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D-CS-M8221-Ø-1	C.D.M.
E-UA-M8222-Ø-Ø	T.B.M.
B-PL-M8222-Ø-Ø	T.B.M.
D-CS-M8222-Ø-1	T.B.M.
E-UA-M8223-Ø-Ø	I.D.P.
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D-CS-M8224-Ø-1	I.R.C.
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E-UA-M8226-Ø-Ø	D.E.P.
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D-CS-M8226-Ø-1	D.E.P.
E-UA-M8227-Ø-Ø	D.D.P.

UNIT VARIATIONS COVERED BY THIS PRINT SET
KA78Ø-AA
KA78Ø-AB

KA78Ø

Field Maintenance Print Set

Digital Equipment Corporation

PRINT SET ORDER NO.
MP00496

REVISIONS		
REV.	A	
CHG. NO.	KA780-TW3	
DATE	22Nov77	

USED ON OPTION/MODEL	
11780	

SHEET I OF 2

DRN. BOUDREAU	DATE SEPT 77	
CHK'D HEALY	DATE NOV 77	
PROJ. ENG. E. Arton	DATE 15 NOV 77	
FIELD SERV. Wm Freeman	DATE 15 Nov 77	

digital

TITLE: CPU ASSY KA780

SIZE	CODE	NUMBER	REV.
B	TC	KA780-Ø-1	A

DIST.

TW

EN-0112-4-16-N675-(327)

DRB 124

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B-PL-M8227-Ø-Ø	D.D.P.
D-CS-M8227-Ø-1	D.D.P.
E-UA-M8228-Ø-Ø	D.C.P.
B-PL-M8228-Ø-Ø	D.C.P.
D-CS-M8228-Ø-1	D.C.P.
E-UA-M8229-Ø-Ø	D.A.P.
B-PL-M8229-Ø-Ø	D.A.P.
D-CS-M8229-Ø-1	D.A.P.
E-UA-M823Ø-Ø-Ø	C.E.H.
B-PL-M823Ø-Ø-Ø	C.E.H.
D-CS-M823Ø-Ø-1	C.E.H.
E-UA-M8231-Ø-Ø	I.C.L.
B-PL-M8231-Ø-Ø	I.C.L.
D-CS-M8231-Ø-1	I.C.L.
E-UA-M8232-Ø-Ø	C.L.K.
B-PL-M8232-Ø-Ø	C.L.K.
D-CS-M8232-Ø-1	C.L.K.
E-UA-M8233-Ø-Ø	W.C.S.
B-PL-M8233-Ø-Ø	W.C.S.
D-CS-M8233-Ø-1	W.C.S.
E-UA-M8234-Ø-Ø	P.C.S.
B-PL-M8234-Ø-Ø	P.C.S.
D-CS-M8234-Ø-1	P.C.S.
E-UA-M8235-Ø-Ø	U.S.C.
B-PL-M8235-Ø-Ø	U.S.C.
D-CS-M8235-Ø-1	U.S.C.
E-UA-M8236-Ø-Ø	C.I.B.
B-PL-M8236-Ø-Ø	C.I.B.
D-CS-M8236-Ø-1	C.I.B.
E-UA-M8237-0-0	T.R.S.
B-PL-M8237-0-0	T.R.S.
D-CS-M8237-0-1	T.R.S.

TITLE		SIZE	CODE	NUMBER	REV
CPU ASSY (KA78Ø)	SHEET 2 OF 2	B	TC	KA78Ø-Ø-1	A

SIZE B | CODE TC | NUMBER KA78Ø-Ø-1 | REV A

2

DRB 107

TW

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DRAWING DIRECTORY

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UNIT VARIATIONS

VAR	TITLE
KA78Ø-AA	C.P.U. ASSY (KA78Ø) 115V AC
KA78Ø-AB	C.P.U. ASSY (KA78Ø) 23ØV AC

REVISIONS

REV.	CHANGE NO.	CHK
A	KA78Ø-0000	
B	KA78Ø-TW-3	

USED ON OPTION/MODEL

11780

SHEET 1 OF 4

DRN. BOUDREAU	DATE OCT 77	
CHK'D. HEALY	DATE NOV 77	
PROJ. ENG. E. Aston	DATE 15 NOV 77	
PROD. Grant Lee	DATE 11/17/77	

TITLE

digital

C.P.U. ASSY (KA78Ø)

SIZE	CODE	NUMBER	REV
B	DD	KA78Ø-Ø	B

DIST.

DRB 106A

TW

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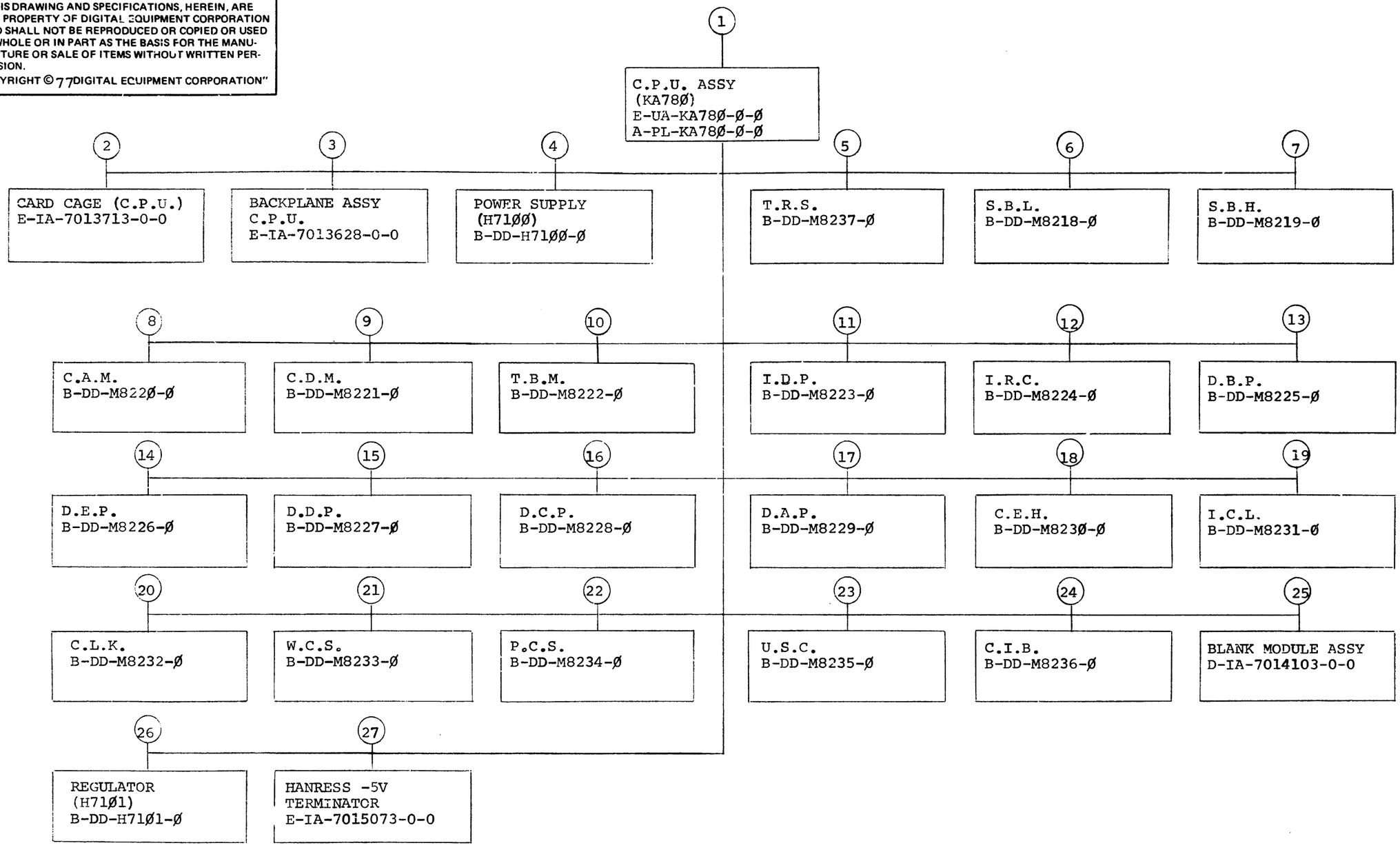

TITLE		SIZE	CODE	NUMBER	REV
C.P.U. ASSY (KA78Ø)	SHEET 2 OF 4	B	DD	KA78Ø-Ø	B

FIND NO.	DRAWING NO.	DESCRIPTION	TYPE
1	MPØØ496	CPU ASSY (KA78Ø) (MP)	-
	B-TC-KA78Ø-Ø-1	CPU ASSY (KA78Ø) (TC)	-
	E-UA-KA78Ø-Ø-Ø	CPU ASSY (KA78Ø)	E/M
	A-PL-KA78Ø-Ø-Ø	CPU ASSY (KA78Ø) (PL)	E/M
	B-MD-7418902-0-0	PLATE, STUD	M
	B-MD-7418903-0-0	"U" BAR	M
	C-MD-7418904-0-0	PLATE, SUPPORT	M
	B-MD-7419483-0-0	COVER, BUS BAR	M
	D-IC-11780-0-1	11780 SYSTEM POWER DIAGRAM	E/M
	D-IC-11780-0-2	11780 SYSTEM INTERCONNECT DIAGRAM	E/M
	D-IC-11780-0-3	11780 SUB SYSTEM INTERCONNECT	E/M
	D-MU-KA78Ø-Ø-2	KA78Ø MODULE UTILIZATION (CPU)	E
	D-BD-KA78Ø-Ø-3	CPU SYSTEM BLOCK DIAGRAM	E
	D-FD-KA78Ø-Ø-4	VAX AND CM MODE ENTRY POINTS	E
	D-IA-7014530-0-0	CABLE, POWER (RED)	E/M
	D-IA-7014249-0-0	CABLE, POWER (BLACK)	E/M
	D-IA-7014212-0-0	CABLE, AC, DC LO	E/M
	E-IA-7015073-0-0	HARNESS, -5V TERMINATOR	E/M
	C-MD-7419458-0-0	COVER, C.P.U. BACKPLANE	M
	E-AD-7014956-0-0	SUPPLY, UBA OPTION	E/M
2	E-IA-7013713-0-0	CARD CAGE (CPU)	M
	C-MD-7417930-0-0	MOUNTING BAR VERTICAL	M
	C-MD-7417971-0-0	BRACKET BOTTOM REAR	M
	B-MD-7417968-0-0	BRACKET CARD GUIDE	M
	C-MD-7417972-0-0	BRACKET BOTTOM CARD GUIDE	M
	C-MD-7417969-0-0	BRACKET TOP CARD GUIDE	M
	C-MD-7417942-0-0	HANDLE, CARD CAGE	M
	C-MD-7417970-0-0	BRACKET, TOP REAR	M
	C-MD-7418194-0-0	STIFFENER	M
	C-MD-7418181-0-0	STIFFENER, CORNEI CARD CAGE	M
3	E-IA-7013628-0-0	BACKPLANE ASSY (CPU)	E/M
	E-MD-5012869-0-0	BOARD DRILL AND ETCH (CPU A,B,C)	E/M
	E-MD-5012871-0-0	BOARD DRILL AND ETCH (CPU D,E,F)	E/M
	D-PS-1214348-0-0	BUS BAR	M
	D-MD-7417868-0-0	BAR, MOUNTING CPU	M
	D-MD-7409259-0-0	SUPPORT LOGIC FRAME SIDE	M
4	B-DD-H71ØØ-Ø	POWER SUPPLY (H71ØØ)	E/M
5	B-DD-M8237-Ø	T.R.S.	E/M
6	B-DD-M8218-Ø	S.B.L.	E/M
7	B-DD-M8219-Ø	S.B.H.	E/M
8	B-DD-M822Ø-Ø	C.A.M.	E/M
9	B-DD-M8221-Ø	C.D.M.	E/M
10	B-DD-M8222-Ø	T.B.M.	E/M
11	B-DD-M8223-Ø	I.D.P.	E/M
	C-MD-7411399-0-0	SPACER BACK PANEL	M
	A-DC-7411881-0-0	DECAL A.W.T. REV. STATUS	M
	K-WL-7013628-0-1	WIRE LIST CPU	E
	A-WT-7013628-0	A.W.T. REV STATUS	E

TYPE: E ELECTRICAL
M MECHANICAL
E/M ELECTRO/MECHANICAL

digital

TITLE: C.P.U ASSY (KA78Ø)

SHEET 3 OF 4 | SIZE B | CODE DD | NUMBER KA78Ø-Ø | REV B

DRB 108A

FIND NO.	DRAWING NO.	DESCRIPTION	TYPE
12	B-DD-M8224-Ø	I.R.C.	E/M
13	B-DD-M8225-Ø	D.B.P.	E/M
14	B-DD-M8226-Ø	D.E.P.	E/M
15	B-DD-M8227-Ø	D.D.P.	E/M
16	B-DD-M8228-Ø	D.C.P.	E/M
17	B-DD-M8229-Ø	D.A.P.	E/M
18	B-DD-M823Ø-Ø	C.E.H.	E/M
19	B-DD-M8231-Ø	I.C.L.	E/M
20	B-DD-M8232-Ø	C.L.K.	E/M
21	B-DD-M8233-Ø	W.C.S.	E/M
22	B-DD-M8234-Ø	P.C.S.	E/M
23	B-DD-M8235-Ø	U.S.C.	E/M
24	B-DD-M8236-Ø	C.I.B.	E/M
25	D-IA-7014103-0-0	BLANK MODULE ASSY	M
	E-MD-7418172-0-0	BLANK MODULE	M
26	B-DD-H71Ø1-Ø	H71Ø1 REGULATOR	E/M
27	E-IA-7015073-0-0	HARNESS -5V TERMINATOR	E/M
	A-DC-7409872-0-0	POWER HARNESS DECAL	M

TYPE: E ELECTRICAL
M MECHANICAL
E/M ELECTRO/MECHANICAL

digital

TITLE	SHEET	SIZE	CODE	NUMBER	REV
C.P.U. ASSY (KA78Ø)	4 OF 4	B	DD	KA78Ø-Ø	B

DRB 108A

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NOTES: (PERTAINS TO SHEET 1 ONLY)
1. CARD GUIDES TO BE INSTALLED AS FOLLOWS
   ITEM 34 IN ODD ROWS 1,3,5 ETC.
   ITEM 35 IN EVEN ROWS 2,4,6 ETC.
2. FOR SYSTEM INTERCONNECTION SEE D-IC-11780-0-3
3. FOR SYSTEM INTERCONNECTION DIAGRAM SEE E-IC-11780-0-2.
4. FOR SYSTEM INTERCONNECTION POWER DIAGRAM SEE D-IC-11780-0-1
5. FOR KA78Ø MODULE UTILIZATION SEE D-MU-KA78Ø-Ø-4.

15.45 IN 392.4 MM REF
14.00 IN 355.6 MM REF
20.46 IN 519.7 MM REF
2.85 REF
9.50 REF
41 42 43 } QTY 6
34 OR 35 } REF
36 (QTY 5) (SHEET 1)
36 (QTY 5)
35 (QTY 14) SEE NOTE 1 (SHEET 1)
34 (QTY 15) SEE NOTE 1 (SHEET 1)
SEE NOTE 1 (SHEET 1)
34 (QTY 15)
20 OR 21
19 18 SEE NOTE 5 (SHEET 1)
35 (QTY 14)
SEE NOTE 1 (SHEET 1)
32 33 } QTY 20
H7100 POWER SUPPLY
H7100 POWER SUPPLY WITH H7101 REGULATOR BOARD
BLK +5 RET (GND)
OUTPUT BUS
RED +5
J3 POWER FAIL
J4 OVER TEMP
J5
2 OR 3
61 OR 62
POWER NORMAL
PLUG IN REG. FAILURE
OVER CURRENT
OVER VOLTAGE
POWER INV. FAIL
OVERTEMP
POWER
BATTERY ADAPTOR
120V ONLY
61 OR 62
2 OR 3
38 (QTY 4)
37 (QTY 4)
31
28
39 40 } (QTY 2)
29
30
13
SECTION A-A
SCALE: 1/1
(TYP. 3 PLACES)
31 REF
28
30
39 40 } QTY 2
37 (QTY 4)
38 (QTY 4)
SEE NOTES 2,3 & 4 (SHEET 1)
VIEW C-C
SCALE 1/1
(TYP 3 PLACES)

FOR PARTS LIST SEE A-PL-KA78Ø-Ø-5

REV	DESCRIPTION	DWG./PART NO.	ITEM NO.
A	KA78Ø-0001		
B	ECO #AXA78-0004		
C	ECO #AXA78-0005		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
ANGLES ±0° 30'
SURFACE QUALITY 125 MICROINCHES
CLASS OF ACCURACY (CHECK ONE): MEDIUM ☐ PREFERRED ☐
NOMINAL DIMENSION RANGE INCHES: OVER 0 TO 6 (±.004 / ±.013); OVER 6 TO 30 (±.008 / ±.016); OVER 30 TO 120 (±.012 / ±.025); OVER 120 TO 315 (±.016 / ±.04); OVER 315 TO 1000 (±.024 / ±.063)
QUANTITY & VARIATION
THIRD ANGLE PROJECTION
REMOVE BURRS AND BREAK SHARP CORNERS
DO NOT SCALE DWG
MATERIAL SEE PARTS LIST
FINISH
DRN. [illegible]
CHK'D Rooney
ENGR Rooney
PROJ. Rooney
NEXT HIGHER ASSY. B-DD-KA78Ø-Ø
SCALE 1/2
SHEET 1 OF 3
FIRST USED ON VAX 11/78Ø
TITLE CPU ASSY (KA78Ø)
SIZE E CODE DUA NUMBER KA78Ø-Ø-Ø REV. C
DIST.
TW 1

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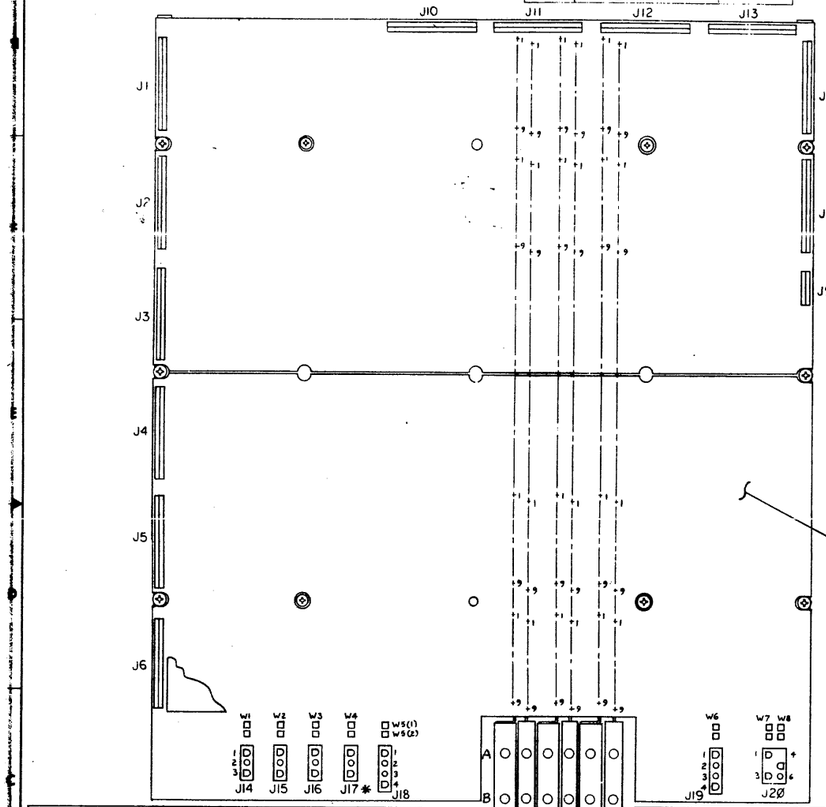
FOR J10 USAGE SEE CPU TR ARBITRATION LEVEL SELECTION

J10 PIN	J10 SIGNAL NAME
B	TR SEL 1 L
D	TR SEL 2 L
F	TR SEL 4 L
J	TR SEL 8 L

FOR J11 & J12 USAGE SEE PCS/WCS JUMPER CONFIGURATION TABLE AT FAR RIGHT.

J11 PIN	J11 TO	J12 PIN	J12 TO
X	C18B1	B	C22B1
Z	C18L1	D	C22L1
BB	C18L2	F	C22L2
DD	C18M1	J	C22M1
FF	C18V2	L	C22V2
LL	C20B1		
NN	C20L1		
RR	C20L2		
TT	C20M1		
VV	C20V2		

CONNECTORS J1-J6 ARE SBI SIGNALS OUT AND CONNECT TO ANOTHER BACKPLANE (E.G. UBA, MBA) OR A TERMINATOR



SEE NOTE 4 (SHEET 2)

LSI 11 BUS

PIN	TO	SIGNAL NAME
(J7)		
C	B29R1	BEVNT L
E	B29N1	BSACK L
K	B29B1	BPOK L
M	B29A1	BDCOK L
S	A29R1	BREF L
W	A29S1	BHALT L
Y	B29S1	BINIT L
CC	B29B2	BDMR L
EE	A29M2	BIAKI L
HH	A29L2	BIRQ L
KK	A29J2	BSYNC L
MM	A29D2	BDIN L
PP	B29D2	BRPLY L
SS	A29E2	BDOUT L
(J8)		
C	B29P1	BBS7 L
E	A29K2	BWTBT L
H	B29V2	BDAL 15 L
K	B29U2	BDAL 14 L
M	B29T2	BDAL 13 L
P	B29S2	BDAL 12 L
S	B29R2	BDAL 11 L
U	B29P2	BDAL 10 L
W	B29M1	BDAL 09 L
Y	B29M2	BDAL 08 L
AA	B29L1	BDAL 07 L
CC	B29F1	BDAL 06 L
EE	B29E1	BDAL 05 L
HH	B29D1	BDAL 04 L
KK	B29C1	BDAL 03 L
MM	B29E2	BDAL 02 L
PP	A29V2	BDAL 01 L
SS	A29U2	BDAL 00 L

SCP SIGNAL

PIN	TO	SIGNAL NAME
(J9)		
B	A29A1	SCPA BOOT SW H
D	A29B2	SCPA AUTO RESTART H
F	A29F1	SCPA LOCK H
K	A29D1	CIBN RUN H
L	A29E1	CIBN ATTN H
J	A29K1	SCPA REMOTE H

SYSTEM IDENTITY (SYSID) REGISTER

CIBH SYSID SW (31:00) H BIT	WIRE WRAPPED CONNECTION (REMOVE JUMPER TO ASSERT BIT)
31	J12-V —— F29R2
30	J12-X —— F29U2
29	J12-Z —— F29V2
28	J12-BB —— F29T2
27	J12-DD —— F29L2
26	J12-FF —— F29P2
25	J12-JJ —— F29M2
24	J12-LL —— F29S2
23	J12-NN —— C29D2
22	J12-RR —— C29D1
21	J12-TT —— F29K2
20	J12-VV —— F29B1
19	J13-B —— E29P1
18	J13-D —— E29N1
17	J13-F —— E29A1
16	J13-J —— E29R2
15	J13-L —— D29D1
14	J13-N —— D29P1
13	J13-R —— E29H2
12	J13-T —— D29A1
11	J13-V —— D29N1
10	J13-X —— D29B1
9	J13-Z —— C29S2
8	J13-BB —— C29T2
7	J13-DD —— C29U2
6	J13-FF —— C29U1
5	J13-JJ —— C29P2
4	J13-LL —— C29P1
3	J13-NN —— C29M1
2	J13-RR —— C29B1
1	J13-TT —— C29C1
0	J13-VV —— C29N1

NOTES: (PERTAINS TO SHEET #2 ONLY.)

1. CPU TR SELECTION
   A. SELECT DESIRED TR LEVEL
   B. SET THE TR SEL JUMPERS FOR DESIRED TR LEVEL FROM CHART
   C. ALL TR LEVELS OTHER THAN TR16 REQUIRE A TR JUMPER TO BE WIRE WRAPPED ON THE CPU BACK PANEL SLOT 2
   D. SELECT TR JUMPER FROM CHART. MAKE WIRE WRAP CONNECTION ON SLOT 2 (IF JUMPER IS REQUIRED)
2. JUMPER PART NUMBER 1214314-0-0
3. NORMAL 11780 WCS/PCS CONFIGURATION IS:
   SLOT 18 - OPTIONAL
   SLOT 20 - WCS
   SLOT 22 - PCS - J12-L, J12-J, J12-F, J12-D, J12-B ARE REMOVED.
4. A. PS*1 SOURCES SLOTS 4 THRU 16.
   B. PS*2 SOURCES SLOTS 1 THRU 3, 10, 22, 23, AND 29.
   C. PS*3 SOURCES SLOTS 18, AND 24 THRU 28.

PCS - BACKPLANE SLOT 22 BANK ADDRESS SELECT (SEE NOTE 3 SHEET 2)

BANK ADDRESS	J12 (I: INSTALL JUMPER) L	J	F	D	B
0-4K	I	—	—	—	—

WCS BACKPLANE SLOT 20 BANK ADDRESS SELECT (SEE NOTE 3 SHEET 2)

BANK ADDRESS	J11 (I: INSTALL JUMPER) VV	TT	RR	NN	LL
0-1 K	—	I	I	I	—
1-2 K	—	I	I	—	I
2-3 K	—	I	—	I	I
3-4 K	—	—	I	I	I
4-5 K	I	I	I	I	—
5-6 K	I	I	I	—	I
6-7 K	I	I	—	I	I
7-8 K	I	—	I	I	I

OPTIONAL WCS BACKPLANE SLOT 18 BANK ADDRESS SELECT (SEE NOTE 3, SHEET 2)

BANK ADDRESS	J11 FF	DD	BB	Z	X
0-1 K	—	I	I	I	—
1-2 K	—	I	I	—	I
2-3 K	—	I	—	I	I
3-4 K	—	—	I	I	I
4-5 K	I	I	I	I	—
5-6 K	I	I	I	—	I
6-7 K	I	I	—	I	I
7-8 K	I	—	I	I	I

CPU TR ARBITRATION LEVEL SELECTION

TR ID LEVEL	J10 TR SEL JUMPER POINTS J - J10	F - J10	D - J10	B - J10	TR ARBITRATION LEVEL SELECT (WIRE WRAPPED JUMPER) FROM	TO
16	I	I	I	I	— **	
15	I	I	I	—	SBIU MY BUS TR L (F02M2)	F02U2 (BUS SBI TR15 L)
14	I	I	—	I		F02U1 TR14 L
13	I	I	—	—		F02T2 TR13 L
12	I	—	I	I		F02S2 TR12 L
11	I	—	I	—		F02P2 TR11 L
10	I	—	—	I		F02P1 TR10 L
09	I	—	—	—		F02N1 TR09 L
08	—	I	I	I		F02M1 TR08 L
07	—	I	I	—		F02J2 TR07 L
06	—	I	—	I		F02J1 TR06 L
05	—	I	—	—		F02H2 TR05 L
04	—	—	I	I		F02F2 TR04 L
03	—	—	I	—		F02E1 TR03 L
02	—	—	—	I		F02D1 TR02 L
01	—	—	—	—	SBIU MY BUS TR L (F02M2)	F02C1 (BUS SBI TR01 L)

SEE NOTE #1.e.2 (SHEET 2)

J14

PIN	
W1-1	1- SUPPLY 4 ACLO
W1-2	2- SUPPLY 4 DCLO
	3- GND

J15

PIN	
W2-1	1- SUPPLY 3 ACLO
W2-2	2- SUPPLY 3 DCLO
	3- GND

J16

PIN	
W3-1	1- SUPPLY 2 ACLO
W3-2	2- SUPPLY 2 DCLO
	3- GND

J17 *

PIN	
W4-1	1- SUPPLY 1 ACLO
W4-2	2- SUPPLY 1 DCLO
	3- GND

J18

PIN	
W5-1	1- -5V (SUPPLY 4)
W5-2	2- -5V (SUPPLY 4)
	3- GND
	4- GND

J19

PIN	
W6-1	1- +5V TO SYSTEM CONTROL PANEL
W6-2	2- CIBP FLOPPY ON H
	3- GND
	4- GND

J20

PIN	
W7-1	1- TIME OF DAY CLOCK +5V
	2- UNUSED
	3- GND
W8-1	4- BATTERY DCLO
	5- UNUSED
	6- GND

* W3:1,2 WILL BE JUMPERED TO W4:1,2 IF POWER SUPPLY *1 IS NOT INSTALLED IN THE SYSTEM

** NORMAL PROCESSOR CONFIGURATION

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CPU ASSY (KA780)	B	UA	KA-780-0-0	C
SCALE 1/1	SHEET 2 OF 2		DIST.	

TW

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS
PARTS LIST

MADE BY W. FISHER — DATE 1 AUG 77
CHECKED D. HEALY — DATE 3 AUG 77
SECTION 1
ENG Edward E Anter — DATE 14 Sept 77
PROD R Fuga — DATE 11/4/77
ISSUED SECT. 1

ITEM NO.	DWG NO./PART NO.	DESCRIPTION	KA78Ø-AA	KA78Ø-AB
1	E-IA-7013713-0-0	CARD CAGE (CPU)	1	1
2	E-UA-H71ØØ-A-Ø	H71ØØ-A POWER SUPPLY 115V AC	1	-
3	E-UA-H71ØØ-B-Ø	H71ØØ-B POWER SUPPLY 23ØV AC	-	1
4	E-UA-M8237-Ø-Ø	TRS	1	1
5	E-UA-M8218-Ø-Ø	SBL	1	1
6	E-UA-M8219-Ø-Ø	SBH	1	1
7	E-UA-M822Ø-Ø-Ø	CAM	1	1
8	E-UA-M8221-Ø-Ø	CDM	1	1
9	E-UA-M8222-Ø-Ø	TBM	1	1
10	E-UA-M8223-Ø-Ø	IDP	1	1
11	E-UA-M8224-Ø-Ø	IRC	1	1
12	E-UA-M8225-Ø-Ø	DBP	1	1
13	E-UA-M8226-Ø-Ø	DEP	1	1
14	E-UA-M8227-Ø-Ø	DDP	1	1
15	E-UA-M8228-Ø-Ø	DCP	1	1
16	E-UA-M8229-Ø-Ø	DAP	1	1
17	E-UA-M823Ø-Ø-Ø	CEH	1	1
18	E-UA-M8231-Ø-Ø	ICL	1	1
19	E-UA-M8232-Ø-Ø	CLK	1	1
20	E-UA-M8233-Ø-Ø	WCS	1	1
21	E-UA-M8234-Ø-Ø	PCS	1	1
22	E-UA-M8235-Ø-Ø	USC	1	1

TITLE: CPU ASSY (KA78Ø) — ASSY NO. E-UA-KA78Ø-Ø-Ø — SIZE A — CODE PL — NUMBER KA78Ø-Ø-Ø — REV C — ECO NO. KA78Ø-TV/ØV3 — SHEET 1 OF 3 — DIST

DEC FORM DRA 110

TW

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS
PARTS LIST

MADE BY W. FISHER — DATE 1 AUG 77
CHECKED D. HEALY — DATE 3 AUG 77
SECTION 1
ENG Edward E Anter — DATE 14 Sept 77
PROD R Fuga — DATE 11/4/77
ISSUED SECT. 1

ITEM NO.	DWG NO./PART NO.	DESCRIPTION	KA78Ø-AA	KA78Ø-AB
45	D-IC-11780-0-3	11780 SUB SYSTEM INTERCONNECT	REF	REF
46	D-IC-11780-0-2	11780 SYSTEM INTERCONNECT DIAGRAM	REF	REF
47	D-IC-11780-0-1	11780 SYSTEM POWER DIAGRAM	REF	REF
48	D-MU-KA78Ø-Ø-2	KA78Ø MODULE UTILIZATION	REF	REF
49	D-IA-7014530-1A-Ø	CABLE POWER (RED)	2	2
50	D-IA-7014530-1E-Ø	CABLE POWER (RED)	4	4
51	D-IA-7014249-1C-Ø	CABLE POWER (BLACK)	2	2
52	D-IA-7014249-1J-Ø	CABLE POWER (BLACK)	4	4
53	D-IA-7014249-ØL-Ø	CABLE POWER (BLACK)	1	1
54	D-IA-7014212-ØM-Ø	CABLE AC, DC LO	2	2
55	A-PS-1214314-0-0	JUMPER	12	12
~~56~~	~~A-PL-H71Ø1-Ø-Ø~~	~~H71Ø1 REGULATOR~~	~~1~~	~~1~~
57	E-IA-7015073-0-0	HARNESS, -5V TERMINATOR	1	1
58	D-IA-7014212-2M-Ø	CABLE AC, DC LO	2	2
59	C-MD-7419458-0-0	COVER, C.P.U. BACKPLANE	1	1
60	3615087-02	LABEL, DANGER	1	1
61	E-AD-7014956-00	UBA OPTION POWER SUPPLY 115V	1	-
62	E-AD-7014956-01	UBA OPTION POWER SUPPLY 230V	-	1

TITLE: CPU ASSY (KA78Ø) — ASSY NO. E-UA-KA78Ø-Ø-Ø — SIZE A — CODE PL — NUMBER KA78Ø-Ø-Ø — REV C — ECO NO. — SHEET 3 OF 3 — DIST

DEC FORM DRA 110

TW

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS
PARTS LIST

MADE BY W. FISHER — DATE 1 AUG 77
CHECKED D. HEALY — DATE 3 AUG 77
SECTION 1
ENG Edward E Anter — DATE 14 Sept 77
PROD R Fuga — DATE 11/4/77
ISSUED SE 1

ITEM NO.	DWG NO./PART NO.	DESCRIPTION	KA78Ø-AA	KA78Ø-AB
23	E-UA-M8236-Ø-Ø	CIB	1	1
24	D-IA-7014103-0-0	BLANK MODULE ASSY	6	6
25	E-UA-H7111-A-Ø	T.O.D. BATTERY BACK UP 115V	REF	-
26	E-UA-H7111-B-Ø	T.O.D. BATTERY BACK UP 23ØV	-	REF
27	E-IA-7013628-0-0	BACKPLANE ASSY (CPU)	1	1
28	B-MD-7418902-0-0	PLATE, STUD	6	6
29	B-MD-7418903-0-0	"U" BAR	3	3
30	C-MD-7418904-0-0	PLATE, SUPPORT	1	1
31	B-MD-7419483-0-0	COVER, BUS BAR	1	1
32	9006073-00	SCR PH HD PAN #10 - 32 x .50	20	20
33	9007906-00	WASHER, LOCK SPLIT #10	20	20
34	1212405-00	CARD GUIDE SINGLE (NATURAL)	30	30
35	1212405-01	CARD GUIDE SINGLE (MAGENTA)	28	28
36	1211630-00	CARD GUIDE	10	10
37	9006610-00	NUT, CAP RELOCK #10 - 32	20	20
38	9006565-00	NUT, KEP #10 - 32	24	24
39	9008032-01	SCR PH HD PAN #4 - 40 x .19	12	12
40	9006655-00	WASH., FLAT .31 o.d. x 12 i.d. x .03	12	12
41	9006043-01	SCR PH HD PAN 8 - 32 x 1.00	6	6
42	9006660-00	WASH. FLAT .38 o.d. x .19 i.d. x .06	6	6
43	9006563-00	NUT KEP #8 - 32	6	6
44	3613281-05	LABEL, ADHESIVE BACKED PRINT (29 SLOT)	1	1

TITLE: CPU ASSY (KA78Ø) — ASSY NO. E-UA-KA78Ø-Ø-Ø — SIZE A — CODE PL — NUMBER KA78Ø-Ø-Ø — REV C — ECO NO. — SHEET 2 OF 3 — DIST

DEC FORM DRA 110

TW

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NOTE * DESIGNATES OPTION

SLOTS 17, 19 & 21 RESERVED FOR POWER BUSSING

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
M8217	M8216	M8219	M8220	M8221	M8222	M8223	M8224	M8225	M8226	M8227	M8228	M8229	M8230	M8231	M8232		M8233 OR M8234		M8233		M8234	M8235	M8285	M8286	M8287	M8288	M8289	M8236
TRS	SBL	SBH	CAM	CDM	TBM	IDP	IRC	DBP	DEP	DDP	DCP	DAP	CEH	ICL	CLK		*WCS OR PCS		WCS		PCS	USC	FNM *	FMH *	FML *	FAD *	FCT *	CIB

A																												
B																												
C																												
C																												
D																												
B																												
E																												
F																												

8	7	6	5	4	3	2	1																					

REVISIONS	CHANGE NO.	CHK.	REV.

DRN. AFM		FIRST USED ON	digital
CHK'D		VAX 11780	
ENG.		TITLE	
PROJ. ENG. E. Anton	Sept 77	MODULE UTILIZATION CPU	
PROD.			
NEXT HIGHER ASSY.			
B-DD-KA780-0		SIZE D	CODE MU
SCALE		NUMBER KA780-0-2	REV.
SHEET 1 OF 1		DIST.	

DMU KA780-0-2

DEC FORM NO. ORD 102-0

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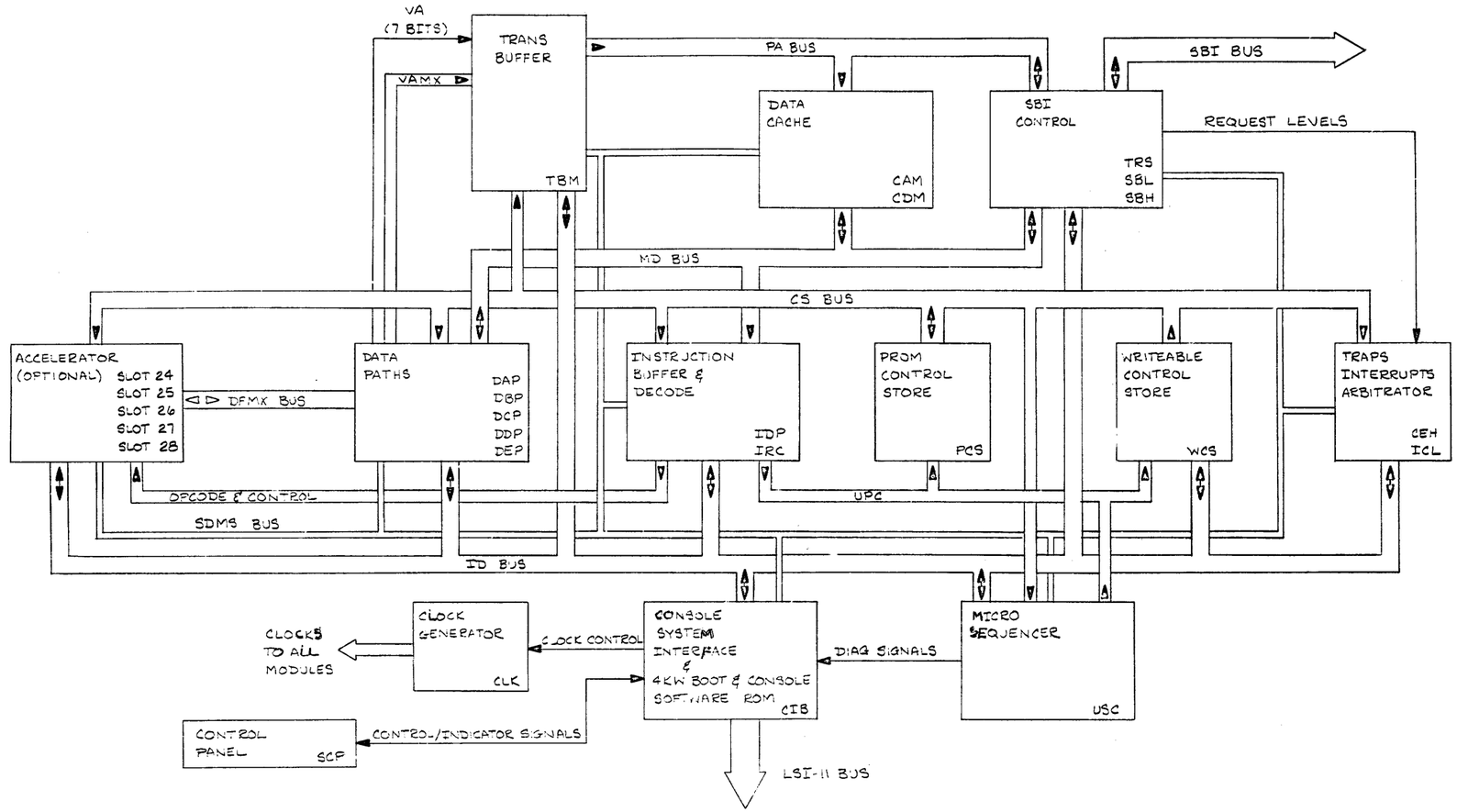

REVISIONS	REV.	CHK	CHANGE NO.

DEC FORM NO. DRD 102-0

DRN. J.C.	9-9-77	FIRST USED ON VAX 11780
CHK'D	9-22-77	
ENG.	9-22-77	TITLE
PROJ. ENG. E. Anton	Sept 27 77	CPU SYSTEM BLOCK DIAGRAM
PROG.	10-4-77	
NEXT HIGHER ASSY.	8-DD-KA780-0	SIZE D CODE BD NUMBER KA780-0-3 REV.
SCALE		
SHEET 1 OF 1		DIST.

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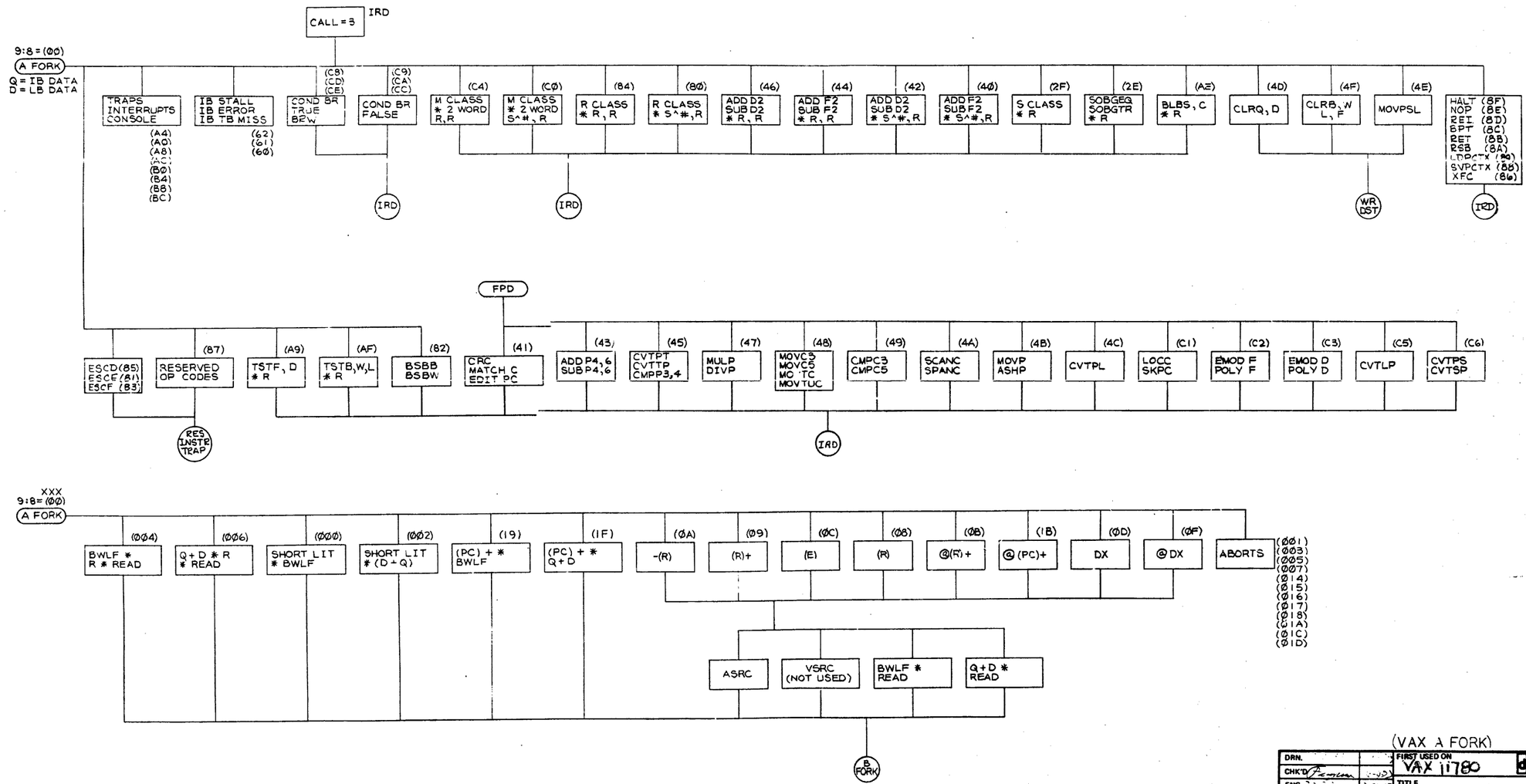
M CLASS = (ADDXX, SUBXX, BISXX, BICXX, XORXX, ADWC, SBWC, MOVX, MNEGX, MCOMX) BWL
R CLASS = (BITX, CMPX) BWL
F1 CLASS = (ADDX2, ADDX3, SUBX2, SUBX3)
S CLASS = (INCX, DECX,) BWL
CF CLASS = (CVTFB, CVTFW, CVTFL, CVTRFL)
CD CLASS = (CVTDB, CVFDW, CVTDL, CVTRDL)



(VAX A FORK)

REVISIONS		
CHK	CHANGE NO.	REV.

DRN.	FIRST USED ON: VAX 11780
CHK'D	digital
ENG.	TITLE: VAX/CM MODE ENTRY POINTS
PROJ. ENG.	
PROD.	
NEXT HIGHER ASSY.	B-DD-KA780-0
SCALE	SIZE D, CODE DFD, NUMBER KA780-0-4, REV.
SHEET 1 OF 6	DIST.

DFD KA780-0-4 REV.

DEC FORM NO. DRD 138

12

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9:8 = (10)

B FORK

(24E) INC (BWL) DEC (BWL) EXEC → STORE

(24D) TST (BWL) EXEC → IRD

(248) PUSHAL PUSHAW PUSHAQ PUSHAB PUSHL → WR DST

(28F) JSB → IRD

(28E) JMP

(2CE) SOBGEQ SOBGTR *-R

(2CF) BLBS BLBC *-R

(28B) BIS PSW BIC PSW

(24A) MOVZ BW MOVZ BL MOVZ WL

(24C) CVTBW CVTBL CVTWL

(24B) CVTWB CVTLB CVTLW → WR DST

(249) MCOM (BWL) MNEG (BWL)

(298) CHM (K,E,S,U) → IRD

(2A8) BBXX * DST=R

(2C4) MCLASS * 3 WORD * R,R

(2C0) MCLASS * 3 WORD * S^# R → IRD

(227) R CLASS * 2 WORD * DST=R

(2AF) R CLASS * DST=R

(223) AOBX * DST=R

(22E) ADDD2 SUBD2 DST=R

(22F) ADDF2 SUBF2 DST=R

(28D) TSTF → IRD

(28C) TSTD

(289) PUSHR

(28A) POPR

(240) ADDF3 SUBF3 S^#,R

(244) ADDF3 SUBF3 RR

(242) ADDD3 SUBD3 S^#,R

(246) ADDD3 SUBD3 RR

(247) B FORK ERROR → FR USE

(245) CF CLASS

(243) CD CLASS

(24F) CVTBF CVTWF CVTLF → WR DST

(2CC) CVTBD CVTWD CVTLD

(247) CVTFD

(2CD) CVTDF

(285) MNEGF MOVF

(241) MNEGD MOVD

(2C7) MFPR

(22C) DIV2 (WL) * R → IRD

(220) MULF2 * R

(224) BWLF * WRITE * R → IRD

(226) Q+D * WRITE * R

(204) BWLF * READ * R

(206) Q+D * READ * R

(200) SHORT LIT * BWLF

(202) SHORT LIT * Q+D

(219) (PC)+ * BWLF → C FORK

(21F) (PC)+ * Q+D

(20A) -(R)

(209) (R)+

(20C) @(R)+

(208) (R)

(20B) @(R)+

(218) @(PC)+

(20D) DX

(20F) @DX

ABORTS (201) (203) (205) (207) (214) (215) (217) (218) (21A) (21C) (21D) (216)

IB STALL WAIT FLOAT IB TB PWRUP (27E) (27D) (27C)

BWLF * READ

Q+D * READ

ASRC

VSRC (NOT USED)

BWLF * WRITE

Q+D * WRITE

ASRC (NOT USED)

VSRC (NOT USED) → WR DST

(234) REMQUE

(221) DIVF2 * R

(20E) ADAWI

(228) MULD2 * R

(229) DIVD2 * R

(22D) MUL2 (BWL) * R

(286) CVT WB CVT LB CVT LW → IRD

C FORK

REVISIONS		
CHK	CHANGE NO.	REV.

DEC FORM NO. DRD 138

(VAX B FORK)

TITLE VAX & CM MODE ENTRY POINTS

SIZE D CODE FD NUMBER KA78Ø-Ø-4 REV.

SCALE — SHEET 2 OF 6 D.I.T.

13

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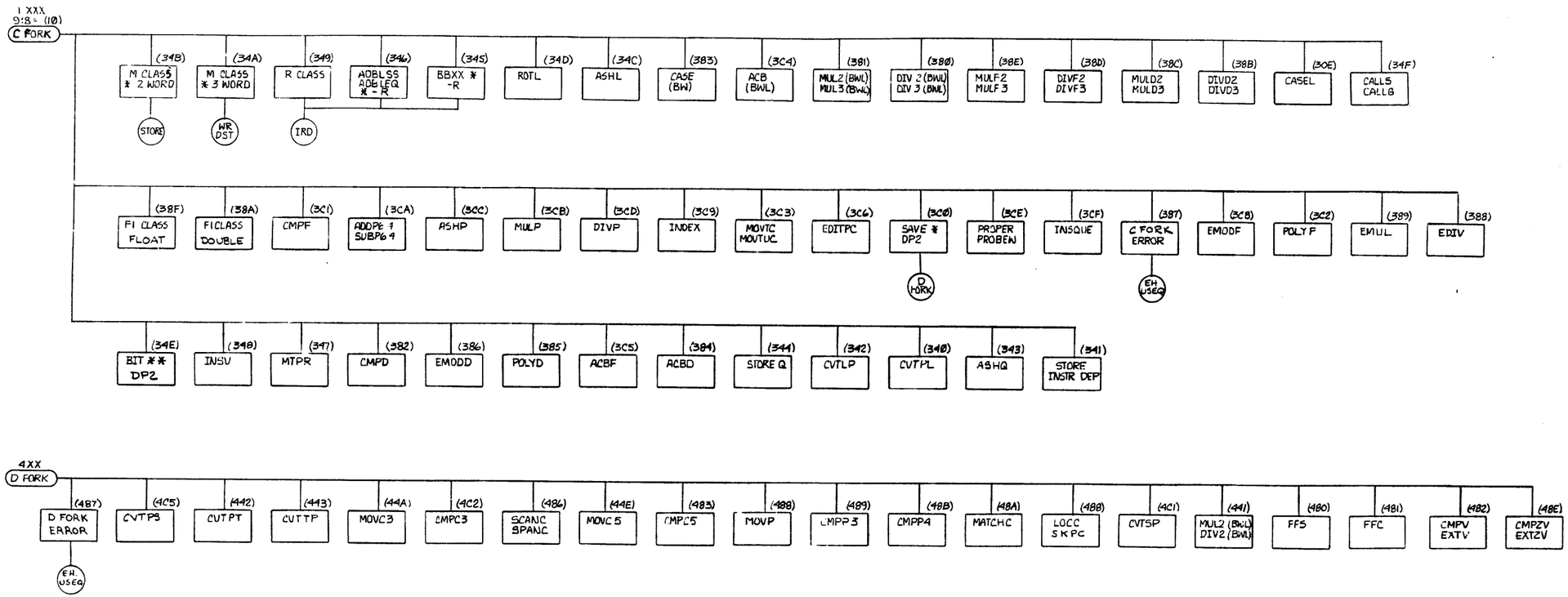
* SAVE DP2 = CVTPS, CVTSP, CVTPT, CVTTP, MOVC3, CMPC3, SCANC, MOVC5, CMPC5, MOVP, CMPP3, CMPP4, MATCHC, LOCC, SKPC, CRC, ASHP
** BIT DP2 = FFS, FFC, CMPV, CMPZV, EXTV, EXTZV



REVISIONS		
CHK	CHANGE NO.	REV.

(VAX C&D FORK)

TITLE	SIZE	CODE	NUMBER	REV.
VAX & CM MODE ENTRY POINTS	D	FD	KA78Ø-Ø-4	
SCALE	SHEET 3 OF 6		DIST.	

KA78Ø-Ø-4

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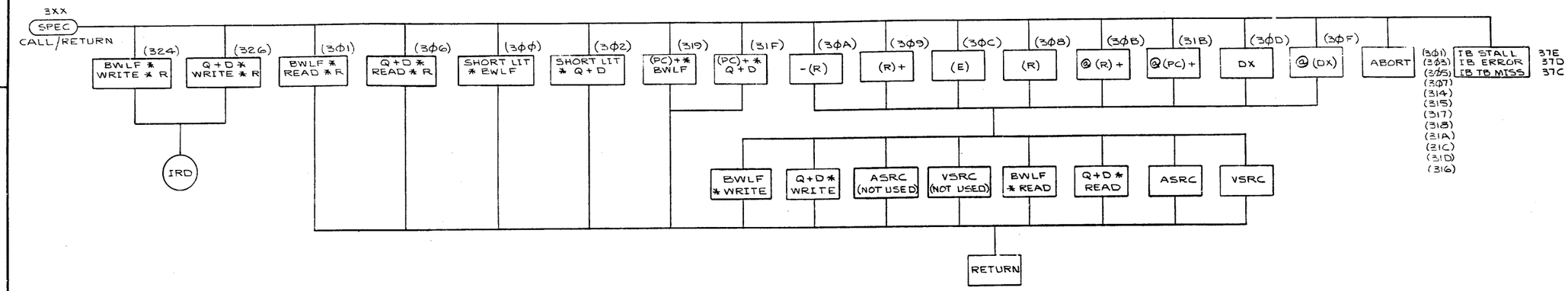

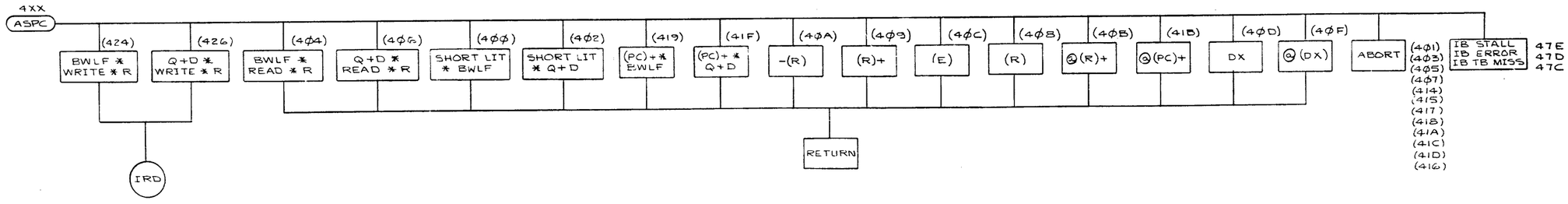

REVISIONS		
CHK	CHANGE NO.	REV.

(VAX SPEC + ASPC)

TITLE	SIZE	CODE	NUMBER	REV.
VAX & CM MODE ENTRY POINTS	D	FD	KA78Φ-Φ-4	
SCALE —11—	SHEET 4 OF 6	DIST.		

DEC FORM NO. DRD 137

15

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(76Ø)
IRD

A FORK

(762) (761) (76Ø) IB STALL, IB ERROR, IB TB MISS
(79Ø) RSVD INSTR, HALT, WAIT, RESET, ECT.
(721) BPT
(722) IOT
(788) EMT
(798) TRAP
(75Ø) RTI, RTT
(7AB) RTS
(754) NOP, CLEAR CC'S
(725) SET CC'S
(7AA) SOB
(7A1) (7A2) (7A4) BRANCH FALSE
(7AØ) (7A5) (7A6) BRANCH TRUE * BR
(7D4) MTPI, MTPD

VAX MODE
IRD
B FORK

(DMØ)

(7DB) MFPI, MFPD
(73A) BIS.B, BIC.B, ADD, SUB, MOV * SM 27 * RD ≠ PC
(7DF) SWAB
(7D6) NEG.B
(7D9) ASR.B
(7D5) MOVB * SMØ * DMØ
(7BB) MUL
(7BE) DIV
(78B) ASH
(7BC) ASHC
(77A) MOVB * SM 27 * RD ≠ PC
(75A) CMP,B,BIT,B * SM 27 * RD ≠ PC
(7DD) JMP, JSR
(72Ø) (724) (722) (726) (73Ø) (734) (738) (73C) TRAPS, INTERRUPTS

IRD
VAX HANDLER

(SINGLE OP * DMØ)

(DOUBLE OP * SMØ * DMØ)

RD ≠ PC
(753) MOV, BIC.B, BIS.B, ADD, SUB, XOR
(751) CMP.B, BIT.B

RD = PC
(7D3) MOV, BIC.B, BIS.B, ADD, SUB, XOB
(7D1) BIT.B, CMP.B

RD ≠ PC
(753) CLR.B, COM.B, INC.B, DEC.B, ALC.B, SBC.B, ROL.B, ASL.B
(751) TST.B
(757) ROR
(758) RORB
(75E) SXT

RD = PC
(7D3) CLR.B, COM.B, INC.B, DEC.B, ADC.B, SBC.B, ROL.B, ASL.B
(7D1) TST.B
(7D7) ROR
(7D8) RORB
(7DE) SXT

IRD

(DOUBLE OP * - SMØ)

RS ≠ PC
(711) SM1
(712) SM2
(713) SM3
(714) SM4
(715) SM5
(716) SM6
(717) SM7

RS = PC
(719) SM1
(71A) SM2 * - DMØ
(71B) SM3
(71C) SM4
(71D) SM5
(71E) SM6
(71F) SM7

(SINGLE OP + REGISTER CLASS) * - DMØ

B FORK

(CM A FORK)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
VAX & CM MODE ENTRY POINTS	D	FD	KA78Ø-Ø-4	

SCALE —//— SHEET 5 OF 6 DIST.

KA78Ø-Ø-4 REV. A

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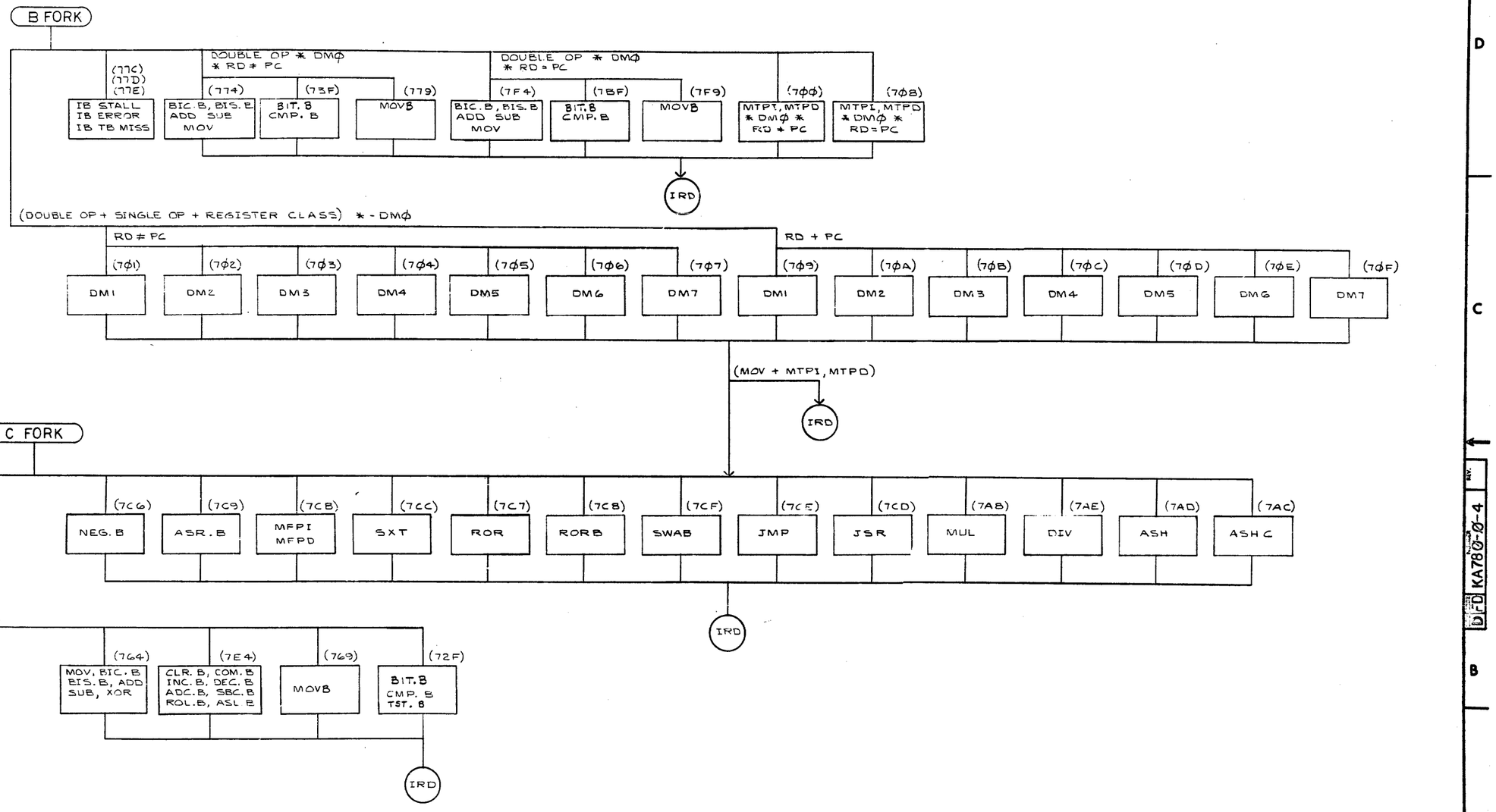

REVISIONS		
CHK	CHANGE NO.	REV.

(CM B FORK & C FORK)

TITLE VAX & CM MODE ENTRY POINTS
SIZE D FD NUMBER KA78Ø-Ø-4 REV.
SCALE — SHEET 6 OF 6

DEC FORM NO. DRD 139

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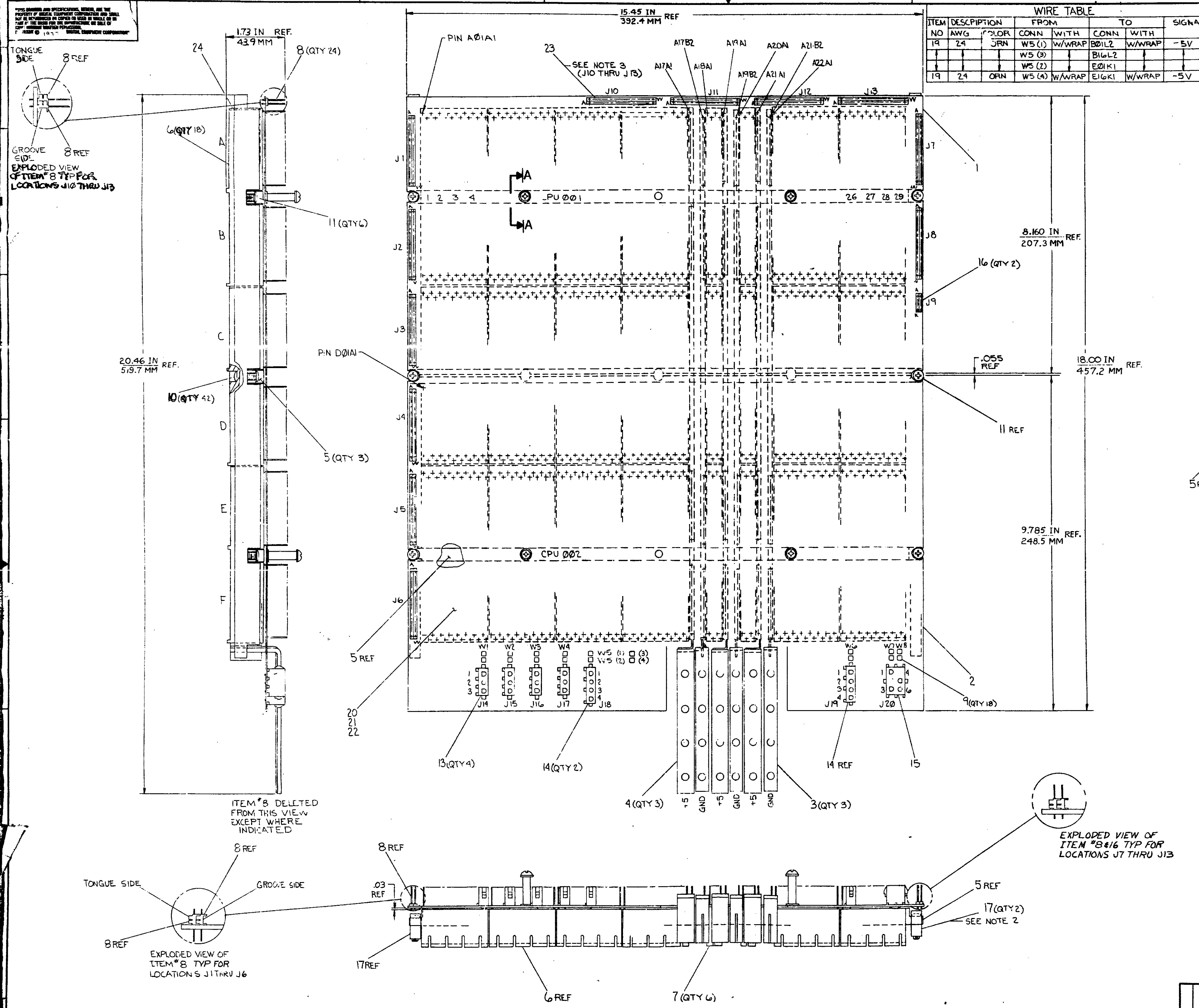


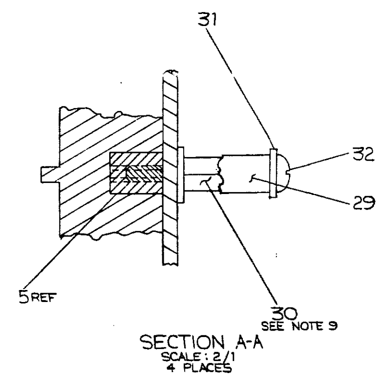
WIRE TABLE

ITEM NO	DESCRIPTION AWG	COLOR	FROM CONN	FROM WITH	TO CONN	TO WITH	SIGNAL
19	24	ORN	W5 (1)	W/WRAP	BØ1L2	W/WRAP	-5V
↕	↕	↕	W5 (3)	↕	B16L2	↕	↕
↕	↕	↕	W5 (2)	↕	EØ1K1	↕	↕
19	24	ORN	W5 (4)	W/WRAP	E16K1	W/WRAP	-5V

NOTES:
1. AFTER ALL MACHINE WIRING'S FINAL AWT IS COMPLETE, WIRE PER "WIRE TABLE".
2. ITEM #17 USED FOR WIRE AND WAVE SOLDER PURPOSES ONLY.
3. ITEM #23 JUMPER WILL BE USED ON CONN J10 THRU J13 FOR SYSTEM CONFIGURATION TO BE INSTALLED AT SYSTEM INTEGRATION.
4. 5412870 & 5412872 USED FOR DATA BASE ONLY.
5. ITEM #8 & #13 THRU #16 TO BE SOLDERED TO ETCH BOARD AFTER WAVE SOLDER.
6. ~~CUT ETCH AT DØ6L1~~
7. ~~ADD THE FOLLOWING WITH ITEM #21 AT SYSTEM INTEGRATION~~

~~FROM~~	~~TO~~
~~AØ1P1~~	~~JØØ1NN~~
~~AØ1P2~~	~~JØØ1DD~~
~~BØ1J1~~	~~JØØ2N~~
~~CØ1D2~~	~~JØØ3F~~
~~CØ1P1~~	~~JØØ3LL~~
~~CØ1P2~~	~~JØØ3DD~~
~~CØ1V1~~	~~JØØ3TT~~

8. ~~CUT ETCH AT D23T2~~
9. APPLY ITEM NO. 33 TO EXTERNAL THREADS OF ITEM NO. 30 BEFORE ASSY OF ITEM NO. 30.
10. FOR INTERPLANT SHIPPING, USE PART NO. 99-05709, CARTON, USING PACKAGING INSTRUCTIONS, PART NO. 37-00189.



SECTION A-A
SCALE: 2/1
4 PLACES

QTY	DESCRIPTION	DWG./PART NO.	ITEM NO.
A/R	LOCKTITE	9009321	33
4	SCR., PH. 8-32 × .38 LG.	9006037-01	32
8	WASHER, NYLON	9006713	31
4	STANDOFF, .875 LG.	9000001-07	30
4	SLEEVE, INSULATOR	B-MD-7420279-0-0	29
~~1~~	~~COVER, CPU BACKPLANE~~	~~C-MD-7419458-0-0~~	~~28~~
3	SPACER BACK PANEL	C-MD-7411399-01	27
REF	WASHER, NYLON #4 .375 OD × .031 TH	9006706-00	26
REF	SCR. PH PAN HD #4-40 × .625	9006014-00	25
1	DECAL, AWT REV STATUS	A-DC-1411881-0-1	24
REF	JUMPER	1214314-00	23
A/R	WIRE #30 AWG TWP (GRY/VIO) 120 OHMS TEFZEL	9107773-87	22
A/R	WIRE #30 AWG TWP (BLK/WHT)	9107720-0[illegible]	21
A/R	WIRE #30 AWG SOLID (YEL)	9105740-44	20
A/R	WIRE #24 AWG SOLID (ORN)	9107688-33	19
REF	WIRE LIST CPU	K-WL-7013628-0-1	18
2	SUPPORT LOGIC FRAME SIDE	D-MD-7409259-0-0	17
2	CONN 5 PIN	1214315-01	16
1	CONN. (6 PIN) FEMALE	1212297-05	15
2	CONN. (4 PIN) FEMALE	1212297-01	14
4	CONN. (3 PIN) FEMALE	1212297-03	13
REF	AWT REV STATUS	A-WT-7013628-0	12
6	SCR PHL PAN HD #8-32 X .69	9007846-01	11
42	SCR PHL HD FIL #8-32 X .62	9006120-06	10
18	POST, STAKING .025 SQ X 1.016 L	9009193-00	9
24	CONN, 20 PIN	1214315-00	8
6	CONN (H8030) 72 PIN SLOTTED	1211425-01	7
18	CONN (H863), 288 PIN SLOTTED	1210258-01	6
3	BAR, MOUNTING CPU	D-MD-7417868-0-0	5
3	BUS BAR RIGHT (+5V)	D-PS-1214348-00-0	4
3	BUS BAR LEFT (GND)	D-PS-1214348-01-0	3
1	BOARD, DRILL & ETCH CPU D,E,F	E-MD-5012871-0-0	2
1	BOARD DRILL & ETCH CPU A,B,C	E-MD-5012869-0-0	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
ANGLES ±0° 30'
SURFACE QUALITY IN MICROINCHES
CLASS OF ACCURACY (CHECK ONE): MEDIUM ☐ ±.004 ±.008 ±.012 ±.016 ±.024 ±.04; PREFERRED ☐ ±.012 ±.016 ±.025 ±.04 ±.063 ±.1
NOMINAL DIMENSION RANGE INCHES: OVER 0 TO 0.2 | OVER 0.2 TO 1.2 | OVER 1.2 TO 4.0 | OVER 4.0 TO 12.0 | OVER 12.0 TO 40.0 | OVER 40.0 TO 80.0

QUANTITY & VARIATION

THIRD ANGLE PROJECTION
REMOVE BURRS AND BREAK SHARP CORNERS
DO NOT SCALE DWG
MATERIAL: SEE PARTS LIST
FINISH

DRN. [signature] 18 MAY 77
CHK'D. [signature] 8 AUG 77
ENG. [signature] 8/1/77
PROJ. ENG. [signature] 8/1/77
PROD. [signature] 8/4/77
NEXT HIGHER ASSY. E-UA-KA780
FIRST USED ON: KA780

digital

TITLE: BACK PLANE ASS'Y (CPU)

SIZE: E | CODE: TA | NUMBER: 7013628-0-0 | REV.: F
SCALE 1/1 | SHEET 1 OF 1 | DIST.

REVISIONS

CHK	CHANGE NO.	REV.
B.C.	7013628-00001 [signature] 23 AUG 77 K. DUGGAN	A
B.C.	7013628-00002 [signature] 19 DEC 77 D. ZWICKER	B
P.C.	KA780-00001 [signature] 29 DEC 77 D. BELANGER	C
G.J.	7013628-TW004 [signature] 3 MAR 78, 3-8-78	D
K.D.	7013628-TW005 [signature] 10-7-78, 1 NOV 78 K. DUGGAN	E
	7013628-TW00K [signature] 27 NOV 78, 31 April 80 E. ANTON	F

8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

TW

18

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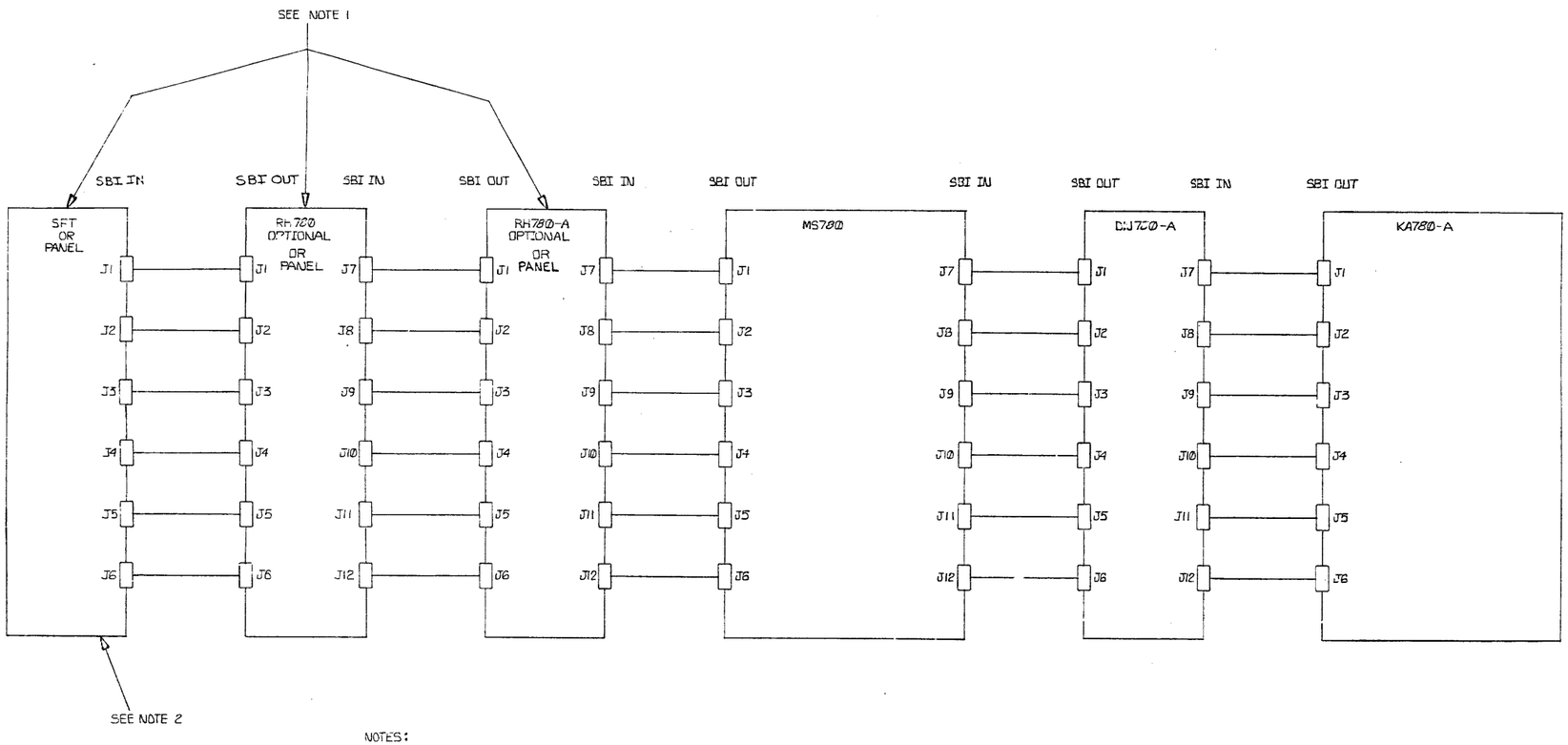


NOTES:

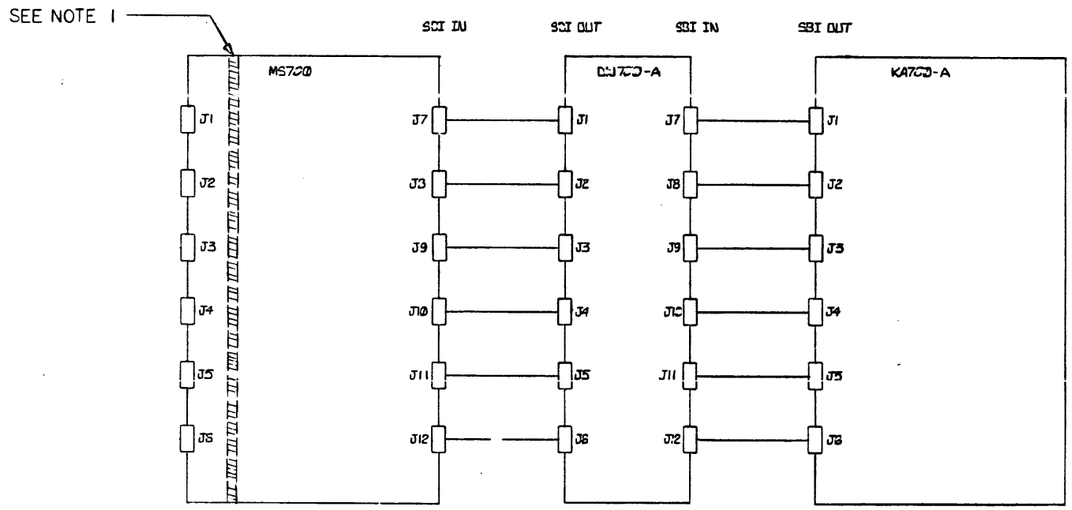
1.) 11780-C SYSTEM CONSISTS OF
- A. KA780-A
- B. DW780-A
- C. MS780
- D. SFT (#'M9043)
- E. 2 DUMMY PANELS (#'7418973)

11780-D SYSTEM CONSISTS OF
- A. KA780-A
- B. DW780-A
- C. MS780
- D. RH780-A
- E. RH780
- F. SFT

2.) SBI CABLE CONNECTIONS TO SFT FROM ADJACENT BACKPLANE ARE ALWAYS 17-00287-1 (QUANTITY 6)
OTHER SBI CABLES ARE 17-00287-0

(BACKPLANE S.B.I. INTERCONNECT)

DRN.	Product 11780
CHKD	TITLE 11780 SUB SYSTEM INTERCONN.
ENGR	
PROJ	
MFG	
SALES	SIZE D / CODE 10 C / NUMBER 11780-0-3 / REV B
APPD	



NOTES:

1) 11780-CU,CV SYSTEM CONSISTS OF
   - A. KA78Ø A
   - B. DW78Ø A
   - C. MS76Ø
   - D. TRM (M9Ø4Ø) MOUNTED IN SLOT# 1 OF MS76Ø BACKPLANE.

THIS SHEET FOR CU+CV VARIATIONS ONLY

(BACKPLANE S.B.I. INTERCONNECT)

11730

11780 SUB SYSTEM INTERCONN.

D | 11780-0-3 | B

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J7

BUS SBI B00 L
BUS SBI B01 L
BUS SBI B02 L
BUS SBI B03 L
BUS SBI B04 L
BUS SBI B07 L
BUS SBI B05 L
BUS SBI B08 L
BUS SBI B06 L
BUS SBI B09 L
BUS SBI B10 L
BUS SBI B11 L

J9

BUS SBI B20 L
BUS SBI B23 L
BUS SBI B22 L
BUS SBI B24 L
BUS SBI B27 L
BUS SBI B25 L
BUS SBI B28 L
BUS SBI B26 L
BUS SBI B29 L
BUS SBI B30 L
BUS SBI FAIL L
BUS SBI B31 L

J11

BUS SBI REQ4 L
BUS SBI REQ7 L
BUS SBI REQ5 L
BUS SBI TP L
BUS SBI REQ6 L
BUS SBI PCLK H
BUS SBI TP H
BUS SBI PDCLK H
BUS SBI PDCLK L
BUS SBI PDCLK L
BUS SBI MP2 L
BUS SBI MP1 L
BUS SBI ALERT L
BUS SBI UNJAM L
BUS SBI CNF0 L
BUS SBI FAULT L
BUS CNFI L

J8

BUS SBI B12 L
BUS SBI B14 L
BUS SBI B13 L
BUS SBI B15 L
BUS SBI B16 L
BUS SBI B17 L
BUS SBI B18 L
BUS SBI B19 L

J10

BUS SBI M0 L
BUS SBI DEAD L
BUS SBI MI L
BUS SBI M3 L
BUS SBI M2 L
BUS SBI P0 L
BUS SBI SPARE 0
BUS SBI PI L
BUS SBI SPARE 1
BUS SBI TAG0 L
BUS SBI ID0 L
BUS SBI TAG1 L
BUS SBI ID1 L
BUS SBI TAG 2 L
BUS SBI ID2 L
BUS SBI ID3 L
BUS SBI ID4 L

J12

BUS SBI INTLK L
BUS SBI TR01 L
BUS SBI TR02 L
BUS SBI TR03 L
BUS SBI TR02 L
BUS SBI TR04 L
BUS SBI TR05 L
BUS SBI TR06 L
BUS SBI TR07 L
BUS SBI TR08 L
BUS SBI TR09 L
BUS SBI TR10 L
BUS SBI TR11 L
BUS SBI TR13 L
BUS SBI TR12 L
BUS SBI TR14 L
BUS SBI TR15 L

(S.B.I. IN)

DRN.		FINISH DON 11780	
CHK'D		TITLE 11780 SUB SYSTEM INTERCONNECT	
ENG.			
PROJ.			
MFG.			
QA			
FINAL		SIZE D / CODE / NUMBER 11Z40-0-3	REV. B

REV.	NO.	CHK

DEC FORM NO. 5-11180

J1

BUS SBI B00 L
BUS SBI B01 L
BUS SBI B02 L
BUS SBI B03 L
BUS SBI B04 L
BUS SBI B07 L
BUS SBI B05 L
BUS SBI B06 L
BUS SBI B26 L
BUS SBI B09 L
BUS SBI B10 L
BUS SBI B11 L

J3

BUS SBI D20 L
BUS SDI D23 L
BUS SBI B21 L
BUS SDI B22 L
BUS SBI B24 L
BUS SBI B27 L
BUS SDI D25 L
BUS SDI D26 L
BUS SDI D29 L
BUS SDI D30 L
BUS SDI FAIL L
BUS SBI B31 L

J5

BUS SBI REQ4 L
BUS SDI REQ7 L
BUS SBI REQ5 L
BUS SBI TP L
BUS SBI REQ6 L
BUS SBI PCLK H
BUS SDI TP H
BUS SBI PDCLK H
BUS SDI PCLK L
BUS SBI PDCLK L
BUS SDI MP2 L
BUS SDI MP1 L
BUS SBI ALERT
BUS SDI UNJAM
BUS SDI CNF0 L
BUS SDI FAULT
BUS SDI CNF1 L

J2

BUS SBI B12 L
BUS SBI B14 L
BUS SBI B13 L
BUS SBI B15 L
BUS SBI B16 L
BUS SBI B17 L
BUS SBI B18 L
BUS SBI B19 L

J4

BUS SBI M0 L
BUS SDI DEAD L
BUS SDI M1 L
BUS SBI M3 L
BUS SDI M2 L
BUS SDI P0 L
BUS SDI SPARE 0
BUS SDI P1 L
BUS SBI SPARE 1
BUS SBI TAG0 L
BUS SBI IO0 L
BUS SBI TAG1 L
BUS SBI IO1 L
BUS SBI TAG2 L
BUS SBI IO2 L
BUS SBI IO3 L
BUS SBI IO4 L

J6

BUS SBI INTLK L
BUS SDI TR01 L
BUS SBI TR00 L
BUS SDI TR03 L
BUS SDI TR02 L
BUS SBI TR04 L
BUS SDI TR05 L
BUS SBI TR06 L
BUS SBI TR07 L
BUS SBI TR08 L
BUS SBI TR09 L
BUS SBI TR10 L
BUS SBI TR11 L
BUS SBI TR13 L
BUS SBI TR12 L
BUS SBI TR14 L
BUS SDI TR15 L

(S.B.I. OUT)

DRN		FINAT USED ON	1178の
CHKD		TITLE	11780 SUB SYSTEM INTERCONNECT
ENG			
PROJ. LDR			
PROD MGR			
NEXT HIGHER ASSY.			
SCALE		SIZE D	CODE IDENT NO. 11780
SHEET 4 OF 53		NUMBER 11780-0-3	REV. B

8 7 6 5 4 3 2 1

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NOTES:
1.) ITEM # 5 ARE SHOWN FOR REFERENCE IN LOCATING CABLE DESTINATIONS ONLY USING SHEET 6 D-IC-11780-0-3

SFT
1 SUPPLY 2 AC LO
2 SUPPLY 2 DC LO
3 GND
1 +5V
2 GND
3 -5.2V
4 GND
J10 J9 J8 J7
P2 P2 P7

OPTIONAL RH780
11780-D
1 -5.2V
2 GND
1 SUPPLY 5 AC LO
2 SUPPLY 5 DC LO
3 GND
J15 J14 J13 +5V +5V RET
P3 P2

OPTIONAL RH780-A
11780-D
1 -5.2V
2 GND
1 SUPPLY 5 AC LO
2 SUPPLY 5 DC LO
3 GND
J15 J14 J13 +5V +5V RET
P4 P1 P2

MS780
1 +5B
2 +5B
3 +5B
4 +5B
1 TERM AC LO
2 TERM DC LO
3 GND
1 -5V
2 +12V
3 +12V
4 -5V
5 GND
6 GND
7 GND
8 GND
9 GND
10 GND
11 GND
12 GND
1 -5.2V
2 GND
1 AC LO
2 DC LO
3 GND
+5 RET
+5V
J14 J15 J16 J17 J18 J19 J20
P3 P2 P5 P2

DW780-A
1 -5.2V
2 GND
1 SUPPLY 2 AC LO
2 SUPPLY 2 DC LO
3 GND
J15 J13 J14 +5V +5RET
P6 P1 P2

KA780-A
1 SUPPLY 3 AC LO
2 SUPPLY 3 DC LO
3 GND
1 SUPPLY 2 AC LO
2 SUPPLY 2 DC LO
3 GND
1 SUPPLY 1 AC LO
2 SUPPLY 2 DC LO
3 GND
1 -5V
2 -5V
3 GND
4 GND
1 +5V FLOPPY/SCP
2 CIBP FLOPPY ON H
3 GND
4 GND
1 T.O.D. +5V
2
3 GND
4 BATTERY DC LO
5
6 GND
J14 J15 J16 J17 J18 +5C +5C RET +5B +5B RET +5A +5A RET J13 J20
P1 P2 P2 P2 P2 P1 P2
ITEM 2
ITEM 33
ITEM 35
ITEM 57
H7111 T.O.D. P1 J1
ITEM 34
SCP P2 J3
RX01-D FLOPPY RELAY P3 J1

ITEM 39
ITEM 3
ITEMS 42,43
ITEMS 46,47
ITEM 56

ITEMS 40,41
ITEMS 44,45
11780-D OPTIONAL H7100 RH780-A PS#5
J3 P1 AC LO DC LO GND
ITEM 38

ITEMS 31,32
H7100 H7102 H7103 MS780-A PS#4
J7 +12V -5B GND -5B
P1 ITEMS 8
J3 P1 1 AC LO 2 DC LO 3 GND
ITEM 7

ITEMS 17,18,19,20
ITEMS 21,22,23,24
H7100 KA780-A PS#3
+5 RET +5V
J3 P1 1 AC LO 2 DC LO 3 GND
ITEM 5

ITEMS 15,16
ITEMS 11,12
ITEMS 9,10
ITEMS 13,14 GND -5V
H7100 H7101 KA780-A DW780-A PS#2
+5 RET +5V
J6 P1 1 AC LO 2 DC LO 3 GND
ITEM 4
ITEM 1

ITEMS 48,49,50,51
ITEMS 52,53,54,55
OPTIONAL H7100 FP780-A PS#1
+5 RET +5V
J3 P1 AC LO DC LO GND
ITEM 56

SEE SHEET #6 FOR REF. PARTS LIST.
(BACKPLANE D.C. INTERCONNECT)

DRN.		PROJECT NO. 11780
CHK.		
ENG.		TITLE 11780 SUB SYSTEM INTERCONNECT
PROJ. ENG.		
MFG. ASS.		
QUALITY ASSY.		
SCALE		SIZE D NUMBER 11780-0 3 REV. B
SHEET 5 OF 6		

REVISIONS: REV. | ORG. CC NO. | CHK

MANUFACTURING RELEASE

DEC FORM NO. CBG 1020

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11780 - C & D (SEE SHEETS 7&8 FOR C,C.V VARIATIONS)

REF ITEM NUMBER	PART NUMBER	DESCRIPTION	FROM	TO	REMARKS
1	7015073-0-0	HARNESS-5V TERMINATOR	HARNESS P1	PS#2 - J6	-5V GND
			HARNESS P2	KA780 - J18	
			HARNESS P5	MS780 - J19	
			HARNESS P6	DW780 - J15	-5V, GND
			HARNESS P7	SFT - J7	±5V, GND
			HARNESS RING TERM (SOLD W/ 5)	DW780+5V-D	+5V
	7015073-0-0	HARNESS-5V TERM	HARNESS RING TERM	DW780+5VRT-D	+5V RETURN
2	7014212-0H	CABLE AC DC LOW	CABLE P1	KA780-J14	
			CABLE P2	DW780-J14	
3	7014212-2M	CABLE AC DC LOW	CABLE P1	KA780-J16	
			CABLE P2	SFT - J8	
4	7014212-2M	CABLE AC DC LOW	CABLE P1	PS#2 - J3	AC DC LOW GND
			P2	SFT - J9	
5	7014212-0M	CABLE AC DC LOW	CABLE P1	PS #3 - J3	AC DC LOW & GND
			P2	KA780 - J15	
7	7014212-1C	CABLE AC DC LOW	CABLE P1	PS #4 - J3	AC DC LOW & GND
			P2	MS780-J20	
8	7014234-0K	CABLE ±5B & +12	CABLE P1	PS #4 - J7	+5B & +12
			P2	MS780-J17	
			P3	MS780 - J14	
9	7014249-1A	CABLE POWER (BLK)	PS#2+5 RET-D	DW780+5 RET-B	PS#2 +5 RETURN
10	7014249-1A	CABLE POWER (BLK)	PS #2+5 RET-C	DW780+5 RET-C	
11	7014249-1C	CABLE POWER (BLK)	PS #2+5 RET-B	KA780+5B RET-B	
12	7014[illegible]-1C	CABLE POWER BLK	PS# 2+5 RET A	KA780+5B RET C	PS# 2+5 RETURN
13	7014530-1A	CABLE POWER (RED)	PS # 2+5 [illegible] D	DW780 [illegible] - B	PS # 2+5
14			C	DW780 [illegible] - C	
15	7014[illegible]-1A	CABLE POWER (RED)	PS# 2+5 B	KA780 [illegible] 3 C	
16	7014[illegible]-1A	CABLE POWER (RED)	PS # 2+5 A	KA780 [illegible] 3 B	PS #2+5
17	7014[illegible]-1J	CABLE POWER (BLK)	PS #2+5 RET D	KA780 [illegible] RET D	PS #3+5 RETURN
18	|	|	C	C	
19			B	B	
20	7014249-1J	CABLE POWER (BLK)	PS #3+5 RET A	KA780+5C - A	PS #3+5 RETURN
21	7014550-1E	CABLE POWER (RED)	PS #3+5 - D	KA780+5C - D	PS #3+5 RETURN
22	|	|	C	C	
23			B	B	
24	7014530-1E	CABLE POWER (RED)	PS #3+5 - A	KA780+5C - A	
29	7014250-0K	CABLE POWER	PS #4+5 RET C	MS780-J15 - A	PS #4+5 RETURN
30	7014[illegible]-0K	RTR MEMORY BLK	PS #4+5 RET D	MS780-J15 B	
31	7014529-0K	CABLE POWER +5 MEMORY (RED)	PS #4+5 C	MS780 - J18 - A	PS #4+5V
32			PS #4+5 D	MS780 - J18 B	
33	7014248-3M	CABLE TOT-O.D-BAT.	HARNESS P2	KA780 - J20	
			P1	H7111 - J1	
34	7014243-21	FLOPPY RELAY	HARNESS P1	KA780 - J13	
	"	SC PWR. HARNESS	P2	SCP - J3	
			P3	RX01 - J1	
35	7014249-0L	CABLE POWER (BLK)	KA780-A+5A RET D	FRAME	
56	7014212-0M	CABLE AC/DC LO	CABLE P1	DW780 - J13	SEE NOTE 3
			CABLE P2	KA780 - J17	

11780-D

REF ITEM NUMBER	PART NUMBER	DESCRIPTION	FROM	TO	REMARKS
1	7015073-0-0	HARNESS-5V TERM.	HARNESS P3	RH780 - J15	-5V GND
1	7015073-0-0	HARNESS-5V TERM.	HARNESS P4	RH780-A- J15	-5V GND
38	7014212-0M	CABLE AC DC LOW	CABLE P1	PS #5 - J3	AC DC LO & GND
	7014212-0M	CABLE AC DC LOW	CABLE P2	RH780 - J13	AC DC LO & GND
39	7014212-0H	CABLE AC DC LOW	CABLE P1	RH780-A- J14	AC DC LO & GND
	7014212-0H	CABLE AC DC LOW	CABLE P2	RH780 - J13	AC DC LO & GND
40	7014243-0L	CABLE POWER (BLK)	PS#5+5 RET- D	RH780-A+5 RET C	PS #5 +5 RETURN
41			C	B	
42	7014243-0L	CABLE POWER (BLK)	PS#5+5 RET- B	RH780 A+5 - C	PS# 5+5 RETURN
43			A	B	
44	7014530-0L	CABLE POWER (RED)	PS #5+5 - D	RH780 A+5 - C	PS #5 + 5V
45			C	B	
46	7014530-0L	CABLE POWER (RED)	PS #5+5 - B	RH780+5 - C	PS #5 + 5V
47			A	B	

FP780
OR
FP780 & KU780 SEE NOTE 1

48	7014249-0L	POWER CABLE BLK	PS #1+5 A RET D	KA780+5A RET D	PS #1+5 RETURN	OPTIONAL
49	|	|	C	C		
50			B	B		
51	7014249-0L	POWER CABLE (BLK)	PS #1+5 A RET-A	KA780+5A RET A	PS #1+5 RETURN	
52	7014530-0L	POWER CABLE (RED)	PS#1+5 - D	KA780+5A - D	PS #1 + 5V	
53	|	|	C	C		
54			B	B		
55	7014530-0L	POWER CABLE (RED)	PS #1+5 - A	KA780+5A - A	PS #1+5V	
56	7014212-0M	CABLE AC DC LO	CABLE P1	PS # 1 J3	AC, DC, LOW	SEE NOTE 3
			P2	KA780 - J17		

KC780 OR KU780 SEE NOTE 2

57	7014530-0L	CABLE POWER (RED)	KA780-A+5A D	KA780-A+5C- B	PS #2+5V

NOTES:

1. REFER TO E-UA-KA780 FOR INSTRUCTIONS OF JUMPER REMOVAL IN CONFIGURATIONS USING PS#1.
2. IF THE FP780 IS INSTALLED REMOVE ITEM 57.
3. IF THE FP780 IS INSTALLED; ITEM #56 P1 CONNECTS TO PS#1-J3, OTHERWISE IT IS CONNECTED TO DW780-J13.

REVISIONS

CHK	CHANGE NO.	REV.

TITLE 11780 SUB-SYSTEM INTERCONNECT
SIZE D | CODE 1C | NUMBER 11780-0-3 | REV B
SCALE — | SHEET 6 OF 8 | DIST.

NOTES:

1.) ITEM # 5 ARE SHOWN FOR REFERENCE 2) W-LISTING CABLE DESTINATIONS ONLY USED SHEET 8 D.W. 11780-0-3

2.) THE SBI IS TERMINATED IN SLOT #1 OF THE MS780 BACKPLANE WITH THE TRM (M9045) MODULE.

P14 P15 P16 P17 P18 P19 P20 P21

+BUS AC LO
3 BUS DC LO
1 GND

4 +5V
GND
2 +15V
13 -15V
GND

RK611
DZ11

OPTIONAL { 1. DQ11-DE C.R 2. DQ11-CE

P7 N.C. P3 N.C. P4 N.C.

ITEM 25

5A13825
1 BUS AC LO
2 GND
3 BUS DC LO
1 SUPPLY 5 AC LO
2 GND
3 SUPPLY 5 DC LO
P13 J2 J1 P12

H7100
H7101
KA780-A
OPTIONS

J10 P1 J3 P3
1 AC LO
2 DC LO
3 GND

PS #5

TRM

1 +5V
2 +5V
3 +5V
4 +5V

1 TERM AC LO
2 TERM DC LO
3 GND

1 -5V
2 +12V
3 +12V
4 -5V
5 GND
6 GND
7 GND
8 GND
9 GND
10 GND
11 GND
12 GND

1 -5.2V
2 GND

1 AC LO
2 DC LO
3 GND

+5 RET +5V J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 P3 P1 P2 P5 P4

ITEM 6

J1 P2
J2 P2

ITEM 3

ITEMS 4

H7100
H7101
KA780-A

1 AC LO
2 DC LO
3 GND

P1 P2

ITEMS 8

ITEM 7

PS #4

ITEMS 21,22,23,24

H7100
KA780-A

1 AC LO
2 DC LO
3 GND

J3 P1

ITEM 5

PS #3

ITEMS 17,18,19,20

1 SUPPLY 5 AC LO
2 SUPPLY 5 DC LO
3 GND

1 +5V
2 GND
3 GND
4 +5V

J11 J12 J13 J14 +5V +5RET P3 P1 P2

ITEMS 11,12

ITEMS 9,13

ITEMS 15,16

-5V

H7100
H7101
KA780-A
DW 780-A

1 AC LO
2 DC LO
3 GND

J6 P1

ITEM 9

PS #2

ITEM 1

1 SUPPLY 3 AC LO
2 SUPPLY 3 DC LO
3 GND

1 SUPPLY 2 AC LO
2 SUPPLY 2 DC LO
3 GND

1 SUPPLY 1 AC LO
2 SUPPLY 2 DC LO
3 GND

1 -5V
2 +5V
3 GND
4 GND

J10 J15 J16 J17 J18 +5C +5C RET +5B +5B RET +5A +5A RET J19 J20 P1 P2 P1 P2 P2 P2 P2

ITEM 2

ITEMS 14,15,16,17

ITEMS 52,53,54,55

+5 +5V RET

OPTIONAL

H7100
FP780-A

J3 P1
AC LO
DC LO
GND

ITEM 56

PS #1

KA780-A

1 +5V FLOPPY/SCP
2 CLR FLOPPY ON H
3 GND
4 GND

1 T.O.D. +5V
2
3 GND
4 BATTERY DC LO
5
6 GND

ITEM 35

ITEM 57

ITEM 33

H7111
T.O.D.
P1 J1

ITEM 34

SCP
P2 J3

RX01-D
FLOPPY
RELAY
P3 J1

THIS SHEET FOR CU & CV VARIATIONS ONLY

SEE SHEET #8 FOR REF. PARTS LIST.

(BACKPLANE D.C. INTERCONNECT)

TITLE			NUMBER	REV.
11780 SUB SYSTEM	D	IC	11780-0-3	B

TW 1

25

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11780-CU/CV

REF ITEM NUMBER	PART NUMBER	DESCRIPTION	FROM	TO	REMARKS
1	70-5073-Ø-Ø	HARNESS -5V TERMINATOR	HARNESS - P1	PS#2 - J6	-5V GND
			HARNESS - P2	KA78Ø-J18	
			HARNESS - P5	MS78Ø-J19	
			HARNESS - P6	DW78Ø-J15	-5V GND
			HARNESS - P7	N.C.	±5V GND
			HARNESS RING TERM. (RED WIRE)	DW78Ø +5V-D	-5V
	7Ø15Ø73-Ø-Ø	HARNESS-5V TERMINATOR	HARNESS RING TERM. (BLK WIRE)	DW78Ø +5V RET-D	+5V RETURN
2	7Ø14212-ØH	CABLE AC DC LOW	CABLE - P1	KA78Ø-J14	AC,DC LOW+GND
			CABLE - P2	DW78Ø-J14	
3	7Ø14212-2M	CABLE AC DC LOW	CABLE - P1	KA78Ø-J16	AC DC LOW+GND
			CABLE - P2	ITEM #6-J1	
4	7Ø14212-2M	CABLE AC DC LOW	CABLE - P1	PS#2 - J3	AC DC LOW+GND
			CABLE - P2	ITEM #6-J2	
5	7Ø14212-ØM	CABLE AC DC LOW	CABLE - P1	PS#3 - J3	AC DC LOW+GND
			CABLE - P2	KA78Ø-J15	
6	7Ø -ØJ	AC DC LOW WYE CABLE	CABLE - P1	MS78Ø-J16	AC,DC LOW+GND
			CABLE - J1	ITEM #3-J2	
			CABLE - J2	ITEM #4-J2	
7	7Ø14212-1C	CABLE AC DC LOW	CABLE - P1	PS#4 - J3	AC DC LOW+GND
			CABLE - P2	MS78Ø-J2Ø	
8	7Ø14212-ØK	CABLE ±5B+ +12V	CABLE - P1	PS#4 - J7	±5B+12V+GND
			CABLE - P2	MS78Ø-J17	
			CABLE - P3	MS78Ø-J14	
9	7Ø14249-1A	CABLE POWER (BLK)	PS#2 +5 RET - D	DW78Ø-J13	PS#2-5 RETURN
10	7Ø14249-1A	CABLE POWER (BLK)	PS#2 +5 RET - C	DW78Ø-J13	
11	7Ø14249-1C	CABLE POWER (BLK)	PS#2 +5 RET - B	KA78Ø-J13	
12	7Ø14249-1C	CABLE POWER (BLK)	PS#2 +5 RET - A	KA78Ø+5C RET-C	PS#2 +5 RETURN
13	7Ø14530-1A	CABLE POWER (RED)	PS#2 +5V - D	DW78Ø +5V-D	PS#2 +5V
14	7Ø14530-1A	CABLE POWER (RED)	PS#2 +5V - C	DW78Ø +5V-C	
15	7Ø14530-1A	CABLE POWER (RED)	PS#2 +5V - B	KA78Ø +5C-B	
16	7Ø14530-1A	CABLE POWER (RED)	PS#2 +5V - A	KA78Ø +5C-B	PS#2 +5V
17	7Ø14249-1J	CABLE POWER (BLK)	PS#3 +5V RET - D	KA78Ø +5C RET-D	
18			-C	-C	
19			-B	-B	
20	7Ø14249-1J	CABLE POWER (BLK)	PS#3 +5V RET - A	KA78Ø +5C RET-A	PS#3 +5 RETURN
21	7Ø14530-1E	CABLE POWER (RED)	PS#3 +5V - D	KA78Ø +5C-B	PS#3 +5 RETURN
22			-C	-C	
23			-B	-B	
24	7Ø14530-1E	CABLE POWER (RED)	PS#3 +5V - A	KA78Ø +5C-A	
25	7Ø/6951-Ø-Ø	UNIBUS PWR HARNESS	HARNESS - P1	PS#5 - J1Ø	PS#5 +15V,-15V+GND
			HARNESS RING TERM (BLK WIRE) - P2	PS#5 +5 RET - D	PS#5 +5 RETURN
			HARNESS - P3	PS#5 - J3	AC,DC LOW+GND
			HARNESS RING TERM (RED WIRE) - P4	PS#5 +5V - D	PS#5 +5V
			-P5	-C	
			-P6	-B	
			HARNESS RING TERM (RED WIRE) - P7	PS#5 +5V - A	
			HARNESS RING TERM (BLK WIRE) - P8	PS#5 +5 RET-D	PS#5 +5 RETURN
			-P9	-C	
			-P10	-B	
			HARNESS RING TERM (BLK WIRE) - P11	PS#5 +5 RET-A	
	7Ø/6951-Ø-Ø	UNIBUS PWR HARNESS	HARNESS - P12	ADAPTER BOARD J1	AC,DC LOW+GND

11780-CU/CV

REF ITEM NUMBER	PART NUMBER	DESCRIPTION	FROM	TO	REMARKS
25	7Ø/6951-Ø-Ø	UNIBUS PWR HARNESS	HARNESS - P13	ADAPTER BOARD-J2	ADAPT. AC,DC LOW+GND
			-P14	N.C. (OPTIONAL)	
			-P15	RK611 - P2	
			-P16	RK611 - P3	
			-P17	RK611 - P4	
			-P18	NC (OPTIONAL)	
			-P19		
			-P20		
	7Ø/6951-Ø-Ø	UNIBUS PWR HARNESS	HARNESS - P21	NC (OPTIONAL)	
29	7Ø15Ø73-Ø-Ø	CABLE POWER RTR MEMORY (BLK)	PS#4 +5V RET -C	MS78Ø-J15-A	PS#4 +5 RETURN
30			-D	-B	
31	7Ø14529-Ø-Ø	CABLE POWER +5 MEMORY (RED)	PS#4 +5V -C	MS78Ø-J18-A	PS#4 +5V
32			-D	-B	
33	7Ø14243-3M	CABLE TO TOD CARD	HARNESS - P2	KA78Ø-J22	
			-P1	H7111-J1	
34	7Ø14243-21	FLOPPY RELAY SC PWR HARNESS	HARNESS - P1	KA78Ø-J19	
			-P2	SCP -J3	
			-P3	RX01 - J1	
35	7Ø14249-ØL	CABLE POWER (BLK)	KA78Ø +5A RET-D	FRAME	
56	7Ø14212-1M	CABLE AC/DC LO	CABLE - P1	DW78Ø-J13	SEE NOTE #3
			CABLE - P2	KA78Ø-J17	

FP78Ø
OR
FP78Ø + KU78Ø

SEE NOTE 1

48	7Ø14249-ØL	POWER CABLE (BLK)	PS#1 +5A RET - D	KA78Ø+5A RET-D	PS#1 + 5 RETURN
49			-C	-C	
50			- B	-B	
51	7Ø14249-ØL	POWER CABLE (BLK)	PS#1 +5A RET - A	KA78Ø-5A RET-	
52	7Ø14530-ØL	POWER CABLE (RED)	PS#1 +5V - D	KA78Ø-5A-D	PS#1 +5A
53			-C	-C	
54			-B	-B	
55	7Ø14530-ØL	POWER CABLE (RED)	PS#1 +5V - A	KA78Ø+5A-A	
56	7Ø14212-1M	CABLE AC DC LO	CABLE - P1	PS#1 - J3	AC,DC LOW & GND
			CABLE - P2	KA78Ø-J17	

OPTIONAL
SEE NOTE 3

KC78Ø OR KU78Ø

SEE NOTE 2

57	7Ø14530-ØL	CABLE POWER (RED)	KA78Ø +5A - D	KA78Ø+5C - B	PS#2 +5V

NOTES:

1. REFER TO E-UA-KA78Ø FOR INSTRUCTIONS OF JUMPER REMOVAL IN CONFIGERATIONS USING PS#1
2. IF THE FP78Ø IS INSTALLED. REMOVE ITEM 57.
3. IF THE FP78Ø IS INSTALLED: ITEM #56 P1 CONNECTS TO PS#1-J3 OTHERWISE IT IS CONNECTED TO DW78Ø-J13.

THIS SHEET FOR CU+CV VARIATION ONLY

REVISION HISTORY		
DATE	ECO NUMBER	REV.

TITLE 11780 SUB-SYSTEM INTERCONNECT

DOCUMENT NUMBER: SIZE D | CODE DTC | NUMBER 11780-0-3 | REV

CAD 137A

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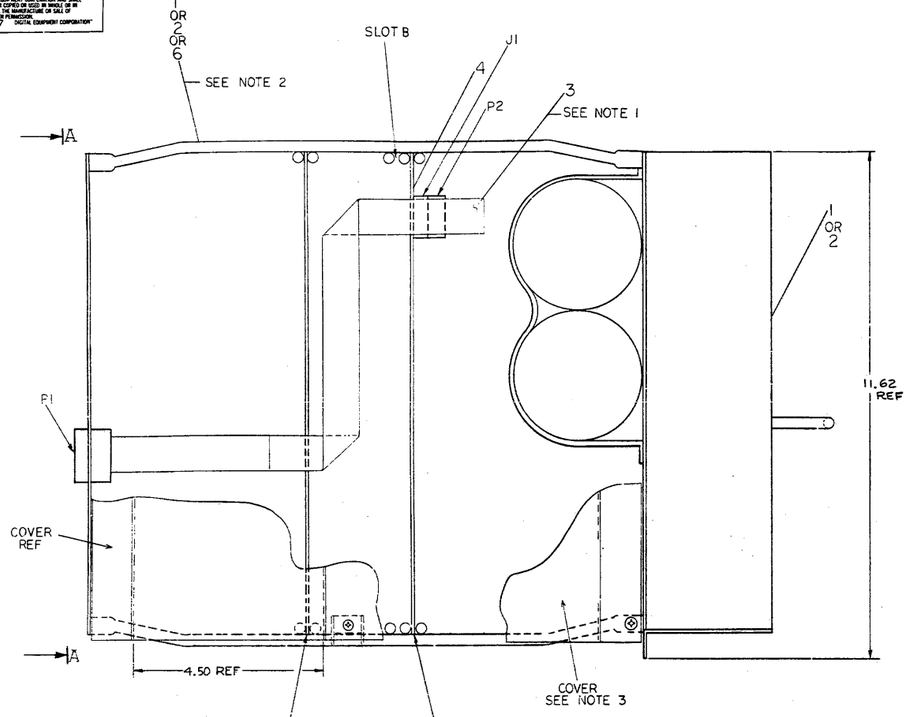
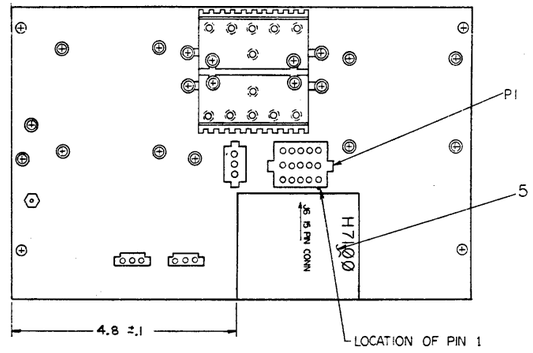
LEGEND	
PART NO	VARIATION
7014956-00	115V
7014956-01	230V
7014956-02	2020 OPTION

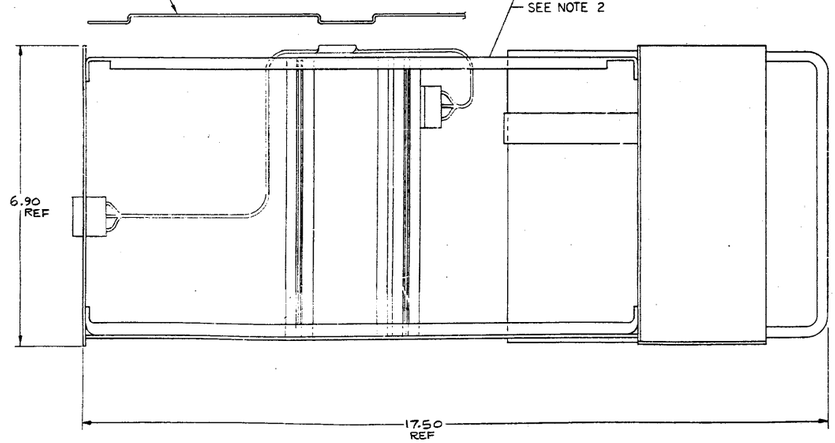
NOTES:

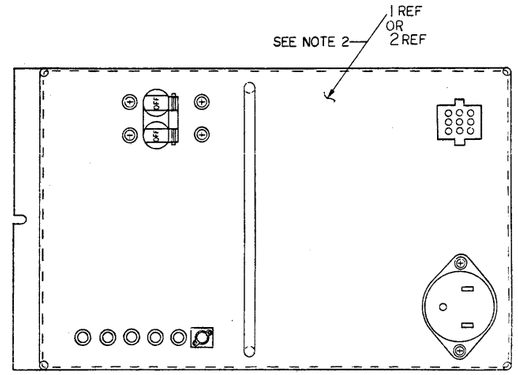
1. ROUTE CABLE -5 OUTPUT (ITEM#3) BEHIND -5.2 REGULATOR (ITEM#4) AND AROUND BARS TO CUTOUT IN REAR PANEL AS SHOWN.
2. THE VIEWS SHOWN ON THIS DRAWING DEPICT THE ASSEMBLY AS IT WOULD LOOK IN THE -00 OR -01 VARIATION. THE -02 VARIATION WOULD LOOK SIMILAR EXCEPT THAT THE FRONT PANEL OF THE H7100 WOULD NOT BE INCLUDED. SEE DEC DRAWING E-UA-H7100-0-0 FOR FURTHER INFORMATION.
3. AFTER INSTALLATION OF REG BOARDS AND CABLE IS COMPLETE, REINSTALL COVER AS SHOWN.





VIEW A-A





1	—	—	POWER SUPPLY(H7100-0)	E-UA-H7100-0-0	6
1	1	1	DECAL (UBA OPTION)	36147762-00	5
1	1	1	-5.2 REGULATOR	D-UA-5412560-00	4
1	1	1	CABLE -5 OUTPUT	1700166-00	3
—	1	—	POWER SUPPLY(H7100-B)	E-UA-H7100-B0	2
—	1	—	POWER SUPPLY(H7100-A)	E-UA-H7100-A0	1
7014956-02 / 7014956-01 / 7014956-00	DESCRIPTION			DWG./PART NO.	ITEM NO.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

CLASS OF ACCURACY (CHECK ONE)	NOMINAL DIMENSION RANGE INCHES					
	OVER 0 TO 6	OVER 6 TO 30	OVER 30 TO 120	OVER 120 TO 315	OVER 315 TO 1000	OVER 1000 TO 2000
MEDIUM	.005	.010	±.012	±.015	±.020	±.04
PREFERRED	±.012	±.016	±.025	±.04	±.063	±.1

QUANTITY & VARIATION

THIRD ANGLE PROJECTION

REMOVE BURRS AND BREAK SHARP CORNERS

DO NOT SCALE DWG.

DRN. [illegible] 12/77
CHK'D [illegible] 12/77
ENGR [illegible] 12-20
PROJ. ENGR [illegible] 12-20-77
PROD. [illegible] 12-20-77
NEXT HIGHER ASSY.

FIT-IT USED ON VAX 11/780

digital

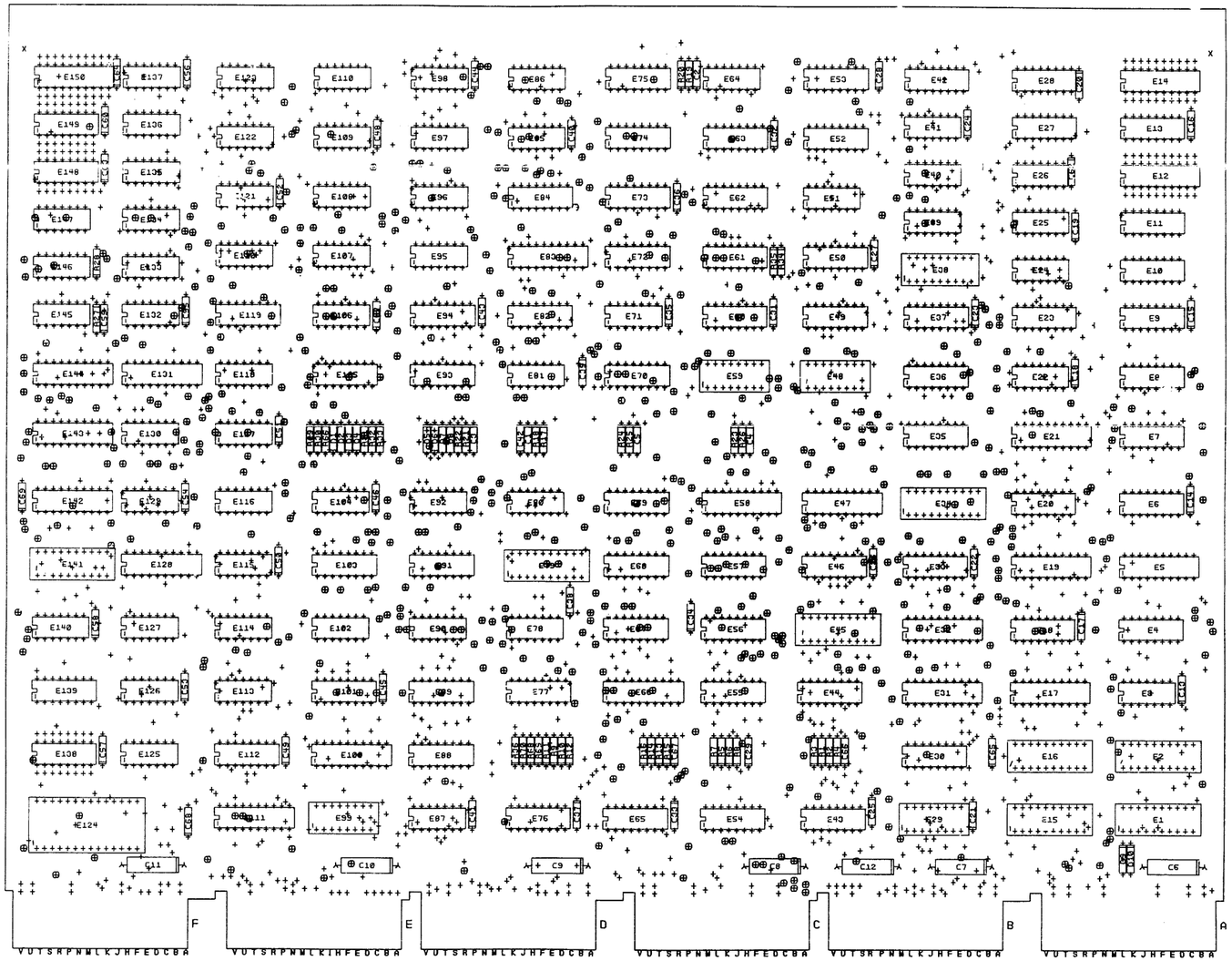
TITLE: SUPPLY, UBA OPTION

MATERIAL: SEE PARTS LIST
FINISH:
SIZE: E | CODE | NUMBER: AD 7014956-0 | REV.
SCALE: NONE
SHEET: OF | DIST.

1 TW

REVISIONS: REV. | CHANGE NO. | CHK

COMPONENT SIDE VIEW



SIGNATURES	DATE		
DRN.			
CHK. D.E. Tansky	24/72		
PROJ.ENG.			
PROD.			
SCALE			
DATE			
NEXT HIGHER ASSY.			

digital

TITLE: SBL

SIZE/CODE: B 104

NUMBER: M3213-0-0

REV:

ETCH REV.

P.C. DESIGN PATH

BASE REV.

CHG/CHANGE NO. REV

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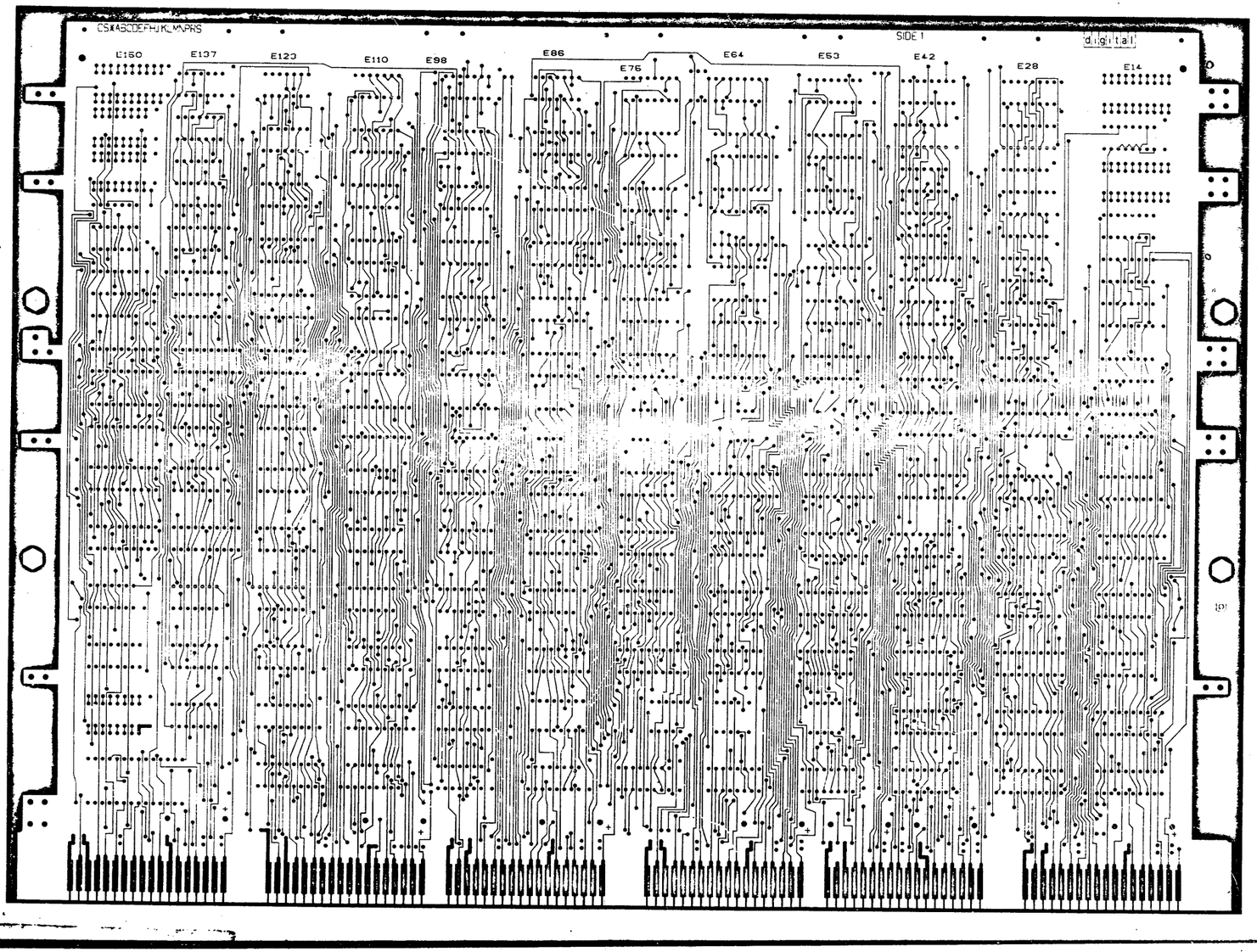
E U A M3213 - 0 - 0

M8218 5012602C-P1

LAYER 1



REVISIONS		
DWG NO	REV	

TITLE	SIZE	CODE	NUMBER	REV
SBL	E	UA	MS218-2-0	D
SCALE 2/1	SHEET 2 OF 3			

LAYER 4

M8218 SBL 50126020-P1 SIDE 2

REVISIONS		
#	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV
SBL	E	UA	M8218-2-0	D
SCALE 2/1 SHEET 3 OF 3				

UA M8218-0-0 D

LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION		QTY	REFERENCE DESIGNATORS
1	1	D-MD-5012602-0-0	5012602-00	M8218		1	
2	2		1910532-00	74S00 NAND GATE-QUAD 2INS		8	E39,E51,E64,E102,E107,E118,
						CONT	E137,E140
3	3		1912388-00	74S02 NOR GATE-QUAD 2IN,POS		5	E25,E81,E95,E117,E121
4	4		1910534-00	74S04 INVERTER GATE-HEX 1IN		9	E26,E41,F104,E113,E123,E125,
						CONT	E130,E132,E135
5	5		1912389-00	74S08 AND GATE-QUAD 2IN,POS	14	4	E96,E98,E106,E126
6	6		1910536-00	74S10 NAND GATE-TRIPLE 3IN		6	E40,E85,E109,E114,E136,E145
7	7		1910537-00	74S11 AND GATE-TRIPLE 3INPUT		2	E97,E120
8	8		1910539-00	74S20 NAND GATE-DUAL 4INPUT		1	E127
9	9		1912746-00	DEC 74S37 NAND GATE-QUAD 2IN		2	E24,E71
10	10		1910541-00	74S40 NAND GATE-DUAL 4IN,BUFFER	16	1	E147
11	11		1910542-00	74S64 A-O-I XPDR GATE,4-2-3-2	14	12	E86,E90,E92,E108,E110,E115,
						CONT	E133,E116,E122,E129,E134,E146
12	12		1910544-00	74S74 FF-D DUAL,EDGE TRIGGER		2	E78,E80
13	13		1910545-00	74S112 FF-JK DUAL,EDGE TRIGGER		7	E61,E72,E73,E82,E94,E105,E93
14	14		1911983-00	74S133 NAND GATE-POSITIVE 13IN		2	E69,E77
15	15		1911675-00	74S138 DECODER-THREE INPUT		1	E112
16	16		1912845-00	LS153 MUX 1 OF 4 (DUAL) & DATA SEL		8	E23,E35,E36,E37,E49,E60,E91,
						CONT	E103
17	17		1910547-00	74S153 MUX 1 OF 4 (DUAL)		2	E9,E10
18	18		1910548-00	74S157 MUX 1 OF 2 (QUAD)		3	E7,E18,E20
19	19		1913839-00	74LS165 SHIFT REG.,8BIT		6	E4,E6,E8,E67,E70,E88
20	20		1910550-00	74S174 FF-D HEX		4	E30,E33,E44,E101
21	21		1910957-00	74S175 FF-D QUAD COMMON CLOCK		4	E74,E75,E84,E119
22	22		1910552-00	74S194 SHIFT REG.,4BIT RIGHT/LEFT		8	E27,E28,E13,E50,E52,E62,E63,
						CONT	E89
23	23		1911641-00	SN 74S257 MUX,QUAD 2 TO 1		4	E55,E56,F57,E68
24	24		1913887-00	74S258 MUX 1 OF 2(QUAD)TRI-STATE		1	E46
25	25		1912860-00	LS259 LATCH 8BIT		1	E11

REVISION HISTORY			VARIATIONS FOR THIS ASSY.
CHK	ECO NO	REV	
---	INIT	D	00

FIRST USED ON:

MADE BY:	M. FUNARO	DATE: 24-AUG-78
CHECKED:	F. SMART	DATE: 24-AUG-78
DSN.ENG.:	T. ERMOLOVICH	DATE: 24-AUG-78
PROD.:	M. TERELLO	DATE: 24-AUG-78
RESP.ENG.:	T. ERMOLOVICH	DATE: 24-AUG-78

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE
PARTS LIST

SBL

SIZE	CODE	DOCUMENT NUMBER	REV
K	PL	M8218-0-DBP	D

EDIT# 5

ASSY.NO.: D-UA-M8218-0-0

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LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
26	26		1911573-00	74S280 PARITY GEN/CHKR,9BIT ODD/EVEN	1	E3
27	27		1913670-00	74S373 LATCH 8BIT TRASP TRISTATE	9	E17,E31,E32,E83,E100,E111,
					CONT	E128,E131,E144
28	28		1912872-00	LS377 FF-D 8BIT W/ENABLE	6	E5,E19,E21,E47,E58,E66
29	29		1912863-00	LS273 FF-D OCTAL W/CLEAR	2	E34,E79
30	30		1912096-00	DEC 74S86 XOR GATE,QUAD 2IN	1	E22
31	31		1913788-00	26S10 TRANSCEIVER,BUS,QUAD	4	E29,E48,E59,E99
32	32		1911469-00	DEC 8640 RECEIVER,BUS,QUAD,UNIBUS,Q-BU	1	E87
33	33		1912731-00	DEC 8646 TRANSCEIVER,4BIT BUS	4	E1,E2,E15,E16
34	34		1913294-00	93S16 COUNTER,SYNCH UP BINARY	2	E42,E53
35	35		1911415-00	10125 ECL TO TTL TRNSLTR ECL 16 P	4	E43,E54,E65,E76
36	36		1913730-00	DC 101 PRIORITY ARBITRATOR CHIP 28P	1	E124
37	37		1913888-00	DC 102 EQUALS CHECKER 8BIT	2	E45,E141
38	38		1012084-01	8 MFD 25V G% 30D AL EL (10-12	7	C6-C12
39	39		1012784-00	.047 MFD 50V -20+80 CER	60	C1-C5,C13-C29,C31-C60,C62-C69
40	40		1103041-00	DEC 777 QS=12PCB PIV= 8VS	2	D9,D10
41	41		1302957-00	121 1/4W 1% RN55D-F 100PPM (13-00	12	R1,R2,R5,R6,R9,R10,R13,R14,
					CONT	R27,R68,R70,R34
42	42		1300250-00	150 1/4W 5% CC (13-00	11	R3,R4,R7,R8,R11,R12,R15,R16,
					CONT	R29,R31,R32
43	43		1300271-00	220 1/4W 5% CC (13-00	2	R36,R69
44	44		1300295-00	330 1/4W 5% CC (13-00	5	R17,R19,R21,R23,R24
45	45		1301424-00	680 1/4W 5% CC (13-00	5	R18,R20,R22,R25,R26
46	46		23019B1-00	B1-01 PROM,	1	E143
47	47		23020B1-00	B1-01 PROM,	1	E142
48	48		1210711-02	HANDLE,HEX MODULE,10-1/2 $	1	
49	49		9000024-01	EYELET, ROLLED FLANGE, .121 OD X .196 LG	12	
50	50		23019F1-00	F1-01 PROM, 1	1	E38
51	51		9105740-55	WIRE(WRAP)30AWG UL1423 (91-00	A/R	

52 NOTE: NOTE 1:LINE 46,NOT USED COMPONENTS REF. DES.; P28,R30,R33,R35,R66,D1-D8
53 NOTE: NOTE 2:LINE 51,SPARES REF. DES.;E12,E14,E138,E139,E148-E150

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	TITLE: PARTS LIST SBL	SIZE: K	CODE: PL	DOCUMENT NUMBER: M8218-0-DBP	REV: D

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AA2, BA2, CA2, DA2, EA2, FA2,
AV1, BV1, CV1, DV1, EV1, FV1.

+5V DC
AH1, BH1, CH1, DH1, EH1, FH1, AC2, BC2, CC2, DC2, EC2, FC2
AN2, BN2, CN2, DN2, EN2, FN2, AT1, BT1, CT1, DT1, ET1, FT1
GND
-5V DC
BL2
8uf 250V10B C6-11
8uf 25V10B C12
C13-28, 31, 32, 34-36, 38-60, 62-69.
C29, 33, 37
+5V DC
GND
-5V DC

T1 (2) TIMEOUT ADDR 74LS377 (SBLB, J)

T3 (2) ADDR REG 74LS377 (SBLB, J)

PA<17:2> 13

ADDRESS MUX (SBLB, J) 745257

PA<11:9>L 3

FAST ADDRESS MUX 745258 (SBLB) 3

ISR CODE 2 — 74LS 259 (SBLA) — 4

MD BUS H <15:ϕϕ, P(15-8), P(7-ϕ)> 18

T0 (2) WRITE DATA 74LS377 16

MD DATA DRIVERS (3) MS373 (SBLC) 18

ENABLE SBI DATA L

T1 (3) WC ADDR READ DATA 74S174 (SBLC) 18

XMIT MUX 74S153 74S157 (SBLA)

SBI XCVR'S (4) 8640 (SBLE)

SBI BUS B<15:ϕϕ>

SBI ARBITRATION CHIP (1)
RAISE HOLD
RAISE H — 74SϕB (SBLU)
DCIϕ1 (SBLV)
MY BUS TR L
TR<15:ϕϕ>L
ARB OK L

ID BUS XCVR'S 26S1ϕ (4) (SBLF, H)

T3 HOLDING LATCH 74S373 (SBLS)

ID BUS MUX (SBLF, H) 74LS 153

T1 (1) MAINT REG 74S174 SBLN 6

T1 ERROR REG 74S112 74S194 SBLM 14

ID BUS <15:ϕϕ>

CACHE PARITY ERRORS 14

(2) PARITY ERR REG 74LS273 (SBLN) 16

EN ID DRIVERS L

(SLOT 2)

REVISIONS			
DWK	CHANGE NO.		REV.
	M8218-00001	T. ERMOLOVICH 9-27-77	B
	M8218-00002	T. ERMOLOVICH 16 JAN 78	C
	M8218-TW003	T. ERMOLOVICH 3-7-78	D
	M8218-TW004	T. ERMOLOVICH 7-27-78	E

DEC FORM NO. DBD 132-0

DRN.		7-27-77
CHK'D		
ENG.		9-3-77
PROJ. ENG.		9-3-77
PROD.		
NEXT HIGHER ASSY.		
SCALE		
SHEET 1 OF 17		

FIRST USED ON 11780

digital

TITLE
SBI INTERFACE LOW BITS

SIZE D | CODE CS | NUMBER M8218-0-1 | REV. E

DIST.

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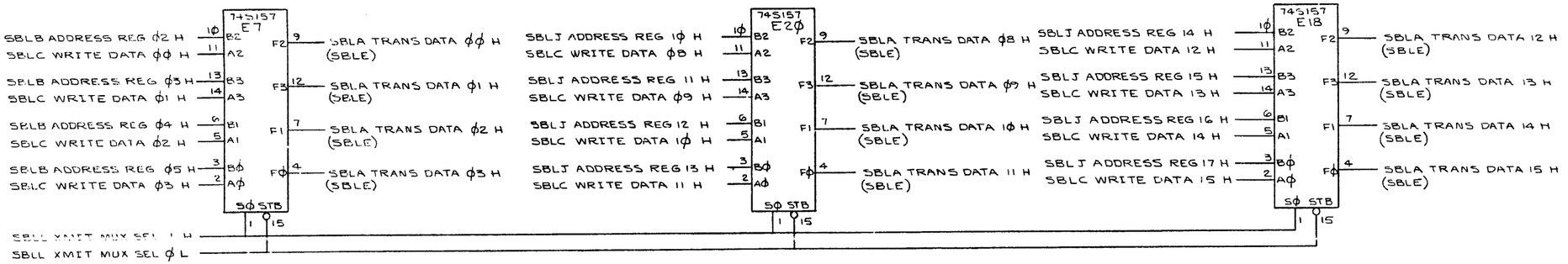
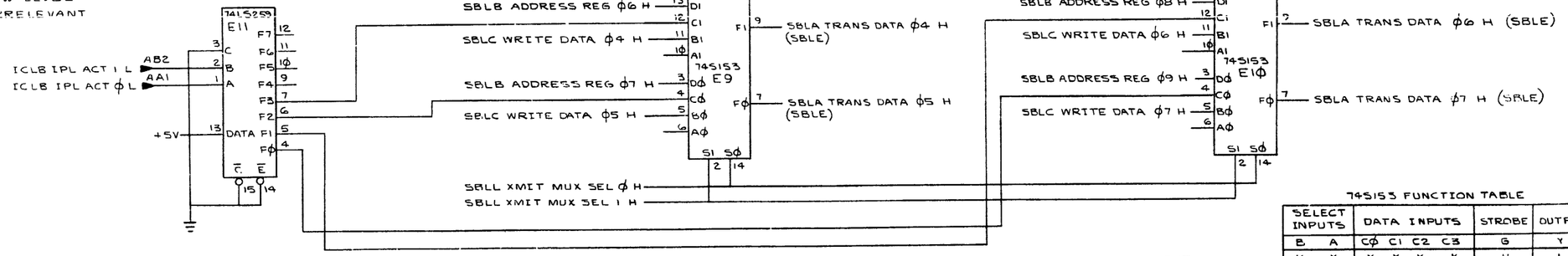
TRANSMIT MULTIPLEXERS



74S157 FUNCTION TABLE

INPUTS				OUTPUT
STROBE	SELECT	A	B	Y
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT



74S153 FUNCTION TABLE

SELECT INPUTS		DATA INPUTS				STROBE	OUTPUT
B	A	CØ	C1	C2	C3	G	Y
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT
SELECT INPUTS A AND B ARE COMMON TO BOTH SECTIONS

74LS259 FUNCTION TABLE

INPUTS		OUTPUT OF ADDRESSED LATCH	EACH OTHER OUTPUT	FUNCTION
CLEAR	$\overline{G}$			
H	L	D	Q_{i0}	ADDRESSABLE LATCH
H	H	Q_{i0}	Q_{i0}	MEMORY
L	L	D	L	8-LINE DEMULTIPLEXER
L	H	L	L	CLEAR

H = HIGH LEVEL, L = LOW LEVEL,
D = THE LEVEL AT THE DATA INPUT,
Q_{i0} = THE LEVEL OF Q1, (Ø, 1, 7 AS APPROPRIATE) BEFORE THE INDICATED STEADY STATE INPUT CONDITIONS WERE ESTABLISHED

LATCH SELECTION TABLE

SELECT INPUTS			LATCH ADDRESSED
C	B	A	
L	L	L	Ø
L	L	H	1
L	H	L	2
L	H	H	3
H	L	L	4
H	L	H	5
H	H	L	6
H	H	H	7

NOTE: ALL RESISTORS ARE 1/4W UNLESS OTHERWISE SPECIFIED

REVISIONS		
CHK	CHANGE NO.	REV.

(SBI TRANSMIT DATA LOGIC) (SLOT 2)

TITLE		SIZE	CODE	NUMBER	REV.
SBI INTERFACE LOW BITS	(SBLA)	D	CS	M8218-Ø-1	E
SCALE —	SHEET 2 OF 27	DIST.			

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74LS257 & 74LS258 FUNCTION TABLE

INPUTS				OUTPUT Y	
OUTPUT CONTROL	SELECT	A	B	'5257	'5258
H	X	X	X	Z	Z
L	L	L	X	L	H
L	L	H	X	H	L
L	H	X	L	L	H
L	H	X	H	H	L

H = HIGH LEVEL L = LOW LEVEL
X = IRRELEVANT Z = HIGH IMPEDANCE (OFF)

74LS377 FUNCTION TABLE
(EACH FLIP-FLOP)

INPUTS			OUTPUTS	
$\overline{G}$	CLOCK	DATA	Q	$\overline{Q}$
H	X	X	Q_0	$\overline{Q}_0$
L	↑	H	H	L
L	↑	L	L	H
X	L	X	Q_0	$\overline{Q}_0$

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT

ADDRESS MUX

74S258 E46

SBLC READ DATA φ7 H
SBLJ ADDRESS REG 1φ H
SBLC READ DATA φ8 H
SBLJ ADDRESS REG 11 H
SBLC READ DATA φ9 H
Bφ
Aφ
ENAB Sφ

F3 → 12 EF1 → SBLB PA φ9 L (TBMK)
F2 → 9 EF2 → SBLB PA 1φ L (TBMK)
F1 → 7 EH2 → SBLB PA 11 L (TBMK)
Fφ → 4

ADDRESS REG

74LS377 E58

BUS PA φ2 H FV2 3
BUS PA φ3 H FS1 4
BUS PA φ4 H FR2 7
BUS PA φ5 H FR1 8
BUS PA φ6 H FL1 13
BUS PA φ7 H FK2 14
BUS PA φ8 H FK1 17
TBMK PA φ9 H FF1 18

Dφ Qφ 2
D1 Q1 5
D2 Q2 6
D3 Q3 9
D4 Q4 12
D5 Q5 15
D6 Q6 16
D7 Q7 19
ENAB CLK 1 11

SBLK BUFFER FULL H
SBLW SBI T3 CPT2 A H

TIMEOUT ADDRESS REG

74LS377 E21

Dφ Qφ 3 2 → SBLB TIMEOUT ADRS φ2 H (SBLF)
D1 Q1 4 5 → SBLB TIMEOUT ADRS φ3 H (SBLF)
D2 Q2 7 6 → SBLB TIMEOUT ADRS φ4 H (SBLF)
D3 Q3 8 9 → SBLB TIMEOUT ADRS φ5 H (SBLF)
D4 Q4 13 12 → SBLB TIMEOUT ADRS φ6 H (SBLF)
D5 Q5 14 15 → SBLB TIMEOUT ADRS φ7 H (SBLF)
D6 Q6 17 16 → SBLB TIMEOUT ADRS φ8 H (SBLF)
D7 Q7 18 19 → SBLB TIMEOUT ADRS φ9 H (SBLF)
ENAB CLK 1 11

SBLS CP TIMEOUT LTH H
SBLW SBI T1 CPTφ A H

SBLB ADDRESS REG φ2 H (SBLA,R)
SBLB ADDRESS REG φ3 H (SBLA)
SBLB ADDRESS REG φ4 H (SBLA)
SBLB ADDRESS REG φ5 H (SBLA)
SBLB ADDRESS REG φ6 H (SBLA)
SBLB ADDRESS REG φ7 H (SBLA)
SBLB ADDRESS REG φ8 H (SBLA)
SBLB ADDRESS REG φ9 H (SBLA)

ADDRESS MUX

74S257 E57

SBLK EXPECT RD L
SBLC READ DATA φφ H
SBLC READ DATA φ1 H
SBLC READ DATA φ2 H
SBLC READ DATA φ3 H
Bφ
Aφ
OUT CONT Sφ

F3 → 12 FV2 → BUS PA φ2 H
F2 → 9 FS1 → BUS PA φ3 H
F1 → 7 FR2 → BUS PA φ4 H
Fφ → 4 FR1 → BUS PA φ5 H

ADDRESS MUX

74S257 E56

SBLC READ DATA φ4 H
SBLC READ DATA φ5 H
SBLC READ DATA φ6 H
Bφ
Aφ
OUT CONT Sφ

F3 → 12 FL1 → BUS PA φ6 H
F2 → 9 FK2 → BUS PA φ7 H
F1 → 7 FK1 → BUS PA φ8 H
Fφ → 4

SBLS SELECT SBI ADR L
SBLS WRITE INVALID L

REVISIONS

CHK	CHANGE NO.	REV.

(ADDRESS LOGIC) (SLOT 2)

TITLE (SBLB) SBI INTERFACE LOW BITS
SIZE D CODE CS NUMBER M8216-0-1 REV. E
SCALE — SHEET 3 OF 29 DIST.

DEC FORM NO. DRD 130

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READ DATA REG

74S174 E3Ø

SBLE RECEIVE DATA Ø4 H → SBLC READ DATA Ø4 H (SBLB)
SBLE RECEIVE DATA Ø5 H → SBLC READ DATA Ø5 H (SBLB)
SBLE RECEIVE DATA Ø6 H → SBLC READ DATA Ø6 H (SBLB)
SBLE RECEIVE DATA Ø7 H → SBLC READ DATA Ø7 H (SBLB)
SBLE RECEIVE DATA Ø8 H → SBLC READ DATA Ø8 H (SBLB)
SBLE RECEIVE DATA Ø9 H → SBLC READ DATA Ø9 H (SBLB)

74S174 E44

SBLE RECEIVE DATA 1Ø H → SBLC READ DATA 1Ø H (SBLJ)
SBLE RECEIVE DATA 11 H → SBLC READ DATA 11 H (SBLJ)
SBLE RECEIVE DATA 12 H → SBLC READ DATA 12 H (SBLJ)
SBLE RECEIVE DATA 13 H → SBLC READ DATA 13 H (SBLJ)
SBLE RECEIVE DATA 14 H → SBLC READ DATA 14 H (SBLJ)
SBLE RECEIVE DATA 15 H → SBLC READ DATA 15 H (SBLJ)

74S174 E33

SBLE RECEIVE DATA ØØ H → SBLC READ DATA ØØ H (SBLB)
SBLE RECEIVE DATA Ø1 H → SBLC READ DATA Ø1 H (SBLB)
SBLE RECEIVE DATA Ø2 H → SBLC READ DATA Ø2 H (SBLB)
SBLE RECEIVE DATA Ø3 H → SBLC READ DATA Ø3 H (SBLB)

74S373 E32 → BUS MD Ø4 H, BUS MD Ø5 H, BUS MD Ø6 H, BUS MD Ø7 H, BUS MD Ø8 H, BUS MD Ø9 H

74S373 E31 → BUS MD 1Ø H, BUS MD 11 H, BUS MD 12 H, BUS MD 13 H, BUS MD 14 H, BUS MD 15 H

MD BUS DRIVERS

MD BUS PARITY DEFINITION

Σ OF BITS IN BYTE PLUS PARITY BIT IS ODD

SBLW +3V A H
TBMD EN SBI DATA L BS2

SBLW CLEAR A L
SBLW SBI T1 CPTØ A H

74S373 E17 → BUS MD ØØ H, BUS MD Ø1 H, BUS MD Ø2 H, BUS MD Ø3 H, BUS MD BYTE Ø PAR H, BUS MD BYTE 1 PAR H

74S373 & 74LS373 FUNCTION TABLE

OUTPUT CONTROL	ENABLE G	D	OUTPUT
L	H	H	H
L	H	L	L
L	L	X	Q_0
H	X	X	Z

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT

SBLE REC PAR Ø H, SBLE REC PAR 1 H → 74S86 E22 → 74S04 E41
SBLE REC PAR 2 H, SBLE REC PAR 3 H → 74S86 E22 → 74S04 E41

WRITE DATA REG

74LS377 E5

BUS MD Ø0 H → SBLC WRITE DATA ØØ H (SBLA,V)
BUS MD Ø1 H → SBLC WRITE DATA Ø1 H (SBLA,V)
BUS MD Ø2 H → SBLC WRITE DATA Ø2 H (SBLA,V)
BUS MD Ø3 H → SBLC WRITE DATA Ø3 H (SBLA,V)
BUS MD Ø4 H → SBLC WRITE DATA Ø4 H (SBLA,V)
BUS MD Ø5 H → SBLC WRITE DATA Ø5 H (SBLA,V)
BUS MD Ø6 H → SBLC WRITE DATA Ø6 H (SBLA,V)
BUS MD Ø7 H → SBLC WRITE DATA Ø7 H (SBLA,V)

74LS377 E19

BUS MD Ø8 H → SBLC WRITE DATA Ø8 H (SBLA,V)
BUS MD Ø9 H → SBLC WRITE DATA Ø9 H (SBLA,V)
BUS MD 1Ø H → SBLC WRITE DATA 1Ø H (SBLA,V)
BUS MD 11 H → SBLC WRITE DATA 11 H (SBLA,V)
BUS MD 12 H → SBLC WRITE DATA 12 H (SBLA,V)
BUS MD 13 H → SBLC WRITE DATA 13 H (SBLA,V)
BUS MD 14 H → SBLC WRITE DATA 14 H (SBLA,V)
BUS MD 15 H → SBLC WRITE DATA 15 H (SBLA,V)

SBLW SBI T3 CPT2 A L
SBLK BUFFER FULL H

REVISIONS		
CHK	CHANGE NO.	REV.

(DATA LOGIC) (SLOT 2)

TITLE (SBLC) SBI INTERFACE LOW BITS
SIZE D | CODE CS | NUMBER M8218-Ø-1 | REV E
SCALE — | SHEET 4 OF 27 | DIST.

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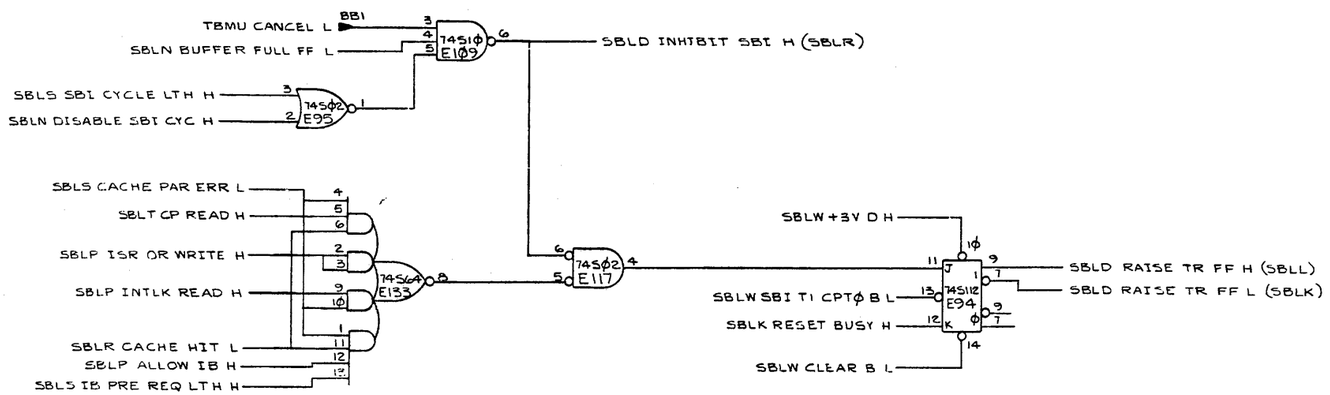

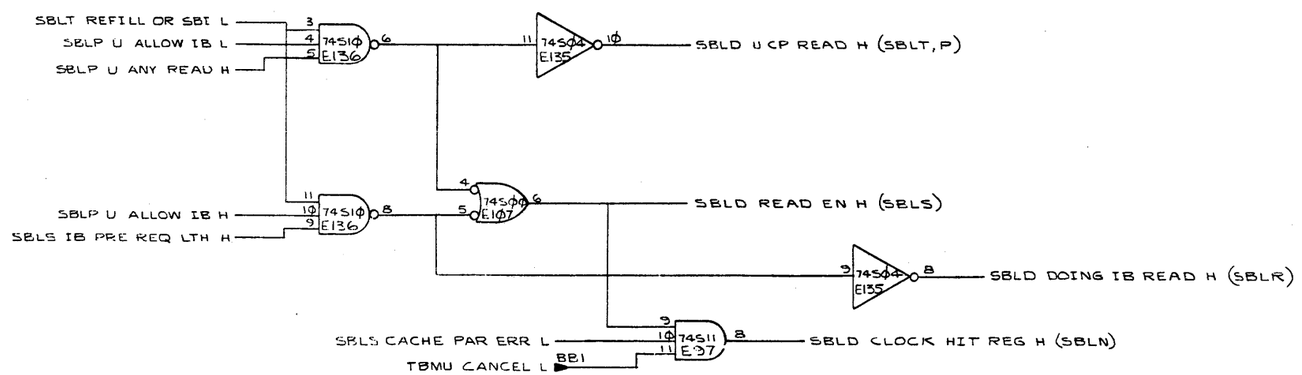

REVISIONS		
CHK	CHANGE NO.	REV.

(START SBI CYCLE LOGIC) (SLOT 2)

TITLE	SIZE	CODE	NUMBER	REV.
(SBLD) SBI INTERFACE LOW BITS	D	CS	M8218-Ø-1	E
SCALE — SHEET 5 OF 27	DIST.			

DEC FORM NO. DRD 138

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8646 E1
SBLA TRANS DATA Φ4 H
SBLA TRANS DATA Φ5 H
SBLA TRANS DATA Φ6 H
SBLA TRANS DATA Φ7 H
BUS: AM1 BUS SBI BΦ4 L; AN1 BUS SBI BΦ5 L; AP1 BUS SBI BΦ6 L; AP2 BUS SBI BΦ7 L
TRANS/REC: SBLE RECEIVE DATA Φ4 H (SBLC); SBLE RECEIVE DATA Φ5 H (SBLC); SBLE RECEIVE DATA Φ6 H (SBLC); SBLE RECEIVE DATA Φ7 H (SBLC)
REC PAR: AF1 SBLE REC PAR 1 H (SBLC) (SBHE,T)
EN TRANS PAR 1Φ
TCLK RCLK

8646 E15
SBLA TRANS DATA Φ8 H
SBLA TRANS DATA Φ9 H
SBLA TRANS DATA 1Φ H
SBLA TRANS DATA 11 H
BUS: AS2 BUS SBI BΦ8 L; AT2 BUS SBI BΦ9 L; AU1 BUS SBI B1Φ L; AU2 BUS SBI B11 L
TRANS/REC: SBLE RECEIVE DATA Φ8 H (SBLC); SBLE RECEIVE DATA Φ9 H (SBLC); SBLE RECEIVE DATA 1Φ H (SBLC,J); SBLE RECEIVE DATA 11 H (SBLC,J)
REC PAR: AF2 SBLE REC PAR 2 H (SBLC) (SBHE,T)
EN TRANS PAR 1Φ
TCLK RCLK

8646 E16
SBLA TRANS DATA 12 H
SBLA TRANS DATA 13 H
SBLA TRANS DATA 14 H
SBLA TRANS DATA 15 H
BUS: BF2 BUS SBI B12 L; BH2 BUS SBI B13 L; BJ1 BUS SBI B14 L; BJ2 BUS SBI B15 L
TRANS/REC: SBLE RECEIVE DATA 12 H (SBLC,J); SBLE RECEIVE DATA 13 H (SBLC,J); SBLE RECEIVE DATA 14 H (SBLC,J); SBLE RECEIVE DATA 15 H (SBLC,J)
REC PAR: AH2 SBLE REC PAR 3 H (SBLC), (SBHE,T)
EN TRANS PAR 1Φ
TCLK RCLK

8646 E2
SBLA TRANS DATA ΦΦ H
SBLA TRANS DATA Φ1 H
SBLA TRANS DATA Φ2 H
SBLA TRANS DATA Φ3 H
BUS: ABI BUS SBI BØØ L; AC1 BUS SBI BØ1 L; AD1 BUS SBI BØ2 L; AE1 BUS SBI BØ3 L
TRANS/REC: SBLE RECEIVE DATA ΦΦ H (SBLC); SBLE RECEIVE DATA Φ1 H (SBLC); SBLE RECEIVE DATA Φ2 H (SBLC); SBLE RECEIVE DATA Φ3 H (SBLC)
REC PAR: AE2 SBLE REC PAR Φ H (SBLC) (SBHE,T)
SBLL TRANS ENABLE L
EN TRANS PAR 1Φ
TCLK RCLK
SBLW SBI TΦ CPT3 B H
SBLW SBI T2 CPT1 A H
D1Φ D9
FD777 FD777

74S280 E3
D0 D1 D2 D3 D4 D5 D6 D7 D8
SBLN REVERSE PI H
Σ EVEN: AJ1 SBLE TRANS PAR L (SBHE,T)
Σ ODD: 6

8646 FUNCTION TABLE

TRANSMIT				RECEIVE		
TCLK	TRANS ENABLE	TRANS DATA	BUS	RCLK	BUS	REC DATA
⌐	H	X	H	H	L	H
⌐	L	L	H	H	H	L
⌐	L	H	L	L	X	Q_0
L	X	X	Q_0			

Q_0 = PREVIOUS STATE OF TRANSMIT FLIP-FLOP
Q_0 = PREVIOUS STATE OF RECEIVE LATCH

PARITY
Σ OF H'S AT TRANS DATA 1 THRU 4 PLUS TRANS PAR IS EVEN
Σ OF H'S AT REC DATA 1 THRU 4 PLUS REC PAR IS EVEN

74S280 FUNCTION TABLE

NUMBER OF INPUTS A THRU I THAT ARE HIGH	OUTPUTS Σ EVEN	Σ ODD
Φ,2,4,6,8	H	L
1,3,5,7,9	L	H

H = HIGH LEVEL L = LOW LEVEL

74S175 E75
SBLK RESET BUSY H
SBLS CACHE PAR ERR L
SBLR SET FORCE SBI H
SBHM ANY READ DATA L
AD2 → 74S04 E41
SBLW CLEAR D L
SBLW SBI T1 CPTΦ A H
R1(1): SBLE RESET BUSY FF H (SBLS)
R1(Φ): SBLE RESET BUSY FF L (SBLL)
R3(1): SBLE CLOCK PAR REG H (SBLN)
R3(Φ)
RΦ(1): SBLE FORCE SBI FF L (SBLU)
RΦ(Φ)
R2(1): SBLE READ DATA FF H (SBLN,R,S)
R2(Φ): SBLE READ DATA FF L (SBLK)
CLR CLK

74S175 E74
SBLL TRANSMIT CA H
SBLL BSY LAST CYC H
SBLM SET RDS H
SBHM SET SBI CYCLE H ← BA1
SBLW CLEAR D L
SBLW SBI T1 CPTΦ A H
R1(1): SBLE START PULSE H (SBLL)
R1(Φ)
R3(1): SBLE HOLD BSY H (SBLL)
R3(Φ)
RΦ(1): SBLE RDS FF H (SBLS)
RΦ(Φ)
R2(1): SBLE SBI CYCLE FF H (SBLR,S,U)
R2(Φ): SBLE SBI CYCLE FF L (SBLR)
CLR CLK

74S175 E84
SBLK EXPECT RD H
SBLR SET WAIT INV H
SBLW +3V A H
TBMC ENABLE IA H ← EJ1
SBLW SBI T3 CPT2 B H
SBLW +3V A H
SBLW CLEAR D L
SBLW SBI T2 CPT1 B H
74S12 E82
R1(1): SBLE LATE EXP RD FF H (SBLM,R)
R3(Φ): SBLE LATE EXP RD FF L (SBLN,R)
RΦ(1): SBLE WAIT INV FF H (SBLR)
R2(1): SBLE AUTO REFILL FF H (SBLT)
R2(Φ): SBLE AUTO REFILL FF L (SBLT)
CLR CLK

SBLK TIMEOUT CARRY L → 74S04 E51 → BD1 SBLE LATE EXP RD L (SBHL,T)

REVISIONS		
CHK	CHANGE NO.	REV.

(SBI TRANSCEIVERS) (SLOT 2)

TITLE: SBI INTERFACE LOW BITS (SBLE)
SIZE D CODE CS NUMBER M8218-Φ-1 REV E
SCALE — SHEET 6 OF 27 DIST. TW

DEC FORM NO. DRD 138

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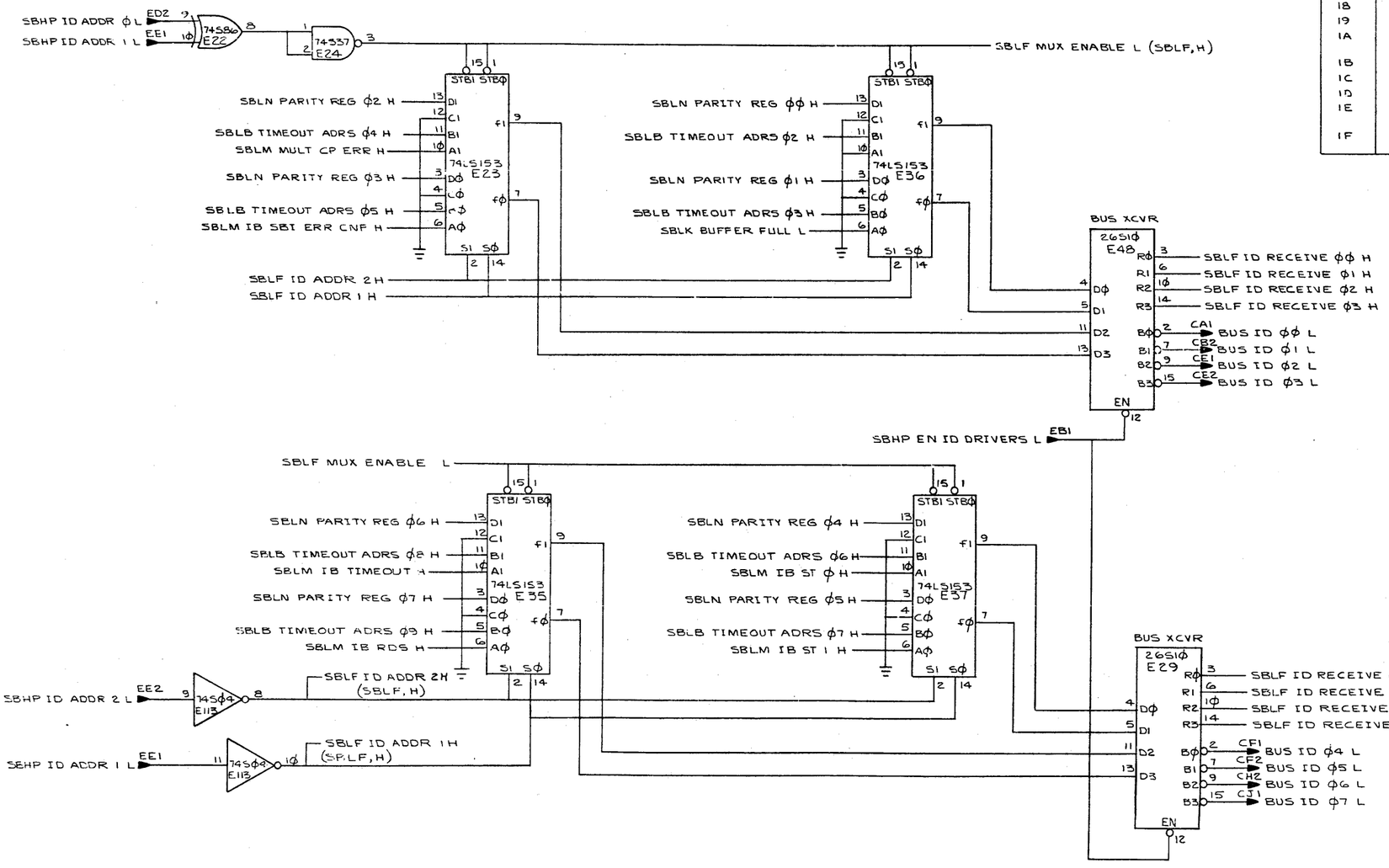
SBL ID BUS BITS 7-Ø

ID BUS ADDRESS				ID BUS DATA
HEX	LOW ADDRESS BITS A2	A1	AØ	
18	0	0	0	0
19	0	0	1	SBI ERROR REG
1A	0	1	0	TIMEOUT ADRS REG
1B	0	1	1	0
1C	1	0	0	0
1D	1	0	1	0
1E	1	1	0	CACHE PARITY REG
1F	1	1	1	0



(ID BUS MUX BITS 7-Ø) (SLOT 2)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
(SBLF) SBI INTERFACE LOW BITS	D	CS	M8218-Ø-1	E
SCALE — / — SHEET 7 OF 27	DIST.			

DEC FORM NO. DRD 138

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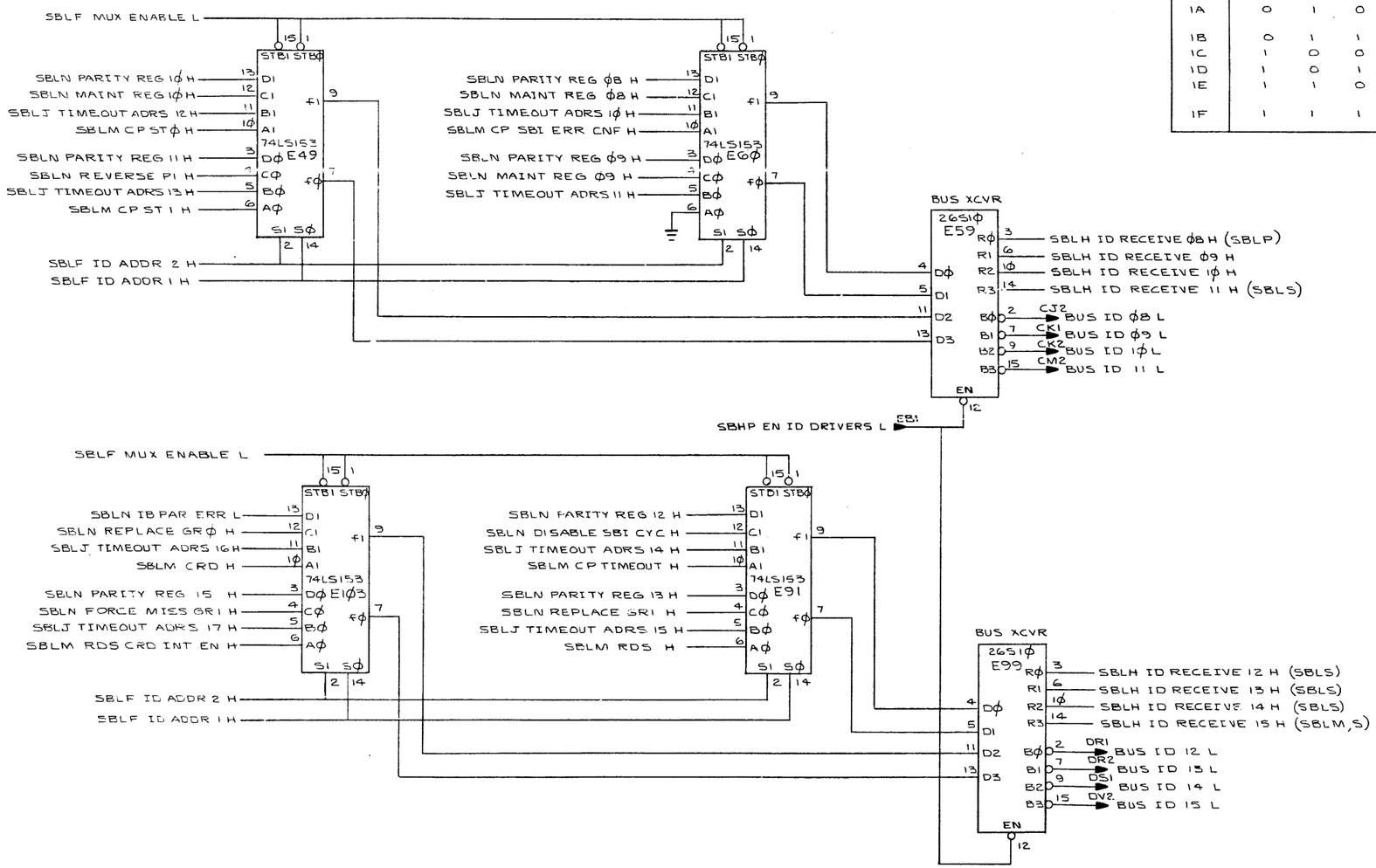
SBL ID BUS BITS 15-8

ID BUS ADDRESS				ID BUS DATA
HEX	LOW ADDRESS BITS A2	A1	Aϕ	
18	0	0	0	0
19	0	0	1	SBI ERROR REG
1A	0	1	0	TIMEOUT ADRS REG
1B	0	1	1	0
1C	1	0	0	0
1D	1	0	1	SBI MAINT REG
1E	1	1	0	CACHE PARITY REG
1F	1	1	1	0



REVISIONS		
CHK	CHANGE NO.	REV.

(ID BUS MUX BITS 15-8) (SLOT 2)

TITLE	SIZE	CODE	NUMBER	REV.
(SBLH) SBI INTERFACE LOW BITS	D	CS	M8218-ϕ-1	E
SCALE —/— SHEET 8 OF 27	DIST.			

DEC FORM NO. DRD 138

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DC1Φ2 - 8 INPUT COMPARATOR

SBLN BUFFER FULL FF L
SBHM SET INVALID L
SBLE RECEIVE DATA 15 H
SBLE RECEIVE DATA 14 H
SBLE RECEIVE DATA 13 H
SBLE RECEIVE DATA 12 H
SBLE RECEIVE DATA 11 H
SBLE RECEIVE DATA 10 H

DC1Φ2 E45

+5V
R34 121Ω 1/4W ±1%
R35 (NOT USED)
A=B

SBLW +3V D H
SBLW SBI TI CPTΦ B L
SBLN BUFFER FULL FF L
SBLW CLEAR B L
74S112 E61

SBLJ MARK INVALID L (SBLR)

ADDRESS REG
74LS377 E66

TBMK PA 10 H FE2
TBMK PA 11 H FD2
BUS PA 12 H FB2
BUS PA 13 H EV2
BUS PA 14 H EU2
BUS PA 15 H ES1
BUS PA 16 H ER2
BUS PA 17 H EA1

SBLW SBI T3 CPT2 A H
SBLK BUFFER FULL H

TIMEOUT ADDRESS REG
74LS377 E47

SBLJ TIMEOUT ADRS 10 H (SBLH)
SBLJ TIMEOUT ADRS 11 H (SBLH)
SBLJ TIMEOUT ADRS 12 H (SBLH)
SBLJ TIMEOUT ADRS 13 H (SBLH)
SBLJ TIMEOUT ADRS 14 H (SBLH)
SBLJ TIMEOUT ADRS 15 H (SBLH)
SBLJ TIMEOUT ADRS 16 H (SBLH)
SBLJ TIMEOUT ADRS 17 H (SBLH)

SBLW SBI TI CPTΦ A H
SBLS CP TIMEOUT LTH H

SBLJ ADDRESS REG 10 H (SBLA,B)
SBLJ ADDRESS REG 11 H (SBLA,B)
SBLJ ADDRESS REG 12 H (SBLA)
SBLJ ADDRESS REG 13 H (SBLA)
SBLJ ADDRESS REG 14 H (SBLA)
SBLJ ADDRESS REG 15 H (SBLA)
SBLJ ADDRESS REG 16 H (SBLA)
SBLJ ADDRESS REG 17 H (SBLA)

ADDRESS MUX
74S257 E68

SBLC READ DATA 10 H
SBLC READ DATA 11 H
BUS PA 12 H FB2
BUS PA 13 H EV2

ADDRESS MUX
74S257 E55

SBLC READ DATA 12 H
SBLC READ DATA 13 H
SBLC READ DATA 14 H
SBLC READ DATA 15 H
BUS PA 14 H EU2
BUS PA 15 H ES1
BUS PA 16 H ER2
BUS PA 17 H EA1

SBLS SELECT SBI ADR L
SBLS WRITE INVALID L

REVISIONS		
CHK	CHANGE NO.	REV.

DEC FORM NO. DRD 138

(ADDRESS LOGIC) (SLOT 2)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE LOW BITS (SBLJ)	D	CS	M8218-Φ-1	E
SCALE — SHEET 9 OF 27	DIST. TW			

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SBLT TIMEOUT TRAP EN H
SBLS RAISE TR LTH H
74S02 E96
SBLW +3V B H
SBLW SBI T1 CPTΦ A L
SBLT STALL L
SBLW CLEAR A L
74S112 E73
SBLK TIMEOUT TRP FF H (SBLS)
SBLD RAISE TR FF L
74S02 E96
SBLE READ DATA FF L
74S10 E40
SBLK EXPECT RD L (SBLB,R)
SBLK BUFFER FULL H (SBLB,C,J,M,P)
SBLW +3V B H
74S37 E24
SBLK BUFFER FULL L (SBLF,R,U)
74S04 E125
FA1
SBLK BUFFER FULL A H (SBHA)(SBLN)

74S194 EXPECT READ DATA

D7 D1 S1 S0	S194 FUNCTION	COMMENTS
L L H H	LOAD	CPU DOES NOT EXPECT ANY DATA
L H H H		STATE NOT GENERATED BY LOGIC
H L H H	LOAD	CPU EXPECTS 1 LONG WORD OF DATA
H H H H	LOAD	CPU EXPECTS 2 LONG WORDS OF DATA
X X L L	HOLD	NO CHANGE
X X L H	SHIFT RIGHT	CLEAR EXPECT READ DATA
X X H L	SHIFT LEFT	SUBTRACT 1 FROM THE AMOUNT OF LONG WORDS EXPECTED BY THE CPU

SBLS CP TIMEOUT LTH H
74S37 E71
BD2
SBLK LATCH TIMO REG L (SBLV) (SBHA, M)

SBLW +3V B H
SBLL TRANSMIT CA H
SBLW SBI T1 CPTΦ A L
74S112 E73
SBLK BUSY H (SBLL)
SBLK BUSY L (SBLL)
SBLW CLEAR A L

SBLN MAINT REG 8 H
SBLK TIMEOUT CARRY H (SBLK,M)
74S04 E41
93S16 E42
93S16 E53
COUT
CLR
LD
CLK
CEP
CET
F0
F1
F2
F3
D0
D1
D2
D3
SBLN BUFFER FULL FF H
SBLE RESET BUSY FF L
SBLW SBI T2 CPT1 B H
SBLW +3V B H
SBLW SBI T1 CPTΦ C L
74S112 E72
TIMEOUT COUNTER
SBLK TIMEOUT CARRY L (SBLE)

SBLM SET TO OR CNF L
SBLK CLEAR BUSY L
74S08 E51
SBLK RESET BUSY H (SBLE, D)

SBLP FORCE HOLD L
74S10 E85
SBLK ACK PULSE L
SBHM ANY READ DATA L
AD2
74S08 E51
74S04 E26
SBLK EXPECT RD H (SBLE)

SBLP ANY READ H
SBLT ADRS LATCH 29 L
SBLP INTLK READ L
74S11 E97
SBLK EXTEND READ H (SBLR)
74S194 E52
S1 S0 DSR
CLK CLR DSL
D0 D1 D2 D3
R0(1) R1(1) R2(1) R3(1)
EXPECT READ DATA CONTROL
SBLW SBI T1 CPTΦ A H
SBLW CLEAR A L

STATE CONTROL ROM

SBLP ISR H
SBLP EXTEND WRITE H
SBLP ANY WRITE H
SBLP ANY READ H
SBLL TIMING PULSE 2 H
SBLL TIMING PULSE 3 H
SBLL TIMING PULSE 4 H
SBLK TIMEOUT CARRY H
SBLL SBI CNFI R L
SBLL BSY OR NR H
23-190F1-ΦΦ E38
A9 A8 A7 A6 A5 A4 A3 A2 A1 AΦ CS2 CS1
D3 SBLK CLEAR BUSY L (SBLK)
D2 SBLK ACK PULSE L (SBLK)
D1 SBLK SET SBI CNF ERR H (SBLM)
D0 SBLK SET RETRY H (SBLL)

74S194 FUNCTION TABLE

INPUTS									OUTPUTS			
CLEAR	MODE S1	MODE S0	CLOCK	SERIAL LEFT	SERIAL RIGHT	PARALLEL A	B	C	D	Q_A	Q_B	Q_C	Q_D
L	X	X	X	X	X	X	X	X	X	L	L	L	L
H	X	X	L	X	X	X	X	X	X	Q_{AO}	Q_{BO}	Q_{CO}	Q_{DO}
H	H	H	↑	X	X	a	b	c	d	a	b	c	d
H	L	H	↑	X	H	X	X	X	X	H	Q_{An}	Q_{Bn}	Q_{Cn}
H	L	H	↑	X	L	X	X	X	X	L	Q_{An}	Q_{Bn}	Q_{Cn}
H	H	L	↑	H	X	X	X	X	X	Q_{Bn}	Q_{Cn}	Q_{Dn}	H
H	H	L	↑	L	X	X	X	X	X	Q_{Bn}	Q_{Cn}	Q_{Dn}	L
H	L	L	X	X	X	X	X	X	X	Q_{AO}	Q_{BO}	Q_{CO}	Q_{DO}

REVISIONS		
CHK	CHANGE NO.	REV.

