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MASTER DRAWING LIST

DWG. NO.	REV. LET.	NO. OF SHEETS	TITLE
D-UA-TD10A-0-0	K	1	TAPE CONTROL 10A ASSY
A-EL-TD10A-0-0	K	5	TAPE CONTROL 10A ASSY
C-AD-7006149-0-0		1	CABLE SET TD10
D-IC-TD10A-0-4	D	1	POWER WIRING AC & DC
D-DI-TD10A-0-1	H	2	DRAWING INDEX LIST
D-AD-7005497-0-0		1	WIRED ASSY TD10A
A-PL-7005497-0-0		1	WIRED ASSY TD10A
K-WL-TD10A-0-3	L		WIRE LIST
D-MU-TD10A-0-2	H	2	MODULE TEST
A-PL-TD10A-0-2	H	4	MODULE TEST
D-BS-TD10A-0-B	A	1	BUFFER REGISTER
D-BS-TD10A-0-COM1	D	1	COMMAND DECTAPE CONTROL #1
D-BS-TD10A-0-COM2	A	1	COMMAND DECTAPE CONTROL #2
D-BS-TD10A-0-DC	A	1	DATA CONTROL
D-BS-TD10A-0-ENB	C	1	ENABLE FLIP FLOP
D-BS-TD10A-0-EPR	C	1	LP/ERR
D-BS-TD10A-0-IOB1		1	IO BUS INTERFACE MANUAL MODE #1
D-BS-TD10A-0-IOB2	C	1	IO BUS INTERFACE MANUAL MODE #2
D-BS-TD10A-0-NK	A	1	MARK TRACK DECODER
D-BS-TD10A-0-MNT		1	MAINTENANCE
D-BS-TD10A-0-RW	B	1	READ WRITE BUFFERS
D-BS-TD10A-0-RWA	E	1	READ WRITE AMPLIFIERS
D-BS-TD10A-0-SH	A	1	SHIFT REGISTER
D-BS-TD10A-0-ST	D	1	STATUS
D-BS-TD10A-0-T1	C	2	TIMING #1
D-BS-TD10A-0-T2	B	1	TIMING #2
A-CP-TD10A-0-5	E	1	EXTERNAL COMPONENT LIST
D-IC-TD10A-0-8		1	INDICATOR CABLE ASSY
D-FD-TD10A-0-7		1	DATA CONTROL FLOW

REVISIONS				DRN. R. ROBICHAUD	DATE 1/2/68	EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
REV.	DATE	CHG. NO.	APP'D.	CHK'D.	DATE	
A	1/68	1	G.G.	J.C. PELLETIER	1-8-68	<div style="text-align: center;"> <p>EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS</p> </div> <p style="text-align: center; font-weight: bold;">TITLE</p> <p style="text-align: center;">TAPE CONTROL 10A (TD10A)</p>
B	2/68	3	D.G.			
C	2/68	5	D.G.			
D	3/68	13	D.G.			
E	3/68	17	R.R.			
F	5/68	31	R.R.			
H	7/68	00001	O.G.			
J	7/68	00002	D.G.			
K	8/68	00003	G.G.			
L	11/68	00005	D.G.			
M	1/69	00007	D.G.			
N	2/69	00008	D.G.			
P	5/69	00009	D.G.			
S	8/69	00012	D.G.			

DRN. R. ROBICHAUD	DATE 1/2/68	EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D. J.C. PELLETIER	DATE 1-8-68	
ENG. G.	DATE 1/68	<div style="text-align: center;"> <p>EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS</p> </div> <p style="text-align: center; font-weight: bold;">TITLE</p> <p style="text-align: center;">TAPE CONTROL 10A (TD10A)</p>
PROJ. ENG. A.K.	DATE 1/68	
PROD. O.G.	DATE 1-8-68	
FIRST USED ON	D-UA-TD10A-A-0	SIZE CODE NUMBER REV.
SCALE	~	A ML TD10A-A V
SHEET 1 OF 2	DIST.	

(1)

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MASTER DRAWING LIST

DWG. NO.	REV. LET.	NO. OF SHEETS	TITLE
A-SP-TD10A-0-14		9	TD10A ENGINEERING SPECIFICATIONS
A-SP-TD10A-0-15		3	TD10A ACCEPTANCE TEST PROCEDURE
A-SP-TD10A-0-16		2	TD10A ACCEPTANCE TEST PROCEDURE
A-SP-TD10A-0-17	A	12	TD10A MANUFACTURING CHECKOUT & TEST PROC.
A-SP-TD10A-0-18		5	TD10A ACCEPTANCE TEST PROCEDURE
A-SP-TD10A-0-19		2	TD10A INSTALLATION DATA
A-SP-TD10A-0-20		4	TD10A MANUFACTURING CHECKOUT & TEST SPECS.
A-SP-TD10A-0-21		2	TD10A SHIPPING LIST
A-SP-TD10A-0-23		4	TD10A RECOMMENDED SPARE PARTS LIST
A-SP-TD10A-0-24		6	TD10A SYSTEM SPECIFICATIONS
A-SP-TD10A-0-25		9	TD10A PROGRAMMING SPECIFICATIONS

REVISIONS				DRN. R. ROBICHAUD	DATE 1/2/68	EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
REV.	DATE	CHG. NO.	APP'D.	CHK'D.	DATE	
T	12/69	00014	D.G.	Pelletier	8/68	<div style="text-align: center;"> <p>EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS</p> </div> <p style="text-align: center; font-weight: bold;">TITLE</p> <p style="text-align: center;">TAPE CONTROL 10A (TD10A)</p>
U	10/70	Misc.79	A.K.			
V	7/71	00016	D.G.			

DRN. R. ROBICHAUD	DATE 1/2/68	EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D. Pelletier	DATE 8/68	
ENG. D. Gross	DATE 1/68	<div style="text-align: center;"> <p>EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS</p> </div> <p style="text-align: center; font-weight: bold;">TITLE</p> <p style="text-align: center;">TAPE CONTROL 10A (TD10A)</p>
PROJ. ENG. D. Gross	DATE 1/68	
PROD. S. Mikulski	DATE 1/68	
FIRST USED ON	D-UA-TD10A-A-0	SIZE CODE NUMBER REV.
SCALE		A ML TD10A-A V
SHEET 2 OF 2	DIST.	

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

QUANTITY

REVISIONS

PARTS LIST

ITEM NO.	DWG. NO.	DESCRIPTION	TD10A-A-0	TD10A-B-0	QUANTITY										REVISIONS				
					CHANGE NO.	DATE	ENG.												
1	E-IA-7406052-0-0	CABINET FRAME REWORK	1	1													B-3165	11/14/67	CHGD QTY
2	D-AD-7005396-0-0	BEZEL ASSEMBLY	1	1													OF PTS #36, 37, & 40 DEL #41 CHGD DWG#		
3																			
4	E-AD-7005474-0-0	FAN HOUSING ASSEMBLY	1	1													C-3274	1/12/68	ADDED PTS
5	C-IA-7406063-0-0	PANEL, BLANK FILLER	3	3													49 THRU 55 & QTY TO #11		
6	C-MD-7406062-0-0	BRACKET, SUPPORT	6	6													C-3287	1/23/68	ADDED ITEM #56
7	D-AD-7005492-2-0	DOOR, FRONT ASSEMBLY	1	1															
8	B-MD-7405861-0-0	BRACKET, DOOR PIVOT	1	1													D-3371	3/20/68	
9	A-MD-7405860-0-0	BAR, SPACER	1	1													CHG #18 & 19		
10	90-06350	SCR CAP SOC H 10-32 X 1" LG SST	2	2													E-#3531	6/3/68	CHG #34
11	90-06635	WASHER LOCK EXT TOOTH #10	38	38													F-TD10A-00002	8/6/68	
12	B-MD-7406049-2-0	PLATE, STRIKER	1	1													H-TD10A-00007	1/14/69	
13	B-MD-5111	CHASSIS "D" SIZE	3	3													J-TD10A-00011	8-8-69	
14	D-MD-7405862-0-0	TRIM STRIP BOTTOM	1	1													K-MISC-00079	10/27/69	
MADE BY J. KALAGHER		DATE 5/19/67	TITLE TAPE CONTROL 10A										DRWG. NO. A-PL-TD10A-0-0		REV. LTR.				
CHECKED R.E. PHIPPS		DATE 6/5/67	FOR TD10A-A-0 50 TD10A-B-0 60										ASSY NO D-UA-TD10A-0-0		SHEET 1 OF 5				
ENG <i>D. Clark</i>		DATE 6/20/67													K				

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G

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

QUANTITY

REVISIONS

PARTS LIST

ITEM NO.	DWG. NO.	DESCRIPTION	TD10A-A-0	TD10A-B-0	QUANTITY										CHANGE NO.	DATE	ENG.
15	90-06073-3	SCR PHL H TRUSS 10-32 X 1/2 SST	18	18													
16	D-AD-7005467-0-0	BRACKET, POWER CONN ASSY	1	1													
17	D-AD-7005497-0-0	WIRED ASSEMBLY	1	1													
18	C-MD-5302486-0-0	PANEL RIGHT END	4	4													
19	C-IA-5402526-0-0	PANEL MARGINAL CHECK	4	4													
20	B-MD-5111	CHASSIS "A" SIZE	1	1													
21	D-UA-844-0-0	844 POWER CONTROL	1	1													
22	D-MA-728-0-1	728 POWER SUPPLY		2													
23	D-AD-7005358-2-0	DOOR FULL ASSEMBLY	1	1													
24	90-07620	BOLT SQ H 3/8-16 X 9-1/2 SST	2	2													
25		WASHER 13/32 X 7/8 X 5/64 SST	2	2													
26	90-06593	NUT HEX 3/8-16 SST	2	2													
27	90-06346	SCR CAP SOC H 10-32 X 1/2 SST	4	4													
28	90-06350	SCR CAP SOC H 10-32 X 1" SST	4	4													
MADE BY J. KALAGHER		DATE 5/19/67	TITLE TAPE CONTROL 10A										DRWG. NO. A-PL-TD10A-0-0		REV. LTR.		
CHECKED R.E. PHIPPS		DATE 6/5/67	FOR TD10A-A-0 50 TD10A-B-0 60										ASSY NO D-UA-TD10A-0-0		K		
ENG <i>D. Herold</i>		DATE 6/28/67											SHEET 2 OF 5				

(4)

G

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS			QUANTITY										REVISIONS				
PARTS LIST			TD10A-A-0	TD10A-B-0											CHANGE NO.	DATE	ENG.
ITEM NO.	DWG. NO.	DESCRIPTION															
29	90-06083-1	SCR PHL H PAN 10-32 X 2-1/2 SST	2	2													
30	D-AD-7005501-1-0	PANEL TRANSFORMER ASSY	1														
31	90-07074	CLAMP CAB-L-TITE #2C1-100 DAKOTA	7	7													
32	90-06075-1	SCR PHL H PAN 10-32 X 3/4 SST	7	7													
33	D-SC-1209850-0-0	BLOCK RETAINER, UNIVERSAL	2	2													
34	9007799	SCR PHL FILL, HD #8-32 x 1 1/2 LG SST	2	2													
35																	
36																	
37																	
38	D-AD-BC10A-7-0	I/O CABLE (W851 TO W851 X 7' LG)	2	2													
39	C-IA-7405553-27-0	FLEX PRINT (W033 TO W033 X 70" LG)	1	1													
40	D-IA-7005459-13-0	W012 TO W0250 X 63-1/2 LG	4	4													
42	B-IA-BC10B-7-0	PDP-10 MARGIN CHECK CABLE	1	1													
MADE BY J. KALAGHER		DATE 5/19/67	TITLE TAPE CONTROL 10A					DRWG. NO. A-PL- TD10A-0-0					REV. LTR.				
CHECKED R.E. PHIPPS		DATE 6/5/67	FOR TD10A-A-0 50 TD10A-B-0 60					ASSY NO D-UA-TD10A-0-0					SHEET 3 OF 5				
ENG <i>J. Kalagher</i>		DATE 6/28/67	G										K				

5)

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS			QUANTITY										REVISIONS					
PARTS LIST			TD10A-A-0	TD10A-B-0												CHANGE NO.	DATE	ENG.
ITEM NO.	DWG. NO.	DESCRIPTION														CHANGE NO.	DATE	ENG.
43	D-MA-728A-0-2	728A POWER SUPPLY	2															
44	B-MD-5111	CHASSIS "C" SIZE		1														
45		117V TURN ON 9' #12-01265	2	2														
46		MALE TO FEMALE TWIST LOCK 25' #70-5427	1	1														
47	90-07238	TAB, SOLDER #T-202-S HEYMAN MFG.	4	4														
48	90-07633	BUSHING, TERM (BRN) #DC-202-2 HEYMAN MFG.	2	2														
49	D-IA-7405347-0-0	FILLER	2	2														
50	D-IA-7405345-0-0	CENTER CLIP	3	3														
51	C-MD-7405343-0-0	CAB SPACER	1	1														
52	D-IA-7405344-0-0	CENTER CLIP	3	3														
53	90-06074-3	SCR PHL TRUSS HD #10-32 x 5/8 LG SST	24	24														
54	90-06077-1	SCR PHL PAN HD #10-32 x 1" SST	12	12														
55		#6 x 5/16LG SELF TAPPING SCR	2	2														
56	A-DC-7406494-0-0	DECAL-TD10A	1	1														
MADE BY J. KALAGHER		DATE 5/24/67	TITLE TAPE CONTROL 10A					DRWG. NO. A-PL- TD10A-0-0					REV. LTR.					
CHECKED R.E. PHIPPS		DATE 6/5/67	FOR TD10A-A-0 50 TD10A-B-0 60					ASSY NO D-UA-TD10A-0-0					SHEET 4 OF 5					
ENG <i>D. Hendon</i>		DATE 6/28/67											K					

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DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

QUANTITY

REVISIONS

PARTS LIST

CHANGE NO. DATE ENG.

ITEM NO.	DWG. NO.	DESCRIPTION	TD10A-A-0	TD10A-E-0																
57	C-IA-7405553-8-0	W033 TO W033 CABLE	1	1																
REF	C-AD-7006149-0-0	CABLE SET TD10	--	--																
MADE BY	DATE	TITLE TAPE CONTROL 10A										DRWG. NO. A-PL- TD10A-0-0					REV. LTR.			
CHECKED	DATE	FOR TD10A-A-0 50 TD10A-E-0 60										ASSY NO D-UA-TD10A-0-0					K			
ENG	DATE											SHEET 5 OF 5								

(7)

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PARTS LIST ITEM NO	MARK END	CONN. TYPE	TO	CONN. TYPE	MARK END	LENGTH	PART NO./DWG. NO
40	Z30	W250	-	W012	C29	63-1/2	7005459-13
40	Z20	W250	-	W012	C28	63-1/2	7005459-13
40	Z21	W250	-	W012	C30	63-1/2	7005459-13
40	Z22	W250	-	W012	C31	63-1/2	7005459-13
57	Z13	W033	-	W033	H32	72	7405553-8

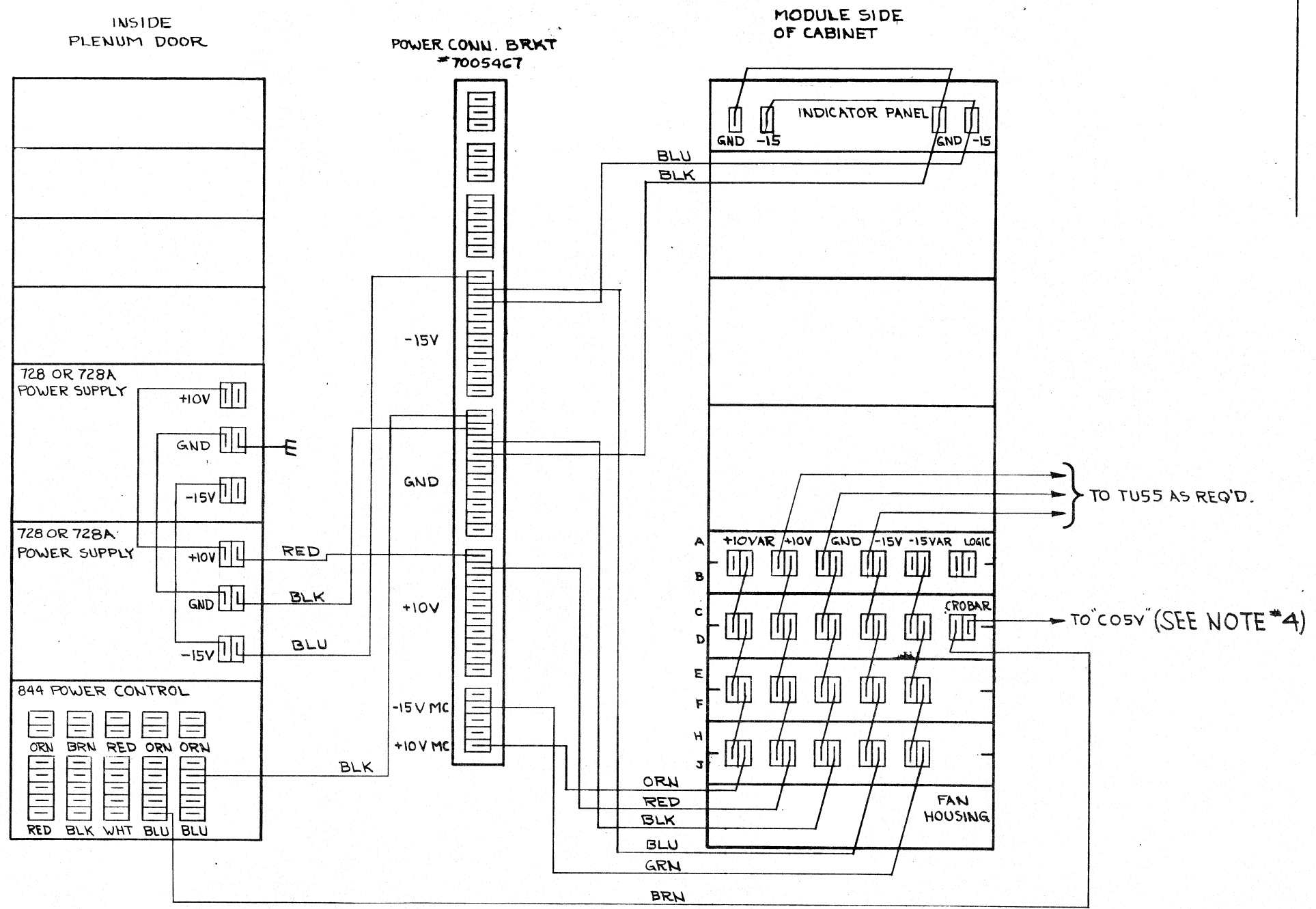
REV.	1
CHANGE NO.	ORIG. TDIO-00007
CHK	1

FIRST USED ON	TDIO	QTY.		DESCRIPTION		PART NO.		ITEM NO.		
PARTS LIST										
UNLESS OTHERWISE SPECIFIED	DRN.	<i>J. Berlin</i>	DATE	1/13/69	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS					
UNLESS OTHERWISE SPECIFIED	CHK'D.	<i>W. Burtch</i>	DATE	1/12/69						
DIMENSION IN INCHES	ENG.	<i>D. Gross</i>	DATE	1/15/69	TITLE CABLE SET TDIO					
TOLERANCES	PROJ. ENG.	<i>D. Gross</i>	DATE	1/15/69						
DECIMALS ± .005	FRACTIONS ± 1/64	ANGLES ± 0°30'	PROD.	<i>M. Lehman</i>	DATE	1/14/69	SIZE CODE			NUMBER
FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS	NEXT HIGHER ASS'Y		D-UA-TDIO-0-0		C/AD		7006149-0-0		REV.	
MATERIAL	--#--		SCALE		--#--		SHEET 1 OF 1			
FINISH	--#--		DIST.							

REV. NUMBER 7006149-0-0
SIZE CODE C/AD

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- NOTES:
1. WIRES TO BE #14AWG STRANDED TEFLON UNLESS OTHERWISE SPECIFIED.
 2. ALL AC WIRING TO BE #14AWG RED/WHT TWISTED PAIRS.
 3. HERTZ (Hz) = CYCLES PER SECOND.
 4. CRO BAR WIRE (TO C05V) IS HAND WIRED. (SEE ALSO D-BS-TD10A-0-1082) CRO BAR BECOMES PWR UP DLY WHEN IT REACHES TU55.



50 & 60 HZ DC WIRING

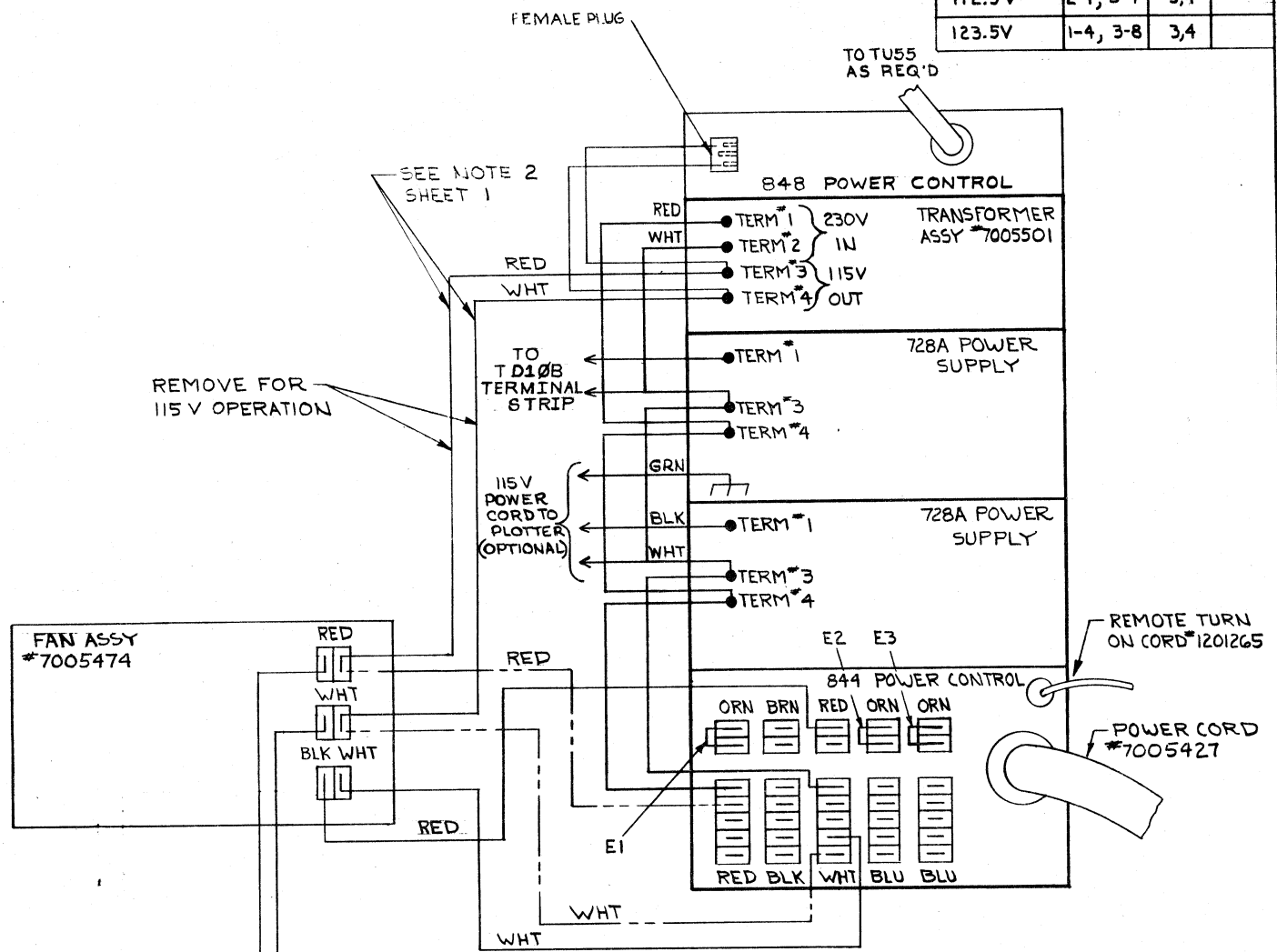
REV.	CHANGE NO.	DATE	BY	DESCRIPTION
1	1	1-11-67		
2	2	1-12-67		
3	3	2-16-68		
4	4	2-16-68		
5	5	2-16-68		
6	6	2-16-68		
7	7	2-16-68		
8	8	2-16-68		

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
DO NOT SCALE DRAWING		DRN: <i>Hultala</i>	DATE: 10-16-67
UNLESS OTHERWISE SPECIFIED		CHK'D: <i>D. Hultala</i>	DATE: 10-18-67
DIMENSION IN INCHES		ENG: <i>D. Hultala</i>	DATE: 11/9/67
TOLERANCES		PROJ. ENG: <i>D. Hultala</i>	DATE: 11/15/67
DECIMALS ± .005	FRACTIONS ± 1/64	PROOF: <i>D. Hultala</i>	DATE: 11/15/67
ANGLES ± 0°30'	FINAL SURFACE QUALITY	FIRST USED ON	
REMOVE BURRS AND BREAK SHARP CORNERS		D-UK-TD10A-0-0	
MATERIAL		SCALE	NONE
FINISH		SHEET	1 OF 2
		TITLE	WIRING, POWER AC & DC 50 & 60 HZ
		SIZE	D
		CODE	IC
		NUMBER	TD10A-0-4
		DIST.	

