fig 3. PDP-11 MEMORY ADDRESS INTERPRETATION

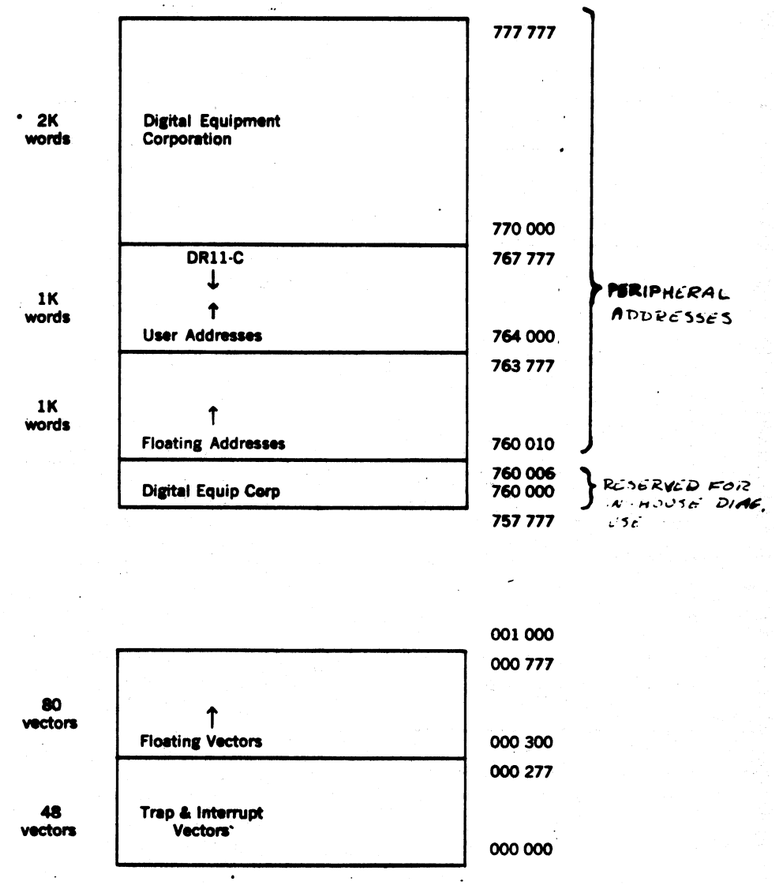
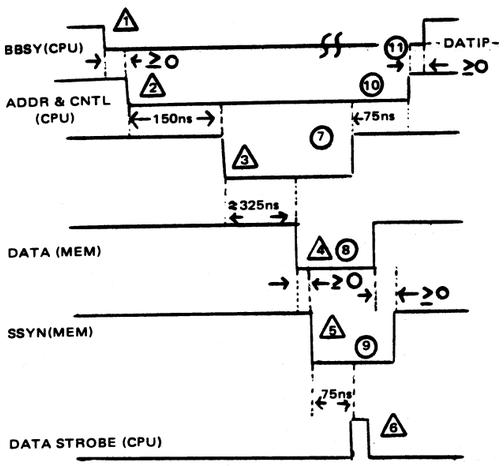


Fig 4 PDP-11 ADDRESS MAP



1. CPU asserts BBSY and is now bus master.
(11). CPU drops BBSY, unless this is a DATIP.
2. CPU asserts address and control lines.
(10). CPU drops addr and cntl lines 75ns after dropping MSYN.
3. CPU asserts MSYN after 150ns DESKEW time.
(7) CPU negates MSYN after strobing data into itself.
4. Memory puts data on bus 325ns after decoding addr.
(8) Memory removes data after seeing MSYN drop.
5. Memory asserts SSYN some time after data is put on bus.
(9). Memory negates SSYN after removing data from bus.
6. CPU strobes data into itself 75ns after receiving SSYN. This signal is not on the ubs, shown for explanation purposes only.

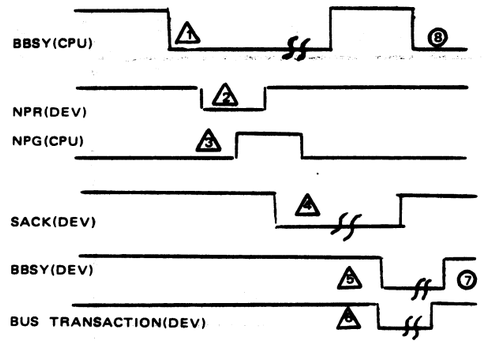
*NOTE: DATIP must be followed by DATO or DATOB cycle.

FIGURE 5 MSYN-SSYN timing for DATI or DATIP transaction: CPU Master, Memory Slave.

1. CPU asserts BBSY and is now bus master
(9) CPU drops BBSY
2. CPU asserts address and control lines.
(8). CPU drops addr and cntl lines 75ns after dropping MSYN.
3. CPU puts data on bus.
4. CPU asserts SSYN after 150ns DESKEW time.
(7). CPU negates MSYN and data after receiving SSYN.
5. Memory strobes data into itself 50ns after MSYN.
6. Memory asserts SSYN after strobing data.

*NOTE: DATO and DATOB transactions are identical except for conditions of control lines.

FIGURE 6 MSYN-SSYN timing for DATO or DATOB transaction: CPU Master, Memory Slave



1. CPU holds BBSY until end of current bus cycle.
(8). CPU asserts BBSY when device drops it.
2. Device requests bus, drops request when granted, and after asserting sack.
3. Arbitration logic sends NPG if no NPG, BG or sack is asserted, drops grant after receipt of sack.
4. Requesting device acknowledges grant, drops sack after it asserts BBSY.
5. Device asserts BBSY when CPU drops it.
(7). Device drops BBSY after transaction is complete.
6. Device initiates DATI or DATO sequence, see Figures 5,6.

FIGURE 7 Priority arbitration timing for non processor request

1. CPU holds BBSY until end of current bus cycle.
(12). CPU asserts BBSY, proceeds to devices service routine.
2. Device requests bus, drops request when granted, and after asserting sack.
3. Arbitration logic sends BGn if no NRG, BG or sack is asserted. Drops grant after receipt of sack.
4. Requesting device acknowledges grant, drops sack after it asserts BBSY.
5. Device asserts BBSY when CPU drops it.
(10). Device drops BBSY, INTR, Vectors after receiving SSYN form CPU.
6. Device asserts INTR when it asserts BBSY.
7. Device puts vector address on data lines when it asserts BBSY.
8. CPU strobes vector address into its internal registers after 75ns DESKEW time.
9. CPU sends SSYN to acknowledge vector transfer.
(11). CPU drops SSYN after device drops INTR.

FIGURE 8 Priority arbitration timing for bus request (Interrupt)

KD11-A PROCESSOR

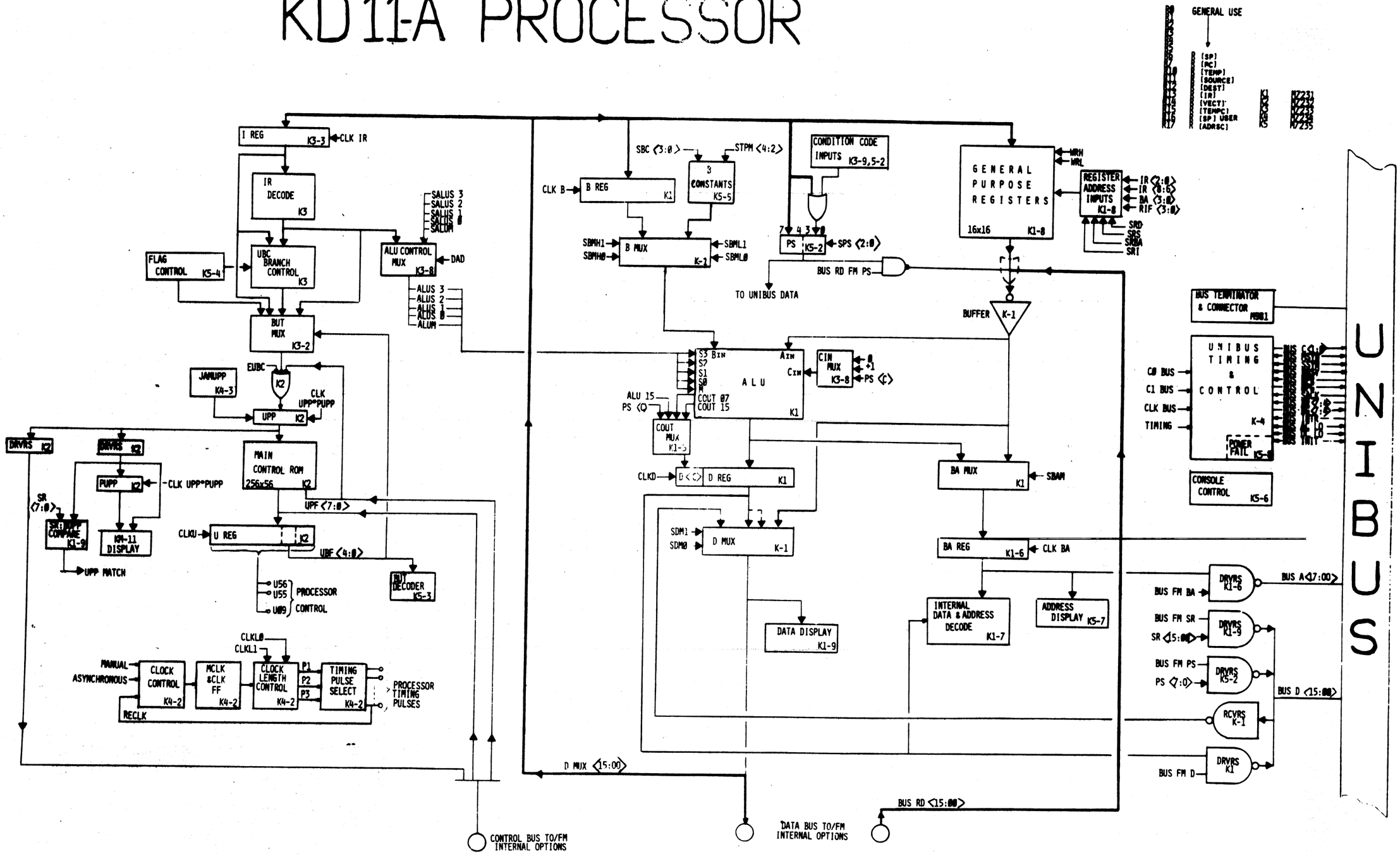


Fig. 10 PDP-11/40 BLOCK DIAGRAM

5 Timing pulses / Rom state

Both general register sets contain = information, can read from different registers depending on SRC & DST, but must write identical data in each set.

ALU
PCA (DAPF,H)
PCB (DAPF,H)
PCB
SHFR (DAPF,H,J)
CTP

ALU (DAPF, DAPH)
B A

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 (DAPB,C,D')
AMX (DAPB,C,D)

GS (16 REGISTERS) (GRAD,E,F,H)
GD (16 REGISTERS) (GRAD,E,F,H)
G S
G D
SHFR
SRMX (GRAD,E,F,H)
DRMX (GRAD,E,F,H)
SR (GRAD,F,H)
DR (GRAD,E,F,H)
SC (GRAJ)

ASH, ASHC MUL, DIV

BAMX (DAPB, C,D)
VIRTUAL ADDRESS
KTIL MM
PHY ADDR

If Mem Mgt is not installed this will be the segmentation jumper board

MOVB SXT DAPD
KOMX (DAPD)
#1
#2
SRCCON
DSTCON

KMX (T1) [19-18]
KOMX
0 1
1 2
2 SOURCE CONST.
3 DEST. CONST.

K1MX
START VECTOR
TRAP VECTOR
SOB & MARK OFFSET
BXX OFFSET

K1MX (DAPE)
TV
SV
INTERNAL TRAP VECTOR
PWR UP START VECTOR
BRANCH SOB MARK

FROM FPP EALU
FAST BUS IN
DATA FROM SEMI-COND MEMORY
TO/FROM UNIBUS

INT BUS
UNIBUS
BRMX (PDRA)
BBR (PDRJ)
T3φ CLK
FROM FPP UADR/ CPU UADR
SHFR
MULTIPLEXER DISPLAY (PDRF)
TO CONSOLE DATA LIGHTS

BR (DAPA)
BRA (PDRB)
IR (IRCA)
AFIR (RACJ)
DATA OR INSTR
INST ONLY
LR
BR

FAST BUS OUT
DATA TO SEMI-COND MEMORY

LR (PDRB)
PS (IRCH,PDRB)
PIRQ (PDRD)
SL (PDRC)
PB (PDRC)
SL/PB
DMX (PDRE)
PIRQ
PS

FROM SWITCH REGISTER (PDRH)
INTERNAL BUS

DATA FROM FPP
DATA TO KT11-C REGISTERS AND FPP DATA
DATA FROM KT11-C REGISTERS

11-1019

REVISIONS			
REV	CHANGE NO	CHK	
A	11145-00065	BOAEN	

FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO	ITEM NO
11/45		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

DRWN DATE
CHKD DATE 4/14/72
ENG DATE 4/14/72
PROJ ENG DATE 4/14/72
PROD DATE

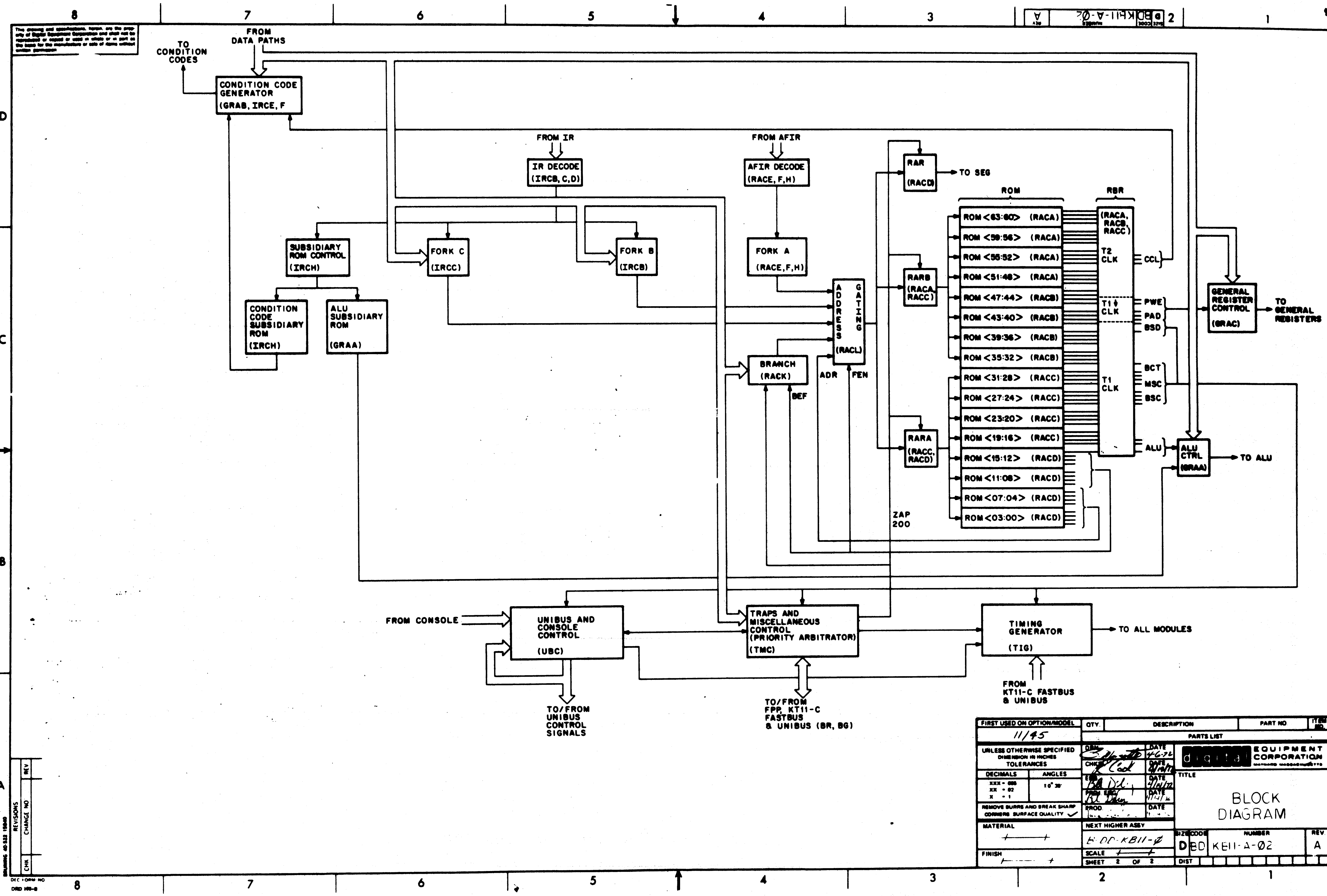
digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: BLOCK DIAGRAM

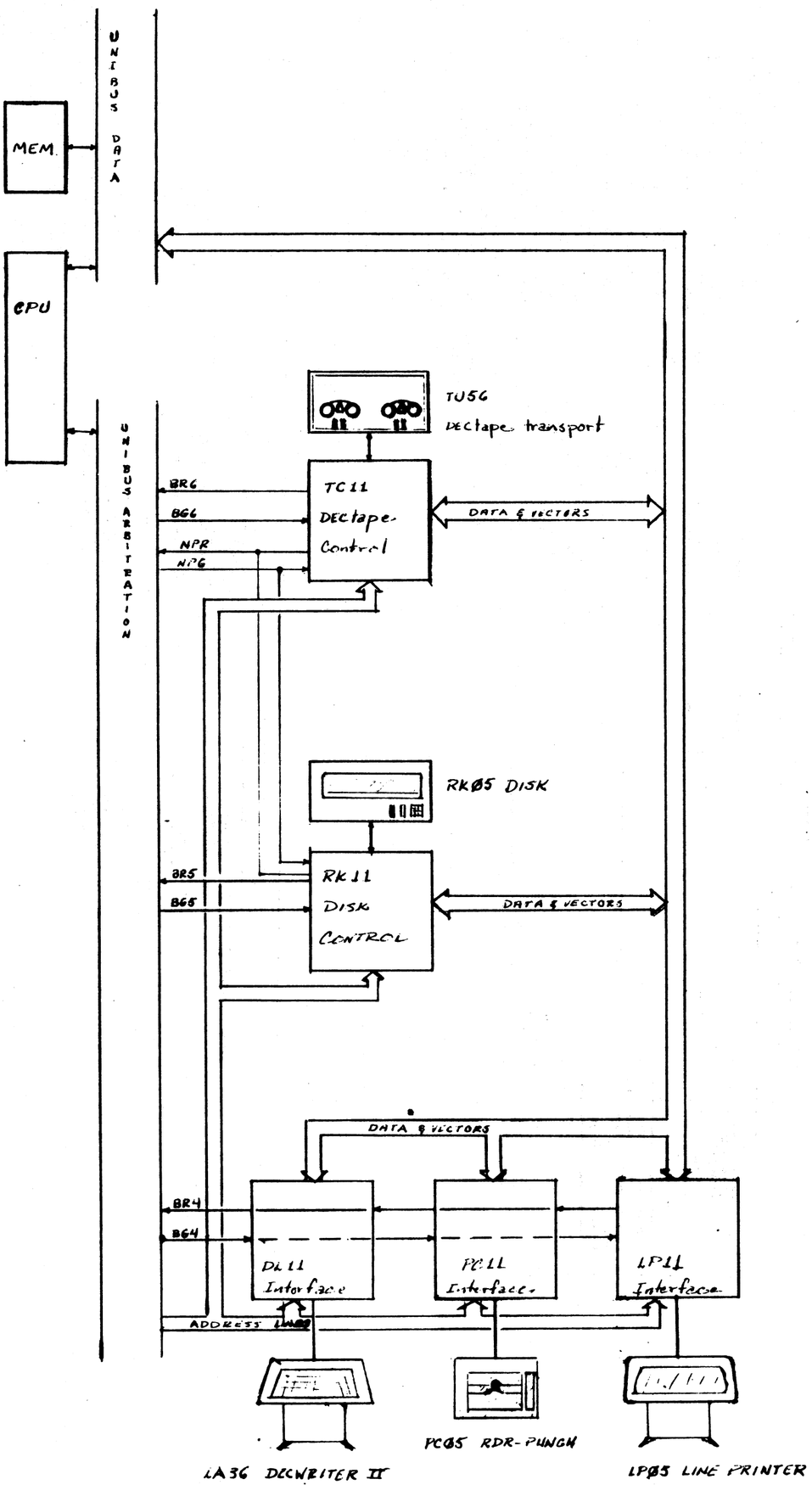
NEXT HIGHER ASSY: KT11-A-0
SIZE D | CODE 80 | NUMBER KT11-A-0 | REV A
SCALE
SHEET 1 OF 1
DIST

DEC FORM NO DRD 102-B

Fig 11. PDP-11/45 BLOCK DIAGRAM


FROM DATA PATHS
TO CONDITION CODES
CONDITION CODE GENERATOR (GRAB, IRCE, F
FROM IR
IR DECODE (IRCB, C, D)
FROM AFIR
AFIR DECODE (RACE, F, H)
RAR (RACD)
TO SEG
ROM
RBR
SUBSIDIARY ROM CONTROL (IRCH)
FORK C (IRCC)
FORK B (IRCB)
FORK A (RACE, F, H)
CONDITION CODE SUBSIDIARY ROM (IRCH)
ALU SUBSIDIARY ROM (GRAA)
ADDRESS GATING (RACL)
RARB (RACA, RACC)
BRANCH (RACK)
BEF
ADR
FEN
RARA (RACC, RACD)
ROM <63:60> (RACA)
ROM <59:56> (RACA)
ROM <55:52> (RACA)
ROM <51:48> (RACA)
ROM <47:44> (RACB)
ROM <43:40> (RACB)
ROM <39:36> (RACB)
ROM <35:32> (RACB)
ROM <31:28> (RACC)
ROM <27:24> (RACC)
ROM <23:20> (RACC)
ROM <19:16> (RACC)
ROM <15:12> (RACD)
ROM <11:08> (RACD)
ROM <07:04> (RACD)
ROM <03:00> (RACD)
(RACA, RACB, RACC)
T2 CLK
T1↑ CLK
T1 CLK
CCL
PWE
PAD
BSD
BCT
MSC
BSC
ALU
GENERAL REGISTER CONTROL (GRAC)
TO GENERAL REGISTERS
ALU CTRL (GRAA)
TO ALU
ZAP 200
FROM CONSOLE
UNIBUS AND CONSOLE CONTROL (UBC)
TO/FROM UNIBUS CONTROL SIGNALS
TRAPS AND MISCELLANEOUS CONTROL (PRIORITY ARBITRATOR) (TMC)
TO/FROM FPP, KT11-C FASTBUS & UNIBUS (BR, BG)
TIMING GENERATOR (TIG)
TO ALL MODULES
FROM KT11-C FASTBUS & UNIBUS
FIRST USED ON OPTION/MODEL 11/45
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS
ANGLES
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY
MATERIAL
FINISH
QTY
DESCRIPTION
PART NO
PARTS LIST
digital EQUIPMENT CORPORATION
TITLE
BLOCK DIAGRAM
NEXT HIGHER ASSY
E-DC-KB11-Ø
SIZE D
CODE BD
NUMBER KB11-A-Ø2
REV A
SHEET 2 OF 2

(7)



11 SYSTEM BLOCK DIAG.
03-08-76 JW

Fig 12. 11 SYSTEM BLOCK DIAGRAM

NOTES:

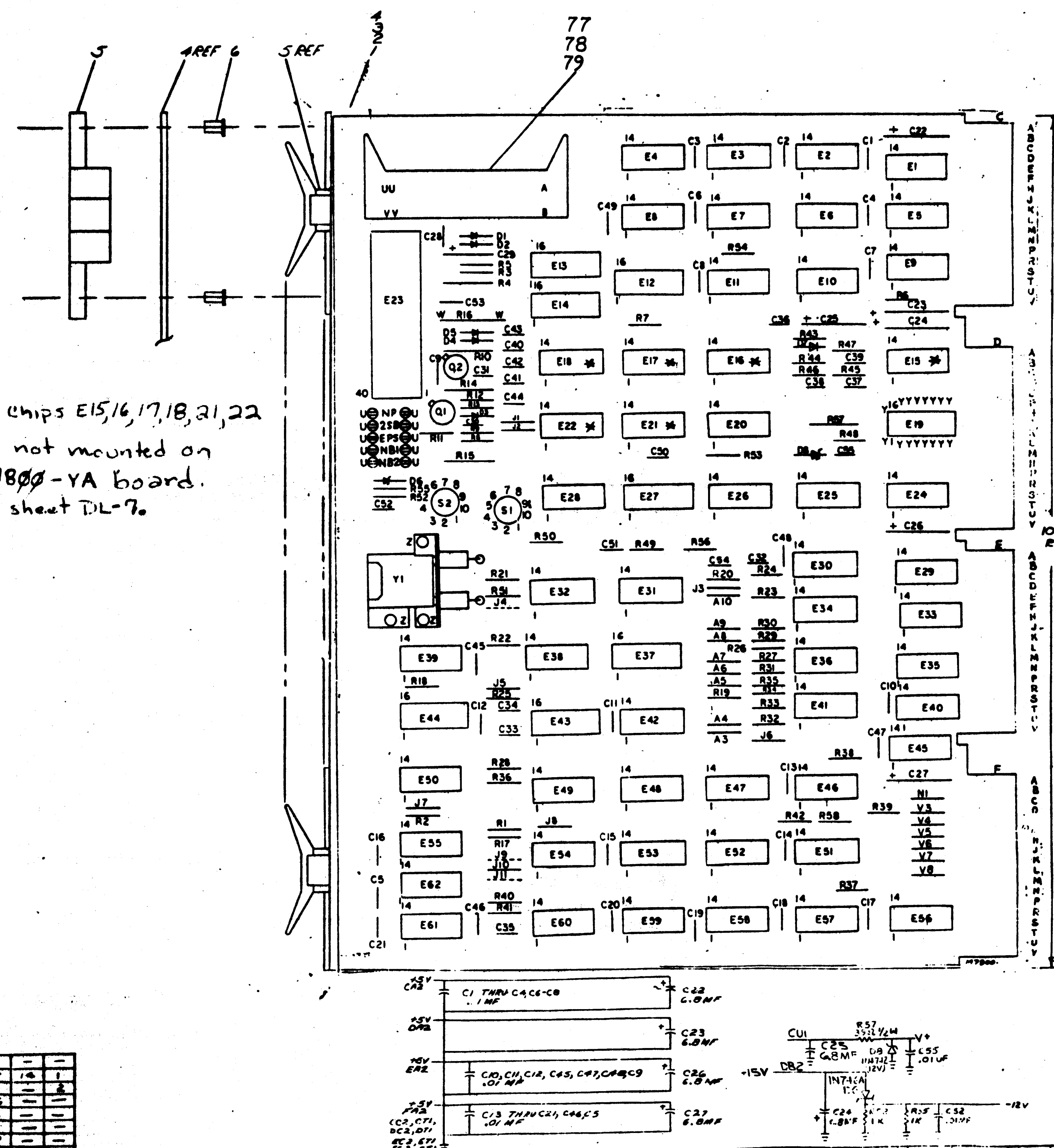
1.) PIN NOTATION THROUGHOUT IS ORDERED UPON MODULE PLACEMENT IN THE SYSTEM UNIT. MODULE REFERENCE ALONE IS OBTAINED BY CONVERTING THE FIRST LETTER ACCORDING TO THE PIN NOMENCLATURE CHART AT THE LEFT.

2.) JUMPERS TO BE USED AT CONNECTIONS A3-A10, J1-J10, V3-V8, AND N1.

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

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

5. FOR YC VERSION, C36 VALUE IS 1200PF.



* Note: chips E15, 16, 17, 18, 21, 22 are not mounted on M7800-YA board. See sheet DL-7.

PIN NOMENCLATURE

MODULE	SYSTEM UNIT
A	C
B	D
C	E
D	F

YC	QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
1	1	E28	IC DEC 7380	1910328	80
1	1		LATCH RIGHT	1209941-04	79
1	1		LATCH LEFT	1209941-03	78
1	1		CONNECTOR BERG	1209941-02	77
1	1		INSULATED JUMPER	9009185	76
1	0	C36	CAP 1200 PF, 100V, 5%	1002424	75
A/R	A/R		WIRE #22 SOLID BUS	9107860-01	74
1	1	R57	RES 39, 1/2W, 5%	1302336	73
1	1	D8	DIODE 4742, 12V, 10%, 1W, ZENER	1109502	72
3	3		INT. WASHER #2	9006631	71
1	1	E27	IC DEC 14161	1910650	70
3	3		NUT, HEX #2	9006555	69
3	3		SCR PHL PAN HD #2-56 X 1/4 LG	9006001-1	68
2	2		ALCAT 5000 PG-1	1202812	67
6	6	D1-D5, D7	DIODE D664 20V 100MA	1100114	66
1	1	D6	DIODE 1N748A	1104860	65
2	2	Q1, Q2	TRANSISTOR G6340	1503401-00	64
1	1	C53	CAP 100PF 100V 5% MICA	1000016	63
1	1	C54	CAP 560PF 100V 5% MICA	1000025	62
2	2	C50, C51	CAP .047MF CERAMIC	1009678	61
[illegible]	1	C30	CAP 220PF 100V 5% DIPPED MICA	1000021	60
2	2	C34, C35	CAP 330PF 100V 5% DIPPED MICA	1000023	59
[illegible]	7	[illegible], C37, C48	CAP 470PF 100V 5% DIPPED MICA	1000029	58
1	1	C31	CAP 120PF 100V 5% DIPPED MICA	1000072	57
30	30	C1-21, 28, 30, 45-49, 52, 55	CAP .01UF 100V 20% CERAMIC DISC	[illegible]-01	56
1	1	C29	CAP .47UF 35V 10% TANT	1005965	55
[illegible]	[illegible]	C22-C27	CAP 6.8UF 35V 10% TANT	[illegible]	[illegible]
1	1	C33	CAP 150PF 100V 5% DIPPED MICA	[illegible]	[illegible]
2	2	R14, R15	RES 1.5K 1/2W 5%	130039[illegible]	[illegible]
6	6	R23, R26, R40, R48, R52, R55	RES 1K 1/4W 5%	[illegible]	[illegible]
1	1	R24	RES 27Ω 1/4W 5%	[illegible]	[illegible]
1	1	R10	RES 68Ω 1/2W 5%	[illegible]	[illegible]
1	1	R5	RES 82Ω 1/4W 5%	[illegible]	[illegible]
4	4	R44, R45, R46, R47	RES 100Ω 1/4W 5%	[illegible]	[illegible]
1	1	R11	RES 130Ω 1/4W 5%	[illegible]	[illegible]
2	2	R42, R58	RES 180Ω 1/4W 5%	[illegible]	[illegible]
2	2	R12, R53	RES 220Ω 1/4W 5%	[illegible]	[illegible]
1	1	R38	RES 390Ω 1/4W 5%	1300307	[illegible]
4	4	R9, R13, R43, R51	RES 470Ω 1/4W 5%	1300306	[illegible]
1	1	R4	RES 560Ω 1/2W 5%	130035[illegible]	[illegible]
1	1	R3	RES 750Ω 1/4W	[illegible]	[illegible]
1	1	R16	RES 750Ω 1W 5%	1302385	37
27	27	R1, R2, R6, R7, R17-R22, R25, R27-R33, R39, R49, R50, R54, R56	RES 10K 1/4W 5%	1300479	36
2	2	R8, R36	RES 1.5K 1/4W 5%	1300391	35
1	1	E23	IC DEC UART	1910759	34
4	4	E32, E55, E61, E62	IC DEC 7474	1905547	33
3	3	E15, E36, E41	IC DEC 8242	1909712	32
3	3	E38, E49, E59	IC DEC 7408	1910133	31
2	2	E19, [illegible]	IC MC 1489	1910323	30
2	2	[illegible]	IC DEC 7490	1909037	29
11	11	E1, E2, [illegible], E9, E11, E30, E47, E54, E56	IC DEC 8881	1909765	28
1	1	E22	IC MC 1488	1910322	27
1	1	E43	IC DEC 74123	[illegible]	26
3	3	E18, E37, E52	IC DEC 74H74	[illegible]	25
3	3	E42, E57, E59	IC DEC 7400	1905575	24
1	1	E10	IC DEC 7413	1909989	23
2	2	E50, E53	IC DEC 7402	1909002	22
7	7	E3, E4, E33, E35, E40, E45, E46	IC DEC 8640	1911469	21
1	1	E12	IC DEC 74153	1909237	20
1	1	E60	IC DEC 74H04	1909731	19
1	1	E25	IC DEC 7492	1909033	18
5	5	E6, E16, E17, E38, E39	IC DEC 7404	1909686	17
1	1	E24	IC DEC 7493	1909036	16
1	1	E34	IC DEC 7410	1905576	15
1	1	E29	IC DEC 314	1907704	14
1	1	E31	IC DEC 7442	1910796	13
1	1	E44	IC DEC 8271	1904615	12
2	2	E13, E14	IC DEC 74175	1910651	13
1	1		REAR NET CRYSTAL HOLDER	5302825	12
1	1		FRONT NET CRYSTAL HOLDER	5303154	11
1	1	E19	IC SOCKET	1209838	10
2	2	S1, S2	SWITCH, SINGLE POLE, 10 POS	1210012-1	9
[illegible]	[illegible]		[illegible]	[illegible]	8
10	10		SPLIT LUGS	9006735	7
8	8		EYELET #5-4-7 E.B. STIMPSON	9006732	6
4	4		HANDLE, FLIP-CHIP, MAGENTA	9008337-06	5
1	1		ETCHED CIRCUIT BOARD	5009978	4
REF	REF		MODULE ECO HISTORY	E-MH-M7800-0-3	3
REF	REF		ASSY/DRILLING HOLE LAYOUT	D-AH-M7800-0-3	2
T.T	T.T		X-Y COORDINATE HOLE	K-CO-M7800-0-0	1

PARTS LIST

ETCH BOARD REV H

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

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

IC PIN LOCATIONS

SEMICONDUCTOR CONVERSION CHART

DEC NO.	EIA NO.
G6340	MPS6534
1N748A	1N4733A
D664	1N4606

digital EQUIPMENT CORPORATION

TITLE: ASYNCHRONOUS LINE INTERFACE

E CS M7800 0 1

9

BUS RECEIVERS (Transmit Data)

DL-2 BDB7 H
DL-2 BDB6 H
DL-2 BDB5 H
DL-2 BDB4 H
DL-2 BDB3 H
DL-2 BDB2 H
DL-2 BDB1 H
DL-2 BDB0 H

BUS DRIVERS (Receive Data)

DL-4 RDB7 H
DL-4 RDB6 H
DL-4 RDB5 H
DL-4 RDB4 H
DL-4 RDB3 H
DL-4 RDB2 H
DL-4 RDB1 H
DL-4 RDB0 H
DL-5 RBUF TO BUS H

BUS DRIVERS (Transmit Status)

DL-4 XMIT READY H
DL-4 XMIT INT ENB (1)H
DL-4 MAINT (1)H
DL-4 BREAK (1)H
DL-5 XCSR TO BUS H

BUS DRIVERS (Receive Status)

DL-4 RCVR DONE H
DL-4 RCVR INT ENB (1)H
DL-4 DATASET INT ENB (1)H
DL-4 SEC XMIT (1)H LKI
DL-4 REQ TO SEND (1)H CMI
DL-4 DATA TERMINAL READY (1)H LTI

DL 2 BINIT H
BUS INIT L
CM2 BUS D07 L
CV2 BUS D06 L
CP2 BUS D05 L
CN2 BUS D04 L
CT2 BUS D03 L
CU2 BUS D02 L
CR2 BUS D01 L
CS2 BUS D00 L

BUS DRIVERS (Receive Status)

+5V
R1 10K
R2 10K
DL-5 RCSR TO BUS L

ERROR H

DL-7 DATASET INT (1)H
DL-7 RING H
DL-7 CLEAR TO SEND H
DL-7 CARRIER H
DL-5 RCSR TO BUS H
DL-4 RCVR BUSY (1)H
DL-7 SEC REC DATA H

CD2 BUS D15 L
CE2 BUS D14 L
CF2 BUS D13 L
CH2 BUS D12 L
CH1 BUS D11 L
BUS D10 L

DL-5 RBUF TO BUS L

DL-4 OR ERR H — Overrun Error
DL-4 FR ERR H — Framing Error
DL-4 P ERR H — Parity Error

BUS DRIVERS (Receive Status) (in most significant bits of Receive Data)

BUS DRIVERS (Receive Status)

REVISIONS		
CHK.	ECO NO.	REV.

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

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

MATERIAL —

FINISH —

NEXT HIGHER ASSY —

SCALE —

SHEET 2 OF 7

DRN. DATE
CHK'D DATE
ENG DATE
MFG ENG DATE
PROG DATE

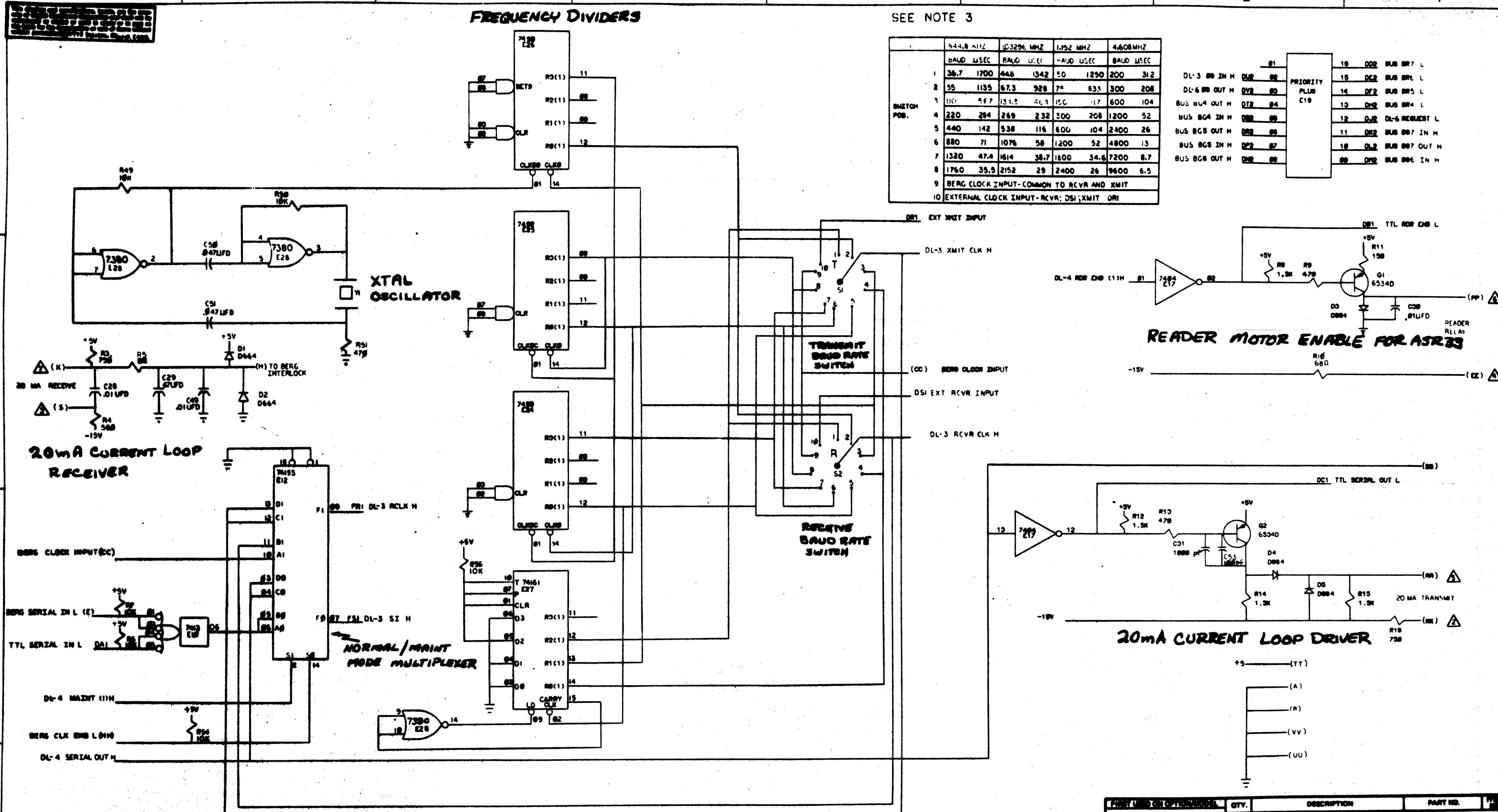
digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

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

SIZE D | CODE | NUMBER M7627 0-1 | REV P

DIST

10



SEE NOTE 3

		544.8 KHZ		.663296 MHZ		1.152 MHZ		4.608MHZ	
		BAUD	μSEC	BAUD	USEC	BAUD	USEC	BAUD	μSEC
SWITCH POS.	1	36.7	1700	448	1342	50	1250	200	312
	2	55	1135	67.3	928	75	833	300	208
	3	110	567	134.5	464	150	417	600	104
	4	220	284	269	232	300	208	1200	52
	5	440	142	538	116	600	104	2400	26
	6	880	71	1076	58	1200	52	4800	13
	7	1320	47.4	1614	38.7	1800	34.6	7200	8.7
	8	1760	35.5	2152	29	2400	26	9600	6.5
	9	BERG CLOCK INPUT-COMMON TO RCVR AND XMIT							
	10	EXTERNAL CLOCK INPUT-RCVR: DSI; XMIT DRI							

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

FIRST USED ON OPTION/MODEL: DL11

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 ✓
MATERIAL —
FINISH —

DRN. B Poi... DATE 5-20-72
CHKD. DATE 4-5-72
DATE
DATE 4-27-72
PROD. DATE 4-27-72
NEXT HIGHER ASSY.
SCALE
SHEET 3 OF 7

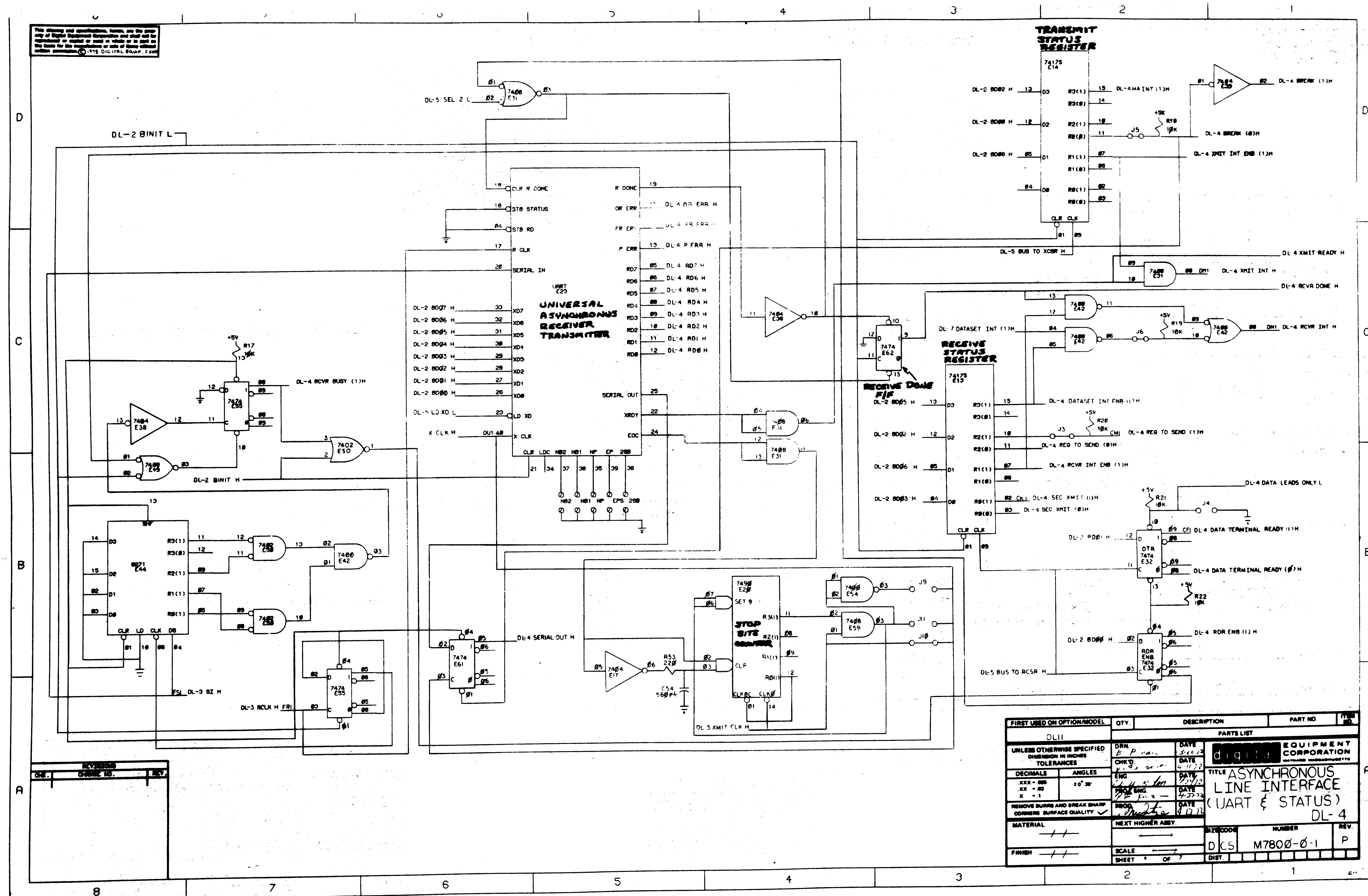
[redacted] EQUIPMENT CORPORATION

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

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

DIST.

11


TRANSMIT STATUS REGISTER
RECEIVE STATUS REGISTER
UNIVERSAL ASYNCHRONOUS RECEIVER TRANSMITTER
STOP BITS COUNTER
RECEIVE DONE F/F
DL-2 BINIT L
DL-4 SERIAL OUT H
DL-4 XMIT READY H
DL-4 RCVR DONE H
DL-4 DATA LEADS ONLY L
FIRST USED ON OPTION/MODEL
DL11
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS
ANGLES
PARTS LIST
QTY.
DESCRIPTION
PART NO.
ITEM NO.
MATERIAL
FINISH
NEXT HIGHER ASSY
DIGITAL EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
TITLE ASYNCHRONOUS LINE INTERFACE (UART & STATUS) DL-4
SIZE
CODE
NUMBER
REV.
D
CS
M7800-0-1
P
REVISIONS
CHG.
CHANGE NO.
REV.

ADDRESS DECODER

FUNCTION DECODER

NOTE 1 THE 'A' LINES ARE TO BE JUMPERED FOR A 0.

DL11

EQUIPMENT CORPORATION

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

D CS M7800-0-1 P

+5V R37 10K

DL-4 RCVR INT H FU1

DL-4 XMIT INT H FV1

Gives priority to receiver if Zp both receiver and transmitter flag set at same time

BUS NPR L FJ1

+5V R39 10K

+5V 1140 1K R41 47

SUS SSYN L FC1

SUS SSYN L FD1

NOTE: THE 'V' LINES ARE TO BE JUMPERED FOR A 1.

FP1 DL-6 REQUEST L
(To sheet DL3 to produce Bus Request)

+5V R42 180

FR1 DL-6 BR OUT H

FT2 BUS BACK L

FF2 BUS D02 L

FF1 BUS D05 L

FH2 BUS D04 L

FH1 BUS D07 L

FK1 BUS D08 L

FR1 BUS INTR L

REVISIONS		
ENG.	CHANGE NO.	REV.

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

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

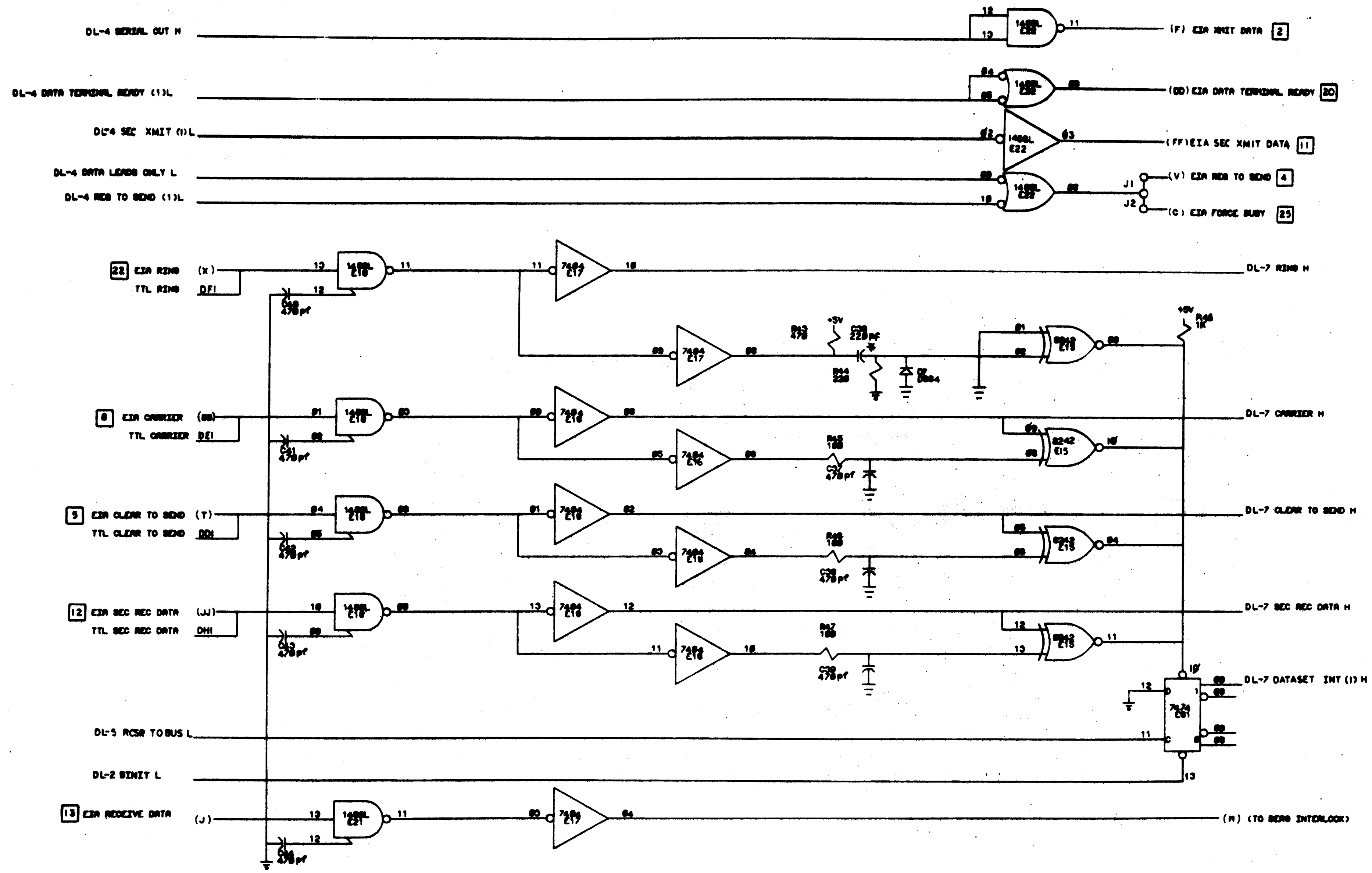
DRN DATE
CHK'D DATE
ENG DATE
PROJ. ENG. DATE
PROD. DATE
NEXT HIGHER ASSY

[redacted] EQUIPMENT CORPORATION

TITLE ASYNCHRONOUS LINE INTERFACE (INTERRUPT CONTROL) DL 6

SIZE D | CODE 05 | NUMBER M7800-0-1 | REV P

SCALE — SHEET OF DIST



NOTES:

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

*FOR YC VERSION, C34 VALUE CHANGES TO 1200PF

* NOTE: This page and these chips do not exist on the M7800-YA board.

FIRST USED ON OPTION/MODEL	DL11
TITLE	ASYNCHRONOUS LINE INTERFACE (EIA DRIVERS & RECEIVERS) DL-7
SIZE	D
NUMBER	M7800-0-1
REV	P

EQUIPMENT CORPORATION

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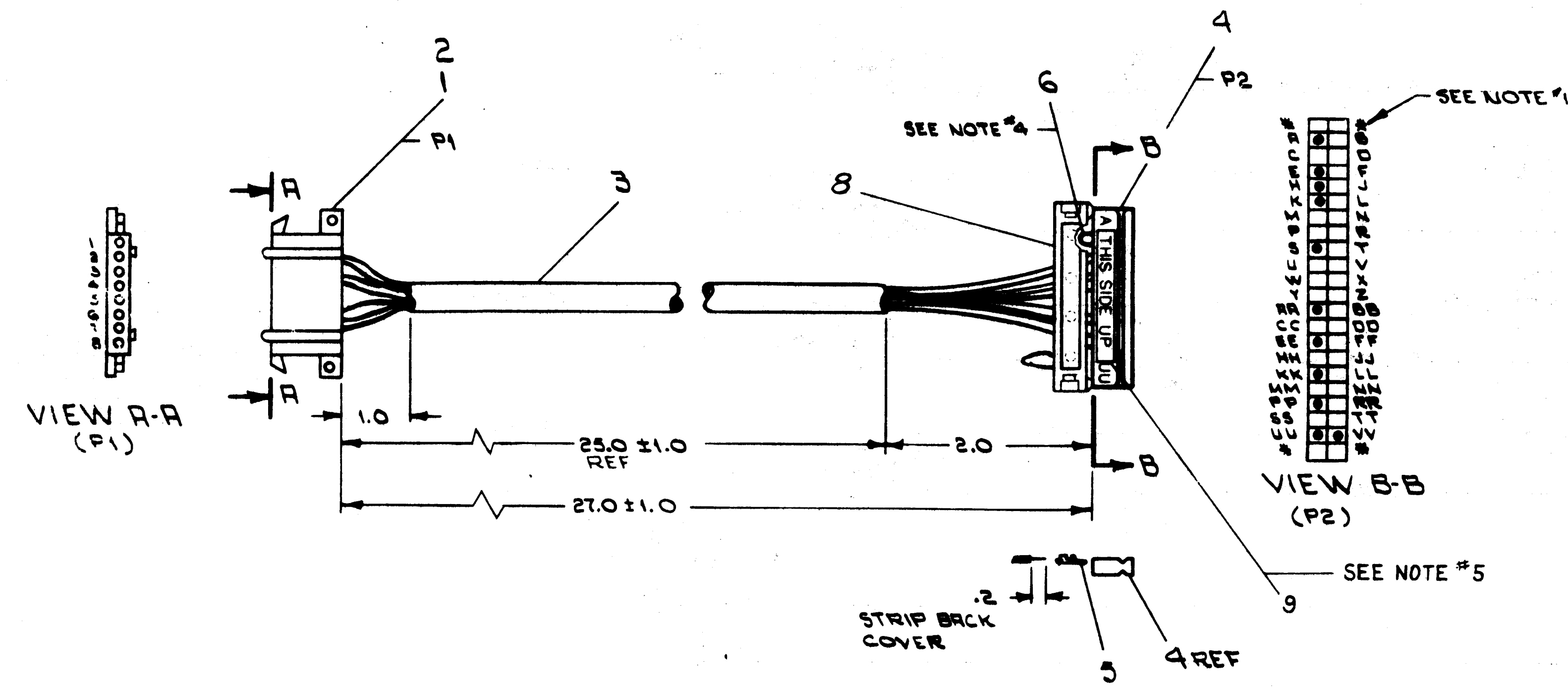
WIRE TABLE

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

NOTES:

1. * [illegible] INDICATE CAVITIES NOT [illegible] BY LETTERS.
2. DRAIN WIRES TO BE CUT BACK TO OUTER INSULATION ON P1 END OF CABLE ONLY. [illegible] TO BE CUT BACK TO OUTER INSULATION ON BOTH ENDS OF CABLES.
3. DRAIN WIRES ON [illegible] END OF CABLE TO BE EACH ENCLOSED WITH ITEM #7 (TUBING) FROM END OF CABLE JACKET TO [illegible] ENTER P2 [illegible].
4. ITEM [illegible] BE APPROXIMATELY [illegible].
5. PLACE ITEM #9 (THIS SIDE UP STICKER) ON LETTERED SIDE OF ITEM #4 (BERG HOUSING) AS SHOWN.



QTY	DESCRIPTION	PART NO.	ITEM NO.
1	LABEL [illegible]		9
	[illegible]		8
A/R	TUBING [illegible]		7
A/R	WIRE [illegible]	[illegible]	6
11	SOCKET [illegible]	[illegible]	5
1	HOUSING [illegible]		4
A/R	CABLE, [illegible]		3
6	CONTACT MATE N LOK, FEMALE	[illegible]	2
1	CONN. MATE N LOK (FEMALE)	[illegible]	1

FIRST USED ON OPTION/MODEL: PDP-8E

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES ANGLES FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS

MATERIAL: SEE PART LIST

FINISH

REVISIONS: KL8E-00002 A; MC NAHARA; KL8E-00006 B; F. CLARK; 7008360-00001 C; B REGAN; 7008360-00002 D; REGAN

D IA 7008360-0-0 LE

DEC FORM NO DRD 100

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

DATE 6-21-72

TITLE DL11 INSTALLATION PROCEDURE

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
C	CHANGE PER ECO	DL11-4	JANSON	3/73	P. Janson	4-6-73
D	CHANGE PER ECO	DL11-5	CONDON	7/73	L. Condon	8-[illegible]-73
E	CHANGE PER ECO	DL11-7	CONDON	8/74	L. Condon	8/21/74
F	CHANGE PER ECO	DL11-8	CONDON	4-75	L. Condon	4/8/75

ENG	APPD	SIZE	CODE	NUMBER	REV
Paul F. Janson	Paul F. Janson	A	[illegible]	[illegible]	F

DEC FORM NO. DRA 107A

SHEET 1 OF 9

ENGINEERING SPECIFICATION [redacted] **CONTINUATION SHEET**

TITLE DL11 INSTALLATION PROCEDURE

DL11 INSTALLATION PROCEDURE:

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

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

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

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

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

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

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

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

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

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

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

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

SHEET 2 OF 9

J7. (con't)

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

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

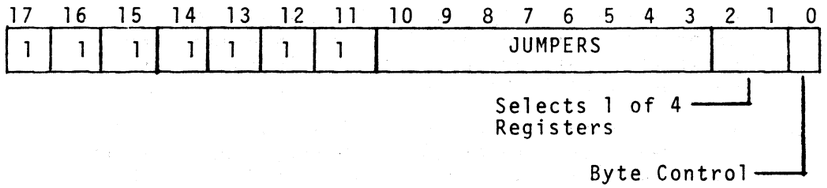
Summary of mode control jumpers:

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

*= don't care

B. REGISTER ADDRESS ASSIGNMENTS:

The DL11 can respond to addresses with the following format:



Bits 10 through 3 are controlled by jumpers A1Ø to A3. A jumper inserted indicates a zero.

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

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

C. VECTOR ADDRESS ASSIGNMENT:

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

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

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

D. PRIORITY ASSIGNMENT:

Interrupt priority is established by inserting a "priority plug" in the socket at 'C location 113. For DL11-A B,C,D and E use level 4, for the [illegible] and [illegible] or level 5-7 as specified by the [illegible] The [illegible] of an option which uses the [illegible].

SUMMARY OF REGISTER, VECTOR AND PRIORITY ASSIGNMENTS:

	ADDRESS	VECTOR	PRIORITY
DL11-A,B	777560		
CONSOLE	777562	[illegible]	
	777564		
	777566		
DL11-A,B	776XXØ		
ADDITIONAL	776XX2	FLOATING	4
UNITS	776XX4		
	776XX6		

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

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

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

E. SPECIAL NPR JUMPER:

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

F. SELECTION OF DATA FORMAT:

1. Data Bits

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

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

2. Parity

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

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

3. Stop Bits

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

2SB	J9	J10	J11	# OF STOP BITS
OUT	OUT	IN	OUT	2
IN	OUT	IN	OUT	1
IN	OUT	OUT	IN	1.5 for TI, GI, and SCM UARTS
IN	IN	OUT	OUT	1.5 for WD UARTS

G. CRYSTAL SELECTION:

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

G. Con't

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

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

*Most counter-clock wise position.

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

1050 X 960 = 10080000 = 1.008MHz.

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

DEC part number for the standard crystals are as follows:

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

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

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

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

H. G8000 INSTALLATION:

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

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

Refer to diagram 1.

I. FILTER CAPACITOR SELECTION:

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

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

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

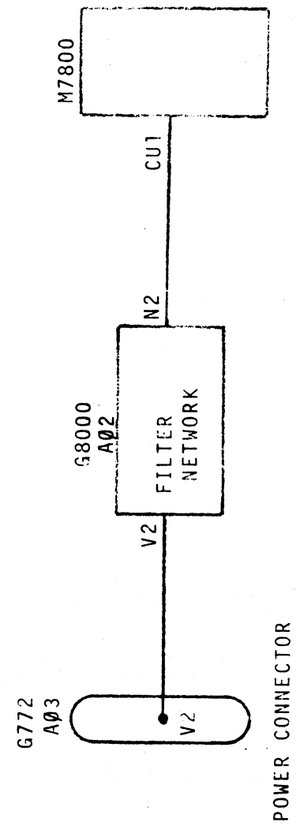
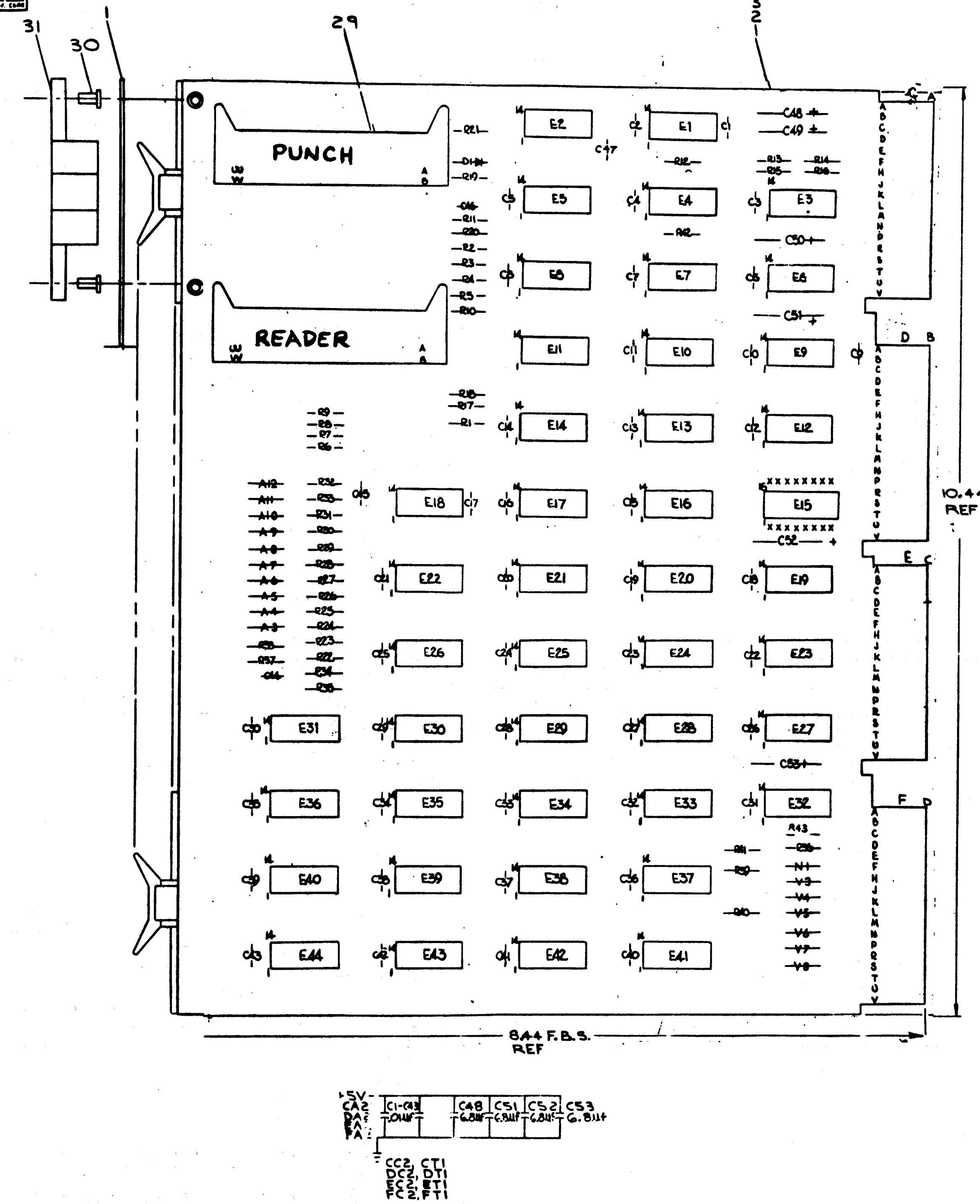


DIAGRAM 1. G8000 INSTALLATION

NOTES:
1.) PIN NOTATION THROUGHOUT IS ORDERED UPON MODULE PLACEMENT IN THE SYSTEM UNIT. MODULE REFERENCE ALONE IS OBTAINED BY CONVERTING THE FIRST LETTER ACCORDING TO THE PIN NOMENCLATURE CHART AT THE LEFT.
2.) JUMPERS TO BE USED AT CONNECTIONS A5-A12, N1, AND V3-V8.
3.) DEC 8640'S WERE PHASED IN AS 380 REPLACEMENTS. ANY 380 FAILURES SHOULD BE REPLACED BY 8640.



PIN NOMENCLATURE

MODULE	SYSTEM UNIT
A	C
B	D
C	E
D	F

QTY	REF DESIGNATION	DESCRIPTION	PART NO	ITEM NO
17	W1 — W17	JUMPER WIRE	9107560-01	34
25	R1, R11, R12, R14, R16, R18-R20, R22-R34, R37, R39, R41, R42	RES 1K 1/4W 5%	1300365	33
1		I.C. SOCKET	[illegible]	32
4		HANDLE FLIP CHIP [illegible]	[illegible]	31
8		EYELET [illegible]	[illegible]	30
2		BERG 40 PIN CONNECTOR	1209941	29
2	E30, E42	I.C. DEC [illegible]	[illegible]	28
2	[illegible]	I.C. DEC [illegible]	[illegible]	27
2	[illegible]	I.C. DEC [illegible]	[illegible]	26
1	[illegible]	I.C. DEC [illegible]	[illegible]	25
[illegible]	[illegible]	I.C. DEC [illegible]	[illegible]	24
2	[illegible]	I.C. DEC [illegible]	[illegible]	23
[illegible]	[illegible]	I.C. DEC [illegible]	[illegible]	22
2	E7, E36	I.C. DEC 7474	[illegible]	21
9	[illegible]	I.C. DEC [illegible]	[illegible]	20
10	[illegible]	I.C. DEC 8640	1911469	19
1	[illegible]	I.C. DEC 74H04	[illegible]	18
1	[illegible]	RES [illegible]	1300202	17
1	[illegible]	RES [illegible]	[illegible]	16
1	[illegible]	RES [illegible]	[illegible]	15
1	R17	RES [illegible]	[illegible]	14
3	[illegible]	RES [illegible]	[illegible]	13
9	[illegible]	RES 470 [illegible]	[illegible]	12
2	R40, R43	RES 180 1/4W 5%	[illegible]	11
1	D1	[illegible]	[illegible]	10
6	C48-C53	CAPACITOR [illegible]	[illegible]	9
2	[illegible]	CAPACITOR [illegible] PF [illegible]	[illegible]	8
1	[illegible]	CAPACITOR 470 PF [illegible]	[illegible]	7
1	C46	CAPACITOR [illegible] PF [illegible]	[illegible]	6
43	C1-C43	CAPACITOR .01 MFD [illegible]	[illegible]	5
REF		MODULE E.C.O. HISTORY	[illegible]	4
REF		ASSY [illegible] LAYOUT	[illegible]	3
REF		[illegible] HOLE LOCATION	[illegible]	2
1		ETCHED [illegible] BOARD	[illegible]	1

PARTS LIST

ETCH BOARD REV E

DEC EG40	7	14
IC TYPE	GND	+5V

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

IC PIN LOCATIONS

ITEM NO.	AWG	FROM PT	TO PT

JUMPER LIST

DIGITAL EQUIPMENT CORPORATION

TITLE: PC11 INTERFACE

PC-1

M7810-0-1

E

BUS DB9 L CS2
BUS DB1 L CR2
BUS DB2 L CU2
BUS DB0 L CT2
BUS DB4 L CN2
PC-3 BINIT L
BUS DB5 L CP2
BUS DB6 L CV2
BUS DB7 L CM2

-64 SELECTGN
LOAD PUNCH BUFR

PC-4 OUT LOW H DC1
PC-4 SELECT 4 H DI1
PUNCH STATUS

R20 1K +5V
R21 4.7K +5V
R19 1K +5V
R14 1K +5V
R13 180
R12 1K +5V
C49 .5 μfd
C47 680pf
D1 D664

PUNCH CONN

9B	AC11 (1)	
FF	IOP 1 (1)	
F	AC10 (1)	
LL	IOP2 (1)	
V	AC9 (1)	
RR	PUN ACTIVE L	
T	AC8 (1)	
TT	PUN QUALIFY H	TO PUNCH
L	AC7 (1)	
NN	PUN INITIALIZE	
D	AC6 (1)	
JJ	PUN OUTAPE L	
J	AC5 (1)	
DD	I/O BUS SKIP L	
X	AC4 (1)	
Z	I/O BUS INT L	
N	IOP 4 (1)	
R	PC-2 BDB8 H	
	BDB1 H	
	BDB2 H	
	BDB0 H	
	BDB4 H	
	BDB5 H	
	PC-2 BDB6 H	

NOTES:
1. THE FOLLOWING PINS ARE GROUNDED ON BOTH THE PUNCH AND THE READER CONN:
B,A,C,E,H,K,M,P,S,U,W,Y,AA,CC,EE, HH,KK,MM,PP,SS,UU,VV
2. THE FOLLOWING PINS ARE NOT USED ON THE PUNCH CONN: X,N,BB

IOT24 = LD PNCH BUFR
SET PNCH ACTIVE
START PNCH CYCLE

PUN INT ENB F17

CJ1 PC-2 INT B H
CD2 BUS DI5 L = PUN OUT OF TAPE
PC-2 HIGH
CL1 PC-2 INT ENB B H

To PC

PC-2 BS IN H	DU2 2		18 DD2	BUS BR7 L
PC-4 BS OUT H	DV2 3		15 DE2	BUS BR6 L
BUS BR4 OUT H	DT2 4	PRIORITY PLUG E15 BR4	14 DF2	BUS BR5 L
BUS BR4 IN H	DS2 5		13 DN2	BUS BR4 L
BUS BR5 OUT H	DR2 6		12 D-J2	PC-4 REQUEST L
BUS BR5 IN H	DP2 7		11 DE2	BUS BR7 IN H
BUS BR6 OUT H	DN2 8		10 DL2	BUS BR7 OUT H
			9 DM2	BUS BR6 IN H

PUNCH INTERRUPT LOGIC

REVISIONS		
CHK	CHANGE NO.	REV

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

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS: XXX ±.005, XX ±.01, X ±.1 — ANGLES: ±0 30
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL
FINISH

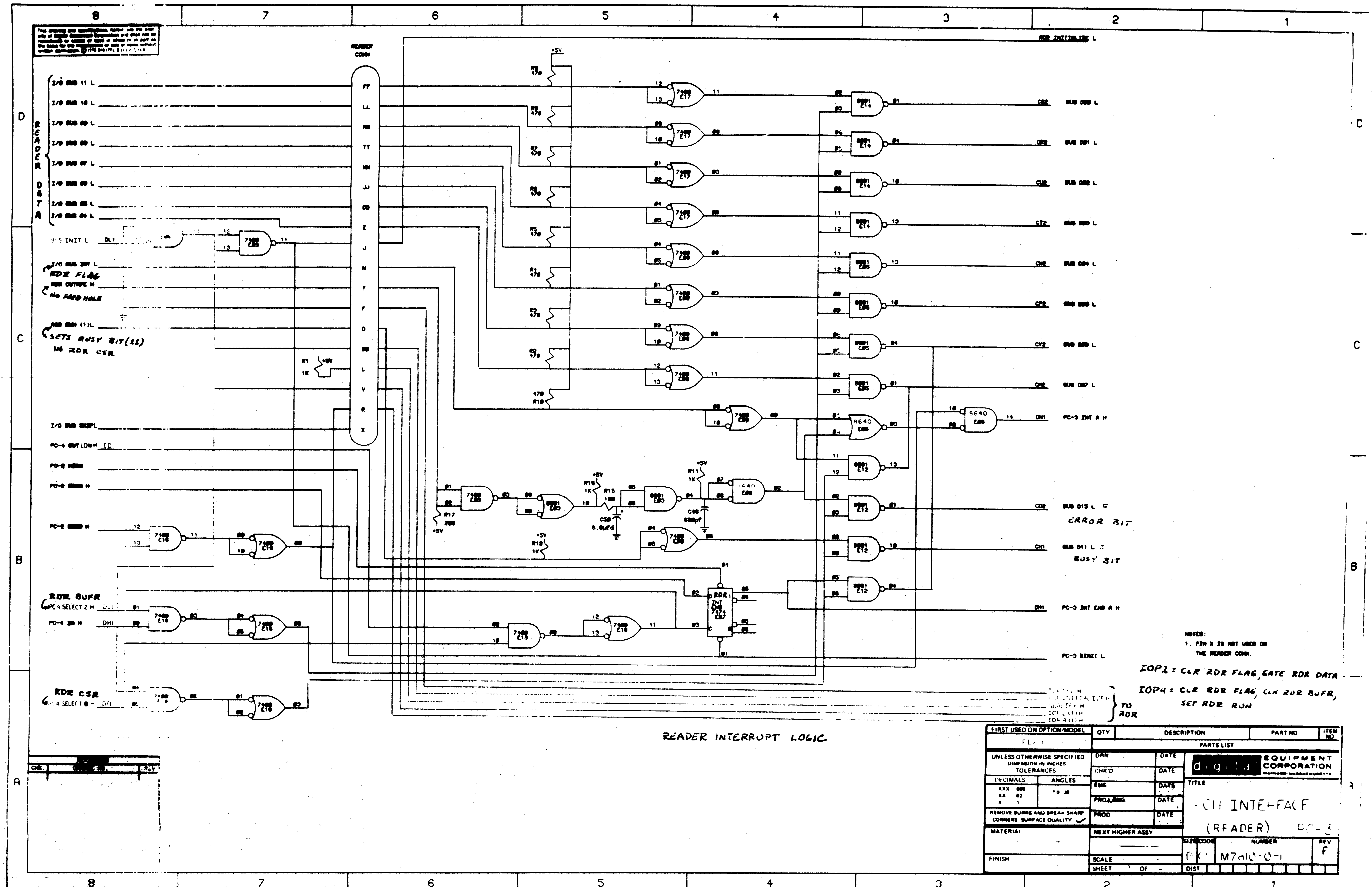
DRN		DATE
CHKD		DATE
ENG		DATE
PROJ ENG		DATE
PROD		DATE
NEXT HIGHER ASSY		
SCALE		
SHEET	OF	

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: PCII INTERFACE (PUNCH)

SIZE	CODE	NUMBER	REV
		1	

DIST


READER DATA
RDR FLAG
NO FEED HOLE
SETS BUSY BIT(11) IN RDR CSR
RDR BUFR
RDR CSR
ERROR BIT
BUSY BIT
NOTES:
1. PIN X IS NOT USED ON THE READER CONN.
IOP2 = CLR RDR FLAG, GATE RDR DATA
IOP4 = CLR RDR FLAG, CLR RDR BUFR, SET RDR RUN
TO RDR
READER INTERRUPT LOGIC
EQUIPMENT CORPORATION
PC11 INTERFACE (READER)
M7810-0-1
F

PC-4 SELECT 8 H — 777550 RDR CSR
PC-4 SELECT 2 H — 777552 RDR BUFR
PC-4 SELECT 4 H — 777554 PUN CSR
PC-4 SELECT 6 H — 777556 PUN BUFR
PC-4 OUT LOW H — DATO
PC-4 OUT HIGH H — DATO
PC-4 IN H — DATI

V2 gives rdr priority if both rdr & punch are done simultaneously

V6,7,8 CUT FOR VECTOR 70 (READER)

* A4 & A7 in, all others cut, for 777550

NOTES:
1. UNLESS OTHERWISE INDICATED: RESISTORS ARE 1K, 1/4W, 5% CAPACITOR VALUES ARE IN PICOFARADS.
2. THE ADDRESS LINES ARE TO BE JUMPERED FOR A 8 AND THE VECTOR LINES ARE JUMPERED FOR A 1. FINAL JUMPER CONFIGURATION TO BE DETERMINED AT SYSTEM CHECKOUT

REVISIONS		
CHR	CHANGE NO.	REV.