(STATE CONTROL) (SLOT 2)

TITLE (SBLK) SBI INTERFACE LOW BITS
SIZE D CODE CS NUMBER M8218-0-1 REV. E
SCALE — SHEET 10 OF 27 DIS1

DEC FORM NO. DRO 138

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DIGITAL M8218-0-1

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74S194 FUNCTION TABLE

SBLK BSY L	SBLL RETRY FF L	SBLE RESET BUSY FF L	S_1	S_0	COMMENTS
H	H	H	L	L	HOLD PREVIOUS STATE
L	H	H	L	H	SHIFT RIGHT, COUNT SBI CYCLES
L	L	H	H	H	LOAD, RESET STATE COUNTER
X	X	L	H	H	LOAD, RESET STATE COUNTER
H	L	H			STATE NOT GENERATED BY LOGIC

SBLK BUSY L
SBLD RAISE TR FF H
74S00 E64

SBLW +3V B H
SBLK SET RETRY H
SBLW SBI T1 CPTØ A L
74S112 EG1
SBLK BUSY H

SELU ARB OK L
74S04 E125
SBLL ARB OK H (SBLL)

SBLS RAISE TR LTH L
74S02 E117
CBI
SBLL TRANSMIT CA H (SBLE,K) (SBHL,M,R,T)

SBHR SEND DATA H
BEI
74S00 E117
SBLL TRANSENABLE L (SBLE)

SBLL RAISE TR H (SBLL,S,U)
SBLL RETRY FF L (SBLL)

SBLE RESET BUSY FF L
SBLK BUSY L
74S00 E64

SBLE START PULSE H

74S194
SØ S1 DSR
DØ D1 D2 D3
RØ(I) R1(I) R2(I) R3(I)
CLR CLK DSL
SBLW CLEAR A L

SBLL TIMING PULSE Ø H (SBLL)
SBLL TIMING PULSE 1 H
SBLL TIMING PULSE 2 H (SBLK,M,R,L)
SBLL TIMING PULSE 3 H (SBLK)

SBI STATE GENERATOR

SBLL SBI CNFI R L (SBLK)
SBHE SBI CNFI R H
EP1
74S04 E41
74S00 E39
SBLL ACK L (SBLM)

74S11 E97
SBLL ERR H (SBLM)

SBHE SBI CNFØ R H
EP2
74S04 E41
SBLL BSY OK NR H (SBLK,M)

74S10 E85
SBLL BSY PULSE L
SBLL TIMING PULSE 2 H

74S194
SØ S1 DSR
DØ D1 D2 D3
RØ(I) R1(I) R2(I) R3(I)
CLR CLK DSL
SBLE HOLD BSY H
SBLW CLEAR A L
SBLW SBI T2 CPTI B H

74S02 E25
74S04 E26
SBLL PULSE 3 OR 4 (SBLM)
SBLL TIMING PULSE 4 H (SBLK)

74S04 E132
74S00 E118
SBLL BSY LAST CYC H (SBLE,M)

SBLP ISR H
74S37 E24
SBLL XMIT MUX SEL Ø H (SBLA,M,T)

74S04 E135
SBLL XMIT MUX SEL Ø L (SBLA)

SBI CONFIRMATION DECODE

SBLP FORCE HOLD L
SBLL RAISE TR H
SBLL ARB OK H
SBLP ANY READ L
74S10 E114

SBLP EXTEND WRITE H
SBLL TIMING PULSE Ø H
74S00 E140

SPLP ISR H
74S00 E140

74S20 E127
SBLL RAISE HOLD H (SBLU)

SBLK BUSY H
SBLL RETRY FF L
74S37 E24
SBLL XMIT MUX SEL 1 H (SBLA)

REVISIONS

CHK	CHANGE NO.	REV.

DEC FORM NO. DRD 138

(SBI STATE GENERATOR) (SLOT 2)

TITLE (SBLL) SBI INTERFACE LOW BITS
SIZE D | CODE CS | NUMBER M8218-Ø-1 | REV. E
SCALE — | SHEET 11 OF 27 | DIST.

DEC CS M8218-Ø-1 E

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SIZE D | CODE CS | NUMBER M8219-0-1 | REV E

SBLL PULSE 3 OR 4 H
SBLL ACK L
74S76 E40
SBLU ARB OK L
SBLS RAISE TR LTH H
SBLL TIMING PULSE 2 H
SBLL ERR H
SBLE LATE EXP RD FF H
SBLL BSY OR NR H
SBLL XMIT MUX SEL Ø H
SBLK TIMEOUT CARRY H
74S64 E86
74S01 E51
74S04 E123
SBLM SET TO OR CNF L (SBLK)
SBLS TIMEOUT TRP LTH H
74S00 E39
BC1
SBLM TIMEOUT TRAP L (CEHE)
SBLM SET TO OR CNF H (SBLM,T)
SBLS IB MISS IN PROG H
74S08 E98
74S04 E132
SBLM IB TIMEOUT L (SBLN)
SI S0 USR
74S194 E28
D0 D1 D2 D3 R0(1) R1(1) R2(1) R3(1)
CLR CLK DSL
SBLM IB TIMEOUT H (SBLF)
SBLE LATE EXP RD FF H
SBLM IB ST 1 H (SBLF)
SBLL BSY LAST CYC H
SBLM IB ST Ø H (SBLF)
SBLM IB SBI ERR CNF H (SBLF)
SBLS ID BUFFØ6 H
SBLW SBI TØ CPT3 A H
SBLS WRITE ERR REG H
74S10 E114
74S00 E39
SBLS FLUSH LATCH H
SBLW CLEAR A H
74S02 E25
SBLM CLEAR IB L (SBLM)
SBLW SBI TI CPTØ B H
74S04 E132
SBLM IB SBI ERR CNF L (SBLN)
SBLS WRITE ERR REG H
SBLS ID BUFF 15 H
74S194 E89
D0 D1 D2 D3 R0(1) R1(1) R2(1) R3(1)
CLR CLK DSL
SBLM RDS CRD INT EN H (SBLH)
74S00 E102
DJ2
SBLM CRD RDS INTR L (ICLA)
SBLW CLEAR A L
SBLW SBI TI CPTØ B H
SBLW +3V C H
SBLM CRD H (SBLM)
SBHN CRD L
SBHM ANY READ DATA L
74S02 E81
74S112 E105
74S00 E107
SBLS WRITE ERR REG H
SBLS ID BUFF 14 H
74S08 E126
SBLW CLEAR A L
SBLM SET RDS H (SBLE)
SBLW +3V C H
SBHN RDS L
SBLM RDS H (SBLH)
SBLS WRITE ERR REG H
SBLS ID BUFF 13 H
SBLM SET TO OR CNF H
SBLP ALLOW IB L
74S02 E25
ASI
SBLM TIMO CNF INT L (ICLA,T)
SBLK BUFFER FULL H
SBLM SAVE ADRS H (SBLS)
SBLK SET SBI CNF ERR H
74S04 E26
SBLM CP TIMEOUT H (SBLH)
SBLM CP ST 1 H (SBLH)
SBLM CP ST Ø (SBLH)
SBLM CP SBI ERR CNF H (SBLH)
SBLW +3V C H
SBLM IB RDS H (SBLF)
SBLW SBI TI CPTØ C L
SBLM IB RDS L (SBLN)
SBLS IB MISS IN PROG H
SBHN RDS L
SBLM CLEAR IB L
DSR S0 S1
SBLM MULT CP ERR H (SBLF)

REVISIONS		
CHK	CHANGE NO.	REV.

(SBI ERROR REG) (SLOT 2)

TITLE (SBLM) SBI INTERFACE LOW BITS
SIZE D | CODE CS | NUMBER M8218-Ø-1 | REV E
SCALE — | SHEET 12 OF 27 | DISP 1

DEC FORM NO. DRD 138

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CACHE PARITY REG

74LS273 E79

SBLW +3V C H
SBLP U ALLOW IB H
CDMS G1 B0 PAR ODD H
CDMS G1 B1 PAR ODD H
CDMS G1 B2 PAR ODD H
CDMS G1 B3 PAR ODD H
CDMR G0 B0 PAR ODD H
CDMR G0 B1 PAR ODD H
SBLE CLOCK PAR REG H
SBLN CLEAR PAR REG L

SBLN PARITY REG 15 H (SBLH)
SBLN IB PAR ERR H (SBLS)
SBLN PARITY REG 13 H (SBLH)
SBLN PARITY REG 12 H (SBLH)
SBLN PARITY REG 11 H (SBLH)
SBLN PARITY REG 10 H (SBLH)
SBLN PARITY REG 09 H (SBLH)
SBLN PARITY REG 08 H (SBLH)

74LS273 - 8 BIT REG

74LS273 E34

CDMR G0 B2 PAR ODD H
CDMR G0 B3 PAR ODD H
CAML G0 BYT 0 PAR OD H
CAML G0 BYT 1 PAR OD H
CAML G0 BYT 2 PAR OD H
CAML G1 BYT 0 PAR OD H
CAML G1 BYT 1 PAR OD H
CAML G1 BYT 2 PAR OD H
SBLE CLOCK PAR REG H

SBLN PARITY REG 07 H (SBLF)
SBLN PARITY REG 06 H (SBLF)
SBLN PARITY REG 05 H (SBLF)
SBLN PARITY REG 04 H (SBLF)
SBLN PARITY REG 03 H (SBLF)
SBLN PARITY REG 02 H (SBLF)
SBLN PARITY REG 01 H (SBLF)
SBLN PARITY REG 00 H (SBLF)

74LS273 FUNCTION TABLE
(EACH FLIP-FLOP)

INPUTS			OUTPUT
CLEAR	CLOCK	D	Q
L	X	X	L
H	↑	H	H
H	↑	L	L
H	L	X	Q_0

SBLN IB PAR ERR L (SBLH,N)
SBLM IB TIMEOUT L
SBLM IB RDS L
SBLM IB SBI ERR CNF L
74S20 E127
SBLN IB ERR H (SBLS)

MAINTENANCE REG
74S174 E101

SBLS ID BUFF 15 H
SBLS ID BUFF 14 H
SBLS ID BUFF 13 H
SBLS ID BUFF 12 H
SBLS ID BUFF 11 H
SBLP ID BUFF 08 H
SBLW CLEAR B L

SBLN REPLACE GR1 H (SBLH)
SBLN FORCE MISS GR1 H (SBLH)
SBLN REPLACE GR0 H (SBLH)
SBLW SBI T1 CPT0 A L
DPI
SBLN FORCE MISS GR1 L (SBLP,S,T) (CAMN,P)
SBLN DISABLE SBI CYC H (SBLD,H,T)
SBLN REVERSE PI H (SBLE,H)
SBLN MAINT REG 08 H (SBLH,K)

SBLS WRITE MAINT REG H
SBLW SBI T0 CPT3 A H
74S00 E102

SBLD CLOCK HIT REG H
CAMK G0 MATCH H BK1
CAMK G1 MATCH H BK2
74S194 E50
SBLW CLEAR B L
SBLW SBI T1 CPT0 B H
SBLN MAINT REG 09 H (SBLH)
SBLN MAINT REG 10 H (SBLH)

SBLE RDS FF L
SBLE READ DATA FF H
SBLT ADRS LATCH 29 L
74S10 E85
SBLU WRITE VALID L

SBLW CLEAR A H
SBLW +3V C H
SBLS FLUSH LATCH H
SBLS IB PAR ERR LTH H
SBLW SBI T0 CPT3 A H
SBLS WRITE PAR REG H
SBLS ID BUFF 15 H
74S64 E90
SBLN CLEAR PAR REG L (SBLN)

RANDOM REPLACEMENT FF
SBLE LATE EXP RD FF L
74S112 E94
74S08 E106

SBI CACHE WRITE PULSE ENABLES
74S04 E118
BU2
SBLN SBI MISS DATA G1 H (CAMN,P)
74S00 E118
BF1
SBLN SBI MISS DATA G0 H (CAMN,P)

74S175 E119

SBLU WRITE NOT VALID H
SBLK BUFFER FULL A H
SBLW CLEAR B L
SBLW SBI T3 CPT2 C H
SBLN BUFFER FULL FF H (SBLJ,K,R,T)
SBLN BUFFER FULL FF L (SBLD,J,P,T)

REVISIONS		
CHK	CHANGE NO.	REV.

(PARITY & MAINTENANCE REGS) (SLOT 2)

TITLE (SBLN) SBI INTERFACE LOW BITS
SIZE D | CODE CS | NUMBER M8218-0-1 | REV E
SCALE — | SHEET 13 OF 27 | DIST.

DEC FORM NO. DRD 138

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TBMN ABORT CYCLE FLOP L — EM1 — 74S00 E140

TBMN BUF IB WR CHK L — DM1
TBMN BUF UFS L — CC1
TBMN BUF UADS L — CU1
TBMN BUF UMCT 3 L — CU2
TBMN BUF UMCT 2 L — CM1
TBMN BUF UMCT 1 L — CD2
TBMN BUF UMCT Ø L — CD1

23-019B1-00 E142 256X8 — A7 A6 A5 A4 A3 A2 A1 AØ — B7 B6 B5 B4 B3 B2 B1 BØ

MCT FIELD DECODE ROMS E142 & E143

74S373 E128 — D7 D6 D5 D4 D3 D2 D1 DØ — Q7 Q6 Q5 Q4 Q3 Q2 Q1 QØ — OUT CONT ENAB
- ES2 — SBLP MD TO D L (SBLV)(DPBA,B)
- SBLP ROM ENABLE 1 H (SBLT)
- SBLP ROM ENABLE 2 H (SBLT)
- SBLP FORCE HOLD L (SBLK,L)
- SBLP U ANY READ H(SBLD)
- EL2 — SBLP FORCE INTLK H (SBHR)

SBLS ADRS LATCH 29 H — 74S00 E140 — 74S08 E126 — SBLP U INTLK READ L (SBLT)

CDMR GØ BØ PAR ODD H — DD1
CDMR GØ B1 PAR ODD H — DD2
CDMR GØ B2 PAR ODD H — CT2
CDMR GØ B3 PAR ODD H — CV2
CAML GØ BYT Ø PAR OD H — CN1
CAML GØ BYT 1 PAR OD H — CP1
CAML GØ BYT 2 PAR OD H — CP2
SBLW +3V E H

74S133 E69 — SBLP GØ PAR ERR H (SBLR,S,T)

74S04 E135 — SBLP U ALLOW IB L (SBLD)

SBLP U ALLOW IB H (SBLN,P)

SBHF FORCE MISS GRØ L — DP2
SBLN FORCE MISS GR1 L

74S08 E92 — DS2 — SBLP PAR ERR TRAP L (CEHE,S) (USCB)

23-019B1-00 E143 256X8 — A7 A6 A5 /A4 A3 A2 A1 AØ — B7 B6 B5 B4 B3 B2 B1 BØ

74S373 E144 — DØ D1 D2 D3 D4 D5 D6 D7 — QØ Q1 Q2 Q3 Q4 Q5 Q6 Q7 — OUT CONT ENAB
- SBLP ADRS LATCH 29 H (SBLP,T)
- SBLP INTLK READ L (SBLK)
- SBLP ALLOW IB H(SBLD)
- SBLP ANY READ H (SBLK,T)
- SBLP EXTEND WRITE H(SBLK,L)
- SBLP ISR H (SBLK,L,R,T)
- SBLP ANY WRITE H (SBLK,T)

SBLW +3V E H — DA1
CDMS G1 BØ PAR ODD H — DB1
CDMS G1 B1 PAR ODD H — DB2
CDMS G1 B2 PAR ODD H — DC1
CDMS G1 B3 PAR ODD H — DF2
CAML G1 BYT Ø PAR OD H — DH2
CAML G1 BYT 1 PAR OD H — DJ1
CAML G1 BYT 2 PAR OD H

74S133 E77 — SBLP G1 PAR ERR H (SBLR,S,T)

74S04 E132 — SBLP ANY READ L (SBLL)

74S04 E135 — SBLP ALLOW IB L (SBLM)

74S04 E135 — SBLP INTLK READ H (SBLD,R)

TBMU CANCEL L — BB1
SBLD U CP READ H — 74S08 E96 — S

SBLK BUFFER FULL H

SBLW +3V C H — 74S02 E81

74S74 E78 — D C — Q Q
- SBLW SBI TØ CPT3 C H
- SBLW SBI T2 CPT1 A L

SBLS READ DATA LTH H — 74S04 E107
SBLR RDS LTH L — 74S02 E95

SBLW +3V D H

SBLW SBI TØ CPT3 C H — 74S112 E93 — J K Q
SBLT WRITE IO L — 74S02 E95
SBLN BUFFER FULL FF L
SBLW CLEAR B L

IMPLICIT INTLK WRITE PENDING FF

74S373 E131 — D7 D6 D5 D4 D3 D2 D1 DØ — Q7 Q6 Q5 Q4 Q3 Q2 Q1 QØ — ENAB CONT
- SBLP ISR GR WRITE H (SBLD)
- SBLP ROM ENABLE Ø H (SBLT)
- SBLP ROM ENABLE 3 H (SBLT)
- SBLP ID BUFF Ø8 H (SBLN)

SBLH ID RECEIVE Ø8 H

REVISIONS

CHK	CHANGE NO.	REV.

(MCT FIELD DECODE) (SLOT 2)

TITLE: SBI INTERFACE LOW BITS (SBLP)
SIZE D | CODE CS | NUMBER M8218-Ø-1 | REV. E
SCALE 1/1 | SHEET 14 OF 27 | DIST

DEC FORM NO. DRD 138

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NOTE:
D1-D8, R30, R33 & R66 ARE NOT USED

+5V
R66
R29 150
R30
D1
D2
D3
D4
SBLR CACHE HIT L (SBLD)
CAMK G0 MATCH H BK1
CAMK G1 MATCH H BK2
74S02 E117
74S04 E123
SBLR CACHE HIT H (SBLR)
+5V
R31 150
R32 150
R33
D5
D6
D7
D8
SBLD DOING IB READ H
SBLR CACHE HIT H
SBLS CACHE PAR ERR L
TBMU CANCEL L BB1
74S64 E103
DN1
SBLR IB READ DATA L (IDPJ,P)
SBLS IB MISS IN PROG H
SBLT CP READ H
SBLR WANTED DATA H
74S109 E109
DT2
SBLR RDS TRAP L (CEHE,S)
SBLS RDS LTH H
74S04 E132
SBLR RDS LTH L (SBLP)
SBLE READ DATA FF H
SBLK EXPECT RD L
SBLJ MARK INVALID L
74S10 E40
SBLE SBI CYCLE FF H
SBLU WRITE NOT VALID H
SBLP INTLK READ H
74S64 E115
EB2
SBLR VALID H (CAMB)
SBLE SBI CYCLE FF L
TBMN BUF UMCT 0 L CD1
TBMN BUF UMCT 1 L CD2
TBMN BUF UADS L CU1
74S04 E130
CACHE VALID BIT INPUT

TBMN BUF UFS L CC1
TBMN BUF UMCT 3 L CD2
SBLK BUFFER FULL L
74S40 E147
SBLR SET CPU WRITE L (SBLS)
TBMN BUF UMCT 2 L CM1
SBLE SBI CYCLE FF H
74S02 E121
SBLS CACHE PAR ERR L
SBLD INHIBIT SBI H
74S02 E121
74S11 E120
SBLD DOING IB READ H
SBLW +3V D H
SBLW SBI TI CPT0 B L
74S112 E72
SBLR IB MISS H (SBLS)
SBLW CLEAR B L
SBLS IB MISS IN PROG H
SBLR WANTED DATA L
SBLN BUFFER FULL FF H
74S10 E103
SBLE LATE EXP RD FF H
SBLB ADDRESS REG 02 H
74S04 E125
SBLR WANTED DATA L (SBLR)
SBLK EXTEND READ H
74S04 E26
74S64 E116
74S04 E123
SBLR WANTED DATA H (SBLR,T)
SBLS READ DATA LTH H
SBLE LATE EXP RD FF L

CLEAR WRITE-MISS PARITY ERROR FF
SBLS CPU WRITE L
74S04 E125
TBMX WRITE PULSE L EM2
74S11 E120
SBLP G0 PAR ERR H
SBLP G1 PAR ERR H
74S02 E121
74S04 E104
SBLW +3V D H
SBLR SET FORCE SBI L
SBLW SBI TI CPT0 B L
74S112 E82
SBLR SET WAIT INV H (SBLE)
SBHM SET INVALID L BE2
SBLE WAIT INV FF H
74S00 E39
74S02 E26
SBLR SET FORCE SBI H (SBLE)
SBLW CLEAR B L
SBLP ISR H
SBLL TIMING PULSE 2 H
74S00 E39
74S08 E96
BB2
SBLR FORCE SBI L (SBLM)(SBHM)

REVISIONS		
CHK	CHANGE NO.	REV.

DEC FORM NO. DRD 138

(MISC CACHE CONTROL) (SLOT 2)

TITLE	SIZE	CODE	NUMBER	REV.
(SBLR) SBI INTERFACE LOW BITS	D	CS	M8218-0-1	E
SCALE —	SHEET 15 OF 27	DIST.		

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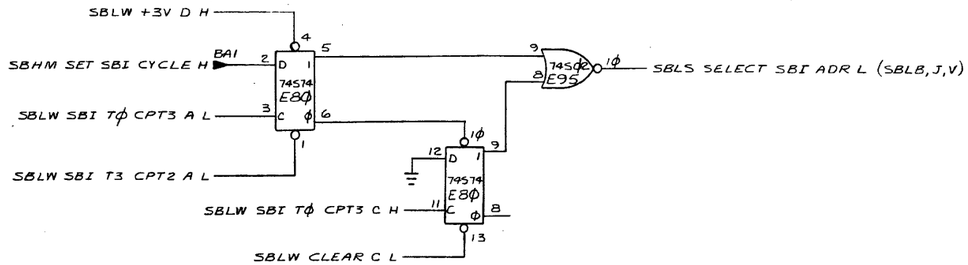
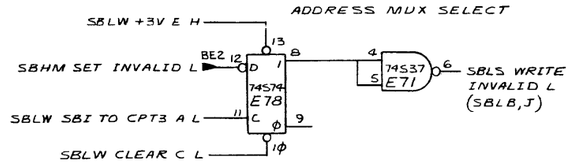
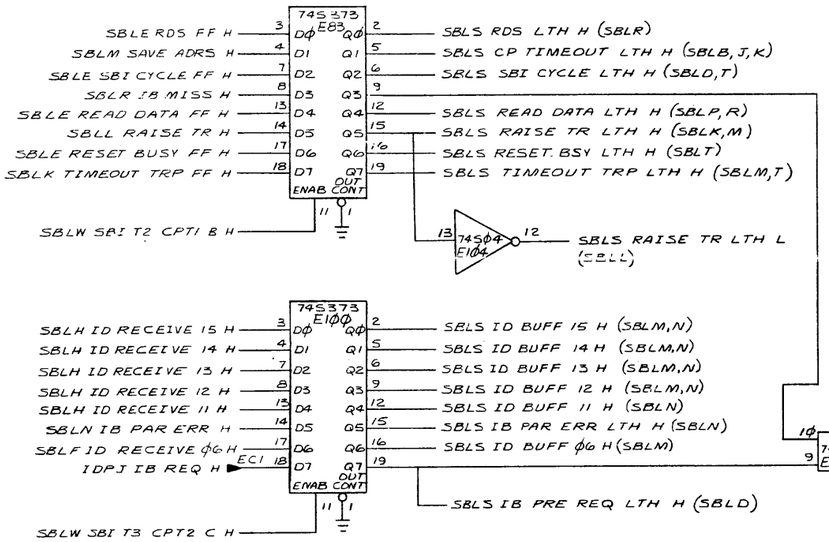
ADDRESS MUX TRI-STATE ENABLE



ADDRESS MUX SELECT



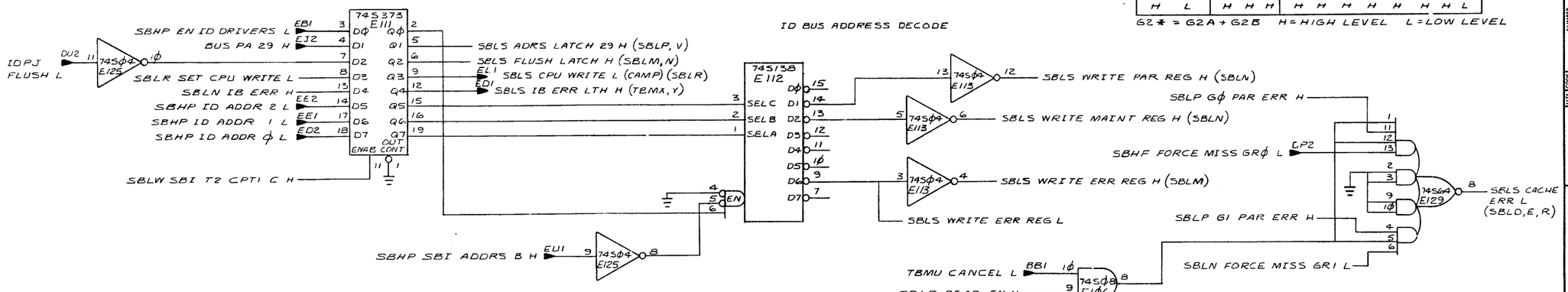


74S138 FUNCTION TABLE

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2*	C	B	A	YØ	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

G2* = G2A + G2B H = HIGH LEVEL L = LOW LEVEL

ID BUS ADDRESS DECODE



REVISIONS		
CHK	CHANGE NO.	REV.

(HOLDING LATCHES) (SLOT 2)

TITLE (SBLS) SBI INTERFACE LOW BITS
SIZE D | CODE CS | NUMBER M8218-Ø-1 | REV. E
SCALE — | SHEET 16 OF 27 | DIST.

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TBMU CANCEL L — BB1 — 74SØ4 E123

SBLE AUTO REFILL FF L
SBLP ROM ENABLE Ø H
74SG4 E122 → SBLS TIMEOUT TRP LTH H, SBLM SET TO OR CNF H, SBLN BUFFER FULL FF L

SBLN DISABLE SBI CYC H — 74SØØ E137 — 74SØ4 E13Ø
SBLT TIMEOUT TRAP EN H (SBLK)

74SØ4 E13Ø → SBLT CP READ H (SBLD,R,T)

SBLL XMIT MUX SEL Ø H
SBLP ANY READ H, SBLP ALLOW IB L — 74SØØ E137 — 74S1Ø E136

CAMK GØ MATCH H — BK1
SBLP U INTLK READ L
SBLP ISR H
SBLP ROM ENABLE 1 H
CAMK G1 MATCH H — BK2
74SG4 E146

74S9Ø E147 → ER1 SBLT STALL L (SBLK) (TBMN,W,Y) (USCB) (CEHD,S)

SBLP ANY WRITE H, SBLP ADRS LATCH 29 H — 74SØØ E137 — 74SØ4 E123 → SBLT WRITE IO H (SBLT)

SBLT WRITE IO L (SBLP)

SBLT ADRS LATCH 29 L
SBLP ANY WRITE H
SBLN BUFFER FULL FF L
74SG2 E11Ø
SBLT CP READ H
SBLR WANTED DATA H
SBLP ROM ENABLE 3 H
SBLN BUFFER FULL FF L

74SØ4 E123 → SBLT ADRS LATCH 29 L (SBLK,N,T)

SBLN BUFFER FULL FF H, SBLT CP READ H — 74S86 E1Ø7
SBLD U CP READ H — 74S11 E12Ø

SBLE AUTO REFILL FF H, SBLS SBI CYCLE LTH H — 74SØ2 E121 → SBLT REFILL OR SBI L (SBLD)

SBLS RESET BSY LTH H, SBLN BUFFER FULL FF H — 74SØ8 E1ØG

SBLP GØ PAR ERR H
SBHF FORCE MISS GRØ L — DP2
SBLP KOM ENABLE 2 H
SBLE AUTO REFILL FF L
SBLT WRITE IO H
SBLN FORCE MISS GR1 L
SBLP G1 PAR ERR H
74SG8 E134

REVISIONS		
CHK	CHANGE NO.	REV.

(STALL GENERATION) (SLOT 2)

TITLE	SIZE	CODE	NUMBER	REV.
(SBLT) SBI INTERFACE LOW BITS	D	CS	M8218-Ø-1	E
SCALE — SHEET 17 OF 27	DIST.			

DEC FORM NO. DRD 138

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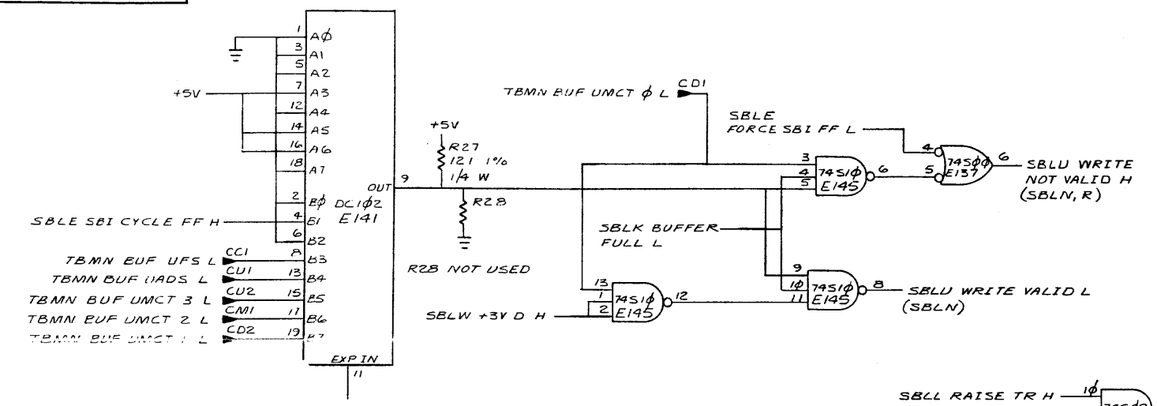
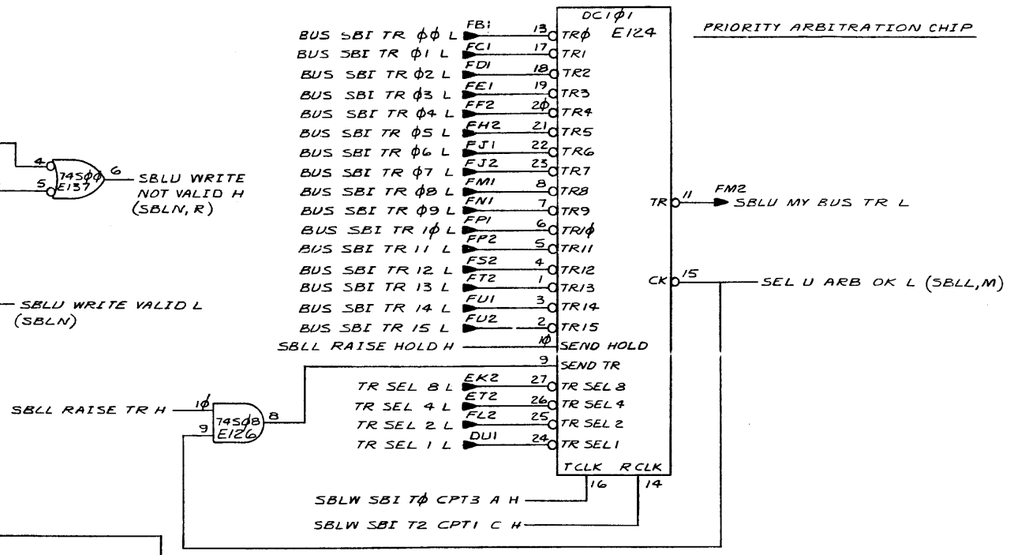
8 INPUT COMPARATOR



PRIORITY ARBITRATION CHIP



DC1Ø1 FUNCTION TABLE

INPUTS				OUTPUTS		
	SEND HOLD	SEND TR	CONDITIONS OF BUS SBI TR LINES AT RCLK	ARB OK L (AT RCLK)	BUS SBI TRØØ L (AT TCLK)	MY BUS TR L (AT TLCK)
OPERATION FOR CPU TR'S 15 THRU 1	L	L	X	H	H	H
	L	H	SOME TR LINE LESS THAN (HIGHER PRIORITY) THAN CPU TR RECEIVED	H	H	L
	L	H	NO TR LINE LESS THAN (HIGHER PRIORITY) THE CPU TR RECEIVED	L	H	L
	H	L	X	H	L	H
	H	H	NOT GENERATED BY LOGIC			
OPERATION FOR CPU OPERATION WITH IMPLIED 16 TR	L	X	SOME TR LINE RECEIVED	H	H	N
	L	X	NO TR LINE RECEIVED	L	H	N
	H	L	X	H	L	N
	H	H	NOT GENERATED BY LOGIC			

X = DON'T CARE N = NOT USED

TR SEL JUMPER CHART

TR SEL 8	TR SEL 4	TR SEL 2	TR SEL 1	CPU TR CPU ID$_{10}$	TR JUMPER NEEDED	JUMPER FROM MY BUS TR L FM2 * TO BUS SBI TR #	PIN
L	L	L	L	16	N	——	**
L	L	L	H	15	Y	15	FU2
L	L	H	L	14	Y	14	FU1
L	L	H	H	13	Y	13	FT2
L	H	L	L	12	Y	12	FS2
L	H	L	H	11	Y	11	FP2
L	H	H	L	1Ø	Y	1Ø	FP1
L	H	H	H	9	Y	9	FN1
H	L	L	L	8	Y	8	FM1
H	L	L	H	7	Y	7	FJ2
H	L	H	L	6	Y	6	FJ1
H	L	H	H	5	Y	5	FH2
H	H	L	L	4	Y	4	FF2
H	H	L	H	3	Y	3	FE1
H	H	H	L	2	Y	2	FD1
H	H	H	H	1	Y	1	FC1

Y = YES N = NO * = JUMPER CONNECTION MADE ON SBL BACK PANEL SLOT
** = NORMAL CONFIGURATION OF UNIT PROCESSORS

NOTE : TR SEL 8, TR SEL 4, TR SEL 2 AND TR SEL 1 ARE CONFIGURED BY JUMPERS ON THE CPU BACKPANEL

REVISIONS

CHK	CHANGE NO.	REV

(SBI ARBITRATION) (SLOT 2)

TITLE (SBLU) SBI INTERFACE LOW BITS | SIZE D | CODE CS | NUMBER M8218-Ø-1 | REV. E

SCALE —//— | SHEET 18 OF 27 | DIST.

DEC FORM NO. ORD 138

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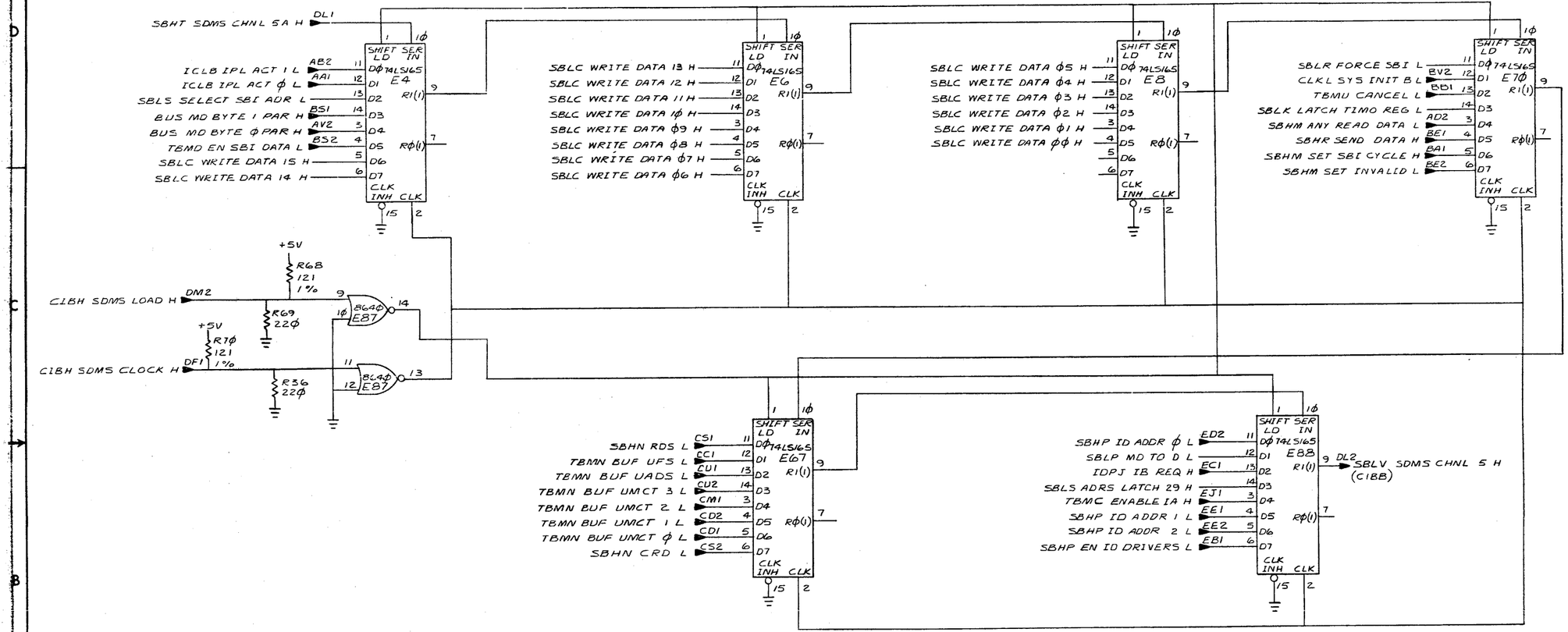

74LS165 FUNCTION TABLE

INPUTS					INTERNAL OUTPUTS		OUTPUT
SHIFT/LOAD	CLOCK INHIBIT	CLOCK	SERIAL	PARALLEL A ··· H	Q_A	Q_B	Q_H
L	X	X	X	a ··· h	a	b	h
H	L	L	X	X	Q_{A0}	Q_{B0}	Q_{H0}
H	L	↑	H	X	H	Q_{An}	Q_{Gn}
H	L	↑	L	X	L	Q_{An}	Q_{Gn}
H	H	X	X	X	Q_{A0}	Q_{B0}	Q_{H0}

REVISIONS		
CHK	CHANGE NO.	REV.

(V BUS LOGIC) (SLOT 2)

TITLE (SBLV) SBI INTERFACE LOW BITS

SIZE D | CODE CS | NUMBER M8218-ϕ-1 | REV. E

SCALE — | SHEET 19 OF 27 | DIST.

DEC FORM NO. DRD 138

TW

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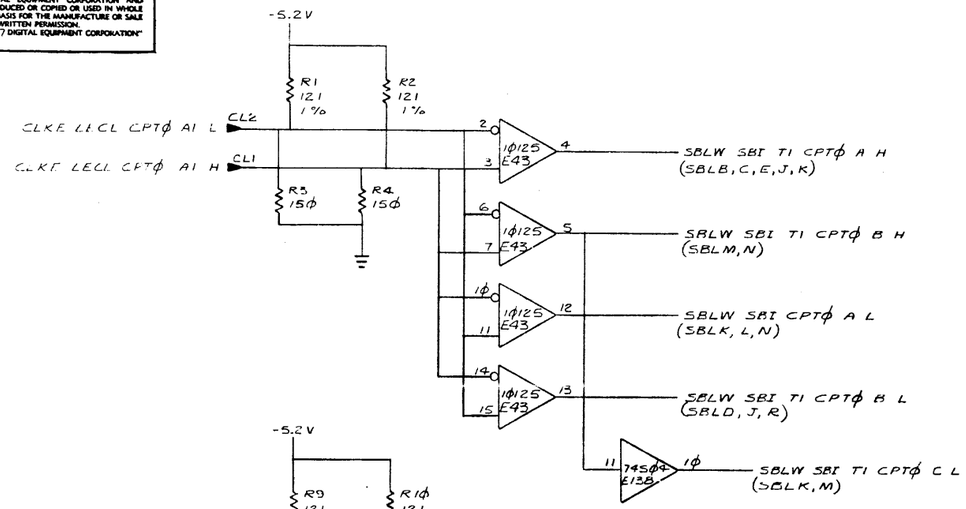

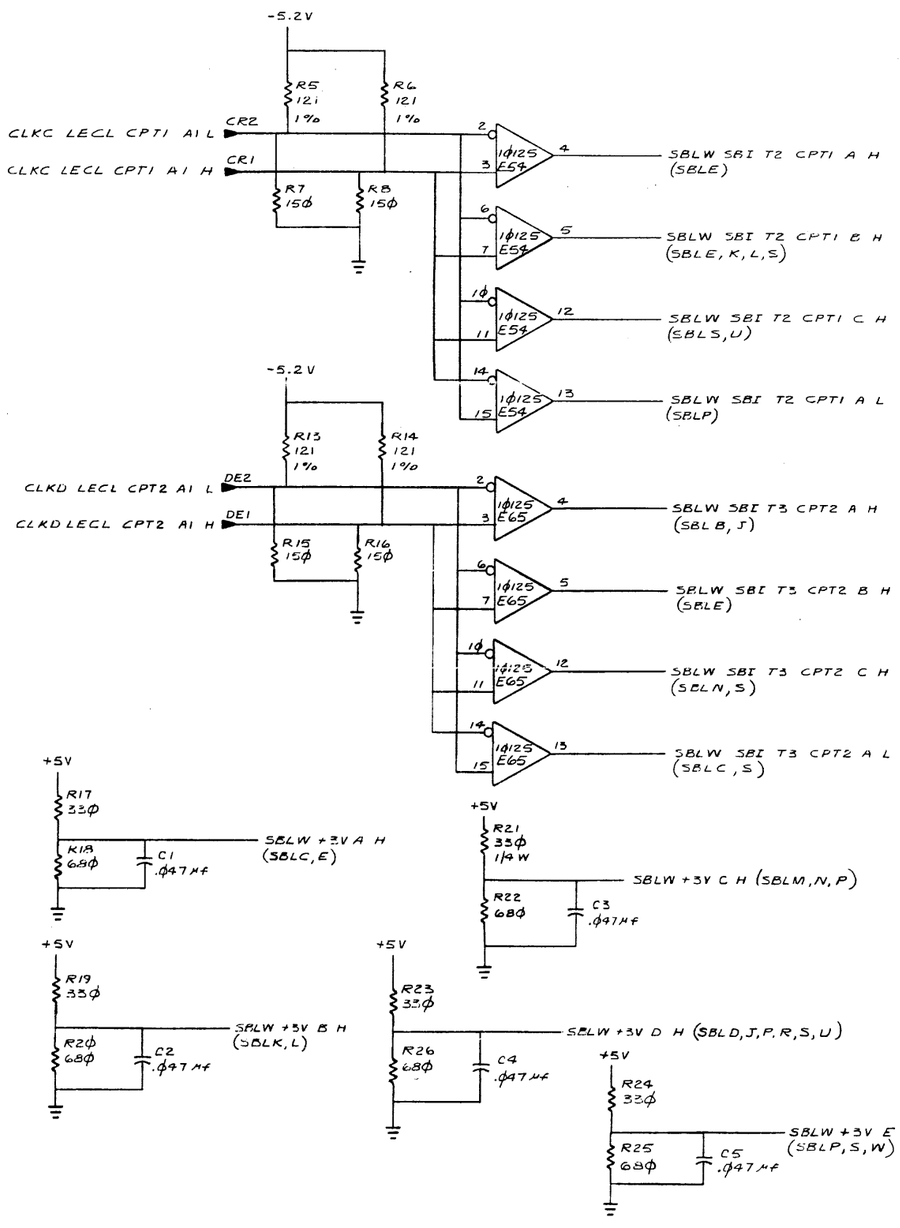

REVISIONS		
CHK	CHANGE NO.	REV.

(CLOCK RECEIVERS) (SLOT 2)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE LOW BITS (SBLW)	D	CS	M8218-Ø-1	E
SCALE —— SHEET 20 OF 27	DIST.			

DEC FORM NO. DRD 138

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DEC PART NO.
23-ϕ2ϕB1-ϕϕ
(256 x 8)
E142

A7	A6	A5	A4	A3	A2	A1	Aϕ	B7	B6	B5	B4	B3	B2	B1	Bϕ	COMMAND DESCRIPTION	COMMENTS
L	L	L	L	X	X	X	X	L	H	L	H	H	H	H	L	DEFAULT, ALLOW IB READ	
L	L	L	H	X	X	X	X	L	H	L	H	L	L	H	L	NO MEMORY OP	
L	L	H	L	L	L	L	L	L	H	L	H	H	H	H	L	ALLOW IB READ	
L	L	H	L	L	L	L	H	L	H	L	H	L	L	H	L		
L	L	H	L	L	L	H	L	H	L	L	H	L	H	L	L	INTLK READ. P	
L	L	H	L	L	L	H	H	L	H	L	H	L	L	H	L		
L	L	H	L	L	H	L	L	H	L	L	H	L	L	H	L	ISR	
L	L	H	L	L	H	L	H	L	H	L	H	L	L	H	L		
L	L	H	L	L	H	H	L	H	L	L	H	L	H	H	L	READ. P	
L	L	H	L	L	H	H	H	L	H	L	H	L	L	H	L		
L	L	H	L	H	L	L	L	L	L	L	H	L	L	H	L	INTLK WRITE. P	
L	L	H	L	H	L	L	H	L	H	L	H	L	L	H	L		
L	L	H	L	H	L	H	L	L	L	L	H	L	L	H	L	WRITE. P	
L	L	H	L	H	L	H	H	L	L	L	H	L	L	H	L	EXTENDED WRITE. P	
L	L	H	L	H	H	L	L	L	L	L	H	L	L	H	L	VALIDATE	
L	L	H	L	H	H	L	H	L	L	L	H	L	L	H	L	INVALIDATE	
L	L	H	L	H	H	H	L	L	H	L	L	L	L	H	L	HOLD & UNJAM	
L	L	H	L	H	H	H	H	L	H	L	L	L	L	H	L	HOLD	
L	L	H	H	L	L	L	L	L	H	L	H	L	L	H	L		
L	L	H	H	L	L	L	H	L	H	L	H	L	L	H	H	INTLK READ. WCHK	
L	L	H	H	L	L	H	L	H	L	L	H	L	H	L	L	INTLK READ. NOCHK	
L	L	H	H	L	L	H	H	L	L	H	H	H	H	H	L	READ. V. NEW PC	
L	L	H	H	L	L	H	L	H	L	L	H	L	H	H	H	READ. V. IBCHK	
L	L	H	H	L	H	L	L	H	L	L	H	L	H	H	H	READ. V. WCHK	FORCE INTLK READ IF PA29 = 1
L	L	H	H	L	H	L	H	H	L	L	H	L	H	H	L	READ. V. NOCHK	
L	L	H	H	L	H	H	L	H	L	L	H	L	H	H	H	READ. V. RCHK	
L	L	H	H	L	H	H	H	L	L	H	L	L	H	L	L	INTLK WRITE. V. XCHK	
L	L	H	H	H	L	L	L	L	L	H	L	L	H	L	L	WRITE. V. WCHK	
L	L	H	H	H	L	L	H	L	L	H	L	L	H	L	H	WRITE. V. NOCHK	
L	L	H	H	H	L	H	L	L	H	L	L	L	L	H	L		
L	L	H	H	H	H	L	L	L	H	L	H	L	L	H	L	TEST. WCHK	
L	L	H	H	H	H	L	H	L	H	L	H	L	L	H	L	MEMORY NOP	
L	L	H	H	H	H	H	L	L	H	L	H	L	L	H	L	TEST. RCHK	
L	H	L	L	X	X	X	X	L	H	L	H	H	H	H	L	DEFAULT ALLOW IB READ	
L	H	L	H	X	X	X	X	L	H	L	H	L	L	H	L	NO MEMORY OP	
L	H	H	L	L	L	L	L	L	H	L	H	H	H	H	L	ALLOW IB READ	
L	H	H	L	L	L	L	H	L	H	L	H	L	L	H	L		
L	H	H	L	L	L	H	L	H	L	L	H	L	H	L	L	INTLK READ. P	
L	H	H	L	L	L	H	H	L	H	L	H	L	L	H	L		
L	H	H	L	L	H	L	L	H	L	L	H	L	L	H	L	ISR	
L	H	H	L	L	H	L	H	L	H	L	H	L	L	H	L		
L	H	H	L	L	H	H	L	H	L	L	H	L	H	H	L	READ. P	
L	H	H	L	L	H	H	H	L	H	L	H	L	L	H	L		
L	H	H	L	H	L	L	L	L	L	L	H	L	L	H	L	INTLK WRITE. P	
L	H	H	L	H	L	L	H	L	H	L	H	L	L	H	L		
L	H	H	L	H	L	H	L	L	L	L	H	L	L	H	L	WRITE. P	
L	H	H	L	H	L	H	H	L	L	L	H	L	L	H	L	EXTENDED WRITE. P	
L	H	H	L	H	H	L	L	L	L	L	H	L	L	H	L	VALIDATE	
L	H	H	L	H	H	L	H	L	L	L	H	L	L	H	L	INVALIDATE	
L	H	H	L	H	H	H	L	L	H	L	L	L	L	H	L	HOLD & UNJAM	
L	H	H	L	H	H	H	H	L	H	L	L	L	L	H	L	HOLD	
L	H	H	H	L	L	L	L	L	H	L	H	L	L	H	L		
L	H	H	H	L	L	L	H	H	L	L	H	L	L	H	L	INTLK READ. WCHK	
L	H	H	H	L	L	H	L	H	L	L	H	L	H	L	L	INTLK READ. NOCHK	

} FORCE INTLK READ IF PA29 = 1

A7	A6	A5	A4	A3	A2	A1	Aϕ	B7	B6	B5	B4	B3	B2	B1	Bϕ	COMMAND DESCRIPTION	COMMENTS
L	H	H	H	L	L	H	H	L	L	H	H	H	H	H	L	READ. V. NEW PC	
L	H	H	H	L	H	L	L	H	L	L	H	L	H	H	L	READ. V. IBCHK	
L	H	H	H	L	H	L	H	H	L	L	H	L	H	H	H	READ. V. WCHK	FORCE INTLK READ IF PA29 = 1
L	H	H	H	L	H	H	L	H	L	L	H	L	H	H	L	READ. V. NOCHK	
L	H	H	H	L	H	H	H	H	L	L	H	L	H	H	L	READ. V. RCHK	
L	H	H	H	H	L	L	L	L	L	L	H	L	L	H	L	INTLK WRITE. V. XCHK	
L	H	H	H	H	L	L	H	L	L	L	H	L	L	H	L	WRITE. V. WCHK	
L	H	H	H	H	L	H	L	L	L	L	H	L	L	H	L	WRITE. V. NOCHK	
L	H	H	H	H	L	H	H	L	H	L	L	L	L	H	L		
L	H	H	H	H	H	L	L	L	H	L	L	L	L	H	L	TEST. WCHK	
L	H	H	H	H	H	L	H	L	H	L	L	L	L	H	L	MEMORY NOP	
L	H	H	H	H	H	H	L	L	H	L	L	L	L	H	L	TEST. RCHK	
H	L	L	L	X	X	X	X	L	H	L	H	H	H	H	L	DEFAULT ALLOW IB READ	
H	L	L	H	X	X	X	X	L	H	L	H	L	L	H	L	NO MEMORY OP	
H	L	H	L	L	L	L	L	L	H	L	H	H	H	H	L	ALLOW IB READ	
H	L	H	L	L	L	L	H	L	H	L	H	L	L	H	L		
H	L	H	L	L	L	H	L	H	L	L	H	L	H	L	L	INTLK READ. P	
H	L	H	L	L	L	H	H	L	H	L	H	L	L	H	L		
H	L	H	L	L	H	L	L	H	L	L	H	L	L	H	L	ISR	
H	L	H	L	L	H	L	H	L	H	L	H	L	L	H	L		
H	L	H	L	L	H	H	L	H	L	L	H	L	H	H	L	READ. P	
H	L	H	L	L	H	H	H	L	H	L	H	L	L	H	L		
H	L	H	L	H	L	L	L	L	L	L	H	L	L	H	L	INTLK WRITE. P	
H	L	H	L	H	L	L	H	L	H	L	H	L	L	H	L		
H	L	H	L	H	L	H	L	L	L	L	H	L	L	H	L	WRITE. P	
H	L	H	L	H	L	H	H	L	L	L	H	L	L	H	L	EXTENDED WRITE. P	
H	L	H	L	H	H	L	L	L	L	L	H	L	L	H	L	VALIDATE	
H	L	H	L	H	H	L	H	L	L	L	H	L	L	H	L	INVALIDATE	
H	L	H	L	H	H	H	L	L	H	L	L	L	L	H	L	HOLD & UNJAM	
H	L	H	L	H	H	H	H	L	H	L	L	L	L	H	L	HOLD	
H	L	H	H	L	L	L	L	L	H	L	H	L	L	H	L		
H	L	H	H	L	L	L	H	H	L	L	H	L	L	H	L	INTLK READ. WCHK	
H	L	H	H	L	L	H	L	H	L	L	H	L	H	L	L	INTLK READ. NOCHK	
H	L	H	H	L	L	H	H	L	L	H	H	H	H	H	L	READ. V. NEW PC	
H	L	H	H	L	H	L	L	H	L	L	H	L	H	H	H	READ. V. IBCHK	
H	L	H	H	L	H	L	H	H	L	L	H	L	H	H	L	READ. V. WCHK	} FORCE INTLK READ IF PA29 = 1
H	L	H	H	L	H	H	L	H	L	L	H	L	H	H	H	READ. V. NOCHK	
H	L	H	H	L	H	H	H	H	L	L	H	L	H	H	L	READ. V. RCHK	
H	L	H	H	H	L	L	L	L	L	H	L	L	H	L	L	INTLK WRITE. V. XCHK	
H	L	H	H	H	L	L	H	L	L	H	L	L	H	L	H	WRITE. V. WCHK	
H	L	H	H	H	L	H	L	L	L	H	L	L	H	L	H	WRITE. V. NOCHK	} FORCE INTLK WRITE IF PA29 = 1
H	L	H	H	H	L	H	H	L	H	L	H	L	L	H	L		
H	L	H	H	H	H	L	L	L	H	L	H	L	L	H	L	TEST. WCHK	
H	L	H	H	H	H	L	H	L	H	L	H	L	L	H	L	MEMORY NOP	
H	L	H	H	H	H	H	L	L	L	H	H	L	L	H	L	TEST. RCHK	

ROM EN 1 = ALWAYS DON'T STALL
ROM EN 2 = STALL IF AUTO REFILL

NOTE: CHART CONTINUED ON NEXT SHEET

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 2)

TITLE: SBI INTERFACE LOW BITS
SIZE D | CODE CS | NUMBER M8218-Ø-1 | REV. E
SCALE — | SHEET 21 OF 27 | DIST.

DEC FORM NO. DRD 138

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(CONTINUED FROM PREVIOUS SHEET)

DEC PART NO.
23-024E1-00
(256 X 8)
E142

FORCE INTLK FF H A7	IB CHECK L A6	UFS L A5	UADS L A4	UMCT 3 L A3	UMCT 2 L A2	UMCT 1 L A1	UMCT 0 L A0	MD TO D H B7	ROM EN 1 H B6	ROM EN 2 H B5	FORCE HOLD L B4	U ALLOW IE L B3	U ANY READ H B2	INTLK READ L B1	FORCE INTLK H B0	COMMAND DESCRIPTION	COMMENTS
H	H	L	L	X	X	X	X	L	H	L	H	H	H	H	L	DEFAULT, ALLOW IB READ	
H	H	L	H	X	X	X	X	L	H	L	H	L	L	H	L	NO MEMORY OP	
H	H	H	L	L	L	L	L	L	H	L	H	H	H	H	L	ALLOW IB READ	
H	H	L	L	L	L	L	H	L	H	L	H	L	L	H	L		
H	H	H	L	L	L	H	L	H	L	L	H	L	H	L	L	INTLK READ. P	
H	H	H	L	L	H	L	L	H	L	L	H	L	L	H	L	ISR	
H	H	H	L	L	H	L	H	L	H	L	H	L	L	H	L		
H	H	H	L	L	H	H	L	H	L	L	H	L	H	H	L	READ. P	
H	H	H	L	L	H	H	H	L	H	L	H	L	L	H	L		
H	H	H	L	H	L	L	L	L	L	L	H	L	L	H	L	INTLK WRITE. P	
H	H	H	L	H	L	L	H	L	H	L	H	L	L	H	L		
H	H	H	L	H	L	H	L	L	L	L	H	L	L	H	H	WRITE. P	FORCE INTLK WRITE IF PA29=1
H	H	H	L	H	L	H	H	L	L	L	H	L	L	H	L	EXTENDED WRITE. P	
H	H	H	L	H	H	L	L	L	L	L	H	L	L	H	L	VALIDATE	
H	H	H	L	H	H	L	H	L	L	L	H	L	L	H	L	INVALIDATE	
H	H	H	L	H	H	H	L	L	H	L	L	L	L	H	L	HOLD & UNJAM	
H	H	H	L	H	H	H	H	L	H	L	L	L	L	H	L	HOLD	
H	H	H	H	L	L	L	L	L	H	L	H	L	L	H	L		
H	H	H	H	L	L	L	H	H	L	L	H	L	H	L	L	INTLK READ. WCHK	
H	H	H	H	L	L	H	L	H	L	L	H	L	H	H	L	INTLK READ. NOCHK	
H	H	H	H	L	L	H	H	L	L	H	H	H	H	H	L	READ. V. NEW PC	
H	H	H	H	L	L	H	L	H	L	L	H	L	H	H	L	READ. V. IBCHK	
H	H	H	H	L	H	L	H	H	L	L	H	L	H	H	H	READ. V. WCHK	FORCE INTLK READ IF PA29=1
H	H	H	H	L	H	H	L	H	L	L	H	L	H	H	L	READ. V. NOCHK	
H	H	H	H	L	H	H	H	H	L	L	H	L	H	H	L	READ. V. RCHK	
H	H	H	H	H	L	L	L	L	L	H	L	L	H	H	L	INTLK WRITE. V. XCHK	
H	H	H	H	H	L	L	H	L	L	L	H	L	L	H	H	WRITE. V. WCHK	FORCE INTLK WRITE IF PA29=1
H	H	H	H	H	L	H	L	L	L	L	H	L	L	H	H	WRITE. V. NOCHK	
H	H	H	H	H	L	H	H	L	H	L	H	L	L	H	L		
H	H	H	H	H	H	L	L	L	H	L	H	L	L	H	L		
H	H	H	H	H	H	L	H	L	L	H	H	L	L	H	L	TEST. WCHK	
H	H	H	H	H	H	H	L	L	H	L	H	L	L	H	L	MEMORY NOP	
H	H	H	H	H	H	H	H	L	L	H	H	L	L	H	L	TEST. RCHK	

DEC PART NO.
23-19001-00 (1K X 4)
E38

DEFAULT CONDITION
CLEAR BUSY L = H
ACK PULSE L = H
CNF ERR H = L
SET RETRY H = L

NOTE: ALL ENTRIES NOT SHOWN ARE IN THE DEFAULT CONDITION

ISR H A9	EXTEND WRITE H A8	ANY WRITE H A7	ANY READ H A6	TP 2 H A5	TP 3 H A4	TP 4 H A3	TIMEOUT CARRY H A2	CNF1 L A1	CNF0 L A0	CLEAR BUSY L D3	ACK PULSE L D2	CNF ERR H D1	SET RETRY H D0	COMMENTS
H	L	L	L	H	L	L	L	H	H	L	H	L	L	ISR
H	L	L	L	H	L	L	L	L	H	L	H	L	L	ISR
H	L	L	L	H	L	L	L	L	H	L	H	L	L	ISR
H	L	L	L	H	L	L	L	L	L	L	H	L	L	ISR
H	L	L	L	H	L	L	H	H	H	L	H	L	L	ISR
H	L	L	L	H	L	L	H	H	L	L	H	L	L	ISR
H	L	L	L	H	L	L	H	L	H	L	H	L	L	ISR
H	L	L	L	H	L	L	H	L	L	L	H	L	L	ISR
L	L	H	L	H	L	L	L	H	H	H	H	L	H	NO RESPONSE, RETRY
L	L	H	L	H	L	L	L	H	L	H	H	L	L	ACK
L	L	H	L	H	L	L	L	L	H	H	H	L	H	BSY
L	L	H	L	H	L	L	L	L	L	L	H	H	L	ERR
L	L	H	L	H	L	L	H	H	H	L	H	L	L	NR, TIMEOUT } 32 BIT WRITE · TP 2
L	L	H	L	H	L	L	H	H	L	L	H	L	L	ACK TIMEOUT
L	L	H	L	H	L	L	H	L	H	L	H	L	L	BSY, TIMEOUT
L	L	H	L	H	L	L	H	L	L	L	H	H	L	ERR, TIMEOUT
L	L	H	L	L	H	L	L	H	H	H	H	L	H	NR
L	L	H	L	L	H	L	L	H	L	L	H	L	L	ACK
L	L	H	L	L	H	L	L	L	H	H	H	L	H	BSY
L	L	H	L	L	H	L	L	L	L	L	H	H	L	ERR } 32 BIT WRITE · TP 3
L	L	H	L	L	H	L	H	H	H	L	H	L	L	NR, TIMEOUT
L	L	H	L	L	H	L	H	H	L	L	H	L	L	ACK, TIMEOUT
L	L	H	L	L	H	L	H	L	H	L	H	L	L	BSY, TIMEOUT
L	L	H	L	L	H	L	H	L	L	L	H	H	L	ERR, TIMEOUT
L	H	H	L	H	L	L	L	H	H	H	H	L	H	NR
L	H	H	L	H	L	L	L	L	H	L	H	L	L	ACK
L	H	H	L	H	L	L	L	L	L	H	H	L	H	BSY
L	H	H	L	H	L	L	L	L	L	H	H	H	L	ERR } EXTENDED WRITE · TP2
L	H	H	L	H	L	L	H	H	H	L	H	L	L	NR, TIMEOUT
L	H	H	L	H	L	L	H	H	L	L	H	L	L	ACK, TIMEOUT
L	H	H	L	H	L	L	H	L	H	L	H	L	L	BSY, TIMEOUT
L	H	H	L	H	L	L	H	L	L	L	H	H	L	ERR, TIMEOUT
L	H	H	L	L	H	L	L	H	H	H	H	L	H	NR
L	H	H	L	L	H	L	L	L	H	L	H	L	L	ACK
L	H	H	L	L	H	L	L	L	L	H	H	L	H	BSY
L	H	H	L	L	H	L	L	L	L	H	H	H	L	ERR } EXTENDED WRITE · TP3
L	H	H	L	L	H	L	H	H	H	L	H	L	L	NR, TIMEOUT
L	H	H	L	L	H	L	H	H	L	L	H	L	L	ACK, TIMEOUT
L	H	H	L	L	H	L	H	L	H	L	H	L	L	BSY, TIMEOUT
L	H	H	L	L	H	L	H	L	L	L	H	H	L	ERR, TIMEOUT
L	H	H	L	L	L	H	L	H	H	H	H	L	H	NR
L	H	H	L	L	L	H	L	L	H	L	H	L	L	ACK
L	H	H	L	L	L	H	L	L	L	H	H	L	H	BSY
L	H	H	L	L	L	H	L	L	L	H	H	H	L	ERR } EXTENDED WRITE · TP4
L	H	H	L	L	L	H	H	H	H	L	H	L	L	NR, TIMEOUT
L	H	H	L	L	L	H	H	H	L	L	H	L	L	ACK, TIMEOUT
L	H	H	L	L	L	H	H	L	H	L	H	L	L	BSY, TIMEOUT
L	H	H	L	L	L	H	H	L	L	L	H	H	L	ERR, TIMEOUT
L	L	L	H	H	L	L	L	H	H	H	H	L	H	NR
L	L	L	H	H	L	L	L	L	H	L	L	L	L	ACK
L	L	L	H	H	L	L	L	L	L	H	H	L	H	BSY
L	L	L	H	H	L	L	L	L	L	H	H	H	L	ERR } READ · TP2
L	L	L	H	H	L	L	H	H	H	L	H	L	L	NR, TIMEOUT
L	L	L	H	H	L	L	H	H	L	L	H	L	L	ACK, TIMEOUT
L	L	L	H	H	L	L	H	L	H	L	H	L	L	BSY, TIMEOUT
L	L	L	H	H	L	L	H	L	L	L	H	H	L	ERR, TIMEOUT

REVISIONS

CHK	CHANGE NO.	REV.

TITLE: SBI INTERFACE LOW BITS (SLOT 2)
SIZE D | CODE CS | NUMBER M8218-0-1 | REV E
SCALE — | SHEET 22 OF 27 | DIST.

DEC FORM NO. DRD 138

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DEC PART NO. 23-ϕ19B1-ϕϕ
(256 X 8)
E143

ROM ENABLE ϕ DECODES CANCEL TERM OF SBLT STALL L

ROM ENABLE 3 DECODES VALIDATE OR INVALIDATE

A7	A6	A5 (UFS L)	A4 (UADS L)	A3 (UMCT3 L)	A2 (UMCT2 L)	A1 (UMCT1 L)	Aϕ (UMCTϕ L)	B7 (EXTEND WRITE H)	B6 (ILLEGAL CODE)	B5 (ISR H)	B4 (ANY WRITE H)	B3 (ISR OR WRITE H)	B2 (ROM ENϕ H)	B1 (ROM EN3 H)	Bϕ (SPARE)	COMMENTS
L	L	L	X	X	X	X	X	L	L	L	L	L	L	L	L	ALLOW IB READ OR MEMORY NOP
L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	ALLOW IB READ
L	L	H	L	L	L	L	H	L	H	L	L	L	H	L	L	
L	L	H	L	L	L	H	L	L	L	L	L	L	H	L	L	INTLK READ. P
L	L	H	L	L	L	H	H	L	H	L	L	L	H	L	L	
L	L	H	L	L	H	L	L	L	L	H	L	H	H	L	L	ISR
L	L	H	L	L	H	L	H	L	H	L	L	L	L	L	L	
L	L	H	L	L	H	H	L	L	L	L	L	L	H	L	L	READ.P
L	L	H	L	L	H	H	H	L	H	L	L	L	L	L	L	
L	L	H	L	H	L	L	L	L	L	L	H	H	H	L	L	INTLK WRITE.P
L	L	H	L	H	L	L	H	L	H	L	L	L	H	L	L	
L	L	H	L	H	L	H	L	L	L	L	H	H	H	L	L	WRITE.P
L	L	H	L	H	L	H	H	H	L	L	H	H	H	L	L	EXTENDED WRITE.P
L	L	H	L	H	H	L	L	L	L	L	L	L	H	H	L	VALIDATE
L	L	H	L	H	H	L	H	L	L	L	L	L	H	H	L	INVALIDATE
L	L	H	L	H	H	H	L	L	L	L	L	L	L	L	L	HOLD & UNJAM
L	L	H	L	H	H	H	H	L	L	L	L	L	L	L	L	HOLD
L	L	H	H	L	L	L	L	L	H	L	L	L	H	L	L	
L	L	H	H	L	L	L	H	L	L	L	L	L	H	L	L	INTLK READ
L	L	H	H	L	L	H	L	L	L	L	L	L	H	L	L	INTLK READ
L	L	H	H	L	L	H	H	L	L	L	L	L	L	L	L	READ NEW PC
L	L	H	H	L	H	L	L	L	L	L	L	L	H	L	L	READ
L	L	H	H	L	H	L	H	L	L	L	L	L	H	L	L	READ
L	L	H	H	L	H	H	L	L	L	L	L	L	H	L	L	READ
L	L	H	H	L	H	H	H	L	L	L	L	L	H	L	L	READ
L	L	H	H	H	L	L	L	L	L	L	H	H	H	L	L	INTLK WRITE
L	L	H	H	H	L	L	H	L	L	L	H	H	H	L	L	WRITE
L	L	H	H	H	L	H	L	L	L	L	H	H	H	L	L	WRITE
L	L	H	H	H	L	H	H	L	H	L	L	L	H	L	L	
L	L	H	H	H	H	L	L	L	H	L	L	L	H	L	L	
L	L	H	H	H	H	L	H	L	L	L	L	L	L	L	L	TEST. WCHK
L	L	H	H	H	H	H	L	L	L	L	L	L	L	L	L	MEMORY NOP
L	L	H	H	H	H	H	H	L	L	L	L	L	L	L	L	TEST. RCHK

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 2)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE LOW BITS	D	CS	M8218-ϕ-1	E
SCALE — 11 —	SHEET 23 OF 27	DIST.		

DEC FORM NO. DRD 138

TW

55

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MEMORY CONTROL FIELD FROM U WORD ADS	MCT F 3 2 1 Ø S	FUNCTION DESCRIPTION	DECODED FROM U WORD: ROM ENABLE Ø H / ROM ENABLE 1 H / ROM ENABLE 2 H / ROM ENABLE 3 H	74S164 USED FOR THIS FUNCTION	TERMS THAT UNSTALL THE CPU (STALL L GOES HIGH)
Ø	Ø Ø Ø Ø Ø	TEST.RCHK	L L H L	E134-2,3	ROM ENABLE 2 · AUTO REFILL
Ø	Ø Ø Ø Ø 1	MEM.NOP	1 H 1 1	E146-9,1Ø	ROM ENABLE 1
Ø	Ø Ø Ø 1 Ø	TEST.WCHK	L L H L	E134-2 3	ROM ENABLE 2·AUTO REFILL
Ø	Ø Ø Ø 1 1	ILLEGAL CODES		E122-1,11,12,13	ROM ENABLE Ø · CANCEL · AUTO REFILL
Ø	Ø 1 Ø Ø Ø		H H L L	E146-9,1Ø	ROM ENABLE 1
Ø	Ø 1 Ø 1 Ø	WRITE.V.NOCHK	H L L L	E122-1,11,12,13	CANCEL · AUTO REFILL · ROM ENABLE Ø
				E122-9,1Ø	IO SPACE · (TIMEOUT + SBI ERROR CNF)
				E122-4 5 6	IO SPACE · BUFFER FULL · DISABLE SBI CYCLE · (AUTO REFILL + SBI CYCLE)
				E11Ø-1,11,12,13	IO SPACE · BUFFER FULL · (AUTO REFILL + SBI CYCLE)
				E134-9,1Ø	IO SPACE · RESET BUSY
Ø	Ø 1 1 Ø Ø	WRITE.V.WCHK	H L L L	SAME AS WRITE.V.NOCHK	
Ø	Ø 1 1 1 Ø	LOCK WRITE.V.XCHK			
Ø	1 Ø Ø Ø Ø	READ.V.RCHK	H L L L	E122-1,11,12,13	CANCEL · AUTO REFILL · ROM ENABLE Ø
				E122-9,1Ø	TIMEOUT + SBI ERROR CNF
				E122-4,5,6	BUFFER FULL · DISABLE SBI CYCLE · (AUTO REFILL + SBI CYCLE)
				E146-1,11,12,13	GØ MATCH · (AUTO REFILL + SBI CYCLE) · (DOING CP READ MISS)
				E146-4,5,6	G1 MATCH · (AUTO REFILL + SBI CYCLE) · (DOING CP READ MISS)
				E11Ø-2,3	DOING CP READ MISS · WANTED DATA
				E134-1,11,12,13	GØ CACHE PARITY ERR · (AUTO REFILL + SBI CYCLE) · (DOING CP READ MISS)
				E134-4,5,6	G1 CACHE PARITY ERR · (AUTO REFILL + SBI CYCLE) · (DOING CP READ MISS)
Ø	1 Ø Ø 1 Ø	READ.V.NOCHK	H L L L	SAME AS READ.V.RCHK	
Ø	1 Ø 1 Ø Ø	READ.V.WCHK	H L L L	CASE 1: IO SPACE, SAME AS READ.V.RCHK	
				CASE 2: IO SPACE, SAME AS LOCK READ.V.NOCHK	
Ø	1 Ø 1 1 Ø	READ.V.IBCHK	H L L L	CASE 1: IO SPACE + (IO SPACE · IB WCHK): SAME AS READ.V.RCHK	
				CASE 2: IO SPACE · IB WCHK : SAME AS LOCK READ.V.NOCHK	
Ø	1 1 Ø Ø Ø	READ.V.NEWPC	L L H L	E134-2,3	ROM ENABLE 2 · AUTO REFILL
Ø	1 1 Ø 1 Ø	LOCK READ.V.NOCHK	H L L L	E122-1,11,12,13	CANCEL · AUTO REFILL · ROM ENABLE Ø
				E122-9,1Ø	TIMEOUT + SBI ERROR CNF
				E122-4,5,6	BUFFER FULL · DISABLE SBI CYCLE · (AUTO REFILL + SBI CYCLE)
				E11Ø-2,3	DOING CP READ MISS · WANTED DATA
				E134-1,11,12,13	GØ CACHE PARITY ERR · (AUTO REFILL + SBI CYCLE) · DOING CP READ MISS
				E134-4,5,6	G1 CACHE PARITY ERR · (AUTO REFILL + SBI CYCLE) · DOING CP READ MISS
Ø	1 1 1 Ø Ø	LOCK READ.V.WCHK	H L L L	SAME AS LOCK READ.V.NOCHK	
Ø	1 1 1 1 Ø	ILLEGAL CODE	H H L L	E122-1,11,12,13	ROM ENABLE Ø · CANCEL · AUTO REFILL
				E146-9,1Ø	ROM ENABLE 1
1	Ø Ø Ø Ø Ø	SBI, HOLD	L H L L	E146-9,1Ø	ROM ENABLE 1
1	Ø Ø Ø 1 Ø	SBI, HOLD + UNJAM			

NOTE: FOR MORE DETAIL SEE LOGIC PAGE SBLT AND PROM CHARTS

CHART CONTINUED ON NEXT SHEET

REVISIONS		
CHK	CHANGE NO.	REV.

(STALL CHART) SH 1 OF 2 (SLOT 2)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE LOW BITS	D	CS	M8218-Ø-1	E
SCALE —11— SHEET 24 OF 27	DIST.			

DEC FORM NO. DRD 138

TW

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MEMORY CONTROL FIELD FROM U WORD ADS MCT F 3 2 1 0 S	FUNCTION DESCRIPTION	DECODED FROM U WORD ROM ENABLE 0 H / ROM ENABLE 1 H / ROM ENABLE 2 H / ROM ENABLE 3 H	74S164 USED FOR THIS FUNCTION	TERMS THAT UNSTALL THE CPU (STALL L GOES HIGH)
1 0 0 1 0 0 1 0 0 1 1 0	INVALIDATE VALIDATE	H L L H	E122-1,11,12,13 E110-4,5,6	ROM ENABLE 0 · CANCEL · AUTO REFILL ROM ENABLE 3 · (AUTO REFILL + SBI CYCLE) · BUFFER FULL
1 0 1 0 0 0 1 0 1 0 1 0	EXT WRITE.P WRITE.P	H L L L	SAME AS WRITE.V. NOCHK	
1 0 1 1 0 0	ILLEGAL CODE	H H L L	E122-1,11,12,13 E146-9,10	ROM ENABLE 0 · CANCEL · AUTO REFILL ROM ENABLE 1
1 0 1 1 1 0	LOCK WRITE.P	H L L L	SAME AS WRITE.V. NOCHK	
1 1 0 0 0 0	ILLEGAL CODE	H H L L	E122-1,11,12 E146-9,10	ROM ENABLE 0 · CANCEL · AUTO REFILL ROM ENABLE 1
1 1 0 0 1 0	READ.P	H L L L	SAME AS READ.V. RCHK	
1 1 0 1 0 0	ILLEGAL CODE	H H L L	E122-1,11,12,13 E146-9,10	ROM ENABLE 0 · CANCEL · AUTO REFILL ROM ENABLE 1
1 1 0 1 1 0	READ.INT.SUM	H L L L	E122-1,11,12,13 E122-9,10 E122-4,5,6 E146-2,3	ROM ENABLE 0 · CANCEL · AUTO REFILL TIMEOUT BUFFER FULL · DISABLE SBI CYCLE · (AUTO REFILL + SBI CYCLE) RESET BUSY
1 1 1 0 0 0	ILLEGAL CODE	H H L L	E122-1,11,12,13 E146-9,10	ROM ENABLE 0 · CANCEL · AUTO REFILL ROM ENABLE 1
1 1 1 0 1 0	LOCK READ.P	H L L L	SAME AS LOCK READ.V. NOCHK	
1 1 1 1 0 0	ILLEGAL CODE	H H L L	E122-1,11,12,13 E146-9,10	ROM ENABLE 0 · CANCEL · AUTO REFILL ROM ENABLE 1
1 1 1 1 0 0 X X X X 1 1 X X X X 1	ALLOW. IB. READ NO MEMORY OPERATION ALLOW. IB. READ	L H L L	E146-9,10	ROM ENABLE1

X = DON'T CARE

NOTE: CHART CONTINUED FROM PREVIOUS SHEET

(STALL CHART) SH 2 OF 2 (SLOT 2)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE LOW BITS	D	CS	M8218-0-1	E
SCALE —H—	SHEET 25 OF 27	DIST.		

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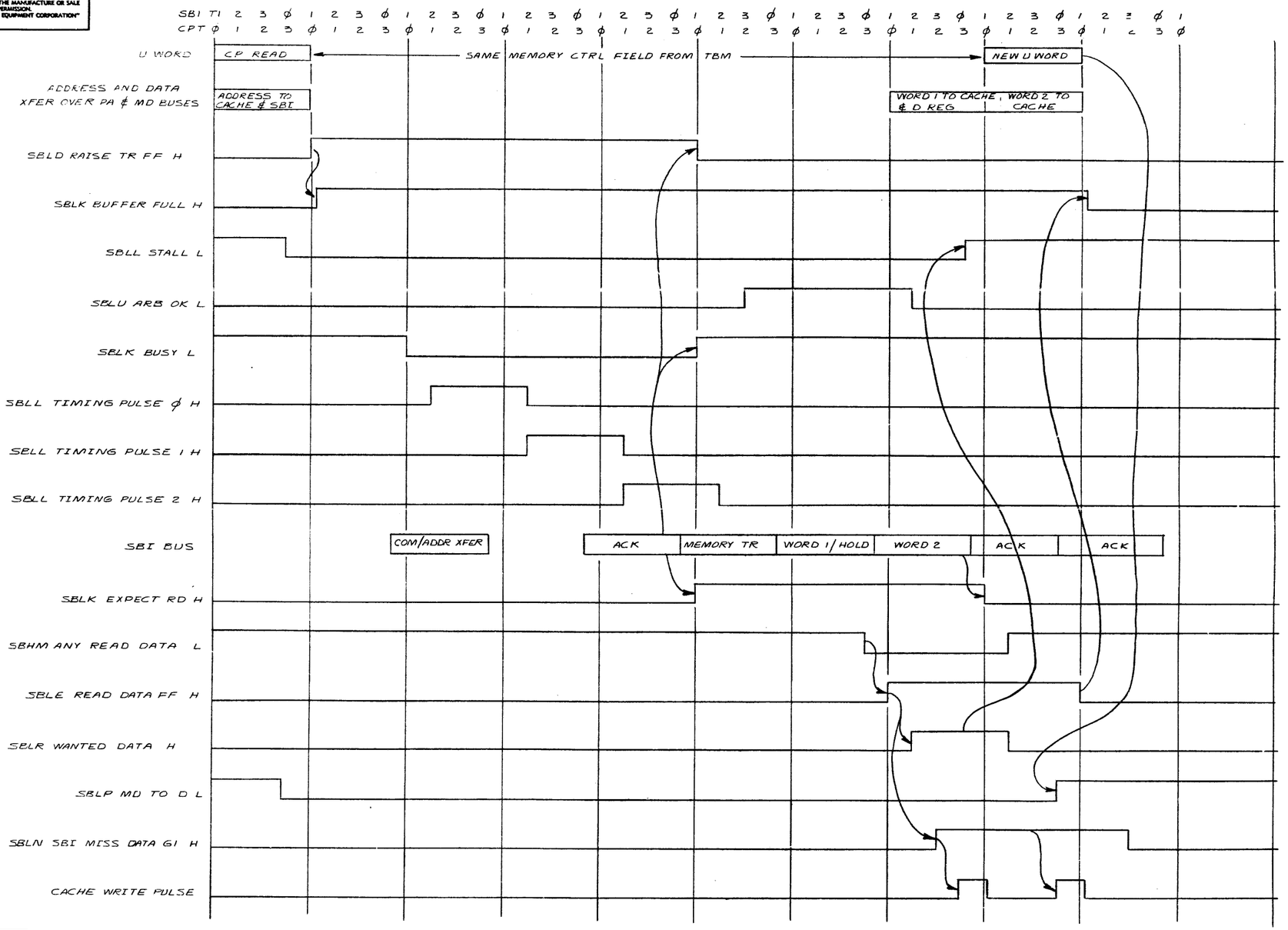

REVISIONS		
CHK	CHANGE NO.	REV.

(CPU READ MISS TIMING) (SLOT 2)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE LOW BITS	D	CS	M8218-Ø-1	E

SCALE — SHEET 26 OF 27 DIST.

DEC FORM NO. DRD 138

58

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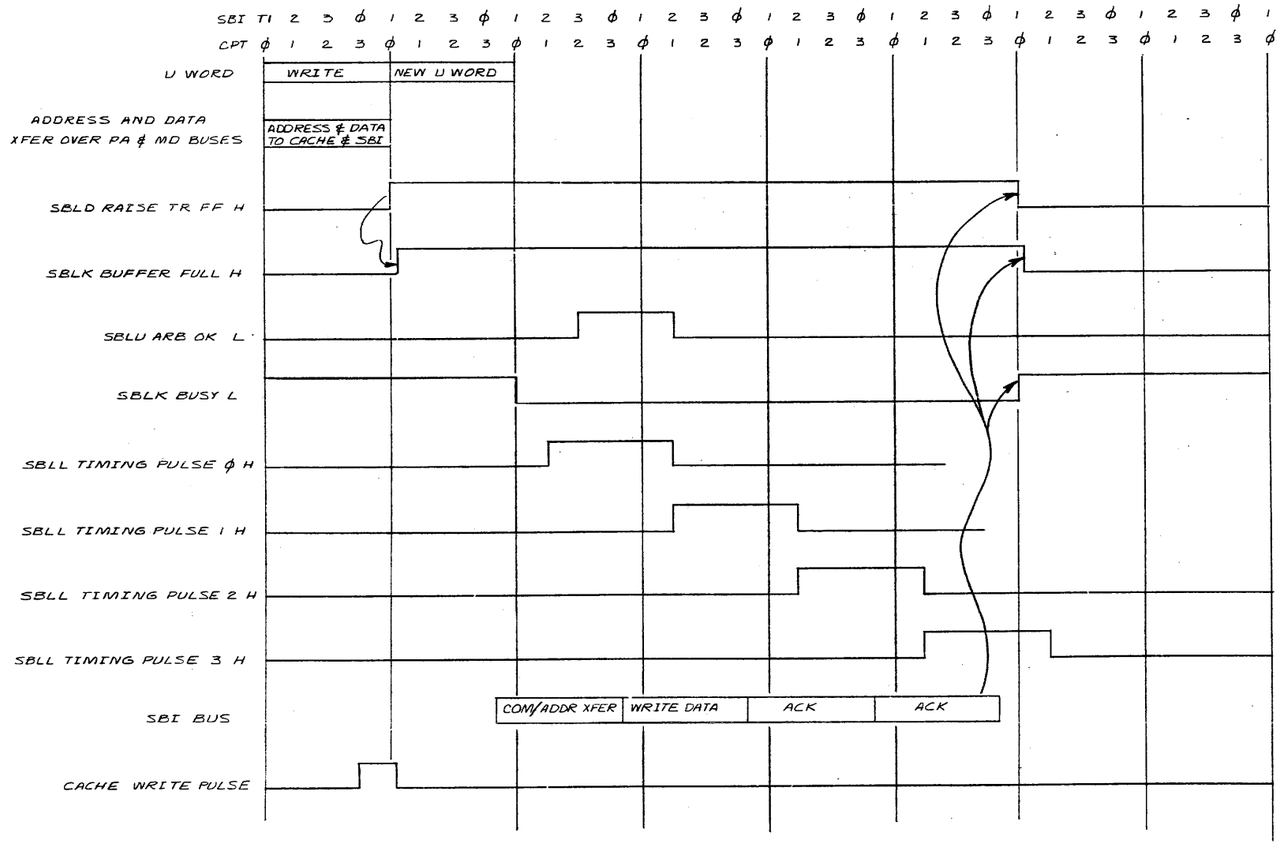


NOTE: WRITE WAS TO MEMORY SPACE
ADDRESS WAS A HIT IN CACHE

(CPU WRITE TIMING) (SLOT 2)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE LOW BITS	D	CS	M8218-Ø-1	E
SCALE —11— SHEET 27 OF 27	DIST.			

DEC FORM NO. DRD 138

COMPONENT SIDE VIEW

SIGNATURES	DATE
DRN	
CHK	
ENG	
ENG	
PROD	
SCALE	
SHT	

digital

TITLE: S8I HIGH BITS

SIZE CODE: E | UA | NUMBER: M8219 | REV: C

ECO REV.

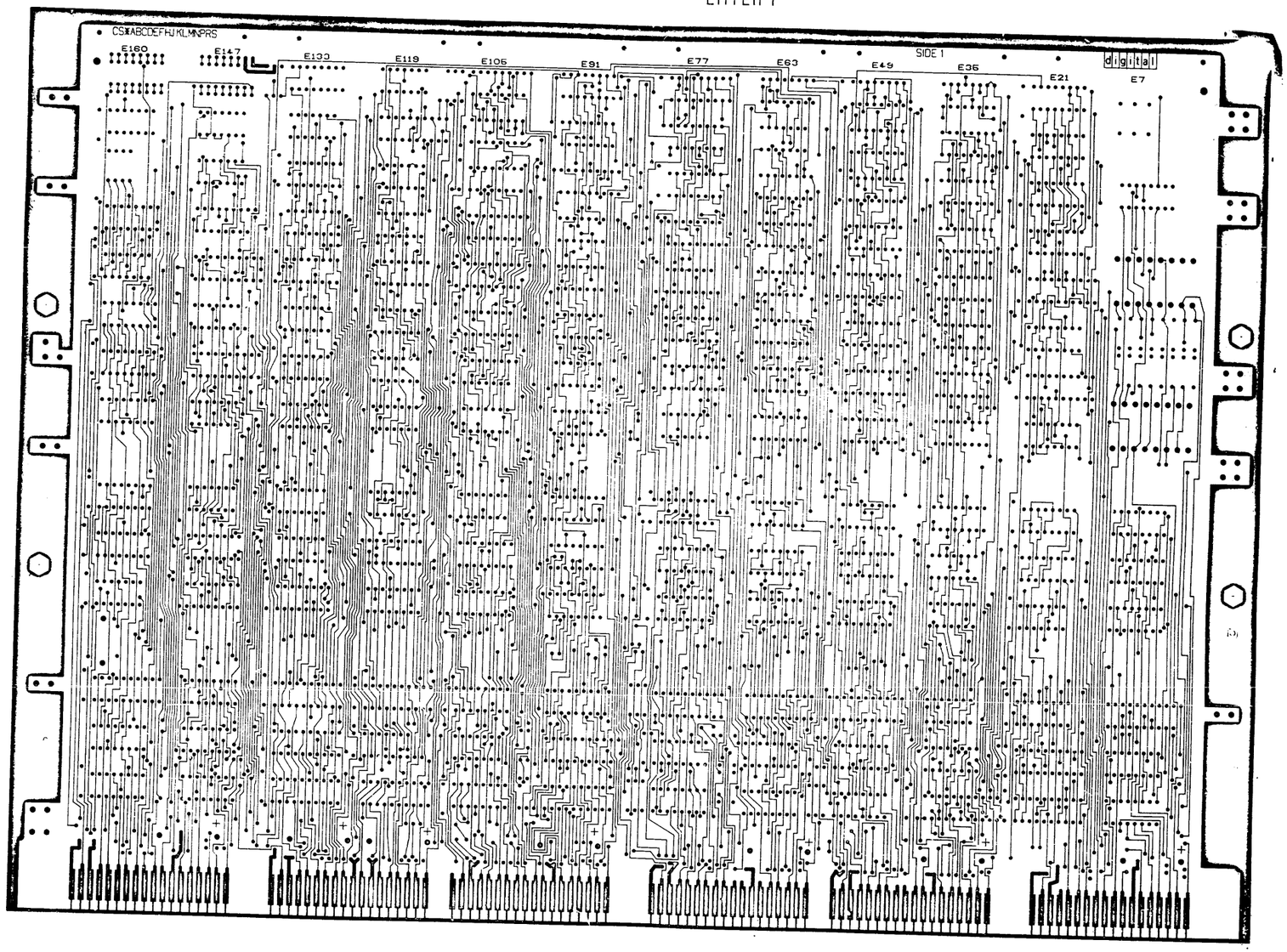
P&C DESIGN DATA BASE REV.

CHG CHANGE NO REV

NOTES:

E UA M8219-00 C

LAYER 1



REVISIONS		
	CHANGE NO	REV

TITLE: SBI HIGH BITS		SIZE: E	CODE: UA	NUMBER: M8219-00	REV: C
SCALE: 2 -	SHEET 2 OF 3	DIST			

LAYER 4

L4

TITLE	SIZE	CODE	NUMBER	REV
S B I HIGH BITS	E	UA	M8219-0-0	C
SCALE 2 - 1	SHEET 3 OF 3		DIST	

M8219-0-0 SHT 3

LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
1	1	E-MD-5012523-0-0	5012523-00	M8219	1	
2	2		1012084-01	8 MFD 25V G% 30D AL EL (10-12	7	C40-C45,C58
3	3		1012784-00	.047 MFD 50V X% CER.	52	C1-C39,C46-C57,C59
4	4		1103041-00	DEC 777 GS=12PCB PIV= BVS	4	D1-D4
5	5		1300295-00	330 1/4W 5% CC (13-00	3	R35,R1,R57
6	6		1301424-00	680 1/4W 5% CC (13-00	3	R36,R2,R58
7	7		1300243-00	120 1/2W 5% CC (13-00	17	R3-R10,R19-R26,R59
8	8		1301972-00	270 1/4W 5% CC (13-00	16	R11-R18,R27-R34
9	9		1300365-00	1 K 1/4W 5% CC (13-00	4	R37-R40
10	10		1300247-00	120 1/4W 5% CC (13-00	8	R41,R43,R45,R47,R49,R51,R53,
					CONT	R55
11	11		1300250-00	150 1/4W 5% CC (13-00	8	R42,R44,R46,R48,R50,R52,R54,
					CONT	R56
12	12		1300271-00	220 1/4W 5% CC (13-00	2	R60,R61
13	13		1910552-00	74S194 SHIFT REG.,4BIT RIGHT/LEFT	11	E27,E41,E69,E131,E137,E148,
					CONT	E83,E84,E20,E43,E135
14	14		1912696-00	LS194A SHIFT REG.,4BIT BI-DIRCT	12	E1,E2,E7,E18,E19,E21,E35,E36,
					CONT	E37,E46,E103,E149
15	15		1911641-00	SN 74S257 MUX,QUAD 2 TO 1	3	E123,E134,E136
16	16		1910548-00	74S157 MUX 1 OF 2 (QUAD)	4	E81,E95,E129,E133
17	17		1912731-00	DEC 8646 TRANSCEIVER,4BIT BUS	11	E8,E9,E52,E66,E78,E79,E106,
					CONT	E108,E120-E122
18	18		1910547-00	74S153 MUX 1 OF 4 (DUAL)	9	E5,E6,E12,E13,E40,E54,E60,E67,
					CONT	E68
19	19		1910550-00	74S174 FF-D HEX	5	E10,E23,E39,E102,E154
20	20		1913670-00	74S373 LATCH 8BIT TRASP TRISTATE	9	E3,E15,E17,E22,E38,E118,E141,
					CONT	E143,E150
21	21		1912844-00	LS151 MUX 1 OF 8 & DATA SELECTOR	16	E28,E29,E32-E34,E42,E45,
					CONT	E47-E49,E57,E58,E61,E75,E76,
					CONT	E44

REVISION HISTORY			VARIATIONS FOR THIS ASSY.
CHK	ECO NO	REV	
---	INIT	C	00

FIRST USED ON:

MADE BY:	R. BARILONE	DATE: 08-AUG-78
CHECKED:	F. SMART	DATE: 08-AUG-78
DSN.ENG.:	T. ERMOLOVICH	DATE: 08-AUG-78
PROD.:	M. TERELLA	DATE: 08-AUG-78
RESP.ENG.:	T. ERMOLOVICH	DATE: 08-AUG-78

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE
PARTS LIST
SBI HIGH BITS

SIZE	CODE	DOCUMENT NUMBER	REV
K	PL	M8219-0-DBP	C

EDIT# 6

ASSY.NO.: E-UA-M8219-0-0

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LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
22	22		1913788-00	26S10 TRANSCEIVER,BUS,QUAD	4	E14,E16,E30,E31
23	23		1912586-00	DM 85S68N REGISTER,64BIT EDGE TRIG,TRIST	4	E71,E77,E89,E91
24	24		1910957-00	74S175 FF-D QUAD COMMON CLOCK	1	E101
25	25		1912865-00	LS283 ADDER-4BIT BINARY FULL W/FAST	1	E158
26	26		1912089-00	74S85 CMPRTR-4BIT MAGNITUDE 16P	4	E63,E90,E104,E130
27	27		1911675-00	74S138 DECODER-THREE INPUT	3	E82,E96,E110
28	28		1912842-00	LS138 DECODER-THREE INPUT,16PIN	1	E142
29	29		1913294-00	93S16 COUNTER,SYNCH UP BINARY	2	E105,E56
30	30		1911415-00	10125 ECL TO TTL TRNSLTR ECL 16 P	4	E51,E64,E65,E92
31	31		1913839-00	74LS165 SHIFT REG.,8BIT	8	E4,E53,E80,E94,E109,E138,E152,
					CONT	E153
32	32		1911573-00	74S280 PARITY GEN/CHKR,9BIT ODD/EVEN	4	E11,E24,E93,E107
33	33		1912746-00	DEC 74S37 NAND GATE-QUAD 2IN	3	E117,E124,E127
34	34		1912096-00	DEC 74S86 XOR GATE,QUAD 2IN	2	E25,E119
35	35		1910534-00	74S04 INVERTER GATE-HEX 1IN	9	E26,E55,E87,E88,E98,E111,E126,
					CONT	E157,E159
36	36		1910532-00	74S00 NAND GATE-QUAD 2INS	4	E146,E86,E125,E145
37	37		1912389-00	74S08 AND GATE-QUAD 2IN,POS 14	6	E62,E73,E116,E132,E140,E59
38	38		1910545-00	74S112 FF-JK DUAL,EDGE TRIGGER	3	E72,E74,E115
39	39		1912388-00	74S02 NOR GATE-QUAD 2IN,POS	2	E113,E128
40	40		1910539-00	74S20 NAND GATE-DUAL 4INPUT	3	E70,E85,E100
41	41		1910536-00	74S10 NAND GATE-TRIPLE 3IN	2	E99,E112
42	42		1910544-00	74S74 FF-D DUAL,EDGE TRIGGER	3	E97,E114,E139
43	43		1911469-00	DEC 8640 RECEIVER,BUS,QUAD,UNIBUS,Q-BU	1	E151
44	44			SPARES	3	E50,E160,E147
45	45		2318981-00	A1-07 PROM,	1	E144
46	46		2343782-00	A2-05 PROM,	1	E155
47	47		2343HA2-00	A2-05 PROM,	1	E156
48	48		1210711-02	HANDLE,HEX MODULE,10-1/2 $	1	
49	49		9000024-01	EYELET, ROLLED FLANGE, .121 OD X .196 LG	12	
50	50		1302957-00	121 1/4W 1% R055D-F 100PPM (13-00	1	R62

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	TITLE: PARTS LIST SBI HIGH BITS	SIZE: K	CODE: PL	DOCUMENT NUMBER: M8219-0-DBP	REV: C

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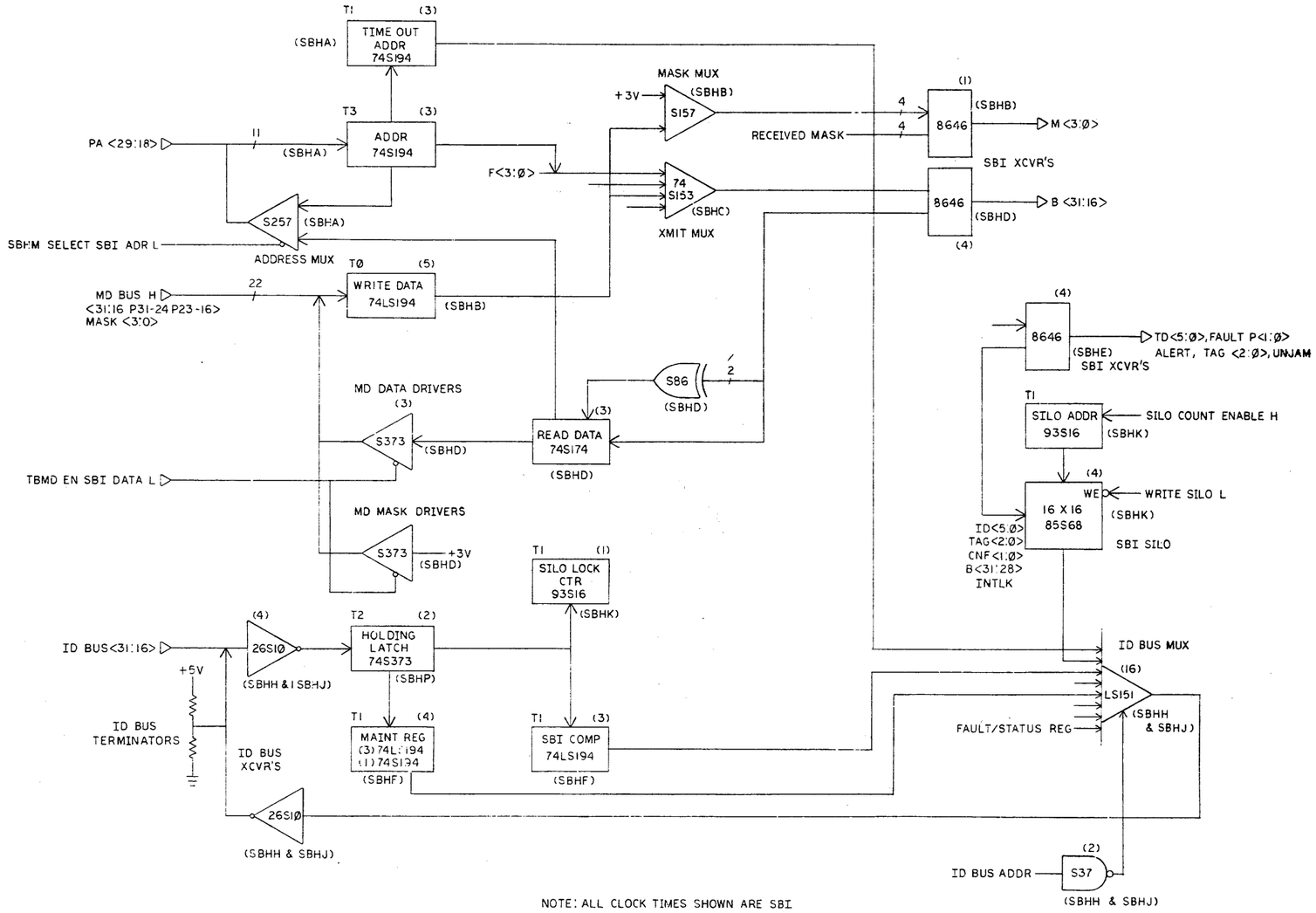

NOTE: ALL CLOCK TIMES SHOWN ARE SBI
TIMES SBI T1=CPTØ

REVISIONS		
CHK	CHANGE NO.	REV.
GS	M8219-OMOI	B
	T. ERMOLOVICH	
	M8219-TWO02	C
	T. ERMOLOVICH	
	M8219-TWO03	D
	R. CHUSMAE	

DEC FORM NO. DBD 102-0

BLOCK DIAGRAM (SLOT 3)

DRN. & CHK'D	MAPE77	FIRST USED ON
CHK'D	6-16-77	digital
ENG	6-16-77	TITLE
PROJ. ENG	6-16-77	SBI INTERFACE HIGH BITS (SBH)
PROD		
NEXT HIGHER ASSY.		
SCALE		SIZE D | CODE CS | NUMBER M8219-Ø-1 | REV. D
SHEET 1 OF 19		DIST.

8 7 6 5 4 3 2 1

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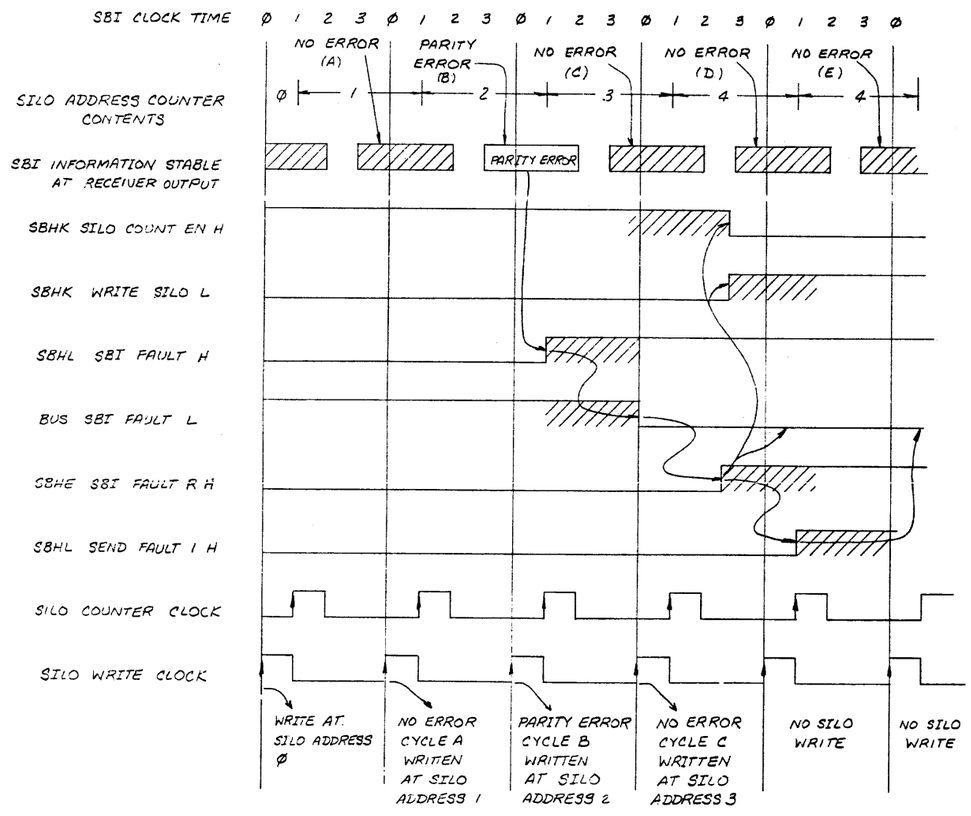

(SBI FAULT TIMING) (SLOT 3)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS	D	CS	M8219-Ø-1	D

SCALE ⟷ SHEET 2 OF 19 DIST. TW 1

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ADDRESS REG

TIMEOUT ADDRESS REG

ADDRESS MUX

74S194 FUNCTION TABLE

INPUTS								OUTPUTS
CLEAR	MODE SI	MODE SØ	CLOCK	ERIAL LEFT	ERIAL RIGHT	PARALLEL A B C D		Q_A Q_B Q_C Q_D
L	X	X	X	X	X	X X X X		L L L L
H	X	X	L	X	X	X X X X		Q_{AO} Q_{BO} Q_{CO} Q_{DO}
H	H	H	↑	X	X	A B C D		A B C D
H	L	H	↑	X	H	X X X X		H Q_{AN} Q_{BN} Q_{CN}
H	L	H	↑	X	L	X X X X		L Q_{AN} Q_{BN} Q_{CN}
H	H	L	↑	H	X	X X X X		Q_{BN} Q_{CN} Q_{DN} H
H	H	L	↑	L	X	X X X X		Q_{BN} Q_{CN} Q_{DN} L
H	L	L	X	X	X	X X X X		Q_{AO} Q_{BO} Q_{CO} Q_{DO}

74S257 FUNCTION TABLE

INPUTS				OUTPUT Y
OUTPUT CONTROL	SELECT	A	B	S257
H	X	X	X	Z
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

H=HIGH LEVEL, L=LOW LEVEL, X=IRRELEVANT
Z=HIGH IMPEDANCE (OFF)

NOTE: E50 I60 ARE SPARE IC LOCATIONS

SBLK LATCH TIMO REG L FRI

SBLK BUFFER FULL A H EV2, 74S37 E124

SBHA BUFFER FULL L (SBHBRT)

+5V, R1 330, R2 680, C1 .047UF

SBHA +3V H (SBHD,H,K) (SBHB)

SBHS SBI T3 CPT2 A H

SBHS CLEAR A L

SBHS SBI TØ CPT3 A L

+5V, GND, -5.2V EKI

AA2,BA2,CA2,DA2,EA2,FA2
AV1, BV1, CV1, DV1, EV1, FV1

C40-C45 8UF

C4-C11, C13-C20, C22-C39, C46-C56 .047UF

AC2,BC2,CC2,DC2,EC2,FC2
AN2,BN2,CN2,DN2,EN2,FN2
AT1, BT1, CT1, DT1, ET1, FT1
AH1,BH1, CH1, DH1, EH1, FH1

C58 8UF, C12 .047UF, C21 .047UF

SBHM SELECT SBI ADR L

SBHM WRITE INVALID L

(ADDRESS LOGIC) (SLOT 3)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS (SBHA)	D	CS	M8219-Ø-1	D
SCALE	SHEET 3 OF 19	DIST.	TV 1	

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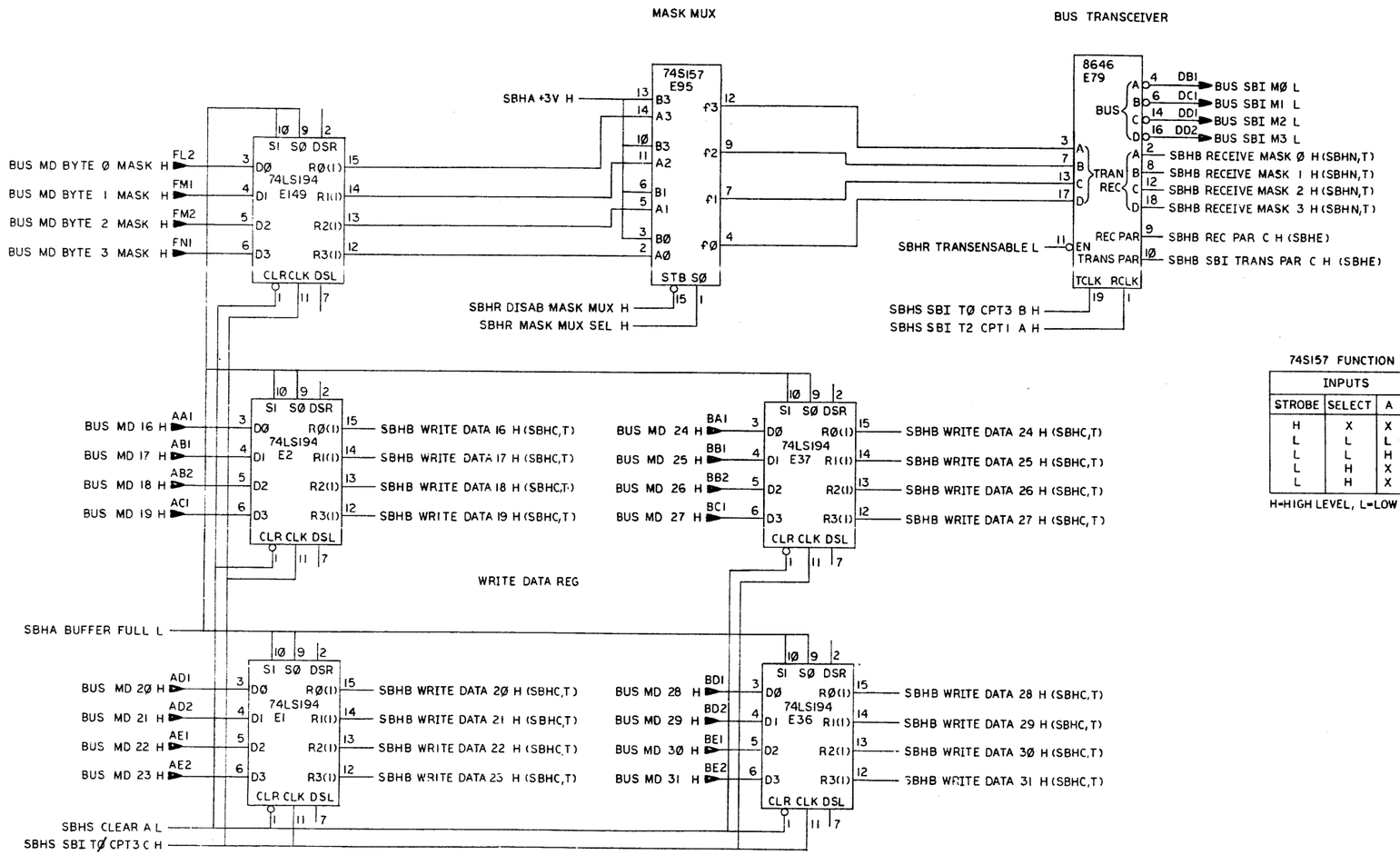

74S157 FUNCTION TABLE

INPUTS				OUTPUTY
STROBE	SELECT	A	B	S157
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

H=HIGH LEVEL, L=LOW LEVEL, X=IRRELEVANT

(WRITE DATA REG) (SLOT 3)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS (SBHB)	D	CS	M8219-Ø-1	D
SCALE	SHEET 4 OF 19	DIST.		

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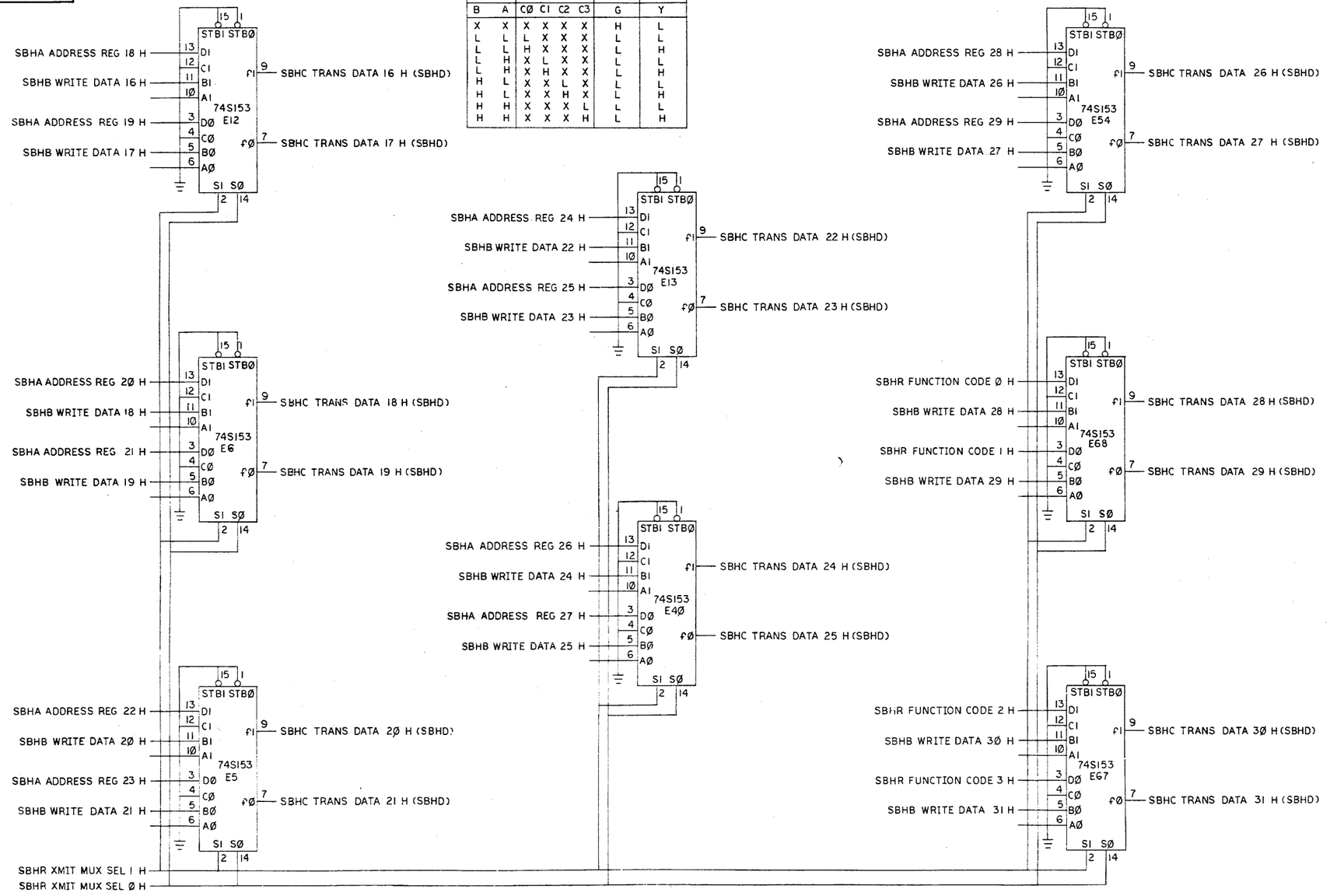
SELECT INPUTS		DATA INPUTS				STROBE	OUTPUT
B	A	CØ	C1	C2	C3	G	Y
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H



REVISIONS		
CHK	CHANGE NO.	REV.

(TRANSMIT MUX) (SLOT 3)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS (SBHC)	D	CS	M8219-Ø-1	D

SCALE — SHEET 5 OF 19 DIST.

DEC FORM NO. DRD 138

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8646 - BUS TRANSCEIVERS

READ DATA REG

MD BUS DATA DRIVERS

8646 E8

SBHC TRANS DATA 16 H
SBHC TRANS DATA 17 H
SBHC TRANS DATA 18 H
SBHC TRANS DATA 19 H
SBHR TRANSENABLE L
SBHS SBI T0 CPT3 B H
SBHS SBI T2 CPT1 A H

BUS: BS2 → BUS SBI B16 L; BT2 → BUS SBI B17 L; BU1 → BUS SBI B18 L; BU2 → BUS SBI B19 L
TRANS REC: SBHD RECEIVE DATA 16 H; SBHD RECEIVE DATA 17 H; SBHD RECEIVE DATA 18 H; SBHD RECEIVE DATA 19 H
REC PAR: SBHD REC PAR 4 H (SBHE)
EN
TRANS PAR: SBHD TRANS PAR 4 H (SBHE)
TCLK RCLK

74S86 E25 → 74S04 E26

74S174 E10
D0 D1 D2 D3 D4 D5 CLR CLK
R0 R1 R2 R3 R4 R5
SBHD READ DATA 16 H (SBHA)
SBHD READ DATA 17 H (SBHA)
SBHD READ DATA 18 H (SBHA)
SBHD READ DATA 19 H (SBHA)

74S373 E3
D0 D1 D2 D3 D4 D5 D6 D7 OUT CONT ENBL
R0 R1 R2 R3 R4 R5 R6 R7
AA1 → BUS MD 16 H
AB1 → BUS MD 17 H
AB2 → BUS MD 18 H
AC1 → BUS MD 19 H
AF1 → BUS MD BYTE 2 PAR H
BF1 → BUS MD BYTE 3 PAR H
TBMD EN SBI DATA
BSI
SBHA+3V H

8646 E9

SBHC TRANS DATA 20 H
SBHC TRANS DATA 21 H
SBHC TRANS DATA 22 H
SBHC TRANS DATA 23 H

BUS: CB1 → BUS SBI B20 L; CC1 → BUS SBI B21 L; CD1 → BUS SBI B22 L; CD2 → BUS SBI B23 L
TRANS REC: SBHD RECEIVE DATA 20 H; SBHD RECEIVE DATA 21 H; SBHD RECEIVE DATA 22 H; SBHD RECEIVE DATA 23 H
REC PAR: SBHD REC PAR 5 H (SBHE)
EN
TRANS PAR: SBHD TRANS PAR 5 H (SBHE)
TCLK RCLK

74S86 E25 → 74S04 E26

74S174 E23
D0 D1 D2 D3 D4 D5 CLR CLK
R0 R1 R2 R3 R4 R5
SBHD READ DATA 20 H (SBHA)
SBHD READ DATA 21 H (SBHA)
SBHD READ DATA 22 H (SBHA)
SBHD READ DATA 23 H (SBHA)

74S373 E22
D0 D1 D2 D3 D4 D5 D6 D7 OUT CONT ENBL
R0 R1 R2 R3 R4 R5 R6 R7
AD1 → BUS MD 20 H
AD2 → BUS MD 21 H
AE1 → BUS MD 22 H
AE2 → BUS MD 23 H
BD1 → BUS MD 28 H
BD2 → BUS MD 29 H
SBHA +3V H

8646 E52

SBHC TRANS DATA 24 H
SBHC TRANS DATA 25 H
SBHC TRANS DATA 26 H
SBHC TRANS DATA 27 H

BUS: CM1 → BUS SBI B24 L; CN1 → BUS SBI B25 L; CP1 → BUS SBI B26 L; CP2 → BUS SBI B27 L
TRANS REC: SBHD RECEIVE DATA 24 H; SBHD RECEIVE DATA 25 H; SBHD RECEIVE DATA 26 H; SBHD RECEIVE DATA 27 H (SBHM)
REC PAR: SBHD REC PAR 6 H (SBHE)
EN
TRANS PAR: SBHD TRANS PAR 6 H (SBHE)
TCLK RCLK

D1 FD777 D2 FD777

74S04 E26

74S174 E39
D0 D1 D2 D3 D4 D5 CLR CLK
R0 R1 R2 R3 R4 R5
SBHD READ DATA 24 H (SBHA)
SBHD READ DATA 25 H (SBHA)
SBHD READ DATA 26 H (SBHA)
SBHD READ DATA 27 H (SBHA)

74S373 E38
D0 D1 D2 D3 D4 D5 D6 D7 OUT CONT ENBL
R0 R1 R2 R3 R4 R5 R6 R7
BA1 → BUS MD 24 H
BB1 → BUS MD 25 H
BB2 → BUS MD 26 H
BC1 → BUS MD 27 H
BE1 → BUS MD 30 H
BE2 → BUS MD 31 H
SBHA+3V H

8646 E66

SBHC TRANS DATA 28 H
SBHC TRANS DATA 29 H
SBHC TRANS DATA 30 H
SBHC TRANS DATA 31 H

BUS: CS2 → BUS SBI B28 L; CT2 → BUS SBI B29 L; CU1 → BUS SBI B30 L; CU2 → BUS SBI B31 L
TRANS REC: SBHD RECEIVE DATA 28 H (SBHN); SBHD RECEIVE DATA 29 H (SBHN); SBHD RECEIVE DATA 30 H (SBHN); SBHD RECEIVE DATA 31 H (SBHN)
REC PAR: SBHD REC PAR 7 H (SBHN)
EN
TRANS PAR: SBHD TRANS PAR 7 H (SBHE)
TCLK RCLK

SEE NOTE SBHE

SBHS SBI T0 CPT3 B H
SBHS CLEAR A L

74S373 E150
D0 D1 D2 D3 D4 D5 D6 D7 OUT CONT ENBL
R0 R1 R2 R3 R4 R5 R6 R7
FL2 → BUS MD BYTE 0 MASK H
FM1 → BUS MD BYTE 1 MASK H
FM2 → BUS MD BYTE 2 MASK H
FN1 → BUS MD BYTE 3 MASK H
SBHA +3V H

MD BUS PARITY DEFINITION
Σ OF BITS IN BYTE
PLUS PARITY BIT IS ODD

REVISIONS		
CHK	CHANGE NO.	REV.

(SBI DATA LOGIC) (SLOT 3)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS (SBHD)	D	CS	M8219-0-1	D
SCALE — SHEET 6 OF 19	DIST.			

M8219-0-1 REV D

DEC FORM NO. DRD 130

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8646-BUS TRANSCEIVERS

74S280 E93 — EVEN / ODD
SBHE SBI PØ R H
SBHE REC PAR A H
SBHE REC PAR B H
SBHE REC PAR C H

74S08 E62 — SBHE PAR OK H (SBHL,M)

74S280 E24 — EVEN / ODD
SBHE SBI PI R H
SBLE REC PAR Ø H
SBLE REC PAR 1 H
SBLE REC PAR 2 H
SBLE REC PAR 3 H
SBHD REC PAR 4 H
SBHD REC PAR 5 H
SBHD REC PAR 6 H
SBHD REC PAR 7 H

74S280 E11 — EVEN / ODD
SBHD TRANS PAR 4 H
SBHD TRANS PAR 5 H
SBHD TRANS PAR 6 H
SBHD TRANS PAR 7 H
SBLE TRANS PAR L

74S86 E25

NUMBER OF INPUTS A THRU I THAT ARE HIGH	OUTPUTS EVEN	ODD
Ø,2,4,6,8,	H	L
1,3,5,7,9	L	H

H=HIGH LEVEL L=LOW LEVEL

74S280 E107 — EVEN / ODD
SBHB TRANS PAR C H
SBHB TRANS PAR B H
SBHB TRANS PAR A H
SBHF REVERSE PØ H

NOTE: 8646 POWER
PIN 20 =+5V
PINS 5 & 15 = GND

8646 E108
SBHM SBI IDØ H
SBHR SBI TAG2 H
SBHR SBI TAG1 H
SBHR SBI TAGØ H
SBHR TRANSENABLE L
BUS: DP2 BUS SBI IDØ L; DP1 BUS SBI TAG2 L; DN1 BUS SBI TAG1 L; DM1 BUS SBI TAGØ L
TRANS/REC: SBHE SBI IDØ R H (SBHM,P); SBHE SBI TAG2 R H (SBHN,P); SBHE SBI TAG1 R H (SBHN,P); SBHE SBI TAGØ R H (SBHN,P)
REC PAR: SBHE REC PAR A H (SBHE)
TRANS PAR: SBHE TRANS PAR A H (SBHE)
TCLK RCLK

8646 E122
SBHM SBI ID4 H
SBHM SBI ID3 H
SBHM SBI ID2 H
SBHM SBI IDI H
BUS: DU2 BUS SBI ID4 L; DU1 BUS SBI ID3 L; DS2 BUS SBI ID2 L; DT2 BUS SBI IDI L
TRANS/REC: SBHE SBI ID4 R H (SBHM,P); SBHE SBI ID3 R H (SBHM,P); SBHE SBI ID2 R H (SBHM,P); SBHE SBI IDI R H (SBHM,P)
REC PAR: SBHE REC PAR B H
TRANS PAR: SBHE TRANS PAR B H
TCLK RCLK

8646 E78
BUS: DJ2 BUS SBT SPARE I L; DJ1 BUS SBI SPARE Ø L; DF2 BUS SBI PØ L; DH2 BUS SBI PI L
TRANS/REC: SBHE SBI PØ R H (SBHE); SBHE SBI PI R H (SBHE)
REC PAR
TRANS PAR
TCLK RCLK

8646 E106
BUS: ED2 BUS SBI REQ7 L; ED1 BUS SBI REQ6 L; EC1 BUS SBI REQ5 L; EB1 BUS SBI REQ4 L
TRANS/REC: EF1 SBHE SBI REQ7 R H (ICLA,ICLT); EF2 SBHE SBI REQ6 R H (ICLA,ICLT); EH2 SBHE SBI REQ5 R H (ICLA,ICLT); EJ1 SBHE SBI REQ4 R H (ICLA,ICLT)
SBHK +3V H
REC PAR
TRANS PAR
TCLK RCLK

SEE NOTE

8646 E120
SBHR SBI UNJAM H
BUS: EP2 BUS SBI ALERT L; EP1 BUS SBI UNJAM L; EN1 BUS SBI MP2 L; EM1 BUS SBI MPI L
TRANS/REC: EU2 SBHE SBI ALERT R H (ICLA,ICLT); EK2 SBHE SBI UNJAM R H (ICLA,ICLT)
REC PAR
TRANS PAR
TCLK RCLK

8646 E121
SBHL SEND INTLK H
SBHL SBI FAULT H
SBHL SEND ACK H
SBHS CLR A H
BUS: FA1 BUS SBI INTLK L; EU1 BUS SBI FAULT L; ET2 BUS SBI CNFI L; ES2 BUS SBI CNFØ L
TRANS/REC: SBHE SBI INTLK R H (SBHK); SBHK SBI FAULT R H (SBHL); ER2 SBHE SBI CNFI R H; ES1 SBHE SBI CNFØ R H; (SBHK,SBLL); (SBHK,SBLL)
REC PAR
TRANS PAR
TCLK RCLK

SBHS SBI TØ CPT3 A H
SBHS SBI T2 CPTI B H
D3 FD777
D4 FD777

REVISIONS		
CHK	CHANGE NO.	REV.

(SBI CONTROL TRANSCEIVERS) (SLOT 3)

TITLE SBI INTERFACE HIGH BITS (SBHE)
SIZE D | CODE CS | NUMBER M8219-Ø-1 | REV. D
SCALE | SHEET 7 OF 19 | DIST.

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SBHF FORCE MISS GRØ H (SBHH)

SBHP ID BUF 16 H
SBHP ID BUF 17 H
SBHP ID BUF 18 H
SBHP ID BUF 19 H
74S194 E43
SBHF MAINT REG 17 H (SBHF,H)
SBHF MAINT REG 18 H (SBHF,H)
SBHF MAINT REG 19 H (SBHF,H)
74S04 E87 2 AM2
SBHF FORCE MISS GRØ L (CAMP,N,SBLD,S)

SBHP WRITE MAINT REG H
SBI MAINTENANCE REG

SBHP ID BUF 20 H
SBHP ID BUF 21 H
SBHP ID BUF 22 H
SBHP ID BUF 23 H
74LS194 E20
SBHF MAINT REG 20 H (SBHF,N)
SBHF ENABL SBI INVAL H (SBHH,M)
SBHF FORCE SBI INVAL H (SBHH,M)
SBHF MAINTENANCE IDØ H (SBHH,M) (SBHN)

SBHS CLEAR A L
SBHS SBI TØ CPT3 B L

SBHF MAINTENANCE ID1 H (SBHJ,M,N)
SBHF MAINTENANCE ID2 H (SBHJ,M,N)
SBHF MAINTENANCE ID3 H (SBHJ,M,N)
SBHF MAINTENANCE ID4 H (SBHJ,M,N)
74LS194 E35

SBHF FORCE MULT XMIT H (SBHJ,M)
SBHF FORCE UNEXP RD H (SBHJ,M,R)
SBHF FORCE WRT SEQ H (SBHJ)(SBHR)
SBHF REVERSE PØ H (SBHE,J)
74LS194 E7

SBHP ID BUF 27 H
SBHP ID BUF 26 H
SBHP ID BUF 25 H
SBHP ID BUF 24 H

SBHP ID BUF 31 H
SBHP ID BUF 30 H
SBHP ID BUF 29 H
SBHP ID BUF 28 H

ID REGISTERS

SBHP WRITE COMP REG H
COMPARATOR REG

SBHF COMP TAG Ø H (SBHH,N)
SBHF COMP TAG 1 H (SBHH,N)
SBHF COMP TAG 2 H (SBHH,N)
SBHF COMP COM MASK Ø H (SBHH,N)
74LS194 E19

SBHF COMP COM MASK 1 H (SBHJ,N)
SBHE COMP COM MASK 2 H (SBHJ,N)
SBHF COMP COM MASK 3 H (SBHJ,N)
SBHF COND LOCK Ø H (SBHJ,N)
74LS194 E21

SBHF COND LOCK 1 H (SBHJ,N)
SBHF LOCK UNCOND H (SBHJ,K)
SBHF SILO LCK INT EN H (SBHJ,K)
74LS194 E18

SBHS CLEAR A L
SBHS SBI TØ CPT3 B L

SBHP WRITE FAULT REG H

SBHP ID BUF 18 H
SBHP ID BUF 20 H
FAULT/STATUS REG
SBHP ID BUF 24 H
SBHP ID BUF 25 H
74LS194 E46
SBHF FAULT INTR EN H (SBHH,L)
SBHF FS REG 20 H (SBHH)
SBHF FS REG 24 H (SBHJ)
SBHF FS REG 25 H (SBHJ)

SBHN +3V H

SBHF MAINT REG 20 H
SBHF MAINT REG 19 H
SBHF MAINT REG 18 H
SBHF MAINT REG 17 H
74LS194 E84

74S37 E124 → DR2 → SBHF REV PAR 3 L (CAMB,CAMN,CDMB,CDMV)
74S04 E98 → DR1 → SBHF REV PAR 2 L (CAMB,CAMN,CDMB,CDMV)
74S04 E98 → DV2 → SBHF REV PAR 1 L (CAMB,CAMN,CDMB,CDMV)
74S04 E98 → DS1 → SBHF REV PAR Ø L (CAMB,CAMN,CDMB,CDMV)

SBHS SBI T2 CPT1 C H

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 3)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS (SBHF)	D	CS	M8219-0-1	D
SCALE —	SHEET 8 OF 19	DIST.		

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INPUTS				OUTPUTS	
SELECT			STROBE		
S2	S1	SØ	S	Y	W
74LS151					
X	X	X	H	L	H
L	L	L	L	DØ	DØ
L	L	H	L	D1	D1
L	H	L	L	D2	D2
L	H	H	L	D3	D3
H	L	L	L	D4	D4
H	L	H	L	D5	D5
H	H	L	L	D6	D6
H	H	H	L	D7	D7

H=HIGH LEVEL L=LOW LEVEL X=IRRELEVANT

STB 74LS151 E44
- SBHF FORCE MISS GRØ H
- SBHK COUNT FIELD Ø H
- SBHL FAULT SILO LOCK 1 H
- SBHA TIMEOUT ADRS 18 H
- SBHK SILO DATA 16 H

STB 74LS151 E42
- SBHF MAINT REG 17 H
- SBHK COUNT FIELD 1 H
- SBHL FAULT LATCH H
- SBHA TIMEOUT ADRS 19 H
- SBHK SILO DATA 17 H

STB 74LS151 E29
- SBHF MAINT REG 18 H
- SBHK COUNT FIELD 2 H
- SBHF FAULT INTR EN H
- SBHA TIMEOUT ADRS 20 H
- SBHK SILO DATA 18 H

STB 74LS151 E28
- SBHF MAINT REG 19 H
- SBHK COUNT FIELD 3 H
- SBHL SEND FAULT 1 H
- SBHA TIMEOUT ADRS 21 H
- SBHK SILO DATA 19 H

BUS TRANSCEIVER 26S10 E14

DO,DI...D7=LEVEL OF D RESPECTIVE INPUT

- SBHH ID RECEIVE 16 H (SBHP)
- SBHH ID RECEIVE 17 H (SBHP)
- SBHH ID RECEIVE 18 H (SBHP)
- SBHH ID RECEIVE 19 H (SBHP)

- BUS ID DI6 L
- BUS ID DI7 L
- BUS ID DI8 L
- BUS ID DI9 L

+5V

R3 120 1/2W RI1 270 | R4 120 1/2W RI2 270 | R5 120 1/2W RI3 270 | R6 120 1/2W RI4 270

- SBHP ID ADDR Ø L
- SBHP ID ADDR 1 L
- SBHP ID ADDR 2 L
- SBHA +3V H

74S37 E127

- SBHH ID ADDR Ø H (SBHJ)
- SBHH ID ADDR 1 H (SBHJ)
- SBHH ID ADDR 2 H (SBHJ)

SEE NOTES PAGE SBHJ

STB 74LS151 E47
- SBHF MAINT REG 20 H
- SBHF COMP TAG Ø H
- SBHF FS REG 20 H
- SBHA TIMEOUT ADRS 22 H
- SBHK SILO DATA 20 H

STB 74LS151 E32
- SBHF ENABL SBI INVAL H
- SBHF COMP TAG 1 H
- SBHA TIMEOUT ADRS 23 H
- SBHK SILO DATA 21 H

STB 74LS151 E33
- SBHF FORCE SBI INVAL H
- SBHF COMP TAG 2 H
- SBHA TIMEOUT ADRS 24 H
- SBHK SILO DATA 22 H

STB 74LS151 E34
- SBHF MAINTENANCE IDØ H
- SBHF COMP COM MASK Ø H
- SBHA TIMEOUT ADRS 25 H
- SBHK SILO DATA 23 H

BUS TRANSCEIVER 26S10 E30

- SBHH ID RECEIVE 20 H (SBHP)
- SBHH ID RECEIVE 21 H (SBHP)
- SBHH ID RECEIVE 22 H (SBHP)
- SBHH ID RECEIVE 23 H (SBHP)

- BUS ID D20 L
- BUS ID D21 L
- BUS ID D22 L
- BUS ID D23 L

+5V

R7 120 1/2W RI5 270 | R8 120 1/2W RI6 270 | R9 120 1/2W RI7 270 | RI0 120 1/2W RI8 270

SBHP EN ID DRIVERS L

REVISIONS		
CHK	CHANGE NO.	REV.

(ID BUS MUX) (SLOT 3)

TITLE SBI INTERFACE HIGH BITS (SBHH) | SIZE D | CODE CS | NUMBER M8219-Ø-1 | REV. D

SCALE — | SHEET 9 OF 19 | DIST.

DEC FORM NO. DEC 138

TW 1

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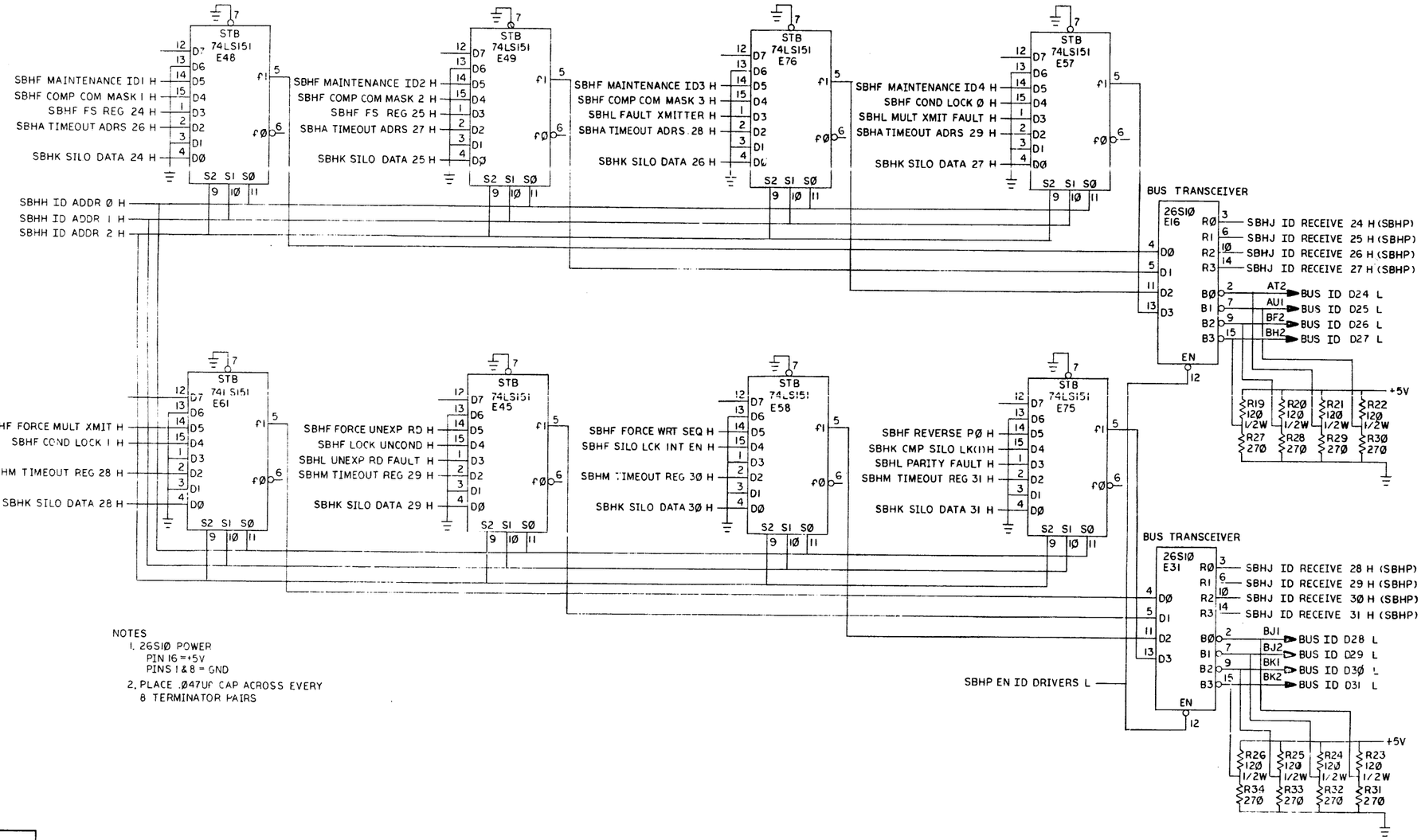

NOTES
1. 26SIØ POWER
   PIN 16 = +5V
   PINS 1 & 8 = GND
2. PLACE .Ø47UF CAP ACROSS EVERY 8 TERMINATOR PAIRS

REVISIONS		
CHK	CHANGE NO.	REV.

(ID BUS MUX) (SLOT 3)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS (SBHJ)	D	CS	M8219-Ø-1	D

SCALE — SHEET 10 OF 13 DIST.

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SBHL SBI FAULT L → 74SØØ E86 → BR1 → SBHK WRITE SILO L (TRSD,E) (SBHL)

SBHF SILO LCK INT EN H → 74S08 E59 → BP2 → SBHK COMP INTR H (ICLA,ICLT), SBHP INC SILO ADRS L

74SØØ E86 → BR2 → SBHK SILO COUNT EN H (TRSD)

74S04 E87, 74S04 E55

COMPARATOR REG BIT 31

SBHA +3V H

SBHL WAS NOT LOCK H, SBHS SBI TI CPTØ B L → 74S08 E59, 74S112 E74 → SBHK CMP SILO LK (I) H (SBHJ)

74S20 E70, 74S08 E59 → SBHS CLEAR B L

SBHP WRITE COMP REG H

93S16 E105 (COUNTER)
SBHA +3V H → LD
SBHS SBI TI CPTØ A H → CLK
CEP, CET

93S16 E56 (COUNTER)
SBHP ID BUF 19 H → D3 → F3 → SBHK COUNT FIELD 3 H (SBHH)
SBHP ID BUF 18 H → D2
SBHP ID BUF 17 H → D1 → F2 → SBHK COUNT FIELD 2 H (SBHH)
SBHP ID BUF 16 H → DØ
SBHS CLEAR C L → CLR → F1 → SBHK COUNT FIELD 1 H (SBHH)
SBHP WRITE COMP REG L → LD
SBHS SBI TI CPTØ A H → CLK
CEP
SBHN COMP LATCH (I) H, SBHF LOCK UNCOND H → 74S02 E113, 74S04 E87 → CET
FØ → SBHK COUNT FIELD Ø H (SBHH)

COMPARATOR REG BITS 19-16

85S68 E71 (SBHA +3V H)
SBHE SBI CNFØ R H → D3 → L3 → SBHK SILO DATA 16 H (SBHH)
SBHE SBI CNF1 R H → D2 → L2 → SBHK SILO DATA 17 H (SBHH)
SBHN MASK OR COM Ø H → D1 → L1 → SBHK SILO DATA 18 H (SBHH)
SBHN MASK OR COM 1 H → DØ → LØ → SBHK SILO DATA 19 H (SBHH)

85S68 E77 (SBHK +3V H)
SBHN MASK OR COM 2 H → D3 → L3 → SBHK SILO DATA 20 H (SBHH)
SBHN MASK OR COM 3 H → D2 → L2 → SBHK SILO DATA 21 H (SBHH)
SBHP SBI TAG Ø B H → D1 → L1 → SBHK SILO DATA 22 H (SBHH)
SBHP SBI TAG 1 B H → DØ → LØ → SBHK SILO DATA 23 H (SBHH)

+5V → R35 330 → SBHK +3V H (SBHK,L,M,N) (SBHE)
C2 D47, R36 680

85S68 E91 (SBHA +3V H)
SBHP SBI TAG 2 B H → D3 → L3 → SBHK SILO DATA 24 H (SBHH)
SBHP SBI IDØ B H → D2 → L2 → SBHK SILO DATA 25 H (SBHH)
SBHP SBI ID1 B H → D1 → L1 → SBHK SILO DATA 26 H (SBHH)
SBHP SBI ID2 B H → DØ → LØ → SBHK SILO DATA 27 H (SBHH)

85S68 E89 (SBHK +3V H)
SBHP SBI ID3 B H → D3 → L3 → SBHK SILO DATA 28 H (SBHJ)
SBHP SBI ID4 B H → D2 → L2 → SBHK SILO DATA 29 H (SBHJ)
SBHE SBI INTLK R H → D1 → L1 → SBHK SILO DATA 30 H (SBHJ)
SBHL AFTER FAULT H → DØ → LØ → SBHK SILO DATA 31 H (SBHJ)

SBHS SBI TØ CPT3 D H

REVISIONS		
CHK	CHANGE NO.	REV.

(SBI SILO) (SLOT 3)

TITLE SBI INTERFACE HIGH BITS (SBHK)
SIZE D | CODE CS | NUMBER M8219-Ø-1 | REV. D
SCALE | SHEET 11 OF 19 | DIST.

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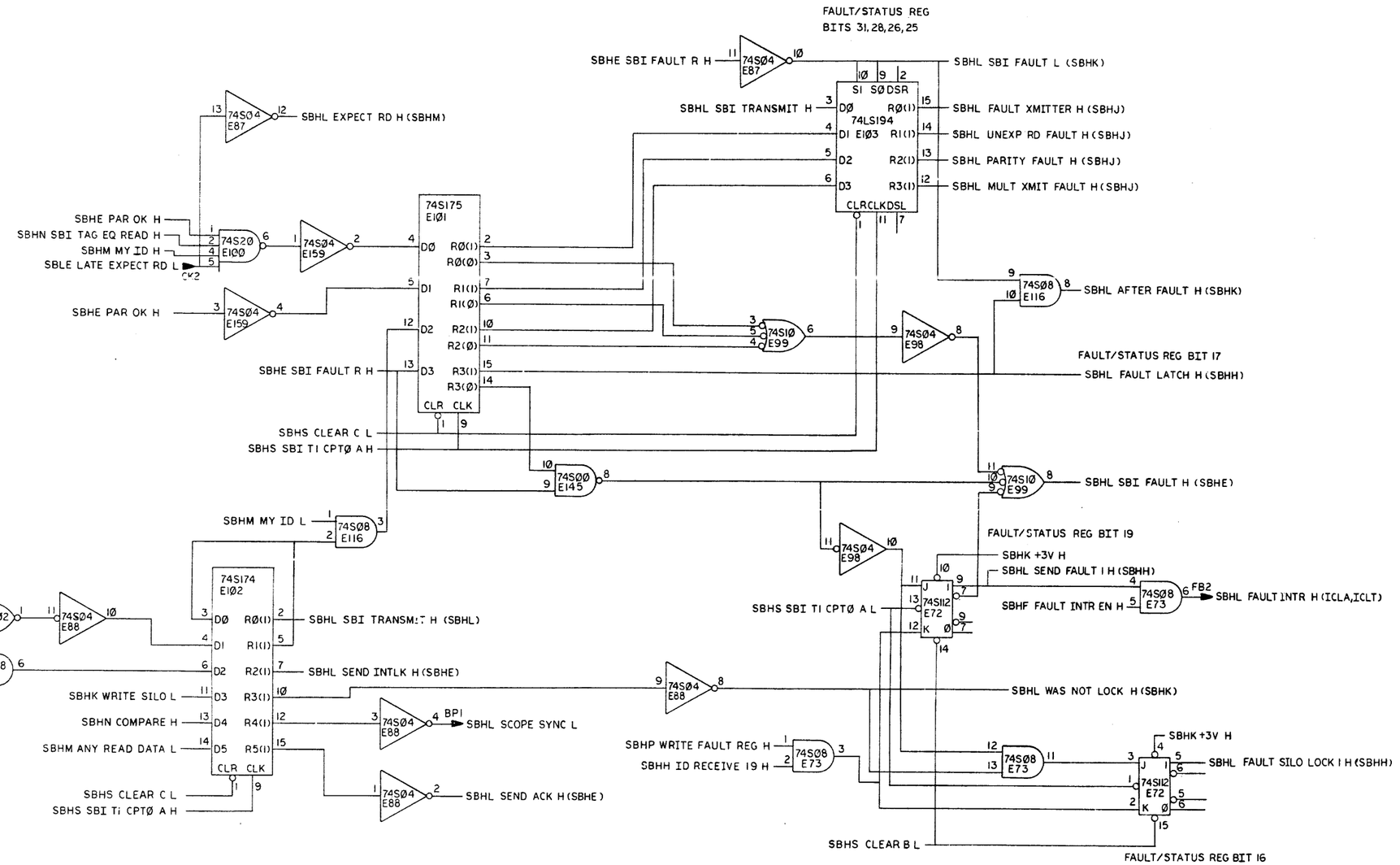

REVISIONS

CHK	CHANGE NO.	REV.

(SBI FAULT LOGIC) (SLOT 3)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS (SBHL)	D	CS	M8219-0-1	D

SCALE — SHEET 12 OF 19 DIST.

DEC FORM NO. DRD 128

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SBHK+3V H
BNI
SBHM SET INVALID L (SBLR,S,V,CAMP)
74S74 E97
74S00 E86
SBHM WRITE INVALID L (SBHA)
SBHS SBI TI CPTØ C H
SBHS CLEAR B L
AR2
SBLR FORCE SBI L
SBHN BUS WRITE COM H
SBHF ENBL SBI INVAL H
74S20 E85
74S10 E99
AV2
SBHS SET SBI CYCLE H (SBLE,S,V, TBMC)
AU2
SBHM ANY READ DATA L (SBHL,SBLE,K,M,V)
SBHE PAR OK H
SBHN SBI TAG EQ READ H
SBHL EXPECT RD H
SBHM MY ID H
74S74 E114
74S02 E113
SBHS SBI T3 CPT2 A H
SBHS CLR H
SBHS SBI T3 CPT2 A L
SBHS CLEAR B L
SBHM SELECT SBI ADR L (SBHA T)
SBHD RECEIVE DATA 27 H
74S04 E88
SBHF FORCE SBI INVAL H
SBLK LATCH TIMO REG L
FR1
74S194 E83
TBMN DIS PROT L
FV2
CEHH CUR MODE 1 H
FR2
CEHH CUR MODE Ø H
FS1
SBHM TIMEOUT REG 28 H (SBHJ)
SBHM TIMEOUT REG 29 H (SBHJ)
SBHM TIMEOUT REG 31 H (SBHJ)
SBHM TIMEOUT REG 30 H (SBHJ)
SBHS CLEAR A L
SBHS SBI TØ CPT3 A L
TIMEOUT ADDRESS REG

+5V
TR SEL 8 L
EJ2
TR SEL 4 L
FB1
TR SEL 2 L
FK1
TR SEL 1 L
FK2
R37 1K
R38 1K
R39 1K
R4Ø 1K
74S04 E157
74LS283 E158
SBHK+3V H
SEE NOTE ON LOGIC PAGE SBLU FOR JUMPER INFORMATION

74S85 E13Ø
SBHE SBI ID 4 R H
SBHE SBI ID 3 R H
SBHE SBI ID 2 R H
SBHE SBI ID 1 R H
SBHE SBI ID Ø R H
74S86 E119
74S157 E129
SBHF MAINTENANCE ID4 H
SBHF MAINTENANCE ID3 H
SBHF MAINTENANCE ID2 H
SBHF MAINTENANCE ID1 H
SBHM SBI ID4 H (SBHE)
SBHM SBI ID3 H (SBHE)
SBHM SBI ID2 H (SBHE)
SBHM SBI ID1 H (SBHE)
SØ STB
74S157 E133
SBHF MAINTENANCE IDØ H
SBHM SBI IDØ H (SBHE)
SBHM MY ID L (SBHL)
SBHM MY ID H (SBHL,M)
SBHF FORCE UNEXP RD H
SBLL TRANSMIT CA H
SBHF FORCE MULT XMIT H
74S08 E116
74S02 E128
74S04 E98
74S112 E115
SBHS SBI TI CPTØ B L
SBHM SEND MAINT ID H
SBHM SEND MAINT ID L (SBHR)

74LS283 FUNCTION TABLE

INPUT				OUTPUT							
				WHEN CO=L		WHEN C2=L		WHEN CO=H		WHEN C2=H	
A1 / A3	B1 / B3	A2 / A4	B2 / B4	Σ1 / Σ3	Σ2 / Σ4	C2 / C4		Σ1 / Σ3	Σ2 / Σ4	C2 / C4	
L	L	L	L	L	L	L		H	L	L	
H	L	L	L	H	L	L		L	H	L	
L	H	L	L	L	H	L		H	H	L	
H	H	L	L	H	H	L		L	L	H	
L	L	H	L	L	L	H		H	L	H	
H	L	H	L	H	L	H		L	H	H	
L	H	H	L	L	H	H		H	H	H	
H	H	H	L	H	H	H		L	L	L	
L	L	L	H	L	L	L		H	L	L	
H	L	L	H	H	L	L		L	H	L	
L	H	L	H	L	H	L		H	H	L	
H	H	L	H	H	H	L		L	L	H	
L	L	H	H	L	L	H		H	L	H	
H	L	H	H	H	L	H		L	H	H	
L	H	H	H	L	H	H		H	H	H	
H	H	H	H	H	H	H		L	L	L	

H=HIGH LEVEL L=LOW LEVEL

NOTE INPUT CONDITIONS AT A1,B1,A2,B2 AND CO ARE USED TO DETERMINE OUTPUTS Σ1 AND Σ2 AND THE VALUE OF THE INTERNAL CARRY C2. THE VALUES AT C2,A3,B3 A4 AND B4 ARE THEN USED TO DETERMINE OUTPUTS C4,Σ3,Σ4

74S85 FUNCTION TABLES

COMPARING INPUTS				CASCADING INPUTS			OUTPUTS		
A3,B3	A2,B2	A1,B1	A0,B0	A>B	A<B	A=B	A>B	A<B	A=B
A3>B3	X X	X X	X X	X	X	X	H	L	L
A3<B3	X X	X X	X X	X	X	X	L	H	L
A3=B3	A2>B2	X X	X X	X	X	X	H	L	L
A3=B3	A2<B2	X X	X X	X	X	X	L	H	L
A3=B3	A2=B2	A1>B1	X X	X	X	X	H	L	L
A3=B3	A2=B2	A1<B1	X X	X	X	X	L	H	L
A3=B3	A2=B2	A1=B1	A0>B0	X	X	X	H	L	L
A3=B3	A2=B2	A1=B1	A0<B0	X	X	X	L	H	L
A3=B3	A2=B2	A1=B1	A0=B0	X	X	H	L	L	H
A3=B3	A2=B2	A1=B1	A0=B0	H	H	L	L	L	L
A3=B3	A2=B2	A1=B1	A0=B0	L	L	L	H	H	L

REVISIONS		
CHK	CHANGE NO.	REV.

(SBI ID LOGIC) (SLOT 3)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS (SBHM)	D	CS	M8219-Ø-1	D
SCALE	SHEET 13 OF 19	DIST.		

DEC FORM NO. DRD 158

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+5V
R57 330Ω
C3 .047
R58 680
SBHN+3V H (SBHN,P,R)

74S85 E104
SBHP SBI ID3 B H
SBHP SBI ID2 B H
SBHP SBI ID1 B H
SBHP SBI ID0 B H
SBHF MAINTENANCE ID 3 H
SBHF MAINTENANCE ID 2 H
SBHF MAINTENANCE ID 1 H
SBHF MAINTENANCE ID 0 H
A<B, A=B, A>B
IN=IN>IN<

SBHP SBI ID4 B H
74S86 E119
SBHF MAINTENANCE ID 4 H
74S04 E26

74S85 E90
SBHP SBI TAG2 B H
SBHP SBI TAG1 B H
SBHP SBI TAG0 B H
SBHF COMP TAG 2 H
SBHF COMP TAG 1 H
SBHF COMP TAG 0 H
A<B, A=B, A>B
IN=IN>IN<
SBHK +3V H

74S08 E62

SBHS SBI TI CPT0 A L
SBHP WRITE COMP REG H
74S112 E115
SBHN 3V H
SBHN COMP LATCH (I) H (SBHK)
SBHS CLEAR B L

STBI STB0
74S153 E60
SI S0
SBHF COND LOCK 1 H
SBHF COND LOCK 0 H
SBHN COMPARE H (SBHL)

74S08 E62

74S157 E81
SBHB RECEIVE MASK 3 H
SBHD RECEIVE DATA 31 H
SBHB RECEIVE MASK 2 H
SBHD RECEIVE DATA 30 H
SBHB RECEIVE MASK 1 H
SBHD RECEIVE DATA 29 H
SBHB RECEIVE MASK 0 H
SBHD RECEIVE DATA 28 H
S0 STB
SBHN SBI TAG EQ CA L

74S85 E63
SBHF COMP COM MASK 3 H
SBHF COMP COM MASK 2 H
SBHF COMP COM MASK 1 H
SBHF COMP COM MASK 0 H
A<B, A=B, A>B
IN=IN>IN<
SBHK +3V H

SBHN MASK OR COM 0 H (SBHK)
SBHN MASK OR COM 1 H (SBHK)
SBHN MASK OR COM 2 H (SBHK)
SBHN MASK OR COM 3 H (SBHK)

SBHN +3V H
74S138 E110
SBHE SBI TAG 2 R H
SBHE SBI TAG 1 R H
SBHE SBI TAG 0 R H
SEL C, SEL B, SEL A
D7 D6 D5 D4 D3 D2 D1 D0
SBHN SBI TAG EQ CA L (SBHN)
74S04 E26
SBHN SBI TAG EQ READ H (SBHL,M)

SBHN+3V H
SBHD RECEIVE DATA 29 H
74S04 E26
74S138 E96
SBHD RECEIVE DATA 31 H
SBHD RECEIVE DATA 30 H
SBHD RECEIVE DATA 28 H
74S10 E112
SBHN BUS WRITE COM H (SBHM)

74S138 E82
SBHB RECEIVE MASK 0 H
SBHB RECEIVE MASK 1 H
SBHB RECEIVE MASK 2 H
SBHB RECEIVE MASK 3 H
SBHK +3V H
74S00 E125
CSI
SBHN RDS L (SBLM,SBLV)
DB2
SBHN CRD L (SBLM, SBLV)

S138 FUNCTION TABLE

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2	C	B	A	D0	D1	D2	D3	D4	D5	D6	D7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

H=HIGH LEVEL, L=LOW LEVEL, X=IRRELEVANT

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 3)

TITLE SBI INTERFACE HIGH BITS (SBHN)
SIZE D CODE CS NUMBER M8219-0-1 REV. D
SCALE — SHEET 14 OF 19 DIST.

DEC FORM NO. DRG 158

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74S373 E118
SBHE SBI ID0 R H → D0 Q0 → SBHP SBI ID0 B H (SBHK,N)
SBHE SBI ID1 R H → D1 Q1 → SBHP SBI ID1 B H (SBHK,N)
SBHE SBI ID2 R H → D2 Q2 → S3HP SBI ID2 B H (SBHK,N)
SBHE SBI ID3 R H → D3 Q3 → SBHP SBI ID3 B H (SBHK,N)
SBHE SBI ID4 R H → D4 Q4 → SBHP SBI ID4 B H (SBHK,N)
SBHE SBI TAG0 R H → D5 Q5 → SBHP SBI TAG 0 B H (SBHK,N)
SBHE SBI TAG1 R H → D6 Q6 → SBHP SBI TAG 1 B H (SBHK,N)
SBHE SBI TAG2 R H → D7 Q7 → SBHP SBI TAG 2 B H (SBHK,N)
OUT ENAB CONT
SBHN +3V H

74S373 E115
SBHH ID RECEIVE 16 H → D0 Q0 → SBHP ID BUF 16 H (SBHF)
SBHH ID RECEIVE 17 H → D1 Q1 → SBHP ID BUF 17 H (SBHF)
SBHH ID RECEIVE 18 H → D2 Q2 → SBHP ID BUF 18 H (SBHF)
SBHH ID RECEIVE 19 H → D3 Q3 → SBHP ID BUF 19 H (SBHF)
SBHH ID RECEIVE 20 H → D4 Q4 → SBHP ID BUF 20 H (SBHF)
SBHH ID RECEIVE 21 H → D5 Q5 → SBHP ID BUF 21 H (SBHF)
SBHH ID RECEIVE 22 H → D6 Q6 → SBHP ID BUF 22 H (SBHF)
SBHH ID RECEIVE 23 H → D7 Q7 → SBHP ID BUF 23 H (SBHF)
OUT ENAB CONT
SBHS SBI T2 CPTI C H

74S373 E117
SBHJ ID RECEIVE 24 H → D0 Q0 → SBHP ID BUF 24 H (SBHF)
SBHJ ID RECEIVE 25 H → D1 Q1 → SBHP ID BUF 25 H (SBHF)
SBHJ ID RECEIVE 26 H → D2 Q2 → SBHP ID BUF 26 H (SBHF)
SBHJ ID RECEIVE 27 H → D3 Q3 → SBHP ID BUF 27 H (SBHF)
SBHJ ID RECEIVE 28 H → D4 Q4 → SBHP ID BUF 28 H (SBHF)
SBHJ ID RECEIVE 29 H → D5 Q5 → SBHP ID BUF 29 H (SBHF)
SBHJ ID RECEIVE 30 H → D6 Q6 → SBHP ID BUF 30 H (SBHF)
SBHJ ID RECEIVE 31 H → D7 Q7 → SBHP ID BUF 31 H (SBHF)
OUT ENAB CONT

ICLJ ID RIGHT WRITE L → EB2
ICLJ ID RIGHT ADDR 5 H → ER1 → 74S04 E126
ICLJ ID RIGHT ADDR 4 H → EM2
ICLJ ID RIGHT ADDR 3 H → EL2 → 74S08 E140
SBHS SBI T1 CPT0 B L
74S10 E112 → EA1 → SBHP EN ID DRIVERS L (SBHH,J,SBLF,H,V)
SBHP ADRS LATCH 29 H (SBHR)
SBHP ID DIR B L
FL1 → SBHP SBI ID ADDRS B H (SBLS)
74S08 E140

74S373 E141
BUS PA 29 H → FU2
D0 Q0 → SBHP ID BUF 00 H (SBHF)
D1 Q1 → SBHP ID BUF 01 H (SBHF)
D2 Q2 → SBHP ID BUF 02 H (SBHF)
D3 Q3 → SBHP ID BUF 03 H (SBHF)
D4 Q4 → SBHP ID BUF 04 H (SBHF)
D5 Q5 → SBHP ID BUF 05 H (SBHF)
D6 Q6 → SBHP ID BUF 06 H (SBHF)
D7 Q7 → SBHP ID BUF 07 H (SBHF)
OUT ENAB CONT
SBHS SBI T2 CPTI D H

74S138 E142
EN
SEL C
SEL B
SEL A
D7 D6 D5 D4 D3 D2 D1 D0

74S04 E111
SBHP WRITE FAULT REG H (SBHL,F)
SBHP WRITE COMP REG H (SBHF,N)
SBHP WRITE MAINT REG H (SBHF)
SBHP WRITE COMP REG L (SBHK)

ICLJ ID RIGHT ADDR 2 H → EL1 → 74S04 E111 → FE2 → SBHP ID ADDR 2 L (SBHH,SBLF,SBLV)
ICLJ ID RIGHT ADDR 1 H → EE2 → 74S04 E111
ICLJ ID RIGHT ADDR 0 H → EE1 → 74S04 E111 → FC1 → SBHP ID ADDR 0 L (SBHH,SBLF,SBLV)
FD2 → SBHP ID ADDR 1 L (SBHH,SBLF,SBLV)

74S20 E70 → SBHP INC SILO ADRS L (SBHK)

S373 FUNCTION TABLE

OUTPUT CONTROL	ENABLE G	D	OUTPUT
L	H	H	H
L	H	L	L
L	L	X	Q_0
H	X	X	Z

ID RIGHT WRITE L=1, ID ← MY REG
=0, MY REG ← ID

ADDRESS	
7	18-1F
6	18-SILO
5	19-
4	1A-TIMEOUT ADDRESS
3	1B-FAULT/STATUS
2	1C-SILO COMPARATOR
1	1D-MAINTENANCE REG
0	1E-
	1F-

REVISIONS
CHK | CHANGE NO. | REV.

(ID ADDRESS DECODE) (SLOT 3)

TITLE SBI INTERFACE HIGH BITS (SBHP)
SIZE D | CODE CS | NUMBER M8219-0-1 | REV. D
SCALE | SHEET 15 OF 19 | DIST.

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MCT FIELD DECODE ROMS
23-437A2-00

74S174 E154

TBMN BUF UFS L
TBMN BUF UADS L
TBMN BUF UMCT 3 L
TBMN BUF UMCT 2 L
TBMN BUF UMCT 1 L
TBMN BUF UMCT 0 L
SBHS CLEAR C L
SBHS SBI T2 CPT1 D H

ROM 256X4 E155
ROM 256X4 23-438A2-00 E156
SBHP ADRS LATCH 29 H
SBLP FORCE INTLK H

74S373 E143

SBHR ISR H (SBHR)
SBHR IB CYCLE L (SBHR)
SBHR EXTEND READ L
SBHR FUNCTION CODE 3 H (SBHC,R)
SBHR FUNCTION CODE 2 H (SBHC,R)
SBHR FUNCTION CODE 1 H (SBHC,R)
SBHR FUNCTION CODE 0 H (SBHC,R)
SBHA BUFFER FULL L

SBHR ISR H
SBHM SEND MAINT ID L
SBHF FORCE UNEXP RD H
SBHF FORCE WRT SEQ H
SBHR EXTEND READ L
SBHN +3V H
SBHR ISR H
SBHN +3V H
SBHR TIMING PULSE 0 H
SBHR ANY WRITE H
SBHR EXTEND WRITE H
SBHR TIMING PULSE 1 H
SBHR IB CYCLE L

74S02 E128
74S10 E112
74S04 E126
74S00 E146
74S20 E100
74S04 E126
74S37 E124
74S04 E126
74S00 E145
74S00 E145
74S00 E145
74S04 E126
74S00 E125

SBHR SBI TAG1 H (SBHE)
SBHR SBI TAG0 H (SBHE)
SBHR SBI TAG2 H (SBHE)
SBHR DISAB MASK MUX H (SBHB)
SBHR XMIT MUX SEL 0 H (SBHC)
SBHR XMIT MUX SEL 1 H (SBHC)
SBHR XMIT WRITE DATA H (SBHL)
SBHR XMIT WRITE DATA L
SBHR MASK MUX SEL H (SBHB)

74S08 E132
74S08 E132
74S37 E124
74S00 E125

TBMU CANCEL L
SBHS SBI T3 CPT2 A L
SBHN +3V H

74S74 E139

SBHN +3V H
74S08 E140
SBHR SBI UNJAM H (SBHE)
SBHS SBI T0 CPT3 A L
SBHS CLEAR B L

SBLL TRANSMIT CA H
74S02 E128
SBHR TRANSENABLE L (SBHB,D,E,T)
SBHN +3V H

74S194 E131
SBHR TIMING PULSE 0 H (SBHR)
SBHR TIMING PULSE 1 H (SBHR)
SBHS SBI T1 CPT0 C H
SBHR SEND DATA H (SBLL,SBLV)

SBI FUNCTION DECODE ROM
ROM 32X8 E144 23-189A1-00 ENABLE

SBHR FUNCTION CODE 0 H
SBHR FUNCTION CODE 1 H
SBHR FUNCTION CODE 2 H
SBHR FUNCTION CODE 3 H

SBHR ANY WRITE H
SBHR EXTEND WRITE H
SBHR INTLK H (SBHL)

REVISIONS		
CHK	CHANGE NO.	REV.

(SBI TIMING AND MCT FIELD DECODE) (SLOT 3)

TITLE	SIZE	CODE	NUMBER	REV.
SBT TNTERFACE HTGH BTTS (SBHR)	D	CS	M8219-0-1	D
SCALE —	SHEET 16 OF 19	DIST.		

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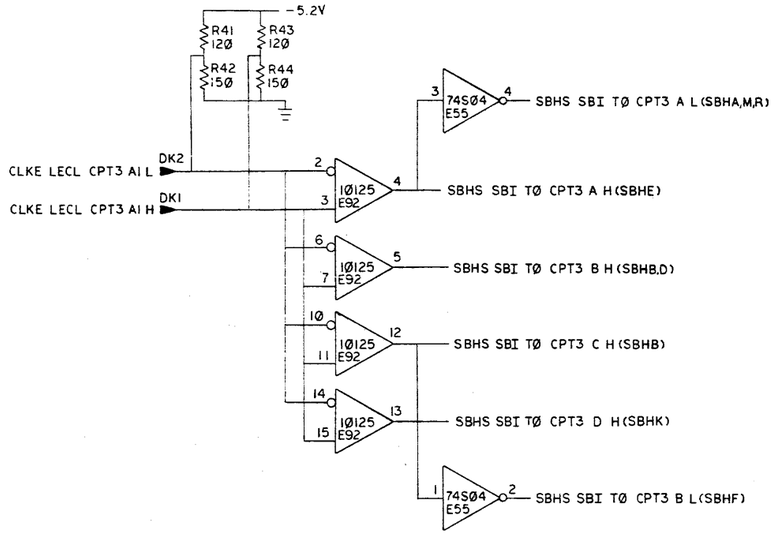
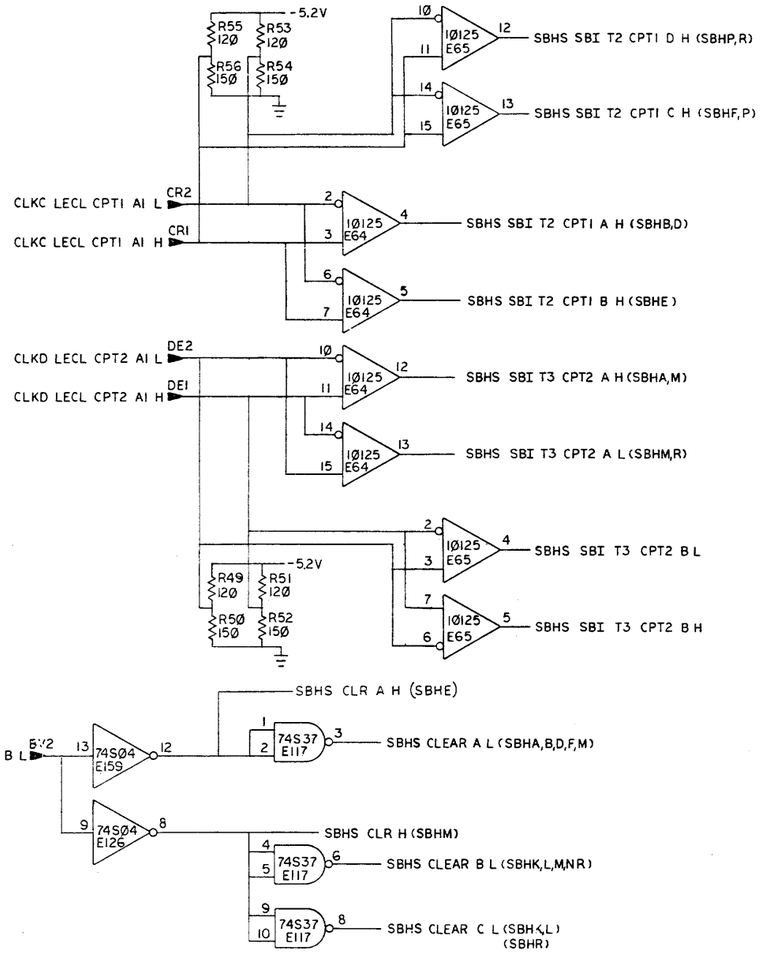


NOTE: 10125 POWER
PIN 8 = -5.2V
PIN 9 = +5V
PIN 16 = GROUND



(CLOCK RECEIVERS) (SLOT 3)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS (SBHS)	D	CS	M8219-Ø-1	D
SCALE	SHEET 17 OF 19	DIST.		

DEC FORM NO. DRD 1.30

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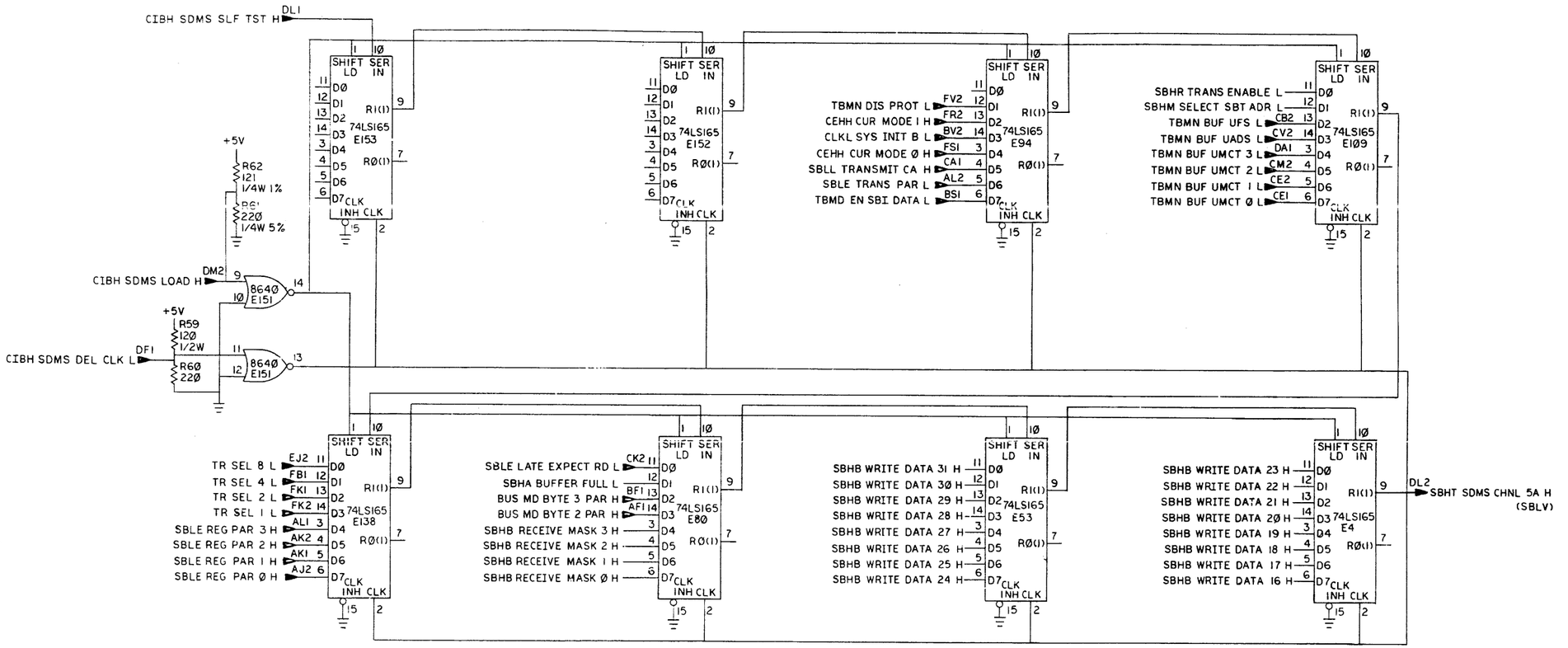

INPUTS					INTERNAL OUTPUTS		OUTPUT
SHIFT/ LOAD	CLOCK INHIBIT	CLOCK	SERIAL	PARALLEL A.....H	Q_A	Q_B	Q_H
L	X	X	X	A.....H	A	B	H
H	L	L	X	X	$Q_{A\phi}$	$Q_{B\phi}$	Q_{HO}
H	L	↑	H	X	H	Q_{AN}	Q_{GN}
H	L	↑	L	X	L	Q_{AN}	Q_{GN}
H	H	X	X	X	Q_{AO}	Q_{BN}	Q_{HO}

REVISIONS		
CHK	CHANGE NO.	REV.

(V BUS LOGIC) (SLOT 3)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS (SBHT)	D	CS	M8219-Ø-1	D
SCALE	SHEET 18 OF 19	DIST.		

MANUFACTURE PLANS
DEC FORM NO. DRD 138

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MCT FIELD DECODE ROM TRUTH TABLE

A7	A6	A5	A4	A3	A2	A1	A0	M3	M2	M1	M0	COMMAND DESCRIPTION	COMMENTS
L	X	L	L	X	X	X	X	H	L	L	L	DEFAULT, ALLOW IB READ	
L	X	L	H	X	X	X	X	X	X	X	X	NO MEMORY OP	
L	X	H	L	L	L	L	L	H	L	L	L	ALLOW IB READ	
L	X	H	L	L	L	L	H	X	X	X	X		
L	X	H	L	L	L	H	L	L	H	L	L	INTLK READ.P	
L	X	H	L	L	L	H	H	X	X	X	X		
L	X	H	L	L	H	L	L	X	X	X	X	ISR	
L	X	H	L	L	H	L	H	X	X	X	X		
L	X	H	L	L	H	H	L	H	L	L	L	READ.P	
L	X	H	L	L	H	H	H	X	X	X	X		
L	X	H	L	H	L	L	L	L	H	H	H	INTLK WRITE.P	
L	X	H	L	H	L	L	H	X	X	X	X		
L	X	H	L	H	L	H	L	L	L	H	L	WRITE.P	
L	X	H	L	H	L	H	H	H	L	H	H	EXTENDED WRITE.P	
L	X	H	L	H	H	L	L	X	X	X	X	VALIDATE	
L	X	H	L	H	H	L	H	X	X	X	X	INVALIDATE	
L	X	H	L	H	H	H	L	X	X	X	X	HOLD & UNJAM	
L	X	H	L	H	H	H	H	X	X	X	X	HOLD	
L	X	H	H	L	L	L	L	X	X	X	X		
L	X	H	H	L	L	L	H	L	H	L	L	INTLK READ.WCHK	
L	X	H	H	L	L	H	L	L	H	L	L	INTLK READ. NOCHK	
L	X	H	H	L	L	H	H	H	L	L	L	READ.V.NEW PC	
L	X	H	H	L	H	L	L	H	L	L	L	READ.V.IBCHK	
L	X	H	H	L	H	L	H	H	L	L	L	READ.V.WCHK	
L	X	H	H	L	H	H	L	H	L	L	L	READ.V.NOCHK	
L	X	H	H	L	H	H	H	H	L	L	L	READ.V.RCHK	
L	X	H	H	H	L	L	L	L	H	H	H	INTLK WRITE.V.XCHK	
L	X	H	H	H	L	L	H	L	L	H	L	WRITE.V.WCHK	
L	X	H	H	H	L	H	L	L	L	H	L	WRITE.V.NOCHK	
L	X	H	H	H	L	H	H	X	X	X	X		
L	X	H	H	H	H	L	L	X	X	X	X		
L	X	H	H	H	H	L	H	X	X	X	X	TEST WCHK	
L	X	H	H	H	H	H	L	X	X	X	X	MEMORY NOP	
L	X	H	H	H	H	H	H	X	X	X	X	TEST.RCHK	
H	L	L	L	X	X	X	X	L	L	L	H	DEFAULT, ALLOW IB READ	
H	L	L	H	X	X	X	X	X	X	X	X	NO MEMORY OP	
H	L	H	L	L	L	L	L	L	L	L	H	ALLOW IB READ	
H	L	H	L	L	L	L	H	X	X	X	X		
H	L	H	L	L	L	H	L	L	H	L	L	INTLK READ.P	
H	L	H	L	L	L	H	H	X	X	X	X		
H	L	H	L	L	H	L	L	X	X	X	X	ISR	
H	L	H	L	L	H	L	H	X	X	X	X		
H	L	H	L	L	H	H	L	L	L	L	H	READ.P	
H	L	H	L	L	H	H	H	X	X	X	X		
H	L	H	L	H	L	L	L	L	L	L	H	INTLK WRITE.P	
H	L	H	L	H	L	L	H	X	X	X	X		
H	L	H	L	H	L	H	L	L	L	H	L	WRITE.P	
H	L	H	L	H	L	H	H	H	L	H	H	EXTENDED WRITE.P	
H	L	H	L	H	H	L	L	X	X	X	X	VALIDATE	
H	L	H	L	H	H	L	H	X	X	X	X	INVALIDATE	
H	L	H	L	H	H	H	L	X	X	X	X	HOLD & UNJAM	
H	L	H	L	H	H	H	H	X	X	X	X	HOLD	

A7	A6	A5	A4	A3	A2	A1	A0	M3	M2	M1	M0	COMMAND DESCRIPTION	COMMENTS
H	L	H	H	L	L	L	L	X	X	X	X		
H	L	H	H	L	L	L	H	L	H	L	L	INTLK READ.WCHK	
H	L	H	H	L	L	H	L	L	H	L	L	INTLK READ. NOCHK	
H	L	H	H	L	L	H	H	L	H	H	H	READ.V.NEWPC	
H	L	H	H	L	H	L	L	L	H	H	H	READ.V.IBCHK	
H	L	H	H	L	H	L	H	L	H	H	H	READ.V.WCHK	
H	L	H	H	L	H	H	L	L	H	H	H	READ.V.NOCHK	
H	L	H	H	L	H	H	H	L	H	H	H	READ.V.RCHK	
H	L	H	H	H	L	L	L	L	H	H	H	INTLK WRITE.V.XCHK	
H	L	H	H	H	L	L	H	L	H	H	H	WRITE.V.WCHK	
H	L	H	H	H	L	H	L	L	H	H	H	WRITE.V.NOCHK	
H	L	H	H	H	L	H	H	L	H	H	H		
H	L	H	H	H	H	L	L	L	H	H	H		
H	L	H	H	H	H	L	H	L	H	H	H	TEST WCHK	
H	L	H	H	H	H	H	L	L	H	H	H	MEMORY NOP	
H	L	H	H	H	H	H	H	L	H	H	H	TEST.RCHK	
H	H	L	L	X	X	X	X	H	L	L	L	DEFAULT, ALLOW IB READ	
H	H	L	H	X	X	X	X	L	L	L	H	NO MEMORY OP	
H	H	H	L	L	L	L	L	L	L	L	H	ALLOW IB READ	
H	H	H	L	L	L	L	H	X	X	X	X		
H	H	H	L	L	L	H	L	L	H	L	L	INTLK READ.P	
H	H	H	L	L	L	H	H	X	X	X	X		
H	H	H	L	L	H	L	L	L	H	H	H	ISR	
H	H	H	L	L	H	L	H	X	X	X	X		
H	H	H	L	L	H	H	L	L	H	H	H	READ.P	
H	H	H	L	L	H	H	H	X	X	X	X		
H	H	H	L	H	L	L	L	L	H	H	H	INTLK WRITE.P	
H	H	H	L	H	L	L	H	X	X	X	X		
H	H	H	L	H	L	H	L	L	H	H	H	WRITE.P	FORCE INTLK WRITE
H	H	H	L	H	L	H	H	H	L	H	H	EXTENDED WRITE.P	
H	H	H	L	H	H	L	L	X	X	X	X	VALIDATE	
H	H	H	L	H	H	L	H	X	X	X	X	INVALIDATE	
H	H	H	L	H	H	H	L	X	X	X	X	HOLD & UNJAM	
H	H	H	L	H	H	H	H	X	X	X	X	HOLD	
H	H	H	H	L	L	L	L	L	H	L	L	INTLK READ.WCHK	
H	H	H	H	L	L	L	H	L	H	L	L	INTLK READ. NOCHK	
H	H	H	H	L	L	H	L	L	L	L	H	READ.V. NEWPC	
H	H	H	H	L	L	H	H	L	H	L	L	READ.V. IBCHK	FORCE INTLK READ
H	H	H	H	L	H	L	L	L	H	L	L	READ.V. WCHK	FORCE INTLK READ
H	H	H	H	L	H	L	H	L	L	L	H	READ.V. NOCHK	
H	H	H	H	L	H	H	L	L	L	L	H	READ.V. RCHK	
H	H	H	H	H	L	L	L	L	H	H	H	INTLK WRITE.V.XCHK	
H	H	H	H	H	L	L	H	L	H	H	H	WRITE.V.WCHK	FORCE INTLK WRITE
H	H	H	H	H	L	H	L	L	H	H	H	WRITE.V.NOCHK	FORCE INTLK WRITE
H	H	H	H	H	L	H	H	X	X	X	X		
H	H	H	H	H	H	L	L	X	X	X	X		
H	H	H	H	H	H	L	H	X	X	X	X	TEST WCHK	
H	H	H	H	H	H	H	L	X	X	X	X	MEMORY NOP	
H	H	H	H	H	H	H	H	X	X	X	X	TEST. RCHK	

INTLK H
EXTEND WRITE H
ANYWRITE H

PROM ADDR	PROM DATA B7	B6	B5	B4	B3	B2	B1	B0	COMMAND DESCRIPTION
00	L	L	L	L	L	L	L	L	
01	L	L	L	L	L	L	L	L	READ MASKED
02	L	L	L	L	L	L	L	H	WRITE MASKED
03	L	L	L	L	L	L	L	L	
04	L	L	L	L	L	H	L	L	INTLK READ
05	L	L	L	L	L	L	L	L	
06	L	L	L	L	L	L	L	L	
07	L	L	L	L	L	L	L	H	INTLK WRITE
08	L	L	L	L	L	L	L	L	EXTENDED READ
09	L	L	L	L	L	L	L	L	
0A	L	L	L	L	L	L	L	L	
0B	L	L	L	L	L	L	H	H	EXTENDED WRITE
0C	L	L	L	L	L	L	L	L	
0D	L	L	L	L	L	L	L	L	
0E	L	L	L	L	L	L	L	L	
0F	L	L	L	L	L	L	L	L	
10-1F	L	L	L	L	L	L	L	L	

SBI FUNCTION DECODE ROM TRUTH TABLE
32 X 8 TRI-STATE
(E144)
PART NO. 23-189A1-00

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 3)

TITLE	SIZE	CODE	NUMBER	REV.
SBI INTERFACE HIGH BITS	D	CS	M8219-0-1	D
SCALE	SHEET 19 OF 19		DIST.	

