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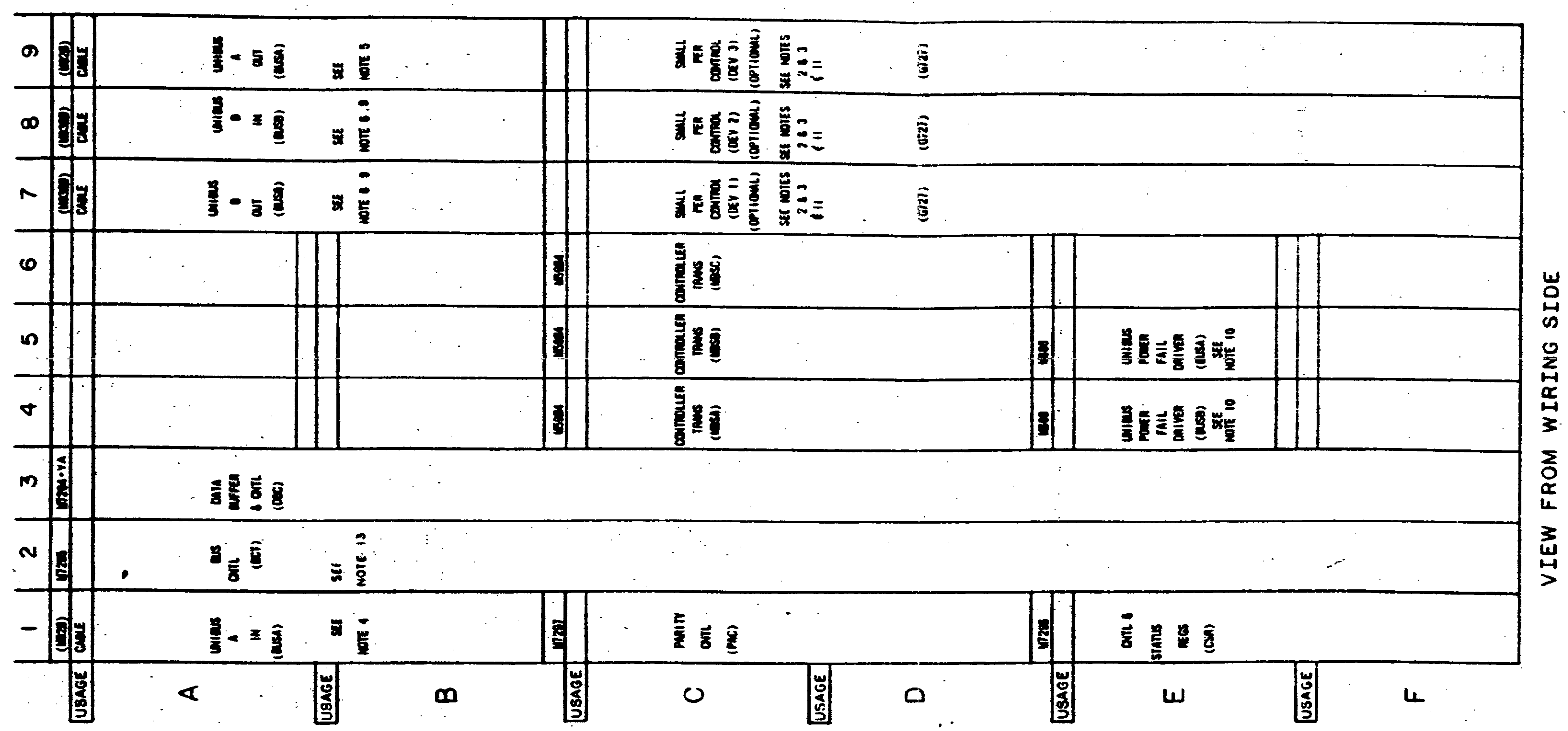


NOTES:

1. VIEW OF LOGIC PANEL IS FROM WIRING SIDE.
2. THE SMALL PERIPHERAL CONTROLLER SLOTS MAY CONTAIN A VARIETY OF PDP 11 OPTIONS. THE OPTION MAY CONSIST OF A SINGLE QUAD MODULE BOARD (SLOTS C,D,E, & F) OR A DOUBLE HEIGHT CONTROLLER BOARD (SLOTS C & D) WITH AN M105 ADDRESS SELECTOR MODULE (SLOT E) AND AN M7821 INTERRUPT CONTROL MODULE (SLOT F)
3. IF NO OPTION IS PRESENT IN THE SMALL PERIPHERAL CONTROLLER SLOTS, G727 GRANT CONTINUITY MODULE(S) MUST BE INSERTED IN SLOTS D.
4. MAY BE EITHER M920 (CONNECTION FROM ADJACENT DEVICE) OR BC11A CABLE (CONNECTION FROM ANOTHER BOX OR NON-ADJACENT DEVICE).
5. MAY BE M920 (CONNECTION TO ADJACENT DEVICE), M930 (TERMINATION AT END OF UNIBUS A), OR BC11A CABLE (CONNECTION TO NEXT BOX OR NON-ADJACENT DEVICE).
6. MAY BE M9300 (TERMINATION AT BEGINNING OR END OF UNIBUS B) OR BC11A CABLE (CONNECTION TO OTHER BUS B DEVICES).
7. FOR DIAGNOSTIC CHECKOUT AN M9200 CONNECTOR MODULE MAY BE PLACED IN SLOTS A,B 08 & 09, AN M930 OR BC11A CABLE IS THEN USED IN SLOT A,B 07.
8. THE H870 MODULE WILL BE INSERTED IN J2 OF EACH OF THE M5903 MODULES IN THE LAST DRIVE UNIT ATTACHED TO THE MASSBUS CABLES ORIGINATING FROM THE M5904(S) IN THE RH11 CONTROLLER BACKPLANE, WHEN BUILDING A MASSBUS SYSTEM.
9. IF NO UNIBUS B CABLE IS CONNECTED TO THE RH11 ONLY ONE M9300 MODULE SHOULD BE USED IN SLOT AB08.
10. IF ANOTHER DEVICE ATTACHED TO THE SAME POWER SUPPLY AS THE RH11 HAS UNIBUS POWER FAIL SIGNALS WIRED TO THE UNIBUS REMOVE THE M808 MODULE FOR THAT BUS.
11. SMALL PER CONTROL SLOTS FOR MANUFACTURING USE ONLY.
12. ONE H870 MODULE WILL BE INSERTED IN J1 (COMPONENT SIDE OUT) OF EACH OF THE 3 M5904 MODULES FOR SHIPMENT ONLY!
13. INSERT BRG PRIORITY PLUG IN DIP SITE E57 OF M7295

Insert BRG priority plug in dip site E57 of M7295. (see board layout in p.8.)

QTY	DESCRIPTION	PART NO.	ITEM NO.
1	BUS CNTL	D-CS-M7295-0-1	1
3	GRANT CONTINUITY	B-CS-G727-0-1	2
3	MASS BUS TERMINATOR	D-CS-H870-C-1	3
1	PARITY CNTL	D-CS-M7297-0-1	4
1	CNTL & STATUS REG	D-CS-M7296-0-1	5
1	DATA BUFFER & CONTROL	B-DD-M7294-YA	6
3	CONTROLLER TRANSCEIVER	D-CS-M5904-0-1	7
2	UNIBUS TERMINATOR (BUS B)	D-CS-M9300-0-1	8
1	UNIBUS CONNECTOR	C-CS-M920-0-1	9
2	POWER FAIL DRIVER	D-CS-M808-0-1	10
2	HANDLE EXTENDER	A-PL-H050-0-0	11
	BRG JUMPER PLUG	5408780	12

PARTS LIST

FIRST USED ON OPTION MODEL: RH11

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES
TOLERANCES
DECIMALS: .xxx ± .005, .xx ± .02, .x ± .1
ANGLES: ±0 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY

MATERIAL
FINISH

NEXT HIGHER ASSY: B-DD-RH11-C

digital EQUIPMENT CORPORATION

TITLE: MODULE UTILIZATION

SIZE: D | CODE: MU | NUMBER: RH11-C-01
SCALE: NONE

D MU RH11-C-01

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION DATE 27-Dec-1977

TITLE RH11-C Jumper Configurations

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE

ENG	APPD	SIZE	CODE	NUMBER	REV
T. Bowen	Philip D. Wilson	A	SP	RH11-C-2	

ENGINEERING SPECIFICATION [redacted] CONTINUATION SHEET

TITLE RH11-C Jumper Configurations

5410506 Etched Backplane

Lowest acceptable wire list revision C
No jumpers or other configurable components

M7294-YA Data Buffer & Control Location ABCDEF03

Lowest acceptable revision Etch rev N/A CS Rev *

Jumper Table

Jumper	State: Disk	State: Tape	Comments
W1	Out	Out	Sense Unibus A parity error
W2	In	In	Sense Unibus B parity error
E66, Pins 1-16	In	In	Start Count 64 words
E66, Pins 5-12	Out	Out	Start count 32 words
E66, Pins 7-10	Out	Out	Start count 16 words
E66, Pins 2-15	In	In	Disable Bus B Hog mode
E66, Pins 3-14	Out	Out	Enable Back to back mem cycles
E66, Pins 4-13	Out	In	For tape subsystem only, otherwise Out
E66, Pins 6-11	In	Out	Configures controller for disk only operation. No other type of drive allowed.