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

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS: XXX ± .005, XX ± .02, X ± .1 — ANGLES: ± 10
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL
FINISH

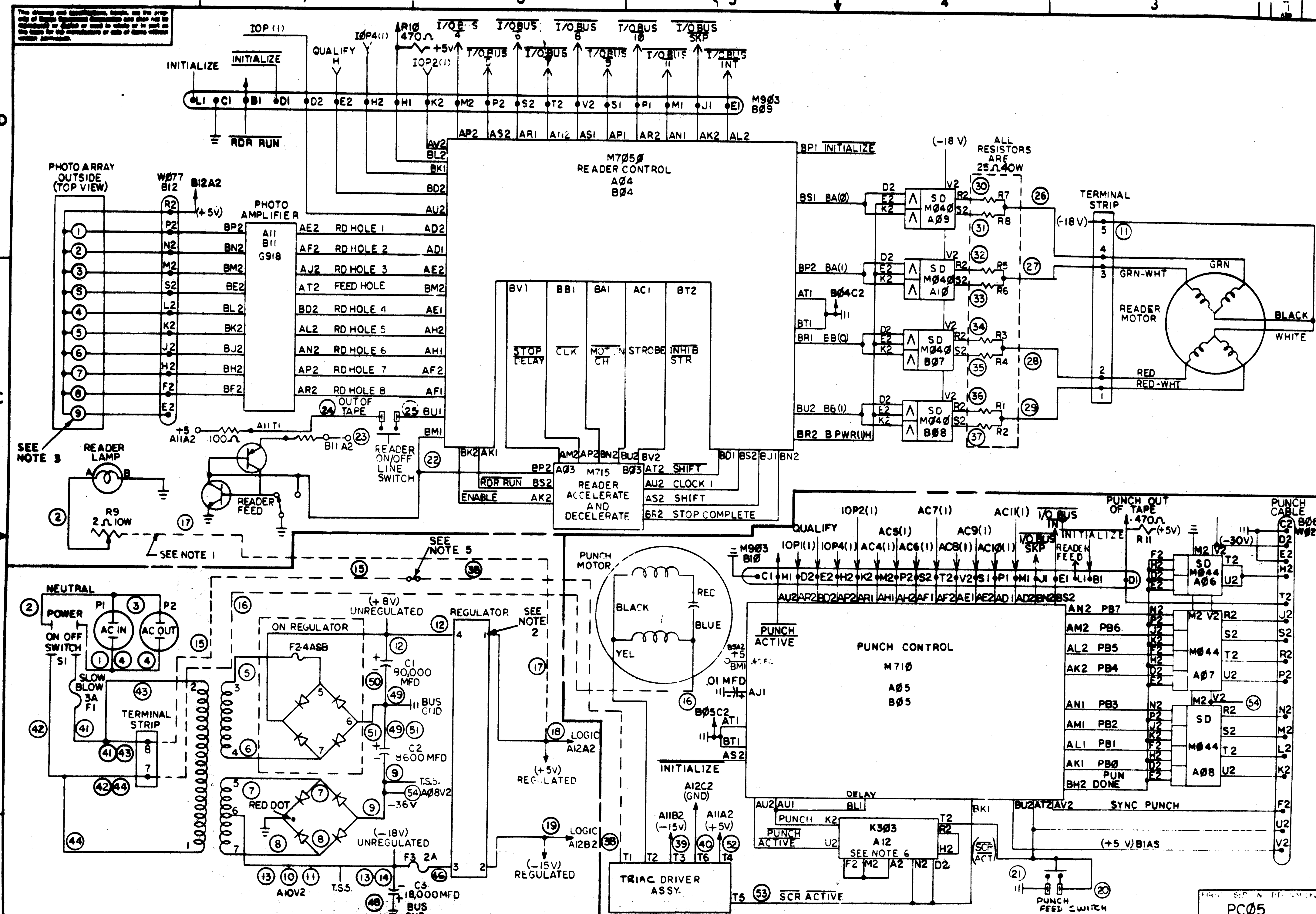
DRN — DATE
CHK'D — DATE
ENG — DATE
PROJ MGR — DATE
PROD — DATE
NEXT HIGHER ASSY
SCALE — SHEET OF

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: PCII INTERFACE (ADDRESS SELECTION & INTERRUPT CONT.)

SIZE	CODE	NUMBER	REV
C	CS	M7810	F

DIST



NOTES:

1. DOTTED LINES [illegible] CONNECTIONS [illegible] AND TRIAC DRIVER. SEE LEGEND.
2. THE [illegible] REFER TO CONNECTIONS ON REGULATOR BOARD.
3. THIS PHOTO-TRANSISTOR [illegible] DETECT OUT OF TAPE.
4. CIRCLED NUMBERS 1 THRU 53 ARE WIRE NUMBERS. SEE TABLE.
5. WIRE #15 AND #38 ARE BUSSED TOGETHER ON SWITCH PANEL ON "C, CA, P & PA" MODELS ONLY. ON "R" MODEL THESE WIRES WILL BE CONNECTED AS USUAL TO THEIR APPROPRIATE TABS.
6. WHEN M710 CKT REV H & HIGHER IS USED, DELETE K303 MODULE.

WIRE TABLE

WIRE NO.	COLOR	WIRE NO.	COLOR
1	RED	24	WHITE-YELLOW
2	WHITE	25	BROWN
3	WHITE	26	WHITE-BROWN
4	RED	27	WHITE-ORANGE
5	ORANGE	28	WHITE-YELLOW
6	GRAY-BLUE	29	WHITE-VIOLET
7	GRAY-WHITE	30	BROWN
8	YELLOW	31	BROWN
9	BLUE	32	ORANGE
10	GREEN	33	ORANGE
11	GREEN	34	YELLOW
12	GRAY-VIOLET	35	YELLOW
13	GREEN	36	VIOLET
14	GREEN	37	VIOLET
15	RED	38	RED
16	WHITE	39	WHITE-BLUE
17	GRAY-RED	40	WHITE-GREEN
18	GRAY-RED	41	RED
19	GRAY-YELLOW	42	WHITE
20	WHITE	43	RED
21	BLACK	44	WHITE
22	YELLOW		
23	WHITE-BLACK	46	GREEN
48 THRU 51	BLACK	[illegible]	GRAY-RED
52	GREEN	53	RED
54	BLUE		

LEGEND

CONNECTIONS	MODEL PC05-C PC05-CA	MODEL PC05-P PC05-PA	MODEL PC05-R
PWR SUP TO READER	+5 TO READER LAMP POT -18V T.S.S.		SAME AS PC05-C PC05-CA
PWR SUP TO PUNCH	-30 V TO A10V2 ON LOGIC 115V(HOT) TO TRIAC DRIVER 115V (NEUTRAL) TO PUNCH MOTOR	SAME AS PC05-C PC05-CA	
TRIAC DRVR TO PUNCH	115 V HOT (OUT) TO PUNCH MOTOR	SAME AS PC05-C PC05-CA	
PWR SUP TO TRIAC DRIVER	A11B2 TO -15 V INPUT A12C2 TO GND INPUT A11A2 TO +5V INPUT	SAME AS PC05-C PC05-CA	

QTY.	DESCRIPTION	PART NO	ITEM NO

PARTS LIST

PC05

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES

digital EQUIPMENT CORPORATION

TITLE: POWER AND CONTROL SCHEMATIC

SIZE D CODE BS NUMBER PC05-0-04

SCALE NONE SHEET 1 OF 3

MODEL	MODULE LIST
PCØ5-C, PCØ5-CA	A3-A12, B6-B12
PCØ5-P, PCØ5-PA	A5, A6, A7, A8, A12, B6, B10
PCØ5-R	A3, A4, A9, A10, A11, B7, B8, B9, B12

NOTES:

1. REF. C-AD-5408231-0-C
2. DELETE THIS MODULE WHEN CKT REV H (ETCH F) AND UP OF M710 IS USED.
3. M715 MUST BE OF REVISION K CIRCUIT / E ETCH OR HIGHER.
4. G918 MUST BE OF REVISION B CIRCUIT / D ETCH OR HIGHER.

	1	2	3	4	5	6	7	8	9	10	11	12
A			M715 READER CLOCK	M7Ø5Ø READER CONTROL	M71Ø PUNCH CONTROL	MØ44	MØ44	MØ44	MØ4Ø	MØ4Ø	G918 PHOTO AMPLIFIER	K3Ø3 *
B			(M715, cont.)	(M7Ø5Ø, cont.)	(M71Ø, cont.)	WØ23 TO PUNCH CONN	MØ4Ø	MØ4Ø	M9Ø3	M9Ø3	(G918, cont.)	WØ77 TO PHOTO HEAD

* SEE NOTE 1, 2

M715 (column 3): SEE NOTE 3

G918 (column 11): SEE NOTE 4

FIRST USED ON OPTION/MODEL: PCØ5

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSION IN INCHES
TOLERANCES
DECIMALS ±.005 FRACTIONS ± 1/64 ANGLES ± 0°30'
FINAL SURFACE QUALITY ✓
REMOVE BURRS AND BREAK SHARP CORNERS

MATERIAL —
FINISH —

DRN. B. Morcotte DATE 6/18/69
CHK'D. D. Carnell DATE 6/20/69
ENG. [illegible] DATE 7/1/69
PROJ. ENG. [illegible] DATE 7/1/69
PROD. DATE

NEXT HIGHER ASSY. A-ML-PCØ5-Ø

SCALE — SHEET 1 OF 1

digital EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS

TITLE: MODULE UTILIZATION LIST PCØ5

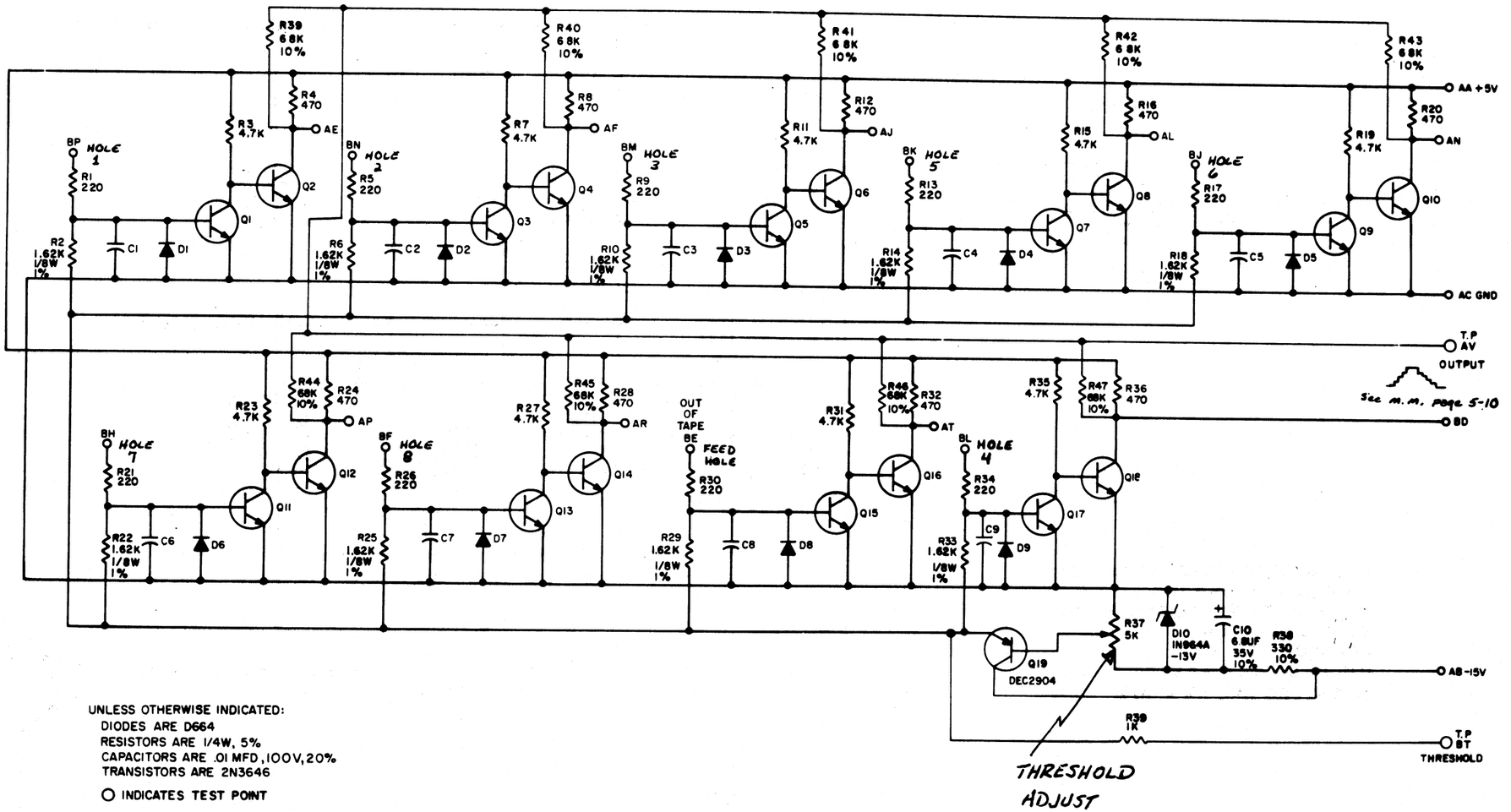
SIZE C CODE MU NUMBER PCØ5-Ø-3 REV. B

DIST.

REVISIONS

CHK	CHANGE NO.	REV.
[illegible]	PC05-00001 / G. BECKNER	A
[illegible]	PC05-00021 / LEIS	B

DEC FORM NO. DRC 100



UNLESS OTHERWISE INDICATED:
DIODES ARE D664
RESISTORS ARE 1/4W, 5%
CAPACITORS ARE .01 MFD, 100V, 20%
TRANSISTORS ARE 2N3646

○ INDICATES TEST POINT

REVISIONS			
CHK	CHG NO	REV.	A
	00001		
	00002		
	00003		B

DRN. REUTER DATE 4/1967
CHK'D DATE 11/1967
ENG. R.A.J. DATE 6/1968
PROD. DATE

DEC FORM NO. DRC 102

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA
2N3646	2N3009	IN964A -13V	SAME
D664	IN3606	DEC2904	2N1132

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

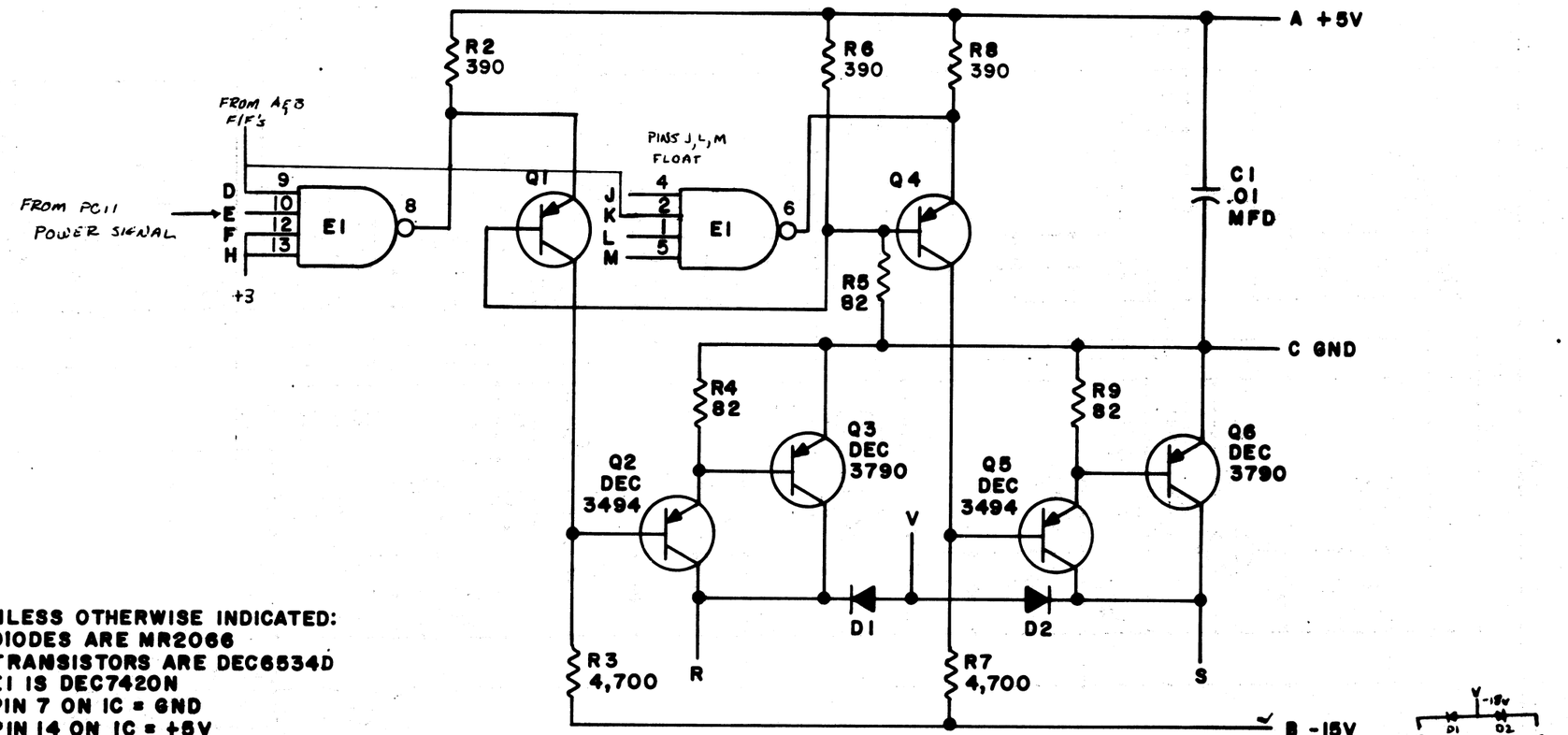
TITLE PHOTO TRANSISTOR AMPLIFIER G918

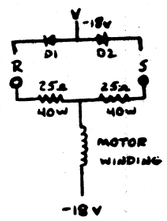
SIZE	CODE	NUMBER	REV
C	CS	G918-0-1	B

PRINTED CIRCUIT REV D

SIZE	CODE	NUMBER	REV
C	CS	G918-0-1	B

SIZE	CODE	NUMBER	REV.
B	CS	M040-0-1	E





UNLESS OTHERWISE INDICATED:
DIODES ARE MR2066
TRANSISTORS ARE DEC6534D
E1 IS DEC7420N
PIN 7 ON IC = GND
PIN 14 ON IC = +5V
RESISTORS ARE 1/4W, 10%

PARTS LIST A-PL-M040-0-0

REVISIONS	CHK	CHG NO.	REV.
		00001	E
		00002	

DRN. M. Keller	DATE 9-14-67	
CHK'D	DATE 9/22/67	
ENG	DATE 9/19/67	
PROD. 4	DATE	

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA
DEC3494	SAME		
DEC3790	2N3790		
DEC6534D	MPS6534		
D662	IN645		
MR2066	IN4003		

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

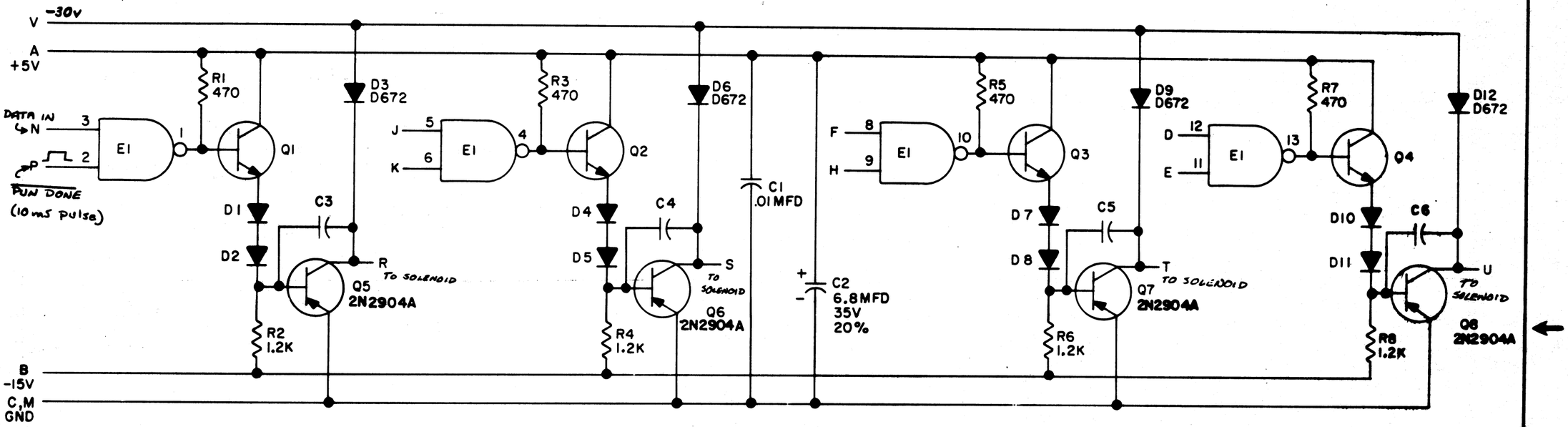
TITLE: SOLENOID DRIVER M040

SIZE	CODE	NUMBER	REV.
B	CS	M040-0-1	E

PRINTED CIRCUIT REV. E

DEC FORM NO. DRB 102

DIST. 230 234,436[3] PINK



UNLESS OTHERWISE INDICATED.
RESISTORS ARE 1/4W, 10%
DIODES ARE D664
E1 IS DEC7401N
TRANSISTORS ARE DEC3009B
PIN 7 ON EACH IC = GND
PIN 14 ON EACH IC = +5V
CAPACITORS ARE 100pf, 100V, 5%

REVISIONS			
REV.	B	C	
CHG NO.	00001	00002	
CHK			

DRN.		DATE
CHK'D	R. Hartt	DATE 6/25/69
ENG.		DATE
PROD.		DATE

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA
D664	IN3606		
2N2904A	2N2904		
DEC3009B	2N3009		

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE 4-100MA SOLENOID DRIVER M044

SIZE	CODE	NUMBER	REV.
B	CS	M044-0-1	C

PRINTED CIRCUIT REV. B

DEC FORM NO. DRB 102

QUALIFY (From PC11)

IOP4 AP2 — LD PUN BUFR, SET PUN ACTIVE

IOP1 AR2 — SKIP ON PUN FLAG

CLR FLAG, CLR PUN ACTIVE — IOP2 AR1

INITIALIZE AS2

BS2 I/O IN INT

BN2 I/O IN SKIP

AS1 IOP 02 (T.P.)

AJ1 CLEAR (T.P.)

BU1 FEED (T.P.)

AU2 PUN ACT (T.P.)

BH2 PUN DONE

BV1 SYNC PUN 0 (T.P.)

AJ1 DEL PUN 1

BL1 DEL PUN 2

BK1 SCR ACTIVE (0)

TO TRIAC DRIVER ASSY

FEED SW AT2

SYNC BIAS BU2 — TO PUNCH

SYNC PUN AV2 — FROM PUNCH RELUCTANCE PICK-UP

AP1 CLOCK B (T.P.)

AJ2 CLOCK A (T.P.)

AC4 AH1 BUS DATA #7 — PB0

AC8 AE1 BUS DATA #3 — PB4

AC5 AH2 BUS DATA #6 — PB1

AC9 AE2 BUS DATA #2 — PB5

AC6 AF1 BUS DATA #5 — PB2

AC10 AD1 BUS DATA #1 — PB6

AC7 AF2 BUS DATA #4 — PB3

AC11 AD2 BUS DATA #0 — PB7

* ALL OUTPUTS TO M044 PUNCH SOLENOID DRIVERS

GND AC2, AT1, BC2, BT1

+5V AA2, BA2

UNLESS OTHERWISE INDICATED:

CAPACITORS ARE .01UF, 100V, 20%
RESISTORS ARE 1K, 1/4W, 5%
DIODES ARE D664
TRANSISTORS ARE DEC8534D
DEC7474 = E1, E2, E4, E7, E9, E16
DEC9601 = E5, E10, E15
DEC7404 = E3, E6
DEC7400 = E8, E14
DEC 7440 = E13
DEC7401 = E12
DEC7430 = E11
PIN 7 = GND, PIN 14 = +5V ON ALL IC'S

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA
D664	IN3606		
DEC8534D	NONE		

REVISIONS

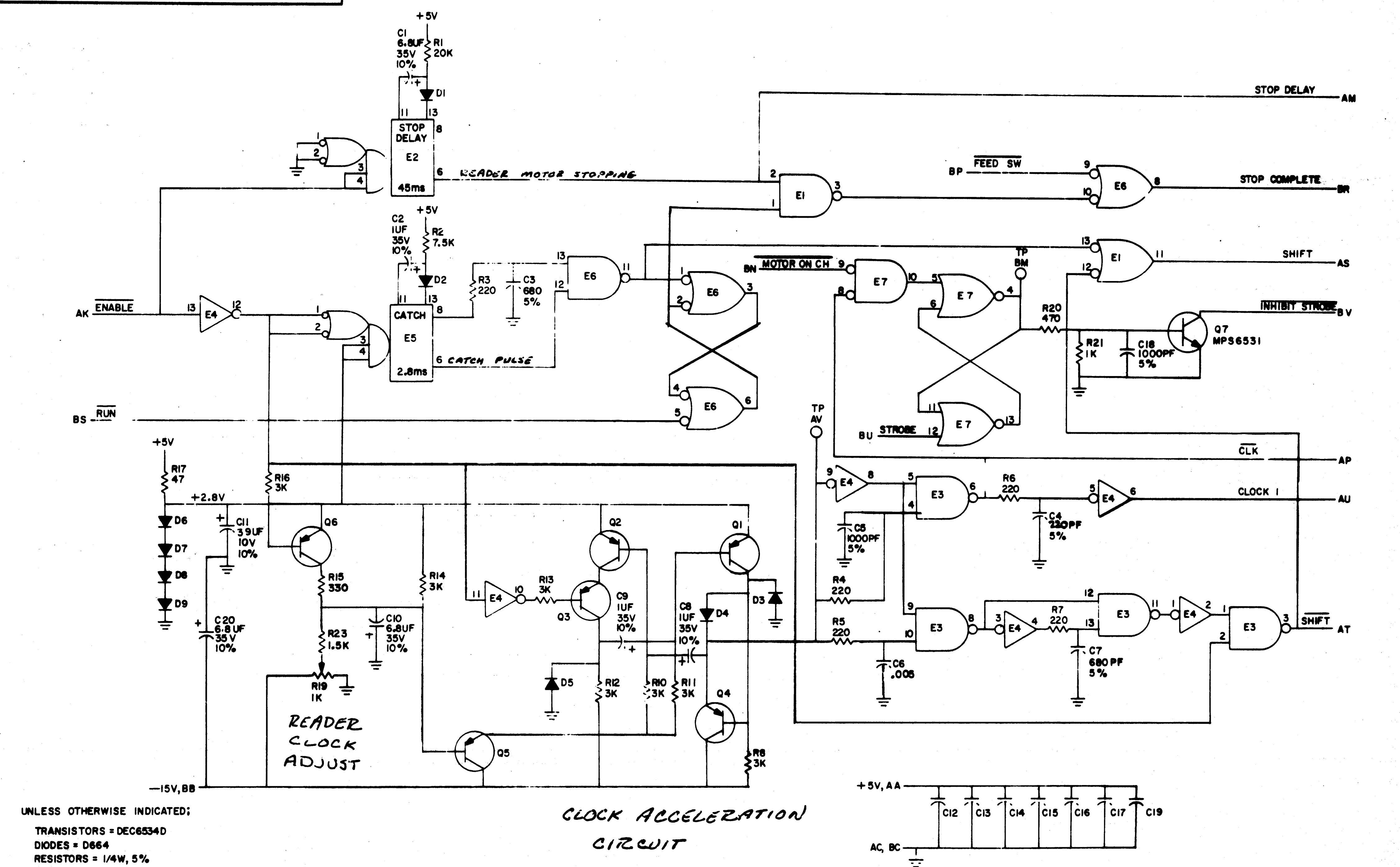
CHG	CHG NO	REV
	00005	H
	00006	J
	00007	K

TITLE: PUNCH CONTROL M710

EQUIPMENT CORPORATION

SIZE D | CODE CS | NUMBER M710-0-1 | REV K

PRINTED CIRCUIT REV H



UNLESS OTHERWISE INDICATED;

TRANSISTORS = DEC6534D
DIODES = D664
RESISTORS = 1/4W, 5%
CAPACITORS = .01UF, 100V, 20%
E1, E3, E6 = DEC7400
E4 = DEC7404
E2, E5 = DEC9601
PIN 7 = GND
PIN 14 = +5V ON ALL IC'S
E7 = DEC7402

TRANSISTOR & DIODE CONVERSION CHART			
DEC	EIA	DEC	EIA
DEC6534D	MPS6534	1N758	SAME
D664	1N3606		
DEC6531	MPS6531		

DRN M. HALLER 10/16/67
CHK'D R. SILVERMAN 11/2/67
ENG. R. G. SOGGE 11/2/67

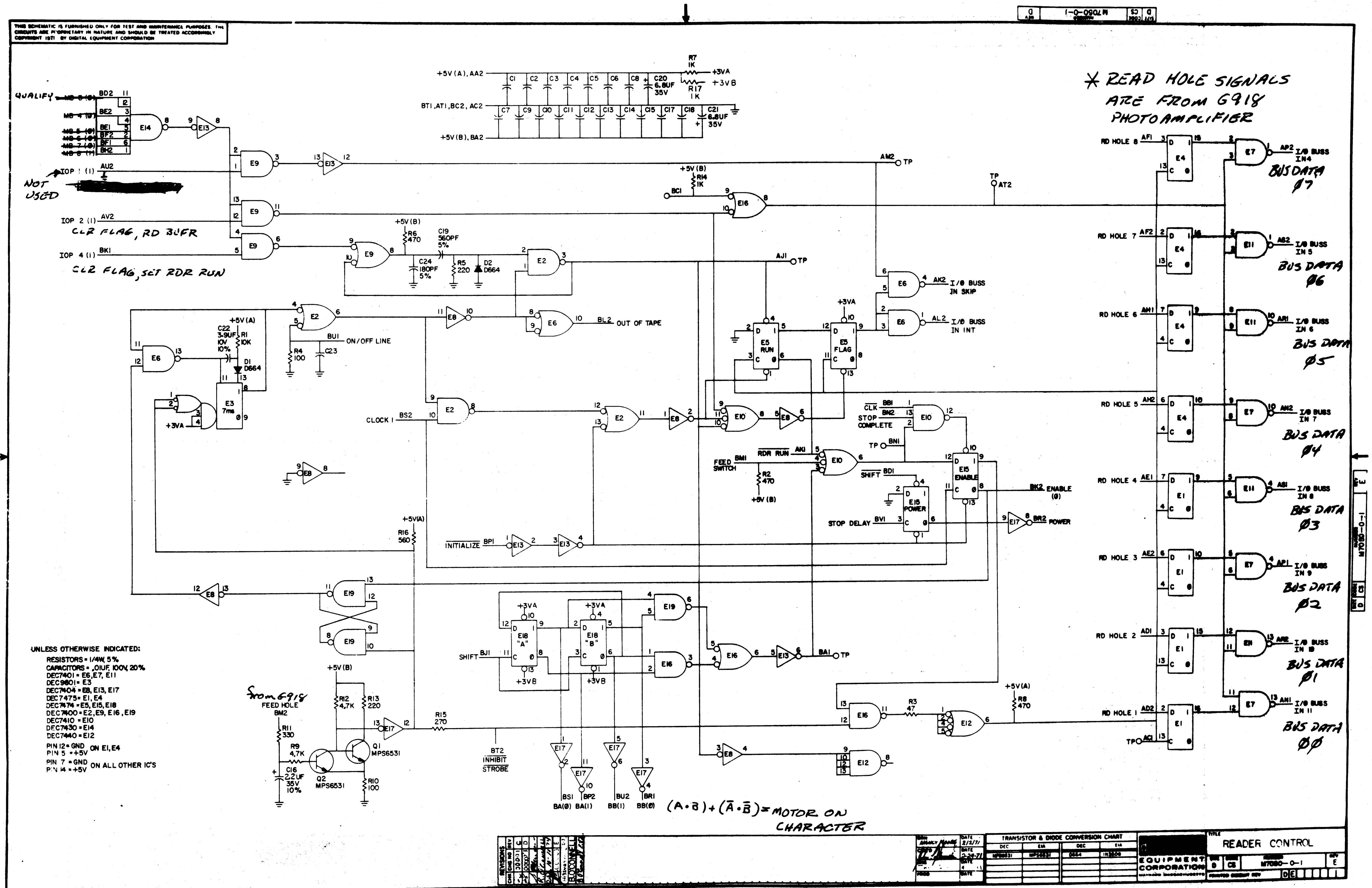
digital EQUIPMENT CORPORATION, MAYNARD MASSACHUSETTS

TITLE: READER CLOCK M715

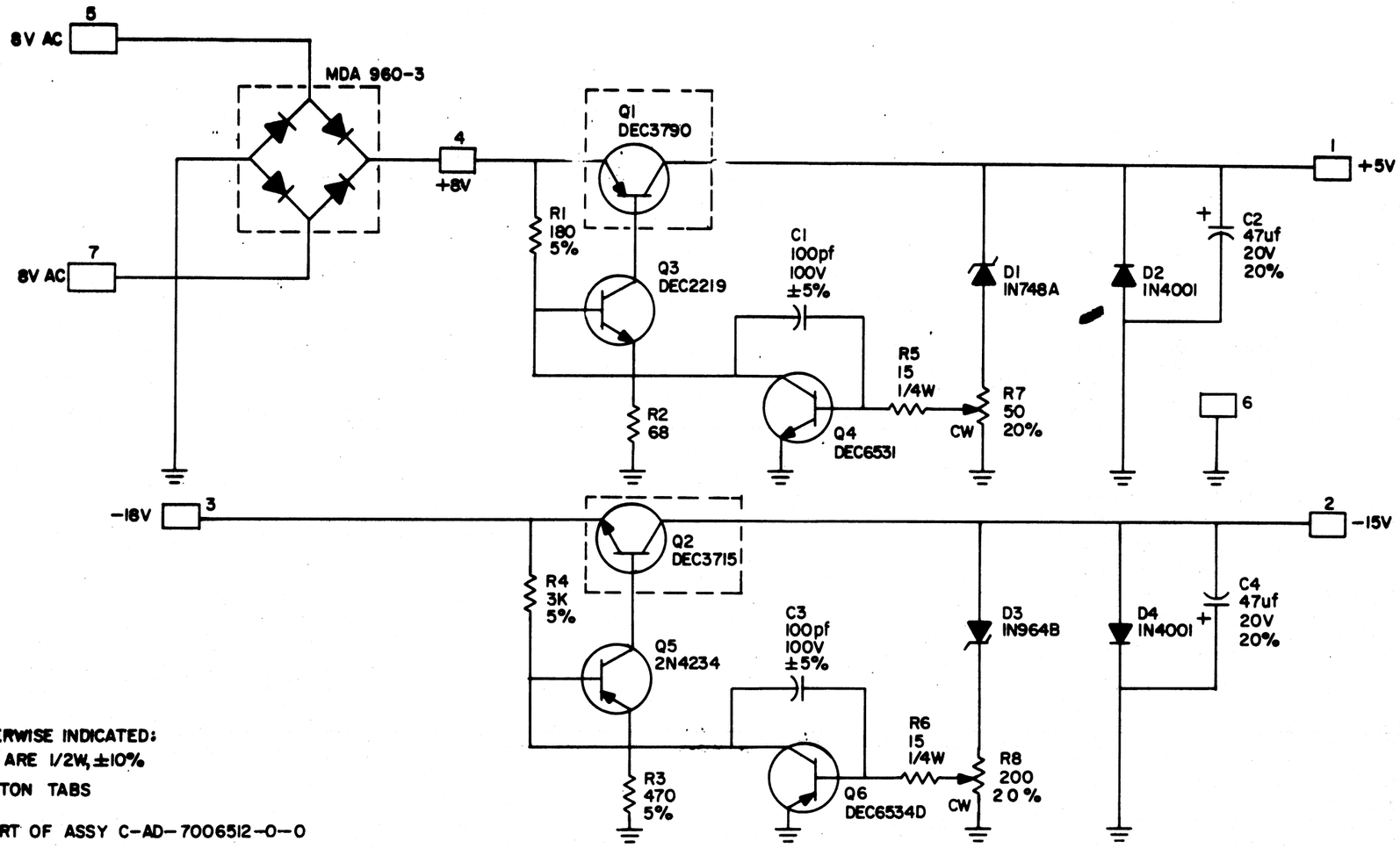
SIZE C | CODE CS | NUMBER M715-0-1 | REV L

PRINTED CIRCUIT REV F

DEC FORM NO DRC 102


THIS SCHEMATIC IS FURNISHED ONLY FOR TEST AND MAINTENANCE PURPOSES. THE CIRCUITS ARE PROPRIETARY IN NATURE AND SHOULD BE TREATED ACCORDINGLY. COPYRIGHT 1971 BY DIGITAL EQUIPMENT CORPORATION
* READ HOLE SIGNALS ARE FROM G918 PHOTOAMPLIFIER
QUALIFY
IOP 1 (1) AU2
NOT USED [redacted]
IOP 2 (1) AV2
CLR FLAG, RD BUFR
IOP 4 (1) BK1
CLR FLAG, SET RDR RUN
+5V (A), AA2
BT1, AT1, BC2, AC2
+5V (B), BA2
C20 6.8UF 35V
C21 6.8UF 35V
R7 1K +3VA
R17 1K +3VB
AM2 TP
AT2 TP
AJ1 TP
OUT OF TAPE
ON/OFF LINE
CLOCK I
AK2 I/O BUSS IN SKIP
AL2 I/O BUSS IN INT
E5 RUN
E5 FLAG
CLK BB1
STOP COMPLETE BN2
E3 7ms
FEED SWITCH BM1
RDR RUN AK1
SHIFT BD1
E15 ENABLE
E15 POWER
BK2 ENABLE (0)
STOP DELAY BV1
BR2 POWER
INITIALIZE BP1
SHIFT BJ1
E18 "A"
E18 "B"
BA1 TP
BT2 INHIBIT STROBE
BS1 BA(0)
BP2 BA(1)
BU2 BB(1)
BR1 BB(0)
(A•B)+(Ā•B̄) = MOTOR ON CHARACTER
From G918 FEED HOLE BM2
Q1 MPS6531
Q2 MPS6531
RD HOLE 8 AF1
RD HOLE 7 AF2
RD HOLE 6 AH1
RD HOLE 5 AH2
RD HOLE 4 AE1
RD HOLE 3 AE2
RD HOLE 2 AD1
RD HOLE 1 AD2
AP2 I/O BUSS IN 4 BUS DATA Ø7
AS2 I/O BUSS IN 5 BUS DATA Ø6
AR1 I/O BUSS IN 6 BUS DATA Ø5
AN2 I/O BUSS IN 7 BUS DATA Ø4
AS1 I/O BUSS IN 8 BUS DATA Ø3
AP1 I/O BUSS IN 9 BUS DATA Ø2
AR2 I/O BUSS IN 10 BUS DATA Ø1
AM1 I/O BUSS IN 11 BUS DATA ØØ
UNLESS OTHERWISE INDICATED:
RESISTORS = 1/4W, 5%
CAPACITORS = .01UF, 100V, 20%
DEC7401 = E6, E7, E11
DEC9601 = E3
DEC7404 = E8, E13, E17
DEC7475 = E1, E4
DEC7474 = E5, E15, E18
DEC7400 = E2, E9, E16, E19
DEC7410 = E10
DEC7430 = E14
DEC7440 = E12
PIN 12 = GND, PIN 5 = +5V ON E1, E4
PIN 7 = GND, PIN 14 = +5V ON ALL OTHER IC'S
TRANSISTOR & DIODE CONVERSION CHART
READER CONTROL
EQUIPMENT CORPORATION
M7060-0-1

SIZE	CODE	NUMBER	REV.
B	CS	5408918-0-1	A



UNLESS OTHERWISE INDICATED:
RESISTORS ARE 1/2W, ±10%
= FASTON TABS
PART OF ASSY C-AD-7006512-0-0

REVISIONS	REV.	CHG NO.	CHK

DRN.	NANCY MOORE	DATE 7/8/70
CHK'D		DATE
ENG.		DATE 10/12/70
PROD.		DATE

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA
DEC3790-2	2N3790	DEC6531	MPS6531
DEC2219	2N2219	IN748A	SAME
DEC3715	2N3715	IN964B	SAME
2N4234	2N4234	IN4001	SAME
DEC6534D	MPS6534		

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

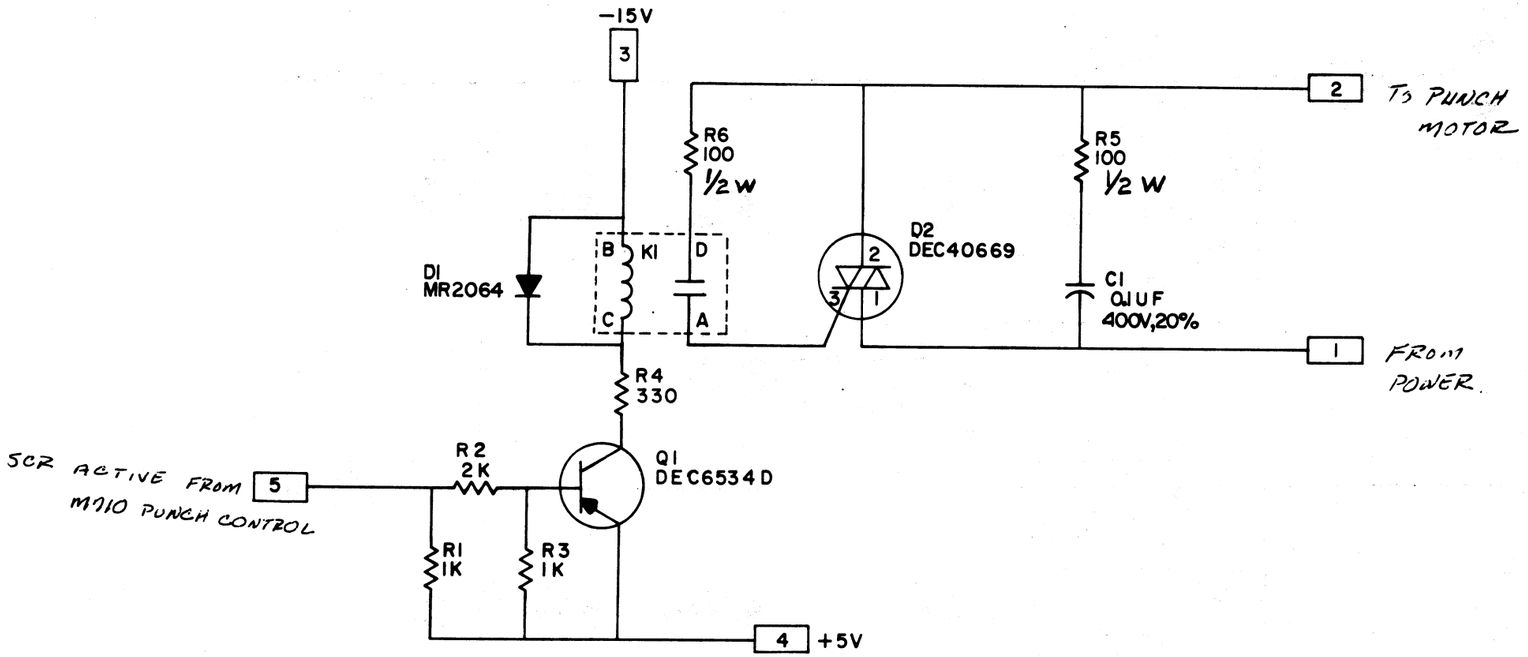
TITLE PCO REGULATOR
5408918

SIZE	CODE	NUMBER	REV.
B	CS	5408918-0-1	A

PRINTED CIRCUIT REV. B

DEC FORM NO.
DRB 102

DIST. 324, 434, 435 PNK 5



UNLESS OTHERWISE INDICATED:
RELAY IS DEC40034
TABS ARE AMP. # 41290
RESISTORS ARE 1/4W, 5%

REVISIONS	REV.	CHG NO.	
CHK	REV. B PER 400001		

DRN. M. HALLER	DATE 6-20-69	
CHK'D T.A. NALETTE	DATE 6-24-69	
ENG. G. BECKNER	DATE 11-19-69	
PROD.	DATE	

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA
		DEC6534D	MPS6534

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: TRIAC SW ASSY (PC05)

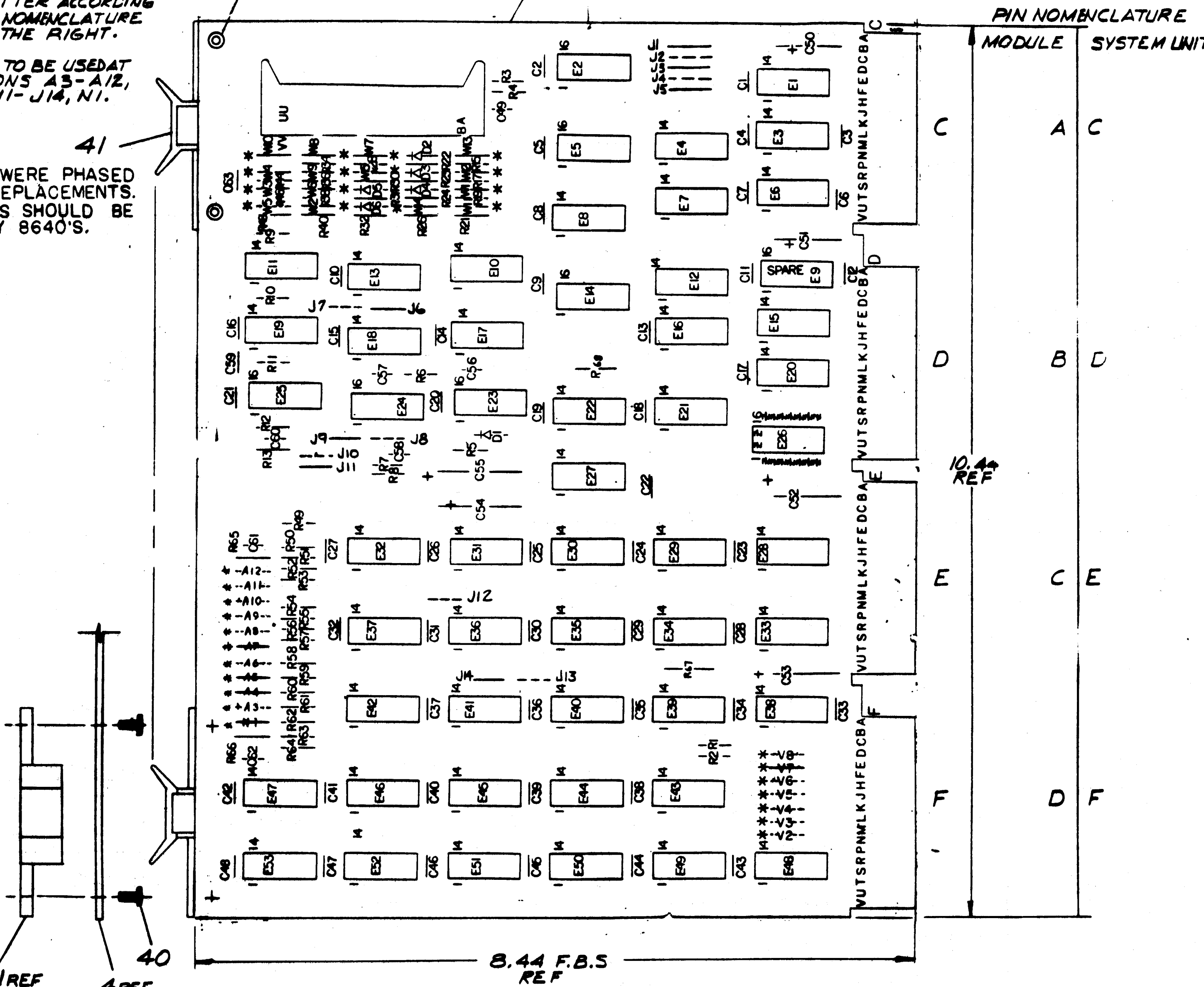
SIZE	CODE	NUMBER	REV.
B	CS	5408384-0-1	B

PRINTED CIRCUIT REV. B

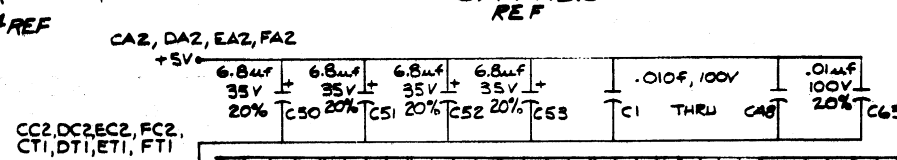
DEC FORM NO. DRB 102

NOTES:

1. PIN NOTATION THROUGHOUT IS ORDERED UPON MODULE PLACEMENT IN THE SYSTEM UNIT. MODULE REFERENCE ALONE IS OBTAINED BY CONVERTING THE 1st LETTER ACCORDING TO THE PIN NOMENCLATURE CHART AT THE RIGHT.
2. JUMPERS TO BE USED AT CONNECTIONS A3-A12, V2-V8, J1-J14, N1.
3. DEC 8640'S WERE PHASED IN AS 380 REPLACEMENTS. 380 FAILURES SHOULD BE REPLACED BY 8640'S.



JUMPER TABLE				
JUMPER DESIGNATION	UNIT NO. LS11	LV11	LP11	LA11
J1	OUT	IN	OUT	IN
J2	IN	OUT	IN	OUT
J3	IN	IN	IN	IN
J4	OUT	OUT	OUT	OUT
J5	IN	IN	IN	IN
J6	IN	OUT	IN	OUT
J7	OUT	IN	OUT	IN
J8	OUT	IN	IN	IN
J9	IN	OUT	OUT	OUT
J10	OUT	IN	OUT	IN
J11	IN	OUT	IN	OUT
J12	OUT	OUT	OUT	OUT
J13	OUT	OUT	OUT	OUT
J14	IN	IN	IN	IN
W5	OUT	IN	OUT	IN
W1-W4, W6-W15	IN	IN	IN	IN
N1	IN	IN	IN	IN



IC TYPE	GND	+5V
74123	8	16
74174	8	16
74175	8	16
8640	1	8

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

IC PIN LOCATIONS

PARTS LIST

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
		X-Y COORDINATE HOLE LOCATION	K-CO-M7258-Ø-4	1
		ASSY/DRILLING HOLE LAYOUT	D-AD-M7258-Ø-5	2
		MODULE ECO HISTORY	D-MH-M7258-Ø-6	3
1		ETCHED CIRCUIT	5010232	4
3	C59, C60, C57	CAP 47PF, 100V 5% D.M.	1000011	5
1	C62	CAP 330PF 100V 5% D.M.	1000023	6
1	C61	CAP 470PF 100V 5% D.M.	1000024	7
4	C50-C53	CAP 6.8UF 35V 10% S.TANT	1005306	8
50	C1-C48, C63	CAP .01UF 100V 20% DISC	1001610	9
2	C54, C55	CAP 22UF 35V 20% S.TANT	1002433	10
6	D1-D6	DIODE D664	1100114	11
1	E26	SOCKET I.C.	1209838	12
1		CONN. BERG 40 PIN	1209941	13
1	,R66	RES. 47, ¼W, 5%	1300202	14
1	R65	RES. 100 ¼W, 5%	1300220	15
1	R3	RES. 330 ¼W, 5%	1300298	16
1	R1	RES. 390, ¼W, 5%	1300300	17
22	R15, R17, R19, R21-R24, R26, R28, R30-R32, R34, R36, R38, R40, R44, R46, R48, R50, R51, R63	RES. 1K, ¼W, 5%	1300385	18
18	R5, R7, R9, R10, R13, R49, R52-R62, R64,	RES. 10K, ¼W, 5%	1300470	19
2	R2, R67	RES. 180, ¼W, 5%	1301322	20
1	R4	RES. 750, ¼W, 5%	1301401	21
4	R6, R8, R11, R12	RES. 30K, ¼W, 5%	1302304	22
1	E17	IC DEC 7474	1905847	23
3	E16, E45, E52	IC DEC 7400	1905575	24
3	E4, E7, E8	IC DEC 7430	1905578	25
3	E27, E35, E44	IC DEC 7402	1905584	26
1	E36	IC DEC 74H00	1905586	27
10	E1, E3, E18, E20, E28, E29, E30, E33, E34, E39	IC DEC 8640	1911469	28
3	E51, E47, E53	IC DEC 74H74	1905587	29
1	E22	IC DEC 7404	1905588	30
5	E6, E31, E38, E43, E48	IC DEC 8881	1908706	31
3	E32, E37, E42	IC DEC 8242	1908712	32
3	E12, E40, E41	IC DEC 8815	1908713	33
4	E10, E11, E13, E19	IC DEC 7437	1910001	34
4	E15, E21, E49, E50	IC DEC 7486	1910108	35
3	E23, E24, E25	IC DEC 74123	1910436	36
2	E2, E5	IC DEC 74175	1910051	37
1	E14	IC DEC 74174	1910052	38
8		EYELET #GS4-7 ED STIMPSON	9006732	39
4		HANDLE FLIP CHIP-MAGENTA	9006397-00	40
1	E46	IC DEC 74H04	1909931	41
				42
2	C56, C58	CAP 100 PF, 100V, 5% DM	1000016	43
14	W1-W4, W6-W15	INSULATED JUMPERS	9009185 *	44
12	A4, A5, A7, V7, J1, J3, J5, J6, J9, J11, J14, N1	JUMPER, BUSS WIRE	9107560-01	45

FIRST USED ON OPTION MODEL: PDP11

ETCH BOARD REV: D

REV	CHANGE NO.	CHK
L	M7258-00009	T. UPTON
K	M7258-00008	L. CONDON
J	M7258-00007	L. CONDON
H	M7258-00006	L. CONDON
F	M7258-00005	L. CONDON
E	M7258-00004	L. CONDON
D	M7258-00003	L. CONDON
C	M7258-00002	L. CONDON
B	M7258-00001	L. CONDON

SEMICONDUCTOR CONVERSION CHART

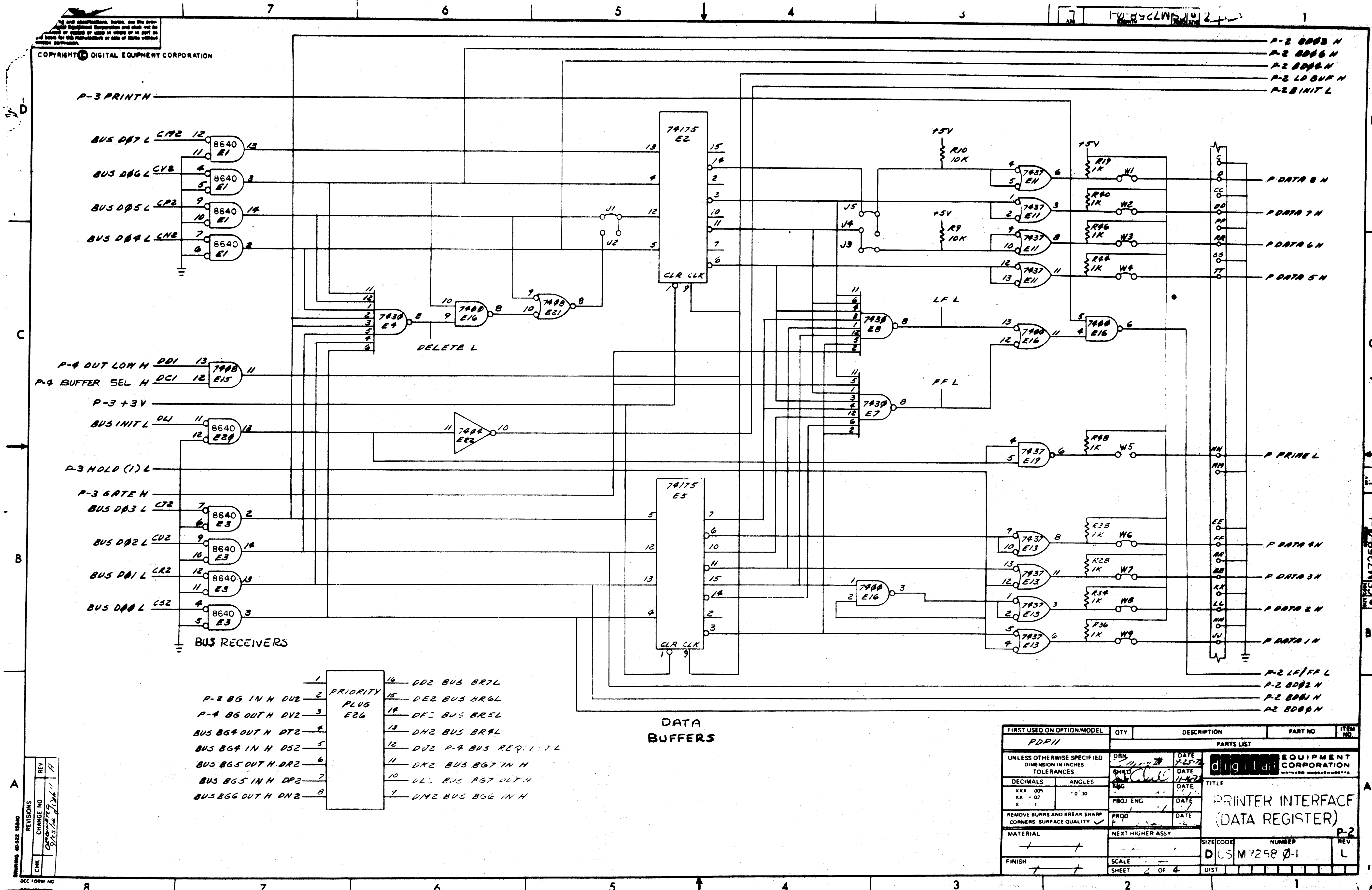
DEC NO.	EIA NO.	DEC NO.	EIA NO.

DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS

TITLE: PRINTER INTERFACE P-1

SIZE: D CODE: CS NUMBER: M7258-Ø-1 REV: C

SHEET 1 OF 4


COPYRIGHT © DIGITAL EQUIPMENT CORPORATION
P-3 PRINT H
BUS DØ7 L
BUS DØ6 L
BUS DØ5 L
BUS DØ4 L
BUS DØ3 L
BUS DØ2 L
BUS DØ1 L
BUS DØØ L
BUS RECEIVERS
8640 E1
8640 E3
8640 E20
74175 E2
74175 E5
7430 E4
7400 E16
7400 E21
DELETE L
P-4 OUT LOW H
P-4 BUFFER SEL H
7400 E15
P-3 +3V
BUS INIT L
7404 E22
P-3 HOLD (1) L
P-3 GATE H
7430 E8
7430 E7
LF L
FF L
7437 E11
7437 E19
7437 E13
+5V
R10 10K
R9 10K
P-2 BDØ3 H
P-2 BDØ6 H
P-2 BDØ5 H
P-2 LD BUF H
P-2 B INIT L
P DATA 8 H
P DATA 7 H
P DATA 6 H
P DATA 5 H
P PRIME L
P DATA 4 H
P DATA 3 H
P DATA 2 H
P DATA 1 H
P-2 LF/FF L
P-2 BDØ2 H
P-2 BDØ1 H
P-2 BDØØ H
DATA BUFFERS
PRIORITY PLUG E26
P-2 BG IN H
P-4 BG OUT H
BUS BG4 OUT H
BUS BG4 IN H
BUS BG5 OUT H
BUS BG5 IN H
BUS BG6 OUT H
DD2 BUS BR7L
DE2 BUS BR6L
DF2 BUS BR5L
DH2 BUS BR4L
DJ2 P-4 BUS REQUEST L
DK2 BUS BG7 IN H
BUS BG7 OUT H
DM2 BUS BG6 IN H
FIRST USED ON OPTION/MODEL PDP11
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY
MATERIAL
FINISH
PARTS LIST
digital EQUIPMENT CORPORATION
PRINTER INTERFACE (DATA REGISTER)
P-2
SIZE D CODE CS NUMBER M7258 Ø-1 REV L
SHEET 2 OF 4

STATUS REGISTER & DRIVERS

P-4 IN H
P-4 STATUS SEL H
P-2 LP/FF L
P-2 LD BUF H
P-4 OUT LOW H
P-2 BD06 H
P-2 BD04 H
P-2 BD03 H
P-2 BD02 H
P-2 BD01 H
P-2 BD00 H
P-2 BINIT L

SEE NOTE 1
Generates strobe to send LF or FF after CR if generated by HOLD F/F.
Set to generate CR when LF or FF are detected.
STROBE DELAY
SEE NOTE 2
SEE NOTE 3
STATUS REGISTER
CLK CLR
STROBE
PDEMAND H
P FAULT L
P SELECT L
P POWR H
P PAPER H
BUS CLR
REM EOT
REM RF
LINE TERM
MODE

P-3 GATE H
BUS D06 L
P-3 INT ENB A H
BUS D07 L
BUS D15 L
ERROR H
BUS D08 L
P-3 HOLD(1) L
P-3 INT A H
P-3 INT B H
P-3 INT ENB B H
P-3 +5V
DRI DONE(1) H
P3 PRINT H

NOTE:
1. CUT ETCH SIDE 1 AT E16-6 ONLY WHEN A LP05 WITH VFU IS USED. FOR REWORK INSTRUCTIONS FOR R68 & E19 11,12,13, SEE ECO M7258-00009.
2. J9 ALWAYS IN AND J8 ALWAYS OUT.
3. FOR JUMPER SELECTION, W10 TO BE TREATED AS J9 AND A WIRE FROM E19 PIN 11 TO W10 (AS SHOWN ABOVE)

3. (CONT'D) IS TO BE TREATED AS J8. REFER TO JUMPER TABLE ON COVER SHEET FOR JUMPER SELECTIONS.

REVISIONS	REV	CHANGE NO	CHK
	1		

FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO	ITEM NO
PDP11		PARTS LIST		

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

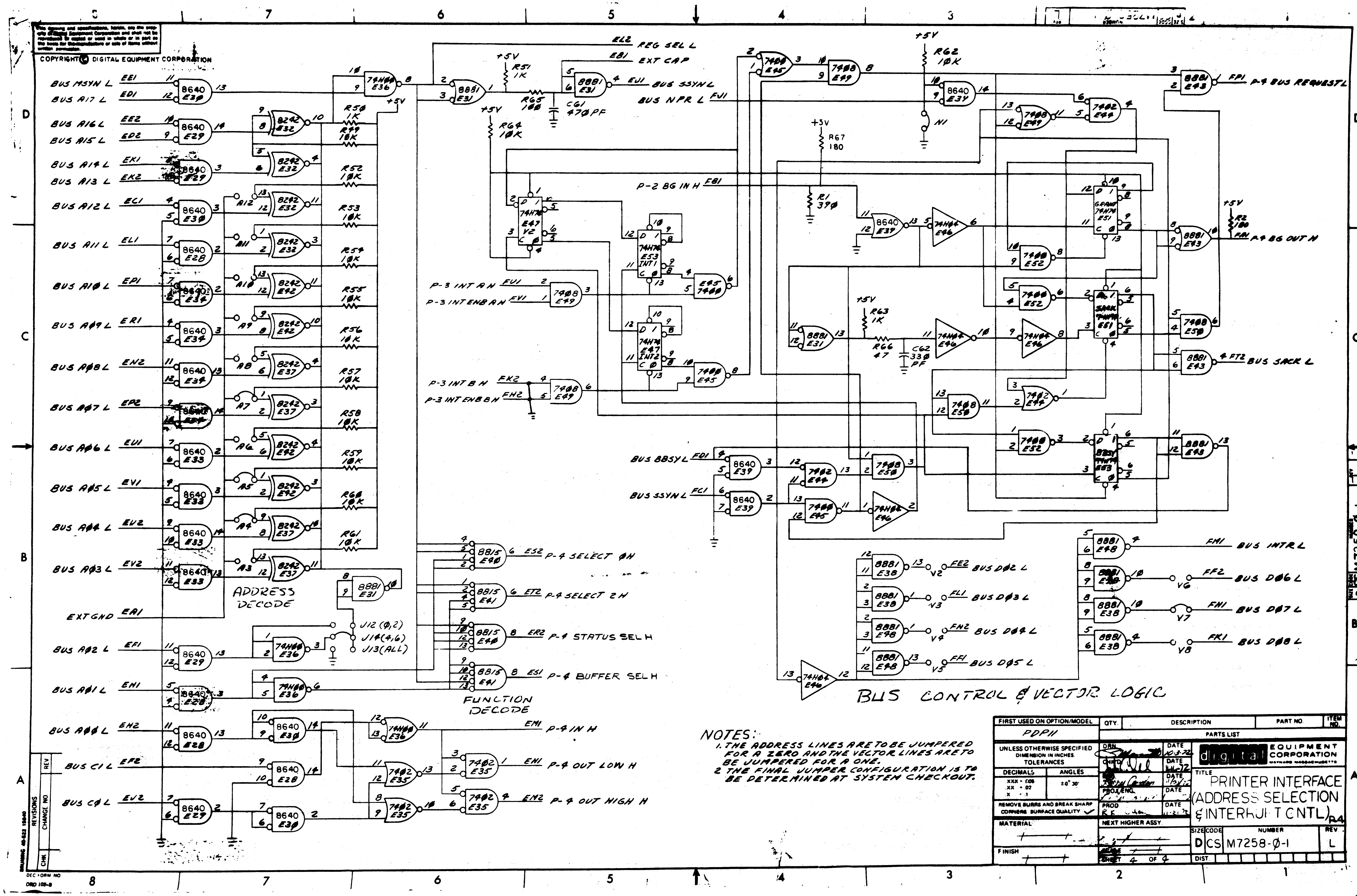
DRN [illegible] DATE 9-29-72
CHK [illegible] DATE 11-14-72
ENG DATE
PROJ ENG DATE
PROD DATE
NEXT HIGHER ASSY
SCALE
SHEET 3 OF 4

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: PRINTER INTERFACE (PRINTER CONTROL) P-3

SIZE D | CODE CS | NUMBER M7258-0-1 | REV L | DIST

DEC FORM NO DRD 192-0

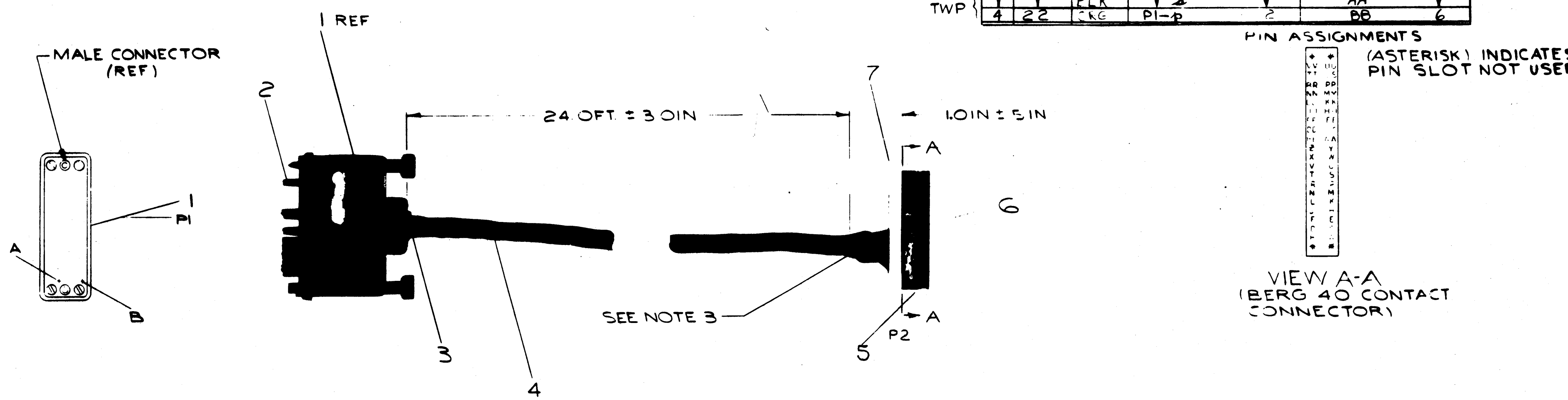

ADDRESS DECODE
FUNCTION DECODE
BUS CONTROL & VECTOR LOGIC
NOTES:
1. THE ADDRESS LINES ARE TO BE JUMPERED FOR A ZERO AND THE VECTOR LINES ARE TO BE JUMPERED FOR A ONE.
2. THE FINAL JUMPER CONFIGURATION IS TO BE DETERMINED AT SYSTEM CHECKOUT.
COPYRIGHT © DIGITAL EQUIPMENT CORPORATION
FIRST USED ON OPTION/MODEL PDP11
DIGITAL EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
PRINTER INTERFACE (ADDRESS SELECTION & INTERRUPT CNTL)
D CS M7258-0-1 L
SHEET 4 OF 4

WIRE TABLE						
ITEM	DESCRIPTION		FROM		TO	
NO	AWG	COLOR	CONNECTION	WITH	CONNECTION	WITH
4	22	RED	P1-M	2	P2-C	6
		YEL	J		D	
		RED	D		E	
		BLU	B		F	
		BLU	T		H	
		BLK	F		J	
		BLK	N		K	
		GRN	L		L	
		RED	T		M	
		WHT	R		N	
		BLK	X		P	
		WHT	V		R	
		BLK	b		S	
		RED	Z		T	
		BLK	k		U	
		BRN	r		V	
		RED	AA		W	
		GRN	Y		X	
		BLK	C		Y	
		YEL	E		Z	
		BLK	a		AA	
4	22	SKG	P1-p	2	BB	6

TWP

NOTES:

1. ITEMS NO 2 & 6 TO BE CRIMPED TO WIRES BEFORE IT IS INSERTED INTO ITEMS NO 1 & 5.
2. THE FOLLOWING "WINCHESTER ELECTRONICS" CRIMPING TOOLS CAN BE USED.
   A) CRIMPER #107-0903-2A
   B) INSERTION TOOL #107-1015
   C) REMOVAL TOOL #107R-1001
3. AT LEAST ONE TWIST OF EACH PAIR MUST SHOW BEYOND CABLE JACKET.



QTY.	DESCRIPTION	PART NO.	ITEM NO.
1	STRAIN RELIEF BERG	1211166	7
22	PIN, #48015 BERG ELECTRONICS	12 10089-4	6
1	HOUSING 40 CONTACT BERG	12 10918-15	5
A/R	CABLE #1324 ALFA 22 COND.	9107707	4
A/R	TAPE, DOUBLE BACK	9007834	3
22	PIN, CONN NR 100-10 WINCHESTER	1209629	2
1	PLUG #MRAC50PJTCH8 WINCHESTER	1209726	1

PARTS LIST

FIRST USED ON OPTION/MODEL: LPII

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES

MATERIAL: SEE PARTS LIST

NEXT HIGHER ASSY: LPII

EQUIPMENT CORPORATION

TITLE: CABLE DATA PRODUCTS TO BERG

D IA 7008837-C-0 REV. B

REVISIONS: 7008837-00001 A; DIGIROLAMO; LPII-00010 B; L. CONDON

WIRE TABLE

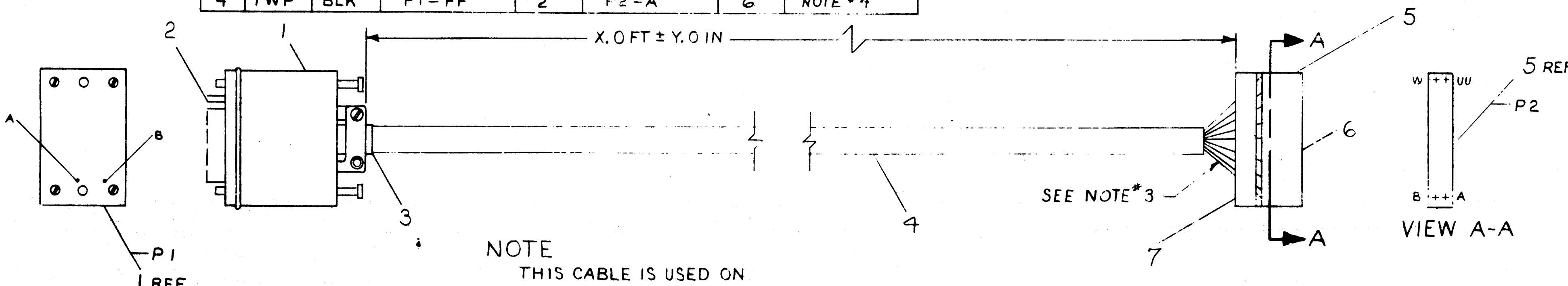
ITEM NO	DESCRIPTION AWG	DESCRIPTION COLOR	FROM CONNECTION	FROM TERM	TO CONNECTION	TO TERM	SIGNAL NAME
4	24 TWP	BLU	P1-B	2	P2-JJ	6	D1
		YEL	P1-F		P2-LL		D2
		ORN	P1-L		P2-BB		D3
		RED	P1-R		P2-FF		D4
		ORN	P1-V		P2-TT		D5
		YEL	P1-Z		P2-RR		D6
		GRN	P1-n		P2-DD		D7
		YEL	P1-p		P2-D		D8(VFU)
		BLU	P1-D		P2-HH		RTN
		WHT	P1-J		P2-KK		RTN
		GRN	P1-N		P2-AA		RTN
		WHT	P1-T		P2-EE		RTN
		BRN	P1-X		P2-SS		RTN
		WHT	P1-b		P2-PP		RTN
		BLU	P1-K		P2-CC		RTN
		RED	P1-s		P2-C		RTN
		BLU	P1-E		P2-X		DEMAND
		BLK	P1-C		P2-W		RTN
		ORN	P1-J		P2-VV		STROBE
		BLK	P1-m		P2-UU		RTN
		GRN	P1-y		P2-R		FAULT
		BLK	P1-AA		P2-P		RTN
		GRY	P1-EE		P2-V		PAPER
		RED	P1-Y		P2-U		RTN
		BRN	P1-a		P2-J		NOTE #4
		RED	P1-c		P2-H		
		GRN	P1-f		P2-L		
		RED	P1-h		P2-K		
		ORN	P1-r		P2-F		
		WHT	P1-t		P2-E		
		BRN	P1-u		P2-T		
		BLK	P1-w		P2-S		
		GRY	P1-z		P2-Z		
		WHT	P1-BB		P2-Y		
	24	GRY	P1-DD		P2-B		
4	TWP	BLK	P1-FF	2	P2-A	6	NOTE #4

LEGEND

NUMBER	DIM "X" VARIATION	DIM "Y" PRECUT
7011212-25	25 FT ± 3 IN	25FT 4IN ± 3IN
7011212-50	50 FT ± 1 FT	50FT 4IN ± 1FT
7011212-AØ	100 FT ± 2 FT	100FT 4IN ± 2FT

NOTES

1. ITEMS NO #2 & #6 TO BE CRIMPED TO WIRES BEFORE IT IS INSERTED INTO ITEMS NO #1 & #5.
2. THE FOLLOWING WINCHESTER ELECTRONICS CRIMPING TOOLS CAN BE USED.
   A.) CRIMPER #107-0903-2A
   B.) INSERTION TOOL #107-1015
   C.) REMOVAL TOOL #107R-1001
3. AT LEAST ONE TWIST OF EACH PAIR MUST SHOW BEYOND CABLE JACKET.
4. ALL UNUSED WIRES TO BE CUT FLUSH WITH OUTER COVER OF THE CABLE AT BOTH ENDS. THIS INCLUDES ALL CONNECTIONS WITH THE REFERENCE TO NOTE 4.



NOTE
THIS CABLE IS USED ON
DATA PRODUCTS TO M7258
DATA PRODUCTS TO M7930 USES 7008837

QTY	DESCRIPTION	DWG./PART NO.	ITEM NO.
1	STRAIN RELIEF	1211166	7
24	SOCKET CRIMP #48015	1210089-4	6
1	CONN 44 PIN	1210918-15	5
A/R	CABLE #24 AWG	9107700	4
A/R	TAPE DOUBLE COATED	9007834	3
24	CONN PIN	1209629	2
1	CONN PLUG	1209726	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
ANGLES ±0° 30'
SURFACE QUALITY IN MICROINCHES
CLASS OF ACCURACY (CHECK ONE): MEDIUM / PREFERRED
QUANTITY & VARIATION
THIRD ANGLE PROJECTION
REMOVE BURRS AND BREAK SHARP CORNERS
DO NOT SCALE DWG
MATERIAL
FINISH

DRN. L. Gilbert 5-3-75
CHK'D L. Gilbert 5-8-75
ENG. 5/1/75
PROJ. ENG.
PROD. 5/9/75
NEXT HIGHER ASSY. B-DD-LP11-?
SCALE
SHEET OF 1

FIRST USED ON

TITLE CABLE LINEPRINTER (M7258)

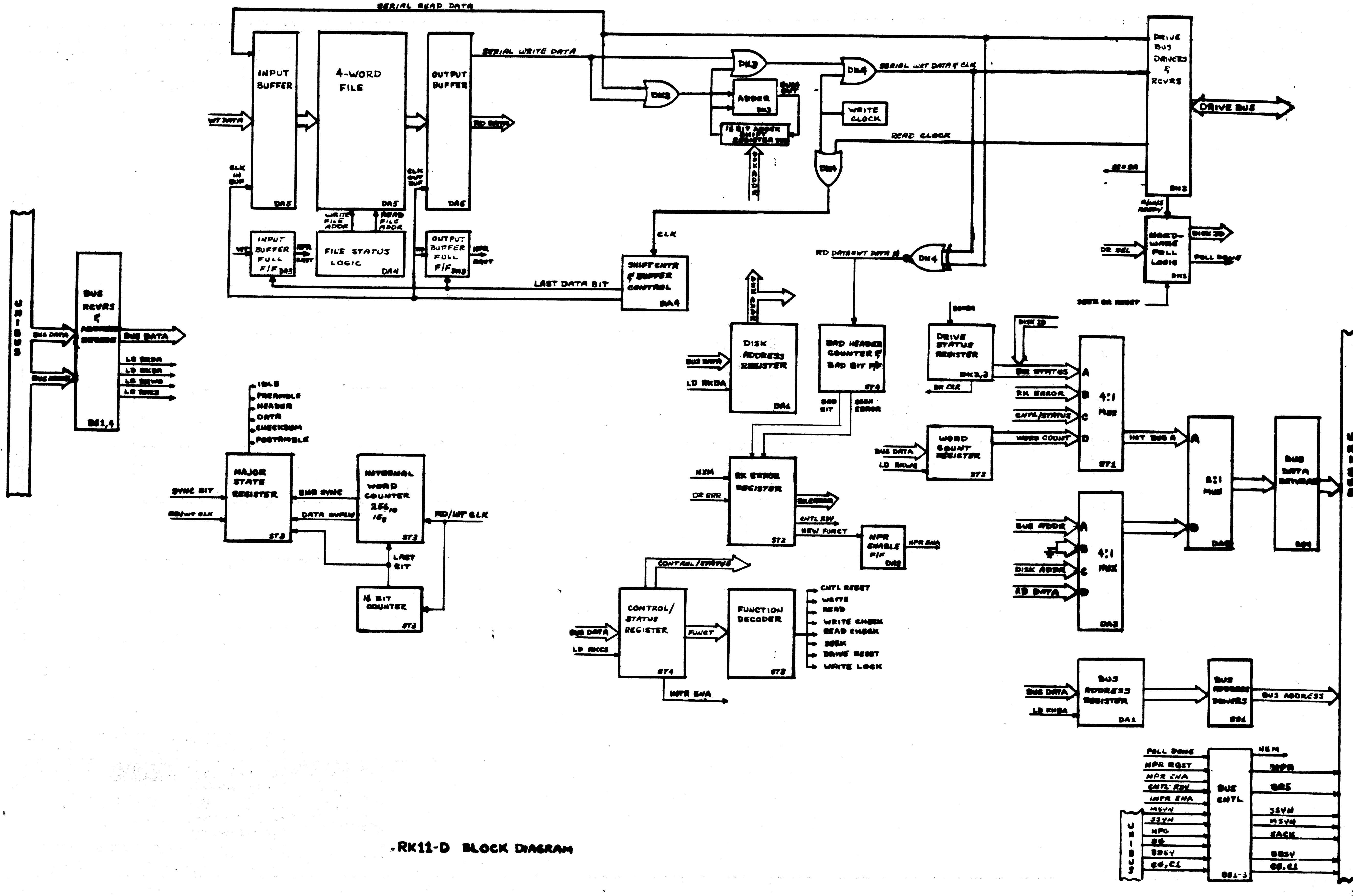
SIZE D | CODE IA | NUMBER 7011212-0-0 | REV. A

DIST.

