MASTER DRAWING LIST

DWG. NO.	REV. LET.	NO. OF SHEETS	TITLE
D-UA-TD10A-0-0	K	1	TAPE CONTROL 10A ASSY
A-PL-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-ERR	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-MK	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			
REV.	DATE	CHG. NO.	APP'D.
A	1/68	1	G.G.
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	D.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.
R	7/69	00011	D.G.
S	8/69	00012	D.G.

(1)

DRN. R. ROBICHAUD	DATE 1/ 2/68	
CHK'D. J.C. PELLETIER	DATE 1-5-68	
ENG.	DATE	
PROJ. ENG.	DATE	
PROD.	DATE	
FIRST USED ON D-UA-TD10A-A-0		
SCALE ~		
SHEET 1 OF 2		

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE

TAPE CONTROL 10A
(TD10A)

SIZE	CODE	NUMBER	REV.
A	ML	TD10A-A	V

DIST.

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

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REVISIONS			
REV.	DATE	CHG. NO.	APP'D.
T	12/69	00014	D.G.
U	10/70	Misc.79	A.K.
V	7/71	00016	D.G.

DRN. R. Robichaud	DATE 1/ 2/68	
CHK'D. Pelletier	DATE 1/ 8/68	
ENG. D. Gross	DATE 1/68	
PROJ. ENG. D. Gross	DATE 1/68	
PROD. S.Mikulski	DATE 1/68	
FIRST USED ON D-UA-TD10A-A-0		
SCALE		
SHEET 2 OF 2		

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE

TAPE CONTROL 10A
(TD10A)

SIZE	CODE	NUMBER	REV.
A	ML	TD10A-A	V

DIST.

LEGEND	
NUMBER	VARIATION
TD10A-A-0	50 ~
TD10A-B-0	60 ~

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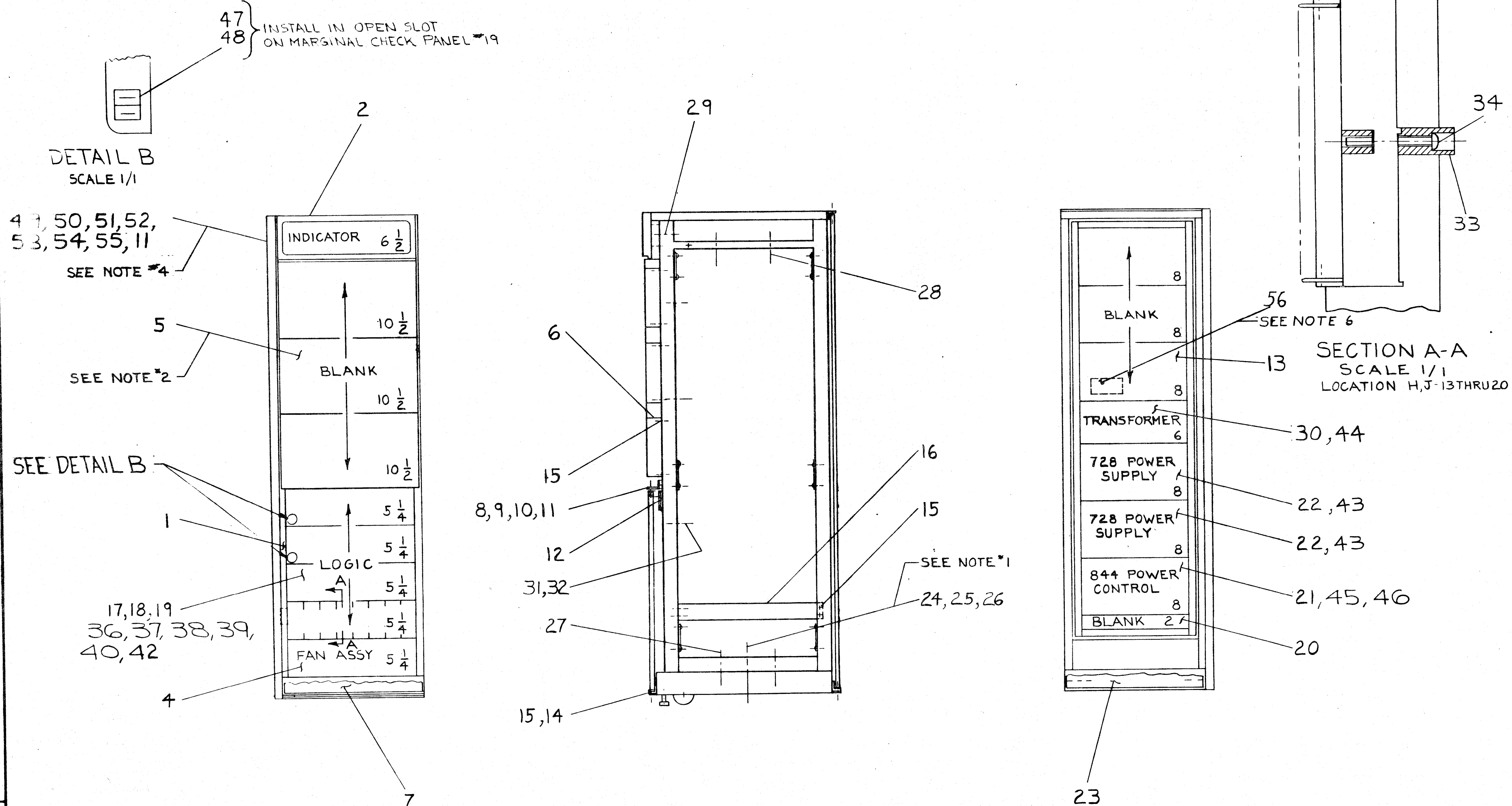


NOTES:

1. DRILL THRU $\frac{13}{32}$ DIA. HOLE IN CAB FRAME THRU SKID (D-01421) & INSTALL ITEMS #24, 25, 26.
2. WHEN TU55 IS INSTALLED REMOVE BLANK FILLER PANEL (ITEM #5) & SUPPORT BRACKET (ITEM #6) & REFER TO INSTALLATION DWG. #C-OD-TU55-0-12
3. REFER TO DWG INDEX LIST, DWG NO. D-DI-TD10A-0-1 & ARRANGEMENT DWG #D-AR-TD10-0-0
4. ITEMS #49 THRU 55 & 11 ARE TO BE SUPPLIED FOR ATTACHING TO PDP-10 CONSOLE. SEE DWG NO. D-DA-7605120-0-0 FOR MOUNTING CONFIGURATION.
5. FOR DRAWING INDEX LIST REFER TO DWG NO. D-DI-TD10A-0-1
6. I/O DECAL GOES ON INSIDE OF REAR DOOR (ON A BLANK PANEL).

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL —

FINISH —

DRN. J. Kalagas DATE 5-19-67
CHK'D. DATE 6-15-67
ENG. DATE
PROJ. ENG. DATE 7/17/67
PROD. DATE

FIRST USED ON —

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE TAPE CONTROL 10A

SIZE D CODE JA NUMBER TD10A-0-0 REV K

SCALE 1/3 SHEET OF

REVISIONS: REV A ECO 3105 ... REV C ECO #3274 ADDED ITEMS 49 THRU 55 & 11 ... REV D ECO #3371 ADDED #18 ... REV E ECO #3531 SEE PARTS LIST ... REV F TD10A-00002 GROSS ... REV H TD10A-00007 ... D GROSS ... REV J TD10A-00011 ... D. NEVALA ... REV K MISC-00079 KENT 10-12-70

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

ITEM NO.	DWG. NO.	DESCRIPTION	QUANTITY TD10A-A-0	QUANTITY TD10A-B-0
1	E-IA-7406052-0-0	CABINET FRAME REWORK -	1	1
2	D-AD-7005396-0-0	BEZEL ASSEMBLY	1	1
3				
4	E-AD-7005474-0-0	FAN HOUSING ASSEMBLY	1	1
5	C-IA-7406063-0-0	PANEL, BLANK FILLER	3	3
6	C-MD-7406062-0-0	BRACKET, SUPPORT	6	6
7	D-AD-7005492-2-0	DOOR, FRONT ASSEMBLY	1	1
8	B-MD-7405861-0-0	BRACKET, DOOR PIVOT	1	1
9	A-MD-7405860-0-0	BAR, SPACER	1	1
10	90-06350	SCR CAP SOC H 10-32 X 1" LG SST	2	2
11	90-06635	WASHER LOCK EXT TOOTH #10	38	38
12	B-MD-7406049-2-0	PLATE, STRIKER	1	1
13	B-MD-5111	CHASSIS "D" SIZE	3	3
14	D-MD-7405862-0-0	TRIM STRIP BOTTOM	1	1

REVISIONS		
CHANGE NO.	DATE	ENG.
A-3105 ADDED PTS 47 & 48 CHANGED VARIANCE NO'S TO LETTERS	10/17/67	
B-3165 CHGD QTY OF PTS #36, 37, & 40 DEL #41 CHGD DWG# OF PT #40	11/14/67	
C-3274 ADDED PTS 49 THRU 55 & QTY TO #11	1/12/68	
C-3287 ADDED ITEM #56	1/23/68	
D-3371 CHG #18 & 19	3/20 68	
E-#3531 CHG #34	6/3 68	
F-TD10A-00002	8/6/68	
H-TD10A-00007	1/14/69	
J-TD10A-00011,	8-8-69	
K-MISC-00079	10/27/70	

MADE BY J. KALAGHER	DATE 5/19/67	TITLE TAPE CONTROL 10A	DRWG. NO. A-PL-TD10A-0-0
CHECKED R.E. PHIPPS	DATE 6/5/67	FOR TD10A-A-0 50 TD10A-B-0 60	ASSY NO D-UA-TD10A-0-0
ENG [signature]	DATE 6/20/67		SHEET 1 OF 5

REV. LTR. K

(3)

G

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

ITEM NO.	DWG. NO.	DESCRIPTION	QUANTITY TD10A-A-0	QUANTITY TD10A-B-0
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

REVISIONS

CHANGE NO.	DATE	ENG.

MADE BY J. KALAGHER	DATE 5/19/67	TITLE TAPE CONTROL 10A	DRWG. NO. A-PL- TD10A-0-0
CHECKED R.E. PHIPPS	DATE 6/5/67	FOR TD10A-A-0 50 TD10A-B-0 60	ASSY NO D-UA-TD10A-0-0
ENG. D. Hench	DATE 6/28/67		SHEET 2 OF 5

REV. LTR. K

(4)

G

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

ITEM NO.	DWG. NO.	DESCRIPTION	QUANTITY TD10A-A-0	QUANTITY TD10A-B-0
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 1½ 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

REVISIONS		
CHANGE NO.	DATE	ENG.

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 [signature]	DATE 6/28/67	G	SHEET 3 OF 5	

5)

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

ITEM NO.	DWG. NO.	DESCRIPTION	QUANTITY TD10A-A-0	QUANTITY TD10A-B-0
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

REVISIONS		
CHANGE NO.	DATE	ENG.

MADE BY J. KALAGHER	DATE 5/24/67	TITLE TAPE CONTROL 10A	DRWG. NO. A-PL- TD10A-0-0
CHECKED R.E. PHIPPS	DATE 6/5/67	FOR TD10A-A-0 50 TD10A-B-0 60	ASSY NO D-UA-TD10A-0-0
ENG D. Clark	DATE 6/28/67	G	SHEET 4 OF 5

REV. LTR. K

(6)

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

ITEM NO.	DWG. NO.	DESCRIPTION	QUANTITY TD10A-A-0	QUANTITY TD10A-B-0
57	C-IA-7405553-8-0	W033 TO W033 CABLE	1	1
REF	C-AD-7006149-0-0	CABLE SET TD10	--	--

REVISIONS		
CHANGE NO.	DATE	ENG.

MADE BY	DATE	TITLE TAPE CONTROL 10A	DRWG. NO. A-PL- TD10A-0-0		REV. LTR.
CHECKED	DATE	FOR TD10A-A-0 50 TD10A-B-0 60	ASSY NO D-UA-TD10A-0-0	SHEET 5 OF 5	K
ENG	DATE				

(7)

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

REVISIONS	CHANGE NO.	REV.
CHK	ORIG. TDIO-00007	—

FIRST USED ON OPT/MOD: TDIO

UNLESS OTHERWISE SPECIFIED

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

MATERIAL —//—

FINISH —//—

QTY.	DESCRIPTION	PART NO.	ITEM NO.
	PARTS LIST		

DRN.		DATE 1/13/69
CHK'D.		DATE 1/14/69
ENG.		DATE 1/15/69
PROJ. ENG.		DATE 1/15/69
PROD.		DATE 1/14/69

NEXT HIGHER ASS'Y: D-UA-TDIO-0-0

SCALE —//—

SHEET 1 OF 1

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE: CABLE SET TDIO

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

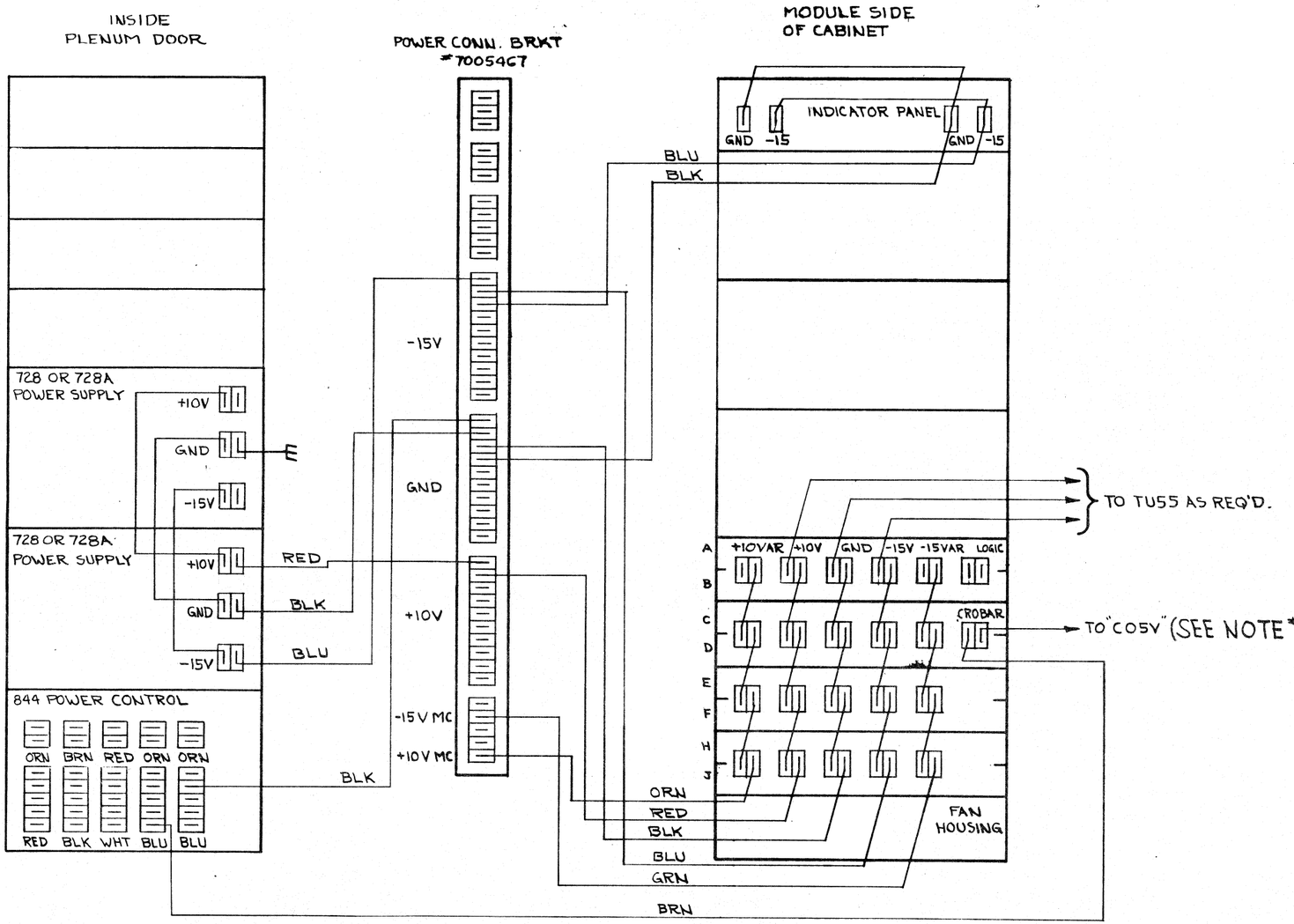
DIST.

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

DEC FORM NO. DRC 100

NOTES:

1. ALL WIRING 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-I082) CRO BAR BECOMES PWR UP DLY WHEN IT REACHES TU55.



50 & 60 Hz DC WIRING

REV.	CHANGE NO.	
A	E.C.O. 3268	ADDED NOTE #4
B		
C	00065	
D	TDIOA-00014	

QTY.	DESCRIPTION	PART NO.	ITEM NO.
	PARTS LIST		

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

MATERIAL —"—

FINISH —"—

FIRST USED ON D-UA-TD10A-0-0

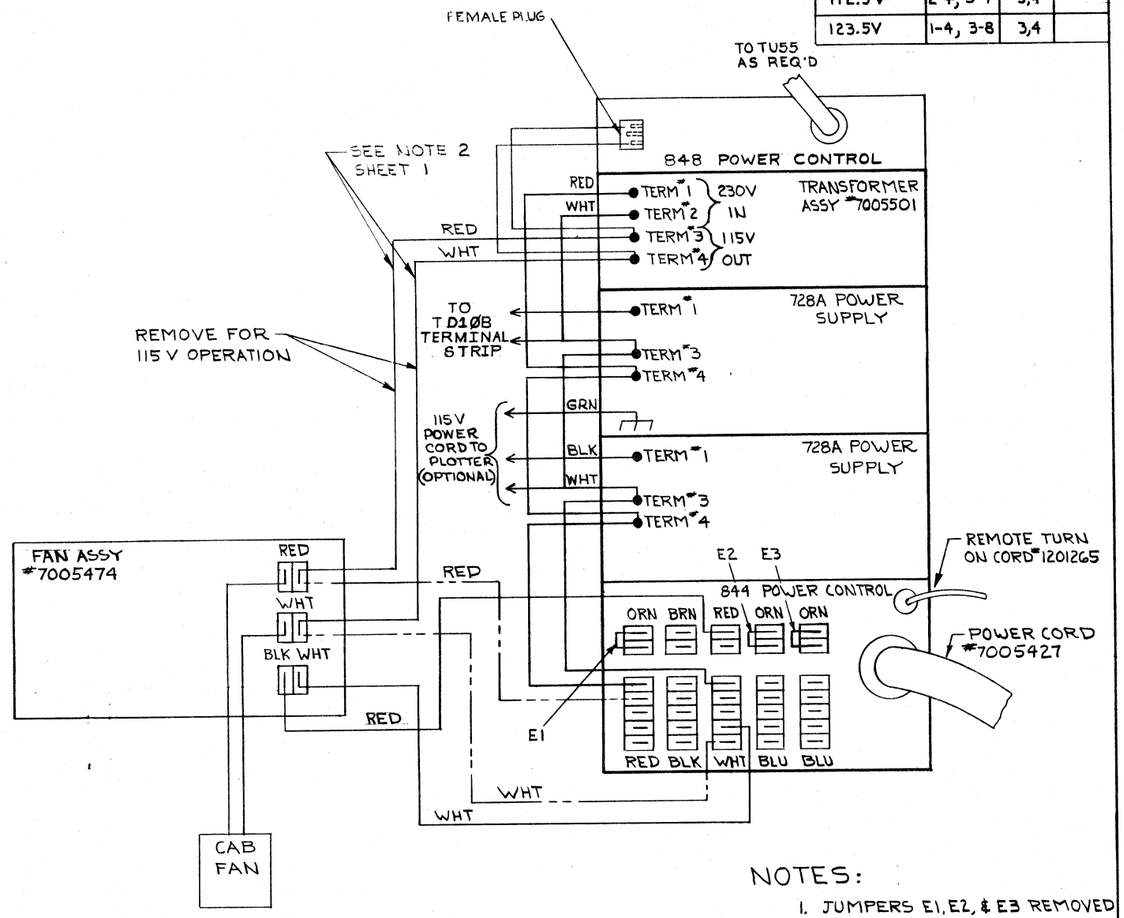
DRN. Hultala	DATE 10-16-67	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D.	DATE 10-18-67	
ENG.	DATE 10-24-67	
PROJ. ENG.	DATE 11/9/67	
PROD.	DATE 11/15/67	

TITLE: WIRING, POWER AC & DC 50 & 60 Hz

SCALE NONE
SHEET 1 OF 2

SIZE	CODE	NUMBER	REV.
D	IC	TD10A-0-4	B
DIST.			