COMPONENT SIDE VIEW

TH2

TH1

45

47

11.91"
302.52MM
REF

0-3

SIGNATURES	DATE
DRN. <illegible>	7-82
CHK'D <illegible>	8-4-82
ENG. <illegible>	8-4-82
PROJ. ENG. <illegible>	8-4-82
PROD. <illegible>	8-4-82
SCALE	
SHT.	OF

digital

TITLE CAM

SIZE/CODE E (UA) NUMBER M8220-0-0 REV B

NEXT HIGHER ASSY. M8220-MF-0

ETCH REV. CP2

P+S DESIGN DATA BASE REV. CL & CM

CHG	CHANGE NO	REV
	M8220-TM002	B
ORIGINATED		

NOTES:

E UA M8220-0-0 B

TW

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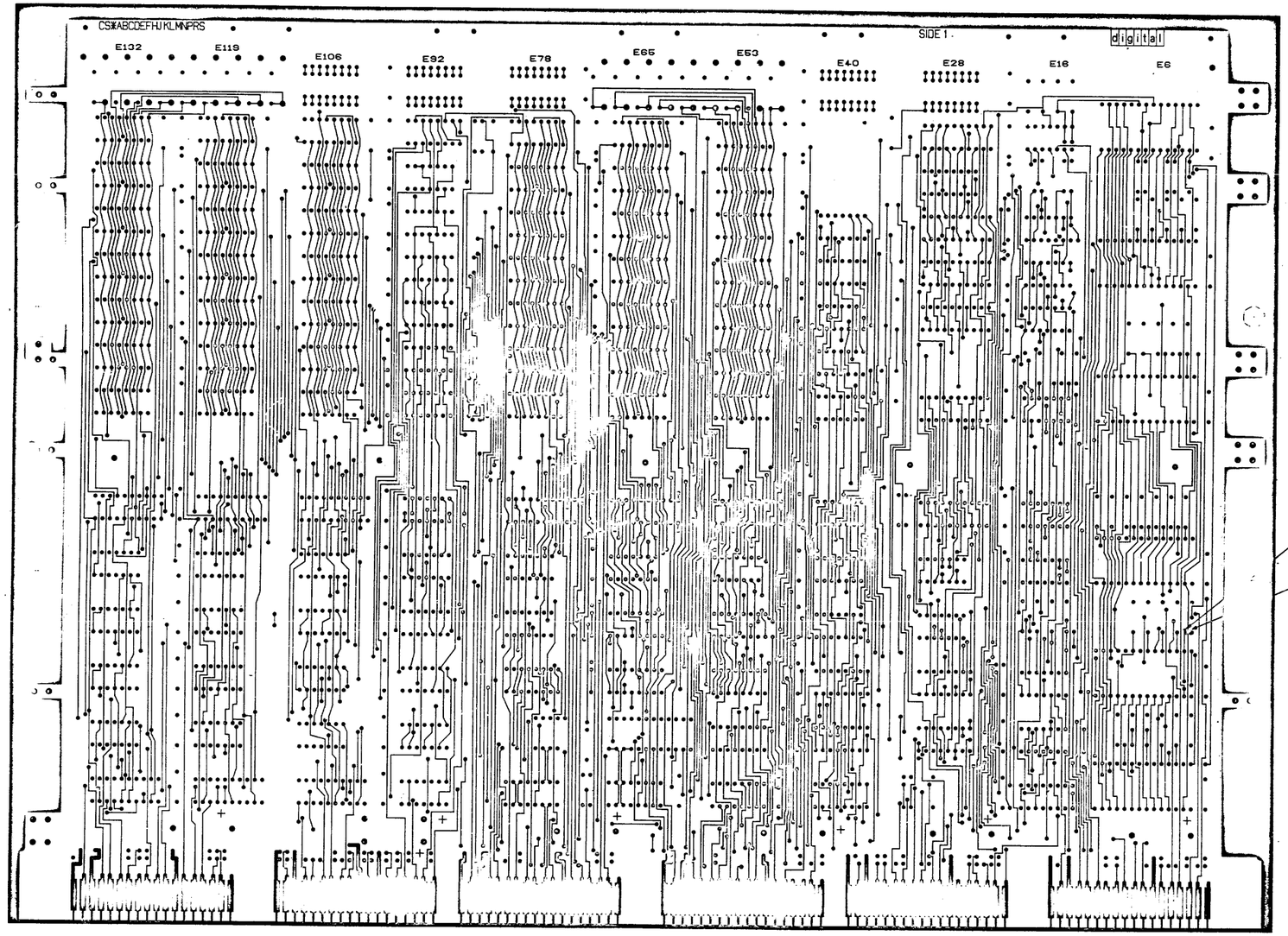
L1

5012526CP2 M8220

LAYER 1



REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: CAM	SIZE: E	CODE: UA	*NUMBER: M8220-0-0
SCALE 2/1 SHEET 2 OF 4	DIST.		REV. B

85

8 7 6 5 4 3 2 1 TW

LAYER H

L4

SIDE 2 M8220 6012626CP2

CACHE ADDRESS MATRIX

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CAM	E	UA	M8220-0-C	B
SCALE 2/1 SHEET 3 OF 4	DIST			

TW

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REWORK INSTRUCTIONS

ETCH CUTS SIDE 1:
0-1 FROM E3-13 TO E2-16
0-2 FROM E3-13 TO R153

WIRE ADDS SIDE 1:
0-3 FROM R153 TO E2-16

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	*NUMBER	REV.
CAM	E	UA	M8220-0-0	B
SCALE —	SHEET 4 OF 4	DIST.		

M8220-0-0 B
PCO UA

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY L. REYNOLDS	CHECKED G. GIDDINGS	SECTION
DATE 7 OCT 76	DATE 18 NOV 76	
ENG DATE G Ruzzier 7/6/77	PROD Mike Trecka DATE 6-21-77	ISSUED SECTION

NOTES:

104817
ETCH REV B
CS REV A

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8220-0-0	REF DESIGNATION
1	E-MD-5012526-0-0	5012526	ETCH BOARD		
2		1012784-00	CAPACITOR, .047UF, 50V	76	C1-C74, C82, C83
3		1012084-01	CAPACITOR, 8UF, 25V	7	C75-C81
4					
5					
6		1300228-00	RESISTOR 100, 1/2W, 5%	18	R1, R3, R5, R7, R9, R11, R13, R15, R17, R22, R24, R26, R28, R30, R32, R34, R36, R38
7					
8		1311522-00	RESISTOR 200, 1/4W, 5%	18	R2, R4, R6, R8, R10, R12 R14, R16, R18, R23, R25, R27, R29, R31, R33, R35, R37, R39
9					
10		1300447-00	RESISTOR, 4.7K, 1/4W, 5%	6	R19, R20, R21, R40, R41, R42
11		1300295-00	RESISTOR 330, 1/4W, 5%	2	R43, R61
12					-
13		1301424-00	RESISTOR 680, 1/4W, 5%	2	R44, R62
14					-
15		1300247-00	RESISTOR 120, 1/4W, 5%	8	R45, R47, R49, R51, R53R55, R57, R59
16		1300250-00	RESISTOR 150, 1/4W, 5%	8	R46, R48, R50, R52, R54, R56, R58, R60
17		13-11845-00	RESISTOR, 487 OHM, 1/8W 1%	54	R63, R65, R67, R69, R71, R73, R75, R77, R79, R81, R83, R85, R87, R89, R91, R93, R95, R97, R99, R101, R103, R105, R107, R109, R111, R113, R115, R117, R119, R121, R123, R125, R127, R129, R131, R133, R135, R137, R139, R141, R143, R145, R147, R149, R151, R153, R155, R157, R159, R161, R163, R165, R167, R169

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX	E-UA-M8220-0-0	B	PL	M8220-0-0	B
	SHEET 1 OF 3	INSERTION PARTS LIST DATA BASE REV			

DRB 125

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY L. REYNOLDS DATE 7 OCT 76	CHECKED G. GIDDINGS DATE 18 NOV 76	SECTION
ENG J. Raynor 7/6/77 DATE	PROD Mike Terella DATE 6-21-77	ISSUED SECTION

NOTES:

104817
ETCH REV B
CS REV A

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8220-0-0	REF DESIGNATION
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29		19-10544-ØØ	DEC I.C., 74S74	1	E35
30		19-10534-ØØ	DEC I.C., 74S04	6	E13,E20,E33,E38,E81,E82
31		19-12746-ØØ	DEC I.C., 74S37	8	E34,E39,E85-E90
32		19-10542-ØØ	DEC I.C., 74S64	13	E19,E32,E36,E37,E80,E83,E84,E95,E96,E109, E110,E123,E122
33		19-13839-ØØ	DEC I.C., 74LS165	8	E17,E31,E30,E43,E44,E55.E56,E67
34		19-12860-ØØ	DEC I.C., 74LS259	2	E18,E91
35		19-11573-ØØ	DEC I.C., 74S280	18	E8-E12,E79,E14-E16,E45,E57,E69,E94,E97, E108,E111,E121,E124
36		19-13670-ØØ	DEC I.C., 74S373	3	E93,E107,E120

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX	E-UA-M8220-0-0	B	PL	M8220-0-0	B
	SHEET 2 OF 3	INSERTION PARTS LIST DATA BASE REV			

DRB 125

TW

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY L. REYNOLDS	CHECKED G. GIDDINGS	SECTION
DATE 7 OCT 76	DATE 18 NOV 76	
ENG DATE J. Rayner 7/6/77	PROD DATE Mike Terrell 6-21-77	ISSUED SECTION

NOTES:

104817
ETCH REV B
CS REV A

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8220-0-0	REF DESIGNATION
37		19-13663-ØØ	DEC I.C., 82S09	6	E1-E6
38		19-11469-ØØ	DEC I.C., 8640	1	E68
39		19-11415-ØØ	DEC I.C., 10125	3	E41,E54,E66
40		19-13662-Ø1	DEC I.C., 93425-1	42	E47-E53,E59-E65,E71-E77,E99-E105,E113-E119,E126-E132
41		19-13888-ØØ	DEC I.C., DC102	12	E21-E25,E27,E46,E58,E70,E98,E112,E125
42			DEC I.C., SPARES	5	E28,E40,E78,E92,E106
43			CAPACITOR SPARE	1	C84
44					
45		1210711-Ø2	HANDLE ASSY HEX	1	
46					
47		90-00024-01	EYELETS	12	
48					
49					
50		19-10548-ØØ	DEC I.C., 74S157	2	E7,E26
51		19-13788-ØØ	DEC I.C., 26S10	2	E29,E42
52					
53		13-00243-ØØ	RESISTOR,120 ,1/2W,5%	1	R171
54		13-01972-ØØ	RESISTOR,270 ,1/4W,5%	1	R172
55					
56		91-05740-55	JUMPER WIRE	AR	

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX	E-UA-M8220-0-0	B	PL	M8220-0-0	B
	SHEET 3 OF 3	INSERTION PARTS LIST DATA BASE REV			

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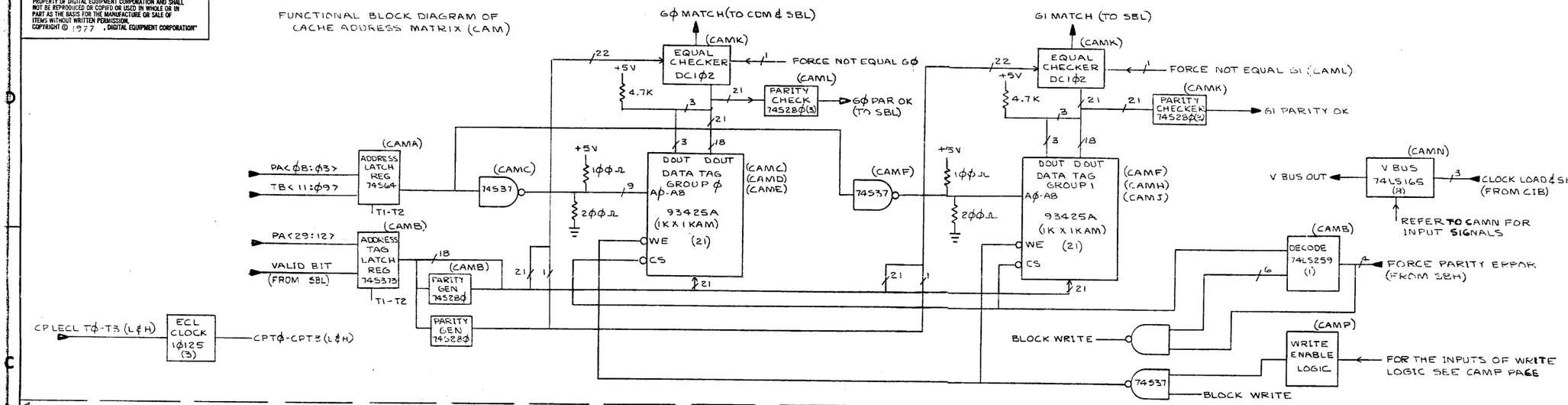
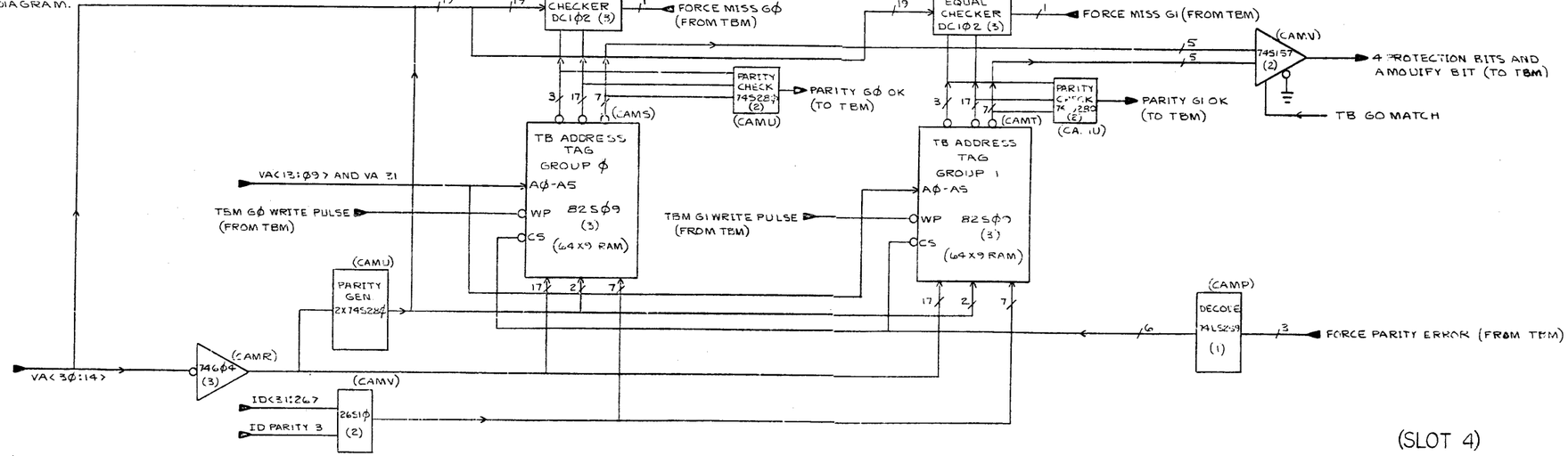
FUNCTIONAL BLOCK DIAGRAM OF CACHE ADDRESS MATRIX (CAM)



TRANSLATION BUFFER (TB) ADDRESS TAG

NOTE: DUE TO CHIP DENSITY ON TBM BOARD THIS SECTION (TB ADDRESS TAG) OF TBM WAS TRANSFERRED TO CAM BOARD, AND THEREFORE, IT IS NOT A PART OF CAM FUNCTIONAL BLOCK DIAGRAM.



(SLOT 4)

BLOCK DIAGRAM

REVISIONS		
CHK	CHANGE NO.	REV.
TB	M8220-00001	B
		7 JAN 78
	I RAGWAR	
	M8220-TWO#2	C
		24 May 79
	B SIMS	

DRN. R.C. Beaudoin	5 Oct 77	FIRST USED ON
CHK'D	5/16/77	digital
ENG	4/6/77	TITLE
PROJ. ENG	5/16/77	CACHE ADDRESS MATRIX
PROD	6-21-77	
NEXT HIGHER ASSY.		SIZE D CODE CS NUMBER M8220-Ø-1 REV. C
SCALE		SHEET 1 OF 19 DIST.

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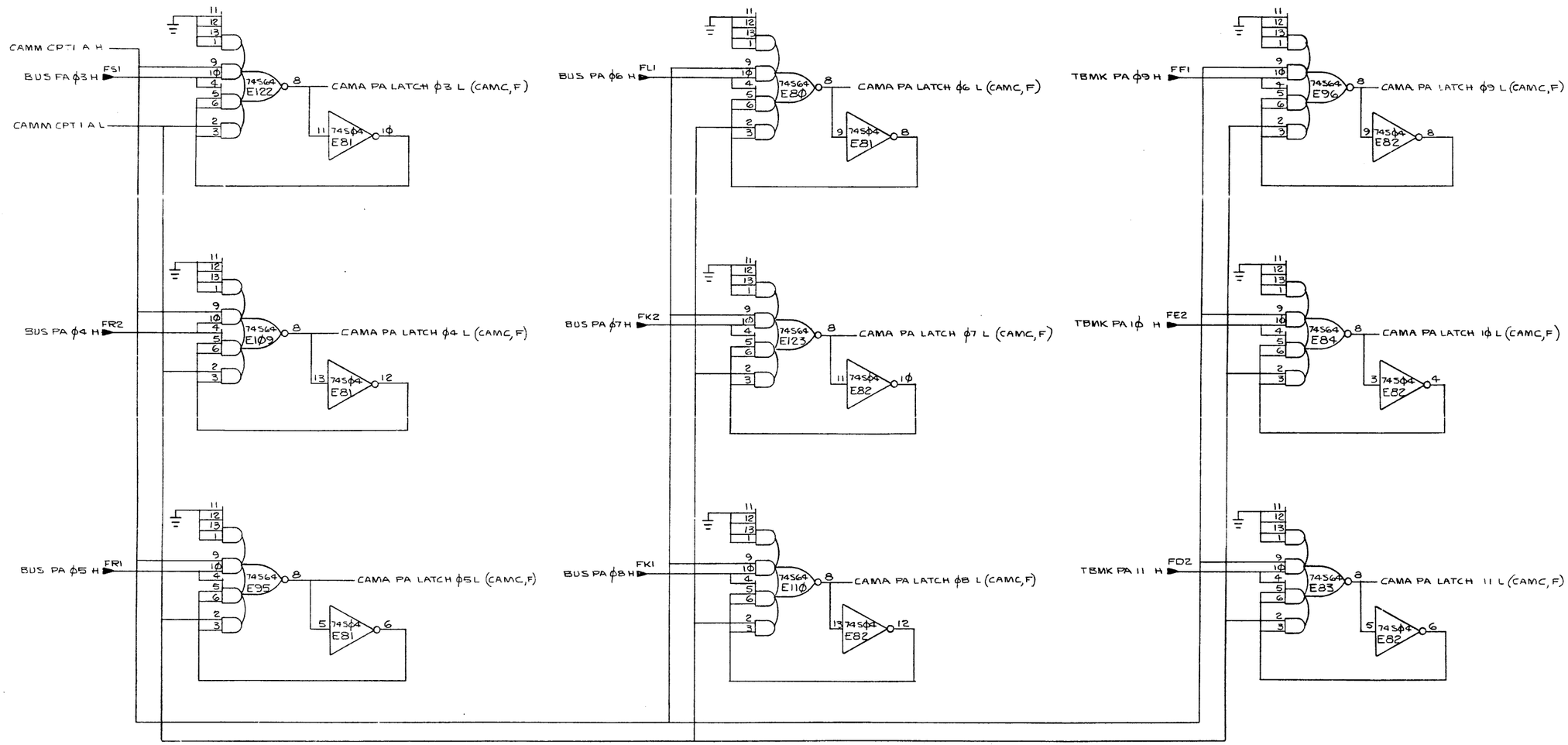

(PA ADDRESS LATCH LOGIC) (SLOT 4)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMA)	D	CS	M822ϕ-ϕ-1	C

SCALE — SHEET 2 OF 19 DIST.

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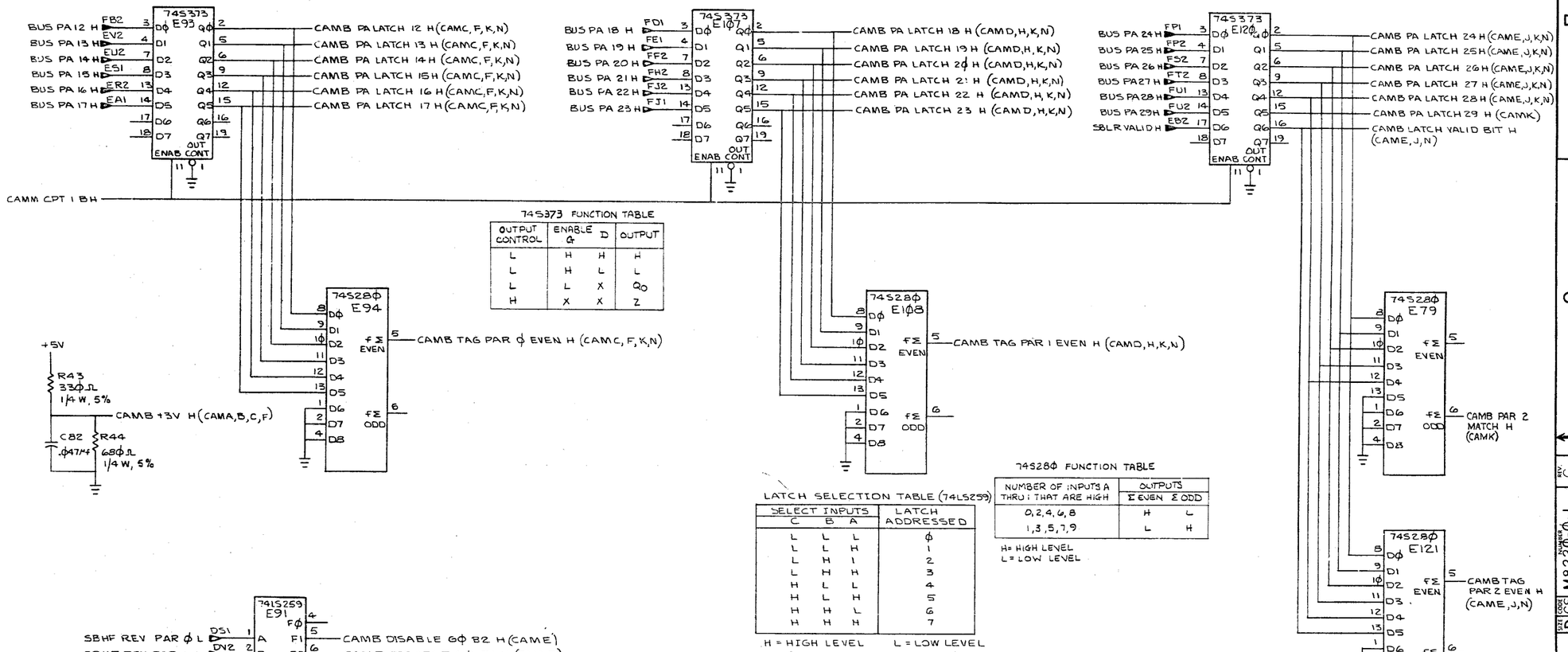

(SLOT 4)
(PA ADDRESS LATCH REGISTER & FORCE PARITY ERROR DECODE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMB)	D	CS	M8220-0-1	C
SCALE	SHEET 3 OF 19	DIST.		

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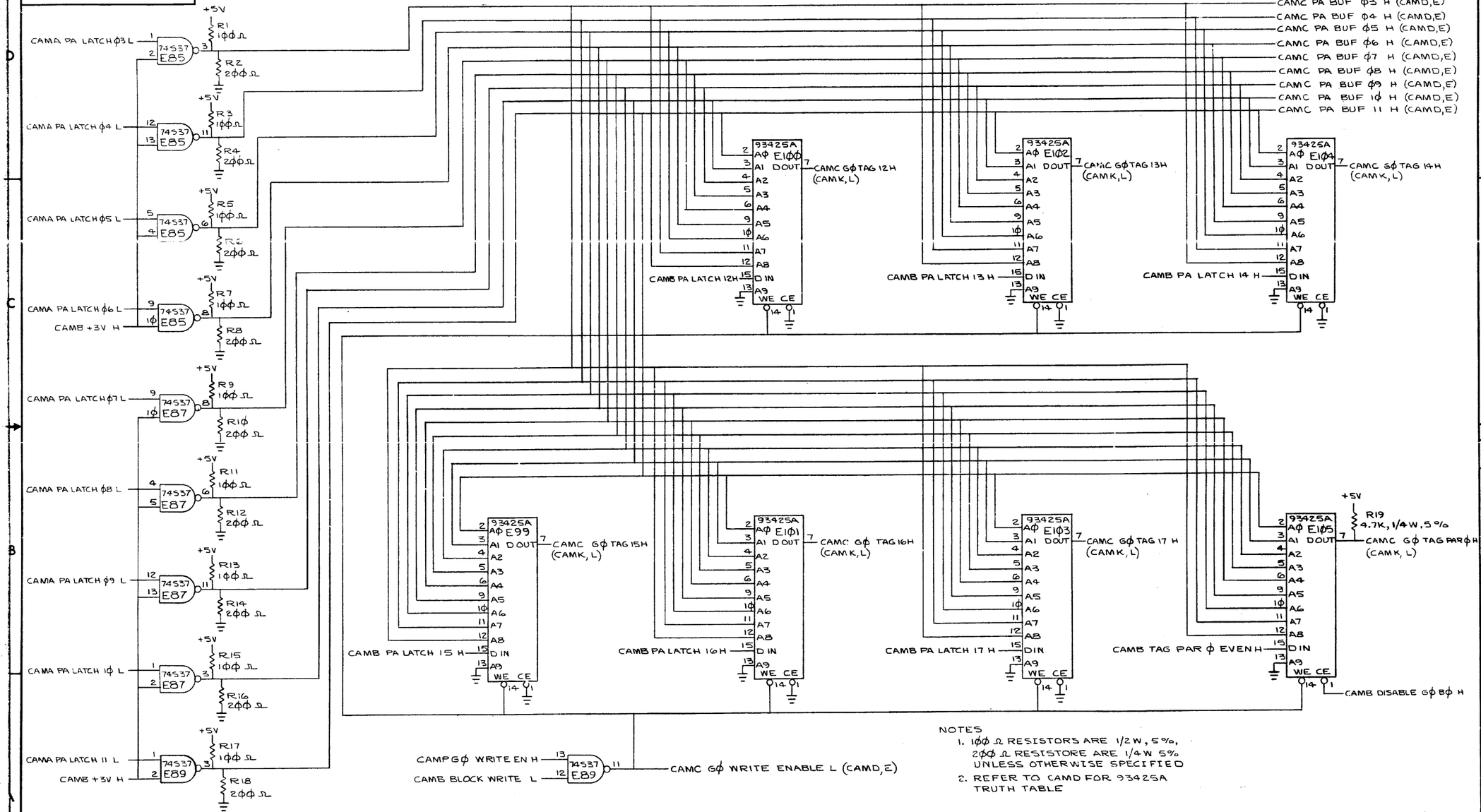

NOTES
1. 1ΦΦ Ω RESISTORS ARE 1/2 W, 5%, 2ΦΦ Ω RESISTORE ARE 1/4 W 5% UNLESS OTHERWISE SPECIFIED
2. REFER TO CAMD FOR 93425A TRUTH TABLE

(SLOT 4)
(CACHE ADDRESS TAG GROUP Φ BYTE Φ)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMC)	D	CS	M822Φ-Φ-1	C
SCALE —	SHEET 4 OF 19	DIST.		

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CAMC PA BUF ϕ3 H
CAMC PA BUF ϕ4 H
CAMC PA BUF ϕ5 H
CAMC PA BUF ϕ6 H
CAMC PA BUF ϕ7 H
CAMC PA BUF ϕ8 H
CAMC PA BUF ϕ9 H
CAMC PA BUF 1ϕ H
CAMC PA BUF 11 H

93425A TRUTH TABLE

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	ϕ	1	X	STORED DATA
WRITE "ϕ"	ϕ	ϕ	ϕ	HIGH-Z
WRITE "1"	ϕ	ϕ	1	HIGH-Z
DISABLED	1	X	X	HIGH-Z

X = DON'T CARE

93425A Aϕ E114 A1 DOUT → CAMD Gϕ TAG 18 H (CAMK,L)
CAMB PA LATCH 18 H

93425A Aϕ E116 A1 DOUT → CAMD Gϕ TAG 19 H (CAMK,L)
CAMB PA LATCH 19 H

93425A Aϕ E118 A1 DOUT → CAMD Gϕ TAG 2ϕ H (CAMK, L)
CAMB PA LATCH 2ϕ H

93425A AO E113 A1 DOUT → CAMD Gϕ TAG21 H (CAMK, L)
CAMB PA LATCH 21 H

93425A Aϕ E115 A1 DOUT → CAMD Gϕ TAG 22 H (CAMK, L)
CAMB PA LATCH 22 H

93425A Aϕ E117 A1 DOUT → CAMD Gϕ TAG 23 H (CAMK, L)
CAMB PA LATCH 23 H

93425A Aϕ E119 A1 DOUT → CAMD Gϕ TAG PAR 1 H (CAMK,L)
CAMB TAG PAR 1 EVEN H

+5V
R2ϕ 4.7K 1/4W, 5%

CAMB DISABLE Gϕ B1 H

CAMC Gϕ WRITE ENABLE L

(SLOT 4)
(CACHE ADDRESS TAG GROUP ϕ BYTE 1)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE CACHE ADDRESS MATRIX (CAM)
SIZE D | CODE DCS | NUMBER M8220-0-1 | REV C
SHEET 5 OF 19

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CAMC PA BUF ϕ3 H
CAMC PA BUF ϕ4 H
CAMC PA BUF ϕ5 H
CAMC PA BUF ϕ6 H
CAMC PA BUF ϕ7 H
CAMC PA BUF ϕ8 H
CAMC PA BUF ϕ9 H
CAMC PA BUF 1ϕ H
CAMC PA BUF 11 H

93425A TRUTH TABLE

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	ϕ	1	X	STORED DATA
WRITE "ϕ"	ϕ	ϕ	ϕ	HIGH - Z
WRITE "1"	ϕ	ϕ	1	HIGH - Z
DISABLED	1	X	X	HIGH - Z

X = DON'T CARE

93425A AϕE127 A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CAME GϕTAG 24 H (CAMK,L)
CAMB PA LATCH 24H

93425A AϕE129 → CAME GϕTAG 25H (CAMK,L)
CAMB PA LATCH 25 H

93425A AϕE131 → CAME GϕTAG 26H (CAMK,L)
CAMB PA LATCH 26 H

93425A AϕE126 → CAME GϕTAG 27H (CAMK,L)
CAMB PA LATCH 27 H

93425A AϕE128 → CAME GϕTAG 28 H (CAMK,L)
CAMB PA LATCH 28 H

93425A AϕE130 → CAME VALID ϕ H (CAMK,L)
CAMB LATCH VALID BIT H

93425A AϕE132 → CAME GϕTAG PAR 2 H (CAMK,L)
CAMB TAG PAR 2 EVEN H
+5V
R21 4.7K, 1/4W, 5%

CAMC GϕWRITE ENABLE L
CAMB DISABLE GϕB2 H

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 4)
(CACHE ADDRESS TAG GROUP ϕ BYTE 2)

TITLE CACHE ADDRESS MATRIX (CAMB) | SIZE D | CS M8220-ϕ-1 | REV. C

SCALE —/— | SHEET 6 OF 15

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CAMA PA LATCH Φ3 L
CAMA PA LATCH Φ4 L
CAMA PA LATCH Φ5 L
CAMA PA LATCH Φ6 L
CAMB +3V H
CAMA PA LATCH Φ7 L
CAMA PA LATCH Φ8 L
CAMA PA LATCH Φ9 L
CAMA PA LATCH 1Φ L
CAMA PA LATCH 11 L
CAMB +3V H

74S37 E86 · 74S37 E86 · 74S37 E86 · 74S37 E86 · 74S37 E88 · 74S37 E88 · 74S37 E88 · 74S37 E88 · 74S37 E89

+5V
R22 1ΦΦ Ω
R23 2ΦΦ Ω
R24 1ΦΦ Ω
R25 2ΦΦ Ω
R26 1ΦΦ Ω
R27 2ΦΦ Ω
R28 1ΦΦ Ω
R29 2ΦΦ Ω
R3Φ 1ΦΦ Ω
R31 2ΦΦ Ω
R32 1ΦΦ Ω
R33 2ΦΦ Ω
R34 1ΦΦ Ω
R35 2ΦΦ Ω
R36 1ΦΦ Ω
R37 2ΦΦ Ω
R38 1ΦΦ Ω
R39 2ΦΦ Ω

CAMF PA BUF Φ3 H (CAMH, J)
CAMF PA BUF Φ4 H (CAMH, J)
CAMF PA BUF Φ5 H (CAMH, J)
CAMF PA BUF Φ6 H (CAMH, J)
CAMF PA BUF Φ7 H (CAMH, J)
CAMF PA BUF Φ8 H (CAMH, J)
CAMF PA BUF Φ9 H (CAMH, J)
CAMF PA BUF 1Φ H (CAMH, J)
CAMF PA BUF 11 H (CAMH, J)

93425A AΦ E72 — CAMB PA LATCH 12 H — CAMF G1 TAG 12 H (CAMK, L)
93425A AΦ E74 — CAMB PA LATCH 13 H — CAMF G1 TAG 13 H (CAMK, L)
93425A AΦ E76 — CAMB PA LATCH 14 H — CAMF G1 TAG 14 H (CAMK, L)
93425A AΦ E71 — CAMB PA LATCH 15 H — CAMF G1 TAG 15 H (CAMK, L)
93425A AΦ E73 — CAMB PA LATCH 16 H — CAMF G1 TAG 16 H (CAMK, L)
93425A AΦ E75 — CAMB PA LATCH 17 H — CAMF G1 TAG 17 H (CAMK, L)
93425A AΦ E77 — CAMB TAG PAR Φ EVEN H — CAMF G1 TAG PAR Φ H (CAMK, L)

+5V R4Φ 4.7K, 1/4W, 5%

CAMB DISABLE G1 BΦ H

CAMPG1 WRITE EN H
CAMB BLOCK WRITE L
74S37 E89
CAMB G1 WRITE ENABLE L (CAMH, J, N)

NOTES
1. 1ΦΦ Ω RESISTORS ARE 1/2W, 5% AND 2ΦΦ Ω RESISTORS ARE 1/4W, 5% UNLESS OTHERWISE SPECIFIED
2. REFER TO CAME FOR 93425A TRUTH TABLE

(SLOT 4)
(CACHE ADDRESS TAG GROUP 1 BYTE Φ)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMF)	D	CS	M822Φ-Φ-1	C
SCALE —	SHEET 7 OF 19		DIST.	

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CAMF PA BUF ϕ3 H
CAMF PA BUF ϕ4 H
CAMF PA BUF ϕ5 H
CAMF PA BUF ϕ6 H
CAMF PA BUF ϕ7 H
CAMF PA BUF ϕ8 H
CAMF PA BUF ϕ9 H
CAMF PA BUF 1ϕ H
CAMF PA BUF 11 H

93425A TRUTH TABLE

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	ϕ	1	X	STORED DATA
WRITE "ϕ"	ϕ	ϕ	ϕ	HIGH-Z
WRITE "1"	ϕ	ϕ	1	HIGH-Z
DISABLED	1	X	X	HIGH-Z

X = DON'T CARE

93425A AϕE60 — A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CAMH G1 TAG 18 H (CAMK,L)
CAMB PA LATCH 18H

93425A AϕE62 — A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CAMH G1 TAG 19 H (CAMK,L)
CAMB PA LATCH 19 H

93425A AϕE64 — A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CAMH G1 TAG 2ϕ H (CAMK,L)
CAMB PA LATCH 2ϕ H

93425A AϕE59 — A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CAMH G1 TAG21 H (CAMK,L)
CAMB PA LATCH 21 H

93425A AϕE61 — A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CAMH G1 TAG 22 H (CAMK,L)
CAMB PA LATCH 22H

93425A AϕE63 — A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CAMH G1 TAG23H (CAMK,L)
CAMB PA LATCH 23 H

93425A AϕE65 — A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CAMH G1 TAG PAR1 H (CAMK,L)
CAMB TAG PAR 1 EVEN H

+5V
R41
4.7K 1/4W, 5%

CAMF G1 WRITE ENABLE L
CAMB DISABLE G1 B1 H

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 4)
(CACHE ADDRESS TAG GROUP 1 BYTE 1)

TITLE CACHE ADDRESS MATRIX (CA...
SIZE D | CODE CS | NUMBER M8220-ϕ-1 | REV. C
SCALE — | SHEET 8 OF 19 | D.T.

REV C | SIZE D | CODE CS | NUMBER M8220-ϕ-1

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CAMF PA BUF Φ3 H
CAMF PA BUF Φ4 H
CAMF PA BUF Φ5 H
CAMF PA BUF Φ6 H
CAMF PA BUF Φ7 H
CAMF PA BUF Φ8 H
CAMF PA BUF Φ9 H
CAMF PA BUF 1Φ H
CAMF PA BUF 11 H

93425A TRUTH TABLE

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	93425A
READ	Φ	1	X	STORED DATA
WRITE "Φ"	Φ	Φ	Φ	HIGH-Z
WRITE "1"	Φ	Φ	1	HIGH-Z
DISABLED	1	X	X	HIGH-Z

X = DON'T CARE

93425A AΦ E48 — CAMB PA LATCH 24H — CAMJ G1 TAG 24 H (CAMK,L)
93425A AΦ E50 — CAMB PA LATCH 25 H — CAMJ G1 TAG 25 H (CAMK,L)
93425A AΦ E52 — CAMB PA LATCH 26 H — CAMJ G1 TAG 26H (CAMK, L)
93425A AΦ E47 — CAMB PA LATCH 27 H — CAMJ G1 TAG27H (CAMK, L)
93425A AΦ E49 — CAMB PA LATCH 28 H — CAMJ G1 TAG 28 H (CAMK, L)
93425A AΦ E51 — CAMB LATCH VALID BIT H — CAMJ VALID 1 H (CAMK, L)
93425A AΦ E53 — CAMB TAG PAR 2 EVEN H — CAMJ G1 TAG PAR 2 H (CAMK,L)

+5V
R42
4.7K 1/4W, 5 %

CAMF G1 WRITE ENABLE L
CAMB DISABLE G1 B2 H

(SLOT 4)
(CACHE ADDRESS TAG GROUP Φ BYTE 2)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMJ	D	CS	M822Φ-Φ-1	C

SCALE — SHEET 9 OF 19 DIST.

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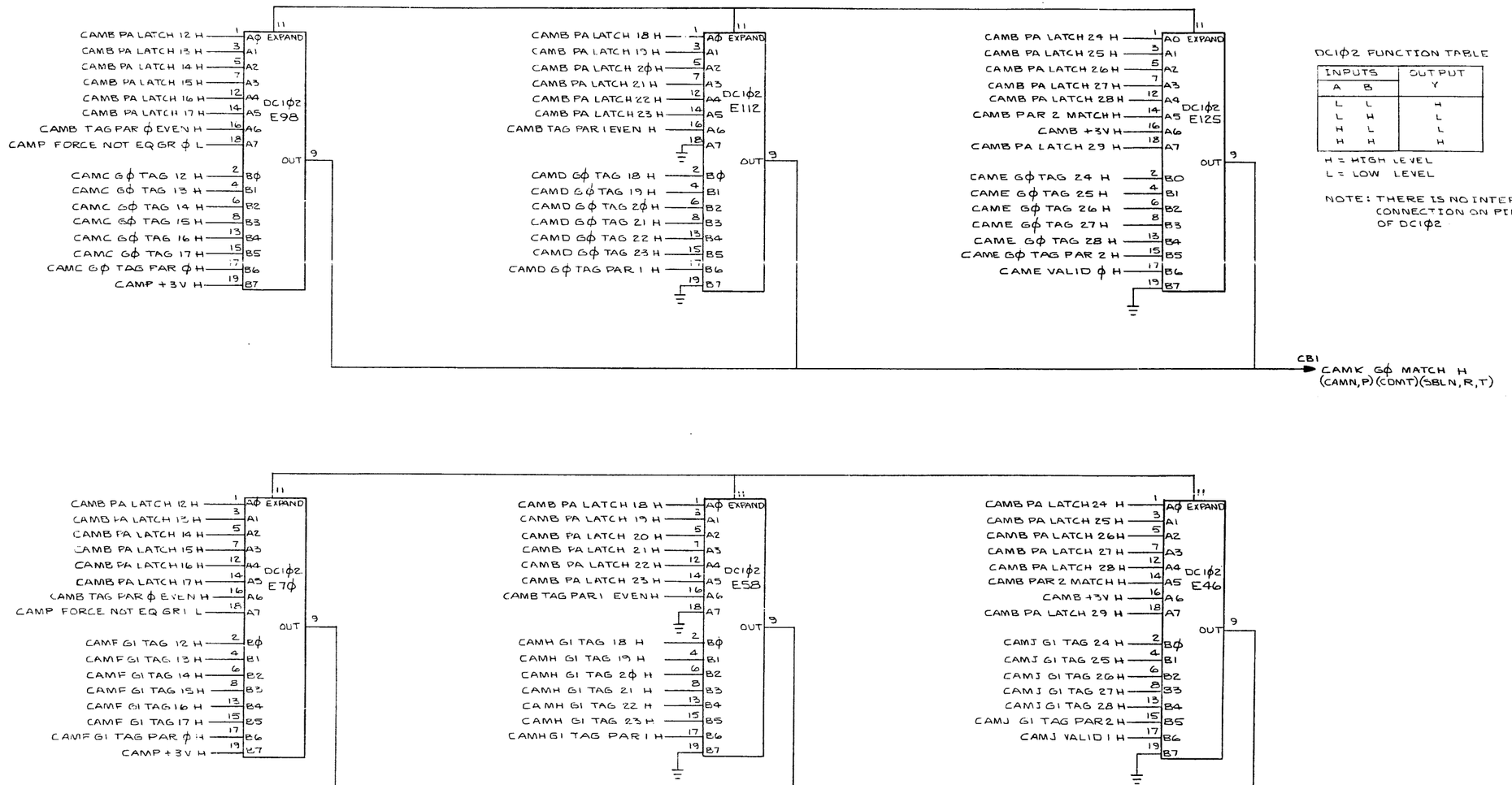

DCIØ2 FUNCTION TABLE

INPUTS A	INPUTS B	OUTPUT Y
L	L	H
L	H	L
H	L	L
H	H	H

H = HIGH LEVEL
L = LOW LEVEL

NOTE: THERE IS NO INTERNAL CONNECTION ON PIN 11 OF DCIØ2

(SLOT 4)
(CACHE ADDRESS TAG EQUAL CHECKER)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMK)	D	CS	M822Ø-Ø-1	C
SCALE —	SHEET 1Ø OF 19	DIST.		

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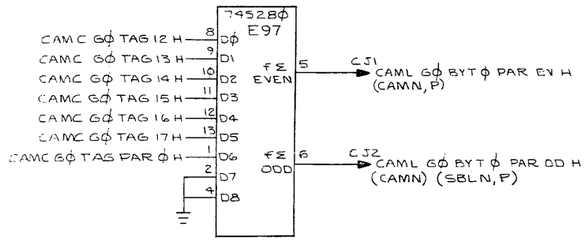
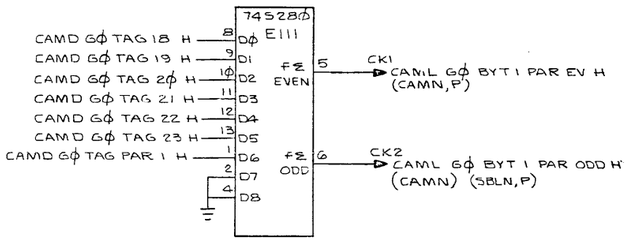
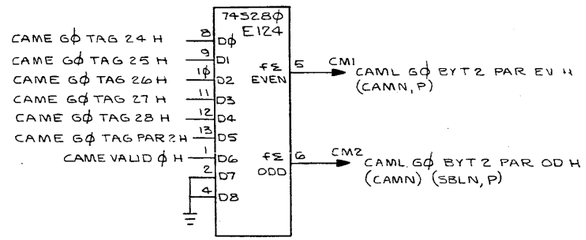
74528Φ FUNCTION TABLE

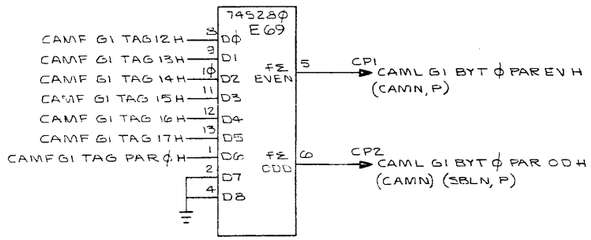
NUMBER OF INPUTS A THRU I THAT ARE HIGH	OUTPUTS	
	Σ EVEN	Σ ODD
Φ,2,4,6,8	H	L
1,3,5,7,9	L	H

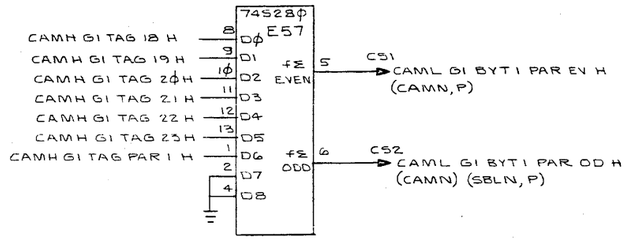
H = HIGH LEVEL L = LOW LEVEL

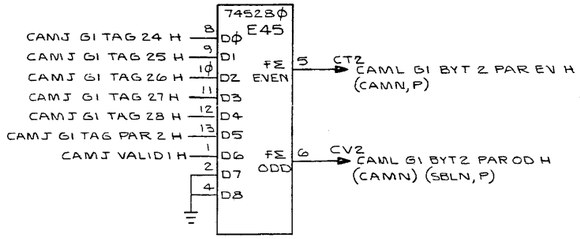












(SLOT 4)
(CACHE ADDRESS TAG PARITY CHECKER)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAML)	D	CS	M822Φ-Φ-1	C

SCALE —#— | SHEET 11 OF 19 | DIST.

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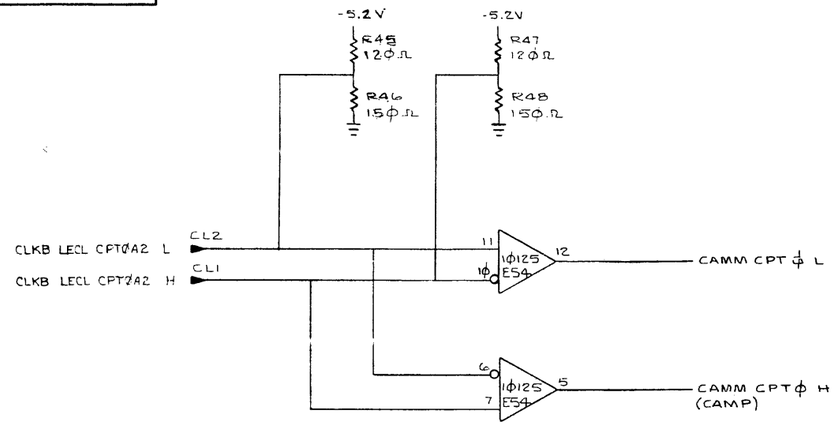
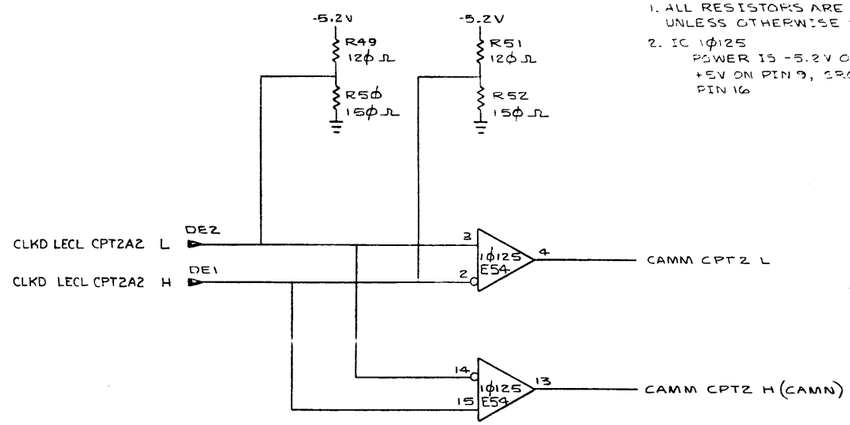
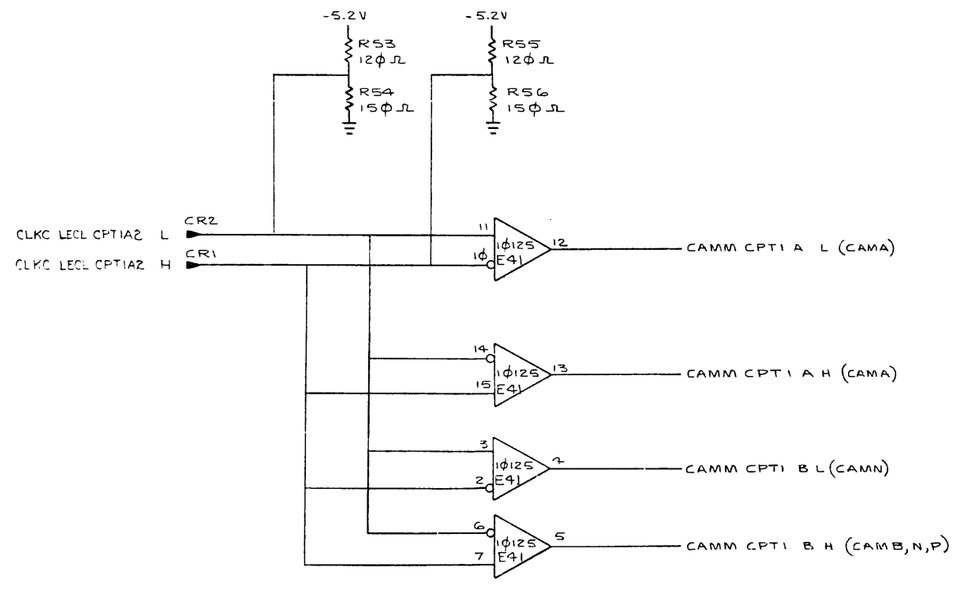
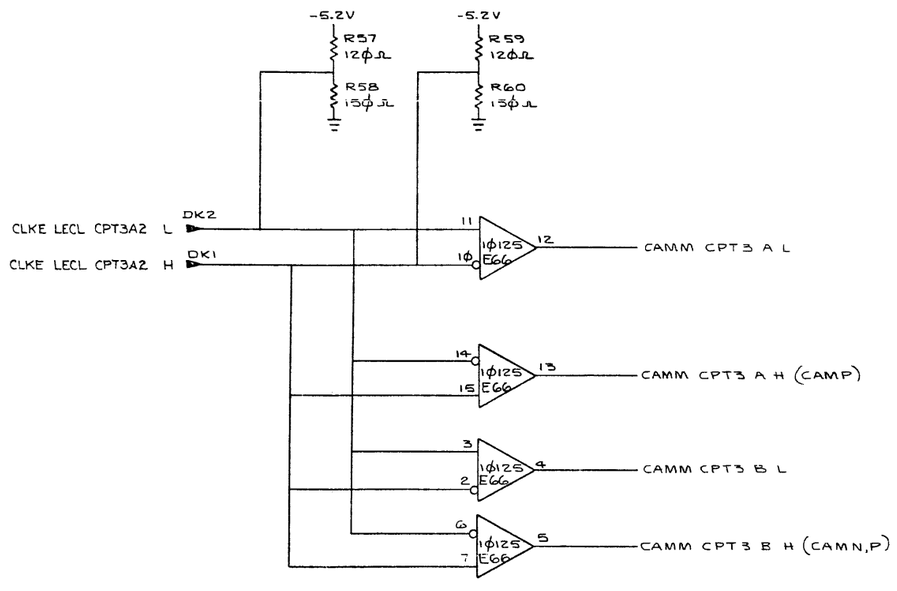
NOTE:
1. ALL RESISTORS ARE 1/4 W, 5% UNLESS OTHERWISE SPECIFIED
2. IC 10125 POWER IS -5.2 V ON PIN 8, +5V ON PIN 9, GROUND ON PIN 16









(SLOT 4)

(CLOCK RECEIVER)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMM)	D	CS	M8220-0-1	C
SCALE —/—	SHEET 12 OF 19	DIST.		

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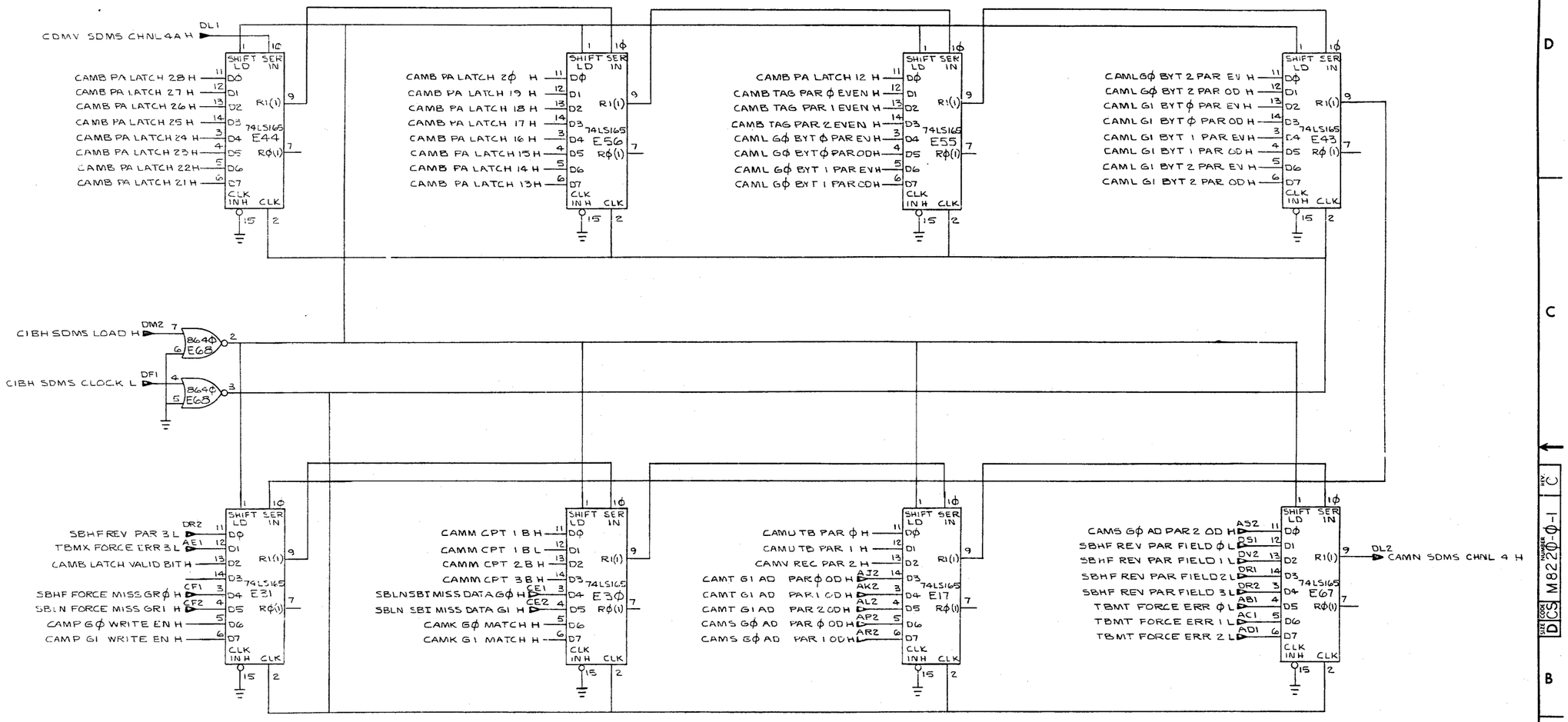

74S165 FUNCTIONS

1. 8 BIT SHIFT REGISTER
2. THE OUTPUT COMES FROM FLIP FLOP NUMBER 7
3. IF SHIFT LOAD IS LOW, DATA IS LOADED FROM D INPUTS REGARDLESS OF CLOCK
4. OTHERWISE DATA SHIFTS FROM Φ TOWARD 7 ON CLOCK RISING EDGE

(SLOT 4)

(V BUS REGISTERS)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMN)	D	CS	M822Φ-Φ-1	C
SCALE —	SHEET 13 OF 19	DIST.		

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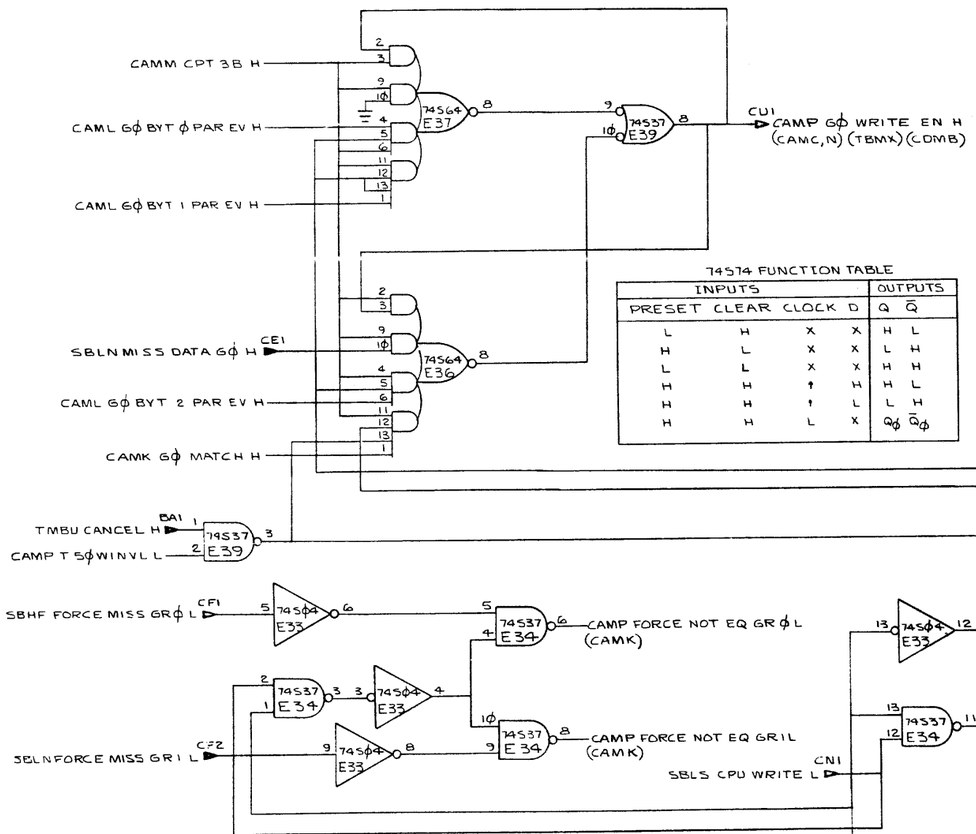
NOTES:
1) 74LS259 IS USED AS 8 LINE DEMULTIPLEXER
2) WHEN BOTH CLEAR AND ENABLE INPUTS ARE LOW, THE ADDRESSED OUTPUT WILL FOLLOW THE LEVEL OF 'D' INPUT WITH ALL OTHER OUTPUTS LOW.



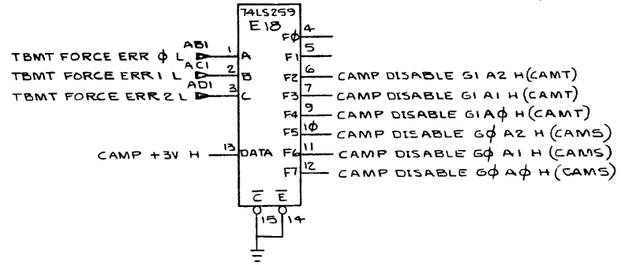
74S74 FUNCTION TABLE

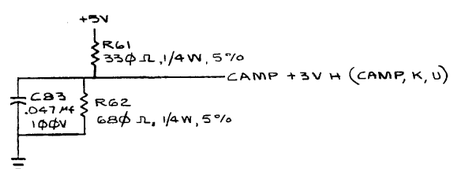
INPUTS				OUTPUTS	
PRESET	CLEAR	CLOCK	D	Q	$\bar{Q}$
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H	H
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	X	$Q_Ø$	$\bar{Q}_Ø$

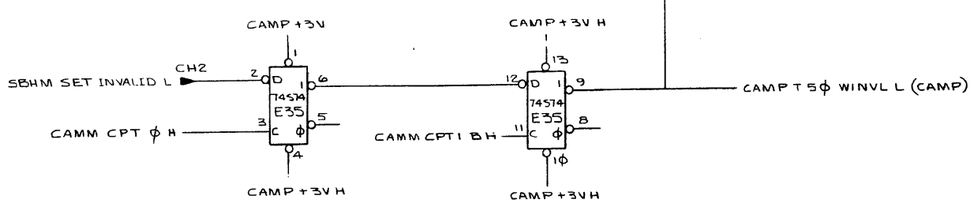
LATCH SELECTION TABLE (74S259)

SELECT INPUTS C	B	A	LATCH ADDRESSED
L	L	L	Ø
L	L	H	1
L	H	L	2
L	H	H	3
H	L	L	4
H	L	H	5
H	H	L	6
H	H	H	7

H = HIGH LEVEL L = LOW LEVEL







(SLOT 4)
(WRITE PULSE LOGIC & TB PARITY FORCE ERROR DECODE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMP)	D	CS	M822Ø-Ø-1	C
SCALE —	SHEET 14 OF 19	DIST.		

DEC FORM NO. ORD 338

10

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DDPJ VAMX 15 L — EB1 — 74S04 E2Ø — CAMR VA MUX 15 BUFF H (CAMS,T,U)

DEPP VAMX 21 L — DN1 — 74S04 E38 — CAMR VA MUX 21 BUFF H (CAMS,T,U)

DEPR VAMX 27 L — DD1 — 74S04 E13 — CAMR VA MUX 27 BUFF H (CAMS,T,U)

DEPN VAMX 16 L — DL1 — 74S04 E2Ø — CAMR VA MUX 16 BUFF H (CAMS,T,U)

DEPP VAMX 22 L — DM1 — 74S04 E38 — CAMR VA MUX 22 BUFF H (CAMS,T,U)

DEPS VAMX 28 L — DD2 — 74S04 E13 — CAMR VA MUX 28 BUFF H (CAMS,T,U)

DEPN VAMX 17 L — DL2 — 74S04 E2Ø — CAMR VA MUX 17 BUFF H (CAMS,T,U)

DEPP VAMX 23 L — DJ2 — 74S04 E38 — CAMR VA MUX 23 BUFF H (CAMS,T,U)

DEPS VAMX 29 L — DC1 — 74S04 E13 — CAMR VA MUX 29 BUFF H (CAMS,T,U)

DEPN VAMX 18 L — DT2 — 74S04 E2Ø — CAMR VA MUX 18 BUFF H (CAMS,T,U)

DEPR VAMX 24 L — DJ1 — 74S04 E38 — CAMR VA MUX 24 BUFF H (CAMS,T,U)

DEPS VAMX 3Ø L — DB1 — 74S04 E13 — CAMR VA MUX 3Ø BUFF H (CAMS,T,U)

DEPN VAMX 19 L — DS2 — 74S04 E2Ø — CAMR VA MUX 19 BUFF H (CAMS,T,U)

DEPR VAMX 25 L — DH2 — 74S04 E38 — CAMR VA MUX 25 BUFF H (CAMS,T,U)

DDPJ VAMX 14 L — EC1 — 74S04 E13 — CAMR VA MUX 14 BUFF H (CAMS,T)

DEPP VAMX 2Ø L — DP1 — 74S04 E2Ø — CAMR VA MUX 2Ø BUFF H (CAMS,T,U)

DEPR VAMX 26 L — DF2 — 74S04 E38 — CAMR VA MUX 26 BUFF H (CAMS,T,U)

(SLOT 4)

(VA MUX DRIVERS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMR)	D	CS	M822Ø-Ø-1	C
SCALE —H— SHEET 15 OF 19	DIST.			

DEC FORM NO. DRD 150

105

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+5V

R79 487 R77 487 R75 487 R73 487 R71 487

TBMT GRP ϕ WP L BB1

CAMP DISABLE G0 A0 H

CAMR VA MUX 15 BUFF H
CAMR VA MUX 16 BUFF H
CAMR VA MUX 17 BUFF H
CAMR VA MUX 18 BUFF H
CAMR VA MUX 19 BUFF H
CAMR VA MUX 20 BUFF H
CAMR VA MUX 21 BUFF H
CAMR VA MUX 22 BUFF H
CAMU TB PAR ϕ H

(64X9) 825ϕϕ E3 RAM

74S28ϕ E11

FΣ EVEN → AP1 → CAMS GϕAD PAR ϕ EV H

FΣ ODD → AP2 → CAMS GϕAD PAR ϕ OD H (CAMN)

+5V

R69 487 R67 487 R65 487 R63 487

CAMS GRP ϕ ADRS 15L (CAMU)
CAMS GRP ϕ ADRS 16L (CAMU)
CAMS GRP ϕ ADRS 17L (CAMU)
CAMS GRP ϕ ADRS 18L (CAMU)
CAMS GRP ϕ ADRS 19L (CAMU)
CAMS GRP ϕ ADRS 20L (CAMU)
CAMS GRP ϕ ADRS 21L (CAMU)
CAMS GRP ϕ ADRS 22L (CAMU)
CAMS GRP ϕ PAR ϕ L (CAMU)

CAMP DISABLE Gϕ A1 H

CAMR VA MUX 23 BUFF H
CAMR VA MUX 24 BUFF H
CAMR VA MUX 25 BUFF H
CAMR VA MUX 26 BUFF H
CAMR VA MUX 27 BUFF H
CAMR VA MUX 28 BUFF H
CAMR VA MUX 29 BUFF H
CAMR VA MUX 30 BUFF H
CAMU TB PAR 1 H

(64X9) 825ϕϕ E5 RAM

74S28ϕ E15

FΣ EVEN → AR1 → CAMS GϕAD PAR 1 EV H

FΣ ODD → AR2 → CAMS GϕAD PAR 1 OD H (CAMN)

CAMS GRP ϕ ADRS 23L (CAMU)
CAMS GRP ϕ ADRS 24 L (CAMU)
CAMS GRP ϕ ADRS 25 L (CAMU)
CAMS GRP ϕ ADRS 26 L (CAMU)
CAMS GRP ϕ ADRS 27 L (CAMU)
CAMS GRP ϕ ADRS 28 L (CAMU)
CAMS GRP ϕ ADRS 29 L (CAMU)
CAMS GRP ϕ ADRS 30 L (CAMU)
CAMS GRP ϕ PAR 1 L (CAMU)

+5V

R121 R123 R125 R127 R129 R131 R133 R135 R137

CAMP DISABLE Gϕ A2 H

CAMR VA MUX 14 BUFF H
CAMV REC ID 26 H
CAMV REC ID 27 H
CAMV REC ID 28 H
CAMV REC ID 29 H
CAMV REC ID 30 H
CAMV REC ID 31 H
CAMV REC PAR 2 H

(64X9) 825ϕϕ E1 RAM

74S28ϕ E8

FΣ EVEN → AS1 → CAMS Gϕ AD PAR 2 EV H

FΣ ODD → AS2 → CAMS Gϕ AD PAR 2 OD H (CAMN)

CAMS GRP ϕ ADRS 14 L (CAMU)
CAMS GRP ϕ MODIFY L (CAMV)
CAMS GRP ϕ PROTECT ϕϕ L (CAMU)
CAMS GRP ϕ PROTECT ϕ1 L (CAMV)
CAMS GRP ϕ PROTECT ϕ2 L (CAMV)
CAMS GRP ϕ PROTECT ϕ3 L (CAMV)
CAMS GRP ϕ VALID L (CAMU)
CAMS GRP ϕ PAR 2 L

+5V

R99 R101 R103 R105 R107 R109 R111 R113 R115

DDPH VAMX ϕ9 L → EP1
DDPH VAMX 10 L → EN1
DDPH VAMX 11 L → EM1
DDPH VAMX 12 L → ED1
DDPH VAMX 13 L → ED2
DDPS VAMX 31 L → DB2

NOTE: ALL RESISTORS ARE 487Ω, 1/4 W, 5% UNLESS OTHERWISE SPECIFIED

(SLOT 4)

(TB ADDRESS TAG GROUP ϕ)

74S28ϕ FUNCTION TABLE

NUMBER OF INPUTS A THRU I THAT ARE HIGH	OUTPUTS Σ EVEN	Σ ODD
0, 2, 4, 6, 8	H	L
1, 3, 5, 7, 9	L	H

H = HIGH LEVEL
L = LOW LEVEL

825ϕ9 TRUTH TABLE

MODE	CE	WE	IN	ON
READ	0	1	X	COMPLEMENT OF DATA STORED
WRITE "0"	0	0	0	1
WRITE "1"	0	0	1	0
DISABLED	1	X	X	1

X = DONT CARE

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMS)	D	CS	M8220-0-1	C
SCALE —	SHEET 16 OF 19		DIST.	

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TBMF GRP 1 WP L BB2
CAMP DISABLE G1 AØ H

+5V
R117 487 R119 487 R121 487 R123 487 R125 487

74S28Ø E12

CAMR VA MUX 15 BUFF H
CAMR VA MUX 16 BUFF H
CAMR VA MUX 17 BUFF H
CAMR VA MUX 18 BUFF H
CAMR VA MUX 19 BUFF H
CAMR VA MUX 20 BUFF H
CAMR VA MUX 21 BUFF H
CAMR VA MUX 22 BUFF H
CAMU TB PAR Ø H

(64 X 9) 825Ø9 E4 RAM

CS WP
AØ A1 A2 A3 A4 A5

AJ1 CAMT G1 AD PAR Ø EV H (TBMT)
AJ2 CAMT G1 AD PAR Ø OD H (CAMN)

+5V
R127 487 R129 487 R131 487 R133 487

CAMP DISABLE G1 A1 H

CAMR VA MUX 23 BUFF H
CAMR VA MUX 24 BUFF H
CAMR VA MUX 25 BUFF H
CAMR VA MUX 26 BUFF H
CAMR VA MUX 27 BUFF H
CAMR VA MUX 28 BUFF H
CAMR VA MUX 29 BUFF H
CAMR VA MUX 30 BUFF H
CAMU TB PAR 1 H

(64 X 9) 825Ø9 E6 RAM

74S28Ø E16

AK1 CAMT G1 AD PAR 1 EV H (TBMT)
AK2 CAMT G1 AD PAR 1 OD H (CAMN)

CAMT GRP 1 ADRS 23 L (CAMU)
CAMT GRP 1 ADRS 24 L (CAMU)
CAMT GRP 1 ADRS 25 L (CAMU)
CAMT GRP 1 ADRS 26 L (CAMU)
CAMT GRP 1 ADRS 27 L (CAMU)
CAMT GRP 1 ADRS 28 L (CAMU)
CAMT GRP 1 ADRS 29 L (CAMU)
CAMT GRP 1 ADRS 3Ø L (CAMU)
CAMT GRP 1 PAR 1 L (CAMU)

+5V
R135 R137 R139 R141 R143 R145 R147 R149 R151

CAMT GRP 1 ADRS 15 L (CAMU)
CAMT GRP 1 ADRS 16 L (CAMU)
CAMT GRP 1 ADRS 17 L (CAMU)
CAMT GRP 1 ADRS 18 L (CAMU)
CAMT GRP 1 ADRS 19 L (CAMU)
CAMT GRP 1 ADRS 2Ø L (CAMU)
CAMT GRP 1 ADRS 21 L (CAMU)
CAMT GRP 1 ADRS 22 L (CAMU)
CAMT GRP 1 PAR Ø L (CAMU)

CAMP DISABLE G1 A2 H

CAMR VA MUX 14 BUFF H
CAMV REC ID 26 H
CAMV REC ID 27 H
CAMV REC ID 28 H
CAMV REC ID 29 H
CAMV REC ID 3Ø H
CAMV REC ID 31 H
CAMV REC PAR 2 H

(64 X 9) 825Ø9 E2 RAM

74S28Ø E9

AL1 CAMT G1 AD PAR 2 EV H (TBMT)
AL2 CAMT G1 AD PAR 2 OD H (CAMN)

CAMT GRP 1 ADRS 14 L CAMU
CAMT GRP 1 MODIFY L (CAMV)
CAMT GRP 1 PROTECT ØØ L (CAMV)
CAMT GRP 1 PROTECT Ø1 L (CAMV)
CAMT GRP 1 PROTECT Ø2 L (CAMV)
CAMT GRP 1 PROTECT Ø3 L (CAMV)
CAMT GRP 1 VALID L (CAMU)
CAMT GRP 1 PAR 2 L

+5V
R153 R155 R157 R159 R161 R163 R165 R167 R169

DDPH VAMX Ø9 L EP1
DDPH VAMX 1Ø L EN1
DDPH VAMX 11 L EM1
DDPJ VAMX 12 L ED1
DDPJ VAMX 13 L ED2
DEPS VAMX 31 L DB2

74528Ø FUNCTION TABLE

NUMBER OF INPUTS A THRU I THAT ARE HIGH	OUTPUTS ΣEVEN	ΣODD
Ø, 2, 4, 6, 8	H	L
1, 3, 5, 7, 9	L	H

H = HIGH LEVEL
L = LOW LEVEL

825Ø9 TRUTH TABLE

MODE	CE	WE	I_N	O_N
READ	Ø	1	X	COMPLEMENT OF DATA STORED
WRITE "Ø"	Ø	Ø	Ø	1
WRITE "1"	Ø	Ø	1	Ø
DISABLED	1	X	X	1

NOTE: RESISTORS ARE 487 Ω, 1/4 W, 5% UNLESS OTHERWISE SPECIFIED

(SLOT 4)

(TB ADDRESS TAG GROUP 1)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE CACHE ADDRESS MATRIX (CAMT)
SIZE D | CODE CS | NUMBER M8220-Ø-1 | REV. C
SCALE — | SHEET 17 OF 19 | DIST.

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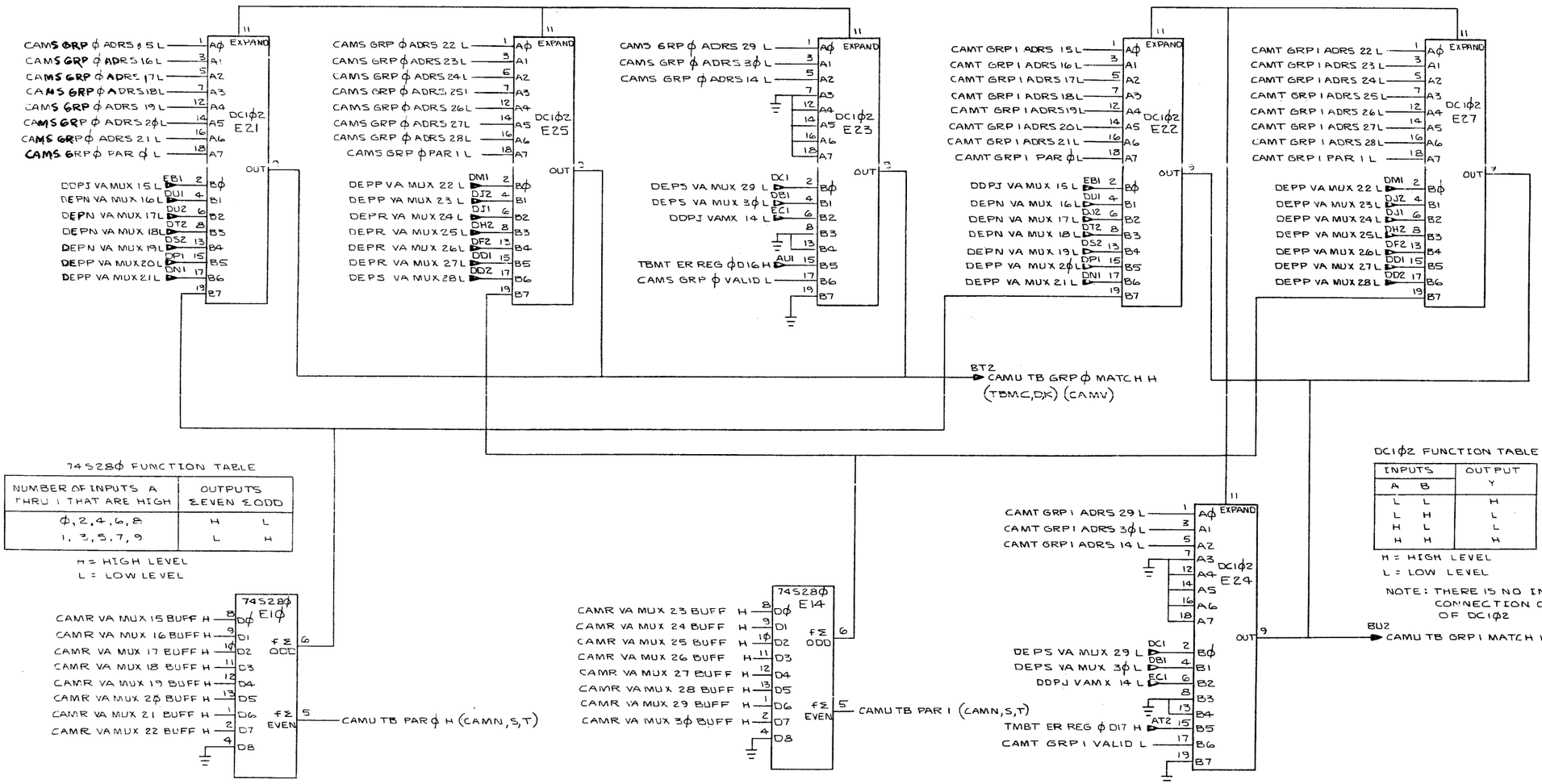

74S280 FUNCTION TABLE

NUMBER OF INPUTS A THRU I THAT ARE HIGH	OUTPUTS ΣEVEN	OUTPUTS ΣODD
0,2,4,6,8	H	L
1,3,5,7,9	L	H

H = HIGH LEVEL
L = LOW LEVEL

DC1φ2 FUNCTION TABLE

INPUTS A	INPUTS B	OUTPUT Y
L	L	H
L	H	L
H	L	L
H	H	H

H = HIGH LEVEL
L = LOW LEVEL

NOTE: THERE IS NO INTERNAL CONNECTION ON PIN 11 OF DC1φ2

(SLOT 4)
(TB ADDRESS TAG EQUAL CHECKER & VA MUX PARITY GENERATE)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMU)	D	CS	M822Φ-Φ-1	C
SCALE —	SHEET 18 OF 19	DIST.		

MANUFACTURED PARTS

DEC FORM NO. DRG 139

108

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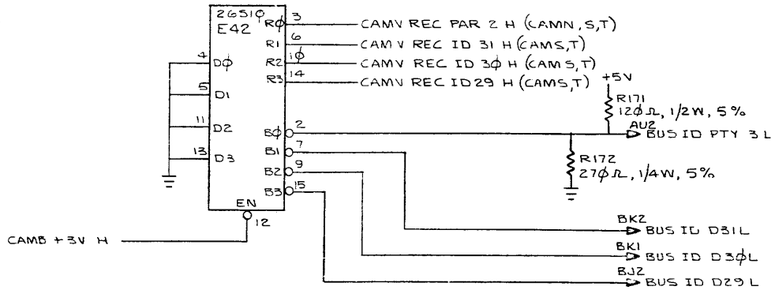
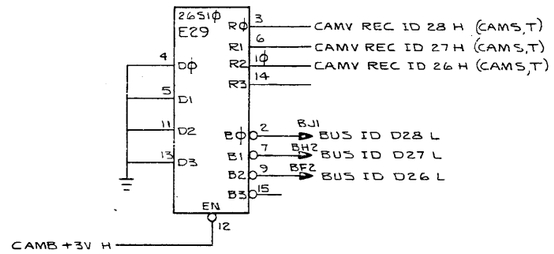
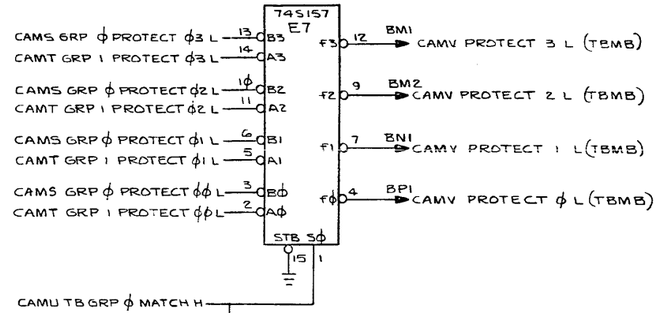
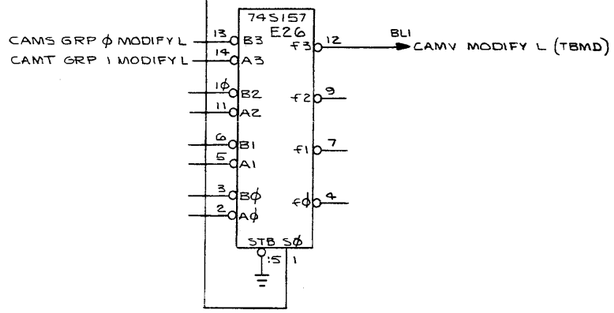








26S1Φ TRUTH TABLE

INPUTS		OUTPUTS	
$\overline{E}$	D	$\overline{B}$	Z
L	L	H	L
L	H	L	H
H	X	Y	Y

H = HIGH VOLTAGE LEVEL
L = LOW VOLTAGE LEVEL
X = DON'T CARE
Y = VOLTAGE LEVEL OF BUS (ASSUMES CONTROL BY ANOTHER BUS TRANSCEIVER)

74S157 TRUTH TABLE

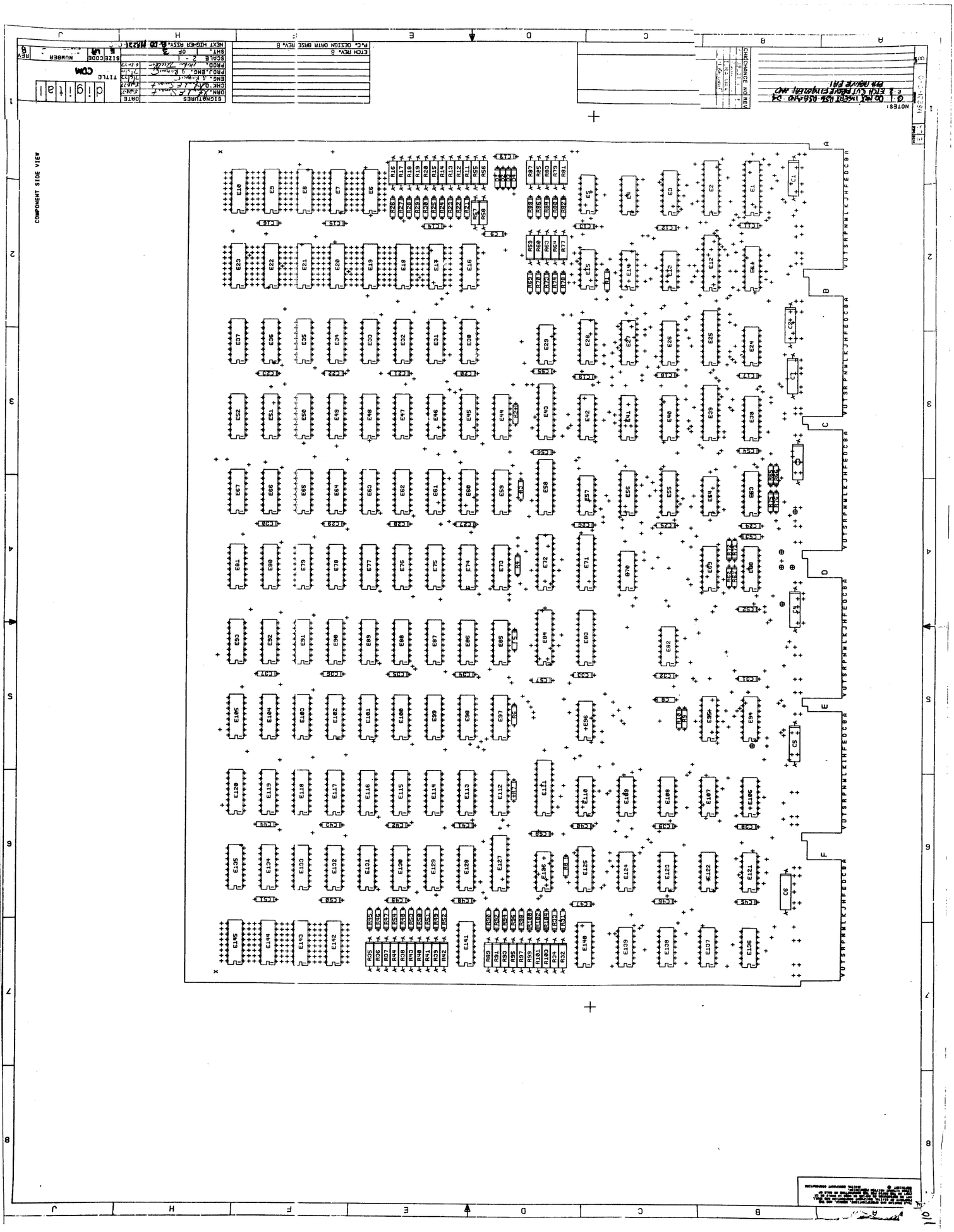
INPUTS				OUTPUTY
STROBE	SELECT	A	B	S157
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

(SLOT 4)

ID TRANSCEIVERS & PROTECTION CODE MUX

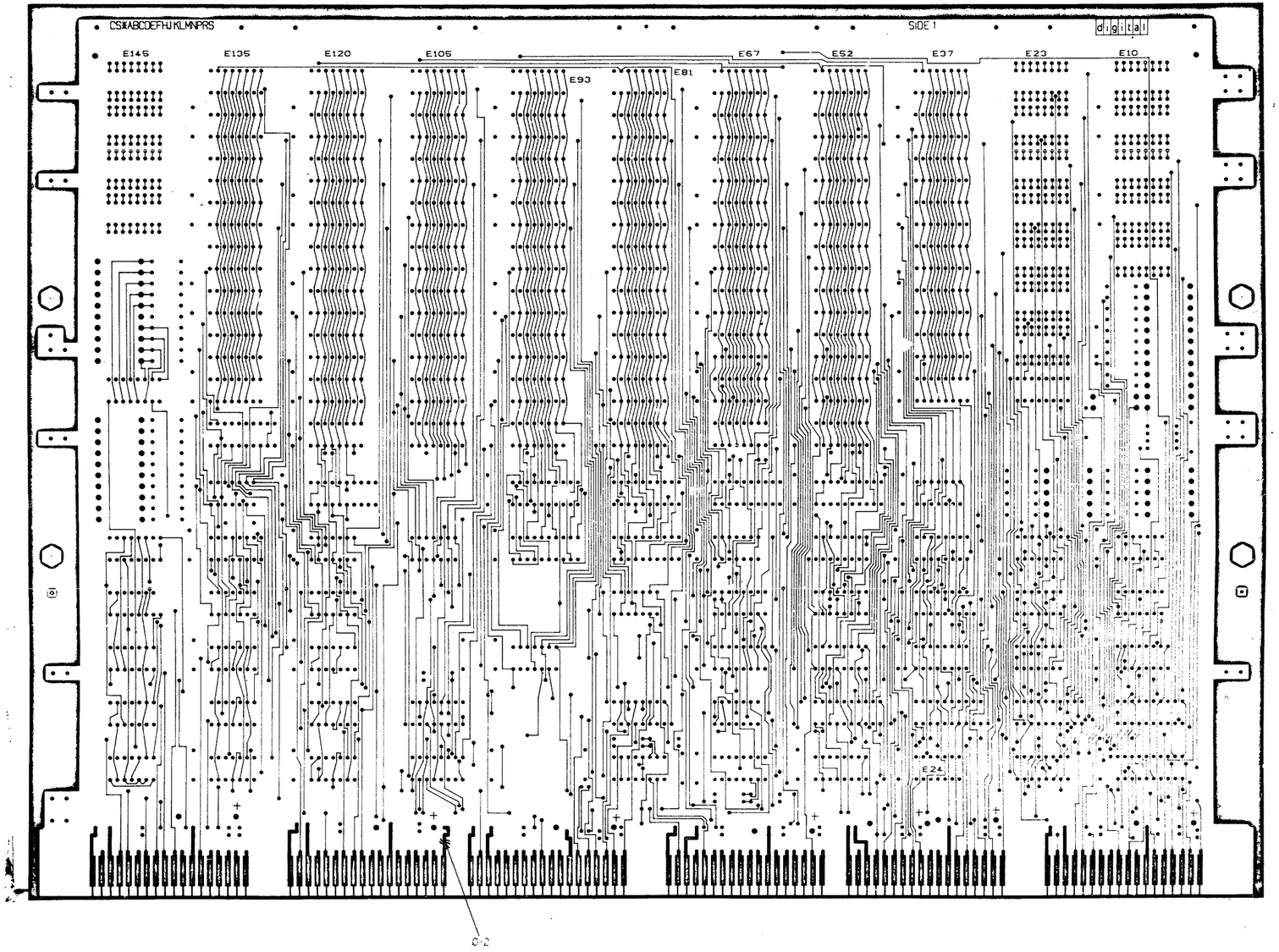
REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE ADDRESS MATRIX (CAMV)	D	CS	M8220-Φ-1	C
SCALE —H—	SHEET 19 OF 19	DIST.		


COMPONENT SIDE VIEW

6012500 B M8221

LAYER 1



CDM 2 of 3 EIA M8221-00- B 111

LAYER 4

L4

SIDE 2

5012500 B

CACHE DATA MATRIX M8221

C D M

3 of 3

M8221-00

B

112

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY F. SMART DATE 5-26-77	CHECKED F. SMART DATE 5-26-77	SECTION
ENG DATE J. Rugwes 7/6/77	PROD DATE Mike Tevilla 6-21-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8221-0-0	NOTES: REF DESIGNATION
1	E-MD-5012500-0-0	5012500	ETCH BOARD	1	
2		1012084-01	CAPACITOR, 8.0 uf, 25V	7	C1 thru C7
3		1012784-00	CAPACITOR, .047 uf 50V +80% -20%	51	C11 thru C54,C8,C9,C10,C55,C56,C57,C58
4		1300228-00	RESISTOR, 100 OHM, 1/2W, 5%	40	R11 thru R20,R34 thru R44, ,R59,R60,R63, R64,R77,R79,R81,R83,R85,R87,R89,R91,R93, R95,R97,R99,R101,R103,R32
5		1300247-00	RESISTOR, 120 OHM, 1/4W, 5%	5	R10,R61,R62,R65,R66
6		1300250-00	RESISTOR, 150 OHM, 1/4W, 5%	4	R71,R72,R75,R76
7		1300447-00	RESISTOR, 4.7K, 1/4W, 5%	8	R1 thru R8
8		1311522-00	RESISTOR, 200 OHM, 1/4W, 5%	41	R21 thru R31, R45 thru R54,R9, ,R69,R70, R73,R74,R78,R80,R82,R84,R86,R88,R90,R92, R94,R96,R98,R100,R102,R104,R33
9		13-00249-00	RESISTOR, 150Ω 1/2W, 5%	1	R55
10		1910534-00	I.C. DEC 74S04	2	E109,E124
11		1910542-00	I.C. DEC 74S64	10	E106,E107,E108,E121,E122,E123,E136,E137, E138,E139
12		1910546-00	I.C. DEC 74S140	4	E4,E5,E14,E13
13		1911415-00	I.C. DEC 10125	2	E53,E68
14		1911469-00	I.C. DEC 8640	1	E54
15		1911573-00	I.C. DEC 74S280	8	E15,E29 E57,E70,E82 E96,E110 E126
16		1911641-00	I.C. DEC 74S257	9	E3,E11,E27,E42,E55,E56,E26,E40,E41
17		19-13839-00	I.C. DEC 74LS165	6	E28,E38 E125 E140,E95,E69

E.C.O. NO. 00001

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX	E-UA-M8221-0-0	B	PL	M8221-0-0	B
	SHEET 1 OF 2	INSERTION PARTS LIST DATA BASE REV			

DRB 125

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY F. SMART DATE 5-26-77	CHECKED F. SMART DATE 5-26-77	SECTION
ENG DATE J. Ragwer 7/6/77	PROD Mike Tenella DATE 6-21-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8221-Ø-Ø	NOTES: REF DESIGNATION
18		1912860-00	I.C. DEC 74LS259	1	E94
19		19-13670-00	I.C. DEC 74S373	5	E1 E2,E12,E25,E39
20		19-13662-00	I.C. DEC 93425-A	72	E59 thru E67,E73 thru E81,E16,E30 thru E37,E44 thru E52,E85 thru E93,E97 thru E105,E112 thru E120,E128 thru E135,E141
21			I.C. DEC SPARE	7	E6 thru E10,E17,E18
22			I.C. DEC SPARE	12	E19 thru E24,E142 thru E145
23		1913462-00	I.C. DEC 74S24Ø	8	E83,E84,E111,E127,E43,E58,E71,E72
24		1210711-2	HANDLE	1	
25		90000240-01	EYELETS	12	

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX	E-UA-M8221-0-0	B	PL	M8221-Ø-Ø	B
	SHEET 2 OF 2	INSERTION PARTS LIST DATA BASE REV			

DRB 125

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SERIAL BUS (V BUS) 74LS165 (6) (CDMV)
SERIAL OUT
SELF TEST
LOAD SHIFT
CLOCK
INPUT SIGNALS TO V BUS (REFER TO CDMV PAGE)

CLOCK (ECL) 10125 (2) (CDMU)
CP LECL T1 L
CP LECL T1 H
CP LECL T2 L
CP LECL T2 H
CPT1 A L
CPT1 A H
CPT1 B L
CPT1 B H
CPT2 L
CPT2 H

WRITE DATA REGISTER 74S373 (5) (CDMA)
36
32
4
MASK BITS

74S140 (4) (CDMB)
2
FROM CAM GROUP Ø & 1 WRITE ENABLE

ADDRESS LATCH 74S64 (10) (CDMU)
PA<11:02>

74S240 (4) (CDMC)
+5V
100 Ω
200 Ω

DATA MEMORY GROUP Ø
WE DIN CE
A0-A9
93425A 1K×1 RAM (36)
DOUT DOUT
CDMD CDMF CDMJ CDMK
+5V
4.7K
32 4
4

74S240 (4) (CDME)
+5V
100 Ω
200 Ω

DATA MEMORY GROUP 1
WE DIN CE
A0-A9
93425A 1K×1 RAM (36)
DOUT DOUT
CDML CDMM CDMN CDMP
+5V
4.7K
32 4
4

FORCE PARITY ERROR DECODE 74LS259 (1) (CDMB)
8
1
3
4
FROM SBH BOARD (FORCE PARITY ERROR BITS)

PARITY CHECKER 74S280 (4) (CDMR)
TO V BUS (ODD & EVEN PARITY) GROUP Ø
8
4
TO SBH BOARD (ODD PARITY) GROUP Ø
4
36

PARITY CHECKER 74S280 (4) (CDMS)
8
TO V BUS (ODD & EVEN PARITY)
4
TO SBH BOARD (ODD PARITY) GROUP 1
4
36

TBM ENABLE CDM DATA
CAM GROUP Ø MATCH
MUX 74S257 (9) (CDMT)
36 36
36
MD BUS

(BLOCK DIAGRAM) (SLOT 5)

DRN.		Final Found Out	
CHKD.			
ENG.		TITLE: CACHE DATA MATRIX (CDM)	
PROJ. ENG.			
PROD.			
NEXT HIGHER ASSY.			
SCALE		SIZE D / CODE CS / NUMBER M8221-0-1	REV. B
SHEET 1 OF 19		DIST.	

M8221-0-1 REV B SHEET 19 OF 19 CS D

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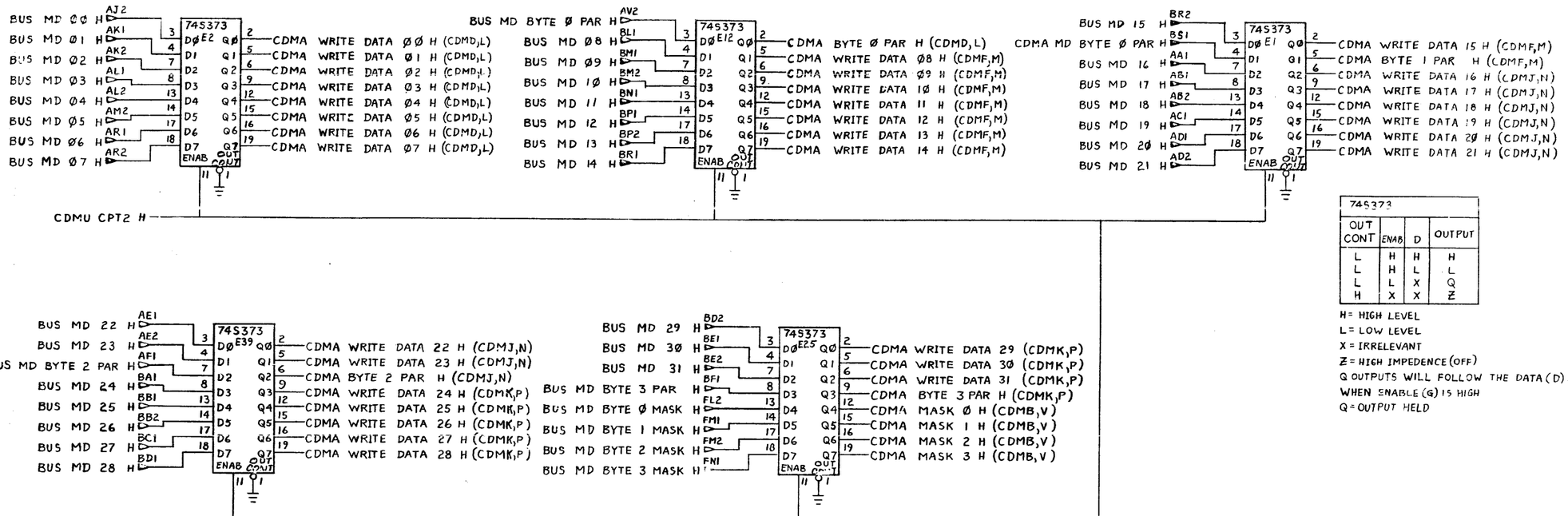
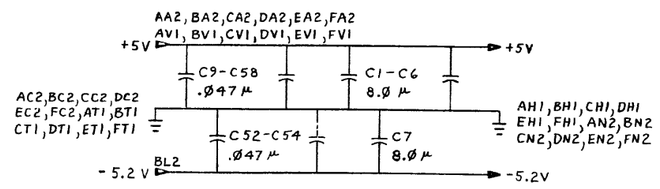


745373			
OUT CONT	ENAB	D	OUTPUT
L	H	H	H
L	H	L	L
L	L	X	Q
H	X	X	Z

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT
Z = HIGH IMPEDENCE (OFF)
Q OUTPUTS WILL FOLLOW THE DATA (D) INPUTS WHEN ENABLE (G) IS HIGH
Q = OUTPUT HELD



REVISIONS

CHK	CHANGE NO.	REV.

(CDM WRITE DATA REGISTERS) (SLOT 5)

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMA)	D	CS	M8221-0-1	B
SCALE —//— SHEET 2 OF 19	DIST.			

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CDMA MASK Ø H
CAMP GØ WRITE EN H — CU1
CDMA MASK 1 H
CDMA MASK 2 H
CDMB +3V H
CDMA MASK 3 H

74S14Ø E14 → CDMB GØ BYTE Ø WP L (CDMD)
74S14Ø E14 → CDMB GØ BYTE 1 WP L (CDMF)
74S14Ø E13 → CDMB GØ BYTE 2 WP L (CDMJ)
74S14Ø E13 → CDMB GØ BYTE 3 WP L (CDMK)

CDMA MASK Ø H
CAMP G1 WRITE EN H — CU2
CDMA MASK 1 H
CDMA MASK 2 H
CDMA MASK 3 H

74S14Ø E4 → CDMB G1 BYTE Ø WP L (CDML)
74S14Ø E4 → CDMB G1 BYTE 1 WP L (CDMM)
74S14Ø E5 → CDMB G1 BYTE 2 WP L (CDMN)
74S14Ø E5 → CDMB G1 BYTE 3 WP L (CDMP)

74LS259 DECODE SELECTION

ENABLE INPUT	SELECT INPUTS C	B	A	DECODED ADDRESS
L	L	L	L	Ø
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7
H	X	X	X	NONE

THIS OUTPUT WILL BE HIGH
OTHER OUTPUTS WILL BE LOW

SBHF REV PAR Ø L — DU1
SBHF REV PAR 1 L — DU2
SBHF REV PAR 2 L — DS2
SBHF REV PAR 3 L — DT2

74LS259 E94
A, B, C, DATA, C̄, Ē
F0 → CDMB DISABLE GØ BØ H (CDMD)
F1 → CDMB DISABLE GØ B1 H (CDMF)
F2 → CDMB DISABLE GØ B2 H (CDMJ)
F3 → CDMB DISABLE GØ B3 H (CDMK)
F4 → CDMB DISABLE G1 BØ H (CDML)
F5 → CDMB DISABLE G1 B1 H (CDMM)
F6 → CDMB DISABLE G1 B2 H (CDMN)
F7 → CDMB DISABLE G1 B3 H (CDMP)

+5V
RIØ 12Ø Ω ¼W 5%
CDMB +3V H (CDMB)
CØ8 .Ø47 µF
RØ9 2ØØ Ω ¼W 5%

(WRITE ENABLE & FORCE PARITY ERROR DECODE) (SLOT 5)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMB)	D	CS	M8221-Ø-1	B

SCALE —/— | SHEET 3 OF 19 | DIST.

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NOTE:
1. RESISTOR VALUES
100 Ω ARE 1/2 WATT 5%
200 Ω ARE 1/4 WATT 5%

(GROUP Ø ADDRESS LINE DRIVERS) (SLOT 5)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMC)	D	CS	M8221-Ø-1	B
SCALE —	SHEET 4 OF 19	DIST.		

SIZE D CODE CS NUMBER M8221-Ø-1 REV B

118

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CDMC ADDR LATCH 11A H
CDMC ADDR LATCH 10A H
CDMC ADDR LATCH 09A H
CDMC ADDR LATCH 08A H
CDMC ADDR LATCH 07A H
CDMC ADDR LATCH 06A H
CDMC ADDR LATCH 05A H
CDMC ADDR LATCH 04A H
CDMC ADDR LATCH 03A H
CDMC ADDR LATCH 02A H

93425A A0 E37 — CDMA WRITE DATA 00 H — CDMD READ DATA G0 00H (CDMR,T)
93425A A0 E36 — CDMA WRITE DATA 01 H — CDMD READ DATA G0 01 H (CDMR,T)
93425A A0 E35 — CDMA WRITE DATA 02 H — CDMD READ DATA G0 02H (CDMR,T)
93425A A0 E34 — CDMA WRITE DATA 03 H — CDMD READ DATA G0 03 H (CDMR,T)
93425A A0 E33 — CDMA WRITE DATA 04 H — CDMD READ DATA G0 04 H (CDMR,T)
93425A A0 E32 — CDMA WRITE DATA 05 H — CDMD READ DATA G0 05H (CDMR,T)
93425A A0 E31 — CDMA WRITE DATA 06 H — CDMD READ DATA G0 06 H (CDMR,T)
93425A A0 E30 — CDMA WRITE DATA 07 H — CDMD READ DATA G0 07 H (CDMR,T)
93425A A0 E16 — CDMA BYTE 0 PAR H — CDMD RD BYTE PAR G0 0 H (CDMR,1)

+5V
R1 4.7K 1/4W 5%

CDMB G0 BYTE 0 WP L
CDMB DISABLE G0 B0 H

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	L	H	X	STORED DATA
WRITE "L"	L	L	L	Z
WRITE "H"	L	L	H	Z
DISABLED	H	X	X	Z

H=HIGH LEVEL
L=LOW LEVEL
X=IRRELEVANT
Z=HIGH IMPEDANCE(OFF)

(DATA MEMORY GROUP 0 BYTE 0) (SLOT 5)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE: CACHE DATA MATRIX (CDMD)
SIZE D | CODE CS | NUMBER M8221-0-1 | REV. B
SCALE — | SHEET 5 OF 19 | DIST.

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CDMH ADDR LATCH 11 L → 74S240 E83 → +5V, R32 100Ω ½W, R31 200Ω ¼W → CDME ADDR LATCH 11A H (CDML,M)

CDMH ADDR LATCH 10 L → 74S240 E83 → +5V, R34 100Ω, R33 200Ω → CDME ADDR LATCH 10A H (CDML,M)

CDMH ADDR LATCH 09 L → 74S240 E83 → +5V, R103 100Ω, R104 200Ω → CDME ADDR LATCH 09A H (CDML,M)

CDMH ADDR LATCH 08 L → 74S240 E83 → +5V, R101 100Ω, R102 200Ω → CDME ADDR LATCH 08A H (CDML,M)

CDMH ADDR LATCH 07 L → 74S240 E83 → +5V, R99 100Ω, R100 200Ω → CDME ADDR LATCH 07A H (CDML,M)

CDMH ADDR LATCH 06 L → 74S240 E84 → +5V, R97 100Ω, R98 200Ω → CDME ADDR LATCH 06A H (CDML,M)

CDMH ADDR LATCH 05 L → 74S240 E84 → +5V, R95 100Ω, R96 200Ω → CDME ADDR LATCH 05A H (CDML,M)

CDMH ADDR LATCH 04 L → 74S240 E84 → +5V, R93 100Ω, R94 200Ω → CDME ADDR LATCH 04A H (CDML,M)

CDMH ADDR LATCH 03 L → 74S240 E84 → +5V, R91 100Ω, R92 200Ω → CDME ADDR LATCH 03A H (CDML,M)

CDMH ADDR LATCH 02 L → 74S240 E84 → +5V, R89 100Ω, R90 200Ω → CDME ADDR LATCH 02A H (CDML,M)

CDMH ADDR LATCH 11 L → 74S240 E127 → +5V, R44 100Ω, R54 200Ω → CDME ADDR LATCH 11B H (CDMN,P)

CDMH ADDR LATCH 10 L → 74S240 E127 → +5V, R43 100Ω, R53 200Ω → CDME ADDR LATCH 10B H (CDMN,P)

CDMH ADDR LATCH 09 L → 74S240 E127 → +5V, R42 100Ω, R52 200Ω → CDME ADDR LATCH 09B H (CDMN,P)

CDMH ADDR LATCH 08 L → 74S240 E127 → +5V, R41 100Ω, R51 200Ω → CDME ADDR LATCH 08B H (CDMN,P)

CDMH ADDR LATCH 07 L → 74S240 E127 → +5V, R40 100Ω, R50 200Ω → CDME ADDR LATCH 07B H (CDMN,P)

CDMH ADDR LATCH 06 L → 74S240 E111 → +5V, R39 100Ω, R49 200Ω → CDME ADDR LATCH 06B H (CDMN,P)

CDMH ADDR LATCH 05 L → 74S240 E111 → +5V, R38 100Ω, R48 200Ω → CDME ADDR LATCH 05B H (CDMN,P)

CDMH ADDR LATCH 04 L → 74S240 E111 → +5V, R37 100Ω, R47 200Ω → CDME ADDR LATCH 04B H (CDMN,P)

CDMH ADDR LATCH 03 L → 74S240 E111 → +5V, R36 100Ω, R46 200Ω → CDME ADDR LATCH 03B H (CDMN,P)

CDMH ADDR LATCH 02 L → 74S240 E111 → +5V, R35 100Ω, R45 200Ω → CDME ADDR LATCH 02B H (CDMN,P)

NOTE:
1. RESISTOR VALUES
100Ω ARE ½ WATT 5%
200Ω ARE ¼ WATT 5%

SPARE: 74S240 E83 (13→7), 74S240 E83 (15→5), 74S240 E83 (17→3), 74S240 E84 (11→9), 74S240 E84 (8→12), 74S240 E84 (13→7), 74S240 E111 (11→9), 74S240 E111 (13→7), 74S240 E111 (8→12), 74S240 E127 (11→9), 74S240 E127 (15→5), 74S240 E127 (17→3)

(SLOT 5)
(GROUP I ADDRESS LINE DRIVERS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDME)	D	CS	M8221-0-1	B
SCALE	SHEET 6 OF 19	DIST.		

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CDMC ADDR LATCH 11A H
CDMC ADDR LATCH 10A H
CDMC ADDR LATCH 09A H
CDMC ADDR LATCH 08A H
CDMC ADDR LATCH 07A H
CDMC ADDR LATCH 06A H
CDMC ADDR LATCH 05A H
CDMC ADDR LATCH 04A H
CDMC ADDR LATCH 03A H
CDMC ADDR LATCH 02A H

93425A A0 E52 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT 7 — CDMF READ DATA G0 08H (CDMR,T)
CDMA WRITE DATA 08 H

93425A A0 E51 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT 7 — CDMF READ DATA G0 09H (CDMR,T)
CDMA WRITE DATA 09 H

93425A A0 E50 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT 7 — CDMF READ DATA G0 10H (CDMR,T)
CDMA WRITE DATA 10 H

93425A A0 E49 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT 7 — CDMF READ DATA G0 11 H (CDMR,T)
CDMA WRITE DATA 11 H

93425A A0 E48 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT 7 — CDMF READ DATA G0 12 H (CDMR,T)
CDMA WRITE DATA 12 H

93425A A0 E47 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT 7 — CDMF READ DATA G0 13 H (CDMR,T)
CDMA WRITE DATA 13 H

93425A A0 E46 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT 7 — CDMF READ DATA G0 14H (CDMR,T)
CDMA WRITE DATA 14 H

93425A A0 E45 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT 7 — CDMF READ DATA G0 15 H (CDMR,T)
CDMA WRITE DATA 15 H

93425A A0 E44 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT 7 — CDMF RD BYTE PAR G0 1 H (CDMB,T)
CDMA BYTE 1 PAR H

+5V — R2 4.7K 1/4W 5%

CDMB DISABLE G0 B1 H

CDMB G0 BYTE 1 WP L

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	L	H	X	STORED DATA
WRITE " "	L	L	L	Z
WRITE " "	L	L	H	Z
DISABLE	H	X	X	Z

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT
Z = HIGH IMPEDANCE (OFF)

(DATA MEMORY GROUP 0 BYTE 1) (SLOT 5)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMF)	D	CS	M8221-0-1	B
SCALE	SHEET 7 OF 19	DIST.		

12/

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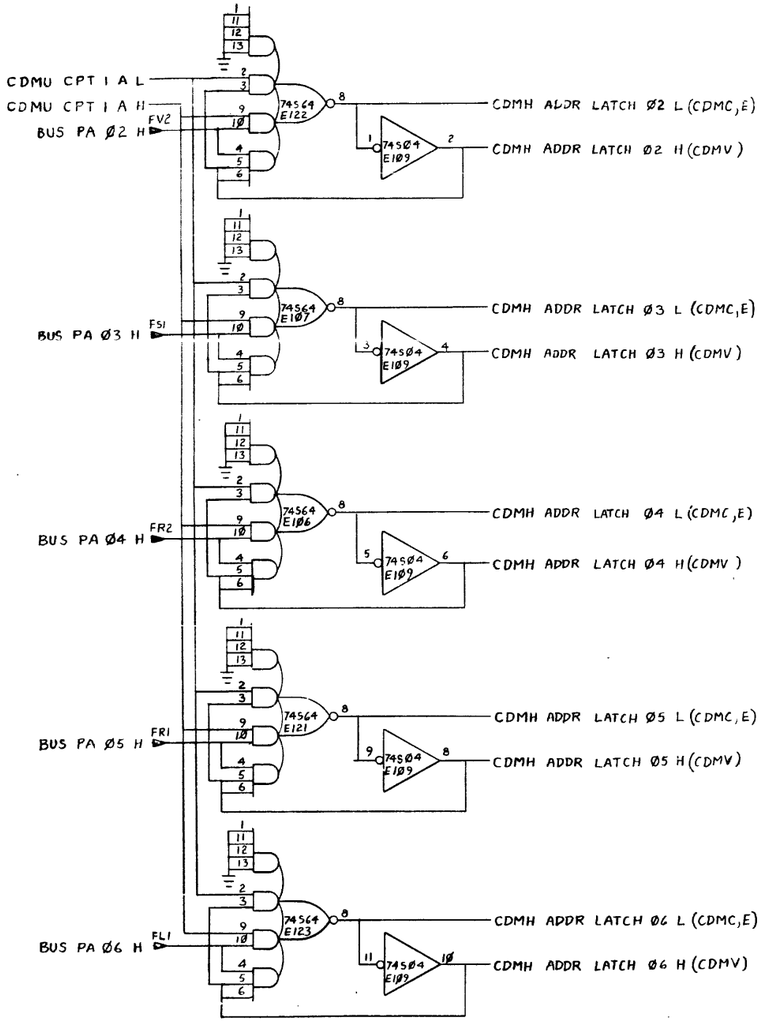

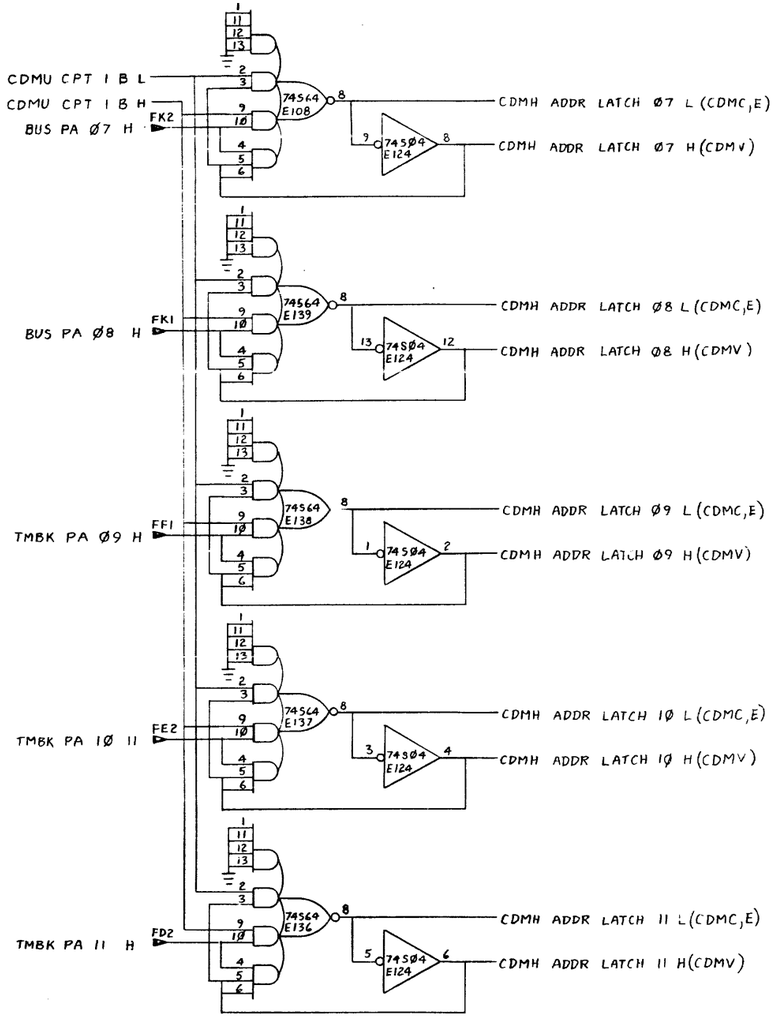

(ADDRESS LATCH LOGIC) (SLOT 5)

REVISIONS		
CHK	CHANGE NO	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMH)	D	CS	MB221-Ø-1	B
SCALE —H—	SHEET 8 OF 19	DIST.		

DEC FORM NO. DRB 139

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CDMC ADDR LATCH 11B H
CDMC ADDR LATCH 10B H
CDMC ADDR LATCH 09B H
CDMC ADDR LATCH 08B H
CDMC ADDR LATCH 07B H
CDMC ADDR LATCH 06B H
CDMC ADDR LATCH 05B H
CDMC ADDR LATCH 04B H
CDMC ADDR LATCH 03B H
CDMC ADDR LATCH 02B H

93425A A0 E67 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CDMJ READ DATA G0 16 H (CDMR,T)
CDMA WRITE DATA 16 H

93425A A0 E66 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CDMJ READ DATA G0 17 H (CDMR,T)
CDMA WRITE DATA 17 H

93425A A0 E65 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CDMJ READ DATA G0 18 H (CDMR,T)
CDMA WRITE DATA 18 H

93425A A0 E64 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CDMJ READ DATA G0 19 H (CDMR,T)
CDMA WRITE DATA 19 H

93425A A0 E63 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CDMJ READ DATA G0 20 H (CDMR,T)
CDMA WRITE DATA 20 H

93425A A0 E62 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CDMJ READ DATA G0 21 H (CDMR,T)
CDMA WRITE DATA 21 H

93425A A0 E61 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CDMJ READ DATA G0 22 H (CDMR,T)
CDMA WRITE DATA 22 H

93425A A0 E60 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CDMJ READ DATA G0 23 H (CDMR,T)
CDMA WRITE DATA 23 H

93425A A0 E59 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT → CDMJ RD BYTE PAR G0 2 H (CDMR,T)
CDMA BYTE 2 PAR H

+5V
R3 4.7K 1/4W 5%

CDMB G0 BYTE 2 WP L

CDMB DISABLE 60 B2 H

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	L	H	X	STORED DATA
WRITE "L"	L	L	L	Z
WRITE "H"	L	L	H	Z
DISABLE	H	X	X	Z

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT
Z = HIGH IMPEDANCE (OFF)

(DATA MEMORY GROUP 0 BYTE 2) (SLOT 5)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: CACHE DATA MATRIX (CDMJ)
SIZE D | CODE CS | NUMBER M8221-0-1 | REV. B
SCALE | SHEET 9 OF 19 | DIST.

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CDMC ADDR LATCH 11B H
CDMC ADDR LATCH 10B H
CDMC ADDR LATCH 09B H
CDMC ADDR LATCH 08B H
CDMC ADDR LATCH 07B H
CDMC ADDR LATCH 06B H
CDMC ADDR LATCH 05B H
CDMC ADDR LATCH 04B H
CDMC ADDR LATCH 03B H
CDMC ADDR LATCH 02B H

93425A AØ E81 — CDMA WRITE DATA 24 H — CDMK READ DATA GØ 24 H (CDMR,T)
93425A AØ E80 — CDMA WRITE DATA 25 H — CDMK READ DATA GØ 25 H (CDMR,T)
93425A AØ E79 — CDMA WRITE DATA 26 H — CDMK READ DATA GØ 26 H (CDMR,T)
93425A AØ E78 — CDMA WRITE DATA 27 H — CDMK READ DATA GØ 27 H (CDMR,T)
93425A AØ E77 — CDMA WRITE DATA 28 H — CDMK READ DATA GØ 28 H (CDMR,T)
93425A AØ E76 — CDMA WRITE DATA 29 H — CDMK READ DATA GØ 29 H (CDMR,T)
93425A AØ E75 — CDMA WRITE DATA 30 H — CDMK READ DATA GØ 30 H (CDMR,T)
93425A AØ E74 — CDMA WRITE DATA 31 H — CDMK READ DATA GØ 31 H (CDMR,T)
93425A AØ E73 — CDMA BYTE 3 PAR H — CDMK RD BYTE PAR (CDMR,T)

+5V
R-4 4.7K 1/4W 5%

CDMB GØ BYTE 3 WP L
CDMB DISABLE GØ B3 H

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	L	H	X	STORED DATA
WRITE "L"	L	L	L	Z
WRITE " "	L	L	H	Z
DISABLE	H	X	X	Z

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT
Z = HIGH IMPEDANCE

(DATA MEMORY GROUP Ø BYTE 3) (SLOT 5)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: CACHE DATA MATRIX (CDMK)
SIZE D | CODE CS | NUMBER M8221-Ø-1 | REV. B
SCALE | SHEET 10 OF 19 | DIST.

1977

CDME ADDR LATCH 11A H
CDME ADDR LATCH 10A H
CDME ADDR LATCH 09A H
CDME ADDR LATCH 08A H
CDME ADDR LATCH 07A H
CDME ADDR LATCH 06A H
CDME ADDR LATCH 05A H
CDME ADDR LATCH 04A H
CDME ADDR LATCH 03A H
CDME ADDR LATCH 02A H

93425A A0 E93 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT
CDMA WRITE DATA 00 H
CDML READ DATA G1 00H (CDMS,T)

93425A A0 E92 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT
CDMA WRITE DATA 01 H
CDML READ DATA G1 01 H (CDMS,T)

93425A A0 E91 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT
CDMA WRITE DATA 02 H
CDML READ DATA G1 02H (CDMS,T)

93425A A0 E90 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT
CDMA WRITE DATA 03 H
CDML READ DATA G1 03 H (CDMS,T)

93425A A0 E09 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT
CDMA WRITE DATA 04 H
CDML READ DATA G1 04H (CDMS,T)

93425A A0 E08 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT
CDMA WRITE DATA 05H
CDML READ DATA G1 05 H (CDMS T)

93425A A0 E87 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT
CDMA WRITE DATA 06 H
CDML READ DATA G1 06 H (CDMS,T)

93425A A0 E86 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT
CDMA WRITE DATA 07 H
CDML READ DATA G1 07 H (CDMS,T)

93425A A0 E85 A1 A2 A3 A4 A5 A6 A7 A8 A9 DIN WE CE DOUT
CDMA BYTE 0 PAR H
+5V
R5 4.7K 1/4W 5%
CDML RD BYTE PAR G1 00 H (CDMS,T)

CDMB G1 BYTE 0 WP L
CDMR DISABLE G1 B0 H

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	L	H	X	STORED DATA
WRITE "L"	L	L	L	Z
WRITE "1"	L	L	H	Z
DISABLE	H	X	X	Z

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT
Z = HIGH IMPEDANCE (OFF

(DATA MEMORY GROUP 1 BYTE 0) (SLOT 5)

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDML)	D	CS	M8221-0-1	B

SCALE — SHEET 11 OF 17 DIST.

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CDME ADDR LATCH 11A H
CDME ADDR LATCH 10A H
CDME ADDR LATCH 09A H
CDME ADDR LATCH 08A H
CDME ADDR LATCH 07A H
CDME ADDR LATCH 06A H
CDME ADDR LATCH 05A H
CDME ADDR LATCH 04A H
CDME ADDR LATCH 03A H
CDME ADDR LATCH 02A H

93425A A0 E105 — CDMA WRITE DATA 08H — CDMM READ DATA GI 08 H (CDMS,T)
93425A A0 E104 — CDMA WRITE DATA 09 H — CDMM READ DATA GI 09 H (CDMS,T)
93425A A0 E103 — CDMA WRITE DATA 10 H — CDMM READ DATA GI 10 H (CDMS,T)
93425A A0 E102 — CDMA WRITE DATA 11 H — CDMM READ DATA GI 11 H (CDMS,T)

93425A A0 E101 — CDMA WRITE DATA 12 H — CDMM READ DATA GI 12 H (CDMS T)
93425A A0 E100 — CDMA WRITE DATA 13 H — CDMM READ DATA GI 13 H (CDMS,T)
93425A A0 E99 — CDMA WRITE DATA 14 H — CDMM READ DATA GI 14 H (CDMS,T)
93425A A0 E98 — CDMA WRITE DATA 15 H — CDMM READ DATA GI 15 H (CDMS,T)
93425A A0 E97 — CDMA BYTE 1 PAR H — CDMM RD BYTE PAR GI 1 H (CDMS,T)

+5V
R6 4.7K 1/4W 5%

CDMB GI BYTE 1 WP L
CDMB DISABLE GI BI H

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	L	H	X	STORED DATA
WRITE "L"	L	L	L	Z
WRITE "H"	L	L	H	Z
DISABLE	H	X	X	Z

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT
Z = HIGH IMPEDANCE

REVISIONS		
CHK	CHANGE NO	REV.

(DATA MEMORY GROUP 1 BYTE 1) (SLOT 5)

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMM)	D	CS	M8221-0-1	B
SCALE —/—	SHEET 12 OF 19	DIST.		

REV B | DATE CODE D CS | NUMBER M8221-0-1

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CDME ADDR LATCH 11B H
CDME ADDR LATCH 10B H
CDME ADDR LATCH 09B H
CDME ADDR LATCH 08B H
CDME ADDR LATCH 07B H
CDME ADDR LATCH 06B H
CDME ADDR LATCH 05B H
CDME ADDR LATCH 04B H
CDME ADDR LATCH 03B H
CDME ADDR LATCH 02B H

93425A E120 — CDMA WRITE DATA 16 H — CDMN READ DATA GI 16 H (CDMS,T)
93425A E119 — CDMA WRITE DATA 17 H — CDMN READ DATA GI 17 H (CDMS,T)
93425A E118 — CDMA WRITE DATA 18 H — CDMN READ DATA GI 18H (CDMS, T)
93425A E117 — CDMA WRITE DATA 19 H — CDMN READ DATA GI 19 H (CDMS,T)

93425A E116 — CDMA WRITE DATA 20 H — CDMN READ DATA GI 20H (CDMS,T)
93425A E115 — CDMA WRITE DATA 21 H — CDMN READ DATA GI 21 H (CDMS, T)
93425A E114 — CDMA WRITE DATA 22 H — CDMN READ DATA GI 22H (CDMS,T)
93425A E113 — CDMA WRITE DATA 23 H — CDMN READ DATA GI 23 H (CDMS,T)
93425A E112 — CDMA BYTE 2 PAR H — CDMN RD BYTE PAR GI 2 H (CDMS,T)

+5V
R7 4.7K 1/4W 5%

CDMB DISABLE GI B2 H
CDMB GI BYTE 2 WP L

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	L	H	X	STORED DATA
WRITE "L"	L	L	L	Z
WRITE "H"	L	L	H	Z
DISABLE	H	X	X	Z

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT
Z = HIGH IMPEDANCE (OFF)

(DATA MEMORY GROUP 1 BYTE 2)(SLOT 5)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: CACHE DATA MATRIX (CDMN)
SIZE: D | CODE: CS | NUMBER: M8221-0-1 | REV: B
SCALE: -/- | SHEET 13 OF 19 | DIST.

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CDME ADDR LATCH 11B H
CDME ADDR LATCH 10B H
CDME ADDR LATCH 09B H
CDME ADDR LATCH 08B H
CDME ADDR LATCH 07B H
CDME ADDR LATCH 06B H
CDME ADDR LATCH 05B H
CDME ADDR LATCH 04B H
CDME ADDR LATCH 03B H
CDME ADDR LATCH 02B H

93425A E135 — CDMA WRITE DATA 24 H → CDMP READ DATA GI 24H (CDMS,T)
93425A E134 — CDMA WRITE DATA 25 H → CDMP READ DATA GI 25H (CDMS,T)
93425A E133 — CDMA WRITE DATA 26 H → CDMP READ DATA GI 26H (CDMS,T)
93425A E132 — CDMA WRITE DATA 27 H → CDMP READ DATA GI 27 H (CDMS,T)
93425A E131 — CDMA WRITE DATA 28 H → CDMP READ DATA GI 29H (CDMS,T)
93425A E130 — CDMA WRITE DATA 29 H → CDMP READ DATA GI 29H (CDMS,T)
93425A E129 — CDMA WRITE DATA 30 H → CDMP READ DATA GI 30H (CDMS,T)
93425A E128 — CDMA WRITE DATA 31 H → CDMP READ DATA GI 31 H (CDMS,T)
93425A E141 — CDMA BYTE 3 PAR H → CDMP RD BYTE PAR GI 3 H (CDMS,T)

+5V
R8 4.7K 1/4W 5%

CDMB DISABLE GI 83 H

CDMB GI BYTE 3 WP L

MODE	$\overline{CE}$	$\overline{WE}$	D_{IN}	D_{OUT} 93425A
READ	L	H	X	STORED DATA
WRITE "L"	L	L	L	Z
WRITE "H"	L	L	H	Z
DISABLE	H	X	X	Z

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT
Z = HIGH IMPEDDANCE (OFF)

(DATA MEMORY GROUP 1 BYTE 3) (SLOT 5)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMP)	D	CS	M8221-0-1	B
SCALE	SHEET 14 OF 19	DIST.		

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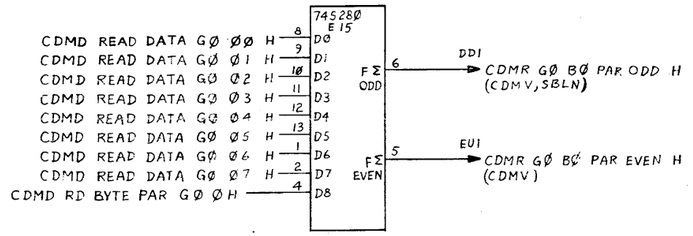

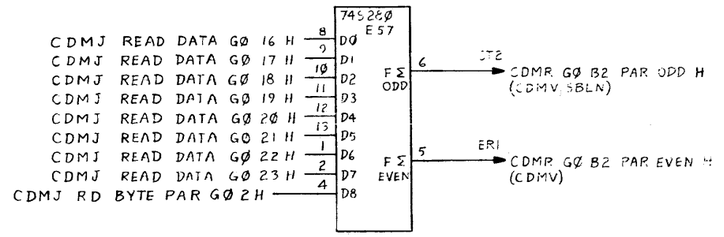

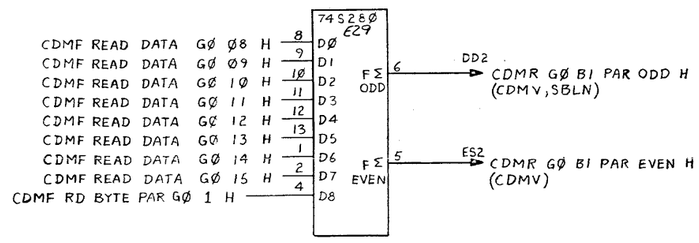

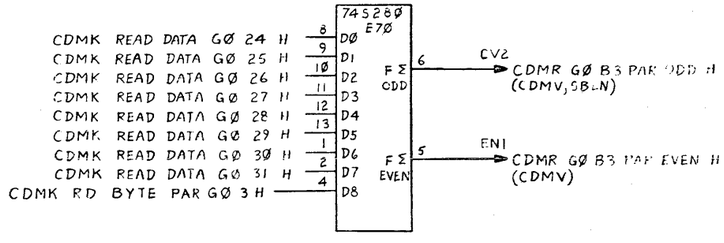

74S280 FUNCTION TABLE		
NUMBER OF INPUTS A THRU I THAT ARE HIGH	OUTPUTS	
	Σ EVEN	Σ ODD
Ø,2,4,6,8	H	L
1,3,5,7,9	L	H

H = HIGH LEVEL, L = LOW LEVEL

(PARITY CHECKER GROUP Ø) (SLOT 5)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMR)	D	CS	M8221-Ø-1	B
SCALE —/—	SHEET 15 OF 19	DIST.		

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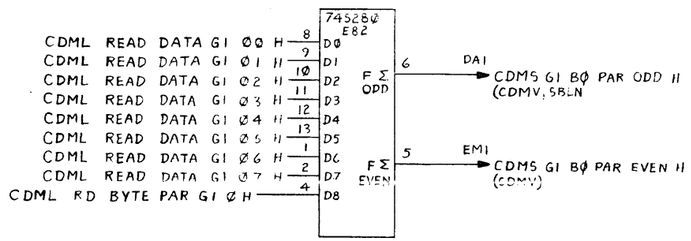

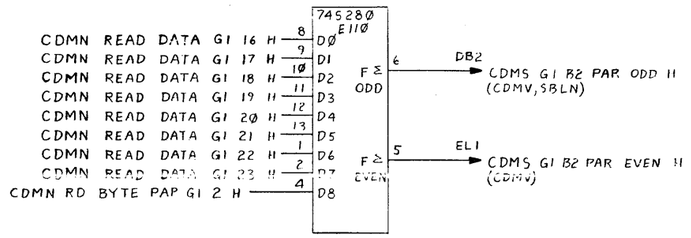

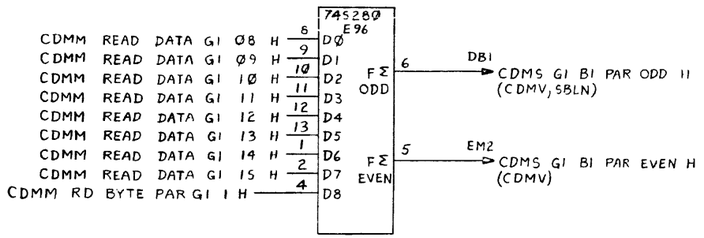

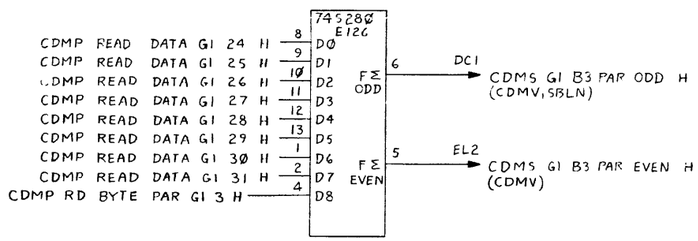

74S280 FUNCTION TABLE		
NUMBER OF INPUTS A THRU I THAT ARE HIGH	OUTPUTS	
	Σ EVEN	Σ ODD
0,2,4,6,8	H	L
1,3,5,7,9	L	H

H = HIGH LEVEL, L = LOW LEVEL

(PARITY CHECKER GROUP 1) (SLOT 5)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMS)	D	CS	M8221-0-1	B
SCALE —	SHEET 16 OF 19		DIST.	

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745257 E11
CDMD READ DATA GØ ØØ H 13 B3 — f3 12 AJ2 → BUS MD ØØ H
CDML READ DATA GI ØØ H 14 A3
CDMD READ DATA GØ Ø1 H 10 B2 — f2 9 AK1 → BUS MD Ø1 H
CDML READ DATA GI Ø1 H 11 A2
CDMD READ DATA GØ Ø2 H 6 B1 — f1 7 AK2 → BUS MD Ø2 H
CDML READ DATA GI Ø2 H 5 A1
CDMD READ DATA GØ Ø3 H 3 BØ — fØ 4 AL1 → BUS MD Ø3 H
CDML READ DATA GI Ø3 H 2 AØ
OUT CONT SØ 15 1

745257 E55
CDMF READ DATA GØ 11 H 13 B3 — f3 12 BN1 → BUS MD 11 H
CDMM READ DATA GI 11 H 14 A3
CDMF READ DATA GØ 12 H 10 B2 — f2 9 BP1 → BUS MD 12 H
CDMM READ DATA GI 12 H 11 A2
CDMF READ DATA GØ 13 H 6 B1 — f1 7 BP2 → BUS MD 13 H
CDMM READ DATA GI 13 H 5 A1
CDMF READ DATA GØ 14 H 3 BØ — fØ 4 BR1 → BUS MD 14 H
CDMM READ DATA GI 14 H 2 AØ
OUT CONT SØ 15 1

745257 E40
CDMJ READ DATA GØ 22 H 13 B3 — f3 12 AE1 → BUS MD 22 H
CDMN READ DATA GI 22 H 14 A3
CDMJ READ DATA GØ 23 H 10 B2 — f2 9 AE2 → BUS MD 23 H
CDMN READ DATA GI 23 H 11 A2
CDMJ RD BYTE PAR GØ 2 H 6 B1 — f1 7 AF1 → BUS MD BYTE 2 PAR H
CDMN RD BYTE PAR GI 2 H 5 A1
CDMK READ DATA GØ 24 H 3 BØ — fØ 4 BA1 → BUS MD 24 H
CDMP READ DATA GI 24 H 2 AØ
OUT CONT SØ 15 1

NOTES:
1. RESISTORS MUST BE AT OPPOSITE END OF RUN FROM INPUT PIN
2. RESISTORS R56 & R58 ARE NOT USED

745257 E3
CDMD READ DATA GØ Ø4 H 13 B3 — f3 12 AL2 → BUS MD Ø4 H
CDML READ DATA GI Ø4 H 14 A3
CDMD READ DATA GØ Ø5 H 10 B2 — f2 9 AM2 → BUS MD Ø5 H
CDML READ DATA GI Ø5 H 11 A2
CDMD READ DATA GØ Ø6 H 6 B1 — f1 7 AR1 → BUS MD Ø6 H
CDML READ DATA GI Ø6 H 5 A1
CDMD READ DATA GØ Ø7 H 3 BØ — fØ 4 AR2 → BUS MD Ø7 H
CDML READ DATA GI Ø7 H 2 AØ
OUT CONT SØ 15 1

745257 E56
CDMF READ DATA GØ 15 H 13 B3 — f3 12 BR2 → BUS MD 15 H
CDMM READ DATA GI 15 H 14 A3
CDMF RD BYTE PAR GØ 1 H 10 B2 — f2 9 BS1 → BUS MD BYTE 1 PAR H
CDMM RD BYTE PAR GI 1 H 11 A2
CDMJ READ DATA GØ 16 H 6 B1 — f1 7 AA1 → BUS MD 16 H
CDMN READ DATA GI 16 H 5 A1
CDMJ READ DATA GØ 17 H 3 BØ — fØ 4 AB1 → BUS MD 17 H
CDMN READ DATA GI 17 H 2 AØ
OUT CONT SØ 15 1

745257 E26
CDMK READ DATA GØ 25 H 13 B3 — f3 12 BB1 → BUS MD 25 H
CDMP READ DATA GI 25 H 14 A3
CDMK READ DATA GØ 26 H 10 B2 — f2 9 BB2 → BUS MD 26 H
CDMP READ DATA GI 26 H 11 A2
CDMK READ DATA GØ 27 H 6 B1 — f1 7 BC1 → BUS MD 27 H
CDMP READ DATA GI 27 H 5 A1
CDMK READ DATA GØ 28 H 3 BØ — fØ 4 BD1 → BUS MD 28 H
CDMP READ DATA GI 28 H 2 AØ
OUT CONT SØ 15 1

745257 E27
CDMD RD BYTE PAR GØ Ø H 13 B3 — f3 12 AV2 → BUS MD BYTE Ø PAR H
CDML RD BYTE PAR GI Ø H 14 A3
CDMF READ DATA GØ Ø8 H 10 B2 — f2 9 BL1 → BUS MD Ø8 H
CDMM READ DATA GI Ø8 H 11 A2
CDMF READ DATA GØ Ø9 H 6 B1 — f1 7 BM1 → BUS MD Ø9 H
CDMM READ DATA GI Ø9 H 5 A1
CDMF READ DATA GØ 1Ø H 3 BØ — fØ 4 BM2 → BUS MD 1Ø H
CDMM READ DATA GI 1Ø H 2 AØ
OUT CONT SØ 15 1

745257 E42
CDMJ READ DATA GØ 18 H 13 B3 — f3 12 AB2 → BUS MD 18 H
CDMN READ DATA GI 18 H 14 A3
CDMJ READ DATA GØ 19 H 10 B2 — f2 9 AC1 → BUS MD 19 H
CDMN READ DATA GI 19 H 11 A2
CDMJ READ DATA GØ 2Ø H 6 B1 — f1 7 AD1 → BUS MD 2Ø H
CDMN READ DATA GI 2Ø H 5 A1
CDMJ READ DATA GØ 21 H 3 BØ — fØ 4 AD2 → BUS MD 21 H
CDMN READ DATA GI 21 H 2 AØ
OUT CONT SØ 15 1

745257 E41
CDMK READ DATA GØ 29 H 13 B3 — f3 12 BD2 → BUS MD 29 H
CDMP READ DATA GI 29 H 14 A3
CDMK READ DATA GØ 3Ø H 10 B2 — f2 9 BE1 → BUS MD 3Ø H
CDMP READ DATA GI 3Ø H 11 A2
CDMK READ DATA GØ 31 H 6 B1 — f1 7 BE2 → BUS MD 31 H
CDMP READ DATA GI 31 H 5 A1
CDMK RD BYTE PAR GØ 3 H 3 BØ — fØ 4 BF1 → BUS MD BYTE 3 PAR H
CDMP RD BYTE PAR GI 3 H 2 AØ
OUT CONT SØ 15 1
+5V
R55 150Ω 1/2W 5%

CBI
CAMK GØ MATCH H
AS1
TBMD EN CDM DATA L

H= HIGH LEVEL
L= LOW LEVEL
X= IRRELEVANT
Z= HIGH IMPEDANCE (OFF)

745257 FUNCTION TABLE

INPUT				OUTPUT f
OUTPUT CONT	SELECT	A	B	
H	X	X	X	Z
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

(CDM OUTPUT DATA MULTIPLEXER) (SLOT 5)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMT)	D	CS	M8221-0-1	B
SCALE —	SHEET 17 OF 19	DIST.		

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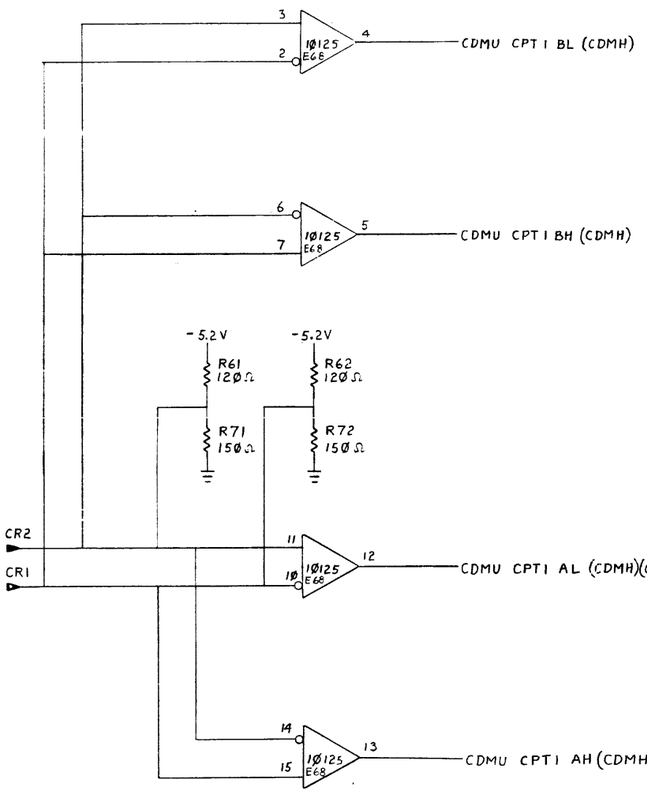
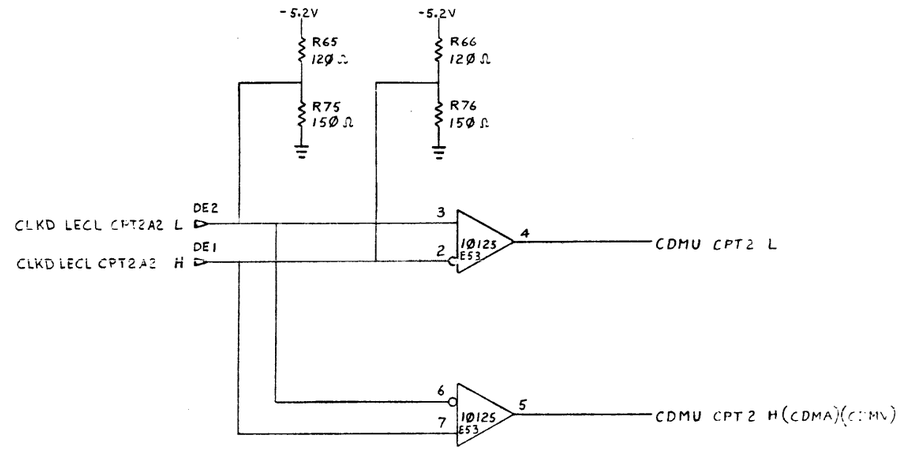
NOTES:
1. ALL RESISTORS ARE 1/4 WATT 5%
2. IC 10125 POWER IS -5.2 ON PIN 8
+5V ON PIN 9
GND ON PIN 16





REVISIONS		
CHK	CHANGE NO.	REV.

(CLOCK RECEIVERS) (SLOT 5)

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMU)	D	CS	M8221-0-1	B
SCALE —	SHEET 18 OF 19	DIST.		

M8221-0-1 REV F

132

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CIBH SDMS LOAD H — DM2 — 9640 E54

CIBH SDMS SLF TST H — DL1

CIBH SDMS DEL CLOCK L — DF1 — 9640 E54

74LS165 E28
- CDMA MASK Ø H
- CDMA MASK 1 H
- CDMA MASK 2 H
- CDMA MASK 3 H
- CAMP GØ WRITE EN H — CU1
- CAMP G1 WRITE EN H — CU2
- SBHF REV PAR Ø L — DU1

74LS165 E125
- SBHF REV PAR 1 L — DU2
- SBHF REV PAR 2 L — DS2
- SBHF REV PAR 3 L — DT2
- CDMH ADDR LATCH Ø2 H
- CDMH ADDR LATCH Ø3 H
- CDMH ADDR LATCH Ø4 H
- CDMH ADDR LATCH Ø5 H
- CDMH ADDR LATCH Ø6 H

74LS165 E140
- CDMH ADDR LATCH Ø7 H
- CDMH ADDR LATCH Ø8 H
- CDMH ADDR LATCH Ø9 H
- CDMH ADDR LATCH 1Ø H
- CDMH ADDR LATCH 11 H
- CDMR GØ BØ PAR EVEN H

74LS165 E95
- CDMR GØ BØ PAR ODD H
- CDMR GØ B1 PAR EVEN H
- CDMR GØ B1 PAR ODD H
- CDMR GØ B2 PAR EVEN H
- CDMR GØ B2 PAR ODD H
- CDMR GØ B3 PAR EVEN H
- CDMR GØ B3 PAR ODD H
- CDMS G1 BØ PAR EVEN H

74LS165 E38
- CDMU CPT 1 A H
- CDMU CPT 1 A H
- CDMU CPT2 H
- RI(1) — DL2 → TBMY SDMS CHNL 3 H

74LS165 E69
- CDMS G1 BØ PAR ODD H
- CDMS G1 B1 PAR EVEN H
- CDMS G1 B1 PAR ODD H
- CDMS G1 B2 PAR EVEN H
- CDMS G1 B2 PAR ODD H
- CDMS G1 B3 PAR EVEN H
- CDMS G1 B3 PAR ODD H
- TBMD EN CDM DATA L — AS1

74LS165 FUNCTIONS
1. 8 BIT SHIFT REGISTER
2. THE OUTPUT COMES FROM FLIP FLOP #7
3. IF SHIFTLOAD IS LOW DATA IS LOADED FROM D INPUTS REGARDLESS OF CLOCK
4. OTHERWISE, DATA SHIFTS FROM Ø TOWARD 7 ON CLOCK RISING EDGE

REVISIONS		
CHK	CHANGE NO.	REV.

(V BUS REGISTERS) (SLOT 5)

TITLE	SIZE	CODE	NUMBER	REV.
CACHE DATA MATRIX (CDMV)	D	CS	M8221-Ø-1	B
SCALE —	SHEET 19 OF 19		DIST.	

COMPONENT SIDE VIEW

NOTE 1

NOTE 1

SIGNATURES	DATE
DRN.	2.1.77
CHK'D.	2.1.77
ENG.	2.1.78
PROJ.ENG.	12.1.78
PROD.	12.1.78

TITLE: TRANS BUFFER MATRIX

SIZE/CODE: E | UA | MUMBER: M8222-0000 | REV: B

SCALE: 2/1 | SHT.: 1 OF 3

NEXT HIGHER ASSY: A DD M8112-0

ETCH REV.

P.C. DESIGN DATA BASE REV.

CHG/CHANGE NO. REV

M8222-00001 | B

M. FUHARO

T. RAGWAR

D. RAGWAY

NOTES:
1. R20, R22, R23, R30, AND D1 THRU D8 ARE NOT TO BE INSERTED.

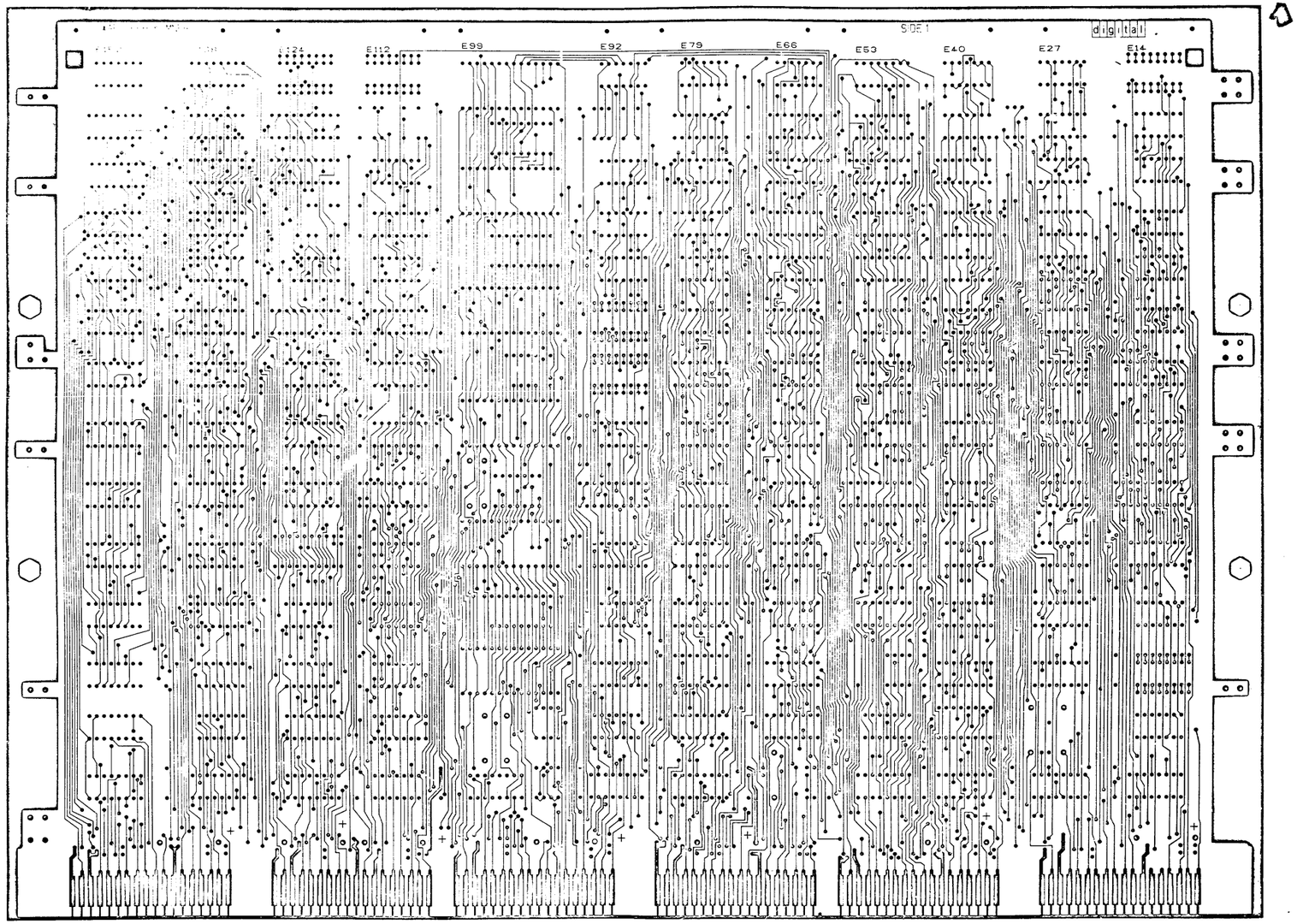
E UA M8222-0-0 9

13

M8222 5012619C-P1

L1

LAYER 1



REVISIONS		
CHK	CHANGE NO.	REV

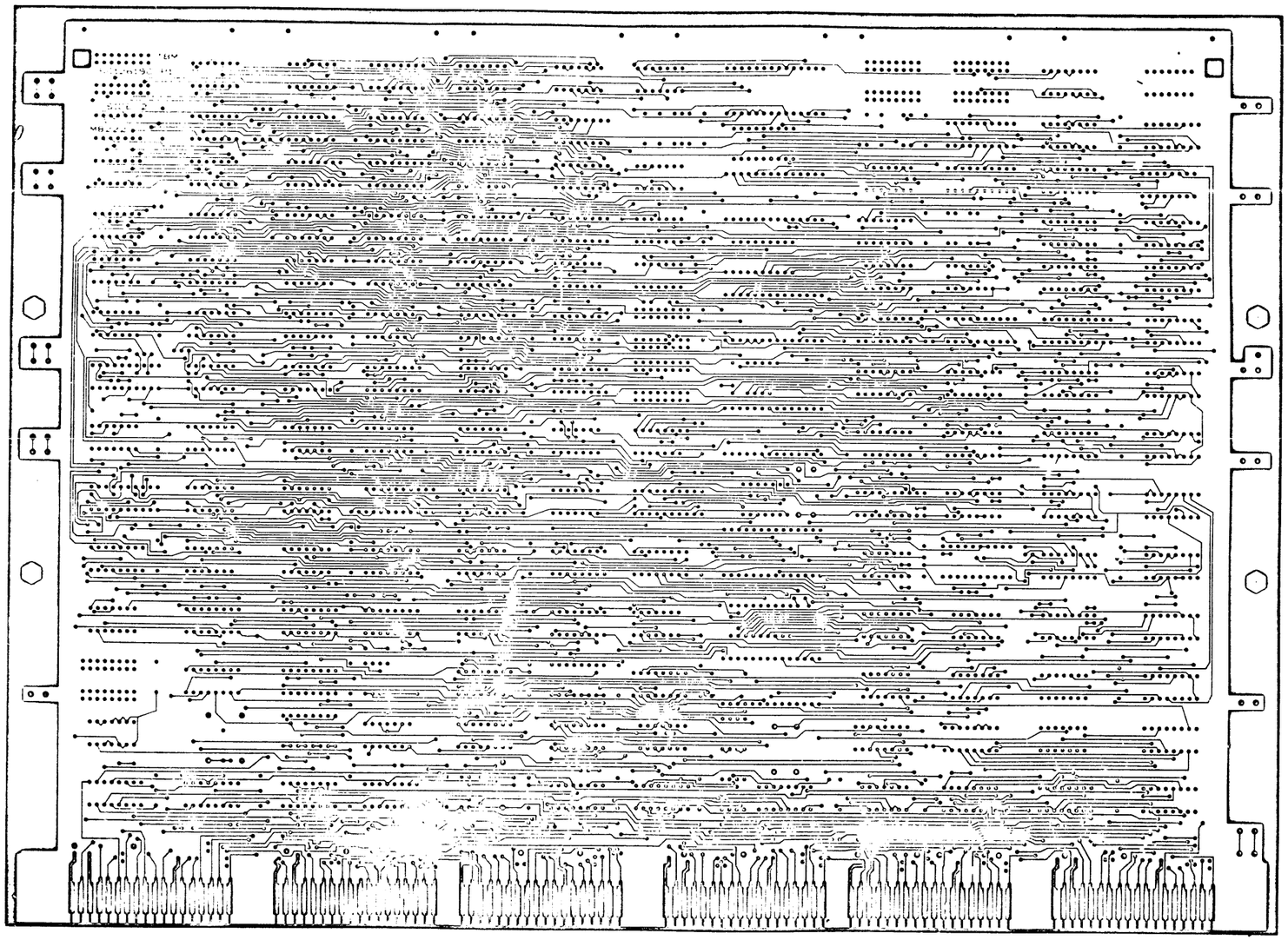
TITLE	SIZE	CODE	NUMBER	REV
TRANS BUFFER MATRIX	E	UA	M8222-00	B
SCALE 2 - 1 SHEET 2 OF 3	DIST.			

M8222-00 REV B

B5

TW1

LAYER 4



TITLE					
TRANS BUFFER MATRIX					
SCALE 1 = 1	SHEET 3 OF 3	DRAWN EDA	NUMBER MB2220-0	REV B	
		DIST			

LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION		QTY	REFERENCE DESIGNATORS
1	1	D-MD-5012619-0-0	5012619-00	M8222		1	
2	2		1012784-00	.047 MFD 50V X% CER. $		46	C1-C45,C200
3	3		1012084-01	8 MFD 25V G% 30D AL EL	(10-12	7	C46-C52
4	4		1301781-00	82 1/2W 5% CC	(13-00	2	R19,R21
5	5		1300243-00	120 1/2W 5% CC	(13-00	3	R23-R25
6	6		1300247-00	120 1/4W 5% CC	(13-00	9	R1-R8,R28
7	7		1301775-00	820 1/4W 5% CC	(13-00	60	R37-R96
8	8		1300295-00	330 1/4W 5% CC	(13-00	7	R17,R31-R36
9	9		1300250-00	150 1/4W 5% CC	(13-00	8	R9-R16
10	10		1301424-00	680 1/4W 5% CC	(13-00	1	R18
11	11		1301972-00	270 1/4W 5% CC	(13-00	2	R26,R27
12	12		1910532-00	74S00 NAND GATE-QUAD 2IN		6	E9,E10,E13,E24,E48,E75
13	13		1912388-00	74S02 NOR GATE-QUAD 2IN,POS		6	E11,E27,E19,E31,E83,E91
14	14		1910534-00	74S04 INVERTER GATE-HEX 1IN		14	E4,E7,E20,E25,E35,E46,E56,E66,
						CONT	E89,E90,E100,E115,E116,E127
15	15		1912389-00	74S08 AND GATE-QUAD 2IN,POS	14	6	E22,E23,E39,E59,E21,E72
16	16		1910536-00	74S10 NAND GATE-TRIPLE 3IN		4	E12,E26,E34,E18
17	17		1910537-00	74S11 AND GATE-TRIPLE 3INPUT		1	E36
18	18		1910539-00	74S20 NAND GATE-DUAL 4INPUT		2	E71,E126
19	19		1912746-00	/OBSOLETE $		3	E42,E57,E60
20	20		1911712-00	74S51 AND-OR GATE-INVERT DUAL 2W/2IN		1	E58
21	21		1910542-00	74S64 A-O-I XPDR GATE,4-2-3-2	14	9	E2,E32,E33,E37,E40,E79,E102,
						CONT	E103,E104
22	22		1910544-00	74S74 FF-D DUAL,EDGE TRIGGER		1	E74
23	23		1910545-00	74S112 FF-JK DUAL,EDGE TRIGGER		2	E50,E61
24	24		1911983-00	74S133 NAND GATE-POSITIVE 13IN		3	E5,E62,E114
25	25		1911675-00	74S138 DECODER-THREE INPUT		1	E84
26	26		1910548-00	74S157 MUX 1 OF 2 (QUAD)		5	E44,E49,E51,E52,E77
27	27		1910549-00	74S158 MUX 1 OF 2 (QUAD)		1	E108
28	28		1910957-00	74S175 FF-D QUAD COMMON CLOCK		2	E17,E69

REVISION HISTORY			VARIATIONS FOR THIS ASSY.
CHK	ECO NO	REV	
---	INIT	B	00

FIRST USED ON: M8222

MADE BY:	F. SMART	DATE: 4-10-78
CHECKED:	F. SMART	DATE: 4-10-78
DSN.ENG.:	I. RAGWAR	DATE: 4-10-78
PROD.:	M. TERELLA	DATE: 4-10-78
RESP.ENG.:	I. RAGWAR	DATE: 4-10-78

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE
PARTS LIST
TBM

SIZE	CODE	DOCUMENT NUMBER	REV
B	PL	M8222-0-0	B
			EDIT$ 7

ASSY.NO.: E-UA-M8222-0-0

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LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
29	29		1910552-00	74S194 SHIFT REG.,4BIT RIGHT/LEFT	14	E30,E38,E43,E47,E65,E68,E76,
					CONT	E78,E110,E119,E131,E136,E144,
					CONT	E150
30	30		1913462-00	74S240 OCTAL BUFFER,INVERTING TRI-STA	6	E85,E105,E120,E122,E123,E133
31	31		1912660-00	74S253 MUX 1 OF 4 (DUAL) TRI-STATE	9	E128,E129,E132,E134,E135,E141,
					CONT	E142,E147,E148
32	32		1911641-00	SN 74S257 MUX,QUAD 2 TO 1	2	E139,E140
33	33		1911573-00	74S280 PARITY GEN/CHKR,9BIT ODD/EVEN	6	E86,E92,E106,E109,E111,E121
34	34		1913670-00	74S373 LATCH 8BIT TRASP TRISTATE	3	E6,E8,E45
35	35		1911469-00	DEC 8640 RECEIVER,BUS,QUAD,UNIBUS,Q-BU	1	E81
36	36		1913788-00	26S10 TRANSCEIVER,BUS,QUAD	6	E1,E15,E41,E54,E67,E93
37	37		1913663-00	93419DC RAM 64X9 28PIN TTL ISOPLANA	6	E94-E99
38	38		1913294-00	93S16 COUNTER,SYNCH UP BINARY	2	E113,E125
39	39		1911415-00	10125 ECL TO TTL TRNSLTR ECL 16 P	3	E28,E80,E82
40	40		1910547-00	74S153 MUX 1 OF 4 (DUAL)	11	E107,E117,E118,E130,E137,E138,
					CONT	E143,E145,E149,E151,E146
41	41		1913839-00	74LS165 SHIFT REG.,8BIT $	4	E16,E29,E55,E101
42	42		1912696-00	LS194A SHIFT REG.,4BIT BI-DIRCT	4	E53,E63,E64,E70
43	43		1912860-00	LS259 LATCH 8BIT	1	E73
44	44		1210711-02	HANDLE ASSY,MOD DOEHLER-JARVIS	1	
45	45		9000024-01	EYELET, ROLLED FLANGE, .121 OD X .196 LG	12	

46 NOTE: IC SPARES E3,E14,E87,E88,E112,E124,E152

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	TITLE PARTS LIST TBM	SIZE K	CODE PL	DOCUMENT NUMBER M8222-0-0	REV B

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ERROR REG Ø SEL

REFER TO TB PAGES FOR INPUTS TO ERROR REGISTER

ERROR REGISTER (3) (TBMT)

CPT3 CLEAR PAR REG ENABLE

ERROR REGISTER 74S194 (3)

REFER TO TB PAGES FOR INPUTS TO ERROR REGISTER

CPT3 CLEAR ERROR REG 1

(TBMT, U)

A 74S157 (3) (TBMV)

SEL ID MUX

VA <31:09> 74S04 (A) (TBMA, TBMF) <29:12>

(TBMJ) A B C D 74S253 (3)

18

BUS PA <29:12>

PA MUX SEL

VIRTUAL ADDRESS

TO ERROR REGISTERS PARITY UTRAP LOGIC

TO ERROR REGISTERS PARITY UTRAP LOGIC

<11:09>

<13:09> & 31

PARITY CHECK (3X S280) (TBMF)

PARITY CHECK (3X S280) (TBMH)

+5

DOUT DOUT DOUT

TB T.S Ø DATA

TB T.S 1 DATA

AØ-A5

WP

CS

(3X 82S09)

DIN DIN

3

24

(TBMF)

(TBMH)

TB T.S WP ENABLE TO WRITE EN CPT2

74S10

74S10

31 WP ENABLE

74S240 (3) (TBMP)

74S240 (3) (TBMR)

<11:09>

<29:09>

(TBML & TBMM)

74S153 (1)

TB G1 MATCH

MEMORY MGMTEN (MME)

IPA 74S194 (6)

(TBMM)

TB CLEAR

CPT2

LOAD IPA

FORCE PARITY ERROR DECODE 74LS251 (1) (TBMK)

4

FROM ERROR REGISTER Ø <04:01>

TBMK B 74S158 A (1)

SELECT IPA

74S64 (3)

3

TB PA <11:09>

2

TBM G0 & G1 MATCH

SBL PA <11:09>

TBM VIRTUAL OR SBI

TBM NOT SBI CYCLE

(TBMK)

(TEME)

+5V

TRANCEIVER 26S10 (6)

ID PARITY <0:2>

3

21

24

EN ID DRIVERS

ID BUS

VA <08:02>

IPA 93S16 (2)

B 74S257 (2) A

BUS PA <08:02>

NOT SBI CYCLE

SELECT IPA

CPT3 COUNT CLEAR

(SLOT 6) (BLOCK DIAGRAM)

DRN.		6/5/77
CHK'D		7/5/77
ENG.		7/5/77
MGR. ENGR.		7/5/77
PROD.		
NEXT HIGHER ASSY.		
SCALE		
SHEET 1 OF 22		

FIRST USED ON

TITLE: TRANSLATION BUFFER MATRIX

SIZE D | CODE CS | NUMBER M8222-Ø1 | REV. C | DIST.

REV.	CHANGE NO.	
B	M8222-TW002	
C		

DEC FCSD NO. DBD 102-0

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DDPJ VAMX 15 L — 6D1 — 74S04 E117 — TBMA VA MUX 15 BUFF H (TBMJ,L)

DEPN VAMX 16 L — DJ1 3 — 74S04 E127 4 — TBMA VA MUX 16 BUFF H (TBMJ,L)

DEPN VAMX 17 L — DJ2 5 — 74S04 E127 6 — TBMA VA MUX 17 BUFF H (TBMJ,L)

DEPN VAMX 18 L — DJ2 9 — 74S04 E127 8 — TBMA VA MUX 18 BUFF H (TBMJ,L)

DEPN VAMX 19 L — DJ2 11 — 74S04 E127 10 — TBMA VA MUX 19 BUFF H (TBMJ,L)

DEPP VAMX 20 L — DP1 13 — 74S04 E127 12 — TBMA VA MUX 20 BUFF H (TBMJ,L)

DEPP VAMX 21 L — DJ1 1 — 74S04 E115 2 — TBMA VA MUX 21 BUFF H (TBMJ,L)

DEPP VAMX 22 L — DJ1 3 — 74S04 E115 4 — TBMA VA MUX 22 BUFF H (TBMJ,L)

DEPP VAMX 23 L — DJ2 5 — 74S04 E115 6 — TBMA VA MUX 23 BUFF H (TBMJ,L)

DEPP VAMX 24 L — DJ1 9 — 74S04 E115 8 — TBMA VA MUX 24 BUFF H (TBMJ,L)

DEPP VAMX 25 L — DJ2 11 — 74S04 E115 10 — TBMA VA MUX 25 BUFF H (TBMJ,L)

DEPP VAMX 26 L — DP2 13 — 74S04 E115 12 — TBMA VA MUX 26 BUFF H (TBMJ,L)

DEPR VAMX 27 L — DD1 1 — 74S04 E90 2 — TBMA VA MUX 27 BUFF H (TBMJ,M)

DEPS VAMX 28 L — DD2 3 — 74S04 E90 4 — TBMA VA MUX 28 BUFF H (TBMJ,M)

DEPS VAMX 29 L — DC1 5 — 74S04 E90 6 — TBMA VA MUX 29 BUFF H (TBMJ,M)

DDPJ VAMX 14 L — EC1 13 — 74S04 E89 12 — TBMA VA MUX 14 B H (TBMJ,J)

AA2 EA2 CV1
BA2 FJ2 DV1
CA2 AV1 EV1
DA2 BV1 FV1

AC2 AH1 AN2 AT1
BC2 BH1 BN2 BT1
CC2 CH1 CN2 CT1
DC2 DH1 DN2 DT1
EC2 EH1 EJ2 ET1
FC2 FH1 FN2 FT1

+5V — C96-51 Buf — C1-17 L19-29 C31-45 .047 — GND — C52 Buf — C2 C18 C30 .047 — -5.2V EK1

(SLOT 6)

(VA MUX DRIVERS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX (TBMA)	D	CS	M8222-0-1	C

SCALE — SHEET 2 OF 22

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CAMV PROTECT CODE 3 — BM1
CAMV PROTECT CODE 2 L — BM2
CAMV PROTECT CODE 1 L — BN1
CAMV PROTECT CODE 0 L — BP1

74S08 E39
74S08 E39
74S10 E26
74S86A E79
74S64 E40
74S04 E69
74S02 E27
74S04 E20

TBMT MME BUF H

TBMB PROTECT CODE OK H (TBMC,U)
TBMB PROTECT CODE OK L (TBMX)
TBMB CAUSE PROT TRAP H (TBMU)
TBMW DIS PROT L

TBMW WRITE CHECK H
TBMW IB RCHK L

74S51A E37
74S04 E89

CEHH CUR MODE 1 H — FM2
CEHH CUR MODE 0 H — FN1

74S04 E90
74S04 E90
74S02 E83

ALU2
TBMB KERNEL MODE H (USCP)

TBMM BITS 5-2 CARRY H
TBMM IPA 08 H
TBMM IPA 07 H
TBMM IPA 06 H

74S20 E126

TBMB IPA OVER PAGE L (TBMC)

REVISIONS

CHK	CHANGE NO.	REV.

MANUFACTURE PLANS

(PROTECTION CODE LOGIC) (SLOT 6)

TITLE TRANSLATION BUFFER MATRIX (TBMB)
SIZE D | CODE CS | NUMBER M8222-Ø-1 | REV C
SCALE — | SHEET 3 OF 22 | DIST.

DEC FORM NO. DRD 130

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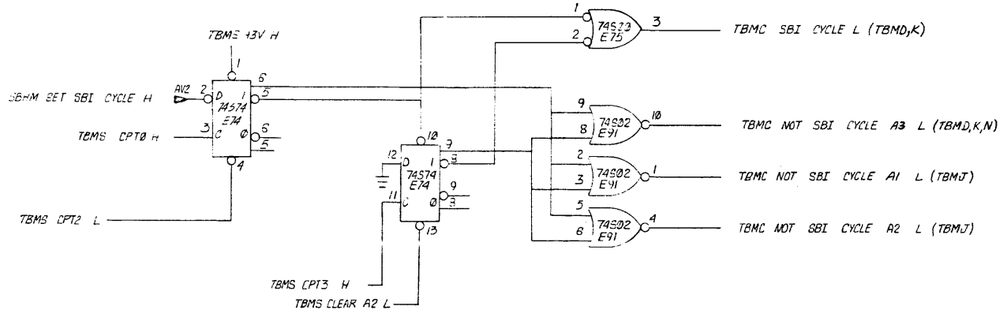
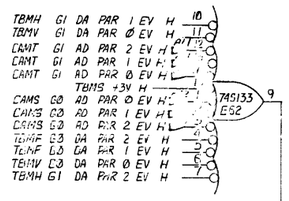
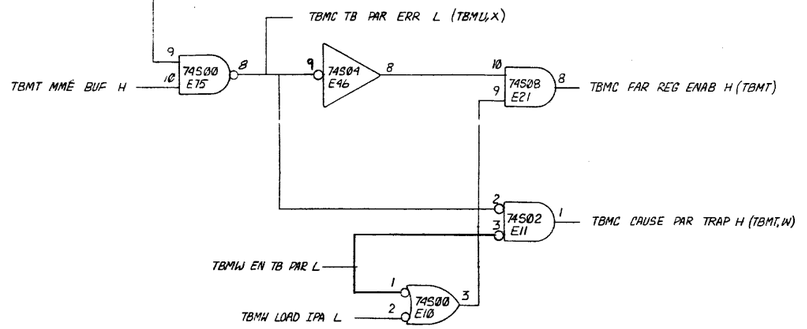
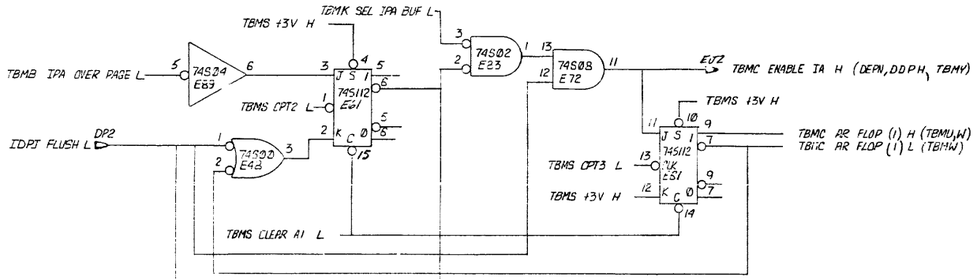






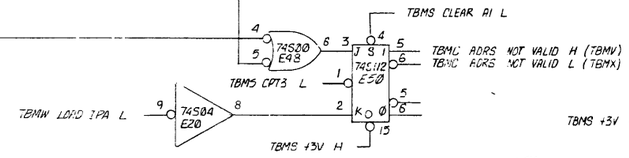


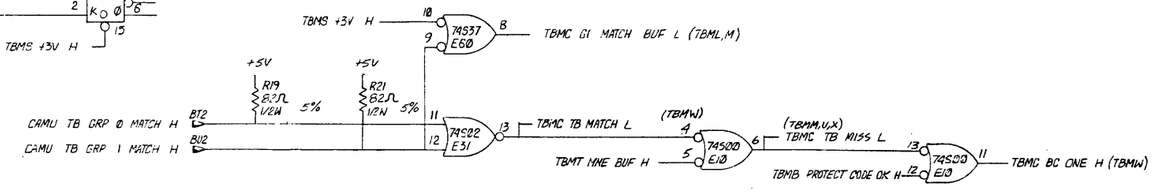
- 74S112 -

WHEN THE CLOCK GOES LOW THE INPUTS ARE ENABLED AND DATA WILL BE ACCEPTED. LOW INPUT TO PRESET SETS OUPUT (1) TO HIGH LEVEL. LOW INPUT TO CLEAR RESETS OUTPUT (1) TO LOW LEVEL. CLEAR AND PRESET ARE INDEPENDENT OF CLOCK.