REVISIONS			
CHK	CHANGE NO.	REV.	
—	LP11-00011	—	ORIGINATED
LY	LP11-00012	A	8-11-75 L. CONDON 8/14/75

DEC FORM NO. DRD 160-C

D 7011212-0-0 A



RK11-D BLOCK DIAGRAM

NOTE:
FOR PROPER OPERATION OF RK11-D, E THE RK05 DRIVE MUST HAVE AN M7700 REV. J OR LATER AND HAVE A BACK PANEL OF REV. A OR LATER. FOR RK11-E THE RK05 MUST ALSO HAVE A G180 REV. K OR LATER.

Slot	A	B	C	D	E	F
4	UNIBUS OUT — M930 TERMINATOR OR M920 INTERNAL CONNECTOR OR BC11-A CABLE		M7257 BUS CONTROL			
3	G772 POWER CONN.	W130 KM11A MAINTENANCE BOARD (OPTIONAL)	M7256 DATA PATHS			
2	BC11-A DISK CABLE		M7255 DISK CONTROL			
1	UNIBUS IN — M920 INTERNAL CONNECTOR OR BC11-A CABLE		M7254 STATUS CONTROL			

QTY.	DESCRIPTION	PART NO	ITEM NO.

PARTS LIST

FIRST USED ON OPTION/MODEL: RK11-D

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

MATERIAL

FINISH

DRN. E. Wilson DATE 7/25/72
CHKD. DATE
ENG. DATE
PROJ. ENG. DATE
PROD. R. Dooley DATE 11/3/72

NEXT HIGHER ASSY: B-DD-RK11-D

SCALE NONE
SHEET 1 OF 1

[redacted] EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS

TITLE: MODULE UTILIZATION

SIZE D CODE MU NUMBER RK11-D-1 REV

DIST.

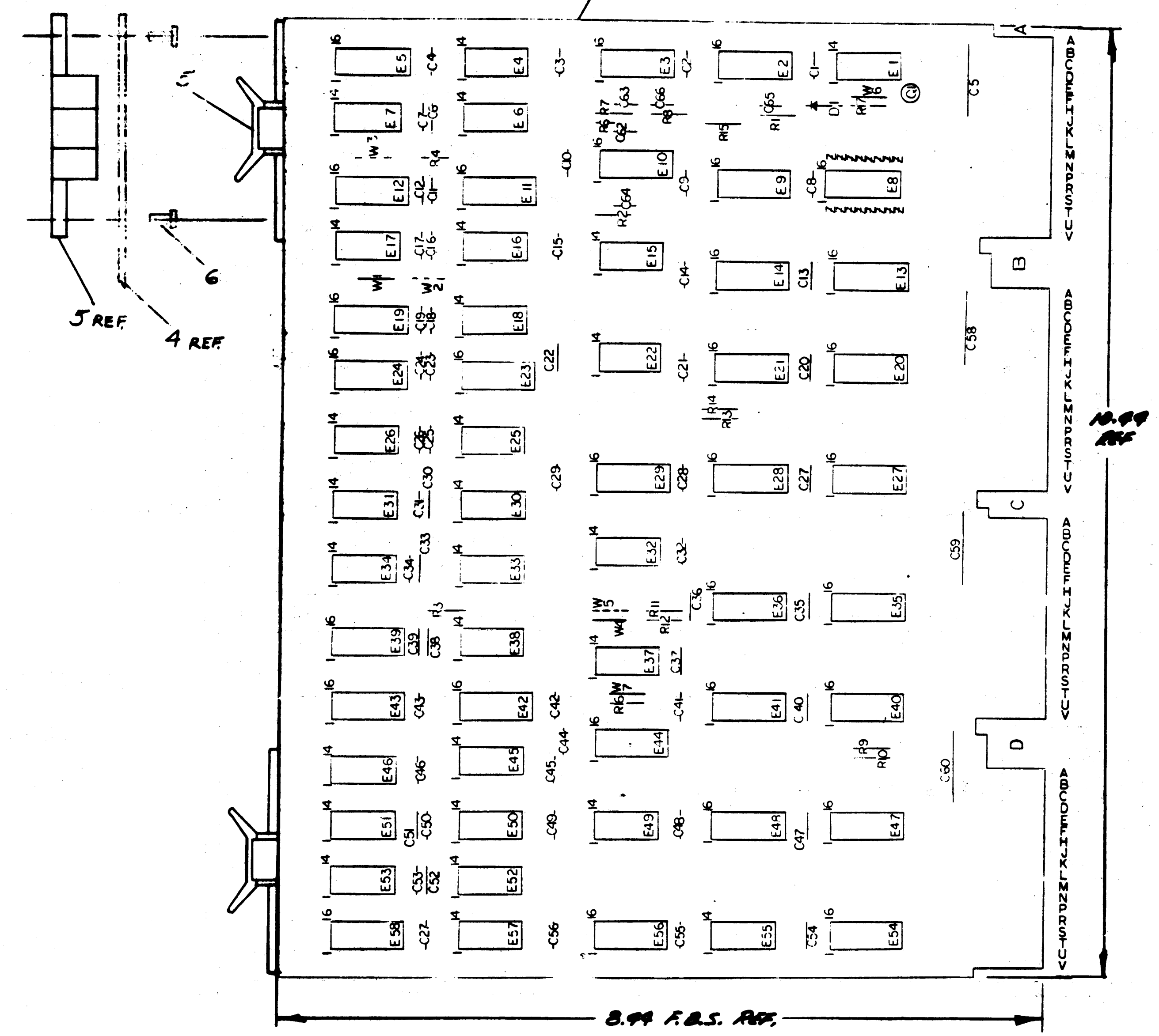
REVISIONS: REV | CHANGE NO. | CHK

DEC FORM NO DRD 100

NOTES:

* IF NECESSARY USE I.C DEC 8875 P/N 1910647

** IC DEC 384 P/N 1909486 OR 5384 P/N 1910394 MAY BE SUBSTITUTED FOR 7384 IN E26. E1 MUST BE A 7384



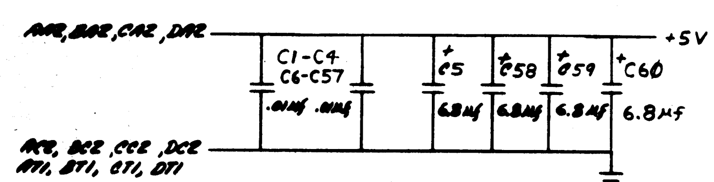
QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
1	Q1	TRANSISTOR DEC 6534B	1503409-01	50
1	E8	IC SOCKET	1209838	[illegible]
4	W1,W4,W6,W7	INSULATED JUMPER C-2007-1	9009185	[illegible]
1	E39	I.C. DEC 7475	1909050	[illegible]
2	E23,E41	I.C. DEC 74175	1910651	[illegible]
1	E55	I.C. DEC 8815	[illegible]	[illegible]
1	E4	I.C. DEC 74H55	[illegible]	[illegible]
2	E17 E52	I.C. DEC 74H53	1909062	[illegible]
1	E38	I.C. DEC 7408	1910155	[illegible]
1	E45	I.C. DEC 74H11	1909857	[illegible]
5	E21,E27,E28,E29,E40	I.C. DEC 74193	1910018	[illegible]
4	E12,E19,E24,E56	I.C. DEC 74161	1910650	[illegible]
1	E57	I.C. DEC 74H74	1909067	[illegible]
3	E6,E7,E37	I.C. DEC 7474	[illegible]	[illegible]
1	E53	I.C. DEC 74H52	[illegible]	[illegible]
2	E15,E22	I.C. DEC 7437	1910091	[illegible]
2	E1,E26 **	I.C. DEC 7384	[illegible]	[illegible]
1	E30	I.C. DEC 8881	[illegible]	[illegible]
3	E2,E3,E10	I.C. DEC 74123	[illegible]	31
3	E9,E42,E44	I.C. DEC 4015	1910087	30
2	E31,E32	I.C. DEC 7420	[illegible]	[illegible]
1	E16	I.C. DEC 7410	[illegible]	[illegible]
3	E18,E34,E49	I.C. DEC 7400	[illegible]	[illegible]
2	E46,E50	I.C. DEC 7402	[illegible]	[illegible]
8	[illegible]	I.C. DEC 74153	[illegible]	[illegible]
1	E11	I.C. DEC 7496	[illegible]	[illegible]
1	E25 *	I.C. DEC 7487	[illegible]	[illegible]
2	E51,E33	I.C. DEC 7404	[illegible]	[illegible]
1	E43	I.C. DEC 7442	[illegible]	21
3	R10,R12,R14	RES. 750 Ω 1/4 W 5%	[illegible]1401	[illegible]
3	R9,R11,R13	RES. 330 Ω 1/4 W 5%	[illegible]0295	[illegible]
3	R3,R15,R16	RES. 1K 1/4 W 5%	[illegible]	18
1	R1	RES. 47K 1/4 W 5%	[illegible]	17
1	R4	RES. 3K 1/4 W 5%	[illegible]	[illegible]
4	R2,R6,R7,R8	RES. 10K 1/4 W 5%	[illegible]	[illegible]
1	R17	RES. 470 Ω 1/4 W 5%	[illegible]	[illegible]
1	D1	DIODE IN748A 3.9V	[illegible]00122	[illegible]
2	C62,C63	CAP. 47 PF 100V 5% D.M.	1000011	[illegible]
1	C65	CAP. 330 PF 100V 5% D.M.	[illegible]	11
1	C64	CAP. 56 PF 100V 5% D.M.	[illegible]	[illegible]
1	C66	CAP. 120 PF 100V 5% D.M.	[illegible]0018	9
56	C1-C4, C6-C57	CAP. .01 MF 100V 20% AXIAL	1001610	[illegible]
4	C5,C58,C59,C60	CAP. 6.8 MF 35V, 10% TANT	[illegible]	7
8		EYELET (SS-4-7) STANDOFF	[illegible]	6
4		HANDLE (FLIP-CHIP) MAGENTA	9006997-[illegible]	5
1		ETCHED CIRCUIT BOARD	5009386	4
REF		MODULE ECO HISTORY	[illegible]	3
REF		ASSY/DRILLING HOLE LAYOUT	D-AH-M7254-0-5	2
REF		X-Y COORDINATE HOLE LOCATION	K-[illegible]-M7254-0-[illegible]	1

PARTS LIST

IC TYPE	GND	+ 5V
I.C. DEC 74175	8	16
I.C. DEC 74161	8	16
I.C. DEC 7384	1	8
I.C. DEC 4015	8	16
I.C. DEC 7496	12	5
I.C. DEC 74193	8	16
I.C. DEC 74H53	8	16
I.C. DEC 74123	8	16
I.C. DEC 7475	12	5
I.C. DEC 7442	8	16

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

IC PIN LOCATIONS



FIRST USED ON OPTION MODEL: RK11-D

ETCH BOARD REV: E

DEC NO.	EIA NO.	DEC NO.	EIA NO.
		DEC 6534B	NONE
		IN748A	IN748A

SEMICONDUCTOR CONVERSION CHART

REV: E — ORIGINATED

DATE 4-5-73; DATE 5-29-73; DATE 5/29/73; DATE 5/29/73

EQUIPMENT CORPORATION, MAYNARD MASSACHUSETTS

TITLE: STATUS CONTROL RK11-D

NEXT HIGHER ASSY: B-DD-RK11-D

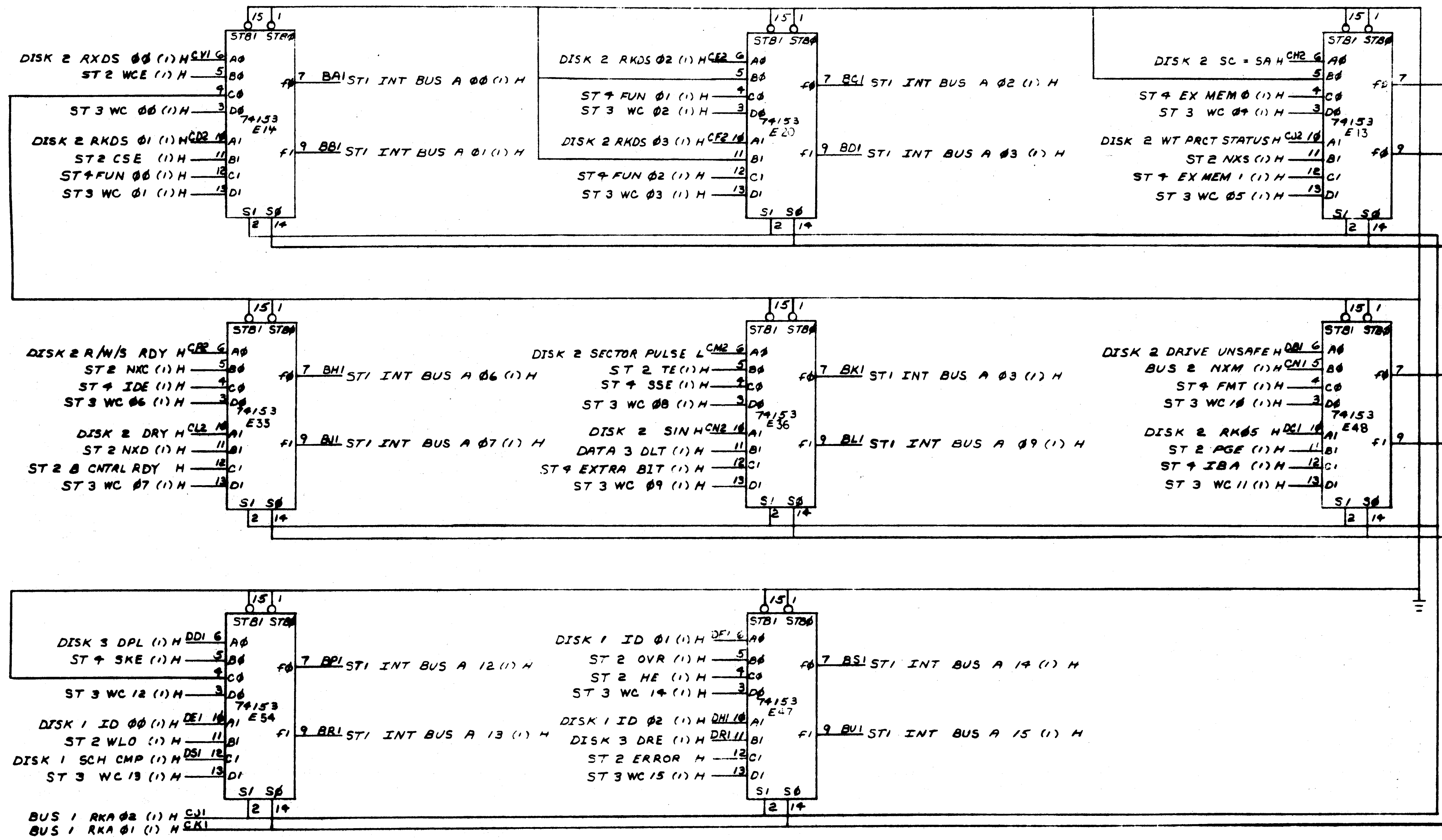
SIZE: D CODE: CS NUMBER: M7254-[illegible] REV: H

SCALE: NONE SHEET 2 OF

D CS M7254-D-1

DEC FORM NO DRD-13BA

4:1 MULTIPLEXER

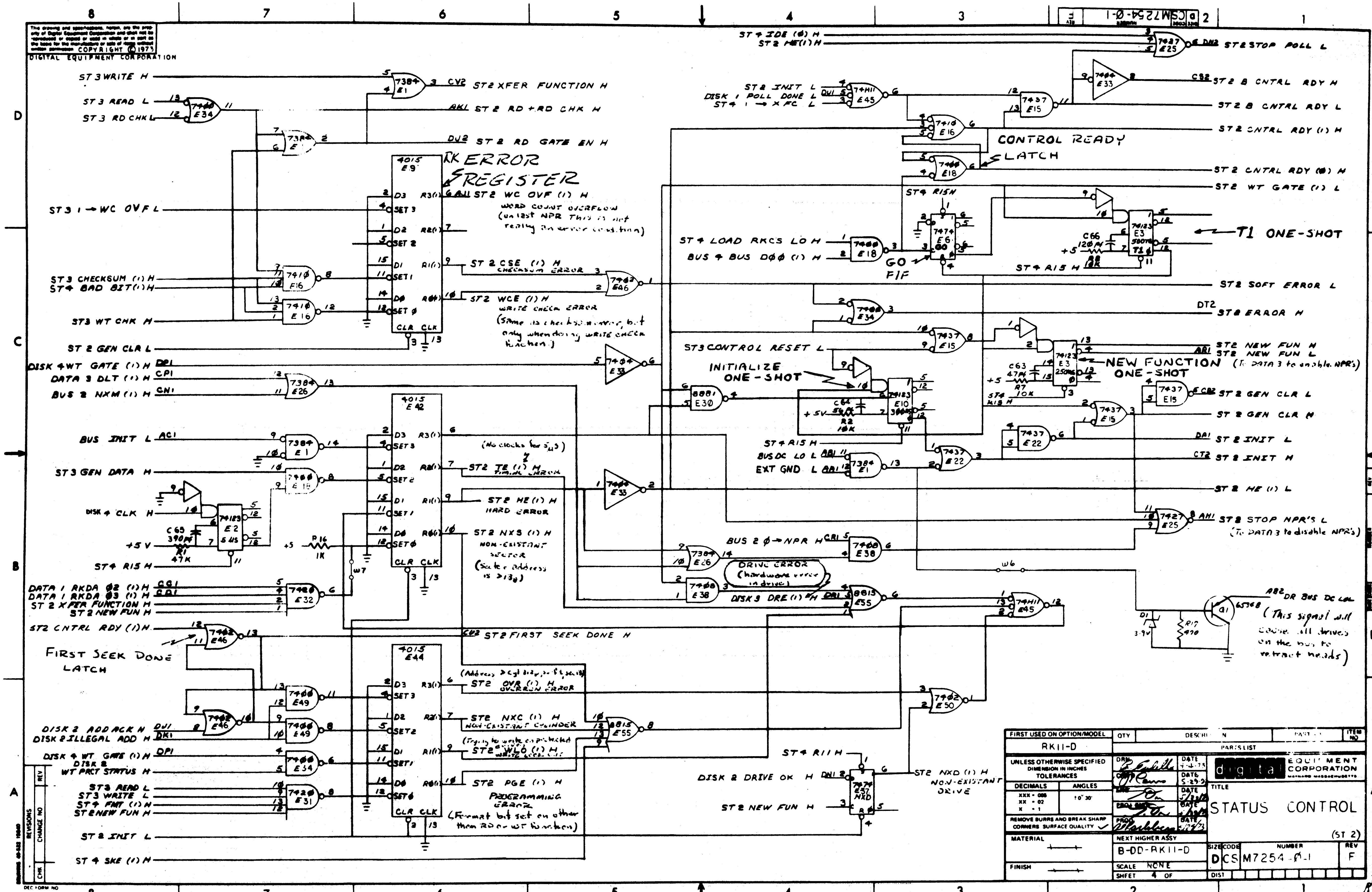


* NOTE: ALL OUTPUTS GO TO SHEET DATA 2

NOTES:
1. CUT W3 FOR 16 BIT OPERATION (RK11-C)
2. CUT W1 FOR 18 BIT OPERATION (RK11-E)
   CUT W2 FOR 16 BIT OPERATION (RK11-D)
3. CUT W5 FOR NORMAL OPERATION (CHECKS HEADER 16 TIMES BEFORE FLAGGING SEEK ERROR)
   CUT W4 FOR RK11-C COMPATABILITY (CHECKS HEADER ONCE)

FIRST USED ON OPTION/MODEL	RK11-D
NEXT HIGHER ASSY	B-DD-RK11-D
TITLE	STATUS CONTROL (ST 1)
SIZE / CODE	D CS
NUMBER	M7254-Ø-1
REV.	C
SCALE	NONE
SHEET	3 OF
DATE	4-4-73

EQUIPMENT CORPORATION



DIGITAL EQUIPMENT CORPORATION
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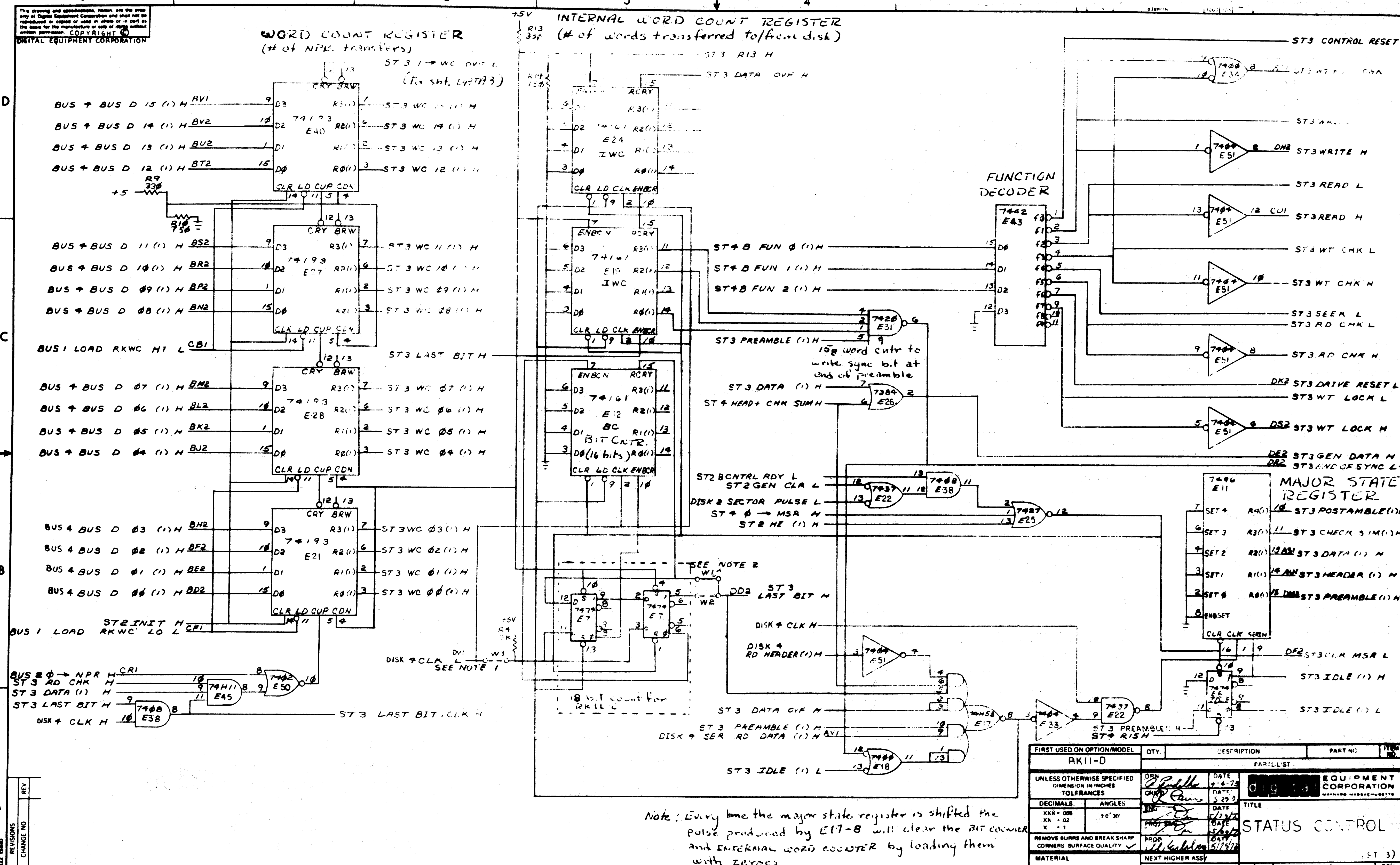
ST 3 WRITE H
ST 3 READ L
ST 3 RD CHK L
ST 2 XFER FUNCTION H
ST 2 RD + RD CHK H
ST 2 RD GATE EN H
ERROR REGISTER
ST 2 WC OVF (1) H
WORD COUNT OVERFLOW (on last NPR This is not really an error condition)
ST 3 1 → WC OVF L
ST 3 CHECKSUM (1) H
ST 4 BAD BIT (1) H
ST 3 WT CHK H
ST 2 CSE (1) H
CHECKSUM ERROR
ST 2 WCE (1) H
WRITE CHECK ERROR
(Same as checksum error, but only when doing write check function)
ST 2 GEN CLR L
DISK 4 WT GATE (1) H
DATA 3 DLT (1) H
BUS 2 NXM (1) H
BUS INIT L
ST 3 GEN DATA H
DISK 4 CLK H
+5 V
ST 4 RIS H
(No clocks for 5 µs)
ST 2 TE (1) H
TIMING ERROR
ST 2 HE (1) H
HARD ERROR
ST 2 NXS (1) H
NON-EXISTANT SECTOR
(Sector address is > 13₈)
DATA 1 RKDA 02 (1) H
DATA 1 RKDA 03 (1) H
ST 2 XFER FUNCTION H
ST 2 NEW FUN H
ST 2 CNTRL RDY (1) H
FIRST SEEK DONE LATCH
ST 2 FIRST SEEK DONE H
ST 2 OVR (1) H
OVERRUN ERROR
ST 2 NXC (1) H
NON-EXISTANT CYLINDER
ST 2 WLO (1) H
WRITE LOCK OUT
ST 2 PGE (1) H
PROGRAMMING ERROR
(Format bit set on other than RD or WT function)
DISK 2 ADD ACK H
DISK 2 ILLEGAL ADD H
DISK 4 WT GATE (1) H
DISK 2 WT PRCT STATUS H
ST 3 READ L
ST 3 WRITE L
ST 4 FMT (1) H
ST 2 NEW FUN H
ST 2 INIT L
ST 4 SKE (1) H
ST 4 IDE (0) H
ST 2 HE (1) H
ST 2 STOP POLL L
ST 2 INIT L
DISK 1 POLL DONE L
ST 4 1 → XFC L
ST 2 B CNTRL RDY H
ST 2 B CNTRL RDY L
ST 2 CNTRL RDY (1) H
CONTROL READY LATCH
ST 2 CNTRL RDY (0) H
ST 2 WT GATE (1) L
ST 4 RISH
T1 ONE-SHOT
ST 4 LOAD RKCS LO H
BUS 4 BUS D00 (1) H
GO F/F
ST 4 RIS H
ST 2 SOFT ERROR L
ST 2 ERROR H
ST 3 CONTROL RESET L
ST 2 NEW FUN H
ST 2 NEW FUN L
NEW FUNCTION ONE-SHOT
(To DATA 3 to enable NPR's)
INITIALIZE ONE-SHOT
ST 2 GEN CLR L
ST 2 GEN CLR H
ST 4 RIS H
BUS DC LO L
EXT GND L
ST 2 INIT L
ST 2 INIT H
ST 2 HE (1) L
ST 2 STOP NPR'S L
(To DATA 3 to disable NPR's)
BUS 2 0 → NPR H
DRIVE ERROR (hardware error in drive)
DISK 3 DRE (1) H
DR BUS DC LOL
(This signal will cause all drives on the bus to retract heads)
ST 4 RII H
DISK 2 DRIVE OK H
ST 2 NEW FUN H
ST 2 NXD (1) H
NON-EXISTANT DRIVE
FIRST USED ON OPTION/MODEL RK11-D
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS ANGLES
REMOVE BURRS AND BREAK SHARP CORNERS
MATERIAL
FINISH
NEXT HIGHER ASSY B-DD-RK11-D
SCALE NONE
SHEET 4 OF
digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
TITLE STATUS CONTROL (ST 2)
SIZE D CODE CS NUMBER M7254-0-1 REV F



WORD COUNT REGISTER
(# of NPR transfers)
INTERNAL WORD COUNT REGISTER
(# of words transferred to/from disk)
BUS 4 BUS D 15 (1) H
BUS 4 BUS D 14 (1) H
BUS 4 BUS D 13 (1) H
BUS 4 BUS D 12 (1) H
BUS 4 BUS D 11 (1) H
BUS 4 BUS D 10 (1) H
BUS 4 BUS D Ø9 (1) H
BUS 4 BUS D Ø8 (1) H
BUS 1 LOAD RKWC HI L
BUS 4 BUS D Ø7 (1) H
BUS 4 BUS D Ø6 (1) H
BUS 4 BUS D Ø5 (1) H
BUS 4 BUS D Ø4 (1) H
BUS 4 BUS D Ø3 (1) H
BUS 4 BUS D Ø2 (1) H
BUS 4 BUS D Ø1 (1) H
BUS 4 BUS D ØØ (1) H
ST2 INIT H
BUS 1 LOAD RKWC LO L
BUS 2 Ø → NPR H
ST 3 RD CHK H
ST 3 DATA (1) H
ST 3 LAST BIT H
DISK 4 CLK H
ST 3 LAST BIT CLK H
ST 3 WC 15 (1) H
ST 3 WC 14 (1) H
ST 3 WC 13 (1) H
ST 3 WC 12 (1) H
ST 3 WC 11 (1) H
ST 3 WC 10 (1) H
ST 3 WC Ø9 (1) H
ST 3 WC Ø8 (1) H
ST 3 LAST BIT H
ST 3 WC Ø7 (1) H
ST 3 WC Ø6 (1) H
ST 3 WC Ø5 (1) H
ST 3 WC Ø4 (1) H
ST 3 WC Ø3 (1) H
ST 3 WC Ø2 (1) H
ST 3 WC Ø1 (1) H
ST 3 WC ØØ (1) H
ST 3 1 → WC OVF L
(To sht. DATA 3)
ST 3 R13 H
ST 3 DATA OVF H
74193 E40
74193 E27
74193 E28
74193 E21
74161 E24 IWC
74161 E19 IWC
74161 E12 BC BIT CNTR. DØ (16 bits)
7474 E7
SEE NOTE 2
SEE NOTE 1
ST 3 LAST BIT H
18 bit count for RK11-E
DISK 4 CLK L
ST4B FUN Ø (1) H
ST4B FUN 1 (1) H
ST4B FUN 2 (1) H
ST 3 PREAMBLE (1) H
15₈ word cntr to write sync bit at end of preamble
ST 3 DATA (1) H
ST 4 HEAD + CHK SUM H
ST2 BCNTRL RDY L
ST2 GEN CLR L
DISK 2 SECTOR PULSE L
ST 4 Ø → MSR H
ST 2 HE (1) H
DISK 4 CLK H
DISK 4 RD HEADER (1) H
ST 3 DATA OVF H
ST 3 PREAMBLE (1) H
DISK 4 SER RD DATA (1) H
ST 3 IDLE (1) L
ST 3 PREAMBLE H
ST 4 RISH
FUNCTION DECODER
7442 E43
ST 3 CONTROL RESET L
ST 3 WRITE H
ST 3 READ L
ST 3 READ H
ST 3 WT CHK L
ST 3 WT CHK H
ST 3 SEEK L
ST 3 RD CHK L
ST 3 RD CHK H
ST 3 DRIVE RESET L
ST 3 WT LOCK L
ST 3 WT LOCK H
ST 3 GEN DATA H
ST 3 END OF SYNC L
To sht. DK4
MAJOR STATE REGISTER
7496 E11
ST 3 POSTAMBLE (1) H
ST 3 CHECK SUM (1) H
ST 3 DATA (1) H
ST 3 HEADER (1) H
ST 3 PREAMBLE (1) H
ST 3 CLR MSR L
ST 3 IDLE (1) H
ST 3 IDLE (1) L
Note: Every time the major state register is shifted the pulse produced by E17-8 will clear the BIT COUNTER and INTERNAL WORD COUNTER by loading them with zeroes.

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.
RK11-D		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

DIGITAL EQUIPMENT CORPORATION, MAYNARD MASSACHUSETTS

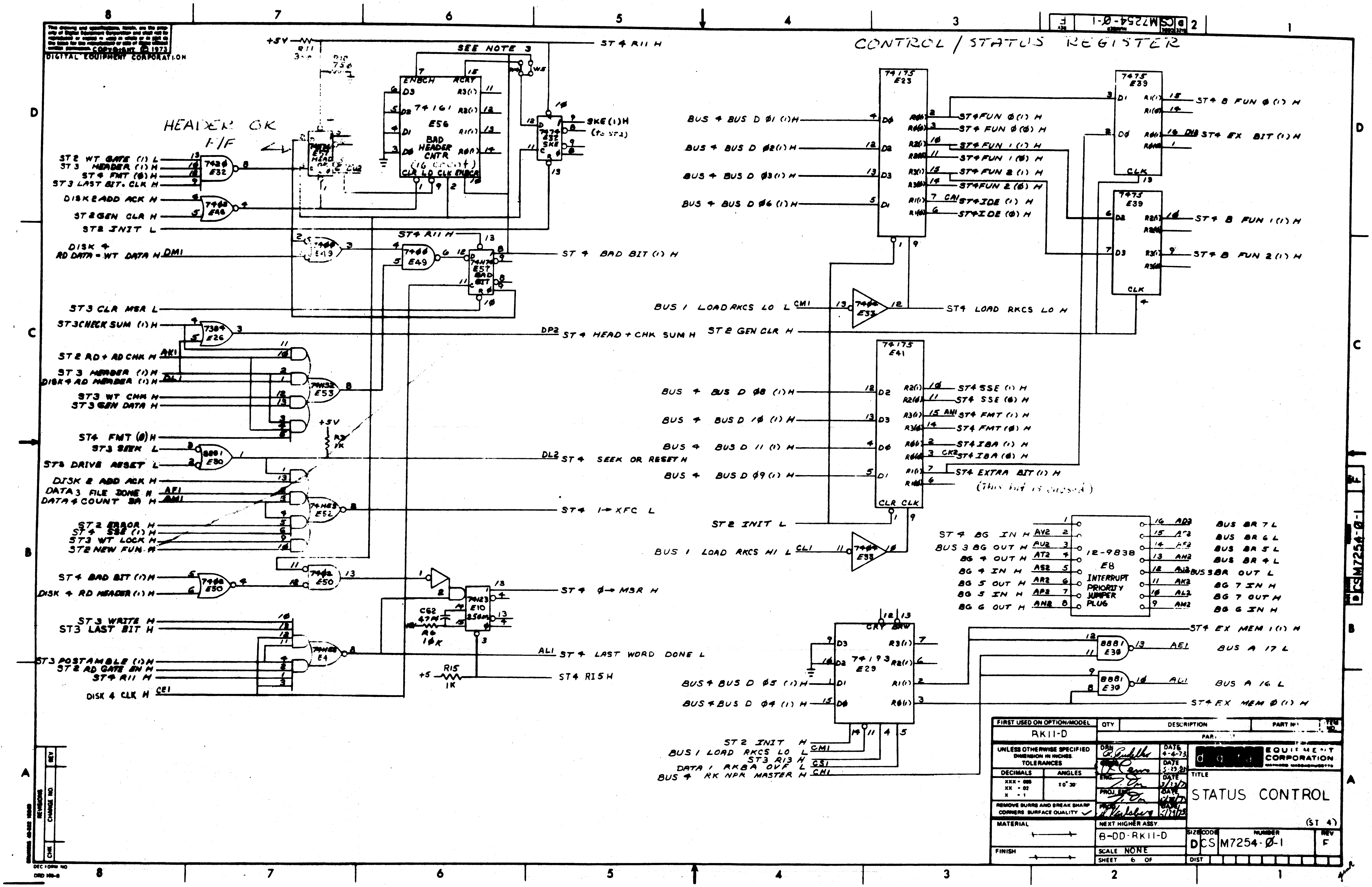
TITLE: STATUS CONTROL (ST 3)

NEXT HIGHER ASSY: B-DD-RK11-D

SIZE D, CODE CS, NUMBER M7254-Ø-1, REV F

SCALE: NONE

DEC FORM NO DRD 102-B


CONTROL / STATUS REGISTER
HEADER OK F/F
SEE NOTE 3
ST4 R11 H
ST2 WT GATE (1) L
ST3 HEADER (1) H
ST4 FMT (0) H
ST3 LAST BIT. CLK H
DISK2ADD ACK H
ST2GEN CLR H
ST2 INIT L
DISK 4 RD DATA = WT DATA H
ST4 BAD BIT (1) H
ST3 CLR MSR L
ST3CHECK SUM (1) H
ST4 HEAD + CHK SUM H
ST2 RD + RD CHK H
ST3 HEADER (1) H
DISK4 RD HEADER (1) H
ST3 WT CHK H
ST3 GEN DATA H
ST4 FMT (0) H
ST3 SEEK L
ST3 DRIVE RESET L
ST4 SEEK OR RESET H
DISK 2 ADD ACK H
DATA3 FILE DONE H
DATA4 COUNT BA H
ST4 1→XFC L
ST2 ERROR H
ST4 SSE (1) H
ST3 WT LOCK H
ST2 NEW FUN H
ST4 BAD BIT (1) H
DISK 4 RD HEADER (1) H
ST4 0→MSR H
ST3 WRITE H
ST3 LAST BIT H
ST3 POSTAMBLE (1) H
ST2 RD GATE EN H
ST4 R11 H
DISK 4 CLK H
ST4 LAST WORD DONE L
ST4 R15 H
BAD HEADER CNTR
BUS 4 BUS D 01 (1) H
BUS 4 BUS D 02 (1) H
BUS 4 BUS D 03 (1) H
BUS 4 BUS D 06 (1) H
ST4 FUN 0 (1) H
ST4 FUN 0 (0) H
ST4 FUN 1 (1) H
ST4 FUN 1 (0) H
ST4 FUN 2 (1) H
ST4 FUN 2 (0) H
ST4 IDE (1) H
ST4 IDE (0) H
ST4 B FUN 0 (1) H
ST4 EX BIT (1) H
ST4 B FUN 1 (1) H
ST4 B FUN 2 (1) H
BUS 1 LOAD RKCS LO L
ST4 LOAD RKCS LO H
ST2 GEN CLR H
BUS 4 BUS D 08 (1) H
BUS 4 BUS D 10 (1) H
BUS 4 BUS D 11 (1) H
BUS 4 BUS D 09 (1) H
ST4 SSE (1) H
ST4 SSE (0) H
ST4 FMT (1) H
ST4 FMT (0) H
ST4 IBA (1) H
ST4 IBA (0) H
ST4 EXTRA BIT (1) H
ST2 INIT L
BUS 1 LOAD RKCS HI L
ST4 BG IN H
BUS 3 BG OUT H
BG 4 OUT H
BG 4 IN H
BG 5 OUT H
BG 5 IN H
BG 6 OUT H
12-9838 E8 INTERRUPT PRIORITY JUMPER PLUG
BUS BR 7 L
BUS BR 6 L
BUS BR 5 L
BUS BR 4 L
BUS 3 BR OUT L
BG 7 IN H
BG 7 OUT H
BG 6 IN H
ST4 EX MEM 1 (1) H
BUS A 17 L
BUS A 16 L
ST4 EX MEM 0 (1) H
BUS 4 BUS D 05 (1) H
BUS 4 BUS D 04 (1) H
ST2 INIT H
BUS 1 LOAD RKCS LO L
ST3 R13 H
DATA 1 RKBA OVF L
BUS 4 RK NPR MASTER H
FIRST USED ON OPTION/MODEL RK11-D
DIGITAL EQUIPMENT CORPORATION
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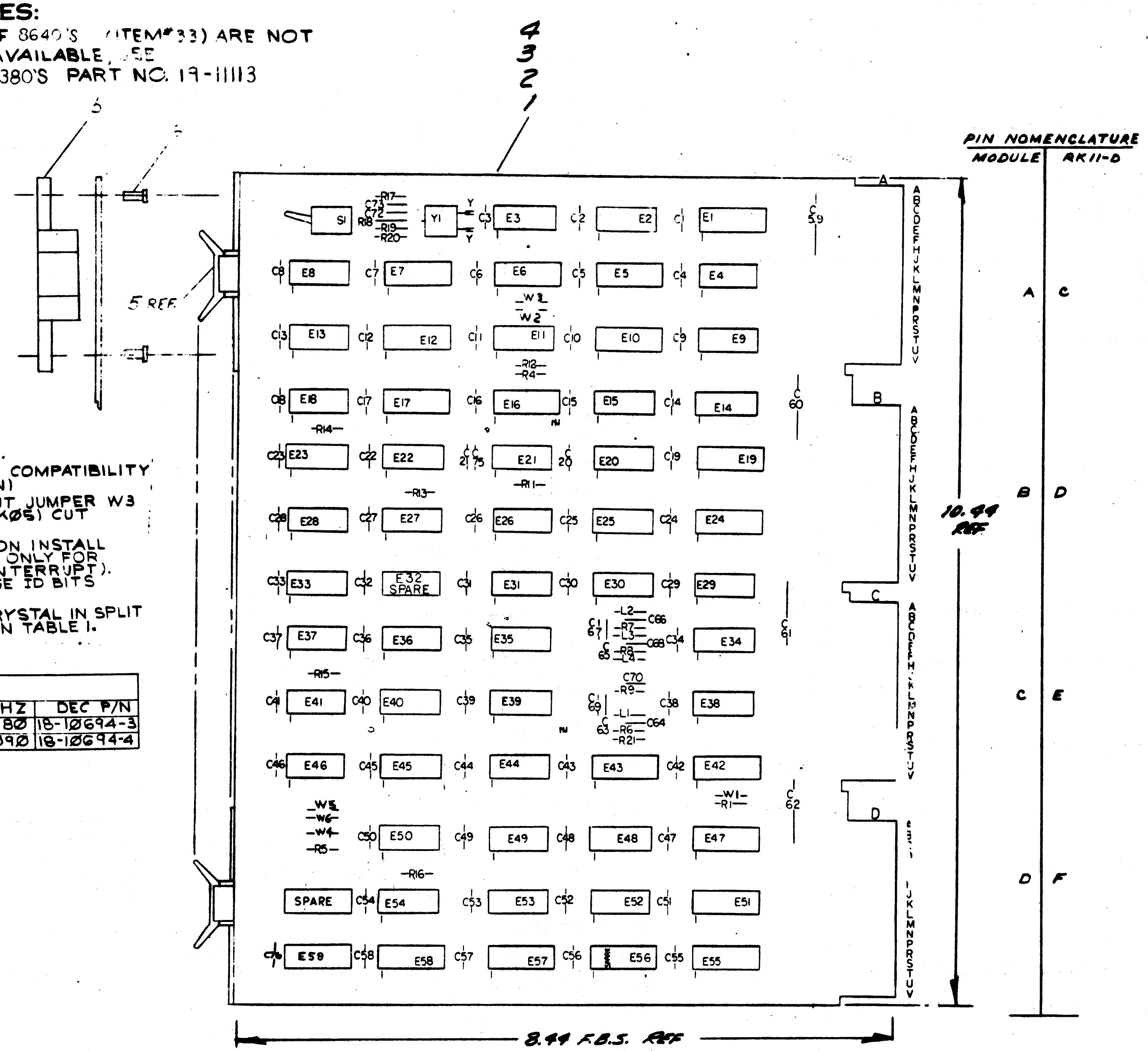
TITLE STATUS CONTROL (ST 4)
NEXT HIGHER ASSY B-DD-RK11-D
SCALE NONE
SHEET 6 OF
SIZE D CODE CS NUMBER M7254-0-1 REV F

NOTES:

1.) IF 8640'S (ITEM#33) ARE NOT AVAILABLE, USE 11380'S PART NO. 19-11113

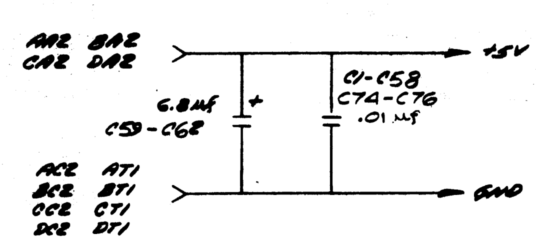


NOTES

1.) INSTALL W1 FOR RK05.
2.) CUT W4 FOR RK11-C COMPATIBILITY (NORMAL OPERATION)
3.) FOR RK11-D (RK05) CUT JUMPER W3 FOR RK11-E (18 BIT RK05) CUT JUMPER W2.
4.) FOR NORMAL OPERATION INSTALL W6 (CHANGES ID BITS ONLY FOR SEARCH COMPLETE INTERRUPT). INSTALL W5 TO CHANGE ID BITS FOR ANY INTERRUPT.
5.) INSTALL PROPER CRYSTAL IN SPLIT LUGS AS OUTLINED IN TABLE I.

TABLE I

	DISK	BITS/WORD	MHZ	DEC P/N
RK11-D	RK05	16	2.880	18-10694-3
RK11-E	RK05	18	3.090	18-10694-4



IC TYPE	GND	+ 5V
I.C. DEC 8640	1	8
I.C. DEC 7380	1	8
I.C. DEC 74193	8	16
I.C. DEC 74175	8	16
I.C. DEC 74161	8	16
I.C. DEC 74151	8	16
I.C. DEC 74157	8	16
I.C. DEC 7496	5	12
I.C. DEC 314	1	8
I.C. DEC 7482	11	4
I.C. DEC 74174	8	16
I.C. DEC 7476	5	13
I.C. DEC 7442	8	16
I.C. DEC 74123	8	16

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

IC PIN LOCATIONS

PARTS LIST

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM
3	W1, W2, W6	INSULATED JUMPER L2007-1	9009185	53
2		SPLIT LUGS	9006735	52
2		SWAGE LUGS	9007791	51
1	S1	SWITCH TOGGLE SPDT	1810209	50
4	L1-L4	INDUCTOR,100UH,165MA 10%	1610662	49
1	Y1	CRYSTAL (SEE TABLE I)		48
10	E11, E16, E22, E27, E41, E48, E49, E52-E54	I.C. DEC 7474	1905547	47
1	E50	I.C. DEC 74H04	1909931	46
2	E13, E46	I.C. DEC 7408	1910155	45
1	E59	I.C. DEC 314	1909704	44
1	E55	I.C. DEC 74161	1910650	43
1	E31	I.C. DEC 8815	1909718	42
1	E43	I.C. DEC 7442	1910096	41
1	E7	I.C. DEC 7476	1905585	40
1	E6	I.C. DEC 74174	1910652	39
1	E28	I.C. DEC 7482	1905584	38
1	E18	I.C. DEC 74H21	1909058	37
1	E36	I.C. DEC 74H30	1909060	36
1	E37	I.C. DEC 7450	1905580	35
1	E34	I.C. DEC 8242	1909718	34
6	E20, E21, E25, E29, E30, E38	I.C. DEC 8640	1911469	33
2	E12, E17	I.C. DEC 74193	1910018	32
2	E42, E47	I.C. DEC 74157	1910655	31
1	E57	I.C. DEC 74151	1909986	30
2	E51, E58	I.C. DEC 74175	1910651	29
1	E3	I.C. DEC 7380	1910390	28
5	E2, E4, E9, E14, E15	I.C. DEC 8881	1909705	27
				26
1	E35	I.C. DEC. 7420	1905577	25
3	E23, E39, E45	I.C. DEC 7410	1905576	24
3	E8, E40, E44	I.C. DEC 7400	1905575	23
2	E5, E10	I.C. DEC 7496	1910363	22
2	E26, E33	I.C. DEC 7404	1909886	21
7	R1, R4, R12, R13, R15, R16, R21	RES. 1K 1/4W 5%	1300265	20
1	R5	RES. 3K 1/4W 5%	[illegible]	19
4	R6 - R9	RES. 910Ω 1/4W 5%	[illegible]	18
2	R17, R18	RES. 10K 1/4W %	1300979	17
				16
2	R11, R14	RES. [illegible] Ω 1/4W [illegible]	1300[illegible]9	15
2	R19, R20	RES. 47[illegible] Ω 1/4W 5%	1300[illegible]	14
3	E1, E19, E24	RES. PACK	131100 01	13
2	C72, C73	CAP .005µf 100V 20%	1001765	12
4	C63, C65, C67, C69	CAP 270 PF 100V 5% DM	1000082	11
4	C64, C66, C68, C70	CAP. 39PF 100V 5% DM	1000010	10
60	C1-C58, C75, C76	CAP. .01µf 100V 20% AXIAL	1001610	9
4	C59 - C62	CAP. 6.8µf 35V 10% TANT	1003806	8
				7
8		EYELET (GS-4-7) THOMPSON	9006732	6
4		HANDLE FLIP-CHIP [illegible]	[illegible]8337-00	5
1		ETCHED CIRCUIT BOARD	5009986	4
REF		MODULE ECO HISTORY	[illegible]-M7255-0-6	3
REF		ASSY/DRILLING HOLE LAYOUT	D-AH-M7255-0-5	2
REF		X-Y COORDINATE HOLE LOCATION	ECO-M7255-0-4	1

PARTS LIST

FIRST USED ON OPTION MODEL: RK11-D

ETCH BOARD REV: F

SEMICONDUCTOR CONVERSION CHART

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

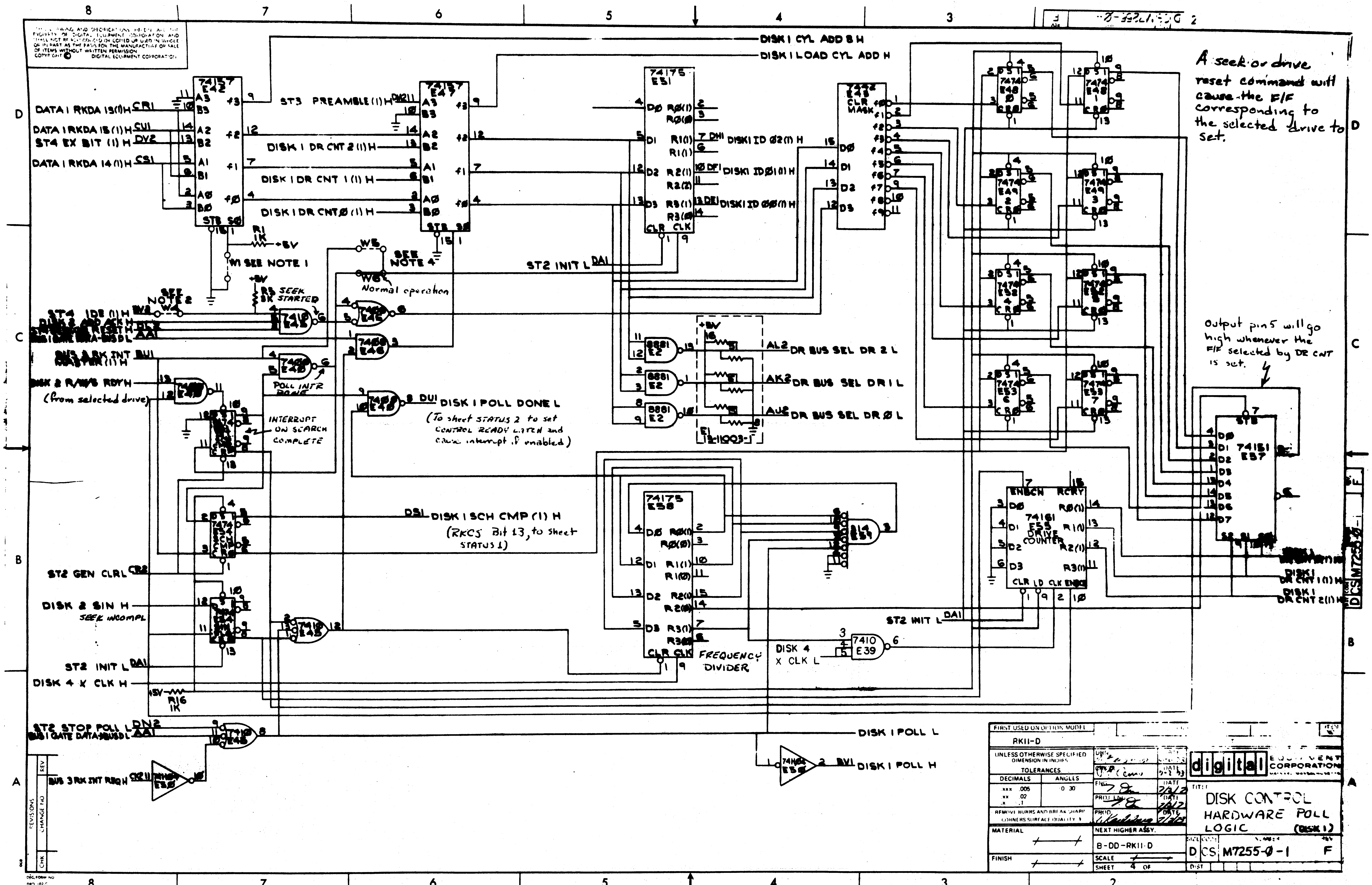
DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS

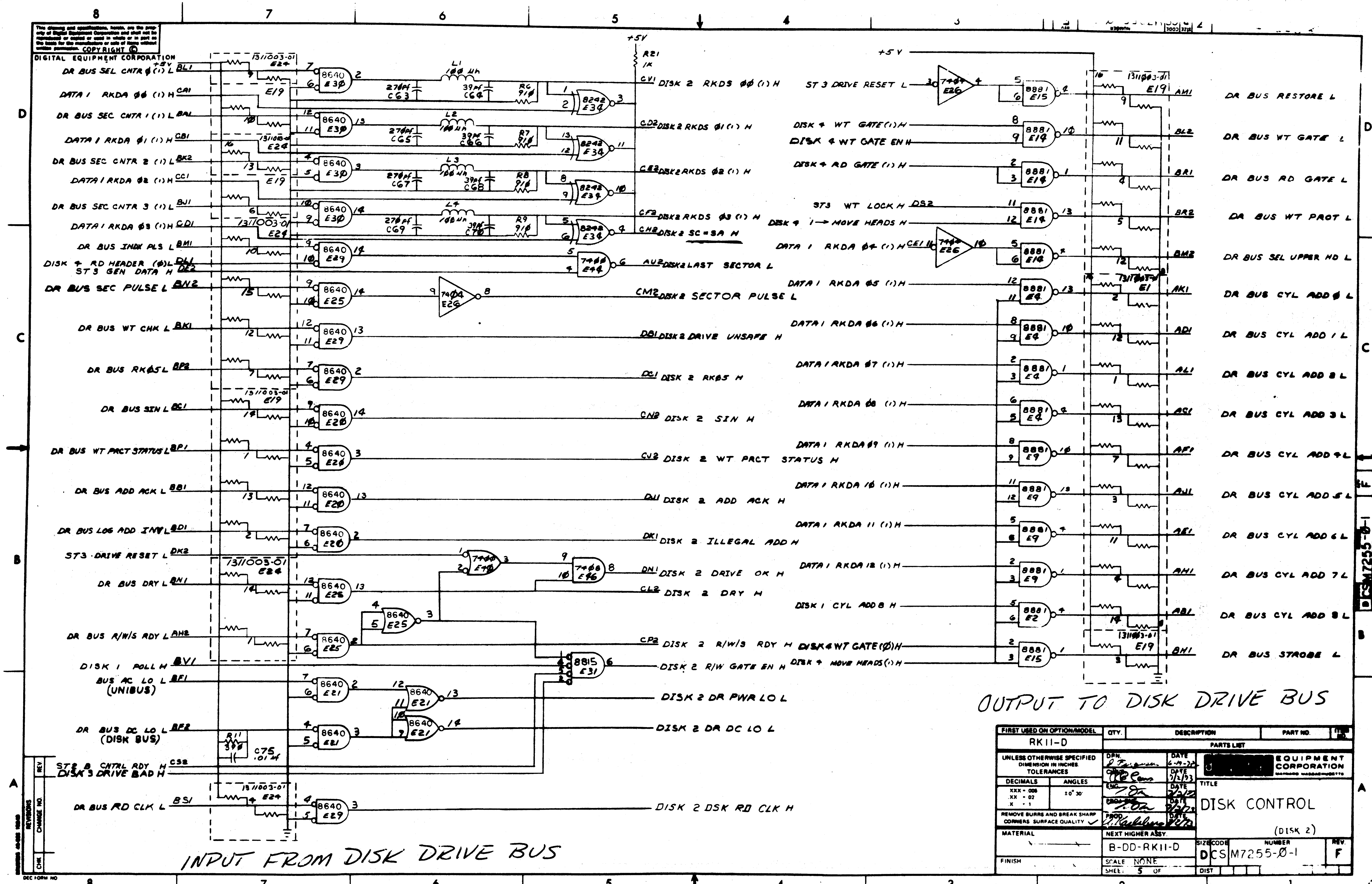
TITLE: DISK CONTROL RK11-D

NEXT HIGHER ASSY: B-DD-RK11-D

SIZE: D CODE: CS NUMBER: M7255-0-1 REV: H

SCALE: NONE SHEET 2 OF


DISK 1 CYL ADD 8 H
DISK 1 LOAD CYL ADD H
DATA 1 RKDA 13(1) H
DATA 1 RKDA 15(1) H
ST4 EX BIT (1) H
DATA 1 RKDA 14(1) H
ST3 PREAMBLE (1) H
DISK 1 DR CNT 2 (1) H
DISK 1 DR CNT 1 (1) H
DISK 1 DR CNT Ø (1) H
74157 E42
74157 E47
74175 E51
DISK1 ID Ø2(1) H
DISK1 IDØ(1) H
DISK1 ID ØØ(1) H
7442 E43 CLR MASK
A seek or drive reset command will cause the F/F corresponding to the selected drive to set.
W1 SEE NOTE 1
SEE NOTE 4
Normal operation
SEE NOTE 2
R5 SEEK STARTED
ST2 INIT L
DR BUS SEL DR 2 L
DR BUS SEL DR 1 L
DR BUS SEL DR Ø L
8881 E2
POLL INTR DONE
DISK 1 POLL DONE L
(To sheet STATUS 2 to set CONTROL READY LATCH and cause interrupt if enabled)
(from selected drive)
INTERRUPT ON SEARCH COMPLETE
Output pin 5 will go high whenever the F/F selected by DR CNT is set.
74151 E57
74161 E55 DRIVE COUNTER
DISK 1 SCH CMP (1) H
(RKCS Bit 13, to sheet STATUS 1)
74175 E58
FREQUENCY DIVIDER
ST2 GEN CLR L
DISK 2 SIN H
SEEK INCOMPL
ST2 INIT L
DISK 4 X CLK H
R16 1K
DISK 4 X CLK L
7410 E39
DISK 1 DR CNT 1 (1) H
DISK 1 DR CNT 2 (1) H
ST2 STOP POLL L
DISK 1 POLL L
DISK 1 POLL H
BUS 3 RK INT RQ H
FIRST USED ON OPTION MODEL
RK11-D
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES
TOLERANCES
DECIMALS
ANGLES
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY
MATERIAL
FINISH
NEXT HIGHER ASSY.
B-DD-RK11-D
SCALE
SHEET 4 OF
digital EQUIPMENT CORPORATION
DISK CONTROL HARDWARE POLL LOGIC (DISK 1)
D CS M7255-Ø-1 F



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DR BUS SEL CNTR Ø (1) L
DATA 1 RKDA ØØ (1) H
DR BUS SEC CNTR 1 (1) L
DATA 1 RKDA Ø1 (1) H
DR BUS SEC CNTR 2 (1) L
DATA 1 RKDA Ø2 (1) H
DR BUS SEC CNTR 3 (1) L
DATA 1 RKDA Ø3 (1) H
DR BUS INDX PLS L
DISK 4 RD HEADER (Ø) L
ST3 GEN DATA H
DR BUS SEC PULSE L
DR BUS WT CHK L
DR BUS RKØ5 L
DR BUS SIN L
DR BUS WT PRCT STATUS L
DR BUS ADD ACK L
DR BUS LOG ADD INV L
ST3 DRIVE RESET L
DR BUS DRY L
DR BUS R/W/S RDY L
DISK 1 POLL H
BUS AC LO L (UNIBUS)
DR BUS DC LO L (DISK BUS)
ST2 & CNTRL RDY H
DISK 3 DRIVE BAD H
DR BUS RD CLK L
DISK 2 RKDS ØØ (1) H
DISK 2 RKDS Ø1 (1) H
DISK 2 RKDS Ø2 (1) H
DISK 2 RKDS Ø3 (1) H
DISK 2 SC = SA H
DISK 2 LAST SECTOR L
DISK 2 SECTOR PULSE L
DISK 2 DRIVE UNSAFE H
DISK 2 RKØ5 H
DISK 2 SIN H
DISK 2 WT PRCT STATUS H
DISK 2 ADD ACK H
DISK 2 ILLEGAL ADD H
DISK 2 DRIVE OK H
DISK 2 DRY H
DISK 2 R/W/S RDY H
DISK 2 R/W GATE EN H
DISK 2 DR PWR LO L
DISK 2 DR DC LO L
DISK 2 DSK RD CLK H
ST3 DRIVE RESET L
DISK 4 WT GATE (1) H
DISK 4 WT GATE EN H
DISK 4 RD GATE (1) H
ST3 WT LOCK H
DISK 4 1 → MOVE HEADS H
DATA 1 RKDA Ø4 (1) H
DATA 1 RKDA Ø5 (1) H
DATA 1 RKDA Ø6 (1) H
DATA 1 RKDA Ø7 (1) H
DATA 1 RKDA Ø8 (1) H
DATA 1 RKDA Ø9 (1) H
DATA 1 RKDA 1Ø (1) H
DATA 1 RKDA 11 (1) H
DATA 1 RKDA 12 (1) H
DISK 1 CYL ADD 8 H
DISK 4 WT GATE (Ø) H
DISK 4 MOVE HEADS (1) H
DR BUS RESTORE L
DR BUS WT GATE L
DR BUS RD GATE L
DR BUS WT PROT L
DR BUS SEL UPPER HD L
DR BUS CYL ADD Ø L
DR BUS CYL ADD 1 L
DR BUS CYL ADD 2 L
DR BUS CYL ADD 3 L
DR BUS CYL ADD 4 L
DR BUS CYL ADD 5 L
DR BUS CYL ADD 6 L
DR BUS CYL ADD 7 L
DR BUS CYL ADD 8 L
DR BUS STROBE L
INPUT FROM DISK DRIVE BUS
OUTPUT TO DISK DRIVE BUS
FIRST USED ON OPTION/MODEL RK11-D
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES
DECIMALS XXX ± .005 XX ± .02 X ± .1
ANGLES ± 0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY
MATERIAL
FINISH
NEXT HIGHER ASSY. B-DD-RK11-D
SCALE NONE
SHEET 5 OF
PARTS LIST
EQUIPMENT CORPORATION
TITLE DISK CONTROL (DISK 2)
SIZE D CODE CS NUMBER M7255-Ø-1 REV. F
D CS M7255-Ø-1 F

+5V
R15
1K

DISK 3 DRIVE BAD H

DISK 2 DR PWR LO L
DISK 4 1→ MOVE HEADS H
ST 3 DRIVE RESET L
DISK 2 SIN H

7400 E44 | 7410 E39 | 7400 E44 | 7474 E41 DPL

DDI DISK 3 DPL (1) H
DRIVE POWER LOW

DISK 2 DR UNSAFE H
7404 E26

DISK 2 DRY H
DISK 2 DR DC LO L
ST2 XFER FUNCTION H CV2
ST 2 FIRST SEEK DONE H CU2
DISK 1 SIN FLAG (1) L

7428 E35 | 7410 E39 | 7428 E35

ST2 INIT L

7400 E44

DRL DISK 3 DRE (1) H

ST4 HEAD + CHK SUM H DPE
ST3 DATA (1) H
DATA 5 RKDB 00 (1) H ATB
ST3 WRITE H
ST2 RD GATE EN H
DISK 4 SER RD DATA (1) H

74H50 E36 | 7450 E37 | 7404 E33

DISK 3 WT DATA L

ST3 LAST BIT H DDE
7404 E33

CHECKSUM & CYL ADDR. REGS.

7496 E5 | 74174 E6

DATA 1 RKDA 05 (1) H CH1
DATA 1 RKDA 06 (1) H CH1
DATA 1 RKDA 07 (1) H CH1
DATA 1 RKDA 08 (1) H CK1

ADD 04 (1) H
ADD 05 (1) H
ADD 06 (1) H
ADD 07 (1) H
ADD 08 (1) H

ADD 00 (1) H
ADD 01 (1) H
ADD 02 (1) H
ADD 03 (1) H
ADD 14 (1) H
ADD 15 (1) H

7482 E28 ADDER

DISK 3 SUM OUT H

DISK 4 R23 H

7474 CRY E27

DISK4 CLK H
ST3 GEN DATA H
7400 E13

ST3 CLR MSA L

7496 E10

DATA 1 RKDA 09 (1) H CL1
DATA 1 RKDA 10 (1) H CM1
DATA 1 RKDA 11 (1) H CN1
DATA 1 RKDA 12 (1) H CP1
DISK 1 CYL ADDR H

ADD 09 (1) H
ADD 10 (1) H
ADD 11 (1) H
ADD 12 (1) H
ADD 13 (1) H

SEE NOTE 3
W2 W3
+5V
R12
1K

For RK11-E

7474 E10 ADD 17 | 7474 E11 ADD 14

ST2 GEN CLR L
DISK 1 LOAD CYL ADD H

ST3 DATA (1) H AS1
DISK 3 SUM OUT H
7400 E13

REV	CHANGE NO	REVISIONS
CHK		

DRAWING 40 533 1060
DEC FORM NO DRD 102-B

FIRST USED ON OPTION/MODEL	RK11-D
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	

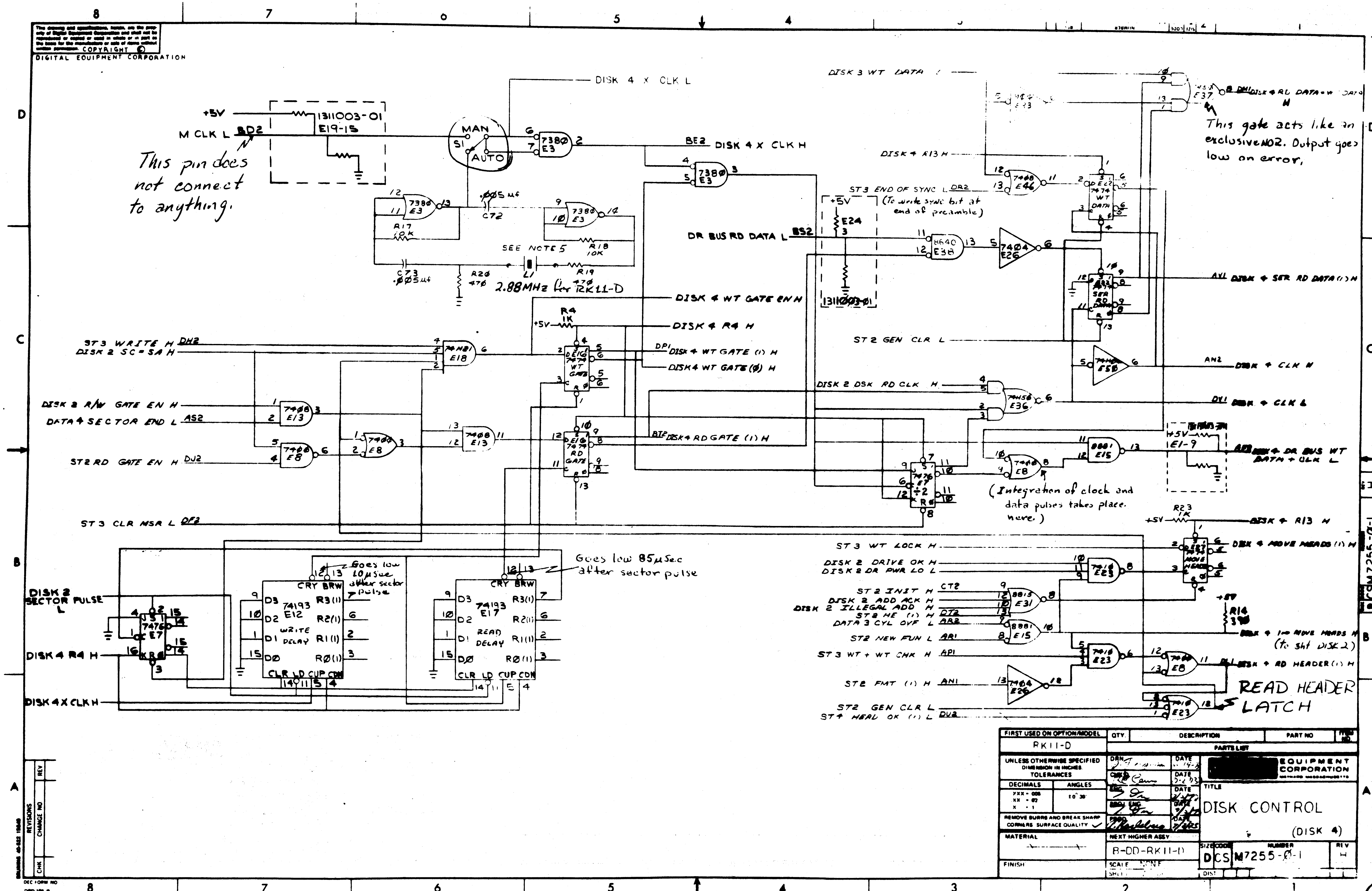
QTY | DESCRIPTION | NO | ITEM

DRN		DATE
CHKD Ric Pavia		DATE 12-2
ENG		DATE 7/80
PROJ ENG		DATE 7/80
PROD		DATE 7/81

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: DISK CONTROL (DISK 3)

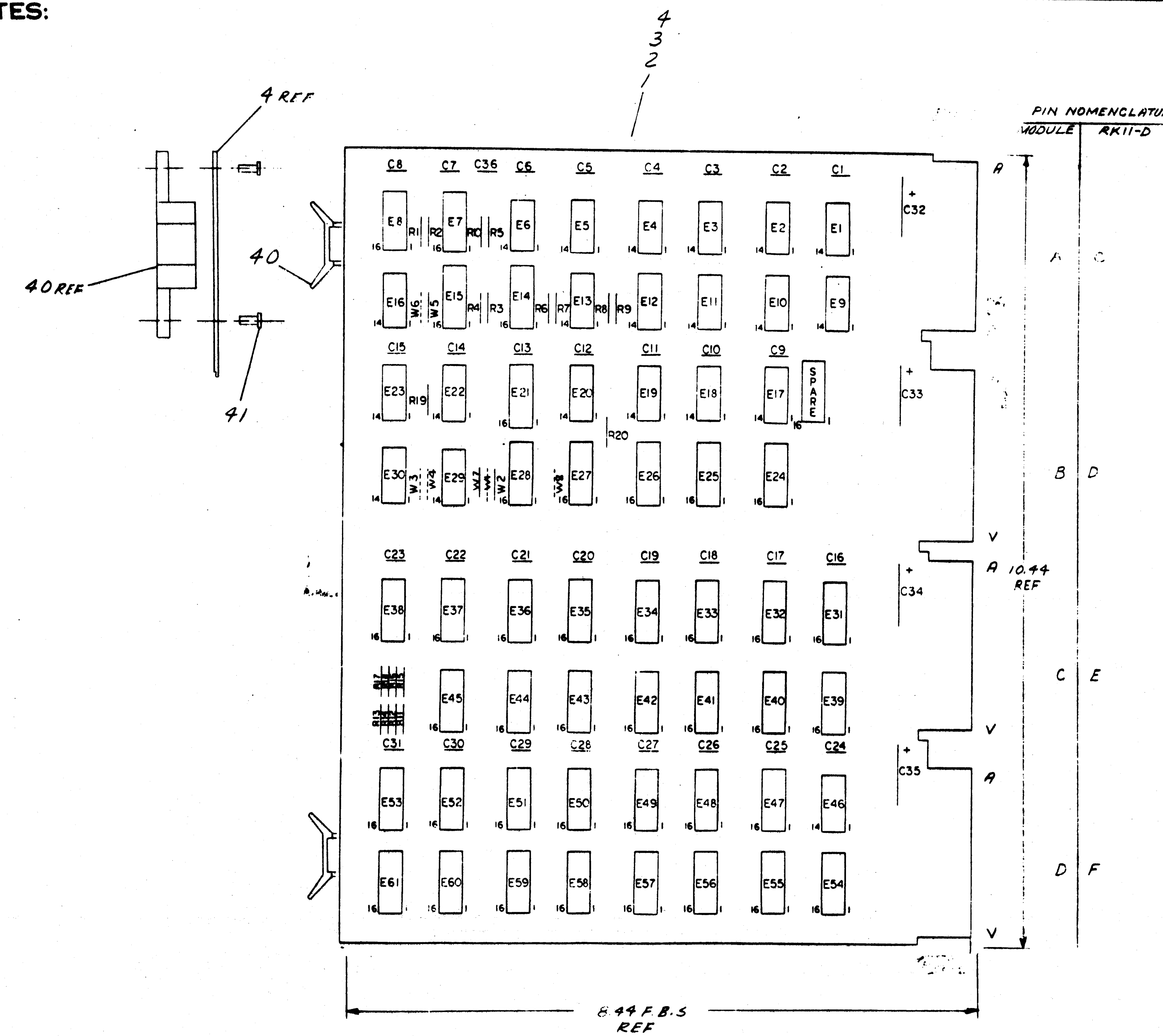
NEXT HIGHER ASSY	SIZE	CODE	NUMBER	REV
B-DD-RK11-D	D	DCS	M7255	D
SCALE NONE				
SHEET 6 OF	DIST			



COPYRIGHT © DIGITAL EQUIPMENT CORPORATION
DISK 4 X CLK L
+5V
1311003-01
E19-15
M CLK L BD2
MAN
S1
AUTO
7380 E3
BE2 DISK 4 X CLK H
This pin does not connect to anything.
.005 uf
C72
R17 10K
SEE NOTE 5
R18 10K
L1
R19 470
C73 .005uf
R20 470
2.88MHz for RK11-D
DISK 4 WT GATE EN H
R4 1K
DISK 4 R4 H
DISK 4 WT GATE (1) H
DISK4 WT GATE (0) H
ST3 WRITE H DH2
DISK 2 SC=SA H
74H21 E18
DISK 2 R/W GATE EN H
DATA 4 SECTOR END L AS2
7408 E13
7408 E8
ST2 RD GATE EN H DU2
7400 E8
7408 E13
E16 7474 WT GATE
E16 7474 RD GATE
DISK4 RD GATE (1) H
ST3 CLR MSR L DF2
DR BUS RD DATA L BS2
+5V
E24
1311003-01
8640 E38
7404 E26
DISK 3 WT DATA
E37
DISK 4 RD DATA H
This gate acts like an exclusive NOR. Output goes low on error.
DISK 4 R13 H
ST3 END OF SYNC L DR2
(To write sync bit at end of preamble)
7408 E46
E22 7474 WT DATA
E22 SER RD DATA
DISK 4 SER RD DATA (1) H
ST2 GEN CLR L
7404 E50
DISK 4 CLK H
DISK 4 CLK L
DISK 2 DSK RD CLK H
74H50 E36
8881 E15
+5V
E1-9
DISK 4 DR BUS WT DATA + CLK L
7400 E8
(Integration of clock and data pulses takes place here.)
7476 E7 ÷2
R23 1K
ST3 WT LOCK H
DISK 2 DRIVE OK H
DISK 2 DR PWR LO L
7410 E23
E27 MOVE HEADS
DISK 4 MOVE HEADS (1) H
ST2 INIT H CT2
DISK 2 ADD ACK H
DISK 2 ILLEGAL ADD H
ST2 HE (1) H DT2
DATA 3 CYL OVF L AR2
ST2 NEW FUN L AR1
8881 E31
8881 E15
R14 390
DISK 4 1 = MOVE HEADS H
(to sht DISK 2)
ST3 WT + WT CHK H AP1
7410 E23
7400 E8
DISK 4 RD HEADER (1) H
ST2 FMT (1) H AN1
7404 E26
ST2 GEN CLR L
ST4 HEAD OK (1) L DU2
7410 E23
READ HEADER LATCH
Goes low 10μSec after sector pulse
Goes low 85μSec after sector pulse
DISK 2 SECTOR PULSE L
7476 E7
DISK 4 R4 H
DISK4XCLKH
74193 E12 WRITE DELAY
74193 E17 READ DELAY
CRY BRW
D3 D2 D1 D0
R3(1) R2(1) R1(1) R0(1)
CLR LD CUP CDN
FIRST USED ON OPTION/MODEL RK11-D
QTY DESCRIPTION PART NO
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS ANGLES
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY
MATERIAL
FINISH
NEXT HIGHER ASSY B-DD-RK11-D
EQUIPMENT CORPORATION
TITLE DISK CONTROL (DISK 4)
SIZE D CODE CS NUMBER M7255-0-1 REV H
REVISIONS