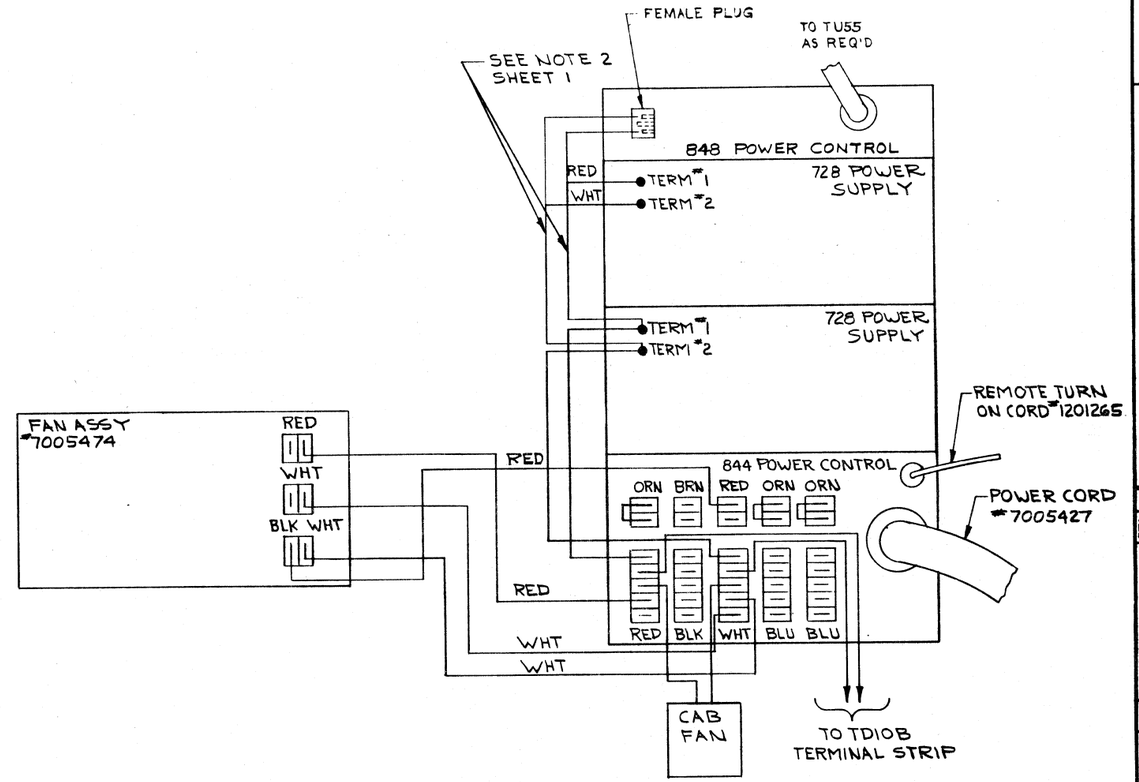
728A JUMPERING			
INPUT VOLTAGE	JUMPER	LINE	
195 V	1-5	3,4	
220 V	1-6	3,4	
235 V	2-8	3,4	
112.5 V	2-4, 3-7	3,4	
123.5 V	1-4, 3-8	3,4	



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

QTY.	DESCRIPTION	PART NO.	ITEM NO.
	PARTS LIST		

DO NOT SCALE DRAWING

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

MATERIAL —"—

FINISH —"—

DRN. Hultala	DATE 10-17-67	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D.	DATE 10-18-67	
ENG.	DATE 10/31/67	
PROJ. ENG.	DATE 10/31/67	
PROD.	DATE 11/15/67	

FIRST USED ON D-UA-TD10A-0-0

SCALE NONE

SHEET 2 OF 2

TITLE: WIRING POWER AC & DC 50&60 Hz

SIZE D | CODE IC | NUMBER TD10A-0-4 | REV

DIST.

REVISIONS			
REV.	CHANGE NO.	CHK.	

DEC FORM NO. DRD 102

SIZE NUMBER D-IC-TD10A-0-4 REV

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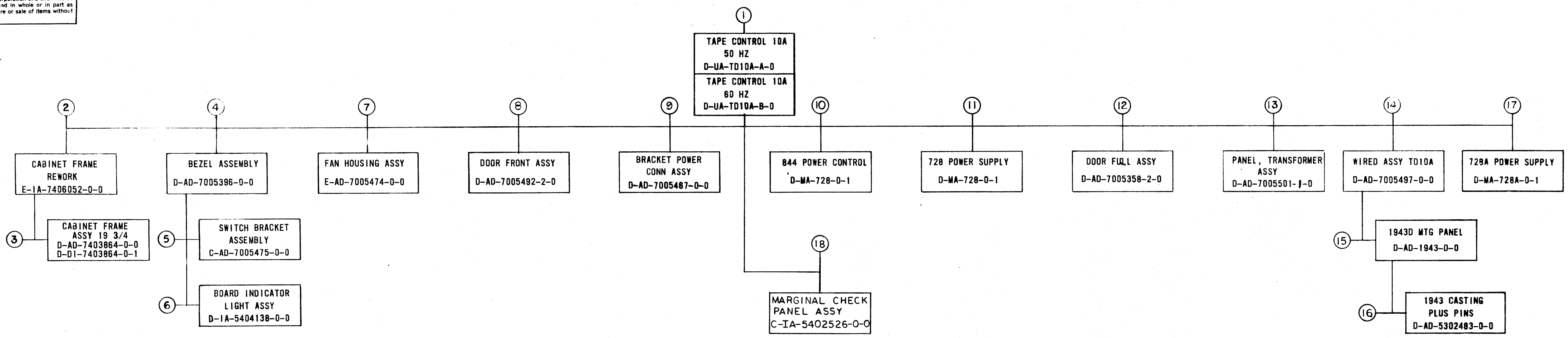


NOTE:
SEE CONFIGURATION REFERENCE TDIØ (D-AR-TDIØ-Ø-Ø, NOTE 1) FOR TU55 CABLE INFORMATION

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

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL —//—
FINISH —//—

DRN. J. Kalaghan DATE 5-23-67
CHK'D. R. E. Phelps DATE 6-8-67
ENG. D. Nevala DATE 6/20/67
PROJ. ENG. DATE 7/17/67
PROD. DATE 7-21-67
FIRST USED ON

SCALE —/— SHEET 1 OF 2

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE
DRAWING INDEX LIST TD10A

SIZE D CODE DI NUMBER TD10A-0-1 REV. K

REVISIONS

CHK	CHANGE NO.	REV.
DR	ECO 3105 EXTENSIVE CHANGE TO ITEM 1 SHEETS 1 & 2	A
	ECO 3163 D-IA-7005459-13-0 WAS D-IA-7406057-13-0 DELETED (1) DWG. NO.	B
HS	ECO #3274 ADDED FOUR PARTS TO FIND NO. 1	C
HS	ECO #3287 ADDED ONE PART TO FIND NO. 1	C
DK	ECO #3371 CHG # ADDED #18	D
	TD10A-00002	E
	ECO #17	F
	FIND NO 6-CHG "C" SIZE TO "D"	G
	TD10A-00007 D GROSS	H
	TD10-00008 D GROSS	J
	TD10A-00011 D. NEVELA	K

DEC FORM NO. DRD 100

MECHANICAL

FIND NO.	DESCRIPTION	PART NO.	DEPT USAGE PROD	CUST	F/C
1	TAPE CONTROL 10A (50 HZ)	D-UA-TD10A-A-0			
	TAPE CONTROL 10A (60 HZ)	D-UA-TD10A-B-0			
	TAPE CONTROL 10A (PL)	A-PL-TD10A-0-0			
	BRACKET SUPPORT	C-MD-7406062-0-0			
	BRACKET DOOR PIVOT	B-MD-7405861-0-0			
	SPACER BAR	A-MD-7405860-0-0			
	PLATE STRIKER	B-MD-7406049-2-0			
	CHASSIS 'D' SIZE	B-MD-5111			
	TRIM STRIP BOTTOM	D-MD-7405862-0-0			
	RIGHT END PANEL	C-MD-5302486-0-0			
	CHASSIS 'A' SIZE	B-MD-5111			
	BLOCK RETAINER	B-MD-7406047-0-0			
	PANEL BLANK FILLER	C-IA-7406063-0-0			
	I/O CABLE (W851 TO W851 X 7' LG)	D-AD-BC10A -7-0			
	FLEX PRINT (W033 TO W033 X 70'' LG)	D-IA-7405553-27-0			
	W012 TO W250 X 63½ LG	D-IA-7005459-13-0			
	POP-10 MARGIN CHECK CABLE	B-IA-BC10B-7 -0			
	CHASSIS 'C' SIZE	B-MD-5111			
	117V TURN ON 9	12-01265			
	MALE TO FEMALE TWIST LOCK 25'	70-5427			
	TD10A I/O DECALS	A-DC-7406494-0-0			
2	CABINET FRAME REWORK TD10A	E-IA-7406052-0-0			
3	CAB FRAME ASSY 19 3/4	E-AD-7403864-0-0			
	DRAWING INDEX LIST 19 3/4 CAB	D-DI-7403864-0-1			
4	BEZEL ASSY	D-AD-7005396-0-0			
	BEZEL ASSY (P.L.)	A-PL-7005396-0-0			
	BEZEL (REWORK)	D-MD-7405729-0-0			
	INDICATOR PANEL	D-IA-7405744-0-0			
	GLASS SUPPORT	D-IA-7406022-0-0			
	BRKT PANEL MTG	B-IA-7405929-0-0			
5	SWITCH BRKT ASSY	C-AD-7005475-0-0			
	SWITCH BRKT ASSY (P.L.)	A-PL-7005475-0-0			
	BRACKET SWITCH	C-MD-7406031-0-0			
	18 PIN RECEPTACLE, REWORK	B-MD-5503964-0-0			
6	BOARD INDICATOR LIGHT ASSY	D-IA-5404138-0-0			
	RECEPTACLE (REWORK)	B-MD-H901-0-1-0-2			
	ETCH BOARD	C-IA-5004137-0-0			
7	FAN HOUSING ASSY	E-AD-7005474-0-0			
	FAN HOUSING ASSY (P.L.)	A-PL-7005474-0-0			
	HOUSING FAN	D-MD-7406032-0-0			
	PANEL FRONT FAN	D-MD-7406030-0-0			
	COVER PROTECTION 4 TERM	B-MD-7404721-0-0			
	SCREEN FAN	C-MD-7404881-0-0			
8	FRONT DOOR ASSY	D-AD-7005492-2-0			
	FRONT DOOR ASSY (P.L.)	A-PL-7005492-0-0			
	FRONT DOOR	D-IA-7406013-0-0			
	HINGE PIN TOP	B-MD-7405865-0-0			
	DOOR SPACER BOTTOM	A-MD-7405312-0-0			
	HINGE PIN BOTTOM	B-MD-20400-8			
9	BRACKET POWER CONN ASSY	D-AD-7005467-0-0			
	BRACKET POWER CONN ASSY (P.L.)	A-PL-7005467-0-0			
	BRACKET, POWER CONN	D-MD-7406024-0-0			
	SCOTCHCAL BRAND FILM DECALS	A-SS-7406051-0-0			
10	844 POWER CONTROL	D-UA-844-0-1			
	844 POWER CONTROL(P.L.)	A-PL-844-0-1			
11	728 POWER SUPPLY	D-MA-728-0-1			
	728 POWER SUPPLY (P.L.)	A-PL-728-0-1			
12	FULL DOOR ASSY	D-AD-7005358-2-0			
	FULL DOOR ASSY (P.L.)	A-PL-7005358-0-0			
	FULL BOOR	D-IA-7405741-0-0			
	HINGE PIN TOP	B-MD-20400-7			
	DOOR SPACER BOTTOM	A-MD-7405312-0-0			
	HINGE PIN BOTTOM	B-MD-20400-8			
13	TRANSFORMER PANEL ASSY	D-AD-7005501-1-0			
	TRANSFORMER PANEL ASSY (P.L.)	A-PL-7005501-1-0			
	TRANSFORMER PANEL	E-IA-7406064-0-0			
	COVER PROTECTION 4 TERM	B-MD-7404721-0-0			
14	WIRED ASSY TD10A	D-AD-7005497-0-0			
	WIRED ASSY TD10A (P.L.)	A-PL-7005497-0-0			
	VOLTAGE CHAIN	1202188-0-0			
15	1943D MTG PANEL	D-AD-1943-0-0			
	1943D MTG PANEL (P.L.)	A-PL-1943-0-0			
16	1943 CASTING PLUS PINS	D-AD-5302483-0-0			
	1943 CASTING PLUS PINS (P.L.)	A-PL-5302483-0-0			
	1943 FRAME CASTING	E-MD-1202885-0-0			
17	728A POWER SUPPLY	D-MA-728A-0-1			
	728A POWER SUPPLY (P.L.)	A-PL-728A-0-1			
1 CONT	FILLER	D-IA-7405347-0-0			
	CTR CLIP 'U' SHAPE	D-IA-7405344-0-0			
	CTR CLIP	D-IA-7405345-0-0			
	CAB SPACER	C-MD-7405343-0-0			
18	MARGINAL CHECK PANEL ASSY	C-IA-5402526-0-0			
	PANEL MARGINAL CHECK	C-MD-5302484-0-0			
	SCOTCHCAL	C-SS-10801			

ELECTRICAL

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

QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST			

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

MATERIAL —

FINISH —

		DATE
DRN.	[illegible]	[illegible]
CHK'D	[illegible]	7/1/67
ENG.	[illegible]	7/24/67
PROJ. ENG.	[illegible]	7/27/67
PROD.		

FIRST USED ON TDIO

SCALE —

SHEET 2 OF 2

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

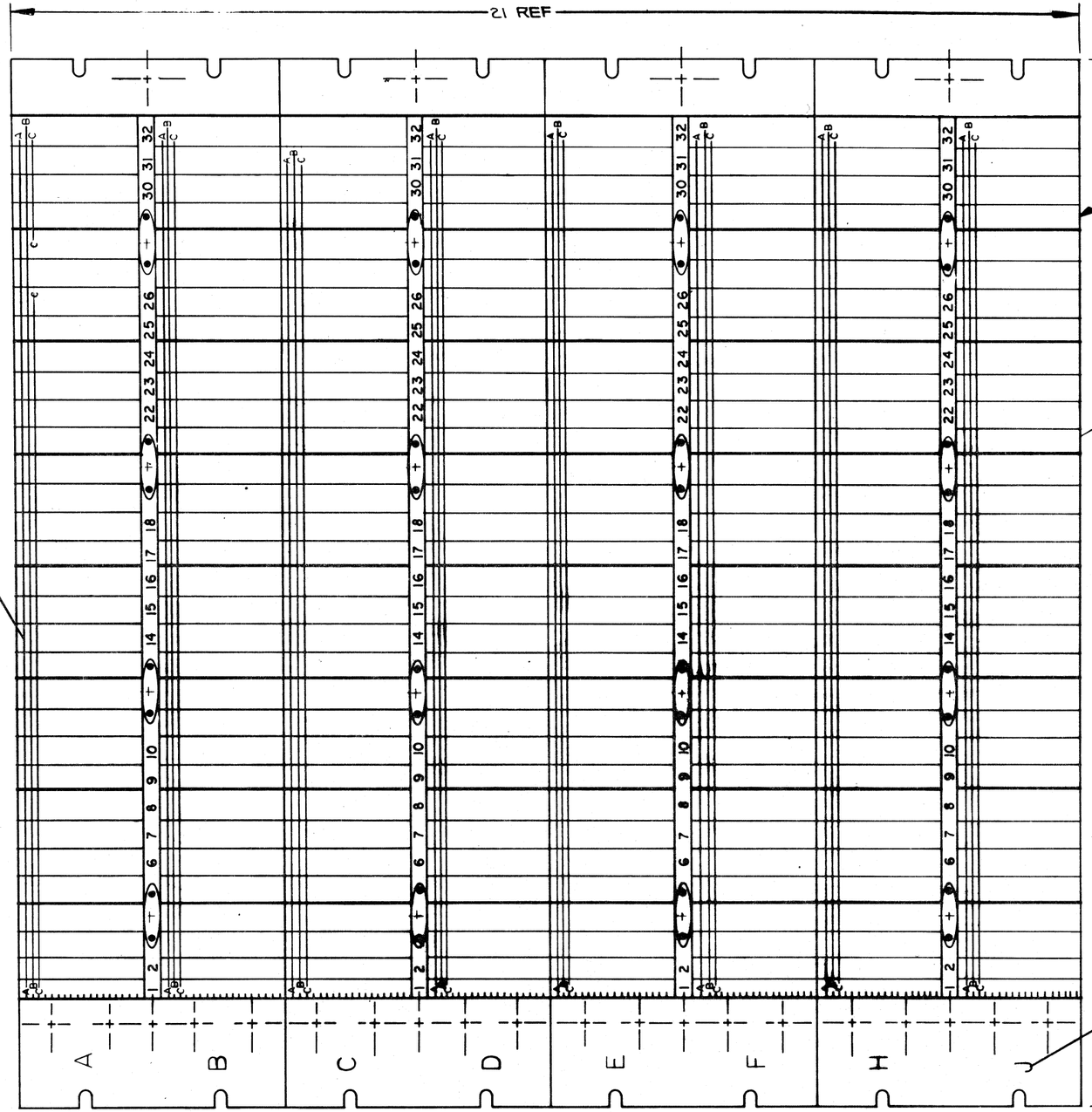
TITLE: DRAWING INDEX LIST TDIOA

SIZE	CODE	NUMBER	REV
D	DI	[illegible]-0-1	UK

DIST.

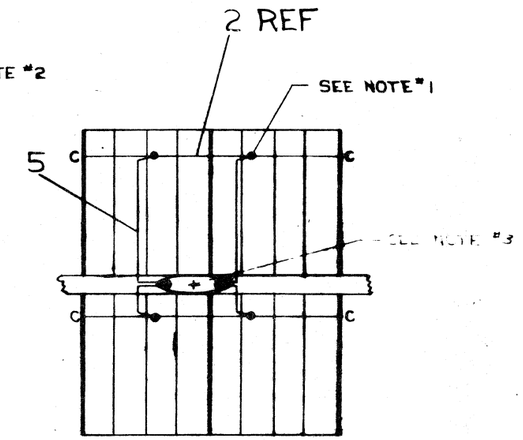
REVISIONS: REV. | CHANGE NO. | CHK

DEC FORM NO DRD 100



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

REVISIONS			
CHK	CHANGE NO.	REV.	
	ECO #3116	A	
	ADDED GND, DETAIL A & NOTES #1, 2, & 3		
	Dana Hall 10-24-67		
	[illegible] 10-30-67		

QTY.	DESCRIPTION	PART NO.	ITEM NO.
	PARTS LIST		

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

DRN.	A. Cook	DATE 7/14/67
CHK'D	R. E. Pfeffer	DATE 7/13/67
ENG.	[illegible]	DATE 7/22/67
PROJ. ENG.	[illegible]	DATE 7/17/67
PROD.	[illegible]	DATE 8-3-67

FIRST USED ON D-UA-TDIOA-0-0
SCALE NONE
SHEET 1 OF 1

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: WIRED ASSEMBLY

CODE	SIZE	NUMBER	REV.
AD	D	7005497-0-0	A
DIST.			