- 74S74 FUNCTIONS -

THE INFORMATION AT D INPUT IS TRANSFERRED TO THE OUTPUT (1) OF THE FLOP ON THE POSITIVE GOING EDGE OF THE CLOCK PULSE. LOW INPUT TO PRESET SETS OUTPUT (1) TO HIGH LEVEL. LOW INPUT TO CLEAR RESETS OUTPUT (1) TO LOW LEVEL PRESENT AND CLEAR ARE INDEPENDENT OF CLOCK.





(SLOT 6)

(TB PARITY UTRAP & PA MUX ENABLE LOGIC)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: TRANSLATION BUFFER MATRIX (TBMC)
SIZE D | CODE CS | NUMBER M8222-0-1 | REV C
SCALE | SHEET 4 OF 22 | DIST.

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FUNCTION CHART FOR 74S138

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2*	C	B	A	D0	D1	D2	D3	D4	D5	D6	D7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

H = HIGH LEVEL L = LOW LEVEL x = IRRELEVANT
G2* = (INPUT PIN 4) + (INPUT PIN 5)
G1 = INPUT PIN 6

TBMS CPT0 L
ICLJ ID RIGHT WRITE L
74S20 E71
TBMD EN ID DRIVERS L (TBME,Y)
74S08 E72
74S04 E20
74S04 E100
ICLJ ID RIGHT ADDR 4 H
74S02 E83
ICLJ ID RIGHT ADDR 5 H
ICLJ ID RIGHT ADDR 3 H
74S04 E100
ICLJ ID RIGHT ADDR 2 H
ICLJ ID RIGHT ADDR 1 H
74S04 E100
ICLJ ID RIGHT ADDR 0 H
74S138 E84
EN
SEL C
SEL B
SEL A
74S04 E46
TBMD TB WRITE ENABLE H (TBMF)
74S04 E45
TBMD ERROR REG 0 SEL H (TBMT)
74S04 E83
TBMS CPT2 H
74S00 E75
TBMS CLEAR AI L
74S08 E72
TBMD CLR ERR REG 1 L (TBMT)
74S37 E53
TBMD SEL ID MUX H (TBMV)

TBMW WOMBAT H
TBMT MME BUF H
74S08 E59
TBMD VIRT ADRS BUF A H (TBMJ)
TBMG NOT SBI CYCLE A3 L
74S51 E58
TBMD VIRT OR SBI L (TBMK)

TBMS CPT0 L
74S02 E83
74S37 E42
TBMD EN SBI DATA L (SBHD.T,S BLC,V)
TBMD EN CDM DATA L (CDMT)
TBMD D TO MD L (DBPF,U) (TBMY)
TBMD MASK TO MD L (DAPF) (TBMY)
TBMD ER REG Ø D Ø7 H (TBMV,X)
TBMD ER REG Ø D Ø6 H (TBMV,X)

- 74S373 - REFER TO TABLE ON TBMW

TBMC NOT SBI CYCLE A3 L
TBMN UFS H
TBMN UMCT 3 H
74S02 E19
74S08 E23
TBMC SBI CYCLE L
74S373 E15
CAMU TB GRP 1 MATCH H
CAMU TB GRP Ø MATCH H

TBMS CPT0 H
8640 E31

TBMW SAVE CONTEXT H
TBMN UMCT 2 BUF H
TBMW WRITE CHECK H
74S08 E23
TBMN UMCT 2 BUF H
TBMN UMCT 3 BUF H
74S00 E24
74S194 E43
TBMD LAST REF CODE 1 H (USCN)
TBMD LAST REF CODE Ø H (USCN)
TBMS CLEAR A2 L
TBMS CPT 3 H

74S194

PARRALLEL LOADING IS ACCOMPLISHED BY APPLYING THE INPUT DATA AND TAKING BOTH MODE CONTROL INPUTS, S0 AND S1 HIGH. THE DATA WILL APPEAR AT THE OUTPUTS AFTER POSITIVE TRANSITION OF THE CLOCK INPUT.

CAMU MODIFY L
TBMW WRITE CHECK H
TBMT MME BUF H
74S11 E26
TBMD MBIT ERR H (TBMU)
74S00 E10
TBMW DIS PROT L
TBMD CAUSE MBIT TRAP L (TBMW)

REVISIONS

CHK	CHANGE NO.	REV.

(TB ADDRESS DECODE) (SLOT 6)

TITLE TRANSLATION BUFFER MATRIX (TBMD)
SIZE D CODE CS NUMBER M8222-Ø-1 REV. C
SCALE NONE SHEET 5 OF 22 DLR

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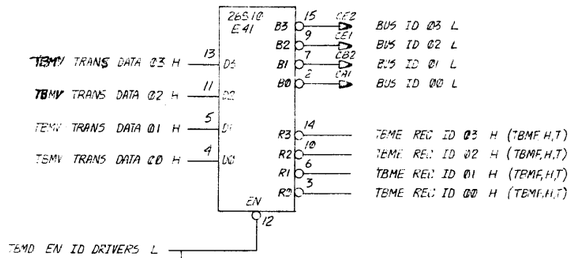
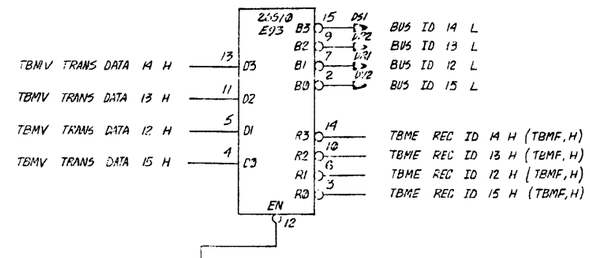
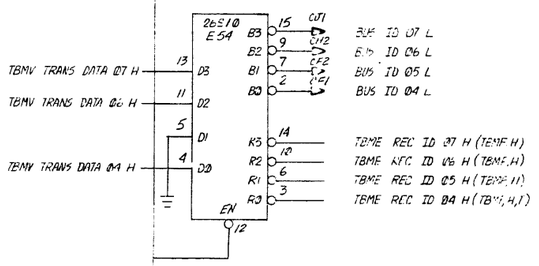


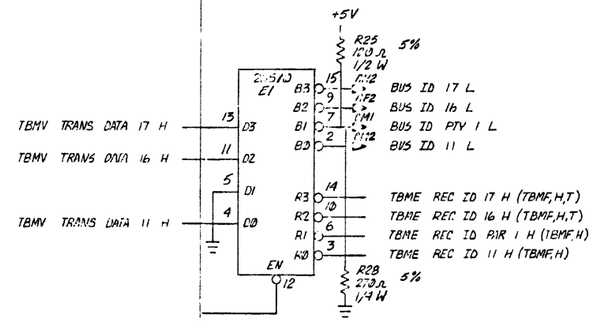


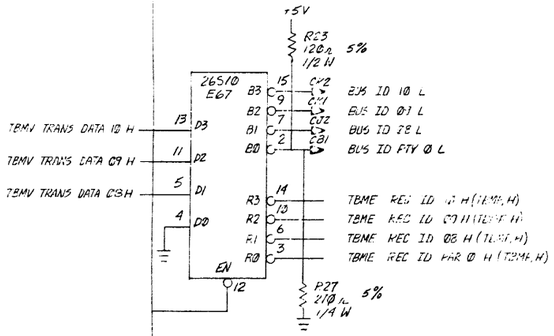
26S10

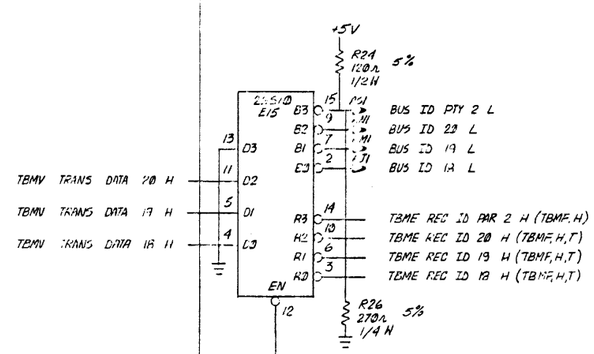
INPUTS		OUTPUTS	
$\overline{E}$	I	B	Z
L	L	H	L
L	H	L	H
H	X	Y	$\overline{Y}$

H = HIGH VOLTAGE LEVEL
L = LOW VOLTAGE LEVEL
X = DON'T CARE
Y = VOLTAGE LEVEL OF BUS (ASSUMES CONTROL BY ANOTHER BUS TRANSCEIVER)









NOTE: 26S10 HAS +5V ON PIN 16 AND ON PINS 1 AND 8

REVISIONS		
CHK	CHANGE NO.	REV.

(1D TRANSCEIVER) (SLOT 6)

TITLE TRANSLATION BUFFER MATRIX (TBME) | D | CS | NUMBER M8222-0-1 | REV. C

DIST.

MATERIAL PLATE

DEC FORM NO. DRD 139

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TBMS CPT2 H
TBMX CD WP EN H
TBMD TB WRITE ENABLE H
74S10 E45
74S10 E26
TBMX CI WP EN H
BB2 TBMF GRP 1 WP L (TBMH,U,CAMT)(TBMV)

(82S09)

MODE	CE	WE	IN	OUT
READ	0	1	X	COMPLEMENT OF DATA STORED
WRITE "0"	0	0	0	1
WRITE "1"	0	0	1	0
DISABLED	1	X	X	1

X = DONT CARE

TBMK DIS GD DD H
TBME REC ID 00 H
TBME REC ID 01 H
TBME REC ID 02 H
TBME REC ID 03 H
TBME REC ID 04 H
TBME REC ID 05 H
TBME REC ID 06 H
TBME REC ID 07 H
TBME REC ID PAR 0 H
82S09 E94 (64X9) RAM
+5V R70
TBMF GRP 0 DATA 09 L (TBMK,P)
TBMF GRP 0 DATA 10 L (TBMK,P)
TBMF GRP 0 DATA 11 L (TBMK,P)
TBMF GRP 0 DATA 12 L (TBMP)
TBMF GRP 0 DATA 13 L (TBMP)
TBMF GRP 0 DATA 14 L (TBMP)
TBMF GRP 0 DATA 15 L (TBMP)
TBMF GRP 0 DATA 16 L (TBMP)
TBMF GRP 0 PAR 0 L (TBMV)
DDPH VAMX 09 L
DDPH VAMX 10 L
DDPH VAMX 11 L
DDPJ VAMX 12 L
DDPJ VAMX 13 L
DDPS VAMX 31 L
EPI EN1 EM1 ED1 ED2 EB1

BB1 TBMF GRP 0 WP L (TBMU, CAMS) (TBMV)

TBMK DIS GD D1 H
TBME REC ID 08 H
TBME REC ID 09 H
TBME REC ID 10 H
TBME REC ID 11 H
TBME REC ID 12 H
TBME REC ID 13 H
TBME REC ID 14 H
TBME REC ID 15 H
TBME REC ID PAR 1 H
82S09 E96 (64X9) RAM
74S280 E121
FE EVEN 5 TBMF GD DA PAR 1 EV H (TBMC)
FE ODD 6 TBMF GD DA PAR 1 OD H (TBMT)
TBMF GRP 0 DATA 17 L (TBMP)
TBMF GRP 0 DATA 18 L (TBMP)
TBMF GRP 0 DATA 19 L (TBMP)
TBMF GRP 0 DATA 20 L (TBMP)
TBMF GRP 0 DATA 21 L (TBMP)
TBMF GRP 0 DATA 22 L (TBMP)
TBMF GRP 0 DATA 23 L (TBMP)
TBMF GRP 0 DATA 24 L (TBMP)
+5V R79 820Ω 1/4W
+5V R80 2.2Ω 1/4W
+5V R81 220Ω 1/4W
+5V R82 5.6Ω 1/4W
+5V R83 5.6Ω 1/4W
+5V R84 820Ω 1/4W
+5V R85 820Ω 1/4W
+5V R86 820Ω 1/4W
+5V R87 820Ω 1/4W

TBMK DIS GD D2 H
TBME REC ID 16 H
TBME REC ID 17 H
TBME REC ID 18 H
TBME REC ID 19 H
TBME REC ID 20 H
TBME REC ID PAR 2 H
82S09 E97 (64X9) RAM
74S280 E109
FE EVEN 5 TBMF GD DA PAR 2 EV H (TBMC)
FE ODD 6 TBMF GD DA PAR 2 OD H (TBMT)
TBMF GRP 0 DATA 25 L (TBMP)
TBMF GRP 0 DATA 26 L (TBMP)
TBMF GRP 0 DATA 27 L (TBMP)
TBMF GRP 0 DATA 28 L (TBMP)
TBMF GRP 0 DATA 29 L (TBMP)
-5V R88 820Ω 1/4W
+5V R89 820Ω 1/4W
+5V R90 820Ω 1/4W
+5V R91 820Ω 1/4W
+5V R92 820Ω 1/4W
+5V R93 820Ω 1/4W
+5V R94 820Ω 1/4W
+5V R95 820Ω 1/4W
+5V R96 820Ω 1/4W

DDPH VAMX 09 L → EPI 1 → 74S04 E116 → 2 → TBMF VA MUX 09 B H (TBMH,K,L)
DDPH VAMX 10 L → EN1 3 → 74S04 E116 → 4 → TBMF VA MUX 10 B H (TBMH,K,L)
DDPH VAMX 11 L → EM1 5 → 74S04 E116 → 6 → TBMF VA MUX 11 B H (TBMH,K,L)
DDPJ VAMX 12 L → ED1 9 → 74S04 E116 → 8 → TBMF VA MUX 12 B H (TBMH,J,L)
DDPJ VAMX 13 L → ED2 11 → 74S04 E116 → 10 → TBMF VA MUX 13 B H (TBMH,J,L)
DDPS VAMX 31 L → DB1 13 → 74S04 E116 → 12 → TBMF VA MUX 31 B H (TBMH)

NOTE: ALL RESISTORS ARE 820Ω, 1/4W, 5%, UNLESS OTHERWISE SPECIFIED.

(TB MEMORY TAG GROUP 0) (SLOT 6)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	TRANSLATION BUFFER MATRIX (TBMF)	SIZE D / CODE CS	NUMBER M8222-0-1 / REV. C
SCALE		SHEET 7 OF 23	DIST.

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TBMK DIS GI D3 H

TBME REC ID 00 H
TBME REC ID 01 H
TBME REC ID 02 H
TBME REC ID 03 H
TBME REC ID 04 H
TBME REC ID 05 H
TBME REC ID 06 H
TBME REC ID 07 H
TBME REC ID PAR 0 H

82S09 E95

TBMH GRP 1 DATA 09 L (TBMK,R)
TBMH GRP 1 DATA 10 L (TBMK,R)
TBMH GRP 1 DATA 11 L (TBMK,R)
TBMH GRP 1 DATA 12 L (TBMR)
TBMH GRP 1 DATA 13 L (TBMR)
TBMH GRP 1 DATA 14 L (TBMR)
TBMH GRP 1 DATA 15 L (TBMR)
TBMH GRP 1 DATA 16 L (TBMR)
TBMH GRP 1 PAR 0 L (TBMV)

R43 R44 R45 R46 R47 R48 R49 R51 +5

TBMF GRP 1 WP L

DDPH VAMX 09 L
DDPH VAMX 10 L
DDPH VAMX 11 L
DDPJ VAMX 12 L
DDPJ VAMX 13 L
DDPS VAMX 31 L

EP1 E11 E7 E21 EP2 E31

TBMF VA MUX 09 B H
TBMF VA MUX 10 B H
TBMF VA MUX 11 B H
TBMF VA MUX 12 B H
TBMF VA MUX 13 B H
TBMA VA MUX 31 B H

TBMK DIS GI DI H

TBME REC ID 08 H
TBME REC ID 09 H
TBME REC ID 10 H
TBME REC ID 11 H
TBME REC ID 12 H
TBME REC ID 13 H
TBME REC ID 14 H
TBME REC ID 15 H
TBME REC ID PAR 1 H

82S99 E98 (64x9) RAM

74S280 E111

TBMH GI DA PAR 1 EV H (TBMC)
TBMH GI DA PAR 1 OD H (TBMT)

TBMH GRP1 DATA 17 L (TBMR)
TBMH GRP1 DATA 18 L (TBMR)
TBMH GRP1 DATA 19 L (TBMR)
TBMH GRP1 DATA 20 L (TBMR)
TBMH GRP1 DATA 21 L (TBMR)
TBMH GRP1 DATA 22 L (TBMR)
TBMH GRP1 DATA 23 L (TBMR)
TBMH GRP1 DATA 24 L (TBMR)

+5V R53 820Ω 1/4W; +5V R53 820Ω 1/4W; +5V R54 820Ω 1/4W; +5V R55 820Ω 1/4W; +5V R56 820Ω 1/4W; +5V R57 820Ω 1/4W; +5V R58 820Ω 1/4W; +5V R59 820Ω 1/4W; +5V R60 820Ω 1/4W

TBMK DIS GI D2 H

TBME REC ID 16 H
TBME REC ID 17 H
TBME REC ID 18 H
TBME REC ID 19 H
TBME REC ID 20 H
TBME REC ID PAR 2 H

82S09 E93 (64x9) RAM

74S280 E92

TBMH GI DA PAR 2 EV H (TBMT)
TBMH GI DA PAR 2 OD H (TBMT)

TBMH GRP1 DATA 25 L (TBMR)
TBMH GRP1 DATA 26 L (TBMR)
TBMH GRP1 DATA 27 L (TBMR)
TBMH GRP1 DATA 28 L (TBMR)
TBMH GRP1 DATA 29 L (TBMR)

+5V R63 510Ω 1/4W; +5V R64 820Ω 1/4W; +5V R65 820Ω 1/4W; +5V R66 820Ω 1/4W; +5V R67 510Ω 1/4W; -5V R93 5.1 1/4W; +5V R69 820Ω 1/4W; +5V R62 820Ω 1/4W; +5V R61 820Ω 1/4W

FUNCTION CHART FOR 74S280

NUMBER OF INPUTS A THRU I THAT ARE HIGH	OUTPUTS Σ EVEN	Σ ODD
0,2,4,6,8	H	L
1,3,5,7,9	L	H

H = HIGH LEVEL L = LOW LEVEL

NOTE
1.) UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 820Ω 1/4 WATT 5%
2.) SEE TDME FOR 82S09 FUNTION TABLE.

(TB MEMORY TAG GROUP 1) (SLOT 6)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX (TBMH)	D	CS	M8222-01	C
SCALE	SHEET 8 OF 22	DIST.		

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TBMC NOT SBI CYCLE A1 L

TBMR GRP 1 DATA 12 B H
TBMP GRP 0 DATA 12 B H
TBMM IPA 12 H
TBMF VA MUX 12 B H
TBMR GRP 1 DATA 13 B H
TBMP GRP 0 DATA 13 B H
TBMM IPA 13 H
TBMF VA MUX 13 B H

TBMC NOT SBI CYCLE A2 L

TBMR GRP 1 DATA 18 B H
TBMP GRP 0 DATA 18 B H
TBMM IPA 18 H
TBMA VA MUX 18 BUFF H
TBMR GRP 1 DATA 19 B H
TBMP GRP 0 DATA 19 B H
TBMM IPA 19 H
TBMA VA MUX 19 BUFF H

TBMR GRP 1 DATA 24 B H
TBMP GRP 0 DATA 24 B H
TBMM IPA 24 H
TBMA VA MUX 24 BUFF H
TBMR GRP 1 DATA 25 B H
TBMP GRP 0 DATA 25 B H
TBMM IPA 25 H H
TBMA VA MUX 25 BUFF H

TBMK PA MUX SEL 0 A1 H
TBMD VIRT ADRS BUF A H

TBMR GRP 1 DATA 14 B H
TBMR GRP 0 DATA 14 B H
TBMM IPA 14 H
TBMA VA MUX 14 B H
TBMR GRP 1 DATA 15 B H
TBMP GRP 0 DATA 15 B H
TBMM IPA 15 H
TBMA VA MUX 15 BUFF H

TBMR GRP 1 DATA 20 B H
TBMP GRP 0 DATA 20 B H
TBMM IPA 20 H
TBMA VA MUX 20 BUFF H
TBMR GRP 1 DATA 21 B H
TBMP GRP 0 DATA 21 B H
TBMM IPA 21 H
TBMA VA MUX 21 BUFF H

TBMR GRP 1 DATA 26 B H
TBMP GRP 0 DATA 26 B H
TBMM IPA 26 H
TBMA VA MUX 26 BUFF H
TBMR GRP 1 DATA 27 B H
TBMP GRP 0 DATA 27 B H
TBMM IPA 27 H
TBMA VA MUX 27 BUFF H

TBMR GRP 1 DATA 16 B H
TBMP GRP 0 DATA 16 B H
TBMM IPA 16 H
TBMA VA MUX 16 BUFF H
TBMR GRP 1 DATA 17 B H
TBMP GRP 0 DATA 17 B H
TBMM IPA 17 H
TBMA VA MUX 17 BUFF H

TBMR GRP 1 DATA 22 B H
TBMP GRP 0 DATA 22 B H
TBMM IPA 22 H
TBMA VA MUX 22 BUFF H
TBMR GRP 1 DATA 23 B H
TBMP GRP 0 DATA 23 B H
TBMM IPA 23 H
TBMA VA MUX 23 BUFF H

TBMR GRP 1 DATA 28 B H
TBMP GRP 0 DATA 28 B H
TBMM IPA 28 H
TBMA VA MUX 28 BUFF H
TBMR GRP 1 DATA 29 B H
TBMP GRP 0 DATA 29 B H
TBMM IPA 29 H
TBMA VA MUX 29 BUFF H

SELECT INPUTS		DATA INPUTS				OUTPUT CONTROL	OUTPUT
S1	S0	A	B	C	D	STB	F
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

FUNCTION CHART FOR 74S153
ADDRESS INPUTS S0 AND S1 ARE COMMON TO BOTH SECTIONS.
H = HIGH LEVEL L = LOW LEVEL X = IRRELEVANT Z = HIGH IMPEDENCE (OFF)

REVISIONS		
CHK	CHANGE NO.	REV.

(PA MUX) (SLOT 6)

TITLE TRANSLATION BUFFER MATRIX (TBMJ)
SIZE D | CODE CS | NUMBER M8222-0-1 | REV. C
SCALE | SHEET 9 OF 22 | DIST.

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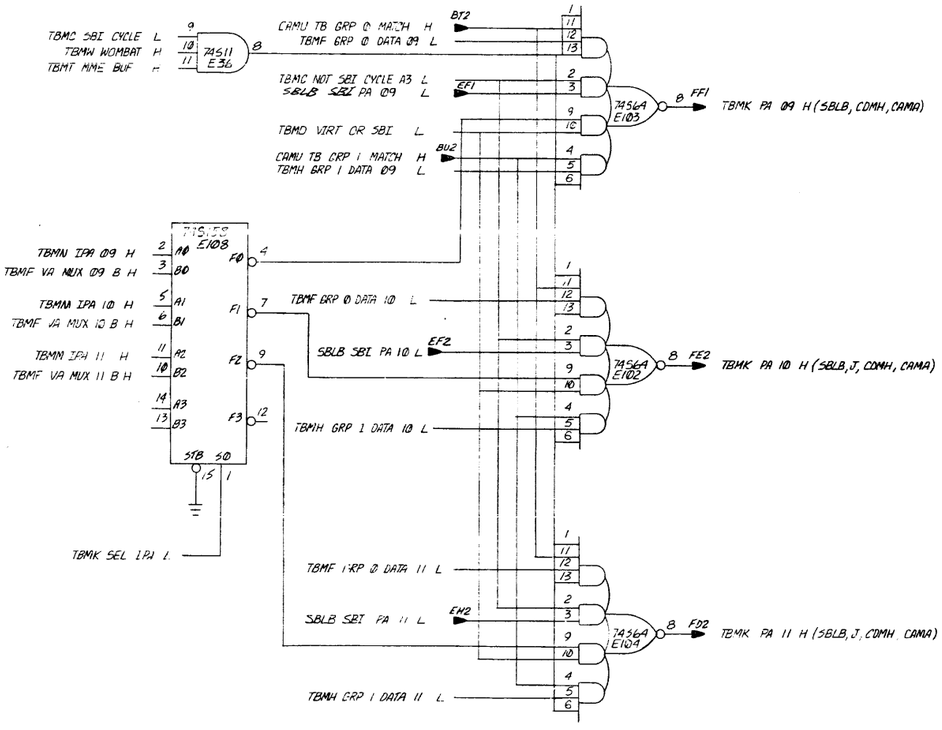

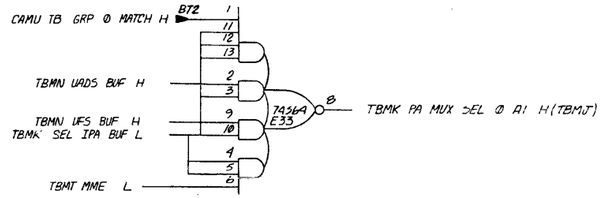

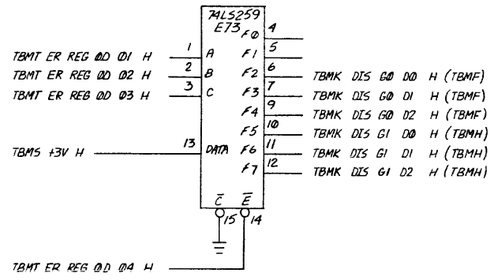

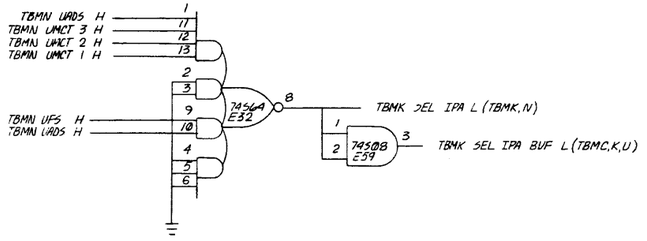

-74S158-

FUNCTION TABLE

INPUTS				OUTPUT Y
STROBE	SELECT	A	B	S 158
H	X	X	X	H
L	L	L	X	H
L	L	H	X	L
L	H	X	L	H
L	H	X	H	L

H = HIGH LEVEL, L = LOW LEVEL, X = IRRELEVANT

(SLOT 6)

(FAST PA ADDRESS BITS & FORCE PARITY ERROR DECODE)

REVISIONS		
CHK	CHANGE NO.	REV

TITLE	SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX (TBMK)	D	CS	M 8222-Ø-1	C
SCALE	SHEET 10 OF 22	DIST.		

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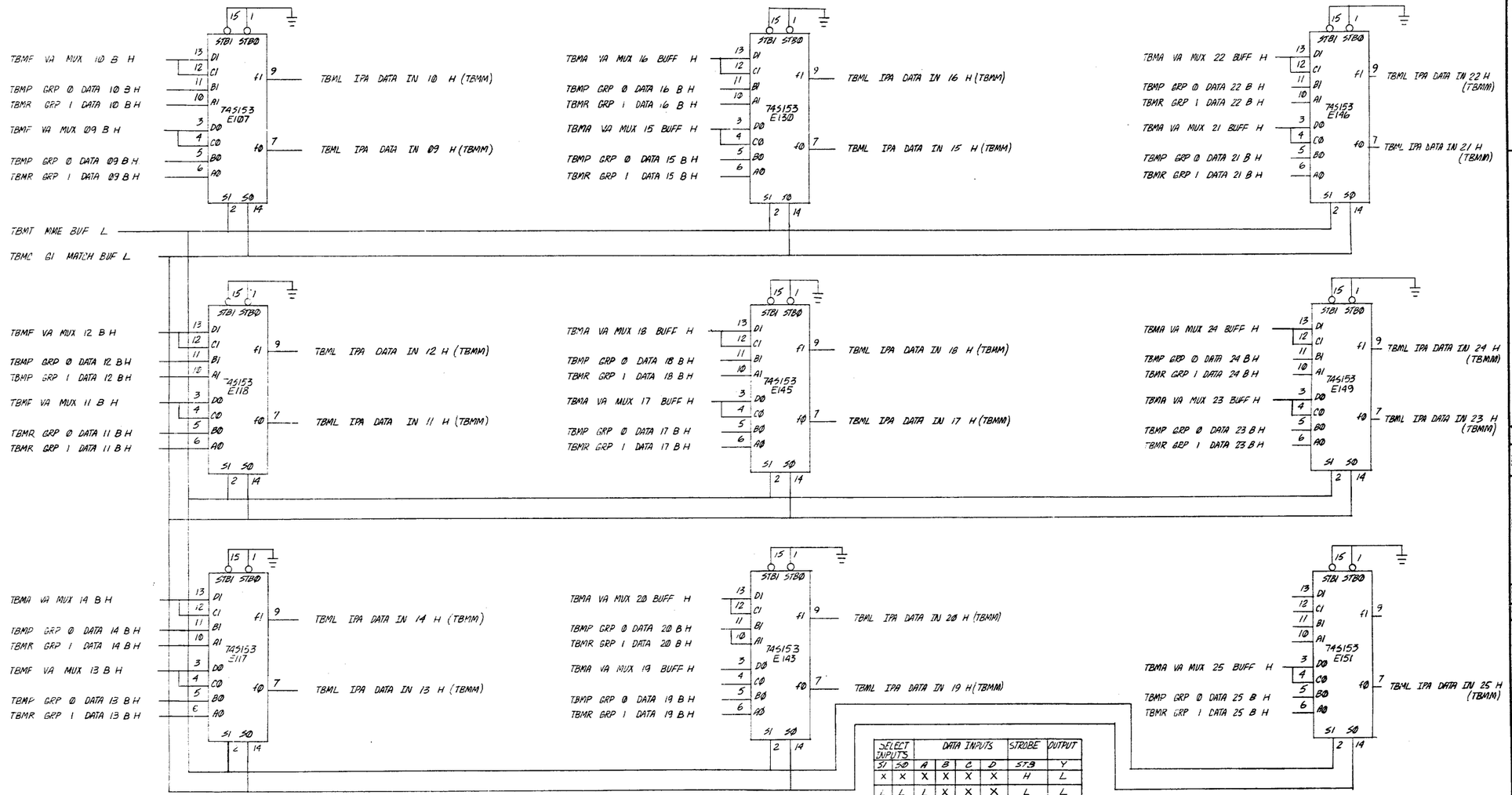

SELECT INPUTS		DATA INPUTS				STROBE	OUTPUT
S1	S0	A	B	C	D	STB	Y
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

FUNCTION CHART - 74S153

SELECT INPUTS S0 AND S1 ARE COMMON TO BOTH SECTIONS
H = HIGH LEVEL, L = LOW LEVEL, X = IRRELEVANT

(SLOT 6)

(IPA MUX)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE TRANSLATION BUFFER MATRIX (TBML)
SIZE D CODE CS NUMBER M-8222-0-1 REV. C
SCALE SHEET 11 OF 22 DIST.

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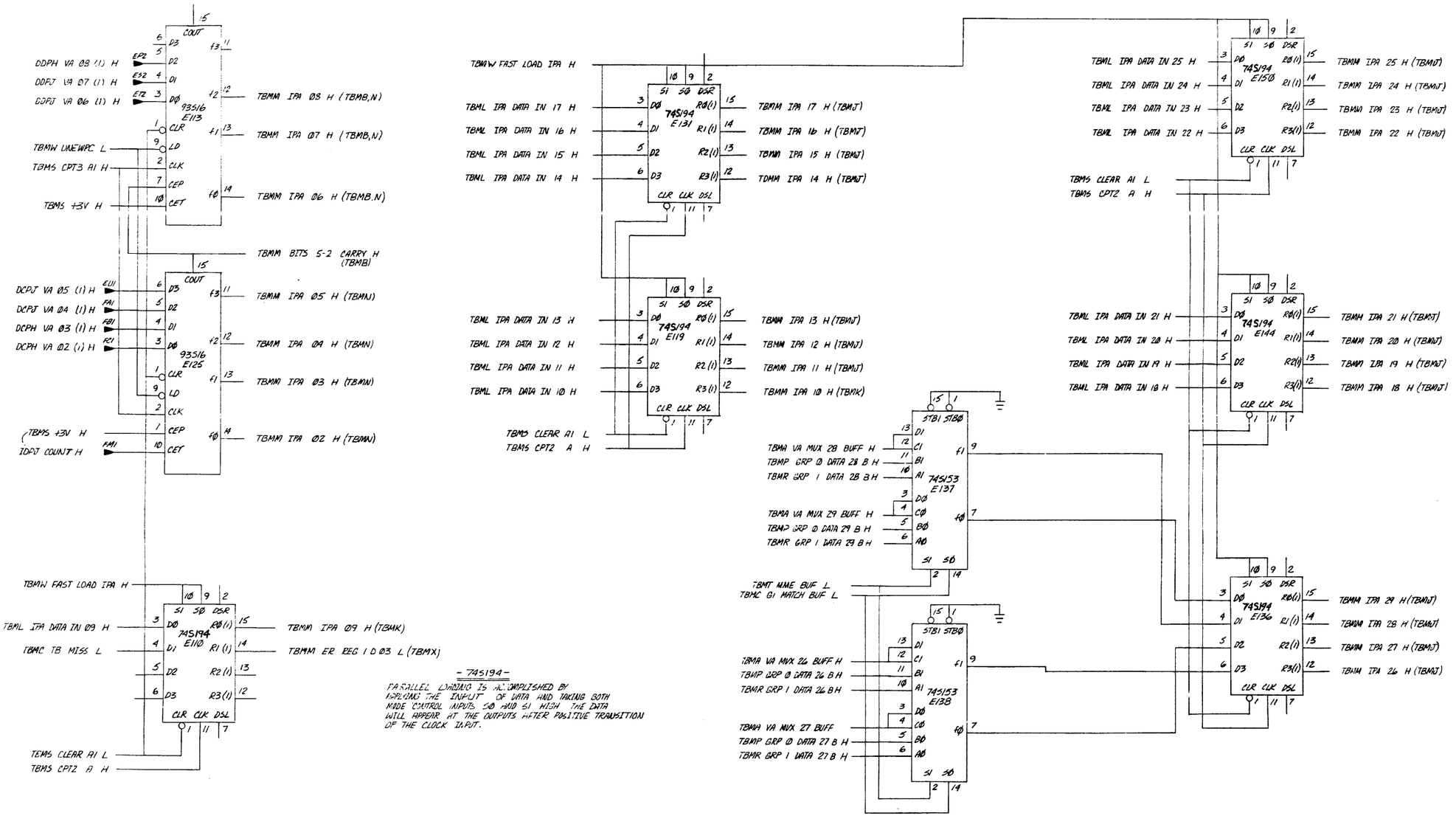

- 74S194 -

PARALLEL LOADING IS ACCOMPLISHED BY APPLYING THE INPUT OF DATA AND TAKING BOTH MODE CONTROL INPUTS S0 AND S1 HIGH. THE DATA WILL APPEAR AT THE OUTPUTS AFTER POSITIVE TRANSITION OF THE CLOCK INPUT.

REVISIONS		
CHK	CHANGE NO.	REV.

(IPA REGISTERS) (SLOT 6)

TITLE	SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX (TBMM)	D	CS	M8222-Ø-1	C
SCALE	SHEET 12 OF 22		DIST.	

DEC FORM NO. DRD 188

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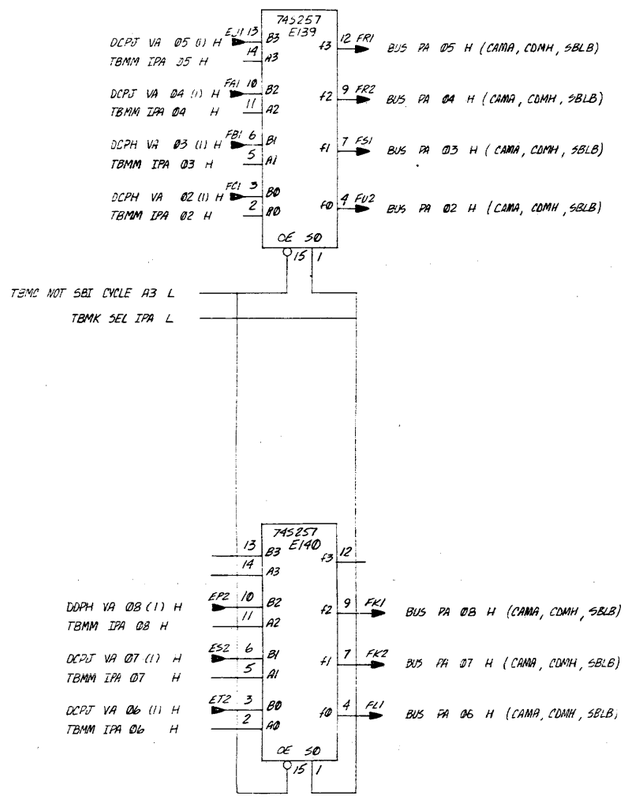

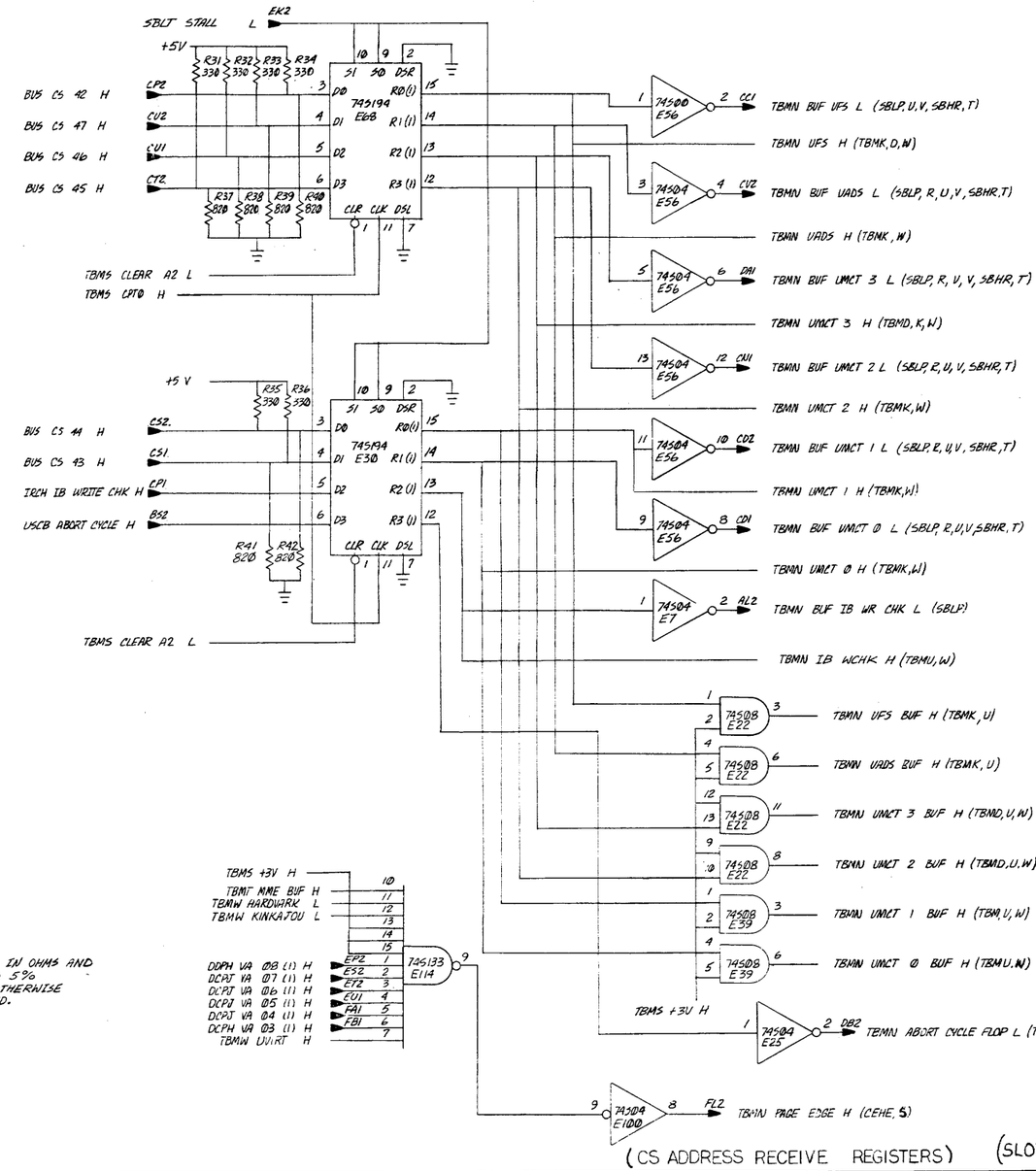

NOTE: ALL RESISTORS IN OHMS AND ARE 1/4 W @ 5% UNLESS OTHERWISE SPECIFIED.

(CS ADDRESS RECEIVE REGISTERS) (SLOT 6)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX (TBMN)	D	CS	M8222-Ø-1	C
SCALE	SHEET 13 OF 22	DIST.		

DEC FORM NO. ORD 130

MANUFACTURED IN USA

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TBMF GRP Ø DATA 09 L — 745240 E105 (2, 18, 1) — TBMP GRP Ø DATA 09 B H (TBMJ,L,V)

TBMF GRP Ø DATA 10 L — 745240 E105 (17, 3, 19) — TBMP GRP Ø DATA 10 B H (TBMJ,L,V)

TBMF GRP Ø DATA 11 L — 745240 E105 (4, 6, 1) — TBMP GRP Ø DATA 11 B H (TBMJ,L,V)

TBMF GRP Ø DATA 12 L — 745240 E105 (15, 5, 19) — TBMP GRP Ø DATA 12 B H (TBMJ,L,V)

TBMF GRP Ø DATA 13 L — 745240 E105 (6, 14, 1) — TBMP GRP Ø DATA 13 B H (TBMJ,L,V)

TBMF GRP Ø DATA 14 L — 745240 E105 (13, 7, 19) — TBMP GRP Ø DATA 14 B H (TBMJ,L,V)

TBMF GRP Ø DATA 15 L — 745240 E105 (8, 12, 1) — TBMP GRP Ø DATA 15 B H (TBMJ,L,V)

TBMF GRP Ø DATA 16 L — 745240 E120 (2, 18, 1) — TBMP GRP Ø DATA 16 B H (TBMJ,L,V)

TBMF GRP Ø DATA 17 L — 745240 E120 (17, 3, 19) — TBMP GRP Ø DATA 17 B H (TBMJ,L)

TBMF GRP Ø DATA 18 L — 745240 E120 (4, 16, 1) — TBMP GRP Ø DATA 18 B H (TBMJ,L)

TBMF GRP Ø DATA 19 L — 745240 E120 (15, 5, 19) — TBMP GRP Ø DATA 19 B H (TBMJ,L)

TBMF GRP Ø DATA 20 L — 745240 E120 (6, 14, 1) — TBMP GRP Ø DATA 20 B H (TBMJ,L)

TBMF GRP Ø DATA 21 L — 745240 E120 (13, 7, 19) — TBMP GRP Ø DATA 21 B H (TBMJ,L)

TBMF GRP Ø DATA 22 L — 745240 E120 (8, 12, 1) — TBMP GRP Ø DATA 22 B H (TBMJ,L)

TBMF GRP Ø DATA 23 L — 745240 E122 (2, 18, 1) — TBMP GRP Ø DATA 23 B H (TBMJ,L)

TBMF GRP Ø DATA 24 L — 745240 E122 (17, 3, 19) — TBMP GRP Ø DATA 24 B H (TBMJ,L)

TBMF GRP Ø DATA 25 L — 745240 E122 (4, 16, 1) — TBMP GRP Ø DATA 25 B H (TBMJ,L)

TBMF GRP Ø DATA 26 L — 745240 E122 (15, 5, 19) — TBMP GRP Ø DATA 26 B H (TBMJ,M)

TBMF GRP Ø DATA 27 L — 745240 E122 (6, 14, 1) — TBMP GRP Ø DATA 27 B H (TBMJ,M)

TBMF GRP Ø DATA 28 L — 745240 E122 (13, 7, 19) — TBMP GRP Ø DATA 28 B H (TBMJ,M)

TBMF GRP Ø DATA 29 L — 745240 E122 (8, 12, 1) — TBMP GRP Ø DATA 29 B H (TBMJ,M)

REVISIONS		
CHK	CHANGE NO.	REV.

(TB GROUP Ø MEMORY DATA DRIVERS) (SLOT 6)

TITLE	SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX (TBMP)	D	CS	M8222Ø-1	C
SCALE	SHEET 14 OF 22	DIST.		

DEC FORM NO. 1ØØ 138

15

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TBMH GRP 1 DATA 10 L — 745240 E85 (2, 18, 1) — TBMR GRP 1 DATA 09 B H (TBML, V)

TBMH GRP 1 DATA 10 L — 745240 E85 (17, 3, 19) — TBMR GRP 1 DATA 10 B H (TBML, V)

TBMH GRP 1 DATA 11 L — 745240 E85 (4, 16, 1) — TBMR GRP 1 DATA 11 B H (TBML, V)

TBMH GRP 1 DATA 12 L — 745240 E85 (15, 5, 19) — TBMR GRP 1 DATA 12 B H (TBMJ,L, V)

TBMH GRP 1 DATA 13 L — 745240 E85 (6, 4, 1) — TBMR GRP 1 DATA 13 B H (TBMJ,L,V)

TBMH GRP 1 DATA 14 L — 745240 E85 (13, 7, 19) — TBMR GRP 1 DATA 14 B H (TBMJ,L, V)

TBMH GRP 1 DATA 15 L — 745240 E85 (8, 12, 1) — TBMR GRP 1 DATA 15 B H (TBMJ,L, V)

TBMH GRP 1 DATA 16 L — 745240 E133 (2, 18, 1) — TBMR GRP 1 DATA 16 B H (TBMJ,L, V)

TBMH GRP 1 DATA 17 L — 745240 E133 (17, 3, 19) — TBMR GRP 1 DATA 17 B H (TBMJ,L)

TBMH GRP 1 DATA 18 L — 745240 E133 (4, 16, 1) — TBMR GRP 1 DATA 18 B H (TBMJ,L)

TBMH GRP 1 DATA 19 L — 745240 E133 (15, 5, 19) — TBMR GRP 1 DATA 19 B H (TBMJ,L)

TBMH GRP 1 DATA 20 L — 745240 E133 (6, 4, 1) — TBMR GRP 1 DATA 20 B H (TBMJ,L)

TBMH GRP 1 DATA 21 L — 745240 E133 (13, 7, 19) — TBMR GRP 1 DATA 21 B H (TBMJ,L)

TBMH GRP 1 DATA 22 L — 745240 E133 (8, 12, 1) — TBMR GRP 1 DATA 22 B H (TBMJ,L)

TBMH GRP 1 DATA 23 L — 745240 E123 (2, 18, 1) — TBMR GRP 1 DATA 23 B H (TBMJ,L)

TBMH GRP 1 DATA 24 L — 745240 E123 (17, 3, 19) — TBMR GRP 1 DATA 24 B H (TBMJ,L)

TBMH GRP 1 DATA 25 L — 745240 E123 (4, 16, 1) — TBMR GRP 1 DATA 25 B H (TBMJ,L)

TBMH GRP 1 DATA 26 L — 745240 E123 (15, 5, 19) — TBMR GRP 1 DATA 26 B H (TBMJ,M)

TBMH GRP 1 DATA 27 L — 745240 E123 (6, 4, 1) — TBMR GRP 1 DATA 27 B H (TBMJ,M)

TBMH GRP 1 DATA 28 L — 745240 E123 (13, 7, 19) — TBMR GRP 1 DATA 28 B H (TBMJ,M)

TBMH GRP 1 DATA 29 L — 745240 E123 (8, 12, 1) — TBMR GRP 1 DATA 29 B H (TBMJ,M)

REVISIONS		
CHK	CHANGE NO.	REV

(TB GROUP 1 MEMORY DATA DRIVERS) (SLOT 6)

TITLE	SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX (TBMR)	D	CS	M8222-01	C
SCALE	SHEET 15 OF 22	DIST.		

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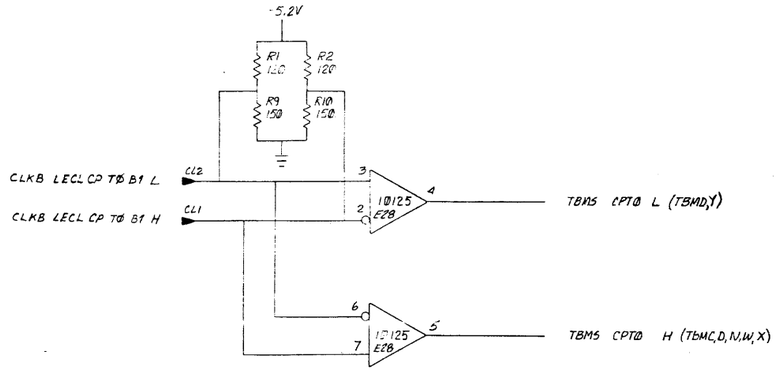

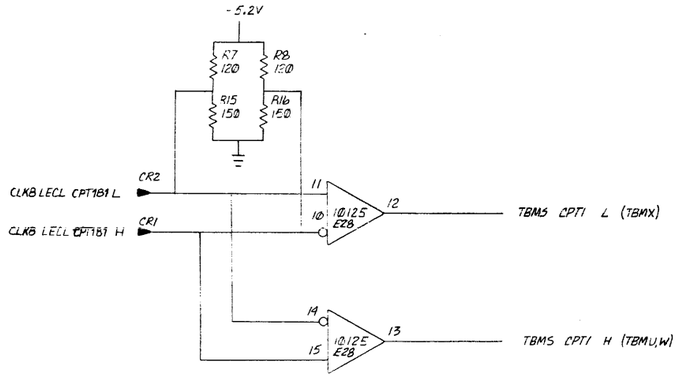

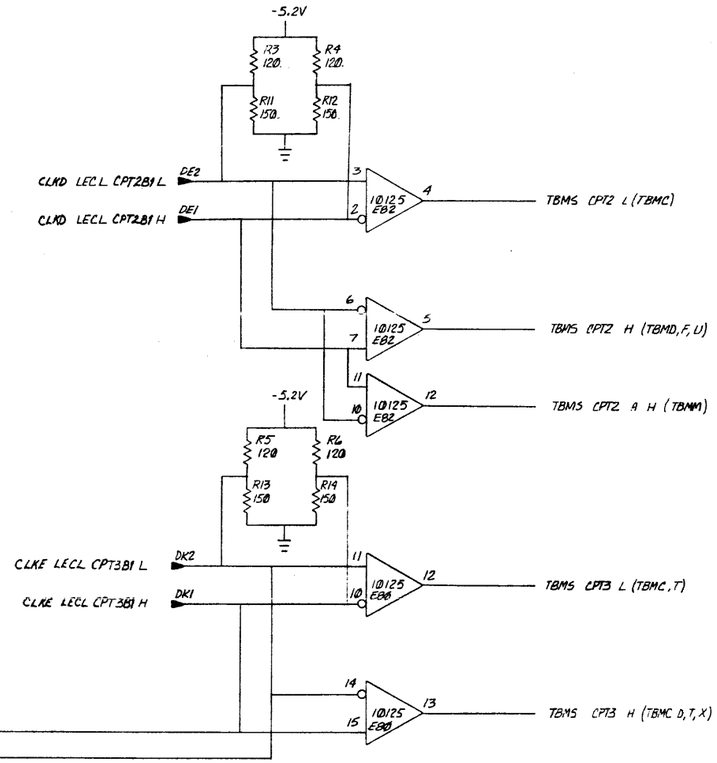

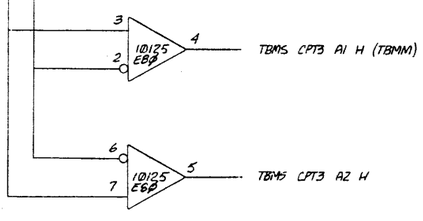

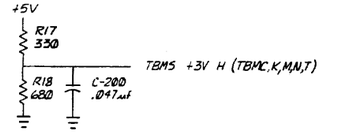

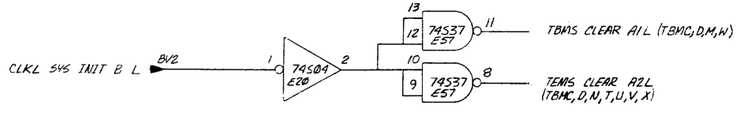

NOTE: 10125 HAS +5V ON PIN 9
-5.2V ON PIN 8
GND ON PIN 16
ALL RESISTORS 2V 0-MNS AND 1/4 W, 5%
UNLESS OTHERWISE SPECIFIED.

REVISIONS		
CHK	CHANGE NO.	REV.

(CLOCK REGEIVER) (SLOT 6)

TITLE TRANSLATION BUFFER MATRIX (TBMS)
SIZE D | CODE CS | NUMBER M8222-0-1 | REV. C
SCALE | SHEET 16 OF 22 | DIST.

MASTER FILES
DEC FORM NO. 0140 138

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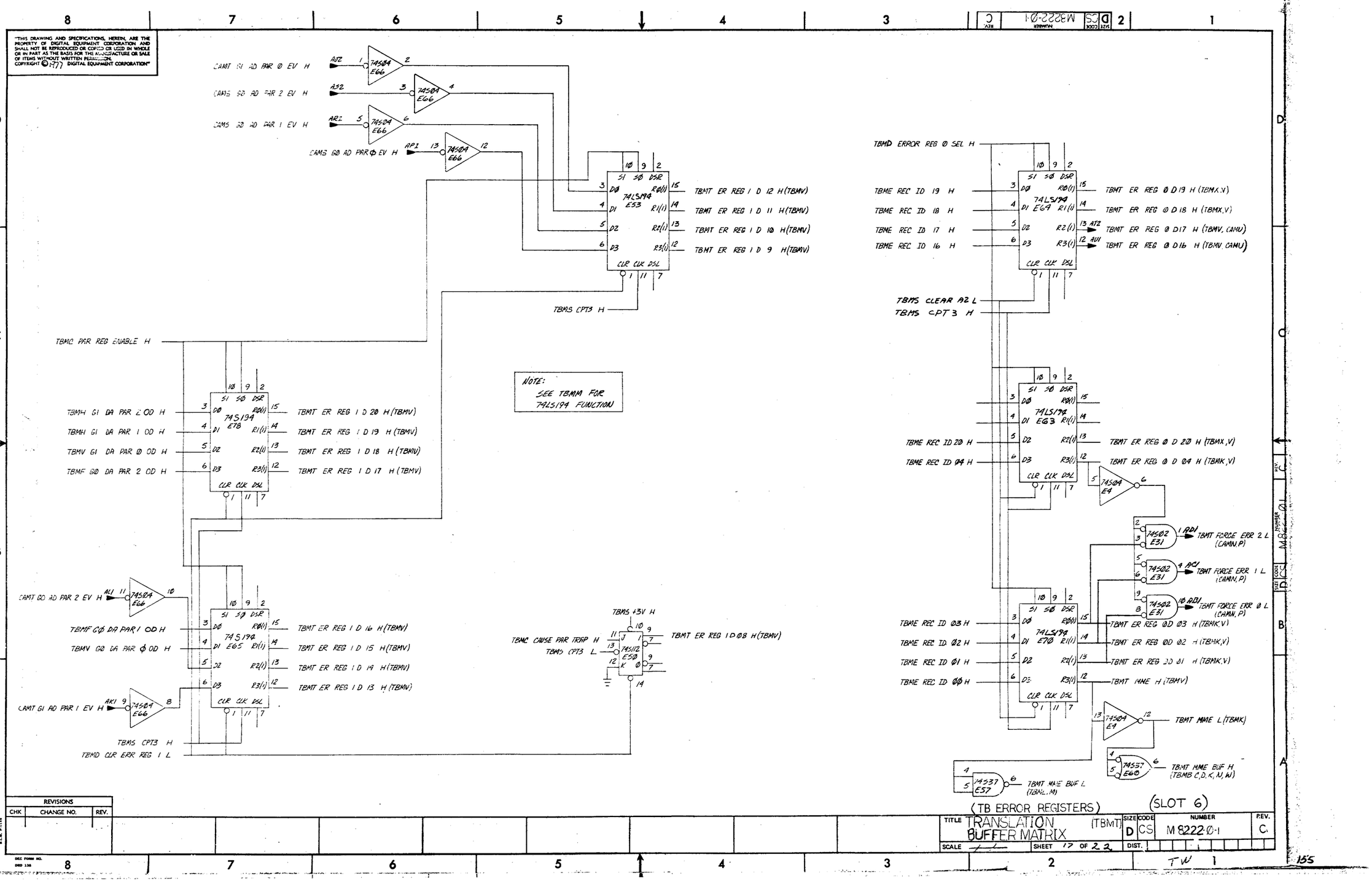

REVISIONS		
CHK	CHANGE NO.	REV.

(TB ERROR REGISTERS) (SLOT 6)

TITLE			SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX	(TBMT)		D	CS	M8222-0-1	C
SCALE		SHEET 17 OF 22	DIST.			

DEC FORM NO. DRD 138

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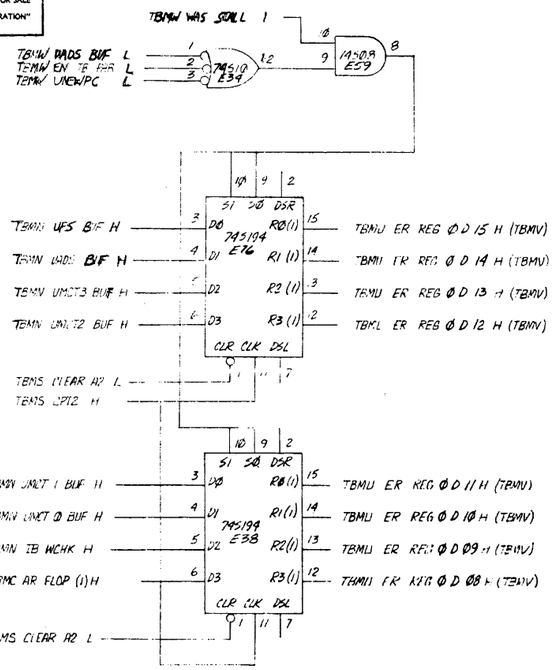
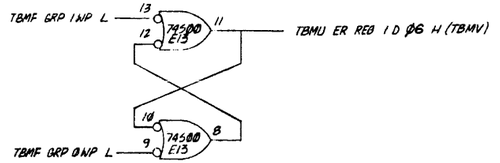
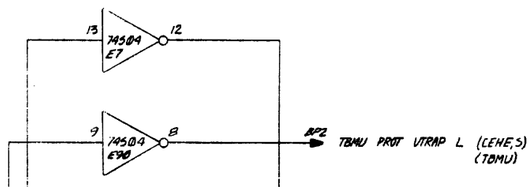
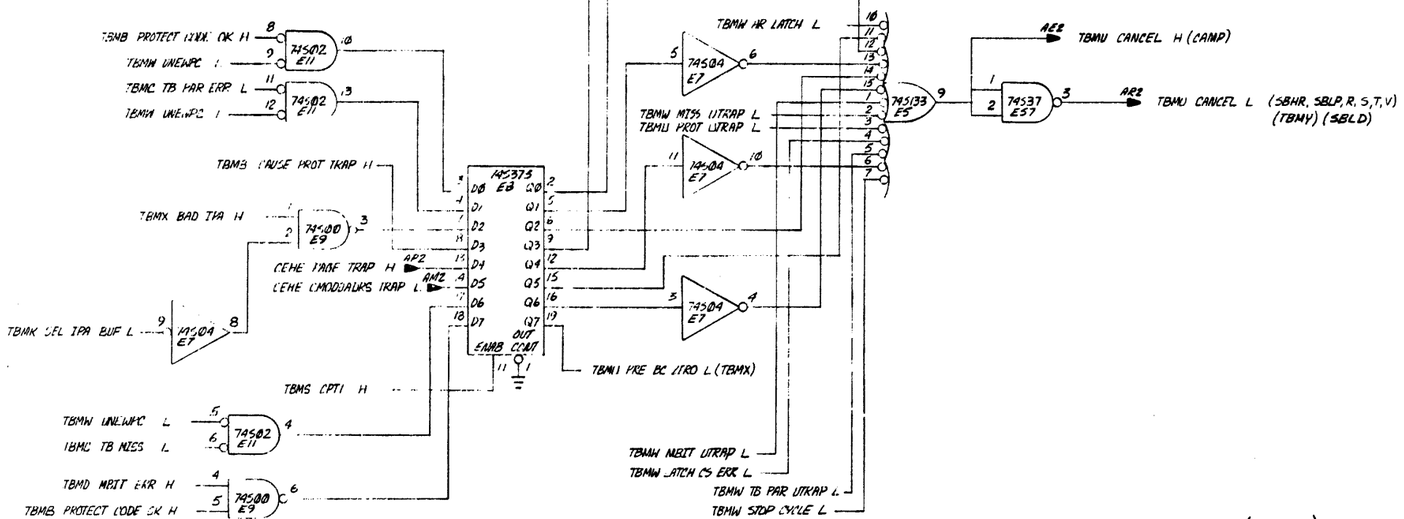


NOTE:
SEE PAGE TBMM FOR 74S194 FUNCTION







REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 6)
(TB CANCEL LOGIC)

TITLE: TRANSLATION BUFFER MATRIX (TBMU)		SIZE: D	CODE: CS	NUMBER: M8222-Ø1 REV: C
SCALE	SHEET 18 OF 22	DIST.		

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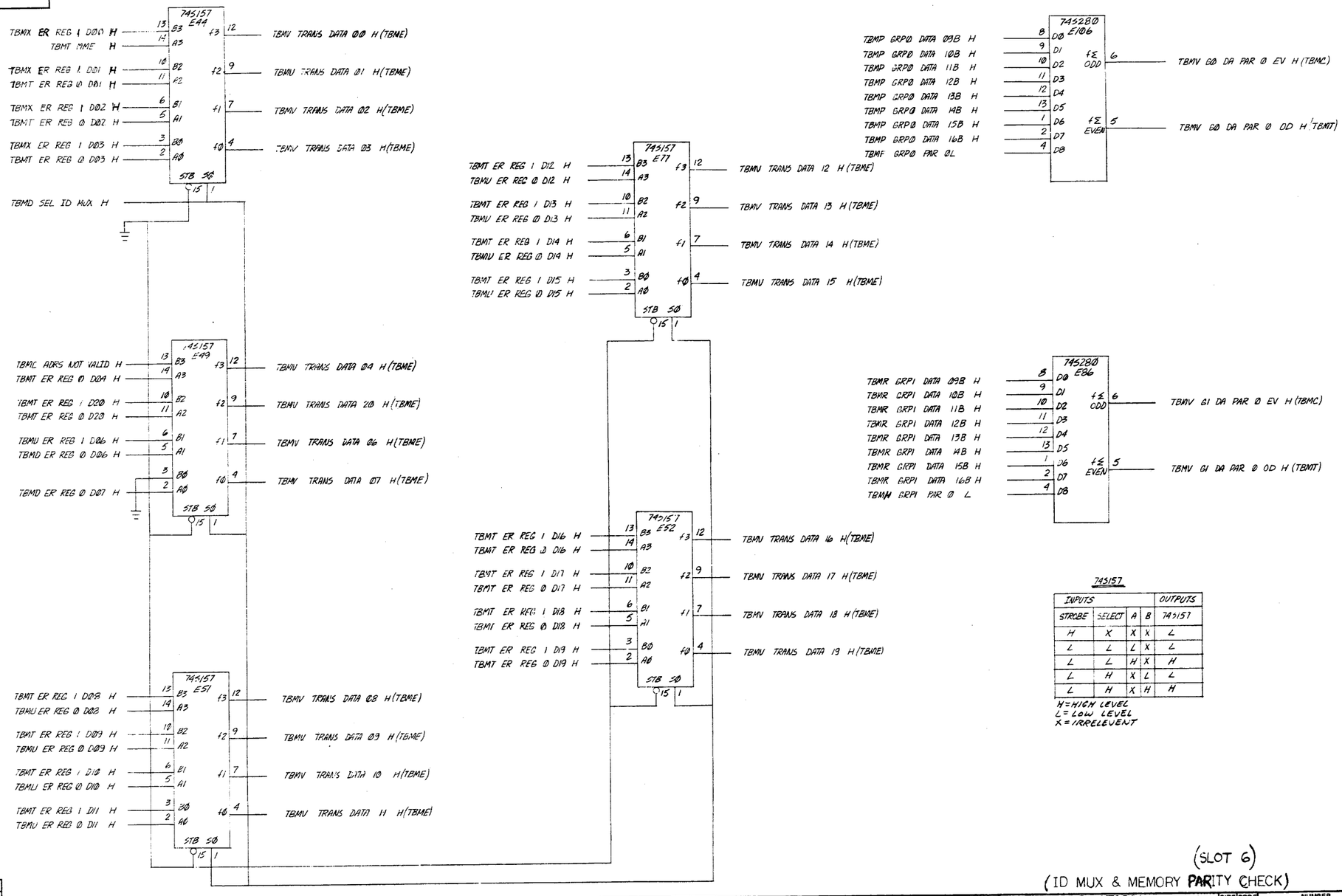

745157

INPUTS				OUTPUTS
STROBE	SELECT	A	B	745157
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVENT

(SLOT 6)
(ID MUX & MEMORY PARITY CHECK)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX (TBMV)	D	CS	M8222-0-1	C
SCALE —	SHEET 19 OF 22	DIST.		

DEC FORM NO. DRD 138

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TBMN IB WCHK H → 74S04 E25 → TBMN UMCT Ø BUF H → 74S00 E24 → TBMN UMCT 1 BUF H → 74S11 E36 → TBMW WRITE CHECK H (TBMB, D)

TBMN UADS H → 74S04 E35 → TBMW UADS BUF L (TBMU)
TBMN UMCT 3 H → 74S04 E35 → TBMW UMCT 3 BUF L (TBMW)
TBMN UMCT 2 H → 74S04 E35 → TBMW UMCT 2 BUF L (TBMW)
TBMN UMCT 1 H → 74S04 E35 → TBMW UMCT 1 BUF L (TBMW)
TBMN UMCT Ø H → 74S04 E35 → TBMW UMCT Ø BUF L (TBMW)

OUTPUT CONTROL	ENABLE G	ENABLE D	OUTPUT
L	H	H	H
L	H	L	L
L	L	X	Q0
H	X	X	Z

FUNCTION CHART FOR -74S373-

TBMW UMCT 3 BUF L, TBMW UMCT 2 BUF L → 74S00 E24 → TBMW AARDVARK L (TBMN)

TBMN UMCT 3 BUF H, TBMN UMCT 2 BUF H, TBMW UMCT 1 BUF L, TBMW UMCT Ø BUF L → 74S20 E71 → TBMW KINKAJOU L (TBMN)

TBMW UMCT Ø BUF L, TBMW UMCT 3 BUF L → 74S10 E34 → 74S08 E21 → TBMW EN TB PAR L (TBMC,U)

74S10 E34 → 74S04 E20 → BF1 TBMW EN UNALIGN TRAP H (CEHE,S)

74S10 E34 → TBMW UVIRT H (TBMN)

TBMN ABORT CYCLE FLOP L → 74S08 E21 → 74S00 E48 → TBMW U NEWPC L (TBMU,X,M)

TBMW UMCT 1 BUF L, TBMN UMCT Ø BUF H → 74S00 E23 → 74S02 E19 → AK2 TBMW DES PROT L (TBMB,D) (SBHJ,M)

TBMT MME BUF H, TBMC TB MATCH L → 74S10 E12

TBMW WAS STALL L (TBMU) → 74S08 E23

BII TBMW TB PAR UTRAP L (CEHE,S,TBMU) → 74S04 E4

TBMN UFS H, TBMN UADS H → 74S02 E19 → TBMW WOMBAT H (TBMD,K)

74S08 E21 → 74S04 E20 → BAI TBMW EN CMOODAORS H (CEHE,S)

SBLT STALL L → EK2 → 74S175 E69 D3 → R3(1), R3(0)
TBMC AR FLOP (1) H → 74S175 E69 D2 → R2(1), R2(0) → TBMW IB BCHK L (TBMB)
74S175 E69 D1 → R1(1), R1(0)
74S175 E69 D0 → R0(1), R0(0)
74S175 E69 CLR, CLK → TBMS CLEAR A1 L, TBMS CPT0 H
74S175 E69 → TBMU RANDOM BI L (TBMX)

ICLK CS PAR ERR H, BC110 → 74S51 E58 → 74S04 E20

74S373 E66
D0 D1 D2 D3 D4 D5 D6 D7 ENAB CONT
Q0 Q1 Q2 Q3 Q4 Q5 Q6 Q7 OUT
TBMD CAUSE MBIT TRAP L
TBMC CAUSE PAR TRAP H
TBMC BC ONE H
TBMC AR FLOP (1) L
TBMN ABORT CYCLE FLOP L
TBMS CPT1 H
(CEHD,S) BF2 TBMW SAVE CONTEXT H (TBMD)
BH2 TBMW MBIT UTRAP L (TBMU) (<CEHE,S>)
TBMW BUF BC ONE H (TBMX)
BS1 TBMW MISS UTRAP L (TBMU)
TBMW AR LATCH L (TBMU)
TBMW LATCH CS ERR L (TBMU)
TBMW STOP CYCLE L (TBMU)

IDPT FLUSH L, DF2 → 74S00 E48 → 74S00 E24 → TBMW LOAD IPA L (TBMC,U,X)

TBMC AR FLOP(1) L → 74S37 E40 → TBMW FAST LOAD IPA H (TBMM)

(SLOT 6)
(UTRAP COMMAND DECODING)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX (TBMW)	D	CS	M8222-0-1	C
SCALE	SHEET 20 OF 22	DIST.		

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TBMD ER REG Ø D Ø6 H — 74S04 E25

TBMW RANDOM G1 L — 74S02 E27
TBMT ER REG Ø D 18 H — 74S02 E27
TBMT ER REG Ø D 19 H — 74S04 E25

TBMD ER REG Ø D Ø7 H — 74S04 E25

TBMM ER REG1 D03 L — 74S04 E46 — TBMX ER REG 1 D Ø3 H (TBMV)

TBMT ER REG 1Ø D 2Ø H — 74S04 E25

TBMW LOAD IPA L — 74S04 E46

74S00 E13 — TBMX G0 WP EN H (TBMF)

74S00 E13 — 74S10 E12 — TBMX G1 WP EN H (TBME)

TBMC ADRS NOT VALID L — 74S10 E18 — TBMX BAD IPA H (TBMI)

74S04 E46 — TBMX ER REG 1 D Ø2 H (TBMV)

74S194 E47 (SI SO DSR, D0 D1 D2 D3, R0(1) R1(1) R2(1) R3(1), CLR CLK DSL)

TBMC TB PAR ERR L
TBMB PROTECT CODE OK L
TBMW U NEWPC L
TBMS CLEAR A2 L
TBMS CPT 3 H

74S10 E18 — TBMX ER REG 1 D Ø1 H (TBMU)
74S00 E9 — TBMX ER REG 1 D Ø Ø H (TBMN)

SBLS IB ERR LTH H — EJ1 — 74S04 E1Ø Ø

74S175 E17 (D3 D2 D1 D0, CLR CLK)

TBMW BUF BC ONE H
TBMS CLEAR A2 L
TBMS CPT Ø H

R3(1) — B01 — TBMX IB MISS L (IRCH,M)
R3(Ø)
R2(1) — B02 — TBMX IB ERR L (IRCH,M)
R2(Ø)
R1(1) — BE1 — TBMX BRANCH CODE 1 H (USCP)
R1(Ø)
R0(1) — BE2 — TBMX BRANCH CODE Ø H (USCP)
R0(Ø)

TBMC TB MISS L
TBMW PRE BC ZERO L — 74S00 E9

CAMP G0 WRITE EN H — AA1
CAMP G1 WRITE EN H — AB2
TBMS CPT1 L
74S64 E2 — 74S04 E9 — AD2 — TBMX WRITE PULSE L (SBLR)

74S175 FUNCTIONS
THE INFORMATION AT D INPUT IS TRANSFERRED TO R OUTPUT OF THE FLOP ON THE POSITIVE GOING EDGE OF THE CLOCK PULSE.
LOW INPUT TO PRESET SETS R OUTPUT TO HIGH LEVEL, LOW INPUT TO CLEAR RESETS R OUTPUT TO LOW LEVEL. PRESENT AND CLEAR ARE INDEPENDENT OF CLOCK.

(SLOT 6)

(TB WRITE PULSE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE TRANSLATION BUFFER MATRIX (TBMX)
SIZE D CODE CS NUMBER M8222-0-1 REV C
SCALE — SHEET 21 OF 22 DIST.

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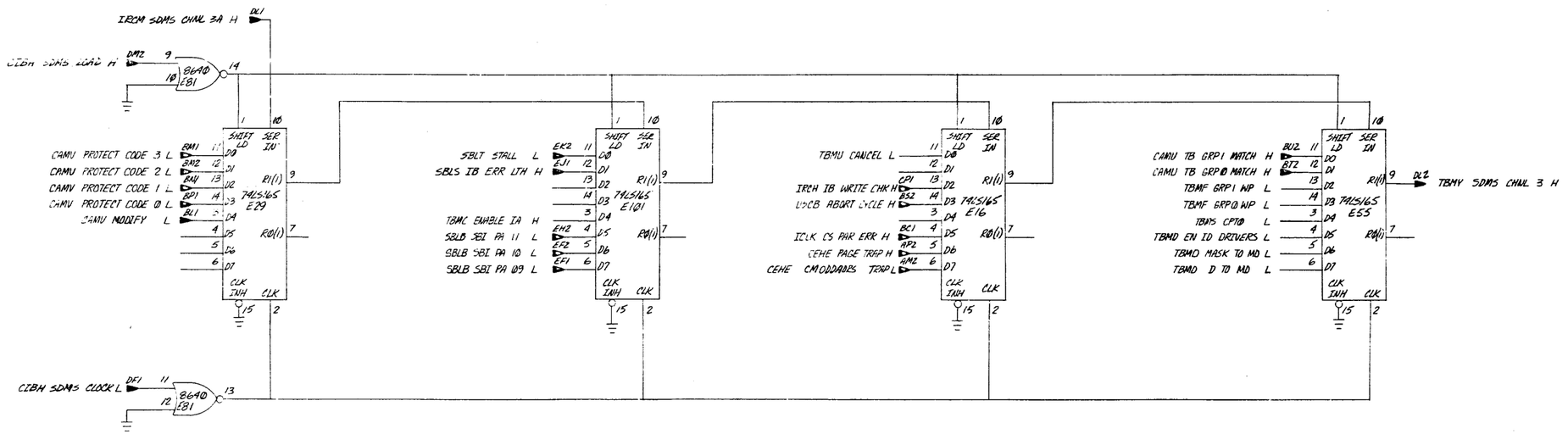

74LS165 FUNCTIONS

1. 8 BIT SHIFT REGISTER.
2. THE OUTPUT COMES FROM FLIP FLOP NUMBER 7.
3. IF SHIFTLOAD IS LOW DATA IS LOADED FROM D INPUTS REGARDLESS OF CLOCK.
4. OTHERWISE DATA SHIFTS FROM 0 TOWARD 7 ON CLOCK RISING EDGE.

(SLOT 6)

(V BUS REGISTERS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
TRANSLATION BUFFER MATRIX (TBMY)	D	CS	M8222-0-1	C

SCALE — SHEET 22 OF 22 — DIST.

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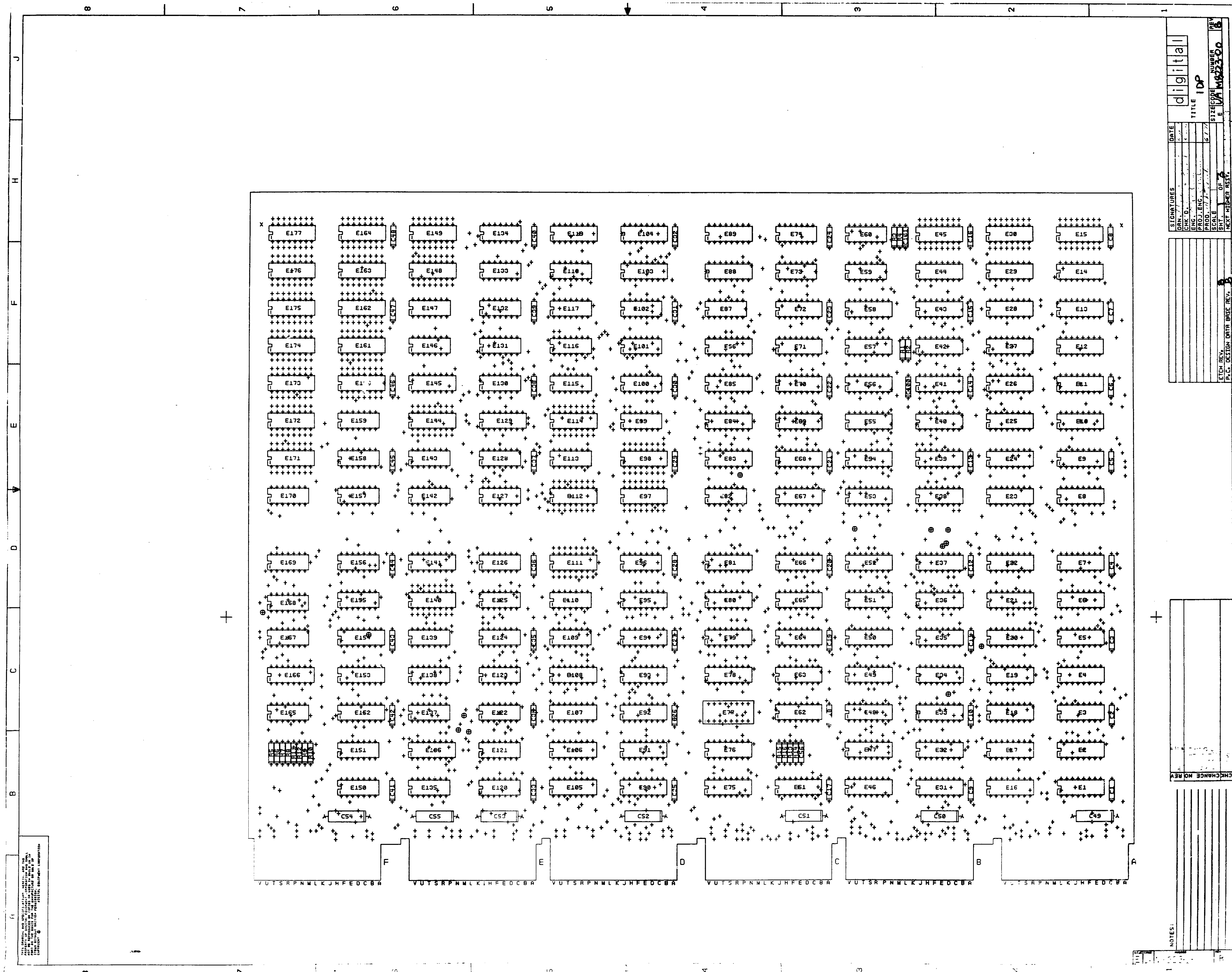
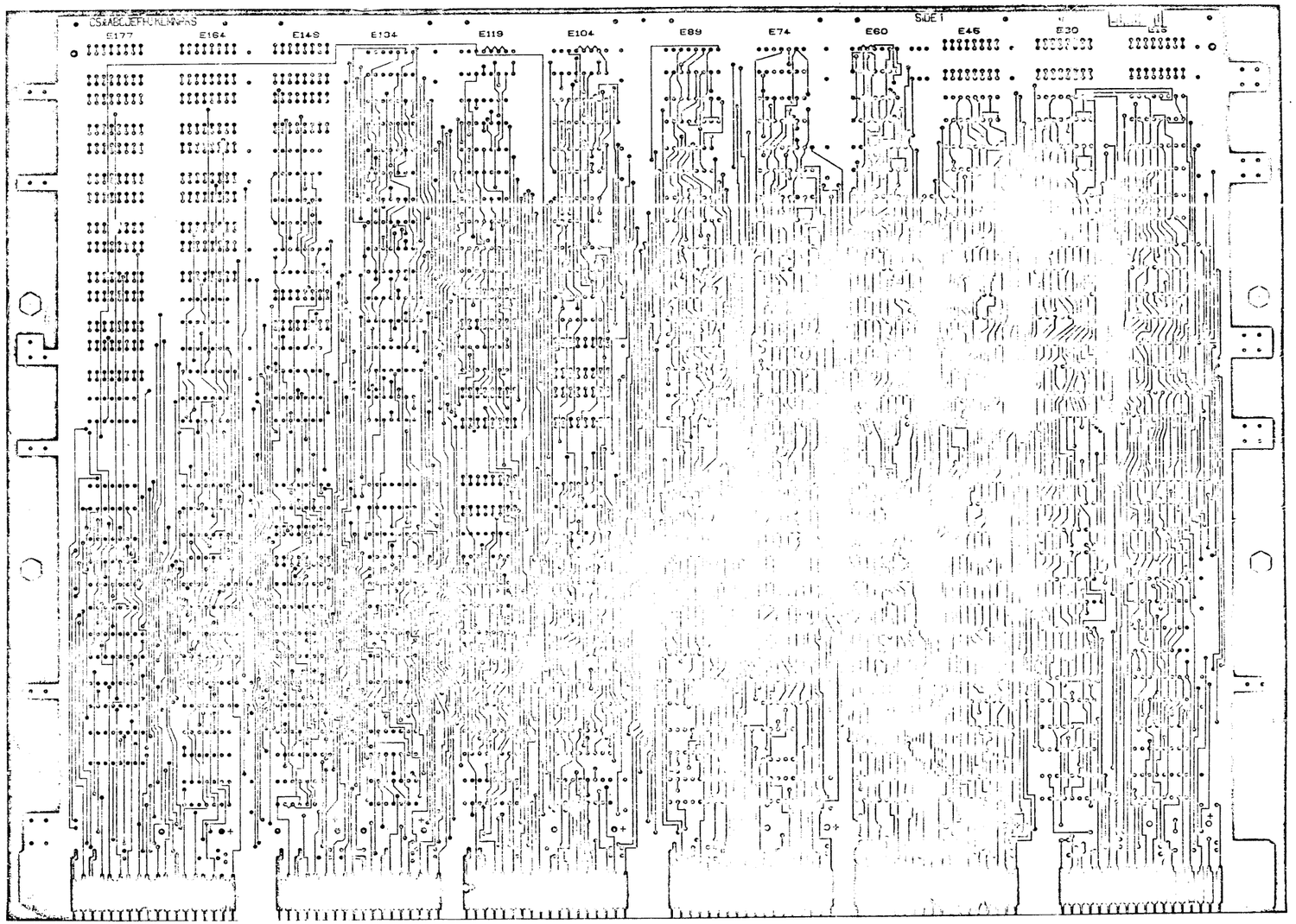

digital
TITLE IDP
SIZE E
CODE VA
NUMBER M8223-00
REV B
SIGNATURES
DATE
DRN.
CHK'D.
ENG.
PROJ. ENG.
PROD.
SCALE
SHT. 1 OF 3
NEXT HIGHER ASSY.
ETCH REV.
P.C. DESIGN DATA BASE REV. B
CHK CHANGE NO REV
NOTES:
F
E
D
C
B
A



REVISIONS		
UNIT	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV.
INSTR DATA PATH	B	01A	M-2230-0	B
SCALE 2 = 1	SHEET 2 OF 2		DIST	

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REVISIONS		
CHK	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV
INSTR DATA PATH	E	MA	M8223-0	B
SCALE 2 - 1	SHEET 3 OF 3		DIST	

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY F. MALANSON DATE 23 SEP 77	CHECKED F. SMART DATE 5-12-77	SECTION
ENG C. Coleman DATE 6-16-77	PROD Mike Torella 6-17-77 DATE	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	M8223-0-0	REF DESIGNATION
1	E-MD-5012565-0-0	5012565	ETCH BOARD	1	
2		1012784	CAP .047UF 50V	51	C1-C48,C56,C100,C101
3		1012084-C1	CAP 8UF 25V	7	C49-C55
4		1301972	RES 270,1/4 W, 5%	2	R1,R3
5		1301890	RES 560, 1/4 W, 5%	2	R2,R4
6		1300247	RES 120, 1/4 W, 5%	2	R13,R14
7		1300250	RES 150, 1/4 W, 5%	2	R15,R16
8		1300295	RES 330, 1/4 W, 5%	4	R5,R7,R9,R11
9		1301775	RES 820, 1/4W, 5%	4	R6,R8,R10,R12
10		1910532	IC DEC 74S00	7	E100,E126,E137,E139,E74,E155,E130
11		1910534	IC DEC 74S04	7	E102,E120,E127,E142,E96,E118,E170
12		1912389	IC DEC 74S08	4	E124,E134,E138,E158
13		1910536	IC DEC 74S10	6	E109,E99,E117,E116,E159,E151
14		1910537	IC DEC 74S11	6	E82,E131,E121,E132,E156,E168
15		1910539	IC DEC 74S20	2	E123,E169
16		1910541	IC DEC 74S40	3	E122,E101,E110
17		1911712	IC DEC 74S51	7	E133,E128,E146,E147,E157,E143,E125
18		1910542	IC DEC 74S64	8	E113,E115,E135,E150,E60,E59,E73,E165
19		1910544	IC DEC 74S74	2	E167,E87
20		1910547	IC DEC 74S153	13	E89,E104,E119,E103,E88,E62,E63,E78,E79 E91,E92,E106,E107

QUANTITY / VARIATION

NOTES:

E.C.O. NO. 00001

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH	E-UA-M8223-Ø-Ø	B	PL	M8223-0-Ø	B
	SHEET 1 OF 2	INSERTION PARTS LIST DATA BASE REV B			

DRB 125

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY F. MALANSON DATE 23 SEP 77	CHECKED F. SMART DATE 5-12-77	SECTION
ENG C Calaman DATE 6-16-77	PROD Mike Tirella DATE 6-1-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8223-0-0	REF DESIGNATION
[illegible]		1912845	IC DEC 74LS153	24	E8,E70,E43,E29,E14,E10,E7,E86,E58,E44, E81,E25,E56,E72,E71,E57,E26.E85,E52, E12.E27,E28,E13,E11
[illegible]		1910549	IC DEC 74S158	2	E108,E95
[illegible]		1910548	IC DEC 74S 157	22	E5,E9,E6,E65,E84,E55,E37,E40,E42,E20, E21,E64,E24,E69,E51,E23,E54,E68,E4,E17,E32,E47,
[illegible]		1910545	IC DEC 74S112	1	E166
[illegible]		1913788	IC DEC 26S10	8	E1,E16,E31,E46,E61,E75,E76 E105
[illegible]		1912693	IC DEC 25S10	8	E2,E3,E18,E19,E33,E34,E48,E49
[illegible]		1911415	IC DEC 10125	1	E77
[illegible]		1910550	IC DEC 74S174	8	E38,E35,E50,E41,E53,E22,E39,E83
[illegible]		1910957	IC DEC 74S175	7	E67,E36,E80,E66,E129,E145,E136
30		1913839	IC DEC 74LS165	6	E93,E94,E141,E153,E152,E154
31		1910552	IC DEC 74S194	1	E90
32		1210711-02	HEX HANDLE ASSEMBLY	1	
[illegible]		90CC24-01	EYELET	12	
34			SPARES	24	E15, E30, E45, E97, E98, E111, E112, E140, E144, E148, E149, E160-E164, E171-E177, E114.

NOTES:

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATCH	E-UA-M8223-Ø-Ø	B	PL	M8223-0-0	B
	SHEET 2 OF 2	INSERTION PARTS LIST DATA BASE REV B			

DRB 125

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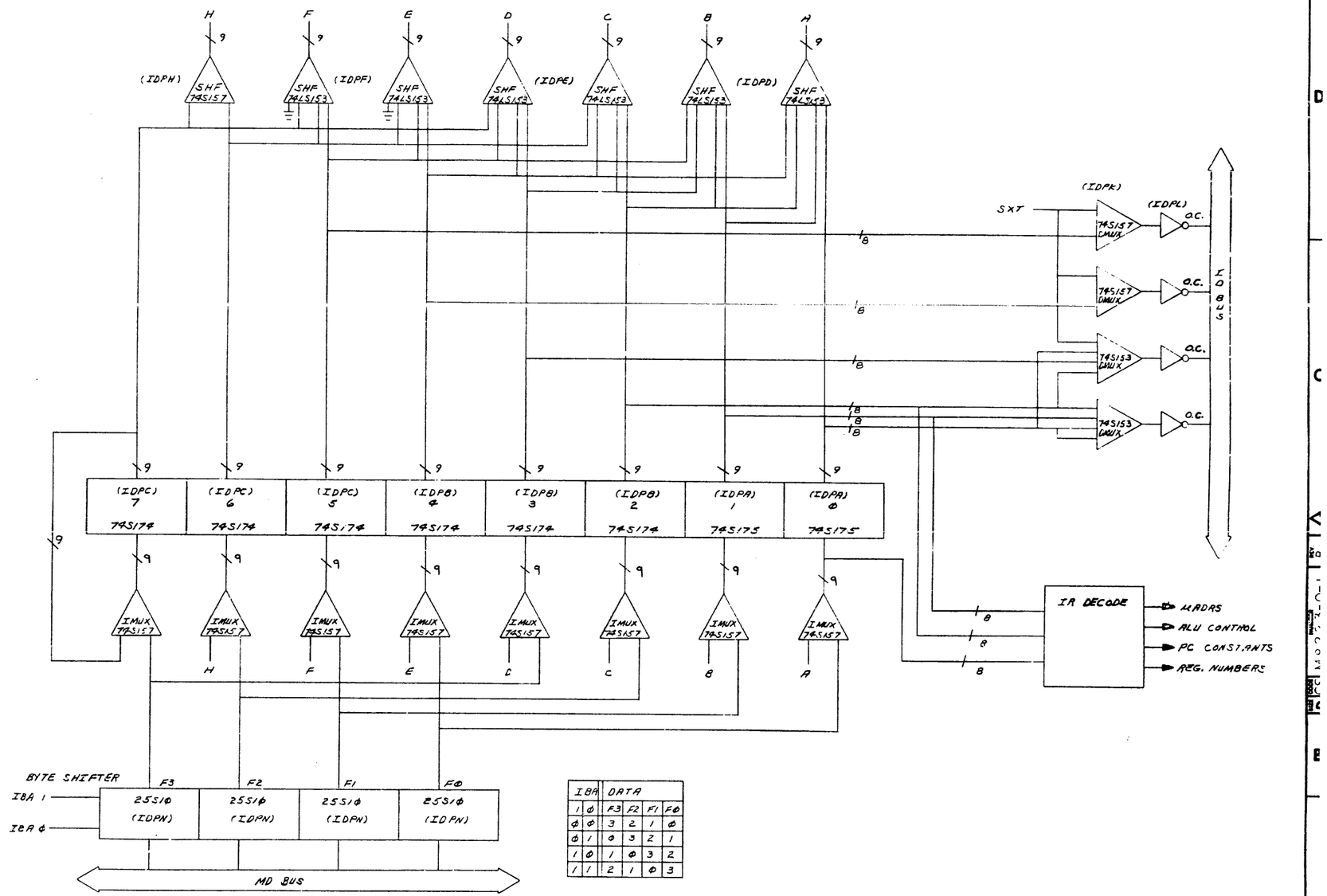

IBA		DATA			
1	0	F3	F2	F1	F0
0	0	3	2	1	0
0	1	0	3	2	1
1	0	1	0	3	2
1	1	2	1	0	3

REVISIONS			
DIR	CHANGE NO.	REV.	
	M8223-TW002	B	1 Apr 80

R. CHUNSAE

(BLOCK DIAGRAM) (SLOT 7)

DRN.		4-21-77
CHK'D		5-17-77
ENG.		5-17-77
PROJ. ENG.		5-17-77
PROD		6/1/77
NEXT HIGHER ASSY.		
SCALE		
SHEET	1 OF 14	

FIRST USED ON

digital

TITLE
INSTRUCTION DATA PATH (IDP)

SIZE	CODE	NUMBER	REV.
D	CS	M8223-0-1	B
DIST.			

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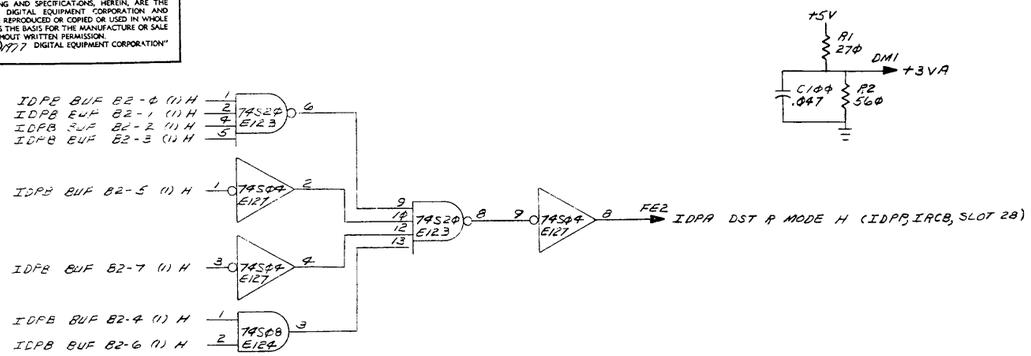

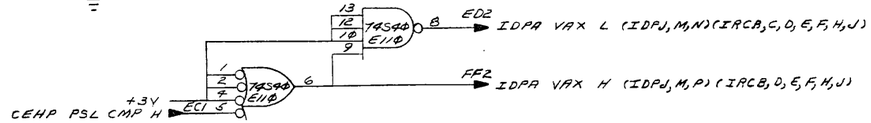

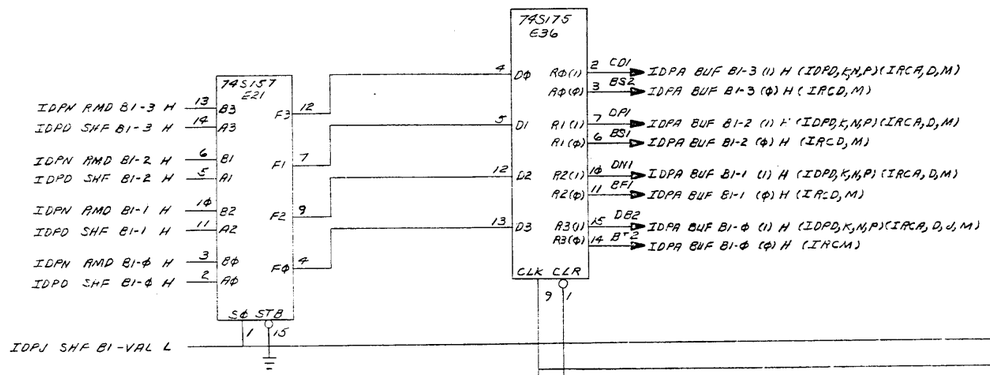

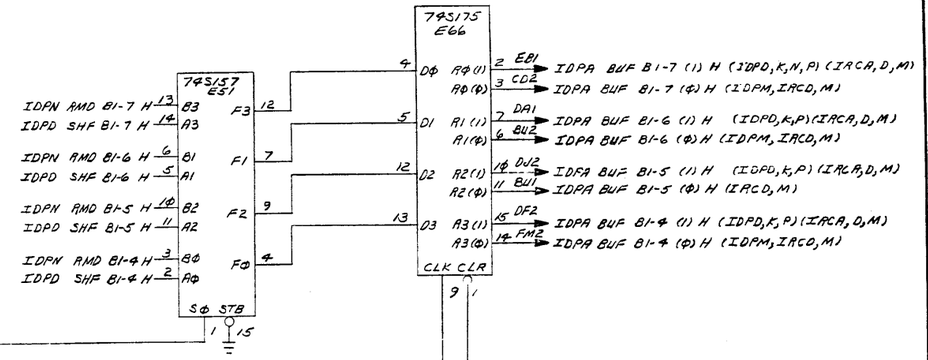

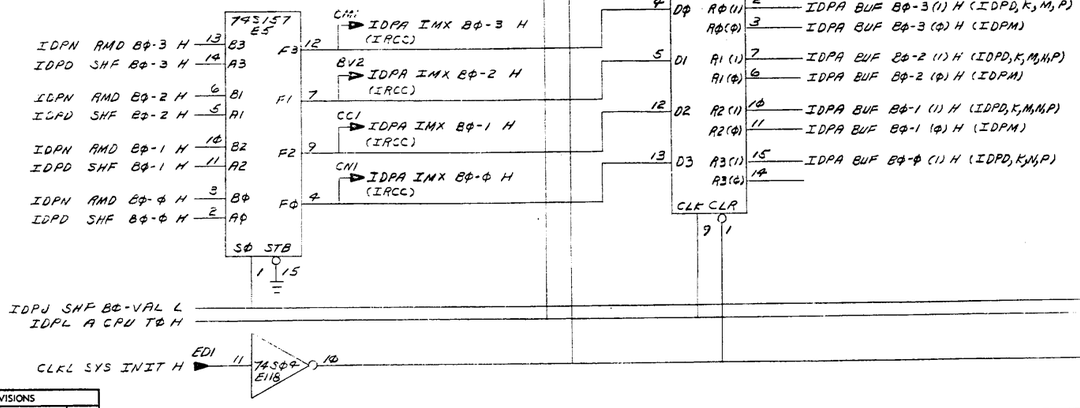

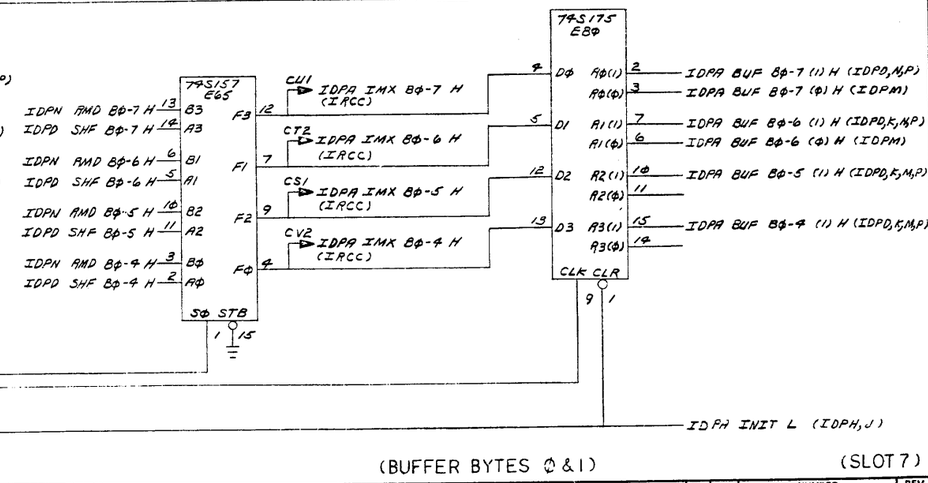

(BUFFER BYTES 0 & 1) (SLOT 7)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPA)	D	CS	M8223-0-1	B
SCALE	SHEET 2 OF 14	DIST.		

DEC FORM NO. DRD 138

167

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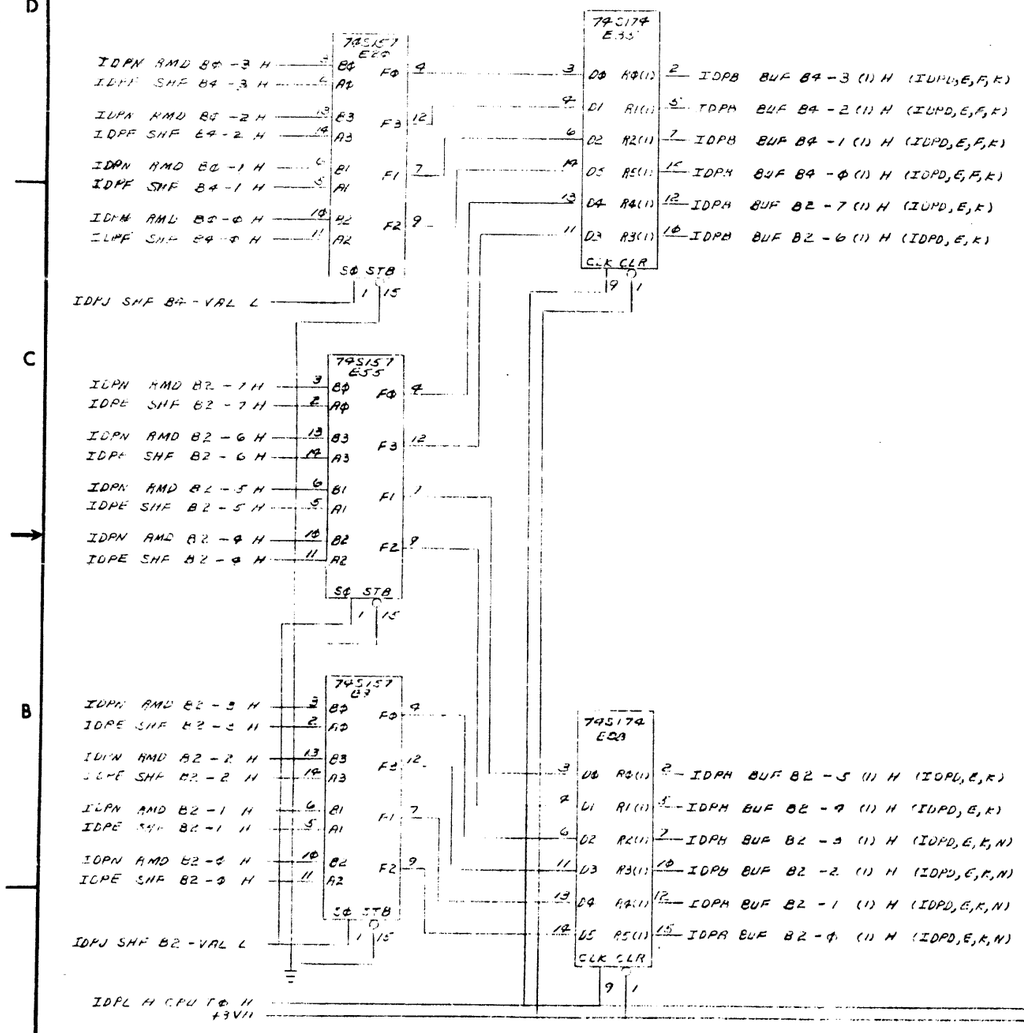

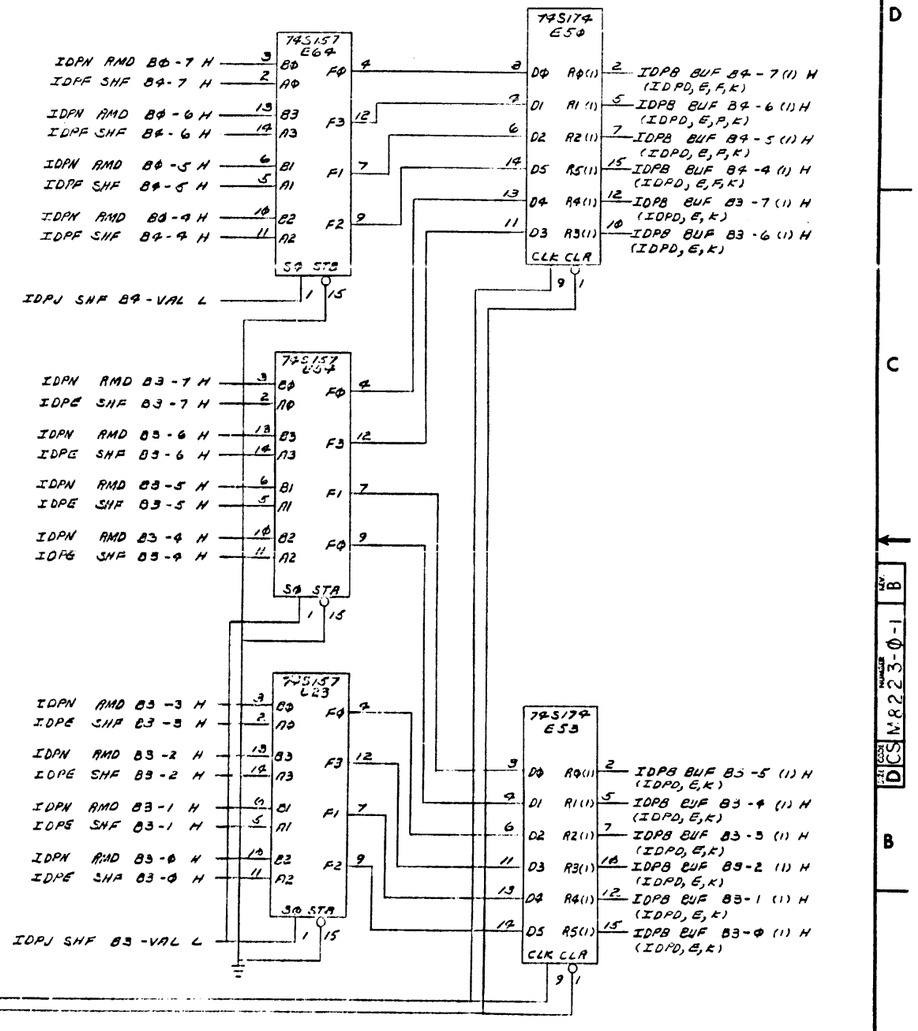

(BUFFER BYTES 2 & 3 & 4) (SLOT 7)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPB)	D	CS	M8223-0-1	B
SCALE	LAST 30F14		DWT.	

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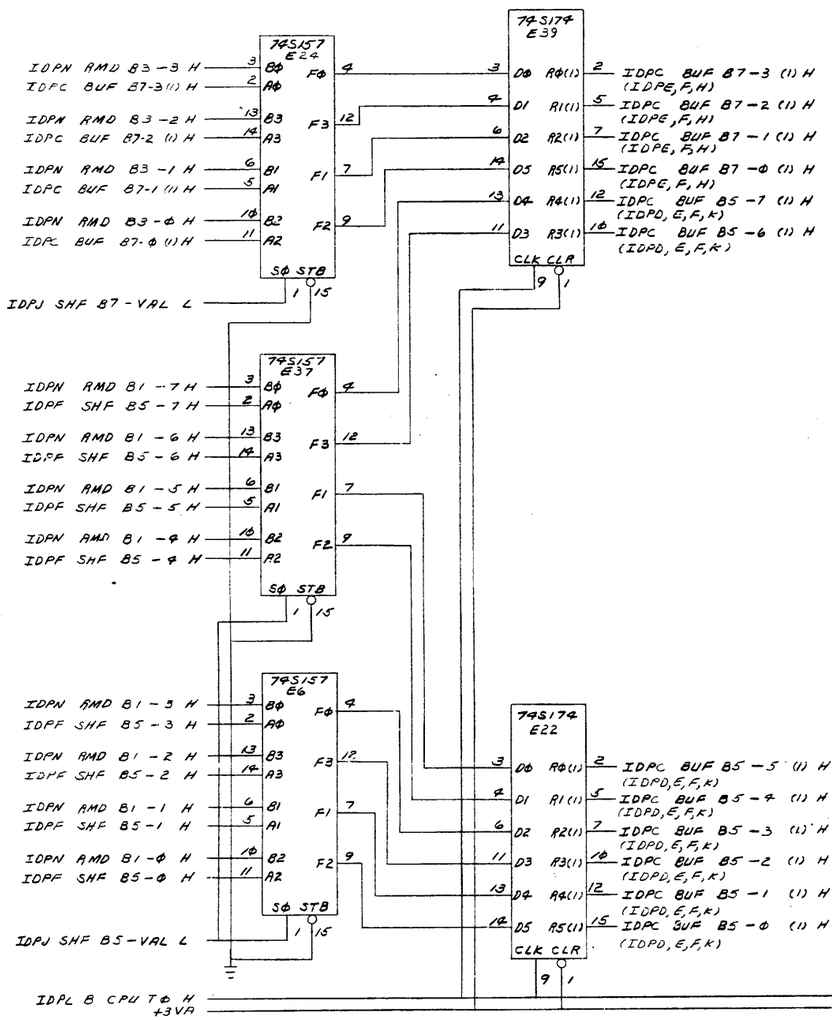

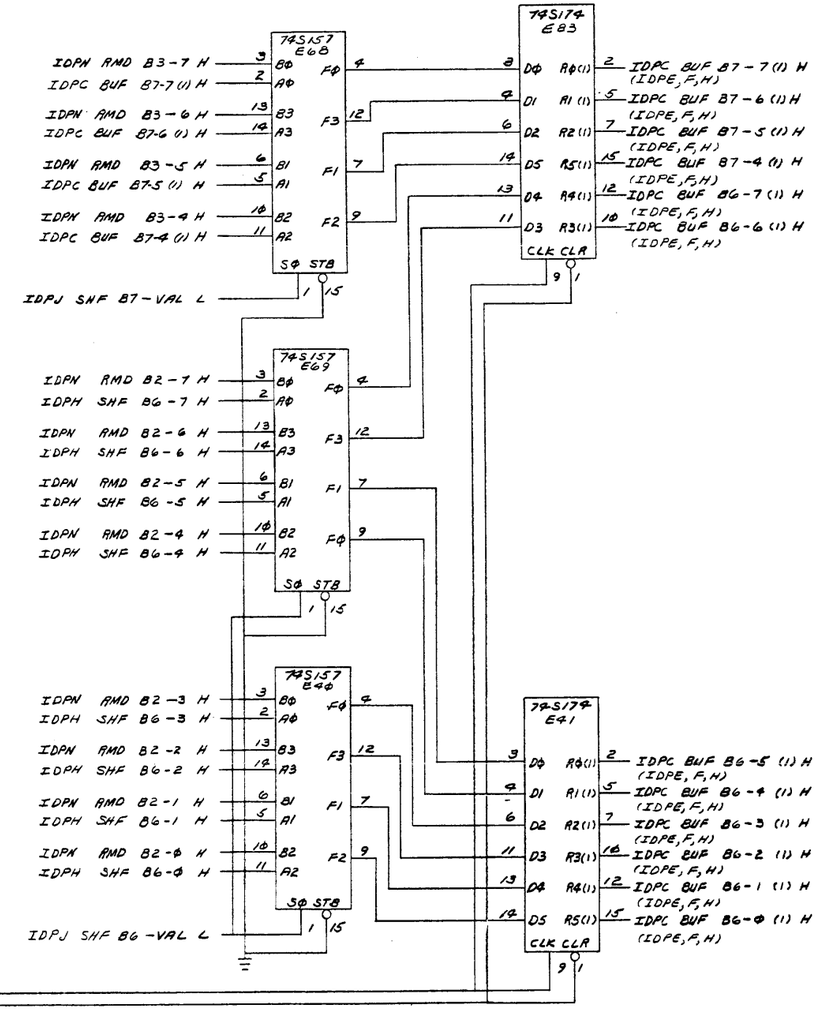

(BUFFER BYTES 5&6&7) (SLOT 7)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPC)	D	CS	M8223-Φ-1	B

SCALE — SHEET 4 OF 14 DIST. TW 1

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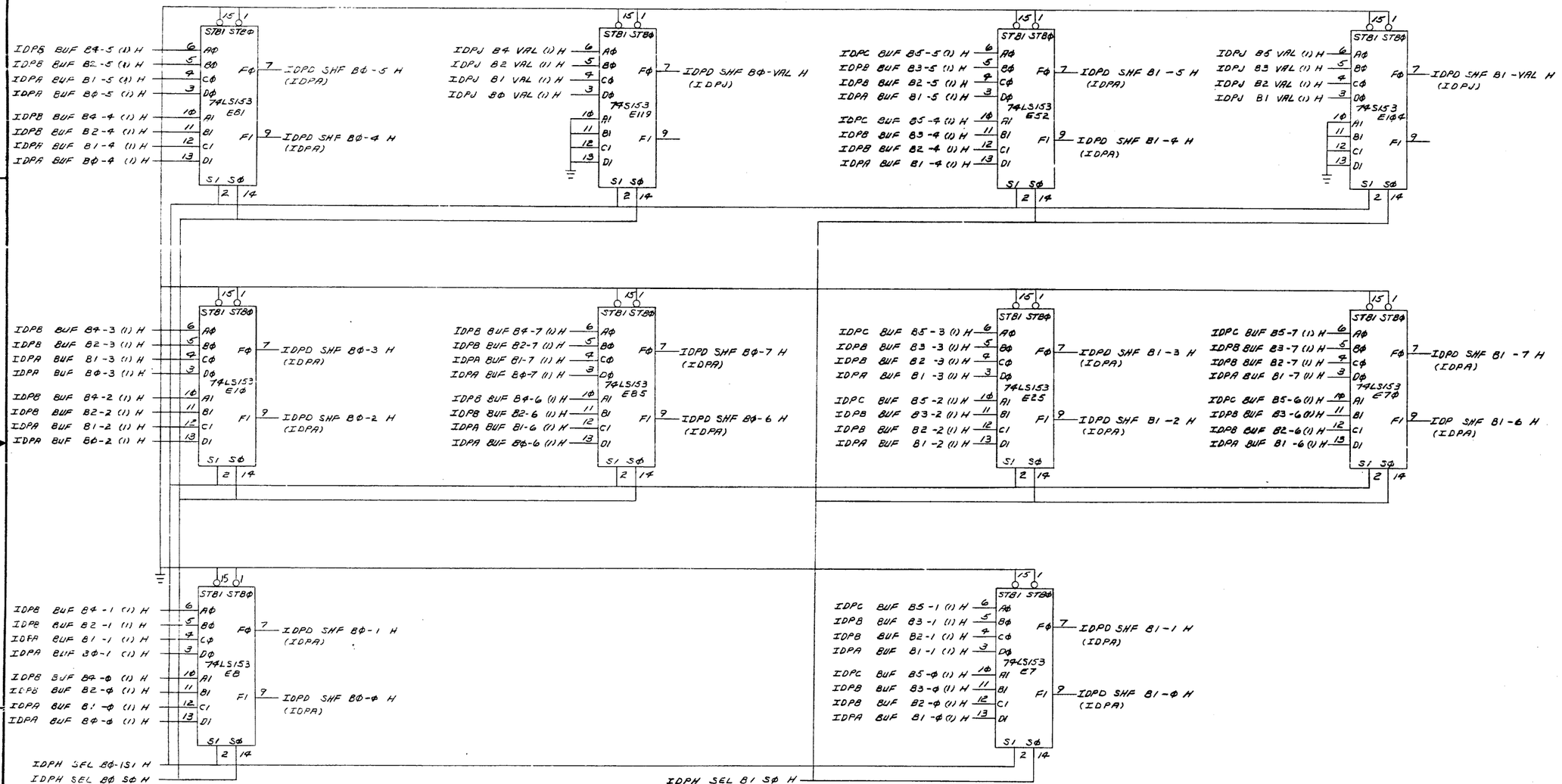

74LS153

S1	S0	FN	SHF
0	0	A	4
0	1	B	2
1	0	C	1
1	1	D	0

(SHIFTER BYTES 0 & 1) (SLOT 7)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPD)	D	CS	M8223-0-1	B
SCALE	SHEET 5 OF 14	DIST.		

DEC FORM NO. DNS 126

TW 1

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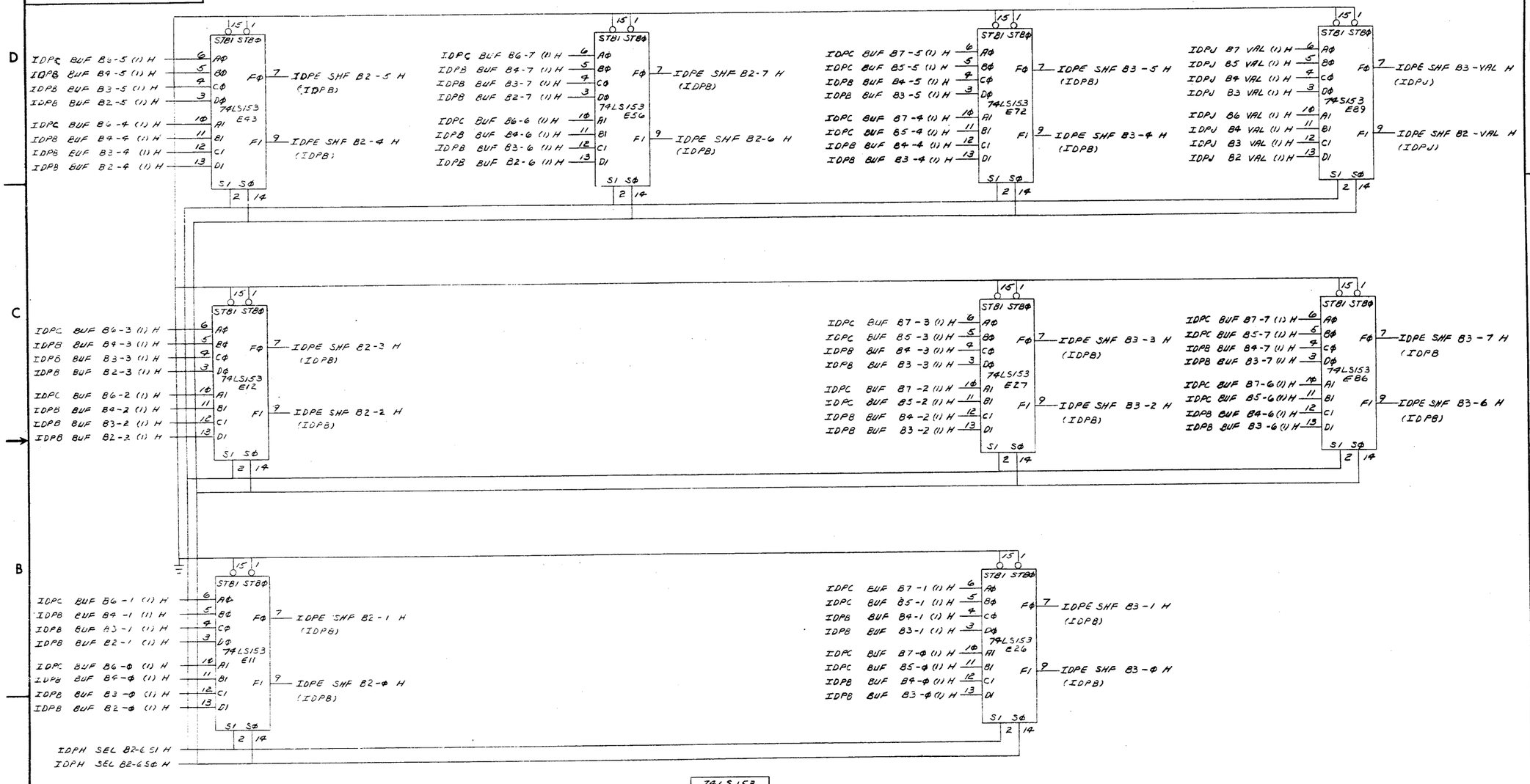

74LS153			
S1	S0	FN	SHF
0	0	A	4
0	1	B	2
1	0	C	1
1	1	D	0

(SHIFTER BYTES 2 & 3) (SLOT 7)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPE)	D	CS	M8223-0-1	B
SCALE	SHEET 6 OF 14	DIST.		

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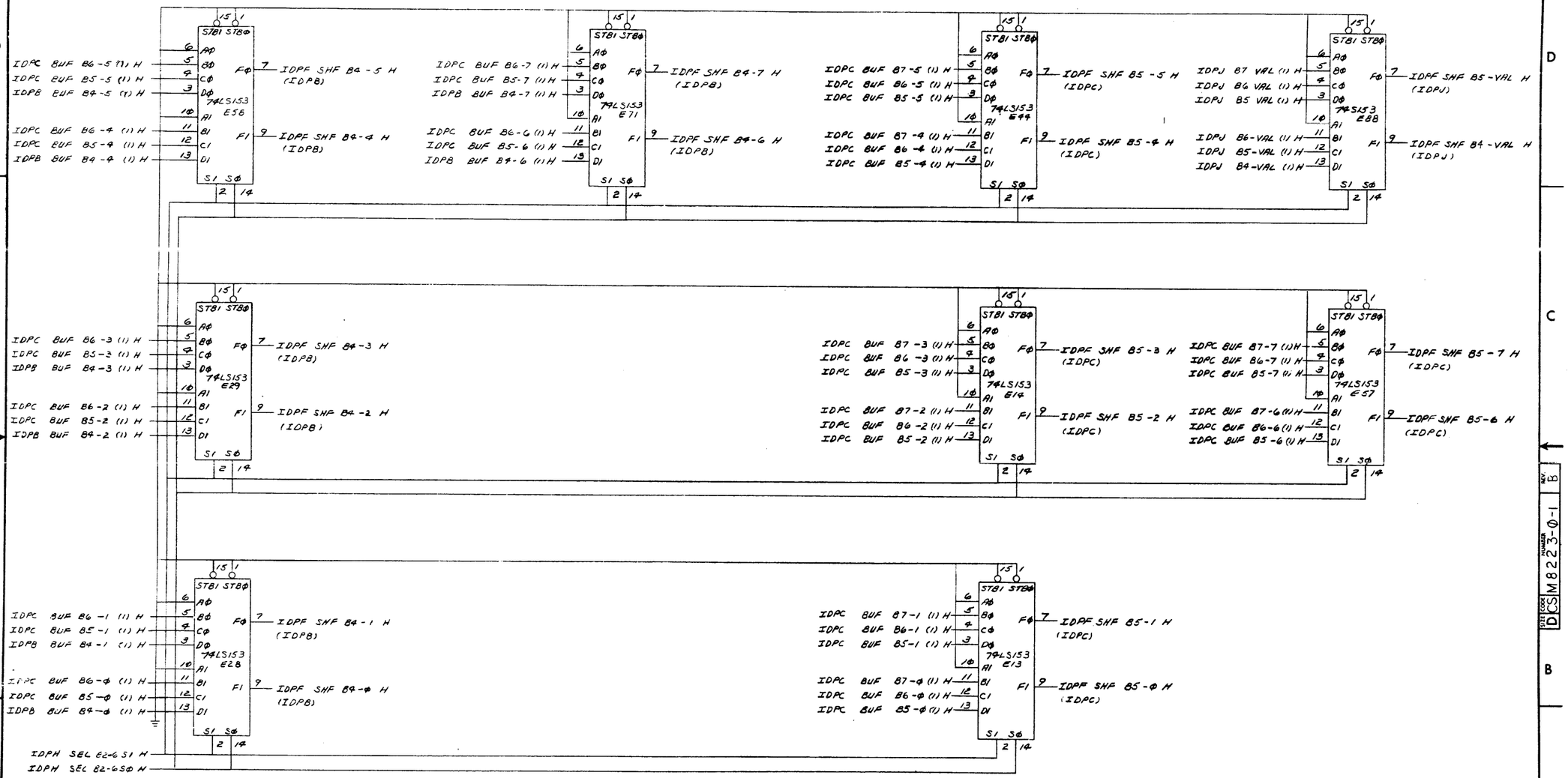

74LS153			
S1	SØ	FN	SHF
Ø	Ø	A	4
Ø	1	B	2
1	Ø	C	1
1	1	D	Ø

(SHIFTER BYTES 4&5) (SLOT 7)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPF)	D	CS	M8223-Ø-1	E
SCALE	SHEET 7 OF 14	DIST.		

DEC FORM NO. DRD 130

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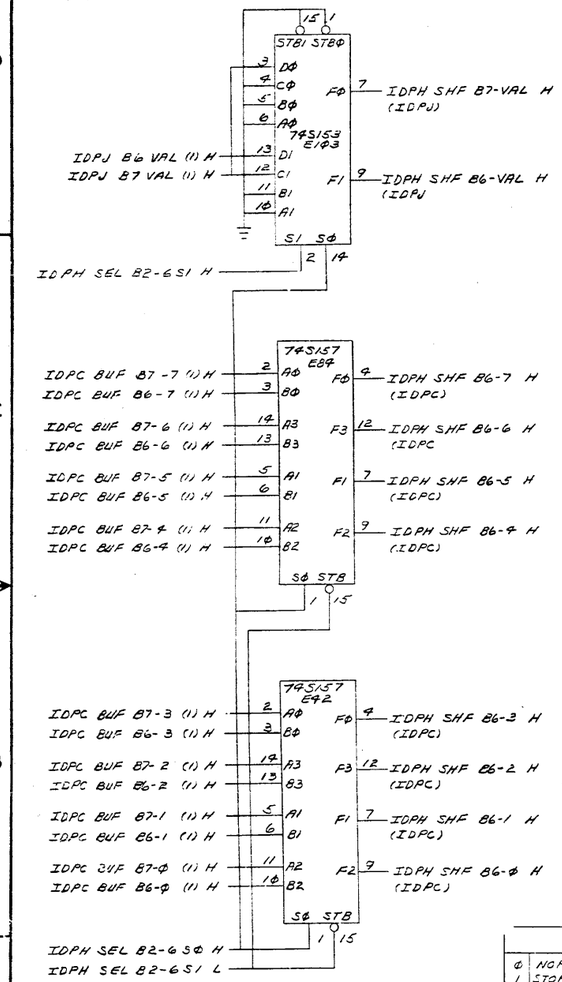

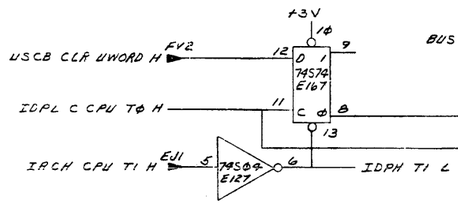

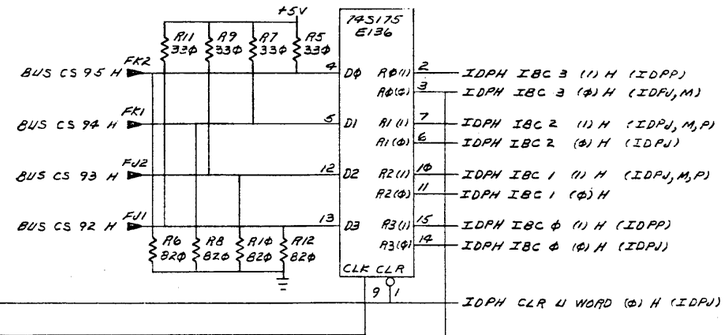

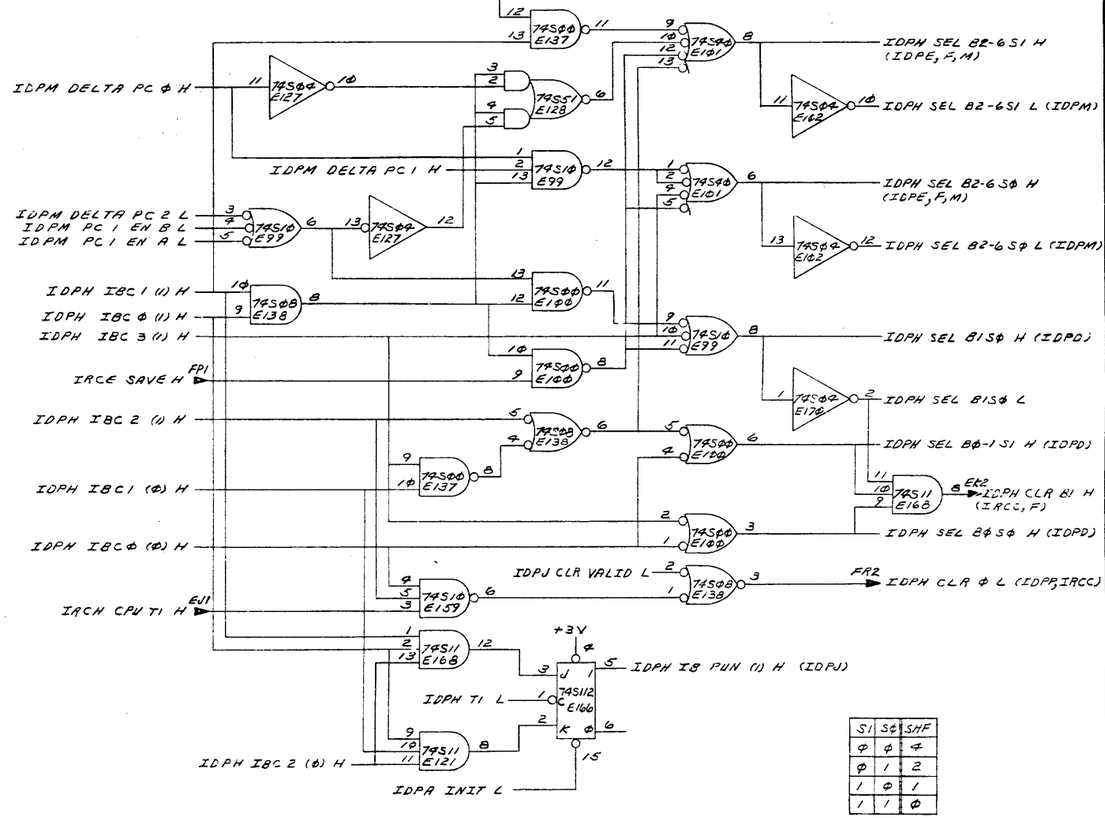

UIBC CODES			
0	NOP	8	NOT USED
1	STOP	9	NOT USED
2	FLUSH *LD YIBA	A	NOT USED
3	START	B	NOT USED
4	0, 1	C	0
5	2, 3	D	1
6	NOT USED	E	0, 1, 2, 3
7	BDEST	F	1-5 COND

S1	S0	SHF
0	0	4
0	1	2
1	0	1
1	1	0

REVISIONS		
CHK	CHANGE NO.	REV.

(SHIFTER BYTE 6 & SHIFT CONTROL) (SLOT 7)

TITLE		SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPH)		D	CS	M8223-0-1	B
SCALE	SHEET 8 OF 14	DIST.			

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IDPM IBC Ø (Ø) H
IDPM IBC 1 (1) H
IDPM IBC 2 (Ø) H
IDPM CLR W WORD (Ø) H
74S24Ø E167
74S04Ø E142
IDPJ FLUSH H (IDPM)
FC1
IDPJ FLUSH L (IDPM,P)(DCPJ)(TBMC,W)(SBLS)

IDPM IBC 2 (1) H
IDPM IBC 1 (Ø) H
74S00 E126
74S00 E155
IDPH IB RUN (1) H
+3V
SBLR IB READ DATA L
FU2
74S74 E167
IDPL C CPU T0 H
IDPA INIT L
IRCE SAVE H
FPI
IDPJ B7 VAL (1) H
IDPH IBC 3 (Ø) H
74S64 E165
FRI
IDPJ IB REQ H (SBLS)
74S11 E150
EV2
IDPJ COUNT H (IDPP)(DCPH,J)(TBMM)
IDPM PC EVEN L
74S00 E74

IDPD SMF B1-VAL H
IDPM IBA 1 H
IDPE SMF B2-VAL H
IDPM IBA Ø L
IDPM IBA 1 L
IDPD SMF B0-VAL H
IDPM IBA Ø H
IDPE SMF B3-VAL H
IDPF SMF B4-VAL H
IDPF SMF B5-VAL H
IDPH SMF E6-VAL H
IDPH SMF 37-VAL H
74S04 E182
74S10 E117
74S08 E138
74S11 E132
74S11 E131
74S11 E130

IDPJ SMF B1-VAL L (IDPA)
IDPJ MARK B2 VAL L
IDPJ SMF B2-VAL L (IDPB)
IDPJ MARK B3 VAL L
IDPJ MARK B4 VAL L
IDPJ SMF B3-VAL L (IDPB)
IDPJ MARK B5 VAL L
IDPJ SMF B4-VAL L (IDPB)
IDPJ MARK B6 VAL L
IDPJ SMF B5-VAL L (IDPC)
IDPJ MARK B7-VAL L
IDPJ SMF B6-VAL L (IDPC)
IDPJ SMF B7-VAL L (IDPC)(SLOT 7)

74S51 E128
74S51 E146
74S51 E133
74S51 E139
74S51 E147
74S51 E148

74S175 E195
D0 R0(1) R0(0) 2 9
D1 R1(1) R1(0) 7 6
D2 R2(1) R2(0) 10 11
D3 R3(1) R3(0) 15 14
CLR CLK 1 9
ESI
EPI
IDPJ B7 VAL (1) H (IDPE,F,M)
IDPJ B6 VAL (1) H (IDPE,F,M)
IDPJ B5 VAL (1) H (IRCE)(IDPD,E,F,M,P)
IDPJ B4 VAL (1) H (IRCE)(IDPD,E,F,P)

74S175 E129
EP2
ES2
EP1
ES1
IDPJ B3 VAL (1) H (IDPD,E)
IDPJ B3 VAL (Ø) H (IDPB,IRCE)
IDPJ B2 VAL (1) H (IDPD,E,M)
IDPJ B2 VAL (Ø) H (IDPM,IRCE) (SLOT 28)
IDPJ B1 VAL (1) H (IDPD,M)
IDPJ B1 VAL (Ø) H (IRCE) (SLOT 28)
IDPJ B0 VAL (1) H (IDPD)
IDPJ B0 VAL (Ø) H (IRCE)

IDPM IBA 1 H
IDPM IBA Ø H
74S11 E156
IDPJ MARK B1 VAL L
IDPL C CPU T0 H
74S00 E138
IDPD SMF B0-VAL H
74S04 E118
IDPJ SMF B0-VAL L (IDPA)
IDPJ FLUSH H
IRCN CPU T1 H
EJI
74S00 E130
IDPJ CLR VALID L (IDPH)

(BUFFER VALID BITS, REQUEST) (SLOT 7)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPJ)	D	CS	M8223-Ø-1	B
SCALE	SHEET 9 OF 14	DIST.		

DCS M8223-Ø-1 REV B

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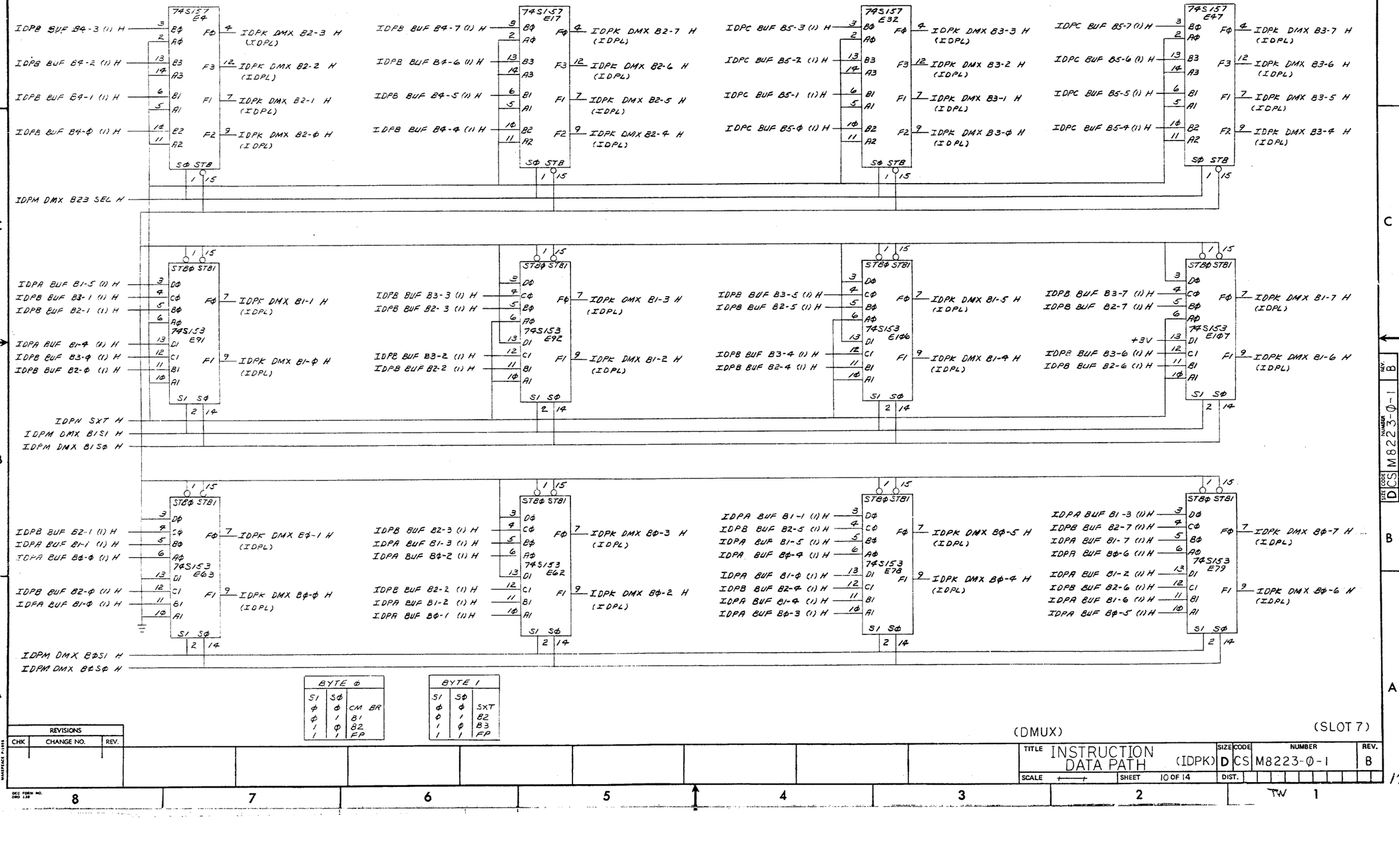

BYTE Φ		
S1	SΦ	
Φ	Φ	CM BR
Φ	1	B1
1	Φ	B2
1	1	FP

BYTE 1		
S1	SΦ	
Φ	Φ	SXT
Φ	1	B2
1	Φ	B3
1	1	FP

REVISIONS		
CHK	CHANGE NO.	REV.

(DMUX) (SLOT 7)

TITLE		SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPK)		D	CS	M8223-Φ-1	B
SCALE	SHEET 10 OF 14	DIST.			

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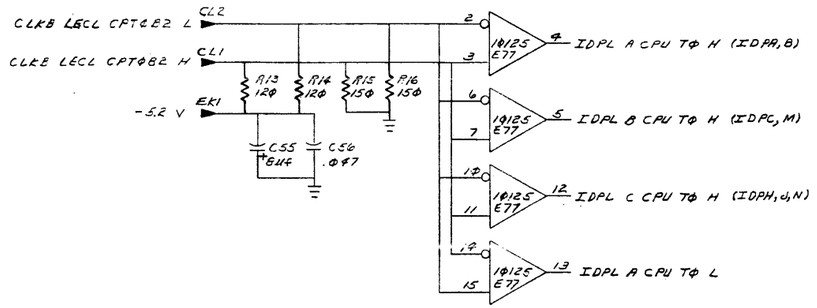

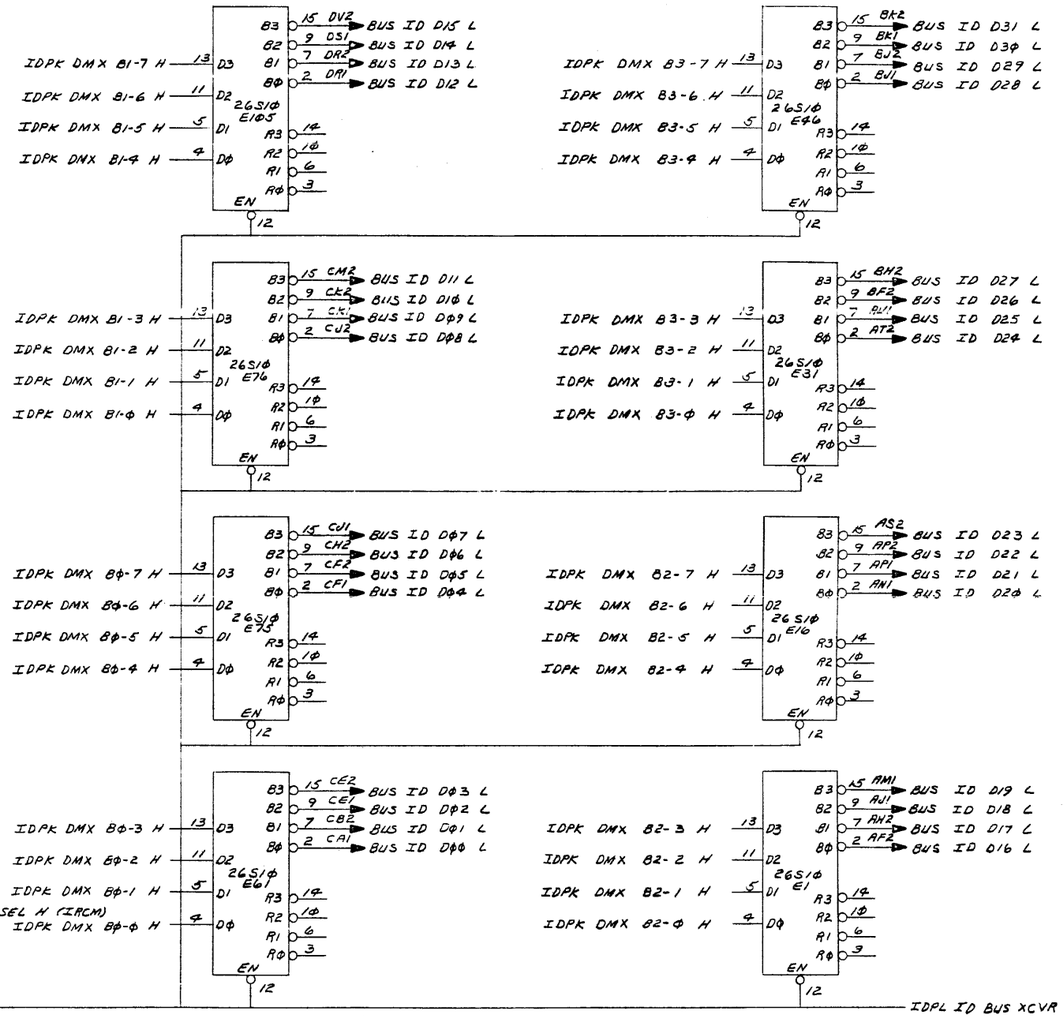

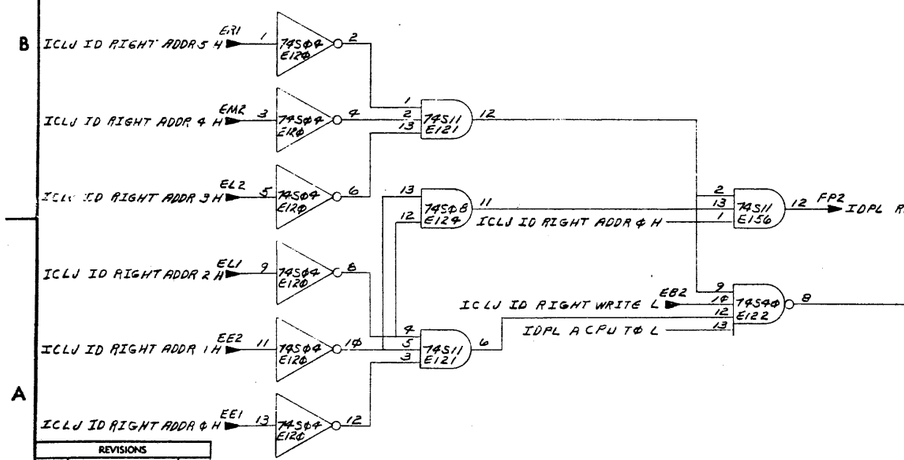

(CLOCKS, ADR DECODE, BUS DRIVERS) (SLOT 7)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPL)	D	CS	M8223-Φ-1	B
SCALE	SHEET 11 OF 14	DIST.		

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IDPA BUF B¢-4 (1) H
IDPA BUF B¢-3 (¢) H
IDPA BUF B¢-2 (¢) H
IDPA BUF B¢-1 (¢) H
74S11 E82
IDPA BUF B¢-5 (1) H
IDPA BUF B¢-6 (¢) H
74S64 E115
FU1
IDPM 16 BIT BDEST L (IDPP, IRCD)
IDPA BUF B¢-7 (¢) H
IDPA BUF B¢-7 (¢) H
IDPA BUF B¢-6 (¢) H
IDPA BUF B¢-4 (1) H
74S11 E82
74S08 E124
IDPA VAX H
IDPH IBC 3 (¢) H
IDPH IBC 2 (1) H
IDPH IBC 1 (1) H
74S11 E168
74S51 E143
74S04 E170
FM1
IDPM BDEST H (IDPP) (IRCD)
EF2
IDPM BDEST L (IRCD, E)
IRCD PC MODE H
FH2
74S00 E155
IDPA BUF B¢-3 (¢) H
IDPA BUF B¢-2 (1) H
IDPA BUF B¢-1 (1) H
IDPA BUF B¢-5 (1) H
74S64 E113
IDPA BUF B¢-3 (1) H
+3V
IRCE CTX 3 L
IRCD SEL LONG L
FL2
EN1
74S51 E143
IDPM REAL PC MODE L
IDPM DMX B23 SEL H (IDPK)
74S04 E192
IDPM DMX B1 S¢ L (IDPN)
74S00 E139
IDPM DMX B1 S¢ H (IDPK)
74S04 E96
IDPM DMX B¢ S1 L (IDPN)
IRCH FPSL L
EU1
74S00 E132
IDPM DMX B¢ S1 H (IDPK)
74S04 E96
IDPM DMX B¢ S¢ L (IDPN)
IDPM BDEST L
IDPM VAXSL L
74S00 E131
IDPM DMX B¢ S¢ H (IDPK,N)
IDPM 16 BIT BDEST L
IRCD SEL BYTE H
FF1
74S00 E155
IDPM BYTE 2 SXT L (IDPN)
IDPA BUF B1-7 (¢) H
IDPA BUF B1-6 (¢) H
IDPA VAX H
74S10 E116
EU2
IDPM VAXSL L (IDPP, IRCB) (SLOT 28)
74S04 E192
EM1
IDPM VAXSL H (IRCH)
IDPM REAL PC MODE L
74S64 E135
IDPM DMX B1 S1 H (IDPK)
IRCE CTX 2 L
IRCE CTX 3 L
IRCD SEL WORD L
IRCH FPSL L
FL1
FL2
FE1
EU1
IDPM IBA 1 H
DCPJ VA ¢1 (1) H
FS2
74S51 E157
IDPJ FLUSH L
IDPM IBA ¢ H
IDPJ FLUSH H
DCPJ VA ¢¢ (1) H
FT2
74S51 E157
IDPM DIBA 1 L
IDPM DIBA ¢ L
IRCE SAVE H
FP1
74S04 E118
IDPM DELTA PC 2 L (IDPH)
74S08 E158
EN1
IDPM BDELTA PC 2 H (IDPP, DCPH)
IDPM DELTA PC 2 H (IDPH)
IDPM DMX B23 SEL H
74S04 E192
74S04 E192
IDPA BUF B1-4 (¢) H
74S10 E151
IDPM PC 1 EN B L (IDPH)
IDPM DELTA PC 1 H (IDPH)
74S00 E137
IRCD SEL LONG L
FN1
IRCD SEL BYTE H
FF1
74S10 E151
IDPM PC 1 EN A L (IDPH)
74S08 E158
ET2
IDPM BDELTA PC 1 H (IDPP, DCPH)
74S00 E137
IRCE CTX 3 L
IRCE CTX 2 L
FL2
FL1
74S08 E158
FA1
IDPM B DELTA PC ¢ H (IDPP, DCPH)
IDPM REAL PC MODE L
74S64 E150
IDPM DELTA PC ¢ H (IDPH)
IDPA VAX L
IRCD SELWORD L
FE1
IDPH SEL B2-6 S1 H
IDPH SEL B2-6 S¢ L
IDPH SEL B2-6 S¢ H
IDPH SEL B2-6 S1 L
74S67 E73
+3V
74S79 E87
IDPL B CPU T¢ H
74S64 E59
IDPM IBA 1 H (IDPJ)
IDPM IBA 1 L (IDPJ)
74S04 E96
IDPM BIBA 1 H (IDPN)
74S00 E77
IDPM PC EVEN L (IDPJ)
74S64 E60
IDPM BIBA ¢ H (IDPN)
IDPM IBA ¢ L (IDPJ)
74S04 E96
IDPM IBA ¢ H (IDPJ)

(DMX SELECTS, BDEST, DELTA PC, IBA ¢ & 1) (SLOT 7)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPM)	D	CS	M8223-¢-1	B
SCALE	SHEET 12 OF 14	DIST.		

DEC FORM NO. DRD 158 MAKEPEACE P-1899

1977

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IRCE LOAD PRN H
FS1
74S195 E94
S1 S0 DSR
D0 D1 D2 D3 CLK CLR DSL
R0 (1) R1 (1) R2 (1) R3 (1)
DH2 DD2 DD1 DF1
DU1 DC1 DB1 DM2
IDPN PRN ADR 3 L (DAPL,M,R)
IDPN PRN ADR 2 L (DAPL,M,R)
IDPN PRN ADR 1 L (DAPL,M,R)
IDPN PRN ADR Φ L (DAPL,M,R)
IDPL C CPU TΦ H
+3V A

74S158 E95
IDPA BUF B1-3 (1) H
IDPA BUF B1-Φ (1) H
IDPA BUF B1-2 (1) H
IDPA BUF BΦ-7 (1) H
IDPA BUF B1-1 (1) H
IDPA BUF BΦ-6 (1) H
IDPN SP1 ADR 3 L (DAPL,M,R) (SLOT 28)
IDPN SP1 ADR 2 L (DAPL,M,R) (SLOT 28)
IDPN SP1 ADR 1 L (DAPL,M,R) (SLOT 28)
IDPN SP1 ADR Φ L (DAPL,M,R) (SLOT 28)
IDPA VAX L

74S158 E108
IDPB BUF B2-3 (1) H
IDPA BUF BΦ-2 (1) H
IDPB BUF B2-2 (1) H
IDPA BUF BΦ-1 (1) H
IDPB BUF B2-1 (1) H
IDPA BUF BΦ-Φ (1) H
IDPB BUF B2-Φ (1) H
DU1 DU2 DT2 EA1
IDPN SP2 ADR 3 L (DAPL,M,R) (SLOT 28)
IDPN SP2 ADR 2 L (DAPL,M,R) (SLOT 28)
IDPN SP2 ADR 1 L (DAPL,M,R) (SLOT 28)
IDPN SP2 ADR Φ L (DAPL,M,R) (SLOT 28)

IDPM 16 BIT BDEST L
IDPM BYTE 2 SXT L
74S51 E125
IDPB BUF B2-7 (1) H
IDPM DMX B1 S1 H
74S08 E126
IDPM DMX B1 SΦ L
IDPM DMX B1 S1 H
IDPB BUF B3-7 (1) H
74S10 E103
IDPM DMX BΦ SΦ H
IDPA BUF B1-7 (1) H
IDPM DMX BΦ S1 L
IDPM DMX BΦ S1 L
IDPA BUF BΦ-7 (1) H
74S10 E103
74S04 E128
IDPN SXT H (IDPK)

25S10 E2
BUS MD Φ1 H AK1
BUS MD Φ9 H BM1
BUS MD 17 H AB1
BUS MD 25 H BB1
IDPN RMD BΦ-1 H (IDPA,B)
IDPN RMD B1-1 H (IDPA,C)
IDPN RMD B2-1 H (IDPB,C)
IDPN RMD B3-1 H (IDPB,C)

25S10 E19
BUS MD Φ3 H AL1
BUS MD 11 H BN1
BUS MD 19 H AC1
BUS MD 27 H BC1
IDPN RMD BΦ-3 H (IDPA,B)
IDPN RMD B1-3 H (IDPA,C)
IDPN RMD B2-3 H (IDPB,C)
IDPN RMD B3-3 H (IDPB,C)

25S10 E34
BUS MD Φ5 H AM2
BUS MD 13 H BP2
BUS MD 21 H AD2
BUS MD 29 H BD2
IDPN RMD BΦ-5 H (IDPA,B)
IDPN RMD B1-5 H (IDPA,C)
IDPN RMD B2-5 H (IDPB,C)
IDPN RMD B3-5 H (IDPB,C)

25S10 E49
BUS MD Φ7 H AR2
BUS MD 15 H BR2
BUS MD 23 H AE2
BUS MD 31 H BE2
IDPN RMD BΦ-7 H (IDPA,B)
IDPN RMD B1-7 H (IDPA,C)
IDPN RMD B2-7 H (IDPB,C)
IDPN RMD B3-7 H (IDPB,C)

25S10 E3
BUS MD ΦΦ H AV2
BUS MD Φ8 H BL1
BUS MD 16 H AA1
BUS MD 24 H BA1
IDPN RMD BΦ-Φ H (IDPA,B)
IDPN RMD B1-Φ H (IDPA,C)
IDPN RMD B2-Φ H (IDPB,C)
IDPN RMD B3-Φ H (IDPB,C)

25S10 E18
BUS MD Φ2 H AK2
BUS MD 1Φ H BM2
BUS MD 18 H AB2
BUS MD 26 H BB2
IDPN RMD BΦ-2 H (IDPA,B)
IDPN RMD B1-2 H (IDPA,C)
IDPN RMD B2-2 H (IDPB,C)
IDPN RMD B3-2 H (IDPB,C)

25S10 E33
BUS MD Φ4 H AL2
BUS MD 12 H BP1
BUS MD 2Φ H AD1
BUS MD 28 H BD1
IDPN RMD BΦ-4 H (IDPA,B)
IDPN RMD B1-4 H (IDPA,C)
IDPN RMD B2-4 H (IDPB,C)
IDPN RMD B3-4 H (IDPB,C)

25S10 E98
BUS MD Φ6 H AR1
BUS MD 14 H BR1
BUS MD 22 H AE1
BUS MD 3Φ H BE1
IDPN RMD BΦ-6 H (IDPA,B)
IDPN RMD B1-6 H (IDPA,C)
IDPN RMD B2-6 H (IDPB,C)
IDPN RMD B3-6 H (IDPB,C)

IDPM BIBA Φ H
IDPM BIBA 1 H

S1	SΦ	OUTA/BYTES
Φ	Φ	321Φ
Φ	1	Φ321
1	Φ	1Φ32
1	1	21Φ3

(REG ADRS, SXT, MD BYTE SHIFTER) (SLOT 7)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH (IDPN)	D	CS	M8223-Φ-1	B
SCALE	SHEET 13 OF 14	DIST.		

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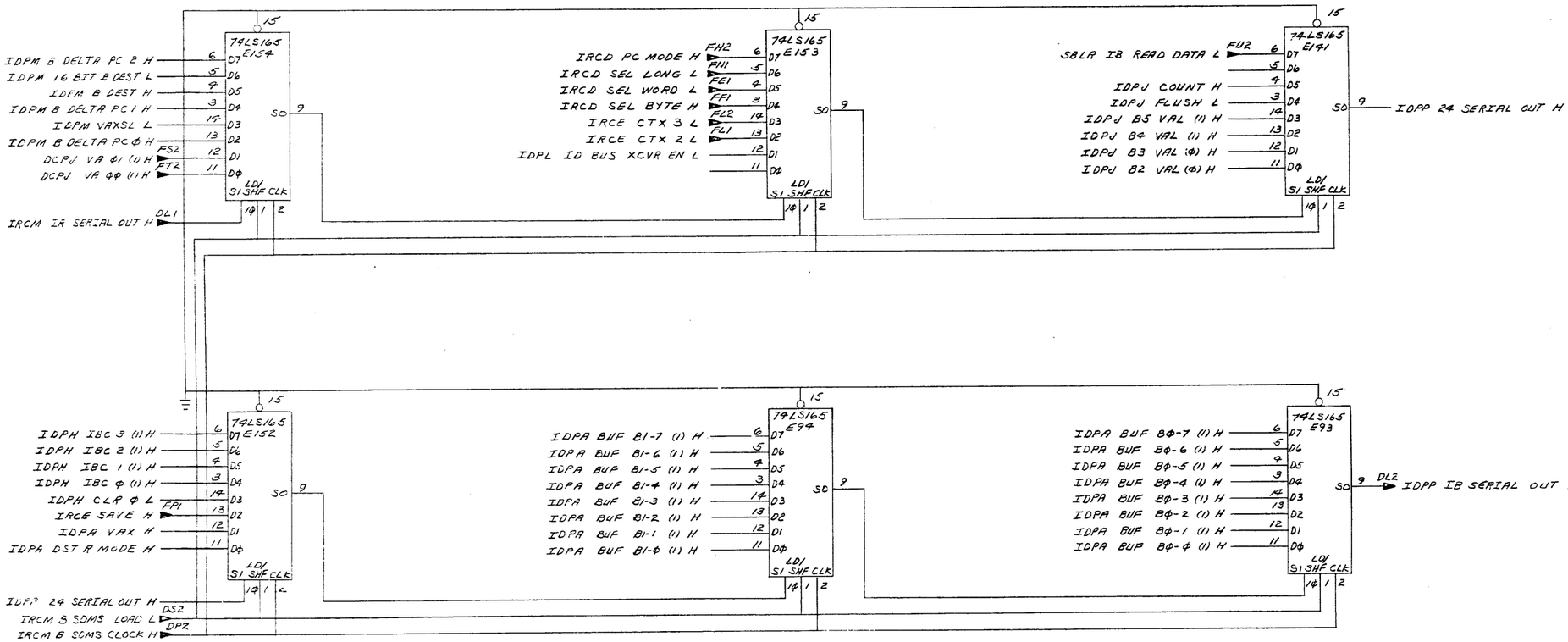


REVISIONS		
CHK	CHANGE NO.	REV.

(V-BUS) (SLOT 7)

TITLE		SIZE	CODE	NUMBER	REV.
INSTRUCTION DATA PATH	(IDPP)	D	CS	M8223-Ø-1	B
SCALE	SHEET 14 OF 14	DIST.			

COMPONENT SIDE VIEW

0-1 0-2 0-3 0-4 0-5 0-6 2-9 2-1 2-2 2-8 2-7 2-10

0-16 2-3 1-1 2-4 0-7 2-5 1-3 1-2 2-6 1-4

E157 E140 E123 E115 E101 E89 E76 E64 E51 E38 E25 E12
E156 E142 E128 E114 E100 E88 E75 E63 E50 E37 E24 E11
E155 E141 E127 E113 E99 E87 E74 E62 E49 E36 E23 E10
E154 E140 E126 E112 E98 E86 E73 E61 E48 E35 E22 E9
E153 E139 E125 E111 E97 E85 E72 E60 E47 E34 E21 E8
E152 E138 E124 E110 E96 E84 E71 E59 E46 E33 E20 Y1
E151 E137 E123 E109 E95 E83 E70 E58 E45 E32 E19 E7
E150 E136 E122 E108 E94 E82 E69 E57 E44 E31 E18 E6
E149 E135 E121 E107 E93 E81 E68 E56 E43 E30 E17 E5
E148 E134 E120 E106 E92 E80 E67 E55 E42 E29 E16 E4
E147 E133 E119 E105 E92 E79 E67 E54 E41 E28 E15 E3
E146 E132 E118 E104 E91 E78 E66 E53 E40 E27 E14 E2
E145 E131 E117 E103 E91 E78 E66 E53 E40 E27 E14 E2
E144 E130 E116 E102 E90 E77 E65 E52 E39 E26 E13 E1

C55 C54 C53 C52 C51 C50 C49 C48

F E D C B A

V U T S R P N M L K J H F E D C B A

DATE	SIGNATURES
4-18-79	DRN.
5-17-79	CHK.
7-11-79	ENG.
	PROJ.ENG.
	PROD.
	SYS.E.

TITLE: WASHINGTON RECEIVER AND CLOCK
SIZE: E | DWG NO: M8274-0-0 | REV: C
SHEET 1 OF 4 | NEXT HIGHER ASSY: M8274-0-0

digital

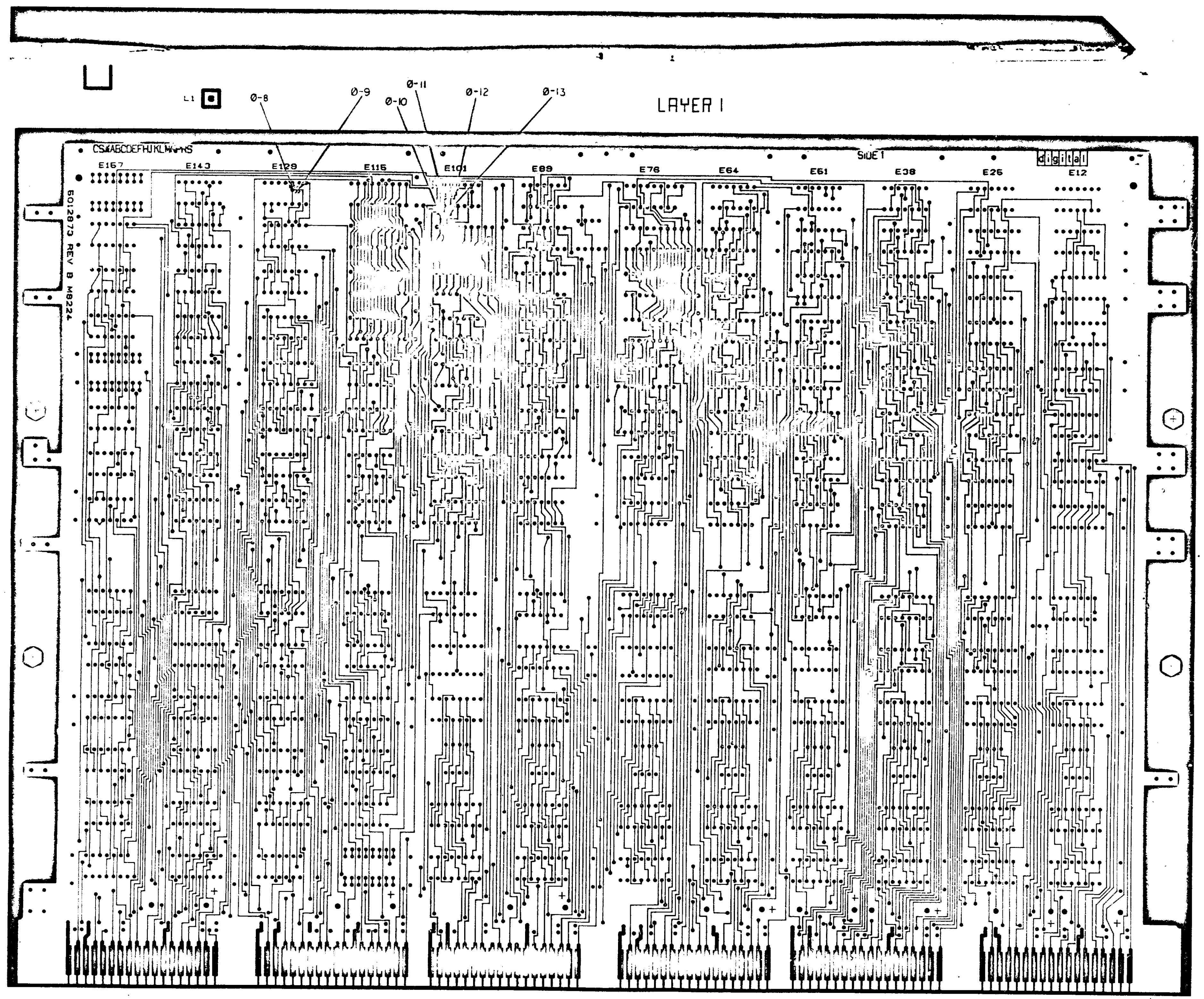
ETCH REV.
P.C. DESIGN DWG. NO. M8274 REV. B

CHG CHANGE NO REV
3 DWG 24-1 3
2 M8274 2 C
1 M8274 1 B

NOTES:

E LR M8274-0-0

TW 1



TITLE	SIZE	CODE	NUMBER	REV.
IRC	E	UA	M8224ØØ	C

SCALE 2-1 SHEET 2 OF 4

(8)

TW

LAYER 4

L4

2-11

2-12

Ø-14

Ø-17

1-5

1-6

Ø-5

1-7

5012873 REV B MB224

DIVISIONS		
DIV.	DRAWING NO.	REV.

TITLE	IRC			
SCALE 2 – 1	SHEET 3 OF 4	SIZE	CODE	NUMBER / REV.
		E	UA	MB240-0 C
		DIST.		

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TW

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WIRE ADS

Ø-1: E129-10 TO PTH ABOVE LEFT OF E128-9
Ø-2: E129-2 TO E161-3
Ø-3: E101-2 TO E81-13
Ø-4: E101-10 TO PTH ABOVE LEFT OF E96-13
Ø-5: E64-2 TO PTH LEFT OF E97
Ø-6: E64-1 TO E61-9
Ø-7 E96-5 TO E18-3

ETCH CUTS

Ø-8: BETWEEN E129-10 AND PTH BELOW E129-10
Ø-9: BETWEEN PTH BELOW E129-10 AND PTH ABOVE LEFT OF E128-9
Ø-10: BETWEEN E101-2 AND PTH LEFT OF E97
Ø-11: BETWEEN E101-2 AND PTH ABOVE E101-2
Ø-12: BETWEEN E101-3 AND E101-10
Ø-13: BETWEEN E101-3 AND PTH ABOVE LEFT OF E96-13
Ø-14: BETWEEN E61-9 AND E61-10
Ø-15: BETWEEN E18-1 AND PTH ABOVE LEFT OF E18-4

Ø-16: ADD WIRE FROM E61-1 TO E11-4

Ø-17: ETCH CUT BETWEEN E11-1 AND E11-13

ECO #1

WIRE ADDS SIDE 1:
1-1. E9-9 TO E5-11
1-2. Y1-8 TO PTH TO AK1 *
1-3. E8-3 TO PTH TO AK2
1-4. E23-3 TO E146-11

ETCH CUTS SIDE 2:

1-5. BETWEEN E9-9 AND E9-10
1-6. BETWEEN Y1-8 AND E8-3
1-7. BETWEEN E146-11 AND E146-12

*NOTE: TO GET TO Y1-8, WIRE IS TO GO THROUGH FEEDTHRU RIGHT OF Y1-7, THEN TACK SOLDERED TO Y1-8 ON SIDE 2.

ECO #2

WIRE ADDS SIDE 1:
2-1. FROM E60-1 TO E33-1
2-2. FROM E22-8 TO E48-2
2-3. FROM E18-8 TO E22-9
2-4. FROM E19-6 TO E18-9
2-5. FROM E19-4 TO E18-13
2-6. FROM E95-5 TO E18-1
2-7. FROM E37-8 TO E18-10
2-8. FROM E31-13 TO E19-3
2-9. FROM E37-6 TO E19-5
2-10. FROM E36-1 TO E22-10

ETCH CUTS SIDE 2
2-11 ABOVE AND TO THE LEFT OF E48-2
2-12 BELOW AND TO THE RIGHT OF E48-2

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: IRC	SCALE	SHEET 1 OF 1	NO. CODE: 80 UA	NUMBER: M8224-0-0	REV: C
			DIST.		

TW

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AUTOMATED BY PRTLST.2E(3) — P A R T S L I S T — SHEET A1 OF A2

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION 00	REFERENCE DESIGNATOR
1	1	E-MD-5012873-0-0	5012873-00	INSTR REGISTERED AND CLOCK	1	
2	2		1012784-00	.047 MFD 50V -20+80 CER	55	C1-C47,C58,C59,C60,C56,C57,
						CONT C201-C203
3	3		1012084-01	8 MFD 25V 6% 30D AL EL	8	C48-C55
4	4		1300447-00	4.7 K 1/4W 5% CC	33	R23-R55
5	5		1300247-00	120 1/4W 5% CC	8	R3,R4,R6,R8,R10,R12,R13,R14
6	6		1301972-00	270 1/4W 5% CC	3	R17,R19,R21
7	7		1301890-00	560 1/4W 5% CC	3	R18,R20,R22
8	8		1813951-00	OSCILLATOR, CRYSTAL 1.00 KHZ	1	Y1
9	9		2114018-00	MM 74C74 FF-D DUAL 10MHZ,CMOS	1	E8
10	10		1913839-00	74LS165 SHIFT REG.,8BIT	2	E68,E130
11	11		1910532-00	74S00 NAND GATE-QUAD 2IN$	10	E17,E23,E31,E34,E89,E103,E106,
						CONT E109,E133,E138
12	12		1910534-00	74S04 INVERTER GATE-HEX 1I	12	E19,E47,E57,E62,E64,E86,E93,
						CONT E105,E127,E132,E135,E118
13	13		1912389-00	74S08 AND GATE-QUAD 2IN,PO	6	E22,E42,E51,E104,E126,E131
14	14		1910536-00	74S10 NAND GATE-TRIPLE 3IN	13	E21,E25,E43,E44,E49,E81,E98,
						CONT E119,E108,E136,E139,E143,E147
15	15		1910539-00	74S20 NAND GATE-DUAL 4INPU	4	E50,E128,E129,E151
16	16		1911712-00	74S51 AND-OR GATE-INVERT D	7	E18,E37,E48,E61,E87,E116,E123
17	17		1910542-00	74S64 A-O-I GATE 4-2-3-2	30	E83,E84,E85,E58,E94-E97,E110,
						CONT E111,E121,E140-E142,E145,E150,
						CONT E152,E154-E156,E148,E149,E60,
						CONT E59,E82,E107,E101,E122,E144,E146
18	18		1300250-00	150 1/4W 5% CC	8	R1,R2,R5,R7,R9,R11,R15,R16
19	19		1910537-00	74S11 AND GATE-TRIPLE 3INP	6	E12,E38,E45,E63,E120,E137
20	20		1910545-00	74S112 FF-JK DUAL,EDGE TRIG	4	E10,E20,E124,E125
21	21		1910956-00	74S151 MUX 1 OF 8	2	E7,E32
22	22		1910548-00	74S157 MUX 1 OF 2 (QUAD)	1	E24
23	23		1910552-00	74S194 SHIFT REG.,4BIT RIGH	3	E4,E6,E30

REVISION HISTORY			
ENG	ECO NUMBER	REV	
---	INIT	C	
---	INIT	C	

BASIC PART NO: M8224
SECTION A OF A
SECTION.VARIATION INDEX
[A] 00
[B]
[C]
[D]
[E]
[F]
[H]
[J]
[K]
[L]
[M]
[N]

DRN: F.MALANSON — DATE: 17-FEB-77
CHK'D: F.SMART — DATE: 17-MAR-77
DES.ENG: R.BARRY — DATE: 1-24-78
RESP.ENG.: C.CALAMA — DATE: 1-JUL-77
MFG.ENG.: M.TIRELLA — DATE: 21-JUN-77
ASSEMBLY NUMBER: D-UA-M8224-0-0
TOP DOCUMENT NUMBER:

D	I	G	I	T	A	L

TITLE: PARTS LIST
INSTRUCTION REGISTER & CLOCK

DOCUMENT NUMBER

SIZE	CODE	NUMBER	REV
K	PL	M8224-0-DBP	C

FILE NAME: Z0383C.PLS
EDIT #: 3

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AUTOMATED BY PRTLST.2E(3) P A R T S L I S T SHEET A2 OF A2

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION 00	REFERENCE DESIGNATOR
24	24		1910549-00	74S158 MUX 1 OF 2 (QUAD)	8	E16,E29,E33,E35,E36,E71,E72,E76
25	25		1911415-00	10125 ECL TO TTL TRNSLTR	2	E55,E80
26	26		1912867-00	LS298 MUX 1 OF 4,2IN W/S	8	E2,E14,E27,E40,E53,E66,E78,E91
27	27		1913887-00	74S258 MUX 1 OF 2(QUAD)TRI	2	E117,E134
28	28		1913788-00	26S10 TRANSCEIVER,BUS,QUA	8	E1,E13,E26,E39,E52,E65,E77,E90
29	29		1911469-00	DEC 8640 RECEIVER,BUS,QUAD,U	1	E5
30	30		2113907-00	MM 74C160 COUNTER-DECADE,ASYNC	1	E9
31	31		2113908-00	MM 74C161 COUNTER,ASYNCH.BINAR	8	E3,E15,E28,E41,E54,E67,E79,E92
32	32		1910544-00	74S74 FF-D DUAL,EDGE TRIGG	6	E11,E46,E56,E69,E70,E88
33	33		23023B1-00	B1-01	1	E73
34	34		23024B1-00	B1-01	1	E74
35	35		23025B1-00	B1-01	1	E75
36	36		23168F1-00	F1-01	1	E99
37	37		23169F1-00	F1-01	1	E100
38	38		23170F1-00	F1-01	1	E112
39	39		23171F1-00	F1-01	1	E113
40	40		23172F1-00	F1-01	1	E114
41	41		23173F1-00	F1-01	1	E115
42	42		1210711-02	HANDLE,MODULE,HEX	1	
43	43		9000024-01	EYELET, ROLLED FLANGE, .121 OD X	12	

0 NOTE: E102,E153,E157 ARE SPARE I.C. LOCATIONS.

DIGITAL	TITLE	SIZE	CODE	DOCUMENT NUMBER	REV
	INSTRUCTION REGISTER & CLOCK SECTION A OF A	K	PL	M8224-0-DBP	C

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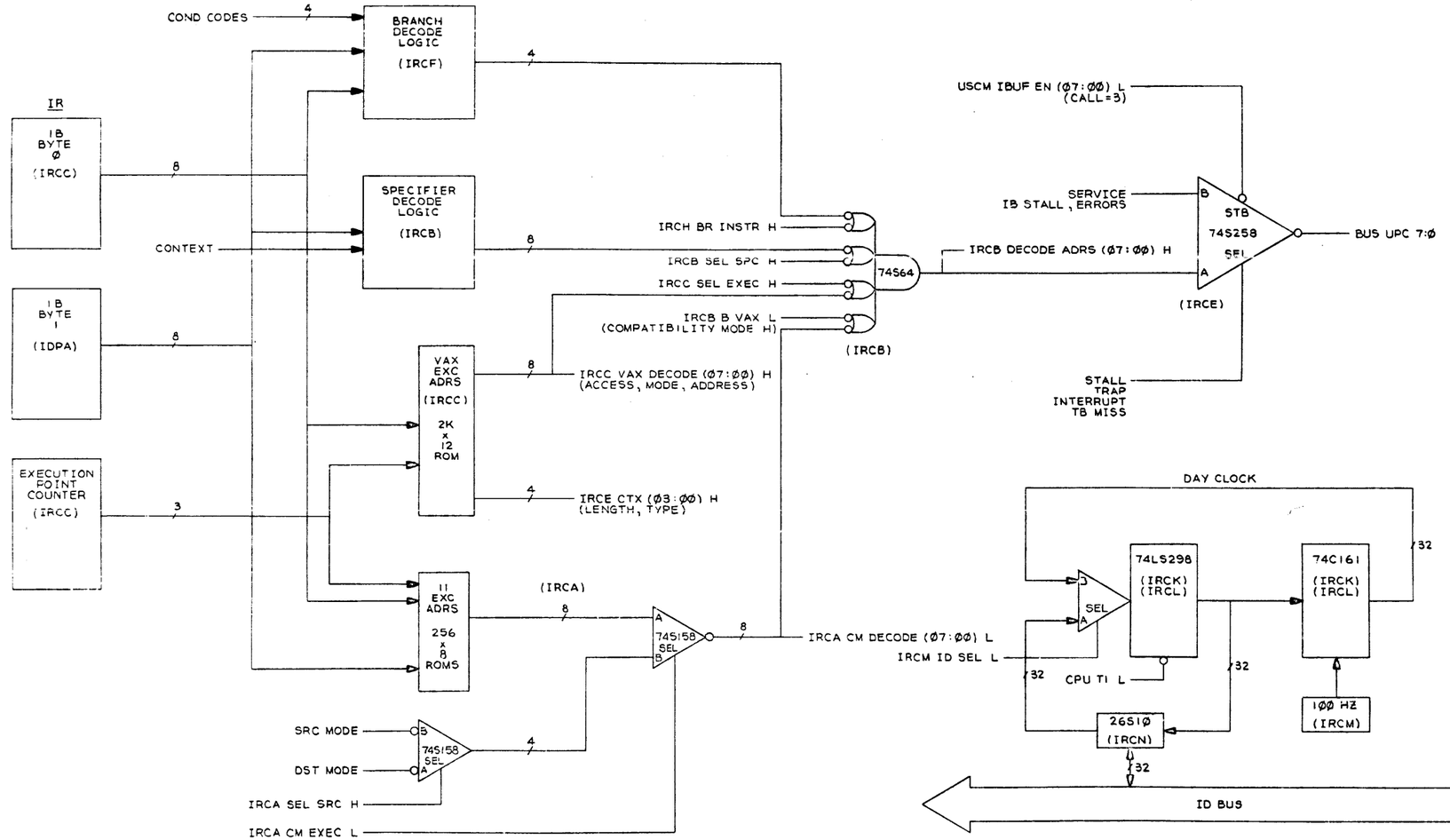

REVISIONS			
REV	CHANGE NO.	CHK	
B	M8224-00001		
C	M8224-11-82	C. CALAMARI	17 AUG 77
		C. Calamari	29 AUG 78
		J. Kenney	13 DEC 78
		T. RAGWAR	22-MAY-79
		C. Calamari	

DRN. H W Cramer	6-27-77	FIRST USED ON
CH'K'D [illegible]	6-27-77	
ENG. C Calamari	6-27-77	TITLE
PROJ. ENGR [illegible]	6-27-77	INSTRUCTION DECODE
PROD. [illegible]		
NEXT HIGHER ASSY.		
SCALE —	SIZE D	CODE CS
SHEET 1 OF 13	DIST.	NUMBER M8224-Ø-1
		REV. C

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IRCH B CPU T0 H
IRCD IR 14:12=0 L
74S04 E64
IRCA IR 14:12=0 H (IRCE, IRCH)
IRCC EXC CT1(0) H
IRCC EXC CT0(0) H
74S00 E89
DOUBLE OP & REG CLASS E75
256 x 8 ROM
23025B1-01
IDPA BUF B1-7(1) H
IDPA BUF B1-6(1) H
IDPA BUF B1-5(1) H
IDPA BUF B1-4(1) H
IDPA BUF B1-3(1) H
IDPA BUF B1-2(1) H
IDPA BUF B1-1(1) H
DA1
DU2
DP2
DD1
DP1
DN1

IRCH B CPU T0 H
IRCA IR 14:12=0 H
IRCA BYTE I=0 L
74S00 E89
SINGLE OP E74
256 x 8 ROM
23024B1-01
IRCC EXC CT0(1) H
IDPA BUF B1-0(1) H
DB2

IRCA IR 14:12=0 H
IRCM BUF B1-7 L
IRCM BUF B1-0 L
74S11 E63
74S00 E89
IRCM BUF B1-3 L
IRCM BUF B1-2 L
IRCM BUF B1-1 L
74S04 E64
IRCA BYTE I=0 H (IRCH)
IRCA BYTE I=0 L

IRCH B CPU T0 H
SINGLE BYTE INSTR E73
256 x 8 ROM
23023B1-01
IRCC IR07(1) H
IRCC IR06(1) H
IRCC IR05(1) H
IRCC IR04(1) H
IRCC IR03(1) H
IRCC IR02(1) H
IRCC IR01(1) H
IRCC IR00(1) H

SINGLE BYTE = HALT, WAIT, RTI, BPT, IOT, RESET, RTT, JMP, RTS, NOP, CLEAR CC'S, SET CC'S, SWAB.