D-UK-TD10A-0-4

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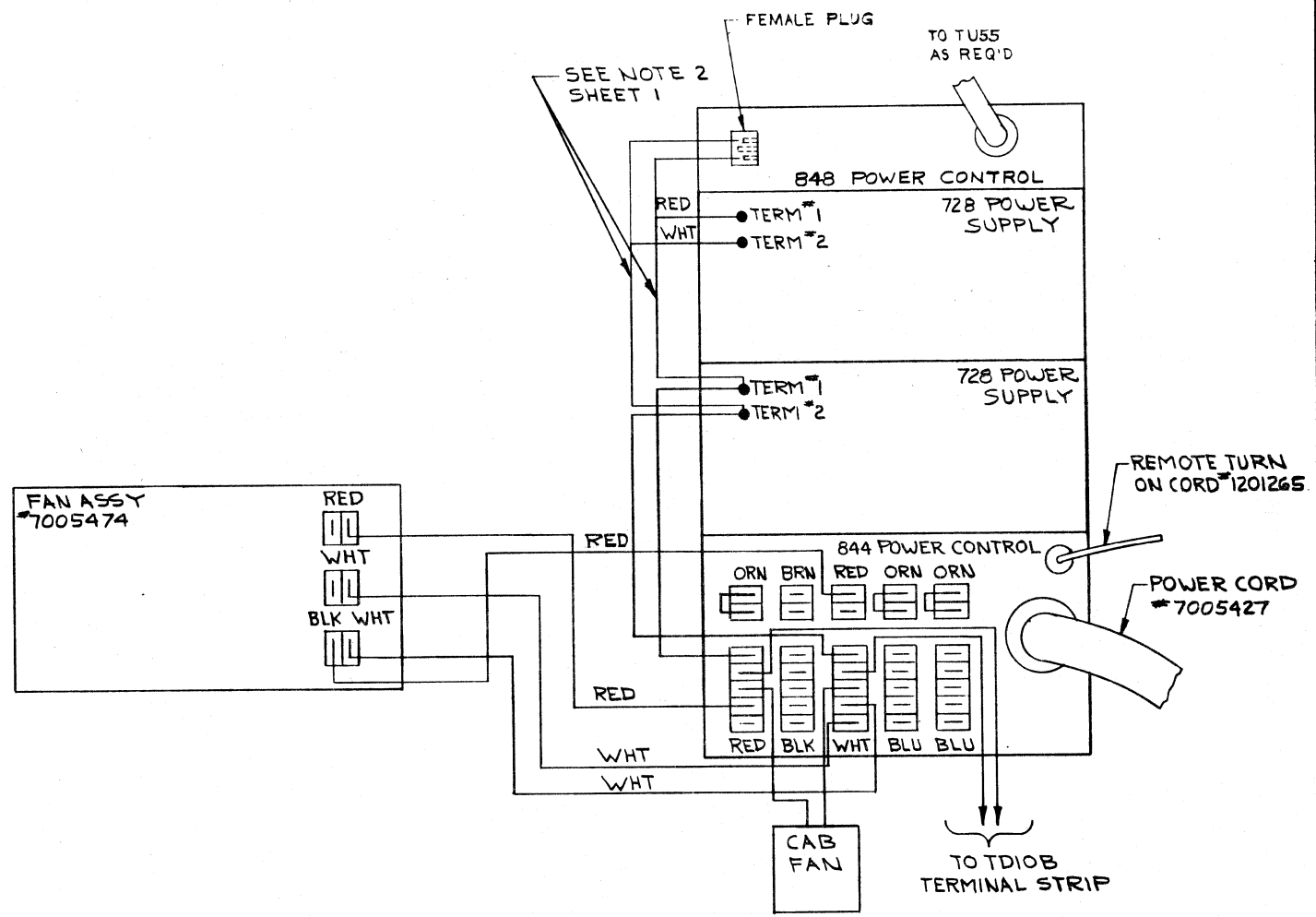
728A JUMPING		
INPUT VOLTAGE	JUMPER	LINE
195 V	1-5	3,4
220 V	1-6	3,4
235 V	2-8	3,4
112.5 V	2-4, 3-7	3,4
123.5 V	1-4, 3-8	3,4



REMOVE FOR 115 V OPERATION

- NOTES:
1. JUMPERS E1, E2, & E3 REMOVED FOR 230V OPERATION.
 2. WIRING SHOWN IN PHANTOM USED FOR 115V OPERATION ONLY.

115V OR 230V 50 Hz A.C. WIRING



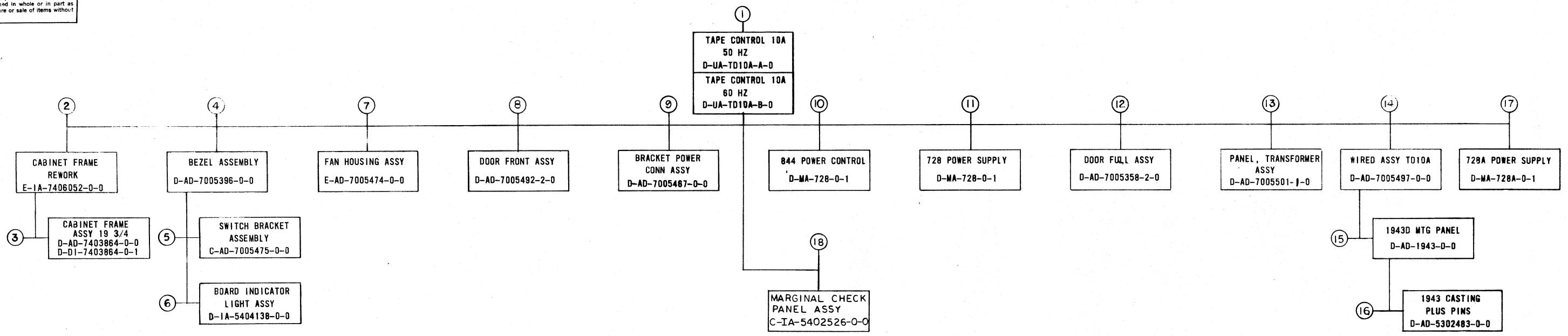
115V 60 Hz A.C. WIRING

REV.	CHANGE NO.
10	1

DO NOT SCALE DRAWING		DRN.	DATE	PARTS LIST	
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES		Hultala	10-17-67	digital EQUIPMENT CORPORATION	
TOLERANCES		CHK'D.	DATE	MAYNARD, MASSACHUSETTS	
DECIMALS ± .005	FRACTIONS ± 1/64	ENG.	DATE	TITLE	
ANGLES ± 0'30"		PROX. EGP.	DATE	WIRING POWER AC & DC 50 & 60 HZ	
FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS		PROX. S	DATE	SIZE	
		PROX. S	DATE	D IC TD10A-0-4	
MATERIAL		FIRST USED ON		NUMBER	
FINISH		D-UA-TD10A-0-0		D	
		SCALE NONE		DIST.	
		SHEET 2 OF 2			



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NOTE:
SEE CONFIGURATION REFERENCE TD10
(D-AR-TD10-0-0, NOTE 1) FOR TUS5
CABLE INFORMATION

REV.	CHG.	NO.	DATE	BY	DESCRIPTION
A	DR	ECO 3105			EXTENSIVE CHANGE TO EVERY SHEET 1 & 2
B	DR	ECO 3163	10-17-67	A. N. S. L.	10-17-67
C	DR	ECO #3274			D-1A-7005459-13-0 WAS D-1A-7406037-13-0 DELETED (0) DWG. NO.
D	DR	ECO #3371			ADDED FOUR PARTS TO FIND NO. 1
E	DR	ECO #3587			ADDED ONE PART TO FIND NO. 1
F	DR	ECO #377			CHG # ADDED #18
G	DR	ECO #377			CHG # ADDED #18
H	DR	ECO #377			CHG # ADDED #18
I	DR	ECO #377			CHG # ADDED #18
J	DR	ECO #377			CHG # ADDED #18
K	DR	ECO #377			CHG # ADDED #18
L	DR	ECO #377			CHG # ADDED #18
M	DR	ECO #377			CHG # ADDED #18
N	DR	ECO #377			CHG # ADDED #18
O	DR	ECO #377			CHG # ADDED #18
P	DR	ECO #377			CHG # ADDED #18
Q	DR	ECO #377			CHG # ADDED #18
R	DR	ECO #377			CHG # ADDED #18
S	DR	ECO #377			CHG # ADDED #18
T	DR	ECO #377			CHG # ADDED #18
U	DR	ECO #377			CHG # ADDED #18
V	DR	ECO #377			CHG # ADDED #18
W	DR	ECO #377			CHG # ADDED #18
X	DR	ECO #377			CHG # ADDED #18
Y	DR	ECO #377			CHG # ADDED #18
Z	DR	ECO #377			CHG # ADDED #18

ASSY NO. D-UA-TD10A-0-0

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED			
UNLESS OTHERWISE SPECIFIED			
DIMENSION IN INCHES			
TOLERANCES			
DECIMALS	FRACTIONS	ANGLES	
± .005	± 1/64	± 0°30'	
FINAL SURFACE QUALITY			
REMOVE BURRS AND BREAK SHARP CORNERS			
MATERIAL		FIRST USED ON	
FINISH		SCALE	
		SHEET 1 OF 2	
DATE		DATE	
5-23-67		6-8-67	
DATE		DATE	
6-8-67		7/17/67	
DATE		DATE	
7/17/67		7/17/67	
DATE		DATE	
7/17/67		7/17/67	
TITLE			
DRAWING INDEX			
LIST TD10A			
SIZE CODE		NUMBER	
DDI		TD10A-0-1	
DIST.		REV.	
		K	

REV. K
ITEM NO. TD10A-0-1
PARTS LIST

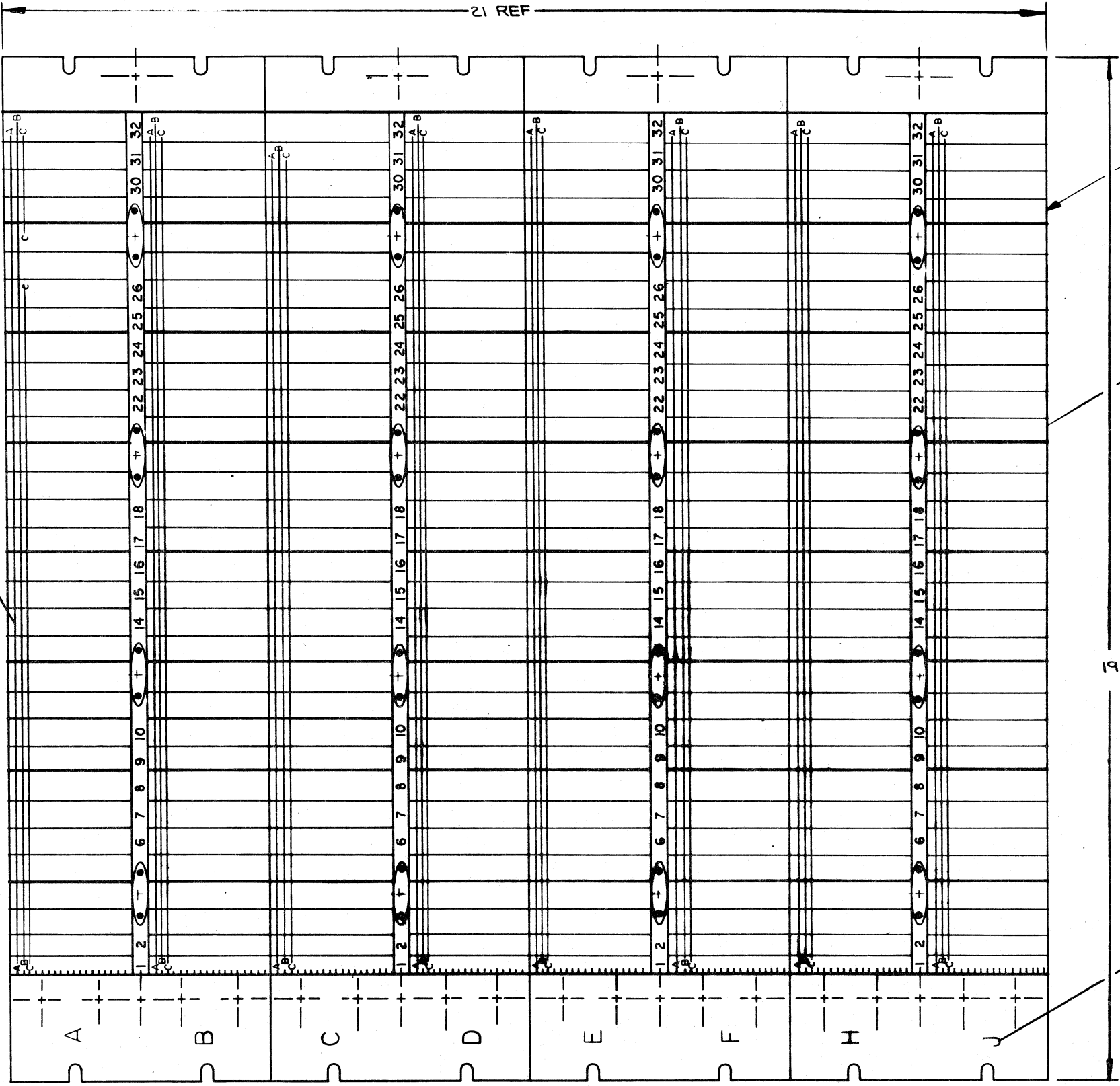
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MECHANICAL			DEPT USAGE			MECHANICAL			DEPT USAGE		
FIND NO.	DESCRIPTION	PART NO.	PROD	CUST	F/C	FIND NO.	DESCRIPTION	PART NO.	PROD	CUST	F/C
1	TAPE CONTROL 10A (50 HZ) TAPE CONTROL 10A (60 HZ) TAPE CONTROL 10A (PL)	D-UA-TD10A-A-0 D-UA-TD10A-B-0 A-PL-TD10A-D-0				12	FULL DOOR ASSY FULL DOOR ASSY (P.L.) FULL DOOR HINGE PIN TOP DOOR SPACER BOTTOM HINGE PIN BOTTOM	D-AD-7005358-2-0 A-PL-7005358-0-0 D-IA-7405741-0-0 B-MD-20400-7 A-MD-7405312-0-0 B-MD-20400-8			
	BRACKET SUPPORT BRACKET DOOR PIVOT SPACER BAR PLATE STRIKER CHASSIS 'D' SIZE TRIM STRIP BOTTOM RIGHT END PANEL	C-MD-7406062-0-0 B-MD-7405861-0-0 A-MD-7405860-0-0 B-MD-7406049-2-0 B-MD-5111 D-MD-7405862-0-0 C-MD-5302486-0-0				13	TRANSFORMER PANEL ASSY TRANSFORMER PANEL ASSY (P.L.) TRANSFORMER PANEL COVER PROTECTION 4 TERM	D-AD-7005501-1-0 A-PL-7005501-1-0 E-IA-7406064-0-0 B-MD-7404721-0-0			
	CHASSIS 'A' SIZE BLOCK RETAINER PANEL BLANK FILLER	B-MD-5111 B-MD-7406047-0-0 C-IA-7406063-0-0				14	WIRED ASSY TD10A WIRED ASSY TD10A (P.L.) VOLTAGE CHAIN	D-AD-7005497-0-0 A-PL-7005497-0-0 1202188-0-0			
	1/0 CABLE (W851 TO W851 X 7' LG)	D-AD-8C10A -7-0				15	1943D MTG PANEL 1943D MTG PANEL (P.L.)	D-AD-1943-D-0 A-PL-1943-D-0			
	FLEX PRINT (W033 TO W033 X 70" LG)	D-IA-7405559-27-0 D-IA-7005459-13-0				16	1943 CASTING PLUS PINS 1943 CASTING PLUS PINS (P.L.) 1943 FRAME CASTING	D-AD-5302483-0-0 A-PL-5302483-0-0 E-MD-1202885-0-0			
	POP-10 MARGIN CHECK CABLE CHASSIS 'C' SIZE 117V TURN ON 9 MALE TO FEMALE TWIST LOCK 25' TD10A I/O DECALS	B-IA-8C10B-7-0 B-MD-5111 12-01265 70-5427 A-DC-7406494-0-0				17	728A POWER SUPPLY 728A POWER SUPPLY (P.L.)	D-MA-728A-0-1 A-PL-728A-0-1			
2	CABINET FRAME REWORK TD10A	E-IA-7406052-0-0				18	MARGINAL CHECK PANEL ASSY PANEL MARGINAL CHECK SCOTCHCAL	C-IA-5402526-0-0 C-MD-5302484-0-0 C-SS-10801			
3	CAB FRAME ASSY 19 3/4 DRAWING INDEX LIST 19 3/4 CAB	E-AD-7403864-0-0 D-DI-7403864-0-1				1 CONT	FILLER CTR CLIP 'U' SHAPE CTR CLIP CAB SPACER	D-IA-7405347-0-0 D-IA-7405348-0-0 D-IA-7405345-0-0 C-MD-7405343-0-0			
4	BEZEL ASSY BEZEL ASSY (P.L.) BEZEL (REWORK) INDICATOR PANEL GLASS SUPPORT BRKT PANEL MTG	D-AD-7005386-0-0 A-PL-7005386-0-0 D-MD-7405729-0-0 D-IA-7405744-0-0 D-IA-7406022-0-0 B-IA-7405929-0-0									
5	SWITCH BRKT ASSY SWITCH BRKT ASSY (P.L.) BRACKET SWITCH 18 PIN RECEPTACLE, REWORK	C-AD-7005475-0-0 A-PL-7005475-0-0 C-MD-7406031-0-0 B-MD-5503964-0-0									
6	BOARD INDICATOR LIGHT ASSY RECEPTACLE (REWORK) ETCH BOARD	D-IA-5404138-0-0 B-MD-H801-0-1-D-2 C-IA-5004137-0-0									
7	FAN HOUSING ASSY FAN HOUSING ASSY (P.L.) HOUSING FAN PANEL FRONT FAN COVER PROTECTION 4 TERM SCREEN FAN	E-AD-7005474-0-0 A-PL-7005474-0-0 D-MD-7406032-0-0 D-MD-7406030-0-0 B-MD-7404721-0-0 C-MD-7404881-0-0									
8	FRONT DOOR ASSY FRONT DOOR ASSY (P.L.) FRONT DOOR HINGE PIN TOP DOOR SPACER BOTTOM HINGE PIN BOTTOM	D-AD-7005492-2-0 A-PL-7005492-0-0 D-IA-7406013-0-0 B-MD-7405865-0-0 A-MD-7405312-0-0 B-MD-20400-8									
9	BRACKET POWER CONN ASSY BRACKET POWER CONN ASSY (P.L.) BRACKET, POWER CONN SCOTCHCAL BRAND FILM DECALS	D-AD-7005467-0-0 A-PL-7005467-0-0 D-MD-7406024-0-0 A-SS-7406051-0-0									
10	844 POWER CONTROL 844 POWER CONTROL(P.L.)	D-IA-844-0-1 A-PL-844-0-1									
11	728 POWER SUPPLY 728 POWER SUPPLY (P.L.)	D-MA-728-0-1 A-PL-728-0-1									

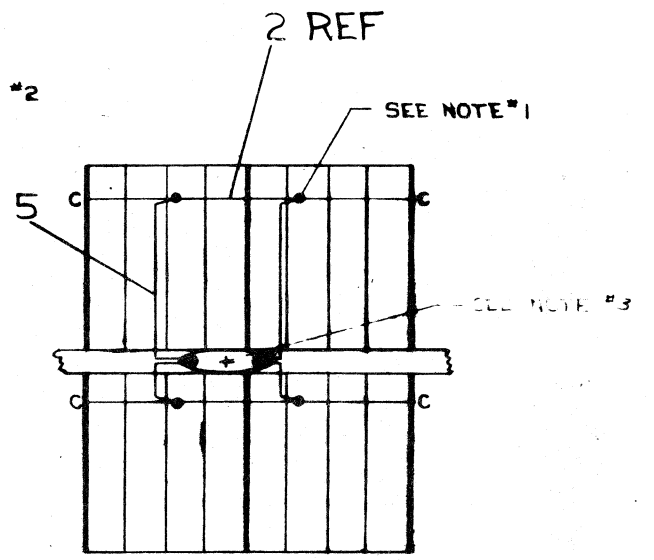
ELECTRICAL			DEPT USAGE			ELECTRICAL			DEPT USAGE		
FIND NO.	DESCRIPTION	PART NO.	PROD	CUST	F/C	FIND NO.	DESCRIPTION	PART NO.	PROD	CUST	F/C
1	TAPE CONTROL 10A (50 HZ) TAPE CONTROL 10A (60 HZ) TAPE CONTROL 10A WIRE LIST MODULE LIST I/O BUS INTERFACE MANUAL MODE MAINTENANCE BUFFER REGISTER SHIFT REGISTER READ WRITE REGISTERS MARK TRACK DECODER COMMAND DECTAPE CONTROL LP/ERR DATA CONTROL TIMING ENABLE FLIP FLOPS STATUS READ WRITE AMPLIFIERS POWER WIRING AC & DC CABLE SET TDIO	A-ML-TD10A-A A-ML-TD10A-B D-UA-TD10A-0-0 K-WL-TD10A-0-3 D-MU-TD10A-0-2 D-BS-TD10A-0-10B D-BS-TD10A-0-MNT D-BS-TD10A-0-B D-BS-TD10A-0-SH D-BS-TD10A-0-RW D-BS-TD10A-0-MK D-BS-TD10A-0-COM D-BS-TD10A-0-ERR D-BS-TD10A-0-DC D-BS-TD10A-0-T D-BS-TD10A-0-ENB D-BS-TD10A-0-ST D-BS-TD10A-0-RWA D-IC-TD10A-0-4 C-AD-7006149-0-0 D-MA-844-0-1 B-CS-844-0-1				10	844 POWER CONTROL CIRCUIT SCHEMATIC				
	728 POWER SUPPLY CIRCUIT SCHEMATIC	D-MA-728-0-1 B-CS-728-0-1				11	728 POWER SUPPLY CIRCUIT SCHEMATIC				
	728A POWER SUPPLY CIRCUIT SCHEMATIC	D-MA-728A-0-1 B-CS-728A-0-1				17	728A POWER SUPPLY CIRCUIT SCHEMATIC				
	CIRCUIT SCHEMATIC	B-CS-1943-0-1				18	CIRCUIT SCHEMATIC				
1 CONT	TDIOA ENGINEERING SPEC TDIOA ACCEPTANCE TEST PROCEDURE TDIOA ACCEPTANCE TEST SPEC TDIOA MANUFACTURING CHECKOUT & TEST PROC. TDIOA ACCEPTANCE TEST PROC. TDIOA INSTALLATION DATA TDIOA MANUFACTURING CHECKOUT & TEST SPEC TDIOA SHIPPING LIST	A-SP-TDIOA-0-14 A-SP-TDIOA-0-15 A-SP-TDIOA-0-16 A-SP-TDIOA-0-17 A-SP-TDIOA-0-18 A-SP-TDIOA-0-19 A SP TDIOA 0 20 A-SP-TDIOA-0-21									
	TDIOA RECOMMENDED SPARE PARTS LIST TDIOA SYSTEM SPEC TDIOD PROG SPEC	A-SP-TDIOA-0-23 A-SP-TDIOA-0-24 A-SP-TDIOA-0-25									

REV CHANGE NO.	11	UNLESS OTHERWISE SPECIFIED		DRN. <i>3/20/67</i>	DATE <i>6/20/67</i>	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	TITLE DRAWING INDEX LIST TDIOA
		UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES		CHK'D. <i>RE</i>	DATE <i>7/15/67</i>		
		TOLERANCES DECIMALS FRACTIONS ANGLES ± .005 ± 1/64 ± 0°30'		ENG. <i>2/19/67</i>	DATE <i>2/19/67</i>		
		FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS		PROJ. ENG. <i>2/19/67</i>	DATE <i>2/19/67</i>		
MATERIAL <i>1/1</i>		FIRST USED ON TDIOA		SCALE <i>1/1</i>	SIZE CODE	NUMBER	REV <i>OK</i>
FINISH <i>1/1</i>		SHEET <i>2</i> OF <i>2</i>		DIST.			

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NOTES:
 1. CONNECTIONS ON ITEMS #2 & #5 TO BE SOLDERED AND LOCATED AT MINIMUM PRACTICAL HEIGHT ABOVE BLOCK.
 2. USE YELLOW WIRE (ITEM #6) FOR MACHINE WRAPPED & BLUE WIRE (ITEM #7) FOR HAND WRAPPED WIRING.
 3. ALL CONN BLOCKS TO BE GROUNDED TO GND LUGS AS SHOWN.



DETAIL A
 16 PLACES
 SEE NOTE #3

REV. NO.	REV.
ECO # 3116	A
ADDED GND. DETAIL A & NOTES #1, 2, & 3	
Date: 10-25-67	
By: [Signature]	


DO NOT SCALE DRAWING		DRN. [Signature]	DATE [Date]
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES		CHK'D [Signature]	DATE [Date]
TOLERANCES		ENG. [Signature]	DATE [Date]
DECIMALS ± .005	FRACTIONS ± 1/64	PROJ. ENG. [Signature]	DATE [Date]
ANGLES ± 0°30'		PROD. [Signature]	DATE [Date]
FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS		FIRST USED ON	
MATERIAL		D-UA-TDIOA-0-0	
FINISH		SCALE NONE	
SHEET 1 OF 1		CODE AD	SIZE D
		NUMBER 7005497-0-0	REV. A

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
	digital EQUIPMENT CORPORATION		
	MAYNARD, MASSACHUSETTS		
	TITLE WIRED ASSEMBLY		

DRWG NO
K-WL-TDIØA-Ø-3

REVLTR
L

REVISIONS			
REV LTR	ECO NO	DATE	ENG
A	1	1-24-68	ADD
B	3	2-13-68	ADD
C	5	2-26-68	ADD
D	13	3-19-68	ADD
E	17	3-29-68	ADD
F	TDIØA-00003	8-29-68	ADD
H	TDIØA-00005	11-12-68	ADD
J	00009	6/9/69	ADD
K	TDIØA-00012	8-25-69	ADD
L	TDIØA-00016	7-20-71	ADD

DRAWN <i>Ray Robinson</i>	DATE 12-15-67		TITLE WIRE LIST		
CHECKED <i>W. H. ...</i>	DATE 12-15-67		FOR TAPE # FILE *		
ENG <i>D. Gross</i>	DATE 1/9/68		SIZE	CODE	DWG. NO.
PROJ. ENG <i>D. Gross</i>	DATE 1/9/68		K WL		TDIØA-Ø-3
PROD <i>M. ...</i>	DATE 1-8-68	ASSY NO	REV LTR	L	
SCALE <i>H</i>		SHEET	OF	DIST.	