NOTES:

* DEC 8640'S WERE PHASED IN AS [illegible] REPLACEM[illegible]



AA2,BA2,CA2,DA2 +5V — C1-C31 .01 UF — C32-C35 6.8 UF
AC2 AT1
BC2 BT1
CC2 CT1
DC2 DT1

DEC 4007	8	16
DEC 7473	11	4
DEC 74170	8	16
DEC 74193	8	16
DEC 74161	8	16
DEC 74157	8	16
DEC 74153	8	16
DEC 8271	8	16
DEC 8640	1	8
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
1	R6	5.6K 1/4 W [illegible] CC	[illegible]187[illegible]	43
3	W2, W5, W7	INSULATED JUMPER L-20 [illegible]	9009185	42
8		EYELET [illegible] STIMPS [illegible]	[illegible]732	41
4		HANDLE, FLIP CHIP MAGEN. A	[illegible]08337-6	40
4	E52, E53, E60, E61	I.C. DEC 74157	1910655	39
8	E48-E51, E56-E59	I.C. DEC 74153	1909937	38
1	E46	I.C. DEC [illegible] DC	[illegible]9490	37
1	E38	DIP RESISTOR PACK	1311003-02	36
5	E33-E37	I.C. DEC 74170	19[illegible]38	35
7	E31, E32, E39, E40, E47, E54, E55	I.C. DEC 74193	1910018	34
1	E30	I.C. DEC [illegible]	[illegible]469	33
10	E24-E28, E41-E45	I.C. DEC 8271	1909615	32
1	E23	I.C. DEC 8881	1909705	31
2	E22, E29	I.C. DEC 7473	1905587	30
1	E21	I.C. DEC 4007	1909867	29
1	E18	I.C. DEC 744[illegible]	[illegible]9058	28
1	E17	I.C. DEC 7437	1910091	27
1	E13	I.C. DEC 7413	[illegible]9255	26
1	E12	I.C. DEC 7400	1905575	25
4	E11, E16, E19, E20	I.C. DEC 7474	1905547	24
1	E10	I.C. DEC 74H10	[illegible]9057	23
1	E9	I.C. DEC 74H55	1909063	22
1	E8	I.C. DEC 74161	1910[illegible]50	21
3	E7, E14, E15	I.C. DEC 74123	1910436	20
1	E5	I.C. DEC 74H74	1909667	19
2	E4, E6	I.C. DEC 74H50	1909[illegible]60	18
1	E3	I.C. DEC 7402	1909004	17
1	E2	I.C. DEC 74H04	1909931	16
1	E1	I.C. DEC 7408	1910155	15
4	R15-R18	RES. 680Ω 1/4W 5% CC	1301424	14
4	R11-R14	RES 330Ω 1/4W 5% CC	1300395	13
1	R10	RES. 20K 1/4W 5% CC	1302391	12
4	R8, R9, R19, R20	RES. 1K 1/4W 5% CC	1300365	11
4	R3-R5, R7	RES 5.11K 1/4W 1% MF	130[illegible]54	10
1	R2	RES. 390Ω 1/4W 5% CC	130[illegible]	9
1	R1	RES. 180Ω 1/4W 5% CC	13[illegible]322	8
1	C36	CAP 150PF 100V 5% D.M.	1000019	7
4	C32-C35	CAP. 6.8 UF 35V 20% TANT	100[illegible]	6
31	C1-C31	CAP. .01 UF 100V 20% DISC	[illegible]	5
1		ETCHED CIRCUIT BOARD	[illegible]	4
REF		MODULE ECO HISTORY	B-MH-M7256-0-6	3
REF		ASSY/DRILLING HOLE LAYOUT	D-AA-M7256-0-5	2
REF		X-Y COORDINATE HOLE LOCATION	[illegible]-M7256-0-4	1

PARTS LIST

FIRST USED ON OPTION MODEL: RK11-D

ETCH BOARD REV: D

CHANGE NO	REVISIONS	CHK

SEMICONDUCTOR CONVERSION CHART

DEC NO	EIA NO	DEC NO	EIA NO

DRN. [signature] DATE 4-20-72
CHK'D. DATE
ENG. DATE
PROJ ENG. DATE
PROD. DATE
NEXT HIGHER ASSY

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

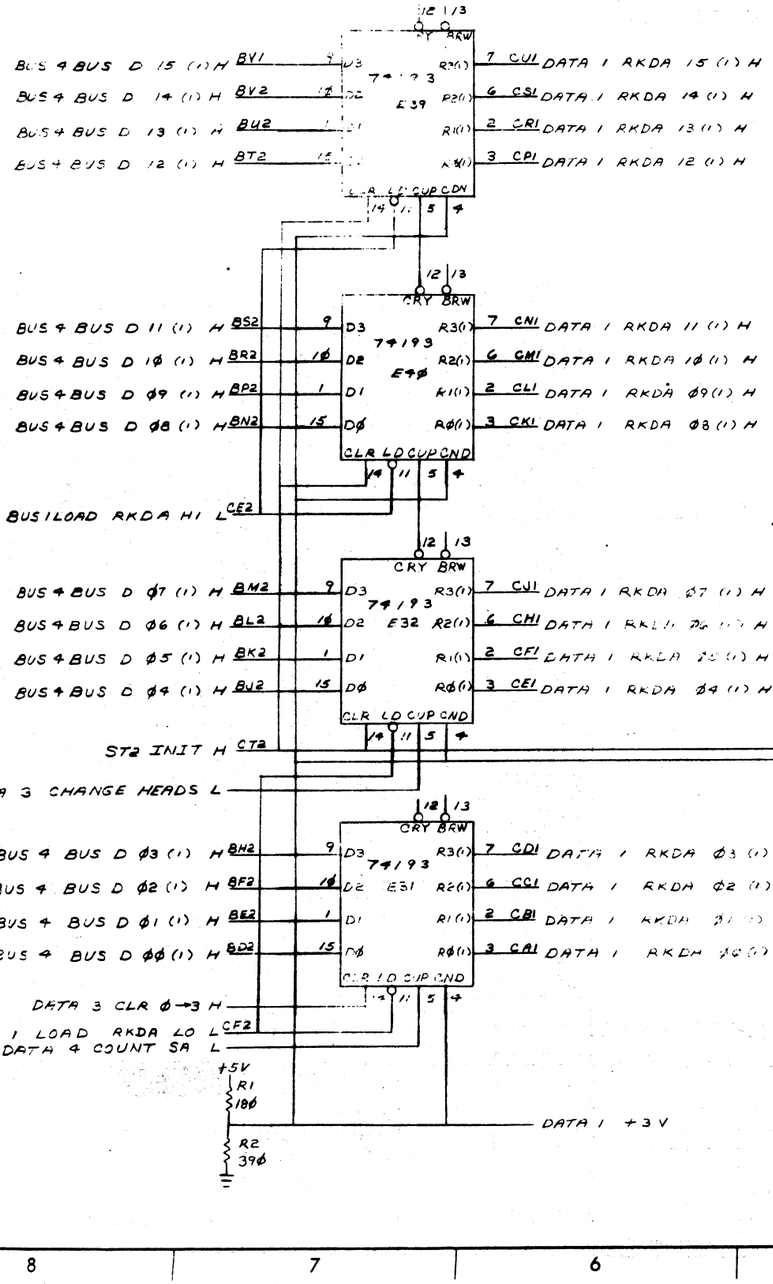
TITLE

SIZE D CODE CS NUMBER M7256 0-1 REV E

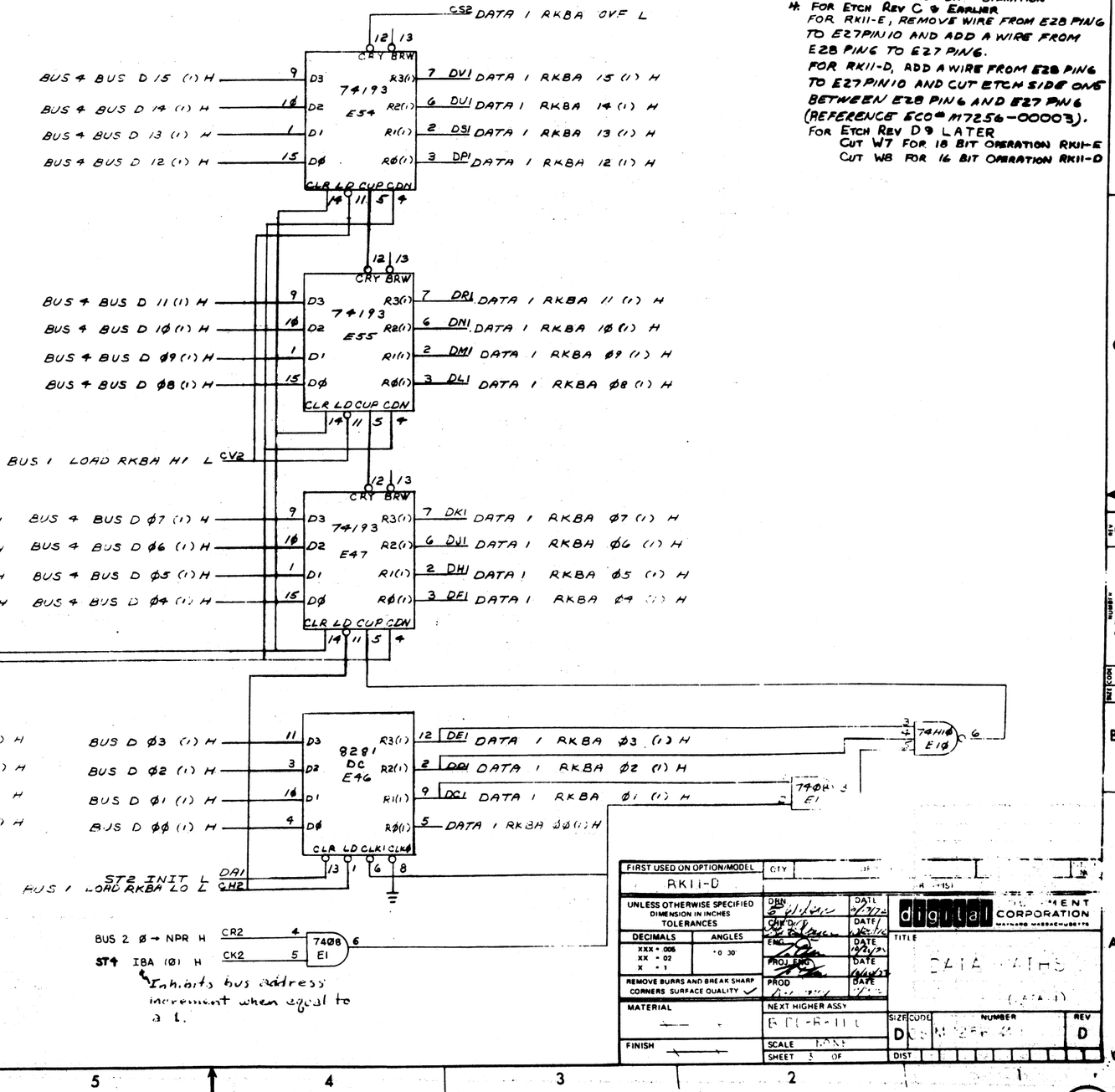
SHEET

DEC FORM NO DRD 135A

DISK ADDRESS REGISTER



BUS ADDRESS REGISTER



NOTES:
1. CUT W1 FOR 16 BIT OPERATION (RK11-D)
   CUT W2 FOR 18 BIT OPERATION (RK11-E)
2. CUT W3+W4 FOR 18 BIT OPERATION
3. CUT W5 FOR 18 BIT OPERATION
   CUT W6 FOR 16 BIT OPERATION
4. FOR ETCH REV C & EARLIER
   FOR RK11-E, REMOVE WIRE FROM E28 PIN6 TO E27 PIN10 AND ADD A WIRE FROM E28 PIN6 TO E27 PIN6.
   FOR RK11-D, ADD A WIRE FROM E28 PIN6 TO E27 PIN10 AND CUT ETCH SIDE ONE BETWEEN E28 PIN6 AND E27 PIN6 (REFERENCE ECO# M7256-00003).
   FOR ETCH REV D & LATER
   CUT W7 FOR 18 BIT OPERATION RK11-E
   CUT W8 FOR 16 BIT OPERATION RK11-D

FIRST USED ON OPTION/MODEL	RK11-D	CITY	
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES		DRN	DATE 9/27/72
DECIMALS	ANGLES	CHK	DATE
XXX ± .005 XX ± .02 X ± .1	± 0 30'	ENG	DATE 10/2/72
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY		PROJ ENG	DATE
MATERIAL		PROD	DATE
FINISH		NEXT HIGHER ASSY	
		SCALE NONE	SIZE D
		SHEET 3 OF	DIST

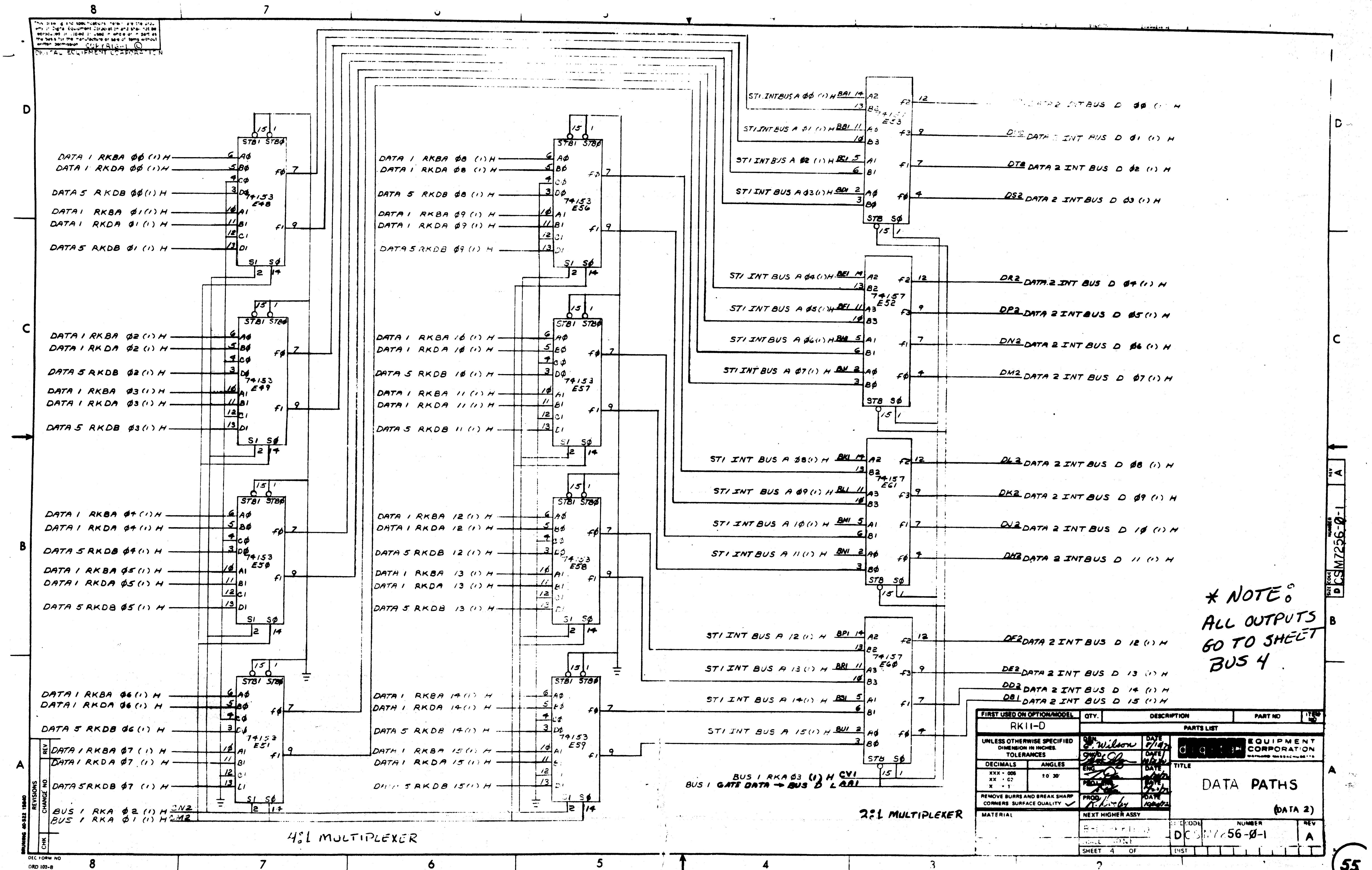
digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: DATA PATHS (DATA 1)

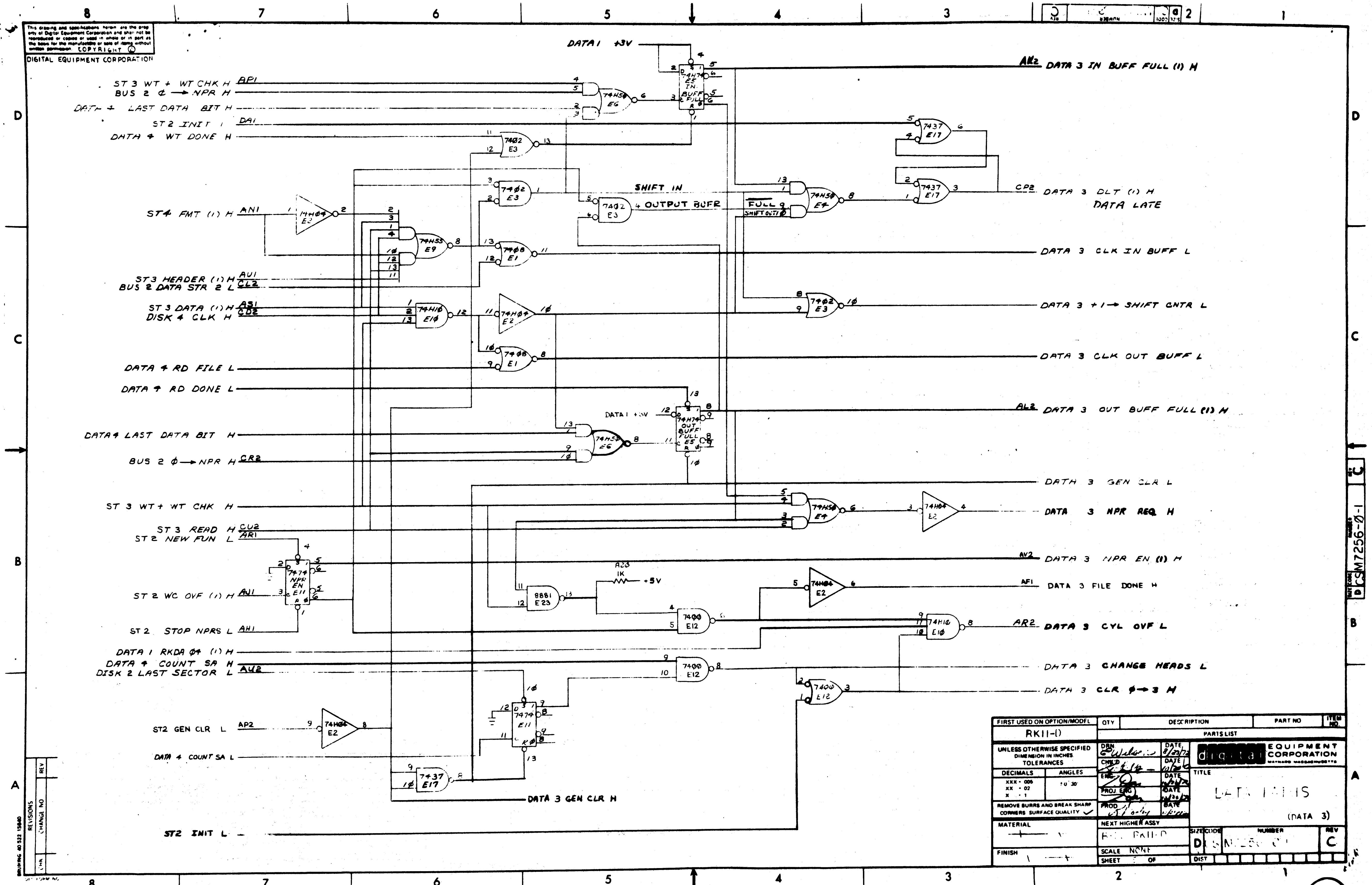
CODE | NUMBER | REV: D

REVISIONS: REV | CHANGE NO | CHK

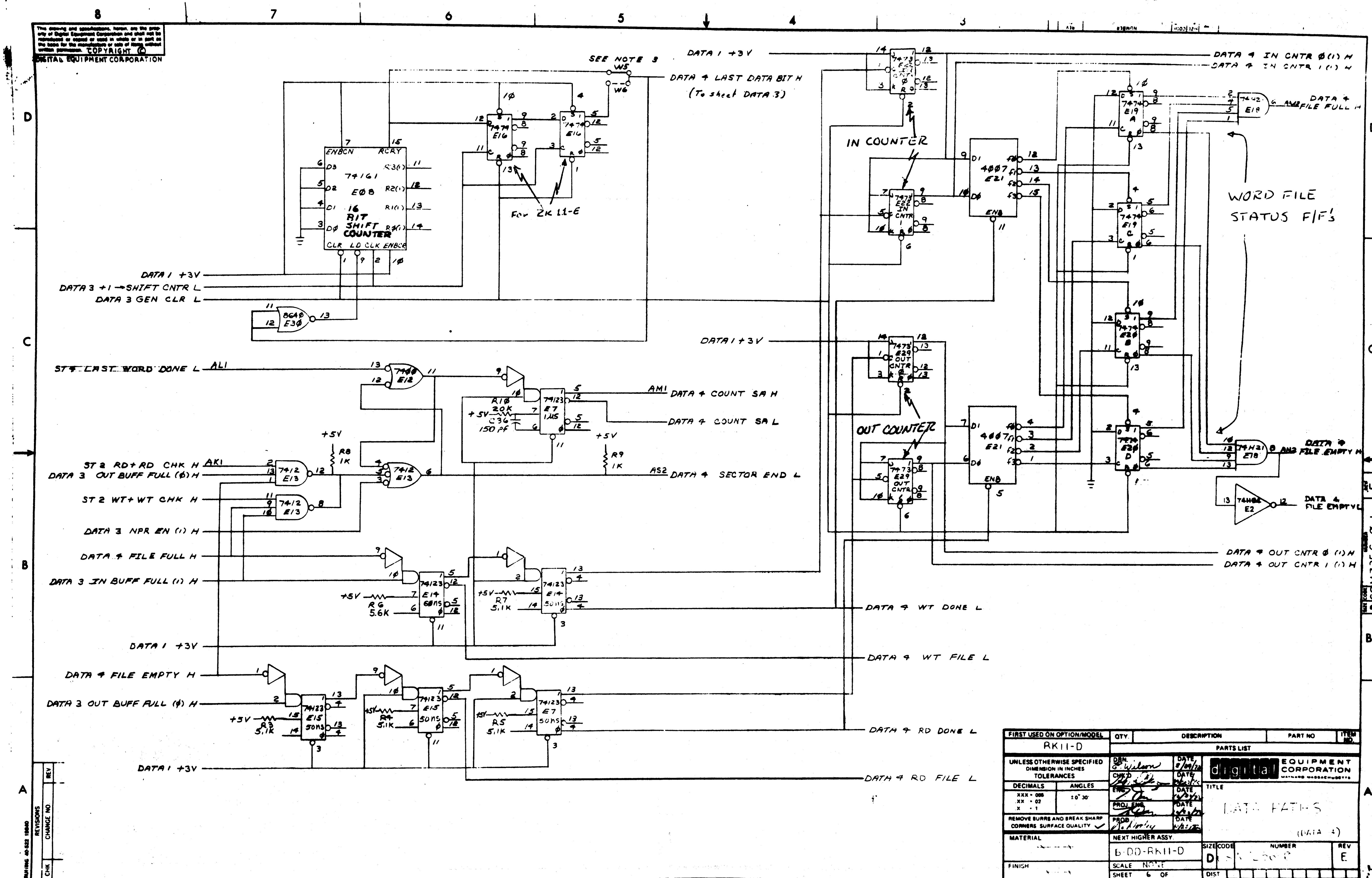
DRAWING 40-522 15460

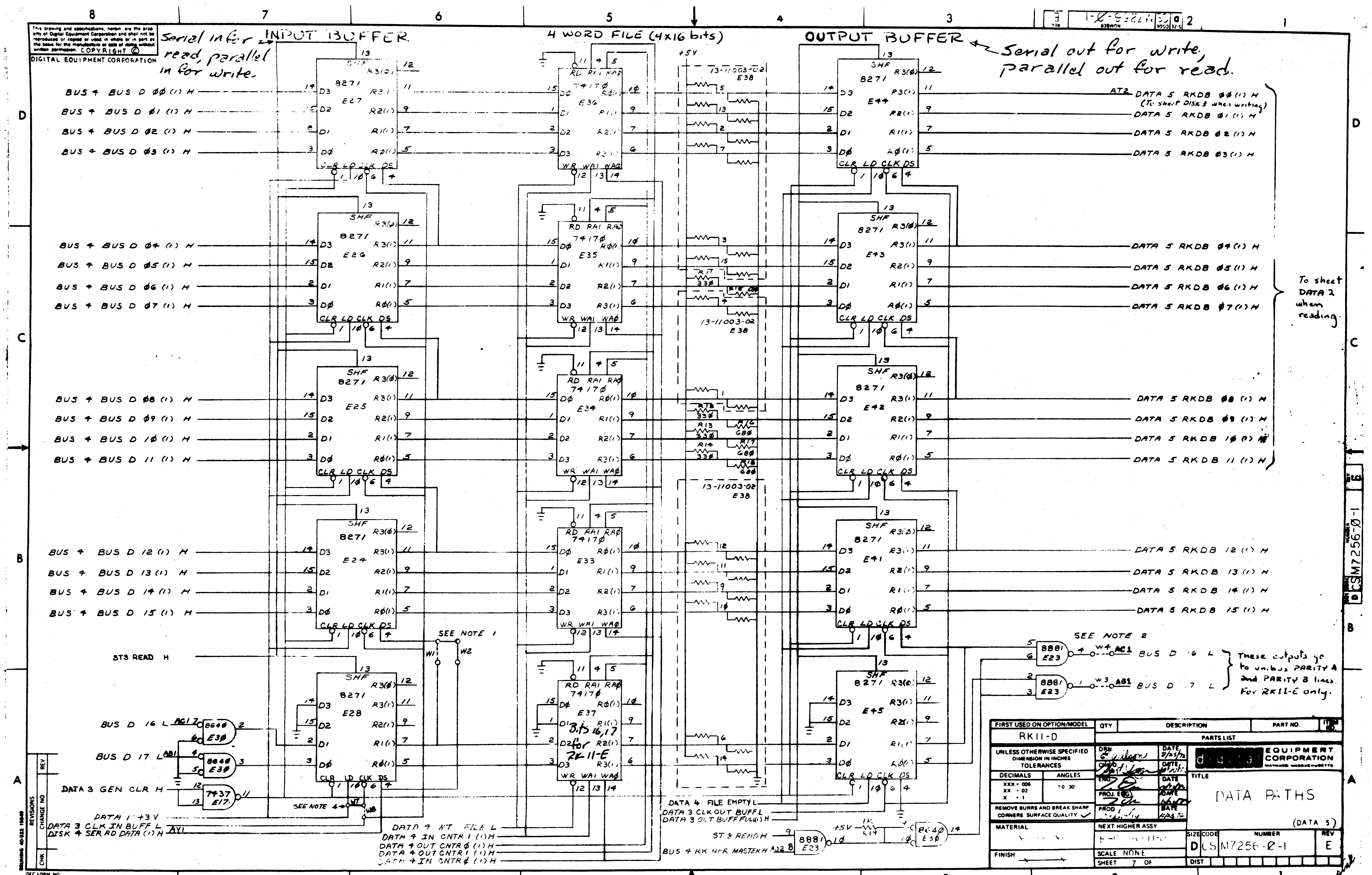


74153 E48
74153 E49
74153 E50
74153 E51
74153 E56
74153 E57
74153 E58
74153 E59
74157 E53
74157 E52
74157 E61
74157 E60
DATA 1 RKBA ØØ (1) H
DATA 1 RKDA ØØ (1) H
DATA 5 RKDB ØØ (1) H
DATA 1 RKBA Ø1 (1) H
DATA 1 RKDA Ø1 (1) H
DATA 5 RKDB Ø1 (1) H
DATA 1 RKBA Ø8 (1) H
DATA 1 RKDA Ø8 (1) H
DATA 5 RKDB Ø8 (1) H
DATA 1 RKBA Ø9 (1) H
DATA 1 RKDA Ø9 (1) H
DATA 5 RKDB Ø9 (1) H
ST1 INT BUS A ØØ (1) H
ST1 INT BUS A Ø1 (1) H
ST1 INT BUS A Ø2 (1) H
ST1 INT BUS A Ø3 (1) H
DATA 2 INT BUS D ØØ (1) H
DATA 2 INT BUS D Ø1 (1) H
DATA 2 INT BUS D Ø2 (1) H
DATA 2 INT BUS D Ø3 (1) H
DATA 2 INT BUS D Ø4 (1) H
DATA 2 INT BUS D Ø5 (1) H
DATA 2 INT BUS D Ø6 (1) H
DATA 2 INT BUS D Ø7 (1) H
DATA 2 INT BUS D Ø8 (1) H
DATA 2 INT BUS D Ø9 (1) H
DATA 2 INT BUS D 1Ø (1) H
DATA 2 INT BUS D 11 (1) H
DATA 2 INT BUS D 12 (1) H
DATA 2 INT BUS D 13 (1) H
DATA 2 INT BUS D 14 (1) H
DATA 2 INT BUS D 15 (1) H
BUS 1 RKA Ø3 (1) H
BUS 1 GATE DATA → BUS D L
BUS 1 RKA Ø2 (1) H
BUS 1 RKA Ø1 (1) H
4:1 MULTIPLEXER
2:1 MULTIPLEXER
* NOTE:
ALL OUTPUTS GO TO SHEET BUS 4
RK11-D
DIGITAL EQUIPMENT CORPORATION
TITLE DATA PATHS (DATA 2)
D CS M7256-Ø-1
REV A
SHEET 4



DIGITAL EQUIPMENT CORPORATION
ST 3 WT + WT CHK H
BUS 2 Ø → NPR H
DATA 4 LAST DATA BIT H
ST 2 INIT L
DATA 4 WT DONE H
ST4 FMT (1) H
ST3 HEADER (1) H
BUS 2 DATA STR 2 L
ST 3 DATA (1) H
DISK 4 CLK H
DATA 4 RD FILE L
DATA 4 RD DONE L
DATA4 LAST DATA BIT H
BUS 2 Ø → NPR H
ST 3 WT + WT CHK H
ST 3 READ H
ST 2 NEW FUN L
ST 2 WC OVF (1) H
ST 2 STOP NPRS L
DATA 1 RKDA Ø4 (1) H
DATA 4 COUNT SA H
DISK 2 LAST SECTOR L
ST2 GEN CLR L
DATA 4 COUNT SA L
ST2 INIT L
DATA 1 +3V
SHIFT IN
OUTPUT BUFR
FULL
DATA 3 IN BUFF FULL (1) H
DATA 3 DLT (1) H
DATA LATE
DATA 3 CLK IN BUFF L
DATA 3 +1 → SHIFT CNTR L
DATA 3 CLK OUT BUFF L
DATA 3 OUT BUFF FULL (1) H
DATA 3 GEN CLR L
DATA 3 NPR REQ H
DATA 3 NPR EN (1) H
DATA 3 FILE DONE H
DATA 3 CYL OVF L
DATA 3 CHANGE HEADS L
DATA 3 CLR Ø → 3 H
DATA 3 GEN CLR H
R23 1K +5V
RK11-D
DATA PATHS
(DATA 3)
D CSM7256-Ø-1 C


COPYRIGHT © DIGITAL EQUIPMENT CORPORATION
SEE NOTE 3
W5
W6
DATA 4 LAST DATA BIT H
(To sheet DATA 3)
DATA 1 +3V
74161 E08 16 BIT SHIFT COUNTER
For RK11-E
DATA 3 +1 → SHIFT CNTR L
DATA 3 GEN CLR L
8640 E30
IN COUNTER
WORD FILE STATUS F/F'S
DATA 4 IN CNTR 0 (1) H
DATA 4 IN CNTR 1 (1) H
DATA 4 FILE FULL H
DATA 4 FILE EMPTY H
DATA 4 FILE EMPTY L
4007 E21
OUT COUNTER
ST 4 LAST WORD DONE L
DATA 4 COUNT SA H
DATA 4 COUNT SA L
DATA 4 SECTOR END L
ST 2 RD+RD CHK H
DATA 3 OUT BUFF FULL (0) H
ST 2 WT+WT CHK H
DATA 3 NPR EN (1) H
DATA 4 FILE FULL H
DATA 3 IN BUFF FULL (1) H
DATA 4 OUT CNTR 0 (1) H
DATA 4 OUT CNTR 1 (1) H
DATA 4 WT DONE L
DATA 4 WT FILE L
DATA 4 FILE EMPTY H
DATA 3 OUT BUFF FULL (0) H
DATA 4 RD DONE L
DATA 4 RD FILE L
RK11-D
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
TITLE DATA PATHS (DATA 4)
NEXT HIGHER ASSY D-DD-RK11-D
SCALE NONE
SHEET 6 OF
CS M7256-0-1
REV E

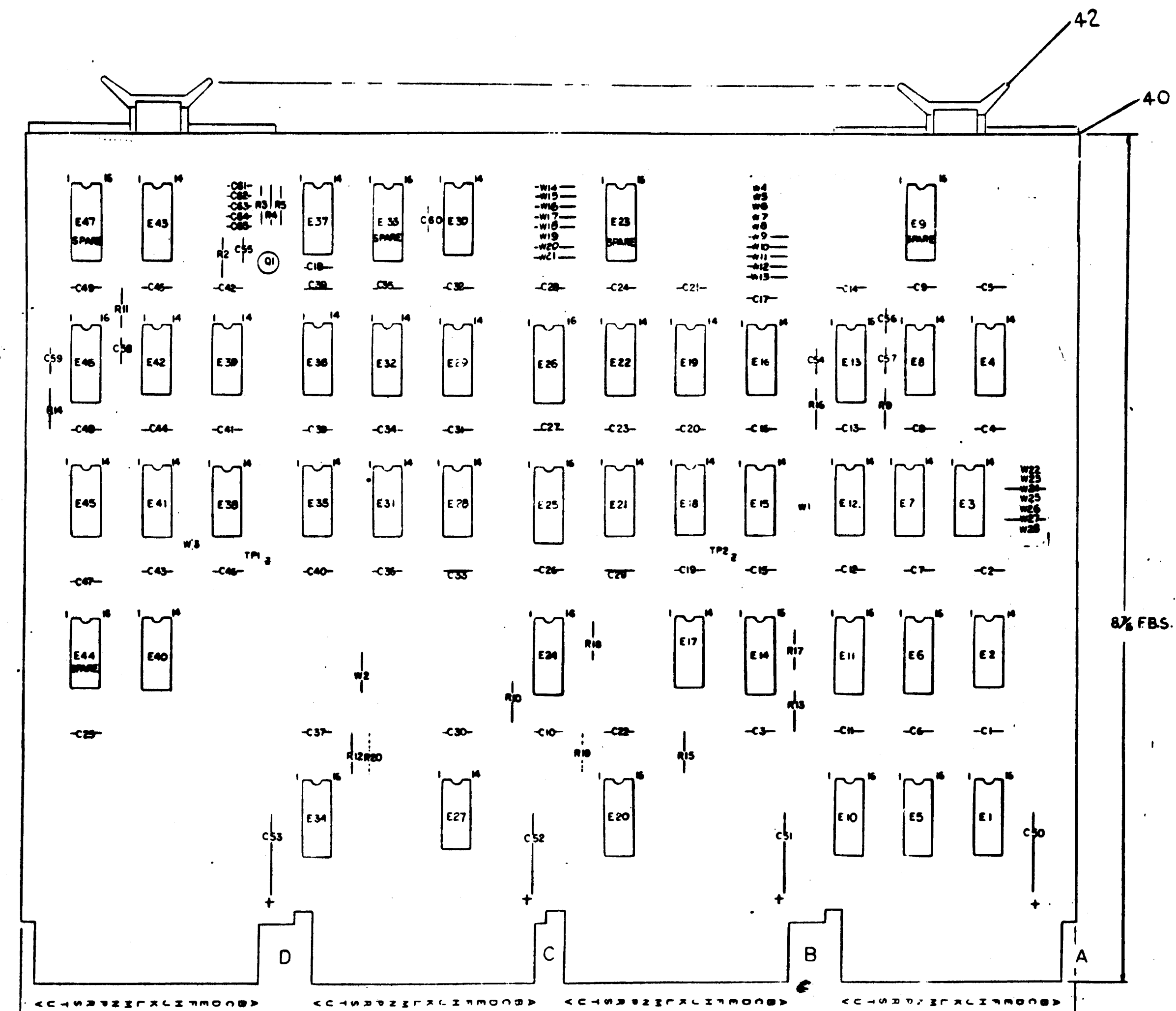


Serial in for read, parallel in for write.
INPUT BUFFER
4 WORD FILE (4x16 bits)
OUTPUT BUFFER
Serial out for write, parallel out for read.
BUS 4 BUS D ØØ (1) H
BUS 4 BUS D Ø1 (1) H
BUS 4 BUS D Ø2 (1) H
BUS 4 BUS D Ø3 (1) H
BUS 4 BUS D Ø4 (1) H
BUS 4 BUS D Ø5 (1) H
BUS 4 BUS D Ø6 (1) H
BUS 4 BUS D Ø7 (1) H
BUS 4 BUS D Ø8 (1) H
BUS 4 BUS D Ø9 (1) H
BUS 4 BUS D 1Ø (1) H
BUS 4 BUS D 11 (1) H
BUS 4 BUS D 12 (1) H
BUS 4 BUS D 13 (1) H
BUS 4 BUS D 14 (1) H
BUS 4 BUS D 15 (1) H
STS READ H
BUS D 16 L
BUS D 17 L
DATA 3 GEN CLR H
DATA 1 +3V
DATA 3 CLK IN BUFF L
DISK 4 SER RD DATA (1) H
SEE NOTE 1
SEE NOTE 4
8271
74170
E27
E26
E25
E24
E28
E36
E35
E34
E33
E37
E44
E43
E42
E41
E45
13-11003-02
E38
+5V
Bits 16,17 for RK11-E
DATA 4 INT FILE L
DATA 4 IN CNTR 1 (1) H
DATA 4 OUT CNTR Ø (1) H
DATA 4 OUT CNTR 1 (1) H
DATA 4 IN CNTR Ø (1) H
DATA 4 FILE EMPTY L
DATA 3 CLK OUT BUFF L
DATA 3 OUT BUFF FULL (1) H
ST 3 READ H
BUS 4 RK NPR MASTER H
DATA 5 RKDB ØØ (1) H
(To sheet DISK 3 when writing)
DATA 5 RKDB Ø1 (1) H
DATA 5 RKDB Ø2 (1) H
DATA 5 RKDB Ø3 (1) H
DATA 5 RKDB Ø4 (1) H
DATA 5 RKDB Ø5 (1) H
DATA 5 RKDB Ø6 (1) H
DATA 5 RKDB Ø7 (1) H
To sheet DATA 2 when reading.
DATA 5 RKDB Ø8 (1) H
DATA 5 RKDB Ø9 (1) H
DATA 5 RKDB 1Ø (1) H
DATA 5 RKDB 11 (1) H
DATA 5 RKDB 12 (1) H
DATA 5 RKDB 13 (1) H
DATA 5 RKDB 14 (1) H
DATA 5 RKDB 15 (1) H
SEE NOTE 2
BUS D 16 L
BUS D 17 L
These outputs go to unibus PARITY A and PARITY B lines. For RK11-E only.
FIRST USED ON OPTION/MODEL
RK11-D
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DIGITAL EQUIPMENT CORPORATION
TITLE
DATA PATHS
(DATA 5)
SIZE D
CS M7256-Ø-1
REV E
SCALE NONE
SHEET 7
COPYRIGHT DIGITAL EQUIPMENT CORPORATION

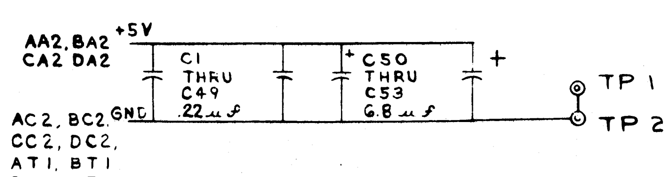
NOTES:

1. R19 AND R20 ARE OPTIONAL COMPONENTS DO NOT INSERT
2. W1, W3 THRU W8, W19, W22, W23, W25, W26 W28, ARE OPTIONAL JUMPERS. DO NOT INSERT.

* IF 8641'S ARE NOT AVAILABLE, USE 8888's, PART NO. 1911117-00.



PIN NOMENCLATURE				
MODULE	D	C	B	A
RK11-D	F	E	D	C



QTY	REF DESIGNATION	DESCRIPTION	PART NO	ITEM NO
REF		X-Y CORDINATE HOLE LOC.	K-CO-M7257-0-4	1
REF		ASSY/DRILLING HOLE LAYOUT	D-AH-M7257-0-5	2
REF		MODULE ECO HISTORY	B-MH-M7257-0-6	3
1		ETCHED CIRCUT BOARD	5009990	4
2	C58, C59	CAP 10 MMF 100V 5%	1000006	5
1	C54	CAF 270 MMF 100V 5%	1000022	6
2	C57, C60	CAP 330 MMF 100V 5%	1000023	7
1	C56	CAP 1200 MMF 100V 5%	1002424	8
49	C1 THRU C49	CAP .22 MF 50V 20%	1010274-01	9
4	C50 THRU C53	CAP 6.8 MFD 35V 10% TANT	1005306	10
5	C61 THRU C65	CAP 6.8 MMF 100V 5%	1000005	11
1	C55	CAP 27 MMF 100V 5%	1001739	12
1	Q1	TRANS DEC 3009B	1503100	13
3	R2, R3, R4,	RES. 330 1/4 W 5%	1300295	14
2	R10, R13	RES. 390 1/4 W 5%	1300309	15
1	R5	RES. 287 1/8 W, 1%	1305124	16
4	R12, R15, R17, R18	RES. 180 1/4 W 5%	1301322	17
1	R16	RES. 5.6K 1/4 W 5%	1301874	18
1	R9	RES. 4.7K 1/4 W 5%	1302177	19
2	R11, R14	RES. 5.11K 1/8 W 1%	1304854	20
				21
2	E16, E30	RES. 1K RESISTOR PACK	1300005-01	22
1	E19	I.C. 74H20	1905635	23
2	E22, E38	I.C. 7402	1909004	24
3	E18, E31, E37	I.C. 74H00	1909056	25
4	E40, E41, E42, E35	IC. 74H74	1909667	26
1	E2	IC. 314	1909704	27
4	E3, E4, E8, E27	IC. 8881	1909705	28
3	E7, E12, E15	IC. 8242	1909712	29
1	E21	IC. 74H04	1909931	30
1	E26	IC. 74151	1909936	31
2	E24, E25	IC. 7442	1910046	32
1	E28	IC. 7437	1910091	33
3	E36, E39, E45	IC. 7408	1910155	34
3	E29, E32, E43	IC. 74H103	1910409	35
2	E13, E46	IC. 74123	1910436	36
1	E17	IC 8640	1911469	37
* 8	E1, E5, E6, E10, E11, E14, E20, E34	IC 8641	1911579	38
15	W2, W9 THRU W18, W20, W21, W24, W27	INSULATED JUMPER	9009185	39
8		EYELET	9006732	40
2	TP1, TP2	SOLDER TERMINALS	9007791	41
4		HANDLE (FLIPCHIP) MAGENTA	9008337-06	42

PARTS LIST

IC PIN LOCATIONS		
IC TYPE	GND	+ 5V
I.C. DEC 8640	1	8
I C DEC 74H103	11	4
I C DEC 314	1	8
I C DEC 7442	8	16
I C DEC 74123	8	16
I C DEC 74151	8	16

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

FIRST USED ON OPTION MODULE: RK11-D

ETCH BOARD REV: C

SEMICONDUCTOR CONVERSION CHART

DEC NO	EIA NO	DEC NO	EIA NO

NEXT HIGHER ASSY: B-DD-RK11-D

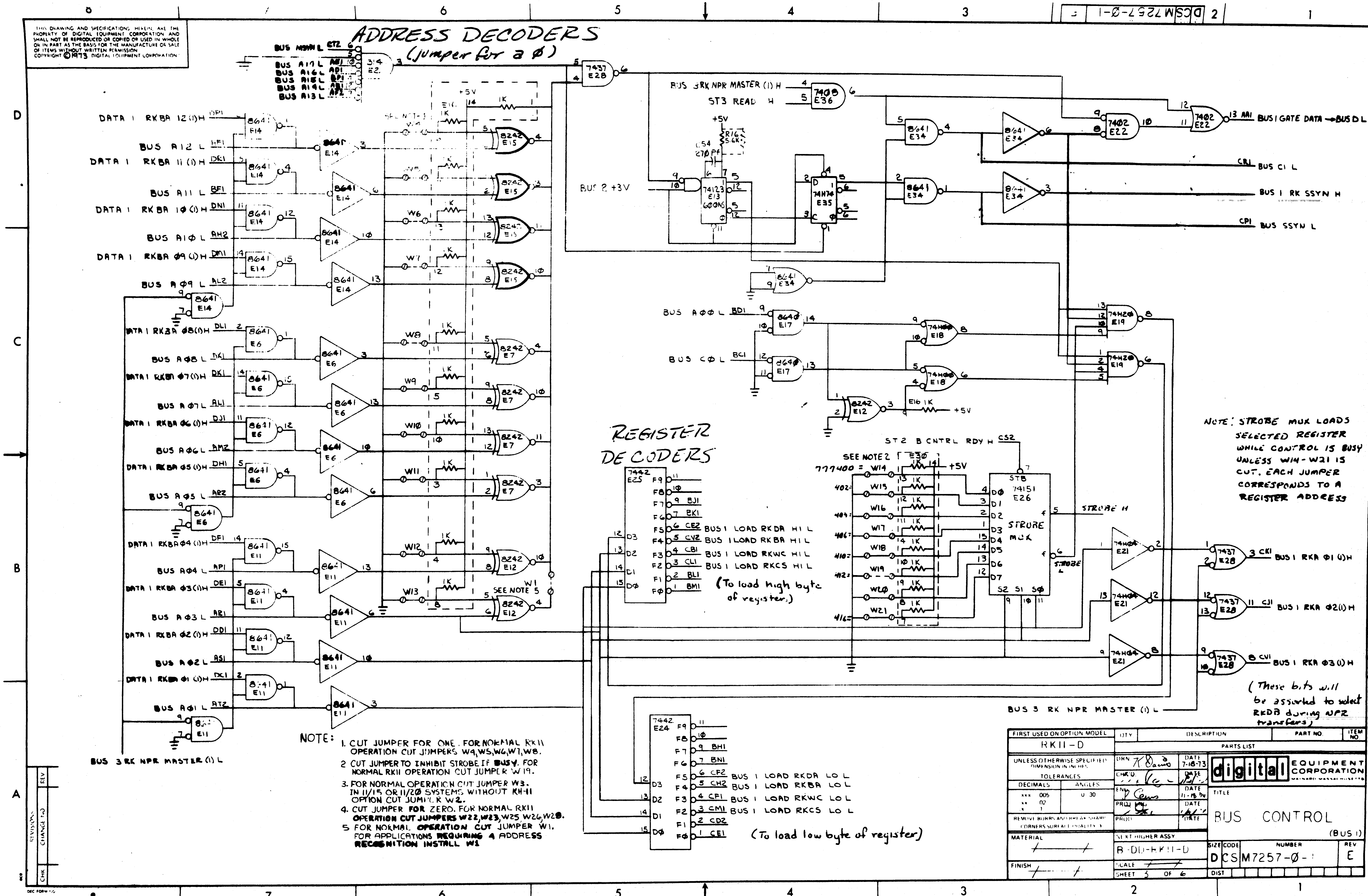
SCALE: NONE

digital EQUIPMENT CORPORATION

TITLE: BUS CONTROL RK11-D

SIZE: D CODE: CS NUMBER: M7257-0-1 REV: K

DCS M7257-0-1 K



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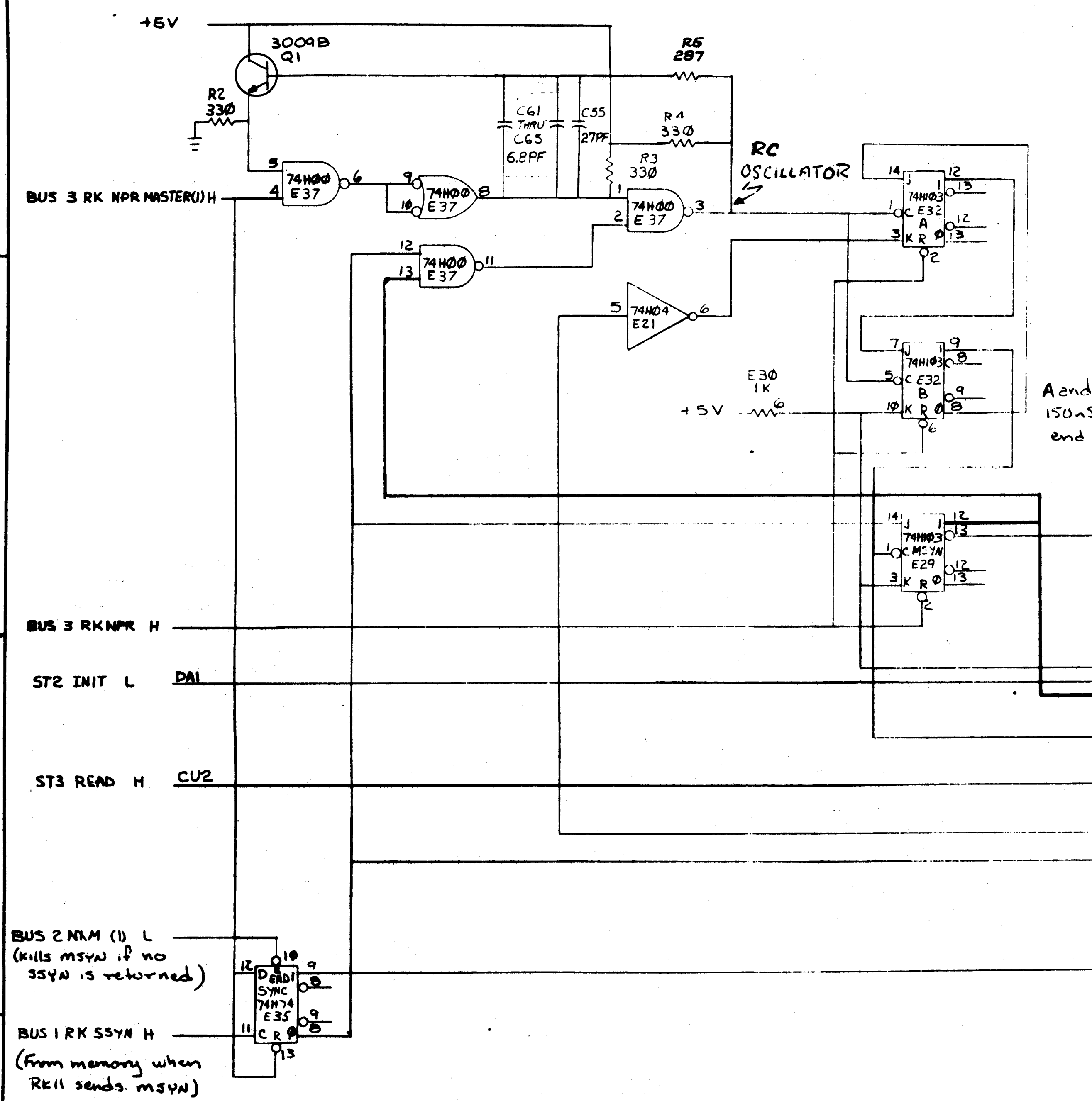
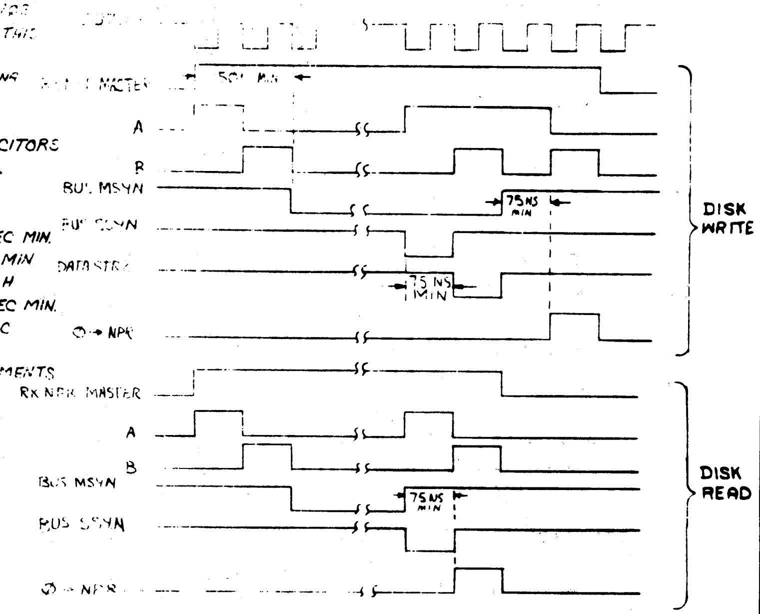
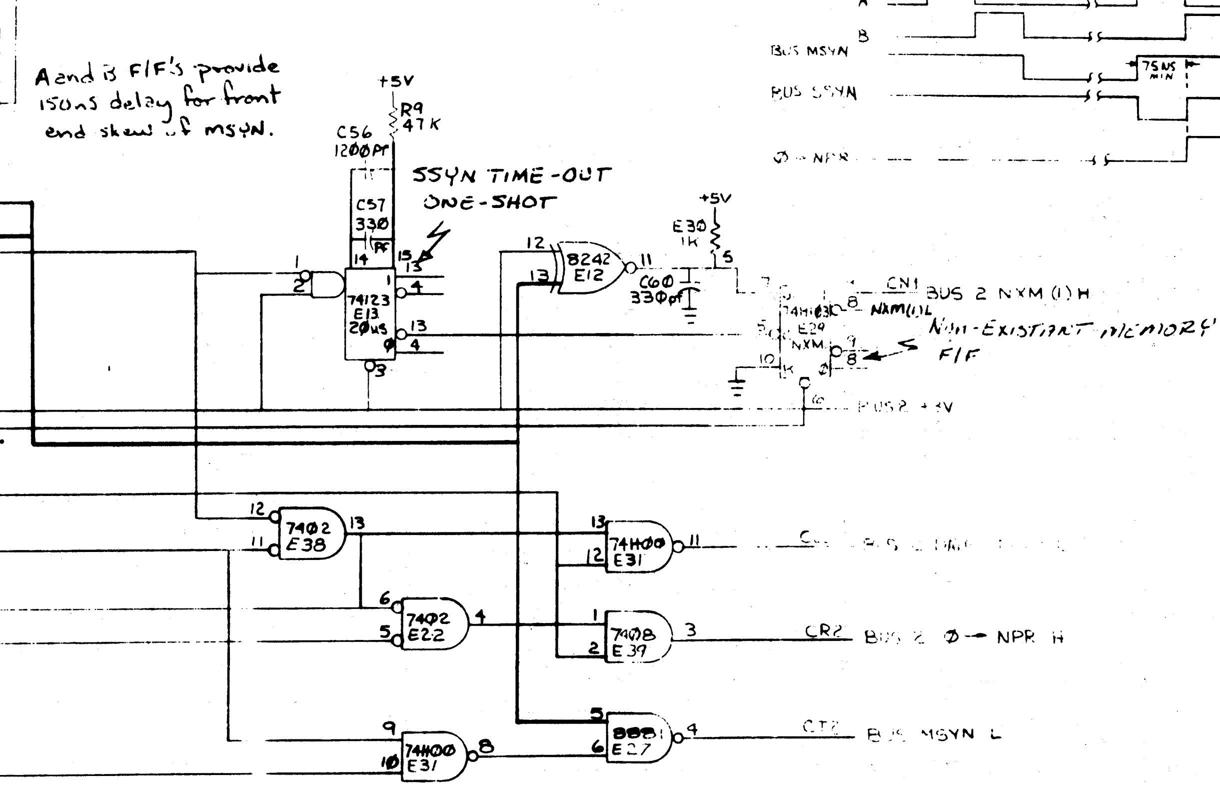
ADDRESS DECODERS
(jumper for a ∅)
REGISTER DECODERS
BUS 1 LOAD RKDA HI L
BUS 1 LOAD RKBA HI L
BUS 1 LOAD RKWC HI L
BUS 1 LOAD RKCS HI L
(To load high byte of register.)
BUS 1 LOAD RKDA LO L
BUS 1 LOAD RKBA LO L
BUS 1 LOAD RKWC LO L
BUS 1 LOAD RKCS LO L
(To load low byte of register)
STROBE MUX
BUS 1 GATE DATA → BUS D L
BUS C1 L
BUS 1 RK SSYN H
BUS SSYN L
BUS 1 RKA ∅1 (1) H
BUS 1 RKA ∅2 (1) H
BUS 1 RKA ∅3 (1) H
(These bits will be asserted to select RKDB during NPR transfers)
BUS 3 RK NPR MASTER (1) L
NOTE: STROBE MUX LOADS SELECTED REGISTER WHILE CONTROL IS BUSY UNLESS W14-W21 IS CUT. EACH JUMPER CORRESPONDS TO A REGISTER ADDRESS
NOTE:
1. CUT JUMPER FOR ONE. FOR NORMAL RK11 OPERATION CUT JUMPERS W4,W5,W6,W7,W8.
2. CUT JUMPER TO INHIBIT STROBE IF BUSY. FOR NORMAL RK11 OPERATION CUT JUMPER W19.
3. FOR NORMAL OPERATION CUT JUMPER W3. IN 11/15 OR 11/20 SYSTEMS WITHOUT RK11 OPTION CUT JUMPER W2.
4. CUT JUMPER FOR ZERO. FOR NORMAL RK11 OPERATION CUT JUMPERS W22,W23,W25 W26,W28.
5. FOR NORMAL OPERATION CUT JUMPER W1. FOR APPLICATIONS REQUIRING 4 ADDRESS RECOGNITION INSTALL W1
FIRST USED ON OPTION MODEL RK11-D
DATE 7-18-73
digital EQUIPMENT CORPORATION
TITLE BUS CONTROL (BUS 1)
NEXT HIGHER ASSY B-DD-RK11-D
SIZE D CODE CS NUMBER M7257-∅-1 REV E
SHEET 3 OF 6

SET UP UNIBUS TIMING AS FOLLOWS:

1. TIMING ADJUSTMENTS ARE MADE BY REMOVING CAPACITORS C61 THRU C65 AS REQUIRED. WITH C61 THRU C65 [illegible] INSTALLED THE OUTPUT AT [illegible] HAS A PERIOD OF ≈ 88 NSEC. REMOVAL OF EACH CAP DECREASES THIS BY ≈ 5 NSEC.
2. MAKE THE FOLLOWING MEASUREMENT AND ADJUSTMENT WHILE DOING A DISK WRITE.
   a. SYNC EXTERNALLY ON RK NPR MASTER (1) H
   b. MEASURE FROM BUS BBSY L TO BUS MSYN L. DELETE CAPACITORS AS REQUIRED TO MAKE THIS TIME EQUAL TO 150 NSEC MINIMUM.
3. TO VERIFY PROPER TIMING MAKE THE FOLLOWING MEASUREMENTS:
   a. WHILE DOING A DISK WRITE, SYNC EXTERNALLY ON END SYNC (1) H
   b. MEASURE FROM BUS SSYN L TO DATA STR 2 L EQUAL TO 75 NSEC MIN.
   c. MEASURE FROM BUS MSYN L TO Ø → NPR H EQUAL TO 75 NSEC MIN
   d. WHILE DOING A DISK READ, SYNC EXTERNALLY ON END SYNC (1) H
   e. MEASURE FROM BUS MSYN L TO Ø → NPR H EQUAL TO 75 NSEC MIN.
4. IF ANY TIMES MEASURED IN PART 3 ABOVE ARE LESS THAN 75 NSEC ADD ONE 6.8 CAP
5. IF ANY COMPONENT IN THE TIMING CIRCUIT IS REPLACED MEASUREMENTS MUST BE RETAKEN AND CAPACITORS ADDED OR REMOVED AS REQUIRED.







FIRST USED ON OPTION MODULE		
RK11-D		
TITLE	BUS CONTROL (BUS 2)	
SIZE D	CODE CS	NUMBER M7257-Ø-1	REV C

digital EQUIPMENT CORPORATION

DCS M7257-Ø-1 C

NPR LOGIC

BR LOGIC

DATA 3 NPR REQ H CJ2
DATA 3 NPR EN(1) H CM2
BUS 2 Ø → NPR H
BUS 3 RK NPR H
BUS NPG IN H CD1
BUS 2 +3V
BUS 1 RK SSYN H
CSI BUS NPR L
SEE NOTE 3
W2
W3
CLI BUS NPG OUT H
ST4 BG IN H
CH1 BUS 3 RK NPR MASTER (1) H
SACK DELAY 0-5
ST4 IDE (1) H CAI
ST2 B CNTRL RDY H CS2
CM2 BUS 3 RK INT REQ H
BUS 3 BR OUT L
BUS SACK L
BUS 3 BG OUT H
BUS 3 RK INT MASTER (1) H
CP2 BUS BBSY L

FIRST USED ON OPTION/MODEL	RK11-D
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES	
TOLERANCES	
DECIMALS	ANGLES
.xxx ± .005	±0° 30'
.xx ± .02	
.x ± .1	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓	
MATERIAL	
FINISH	

PARTS LIST

QTY.	DESCRIPTION	PART NO.	ITEM NO.

DRN.	DATE 7/27/73	digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
DSN B.	DATE 8/1/73	
ENG	DATE 11-15-74	
PROJ. ENG.	DATE 11/27/73	
PROD.	DATE	
NEXT HIGHER ASSY.	B-DD-RK -D	
SCALE		
SHEET	5 OF 6	

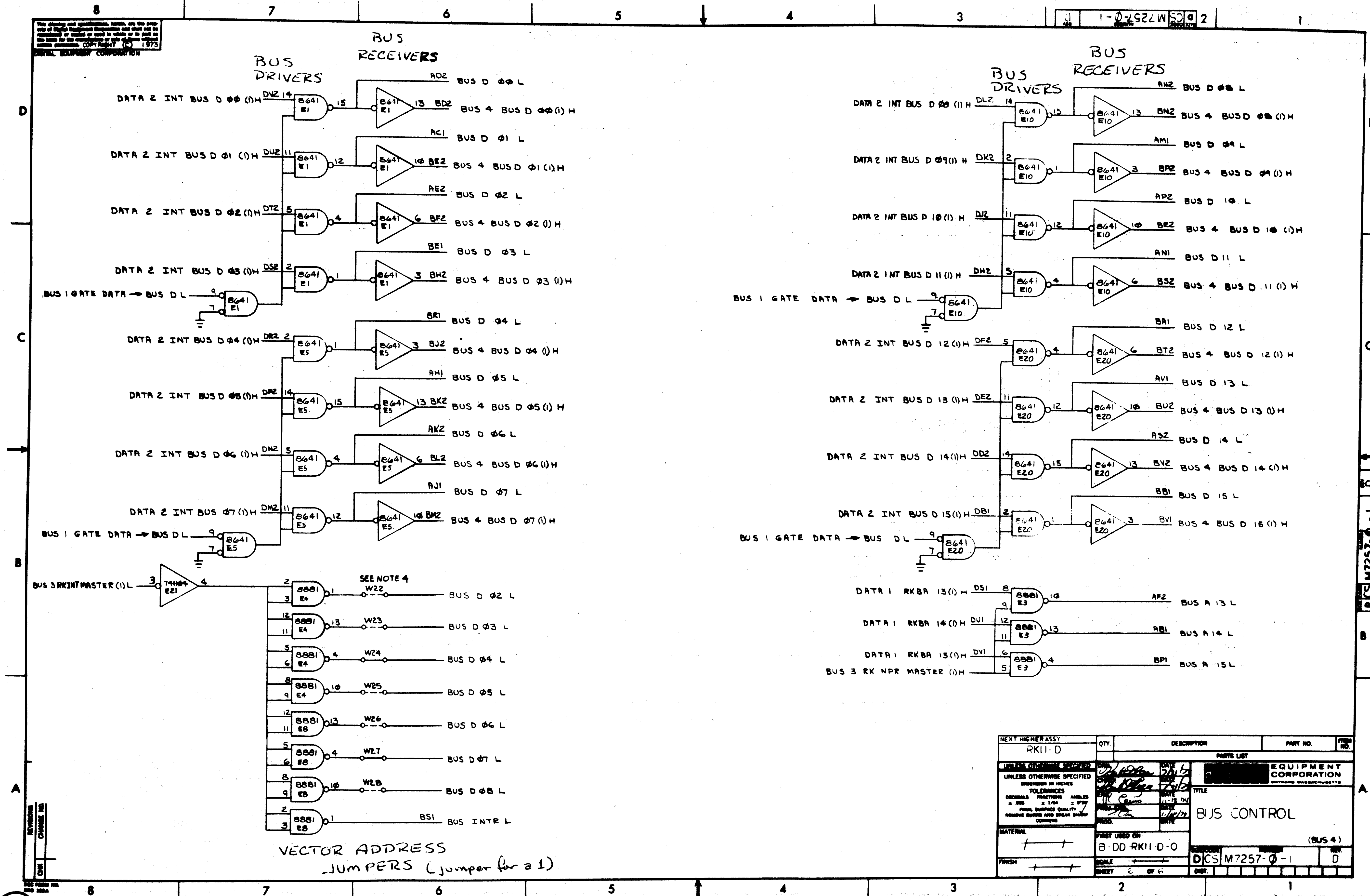
TITLE: BUS CONTROL (BUS 3)

SIZE	CODE	NUMBER	REV.
D	CS	M7257-Ø-1	A

DIST

REVISIONS		
REV	CHANGE NO	CHK

DEC FORM NO. DRD 102-C



BUS DRIVERS
BUS RECEIVERS
DATA 2 INT BUS D ØØ (1) H
BUS D ØØ L
BUS 4 BUS D ØØ (1) H
DATA 2 INT BUS D Ø1 (1) H
BUS D Ø1 L
BUS 4 BUS D Ø1 (1) H
DATA 2 INT BUS D Ø2 (1) H
BUS D Ø2 L
BUS 4 BUS D Ø2 (1) H
DATA 2 INT BUS D Ø3 (1) H
BUS D Ø3 L
BUS 4 BUS D Ø3 (1) H
BUS 1 GATE DATA → BUS D L
DATA 2 INT BUS D Ø4 (1) H
BUS D Ø4 L
BUS 4 BUS D Ø4 (1) H
DATA 2 INT BUS D Ø5 (1) H
BUS D Ø5 L
BUS 4 BUS D Ø5 (1) H
DATA 2 INT BUS D Ø6 (1) H
BUS D Ø6 L
BUS 4 BUS D Ø6 (1) H
DATA 2 INT BUS Ø7 (1) H
BUS D Ø7 L
BUS 4 BUS D Ø7 (1) H
BUS 1 GATE DATA → BUS D L
BUS 3 RKINT MASTER (1) L
SEE NOTE 4
W22 BUS D Ø2 L
W23 BUS D Ø3 L
W24 BUS D Ø4 L
W25 BUS D Ø5 L
W26 BUS D Ø6 L
W27 BUS D Ø7 L
W28 BUS D Ø8 L
BUS INTR L
VECTOR ADDRESS JUMPERS (jumper for a 1)
DATA 2 INT BUS D Ø8 (1) H
BUS D Ø8 L
BUS 4 BUS D Ø8 (1) H
DATA 2 INT BUS D Ø9 (1) H
BUS D Ø9 L
BUS 4 BUS D Ø9 (1) H
DATA 2 INT BUS D 1Ø (1) H
BUS D 1Ø L
BUS 4 BUS D 1Ø (1) H
DATA 2 INT BUS D 11 (1) H
BUS D 11 L
BUS 4 BUS D 11 (1) H
BUS 1 GATE DATA → BUS D L
DATA 2 INT BUS D 12 (1) H
BUS D 12 L
BUS 4 BUS D 12 (1) H
DATA 2 INT BUS D 13 (1) H
BUS D 13 L
BUS 4 BUS D 13 (1) H
DATA 2 INT BUS D 14 (1) H
BUS D 14 L
BUS 4 BUS D 14 (1) H
DATA 2 INT BUS D 15 (1) H
BUS D 15 L
BUS 4 BUS D 15 (1) H
BUS 1 GATE DATA → BUS D L
DATA 1 RKBA 13 (1) H
BUS A 13 L
DATA 1 RKBA 14 (1) H
BUS A 14 L
DATA 1 RKBA 15 (1) H
BUS 3 RK NPR MASTER (1) H
BUS A 15 L
NEXT HIGHER ASSY RK11-D
EQUIPMENT CORPORATION
TITLE BUS CONTROL (BUS 4)
FIRST USED ON B-DD RK11-D-O
D CS M7257-Ø-1 D
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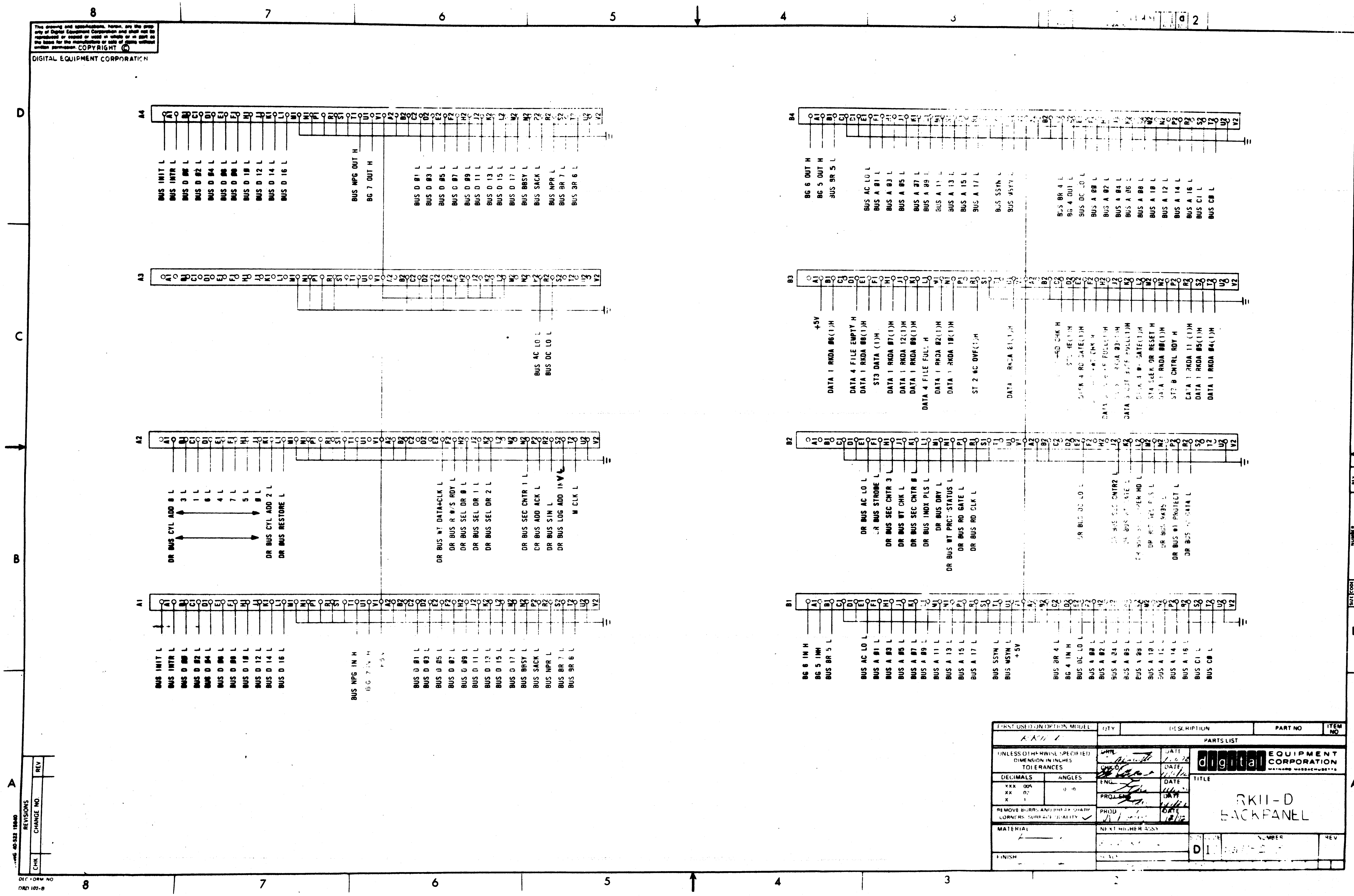

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A4
A3
A2
A1
B4
B3
B2
B1
BUS INIT L
BUS INTR L
BUS NPG OUT H
BG 7 OUT H
BUS AC LO L
BUS DC LO L
BUS BBSY L
BUS SACK L
BUS NPR L
BG 6 OUT H
BG 5 OUT H
BUS SSYN L
BUS MSYN L
+5V
DR BUS CYL ADD 0 L
DR BUS CYL ADD 2 L
DR BUS RESTORE L
M CLK L
BUS NPG IN H
BG 6 IN H
BG 5 INH
BUS BR 5 L
BUS BR 4 L
BG 4 IN H
FIRST USED ON OPTION MODEL
RK11
QTY
DESCRIPTION
PART NO
ITEM NO
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES
DECIMALS
ANGLES
DRN
CHKD
ENG
PROJ ENG
PROD
DATE
digital EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS
TITLE
RK11-D
BACKPANEL
MATERIAL
FINISH
NEXT HIGHER ASSY
SIZE
CODE
NUMBER
REV
D
REVISIONS
CHANGE NO.
CHK
REV
DEC FORM NO
DRD 102-B
D C RK11-D-3

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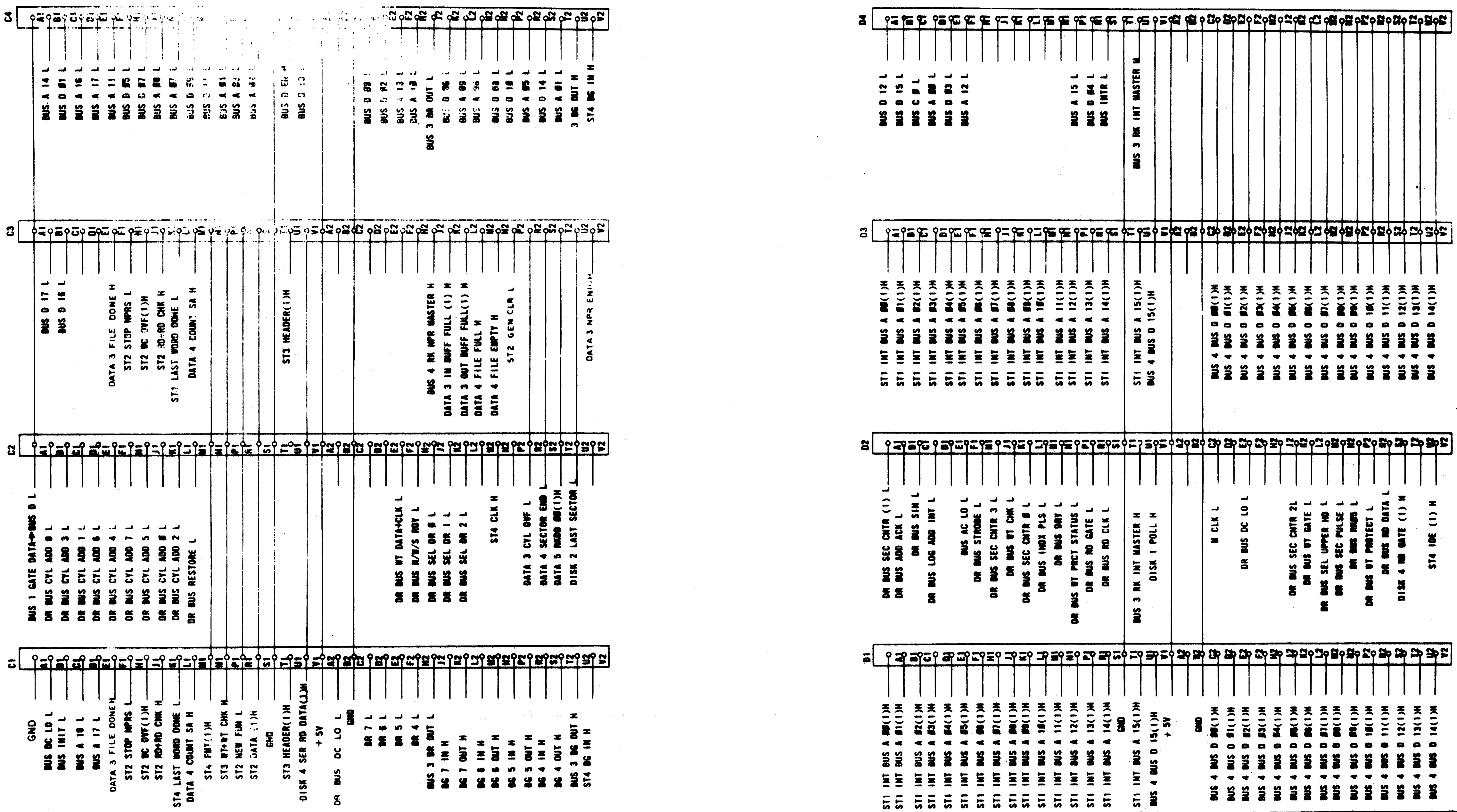


FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO	ITEM NO
RK11 D		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES

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

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY

MATERIAL

FINISH

DRN / CHKD / ENG / PROJ ENG / PROD — DATE

NEXT HIGHER ASSY: RK11 D

SCALE

SHEET OF

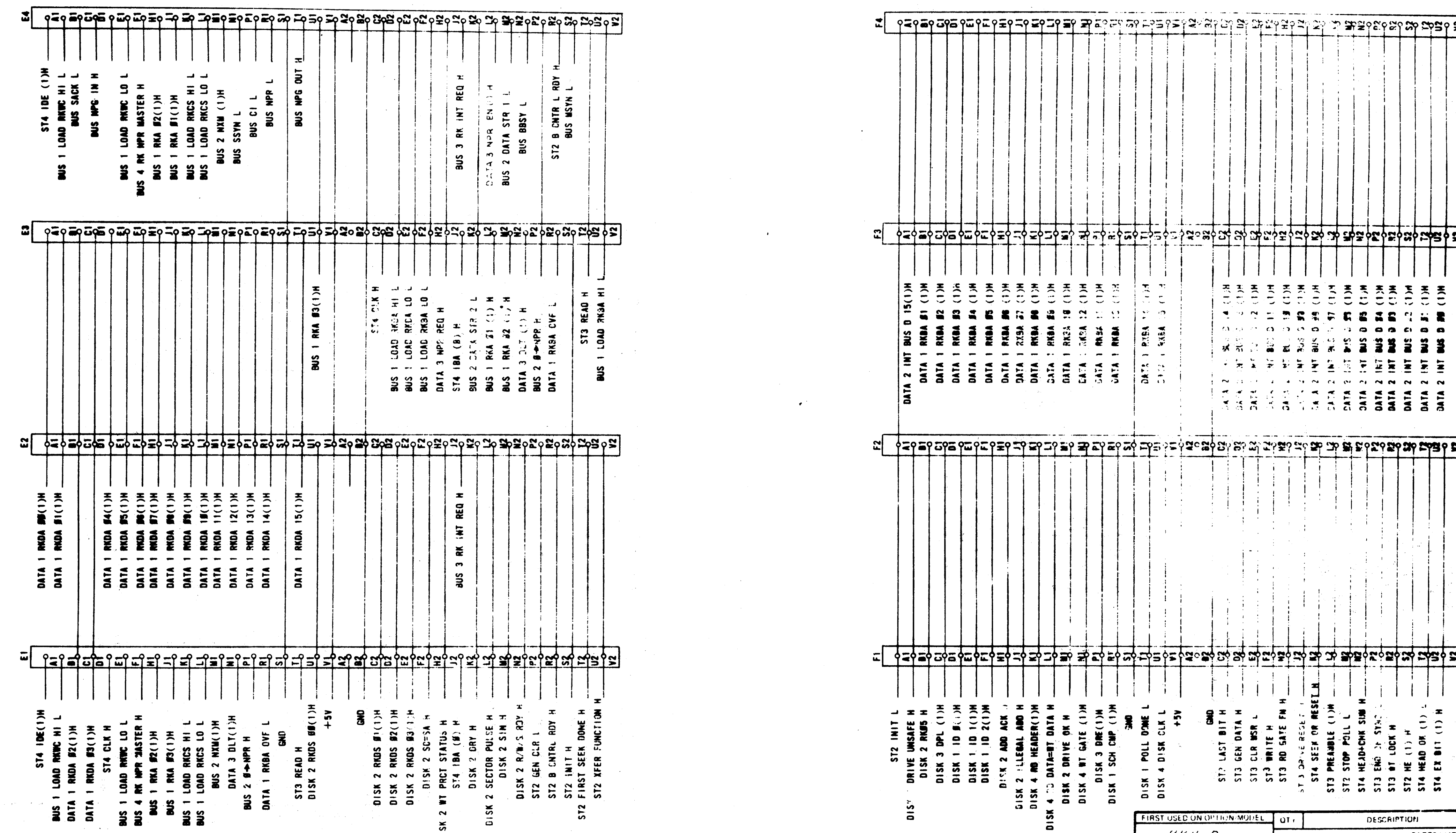
digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: RK11-D BACKPANEL

SIZE	CODE	NUMBER	REV
D	IC	RK11-D-3	C

DIST

REVISIONS — REV — CHANGE NO



FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO	ITEM NO.
RK11-D		PARTS LIST		

UNLESS OTHERWISE SPECIFIED
DIMENSION IN INCHES
TOLERANCES

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

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL

FINISH

digital EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS

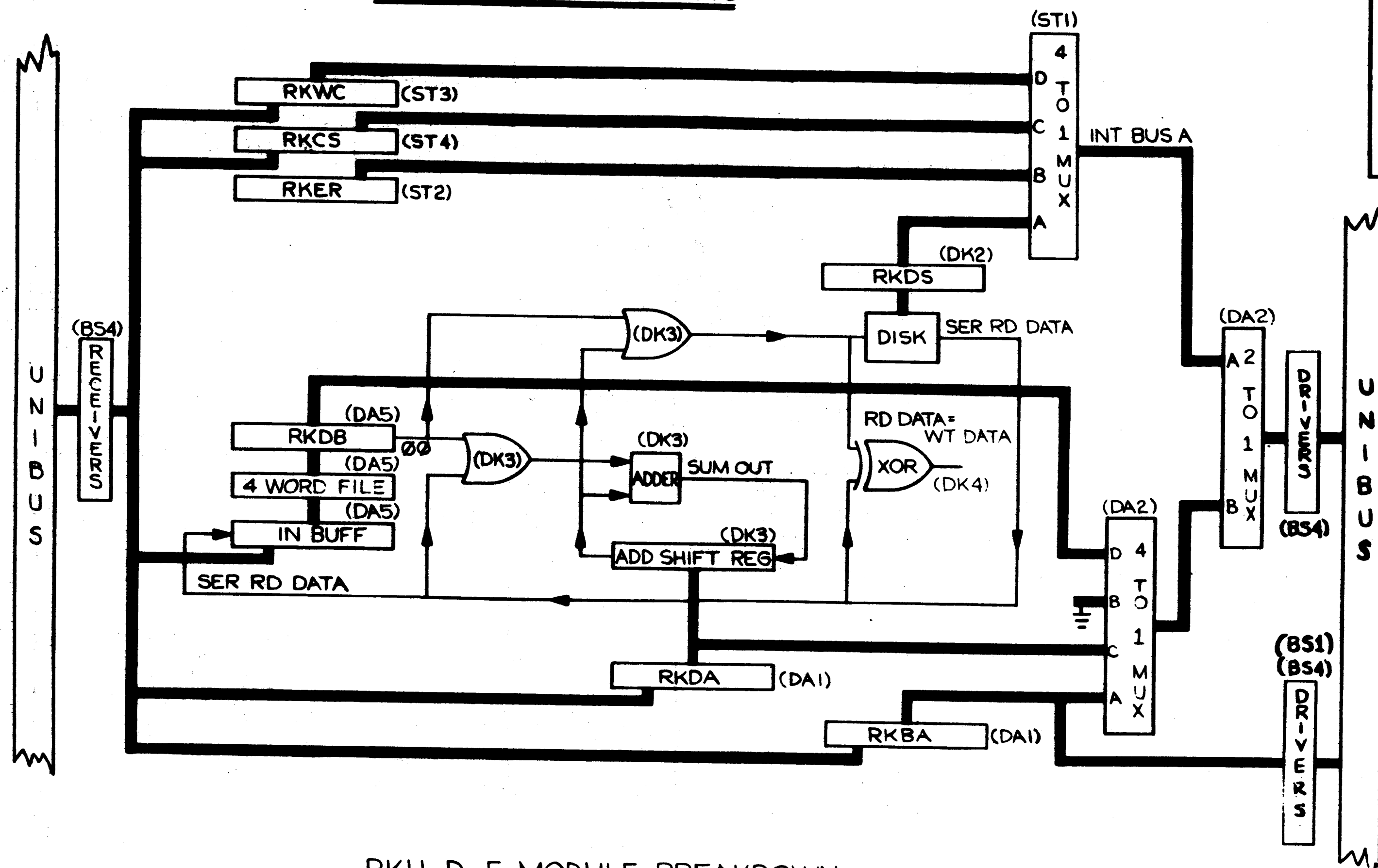
TITLE
RK11-D
BACKPANEL

SIZE	CODE	NUMBER	REV
D	IC	RK11-D-3	A

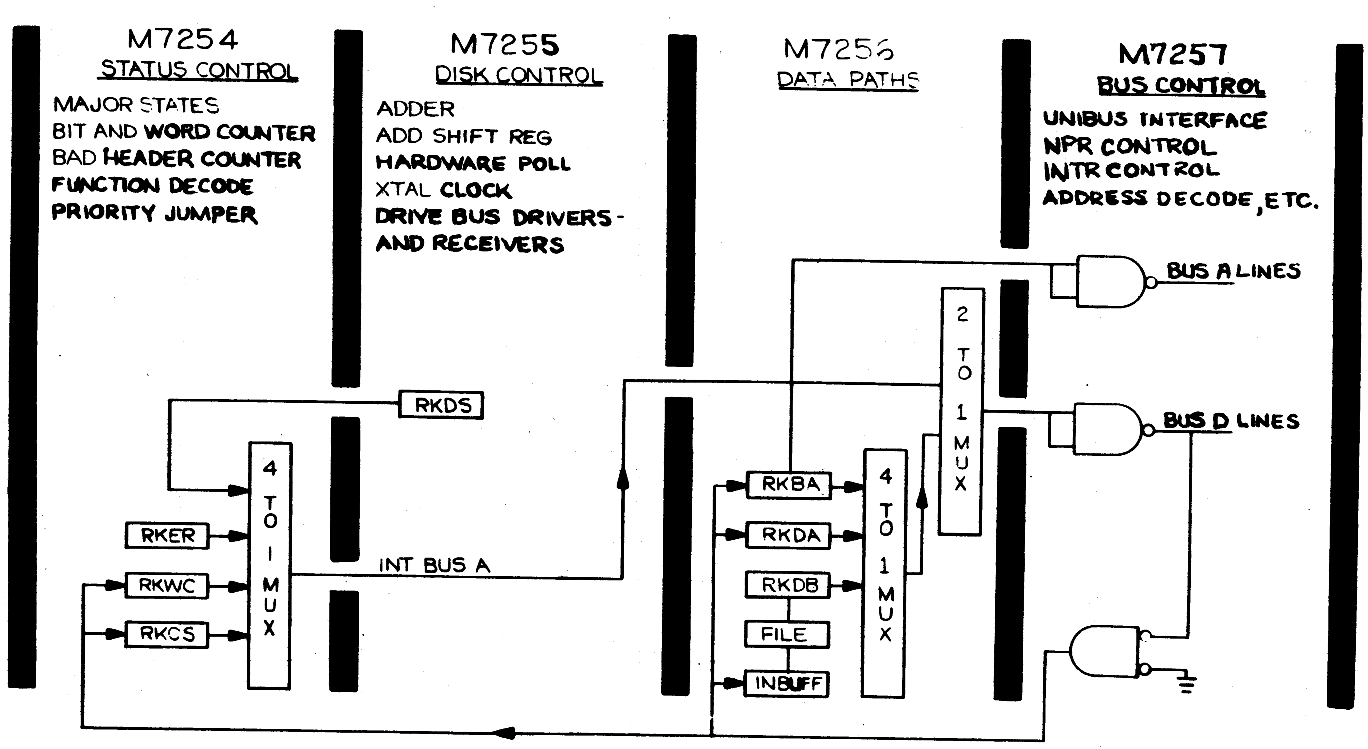
NEXT HIGHER ASSY
SCALE
SHEET 1 OF

■ DESIGNATES PARALLEL TRANSFER
— DESIGNATES SERIAL TRANSFER

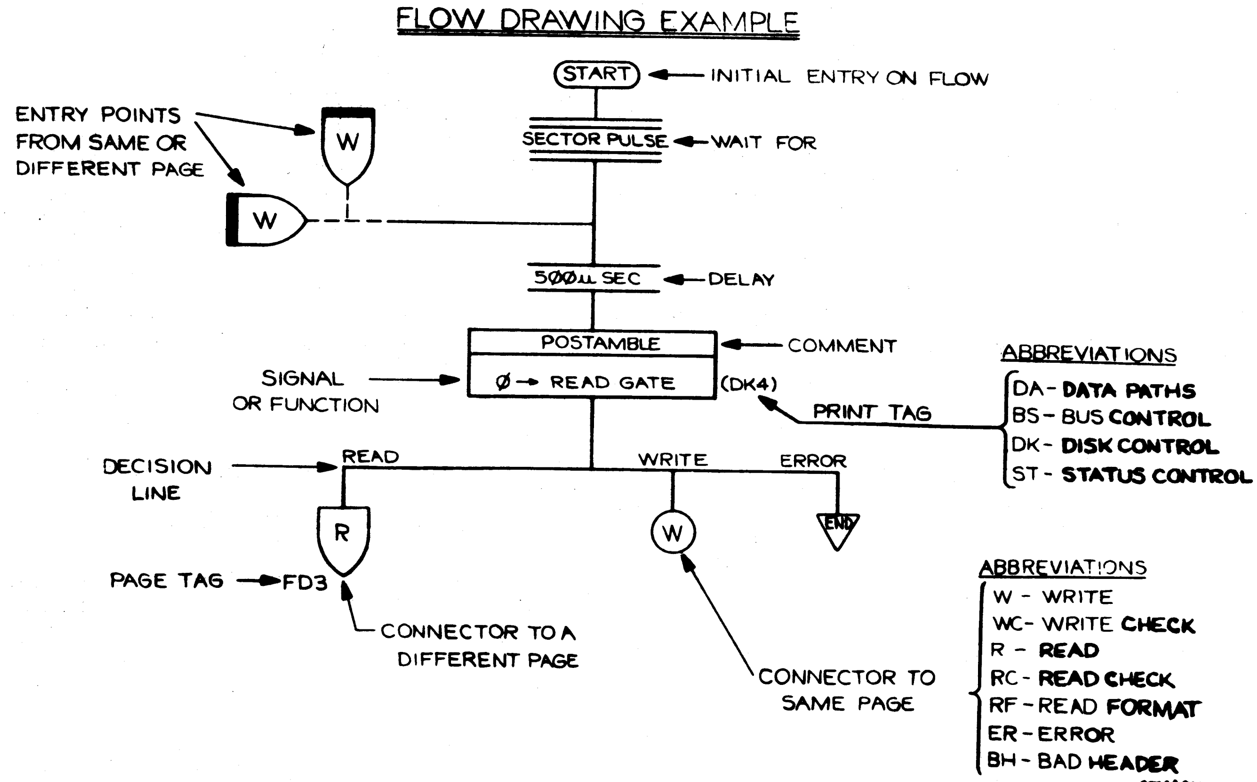
RK11-D, E DATA PATHS



RK11-D, E MODULE BREAKDOWN



FLOW DRAWING EXAMPLE



FD1

FIRST USED ON OPTION/MODEL: RK11-D

DIMENSIONAL TOLERANCE — DIMENSIONS ARE MILLIMETERS / INCHES UNLESS OTHERWISE SPECIFIED

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

THIRD ANGLE PROJECTION — REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓

MATERIAL

FINISH

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

DRN. [signature] DATE 2-20-74
CHK'D [signature] DATE 3-13-74
ENG. [signature]
PROJ. ENG. [signature]
PROD. [signature]

NEXT HIGHER ASSY. B-DD-RK11-D

digital

TITLE: RK11-D, E FUNCTION FLOWS

SIZE D | CODE FD | NUMBER RK11-D-9 | REV.

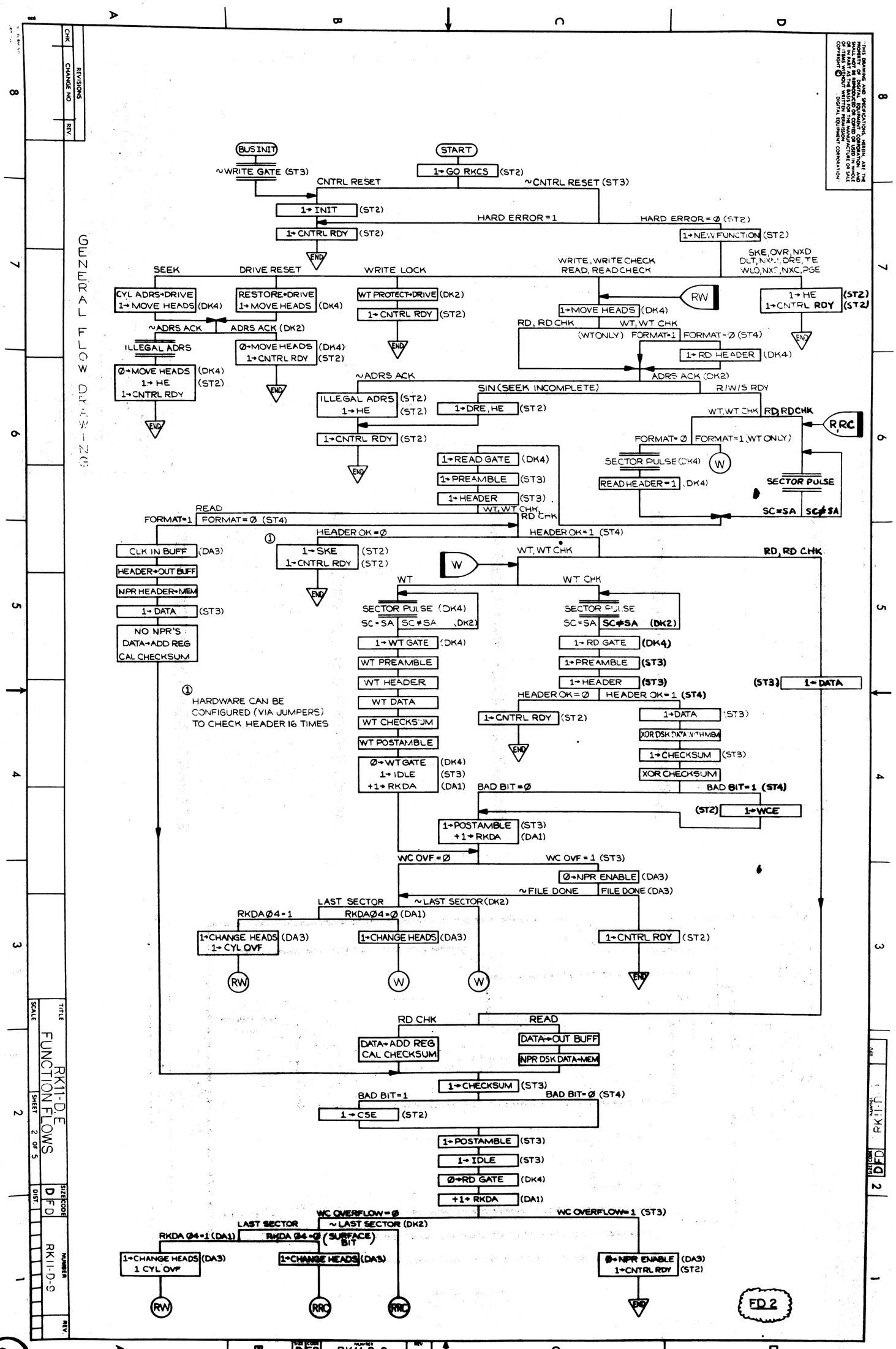
SCALE

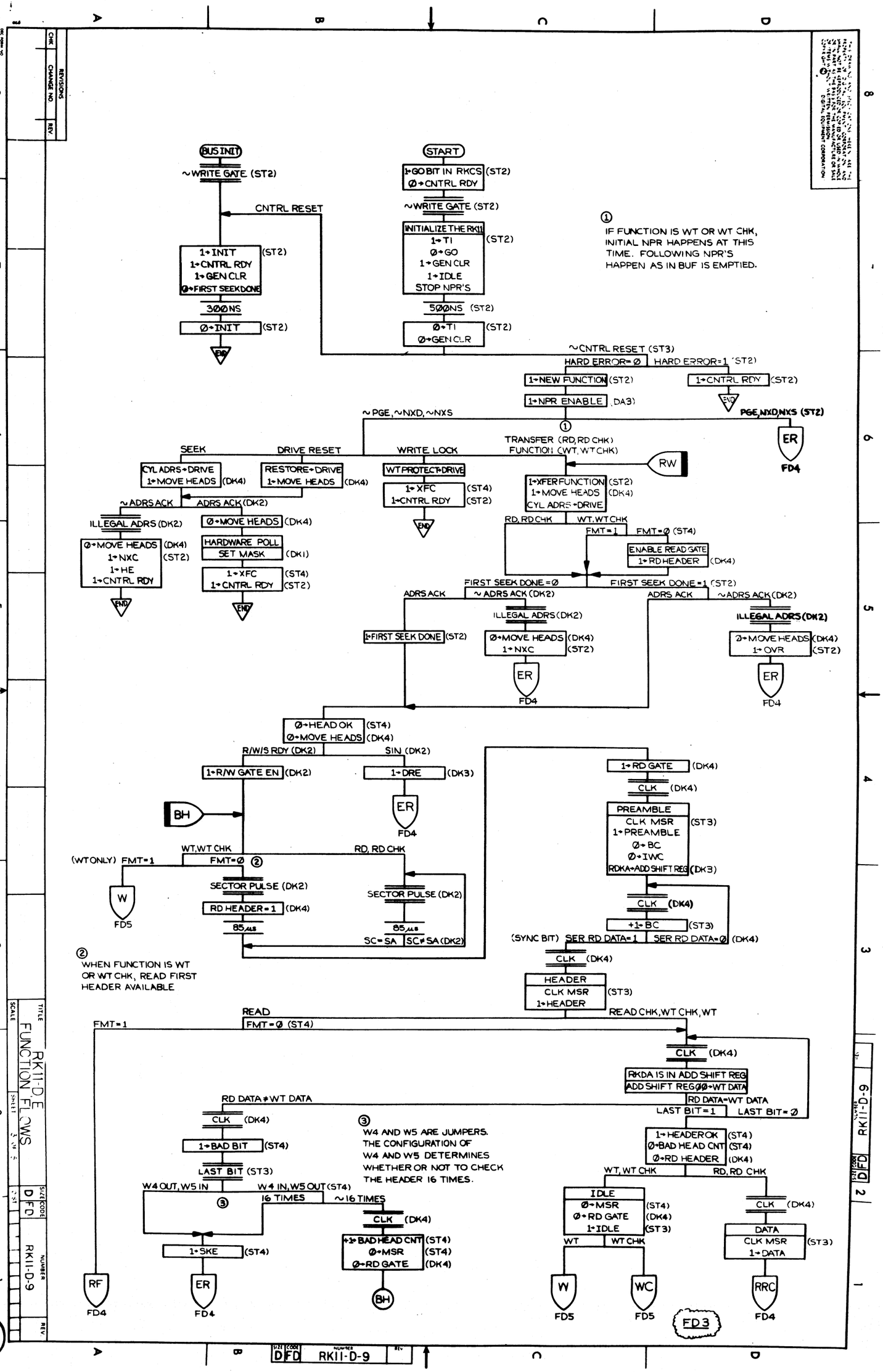
SHEET 1 OF 5

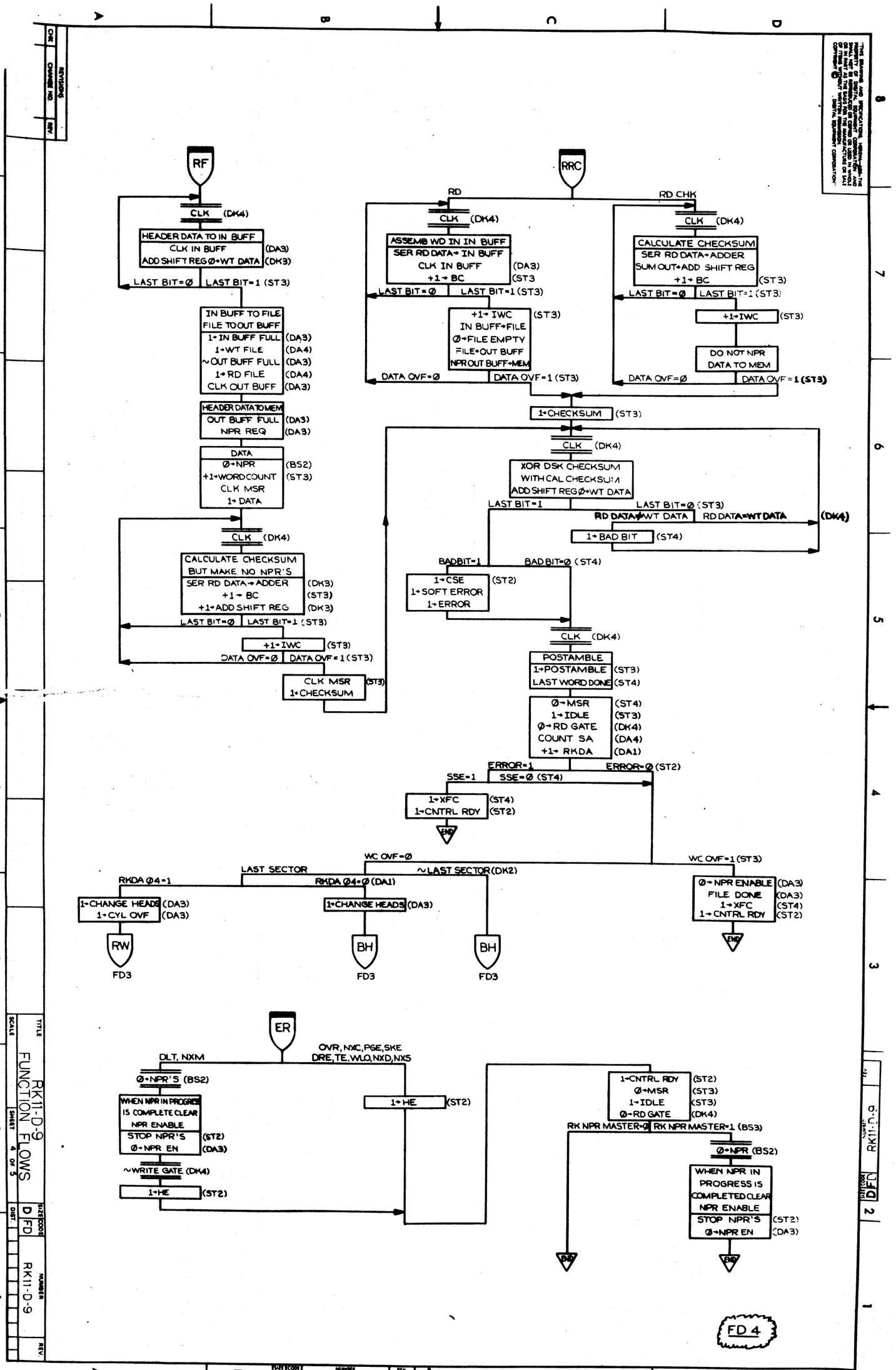
DIST

REVISIONS | CHK | CHANGE NO. | REV.

D FD RK11-D-9


BUS INIT
~WRITE GATE (ST3)
START
1→GO RKCS (ST2)
CNTRL RESET
~CNTRL RESET (ST3)
1→INIT (ST2)
HARD ERROR=1
HARD ERROR=Ø (ST2)
1→CNTRL RDY (ST2)
1→NEW FUNCTION (ST2)
END
SEEK
DRIVE RESET
WRITE LOCK
WRITE, WRITE CHECK
READ, READ CHECK
SKE, OVR, NXD
DLT, NXM, DRE, TE
WLO, NXC, NXM, PGE
CYL ADRS→DRIVE
1→MOVE HEADS (DK4)
RESTORE→DRIVE
1→MOVE HEADS (DK4)
WT PROTECT→DRIVE (DK2)
1→CNTRL RDY (ST2)
RW
1→MOVE HEADS (DK4)
1→HE (ST2)
1→CNTRL RDY (ST2)
~ADRS ACK
ADRS ACK (DK2)
ILLEGAL ADRS
Ø→MOVE HEADS (DK4)
1→HE (ST2)
1→CNTRL RDY
Ø→MOVE HEADS (DK4)
1→CNTRL RDY (ST2)
RD, RD CHK
WT, WT CHK
(WTONLY)
FORMAT=1
FORMAT=Ø (ST4)
1→RD HEADER (DK4)
~ADRS ACK
ADRS ACK (DK2)
SIN (SEEK INCOMPLETE)
R/W/S RDY
ILLEGAL ADRS (ST2)
1→HE (ST2)
1→DRE, HE (ST2)
WT, WT CHK
RD, RD CHK
R, RC
1→CNTRL RDY (ST2)
FORMAT=Ø
FORMAT=1 (WT ONLY)
1→READ GATE (DK4)
1→PREAMBLE (ST3)
1→HEADER (ST3)
SECTOR PULSE (DK4)
W
READ HEADER=1 (DK4)
SECTOR PULSE
SC=SA
SC≠SA
WT, WT CHK
RD CHK
READ
FORMAT=1
FORMAT=Ø (ST4)
HEADER OK=Ø
HEADER OK=1 (ST4)
CLK IN BUFF (DA3)
HEADER→OUT BUFF
NPR HEADER→MEM
1→DATA (ST3)
NO NPR'S
DATA→ADD REG
CAL CHECKSUM
1→SKE (ST2)
1→CNTRL RDY (ST2)
WT, WT CHK
RD, RD CHK
WT
WT CHK
SECTOR PULSE (DK4)
SC=SA
SC≠SA (DK2)
SECTOR PULSE
SC=SA
SC≠SA (DK2)
1→WT GATE (DK4)
WT PREAMBLE
WT HEADER
WT DATA
WT CHECKSUM
WT POSTAMBLE
Ø→WT GATE (DK4)
1→IDLE (ST3)
+1→RKDA (DA1)
1→RD GATE (DK4)
1→PREAMBLE (ST3)
1→HEADER (ST3)
(ST3) 1→DATA
HEADER OK=Ø
HEADER OK=1 (ST4)
1→CNTRL RDY (ST2)
1→DATA (ST3)
XOR DSK DATA WITH MEM
1→CHECKSUM (ST3)
XOR CHECKSUM
BAD BIT=Ø
BAD BIT=1 (ST4)
(ST2) 1→WCE
1→POSTAMBLE (ST3)
+1→RKDA (DA1)
WC OVF=Ø
WC OVF=1 (ST3)
Ø→NPR ENABLE (DA3)
~FILE DONE
FILE DONE (DA3)
LAST SECTOR
~LAST SECTOR (DK2)
RKDAØ4=1
RKDAØ4=Ø (DA1)
1→CHANGE HEADS (DA3)
1→CYL OVF
1→CHANGE HEADS (DA3)
1→CNTRL RDY (ST2)
RW
W
W
END
RD CHK
READ
DATA→ADD REG
CAL CHECKSUM
DATA→OUT BUFF
NPR DSK DATA→MEM
1→CHECKSUM (ST3)
BAD BIT=1
BAD BIT=Ø (ST4)
1→CSE (ST2)
1→POSTAMBLE (ST3)
1→IDLE (ST3)
Ø→RD GATE (DK4)
+1→RKDA (DA1)
WC OVERFLOW=Ø
WC OVERFLOW=1 (ST3)
LAST SECTOR
~LAST SECTOR (DK2)
RKDA Ø4=1 (DA1)
RKDA Ø4=Ø (SURFACE BIT)
1→CHANGE HEADS (DA3)
1 CYL OVF
1→CHANGE HEADS (DA3)
Ø→NPR ENABLE (DA3)
1→CNTRL RDY (ST2)
RW
RRC
RRC
END
FD 2
① HARDWARE CAN BE CONFIGURED (VIA JUMPERS) TO CHECK HEADER 16 TIMES
GENERAL FLOW DIAGRAM
REVISIONS
CHK
CHANGE NO.
REV
TITLE
RK11-D-E FUNCTION FLOWS
SCALE
SHEET 2 OF 5
SIZE D
CODE FD
DIST
NUMBER RK11-D-9
REV
DFD RK11-D-9
68

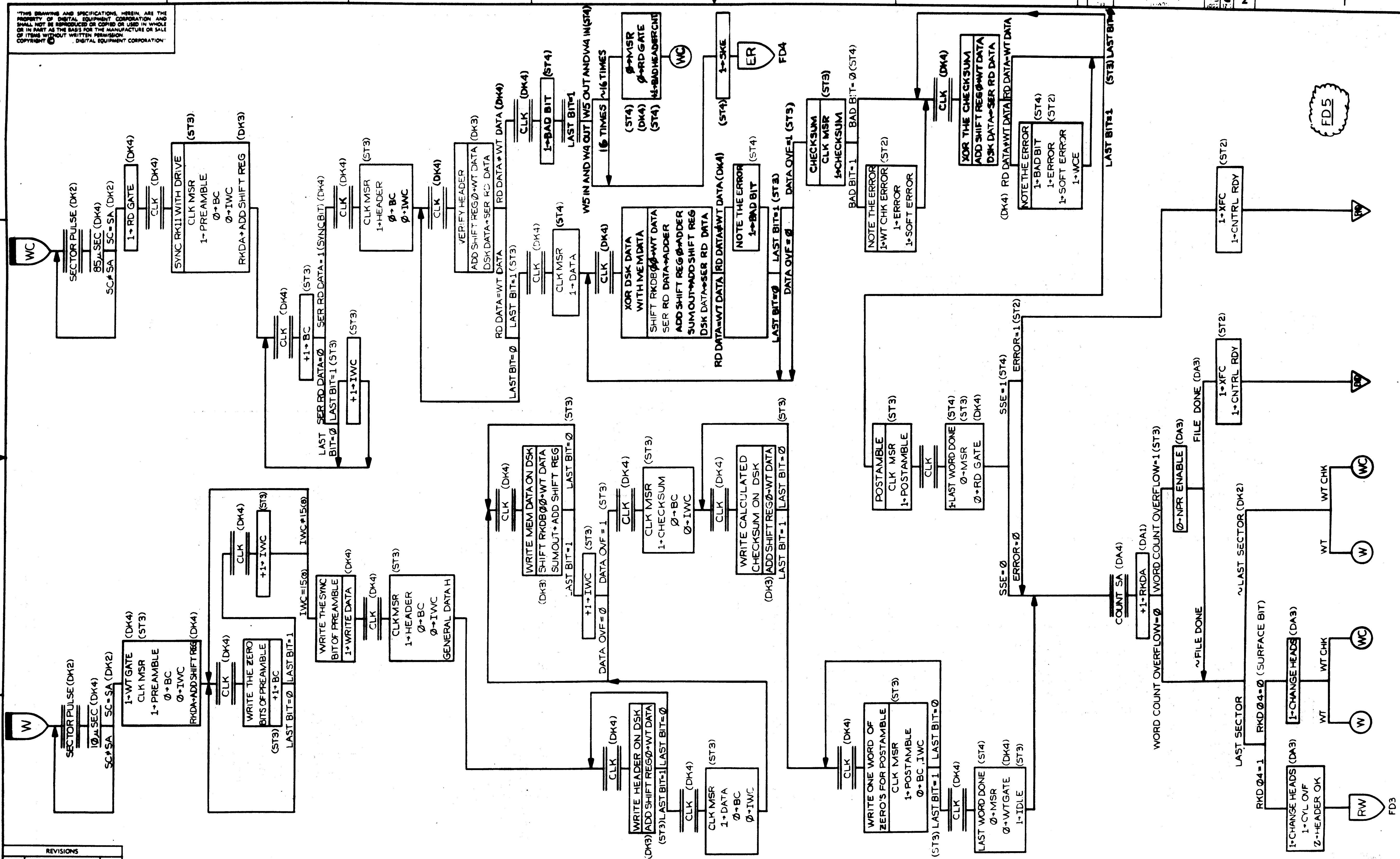

BUS INIT
~WRITE GATE (ST2)
CNTRL RESET
1→INIT (ST2)
1→CNTRL RDY
1→GEN CLR
Ø→FIRST SEEKDONE
300NS
Ø→INIT (ST2)
END
START
1→GO BIT IN RKCS (ST2)
Ø→CNTRL RDY
~WRITE GATE (ST2)
INITIALIZE THE RK11 (ST2)
1→TI
Ø→GO
1→GEN CLR
1→IDLE
STOP NPR'S
500NS (ST2)
Ø→TI (ST2)
Ø→GEN CLR
① IF FUNCTION IS WT OR WT CHK, INITIAL NPR HAPPENS AT THIS TIME. FOLLOWING NPR'S HAPPEN AS IN BUF IS EMPTIED.
~CNTRL RESET (ST3)
HARD ERROR=Ø
HARD ERROR=1 (ST2)
1→NEW FUNCTION (ST2)
1→CNTRL RDY (ST2)
1→NPR ENABLE (DA3)
~PGE, ~NXD, ~NXS
PGE,NXD,NXS (ST2)
ER
FD4
SEEK
DRIVE RESET
WRITE LOCK
TRANSFER (RD,RD CHK) FUNCTION (WT,WT CHK)
RW
CYL ADRS→DRIVE
1→MOVE HEADS (DK4)
RESTORE→DRIVE
1→MOVE HEADS (DK4)
WT PROTECT→DRIVE
1→XFC (ST4)
1→CNTRL RDY (ST2)
1→XFER FUNCTION (ST2)
1→MOVE HEADS (DK4)
CYL ADRS→DRIVE
~ADRS ACK
ADRS ACK (DK2)
ILLEGAL ADRS (DK2)
Ø→MOVE HEADS (DK4)
1→NXC (ST2)
1→HE
1→CNTRL RDY
Ø→MOVE HEADS (DK4)
HARDWARE POLL
SET MASK (DK1)
1→XFC (ST4)
1→CNTRL RDY (ST2)
RD, RD CHK
WT, WT CHK
FMT=1
FMT=Ø (ST4)
ENABLE READ GATE
1→RD HEADER (DK4)
FIRST SEEK DONE=Ø
FIRST SEEK DONE=1 (ST2)
ADRS ACK
~ADRS ACK (DK2)
ILLEGAL ADRS (DK2)
1→FIRST SEEK DONE (ST2)
Ø→MOVE HEADS (DK4)
1→NXC (ST2)
ER
FD4
ADRS ACK
~ADRS ACK (DK2)
ILLEGAL ADRS (DK2)
Ø→MOVE HEADS (DK4)
1→OVR (ST2)
ER
FD4
Ø→HEAD OK (ST4)
Ø→MOVE HEADS (DK4)
R/W/S RDY (DK2)
SIN (DK2)
1→R/W GATE EN (DK2)
1→DRE (DK3)
ER
FD4
BH
WT, WT CHK
RD, RD CHK
(WT ONLY) FMT=1
FMT=Ø ②
W
FD5
SECTOR PULSE (DK2)
RD HEADER=1 (DK4)
85 μs
SECTOR PULSE (DK2)
85 μs
SC=SA
SC≠SA (DK2)
② WHEN FUNCTION IS WT OR WT CHK, READ FIRST HEADER AVAILABLE
1→RD GATE (DK4)
CLK (DK4)
PREAMBLE
CLK MSR
1→PREAMBLE
Ø→BC
Ø→IWC
RDKA→ADD SHIFT REG (ST3) (DK3)
CLK (DK4)
+1→BC (ST3)
(SYNC BIT) SER RD DATA=1
SER RD DATA=Ø (DK4)
CLK (DK4)
HEADER
CLK MSR
1→HEADER (ST3)
READ
READ CHK, WT CHK, WT
FMT=1
FMT=Ø (ST4)
CLK (DK4)
RKDA IS IN ADD SHIFT REG
ADD SHIFT REG Ø→WT DATA
RD DATA≠WT DATA
RD DATA=WT DATA
LAST BIT=1
LAST BIT=Ø
CLK (DK4)
1→BAD BIT (ST4)
LAST BIT (ST3)
③ W4 AND W5 ARE JUMPERS. THE CONFIGURATION OF W4 AND W5 DETERMINES WHETHER OR NOT TO CHECK THE HEADER 16 TIMES.
1→HEADER OK (ST4)
Ø→BAD HEAD CNT (ST4)
Ø→RD HEADER (DK4)
W4 OUT, W5 IN
W4 IN, W5 OUT (ST4)
16 TIMES
~16 TIMES
③
WT, WT CHK
RD, RD CHK
IDLE
Ø→MSR (ST4)
Ø→RD GATE (DK4)
1→IDLE (ST3)
CLK (DK4)
+1→BAD HEAD CNT (ST4)
Ø→MSR (ST4)
Ø→RD GATE (DK4)
CLK (DK4)
DATA
CLK MSR (ST3)
1→DATA
1→SKE (ST4)
RF
FD4
ER
FD4
BH
WT
WT CHK
W
FD5
WC
FD5
RRC
FD4
FD3
REVISIONS
CHK
CHANGE NO.
REV.
TITLE
RK11-D,E FUNCTION FLOWS
SIZE/CODE
D FD
NUMBER
RK11-D-9
REV.
SCALE
SHEET
DFD RK11-D-9
69A



CHG | REVISIONS | CHANGE NO. | REV.

TITLE: RK11-D-9 FUNCTION FLOWS
SCALE | SHEET 4 OF 5 | SIZE/CODE D FD | DIST | NUMBER RK11-D-9 | REV.

DFD RK11-D-9 REV



REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: RKII-D, F FUNCTION FLOWS

SIZE: D | CODE: FD | NUMBER: RK11-D-9

70

RK11-D CONTROLLER

RK05 DISK DRIVE

UNIBUS

DATA 15:0
ADDR 17:0
NPR
NPG
BR
BG
MSYN
SSYN
INTR
C0,C1
BBSY

M7257 BUS CNTL

M7256 DATA PATHS

M7254 STATUS CNTL

INIT

M7255 DISK CNTL

WRITE GATE L — AJ2
WRITE DATA & CLOCK L — AJ1
READ DATA L — AE2
READ CLOCK L — AF2
HEAD SELECT — AP1
NO PROTECT L (from M7701) — AH2

G180 READ/WRITE AMPL — AB01

AH2 SET UNSAFE L (to M7701)

READ/WRITE DATA & CLOCK

MOTOR POSITION CURRENT

SAFETY RELAY

H604 PWR AMP

PWR AMP DRIVE

HOME SW

READ/WRITE HEADS

DISK

LINEAR MOTOR

POSN XDUCER

SPINDLE MOTOR

SECTOR XDUCER

CARTR ON INTLK

DOOR CLOSED INTLK

BUS CYL ADDR 0 L — BL1
" 1 L — BM1
" 2 L — BP1
" 3 L — BP2
" 4 L — BU1
" 5 L — BV1
" 6 L — BS1
" 7 L — BT1

M7702 CYLINDER ADDRESS & DIFFERENCE REGISTER — AB03

AA1 DIFF 1 L — BW2
AB1 " " 2 L — BP2
AD1 " " 4 L — BR2
AE1 " " 16 L — BT2
BJ1 FWD — BW2
BH1 REV — BW2
BK1 COUNT PULSE FWD — AG1
BF1 COUNT PULSE REV — AG1
AU1 INNER LIMIT — AB1
AK1 OUTER LIMIT — AD1

G938 POSN SERVO PREAMP — AB05

AK1 LIMIT
AN1 SIN
AJ1 -COS

HOME SW L
LOAD HEADS L

M7703 PWR SUPPLY
-15V
EMER HEAD RETRACT
+30VAC
+15V +5V

M7700 INDEX/SECTOR REGISTER — AB02

RK11D L — BU2
BUS SEL 0 L — BE2
" 1 L — BS2
" 2 L — BT2
" 3 L — BU2
SEEK INCOMPL L — AM1
R/W/S RDY L — AM1
ADDR INVALID L — BA1

WRT PROT SET L — BS1
STROBE L — BV1
RESTORE L — BB1
ADDR ACC L — AR1
SECTOR PLS L — AF1
INDEX PLS L — AK1
SECTOR ADDR 0 L — AM1
" 1 L — AJ1
" 2 L — AL1
" 3 L — AP1

AE1 SECTOR/INDEX
BD1 SECTOR/INDEX L — BH2
AR2 INDEX PULSE L — AJ1
BL1 R/W/S READY — BJ1
BR1 SET WT PROT L — BB1
WRT PROT SET L — BU1

M7701 CONTROL & INTERLOCK — AB04

BC1
AR1 HOME SW L
AA1 SAFETY RELAY L
AK1 OUTER LIMIT
BH1 NO PROT L (to G180)
BA1 SET UNSAFE L (from G180)
AN1 SPINDLE MTR RLY L
AH1 INTERLOCK L
BV1 DOOR UNLOCK L

SPINDLE MOTOR RELAY
+18V
AC IN

+15V
DOOR UNLOCK SOLENOID

BL1 RUN SW L
BD1 LOAD SW L
BE1 WRITE SW ON L
BF1 WRITE SW OFF L

CNTL PNL

FILE READY L
DC LOW L

* SWITCHES, INTERLOCKS, AND RELAYS ARE SHOWN IN NORMAL (RUN) OPERATING POSITION.

RK05/RK11-D SYSTEM BLOCK DIAGRAM

NOTE:
TERMINATOR OR DISK BUS CABLE CONNECTOR MAY BE INTERCHANGED BETWEEN SLOTS 7 AND 8

	1	2	3	4	5	6	7	8
		M77ØØ if OLD BOARD	M77Ø2 if OLD BOARD		* See note on G938 schematic			
	G18Ø	M768Ø	M7681	M77Ø1	G938-YA	M983	M93Ø *	M929
USAGE	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2
	READ/ WRITE	INDEX & SECTOR	CYLINDER ADDRESS DIFFERENCE	CONTROL & INTERLOCK	POSITION SERVO PREAMP	CHASSIS CONNECTOR	TERMINATOR	DISKBUS CABLE CONNECTOR

* IF MORE THAN ONE DRIVE IS USED, M93Ø IS REPLACED BY M929 (BC11A) M93Ø IS USED IN THE LAST DRIVE ON THE BUS

DESCRIPTION	DWG./PART NO.	ITEM NO.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

ANGLES ±0° 30'

SURFACE QUALITY IN MICROINCHES

CLASS OF ACCURACY (CHECK ONE)	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 [illegible]	OVER [illegible] TO [illegible]
MEDIUM	±.004	±.008	±.012	±.016	[illegible]	±.04
PREFERRED	±.012	±.016	±.025	±.04	[illegible]	±0.1

QUANTITY & VARIATION

THIRD ANGLE PROJECTION

REMOVE BURRS AND BREAK SHARP CORNERS

DO NOT SCALE DWG

MATERIAL —

FINISH —

DRN. Soellretzer 4/16/76
CHK'D T. [illegible] 18 MAY 76
ENG. W. [illegible] 5/[illegible]/76
PROJ. ENG. W. [illegible] 5/19/76
PROD. [illegible] 5/26/76

NEXT HIGHER ASSY. B-DD-RKØ5F-Ø

SCALE NONE

SHEET 1 OF 1

FIRST USED ON RKØ5F

digital

TITLE MODULE UTILIZATION

SIZE C CODE MU NUMBER RKØ5F-Ø-2 REV.

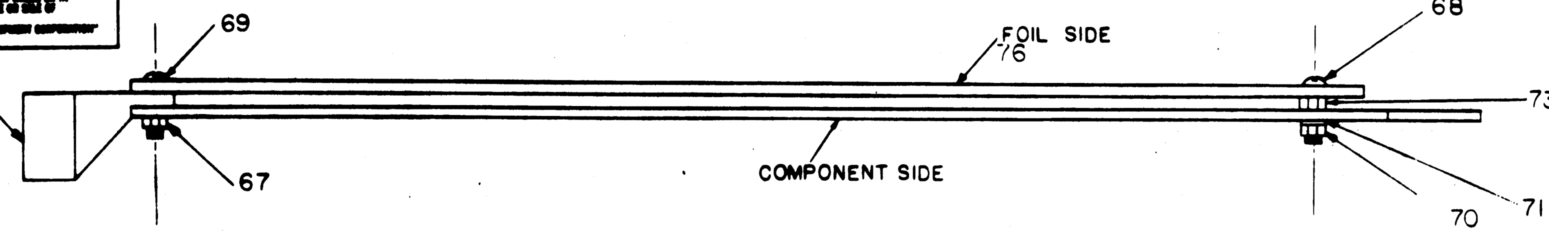
DIST.

REVISIONS: CHK | CHANGE NO. | REV.

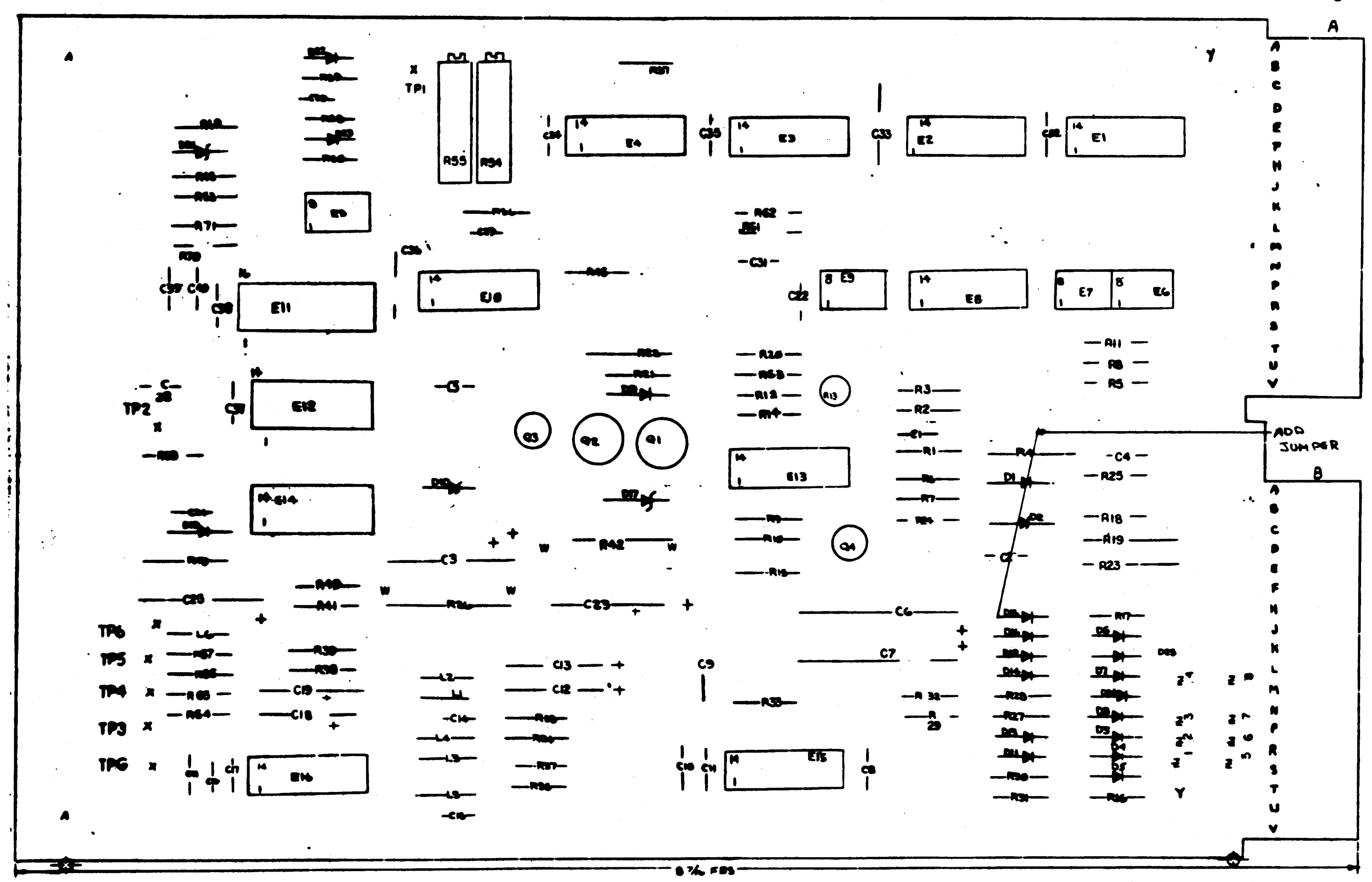
DEC FORM NO. DRC 100-C

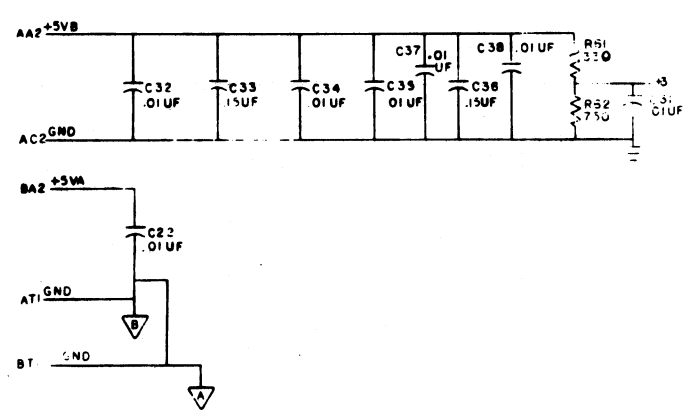
C MU RKØ5F-Ø-2

NOTES:



NOTE:
DO NOT INSERT HANDLE HOLE EYELETS ON OUTSIDE HANDLE HOLES: (2 PLCS)





QTY	REF. DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
1	D26	DIODE IN748A (3.9V ZENER)	1100122	79
1	R69	RES. 180 1/4W 5%	1301322	78
2	R7,R10	RES. 100 1/4W 5%	1300229	77
1		NOISE SHIELD	5009893	76
2		HANDLE,FLIP CHIP-GREEN	9008337-01	75
7	TPG,TP1 THRU TP6	SWAGE LUG	9007791	74
2		HEX NUT,NYLON, #2-56	9007763	73
2		EYELET #6S4-7	9006732	72
2		INTERNAL LOCK WASHER #2-56	9006621	71
2		HEX NUT #2-56	9006555	70
2		SCREW 4/40X3/8	9006011-4	69
2		SCREW PAN HD #2-56 \ 5/16	9006002-1	68
2		KEP NUT 4/40	9006557	67
3	E6F	I.C. DEC 7545	1910645	66
2	E15,16	I.C. DEC 733	1910644	65
1	E14	I.C. DEC 1414	1910337	64
1	E5	I.C. DEC 741	1910298	63
1	E1	I.C. DEC 8891	1909705	62
2	E2,E8	I.C. DEC 8640	1911469	61
1	E10	I.C. DEC 9601	1909373	60
1	E13	I.C. DEC 7472	1905588	59
2	E4,E12	I.C. DEC 7400	1905575	58
1	E3	I.C. DEC 7474	1905547	57
1	L6	INDUCTOR 120UH	1610663	56
2	L1,L2	INDUCTOR 56UH	1610661	55
3	L3,L4,L5	INDUCTOR 100UH	1610662	54
1	Q3	TRANSISTOR DEC 6534C	1503409-02	53
1	Q4	TRANSISTOR DEC 3009B	1503100	52
2	Q1,Q2	TRANSISTOR 2N2904	1501742	51
				50
1	R13	POT 1K 1/2W 20% 62PR	1309150-03	49
2	R54,55	POT 10K 3/4W 10% 78PR	1309143-10	48
2	R16,R17	RES.27K 1/4W 5%	1305346	47
2	R27,R28	RES. 8.2K 1/4W 5%	1303179	46
1	R60	RES. 220K 1/4W 5%	1302092	45
1	R4	RES 270 1/2W 5%	1300285	44
2	R40,R41	RES. 560 1/4W 5%	1301890	43
6	R6,9,45,53,70,71	RES 5.6K 1/4W 5%	1301874	42
1	R11	RES. 1.1K 1/4W 5%	1301475	41
1	R58	RES. 3.3K 1/4W 5%	1300439	40
1	R62	RES. 750 1/4W 5%	1301401	39
2	R15,R21	RES 1.2K 1/4W 5%	1301320	38
2	R30,R31	RES. 15K 1/4W 5%	1300496	37
6	R5,8,18,38,39,57	RES. 10K 1/4W 5%	1300479	36
1	R59	RES. 4.7K 1/4W 5%	1300447	35
1	E11	I.C. DEC 74123	1910438	34
16	R1,R2,R3 R20,R34-37 R46 R56,R63-68	RES. 1K 1/4W 5%	1300365	33
2	R24,R12	RES 470 1/4W 5%	1300316	31
1	R43	RES 470 1/2W 5%	1300315	30
3	R22,R25,R61	RES 330 1/4W 5%	1300295	29
2	R29,R32	RES 220 1/4 5%	1300271	28
2	R26 R42	RES 180 1W 5%	1300262	27
1	R19	RES 180 1/2W 5%	1300260	26
1	R14	RES 150 1/4W 5%	1300250	25
1	R23	RES 150 1/2W 5%	1300249	24
1	R33	RES. 68 1/4W 5%	1300219	23
8	1-8	GOLD WIREWRAP PINS	9009217	22
18	D1,D3-9,D11-16,D22-25	DIODE D672	1105275	21
1	D2	DIODE IN 751A (5.1V ZENER)	1110994	20
				19
3	D10,D17,D18	DIODE IN 753A (6.2V ZENER)	1102421	18
13	C9,C33,C36	CAP .15UF 50V 10% POLYCARBONATE	1010031	17
~~1~~	~~C15~~	~~CAP 10PF 100V 5% D.M.~~	[illegible]	~~16~~
4	C12,C13,C18,C19	CAP .01 UF 50V AXIAL	1001610-00	15
14	C4,10,11,16,17,22 2-29 31 32,34,35,37,39	CAP .01UF 100V 20% DISC	1001610-01	14
2	C6,C7	CAP 10UF 35V 20% S TANT	1000069	13
3	C3,C23,C25	CAP 6.8UF 35V 20% S. TANT	1000067	12
1	C2	CAP 680PF 100V 5% D.M.	1000026	11
2	C5,C30	CAP 470PF 100V 5% D.M.	1000024	10
1	C29	CAP 150PF 100V 5% DM	1000019	9
1	C41	CAP 27PF 100V 5% D.M.	1001739	8
1	C14	CAP 56PF 100V 5% D.M.	1000012	7
3	C1,C39,C40	CAP 47PF 100V 5% D.M.	1000011	6
2	C8,C15	CAP 18 PF 100V 5% DM	1002608	5
		ETCHED CIRCUIT BOARD	5009743	4
		MODULE ECO HISTORY	B-MH-G180-0-6	3
		ASS'Y/DRILLING HOLE LAYOUT	E-AH-G180-0-5	2
		X-Y COORDINATE HOLE LOCATION	K-CO-G180-0-4	1

PARTS LIST

ETCH BOARD REV. L

DEC NO.	EIA NO.	DEC NO.	EIA NO.
		IN746A	SAME
2N2904	2N3118A	IN753A	SAME
DEC 3009B	2N3009	IN751A	SAME
DEC 6534C	MPS6534	D672	IN4153

SEMICONDUCTOR CONVERSION CHART

REV.	CHANGE NO.
N	G180-00010
M	G180-00009
L	
K	G180-00006

REVISIONS

IC TYPE	GND	+5V
DEC 8640	1	8
DEC 75452	4	8

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

IC PIN LOCATIONS

DRN. R. DOUCETTE DATE 10-22-71
CHK'D. NANCY MOORE DATE 11-30-71
ENG. DALE JENSEN DATE 1-22-72
PROJ. ENG. A. KALLBERG DATE 1-22-72
PROD. DATE
NEXT HIGHER ASSY

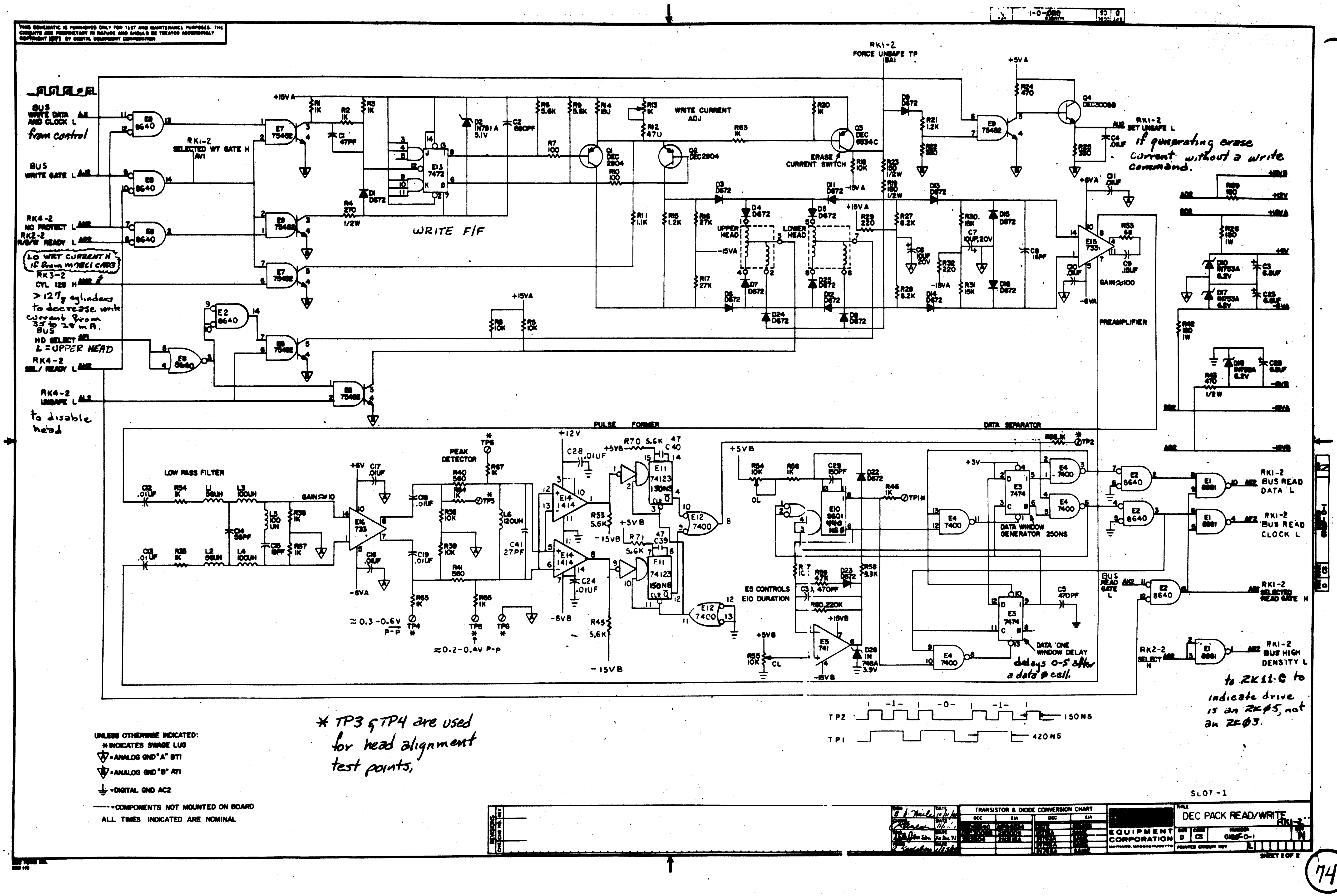
digital

TITLE DEC PACK READ/WRITE

SIZE D CODE CS NUMBER G180-0-1 REV. N

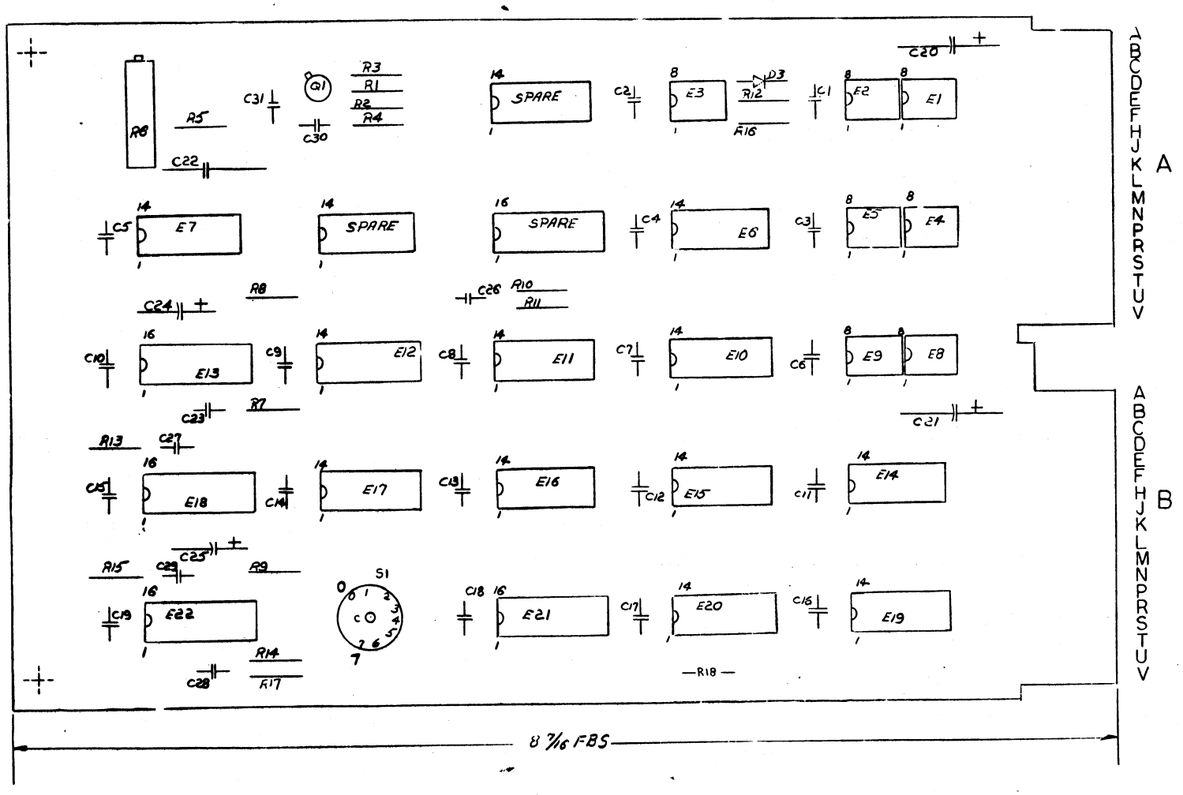
SCALE
SHEET 1 OF 2
DIST.

73

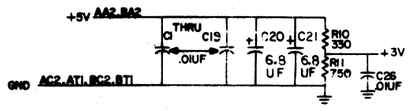

THIS SCHEMATIC IS FURNISHED ONLY FOR TEST AND MAINTENANCE PURPOSES. THE CIRCUITS ARE PROPRIETARY IN NATURE AND SHOULD BE TREATED ACCORDINGLY. COPYRIGHT 1971 BY DIGITAL EQUIPMENT CORPORATION
BUS WRITE DATA AND CLOCK L
from control
BUS WRITE GATE L
RK4-2 NO PROTECT L
RK2-2 R/S/W READY L
LO WRT CURRENT H if from M7861 CARD
RK3-2 CYL 128 H
>127 cylinders to decrease write current from 35 to 27 mA.
BUS HD SELECT
L = UPPER HEAD
RK4-2 SEL/ READY L
RK4-2 UNSAFE L
to disable head
RK1-2 SELECTED WT GATE H
WRITE F/F
WRITE CURRENT ADJ
ERASE CURRENT SWITCH
UPPER HEAD
LOWER HEAD
RK1-2 FORCE UNSAFE TP
RK1-2 SET UNSAFE L
If generating erase current without a write command.
PREAMPLIFIER
GAIN≈100
PULSE FORMER
DATA SEPARATOR
LOW PASS FILTER
GAIN≈10
PEAK DETECTOR
≈0.3-0.6V P-P
≈0.2-0.4V P-P
E5 CONTROLS E10 DURATION
DATA WINDOW GENERATOR 250NS
DATA 'ONE' WINDOW DELAY
delays 0-5 after a data φ cell.
RK1-2 BUS READ DATA L
RK1-2 BUS READ CLOCK L
BUS READ GATE L
RK1-2 SELECTED READ GATE H
RK2-2 SELECT H
RK1-2 BUS HIGH DENSITY L
to RK11-C to indicate drive is an RK05, not an RK03.
TP2
TP1
150NS
420NS
* TP3 & TP4 are used for head alignment test points.
UNLESS OTHERWISE INDICATED:
* INDICATES SWAGE LUG
= ANALOG GND "A" BT1
= ANALOG GND "B" AT1
= DIGITAL GND AC2
= COMPONENTS NOT MOUNTED ON BOARD
ALL TIMES INDICATED ARE NOMINAL
TRANSISTOR & DIODE CONVERSION CHART
EQUIPMENT CORPORATION
DEC PACK READ/WRITE
SLOT-1
SHEET 2 OF 2
74

M7700-0-1 D CS

NOTES:
1. ITEM #23 CAN BE REPLACED BY A DEC 6534C(1503409-02) TRANSISTOR IF NEEDED



NOTES:
PIN 7 = GND ON E2, E5, E7, E11, E13, E14, E17, E20, E21, E23
PIN 14 = +5V
PIN 4 = GND ON E1, E3, E4, E6, E10, E15, E16
PIN 8 = +5V
PIN 10 = GND ON E8, E12
PIN 5 = +5V
PIN 1 = GND ON E22
PIN 8 = +5V
PIN 8 = GND ON E9, E18, E19
PIN 16 = +5V



QTY	REF. DESIGNATION	DESCRIPTION	DEC PART NO.	
		PARTS LIST		
2	C20,21	CAP. 6.8UF 35V 20%	1000067	40
1	R2	RESISTOR 4.7K ¼W 5%	1300447	39
1	C22	CAP. .01UF 100V 10% MYLAR	1005784	38
				37
2		HANDLE, FLIP CHIP - MAGENTA	9008337-06	36
4		EYELET	9006732	35
1	E20	I.C. DEC 7401	1909980	34
3	E13, 18, 22	I.C. DEC 74123	1910636	33
7	E1-5, E8, E9	I.C. DEC 7452	1910648	32
1	E7	I.C. DEC 74121	1910230	31
1	E21	I.C. DEC 74145	1910047	30
1	E14	I.C. DEC 7404	1909686	29
2	E15, 19	I.C. DEC 8640	1911459	28
2	E6, 11	I.C. DEC 7493	1909954	27
1	E10	I.C. DEC 7410	1905576	26
2	E12, 16	I.C. DEC 7400	1905575	25
1	E17	I.C. DEC 7474	1905547	24
1	Q1 SEE NOTE 1	TRANSISTOR DEC 3639C	1502748-01	23
1	R13	RES. 18K ¼W 5%	1302465	22
3	R14, 15, 8	RES. 30K ¼W 5%	1302994	21
1	R6	POT. 10K 3/4W 10%	1309143-10	20
7	R9	RES. 22K ¼W 5%	1301808	19
1	R11	RES. 750 ¼W 5%	1301401	18
3	R3, R7, R18	RES. 10K ¼W 5%	1308479	17
2	R4, 10	RES. 330 ¼W 5%	1300295	16
1	R12	RES. 150 ¼W 5%	1300250	15
1	R1	RES. 100 ¼W 5%	1300229	14
1	S1	SWITCH ROTARY 8 POS	1210043	13
1	D3	DIODE AZ5 (2.4)	1101938	12
3	R5, 16, 17	RES 1K 1/4W 5%	1300349	11
1	C24	CAP. .15UF 35V 20% S.TANT	1002180	10
1	C25	CAP. 1.0UF 35V 10% S.TANT	1001776	9
21	C1 thru C19, C26, C31	CAP. .01UF 100V 20% DISC	1001610	8
1	C29	CAP. 470PF 100V 5% D.M.	1000024	7
2	C23, C30	CAP. 130PF 100V 5% D.M.	1000023	6
2	C28, 27	CAP. 100PF 100V 5% D.M.	1000016	5
1		ETCHED CIRCUIT BOARD	5009716	4
		MODULE ECO HISTORY	B-MM-M7708-0-6	3
		ASSY/DRILLING HOLE LAYOUT	K-MM-M7700-0-5	2
		X-Y COORDINATE HOLE LOCATION	K-CO-M7700-0-4	1

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA

EQUIPMENT CORPORATION

TITLE: DEC PAK INDEX AND SECTOR
RK2-1
SIZE D CODE CS NUMBER M7700-0-1
PRINTED CIRCUIT REV K
SHEET 1 OF 2

Note: +5 is supply voltage for sector xducer LED.

2.5mS for 16 Sector pack
3.3mS for 12 Sector pack

POWER SECTOR TRANSDUCER H
CHASSIS ADI
CHASSIS AEI
SECTOR INDEX RAW H
R1 100
R2 4.7K
R3 10K
C31 .01UF
Q1 DEC 3639C OR DEC 6539C
C30 330PF
R4 330

SECTOR TIMING DELAY Set to 70μS
C22 .01UF
R6 10K
R5 1K
E7 74121 8-80 4LS
C23 330
R7 10K
E13 74123 1LS

BDI INDEX/SECTOR L RK2-2

C24 .15UF
R8 30K
E13 74123 1MS
SECTOR/INDEX SEPARATOR 0-8

AP2 INDEX PULSE L RK2-2
AS2 SECTOR PULSE L RK2-2
E12 7400

HEAD SETTLE DELAY
R9 22K
C25 1UF
E18 74123 6MS

BLI R/W/S READY H RK2-2
BKI R/W/S READY L RK2-2
E17 7474

RK3-2 MOVE L BPI

INDEX PULSE TRUE CLEARS SECTOR CNTR AT NEXT SECTOR PULSE (Ø)
E4A 7404
R2 EG 7493
SECTOR CNTR
13g or 17g

RK3-2 INNER LIMIT H BJI
E14 7404

BUS RESTORE L BBI
E16 7400
E15 8640
RESTORE H RK2-2 ABI

SEEK MUST COMPLETE IN 280MS
E10 7410
E11 7493
SEEK INCOMPLETE CNTR
Counts 7 revolutions of disk.

RK3-2 RTZ L BCI
BUS STROBE L BVI

GOOD STROBE H
E12 7400
RK4-2 SELECT/READY L BH1
E14 7404

RK4-2 READY H ACI
E10 7410
(I) SEEK INCOMPLETE (D)

RK1-2 SELECTED WRITE GATE H AV2
C27 100PF R13 18K +5V
C28 100PF R14 30K +5V
C29 470PF R15 30K +5V
E18 74123 150 NS
E22 74123 1MS
E22 74123 5MS
BFI GOOD STROBE L RK2-2 TO RK3-2
E16 7400
RK3-2 ADDRESS INVALID L

D3 AZ5 2.4V
R16 1K
E3 75452
AAI ON L RK2-2

RK1-2 SELECTED READ GATE H AF2
AE2 RK2-2 READ INDICATOR

E21 74145
S1
SELECT L
R17 1K

BUS SELECT 2L BT2
BUS SELECT 1L BS2
BUS SELECT 0L BR2
BUS SELECT 3L BV2
BUS RK-11D L AVI
E19 8640
E20 7401
R18 10K
E4B 7404
RK-11D L TRUE ALLOWS BINARY CODED SELECTION

RK2-2 SELECT H BV2
BUS WRITE PROTECT SET L BSI
E15 8640
RK2-2 SELECT/WRITE PROTECT SET L BRI

RK8E and RK11-C use Nand gates E20 for select.