SINGLE OPERAND = JSR, CLR. B, COM. B, INC. B, DEC. B, NEG. B, ADC. B, SBC. B, TST. B, ROR. B, ROL. B, ASR. B, ASL. B, MFPI, MFPD, MTPI, MTPD, EMT, TRAP, SXT.

DOUBLE OP & REGISTER CLASS = MOV. B, CMP. B, BIT. B, BIC. B, BIS. B, ADD, SUB, MUL, DIV, ASH, ASHC, XOR, SOB.

IRCM BUF B1-3 L
IRCM BUF B1-2 H
IRCM BUF B1-1
74S11 E38
IRCD SRC R=PC H
IRCA DEST MODE 0 H
IRCM BUF B1-6 L
IRCM BUF B1-7 L
74S51 E37
IRCM BUF B1-5 L
IRCM BUF B1-4 L
IRCM BUF B1-5 H
IRCM BUF B1-4 H
IRCM BUF B1-6 L
74S51 E37
IRCA LITERAL TO REG H
74S11 E38
IRCA OPT 1 H
74S08 E51
IRCA OPT 0 H
IRCA MOVB+CMP+BIT H
IRCA CMP+BIT L
IRCA SEL SRC H

1	0	CM OPTIMIZATION CODES
0	0	NOT BIN
0	1	BIS, BIC, ADD, SUB, MOV
1	0	CMP, BIT
1	1	MOVB

74S158 E76
IRCA CM NRT CHK H (IRCH)
IRCA CM DECODE 07 L (IRCB)
IRCA CM DECODE 06 L (IRCB)
IRCA CM DECODE 05 L (IRCB)
IRCA CM DECODE 04 L (IRCB)
S0 STB
IRCA CM EXEC L (IRCD)

IRCJ SRC R=PC L
IRCD DST R=PC L
IRCM BUF B1-3 L
IRCC IR05(0) H
IRCM BUF B1-2 L
IRCC IR04(0) H
IRCM BUF B1-1 L
IRCC IR03(0) H
74S158 E35
S0 STB

74S158 E72
IRCA CM DECODE 03 L (IRCB)
IRCA CM DECODE 02 L (IRCB)
IRCA CM DECODE 01 L (IRCB)
IRCA CM DECODE 00 L (IRCB)
S0 STB

IRCC EXC CT0(0) H
IRCD BIN L
IRCD SINGLE OP L
IRCD REG CLASS L
IRCC EXC CT1(1) H
IRCA DM0 H
IRCC EXC CT0(1) H
74S64 E142
74S04 E64
IRCA CM EXEC H (IRCB, IRCD, IRCE)

IRCD SRC EP0 H
74S08 E51
IRCA SEL SRC H
IRCC EXC CT0(0) H
74S20 E129
74S10 E143
74S04 E64
IRCA SM0 L (IRCD)

IRCC IR05(0) H
IRCC IR04(0) H
IRCC IR03(0) H
74S11 E63
IRCA DM0 H (IRCB)

IRCD BIN L
IRCD REG CLASS L
IRCD SINGLE OP L
74S10 E143
74S00 E89
IRCA DST MODE 0 L (IRCB)
IRCD DST R=PC L
74S08 E51
IRCA DEST MODE 0 H

(SLOT 8)

(CM DECODE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: INSTRUCTION DECODE (IRCA)
SIZE D | CODE CS | NUMBER M8224-0-1 | REV C
SCALE | SHEET 2 OF 13 | DIGT.

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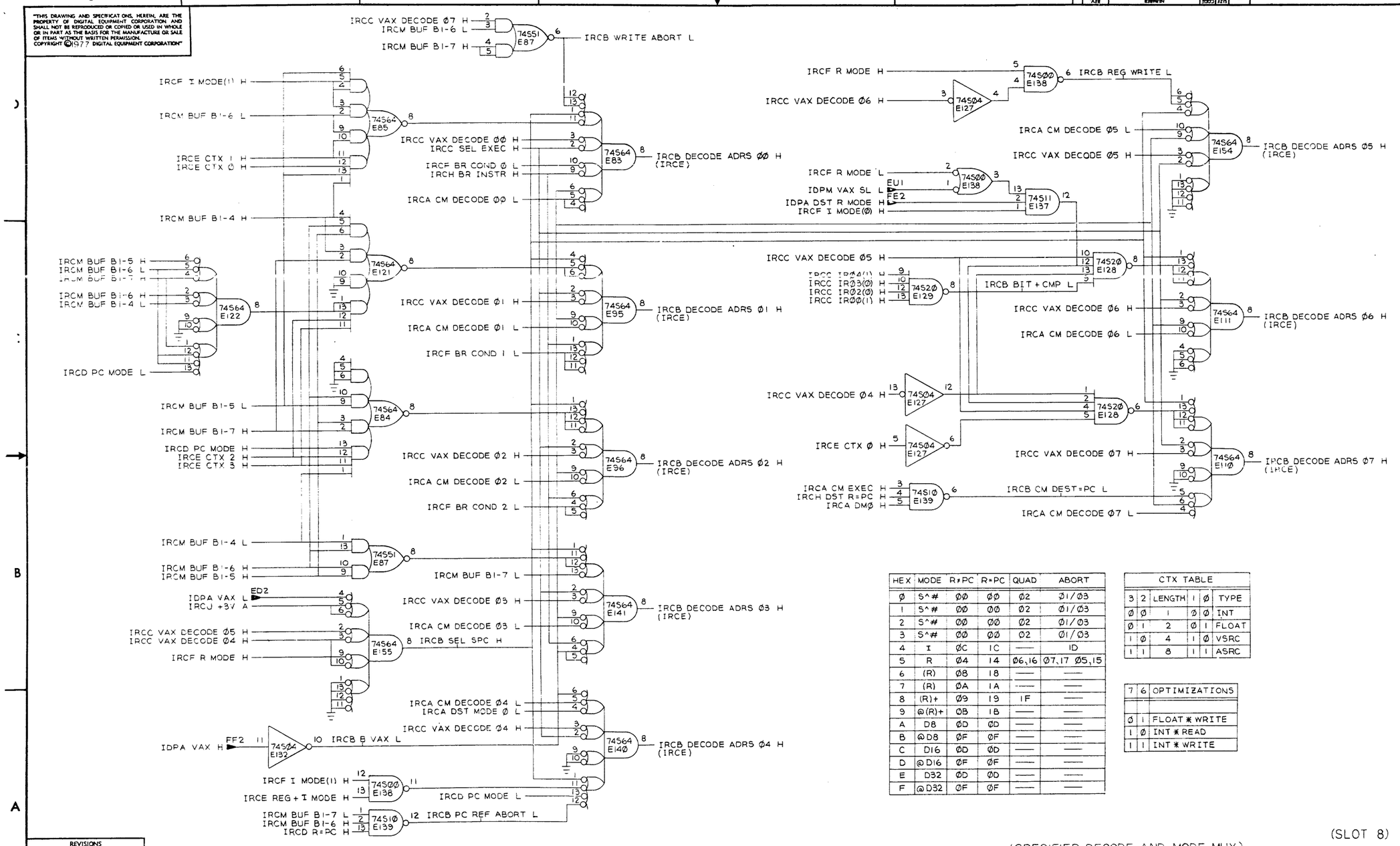

HEX	MODE	R=PC	R=PC	QUAD	ABORT
Ø	S^#	ØØ	ØØ	Ø2	Ø1/Ø3
1	S^#	ØØ	ØØ	Ø2	Ø1/Ø3
2	S^#	ØØ	ØØ	Ø2	Ø1/Ø3
3	S^#	ØØ	ØØ	Ø2	Ø1/Ø3
4	I	ØC	1C	——	ID
5	R	Ø4	14	Ø6,16	Ø7,17 Ø5,15
6	(R)	Ø8	18	——	——
7	(R)	ØA	1A	——	——
8	(R)+	Ø9	19	1F	——
9	@(R)+	ØB	1B	——	——
A	D8	ØD	ØD	——	——
B	@D8	ØF	ØF	——	——
C	D16	ØD	ØD	——	——
D	@D16	ØF	ØF	——	——
E	D32	ØD	ØD	——	——
F	@D32	ØF	ØF	——	——

CTX TABLE					
3	2	LENGTH	1	Ø	TYPE
Ø	Ø	1	Ø	Ø	INT
Ø	1	2	Ø	1	FLOAT
1	Ø	4	1	Ø	VSRC
1	1	8	1	1	ASRC

7	6	OPTIMIZATIONS
Ø	1	FLOAT * WRITE
1	Ø	INT * READ
1	1	INT * WRITE

(SLOT 8)

(SPECIFIER DECODE AND MODE MUX)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DECODE (IRCB)	D	CS	M8224-Ø-1	C
SCALE —/— SHEET 3 OF 13	DIST.			

DEC FORM NO. DRD 139

TW

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IRCU +8V A

IDPA IMX BØ-3 H — CM1 — 74S74 E88 — IRCC IRØ3(1) H (IRCA, IRCF); IRCC IRØ3(Ø) H (IRCA, IRCB, IRCE, IRCF, IRCH)

IDPA IMX BØ-2 H — BV2 — 74S74 E46 — IRCC IRØ2(1) H (IRCA, IRCD, IRCE, IRCH); IRCC IRØ2(Ø) H (IRCB, IRCE, IRCF)

IDPA IMX BØ-1 H — CC1 — 74S74 E46 — IRCC IRØ1(1) H (IRCA, IRCD, IRCE, IRCH); IRCC IRØ1(Ø) H (IRCE, IRCF)

IDPA IMX BØ-Ø H — CN1 — 74S74 E88 — IRCC IRØØ(1) H (IRCA, IRCB, IRCD, IRCE); IRCC IRØØ(Ø) H (IRCE, IRCF)

IRCH A CPU TØ H

IDPA IMX BØ-7 H — CU1 — 74S74 E70 — IRCC IRØ7(1) H (IRCA, IRCD, IRCE, IRCH, IRCJ); IRCC IRØ7(Ø) H (IRCE, IRCF, IRCH)

IDPA IMX BØ-6 H — CT2 — 74S74 E69 — IRCC IRØ6(1) H (IRCA, IRCD, IRCH, IRCJ); IRCC IRØ6(Ø) H (IRCD, IRCE, IRCF, IRCH)

IDPA IMX BØ-5 H — CS1 — 74S74 E69 — IRCC IRØ5(1) H (IRCA, IRCH); IRCC IRØ5(Ø) H (IRCA, IRCD, IRCE, IRCF, IRCH)

IDPA IMX BØ-4 H — CV2 — 74S74 E70 — IRCC IRØ4(1) H (IRCA, IRCB, IRCH); IRCC IRØ4(Ø) H (IRCA, IRCD, IRCE, IRCF, IRCH)

IRCH C CPU TØ H

IRCC VAX DECODE Ø4 H — 74S04 E127 — IRCU +8V A; IDPA VAX L — ED2 — 74S64 E156 — IRCC SEL EXEC H (IRCB, IRCC)

IRCC VAX DECODE Ø5 H — 74S04 E127 — IRCF R MODE L

IRCC EXC CT2(1) H

IRCC EXC CT1(1) H
IRCC EXC CTØ(1) H
IRCC IRØ7(1) H
IRCC IRØ6(1) H
IRCC IRØ5(1) H
IRCC IRØ4(1) H
IRCC IRØ3(1) H
IRCC IRØ2(1) H
IRCC IRØ1(1) H
IRCC IRØØ(1) H

ADR Ø-3 E115 — 1K x 4 ROM — 23173F1

IRCC EXC CT2(Ø) H

ADR 4-7 E114 — 1K x 4 ROM — 23172F1

IRCC VAX DECODE ØØ H (IRCB)
IRCC VAX DECODE Ø1 H (IRCB)
IRCC VAX DECODE Ø2 H (IRCB)
IRCC VAX DECODE Ø3 H (IRCB)

IRCC EXC CT2(1) H

CTL Ø-3 E113 — 1K x 4 ROM — 23171F1

IRCC VAX DECODE Ø4 H (IRCB, IRCE)
IRCC VAX DECODE Ø5 H (IRCB, IRCE)
IRCC VAX DECODE Ø6 H (IRCB, IRCH, IRCJ)
IRCC VAX DECODE Ø7 H (IRCB, IRCH)

IRCC EXT CT2(Ø) H

CTL 4-7 E112 — 1K x 4 ROM — 23170F1

CEHH FPD BIT L — FS2 — 74S08 E126 — IRCC COUNT EXC H

IRCC EXC CTØ(1) H (IRCA)
IRCC EXC CT1(1) H (IRCA)

74S08 E126 — 74S112 E125 — 74S08 E126 — 74S112 E124

IRCC EXC CT2(1) H (IRCE)
74S04 E132 — FK2 — IRCC EP2 H (IRCN, SLOT 28)
IRCC EXC CT2(Ø) H (IRCE)

IDPH CLR Ø L — FR2 — 74S08 E126 — IRCC B CLR Ø L (IRCF)

IRCJ +8V A

IDPH CLR B1 H — EK2 — 74S00 E133 — 74S00 E133

IRCF I MODE L

IRCE STALL + SVC L
IRCE IB ADVANCE H — 74S10 E119

IRCC EXC CTØ(Ø) H (IRCA, IRCD, IRCE)

IRCC EXC CT1(Ø) H (IRCA, IRCD, IRCE) — 74S10 E119 — IRCC EPØ L (IRCH)

CEHH FPD BIT L — FS2 — 74S00 E133 — IRCC EN SERVICE BR H (IRCE)

IDPA VAX H — FF2 — 74S00 E133

IRCC SEL EXEC H — 74S04 E132 — FU2 — IRCC EPI H (IRCN, SLOT 28)

74S04 E132 — FK1 — IRCC EPØ H (IRCN, SLOT 28)

CLKL SYS INIT H — ED1 — 74S04 E132 — IRCC INIT L (IRCE, IRCH, IRCM)

VAX DECODE					
5	4	MODE	7	6	ACCESS
Ø	Ø	SEL SPECIFIER	Ø	Ø	BR INSTR
Ø	1	EXECUTE IF R	Ø	1	READ
1	Ø	OPTIMIZED	1	Ø	WRITE
1	1	SEL EXECUTE	1	1	MODIFY

(SLOT 8)

(IR, EXC PT COUNTER, VAX DECODE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	INSTRUCTION DECODE (IRCC)	SIZE D / CODE CS	NUMBER M8224-Ø-1 / REV. C
SCALE		SHT 4 OF 13	

DEC FORM NO. DRD 150

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IDPA BUF BI-3(Ø) H
IRCJ SRC R+PC L
IDPA BUF BI-2(Ø) H
IRCJ +3V B
BS2
BS1
74S51 E61
IRCD SRC NEEDS 23 H

IRCC EXC CT 1(Ø) H
IRCC EXC CT Ø(Ø) H
IRCD BIN H
74S11 E120
IRCD SRC EPØ H (IRCA)
IRCA CM EXEC L
74S51 E61
IRCD DST NEEDS 23 H

IDPM 16 BIT BDEST L
IDPM B DEST H
IDPA VAX L
FU1
FM1
ED2
74S64 E145
FF1
IRCD SEL BYTE H (IRCE, IDPM)

IDPA BUF BI-5(Ø) H
IDPA BUF BI-6(1) H
IDPA BUF BI-5(1) H
IDPA BUF BI-4(Ø) H
IDPA BUF BI-6(Ø) H
IDPA BUF BI-4(1) H
BU1
BU2
74S64 E97
74S04 E135
IRCD BIN H
IRCD BIN L (IRCA)

IRCC IRØ2(1) H
IRCC IRØ1(1) H
IRCC IRØØ(1) H
74S10 E108
IRCD DST R+PC L (IRCA, IRCH)
IRCC IRØ5(Ø) H
IRCC IRØ4(Ø) H
IRCJ +3V B
IRCA SMØ L
IRCD SRC EPØ H
74S64 E101

IDPA BUF BI-6(1) H
IRCM B BUF BI-7 H
IDPA BUF BI-5(1) H
DA1
DU2
74S51 E123
IRCD DISP MODE L
IRCD PC MODE L
IDPA VAX H
FF2
IDPM B DEST L
EF2

IDPA BUF BI-6(1) H
IDPA BUF BI-5(1) H
IDPA BUF BI-4(1) H
IDPA BUF BI-7(Ø) H
IDPA BUF BI-3(1) H
IDPA BUF BI-2(1) H
IDPA BUF BI-1(1) H
CD2
CD1
DN1
74S11 E120
74S10 E98
74S51 E123
IRCD REG CLASS L (IRCA)

IDPA VAX L
IDPM B DEST H
IDPA VAX H
ED2
FM1
FF2
74S64 E150
IRCD SEL WORD H (IRCE)
74S04 E135
FB1
IRCD SEL WORD L (IDPM)

IRCD IR 14:12+Ø L (IRCA, IRCF)
IDPA BUF BI-6(Ø) H
IDPA BUF BI-5(Ø) H
IDPA BUF BI-4(Ø) H
74S10 E98
IRCJ +3V A
IDPA BUF BI-Ø(1) H
IDPA BUF BI-3(Ø) H
DB2
74S64 E94
74S00 E109
IRCD SINGLE OP L (IRCA)
IRCC IRØ6(Ø) H
IDPA BUF BI-7(1) H
IDPA BUF BI-2(1) H
EB1
IDPA BUF BI-Ø(1) H
IRCC IRØ7(1) H
IRCC IRØ6(1) H
74S11 E120
IRCD SRC R+PC H (IRCA, IRCH)

IRCM B BUF BI-7 H
IDPA BUF BI-6(1) H
DA1
74S00 E109
IRCD D16+D32 L
IDPA BUF BI-4(1) H
IRCD PC MODE H
DF2
74S00 E109
IRCD ABSOLUTE MODE L

IRCJ +3V B
IDPM B DEST H
IDPA VAX L
IRCD PC MODE L
FM1
ED2
74S64 E152
IRCD SEL LONG H (IRCE)
74S04 E135
FN1
IRCD SEL LONG L (IDPM)

IRCM B BUF BI-7 H
IDPA BUF BI-6(1) H
IDPA BUF BI-5(1) H
74S10 E98
IRCD D32 L
IDPA BUF BI-4(Ø) H
FM2

IDPA BUF BI-7(1) H
IDPA BUF BI-1(Ø) H
IDPA BUF BI-2(Ø) H
IDPA BUF BI-1(1) H
IDPA BUF BI-3(Ø) H
IDPA BUF BI-2(1) H
IDPA BUF BI-Ø(1) H
IRCC IRØ6(Ø) H
EB1
BF1
DN1
DP1
DB2
74S64 E58

IDPA BUF BI-3(1) H
IDPA BUF BI-2(1) H
IDPA BUF BI-1(1) H
IDPA BUF BI-Ø(1) H
74S20 E151
74S04 E135
IRCD R+PC H (IRCB)
IRCD R+PC L (IRCF, IRCJ)
IRCD MODE 8+9 H

IDPA BUF BI-7(1) H
IDPA BUF BI-6(Ø) H
IDPA BUF BI-5(Ø) H
74S11 E137
74S10 E108
74S04 E135
IRCD PC MODE L (IRCB, IRCH)
FH2
IRCD PC MODE H (IDPM, IRCB, IRCE)
IDPA VAX H
FF2
IRCD R+PC
IRCM BUF BI-
74S10 E108
BL1
IRCD IMMED L (SLOT 28)

(SLOT 8)

REVISIONS		
CHK	CHANGE NO.	REV.

(SIZE SELECT)

TITLE: INSTRUCTION DECODE (IRCD)
SIZE D | CODE CS | NUMBER M8224-Ø-1 | REV C
SCALE: 1/1 | SHEET 5 OF 13 | DIST. TW

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IRCC EXC CT2(0) H
IRCC EXC CT2(1) H
IRCC EXC CT1(0) H
IRCC EXC CT0(0) H
IRCC IR07(0) H
IRCC IR06(0) H
IRCC IR05(0) H
IRCC IR04(0) H
IRCC IR03(0) H
IRCC IR02(0) H
IRCC IR01(0) H
IRCC IR00(0) H
23169F1 (1K x 4 CTX 4-7 E100)
23168F1 (1K x 4 CTX 0-3 E99)
74S04 E105 → IRCE CTX 3 L (IRCF, IRCJ, IDPM)
74S04 E105 → IRCE CTX 2 L (IRCF, IDPM)
IRCE CTX 3 H (IRCB)
IRCE CTX 2 H (IRCB)
IRCE CTX 1 H (IRCB, IRCH, IRCJ)
IRCE CTX 0 H (IRCB, IRCH, IRCJ)

IDPJ B1 VAL(0) H
IDPA VAX L (ED2)
IDPJ B0 VAL(0) H
IRCF I MODE(0) H
IRCC EN SERVICE BR H
IRCJ CALL=3 H
ICLD SERVICE H
74S64 E146 → IRCE SRV+INV L
74S10 E147

IDPJ B2 VAL(0) H
IRCC VAX DECODE 05 H
IDPM B DEST L
IRCD SEL WORD H
IRCD SEL BYTE H
IRCD SEL LONG H
IDPJ B5 VAL(1) H
IDPJ B4 VAL(1) H
74S00 E138
IRCE CTX 3 H
IDPJ B1 VAL(0) H
IDPJ B3 VAL(0) H
IRCE CTX 2 H
IRCD PC MODE H
74S64 E144
74S64 E149

IRCM BUF B1-7 L
IRCM BUF B1-5 L
74S11 E137 → IRCE REG+I MODE H (IRCB, IRCF)
IRCM BUF B1-2 L
IRCM BUF B1-1 L
IRCM BUF B1-3 L
IRCM BUF B1-6 H
IRCM BUF B1-5 H
IRCM BUF B1-2 H
IRCM BUF B1-1 H
IRCJ +3V B
74S64 E59
IRCM BUF B1-7 H
74S10 E43
IRCM BUF B1-2 H
IRCM BUF B1-0 H
74S10 E43
IRCA IR 14:12=0 H
IRCE CM BYTE INSTR L (IRCJ)

IRCE EXECUTE L
IRCJ +3V B
74S08 E104 → FS1 → IRCE LOAD PRN H (IDPN)
USCM IBUF EN(07:00) L
74S74 E56
IRCE IB ADVANCE(1) H (IRCH, IRCJ)
IRCH CPU T2 H
IRCE IB ADVANCE(0) H
IRCC INIT L
74S04 E105 → IRCE IB ADVANCE H (IRCC, IRCJ, IRCM)

IRCB DECODE ADRS 07 H
IRCB DECODE ADRS 06 H
IRCJ +3V A
IRCD DECODE ADRS 05 H
ICLD SERV BIT 2 H
IRCD DECODE ADRS 04 H
745258 E134 → FD2 BUS UPC 07 L; FD1 BUS UPC 06 L; FB2 BUS UPC 05 L; EV2 BUS UPC 04 L
USCM IBUF EN(07:00) L (AV2)

ICLD SERV BIT 1 H
IRCB DECODE ADRS 03 H
ICLD SERV BIT 0 H
IRCB DECODE ADRS 02 H
IRCB DECODE ADRS 01 H
IRCB DECODE ADRS 00 H
745258 E117 → EU2 BUS UPC 03 L; ES1 BUS UPC 02 L; ER2 BUS UPC 01 L; EA1 BUS UPC 00 L

IRCH NO FAULT H
IRCH ERR H
74S08 E131
74S08 E131

IRCC VAX DECODE 05 H
IRCC VAX DECODE 04 H
IDPA VAX L (ED2)
IRCA CM EXEC H
74S08 E131
74S64 E148
IRCE SRV+INV L
IDPA VAX H (FF2)
IDPM B DEST L (EF2)
74S08 E131
74S04 E105 → EC1 → IRCE STALL+SVC L (IRCC, ICLD, ICLT)
IRCE STALL+SVC H (IRCH, IRCJ)
74S00 E103 → FP1 → IRCE SAVE H (IDPH)
IRCC VAX DECODE 05 H
IRCC VAX DECODE 04 H
74S10 E147
IRCE EXECUTE L

IRCM BUF B1-0 H
IRCC IR07(1) H
74S00 E103
IRCE SRC REG 6+7 L (IRCJ)
IRCE SRC CON=1 L (IRCJ)
IRCE SRC CON=2 L (IRCJ)
74S04 E105
IRCE CM BYTE INSTR H (IRCJ)
IRCE DST CON=1 H (IRCJ)
IRCE DST CON=2 H (IRCJ)
IRCE DST REG 6+7 L
IRCC IR02(1) H
IRCC IR01(1) H
74S08 E104
74S00 E103

(SLOT 8)
(STALL, CONTEXT LOOK UP, UPC MUX, DST & SRC CONSTANTS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DECODE (IRCE)	D	CS	M8224-0-1	C
SCALE —	SHEET 6 OF 13		DWG.	

M8224-0-1 REV C
SIZE D CODE CS
DCS M8224-0-1 REV C
191

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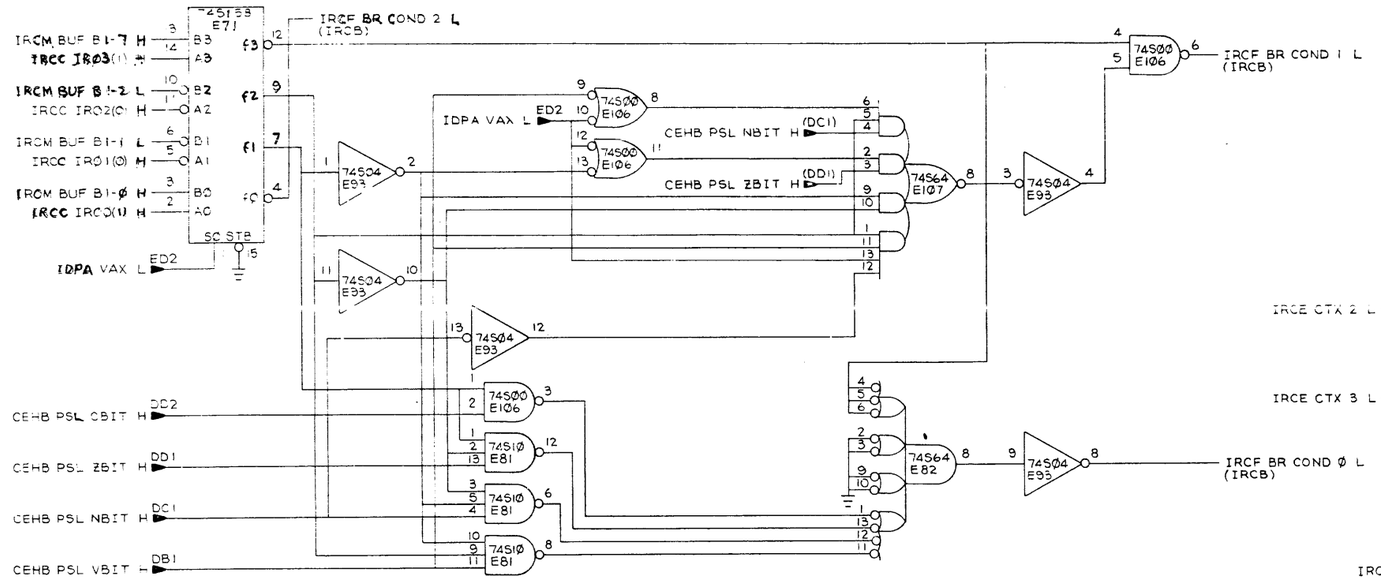

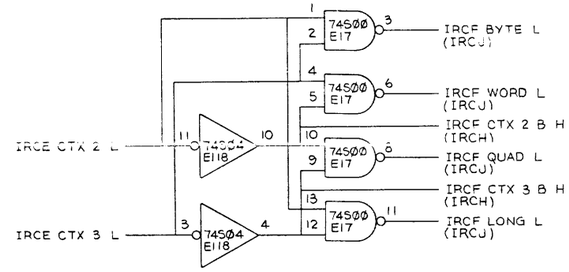

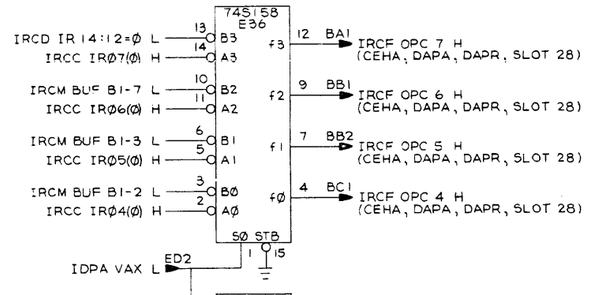

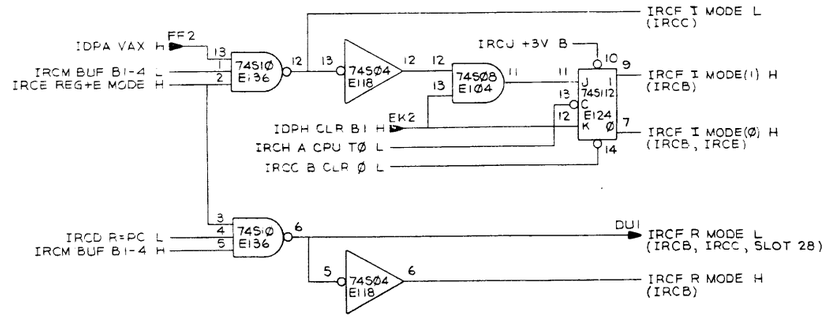

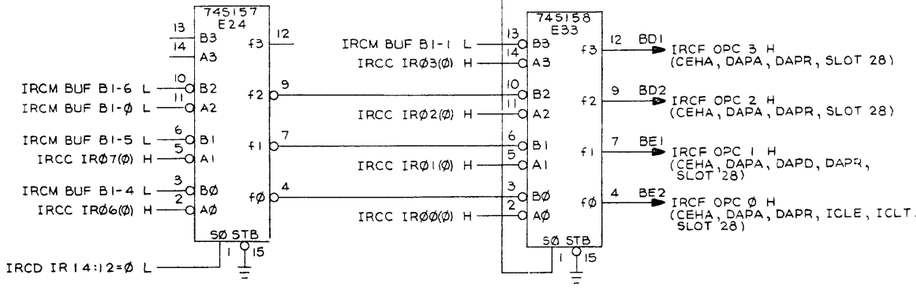

(SLOT 8)
(E MODE FLAG, CONTEXT DECODE, BRANCH DECODE, ALU CONTROL)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	INSTRUCTION DECODE (IRCF)	SIZE	CODE	NUMBER	REV.
		D	CS	M8224 - Ø - 1	C
SCALE	SHEET 7 OF 13	DIST.			

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TW

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IRCM BUF B1-6 L
IRCM BUF B1-5 L
IRCM BUF B1-4 H
IRCM BUF B1-2 H
74S10 E25 → IRCH MOV. B L → 74S00 E34

IRCM BUF B1-Ø H
IRCC IRØ7(1) H
IRCC IRØ6(2) H
74S11 E45 → 74S10 E25 → IRCH MTP L

IRCM BUF B1-3 H
IRCM BUF B1-1 L
IRCA IR 14:12=Ø H
74S11 E45 → 74S00 E34 → IRCH JSR L → 74S10 E49

IRCM BUF B1-2 L
IRCA BYTE 1=Ø H
IRCC IRØ7(Ø) H
IRCC IRØ6(1) H
74S10 E49 → IRCH JMP L

IRCC IRØ5(Ø) H
IRCC IRØ4(1) H
IRCC IRØ3(Ø) H
74S20 E50 → IRCH DM27 L

IRCH DST R=PC H
IRCC IRØ5(1) H
IRCC IRØ4(Ø) H
74S10 E44 → 74S00 E31

IRCD SRC R=PC H
IRCM BUF B1-3 H
IRCM BUF B1-2 L
74S10 E44 → IRCH SM45+PC L

IRCD DST R=PC L
74S04 E47 → IRCH DST R=PC H (IRCB)

IRCF CTX 3 B H
IRCF CTX 2 B H
74S10 E44

IRCE CTX 1 H
74S04 E47 → IRCH CTX 1 L (IRCJ)

IRCE CTX Ø H
74S00 E31

IRCH ASRC+QUAD H (IRCJ)
74S00 E31

IDPM VAX SL H (EM1)
74S00 E31 → CB1 → IRCH FPSL L (IDPM)

IRCJ +3V C
IRCC VAX DECODE Ø7 H
IDPA VAX H
74S51 E48 → 74S74 E58 → AE2 → IRCH IB WRITE CHK H (TBMN)

IDPA VAX L
74S08 E22 → IRCA CM WRT CHK H

IRCE IB ADVANCE(1) H
74S08 E104 → IRCH CPU T3 H
IRCC INIT L

IRCA CMP+BIT L
74S04 E19

IRCA MOVB+CMP+BIT H
IRCA IR 14:12=ØH
74S51 E18

IRCH SM45+PC L
74S04 E5

IRCJ +3V C
IRCC EPØ L
IDPA VAX H
IRCC VAX DECODE Ø7 H
IRCC VAX DECODE Ø6 H
IDPA VAX L
74S64 E60 → IRCH BR INSTR H (IRCB)

IRCM BUF B1-3 L
IRCA IR 14:12=Ø H
74S10 E49 → IRCH CM BR INSTR L

IRCM BUF B1-7 L
IRCM BUF B1-2 L
IRCM BUF B1-1 L
IRCM BUF B1-Ø L
74S20 E50

IRCH IB CHK 1 H
IRCC IRØ2(1) H
IRCJ CTX 1 SAVED H
IRCH (SM45+DM45) *PC H
74S151 E7 (STB) → IRCH BRC 1 H (ICLE, ICLT)

IRCH IB CHK Ø H
IRCC IRØ1(1) H
IRCJ ASRC+QUAD SAVED H
IRCD SRC R=PC H
74S151 E32 (STB) → IRCH BRC Ø H (ICLE, ICLT)

IDPA VAX H
ICLE REM BEMX S1 H
ICLE REM BEMX SØ H

74S151		
S1	SØ	BEN
Ø	Ø	8
Ø	1	9
1	Ø	A
1	1	B

TBMX IB MISS L
TBMX IB ERR L
74S00 E34 → 74S04 E47 → IRCH NO FAULT H (IRCE)
74S00 E34 → IRCH IB CHK 1 H
IRCE STALL+SVC H
74S51 E48 → IRCH IB CHK Ø H
74S04 E47 → IRCH ERR H (IRCE)

-5.2V
R1 150Ω, R2 150Ω, R3 120Ω, R4 120Ω
CLKD LECL CPT2 B1 L (DE2)
CLKD LECL CPT2 B1 H (DE1)
10125 E80 → IRCH CPU T2 L (IRCM)
10125 E80 → IRCH CPU T2 H (IRCE)

10125	
PIN	
8	-5.2V
9	+5V
16	GND

10125 E55 → IRCH A CPU TØ L (IRCC, IRCM)
10125 E55 → IRCH A CPU TØ H (IRCC)
10125 E55 → IRCH B CPU TØ H (IRCA, IRCJ)
10125 E55 → IRCH C CPU TØ H (IRCC)

C51 8µf, C59 .047µf
-5.2V (BL2)
RI3 120Ω, RI4 120Ω, RI5 150Ω, RI6 150Ω
CLKB LECL CPTØ B1 L (CL2)
CLKB LECL CPTØ B1 H (CL1)
CLKC LECL CPT1 B1 L (CR2)
CLKC LECL CPT1 B1 H (CR1)
10125 E80 → EJ1 → IRCH CPU T1 H (IRCM, IDPH, IDPJ)
CLKE LECL CPT3 B1 H (DK1)
CLKE LECL CPT3 B1 L (DK2)
10125 E80 → IRCH CPU T3 H (IRCH, IRCJ)
R5 150Ω, R6 120Ω, R7 150Ω, R8 120Ω, R9 150Ω, RIØ 120Ω, RI1 150Ω, RI2 120Ω
-5.2V
C60 .047µf

(SLOT 8)

(ERROR CHECK, BRANCH CONDITIONS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	INSTRUCTION DECODE (IRCH)	SIZE D	CODE CS	NUMBER M8224 - Ø - 1	REV. C
SCALE	SHEET 8 OF 13	DIST.			

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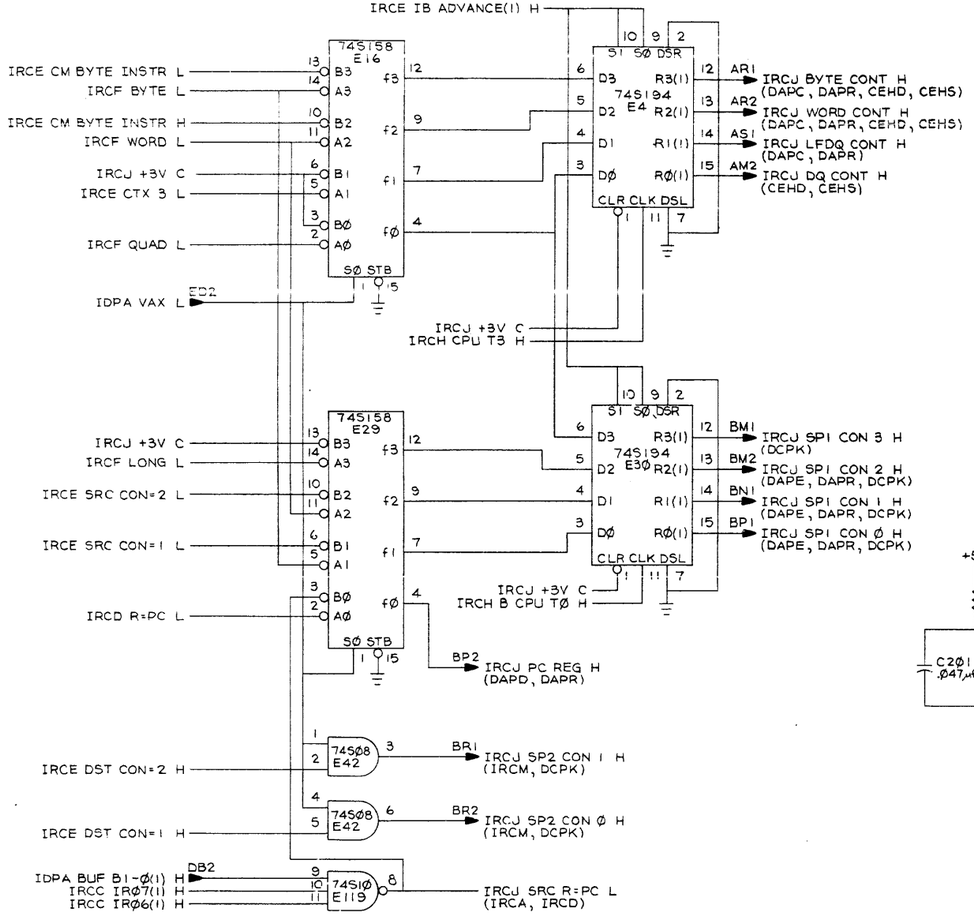

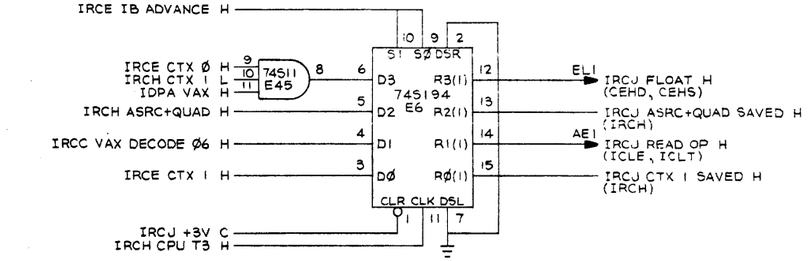

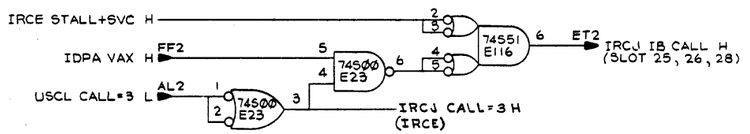

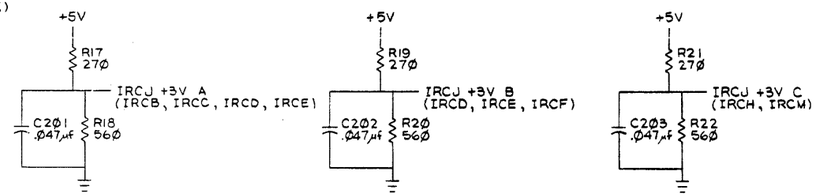

(SLOT 8)

(CONTEXT SAVE, SPI AND SP2 CON)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DECODE (IRCJ)	D	CS	M8224-Ø-1	C

SCALE — SHEET 9 OF 13 DIST.

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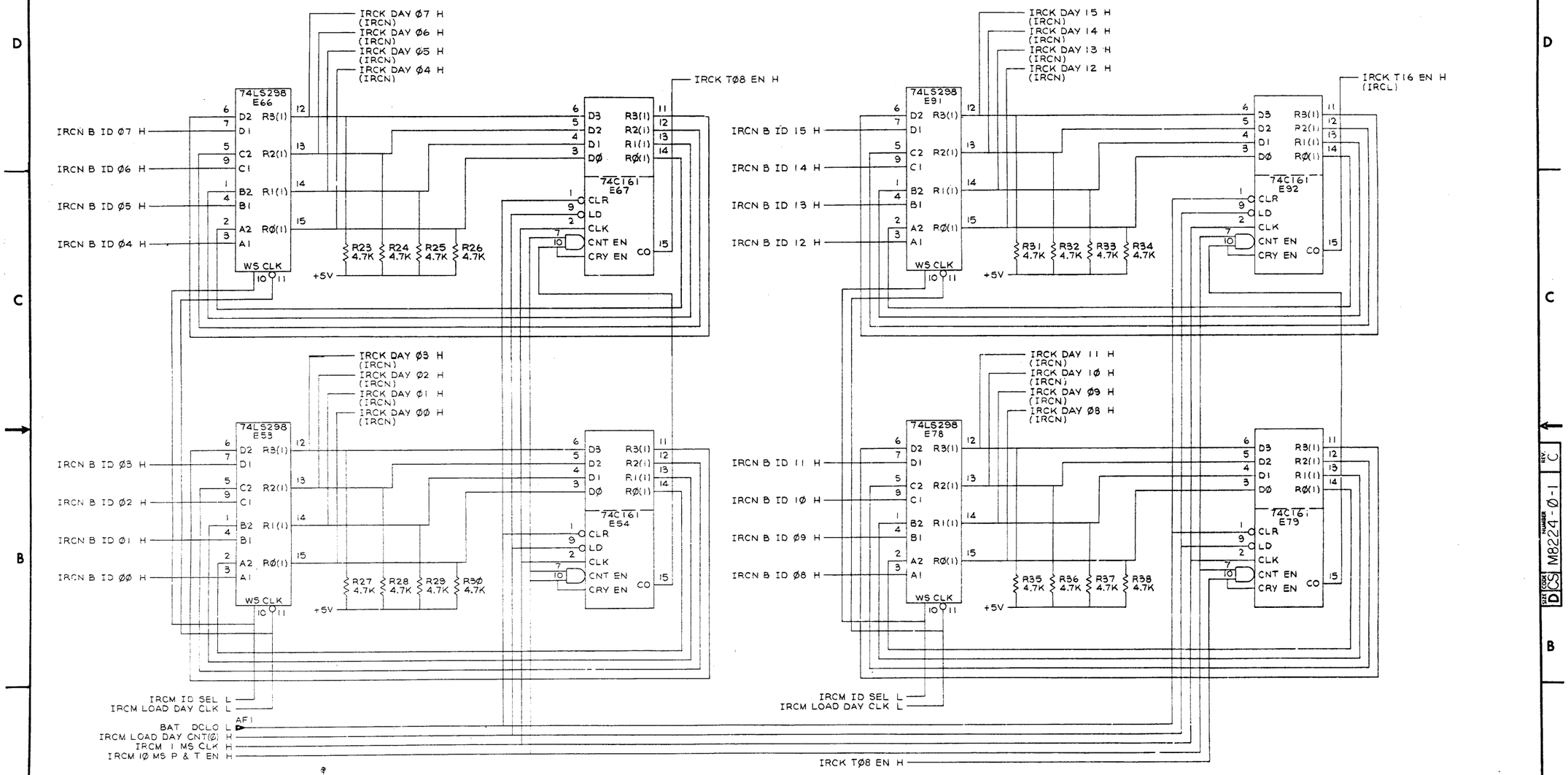

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 8)

(DAY CLOCK 15:ØØ)

TITLE: INSTRUCTION DECODE (IRCK)
SIZE D CODE CS NUMBER M8224-Ø-1 REV C
SCALE — SHEET 10 OF 13 DWT TW

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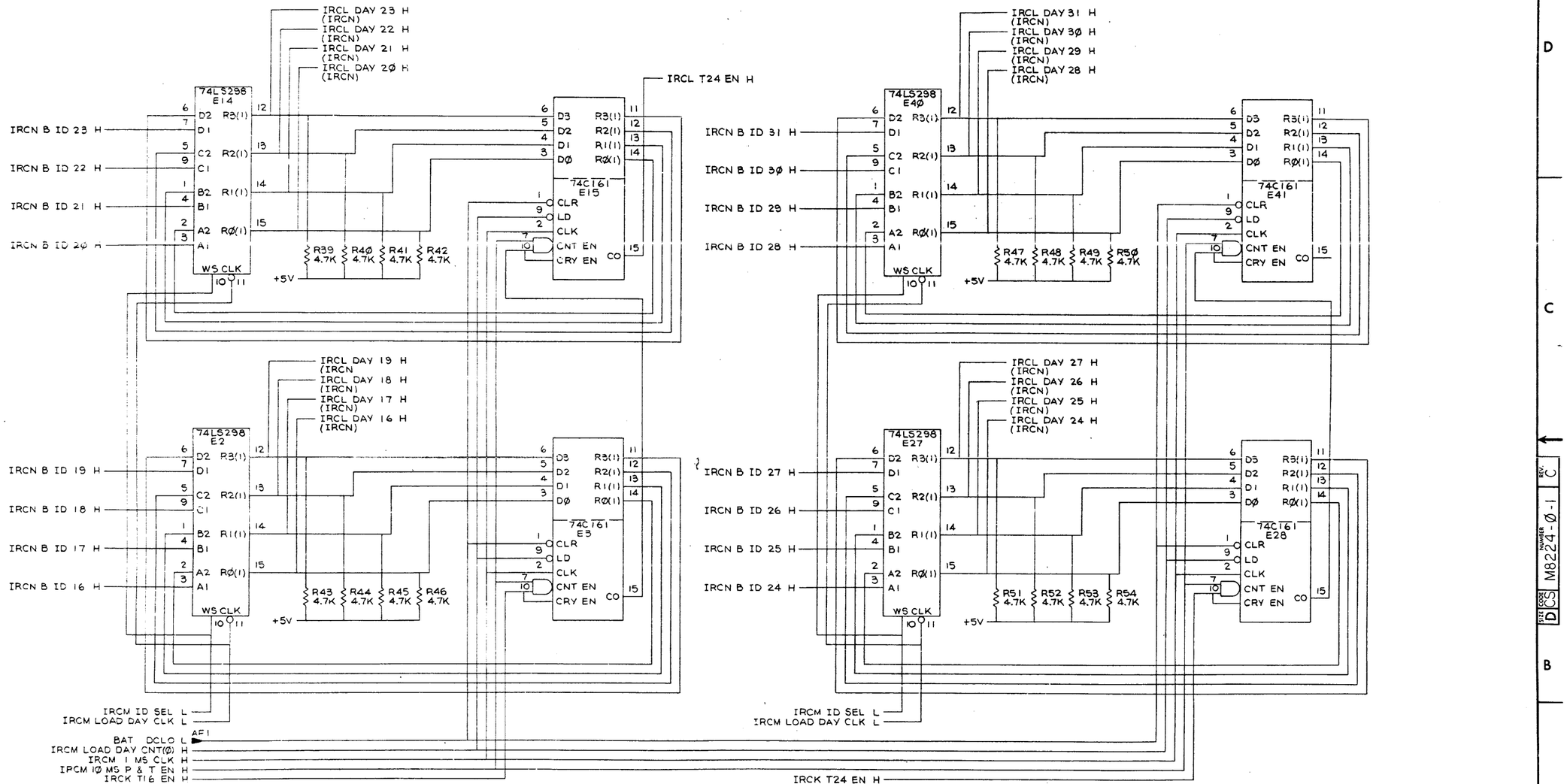

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 8)

(DAY CLOCK 31:16)

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DECODE (IRCL)	D	CS	M8224 - Ø - 1	C
SCALE —	SHEET 11 OF 13	DIST.		

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NOTE: THE +5 VOLTS OF THE FOLLOWING IC'S GO TO I/O PIN AU2. E3, E8, E9, E15, E28, E41, E54, E67, E79, E92, Y1.

IRCM 1MS CLK H AK2 → AK1 IRCM 1 MS CLK H (IRCK, IRCL)

DAY CLOCK +5 AU2

1KHZ OSC Y1

BAT DCLO L AF1

74C160 E9: D3 D2 D1 DØ; R3(1) R2(1) R1(1) RØ(1); CLR LD CLK CNT EN CRY EN; CO → IRCM 1Ø MS P & T EN H (IRCK, IRCL)

+5V

R55 4.7K

IRCJ +3V C

IRCM SET START H

IRCM B CPU T2 H

74S112 E10 → IRCM LOAD DAY CNT(1) H

74C74 E8 → IRCM LOAD DAY CNT(Ø) H (IRCK, IRCL)

IRCM 1 MS CLK H

CLKR PS DCLO L AU2

IRCJ +3V C

74S04 E19; 8640 E5; 74574 E11 → IRCM DONE(1) H

IRCM LOAD DAY CNT(1) H

IRCM BUSY(1) H

IRCH CPU T2 L

74S04 E19; 74S04 E19

IRCM B CPU T2 H

IRCM DONE(1) H

74S00 E23; 74S00 E23 → IRCM SET START H

IRCM BUSY(Ø) H

74S10 E21 → IRCM BUSY(1) H

IRCM B CPU T2 H

IRCM DONE(1) H

74S112 E10 → IRCM BUSY(Ø) H

IRCC INIT L

IDPL REG SEL H FP2

IRCJ +3V C

74S11 E12

IRCM BUSY(1) H

IRCM BUSY(Ø) H

74S112 E20

IRCC INIT L

74S08 E22

IRCH CPU T1 H

74S51 E18 → IRCM LOAD DAY CLK L (IRCK, IRCL)

ICLJ ID RIGHT WRITE L EB2

74S04 E19; 74S08 E22

IRCH CPU T2 L

74S112 E20 → IRCM ID SEL L (IRCK, IRCL)

IRCH A CPU TØ L

74S10 E21 → IRCM DATA EN L (IRCN)

IDPA BUF B1-3(1) H CD1 → 74SØ4 E86 → IRCM BUF B1-3 L (IRCA, IRCE, IRCF, IRCH)

IDPA BUF B1-3(Ø) H BS2 → 74SØ4 E57 → IRCM BUF B1-3 H (IRCH)

IDPA BUF B1-2(1) H DP1 → 74SØ4 E62 → IRCM BUF B1-2 L (IRCA, IRCE, IRCF, IRCH)

IDPA BUF B1-2(Ø) H BS1 → 74SØ4 E57 → IRCM BUF B1-2 H (IRCA, IRCE, IRCH)

IDPA BUF B1-1(1) H DN1 → 74SØ4 E62 → IRCM BUF B1-1 L (IRCA, IRCE, IRCF, IRCH)

IDPA BUF B1-1(Ø) H BF1 → 74SØ4 E57 → IRCM BUF B1-1 H (IRCE)

IDPA BUF B1-Ø(1) H DB2 → 74SØ4 E62 → IRCM BUF B1-Ø L (IRCA, IRCF, IRCH)

IDPA BUF B1-Ø(Ø) H BT2 → 74S04 E57 → IRCM BUF B1-Ø H (IRCE, IRCF, IRCH)

IDPA BUF B1-7(1) H EB1 → 74SØ4 E86 → IRCM BUF B1-7 L (IRCA, IRCB, IRCE, IRCF, IRCH)

IDPA BUF B1-7(Ø) H CD2 → 74SØ4 E86 → IRCM BUF B1-7 H (IRCB, IRCE, IRCF, IRCH)

IDPA BUF B1-6(1) H DA1 → 74SØ4 E62 → IRCM BUF B1-6 L (IRCA, IRCB, IRCF, IRCH)

IDPA BUF B1-6(Ø) H BU2 → 74SØ4 E57 → IRCM BUF B1-6 H (IRCB, IRCE, IRCH)

IDPA BUF B1-5(1) H DU2 → 74SØ4 E62 → IRCM BUF B1-5 L (IRCA, IRCB, IRCE, IRCF, IRCH)

IDPA BUF B1-5(Ø) H BU1 → 74SØ4 E57 → IRCM BUF B1-5 H (IRCA, IRCB, IRCE, IRCH)

IDPA BUF B1-4(1) H DF2 → 74SØ4 E62 → IRCM BUF B1-4 L (IRCA, IRCB, IRCD, IRCH)

IDPA BUF B1-4(Ø) H FM2 → 74SØ4 E86 → IRCM BUF B1-4 H (IRCA, IRCB, IRCF, IRCH)

IRCM B BUF B1-7 H (IRCD)

IRCN IRC SERIAL H

74S165 E68: SER IN; SHIFT LD; CP1 CP2 FS2; D7 D6 D5 D4 D3 D2 D1 DØ; CLK INH; CLK; R1(1) RØ(1) → DL2 IRCM IR SERIAL OUT H (IDPP)

TBMX IB ERR L

TBMX IB MISS L

CEHH FPD BIT L

IRCE IB ADVANCE H

IRCJ SP2 CON 1 H

IRCJ SP2 CON Ø H

IRCM DATA EN L

CIBH SDMS DEL CLK L DF1 → 8640 E5 → DP2 IRCM B SDMS CLOCK H (IRCN, IDPP)

CIBH SDMS LOAD H DM2 → 8640 E5 → DS2 IRCM B SDMS LOAD L (IRCN, IDPP)

+5V

R56

BAT DCLO L AF1

R57

8640 E5 → AL1 IRCM BAT DCLO H (CLKK)

NOTE: R56 & R57 ARE SPARES.

(SLOT 8)

(DAY CLOCK CONTROL, BYTE 1 BUFFERS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE	CODE	NUMBER	REV.
INSTRUCTION DECODE (IRCM)		D	CS	M8224 -Ø - 1	C
SCALE	SHEET 12 OF 13	DIST.			

M8224-Ø-1 REV C

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IRCM B SDMS LOAD L
CIBH SLF TST H
ICLD SERVICE H
ICLD SERV BIT 1 H
ICLD SERV BIT 2 H
IRCC EPØ H
IRCC EP1 H
IRCC EP2 H
IRCM B SDMS CLOCK H

SER SHIFT IN LD D7 74LS165 E130 D6 D5 D4 D3 D2 D1 DØ CLK INH
FC1 FJ1 FE1 FJ2 CLK
R1(1) R0(1)

IRCN IRC SERIAL H (IRCM)

IRCK DAY 15 H
IRCK DAY 14 H
IRCK DAY 13 H
IRCK DAY 12 H

26S10 E90 B3 B2 B1 BØ D3 D2 D1 DØ R3 R2 R1 RØ EN
DV2 DS1 DR2 DR1

BUS ID D15 L
BUS ID D14 L
BUS ID D13 L
BUS ID D12 L

IRCN B ID 15 H(IRCK)
IRCN B ID 14 H(IRCK)
IRCN B ID 13 H(IRCK)
IRCN B ID 12 H(IRCK)

IRCK DAY 11 H
IRCK DAY 1Ø H
IRCK DAY Ø9 H
IRCK DAY Ø8 H

26S10 E77
CM2 CK2 CK1 CJ2

BUS ID D11 L
BUS ID D1Ø L
BUS ID D09 L
BUS ID D08 L

IRCN B ID 11 H(IRCK)
IRCN B ID 1Ø H(IRCK)
IRCN B ID Ø9 H(IRCK)
IRCN B ID Ø8 H(IRCK)

IRCK DAY Ø7 H
IRCK DAY Ø6 H
IRCK DAY Ø5 H
IRCK DAY Ø4 H

26S10 E65
CJ1 CH2 CF2 CF1

BUS ID D07 L
BUS ID D06 L
BUS ID D05 L
BUS ID D04 L

IRCN B ID Ø7 H(IRCK)
IRCN B ID Ø6 H(IRCK)
IRCN B ID Ø5 H(IRCK)
IRCN B ID Ø4 H(IRCK)

IRCK DAY Ø3 H
IRCK DAY Ø2 H
IRCK DAY Ø1 H
IRCK DAY ØØ H

26S10 E52
CE2 CE1 CB2 CA1

BUS ID D03 L
BUS ID D02 L
BUS ID D01 L
BUS ID DØØ L

IRCN B ID Ø3 H(IRCK)
IRCN B ID Ø2 H(IRCK)
IRCN B ID Ø1 H(IRCK)
IRCN B ID ØØ H(IRCK)

IRCM DATA EN L

IRCL DAY 31 H
IRCL DAY 3Ø H
IRCL DAY 29 H
IRCL DAY 28 H

26S10 E39
BK2 BK1 BJ2 BJ1

BUS ID D31 L
BUS ID D3Ø L
BUS ID D29 L
BUS ID D28 L

IRCN B ID 31 H(IRCL)
IRCN B ID 3Ø H(IRCL)
IRCN B ID 29 H(IRCL)
IRCN B ID 28 H(IRCL)

IRCL DAY 27 H
IRCL DAY 26 H
IRCL DAY 25 H
IRCL DAY 24 H

26S10 E26
BH2 BF2 AU1 AT2

BUS ID D27 L
BUS ID D26 L
BUS ID D25 L
BUS ID D24 L

IRCN B ID 27 H(IRCL)
IRCN B ID 26 H(IRCL)
IRCN B ID 25 H(IRCL)
IRCN B ID 24 H(IRCL)

IRCL DAY 23 H
IRCL DAY 22 H
IRCL DAY 21 H
IRCL DAY 2Ø H

26S10 E13
AS2 AP2 AP1 AN1

BUS ID D23 L
BUS ID D22 L
BUS ID D21 L
BUS ID D2Ø L

IRCN B ID 23 H(IRCL)
IRCN B ID 22 H(IRCL)
IRCN B ID 21 H(IRCL)
IRCN B ID 2Ø H(IRCL)

IRCL DAY 19 H
IRCL DAY 18 H
IRCL DAY 17 H
IRCL DAY 16 H

26S10 E1
AM1 AJ1 AH2 AF2

BUS ID D19 L
BUS ID D18 L
BUS ID D17 L
BUS ID D16 L

IRCN B ID 19 H(IRCL)
IRCN B ID 18 H(IRCL)
IRCN B ID 17 H(IRCL)
IRCN B ID 16 H(IRCL)

(ID BUS X-CEIVERS)

(SLOT 8)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INSTRUCTION DECODE (IRCN)	D	CS	M8224-Ø-1	C
SCALE -/-	SHEET 13 OF 13	DIST. TW		

198

COMPONENT SIDE VIEW

digital

SIGNATURES
DRAF.
ENG.
PROJ.
PROD.
SCHEM.
MFG.

DATE

TITLE

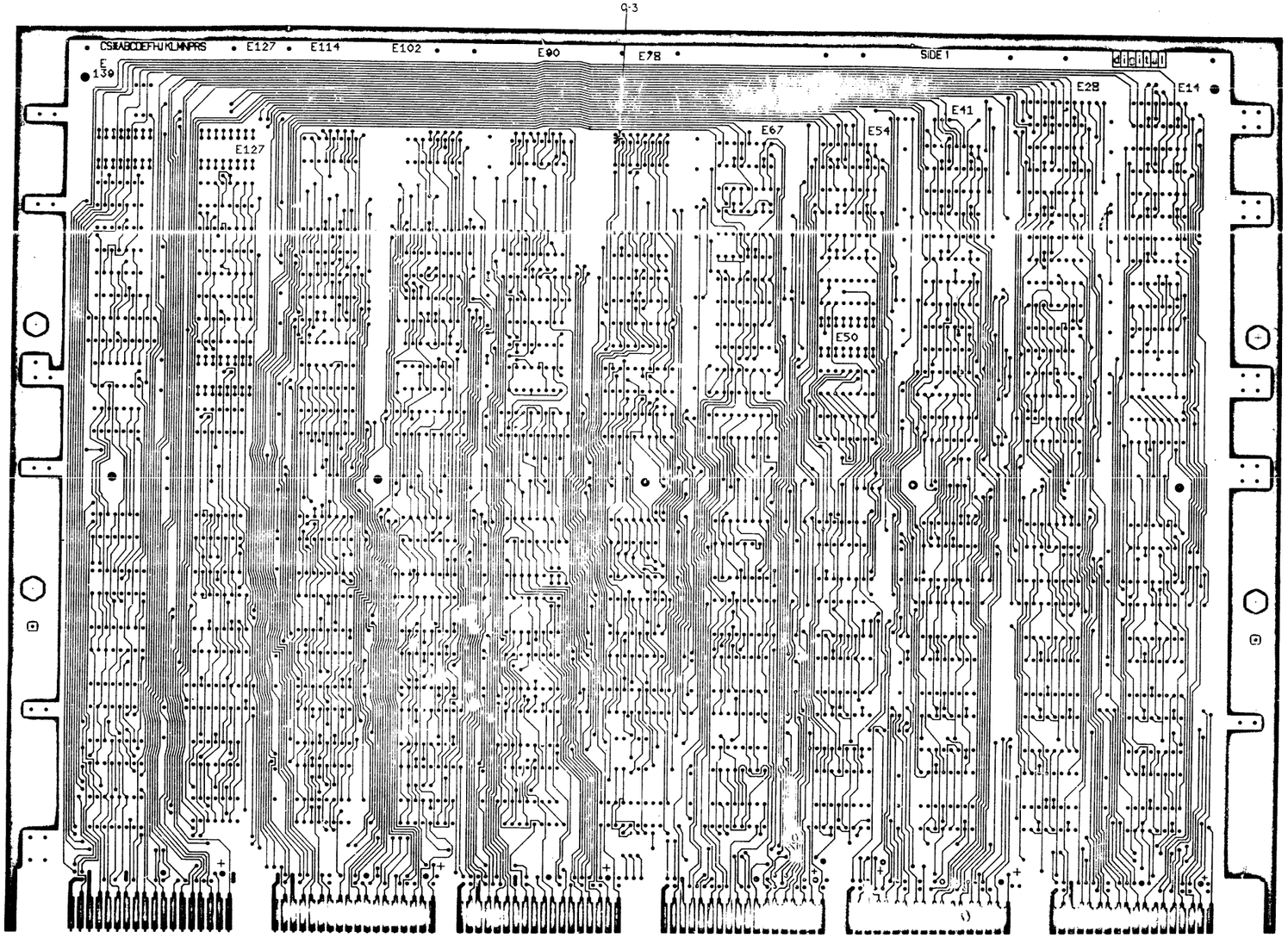
SIZE CODE NUMBER
C 54-14178-01

SHT. NUMBER REV.
OF

ECO REV.
P.C. DESIGN DATA SPEC REV.

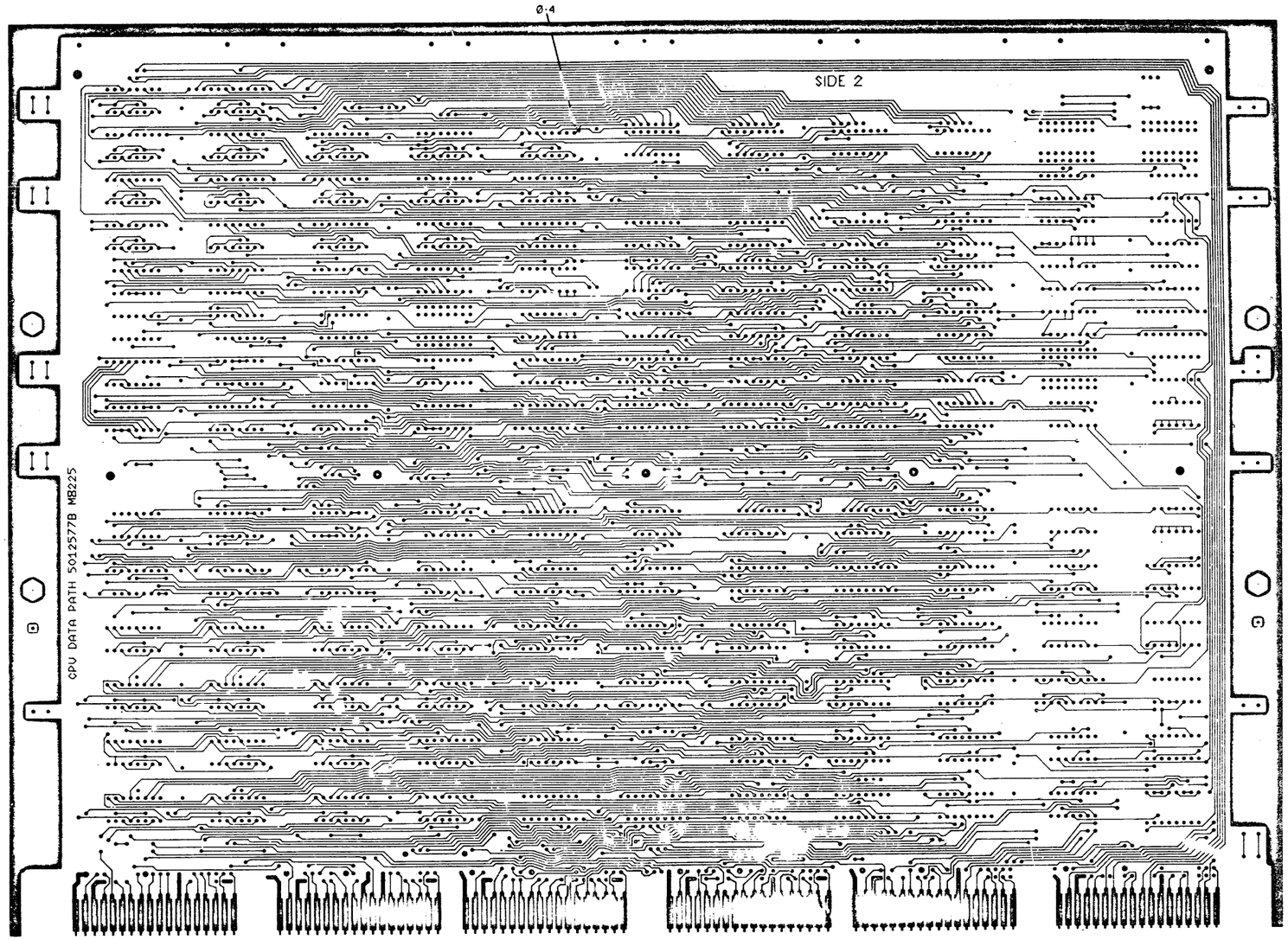
CHANGE NO REV

NOTES:



REVISIONS		
ECO#	CHANGE NO	REV

TITLE: CPU DATA PATH B		SIZE: E	CODE: UA	NUMBER: M8225-0-2
SCALE: 2-1	SHEET: 2 OF 3	DIST:		REV: A



REVISIONS		
CHK	CHANGE NO	REV

TITLE	SIZE	CODE	*NUMBER	REV.
CPU DATA PATH B	E	UA	MB225-2-0	A
SCALE 2-1	SHEET 3 OF 3	DIST		

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DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY TRIAD DATE 22 NOV 77	CHECKED F. Smaet DATE 6-1-77	SECTION
ENG E Anton DATE 6-9-77	PROD Mike Tullo DATE 6-1-77	ISSUED SECTION

NOTES:
MS 104840
ETCH REV B
CS REV A

ITEM NO.	DRAWING NO	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8225-Ø-Ø	REF DESIGNATION
1		10-12084-1	CAPACITOR, 8UF	7	C1-C7
2		10-12784	CAPACITOR, .047UF	37	C8-C44
3		13-00295	RESISTOR, 330 , 1/4W, 5%	5	R1,R3,R5,R7,R9
4		13-01775	RESISTOR, 820 , 1/4W, 5%	4	R2,R4,R6,R8
5		13-00247	RESISTOR, 120 , 1/4W, 5%	2	R12,R14
6		13-00250	RESISTOR, 150 , 1/4W, 5%	2	R11,R13
7		13-01424	RESISTOR, 680 , 1/4W, 5%	1	R10
8		19-10532	I.C. DEC 74S00	2	E115,136
9		19-10534	I.C. DEC 74S04	9	E5,E6,E19,E33,E46,E47,E98,E116,E121
10		19-12389	I.C. DEC 74S08	4	E23,E119,E120,E134
11		19-10536	I.C. DEC 74S10	1	E10
12		19-10537	I.C. DEC 74S11	1	E37
13		19-10539	I.C. DEC 74S20	2	E9,E36
14		19-11712	I.C. DEC 74S51	2	E129,E137
15		19-10542	I.C. DEC 74S64	3	E22,E132,E133
16		19-12796	I.C. DEC 74148	4	E8,E21,E35,E49
17		19-11675	I.C. DEC 74S138	3	E24,E130,E131
18		19-10556	I.C. DEC 74S151	4	E123-E126
19		19-10547	I.C. DEC 74S153	19	E38,E51,E57,E58,E69,E70,E79-E82,E86, E91-E94,E103-E106
20		19-10549	I.C. DEC 74S158	2	E62,E118

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CPU DATA PATH B	E-UA-M8225-Ø-Ø	B	PL	M8225-0-0	A
	SHEET 1 OF 2	INSERTION PARTS LIST DATA BASE REV			

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY TRIAD DATE 22NOV.77	CHECKED F. SMART DATE 6-1-77	SECTION
ENG E Anton DATE 6-9-77	PROD Mike Miller DATE 6-1-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8225-0-0	REF DESIGNATION
21		19-10957	I.C. DEC 74S175	1	E128
22		19-10552	I.C. DEC 74S194	8	E59,E71,E83,E95,E107-E110
23		19-13493	I.C. DEC 74S241	5	E61,E73,E85,E97,E117
24		19-11573	I.C. DEC 74S280	4	E60,E72,E84,E96
25		19-13670	I.C. DEC 74S373	1	E135
26		19-12693	I.C. DEC 25S10	52	E1-E4,E11-E18,E25-E32,E39-E45,E52-E54, E56,E63-E67,E75-E78,E87-E90,E99-E102, E111-E114
27		19-13788	I.C. DEC 26S10	1	E55
28		19-11415	I.C. DEC 10125	1	E68
29		19-11983	I.C. DEC 74S133	4	E7,E20,E34,E48
30		19-13462	I.C. DEC 74S240	1	E74
31		19-12746	I.C. DEC 74S37	1	E138
32		1210711-2	HEX HANDLE ASSY	1	
33		9000024-01	EYELET	12	
34	E-MD-50 2577-0-0	5012577	ETCHED BOARD		
35			SPARES		E50,E122,E127,E139

NOTES:

MS 104840
ETCH REV B
CS REV A

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CPU DATA PATH B	E-UA-M8225-0-0	B	PL	M8225-0-0	A
	SHEET 2 OF 2	INSERTION PARTS LIST DATA BASE REV			

DRB 125

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DCPJ VA (Ø1:ØØ) H / 2
BAL & MDAL CONTROL PRINT DBPA
DBPA MDALM (1:Ø) H / 2
DBPA BALM (1:Ø) H / 2
BUS MD DATA ALIGN. (BAL) DBPU 8X25S1Ø
32
MEMORY DATA ALIGNER DBPT MDAL (31:ØØ) 8X25S1Ø
32 T.S. BUS MD (31:ØØ) H
4 BUS MD BYTE (3:Ø) PAR H
BUS MD PARITY ALIGNER PRINT DBPF 1X25S1Ø
4 T.S. BUS ID P (3:Ø) L
TBMD D TO MD L
BUS DPMX (31:ØØ) L / 32
DBPS DAL (31:ØØ) H
DREG MULTIPLEXER DBPC,D DMX(31:ØØ)H 16X74S153
DBPA DMUX S1 (A:B) H / 2
DBPA DMUX SØ (A:B) H / 2
DBPA CLR D H / 1
ID BUS PARITY DRIVER PRINT DBPF 2GS1Ø
DATA ALIGNER SHIFT LEFT Ø-63 PRINTS DBPM,N,P,R,S 35X25S1Ø
DAPH D SHIFT INPUT H / 1
DBPA DBYTE (3:Ø) S1 H / 4
DBPE DBYTE (3:Ø) SØ H / 4
RSHFT D REGISTER LSHFT 32 BIT SHIFT REG. DBPE DREG (31:ØØ) H 8X79S194
D REG PARITY GEN PRINT DBPF 4X74S280
BUS CS (91:88) H / 4
DBPN PCLK A L / 1
SBLP MD TO D L / 1
DAPN UWORD CLR (1) L / 1
DAPP DFMX UNPACK L / 1
DCPL ALU CARRY 31 L / 1
D REG CONTROL
PRINT DBPA,B
DBPA DFMX SØ H (DCPC, DDPC, DEPL, M)
DBPE DREG 31:ØØ H
D REG BUFFER DBPK BUFF DREG (31:ØØ) 4X74S241
CLOCK CONTROL DBPV 1X1Ø125
DBPV TP L
CLKF ECL CPTPI H / 1
CLKF ECL CPTPI L / 1
DBPV QREG CLK TP L
D REGISTER NORMALIZE SHIFT VALUE GENERATOR PRINT DBPH,J,K L
DBPL SV (Ø5:ØØ) H (DDPN)
DATA ALIGNER CONTROL MUX DBPL
DBPL DALX (Ø5:ØØ) H / 6
DDPR SC (Ø9,Ø4:ØØ) H / 6
DBPE BUFF DREG (31:ØØ) H
DEPE QREG (31:16) H
DDPF QREG (15:Ø8) H
DCPF QREG (Ø7:ØØ) H

REVISIONS		
CHK	CHANGE NO.	REV.
E. ANTON 26 Oct 77	M8225-00001	A

(BLOCK DIAGRAM XSLOT 9)

DRN. J. Vincent	3-24-77	FIRST USED ON
CHK'D [illegible]	[illegible]	
ENG. E. ANTON	5-17-77	
PROJ. ENGR ANTON	5-17-77	
PROJ. [illegible]	6/1/77	
NEXT HIGHER ASSY.		
SCALE		
SHEET 1 OF 19		

TITLE: DATA ALIGNER

SIZE	CODE	NUMBER	REV.
D	CS	M8225-Ø-1	B

DIST.

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DBPA D COND SNGL SHF LFT L
DBPA D SNGL SHF LFT L
SBLP MD TO D L FU1
DBPA UDK3 (1) L
74S08 E.36
DAPN PCLK A L FT2
DBPA D DBL SHF LFT L
74S64 E132
DBPA D SNGL SHF RHT L
DBPA D DBL SHIFT RHT L
74S64 E133
DBPA D COND SNGL SHF LFT L
74S04 E116
74S00 E115
DCPL ALU CARRY 31 L FU2
74S04 E121

DBPB ENA BYTE3 H
DBPB ENA BYTE2 H
DBPB ENA BYTE1 H
DBPB ENA BYTEØ H
74S08 E120 DBPA DBYTE3 S1 H (DBPE)
74S08 E120 DBPA DBYTE2 S1 H (DBPE)
74S08 E120 DBPA DBYTE1 S1 H (DBPE)
74S08 E120 DBPA DBYTEØ S1 H (DBPE)
74S08 E119 DBPA DBYTE3 SØ H (DBPE)
74S08 E119 DBPA DBYTE2 SØ H (DBPE)
74S08 E119 DBPA DBYTE1 SØ H (DBPE)
74S08 E119 DBPA DBYTEØ SØ H (DBPE)

SBLP MD TO D L (FU1)
DBPA LOAD NIB SWAP L
74S37 E138 DBPA DMX S1 H (DBPC,D)
DBPA UDK2 (Ø) L
DBFA D COND SNGL SHF LFT L
74S51 E129 DBPA DMX SØ H (DBPC,D)
DBPB MD TO D H
DBPA DMX S1 H
74S241 E117 DBPA DMX S1 A H (DBPC)
DBPE +3V H
74S241 E117 DBPA DMX S1 B H (DBPD)
DBPA DMX SØ H
74S241 E117 DBPA DMX SØ A H (DBPC)
74S241 E117 DBPA DMX SØ B H (DBPD)

DBPA UDK3 (Ø) H
DBPA UDK2 (1) H
DBPA UDK1 (1) H
DBPA UDKØ (1) H
74S138 E131
D7 DBPA D SNGL SHF RHT L
D6 DBPA D SNGL SHF LFT L
D5 DBPA D COND SNGL SHF LFT L
D4 DBPA D DBL SHF RHT L
D3 DBPA D DBL SHF LFT L
DBPA UDK3 (1) H
74S138 E130
D7
D6
D5 DBPA LOAD D SHF BY SC L (DBPL)
D4 DBPA LOAD Q L (DBPL)
D3 DBPA LOAD NIB SWAP L
D2 DBPA LO. D ACC D L (DAPK) DK2
D1
D0
74S240 E74 DBPA CLR D H
DAPP DFMX UNPACK L DR2
74S37 E138 FV2 DBPA DFMUX SØ H C,DIPC,DEPL,M)

+5V
R1 330 R3 330 R5 330 R7 330
R2 820 R4 820 R6 820 R8 820
74S175 E128 UWORD REG
BUS CS 91 H FR2
BUS CS 90 H FR1
BUS CS 89 H FP2
BUS CS 88 H FP1
D3 R3(1) DBPA UDK3 (1) H
R3(Ø) DBPA UDK3 (1) L
D0 R0(1) DBPA UDK2 (1) H
R0(Ø)
D2 R2(1) DBPA UDK1 (1) H
R2(Ø)
D1 R1(1) DBPA UDKØ (1) H
R1(Ø)
CLR CLK
DAPN UWORD CLR (1) L FS1
DAPN PCLK A L (FT2)

(D REG CONTROL) SLOT 9)

REVISIONS
CHK | CHANGE NO. | REV.

TITLE: DATA ALIGNER (DBPA)
SIZE D | CODE CS | NUMBER M8225-Ø-1 | REV. B
SCALE — | SHEET 2 OF 9 | DIST.

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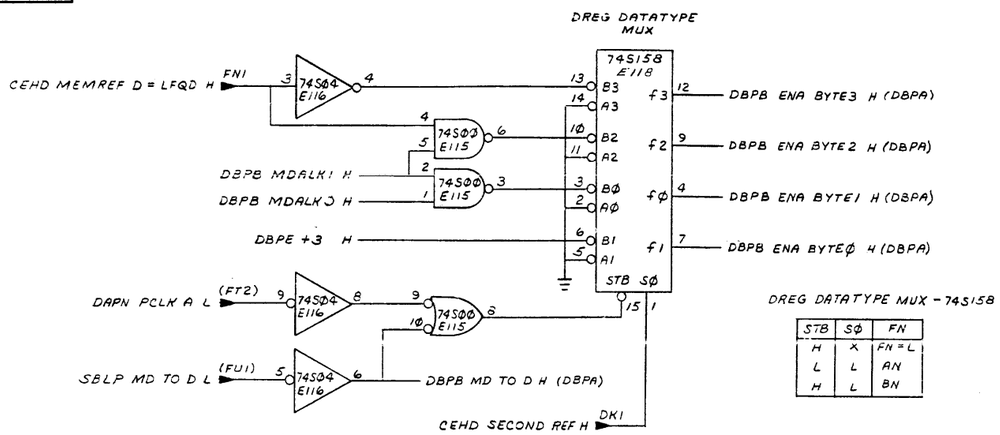
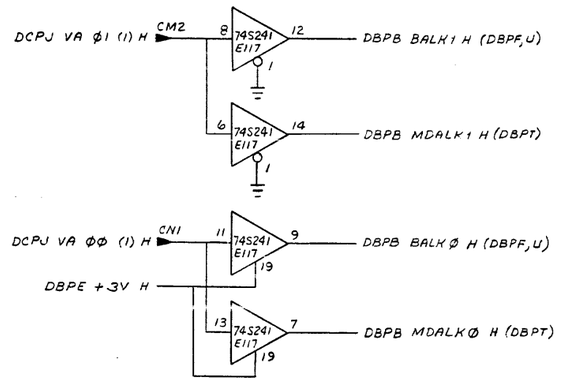


DREG DATATYPE MUX - 74S158

STB	SØ	FN
H	X	FN = L
L	L	AN
H	L	BN



D REGISTER WRITE ENABLE TPUTH TABLE

MDBAL		DATA TYPE	SEC. REF	D REG ENA BYTE (3:Ø) = 1 = H			
VAØ1	VAØØ	DT = LQDF		BYTE 3	BYTE 2	BYTE 1	BYTE Ø
L	L	L	L	H	H	H	H
L	H	L	L	H	H	H	H
		H	L	H	H	H	H
		H	H	H	L	L	L
H	L	L	L	H	H	H	H
		H	L	H	H	H	H
		H	H	H	H	L	L
H	H	L	L	H	H	H	H
H	H	H	L	H	H	H	H
H	H	H	H	H	H	H	L

UDK CONTROL TRUTH TABLE

UWORD HEX	WDK UWORD				DMX CONTROL			DREG CONTROL		
	3	2	1	Ø	S1	SØ	DATA SOURCE	S1	SØ	FUNCTION
Ø	L	L	L	L	X	X	—	L	L	NO OPERATION.
1	L	L	L	H	X	X	—	H	L	DOUBLE SHIFT LEFT.
2	L	L	H	L	X	X	—	L	H	DOUBLE SHIFT RIGHT.
3	L	L	H	H	X	X	—	L	L	RESERVED.
4	L	H	L	L	L	H	DFMX	H	L/H	CONDITIONAL WITH ALU CARRY, ALU CARRY 31 = 1 = L.
								H	L	⟷ SINGLE SHIFT LFT IF .NOT. ALU CARRY; ELSE.
								H	H	⟷ LOAD DFMX (INTEGER).
5	L	H	L	H	X	X	—	H	L	SINGLE SHIFT LEFT.
6	L	H	H	L	X	X	—	L	H	SINGLE SHIFT RIGHT.
7	L	H	H	H	X	X	—	L	L	RESERVED.
8	H	L	L	L	L	H	DFMX	H	H	LOAD DFMX (INTEGER).
9	H	L	L	H	L	H	DFMX	H	H	LOAD DFMX (UNPACKED FLOAT).
A	H	L	H	L	L	H	ACCELERATOR	H	H	LOAD ACC DATA.
B	H	L	H	H	H	H	BUFF. DREG	H	H	LOAD D NIBBLE SWAP.
C	H	H	L	L	L	L	DAL	H	H	LOAD Q REG [DAL SHIFTED BY 3].
D	H	H	L	H	L	L	DAL	H	H	LOAD D [SHIFTED BY SC(Ø9,Ø4:ØØ)].
E	H	H	H	L	L	L	DAL	H	H	LOAD D [SHIFTED BY SHF VAL].
F	H	H	H	H	X	X	—	H	H	LOAD ZEROES (DISABLE DMX STROBE).

(DREG DATATYPE)SLOT 9)

REVISIONS

CHK	CHANGE NO.	REV

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPB)	D	CS	M8225-Ø-1	B
SCALE — H — SHEET 3 OF 19	DIST.			

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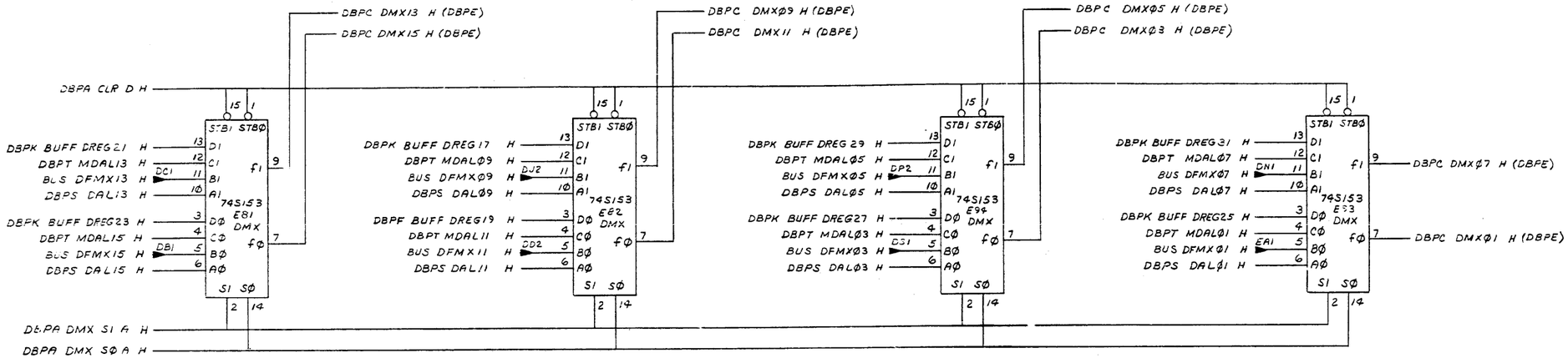

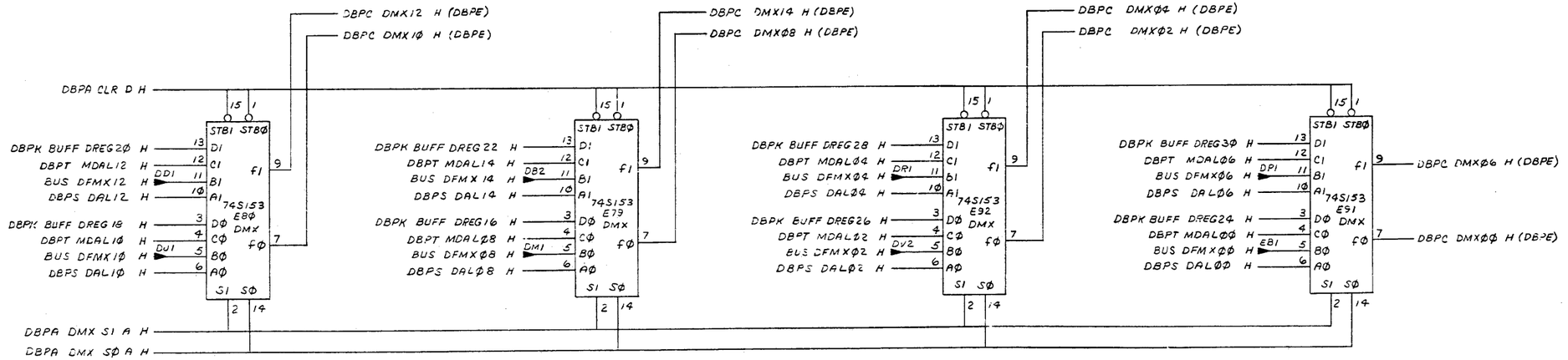

BUFF DREG | BYTE 3 | BYTE 2 | BYTE 1 | BYTE Ø

D NIBBLE SWAP

DMX | BYTE Ø | BYTE 1 | BYTE 2 | BYTE 3

DMX - 74S153

STB1, Ø	S1	SØ	FN
H	X	X	FN = L
L	L	L	DAL
L	L	H	BUS DFMX
L	H	L	MDAL
L	H	H	D SWAP

(DMX) (SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPC)	D	CS	M8225-Ø-1	B
SCALE —	SHEET 4 OF 19		DIST.	

207

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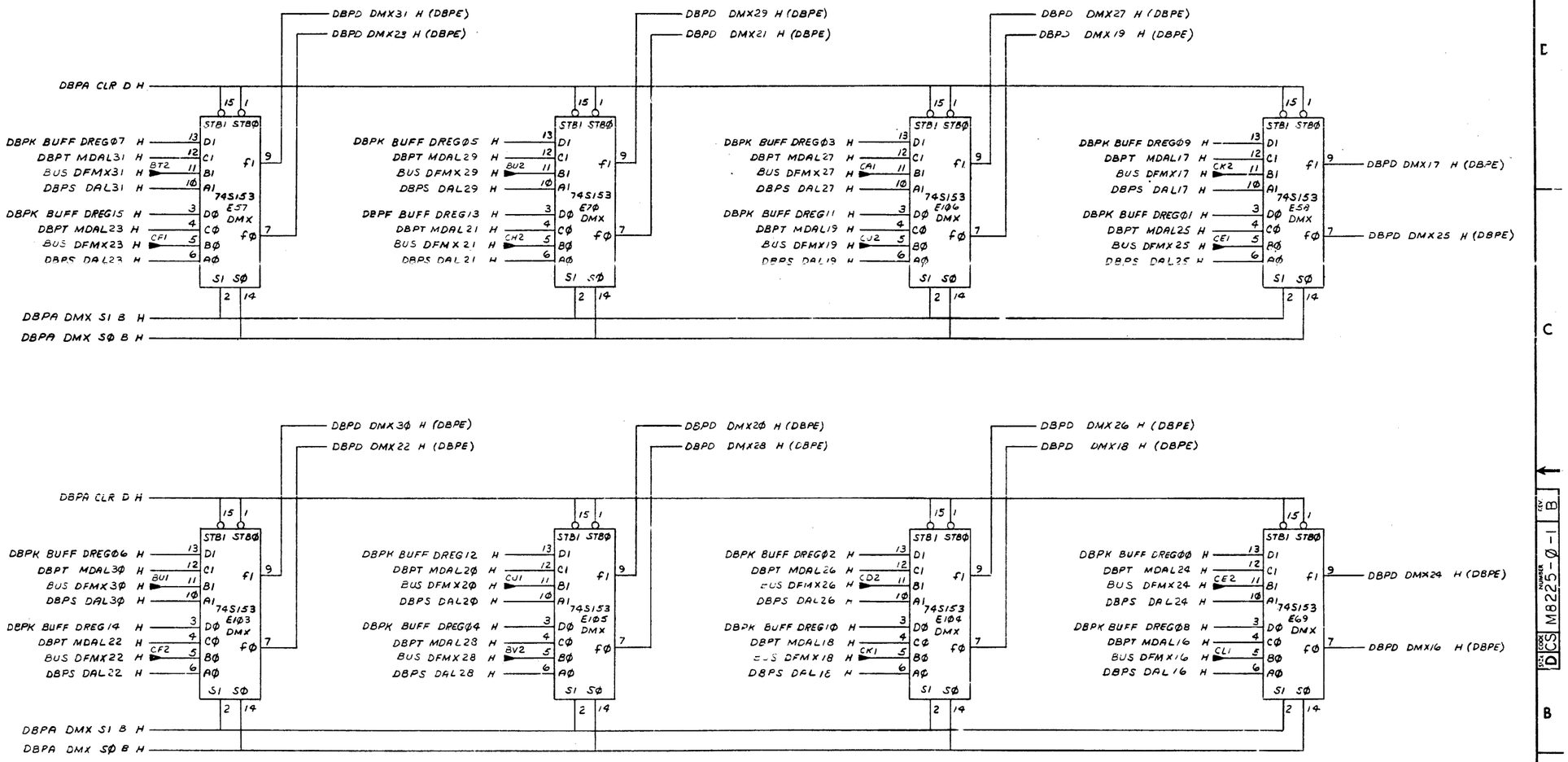

DMX - 74S153

STB1,0	S1	S0	FUNCT
H	X	X	F1,F0 = L
L	L	L	DAL
L	L	H	BUS DFMX
L	H	L	MDAL
L	H	H	NIBBLE SWAP

(DMX) (SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPD)	D	CS	M8225-0-1	B
SCALE —	SHEET 5 OF 19	DIST.		

MAINTENANCE PRINT

DEC FORM NO. 2123-1-78

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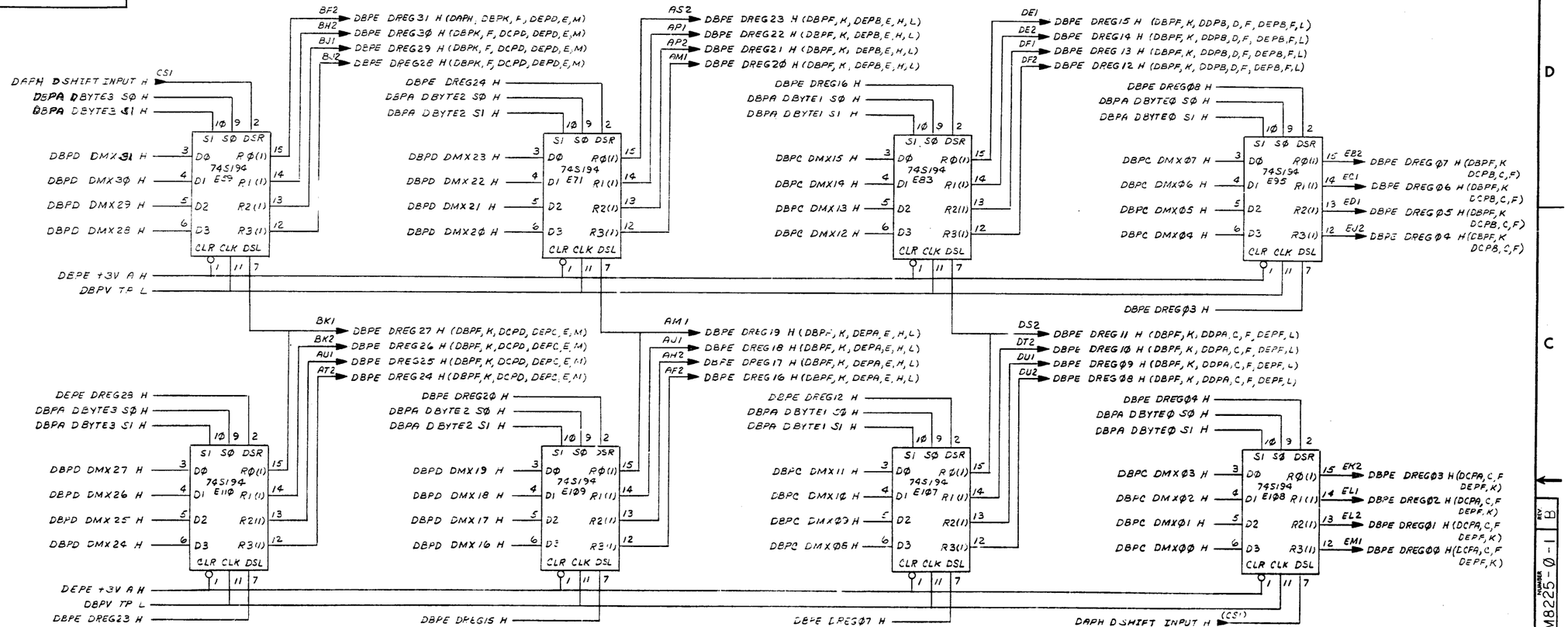
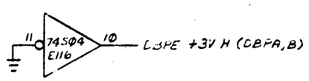
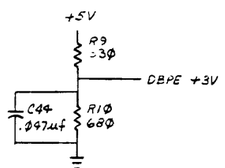


D REG 74S194 TRUTH TABLE

S1	S0	FUNCTION	Q3	Q2	Q1	Q0
L	L	NO OPERATION	Q3	Q2	Q1	Q0
L	H	SHIFT RIGHT	RSHF	Q3	Q2	Q1
H	L	SHIFT LEFT	Q2	Q1	Q0	LSHF
H	H	LOAD	D3	D2	D1	D0





(DREG 31:00) (SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPE)	D	CS	M8225-0-1	B
SCALE —	SHEET 6 OF 19	DIST.		

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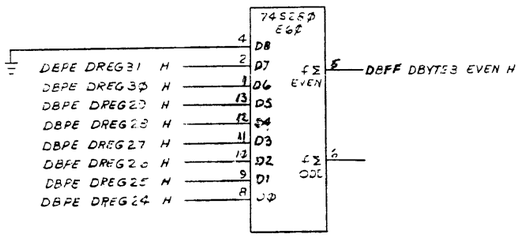
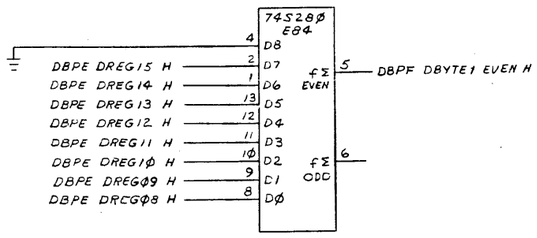
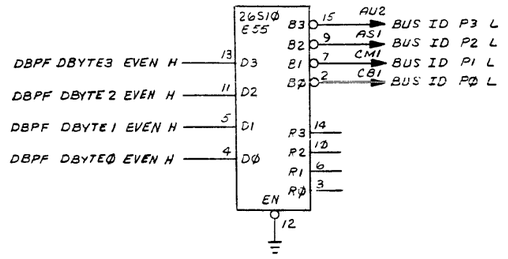
BYTE 3 PARITY GENERATOR



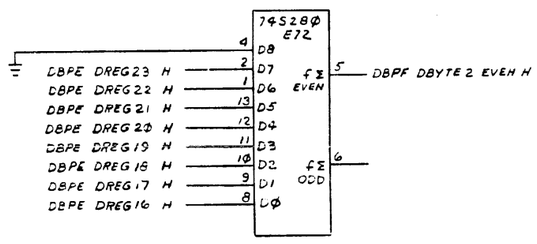
BYTE 1 PARITY GENERATOR



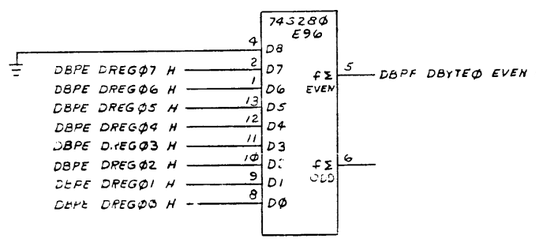
ID BUS PARITY DRIVER



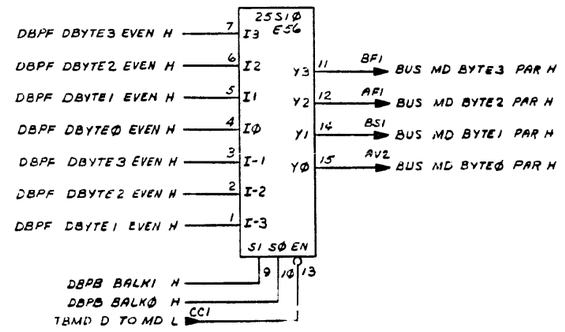
BYTE 2 PARITY GENERATOR



BYTEØ PARITY GENERATOR



BUS MD BYTE PARITY ALIGNER



2S1Ø LOGIC TRUTH TABLE

EN (1=L)	S1 (1=H)	SØ	OUTPUT (1=H) Y3	Y2	Y1	YØ
H	X	X	L	L	L	L
L	L	L	I3	I2	I1	IØ
L	L	H	I2	I1	IØ	I-1
L	H	L	I1	IØ	I-1	I-2
L	H	H	IØ	I-1	I-2	I-3

(BUS ID AND MD PARIY GEN.)(SLOT 9)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPF)	D	CS	M8225-Ø-1	B
SCALE —/— SHEET 7 OF 19	DIST.			

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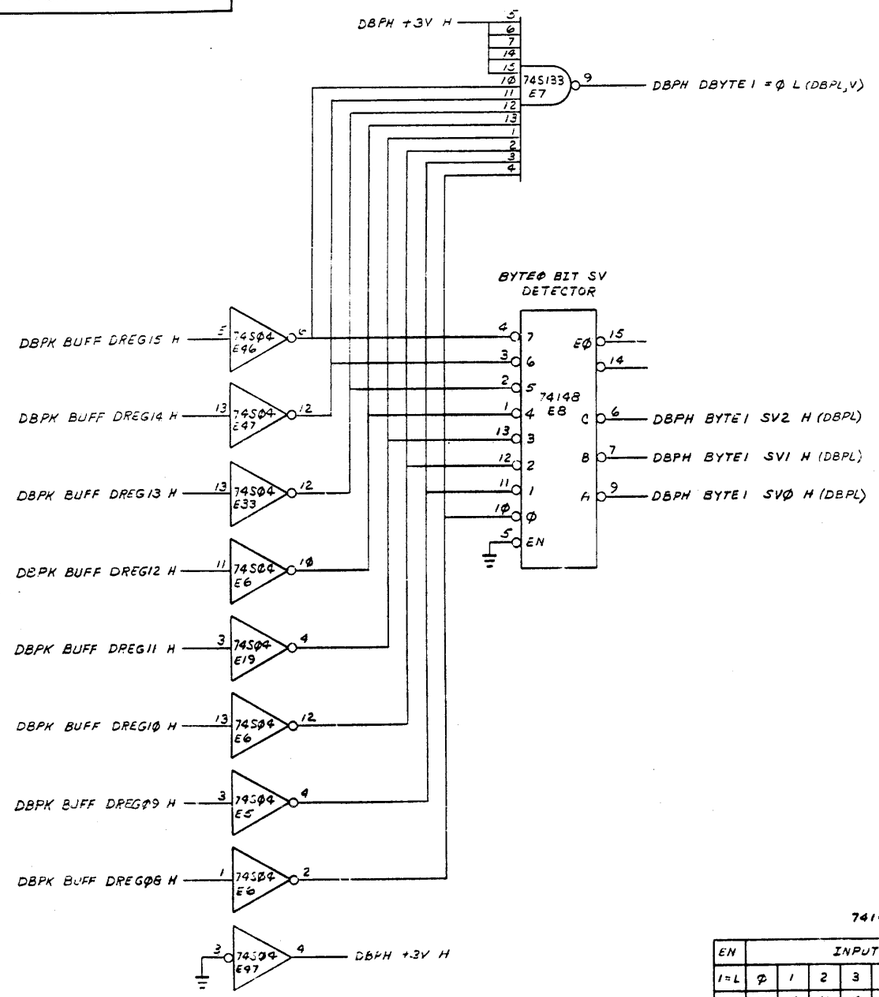

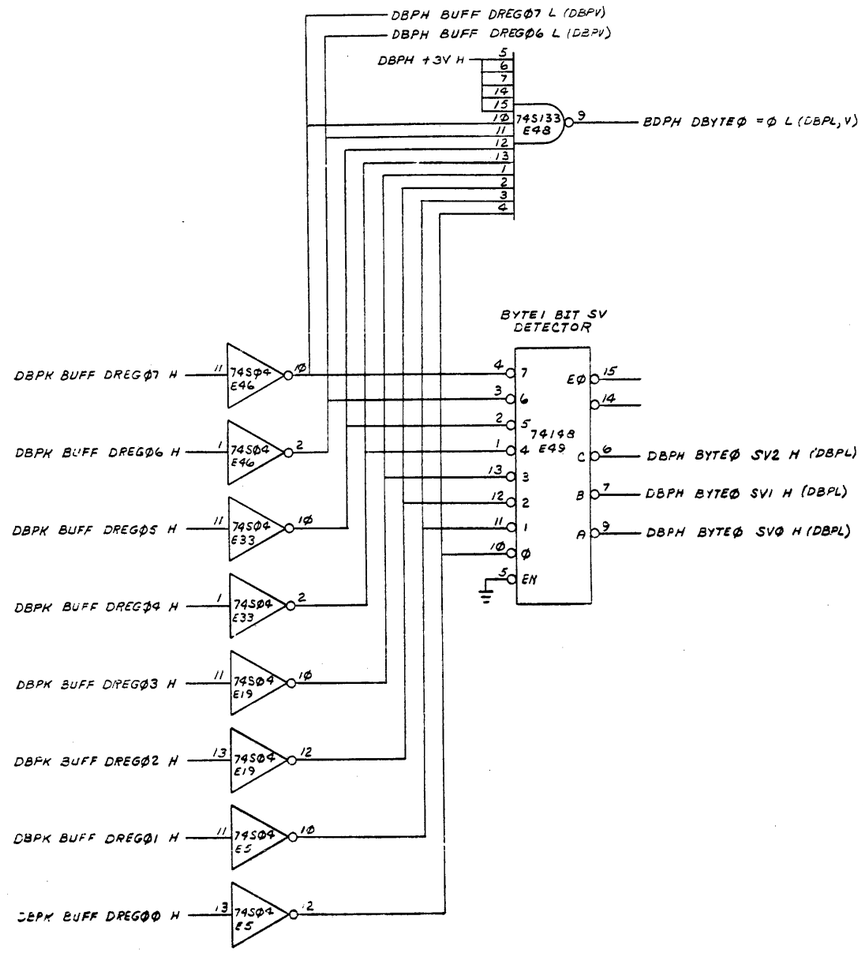

74148 TRUTH TABLE

EN	INPUTS								OUTPUT			
I=L	Ø	1	2	3	4	5	6	7	2	1	Ø	BIT SV
H	X	X	X	X	X	X	X	X	L	L	L	Ø
L	X	X	X	X	X	X	X	L	L	L	L	Ø
L	X	X	X	X	X	X	L	H	L	L	H	1
L	X	X	X	X	X	L	H	H	L	H	L	2
L	X	X	X	X	L	H	H	H	L	H	H	3
L	X	X	X	L	H	H	H	H	H	L	L	4
L	X	X	L	H	H	H	H	H	H	L	H	5
L	X	L	H	H	H	H	H	H	H	H	L	6
L	L	H	H	H	H	H	H	H	H	H	H	7

(BYTES 1 AND Ø BIT SV DETECTOR XSLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPH)	D	CS	M8225-Ø-1	B
SCALE —	SHEET 8 OF 19	DIST.		

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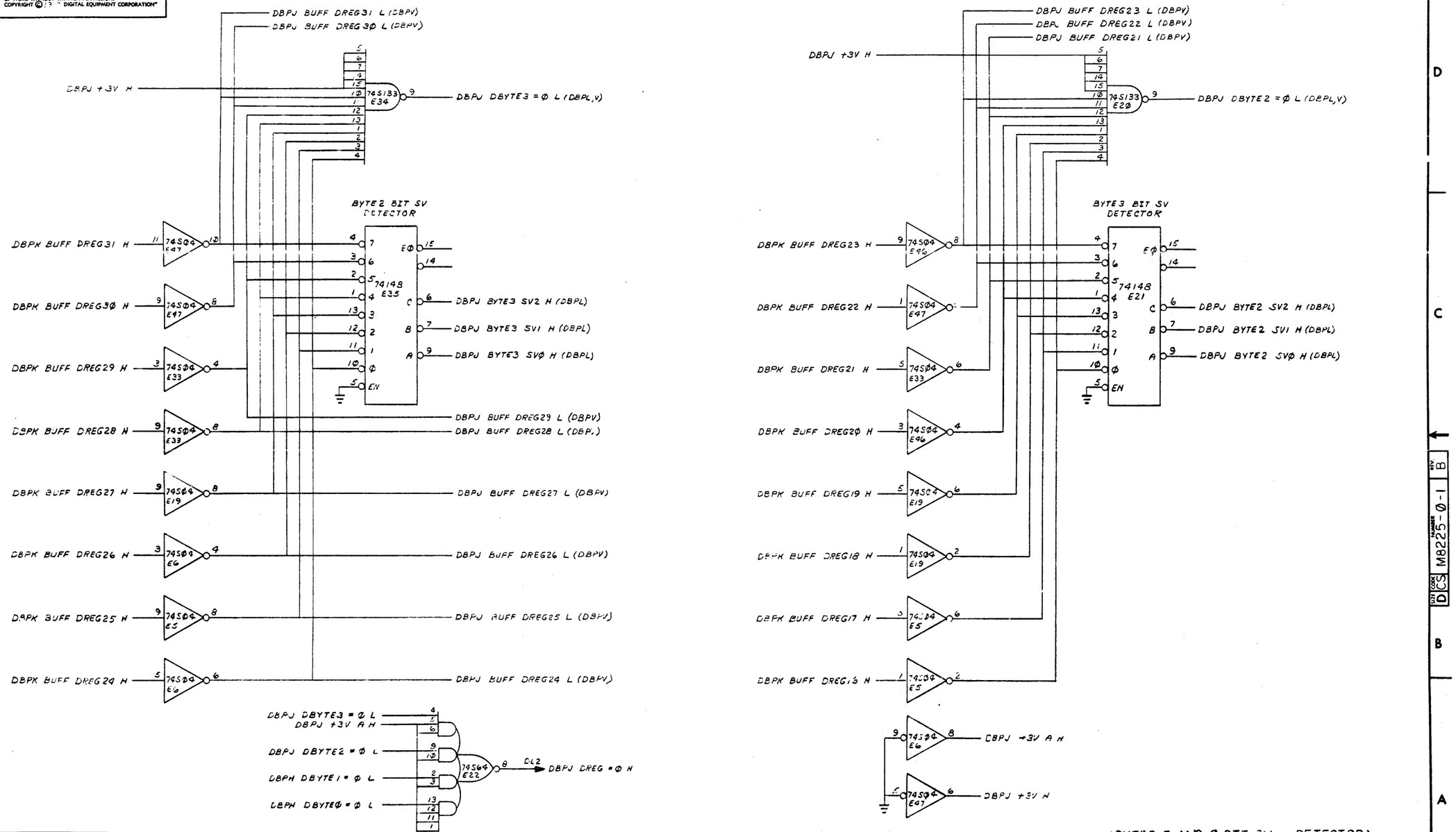

REVISIONS		
CHK	CHANGE NO.	REV.

(BYTES 3 AND 2 BIT SV DETECTOR)
(SLOT 9)

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPJ)	D	CS	M8225-Ø-1	B
SCALE —	SHEET 9 OF 19	DIST.		

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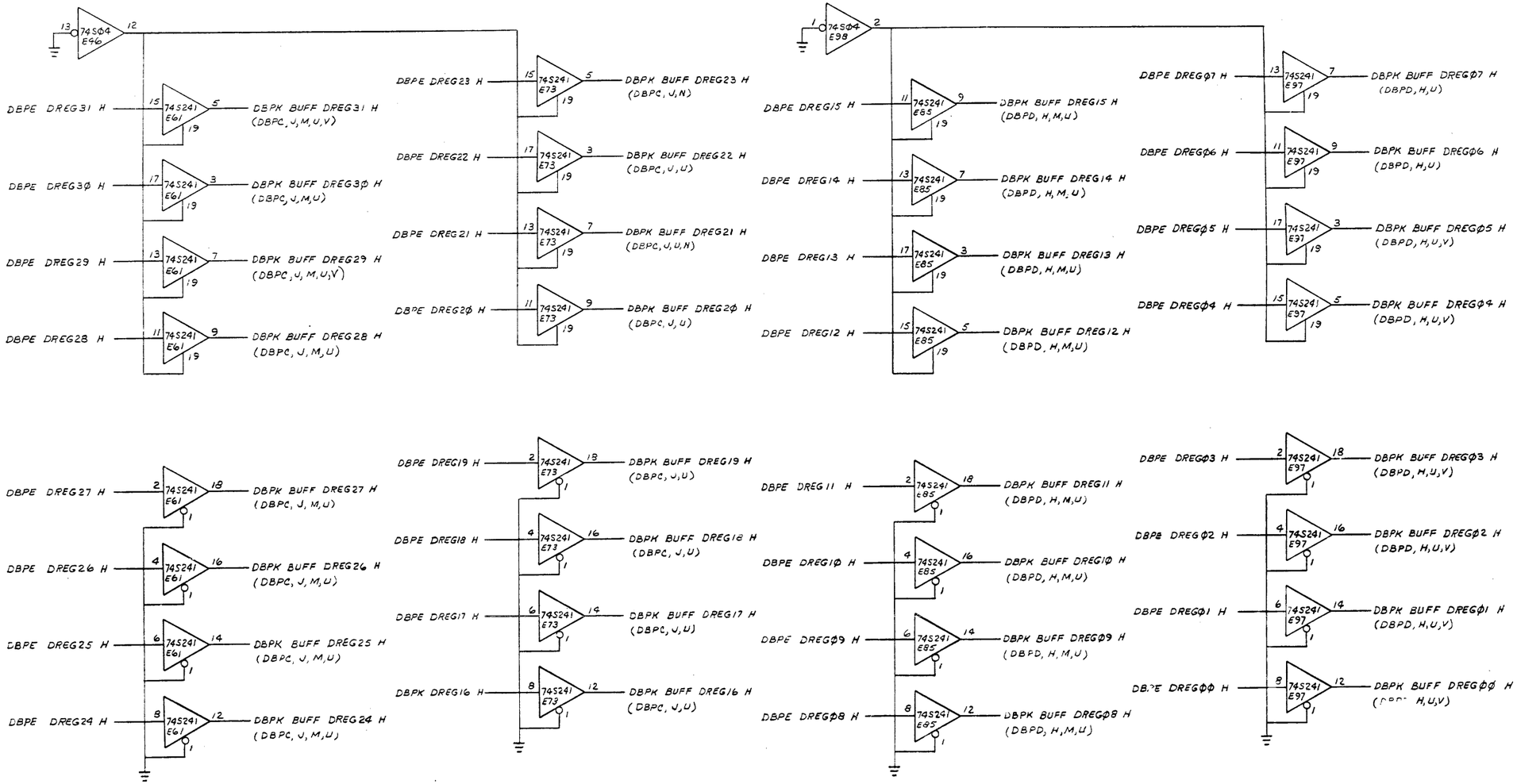

(BUFF DREG 31:00 XSLOT9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPK)	D	CS	M8225-0-1	B
SCALE —	SHEET 10 OF 19	DIST.		

213

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BYTE = ZERO DECODER

74S138 E24

DBPJ +3V A H
DBPJ DBYTE3 = Ø L
DBPJ DBYTE2 = Ø L
DBPH DBYTE1 = Ø L
DBPH DBYTEØ = Ø L
DBPL DREG = Ø L (DBPV)

74S08 E22

CT2 → DBPL NORM SV3 H (DDPN)

74S20 E9

CS2 → DBPL NORM SV4 H (DDPN)

74S10 E10

DBPL DREG = Ø L

74S10 E10

SV2 MUX

74S153 E51

DBPH BYTEØ SV2 H
DBPH BYTE1 SV2 H
DBPJ BYTE2 SV2 H
DBPJ BYTE3 SV2 H

CU1 → DBPL NORM SV2 H (DDPN)

SV1, SVØ MUX

74S153 E38

DBPH BYTEØ SV1 H
DBPH BYTE1 SV1 H
DBPJ BYTE2 SV1 H
DBPJ BYTE3 SV1 H

CU2 → DBPL NORM SV1 H (DDPH)

DBPH BYTEØ SVØ H
DBPH BYTE1 SVØ H
DBPJ BYTE2 SVØ H
DBPJ BYTE3 SVØ H

CV2 → DBPL NORM SVØ H (DDPN)

74S153

STB1,Ø	S1	SØ	FUNCT
H	X	X	FN = L
L	L	L	FN = A
L	L	H	FN = B
L	H	L	FN = C
L	H	H	FN = D

74S240 E74 → DBPL DALKØ5 H (DBPM,11)

DAL SV (5:4) MUX

74S153 E86

DBPR +3V H
DBPL SCØ9 L
DBPL SCØ4 L
DBPL NORM SV4 H
DBPA LOAD Q L
DBPA LOAD DSHF BY SC L

74S240 E74 → DBPL DALKØ4 H (DBPM,N)

DAL SV (3:Ø) MUX

74S158 E62

DDPR SCØ3 H
DBPL NORM SV3 H
DDPR SCØ2 H
DBPL NORM SV2 H
DDPR SCØ1 H
DBPL NORM SV1 H
DDPP SCØØ H
DBPL NORM SVØ H

74S240 E74 → DBPL DALKØ3 H (DBPP,N)

74S240 E74 → DBPL DALKØ2 H (DBPP,R)

74S240 E74 → DBPL DALKØ1 H (DBPS)

74S240 E74 → DBPL DALKØØ H (DBPS)

74S158

STB	SØ	FUNCT
H	X	FN = L
L	L	FN = A
L	H	FN = B

DBPR SCØ4 (1) H → 74S04 E98 → DBPL SCØ4 L

DBPR SCØ9 (1) H → 74S04 E98 → DBPL SCØ9 L

NORMALIZATION SHIFT VALUE DETECT TRUTH TABLE

BYTE = ZERO DECODER INPUT 3	2	1	Ø	SV(4:3) SV4	SV3	SV(2:Ø) SOURCE	NORM SV RANGE
L	L	L	L	L	L	BYTE3	Ø
L	L	L	H	H	H	BYTEØ	31-24
L	L	H	X	H	L	BYTE1	23-16
L	H	X	X	L	H	BYTE2	15-8
H	X	X	X	L	L	BYTE3	7-Ø

X = DON'T CARE

(DATA ALIGNER CONTROL XSLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPL)	D	CS	M8225-Ø-1	B
SCALE —//	SHEET 11 OF 19	DIST.		

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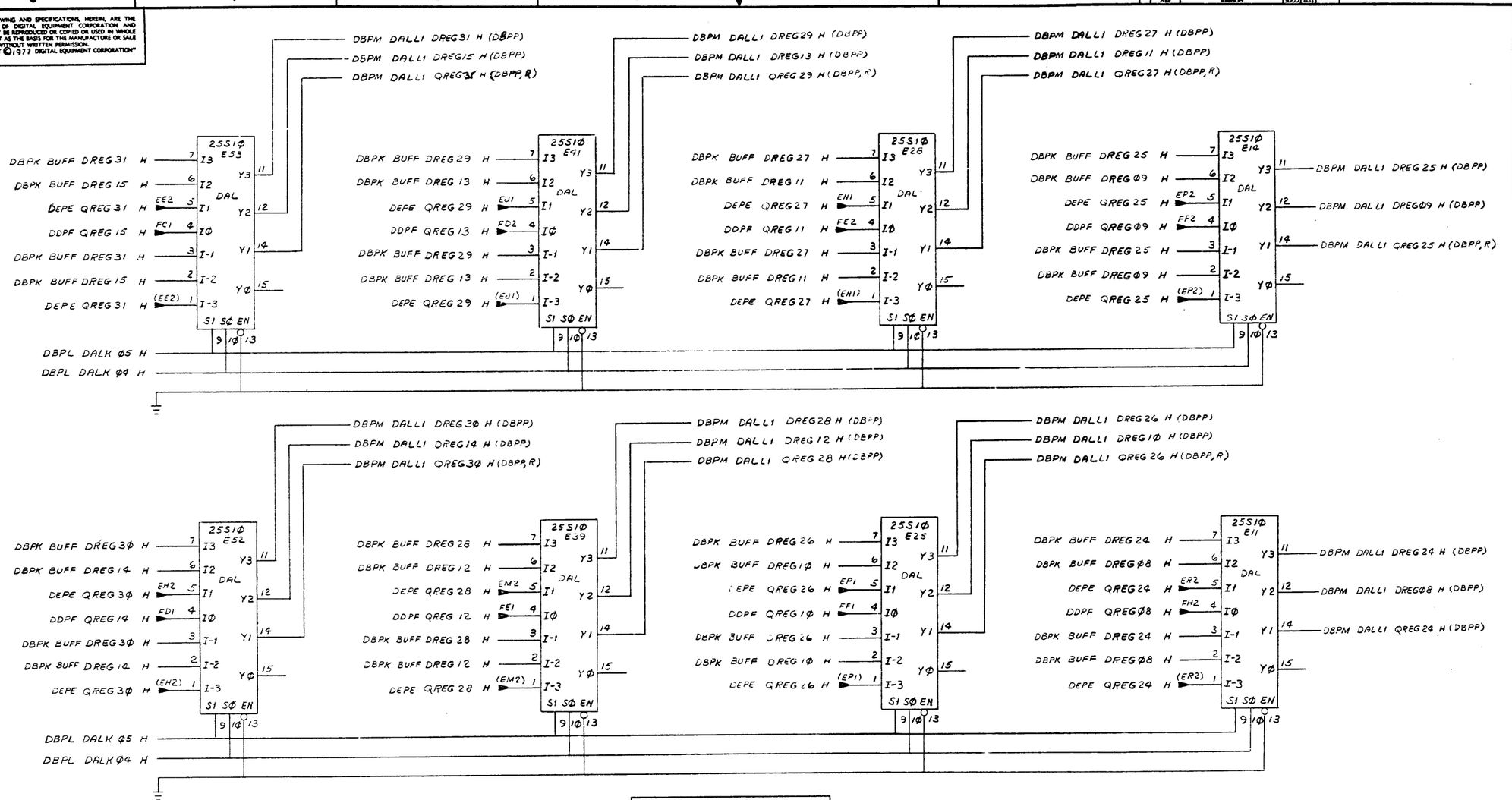

25S1Ø LOGIC TRUTH TABLE

EN	S1	SØ	OUTPUT Y3	Y2	Y1	YØ
H	X	X	L	L	L	L
L	L	L	I3	I2	I1	IØ
L	L	H	I2	I1	IØ	I-1
L	H	L	I1	IØ	I-1	I-2
L	H	H	IØ	I-1	I-2	I-3

(DAL LEVEL 1) (SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPM)	D	CS	M8225-Ø-1	B
SCALE —11— SHEET 12 OF 19	DIST.			

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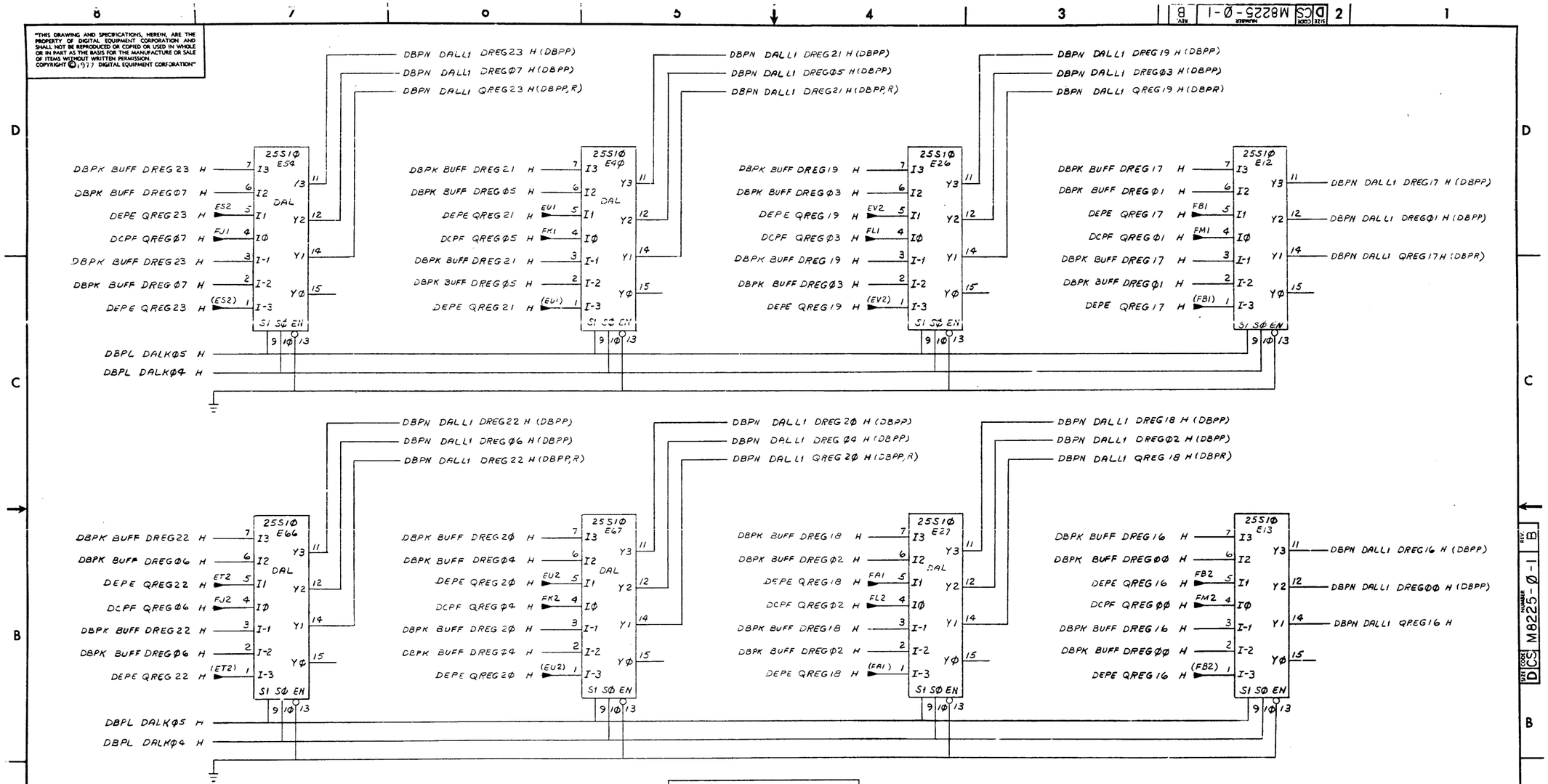

25S1Ø LOGIC TRUTH TABLE

EN	S1	SØ	OUTPUT Y3	Y2	Y1	YØ
H	X	X	L	L	L	L
L	L	L	I3	I2	I1	IØ
L	L	H	I2	I1	IØ	I-1
L	H	L	I1	IØ	I-1	I-2
L	H	H	IØ	I-1	I-2	I-3

(DAL LEVEL 1)(SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPN)	D	CS	M8225-Ø-1	B
SCALE —	SHEET 13 OF 19	DIST.		

DEC FORM NO. DRO 130

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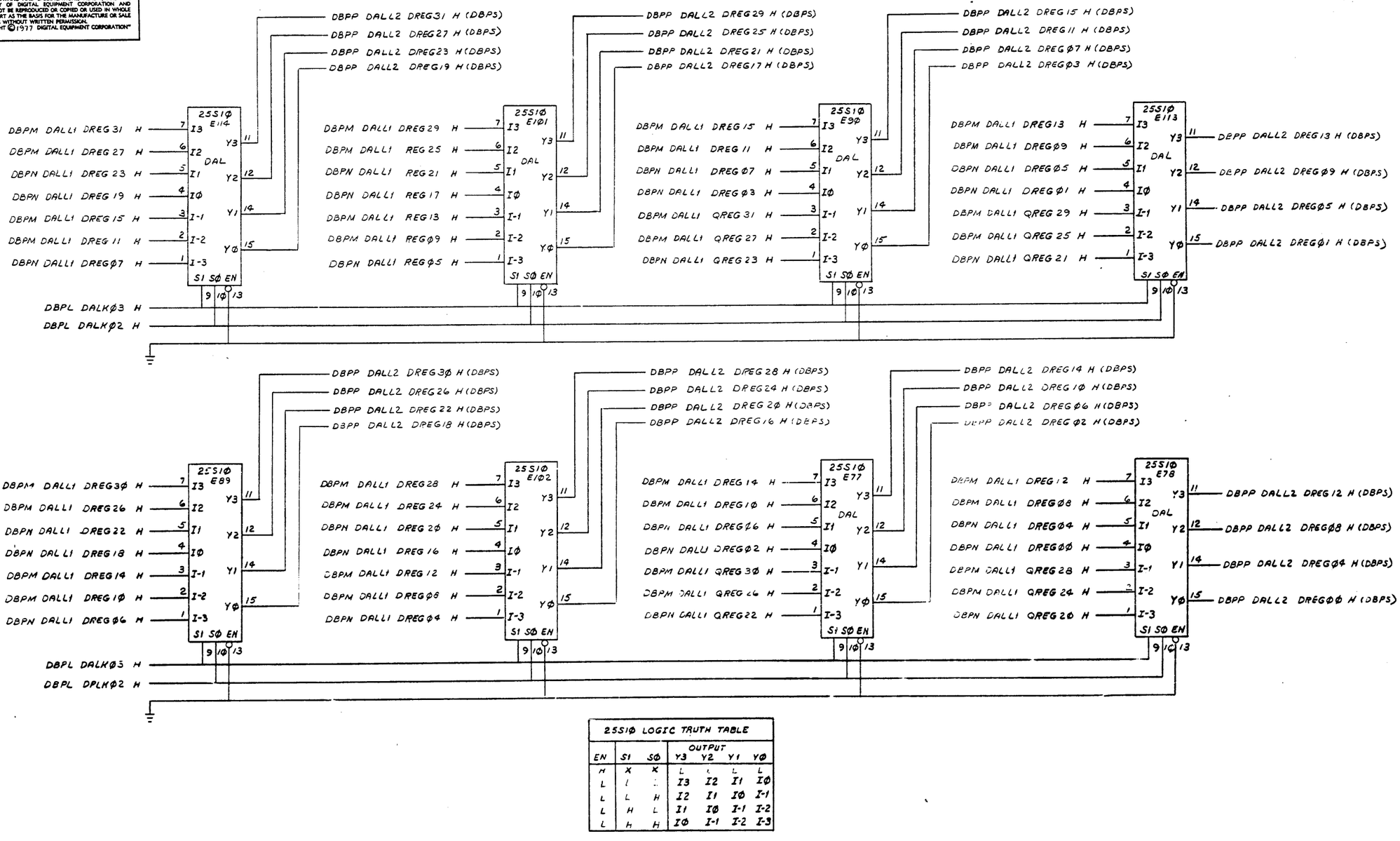

25S1Ø LOGIC TRUTH TABLE

EN	S1	SØ	OUTPUT Y3	Y2	Y1	YØ
H	X	X	L	L	L	L
L	L	L	I3	I2	I1	IØ
L	L	H	I2	I1	IØ	I-1
L	H	L	I1	IØ	I-1	I-2
L	H	H	IØ	I-1	I-2	I-3

(DAL LEVEL 2)(SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPP)	D	CS	M8225-Ø-1	R
SCALE —	SHEET 14 OF 19	DIST.		

DEC CODE DCS M8225-Ø-1 REV B

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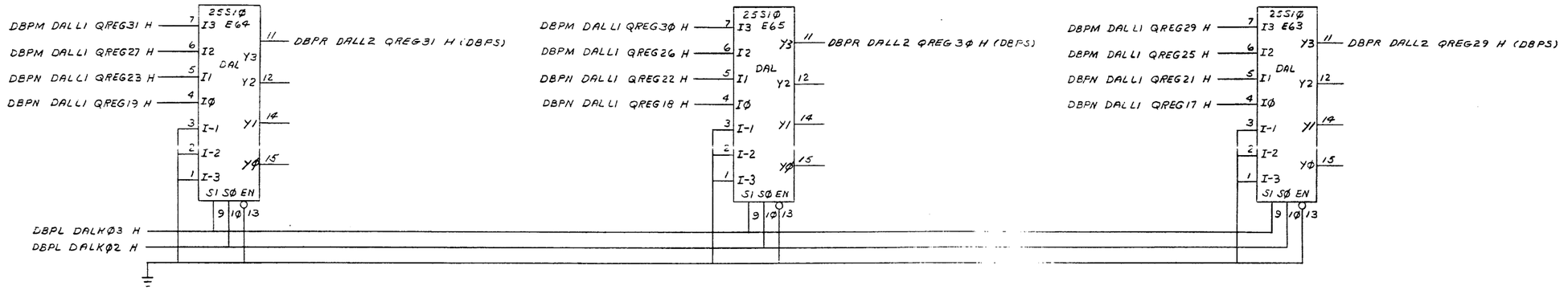

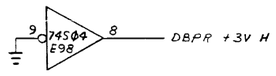

(DAL LEVEL 2) (SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPR)	D	CS	M8225-Ø-1	B
SCALE —N— SHEET 15 OF 19	DIST.			

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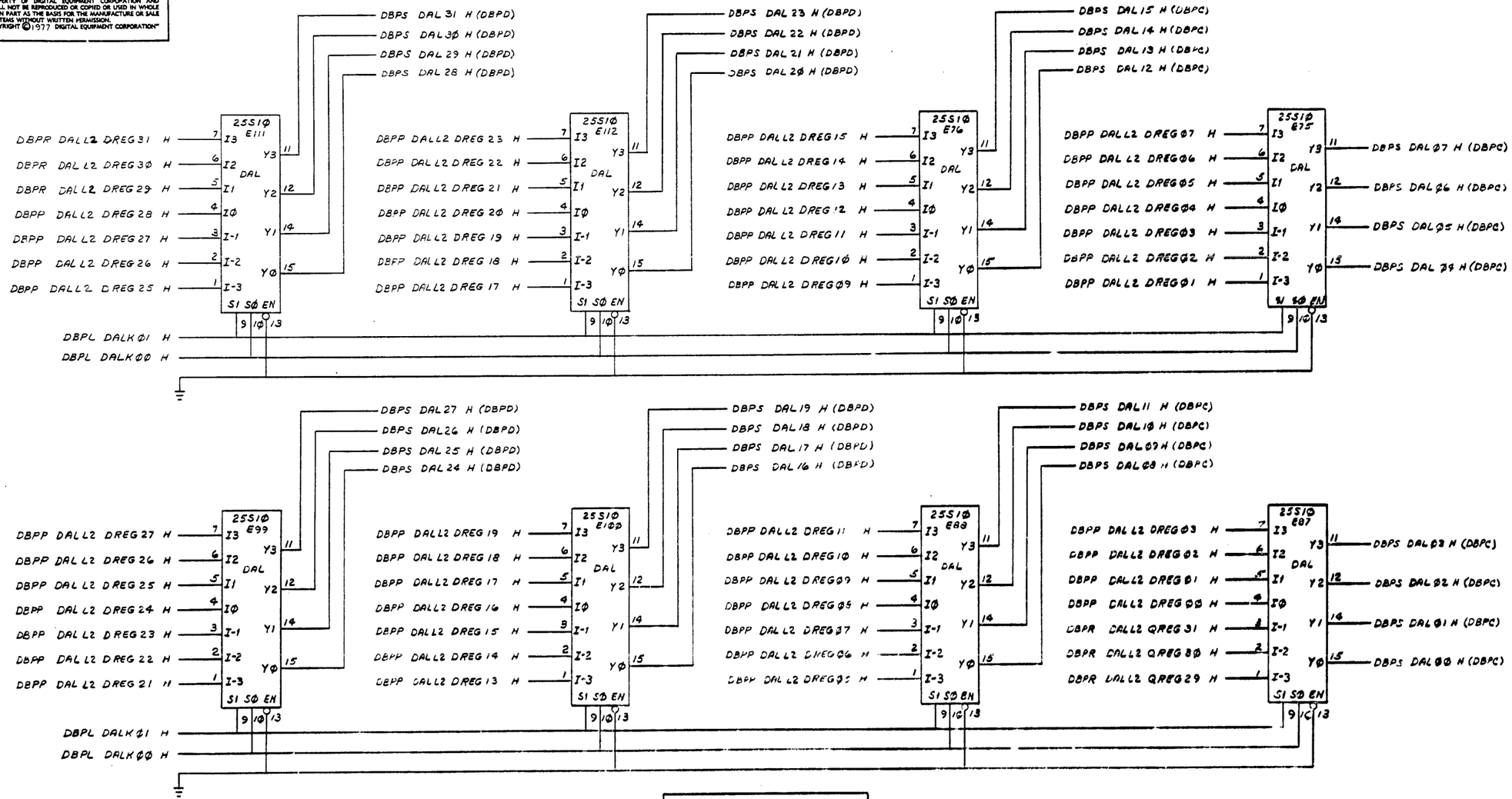

25S1Ø LOGIC TRUTH TABLE

EN	S1	SØ	OUTPUT Y3	Y2	Y1	YØ
H	X	X	L	L	L	L
L	L	L	I3	I2	I1	IØ
L	L	H	I2	I1	IØ	I-1
L	H	L	I1	IØ	I-1	I-2
L	H	H	IØ	I-1	I-2	I-3

(DAL 31:ØØ) (SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPS)	D	CS	M8225-Ø-1	B
SCALE	SHEET 16 OF 19	DIST.		

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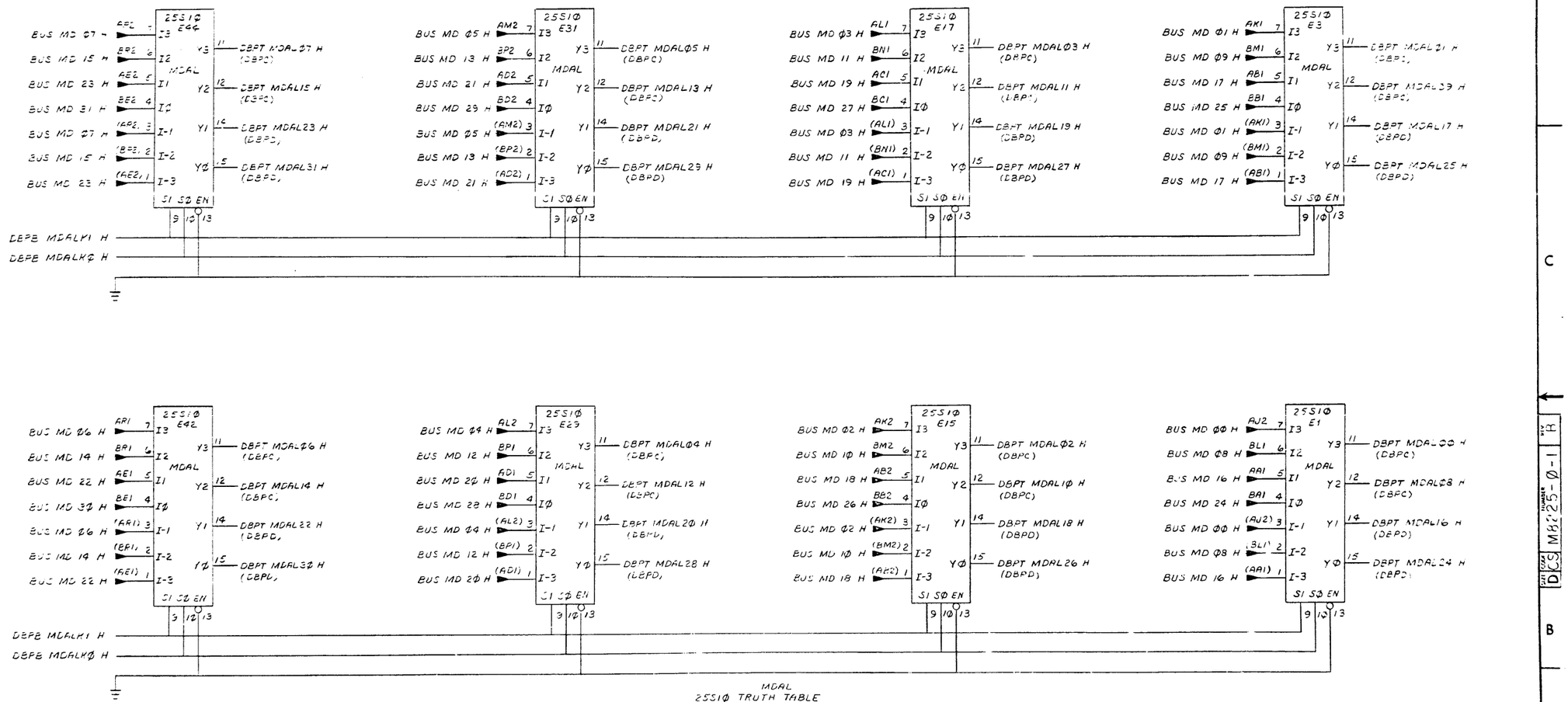

MDAL
2551Ø TRUTH TABLE

BYTE SHIFT RIGHT		MDAL			
S1	SØ	BYTE 3	BYTE 2	BYTE 1	BYTE Ø
L	L	BUS MD (31:24)	BUS MD (23:16)	BUS MD (15:Ø8)	BUS MD (Ø7:ØØ)
L	H	BUS MD (Ø7:ØØ)	BUS MD (31:24)	BUS MD (23:16)	BUS MD (15:Ø8)
H	L	BUS MD (15:Ø8)	BUS MD (Ø7:ØØ)	BUS MD (31:24)	BUS MD (23:16)
H	H	BUS MD (23:16)	BUS MD (15:Ø8)	BUS MD (Ø7:ØØ)	BUS MD (31:24)

(MDAL 31:ØØ) (SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

MAGNIFACE PLUS

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPT)	D	CS	M8225-Ø-1	B
SCALE —/— SHEET 17 OF 19	DIST.			

DEC FORM NO. 1139

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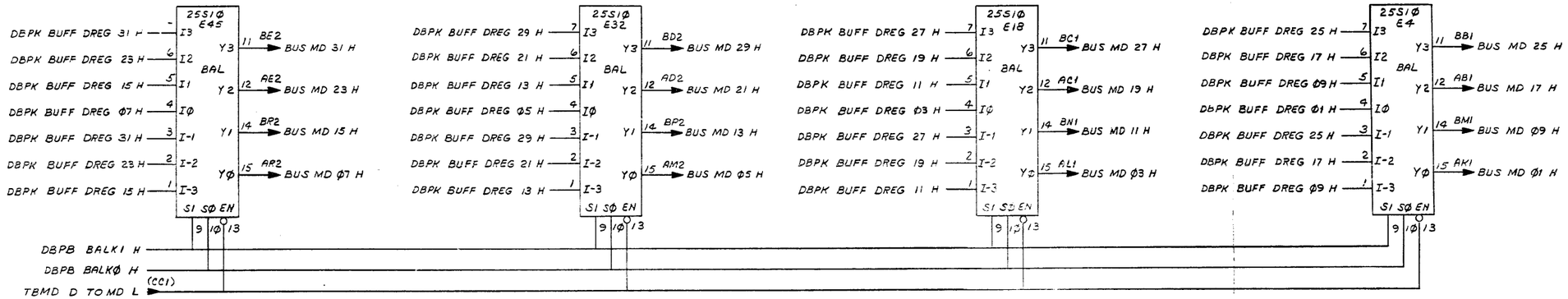

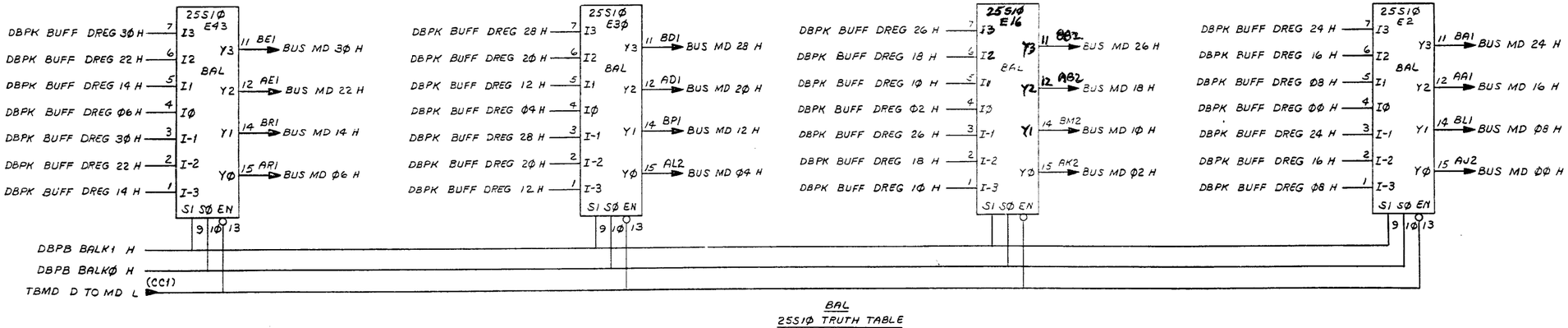

BAL
25S1Ø TRUTH TABLE

BYTE SHIFT LEFT		BUS MD DATA			
S1	SØ	BYTE 3	BYTE 2	BYTE 1	BYTE Ø
L	L	DREG(31:24)	DREG (23:16)	DREG (15:Ø8)	DREG (Ø7:ØØ)
L	H	DREG (23:16)	DREG (15:Ø8)	DREG (Ø7:ØØ)	DREG (31:24)
H	L	DREG (15:Ø8)	DREG (Ø7:ØØ)	DREG (31:24)	DREG (23:16)
H	H	DREG (Ø7:ØØ)	DREG (31:24)	DREG (23:16)	DREG (15:Ø8)

(BUS MD 31:ØØ)(SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPU)	D	CS	M8225-Ø-1	B
SCALE —	SHEET 18 OF 19	DIST.		

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POWER PINNING 1Ø125
PIN 8 · -5.2V
PIN 9 · +5V
PIN 16 · GND

-5.2V BL2
C3 .1uf
RI1 150Ω RI2 120Ω
RI3 150Ω RI4 120Ω

1Ø125 E68 → DBPV TP L (DBPE)

CLKF LECL CPTPI H EF1
CLKF LECL CPTPI L EF2
1Ø125 E68 → EH1 → DBPV QREG CLK TP L (DCPF, DDPF, DEPE)

DBPJ BUFF DREG3Ø L
DBPJ BUFF DREG29 L
DBPJ BUFF DREG28 L
74S24 E36 → DBPV D(3Ø:27) = Ø L

74S1Ø E1Ø → ED2 → DBPV PTE INVALID H (USCP)

DBPJ BUFF DREG25 L
DBPJ BUFF DREG24 L
DBPJ BUFF DREG23 L
74S11 E37 → 74S08 E23 → DBPV D(25:21) = Ø H

DBPJ BUFF DREG22 L
DBPJ BUFF DREG21 L
74S08 E23

DBPK BUFF DREG31 H

74S373 E135 MUL LATCH
DBPK BUFF DREGØ1 H
DBPK BUFF DREGØØ H
OC ENA
DAPN CPTØB H (FS2)
DBPV MUL DREGØ1 H
DBPV MUL DREGØØ H

MUL LATCH -74S373

OC	ENA	D	OUTPUT
L	H	H	H
L	H	L	L
L	L	X	PREV. D
H	X	X	HI-Z.

DBPK BUFF DREGØ3 H
DBPH DBYTE3 = Ø L
74S151 E125 UPC<Ø3> MUX → CR2 → DBPV BR BIT3 H (ICLE,T)

ICLE REM BEMX S2 H
ICLE REM BEMX S1 H
ICLE REM BEMX SØ H

DBPK BUFF DREGØ2 H
DBPH DBYTE2 = Ø L
DEPE QREG31 H
DDPS SC NE Ø H
74S151 E126 UPC<Ø2> MUX → CH1 → DBPV BR BIT2 H (ICLE,T)

DBPK BUFF DREGØ3 H
DBPK BUFF DREGØ2 H
DBPK BUFF DREGØ1 H
74S51 E137 → 74S08 E134

DAPK BUFF DREGØ7 L
DAPK BUFF DREGØ6 L
DAPK BUFF DREGØ5 H
DAPK BUFF DREGØ4 H
74S2Ø E36 → 74SØØ E136

DBPV D(7:Ø) = 3Ø THRU 39 H
DBPK BUFF DREGØ1 H
DBPH DBYTE1 = Ø L
DBPL DREG = Ø L
DBPV MUL DREGØ1 H
74S151 E124 UPC<11> MUX → DA1 → DBPV BR BIT1 H (ICLE,T)

DBPK BUFF DREGØØ H
DBPK BUFF DREGØ1 H
DBPK BUFF DREGØ2 H
74SØØ E136 → 74S08 E134

DBPV D(3:Ø) = Ø B + ØØ H
DBPK BUFF DREGØØ H
DBPH DBYTEØ = Ø L
DBPK BUFF DREG31 H
DBPV MUL DREGØØ H
74S151 E123 UPC<ØØ> MUX → DN2 → DBPV BR BITØ H (ICLE,T)

UPC MUX 74S151

S2	S1	SØ	FUNCT
L	L	L	FN = DØ
L	L	H	FN = D1
L	H	L	FN = D2
L	H	H	FN = D3
H	L	L	FN = D4
H	L	H	FN = D5
H	H	L	FN = D6
H	H	H	FN = D7

(CLKS AND DREG BRANCH CONDITIONS)(SLOT 9)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA ALIGNER (DBPV)	D	CS	M8225-Ø-1	B
SCALE —	SHEET 19 OF 19		DIST.	

COMPONENT SIDE VIEW

SIGNATURES	DATE	digital	TITLE CPU DATA PATH E		REV B
DRN.					
CHK. D1					
ENG.					
ENG. ENG.					
PROD.			SIZE	CODE	NUMBER
L. ALE			A	MAXXXX	54-[illegible]
SYS.			SCALE NONE	SHEET 1 OF 2	

ETCH REV:
P.C. DESIGN DATA BASE REV:

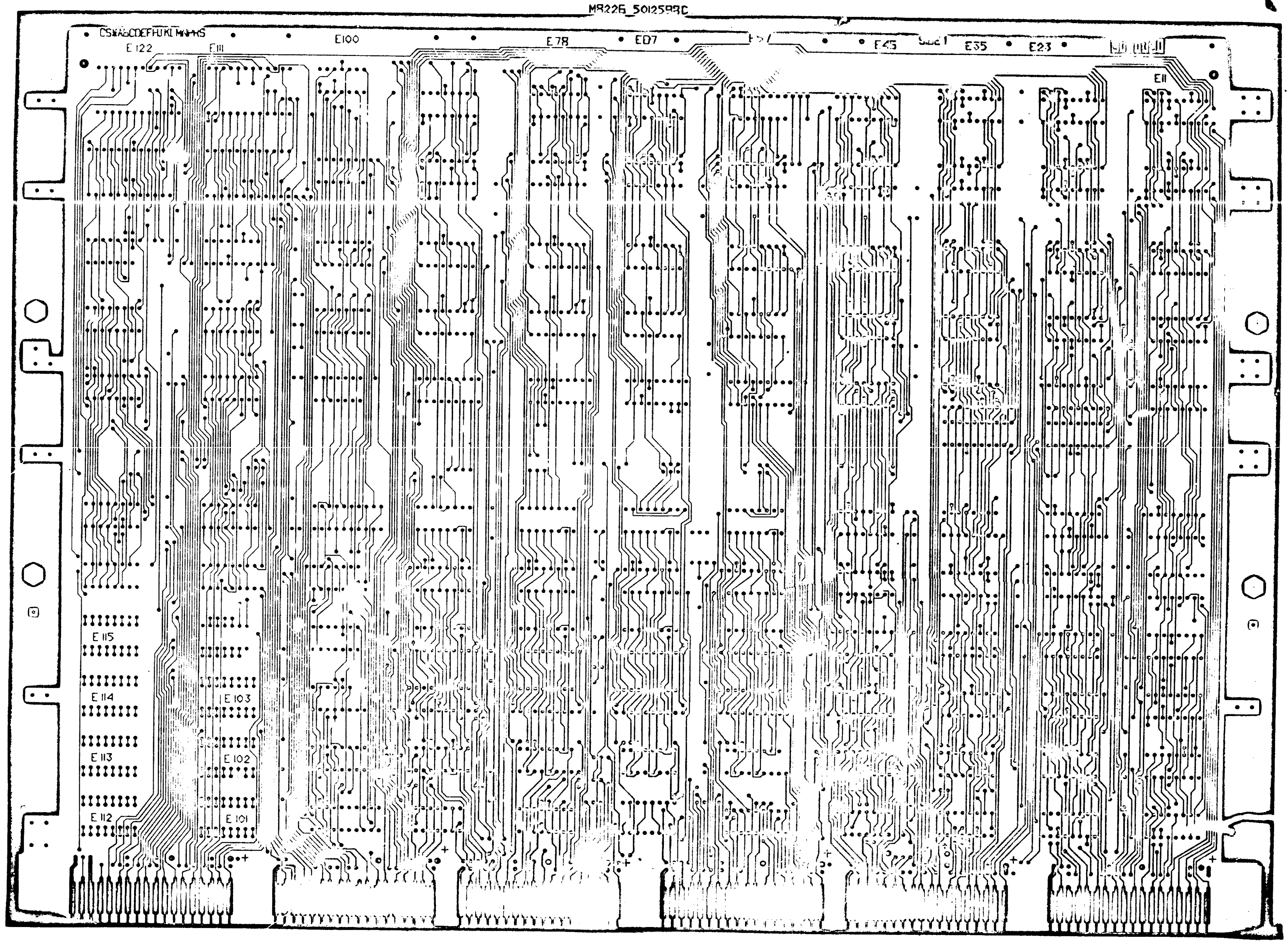
CH. CHANGE NO. REV

NOTES:

E	UA	M8226-2-E

L1

LAYER 1



TITLE	SIZE	CODE	NUMBER	REV.
CPU DATA PATH E	E	UA	M8226-0-0	B
SCALE 2-1	SHEET 2 OF 3	DIST		

LAYER 4

L4

SIDE 2 CPU DATA PATH E M8226 5012542C

REVISIONS		
LTR	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV.
CPU DATA PATH E	E	LM	M8226Ø	B
SCALE 2 - 1	SHEET 3 OF 3		DIST	

225

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY F. SMART DATE 5-20-77	CHECKED F. SMART DATE 5-20-77	SECTION
ENG E. Anton DATE 6-9-77	PROD Mike Terella DATE 6-21-77	ISSUED SECTION

NOTES:

MS 104849
CS REV B
ETCH REV C

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8226-0-0	REF DESIGNATION
1	E-ND-5012598-0-2	5012598B	ETCH BOARD	1	
2		1012084-01	CAPACITOR,8UF,25V,10%	7	C1-C7
3		1012784	CAPACITOR,.047UF,50V	37	C8-C44
4		1300247	RESISTOR,120,1/4W	4	R1,R3,R6,R8
5		1300250	RESISTOR,150,1/4W	4	R2,R4,R5,R7
6		1300295	RESISTOR,330,1/4W	5	R9-R13
7		1301424	RESISTOR,680,1/4W	5	R14-R18
8			SPARE		E101-E103,E112-E115
9		1910531	I.C. DEC 74S181	4	E110,E111,E121,E122
10		1910534	I.C. DEC 74S04	5	E79,E99,E100,E120,E104
11		1910545	I.C. DEC 74S112	2	E91,E92
12		1910549	I.C. DEC 74S158	4	E48,E58,E69,E80
13		1910552	I.C. DEC 74S194	4	E5,E16,E28,E40
14		1910547	I.C. DEC 74S153	16	E1,E2,E14,E15,E26,E27,E36,E37,E105-108,E116-E119
15		1910548	I.C. DEC 74S157	12	E6,E7,E17,E19,E29,E31,E41,E42,E51,E61,E72,E83
16		1910956	I.C. DEC 74S151	16	E8,E9,E20,E21,E32,E33,E43,E44,E54,E55,E64,E65,E75,E76,E86,E87
17		1911[illegible]	I.C. DEC 10125	2	E47,E68
18		1911641	I.C. DEC 74S257	8	E3,E4,E38,E39,E57,E67,E78,E89
19		1911675	I.C. DEC 74S138	2	E18,E30

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CPU DATA PATH E	E-UA-M8226-0-0	B	PL	M8226-0-0	B
	SHEET 1 OF 2	INSERTION PARTS LIST DATA BASE REV			

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY F. Smart DATE 5-20-77	CHECKED F. Smart DATE 5-20-77	SECTION
ENG E. Anton DATE 6.9.77	PROD Mike Tirella DATE 6-21-77	ISSUED SECTION

NOTES:

MS 104849
CS REV B
ETCH REV C

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8226-0-0	REF DESIGNATION
20		1911712	I.C. DEC 74S51	1	E93
21		1911983	I.C. DEC 74S133	1	E98
22		1912097	I.C. DEC 74S182	1	E109
23		1912389	I.C. DEC 74S08	1	E94
24		1912586	I.C. DEC 85S68	12	E10,E11,E22,E23,E34,E35,E45,E46,E53,E63, E74,E85
25		1912660	I.C. DEC 74S253	1	E97
26		1912693	I.C. DEC 25S10	4	E56,E66,E77,E88
27		1912746	I.C. DEC 74S37	1	E96
28		1913294	I.C. DEC 93S16	12	E49,E50,E59,E60,E70.E71,E81,E82,E52, E62,E73,E84
29		1913462	I.C. DEC 74S240	1	E90
30		1913493	I.C. DEC 74S241	1	E95
31		1913788	I.C. DEC 26S10	4	E12,E13,E24,E25
32		1210711-2	HANDLE ASSY (HEX)	1	
33		9000024-C	EYELET, HANDLE	12	

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CPU DATA PATH E	E-UA-M8226-0-0	B	PL	M8226-0-0	B
	SHEET 2 OF 2	INSERTION PARTS LIST DATA BASE REV			

DRB 125

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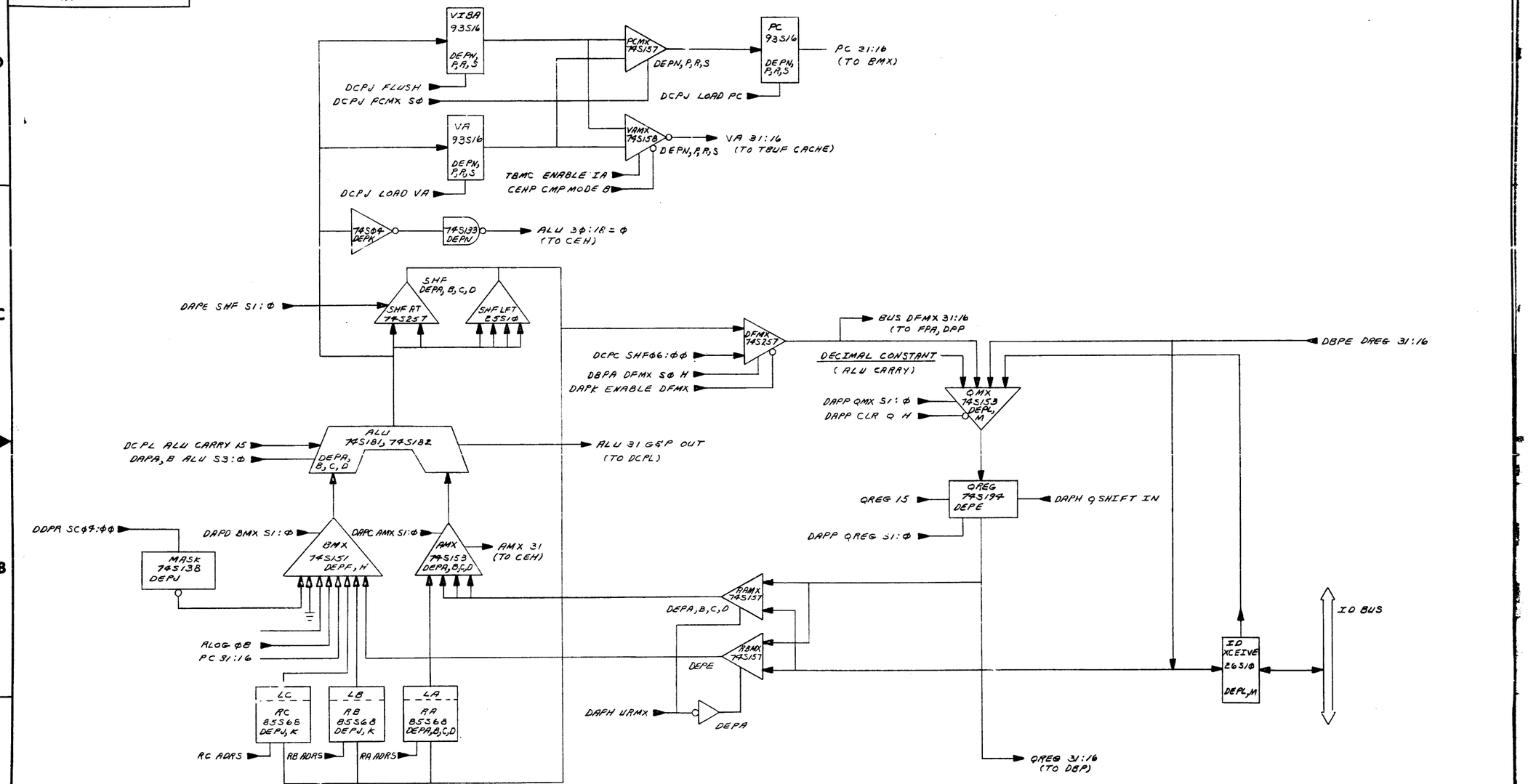

(BLOCK DIAGRAM) (SLCT 10)

DRN. Ray Lemmon	3-25-77	FIRST USED ON: digital
CHK'D Jessica	5-9-77	
ENG. E. ANTON	5-17-77	TITLE: DATA PATH 31:16
PROJ. ENG. E. ANTON	5-17-77	
PROD Sharon	6/1/77	
NEXT HIGHER ASSY.		SIZE D CODE CS NUMBER M8226-0-1 REV. C
SCALE		SHEET 1 OF 16 DIST.

REVISIONS		
CHK	CHANGE NO.	REV.
GM	M8226-00001	C
D. Zwicker	10 OCT 77	
E. ANTON		
E. Anton	14 OCT 77	

228

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RAMX-74S157

STB	SC	RAMX
H	X	FN=L
L	L	DREG
L	H	QREG

DEPE QREG 19 H
DBPE DREG 19 H
DEPE QREG 18 H
DBPE DREG 18 H
DEPE QREG 17 H
DBPE DREG 17 H
DEPE QREG 16 H
DBPE DREG 16 H
74S157 E66 RAMX
STB S0
DEPA RAMXS0 H

DEPP LATCH LA (1) H
DEPS CPT24 L
DAPK RA RB WRT B 2 L
85S68 E85 RA(19:16)
WE CLK LE OE
DEPA SHF 19 H
DEPA SHF 18 H
DEPA SHF 17 H
DEPA SHF 16 H
DAPL RA ADRS3 H
DAPL RA ADRS2 H
DAPL RA ADRS1 H
DAPL RA ADRS0 H

RA-85S68

LE	WE	CLK	RA FUNCT
H	H	↗	NO-OP
H	L	↗	STORE, RN←SHF
↘	H	X	LATCH, LA←(RN)

FD2
DAPC ZEXT B3:2 H
74S153 E116 AMX
STB1 STB0 S1 S0
DEPB AMX SXT15 H
DEPA AMX SXTØ7 H
DAPC AMX B3:2 S1 H
DAPC AMX B3:2 S0 H

74S153

STB	S1	S0	F
H	X	X	L
L	L	L	A
L	L	H	B
L	H	L	C
L	H	H	D

DEPA ALU 20 CIN L (DEPB)
DCPL ALU CARRY 15 L
74S182 E129 COUTX CIN G0 P0
EM1
BUS ALU BYTE 2,3 A=B H
DEPA ALU COUT (19:16) L (DEPL)
74S181 E122 ALU (19:16)
DEPF BMX 19 H
DEPF BMX 18 H
DEPF BMX 17 H
DEPF BMX 16 H
AB COUT4 G P
S3 S2 S1 S0 M CIN
DAPA ALU B3:2 S3 H
DAPA ALU B3:2 S2 H
DAPB ALU B3:2 S1 H
DAPB ALU B3:2 S0 H
DAPB ALU MODE H
DCPL ALU CARRY 15 L (FF2)

DAPE SHF RT L
74S02 E120
74S37 E96
DEPA SHF RT EN L (DEPA,B,C,D)
DEPS CPT 0 L
DEPA SHF LFT EN L (DEPA,B,C,D)
DAPE SHF S0 H
74S241 E95
DEPA SHF S0 H (DEPA,B,C,D)
DCPB RAMXØ7 H
DEPA AMX SXT Ø7 H (DEPA,B,C,D)
DEPA +3VB H
DAPH URMX (1) H
74S04 E120
DEPA RBMX S0 H (DEPE)
DEPA +3V BH
74S08 E94
DEPA RAMX S0 H (DEPA,B,C,D)

DEPB ALU21 H
DEPB ALU20 H
74S257 E89 SHF[R]
DEPA SHF RT EN L
DEPA SHF S0 H
DEPA ALU 19 H (DEPB,K,N)
DEPA ALU 18 H (DEPB,K,N)
DEPA ALU 17 H (DEPB,DDPB,DEPN,CEHA,CEHS)
DEPA ALU 16 H (DDPB,DEPN,CEHA,CEHS)
25S10 E88 SHF[L]
DDPB ALU 15 H
DDPB ALU 14 H
DDPB ALU 13 H
SI S0 OE
DAPE SHF LFT SI H
DEPA SHF S0 H
DEPA SHF LFT EN L

DEPA SHF19 H (DDPC,DEPA,J,L)
DEPA SHF18 H (DDPC,DEPA,J,L)
DEPA SHF17 H (DDPC,DEPA,J,L)
DEPA SHF16 H (DCPC,DEPA,J,L)

+5V
R11 330Ω
R14 680Ω C38 .047
DEPA +3VC H (DEPE,S,M)
R12 330Ω
R17 680Ω C41 .047
DEPA +3VD H (DEPN,F,R,S)
R9 330Ω
R16 680Ω C40 .047
DEPA +3VA H (DEPA,N,P,R,S)
R10 330Ω
R15 680Ω C39 .047
DEPA +3VB H (DEPE,N,P,R)
R13 330Ω
R18 680Ω C42 .047
DEPA +3VE H (DEPD)

(RA, RAMX, ALU, SHF 19:16)
(SLOT 10)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPA)	D	CS	M8226-Ø-1	C
SCALE NONE	SHEET 2 OF 16		DIST.	

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DEPB ALU 24 CIN L (DEPC)

COUTY 74S182 E109 G1 P1

(EM1) BUS ALU BYTE 2,3 A+B H

DEPB ALU COUT(23:20) L (DEPL)

74S181 E111 ALU(23:20)

DEPF BMX 23 H
DEPF BMX 22 H
DEPF BMX 21 H
DEPF BMX 20 H

DAPA ALU B3:2 S3 H (EV2)
DAPA ALU B3:2 S2 H (EU2)
DAPB ALU B3:2 S1 H (ES1)
DAPB ALU B3:2 S0 H (ER2)
DAPB ALU MODE H (ER1)
DEPA ALU 20 CIN L

SHF RT MUX-74S257

OE	SØ	FN
H	X	HI-Z
L	L	AN, SHF [R1]
L	H	BN, SHF [R2]

DEPC ALU 25 H
DEPC ALU 24 H

74S257 E78 SHF [R] (23:20)

DEPA SHF RT EN L
DEPA SHF S0 H
DEPB ALU 23 H (DEPC,K,P)
DEPB ALU 22 H (DEPC,K,P)
DEPB ALU 21 H (DEPA,C,K,P)
DEPB ALU 20 H (DEPA,K,P)

FF1 DEPB SHF23 H (DDPC,DEPJ,L)
FH1 DEPB SHF22 H (DDPC,DEPJ,L)
FJ1 DEPB SHF21 H (DDPC,DEPJ,L)
FH2 DEPB SHF20 H (DDPC,DEPJ,L)

25S10 E77 SHF [L]

DEPA ALU 19 H
DEPA ALU 18 H
DEPA ALU 17 H

DAPE SHF LFT SI H (FF2)
DEPA SHF S0 H
DEPA SHF LFT EN L

SHF LFT MUX-25S10

OE	SI	SØ	YN
H	X	X	HI-Z
L	L	L	I_3-I_0, NO SHIFT
L	L	H	I_2-I_{-1}, SHF [L1]
L	H	L	I_1-I_{-2}, SHF [L2]
L	H	H	I_0-I_{-3}, SHF [L3]

74S157 E17 RAMX (23:20)

DEPE QREG 23 H
DBPE DREG 23 H
DEPE QREG 22 H
DBPE DREG 22 H
DEPE QREG 21 H
DBPE DREG 21 H
DEPE QREG 20 H
DBPE DREG 20 H

DEPA RAMX S0 H

DAPC ZEXT B3:2 H (FD2)

74S158 E106 AMX (23:20)

74S153 E105 AMX (21:20)

DEPB AMX SXT 15 H
DEPA AMX SXT 07 H
DAPC AMX B3:2 S1 H (FE1)
DAPC AMX B3:2 S0 H (FD1)

DEPP LATCH LA (1) H
DEPS CPT2A L
DAPK RA RB WRT B2 L (BS1)

8S5268 E74 RA (23:20)

DEPB SHF 23 H
DEPB SHF 22 H
DEPB SHF 21 H
DEPB SHF 20 H

DAPL RA ADR53 H (BF2)
DAPL RA ADR52 H (BP1)
DAPL RA ADR51 H (BN1)
DAPL RA ADR50 H (BM2)

DEPA RAMX S0 H
DDPF Q REG15 H FC1
DEPA RBMX S0 H
DBPE DREG15 H DF1

74S51 E93

74S240 E90

DEPB AMX SXT 15 H (DEPA,B,C,D)

(RA, RAMX, AMX, SHF 23:20) (SLOT 10)

REVISIONS		
CHK	CHANGE NO.	REV.

MADE/FACE P-1193

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPB)	D	CS	M8226-0-1	C
SCALE NONE	SHEET 3 OF 16	DIST.		

DEC FORM NO. BRD 132

230

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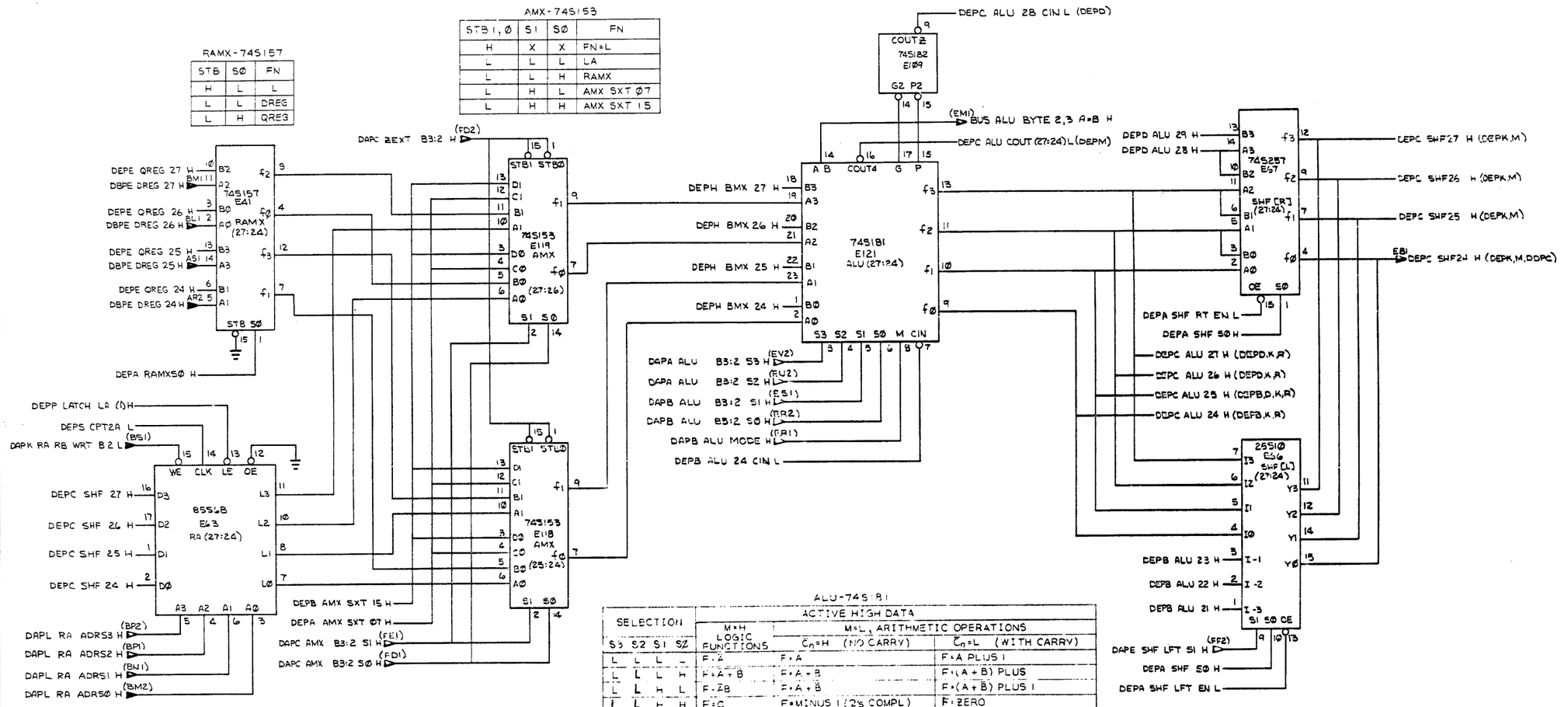
RAMX-745157

STB	SØ	FN
H	L	L
L	L	DREG
L	H	QREG

AMX-745153

STB1,Ø	S1	SØ	FN
H	X	X	FN=L
L	L	L	LA
L	L	H	RAMX
L	H	L	AMX SXT Ø7
L	H	H	AMX SXT 15



RA-85568

LE	$\overline{WE}$	CLK	RA FUNCT
H	H	X	NO-OP
H	L	↓	STORE, RN←SHF
↓	H	X	LATCH, LA←(RN)

ALU-74S181

SELECTION				ACTIVE HIGH DATA		
				M=H LOGIC FUNCTIONS	M=L, ARITHMETIC OPERATIONS	
S3	S2	S1	SØ		C_n=H (NO CARRY)	C_n=L (WITH CARRY)
L	L	L	L	F=$\bar{A}$	F=A	F=A PLUS 1
L	L	L	H	F=$\overline{A+B}$	F=A+B	F=(A+B) PLUS
L	L	H	L	F=$\bar{A}\bar{B}$	F=A+$\bar{B}$	F=(A+$\bar{B}$) PLUS 1
L	L	H	H	F=Ø	F=MINUS 1 (2'S COMPL)	F=ZERO
L	H	L	L	F=$\overline{A\bar{B}}$	F=A PLUS AB	F=A PLUS AB PLUS 1
L	H	L	H	F=$\bar{B}$	F=(A+B) PLUS A$\bar{B}$	F=(A+B) PLUS A$\bar{B}$ PLUS 1
L	H	H	L	F=A⊕B	F=A MINUS B MINUS 1	F=A MINUS B
L	H	H	H	F=A$\bar{B}$	F=A$\bar{B}$ MINUS 1	F=A$\bar{B}$
H	L	L	L	F=$\bar{A}$+B	F=A PLUS AB	F=A PLUS AB PLUS 1
H	L	L	H	F=$\overline{A⊕B}$	F=A PLUS B	F=A PLUS B PLUS 1
H	L	H	L	F=B	F=(A+$\bar{B}$) PLUS AB	F=(A+$\bar{B}$) PLUS AB PLUS 1
H	L	H	H	F=AB	F=AB MINUS 1	F=AB
H	H	L	L	F=1	F=A PLUS A*	F=A PLUS A PLUS 1
H	H	L	H	F=A+$\bar{B}$	F=(A+B) PLUS A	F=(A+B) PLUS A PLUS 1
H	H	H	L	F=A+B	F=(A+$\bar{B}$) PLUS A	F=(A+$\bar{B}$) PLUS A PLUS 1
H	H	H	H	F=A	F=A MINUS 1	F=A

REVISIONS		
CHK	CHANGE NO.	REV.