M7295 Bus Control Location ABCDEF02

Lowest acceptable revision Etch Rev N/A CS Rev D

Jumper Table

Jumper	State: Disk	State: Tape	Comments
W1	Out	Out	Address bit 12
W2	Out	In	Address bit 11
W3	Out	Out	Address bit 10
W4	In	In	Address bit 09
W5	Out	Out	Address bit 08
W6	Out	In	Address bit 07
W7	Out	In	Address bit 06
W8	In	Out	Address bit 05
E3, Pins 1-16	Out	In	16-32 registers
E3, Pins 2-15	Out	In	16-32 registers
E3, Pins 3-14	In	Out	1-16 registers
E3, Pins 4-13	In	Out	1-16 registers
E3, Pins 5-12	In	Out	16 registers
E3, Pins 6-11	Out	Out	8 registers
E3, Pins 7-10	In	Out	4 registers
E3, Pins 8-9	Out	In	2 registers
W11	In	In	Vector bit V2
W12	In	Out	Vector bit V3
W13	Out	In	Vector bit V4
W14	In	Out	Vector Bit V5
W15	Out	Out	Vector bit V6
W16	In	In	Vector bit V7

SIZE	CODE	NUMBER	REV
A	SP	RH11-C-2	

6

M7295 Bus Control Jumper Table (Continued)

W17	Out	Out	Vector bit V8
W18	In	In	NPR latency
W19	In	In	Maintenance (MXF errors)

W1-W8 Correspond to a base address of 7767XX for disks and 7724XX for tapes

W11-W17 correspond to a vector address of 000254 for disks and 000224 for tapes

Jumpers on E3 are set for 20 registers for disks and 14 for tapes

Dip site E57 should contain priority plug BR6 (54-08780)

M7296 Control & Status Registers Location EF01

Lowest acceptable revision Etch Rev N/A CS Rev B

Install jumper W1 to allow only unibus A to be selected

M7297 Parity Control Location CD01

Lowest acceptable revision Etch rev N/A CS Rev A

No jumpers or other configurable components

There are two visual indicators (LEDs) for Massbus parity error display on this board (lit if parity error detected.)

M9300 Unibus B Terminator Location AB08

Lowest acceptable revision Etch Rev N/A CS Rev 0

Jumper Table

Jumper	State	Comments
W1	Out	Beginning of bus
W2	In	Not end of bus
W3	In	Not end of bus

There is a visual indicator (LED) for an illegal jumper configuration check (lit if illegal).

M9504 Controller Transceiver Locations CD04, CD05, CD06

Lowest acceptable revision Rev N/A CS Rev D

Jo jumpers or other configurable component.

M688 Unibus Power Fail Drivers Locations E04 and E05

Lowest acceptable revision Etch Rev N/A CS Rev N/A

No jumpers or other configurable component

NOTE: No devices other than disks can be connected to the RH11-C jumpered for disk operation.

SIZE	CODE	NUMBER	REV.
B	DD	M7294-YA	

DRAWING NO.	NO. OF SHTS	PART NO.	DESCRIPTION	REVISIONS
			MODULE REVISION	A
D-UA-M7294-YA-0	5		DATA BUFFER & CONTROL	-
D-CS-M7294-YA-DBC1	1		DATA BUFFER & CONTROL	-
D-CS-M7294-YA-DBC2	1		DATA BUFFER & CONTROL	-
D-CS-M7294-YA-DBC3	1		DATA BUFFER & CONTROL	-
D-CS-M7294-YA-DBC4	1		DATA BUFFER & CONTROL	-
D-CS-M7294-YA-DBC5	1		DATA BUFFER & CONTROL	-
D-CS-M7294-YA-DBC6	1		DATA BUFFER & CONTROL	-
D-CS-M7294-YA-DBC7	1		DATA BUFFER & CONTROL	-
D-CS-M7294-YA-DBC8	1		DATA BUFFER & CONTROL	-
D-AH-M7294-0-5	1		DATA BUFFER & CONTROL	J
		5010427	ETCHED CIRCUIT BOARD	C
P00-M7294-YA	-		PROCESS SHEET	REF
M7294-0-L	-		P.C. DESIGN DATA BASE	REF
M7294-YA-PL	-		INSERTION P/L DATA BASE	REF

NOTES:

REVISIONS	DATE	CHG NO.	REV.
ORIG	X		X

digital

USED ON OPTION/MODEL	
RH11-C	

DRN. E. WILSON	2DEC77	TITLE: DATA BUFFER & CONTROL
CHK'D RW Counter	2Dec77	SIZE B CODE DD NUMBER M7294-YA REV.
ENG. [illegible]	4 DEC 77	SHEET 1 OF 1
PROD. W. Bishop	20 DEC 77	

DRB 126 EN-01149-16-N176(325)

NOTES:
1. FOR DRAWING DIRECTORY REFER TO B-DD M7294-YA
2. UNLESS OTHERWISE SPECIFIED THE FOLLOWING PIN NUMBER APPLY:

PACKAGE TYPE	VCC	GND
16 PIN DIP	16	8
14 PIN DIP	14	7

QTY	REF. DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
1		ETCHED CIRCUIT BOARD	5010427	1
98	C1 THRU C87.C89 THRU C96. C104.C111.C112	CAP .01 UF. 20%.	1001610-00	2
6	C97 THRU C102	CAP 6.8 UF. 10%. 35V	1005306	3
1	C103	CAP 56 PF. 5%. 100V	1000012	4
1	C105	CAP. 30 PF. 5%. 100V	1000010	5
1	C106	CAP 2400 PF. 5%. 100V	1001636	6
1	C107	CAP. 220 PF. 5%. 100	1000021	7
2	C104 C109	CAP 62 PF. 5%. 100V.	1000013	8
1	C110	CAP 15 PF. 5%.100 DM	1002427	9
1	D1	DIODE 1N9648 ZENER	1109900	10
1	D3	DIODE D664	1100114	11
23	R1 THRU R17.R20.R21.R23. R26.R27.R28	RESISTOR 1K. 5%. ¼W	1300365	12
2	R18.R19	RESISTOR 750. 5%. ¼W	1301401	13
2	R22.R30	RESISTOR 15K. 5%. ¼W	1300496	14
8	R24.R25.R29.R31 THRU R35	RESISTOR 5.6K. 5%. ¼W	1301074	15
1	Q2	TRANSISTOR 2N3906	1509525	16
1	Q1	TRANSISTOR 2N5490	1509374	17
10	E1.E3.E5.E7.E9.E13.E15.E17. E19.E20	I.C. DEC 9641	1911579	18
11	E2.E4.E6.E8.E10.E21.E43. E49.E51.E55.E57	I.C. DEC 74157	1910655	19
2	E11.E93	I.C DEC 74S74	1910544	20
5	E12.E14.E16.E18.E99	I.C DEC 8881	1909705	21
8	E23 THRU E26.E61.E74.E82. E91	I.C. DEC 74H04	1909931	22
4	E27.E75.E86.E90	I.C. DEC 74H00	1909056	23
3	E28.E60.E94	I.C. DEC 74H11	1909267	24
6	E29 THRU E33.E35	I.C. DEC 8234	1911315	25
5	E34.E39.E41.E45.E47	I.C. DEC 8242	1908712	26
6	E36.E37.E80.E81.E85.E87	I.C. DEC 74H74	1909067	27
8	E38.E42.E44.E50.E53.E58	I.C. DEC 74174	1910652	28
5	E40.E46.E48.E52.E54	I.C. DEC 3341	2111108	29
5	E56.E70.E83.E92.E95	I.C. DEC 74123	1910436	30
2	E59.E62	I.C. DEC 74H30	1909059	31
1	E63	I.C. DEC 7437	1910001	32
2	E64.E65	I.C. DEC 74107	1910035	33
1	E66	I.C. COMPONENT CARRIER	1211323	34
2	E67.E68	I.C. DEC 74H53	1909062	35
1	E69	I.C. DEC 74S04	1910542	36
3	E71.E79.E98	I.C. DEC 7402	1909004	37
1	E72	I.C. DEC 74S00	1910532	38
1	E73	I.C. DEC 7474	1905547	39
2	E76.E77	I.C. DEC 74H50	1909060	40
1	E78	I.C. DEC 7410	1905576	41
2	E89.E96	I.C DEC 7400	1910155	42
2	E84.E97	I.C. DEC 74H10	1909057	43
1		HANDLE	1210711-2	44
12		EYELET	9000024-01	45
3	W1.W2, W3	JUMPER. INSULATED	9009105	46
3	(SEE E66)	JUMPER WIRE	9107560-01	47
1	E22	I.C. DEC 74191	1910096	48
A/R		WIRE SOLID #30 AWG GRN	9105740-55	49

PARTS LIST

ETCH BOARD REV.

FIRST USED ON OPTION MODEL: RH11-C

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

SEMICONDUCTOR CONVERSION CHART

REV. | CHANGE NO. | REVISIONS | CHK.

IC TYPE	GND	+5V

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

IC PIN LOCATIONS

DRN. | DATE NOV 77

CHKD. | DATE NOV 77

ENG. | DATE

PROJ. ENG. | DATE

PROD. | DATE

NEXT HIGHER ASSY: B-DD-M7294 YA

SCALE: —

SHEET 1 OF 5

digital

TITLE: DATA BUFFER & CONTROL

SIZE: D | CODE: A | NUMBER: M7294-YA-Ø | REV.

DIST.