PARTS LIST			DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS			REVISIONS		
PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.	CHANGE NO.	DATE	ENG.	
		2	B152 BINARY TO OCTAL DECODER		A-1	1/24/68	DAZ	
		2	B156 DIODE GATE		B-3	2-13-68	DAZ	
		17	B163 DIODE GATE		C-5	2/26/68	DAZ	
		2	B685 DIODE GATE DRIVER		D-31	5/14/68	DAZ	
		1	G853 MOTION & SELECTION CRT.		E-TDIOA-00005	11/12/68	DAZ	
		5	G882 MANCHESTER READ WRITE AMP.		F-00009	6/9/67	DAZ	
		19	R002 DIODE NETWORK		H-00016	7/20/71	DAZ	
		12	R107 INVERTER					
		13	R111 DIODE GATE					
		8	R113 DIODE GATE					
		9	R141 DIODE GATE					
		1	R151 OCTAL DECODER					
		9	R201 FLIP FLOP					
		23	S202 DUAL FLIP FLOP					
		8	S203 TRIPLE FLIP FLOP					
		26	S205 DUAL FLIP FLOP					
MADE BY <i>R. Richant</i>		DATE 8-15-67	TITLE MODULE PARTS LIST		SIZE A	CODE PL	NUMBER TDIOA-0-2	REV. H
CHECKED <i>[Signature]</i>		DATE 9-15-67	FOR		ASSY. NO. D-MU-TDIOA-Q-2		SHEET 1 OF 4	
ENG. <i>[Signature]</i>		DATE 11/17/67						

(17) DEC FORM NO. DRA 109

PARTS LIST		DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS				REVISIONS		
PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.	CHANGE NO.	DATE	ENG.	
		4	R302 DELAY (ONE SHOT)					
		4	R303 INTERGRATING ONE SHOT					
		1	R401 CLOCK					
		9	R602 PULSE AMPLIFIER					
		11	R603 PULSE AMPLIFIER					
		1	W005 CLAMPED LOAD					
		4	W012 INDICATOR CABLE CONN.					
		2	W023 CONNECTOR BOARD					
		2	W032 DEC TAPE SIGNAL CONN.					
		2	W033 CABLE CONN.					
		6	W107 I/O BUS RECEIVER					
		1	W520 COMPARATOR					
		1	W532 DIFFERENCE AMPLIFIER					
		1	W533 RECTIFYING SLICER					
		1	W808 RELAY					
		8	W851 I/O CONNECTOR					
MADE BY <i>R. Robichaud</i>		DATE 8-15-67	TITLE MODULE PARTS LIST		SIZE A	CODE PL	NUMBER TD10A-0-2	REV. H
CHECKED <i>Maugerault</i>		DATE 9-15-67	FOR		ASSY. NO. D-MU-TD10A-0-2		SHEET 2 OF 4	
ENG. <i>A. Gross</i>		DATE 11/17/67						

(18)

DEC FORM NO.
DRA 109

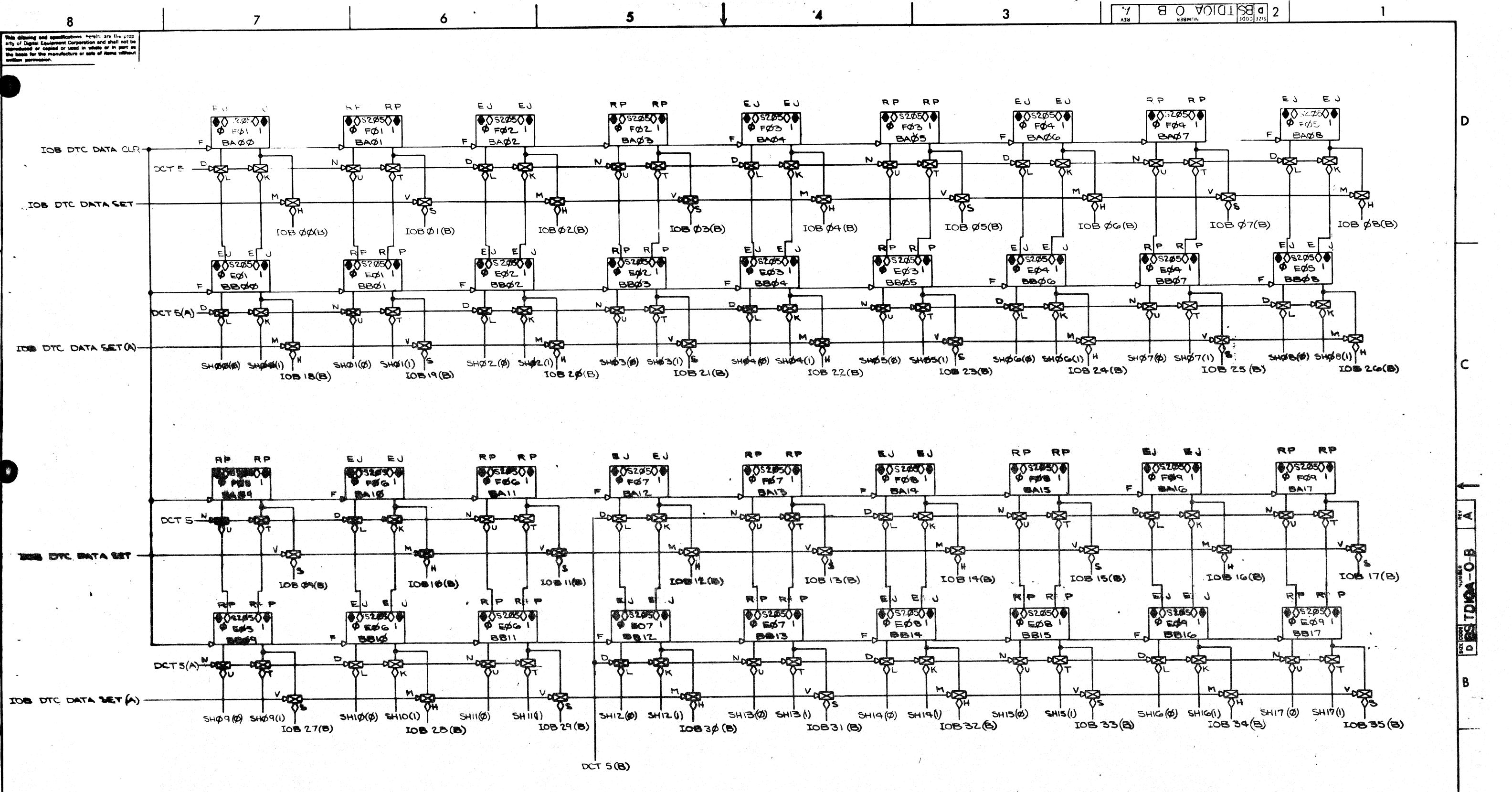
PARTS LIST		DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS				REVISIONS		
PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.	CHANGE NO.	DATE	ENG.	
		4	W25Ø INDICATOR CABLE CONN.					
		2	G7Ø5 DECTAPE JUMPER					
		1	G7Ø6 DECTAPE ATTENUATOR					
		1	B214 TRIPLE FLIP-FLOP					
MADE BY <i>R. Richard</i>	DATE 8-15-67	TITLE MODULE PARTS LIST		SIZE A	CODE PL	NUMBER TD10A-0-2	REV. H	
CHECKED <i>P. Sargent</i>	DATE 9-15-67	FOR		ASSY. NO. D-MU-TDICA-0-2		SHEET 3 OF 4		
ENG. <i>D. Gross</i>	DATE 11/17/67							

(19) DEC FORM NO. DRA 109

PARTS LIST		DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS				REVISIONS		
PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.	CHANGE NO.	DATE	ENG.	
		1	B152 BINARY TO OCTAL DECODER					
		1	B163 DIODE GATE					
		1	R002 DIODE NETWORK					
		3	R302 DELAY (ONE SHOT)					
		2	R602 PULSE AMPLIFIER					
		1	R613 PULSE AMPLIFIER					
		1	S107 INVERTER					
		3	S203 TRIPLE FLIP FLOP					
		1	S205 DUAL FLIP FLOP					
		1	W012 INDICATOR CABLE CONN.					
		1	W028 CONNECTOR CABLE					
		2	W600 NEG. LEVEL AMPLIFIER					
MADE BY <i>Kay Robinson</i>		DATE 10-25-67	TITLE MODULE PARTS LIST (PLOTTER)		SIZE A	CODE PL	NUMBER TD10A-0-2	REV. H
CHECKED <i>J. Baggett</i>		DATE 9-15-67	FOR		ASSY. NO. D-MU-TD10A-0-2		SHEET 4 OF 4	
ENG. <i>D. Grove</i>		DATE 11/17/67						

(20)

DEC FORM NO.
DRA 109



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2
 B
 BS
 TD
 10A
 0
 B

REV.	A
CHANGE NO.	31
DATE	5-15-67
BY	W. J. ...

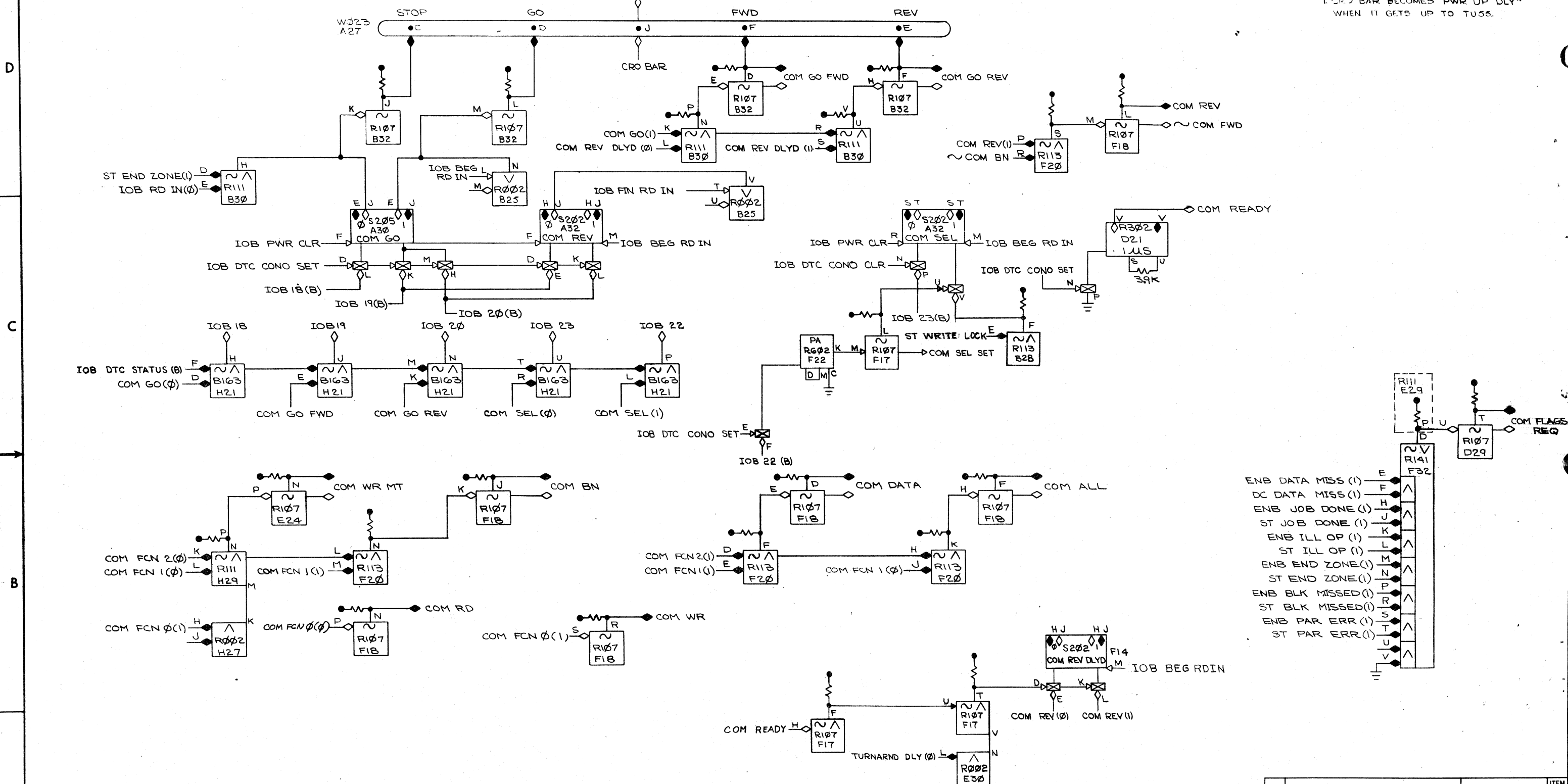
UNLESS OTHERWISE SPECIFIED
 DIMENSION IN INCHES
 TOLERANCES
 DECIMALS FRACTIONS ANGLES
 ± .005 ± 1/64 ± 0°30'
 FINAL SURFACE QUALITY
 REMOVE BURRS AND BREAK SHARP
 CORNERS

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
DRN	R. Lock	DATE	5/15/67
CHK'D	W. J. ...	DATE	6-22-67
ENG	W. J. ...	DATE	11/13/67
PROJ. ENG.	W. J. ...	DATE	11/13/67
PROD.	W. J. ...	DATE	11-15-67
FIRST USED ON		1) UA-TD10A-0-0	
FINISH		SCALE	
SHEET 1		OF 1	
TITLE		BUFFER REGISTER	
SIZE CODE		D B S T D 10 A - 0 - B	
NUMBER		1	
REV.		A	

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* NOTE 1
PWR UP DLY

NOTE:
"CRO BAR" BECOMES "PWR UP DLY"
WHEN IT GETS UP TO TU35.



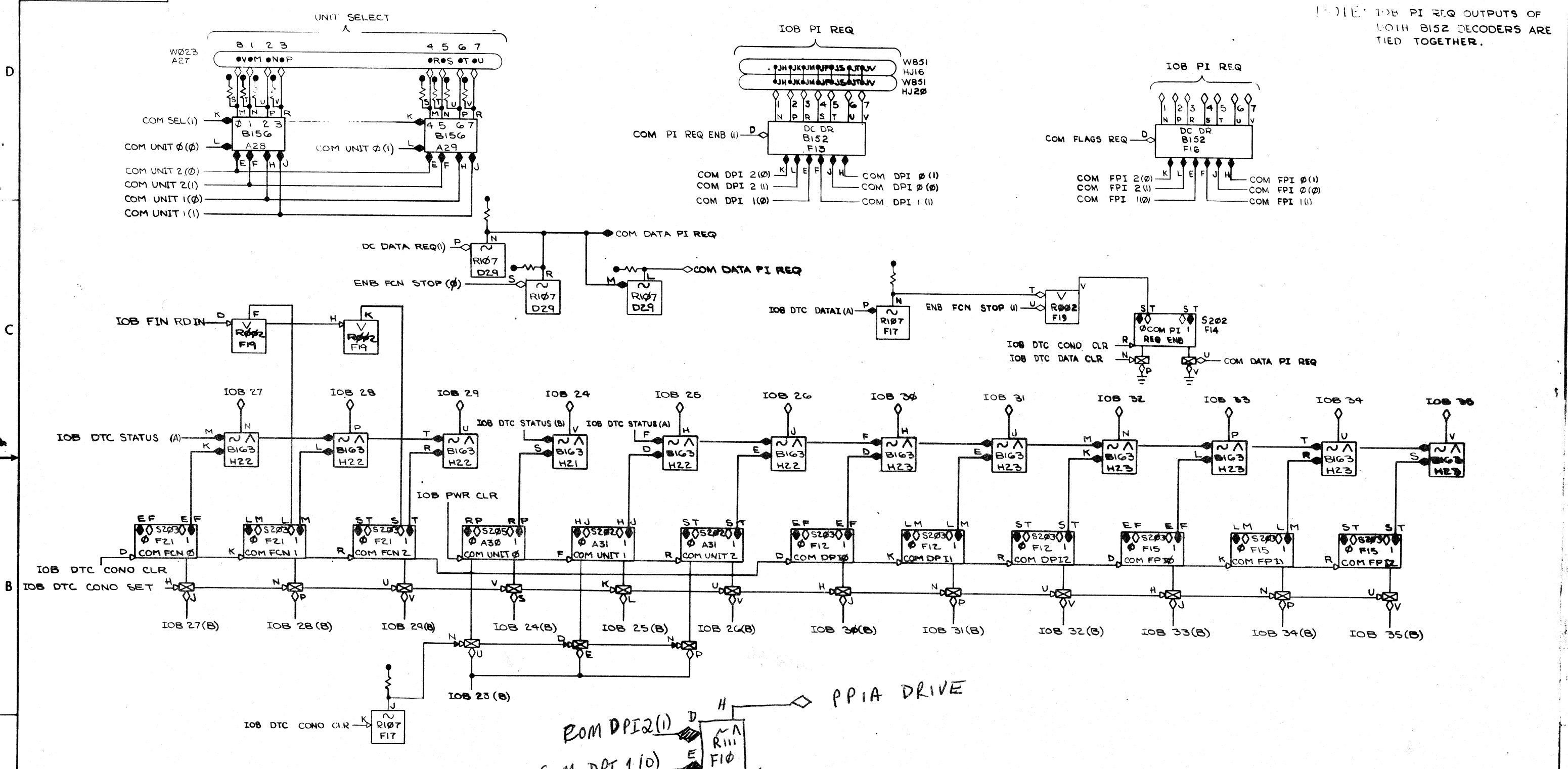
QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
COMMAND DECTAPE CONTROL #1			
UNLESS OTHERWISE SPECIFIED		UNLESS OTHERWISE SPECIFIED	
DIMENSION IN INCHES		DIMENSION IN INCHES	
TOLERANCES		TOLERANCES	
DECIMALS	FRACTIONS	ANGLES	ANGLES
± .005	± 1/64	± 0°30'	± 0°30'
REMOVE BURRS AND BREAK SHARP CORNERS			
MATERIAL		MATERIAL	
FINISH		FINISH	
SCALE		SCALE	
SHEET 1 OF		SHEET 1 OF	
DIST.		DIST.	

REV.	CHANGE NO.	DATE	BY	CHK'D.
A				
B				
C				
D				
E				
F				
G				
H				
I				
J				
K				
L				
M				
N				
O				
P				
Q				
R				
S				
T				
U				
V				
W				
X				
Y				
Z				

DEC FORM 102

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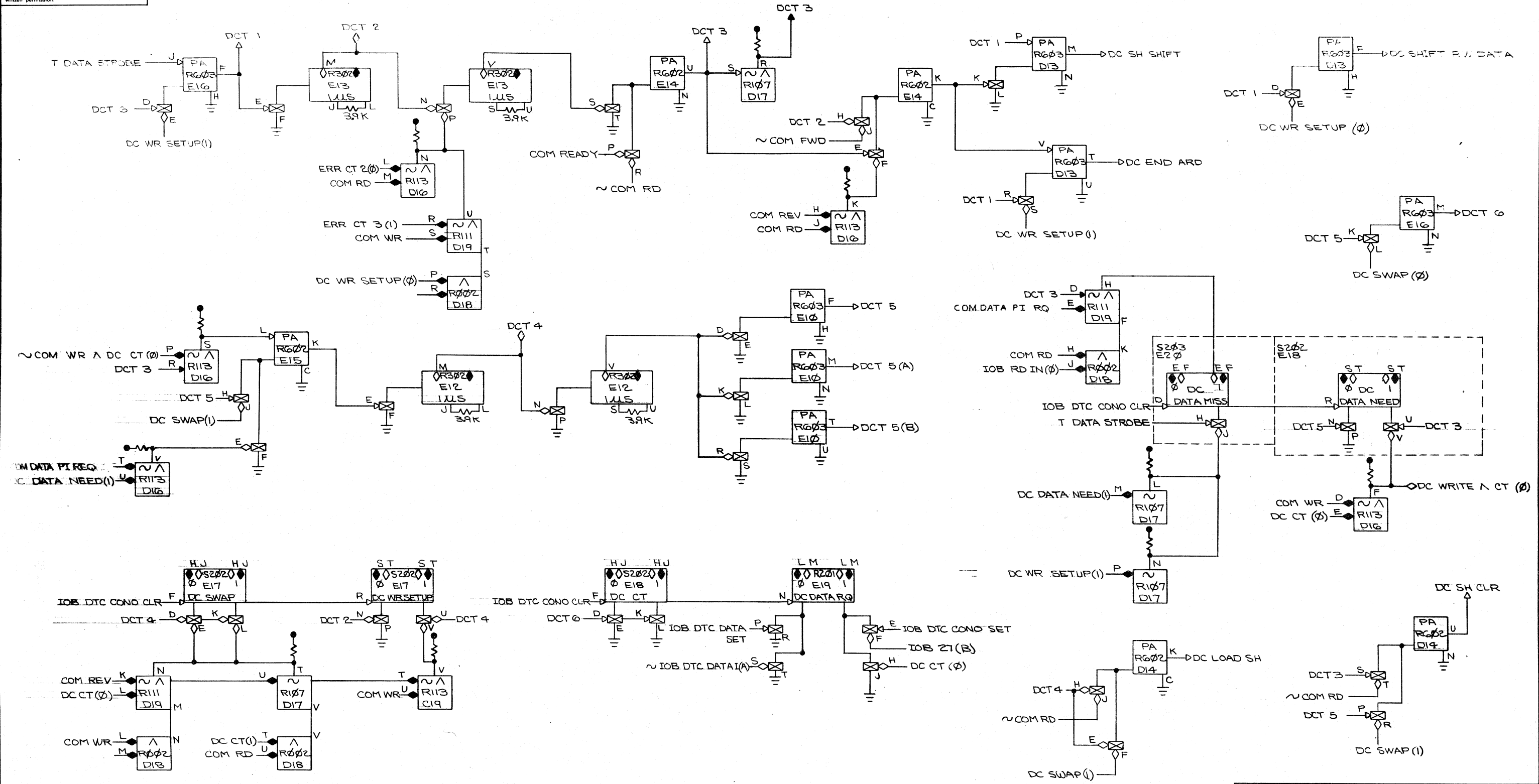
NOTE: THE PI REQ OUTPUTS OF BOTH B152 DECODERS ARE TIED TOGETHER.



REV	NO	DATE	BY
A	1	5/24/67	R. Cook
B	1	6/27/67	R. Cook
C	1	11/16/67	R. Cook
D	1	11/16/67	R. Cook
E	1	11/16/67	R. Cook

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED	DRN: R. Cook	DATE: 5/24/67	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
UNLESS OTHERWISE SPECIFIED	CHK'D: R. Cook	DATE: 6/27/67	
UNLESS OTHERWISE SPECIFIED	ENG: R. Cook	DATE: 11/16/67	
UNLESS OTHERWISE SPECIFIED	PROJ. ENG: R. Cook	DATE: 11/16/67	
UNLESS OTHERWISE SPECIFIED	PROD: R. Cook	DATE: 11/16/67	TITLE COMMAND DECTAPE CONTROL * 2
MATERIAL	FIRST USED ON	U-UA-1DIOA-0-0	
FINISH	SCALE	SIZE CODE: DBS TDIOA-0-COM2	REV. A
	SHEET 1	DIST.	