(RA, RAMX, AMX, ALU, SHF 27:24) (SLOT Ø)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPC)	D	CS	M8226-Ø-1	C
SCALE NONE	SHEET 4 OF 16	DIST.		

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EM1 BUS ALU BYTE 2,3 A=B H
EF1 DEPD ALU COUT (31:28) L (DEPM)
EE1 DEPD ALU 31:28 P H (DCPL)
DEPD ALU 31:28 G H (DCPL)

POUT GOUT 74S182 E109 P3 G3

SHF RT MUX-74S257

OE	SØ	FN
H	X	HI-Z
L	L	AN, SHF [R1]
L	H	BN, SHF [R2]

DAPC ZEXT B3:2 H (FD2)

DEPE QREG31 H / DBPE DREG31 H
DEPE QREG3Ø H / DBPE DREG3Ø H
DEPE QREG29 H / DBPE DREG29 H
DEPE QREG28 H / DBPE DREG28 H
74S157 E25 RAMX (31:28)
STB SØ
DEPA RAMXSØ H

DEPP LATCH LA (1) H
DEPS CPT2A L
DAPK RA RB WRT B 2 L (BS1)
85568 E53 RA (31:28) WE CLK LE OE
DEPD SHF31 H
DEPD SHF3Ø H
DEPD SHF29 H
DEPD SHF28 H
DAPL RA ADRS3 H (BP2)
DAPL RA ADRS2 H (BP1)
DAPL RA ADRS1 H (BN1)
DAPL RA ADRSØ H (BM2)

74S153 E1Ø8 AMX (31:28) STB1 STBØ S1 SØ
DEPB AMX SXT15 H
DEPA AMX SXTØ7 H
DAPC AMX B3:2 S1 H (FE1)
DAPC AMX B3:2 SØ H (FD1)

74S153 E1Ø7 AMX (25:28) STB1 STBØ S1 SØ

DEPH BMX31 H
DEPH BMX3Ø H
DEPH BMX29 H
DEPH BMX28 H
74S181 E11Ø ALU (31:28) A-B COUT P G S3 S2 S1 SØ M CIN
DAPA ALU B3:2 S3 H (EV2)
DAPA ALU B3:2 S2 H (EU2)
DAPB ALU B3:2 S1 H (ES1)
DAPB ALU B3:2 SØ H (ER2)
DAPB ALU MODE H (ER1)
DEPC ALU 28 CIN L

74S04 E12Ø → BC1 DEPD AMX 31 L (CEHA, CEHS)

DAPE SHF [R] ALU 31 H (FP1) → 74S04 E1Ø4 → 74S08 E94 ← DEPA SHF SØ H

DEPD ALU 28 H (DEPC,K,S)
DEPD ALU 29 H (DEPC,K,S)
DEPD ALU 3Ø H (DEPK,S)
DEPD ALU 31 H (DEPK,S)

74S257 E57 SHF[R] (29:28)
DEPD SHF29 H (DEPK,M)
DEPD SHF28 H (DEPK,M)
DE SØ
DEPA SHF SØ H
DEPA SHF RT EN L

STB1 STBØ
DEPA +3VE H
DAPH SHF USI INPUT H (CT2)
74S253 E97 SHF[R] (31:3Ø)
DEPA +3VE H
DEPD SHF31 H (DEPK,M)
DEPD SHF3Ø H (DEPK,M)
DAPE SHF [R] ALU 31 H (FP1)

SHF RT MUX-74S253

STB 1, Ø	S1	SØ	SHF 31	SHF 3Ø
H	X	X	HI-Z	HI-Z
L	L	L	USI INPUT	ALU 31
L	L	H	USI INPUT	USI INPUT
L	H	L	ALU 31	ALU 31
L	H	H	FN=H	FN=H

25S1Ø E56 SHF [L] (31:28)
DEPC ALU 27 H
DEPC ALU 26 H
DEPC ALU 25 H
S1 SØ OF
(FF2) DAPE SHF LFT S1 H
DEPA SHF SØ H
DEPA SHF LFT EN L

SHF LFT MUX-25S1Ø

OE	S1	SØ	YN
H	X	X	HI-Z
L	L	L	I_3-I_0, NO SHIFT
L	L	H	I_2-I_{-1}, SHF [L1]
L	H	L	I_1-I_{-2}, SHF [L2]
L	H	H	I_0-I_{-3}, SHF [L3]

REVISIONS

CHK	CHANGE NO.	REV.

(RA, RAMX, AMX, ALU, SHF 31:28) (SLOT IØ)

TITLE: DATA PATH 31:16 (DEPD)
SIZE D | CODE CS | NUMBER M8226-Ø-1 | REV. C
SCALE NONE | SHEET 5 OF 16 | DIST.

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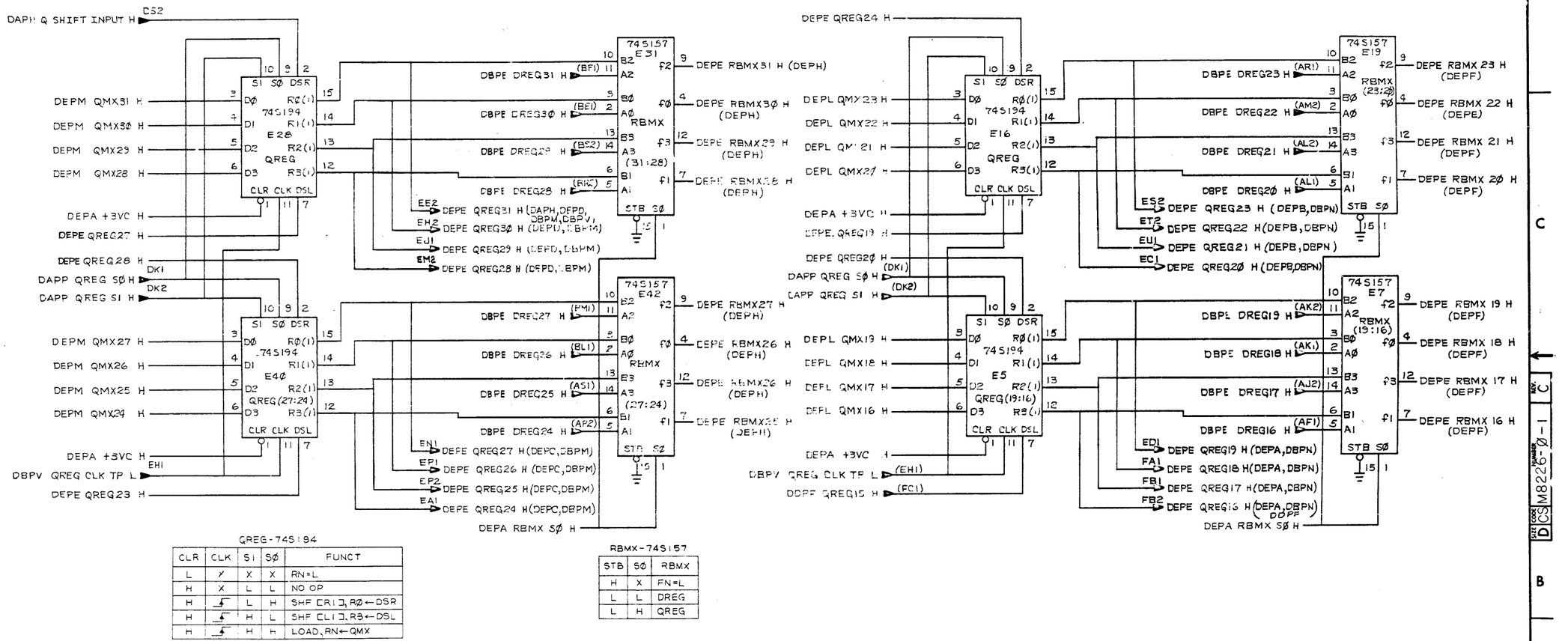

QREG-74S194

CLR	CLK	S1	S0	FUNCT
L	X	X	X	RN=L
H	X	L	L	NO OP
H	↓	L	H	SHF ER1], RØ←DSR
H	↓	H	L	SHF EL1], RB←DSL
H	↓	H	H	LOAD, RN←QMX

RBMX-74S157

STB	S0	RBMX
H	X	FN=L
L	L	DREG
L	H	QREG

REVISIONS		
CHK	CHANGE NO.	REV.

(QREGISTER & RBMX 31:16) (SLOT 10)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16(DEPE)	D	CS	M8226-0-1	C
SCALE NONE	SHEET 6 OF 16		DIST.	

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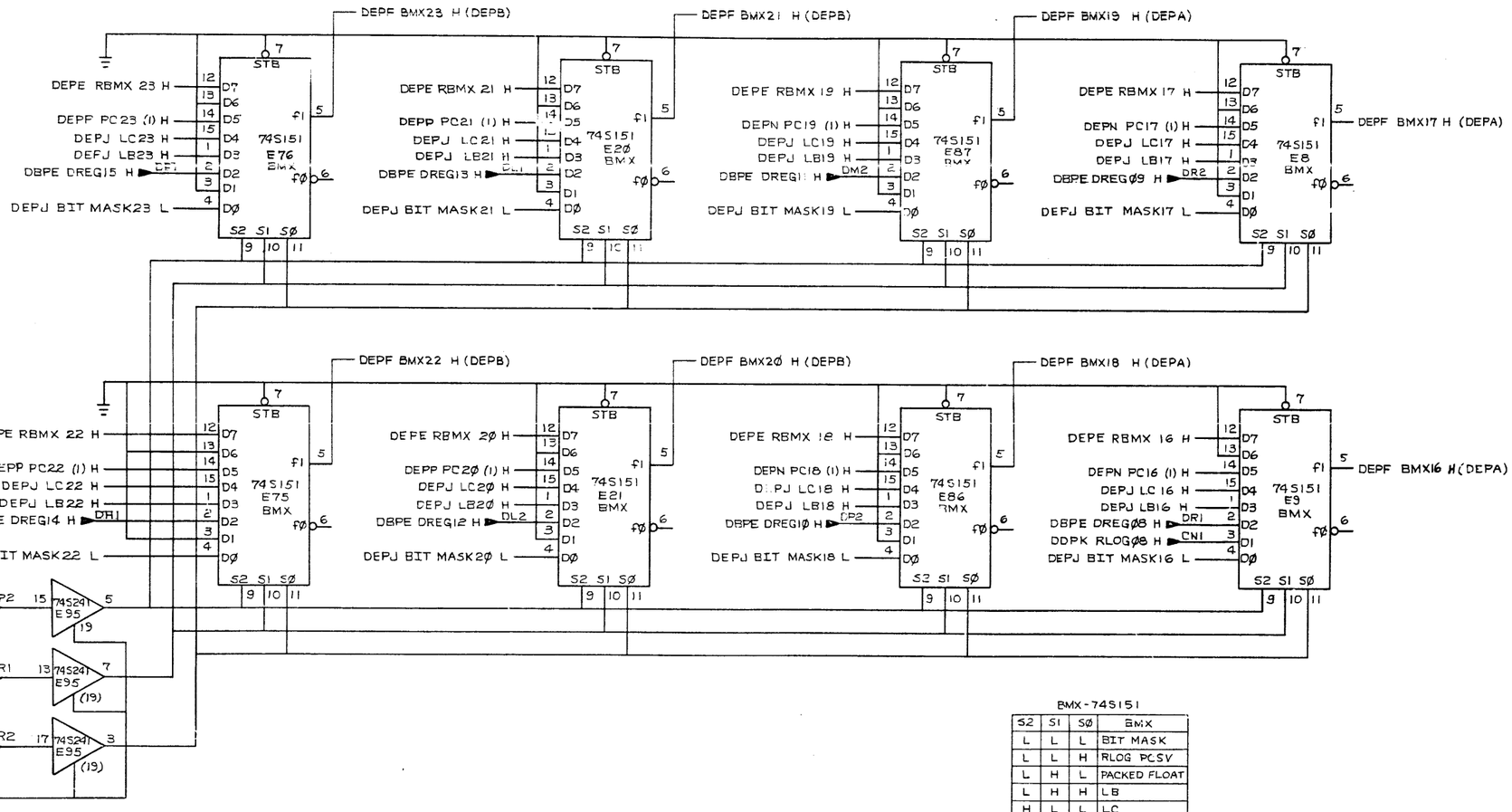

BMX-74S151

S2	S1	S0	BMX
L	L	L	BIT MASK
L	L	H	RLOG PCSV
L	H	L	PACKED FLOAT
L	H	H	LB
H	L	L	LC
H	L	H	PC
H	H	L	0
H	H	H	RBMX

REVISIONS		
CHK	CHANGE NO.	REV.

(BMX 23:16) (SLOT 00)

TITLE: DATA PATH 31:16 (DEPF)
SIZE: D | CODE: CS | NUMBER: M8226-0-1 | REV: C
SCALE: NONE | SHEET: 7 OF 16 | DIST:

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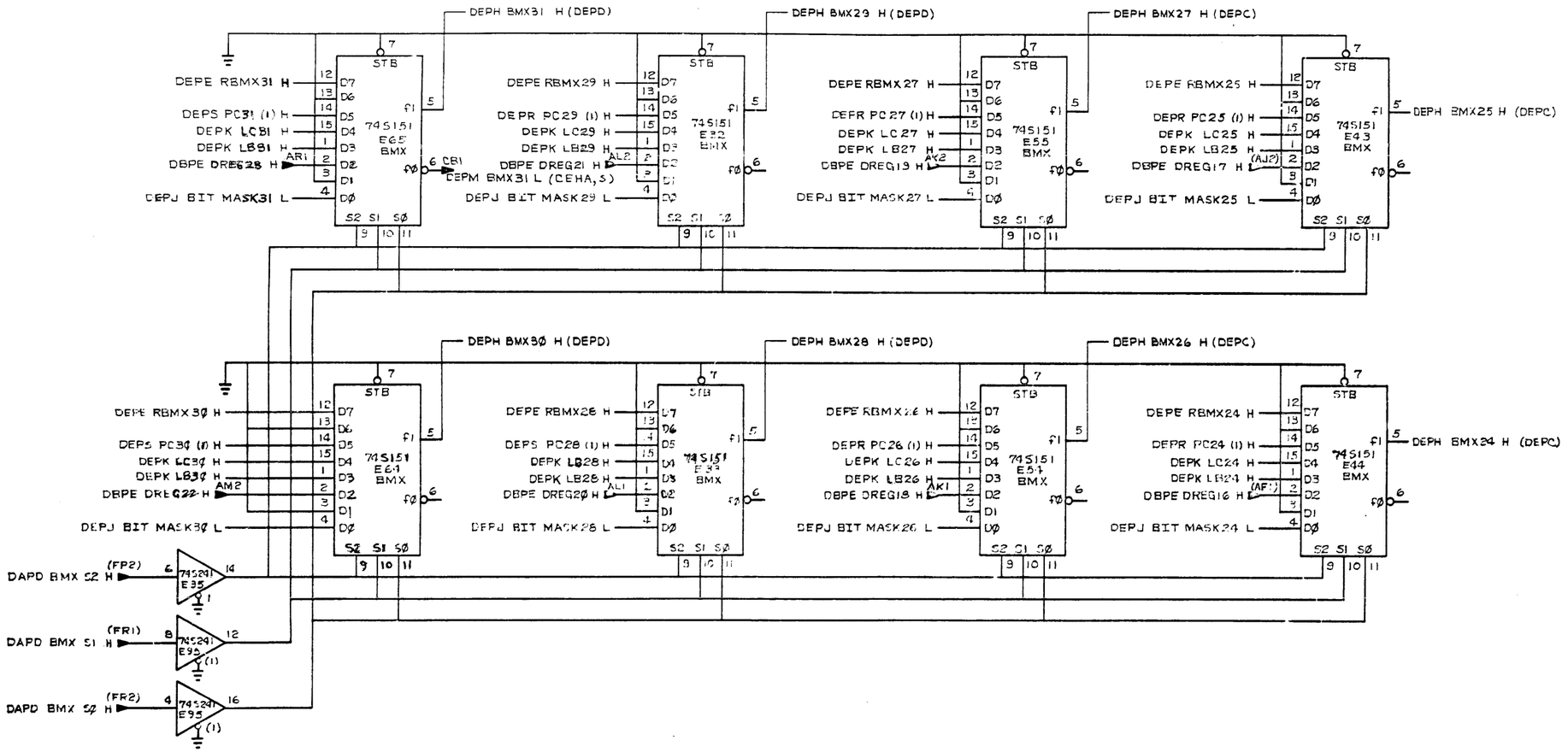

REVISIONS		
CHK	CHANGE NO.	REV.

(BMX 31:24) (SLOT 0)

TITLE: DATA PATH 31:16 (DEPH)

SIZE D | CODE CS | NUMBER M8226-0-1 | REV. C

SCALE NONE | SHEET 8 OF 16 | DIST.

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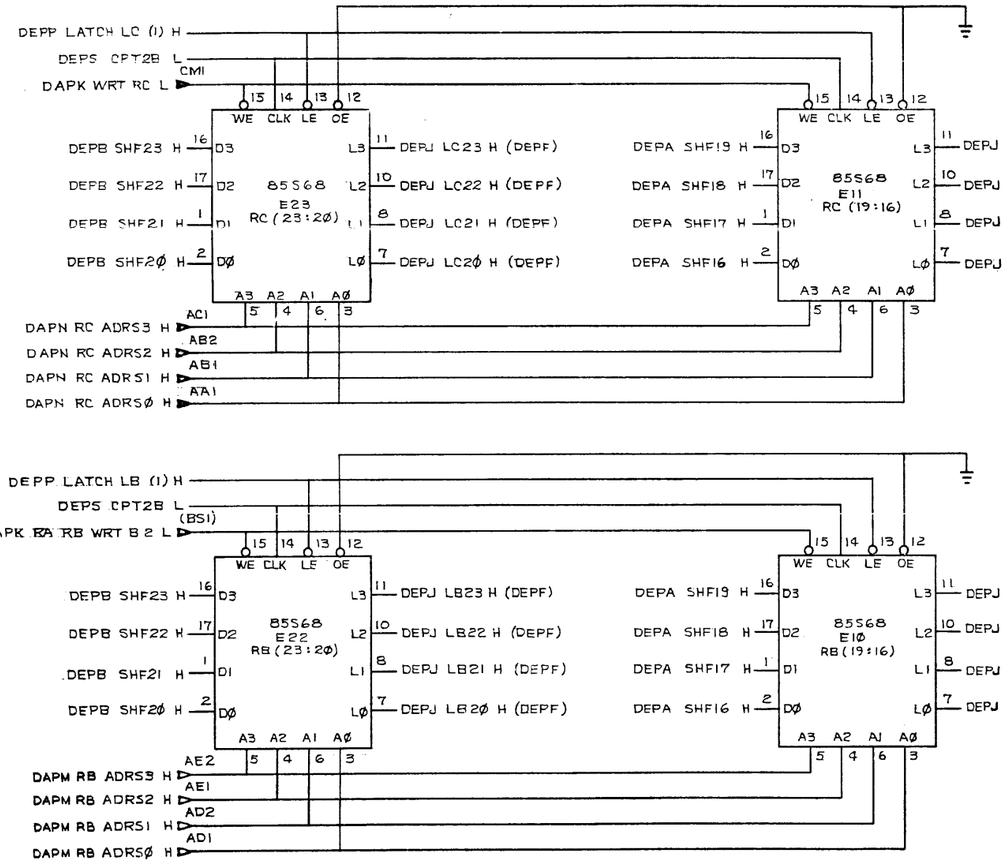
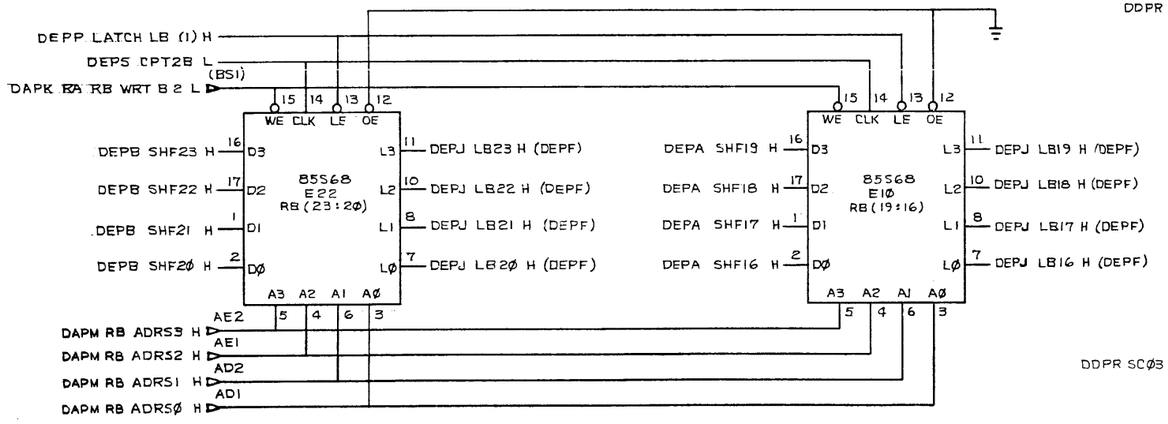
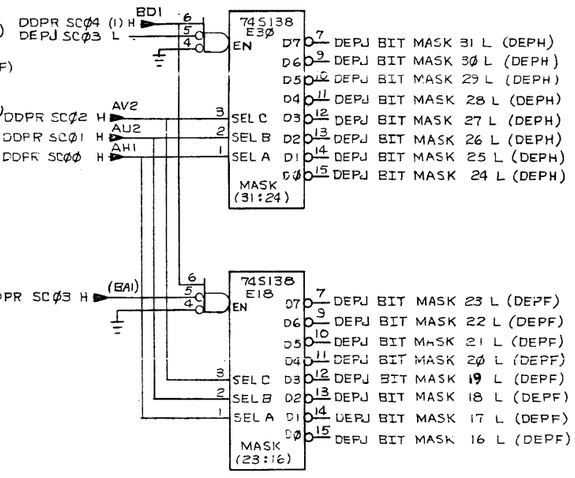
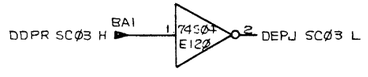




RX-85568

LE	$\overline{WE}$	CLK	FUNCT
H	H	X	NO OP
H	L	⌐	STORE, RN←SHF
⌐	H	X	LATCH, LA←(RN)





BIT MASK-74S138

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2*	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

*NOTE:
G1 = G2+G2B

(RB, RC 23:16 & BIT MASK) (SLOT 10)

REVISIONS		
CKT	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPJ)	D	CS	M8226-0-1	C
SCALE NONE SHEET 9 OF 16	DIST.			

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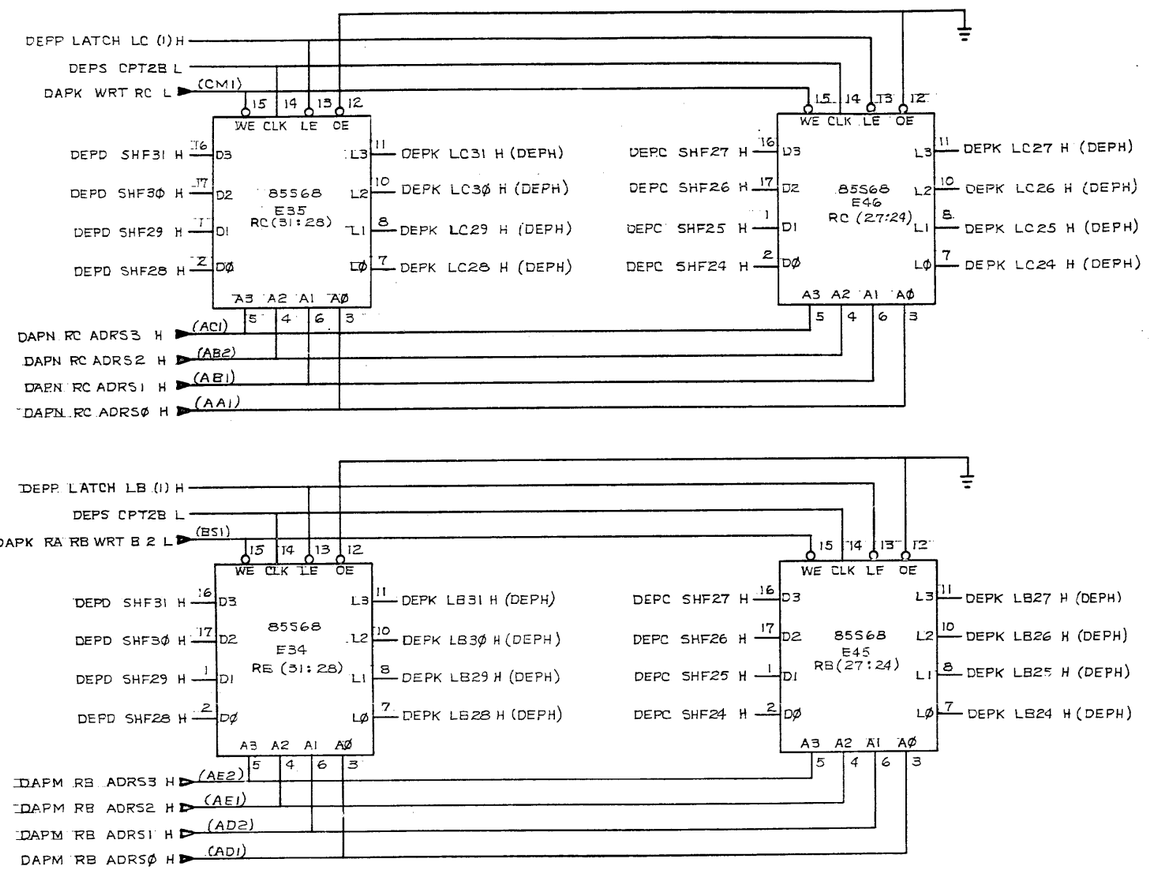

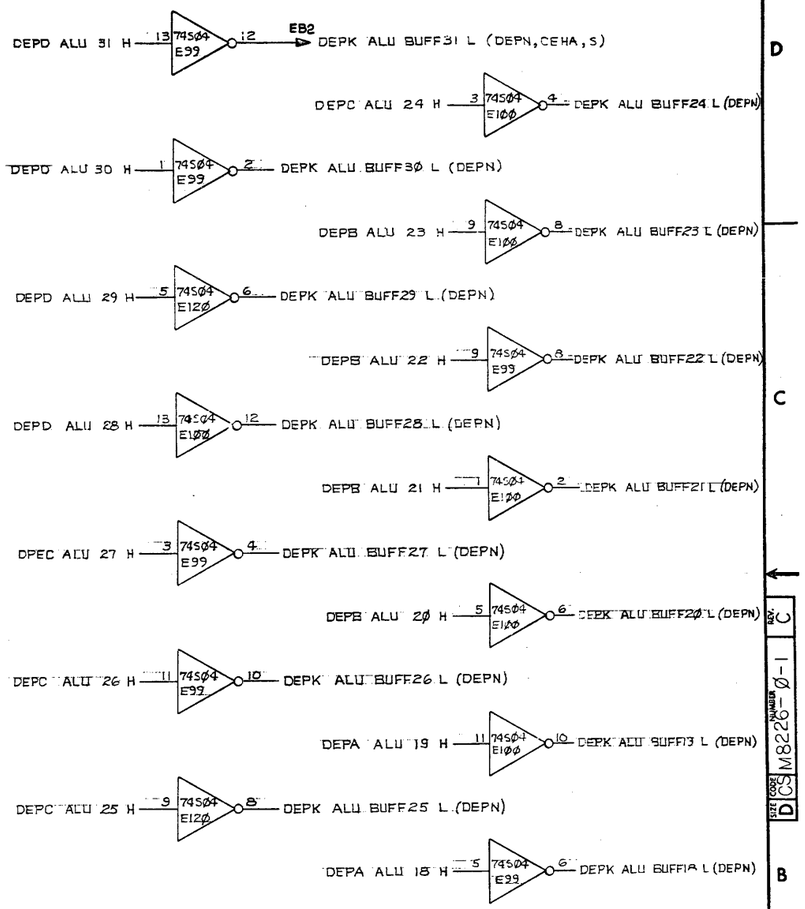

REVISIONS		
CHK	CHANGE NO.	REV.

(RB, RC 31:24 ALU BUFFERS) (SLOT 10)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPK)	D	CS	M8226 - 0 - 1	C
SCALE NONE	SHEET 10 OF 16	DIST.		

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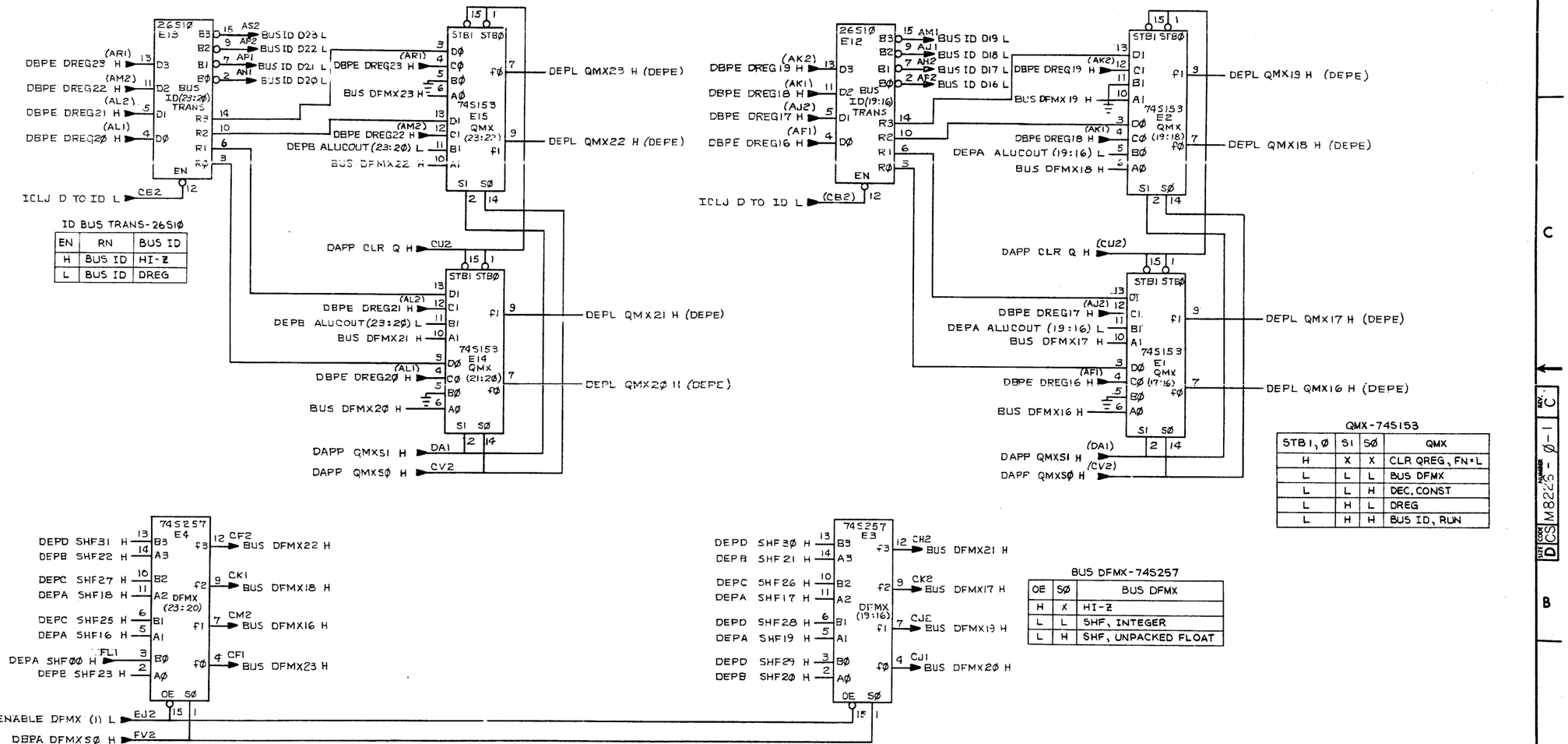

QMX-74S153

STB1,0	S1	S0	QMX
H	X	X	CLR QREG, FN=L
L	L	L	BUS DFMX
L	L	H	DEC. CONST
L	H	L	DREG
L	H	H	BUS ID, RUN

BUS DFMX-74S257

OE	S0	BUS DFMX
H	X	HI-Z
L	L	SHF, INTEGER
L	H	SHF, UNPACKED FLOAT

REVISIONS		
CHK	CHANGE NO.	REV.

(DFMX, QMX, ID BUS TRANSCEIVERS 23:16) (SLOT 10)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPL)	D	CS	M8226-0-1	C
SCALE NONE	SHEET 11 OF 16		DIST.	

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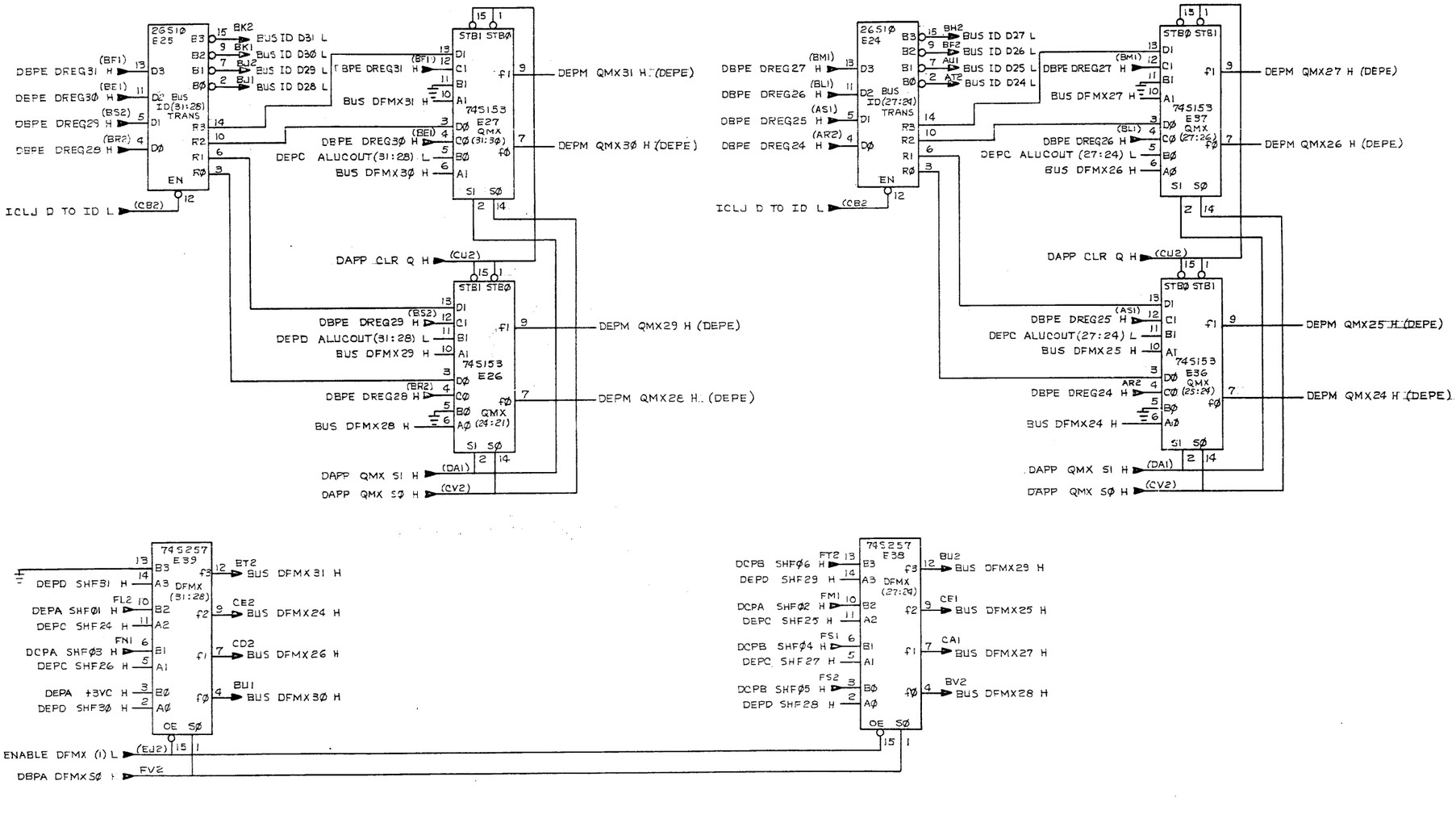

REVISIONS		
CHK	CHANGE NO.	REV.

(DFMX QMX ID BUS TRANCEIVERS 31:24) (SLOT 10)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPM)	D	CS	M8226-0-1	C

SCALE NONE | SHEET 12 OF 16 | DIST.

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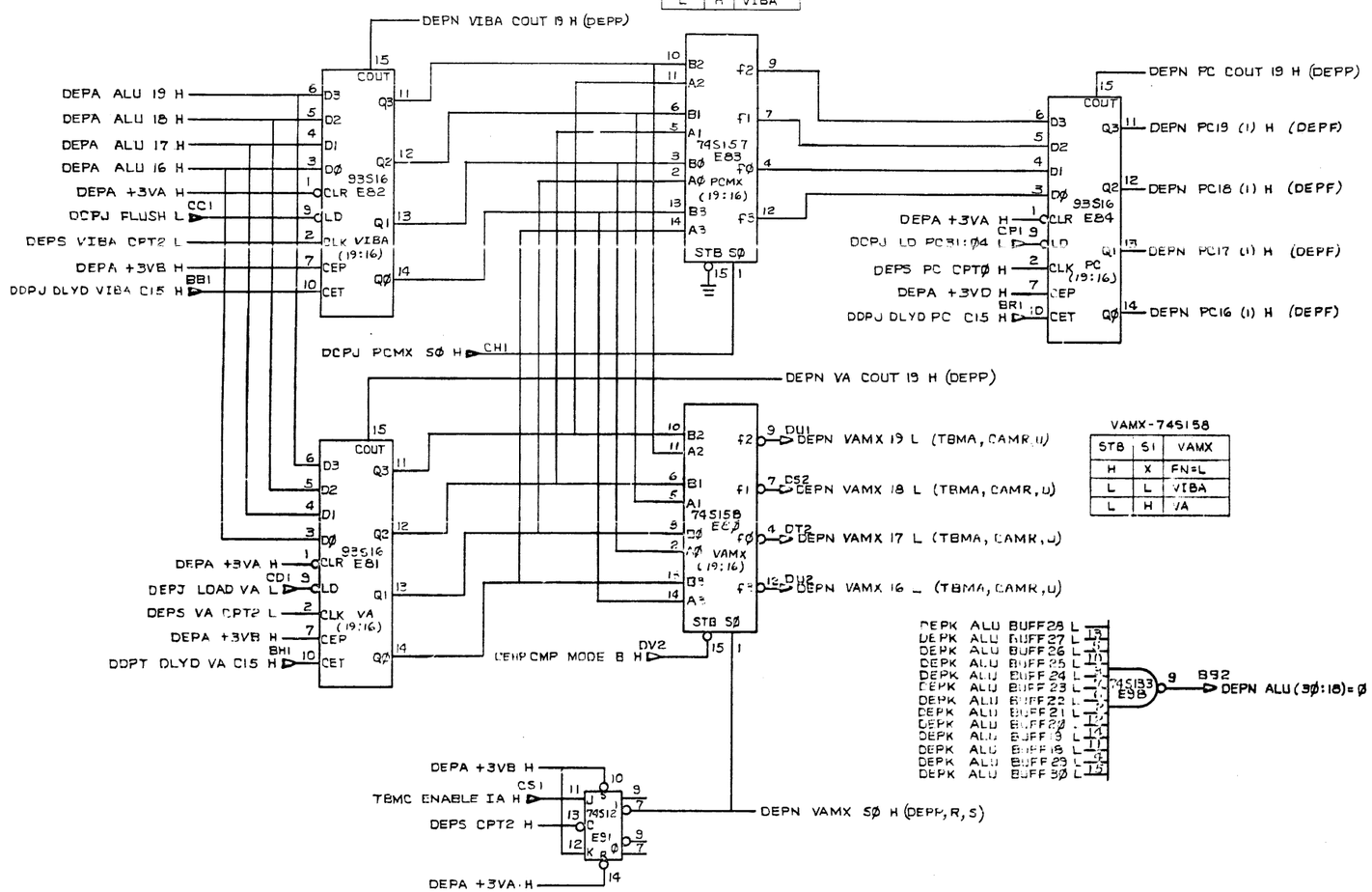
PCMX-74S157

STB	SØ	PCMX
H	X	FN=L
L	L	VA
L	H	VIBA

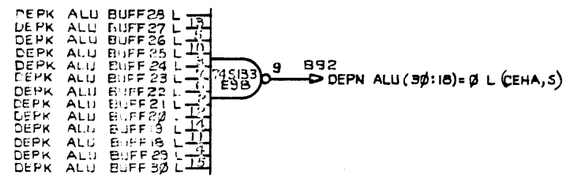


VAMX-74S158

STB	SI	VAMX
H	X	FN=L
L	L	VIBA
L	H	VA

VA, VIBA, PC-93S16

CLR	LD	CLK	CEP	CET	FUNCT
L	X	X	X	X	CLR, FN←L
H	L	↓	X	X	LOAD, FN←ALU
H	H	↓	H	L	INC, FN=FN
H	H	↓	H	H	INC, FN=FN + 1



(VA, VIBA, PC 19:16 ALU ZERO DETECT)

(SLOT 10)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPN)	D	CS	M8226-Ø-1	C
SCALE NONE	SHEET 13 OF 16	DIST.		

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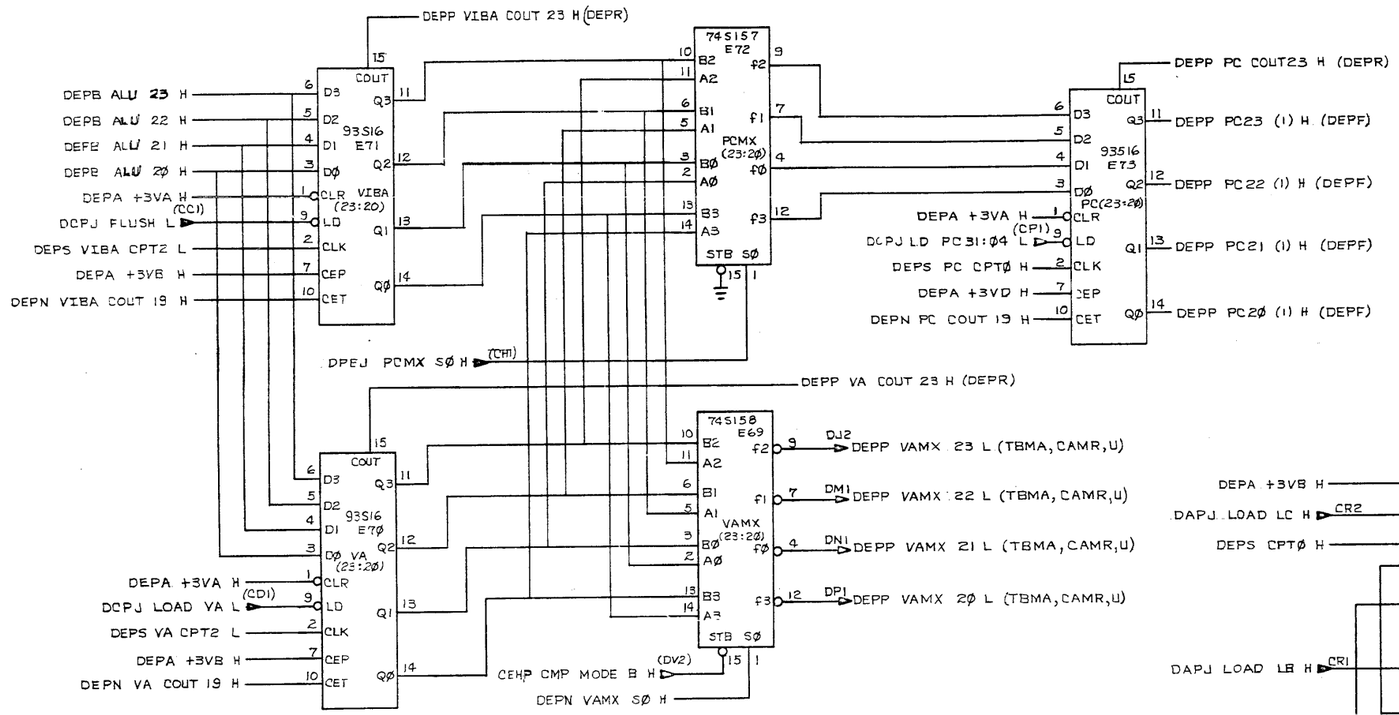

REVISIONS		
CHK	CHANGE NO.	REV.

(VA, VIBA, PC 23:16 LATCH CONTROLS) (SLOT 1Ø)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPP)	D	CS	M8226-Ø-1	C
SCALE NONE SHEET 14 OF 16	DIST.			

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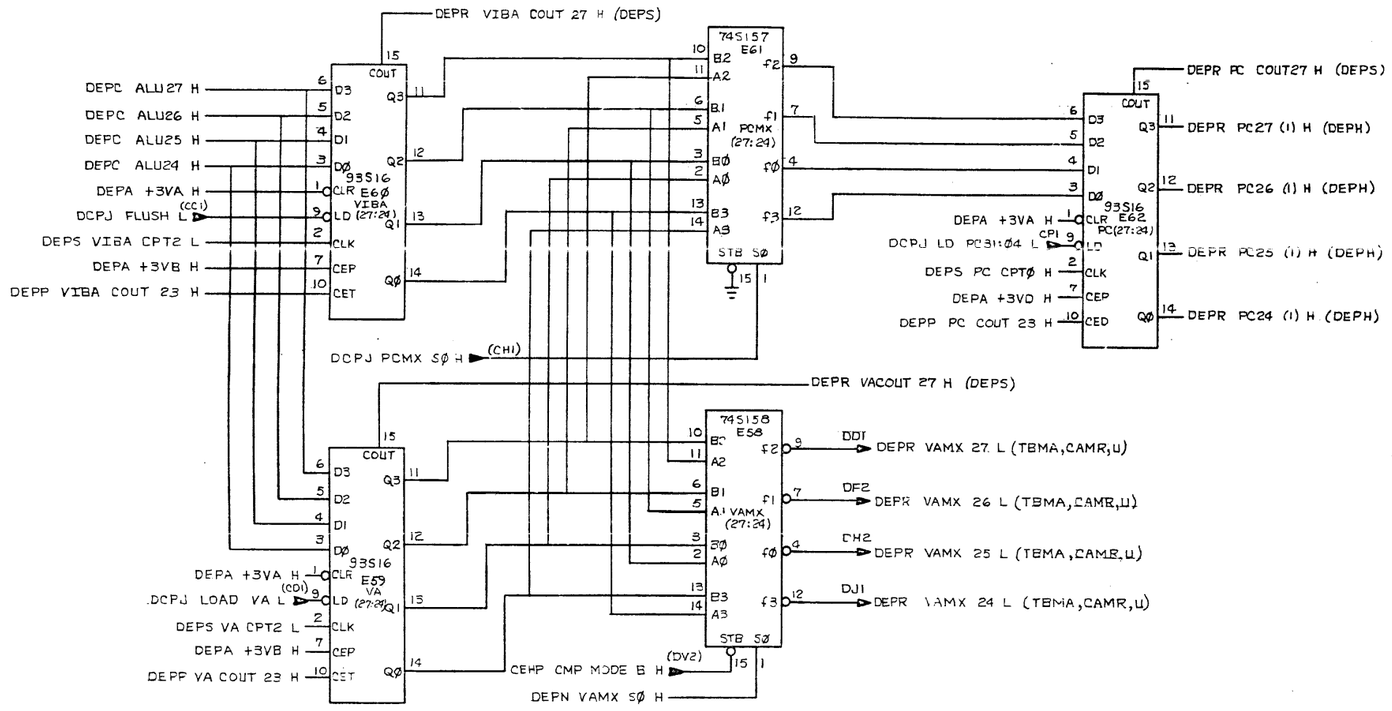

VA, VIBA, PC-93S16

CLR	LD	CLK	CEP	CET	FUNCT
L	X	X	X	X	CLR, FN←L
H	L	↓	X	X	LOAD, FN←ALU
H	H	↓	H	L	INC, FN=FN
H	H	↓	H	H	INC, FN=FN+1

VAMX-74S158

STB	SØ	VAMX
H	X	FN=L
L	L	VIBA
L	H	VA

REVISIONS		
CHK	CHANGE NO.	REV.

(VA VIBA 27:24) (SLOT 10)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPR)	D	CS	M8226-Ø-1	C
SCALE NONE SHEET 15 OF 16	DIST.			

242

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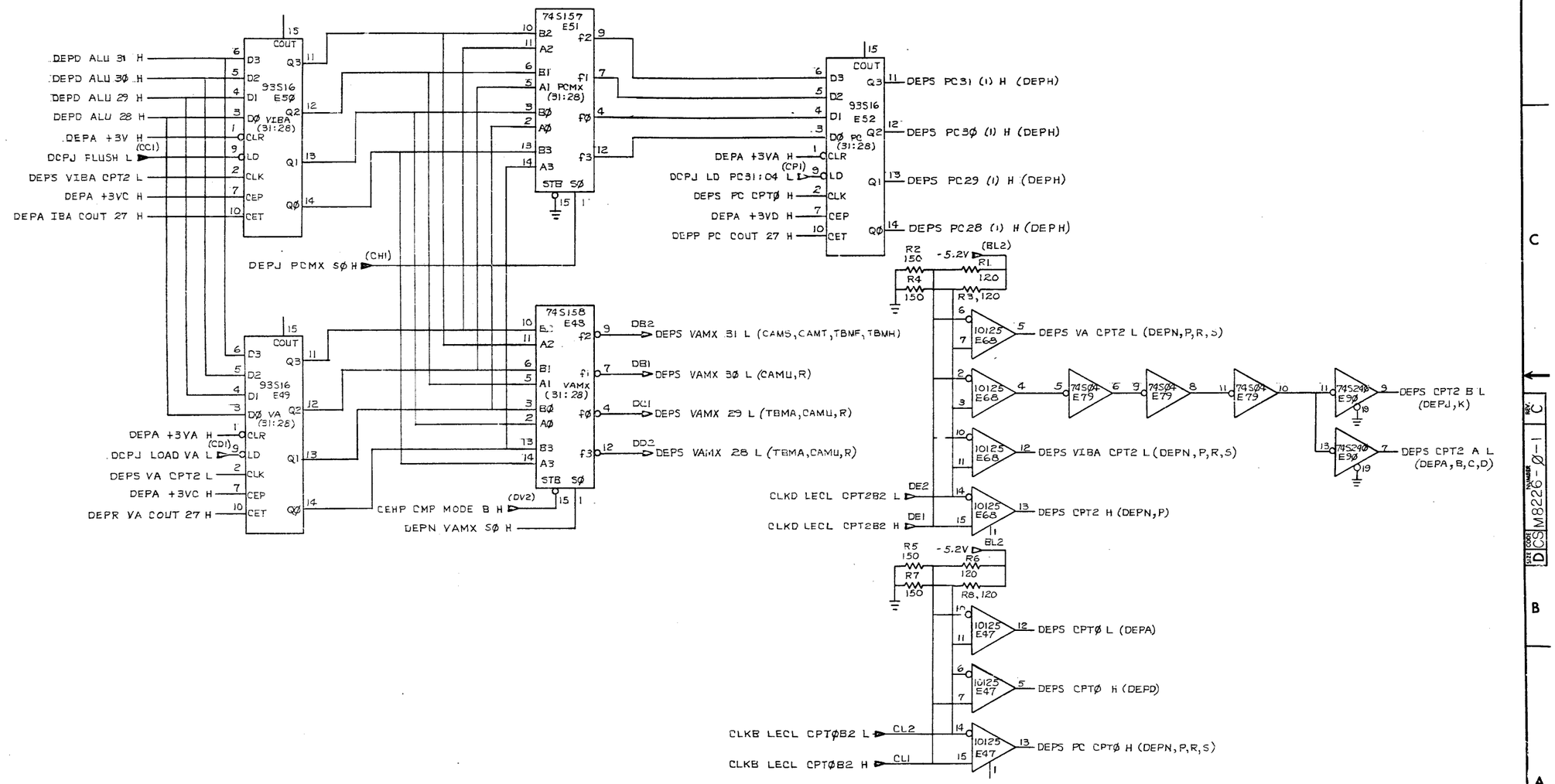
NOTE:
POWER PINNING ON 10125
+5 PIN 9
-5 PIN 8
GND PIN 16



REVISIONS		
CHK	CHANGE NO.	REV.

(VA, VIBA, PC 31:28 CLOCK TRANSLATORS) (SLOT 10)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 31:16 (DEPS)	D	CS	M8226-Ø-1	C
SCALE NONE	SHEET 16 OF 16		DIST.	

COMPONENT SIDE VIEW

1191
30262MM
F.B.S.

SIGNATURES	DATE
DRN.	6/28
CHK. D.	6/29
ENG.	6/29
PROJ. ENG.	7/2/74
PROD.	7/2/74

TITLE: CPU DATA PATH D

SIZE: C | CODE IDENT NO: 27014 | DWG NO: 8-DD-MB227-0

SCALE: 2/1 | SHEET 3 OF 3

NEXT HIGHER ASSY: 8-DD-MB227-0

REV: D

ECN REV.
P.C. DESIGN DATA RELEASE REV.

CHK CHANGE NO REV

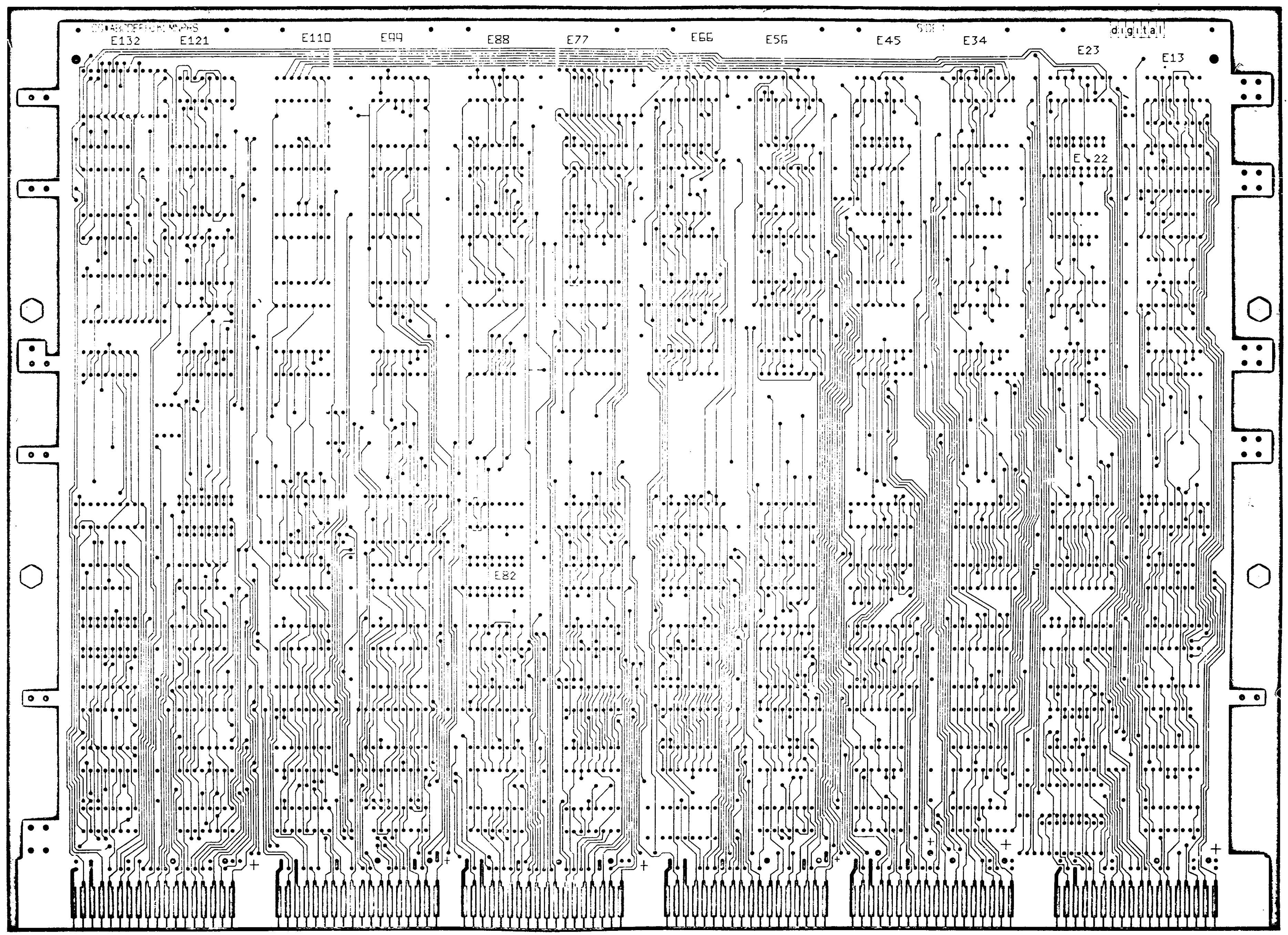
NOTES:

E U-MB227-00 B

344

L1

LAYER 1 M8227 5012599LP1



REVISIONS		
CHK	CHANGE NO	REV.

DEC FORM NO. DRE 106

TITLE	SIZE	CODE	NUMBER	REV.
CPU DATA PATH D	E	UA	M8227-Ø-Ø	B
SCALE 2 - 1 / SHEET 2 OF 3	DIST.			

M8227-Ø-Ø REV. B

245

LAYER H

L4

CPU DATA PATH D
5012599C-PI M8227

REVISIONS		
CHK	CHANGE NO.	REV

TITLE	SIZE	CODE	NUMBER	REV
CPU DATA PATH D	E	LUA	M8227-00	B
SCALE 2 – 1	SHEET 3 OF 3		DIST	

DEC FORM NO
DNE 1106

LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
1	1	E-MD-5012599-0-0	5012599-00	M8227	1	
2	2		1012084-01	8 MFD 25V G% 30D AL EL (10-12	7	C1-C7
3	3		1012784-00	.047 MFD 50V X% CER. $	40	C8-C43,C46,C48,C49,C50
4	4		1300295-00	330 1/4W 5% CC (13-00	13	R9,R11,R13,R15,R17,R19,R21,
					CONT	R23,R25,R28,R29,R35,R39
5	5		1301424-00	680 1/4W 5% CC (13-00	4	R27,R30,R36,R40
6	6		1300247-00	120 1/4W 5% CC (13-00	4	R1,R3,R6,R8
7	7		1300250-00	150 1/4W 5% CC (13-00	4	R2,R4,R5,R7
8	8		1301775-00	820 1/4W 5% CC (13-00	9	R10,R12,R14,R16,R18,R20,R22,
					CONT	R24,R26
9	9		1910532-00	74S00 NAND GATE-QUAD 2IN	4	E5,E21,E84,E126
10	10		1910534-00	74S04 INVERTER GATE-HEX 1IN	10	E8,E35,E42,E45,E64,E65,E97,
					CONT	E115,E120,E131
11	11		1912389-00	74S08 AND GATE-QUAD 2IN,POS 14	2	E32,E114
12	12		1910537-00	74S11 AND GATE-TRIPLE 3INPUT	2	E15,E44
13	13		1910539-00	74S20 NAND GATE-DUAL 4INPUT	2	E3,E9
14	14		1911712-00	74S51 AND-OR GATE-INVERT DUAL 2W/2IN	1	E10
15	15		1910542-00	74S64 4-O-I XPDR GATE,4-2-3-2 14	1	E14
16	16		1910545-00	74S112 FF-JK DUAL,EDGE TRIGGER	3	E50,E51,E78
17	17		1911983-00	74S133 NAND GATE-POSITIVE 13IN	4	E43,E98,E108,E109
18	18		1911675-00	74S138 DECODER-THREE INPUT	2	E2,E52
19	19		1910956-00	74S151 MUX 1 OF 8	8	E7,E19,E30,E41,E95,E106,E117,
					CONT	E128
20	20		1910547-00	74S153 MUX 1 OF 4 (DUAL)	19	E20,E23,E31,E34,E48,E49,E53,
					CONT	E56,E60,E61,E62,E63,E66,E71,
					CONT	E72,E80,E81,E86,E87
21	21	BLANK			0	
22	22		1910548-00	74S157 MUX 1 OF 2 (QUAD)	13	E57,E58,E68,E69,E73,E75,E76,
					CONT	E85,E88,E92,E103,E118,E121
23	23		1910549-00	74S158 MUX 1 OF 2 (QUAD)	4	E4,E27,E89,E100

REVISION HISTORY			VARIATIONS FOR THIS ASSY.
CHK	ECO NO	REV	
---	00002	B	00

FIRST USED ON:

MADE BY: F SMART DATE: 29-MAR-78

CHECKED: F SMART DATE: 29-MAR-78

DSN.ENG.: E ANTON DATE: 29-MAR-78

PROD.: M. TERELLA DATE: 29-MAR-78

RESP.ENG.: E ANTON DATE: 29-MAR-78

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE
PARTS LIST
CPU DATA PATH D

SIZE	CODE	DOCUMENT NUMBER	REV
K	PL	M8227-0-DBP	B

EDIT# 6

ASSY.NO.: E-UA-M8227-0-0

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LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
24	24		1910957-00	74S175 FF-D QUAD COMMON CLOCK	4	E1,E12,E24,E25
25	25		1910531-00	DEC 74S181 ALU-4BIT	5	E77,E94,E105,E129,E132
26	26		1912097-00	SN 74S182 LOOK AHD CARRY GEN	2	E83,E130
27	27		1910552-00	74S194 SHIFT REG.,4BIT RIGHT/LEFT	10	E33,E54,E55,E59,E70,E74,E96,
					CONT	E99,E107,E110
28	28		1913493-00	74S241 OCTAL BUFFER,TRI-STATE	2	E11,E127
29	29		1911641-00	SN 74S257 MUX,QUAD 2 TO 1	4	E111,E113,E122,E124
30	30		1912865-00	LS283 ADDER-4BIT BINARY FULL W/FAST	1	E13
31	31		1911469-00	DEC 8640 RECEIVER,BUS,QUAD,UNIBUS,Q-BU	1	E36
32	32		1912586-00	85S68 REGISTER,64BIT EDGE TRIG,TRIST	9	E17,E18,E26,E28,E29,E37,E38,
					CONT	E39,E40
33	33		1913294-00	93S16 COUNTER,SYNCH UP BINARY	6	E90,E91,E93,E101,E102,E104
34	34		1912693-00	25S10 SHIFTER,4BIT TRI-STATE	2	E112,E123
35	35		1913788-00	26S10 TRANSCEIVER,BUS,QUAD	2	E47,E79
36	36		1911415-00	10125 ECL TO TTL TRNSLTR ECL 16 P	2	E46,E67
37	37		23028B1-00	B1-01	1	E119
38	38		23029B1-00	B1-01	1	E16
39	39		1913462-00	74S240 OCTAL BUFFER,INVERTING TRI-STA	1	E6
40	40		1210711-02	HANDLE ASSY,MOD DOEHLER-JARVIS	1	
41	41		9000024-01	EYELET, ROLLED FLANGE, .121 OD X .196 LG	12	
42	NOTE:		IC SPARES	E22,E82,E116,E125		

	TITLE	SIZE	CODE	DOCUMENT NUMBER	REV
DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	PARTS LIST CPU DATA PATH D	K	PL	M9227-0-DBP	B

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EXPD 74S157 DDPL,M
NABS DDPL
EALU 74S181 74S182 DDPL, M, N
DDPN
EBMX 74S153
EAMX 74S157
DDPL,M,N
AMX 14:07
DBPL SHF VAL
FE 74S194 DDPL,M
STATE 74S194 DDPL,M
SC 74S194 DDPR
DCPA,B ALU 07:00
SMX 74S153
8
ALU 15:08 = 0
74S133 DDPF
VA 93S16 DDPH,J
DCPJ LOAD VA
VAMX 74S158 DDPH,J
VAMX 15:09 TO CACHE & TBUF
VIBA 93S16 DDPH J LD
DCPJ FLUSH
PCMX DDPH J
PC 93S16 DDPH J
PC 15:08 TO BMX
DCPJ LD PC
SHF DDPA,B
RT 74S257
LFT 25S10
DFMX 74S257 DDPC
BUS DFMX 15:08 TO AND FROM FPA
DAPK ENABLE DFMX
DBPE DREG 15:08
DECIMAL CONSTANT
QMUX 74S153 DDPC
DAPP QMX S1:0
DAPP CLR Q
74S181, 74S182 ALU DDPA,B
DCPL ALU CARRY 07
DDPB ALU G&P
BIT MASK 74S138
DDPF
DCPF QREG 07
QREG 74S194 DDPF
DEPE QREG 16
DAPP QREG S1:0
DAPD BMX S2:0
BMX 74S151 DDPD
DAPC AMX S1:0
AMX 74S153 DDPA,B
EXP D6:01 SD
PC 15:08
RAMX 74S157
RBMX 74S157
DDPA,B
DDPF
SK 15:08 DDPH
DCPK UKMX 5:0
KMX 74S153 DDPH
FK = SC
FKMX 74S00 DDPH
SC 9:8
RLOG 08
RLOG STACK DDPK
KMX 3:0 RA ADRS ADD + SUB
LC RC 85S68 DDPE
RC ADRS
LB RB 85S68 DDPE
RB ADRS
LA RA 85S68 DDPA,B
RA ADRS
DAPH URMX
ID XCEIV DDPC EN
ICLJ D TO ID L
ID BUS
DCPK KMX 07:00
1/2

REVISIONS			
CHK	CHANGE NO.	REV.	
BC	M8227-00001	B	D. Bruckner 10 OCT 77
	M8227-0002	C	E. ANTON 14 OCT 77
BS	SHORT		4-10-78
			4-10-78

BLOCK DIAGRAM (SLOT 11)

DRN. G. Vincent	4-22-77	FIRST USED ON digital
CHK D. Bruckner	5/22/77	
ENG. E. ANTON	5/22/77	TITLE
PROJ. ENG. E. ANTON		DATA PATH 15:08 (DDP)
PROD. G. Vincent	6/1/77	
NEXT HIGHER ASSY.		
SCALE — H —		SIZE D CODE CS NUMBER M8227-0-1 REV. C
SHEET 1 OF 19		DIST.

DEC FORM NO. DDD 102-0

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RAMX - 74S157

STB	SØ	RAMX
H	X	FN = L
L	L	DREG
L	H	QREG

74S153

STB1,Ø	S1	SØ	FN
H	X	X	FN = L
L	L	L	FN = A
L	L	H	FN = B
L	H	L	FN = C
L	H	H	FN = D

RA - 85S68

LE	WE	CLK	RA FUNCT
H	H	X	NO OPER.
H	L	⤒	STORE, RN ← SHF
⤒	H	X	LATCH, LA ← (RN)

ALU FUNCT - 74S181

SELECTION S3 S2 S1 SØ	ACTIVE HIGH DATA: M=H LOGIC FUNCTIONS	M=L ARITHMETIC OPERATIONS: $\overline{C}_n$ = H (NO CARRY)	M=L ARITHMETIC OPERATIONS: $\overline{C}_n$ = L (WITH CARRY)
L L L L	$F=\overline{A}$	F = A	F = A PLUS 1
L L L H	$F=\overline{A+B}$	F = A+B	F = (A+B) PLUS 1
L L H L	$F=\overline{A}B$	$F=A+\overline{B}$	$F=(A+\overline{B})$ PLUS 1
L L H H	F = 0	F = MINUS 1 (2'S COMPL)	F = ZERO
L H L L	$F=\overline{AB}$	$F=A$ PLUS $A\overline{B}$	$F=A$ PLUS $A\overline{B}$ PLUS 1
L H L H	$F=\overline{B}$	$F=(A+B)$ PLUS $A\overline{B}$	$F=(A+B)$PLUS $A\overline{B}$ PLUS 1
L H H L	$F=A\oplus B$	F = A MINUS B MINUS 1	F = A MINUS B
L H H H	$F=A\overline{B}$	$F=A\overline{B}$ MINUS 1	$F=A\overline{B}$
H L L L	$F=\overline{A}+B$	F = A PLUS AB	F = A PLUS AB PLUS 1
H L L H	$F=\overline{A\oplus B}$	F = A PLUS B	F = A PLUS B PLUS 1
H L H L	F = B	$F=(A+\overline{B})$ PLUS AB	$F=(A+\overline{B})$ PLUS AB PLUS 1
H L H H	F = AB	F = AB MINUS 1	F = AB
H H L L	F = 1	F = A PLUS A*	F = A PLUS A PLUS 1
H H L H	$F=A+\overline{B}$	F=(A+B) PLUS A	$F=(A+B)$ PLUS A PLUS 1
H H H L	F = A+B	$F=(A+\overline{B})$ PLUS A	$F=(A+\overline{B})$ PLUS A PLUS 1
H H H H	F = A	F = A MINUS 1	F = A

(RA, RAMX, ALU, SHF 11:Ø8)

(SLOT 11)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8 (DDPA)	D	CS	M8227-Ø-1	C
SCALE —	SHEET 2 OF 19	DIST.		

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DDPF QREG15 H
DBPE DREG15 H
DDPF QREG14 H
DBPE DREG14 H
DDPF QREG13 H
DBPE DREG13 H
DDPF QREG12 H
DBPE DREG12 H
74S57 E68 PAMX

DDPA RAMX SØ H

DDPF LATCH LA (1) H
DDPS RA RB CPT2 L
DAPK RA RB WRT B1 L (BR2)
85S68 E49 RA(15:12)
DDPB SHF15 H
DDPB SHF14 H
DDPB SHF13 H
DDPB SHF12 H
DAPL RA ADRS3 H (BP2)
DAPL RA ADRS2 H (BP1)
DAPL RA ADRS1 H (BN1)
DAPL RA ADRSØ H (BM2)

74S153 E71 AMX
74S153 E72 AMX

DDPA AMX SXT H (FE1)
DAPC AMX B1 S1 H (FE2)
DAPC AMX B1 SØ H

DDPD BMX15 H
DDPD BMX14 H
DDPD BMX13 H
DDPD BMX12 H

74S181 E94 ALU (15:12)

DAPA ALU B1:Ø S3 H (EF2)
DAPA ALU B1:Ø S2 H (EF1)
DAPB ALU B1:Ø S1 H (EE2)
DAPB ALU B1:Ø SØ H (EE1)
DAPB ALU MODE H (ER1)
DDPB ALU 12 CIN L

DDPR +3V B H
74SØØ E84 → BM1 → DDPB AMX15 L (CEHA,S)

DDPB AMX 15 H (DDPN)
DDPB AMX 14 H (DDPN)
DDPB AMX 13 H (DDPN)
DDPB AMX 12 H (DDPN)

(AP2) BUS ALU BYTE1 A=B H
DDPB ALU COUT (15:12) L (DDPC)
DDPB ALU 15:12 G H (DCPL,DDFB)
DDPB ALU 15:12 P H (DCPL,DDFB)
EL2 DDPB ALU 15 H (DDPE,J,DEPA,CEHA)
EL1 DDPB ALU 14 H (DDPA,E,J,DEPA)
EK2 DDPB ALU 13 H (DDPA,E,J,DEPA)
DDPB ALU 12 H (DDPA,E,J)

DEPA ALU 17 H (BJ2)
DEPA ALU 16 H (BJ1)
74S257 E122 B2 A2 B3 A3 B1 A1 BØ AØ OE SØ → f2 f3 f1 fØ
DDPB SHF15 H (DDPE)
DDPB SHF14 H (DDPE)
DDPB SHF13 H (DDPE)
DDPB SHF12 H (DDPE)
DDPJ SHF RT EN L
DDPA SHF SØ H

25S1Ø E123 SHF LFT (15:12) I3 I2 I1 IØ I-1 I-2 I-3 S1 SØ OE → Y3 Y2 Y1 YØ
DDPA ALU 11 H
DDPA ALU 10 H
DDPA ALU Ø9 H
DAPE SHF LFT S1 H (FF2)
DDPA SHF SØ H
DDPJ SHF LFT EN L

74S182 E83
DCPL ALU CARRY Ø7 L (FJ2)
DDPB ALU 15:12 P H
DDPB ALU 15:12 G H
C0 P3 G3 POUT P2 GOUT G2 P1 G1 P0 G0 C3 C2 C1
DDPB ALU15 P H (DCPL) (EB1)
DDPB ALU 15 G H (DCPL) (EA1)
DDPR +3V F H
DDPA ALU 11:Ø8 P H
DDPA ALU 11:Ø8 G H
DDPB ALU 12 CIN L (DDPB)

SHF RT MUX 74S257

OE	SØ	FN
H	X	HI-Z
L	L	AN, SHF [R1]
L	H	BN, SHF [R2]

SHF LFT MUX-25S1Ø

OE	S1	SØ	FN
H	X	X	HI-Z
L	L	L	$I_3-I_Ø$, NO SHIFT
L	L	H	I_2-I_{-1}, SHF [L1]
L	H	L	I_1-I_{-2}, SHF [L2]
L	H	H	$I_Ø-I_{-3}$, SHF [L3]

(RA, RAMX, ALU, SHF 15:12)

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 11)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8 (DDPB)	D	CS	M8227-Ø-1	C
SCALE —	SHEET 3 OF 19	DIST.		

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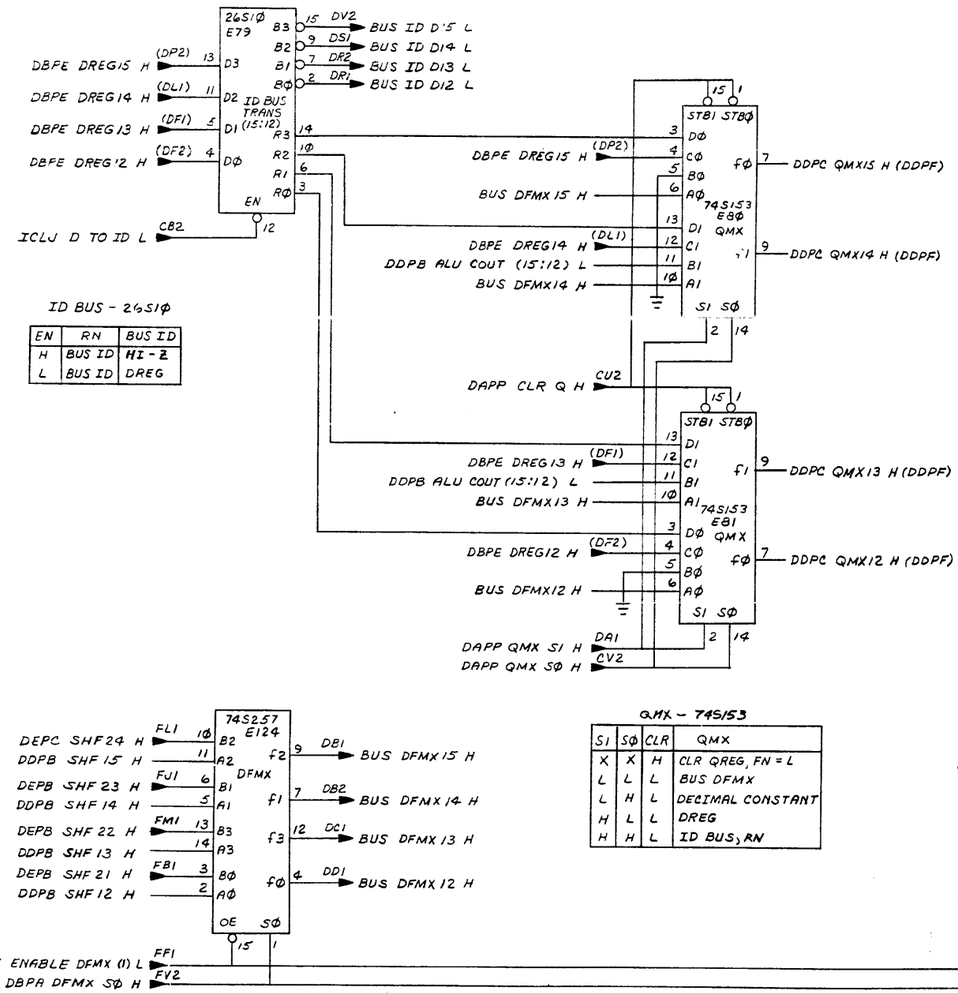
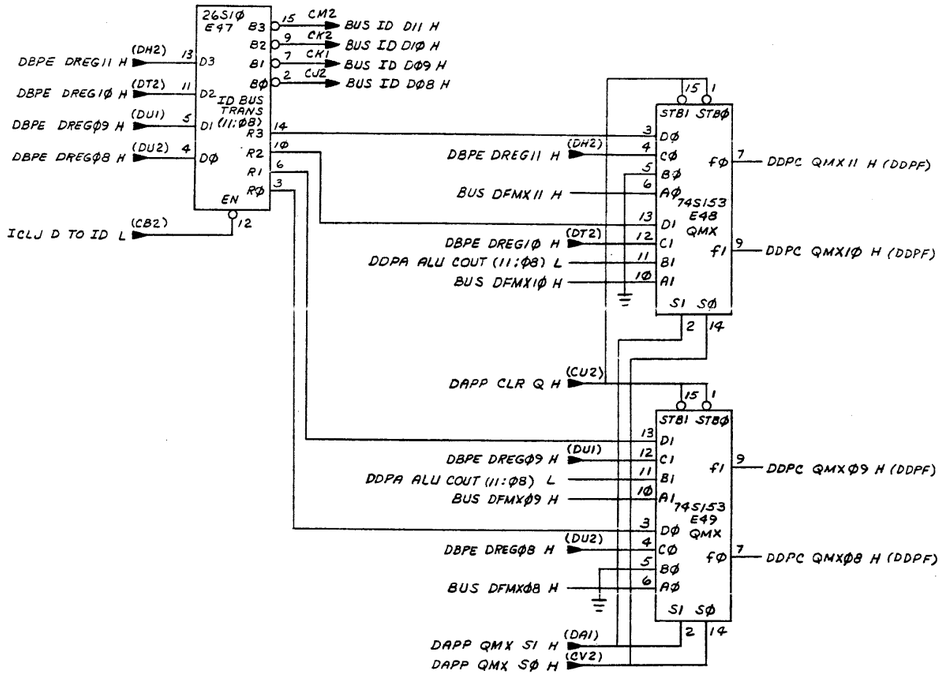
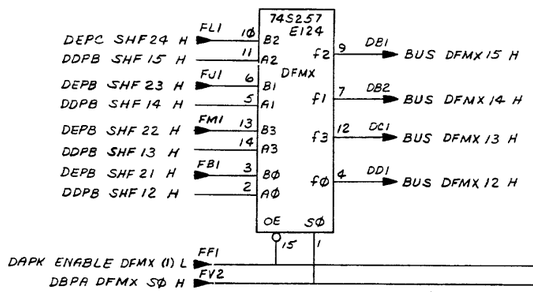


ID BUS - 26S1Ø

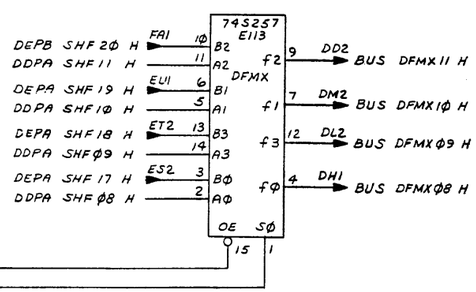
EN	RN	BUS ID
H	BUS ID	HI-Z
L	BUS ID	DREG





QMX - 74S153

S1	SØ	CLR	QMX
X	X	H	CLR QREG, FN = L
L	L	L	BUS DFMX
L	H	L	DECIMAL CONSTANT
H	L	L	DREG
H	H	L	ID BUS, RN



BUS DFMX - 74S257

OE	SØ	BUS DFMX
H	X	HI-Z
L	L	SHF, INTEGER
L	H	SHF, UNPACKED FLOAT

REVISIONS		
CHK	CHANGE NO.	REV.

QMX, DFMX, ID BUS 15:Ø8 (SLOT 11)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8 (DDPC)	D	CS	M8227-Ø-1	C
SCALE —11— SHEET 4 OF 19	DIST.			

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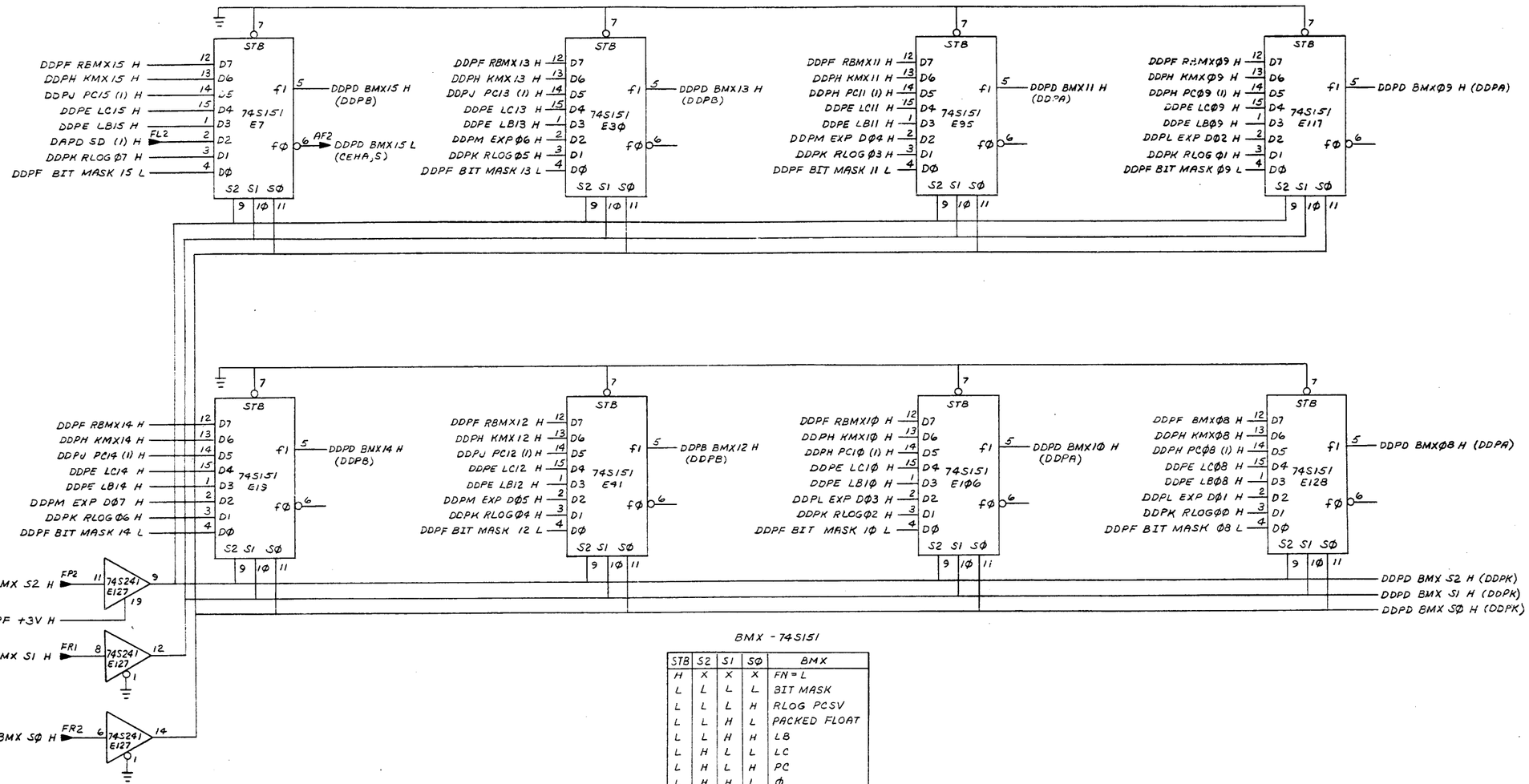

BMX - 74S151

STB	S2	S1	SØ	BMX
H	X	X	X	FN = L
L	L	L	L	BIT MASK
L	L	L	H	RLOG PCSV
L	L	H	L	PACKED FLOAT
L	L	H	H	LB
L	H	L	L	LC
L	H	L	H	PC
L	H	H	L	Ø
L	H	H	H	RBMX

(BMX 15:Ø8)

(SLOT 11)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8 (DDPD)	D	CS	M8227-Ø-1	C
SCALE —	SHEET 5 OF 19	DIST.		

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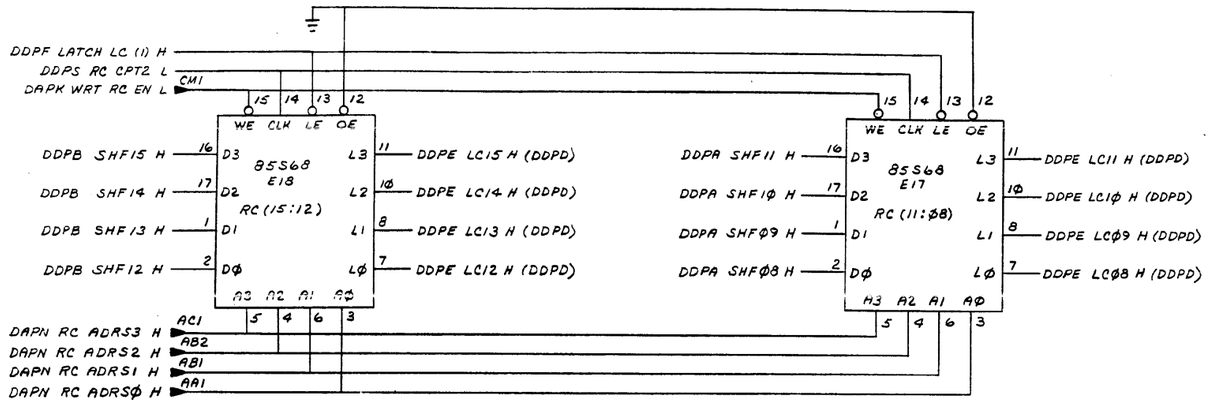
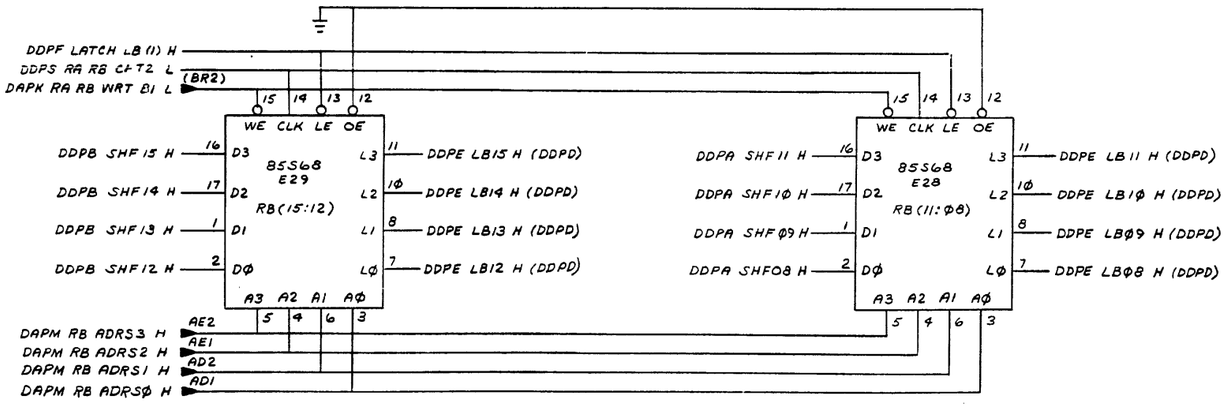
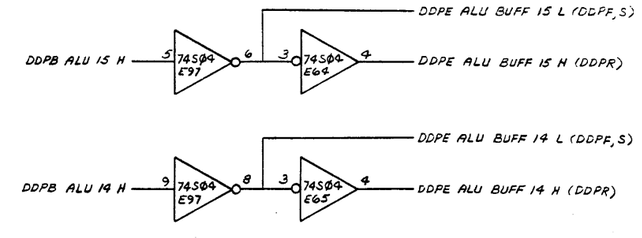
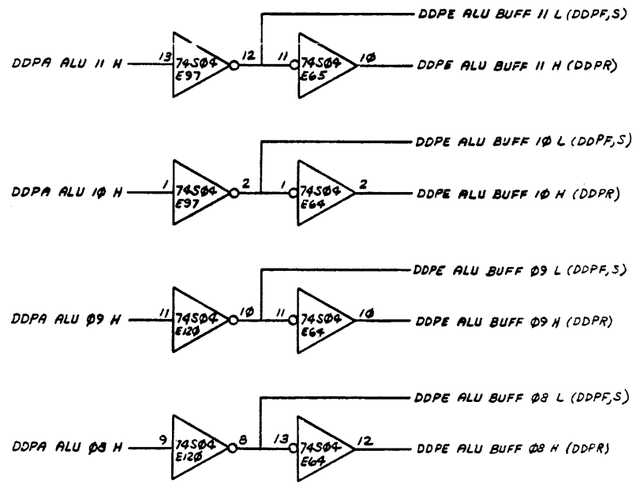




RB,RC- 85S68

LE	$\overline{WE}$	CLK	FUNCT
H	H	X	NO OPER.
H	L	⤓	STORE, RN←SHF
⤒	H	X	LATCH, LB,LC←(RN)





(ALU BUFFERS RB & RC 15:08)

(SLOT 11)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:08 (DDPE)	D	CS	M8227-0-1	C
SCALE —	SHEET 6 OF 19	DIST.		

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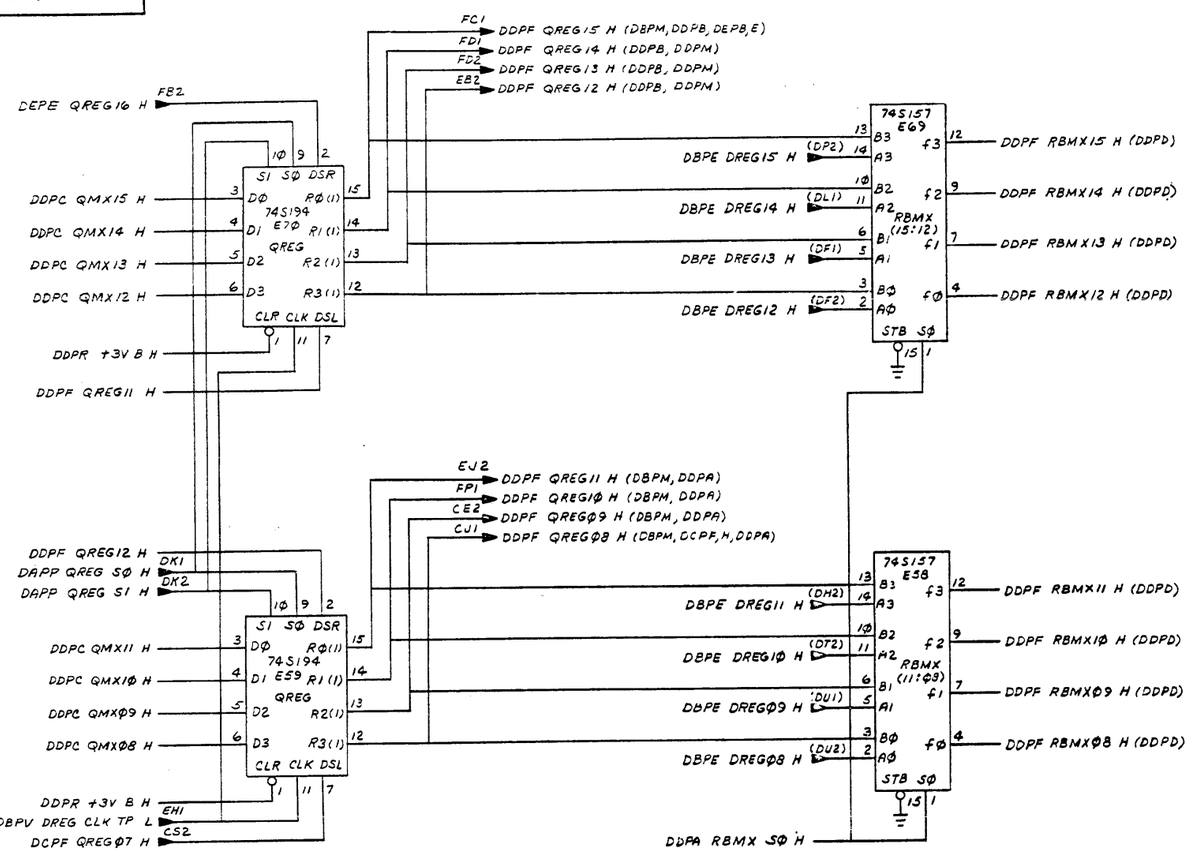
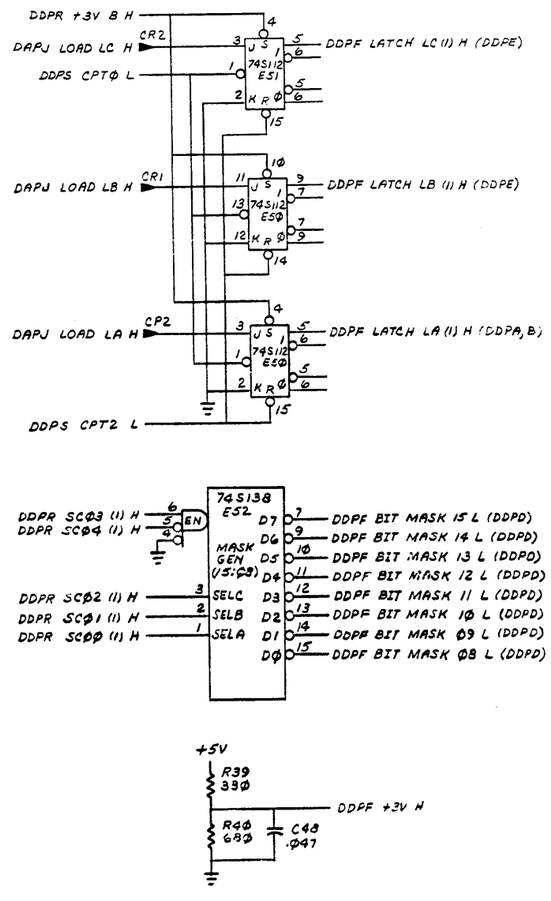


QREG - 74S194

CLR	CLK	S1	S0	FUNCT
L	X	X	X	RN = L
H	X	L	L	NO OPERATION
H	↑	L	H	SHF [RI], R0 ← DSR
H	↑	H	L	SHF [LI], R3 ← DSL
H	↑	H	H	LOAD, RN ← QMX

RBMX - 74S157

STB	S0	RBMX
H	X	FN = L
L	L	QREG
L	H	DREG



REVISIONS		
CHK	CHANGE NO.	REV.

(QREG RBMX & MASK)

(SLOT 11)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:08 (DDPF)	D	CS	M8227-0-1	C
SCALE —	SHEET 7 OF 19	DIST.		

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DDPH VIBA COUT 11 H (DDPJ)

DDPA ALU 11 H
DDPA ALU 10 H
DDPA ALU 09 H
DDPA ALU 08 H
DDPH +3V B H
DCPJ FLUSH L (CC1)
DDPS CPT2B L
DDPH +3V C H
DCPJ DLYD VIBA C07 H (BV2)

93S16 E102 VIBA: COUT, D3, D2, D1, D0, F3, F2, F1, F0, CLR, LD, CLK, CEP, CET

74S157 E103 PCMX: B2, A2, B1, A1, B0, A0, B3, A3, STB S0, f2, f1, f0, f3

DCPJ PCMX S0 H (CH1)

DDPH PC COUT 11 H (DDPJ)

93S16 E104: DDPH +3V B H; DCPJ LOAD PC 31:04 L (CP1); DDPS CPT03 H; DDPH +3V C H; DCPJ DLYD PC COUT07 H (BV2)

DDPH PC11 (1) H (DDPD)
DDPH PC10 (1) H (DDPD)
DDPH PC09 (1) H (DDPD)
DDPH PC08 (1) H (DDPD)

DDPH VA COUT 11 H (DDPJ)

93S16 E101 VA: DDPH +3V B H; DCPJ LOAD VA L (CD1); DDPS CPT2B L; DDPH +3V C H; DCPJ DLYD VA COUT01 H (BU1)

74S158 E100 VAMX: B2, A2, B1, A1, B0, A0, B3, A3, STB S0, f2, f1, f0, f3

DDPH VAMX 11 L (CAMS,T,TBMF) (EM1)
DDPH VAMX 10 L (CAMS,T,TBMF) (EN1)
DDPH VAMX 09 L (CAMS,T,TBMF) (EP1)

DDPH +3V C H
TBMC ENABLE IA H (CS1)

74S112 E78: J, S, K, R, Q

DDPS CPT2 H
DDPH +3V B H

DDPH VAMX S0 A (0) H (DDPJ)

+5V
R35 330
C46 .047uf
R36 680
DDPH +3V C H

DDPR SC09 (1) H
DDPR SC08 (1) H
DCPK UKMX2 (1) H
DCPK UKMX1 (1) H
DCPK UKMX0 (1) H

74S11 E15; 74S00 E5

DDPH FKMX09 L
DDPH FKMX08 L
DDPH FKMX =SC H

DDPR +3V A H
DDPH SK15 L
DDPH SK14 L
DDPH SK12 L
DDPH SK11 L
DDPH SK10 L
DDPH FKMX09 L
DDPH SK09 L
DDPH FKMX08 L
DDPH SK08 L

74S158 E27 KMX: B2, A2, B3, A3, STB S0, f2, f3, B0, A0, B1, A1, f0, f1

DDPH KMX 15 H (DDPD)
DDPH KMX 14 H (DDPD)
DDPH KMX 12 H (DDPD)
DDPH KMX 11 H (DDPD)
DDPH KMX 10 H (DDPD)
DDPH KMX 09 H (DDPD,N)
DDPH KMX 08 H (DDPD,N)

74S158 E4

74S64 E14: DCPK UKMX5 (1) H (AK2); DCPK UKMX4 (1) H (AL1); DCPK UKMX3 (1) H (AL2); DDPR +3V A H

DDPH KMX S0 L

23029B1-00 74S471 E16 SK ROM: DCPK UKMX5 (1) H (AK2); DCPK UKMX4 (1) H (AL1); DCPK UKMX3 (1) H (AL2); DCPK UKMX2 (1) H (AM1); DCPK UKMX1 (1) H (AF1); DCPK UKMX0 (1) H (AN1)

DDPH SK15 L
DDPH SK14 L
DDPH SK13 L
DDPH SK12 L
DDPH SK11 L
DDPH SK10 L
DDPH SK09 L
DDPH SK08 L

(SLOT 11)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:08 (DDPH)	D		M8227-0-1	C
SCALE —	SHEET 8 OF 19	DIST.		

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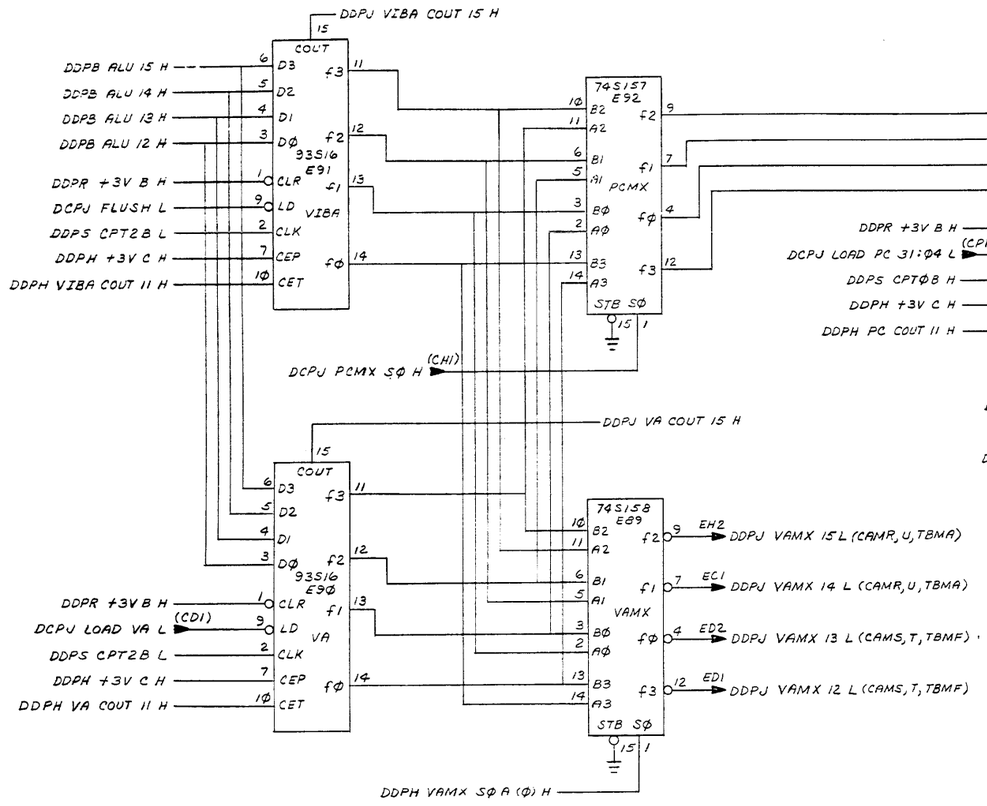

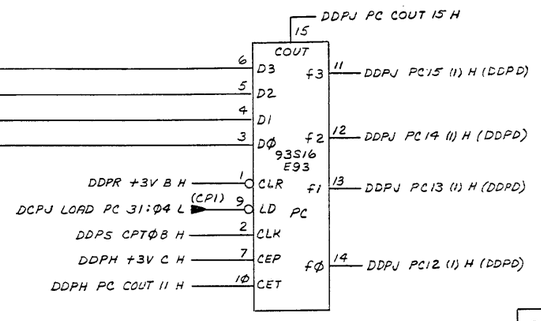

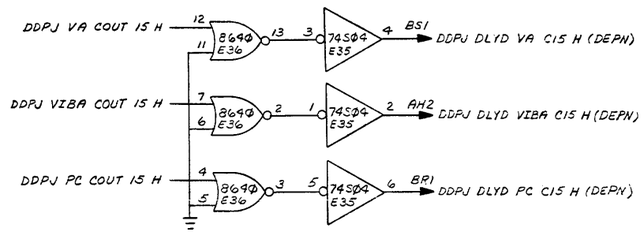

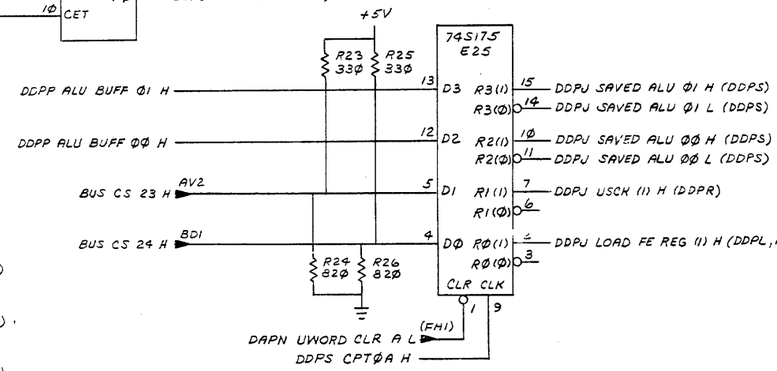

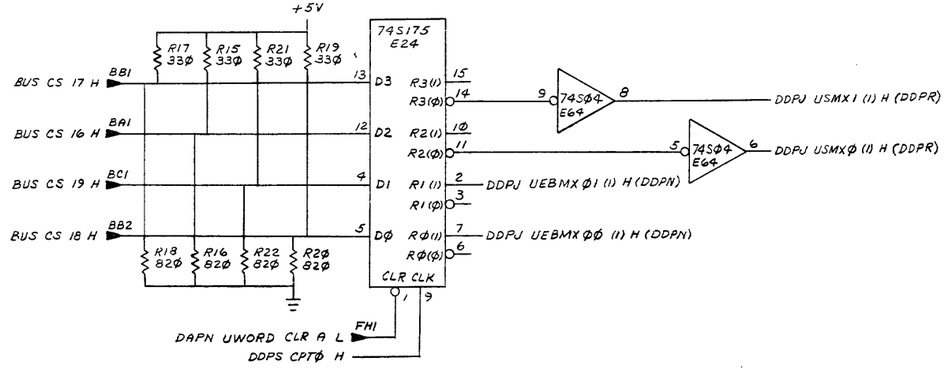

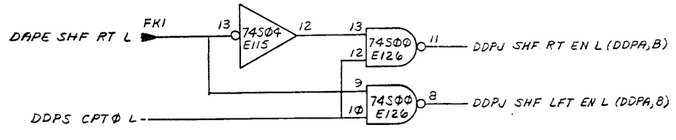

VA, VIBA, PC - 93S16

CLR	LD	CLK	CEP	CET	FUNCT
L	X	X	X	X	CLR, FN ← L
H	L	↓	X	X	LOAD, FN ← ALU
H	H	↓	H	L	INC, FN ← FN
H	H	↓	H	H	INC, FN ← FN+1

VAMX - 74S158

STB	SØ	VAMX
H	X	FN=L
L	L	VIBA
L	H	VA

(VA, VIBA, PC 15:12)

(SLOT 11)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:ØØ (DDPJ)	D	CS	M8227-Ø-1	C
SCALE —	SHEET 9 OF 19	DIST.		

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DAPB RLOG UPDATE H (BE1) → 74SØ4 E8 → DDPK WRITE RLOG L

DDPK WRITE RLOG L → C4 74LS283 E13 RLOG ADR CNTR (B4 B3 B2 B1 / A4 A3 A2 A1 / ΣΦ Σ3 Σ2 Σ1 / CO)

RLOG ADDRESS 74S175 E12 (D2 D3 DØ D1 / R2(1) R2(Ø) R3(1) R3(Ø) RØ(1) RØ(Ø) R1(1) R1(Ø) / CLR CLK)

CO → 74SØ4 E8 → CEHF IRD STATE H (CT2) → 74SØØ E84 → DDPS CPT2 H

DDPD BMX S2 H → 74SØ4 E8 → 74S2Ø E9

DDPD BMX S1 H → 74SØ4 E8 → 74S2Ø E9

DDPD BMX SØ H

74S2Ø E9 → DDPK RLOG DONE L

DDPS RLOG CPT2 L → 74S51 E1Ø

DDPK RLOG DONE L → 74SØ4 E8 → DDPK RLOG DONE H (DDPS)

DDPS CPTØB H
DDPS RLOG CPT2 L
DDPK WRITE RLOG L

DAPL RA ADRSØ H (BM2) → 85S68 E37 RLOG (WE CLK LE OE / D3 D2 D1 DØ / L3 L2 L1 LØ / A3 A2 A1 AØ) → DDPK RLOGØØ H (DDPD)

DAPB ALU B1:Ø SØ H (EE1) → 85S68 E26 RLOG → DDPK RLOGØ8 H (DEPF) (CN1)
DCPK KMX Ø3 H (AP1) → DDPK RLOGØ7 H (DDPD)
DCPK KMX Ø2 H (AK1) → DDPK RLOGØ6 H (DDPD)
DCPK KMX Ø1 H (AJ2) → DDPK RLOGØ5 H (DDPD)

DCPK KMX ØØ H (AJ2) → 85S68 E38 RLOG → DDPK RLOGØ4 H (DDPD)
DAPL RA ADRS3 H (BP2) → DDPK RLOGØ3 H (DDPD)
DAPL RA ADRS2 H (BP1) → DDPK RLOGØ2 H (DDPD)
DAPL RA ADRS1 H (BN1) → DDPK RLOGØ1 H (DDPD)

RLOG ADRS CNTR - 74LS283

CØ	FUNCT
H	INC ADRS, B. PLUS 1.
L	DEC. ADRS, B. MINUS. 1.

RLOG ADRS - 74S175

CLR	CLK	RLOG ADRS
L	X	RN ← L
H	↑	RN = RLOG ADRS CNTR

(RLOG STACK) (SLOT 11)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8 (DDPK)	D	CS	M8227-Ø-1	C

SCALE — SHEET 10 OF 19 DIST.

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EAMX-74S157

STB	SØ	EAMX
H	X	FN=L
L	L	SC
L	H	STATE

BUS EALU A=B H

DDPL EALU COUT Ø3 L (DDPM)

23Ø28B1-ØØ

74S157 E85 EAMX

DDPL STATEØ3 (1) H
DDPR SCØ3 (1) H
DDPL STATEØ2 (1) H
DDPR SCØ2 (1) H
DDPL STATEØ1 (1) H
DDPR SCØ1 (1) H
DDPL STATEØØ (1) H
DDPR SCØØ (1) H
STB SØ

CEHF LOAD STATE H (BH2)
DDPP EALU CIN L

COUTX 74S182 CIN E13Ø GØ PØ

74S181 E129 EALU Ø3:ØØ

DDPN EBMXØ3 H
DDPN EBMXØ2 H
DDPN EBMXØ1 H
DDPN EBMXØØ H
A B COUT4 G P
S3 S2 S1 SØ M CIN

DDPP EALU S3 H
DDPP EALU S2 H
DDPP EALU S1 H
DDPP EALU SØ H
DDPP EALU M H
DDPP EALU CIN L

74S471 E119 NABS (7:4)

DDPM EALUØ7 H
DDPM EALUØ6 H
DDPM EALUØ5 H
DDPM EALUØ4 H
DDPL NABS EALU DØ7 H (DDPM)
DDPL NABS EALU DØ6 H (DDPM)
DDPL NABS EALU DØ5 H (DDPM)
DDPL NABS EALU DØ4 H (DDPM)

74S157 E118 EXP MUX

DDPM SEL NABS L

74SØ4 E12Ø

DDPL EALUØ3 L (DDPS)
DDPL EALUØ2 L (DDPS)
DDPL EALUØ1 L (DDPS)
DDPL EALUØØ L (DDPS)
DDPL EALUØ3 H
DDPL EALUØ2 H
DDPL EALUØ1 H
DDPL EALUØØ H

DDPJ LOAD FE REG H

74S194 E107 FE

DDPL FEØ3 (1) H (DDPN,R)
DDPL FEØ2 (1) H (DDPN,R)
DDPL FEØ1 (1) H (DDPN,R)
DDPL FEØØ (1) H (DDPN,R)
S1 SØ DSR
D3 D2 D1 DØ
R3(1) R2(1) R1(1) RØ(1)
CLR CLK DSL
DDPR +3V B H
DDPS CPTØA H

CEHF LOAD STATE H (BH2)

74S194 E96 STATE

DDPL STATEØ3 (1) H (DDPS)
DDPL STATEØ2 (1) H (DDPS)
DDPL STATEØ1 (1) H (DDPS)
DDPL STATEØØ (1) H (DDPS)

DDPL EXP DØ3 H
DDPL EXP DØ2 H
DDPL EXP DØ1 H
CD2
DDPL EXP DØØ H (DDPR, DCPD)

EALU FUNCT DECODE

FUNCT	M	CIN	S3	S2	S1	SØ
A	H	L	H	H	H	H
A.OR.B	H	L	H	H	H	L
A.AND,NOT.B	H	L	L	H	H	H
B	H	L	H	L	H	L
A.PLUS.B	L	H	H	L	L	H
A.MINUS.B	L	L	L	H	H	L
A.PLUS.1	L	L	L	L	L	L
NAB (A.MINUS.B)	L	L	L	H	H	L

EXP. MUX-74S157

STB	SØ	EXP MUX
H	X	FN=L
L	L	NABS
L	H	EALU

EXPONENT Ø3:ØØ (SLOT 11)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8 (DDPL)	D	CS	M8227-Ø-1	C
SCALE —	SHEET 11 OF 19	DIST.		

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74S157 E38 (EAMX)
DDPM STATE Ø7 (1) H
DDPR SC Ø7 (1) H
DDPM STATE Ø6 (1) H
DDPR SC Ø6 (1) H
DDPM STATE Ø5 (1) H
DDPR SC Ø5 (1) H
DDPM STATE Ø4 (1) H
DDPR SC Ø4 (1) H
STB SØ
CEHF LOAD STATE H (BH2)

74S157 E73
DDPN EALU Ø9 H
DDPR +3V B H
DDPN EALU Ø8 H
STB SØ
DDPM EXP DØ9 H (DDPR)
DDPM EXP DØ8 H (DDPR)
BUS EALU A=B H
DDPM EALU Ø7 COUT L (DDPN)
DDPM SEL NABS L

COUTY 74S182 E130
G1 P1

74S181 E132 (EALU)
A B COUT4 G P
DDPN EBMX Ø7 H
DDPN EBMX Ø6 H
DDPN EBMX Ø5 H
DDPN EBMX Ø4 H
S3 S2 S1 SØ M CIN
DDPP EALU S3 H
DDPP EALU S2 H
DDPP EALU S1 H
DDPP EALU SØ H
DDPP EALU M H
DDPL EALU COUT Ø3 L

DDPL NABS EALU DØ7 H
DDPL NABS EALU DØ6 H
DDPL NABS EALU DØ5 H
DDPL NABS EALU DØ4 H

74S157 E121
STB SØ
DDPM SEL NABS L

74S04 E131
DDPM EALU Ø7 L (DDPS)
DDPM EALU Ø6 L (DDPS)
DDPM EALU Ø5 L (DDPS)
DDPM EALU Ø4 L (DDPS)
DDPM EALU Ø7 H
DDPM EALU Ø6 H
DDPM EALU Ø5 H
DDPM EALU Ø4 H

DDPM EXP DØ7 H (DDPR)
DDPM EXP DØ6 H (DDPR)
DDPM EXP DØ5 H (DDPR)
DDPM EXP DØ4 H (DDPR)

DDPJ LOAD FE REG H
74S194 E110 FE
SI SØ DSR
D3 D2 D1 DØ
R3(1) R2(1) R1(1) RØ(1)
CLR CLK DSL
DDPM FEØ7 (1) H (DDPN,R)
DDPM FEØ6 (1) H (DDPN,R)
DDPM FEØ5 (1) H (DDPN,R)
DDPM FEØ4 (1) H (DDPN,R)
DDPR +3V B H
DDPS CPTØA H

CEHF LOAD STATE H (BH2)
74S194 E99 STATE
SI SØ DSR
D3 D2 D1 DØ
R3(1) R2(1) R1(1) RØ(1)
CLR CLK DSL
DDPM STATEØ7 (1) H (DDPS)
DDPM STATEØ6 (1) H (DDPS)
DDPM STATEØ5 (1) H (DDPS)
DDPM STATEØ4 (1) H (DDPS)
DDPR +3V B H
DDPS CPTØA H

74S00 E84
DDPN EALUØ9 L
DDPP EALU=7 H
DDPM SEL NABS L (DDPL)

(EXPONENT Ø7:Ø4)
(SLOT 11)

REVISIONS
CHK | CHANGE NO. | REV.

TITLE: DATA PATH 15:Ø8 (DDPM)
SIZE D | CODE CS | NUMBER M8227-Ø-1 | REV C
SCALE | SHEET 12 OF 19 | DIST.

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BUS EALU A=B H

74S04 E65 — DDPN EALUØ9 L (DDPS)

74S04 E65 — DDPN EALUØ8 L (DDPS)

BF1 — DDPN EALU Ø9 H (CEHC, S, ICLK, T)

BH1 — DDPN EALU Ø8 H (CEHC, S)

74S157 E75 (EAMX)
- DDPR SCØ9 (1) H
- DDPR SCØ8 (1) H
- (BH2) CEHF LOAD STATE H
- STB SØ

74S181 E77 (EALU Ø9:Ø8)
- DDPR EALU S3 H
- DDPR EALU S2 H
- DDPR EALU S1 H
- DDPR EALU SØ H
- DDPR EALU M H
- DDPR EALUØ7 COUT L

74S153 E34 (EBMX)
- DDPB AMX 14 H
- DCPK KMX Ø7 H
- DDPM FEØ7 (1) H
- DDPB AMX 13 H
- DCPK KMX Ø6 H
- DDPM FEØ6 (1) H
- DDPN EBMXØ7 H (DDPM)
- DDPN EBMXØ6 H (DDPM)
- DDPJ UEBMX1 (1) H
- DDPJ UEBMXØ (1) H

74S153 E31 (EBMX)
- DBPL NORM SV3 H
- DDPA AMX 1Ø H
- DCPK KMX Ø3 H
- DDPL FEØ3 (1) H
- DBPL NORM SV2 H
- DDPA AMX Ø9 H
- DCPK KMX Ø2 H
- DDPL FEØ2 (1) H
- DDPN EBMXØ3 H (DDPL)
- DDPN EBMXØ2 H (DDPL)

74S157 E76 (EBMX)
- DDPN KMX Ø9 H
- DDPN FEØ9 (1) H
- DDPN KMX Ø8 H
- DDPN FEØ8 (1) H
- DDPJ UEBMX1 (1) H
- DDPJ UEBMXØ (1) H

74S194 E74 (FE)
- DDPJ LOAD FE REG H
- DDPM EXP DØ9 H
- DDPM EXP DØ8 H
- DDPR +3V B H
- DDPS CPTØA H
- DDPN FEØ9 (1) H (DDPR)
- DDPN FEØ8 (1) H (DDPR)

74S153 E23 (EBMX)
- DDPB AMX 12 H
- DCPK KMX Ø5 H
- DDPM FEØ5 (1) H
- DBPL NORM SV4 H
- DDPA AMX 11 H
- DCPK KMX Ø4 H
- DDPM FEØ4 (1) H
- DDPN EBMXØ5 H (DDPM)
- DDPN EBMXØ4 H (DDPM)
- DDPJ UEBMX1 (1) H
- DDPJ UEBMXØ (1) H

74S153 E29 (EBMX)
- DBPL NORM SV1 H
- DDPA AMX Ø8 H
- DCPK KMX Ø1 H
- DDPL FEØ1 (1) H
- DBPL NORM SVØ H
- DDPN AMXØ7 H
- DCPK KMX ØØ H
- DDPL FEØØ (1) H
- DDPN EBMXØ1 H (DDPL)
- DDPN EBMXØØ H (DDPL)

74S00 E84
- DCPB AMXØ7 L
- DDPR +3V B H
- DDPN AMXØ7 H

EBMX - 74S153

STBI,Ø	S1	SØ	EBMX
H	X	X	FN = L
L	L	L	FE
L	L	H	KMX
L	H	L	AMX EXP
L	H	H	NORM SV

(EXPONENT 9:8 EBMX)

(SLOT 11)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8 (DDPN)	D	CS	M8227-Ø-1	C
SCALE —	SHEET 13 OF 19	DIST.		

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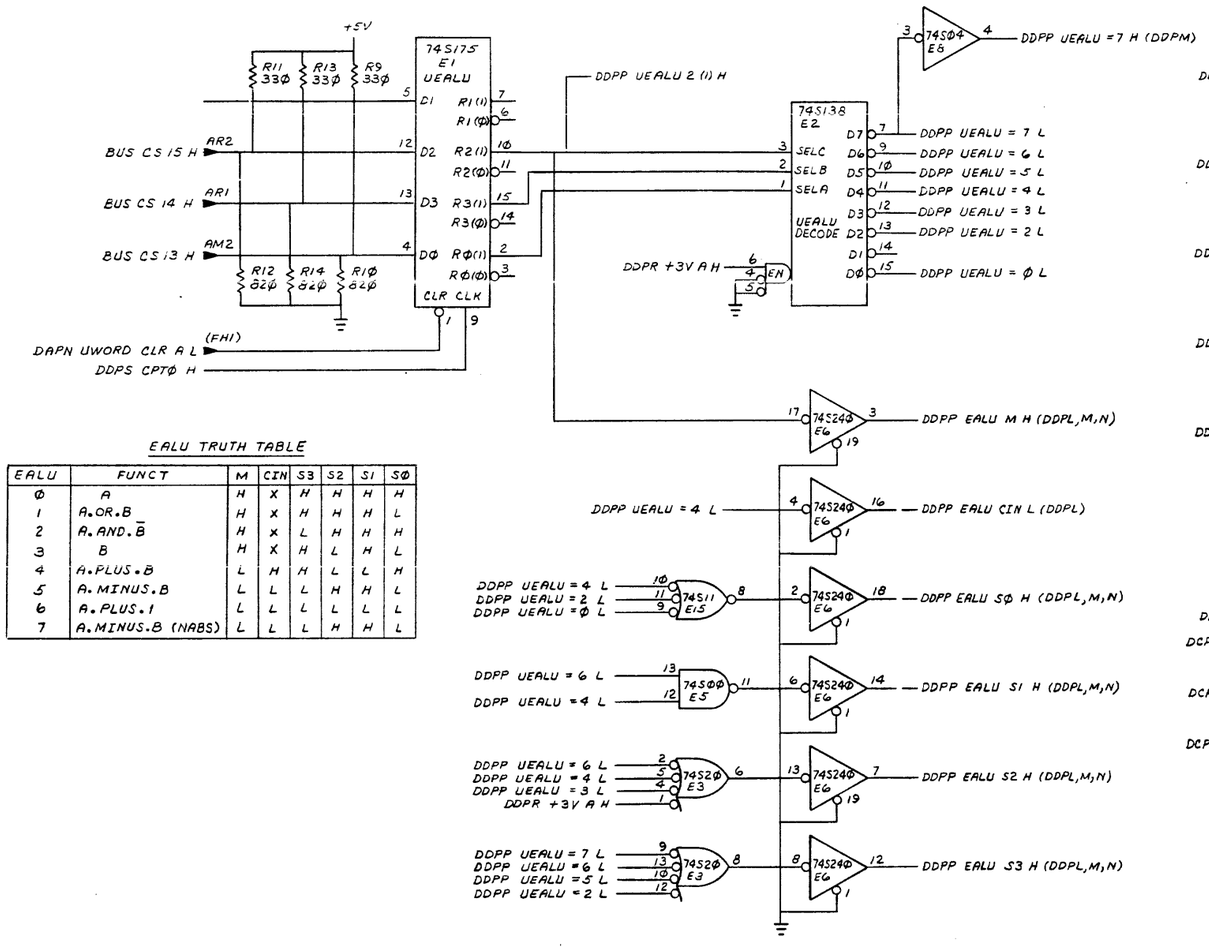
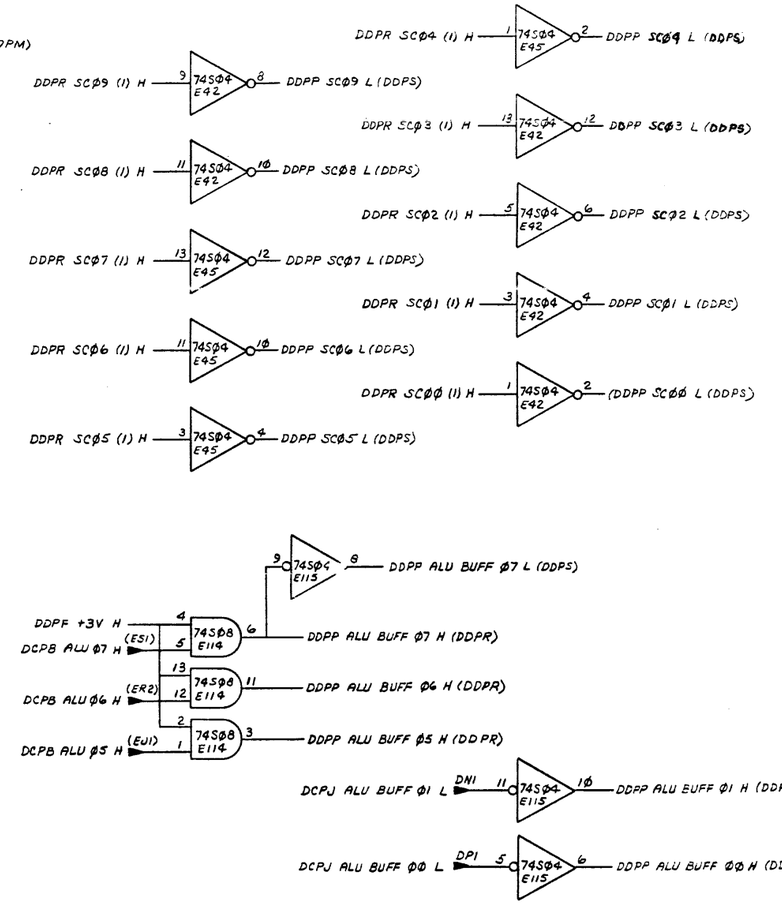


EALU TRUTH TABLE

EALU	FUNCT	M	CIN	S3	S2	S1	SØ
Ø	A	H	X	H	H	H	H
1	A.OR.B	H	X	H	H	H	L
2	A.AND.$\overline{B}$	H	X	L	H	H	H
3	B	H	X	H	L	H	L
4	A.PLUS.B	L	H	H	L	L	H
5	A.MINUS.B	L	L	L	H	H	L
6	A.PLUS.1	L	L	L	L	L	L
7	A.MINUS.B (NABS)	L	L	L	H	H	L



(EALU CONTROL, SC BUFFERS)

(SLOT 11)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:ØØ (DDPP)	D	CS	M8227-Ø-1	C
SCALE —H—	SHEET 14 OF 19	DIST.		

DEC TYPE NO. 120

262

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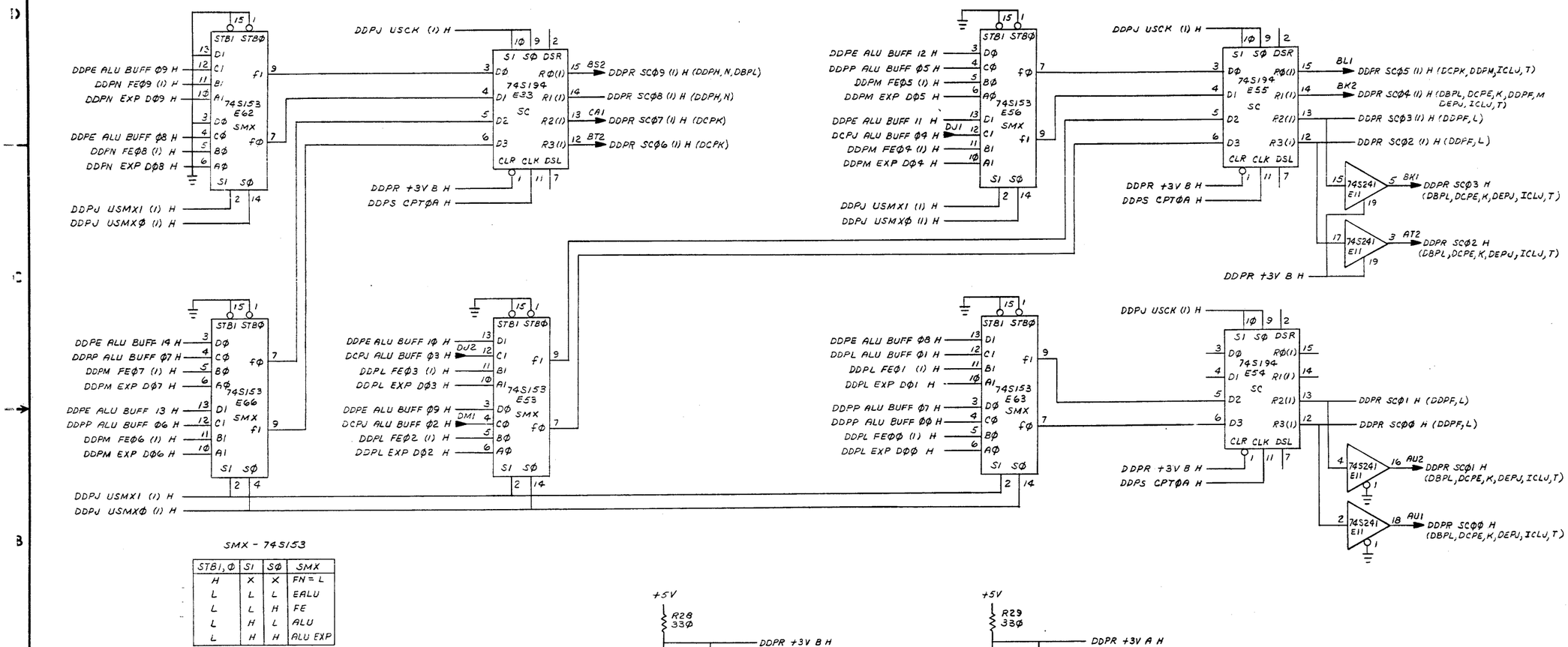

SMX - 74S153

STBI, Ø	SI	SØ	SMX
H	X	X	FN = L
L	L	L	EALU
L	L	H	FE
L	H	L	ALU
L	H	H	ALU EXP

(SMX & SC)

(SLOT 11)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8 (DDPR)	D		M8227-Ø-1	C
SCALE —	SHEET 15 OF 19		DIST.	

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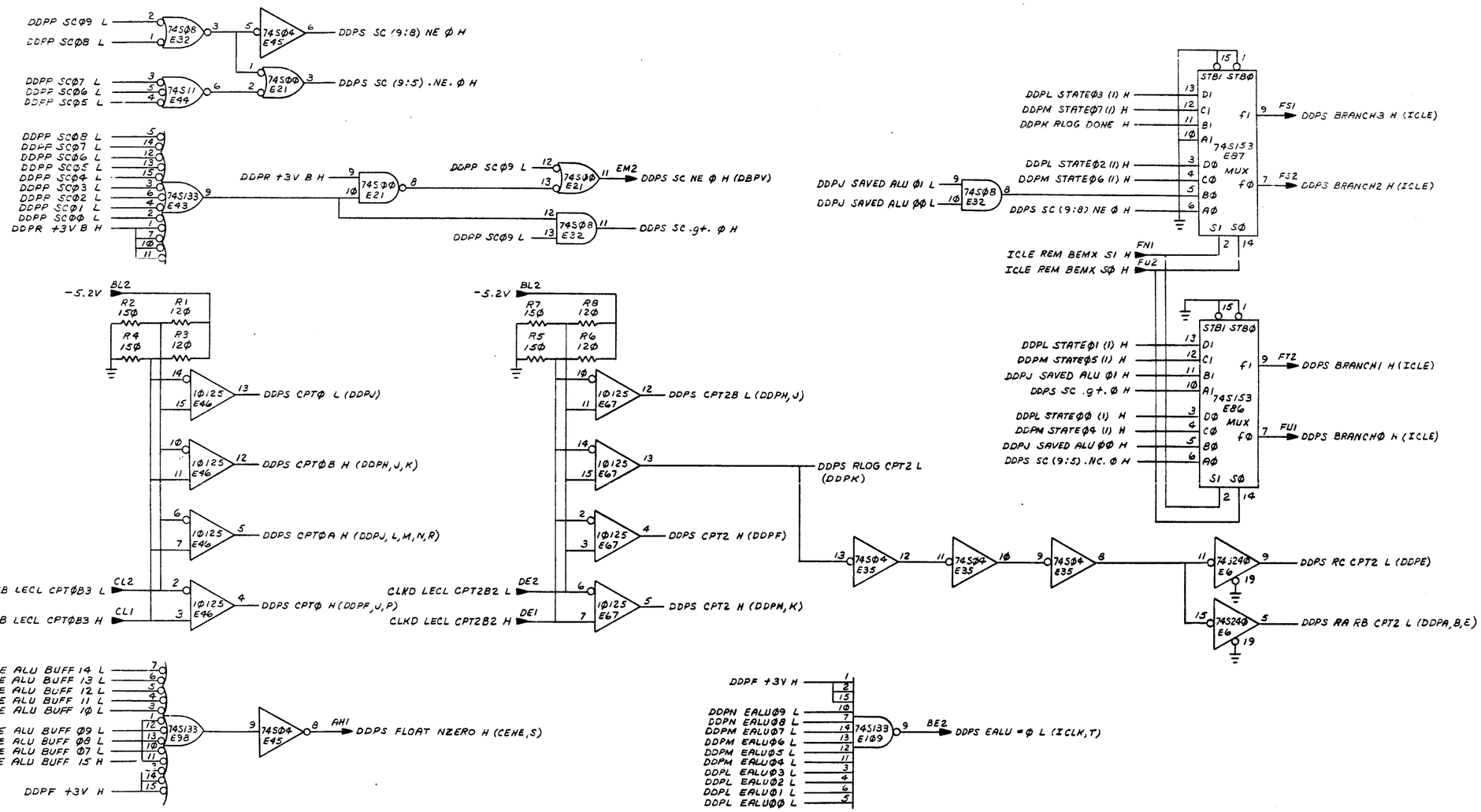

REVISIONS		
CHK	CHANGE NO.	REV.

(UBRANCH & CLOCK TRANSLATORS)

(SLOT 11)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8 (DDPS)	D	CS	M8227-Ø-1	C
SCALE —H—	SHEET 16 OF 19	DIST.		

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SLOW CONSTANT ROM

ROM ADDR	UKMX	SK (15:08) L ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	SLOW CONSTANT
ØØ		L	L	L	L	L	L	L	L	X
Ø1		L	L	L	L	L	L	L	L	X
Ø2		L	L	L	L	L	L	L	L	X
Ø3		L	L	L	L	L	L	L	L	X
Ø4		L	L	L	L	L	L	L	L	X
Ø5		L	L	L	L	L	L	L	L	X
Ø6		L	L	L	L	L	L	L	L	X
Ø7		L	L	L	L	L	L	L	L	X
Ø8		H	H	H	H	H	H	H	H	ØØ- -
Ø9		H	H	H	H	H	H	H	H	ØØ- -
ØA		H	H	H	H	H	H	H	H	ØØ- -
ØB		H	H	H	H	H	H	H	H	ØØ- -
ØC		H	H	H	H	H	H	H	H	ØØ- -
ØD		H	H	H	H	H	H	H	H	ØØ- -
ØE		H	H	L	L	H	H	H	H	3Ø- -
ØF		H	H	H	H	H	H	H	H	ØØ- -
1Ø		H	H	H	H	H	H	H	H	ØØ- -
11		L	H	H	H	H	H	H	H	8Ø- -
12		H	H	H	H	H	H	H	H	ØØ- -
13		L	L	L	L	L	L	L	L	FF- -
14		H	H	H	H	H	H	H	H	ØØ- -
15		H	H	H	H	H	H	H	H	ØØ- -
16		H	H	H	H	H	H	H	H	ØØ- -
17		H	H	H	H	H	H	H	H	ØØ- -
18		H	H	H	H	H	H	H	H	ØØ- -
19		H	H	H	H	H	H	H	H	ØØ- -
1A		L	L	L	L	L	L	L	L	FF- -
1B		L	L	L	L	L	L	L	L	FF- -
1C		L	L	L	L	L	L	L	L	FF- -
1D		H	H	H	H	H	H	H	H	ØØ- -
1E		H	H	H	H	H	H	H	H	ØØ- -
1F		H	H	H	H	H	H	H	H	ØØ- -

ROM ADDR	UKMX	SK (15:08) L ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	SLOW CONSTANT
2Ø		H	H	H	H	H	H	L	L	Ø3- -
21		H	H	H	H	H	H	H	H	ØØ- -
22		H	H	H	H	H	H	H	H	ØØ- -
23		H	H	H	H	H	H	H	H	ØØ- -
24		H	H	H	L	L	L	L	L	1F- -
25		H	H	H	H	H	H	H	H	ØØ- -
26		L	L	L	H	H	H	H	H	E Ø- -
27		H	H	H	H	H	H	H	H	ØØ- -
28		L	L	L	L	L	L	L	L	FF- -
29		H	H	H	H	H	H	H	H	ØØ- -
2A		L	L	L	L	L	L	L	L	SPARE
2B		L	L	H	L	L	L	L	L	DF- -
2C		L	L	L	L	L	L	L	L	FF- -
2D		L	L	L	L	L	L	L	L	FF- -
2E		H	H	H	H	H	H	H	H	ØØ- -
2F		L	L	L	L	L	L	L	L	FF- -
3Ø		L	L	L	L	L	L	L	L	FF- -
31		H	H	H	H	H	H	H	H	ØØ- -
32		H	H	L	L	H	H	H	H	3Ø- -
33		H	H	H	H	H	H	H	H	ØØ- -
34		H	H	H	H	H	H	H	H	ØØ- -
35		H	H	H	H	H	H	H	H	ØØ- -
36		H	H	H	H	H	H	H	H	ØØ- -
37		L	L	L	L	L	L	L	L	FF- -
38		L	L	L	L	L	L	L	L	FF- -
39		H	H	H	H	H	H	H	H	ØØ- -
3A		H	H	H	H	H	H	H	H	ØØ- -
3B		H	H	H	H	H	H	H	H	ØØ- -
3C		L	L	L	L	L	L	L	L	FF- -
3D		H	H	H	H	H	H	H	H	ØØ- -
3E		H	H	H	H	H	H	H	H	ØØ- -
3F		L	L	H	H	L	H	L	L	CB- -

ROM ADDR	UKMX	SK (15:08) L ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	SLOW CONSTANT
4Ø		L	L	L	L	L	L	L	L	NOT USED
41										
42										
43										
44										
45										
46										
47										
48										
49										
4A										
4B										
4C										
4D										
4E										
4F										
5Ø										
51										
52										
53										
54										
55										
56										
57										
58										
59										
5A										
5B										
5C										
5D										
5E										
5F										

ROM ADDR	UKMX	SK (15:08) L ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	SLOW CONSTANT
6Ø		L	L	L	L	L	L	L	L	NOT USED
61										
62										
63										
64										
65										
66										
67										
68										
69										
6A										
6B										
6C										
6D										
6E										
6F										
7Ø										
71										
72										
73										
74										
75										
76										
77										
78										
79										
7A										
7B										
7C										
7D										
7E										
7F										

8Ø TO FF		L	L	L	L	L	L	L	L	NOT USED

REVISIONS

CHK	CHANGE NO.	REV.

(SLOW CONSTANT ROM 15:08 23-029BI-ØØ)(SLOT 11)

TITLE: DATA PATH 15:08 | SIZE D | CODE CS | NUMBER M8227-Ø-1 | REV. C | SCALE | SHEET 17 OF 19 | DIST.

M8227-Ø-1 REV C

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NABS ROM

NABS EALU D(Ø7:ØØ) H

ROM ADDR	EALU	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	DECIMAL VALUE
ØØ		L	L	L	L	L	L	L	L	-0
Ø1		H	H	H	H	H	H	H	H	-1
Ø2		H	H	H	H	H	H	H	L	-2
Ø3		H	H	H	H	H	H	L	H	-3
Ø4		H	H	H	H	H	H	L	L	-4
Ø5		H	H	H	H	H	L	H	H	-5
Ø6		H	H	H	H	H	L	H	L	-6
Ø7		H	H	H	H	H	L	L	H	-7
Ø8		H	H	H	H	H	L	L	L	-8
Ø9		H	H	H	H	L	H	H	H	-9
ØA		H	H	H	H	L	H	H	L	-1Ø
ØB		H	H	H	H	L	H	L	H	-11
ØC		H	H	H	H	L	H	L	L	-12
ØD		H	H	H	H	L	L	H	H	-13
ØE		H	H	H	H	L	L	H	L	-14
ØF		H	H	H	H	L	L	L	H	-15
1Ø		H	H	H	H	L	L	L	L	-16
11		H	H	H	L	H	H	H	H	-17
12		H	H	H	L	H	H	H	L	-18
13		H	H	H	L	H	H	L	H	-19
14		H	H	H	L	H	H	L	L	-2Ø
15		H	H	H	L	H	L	H	H	-21
16		H	H	H	L	H	L	H	L	-22
17		H	H	H	L	H	L	L	H	-23
18		H	H	H	L	H	L	L	L	-24
19		H	H	H	L	L	H	H	H	-25
1A		H	H	H	L	L	H	H	L	-26
1B		H	H	H	L	L	H	L	H	-27
1C		H	H	H	L	L	H	L	L	-28
1D		H	H	H	L	L	L	H	H	-29
1E		H	H	H	L	L	L	H	L	-3Ø
1F		H	H	H	L	L	L	L	H	-31

NABS EALU D(Ø7:ØØ) H

ROM ADDR	EALU	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	DECIMAL VALUE
2Ø		H	H	H	L	L	L	L	L	-32
21		H	H	L	H	H	H	H	H	-33
22		H	H	L	H	H	H	H	L	-34
23		H	H	L	H	H	H	L	H	-35
24		H	H	L	H	H	H	L	L	-36
25		H	H	L	H	H	L	H	H	-37
26		H	H	L	H	H	L	H	L	-38
27		H	H	L	H	H	L	L	H	-39
28		H	H	L	H	H	L	L	L	-4Ø
29		H	H	L	H	L	H	H	H	-41
2A		H	H	L	H	L	H	H	L	-42
2B		H	H	L	H	L	H	L	H	-43
2C		H	H	L	H	L	H	L	L	-44
2D		H	H	L	H	L	L	H	H	-45
2E		H	H	L	H	L	L	H	L	-46
2F		H	H	L	H	L	L	L	H	-47
3Ø		H	H	L	H	L	L	L	L	-48
31		H	H	L	L	H	H	H	H	-49
32		H	H	L	L	H	H	H	L	-5Ø
33		H	H	L	L	H	H	L	H	-51
34		H	H	L	L	H	H	L	L	-52
35		H	H	L	L	H	L	H	H	-53
36		H	H	L	L	H	L	H	L	-54
37		H	H	L	L	H	L	L	H	-55
38		H	H	L	L	H	L	L	L	-56
39		H	H	L	L	L	H	H	H	-57
3A		H	H	L	L	L	H	H	L	-58
3B		H	H	L	L	L	H	L	H	-59
3C		H	H	L	L	L	H	L	L	-6Ø
3D		H	H	L	L	L	L	H	H	-61
3E		H	H	L	L	L	L	H	L	-62
3F		H	H	L	L	L	L	L	H	-63

NABS EALU D(Ø7:ØØ) H

ROM ADDR	EALU	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	DECIMAL VALUE
4Ø		H	H	L	L	L	L	L	L	-64
41		H	L	H	H	H	H	H	H	-65
42		H	L	H	H	H	H	H	L	-66
43		H	L	H	H	H	H	L	H	-67
44		H	L	H	H	H	H	L	L	-68
45		H	L	H	H	H	L	H	H	-69
46		H	L	H	H	H	L	H	L	-7Ø
47		H	L	H	H	H	L	L	H	-71
48		H	L	H	H	H	L	L	L	-72
49		H	L	H	H	L	H	H	H	-73
4A		H	L	H	H	L	H	H	L	-74
4B		H	L	H	H	L	H	L	H	-75
4C		H	L	H	H	L	H	L	L	-76
4D		H	L	H	H	L	L	H	H	-77
4E		H	L	H	H	L	L	H	L	-78
4F		H	L	H	H	L	L	L	H	-79
5Ø		H	L	H	H	L	L	L	L	-8Ø
51		H	L	H	L	H	H	H	H	-81
52		H	L	H	L	H	H	H	L	-82
53		H	L	H	L	H	H	L	H	-83
54		H	L	H	L	H	H	L	L	-84
55		H	L	H	L	H	L	H	H	-85
56		H	L	H	L	H	L	H	L	-86
57		H	L	H	L	H	L	L	H	-87
58		H	L	H	L	H	L	L	L	-88
59		H	L	H	L	L	H	H	H	-89
5A		H	L	H	L	L	H	H	L	-9Ø
5B		H	L	H	L	L	H	L	H	-91
5C		H	L	H	L	L	H	L	L	-92
5D		H	L	H	L	L	L	H	H	-93
5E		H	L	H	L	L	L	H	L	-94
5F		H	L	H	L	L	L	L	H	-95

NABS EALU D(Ø7:ØØ) H

ROM ADDR	EALU	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	DECIMAL VALUE
6Ø		H	L	H	L	L	L	L	L	-96
61		H	L	L	H	H	H	H	H	-97
62		H	L	L	H	H	H	H	L	-98
63		H	L	L	H	H	H	L	H	-99
64		H	L	L	H	H	H	L	L	-1ØØ
65		H	L	L	H	H	L	H	H	-1Ø1
66		H	L	L	H	H	L	H	L	-1Ø2
67		H	L	L	H	H	L	L	H	-1Ø3
68		H	L	L	H	H	L	L	L	-1Ø4
69		H	L	L	H	L	H	H	H	-1Ø5
6A		H	L	L	H	L	H	H	L	-1Ø6
6B		H	L	L	H	L	H	L	H	-1Ø7
6C		H	L	L	H	L	H	L	L	-1Ø8
6D		H	L	L	H	L	L	H	H	-1Ø9
6E		H	L	L	H	L	L	H	L	-11Ø
6F		H	L	L	H	L	L	L	H	-111
7Ø		H	L	L	H	L	L	L	L	-112
71		H	L	L	L	H	H	H	H	-113
72		H	L	L	L	H	H	H	L	-114
73		H	L	L	L	H	H	L	H	-115
74		H	L	L	L	H	H	L	L	-116
75		H	L	L	L	H	L	H	H	-117
76		H	L	L	L	H	L	H	L	-118
77		H	L	L	L	H	L	L	H	-119
78		H	L	L	L	H	L	L	L	-12Ø
79		H	L	L	L	L	H	H	H	-121
7A		H	L	L	L	L	H	H	L	-122
7B		H	L	L	L	L	H	L	H	-123
7C		H	L	L	L	L	H	L	L	-124
7D		H	L	L	L	L	L	H	H	-125
7E		H	L	L	L	L	L	H	L	-126
7F		H	L	L	L	L	L	L	H	-127

REVISIONS		
CHK	CHANGE NO.	REV.

(EALU NABS ROM 23-Ø2881-ØØ) (SLOT 11)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8	D	CS	M8227-Ø-1	C
SCALE	SHEET 18 OF 19	DIST.		

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NAB S ROM

NABS EALU D(Ø7:ØØ) H

ROM ADDR	EALU	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	DECIMAL VALUE
8Ø		H	L	L	L	L	L	L	L	-128
81		L	H	H	H	H	H	H	H	-129
82		L	H	H	H	H	H	H	L	-13Ø
83		L	H	H	H	H	H	L	H	-131
84		L	H	H	H	H	H	L	L	-132
85		L	H	H	H	H	L	H	H	-133
86		L	H	H	H	H	L	H	L	-134
87		L	H	H	H	H	L	L	H	-135
88		L	H	H	H	H	L	L	L	-136
89		L	H	H	H	L	H	H	H	-137
8A		L	H	H	H	L	H	H	L	-138
8B		L	H	H	H	L	H	L	H	-139
8C		L	H	H	H	L	H	L	L	-14Ø
8D		L	H	H	H	L	L	H	H	-141
8E		L	H	H	H	L	L	H	L	-142
8F		L	H	H	H	L	L	L	H	-143
9Ø		L	H	H	H	L	L	L	L	-144
91		L	H	H	L	H	H	H	H	-145
92		L	H	H	L	H	H	H	L	-146
93		L	H	H	L	H	H	L	H	-147
94		L	H	H	L	H	H	L	L	-148
95		L	H	H	L	H	L	H	H	-149
96		L	H	H	L	H	L	H	L	-15Ø
97		L	H	H	L	H	L	L	H	-151
98		L	H	H	L	H	L	L	L	-152
99		L	H	H	L	L	H	H	H	-153
9A		L	H	H	L	L	H	H	L	-154
9B		L	H	H	L	L	H	L	H	-155
9C		L	H	H	L	L	H	L	L	-156
9D		L	H	H	L	L	L	H	H	-157
9E		L	H	H	L	L	L	H	L	-158
9F		L	H	H	L	L	L	L	H	-159

NABS EALU D(Ø7:ØØ) H

ROM ADDR	EALU	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	DECIMAL VALUE
AØ		L	H	H	L	L	L	L	L	-16Ø
A1		L	H	L	H	H	H	H	H	-161
A2		L	H	L	H	H	H	H	L	-162
A3		L	H	L	H	H	H	L	H	-163
A4		L	H	L	H	H	H	L	L	-164
A5		L	H	L	H	H	L	H	H	-165
A6		L	H	L	H	H	L	H	L	-166
A7		L	H	L	H	H	L	L	H	-167
A8		L	H	L	H	H	L	L	L	-168
A9		L	H	L	H	L	H	H	H	-169
AA		L	H	L	H	L	H	H	L	-17Ø
AB		L	H	L	H	L	H	L	H	-171
AC		L	H	L	H	L	H	L	L	-172
AD		L	H	L	H	L	L	H	H	-173
AE		L	H	L	H	L	L	H	L	-174
AF		L	H	L	H	L	L	L	H	-175
BØ		L	H	L	H	L	L	L	L	-176
B1		L	H	L	L	H	H	H	H	-177
B2		L	H	L	L	H	H	H	L	-178
B3		L	H	L	L	H	H	L	H	-179
B4		L	H	L	L	H	H	L	L	-18Ø
B5		L	H	L	L	H	L	H	H	-181
B6		L	H	L	L	H	L	H	L	-182
B7		L	H	L	L	H	L	L	H	-183
B8		L	H	L	L	H	L	L	L	-184
B9		L	H	L	L	L	H	H	H	-185
BA		L	H	L	L	L	H	H	L	-186
BB		L	H	L	L	L	H	L	H	-187
BC		L	H	L	L	L	H	L	L	-188
BD		L	H	L	L	L	L	H	H	-189
BE		L	H	L	L	L	L	H	L	-19Ø
BF		L	H	L	L	L	L	L	H	-191

NABS EALU D(Ø7:ØØ) H

ROM ADDR	EALU	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	DECIMAL VALUE
CØ		L	H	L	L	L	L	L	L	-192
C1		L	L	H	H	H	H	H	H	-193
C2		L	L	H	H	H	H	H	L	-194
C3		L	L	H	H	H	H	L	H	-195
C4		L	L	H	H	H	H	L	L	-196
C5		L	L	H	H	H	L	H	H	-197
C6		L	L	H	H	H	L	H	L	-198
C7		L	L	H	H	H	L	L	H	-199
C8		L	L	H	H	H	L	L	L	-2ØØ
C9		L	L	H	H	L	H	H	H	-2Ø1
CA		L	L	H	H	L	H	H	L	-2Ø2
CB		L	L	H	H	L	H	L	H	-2Ø3
CC		L	L	H	H	L	H	L	L	-2Ø4
CD		L	L	H	H	L	L	H	H	-2Ø5
CE		L	L	H	H	L	L	H	L	-2Ø6
CF		L	L	H	H	L	L	L	H	-2Ø7
DØ		L	L	H	H	L	L	L	L	-2Ø8
D1		L	L	H	L	H	H	H	H	-2Ø9
D2		L	L	H	L	H	H	H	L	-21Ø
D3		L	L	H	L	H	H	L	H	-211
D4		L	L	H	L	H	H	L	L	-212
D5		L	L	H	L	H	L	H	H	-213
D6		L	L	H	L	H	L	H	L	-214
D7		L	L	H	L	H	L	L	H	-215
D8		L	L	H	L	H	L	L	L	-216
D9		L	L	H	L	L	H	H	H	-217
DA		L	L	H	L	L	H	H	L	-218
DB		L	L	H	L	L	H	L	H	-219
DC		L	L	H	L	L	H	L	L	-22Ø
DD		L	L	H	L	L	L	H	H	-221
DE		L	L	H	L	L	L	H	L	-222
DF		L	L	H	L	L	L	L	H	-223

NABS EALU D(Ø7:ØØ) H

ROM ADDR	EALU	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	DECIMAL VALUE
EØ		L	L	H	L	L	L	L	L	-224
E1		L	L	L	H	H	H	H	H	-225
E2		L	L	L	H	H	H	H	L	-226
E3		L	L	L	H	H	H	L	H	-227
E4		L	L	L	H	H	H	L	L	-228
E5		L	L	L	H	H	L	H	H	-229
E6		L	L	L	H	H	L	H	L	-23Ø
E7		L	L	L	H	H	L	L	H	-231
E8		L	L	L	H	H	L	L	L	-232
E9		L	L	L	H	L	H	H	H	-233
EA		L	L	L	H	L	H	H	L	-234
EB		L	L	L	H	L	H	L	H	-235
EC		L	L	L	H	L	H	L	L	-236
ED		L	L	L	H	L	L	H	H	-237
EE		L	L	L	H	L	L	H	L	-238
EF		L	L	L	H	L	L	L	H	-239
FØ		L	L	L	H	L	L	L	L	-24Ø
F1		L	L	L	L	H	H	H	H	-241
F2		L	L	L	L	H	H	H	L	-242
F3		L	L	L	L	H	H	L	H	-243
F4		L	L	L	L	H	H	L	L	-244
F5		L	L	L	L	H	L	H	H	-245
F6		L	L	L	L	H	L	H	L	-246
F7		L	L	L	L	H	L	L	H	-247
F8		L	L	L	L	H	L	L	L	-248
F9		L	L	L	L	L	H	H	H	-249
FA		L	L	L	L	L	H	H	L	-25Ø
FB		L	L	L	L	L	H	L	H	-251
FC		L	L	L	L	L	H	L	L	-252
FD		L	L	L	L	L	L	H	H	-253
FE		L	L	L	L	L	L	H	L	-254
FF		L	L	L	L	L	L	L	H	-255

REVISIONS		
CHK	CHANGE NO.	REV.

(EALU NABS ROM 23-Ø28BI-ØØ) (SLOT 11)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 15:Ø8	D	CS	M8227-Ø-1	C
SCALE	SHEET 19 OF 19	DIST.		

COMPONENT SIDE VIEW

T-2

THI

12.000 F. B. S.

E102 E101 E100 E99 E98 E97 E96 E95 E94 E93 E92

E91 E90 E89 E88 E87 E86 E85 E84 E83

E82 E81 E80 E79 E78 E77 E76 E75 E74 E73 E72

E71 E70 E69 E68 E67 E66 E65 E64 E63 E62

E61 E60 E59 E58 E57 E56 E55

E54 E53 E52 E51 E50 E49 E48 E47

E46 E45 E44 E43 E42 E41 E40 E39

E38 E37 E36 E35 E34 E33 E32 E31 E30 E29

E28 E27 E26 E25 E24 E23 E22 E21 E20

E19 E18 E17 E16 E15 E14 E13 E12 E11 E10

E9 E8 E7 E6 E5 E4 E3 E2 E1

C62 C63 C64 C65 C66 C67

F E D C B A

V U T S R P N M L K J H F E D C B A

SIGNATURES	DATE
DRAWN J.PIKOWSKI	3-20
CHK. D.	3-20
ENG.	4-21-78
PROJ. ENG.	4-21-78
PROD. CTL.	5-2-78

digital

TITLE: CPU DATA PATH C

SIZE/CODE: E UA

NUMBER: M8228-0-0

REV: C

SCALE 2 IN 1 | SHT 1 OF 3 | NEXT HIGHER ASSY: B.00-M8228.0

ETCH REV. C

P.C. DESIGN DATA BASE REV. C-P2

CHANGE NO REV

M8228-0000 C

NOTES:

1. R31-R34 ARE SPARE RESISTORS

E UA M8228-C-0 C

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LAYER 1

L1 M8228 5012600C-P2

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CPU DATA PATH C	E	UA	M8228-0#	C
SCALE 2 – 1	SHEET 2 OF 3	DIST.		

M8228Ø0 REV C

LAYER 04

L4

CPU DATA PATH C

M8228 5012600C-P2 SIDE 2

REVISIONS		
CHR.	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CPU DATA PATH C	E	UA	M8228-0-0	C
SCALE 2 – 1	SHEET 3 OF 3		DICT.	

M8228 ØØ REV C

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AUTOMATED BY PRTLST 2D(11) P A R T S L I S T SHEET 1 OF 2

LINE	ITEM	DOCUMENT NO.	PART NO.		DESCRIPTION		QTY	REFERENCE DESIGNATORS
1	1	E-MD-5012600-0-0	5012600-00	M8228			1	
2	2		1910534-00	74S04	INVERTER GATE-HEX 1IN		6	E22,E31,E54,E99,E100,E101
3	3		1912389-00	74S08	AND GATE-QUAD 2IN,POS	14	1	E53
4	4		1910536-00	74S10	NAND GATE-TRIPLE 3IN		1	E33
5	5		1910537-00	74S11	AND GATE-TRIPLE 3INPUT		2	E49,E94
6	6		1910542-00	74S64	A-O-I XPDR GATE,4-2-3-2	14	5	E1,E41,E42,E48,E50
7	7		1910545-00	74S112	FF-JK DUAL,EDGE TRIGGER		2	E12,E23
8	8		1911983-00	74S133	NAND GATE-POSITIVE 13IN		1	E102
9	9		1911675-00	74S138	DECODER-THREE INPUT		1	E24
10	10		1910956-00	74S151	MUX 1 OF 8		8	E16,E17,E26,E27,E36,E37,E45,
							CONT	E46
11	11		1910547-00	74S153	MUX 1 OF 4 (DUAL)		10	E9,E18,E57,E61,E66,E71,E88,
							CONT	E90,E91,E98
12	12		1910548-00	74S157	MUX 1 OF 2 (QUAD)		7	E8,E70,E73,E80,E81,E84,E89
13	13		1910549-00	74S158	MUX 1 OF 2 (QUAD)		2	E2,E10
14	14		1910957-00	74S175	FF-D QUAD COMMON CLOCK		3	E20,E47,E55
15	15		1910531-00	DEC 74S181	ALU-4BIT		3	E19,E65,E95
16	16		1912097-00	SN 74S182	LOOK AHD CARRY GEN		2	E64,E85
17	17		1910552-00	74S194	SHIFT REG.,4BIT RIGHT/LEFT		4	E28,E38,E69,E82
18	18		1913462-00	74S240	OCTAL BUFFER,INVERTING TRI-STA		1	E21
19	19		1913493-00	74S241	OCTAL BUFFER,TRI-STATE		1	E60
20	20		1911641-00	SN 74S257	MUX,QUAD 2 TO 1		4	E56,E62,E77,E86
21	21		1911415-00	10125	ECL TO TTL TRNSLTR ECL	16 P	2	E39,E40
22	22		1913788-00	26S10	TRANSCEIVER,BUS,QUAD		2	E29,E30
23	23		1913294-00	93S16	COUNTER,SYNCH UP BINARY		8	E7,E63,E72,E75,E83,E92,E93,E51
24	24	BLANK					0	
25	25		1912586-00	85S68	REGISTER,64BIT EDGE TRIG,TRIST		6	E4,E5,E13,E14,E34,E43
26	26		1912693-00	25S10	SHIFTER,4BIT TRI-STATE		2	E76,E96
27	27		2303081-00	B1-01			1	E11
28	28		1300247-00	120	1/4W 5% CC (13-00		4	R25,R26,R29,R30

REVISION HISTORY			VARIATIONS FOR THIS ASSY.
CHK	ECO NO	REV	
PG	00002	C	00

FIRST USED ON:

MADE BY: F.SMART DATE: 20-APR-78

CHECKED: F.SMART DATE: 20-APR-78

DSN.ENG.: E.ANTON DATE: 20-APR-78

PROD.: M.TERELLO DATE: 20-APR-78

RESP.ENG.: E.ANTON DATE: 20-APR-78

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE
PARTS LIST
DATA PATH

SIZE	CODE	DOCUMENT NUMBER	REV
K	PL	M8228-0-DBP	C

ASSY.NO.: E-UA-M8228-0-0 EDIT# 2

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LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
29	29		1300250-00	150 1/4W 5% CC (13-00	4	R23,R24,R27,R28
30	30		1300295-00	330 1/4W 5% CC (13-00	11	R1,R3,R5,R7,R9,R11,R13,R15,
					CONT	R17,R19,R21
31	31		1301424-00	680 1/4W 5% CC (13-00	1	R2
32	32		1301775-00	820 1/4W 5% CC (13-00	10	R4,R6,R8,R10,R12,R14,R16,R18,
					CONT	R20,R22
33	33		1012084-01	8 MFD 25V G% 30D AL EL (10-12	7	C62-C68
34	34		1012784-00	.047 MFD 50V X% CER. $	63	C1,C2-C61,C69,C70
35	35		1910532-00	74S00 NAND GATE-QUAD 2IN	3	E3,E74,E79
36	36		1210711-02	HANDLE ASSY,MOD DOEHLER-JARVIS	1	
37	37		9000024-01	EYELET, ROLLED FLANGE, .121 OD X .196 LG	12	

38 NOTE: E6,E15,E25,E44,E52,E58,E59,E67,E78,E87,E97,E68,E35,E32 ARE SPARE I.C. S

	TITLE	SIZE	CODE	DOCUMENT NUMBER	REV
DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	PARTS LIST DATA PATH	K	PL	M8228-0-DBP	C

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BUS 34:32 H
BUS CS 25 H
IDPJ FLUSH L
UPCR 74S175 DCPH
UVAK
PC & VA CONTROL
DCPH,J
DCPJ PCMX S0 H
DCPJ LOAD PC 31:04 L
DCPJ LOAD VA L
DCPJ FLUSH L (TO DDP & DEP)

VA 93S16 DCPH, J, L
LD
DCPJ LOAD VA L
VA 08:00 (TO TBUF, CACHE ICL L)
PCMX 74S157 DCPH, J
PC 93S16 DCPJ
PC07:00 (TO BMX, PCSV, PCMX)
VIBA 93S16 DCPH, J
LD
DCPJ FLUSH L
PC 03:00
PC ADDER 74S181 DCPJ
#1 #2 #4
VMX 74S153 DCPJ
IDPM DELTA PC 2:0
PCMX 74S157 DCPH
74S64 DCPJ
74S133 DCPE
ALU 07:00 = 0
DBPD ALU 31:16 GEP
DDPB ALU 15:08 GEP
ALU CARRY LOOK AHEAD 74S182 DCPL
ALU CARRY 31
ALU CARRY 15
ALU CARRY 7

SHIFT MUX DCPA,B
DAPE SHFRT L
DAPE SHFSI:0 H
SHF RIGHT 74S257
SHF LEFT 25S10
DFMX 74S257 DCPC
DAPK ENABLE DFMX
DBPA DFMX S0
BUS DFMX 07:00 (TO DBP & FPA)
DBPE DREG 07:00

DECIMAL CONSTANT (ALU CARRY)
QMX 74S153 DCPC
DAPP QMX S1:0 H
DAPP CLR Q H
QREG 74S194 DCPF
DAPH Q SHIFT INPUT H
DDPF QREG 08 H
DAPP QREG S1:0
AMX 74S157 DCPA,B
AMX 74S157 DCPF
ID XCEIVE 26S10 DCPC EN
ID BUS
ICLJ D TO ID
DCPF QREG 07:00 (TO DBP, DDP)

DDPR SC 04:00
DAPB ALU CIN
DAPA,B ALU S3:0 M
ALU 74S181, 74S182 GEP
DCPA,B,L
BIT MASK 79S138 DCPE
DAPD BMX S2:0
DAPC AMX S1:0
BMX 74S151 DCPD
BMX 74S153 DCPA,B
DREG 30:29, EXP 00
PC 07:00
KMX 07:00 (TO DDP)
DCPE UKMX 05:00
23-03681-00 (TO DDP)
UKMX 74S153 DCPK
SK ROM DCPK
BUS 68:58
KMX 74S158 DCPK
#8 #1 #2 #3 #4
IRCE SP2 CON
IRCE SP1 CON
DDPA SC 07:00
FK 74S64 DCPK
CEWF IRD STATE
PCSV 74S194 DCPE
AC ADRS
LC AC 85S68 DCPE
RB ADRS
LB RB 85S68 DCPE
RA ADRS
LA RA 85S68 DCPA,B
PC 07:00
DAPH URMX
74S04 DCPA

(BLOCK DIAGRAM) (SLOT 12)

REVISIONS	CHK	CHANGE NO.	REV.
		M8228-00001	B
		M8228-00002	C

DRN.		3-25-77
CHK'D		4-7-77
ENG.	E. ANTON	5-17-77
PROJ. ENG.	E. ANTON	
PROD.		6/1/77
NEXT HIGHER ASSY.		
SCALE		
SHEET	1 OF 12	

FIRST USED ON: d-u-b-u

TITLE: DATA PATH 07:00 (DCP)

SIZE	CODE	NUMBER	REV.
D	CS	M8228-0-1	C

DIST.

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RAMX - 74S157

S0	RAMX
L	Q REG
H	Q REG

AMX - 74S153

STB	S1	S0	FN
L	L	L	LA
L	L	H	RAMX
H	X	X	FN=L

DAPC ≠EXT B0 H FJ1

(03:00)

DCPF QREG 03 H
DBPE DREG 03 H EL2
DCPF QREG 02 H
DBPE DREG 02 H EL1
DCPF QREG 01 H
DBPE DREG 01 H EL2
DCPF QREG 00 H
DBPE DREG 00 H EM1

74S157 E88 RAMX

DCPR RAMXS0 H

DCPF LATCH LA (1) H
DCPL RA RB CPT2 L
DAPE RA RB WRT B0 L BR1

85S68 E43 RR(03:00)

DCPA SHF03 H
DCPA SHF02 H
DCPA SHF01 H
DCPA SHF00 H

DCPA LA01 H (USCM,S) EF2
DCPA LA00 H (USCM,S) EF1

DAPL RA ADAS 3 H BP2
DAPL RA ADAS 2 H BP1
DAPL RA ADAS 1 H BN1
DAPL RA ADAS 0 H BM2

DAPC AMX ≠0 S0 H FE2

74S153 E57 AMX
74S153 E66 AMX

DCPD BMX03 H
DCPD BMX02 H
DCPD BMX01 H
DCPD BMX00 H

74S181 E65 DP ALU(03:00)

DAPA ALUBI:0 S3 H EF2
DAPA ALUBI:0 S2 H EF1
DAPB ALUBI:0 S1 H EE2
DAPB ALUBI:0 S0 H EE1
DAPB ALU MODE H EF1
DAPB ALU CIN L EE2

74S04 E99 FO1 DCPA AMX00 L (CEHB,S)

BS1 BUS ALU BYTE0 A=B H (CENA,S)
DCPA ALU COUT (03:00) L (DCPC)
DCPA ALU (03:00) G H (DCPL)
DCPA ALU (03:00) P H (DCPL)

DCPB ALU 05 H
DCPB ALU 00 H

74S257 E77 SHF RT MUX

DCPA ALU 03 H (DCPB,M,J)
DCPA ALU 02 H (DCPB,J)
DCPA ALU 01 H (DCPB,J)
DCPA ALU 00 H (DCPB,J)

FN1 DCPA SHF03 H (DCPE,DEPM)
FM1 DCPA SHF02 H (DCPE,DEPM)
FL2 DCPA SHF01 H (DCPE,DEPM)
FL1 DCPA SHF00 H (DCPE,DEPL)

SHF RT MUX - 74S257

OE	S0	FN
H	X	HI-Z
L	L	AN, SHF [A1]
L	H	BM, SHF [A2]

DAPE SHF RT L FK1
74S04 E97
74S00 E79
74S00 E79
DCPA SHF RT EN L (DCPA)
DCPL CPT0 L
DCPA SHF LFT EN L (DCPB)

DAPH SHF USI INPUT H CT2

25S10 E76 SHF LFT MUX

DAPE SHF LFT SI H FK2

SHF LFT MUX - 25S10

OE	SI	S0	YN
H	X	X	HI-Z
L	L	L	I3-I0, NO SHIFT
L	L	H	I2-I1, SHF [1]
L	H	L	I1-I2, SHF [2]
L	H	H	I0-I3, SHF [3]

DAPH URMX (1) H CU1
74S04 E99
74S08 E53
DCPH +3V H
DCPA RBMX S0 H (DCPF)
DCPA RAMX S0 H (DCPA,B)

DAPE SHF S0 H FK2
74S241 E68
DCPA SHF S0 H (DCPB)

RA - 85S68

CE	WE	CLK	RA FUNCT
H	H	X	NO-OPERATION
L	L	⊓	STORE, RN ← SHF
L	H	X	LATCH, LA ← (RN)

+5V AA2 AV1 BA2 BV1 CA2 CV1 DA2 DV1 EA2 EV1 FA2 FV1
C62-C67 8uF
C2-C61 .047uF
+5
GND
GND
AC2 AN2 AT1 BC2 BN2 BT1 CC2 CN2 CT1 DC2 DN2 DT1 EC2 EN2 ET1 FC2 FN2 FT1
C68 8uF
C69,C70 .047uF
-5.2V BL2
-5.2V

REVISIONS

CHK	CHANGE NO.	REV.

(RA, RAMX, AMX, ALU, SHF 03:00) (SLOT 12)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 07:00 (DCPA)	D	CS	M8228-0-1	C
SCALE	SHEET 2 OF 12	DIST.		

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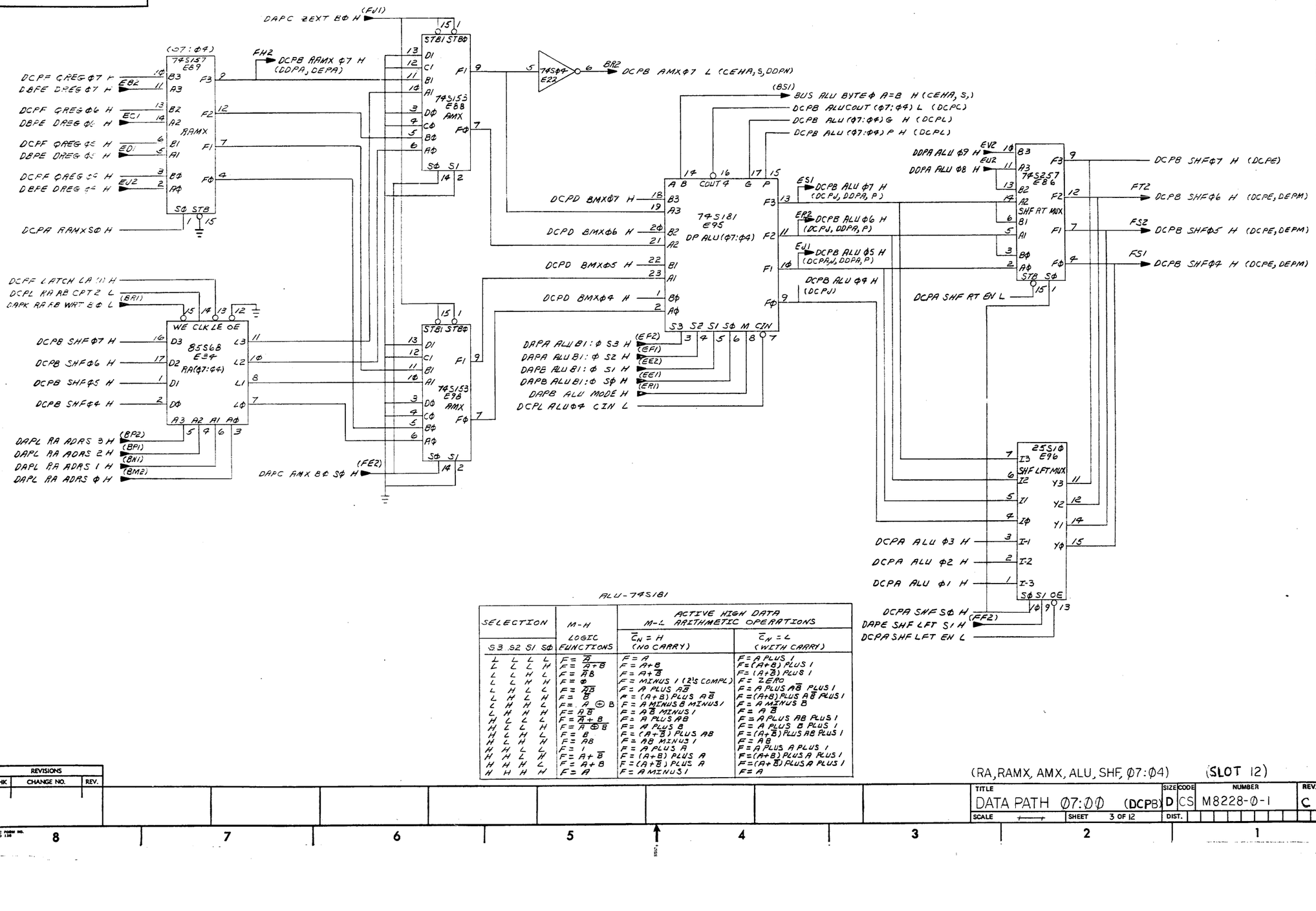

ALU-74S181

SELECTION S3 S2 S1 S0	M-H LOGIC FUNCTIONS	ACTIVE HIGH DATA M-L ARITHMETIC OPERATIONS $\overline{C}_N$ = H (NO CARRY)	$\overline{C}_N$ = L (WITH CARRY)
L L L L	F = $\overline{A}$	F = A	F = A PLUS 1
L L L H	F = $\overline{A+B}$	F = A+B	F = (A+B) PLUS 1
L L H L	F = $\overline{A}B$	F = A+$\overline{B}$	F = (A+$\overline{B}$) PLUS 1
L L H H	F = 0	F = MINUS 1 (2'S COMPL)	F = ZERO
L H L L	F = $\overline{AB}$	F = A PLUS A$\overline{B}$	F = A PLUS A$\overline{B}$ PLUS 1
L H L H	F = $\overline{B}$	F = (A+B) PLUS A$\overline{B}$	F = (A+B) PLUS A$\overline{B}$ PLUS 1
L H H L	F = A ⊕ B	F = A MINUS B MINUS 1	F = A MINUS B
L H H H	F = A$\overline{B}$	F = A$\overline{B}$ MINUS 1	F = A$\overline{B}$
H L L L	F = $\overline{A}$+B	F = A PLUS AB	F = A PLUS AB PLUS 1
H L L H	F = $\overline{A \oplus B}$	F = A PLUS B	F = A PLUS B PLUS 1
H L H L	F = B	F = (A+$\overline{B}$) PLUS AB	F = (A+$\overline{B}$) PLUS AB PLUS 1
H L H H	F = AB	F = AB MINUS 1	F = AB
H H L L	F = 1	F = A PLUS A	F = A PLUS A PLUS 1
H H L H	F = A+$\overline{B}$	F = (A+B) PLUS A	F = (A+B) PLUS A PLUS 1
H H H L	F = A+B	F = (A+$\overline{B}$) PLUS A	F = (A+$\overline{B}$) PLUS A PLUS 1
H H H H	F = A	F = A MINUS 1	F = A

REVISIONS		
CHK	CHANGE NO.	REV.

(RA, RAMX, AMX, ALU, SHF, 07:04) (SLOT 12)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 07:00 (DCPB)	D	CS	M8228-0-1	C
SCALE	SHEET 3 OF 12	DIST.		