BUS SECTOR PULSE L RK2-2 AFI
BUS INDEX PULSE L RK2-2 AKI
BUS SECTOR ADDRESS ØL RK2-2 AHI
BUS SECTOR ADDRESS 1L RK2-2 AJI
BUS SECTOR ADDRESS 2L RK2-2 ALI
BUS SECTOR ADDRESS 3L RK2-2 API
BUS R/W/S READY L RK2-2 ANI
BUS SEEK INCOMPLETE L RK2-2 ANI
BUS ADDRESS ACCEPTED L RK2-2 ARI
BUS ADDRESS INVALID L RK2-2 BAI
SEEK DONE INDICATOR RK2-2 (ON CYL) AVI
WRITE INDICATOR RK2-2 AWI
ADDRESS ACCEPTED L RK2-2 ASI
E2 75452
E1 75452
E5 75452
E4 75452
E9 75452
E8 75452
E16 7400

SLOT 2

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

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

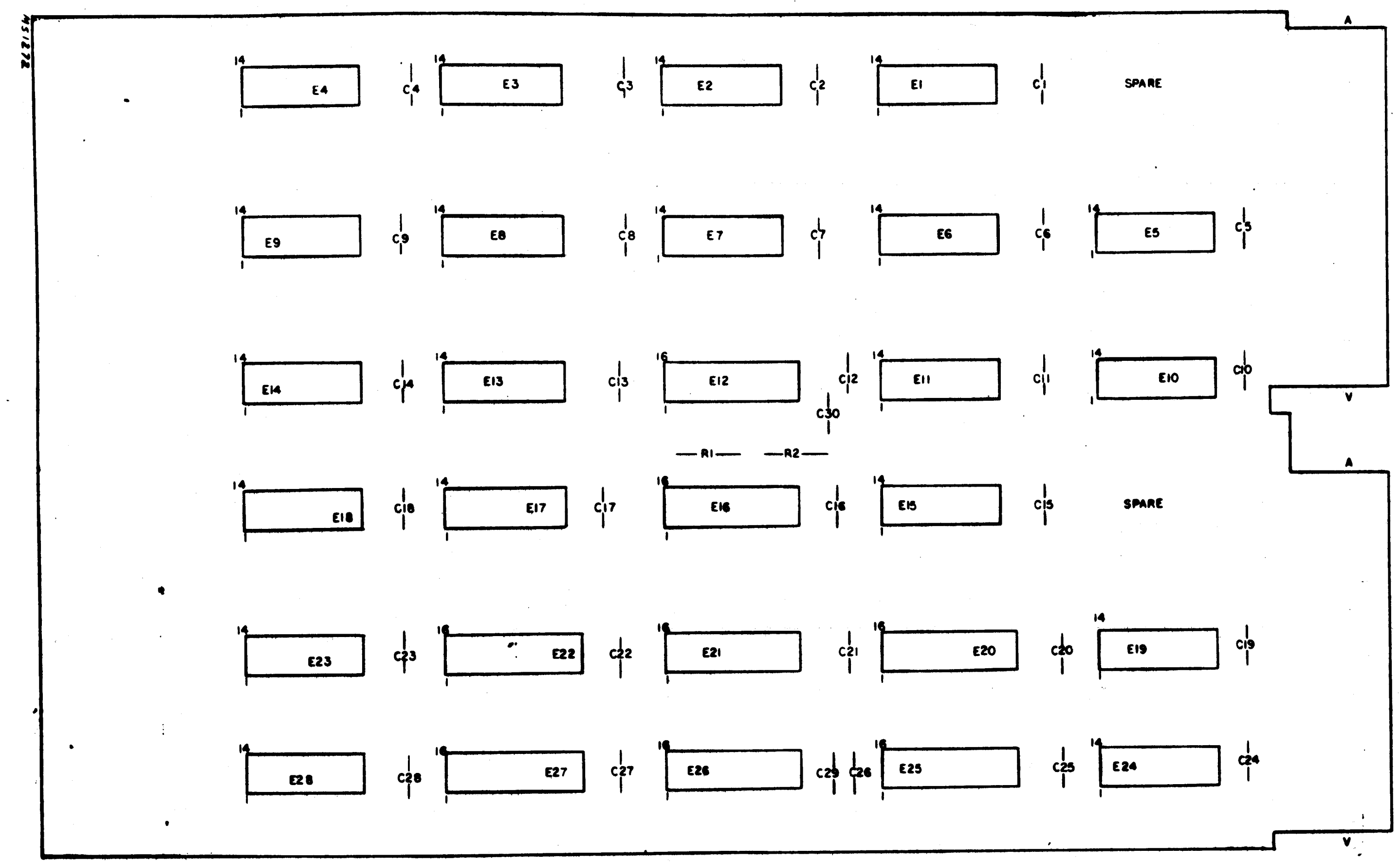
DRN. E J Neale DATE 8-17-72
CHK'D. DATE 8/23/72
ENG. DATE 10-5-72
PROJ. ENG. DATE 10-5-72
PROD. DATE
NEXT HIGHER ASSY.
SCALE
SHEET 2 OF 2

Digital EQUIPMENT CORPORATION

TITLE: DEC PAK INDEX AND SECTOR
RK2-2

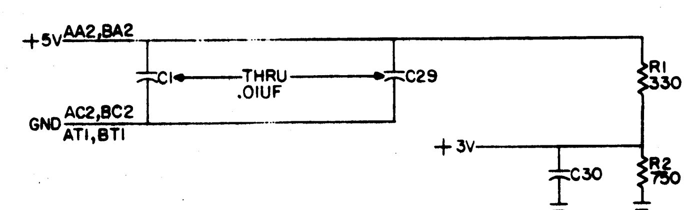
SIZE	CODE	NUMBER	REV.
D	CS	M7700-0-1	R

DIST.



UNLESS OTHERWISE INDICATED:

PIN 8 = +5V, PIN 1 = GND	DEC 380
PIN 5 = +5V, PIN 12 = GND	DEC 7483
PIN 16 = +5V, PIN 8 = GND	DEC 74175
PIN 16 = +5V, PIN 8 = GND	DEC 74193
PIN 14 = +5V, PIN 7 = GND	ALL OTHER IC'S



QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
4		EYELET #04-7	[illegible]	[illegible]
2		HANDLE, FLIP CHIP - MAGENTA	[illegible]	[illegible]
2	E20, E25	I.C. DEC 74175	[illegible]	[illegible]
2	E5, E17	I.C. DEC 7437	[illegible]	[illegible]
2	E19, E24	I.C. DEC 380	[illegible]	[illegible]
2	E12, E16	I.C. DEC 74193	[illegible]	[illegible]
2	E23, E28	I.C. DEC 7486	[illegible]	[illegible]
4	E21, E22, E26, E27	I.C. DEC 7483	[illegible]	[illegible]
2	E7, E11	I.C. DEC 7404	[illegible]	[illegible]
1	E1	I.C. DEC 7402	[illegible]	[illegible]
1	E14	I.C. DEC 7440	[illegible]	12
2	E15, E18	I.C. DEC 7410	[illegible]	[illegible]
4	E2, E6, E10, E13	I.C. DEC 7400	[illegible]	[illegible]
4	E3, E4, E8, E9	I.C. DEC 7474	[illegible]	9
1	R2	RES. 750 1/4W 5%	[illegible]	[illegible]
1	R1	RES. 330 1/4W 5%	1300295	7
		GRIPLET	12102[illegible]-0	6
30	C1 - C30	CAP. .01UF 100V 20% DISC	1001610	5
1		ETCHED CIRCUIT BOARD	5009710	4
		MODULE ECO HISTORY	D-[illegible]-M7702-0-6	3
		ASSY/DRILLING HOLE LAYOUT	E-AH-M7702-0-5	2
		X-Y COORDINATE HOLE LOCATION	[illegible]-M7702-0-4	1

PARTS LIST

ETCH BOARD REV C

REV	CHANGE NO.	CHK	
C	M7702-00001		D. JENSEN 5/24/73

REVISIONS

SEMICONDUCTOR CONVERSION CHART

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

DRN. Roger J. Dankert DATE 11-17-71
CHK'D. Smith DATE 11-29-71
ENG. DATE 12-16-71
PROD. DATE

NEXT HIGHER ASSY

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

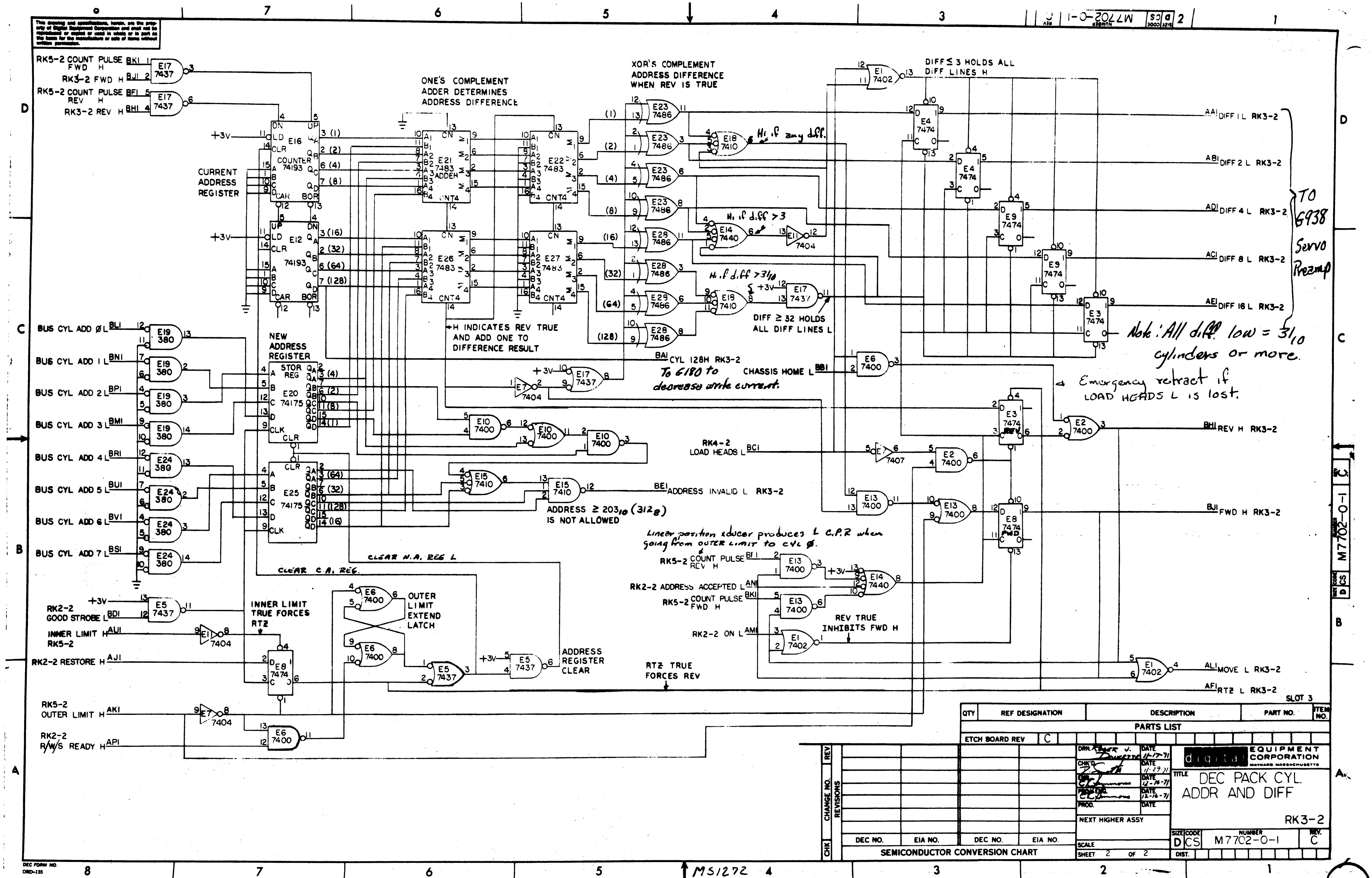
TITLE DEC PACK CYL ADDR AND DIFF

RK3-1

SIZE D CODE CS NUMBER M7702-0-1 REV. C

SCALE
SHEET 1 OF 2

DEC FORM NO. DRD-13B



RK5-2 COUNT PULSE FWD H
RK3-2 FWD H
RK5-2 COUNT PULSE REV H
RK3-2 REV H
CURRENT ADDRESS REGISTER
ONE'S COMPLEMENT ADDER DETERMINES ADDRESS DIFFERENCE
XOR'S COMPLEMENT ADDRESS DIFFERENCE WHEN REV IS TRUE
DIFF ≤ 3 HOLDS ALL DIFF LINES H
Hi if any diff.
Hi if diff > 3
Hi if diff > 31₁₀
DIFF ≥ 32 HOLDS ALL DIFF LINES L
DIFF 1 L RK3-2
DIFF 2 L RK3-2
DIFF 4 L RK3-2
DIFF 8 L RK3-2
DIFF 16 L RK3-2
TO 6938 Servo Preamp
Note: All diff low = 31₁₀ cylinders or more.
H INDICATES REV TRUE AND ADD ONE TO DIFFERENCE RESULT
NEW ADDRESS REGISTER
CYL 128H RK3-2
To 6180 to decrease write current.
CHASSIS HOME L
Emergency retract if LOAD HEADS L is lost.
BUS CYL ADD Ø L
BUS CYL ADD 1 L
BUS CYL ADD 2 L
BUS CYL ADD 3 L
BUS CYL ADD 4 L
BUS CYL ADD 5 L
BUS CYL ADD 6 L
BUS CYL ADD 7 L
REV H RK3-2
RK4-2 LOAD HEADS L
ADDRESS INVALID L RK3-2
ADDRESS ≥ 203₁₀ (312₈) IS NOT ALLOWED
FWD H RK3-2
Linear position educer produces ↓ C.P.R when going from OUTER LIMIT to CYL Ø.
CLEAR N.A. REG L
CLEAR C.A. REG.
RK5-2 COUNT PULSE REV H
RK2-2 ADDRESS ACCEPTED L
RK5-2 COUNT PULSE FWD H
RK2-2 ON L
REV TRUE INHIBITS FWD H
RK2-2 GOOD STROBE L
INNER LIMIT H RK5-2
RK2-2 RESTORE H
INNER LIMIT TRUE FORCES RTZ
OUTER LIMIT EXTEND LATCH
ADDRESS REGISTER CLEAR
RTZ TRUE FORCES REV
MOVE L RK3-2
RTZ L RK3-2
SLOT 3
RK5-2 OUTER LIMIT H
RK2-2 R/W/S READY H
PARTS LIST
ETCH BOARD REV C
DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
DEC PACK CYL. ADDR AND DIFF
RK3-2
D CS M7702-0-1 C
SEMICONDUCTOR CONVERSION CHART
SHEET 2 OF 2
MS1272

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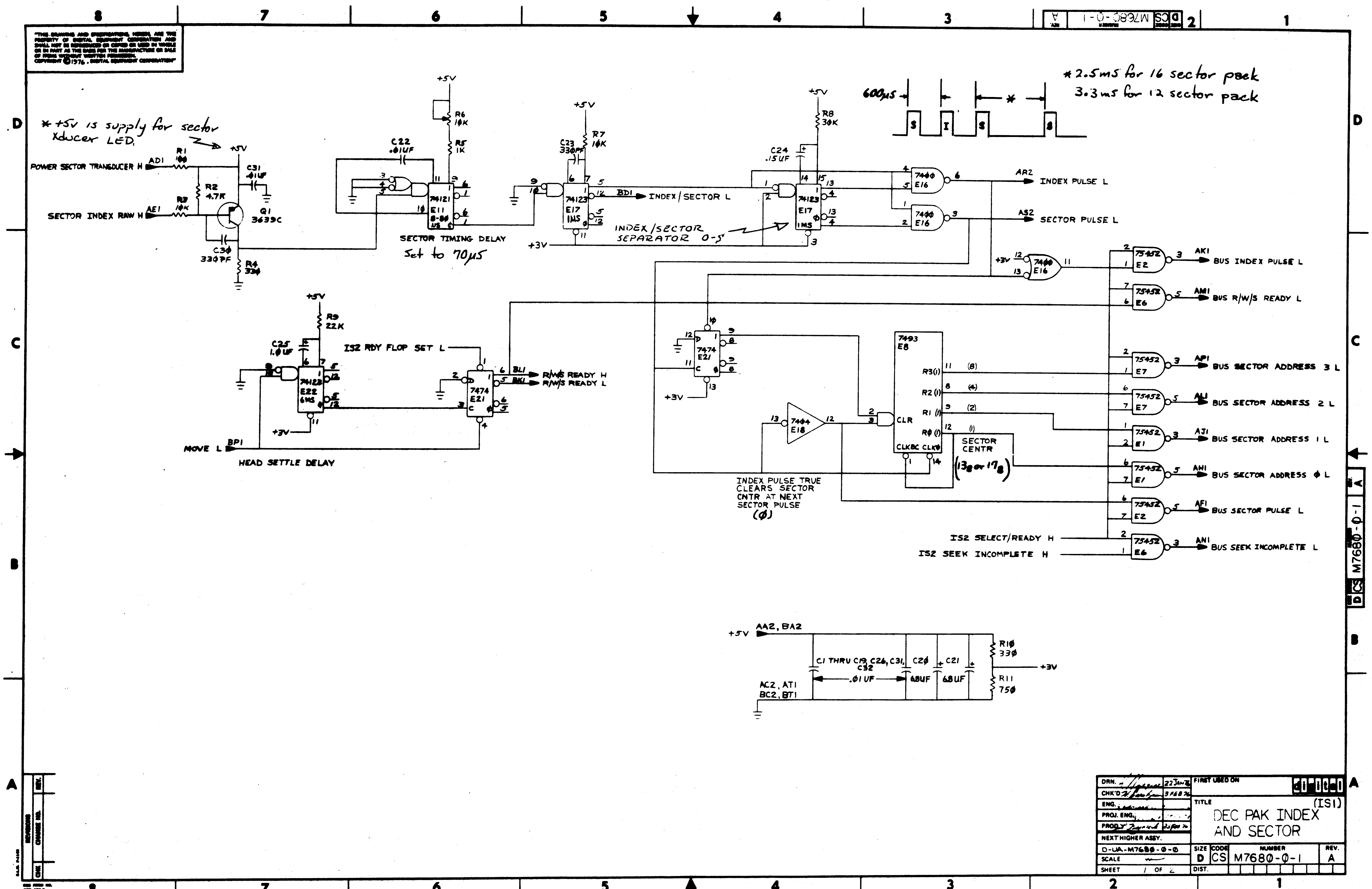
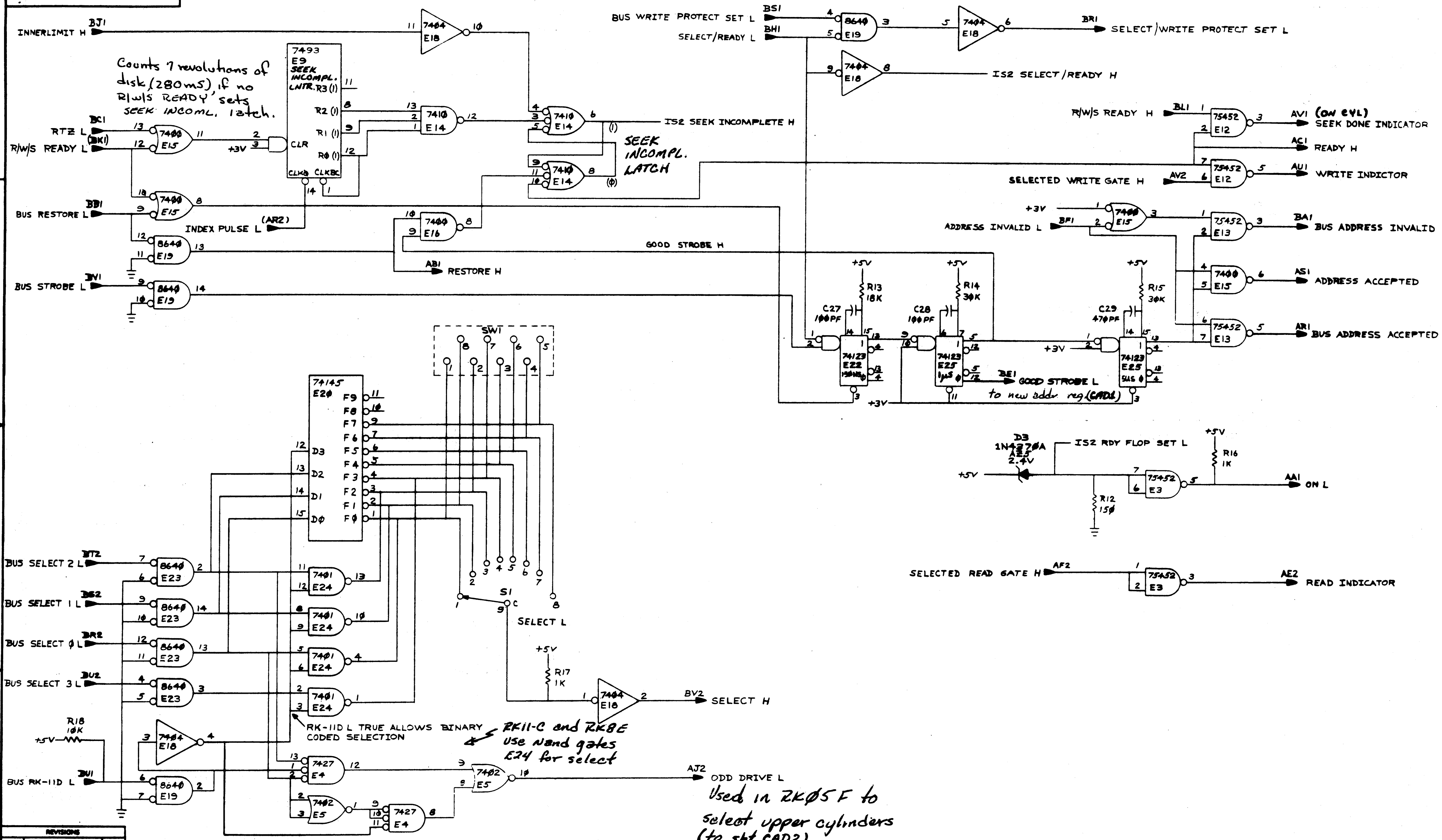

* +5V is supply for sector Xducer LED.
POWER SECTOR TRANSDUCER H
SECTOR INDEX RAW H
SECTOR TIMING DELAY
Set to 70μS
INDEX/SECTOR L
INDEX/SECTOR SEPARATOR O-S
600μS
* 2.5mS for 16 sector pack
3.3mS for 12 sector pack
INDEX PULSE L
SECTOR PULSE L
BUS INDEX PULSE L
BUS R/W/S READY L
BUS SECTOR ADDRESS 3 L
BUS SECTOR ADDRESS 2 L
BUS SECTOR ADDRESS 1 L
BUS SECTOR ADDRESS Φ L
BUS SECTOR PULSE L
BUS SEEK INCOMPLETE L
IS2 SELECT/READY H
IS2 SEEK INCOMPLETE H
SECTOR CENTR
INDEX PULSE TRUE CLEARS SECTOR CNTR AT NEXT SECTOR PULSE (Φ)
IS2 RDY FLOP SET L
R/W/S READY H
R/W/S READY L
MOVE L
HEAD SETTLE DELAY
C1 THRU C19, C26, C31, C32 .01 UF
DEC PAK INDEX AND SECTOR (IS1)
D CS M7680-Φ-1 A
SHEET 1 OF 2


INNERLIMIT H
Counts 7 revolutions of disk (280mS) if no R/W/S READY sets SEEK INCOML. latch.
RTZ L
R/W/S READY L
BUS RESTORE L
INDEX PULSE L
BUS STROBE L
7493 E9 SEEK INCOMPL. CNTR.
IS2 SEEK INCOMPLETE H
SEEK INCOMPL. LATCH
RESTORE H
GOOD STROBE H
BUS WRITE PROTECT SET L
SELECT/READY L
SELECT/WRITE PROTECT SET L
IS2 SELECT/READY H
R/W/S READY H
(ON CYL) SEEK DONE INDICATOR
READY H
SELECTED WRITE GATE H
WRITE INDICTOR
ADDRESS INVALID L
BUS ADDRESS INVALID L
ADDRESS ACCEPTED
BUS ADDRESS ACCEPTED L
GOOD STROBE L
to new addr reg (CAD1)
IS2 RDY FLOP SET L
ON L
SELECTED READ GATE H
READ INDICATOR
SW1
74145 E20
BUS SELECT 2 L
BUS SELECT 1 L
BUS SELECT 0 L
BUS SELECT 3 L
BUS RK-11D L
SELECT L
SELECT H
RK-11D L TRUE ALLOWS BINARY CODED SELECTION
RK11-C and RK8E use Nand gates E24 for select
ODD DRIVE L
Used in RK05F to select upper cylinders (to sht CAD2)

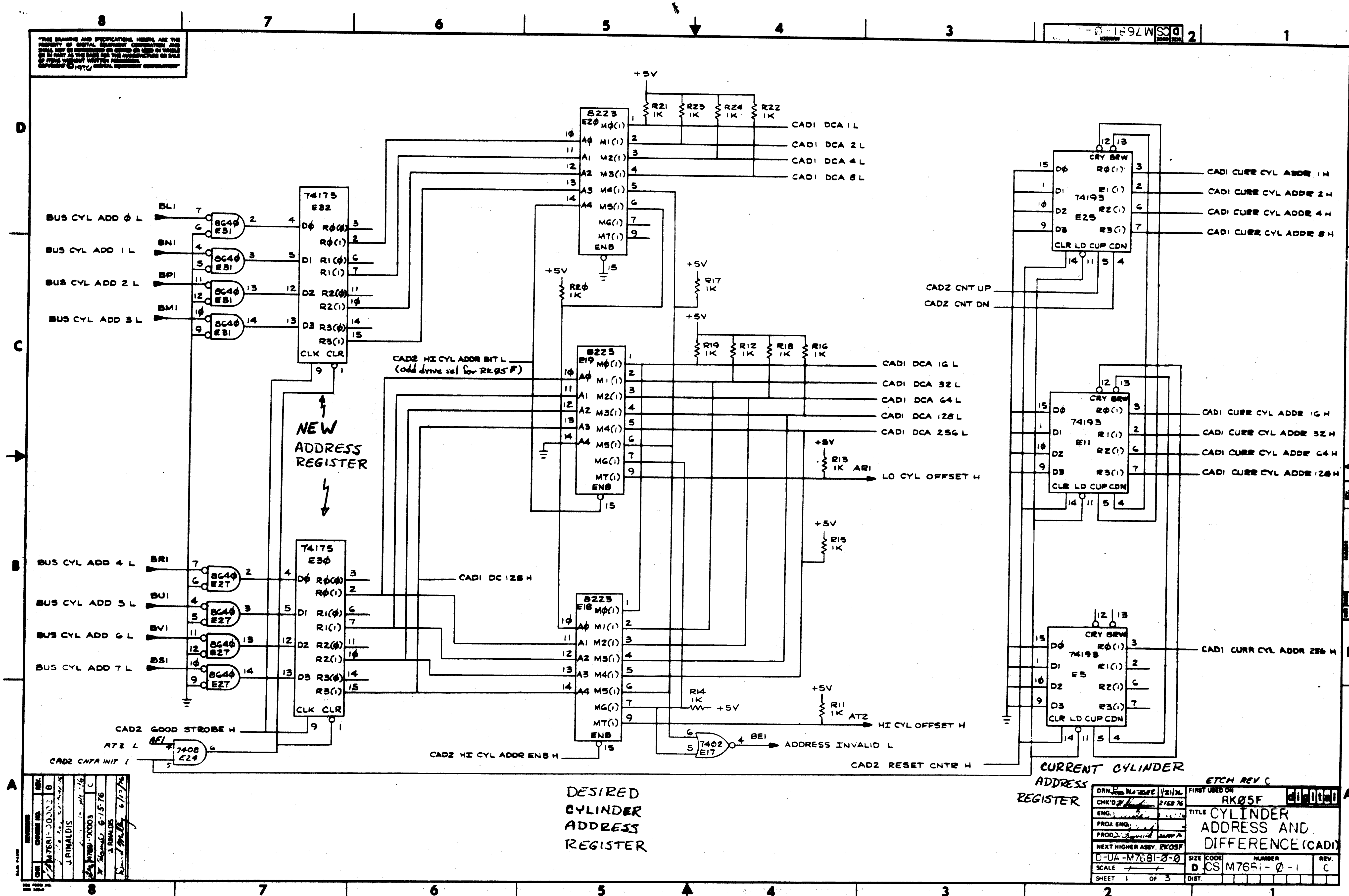
REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: DEC PAK INDEX AND SECTOR (IS2)

SIZE: D | CODE: CS | NUMBER: M7680-0-1 | REV: A

SCALE: — | SHEET 2 OF 2

DEC FORM NO. DRD 130



BUS CYL ADD Ø L
BUS CYL ADD 1 L
BUS CYL ADD 2 L
BUS CYL ADD 3 L
BUS CYL ADD 4 L
BUS CYL ADD 5 L
BUS CYL ADD 6 L
BUS CYL ADD 7 L
74175 E32
74175 E3Ø
8223 E2Ø
8223 E19
8223 E18
74193 E25
74193 E11
74193 E5
CADI DCA 1 L
CADI DCA 2 L
CADI DCA 4 L
CADI DCA 8 L
CADI DCA 16 L
CADI DCA 32 L
CADI DCA 64 L
CADI DCA 128 L
CADI DCA 256 L
LO CYL OFFSET H
HI CYL OFFSET H
ADDRESS INVALID L
CADI DC 128 H
CAD2 HI CYL ADDR BIT L
(odd drive sel for RKØ5F)
CAD2 GOOD STROBE H
CAD2 CNTR INIT L
CAD2 HI CYL ADDR ENB H
CAD2 CNT UP
CAD2 CNT DN
CAD2 RESET CNTR H
CADI CURR CYL ADDR 1 H
CADI CURR CYL ADDR 2 H
CADI CURR CYL ADDR 4 H
CADI CURR CYL ADDR 8 H
CADI CURR CYL ADDR 16 H
CADI CURR CYL ADDR 32 H
CADI CURR CYL ADDR 64 H
CADI CURR CYL ADDR 128 H
CADI CURR CYL ADDR 256 H
NEW ADDRESS REGISTER
DESIRED CYLINDER ADDRESS REGISTER
CURRENT CYLINDER ADDRESS REGISTER
ETCH REV C
FIRST USED ON RKØ5F
TITLE CYLINDER ADDRESS AND DIFFERENCE (CADI)
NEXT HIGHER ASSY. RKØ5F
D-UA-M7681-Ø-Ø
SIZE D CODE CS NUMBER M7681-Ø-1 REV. C
SHEET 1 OF 3

+3V

ODD DRIVE L — BF2

7474 E13 — CAD2 HI CYL ADDR BIT L; CAD2 HI CYL ADDR ENB H

DBL DEN H — BE2

CAD2 GOOD STROBE H

INNER LIMIT H — AU1 — 7404 E15

RESTORE H — AJ1

GOOD STROBE L — BD1 — 7404 E23

7474 E13

CAD2 RESET CNTR H (to CAD1 to clear C.A. reg.)

LD HEADS L — BC1

7404 E23 — 7400 E22 — 7427 E1C — 7474 E29 — BJ1 — FWD H

FWD F/F

OUTER LIMIT H — AK1 — 7404 E15 — 7400 E21

7404 E23 — 7400 E21

CAD2 CNTR INIT L (to CAD1 to clear NEW ADDR reg.)

7400 E22 — CAD2 DIFF ENB L (to CAD1 to enable DCA reg.)

CAD3 ZERO DETECT H when DCA=CA

ADDRESS ACCEPTED L — AN1 — 7402 E1T

CAD3 FWD TRUE XOR H — 7402 E17 — 7474 E29 — REV FF — AF1 — RTZ L

7408 E24

CAD3 REV TRUE CARRY H — 7402 E28

COUNT PULSE REV H — BF1

COUNT PULSE FWD H — BK1

from G938

+5V — AA2, BA2 — C1 THRU C32 — .01 µf — C33 THRU C35 — 6.8 µf — AC2, AT1, BC2, BT1

+5V — RT 330 — +3V — RB 750

7400 E22 — CAD2, CNT UP

7402 E28 — AL1 — MOVE L

Forces head retract if LOAD HEADS L is lost.

7404 E23 — 7400 E21 — BH1 — REV H

CHASSIS HOME L — BB1 — 7400 E21

7400 E22 — CAD2 CNT DN

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CYLINDER ADDRESS AND DIFFERENCE (CAD2)	D	CS	M7681-Ø-1	C
SCALE —	SHEET 2 OF 3	DIST.		

DEC FORM NO. DRD 131

82

ONES COMPLEMENT ADDER

7483 E26
- CADI CURR CYL ADDR 1 H / CADI DCA 1 L
- CADI CURR CYL ADDR 2 H / CADI DCA 2 L
- CADI CURR CYL ADDR 4 H / CADI DCA 4 L
- CADI CURR CYL ADDR 8 H / CADI DCA 8 L

7483 E10
- CADI CURR CYL ADDR 16 H / CADI DCA 16 L
- CADI CURR CYL ADDR 32 H / CADI DCA 32 L
- CADI CURR CYL ADDR 64 H / CADI DCA 64 L
- CADI CURR CYL ADDR 128 H / CADI DCA 128 L

7483 E4
- CADI CURR CYL ADDR 256 H
- CADI DCA 256 L
- +3V

Determines difference between DESIRED CYL ADDR and CURRENT CYL ADDR.

7408 E24

7404 E23

CAD3 REV TRUE CARRY H

Hi if difference is negative (DCA < CA)

XOR's complement address difference when REV is true.

7486 EG, 7486 E9, 7486 E12

CAD3 FWD TRUE XOR H

RG 5.6K +5V

C34 33pF

74123 E3

+3V

DIFFERENCE REGISTER

8223 E1 (SEE NOTE 1)
- AAI DIFF 1/2 L
- ABI DIFF 2/4 L
- ADI DIFF 4/8 L
- ACI DIFF 8/16 L
- AEI DIFF 16/32 L

CAD2 DIFF ENB L

8223 E2 (SEE NOTE 1)

74157 E8
- CAD2 HI CYL ADDR BIT L
- CADI DC 128 H

+5V R10 1K

BAI LO WRT CURRENT H

BE2 DBL DEN H

S1 (OFF / ON)

SEE NOTE 2

7427 E16

7402 E28

7427 E16 — CAD3 ZERO DETECT H

When DCA = CA

+5V R9 1K

74LG E7 — R2 1K, R3 1K, R1 1K, R4 1K, R5 1K

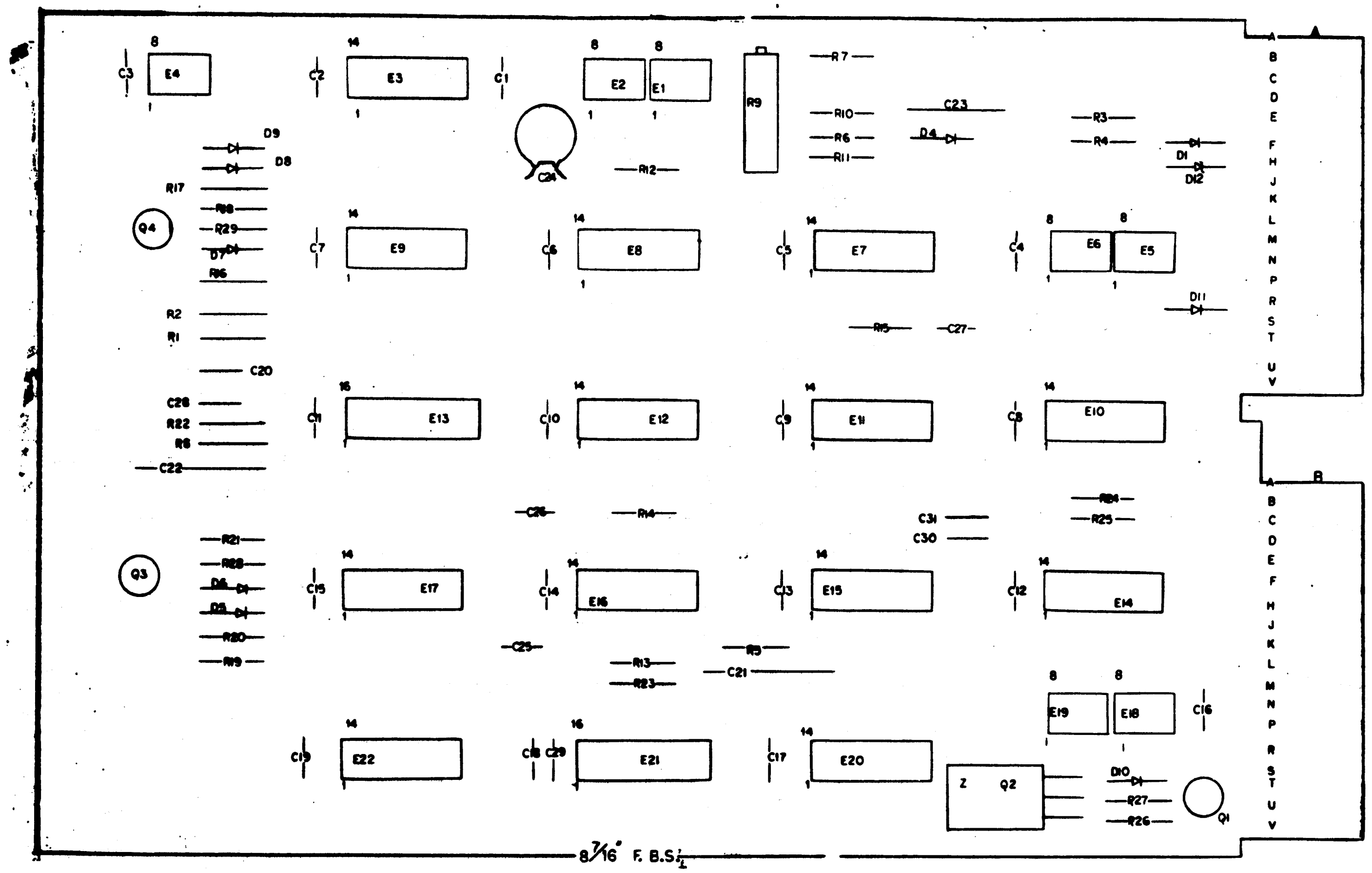
NOTE:
1. FOR RK05J I.C. LOCATION E1 IS USED
   FOR RK05F I.C. LOCATION E2 IS USED
2. FOR RK05J S1 IS IN THE ON POSITION
   FOR RK05F S1 IS IN THE OFF POSITION

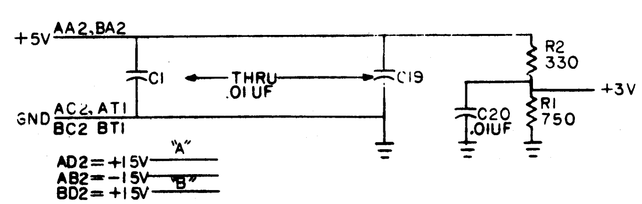
REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CYLINDER ADDRESS AND DIFFERENCE (CAD3)	D	CS	M7681-0-1	C
SCALE	SHEET 3 OF 5		DIST.	

DEC FORM NO. DPD 139

NOTES:





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.
1	C24	CAP. .047UF 16V DISC	1009678	50
1	D12	DIODE IN5248B 18V 5%	1110766	49
1		KEP NUT #4	9006557	48
1		SCREW 4-40 X 5/16	9006010-1	47
2		HANDLE, FLIP CHIP-MAGENTA	9008337-06	46
4		EYELET #GS4-7	9006732	45
1	E1	I.C. DEC 301	1910282	44
6	E2,4,6,5,18,19	I.C. DEC 75451	1910406	43
2	E21, E13	I.C. DEC 74123	1910436	42
2	E22, E17	I.C. DEC 7493	1909054	41
2	E9, E15	I.C. DEC 7474	1905547	40
2	E12,10	I.C. DEC 7410	1905576	39
2	E11, E8	I.C. DEC 7404	1909686	38
1	E20	I.C. DEC 7402	1909004	37
4	E3,7,16,14	I.C. DEC 7400	1905575	36
1	Q2	TRANSISTOR DEC 4403	1510171	35
1	Q3	TRANSISTOR DEC 6534D	1503409-00	34
1	Q1	TRANSISTOR DEC 2219	1501881	33
1	Q4	TRANSISTOR DEC 6531	1509338	32
1	R9	RES. 10K 3/4W 10% 76PR	1309143-10	31
1	R6	RES. 10M 1/4W 5%	1302666	30
2	R7, R10	RES. 1M 1/4W 5%	1309595	29
				28
				27
5	R17,5,22,23,8	RES. 10K 1/4W 5%	1300479	26
1	R18	RES. 5.6K 1/4W 5%	1301874	25
1	R11	RES. 4.7K 1/4W 5%	1300447	24
1	R4	RES. 680 1/4W 5%	1300424	23
1	R28	RES. 1.5K 1/4W 5%	1300391	22
9	R12,13,14,15,20,24,25,26,29	RES. 1K 1/4W 5%	1300365	21
1	R1	RES. 750 1/4W 5%	1301401	20
2	R16, R19	RES. 470 1/4W 5%	1300316	19
2	R2, R3	RES. 330 1/4W 5%	1300295	18
1	R27	RES. 100 1/4W 5%	1300229	17
A/R		GRIPLETS	1210244-0	16
2	D5, D7	DIODE IN759A 12V 5%	1110643	15
1	D4	DIODE IN748 3.9V 10%	1100121	14
1	D6	DIODE IN746A 3.3V 5%	1104860	13
3	D9, D10, D11	DIODE IN4001	1102942	12
1	D1	DIODE D670	1102162	11
1	D8	DIODE D664	1100114	10
2	C28, C29	CAP. 470PF 100V 5% DM.	1000024	9
1	C23	CAP. .15UF 35V 20% TANT	1002180	8
1	C22	CAP. 10UF 20V 10% TANT	1004813	7
1	C21	CAP. 15UF 20V 10% TANT	1004812	6
25	C1-20,25-27,30,31	CAP. .01UF 100V 20% DISC.	1001610	5
1		ETCED CIRUIT BOARD	5009714	4
		MODULE ECO HISTORY	B-MH-M7701-0-6	3
		ASSY/DRILLING HOLE LAYOUT	E-AH-M7701-0-5	2
		X-Y COORDINATE HOLE LOCATION	K-CO-M7701-0-4	1

PARTS LIST

FIRST USED ON OPTION MODEL

ETCH BOARD REV. K

DEC NO.	EIA NO.	DEC NO.	EIA NO.
IN748 3.9V	SAME	DEC 6534D	MPS6534
IN746A 3.3V	SAME	DEC 4403	
IN4001	SAME	IN759A	SAME
D670	IN3653		
DEC6531	MPS6531		
DEC664	IN3606		
DEC2219	2N2219		

SEMICONDUCTOR CONVERSION CHART

REV.	CHANGE NO.	CHK
N	M7701-00009	DALE JENSON 10-16-74

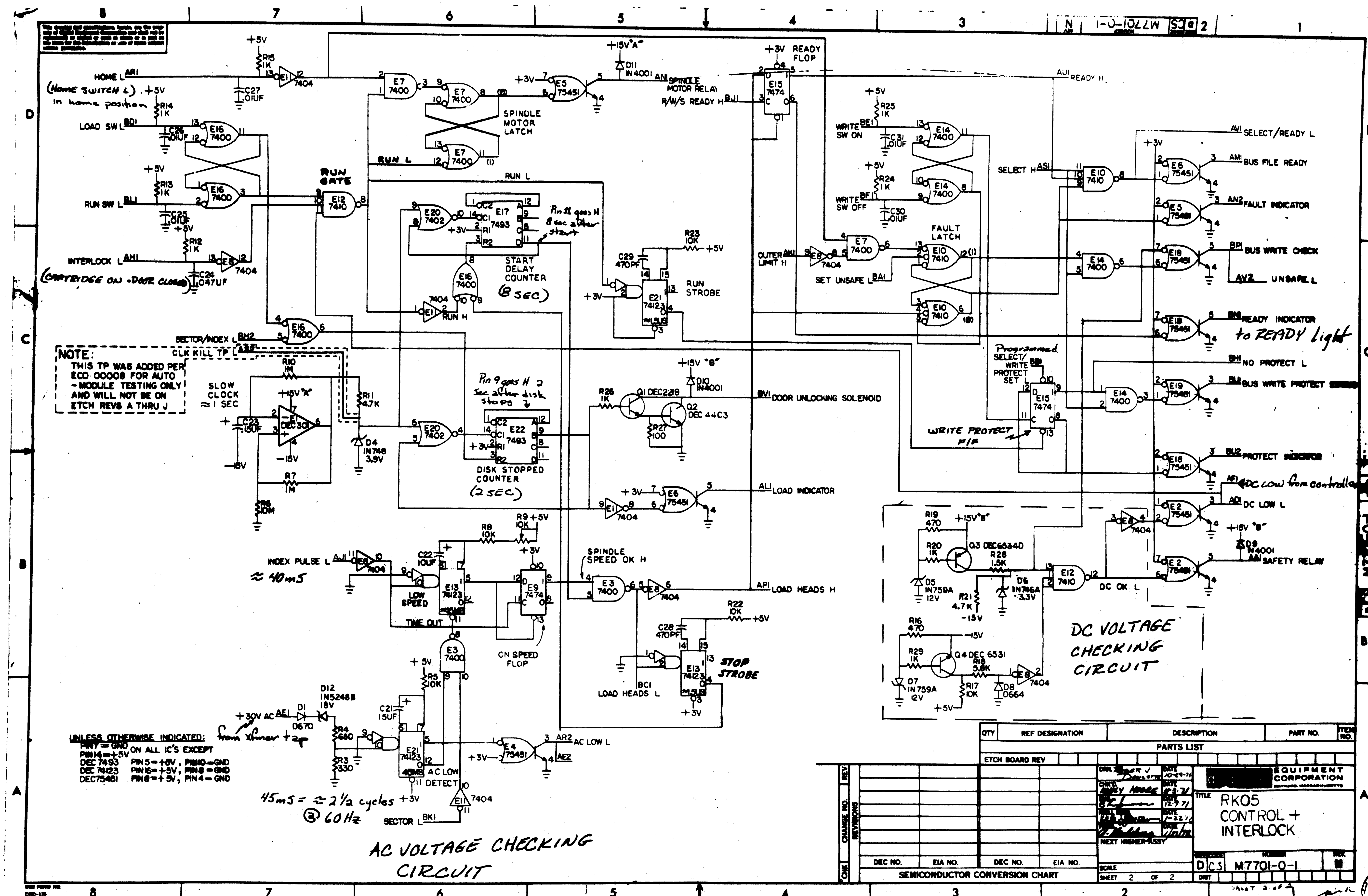
DRN. Roger J Doucette — DATE 10-29-71
CHK'D. Nancy Moore — DATE 11-3-71
ENG. — DATE 12-9-71
PROJ. ENG. Dale J. Olsen — DATE 7-22-72
PROD. — DATE 7/21/72
NEXT HIGHER ASSY
SCALE
SHEET 1 OF 2

digital

TITLE DISK ENG. CONTROL + INTERLOCK

SIZE D | CODE | NUMBER M7701-0-1 | REV. N

DIST.



RUN GATE
SPINDLE MOTOR LATCH
START DELAY COUNTER
(8 SEC)
Pin 11 goes H 8 sec after start
RUN STROBE
READY FLOP
FAULT LATCH
SET UNSAFE L
NOTE: THIS TP WAS ADDED PER ECO 00008 FOR AUTO-MODULE TESTING ONLY AND WILL NOT BE ON ETCH REVS A THRU J
SLOW CLOCK ≈1 SEC
DISK STOPPED COUNTER
(2 SEC)
Pin 9 goes H 2 sec after disk stops
DOOR UNLOCKING SOLENOID
LOAD INDICATOR
LOAD HEADS H
LOAD HEADS L
STOP STROBE
ON SPEED FLOP
SPINDLE SPEED OK H
INDEX PULSE L
≈ 40mS
LOW SPEED
TIME OUT
AC LOW DETECT
AC LOW L
45mS = ≈ 2½ cycles @ 60Hz
AC VOLTAGE CHECKING CIRCUIT
DC VOLTAGE CHECKING CIRCUIT
DC OK L
DC LOW L
SAFETY RELAY
SELECT/READY L
BUS FILE READY
FAULT INDICATOR
BUS WRITE CHECK
UNSAFE L
READY INDICATOR
to READY light
NO PROTECT L
BUS WRITE PROTECT
PROTECT INDICATOR
Programmed SELECT/WRITE PROTECT SET L
WRITE PROTECT F/F
HOME L
(Home switch L) in home position
LOAD SW L
RUN SW L
INTERLOCK L
(Cartridge on - door closed)
SECTOR/INDEX L
CLK KILL TP L
SECTOR L
+30V AC from xfmr tap
UNLESS OTHERWISE INDICATED:
PIN 7 = GND, PIN 14 = +5V ON ALL IC'S EXCEPT
DEC 7493 PIN 5 = +5V, PIN 10 = GND
DEC 74123 PIN 16 = +5V, PIN 8 = GND
DEC 75451 PIN 8 = +5V, PIN 4 = GND
PARTS LIST
SEMICONDUCTOR CONVERSION CHART
EQUIPMENT CORPORATION
RK05 CONTROL + INTERLOCK
D CS M7701-0-1
SHEET 2 OF 2

NOTES:

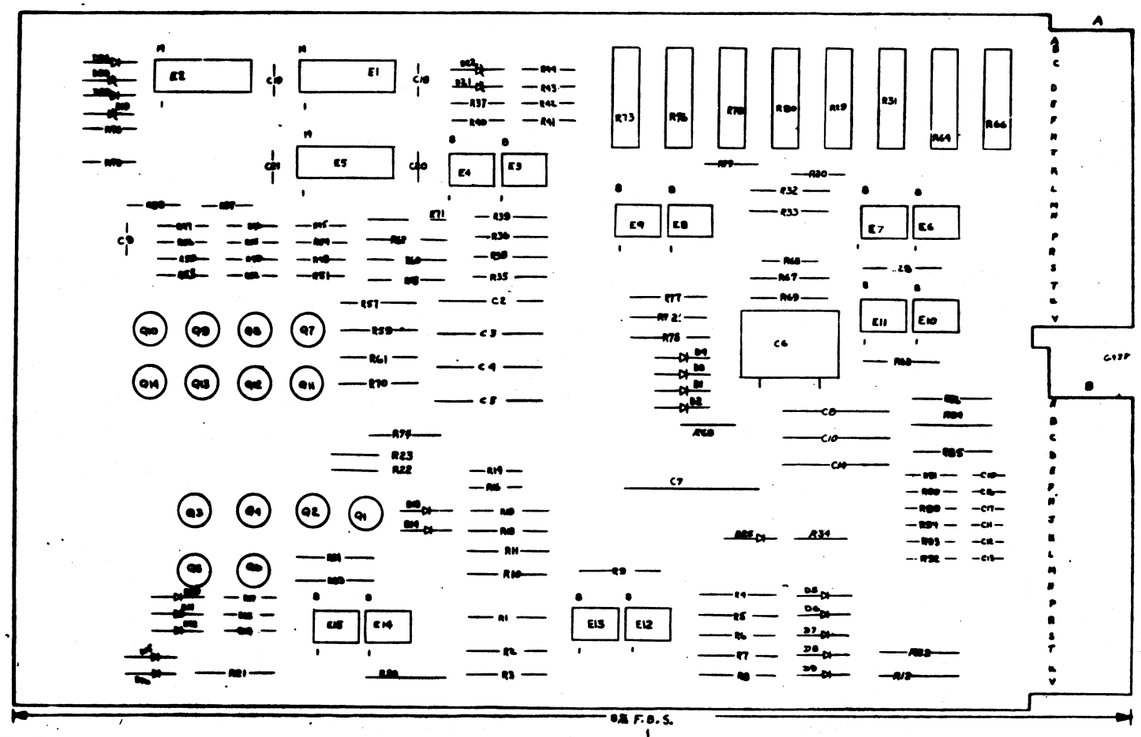
8	8	Q4 THRU Q8, Q11 THRU 15	TRANSISTOR 2N5245	1509681	49	REF	REF	X-Y COORDINATE HOLE LOCATION	9-09-9938-0-4	1
6	6	Q5 THRU Q10	TRANSISTOR DEC 65340	1503609-00	50	REF	REF	ASSY/DRILLING HOLE LAYOUT	5-AW-6938-0-5	2
1	1	E1	I.C. DEC 7404	1909686	51	REF	REF	MODULE ECO HISTORY	9-MM-6938-0-6	3
1	1	E2	I.C. DEC 7413	1909989	52	1	1	ETCHED CIRCUIT BOARD	5009886	4
2	2	E3, E4	I.C. DEC 301	1910282	53	4	4	CAP. .015 UF 50V 2% POLY CARB	1010646	5
1	1	E5	I.C. DEC 7400	1905575	54	1	1	C6	CAP. 8200 PF 100V MICA	1000061	6
10	10	E6 THRU E15	I.C. DEC 7274	1910298	55	1	1	C7	CAP. .022 UF 100V 10% MYLAR	1002323	7
4	4		EYELET #GS4-7	9006732	56	3	3	C8, C10, C14	CAP. 15 UF 20V 10% S. TANT	1004813	8
2	2		HANDLE, FLIP CHIP GREEN	9008337-01	57	11	11	C9, C11, C12, C13, C15 THRU C25	CAP. .01 UF 100V 20% DISC	1001610-01	9
A/R	A/R		GRIPLET	12/0244-0	58	7	7	D1 THRU D4, D23 THRU D25	DIODE DG62	1100113	10
1	—	R22	RES 200K, ¼W, 1%	1305336	59	10	10	D5 THRU D14	DIODE DG64	1100114	11
1	—	R23	RES 137K, ¼W, 1%	1305442	60	2	2	D15, D16	DIODE IN758A 10V	1100125	12
2	—	R13, R19	RES 9.09K, ¼W, 1%	1304855	61	4	4	D19 THRU D22	DIODE IN746A	1104860	13
1	—	R74	RES 2.94K, ¼W, 1%	1301981	62	7	7	R1, R15, R17, R46, R49, R52, R55	RES. 15K ⅛ W 5%	1300496	14
						1	1	R2	RES. 13.3K 1/4W 1% MF	1312565	15
						1	1	R3	RES. 9.09K 1/8 W 1% MF	1304855	16
						1	—	R4	RES. 34.8K 1/8W 1% MF	1303156	17
						—	1	R4	RES. 68.1K 1/8W 1% MF	1305252	18
						—	1	R5	RES. 34.8K 1/8W 1% MF	1303156	19
						1	—	R5	RES. 21.5K 1/8W 1% MF	1303155	20
						1	—	R6	RES. 11.5K 1/8W 1% MF	1309615	21
						—	1	R6	RES. 21.5K 1/8W 1% MF	1303155	22
						1	—	R7	RES. 5.62K 1/8W 1% MF	1305128	23
						—	1	R7	RES. 11.5K 1/8W 1% MF	1309615	24
						1	—	R8	RES. 2.74K 1/8W 1%	1304868	25
						—	1	R8	RES. 5.62K 1/8W 1%	1305128	26
						5	5	R9, R57, R59, R61, R70	RES. 10K 1/8W 1% MF	1303312	27
						12	12	R10, R11, R32, R33, R35, R36, R38, R39, R67, R69, R84, R83.	RES. 19.6K 1/8W 1% MF	1309619	28
						2	2	R12, R72	RES. 6.81K 1/8W 1% MF	1304870	29
						—	2	R13, R19	RES. 4.64K 1/8W 1% MF	1304856	30
						9	9	R14, R16, R43, R44, R45, R48, R51, R54, R68	RES. 2.5K 1/4 W 5%	1300391	31
						5	5	R18, R47, R58, R53, R56	RES. 3.9K 1/4 W 5%	1300444	32
						1	1	R20	RES. 200K 1/8W 1% MF	1305336	33
						1	1	R21	RES. 3.83K 1/8W 1% MF	1309613	34
						—	1	R22	RES. 100K 1/4 W 5%	1302466	35
						5	6	*2 3, R36, R41, R42, R65, R79	RES. 75K 1/4W 5%	1309841	36
						5	5	R29, R64, R73, R76, R78	POT. 10K 3/4W 20% 76PR	1309143-10	37
						3	3	R31, R66, R80	POT. 2K 3/4W 10% 76PR	1309143-08	38
						3	3	R37, R40, R67	RES. 330 1/4W 5%	1300295	39
						5	5	R58, R60, R62, R71, R82	RES. 511 1/8W 1% MF	1302411	40
						1	1	R75	RES. 24.3K 1/8W 1% MF	1309618	41
						2	2	R84, R85	RES. 10 1/2W 5%	1300168	42
						1	1	R86	RES. 2.7 1/2W 10%	1309449	43
						6	6	R87 THRU R94	RES. 22 1/4W 5%	1301969	44
						1	1	R88	RES. 750 1/4W 5%	1301401	45
						3	3	R20, R63, R77	RES. 1.96K 1/8W 1% MF	1309838	46
						—	1	R74	RES. 1.47K 1/8W 1% MF	1305108	47
						3	3	R34, R95, R96	RES. 18K 1/4W 5%	1300479	48

G938-YA / G938-0

QTY	QTY	REF. DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

ETCH BOARD REV. K



72741	SEE SHT 2
LM301	SEE SHT 2
IC TYPE	GND +5V

GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTIVELY UNLESS ARE GIVEN ABOVE.

IC PIN LOCATIONS

FIRST USED ON OPTION MODEL			
6534D	NONE		
2N5245			
D662	IN645		
D664	IN3606		
1746A	SAME		
DEC NO.	EIA NO.	DEC NO.	EIA NO.

SEMICONDUCTOR CONVERSION CHART

DSN. R. DOUCETTE	DATE 12-8-71	digital	
CHK'D. DEVALL	DATE 12-9-71		
ENGR. R. JENSEN	DATE 12-10-71	TITLE DEC PACK HEAD POSITION SERVO PREAMP RK5-1	
APPR. R. JENSEN	DATE 12-10-71		
MFG. R. KARLSBERG	DATE 1-31-72		
NEXT HIGHER ASSY		SIZE D CODE IDENT. NO. DCS G938-0-1	REV. R
SCALE			
SHEET 1 OF 2			

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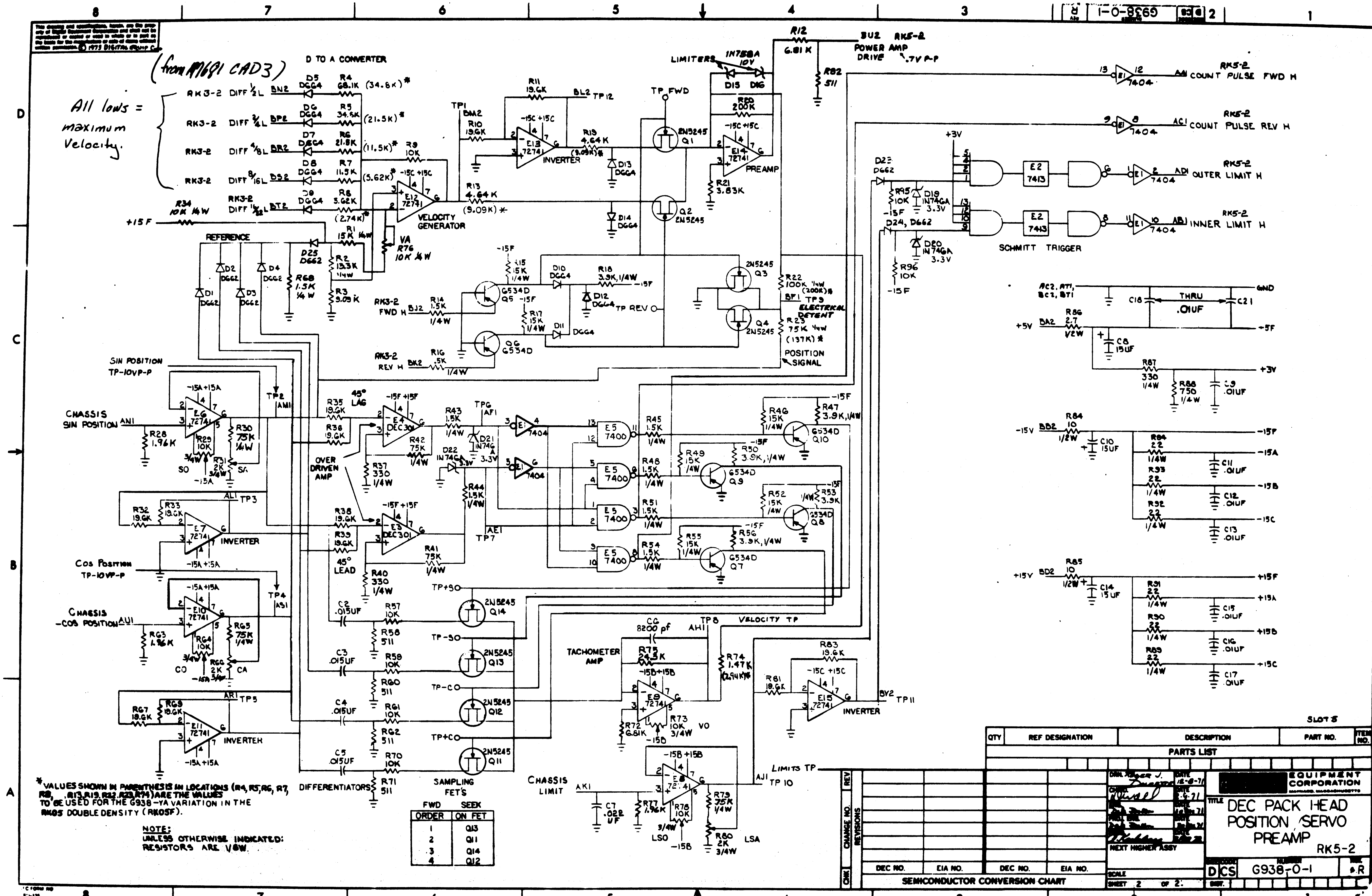
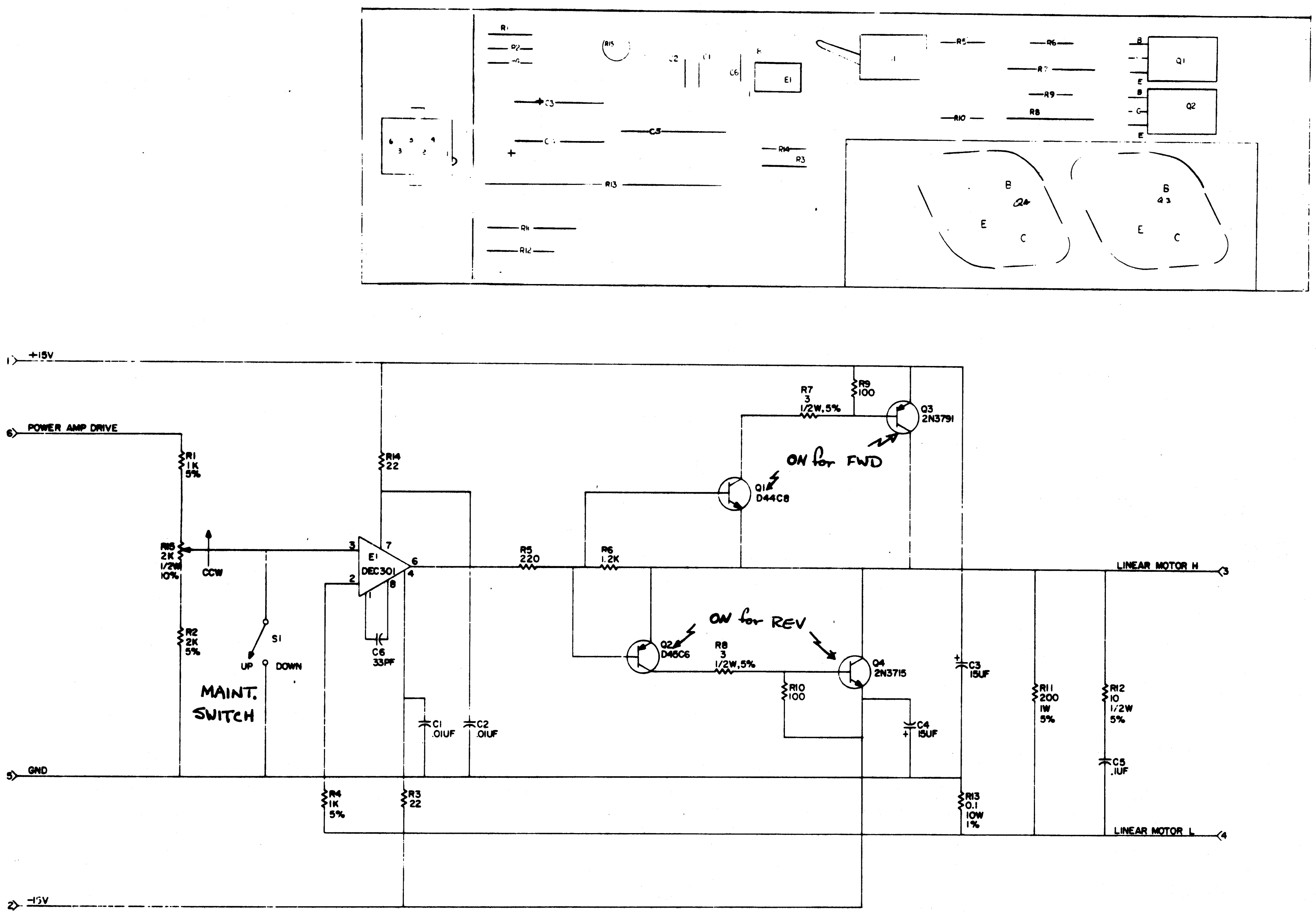

(from M7681 CAD3)
All lows = maximum Velocity.
D TO A CONVERTER
VELOCITY GENERATOR
INVERTER
PREAMP
LIMITERS
POWER AMP DRIVE
COUNT PULSE FWD H
COUNT PULSE REV H
OUTER LIMIT H
INNER LIMIT H
SCHMITT TRIGGER
REFERENCE
TP FWD
TP REV
ELECTRICAL DETENT
POSITION SIGNAL
SIN POSITION TP-10VP-P
CHASSIS SIN POSITION
COS POSITION TP-10VP-P
CHASSIS -COS POSITION
45° LAG
45° LEAD
OVER DRIVEN AMP
TACHOMETER AMP
VELOCITY TP
LIMITS TP
CHASSIS LIMIT
DIFFERENTIATORS
SAMPLING FET'S
FWD ORDER | SEEK ON FET
1 | Q13
2 | Q11
3 | Q14
4 | Q12
*VALUES SHOWN IN PARENTHESIS IN LOCATIONS (R4, R5, R6, R7, R8, R13, R19, R22, R23, R74) ARE THE VALUES TO BE USED FOR THE G938-YA VARIATION IN THE RK05 DOUBLE DENSITY (RK05F).
NOTE: UNLESS OTHERWISE INDICATED: RESISTORS ARE 1/8W.
SLOT 5
PARTS LIST
SEMICONDUCTOR CONVERSION CHART
EQUIPMENT CORPORATION
DEC PACK HEAD POSITION /SERVO PREAMP
RK5-2
G938-0-1
SHEET 2 OF 2



UNLESS OTHERWISE INDICATED:
RES. ARE 1/4W, 10%
R13 IS A CURRENT SAMPLING RES.

TRANSISTOR & DIODE CONVERSION CHART			
DEC	EIA	DEC	EIA
2N3715			
D45C6			
D44C8			

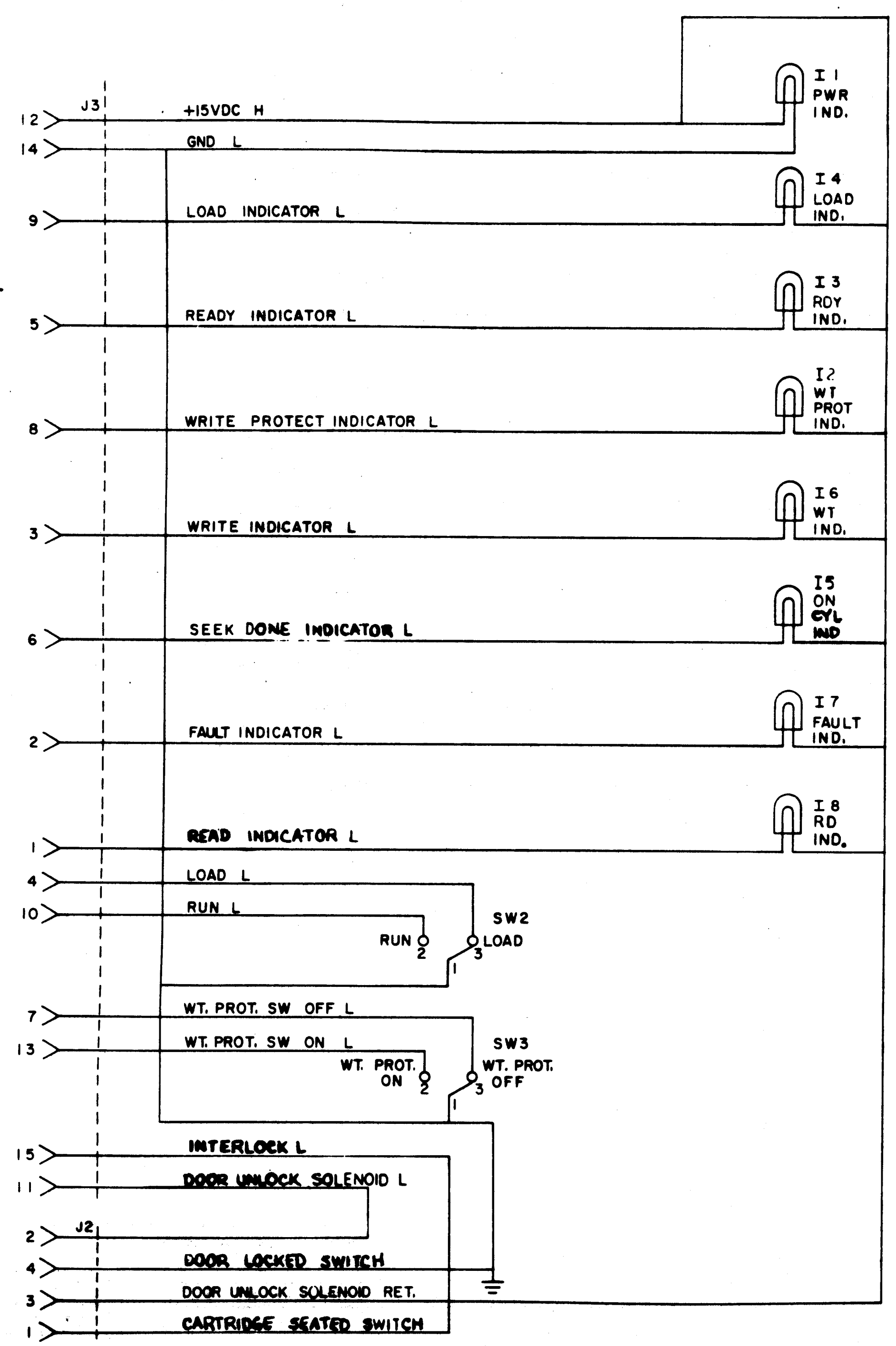
DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS

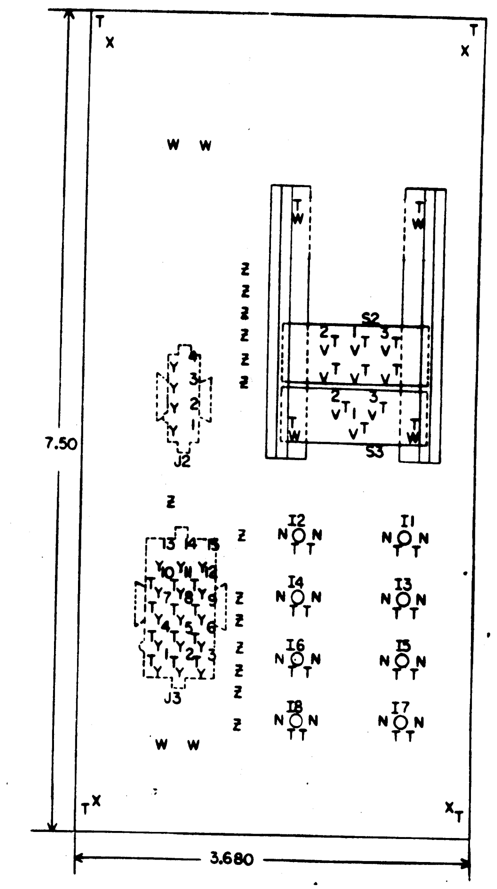
TITLE: DECPAK HEAD POS. SERVO PWR. AMP.