PARTS LIST

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
1	D-AD-1943-D-0	4	MOUNTING PANEL	1943-D
2		AS REQ'D	VOLTAGE CHAIN PCH. #CHV-0001	1202188-0-0
3	SEE MDL	REF	WIRE LIST	
4		REQ'D	PANEL SCOTCHCALS-1/4 HIGH BLACK	
5		A/R	#24 AWG SOLID KYNAR WHT	
6		A/R	#24 AWG SOLID TEF YEL	
7		A/R	#24 AWG SOLID KYNAR BLU	

REVISIONS

CHANGE NO.	DATE	ENG.
A-3116 ADDED #5,6, & 7	10/24 67	

MADE BY R. COOK	DATE 5/24/67	TITLE WIRED ASSEMBLY	SIZE A / CODE PL / NUMBER 7005497-0-0 / REV. A
CHECKED R.E. PHIPPS	DATE 6/7/67	FOR TD10A	ASSY. NO. D-AD-7005497-0-0 / SHEET 1 OF 1
ENG. D. Hawks	DATE 6/27/67		

(13)

DEC FORM NO.
DRA 109

DRWG NO	REVLTR
K-WL-TDIØA-Ø-3	L

REVISIONS			
REV LTR	ECO NO	DATE	ENG
A	1	1-24-68	DH
B	3	2-13-68	MD
C	5	2-26-68	DD
D	13	3-19-68	DD
E	17	3-29-68	MD
F	TD10A-00003	8-29-68	MD
H	TD10A-00005	11-12-68	DD
J	00009	6/9/69	DD
K	TD10A-00012	8-25-67	DD
L	TD10A-00016	7-20-71	DD

DRAWN	Ray Rowland	DATE	12-15-67
CHECKED	C Daigneault	DATE	12-15-67
ENG	D Gross	DATE	1/9/68
PROJ ENG	D Gross	DATE	1/9/68
PROD	[illegible]	DATE	1-8-68

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ASSY NO

SCALE — SHEET OF

TITLE: WIRE LIST

FOR TAPE* FILE*

SIZE	CODE	DWG. NO.	REV LTR
K	WL	TDIØA-Ø-3	L

DIST.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	W808	W032	G705	G882	G882	G853	W532	W533	R201	S202	S202	S202	S202	S202		R107	R151	S202	S205	S202	S202	R303	R603	S202	R141	G706	W023	B156	B156	S205	S202	S202													
A	MARK & TIMING TRACK RELAY	TU-55 HEAD CABLE	JUMP-ER PLUG	RWA MK TRK	RWA TM	ERR SEL / RWA TP	RWA TP	RWA TP	MK 8	MK 7 / MK 6	MK 5 / MK 4	MK 3 / MK 2	MK 1 / MK Ø		T STOP / T SYNC / T REV CKS / T BLOCK / T PRE FINAL / T FWD CKS / MK BN SPACE	T DATA DECOD-ER	T DATA 1 / T DATA 2	T DATA Ø / TBN Ø	T TBN 1 / TBN 2	T UPS 1	T UPS Ø	TPI (SP) / MAINT DATA O CLR / MAINT DATA O SET	T ACT / T WREN	T INACT COND	ATTEN PLUG	TU55 LOGIC CABLE	UNIT SELECT	UNIT SELECT	COM GO / COM UNIT Ø	COM UNIT 1 / COM UNIT 2	COM REV / COM SEL													
		X	G705	G882	G882	G882	RIØ7	RØØ2	RIII	RØØ2	RØØ2	RØØ2	RIII	RØØ2	RØØ2	R602	RØØ2	RIII	RØØ2	RIII	R602	R303	R303	RIII	RØØ2	RII3	R603	RII3	W520	RIII	RØØ2	RIØ7													
B	JUMP-ER PLUG	RWA Ø	RWA 1	RWA 2	RWA TP / TPØ / TPI / MK PRES / IOB 35(B) / MK BN SYNC / MK BN SPACE	MK / BN END / BN SPACE	MK / BN END / MK BN SYNC / BN PRES	MK / BN END / MK BN SYNC / MK PRES	MK / BN END / BN SYNC / MK PRES	MK / BN END / MK BN SYNC / MK PRES	MK / BN END / BN SYNC / MK PRES	MK / DATA SYNC / MK END ZONE / MK DATA	MK / DATA SYNC / MK END ZONE / MK DATA	MK / DATA SYNC / END ZONE / MK ZONE	MK / DATA SYNC / MK END ZONE / MK DATA	T CNTRS CL / T DATA Ø CL	MK REV DATA END / MK FWD DATA END	T DATA STROBE / TPI / MK REV DATA END / MK FWD DATA END	T DATA STROBE / T DATA STROBE / T RD FWD / T RD REV / MK FWD DATA END	T DATA STROBE / T DATA STROBE / T RD FWD / T RD REV	T DATA STROBE / T RD FWD / T RD REV	TPØ / TP1	T RELAY	T SPEED	T ACT COND / T INACT COND / T ACT COND / T ACT COND IOB DTC CONF CLR / T ACT COND	T ACT COND / T ACT COND / T ACT COND / COM GO / T ACT COND / COM REV	T INACT COND / T ACT COND / T WREN / LP XOR / ERR MK TIME	TPØ (B) / TPI (B) / LP CLR	COM SEL / T WR LP / ERR SW / ERR MK TRK / ERR MK TRK	ERR SEL	COM GO / ST WRITE LOCK / COM GO FIND / COM GO REV	ERR MK TRK / ERR MK TRK / ERR MK TRK / T UPS 1 / T WREN	COM GO FWD / COM GO REV / STOP / GO / ERR MK TRK / IOB 21 (B) CP ON / ERR MK TRK											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	S202	S202	S202	RIØ7	WØØ5	R141	R141	R141	R141	R141	R141	RØØ2	S202	S202	S202	R603	R302	RIØ7	RII3	RIII	RØØ2	S202	R401	S202	R II3	RIØ7	R141	W012	W012	W012	W012	R303													
C	RWB Ø / RWB 1	RWB 2 / RWB 3	RWB 4 / RWB 5	RW DATA Ø / RW DATA 1 / RW DATA 2 / RW DATA 3 / RW DATA 4 / RW DATA 5 / T RWB COMP	RWA TP / RW DATA Ø / TMCL / RW DATA 1 / RW DATA 2 / RW DATA 3 / TPØ / RW DATA 4 / TPØ / RW DATA 5 / ENB STOP ALL / CRO BAR	RW DATA Ø	RW DATA 1	RW DATA 2	RW DATA 3	RW DATA 4	RW DATA 5	PPIA DRIVE / CRO BAR	LP Ø / LP 1	LP 2 / LP 3	LP 4 / LP 5	RWB JAM / T BN Ø CL / LP XOR	ENB STOP ALL	T WR LP / T WR REV / T RD REV / T RD FWD / T RWB COMP / RWB SH LT	MK1 ∀ MK2 / MK DATA END / T RWB SH LT / DC WR SETUP	T WR FWD / T WR REV / T WR LP	T WR FWD / T WR REV / T WR LP	TCT Ø / TCT 1	T/M CLOCK	TCK Ø / TCK 1	TPI / TPI / T DATA Ø / TBN CT / T/M ENB	T/M ENB / T UPS / T WAIT / T WAIT / TBN CT / MAINT DATA O CLR	T PAUSE	COM GO / COM REV / COM SEL / COM UNIT Ø / COM UNIT 1 / COM UNIT 2 / COM FCN Ø / COM FCN 1 / COM FCN 2 / COM DPI Ø / COM DPI 1 / COM DPI 2	COM FPI Ø / COM FPI 1 / COM FPI 2 / RWB Ø / RWB 1 / RWB 2 / RWB 3 / RWB 4 / RWB 5	ENB PAR ERR / ENB DATAMISS / ENB JOB DONE / ENB ILL OP / ENB END ZONE / ENB BLK MISSED / TUPS 1 / ENB FCN STOP / T ACT / T WREN / IOB RD IN	ST PAR ERR / DC DATA MISS / ST JOB DONE / ST ILL OP / ST END ZONE / ST BLK MISSED / ST INC BLK / ST ILL OP / ERR MK TRK / ERR SEL / DC DATA REQ / DC DATA NEED	TURN-ARND DLY											
	S205	R201	S205	R201	S205	R201	S205	R201	S205	R201	S205	R201	R603	R602		RII3	RIØ7	RØØ2	RIII	R602	R302	R602	R603	RII3	RIII	S202	RIII	RØØ2	RIØ7	S202	RII3													
D	SHØØ / SH12 / SHØ6	SHØ1 / SH13 / SHØ7	SHØ2 / SH14 / SHØ8	SHØ3 / SH15 / SHØ9	SHØ4 / SH16 / SH1Ø	SHØ5 / SH17 / SH11	DC SHIFT RW DATA / DC SH SHIFT / DC END ARD	DC LOAD SH / DC SH CLR	DC WRITE ACT(Ø) / DC SH SHIFT / DCT 3 / DCT 4 / DCT 4	MK BN END / TP DLY / T PAUSE / DC DATA MISS / DC SWAP	ST JOB DONE / DC DATA MISS / DC SWAP / DCT 3 / DC SWAP	DC DATA MISS / T PAUSE / DC SWAP / ST WRTM / DCT 3 / MAN-UAL CLR	ENB STOP ALL / TURN-ARND DLY	TP DLY / COM READY	T MCL / T SPEED	ERR MK TRK / TP DLY / T SEL	T DATA STROBE / ST INC BLK / ST INC BLK / ST BLK MISS / T CKS	ST JOB DONE / ST JOB DONE / ST JOB DONE / T CKS	ERR CT2 / ERR CT3	ERR MK TRK / TPØ / LP=1	ERR MK TRK / ERR MK TRK / LP=1	INACT COND / T INACT COND / T CKS / COM DATA PI REQ / COM DATA PI REQ / COM FLAGS REQ	ERR CK / ENB BNR	ERR SW / MAN-UAL MODE / ERR SEL													

REVISIONS			
CHK	CHANGE NO.		REV
AV	ECO #1 FERGUSEN GROSS		A
AV	ECO #3 FERGUSEN GROSS		B
AV	ECO #5 BUCKHEIT GROSS		C
AV	ECO #31 BUCKHEIT GROSS		D
AV	ECO-0005 BUCKHEIT GROSS		E
	REDRAWN NO CHANGE		E
			F
			H

UNLESS OTHERWISE SPECIFIED	DRN. R COOK	DATE 5/24/67
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES DECIMALS ± .005 FRACTIONS ± 1/64 ANGLES ± 0°30' FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS	CHK'D. P DAIGNEAULT	DATE 6/22/67
	ENG. D GROSS	DATE 7/7/67
	PROJ. ENG. D GROSS	DATE 10/13/67
MATERIAL	PROD. S MIKULSKI	DATE 12/15/67
	NEXT HIGHER ASSY. TDIOA-0-1	
FIRST USED ON OPTION / MODEL	FINISH	SCALE
		SHEET 1 OF 1

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: MODULE LIST

SIZE	CODE	NUMBER	REV.
D	DM	TDIOA-0-2	H

DIST.

DEC FORM NO DRD 105

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	S2Ø5	S2Ø5	S2Ø5	S2Ø5	S2Ø5	S2Ø5	S2Ø5	S2Ø5	S2Ø5	R6Ø3		R3Ø2	R3Ø2	R6Ø2	R6Ø2	R6Ø3	S2Ø2	S2Ø2	R2Ø1	S2Ø3	R6Ø2	R6Ø3	R6Ø3	R1Ø7	S2Ø3	S2Ø3	S2Ø3	S2Ø3	R111	RØØ2		R2Ø1												
D	BBØØ	BBØ2	BBØ4	BBØ6	BBØ8	BB1Ø	BB12	BB14	BB16	DCT 5		DCT 4	DCT 2	DC SH SHIFT	IOB BEG RD IN	DCT 1	DC SWAP	DC CT	DC DATA REQ	DC DATA MISS	IOB DTC CONO CLR	IOB PWR CLR		ENB FCN STOP	ENB PAR ERR	ENB ILL OP	ST PAR ERR	ERR MK TRK	ST PAR ERR		ST INC BLK													
E	BBØ1	BBØ3	BBØ5	BBØ7	BBØ9	BB11	BB13	BB15	BB17	DCT 5 (A)		DCT 5	DCT 3	DC 3		DCT 6	DC WR SETUP	DC DATA NEED		IOB RD IN	T DATA STROBE	ST ILL OP	IOB DTS CONO CLR	ST PAR ERR	ENB DATA MISS	ENB END ZONE	ST JOB DONE	ST END ZONE	T/M ENB															
										DCT 5 (B)						IOB FIN RD IN				ENB FCN STOP	IOB DTC CONO SET	IOB DTS CONO SET		ST WRTM	ENB JOB DONE	ENB BLK MISS-ED	ST ILL OP	ST BLK MISS-ED	COM REV DLYD														
																								COM WR MT					ST END ZONE														
																								IOB SEL DTC					ST INC BLK														
																								IOB SEL DTS																			
	S2Ø5	S2Ø5	S2Ø5	S2Ø5	S2Ø5	S2Ø5	S2Ø5	S2Ø5	S2Ø5	R111 PPIA DRIVE	R6Ø3	S2Ø3	B152	S2Ø2	S2Ø3	B152	RIØ7	RIØ7	RØØ2	RI13	S2Ø3	R6Ø2	B163	B163	B163	B163	B163	B163		B163	B163	R141												
C	BAØØ	BAØ2	BAØ4	BAØ6	BAØ8	BA1Ø	BA12	BA14	BA16		IOB DTC DATA CLR	COM DPI Ø	IOB PI REQ	COM REV DLYD	COM FPI Ø	IOB PI REQ	T WAIT	COM DATA	COM FCN 1	COM DATA	COM FCN Ø	COM SEL	IOB Ø Ø	IOB Ø6	IOB 13	IOB 19	IOB 25	IOB 15		IOB 21														
F											IOB DTC DATA SET	COM DPI 1		IOB PI REQ ENB	COM FPI 1		COM REV DLYD	COM ALL	COM FCN 2	COM ALL	COM FCN 1		IOB Ø1	IOB Ø8	IOB 15	IOB 2Ø	IOB 26	IOB 16		IOB 22	IOB 29												
	BAØ1	BAØ3	BAØ5	BAØ7	BAØ9	BA11	BA13	BA15	BA17								IOB PI REQ ENB	COM BN	IOB RESET	COM BN	COM FCN Ø		IOB Ø2	IOB Ø9	IOB 17	IOB 21	IOB 28	IOB 17		IOB 23	IOB 3Ø												
											IOB DTC DATA SET (A)	COM DPI 2			COM FPI 2		IOB 21(B) CP ON	COM RD	IOB 21 (B) CP ON	COM FWD	COM FCN 1	IOB PWR CLR	IOB Ø3	IOB 1Ø	IOB 18	IOB 22	IOB 29	IOB 18		IOB 24	IOB 31												
																	COM REV DLYD	COM WR	IOB PI REQ ENB	COM RD	COM FCN 2		IOB Ø4	IOB 11	IOB 34	IOB 23	IOB 34	IOB 19		IOB 25	IOB 32												
																	IOB 21(B) CP ON		IOB PI REQ ENB	IOB BEG RDI		IOB Ø5	IOB 12	IOB 35	IOB 24	IOB 35	IOB 2Ø		IOB 26	IOB 33												

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	B163	B163	B163	B163	B163	B163	W1Ø7	W1Ø7	W1Ø7	W1Ø7	W1Ø7	W1Ø7	◊W851	◊W851	◊W851	◊W851	◊W851	◊W851	◊W851	◊W851	◊W851	B163	B163	B163	B685	B685	RØØ2	RØØ2	R111	R111	RØØ2	R214	WØ33												
	IOB ØØ	IOB Ø6	IOB 12	IOB 18	IOB 24	IOB 3Ø	IOB ØØ (B)	IOB Ø6 (B)	IOB 12 (B)	IOB 18 (B)	IOB 24 (B)	IOB 3Ø (B)			IOB RESET	IOB DATA O CLR	IOB ØØ TO IOB Ø8	IOB 18 TO IOB 26	IOB RESET	IOB DATA O CLR		IOB 18	IOB 25	IOB 3Ø			IOB RD IN	IOB 14	IOB 14	IOB RDI DATA														
	IOB Ø1	IOB Ø7	IOB 13	IOB 19	IOB 25	IOB 31	IOB Ø1 (B)	IOB Ø7 (B)	IOB 13 (B)	IOB 19 (B)	IOB 25 (B)	IOB 31 (B)	ØØ TO Ø8	18 TO 26		DATA O SET				DATA O SET		IOB 19	IOB 26	IOB 31	MAINT DATA I (A) & (B)	IOB DTC DATA I (A) & (B) & (C)	IOB RD IN	COM WR MT	IOB SEL DTS	MAN TAPE ROCK	MAN-UAL SWITCH-ES	MAN-UAL SWITCH-ES	MAN-UAL SWITCH-ES												
H	IOB Ø2	IOB Ø8	IOB 14	IOB 2Ø	IOB 26	IOB 32	IOB Ø2 (B)	IOB Ø8 (B)	IOB 14 (B)	IOB 2Ø (B)	IOB 26 (B)	IOB 32 (B)				CONO SET				CONO SET		IOB 2Ø	IOB 27	IOB 32			IOB SEL DTS	IOB SEL														
	IOB Ø3	IOB Ø9	IOB 15	IOB 21	IOB 27	IOB 33	IOB Ø3 (B)	IOB Ø9 (B)	IOB 15 (B)	IOB 21 (B)	IOB 27 (B)	IOB 33 (B)				RDI PULSE				RDI PULSE		IOB 22	IOB 28	IOB 33			IOB SEL DTC	DTS														
B	IOB Ø4	IOB 1Ø	IOB 16	IOB 22	IOB 28	IOB 34	IOB Ø4 (B)	IOB 1Ø (B)	IOB 16 (B)	IOB 22 (B)	IOB 28 (B)	IOB 34 (B)			IOS3(Ø) IOS4(1) IOS5(1)	RDI DATA DATA I CON I			IOS3(Ø) IOS4(1) IOS5(1)	RDI DATA DATA I CON I		IOB 23	IOB 29	IOB 34	IOB DTS STATUS (A) & (B) & C	IOB DTC STATUS (A) & (B) & C	IOB SEL DTC	IOB SEL DTC	IOB 7															
	IOB Ø5	IOB 11	IOB 17	IOB 23	IOB 29	IOB 35	IOB Ø5 (B)	IOB 11 (B)	IOB 17 (B)	IOB 23 (B)	IOB 29 (B)	IOB 35 (B)										IOB 24		IOB 35			IOB SEL DTC																
				*R3Ø2	*R3Ø2	*R3Ø2	*R6Ø2	*R613	*S2Ø5	*B163	*R6Ø2	RIØ7										*B152	*S2Ø3	*RØØ2	*SIØ7			*S2Ø3	*S2Ø3	*W6ØØ	*W6ØØ	*WØ28	*WØ12												
				PL RAISE DONE	PL REQ CLR	PL PEN DONE	PL CONO CLR	PL DATA O CLR	PL DONE	IOB 3Ø	PL DONE	IOB DATA CLR	IOB9 Ø TO IOB 17	IOB 27 TO IOB 35	IOS6(Ø) IOS7(1) IOS8(Ø) IOS8(1) IOS9(Ø) IOS9(1)	IOB PI REQ	IOB Ø9 TO 17	IOB 27 TO 35	IOS6(Ø) IOS7(1) IOS8(Ø) IOS8(1) IOS9(Ø) IOS9(1)	IOB PI REQ	IOB PI REG	PL PI 33		PL PWR OFF	PL RAISE PEN	PL MOVE RT	PEN UP POS	CAR RT POS	DRUM UP POS	PL CABLE												
J					PL MOVE DONE	PL PEN DONE	PL PI 33	PL DONE	PL BUSY	IOB 31	PL BUSY	IOB DATA SET											PL CON I	PL PWR OFF		PL LOWER	PL DRUM UP	PEN DOWN POS	DRUM UP POS	DRUM DOWN POS														
										IOB 32		IOB CONO CLR									PL PI 34	PL SEL	PL CONO CLR					CAR LT POS														
										IOB 33		IOB CONO SET											PL CONI					CAR RT POS														
										IOB 34		IOB RDI PULSE									PL PI 35	PL SEL	PL CONI			PL MVE LT	PL DRUM DN	CAR LT POS	DRUM DOWN POS	PEN UP POS	PEN DOWN POS												
										IOB 35		IOB RESET											PL SEL																			

◊NOTE: THESE W851 I/O CONNECTOR MODULES ARE USED IN TWO (2) BC-10A-7 CONFIGURATIONS SEE A-PL-TDIOA-Ø-Ø ITEM NO. 38

*NOTE: WHENTHE XYIØ PLOTTER SECTION OF THE TDIØ LOGIC IS BEING USED, THESE MODULES SHOULD BE INCLUDED. IF A BAIØ AND TDIØ ARE BOTH INCLUDED IN THE SYSTEM, THE PLOTTER MODULES GO INTO THE BAIØ ONLY

REVISIONS | REV | CHANGE NO | CHK

UNLESS OTHERWISE SPECIFIED	DRN. R. COOK — DATE 5/24/67
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES DECIMALS ± .005 FRACTIONS ± 1/64 ANGLES ± 0°30' FINAL SURFACE QUALITY √ REMOVE BURRS AND BREAK SHARP CORNERS	CHK'D. P. DAIGNEALT — DATE 6/27/67
	ENG. D. GROSS — DATE 11/3/67
	PROJ. ENG. D. GROSS — DATE 11/13/67
MATERIAL	PROD. S. MIKULSKI — DATE 12/15/67
	NEXT HIGHER ASSY. D-UA-TDIOA-0-0
FIRST USED ON OPTION/MODEL	FINISH — SCALE — SHEET 2 OF —

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: MODULE LIST

SIZE D | CODE MU | NUMBER TDIOA-0-2 | REV H | DIST.