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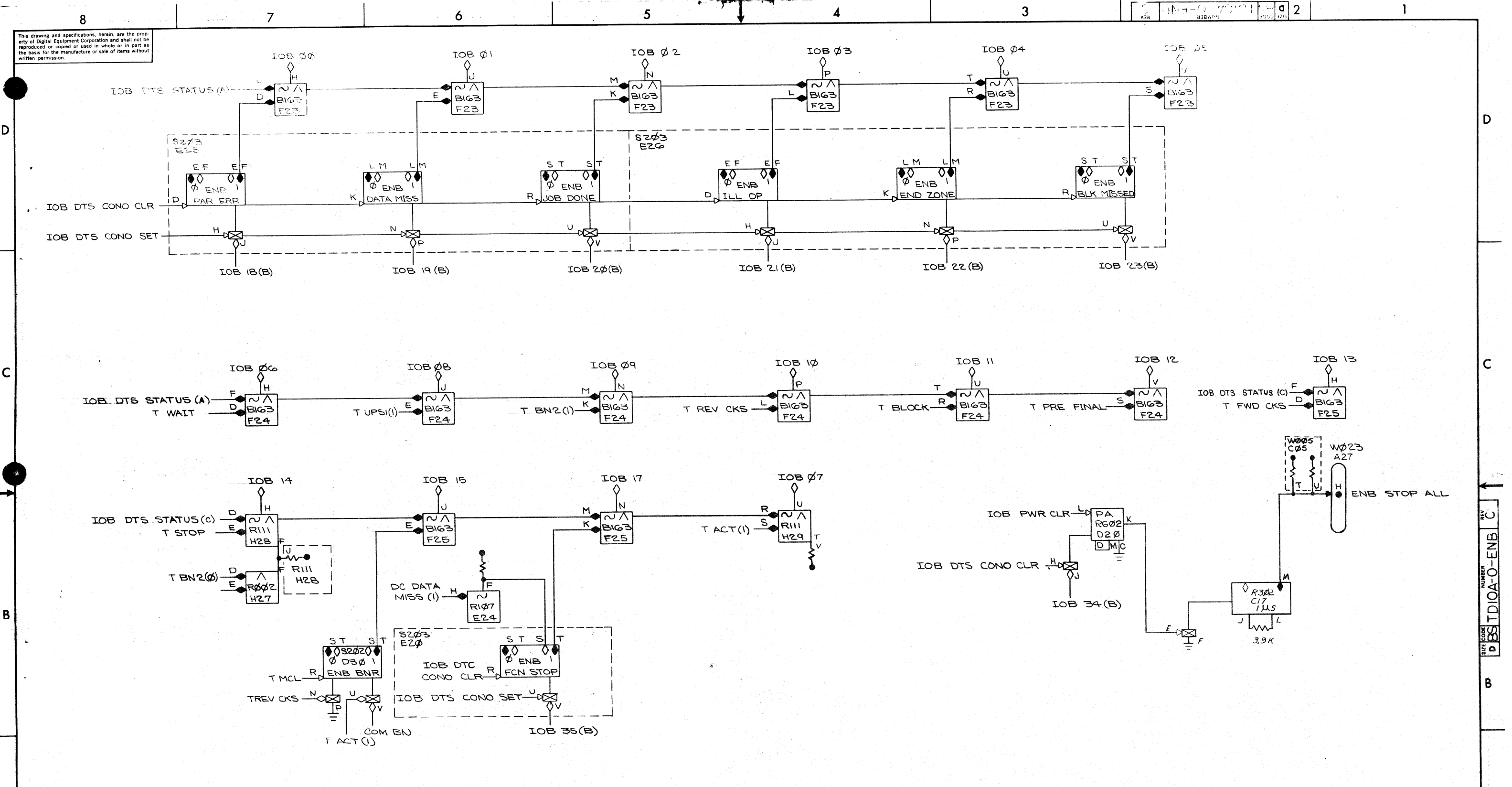
REV.	NO.	DATE	BY
A	31	5/20/68	J. J. ...

DEC FORM NO. DRD 102

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED			
DIMENSION IN INCHES			
TOLERANCES			
DECIMALS FRACTIONS ANGLES			
± .005 ± 1/64 ± 0°30'			
FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS			
MATERIAL			
FINISH			
UNLESS OTHERWISE SPECIFIED			
DRN.	DATE	digital EQUIPMENT CORPORATION	
CHK'D	DATE	MAYNARD MASSACHUSETTS	
ENG.	DATE	TITLE	
PROJ. ENG.	DATE	DATA CONTROL	
PROD.	DATE	SIZE CODE	
FIRST USED ON	DATE	NUMBER	
D-0A-TD10A-0-0	12-15-67	D BS TD10A-0-DC	
SCALE		REV.	
SHEET 1 OF 1		A	

REV. A
PARTS LIST
D BS TD10A-0-DC
NUMBER
SIZE CODE

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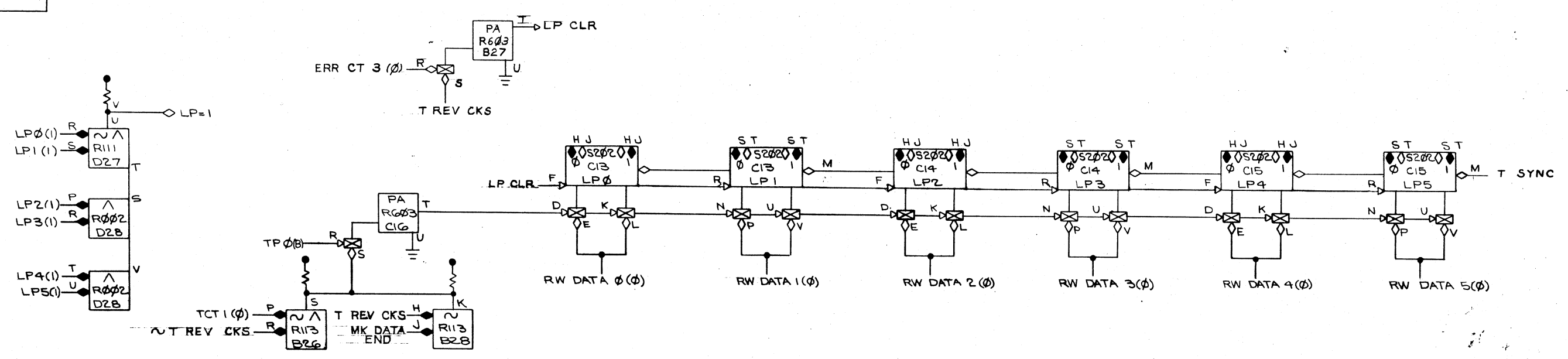


REV.	CHG. NO.	DATE	BY	APP.
A	31	5/24/67	ECO	
B		5/24/68	B. Cabot	
C		7/17/67	K. J. ...	
D		7/17/67	...	

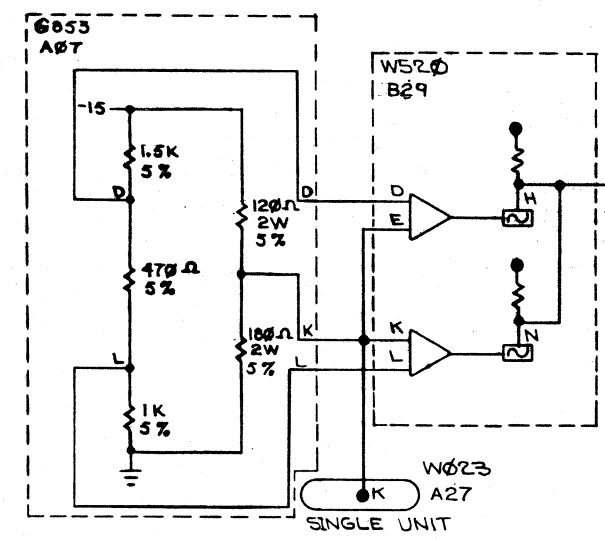
QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED			
DRN: <i>ECOC</i> DATE: <i>5/24/67</i>			
CHK'D: <i>...</i> DATE: <i>...</i>			
ENG: <i>...</i> DATE: <i>11/13/67</i>			
PRJ. ENG. <i>...</i> DATE: <i>11/13/67</i>			
PRD. <i>...</i> DATE: <i>...</i>			
FIRST USED ON: D-11A-TDIOA-O-C			
SCALE: SHEET 1 OF 1			
TITLE: ENABLE FLIP FLOPS			
MATERIAL:			
FINISH:			
UNLESS OTHERWISE SPECIFIED			
DIMENSION IN INCHES			
TOLERANCES			
DECIMALS FRACTIONS ANGLES			
± .005 ± 1/64 ± 0°30'			
FINAL SURFACE QUALITY			
REMOVE BURRS AND BREAK SHARP CORNERS			
SIZE CODE: D			
NUMBER: BS1TDIOA-O-ENB			
REV: C			

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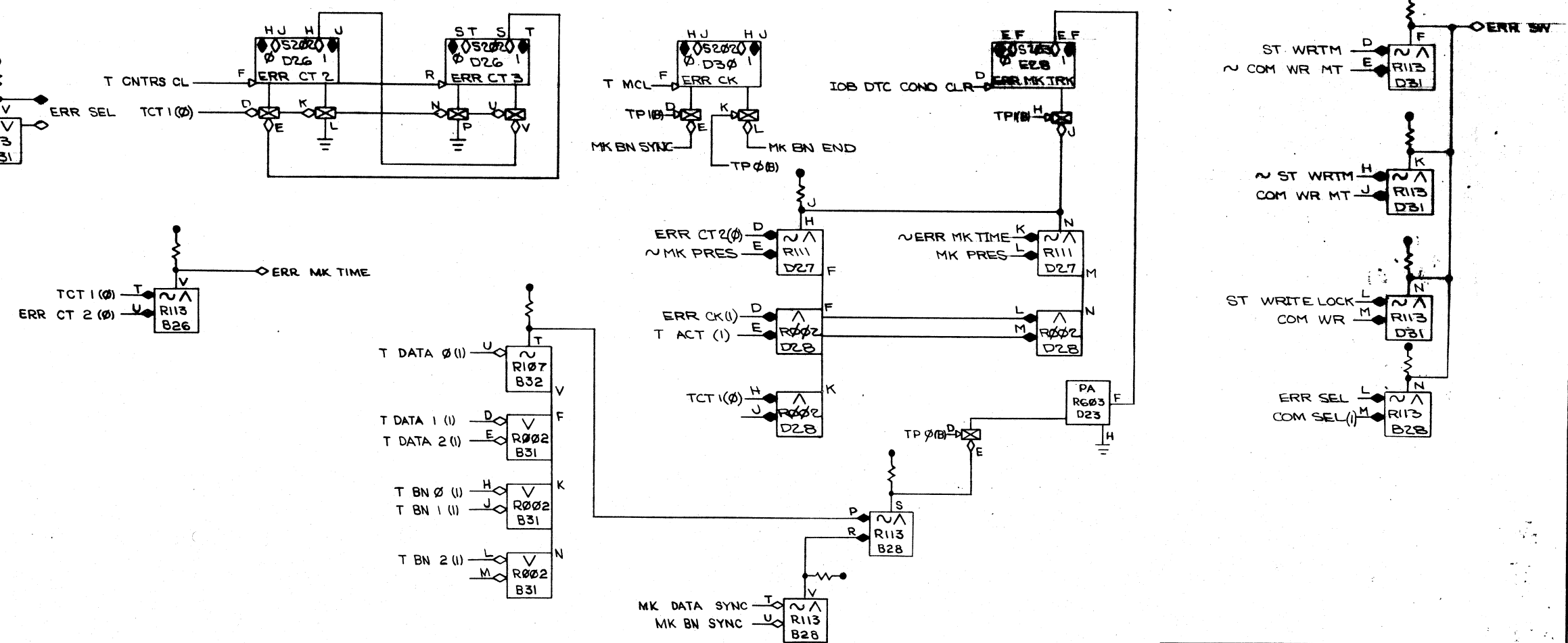
D



C



B

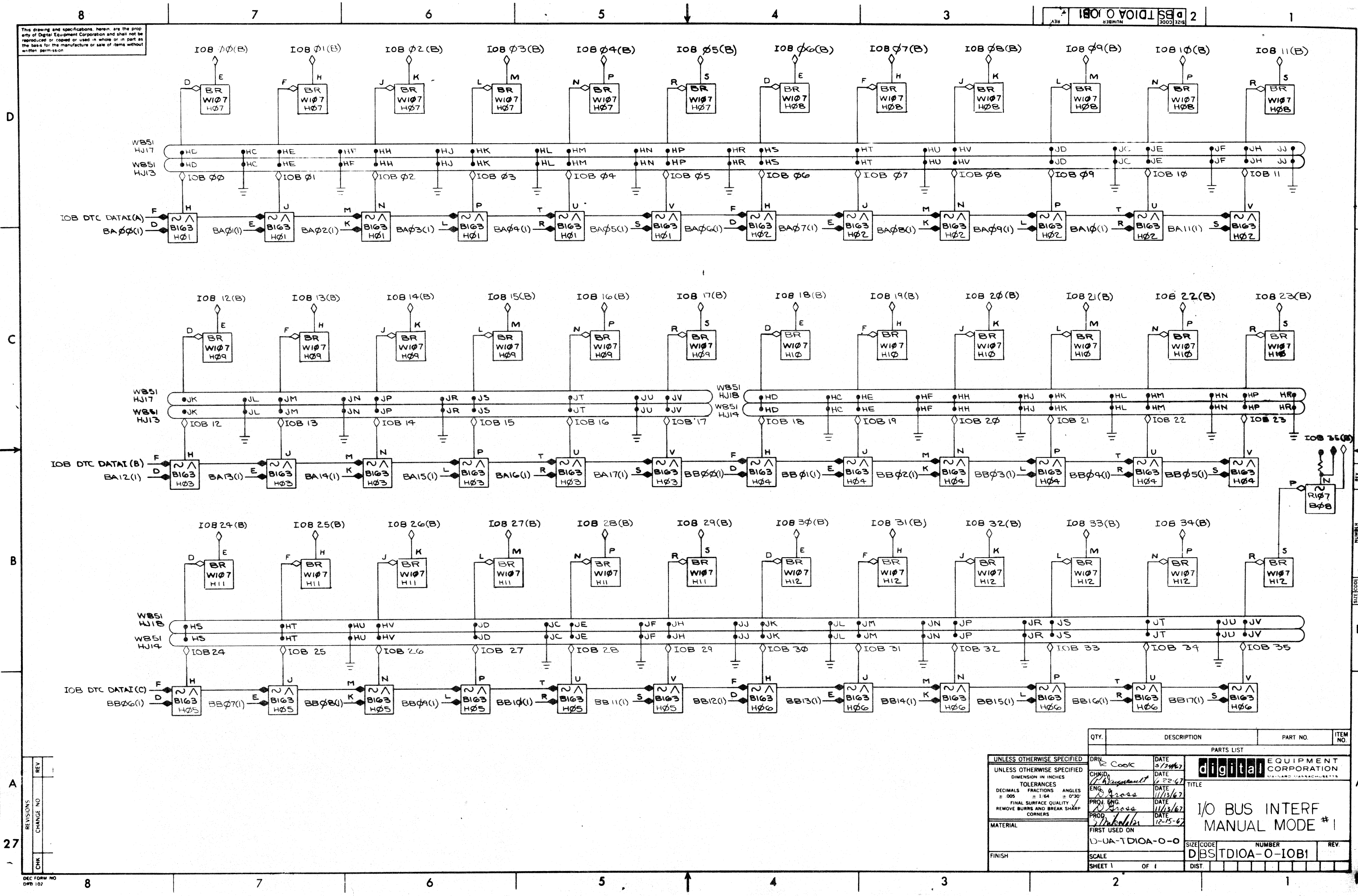


A

REV	CHANGE NO.	DATE	BY	CHK
1	A	11/13/62
2	B	11/13/62
3	C	11/13/62
4	D	11/13/62
5	E	11/13/62
6	F	11/13/62	...	...
7	G	11/13/62	...	...
8	H	11/13/62	...	...

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED			
DIMENSION IN INCHES			
TOLERANCES			
DECIMALS	FRACTIONS	ANGLES	
± .005	± 1/64	± 0°30'	
FINAL SURFACE QUALITY			
REMOVE BURRS AND BREAK SHARP CORNERS			
MATERIAL		FIRST USED ON	
FINISH		SCALE	
SHEET 1		OF 1	
DRN Code		DATE 11/13/62	
CHK'D		DATE 11/13/62	
ENG		DATE 11/13/62	
PROJ. ENG.		DATE 11/13/62	
PROD.		DATE 11/13/62	
TITLE		LP/ERR	
SIZE CODE		NUMBER	
D31		ID10A-0-ERR	
DIST.			

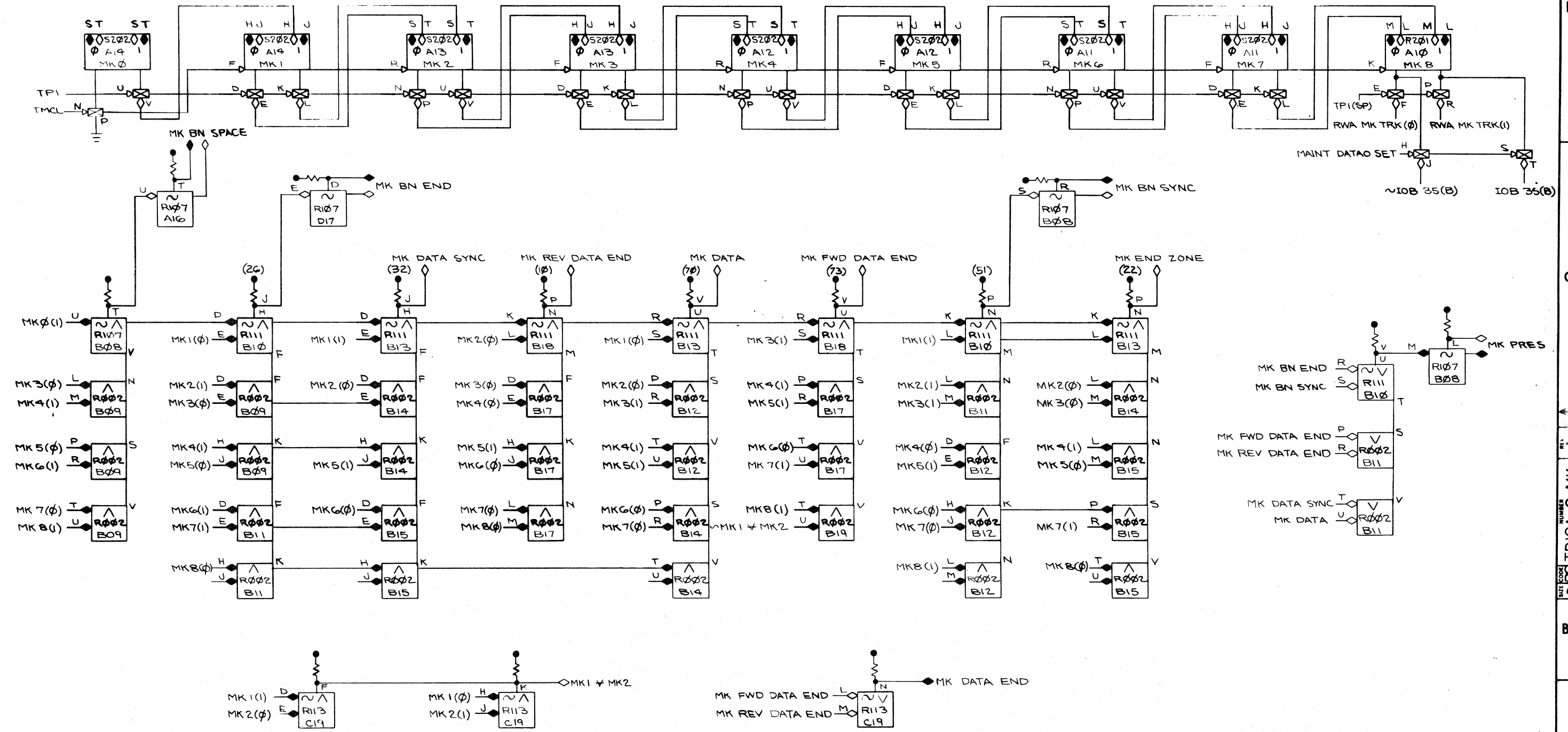
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REV	CHG	NO

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED			
DRW: Cook DATE: 5/24/67			
CHG: W. H. G. DATE: 6/22/67			
ENG: A. G. DATE: 11/13/67			
PROJ. ENG. DATE: 11/13/67			
PROD. DATE: 12-5-67			
FIRST USED ON: U-UA-7DIOA-0-0			
MATERIAL:		SCALE: SHEET 1 OF 1	
FINISH:		SIZE CODE: DBS1TDIOA-0-IOB1	
digital EQUIPMENT CORPORATION TITLE: I/O BUS INTERF. MANUAL MODE #1			
REV.:		REV.:	

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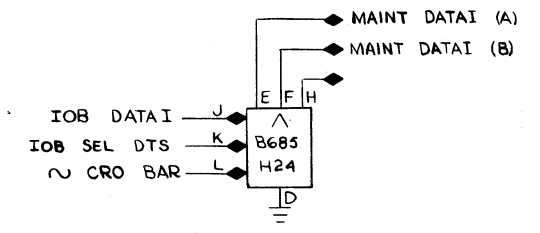
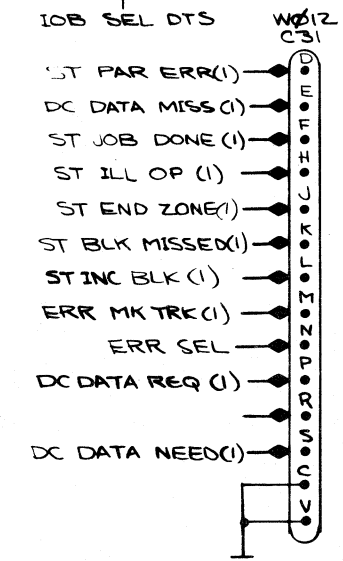
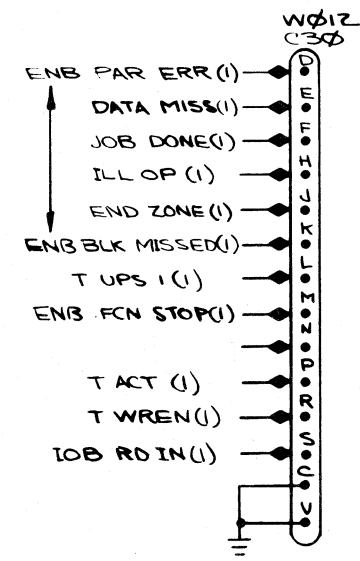
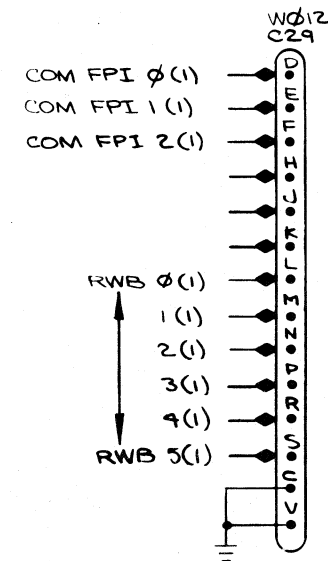
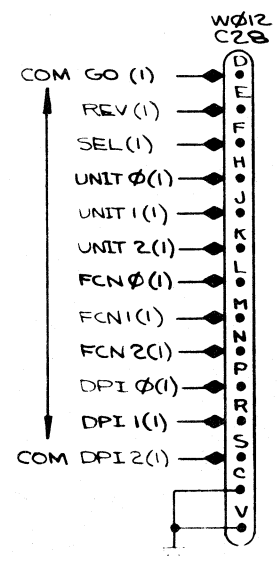
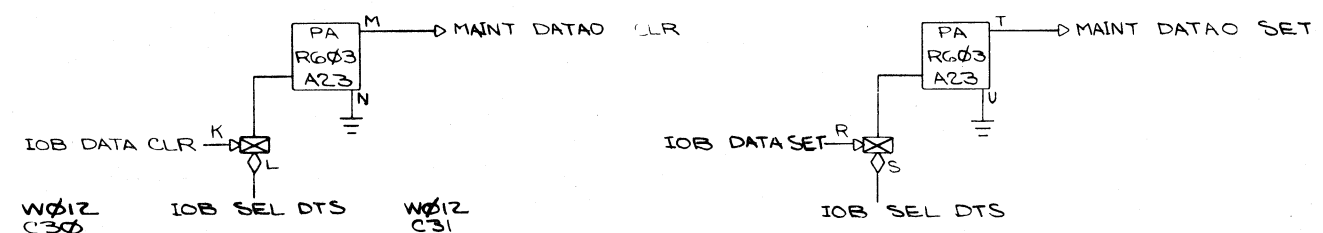
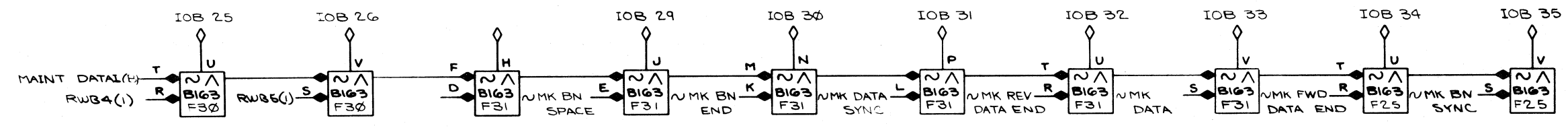
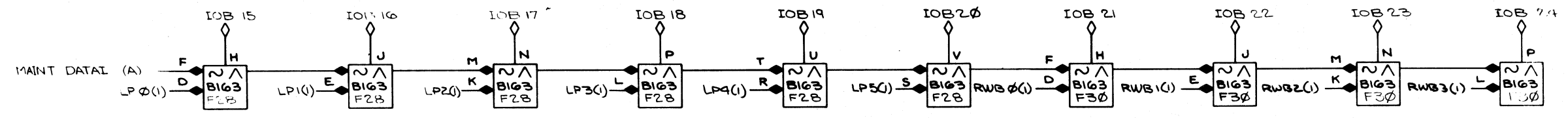
REV	CHANGE NO	DATE
A	ECO 31	5/10/68

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED		DRN	R Cook
UNLESS OTHERWISE SPECIFIED		DATE	5/24/67
DIMENSION IN INCHES		CHWD	Phangneault
TOLERANCES		DATE	6/22/67
DECIMALS	FRACTIONS	ENG	Yocco
= .005	= 1/64	DATE	11/13/67
ANGLES		PROJ. ENG.	DATE
= 0°30'		DATE	11/13/67
FINAL SURFACE QUALITY		PROD.	DATE
REMOVE BURRS AND BREAK SHARP CORNERS		DATE	12/12/67
MATERIAL			
FINISH			
FIRST USED ON			
17-UA-TDIOA-O-O			
SCALE		SIZE CODE	NUMBER
SHEET 1 OF 1		DBS TDIOA-O-MK	A
DIST.			

digital EQUIPMENT CORPORATION
 MAYNARD MASSACHUSETTS

TITLE
MARK TRACK DECODER

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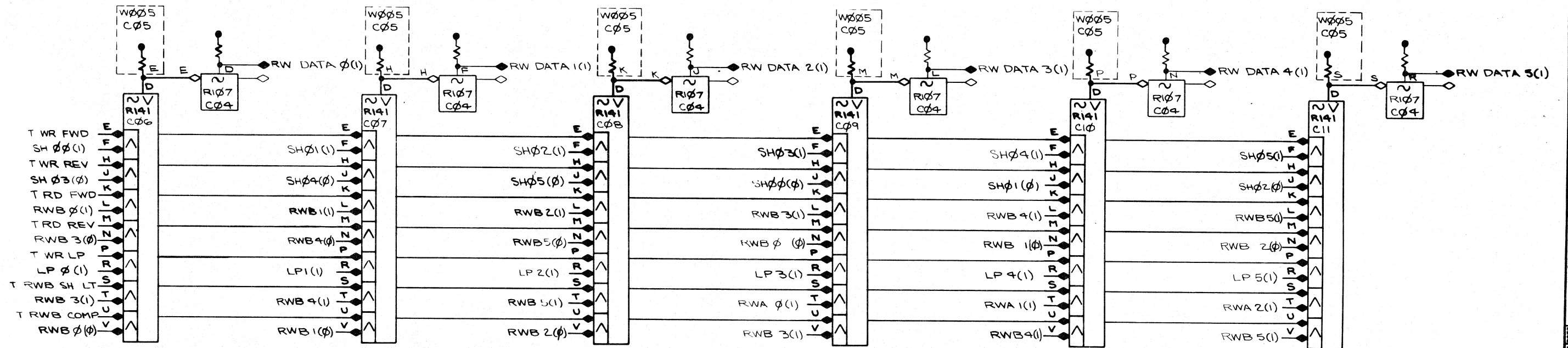
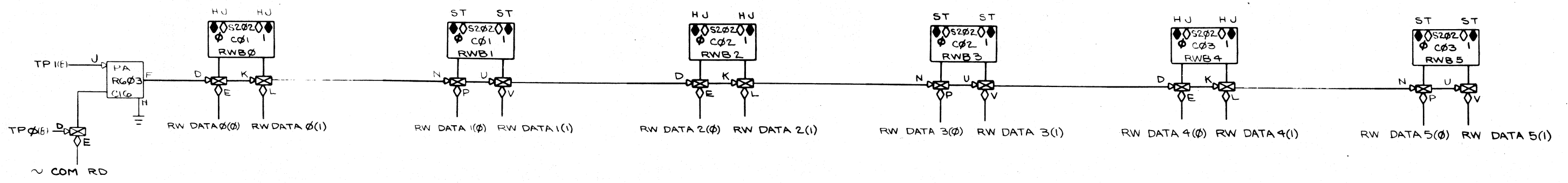
REV	
CHG	
NO	

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED		DRN: Cook	DATE: 5/29/67
UNLESS OTHERWISE SPECIFIED		CHWD: [Signature]	DATE: 6-6-67
DIMENSION IN INCHES		ENG: [Signature]	DATE: 11/13/67
TOLERANCES		PROJ. ENG: [Signature]	DATE: 11/13/67
DECIMALS FRACTIONS ANGLES		PROD: [Signature]	DATE: 11/13/67
= .005 = 1/64 = 0°30'		TITLE: MAINTENANCE	
FINAL SURFACE QUALITY		EQUIPMENT CORPORATION	
REMOVE BURRS AND BREAK SHARP CORNERS		MAYNARD, MASSACHUSETTS	
MATERIAL		FIRST USED ON	
FINISH		D/EUA-TDIOA-O-O	
SCALE		SIZE CODE: DBS	
SHEET 1 OF 1		NUMBER: TDIOA-O-MNT	
		REV.	