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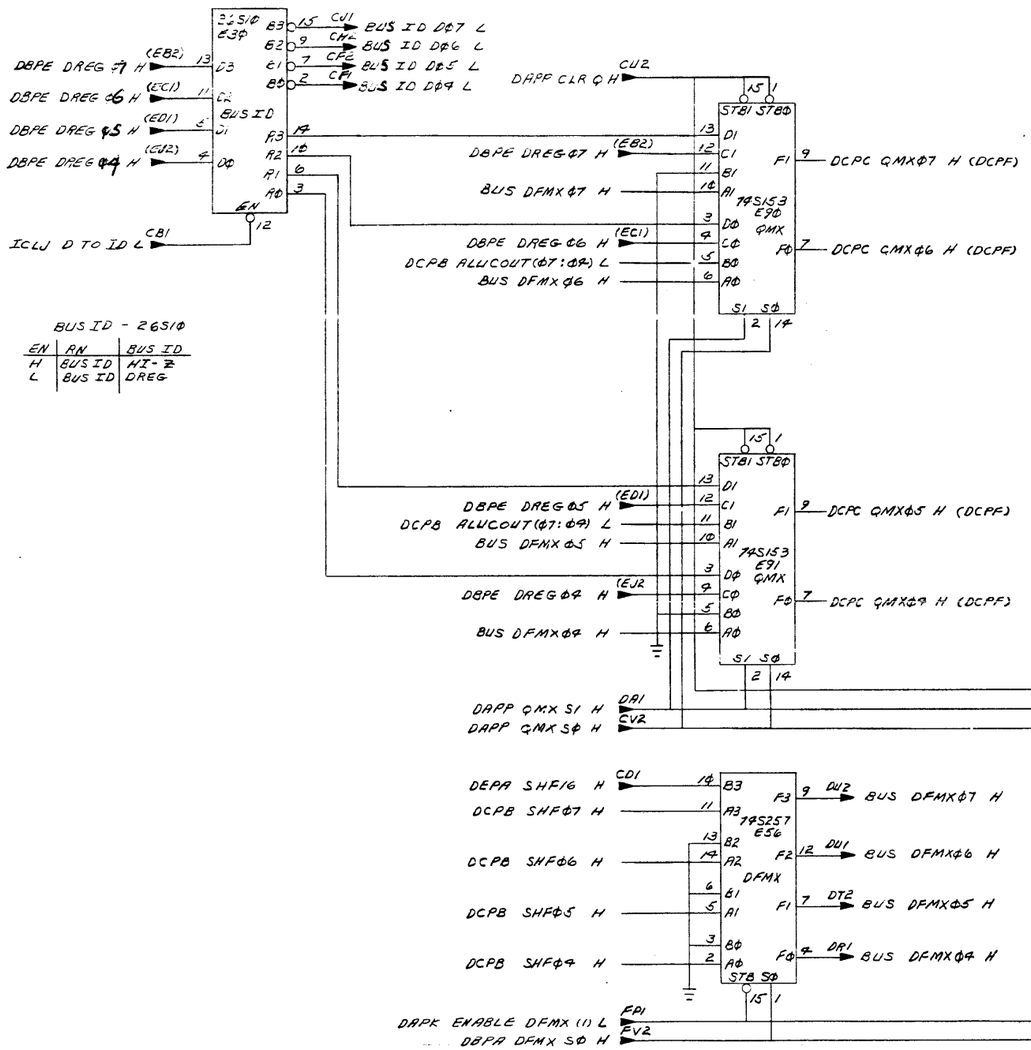

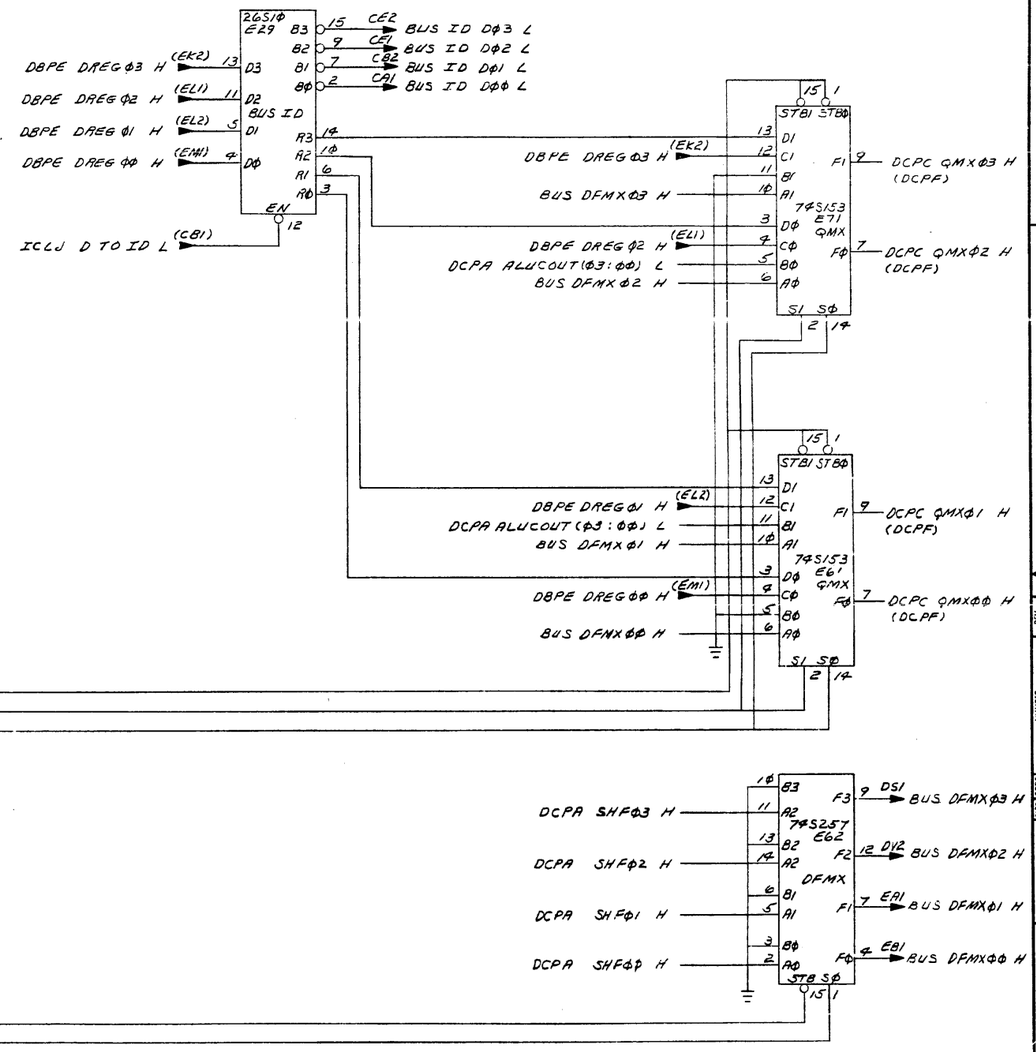

(QMX, BUS MD, BUS ID 07:ΦΦ) (SLOT 12)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 07:00 (DCPD)	D	CS	M8228-Φ-1	C
SCALE	SHEET 4 OF 12	DIST.		

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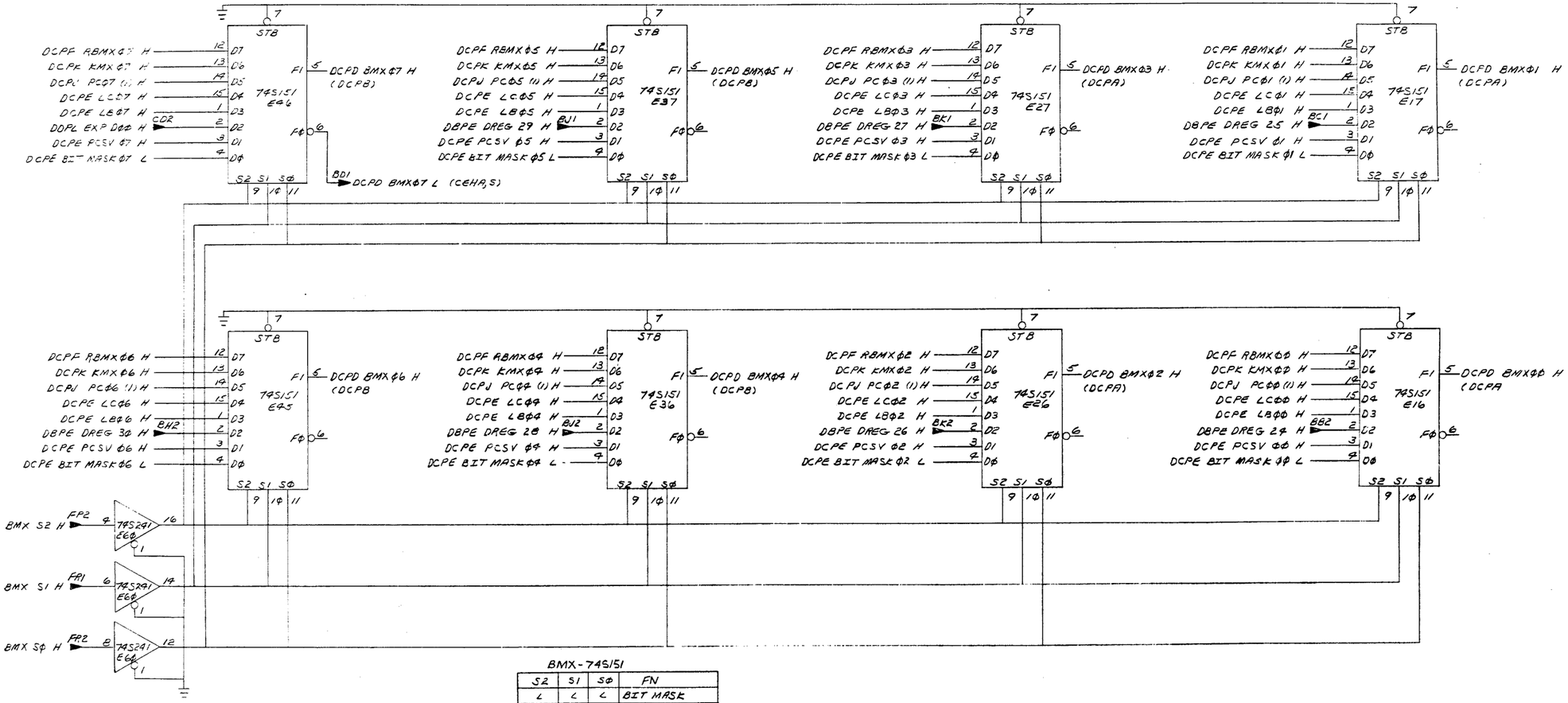

BMX-74S151

S2	S1	SØ	FN
L	L	L	BIT MASK
L	L	H	ALOG, PCSV
L	H	L	PACKED FLOAT
L	H	H	LB
H	L	L	LC
H	L	H	PC
H	H	L	KMX
H	H	H	RBMX

REVISIONS		
CHK	CHANGE NO.	REV.

(BMX Ø7:ØØ) (SLOT 12)

TITLE: DATA PATH Ø7:ØØ (DCPD)
SIZE D | CODE CS | NUMBER M8228-Ø-1 | REV. C
SCALE | SHEET 5 OF 12 | DIST.

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DCPE LATCH LC (1) H
DCPL RC CNTR L
DAPK RC WRT EN L (EN)

B5568 E5 RC(07:04)
B5568 E14 RC(03:00)

DCPE LC07 H (DCPD)
DCPE LC06 H (DCPD)
DCPE LC05 H (DCPD)
DCPE LC04 H (DCPD)
DCPE LC03 H (DCPD)
DCPE LC02 H (DCPD)
DCPE LC01 H (DCPD)
DCPE LC00 H (DCPD)

DAPN RC ADRS3 H (AE2)
DAPN RC ADRS2 H (AE1)
DAPN RC ADRS1 H (AD2)
DAPN RC ADRS0 H (AD1)

DCPF LATCH LB (1) H
DCPL RA RB CPT 2 L (BA1)
DAPK RA RB WRT B0 L

B5568 E4 RB(07:04)
B5568 E13 RB(03:00)

DCPB SHF07 H
DCPB SHF06 H
DCPB SHF05 H
DCPB SHF04 H
DCPA SHF03 H
DCPA SHF02 H
DCPA SHF01 H
DCPA SHF00 H

DCPE LB07 H (DCPD)
DCPE LB06 H (DCPD)
DCPE LB05 H (DCPD)
DCPE LB04 H (DCPD)
DCPE LB03 H (DCPD)
DCPE LB02 H (DCPD)
DCPE LB01 H (DCPD)
DCPE LB00 H (DCPD)

DAPN RB ADRS3 H (BE2)
DAPN RB ADRS2 H (BE1)
DAPN RB ADRS1 H (BD2)
DAPN RB ADRS0 H (BD1)

RB, RC - B5568

LE	WE	CLK	FUNCTION
H	H	X	NO OPERATION
H	L	↓	STORE, AN ← SHF
↓	H	X	LATCH, LA ← (AN)

DDPR SC03 H (BA1)
DDPR SC04 (1) H (BA2)
DCPJ +3 H (EN)
DDPR SC02 H (AU2)
DDPR SC01 H (AU1)
DDPR SC00 H (AU0)

74S138 E24

DCPE BIT MASK 07 L (DCPD)
DCPE BIT MASK 06 L (DCPD)
DCPE BIT MASK 05 L (DCPD)
DCPE BIT MASK 04 L (DCPD)
DCPE BIT MASK 03 L (DCPD)
DCPE BIT MASK 02 L (DCPD)
DCPE BIT MASK 01 L (DCPD)
DCPE BIT MASK 00 L (DCPD)

DCPJ PC07 (1) H
DCPJ PC06 (1) H
DCPJ PC05 (1) H
DCPJ PC04 (1) H

74S174 E38

DCPE PCSV 07 H (DCPD)
DCPE PCSV 06 H (DCPD)
DCPE PCSV 05 H (DCPD)
DCPE PCSV 04 H (DCPD)

CENF IRD STATE H (CSI)

DCPJ PC03 (1) H
DCPJ PC02 (1) H
DCPJ PC01 (1) H
DCPJ PC00 (1) H

74S194 E28

DCPE PCSV 03 H (DCPD)
DCPE PCSV 02 H (DCPD)
DCPE PCSV 01 H (DCPD)
DCPE PCSV 00 H (DCPD)

DCPF +3A H
DCPL CPT 2 H

PCSV - 74S194

CLR	CLK	S1	S0	FUNCT
L	X	X	X	AN = L
H	X	L	L	NO OPERATION
H	↑	H	H	STORE, AN = PC

REVISIONS

CHK	CHANGE NO.	REV.

(RB, RC, PCSV AND BITMASK 07:00 (SLOT 12)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 07:00 , DCPE	D	CS	M8228-0-1	C
SCALE	SHEET 6 OF 12	DIST.		

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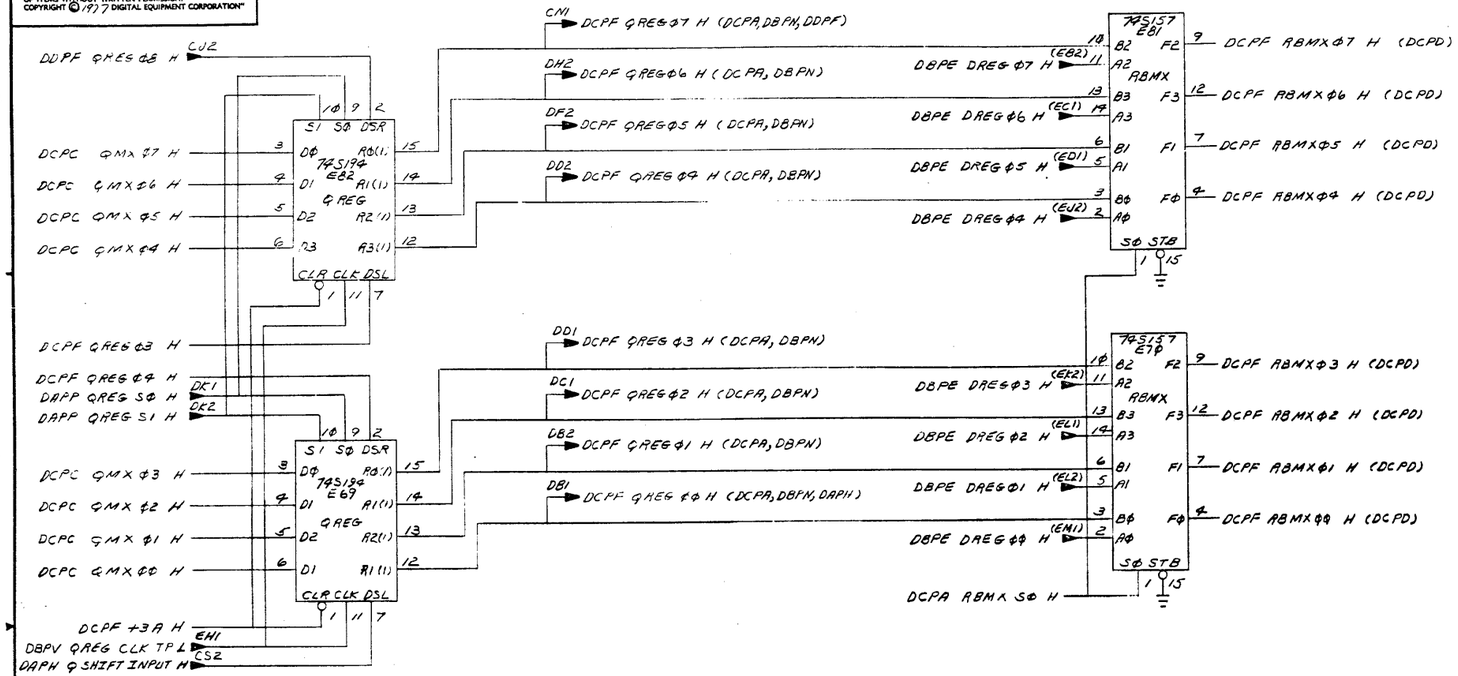

REVISIONS		
CHK	CHANGE NO.	REV.

(LATCH CONTROL, QREG, RBMX Ø7:ØØ (SLOT 12)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH Ø7:ØØ (DCPF)	D	CS	M8228-Ø-1	C
SCALE	SHEET 7 OF 12	DIST.		

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PCMX - 74S157

STB	SØ	FN
H	X	FN = L
L	L	VA
L	H	VIBA

DCPA ALU Ø3 H
DCPA ALU Ø2 H
DCPF +3A H
DCPJ FLUSH L
DCPL CPT28 L
IDPJ COUNT H
DCPF +3 H
DCPJ VA Ø1 (1) H
DCPJ VA ØØ (1) H
DCPJ PCMX SØ H
DCPH VIBA COUT Ø3 H (DCPJ)
DCPH PCMX Ø3 H
DCPH PCMX Ø2 H
DCPH PCMX Ø1 H
DCPH PCMX ØØ H

DCPF +3A H
DCPH LOAD VA (1) L
DCPL CPT2 L
DCPH VA COUT Ø3 H (DCPJ)
FBI → DCPH VAØ3 (1) H (TBMM, N)
FCI → DCPH VA Ø2 (1) H (TBMM, N CEHE)

DCPH INC VA H (DCPJ)

DAPN UWORD CLR A L
DCPL CPT Ø H
FUI

BUS CS 25 H
BUS CS 34 H
BUS CS 33 H
BUS CS 32 H
DCPH LOAD VA (1) H
DCPH LOAD VA (1) L
DCPH UPCK Ø2 (1) H
DCPH UPCK Ø2 (Ø) H
DCPH UPCK Ø1 (1) H
DCPH UPCK Ø1 (Ø) H
DCPH UPCK ØØ (1) H
DCPH UPCK ØØ (Ø) H

IDPM DELTA PC 2 H
DCPH +3 H
IDPM DELTA PC 1 H
IDPM DELTA PC Ø H

DCPJ PCØ3 (1) H
DCPJ PCØ2 (1) H
DCPJ PCØ1 (1) H
DCPJ PCØØ (1) H

DCPH UPCK Ø2 (Ø) H
DCPH UPCK Ø1 (Ø) H
DCPH UPCK ØØ (Ø) H
DCPJ +3 H
DCPH LD PC 31:Ø4 L (DCPJ)
DCPH LOAD PC Ø3:ØØ L (DCPJ)

DCPH UPCK Ø2 (1) H
DCPH INC PC 31:Ø4 H (DCPJ)

DCPF PCMX Ø3 H
DCPH PCMX Ø2 H
DCPH PCMX Ø1 H
DCPH PCMX ØØ H
DCPH UPCK Ø2 (1) H
DCPH PCAMX Ø3 H (DCPJ)
DCPH PCAMX Ø2 H (DCPJ)
DCPH PCAMX Ø1 H (DCPJ)
DCPH PCAMX ØØ H (DCPJ)

DCPH +3 H

PC ADDER - 74S181

SM = A. PLUS. B.

NMX - 74S153

S1	SØ	NMX
L	L	#1
L	H	#2
H	L	#4
H	H	DELTA PC

UPCK	FUNCTION
L L L	NO OP
L L H	PC ← VA
L H L	PC ← VIBA
L H H	VA ← VA+4
H L L	PC ← PC+1
H L H	PC ← PC+2
H H L	PC ← PC+4
H H H	PC ← PC+N

REVISIONS

CHK	CHANGE NO.	REV.

(VA, VIBA, NMUX, PCAMX Ø3:ØØ) (SLOT 12)

TITLE: DATA PATH Ø7:ØØ (DCPH)
SIZE: D | CODE: CS | NUMBER: M8228-Ø-1 | REV: C
SCALE | SHEET 8 OF 12 | DIST.

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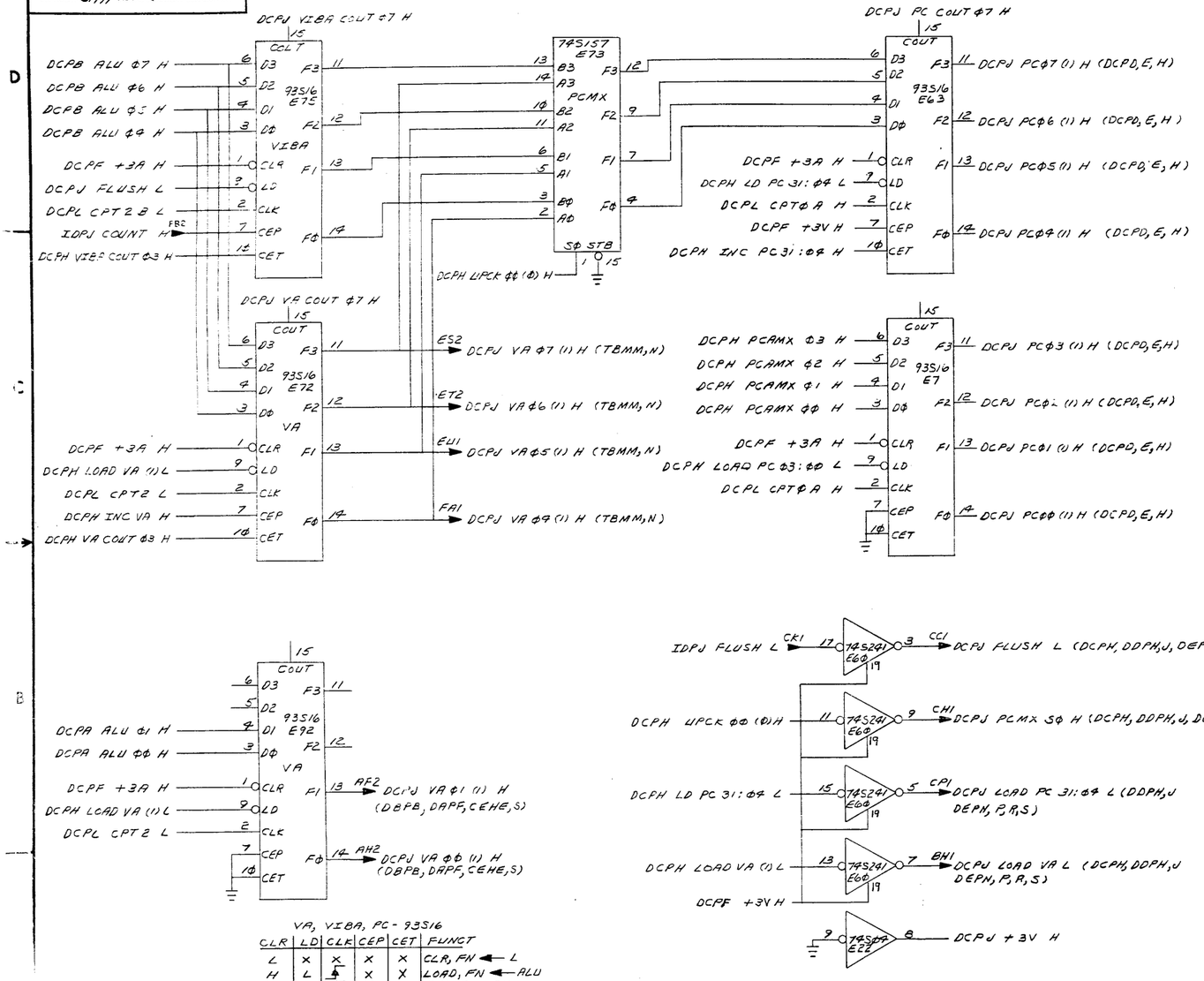

REVISIONS		
CHK	CHANGE NO.	REV.

(VA VIBA PCMX Ø7:Ø4, PC AND ALU BUFF Ø7:ØØ) (SLOT 12)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH Ø7:ØØ (DCPJ)	D	CS	M8228-Ø-1	C
SCALE	SHEET 9 OF 12	DIST.		

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74S175 E55 UKMX

+5V
RP11 330Ω RP13 330Ω
DS2
BUS CS63 H
DP1
BUS CS62 H
RP12 820Ω RP14 82Ω
D3 D2 DØ D1 CLR CLK
R3(1) R3(Ø) R2(1) R2(Ø) RØ(1) RØ(Ø) R1(1) R1(Ø)
AK2 DCPK UKMX5 (1) H (DDPH)
AL1 DCPK UKMX4 (1) H (DDPH)

74S175 E47 UKMX

+5V
RP15 330Ω RP17 330Ω RP19 330Ω RP21 330Ω
DN1
BUS CS61 H
DM1
BUS CS60 H
DJ2
BUS CS59 H
DJ1
BUS CS58 H
RP16 820Ω RP18 820Ω RP20 820Ω RP22 820Ω
DCPF +3A H
DCPL CPTØ H
HL2 DCPK UKMX3 (1) H (DDPH)
DCPK UKMX3 (Ø) H (DDPH)
AM1 DCPK UKMX2 (1) H (DDPH)
DCPK UKMX2 (Ø) H (DDPH)
AM2 DCPK UKMX1 (1) H (DDPH)
DCPK UKMX1 (Ø) H (DDPH)
AN1 DCPK UKMXØ (1) H (DDPH)
DCPK UKMXØ (Ø) H (DDPH)

UKMX FUNCT DECODE

UKMX (HEX)	FUNCT (KMX)
Ø	FKMX = 8;16
1	FKMX = 1;16
2	FKMX = 2;16
3	FKMX = 3;16
4	FKMX = 9;16
5	FKMX = SPI CON
6	FKMX = SP2 CON
7	FKMX = SC
8	UKMX = SK [ADRS]

23-03081-00 E11 SLAW CONSTANT Ø7:ØØ
A5 A4 A3 A2 A1 AØ
DCPK SKØ7 L
DCPK SKØ6 L
DCPK SKØ5 L
DCPK SKØ4 L
DCPK SKØ3 L
DCPK SKØ2 L
DCPK SKØ1 L
DCPK SKØØ L

DDPR SCØ7 (1) H FE1 → 74SØØ E3 → DCPK FKMXØ7 L
DDPR SCØ6 (1) H FD2 → 74SØØ E3 → DCPK FKMXØ6 L
DDPR SCØ5 (1) H EM2 → 74SØØ E3 → DCPK FKMXØ5 L
DDPR SCØ4 (1) H EH2 → 74SØØ E3 → DCPK FKMXØ4 L

74S11 E47 → DCPK UKMX = SC H

DDPR SCØ3 H, IRCE SPI CON3 H → 74S11 E49 → DCPK FKMX = SPI H
BA1 AF1 → 74S64 E58 → DCPK FKMXØ3 L

DDPR SCØ2 H, IRCE SPI CON2 H → 74S64 E48 → DCPK FKMXØ2 L
FN2 BL1

DCPJ +3VH
DDPR SCØ1 H, IRCE SPI CON1 H → 74S64 E42 → DCPK FKMXØ1 L
AU2 BS2

IRCE SP2 CONØ1 H → DCPK FKMXØØ L
CM2

DDPR SCØØ H, IRCE SPI CONØ H → 74S64 E41 → DCPK FKMXØØ L
AU1 BT2

IRCE SP2 CONØ H
CK2

DCPK UKMXØ5 (Ø) H, DCPK UKMXØ4 (Ø) H, DCPK UKMXØ3 (Ø) H → 74S10 B33 → 12

KMX - 74S158

SØ	FN
L	SK
H	FK

74S158 E2 KMX
B3 A3 B2 A2 B1 A1 BØ AØ SØ STB
F3 DCPK KMXØ7 H (DCPD, DDPN)
F2 DCPK KMXØ6 H (DCPD, DDPN)
F1 DCPK KMXØ5 H (DCPD, DDPN)
FØ DCPK KMXØ4 H (DCPD, DDPN)

74S158 E10 KMX
F3 DCPK KMXØ3 H (DCPD, DDPK, N)
F2 DCPK KMXØ2 H (DCPD, DDPK, N)
F1 DCPK KMXØ1 H (DCPD, DDPK, N)
FØ DCPK KMXØØ H (DCPD, DDPK, N)

(KMX AND CONTROL Ø7:ØØ) (SLOT 12)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH Ø7:ØØ (DCPK)	D	CS	M8228-Ø-1	C
SCALE	SHEET 10 OF 12	DIST.		

M8228-Ø-1 REV. C SIZE D CODE CS

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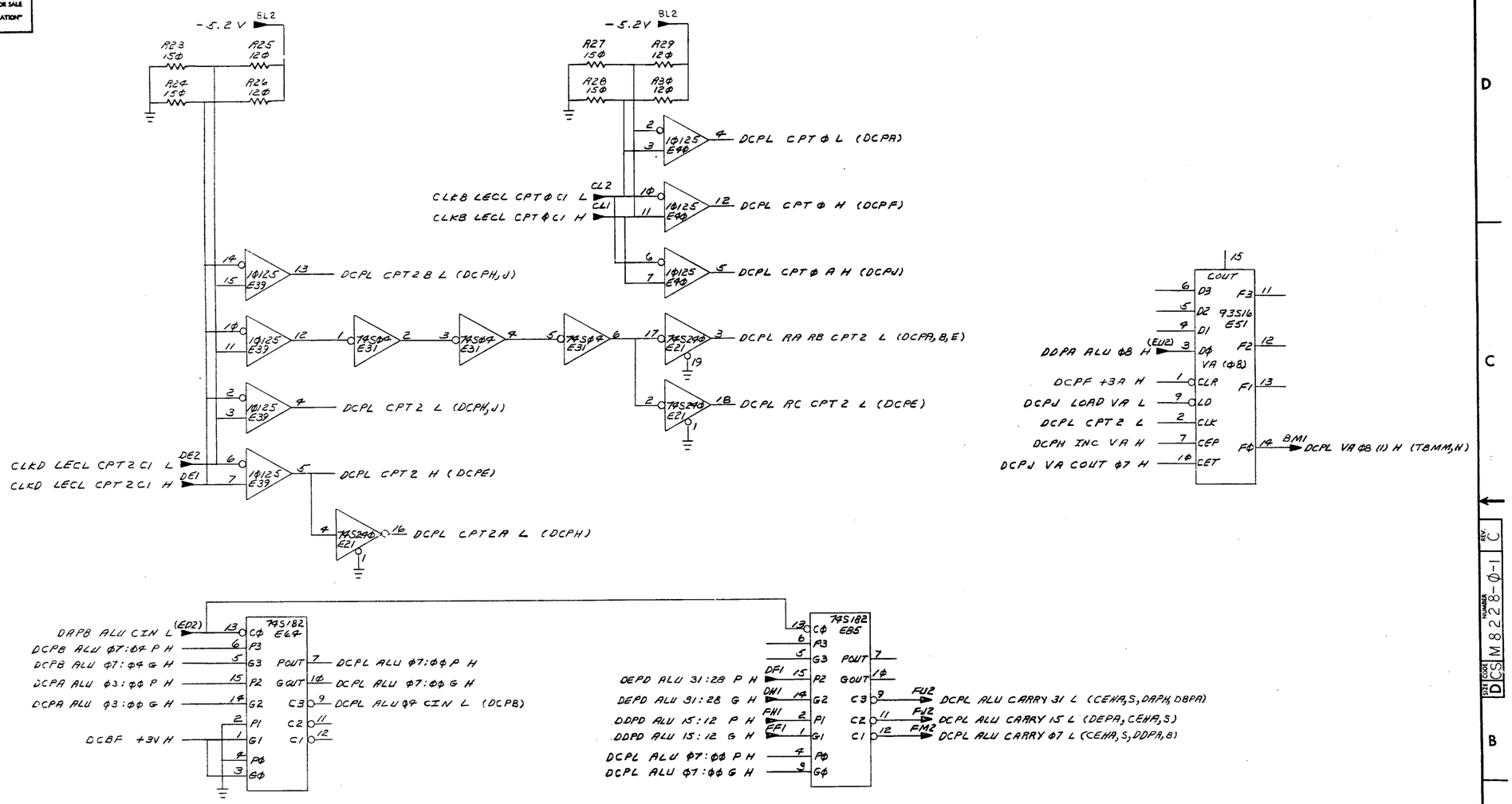

REVISIONS		
CHK	CHANGE NO.	REV.

(CLKS AND LOOKAHEAD CARRY) (SLOT 12)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH 07:00 (DCPL)	D	CS	M8228-0-1	C
SCALE	SHEET 11 OF 12	DIST.		

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SK (Ø7:ØØ) L

ROM ADDR = UKMX	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	SLOW CONSTANT
ØØ	L	L	L	L	L	L	L	L	X
Ø1	L	L	L	L	L	L	L	L	X
Ø2	L	L	L	L	L	L	L	L	X
Ø3	L	L	L	L	L	L	L	L	X
Ø4	L	L	L	L	L	L	L	L	X
Ø5	L	L	L	L	L	L	L	L	X
Ø6	L	L	L	L	L	L	L	L	X
Ø7	L	L	L	L	L	L	L	L	X
Ø8	H	H	H	L	H	L	H	H	--14
Ø9	L	H	L	H	H	H	H	H	--AØ
ØA	H	H	L	L	H	L	H	H	--34
ØB	H	H	L	H	L	H	H	H	--2Ø
ØC	H	L	H	H	H	H	H	H	--4Ø
ØD	H	L	H	L	H	H	H	H	--5Ø
ØE	H	H	H	H	H	H	H	H	--ØØ
ØF	L	L	L	H	L	L	L	L	--EF
1Ø	L	H	H	H	H	H	H	H	--8Ø
11	H	H	H	H	H	H	H	H	--ØØ
12	L	L	L	L	L	L	L	L	--FF
13	H	H	H	H	H	H	H	H	--ØØ
14	H	H	H	L	L	L	L	H	--1E
15	H	H	L	L	L	L	L	L	--3F
16	H	L	L	L	L	L	L	L	--7F
17	H	H	H	H	H	L	L	L	--Ø7
18	H	H	H	H	L	L	L	L	--ØF
19	H	H	H	L	H	H	H	H	--1Ø
1A	L	L	L	H	L	H	H	H	--E8
1B	L	L	L	L	H	H	H	H	--F8
1C	L	L	L	L	L	H	H	H	--F8
1D	H	H	L	H	H	H	H	H	--2Ø
1E	H	H	L	L	H	H	H	H	--3Ø
1F	H	H	H	L	L	H	H	H	--18

SK (Ø7:ØØ) L

ROM ADDR = UKMX	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	SLOW CONSTANT
2Ø	L	L	L	L	L	L	L	L	--FF
21	H	H	H	H	L	L	H	H	--ØC
22	H	H	H	H	L	L	H	L	--ØD
23	H	H	H	L	L	L	L	L	--1F
24	H	H	H	H	H	H	H	H	--ØØ
25	L	H	L	L	H	H	H	H	--BØ
26	H	H	H	H	H	H	L	L	--Ø3
27	H	L	L	L	L	L	H	H	--7C
28	L	L	L	H	H	H	H	H	--EØ
29	H	L	L	H	H	H	H	H	--6Ø
2A	L	L	L	L	L	L	L	L	-- SPARE
2B	L	L	H	H	L	L	L	L	--CF
2C	L	L	L	H	L	L	L	L	--EF
2D	L	L	L	L	H	H	H	L	--F1
2E	H	H	H	L	L	H	H	L	--19
2F	L	L	L	L	L	H	H	L	--F9
3Ø	L	L	L	L	L	L	L	L	--FF
31	L	H	H	H	H	L	L	H	--86
32	H	H	L	L	H	H	H	H	--3Ø
33	L	L	L	L	H	H	H	H	--FØ
34	L	L	H	H	H	H	H	H	--CØ
35	H	H	H	H	H	L	L	H	--Ø8
36	H	H	H	H	L	H	H	L	--Ø9
37	L	L	L	L	H	L	L	H	--F8
38	L	L	L	L	H	L	H	L	--F5
39	H	H	H	L	L	H	L	H	--1A
3A	H	H	L	H	H	L	H	H	--24
3B	H	H	H	L	L	H	L	L	--1B
3C	L	L	L	L	L	L	H	H	--FC
3D	H	H	H	H	L	H	L	H	--ØA
3E	H	L	L	L	L	L	L	H	--7E
3F	L	L	L	H	L	L	H	H	--EC

SK (Ø7:ØØ) L

ROM ADDR = UKMX	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	SLOW CONSTANT
4Ø	L	L	L	L	L	L	L	L	NOT USED
41									
42									
43									
44									
45									
46									
47									
48									
49									
4A									
4B									
4C									
4D									
4E									
4F									
5Ø									
51									
52									
53									
54									
55									
56									
57									
58									
59									
5A									
5B									
5C									
5D									
5E									
5F									

SK (Ø7:ØØ) L

ROM ADDR = UKMX	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	SLOW CONSTANT
6Ø	L	L	L	L	L	L	L	L	NOT USED
61									
62									
63									
64									
65									
66									
67									
68									
69									
6A									
6B									
6C									
6D									
6E									
6F									
7Ø									
71									
72									
73									
74									
75									
76									
77									
78									
79									
7A									
7B									
7C									
7D									
7E									
7F									

8Ø to FF		L	L	L	L	L	L	L	L	NOT USED

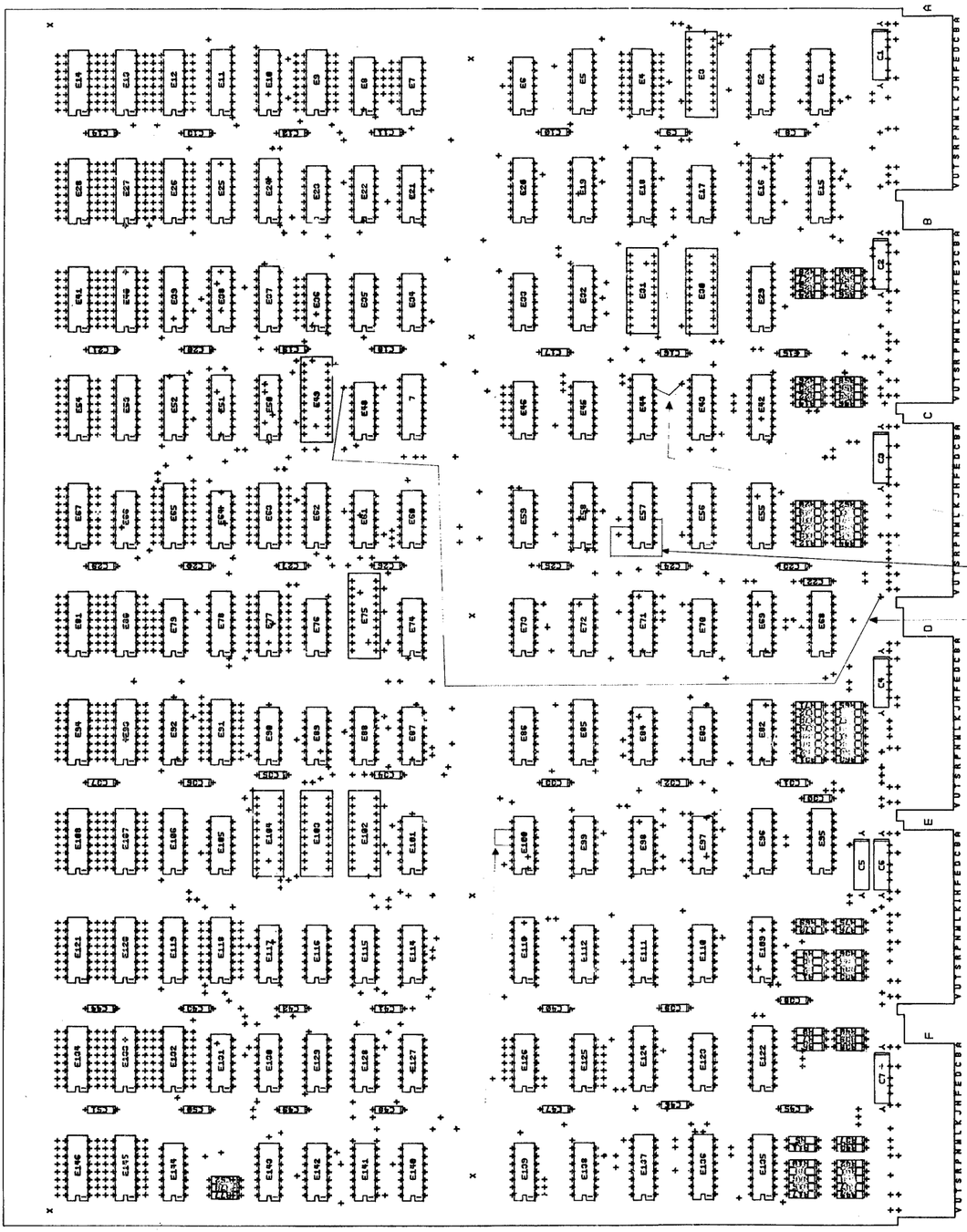
SLOW CONSTANT ROM Ø7:ØØ- 23-Ø3ØB1-ØØ (SLOT 12)

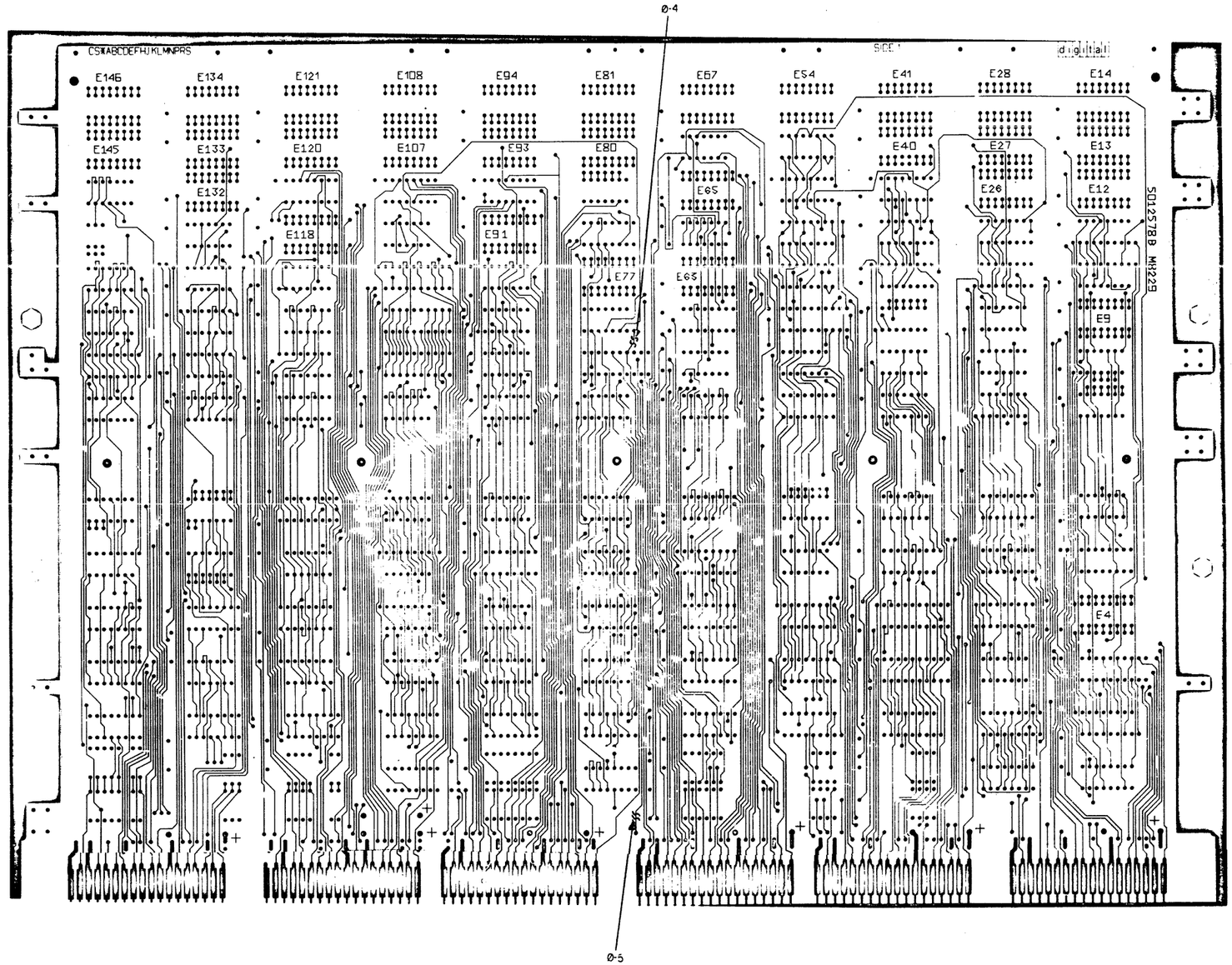
REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH Ø7:ØØ (DCP)	D	CS	M8228-Ø-1	C

SCALE ⟷ SHEET 12 OF 12 DIST.

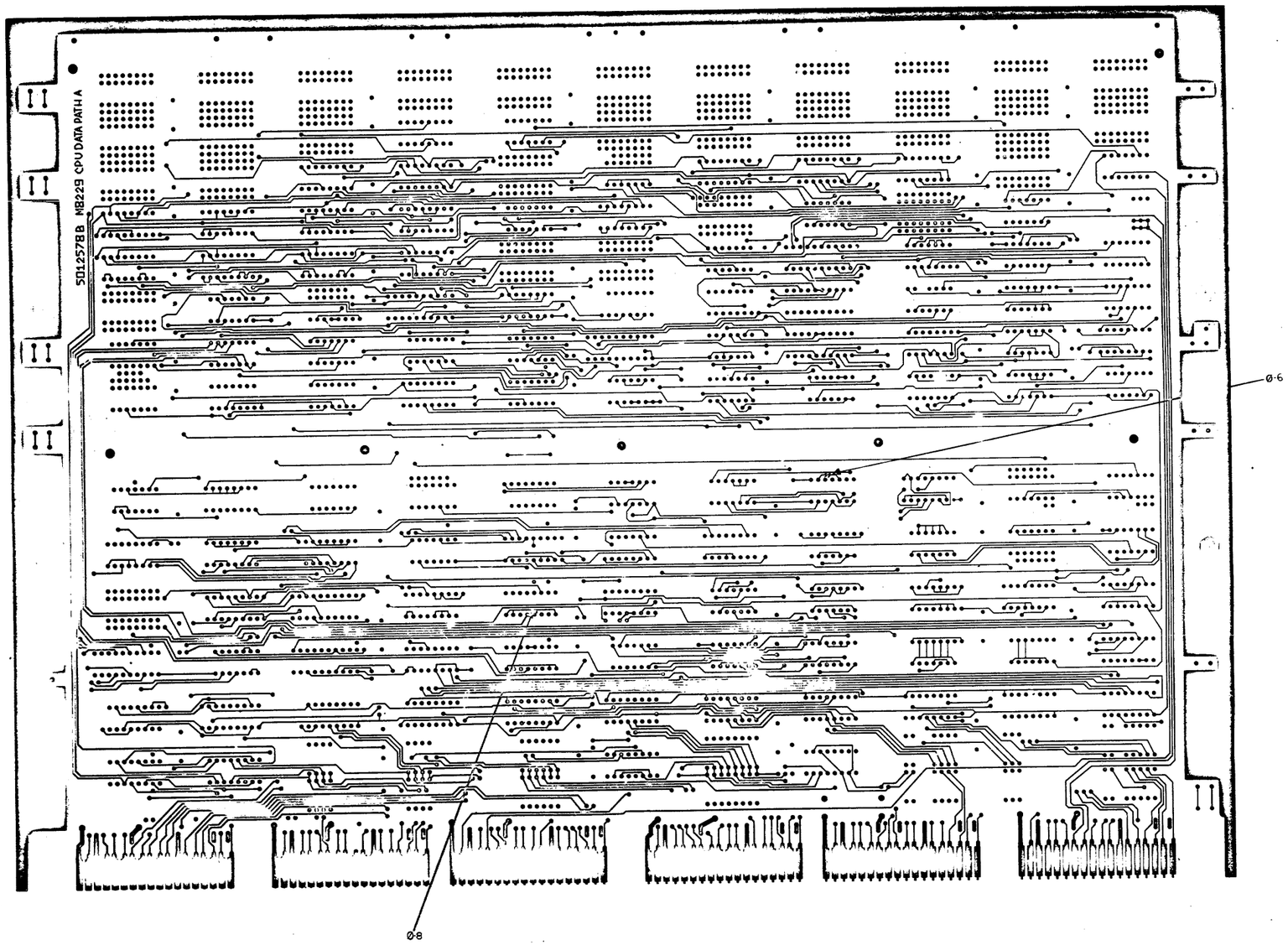




REVISIONS		
LTR	CHANGE NO	REV

8		7		6		5		4		3		2		1		

TITLE	SIZE	CODE	NUMBER	REV.
CPU DATA PATH A	E	UA	M8229-0-0	B
SCALE 2-1	SHEET 2 OF 3		DIST	



REVISIONS		
CHK	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV
CPU DATA PATH A	E	LIA	MB229-00	B
SCALE 2 - 1	SHEET 3 OF 3		DIST	

DEC FORM NO. DW 30A

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY TRIAD	CHECKED F. SMART	SECTION
DATE 6 NOV 76	DATE 12 MAY 77	
ENG E. Anton	PROD Mike Terella	ISSUED SECTION
DATE 6-9-77	DATE 6-1-77	

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8229-Ø-Ø	NOTES: REF DESIGNATION
1	E-MD-5012578-Ø-Ø	5012578	ETCHED CIRCUIT BOARD	1	
2		10-12084-1	CAP. 8UF	7	C1-C7
3		10-12784	CAP. .047UF	45	C8-C52
4		13-01424	RES. 680 , 1/4 W, 5%	1	R78
5		13-00247	RES. 120 , 1/4W, 5%	6	R71-R76
6		13-00250	RES. 150 , 1/4 W, 5%	6	R65-R70
7		13-00295	RES. 330 , 1/4 W, 5%	33	R1-R32,R77
8		13-01775	RES. 820 , 1/4 W, 5%	32	R33-R64
9		19-12693	I.C. DEC 25S10	1	E136
10		19-13839	I.C. DEC 74LS165	5	E39,E52,E92,E119,E106
11		19-10532	I.C. DEC 74S00	6	E7,E36,E87,E139,E141,E131
2		19-10534	I.C. DEC 74S04	10	E6,E23,E45,E59,E60,E66,E88,E140,E130,E48
3		19-10536	I.C. DEC 74S10	3	E35,E70,E142
4		19-10537	I.C. DEC 74S11	4	E8,E72,E89,E126
5		19-10539	I.C. DEC 74S20	6	E21,E33,E34,E125,E143,E105

E.C.O. NO. 00001

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CPU DATA PATH A	E-UA-M8229-Ø-Ø	B	PL	M8229-Ø-Ø	B
	SHEET 1 OF 3	INSERTION PARTS LIST DATA BASE REV			

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY	TRIAD	CHECKED	F. SMART	SECTION
DATE	6 NOV 76	DATE	12 MAY 77	
ENG	E. Anton	PROD	Mike Tirella	ISSUED SECTION
DATE	6-9-77	DATE	6-1-77	

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8229-Ø-Ø	NOTES: REF DESIGNATION
16		19-10541	I.C. DEC 74S40	2	E17,E101
17		19-10542	I.C. DEC 74S64	15	E83 E84,E86,E97,E98,E99,E100,E110,E111, E11 ,E127,E123,E128,E129,E117
18		19-10544	I.C. DEC 74S74	3	E61,E64,E144
19		19-10548	I.C. DEC 74S157	1	E137
20		19-10549	I.C. DEC 74S158	4	E1,E2,E18,E62
21		19-10552	I.C. DEC 74S194	1	E113
22		19-10956	I.C. DEC 74S151	13	E10,E11,E21 ,E25,E37,E38,E43,E44,E50,E51, E56,E57,E58
23		19-10957	I.C. DEC 74S175	12	E15,E16,E29,E47,E55,E69,E82,E96,E109, 22,E135,E42
24		19-11469	I.C. DEC 8640	1	E79
25		19-11675	I.C. DEC 74S138	4	E5 ,E71,E85,E124
26		19-11415	I.C. DEC 10125	2	E68,E95
27		19-11712	I.C. DEC 74S51	6	E46,E74,E114,E115,E116,E76
28		19-11983	I.C. DEC 74S133	3	E19,E20,E32

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CPU DATA PATH A	E-UA-M8229-Ø-Ø	B	PL	M8229-Ø-Ø	B
	SHEET 2 OF 3	INSERTION PARTS LIST DATA BASE REV			

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY TRIAD	CHECKED F. SMART	SECTION	
DATE 6 NOV 76	DATE 12 MAY 77		
ENG E. Anton	PROD Mike Tarello	ISSUED SECTION	
DATE 6-9-77	DATE 6-1-77		

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8229-Ø-Ø	NOTES: REF DESIGNATION
29		19-12096	I.C. DEC 74S86	1	E90
30		19-12389	I.C. DEC 74S08	3	E22, E73, E138
31		19-12865	I.C. DEC 74LS283	2	E78, E53
32		19-13462	I.C. DEC 74S240	4	E3, E31, E75, E104
33		19-13493	I.C. DEC 74S241	1	E49
34		19-13670	I.C. DEC 74S373	1	E30
35		23-027B1-00	I.C. DEC ROM 11 MODE	1	E102
36		23-026B1-00	I.C. DEC ROM VAX	1	E103
37		12-10711-2	MODULE HANDLE	1	
38		9000024-01	MODULE HANDLE EYELETS	12	
			SPARES	30	E12-E14, E9, E4, E26-E28, E40, E41, E54, E63, E65, E67, E80, E81, E77, E91, E93 E94, E108, E107, E118, E120, E121, E132-E134, E146, E145

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CPU DATA PATH A	E-UA-M8229-Ø-Ø	B	PL	M8229-Ø-Ø	B
	SHEET 3 OF 3	INSERTION PARTS LIST DATA BASE REV			

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NOTES:

DATA PATH

EXPONENT SECTION

EALU
745157
NABS ROM 256X8
745181, 745182
EBMX 745153
EAMX 745157
AMX EXP
SMF VAL
FE 745194
STATE 745194
745153 SMX
SC 745194
MASK 745138
SK ROM 256X8
KMX 745138
FK 745564 745568
"8, "1, "2, "3, "4
SP1CON
SP2CON
SC
PCSV 745194
RLOG 16X9 74S68
PC
RA ADDRESS, KMX (Ø3:ØØ), AND ADD/SUB BIT

ADDRESS SECTION

74S04
74S04
ALU ZERO DET.
VA 93516
IBA 93516
PC 93516
PC (TO BMX)
PC (Ø3:ØØ)
A PCADD 745181
PCAMX 745157
PCMX 745157
#1 #2 #4 N
NMX 745153
CM
745158
VAMX (31:16)
VA (Ø8:Ø2)
745158
VAMX (15:Ø9)
TBUF ADDRESS INTERFACE
SHF
25510
745257
ARITHMETIC SECTION
ALU 745181, 745182
BMX 745151
AMX 745153
LC RC 16X32 74S68
LB RB 16X32 74S68
LA RA 16X32 74S68
RBMX
SD, EALU EXP, DREG
PC

DATA SECTION

MD BUS (MEMORY DATA)
BAL 25510
25510 MDAL
(GENERAL REG DATA) TO AND FROM ACC
DFMX 745157
DECIMAL CONSTANT
D NIBBLE SWAP
745153 QMX
745153 DMX
DAL 63 BIT SHIFT MATRIX 25510
Q 745194
D 745194
D PGEN 74S280
74S241
RAMX 745157
RBMX 745157
REMX
INTERNAL PROCESSOR REGISTERS

I/O

SBI
SBI CNTL
TBUF AND CACHE
XCEIV 26510
CONSOLE
TRAP AND INTERRUPT
IBUF
(INTERNAL DATA)
WCS
ACC
MICRO SEQUENCER
I D BUS
O.C.

BLOCK DIAGRAM (SLOT 13)

REVISIONS			
CHK	CHANGE NO.	REV.	
RJG	M8229-00001	B	
	D. GAMON JUN 77		
	E. ANTON JUN 77		
	S. ALLEN JUN 77		

DRAWN		FIRST USED ON
CHKD	5-20-77	
ENG. E. ANTON	5-47-77	
PROJ. ENGR.	5 20 77	
PROD. QUAL.	6/6/77	
NEXT HIGHER ASSY.		
SCALE		SIZE D
SHEET 1 OF 21		CODE CS
		NUMBER M8229-0-1
		REV. B
		DIST.

TITLE: DATA PATH CONTROL

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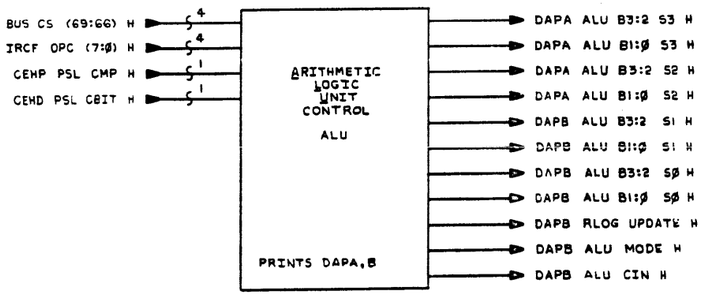

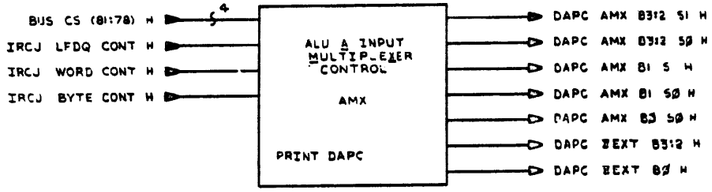

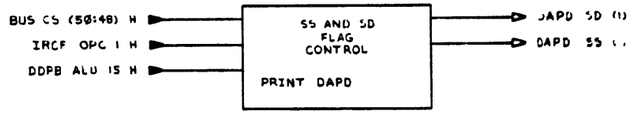

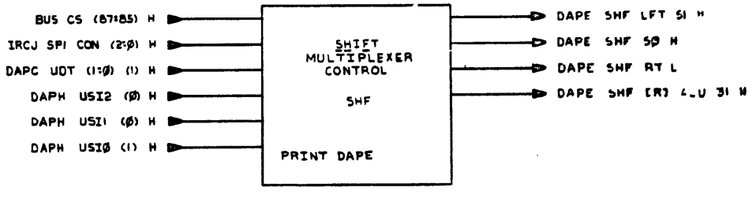

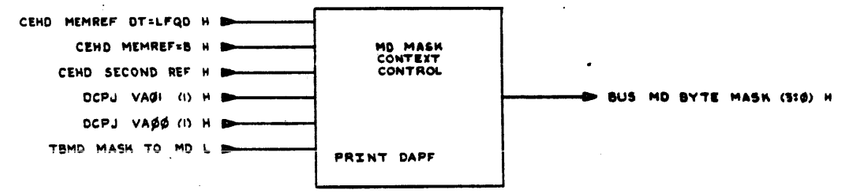

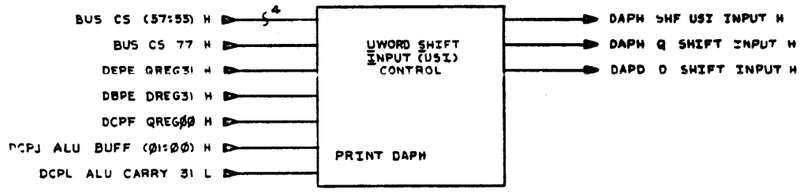

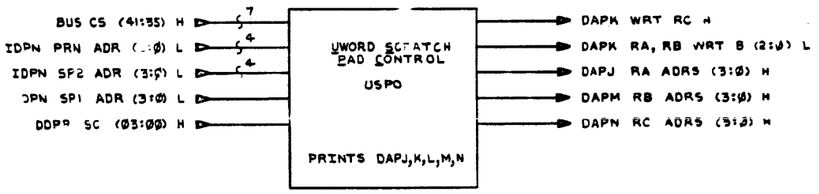

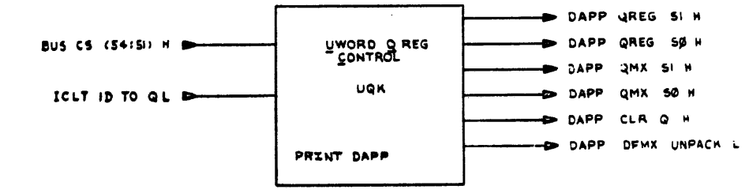

(DATA PATH CONTROL BLOCK DIAGRAM)(SLOT 13)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: DATA PATH CONTROL	DCS	M8229-0-1	REV. B
SCALE: NONE	SHEET 2 OF 21		

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AMX CONTROL — TRUTH TABLE

UAMX.		UDT		CONTEXT			AMX CONTROL												AMX OUTPUT FUNCTIONS			
							BYTE 3			BYTE 2			BYTE 1			BYTE Ø			BYTE 3	BYTE 2	BYTE 1	BYTE Ø
1	Ø	1	Ø	LONG	WORD	BYTE	S1	SØ	STB	S1	SØ	STB	S1	SØ	STB	S1	SØ	STB				
L	L	X	X	X	X	X	L	L	L	L	L	L	L	L	L	L	L	L	LA (31:ØØ)			
L	H	X	X	X	X	X	L	H	L	L	H	L	L	H	L	L	H	L	RAMX (31:ØØ)			
H	L	L	L	X	X	X	L	H	L	L	H	L	L	H	L	L	H	L	[SXT LONG]	RAMX (31:ØØ)		
H	L	L	H	X	X	X	H	H	L	H	H	L	L	H	L	L	H	L	[SXT WORD]	← RAMX 15	RAMX (15:ØØ)	
H	L	H	L	X	X	X	H	L	L	H	L	L	H	H	L	L	H	L	[SXT BYTE]	← RAMX 7	RAMX (Ø7:ØØ)	
H	L	H	H	H	L	L	L	H	L	L	H	L	L	H	L	L	H	L	RAMX (31:ØØ)			
H	L	H	H	L	H	L	H	H	L	H	H	L	L	H	L	L	H	L	[SXT WORD]	← RAMX 15	RAMX (15:ØØ)	
H	L	H	H	L	L	L	H	L	L	H	L	L	H	H	L	L	H	L	[SXT BYTE]	← RAMX 7	RAMX (Ø7:ØØ)	
H	H	L	L	X	X	X	X	X	H	X	X	H	H	L	L	X	X	H	[ØXT LONG] L	← L		
H	H	L	H	X	X	X	X	X	H	X	X	H	L	H	L	L	H	L	[ØXT WORD] L	← L	RAMX (15:ØØ)	
H	H	H	L	X	X	X	X	X	H	X	X	H	H	L	L	L	H	L	[ØXT BYTE] L	← L	RAMX (Ø7:ØØ)	
H	H	H	H	H	L	L	X	X	H	X	X	H	H	L	L	X	X	H	[ØXT LONG] L	← L		
H	H	H	H	L	H	L	X	X	H	X	X	H	L	H	L	L	H	L	[ØXT WORD] L	← L	RAMX (15:ØØ)	
H	H	H	H	L	L	H	X	X	H	X	X	H	H	L	L	L	H	L	[ØXT BYTE] L	← L	RAMX (Ø7:ØØ)	

NOTE: X=DON'T CARE
SXT=SIGN EXTEND
ØXT=ZERO EXTEND

ALU FUNCTION SELECT — TRUTH TABLE

UALU (Ø3:ØØ)					FUNCTION SELECT LINES				MODE CONTROL	CARRY INPUT	ALU FUNCTION
HEX	3	2	1	Ø	S3	S2	S1	SØ	H=LOGIC L=ARITH	CARRY=L	
Ø	L	L	L	L	L	H	H	L	L	L	A. MINUS. B
1	L	L	L	H	L	H	H	L	L	L	A. MINUS. B [R LOG]
2	L	L	H	L	L	H	H	L	L	H	A. MINUS. B. MINUS. 1
3	L	L	H	H	*	*	*	*	*	*	INSTRUCTION DEP.
4	L	H	L	L	H	L	L	H	L	L	A. PLUS. B. PLUS. 1
5	L	H	L	H	H	L	L	H	L	H	A. PLUS. B
6	L	H	H	L	H	L	L	H	L	H	A. PLUS. B [R LOG]
7	L	H	H	H	H	H	L	H	H	X	A. OR. NOT. B
8	H	L	L	L	L	H	H	L	H	X	A. XOR. B
9	H	L	L	H	L	H	H	H	H	X	A. AND. NOT. B
A	H	L	H	L	L	L	L	L	H	X	.NOT. A
B	H	L	H	H	H	L	L	H	L	PSL. C	A. PLUS. B. PLUS. C
C	H	H	L	L	H	H	H	L	H	X	A. OR. B
D	H	H	L	H	H	L	H	H	H	X	A. AND. B
E	H	H	H	L	H	L	H	L	H	X	B
F	H	H	H	H	H	H	H	H	H	X	A

NOTE: X=DON'T CARE
*=INSTRUCTION DEPENDENT

REVISIONS		
CHK	CHANGE NO.	REV.

(ALU AND AMX CONTROL TRUTH TABLES) (SLOT 13)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL	D	CS	M8229 - Ø - 1	B
SCALE NONE	SHEET 3 OF 21	DIST.		

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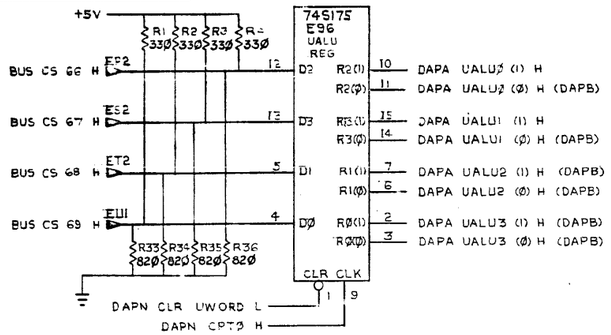

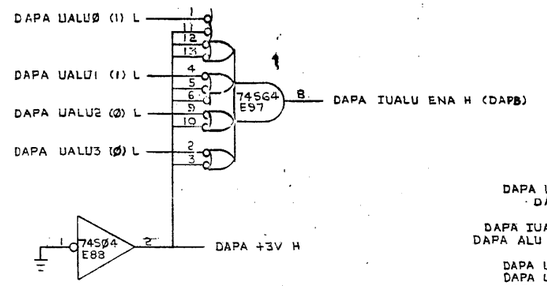

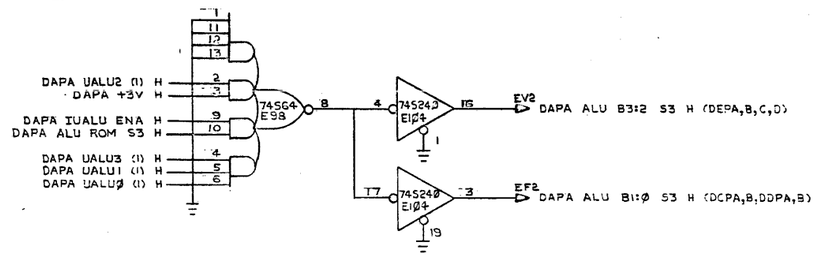

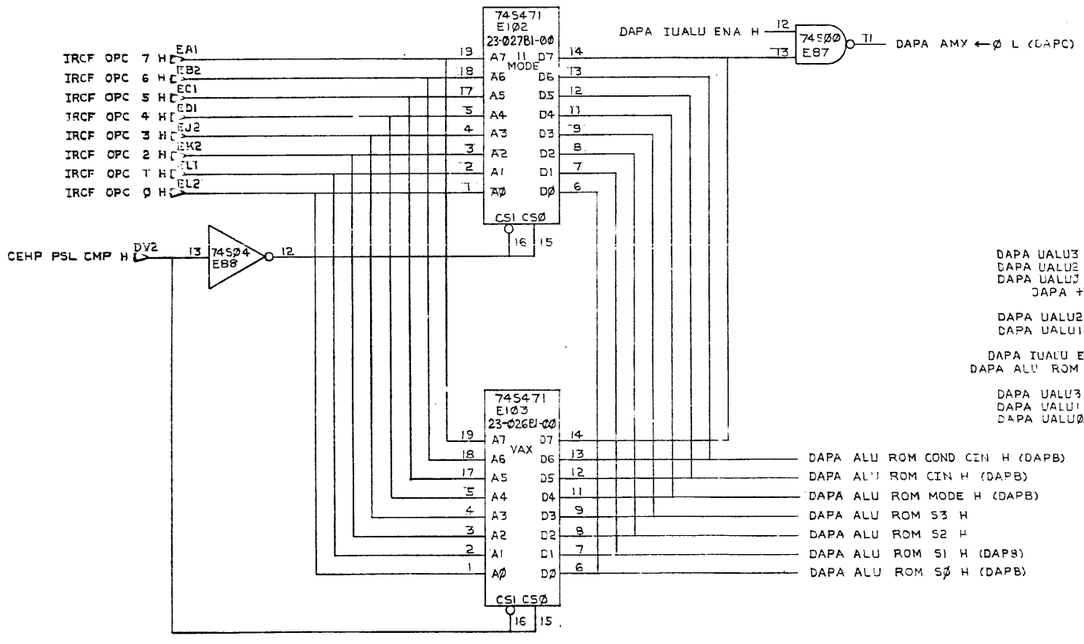

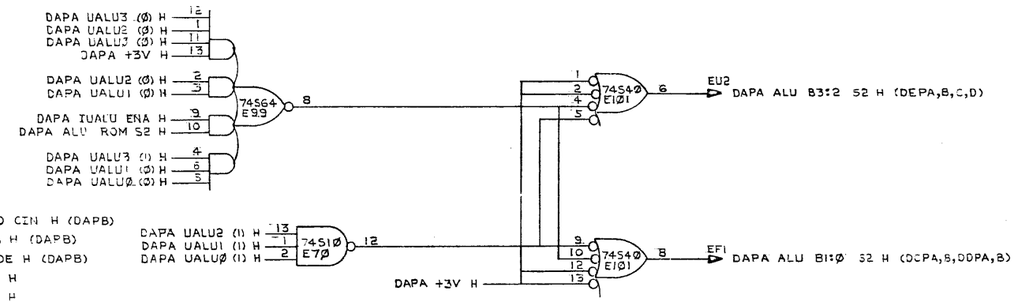

REVISIONS		
CHK	CHANGE NO.	REV.

(ALU UWORD AND INSTR DEP CONTROL) (SLOT 13)

TITLE		SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL	(DAPA)	D	CS	M8229-Ø-1	B
SCALE NONE	SHEET 4 OF 21	DIST.			

DCS M8229-Ø-1 REV. B

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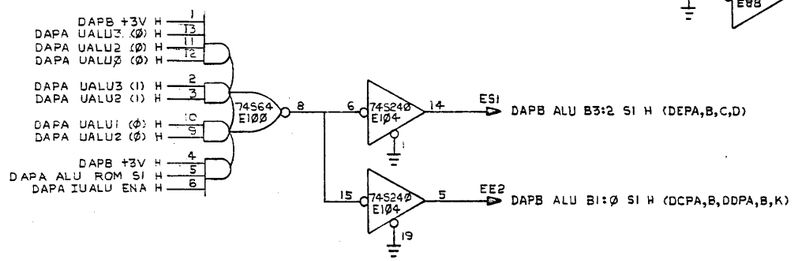

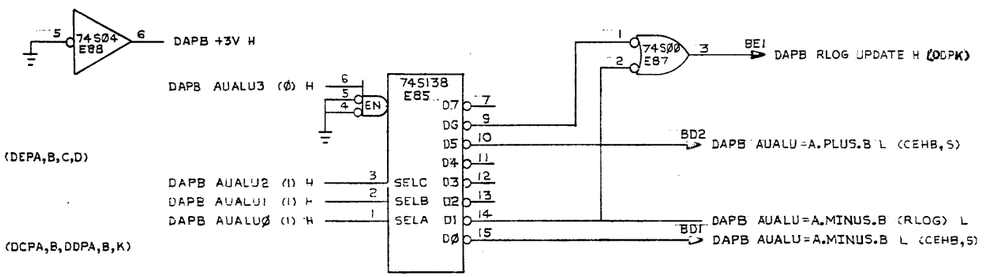

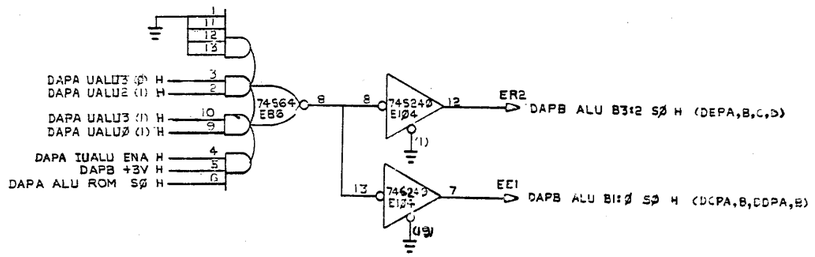

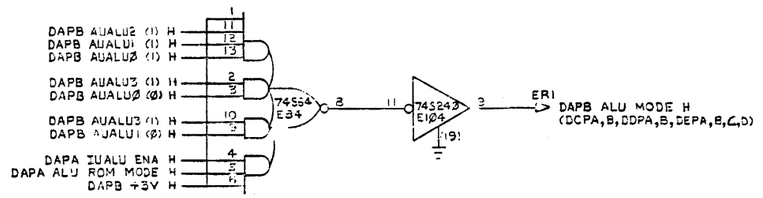

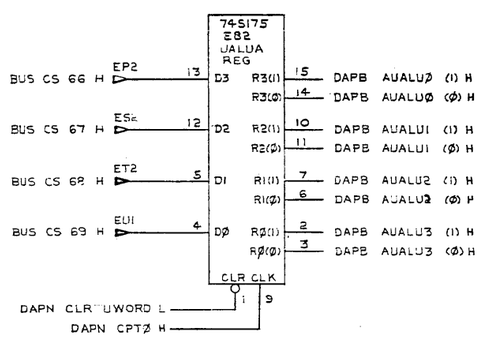

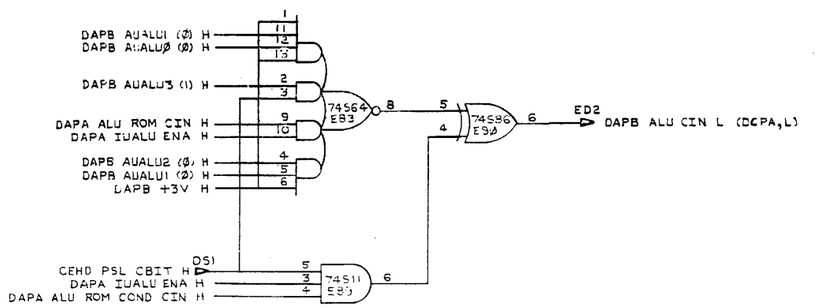

REVISIONS		
CHK	CHANGE NO.	REV.

(ALU CONTROL) (SLOT 13)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL (DAPB)	D	CS	M8229-Ø-1	B
SCALE NONE SHEET 5 OF 21	DIST.			

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* NOTE:
XX(1)L = XX(Ø)H

DAPC UDT1 (1) H
DAPC UDTØ (Ø) H
74S64 E110
DAPC BYTE CNTX L

DAPC UDT1 (1) H
DAPC UDTØ (1) H
DAPC CONTEXT=BYTE H

DAPC +3V H
DAPC UAMX1 (1) L
74S51 E114
FB2
DAPC AMX B3:2 S1 H (DEPA,B,C,D)

DAPC WORD CNTX L
DAPC BYTE CNTX L

+5V
R5 330Ω R6 330Ω R7 330Ω R8 330Ω
745175 E109
BUS CS 78 H → FA1 → D2 → R2(1) → 10 → DAPC UDTØ (1) H (DAPE)
R2(Ø) → 11 → DAPC UDTØ (Ø) H (DAPE)
BUS CS 79 H → FB1 → D3 → R3(1) → 15 → DAPC UDT1 (1) H (DAPE)
R3(Ø) → 14 → DAPC UDT1 (Ø) H (DAPE)
BUS CS 80 H → FC1 → D1 → R1(1) → 7 → DAPC UAMXØ (1) H
R1(Ø) → 6 → DAPC UAMXØ (Ø) H
BUS CS 81 H → FL1 → DØ → RØ(1) → 2 → DAPC UAMX1 (1) H
RØ(Ø) → 3 → DAPC UAMX1 (Ø) H
R37 820Ω R38 820Ω R39 820Ω R40 820Ω
CLR CLK
DAPC +3VA H
DAPN CPTØ H

DAPC UAMX1 (1) L
DAPC AMX←Ø L
74S51 E115
FD2
DAPC ZEXT B3:2 H (DEPA,B,C,D)
DAPC UAMXØ (1) L

DAPC UDT1 (Ø) H
DAPC UDTØ (Ø) H
74S64 E111
DAPC WORD CNTX L (DAPC)
DAPC UDT1 (1) H
DAPC UDTØ (1) H
DAPC CONTEXT=WORD H

74S64 E129
FD1
DAPC AMX B3:2 SØ H (DEPA,B,C,D)
DAPC UAMX1 (1) L
DAPC UAMXØ (1) L
DAPC L+Q+F+DF CNTX L
DAPC WORD CNTX L

DAPC UDTØ (Ø) H
DAPC UDT1 (Ø) H
74S64 E112
DAPC L+Q+F+DF CNTX L (DAPC)
DAPC UDT1 (1) H
DAPC UDTØ (1) H
DAPC CONTEXT=LONG+QUAD H

DAPC WORD CNTX L
74S04 E130
74S24 E128
FE1
DAPC AMX B1 S1 H (DDPA,B)
DAPC UAMX1 (1) L
DAPC UAMXØ (1) L
DAPC BYTE CNTX L
DAPA AMX←Ø L

DAPC +3V H
S1 SØ DSR
745194 E113
DAPC +3V H → DØ
IRCJ BYTE CONT H → EM1 → D1
IRCJ WORD CONT H → EN1 → D2
IRCJ LFDQ CONT H → EP1 → D3
R1(1) → DAPC CONTEXT=BYTE H
R2(1) → DAPC CONTEXT=WORD H
R3(1) → DAPC CONTEXT=LONG+QUAD H
CLR CLK DSL
DAPC +3VA H
DAPN CPTØ H

DAPA AMX←Ø L
DAPC L+Q+F+DF CNTX L
DAPC UAMXØ (1) L
DAPC UAMX1 (1) L
DAPC +3V H
74S64 E127
FJ1
DAPC ZEXT BØ H (DCPA,B)

DAPA AMX←Ø L
74S04 E130
74S64 E117
FF1
DAPC AMX B1 SØ H (DDPA,B)
DAPC UAMX1 (1) L
DAPC UAMXØ (1) L
DAPC UAMXØ (1) H
DAPC WORD CNTX L
DAPC UAMX1 (1) H

+5V
R77 332Ω
R78 680Ω
C52 .Ø47
DAPC +3VA H (DAPD,E,H,N)

74S04 E140
DAPC +3V H (DAPF)

DAPC UDT1 (1) H
DAPC UDTØ (1) H
74S08 E138
DAPC UDT-IDEP H (DAPE)

DAPC UAMX1 (1) L
DAPC UAMXØ (1) L
74S08 E139
FE2
DAPC AMX BØ SØ H (DCPA,B)

REVISIONS
CHK | CHANGE NO. | REV.

(AMX CONTROL) (SLOT 13)
TITLE (DAPC) DATA PATH CONTROL
SIZE D | CODE CS | NUMBER M8229-Ø-1 | REV. B
SCALE NONE | SHEET 6 OF 21 | DIST.

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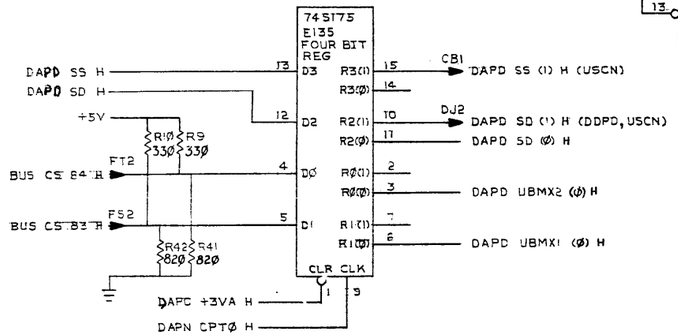
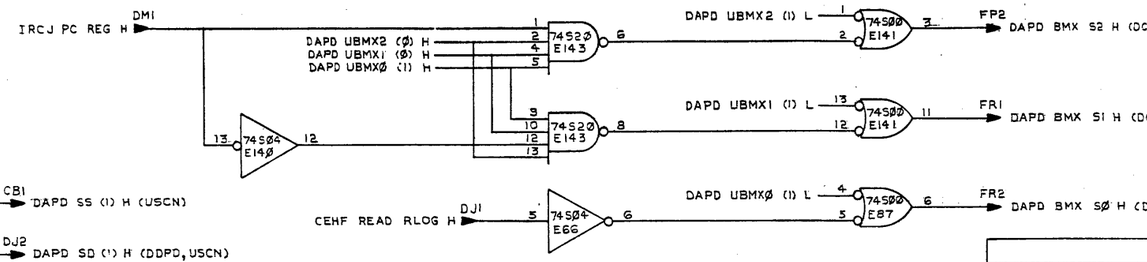
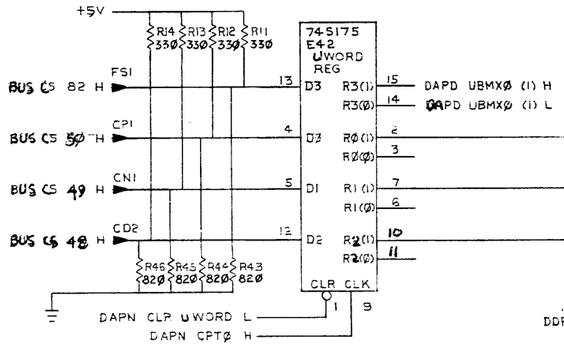


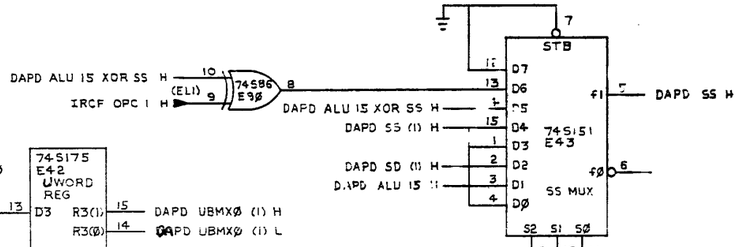


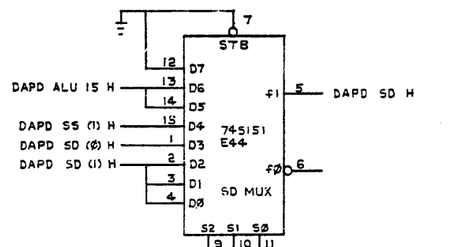
BMX CONTROL TRUTH TABLE									
UBMX				READ RLOG REQUEST	COND PC OR LB	BMX DATA	BMX SELECT		
HEX	2	1	Ø				S2	S1	SØ
Ø	L	L	L	L	L	MASK	L	L	L
Ø	L	L	L	H	L	RLOG & PCSV	L	L	H
1	L	L	H	L	L	LB	L	H	H
1	L	L	H	L	H	PC	H	L	H
2	L	H	L	L	X	PACKED F	H	H	L
3	L	H	H	L	X	LB	L	H	H
4	H	L	L	L	X	LC	H	L	L
5	H	L	H	L	X	PC	H	L	H
6	H	H	L	L	X	KMX	H	H	L
7	H	H	H	L	X	RBMX	H	H	H

X = DON'T CARE

NOTE:
XX(1)L = XX(Ø)H





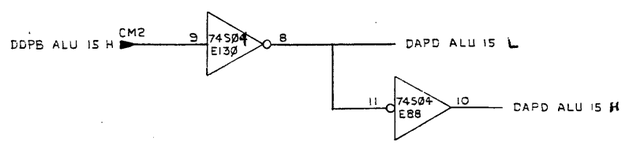


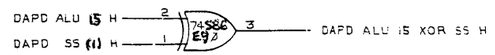
74S151 TRUTH TABLE			
S2	S1	SØ	FI
L	L	L	DØ
L	L	H	D1
L	H	L	D2
L	H	H	D3
H	L	L	D4
H	L	H	D5
H	H	L	D6
H	H	H	D7

DAPD USGN2 (1) H

DAPD USGN1 (1) H

DAPD USGNØ (1) H





REVISIONS		
CHK	CHANGE NO.	REV.

(BMX, SS & SD CONTROL) (SLOT 13)

TITLE DATA PATH CONTROL (DAPD)
SIZE D CODE CS NUMBER M8229-Ø-1 REV. B
SCALE NONE SHEET 7 OF 21 DIST.

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+5V
R15 330 R16 330 R17 330
BUS CS 85 H — FU1
BUS CS 86 H — FU2
BUS CS 87 H — FV2
R47 820 R48 820 R49 820
DAPC +3VA H
DAPN CPTØ H
74S175 E122 SHF UWORD REG
D3 D2 D1 DØ
R3(1) R3(Ø) R2(1) R2(Ø) R1(1) R1(Ø) RØ(1) RØ(Ø)
CLR CLK
DAPE SHFØ (1) H
DAPE SHFØ (Ø) H
DAPE SHF1 (Ø) H
DAPE SHF2 (Ø) H
74S138 E124 SHF DECODER
EN
SELC SELB SELA
D7 D6 D5 D4 D3 D2 D1 DØ
DAPE SHF=ALU [L3] L
DAPE SHF=ALU [R2] L
DAPE SHF=UDT L
DAPE SHF=ALU [R1] L
DAPE SHF=ALU [L1] L
DAPE SHF1 (1) H
DAPE SHF2 (1) H

DAPE SHF CNTX=WORD L
DAPE SHF CNTX=BYTE L
74S10 E142
DAPE SHF=ALU [L3] L
74S08 E139
74S240 E124
FF2
DAPE SHF LFT SI H (DCPA,B,DDPA,B DEPA,B,C,D)
DAPE SHF=UDT L
74S04 E140
DAPE SHF CNTX=L+F L
DAPE SHF=ALU [L1] L
DAPE SHF=ALU [R2] L
74S20 E125
FK2
DAPE SHF SØ H (DCPA,DDPA, DEPA)

DAPE SHF=ALU [L1] L
DAPE SHF=ALU [R1] L
DAPE SHF=ALU [R2] L
74S11 E126
DAPE SHF WITH USI L

DAPC +3V H
DAPE SHF2 (1) H
DAPE SHF1 (Ø) H
DAPE SHFØ (Ø) H
DAPE SHF2 (Ø) H
DAPE SHF1 (1) H
DAPE SHFØ (Ø) H
74S64 E123
74S241 E49
FK1
DAPE SHF RT L (DCPA,DDPJ,DEPA,

DAPC UDT1 (Ø) H
DAPC UDTØ (Ø) H
IRCJ SPI CON 2 H
DAPC UDT=IDEP H
74S51 E116
DAPE SHF CNTX=L+F L

DAPC UDTØ (1) H
IRCJ SPI CON 1 H
AL2
74S51 E115
DAPE SHF CNTX=WORD L

DAPC UDT1 (1) H
IRCJ SPI CON Ø H
AM1
74S51 E116
DAPE SHF CNTX=BYTE L

DAPH USI2 (Ø) H
DAPH USI1 (Ø) H
DAPH USIØ (1) H
74S11 E72
DAPE SHF USI=ALU 31 H

DAPE SHF=ALU [R2] L
DAPE SHF=ALU [R1] L
74S00 E139
DAPE SHF USI=ALU 31 H
74S08 E138
FP1
DAPE SHF[R] ALU 31 H (DEPU)

REVISIONS		
CHK	CHANGE NO.	REV.

(SHF MUX CONTROL) (SLOT 13)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL (DAPE)	D	CS	M8229-Ø-1	B
SCALE NONE SHEET 8 OF 21	DIST.			

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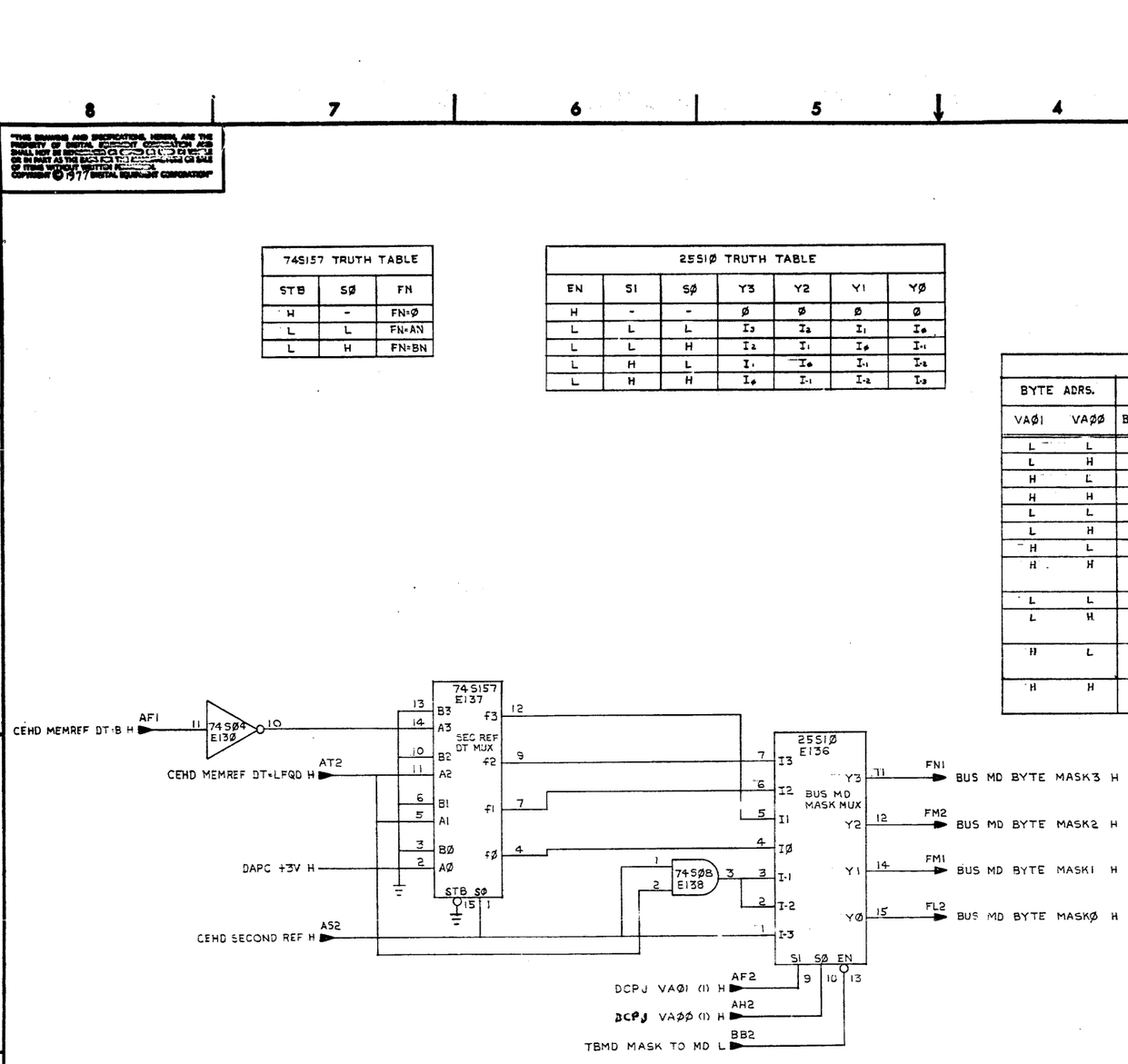
74S157 TRUTH TABLE		
STB	SØ	FN
H	-	FN=Ø
L	L	FN=AN
L	H	FN=BN

2551Ø TRUTH TABLE						
EN	S1	SØ	Y3	Y2	Y1	YØ
H	-	-	Ø	Ø	Ø	Ø
L	L	L	I_3	I_2	I_1	$I_Ø$
L	L	H	I_2	I_1	$I_Ø$	I_{-1}
L	H	L	I_1	$I_Ø$	I_{-1}	I_{-2}
L	H	H	$I_Ø$	I_{-1}	I_{-2}	I_{-3}

BUS MD BYTE MASK TRUTH TABLE

BYTE ADRS.		DATA TYPE			SEC. REF. REQUIRED	BUS MD BYTE MASK			
VAØ1	VAØØ	BYTE (B)	LONG (LQDF)	WORD (.NOT.B*.NOT.LQDF)		3	2	1	Ø
L	L	H	L	L	L	L	L	L	H
L	H	H	L	L	L	L	L	H	L
H	L	H	L	L	L	L	H	L	L
H	H	H	L	L	L	H	L	L	L
L	L	L	L	H	L	L	L	H	H
L	H	L	L	H	L	L	H	H	L
H	L	L	L	H	L	H	H	L	L
H	H	L	L	H	L	H	L	L	L
					H	L	L	L	H
L	L	L	H	L	L	H	H	H	H
L	H	L	H	L	L	H	H	H	L
					H	L	L	L	H
H	L	L	H	L	L	H	H	L	L
					H	L	L	H	H
H	H	L	H	L	L	H	L	L	L
					H	L	H	H	H



REVISIONS		
CHK	CHANGE NO.	REV.

(MASK CONTEXT) (SLOT 13)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL (DAPF)	D	CS	M8229-Ø-1	B
SCALE NONE	SHEET 9 OF 21	DIST.		

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DEPE QREG31 H — AR2 — 74S04 E60 — 74S04 E60 — 74S04 E59 — 74S04 E59 — DAPH DELAYED QREG31 H

DEPE DREG31 H — AS1 — 74S04 E60 — 74S04 E60 — 74S04 E59 — 74S04 E59 — DAPH DELAYED DREG31 H

DEPE QREGØØ H — AP2 — 74S04 E60 — 74S04 E60 — 74S04 E59 — 74S04 E59 — DAPH DELAYED QREGØØ H

DAPE SHF WITH USI L

DAPH +3V H
DAPH DELAYED QREG31 H
CEHB PSL NBIT H — DN1

74S151 E58 (STB, S2 ST SØ)
- f1 — CT2 — DAPH SHF USI INPUT H (DCPA,DEPD)
- fØ — DAPH USI2 H
- DAPH USI1 H
- DAPH USIØ H

CUI — DAPH URMX (1) H (DCPA,DDPA,DEPA)

+5V — R18 330Ø, R19 330Ø, R20 330Ø, R21 330Ø

74S175 E55 UWORD

BUS CS 77 H	EB1	D3	R3(1), R3(Ø)
BUS CS 55 H	DD2	D2	R2(1), R2(Ø)
BUS CS 56 H	DF2	D1	R1(1), R1(Ø)
BUS CS 57 H	DH2	DØ	RØ(1), RØ(Ø)

R50 82Ø, R51 82Ø, R52 82Ø, R53 82Ø

CLR CLK — DAPC +3VA H — DAPN CPTØ H

- R3(1) — DAPH USIØ (1) H (DEPE) / DCPL ALU CARRY 31 L
- R3(Ø) — DAPH USI1 (1) H
- R2(1) — DAPH USI1 (Ø) H (DEPE
- R2(Ø) — DAPH USI2 (1) H
- R1(1) — DAPH USI2 (Ø) H (DEPE)
- R1(Ø)
- RØ(1)
- RØ(Ø)

74S04 E48 — 74S04 E48 — 74S04 E48

AK2 — 74S04 E23

DAPH +3V H
DAPH DELAYED DREG31 H

74S151 E57 (STB, S2 S1 SØ)
- f1 — 74S08 E22 — CS2 — DAPH Q SHIFT INPUT H (DCPF,DEPE)
- fØ — DAPH USI2 H
- DAPH USI1 H
- DAPH USIØ H

74S175 E47 PREVIOUS ALU REG

DCPJ ALU BUFF Ø1 L — DP1 — D1 — R1(Ø), R1(1) — DAPH SAVED ALUØ1 (1) H

DCPJ ALU BUFF ØØ L — DS2 — DØ — RØ(Ø), RØ(1) — DAPH SAVED ALUØØ (1) H

CLR CLK — DAPC +3VA H — DAPN CPTØA H

74S04 E45 — 74S04 E45 — 74S51 E46 — 74S04 E45 — DAPN ALUØØ/ALUØ1 H

74S151 E56 (STB, S2 S1 SØ)
- f1 — 74S08 E22 — CS1 — DAPH D SHIFT INPUT H (DBPE)
- fØ — DAPH DELAYED QREGØØ H

74S04 E45 — DAPH +3V H

74S74 E61 — DAPN CPT2 H — DAPN CPTØA L — DAPH D SHF WITH ALUØØ (Ø) H

74S08 E73 — DAPH USI1 (1) H — DAPH USI2 (1) H — 74S08 E78

74S151 TRUTH TABLE

STB	S2	S1	SØ	FN
H	X	X	X	Ø
L	L	L	L	FN=DØ
L	L	L	H	FN=D1
L	L	H	L	FN=D2
L	L	H	H	FN=D3
L	H	L	L	FN=D4
L	H	L	H	FN=D5
L	H	H	L	FN=D6
L	H	H	H	FN=D7

REVISIONS		
CHK	CHANGE NO.	REV.

(USI SHIFT CONTROL) (SLOT 13)

TITLE: DATA PATH CONTROL (DAPH)	SIZE D	CODE CS	NUMBER M8229-Ø-1	REV B
SCALE NONE	SHEET 10 OF 21	DIST		

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+5V
R24 330 R23 330 R22 330
74S175 E29 USPO REG
CD1
BUS CS 41 H
BUS CS 40 H
BV2
BUS CS 39 H
D1 D2 D3 D0 CLR CLK
R1(1) R1(0) R2(1) R2(0) R3(1) R3(0) R0(1) R0(0)
DAPJ USPO 6 (1) H
DAPJ USPO 6 (0) H
DAPJ USPO 5 (1) H
DAPJ USPO 5 (0) H
DAPJ USPO 4 (1) H
DAPJ USPO 4 (0) H
R56 820 R55 820 R54 820

DAPJ +3V H
74S138 E5 USPO DECODE
SELC SELB SELA
D7 D6 D5 D4 D3 D2 D1 D0
DAPJ WRITE RAB [RNJ L
DAPJ WRITE RC [RNJ L
DAPJ RC ADR3 = SC L (DAPN)

74S04 E6
74S00 E7
DAPJ USPO 3 (1) H
DAPJ WRITE RAB [ACNJ [UDTJ L
DAPJ WRITE RC [SCJ L
74S20 E21
DAPJ USPO 0 (1) H
DAPJ USPO 1 (1) H
DAPJ USPO 2 (1) H
DAPJ USPO 3 (0) H

DAPJ WRITE RC [RNJ L
DAPJ WRITE RC [RNJ A L
DAPJ WRITE RC [SCJ L
74S11 E8
DAPJ WRITE RC L (DAPK)
DAPJ WRITE RAB [ACNJ [UDTJ L
DAPJ WRITE RAB [RNJ L
DAPJ WRITE RAB [RIJ L
DAPJ WRITE RAB L (DAPK)
DAPJ USPO 6 (0) H
DAPJ USPO 5 (0) H
DAPJ USPO 3 (1) H
74S10 E35
DAPJ ACN ADR5 L
DAPJ USPO 6 (1) H
DAPJ USPO 5 (1) H
74S08 E22
DAPJ ENA RI ADR5 H

+5V
R28 330 R27 330 R26 330 R25 330
74S175 E17 USPO REG
BU2
BUS CS 38 H
BU1
BUS CS 37 H
BT2
BUS CS 36 H
BS2
BUS CS 35 H
D2 D3 D1 D0 CLR CLK
R2(1) R2(0) R3(1) R3(0) R1(1) R1(0) R0(1) R0(0)
DAPJ USPO 3 (1) H
DAPJ USPO 3 (0) H
DAPJ USPO 2 (1) H
DAPJ USPO 1 (1) H
DAPJ USPO 1 (0) H
DAPJ USPO 0 (1) H
DAPJ USPO 0 (0) H
R60 820 R59 820 R58 820 R57 820

74S175 E15
DAPJ AUSPO 3 (1) H
DAPJ AUSPO 3 (0) H
DAPJ AUSPO 2 (1) H
DAPJ AUSPO 2 (0) H
DAPJ AUSPO 1 (1) H
DAPJ AUSPO 1 (0) H
DAPJ AUSPO 0 (1) H
DAPJ AUSPO 0 (0) H
DAPN CLR UWORD L
DAPN CPTØA H

74S04 E6
DAPJ +3V H
74S133 E22
DAPJ USPO 0 (0) H
DAPN DISA LATCH CNTRL (1) L
DAPJ USPO 6 (0) H
DAPJ USPO 5 (0) H
DAPJ USPO 4 (0) H
DAPJ USPO 3 (0) H
DAPJ USPO 2 (1) H
DAPJ USPO 1 (1) H
74S20 E21
DAPJ USPO 6 (0) H
DAPJ USPO 5 (0) H
DAPJ USPO 4 (0) H
74S20 E34
DAPJ USPO 6 (1) H
DAPJ USPO 5 (1) H
DAPJ USPO 4 (1) H
DAPJ WRITE RAB [RIJ L
74S10 E35
CR2
DAPJ LOAD LC H (DCPF, DDPF, DEPP)

74S04 E6
74S133 E19
DAPN DISA LATCH CNTRL (1) L
DAPJ USPO 6 (0) H
DAPJ USPO 5 (0) H
DAPJ USPO 4 (0) H
DAPJ USPO 3 (1) H
74S20 E34
CP2
DAPJ LOAD LA H (DCPF, DDPF, DEPP)
74S10 E35
CR1
DAPJ LOAD LB H (DCPF, DDPF, DEPP)
74S04 E6
74S133 E32
DAPJ USPO 6 (0) H
DAPJ USPO 5 (0) H
DAPJ USPO 4 (1) H
DAPJ USPO 3 (0) H
74S20 E33
DAPJ USPO 6 (1) H
DAPJ USPO 5 (0) H
DAPJ USPO 4 (0) H
DAPJ LOAD LA, LB [RNJ L
74S20 E33
DAPJ USPO 6 (1) H
DAPJ USPO 5 (1) H
DAPJ USPO 4 (0) H
DAPJ WRITE RC [RNJ A L

(USPO CONTROL) (SLOT 13)

REVISIONS
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
(DAPJ) DATA PATH CONTROL	D	CS	M8229 Ø-1	B
SCALE NONE	SHEET 11 OF 21		DIST.	

DIST CODE NUMBER D CS M8229-0-1 REV. B

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DAPP UQK3 (1) H
DAPP UQK2 (Ø) H
DAPP UQK1 (1) H
DAPP UQKØ (1) H
74S2Ø E1Ø5
CE2
DBPA LOAD ACC D L
74S5ØØ E131
DAPN CPT2 H
74S5ØØ E131
74S574 E144
FJ2
DAPK ENA ACC D (1) L D2482
DAPJ WRITE RC L
74S241 E43
CMI
DAPK WRT RC EN L (DCPE,DDPE,DEPJ,K)
DAPP +3V H
74S5Ø4 E13Ø
74S5ØØ E131
74S574 E144
DAPN PCLK L
FH2
DAPK ENABLE DFMX (1) L (DCPC,DDPC,DEPL,M)
DAPP +3V H
DAPK +3V H (DAPL)
74S5Ø4 E45
74S158 E02
RA,RB WRITE BYTE ENABLE MUX
DAPC L+Q+F+DF CNTX L
74S5Ø4 E1Ø4
DAPC WORD CNTX L
74S2Ø E141
DAPP +3V H
74S241 E49
BS1
DAPK RA RB WRT B 2 L (DAPL,DEPA,B,C,D,J,K)
74S241 E49
BR2
DAPK RA RB WRT B 1 L (DAPL,DDPA,B,E)
74S241 E49
BR1
DAPK RA RB WRT B Ø L (DAPL,DCPA,B,E)
DAPJ WRITE RAB L

74S158 TRUTH TABLE		
STB	SØ	FN
H	X	FN=Ø
L	L	FN=AN
L	H	FN=BN

REVISIONS		
CHK	CHANGE NO.	REV.

(RA. RB. RC WRITE) (SLOT 13)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL (DAPK)	D	CS	MB229-Ø-1	B
SCALE NONE SHEET 12 OF 21	DIST.			

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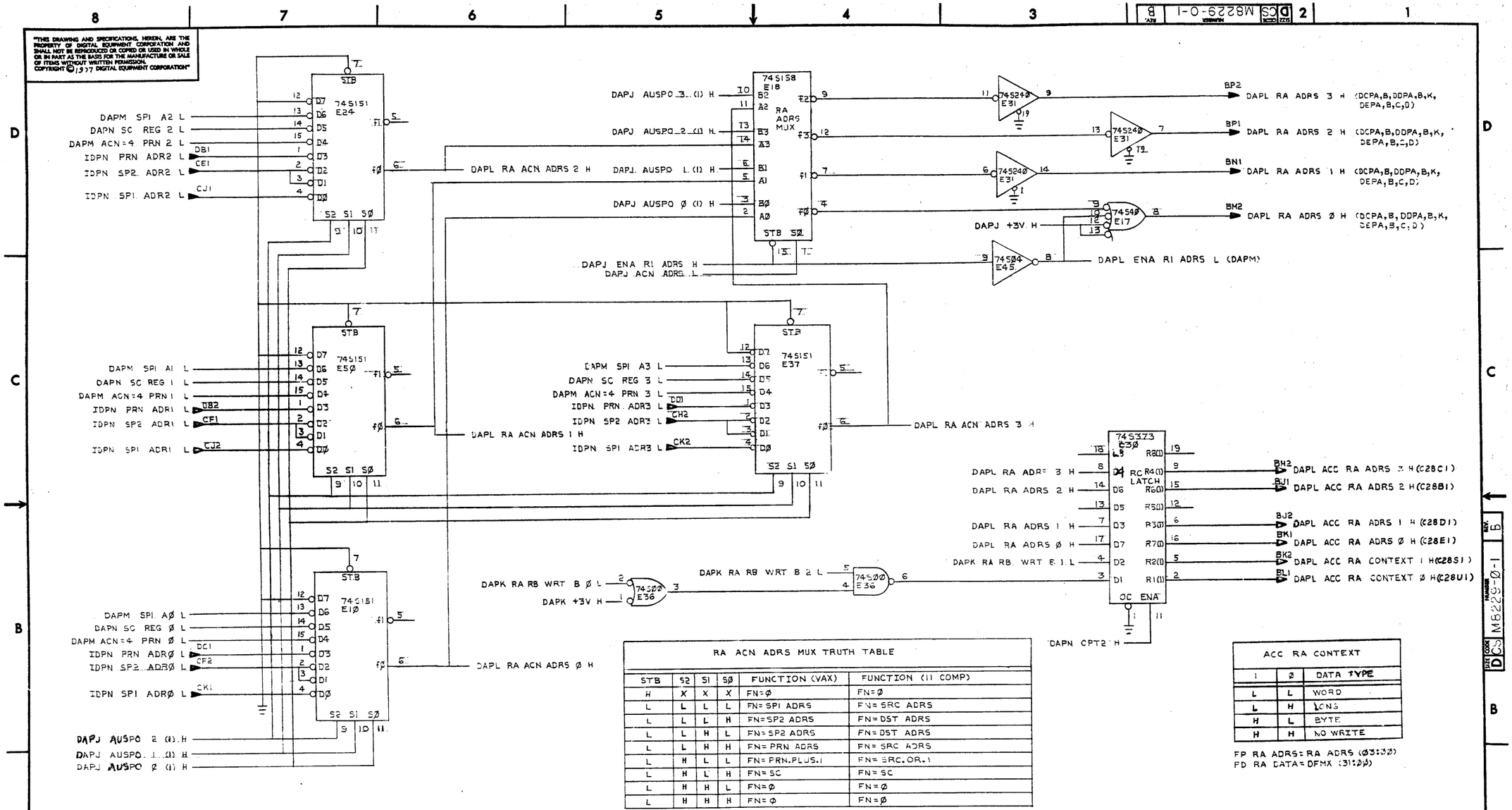

RA ACN ADRS MUX TRUTH TABLE

STB	S2	S1	SØ	FUNCTION (VAX)	FUNCTION (11 COMP)
H	X	X	X	FN=Ø	FN=Ø
L	L	L	L	FN=SP1 ADRS	FN=SRC ADRS
L	L	L	H	FN=SP2 ADRS	FN=DST ADRS
L	L	H	L	FN=SP2 ADRS	FN=DST ADRS
L	L	H	H	FN=PRN ADRS	FN=SRC ADRS
L	H	L	L	FN=PRN.PLUS.1	FN=SRC.OR.1
L	H	L	H	FN=SC	FN=SC
L	H	H	L	FN=Ø	FN=Ø
L	H	H	H	FN=Ø	FN=Ø

ACC RA CONTEXT

1	Ø	DATA TYPE
L	L	WORD
L	H	LONG
H	L	BYTE
H	H	NO WRITE

FP RA ADRS=RA ADRS (Ø3:3Ø)
FD RA DATA=DFMX (31:2Ø)

(RA ADDRESS) (SLOT 13)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
(DAPL) DATA PATH CONTROL	D	DCS	M8229-Ø-1	B
SCALE NONE	SHEET 13 OF 21		DIST.	

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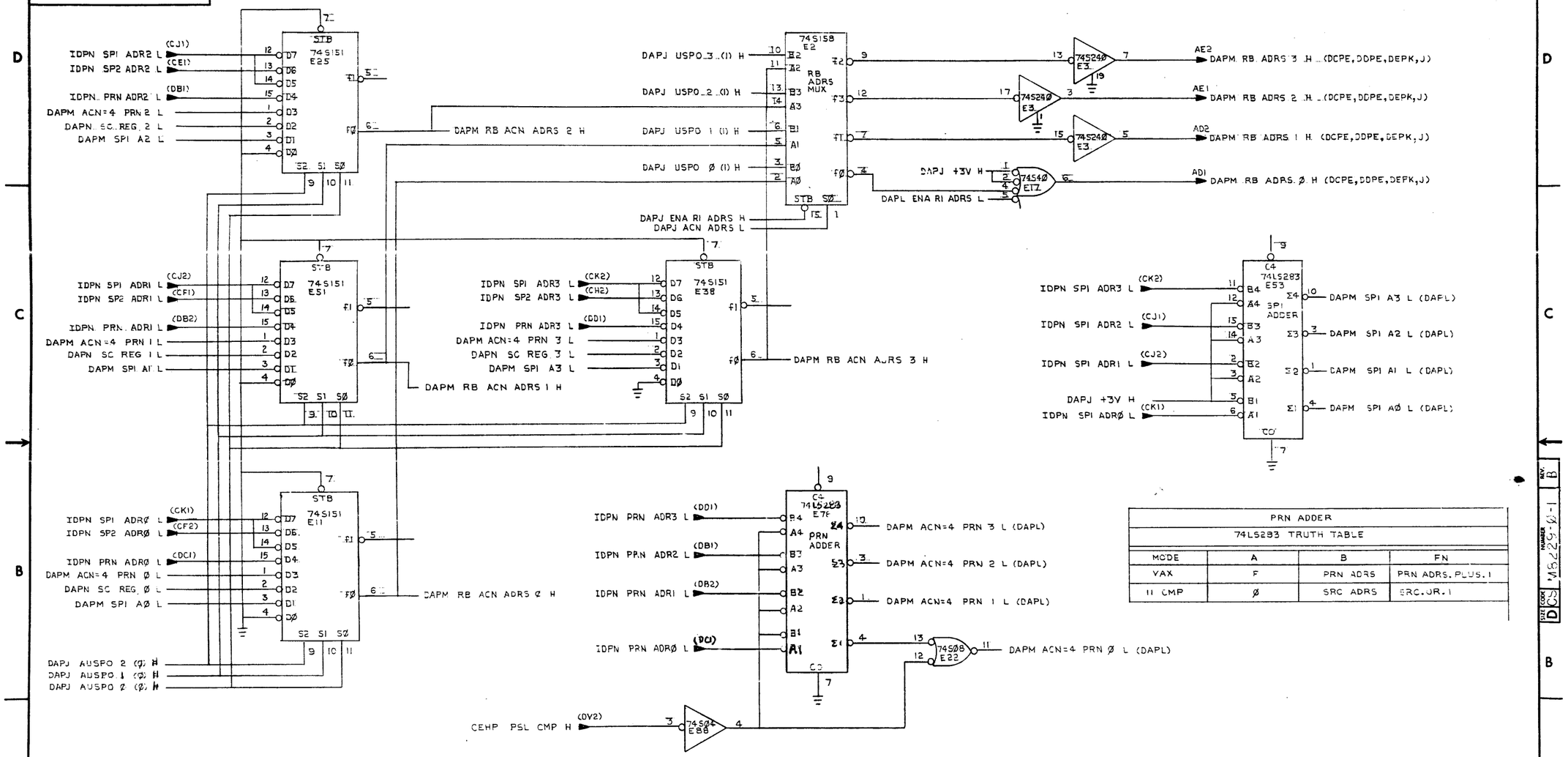

PRN ADDER			
74LS283 TRUTH TABLE			
MODE	A	B	FN
VAX	F	PRN ADRS	PRN ADRS. PLUS. 1
11 CMP	Ø	SRC ADRS	SRC.JR.1

(RB ADDRESS) (SLOT 13)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL (DAPM)	D	CS	M8229-Ø-1	B
SCALE NONE SHEET 14 OF 21	DIST.			

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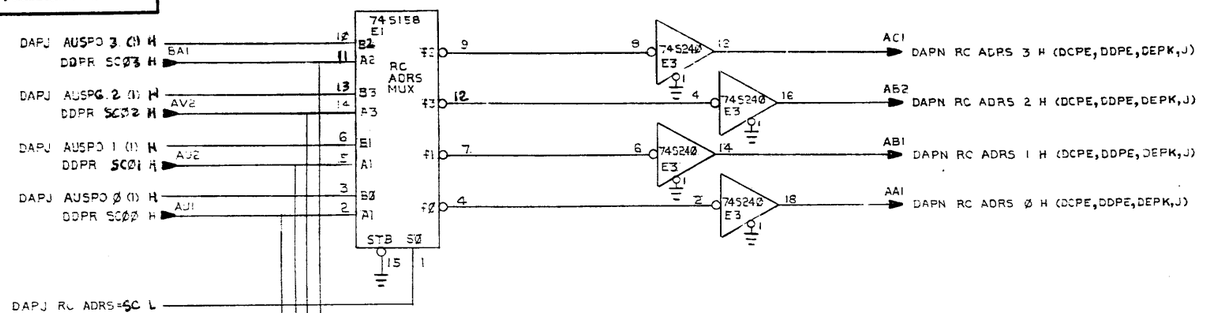

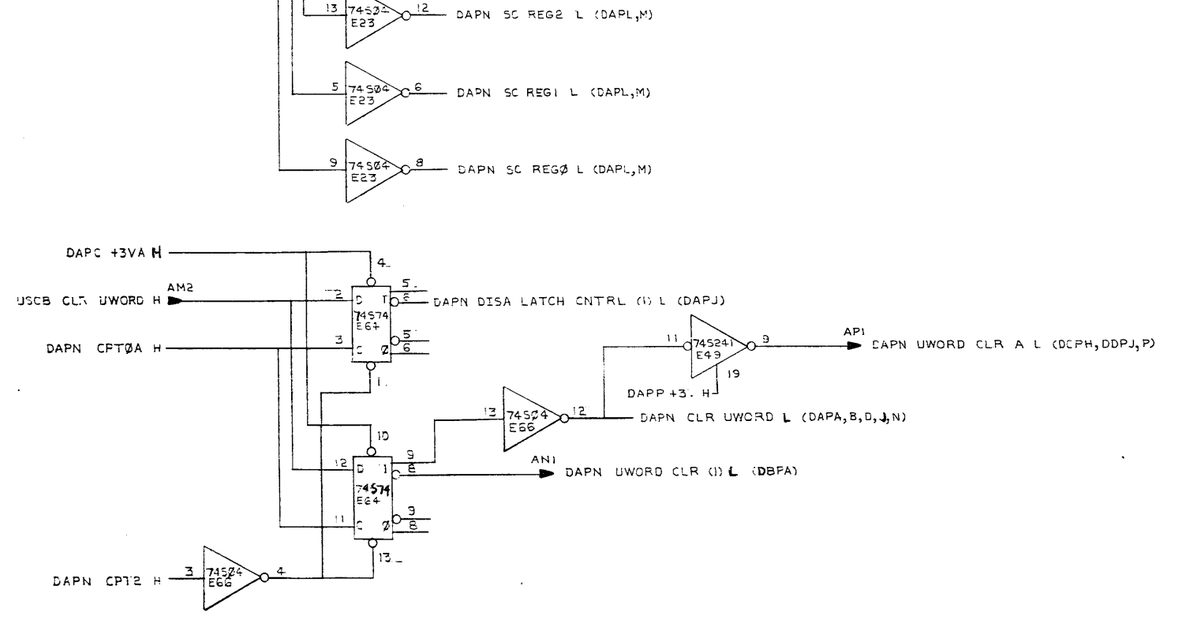

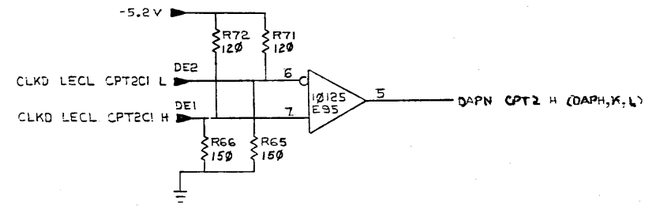

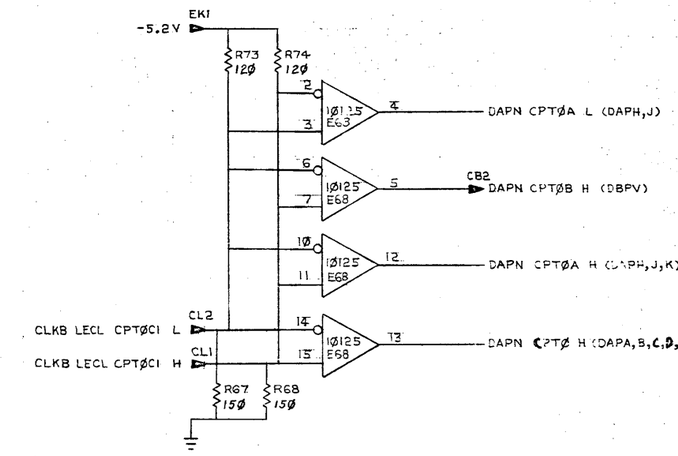

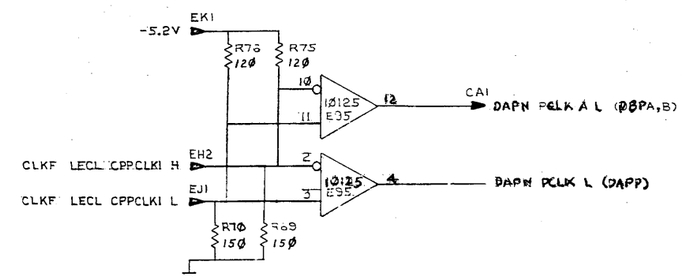

REVISIONS		
CHK	CHANGE NO.	REV.

(RC ADDRESS AND CLOCKS) (SLOT 13)

TITLE		SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL	(DAPN)	D	CS	M8229-Ø-1	B
SCALE NONE	SHEET 15 OF 21	DIST.			

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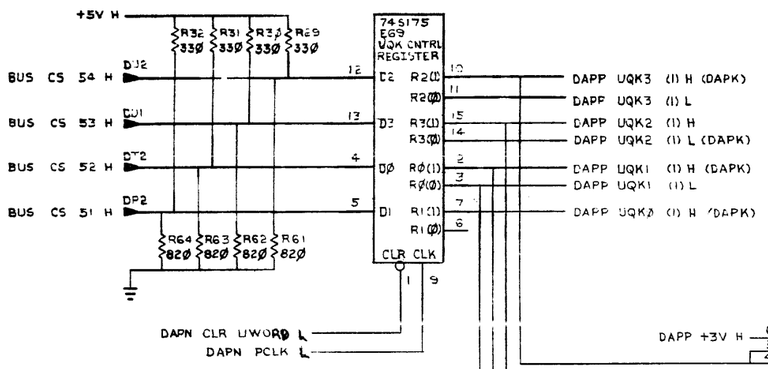

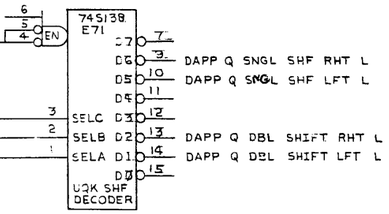

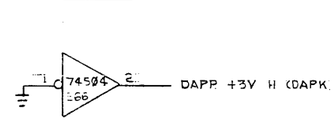

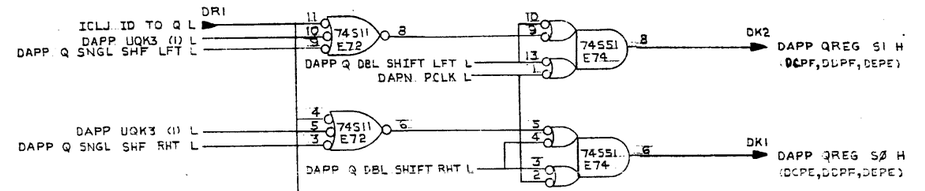

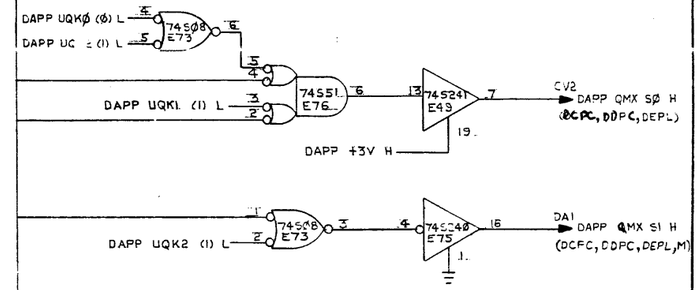

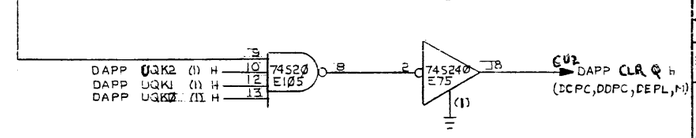

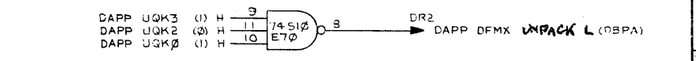

UQK CONTROL

	UQK 3	UQK 2	UQK 1	UQK Ø	QMX S1	QMX SØ	QREG S1	QREG SØ	UQK FUNCTION
Ø	L	L	L	L	X	X	L	L	NO OPERATION
1	L	L	L	H	X	X	H	L	DBL SHIFT LEFT
2	L	L	H	L	X	X	L	H	DBL SHIFT RIGHT
3	L	L	H	H	X	X	L	L	RESERVED
4	L	H	L	L	X	X	L	L	RESERVED
5	L	H	L	H	X	X	H	L	SINGLE SHIFT LEFT
6	L	H	H	L	X	X	L	H	SINGLE SHIFT RIGHT
7	L	H	H	H	X	X	L	L	RESERVED
8	H	L	L	L	L	L	H	H	LOAD SHF (INTEGER)
9	H	L	L	H	L	L	H	H	LOAD SHF (UNPACKED F)
A	H	L	H	L	L	H	H	H	LOAD DECIMAL CONST.
B	H	L	H	H	L	L	H	H	LOAD ACC DATA
C	H	H	L	L	H	L	H	H	LOAD D
D	H	H	L	H	H	L	H	H	RESERVED
E	H	H	H	L	H	H	H	H	LOAD ID BUS
F	H	H	H	H	H	H	H	H	LOAD ZEROES

X=DON'T CARE STATE

(QREG CONTROL) (SLOT 13)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL (DAPP)	D	CS	M8229-Ø-1	B
SCALE NONE	SHEET 16 OF 21		DIST.	

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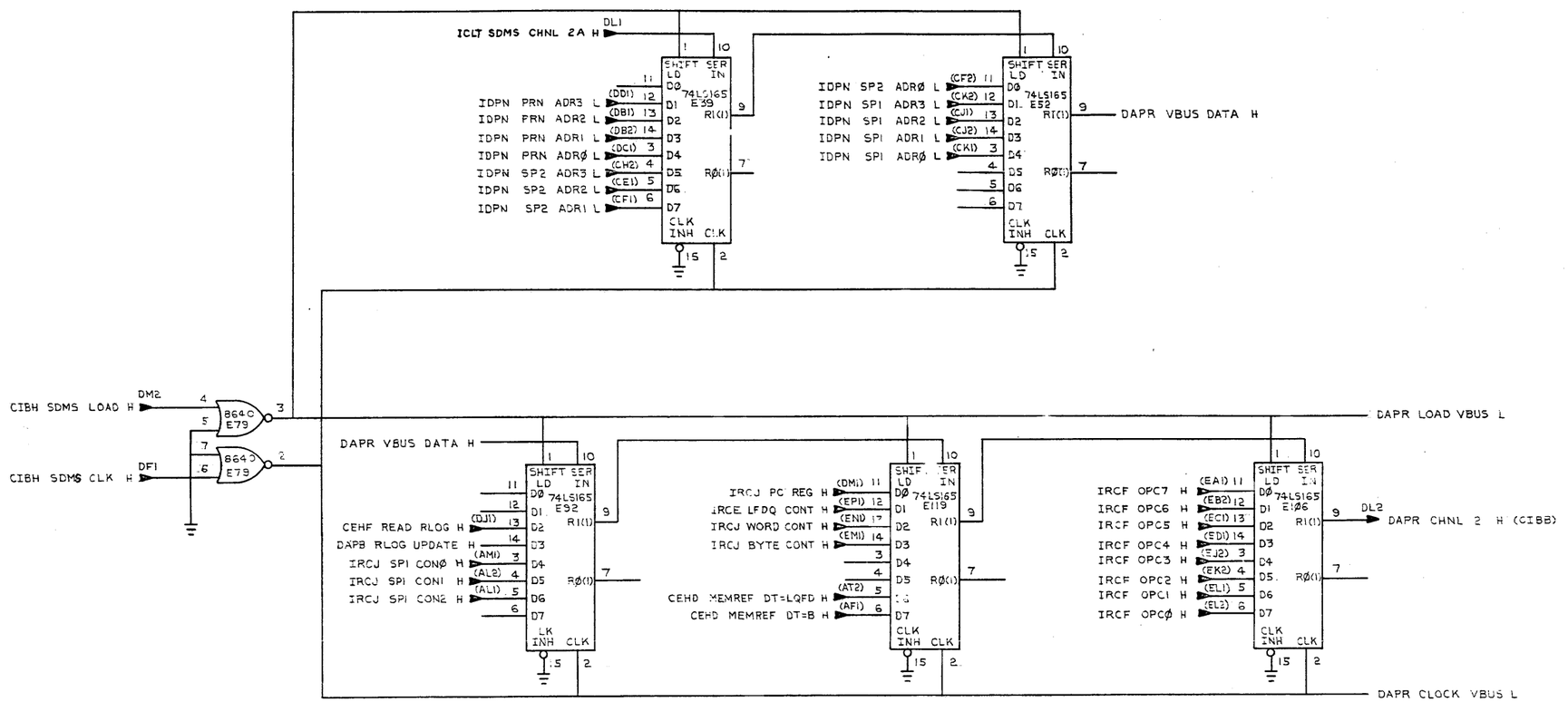

(VBUS REGISTER) (SLOT 13)

REVISIONS		
CHK	CHANGE NO.	REV.
	•	

TITLE	SIZE	CODE	NUMBER	REV.
(DAPR) DATA PATH CONTROL	D	CS	M8229-0-1	B
SCALE NONE SHEET 17 OF 21	DIST.			

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ALU INSTR. DEPENDENT ROM ($\overline{CM}$)

ROM ADDR	OP-CODE	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	FUNCTION
ØØ	HALT	L	L	L	L	L	L	L	L	X
Ø1	NOP	L	L	L	L	L	L	L	L	X
Ø2	REI	L	L	L	L	L	L	L	L	X
Ø3	BPT	L	L	L	L	L	L	L	L	X
Ø4	RET	L	L	L	L	L	L	L	L	X
Ø5	RSB	L	L	L	L	L	L	L	L	X
Ø6	LDPCTX	L	L	L	L	L	L	L	L	X
Ø7	SVPCTX	L	L	L	L	L	L	L	L	X
Ø8	—	L	L	L	L	L	L	L	L	X
Ø9	—	L	L	L	L	L	L	L	L	X
ØA	—	L	L	L	L	L	L	L	L	X
ØB	CRC	L	L	L	L	L	L	L	L	X
ØC	PROBER	L	L	L	L	L	L	L	L	X
ØD	PROBEW	L	L	L	L	L	L	L	L	X
ØE	INSQUE	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
ØF	REMQUE	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
1Ø	BSBB	L	L	L	L	L	L	L	L	X
11	BRB	L	L	L	L	L	L	L	L	X
12	BNEQ	L	L	L	L	L	L	L	L	X
13	BEQL	L	L	L	L	L	L	L	L	X
14	BGTR	L	L	L	L	L	L	L	L	X
15	BLEQ	L	L	L	L	L	L	L	L	X
16	JSB	L	L	L	L	L	L	L	L	X
17	JMP	L	L	L	L	L	L	L	L	X
18	BGEQ	L	L	L	L	L	L	L	L	X
19	BLSS	L	L	L	L	L	L	L	L	X
1A	BGTRU	L	L	L	L	L	L	L	L	X
1B	BLEQU	L	L	L	L	L	L	L	L	X
1C	BVC	L	L	L	L	L	L	L	L	X
1D	BVS	L	L	L	L	L	L	L	L	X
1E	BCC	L	L	L	L	L	L	L	L	X
1F	BCS	L	L	L	L	L	L	L	L	X

ROM ADDR	OP-CODE	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	FUNCTION
2Ø	ADDP4	L	H	L	L	L	H	H	L	A.MIN.B.MIN.PSLC
21	ADDP6	L	H	L	L	L	H	H	L	A.MIN.B.MIN.PSLC
22	SUBP4	L	H	L	L	L	H	H	L	A.MIN.B.MIN.PSLC
23	SUBP6	L	H	L	L	L	H	H	L	A.MIN.B.MIN.PSLC
24	CVTPN	L	L	L	L	H	H	H	H	A.MINUS.1
25	MULP	L	H	L	L	L	H	H	L	A.MIN.B.MIN.PSLC
26	CVTNP	L	L	L	L	H	H	H	H	A.MINUS.1
27	DIVP	L	H	L	L	L	H	H	L	A.MIN.B.MIN.PSLC
28	MOVC3	L	L	L	L	L	L	L	L	X
29	CMPC3	L	L	L	L	L	L	L	L	X
2A	SCANC	L	L	L	L	L	L	L	L	X
2B	SPANC	L	L	L	L	L	L	L	L	X
2C	MOVC5	L	L	L	L	L	L	L	L	X
2D	CMPC5	L	L	L	L	L	L	L	L	X
2E	MOVTC	L	L	L	L	L	L	L	L	X
2F	MOVTUC	L	L	L	L	L	L	L	L	X
3Ø	BSBW	L	L	L	L	L	L	L	L	X
31	BRW	L	L	L	L	L	L	L	L	X
32	CVTWL	L	L	L	L	L	L	L	L	X
33	CVTWB	L	L	L	L	L	L	L	L	X
34	MOVP	L	L	L	L	H	H	H	H	A.MINUS.1
35	CMPP3	L	L	L	L	H	H	H	H	A.MINUS.1
36	CVTPL	L	L	L	L	H	H	H	H	A.MINUS.1
37	CMPP4	L	L	L	L	H	H	H	H	A.MINUS.1
38	EDITPC	L	L	L	L	L	L	L	L	X
39	MATCHC	L	L	L	L	L	L	L	L	X
3A	LOCC	L	L	L	L	L	L	L	L	X
3B	SKPC	L	L	L	L	L	L	L	L	X
3C	MOVZWL	L	L	L	L	L	L	L	L	X
3D	ACBW	L	L	L	L	L	L	L	L	X
3E	MOVAW	L	L	L	H	H	L	H	L	B
3F	PUSHAW	L	L	L	H	H	L	H	L	B

ROM ADDR	OP-CODE	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	FUNCTION
4Ø	ADDF2	L	L	L	L	L	L	L	L	X
41	ADDF3	L	L	L	L	L	L	L	L	X
42	SUBF2	L	L	L	L	L	L	L	L	X
43	SUBF3	L	L	L	L	L	L	L	L	X
44	MULF2	L	L	L	L	L	L	L	L	X
45	MULF3	L	L	L	L	L	L	L	L	X
46	DIVF2	L	L	L	L	L	L	L	L	X
47	DIVF3	L	L	L	L	L	L	L	L	X
48	CVTFB	L	L	L	L	H	H	H	H	A.MIN.1
49	CVTFW	L	L	L	L	H	H	H	H	A.MIN.1
4A	CVTFL	L	L	L	L	H	H	H	H	A.MIN.1
4B	CVTRFL	L	L	L	L	H	H	H	H	A.MIN.1
4C	CVTBF	L	L	L	L	H	H	H	H	A.MIN.1
4D	CVTWF	L	L	L	L	H	H	H	H	A.MIN.1
4E	CVTLF	L	L	L	L	H	H	H	H	A.MIN.1
4F	ACBF	L	L	L	L	L	L	L	L	X
5Ø	MOVF	L	L	L	H	H	H	H	H	A
51	CMPF	L	L	L	L	L	L	L	L	X
52	MNEGF	L	L	L	H	L	H	H	L	A⊕B
53	TSTF	L	L	L	H	H	L	H	L	B
54	EMODF	L	L	L	L	L	L	L	L	X
55	POLYF	L	L	L	L	L	L	L	L	X
56	CVTFD	L	L	L	H	H	H	H	H	A.MIN.1
57	—	L	L	L	L	L	L	L	L	X
58	—	L	L	L	L	L	L	L	L	X
59	—	L	L	L	L	L	L	L	L	X
5A	—	L	L	L	L	L	L	L	L	X
5B	—	L	L	L	L	L	L	L	L	X
5C	—	L	L	L	L	L	L	L	L	X
5D	—	L	L	L	L	L	L	L	L	X
5E	—	L	L	L	L	L	L	L	L	X
5F	—	L	L	L	L	L	L	L	L	X

ROM ADDR	OP-CODE	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	FUNCTION
6Ø	ADDD2	L	L	L	L	L	L	L	L	X
61	ADDD3	L	L	L	L	L	L	L	L	X
62	SUBD2	L	L	L	L	L	L	L	L	X
63	SUBD3	L	L	L	L	L	L	L	L	X
64	MULD2	L	L	L	L	L	L	L	L	X
65	MULD3	L	L	L	L	L	L	L	L	X
66	DIVD2	L	H	L	L	L	H	H	L	A.MIN.B.MIN.PSLC
67	DIVD3	L	H	L	L	L	H	H	L	A.MIN.B.MIN.PSLC
68	CVTDB	L	L	L	L	H	H	H	H	A.MIN.1
69	CVTDW	L	L	L	L	H	H	H	H	A.MIN.1
6A	CVTDL	L	L	L	L	H	H	H	H	A.MIN.1
6B	CVTRDL	L	L	L	L	H	H	H	H	A.MIN.1
6C	CVTBD	L	L	L	L	H	H	H	H	A.MIN.1
6D	CVTWD	L	L	L	L	H	H	H	H	A.MIN.1
6E	CVTLD	L	L	L	L	H	H	H	H	A.MIN.1
6F	ACBD	L	L	L	L	L	L	L	—	X
7Ø	MOVD	L	L	L	H	H	H	H	H	A
71	CMPD	L	L	L	L	L	L	L	L	X
72	MNEGD	L	L	L	H	L	H	H	L	A⊕B
73	TSTD	L	L	L	H	H	L	H	L	B
74	EMODD	L	L	L	L	L	L	L	L	X
75	POLYD	L	L	L	L	L	L	L	L	X
76	CVTDF	L	L	L	L	H	H	H	H	A.MIN.1
77	—	L	L	L	L	L	L	L	L	X
78	ASHL	L	L	L	L	L	L	L	L	X
79	ASHQ	L	L	L	L	L	L	L	L	X
7A	EMUL	L	L	L	L	L	L	L	L	X
7B	EDIV	L	L	L	L	L	L	L	L	X
7C	CLRQ	L	L	L	L	L	L	L	L	X
7D	MOVQ	L	L	L	H	H	L	H	L	B
7E	MOVAQ	L	L	L	H	H	L	H	L	B
7F	PUSHAQ	L	L	L	H	H	L	H	L	B

REVISIONS		
CHK	CHANGE NO.	REV.

(VAX ALU INSTR. DEP. ROM – 23026B1-ØØ) (SLOT 13)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL	D	CS	M8229-Ø-1	B
SCALE NONE	SHEET 18 OF 21		DIST.	

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ALU INSTR. DEPENDENT ROM ($\overline{CM}$)

ROM ADDR	OP-CODE	ALU ROM AMX ← Ø H	ALU ROM COND CIN H	ALU ROM CIN H	ALU ROM MODE H	ALU ROM S3 H	ALU ROM S2 H	ALU ROM S1 H	ALU ROM SØ H	FUNCTION
		ROM DATA								
		M7	M6	M5	M4	M3	M2	M1	MØ	
8Ø	ADDB2	L	L	L	L	H	L	L	H	A.PL.B
81	ADDB3	L	L	L	L	H	L	L	H	A.PL.B
82	SUBB2	L	L	H	L	L	H	H	L	A.MIN.B
83	SUBB3	L	L	H	L	L	H	H	L	A.MIN.B
84	MULB2	L	L	L	L	L	L	L	L	X
85	MULB3	L	L	L	L	L	L	L	L	X
86	DIVB2	L	L	L	L	L	L	L	L	X
87	DIVB3	L	L	L	L	L	L	L	L	X
88	BISB2	L	L	L	H	H	H	H	L	A+B
89	BISB3	L	L	L	H	H	H	H	L	A+B
8A	BICB2	L	L	L	H	L	H	H	H	A✱$\overline{B}$
8B	BICB3	L	L	L	H	L	H	H	H	A✱$\overline{B}$
8C	XORB2	L	L	L	H	L	H	H	L	A⊕B
8D	XORB3	L	L	L	H	L	H	H	L	A⊕B
8E	MNEGB	H	L	H	L	L	H	H	L	Ø.MIN.B
8F	CASEB	L	L	L	L	L	L	L	L	X
9Ø	MOVB	L	L	L	H	H	L	H	L	B
91	CMPB	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
92	MCOMB	L	L	L	H	L	H	L	H	$\overline{B}$
93	BITB	L	L	L	H	H	L	H	H	A✱B
94	CLRB	L	L	L	H	L	L	H	H	Ø
95	TSTB	L	L	L	H	H	L	H	L	B
96	INCB	L	L	H	L	L	L	L	L	A.PL.1
97	DECB	L	L	L	L	H	H	H	H	A.MIN.1
98	CVTBL	L	L	L	L	L	L	L	L	X
99	CVTBW	L	L	L	L	L	L	L	L	X
9A	MOVZBL	L	L	L	L	L	L	L	L	X
9B	MOVZBW	L	L	L	L	L	L	L	L	X
9C	ROTL	L	L	L	L	L	L	L	L	X
9D	ACBB	L	L	L	L	L	L	L	L	X
9E	MOVAB	L	L	L	H	H	L	H	L	B
9F	PUSHAB	L	L	L	H	H	L	H	L	B

ROM ADDR	OP CODE	ALU ROM AMX ← Ø H	ALU ROM COND CIN H	ALU ROM CIN H	ALU ROM MODE H	ALU ROM S3 H	ALU ROM S2 H	ALU ROM S1 H	ALU ROM SØ H	FUNCTION
		ROM DATA								
		M7	M6	M5	M4	M3	M2	M1	MØ	
AØ	ADDW2	L	L	L	L	H	L	L	H	A.PL.B
A1	ADDW3	L	L	L	L	H	L	L	H	A.PL.B
A2	SUBW2	L	L	H	L	L	H	H	L	A.MIN.B
A3	SUBW3	L	L	H	L	L	H	H	L	A.MIN.B
A4	MULW2	L	L	L	L	L	L	L	L	X
A5	MULW3	L	L	L	L	L	L	L	L	X
A6	DIVW2	L	L	L	L	L	L	L	L	X
A7	DIVW3	L	L	L	L	L	L	L	L	X
A8	BISW2	L	L	L	H	H	H	H	L	A+B
A9	BISW3	L	L	L	H	H	H	H	L	A+B
AA	BICW2	L	L	L	H	L	H	H	H	A✱$\overline{B}$
AB	BICW3	L	L	L	H	L	H	H	H	A✱$\overline{B}$
AC	XORW2	L	L	L	H	L	H	H	L	A⊕B
AD	XORW3	L	L	L	H	L	H	H	L	A⊕B
AE	MNEGW	H	L	H	L	L	H	H	L	Ø.MIN.B
AF	CASEW	L	L	L	L	L	L	L	L	X
BØ	MOVW	L	L	L	H	H	L	H	L	B
B1	CMPW	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
B2	MCOMW	L	L	L	H	L	H	L	H	$\overline{B}$
B3	BITW	L	L	L	H	H	L	H	H	A✱B
B4	CLRW	L	L	L	H	L	L	H	H	Ø
B5	TSTW	L	L	L	H	H	L	H	L	B
B6	INCW	L	L	H	L	L	L	L	L	A.PL.1
B7	DECW	L	L	L	L	H	H	H	H	A.MIN.1
B8	BISPSW	L	L	L	H	H	H	H	L	A+B
B9	BICPSW	L	L	L	H	L	H	H	H	A✱$\overline{B}$
BA	POPR	L	L	L	L	L	L	L	L	X
BB	PUSHR	L	L	L	L	L	L	L	L	X
BC	CHMK	L	L	L	L	L	L	L	L	X
BD	CHME	L	L	L	L	L	L	L	L	X
BE	CHMS	L	L	L	L	L	L	L	L	X
BF	CHMU	L	L	L	L	L	L	L	L	X

ROM ADDR	OP CODE	ALU ROM AMX ← Ø H	ALU ROM COND CIN H	ALU ROM CIN H	ALU ROM MODE H	ALU ROM S3 H	ALU ROM S2 H	ALU ROM S1 H	ALU ROM SØ H	FUNCTION
		ROM DATA								
		M7	M6	M5	M4	M3	M2	M1	MØ	
CØ	ADDL2	L	L	L	L	H	L	L	H	A.PL.B
C1	ADDL3	L	L	L	L	H	L	L	H	A.PL.B
C2	SUBL2	L	L	H	L	L	H	H	L	A.MIN.B
C3	SUBL3	L	L	H	L	L	H	H	L	A.MIN.B
C4	MULL2	L	L	L	L	L	L	L	L	X
C5	MULL3	L	L	L	L	L	L	L	L	X
C6	DIVL2	L	L	L	L	L	L	L	L	X
C7	DIVL3	L	L	L	L	L	L	L	L	X
C8	BISL2	L	L	L	H	H	H	H	L	A+B
C9	BISL3	L	L	L	H	H	H	H	L	A+B
CA	BICL2	L	L	L	H	L	H	H	H	A✱$\overline{B}$
CB	BICL3	L	L	L	H	L	H	H	H	A✱$\overline{B}$
CC	XORL2	L	L	L	H	L	H	H	L	A⊕B
CD	XORL3	L	L	L	H	L	H	H	L	A⊕B
CE	MNEGL	H	L	H	L	L	H	H	L	Ø.MIN.B
CF	CASEL	L	L	L	L	L	L	L	L	X
DØ	MOVL	L	L	L	H	H	L	H	L	B
D1	CMPL	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
D2	MCOML	L	L	L	H	L	H	L	H	$\overline{B}$
D3	BITL	L	L	L	H	H	L	H	H	A✱B
D4	CLRL	L	L	L	H	L	L	H	H	Ø
D5	TSTL	L	L	L	H	H	L	H	L	B
D6	INCL	L	L	H	L	L	L	L	L	A.PL.1
D7	DECL	L	L	L	L	H	H	H	H	A.MIN.1
D8	ADWC	L	H	L	L	H	L	L	H	A.PL.B.PL.PSLC
D9	SBWC	L	H	H	L	L	H	H	L	A.MIN.B.MIN.PSLC
DA	MTPR	L	L	L	L	L	L	L	L	X
DB	MFPR	L	L	L	L	L	L	L	L	X
DC	MOVPSL	L	L	L	L	L	L	L	L	X
DD	PUSHL	L	L	L	L	L	L	L	L	X
DE	MOVAL	L	L	L	H	H	L	H	L	B
DF	PUSHAL	L	L	L	H	H	L	H	L	B

ROM ADDR	OP-CODE	ALU ROM AMX ← Ø H	ALU ROM COND CIN H	ALU ROM CIN H	ALU ROM MODE H	ALU ROM S3 H	ALU ROM S2 H	ALU ROM S1 H	ALU ROM SØ H	FUNCTION
		ROM DATA								
		M7	M6	M5	M4	M3	M2	M1	MØ	
EØ	BBS	L	L	L	H	H	H	H	H	A
E1	BBC	L	L	L	H	H	H	H	H	A
E2	BBSS	L	L	L	H	H	H	L	H	A+$\overline{B}$
E3	BBCS	L	L	L	H	H	H	L	H	A+$\overline{B}$
E4	BBSC	L	L	L	H	H	L	H	H	A✱B
E5	BBCC	L	L	L	H	H	L	H	H	A✱B
E6	BBSSI	L	L	L	H	H	H	L	H	A+$\overline{B}$
E7	BBCCI	L	L	L	H	H	L	H	H	A✱B
E8	BLBS	L	L	L	H	H	L	H	H	A✱B
E9	BLBC	L	L	L	H	L	L	H	L	$\overline{A}$✱B
EA	FFS	L	L	L	L	L	L	L	L	X
EB	FFC	L	L	L	L	L	L	L	L	X
EC	CMPV	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
ED	CMPZV	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
EE	EXTV	L	L	L	L	L	L	L	L	X
EF	EXTZV	L	L	L	L	L	L	L	L	X
FØ	INSV	L	L	L	L	L	L	L	L	X
F1	ACBL	L	L	L	L	L	L	L	L	X
F2	AOBLSS	L	L	L	L	L	L	L	L	X
F3	AOBLEQ	L	L	L	L	L	L	L	L	X
F4	SOBGEQ	L	L	L	L	L	L	L	L	X
F5	SOBGTR	L	L	L	L	L	L	L	L	X
F6	CVTLB	L	L	L	L	L	L	L	L	X
F7	CVTLW	L	L	L	L	L	L	L	L	X
F8	ASHP	L	H	L	L	L	H	H	L	A.MIN.B.MIN $\overline{PSLC}$
F9	CVTLP	L	H	L	L	L	H	H	L	A.MIN.B.MIN.$\overline{PSLC}$
FA	CALLG	L	L	L	L	L	L	L	L	X
FB	CALLS	L	L	L	L	L	L	L	L	X
FC	XFC	L	L	L	L	L	L	L	L	X
FD	ESCD	L	L	L	L	L	L	L	L	X
FE	ESCE	L	L	L	L	L	L	L	L	X
FF	ESCF	L	L	L	L	L	L	L	L	X

(SLOT 13)
(VAX ALU INSTR. DEP ROM — 23026B1-00)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL	D	CS	M8229-Ø-1	B
SCALE NONE	SHEET 19 OF 21		DIST.	

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ROM ADDR	OP-CODE	ALU ROM AMX Ø H	ALU ROM COND CIN H	ALU ROM CIN H	ALU ROM MODE H	ALU ROM S3 H	ALU ROM S2 H	ALU ROM S1 H	ALU ROM SØ H	FUNCTION
		ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	
ØØ	X	L	L	L	L	L	L	L	L	X
Ø1	MOV	L	L	L	H	H	L	H	L	B
Ø2	CMP	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
Ø3	BIT	L	L	L	H	H	L	H	H	A∗B
Ø4	BIC	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
Ø5	BIS	L	L	L	H	H	H	H	L	A+B
Ø6	ADD	L	L	L	L	H	L	L	H	A.PL.B
Ø7	MUL	L	L	L	L	L	L	L	L	X
Ø8	X	L	L	L	L	L	L	L	L	X
Ø9	MOV	L	L	L	H	H	L	H	L	B
ØA	CMP	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
ØB	BIT	L	L	L	H	H	L	H	H	A∗B
ØC	BIC	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
ØD	BIS	L	L	L	H	H	H	H	L	A+B
ØE	ADD	L	L	L	L	H	L	L	H	A.PL.B
ØF	DIV	L	L	L	L	L	L	L	L	X
1Ø	X	L	L	L	L	L	L	L	L	X
11	MOV	L	L	L	H	H	L	H	L	B
12	CMP	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
13	BIT	L	L	L	H	H	L	H	H	A∗B
14	BIC	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
15	BIS	L	L	L	H	H	H	H	L	A+B
16	ADD	L	L	L	L	H	L	L	H	A.PL.B
17	ASH	L	L	L	L	L	L	L	L	X
18	X	L	L	L	L	L	L	L	L	X
19	MOV	L	L	L	H	H	L	H	L	B
1A	CMP	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
1B	BIT	L	L	L	H	H	L	H	H	A∗B
1C	BIC	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
1D	BIS	L	L	L	H	H	H	H	L	A+B
1E	ADD	L	L	L	L	H	L	L	H	A.PL.B
1F	ASHC	L	L	L	L	L	L	L	L	X

ROM ADDR	OP-CODE	ALU ROM AMX Ø H	ALU ROM COND CIN H	ALU ROM CIN H	ALU ROM MODE H	ALU ROM S3 H	ALU ROM S2 H	ALU ROM S1 H	ALU ROM SØ H	FUNCTION
		ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	
2Ø	X	L	L	L	L	L	L	L	L	X
21	MOV	L	L	L	H	H	L	H	L	B
22	CMP	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
23	BIT	L	L	L	H	H	L	H	H	A∗B
24	BIC	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
25	BIS	L	L	L	H	H	H	H	L	A+B
26	ADD	L	L	L	L	H	L	L	H	A.PL.B
27	XOR	L	L	L	H	L	H	H	L	A.MIN.B
28	X	L	L	L	L	L	L	L	L	X
29	MOV	L	L	L	H	H	L	H	L	B
2A	CMP	L	L	L	L	L	L	H	L	A.MIN.B.MIN.1
2B	BIT	L	L	L	H	H	L	H	H	A∗B
2C	BIC	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
2D	BIS	L	L	L	H	H	H	H	L	A+B
2E	ADD	L	L	L	L	H	L	L	H	A.PL.B
2F	X	L	L	L	L	L	L	L	L	X
3Ø	X	L	L	L	L	L	L	L	L	X
31	MOV	L	L	L	H	H	L	H	L	B
32	CMP	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
33	BIT	L	L	L	H	H	L	H	H	A∗B
34	BIC	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
35	BIS	L	L	L	H	H	H	H	L	A+B
36	ADD	L	L	L	L	H	L	L	H	A.PL.B
37	X	L	L	L	L	L	L	L	L	X
38	X	L	L	L	L	L	L	L	L	X
39	MOV	L	L	L	H	H	L	H	L	B
3A	CMP	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
3B	BIT	L	L	L	H	H	L	H	H	A∗B
3C	BIC	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
3D	BIS	L	L	L	H	H	H	H	L	A+B
3E	ADD	L	L	L	L	H	L	L	H	A.PL.B
3F	SOB	L	L	L	L	H	H	H	H	A.MIN.1

ROM ADDR	OP-CODE	ALU ROM AMX Ø H	ALU ROM COND CIN H	ALU ROM CIN H	ALU ROM MODE H	ALU ROM S3 H	ALU ROM S2 H	ALU ROM S1 H	ALU ROM SØ H	FUNCTION
		ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	
4Ø	X	L	L	L	L	L	L	L	L	X
41	MOVB	L	L	L	H	H	L	H	L	B
42	CMPB	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
43	BITB	L	L	L	H	H	L	H	H	A∗B
44	BICB	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
45	BISB	L	L	L	H	H	H	H	L	A+B
46	SUB	L	L	H	L	L	H	H	L	A.MIN.B
47	X	L	L	L	L	L	L	L	L	X
48	X	L	L	L	L	L	L	L	L	X
49	MOVB	L	L	L	H	H	L	H	L	B
4A	CMPB	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
4B	BITB	L	L	L	H	H	L	H	H	A∗B
4C	BICB	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
4D	BISB	L	L	L	H	H	H	H	L	A+B
4E	SUB	L	L	H	L	L	H	H	L	A.MIN.B
4F	X	L	L	L	L	L	L	L	L	X
5Ø	X	L	L	L	L	L	L	L	L	X
51	MOVB	L	L	L	H	H	L	H	L	B
52	CMPB	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
53	BITB	L	L	L	H	H	L	H	H	A∗B
54	BICB	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
55	BISB	L	L	L	H	H	H	H	L	A+B
56	SUB	L	L	H	L	L	H	H	L	A.MIN.B
57	X	L	L	L	L	L	L	L	L	X
58	X	L	L	L	L	L	L	L	L	X
59	MOVB	L	L	L	H	H	L	H	L	B
5A	CMPB	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
5B	BITB	L	L	L	H	H	L	H	H	A∗B
5C	BICB	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
5D	BISB	L	L	L	H	H	H	H	L	A+B
5E	SUB	L	L	H	L	L	H	H	L	A.MIN.B
5F	X	L	L	L	L	L	L	L	L	X

ROM ADDR	OP-CODE	ALU ROM AMX Ø H	ALU ROM COND CIN H	ALU ROM CIN H	ALU ROM MODE H	ALU ROM S3 H	ALU ROM S2 H	ALU ROM S1 H	ALU ROM SØ H	FUNCTION
		ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	
6Ø	X	L	L	L	L	L	L	L	L	X
61	MOVB	L	L	L	H	H	L	H	L	B
62	CMPB	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
63	BITB	L	L	L	H	H	L	H	H	A∗B
64	BICB	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
65	BISB	L	L	L	H	H	H	H	L	A+B
66	SUB	L	L	H	L	L	H	H	L	A.MIN.B
67	X	L	L	L	L	L	L	L	L	X
68	X	L	L	L	L	L	L	L	L	X
69	MOVB	L	L	L	H	H	L	H	L	B
6A	CMPB	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
6B	BITB	L	L	L	H	H	L	H	H	A∗B
6C	BICB	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
6D	BISB	L	L	L	H	H	H	H	L	A+B
6E	SUB	L	L	H	L	L	H	H	L	A.MIN.B
6F	X	L	L	L	L	L	L	L	L	X
7Ø	X	L	L	L	L	L	L	L	L	X
71	MOVB	L	L	L	H	H	L	H	L	B
72	CMPB	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
73	BITB	L	L	L	H	H	L	H	H	A∗B
74	BICB	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
75	BISB	L	L	L	H	H	H	H	L	A+B
76	SUB	L	L	H	L	L	H	H	L	A.MIN.B
77	X	L	L	L	L	L	L	L	L	X
78	X	L	L	L	L	L	L	L	L	X
79	MOVB	L	L	L	H	H	L	H	L	B
7A	CMPB	L	L	L	L	L	H	H	L	A.MIN.B.MIN.1
7B	BITB	L	L	L	H	H	L	H	H	A∗B
7C	BICB	L	L	L	H	L	H	H	H	A∗ $\overline{B}$
7D	BISB	L	L	L	H	H	H	H	L	A+B
7E	SUB	L	L	H	L	L	H	H	L	A.MIN.B
7F	X	L	L	L	L	L	L	L	L	X

11 COMP ROM ADDR, INSTR - IB BYTE BIT ENCODING

IR (14:12)=ØL	H	15	11	10	9	8	7	6	
IR (14:12)=ØL	L	15	11	10	5	14	13	12	

COMP MODE ALU INSTR DEP ROM — 23027B1-ØØ (SLOT 13)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL	D	CS	M8229-Ø-1	B
SCALE NONE SHEET 20 OF 21	DIST.			

DCS M8229-Ø-1 REV B

3/0

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ROM ADDR	OP-CODE	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	FUNCTION
8Ø	X	L	L	L	L	L	L	L	L	X
81	JMP									X
82	X									X
83	SWAB									X
84	BR									X
85	BR									X
86	BR									X
87	BR									X
88	BNE									X
89	BNE									X
8A	BNE									X
8B	BNE									X
8C	BEQ									X
8D	BEQ									X
8E	BEQ									X
8F	BEQ									X
9Ø	BGE									X
91	BGE									X
92	BGE									X
93	BGE									X
94	BLT									X
95	BLT									X
96	BLT									X
97	BLT									X
98	BGT									X
99	BGT									X
9A	BGT									X
9B	BGT									X
9C	BLE									X
9D	BLE									X
9E	BLE									X
9F	BLE									X

ROM ADDR	OP-CODE	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	FUNCTION
AØ	JSR	L	L	L	L	L	L	L	L	X
A1	JSR									X
A2	JSR									X
A3	JSR									X
A4	JSR									X
A5	JSR									X
A6	JSR									X
A7	JSR									X
A8	CLR	L	L	L	H	L	L	H	H	Ø
A9	COM	L	L	L	H	L	L	L	L	$\bar{A}$
AA	INC	L	L	H	L	L	L	L	L	A.PL.1
AB	DEC	L	L	L	L	H	H	H	H	A.MIN.1
AC	NEG	H	L	H	L	L	H	H	L	Ø:MIN.B
AD	ADC	L	H	L	L	L	L	L	L	A.PL.C
AE	SBC	L	H	H	L	H	H	H	H	A.MIN.C
AF	TST	L	L	L	H	H	H	H	H	A
BØ	ROR	L	L	L	L	L	L	L	L	X
B1	ROL	L	H	L	L	H	H		L	A.PL.A.PL.C
B2	ASR	L	L	L	L	L	L	L	L	X
B3	ASL	L	L	L	L	H	H	L	L	A.PL.A
B4	MARK	L	L	L	L	L	L	L	L	X
B5	MFPI	L	L	L	H	H	H	H	H	A
B6	MTPI	L	L	L	H	H	H	H	H	A
B7	SXT	L	L	L	L	L	L	L	L	X
B8	X									X
B9	X									X
BA	X									X
BB	X									X
BC	X									X
BD	X									X
BE	X									X
BF	X									X

ROM ADDR	OP-CODE	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	FUNCTION
CØ	BPL	L	L	L	L	L	L	L	L	X
C1	BPL									X
C2	BPL									X
C3	BPL									X
C4	BMI									X
C5	BMI									X
C6	BMI									X
C7	BMI									X
C8	BHI									X
C9	BHI									X
CA	BHI									X
CB	BHI									X
CC	BLOS									X
CD	BLOS									X
CE	BLOS									X
CF	BLOS									X
DØ	BVC									X
D1	BVC									X
D2	BVC									X
D3	BVC									X
D4	BVS									X
D5	BVS									X
D6	BVS									X
D7	BVS									X
D8	BCC									X
D9	BCC									X
DA	BCC									X
DB	BCC									X
DC	BCS									X
DD	BCS									X
DE	BCS									X
DF	BCS									X

ROM ADDR	OP-CODE	ROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	FUNCTION
EØ	EMT	L	L	L	L	L	L	L	L	X
E1	EMT									X
E2	EMT									X
E3	EMT									X
E4	TRAP									X
E5	TRAP									X
E6	TRAP									X
E7	TRAP									X
E8	CLRB	L	L	L	H	L	L	H	H	Ø
E9	COMB	L	L	L	H	L	L	L	L	$\bar{A}$
EA	INCB	L	L	H	L	L	L	L	L	A.PL.1
EB	DECB	L	L	L	L	H	H	H	H	A.MIN.1
EC	NEGB	H	L	H	L	L	H	H	L	Ø.MIN.B
ED	ADCB	L	H	L	L	L	L	L	L	A.PL.C
EE	SBCB	L	H	H	L	H	H	H	H	A.MIN.C
EF	TSTB	L	L	L	H	H	H	H	H	A
FØ	RORB	L	L	L	L	L	L	L	L	X
F1	ROLB	L	H	L	L	H	H	L	L	A.PL.A.PL.C
F2	ASRB	L	L	L	L	L	L	L	L	X
F3	ASLB	L	L	L	L	H	H	L	L	A.PL.A
F4	X	L	L	L	L	L	L	L	L	X
F5	MFPD	L	L	L	H	H	H	H	H	A
F6	MTPD	L	L	L	H	H	H	H	H	A
F7	X	L	L	L	L	L	L	L	L	X
F8	X									X
F9	X									X
FA	X									X
FB	X									X
FC	X									X
FD	X									X
FE	X									X
FF	X									X

REVISIONS

CHK	CHANGE NO.	REV.

COMP MODE ALU INSTR DEP. ROM — 23027B! (SLOT 13)

TITLE	SIZE	CODE	NUMBER	REV.
DATA PATH CONTROL	D	CS	M8229-Ø-1	B
SCALE NONE SHEET 21 OF 21	DIST.			

COMPONENT SIDE VIEW

11 15/16" 302.52MM FBS

SIGNATURES	DATE
DRN.	
ENG.	
PROJ. ENG.	
PROD.	

digital

TITLE CEM

SIZE E CODE IDENT NUMBER 54 M0230 REV C

SCALE 2 OF 3

NEXT HIGHER ASSY B 100 M0230

ETCH REV.

P.C. DESIGN DATA BASE REV. 15

CHG CHANGE NO REV

NOTES:

312

LAYER 1

L1

M8230501828JC -P1

CS%ABCDEFHJKLMNPRS

SIDE 1

digital

E157 E144 E131 E119 E105 E91 E78 E67 E54 E40 E25 E13

REVISIONS		
LTR	CHANGE NO.	REV.

TITLE: CEH		SIZE: E	CODE: LVA	NUMBER: M8230-0-0
SCALE: 2 -	SHEET 2 OF 3	DIST:		REV: C

313

L4

LAYER 4

CEH M8230
SN12823C-P1 SIDE 2

REVISIONS		
LTR	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV
CEH	E	UA	M8230-0-0	C
SCALE 2-1 SHEET 3 OF 3	DIST			

34

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY ANTAL DATE	CHECKED L. GIAMMARINO DATE 7-5-77	SECTION
ENG S. Jenkins DATE 6-21-77	PROD Mike Torello DATE 6-21-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8230-0-0	NOTES: / REF DESIGNATION
1.	D-MD-5012823	5012823	ETCH BOARD	1	
2.		1012784	CAPACITOR,.047UF 50 V	85	C1-C5.C13-C92
3.		1012084-1	CAPACITOR,8UF 25 V	7	C6-C12
4.		1300247	RESISTOR 120,1/4W,5%	6	R31,R33,R35.R37,R39.R41
5.		1300250	RESISTOR 150,1/4W,5%	6	R32,R34.R36,R38,R40,R42
6.		1300295	RESISTOR 330,1/4W,5%	14	R1,R5,R7,R9,R11,R13,R15,R17,R19,R21,R23, R25,R27,R29
7.		1300365	RESISTOR 1K,1/4W,5%	3	R3,R4,R43
8.		1301424	RESISTOR 680,1/4W,5%	5	R2,R26,R30,R18,R28
9.		1301775	RESISTOR 820,1/4W,5%	9	R6,R8,R10,R12,R14,R16.R20,R22,R24
10.		1910531	I.C. DEC 74S181	1	E21
11.		1910532	I.C. DEC 74S00	11	E35,E50,E53,E103.E112.E113,E114.E117, E138,E123,E143
12.		1910534	I.C. DEC 74S04	14	E9,E14,E67.E81,E85,E90,E92,E102,E120, E125,E148,E151,E11,E140
13.		1910536	I.C. DEC 74S10	5	E78,E86,E105,E141,E142
14.		1910537	I.C. DEC 74S11	2	E51,E88
15.		1910539	I.C. DEC 74S20	2	E91,E119
16.		1910542	I.C. DEC 74S64	7	E12,E136,E137,E147,E152,E153,E154
17.		1910544	I.C. DEC 74S74	2	E52,E80
18.		1910545	I.C. DEC 74S112	2	E94,E111
19.		1910547	I.C. DEC 74S153	3	E118,E132,E145

E.C.O. NO. 00001

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CEH	E-UA-M8230-0-0	B	PL	M8230-0-0	B
	SHEET 1 OF 3	INSERTION PARTS LIST DATA BASE REV			

DRB 125

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY ANTAL DATE	CHECKED L. GIAMMARINO DATE 7-5-77	SECTION
ENG S. Jenkins DATE 6-27-77	PROD Mike Tullo DATE 6-21-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8230-0-0	NOTES: / REF DESIGNATION
20.		1910548	I.C. DEC 74S157	6	E22,E24,E36,E38,E100,E155
21.		1910549	I.C. DEC 74S158	3	E20,E83,E87
22.		1910550	I.C. DEC 74S174	3	E32,E46,E47
23.		1910552	I.C. DEC 74S194	13	E23,E25,E34,E37,E39,E48,E63,E64,E74,E75, E82.E93,E99
24.		1910956	I.C. DEC 74S151	20	E3,E4,E5,E6,E15,E16,E17,E18,E57,E58,E59, E60,E69,E70,E71,E72.E110,E124,E126,E156
25.		1910957	I.C. DEC 74S175	5	E65,E77,E122,E131,E149
26.		1911415	I.C. DEC 10125	2	E68,E79
27.		1911469	I.C. DEC 8640	1	E116
28.		1911675	I.C. DEC 74S138	2	E66,E127
29.		1911676	I.C. DEC 74S139	1	E76
30.		1911712	I.C. DEC 74S51	2	E129,E139
31.		1912089	I.C. DEC 74S85	2	E10,E40
32.		1912096	I.C. DEC 74S86	1	E128
33.		1912388	I.C. DEC 74S02	1	E89
34.		1912389	I.C. DEC 74S08	5	E54,E95,E101,E104,E150
35.		1912586	I.C. DEC 85S68	8	E28,E29,E30,E31.E42.E43,E44,E45
36.		1912746	I.C. DEC 74S37	1	E62
37.		1912796	I.C. DEC 74148	2	E84,E97
38.		1913294	I.C. DEC 93S16	4	E7,E19,E61,E73

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CEH	E-UA-M8230-0-0	B	PL	M8230-0-0	B
	SHEET 2 OF 3	INSERTION PARTS LIST DATA BASE REV			

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY ANTAL	CHECKED L. GIAMMARINO	SECTION
DATE	DATE 7-5-77	
ENG S. Jenkins	PROD Mike Tierlon	ISSUED SECTION
DATE 6-27-77	DATE 6-21-77	

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	M8230-0-0 QUANTITY / VARIATION	NOTES: REF DESIGNATION
39.		1913788	I.C. DEC 26S10	6	E1,E2.E26,E27,E55,E56
40.		1913839	I.C. DEC 74LS165	8	E96,E98,E115,E133,E134,E135,E144,E146
41.		23013B1-00	I.C. ROM 256X8	1	E1Ø6
42.		23037B1-00	I.C. ROM 256X8	1	E107
43.		23015B1-00	I.C. ROM 256X8	1	E108
44.		23016B1-00	I.C. ROM 256X8	1	E109
45.		23017B1-00	I.C. ROM 256X8	2	E8,E33
46		1210711-02	HANDLE	1	
47.		9000024-01	EYELET	12	
		SPARES			E13, E41, E49, E121, E130, E157

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
CEH	E-UA-M8230-0-0	B	PL	M8230-0-0	B
	SHEET 3 OF 3	INSERTION PARTS LIST DATA BASE REV			

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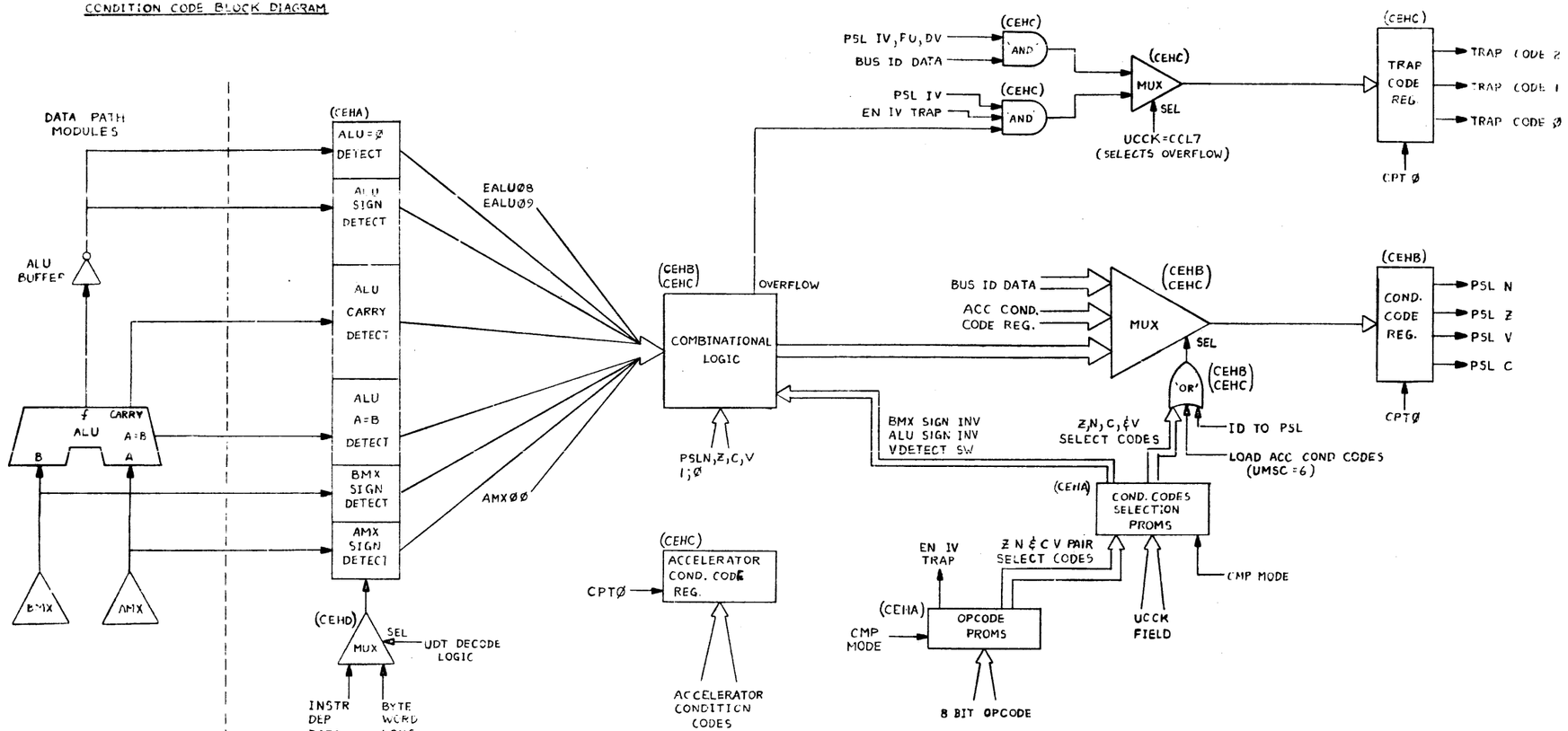
CONDITION CODE BLOCK DIAGRAM



(CONDITION CODE BLOCK DIAGRAM)

DRN. AFM	5/18/77	FIRST USED ON	8-0-1 A
CHK'D	5/20/77		
ENG.	6/20/77	TITLE	COND. CODES EXCEPT. AND HIGH BITS
PROJ. ENG.	6/20/77		
PROD.	6/20/77		
NEXT HIGHER ASSY.		SIZE D CODE CS NUMBER M8230-0-1 REV. C	
SCALE		SHEET 1 OF 29	DIST.

REVISIONS			
DIR	CHANGE NO.		REV
R.C.	M8230-0001		B
	S. JENKINS		
	M8230-TWU02		C
	R. SHORT		

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CONDITION CODE SELECTION CODES

DATA PATH CONDITION CODE DETECT SIGNALS

DATA TYPE \ DETECT COND.	AMX SIGN	BMX SIGN	ALU A = B	ALU CARRY	ALU SIGN	ALU = Ø
BYTE	AMX07	BMX07	ALU(07:00) A = B	ALU CARRY 07	ALU 07	ALU (07:00) = Ø
WORD	AMX15	BMX15	ALU(15:00) A = B	ALU CARRY 15	ALU 15	ALU (15:00) = Ø
LONG QUAD	AMX31	BMX31	ALU(31:00) A = B	ALU CARRY 31	ALU 31	ALU (31:00) = Ø
FLOAT DOUBLE	Ø	Ø	Ø	Ø	ALU 15	ALU (15:07) = Ø

INSTRUCTION DEPENDENT ZN PAIR SELECT CODES

ZN CODE	CMP MODE	Z COND	ZSEL	N COND	NSEL	INV ALU SIGN	V DETECT SW
0	X	PSL Z	Ø	PSL N	Ø	X	X
1	X	ALU = Ø	3	ALU SIGN	1	Ø	X
2	Ø	ALU A=B	2	$\overline{\text{ALU SIGN}} \oplus$ SUB V DET	5	X	Ø
2	1	ALU A=B	2	$\overline{\text{ALU SIGN}}$	1	1	X
3	Ø	ALU=Ø	3	ALU SIGN	1	Ø	X
3	1	ALU=Ø	3	PSL N	Ø	X	X
4	Ø	PSL Z	Ø	ALU SIGN	1	Ø	X
4	1	1	4	ALU SIGN	1	Ø	X
5	Ø	ALU=Ø	3	Ø	4	X	X
5	1	UNUSED	X	UNUSED	X	X	X
6	Ø	UNUSED	X	UNUSED	X	X	X
6	1	UNUSED	X	UNUSED	X	X	X
7	Ø	UNUSED	X	UNUSED	X	X	X
7	1	UNUSED	X	UNUSED	X	X	X

ADD V DET = (AMX SIGN * BMX SIGN * $\overline{\text{ALU SIGN}}$) + ($\overline{\text{AMX SIGN}}$ * $\overline{\text{BMX SIGN}}$ * ALU SIGN)
INC V DET = ($\overline{\text{AMX SIGN}}$ * ALU SIGN)
SUB V DET = (AMX SIGN * $\overline{\text{BMX SIGN}}$ * $\overline{\text{ALU SIGN}}$) + ($\overline{\text{AMX SIGN}}$ * BMX SIGN * ALU SIGN)
DEC V DET = (AMX SIGN * $\overline{\text{ALU SIGN}}$)
EXP V DET = $\overline{\text{EALU09}}$ * EALU08

INSTRUCTION DEPENDENT CV PAIR SELECT CODES

CV CODE	CMP MODE	C COND	CSEL		V COND	VSEL	V DETECT SW	INV BMX SIGN
Ø	X	PSL C	Ø		Ø	5	Ø	X
1	X	Ø	3		Ø	5	Ø	X
2	X	ALU CARRY	1		ADD V DET	Ø	Ø	1
3 N1	X	ALU CARRY	1		INC V DET	Ø	1	Ø
4	X	$\overline{\text{ALU CARRY}}$	5		SUB V DET	Ø	Ø	Ø
5 N1	X	$\overline{\text{ALU CARRY}}$	5		DEC V DET	Ø	1	1
6 N1	X	PSL C	Ø		INC V DET	Ø	1	Ø
7 N1	X	PSL C	Ø		DEC V DET	Ø	1	1
8 N1	Ø	Ø	3		EXP V DET	6	1	X
8	1	1	7		Ø	5	Ø	X
9 N1	Ø	PSL C	Ø		EXP V DET	6	1	X
9 N1	1	1	7		1	5	1	X
A	Ø	ALU CARRY	1		Ø	5	Ø	X
A	1	ALU CARRY	1		SUB V DET	Ø	Ø	Ø
B	Ø	Ø	3		ALU ≠ Ø	6	Ø	X
B	1	ALU ≠ Ø	2		Ø	5	Ø	X
C	Ø	PSL C	Ø		ADD V DET	Ø	Ø	1
C	1	PSL C	Ø		PSL C ⊕ ALU SIGN	4	X	X
D N1	Ø	Ø	3		INC V DET	Ø	1	Ø
D N1	1	AMX SIGN	6		AMX SIGN ⊕ ALU SIGN	1	1	1
E	Ø	UNUSED	X		UNUSED	X	X	X
E N1	1	AMX SIGN	6		(AMX SIGN ⊕ ALU SIGN) + PSL V	2	1	1
F	Ø	UNUSED	X		UNUSED	X	X	X
F	1	UNUSED	X		UNUSED	X	X	X

N1: CANNOT BE USED WITH ZN CODE 2 (CMP MODE = Ø) DUE TO USE OF V DETECT SW

REVISIONS

CHK	CHANGE NO.	REV.