DEC FORM NO DRD 105

PARTS LIST

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.
		2	B152 BINARY TO OCTAL DECODER	
		2	B156 DIODE GATE	
		17	B163 DIODE GATE	
		2	B685 DIODE GATE DRIVER	
		1	G853 MOTION & SELECTION CRT.	
		5	G882 MANCHESTER READ WRITE AMP.	
		19	R002 DIODE NETWORK	
		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	

REVISIONS		
CHANGE NO.	DATE	ENG.
A-1	1/24/68	DLB
B-3	2-13-68	DLB
C-5	2/26/68	DLB
D-31	5/14/68	DLB
E-TD10A-00005	11/12/68	DLB
F-00009	6/9/69	DLB
H-00016	11/27/71	DLB

MADE BY R Richard	DATE 8-15-67	TITLE MODULE PARTS LIST		SIZE A	CODE PL	NUMBER TD10A-0-2	REV. H
CHECKED [illegible]	DATE 9-15-67	FOR		ASSY. NO. D-MU-TD10A-0-2		SHEET 1 OF 4	
ENG. [illegible]	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 DIFFERANCE AMPLIFIER				
		1	W533 RECTIFYING SLICER				
		1	W808 RELAY				
		8	W851 I/O CONNECTOR				

MADE BY R Richard	DATE 8-15-67	TITLE MODULE PARTS LIST	SIZE A	CODE PL	NUMBER TDIOA-0-2	REV. H
CHECKED Maynard	DATE 9-15-67	FOR	ASSY. NO. D-MU-TDIOA-0-2		SHEET 2 OF 4	
ENG. D. Gross	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 R Roseland	DATE 8-15-67	TITLE MODULE PARTS LIST	SIZE A	CODE PL	NUMBER TD10A-0-2	REV. H
CHECKED P Daigneault	DATE 9-15-67	FOR	ASSY. NO. D-MU-TD10A-0-2		SHEET 3 OF 4	
ENG. D Gross	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 Ray Richmond	DATE 10-25-67	TITLE MODULE PARTS LIST (PLOTTER)	SIZE A	CODE PL	NUMBER TD10A-0-2	REV. H
CHECKED T Daigle	DATE 9-15-67	FOR	ASSY. NO. D-MU-TD10A-0-2		SHEET 4 OF 4	
ENG. D Grave	11/17/67					

(20) DEC FORM NO. DRA 109

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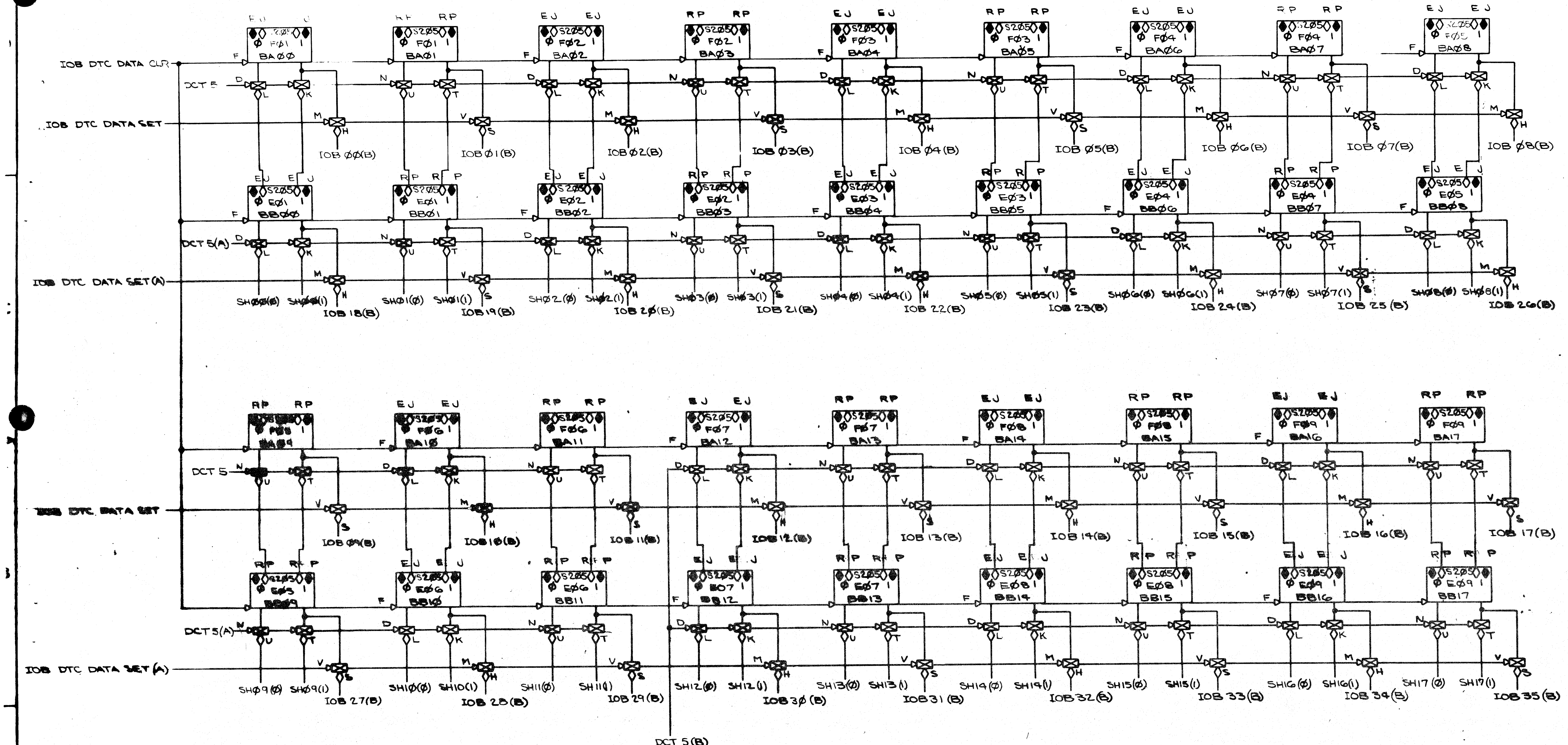

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL

FINISH

DRN. R. Cook DATE 5/24/67
CHK'D Daigneault DATE 6-22-67
ENG. D. Gross DATE 11/13/67
PROJ. ENG. D. Gross DATE 11/13/67
PROD. DATE 11-15-67

FIRST USED ON
1) UA-TD10A-0-0

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE
BUFFER REGISTER

SIZE D | CODE BS | NUMBER TD10A-0-B | REV. A

SCALE

SHEET 1 OF 1

DIST

REVISIONS
REV. A | CHANGE NO. ECO#31 | CHK R. Burt 5-15-68 | D. Gross 5/20/68

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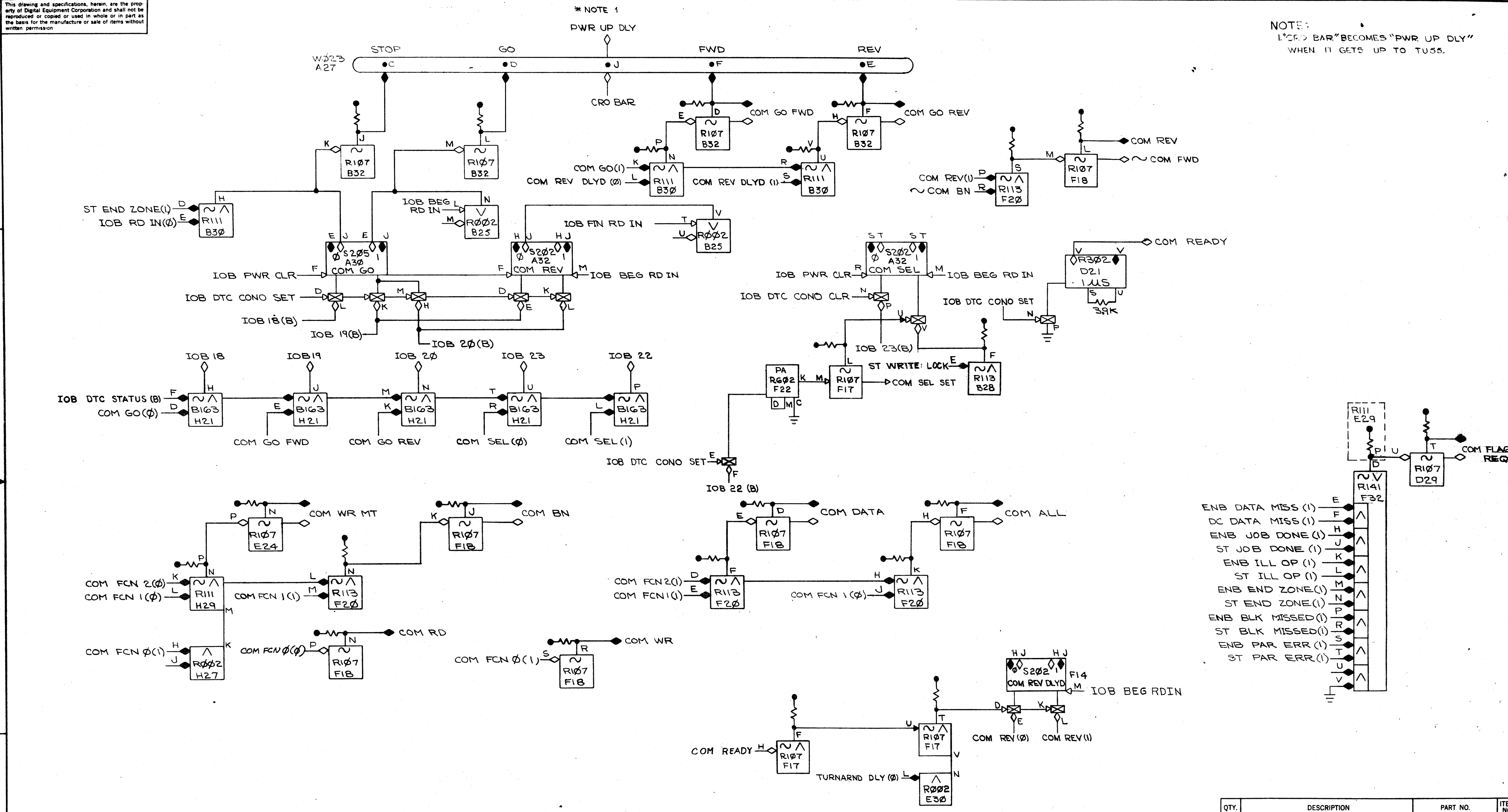
NOTES:
1. "CRO BAR" BECOMES "PWR UP DLY" WHEN IT GETS UP TO TU55.



* NOTE 1
PWR UP DLY
W023 A27
STOP
GO
FWD
REV
CRO BAR
COM GO FWD
COM GO REV
COM REV
COM FWD
R107 B32
R111 B30
R113 F20
R107 F18
ST END ZONE(1)
IOB RD IN(Ø)
IOB BEG RD IN
R002 B25
IOB FIN RD IN
COM GO(1)
COM REV DLYD (Ø)
COM REV DLYD (1)
COM REV(1)
COM BN
COM READY
S205 A30 COM GO
S202 A32 COM REV
S202 A32 COM SEL
R302 D21 1 μS
39K
IOB PWR CLR
IOB DTC CONO SET
IOB DTC CONO CLR
IOB 18(B)
IOB 19(B)
IOB 20(B)
IOB 23(B)
IOB 18
IOB19
IOB 20
IOB 23
IOB 22
IOB DTC STATUS (B)
COM GO(Ø)
B163 H21
COM GO FWD
COM GO REV
COM SEL(Ø)
COM SEL(1)
PA R602 F22
R107 F17
COM SEL SET
ST WRITE LOCK
R113 B28
IOB 22 (B)
R111 E29
R141 F32
R107 D29
COM FLAGS REQ
ENB DATA MISS (1)
DC DATA MISS (1)
ENB JOB DONE (1)
ST JOB DONE (1)
ENB ILL OP (1)
ST ILL OP (1)
ENB END ZONE(1)
ST END ZONE(1)
ENB BLK MISSED(1)
ST BLK MISSED(1)
ENB PAR ERR (1)
ST PAR ERR(1)
COM WR MT
R107 E24
COM DATA
COM ALL
COM FCN 2(Ø)
COM FCN 1(Ø)
R111 H29
COM FCN 1(1)
COM FCN 2(1)
COM FCN 1(Ø)
COM RD
COM WR
COM FCN Ø(1)
R002 H27
COM FCN Ø(Ø)
S202 F14 COM REV DLYD
IOB BEG RDIN
COM REV(Ø)
COM REV(1)
COM READY
TURNARND DLY (Ø)
R002 E30

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL

FINISH

DRN. R Cook DATE 5/23/67
CHK'D. DATE
ENG. DATE 11/13/67
PROJ. ENG. DATE 11/13/67
PROD. DATE
FIRST USED ON D-UA-TDIOA-0-0

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE
COMMAND DECTAPE CONTROL #1

SIZE D CODE BS NUMBER TDIOA-0-COM1 REV. D

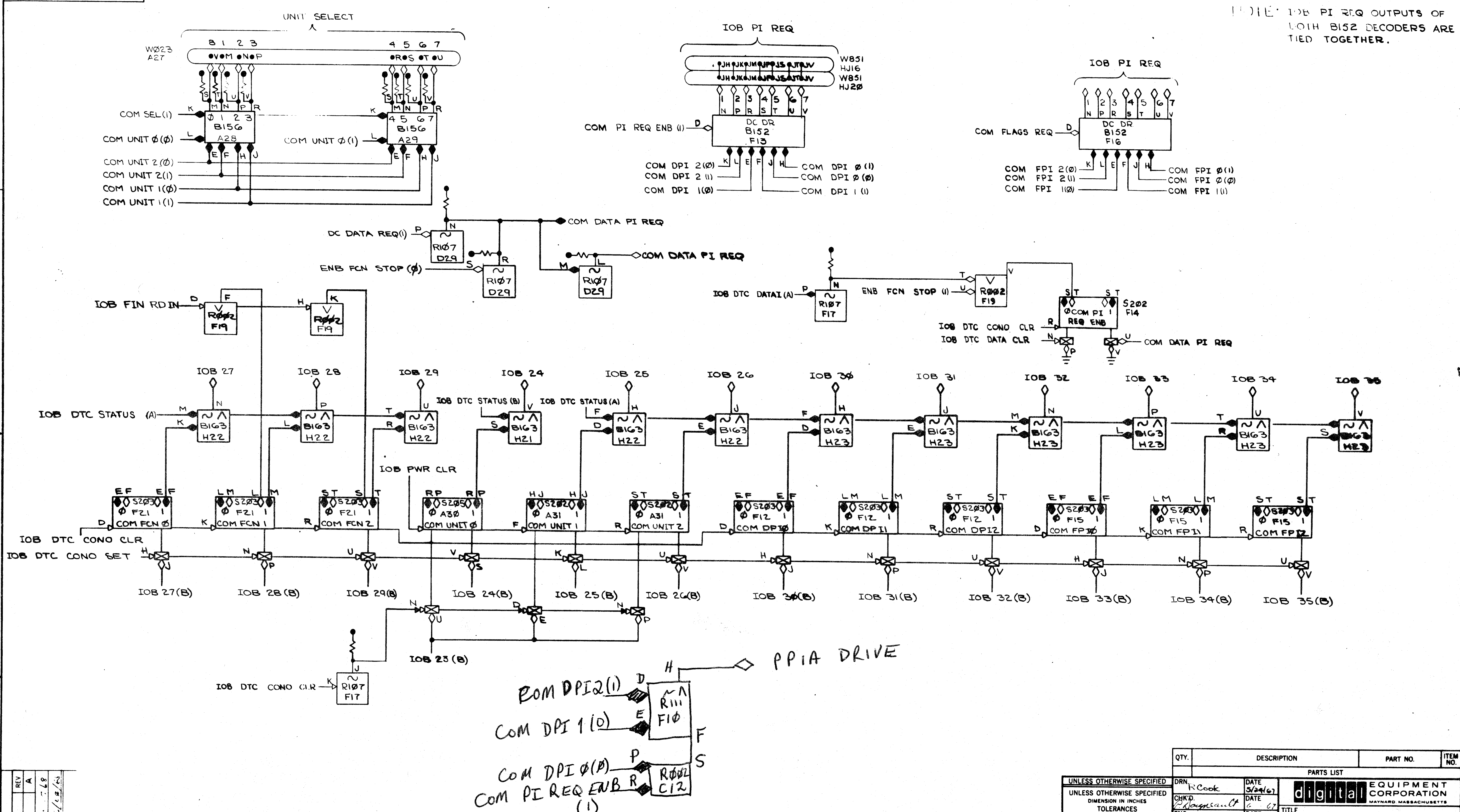
SCALE
SHEET 1 OF
DIST.

REVISIONS		
REV.	CHANGE NO	CHK
A		
B	ECO #5 2-26-68	
C	ECO #31 5-15-68	
D	TDIOA-00005 11-12-68	

DEC FORM DRD 102

22

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


UNIT SELECT
IOB PI REQ
COM SEL (1)
COM UNIT Ø (Ø)
COM UNIT Ø (1)
COM UNIT 2 (Ø)
COM UNIT 2 (1)
COM UNIT 1 (Ø)
COM UNIT 1 (1)
B156 A28
B156 A29
W023 A27
W851 HJ16
W851 HJ20
COM PI REQ ENB (1)
DC DR B152 F13
COM DPI 2 (Ø)
COM DPI 2 (1)
COM DPI 1 (Ø)
COM DPI Ø (1)
COM DPI Ø (Ø)
COM DPI 1 (1)
COM FLAGS REQ
DC DR B152 F16
COM FPI 2 (Ø)
COM FPI 2 (1)
COM FPI 1 (Ø)
COM FPI Ø (1)
COM FPI Ø (Ø)
COM FPI 1 (1)
DC DATA REQ (1)
ENB FCN STOP (Ø)
COM DATA PI REQ
IOB FIN RD IN
IOB DTC DATAI (A)
ENB FCN STOP (1)
S202 F14
ØCOM PI REQ ENB
IOB DTC CONO CLR
IOB DTC DATA CLR
IOB DTC STATUS (A)
IOB DTC STATUS (B)
IOB 27
IOB 28
IOB 29
IOB 24
IOB 25
IOB 26
IOB 30
IOB 31
IOB 32
IOB 33
IOB 34
IOB 35
IOB PWR CLR
COM FCN Ø
COM FCN 1
COM FCN 2
COM UNIT Ø
COM UNIT 1
COM UNIT 2
COM DPI Ø
COM DPI 1
COM DPI 2
COM FPI Ø
COM FPI 1
COM FPI 2
IOB DTC CONO SET
IOB 27 (B)
IOB 28 (B)
IOB 29 (B)
IOB 24 (B)
IOB 25 (B)
IOB 26 (B)
IOB 30 (B)
IOB 31 (B)
IOB 32 (B)
IOB 33 (B)
IOB 34 (B)
IOB 35 (B)
IOB 23 (B)
IOB DTC CONO CLR
PPIA DRIVE
COM DPI 2 (1)
COM DPI 1 (Ø)
COM DPI Ø (Ø)
COM PI REQ ENB (1)
R111 F10
R002 C12

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL

FINISH

DRN. R. Cook DATE 5/24/67
CHK'D. DATE
ENG. DATE
PROJ. ENG. DATE
PROD. DATE

FIRST USED ON D-UA-1DIOA-0-0

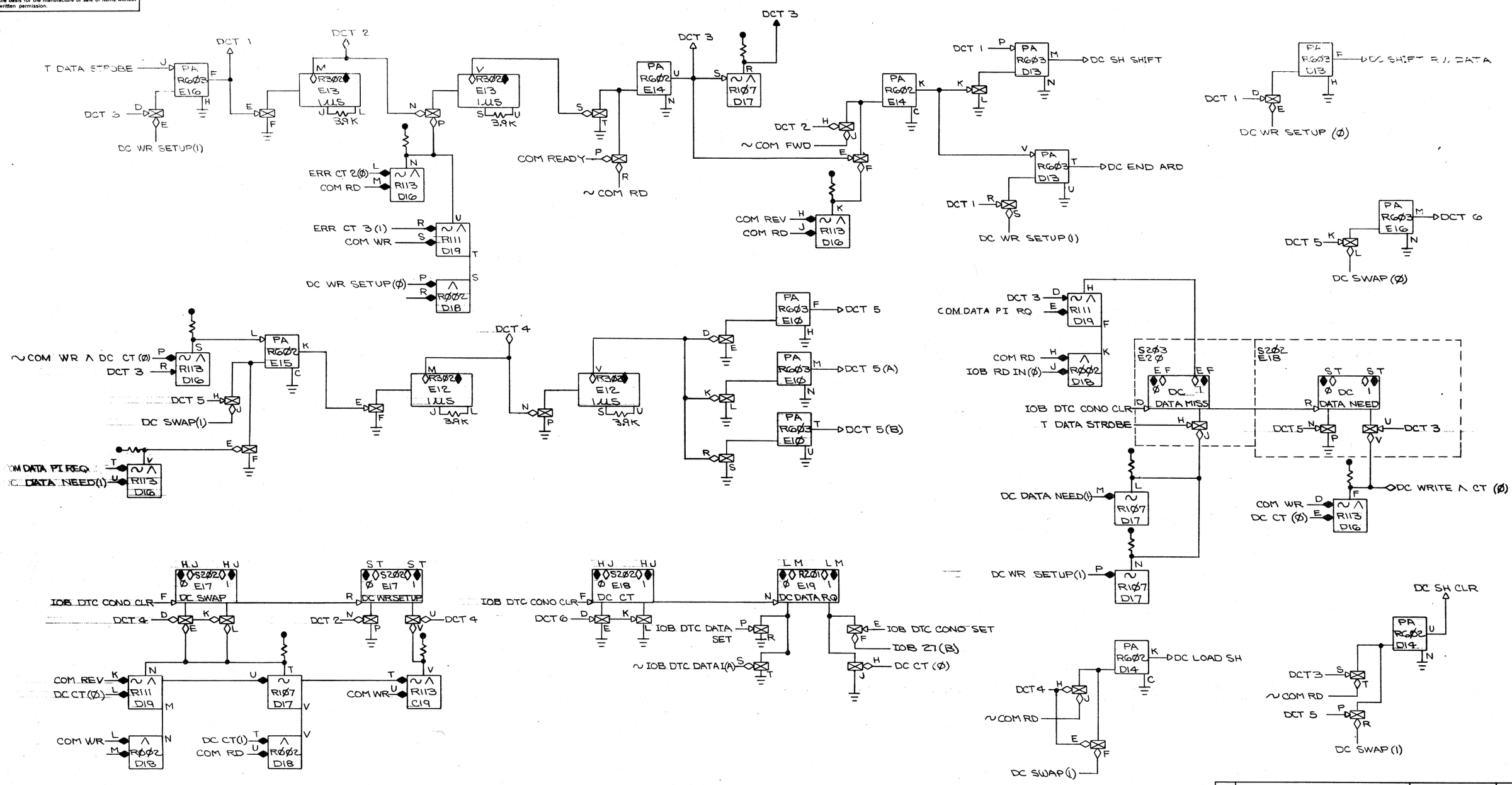
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE
COMMAND DECTAPE CONTROL # 2

SIZE	CODE	NUMBER	REV.
D	BS	TDIOA-0-COM2	A

SCALE
SHEET 1
DIST.