SIZE: D | CODE: CS | NUMBER: H604-0-1 | REV: K

PRINTED CIRCUIT REV: K

DRN: B. Harle, DATE: 11/30/71
CHK'D, DATE: 12-7-71
ENG





REVISIONS			
CHK	CHG NO.	REV.	
	0-2001	B	D. JENSEN
	0-0001	C	D. JENSEN
	0-0003	D	D. JENSEN

DRN.	S. COOPER	DATE	11-20-71
CHK'D		DATE	
ENG.	Dale Jensen	DATE	19 Dec 71
PROD.		DATE	

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

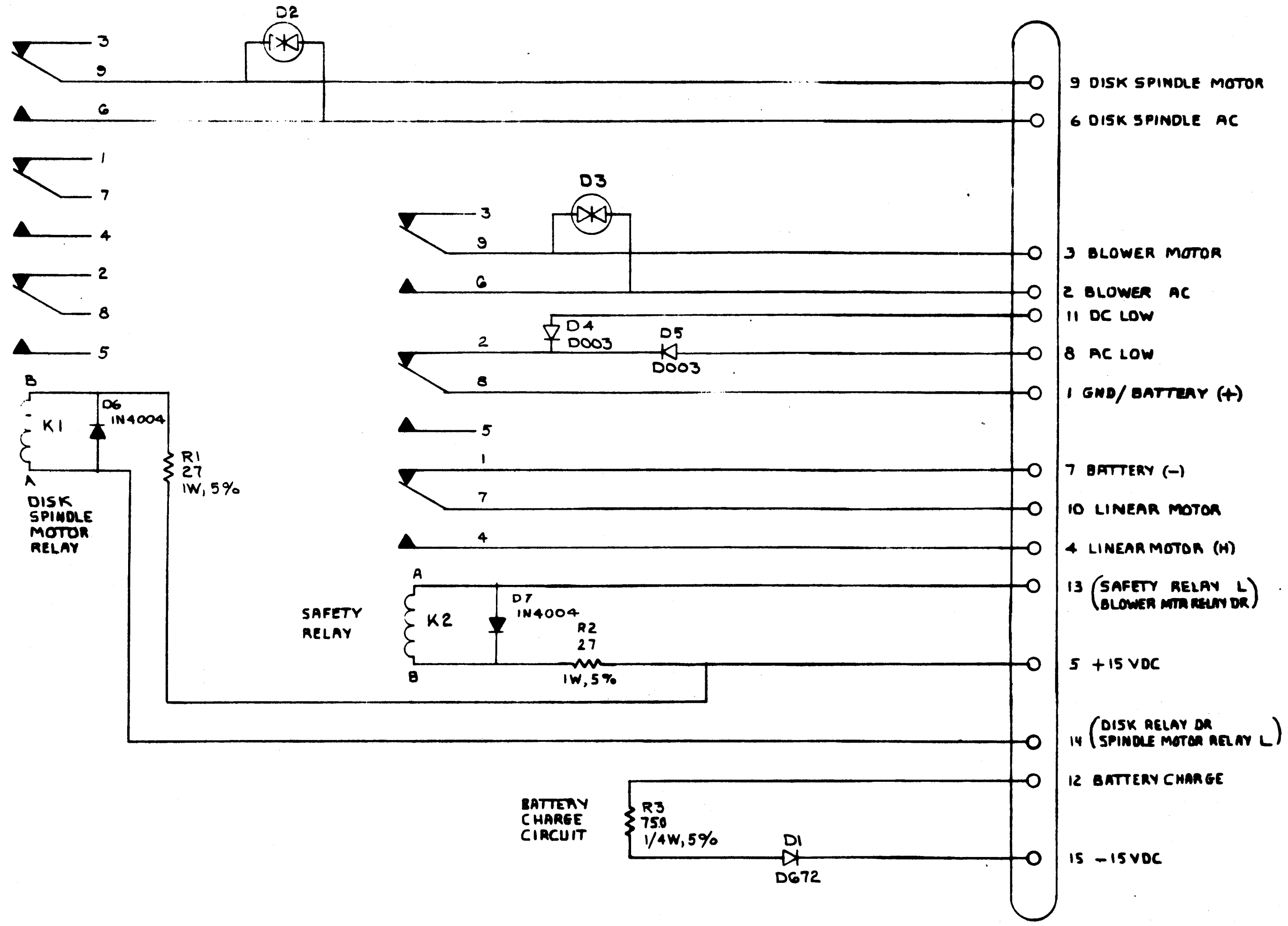
TITLE RK05 CONTROL PANEL RK7-1

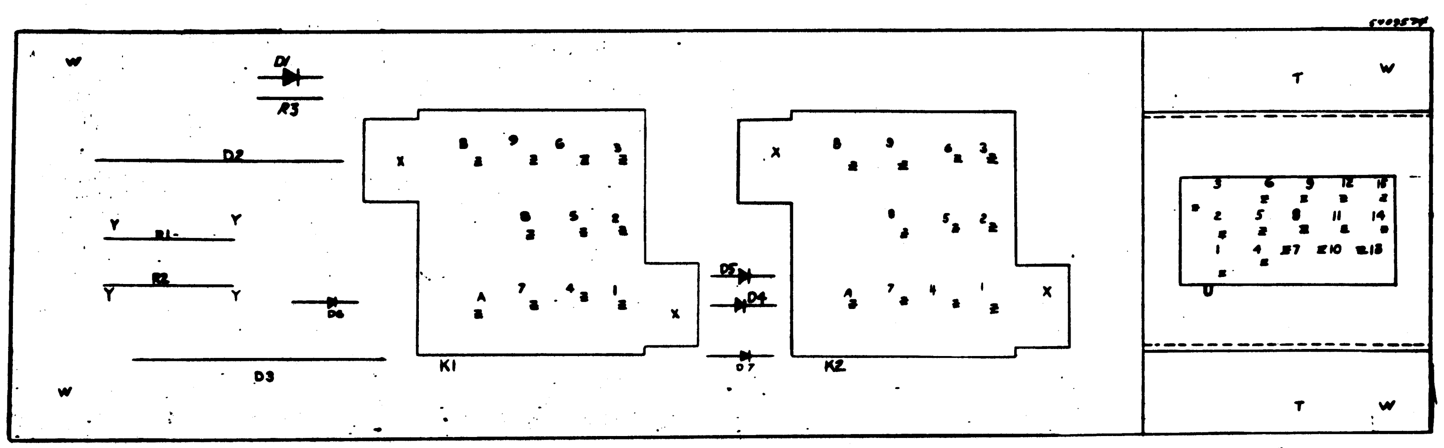
SIZE	CODE	NUMBER	REV.
C	CS	5409698-0-1	D

PRINTED CIRCUIT REV. D

DEC FORM NO. DRC 102

NOTE:
1. RELAY CONTACTS ARE SHOWN IN THE DE-ENERGIZED POSITIONS.
2. SAFETY RELAY L AND BLOWER MTR RELAY DR ARE THE SAME SIGNAL.
3. SPINDLE MOTOR RELAY L AND DISK RELAY DR ARE THE SAME SIGNAL.
4. THIS MODULE MUST BE UL APPROVED





QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

ETCH BOARD REV F

REV	CHANGE NO.			
E	5409574-0001	D. JENSEN	2/15/73	
F	5409574-000C2	N. FIELD	2/13/75	
H	5409574-00003	J. RINALDIS	3-NOV-75	

REVISIONS

DEC NO.	EIA NO.	DEC NO.	EIA NO.
D003	IN994		
D672	IN3653		

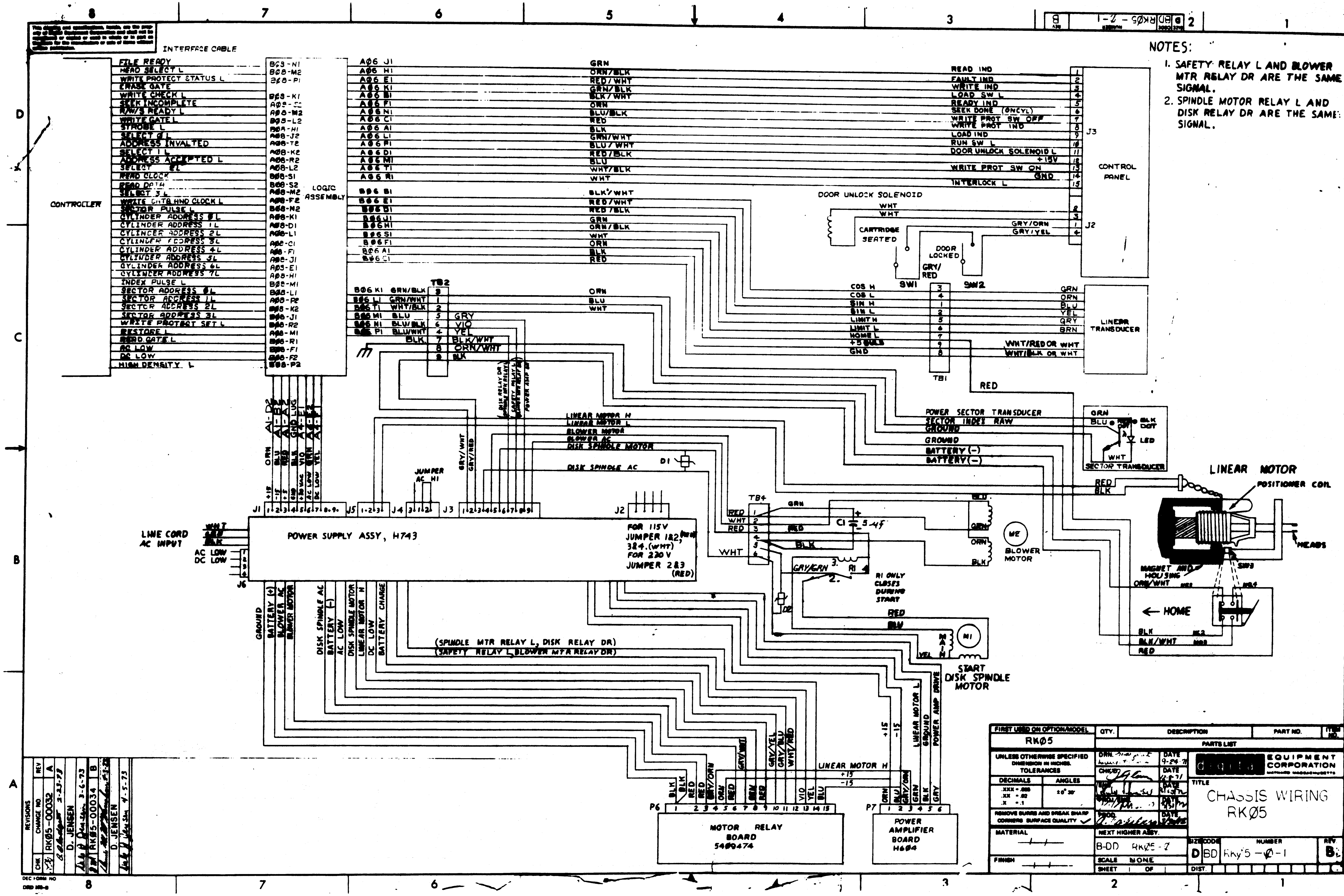
SEMICONDUCTOR CONVERSION CHART

DRN. Roger J Doucette DATE 12-9-71
CHK'D. DATE 12-15-71
ENG. Dale I Jensen DATE 11-Jan-72
PROJ. ENG. DATE 11-Jan-72
PROD. DATE
NEXT HIGHER ASSY
SCALE
SHEET 1 OF 1

EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE DEC PACK MOTOR RELAYS

SIZE D CODE CS NUMBER 5409574-0-1 REV. H


NOTES:
1. SAFETY RELAY L AND BLOWER MTR RELAY DR ARE THE SAME SIGNAL.
2. SPINDLE MOTOR RELAY L AND DISK RELAY DR ARE THE SAME SIGNAL.
INTERFACE CABLE
CONTROLLER
LOGIC ASSEMBLY
CONTROL PANEL
J3
J2
DOOR UNLOCK SOLENOID
CARTRIDGE SEATED
DOOR LOCKED
SW1
SW2
TB1
TB2
LINEAR TRANSDUCER
POWER SECTOR TRANSDUCER
SECTOR INDEX RAW
SECTOR TRANSDUCER
LINEAR MOTOR
POSITIONER COIL
HEADS
MAGNET AND HOUSING
HOME
POWER SUPPLY ASSY, H743
FOR 115V JUMPER 1&2, 3&4 (WHT)
FOR 230V JUMPER 2&3 (RED)
LINE CORD AC INPUT
AC LOW
DC LOW
J6
TB4
BLOWER MOTOR
R1 ONLY CLOSES DURING START
DISK SPINDLE MOTOR
START
MAIN
(SPINDLE MTR RELAY L, DISK RELAY DR)
(SAFETY RELAY L, BLOWER MTR RELAY DR)
MOTOR RELAY BOARD 5409474
POWER AMPLIFIER BOARD H604
P6
P7
FIRST USED ON OPTION/MODEL RK05
EQUIPMENT CORPORATION
TITLE CHASSIS WIRING RK05
D BD RK05-0-1
REV B
SCALE NONE
SHEET 1 OF 1

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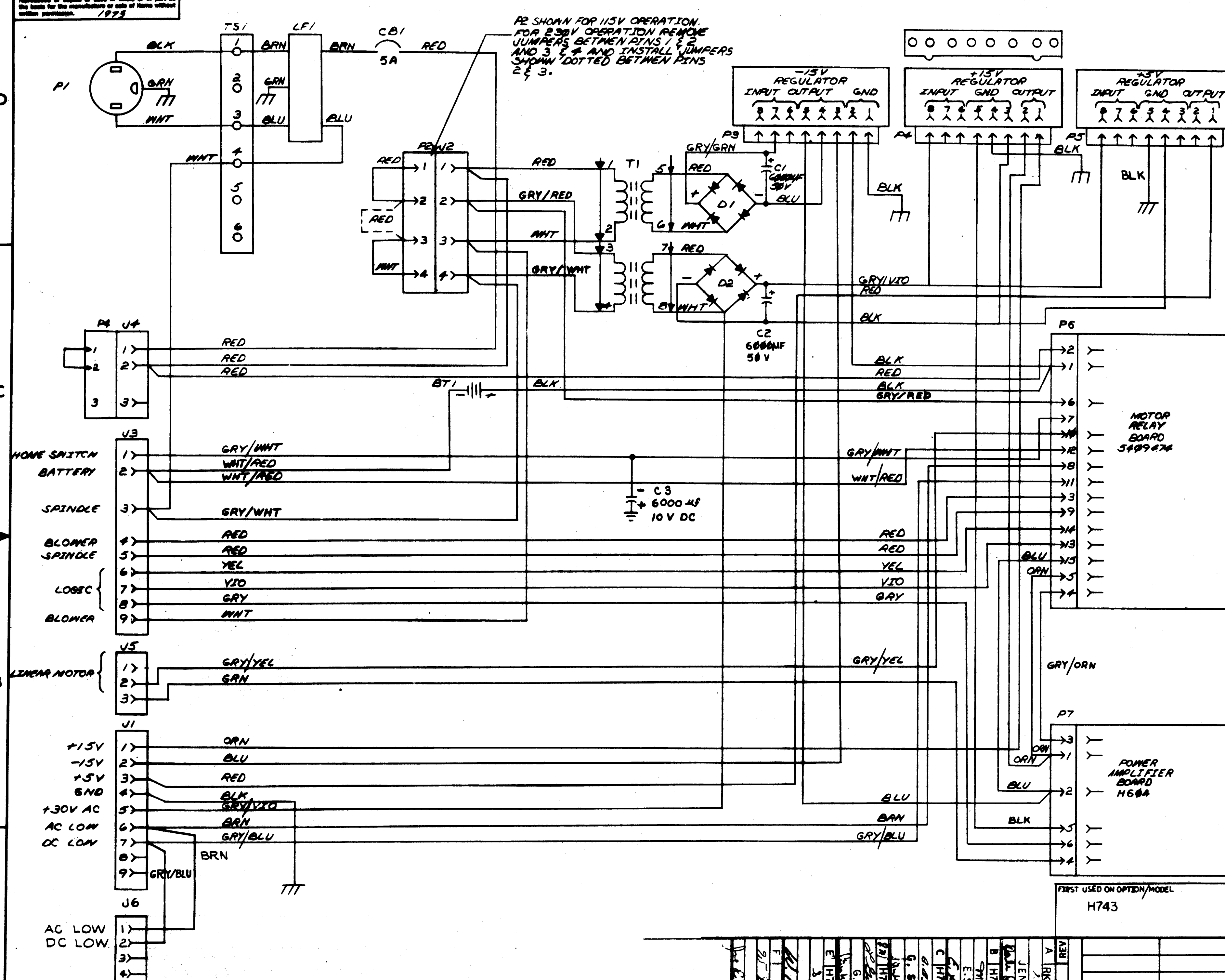

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
1	P1	POWER CORD 230V	1700016-09	22
1	C3	CAP 6000 µf 10 VDC	1010704	21
1	P4	JUMPER AC HI	B-IA-7008729-3-0	20
1	P2	JUMPER 230V	B-IA-7008729-2-0	19
1	P2	JUMPER 115V	B-IA-7008729-1-0	18
3	P3, P4, P6	CONN, MATE-N-LOCK, 8 PIN	1209340-01	17
1	TS1	TERMINAL STRIP (6POS)	9006906	16
1	T1	TRANSFORMER	1610511	15
~~1~~	~~M1~~	~~ELAPSED TIME INDICATOR~~	~~[illegible]~~	~~14~~
1	P7	CONN, MATE-N-LOCK, 6 PIN	1209351-06	13
1	P6	CONN, MATE-N-LOCK, 15 PIN	1209351-15	12
1		+5V REGULATOR	E-IA-5409503-0-0	11
2		± 15V REGULATOR	E-IA-5409484-0-0	10
1	BT1	BATTERY	1210641	9
1	P1	POWER CORD 115 V	1700006-09	8
2	J4, J5	CONN, MATE-N-LOCK, 3 PIN	1209350-03	7
2	J2, J6	CONN, MATE-N-LOCK, 4 PIN	1209350-04	6
2	J1, J3	CONN, MATE-N-LOCK, 9 PIN	1209350-09	5
1	LF1	LINE FILTER	1212877-01	4
2	C1, C2	CAP 6000 µF, 50 V	1010510	3
2	D1, D2	RECTIFIER (MDA990-3)	1110051	2
1	CB1	CIRCUIT BREAKER 5A	1205293	1

PARTS LIST

FIRST USED ON OPTION/MODEL: H743

ETCH BOARD REV

SEMICONDUCTOR CONVERSION CHART

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

DRN. DATE 10/12/71
CHK'D. DATE 11-5-71
ENG. DATE
PROJ. ENG. DATE 11-29-71
PROD. DATE 3/30/72

NEXT HIGHER ASSY B-DD-H743-Ø

SCALE N/C SHEET 1 OF 1

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: CIRCUIT SCHEMATIC H743

SIZE D CODE CS NUMBER H743-Ø-1 REV. E

REVISIONS: A RK3C-00019 · B H743-00001 · C H743-00002 · D H743-00004 · E H743-00006 · F H743-00016

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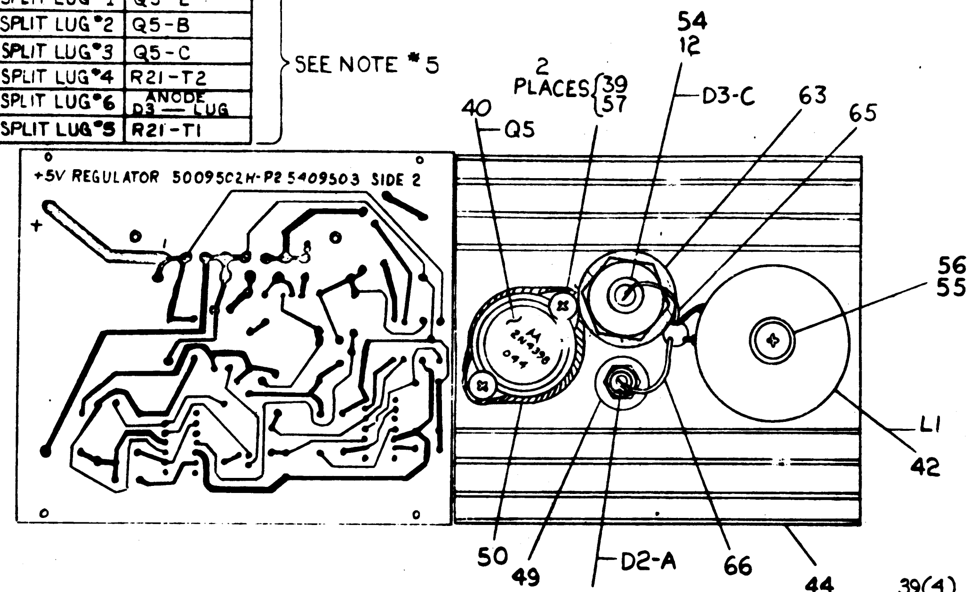
WIRE TABLE

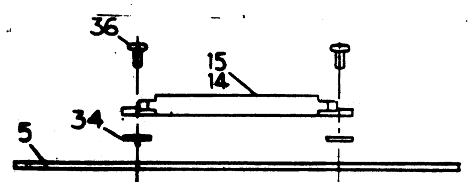
ITEM NO.	DESCRIPTION AWG	DESCRIPTION COLOR	LENGTH IN. ± 1/8"	STRIP LENGTH-X	STRIP LENGTH-Y	CONNECTIONS FROM	CONNECTIONS TO
42	—	BLK	2 1/8	—	1/2"	L1	D2 CATHODE — LUG
42	—	BLK	2 1/8	—	1/2"	L1	R21-T2
68	18	VIO	2 1/4	1/2"	1/2"	Q5-C	D2 CATHODE — LUG
66		GRN	4 1/4	1/2"	1/2"	D2 ANODE	D3 ANODE — LUG
65		YEL	4 1/8	1/2"	1/2"	D3 CATHODE	R21-T1
70		WHT	4 3/8	1/2"	1/2"	SPLIT LUG #1	Q5-E
69		GRY	5 1/4	1/2"	1/2"	SPLIT LUG #2	Q5-B
68		VIO	5 1/4	1/2"	1/2"	SPLIT LUG #3	Q5-C
67		BLU	8	1/2"	1/2"	SPLIT LUG #4	R21-T2
66		GRN	5 3/4	1/2"	1/2"	SPLIT LUG #6	D3 ANODE — LUG
65	18	YEL	8 1/4	1/2"	1/2"	SPLIT LUG #5	R21-T1

SEE NOTE #5 (items 70–65, split lug connections)

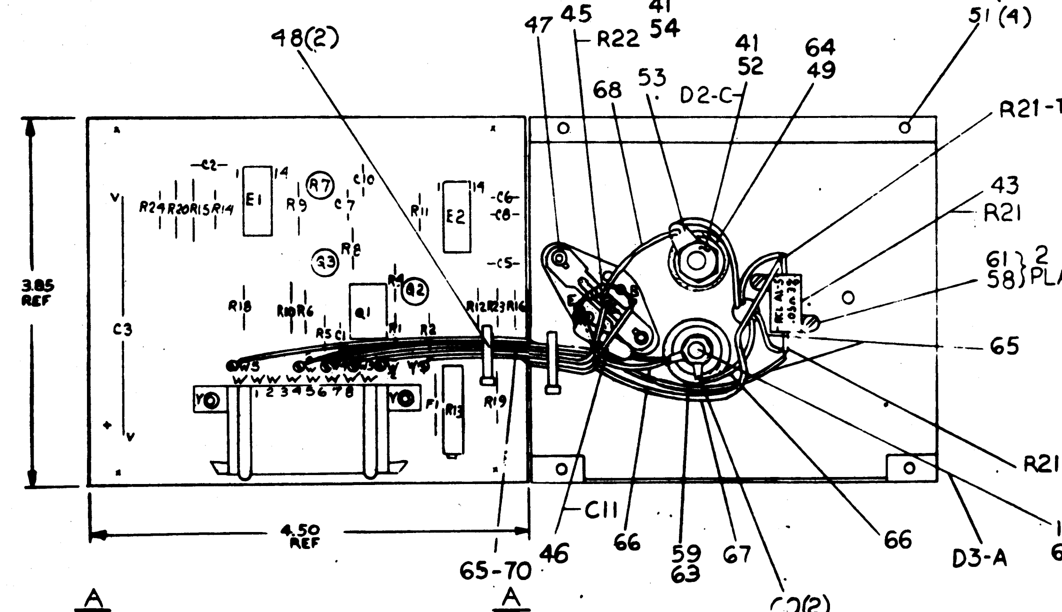
EXTERNAL COMPONENTS

ITEM NO.	LENGHT	DESCRIPTION	POL.	CONNECTIONS FROM	CONNECTIONS TO	POL
45	NOTE #2	RES. 100 1/4W 5%		Q5-E	Q5-B	
46	NOTE #3	CAP. 10UF, 50V, 10%	+	Q5-E	D3 ANODE — LUG	—





VIEW A-A
SCALE: NONE



NOTES:

1. R13 IS USED FOR OUTPUT VOLTAGE ADJUSTMENT. R7 IS USED FOR OUTPUT CURRENT ADJUSTMENT.
2. CUT LEADS OF RES. (R22) SO THERE IS 3/8" OF A LEAD LEFT ON BOTH ENDS.
3. CUT LEADS OF CAP. (C11) SO THERE IS 1/2" OF A LEAD LEFT ON BOTH ENDS.
4. THERMAL COMPOUND (ITEM 31) IS TO BE APPLIED TO BOTH SIDES OF ALL THERMAL INSULATORS (ITEM 49, 50 & 63). BOTH SIDES OF EACH INSULATOR SHOULD BE COVERED, LEAVING NO VOIDS WHEN INSTALLED. CARE MUST BE EXERCISED SO THAT NO EXTRA COMPOUND INTERFERES WITH ANY ELECTRICAL CONNECTION MADE TO ANY DIVICE.
5. WHEN ASSEMBLING THE WIRES FROM THE CIRCUIT BOARD TO THE HEAT SINK, PLACE THE MODULE AGAINST THE HEAT SINK, WIRE AS SHOWN BY THE WIRE LIST AND MAKE A SERVICE LOOP AT THE CONNECTIONS ON THE HEAT SINK TO TAKE UP ANY EXCESS WIRE THAT MIGHT BE AVAILABLE.

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

FIRST USED ON OPTION MODEL: —

ETCH BOARD REV: H

SEMICONDUCTOR CONVERSION CHART

DEC NO.	EIA NO.
1N3889	SAME
2N4398	—
D4506	—
2N4441	—
DEC 6534 D	MPS 6534
1N752A	SAME

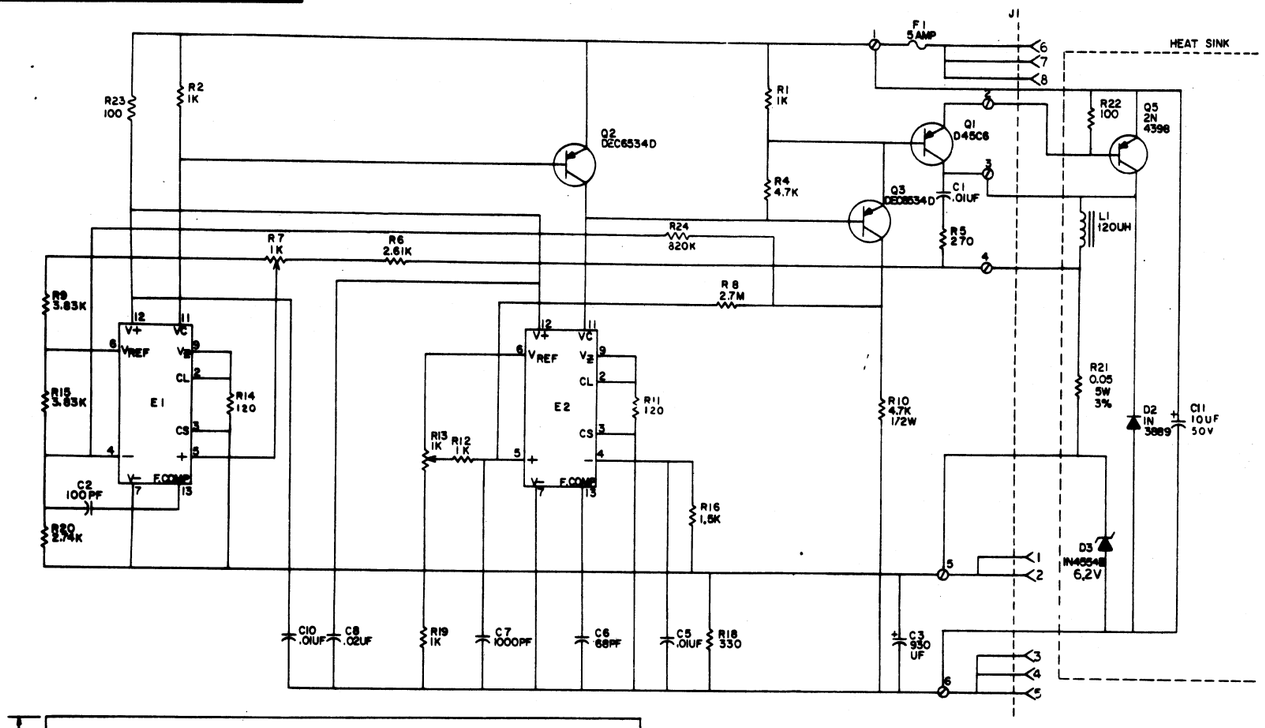
REV	CHANGE NO.		
R	5409503-00013	REVISED & REDRAWN	J. RINALDI

DRN: G MARINI, DATE 8-21-71
CHK'D: J. FLEMING, DATE 8-27-71
ENG: P. SVENDSON, DATE 9-8-71
PROJ ENG: P. SVENDSON, DATE 9-8-71
PROD: P. FAZIO, DATE 9-9-71
NEXT HIGHER ASSY: —
SCALE: NONE
SHEET 1 OF 1

[redacted] EQUIPMENT CORPORATION

TITLE: + 5 VOLT POWER REGULATOR

SIZE D, CODE IA, NUMBER 5409503-0-0, REV R



QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
A/R		WIRE #18 AWG STRD (WHT.)	9107360-99	70
A/R		WIRE #18AWG STRD (GRY.)	9107360-88	69
A/R		WIRE #18AWG STRD (VIO.)	9107360-77	68
A/R		WIRE #18AWG STRD (BLU.)	9107360-66	67
A/R		WIRE #18AWG STRD (GRN.)	9107360-55	66
A/R		WIRE #18AWG STRD (YEL.)	9107360-44	65
1		3/16 FLAT WASHER	9006666	64
2		THERMAL INSULATOR	9009678	63
1		NUT, HEX 1/4 X 28	9008063	62
2		WASHER, INT TOOTH LOCK #2	9006631	61
2		SOLDER LUG	9006764	60
1		1/4 FLAT WASHER	9006676	59
2		SCR BINDING HD 2-56X 3/16 SST	9006000-4	58
2		SCR PHIL PAN HD 6-32 X 5/8 SST	9006025-1	57
1		SCR PHIL TRUSS HD 10-32 X 1 SST	9006077-3	56
1		WASHER INT TOOTH LOCK #10	9006635	55
2		BUSHING	9008441	54
1		SOLDER LUG	9008150	53
1		NUT, HEX #10-32	9006564	52
4		SCR PHL PAN HD #6-20X 3/8 ST	9008407	51
1		THERMAL INSULATOR	9008419	50
2		THERMAL INSULATOR	9008424	49
2		TIE WRAPS	9007031	48
1		TRANSISTOR SOCKET	1210130	47
1	C11	CAP 10UF 50V	1000070	46
2	R22, R23	RES 100 1/4W 5%	1300229	45
1		HEAT SINK	D-IA-5309543-0-0	44
1	R21	RES 0.05 5W 3%	1310507	43
1	L1	CHOKE 120 UH	1610573	42
1	D2	DIODE IN3889	1110491	41
1	Q5	TRANSISTOR 2N4398	1505870	40
6		WASHER INT TOOTH #6	9006633	39
2	R11, R14	RES 120 1/4W 5%	1300247	38
1	R16	RES 1.5K 1/4W 5%	1300391	37
2		EYELETS	9006732	36
6		SPLIT LUGS	9006735	35
2		WASHER NYLON	9006707	34
2	E1, E2	IC 723C D.I.P. REGULATOR	1910415	33
1	Q1	TRANSISTOR D45C6 G.E.	1510414	32
A/R		THERMAL COMPOUND	9008268	31
2	Q2, Q3	TRANSISTOR DEC 6534D	1503409-00	30
1	R8	RES 2.7M 1/4W 5%	1309680	29
2	R9, R15	RES 3.83K 1/8W 1%	1309413	28
1	R7	RES 1K 1/2W 20%	1309150-3	27
1	R13	RES 1K 10W 76PR	1309143-07	26
1	R20	RES 2.74K 1/8W 1% MF	1304868	25
1	R6	RES 2.61K 1/8W 1% MF	1303303	24
1	R19	RES 1K 1/8W 1% MF	1303114	23
				22
1	R10	RES 4.7K 1/2W 5%	1300445	21
1	R5	RES 270 1/4W 5%	1301972	20
1	R4	RES 4.7K 1/4W 5%	1300447	19
3	R1, R2, R12	RES 1K 1/4W 5%	1300365	18
1	R18	RES 330 1/4W 5%	1300255	17
1	R24	RES 820K 1/4W 10%	1303187	16
8		CONNECTOR PIN	1209456	15
1	J1	CONN. 8 PIN AMP.	1209340-00	14
1	F1	FUSE 5 AMPS	1209070	13
1	D3	DIODE IN4554B 6.2V	1112122	12
1	C8	CAP .02UF 100V -0 +20% DISC	1000004	11
1	C3	CAP 930UF 30V -10 +75% ELEC.	1010509	10
3	C1, C5, C10	CAP .01 UF 100V 20% DISC	1001610	9
1	C7	CAP 1000PF 100V 5% MICA	1000042	8
1	C2	CAP 100 PF 100V 5% DM	1000016	7
1	C6	CAP 68PF 100V 5% DM	1000014	6
1		ETCH CIRCUIT BOARD	5009502	5
		MODULE ECO HISTORY	B MH-5409503-0-6	4
		ASSY/DRILLING HOLE LAYOUT	D-AH-5409503-0-5	3
		X-Y COORDINATE HOLE LOCATION	K-CO-5409503-0-4	2
		+5V REGULATOR	D-IA-5409503-0-0	1

PARTS LIST

REVISIONS
CHG | CHG NO. | REV.
D. JENSEN
N. FIELD
J. RINALDIS

DRN S. Cooper DATE 6-2-71
CHKD Nancy Moore DATE 6-7-71
ENG DATE

TRANSISTOR & DIODE CONVERSION CHART

DEC	EIA	DEC	EIA
		IN752A	SAME
		IN3889	SAME

EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS

TITLE
+5 VOLT REGULATOR

SIZE	CODE	NUMBER	REV
D	CS	5409503-0-1	R

PRINTED CIRCUIT REV H

WIRE TABLE

ITEM NO.	DESCRIPTION AWG	DESCRIPTION COLOR	LENGTH INCHES +-1/8	STRIP LENGTH X	STRIP LENGTH Y	CONNECTIONS FROM	CONNECTIONS TO
43	—	BLK	2 1/8	—	1/2	L1	D3-LUG (CATHODE)
43	—	BLK	2 1/8	—	1/2	L1	TS-2
65	18	BLU	2 1/4	1/2	1/2	Q4-C	D3-LUG (CATHODE)
67	18	GRY	3 5/8	1/2	1/2	Q4-E	R24-T2
64	18	GRN	4 1/2	1/2	1/2	D3-ANODE	TS-1
68	18	WHT	5 7/8	1/2	1/2	SPLIT LUG *1	R24-T1
67	18	GRY	4 7/8	1/2	1/2	*2	Q4-E
66	18	VIO	5 1/8	1/2	1/2	*3	Q4-B
65	18	BLU	5 1/8	1/2	1/2	*4	Q4-C
64	18	GRN	5 1/2	1/2	1/2	*6	TS-1
63	18	YEL	6 7/8	1/2	1/2	SPLIT LUG *5	TS-2

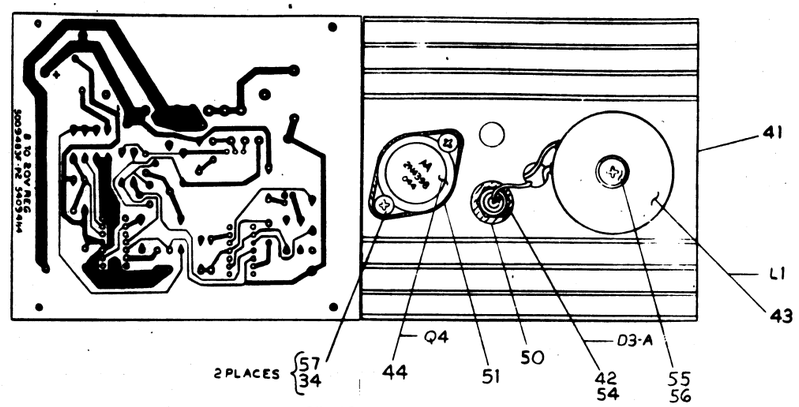
SEE NOTE 5

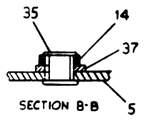
EXTERNAL COMPONENTS

ITEM NO.	LENGTH	DESCRIPTION	POL	CONNECTIONS FROM	CONNECTIONS TO	POL
45	SEE NOTE 2	RES 100Ω 1/4W 5%		Q4-E	Q4-B	
47	SEE NOTE 3	CAP 10 uF 50V 10%	+	S4-E	TS-1	—

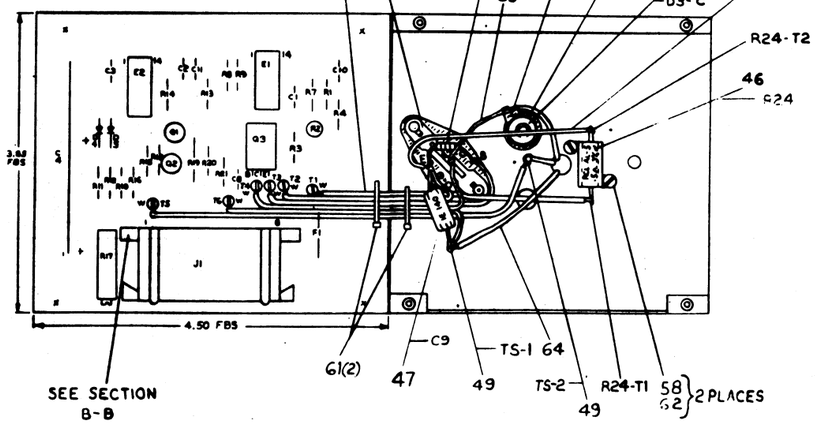
NOTES:

1. R17 IS USED FOR OUTPUT VOLTAGE ADJUSTMENT. R2 IS USED FOR OUTPUT POWER ADJUSTMENT.
2. CUT LEADS OF RES. (R25) SO THERE IS 3/8" OF A LEAD LEFT AT BOTH ENDS. 3/8 R25
3. CUT LEADS OF CAP. (C9) SO THERE IS 1/2 OF A LEAD LEFT AT BOTH ENDS. 1/2 C9
4. THERMAL COMPOUND (ITEM *39) IS TO BE APPLIED TO BOTH SIDES OF ALL THERMAL INSULATORS (ITEM *50+51) BOTH SIDES OF EACH INSULATOR SHOULD BE COMPLETELY COVERED, LEAVING NO VOIDS WHEN INSTALLED. CARE MUST BE EXERCISED SO THAT NO EXTRA COMPOUND INTERFERES WITH ANY ELECTRICAL CONNECTION MADE TO ANY DEVICE.
5. WHEN ASSEMBLING THE WIRES FROM THE CIRCUIT BOARD TO THE HEAT SINK, PLACE THE MODULE AGAINST THE HEAT SINK. WIRE AS SHOWN BY THE WIRE LIST AND MAKE A SERVICE LOOP AT THE CONNECTIONS ON THE HEAT SINK TO TAKE UP ANY EXCESS WIRE THAT MIGHT BE AVAILABLE.





SECTION B-B



QTY	REF DESIGNATION	DESCRIPTION	PART NO	ITEM NO.
		PARTS LIST		
		ETCH BOARD REV		

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

SEMICONDUCTOR CONVERSION CHART

REVISED/REDRAWN	5409484-00007	K
CHG	CHANGE NO.	REV
REVISIONS		

J. RINALDIS

DRN. T. QUILLIN 7 SEP 71
CHK'D. J. FLEMING 8 SEP 71
ENG. P. SVENDSEN 8 SEP 71
PROJ. ENG. P. SVENDSEN 8 SEP 71
PROD. P. FAZI 9 SEP 71
NEXT HIGHER ASSY D-UA-H737-0-0
SCALE NONE
SHEET 1 OF 1

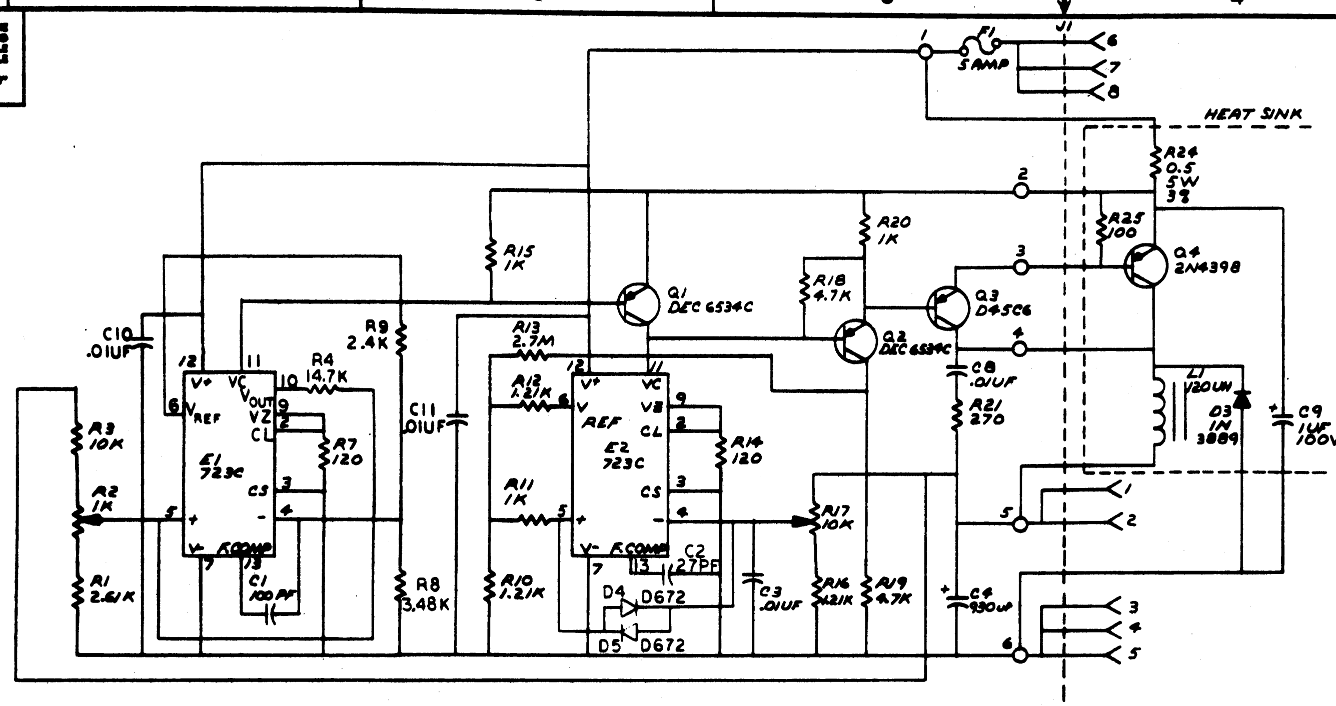
EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS

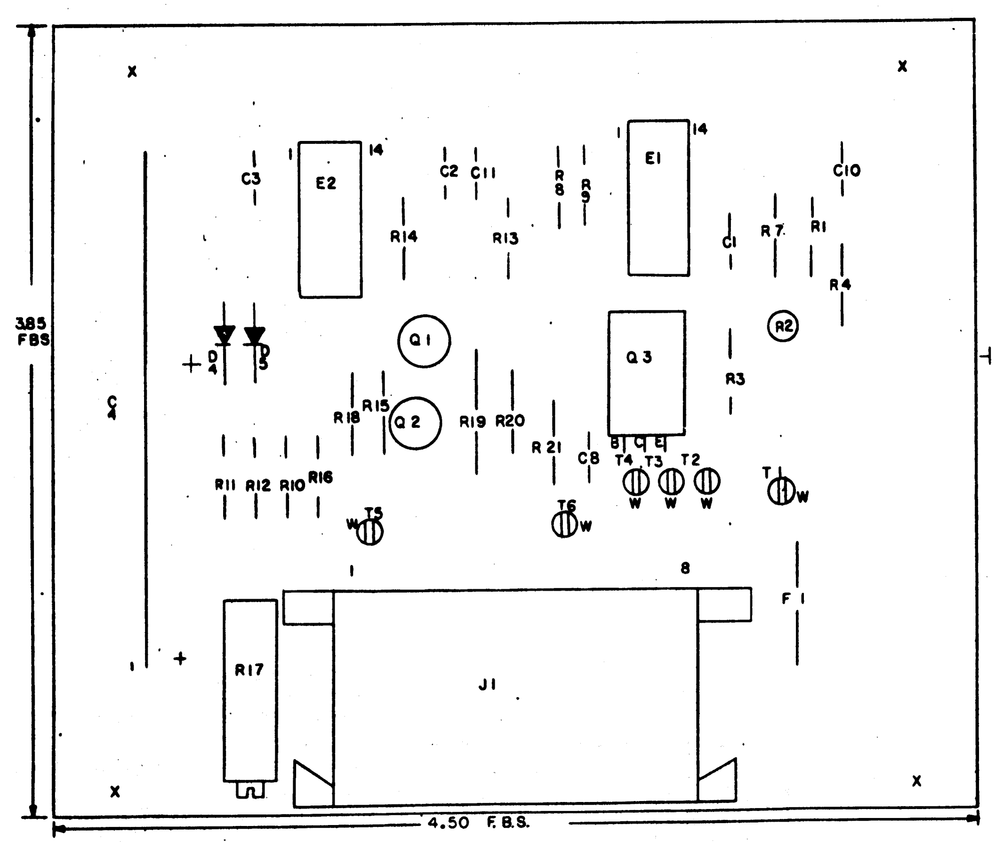
TITLE: 8 TO 20V REGULATOR

SIZE D | CODE IDENT IA | NUMBER 5409484-0-0 | REV K

DIST.

95





QTY	REF DESIGNATION	DESCRIPTION	PART NO	
4		WASHER, LOCK SPRING	9007801	69
A/R		WIRE #18 AWG STRD (WHT)	9107360-99	68
A/R		WIRE #18 AWG STRD (GRY)	9107360-88	67
A/R		WIRE #18 AWG STRD (VIO)	9107360-77	66
A/R		WIRE #18 AWG STRD (BLU)	9107360-66	65
A/R		WIRE #18 AWG STRD (GRN)	9107360-55	64
A/R		WIRE #18 AWG STRD (YEL)	9107360-44	63
2		#2 INTERNAL LOCK WASHER	9006631	62
2		TIE WRAPS	9007031	61
1		WASHER FLAT 3/16	9006666	60
1		#10-32 HEX NUT	9006564	59
2		2/56 x 3/16" SCREW	9006000-4	58
2		6/32 x 3/8" PAN HD SCREW	9006025-1	57
1		10-32 x 1" TRUSS HD SCREW	9006077-3	56
1		#10 INTERNAL LOCK WASHER	9006635	55
1		BUSHING (DIODE)	9008441	54
1		SOLDER LUG	9008150	53
4		#6-20 x 3/8 SELF TAPPING SCREW	9008407-01	52
1		THERMAL INSULATOR	9008419	51
2		THERMAL INSULATOR	9008424	50
2	TS-1, TS-2	STAND OFF (STUD TYPE)	9009060	49
1		TRANSISTOR SOCKET	1210130	48
1	C9	CAP 1UF 100V	1005507	47
1	R24	RES. 0.5 3% 5W	1310508	46
1	R25	RES. 100 5% 1/4W	1300229	45
1	Q4	TRANSISTOR 2N4398	1505870	44
1	L1	120UH CHOKE	1610573	43
1	D3	DIODE 1N3889	1110491	42
1		HEAT SINK	D-IA-5509545-0-0	41
6		SPLIT LUGS	9006735	40
A/R		THERMAL COMPOUND	9008268	39
1	F1	FUSE 5 AMPS	1209070	38
2		WASHER NYLON	9006707	37
8		CONNECTOR PINS	1209456	36
2		EYELET	9006732	35
2		WASHER INT TOOTH #6	9006633	34
2	E1, 2	DIP REGULATOR 723C	1910415	33
1	Q3	TRANSISTOR D45C6	1510414	32
2	Q1, 2	TRANSISTOR DEC 6534C	1503409-02	31
				30
1	R21	RES. 270 1/4W 5%	1301972	29
1	R19	RES. 4.7K 1/2 W 5%	1300445	28
1	R18	RES. 4.7K 1/4W 5%	1300447	27
1	R17	RES. VARIABLE 10K 3/4 W 10%	1309143-10	26
1	R13	RES 2.7M 1/4W 5%	1309680	25
3	R11, 15, 20	RES 1K 1/4 W 5%	1300365	24
3	R10, 12, 16	RES 1.21K 1/8W 1% MF	1302871	23
1	R8	RES 3.48K 1/8W 1% MF	1305114	22
2	R7, 14	RES 120 1/4W 5%	1300247	21
				[illegible]
1	R9	RES 2.4K 1/4W 5%	1303177	[illegible]
1	R4	RES 14.7K 1/8W 1% MF	1302941	[illegible]
1	R3	RES 10K 1/8W 1% MF	1303312	17
1	R2	RES VARIABLE 1K 1/2W	1309150-03	[illegible]
1	R1	RES 2.61K 1/8W 1% MF	1303303	15
1	J1	AMP 8 PIN CONNECTOR (MATE-LOC)	1209340-00	[illegible]
2	D4, D5	DIODE D672	1105275	13
				12
				11
				10
1	C4	CAP. 930UF 30V, -10 +75%	1010509	9
4	C3, 8, 10, 11	CAP. .01UF 100V 20% AXIAL	1001610	8
1	C2	CAP. 27 PF 100V 5% MICA	1001739	7
1	C1	CAP. 100PF 100V 5% DM.	1000016	6
1		ETCHED CIRCUIT BOARD	5009483	5
		MODULE ECO HISTORY	B-MH-5409484-0-6	4
		ASSY DRILLING HOLE LAYOUT	D-AH-5409484-0-5	3
		X-Y COORDINATE HOLE LOCATION	K-CO-5409484-0-4	2
		8 TO 20 V REGULATOR	E-IA-5409484-0-0	1

REVISIONS

CHK	CHANGE NO.	REV.
	00005	H
	5409484-00006	J
	5409484-00007	K

J. RINALDIS 5/19/75 — J. RINALDIS 7/21/75 — J. RINALDIS 11/4/75

TITLE: 8 TO 20V REGULATOR | SIZE: D | CODE: CS | NUMBER: 5409484-0-1 | REV.: K

SCALE | SHEET 1 OF 1 | DIST.

D CS 5409484-0-1 K

RKOSLM,M WRP288,V22(22) 11/06/73 11-FEB-74 23114 PAGE 1

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
+15VDC	H	A05D2		1-01		D05-9			1				1
+15VDC	H	A06D1		1-02		D05-9							1
+15VDC				1							2-6/8		1
+5VDC BUS	H	B06A1		1-01		D05-9			1				2
+5VDC BUS	H	B06A2		1-02		D05-9							2
+5VDC BUS				1							2-6/8		2
12B	H	A01M2		1-01		D05-1			1				3
12B	H	B03A1		1-02		D05-1						3	3
12B				1							5-2/8		3
AC LOW	H	A04R2		1-01		D05-8			1				4
AC LOW	H	B08F1		1-02		D05-8			2				4
AC LOW	H	B07F1		1-03		D05-8							4
AC LOW				1							9-0/8		4
ADDR ACCEPTED	L	A02B1		1-01		D05-5			1				5
ADDR ACCEPTED	L	A03N1		1-02		D05-5							5
ADDR ACCEPTED				1							3-6/8		5
ADDRESS INVALID	L	B02F1		1-01		D05-2			1				6
ADDRESS INVALID	L	B03E1		1-02		D05-2							6
ADDRESS INVALID				1							2-7/8		6
BLOWER MTR RELAY DR	H	A04A1		1-01		D05-9			1				7
BLOWER MTR RELAY DR	H	B06N1		1-02		D05-9							7
BLOWER MTR RELAY DR				1							8-2/8		7
BUS ADDR ACCEPTED	L	A02R1		1-01		D05-4			1				8
BUS ADDR ACCEPTED	L	A07R2		1-02		D05-4			2				8
BUS ADDR ACCEPTED	L	A08R2		1-03		D05-4							8
BUS ADDR ACCEPTED				1							9-2/8		8
BUS ADDR INVALID	L	A08T2		1-01		D05-4			2				9
BUS ADDR INVALID	L	A07T2		1-02		D05-4			1				9
BUS ADDR INVALID	L	B02A1		1-03		D05-4							9
BUS ADDR INVALID				1							10-2/8		9
BUS FILE READY	L	A04M1		1-01		D05-7			1				10
BUS FILE READY	L	B08N1		1-02		D05-7			2				10
BUS FILE READY	L	B07N1		1-03		D05-7							10
BUS FILE READY				1							10-7/8		10

	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
BUS INDEX PUL	L	A02K1		1-01		D05-3		1				11
BUS INDEX PUL	L	B08M1		1-02		D05-3		2				11
BUS INDEX PUL	L	B07M1		1-03		D05-3						11
BUS INDEX PUL				1						10-7/8		11
BUS R/W/S READY	L	A02M1		1-01		D05-4		1				12
BUS R/W/S READY	L	A07H2		1-02		D05-4		2				12
BUS R/W/S READY	L	A08H2		1-03		D05-4						12
BUS R/W/S READY				1						9-6/8		12
BUS SECTOR ADDR	L	A02H1		1-01		D05-3		1				13
BUS SECTOR ADDR	L	B08L1		1-02		D05-3		2				13
BUS SECTOR ADDR	L	B07L1		1-03		D05-3						13
BUS SECTOR ADDR				1						11-0/8		13
BUS SECTOR ADDR 1	L	A02J1		1-01		D05-4		1				14
BUS SECTOR ADDR 1	L	A07P2		1-02		D05-4		2				14
BUS SECTOR ADDR 1	L	A08P2		1-03		D05-4						14
BUS SECTOR ADDR 1				1						9-6/8		14
BUS SECTOR ADDR 2	L	A02L1		1-01		D05-4		1				15
BUS SECTOR ADDR 2	L	B07K2		1-02				2				15
BUS SECTOR ADDR 2	L	B08K2		1-03		D05-4						15
BUS SECTOR ADDR 2				1						10-2/8		15
BUS SECTOR ADDR 3	L	A02P1		1-01		D05-4		1				16
BUS SECTOR ADDR 3	L	B07J1		1-02		D05-4		2				16
BUS SECTOR ADDR 3	L	B08J1		1-03		D05-4						16
BUS SECTOR ADDR 3				1						10-2/8		16
BUS SECTOR PULSE	L	A02F1		1-01		D05-3		1				17
BUS SECTOR PULSE	L	B08N2		1-02		D05-3		2				17
BUS SECTOR PULSE	L	B07N2		1-03		D05-3						17
BUS SECTOR PULSE				1						11-2/8		17
BUS SEEK INCOMPLETE	L	A02N1		1-01		D05-4		1				18
BUS SEEK INCOMPLETE	L	A07S2		1-02		D05-4		2				18
BUS SEEK INCOMPLETE	L	A08S2		1-03		D05-4						18
BUS SEEK INCOMPLETE				1						9-4/8		18
BUS WR PROTECT STATUS	H	B04U1		1-01		D05-8		1				19
BUS WR PROTECT STATUS	H	B07P1		1-02		D05-8		2				19
BUS WR PROTECT STATUS	H	B08P1		1-03		D05-8						19
BUS WR PROTECT STATUS				1						8-4/8		19

	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
BUS WRITE CK	H	B04P1		1-01		D05-8		1				20
BUS WRITE CK	H	B07K1		1-02		D05-8		2				20
BUS WRITE CK	H	B08K1		1-03		D05-8						20
BUS WRITE CK				1						8-4/8		20
COS POSITION	H	A05U1		1-01		D05-9		1				21
COS POSITION	H	B06B1		1-02		D05-9						21
COS POSITION				1						4-1/8		21
COUNT PULSE FWD	H	A05A1		1-01		D05-5		1				22
COUNT PULSE FWD	H	B03K1		1-02		D05-5						22
COUNT PULSE FWD				1						7-6/8		22
COUNT PULSE REV	H	A05C1		1-01		D05-5		1				23
COUNT PULSE REV	H	B03F1		1-02		D05-5						23
COUNT PULSE REV				1						7-0/8		23
CYC ADDR 0	L	A07K1		1-01		D05-5		2				24
CYC ADDR 0	L	A08K1		1-02		D05-5		1				24
CYC ADDR 0	L	B03L1		1-03		D05-5						24
CYC ADDR 0				1						10-5/8		24
CYC ADDR 1	L	A07D1		1-01		D05-6		2				25
CYC ADDR 1	L	A08D1		1-02		D05-6		1				25
CYC ADDR 1	L	B03N1		1-03		D05-6						25
CYC ADDR 1				1						11-3/8		25
CYC ADDR 2	L	A08L1		1-01		D05-6		2				26
CYC ADDR 2	L	A07L1		1-02		D05-6		1				26
CYC ADDR 2	L	B03P1		1-03		D05-6						26
CYC ADDR 2				1						10-5/8		26
CYC ADDR 3	L	A07C1		1-01		D05-6		2				27
CYC ADDR 3	L	A08C1		1-02		D05-6		1				27
CYC ADDR 3	L	B03M1		1-03		D05-6						27
CYC ADDR 3				1						11-3/8		27
CYC ADDR 4	L	A07F1		1-01		D05-6		2				28
CYC ADDR 4	L	A08F1		1-02		D05-6		1				28
CYC ADDR 4	L	B03R1		1-03		D05-6						28
CYC ADDR 4				1						11-3/8		28
CYC ADDR 5	L	A07J1		1-01		D05-6		2				29
CYC ADDR 5	L	A08J1		1-02		D05-6		1				29
CYC ADDR 5	L	B03U1		1-03		D05-6						29
CYC ADDR 5				1						11-4/8		29

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
CYC ADDR 6	L	A08E1		1-01			D05	-6			2				30
CYC ADDR 6	L	A07E1		1-02			D05	-6			1				30
CYC ADDR 6	L	B03V1		1-03			D05	-6							30
CYC ADDR 6				1									12-6/8		30
CYC ADDR 7	L	A07H1		1-01			D05	-6			2				31
CYC ADDR 7	L	A08H1		1-02			D05	-6			1				31
CYC ADDR 7	L	B03S1		1-03			D05	-6							31
CYC ADDR 7				1									11-3/8		31
DC LO=	H	A04D1		1-01			D05	-8			1				32
DC LO=	H	B08F2		1-02			D05	-8			2				32
DC LO=	H	B07F2		1-03			D05	-8							32
DC LO=				1									11-1/8		32
DIFF 1	L	A03A1		1-01			D05	-7			1				33
DIFF 1	L	B05N2		1-02			D05	-7							33
DIFF 1				1									8-4/8		33
DIFF 16	L	A03E1		1-01			D05	-7			1				34
DIFF 16	L	B05T2		1-02			D05	-7							34
DIFF 16				1									8-4/8		34
DIFF 2	L	A03B1		1-01			D05	-7			1				35
DIFF 2	L	B05P2		1-02			D05	-7							35
DIFF 2				1									8-2/8		35
DIFF 4	L	A03D1		1-01			D05	-7			1				36
DIFF 4	L	B05R2		1-02			D05	-7							36
DIFF 4				1									8-2/8		36
DIFF 8	L	A03C1		1-01			D05	-7			1				37
DIFF 8	L	B05S2		1-02			D05	-7							37
DIFF 8				1									8-4/8		37
DISK RELAY DR	H	A04N1		1-01			D05	-8			1				38
DISK RELAY DR	H	B06P1		1-02			D05	-8							38
DISK RELAY DR				1									6-6/8		38
DR UNLOCKING SOLENOID	L	A06P1		1-01			D05	-8			1				39
DR UNLOCKING SOLENOID	L	B04V1		1-02			D05	-8							39
DR UNLOCKING SOLENOID				1									7-2/8		39
FAULT IND	H	A04N2		1-01			D05	-8			1				40
FAULT IND	H	A06H1		1-02			D05	-8							40
FAULT IND				1									4-0/8		40

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
FWD	H	B03J1		1-01			D05	-5			1				41
FWD	H	B05J2		1-02			D05	-5							41
FWD				1									4-2/8		41
GND 01		A01C2		1-01							1				42
GND 01		A01T1		1-02							2				42
GND 01		B01C2		1-03							1				42
GND 01		B01T1		1-04											42
GND 01				1									13-6/8		42
GND 02		A02C2		1-01							1				43
GND 02		A02T1		1-02							2				43
GND 02		B02C2		1-03							1				43
GND 02		B02T1		1-04											43
GND 02				1									13-6/8		43
GND 03		A03C2		1-01							1				44
GND 03		A03T1		1-02							2				44
GND 03		B03C2		1-03							1				44
GND 03		B03T1		1-04											44
GND 03				1									13-6/8		44
GND 04		A04C2		1-01							1				45
GND 04		A04T1		1-02							2				45
GND 04		B04C2		1-03							1				45
GND 04		B04T1		1-04											45
GND 04				1									13-6/8		45
GND 05		A05C2		1-01							1				46
GND 05		A05T1		1-02							2				46
GND 05		B05C2		1-03							1				46
GND 05		B05T1		1-04											46
GND 05				1									13-6/8		46
GND 06		A06C2		1-01							1				47
GND 06		A06T1		1-02							2				47
GND 06		B06C2		1-03			D05	-9			1				47
GND 06		B06C1		1-04			D05	-9			2				47
GND 06		B06E1		1-05			D05	-9			1				47
GND 06		B06J1		1-06			D05	-9			2				47
GND 06		B06T1		1-07			D05	-9			1				47
GND 06		B06S1		1-08			D05	-9							47
GND 06				1									23-6/8		47

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
GND 07		A07B2		1-01				1				48
GND 07		A07C2		1-02				2				48
GND 07		A07N1		1-03				1				48
GND 07		A07P1		1-04				2				48
GND 07		A07R1		1-05				1				48
GND 07		A07S1		1-06				2				48
GND 07		A07T1		1-07				1				48
GND 07		A07V1		1-08				2				48
GND 07		B07B2		1-09				1				48
GND 07		B07C2		1-10				2				48
GND 07		B07D1		1-11				1				48
GND 07		B07E1		1-12				2				48
GND 07		B07T1		1-13				1				48
GND 07		B07V2		1-14								48
GND 07				1						37-2/8		48
GND 08		A08B2		1-01				1				49
GND 08		A08C2		1-02				2				49
GND 08		A08N1		1-03				1				49
GND 08		A08P1		1-04				2				49
GND 08		A08R1		1-05				1				49
GND 08		A08S1		1-06				2				49
GND 08		A08T1		1-07				1				49
GND 08		A08V1		1-08				2				49
GND 08		B08B2		1-09				1				49
GND 08		B08C2		1-10				2				49
GND 08		B08D1		1-11				1				49
GND 08		B08E1		1-12				2				49
GND 08		B08T1		1-13				1				49
GND 08		B08V2		1-14								49
GND 08				1						37-2/8		49
GOOD STROBE	L	B02E1		1-01		D05-5		1				50
GOOD STROBE	L	B03D1		1-02		D05-5						50
GOOD STROBE				1						3-6/8		50
HEAD SELECT	L	A01P1		1-01		D05-1		1				51
HEAD SELECT	L	B07M2		1-02		D05-1		2				51
HEAD SELECT	L	B08M2		1-03		D05-1						51
HEAD SELECT				1						11-3/8		51
HIGH DENSITY	L	A01R2		1-01		D05-4		1				52
HIGH DENSITY	L	B07P2		1-02		D05-4		2				52
HIGH DENSITY	L	B08P2		1-03		D05-4						52
HIGH DENSITY				1						10-3/8		52

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
HOME	L	A04R1		1-01		D05-7		2				53
HOME	L	B03B1		1-02		D05-7		1				53
HOME	L	B06F1		1-03		D05-7						53
HOME				1						9-6/8		53
INDEX PULSE	L	A02R2		1-01		D05-3		1				54
INDEX PULSE	L	A04J1		1-02		D05-3						54
INDEX PULSE				1						4-1/8		54
INDEX/SECTOR	L	B02D1		1-01		D05-5		1				55
INDEX/SECTOR	L	B04H2		1-02		D05-5						55
INDEX/SECTOR				1						4-4/8		55
INNER LIMIT	H	A05B1		1-01		D05-2		1				56
INNER LIMIT	H	A03U1		1-02		D05-2		2				56
INNER LIMIT	H	B02J1		1-03		D05-2						56
INNER LIMIT				1						11-0/8		56
INTERLOCK	L	A04H1		1-01		D05-7		1				57
INTERLOCK	L	A06R1		1-02		D05-7						57
INTERLOCK				1						4-3/8		57
LIMIT	H	A05K1		1-01		D05-9		1				58
LIMIT	H	B06H1		1-02		D05-9						58
LIMIT				1						6-0/8		58
LOAD HEADS	L	B03C1		1-01		D05-6		1				59
LOAD HEADS	L	B04C1		1-02		D05-6						59
LOAD HEADS				1						3-4/8		59
LOAD IND	H	A04L1		1-01		D05-8		1				60
LOAD IND	H	A06A1		1-02		D05-8						60
LOAD IND				1						4-3/8		60
LOAD SW	L	A06K1		1-01		D05-7		1				61
LOAD SW	L	R04D1		1-02		D05-7						61
LOAD SW				1						6-0/8		61
MOVE	L	A03L1		1-01		D05-2		1				62
MOVE	L	B02P1		1-02		D05-2						62
MOVE				1						6-6/8		62
NO PROTECT	L	A01N2		1-01		D05-1		1				63
NO PROTECT	L	B04H1		1-02		D05-1						63
NO PROTECT				1						6-2/8		63

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
ON	L	A02A1		1-01			D05	-5			1				64
ON	L	A03M1		1-02			D05	-5							64
ON				1									4-6/8		64
OUTER LIMIT	H	A03K1		1-01			D05	-6			2				65
OUTER LIMIT	H	A04K1		1-02			D05	-6			1				65
OUTER LIMIT	H	A05D1		1-03			D05	-6							65
OUTER LIMIT				1									7-4/8		65
POWER AMP DR	H	B05U2		1-01			D05	-9			1				66
POWER AMP DR	H	B06M1		1-02			D05	-9							66
POWER AMP DR				1									4-0/8		66
PROTECT IND	H	A06C1		1-01			D05	-8			1				67
PROTECT IND	H	B04U2		1-02			D05	-8							67
PROTECT IND				1									8-2/8		67
PWR SEC XNSOUR	H	A02D1		1-01			D05	-2			1				68
PWR SEC XNSOUR	H	B06K1		1-02			D05	-2							68
PWR SEC XNSOUR				1									8-2/8		68
R/W/S READY	H	A03P1		1-01			D05	-5			1				69
R/W/S READY	H	B04J1		1-02			D05	-5			2				69
R/W/S READY	H	B02L1		1-03			D05	-5							69
R/W/S READY				1									10-0/8		69
R/W/S READY	L	A01P2		1-01			D05	-1			1				70
R/W/S READY	L	B02K1		1-02			D05	-1							70
R/W/S READY				1									5-4/8		70
READ CLOCK	L	A01F2		1-01			D05	-2			1				71
READ CLOCK	L	B07S1		1-02			D05	-2			2				71
READ CLOCK	L	B08S1		1-03			D05	-2							71
READ CLOCK				1									11-4/8		71
READ DATA	L	A01E2		1-01			D05	-2			1				72
READ DATA	L	B07S2		1-02			D05	-2			2				72
READ DATA	L	B08S2		1-03			D05	-2							72
READ DATA				1									11-7/8		72
READ GATE	L	A01K2		1-01			D05	-1			1				73
READ GATE	L	B08R1		1-02			D05	-1			2				73
READ GATE	L	B07R1		1-03			D05	-1							73
READ GATE				1									11-3/8		73

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
READ IND	H	A02E2		1-01			D05	-9			1				74
READ IND	H	A06J1		1-02			D05	-9							74
READ IND				1									5-2/8		74
READY	H	A02C1		1-01			D05	-3			1				75
READY	H	A04U1		1-02			D05	-3							75
READY				1									5-6/8		75
READY IND	H	A06B1		1-01			D05	-8			1				76
READY IND	H	B04M1		1-02			D05	-8							76
READY IND				1									8-0/8		76
RESTORE	H	A02B1		1-01			D05	-4			1				77
RESTORE	H	A03J1		1-02			D05	-4							77
RESTORE				1									3-7/8		77
RESTORE	L	A08M1		1-01			D05	-2			2				78
RESTORE	L	A07M1		1-02			D05	-2			1				78
RESTORE	L	B02N1		1-03			D05	-2							78
RESTORE				1									10-2/8		78
REV	H	B03M1		1-01			D05	-5			1				79
REV	H	B05K2		1-02			D05	-5							79
REV				1									4-4/8		79
RK-11D	L	A08U1		1-01							2				80
RK-11D	L	A07U1		1-02							1				80
RK-11D	L	B02U1		1-03											80
RK-11D				1									10-2/8		80
RTZ	L	A03F1		1-01			D05	-2			1				81
RTZ	L	B02C1		1-02			D05	-2							81
RTZ				1									6-0/8		81
RUN S=	L	A06L1		1-01			D05	-7			1				82
RUN S=	L	B04L1		1-02			D05	-7							82
RUN S=				1									6-6/8		82
SECTOR	L	A02B2		1-01			D05	-9			1				83
SECTOR	L	B04K1		1-02			D05	-9							83
SECTOR				1									5-6/8		83
SECTOR/INDEX RAW	H	A02E1		1-01			D05	-2			1				84
SECTOR/INDEX RAW	H	B06L1		1-02											84
SECTOR/INDEX RAW				1									8-4/8		84

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	RUN NUMBER
SEEK DONE IND	H	A02V1		1-01		D05-6		1			85
SEEK DONE IND	H	A06F1		1-02		D05-5					85
SEEK DONE IND				1						5-7/8	85
SEL/WRITE PROTECT SET	L	B02R1		1-01		D05-5		1			86
SEL/WRITE PROTECT SET	L	B04B1		1-02		D05-5					86
SEL/WRITE PROTECT SET				1						5-2/8	86
SELECT	H	A01S2		1-01		D05-2		2			87
SELECT	H	A04S1		1-02		D05-2		1			87
SELECT	H	B02V2		1-03		D05-2					87
SELECT				1						11-0/8	87
SELECT 1	L	A08J2		1-01		D05-3		2			88
SELECT 1	L	A07J2		1-02		D05-3		1			88
SELECT 1	L	B02R2		1-03		D05-3					88
SELECT 1				1						11-1/8	88
SELECT 2	L	A08K2		1-01		D05-3		2			89
SELECT 2	L	A07K2		1-02		D05-3		1			89
SELECT 2	L	B02S2		1-03		D05-3					89
SELECT 2				1						11-1/8	89
SELECT 3	L	A08L2		1-01		D05-3		2			90
SELECT 3	L	A07L2		1-02		D05-3		1			90
SELECT 3	L	B02T2		1-03		D05-3					90
SELECT 3				1						11-1/8	90
SELECT 4	L	A08M2		1-01		D05-3		2			91
SELECT 4	L	A07M2		1-02		D05-3		1			91
SELECT 4	L	B02U2		1-03		D05-3					91
SELECT 4				1						11-1/8	91
SELECT/READY	L	A01H2		1-01		D05-1		1			92
SELECT/READY	L	A04V1		1-02				2			92
SELECT/READY	L	B02H1		1-03		D05-1					92
SELECT/READY				1						9-6/8	92
SELECTED READ GATE	H	A01B1		1-01		D05-9		1			93
SELECTED READ GATE	H	A02F2		1-02		D05-9					93
SELECTED READ GATE				1						3-7/8	93
SELECTED WRITE GATE	H	A01V1		1-01		D05-1		1			94
SELECTED WRITE GATE	H	A02V2		1-02		D05-1					94
SELECTED WRITE GATE				1						3-6/8	94

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	RUN NUMBER
SET UNSAFE	L	A01U2		1-01		D05-1		1			95
SET UNSAFE	L	B04A1		1-02		D05-1					95
SET UNSAFE				1						4-7/8	95
SIN POSITION	H	A05N1		1-01		D05-9		1			96
SIN POSITION	H	B06D1		1-02		D05-9					96
SIN POSITION				1						5-2/8	96
STROBE	L	B02V1		1-01		D05-2		1			97
STROBE	L	B07H1		1-02		D05-2		2			97
STROBE	L	B08H1		1-03		D05-2					97
STROBE				1						10-2/8	97
UNSAFE	L	A01L2		1-01		D05-1		1			98
UNSAFE	L	A04V2		1-02		D05-1					98
UNSAFE				1						5-2/8	98
WRITE DATA + CLK	H	A01J1		1-01		D05-1		1			99
WRITE DATA + CLK	H	A07F2		1-02		D05-1		2			99
WRITE DATA + CLK	H	A08F2		1-03		D05-1					99
WRITE DATA + CLK				1						10-0/8	99
WRITE GATE	L	A01J2		1-01		D05-1		1			100
WRITE GATE	L	B07L2		1-02		D05-1		2			100
WRITE GATE	L	B08L2		1-03		D05-1					100
WRITE GATE				1						10-7/8	100
WRITE PROTECT SET	L	B02S1		1-01		D05-3		1			101
WRITE PROTECT SET	L	B07R2		1-02		D05-3		2			101
WRITE PROTECT SET	L	B08R2		1-03		D05-3					101
WRITE PROTECT SET				1						9-4/8	101
WRITE SW OFF	L	A06N1		1-01		D05-7		1			102
WRITE SW OFF	L	B04F1		1-02		D05-7					102
WRITE SW OFF				1						6-0/8	102
WRITE SW ON	L	A06M1		1-01		D05-7		1			103
WRITE SW ON	L	B04E1		1-02		D05-7					103
WRITE SW ON				1						6-0/8	103
WRITING IND	H	A02U1		1-01		D05-5		1			104
WRITING IND	H	A06E1		1-02		D05-5					104
WRITING IND				1						5-7/8	104

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SPOULER RUNTIME 7 SECONDS, 42 KCS, 251 DISK READS, 3 DISK WRITES, 24 PAGES
**END** USER DRAFTING #4 [202,202] JOB  RKOSLB SEQ, 840 DATE 12-FEB-75 15:12:52 MONITOR DDC KI#567 506BSE+DATE75  **END**

**END** USER DRAFTING #4 [202,202] JOB  RKOSLB SEQ, 840 DATE 12-FEB-75 15:12:52 MONITOR DDC KI#567 506BSE+DATE75  **END**

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**END** USER DRAFTING #4 [202,202] JOB  RKOSLB SEQ, 840 DATE 12-FEB-75 15:12:52 MONITOR DDC KI#567 506BSE+DATE75  **END**

**END** USER DRAFTING #4 [202,202] JOB  RKOSLB SEQ, 840 DATE 12-FEB-75 15:12:52 MONITOR DDC KI#567 506BSE+DATE75  **END**

**END** USER DRAFTING #4 [202,202] JOB  RKOSLB SEQ, 840 DATE 12-FEB-75 15:12:52 MONITOR DDC KI#567 506BSE+DATE75  **END**

**END** USER DRAFTING #4 [202,202] JOB  RKOSLB SEQ, 840 DATE 12-FEB-75 15:12:52 MONITOR DDC KI#567 506BSE+DATE75  **END**

**END** USER DRAFTING #4 [202,202] JOB  RKOSLB SEQ, 840 DATE 12-FEB-75 15:12:52 MONITOR DDC KI#567 506BSE+DATE75  **END**

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RUN NAME	A/P	PIN NAME	ORDER PIN	RAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS		LENGTH	EXCEPTIONS	RUN NUMBER
+5V		A01A2		1-01 *	H	D02		2		P		HAND WIRE	1
+5V		A02A2		1-02 *	H	D02		1		P		HAND WIRE	1
+5V		A03A2		1-03 *	H	D02		2		P		HAND WIRE	1
+5V		A04A2		1-04 *	H	D02		1		P		HAND WIRE	1
+5V		A03H2		1-05 *	H	D02		2		P		HAND WIRE	1
+5V		A03J2		1-06 *	H	D02		1		P		HAND WIRE	1
+5V		A03K2		1-07 *	H	D02		2		P		HAND WIRE	1
+5V		A03L2		1-08 *	H	D02		1		P		HAND WIRE	1
+5V		A03M2		1-09 *	H	D02		2		P		HAND WIRE	1
+5V		B01A2		1-10 *	H	D02		1		P		HAND WIRE	1
+5V		B02A2		1-11 *	H	D02		2		P		HAND WIRE	1
+5V		B03B1		1-12 *	H	D02		1		P		HAND WIRE	1
+5V		B03A2		1-13 *	H	D02		2		P		HAND WIRE	1
+5V		B04A2		1-14 *	H	D02		1		P		HAND WIRE	1
+5V		C04A2		1-15 *	H	D01		2		P		HAND WIRE	1
+5V		C03A2		1-16 *	H	D01		1		P		HAND WIRE	1
+5V		C02A2		1-17 *	H	D01		2		P		HAND WIRE	1
+5V		C01A2		1-18 *	H	D01		1		P		HAND WIRE	1
+5V		D01A2		1-19 *	H	D01		2		P		HAND WIRE	1
+5V		D02A2		1-20 *	H	D01		1		P		HAND WIRE	1
+5V		D03A2		1-21 *	H	D01		2		P		HAND WIRE	1
+5V		D04A2		1-22 *	H	D01		1		P		HAND WIRE	1
+5V		E04A2		1-23 *	H	D01		2		P		HAND WIRE	1
+5V		E03A2		1-24 *	H	D01		1		P		HAND WIRE	1
+5V		E02A2		1-25 *	H	D01		2		P		HAND WIRE	1
+5V		E01A2		1-26 *	H	D01		1		P		HAND WIRE	1
+5V		F01A2		1-27 *	H	D01		2		P		HAND WIRE	1
+5V		F02A2		1-28 *	H	D01		1		P		HAND WIRE	1
+5V		F03A2		1-29 *	H	D01		2		P		HAND WIRE	1
+5V		F04A2		1-30 *	H	D01				P		H TO WHERE	1
+5V				1							89-0/8		1
B TO NPR	H	F01R1		1-01 *	H	D01		1		P		HAND WIRE	2
B TO NPR	H	E03R2		1-02 *	H	D01		2		P		HAND WIRE	2
B TO NPR	H	E04R2		1-03 *	H	D01				P		H TO WHERE	2
B TO NPR				1							6-2/8		2
ADD ACK	H	F01J1		1-01 *	H	D01		1		P		HAND WIRE	3
ADD ACK	H	F02J1		1-02 *	H	D01				P		H TO WHERE	3
ADD ACK				1							2-6/8		3
B CNTRL RDY	H	B03R2		1-01 *		D02		1					4
B CNTRL RDY	H	E04S2		1-02 *	H	D01		2		P		HAND WIRE	4
B CNTRL RDY	H	E02S2		1-03 *	H	D01		1		P		HAND WIRE	4
B CNTRL RDY	H	E01S2		1-04 *	H	D01				P		H TO WHERE	4
B CNTRL RDY				1							16-4/8		4

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RUN NAME	A/P	PIN NAME	ORDER PIN	RAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS		LENGTH	EXCEPTIONS	RUN NUMBER
BG 4 IN	H	B01E2		1-01 *		D02		1					5
BG 4 IN	H	C01S2		1-02 *		D01							5
BG 4 IN				1							6-0/8		5
BG 4 OUT	H	B04E2		1-01 *		D02		1					6
BG 4 OUT	H	C01T2		1-02 *		D01							6
BG 4 OUT				1							6-6/8		6
BG 5 IN	H	B01D1		1-01 *		D02		1					7
BG 5 IN	H	C01P2		1-02 *		D01							7
BG 5 IN				1							6-2/8		7
BG 5 OUT	H	B04D1		1-01 *		D02		1					8
BG 5 OUT	H	C01R2		1-02 *		D01							8
BG 5 OUT				1							7-0/8		8
BG 6 IN	H	B01A1		1-01 *		D02		1					9
BG 6 IN	H	C01M2		1-02 *		D01							9
BG 6 IN				1							6-2/8		9
BG 6 OUT	H	B04A1		1-01 *		D02		1					10
BG 6 OUT	H	C01N2		1-02 *		D01							10
BG 6 OUT				1							6-6/8		10
BG 7 IN	H	A01V1		1-01 *		D02		1					11
BG 7 IN	H	C01K2		1-02 *		D01							11
BG 7 IN				1							6-4/8		11
BG 7 OUT	H	A04V1		1-01 *		D02		1					12
BG 7 OUT	H	C01L2		1-02 *		D01							12
BG 7 OUT				1							7-2/8		12
BG IN	H	C01V2		1-01 *	H	D01		1		P		HAND WIRE	13
BG IN	H	C04V2		1-02 *	H	D01				P		H TO WHERE	13
BG IN				1							3-6/8		13
BG OUT	H	C01U2		1-01 *	H	D01		1		P		HAND WIRE	14
BG OUT	H	C04U2		1-02 *	H	D01				P		H TO WHERE	14
BG OUT				1							3-6/8		14
BR OUT	L	C01J2		1-01 *	H	D01		1		P		HAND WIRE	15
BR OUT	L	C04J2		1-02 *	H	D01				P		H TO WHERE	15
BR OUT				1							3-6/8		15

BK11D.F

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG	Y	X	Z	REMARKS		LENGTH	EXCEPTIONS	RUN NUMBER
HND2BB.V22(22) 11/06/73											1-MAY-74		19:27	PAGE 3
BUS A00	L	B01H2	B04H2	1-01 *	H	D02			2		P		HAND WIRE	16
BUS A00	L	B04H2		1-02 *		D02			1			3-4	TO HERE	16
BUS A00	L	D04D1		1-03 *		D01								16
BUS A00				1								11-3/8		16
BUS A01	L	B01H1		1-01 *	H	D02			2		P		HAND WIRE	17
BUS A01	L	B04H1		1-02 *		D02			1				TO HERE	17
BUS A01	L	C04T2		1-03 *		D01								17
BUS A01				1								10-0/8		17
BUS A02	L	B01J2		1-01 *	H	D02			2		P		HAND WIRE	18
BUS A02	L	B04J2		1-02 *		D02			1				TO HERE	18
BUS A02	L	C04S1		1-03 *		D01								18
BUS A02				1								9-6/8		18
BUS A03	L	B01J1		1-01 *	H	D02			2		P		HAND WIRE	19
BUS A03	L	B04J1		1-02 *		D02			1				TO HERE	19
BUS A03	L	C04R1		1-03 *		D01								19
BUS A03				1								9-2/8		19
BUS A04	L	B01K2		1-01 *	H	D02			2		P		HAND WIRE	20
BUS A04	L	B04K2		1-02 *		D02			1				TO HERE	20
BUS A04	L	C04P1		1-03 *		D01								20
BUS A04				1								9-2/8		20
BUS A05	L	B01K1		1-01 *	H	D02			2		P		HAND WIRE	21
BUS A05	L	B04K1		1-02 *		D02			1				TO HERE	21
BUS A05	L	C04R2		1-03 *		D01								21
BUS A05				1								9-4/8		21
BUS A06	L	B01L2		1-01 *	H	D02			2		P		HAND WIRE	22
BUS A06	L	B04L2		1-02 *		D02			1				TO HERE	22
BUS A06	L	C04M2		1-03 *		D01								22
BUS A06				1								8-6/8		22
BUS A07	L	B01L1		1-01 *	H	D02			2		P		HAND WIRE	23
BUS A07	L	B04L1		1-02 *		D02			1				TO HERE	23
BUS A07	L	C04L1		1-03 *		D01								23
BUS A07				1								8-4/8		23
BUS A08	L	B01M2		1-01 *	H	D02			2		P		HAND WIRE	24
BUS A08	L	B04M2		1-02 *		D02			1				TO HERE	24
BUS A08	L	C04K2		1-03 *		D01								24
BUS A08				1								8-4/8		24