REV B
 SIZE CODE DBS
 NUMBER TDIOA-O-MNT

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DBS TDIOA-0-RW 2



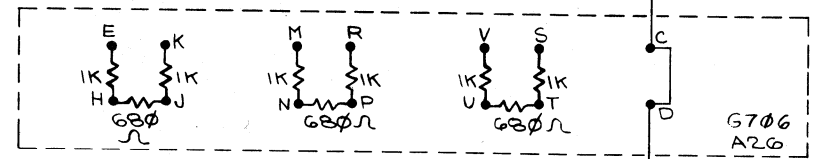
REV	NO	DATE	BY	CHK
A	1	11/13/67
B	2	11/13/67

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED			
DIMENSION IN INCHES			
TOLERANCES			
DECIMALS	FRACTIONS	ANGLES	
± .005	± 1/64	± 0°30'	
FINAL SURFACE QUALITY			
REMOVE BURRS AND BREAK SHARP CORNERS			
MATERIAL		FINISH	
FIRST USED ON		SCALE	
1) UA-TDIOA-0-0		SHEET 1 OF 1	
DRN. R Cook		DATE 5/24/67	
CHK'D. ...		DATE 6/22/67	
ENG. ...		DATE 11/13/67	
PROJ. ENG. ...		DATE 11/13/67	
PROD. ...		DATE 12/22/67	
digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS			
TITLE READ WRITE BUFFERS			
SIZE CODE		NUMBER	
DBS TDIOA-0-RW		REV. B	
DIST.			

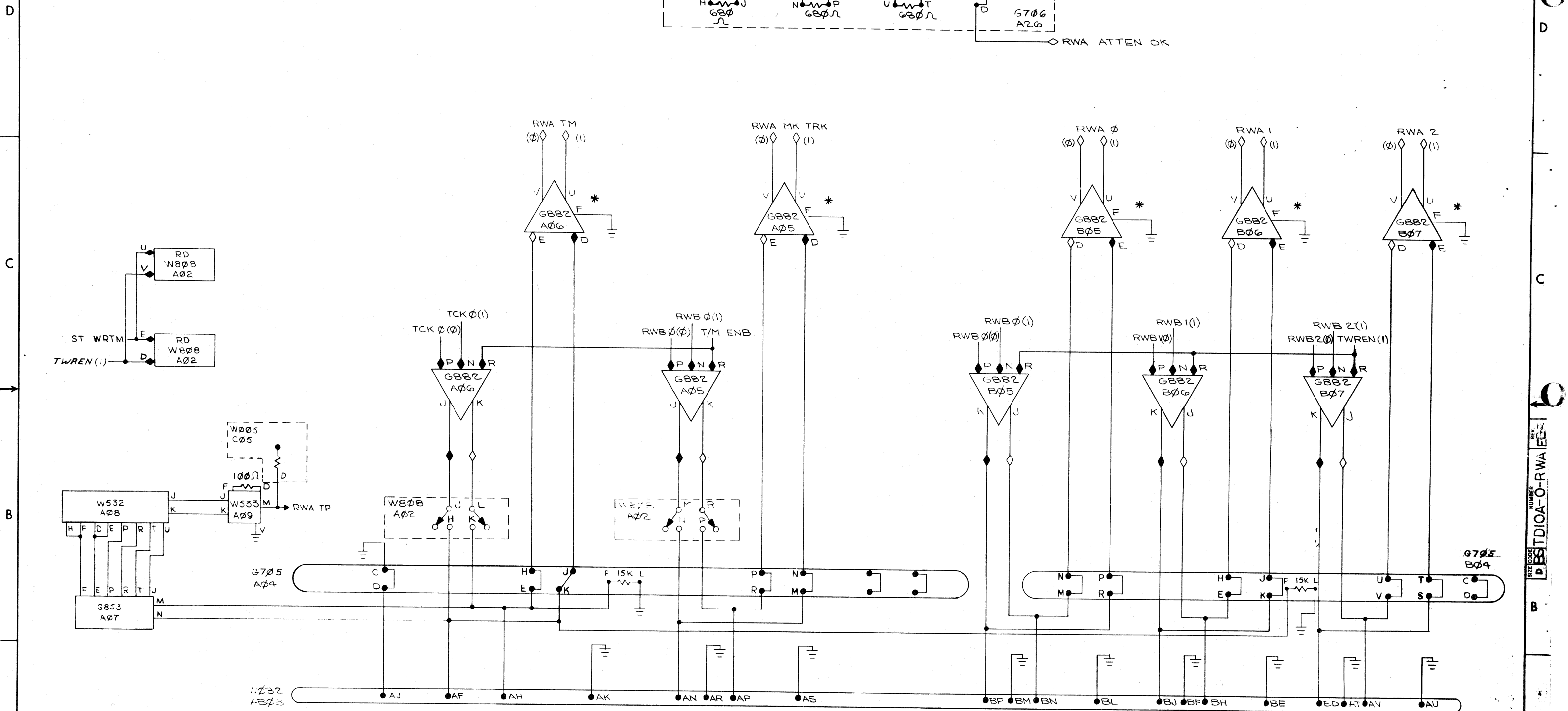
DBS TDIOA-0-RW 1

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NOTE: *ALL G882 MODULES SHOULD CORRESPOND WITH SCHEMATIC REVISION 4 OR LATER.



G706 A26
RWA ATTEN OK



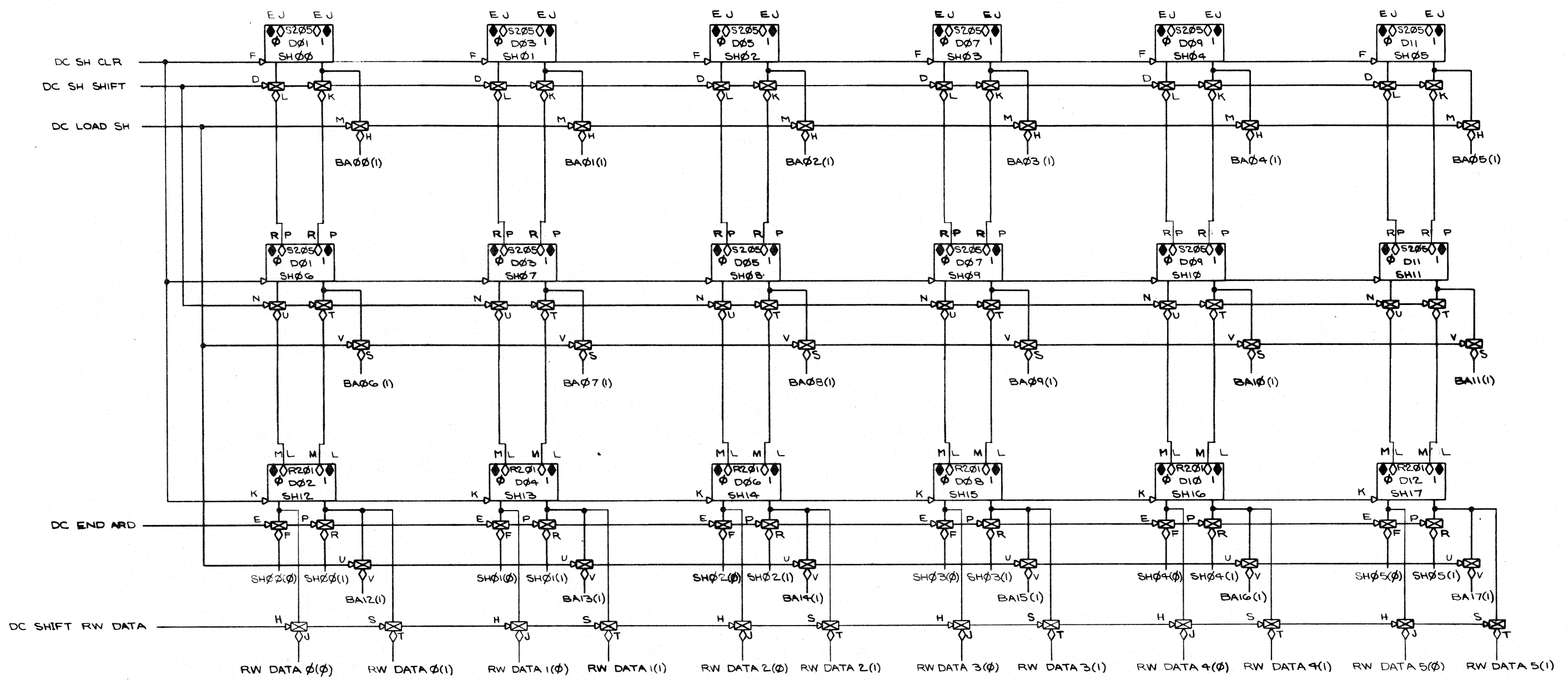
REV	DATE	BY	CHK	DESCRIPTION
1	11/13/67	...	...	...
2	11/13/67	...	...	...
3	11/13/67	...	...	...
4	11/13/67	...	...	...
5	11/13/67	...	...	...
6	11/13/67	...	...	...
7	11/13/67	...	...	...
8	11/13/67	...	...	...

QTY.	DESCRIPTION	PART NO.	ITEM NO.
	PARTS LIST		
	UNLESS OTHERWISE SPECIFIED		
	DIMENSION IN INCHES		
	TOLERANCES		
	DECIMALS FRACTIONS ANGLES		
	± .005 ± 1/64 ± 0°30'		
	FINAL SURFACE QUALITY		
	REMOVE BURRS AND BREAK SHARP CORNERS		
	MATERIAL		
	FINISH		
	DRN: <i>RCOC</i>	DATE: <i>11/13/67</i>	
	CHK'D:	DATE:	
	ENG: <i>...</i>	DATE: <i>11/13/67</i>	
	PROJ. ENG.:	DATE:	
	PROD.:	DATE:	
	FIRST USED ON		
	D-UA-11000-0-0		
	SCALE	SIZE CODE	NUMBER
	SHEET 1 OF 1	DIPST1010A-O-RWA	REV
		DIST.	

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS
TITLE: READ - WRITE AMPLIFIERS

REV. 4
NUMBER
DIPST1010A-O-RWA

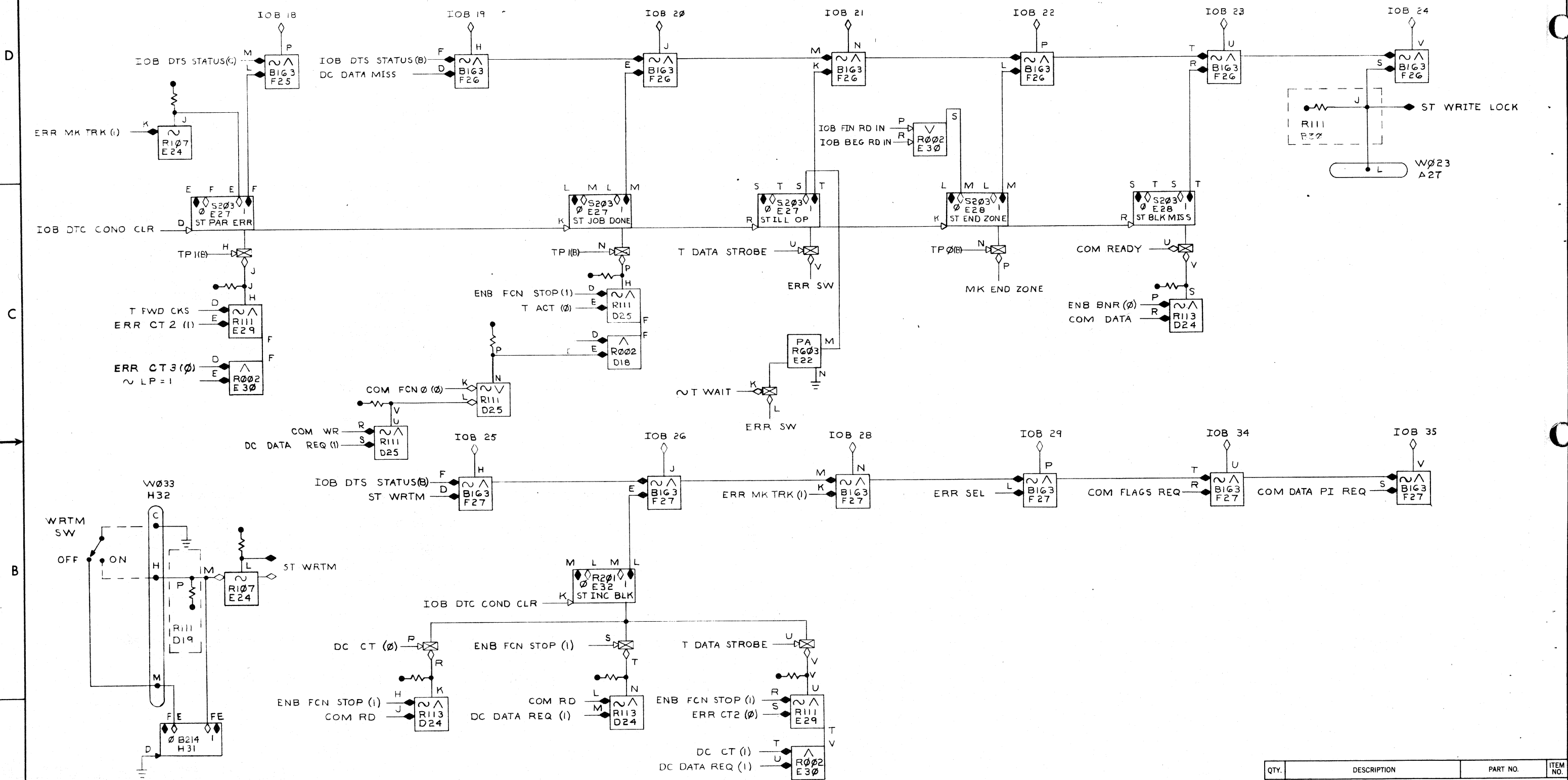
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REV	CHG	NO	DATE
1	ECO	31	5-14-68
2			5/20/68

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES DECIMALS ± .005 FRACTIONS ± 1/64 ANGLES ± 0°30'	DRN R Cook DATE 5/24/67	DATE 6-22-67	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS	CHKD K. Campbell DATE 11/13/67	DATE 11/13/67	
MATERIAL	ENG D. Gross DATE 12-12-62	DATE 12-12-62	TITLE SHIFT REGISTER
FINISH	PROD M. Smith	DATE 12-12-62	NUMBER DBS TDIOA-O-SH
SCALE SHEET 1 OF 1	FIRST USED ON U-UA-TDIOA-O-O	SIZE CODE DIST.	REV. A

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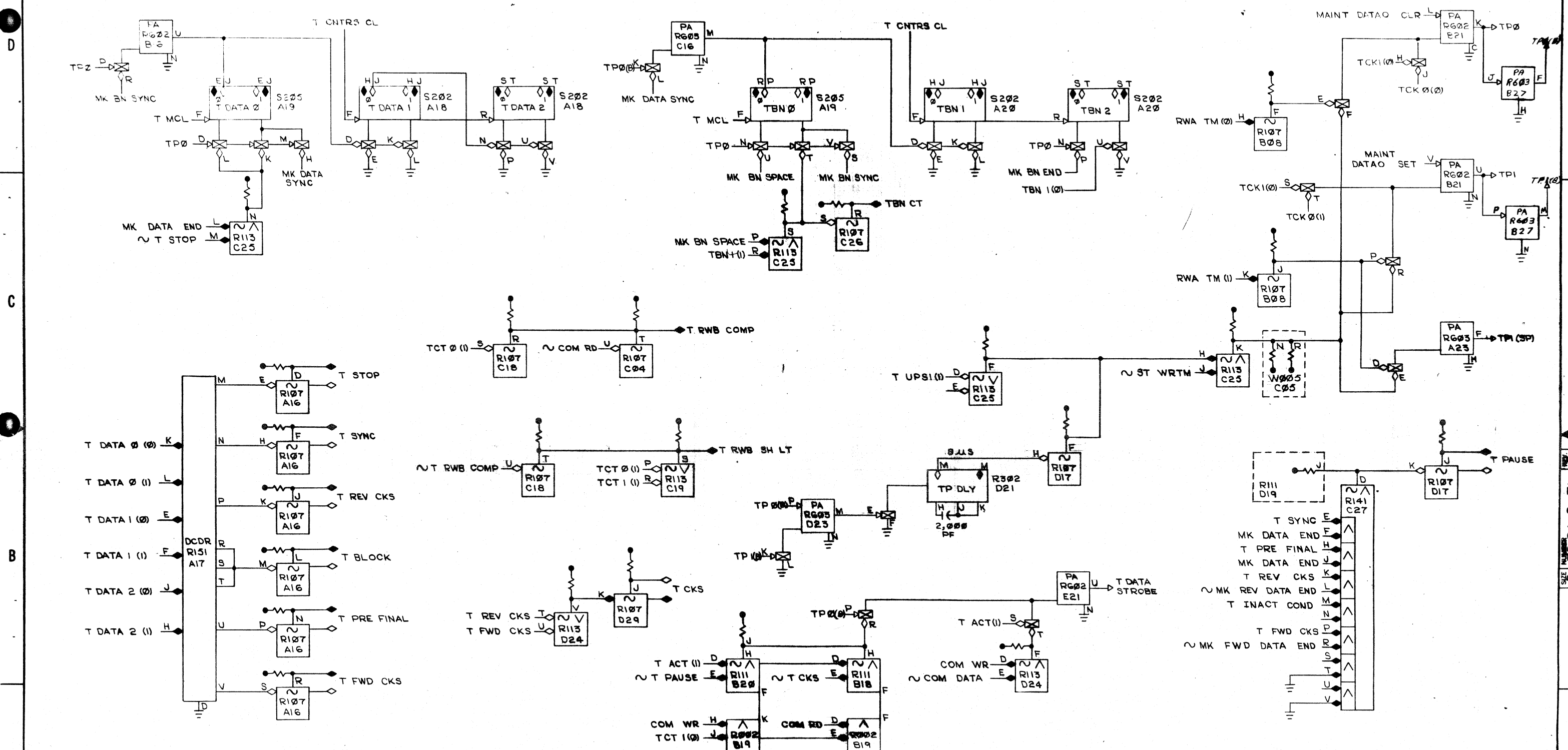
REV	CHG	NO	DATE	BY
34				

REVISIONS
 CHK
 CHG
 NO
 DATE
 BY

W033 H32
 W023 A27
 B214 H31
 R111 D19
 R111 D25
 R113 D24
 R002 E30
 R107 E24
 R111 E29
 R002 E30
 R111 D25
 R113 D24
 R002 E30

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED			
DIMENSION IN INCHES			
TOLERANCES			
DECIMALS	FRACTIONS	ANGLES	
± .005	± 1/64	± 0°30'	
FINAL SURFACE QUALITY			
REMOVE BURRS AND BREAK SHARP CORNERS			
MATERIAL		FINISH	
FIRST USED ON		SCALE	
D-UA-1D10A-0-0		SHEET 1 OF 1	
DATE		REV	
4/28/67		D	
DATE		NUMBER	
11/13/67		D BS1D10A-0-ST	
DATE		DIST.	
12/20/67			
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS			
TITLE STATUS			

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REV	CHANGE NO.	DATE	BY	CHKD.
1		11-12-67		
2		11-12-67		
3		11-12-67		
4		11-12-67		
5		11-12-67		
6		11-12-67		
7		11-12-67		
8		11-12-67		

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
1	DO NOT SCALE DRAWING		
1	UNLESS OTHERWISE SPECIFIED		
1	DIMENSION IN INCHES		
1	TOLERANCES		
1	DECIMALS FRACTIONS ANGLES		
1	± .005 ± 1/64 ± 0°30'		
1	FINAL SURFACE QUALITY		
1	REMOVE BURRS AND BREAK SHARP CORNERS		
MATERIAL		FIRST USED ON	
FINISH		SCALE	
SHEET 1 OF 2		DIST.	