REVISIONS: REV A — CHANGE NO ECO #21



QTY.	DESCRIPTION	PART NO.	ITEM NO.
	PARTS LIST		

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

		DATE
DRN.		5/24/67
CHK'D.		6/22/67
ENG.		11/13/67
PROJ. ENG.		11/13/67
PROD.		12-15-67

FIRST USED ON: D-UA-TDIOA-C-0
SCALE
SHEET 1 OF 1

digital EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS

TITLE: DATA CONTROL

SIZE D | CODE BS | NUMBER TDIOA-0-DC | REV. A
DIST.

REVISIONS	REV.	CHK	CHANGE NO.
	A		ECO#31

DEC FORM NO. DRD 102

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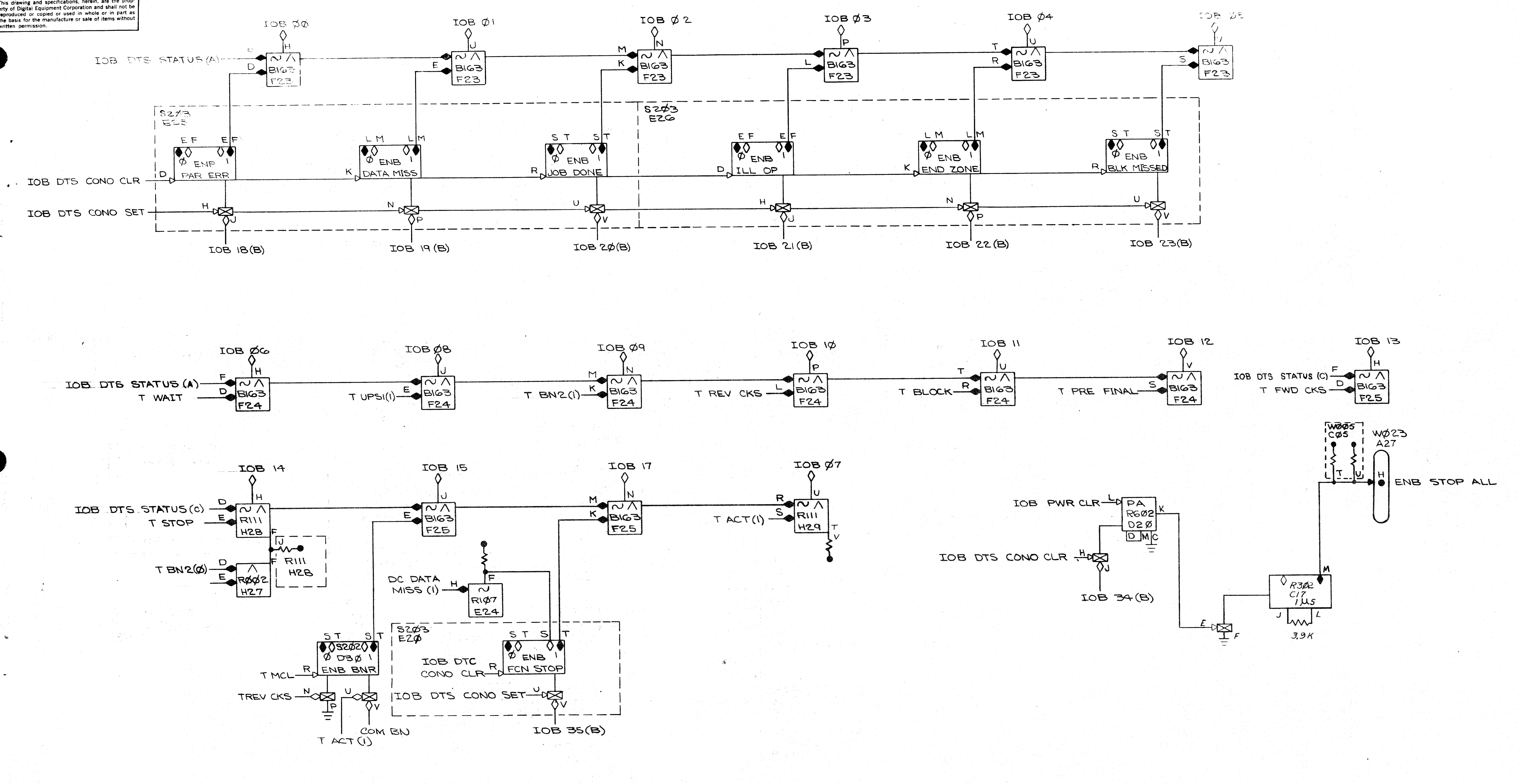


QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL

FINISH

DRN. E Cook DATE 5/29/67
CHK'D.
ENG. B. Gross DATE 11/13/67
PROJ. ENG. DATE 11/13/67
PROD. DATE

FIRST USED ON D-11A-TDIOA-0-0

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE

ENABLE FLIP FLOPS

SIZE D | CODE BS | NUMBER TDIOA-O-ENB | REV. C

SCALE

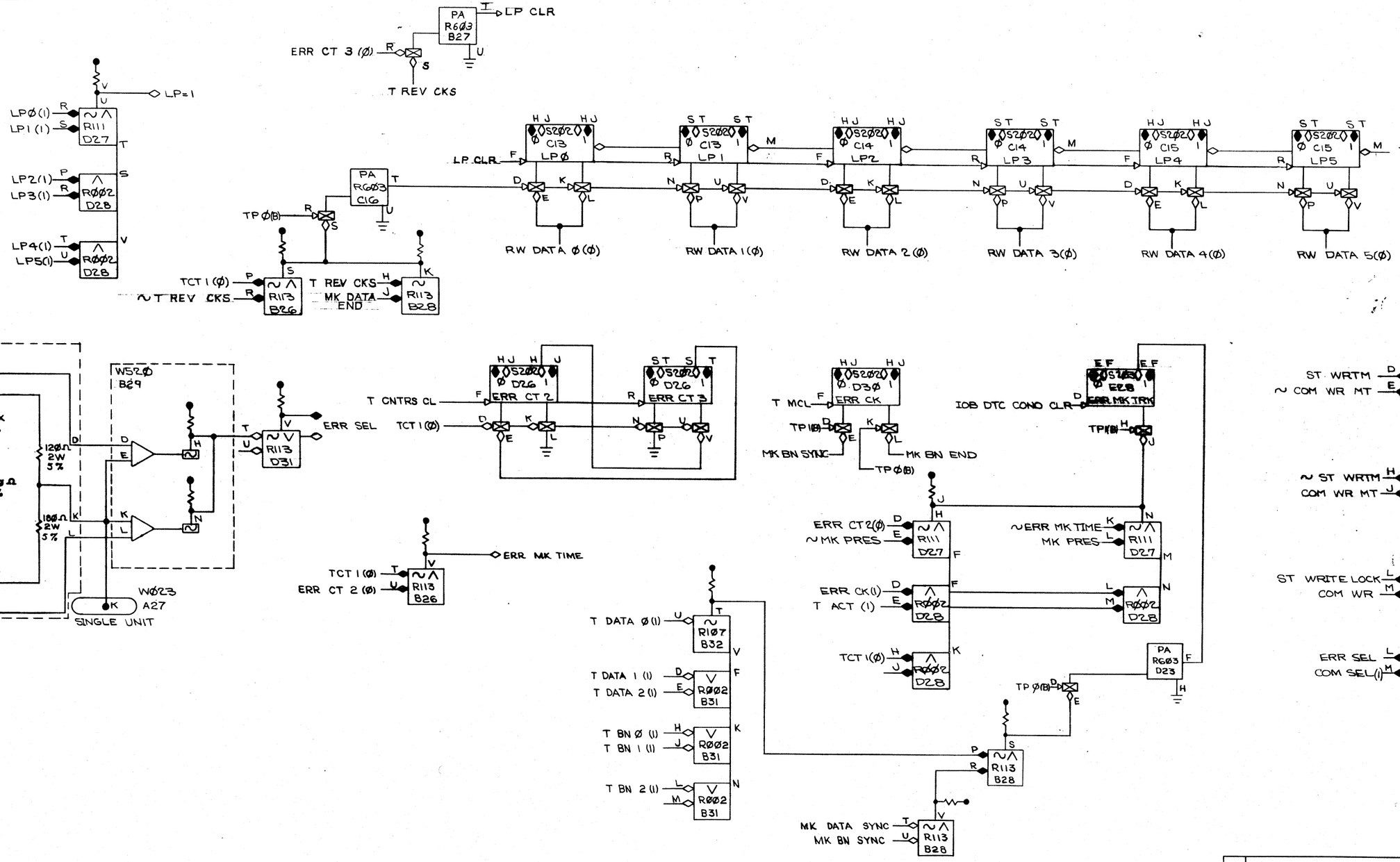
SHEET 1 OF 1

DIST.

REV.	CHANGE NO.	
A	ECO#31	B. Burkhart 5-14-68
B	TDIOA-00011	B. Gross 5-28-68
C		7-19-68

DEC FORM NO. DRD 102

25



REVISIONS	REV	CHK	CHANGE NO.
	A		1
	B		3
	C		4

DEC FORM NO. DRD 102

QTY.	DESCRIPTION	PART NO.	ITEM NO.
	PARTS LIST		

UNLESS OTHERWISE SPECIFIED

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

MATERIAL

FINISH

DRN.	COOK	DATE 5/11/67
CHK'D.		DATE
ENG.		DATE 11/13/67
PROJ. ENG.		DATE 11/13/67
PROD.		DATE 12/ 67

FIRST USED ON D-UA-TDIOA-O

SCALE

SHEET 1 OF 1

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: LP/ ERR

SIZE D | CODE BS | NUMBER TDIOA-O-ERR

DIST.

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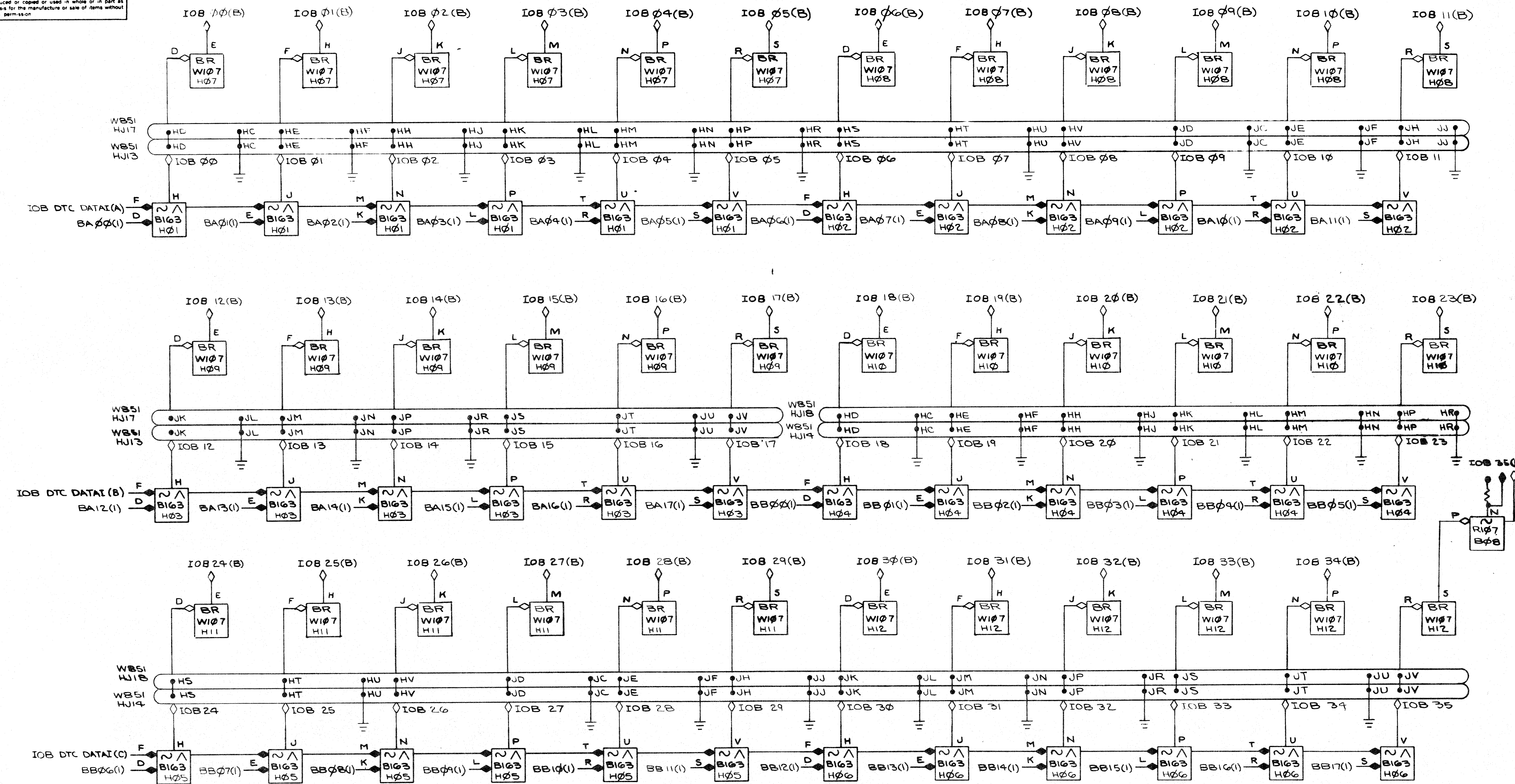


QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL

FINISH

DRN	R Cook	DATE 3/24/67
CHK'D	P. Beaurepault	DATE 6-22-67
ENG.	D. Gross	DATE 11/13/67
PROJ. ENG.	D. Gross	DATE 11/13/67
PROD.	S Makowski	DATE 12-15-67

FIRST USED ON D-UA-TD10A-0-0

SCALE

SHEET 1 OF 1

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE

I/O BUS INTERF MANUAL MODE #1

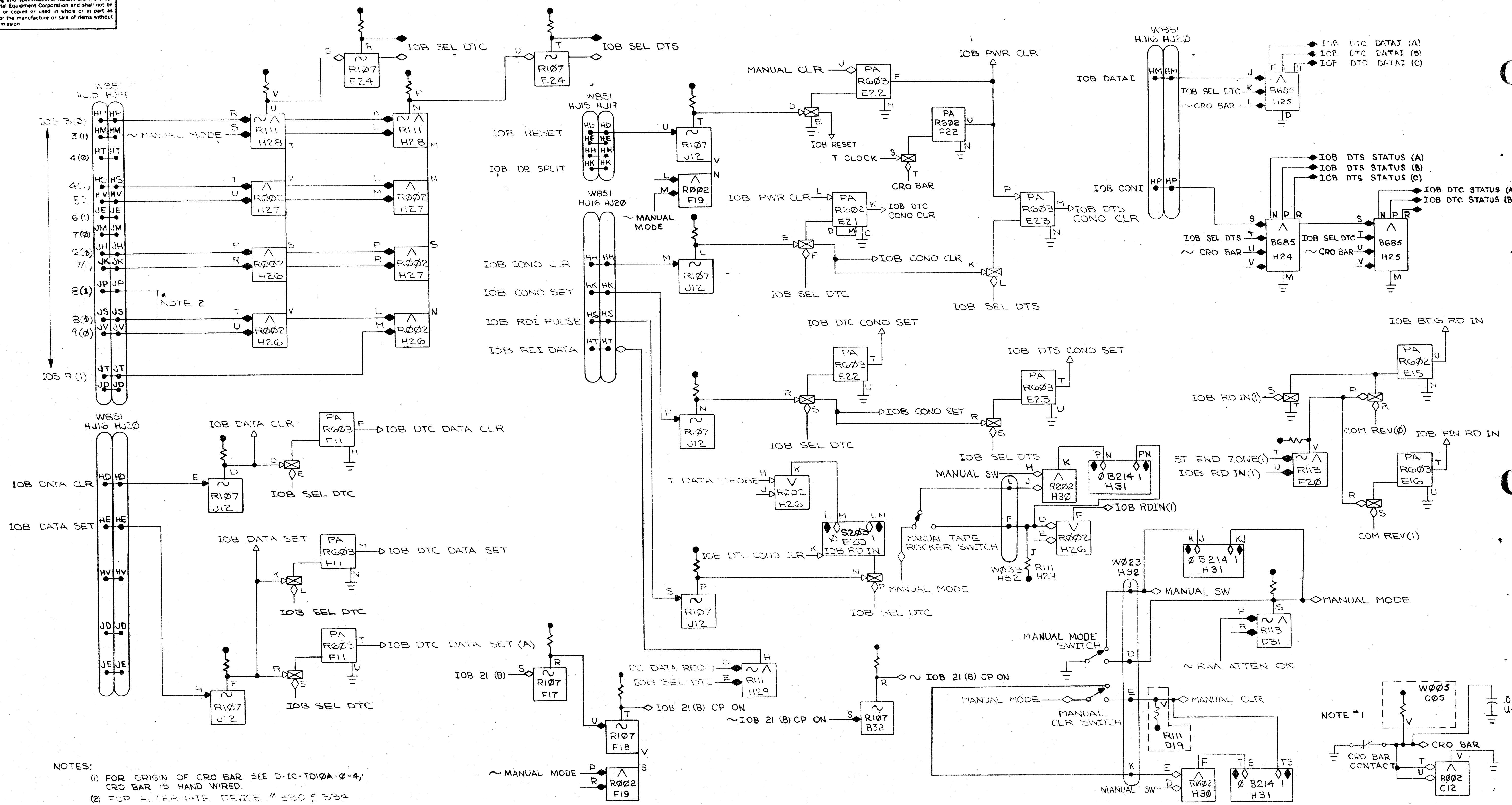
SIZE D CODE BS NUMBER TD10A-0-IOB1 REV.

DIST.

REVISIONS: REV / CHANGE NO / CHK

27

DEC FORM NO DRD 102



NOTES:

(1) FOR ORIGIN OF CRO BAR SEE D-IC-TD1ØA-Ø-4, CRO BAR IS HAND WIRED.

(2) FOR ALTERNATE DEVICE # 330 & 334 REMOVE SOLID WIRE, INSERT DOTTED WIRE

(3) PINS C,F,J,L,N,R,U IN I/O CABLE LOCATIONS HJ13, HJ14, HJ15, HJ16, HJ17, HJ18, HJ19, HJ2Ø, SHALL BE GROUNDED.