D A M7294-YA-Ø

22

REWORK INSTRUCTIONS

NOTE:
M7294 MINIMUM MODULE REV J IS REQUIRED TO REWORK TO A 'YA' VERSION. REV J

COMPONENT DELETE SIDE 1 AS SHOWN
0-1. E98 (I.C. DEC 74HCC) (P/N 19-09056)

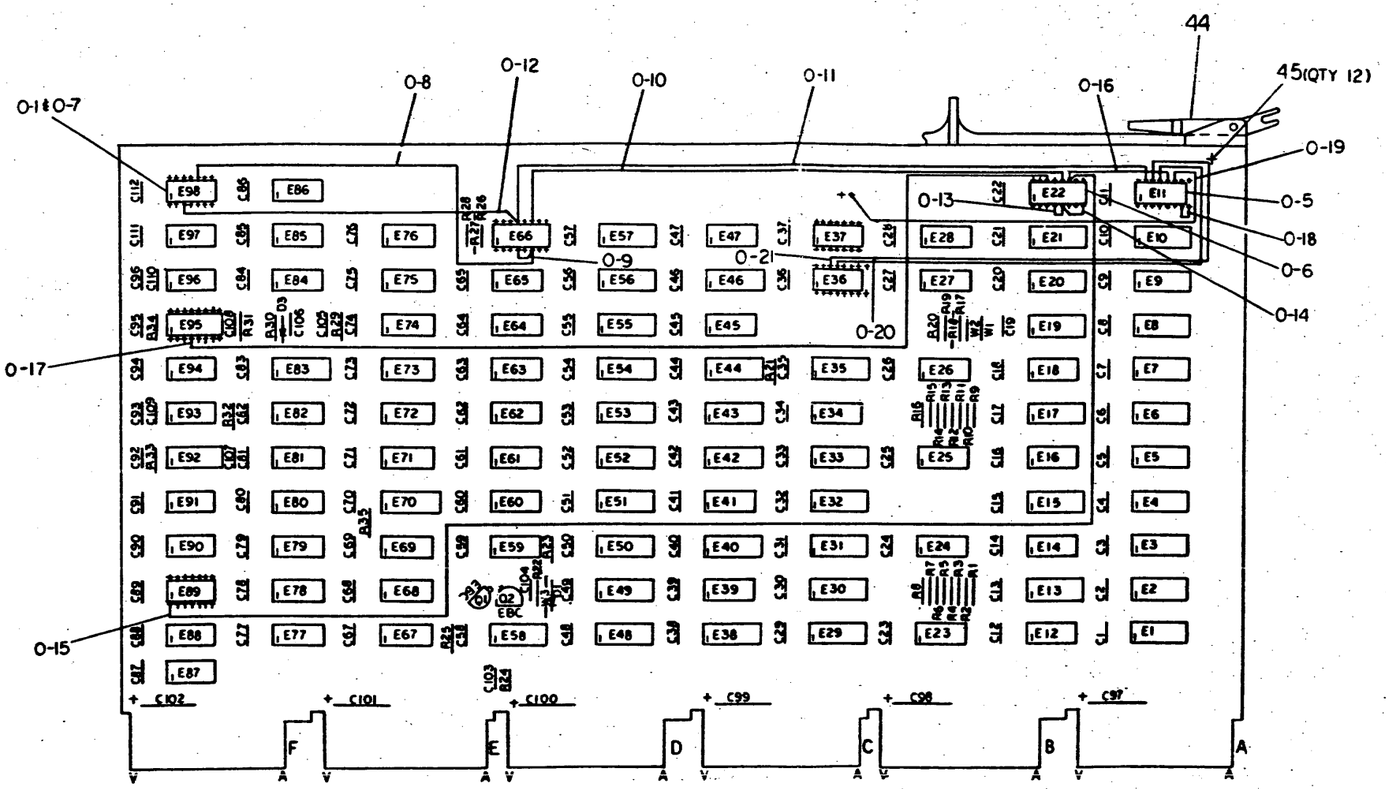
ETCH CUTS SIDE 1 AS SHOWN
0-2. AT E98(3)
0-3. ABOVE E98(10)
0-4. ABOVE E36(9)

COMPONENT ADD SIDE 1 AS SHOWN
0-5. E11 (I.C. DEC 74S74) (P/N 19-10544)
0-6. E22 (I.C. DEC 74191) (P/N 19-10096)
0-7. E98 (I.C. DEC 74H00) (P/N 19-09056)

WIRE ADD SIDE 1 AS SHOWN
0-8. FROM E66 (6) TO E98 (2)
0-9. FROM E66 (6) TO E66 (4)
0-10. FROM E66 (11) TO E22 (12)
0-11. FROM E66 (13) TO E11 (13)
0-12. FROM E66 (13) TO E98 (3)
0-13. FROM E22 (5) TO E22 (4)
0-14. FROM E22 (5) TO E22 (8)
0-15. FROM E22 (11) TO E69 (1)
0-16. FROM E22 (11) TO E11 (10)
0-17. FROM E22 (14) TO E85 (4)
0-18. FROM E11 (7) TO PTH TO THE RIGHT OF E11 (7)
0-19. FROM E11 (9) TO PTH ABOVE E37 (9)
0-20. FROM E11 (11) TO E36 (11)
0-21. FROM E11 (12) TO E36 (12)

REVISIONS		
CHK.	CHANGE NO.	REV.

TITLE
SIZE/CODE: D
NUMBER: M7294-YA-0
REV: D
SCALE
SHEET OF
DIST.



REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA BUFFER & CONTROL	D	UA	M7294-YA-Ø	
SCALE — / SHEET 3 OF 5	DIST.			

CS%ABCDEFHJKLMNPRS • 86 • 76 • 66 57 • • 47 37 • • 28 SIDE 1 • 22 • FLIP CHIP ® •

98 11

0-3

0-2

0-4

A

F E D C B A

V A V A V A V A V A

REVISIONS

CHK	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV.
DATA BUFFER & CONTROL	D	UA	M7294-YA-Ø	
SCALE 2/1 SHEET 4 OF 5	DIST.			

5010427C

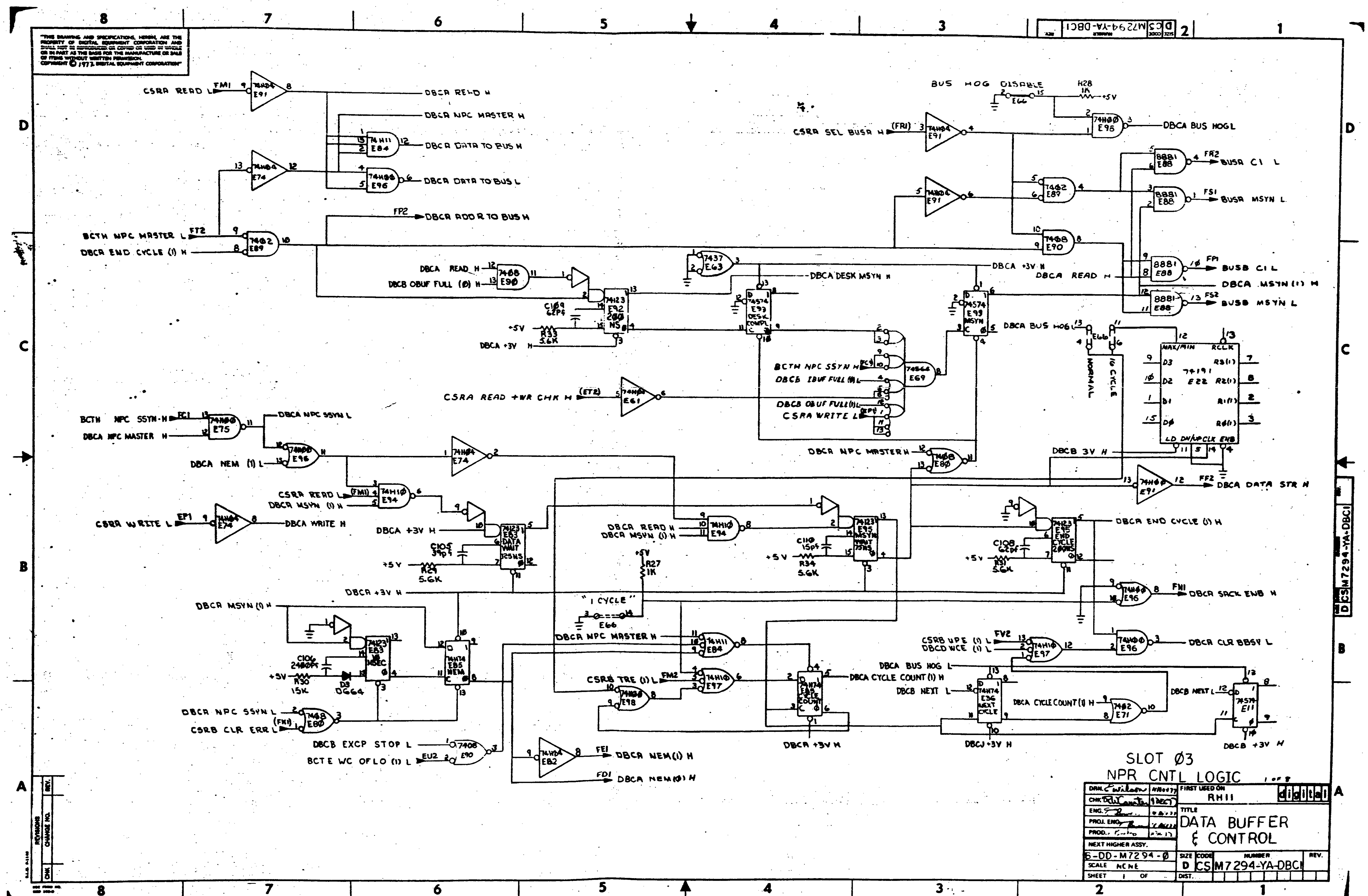
SIDE 2

M7294
DATA BUFFER AND CONTROL

A B C D E F

REVISIONS		
CHG	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV.
DATA BUFFER & CONTROL	D	UA	M7294-YA-Ø	
SCALE 2/1	SHEET 5 OF 5		DIST.	