DRN	DATE	11-12-67
CHKD.	DATE	11-12-67
ENG.	DATE	11-12-67
PROJ. ENG.	DATE	11-12-67
PROD.	DATE	11-12-67
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS		
TIMING #1		
SIZE	CODE	NUMBER
D	BS	TD10A-0-TI
REV	C	

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D

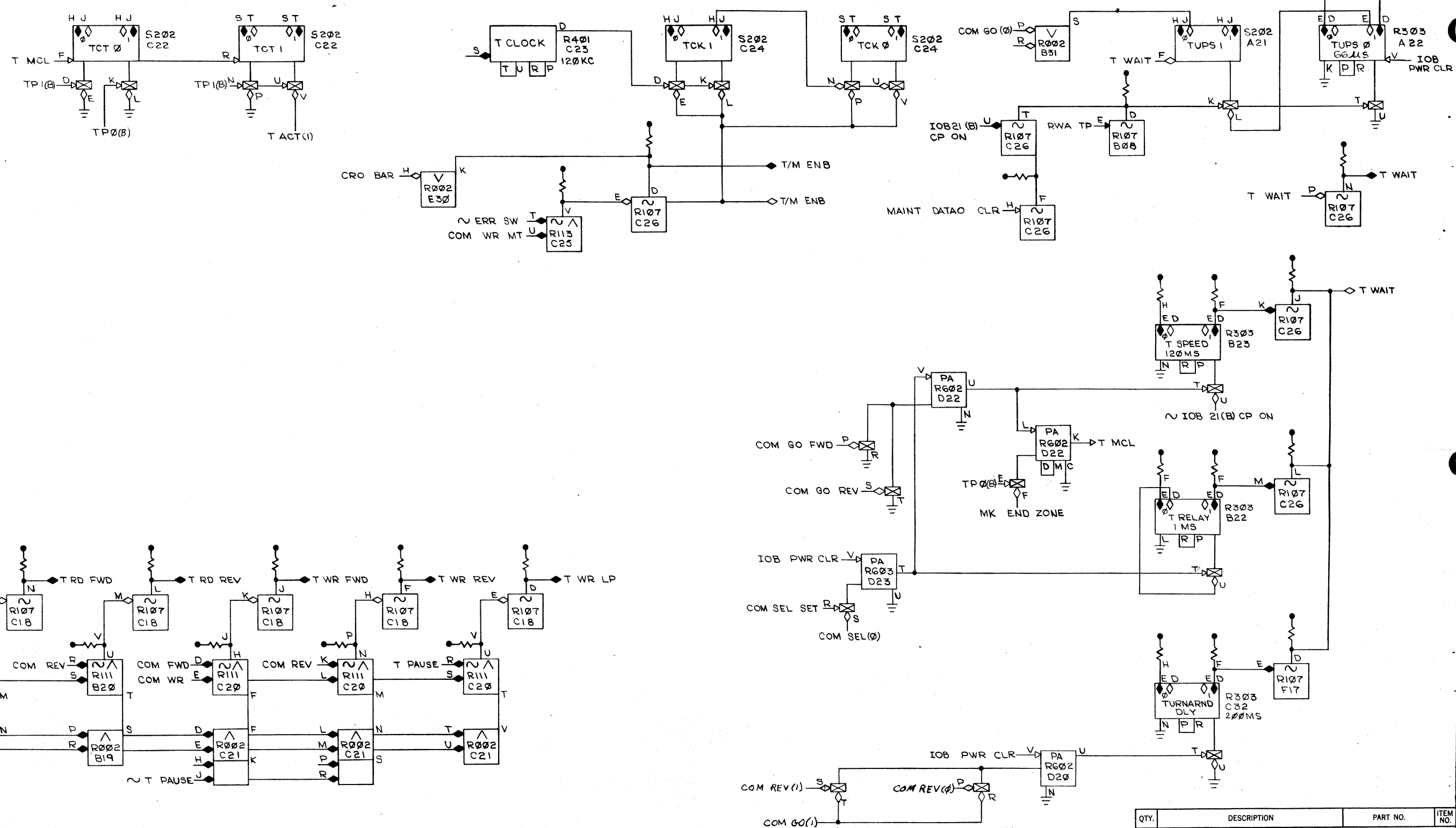
C

B

A

36

REV. 0 11-0-VOIDA D 2



QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS			
TITLE			
TIMING #1			
SCALE		SIZE	CODE
SHEET 2 OF 2		D	BS
DIST.		NUMBER	REV.
		TD10A-0-T1	G

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

DRN. Ray Rotelund DATE 10-13-67
CHKD. T. Neugebauer DATE 11-16-67
ENG. R. Gross DATE 11/16/67
PROJ. ENG. R. Gross DATE 11/16/67
PROD. M. Miller DATE 12/15/67
FIRST USED ON

REVISIONS
CHANGE NO. 1
CHK

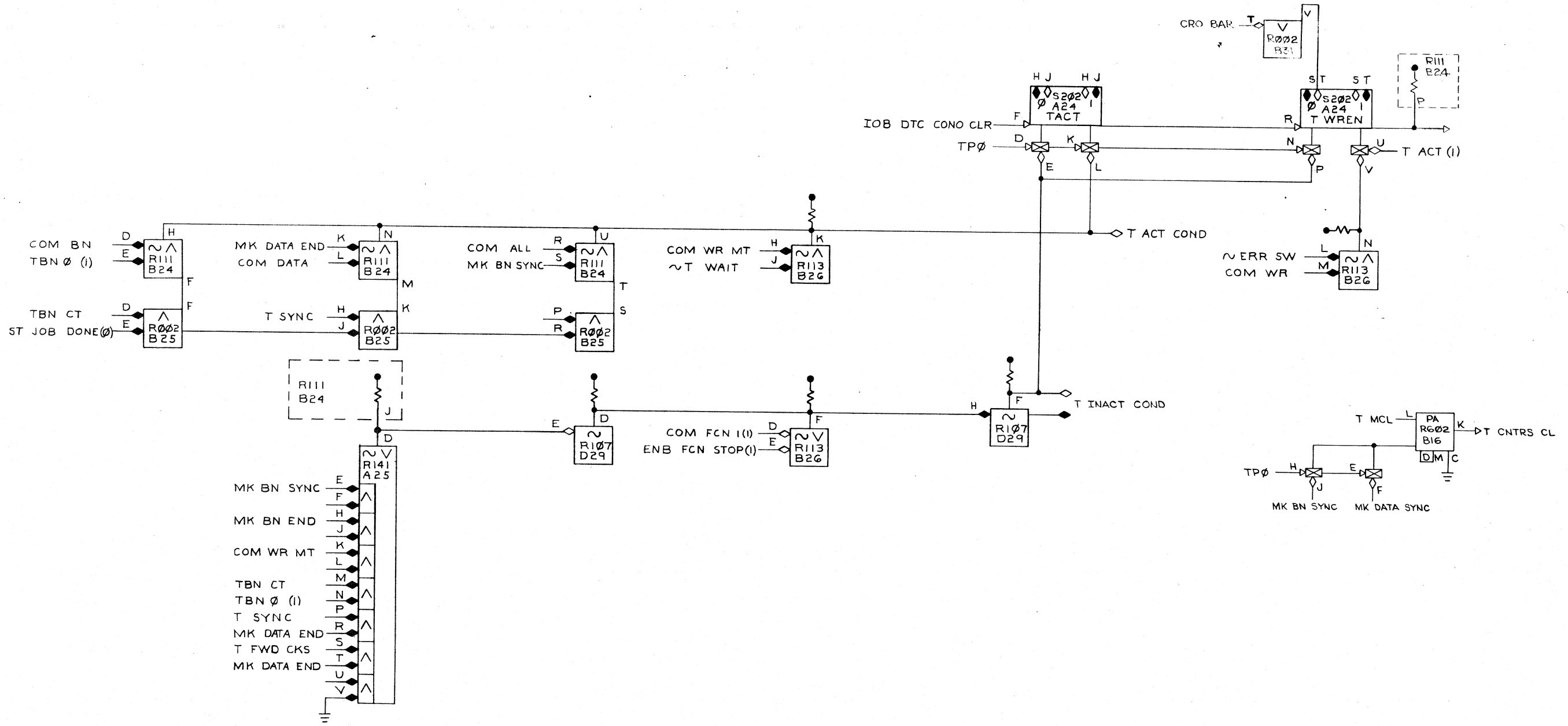
8 7 6 5 4 3 2 1

REV. 0 11-0-VOIDA D 2

B

A

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REV	CHANGE NO.	DATE	BY
A	3	4/28/67	R. B. Binnie
B	31	11/13/67	A. Gross
C	31	11/13/67	A. Gross
D	31	12-15-67	A. Gross

DEC FORM NO. DRD 102

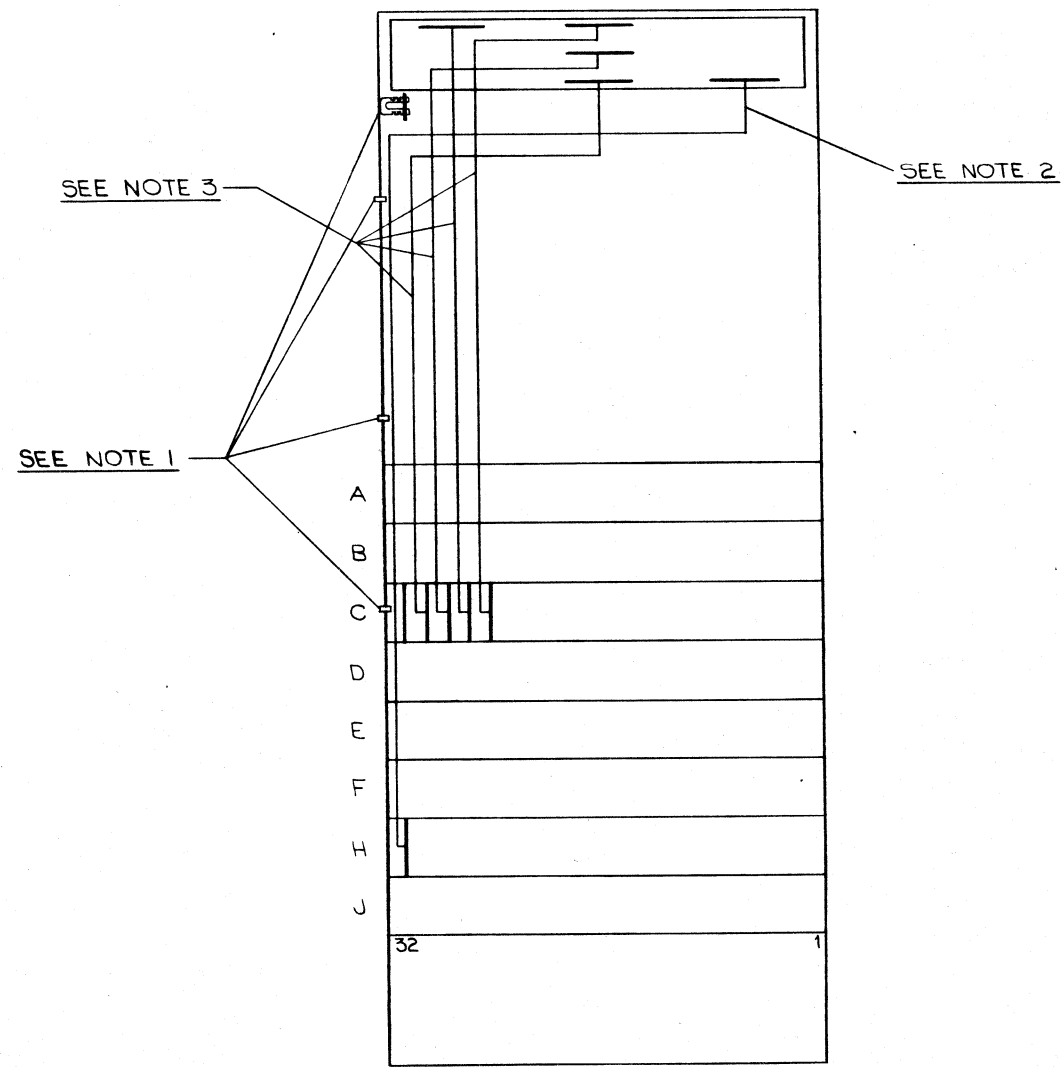
QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
TITLE			
TIMING # 2			
MATERIAL		FIRST USED ON	
D-UA-TDIOA-0-0		D-UA-TDIOA-0-0	
FINISH		SCALE	
y		1 OF 1	
SHEET		DIST.	
1		1	

37

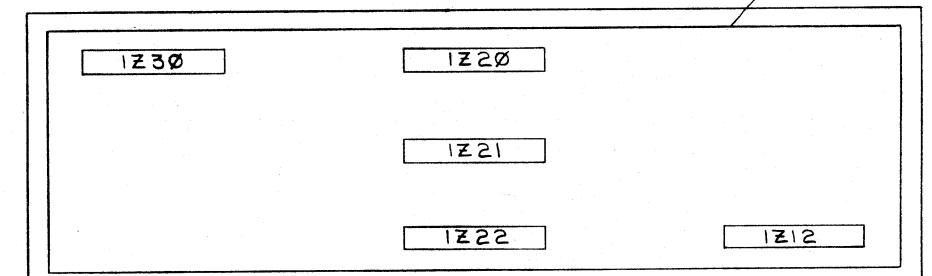


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- NOTES:**
1. ALL CABLES WILL BE DRESSED DOWN THE LEFT SIDE (FROM BACK) USING DAKOTA CLAMPS AS INDICATED.
 2. SWITCHES CABLE - 70" W033 - W033
SEE C-IA-7405553-27-0
1 REQUIRED: 1Z12 - H32
 3. INDICATOR CABLE - 63 1/2" W012 - W250
SEE D-IA-7005459-13-0
4 REQUIRED: 1Z20 - C28
1Z21 - C30
1Z22 - C31
1Z30 - C29
 4. INDICATOR PANEL
SEE D-IA-7405744-0-0



BACK VIEW OF TD10A



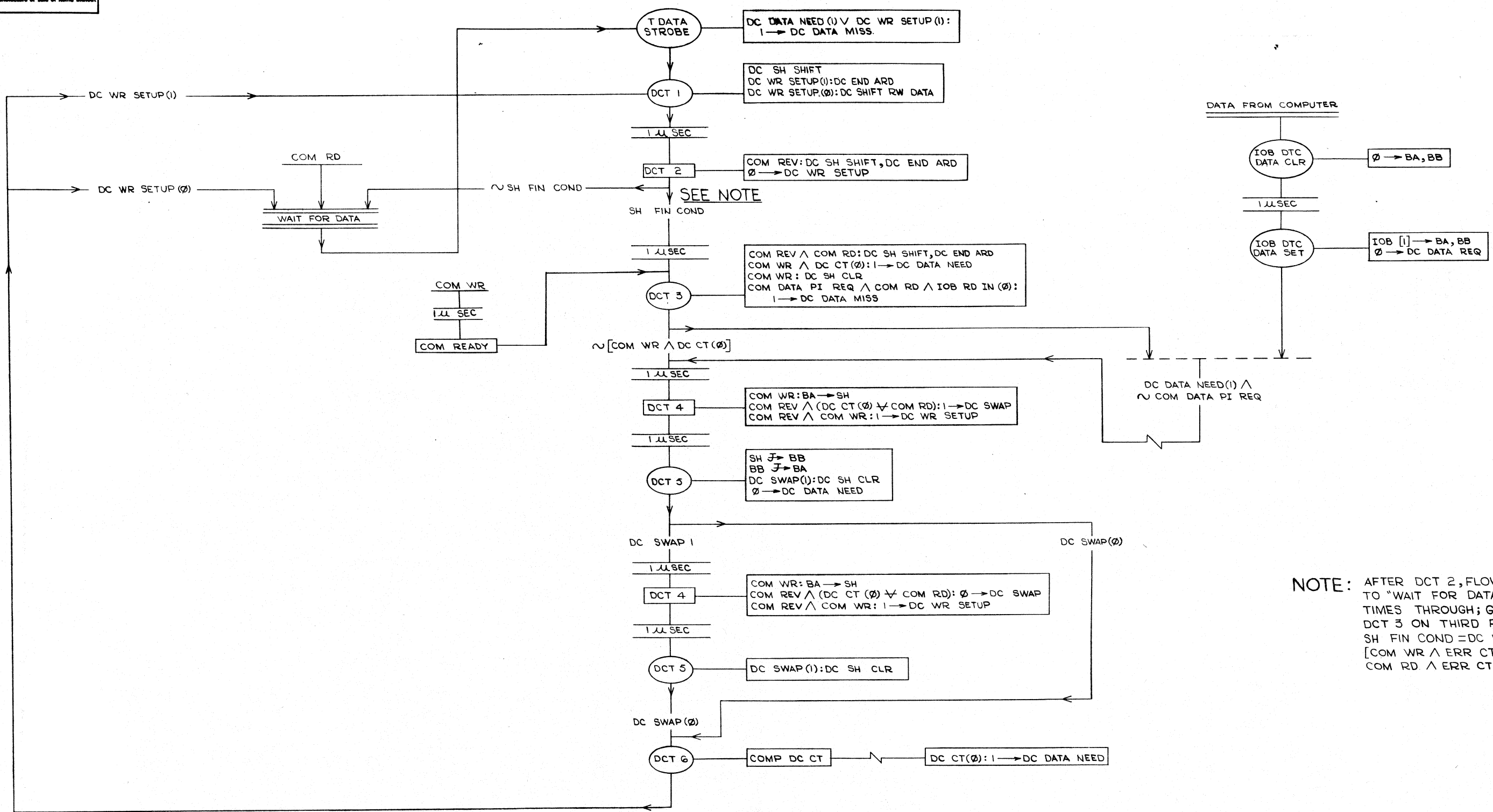
BAY 1Z
BACK VIEW OF
INDICATOR PANEL

REV	CHANGE NO
38	

UNLESS OTHERWISE SPECIFIED		DRN. <i>R. Robelaud</i>	DATE <i>12-28-65</i>	PARTS LIST	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
DIMENSION IN INCHES		CHK'D. <i>J.C. PELLETIER</i>	DATE <i>1-1-66</i>		
TOLERANCES		ENG. <i>D. Green</i>	DATE <i>1/9/66</i>	TITLE	
DECIMALS ± .005	FRACTIONS ± 1/64	PROJ. ENG. <i>D. Green</i>	DATE <i>1/9/66</i>	INDICATOR CABLE ASSY.	
ANGLES ± 0'30"		PROD. <i>3/1/66</i>	DATE <i>1-8-66</i>	SIZE CODE NUMBER	
FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS		FIRST USED ON		D I C TD10A-0-8	
MATERIAL	FINISH		SCALE	REV.	
			SHEET 1 OF 1	DIST.	

REV. NUMBER
D I C TD10A-0-8

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NOTE: AFTER DCT 2, FLOW FOLLOWS TO "WAIT FOR DATA" FIRST TWO TIMES THROUGH; GOES TO DCT 3 ON THIRD PASS. SH FIN COND = DC WR SETUP (0) ∧ [COM WR ∧ ERR CT 3 (1) ∨ COM RD ∧ ERR CT 2 (0)]

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			
DO NOT SCALE DRAWING UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES DECIMALS FRACTIONS ANGLES ± .005 ± 1/64 ± 0°30' FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS		DRN. <i>R. Holbrook</i> DATE 11-21-67 CHK'D. <i>W. D. ...</i> DATE 12-7-67 ENG. <i>D. ...</i> DATE 12-8-67 PROJ. ENG. <i>D. ...</i> DATE 12-8-67 PROD. <i>C. ...</i> DATE 12-15-67	
MATERIAL ~~~~~ FINISH ~~~~~		TITLE digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS DATA CONTROL FLOW	
FIRST USED ON D-UA-TDIOA-0-0		SIZE CODE NUMBER REV. D FD TDIOA-0-7	
SCALE ~~~~~ SHEET 1 OF 1		DIST.	

39 REVISIONS
 CHANGE NO. REV.

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DIGITAL EQUIPMENT CORPORATION						
MAYNARD, MASSACHUSETTS						
ENGINEERING SPECIFICATION					DATE 17 Sept 1968	
TITLE TD10A ENGINEERING SPECIFICATIONS						
REVISIONS						
REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
--	ORIGINATED	TD10A 00008	G. GARDNER	2/69	--	--
(40) ENG	George Gardner	APPD	i. Gross	SIZE A	CODE SP	NUMBER TD10A-0-14
						REV

DEC FORM NO. DRA 107

SHEET 1 OF 9

ENGINEERING SPECIFICATION				digital	CONTINUATION SHEET	
TITLE TD10A ENGINEERING SPECIFICATIONS						
<p>1. <u>General</u></p> <p style="padding-left: 40px;">This spec defines the TD10A Dectape Control.</p> <p>2. <u>Mechanical</u></p> <p style="padding-left: 40px;">Mechanical construction including cables and switches, etc. should be of a high quality consistent with good DEC practice. Cables will be dressed and will fit neatly.</p> <p style="padding-left: 40px;">A. The door on the logic shall be removable by one person without the use of any tools.</p> <p style="padding-left: 40px;">B. No sharp edges shall be exposed which might create a safety hazard such as the edges of doors and end panels.</p> <p style="padding-left: 40px;">C. The forced air cooling shall be adequate to insure less than 15°F at 60Hz temperature rise above inlet temperature in the proximity of any module.</p> <p style="padding-left: 40px;">D. The forced air cooling shall not be excessively noisy.</p> <p style="padding-left: 40px;">E. The cabinet shall be stable with any combination of doors open.</p> <p style="padding-left: 40px;">F. The rear internal door shall not short out or otherwise interfere with the power supplies and wiring.</p> <p><u>Indicators</u></p> <p style="padding-left: 40px;">A. Indicator lamps shall be pluggable.</p> <p style="padding-left: 40px;">B. Indicator lamps shall be bright enough such that it is evident that an indicator is on, in normal light, looking from a 45° angle or less from the normal.</p> <p style="padding-left: 40px;">C. All indicator labels shall be easily readable, whether the indicator is on or off. Therefore, no labels shall be back-lit.</p>						
				SIZE A	CODE SP	NUMBER TD10A-0-14
					REV	

DEC FORM NO. DRA 108

SHEET 1 OF 9

ENGINEERING SPECIFICATION **digital** CONTINUATION SHEET

TITLE TD10A ENGINEERING SPECIFICATIONS

- D. It shall be possible to replace an indicator without removing numerous electrical connections from the indicator panel.

Switches

- A. All switches shall operate freely and not cause adjacent switches to move.
- B. Switches shall be checked for immunity to vibration and shock.

3. Interface

I/O Bus

- A. The I/O Bus must be logically and electrically compatible with PDP-6. The TD10 may be connected to a PDP-6.
- B. Loading definitions, voltage amplitudes, rise and fall times, etc. must be checked at the end of 100 ft. of cable, or whatever length is decided upon to be maximum. These characteristics shall be tested with a single device and with some reasonably large number of devices.

TU55

- A. Interface shall be to 1 to 8 standard TU55.
- B. Info cables shall be coaxial, balanced. Center-taps and shield wires shall be grounded at the TD10 and not elsewhere.
- C. Logic cable shall carry only low power signals (no DC power). No circuit may edge-trigger on any signal that must travel through the logic cable.

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SIZE	CODE	NUMBER	REV
A	SF	TD10A-0-14	

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TITLE TD10A ENGINEERING SPECIFICATIONS

4. Electrical Specifications

- A. No module shall be used outside of its rating as specified by the Circuit Designers in Pat Sullivan's group or by the FLIP CHIP catalog. All wiring rules specified by the Circuit Designers shall be adhered to.
- B. See Figure 1 for examples of acceptable waveforms:
 - a) Note 1. Steady state lower level to be -3.3 to -3.9v.
 - b) Note 2. Rise time less than 60 nsec., measured from -3v to -.5v.
 - c) Note 3. Glitches on upper level to be more positive than -.5v.
 - d) Note 4. Steady state upper level to be more positive than -.3v.
 - e) Note 5. Glitches on steady state lower level shall be more negative than -2.5v.

SIZE	CODE	NUMBER	REV
A	SF	TD10A-0-14	

TITLE TD10A ENGINEERING SPECIFICATIONS

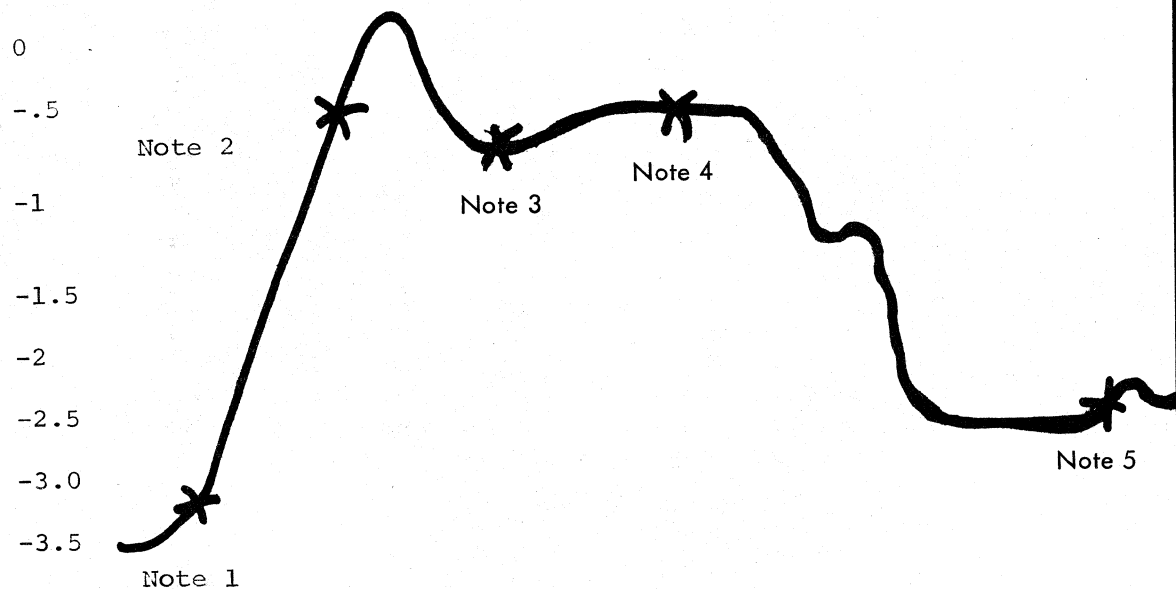


FIGURE 1
ACCEPTABLE WAVE FORM

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SIZE A	CODE SP	NUMBER TD10A-0-14	REV
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TITLE TD10A ENGINEERING SPECIFICATIONS

C. In general, all signals should be as clean as possible from off-line tests. Where the signals are not as specified, the engineer in charge will demonstrate (if need be) that the dirty signals will not cause any problems.

5. AC and DC Power Wiring

- A. Machine will require a 117 volt single phase, 60Hz line rated at 30 amps.
- B. On customer option, the machine will be equipped to operate on 50Hz, at nominal voltages of 112.5, 123.5, 195, 220, or 235. One of the first TD10A's will be a 50Hz system.
- C. The machine will have a single power card, terminated in a Hubbell Twistlock type 3331,1 wire connector.

Convenience Outlets

- A. At least two (2) convenience outlets shall be provided on the front of the machine.
- B. The outlets in (A) shall not be switched by the computer power switch.

Internal Power Distribution

- A. No uninsulated conductors carrying AC line voltage will be placed in such a position that a person not specifically attempting to gain access to them would inadvertently do so.
- B. Warning labels will be placed in such positions as necessary to warn of the presence of AC line voltage.
- C. The AC circuit breaker shall be labeled as to its function.