REVISIONS			
REV	CHANGE NO	CHK	
A	ECO 5		
B			
C	ECO 31		

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

MATERIAL

FINISH

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

DRN. K Cost
CHK'D.
ENG. D Gross — DATE 11/17/67
PROJ. ENG. D Gross — DATE 11/17/67
PROD. — DATE 12-15-67
FIRST USED ON D-UA-TD10A-0-0

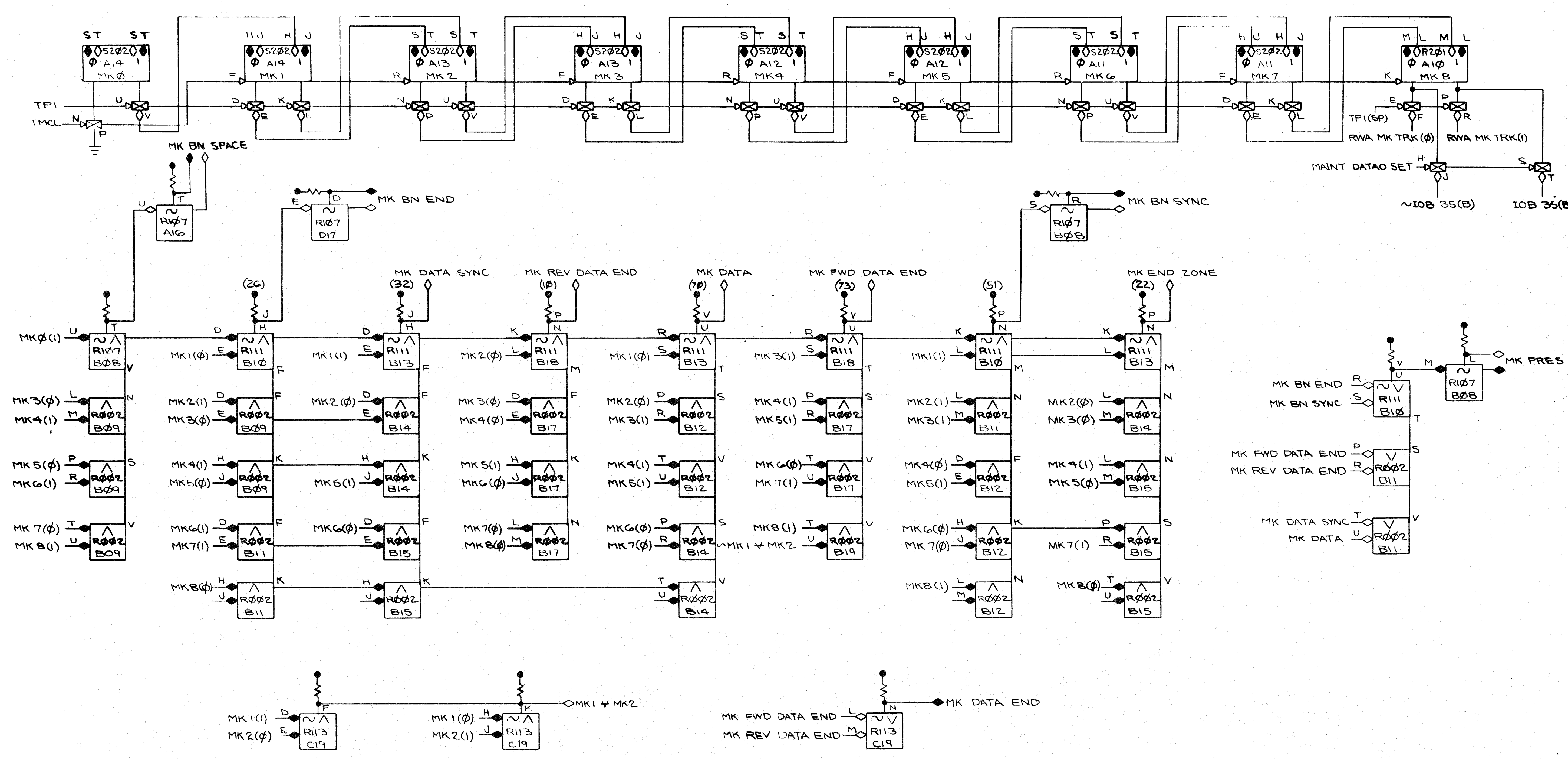
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: I/O BUS INTERF. MANUAL MODE #2

SIZE	CODE	NUMBER	REV.
D	BS	TD10A-0-IOB2	C

SCALE — SHEET 1 OF 1

DEC FORM NO DRD 102



QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL

FINISH

DRN. R Cook	DATE 5/24/67	
CHK'D	DATE 6-22-67	
ENG. S. Gross	DATE 11/13/67	
PROJ. ENG. S. Gross	DATE 11/13/67	
PROD.	DATE 12/5/67	

FIRST USED ON D-UA-TDIOA-O-O

SCALE

SHEET 1 OF 1

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE
MARK TRACK DECODER

SIZE	CODE	NUMBER	REV.
D	BS	TDIOA-O-MK	A

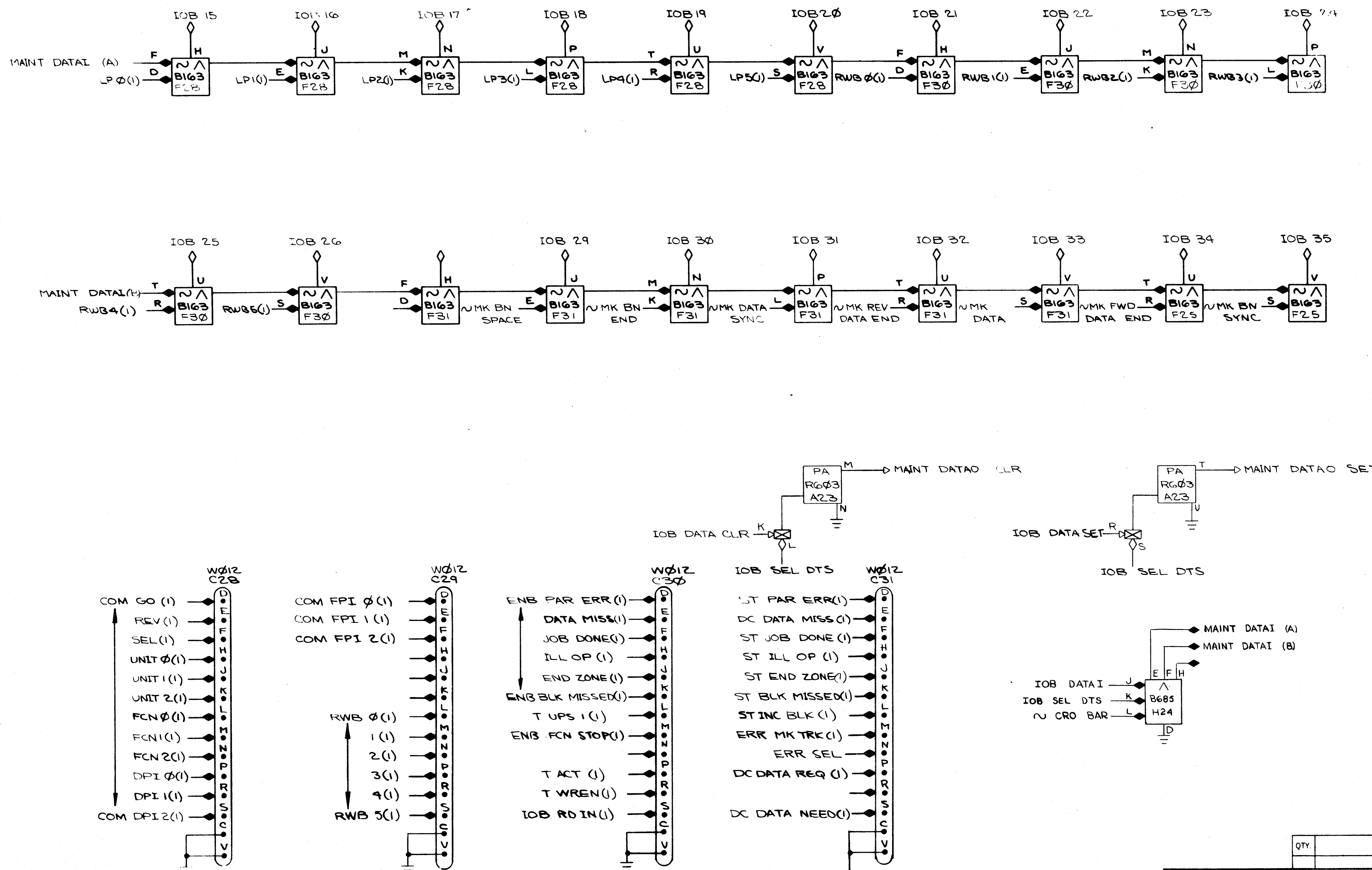
DIST.

REVISIONS

REV	CHANGE NO	CHK
A	ECO# 31	5-9-68 / 5/28/68

DEC-DRM NO DRD 102

29



QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL

FINISH

DRN: P Cook DATE 5/29/67
CHK'D DATE 6-?-67
ENG. DATE 11/13/67
PROJ. ENG. DATE 11/13/67
PROD. DATE

FIRST USED ON: DUA-TDIOA-O-O

SCALE ~

SHEET 1 OF 1

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE

MAINTENANCE

SIZE D CODE BS NUMBER TDIOA-O-MNT REV.

DEC FORM NO DRD 107

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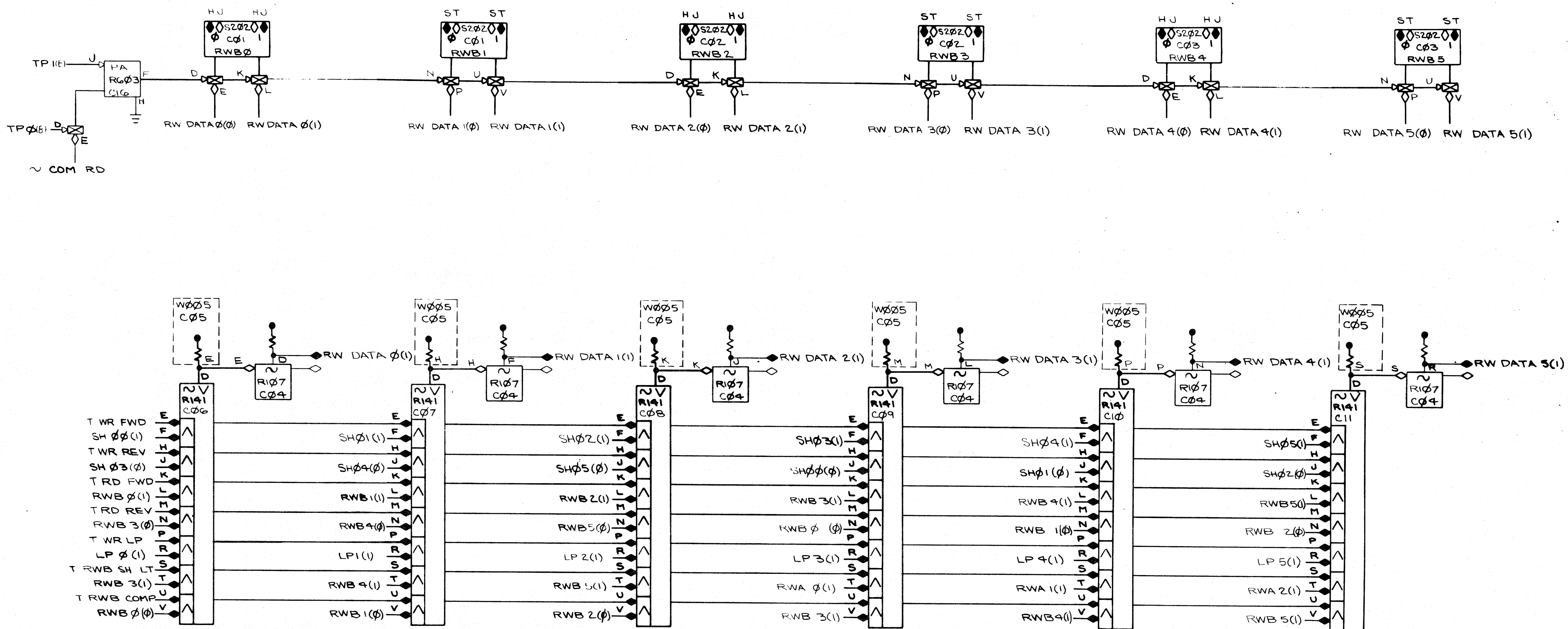


QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL

FINISH

		DATE
DRN.	R Cook	5/24/67
CHK'D.	[illegible]	6-22-67
ENG.	R. Gross	11/13/67
PROJ. ENG.	R Gross	11/13/67
PROD.	[illegible]	[illegible]

FIRST USED ON
1) UA-TD10A-0-0

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE
READ WRITE BUFFERS

SIZE	CODE	NUMBER	REV.
D	BS	TD10A-0-RW	B

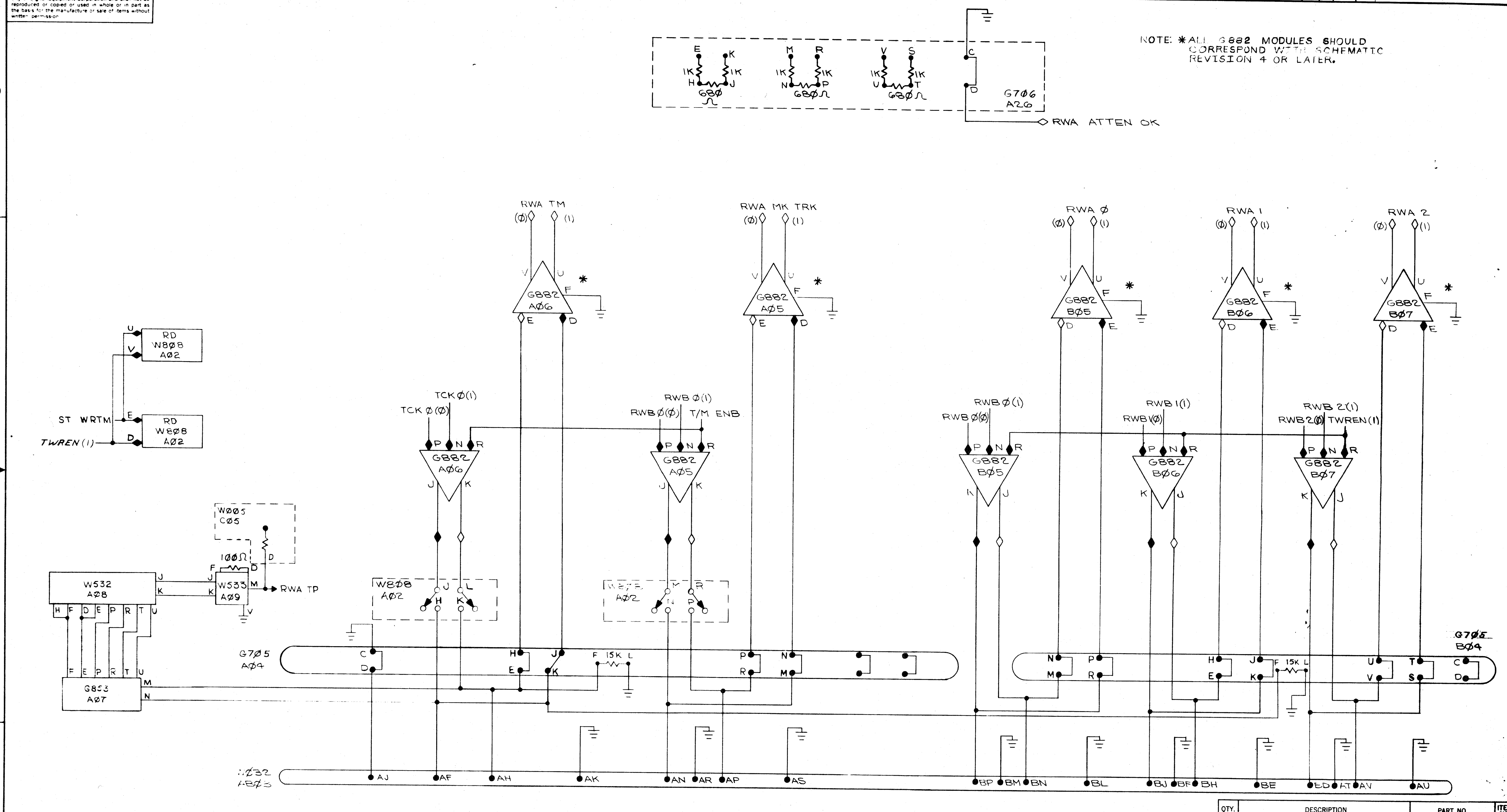
SCALE
SHEET 1 OF 1
DIST.

REVISIONS

REV	CHANGE NO	CHK
A	[illegible] 1-26-68	
B	ECO# 31 [illegible] 5-8-68	

DEC FORM NO DRD 102

D BS TD10A-0-RW B



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

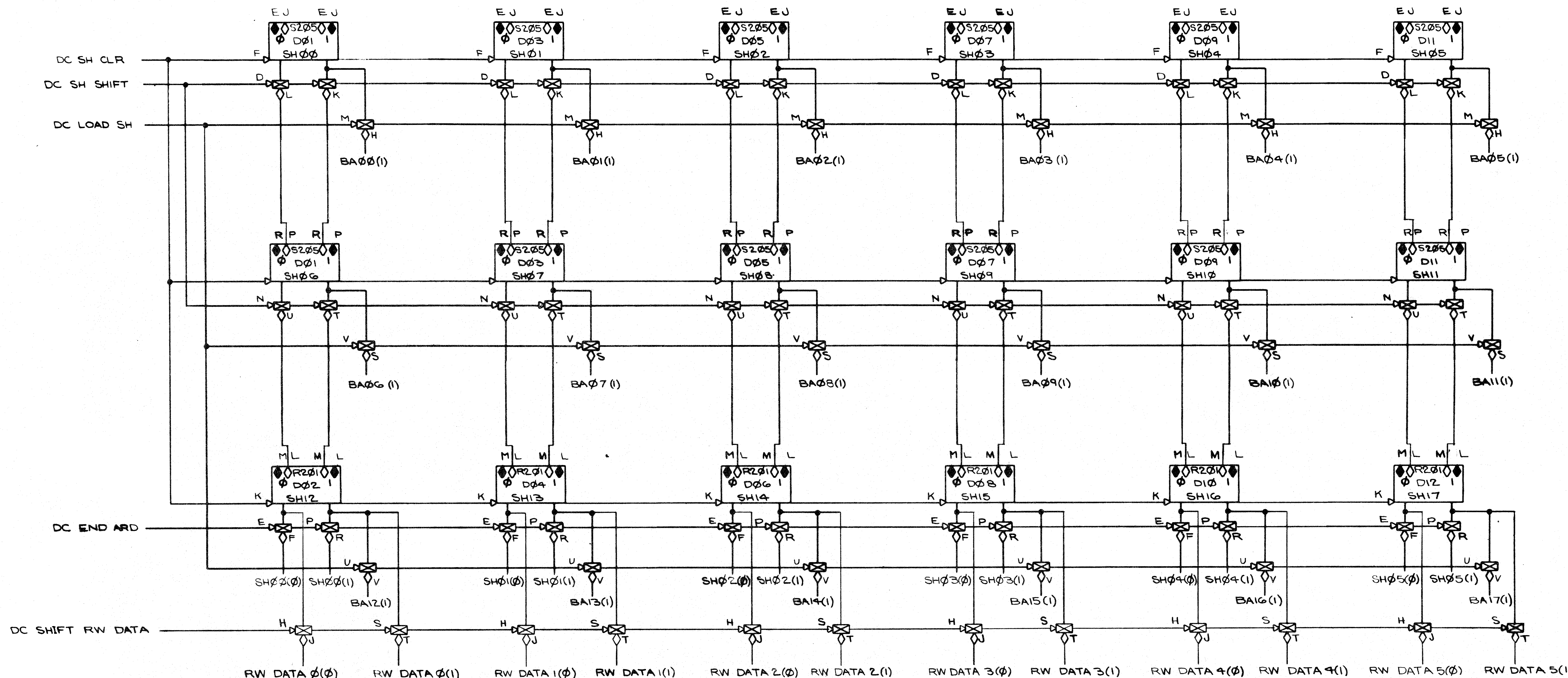
digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: **READ – WRITE AMPLIFIERS**

DATE 11/13/67

SIZE D CODE BS NUMBER TD10A-O-RWA REV E

SCALE — SHEET 1 OF 1



QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

DRN R Cook DATE 5/29/67
CHK'D P Dargeault DATE 6-22-67
ENG. D Gross DATE 11/13/67
PROJ. ENG. D Gross DATE 11/13/67
PROD. DATE 12-13-67
FIRST USED ON D-UA-TD10A-0-0

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE
SHIFT REGISTER

SIZE	CODE	NUMBER	REV.
D	BS	TD10A-0-SH	A

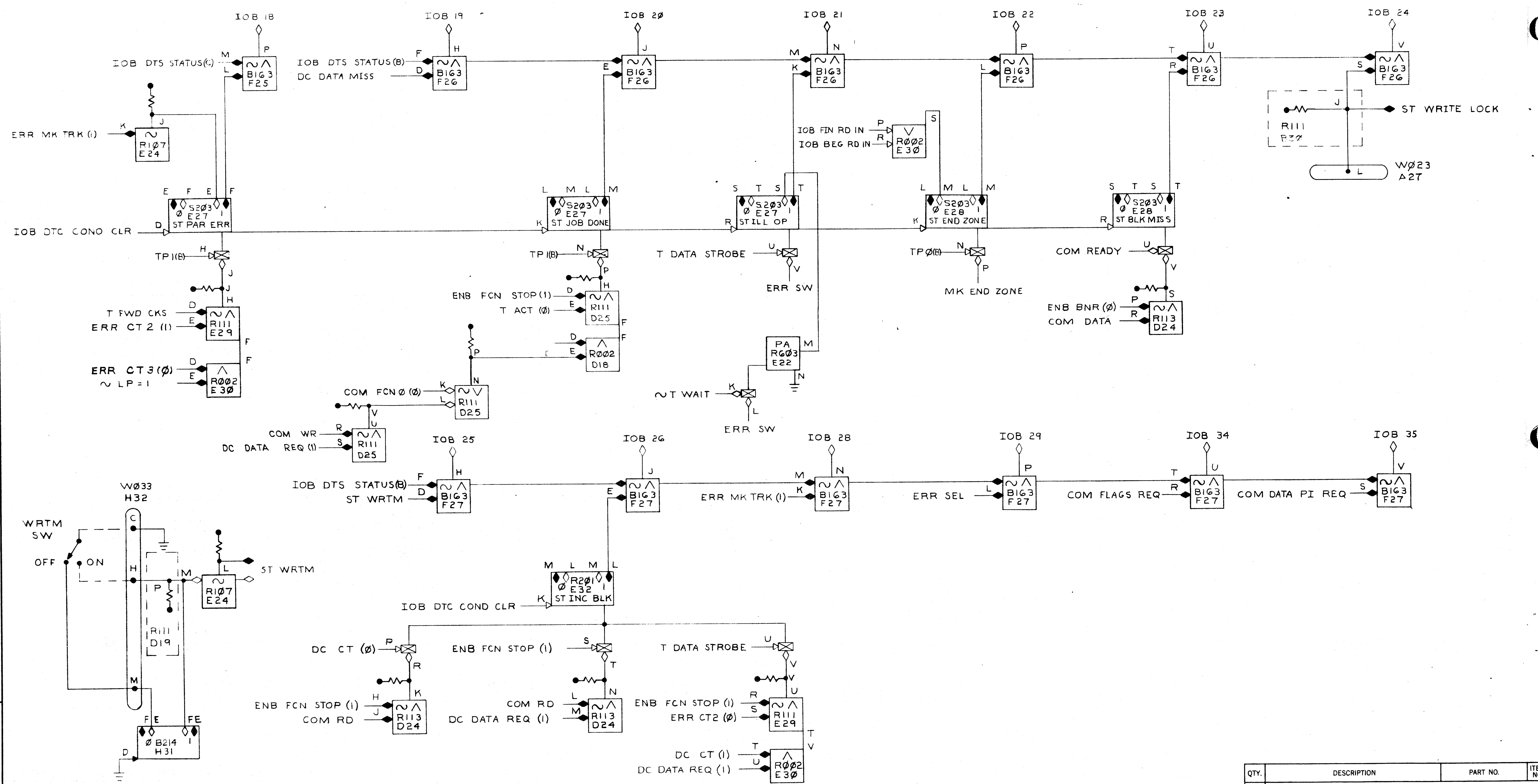
SCALE
SHEET 1 OF 1
DIST.