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CSRA READ L
DBCA READ H
DBCA NPC MASTER H
DBCA DATA TO BUS H
DBCA DATA TO BUS L
DBCA ADDR TO BUS H
BCTH NPC MASTER L
DBCA END CYCLE (1) H
DBCA READ H
DBCB OBUF FULL (Ø) H
DBCA +3V H
CSRA SEL BUSA H
BUS HOG DISABLE
DBCA BUS HOG L
BUSA C1 L
BUSA MSYN L
BUSB C1 L
DBCA MSYN (1) H
BUSB MSYN L
DBCA DESK MSYN H
DBCA BUS HOG L
NORMAL
16 CYCLE
BCTH NPC SSYN H
DBCB IBUF FULL (1) L
DBCB OBUF FULL (1) L
CSRA WRITE L
CSRA READ +WR CHK H
BCTH NPC SSYN H
DBCA NPC MASTER H
DBCA NPC SSYN L
DBCA NEM (1) L
DBCA NPC MASTER H
DBCB 3V H
DBCA DATA STR H
CSRA READ L
DBCA MSYN (1) H
CSRA WRITE L
DBCA WRITE H
DBCA READ H
DBCA MSYN (1) H
DBCA END CYCLE (1) H
DBCA SACK ENB H
DBCA CLR BBSY L
"1 CYCLE"
DBCA MSYN (1) H
DBCA NPC MASTER H
CSRB UPE (1) L
DBCD WCE (1) L
DBCA BUS HOG L
DBCA CYCLE COUNT (1) H
DBCB NEXT L
DBCA CYCLE COUNT (1) H
DBCB NEXT L
CSRB TRE (1) L
DBCA NPC SSYN L
CSRB CLR ERR L
DBCB EXCP STOP L
BCTE WC OFLO (1) L
DBCA NEM (1) H
DBCA NEM (Ø) H
DBCA +3V H
DBCB +3V H
SLOT Ø3
NPR CNTL LOGIC
1 OF 8
FIRST USED ON RH11
TITLE DATA BUFFER & CONTROL
NEXT HIGHER ASSY. 6-DD-M7294-Ø
SCALE NONE
SIZE D CODE CS NUMBER M7294-YA-DBC1
SHEET 1 OF
D CS M7294-YA-DBC1

CSRA RDY H — FL1 — 74H04 E61 — DBCB RDY L
BCTD CLRB H — FM2 — DBCN SEL BUSA L — 74H0 E79
DBCB DRIVE CLK H — CSRB EXCP L — FU2 — C103 56PF — R24 5.6K — +5V — 74123 E58 150 NS — DBCA +3V H
DBCB IBUF FULL (1) H — 7474 E73 DLT IN
BCTB DB OCLK H — DBCB DB OUT H — DBCB OBUF FULL (Ø) H — 74H0 E97
DBCB ORDY H — BCTE LWRD H — ERI — 7402 E71
DBCB OUT CLK L — 7474 E73 DLT OUT
CSRB CLR ERR L — (FK1)
CSRA READ +WR CHK H — ET2 — BCTA REG STR H — FK2 — 74H50 E77
BCTA DB IN L — FL2 — 74H04 E82 — DBCB DB IN H
DBCA MSYN WAIT (1) H — DBCA WRITE H — 74S00 E72
74H04 E34
74S00 E72
74H04 E82
74S00 E72 — FB1 — DBCB DLT H
DBCB CLK IBUF H — EE2
DBCB IBUF FULL (Ø) H
DBCB IBUF FULL (1) H
DBCA +3V H
74H74 E81 BUBBLE IN
74H74 E81 IBUF FULL
7402 E78 — DBCB SHIFT IN H
DBCA CLR BBSY L — DBCB RDY L — 7408 E88 — EV2 — DBCB CLR DREQ L
DBCB IBUF FULL (Ø) H
DBCB OBUF FULL (1) H
74H53 E67 — 74H04 E82 — DBCB DATA REQ H — ES2 — DBCB DATA REQ L
DBCA WRITE H — BCTE WC OFLO (1) L — (EU2) — 74H11 E68
CSRB TRE (1) L — (FM2) — CSRA READ +WR CHK H — (ET2) — 74H11 E68
DBCB SHIFT IN H
BCTD CLR+GO CLR H — EJ2 — 74123 E58 400 NS — C107 220PF — R32 56K — +5V — DBCA +3V H
7437 E63 — DBCB SILO CLR L
DBCD IR5 H
DBCD IR4 H
DBCC IR3 H
DBCC IR2 H
DBCC IR1 H
DBCA +3V H
74H30 E62
DBCB CLR+GO CLR L — 74H00 E96
74H04 E61 — DBCB IRDY H
DBCB INH CLK L — BCTE DRWC OFLO (Ø) H — MBSA SYNC CLK H — FJ2 — FA1 — 74H11 E68 — EU1 — DBCB DRIVE CLK H
DBCA WRITE H — 74Ø8 E9C — FU1 — DBCB WRITE CLK H
DB:D OR5 H
DBCD OR4 H
DBCC OR3 H
DBCC OR2 H
DBCC OR1 H
DBCA +3V H
74H30 E59
TEST INPUT L — EH1 — R23 1K — +5V
74H04 E61 — EF2 — DBCB ORDY H
DBCA DESK MSYN H — DBCA WRITE H — CSRA READ + WR CHK H — (ET2) — 74H50 E77 — FH1 — DBCB INC WC L
74H50 E76 — DBCB NEXT L
DBCB SET OFULL L
FJ1 — DBCB OBUF FULL (1) H
DBCB SHIFT OUT H
BCTA DB OUT L — CM2 — 74H04 E76 — DBCB DB OUT H
BCTB DB OCLK H — FD2 — 74H00 E75
DBCB DRIVE CLK H
DBCA WRITE H — 74H00 E75 — DBCB OUT CLK L
DBCA DATA STR H — CSRA READ+WR CHK H — (ET2) — 74H50 E76
DBCD WCE (1) H
74H11 E84
DBCB SILO CLR L
74H74 E68 OBUF FULL
74H74 E87 SHIFT OUT
7402 E78
BCTE WC OFLO (1) L — (EU2) — 74H04 E82
DBCD EXCP SAVE (1) H
DBCA WRITE H — 74H53 E86 — FB2 — DBCB EXCP ERR L
74H04 E25
DBCD EXCP STOP L
DBCB +3V H
7402 E89
DBCB SET OFULL L — 74H00 E75
DBCB SHIFT OUT H — R25 5.6K — +5V — 74123 E58 45 NS
+5V — 5.6K R35 — 74123 E79 45 NS — 74H02 E82 — DBCB CLK OBUF H
DBCA +3V H
DBCB SILO CLR L
CSRB TRE (1) L — (FM2) — DBCA +3V H — EH2 — DBCB ERROR (1) H
MBSA SYNC CLK H — FA1 — 74H04 E91 — DBCB ERROR (Ø) H
DBCB SILO CLR L
DBCA WRITE H — BCTE DRWC OFLO (Ø) H — (FJ2) — 7410 E79 — 7437 E63 — EJ1 — DBCB GATE SYNCD H

REVISIONS		
CHK	CHANGE NO	REV

SLOT Ø3
SILO TIMING CNTL
2 OF 8

TITLE DATA BUFFER & CONTROL
SIZE D CODE DCS NUMBER M7294-YA-DBC2 REV
SCALE NONE SHEET 1 OF 1 DIGT

DCS M7294-YA-DBC2

28

DBCE UNIB DI1 H
DBCF DI1 IN H
DBCE UNIB DI0 H
DBCF DI0 IN H
DBCE UNIB D09 H
DBCF D09 IN H
DBCE UNIB D08 H
DBCF D08 IN H
74157 E6 DMX (11:08)
DBCC DMX11 H
DBCC DMX10 H
DBCC DMX09 H
DBCC DMX08 H
MBSE SYNC DI1 H
MBSB SYNC DI0 H
MBSE SYNC D09 H
MBSE SYNC D08 H
74157 E43 IMX (11:23)

DBCE UNIB D07 H
DBCF D07 IN H
DBCE UNIB D06 H
DBCF D06 IN H
DBCE UNIB D05 H
DBCF D05 IN H
DBCE UNIB D04 H
DBCF D04 IN H
74157 E4 DMX (07:00)
DBCC DMX07 H
DBCC DMX06 H
DBCC DMX05 H
DBCC DMX04 H
MBSB SYNC D07 H
MBSE SYNC D06 H
MBSA SYNC D05 H
MBSA SYNC D04 H
74157 E51 IMX (07:04)

DBCE UNIB D03 H
DBCF D03 IN H
DBCE UNIB D02 H
DBCF D02 IN H
DBCE UNIB D01 H
DBCF D01 IN H
DBCE UNIB D00 H
DBCF D00 IN H
74157 E2 DMX (03:00)
DBCC DMX03 H
DBCC DMX02 H
DBCC DMX01 H
DBCC DMX00 H
MBSA SYNC D03 H
MBSA SYNC D02 H
MBSA SYNC D01 H
MBSA SYNC D00 H
74157 E99 IMX (03:00)

CSRA SEL BUSA H
BCTN MPC MASTER L
74S02 E89
DBCC DMX S0 L
CSRA READ+WR CHK H (ET2)

74157 QUAD MULTIPLEXER

S0	OUTPUT
L	A→F
H	B→F

74174 E53 TBUF (11:06)
74174 E50 IBUF (05:00)
DBCJ +3V H
DBCB CLK IBUF H
DBCB SHIFT IN H
DBCB SHIFT OUT H
DBCB SILO CLR L

DBCC IR3 H
DBCC OR3 H
DBCC IR2 H
DBCC OR2 H
DBCC IR1 H
DBCC OR1 H
VGG IR OR
3341 E52 SILO (11:08)
3341 E40 SILO (07:04)
3341 E48 SILO (03:00)

74174 E42 OBUF (11:06)
74174 E38 OBUF (05:00)
DBCC OBUF 11 H
DBCC OBUF 10 H
DBCC OBUF 09 H
DBCC OBUF 08 H
DBCC OBUF 07 H
DBCC OBUF 06 H
DBCC OBUF 05 H
DBCC OBUF 04 H
DBCC OBUF 03 H
DBCC OBUF 02 H
DBCC OBUF 01 H
DBCC OBUF 00 H
DBCB CLK OBUF H

REVISIONS		
CHK	CHANGE NO	REV

SLOT 03
SILO DATA PATH <11:00>
3 OF 8

TITLE	SIZE	CODE	NUMBER	REV.
DATA BUFFER & CONTROL	D	CS	M7294-YA-DBC3	
SCALE NONE	SHEET	OF	DIST.	