SIZE A	CODE SP	NUMBER TD10A-0-14	REV
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ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A ENGINEERING SPECIFICATIONS

DC Power

- A. The loads on all power supplies shall be checked to be within the rated load, yet not so lightly loaded that there are extra unnecessary supplies.
- B. DC power conductors shall be of adequate size so that the voltage drop from supply to the last module is less than .5v.
- C. DC power wiring shall not be noticeably warm to the touch.
- D. At the modules, power voltages shall be:

-14.0 to -16.5 on -15v
+9.0 to +11.5 on +10v

6. Timing

The TD10A derives its operating pulses from the timing track. Thus, the pulses that make things go, form a 2 phase clock (TP0, TP1) with 33 μsec between opposite phases. The fastest circuit speed requirement shall not exceed 1 μsec.

- A. For complete timing sequence, along with data transfer paths, see TD10A System Specification.

7. Testing

Margins -

- A. Margin checking shall be done one panel at a time.
- B. The following margin specifications shall be met:

+10v ± 7.5v
-15v ± 3.0v except:

- a) Under Tape Rocker Mode:
 - 1. +10v ± 7.5v except A and B
A and B = +10v ± 2.0v.

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SIZE	CODE	NUMBER	REV
A	SE	TD10A-0-14	

ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A ENGINEERING SPECIFICATIONS

b) Diagnostics

- 1. +10v ± 7.5v except:
 - A & B = +10v ± 2.0v
 - H = lower limit +6.0v
upper limit +16.0v

- C. Margins will be run to the limit of the margin specification voltages only, and any and all causes of failures must be determined.
- D. Margining of Tape Rocker, D3HA, D3EA, and D3FA will be run at 105°F. All doors and end panels will be in place for these tests.
- E. The system will stabilize for one half hour at 105°F before heat margining tests will be started.

Mechanical Tests

- A. A module vibration test will be performed using a plastic ruler, brushed across the module handles. This may be done while running the reliability test. Vibrate each row of modules 2 or 3 times while running the test.
- B. Under the same conditions (tests) the cabinet shall be struck lightly on all four sides to observe any failures.

8. Switches

- A. Proper operation of each switch on the TD10A indicator panel will be demonstrated. The list of these switches follows:
 - a. MANUAL
 - b. MANUAL CLEAR
 - c. TAPE ROCKER'
 - d. WRTM

9. Maintenance Information

A maintenance facility will be installed in the TD10A. An attenuator board installed in location A26 will be used for attenuating head signals under maintenance only. This board will be swapped with the jumper boards in A04 or F04

SIZE	CODE	NUMBER	REV
A	SE	TD10A-0-14	

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digital

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TITLE TD10A ENGINEERING SPECIFICATIONS

(one at a time) to attenuate the signals. When swapped, the jumper board must replace the attenuator board, it will, be wired such that the TD10A will not run if the board is not in.

10. Documentation

All documents required by L.C. Engineering shall be completed before the project is finished (see DS4D).

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SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-14	

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DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS						
ENGINEERING SPECIFICATION				DATE 12/18/68		
TITLE TD10A ACCEPTANCE TEST PROCEDURE						
REVISIONS						
REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
-	ORIGINATED	TD10A 00008	G. GARDNER	2/69	--	--
(45) ENG	GEORGE GARDNER	APPD	SIZE A	CODE SP	NUMBER TD10A-0-15	REV

DEC FORM NO.
DRA 107

SHEET 1 OF 3

ENGINEERING SPECIFICATION		digital	CONTINUATION SHEET
TITLE TD10A ACCEPTANCE TEST PROCEDURE			
<p>1. PRELIMINARY</p> <p>A. Check the TU55 DEctape XPort for the following items before applying power:</p> <ul style="list-style-type: none"> a) Chrome plated tape guides, not aluminum. b) Tape reels are relatively easy to remove. c) "Momentary" direction switches should not stick. This is usually caused by binding against the cover plate. d) Lock pins are in place so that the TU55 cannot slide out when a tape reel is pulled. e) A #6 nut is in place under the door catch pin. This allows the door to fit better, and close properly (see 1A.c) f) AC power cords cannot be tie wrapped or be physically near any cables or other wiring between transports. g) Check to see that brakes do not slip. h) Check to see that the tape still rewinds when you switch from local to remote. i) Make sure a ground wire goes from each transport chassis to DC signal ground. <p>B. All tape guides and heads must be clean.</p> <p>2. REQUIREMENT</p> <p>A. PDP-10 with TD10A DEctape system and one or more TU55 DEctape transports.</p> <p>B. One certified (by DEC) DEctape per TU55 transport.</p> <p>C. Rotate the DEctapes. The tape that is on Unit 0 goes to Unit 1; the tape on Unit 1 goes to Unit 2; etc.</p> <p>D. Use the "exercise" option of Maindec 10-D3HA diagnostic to test data reliability for each DEctape on its corresponding transport. Let the program run once per DEctape.</p> <p>E. No errors are acceptable during this test.</p>			
		SIZE A	CODE SP
		NUMBER TD10A-0-15	REV

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SHEET 2 OF 3

TITLE TD10A ACCEPTANCE TEST PROCEDURE

4. SOFTWARE INTEGRATION TEST

This test will be performed only on time-sharing PDP-10 configurations.

- A. Use the Peripheral Interchange Program (PIP) to copy the source tape from one transport to another.
- B. Repeat this procedure (transport 1 to transport 2 to 3 etc., - after replacing MAC with a scratch tape) until 2 complete passes on each transport have been made.
- C. Remount the original MAC tape on its original unit and, using SRCCOM, compare the original MAC against the last generated tape. There should be no errors.

Note: A "source" consisting of one file containing all MAC files from a CUSP 4 tape can be used to facilitate using the SRCCOM program.

- D. Error Rate
No errors will be acceptable during the specified time of each program (or test) is run.
- E. Margins
Margins shall not be run for acceptance, but for the acceptors benefit (may want to spot check some racks) the marginal information is documented. See TD10A Acceptance Test Specification.
- F. Spot Checking
Any test performed in the TD10A Manufacturing Checkout and Test Procedure may also be performed (or spot checked) by the acceptor at any time during acceptance.

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	SIZE A	CODE SP	NUMBER TD10A-0-15	REV
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DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS						
ENGINEERING SPECIFICATION					DATE 9/20/68	
TITLE TD10A ACCEPTANCE TEST SPECIFICATIONS						
REVISIONS						
REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
--	ORIGINATED	TD10A 00008	G. GARDNER	2/69	--	-

(47)	ENG GEORGE GARDNER	APPD <i>A. Gross</i>	SIZE A	CODE SP	NUMBER TD10A-0-16	REV
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DEC FORM NO.
DRA 107

SHEET 1 OF 2

ENGINEERING SPECIFICATION					CONTINUATION SHEET	
TITLE TD10A ACCEPTANCE TEST SPECIFICATIONS						
PROGRAM	SPECIAL INSTRUCTIONS FOR OPERATING	PANELS FOR MARGINING	MARGIN SPECS		TEST TIME (PER RACK) (HOURS)	ACCEPT. DATE
			+10V	-15V		
Tape Racker Mode	Margin all racks separately (+10V and -15V)	1A & 1B	+2	+3	.1	
		1C - 1J	-2	-3		
Maindec 10-D3EA	Margin all racks separately (+10V and -15V)	1A & 1B	+7.5	+3	.1	
		1H	-7.5	-3		
		1A, 1C - 1F, 1J	+2	+3	.1	
		1A & 1B	-2	-3		
Maindec 10-D3FA	Same as instructions. Maindec 10-D3EA	1A & 1B	+6	+3	.2	
		1H	-2	-3		
		1A, 1C - 1F, 1J	+6	+3	.2	
		1A & 1B	-4	-3		
Maindec 10-D3HA	Margin all racks separately (+10V and -15V).	1A & 1B	+7.5	+3	.2	
		1H	-7.5	-3		
		1A & 1B	+2	+3	.1	
		1H	-2	-3		
		1C - 1F, 1J	+6	+3	.1	
		1C - 1F, 1J	-4	-3		
		1C - 1F, 1J	+7.5	+3	.1	
		1C - 1F, 1J	-7.5	-3		

SIZE A	CODE SP	NUMBER TD10A-0-16	REV
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DEC FORM NO
DRA 108

SHEET 2 OF 2

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DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS							
ENGINEERING SPECIFICATION				DATE 19 Sept 1968			
TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE							
REVISIONS							
REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE	
--	ORIGINATED	TD10A 00008	G. GARDNER	2/69	--	--	
A	_____	TD10A 00014	D. GROSS	12/9/69	<i>D. Gross</i>	12/11/69	
ENG	G. Gardner	APPD	<i>D. Gross</i>	SIZE	CODE	NUMBER	REV
				A	SP	TD10A-0-17	A

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ENGINEERING SPECIFICATION				CONTINUATION SHEET															
TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE																			
<p>In all respects, unless otherwise specified, the TD10A (TD10A-A-0, TD10A-B-0) shall conform to LCE DS4D General Specifications.</p> <p>1. Off-Line Checkout</p> <p style="padding-left: 20px;">1. <u>Smoke Test</u></p> <p>Assemble the TD10A with all external components, power wiring, power control, and power supplies in place but no modules or TU55's plugged in. Turn on power and watch for signs of faulty power wiring, sparks, smoke, etc. Check for proper power supply voltages on pins A, B, and C of all racks.</p> <p>1.a. <u>50 Hz Systems Only:</u></p> <p>Before any modules or cables are plugged into the TD10A control the following checks (on 50Hz systems only) must be made.:</p> <p>Using a Triplet VOM (or equivalent) set it to to 300 VAC scale. Turn power on. NOTE: Voltage readings are approximate.</p> <p>Measure the voltage between the cabinet frame and each of the output wires from the transformer assembly (lower two wires at the terminal block)</p> <p>Observe the following and take the appropriate action:</p>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">RED WIRE</th> <th style="width: 25%;">WHITE WIRE</th> <th style="width: 50%;">ACTION</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">115 VAC</td> <td style="text-align: center;">Ø VAC</td> <td style="text-align: center;">OK. No action necessary</td> </tr> <tr> <td style="text-align: center;">230 VAC</td> <td style="text-align: center;">115 VAC</td> <td style="text-align: center;">Reverse plug and Reverse transformer input</td> </tr> <tr> <td style="text-align: center;">115 VAC</td> <td style="text-align: center;">230 VAC</td> <td style="text-align: center;">Reverse transformer input</td> </tr> <tr> <td style="text-align: center;">Ø VAC</td> <td style="text-align: center;">115 VAC</td> <td style="text-align: center;">Reverse plug</td> </tr> </tbody> </table>					RED WIRE	WHITE WIRE	ACTION	115 VAC	Ø VAC	OK. No action necessary	230 VAC	115 VAC	Reverse plug and Reverse transformer input	115 VAC	230 VAC	Reverse transformer input	Ø VAC	115 VAC	Reverse plug
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Ø VAC	115 VAC	Reverse plug																	
SIZE	CODE	NUMBER	REV																
A	SP	TD10A-0-17	A																

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ENGINEERING SPECIFICATION

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CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

When reversing the transformer 240 VAC input, interchange the wires on the transformer side of the terminal block only. Turn off power when this test is completed.

CAUTION: Avoid shocks while performing this test; lethal voltages are present on the transformer assembly terminal block.

1. b. Plug in all modules, cables, and one or more TU-55's.

2. Adjustments

With the TD10A set up as described in Test 1, turn on power and throw the MANUAL MODE switch to the MANUAL position (henceforth this procedure shall be called "throwing the control into MANUAL"). Hit MANUAL CLEAR. All indicator lights should go off with the exception of ERR SEL and (possibly) the RWB lights. Pressing the MANUAL CLEAR SWITCH fires the T SPEED (120 ms), T RELAY (1 ms), TURNARND (200 ms), 7 UPS (66 ms) delays which can thereby be adjusted. Adjust the TP DLY (8 ms) by clipping a ground lead to pin A23E (the level input of DCD gate on the TP1 (SP) pulse amplifier).

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A	SP	TD10A-0-17	A

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TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

Adjust the mark and timing track generator clock (T CLOCK) to 8.3 μ s between pulses.

3. Tape Motion Test

Throw the control into MANUAL. Mount a tape on the TU55 and dial the select switch to unit 8. Turn the unit on in the LOCAL mode and move the tape to the approximate middle. Switch the TU55 unit to REMOTE. Press MANUAL CLEAR. Then throw the TAPE ROCKER switch to the ON position. The tape should move in reverse (collect tape on left reel) and the ERR SEL light should go off. The GO, REV, RD IN, and SEL lights should come on. For the purpose of this test, ignore all other lights. Turn off the TAPE ROCKER switch and then press MANUAL CLEAR. The tape should stop and the ERR SEL light should come on. The GO, REV, RD IN, and SEL lights should go off.

4. T UPS1 Test

Test T UPS1 by starting test 3 again. Observe that the T UPS1 light comes on when the tape begins to move and goes off when MANUAL CLEAR is pressed. Repeat test 3 once again, but manually grip the left-hand tape reel so that it cannot move. Check that the T UPS1 light does not come on until the reel is released.

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A	SP	TD10A-0-17	A

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CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

5. Mark Track Reader Test

Mount a certified DECTape on the TU55. Throw the control into MANUAL. Turn on the TU55 in the REMOTE position. Dial the TU55 to unit 8 and have the WRITE LOCK switch in the LOCK position. Press MANUAL CLEAR on the TD10A. Then put the TAPE ROCKER switch to the ON position. While this is being done, observe the indicator panel for the following sequence of events.

- a) The GO, REV, SEL and RD IN lamps should light. The tape should move in reverse direction. Then almost immediately afterward
- b) The T UPS1 lamp should light.
- c) The tape should wind to the end zone and turn around. The REV and T UPS1 lamps should go off. The FCN 1 and FCN 2 lamps should light. Then almost immediately:
- d) The T UPS1 lamp should relight.
- e) The tape should wind all the way down the tape to the forward end zone and then turn around. The REV lamp should light. The T ACT and T UPS1 lamps should go off. The GO, FCN 1 and FCN 2 lamps should remain lit. Then almost immediately:
- f) The T UPS1 lamp should relight.

SIZE A	CODE SP	NUMBER TD10A-0-17	REV A
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CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

From this point on, the tape should move from end zone to end zone with the sequence of events described in steps c through f. After satisfactory completion of this test, stop the tape by pressing MANUAL CLEAR.

6. Miscellaneous Functions Test

Repeat test 5 up through step A. Then throw the TAPE ROCKER switch to the OFF position.

The following sequence of events should occur:

- a) The RD IN lamp should go off. Then almost immediately:
- b) The DATA MISS, INC BLK, FCN STOP, and JOE DONE lamps should come on. The T ACT lamp should go off.
- c) The tape should wind all the way down to the end zone and then stop. The END ZONE lamp should light and the GO and UPS1 lamps should go off.

Note: There is a 1 in 128 chance that the INC BLK flag will not come on as described yet is working correctly. If this happens, simply repeat the test once to double check.

7. Skew Check

1. Equipment necessary:

- a) Type 551 Dual Beam Oscilloscope (Tektronix)

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CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

- b) Two (2) type "E" preamps, with probes. 1 preamp will be upper trace, the other lower
- c) TD10A Dectape control with 1 or more TU55's to be checked.
- d) Zero skew DECTape.

2. Scope settings:

- a) Set the variable time/cm to 2 μ sec/cm.
- b) Set the gain on the 2 type "E" preamps to 1 mv/cm. Notice the probes used have 3 leads: normal (N), inverted (I) and ground (G).

3. Procedure

- a) Place a zero skew tape on the left reel of the TU55 to be tested. Place an empty reel on the right hub and pass the tape over the head to the right reel.
- b) Type of head tested.

Note: Use the appropriate section (I or II) for the type of head being tested, then proceed directly to section 4 (test).

I. If testing a "brush" head:

- a) Taking the "N" lead of the upper beam probe, place the "N" lead on pin "E" of the head cable.

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ENGINEERING SPECIFICATION

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CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

- b) Place the "I" and "G" leads to pin "A" of the head cable (ground).
- c) Taking the "I" lead of the lower beam probe, place the "I" lead on pin "D" of the head cable.
- d) Ground the "N" and "G" leads to pin "A" with the other grounded leads from the upper beam probe.
- e) Adjust the scope to get the 2 horizontal traces on the screen. Using the vertical position on the upper and lower traces, bring both horizontal beams together.

II. If testing a GJM head:

- a) Taking the "N" lead of the upper beam probe, place the "N" lead to pin "C" of the head cable.
- b) Place the "I" and "G" leads to pin "A" of the head cable (ground).
- c) Taking the "I" lead of the lower beam probe, place the "I" lead to pin "D" of the head cable.
- d) Ground the N and G leads to pin "A" of the head cable with the other grounded leads from the upper beam probe.
- e) Adjust the scope to get the 2 horizontal traces on the screen. Using the vertical position on the upper and lower beam traces, bring both horizontal beams together.

SIZE A	CODE SP	NUMBER TD10A-0-17	REV A
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TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

4. Test

- a) Pass the zero skew tape in the forward direction over the head, by placing the TU55 in "local" and pushing the desired direction switch.
- b) The lower beam shall lead the upper beam by no more than 2 μ sec.
- c) Pass the tape over the head in reverse direction.
- d) The upper beam shall lead the lower beam by no more than 2 μ sec.

If it is difficult to distinguish the lower beam from the upper beam while moving the tape, press the trace restorer button, shorting out the lower trace for easy distinction.

- 5. A TU55 which does not pass step 4 must be returned to TU55 production for de-skewing.

II. On-Line Checkout

Connect the TD10A to a PDP-6 or PDP-10 Central Processor. If connected to a PDP-6, be sure to terminate the I/O Bus as required (the PDP-10 requires no terminating).

- 1. Recheck all the delay adjustments that were made off-line in step 1.2.

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A	SP	TD10A-0-17	A

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digital

CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

2. Status Bit Test

CONO 320, 340000

CONI 324, 0

JRST .-1

Run the above program to check the functions of every status bit, one by one. Be sure to check at least the following functions.

- a) Use this program that selects transport 8, stops, and loops on a CONI 324, 0. Set the address switches on the PDP-10 (or PDP-6, understood henceforth) to Address 0. Switch the dial on the transport from unit 8 to unit 7 and back a few times. Bit 29 should go off and on correspondingly.
- b) Running the program of step a, throw the WRITE LOCK switch on and off a few times. Bit 24 should go on and off correspondingly.
- c) Throw the WRITE TIMING AND MARK TRACK switch on and off a few times. Bit 25 should go on and off correspondingly.
- d) In steps A through C, all other right-half bits should be off during this test. Bit 14 is the only left-half bit that is on; all others must be off.

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A	SP	TD10A-0-17	A

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ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

- e) Repeat test 6. When the tape stops in the end zone, do not hit MANUAL CLEAR, but instead throw the MANUAL MODE switch to the off position. Bits 1, 2, 26, should now be on, followed shortly by bit 22.
- f) Execute CONO 320, 230700 (write data) with WRITE LOCK on. Check that the ILLEGAL OPERATION flag comes on and WREN stays off. Check the other three cases for the ILLEGAL OPERATION flag: selecting a unit number which has 0 or 2 units dialed up (it is necessary to connect a second TU55 in order to perform this test), trying to write timing and mark tracks with the WRTM switch off (CONO 320 400), and trying any command other than write timing and mark track with the WRTM switch on (no tape mounted for the last test mentioned).
- g) Execute a CONO 320, 230300 (read data). Check that the block missed flag comes on.

3. On-Line Diagnostics

Run all DECTape diagnostic programs to successful completion.

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TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

4. Certification

Using the DECTape Certification Program (MAINDEC 10-D3DC), certify a DECTape. Verify proper operation of this program.

5. Data Reliability Test

Using the DECTape Data Reliability Program (MAINDEC 10-D3HA) exercise the TD10A control. This program will transmit random data and check it (consult program writeup). Verify proper operation of the program and that reliable data transfers are taking place.

6. Vibration Test

Having run the Data Reliability Program successfully, a short vibration check of the modules will be necessary. Still running the Data Reliability program (MAINDEC 10-D3HA) vibrate each rack of modules with a nylon rod for a total time of 3 to 5 minutes. Verify continued operation of the program.

7. Plotter Check

It is necessary to insure correct wiring of the XY10 plotter interface wired into the TD10A. To check:

- a) insert modules necessary for plotter operation into the TD10A (for correct modules and locations, see D-MU-TD10A-0-2).
- b) Run the MAINDEC 10-D2FA-D Calcomp Plotter diagnostic to completion.

SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-17	A

DEC FORM NO
DRA 108

SHEET 12 OF 13

ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

8. Margins

For margining, see TD10A Manufacturing Checkout Specifications.

9. Heat

For heat test data, see TD10A Manufacturing Checkout Specifications.

(54)

SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-17	A

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DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS						
ENGINEERING SPECIFICATION				DATE 18 Sept 1968		
TITLE TD10A ACCEPTANCE TEST PROCEDURE						
REVISIONS						
REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
--	ORIGINATED	TD10A 00008	G. GARDNER	2/69	--0	--
(55)	ENG George Gardner	APPD <i>W. Gross</i>	SIZE A	CODE SP	NUMBER TD10A-0-18	REV

DEC FORM NO. DRA 107

SHEET 1 OF 5

ENGINEERING SPECIFICATION	digital	CONTINUATION SHEET
TITLE TD10A ACCEPTANCE TEST PROCEDURE		
<p>1. Preliminary</p> <p>A. Check the TU55 DEctape XPort for the following items before applying power:</p> <ul style="list-style-type: none"> a) Chrome plated tape guides, not aluminum. b) Tape reels are relatively easy to remove. c) "Momentary" direction switches should not stick. This is usually caused by binding against the cover plate. d) Lock pins are in place so that the TU55 cannot slide out when a tape reel is pulled. e) A #6 nut is in place under the door catch pin. This allows the door to fit better, and close properly (see 1A.c) f) AC power cords cannot be tie wrapped or be physically near any cables or other wiring between transports. g) Check to see that brakes do not slip. h) Check to see that the tape still rewinds when you switch from local to remote. i) Make sure a ground wire goes from each transport chassis to DC signal ground. <p>B. All tape guides and heads must be clean.</p>		
	SIZE A	CODE SP
		NUMBER TD10A-0-18
		REV

DEC FORM NO DRA 108

SHEET 2 OF 5

ENGINEERING SPECIFICATION digital CONTINUATION SHEET

TITLE TD10A ACCEPTANCE TEST PROCEDURE

2. Requirements; Procedure
 - A. PDP-10 with TD10A DECTape system and one or more TU55 DECTape transports.
 - B. One certified (by DEC) DECTape per TU55 transport.
 - C. DECTape Certification Program (Maindec 10 - D3DC) as revised, and its description.
 - D. DECTape Maindec 10-D3HA, as revised, and its description.
 - E. For time-sharing configurations, a current PDP-10 time sharing monitor.
3. Hardware test
 - A. Mount a certified DECTape on each TU55 transport to be controlled by the TD10A control.
 - B. Using the DECTape Certification program, recertify each tape on its corresponding transport.
 - C. Rotate the DECTapes. The tape that is on Unit 0 goes to Unit 1; the tape on Unit 1 goes to Unit 2; etc.
 - D. Use the "exercise" option of Maindec 10-D3HA diagnostic to test data reliability for each DECTape on its corresponding transport. Let the program run once per DECTape.
 - E. No errors are acceptable during this test.

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DRA 108

SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-18	

SHEET 3 OF 5

ENGINEERING SPECIFICATION digital CONTINUATION SHEET

TITLE TD10A ACCEPTANCE TEST PROCEDURE

4. Software Integration Test.

This test will be performed only on time-sharing PDP-10 configurations.

 - A. Use the Peripheral Interchange Program (PIP) to copy the MAC file from one transport to another.
 - B. Repeat this procedure (transport 1 to transport 2 to 3 etc. - after replacing MAC with a scratch tape) until 2 complete passes on each transport have been made.
 - C. Remount the original MAC tape on its original unit and, using SRCCOM, compare the original MAC against the last generated tape. There should be no errors.

Note: A "source" consisting of one file containing all MAC files from a CUSP 4 tape can be used to facilitate using the SRCCOM program.

 - D. Error Rate

No errors will be acceptable during the specified time of each program (or test) is run.
 - E. Margins

Margins shall not be run for acceptance, but for the acceptors benefit (may want to spot check some racks) the marginal information is documented. See TD10A Acceptance Test Specification.

DEC FORM NO
DRA 108

SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-18	

SHEET 4 OF 5

ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A ACCEPTANCE TEST PROCEDURE

F. Spot Checking

Any test performed in the TD10A Manufacturing checkout and Test Procedure may also be performed (or spot checked) by the acceptor at any time during acceptance.

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SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-18	

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DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS						
ENGINEERING SPECIFICATION					DATE 9/20/68	
TITLE TD10A MANUFACTURING CHECKOUT AND TEST SPECIFICATION						
REVISIONS						
REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
--	ORIGINATED	TD10A 00008	G. GARDNER	2/69	--	--
(59)	ENG GEORGE GARDNER	APPD <i>[Signature]</i>	SIZE A	CODE SF	NUMBER TD10A-0-20	REV

DEC FORM NO.
DRA 107

SHEET 1 OF 4

ENGINEERING SPECIFICATION				CONTINUATION SHEET
TITLE TD10A MANUFACTURING CHECKOUT AND TEST SPECIFICATIONS				
RESULT SHEET				
	<u>MARGIN ROOM TEMP.</u>		<u>MARGIN HEAT</u>	
TESTS RUN				
Tape Rocker	_____		_____	
(Maindec 10-D3EA)	_____		_____	
(Maindec 10-D3FA)	_____		_____	
Data Reliability				
(Maindec 10-D3HA)	_____		_____	
Date: _____				
Technician: _____				
System: _____				
			SIZE A	CODE SF
			NUMBER TD10A-0-20	REV

DEC FORM NO.
DRA 108

SHEET 2 OF 4

ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT AND TEST SPECIFICATION

After the Manufacturing Checkout and Test Procedure has been completed, margined tests on the TD10A must also be completed.