REVISIONS

CHK	CHANGE NO	REV
B Burkhart 5-14-68, D Gross 5/20/68	ECO#31	A

33

DEC FORM NO. DRD 102



IOB 18
IOB 19
IOB 20
IOB 21
IOB 22
IOB 23
IOB 24
IOB DTS STATUS(C)
IOB DTS STATUS(B)
DC DATA MISS
B163 F25
B163 F26
B163 F26
B163 F26
B163 F26
B163 F26
B163 F26
ST WRITE LOCK
R111 B30
W023 A27
ERR MK TRK (1)
R107 E24
IOB FIN RD IN
IOB BEG RD IN
R002 E30
S203 E27 ST PAR ERR
S203 E27 ST JOB DONE
S203 E27 ST ILL OP
S203 E28 ST END ZONE
S203 E28 ST BLK MISS
IOB DTC CONO CLR
TP1(B)
T DATA STROBE
ERR SW
TP0(B)
MK END ZONE
COM READY
T FWD CKS
ERR CT2 (1)
R111 E29
ERR CT3(0)
~LP=1
R002 E30
ENB FCN STOP(1)
T ACT (0)
R111 D25
R002 D18
PA R603 E22
ENB BNR (0)
COM DATA
R113 D24
COM FCN 0 (0)
R111 D25
~T WAIT
ERR SW
COM WR
DC DATA REQ (1)
R111 D25
IOB 25
IOB 26
IOB 28
IOB 29
IOB 34
IOB 35
IOB DTS STATUS(B)
ST WRTM
B163 F27
ERR MK TRK (1)
ERR SEL
COM FLAGS REQ
COM DATA PI REQ
W033 H32
WRTM SW
OFF
ON
R107 E24
ST WRTM
R111 D19
R201 E32 ST INC BLK
IOB DTC COND CLR
DC CT (0)
ENB FCN STOP (1)
T DATA STROBE
ENB FCN STOP (1)
COM RD
R113 D24
COM RD
DC DATA REQ (1)
R113 D24
ENB FCN STOP (1)
ERR CT2 (0)
R111 E29
DC CT (1)
DC DATA REQ (1)
R002 E30
B214 H31

QTY.	DESCRIPTION	PART NO.	ITEM NO.
	PARTS LIST		

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

DRN. R. L. Gunnier DATE 4/28/67
CHK'D.
ENG. DATE 11/13/67
PROJ. ENG. DATE 11/13/67
PROD. DATE
FIRST USED ON D-UA-TD10A-0-0

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

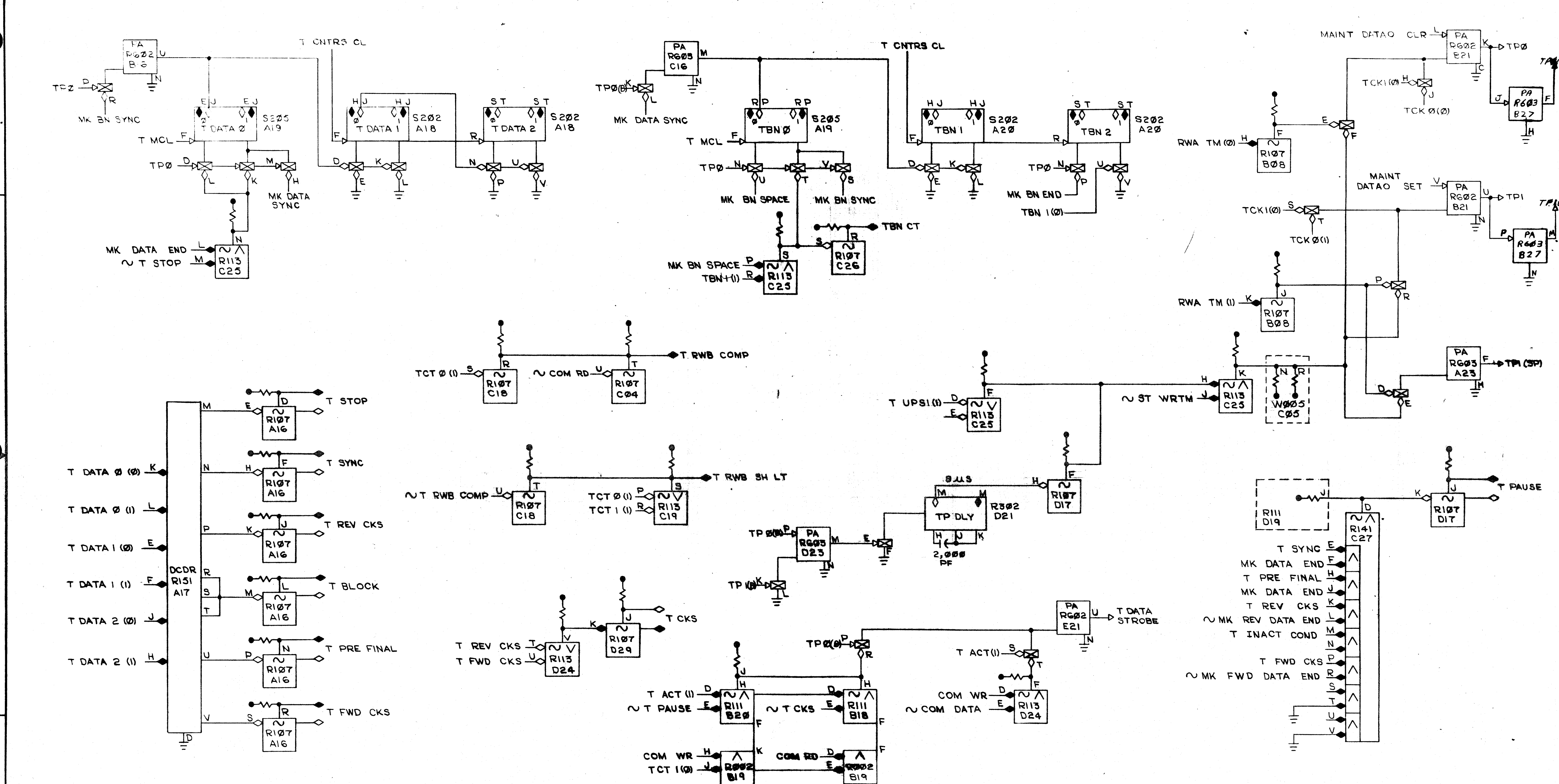
TITLE
STATUS

SIZE D CODE BS NUMBER TD10A-0-ST REV. D
SCALE
SHEET 1 OF 1

REVISIONS: A, B, C, D — ECO #31

DEC FORM NO DRD 102

34



REVISIONS: CHANGE NO. — A, B, C; ECO 31 11-14-68

35

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

DO NOT SCALE DRAWING

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

MATERIAL ~

FINISH ~

DRN. Roy Robichaud DATE 10-11-67
CHK'D. DATE 11-12-67
ENG. Gross DATE 11/13/67
PROJ. ENG. Gross DATE 11/1/67
PROD. DATE 12-
FIRST USED ON

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE: TIMING #1

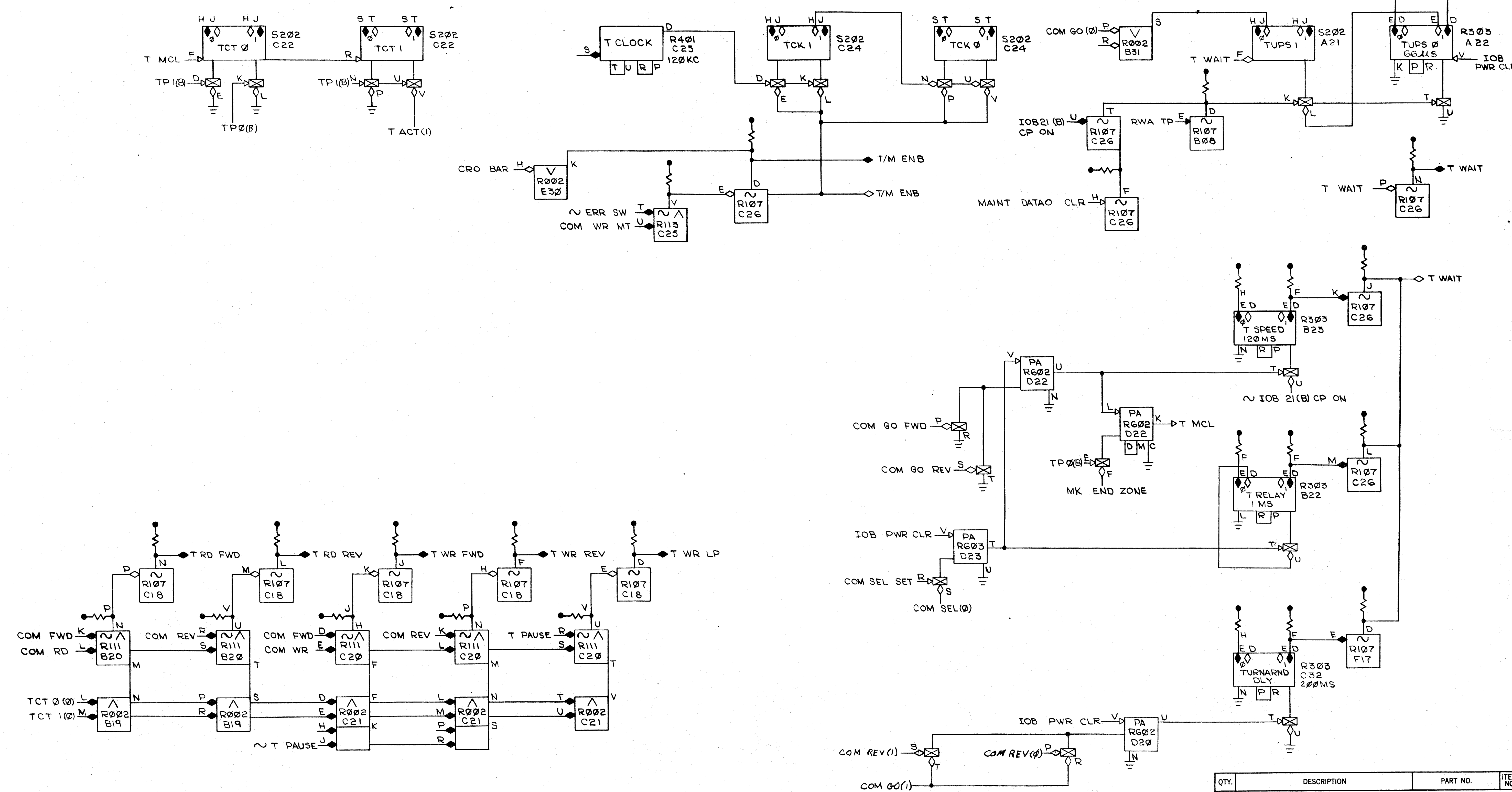
SIZE D | CODE BS | NUMBER TD10A-0-T1 | REV C

SCALE ~

SHEET 1 OF 2

DIST.

DEC FORM NO DRD 107



QTY.	DESCRIPTION	PART NO.	ITEM NO.
	PARTS LIST		

DO NOT SCALE DRAWING

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

MATERIAL ~

FINISH ~

DRN Ray Robichaud DATE 10-13-67
CHKD. [illegible] DATE 11-16-67
ENG. D. Gross DATE 11/17/67
PROJ. ENG. D. Gross DATE 11/17/67
PROD. [illegible] DATE 12/15/67
FIRST USED ON

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE

TIMING #1

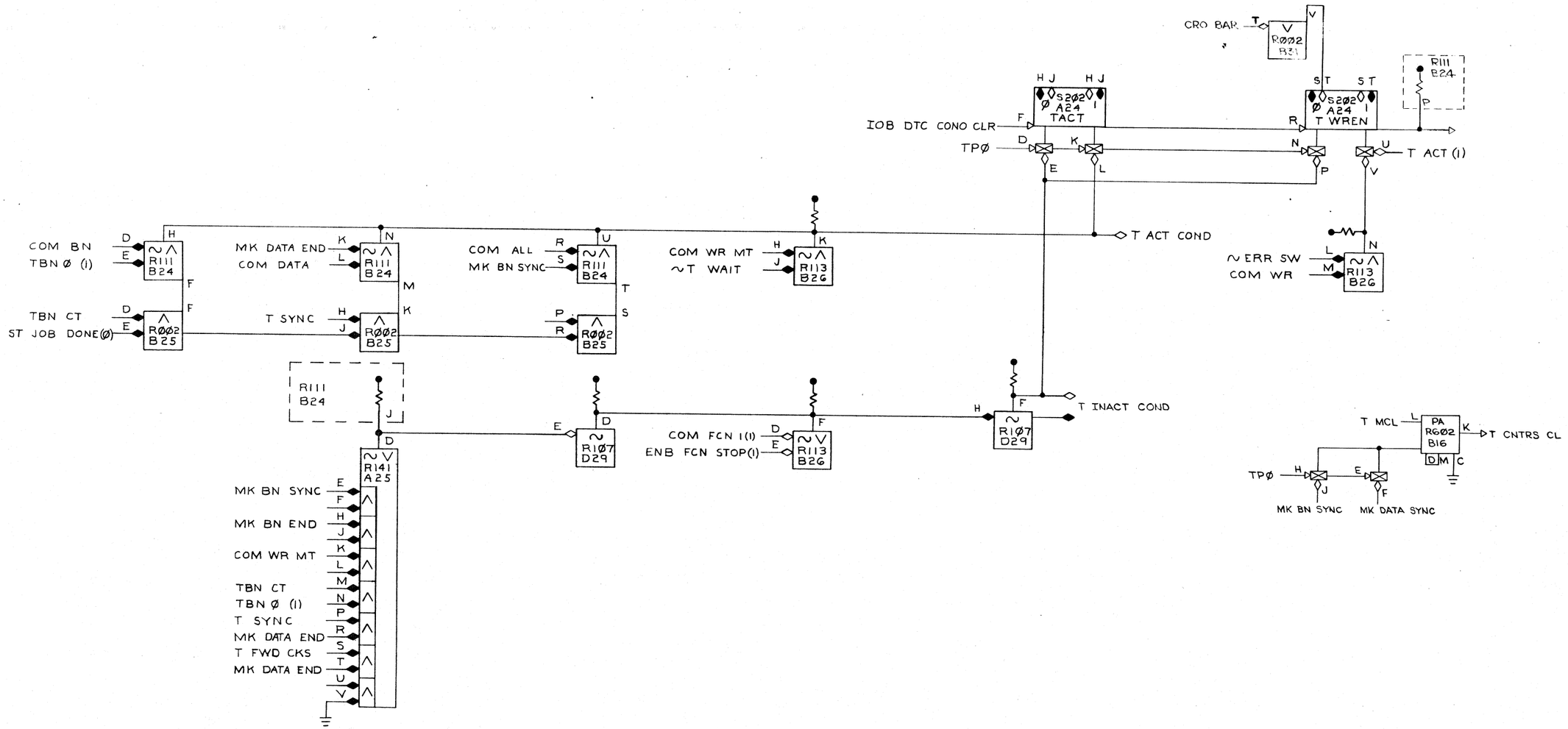
SIZE D CODE BS NUMBER TDIOA-O-T1 REV. G

SCALE ~
SHEET 2 OF 2
DIST.

REVISIONS | CHANGE NO. | CHK

DEC FORM NO. DRD 102

36



REVISIONS	CHK	CHANGE NO	REV
		3	A
		ECO#31	B

DEC FORM NO. DRD 102

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

UNLESS OTHERWISE SPECIFIED

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

MATERIAL

FINISH

DRN. R.E. Benner	DATE 4/28/67	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D. [illegible]	DATE 6-22-67	
ENG. D. Gross	DATE 11/13/67	TITLE: TIMING # 2
PROJ. ENG. D. Gross	DATE 11/13/67	
PROD. [illegible]	DATE 12-15-67	

FIRST USED ON: D-UA-TDIOA-0-0

SCALE ~

SHEET 1 OF 1

SIZE	CODE	NUMBER	REV.
D	BS	TDIOA-0-T2	B

DIST.

COMPONENT NAME	VALUE	POL.	FROM PIN	TO PIN	POL.
RESISTOR , 1/4 W., 5 %	3.9K		D21S	D21U	
RESISTOR , 1/4 W., 5 %	3.9K		E13J	E13L	
RESISTOR , 1/4 W., 5 %	3.9K		E13S	E13U	
RESISTOR , 1/4 W., 5 %	3.9K		E12J	E12L	
RESISTOR , 1/4 W., 5 %	3.9K		E12S	E12U	
CAPACITOR , 6VDC	2000 μμf	—	D21H	D21J	+
CAPACITOR, 6VDC	.39 μf	—	JØ4H	JØ4J	+
CAPACITOR, 6VDC	.22 μf	—	JØ5H	JØ5J	+
CAPACITOR, 6VDC	.22 μf	—	JØ5R	JØ5S	+
CAPACITOR, 6VDC	3.9 μf	—	JØ6H	JØ6J	+
CAPACITOR, 6VDC	3.9 μf	—	JØ6R	JØ6S	+
RESISTOR 1/4W 5%	100Ω		AØ9D	AØ9F	
CAPACITOR, 50 V DC	.01 μf	—	C12T	C12Y	+
RESISTOR, 1/4 W., 5%	3.9K		C17J	C17L	

REVISIONS			
REV.	DATE	CHG. NO.	APP'D.
A	1-24-68	1	DAG
B	2-13-68	3	DAG
C	2-26-68	5	DAG
D	6/19/67	00009	DAG
E	7/20/11	0001E	DAG

DRN. Kay Richards	DATE 9-18-67	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D. J.C. PELLETIER	DATE 9-19-67	
ENG. D Gross	DATE 11/13/67	TITLE EXTERNAL COMPONENT LIST FOR
PROJ. ENG. D Gross	DATE 11/13/67	
PROD. [illegible]	DATE 12-15-67	
FIRST USED ON		
SCALE ~		
SHEET 1 OF 1		

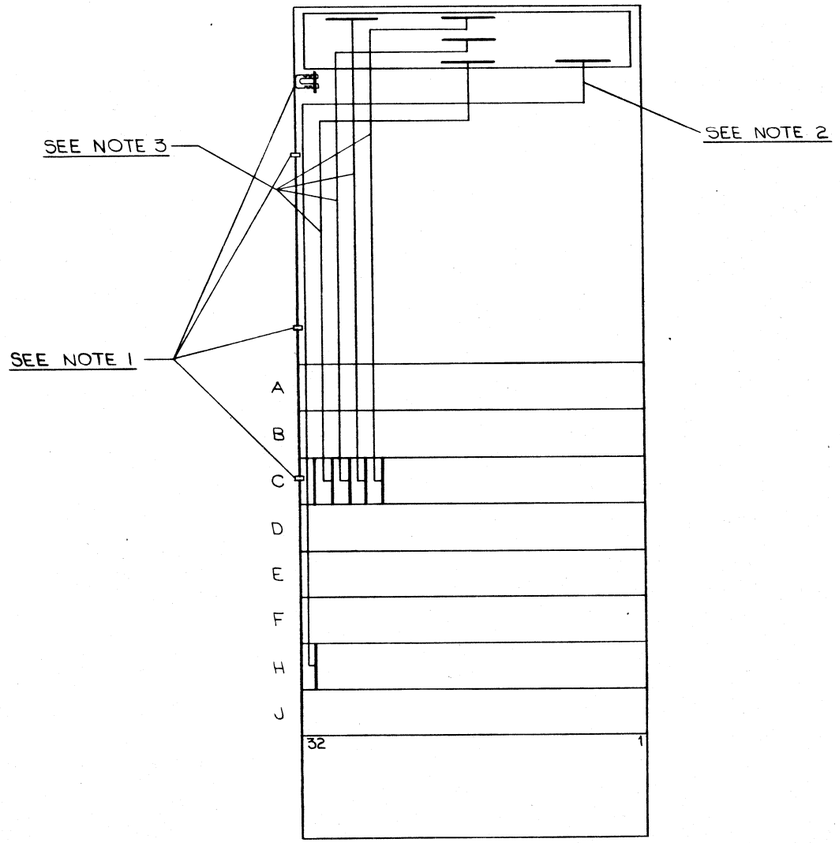
SIZE	CODE	NUMBER	REV.
A	CP	TD10A-0-5	E

DIST.