DBCC OBUF04 H
DBCC DMX04 H
DBCC OBUF03 H
DBCC DMX03 H
DBCC OBUF02 H
DBCC DMX02 H
DBCC OBUF01 H
DBCC DMX01 H
DBCC OBUF00 H
DBCC DMX00 H
8242 E41
8242 E39

DBCC OBUF09 H
DBCC DMX09 H
DBCC OBUF08 H
DBCC DMX08 H
DBCC OBUF07 H
DBCC DMX07 H
DBCC OBUF06 H
DBCC DMX06 H
DBCC OBUF05 H
DBCC DMX05 H
8242 E34
8242 E41

DBCD OBUF14 H
DBCD DMX14 H
DBCD OBUF13 H
DBCD DMX13 H
DBCD OBUF12 H
DBCD DMX12 H
DBCC OBUF11 H
DBCC DMX11 H
DBCC OBUF10 H
DBCC DMX10 H
8242 E43
8242 E45
8242 E34

DBCD OBUF17 H
DBCD DMX17 H
DBCD OBUF16 H
DBCD DMX16 H
DBCD OBUF15 H
DBCD DMX15 H
8242 E47
8242 E45

R18 750Ω +5V
R19 750Ω +5V
DBCJ +3V H
74H04 E27
74H74 WCE E56
EM1 DBCD WCE (1) H
EM2 DBCD WCE (0) H
CSRA WR CHK H EK2
DBCA MCYN WAIT(1) H
74H11 E28
CSRB CLR ERR L FK1

74157 E40
DMX (17:16)
DBCE UNIB D17 H
DBCF D17 IN H
DBCE UNIB D16 H
DBCF D16 IN H
DBCH EN PAR H
DBCC DMX S0 L
DBCD DMX17 H
DBCD DMX16 H
S0 STB

74157 E57
IMX (17:16) (PA)
MBSC SYNC PA H EM2
MBSC SYNC D17 H EL1
MBSC SYNC D16 H EP2
S0 STB

DBCJ +3V H
74H74 E37 IBUF PA
DBCD EXCP SAVE (1) H
DBCD IRS H
DBCD ORS H
VGG IR OR 3341 E46
SILO (17:16) PA
SI SO MR
74H04 E24
DBCD EXCP STOP L
74H74 E37 OBUF PA
DP1 DBCD OBUF PA H
DBCJ +3V H

74157 E56
MBSC SYNC D15 H EE2
MBSC SYNC D14 H DR1
MBSC SYNC D13 H DI2
MBSC SYNC D12 H EF1
CSRA READ + WR CHK H (ET2)
DBCD DMX15 H
DBCD DMX14 H
DBCD DMX13 H
DBCD DMX12 H
DBCE UNIB D15 H
DBCF D15 IN H
DBCE UNIB D14 H
DBCF D14 IN H
DBCE UNIB D13 H
DBCF D13 IN H
DBCE UNIB D12 H
DBCF D12 IN H
DBCC DMX S0 L
S0 STB

74179 E56
IBUF (17:12)
CLK CLR
DBCJ +3V H
DBCB CLK IBUF H
DBCD IR1 H
DBCD OR1 H
VGG IR OR 3341 E59
SILO (15:12)
SI S0 MR
R21 1K +5V
DBCB SHIFT IN H
DBCB SHIFT OUT H
DBCB SILO CLR L

74174 E44
OBUF (17:12)
CLK CLR
DBCD OBUF 17 H
DBCD OBUF 16 H
DBCD OBUF 15 H
DBCD OBUF 14 H
DBCD OBUF 13 H
DBCD OBUF 12 H
DBCJ +3V H
DBCB CLK OBUF H

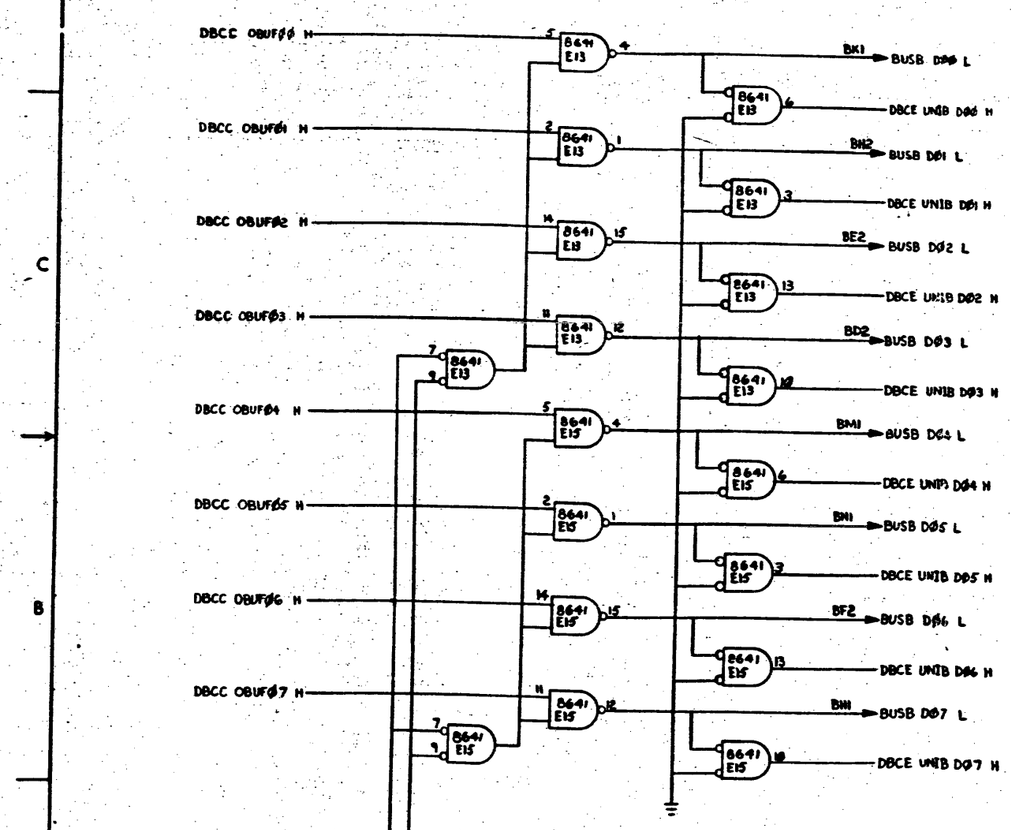
DBCB +3V H
74H74 E87
DBCD EXCP SAVE (1) H
CSRB EXCP L (FU2)
DBCB SILO CLR L

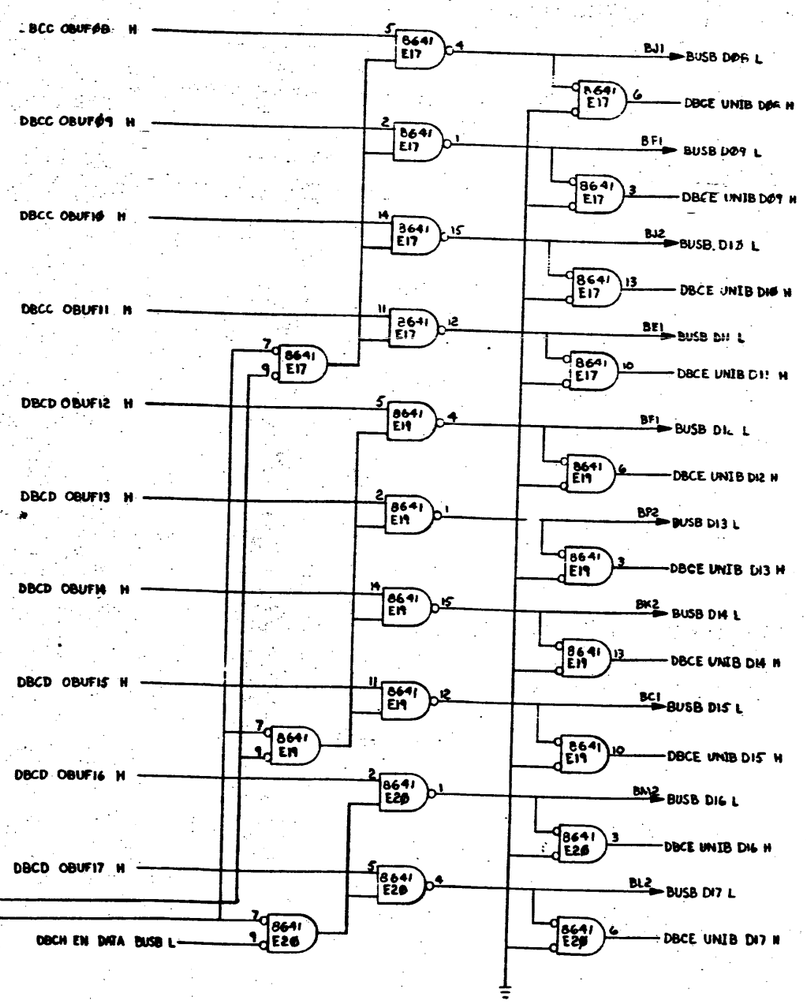
SLOT 03
SILO DATA PATH <17:12> & WRITE CHECK 4 of 8

REVISIONS		
CHK	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV.
DATA BUFFER & CONTROL	D	CS	M7294-YA-DBC4	
SCALE NONE	SHEET 1 OF 1		DIST.	