All tests mentioned on the cover sheet shall pass margins at room temperature and under heat (105°F). Maindec 10-D3BA will not be margined at all; it will be used only in bringing the machine up. Tape Rocker Mode, Maindec 10-D3EA, Maindec 10-D3FA, and Maindec 10-D3HA will be margined to the specifications herein.

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SIZE A	CODE SP	NUMBER TD10A-0-20	REV
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SHEET 3 OF 4

DEC FORM NO
DRA 108

ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT AND TEST SPECIFICATION

PROGRAM	SPECIAL INSTRUCTIONS FOR OPERATING	PANELS FOR MARGINING	MARGIN SPECS		TEST TIME (PER RACK) (HOURS)	ACCEPT. DATE
			+10V	-15V		
Tape Rocker Mode	Margin all racks separately (+10V and -15V).	1A & 1B	+2	+3	.1	
			-2	-3		
Maindec 10-D3EA	Margin all racks separately (+10V and -15V).	1C - 1J	+7.5	+3	.1	
			-7.5	-3		
		1A & 1B	+2	+3	.1	
		1H	+6	+3	.1	
		1A, 1C-1F, 1J	-4	-3	.1	
			+7.5	+3	.1	
			-7.5	-3	.1	
Maindec 10-D3FA	Same as Maindec 10-D3EA instructions	1A & 1B	+2	+3	.2	
		1H	+6	+3	.2	
		1A, 1C-1F	-4	-3	.2	
			+7.5	+3	.2	
			-7.5	-3	.2	
Maindec 10-D3HA	Margin all racks separately (+10V and -15V).	1A & 1B	+2	+3	.1	
		1H	+6	+3	.1	
		1C-1F, 1J	-4	-3	.1	
			+7.5	+3	.1	
			-7.5	-3	.1	

SIZE A	CODE SP	NUMBER TD10A-0-20	REV
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SHEET 4 OF 4

DEC FORM NO
DRA 108

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DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS						
ENGINEERING SPECIFICATION					DATE 2 Feb. 1968	
TITLE TD10A RECOMMENDED SPARE PARTS LIST						
REVISIONS						
REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
--	ORIGINATED	TD10A 00008	G. GARDNER	2/69	--	--
(62) ENG George Gardner	APPD <i>L. Gross</i>	SIZE A	CODE SP	NUMBER TD10A-0-23	REV	

DEC FORM NO. DRA 107

SHEET 1 OF 4

ENGINEERING SPECIFICATION		Digital	CONTINUATION SHEET		
TITLE TD10A RECOMMENDED SPARE PARTS LIST					
MODULES					
TYPE	QUANTITY	TYPE	QUANTITY		
B152	1	S202	3		
B156	1	S203	1		
B163	2	S205	3		
B214	1	W005	1		
B685	1	W012	1		
G705	1	W023	1		
G706	1	W032	1		
G853	1	W033	1		
G882	1	W107	1		
R002	1	W250	1		
R107	2	W520	1		
R111	2	W532	1		
R113	1	W533	1		
R141	1	W808	1		
R151	1	W851	1		
R201	1				
R302	1				
R303	1				
R401	1				
R602	1				
R603	1				
		SIZE A	CODE SP	NUMBER TD10A-0-23	REV

DEC FORM NO. DRA 108

SHEET 2 OF 4

ENGINEERING SPECIFICATION



CONTINUATION SHEET

TITLE TD10A RECOMMENDED SPARE PARTS LIST

TRANSISTORS

<u>TYPE</u>	<u>QUANTITY</u>
IN748	2
IN756A	2
DEC2896-3B	2
DEC3639D	2
DEC2894-18-S	2
2N3605	2
DEC2219	2
DEC6534B	7
DEC6534C	2
DEC6534D	2

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CODE A	SIZE SP	NUMBER TD10A-0-23	REV
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ENGINEERING SPECIFICATION



CONTINUATION SHEET

TITLE TD10A RECOMMENDED SPARE PARTS LIST

ADDITIONAL

<u>DESCRIPTION</u>	<u>PART NO.</u>	<u>QUANTITY</u>
Diode - D670	11-2162	10
TRIMPOT	A-13-5395	2
Indicator Lights	12-555	10

CODE A	SIZE SP	NUMBER TD10A-0-23	REV
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ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A System Specifications

During a write operation, 18-bits to be written are placed in the ^{SH} register while the remaining 18-bits are stored in the BA register. On request from the DECTape writing section of the control, 6 bits are shifted to the read-write buffer and the next 6 bits are shifted into place in preparation for the next request. When all 18 bits have been written in this manner, the 18 bits of data in BA are transferred to SH and a data request flag is raised for the program to refill the BA/BB register. The program has approximately 200 μs before the SH register requires refilling.

During a write reverse operation, the 6-bit bytes must be fed to the DECTape writing section in reverse order. This reversal is accomplished by shifting the data in BA/BB to SH/BA and then shifting once more so that the data is in BB/SH; in other words, the second 18-bit half-word is shifted around to the SH register. The SH register is then rotated twice to bring the third byte into position for writing. Each time the DECTape writer accepts the 6-bit byte that is waiting, the SH register rotates twice to bring the "next" byte into position. When the SH register requires refilling, the unwritten half-word (located in BB) is shifted around to the SH register and the cycle repeats.

During a read operation, 6 bits of data from the DECTape reader section shift at one time into the SH register. After three such shifts the SH register is full and an automatic transfer of the data is made to the BB register. After three more shifts the BB is transferred to the BA and the SH is transferred to the BB (simultaneously). A data request flag is now raised. The program must read the data out of the BA/BB register before the SH fills up again (200 μs approx.).

During a read reverse operation, the SH register shifts twice each time a 6-bit byte arrives from the DECTape reader. This process reverses the order of the bytes when all three are finally assembled. The 18 bits thus assembled are jammed into the BB register and immediately jammed again up to the BA register. The next 18 bits to arrive are transferred

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DRA 108

SIZE A	CODE SP	NUMBER TD10A-0-24	REV
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SHEET 3 OF 6

ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A System Specifications

to the BA register by the same process while simultaneously the data in the BA is transferred to the BB register via the SH.

Pulses to drive the data control section are derived by R302 delays which are coarsely adjusted to 1 μs. A total of four such delays are required. The timing chain is triggered either by commands from the program or by data strobe pulses derived in the DECTape reader/writer from the DECTape timing track.

In the following discussion, it is assumed that the reader understands the sequence of codes in the mark track.

The up-to-speed circuit times the repetition rate of the timing track pulses to determine when the tape is moving fast enough for successful reading and writing. Timing track pulses occur at the zero-point crossings of the timing track output. If the tape is stopped or is moving very slowly, the zero crossings consist entirely of noise variations. There is, therefore, a need for a slicing sense amplifier to produce the pulses for timing the rep rate of the timing track. The slicing sense amplifier used is a W532-W533 combination. The output pulse of the sense amp triggers an R303 integrating one-shot. If the R303 times out before the next pulse, the tape is moving too slowly; otherwise, the next pulse sets the up-to-speed flip flop. The up-to-speed circuit inhibits the generation of time pulses until the tape is up to speed. Thus nothing in particular happens in the control unit the tape is up to speed.

To determine the position of the tape, the control decodes information in the mark track. Mark track codes are six bits long and appear serially. The mark track decoder contains an 8-bit shift register to provide redundancy. In addition, a ninth flip flop is set when the first ONE shifts off the end of the mark track register. Thus the conditions for recognizing a mark are: the six bits of the mark must be right, the preceeding two bits must also be right and at least nine shifts must have occurred since the tape came up to speed.

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DRA 108

SIZE A	CODE SP	NUMBER TD10A-0-24	REV
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SHEET 4 OF 6

ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A System Specifications

The marks required for the operation of the DECTape control are decoded individually in R111 gates expanded with R002's.

Several of the marks occur more than once within a block. Therefore, it is necessary to count marks. Two such counters are present in the control; the TBN counter which counts the "25" codes to determine the start of the block number, and the T DATA counter which counts "10" and "73" codes to control the parity check words at the beginning and end of a block.

The TBN counter does not count unless preset to a "1" by the block number sync code; thus, there is no error if the tape comes up to speed in the middle of the sequence of "25's". However, the block number of the first and last blocks cannot be read (also a feature of the 551 control). TBN has three flip flops, two(2) to count the requisite number of "25's" and one (1) to provide a "block number under the read heads" status to the program. When the TBN counter reaches 0, it stops counting until primed again.

The T DATA counter does not count unless preset to a "1" by the data sync code; thus, there is no error if the tape comes up to speed in the middle of the sequence of "10's" and "73's". T DATA has three flip flops. The count pulses are triggered by one data sync, four rev data end (10), and four fwd data end (73), but on the eighth pulse the counter returns to the "0" state and does not resume counting until preset again. The outputs of the T DATA flip flop, applied to an R151 decoder, generate the state levels necessary to control the sequence of operations that occur during a data block. This sequence is T STOP (0), T SYNC (1), T REV CKS (2), T BLOCK (3, 4, 5), T PRE FINAL (6), T FWD CKS (7).

The most interesting state flip flop is T ACT (active). T ACT turns on the write current when writing and enables data strobe pulses in any event. Normally, data juggles back and forth in the read-write buffer and the parity buffer but does not go anywhere. When

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DRA 108

SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-24	

SHEET 5 OF 6

ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A System Specifications

T ACT is set, data makes the final transfer between the read-write buffer and the shift register. Thus, the principal difference between the way the different modes operate is the condition under which the T ACT flip flop is set and reset. The ST JOB DONE flip flop is "the other" state flip flop. T ACT cannot be set if ST JOB DONE is set. The program requests the control to go into job done status by setting the function stop bit. The control obliges by turning on ST JOB DONE as soon as the control comes to the next convenient stopping point and becomes inactive. A cono to do something followed by an immediate cono to set the function stop bit causes job done immediately (before anything happens).

The parity check is compatible with the 551 and the TC02.

A count-to-six circuit checks the mark track to ensure that a mark occurs every sixth time pulse and at no other time pulse. An inhibit flip flop stops this error check during the codes that the control does not decode and during the code (25) that occurs more often than every sixth pulse.

The read-in circuit consists of a PA that sets up the control flip flops needed to rewind the tape to the end zone, a flip flop to remember that when the tape reached the end zone it must be turned around and read and second PA to set the control flip flops needed to read the tape going forward.

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SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-24	

SHEET 6 OF 6

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DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS						
ENGINEERING SPECIFICATION				DATE 6 Feb 1968		
TITLE TD10A PROGRAMMING SPECIFICATIONS						
REVISIONS						
REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
-	ORIGINATED	TD10A 00008	G. GARDNER	2/69	--	--

(67)	ENG George Gardner	APPD <i>D. Gross</i>	SIZE A	CODE SP	NUMBER TD10A-0-25	REV
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DEC FORM NO.
DRA 107

SHEET 1 OF 9

ENGINEERING SPECIFICATION	CONTINUATION SHEET														
TITLE TD-10A PROGRAMMING SPECIFICATIONS															
<p>The TD-10 DECTape control for the PDP-10 requires two device numbers; DTC (=320) and DTS (=324). Commands to the DECTape control and data pass via the DTC number. Interrupt enables are set via the DTS number. Error bits and status indications read in via the DTS number. (DTS = 330, DTS = 334 is an option).</p> <p>The command to the DECTape control consists of a CON0 to the DTC device number. The 18 bits thus sent have the following meanings:</p> <table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Bits</th> <th style="text-align: left; border-bottom: 1px solid black;">Meaning</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">18-20</td> <td> <u>Motion Selection</u> Bit 18 = Stop Bit 19 = Go forward Bit 20 = Go reverse Bits 19 and 20 given together cause a turnaround. If bit 18 is given, bits 19 and 20 should be zero. All zeros in bits 18 - 20 mean no change in transport motion. </td> </tr> <tr> <td style="vertical-align: top;">21</td> <td> <u>Delay Inhibit.</u> A DECTape transport requires about 200 mS to come up to speed. This delay is suppressed when reselecting a transport that is already up to speed by sending the delay inhibit bit. Ignore this bit if all deselected tapes are stopped. </td> </tr> <tr> <td style="vertical-align: top;">22</td> <td> <u>Select.</u> Enables the selection of a particular transport. This bit should be a 1 whenever a new transport is selected. </td> </tr> <tr> <td style="vertical-align: top;">23</td> <td> <u>Deselect.</u> Deselects all transports and clears the transport number register. This bit is sent whenever the DECTape control must disconnect from the current transport. This bit must also be sent whenever the select bit is sent. </td> </tr> <tr> <td style="vertical-align: top;">24-26</td> <td> <u>Transport Number.</u> 0 is the same as transport 8. Ones in bits 24-26 OR into the transport number register. </td> </tr> <tr> <td style="vertical-align: top;">27-29</td> <td> <u>Function Number</u> 0=Do nothing 1=Read all 2=Read block number 3=Read data 4=Write mark and timing tracks 5=Write all 6=Write block number 7=Write data </td> </tr> </tbody> </table>		Bits	Meaning	18-20	<u>Motion Selection</u> Bit 18 = Stop Bit 19 = Go forward Bit 20 = Go reverse Bits 19 and 20 given together cause a turnaround. If bit 18 is given, bits 19 and 20 should be zero. All zeros in bits 18 - 20 mean no change in transport motion.	21	<u>Delay Inhibit.</u> A DECTape transport requires about 200 mS to come up to speed. This delay is suppressed when reselecting a transport that is already up to speed by sending the delay inhibit bit. Ignore this bit if all deselected tapes are stopped.	22	<u>Select.</u> Enables the selection of a particular transport. This bit should be a 1 whenever a new transport is selected.	23	<u>Deselect.</u> Deselects all transports and clears the transport number register. This bit is sent whenever the DECTape control must disconnect from the current transport. This bit must also be sent whenever the select bit is sent.	24-26	<u>Transport Number.</u> 0 is the same as transport 8. Ones in bits 24-26 OR into the transport number register.	27-29	<u>Function Number</u> 0=Do nothing 1=Read all 2=Read block number 3=Read data 4=Write mark and timing tracks 5=Write all 6=Write block number 7=Write data
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(67)	ENG George Gardner	APPD <i>D. Gross</i>	SIZE A	CODE SP	NUMBER TD10A-0-25	REV									

DEC FORM NO.
DRA 108

SHEET 2 OF 9

ENGINEERING SPECIFICATION

digit

CONTINUATION SHEET

TITLE TD-10A PROGRAMMING SPECIFICATIONS

30-32 PI channel for data interrupts
 33-35 PI channel for flag interrupts.
 CONI 340 reads back the bits sent via CONO 340.
 The DTS device number transmits interrupt enable bits, Function Stop which stops transmission of data and terminates a read or write operation, and Stop All Transports.

Bits	Meaning (for CONO DTS, only)
18	<u>Parity Error Enable.</u> Allows the parity error bit to cause an interrupt on the flags channel.
19	<u>Data Missed Enable.</u> Allows the data missed error bit to cause an interrupt on the flags channel.
20	<u>Job Done Enable.</u> Allows the job done bit to cause an interrupt on the flags channel.
21	<u>Illegal Operation Enable.</u> Allows the illegal operation error bit to cause an interrupt on the flags channel.
22	<u>End Zone Enable.</u> Allows the end zone bit to cause an interrupt on the flags channel.
23	<u>Block Missed Enable.</u> Allows the block missed bit to cause an interrupt on the flags channel.
34	<u>Stop All Transports.</u> Sending this bit causes all transports to stop. The selected transport will, however, resume motion if forward or reverse motion is currently selected.
35	<u>Function Stop.</u> Sending this bit signals the end of a read or write data operation or a read or write all operation. If this bit is sent while the tape is between blocks, the current operation terminates and the job done flag comes on. If the bit is sent at any other time, the control continues, if reading, to read to the end of the current block and check the checksum; if writing, to write the last word sent repeatedly until the end of the current block and to write a correct checksum. At the end of the current block the job done flag comes on. The data missed flag cannot be set after this bit is sent but may be set prior to the function stop.

The CONI from the DTS device number receives all status levels that are useful in programming DECTape. The cause of any interrupt is uniquely determined by these status levels.

(68)	SIZE A	CODE SF	NUMBER TD10A-0-25	REV
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DEC FORM NO
DRA 108

SHEET 3 OF 9

ENGINEERING SPECIFICATION

digit

CONTINUATION SHEET

TITLE TD-10 PROGRAMMING SPECIFICATIONS

Although the DECTape control provides more than 18 status bits, all bits are read in via one device number by the expedient of having the least used bits appear in the left half word. These bits in the left half are not testable by the CONSZ or CONSO instructions, but must be read via the CONI instruction into an accumulator and tested by the TLNE and TLNN instructions. Also note that bits which are set by the CONO DTS, instruction read back in the left half of the CONI DTS, word.

Bit	Meaning (for CONI DTS, only)
0	Parity Error Enable
1	Data Missed Enable
2	Job Done Enable.
3	Illegal Operation Enable
4	End Zone Enable
5	Block Missed Enable
6	Delay in Progress. This bit is a one when the control is waiting for a transport to connect, turnaround.
7	Active. The control is transferring data.
8	Up to Speed. This bit is a one when the tape is actually moving fast enough for successful reading or writing.
9	Block Number. This bit is a one when the DECTape control is in the process of reading a block number.
10	Reverse Check. This bit is a one when the DECTape control is processing a reverse checksum.
11	Data. This bit is a one when the DECTape control is processing data.
12	Final. This bit is a one when the DECTape control is processing the last data word in a block. The data bit will be off when this bit is on.
13	Checksum. This bit is a one when the DECTape control is processing the final checksum.
14	Idle. This bit is a one when the tape is between blocks.

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- 15 Block Number Read. This bit is set to one when the control reads a block number from the tape. The bit is cleared when the reverse check bit comes on. A CONO to read or write data, given when the Block Number Read bit is off, causes the block missed flag to come on.
- 16 N.U.
- 17 Function Stop.
- 18 Parity Error. This bit is a one if any of the blocks read since the last CONO DTC, had a checksum failure. This bit is also set if the Mark Track Error bit is on.
- 19 Data Missed. This bit is a one if a data request is not answered in time. This bit is also set if a read or write data command is sent without reading the block number of the current block.
- 20 Job Done. This bit is set when a block mark is read or written if the command is read or write block marks; when the checksum is read or written when the command is read or write data and function stop or data missed is on; when data transmission finally ceases during all mode.
- 21 Illegal Operation. This bit is set whenever any of the following manual switch settings conflict with the command sent by the program; write lock when trying to write; write timing and mark track switch off while trying to write timing and mark track; no units dialed to the selected transport number, or more than one unit dialed to the same number.
- 22 End Zone. This bit is set when the tape moves into the end zone and the end zone mark from the tape is sensed. The DECTape control automatically stops the tape when the end zone bit comes on.
- 23 Block Missed. This bit is set if a read block mark operation is followed by a read or write data operation too late to catch the current block.
- 24 Write Lock. This bit is a one when the selected transport has its switch set on the write lock position.
- 25 Write Mark and Timing Switch. This bit is a one when the write mark and timing track switch in the control is set.

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- 26 Incomplete Block. This bit is set when function stop is given or data missed occurs during the reading or writing of a block. This bit is not set if reading or writing stops between blocks.
- 27 Not used
- 28 Mark Track Error. This bit is set to one when a valid mark track code fails to appear every sixth bit time or if reading or writing is not terminated when the guard mark appears.
- 29 Select Error. This bit is set to one if no unit or more than one unit is dialed to the selected transport number.
- 30-33 N.U.
- 34 Flag Request. This bit is on whenever any of bits 18-23 is a one and its corresponding enable bit is also a one. The flag request bit means that an interrupt is being requested on the flags channel.
- 35 Data Request. This bit is on during reading to request that the program read in a data word from the DECTape control. It is on during writing to request the program to transmit the next word to be written. This bit requests an interrupt on the data channel. Satisfying the request or sending data stop clears the data request bit.

Normal DECTape operation consists of reading block numbers until the target block is found, followed by reading or writing as many data words as required, followed by a waiting period for the job done flag to come on (indicating that the parity word has been written out or read and checked). An interrupt program should first clear all interrupt enables by giving a "CONO DTS, 0." Next give a "CONO DTC,..." with the desired direction bit on, the select and deselect bits on, the unit number, function number 2 to read block numbers and the two PI channel numbers. An interrupt program now gives 'CONO DTS, 660000' to enable all interrupts except job done, and block missed. A non-interrupt program must continually check the four corresponding flag bits but an interrupt program just waits for an interrupt. When the transport comes up to speed and a block number is read, the data request flag and the job done flag are both raised. The program must give a 'DATA1 DTC' to obtain the block number and compare it with the block number of the target block. If the numbers match the program has 800 microseconds to give a "CONO DTC,..." to select a read or write data operation. If the number read in is high, the program must give a 'CONO DTC, 300200' which turns the tape around and reads the next block mark going the other direction. If the number is low the program must wait for another data request to read the next block mark going in the same direction. After the first step the tape may be moving in either direction. Example 1 shows a non-interrupt program to find a given block and

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to approach it with the tape moving forward.

If an error bit comes on the program must stop the tape (CONO DTC, 400000) and take some corrective action. If the end zone bit comes on the program merely give a 'CONO DTC, 300200' to turn the tape around.

Example 1 This routine finds a given block and guarantees the tape will be moving forward.

```

CONO DTC,231200 ;GO FWD, UNIT 1, READ BLOCK NUM.
A:  CONSZ DTS,640000 ;ANY MISC. ERROR ON?
    JRST ERRS ;YES,DO SOMETHING
    CONSZ DTS,20000 ;END ZONE?
B:  CONO DTC,300200 ;TURNAROUND, READ BN
    CONSO DTS,1 ;DATA AVAILABLE?
    JRST A ;NO,RETEST ALL
    DATAI DTC,2 ;READ IN BLOCK NUM.
    SUB 2,NUMBER ;COMPUTE THIS #-DESIRED#
    CONSZ DTC,100000 ;GOING REV?
    TLCA 2,400000 ;YES,COMPLEMENT TURNAROUND
    ;CONDITION AND SKIP THE = TEST
    JUMPE 2,FOUND ;AT THE DESIRED BLOCK?
    JUMPGE 2, B ;NO,TURNAROUND REQUIRED?
    JRST A
    
```

After the program finds the target block, it must issue a new "CONO DTC,..." to enter read or write data mode and must do so within 800 microseconds of the time when the block number appeared. An interrupt program also gives a fresh set of interrupt enables via the "CONO DTS,..." this time enabling everything. Each time the data request flag comes on the program must give a "DATAI DTC," (or DATAO or BLKI or BLKO) instruction which clears the data request. The control continues to read or write across block boundaries until a "CONO DTS,1" is given to cause a function stop. The control will

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continue through the current block when told to stop, and turn on the job done flag and enter the idle state at the end of the block. When the control reaches the end of any block, it reads and checks (or writes out) the parity check word, possibly setting the parity error flag. When the job done flag is raised the function is complete and a new "CONO DTC" must be issued before any further data will pass. The transport, however, continues to move until a "CONO DTC,400000"(stop) command is given.

Data request flags occur at 400 microsecond intervals (nominal) but the request must be serviced within 200 microseconds or else the data missed flag is set.

The four modes; write block number, read all, write all, and write mark and timing track; are used mainly for the generation and maintenance of the pre-written block format. Write block number mode is used to write a single block number on the tape. Programming for this mode is complicated by the fact that the program must search for the block number preceeding the block number to be re-written. Only the block number for the direction in which the tape is moving is written. For example, when the tape is moving in reverse, the write block number command writes a reverse block number.

The write mark and timing track command must be enabled by manually setting the write mark and timing track switch inside the control. When this command is used the entire contents of the tape are lost. Therefore, this mode is only used to prepare an uncertified tape or to repair a tape which has lost its mark and/or timing track (perhaps by being placed in a strong magnetic field). The transport used to generate the mark and timing tracks must have read write head certified for zero skew. The timing track is automatically written via the output of a clock in the control. Mark track data is taken from bits 0, 3, 6, 9, ..., 33. Thus for each data word transferred, two mark track codes are written. See the PDP-6 Handbook F-65 for details of the mark track format. The mark and timing tracks for the entire tape must be generated in a single pass, beginning with about 10 feet of reverse end zone codes and ending with as many forward end zone codes as will fit.

The all mode permits writing or reading in all slots on the tape except the parity word slots which are always written automatically. Reading or writing in the all mode always begins with the first reverse block number slot encountered and continues until a function stop command is given. If the tape is reading or writing in a data block when the function stop is given, the action taken is the same as for read or write data modes. Otherwise, the function ceases at the end of the current word. For example, a CONO DTC, to enter write all mode followed by a DATAO DTC, followed by CONO DTS writes one reverse block number.

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MAINT DATA0 is DATA0 to device 324.
MAINT DATA0 CLR fires TPO
MAINT DATA0 SET fires TPI
Bit 35 enters mark track shift register.
Bit 21 fires pulse to up to speed detector.
All other bits are ignored.

During DATA1 324, the following bits indicate:

- 1) Bits 15-20 - The LP Buffer.
- 2) Bits 21-26 - The RW Buffer.

During DATA1 324, the following bits containing zero (0) indicate:

- 1) MK BN SPACE (25) - bit 29
- 2) MK BN END (26) - bit 30
- 3) MK DATA SYNC (32) - bit 31
- 4) MK REV DATA END (10) - bit 32
- 5) MK DATA (70) - bit 33
- 6) MK FWD DATA END (73) - bit 34
- 7) MK BN SYNC (51) - bit 35

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