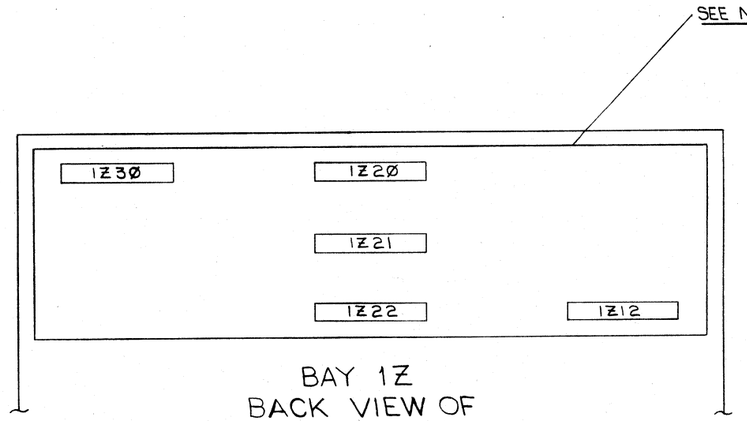
DEC FORM NO.
DRA 106

NOTES:

1. ALL CABLES WILL BE DRESSED DOWN THE LEFT SIDE (FROM BACK) USING DAKOTA CLAMPS AS INDICATED.
2. SWITCHES CABLE - 70" WØ33 - WØ33
   SEE C-IA-7405553-27-Ø
   1 REQUIRED: 1Z12 - H32
3. INDICATOR CABLE - 63½" WØ12 - W25Ø
   SEE D-IA-7ØØ5459-13-Ø
   4 REQUIRED: 1Z2Ø - C28
   1Z21 - C3Ø
   1Z22 - C31
   1Z3Ø - C29
4. INDICATOR PANEL
   SEE D-IA-7405744-Ø-Ø



BACK VIEW
OF TDIØA



BAY 1Z
BACK VIEW OF
INDICATOR PANEL

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL

FINISH

DRN. R. Rockland DATE 12-28-67
CHK'D. J.C. FELLETTER DATE 1-1-68
ENG. D. Gross DATE 1/9/68
PROJ. ENG. D. Gross DATE 1/9/68
PROD. [illegible] DATE 1-8-68
FIRST USED ON

SCALE
SHEET 1 OF 1

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

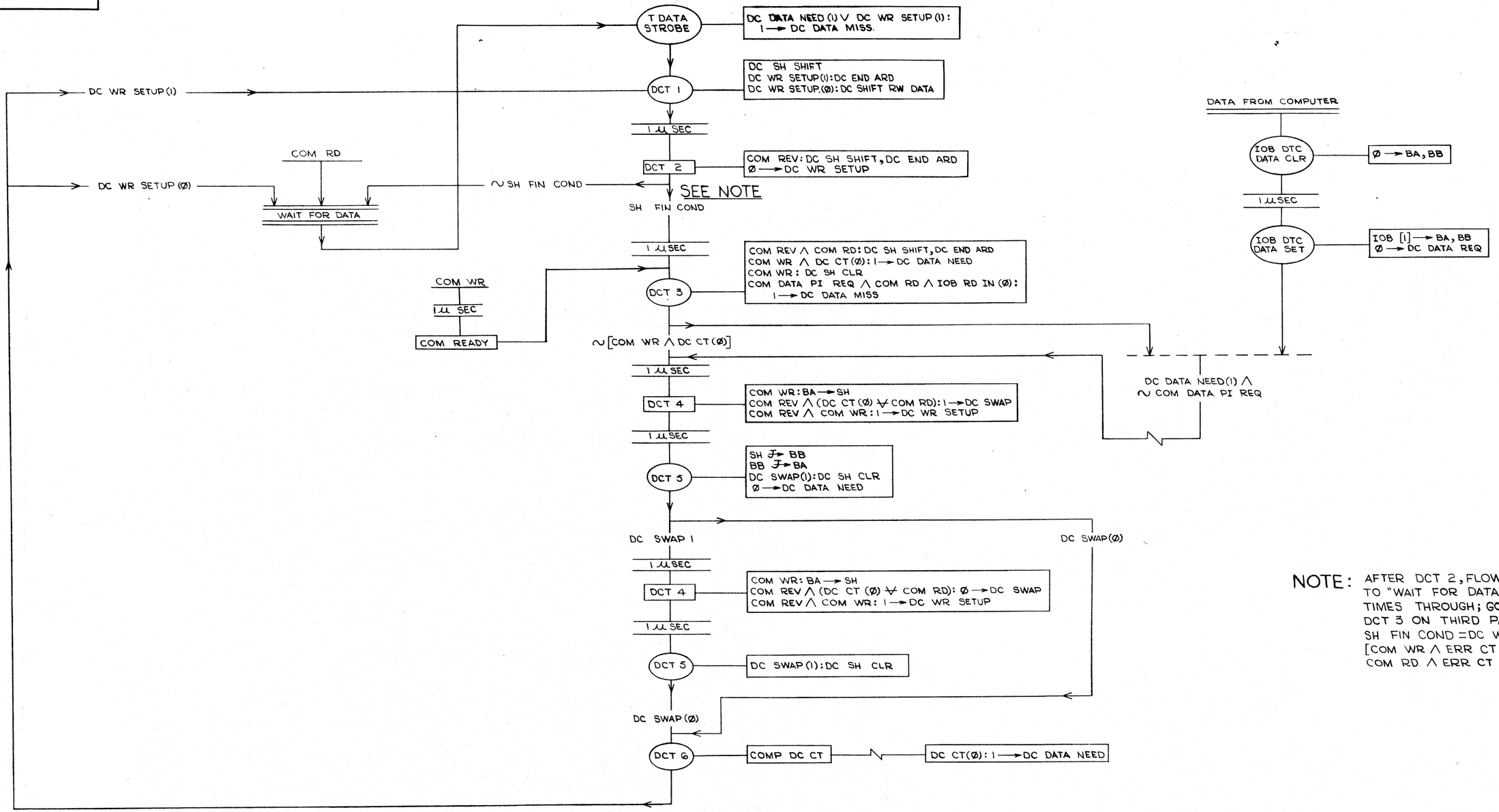
TITLE
INDICATOR CABLE ASSY.

SIZE D | CODE IC | NUMBER TDIOA-0-8 | REV.
DIST.

REVISIONS
REV. | CHANGE NO | CHK

DEC FORM NO
DRD 100

38



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 (Ø) ∧ [COM WR ∧ ERR CT 3 (1) ∨ COM RD ∧ ERR CT 2 (Ø)]

QTY.	DESCRIPTION	PART NO.	ITEM NO.

PARTS LIST

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

MATERIAL ∼
FINISH ∼

DRN. K Kolehmainen	DATE 11-21-67	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D. C Waterhouse	DATE 12-7-67	
ENG. D Gross	DATE 12-8-67	TITLE: DATA CONTROL FLOW
PROJ. ENG. D Gross	DATE 12-8-67	
PROD. C Mulcahy	DATE 12-15-67	
FIRST USED ON D-UA-TDIØA-0-0		SIZE D · CODE FD · NUMBER TDIØA-0-7 · REV.
SCALE ∼		DIST.
SHEET 1 OF 1		

REVISIONS | REV. | CHANGE NO. | CHK

39

SIZE D NUMBER TDIØA-0-7 REV.

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	APPD	SIZE	CODE	NUMBER	REV
George Garnder		A	SP	TD10A-0-14	

DEC FORM NO. DRA 107

SHEET 1 OF 9

ENGINEERING SPECIFICATION digital CONTINUATION SHEET

TITLE TD10A ENGINEERING SPECIFICATIONS

1. General

This spec defines the TD10A Dectape Control.

2. Mechanical

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.

A. The door on the logic shall be removable by one person without the use of any tools.

B. No sharp edges shall be exposed which might create a safety hazard such as the edges of doors and end panels.

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.

D. The forced air cooling shall not be excessively noisy.

E. The cabinet shall be stable with any combination of doors open.

F. The rear internal door shall not short out or otherwise interfere with the power supplies and wiring.

Indicators

A. Indicator lamps shall be pluggable.

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.

C. All indicator labels shall be easily readable, whether the indicator is on or off. Therefore, no labels shall be back-lit.

SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-14	

DEC FORM NO DRA 108

SHEET 2 OF 9

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.

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.

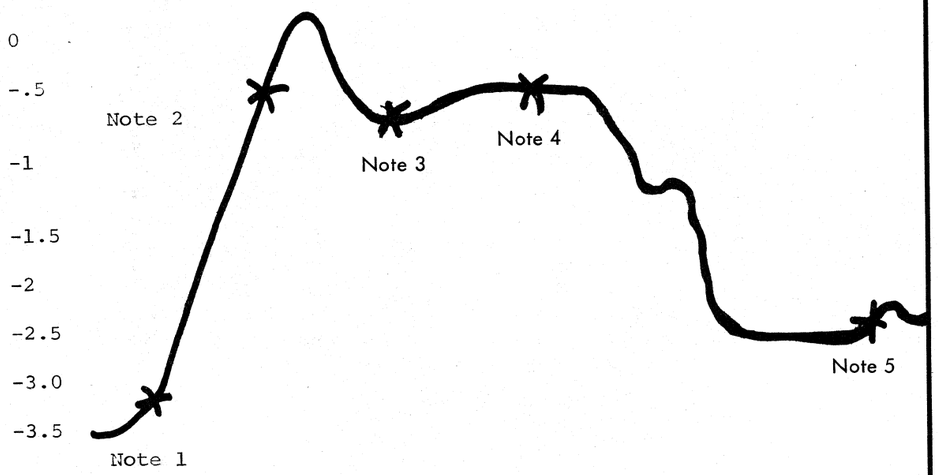


FIGURE 1

ACCEPTABLE WAVE FORM

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.

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.

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 B04

(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).

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	APPD	SIZE	CODE	NUMBER	REV
GEORGE GARDNER		A	SP	TD10A-0-15	

DEC FORM NO. DRA 107

SHEET 1 OF 3

ENGINEERING SPECIFICATION

digital

CONTINUATION SHEET

TITLE TD10A ACCEPTANCE TEST PROCEDURE

1. PRELIMINARY

   A. Check the TU55 DECtape XPort for the following items before appyling power:

      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.

   B. All tape guides and heads must be clean.

2. REQUIREMENT

   A. PDP-10 with TD10A DECtape system and one or more TU55 DECtape transports.

   B. One certified (by DEC) DECtape per TU55 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.

SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-15	

DEC FORM NO DRA 108

SHEET 2 OF 3

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.

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	APPD	SIZE	CODE	NUMBER	REV
GEORGE GARDNER		A	SP	TD10A-0-16	

DEC FORM NO. DRA 107

SHEET 1 OF 2

ENGINEERING SPECIFICATION [redacted] CONTINUATION SHEET

TITLE TD10A ACCEPTANCE TEST SPECIFICATIONS

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

	SIZE	CODE	NUMBER	REV
	A	SP	TD10A-0-16	

DEC FORM NO DRA 108

SHEET 2 OF 2

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	D Gross	12/11/69

ENG	APPD	SIZE	CODE	NUMBER	REV
G. Gardner	D. Gross	A	SP	TD10A-0-17	A

(48)

DEC FORM NO. DRA 107

SHEET 1 OF 13

ENGINEERING SPECIFICATION [redacted] CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT & TEST PROCEDURE

In all respects, unless otherwise specified, the TD10A (TD10A-A-0, TD10A-B-0) shall conform to LCE DS4D General Specifications.

1. Off-Line Checkout

1. Smoke Test

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.

1.a. 5Ø HZ Systems Only:

Before any modules or cables are plugged into the TD10A control the following checks (on 50HZ systems only) must be made.:

Using a Triplett VOM (or equivalent) set it to to 300 VAC scale. Turn power on. NOTE: Voltage readings are approximate.

Measure the voltage between the cabinet frame and each of the output wires from the transformer assembly (lower two wires at the terminal block)

Observe the following and take the appropriate action:

RED WIRE	WHITE WIRE	ACTION
115 VAC	Ø VAC	OK. No action necessary
23Ø VAC	115 VAC	Reverse plug and Reverse transformer input
115 VAC	230 VAC	Reverse transformer input
Ø VAC	115 VAC	Reverse plug

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

DEC FORM NO DRA 108

SHEET 2 OF 13

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).

Adjust the mark and timing track generator clock (T CLOCK) to 8.3 μs 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.

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 lampsshould 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.

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 JOB 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

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 μsec/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 "B" 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 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.

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 μsec.

c) Pass the tape over the head in reverse direction.

d) The upper beam shall lead the lower beam by no more than 2 μsec.

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.

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.

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.

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.

8. Margins

For marginingg, see TD10A Manufacturing Checkout Specifications.

9. Heat

For heat test data, see TD10A Manufacturing Checkout Specifications.

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 D Gross	SIZE A	CODE SP	NUMBER TD10A-0-18	REV

DEC FORM NO. DRA 107

ENGINEERING SPECIFICATION digital CONTINUATION SHEET

1. Preliminary

   A. Check the TU55 DECtape XPort for the following items before applying power:

      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.

   B. All tape guides and heads must be clean.

	SIZE A	CODE SP	NUMBER TD10A-0-18	REV

DEC FORM NO DRA 108

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.

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.

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.

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION

DATE 19 Sept 1968

TITLE TD10A INSTALLATION DATA

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
--	ORIGINATED	TD10A 00008	G. GARDNER	2/69	--	--

(58)

ENG	APPD	SIZE	CODE	NUMBER	REV
G. Gardner		A	SP	TD10A-0-19	

DEC FORM NO. DRA 107

SHEET 1 OF 2

ENGINEERING SPECIFICATION — CONTINUATION SHEET

TITLE TD10A INSTALLATION DATA

1. Power Dissipation:

   A. TD10A - 400 VA

   B. Each TU55 - 200 VA

2. Procedure

   The TD10A will be bolted to the right side of the KA10. For further information, see the TD10. DECtape Maintenance Manual (DEC-10-13AA-D), chapter 5.

3. Power & Cable Requirements

   The TD10A control operates from single-phase 115V ± 10%, 60Hz ± 2Hz or from 230V ± 10%, 50Hz ± 2Hz line voltage. AC power is supplied by a 3-wire (single-phase) line cord, Hubbell Twistlock connector normally supplied. For cabling information,,see:

   a) D-IC-TD10A-0-8

   b) D-IC-TD10A-0-4

   c) D-AR-TD10-0-0

4. Heat dissipation

   A. TD10A - 138 BTU/hr.

   B. Each TU55 - 69 BTU/hr.

5. Surge Current - negligible.

	SIZE	CODE	NUMBER	REV
	A	SP	TD10A-0-19	

DEC FORM NO DRA 108

SHEET 2 OF 2

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	APPD	SIZE	CODE	NUMBER	REV
GEORGE GARDNER		A	SI	TD10A-0-20	

DEC FORM NO. DRA 107

SHEET 1 OF 4

ENGINEERING SPECIFICATION digital CONTINUATION SHEET

TITLE TD10A MANUFACTURING CHECKOUT AND TEST SPECIFICATIONS

RESULT SHEET

TESTS RUN	MARGIN ROOM TEMP.	MARGIN HEAT
Tape Rocker		
(Maindec 10-D3EA)		
(Maindec 10-D3FA)		
Data Reliability (Maindec 10-D3HA)		

Date: _____

Technician: _____

System: _____

	SIZE	CODE	NUMBER	REV
	A	SI	TD10A-0-20	

DEC FORM NO DRA 108

SHEET 2 OF 4

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.

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

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION

DATE Aug 13, 1968

TITLE TD10A SHIPPING LIST

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
--	ORIGINATED	TD10A 00008	G. GARDNER	2/69	--	--

(61)

ENG	APPD	SIZE	CODE	NUMBER	REV
GEORGE GARDNER		A	SP	TD10A-0-21	

DEC FORM NO. DRA 107

SHEET 1 OF 2

ENGINEERING SPECIFICATION digital CONTINUATION SHEET

TITLE TD10A SHIPPING LIST

TD10A

ITEM	QUANTITY
TD10A DECtape Control	as ordered
1 - 5 TU-55 DECtape transports	as ordered
BS10A (see note 1)	per parts list
Indicator Cables (4)	per parts list
Switches Cable (1)	per parts list
Prints and Documentation	1 set
Blank Panels (see note 2)	as ordered

TD10B

ITEM	QUANTITY
TD10B Assembly	as ordered
1-3 TU-55 DECtape transports	as ordered
Prints	1 set
Blank Panels (see note 2)	as ordered

Notes:

1) 1 BS10A Assembly consists of a BC10A, a BC10B, and a power turn on cord.
2) To figure the required number of blanks for:
   a) TD10A: Blank panels = 5- the number of TU-55's used.
   b) TD10B: Blank panels = 3- the number of TU-55's used.
3) The I/O cables will be routed through the floor opening of the KA10, up through the TD10A floor hole to the control logic. For correct locations, see D-MU-TD10A-0-2.
4) For correct routing of Indicator and Switches cables, see D-IC-TD10A-0-8.
5) For correct routing of logic and command cables, see the Configuration Reference D-AR-TD10-0-0.

SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-21	

DEC FORM NO DRA 108

SHEET 2 OF 2

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	APPD	SIZE	CODE	NUMBER	REV
George Gardner		A	SP	TD10A-0-23	

DEC FORM NO. DRA 107

ENGINEERING SPECIFICATION [redacted] 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	CODE	NUMBER	REV
	A	SP	TD10A-0-23	

DEC FORM NO DRA 108

TRANSISTORS

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

ADDITIONAL

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

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION DATE 6 Feb 1968

TITLE TD10A SYSTEM SPECIFICATIONS

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
	ORIGINATED	TD10A-00008	G. GARDNER	2/69	--	--

ENG	APPD	SIZE	CODE	NUMBER	REV
George Gardner		A	SP	TD10A-0-24	

DEC FORM NO. DRA 107

SHEET 1 OF 6

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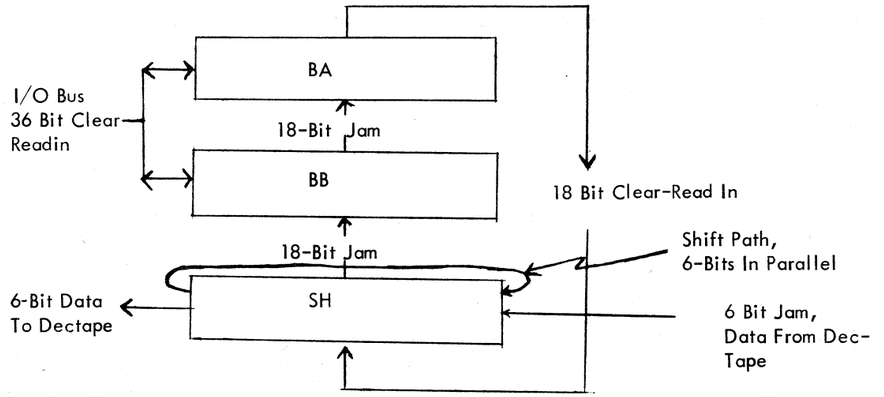
ENGINEERING SPECIFICATION digital CONTINUATION SHEET

TITLE TD10A System Specifications

The TD10A DECtape control derives its operating pulses from the timing track. Thus, the pulses that make things go form a 2-phase clock (TP0 and TP1) with 33 μs between opposite phases. There are few places in the logic where circuit speed requirements are high; the fastest is 1 μs between pulses.

The control contains two logically distinct sections - a 6-bit-at-a-time DECtape reader/writer and a 36-bit interface to the I/O bus. An operation begins with an IOB Cono Clear pulse which wipes out any other operation currently in progress (with proper programming the control should be idle). The Cono Set pulse, which follows 1 μs later, partly jams, partly Or's in the new command which sets up enabling levels in the control and starts the DECtape spinning (if it wasn't already). 1 μs later, a pulse derived in the DECtape control sets off the first **timing chain.**

36-bit data is processed in the 36-bit data control section of the DECtape control. This section consists of a 36-bit buffer register (split into two 18-bit halves) and an 18-bit shift register. The halves of the buffer register are called BA and BB. The shift register is called SH. The data paths appear in the figure below:



	SIZE	CODE	NUMBER	REV
	A	SP	TD10A-0-24	

DEC FORM NO DRA 108

SHEET 2 OF 6

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

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 tack 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.

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

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.

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	APPD	SIZE	CODE	NUMBER	REV
George Gardner		A	SP	TD10A-0-25	

DEC FORM NO. DRA 107

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).

The command to the DECtape control consists of a CONO to the DTC device number. The 18 bits thus sent have the following meanings:

Bits	Meaning
18-20	Motion Selection 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	Delay Inhibit. 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	Select. Enables the selection of a particular transport. This bit should be a 1 whenever a new transport is selected.
23	Deselect. 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	Transport Number. 0 is the same as transport 8. Ones in bits 24-26 OR into the transport number register.
27-29	Function Number 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

SIZE	CODE	NUMBER	REV
A	SP	TD10A-0-25	

DEC FORM NO DRA 108

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	Parity Error Enable. Allows the parity error bit to cause an interrupt on the flags channel.
19	Data Missed Enable. Allows the data missed error bit to cause an interrupt on the flags channel.
20	Job Done Enable. Allows the job done bit to cause an interrupt on the flags channel.
21	Illegal Operation Enable. Allows the illegal operation error bit to cause an interrupt on the flags channel.
22	End Zone Enable. Allows the end zone bit to cause an interrupt on the flags channel.
23	Block Missed Enable. Allows the block missed bit to cause an interrupt on the flags channel.
34	Stop All Transports. Sending this bit causes all transports to stop. The selected transport will, however, resume motion if forward or reverse motion is currently selected.
35	Function Stop. 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.

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.

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 timeing 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.

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 'DATAI 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 I shows a non-interrupt program to find a given block and

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

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 prewritten 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.

MAINT DATAO is DATAO to device 324.
MAINT DATAO CLR fires TP0
MAINT DATAO SET fires TP1
Bit 35 enters mark track shift register.
Bit 21 fires pulse to up to speed detector.
All other bits are ignored.

During DATAI 324, the following bits indicate:

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

During DATAI 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