30





REVISIONS		
CHK	CHANGE NO	REV

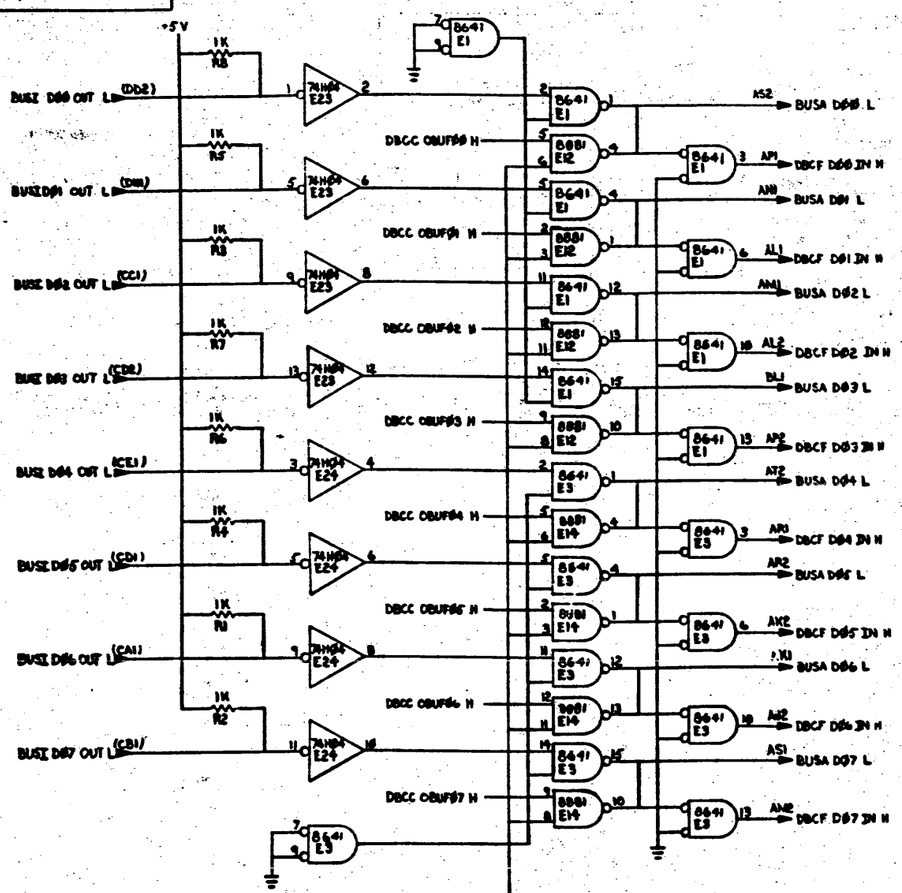
SLOT Ø3
UNIBUS B DATA TRANSCEIVERS

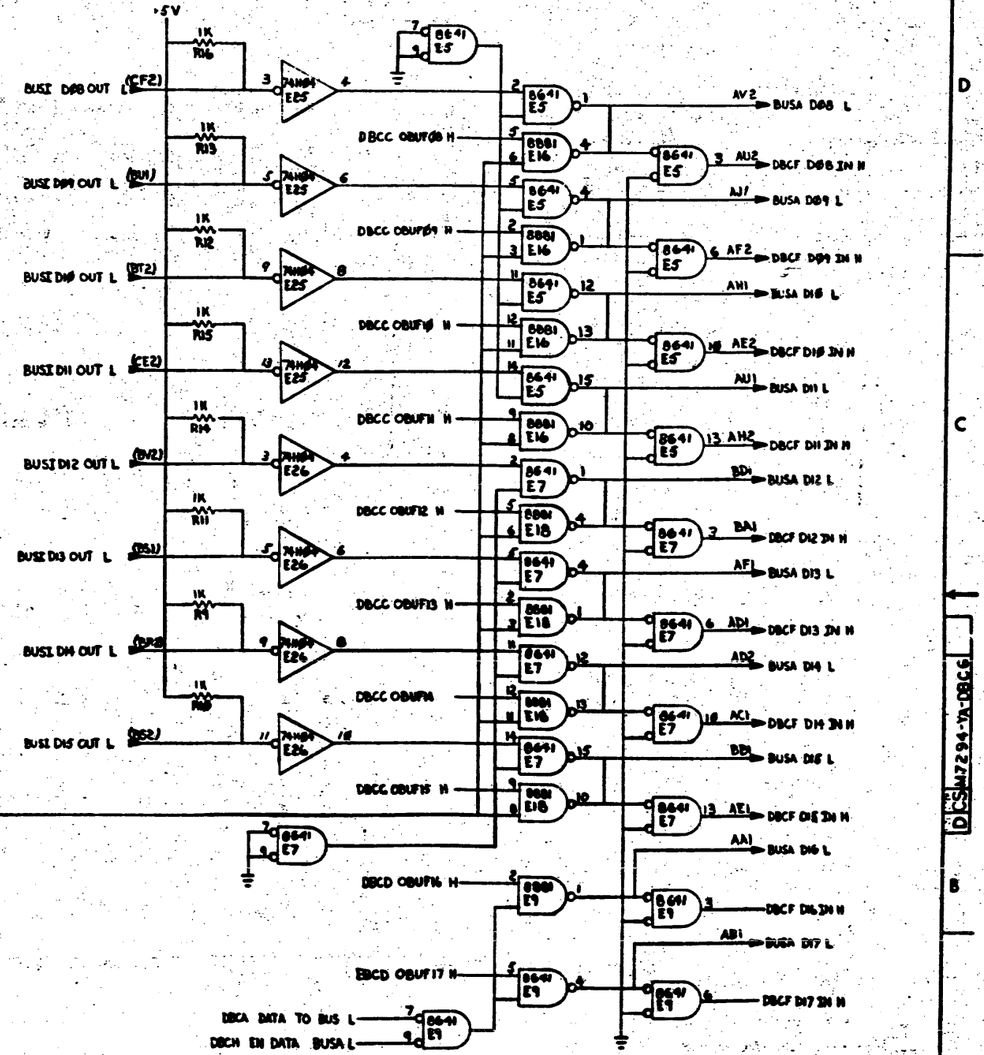
TITLE DATA BUFFER & CONTROL
SCALE NONE
SHEET 1 OF 1
SIZE D CODE DCS NUMBER M7294-YA-DBC5 REV.
DIST

5 of 8

DCS M7294-YA-DBC5

31





REVISIONS		
CHG	CHANGE NO.	REV.

SLOT 03
UNIBUS A DATA TRANSCEIVERS

TITLE	SIZE/CODE	NUMBER	REV.
DATA BUFFER & CONTROL	D	CS M7294-YA-DBC6	
SCALE NONE	SHEET 1 OF 1	DIST.	

6 of 8

DCS M7294-YA-DBC6

32

DBCF DI7 IN H
DBCE UNIB DI7 H
DBCF DI6 IN H
DBCE UNIB DI6 H
74157 E21
(PB) F1
(PA) F0
S0 STR
(FRI)
CSRA SEL BUSA H
DBCH EN PAR H
74H04 E26
DBCA DATA STR H
74H08 E79
FF1
DBCH SET UPE L
BCTA CNTL OUT L (CM1)
BCTA DB OUT L (CM2)

DBCD OBUF15 H
MBSC C15 IN H
DBCD OBUF14 H
MBSC C14 IN H
DBCD OBUF13 H
MBSC C13 IN H
DBCD OBUF12 H
MBSC C12 IN H
CK1
DC1
CS1
CT2
8234 E35
S1 S0
/2 BS2 → BUSI DØ5 OUT L
/3 BR2 → BUSI DØ4 OUT L
3 BS1 → BUSI DØ3 OUT L
4 BV2 → BUSI DØ2 OUT L

DBCC OBUF07 H
MBSB C07 IN H
DBCC OBUF06 H
MBSB C06 IN H
DBCC OBUF05 H
MBSA C05 IN H
DBCC OBUF04 H
MBSA C04 IN H
CJ2
CR1
DD1
DA1
8234 E31
S1 S0
/2 CB1 → BUSI DØ7 OUT L
/3 CA1 → BUSI DØ6 OUT L
3 CD1 → BUSI DØ5 OUT L
4 CE1 → BUSI DØ4 OUT L

DBCC OBUFØ H
MBSB C11 IN H
DBCC OBUFØ H
MBSB C10 IN H
DBCC OBUF09 H
MBSB C09 IN H
DBCC OBUF08 H
MBSB C08 IN H
CK2
DB1
CS2
CJ1
8234 E33
S1 S0
/2 CE2 → BUSI DI1 OUT L
/3 BT2 → BUSI DI0 OUT L
3 BU1 → BUSI DI9 OUT L
4 CF2 → BUSI DI8 OUT L

DBCC OBUF03 H
MBSA C03 IN H
DBCC OBUF02 H
MBSA C02 IN H
DBCC OBUF01 H
MBSA C01 IN H
DBCC OBUF00 H
MBSA C00 IN H
DE1
CP2
DF2
DJ2
8234 E29
S1 S0
/2 CD2 → BUSI DØ3 OUT L
/3 CC1 → BUSI DØ2 OUT L
3 DN1 → BUSI DØ1 OUT L
4 DD2 → BUSI DØØ OUT L

BCTA CNTL OUT L (CM1)
BCTA DB OUT L (CM2)

CSRA SEL BUSA H
FRI
74H04 E26
DBCH SEL BUSA L
+5V
1K R27
W2 16 BIT BUSB B
74H08 E27
DBCH EN DATA BUSB L
+5V
1K R28
W1 16 BIT BUSA A
74H08 E27
74H11 E28
DBCH EN PAR H
DBCH EN DATA BUSA L