BK11D.F

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG	Y	X	Z	REMARKS		LENGTH	EXCEPTIONS	RUN NUMBER
HND2BB.V22(22) 11/06/73											1-MAY-74		19:27	PAGE 4
BUS A09	L	B01M1		1-01 *	H	D02			2		P		HAND WIRE	25
BUS A09	L	[illegible]		1-02 *		D02			1				TO HERE	25
BUS A09	L	[illegible]		1-03 *		D02								25
BUS A09				1								8-6/8		25
BUS A10	L	[illegible]		1-01 *	H	D02			2		P		HAND WIRE	26
BUS A10	L	[illegible]		1-02 *		D02			1				TO HERE	26
BUS A10	L	[illegible]		1-03 *		D01								26
BUS A10				1								8-0/8		26
BUS A11	L	B01N1	B04N1	1-01 *	H	D02			2		P		HAND WIRE	27
BUS A11	L	B04N1		1-02 *		D02			1			3-2	TO HERE	27
BUS A11	L	D04P1		1-03 *		D01								27
BUS A11				1								10-7/8		27
BUS A12	L	B01P2		1-01 *	H	D02			2		P		HAND WIRE	28
BUS A12	L	B04P2		1-02 *		D02			1				TO HERE	28
BUS A12	L	C04F1		1-03 *		D01								28
BUS A12				1								7-6/8		28
BUS A13	L	B01P1		1-01 *	H	D02			2		P		HAND WIRE	29
BUS A13	L	B04P1		1-02 *		D02			1				TO HERE	29
BUS A13	L	C04F2		1-03 *		D01								29
BUS A13				1								8-0/8		29
BUS A14	L	B01R2		1-01 *	H	D02			1		P		HAND WIRE	30
BUS A14	L	B04R2		1-02 *		D02			2				TO HERE	30
BUS A14	L	C04R1		1-03 *		D01								30
BUS A14				1								7-2/8		30
BUS A15	L	B01R1	B04R1	1-01 *	H	D02			2		P		HAND WIRE	31
BUS A15	L	B04R1		1-02 *		D02			1			3-5	TO HERE	31
BUS A15	L	D04P1		1-03 *		D01								31
BUS A15				1								11-5/8		31
BUS A16		B01S2	B04S2	1-01	H	D02			1		P		HAND WIRE	32
BUS A16		B04S2	C04D1	1-02 *		D02			2				TO HERE	32
BUS A16		C04D1	C01D1	1-03 *	H	D01			1		P		HAND WIRE	32
BUS A16		C01D1		1-04 *		D01							TO HERE	32
				1								11-0/8		32
BUS A17		B01S1	B04S1	1-01 *	H	D02			1		P		HAND WIRE	33
BUS A17	L	B04S1	C04E1	1-02 *		D02			2				TO HERE	33
BUS A17	L	C04E1	C01E1	1-03 *	H	D01			1		P		HAND WIRE	33
BUS A17	L	C01E1		1-04 *		D01							TO HERE	33
BUS A17				1								11-0/8		33

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
BUS AC LO	L	D02F1		1-01 * 1				1				34
BUS AC LO	L	B01F1		1-02 * H				2		3-6		34
BUS AC LO	L	B04F1		1-03 *				1		P	HAND WIRE	34
BUS AC LO	L	A03R2		1-04 *							TO HERE	34
BUS AC LO				1								34
										16-1/8		34
BUS BRBY	L	A01P2		1-01 * H		D02		2		P	HAND WIRE	35
BUS BRBY	L	A04P2		1-02 *		D02		1			TO HERE	35
BUS BRBY	L	E04P2		1-03 *		D01						35
BUS BRBY				1								35
										16-4/8		35
BUS BR 4	L	B04D2		1-01 * H		D02		2		P	HAND WIRE	36
BUS BR 4	L	B01D2		1-02 *		D02		1			TO HERE	36
BUS BR 4	L	C01H2		1-03 *		D01						36
BUS BR 4				1								36
										9-0/8		36
BUS BR 5	L	B04C1		1-01 * H				2		P	HAND WIRE	37
BUS BR 5	L	B01C1		1-02 *		D02		1			TO HERE	37
BUS BR 5	L	C01F2		1-03 *		D01						37
BUS BR 5				1								37
										9-2/8		37
BUS BR 6	L	A04U2		1-01 * H		D02		2		P	HAND WIRE	38
BUS BR 6	L	A01U2		1-02 *		D02		1			TO HERE	38
BUS BR 6	L	C01E2		1-03 *		D01						38
BUS BR 6				1								38
										9-6/8		38
BUS BR 7	L	A04T2		1-01 * H		D02		2		P	HAND WIRE	39
BUS BR 7	L	A01T2		1-02 *		D02		1			TO HERE	39
BUS BR 7	L	C01D2		1-03 *		D01						39
BUS BR 7				1								39
										9-6/8		39
BUS C0	L	B01U2	B04U2	1-01 * H		D02		2		P	HAND WIRE	40
BUS C0	L	B04U2		1-02 *		D02		1		2-7	TO HERE	40
BUS C0	L	D04C1		1-03 *		D01						40
BUS C0				1								40
										18-1/8		40
BUS C1	L	B01T2	B04T2	1-01 * H		D02		2		P	HAND WIRE	41
BUS C1	L	B04T2		1-02 *		D02		1		4-7	TO HERE	41
BUS C1	L	E04R1		1-03 *		D01						41
BUS C1				1								41
										14-1/8		41
BUS D EN	H	C04U1			H	D01				P	1-PIN RUN	42
BUS D00	L	A01C1		1-01 * H		D02		2		P	HAND WIRE	43
BUS D00	L	A04C1		1-02 *		D02		1			TO HERE	43
BUS D00	L	C04D2		1-03 *		D01						43
BUS D00				1								43
										11-6/8		43

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
BUS D00 (1)	H	D01D2		1-01 * H		D01		1		P	HAND WIRE	44
BUS D00 (1)	H	D03D2		1-02 * H		D01		2		P	HAND WIRE	44
BUS D00 (1)	H	D04D2		1-03 * H		D01				P	H TO WHERE	44
BUS D00 (1)				1								44
										6-0/8		44
BUS D01	L	A01D2		1-01 * H		D02		2		P	HAND WIRE	45
BUS D01	L	A04D2		1-02 *		D02		1			TO HERE	45
BUS D01	L	C04C1		1-03 *		D01						45
BUS D01				1								45
										11-4/8		45
BUS D01 (1)	H	D01E2		1-01 * H		D01		1		P	HAND WIRE	46
BUS D01 (1)	H	D03E2		1-02 * H		D01		2		P	HAND WIRE	46
BUS D01 (1)	H	D04E2		1-03 * H		D01				P	H TO WHERE	46
BUS D01 (1)				1								46
										6-0/8		46
BUS D02	L	A01D1		1-01 * H		D02		2		P	HAND WIRE	47
BUS D02	L	A04D1		1-02 *		D02		1			TO HERE	47
BUS D02	L	C04E2		1-03 *		D01						47
BUS D02				1								47
										11-4/8		47
BUS D02 (1)	H	D01F2		1-01 * H		D01		1		P	HAND WIRE	48
BUS D02 (1)	H	D03F2		1-02 * H		D01		2		P	HAND WIRE	48
BUS D02 (1)	H	D04F2		1-03 * H		D01				P	H TO WHERE	48
BUS D02 (1)				1								48
										6-0/8		48
BUS D03	L	A01E2		1-01 * H		D02		2		P	HAND WIRE	49
BUS D03	L	A04E2		1-02 *		D02		1			TO HERE	49
BUS D03	L	D04E1		1-03 *		D01						49
BUS D03				1								49
										14-2/8		49
BUS D03 (1)	H	D01H2		1-01 * H		D01		1		P	HAND WIRE	50
BUS D03 (1)	H	D03H2		1-02 * H		D01		2		P	HAND WIRE	50
BUS D03 (1)	H	D04H2		1-03 * H		D01				P	H TO WHERE	50
BUS D03 (1)				1								50
										6-0/8		50
BUS D04	L	A01E1		1-01 * H		D02		2		P	HAND WIRE	51
BUS D04	L	A04E1		1-02 *		D02		1			TO HERE	51
BUS D04	L	D04R1		1-03 *		D01						51
BUS D04				1								51
										15-2/8		51
BUS D04 (1)	H	D01J2		1-01 * H		D01		1		P	HAND WIRE	52
BUS D04 (1)	H	D03J2		1-02 * H		D01		2		P	HAND WIRE	52
BUS D04 (1)	H	D04J2		1-03 * H		D01				P	H TO WHERE	52
BUS D04 (1)				1								52
										6-0/8		52

RK110.F
RUN NAME

HND280.V22(22) 11/06/73

A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	1-MAY-74 19:27 LENGTH	EXCEPTIONS	PAGE 7 RUN NUMBER
	BUS D05									2				
L	A01F2		1-01	*	H		D02			1		P	HAND WIRE	53
L	A04F2		1-02	*			D02						TO HERE	53
L	C04H1		1-03	*			D01							53
			1								11-6/8			53
	BUS D05 (1)									1		P	HAND WIRE	54
H	D01K2		1-01	*	H		D01			2		P	HAND WIRE	54
H	D03K2		1-02	*	H		D01					P	H TO WHERE	54
H	D04K2		1-03	*	H		D01				6-8/8			54
			1											54
	BUS D06									2		P	HAND WIRE	55
L	A01F1		1-01	*	H		D02			1			TO HERE	55
L	A04F1		1-02	*			D02							55
L	C04K2		1-03	*			D01				11-6/8			55
			1											55
	BUS D06 (1)									1		P	HAND WIRE	56
H	D01L2		1-01	*	H		D01			2		P	HAND WIRE	56
H	D03L2		1-02	*	H		D01					P	H TO WHERE	56
H	D04L2		1-03	*	H		D01				6-8/8			56
			1											56
	BUS D07									2		P	HAND WIRE	57
L	A01H2	A04H2	1-01	*	H		D02			1	3-6		TO HERE	57
L	A04H2		1-02	*			D02							57
L	C04J1		1-03	*			D01				11-7/8			57
			1											57
	BUS D07 (1)									1		P	HAND WIRE	58
H	D01M2		1-01	*	H		D01			2		P	HAND WIRE	58
H	D03M2		1-02	*	H		D01					P	H TO WHERE	58
H	D04M2		1-03	*	H		D01				6-8/8			58
			1											58
	BUS D08									2		P	HAND WIRE	59
L	A01H1		1-01	*	H		D02			1			TO HERE	59
L	A04H1		1-02	*			D02							59
L	C04M2		1-03	*			D01				12-2/8			59
			1											59
	BUS D08 (1)									1		P	HAND WIRE	60
H	D01N2		1-01	*	H		D01			2		P	HAND WIRE	60
H	D03N2		1-02	*	H		D01					P	H TO WHERE	60
H	D04N2		1-03	*	H		D01				6-8/8			60
			1											60
	BUS D09									2		P	HAND WIRE	61
L	A01J2		1-01	*	H		D02			1			TO HERE	61
L	A04J2		1-02	*			D02							61
L	C04M1		1-03	*			D01				12-8/8			61
			1											61

RK110.F
RUN NAME

HND280.V22(22) 11/06/73

A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS	1-MAY-74 19:27 LENGTH	EXCEPTIONS	PAGE 8 RUN NUMBER
	BUS D09 (1)									1		P	HAND WIRE	62
H	D01P2		1-01	*	H		D01			2		P	HAND WIRE	62
H	D03P2		1-02	*	H		D01					P	H TO WHERE	62
H	D04P2		1-03	*	H		D01				6-8/8			62
			1											62
	BUS D10									2		P	HAND WIRE	63
L	A01J1		1-01	*	H		D02			1			TO HERE	63
L	A04J1		1-02	*			D02							63
L	C04P2		1-03	*			D01				12-6/8			63
			1											63
	BUS D10 (1)									1		P	HAND WIRE	64
H	D01R2		1-01	*	H		D01			2		P	HAND WIRE	64
H	D03R2		1-02	*	H		D01					P	H TO WHERE	64
H	D04R2		1-03	*	H		D01				6-8/8			64
			1											64
	BUS D11									2		P	HAND WIRE	65
L	A01K2	A04K2	1-01	*	H		D02			1	3-7		TO HERE	65
L	A04K2		1-02	*			D02							65
L	C04N1		1-03	*			D01				12-1/8			65
			1											65
	BUS D11 (1)									1		P	HAND WIRE	66
H	D01S2		1-01	*	H		D01			2		P	HAND WIRE	66
H	D03S2		1-02	*	H		D01					P	H TO WHERE	66
H	D04S2		1-03	*	H		D01				6-8/8			66
			1											66
	BUS D12									2		P	HAND WIRE	67
L	A01K1	A04K1	1-01	*	H		D02			1	4-5		TO HERE	67
L	A04K1		1-02	*			D02							67
L	D04A1		1-03	*			D01				13-5/8			67
			1											67
	BUS D12 (1)									1		P	HAND WIRE	68
H	D01T2		1-01	*	H		D01			2		P	HAND WIRE	68
H	D03T2		1-02	*	H		D01					P	H TO WHERE	68
H	D04T2		1-03	*	H		D01				6-8/8			68
			1											68
	BUS D13									2		P	HAND WIRE	69
L	A01L2	A04L2	1-01	*	H		D02			1	4-2		TO HERE	69
L	A04L2		1-02	*			D02							69
L	C04V1		1-03	*			D01				12-7/8			69
			1											69
	BUS D13 (1)									1		P	HAND WIRE	70
H	D01U2		1-01	*	H		D01			2		P	HAND WIRE	70
H	D03U2		1-02	*	H		D01					P	H TO WHERE	70
H	D04U2		1-03	*	H		D01				6-8/8			70

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
BUS D14	L	A01L1		1-01 *	H	D02		2		P	HAND WIRE	71
BUS D14	L	A04L1		1-02 *		D02		1			TO HERE	71
BUS D14	L	C0482		1-03 *		D01						71
BUS D14				1						12-0/8		71
BUS D14 (1)	H	D01V2		1-01 *	H	D01		1		P	HAND WIRE	72
BUS D14 (1)	H	D03V2		1-02 *	H	D01		2		P	HAND WIRE	72
BUS D14 (1)	H	D04V2		1-03 *	H	D01				P	H TO WHERE	72
BUS D14 (1)				1						6-0/8		72
BUS D15	L	A01M2	A04M2	1-01 *	H	D02		2		P	HAND WIRE	73
BUS D15	L	A04M2		1-02 *		D02		1		4-5	TO HERE	73
BUS D15	L	D0481		1-03 *		D01						73
BUS D15				1						13-5/8		73
BUS D15 (1)	H	D01V1		1-01 *	H	D01		1		P	HAND WIRE	74
BUS D15 (1)	H	D03V1		1-02 *	H	D01		2		P	HAND WIRE	74
BUS D15 (1)	H	D04V1		1-03 *	H	D01				P	H TO WHERE	74
BUS D15 (1)				1						6-0/8		74
BUS D16	L	A01M1	A04M1	1-01 *	H	D02		2		P	HAND WIRE	75
BUS D16	L	A04M1		1-02 *		D02		1			TO HERE	75
BUS D16	L	C03C1		1-03 *								75
BUS D16				1						10-4/8		75
BUS D17	L	A01N2	A04N2	1-01 *	H	D02		2		P	HAND WIRE	76
BUS D17	L	A04N2		1-02 *		D02		1			TO HERE	76
BUS D17	L	C0381		1-03 *								76
BUS D17				1						10-4/8		76
BUS DC LO	L	A0382		1-01 *		D02		1				77
BUS DC LO	L	B04F2		1-02 *				2				77
BUS DC LO	L	B01F2		1-03 *		D02		1				77
BUS DC LO	L	C0181		1-04 *		D01						77
BUS DC LO				1						12-4/8		77
BUS INIT	L	A04A1		1-01 *	H	D02		2		P	HAND WIRE	78
BUS INIT	L	A01A1		1-02 *		D02		1			TO HERE	78
BUS INIT	L	C01C1		1-03 *								78
BUS INIT				1						11-4/8		78
BUS INTR	L	A0181		1-01 *	H	D02		2		P	HAND WIRE	79
BUS INTR	L	A0481		1-02 *		D02		1			TO HERE	79
BUS INTR	L	D0481		1-03 *		D01						79
BUS INTR				1						15-6/8		79

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
BUS MSYN	L	B01V1		1-01 *	H	D02		2		P	HAND WIRE	80
BUS MSYN	L	B04V1		1-02 *		D02		1			TO HERE	80
BUS MSYN	L	E04T2		1-03 *		D01						80
BUS MSYN				1						13-6/8		80
BUS NPG IN	H	A01U1		1-01 *		D02		1				81
BUS NPG IN	H	E04D1		1-02 *		D01						81
BUS NPG IN				1						12-0/8		81
BUS NPG OUT	H	A04U1		1-01 *	1	D02		1		6-3		82
BUS NPG OUT	H	E04U1		1-02 *		D01						82
BUS NPG OUT				1						13-3/8		82
BUS NPR	L	A0182		1-01 *	H	D02		2		P	HAND WIRE	83
BUS NPR	L	A0482		1-02 *		D02		1			TO HERE	83
BUS NPR	L	E0481		1-03 *		D01						83
BUS NPR				1						16-6/8		83
BUS SACK	L	A01P2		1-01 *	H	D02		2		P	HAND WIRE	84
BUS SACK	L	A04R2		1-02 *		D02		1			TO HERE	84
BUS SACK	L	E04C1		1-03 *		D01						84
BUS SACK				1						15-4/8		84
BUS SSYN	L	B01U1	B04U1	1-01 *	H	D02		2		P	HAND WIRE	85
BUS SSYN	L	B04U1		1-02 *		D02		1		4-5	TO HERE	85
BUS SSYN	L	E04P1		1-03 *		D01						85
BUS SSYN				1						13-5/8		85
CLK	H	C02N2		1-01 *				1				86
CLK	H	F01E1		1-02 *	H	D01		2		P	HAND WIRE	86
CLK	H	E03D2		1-03 *	H	D01				P	H TO WHERE	86
CLK				1						10-6/8		86
CLR MSR	L	F01F2		1-01 *	H	D01		1		P	HAND WIRE	87
CLR MSR	L	F02F2		1-02 *	H	D01				P	H TO WHERE	87
CLR MSR				1						2-6/8		87
COUNT SA	H	C01M1		1-01 *	H	D01		1		P	HAND WIRE	88
COUNT SA	H	C03M1		1-02 *	H	D01				P	H TO WHERE	88
COUNT SA				1						3-2/8		88
CYL OVF	L	C02R2		1-01 *	H	D01		1		P	HAND WIRE	89
CYL OVF	L	C03P2		1-02 *	H	D01				P	H TO WHERE	89
CYL OVF				1						2-6/8		89

RK11D.F
RUN NAME

HWD208.V22(22) 11/06/73
A/P PIN NAME — ORDER PIN — BAY - ORDER — 0 DRAW RV PG Y

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X E REMARKS — LENGTH — EXCEPTIONS — RUN NUMBER

X	E	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
	1				90
	2		P	HAND WIRE	90
	1		P	HAND WIRE	90
			P	N TO WHERE	90
			11-2/0		90
			P	1=PIN RUN	91
	1		P	HAND WIRE	92
			P	N TO WHERE	92
			2-6/0		92
	1		P	HAND WIRE	93
			P	N TO WHERE	93
			2-6/0		93
	1		P	HAND WIRE	94
			P	N TO WHERE	94
			3-4/0		94
	1		P	HAND WIRE	95
			P	N TO WHERE	95
			2-6/0		95
	1				96
			9-8/0		96
	1				97
			3-8		97
	1				97
			7-7/0		97
	1				98
			3-5		98
			7-7/0		98
	1				99
			3-8		99
			7-7/0		99
	1				100
			3-5		100
			7-7/0		100
	1				101
			3-5		101
			7-7/0		101

NAME	A/P	PIN	ORDER	BAY - ORDER	0 DRAW RV PG Y
DATA (1)	H	B03H1	1-01	*	D02
DATA (1)	H	C03B1	1-02	* H	D01
DATA (1)	H	C02B1	1-03	* H	D01
DATA (1)	H	C01B1	1-04	* H	D01
DATA (1)			1		
DATA STR 1	L	E04H2		H	D01
DATA STR 2	L	E03L2	1-01	* H	D01
DATA STR 2	L	E04L2	1-02	* H	D01
DATA STR 2			1		
DISK CLK	L	F01V1	1-01	* H	D01
DISK CLK	L	F02V1	1-02	* H	D01
DISK CLK			1		
DLT (1)	H	E01P1	1-01	* H	D01
DLT (1)	H	E03P2	1-02	* H	D01
DLT (1)			1		
DPL (1)	H	F01D1	1-01	* H	D01
DPL (1)	H	F02D1	1-02	* H	D01
DPL (1)			1		
DR BUS ADD ACK	L	A02R2	1-01	*	D02
DR BUS ADD ACK	L	D02B1	1-02	*	D01
DR BUS ADD ACK			1		
DR BUS CYL ADD 0	L	A02K1	1-01	*	D02
DR BUS CYL ADD 0	L	C02K1	1-02	*	D01
DR BUS CYL ADD 0			1		
DR BUS CYL ADD 1	L	A02D1	1-01	*	D02
DR BUS CYL ADD 1	L	C02D1	1-02	*	D01
DR BUS CYL ADD 1			1		
DR BUS CYL ADD 2	L	A02L1	1-01	*	D02
DR BUS CYL ADD 2	L	C02L1	1-02	*	D01
DR BUS CYL ADD 2			1		
DR BUS CYL ADD 3	L	A02C1	1-01	*	D02
DR BUS CYL ADD 3	L	C02C1	1-02	*	D01
DR BUS CYL ADD 3			1		
DR BUS CYL ADD 4	L	A02F1	1-01	*	D02
DR BUS CYL ADD 4	L	C02F1	1-02	*	D01
DR BUS CYL ADD 4			1		

RK11D.F
RUN NAME

HWD208.V22(22) 11/06/73
A/P PIN NAME — ORDER PIN — BAY - ORDER — 0 DRAW RV PG Y

1-MAY-74 19127 PAGE 12
X E REMARKS — LENGTH — EXCEPTIONS — RUN NUMBER

X	E	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
	1				102
			3-5		102
			7-7/0		102
	1				103
			3-8		103
			7-7/0		103
	1				104
			3-5		104
			7-7/0		104
	1				105
			3-5		105
			7-7/0		105
	2				106
	1				106
			12-8/0		106
	1				107
			3-5		107
			7-7/0		107
	1				108
			3-5		108
			7-7/0		108
	1				109
			9-8/0		109
	1				110
			7-6/0		110
	1				111
			3-8		111
			7-7/0		111
	1				112
			7-6/0		112

NAME	A/P	PIN	ORDER	BAY - ORDER	0 DRAW RV PG Y
DR BUS CYL ADD 5	L	A02J1	1-01	*	D02
DR BUS CYL ADD 5	L	C02J1	1-02	*	D01
DR BUS CYL ADD 5			1		
DR BUS CYL ADD 6	L	A02E1	1-01	*	D02
DR BUS CYL ADD 6	L	C02E1	1-02	*	D01
DR BUS CYL ADD 6			1		
DR BUS CYL ADD 7	L	A02N1	1-01	*	D02
DR BUS CYL ADD 7	L	C02N1	1-02	*	D01
DR BUS CYL ADD 7			1		
DR BUS CYL ADD 8	L	A02B1	1-01	*	D02
DR BUS CYL ADD 8	L	C02B1	1-02	*	D01
DP BUS CYL ADD 8			1		
DR BUS DC LO	L	C01B2	1-01	* 2	D02
DP BUS DC LO	L	B02F2	1-02	*	D01
DP BUS DC LO	L	D02F2	1-03	*	
DR BUS DC LO			1		
DR BUS DRV	L	BF2N1	1-01	* 1	D02
DR BUS DRV	L	DF2N1	1-02	*	D01
DP BUS DRV			1		
DR BUS INDX PLS	L	B02M1	1-01	* 1	D02
DP BUS INDX PLS	L	D02M1	1-02	*	D01
DR BUS INDX PLS			1		
DR BUS LOG ADD INT	L	A02T2	1-01	*	D02
DP BUS LOG ADD INT	L	D02D1	1-02	*	D01
DR BUS LOG ADD INT			1		
DR BUS R/W/S RDY	L	A02H2	1-01	*	D02
DR BUS R/W/S RDY	L	C02H2	1-02	*	D01
DP BUS R/W/S RDY			1		
DR BUS RD CLK	L	B02B1	1-01	* 1	D02
DR BUS RD CLK	L	D02B1	1-02	*	D01
DR BUS RD CLK			1		
DR BUS RD DATA	L	B02B2	1-01	*	D02
DR BUS RD DATA	L	D02B2	1-02	*	D01
DR BUS RD DATA			1		

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
DR BUS RD GATE	L	B02R1		1-01 *	1	D02		1				113
DR BUS RD GATE	L	D02R1		1-02 *		D01				3-5		113
DR BUS RD GATE				1								113
										7-7/8		113
DR BUS RESTORE	L	A02N1		1-01 *	1	D02		1				114
DR BUS RESTORE	L	C02N1		1-02 *		D01				3-5		114
DR BUS RESTORE				1								114
										7-7/8		114
DR BUS RK05	L	B02P2		1-01 *		D02		1				115
DR BUS RK05	L	D02P2		1-02 *		D01						115
DR BUS RK05				1								115
										7-4/8		115
DR BUS SEC CNTR 0	L	B02L1		1-01 *	1	D02		1				116
DR BUS SEC CNTR 0	L	D02L1		1-02 *		D01				3-5		116
DR BUS SEC CNTR 0				1								116
										7-7/8		116
DR BUS SEC CNTR 1	L	A02P2		1-01 *		D02		1				117
DR BUS SEC CNTR 1	L	D02A1		1-02 *		D01						117
DR BUS SEC CNTR 1				1								117
										9-8/8		117
DR BUS SEC CNTR 2	L	B02K2		1-01 *		D02		1				118
DR BUS SEC CNTR 2	L	D02K2		1-02 *		D01						118
DR BUS SEC CNTR 2				1								118
										7-4/8		118
DR BUS SEC CNTR 3	L	B02J1		1-01 *	1	D02		1				119
DR BUS SEC CNTR 3	L	D02J1		1-02 *		D01				3-5		119
DR BUS SEC CNTR 3				1								119
										7-7/8		119
DR BUS SEC PLS	L	B02N2		1-01 *		D02		1				120
DR BUS SEC PLS	L	D02N2		1-02 *		D01						120
DR BUS SEC PLS				1								120
										7-4/8		120
DR BUS SEL DR 0	L	A02J2		1-01 *		D02		1				121
DR BUS SEL DR 0	L	C02J2		1-02 *		D01						121
DR BUS SEL DR 0				1								121
										7-4/8		121
DR BUS SEL DR 1	L	A02K2		1-01 *		D02		1				122
DR BUS SEL DR 1	L	C02K2		1-02 *		D01						122
DR BUS SEL DR 1				1								122
										7-4/8		122
DR BUS SEL DR 2	L	A02L2		1-01 *		D02		1				123
DR BUS SEL DR 2	L	C02L2		1-02 *		D01						123
DR BUS SEL DR 2				1								123
										7-4/8		123
DR BUS SEL UPPER HD	L	B02M2		1-01 *		D02		1				124
DR BUS SEL UPPER HD	L	D02M2		1-02 *		D01						124
DR BUS SEL UPPER HD				1								124
										7-4/8		124

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
DR BUS SIN	L	A02S2		1-01 *		D02		1				125
DR BUS SIN	L	D02C1		1-02 *								125
DR BUS SIN				1								125
										9-8/8		125
DR BUS STROBE	L	B02H1		1-01 *	1	D02		1				126
DR BUS STROBE	L	D02H1		1-02 *		D01				3-5		126
DR BUS STROBE				1								126
										7-7/8		126
DR BUS WT CHK	L	B02K1		1-01 *	1	D02		1				127
DR BUS WT CHK	L	D02K1		1-02 *		D01				3-5		127
DR BUS WT CHK				1								127
										7-7/8		127
DR BUS WT DATA+CLK	L	A02F2		1-01 *		D02		1				128
DR BUS WT DATA+CLK	L	C02F2		1-02 *		D01						128
DR BUS WT DATA+CLK				1								128
										7-4/8		128
DR BUS WT GATE	L	B02L2		1-01 *		D02		1				129
DR BUS WT GATE	L	D02L2		1-02 *		D01						129
DR BUS WT GATE				1								129
										7-4/8		129
DR BUS WT PRCT STATUS	L	B02P1		1-01 *	1	D02		1				130
DR BUS WT PRCT STATUS	L	D02P1		1-02 *		D01				3-5		130
DR BUS WT PRCT STATUS				1								130
										7-7/8		130
DR BUS WT PROTECT	L	B02R2		1-01 *		D02		1				131
DR BUS WT PROTECT	L	D02R2		1-02 *		D01						131
DR BUS WT PROTECT				1								131
										7-4/8		131
DRE (1)	H	F01R1		1-01 *	H	D01		1		P	HAND WIRE	132
DRE (1)	H	F02R1		1-02 *	H	D01				P	N TO WHERE	132
DRE (1)				1								132
										2-6/8		132
DRIVE OK	H	F01N1		1-01 *	H	D01		1		P	HAND WIRE	133
DRIVE OK	H	F32N1		1-02 *	H	D01				P	N TO WHERE	133
DRIVE OK				1								133
										2-6/8		133
DRIVE RESET	L	F01K2		1-01 *	H	D01		1		P	HAND WIRE	134
DRIVE RESET	L	F02K2		1-02 *	H	D01				P	N TO WHERE	134
DRIVE RESET				1								134
										2-6/8		134
DRIVE UNSAFE	H	F01B1		1-01 *	H	D01		1		P	HAND WIRE	135
DRIVE UNSAFE	H	F02B1		1-02 *	H	D01				P	N TO WHERE	135
DRIVE UNSAFE				1								135
										2-6/8		135
DRY	H	E01L2		1-01 *	H	D01		1		P	HAND WIRE	136
DRY	H	E02L2		1-02 *	H	D01				P	N TO WHERE	136
DRY				1								136
										2-6/8		136

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS		LENGTH	EXCEPTIONS	RUN NUMBER
END OF SYNC	L	F01R2		1-01 *	H		D01				1		P		HAND WIRE	137
END OF SYNC	L	F02R2		1-02 *	H		D01						P		H TO WHERE	137
END OF SYNC				1										2-6/8		137
EX BIT	H	F01V2		1-01 *	H		D01				1		P		HAND WIRE	138
EX BIT	H	F02V2		1-02 *	H		D01						P		H TO WHERE	138
EX BIT				1										2-6/8		138
FILE DONE	H	C01F1		1-01 *	H						1		P		HAND WIRE	139
FILE DONE	H	C03F1		1-02 *	H								P		H TO WHERE	139
FILE DONE				1										3-2/8		139
FILE EMPTY	H	B03E1		1-01 *			D02				1					140
FILE EMPTY	H	C03N2		1-02 *												140
FILE EMPTY				1										6-0/8		140
FILE FULL	H	B03M1		1-01 *			D02				1					141
FILE FULL	H	C03M2		1-02 *												141
FILE FULL				1										5-0/8		141
FIRST SEEK DONE	H	E01U2		1-01 *	H		D01				1		P		HAND WIRE	142
FIRST SEEK DONE	H	E02U2		1-02 *	H		D01						P		H TO WHERE	142
FIRST SEEK DONE				1										2-6/8		142
FMT (1)	H	C01M1		1-01 *	H		D01				2		P		HAND WIRE	143
FMT (1)	H	C02N1		1-02 *	H		D01				1		P		HAND WIRE	143
FMT (1)	H	C03N1		1-03 *	H		D01						P		H TO WHERE	143
FMT (1)				1										5-4/8		143
GATE DATA TO BUS D	L	C02A1		1-01 *	H		D01				2		P		HAND WIRE	144
GATE DATA TO BUS D	L	C03A1		1-02 *	H		D01				1		P		HAND WIRE	144
GATE DATA TO BUS D	L	C04A1		1-03 *	H		D01						P		H TO WHERE	144
GATE DATA TO BUS D				1										5-4/8		144
GEN CLR	L	E01R2	E02R2	1-01 *	H		D01				2		P		HAND WIRE	145
GEN CLR	L	E02R2		1-02 *			D01				1				TO HERE	145
GEN CLR	L	C03P2		1-03 *												145
GEN CLR				1										10-6/8		145
GEN DATA	H	F01E2		1-01 *	H		D01				1		P		HAND WIRE	146
GEN DATA	H	F02E2		1-02 *	H		D01						P		H TO WHERE	146
GEN DATA				1										2-6/8		146

RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW	RV	PG	Y	X	Z	REMARKS		LENGTH	EXCEPTIONS	RUN NUMBER
GND 01		C01A1	C01C2	1-01 *	1						1					147
GND 01		C01C2		1-02 *	H	D01					2		P		HAND WIRE	147
GND 01		A01B2		1-03 *	H		D02				1		P		HAND WIRE	147
GND 01		A01C2		1-04 *	H		D02				2		P		HAND WIRE	147
GND 01		A01N1		1-05 *	H		D02				1		P		HAND WIRE	147
GND 01		A01P1		1-06 *	H		D02				2		P		HAND WIRE	147
GND 01		A01R1		1-07 *	H		D02				1		P		HAND WIRE	147
GND 01		A01S1		1-08 *	H		D02				2		P		HAND WIRE	147
GND 01		A01T1		1-09 *	H		D02				1		P		HAND WIRE	147
GND 01		A01V2		1-10 *	H		D02				2		P		HAND WIRE	147
GND 01		B01B2		1-11 *	H		D02				1		P		HAND WIRE	147
GND 01		B01C2		1-12 *	H		D02				2		P		HAND WIRE	147
GND 01		B01D1		1-13 *	H		D02				1		P		HAND WIRE	147
GND 01		B01E1		1-14 *	H		D02				2		P		HAND WIRE	147
GND 01		B01T1		1-15 *	H		D02				1		P		HAND WIRE	147
GND 01		B01V2		1-16 *	H		D02				2		P		HAND WIRE	147
GND 01		C01T1		1-17 *	H		D01				1		P		HAND WIRE	147
GND 01		D01C2		1-18 *	H		D01				2		P		HAND WIRE	147
GND 01		D01T1		1-19 *	H		D01				1		P		HAND WIRE	147
GND 01		E01C2		1-20 *	H		D01				2		P		HAND WIRE	147
GND 01		E01T1		1-21 *	H		D01				1		P		HAND WIRE	147
GND 01		F01C2		1-22 *	H		D01				2		P		HAND WIRE	147
GND 01		F01T1		1-23 *	H		D01						P		H TO WHERE	147
GND 01				1										73-2/8		147
GND 02		A02B2		1-01 *	H		D02				2		P		HAND WIRE	148
GND 02		A02C2		1-02 *	H		D02				1		P		HAND WIRE	148
GND 02		A02N1		1-03 *	H		D02				2		P		HAND WIRE	148
GND 02		A02P1		1-04 *	H		D02				1		P		HAND WIRE	148
GND 02		A02R1		1-05 *	H		D02				2		P		HAND WIRE	148
GND 02		A02S1		1-06 *	H		D02				1		P		HAND WIRE	148
GND 02		A02T1		1-07 *	H		D02				2		P		HAND WIRE	148
GND 02		A02V2		1-08 *	H		D02				1		P		HAND WIRE	148
GND 02		A02U1		1-09 *	H						2		P		HAND WIRE	148
GND 02		B02B2		1-10 *	H		D02				1		P		HAND WIRE	148
GND 02		B02C2		1-11 *	H		D02				2		P		HAND WIRE	148
GND 02		B02D1		1-12 *	H		D02				1		P		HAND WIRE	148
GND 02		B02E1		1-13 *	H		D02				2		P		HAND WIRE	148
GND 02		B02T1		1-14 *	H		D02				1		P		HAND WIRE	148
GND 02		B02V2		1-15 *	H		D02				2		P		HAND WIRE	148
GND 02		C02C2		1-16 *	H		D01				1		P		HAND WIRE	148
GND 02		C02T1		1-17 *	H		D01				2		P		HAND WIRE	148
GND 02		D02C2		1-18 *	H		D01				1		P		HAND WIRE	148
GND 02		D02T1		1-19 *	H		D01				2		P		HAND WIRE	148
GND 02		E02C2		1-20 *	H		D01				1		P		HAND WIRE	148
GND 02		E02T1		1-21 *	H		D01				2		P		HAND WIRE	148
GND 02		F02C2		1-22 *	H		D01				1		P		HAND WIRE	148
GND 02		F02T1		1-23 *	H		D01						P		H TO WHERE	148
GND 02				1										68-2/8		148

(011)

RK11D,F RUN NAME	A/P	HND200,V22(22) 11/06/73 PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS		1-MAY-74 LENGTH	19:27 EXCEPTIONS	PAGE 17 RUN NUMBER
GND 03		A03C2		1-01 *	H	D02		1		P		HAND WIRE	149
GND 03		A03D2		1-02 *	H	D02		2		P		HAND WIRE	149
GND 03		A03E2		1-03 *	H	D02		1		P		HAND WIRE	149
GND 03		A03F2		1-04 *	H	D02		2		P		HAND WIRE	149
GND 03		A03N1		1-05 *	H	D02		1		P		HAND WIRE	149
GND 03		A03P1		1-06 *	H	D02		2		P		HAND WIRE	149
GND 03		A03R1		1-07 *	H	D02		1		P		HAND WIRE	149
GND 03		A03S1		1-08 *	H	D02		2		P		HAND WIRE	149
GND 03		A03T1		1-09 *	H	D02		1		P		HAND WIRE	149
GND 03		A03U1		1-10 *	H	D02		2		P		HAND WIRE	149
GND 03		A03V1		1-11 *	H			1		P		HAND WIRE	149
GND 03		B03C2		1-12 *	H	D02		2		P		HAND WIRE	149
GND 03		B03T1		1-13 *	H	D02		1		P		HAND WIRE	149
GND 03		C03C2		1-14 *	H	D01		2		P		HAND WIRE	149
GND 03		C03T1		1-15 *	H	D01		1		P		HAND WIRE	149
GND 03		D03C2		1-16 *	H	D01		2		P		HAND WIRE	149
GND 03		D03T1		1-17 *	H	D01		1		P		HAND WIRE	149
GND 03		E03C2		1-18 *	H	D01		2		P		HAND WIRE	149
GND 03		E03T1		1-19 *	H	D01		1		P		HAND WIRE	149
GND 03		F03C2		1-20 *	H	D01		2		P		HAND WIRE	149
GND 03		F03T1		1-21 *	H	D01				P		N TO WHERE	149
GND 03				1							62-4/8		149
GND 04		A04B2		1-01 *	H	D02		1		P		HAND WIRE	150
GND 04		A04C2		1-02 *	H	D02		2		P		HAND WIRE	150
GND 04		A04N1		1-03 *	H	D02		1		P		HAND WIRE	150
GND 04		A04P1		1-04 *	H	D02		2		P		HAND WIRE	150
GND 04		A04R1		1-05 *	H	D02		1		P		HAND WIRE	150
GND 04		A04S1		1-06 *	H	D02		2		P		HAND WIRE	150
GND 04		A04T1		1-07 *	H	D02		1		P		HAND WIRE	150
GND 04		A04V2		1-08 *	H	D02		2		P		HAND WIRE	150
GND 04		B04B2		1-09 *	H	D02		1		P		HAND WIRE	150
GND 04		B04C2		1-10 *	H	D02		2		P		HAND WIRE	150
GND 04		B04D1		1-11 *	H	D02		1		P		HAND WIRE	150
GND 04		B04E1		1-12 *	H	D02		2		P		HAND WIRE	150
GND 04		B04T1		1-13 *	H	D02		1		P		HAND WIRE	150
GND 04		B04V2		1-14 *	H	D02		2		P		HAND WIRE	150
GND 04		C04C2		1-15 *	H	D01		1		P		HAND WIRE	150
GND 04		C04T1		1-16 *	H	D01		2		P		HAND WIRE	150
GND 04		D04C2		1-17 *	H	D01		1		P		HAND WIRE	150
GND 04		D04T1		1-18 *	H	D01		2		P		HAND WIRE	150
GND 04		E04C2		1-19 *	H	D01		1		P		HAND WIRE	150
GND 04		E04T1		1-20 *	H	D01		2		P		HAND WIRE	150
GND 04		F04C2		1-21 *	H	D01		1		P		HAND WIRE	150
GND 04		F04T1		1-22 *	H	D01				P		N TO WHERE	150
GND 04				1							65-0/8		150

RK11D,F RUN NAME	A/P	HND200,V22(22) 11/06/73 PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS		1-MAY-74 LENGTH	19:27 EXCEPTIONS	PAGE 18 RUN NUMBER
HE (1)	H	A03E2		1-01 *		D02		1					151
HE (1)	H	F02T2		1-02 *	H	D01		2		P		HAND WIRE	151
HE (1)	H	F01T2		1-03 *	H	D01				P		N TO WHERE	151
HE (1)				1							17-2/8		151
HEAD + CHK SUM	H	F01P2		1-01 *	H	D01		1		P		HAND WIRE	152
HEAD + CHK SUM	H	F02P2		1-02 *	H	D01				P		N TO WHERE	152
HEAD + CHK SUM				1							2-6/8		152
HEAD OK (1)	L	F01U2		1-01 *	H	D01		1		P		HAND WIRE	153
HEAD OK (1)	L	F02U2		1-02 *	H	D01				P		N TO WHERE	153
HEAD OK (1)				1							2-6/8		153
HEADER (1)	H	C01U1		1-01 *	H	D01		1		P		HAND WIRE	154
HEADER (1)	H	C03U1		1-02 *	H	D01				P		N TO WHERE	154
HEADER (1)				1							3-2/8		154
IRA (0)	H	E01K2		1-01 *	H	D01		1		P		HAND WIRE	155
IRA (0)	H	E03K2		1-02 *	H	D01				P		N TO WHERE	155
IRA (9)				1							3-2/8		155
ID 0 (1)	H	F01E1		1-01 *	H	D01		1		P		HAND WIRE	156
ID 0 (1)	H	F02E1		1-02 *	H	D01				P		N TO WHERE	156
ID 0 (1)				1							2-6/8		156
ID 1 (1)	H	F01F1		1-01 *	H	D01		1		P		HAND WIRE	157
ID 1 (1)	H	F02F1		1-02 *	H	D01				P		N TO WHERE	157
ID 1 (1)				1							2-6/8		157
ID 2 (1)	H	F01H1		1-01 *	H	D01		1		P		HAND WIRE	158
ID 2 (1)	H	F02H1		1-02 *	H	D01				P		N TO WHERE	158
ID 2 (1)				1							2-6/8		158
IOE (1)	H	E01A1		1-01 *	H	D01		1		P		HAND WIRE	159
IOE (1)	H	D02V2		1-02 *	H	D01		2		P		HAND WIRE	159
IOE (1)	H	E04A1		1-03 *	H	D01				P		N TO WHERE	159
IOE (1)				1							6-6/8		159
ILLEGAL ADD	H	F01K1		1-01 *	H	D01		1		P		HAND WIRE	160
ILLEGAL ADD	H	F02K1		1-02 *	H	D01				P		N TO WHERE	160
ILLEGAL ADD				1							2-6/8		160
IN BUFF FULL (1)	H	B03J2		1-01 *		D02		1					161
IN BUFF FULL (1)	H	C03K2		1-02 *									161
IN BUFF FULL (1)				1							5-0/8		161

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RK11D.F                      HND208.V22(22) 11/06/73                                              1-MAY-74      19:27       PAGE 19
RUN NAME                 A/P  PIN        ORDER  BAY -   Q  DRAW RV PG Y    X    Z    REMARKS              LENGTH  EXCEPTIONS   RUN
                              NAME       PIN    ORDER                                                                          NUMBER

INIT                      H   E01T2             1-01 *  H       D01             2                    P             HAND WIRE    162
INIT                      H   E02T2             1-02 *  H       D01             1                    P             HAND WIRE    162
INIT                      H   E03T2             1-03 *  H       D01                                  P             H TO WHERE   162
INIT                                            1                                                           5-4/8                162

INIT                      L   F01A1             1-01 *  H       D01             2                    P             HAND WIRE    163
INIT                      L   F02A1             1-02 *  H       D01             1                    P             HAND WIRE    163
INIT                      L   F03A1             1-03 *  H       D01             2                    P             HAND WIRE    163
INIT                      L   F04A1             1-04 *  H       D01                                  P             H TO WHERE   163
INIT                                            1                                                           8-2/8                163

INT BUS A00 (1)           H   D01A1             1-01 *  H       D01             1                    P             HAND WIRE    164
INT BUS A00 (1)           H   D03A1             1-02 *  H       D01                                  P             H TO WHERE   164
INT BUS A00 (1)                                 1                                                           3-2/8                164

INT BUS A01 (1)           H   D01B1             1-01 *  H       D01             1                    P             HAND WIRE    165
INT BUS A01 (1)           H   D03B1             1-02 *  H       D01                                  P             H TO WHERE   165
INT BUS A01 (1)                                 1                                                           3-2/8                165

INT BUS A02 (1)           H   D01C1             1-01 *  H       D01             1                    P             HAND WIRE    166
INT BUS A02 (1)           H   D03C1             1-02 *  H       D01                                  P             H TO WHERE   166
INT BUS A02 (1)                                 1                                                           3-2/8                166

INT BUS A03 (1)           H   D01D1             1-01 *  H       D01             1                    P             HAND WIRE    167
INT BUS A03 (1)           H   D03D1             1-02 *  H       D01                                  P             H TO WHERE   167
INT BUS A03 (1)                                 1                                                           3-2/8                167

INT BUS A04 (1)           H   D01E1             1-01 *  H       D01             1                    P             HAND WIRE    168
INT BUS A04 (1)           H   D03E1             1-02 *  H       D01                                  P             H TO WHERE   168
INT BUS A04 (1)                                 1                                                           3-2/8                168

INT BUS A05 (1)           H   D01F1             1-01 *  H       D01             1                    P             HAND WIRE    169
INT BUS A05 (1)           H   D03F1             1-02 *  H       D01                                  P             H TO WHERE   169
INT BUS A05 (1)                                 1                                                           3-2/8                169

INT BUS A06 (1)           H   D01H1             1-01 *  H       D01             1                    P             HAND WIRE    170
INT BUS A06 (1)           H   D03H1             1-02 *  H       D01                                  P             H TO WHERE   170
INT BUS A06 (1)                                 1                                                           3-2/8                170

INT BUS A07 (1)           H   D01J1             1-01 *  H       D01             1                    P             HAND WIRE    171
INT BUS A07 (1)           H   D03J1             1-02 *  H       D01                                  P             H TO WHERE   171
INT BUS A07 (1)                                 1                                                           3-2/8                171

INT BUS A08 (1)           H   D01K1             1-01 *  H       D01             1                    P             HAND WIRE    172
INT BUS A08 (1)           H   D03K1             1-02 *  H       D01                                  P             H TO WHERE   172
INT BUS A08 (1)                                 1                                                           3-2/8                172
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RK11D.F                      HND208.V22(22) 11/06/73                                              1-MAY-74      19:27       PAGE 20
RUN NAME                 A/P  PIN        ORDER  BAY -   Q  DRAW RV PG Y    X    Z    REMARKS              LENGTH  EXCEPTIONS   RUN
                              NAME       PIN    ORDER                                                                          NUMBER

INT BUS A09 (1)           H   D01L1             1-01 *  H       D01             1                    P             HAND WIRE    173
INT BUS A09 (1)           H   D03L1             1-02 *  H       D01                                  P             H TO WHERE   173
INT BUS A09 (1)                                 1                                                           3-2/8                173

INT BUS A10 (1)           H   D01M1             1-01 *  H       D01             1                    P             HAND WIRE    174
INT BUS A10 (1)           H   D03M1             1-02 *  H       D01                                  P             H TO WHERE   174
INT BUS A10 (1)                                 1                                                           3-2/8                174

INT BUS A11 (1)           H   D01N1             1-01 *  H       D01             1                    P             HAND WIRE    175
INT BUS A11 (1)           H   D03N1             1-02 *  H       D01                                  P             H TO WHERE   175
INT BUS A11 (1)                                 1                                                           3-2/8                175

INT BUS A12 (1)           H   D01P1             1-01 *  H       D01             1                    P             HAND WIRE    176
INT BUS A12 (1)           H   D03P1             1-02 *  H       D01                                  P             H TO WHERE   176
INT BUS A12 (1)                                 1                                                           3-2/8                176

INT BUS A13 (1)           H   D01R1             1-01 *  H       D01             1                    P             HAND WIRE    177
INT BUS A13 (1)           H   D03R1             1-02 *  H       D01                                  P             H TO WHERE   177
INT BUS A13 (1)                                 1                                                           3-2/8                177

INT BUS A14 (1)           H   D01S1             1-01 *  H       D01             1                    P             HAND WIRE    178
INT BUS A14 (1)           H   D03S1             1-02 *  H       D01                                  P             H TO WHERE   178
INT BUS A14 (1)                                 1                                                           3-2/8                178

INT BUS A15 (1)           H   D01U1             1-01 *  H       D01             1                    P             HAND WIRE    179
INT BUS A15 (1)           H   D03U1             1-02 *  H       D01                                  P             H TO WHERE   179
INT BUS A15 (1)                                 1                                                           3-2/8                179

INT BUS D00 (1)           H   F03V2             1-01 *  H       D01             1                    P             HAND WIRE    180
INT BUS D00 (1)           H   F04V2             1-02 *  H       D01                                  P             H TO WHERE   180
INT BUS D00 (1)                                 1                                                           2-6/8                180

INT BUS D01 (1)           H   F03U2             1-01 *  H       D01             1                    P             HAND WIRE    181
INT BUS D01 (1)           H   F04U2             1-02 *  H       D01                                  P             H TO WHERE   181
INT BUS D01 (1)                                 1                                                           2-6/8                181

INT BUS D02 (1)           H   F03T2             1-01 *  H       D01             1                    P             HAND WIRE    182
INT BUS D02 (1)           H   F04T2             1-02 *  H       D01                                  P             H TO WHERE   182
INT BUS D02 (1)                                 1                                                           2-6/8                182

INT BUS D03 (1)           H   F03S2             1-01 *  H       D01             1                    P             HAND WIRE    183
INT BUS D03 (1)           H   F04S2             1-02 *  H       D01                                  P             H TO WHERE   183
INT BUS D03 (1)                                 1                                                           2-6/8                183

INT BUS D04 (1)           H   F03R2             1-01 *  H       D01             1                    P             HAND WIRE    184
INT BUS D04 (1)           H   F04R2             1-02 *  H       D01                                  P             H TO WHERE   184
INT BUS D04 (1)                                 1                                                           2-6/8                184
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RUN NAME	A/P	PIN NAME	ORDER PIN	RAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
INT BUS D05 (1)	H	F03P2		1-01 *	H	D01		1		P		
INT BUS D05 (1)	H	F04P2		1-02 *	H	D01				P	HAND WIRE	185
INT BUS D05 (1)				1							H TO WHERE	185
										2-6/8		185
INT BUS D06 (1)	H	F03N2		1-01 *	H	D01		1		P		
INT BUS D06 (1)	H	F04N2		1-02 *	H	D01				P	HAND WIRE	186
INT BUS D06 (1)				1							H TO WHERE	186
										2-6/8		186
INT BUS D07 (1)	H	F03M2		1-01 *	H	D01		1		P		
INT BUS D07 (1)	H	F04M2		1-02 *	H	D01				P	HAND WIRE	187
INT BUS D07 (1)				1							H TO WHERE	187
										2-6/8		187
INT BUS D08 (1)	H	F03L2		1-01 *	H	D01		1		P		
INT BUS D08 (1)	H	F04L2		1-02 *	H	D01				P	HAND WIRE	188
INT BUS D08 (1)				1							H TO WHERE	188
										2-6/8		188
INT BUS D09 (1)	H	F03K2		1-01 *	H	D01		1		P		
INT BUS D09 (1)	H	F04K2		1-02 *	H	D01				P	HAND WIRE	189
INT BUS D09 (1)				1							H TO WHERE	189
										2-6/8		189
INT BUS D10 (1)	H	F03J2		1-01 *	H	D01		1		P		
INT BUS D10 (1)	H	F04J2		1-02 *	H	D01				P	HAND WIRE	190
INT BUS D10 (1)				1							H TO WHERE	190
										2-6/8		190
INT BUS D11 (1)	H	F03H2		1-01 *	H	D01		1		P		
INT BUS D11 (1)	H	F04H2		1-02 *	H	D01				P	HAND WIRE	191
INT BUS D11 (1)				1							H TO WHERE	191
										2-6/8		191
INT BUS D12 (1)	H	F03F2		1-01 *	H	D01		1		P		
INT BUS D12 (1)	H	F04F2		1-02 *	H	D01				P	HAND WIRE	192
INT BUS D12 (1)				1							H TO WHERE	192
										2-6/8		192
INT BUS D13 (1)	H	F03E2		1-01 *	H	D01		1		P		
INT BUS D13 (1)	H	F04E2		1-02 *	H	D01				P	HAND WIRE	193
INT BUS D13 (1)				1							H TO WHERE	193
										2-6/8		193
INT BUS D14 (1)	H	F03D2		1-01 *	H	D01		1		P		
INT BUS D14 (1)	H	F04D2		1-02 *	H	D01				P	HAND WIRE	194
INT BUS D14 (1)				1							H TO WHERE	194
										2-6/8		194
INT BUS D15 (1)	H	F03B1		1-01 *	H	D01		1		P		
INT BUS D15 (1)	H	F04B1		1-02 *	H	D01				P	HAND WIRE	195
INT BUS D15 (1)				1							H TO WHERE	195
										2-6/8		195
LAST BIT	H	F01D2		1-01 *	H	D01		1		P		
LAST BIT	H	F02D2		1-02 *	H	D01				P	HAND WIRE	196
LAST BIT				1							H TO WHERE	196
										2-6/8		196

RUN NAME	A/P	PIN NAME	ORDER PIN	RAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS	LENGTH	EXCEPTIONS	RUN NUMBER
LAST SECTOR	L	C02U2		1-01 *	H	D01		1		P		
LAST SECTOR	L	C03U2		1-02 *	H	D01				P	HAND WIRE	197
LAST SECTOR				1							H TO WHERE	197
										2-6/8		197
LAST WORD DONE	L	C01L1		1-01 *	H	D01		1		P		
LAST WORD DONE	L	C03L1		1-02 *	H	D01				P	HAND WIRE	198
LAST WORD DONE				1							H TO WHERE	198
										3-2/8		198
LOAD RKBA HI	L	E03V2		1-01 *	H	D01		1		P		
LOAD RKBA HI	L	E04V2		1-02 *	H	D01				P	HAND WIRE	199
LOAD RKBA HI				1							H TO WHERE	199
										2-6/8		199
LOAD RKBA LO	L	E03M2		1-01 *	H	D01		1		P		
LOAD RKBA LO	L	E04M2		1-02 *	H	D01				P	HAND WIRE	200
LOAD RKBA LO				1							H TO WHERE	200
										2-6/8		200
LOAD RKCS HI	L	E01L1		1-01 *	H	D01		1		P		
LOAD RKCS HI	L	E04L1		1-02 *	H	D01				P	HAND WIRE	201
LOAD RKCS HI				1							H TO WHERE	201
										3-6/8		201
LOAD RKCS LO	L	E01M1		1-01 *	H	D01		1		P		
LOAD RKCS LO	L	E04M1		1-02 *	H	D01				P	HAND WIRE	202
LOAD RKCS LO				1							H TO WHERE	202
										3-6/8		202
LOAD RKDA HI	L	E03E2		1-01 *	H	D01		1		P		
LOAD RKDA HI	L	E04E2		1-02 *	H	D01				P	HAND WIRE	203
LOAD RKDA HI				1							H TO WHERE	203
										2-6/8		203
LOAD RKDA LO	L	E03F2		1-01 *	H	D01		1		P		
LOAD RKDA LO	L	E04F2		1-02 *	H	D01				P	HAND WIRE	204
LOAD RKDA LO				1							H TO WHERE	204
										2-6/8		204
LOAD RKWC HI	L	E01B1		1-01 *	H	D01		1		P		
LOAD RKWC HI	L	E04B1		1-02 *	H	D01				P	HAND WIRE	205
LOAD RKWC HI				1							H TO WHERE	205
										3-6/8		205
LOAD RKWC LO	L	E01F1		1-01 *	H	D01		1		P		
LOAD RKWC LO	L	E04F1		1-02 *	H	D01				P	HAND WIRE	206
LOAD RKWC LO				1							H TO WHERE	206
										3-6/8		206
M CLK	L	A02U2		1-01 *				1				
M CLK	L	D02D2		1-02 *								207
M CLK				1								207
										8-6/8		207

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RUN NAME

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A/P	PIN NAME	PIN ORDER	BAY - ORDER	O	DRAW	RV	PG	Y	X	Z	REMARKS
	NEW FUN	L	C01R1		1-01	*	H		D01		
	NPR FUN	L	C02R1		1-02	*	H		D01		
	NEW FUN	L	C03R1		1-03	*	H		D01		
					1						
	NPR EN (1)	H	C03V2		1-01	*				1	
	NPR EN (1)	H	E04W2		1-02	*					
	NPR EN (1)				1						
	NPR REQ	H	E03J2		1-01	*	H		D01		
	NPR REQ	H	E04J2		1-02	*	H		D01	1	
	NPR REQ				1						
	NXM (1)	H	E01N1		1-01	*	H		D01		
	NXM (1)	H	E04N1		1-02	*	H		D01	1	
	NXM (1)				1						
	OUT BUFF FULL (1)	H	B03L2		1-01	*			D02		
	OUT BUFF FULL (1)	H	C01L2		1-02	*				1	
	OUT BUFF FULL (1)				1						
	POLL DONE	L	F01U1		1-01	*	H		D01		
	POLL DONE	L	F02U1		1-02	*	H		D01	1	
	POLL DONE				1						
	PREAMBLE (1)	H	F01M2		1-01	*	H		D01		
	PREAMBLE (1)	H	F02M2		1-02	*	H		D01	1	
	PREAMBLF (1)				1						
	R/W/B RDY	H	E01P2		1-01	*	H		D01		
	R/W/B RDY	H	E02P2		1-02	*	H		D01	1	
	R/W/B RDY				1						
	RD DATAWT DATA	H	F01M1		1-01	*	H		D01		
	RD DATAWT DATA	H	F02M1		1-02	*	H		D01	1	
	RD DATAWT DATA				1						
	RD GATE (1)	H	B03F2		1-01	*			D02		
	RD GATE (1)	H	D02T2		1-02	*				1	
	RD GATE (1)				1						
	RD GATE EN	H	F01J2		1-01	*	H		D01		
	RD GATE EN	H	F02J2		1-02	*	H		D01	1	
	RD GATE EN				1						

LENGTH	EXCEPTIONS	RUN NUMBER
		208
	HAND WIRE	208
	HAND WIRE	208
	H TO WHERE	208
5-4/8		208
		209
7-0/8		209
	HAND WIRE	210
	H TO WHERE	210
2-6/8		210
	HAND WIRE	211
	H TO WHERE	211
3-6/8		211
		212
4-6/8		212
	HAND WIRE	213
	H TO WHERE	213
2-6/8		213
	HAND WIRE	214
	H TO WHERE	214
2-6/8		214
	HAND WIRE	215
	H TO WHERE	215
2-6/8		215
	HAND WIRE	216
	H TO WHERE	216
2-6/8		216
		217
9-6/8		217
	HAND WIRE	218
	H TO WHERE	218
2-6/8		218

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RUN NAME

HND388.V22(22) 11/06/73

A/P	PIN NAME	PIN ORDER	BAY - ORDER	O	DRAW	RV	PG	Y	X	Z	REMARKS
	RD HEADER (1)	H	F01L1		1-01	*	H		D01		
	RD HEADER (1)	H	F02L1		1-02	*	H		D01	1	
	RD HEADER (1)				1						
	RD+RD CHK	H	B03D2		1-01	*			D02		
	RD+RD CHK	H	C03K1		1-02	*	H		D01	1	
	RD+RD CHK	H	C01K1		1-03	*	H		D01	2	
	RD+RD CHK				1						
	READ	H	E01U1		1-01	*	H		D01		
	READ	H	E03U2		1-02	*	H		D01	1	
	READ	H	E04U2		1-01	*	H		D01	2	
	READ				1						
	RK INT MASTER	H	D02U1		1-01	*	H		D01		
	RK INT MASTER	H	D04U1		1-02	*	H		D01	1	
	RK INT MASTER				1						
	RK INT REQ	H	E02K2		1-01	*	H		D01		
	RK INT REQ	H	E04K2		1-02	*	H		D01	1	
	RK INT REQ				1						
	RK NPR MASTER	H	C03J2		1-01	*	1			1	
	RK NPR MASTER	H	E04H1		1-02	*	H		D01	2	
	RK NPR MASTER	H	F01H1		1-03	*	H		D01		
	RK NPR MASTER				1						
	RKCS	H	F01C1		1-01	*	H		D01		
	RKCS	H	F02C1		1-02	*	H		D01	1	
	RKCS				1						
	RKA 01 (1)	H	E01K1		1-01	*	H		D01		
	RKA 01 (1)	H	E04K1		1-02	*	H		D01	2	
	RKA 01 (1)	H	E03W2		1-03	*			D01	1	
	RKA 01 (1)				1						
	RKA 02 (1)	H	E01J1		1-01	*	H		D01		
	RKA 02 (1)	H	E04J1		1-02	*	H		D01	1	
	RKA 02 (1)	H	E03W2		1-03	*			D01	2	
	RKA 02 (1)				1						
	RKA 03 (1)	H	E03V1		1-01	*	H		D01	1	
	RKA 03 (1)	H	E04V1		1-02	*	H		D01		
	RKA 03 (1)				1						

LENGTH	EXCEPTIONS	RUN NUMBER
		219
	HAND WIRE	219
	H TO WHERE	219
2-6/8		219
		220
	HAND WIRE	220
	H TO WHERE	220
9-6/8		220
	HAND WIRE	221
	HAND WIRE	221
	H TO WHERE	221
6-2/8		221
	HAND WIRE	222
	H TO WHERE	222
3-2/8		222
	HAND WIRE	223
	H TO WHERE	223
3-2/8		223
3-5		
		224
	HAND WIRE	224
	H TO WHERE	224
11-5/8		224
	HAND WIRE	225
	H TO WHERE	225
2-6/8		225
	HAND WIRE	226
	HAND WIRE	226
	TO HERE	226
6-4/8		226
	HAND WIRE	227
	HAND WIRE	227
	TO HERE	227
6-6/8		227
	HAND WIRE	228
	H TO WHERE	228
2-6/8		228

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RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS		LENGTH	EXCEPTIONS	RUN NUMBER
RKBA 01 (1)	H	F03C1		1-01 *	H	D01		1		P		HAND WIRE	229
RKBA 01 (1)	H	F04C1		1-02 *	H	D01				P		H TO WHERE	229
RKBA 01 (1)				1							2-6/8		229
RKBA 02 (1)	H	F03D1		1-01 *	H	D01		1		P		HAND WIRE	230
RKBA 02 (1)	H	F04D1		1-02 *	H	D01				P		H TO WHERE	230
RKBA 02 (1)				1							2-6/8		230
RKBA 03 (1)	H	F03E1		1-01 *	H	D01		1		P		HAND WIRE	231
RKBA 03 (1)	H	F04E1		1-02 *	H	D01				P		H TO WHERE	231
RKBA 03 (1)				1							2-6/8		231
RKBA 04 (1)	H	F03F1		1-01 *	H	D01		1		P		HAND WIRE	232
RKBA 04 (1)	H	F04F1		1-02 *	H	D01				P		H TO WHERE	232
RKBA 04 (1)				1							2-6/8		232
RKBA 05 (1)	H	F03H1		1-01 *	H	D01		1		P		HAND WIRE	233
RKBA 05 (1)	H	F04H1		1-02 *	H	D01				P		H TO WHERE	233
RKBA 05 (1)				1							2-6/8		233
RKBA 06 (1)	H	F03J1		1-01 *	H	D01		1		P		HAND WIRE	234
RKBA 06 (1)	H	F04J1		1-02 *	H	D01				P		H TO WHERE	234
RKBA 06 (1)				1							2-6/8		234
RKBA 07 (1)	H	F03K1		1-01 *	H	D01		1		P		HAND WIRE	235
RKBA 07 (1)	H	F04K1		1-02 *	H	D01				P		H TO WHERE	235
RKBA 07 (1)				1							2-6/8		235
RKBA 08 (1)	H	F03L1		1-01 *	H	D01		1		P		HAND WIRE	236
RKBA 08 (1)	H	F04L1		1-02 *	H	D01				P		H TO WHERE	236
RKBA 08 (1)				1							2-6/8		236
RKBA 09 (1)	H	F03M1		1-01 *	H	D01		1		P		HAND WIRE	237
RKBA 09 (1)	H	F04M1		1-02 *	H	D01				P		H TO WHERE	237
RKBA 09 (1)				1							2-6/8		237
RKBA 10 (1)	H	F03N1		1-01 *	H	D01		1		P		HAND WIRE	238
RKBA 10 (1)	H	F04N1		1-02 *	H	D01				P		H TO WHERE	238
RKBA 10 (1)				1							2-6/8		238
RKBA 11 (1)	H	F03R1		1-01 *	H	D01		1		P		HAND WIRE	239
RKBA 11 (1)	H	F04R1		1-02 *	H	D01				P		H TO WHERE	239
RKBA 11 (1)				1							2-6/8		239
RKBA 12 (1)	H	F03P1		1-01 *	H	D01		1		P		HAND WIRE	240
RKBA 12 (1)	H	F04P1		1-02 *	H	D01				P		H TO WHERE	240
RKBA 12 (1)				1							2-6/8		240

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RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS		LENGTH	EXCEPTIONS	RUN NUMBER
RKBA 13 (1)	H	F03S1		1-01 *	H	D01		1		P		HAND WIRE	241
RKBA 13 (1)	H	F04S1		1-02 *	H	D01				P		H TO WHERE	241
RKBA 13 (1)				1							2-6/8		241
RKBA 14 (1)	H	F03U1		1-01 *	H	D01		1		P		HAND WIRE	242
RKBA 14 (1)	H	F04U1		1-02 *	H	D01				P		H TO WHERE	242
RKBA 14 (1)				1							2-6/8		242
RKBA 15 (1)	H	F03V1		1-01 *	H	D01		1		P		HAND WIRE	243
RKBA 15 (1)	H	F04V1		1-02 *	H	D01				P		H TO WHERE	243
RKBA 15 (1)				1							2-6/8		243
RKBA OVF	L	E01S1		1-01 *	H	D01		1		P		HAND WIRE	244
RKBA OVF	L	E03S2		1-02 *	H	D01				P		H TO WHERE	244
RKBA OVF				1							3-4/8		244
RKDA 00 (1)	H	B03P2		1-01 *		D02		1					245
RKDA 00 (1)	H	E03A1		1-02 *	H	D01		2		P		HAND WIRE	245
RKDA 00 (1)	H	E02A1		1-03 *	H	D01				P		H TO WHERE	245
RKDA 00 (1)				1							11-4/8		245
RKDA 01 (1)	H	B03V1		1-01 *		D02		1					246
RKDA 01 (1)	H	E03B1		1-02 *	H	D01		2		P		HAND WIRE	246
RKDA 01 (1)	H	E02B1		1-03 *	H	D01				P		H TO WHERE	246
RKDA 01 (1)				1							10-6/8		246
RKDA 02 (1)	H	B03M1		1-01 *		D02		1					247
RKDA 02 (1)	H	E03C1		1-02 *	H	D01		2		P		HAND WIRE	247
RKDA 02 (1)	H	E02C1		1-03 *	H	D01		1		P		HAND WIRE	247
RKDA 02 (1)	H	E01C1		1-04 *	H	D01				P		H TO WHERE	247
RKDA 02 (1)				1							14-4/8		247
RKDA 03 (1)	H	B03K2		1-01 *		D02		1					248
RKDA 03 (1)	H	E03D1		1-02 *	H	D01		2		P		HAND WIRE	248
RKDA 03 (1)	H	E02D1		1-03 *	H	D01		1		P		HAND WIRE	248
RKDA 03 (1)	H	E01D1		1-04 *	H	D01				P		H TO WHERE	248
RKDA 03 (1)				1							15-0/8		248
RKDA 04 (1)	H	B03U2		1-01 *		D02		1					249
RKDA 04 (1)	H	E03E1		1-02 *	H	D01		2		P		HAND WIRE	249
RKDA 04 (1)	H	E02E1		1-03 *	H	D01				P		H TO WHERE	249
RKDA 04 (1)				1							11-4/8		249
RKDA 05 (1)	H	B03T2		1-01 *		D02		1					250
RKDA 05 (1)	H	E03F1		1-02 *	H	D01		2		P		HAND WIRE	250
RKDA 05 (1)	H	E02F1		1-03 *	H	D01				P		H TO WHERE	250
RKDA 05 (1)				1							11-6/8		250

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RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS		LENGTH	EXCEPTIONS	RUN NUMBER
RKDA 06 (1)	H	B03C1		1-01 *		D02		1					251
RKDA 06 (1)	H	E03H1		1-02 *	H	D02		2		P		HAND WIRE	251
RKDA 06 (1)	H	E02H1		1-03 *	H	D01				P		H TO WHERE	251
RKDA 06 (1)				1							13-2/8		251
RKDA 07 (1)	H	B03J1		1-01 *		D01		1					252
RKDA 07 (1)	H	E03J1		1-02 *	H	D01		2		P		HAND WIRE	252
RKDA 07 (1)	H	E02J1		1-03 *	H	D01				P		H TO WHERE	252
RKDA 07 (1)				1							12-6/8		252
RKDA 08 (1)	H	B03F1		1-01 *		D02		1					253
RKDA 08 (1)	H	E03K1		1-02 *	H	D01		2		P		HAND WIRE	253
RKDA 08 (1)	H	E02K1		1-03 *	H	D01				P		H TO WHERE	253
RKDA 08 (1)				1							13-2/8		253
RKDA 09 (1)	H	B03L1		1-01 *		D02		1					254
RKDA 09 (1)	H	E03L1		1-02 *	H	D01		2		P		HAND WIRE	254
RKDA 09 (1)	H	E02L1		1-03 *	H	D01				P		H TO WHERE	254
RKDA 09 (1)				1							12-6/8		254
RKDA 10 (1)	H	B03P1		1-01 *		D02		1					255
RKDA 10 (1)	H	E03M1		1-02 *	H	D01		2		P		HAND WIRE	255
RKDA 10 (1)	H	E02M1		1-03 *	H	D01				P		H TO WHERE	255
RKDA 10 (1)				1							12-4/8		255
RKDA 11 (1)	H	B03S2		1-01 *		D02		1					256
RKDA 11 (1)	H	E03N1		1-02 *	H	D01		2		P		HAND WIRE	256
RKDA 11 (1)	H	E02N1		1-03 *	H	D01				P		H TO WHERE	256
RKDA 11 (1)				1							12-4/8		256
RKDA 12 (1)	H	B03K1		1-01 *		D02		1					257
RKDA 12 (1)	H	E03P1		1-02 *	H	D01		2		P		HAND WIRE	257
RKDA 12 (1)	H	E02P1		1-03 *	H	D01				P		H TO WHERE	257
RKDA 12 (1)				1							13-2/8		257
RKDA 13 (1)	H	E02R1		1-01 *	H	D01		1		P		HAND WIRE	258
RKDA 13 (1)	H	E03R1		1-02 *	H	D01				P		H TO WHERE	258
RKDA 13 (1)				1							2-6/8		258
RKDA 14 (1)	H	E02S1		1-01 *	H	D01		1		P		HAND WIRE	259
RKDA 14 (1)	H	E03S1		1-02 *	H	D01				P		H TO WHERE	259
RKDA 14 (1)				1							2-6/8		259
RKDA 15 (1)	H	E02U1		1-01 *	H	D01		1		P		HAND WIRE	260
RKDA 15 (1)	H	E03U1		1-02 *	H	D01				P		H TO WHERE	260
RKDA 15 (1)				1							2-6/8		260

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RUN NAME	A/P	PIN NAME	ORDER PIN	BAY - ORDER	Q	DRAW RV PG Y	X	Z	REMARKS		LENGTH	EXCEPTIONS	RUN NUMBER
RKDB 00 (1)	H	C02T2		1-01 *	H	D01		1		P		HAND WIRE	261
RKDB 00 (1)	H	C03T2		1-02 *	H	D01				P		H TO WHERE	261
RKDB 00 (1)				1							2-6/8		261
RKDS 00 (1)	H	E01V1		1-01 *	H	D01		1		P		HAND WIRE	262
RKDS 00 (1)	H	E02V1		1-02 *	H	D01				P		H TO WHERE	262
RKDS 00 (1)				1							2-6/8		262
RKDS 01 (1)	H	E01D2		1-01 *	H	D01		1		P		HAND WIRE	263
RKDS 01 (1)	H	E02D2		1-02 *	H	D01				P		H TO WHERE	263
RKDS 01 (1)				1							2-6/8		263
RKDS 02 (1)	H	E01E2		1-01 *	H	D01		1		P		HAND WIRE	264
RKDS 02 (1)	H	E02E2		1-02 *	H	D01				P		H TO WHERE	264
RKDS 02 (1)				1							2-6/8		264
RKDS 03 (1)	H	E01F2		1-01 *	H	D01		1		P		HAND WIRE	265
RKDS 03 (1)	H	E02F2		1-02 *	H	D01				P		H TO WHERE	265
RKDS 03 (1)				1							2-6/8		265
SC=SA	H	E01H2		1-01 *	H	D01		1		P		HAND WIRE	266
SC=SA	H	E02H2		1-02 *	H	D01				P		H TO WHERE	266
SC=SA				1							2-6/8		266
SCH CMP (1)	H	F01S1		1-01 *	H	D01		1		P		HAND WIRE	267
SCH CMP (1)	H	F02S1		1-02 *	H	D01				P		H TO WHERE	267
SCH CMP (1)				1							2-6/8		267
SECTOR END	L	C02S2		1-01 *	H	D01		1		P		HAND WIRE	268
SECTOR END	L	C03S2		1-02 *	H	D01				P		H TO WHERE	268
SECTOR END				1							2-6/8		268
SECTOR PULSE	H	E01M2		1-01 *	H	D01		1		P		HAND WIRE	269
SECTOR PULSE	H	E02M2		1-02 *	H	D01				P		H TO WHERE	269
SECTOR PULSE				1							2-6/8		269
SEEK OR RESET	H	B03N2		1-01 *		D02		1					270
SEEK OR RESET	H	F02L2		1-02 *	H	D01		2		P		HAND WIRE	270
SEEK OR RESET	H	F01L2		1-03 *	H	D01				P		H TO WHERE	270
SEEK OR RESET				1							15-4/8		270
SER RD DATA (1)	H	C01V1		1-01 *	H	D01		2		P		HAND WIRE	271
SER RD DATA (1)	H	C02V1		1-02 *	H	D01		1		P		HAND WIRE	271
SER RD DATA (1)	H	C03V1		1-03 *	H	D01				P		H TO WHERE	271
SER RD DATA (1)				1							5-4/8		271

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RUN NAME LENGTH EXCEPTIONS RUN NUMBER

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Y	X	Z	REMARKS	A/P	PIN NAME	ORDER PIN	BAY - ORDER	O	DRAW RV PG	LENGTH EXCEPTIONS	RUN NUMBER
		1		P							272
				P	F01N2		1-01	* H	D01	HAND WIRE	272
					E02N2		1-02	* H	D01	H TO WHERE	272
							1			2-6/8	
		1		P							273
				P	C01H1		1-01	* H	D01	HAND WIRE	273
					C03H1		1-02	* H	D01	H TO WHERE	273
							1			3-2/8	
		1		P							274
				P	F01N2		1-01	* H	D01	HAND WIRE	274
				L	F02N2		1-02	* H	D01	H TO WHERE	274
							1			2-6/8	
		1		P							275
		2		P	B03B1		1-01	*	D02	HAND WIRE	275
				P	C03J1		1-02	* H	D01	H TO WHERE	275
				H	C01J1		1-03	* H	D01	7-2/8	275
							1				
		1		P							276
				P	F01H2		1-01	* H	D01	HAND WIRE	276
				H	F02H2		1-02	* H	D01	H TO WHERE	276
							1			2-6/8	
		1		P							277
		2		P	B03H2		1-01	*	D02	HAND WIRE	277
				P	F02P1		1-02	* H	D01	H TO WHERE	277
				H	F01P1		1-03	* H	D01	16-2/8	277
							1				
		1		P							278
				P	F01B2		1-01	* H	D01	HAND WIRE	278
				H	F02B2		1-02	* H	D01	H TO WHERE	278
							1			2-6/8	
		1		P							279
				P	E01J2		1-01	* H	D01	HAND WIRE	279
				H	E02J2		1-02	* H	D01	H TO WHERE	279
							1			2-6/8	
		1		P							280
		2		P	B03H2		1-01	*	D02	HAND WIRE	280
		1		P	C03P1		1-02	* H	D01	HAND WIRE	280
				P	C02P1		1-03	* H	D01	H TO WHERE	280
				H	C01P1		1-04	* H	D01	11-2/8	280
							1				
		1		P							281
				P	E01V2		1-01	* H	D01	HAND WIRE	281
				H	E02V2		1-02	* H	D01	H TO WHERE	281
							1			2-6/8	
			XFER FUNCTION								
			XFER FUNCTION								
			XFER FUNCTION								