8234 OPEN COLLECTOR MULTIPLEXOR

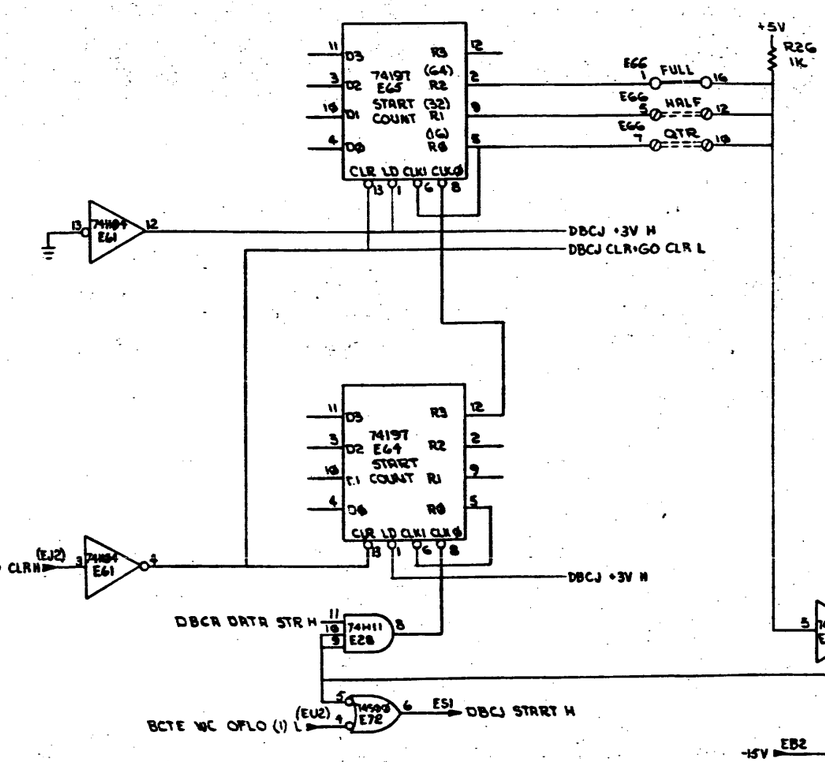
S0	S1	OUTPUT
L	L	B → F (NOT USED)
H	L	A → F
L	H	B → F
H	H	OFF

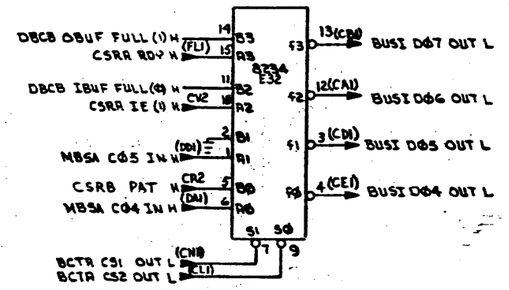
REVISIONS		
CHK	CHANGE NO.	REV

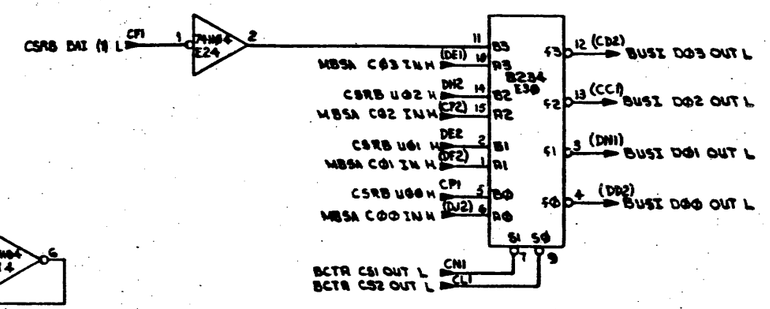
SLOT 03
UNIBUS PARITY CNTL & DATA OUT MPYS
7 OF 8

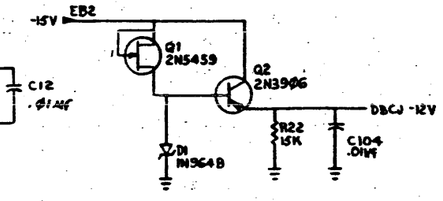
TITLE	SIZE	CODE	NUMBER	REV
DATA BUFFER & CONTROL	D	CS	M7294-YA DBC7	
SCALE NONE	SHEET 1 OF 1		DIST.	

DCSM7294-YA DBC7







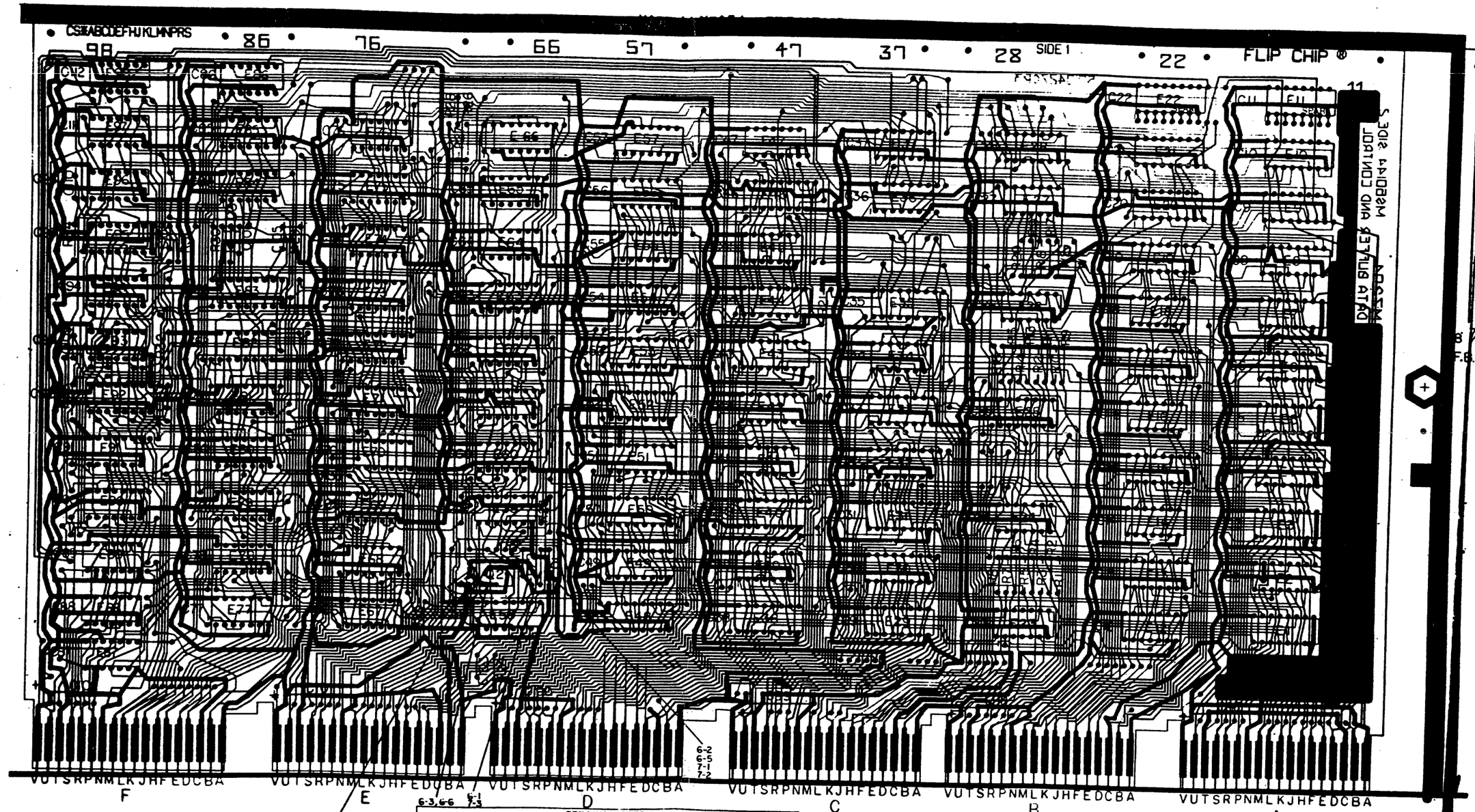


SLOT 03
START CNTL & DATA OUT MPXS

REVISIONS		
CHK	CHANGE NO.	REV

TITLE	SIZE	CODE	NUMBER	REV.
DATA BUFFER & CONTROL	D	CS	M7294-YA DBC8	
SCALE NONE	SHEET	OF	DIST.	

DCS M7294-YA-DBC8



NOTES:

ADD R36 AS SHOWN.

ECO #6 COMPONENT DELETES SIDE 1:

- 6-1 D2 (P/N 1100114)
- 6-2 D1 (P/N 1110836)
- 6-3 Q2 (P/N 1501913)
- 6-4 R36 (P/N 1302957)

COMPONENT ADDS SIDE 1:

- 6-5 D1 (P/N 1109388)
- 6-6 Q2 (P/N 1509525)
- 6-7 Q1 (P/N 1509374)

(CONT. SHEET 2)

DRILLING DATA

HOLE LETTER	DRILL SIZES FOR PTH BOARDS	BEFORE PLATE	AFTER PLATE	FOR NON-PTH BOARDS	CAN TAKE GRIPLETS YES	CAN TAKE GRIPLETS NO	QTY OF HOLES
NONE	6K.039±.004)	✓					

BOARD FABRICATION INFORMATION

BOARD SIZE 8.562 X 17.000
PLRE-MD-7606032-0-0
BOARD MATERIAL HEX .052 THK
1.0Z COPPER 2 SIDES

EYELET ☐ PLATED THRU ☒
2 SIDED ☒ MULTI-LAYER ☐
NOTCH BEFORE GOLD PLATING ☐
NOTCH AFTER GOLD PLATING ☒

DRWN	J.N.CHARTIER	DATE	7-9-73
CHK'D	[illegible]	DATE	11-17-73
ENGR	[illegible]	DATE	1-6-74
PROJ	[illegible]	DATE	[illegible]
PROD		DATE	

digital EQUIPMENT CORPORATION

TITLE: DATA BUFFER AND CONTROL

FIRST USED ON: RHII

SCALE: 2/1

ETCH REV:

SIZE/CODE: D AH | NUMBER: M7294-0-5 | REV: J

MS 60144

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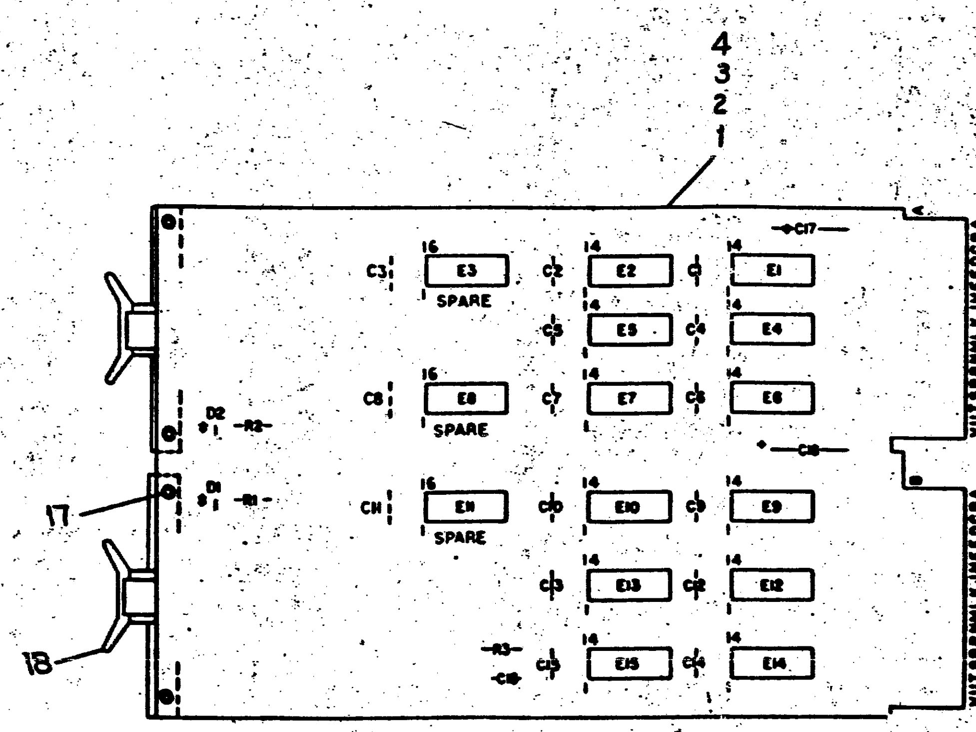
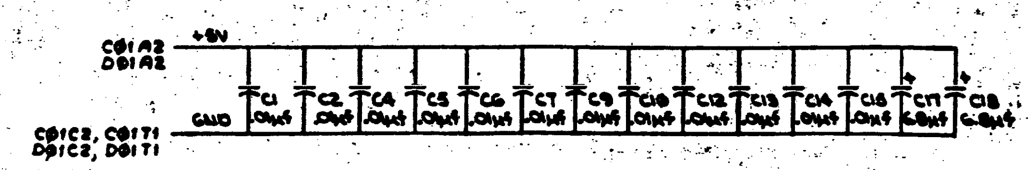
NOTES:

1. PIN NOTATION THROUGHOUT IS ORDERED UPON MODULE PLACEMENT IN THE RH11. MODULE PIN REFERENCE ALONE IS OBTAINED BY DELETING THE NUMBER (SLOT LOCATION) AFTER THE FIRST LETTER AND CONVERTING THE FIRST LETTER ACCORDING TO THE PIN NOMENCLATURE CHART AT RIGHT.
2. C3, C8, C11, E3, E8 & E11 ARE SPARE COMPONENT SLOTS.



PIN NOMENCLATURE

MODULE	RH11
A	C
B	D



QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
REF		X-Y COORDINATE HOLE LOCATION	K-CD-M7297-0-4	1
REF		ASSY/DRILLING HOLE LAYOUT	D-AM-M7297-0-5	2
REF		MODULE ECO HISTORY	B-MI-M7297-0-6	3
1		ETCHED CIRCUIT BOARD	5010504	4
12	C1,C2,C4,C5,C6,C7,C9,C10, C12,C13,C14,C15	CAP .01μf, 20%, 50V DISC	1001610-00	5
1	C16	CAP. 27pf, 5%, 100V MICA	1001739	6
2	C17,C18	CAP 6.8μf, 10%, 35V S.TANT	1005306	7
2	D1,D2	DIODE LED	1110864	8
1	R3	RES. 1K, 5%, 1/4W	1300365	9
2	R1,R2	RES. 330, 5%, 1/4W	1300309	10
1	E7	IC DEC 74H00	1909056	11
1	E5	IC DEC 74H10	1909057	12
1	E10	IC DEC 74H74	1909667	13
1	E15	IC DEC 8881	1909705	14
1	E13	IC DEC 74H04	1909931	15
7	E1,E2,E4,E6,E9,E12,E14	IC DEC 74180	1910724	16
4		EYELET	9006732	17
2		HANDLE, FLIP-CHIP (MAGENTA)	9008537-6	18

PARTS LIST

IC TYPE	GND	+5V

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

IC PIN LOCATIONS

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

SEMICONDUCTOR CONVERSION CHART

REVISIONS: A — M7297-00001 — S. JENKINS — 9/5/73

FIRST USED ON OPTION MODEL: RH11

ETCH BOARD REV: B

DIGITAL EQUIPMENT CORPORATION

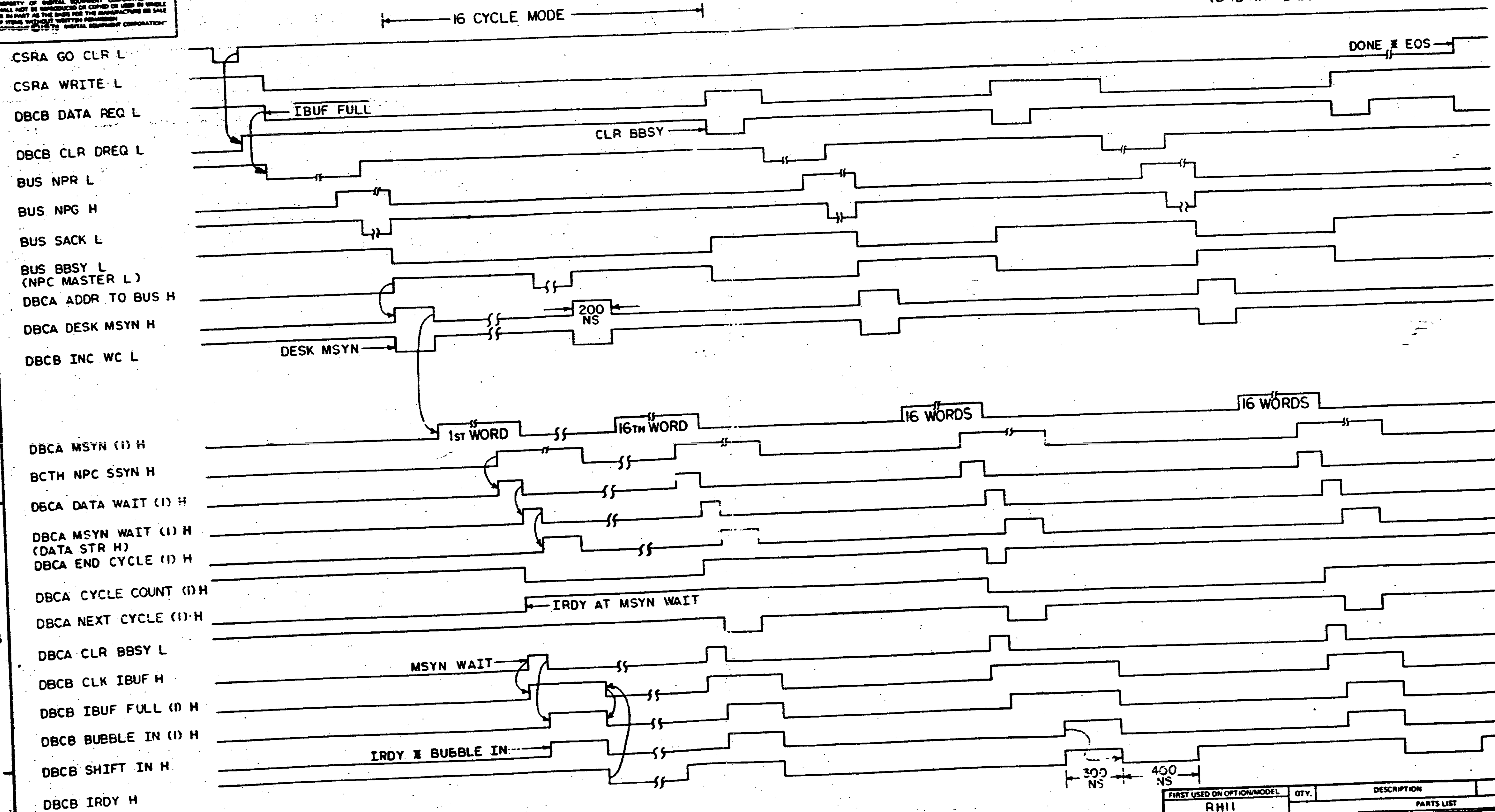
TITLE: PARITY CONTROL (PAC)

SIZE: D | CODE: CS | NUMBER: M7297-0-1 | REV: A

SCALE: NONE | SHEET 1 OF 2

WRITE COMMAND UNIBUS TIMING DIAGRAM (DATI)

NOTES:
MODIFICATION OF WRITE COMMAND TIMING DIAGRAM (D-TD-RH11-Ø-Ø5) FOR 16 CYCLE MODE OPERATION.



FIRST USED ON OPTION/MODEL: RH11

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES

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

REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY

MATERIAL —

FINISH —

NEXT HIGHER ASSY: B-DD-RH11-C

SCALE NONE

digital EQUIPMENT CORPORATION

TITLE: WRITE UNIBUS (TIMING DIAGRAM)

SIZE D CODE TD NUMBER RH11-C-05

D TD RH11-C-05