(CONDITION CODE DECODING TABLES)

TITLE COND. CODES EXCEPT. AND HIGH BITS
SIZE D | CODE CS | NUMBER M8230-Ø-1 | REV. C
SCALE —//— | SHEET 2 OF 29 | DIST.

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UCCK FIELD & ARITHMETIC TRAP CODES

UCCK FIELD DESCRIPTION

UCCK	CMP CODE	Z CONDITION	N CONDITION	C CONDITION	V CONDITION	ZSEL	NSEL	INH ALU SIGN		CSEL	VSEL	INH BMX SIGN	V DETECT SW
Ø	X	PSL Z	PSL N	PSL C	PSL V	Ø	Ø	X		Ø	3	X	X
1 N1	X	PSL Z	PSL N	PSL C	PSL V	Ø	Ø	X		Ø	3	X	Ø
2	Ø	PSL Z	PSL N	PSL C	1	Ø	Ø	X		Ø	5	X	1
2	1	X	X	X	X	X	X	X		X	X	X	X
3	X	(PSL Z) * (ALU = Ø)	AMX SIGN	PSL C	PSL V	1	2	X		Ø	3	X	X
4	Ø	X	X	X	X	X	X	X		X	X	X	X
4	1	ALU = Ø	ALU SIGN	AMX Ø	Ø	3	1	Ø		4	5	X	Ø
5	X	ALU = Ø	ALU SIGN	Ø	Ø	3	1	Ø		3	5	X	Ø
6	Ø	ALU = Ø	ALU SIGN	PSL C	PSL V	3	1	Ø		Ø	3	X	X
6	1	PSL Z	PSL N	AMX Ø	PSL V	Ø	Ø	X		4	3	X	X
7	X	INSTRUCTION DEPENDENT – OPCODE SELECTS ZN & CV PAIR SELECT CODES											

N1: UCCK = 1 LOADS UBRANCH COND. CODES

ALU NDATA

A PLUS B L	A MINUS B L	ALU NDATA
H	H	ALU SIGN
H	L	$[\overline{\text{ALU SIGN}} * \text{AMX SIGN} * \overline{\text{BMX SIGN}}] + [\text{ALU SIGN} * (\text{AMX SIGN} + \overline{\text{BMX SIGN}})]$
L	H	$[\overline{\text{ALU SIGN}} * \text{AMX SIGN} * \text{BMX SIGN}] + [\text{ALU SIGN} * (\text{AMX SIGN} + \text{BMX SIGN})]$
L	L	X

ARITHMETIC TRAP CODES

TRAP CODE	TRAP CONDITION	ENABLE CONDITION	LOAD CONDITION
Ø	NO TRAP	1	ID TO CES
1	INTEGER OVERFLOW	(PSL IV) • (EN IV TRAP)	UCCK = 7
		PSL IV	ID TO CES
2	INTEGER DIVIDE BY ZERO	1	ID TO CES
3	FLOATING OVERFLOW	1	ID TO CES
4	FLOATING OR DECIMAL DIVIDE BY ZERO	1	ID TO CES
5	FLOATING UNDERFLOW	PSL FU	ID TO CES
6	DECIMAL OVERFLOW	PSL DV	ID TO CES
7	SUBSCRIPT RANGE	1	ID TO CES

REVISIONS

CHK	CHANGE NO.	REV.

(CONDITION CODE & ARITHMETIC TRAP DECODING TABLES)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS	D	CS	M8230-Ø-1	C
SCALE —	SHEET 3 OF 29	DIST.		

DEC FORM NO. CAD 130

320

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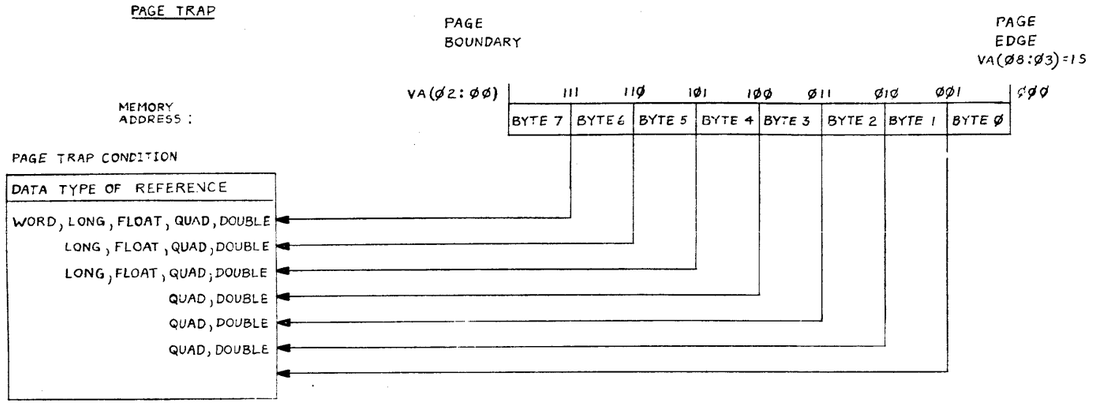
UTRAP LOGIC DESCRIPTION
(CEHE)

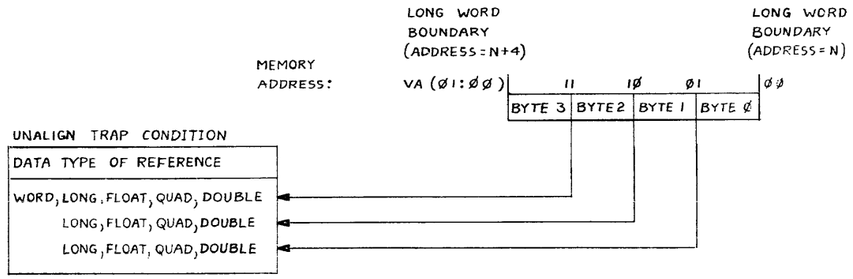
PAGE TRAP



UTRAP VECTORS

UTRAP CONDITION	UTRAP VECTOR	PRIORITY
SYSTEM INIT	1ØØ	HIGHEST
CS PARITY ERROR	1ØF	
CDD ADDRESS ERROR	1ØE	
TIMEOUT	1ØD	
READ DATA SUBSTITUTE	1ØC	
CACHE PARITY ERROR	1Ø8	
TBUF PARITY ERROR	1Ø7	
RESERVED FLOAT OPERAND	1Ø6	
TBUF MISS	1Ø5	
PROTECTION VIOLATION	1Ø4	
MODIFY BIT	1Ø3	
PAGE TRAP	1Ø2	
UNALIGN TRAP	1Ø1	LOWEST

UNALIGN TRAP



REVISIONS		
CHK	CHANGE NO.	REV.

(UTRAP LOGIC DESCRIPTION)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS	D	CS	M8230-Ø-1	C
SCALE —//	SHEET 4 OF 29	DIST.		

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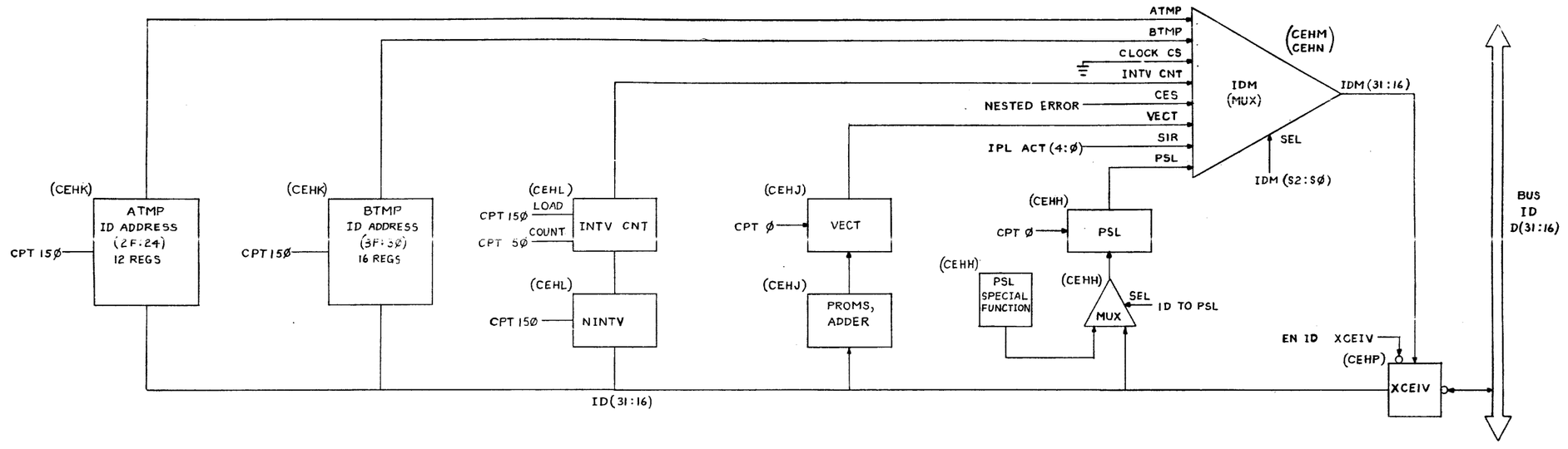
HIGH BITS BLOCK DIAGRAM



PSL REG HIGH BITS

BIT POS	NAME	LOAD CONDITION			
		IACK FUNCTION	EACK FUNCTION	CHK CHMX FUNCTION (WITH ID TO PSL)	ID TO PSL
31	CMP	Ø	Ø	ID 31	ID 31
3Ø	TP	Ø	Ø	ID 3Ø	ID 3Ø
29,28	Ø	Ø	Ø	Ø	Ø
27	FPD	Ø	Ø	ID 27	ID 27
26	IS	IS	IS	ID 26	ID 26
25,24	CUR MOD	Ø	Ø	IF ID25,24 > CUR MOD : CUR MOD ELSE ID 25,24	ID(25,24)
23,22	PREV MOD	Ø	CUR MOD	CUR MOD	ID(23,22)
21	Ø	Ø	Ø	Ø	Ø
2Ø:16	IPL	IPL ACT	IPL	ID (2Ø:16)	ID(2Ø:16)

REVISIONS

CHK	CHANGE NO.	REV.

(REGISTER BLOCK DIAGRAM)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS	D	CS	M8230-Ø-1	C
SCALE —//— SHEET 5 OF 29	DIST.			

322

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+5V
R1 330
C1 .047
R2 680
CEHA +3V A H (CEHA,B,C)

CEHA V DETECT SW H

74S153 E132
CEHA +3V A H
DEPD AMX 31 L
DDPB AMX 15 L
DCPB AMX Ø7 L
CEHA AMX SIGN L (CEHB,C)
CEHA AMX SIGN H (CEHB,C)
CEHA +3V A H
DEPM BMX 31 L
DDPD BMX 15 L
DCPD BMX Ø7 L
CEHA BMX SIGN L (CEHB,C)
CEHA BMX SIGN H (CEHB)

74S153 E145
DEPK ALU BUFF 31 L
CEHA ALU BUFF 15 L
CEHA ALU BUFF Ø7 L
CEHA ALU SIGN L (CEHB,C)
CEHA ALU SIGN H (CEHB,C)
CEHA +3V A H
DCPL ALU CARRY 31 L
DCPL ALU CARRY 15 L
DCPL ALU CARRY Ø7 L
CEHA ALU CARRY L (CEHB)
CEHA ALU CARRY H (CEHB)

CEHD DT=LQ L
CEHD DT=FD L
CEHD DT=W L
CEHD DT=FD H
CEHA ALU BUFF Ø7 L
DCPF ALU(Ø7:Ø8)=Ø L
DDPF ALU(15:Ø8)=Ø L
CEHD DT=B L
DEPN ALU(3Ø:18)=Ø L
CEHD DT=FD L
CEHD DT=BW L
DEPK ALU BUFF 31 L
CEHA ALU BUFF 17 L
CEHA ALU BUFF 16 L
CEHA ALU =Ø H (CEHB,C)
CEHA ALU =Ø L (CEHB)(ICLK)

DCPB ALU Ø7 H
CEHA ALU BUFF Ø7 L (CEHA,S)

74S153 -4:1 MUX

STB	SI	SØ	OUTPUT	FUNCTION
H	X	X	L	X
L	L	L	A → F	BYTE
L	L	H	B → F	WORD
L	H	L	C → F	LONG, QUAD
L	H	H	D → F	FLOAT, DBL

256x8 PROM CCID-CM 23Ø13B1-ØØ E1Ø6
IRCF OPC 7 H
IRCF OPC 6 H
IRCF OPC 5 H
IRCF OPC 4 H
IRCF OPC 3 H
IRCF OPC 2 H
IRCF OPC 1 H
IRCF OPC Ø H
CEHA ZN CODE 2 H (CEHA)
CEHA ZN CODE 1 H (CEHA)
CEHA ZN CODE Ø H (CEHA)
CEHA CV CODE 3 H (CEHA)
CEHA CV CODE 2 H (CEHA)
CEHA CV CODE 1 H (CEHA)
CEHA CV CODE Ø H (CEHA)
CEHA EN IV TRAP L (CEHC)

74S04 E92
CEHH PSL CMP (1) H
CEHA PSL CMP L (CEHP)

256x8 PROM CCID-CM 23Ø37B1-ØØ E1Ø7
IRCF OPC 7 H
IRCF OPC 6 H
IRCF OPC 5 H
IRCF OPC 4 H
IRCF OPC 3 H
IRCF OPC 2 H
IRCF OPC 1 H
IRCF OPC Ø H
CEHH PSL CMP (Ø) L

+5V
R3 1K
R4 1K
R43 1K
74S64 E147
BUS ALU BYTE Ø A=B H
CEHD DT=B H
BUS ALU BYTE 1 A=B H
CEHD DT=W H
BUS ALU BYTE 2,3 A=B H
CEHD DT=LQ H
CEHA ALU A=B L (CEHB)

DEPA ALU 17 H
CEHA ALU BUFF 17 L (CEHA,S)
DEPA ALU 16 H
CEHA ALU BUFF 16 L (CEHA,S)
DDPB ALU 15 H
CEHA ALU BUFF 15 L (CEHA,S)

256x8 PROM ZN SEL 23Ø15B1-ØØ E1Ø8
CEHF LOAD ACC CC H
CEHF UCCK 2 (1) H
CEHF UCCK 1 (1) H
CEHF UCCK Ø (1) H
CEHH PSL CMP (1) H
CEHA ZN CODE 2 H
CEHA ZN CODE 1 H
CEHA ZN CODE Ø H
CEHA Z SEL 2 L (CEHB)
CEHA Z SEL 1 L (CEHB)
CEHA Z SEL Ø L (CEHB)
CEHA N SEL 2 L (CEHB)
CEHA N SEL 1 L (CEHB)
CEHA N SEL Ø L (CEHB)
CEHA INV ALU SIGN H (CEHB)

256x8 PROM CV SEL 23Ø16B1-ØØ E1Ø9
CEHF UCCK 2 (1) H
CEHF UCCK 1 (1) H
CEHF UCCK Ø (1) H
CEHH PSL CMP (1) H
CEHA CV CODE 3 H
CEHA CV CODE 2 H
CEHA CV CODE 1 H
CEHA CV CODE Ø H
CEHA C SEL 2 L (CEHB)
CEHA C SEL 1 L (CEHB)
CEHA C SEL Ø L (CEHB)
CEHA V SEL 2 H (CEHA)
CEHA V SEL 1 H (CEHA)
CEHA V SEL Ø H (CEHA)
CEHA INV BMX SIGN H (CEHC)
CEHA V DETECT SW H (CEHA,C)

3:8 DECODER 74S138 E127
CEHH ID TO PSL L
CEHF LOAD ACC CC H
CEHA V SEL 2 H
CEHA V SEL 1 H
CEHA V SEL Ø H
CEHA V SEL=7 L (CEHC)
CEHA V SEL=6 L (CEHC)
CEHA V SEL=5 L (CEHC)
CEHA V SEL=4 L (CEHC)
CEHA V SEL=3 L (CEHC)
CEHA V SEL=2 L (CEHC)
CEHA V SEL=1 L (CEHC)
CEHA V SEL=Ø L (CEHC)

(CONDITION CODE DETECTION & SELECTION LOGIC) (SLOT 14)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE COND. CODES EXCEPT. AND HIGH BITS (CEHA)
SIZE D | CODE CS | NUMBER M8230-Ø-1 | REV. C
SCALE — | SHEET 6 OF 29 | DIST.

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CEHP ID Ø2 H — 74S04 E81 — CEHC ACC Z (1) L
CEHA ALU=Ø L
CEHA ALU A=B L
CEHB PSL Z (1) L
CEHA ALU=Ø H — 74S00 E112 — CEHB PSL Z (1) H
74S151 E126 — CEHB Z DATA H (CEHB)
CEHA Z SEL 2 L — 74S00 E112
CEHA Z SEL 1 L — 74S00 E112
CEHA Z SEL Ø L — 74S00 E112
EJ1 — 74S04 E120 — ICLH ID TO PSL H — CEHB ID TO PSL L (CEHB,C)

74S151-8:1 MUX				
STB	S2	S1	SØ	OUTPUT
H	X	X	X	fØ=H
L	L	L	L	DØ → fØ
L	L	L	H	D1 → fØ
L	L	H	L	D2 → fØ
L	L	H	H	D3 → fØ
L	H	L	L	D4 → fØ
L	H	L	H	D5 → fØ
L	H	H	L	D6 → fØ
L	H	H	H	D7 → fØ

74S157-2:1 MUX		
STB	SØ	OUTPUT
H	X	L
L	L	A → f
L	H	B → f

CEHP ID ØØ H — 74S04 E81 — CEHC ACC C (1) L
74S151 E156 — CEHB C DATA H (CEHB)
CEHJ +3V D H
CEHA ALU=Ø H
CEHA AMX SIGN L
CEHA ALU CARRY L
CEHA ALU CARRY H
CEHB PSL C (1) L
DCPA AMX ØØ L — FF2
74S157 E155
CEHA CSEL 2 L
CEHF LOAD ACC CC L — 74S00 E143
CEHA CSEL 1 L — 74S10 E142
CEHA CSEL Ø L — 74S00 E143
CEHB ID TO PSL L — 74S00 E143

CEHP ID Ø3 H — 74S04 E81
CEHA AMX SIGN L
CEHA BMX SIGN H
CEHA AMX SIGN H
CEHA BMX SIGN L — 74S00 E123
74S51 E129
CEHC ACC N(1) L
CEHA +3V A H
CEHA ALU SIGN L
CEHA INV ALU SIGN H — 74S86 E128
CEHA AMX SIGN L
CEHB PSL N (1) L
74S151 E124 — CEHB N DATA H (CEHB)
CEHA N SEL 2 L — 74S00 E123
CEHA N SEL 1 L — 74S00 E123
CEHA N SELØ L — 74S00 E123
CEHB ID TO PSL L

CEHA BMX SIGN L — 74S86 E128
CEHA AMX SIGN L — 74S10 E142
74S04 E125
CEHA ALU SIGN H
CEHA ALU SIGN L — 74S51 E129 — EP2 — CEHB ALU N DATA L (ICLK)
DAPB AUALU=A PLUS B L — ED2
DAPB AUALU=A MINUS B L — AK1 — 74S00 E143
74S11 E51
CEHA AMX SIGN H

4 BIT REG
74S175 E149

CEHB N DATA H	D3	R3(1)	CEHB PSL N (1) H
		R3(Ø)	CEHB PSL N (1) L (CEHB)
CEHB Z DATA H	D2	R2(1)	CEHB PSL Z (1) H (CEHB)
		R2(Ø)	CEHB PSL Z (1) L (CEHB)
CEHC V DATA H	D1	R1(1)	CEHB PSL V (1) H (CEHC)
		R1(Ø)	CEHB PSL V (1) L
CEHB C DATA H	DØ	RØ(1)	CEHB PSL C (1) H (CEHC)
		RØ(Ø)	CEHB PSL C (1) L (CEHB,C)

CLR CLK
CEHH PSL CLR L
CEHP CPT Ø A H

74S04 E148 — F51 — CEHB PSL C BIT H (IRCF)(USCN,S)(DAPB)(ICLP)
74S04 E148 — F52 — CEHB PSL V BIT H (IRCF)(ICLP) (SLOT 28)
74S04 E148 — FT2 — CEHB PSL Z BIT H (IRCF)(ICLP)
74S04 E148 — FU1 — CEHB PSL N BIT H (DAPH)(IRCF)(ICLP) (SLOT 28)

REVISIONS		
CHK	CHANGE NO.	REV.

(Z,C,N,& ALU N GENERATION) (SLOT 14)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHB)	D	CS	M8230-Ø-1	C
SCALE —	SHEET 7 OF 29	DIGT.		

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CEHA ALU = Ø H
CEHA V DETECT SW H
DDPN EALU Ø8 H
DDPN EALU Ø9 H
FMI
FNI
CEHC V SEL = 6 H
CEHC V SEL = 7 H
CEHC V SEL = 4 H
CEHB PSL C (Ø) H
CEHA ALU SIGN H
CEHA AMX SIGN L
CEHA V SEL = 2 L
CEHA V SEL = 1 L
CEHA BMX SIGN L
CEHA INV BMX SIGN H
CEHC V DATA 1 L
CEHA V DETECT SW H
CEHC V SEL = 5 H
CEHC V SEL = 4 H
CEHB PSL C (1) H
CEHA ALU SIGN L
CEHA AMX SIGN H
CEHA V SEL = Ø L
CEHA V SEL = 1 L
CEHA V SEL = 2 L
CEHA V SEL = 3 L
CEHC V DATA 2 L
CEHB PSL V (1) H
CEHP IDØ1 H
ICLH ID TO PSL H
CEHF LOAD ACC CC H
CEHC ACC V (1) H
CEHB ID TO PSL L
EJ1
CEHC V DATA H (CEHB)

CEHA V SEL = 7 L → CEHC V SEL = 7 H (CEHC)
CEHA V SEL = 6 L → CEHC V SEL = 6 H (CEHC)
CEHA V SEL = 5 L → CEHC V SEL = 5 H (CEHC)
CEHA V SEL = 4 L → CEHC V SEL = 4 H (CEHC)

4 BIT REG
74S175
E122

(SLOT 28) ACC N DATA H → CEHC ACC N (1) L (CEHB)
(SLOT 28) ACC Z DATA H → CEHC ACC Z (1) L (CEHB)
(SLOT 28) ACC V DATA H → CEHC ACC V (1) H (CEHC)
(SLOT 28) ACC C DATA H → CEHC ACC C (1) L (CEHB)
CEHP SYS INIT A L
CEHP CPTØ A H

CEHP CPT 15Ø C H
CEHP ID Ø6 H
CEHC ID Ø6 L
CEHP SYS INIT A L
CEHP ID Ø5 H
CEHC ID Ø5 L
CEHC ID TO TRAP CODE H
CEHF CC L 7 L
CEHA EN IV TRAP L
CEHH PSL IV (1) H
CEHC ID TO TRAP CODE L
CEHP ID Ø4 H
CEHC ID TO TRAP CODE H
CEHD +3V B H
DII → CEHC TRAP CODE 2 (1) H (ICLD, P, T)
EBI → CEHC TRAP CODE 1 (1) H (ICLD, P, T)
EFI → CEHC TRAP CODE Ø (1) H (ICLD, P, T)

74S151 - 8:1 MUX

STB	S2	S1	SØ	OUTPUT
H	X	X	X	f1=L
L	L	L	L	DØ → f1
L	L	L	H	D1 → f1
L	L	H	L	D2 → f1
L	L	H	H	D3 → f1
L	H	L	L	D4 → f1
L	H	L	H	D5 → f1
L	H	H	L	D6 → f1
L	H	H	H	D7 → f1

ICLH ID TO CES L
CEHH PSL IV (1) H
CEHH PSL FU (1) H
CEHH PSL DV (1) H
CEHA +3V A H
CEHC ID TO TRAP CODE H (CEHC)
CEHC ID TO TRAP CODE L (CEHC)
CEHP ID Ø6 H → CEHC ID Ø6 L (CEHC)
CEHP ID Ø5 H → CEHC ID Ø5 L (CEHC)
CEHP ID Ø4 H → CEHC ID Ø4 L

(V GENERATION & ARITHMETIC TRAP) (SLOT 14)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHC)	D	CS	M8230-Ø-1	C
SCALE —	SHEET 8 OF 29		DIST.	

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745194-4 BIT REG		
S1	SØ	FUNCTION
L	L	HOLD
H	H	LOAD

745157-2:1 MUX		
STB	SØ	OUTPUT
H	X	L
L	L	A → f
L	H	B → f

745158 2:1 MUX			
STB	SØ	OUTPUT	FUNCTION
H	X	H	UDT=Ø (LONG)
L	L	$\overline{A}$ → f	UDT=3 (INST. DEP)
L	H	$\overline{B}$ → f	UDT=1 (WORD) UDT=2 (BYTE)

+5V
R17 330
C2 .047 μFD
R18 680
CEHD+3V B H(CEHC,E)

CEHD UMSC=C L → 74S04 E85 → DT2 → CEHD SECOND REF H (CEHS)(DAPF)(DBPB)

+5V
R5 330 R7 330 R9 330 R11 330
R6 820 R8 820 R10 820 R12 820

BUS CS 29 H BR1
BUS CS 28 H BP2
BUS CS 27 H BP1
BUS CS 26 H BN1

745194 E64: S1 SØ DSR; D3 D2 D1 DØ; R3(1) R2(1) R1(1) RØ(1); CLR CLK DSL

+5V
R13 330 R15 330
R14 820 R16 820

2:4 DECODER
745139 E76: BI AI ENBI; FA3 FA2 FA1 FAØ

74SØØ E143
74SØ2 E89
74S1Ø E86
74S11 E88

CEHD UMSC=INH CMP M L (CEHE)
CEHD UMSC=E L
CEHD UMSC=D L
CEHD UMSC=C L (CEHD)
CEHD USE SAVED DT L (CEHD)
CEHD INH TRAPS L (CEHE)
CEHD CHK ODD ADDRS L (CEHE)

2:1 MUX
745157 E1ØØ: B3 A3 B2 A2 B1 A1 BØ AØ; f3 f2 f1 fØ; STB SØ

CEHD DT=LF L
CEHD SAVED DT=LF L
CEHD DT=QD L
CEHD SAVED DT=QD L
CEHD DT=W L
CEHD SAVED DT=W L
CEHD DT=B H
CEHD SAVED DT=B H

74SØØ E11A
11 BB2
CEHD MEM REF DT=LFQD H (DAPF,R)(DBPB)
CEHD MEM REF DT=LF L (CEHE)
CEHD MEM REF DT=QD L (CEHE)
CEHD MEM REF DT=W L (CEHE)
BB1
CEHD MEM REF DT=B H (CEHE)(DAPF,R)

CEHD USE SAVED DT L
TBMW SAVE CONTEXT H CV2
74S08 E1Ø1

BUS CS 31 H BS1
BUS CS 3Ø H BR2
BUS CS 79 H FB1
BUS CS 78 H FA1

745194 E74: S1 SØ DSR; D3 D2 D1 DØ; R3(1) R2(1) R1(1) RØ(1); CLR CLK DSL

CD2 CEHD UIEK 1 (1) H (CEHF)(ICLD)
CD1 CEHD UIEK Ø (1) H (CEHF)(ICLD)
CEHD UDT Ø1 (1) H (CEHD)
CEHD UDT ØØ (1) H (CEHD)
74S04 E85 → CEHD UDT Ø1 L (CEHD)
74S04 E85 → CEHD UDT ØØ L (CEHD)
74S04 E85 → CEHD IDEP QD L (CEHD)

SBLT STALL L CS1
IRCJ DQ CONT H CS2
IRCJ FLOAT H CT2
IRCJ WORD CONT H CU1
IRCJ BYTE CONT H CU2
CEHP SYS INIT A L
CEHP CPT Ø A H

745194 E75: S1 SØ DSR; D3 D2 D1 DØ; R3(1) R2(1) R1(1) RØ(1); CLR CLK DSL

CEHD IDEP QD (1) H (CEHD)
CEHD IDEP FD (1) H (CEHD)
CEHD IDEP W (1) H (CEHD)
CEHD IDEP B (1) H (CEHD)
74S04 E85 → CEHD IDEP W L (CEHD)
74S04 E85 → CEHD IDEP B L (CEHD)

CEHD DT=LF L
CEHD DT=QD L
74SØØ E114 → 74S08 E1Ø1 → CEHD DT=LQ H (CEHA)
74SØØ E114 → CEHD DT=LQ L (CEHA)

CEHD IDEP FD (1) H
CEHD UDT Ø1 (1) H
CEHD UDT ØØ (1) H
74S1Ø E86 → 74S04 E1Ø2 → CEHD DT=FD H (CEHA)
CEHD DT=FD L (CEHA)

CEHJ +3V D H
CEHD IDEP QD L
CEHD IDEP W L
CEHD IDEP B L
74S1Ø E86
CEHD IDEP QD (1) H
CEHD UDT ØØ (1) H
CEHD IDEP W (1) H
CEHD UDT ØØ L
CEHD IDEP B (1) H
CEHD UDT Ø1 L
CEHD UDT ØØ L
CEHD UDT Ø1 (1) H
CEHD UDT ØØ (1) H
74S08 E1Ø1
74SØØ E114

745158 E87: B3 A3 B2 A2 B1 A1 BØ AØ; f3 f2 f1 fØ; STB SØ

74S04 E1Ø2 → CEHD DT=LF L (CEHD)
CEHD DT=LF H
CEHD DT=QD L (CEHD)
CEHD DT=W L (CEHA,D)
74S08 E1Ø1 → CEHD DT=B L (CEHA)
74S08 E1Ø1 → CEHD DT=BW L (CEHA)
74S04 E1Ø2 → CEHD DT=B H (CEHA,D)
74S04 E1Ø2 → CEHD DT=W H (CEHA)

CEHP SYS INIT A L
CEHP CPT Ø A H

745194 E99: S1 SØ DSR; D3 D2 D1 DØ; R3(1) R2(1) R1(1) RØ(1); CLR CLK DSL

CEHD SAVED DT=LF L (CEHD)
CEHD SAVED DT=QD L (CEHD)
CEHD SAVED DT=W L (CEHD)
CEHD SAVED DT=B L (CEHD)

(UMSC (MEM. REF. FUNCTIONS), UIEK, UDT & DATA TYPE LOGIC) (SLOT 14)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHD)	D	CS	M8230-Ø-1	C
SCALE — // — SHEET 9 OF 29 DIST.				

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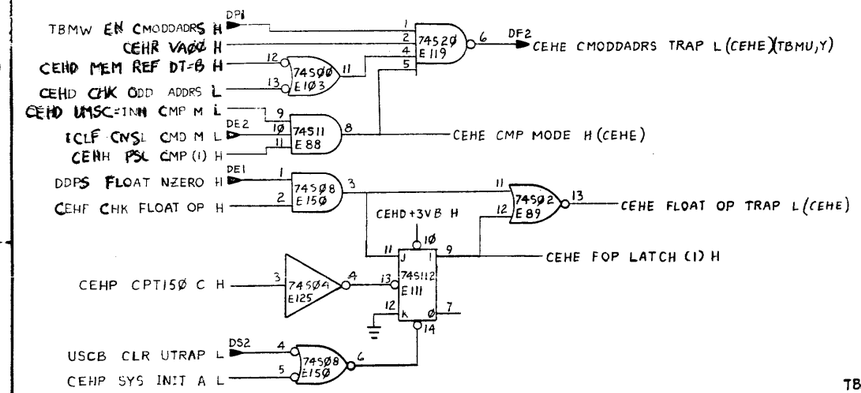
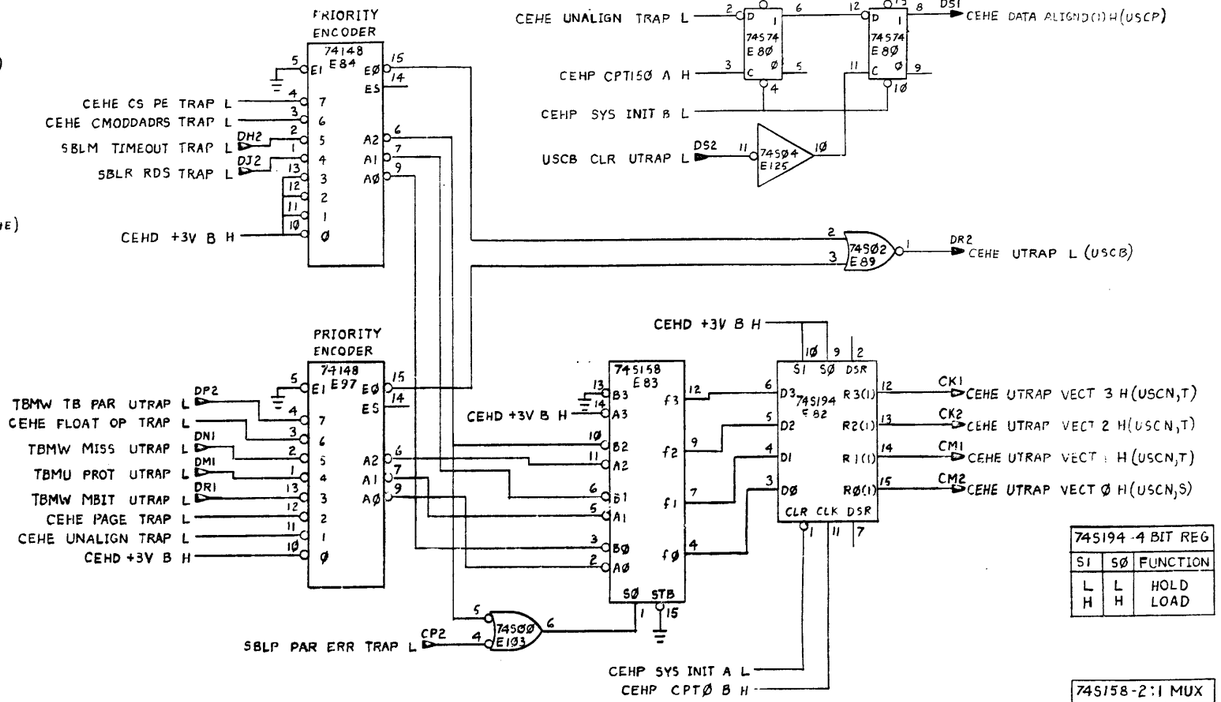
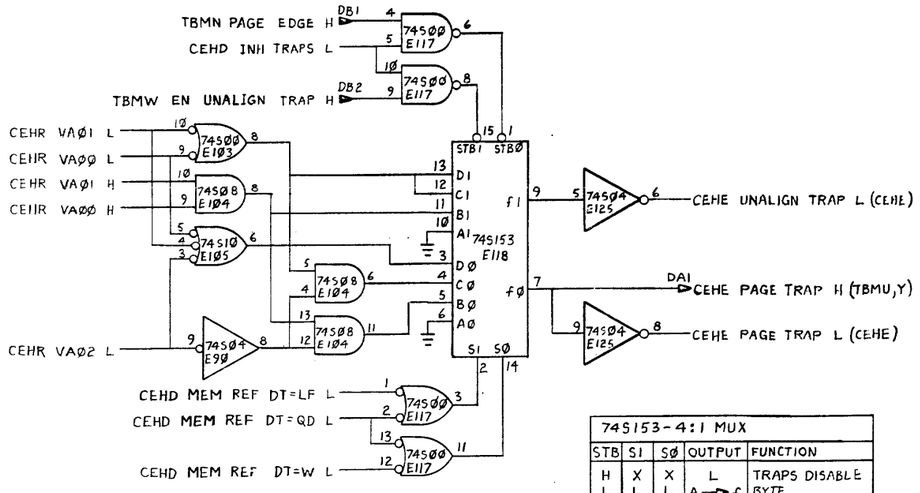


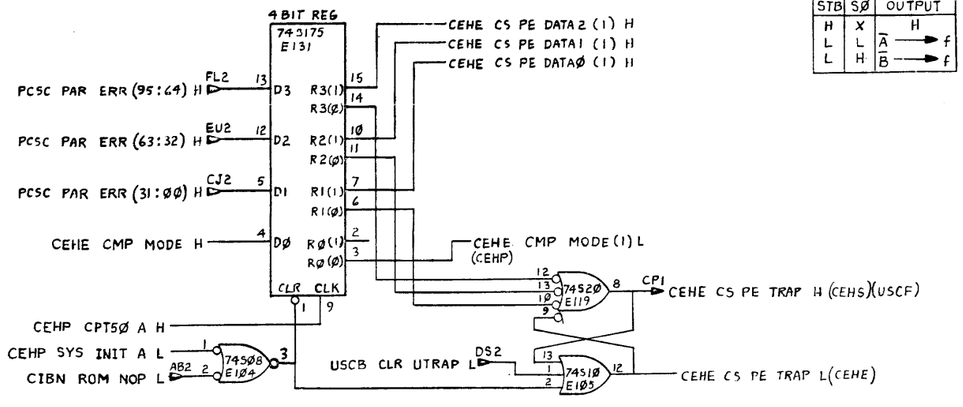


745194 4 BIT REG		
SI	SØ	FUNCTION
L	L	HOLD
H	H	LOAD

745158-2:1 MUX		
STB	SØ	OUTPUT
H	X	H
L	L	$\overline{A} \rightarrow f$
L	H	$\overline{B} \rightarrow f$



745153-4:1 MUX				
STB	SI	SØ	OUTPUT	FUNCTION
H	X	X	L	TRAPS DISABLE
L	L	L	A → f	BYTE
L	L	H	B → f	WORD
L	H	L	C → f	LONG, FLOAT
L	H	H	D → f	QUAD, DBL



REVISIONS		
CHK	CHANGE NO.	REV.

(UTRAP LOGIC) (SLOT 14)

TITLE COND. CODES EXCEPT. AND HIGH BITS (CEHE)

SIZE D | CODE CS | NUMBER M8230-0-1 | REV. C

SCALE — | SHEET 10 OF 29 | DIST.

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+5V — R19 330Ω, R21 330Ω, R23 330Ω, R20 820Ω, R22 820Ω, R24 820Ω

4 BIT REG 745175 E77

BUS CS 22 H (BM2) → D3 — R3(1) CEHF UCCK 2 (1) H (CEHA,F); R3(Ø) CEHF UCCK 2 (Ø) H (CEHF)
BUS CS 21 H (BM1) → D2 — R2(1) CEHF UCCK 1 (1) H (CEHA,F); R2(Ø) CEHF UCCK 1 (Ø) H (CEHF)
BUS CS 20 H (BL1) → D1 — R1(1) CEHF UCCK Ø (1) H (CEHA,F); R1(Ø) CEHF UCCK Ø (Ø) H
DØ — RØ(1), RØ(Ø)
CLR CLK

4 BIT REG 745175 E65

BUS CS 29 H (BR1) → D3 — R3(1) CEHF UMSC 3 (1) H (CEHF); R3(Ø) CEHF UMSC 3 (Ø) H (CEHF)
BUS CS 28 H (BP2) → D2 — R2(1) CEHF UMSC 2 (1) H (CEHF); R2(Ø) CEHF UMSC 2 (Ø) H (CEHF)
BUS CS 27 H (BP1) → D1 — R1(1) CEHF UMSC 1 (1) H (CEHF); R1(Ø) CEHF UMSC 1 (Ø) H (CEHF)
BUS CS 26 H (BN1) → DØ — RØ(1) CEHF UMSC Ø (1) H (CEHF,H); RØ(Ø) CEHF UMSC Ø (Ø) H
CLR CLK

CEHF CLR U WORD (1) L
CEHP CPT Ø A H

CEHJ +3V D H
USCB CLR U WORD H (BS2) → 74S74 E52 D → CEHF CLR U WORD (1) H (CEHS)
CEHP CPTØ A H → 74S74 E52 C → CEHF CLR U WORD (1) L (CEHF)
CEHP CPT 5Ø A H → 74S04 E125 → 74S74 E52 C

2:4 DECODER 745139 E76

CEHD UIEK 1 (1) H → B2
CEHD UIEK Ø (1) H → A2
FB3 → 74S00 E5Ø → CEHF EACK H (CEHF,H)
FB2 → 74S00 E5Ø → CEHF IACK H (CEHF)
FB1 → CEHF EACK L (CEHH)
FBØ → CEHF IACK L (CEHH)
ENB2

CEHF EACK H; CEHP CPT 5Ø A H → 74S00 E5Ø → CEHF EACK PULSE L (CEHH)
CEHF IACK H; CEHP CPT 5Ø A H → 74S00 E5Ø → CEHF IACK PULSE L (CEHH)

UIEK FIELD	
VALUE	FUNCTION
Ø	NO-OP
1	INTERRUPT STROBE
2	INTERRUPT ACKNOWLEDGE
3	EXCEPTION ACKNOWLEDGE

CEHF UCCK 2 (1) H; CEHF UCCK 1 (1) H; CEHF UCCKØ (1) H → 74S10 E78 → CEHF CCL7 L (CEHC)
CEHF UCCK 2 (Ø) H; CEHF UCCK 1 (Ø) H; CEHF UCCKØ (1) H → 74S10 E78 → CEHF CCL1 L (ICLK)

+5V — R25 330Ω, C3 .047 MFD, R26 680Ω → CEHF +5V C H (CEHK)

CEHF UMSC 3 (1) H; CEHF UMSC 2 (Ø) H; CEHF UMSC 1 (Ø) H → 74S10 E78
→ 74S04 E67 → CCI → CEHF IRD STATE H (CEHS)(DDPK)(DCPE)(ICLD)
→ CEHF LOAD FPD L (CEHH)
→ 74S04 E67 → EV2 → CEHF LOAD STATE H (CEHS)(DDPL,M,N)
→ 74S04 E67 → CEHF LOAD ACC CC H (CEHA,C)
→ CEHF LOAD ACC CC L (CEHB)
→ CEHF IRD STATE L
→ CEHF CHK CHMX L (CEHH)
→ 74S04 E67 → CEHF CHK FLOAT OP H (CEHE)
→ 74S04 E67 → CEHF CHK CHMX H (CEHH)

3:8 DECODER 745138 E66

CEHF UMSC 3 (Ø) H → EN
CEHF UMSC 2 (1) H → SEL C
CEHF UMSC 1 (1) H → SEL B
CEHF UMSC Ø (1) H → SEL A
D7 → 74S04 E67 → DJ1 → CEHF READ R LOG H (CEHS)(DAPD,R)
D6, D5, D4, D3, D2, D1, DØ

UMSC FIELD		
VALUE	FUNCTION	
Ø	NO-OP	CLEARED DURING MEMORY STALL CYCLES
1	CHK CHMX INSTR.	
2	CHK FLOAT OP	
4	IRD STATE	
5	LOAD STATE	
6	LOAD ACC COND. CODES	
7	READ R LOG	
8	CLR PSL FPD	
9	SET PSL FPD	
A	CLR NESTED ERROR	
B	SET NESTED ERROR	
CEHD 3	CHK ODD ADDRS	HELD DURING MEMORY STALL CYCLES
CEHD C	SEC. REF., INH TRAPS, SAVED CTX	
CEHD D	INH TRAPS, SAVED CTX	
CEHD E	SAVED CTX	
CEHD F	INH COMPATABILITY MODE	

CEHJ +3V D H
CEHF UMSC Ø (1) H; CEHF UMSC 3 (1) H; CEHF UMSC 2 (Ø) H; CEHF UMSC 1 (1) H; CEHP CPT 5Ø A H → 74S20 E91; CEHP SYS INIT B L
→ 74S74 E52 D → FH2 → CEHF NESTED ERR (1) H (CEHM)(USCN,T)

REVISIONS		
CHK	CHANGE NO.	REV.

(UIEK, UCCK, & UMSC DECODE) (SLOT 14)

TITLE COND. CODES EXCEPT. AND HIGH BITS (CEHF)
SIZE D | CODE CS | NUMBER M8230-Ø-1 | REV. C
SCALE —//— | SHEET 11 OF 29 | DIST.

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CEHH ID TO PSL L (CEHA,H)

ICLH ID TO PSL H

CEHF IACK L

CEHH IS+CM L (USCP)

CEHH PSL IS (1) H

CEHH PSL CMP (1) H

CEHF EACK L

745194-4 BIT REG		
S1	SØ	FUNCTION
L	L	HOLD
H	H	LOAD

CEHR IPL ACT 3 H
CEHP ID 19 H
CEHR IPL ACT 2 H
CEHP ID 18 H
CEHR IPL ACT 1 H
CEHP ID 17 H
CEHR IPL ACT Ø H
CEHP ID 16 H

CEHH IPL 3 (1) H (CEHM,R)
CEHH IPL 2 (1) H (CEHM,R)
CEHH IPL 1 (1) H (CEHM,R)
CEHH IPL Ø (1) H (CEHM,R)

CEHF UMSC Ø (1) H
CEHP ID 27 H
CEHH PSL CMP (1) H
CEHP ID 31 H
CEHH PSL IS (1) H
CEHP ID 26 H
CEHR IPL ACT 4 H
CEHP ID 20 H

CEHH PSL IS (1) H (CEHH,N)
CEHH IPL 4 (1) H (CEHM,R)

CEHP SYS INIT B L
CEHP CPT Ø B H
CEHH ID TO PSL L

CEHF EACK L
CEHF LOAD FPD L

ICLH ID TO PSL H

CEHP ID Ø7 H
CEHP ID Ø6 H
CEHP ID Ø5 H

CEHH PSL DV (1) H (CEHC)
CEHH PSL FU (1) H (CEHC)
CEHH PSL IV (1) H (CEHC)

CEHH CUR MOD 1 (1) H
CEHP ID 25 H
CEHH CUR MOD Ø (1) H
CEHP ID 24 H

CEHF EACK H

CEHH FPD BIT L (IRCC,M)(USCN,T)
CEHH PSL FPD (1) H (CEHN)
CEHH PSL CMP (1) H (CEHA,E,H,N)
CEHH CUR MOD 1 (1) H (CEHH,N)
CEHH CUR MOD Ø (1) H (CEHH,N)
CEHH CUR MODE 1 H (SBHM,T)(TBMB)(ICLF)
CEHH CUR MODE Ø H (SBHM,T)(TBMB)(ICLF)

CEHP SYS INIT B L
CEHF EACK PULSE L
CEHF IACK PULSE L
CEHH PSL CLR L (CEHB)

CEHP CPT Ø B H
CEHH ID TO PSL L
CEHF EACK L

CEHH NCM GT PSL CM H
CEHF CHK CHMX H
CEHF LOAD FPD L

CEHH IACK CLR L

CEHJ +3V D H

745157-2:1 MUX		
STB	SØ	OUTPUT
H	X	L
L	L	A → f
L	H	B → f

CEHH CUR MOD 1 (1) H
CEHP ID 23 H
CEHH CUR MOD Ø (1) H
CEHP ID 22 H

CEHH PRV MOD 1 (1) H (CEHM)
CEHH PRV MOD Ø (1) H (CEHM)

CEHF EACK L
CEHF CHK CHMX L

CEHP SYS INIT B L
CEHF IACK PULSE L
CEHP CPTØ B H

CEHH IACK CLR L (CEHH)

CEHP ID 25 H
CEHP ID 24 H
CEHH CUR MOD 1 (1) H
CEHH CUR MOD Ø (1) H

CEHH NCM LT PSL CM H
CEHH NCM GT PSL CM H (CEHH)

CEHJ +3V D H

REVISIONS		
CHK	CHANGE NO.	REV.

(PSL REGISTER) (SLOT 14)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHH)	D	CS	M8230-Ø-1	C
SCALE —	SHEET 12 OF 29		DIST.	

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745158-2:1 MUX		
STB	SØ	OUTPUT
H	X	H
L	L	$\overline{A} \rightarrow f$
L	H	$\overline{B} \rightarrow f$

745194 4 BIT REG		
SI	SØ	FUNCTION
L	L	HOLD
H	H	LOAD

256X8 PROM
PR/SUM 23Ø17 B1-ØØ
E33

CEHP ID31 H
CEHP ID3Ø H
CEHP ID29 H
CEHP ID28 H
CEHP ID27 H
CEHP ID26 H
CEHP ID25 H
CEHP ID24 H
→ CEHJ AZERO H (CEHJ)
→ CEHJ APRIOR 2 L (CEHJ)
→ CEHJ APRIOR 1 L (CEHJ)
→ CEHJ APRIOR Ø L (CEHJ)
→ CEHJ ASUM 3 H (CEHJ)
→ CEHJ ASUM 2 H (CEHJ)
→ CEHJ ASUM 1 H (CEHJ)
→ CEHJ ASUM Ø H (CEHJ)
ENØ ENJ

256X8 PROM
PR/SUM 23Ø17 B1-ØØ
E8

CEHP ID23 H
CEHP ID22 H
CEHP ID21 H
CEHP ID2Ø H
CEHP ID19 H
CEHP ID18 H
CEHP ID17 H
CEHP ID16 H
→ CEHJ BZERO H (CEHJ)
→ CEHJ BPRIOR 2 L (CEHJ)
→ CEHJ BPRIOR 1 L (CEHJ)
→ CEHJ BPRIOR Ø L (CEHJ)
→ CEHJ BSUM 3 H (CEHJ)
→ CEHJ BSUM 2 H (CEHJ)
→ CEHJ BSUM 1 H (CEHJ)
→ CEHJ BSUM Ø H (CEHJ)
ENØ ENI

+5V
C4 .047 MFD
R27 33Ø
R28 68Ø
→ CEHJ +3V D H (CEHB,D,F,H,J,R)

ICLH ID TO VECT L
BD2
74SØØ E35

745158 E2Ø

CEHJ AZERO H
CEHJ +3VD H
CEHJ APRIOR 2 L
CEHJ BPRIOR 2 L
CEHJ APRIOR 1 L
CEHJ BPRIOR 1 L
CEHJ APRIOR Ø L
CEHJ BPRIOR Ø L
STB SØ

CEHJ BZERO H
CEHJ AZERO H
74SØØ E35

74SØØ E35

745194 E34

→ AV2 CEHJ PRIOR 3 H (CEHN)(ICLC,T)
→ BA1 CEHJ PRIOR 2 H (CEHM)(ICLC,T)
→ BC1 CEHJ PRIOR 1 H (CEHM)(ICLC,T)
→ BD1 CEHJ PRIOR Ø H (CEHM)(ICLC,T)
SI SØ DSR
D3 D2 D1 DØ
R3(1) R2(1) R1(1) RØ(1)
CLR CLK DSL

745194 E63

→ CEHJ PRIOR VALID H (CEHN)
→ CEHJ NUMB ONES 4 H (CEHM)

745181 E21
A PLUS B

CEHJ BSUM 3 H
CEHJ ASUM 3 H
CEHJ BSUM 2 H
CEHJ ASUM 2 H
CEHJ BSUM 1 H
CEHJ ASUM 1 H
CEHJ BSUM Ø H
CEHJ ASUM Ø H
CEHJ +3V D H
A=B COUT4 G P
B3 A3 B2 A2 B1 A1 BØ AØ
f3 f2 f1 fØ
S3 S2 S1 SØ M CIN

745194 E48

→ CEHJ NUMB ONES 3 H (CEHM)
→ CEHJ NUMB ONES 2 H (CEHM)
→ CEHJ NUMB ONES 1 H (CEHM)
→ CEHJ NUMB ONES Ø H (CEHM)

CEHP SYS INIT A L
CEHP CPTØ B H

(VECTOR REG (VECT)) (SLOT 14)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHJ)	D	CS	M8230-Ø-1	C
SCALE —/—	SHEET 13 OF 29	DIST.		

330 DEC FORM NO. CRD 138

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85S68 — 16 x 4 EDGE TRIGGERED REG

CEHF +3V C H
CEHP CPT15Ø A H
ICLH ID TO BTMP L — AR1

85S68 E45
CEHP ID31 H — D3 — L3 — CEHK BTMP31 H (CEHN)
CEHP ID3Ø H — D2 — L2 — CEHK BTMP3Ø H (CEHN)
CEHP ID29 H — D1 — L1 — CEHK BTMP29 H (CEHN)
CEHP ID28 H — DØ — LØ — CEHK BTMP28 H (CEHN)

85S68 E43
CEHP ID23 H — D3 — L3 — CEHK BTMP23 H (CEHM)
CEHP ID22 H — D2 — L2 — CEHK BTMP22 H (CEHM)
CEHP ID21 H — D1 — L1 — CEHK BTMP21 H (CEHM)
CEHP ID2Ø H — DØ — LØ — CEHK BTMP2Ø H (CEHM)

85S68 E42
CEHP ID19 H — D3 — L3 — CEHK BTMP19 H (CEHM)
CEHP ID18 H — D2 — L2 — CEHK BTMP18 H (CEHM)
CEHP ID17 H — D1 — L1 — CEHK BTMP17 H (CEHM)
CEHP ID16 H — DØ — LØ — CEHK BTMP16 H (CEHM)

WE CLK LE OE — A3 A2 A1 AØ

CEHK TMP A3 L
CEHK TMP A2 L
CEHK TMP A1 L
CEHK TMP AØ L

CEHF +3V C H
CEHP CPT15Ø B H
ICLH ID TO BTMP L — AR1

85S68 E44
CEHP ID27 H — D3 — L3 — CEHK BTMP27 H (CEHN)
CEHP ID26 H — D2 — L2 — CEHK BTMP26 H (CEHN)
CEHP ID25 H — D1 — L1 — CEHK BTMP25 H (CEHN)
CEHP ID24 H — DØ — LØ — CEHK BTMP24 H (CEHN)

ICLH ID TO ATMP L — AR2

85S68 E31
CEHP ID31 H — D3 — L3 — CEHK ATMP31 H (CEHN)
CEHP ID3Ø H — D2 — L2 — CEHK ATMP3Ø H (CEHN)
CEHP ID29 H — D1 — L1 — CEHK ATMP29 H (CEHN)
CEHP ID28 H — DØ — LØ — CEHK ATMP28 H (CEHN)

85S68 E29
CEHP ID23 H — D3 — L3 — CEHK ATMP23 H (CEHM)
CEHP ID22 H — D2 — L2 — CEHK ATMP22 H (CEHM)
CEHP ID21 H — D1 — L1 — CEHK ATMP21 H (CEHM)
CEHP ID2Ø H — DØ — LØ — CEHK ATMP2Ø H (CEHM)

ICLJ ID RIGHT ADDRØ H — EE1 — 74S04 E92 — CEHK TMP AØ L (CEHK)
ICLJ ID RIGHT ADDR1 H — EE2 — 74S04 E92 — CEHK TMP A1 L (CEHK)
ICLJ ID RIGHT ADDR2 H — EL1 — 74S04 E92 — CEHK TMP A2 L (CEHK)
ICLJ ID RIGHT ADDR3 H — EL2 — 74S04 E92 — CEHK TMP A3 L (CEHK)

CEHF +3V C H
CEHP CPT15Ø B H
ICLH ID TO ATMP L — AR2

85S68 E3Ø
CEHP ID27 H — D3 — L3 — CEHK ATMP27 H (CEHN)
CEHP ID26 H — D2 — L2 — CEHK ATMP26 H (CEHN)
CEHP ID25 H — D1 — L1 — CEHK ATMP25 H (CEHN)
CEHP ID24 H — DØ — LØ — CEHK ATMP24 H (CEHN)

85S68 E28
CEHP ID19 H — D3 — L3 — CEHK ATMP19 H (CEHM)
CEHP ID18 H — D2 — L2 — CEHK ATMP18 H (CEHM)
CEHP ID17 H — D1 — L1 — CEHK ATMP17 H (CEHM)
CEHP ID16 H — DØ — LØ — CEHK ATMP16 H (CEHM)

CEHK TMP A3 L
CEHK TMP A2 L
CEHK TMP A1 L
CEHK TMP AØ L

REVISIONS

CHK	CHANGE NO.	REV.

(ID REGISTERS (24 TO 3F) HIGH BITS) (SLOT 14)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHK)	D	CS	M8230-Ø-1	C

SCALE — SHEET 14 OF 29 DIST.

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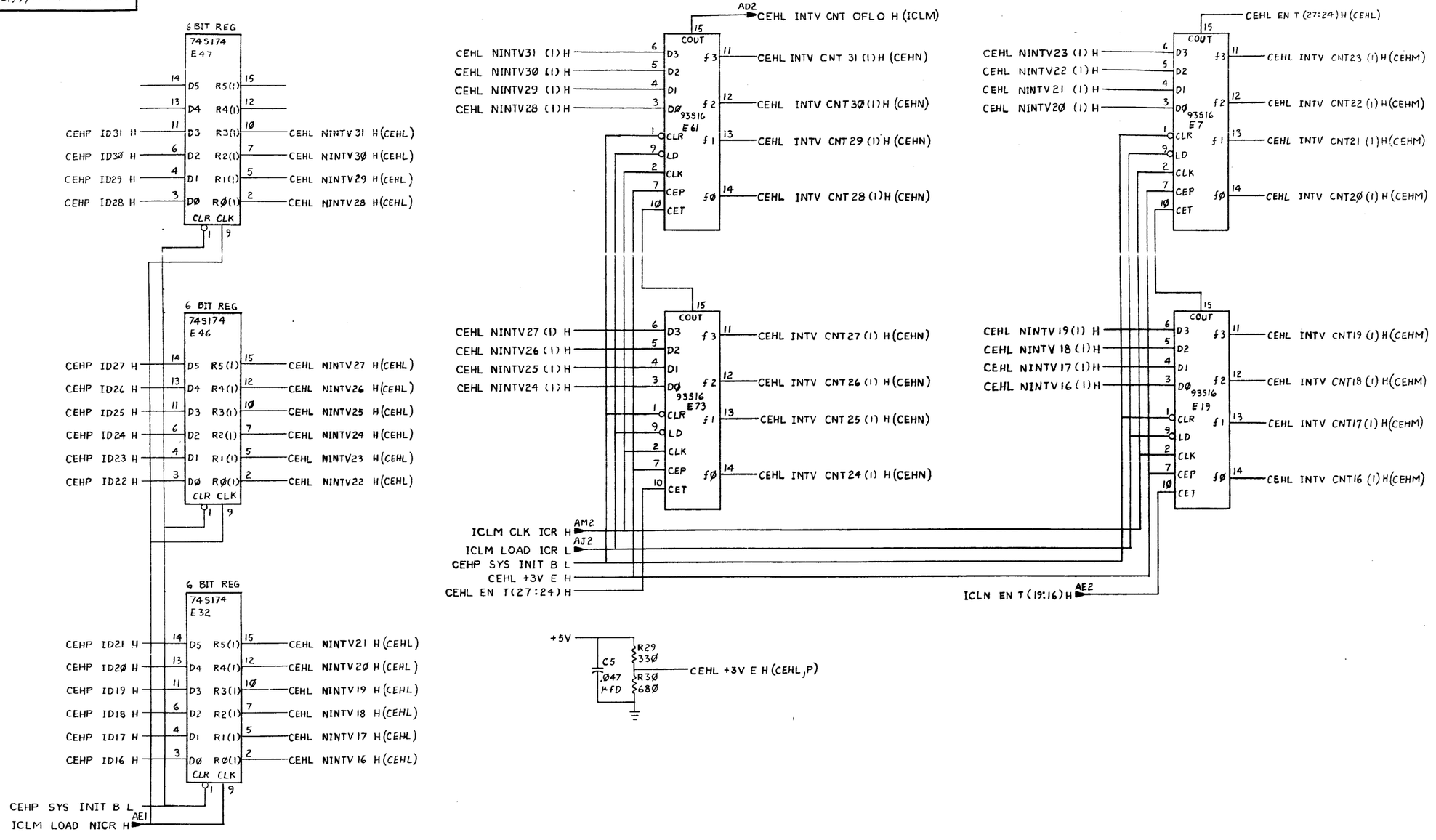
93516-4 BIT BINARY COUNTER



(NEXT INTERVAL REG. & INTERVAL COUNTER HIGH BITS)
(SLOT 14)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHL)	D	CS	M8230-0-1	C
SCALE —	SHEET 15 OF 29	DIST.		

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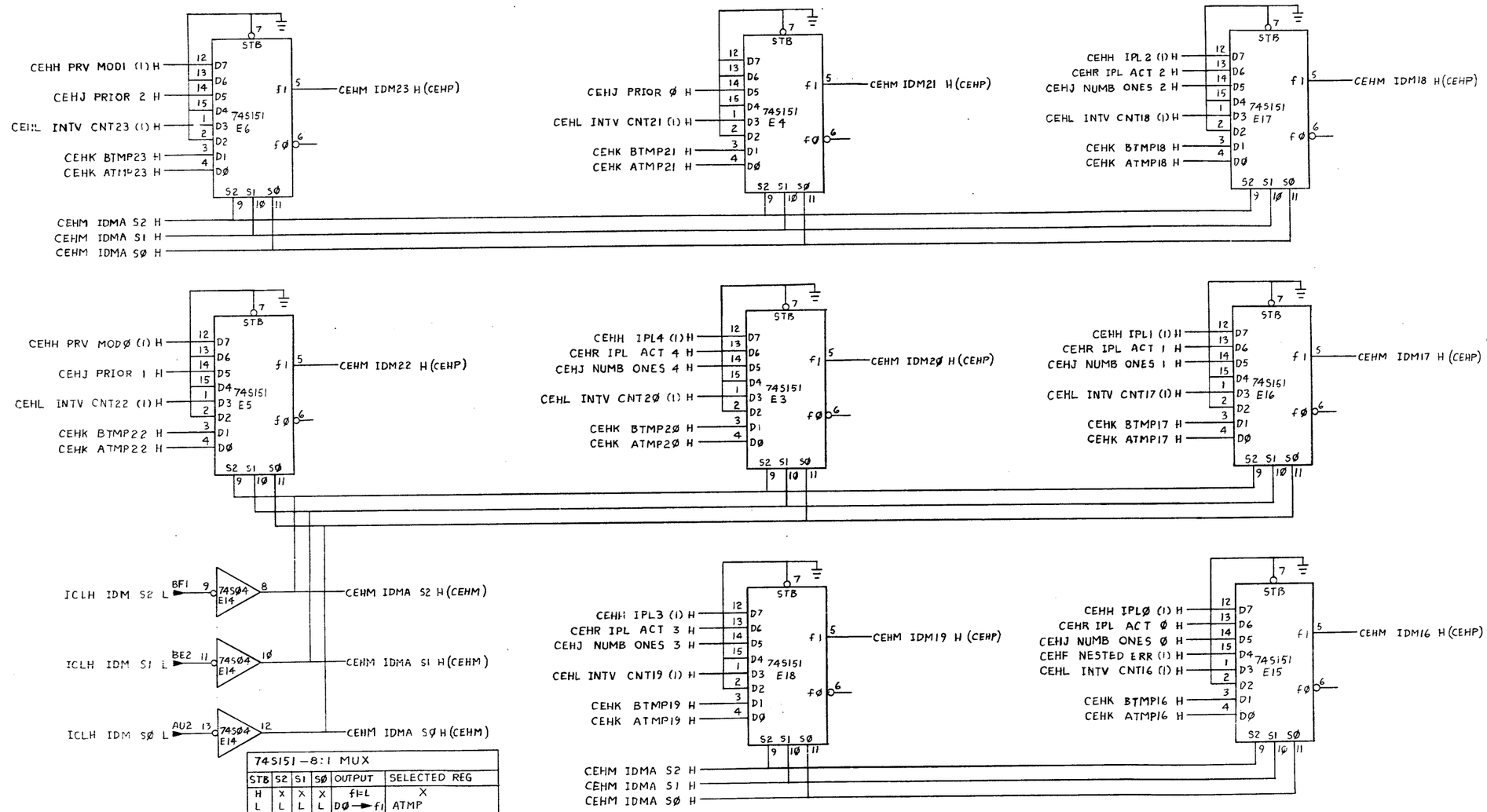

74S151 – 8:1 MUX

STB	S2	S1	SØ	OUTPUT	SELECTED REG
H	X	X	X	f1=L	X
L	L	L	L	DØ → f1	ATMP
L	L	L	H	D1 → f1	BTMP
L	L	H	L	D2 → f1	CLOCK CS
L	L	H	H	D3 → f1	INTERVAL COUNTER
L	H	L	L	D4 → f1	E5
L	H	L	H	D5 → f1	VECTOR
L	H	H	L	D6 → f1	SIR
L	H	H	H	D7 → f1	PSL

REVISIONS		
CHK	CHANGE NO.	REV.

(ID DATA MULTIPLEXOR (IDM) BITS 23:16) (SLOT 14)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHM)	D	CS	M8230-Ø-1	C

SCALE —//— SHEET 16 OF 29 DIST.

DEC FORM NO. DRD 130

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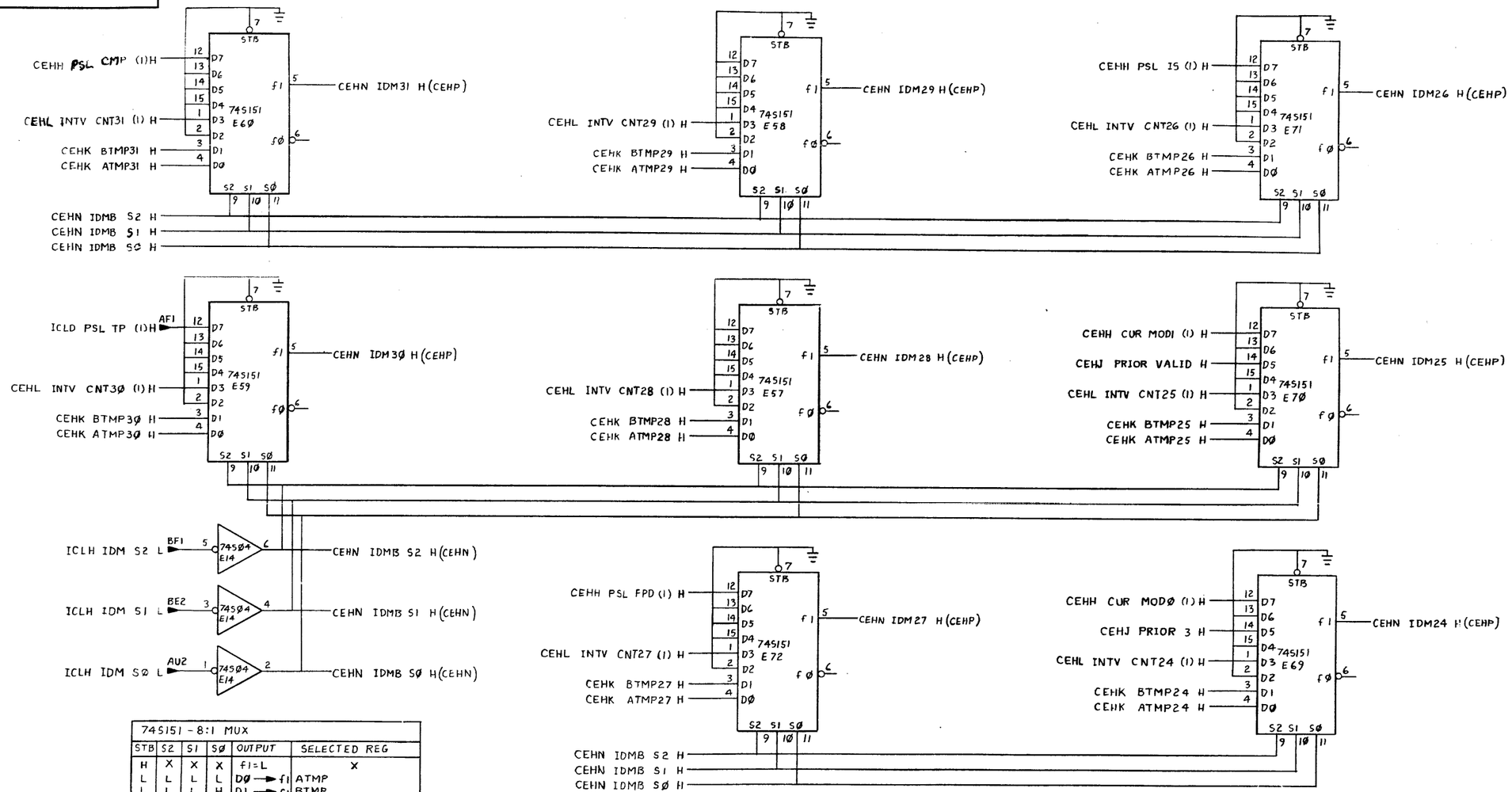

745151 - 8:1 MUX

STB	S2	S1	S0	OUTPUT	SELECTED REG
H	X	X	X	f1=L	X
L	L	L	L	D0 → f1	ATMP
L	L	L	H	D1 → f1	BTMP
L	L	H	L	D2 → f1	CLOCK CS
L	L	H	H	D3 → f1	INTERVAL COUNTER
L	H	L	L	D4 → f1	CES
L	H	L	H	D5 → f1	VECTOR
L	H	H	L	D6 → f1	SIR
L	H	H	H	D7 → f1	PSL

REVISIONS		
CHK	CHANGE NO.	REV.

(ID DATA MULTIPLEXOR (IDM) BITS 31:24) (SLOT 14)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHN)	D	CS	M8230-0-1	C
SCALE —H— SHEET 17 OF 29	DIST.			

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CEHE CMP MODE (1) L → 74S37 E62 pin 3 → DV2 → CEHP CMP MODE B H (DEPN,P,R,S)

CEHA PSL CMP L → 74S37 E62 pin 11 → DV2 → CEHP PSL CMP H (IDPA)(DAPA,M)(SLOT 28)

-5.2V EK1 → R31 120Ω, R33 120Ω, R32 150Ω, R34 150Ω → CL1, CL2

CLKB LECL CPTØA3 H
CLKB LECL CPTØA3 L
→ 10125 E63 → CEHP CPTØ A H (CEHB,C,D,F)

-5.2V EK1 → R35 120Ω, R37 120Ω, R36 150Ω, R38 150Ω → CR1, CR2

CLKC LECL CPT1A3 H
CLKC LECL CPT1A3 L
→ 10125 E68 → CEHP CPTØ B H (CEHE,H,J)

CLKE LECL CPT3B2 H (DK1)
CLKE LECL CPT3B2 L (DK2)
→ 10125 E79 → CEHP CPT15Ø A H (CEHE,K)

-5.2 V EK1 → R39 120Ω, R41 120Ω, R40 150Ω, R42 150Ω

→ 10125 E79 → CEHP CPT15Ø B H (CEHK)

→ 10125 E79 → CEHP CPT15Ø C H (CEHC,E)

CLKL SYS INIT H (CN1)
CEHL +3V E H
→ 74S37 E62 → CEHP SYS INIT A L (CEHC,D,E,J)
→ 74S37 E62 → CEHP SYS INIT B L (CEHF,H,L)

BUS TRANSCIEVER 26S10 E26

CEHN IDM31 H
CEHN IDM30 H
CEHN IDM29 H
CEHN IDM28 H
→ CEHP ID31 H (CEHH,J,K,L)
→ CEHP ID30 H (CEHJ,K,L)(ICLD,T)
→ CEHP ID29 H (CEHJ,K,L)
→ CEHP ID28 H (CEHJ,K,L)
BK2 → BUS ID D31 L
BK1 → BUS ID D30 L
BJ2 → BUS ID D29 L
BJ1 → BUS ID D28 L

BUS TRANSCIEVER 26S10 E27

CEHN IDM27 H
CEHN IDM26 H
CEHN IDM25 H
CEHN IDM24 H
→ CEHP ID27 H (CEHH,J,K,L)
→ CEHP ID26 H (CEHH,J,K,L)
→ CEHP ID25 H (CEHH,J,K,L)
→ CEHP ID24 H (CEHH,J,K,L)
BH2 → BUS ID D27 L
BF2 → BUS ID D26 L
AU1 → BUS ID D25 L
AT2 → BUS ID D24 L

ICLS EN ID XCEIV L (ASI)

BUS TRANSCIEVER 26S10 E55

CEHP ID07 H (CEHH)
CEHP ID06 H (CEHC,H)
CEHP ID05 H (CEHC,H)
CEHP ID04 H (CEHC)
CJ1 → BUS ID D07 L
CH2 → BUS ID D06 L
CF2 → BUS ID D05 L
CF1 → BUS ID D04 L

CEHL +3V E H

BUS TRANSCIEVER 26S10 E2

CEHM IDM23 H
CEHM IDM22 H
CEHM IDM21 H
CEHM IDM20 H
→ CEHP ID23 H (CEHH,J,K,L)
→ CEHP ID22 H (CEHH,J,K,L)
→ CEHP ID21 H (CEHJ,K,L,)
→ CEHP ID20 H (CEHH,J,K,L)
AS2 → BUS ID D23 L
AP2 → BUS ID D22 L
AP1 → BUS ID D21 L
AN1 → BUS ID D20 L

BUS TRANSCIEVER 26S10 E1

CEHM IDM19 H
CEHM IDM18 H
CEHM IDM17 H
CEHM IDM16 H
→ CEHP ID19 H (CEHH,J,K,L)
→ CEHP ID18 H (CEHH,J,K,L)
→ CEHP ID17 H (CEHH,J,K,L)
→ CEHP ID16 H (CEHH,J,K,L)
AM1 → BUS ID D19 L
AJ1 → BUS ID D18 L
AH2 → BUS ID D17 L
AF2 → BUS ID D16 L

BUS TRANSCIEVER 26S10 E56

CEHP ID03 H (CEHB)
CEHP ID02 H (CEHB)
CEHP ID01 H (CEHC)
CEHP ID00 H (CEHB)
CE2 → BUS ID D03 L
CE1 → BUS ID D02 L
CB2 → BUS ID D01 L
CA1 → BUS ID D00 L

REVISIONS

CHK	CHANGE NO.	REV.

(CLOCK LOGIC & ID XCIEVERS HIGH BITS) (SLOT 14)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHP)	D	CS	M8230-0-1	C

SCALE — SHEET 18 OF 29 DIST.

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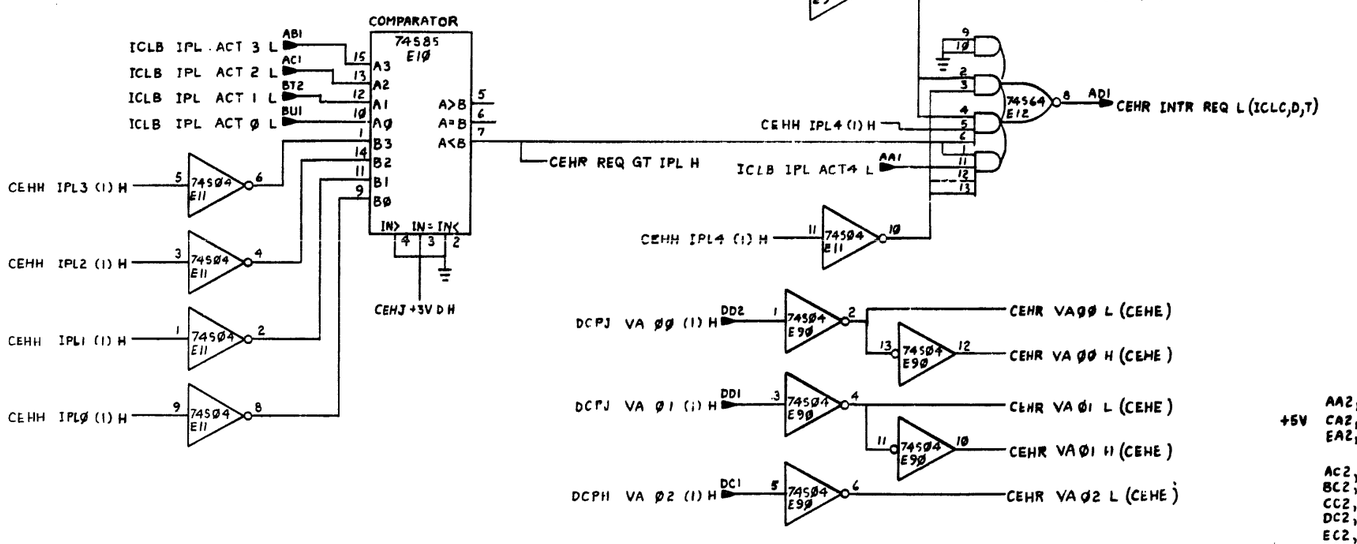
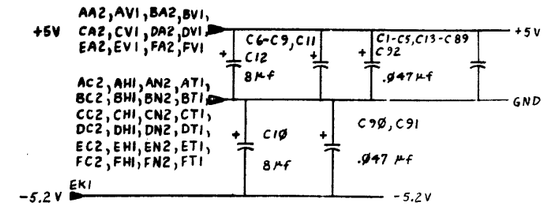
IPL 4	IPL ACT 4	REQ GT IPL	INTR REQ
Ø	Ø	Ø	Ø
Ø	Ø	1	1
Ø	1	X	1
1	Ø	X	Ø
1	1	Ø	Ø
1	1	1	1





REVISIONS		
CHK	CHANGE NO.	REV.

(INTERRUPT REQUEST LOGIC) (SLOT 14)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHR)	D	CS	M8230-Ø-1	C

SCALE — SHEET 19 OF 29 DIST.

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74LS165 - 8 BIT SHIFT REG

DCPH VA Ø2 (1) H
DCPJ VA Ø1 (1) H
DCPJ VA ØØ (1) H
TBMW EN CMODDADRS H
TBMN PAGE EDGE H
TBMW EN UNALIGN TRAP H
SBLM TIMEOUT TRAP L
SBLR RDS TRAP L
→ SHIFT LD D7 74LS165 E98 D6 D5 D4 D3 D2 D1 DØ CLK INH CLK SER IN RØ(1) R1(1)

DEPN ALU (30:18)=Ø L
DDPF ALU (15:Ø8)=Ø L
DCPF ALU (Ø7:ØØ)=Ø L
BUS ALU BYTE 2,3 A=B H
BUS ALU BYTE 1 A=B H
BUS ALU BYTE Ø A=B H
DCPA AMXØØ L
DAPB AUALU=A PLUS B L
→ SHIFT LD D7 74LS165 E135 D6 D5 D4 D3 D2 D1 DØ CLK INH CLK SER IN RØ(1) R1(1)

PCSC PAR ERR (95:64) H
PCSC PAR ERR (63:32) H
PCSC PAR ERR (31:ØØ) H
SBLP PAR ERR TRAP L
TBMU PROT UTRAP L
CEHF IRD STATE H
CEHF READ RLOG H
CEHF LOAD STATE H
→ SHIFT LD D7 74LS165 E144 D6 D5 D4 D3 D2 D1 DØ CLK INH CLK SER IN RØ(1) R1(1)
→ DL2 CEHS SDMS CHNL 1 H (CIBH)

CIBH SDMS SLF TST H
TBMW TB PAR UTRAP L
TBMW MISS UTRAP L
TBMW MBIT UTRAP L
CEHE CS PE TRAP H
→ SHIFT LD D7 74LS165 E96 D6 D5 D4 D3 D2 D1 DØ CLK INH CLK SER IN RØ(1) R1(1)

DAPB AUALU=A MINUS B L
DDPN EALU Ø9 H
DDPN EALU Ø8 H
(SLOT 28) ACC NDATA H
(SLOT 28) ACC ZDATA H
(SLOT 28) ACC VDATA H
(SLOT 28) ACC CDATA H
CEHD SECOND REF H
→ SHIFT LD D7 74LS165 E134 D6 D5 D4 D3 D2 D1 DØ CLK INH CLK SER IN RØ(1) R1(1)

CEHF CLR UWORD (1) H
ICLS EN ID XCEIV L
DEPM BMX31 L
DDPD BMX15 L
DCPD BMXØ7 L
DEPD AMX31 L
DDPB AMX15 L
DCPB AMXØ7 L
→ SHIFT LD D7 74LS165 E133 D6 D5 D4 D3 D2 D1 DØ CLK INH CLK SER IN RØ(1) R1(1)

CIBH SDMS LOAD H
CIBH SDMS DEL CLK L
→ 8640 E116
→ 8640 E116

SBLT STALL L
IRCJ DQ CONT H
IRCJ FLOAT H
IRCJ WORD CONT H
IRCJ BYTE CONT H
TBMW SAVE CONTEXT H
DDPS FLOAT N ZERO H
USCB CLR UTRAP L
→ SHIFT LD D7 74LS165 E115 D6 D5 D4 D3 D2 D1 DØ CLK INH CLK SER IN RØ(1) R1(1)

DEPK ALU BUFF 31 L
DCPL ALU CARRY 31 L
DCPL ALU CARRY 15 L
DCPL ALU CARRY Ø7 L
CEHA ALU BUFF 17 L
CEHA ALU BUFF 16 L
CEHA ALU BUFF 15 L
CEHA ALU BUFF Ø7 L
→ SHIFT LD D7 74LS165 E146 D6 D5 D4 D3 D2 D1 DØ CLK INH CLK SER IN RØ(1) R1(1)

REVISIONS		
CHK	CHANGE NO.	REV.

(SDMS BUS LOGIC) (SLOT 14)

TITLE COND. CODES EXCEPT. AND HIGH BITS (CEHS)

SIZE	CODE	NUMBER	REV.
D	CS	M8230-Ø-1	C

SCALE — SHEET 2Ø OF 29 DIST.

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ZEN SEL PROM (23-015B1-00)

PROM ADDR		PROM DATA M7	M6	M5	M4	M3	M2	M1	M0	Z SEL (2:0)L	N SEL (2:0)L	INV ALU SIGN H	X
00	CCL0	H	H	H	H	H	H	L	L	CM			
01													
02													
03													
04													
05													
06													
07													
08		H	H	H	H	H	H	L	L	CM			
09													
0A													
0B													
0C													
0D													
0E													
0F													
10	CCL1	H	H	H	H	H	H	L	L	CM			
11													
12													
13													
14													
15													
16													
17													
18		H	H	H	H	H	H	L	L	CM			
19													
1A													
1B													
1C													
1D													
1E													
1F													

PROM ADDR		PROM DATA M7	M6	M5	M4	M3	M2	M1	M0	Z SEL (2:0)L	N SEL (2:0)L	INV ALU SIGN H	X
20	CCL2	H	H	H	H	H	H	L	L	CM			
21													
22													
23													
24													
25													
26													
27													
28		H	H	H	H	H	H	L	L	CM	X		
29													
2A													
2B													
2C													
2D													
2E													
2F													
30	CCL3	H	H	L	H	L	H	L	L	CM			
31													
32													
33													
34													
35													
36													
37													
38		H	H	L	H	L	H	L	L	CM			
39													
3A													
3B													
3C													
3D													
3E													
3F													

PROM ADDR		PROM DATA M7	M6	M5	M4	M3	M2	M1	M0	Z SEL (2:0)L	N SEL (2:0)L	INV ALU SIGN H	X
40	CCL4	H	H	H	H	H	H	L	L	CM	X		
41													
42													
43													
44													
45													
46													
47													
48		H	L	L	H	H	L	L	L	CM			
49													
4A													
4B													
4C													
4D													
4E													
4F													
50	CCL5	H	L	L	H	H	L	L	L	CM			
51													
52													
53													
54													
55													
56													
57													
58		H	L	L	H	H	L	L	L	CM			
59													
5A													
5B													
5C													
5D													
5E													
5F													

PROM ADDR		PROM DATA M7	M6	M5	M4	M3	M2	M1	M0	Z SEL (2:0)L	N SEL (2:0)L	INV ALU SIGN L	X
60	CCL6	H	L	L	H	H	L	L	L	CM			
61													
62													
63													
64													
65													
66													
67													
68		H	H	H	H	H	H	L	L	CM			
69													
6A													
6B													
6C													
6D													
6E													
6F													
70	CCL7	H	H	H	H	H	H	L	L	CM	ZN CODE=0		
71		H	L	L	H	H	L	L	L		ZN CODE=1		
72		H	L	H	L	H	L	L	L		ZN CODE=2		
73		H	L	L	H	H	L	L	L		ZN CODE=3		
74		H	H	H	H	H	L	L	L		ZN CODE=4		
75		H	L	L	L	H	H	L	L		ZN CODE=5		
76		H	H	H	H	H	H	L	L		ZN CODE=6		
77		H	H	H	H	H	H	L	L		ZN CODE=7		
78		H	H	H	H	H	H	L	L	CM	ZN CODE=0		
79		H	L	L	H	H	L	L	L		ZN CODE=1		
7A		H	L	H	H	H	L	H	L		ZN CODE=2		
7B		H	L	L	H	H	H	L	L		ZN CODE=3		
7C		L	H	H	H	H	L	L	L		ZN CODE=4		
7D		H	H	H	H	H	H	L	L		ZN CODE=5		
7E		H	H	H	H	H	H	L	L		ZN CODE=6		
7F		H	H	H	H	H	H	L	L		ZN CODE=7		

80 TO FF	LOAD ACC C.C	L	L	H	L	L	H	L	L	

(ZN SEL PROM TRUTH TABLE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHT)	D	CS	M8230-0-1	C
SCALE —	SHEET 21 OF 29		DIST.	

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C & V SEL PROM (23Ø1681-ØØ)

PROM ADDR		PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	
ØØ	CCLØ	H	H	H	L	H	H	L	L	$\overline{CM}$
Ø1										
Ø2										
Ø3										
Ø4										
Ø5										
Ø6										
Ø7										
Ø8										
Ø9										
ØA										
ØB										
ØC										
ØD										
ØE										
ØF										
1Ø		H	H	H	L	H	H	L	L	CM
11										
12										
13										
14										
15										
16										
17										
18										
19										
1A										
1B										
1C										
1D										
1E										
1F										

PROM ADDR		PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	
2Ø	CCL1	H	H	H	L	H	H	L	L	$\overline{CM}$
21										
22										
23										
24										
25										
26										
27										
28										
29										
2A										
2B										
2C										
2D										
2E										
2F										
3Ø		H	H	H	L	H	H	L	L	CM
31										
32										
33										
34										
35										
36										
37										
38										
39										
3A										
3B										
3C										
3D										
3E										
3F										

PROM ADDR		PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	
4Ø	CCL2	H	H	H	H	L	H	L	H	$\overline{CM}$
41										
42										
43										
44										
45										
46										
47										
48										
49										
4A										
4B										
4C										
4D										
4E										
4F										
5Ø		H	H	H	L	H	H	L	L	CM
51										
52										
53										
54										
55										
56										
57										
58										
59										
5A										
5B										
5C										
5D										
5E										
5F										

PROM ADDR		PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ	
6Ø	CCL3	H	H	H	L	H	H	L	L	$\overline{CM}$
61										
62										
63										
64										
65										
66										
67										
68										
69										
6A										
6B										
6C										
6D										
6E										
6F										
7Ø		H	H	H	L	H	H	L	L	CM
71										
72										
73										
74										
75										
76										
77										
78										
79										
7A										
7B										
7C										
7D										
7E										
7F										

REVISIONS

CHK	CHANGE NO.	REV.

(CV SEL PROM TRUTH TABLE)

TITLE: COND. CODES EXCEPT, AND HIGH BITS (CEHU)
SIZE D | CODE CS | NUMBER M8230-Ø-1 | REV. C
SCALE —/— | SHEET 22 OF 29 | DIST.

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C & V SEL PROM (23Ø16B1-ØØ)

PROM ADDR		C SEL (2:Ø) L	V SEL (2:Ø) H	INV BMX SIGN H	V DETECT SW H						
		PROM DATA									
		M7	M6	M5	M4	M3	M2	M1	MØ		
8Ø	CCL4	H	H	H	L	H	H	L	L	$\overline{CM}$	X
81											
82											
83											
84											
85											
86											
87											
88											
89											
8A											
8B											
8C											
8D											
8E											
8F										↓	
9Ø		L	H	H	H	L	H	L	L	CM	
91											
92											
93											
94											
95											
96											
97											
98											
99											
9A											
9B											
9C											
9D											
9E											
9F	↓									↓	

PROM ADDR		C SEL (2:Ø) L	V SEL (2:Ø) H	INV BMX SIGN H	V DETECT SW H						
		PROM DATA									
		M7	M6	M5	M4	M3	M2	M1	MØ		
AØ	CCL5	H	L	L	H	L	H	L	L	$\overline{CM}$	
A1											
A2											
A3											
A4											
A5											
A6											
A7											
A8											
A9											
AA											
AB											
AC											
AD											
AE											
AF										↓	
BØ		H	L	L	H	L	H	L	L	CM	
B1											
B2											
B3											
B4											
B5											
B6											
B7											
B8											
B9											
BA											
BB											
BC											
BD											
BE											
BF	↓									↓	

PROM ADDR		C SEL (2:Ø) L	V SEL (2:Ø) H	INV BMX SIGN H	V DETECT SW H						
		PROM DATA									
		M7	M6	M5	M4	M3	M2	M1	MØ		
CØ	CCL6	H	H	H	L	H	H	L	L	$\overline{CM}$	
C1											
C2											
C3											
C4											
C5											
C6											
C7											
C8											
C9											
CA											
CB											
CC											
CD											
CE											
CF										↓	
DØ		L	H	H	H	L	L	L	L	CM	
D1											
D2											
D3											
D4											
D5											
D6											
D7											
D8											
D9											
DA											
DB											
DC											
DD											
DE											
DF	↓									↓	

PROM ADDR		C SEL (2:Ø) L	V SEL (2:Ø) H	INV BMX SIGN H	V DETECT SW H						
		PROM DATA									
		M7	M6	M5	M4	M3	M2	M1	MØ		
EØ	CCL7	H	H	H	H	L	H	L	L	$\overline{CM}$	CV CODE Ø
E1		H	L	L	H	L	H	L	L		1
E2		H	H	L	L	L	L	H	L		2
E3		H	H	L	L	L	L	L	H		3
E4		L	H	L	L	L	L	L	L		4
E5		L	H	L	L	L	L	H	H		5
E6		H	H	H	L	L	L	L	H		6
E7		H	H	H	L	L	L	H	H		7
E8		H	L	L	H	H	L	L	H		8
E9		H	H	H	H	H	L	L	H		9
EA		H	H	L	H	L	H	L	L		A
EB		H	L	L	H	H	L	L	L		B
EC		H	H	H	L	L	L	H	L		C
ED		H	L	L	L	L	L	L	H		D
EE		H	H	H	L	H	H	L	L		Ex
EF		H	H	H	L	H	H	L	L	↓	Fx
FØ		H	H	H	H	L	H	L	L	CM	CV CODE Ø
F1		H	L	L	H	L	H	L	L		1
F2		H	H	L	L	L	L	H	L		2
F3		H	H	L	L	L	L	L	H		3
F4		L	H	L	L	L	L	L	L		4
F5		L	H	L	L	L	L	H	H		5
F6		H	H	H	L	L	L	L	H		6
F7		H	H	H	L	L	L	H	H		7
F8		L	L	L	H	L	H	L	L		8
F9		L	L	L	H	L	H	L	H		9
FA		H	H	L	L	L	L	L	L		A
FB		H	L	H	H	L	H	L	L		B
FC		H	H	H	H	L	L	L	L		C
FD		L	L	H	L	L	H	H	H		D
FE		L	L	H	L	H	L	H	H		E
FF	↓	H	H	H	L	H	H	L	L	↓	Fx

(CV SEL PROM TRUTH TABLE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHV)	D	CS	M8230-Ø-1	C
SCALE —	SHEET 23 OF 29	DIST.		

DEC FORM NO. DRD 130

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CONDITION CODE INSTR. DEPENDENT PROM - $\overline{CM}$ (23Ø3781-ØØ)

PROM ADDR	OP CODE	ZN CODE 2 H	ZN CODE 1 H	ZN CODE Ø H	CV CODE 3 H	CV CODE 2 H	CV CODE 1 H	CV CODE Ø H	EN IV TRAP L
		PROM DATA							
		M7	M6	M5	M4	M3	M2	M1	MØ
ØØ	HALT	L	L	L	L	L	L	L	H
Ø1	NOP	L	L	L	L	L	L	L	H
Ø2	REI	L	L	L	L	L	L	L	H
Ø3	BPT	L	L	L	L	L	L	L	H
Ø4	RET	L	L	L	L	L	L	L	H
Ø5	RSB	L	L	L	L	L	L	L	H
Ø6	LDPCTX	L	L	L	L	L	L	L	H
Ø7	SVPCTX	L	L	L	L	L	L	L	H
Ø8	——	L	L	L	L	L	L	L	H
Ø9	——	L	L	L	L	L	L	L	H
ØA	INDEX	L	H	L	L	L	L	H	H
ØB	CRC	L	L	H	L	L	L	L	H
ØC	PROBER	L	L	H	L	L	L	L	H
ØD	PROBEW	L	L	H	L	L	L	L	H
ØE	INSQUE	L	H	L	H	L	H	L	H
ØF	REMQUE	L	H	L	H	L	H	L	H
1Ø	BSBB	L	L	L	L	L	L	L	H
11	BRB	L	L	L	L	L	L	L	H
12	BNEQ	L	L	L	L	L	L	L	H
13	BEQL	L	L	L	L	L	L	L	H
14	BGTR	L	L	L	L	L	L	L	H
15	BLEQ	L	L	L	L	L	L	L	H
16	JSB	L	L	L	L	L	L	L	H
17	JMP	L	L	L	L	L	L	L	H
18	BGEQ	L	L	L	L	L	L	L	H
19	BLSS	L	L	L	L	L	L	L	H
1A	BGTRU	L	L	L	L	L	L	L	H
1B	BLEQU	L	L	L	L	L	L	L	H
1C	BVC	L	L	L	L	L	L	L	H
1D	BVS	L	L	L	L	L	L	L	H
1E	BCC	L	L	L	L	L	L	L	H
1F	BCS	L	L	L	L	L	L	L	H

PROM ADDR	OP CODE	ZN CODE 2 H	ZN CODE 1 H	ZN CODE Ø H	CV CODE 3 H	CV CODE 2 H	CV CODE 1 H	CV CODE Ø H	EN IV TRAP L
		PROM DATA							
		M7	M6	M5	M4	M3	M2	M1	MØ
2Ø	ADDP4	L	L	L	H	L	H	L	H
21	ADDP6	L	L	L	H	L	H	L	H
22	SUBP4	L	L	L	H	L	H	L	H
23	SUBP6	L	L	L	H	L	H	L	H
24	CVTPN	L	L	L	L	L	L	L	H
25	MULP	L	L	L	H	L	H	L	H
26	CVTNP	L	L	L	L	L	L	L	H
27	DIVP	L	L	L	H	L	H	L	H
28	MOVC3	H	L	H	L	L	L	H	H
29	CMPC3	L	H	L	H	L	H	L	H
2A	SCANC	H	L	H	L	L	L	H	H
2B	SPAN C	H	L	H	L	L	L	H	H
2C	MOVC5	L	H	L	H	L	H	L	H
2D	CMPC5	L	H	L	H	L	H	L	H
2E	MOVTC	L	H	L	H	L	H	L	H
2F	MOVTUC	L	H	L	H	L	H	L	H
3Ø	BSBW	L	L	L	L	L	L	L	H
31	BRW	L	L	L	L	L	L	L	H
32	CVTWL	L	L	H	L	L	L	H	H
33	CVTWB	L	L	L	H	L	H	H	L
34	MOVP	L	L	H	L	L	L	L	H
35	CMPP3	L	L	L	L	L	L	L	H
36	CVTPL	L	L	L	L	L	L	L	H
37	CMPP4	L	L	L	L	L	L	L	H
38	EDITPC	L	L	L	L	L	L	L	H
39	MATCHC	L	L	L	L	L	L	L	H
3A	LOCC	H	L	H	L	L	L	H	H
3B	SKPC	H	L	H	L	L	L	H	H
3C	MOVZWL	L	L	H	L	L	L	L	H
3D	ACBW	L	L	H	H	H	L	L	L
3E	MOVAW	L	L	H	L	L	L	L	H
3F	PUSHAW	L	L	H	L	L	L	L	H

PROM ADDR	OP CODE	ZN CODE 2 H	ZN CODE 1 H	ZN CODE Ø H	CV CODE 3 H	CV CODE 2 H	CV CODE 1 H	CV CODE Ø H	EN IV TRAP L
		PROM DATA							
		M7	M6	M5	M4	M3	M2	M1	MØ
4Ø	ADDF2	L	L	H	H	L	L	L	H
41	ADDF3	L	L	H	H	L	L	L	H
42	SUBF2	L	L	H	H	L	L	L	H
43	SUBF3	L	L	H	H	L	L	L	H
44	MULF2	L	L	H	H	L	L	L	H
45	MULF3	L	L	H	H	L	L	L	H
46	DIV F2	L	L	H	H	L	L	L	H
47	DIV F3	L	L	H	H	L	L	L	H
48	CVTFB	L	L	L	H	L	H	H	L
49	CVTFW	L	L	L	H	L	H	H	L
4A	CVTFL	L	L	L	H	L	H	H	L
4B	CVTRFL	L	L	H	H	H	L	H	L
4C	CVTBF	L	L	H	L	L	L	H	H
4D	CVTWF	L	L	H	L	L	L	H	H
4E	CVTLF	L	L	H	L	L	L	H	H
4F	ACBF	L	L	H	H	L	L	H	H
5Ø	MOVF	L	L	H	L	L	L	L	H
51	CMPF	L	L	H	L	L	L	H	H
52	MNEGF	L	L	H	L	L	L	H	H
53	TSTF	L	L	H	L	L	L	H	H
54	EMODF	L	L	H	H	L	L	L	H
55	POLYF	L	L	H	H	L	L	L	H
56	CVTFD	L	L	H	L	L	L	H	H
57	——	L	L	L	L	L	L	L	H
58	ADAWI	L	L	H	L	L	H	L	L
59	——	L	L	L	L	L	L	L	H
5A	——	L	L	L	L	L	L	L	H
5B	——	L	L	L	L	L	L	L	H
5C	——	L	L	L	L	L	L	L	H
5D	——	L	L	L	L	L	L	L	H
5E	——	L	L	L	L	L	L	L	H
5F	——	L	L	L	L	L	L	L	H

PROM ADDR	OP CODE	ZN CODE 2 H	ZN CODE 1 H	ZN CODE Ø H	CV CODE 3 H	CV CODE 2 H	CV CODE 1 H	CV CODE Ø H	EN IV TRAP L
		PROM DATA							
		M7	M6	M5	M4	M3	M2	M1	MØ
6Ø	ADDD2	L	L	H	H	L	L	L	H
61	ADDD3	L	L	H	H	L	L	L	H
62	SUBD2	L	L	H	H	L	L	L	H
63	SUBD3	L	L	H	H	L	L	L	H
64	MULD2	L	L	H	H	L	L	L	H
65	MULD3	L	L	H	H	L	L	L	H
66	DIV D2	H	L	L	H	L	H	L	H
67	DIV D3	H	L	L	H	L	H	L	H
68	CVTDB	L	L	L	H	L	H	H	L
69	CVTDW	L	L	L	H	L	H	H	L
6A	CVTDL	L	L	L	H	L	H	H	L
6B	CVTRDL	L	L	H	H	H	L	H	L
6C	CVTBD	L	L	H	L	L	L	H	H
6D	CVTWD	L	L	H	L	L	L	H	H
6E	CVTLD	L	L	H	L	L	L	H	H
6F	ACBD	L	L	H	H	L	L	H	H
7Ø	MOVD	L	L	H	L	L	L	L	H
71	CMPD	L	L	H	L	L	L	H	H
72	MNEGD	L	L	H	L	L	L	H	H
73	TSTD	L	L	H	L	L	L	H	H
74	EMODD	L	L	H	H	L	L	L	H
75	POLYD	L	L	H	H	L	L	L	H
76	CVTDF	L	L	H	H	L	L	L	H
77	——	L	L	L	L	L	L	L	H
78	ASHL	L	L	L	H	L	H	H	L
79	ASHQ	L	L	L	H	L	H	H	L
7A	EMUL	L	L	H	L	L	L	H	H
7B	EDIV	L	L	L	L	L	L	L	H
7C	CLRQ	L	L	H	L	L	L	L	H
7D	MOVQ	L	L	H	L	L	L	L	H
7E	MOVAQ	L	L	H	L	L	L	L	H
7F	PUSHAQ	L	L	H	L	L	L	L	H

(CCID-$\overline{CM}$ PROM TRUTH TABLE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHW)	D	CS	M8230-Ø-1	C
SCALE —/—	SHEET 24 OF 29		DIST.	

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CONDITION CODE INSTR. DEPENDENT PROM - $\overline{CM}$ (23Ø37B1-ØØ)

PROM ADDR	OP CODE	PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ
		ZN CODE 2 H	ZN CODE 1 H	ZN CODE Ø H	CV CODE 3 H	CV CODE 2 H	CV CODE 1 H	CV CODE Ø H	EN IV TRAP L
8Ø	ADD B2	L	L	H	L	L	H	L	L
81	ADD B3	L	L	H	L	L	H	L	L
82	SUB B2	L	L	H	L	H	L	L	L
83	SUB B3	L	L	H	L	H	L	L	L
84	MUL B2	L	L	L	H	L	H	H	L
85	MUL B3	L	L	L	H	L	H	H	L
86	DIV B2	L	L	L	L	L	L	L	H
87	DIV B3	L	L	L	L	L	L	L	H
88	BIS B2	L	L	H	L	L	L	L	H
89	BIS B3	L	L	H	L	L	L	L	H
8A	BIC B2	L	L	H	L	L	L	L	H
8B	BIC B3	L	L	H	L	L	L	L	H
8C	XOR B2	L	L	H	L	L	L	L	H
8D	XOR B3	L	L	H	L	L	L	L	H
8E	MNEG B	L	L	H	L	H	L	L	L
8F	CASE B	L	H	L	H	L	H	L	H
9Ø	MOV B	L	L	H	L	L	L	L	H
91	CMP B	L	H	L	H	L	H	L	H
92	MCOM B	L	L	H	L	L	L	L	H
93	BIT B	L	L	H	L	L	L	L	H
94	CLR B	L	L	H	L	L	L	L	H
95	TST B	L	L	H	L	L	L	H	H
96	INC B	L	L	H	L	L	H	H	L
97	DEC B	L	L	H	L	H	L	H	L
98	CVTBL	L	L	H	L	L	L	H	H
99	CVTBW	L	L	H	L	L	L	H	H
9A	MOVZBL	L	L	H	L	L	L	L	H
9B	MOVZBW	L	L	H	L	L	L	L	H
9C	ROT L	L	L	H	L	L	L	L	H
9D	ACBB	L	L	H	H	H	L	L	L
9E	MOVAB	L	L	H	L	L	L	L	H
9F	PUSHAB	L	L	H	L	L	L	L	H

PROM ADDR	OP CODE	PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ
		ZN CODE 2 H	ZN CODE 1 H	ZN CODE Ø H	CV CODE 3 H	CV CODE 2 H	CV CODE 1 H	CV CODE Ø H	EN IV TRAP L
AØ	ADD W2	L	L	H	L	L	H	L	L
A1	ADD W3	L	L	H	L	L	H	L	L
A2	SUB W2	L	L	H	L	H	L	L	L
A3	SUB W3	L	L	H	L	H	L	L	L
A4	MUL W2	L	L	L	H	L	H	H	L
A5	MUL W3	L	L	L	H	L	H	H	L
A6	DIV W2	L	L	L	L	L	L	L	H
A7	DIV W3	L	L	L	L	L	L	L	H
A8	BIS W2	L	L	H	L	L	L	L	H
A9	BIS W3	L	L	H	L	L	L	L	H
AA	BIC W2	L	L	H	L	L	L	L	H
AB	BIC W3	L	L	H	L	L	L	L	H
AC	XOR W2	L	L	H	L	L	L	L	H
AD	XOR W3	L	L	H	L	L	L	L	H
AE	MNEG W	L	L	H	L	H	L	L	L
AF	CASE W	L	H	L	H	L	H	L	H
BØ	MOV W	L	L	H	L	L	L	L	H
B1	CMP W	L	H	L	H	L	H	L	H
B2	MCOM W	L	L	H	L	L	L	L	H
B3	BIT W	L	L	H	L	L	L	L	H
B4	CLR W	L	L	H	L	L	L	L	H
B5	TST W	L	L	H	L	L	L	H	H
B6	INC W	L	L	H	L	L	H	H	L
B7	DEC W	L	L	H	L	H	L	H	L
B8	BISPSW	L	L	L	L	L	L	L	H
B9	BICPSW	L	L	L	L	L	L	L	H
BA	POPR	L	L	L	L	L	L	L	H
BB	PUSHR	L	L	L	L	L	L	L	H
BC	CHMK	L	L	H	L	L	L	H	H
BD	CHME	L	L	H	L	L	L	H	H
BE	CHMS	L	L	H	L	L	L	H	H
BF	CHMU	L	L	H	L	L	L	H	H

PROM ADDR	OP CODE	PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ
		ZN CODE 2 H	ZN CODE 1 H	ZN CODE Ø H	CV CODE 3 H	CV CODE 2 H	CV CODE 1 H	CV CODE Ø H	EN IV TRAP L
CØ	ADD L2	L	L	H	L	L	H	L	L
C1	ADD L3	L	L	H	L	L	H	L	L
C2	SUB L2	L	L	H	L	H	L	L	L
C3	SUB L3	L	L	H	L	H	L	L	L
C4	MUL L2	L	L	L	H	L	H	H	L
C5	MUL L3	L	L	L	H	L	H	H	L
C6	DIV L2	L	L	L	L	L	L	L	H
C7	DIV L3	L	L	L	L	L	L	L	H
C8	BIS L2	L	L	H	L	L	L	L	H
C9	BIS L3	L	L	H	L	L	L	L	H
CA	BIC L2	L	L	H	L	L	L	L	H
CB	BIC L3	L	L	H	L	L	L	L	H
CC	XOR L2	L	L	H	L	L	L	L	H
CD	XOR L3	L	L	H	L	L	L	L	H
CE	MNEG L	L	L	H	L	H	L	L	L
CF	CASE L	L	H	L	H	L	H	L	H
DØ	MOV L	L	L	H	L	L	L	L	H
D1	CMP L	L	H	L	H	L	H	L	H
D2	MCOM L	L	L	H	L	L	L	L	H
D3	BIT L	L	L	H	L	L	L	L	H
D4	CLR L	L	L	H	L	L	L	L	H
D5	TST L	L	L	H	L	L	L	H	H
D6	INC L	L	L	H	L	L	H	H	L
D7	DEC L	L	L	H	L	H	L	H	L
D8	ADWC	L	L	H	L	L	H	L	L
D9	SBWC	L	L	H	L	H	L	L	L
DA	MTPR	L	L	H	L	L	L	L	H
DB	MFPR	L	L	H	L	L	L	L	H
DC	MOVPSL	L	L	L	L	L	L	L	H
DD	PUSHL	L	L	H	L	L	L	L	H
DE	MOVAL	L	L	H	L	L	L	L	H
DF	PUSHAL	L	L	H	L	L	L	L	H

PROM ADDR	OP CODE	PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ
		ZN CODE 2 H	ZN CODE 1 H	ZN CODE Ø H	CV CODE 3 H	CV CODE 2 H	CV CODE 1 H	CV CODE Ø H	EN IV TRAP L
EØ	BBS	L	L	L	L	L	L	L	H
E1	BBC	L	L	L	L	L	L	L	H
E2	BBSS	L	L	L	L	L	L	L	H
E3	BBCS	L	L	L	L	L	L	L	H
E4	BBSC	L	L	L	L	L	L	L	H
E5	BBCC	L	L	L	L	L	L	L	H
E6	BBSSI	L	L	L	L	L	L	L	H
E7	BBCCI	L	L	L	L	L	L	L	H
E8	BLBS	L	L	L	L	L	L	L	H
E9	BLBC	L	L	L	L	L	L	L	H
EA	FFS	H	L	H	L	L	L	H	H
EB	FFC	H	L	H	L	L	L	H	H
EC	CMPV	L	H	L	H	L	H	L	H
ED	CMPZV	L	H	L	H	L	H	L	H
EE	EXTV	L	L	H	L	L	L	L	H
EF	EXTZV	L	L	H	L	L	L	L	H
FØ	INSV	L	L	H	L	L	L	L	H
F1	ACBL	L	L	H	H	H	L	L	L
F2	AOBLSS	L	L	H	L	H	H	L	L
F3	AOBLEQ	L	L	H	L	H	H	L	L
F4	SOBGEQ	L	L	H	L	H	H	H	L
F5	SOBGTR	L	L	H	L	H	H	H	L
F6	CVTLB	L	L	L	H	L	H	H	L
F7	CVTLW	L	L	L	H	L	H	H	L
F8	ASHP	L	L	L	H	L	H	L	H
F9	CVTLP	L	L	L	H	L	H	L	H
FA	CALLG	L	L	L	L	L	L	L	H
FB	CALLS	L	L	L	L	L	L	L	H
FC	XFC	L	L	L	L	L	L	L	H
FD	ESCD	L	L	L	L	L	L	L	H
FE	ESCE	L	L	L	L	L	L	L	H
FF	ESCF	L	L	L	L	L	L	L	H

(CCID - $\overline{CM}$ PROM TRUTH TABLE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS (CEHX)	D	CS	M8230-0-1	C
SCALE —//—	SHEET 25 OF 29		DIST.	

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CONDITION CODE INSTR. DEPENDENT PROM - CMP MODE (23ØI3BI-ØØ)

PROM ADDR	OP CODE	PROM DATA M7 (ZN CODE 2 H)	M6 (ZN CODE 1 H)	M5 (ZN CODE Ø H)	M4 (CV CODE 3 H)	M3 (CV CODE 2 H)	M2 (CV CODE 1 H)	M1 (CV CODE Ø H)	MØ (EN IV TRAP L)
ØØ	X	L	L	L	L	L	L	L	H
Ø1	MOV	L	L	H	L	L	L	L	H
Ø2	CMP	L	H	L	H	L	H	L	H
Ø3	BIT	L	L	H	L	L	L	L	H
Ø4	BIC	L	L	H	L	L	L	L	H
Ø5	BIS	L	L	H	L	L	L	L	H
Ø6	ADD	L	L	H	L	L	H	L	H
Ø7	MUL	L	L	H	H	L	H	H	H
Ø8	X	L	L	L	L	L	L	L	H
Ø9	MOV	L	L	H	L	L	L	L	H
ØA	CMP	L	H	L	H	L	H	L	H
ØB	BIT	L	L	H	L	L	L	L	H
ØC	BIC	L	L	H	L	L	L	L	H
ØD	BIS	L	L	H	L	L	L	L	H
ØE	ADD	L	L	H	L	L	H	L	H
ØF	DIV	H	L	L	H	L	L	H	H
1Ø	X	L	L	L	L	L	L	L	H
11	MOV	L	L	H	L	L	L	L	H
12	CMP	L	H	L	H	L	H	L	H
13	BIT	L	L	H	L	L	L	L	H
14	BIC	L	L	H	L	L	L	L	H
15	BIS	L	L	H	L	L	L	L	H
16	ADD	L	L	H	L	L	H	L	H
17	ASH	L	L	H	H	H	H	L	H
18	X	L	L	L	L	L	L	L	H
19	MOV	L	L	H	L	L	L	L	H
1A	CMP	L	H	L	H	L	H	L	H
1B	BIT	L	L	H	L	L	L	L	H
1C	BIC	L	L	H	L	L	L	L	H
1D	BIS	L	L	H	L	L	L	L	H
1E	ADD	L	L	H	L	L	H	L	H
1F	ASHC	L	L	H	H	H	H	L	H

PROM ADDR	OP CODE	PROM DATA M7 (ZN CODE 2 H)	M6 (ZN CODE 1 H)	M5 (ZN CODE Ø H)	M4 (CV CODE 3 H)	M3 (CV CODE 2 H)	M2 (CV CODE 1 H)	M1 (CV CODE Ø H)	MØ (EN IV TRAP L)
2Ø	X	L	L	L	L	L	L	L	H
21	MOV	L	L	H	L	L	L	L	H
22	CMP	L	H	L	H	L	H	L	H
23	BIT	L	L	H	L	L	L	L	H
24	BIC	L	L	H	L	L	L	L	H
25	BIS	L	L	H	L	L	L	L	H
26	ADD	L	L	H	L	L	H	L	H
27	XOR	L	L	H	L	L	L	L	H
28	X	L	L	L	L	L	L	L	H
29	MOV	L	L	H	L	L	L	L	H
2A	CMP	L	H	L	H	L	H	L	H
2B	BIT	L	L	H	L	L	L	L	H
2C	BIC	L	L	H	L	L	L	L	H
2D	BIS	L	L	H	L	L	L	L	H
2E	ADD	L	L	H	L	L	H	L	H
2F	X	L	L	L	L	L	L	L	H
3Ø	X	L	L	L	L	L	L	L	H
31	MOV	L	L	H	L	L	L	L	H
32	CMP	L	H	L	H	L	H	L	H
33	BIT	L	L	H	L	L	L	L	H
34	BIC	L	L	H	L	L	L	L	H
35	BIS	L	L	H	L	L	L	L	H
36	ADD	L	L	H	L	L	H	L	H
37	X	L	L	L	L	L	L	L	H
38	X	L	L	L	L	L	L	L	H
39	MOV	L	L	H	L	L	L	L	H
3A	CMP	L	H	L	H	L	H	L	H
3B	BIT	L	L	H	L	L	L	L	H
3C	BIC	L	L	H	L	L	L	L	H
3D	BIS	L	L	H	L	L	L	L	H
3E	ADD	L	L	H	L	L	H	L	H
3F	SOB	L	L	L	L	L	L	L	H

PROM ADDR	OP CODE	PROM DATA M7 (ZN CODE 2 H)	M6 (ZN CODE 1 H)	M5 (ZN CODE Ø H)	M4 (CV CODE 3 H)	M3 (CV CODE 2 H)	M2 (CV CODE 1 H)	M1 (CV CODE Ø H)	MØ (EN IV TRAP L)
4Ø	X	L	L	L	L	L	L	L	H
41	MOVB	L	L	H	L	L	L	L	H
42	CMPB	L	H	L	H	L	H	L	H
43	BITB	L	L	H	L	L	L	L	H
44	BICB	L	L	H	L	L	L	L	H
45	BISB	L	L	H	L	L	L	L	H
46	SUB	L	L	H	L	H	L	L	H
47	X	L	L	L	L	L	L	L	H
48	X	L	L	L	L	L	L	L	H
49	MOVB	L	L	H	L	L	L	L	H
4A	CMPB	L	H	L	H	L	H	L	H
4B	BITB	L	L	H	L	L	L	L	H
4C	BICB	L	L	H	L	L	L	L	H
4D	BISB	L	L	H	L	L	L	L	H
4E	SUB	L	L	H	L	H	L	L	H
4F	X	L	L	L	L	L	L	L	H
5Ø	X	L	L	L	L	L	L	L	H
51	MOVB	L	L	H	L	L	L	L	H
52	CMPB	L	H	L	H	L	H	L	H
53	BITB	L	L	H	L	L	L	L	H
54	BICB	L	L	H	L	L	L	L	H
55	BISB	L	L	H	L	L	L	L	H
56	SUB	L	L	H	L	H	L	L	H
57	X	L	L	L	L	L	L	L	H
58	X	L	L	L	L	L	L	L	H
59	MOVB	L	L	H	L	L	L	L	H
5A	CMPB	L	H	L	H	L	H	L	H
5B	BITB	L	L	H	L	L	L	L	H
5C	BICB	L	L	H	L	L	L	L	H
5D	BISB	L	L	H	L	L	L	L	H
5E	SUB	L	L	H	L	H	L	L	H
5F	X	L	L	L	L	L	L	L	H

PROM ADDR	OP CODE	PROM DATA M7 (ZN CODE 2 H)	M6 (ZN CODE 1 H)	M5 (ZN CODE Ø H)	M4 (CV CODE 3 H)	M3 (CV CODE 2 H)	M2 (CV CODE 1 H)	M1 (CV CODE Ø H)	MØ (EN IV TRAP L)
6Ø	X	L	L	L	L	L	L	L	H
61	MOVB	L	L	H	L	L	L	L	H
62	CMPB	L	H	L	H	L	H	L	H
63	BITB	L	L	H	L	L	L	L	H
64	BICB	L	L	H	L	L	L	L	H
65	BISB	L	L	H	L	L	L	L	H
66	SUB	L	L	H	L	H	L	L	H
67	X	L	L	L	L	L	L	L	H
68	X	L	L	L	L	L	L	L	H
69	MOVB	L	L	H	L	L	L	L	H
6A	CMPB	L	H	L	H	L	H	L	H
6B	BITB	L	L	H	L	L	L	L	H
6C	BICB	L	L	H	L	L	L	L	H
6D	BISB	L	L	H	L	L	L	L	H
6E	SUB	L	L	H	L	H	L	L	H
6F	X	L	L	L	L	L	L	L	H
7Ø	X	L	L	L	L	L	L	L	H
71	MOVB	L	L	H	L	L	L	L	H
72	CMPB	L	H	L	H	L	H	L	H
73	BITB	L	L	H	L	L	L	L	H
74	BICB	L	L	H	L	L	L	L	H
75	BISB	L	L	H	L	L	L	L	H
76	SUB	L	L	H	L	H	L	L	H
77	X	L	L	L	L	L	L	L	H
78	X	L	L	L	L	L	L	L	H
79	MOVB	L	L	H	L	L	L	L	H
7A	CMPB	L	H	L	H	L	H	L	H
7B	BITB	L	L	H	L	L	L	L	H
7C	BICB	L	L	H	L	L	L	L	H
7D	BISB	L	L	H	L	L	L	L	H
7E	SUB	L	L	H	L	H	L	L	H
7F	X	L	L	L	L	L	L	L	H

PROM ADDRESS

	7							Ø
IR(14:12)=Ø	1	IR15	IR11	IR1Ø	IRØ9	IRØ8	IRØ7	IRØ6
IR(14:12)≠Ø	Ø	IR15	IR11	IR1Ø	IRØ9	IR14	IR13	IR12

(CCID-CM PROM TRUTH TABLE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODE EXCEPT. AND HIGH BITS (CEHY)	D	CS	M823Ø-Ø-1	C
SCALE —11—	SHEET 26 OF 29	DIST.		

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CONDITION CODE INSTR. DEPENDENT PROM - CMP MODE (23Ø13BI-ØØ)

PROM ADDR	OP CODE	PROM DATA M7 (ZN CODE 2 H)	M6 (ZN CODE 1 H)	M5 (ZN CODE Ø H)	M4 (CV CODE 3 H)	M3 (CV CODE 2 H)	M2 (CV CODE 1 H)	M1 (CV CODE Ø H)	MØ (EN IV TRAP L)
8Ø	X	L	L	L	L	L	L	L	H
81	JMP								
82	X								
83	SWAB								
84	BR								
85	BR								
86	BR								
87	BR								
88	BNE								
89	BNE								
8A	BNE								
8B	BNE								
8C	BEQ								
8D	BEQ								
8E	BEQ								
8F	BEQ								
9Ø	BGE								
91	BGE								
92	BGE								
93	BGE								
94	BLT								
95	BLT								
96	BLT								
97	BLT								
98	BGT								
99	BGT								
9A	BGT								
9B	BGT								
9C	BLE								
9D	BLE								
9E	BLE								
9F	BLE								

PROM ADDR	OP CODE	PROM DATA M7 (ZN CODE 2 H)	M6 (ZN CODE 1 H)	M5 (ZN CODE Ø H)	M4 (CV CODE 3 H)	M3 (CV CODE 2 H)	M2 (CV CODE 1 H)	M1 (CV CODE Ø H)	MØ (EN IV TRAP L)
AØ	JSR	L	L	L	L	L	L	L	H
A1	JSR	L	L	L	L	L	L	L	H
A2	JSR	L	L	L	L	L	L	L	H
A3	JSR	L	L	L	L	L	L	L	H
A4	JSR	L	L	L	L	L	L	L	H
A5	JSR	L	L	L	L	L	L	L	H
A6	JSR	L	L	L	L	L	L	L	H
A7	JSR	L	L	L	L	L	L	L	H
A8	CLR	L	L	H	L	L	L	H	H
A9	COM	L	L	H	H	L	L	L	H
AA	INC	L	L	H	L	H	H	L	H
AB	DEC	L	L	H	L	H	H	H	H
AC	NEG	L	L	H	L	H	L	L	H
AD	ADC	L	L	H	L	L	H	H	H
AE	SBC	L	L	H	L	H	L	H	H
AF	TST	L	L	H	L	L	L	H	H
BØ	ROR	L	L	H	H	H	L	L	H
B1	ROL	L	L	H	H	H	L	H	H
B2	ASR	L	L	H	H	H	L	L	H
B3	ASL	L	L	H	H	H	L	H	H
B4	MARK	L	L	L	L	L	L	L	H
B5	MFPI	L	L	H	L	L	L	L	H
B6	MTPI	L	L	H	L	L	L	L	H
B7	SXT	L	L	H	L	L	L	L	H
B8	X	L	L	L	L	L	L	L	H
B9	X	L	L	L	L	L	L	L	H
BA	X	L	L	L	L	L	L	L	H
BB	X	L	L	L	L	L	L	L	H
BC	X	L	L	L	L	L	L	L	H
BD	X	L	L	L	L	L	L	L	H
BE	X	L	L	L	L	L	L	L	H
BF	X	L	L	L	L	L	L	L	H

PROM ADDR	OP CODE	PROM DATA M7 (ZN CODE 2 H)	M6 (ZN CODE 1 H)	M5 (ZN CODE Ø H)	M4 (CV CODE 3 H)	M3 (CV CODE 2 H)	M2 (CV CODE 1 H)	M1 (CV CODE Ø H)	MØ (EN IV TRAP L)
CØ	BPL	L	L	L	L	L	L	L	H
C1	BPL								
C2	BPL								
C3	BPL								
C4	BMI								
C5	BMI								
C6	BMI								
C7	BMI								
C8	BHI								
C9	BHI								
CA	BHI								
CB	BHI								
CC	BLOS								
CD	BLOS								
CE	BLOS								
CF	BLOS								
DØ	BVC								
D1	BVC								
D2	BVC								
D3	BVC								
D4	BVS								
D5	BVS								
D6	BVS								
D7	BVS								
D8	BCC								
D9	BCC								
DA	BCC								
DB	BCC								
DC	BCS								
DD	BCS								
DE	BCS								
DF	BCS								

PROM ADDR	OP CODE	PROM DATA M7 (ZN CODE 2 H)	M6 (ZN CODE 1 H)	M5 (ZN CODE Ø H)	M4 (CV CODE 3 H)	M3 (CV CODE 2 H)	M2 (CV CODE 1 H)	M1 (CV CODE Ø H)	MØ (EN IV TRAP L)
EØ	EMT	L	L	L	L	L	L	L	H
E1	EMT	L	L	L	L	L	L	L	H
E2	EMT	L	L	L	L	L	L	L	H
E3	EMT	L	L	L	L	L	L	L	H
E4	TRAP	L	L	L	L	L	L	L	H
E5	TRAP	L	L	L	L	L	L	L	H
E6	TRAP	L	L	L	L	L	L	L	H
E7	TRAP	L	L	L	L	L	L	L	H
E8	CLRB	L	L	H	L	L	L	H	H
E9	COMB	L	L	H	H	L	L	L	H
EA	INCB	L	L	H	L	H	H	L	H
EB	DECB	L	L	H	L	H	H	H	H
EC	NEGB	L	L	H	L	H	L	L	H
ED	ADCB	L	L	H	L	L	H	H	H
EE	SBCB	L	L	H	L	H	L	H	H
EF	TSTB	L	L	H	L	L	L	H	H
FØ	RORB	L	L	H	H	H	L	L	H
F1	ROLB	L	L	H	H	H	L	H	H
F2	ASRB	L	L	H	H	H	L	L	H
F3	ASLB	L	L	H	H	H	L	H	H
F4	X	L	L	L	L	L	L	L	H
F5	MFPD	L	L	H	L	L	L	L	H
F6	MTPD	L	L	H	L	L	L	L	H
F7	X	L	L	L	L	L	L	L	H
F8	X	L	L	L	L	L	L	L	H
F9	X	L	L	L	L	L	L	L	H
FA	X	L	L	L	L	L	L	L	H
FB	X	L	L	L	L	L	L	L	H
FC	X	L	L	L	L	L	L	L	H
FD	X	L	L	L	L	L	L	L	H
FE	X	L	L	L	L	L	L	L	H
FF	X	L	L	L	L	L	L	L	H

REVISIONS

CHK	CHANGE NO.	REV.

(CCID-CM PROM TRUTH TABLE)

TITLE COND. CODES EXCEPT. AND HIGH BITS (CEHZ)
SIZE D | CODE CS | NUMBER M8230-0-1 | REV. C
SCALE —/— | SHEET 27 OF 29 | DIST.

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PRIOR/SUM PROM (23017B1-ØØ)

PROM ADDR	ZERO H	PRIOR (2:Ø) L	SUM (3:Ø) H	PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ
ØØ				H	H	H	H	L	L	L	L
Ø1				L	H	H	H	L	L	L	H
Ø2				L	H	H	L	L	L	L	H
Ø3				L	H	H	H	L	L	H	L
Ø4				L	H	L	H	L	L	L	H
Ø5				L	H	H	H	L	L	H	L
Ø6				L	H	H	L	L	L	H	L
Ø7				L	H	H	H	L	L	H	H
Ø8				L	H	L	L	L	L	L	H
Ø9				L	H	H	H	L	L	H	L
ØA				L	H	H	L	L	L	H	L
ØB				L	H	H	H	L	L	H	H
ØC				L	H	L	H	L	L	H	L
ØD				L	H	H	H	L	L	H	H
ØE				L	H	H	L	L	L	H	H
ØF				L	H	H	H	L	H	L	L
1Ø				L	L	H	H	L	L	L	H
11				L	H	H	H	L	L	H	L
12				L	H	H	L	L	L	H	L
13				L	H	H	H	L	L	H	H
14				L	H	L	H	L	L	H	L
15				L	H	H	H	L	L	H	H
16				L	H	H	L	L	L	H	H
17				L	H	H	H	L	H	L	L
18				L	H	L	L	L	L	H	L
19				L	H	H	H	L	L	H	H
1A				L	H	H	L	L	L	H	H
1B				L	H	H	H	L	H	L	L
1C				L	H	L	H	L	L	H	H
1D				L	H	H	H	L	H	L	L
1E				L	H	H	L	L	H	L	L
1F				L	H	H	H	L	H	L	H

PROM ADDR	ZERO H	PRIOR (2:Ø) L	SUM (3:Ø) H	PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ
2Ø				L	L	H	L	L	L	L	H
21				L	H	H	H	L	L	H	L
22				L	H	H	L	L	L	H	L
23				L	H	H	H	L	L	H	H
24				L	H	L	H	L	L	H	L
25				L	H	H	H	L	L	H	H
26				L	H	H	L	L	L	H	H
27				L	H	H	H	L	H	L	L
28				L	H	L	L	L	L	H	L
29				L	H	H	H	L	L	H	H
2A				L	H	H	L	L	L	H	H
2B				L	H	H	H	L	H	L	L
2C				L	H	L	H	L	L	H	H
2D				L	H	H	H	L	H	L	L
2E				L	H	H	L	L	H	L	L
2F				L	H	H	H	L	H	L	H
3Ø				L	L	H	H	L	L	H	L
31				L	H	H	H	L	L	H	H
32				L	H	H	L	L	L	H	H
33				L	H	H	H	L	H	L	L
34				L	H	L	H	L	L	H	H
35				L	H	H	H	L	H	L	L
36				L	H	H	L	L	H	L	L
37				L	H	H	H	L	H	L	H
38				L	H	L	L	L	L	H	H
39				L	H	H	H	L	H	L	L
3A				L	H	H	L	L	H	L	L
3B				L	H	H	H	L	H	L	H
3C				L	H	L	H	L	H	L	L
3D				L	H	H	H	L	H	L	H
3E				L	H	H	L	L	H	L	H
3F				L	H	H	H	L	H	H	L

PROM ADDR	ZERO H	PRIOR (2:Ø) L	SUM (3:Ø) H	PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ
4Ø				L	L	L	H	L	L	L	H
41				L	H	H	H	L	L	H	L
42				L	H	H	L	L	L	H	L
43				L	H	H	H	L	L	H	H
44				L	H	L	H	L	L	H	L
45				L	H	H	H	L	L	H	H
46				L	H	H	L	L	L	H	H
47				L	H	H	H	L	H	L	L
48				L	H	L	L	L	L	H	L
49				L	H	H	H	L	L	H	H
4A				L	H	H	L	L	L	H	H
4B				L	H	H	H	L	H	L	L
4C				L	H	L	H	L	L	H	H
4D				L	H	H	H	L	H	L	L
4E				L	H	H	L	L	H	L	L
4F				L	H	H	H	L	H	L	H
5Ø				L	L	H	H	L	L	H	L
51				L	H	H	H	L	L	H	H
52				L	H	H	L	L	L	H	H
53				L	H	H	H	L	H	L	L
54				L	H	L	H	L	L	H	H
55				L	H	H	H	L	H	L	L
56				L	H	H	L	L	H	L	L
57				L	H	H	H	L	H	L	H
58				L	H	L	L	L	L	H	H
59				L	H	H	H	L	H	L	L
5A				L	H	H	L	L	H	L	L
5B				L	H	H	H	L	H	L	H
5C				L	H	L	H	L	H	L	L
5D				L	H	H	H	L	H	L	H
5E				L	H	H	L	L	H	L	H
5F				L	H	H	H	L	H	H	L

PROM ADDR	ZERO H	PRIOR (2:Ø) L	SUM (3:Ø) H	PROM DATA M7	M6	M5	M4	M3	M2	M1	MØ
6Ø				L	L	H	L	L	L	H	L
61				L	H	H	H	L	L	H	H
62				L	H	H	L	L	L	H	H
63				L	H	H	H	L	H	L	L
64				L	H	L	H	L	L	H	H
65				L	H	H	H	L	H	L	L
66				L	H	H	L	L	H	L	L
67				L	H	H	H	L	H	L	H
68				L	H	L	L	L	L	H	H
69				L	H	H	H	L	H	L	L
6A				L	H	H	L	L	H	L	L
6B				L	H	H	H	L	H	L	H
6C				L	H	L	H	L	H	L	L
6D				L	H	H	H	L	H	L	H
6E				L	H	H	L	L	H	L	H
6F				L	H	H	H	L	H	H	L
7Ø				L	L	H	H	L	L	H	H
71				L	H	H	H	L	H	L	L
72				L	H	H	L	L	H	L	L
73				L	H	H	H	L	H	L	H
74				L	H	L	H	L	H	L	L
75				L	H	H	H	L	H	L	H
76				L	H	H	L	L	H	L	H
77				L	H	H	H	L	H	H	L
78				L	H	L	L	L	H	L	L
79				L	H	H	H	L	H	L	H
7A				L	H	H	L	L	H	L	H
7B				L	H	H	H	L	H	H	L
7C				L	H	L	H	L	H	L	H
7D				L	H	H	H	L	H	H	L
7E				L	H	H	L	L	H	H	L
7F				L	H	H	H	L	H	H	H

REVISIONS		
CHK	CHANGE NO.	REV.

(PRIOR/SUM PROM TRUTH TABLE)

TITLE COND. CODES EXCEPT. AND HIGH BITS
SIZE D | CODE CS | NUMBER M8230-0-1 | REV. C
SCALE — | SHEET 28 OF 29 | DIST.

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PRIOR/SUM PROM (23Ø17B1-ØØ)

PROM ADDR	ZERO H	PRIOR (2:Ø) L	SUM (3:Ø) H	PROM DATA							
				M7	M6	M5	M4	M3	M2	M1	MØ
8Ø				L	L	L	L	L	L	L	H
81				L	H	H	H	L	L	H	L
82				L	H	H	L	L	L	H	L
83				L	H	H	H	L	L	H	H
84				L	H	L	H	L	L	H	L
85				L	H	H	H	L	L	H	H
86				L	H	H	L	L	L	H	H
87				L	H	H	H	L	H	L	L
88				L	H	L	L	L	L	H	L
89				L	H	H	H	L	L	H	H
8A				L	H	H	L	L	L	H	H
8B				L	H	H	H	L	H	L	L
8C				L	H	L	H	L	L	H	H
8D				L	H	H	H	L	H	L	L
8E				L	H	H	L	L	H	L	L
8F				L	H	H	H	L	H	L	H
9Ø				L	L	H	H	L	L	H	L
91				L	H	H	H	L	L	H	H
92				L	H	H	L	L	L	H	H
93				L	H	H	H	L	H	L	L
94				L	H	L	H	L	L	H	H
95				L	H	H	H	L	H	L	L
96				L	H	H	L	L	H	L	L
97				L	H	H	H	L	H	L	H
98				L	H	L	L	L	L	H	H
99				L	H	H	H	L	H	L	L
9A				L	H	H	L	L	H	L	L
9B				L	H	H	H	L	H	L	H
9C				L	H	L	H	L	H	L	L
9D				L	H	H	H	L	H	L	H
9E				L	H	H	L	L	H	L	H
9F				L	H	H	H	L	H	H	L

PROM ADDR	ZERO H	PRIOR (2:Ø) L	SUM (3:Ø) H	PROM DAT							
				M7	M6	M5	M4	M3	M2	M1	MØ
AØ				L	L	H	L	L	L	H	L
A1				L	H	H	H	L	L	H	H
A2				L	H	H	L	L	L	H	H
A3				L	H	H	H	L	H	L	L
A4				L	H	L	H	L	L	H	H
A5				L	H	H	H	L	H	L	L
A6				L	H	H	L	L	H	L	L
A7				L	H	H	H	L	H	L	H
A8				L	H	L	L	L	L	H	H
A9				L	H	H	H	L	H	L	L
AA				L	H	H	L	L	H	L	L
AB				L	H	H	H	L	H	L	H
AC				L	H	L	H	L	H	L	L
AD				L	H	H	H	L	H	L	H
AE				L	H	H	L	L	H	L	H
AF				L	H	H	H	L	H	H	L
BØ				L	L	H	H	L	L	H	H
B1				L	H	H	H	L	H	L	L
B2				L	H	H	L	L	H	L	L
B3				L	H	H	H	L	H	L	H
B4				L	H	L	H	L	H	L	L
B5				L	H	H	H	L	H	L	H
B6				L	H	H	L	L	H	L	H
B7				L	H	H	H	L	H	H	L
B8				L	H	L	L	L	H	L	L
B9				L	H	H	H	L	H	L	H
BA				L	H	H	L	L	H	L	H
BB				L	H	H	H	L	H	H	L
BC				L	H	L	H	L	H	L	H
BD				L	H	H	H	L	H	H	L
BE				L	H	H	L	L	H	H	L
BF				L	H	H	H	L	H	H	H

PROM ADDR	ZERO H	PRIOR (2:Ø) L	SUM (3:Ø) H	PROM DATA							
				M7	M6	M5	M4	M3	M2	M1	MØ
CØ				L	L	L	H	L	L	H	L
C1				L	H	H	H	L	L	H	H
C2				L	H	H	L	L	L	H	H
C3				L	H	H	H	L	H	L	L
C4				L	H	L	H	L	L	H	H
C5				L	H	H	H	L	H	L	L
C6				L	H	H	L	L	H	L	L
C7				L	H	H	H	L	H	L	H
C8				L	H	L	L	L	L	H	H
C9				L	H	H	H	L	H	L	L
CA				L	H	H	L	L	H	L	L
CB				L	H	H	H	L	H	L	H
CC				L	H	L	H	L	H	L	L
CD				L	H	H	H	L	H	L	H
CE				L	H	H	L	L	H	L	H
CF				L	H	H	H	L	H	H	L
DØ				L	L	H	H	L	L	H	H
D1				L	H	H	H	L	H	L	L
D2				L	H	H	L	L	H	L	L
D3				L	H	H	H	L	H	L	H
D4				L	H	L	H	L	H	L	L
D5				L	H	H	H	L	H	L	H
D6				L	H	H	L	L	H	L	H
D7				L	H	H	H	L	H	H	L
D8				L	H	L	L	L	H	L	L
D9				L	H	H	H	L	H	L	H
DA				L	H	H	L	L	H	L	H
DB				L	H	H	H	L	H	H	L
DC				L	H	L	H	L	H	L	H
DD				L	H	H	H	L	H	H	L
DE				L	H	H	L	L	H	H	L
DF				L	H	H	H	L	H	H	H

PROM ADDR	ZERO H	PRIOR (2:Ø) L	SUM (3:Ø) H	PROM DATA							
				M7	M6	M5	M4	M3	M2	M1	MØ
EØ				L	L	H	L	L	L	H	H
E1				L	H	H	H	L	H	L	L
E2				L	H	H	L	L	H	L	L
E3				L	H	H	H	L	H	L	H
E4				L	H	L	H	L	H	L	L
E5				L	H	H	H	L	H	L	H
E6				L	H	H	L	L	H	L	H
E7				L	H	H	H	L	H	H	L
E8				L	H	L	L	L	H	L	L
E9				L	H	H	H	L	H	L	H
EA				L	H	H	L	L	H	L	H
EB				L	H	H	H	L	H	H	L
EC				L	H	L	H	L	H	L	H
ED				L	H	H	H	L	H	H	L
EE				L	H	H	L	L	H	H	L
EF				L	H	H	H	L	H	H	H
FØ				L	L	H	H	L	H	L	L
F1				L	H	H	H	L	H	L	H
F2				L	H	H	L	L	H	L	H
F3				L	H	H	H	L	H	H	L
F4				L	H	L	H	L	H	L	H
F5				L	H	H	H	L	H	H	L
F6				L	H	H	L	L	H	H	L
F7				L	H	H	H	L	H	H	H
F8				L	H	L	L	L	H	L	H
F9				L	H	H	H	L	H	H	L
FA				L	H	H	L	L	H	H	L
FB				L	H	H	H	L	H	H	H
FC				L	H	L	H	L	H	H	L
FD				L	H	H	H	L	H	H	H
FE				L	H	H	L	L	H	H	H
FF				L	H	H	H	H	L	L	L

REVISIONS		
CHK	CHANGE NO.	REV.

(PRIOR/SUM PROM TRUTH TABLE)

TITLE	SIZE	CODE	NUMBER	REV.
COND. CODES EXCEPT. AND HIGH BITS	D	CS	M8230-0-1	C
SCALE —	SHEET 29 OF 29		DIST.	

COMPONENT SIDE VIEW

SIGNATURES	DATE
DRWN.	
CHK. D.	
ENG.	
PROJ.ENG.	
PROD.	
SCALE	
DWT.	

digital

TITLE TCL

SIZE E | CODE | NUMBER MR23T000 | REV 2

SHT. 1 OF 3

NEXT HIGHER ASSY. G MR23T000

ETCH REV.

P.C. DESIGN DATA BASE REV.

CHECHANGE NO REV

NOTES:

397

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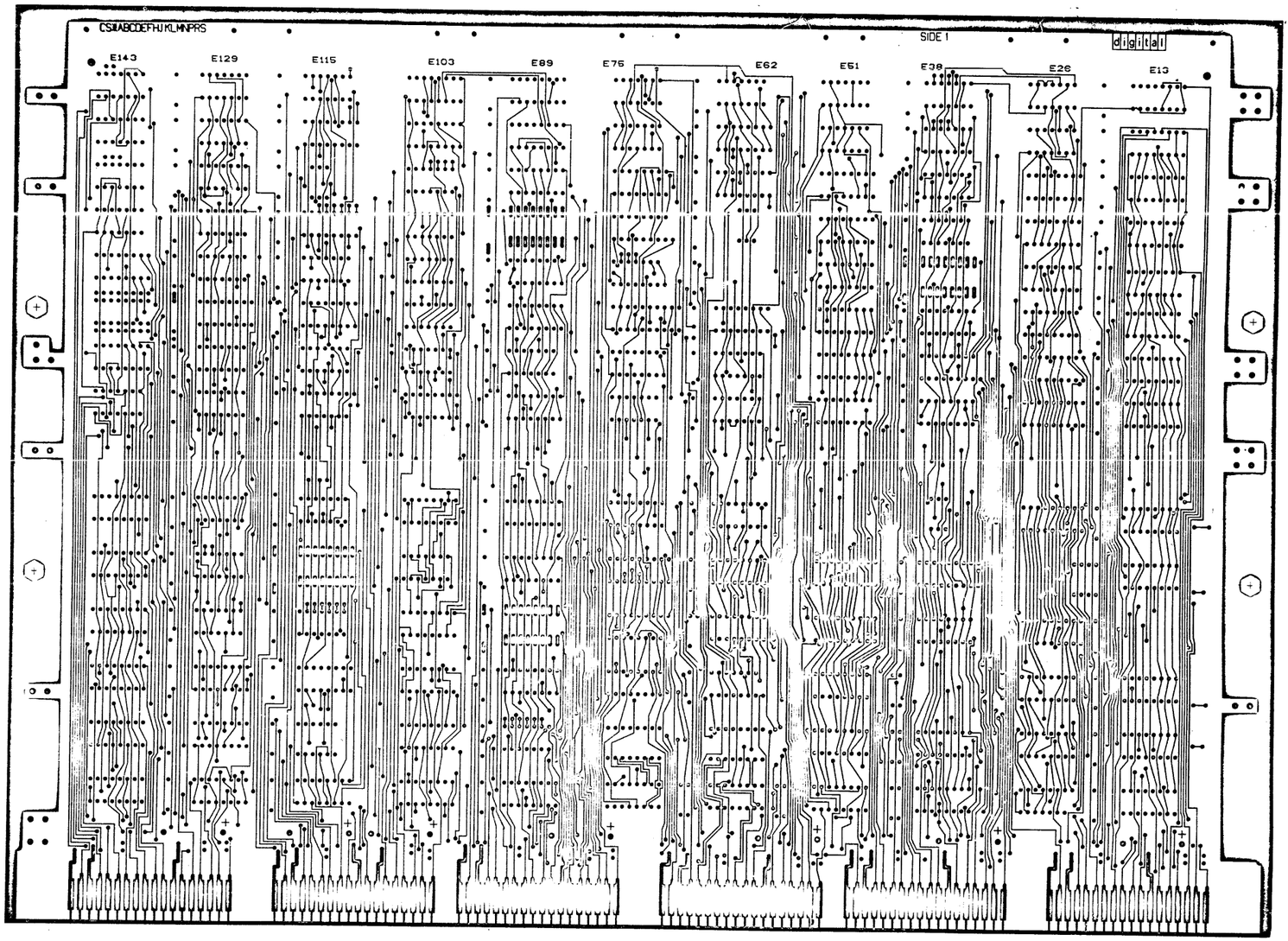

REVISIONS		
QNR	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
I C L	E	UA	M8231-Ø-Ø	C
SCALE 2 – 1 SHEET 2 OF 3	DIST.			

DEC FORM NO. SMM 108

348

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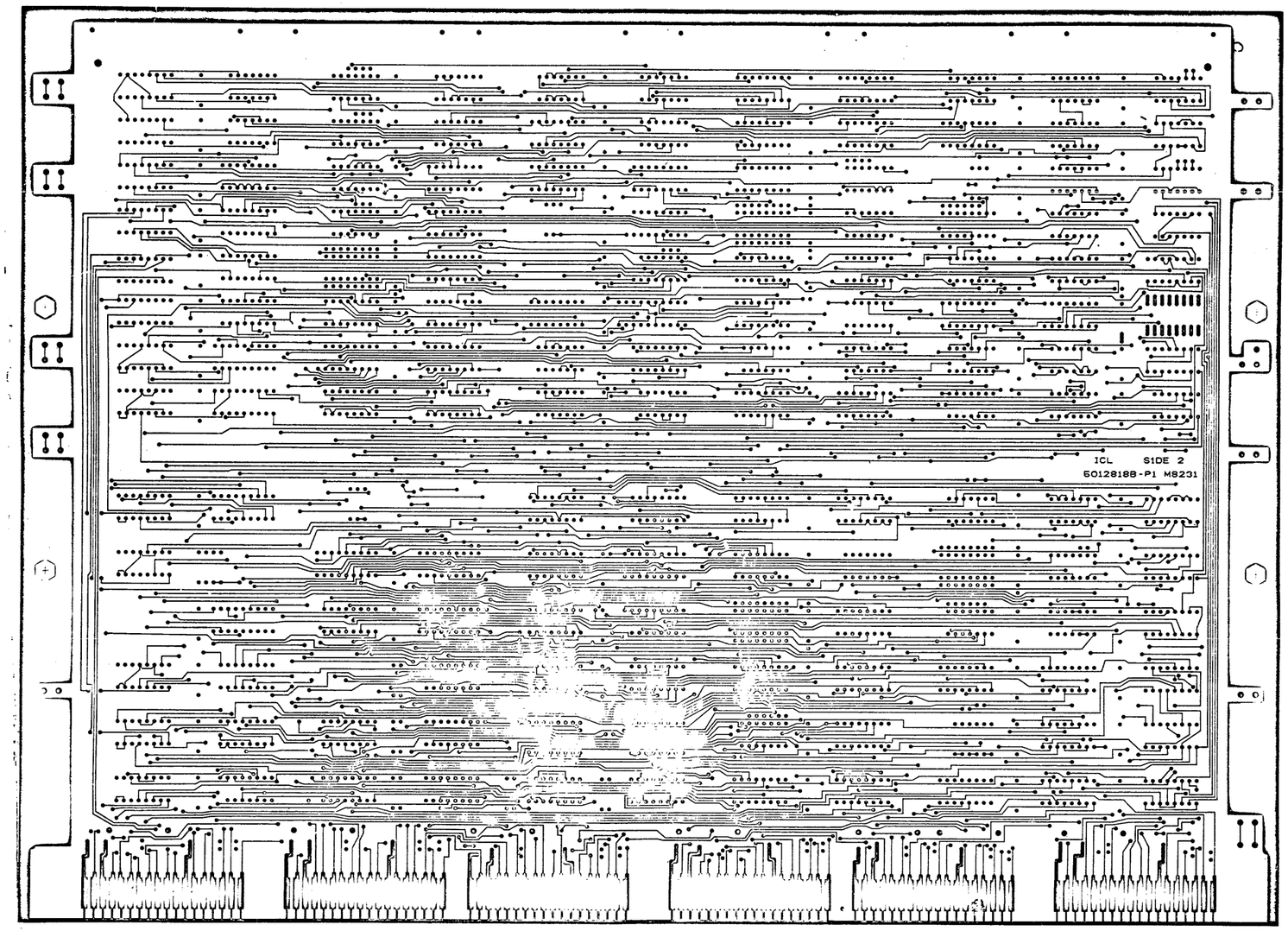

REVITIONS		
CHR	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
ICL	E	UA	M8231-ØØ	C
SCALE 2 — 1 SHEET 3 OF 3	DIST.			

LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
1	1	D-MD-5012818-0-0	5012818-00	M8231	1	
2	2		1012084-01	8 MFD 25V G% 30D AL EL (10-12	7	C1-C7
3	3		1012784-00	.047 MFD 50V X% CER. $	92	C8-C99
4	4		1300247-00	120 1/4W 5% CC (13-00	8	R15-R22
5	5		1300250-00	150 1/4W 5% CC (13-00	8	R23-R30
6	6		1300295-00	330 1/4W 5% CC (13-00	7	R1,R3,R5,R6,R7,R11,R13
7	7		1301424-00	680 1/4W 5% CC (13-00	4	R2,R4,R12,R14
8	8		1301775-00	820 1/4W 5% CC (13-00	3	R8,R9,R10
9	9		1910532-00	74S00 NAND GATE-QUAD 2IN	6	E57,E58,E110,E115,E122,E128
10	10		1910534-00	74S04 INVERTER GATE-HEX 1IN	13	E14,E38,E53,E75,E83,E94,E97,
					CONT	E112,E119,E120,E125,E136,E143
11	11		1912389-00	74S08 AND GATE-QUAD 2IN,POS 14	2	E37,E141
12	12		1910536-00	74S10 NAND GATE-TRIPLE 3IN	5	E66,E98,E123,E129,E142
13	13		1910537-00	74S11 AND GATE-TRIPLE 3INPUT	3	E101,E109,E127
14	14		1910539-00	74S20 NAND GATE-DUAL 4INPUT	1	E108
15	15		1912746-00	DEC 74S37 NAND GATE-QUAD 2IN	2	E35,E71
16	16		1911712-00	74S51 AND-OR GATE-INVERT DUAL 2W/2IN	4	E51,E74,E126,E140
17	17		1910542-00	74S64 A-O-I XPDR GATE,4-2-3-2 14	4	E26,E62,E36,E121
18	18		1910544-00	74S74 FF-D DUAL,EDGE TRIGGER	5	E25,E50,E99,E100,E106
19	19		1912089-00	74S85 CMPRTR-4BIT MAGNITUDE 16P	1	E95
20	20		1910545-00	74S112 FF-JK DUAL,EDGE TRIGGER	2	E13,E113
21	21		1911675-00	74S138 DECODER-THREE INPUT	2	E89,E114
22	22		1911676-00	74S139 DECODER-DUAL TWO-INPUT	1	E96
23	23		1912796-00	74148 ENCODER,PRIORITY,8 TO 3 LINE	4	E32,E49,E73,E88
24	24		1910956-00	74S151 MUX 1 OF 8	17	E1-E7,E15,E28,E29,E31,E44,E45,
					CONT	E46,E54,E55,E135
25	25		1910547-00	74S153 MUX 1 OF 4 (DUAL)	6	E60,E61,E130,E132,E133,E139
26	26		1910548-00	74S157 MUX 1 OF 2 (QUAD)	2	E69,E118
27	27		1910549-00	74S158 MUX 1 OF 2 (QUAD)	7	E64,E90,E92,E105,E111,E116,
					CONT	E117

REVISION HISTORY			VARIATIONS FOR THIS ASSY.	FIRST USED ON:		DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS		
CHK	ECO NO	REV	00					
PG	00003	C		MADE BY: F.MULLIGAN	DATE: 21-APR-78	TITLE PARTS LIST		
				CHECKED: F.MULLIGAN	DATE:	ICL		
				DSN.ENG.: S.JENKINS	DATE: 21-APR-78	SIZE	CODE	DOCUMENT NUMBER / REV
				PROD.: M.TERILLO	DATE: 21-APR-78	K	PL	M8231-0-DBP / C
				RESP.ENG.: S.JENKINS	DATE: 21-APR-78	ASSY.NO.: E-UA-M8231-0-0		EDIT 3

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LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
28	28		1910550-00	74S174 FF-D HEX	4	E8,E11,E22,E91
29	29		1910957-00	74S175 FF-D QUAD COMMON CLOCK	13	E16,E21,E33,E47,E67,E72,E85,
					CONT	E87,E93,E102,E103,E104,E124
30	30		1910552-00	74S194 SHIFT REG.,4BIT RIGHT/LEFT	5	E48,E56,E59,E65,E81
31	31		1913839-00	74LS165 SHIFT REG.,8BIT $	8	E27,E78,E80,E82,E84,E131,E134,
					CONT	E137
32	32		1912586-00	85S68 REGISTER,64BIT EDGE TRIG,TRIST	8	E17-E20,E30,E42,E43,E66
33	33		1913294-00	93S16 COUNTER,SYNCH UP BINARY	5	E9,E10,E12,E23,E24
34	34		1911415-00	10125 ECL TO TTL TRNSLTR ECL 16 P	2	E52,E63
35	35		1913788-00	26S10 TRANSCEIVER,BUS,QUAD	4	E39,E40,E41,E76
36	36		1911469-00	DEC 8640 RECEIVER,BUS,QUAD,UNIBUS,Q-BU	1	E77
37	37		23022B1-00	B1-01	1	E70
38	38		1210711-02	HANDLE ASSY,MOD DOEHLER-JARVIS	1	
39	39		9000024-01	EYELET, ROLLED FLANGE, .121 OD X .196 LG	12	

40 NOTE: I C SPARE LOCATIONS ARE E34,E79,E86,E107,E138

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	TITLE PARTS LIST ICL	SIZE K	CODE PL	DOCUMENT NUMBER M8231-0-DBP	REV C

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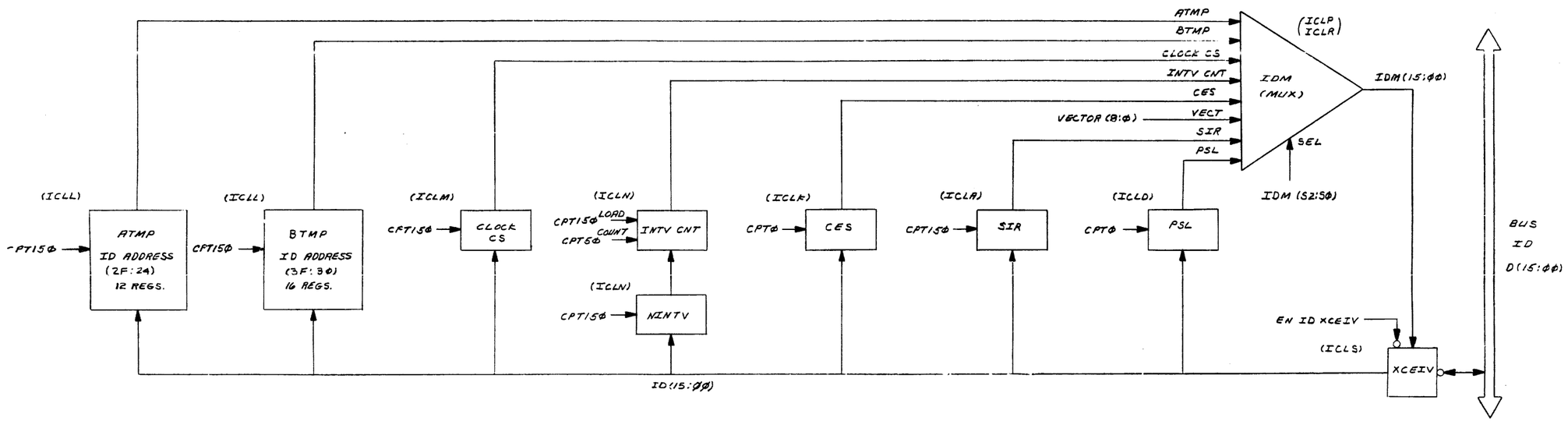
LOW BITS BLOCK DIAGRAM



(REGISTER BLOCK DIAGRAM)

REVISIONS			
CHK	CHANGE NO.	REV.	
GP	M8231-00001	A	P. Green /KRUG 77 S. JENKINS 9-6-77
GP	M8231-00002	B	P. Green 29 SEPT 77 S. JENKINS 10-4-77
GP	M8231-00303	C	P. Green 21 MAR 78 B. SHOLIT 3 APR 78

DRN.		5-12-77
CHK'D		5-23-77
ENG.		5-23-77
PROJ. ENG.		5-23-77
PROD.		
NEXT HIGHER ASSY.		
SCALE		
SHEET	1 OF 21	

FIRST USED ON

digital

TITLE
INTERRUPT CONTROL AND LOW BITS (ICL)

SIZE	CODE	NUMBER	REV.
D	CS	M8231-Ø-1	C

DIST.

DEC FORM NO. SED 162-0

352

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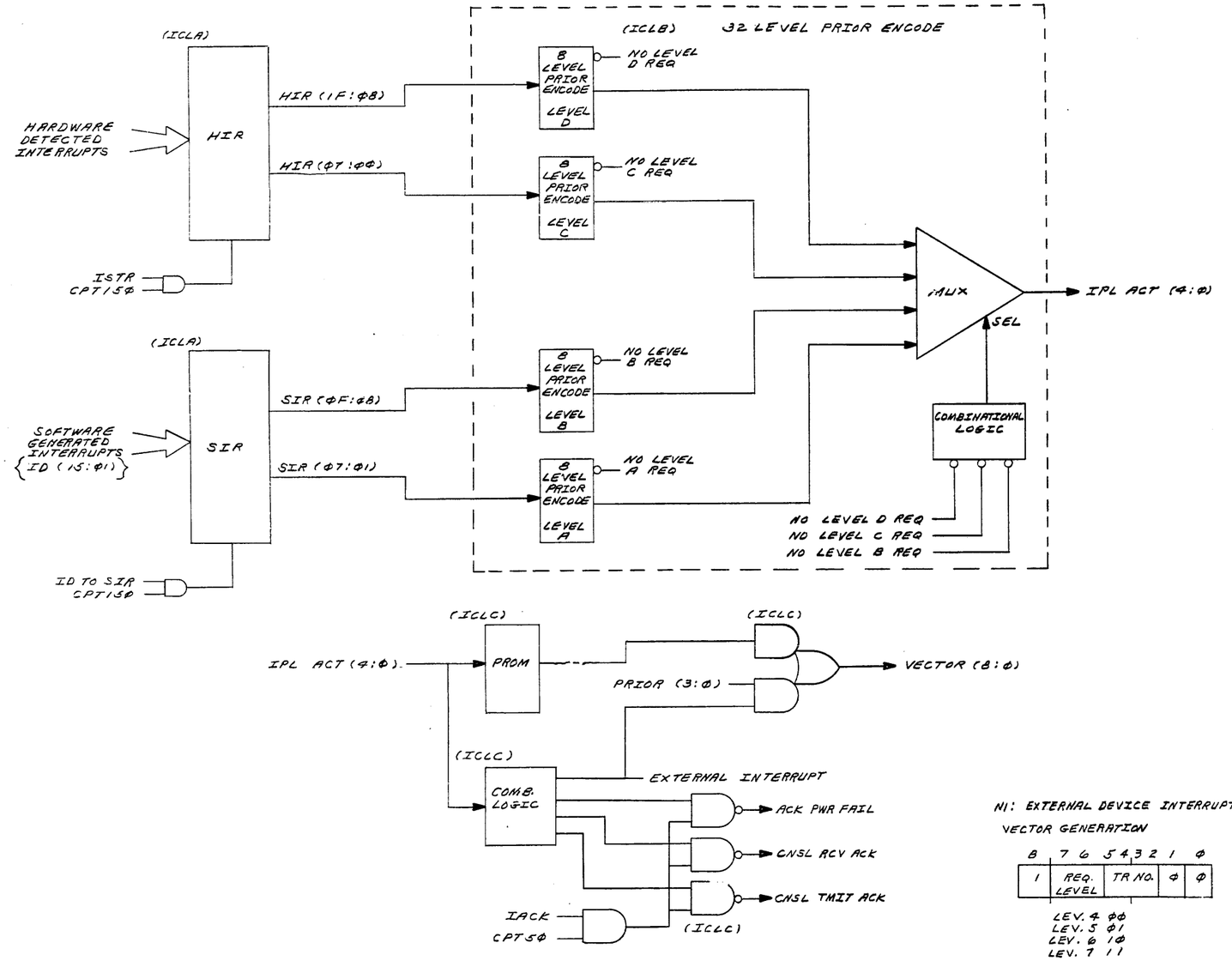
INTERRUPT ARBITRATION



INTERRUPT PRIORITY & VECTORS

IPL ACT	INTERRUPT CONDITION	VECTOR	PRIORITY
1F	NONE ASSIGNED	X	HIGHEST
1E	CPU POWER FAIL	ØC	
1D	CPU TIMEOUT	6Ø	
1C	SBI FAULT	5C	
1B	SBI ALERT	58	
1A	CRD/RDS	54	
19	SBI SILO COMPARE	5Ø	
18	INTERVAL TIMER	CØ	
17	SBI REQ 7 (N1)	1CØ TO 1FC	
16	SBI REQ 6 (N1)	18Ø TO 1BC	
15	SBI REQ 5 (N1)	14Ø TO 17C	
14	SBI REQ 4 (N1)	1ØØ TO 13C	
	CNSL RECEIVE INTR	F8	
	CNSL TRANSMIT INTR	FC	
13	NONE ASSIGNED	X	
12	NONE ASSIGNED	X	
11	NONE ASSIGNED	X	
1Ø	NONE ASSIGNED	X	
ØF	SIRØF	BC	
ØE	SIRØE	B8	
ØD	SIRØD	B4	
ØC	SIRØC	BØ	
ØB	SIRØB	AC	
ØA	SIRØA	A8	
Ø9	SIRØ9	A4	
Ø8	SIRØ8	AØ	
Ø7	SIRØ7	9C	
Ø6	SIRØ6	98	
Ø5	SIRØ5	94	
Ø4	SIRØ4	9Ø	
Ø3	SIRØ3	8C	
Ø2	SIRØ2 OR AST DEL	88	
Ø1	SIRØ1	84	LOWEST
ØØ	NO INTERRUPT	X	X

N1: EXTERNAL DEVICE INTERRUPT (SBI BUS)
VECTOR GENERATION

B	7	6	5	4	3	2	1	Ø
1	REQ. LEVEL		TR NO.				Ø	Ø

LEV. 4 ØØ
LEV. 5 Ø1
LEV. 6 1Ø
LEV. 7 11

(INTERRUPTS BLOCK DIAGRAM)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICL)	D	CS	M8231-Ø-1	C
SCALE	SHEET 2 OF 21	DIST.		

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4 BIT REG
74S175 E21
ICLS ID11 H — D3 R3(1) — ICLA SIR0B (1) H (ICLA)
R3(Φ) — ICLA SIR0B (1) L (ICLB)
ICLS ID10 H — D2 R2(1) — ICLA SIR0A (1) H (ICLA)
R2(Φ) — ICLA SIR0A (1) L (ICLB)
ICLS ID09 H — D1 R1(1) — ICLA SIR09 (1) H (ICLA)
R1(Φ) — ICLA SIR09 (1) L (ICLB)
ICLS ID08 H — DΦ RΦ(1) — ICLA SIR0B (1) H (ICLA)
RΦ(Φ) — ICLA SIR0B (1) L (ICLB)
CLR CLK

4 BIT REG
74S175 E16
ICLS ID15 H — D3 R3(1) — ICLA SIR0F (1) H (ICLA)
R3(Φ) — ICLA SIR0F (1) L (ICLB)
ICLS ID14 H — D2 R2(1) — ICLA SIR0E (1) H (ICLA)
R2(Φ) — ICLA SIR0E (1) L (ICLB)
ICLS ID13 H — D1 R1(1) — ICLA SIR0D (1) H (ICLA)
R1(Φ) — ICLA SIR0D (1) L (ICLB)
ICLS ID12 H — DΦ RΦ(1) — ICLA SIR0C (1) H (ICLA)
RΦ(Φ) — ICLA SIR0C (1) L (ICLB)
CLR CLK

4 BIT REG
74S175 E72
SBHE SBI ALERT A H — DB1 — D3 R3(1) — ICLA HIR 1B (1) L (ICLB)
R3(Φ)
SBLM CRD RDS INTR L — DB2 — 74S04 E83 — D2 R2(1) — ICLA HIR 1A (1) L (ICLB)
R2(Φ)
SBHL COMP INTR H — DC1 — D1 R1(1) — ICLA HIR 19 (1) L (ICLB)
R1(Φ)
ICLM INTERVAL INTR L — 74S04 E83 — DΦ RΦ(1) — ICLA HIR 18 (1) L (ICLB)
RΦ(Φ)
CLR CLK

4 BIT REG
74S175 E47
ICLS ID07 H — D3 R3(1) — ICLA SIR07 (1) H (ICLP)
R3(Φ) — ICLA SIR07 (1) L (ICLB)
ICLS ID06 H — D2 R2(1) — ICLA SIR06 (1) H (ICLP)
R2(Φ) — ICLA SIR06 (1) L (ICLB)
ICLS ID05 H — D1 R1(1) — ICLA SIR05 (1) H (ICLP)
R1(Φ) — ICLA SIR05 (1) L (ICLB)
ICLS ID04 H — DΦ RΦ(1) — ICLA SIR04 (1) H (ICLP)
RΦ(Φ) — ICLA SIR04 (1) L (ICLB)
CLR CLK

4 BIT REG
74S175 E102
D3 R3(1)
R3(Φ)
D2 R2(1) — ICLA SPI INTR (1) H (ICLC)
R2(Φ) — ICLA SPI INTR (1) L
ICLC SYNC CREC INTR A — 74S11 E101 — D1 R1(1) — ICLA CREC INTR (1) H (ICLC)
R1(Φ) — ICLA CREC INTR (1) L (ICLC)
ICLC SYNC CXMT INTR H
ICLC SYNC CREC INTR L
ICLA REQ4 INTR L — 74S11 E101 — DΦ RΦ(1) — ICLA CXMT INTR (1) H (ICLC)
RΦ(Φ) — ICLA CXMT INTR (1) L (ICLC)
CLR CLK

4 BIT REG
74S175 E87
SBHE SBI REQ 7 A H — DD1 — D3 R3(1) — ICLA HIR 17 (1) L (ICLB)
R3(Φ)
SBHE SBI REQ 6 A H — DD2 — D2 R2(1) — ICLA HIR 16 (1) L (ICLB)
R2(Φ)
SBHE SBI REQ 5 A H — DE2 — D1 R1(1) — ICLA HIR 15 (1) L (ICLB)
R1(Φ)
ICLC SYNC CREC INTR L
ICLC SYNC CXMT INTR L — 74S10 E98 — DΦ RΦ(1) — ICLA HIR 14 (1) L (ICLB)
RΦ(Φ)
CLR CLK

SBHE SBI REQ 4 A H — DH2 — 74S04 E83 — ICLA REQ4 INTR L (ICLA)

4 BIT REG
74S175 E33
ICLS ID03 H — D3 R3(1) — ICLA SIR03 (1) H (ICLP)
R3(Φ) — ICLA SIR03 (1) L (ICLB)
ICLS ID02 H — D2 R2(1) — ICLA SIR02 (1) H (ICLP)
R2(Φ) — ICLA SIR02 (1) L (ICLB)
ICLS ID01 H — D1 R1(1) — ICLA SIR01 (1) H (ICLP)
R1(Φ) — ICLA SIR01 (1) L (ICLB)
ICLS ID04 H — DΦ RΦ(1)
RΦ(Φ)
CLR CLK
ICLF SYS INIT A L
ICLH ID TO SIR H — 74S00 E115
ICLS CPT10Φ A H

4 BIT REG
74S175 E85
D3 R3(1) — ICLA HIR 1F (1) L (ICLB)
R3(Φ)
ICLC SYNC PFAIL INTR H — D2 R2(1) — ICLA HIR 1E (1) L (ICLB)
R2(Φ)
SBLM TIMO CNF INTR L — DP2 — 74S04 E83 — D1 R1(1) — ICLA HIR 1D (1) L (ICLB)
R1(Φ)
SBHL FAULT INTR H — DT2 — DΦ RΦ(1) — ICLA HIR 1C (1) L (ICLB)
RΦ(Φ)
CLR CLK
ICLD ISTR H — 74S00 E115

4 BIT REG
74S175 E103
D3 R3(1) — ICLA HIR 13 (1) L (ICLB)
R3(Φ)
D2 R2(1) — ICLA HIR 12 (1) L (ICLB)
R2(Φ)
D1 R1(1) — ICLA HIR 11 (1) L (ICLB)
R1(Φ)
DΦ RΦ(1) — ICLA HIR 10 (1) L (ICLB)
RΦ(Φ)
CLR CLK

(SOFTWARE & HARDWARE INTERRUPT REQUEST REGS (SIR & HIR)) (SLOT 15)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLA)	D	CS	M8231-Ø-1	C
SCALE	SHEET 3 OF 21		DIST.	

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74S153-4:1 MUX				NO LEVEL D REQ L	NO LEVEL C REQ L	NO LEVEL B REQ L	SELECTED LEVEL
STB	S1	S0	OUTPUT				
H	X	X	L	X	X	X	X
L	L	L	A → F	H	X	X	D (2:0)
L	L	H	B → F	L	H	X	C (2:0)
L	H	L	C → F	L	L	H	B (2:0)
L	H	H	D → F	L	L	L	A (2:0)

74148 - PRIORITY ENCODER

ICLA SIR0F (1) L
ICLA SIR0E (1) L
ICLA SIR0D (1) L
ICLA SIR0C (1) L
ICLA SIR0B (1) L
ICLA SIR0A (1) L
ICLA SIR09 (1) L
ICLA SIR08 (1) L
→ 74148 E32 → ICLB NO LEVEL B REQ L (ICLB), ICLB LEVEL B2 L (ICLB), ICLB LEVEL B1 L (ICLB), ICLB LEVEL B0 L (ICLB)

ICLA HIR1F (1) L
ICLA HIR1E (1) L
ICLA HIR1D (1) L
ICLA HIR1C (1) L
ICLA HIR1B (1) L
ICLA HIR1A (1) L
ICLA HIR19 (1) L
ICLA HIR18 (1) L
→ 74148 E73 → ICLB NO LEVEL D REQ L (ICLB), ICLB LEVEL D2 L (ICLB), ICLB LEVEL D1 L (ICLB), ICLB LEVEL D0 L (ICLB)

ICLA SIR07 (1) L
ICLA SIR06 (1) L
ICLA SIR05 (1) L
ICLA SIR04 (1) L
ICLA SIR03 (1) L
ICLA SIR02 (1) L
ICLA SIR01 (1) L
ICLN +3V D H
→ 74148 E99 → ICLB NO LEVEL A REQ L, ICLB LEVEL A2 L (ICLB), ICLB LEVEL A1 L (ICLB), ICLB LEVEL A0 L (ICLB)

ICLA HIR17 (1) L
ICLA HIR16 (1) L
ICLA HIR15 (1) L
ICLA HIR14 (1) L
ICLA HIR13 (1) L
ICLA HIR12 (1) L
ICLA HIR11 (1) L
ICLA HIR10 (1) L
→ 74148 E88 → ICLB NO LEVEL C REQ L (ICLB), ICLB LEVEL C2 L (ICLB), ICLB LEVEL C1 L (ICLB), ICLB LEVEL C0 L (ICLB)

74S153 E61

ICLN +3V D H
ICLB LEVEL A2 L
ICLB LEVEL B2 L
ICLB LEVEL C2 L
ICLB LEVEL D2 L
→ ICLB IPL ACT 4 H (ICLC,T)
→ ICLB IPL ACT 4 L (ICLC)(CEHR)
→ BM1 ICLB IPL ACT 3 L (CEHR)
→ ICLB IPL ACT 3 H (ICLC,T)
→ BM2 ICLB IPL ACT 2 L (ICLC)(CEHR)
→ ICLB IPL ACT 2 H (ICLC,T)

74S153 EG0

ICLB LEVEL A1 L
ICLB LEVEL B1 L
ICLB LEVEL C1 L
ICLB LEVEL D1 L
ICLB LEVEL A0 L
ICLB LEVEL B0 L
ICLB LEVEL C0 L
ICLB LEVEL D0 L
→ BT2 ICLB IPL ACT 1 L (ICLC)(SBLA,V)(CEHR)
→ ICLB IPL ACT 1 H (ICLC,T)
→ BU1 ICLB IPL ACT 0 L (ICLC)(SBLA,V)(CEHR)
→ ICLB IPL ACT 0 H (ICLC,T)

ICLB NO LEVEL C REQ L
ICLB NO LEVEL D REQ L
→ 74S51 E74
ICLB NO LEVEL B REQ L
→ 74S51 E74

74S04 E75

+5V → R1 330Ω, C11 .047, R2 680Ω → ICLB +3V A H (ICLC,D,F,H,K,L)

+5V
AA2, AV1
BA2, BV1
CA2, CV1
DA2, DV1
EA2, EV1
FA2, FV1
→ C1-C6 8.0 µf 25V, C8-C30 C32-C42 C44-C99 .047 µf

AC2, AH1, AN2, AT1
BC2, BH1, BN2, BT1
CC2, CH1, CN2, CT1
DC2, DH1, DN2, DT1
EC2, EH1, EN2, ET1
FC2, FH1, FN2, FT1
-5.2V EK1 → C7 8.0 µf 25V, C31 .047 µf, C43 .047 µf

(INTERRUPT PRIORITY ARBITRATION) (SLOT 15)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLB)	D	CS	M8231-0-1	C
SCALE	SHEET 4 OF 21		DIST.	

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ICLB +3VA H

APP2
CLKK ACLO OR FAIL H → 74S74 E100 (D 2, C 3, 5, 6) → ICLC AC LO BRANCH (ICLE)

AS2
CLKK P FAIL INTR (1) H → 74S74 E100 (D 12, C 11, 9, 8) → ICLC SYNC PFAIL INTR H (ICLA); ICLC SYNC P FAIL INTR L

BR2
CIBS CNSL RCV INTR H → 74S74 E99 (D 2, C 3, 5, 6) → ICLC SYNC CREC INTR H (ICLA); ICLC SYNC CREC INTR L (ICLA)

CBI
CIBS CNSL XMIT INTR H → 74S74 E99 (D 12, C 11, 9, 8) → ICLC SYNC CXMT INTR H (ICLA); ICLC SYNC CXMT INTR L

ICLS CPTΦ C H
ICLF SYS INIT A L

3:8 DECODER
74S138 E89

ICLB IPL ACT 4 H	EN	
ICLB IPL ACT 2 H		
ICLB IPL ACT 3 H	SELC	
ICLB IPL ACT 1 H	SELB	
ICLB IPL ACT Φ H	SELA	
	D7	ICLC REQ 1F L
	D6	ICLC REQ 1E L (ICLC)
	D5	ICLC REQ 1D L
	D4	ICLC REQ 1C L
	D3	ICLC REQ 17 L
	D2	ICLC REQ 16 L
	D1	ICLC REQ 15 L
	D0	ICLC REQ 14 L (ICLC)

256X8 PROM
VECTOR FROM 23ΦØ2B1-Φ1 E70

ICLB IPL ACT 4 H	A7	M7
ICLB IPL ACT 3 H	A6	M6
ICLB IPL ACT 2 H	A5	M5 → ICLC VECBIT5 L (ICLC)
ICLB IPL ACT 1 H	A4	M4 → ICLC VECBIT4 L (ICLC)
ICLB IPL ACT Φ H	A3	M3 → ICLC VECBIT3 L (ICLC)
ICLA CREC INTR (1) H	A2	M2 → ICLC VECBIT2 L (ICLC)
ICLA CXMT INTR (1) H	A1	M1
ICLA SPI INTR (1) H	AΦ	MΦ
	ENI	ENΦ

ICLB IPL ACT 3 H
ICLB IPL ACT 4 L
ICLB IPL ACT 2 L
ICLN +3VD H
ICLB IPL ACT 1 L
ICLB IPL ACT Φ L
→ 74S64 E62 → 74S00 E115
ICLA CREC INTR (1) L
ICLA CXMT INTR (1) L

ICLC REQ 1E L → 74S04 E143 → 74S10 E142 → CMI → ICLC ACK PWR FAIL L (CLKK)
ICLA CREC INTR (1) H → 74S10 E142 → FT2 → ICLC CNSL RCV ACK L (CIBS)
ICLA CXMT INTR (1) H → 74S10 E142 → FW1 → ICLC CNSL XMIT ACK L (CIBS)
ICLC REQ 1F L → 74S04 E143
ICLD IACK H
ICLS CPTSΦ A H → 74S00 E141

ICLC VECBIT5 L
AV2 CENJ PRIOR 3 H → 74S00 E58 → ICLC VECTOR 5 H (ICLP)
ICLC VECBIT4 L
BA1 CENJ PRIOR 2 H → 74S00 E58 → ICLC VECTOR 4 H (ICLP)
ICLC VECBIT3 L
BC1 CENJ PRIOR 1 H → 74S00 E57 → ICLC VECTOR 3 H (ICLP)
ICLC VECBIT2 L
BD1 CENJ PRIOR Φ H → 74S00 E57 → ICLC VECTOR 2 H (ICLP)

ICLC VECTOR 8 H (ICLP)
ICLC VECTOR 7 H (ICLP)
ICLC VECTOR 6 H (ICLP)

ICLC EXT INTR REQ L (ICLD)
AD1 CENR INTR REQ L → 74S04 E143 → ICLC INTR REQ H (ICLE)
74S04 E143 → ICLC INTERN REQ H (ICLE)

(INTERRUPT ACKNOWLEDGES & VECTOR GENERATION) (SLOT 15)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	INTERRUPT CONTROL AND LOW BITS (ICLC)	SIZE D	CODE CS	NUMBER M8231-Φ-1 REV. C
SCALE		SHEET 5 OF 21	DIST.	

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+5 V — R3 330Ω — ICLD +3V B H (ICLL,M,N) — C5 .047 — R4 680Ω

CEHC TRAP CODE 2 (1) H — DU1 — 74S04 E83
CEHC TRAP CODE 1 (1) H — EB1 — 74S04 E136
CEHC TRAP CODE Ø (1) H — EF1 — 74S04 E136
74S11 E109 → ICLD ARITH TRAP L (ICLD)

ICLD HP (1) L — AD1
CEHR INTR REQ L — AD1
ICLD PSL TP (1) L — AD1
74S20 E108 → ET2 — ICLD SERVICE H (IRCE,N)

4 BIT REG 74S175 E124
D3 A3(1) A3(Ø) D2 A2(1) A2(Ø) D1 A1(1) A1(Ø) DØ AØ(1) AØ(Ø) CLR CLK
A1(1) → ICLD HP (1) H (ICLD)
A1(Ø) → ICLD HP (1) L (ICLD)
AØ(1) → AF1 — ICLD PSL TP (1) H (ICLD)(CEHN)
AØ(Ø) → ICLD PSL TP (1) L (ICLD)
ICLF SYS INIT B L
ICLS CPTØ A H

ICLF CNSL CONT H
74S153 E137: ST81 ST8Ø D1 C1 B1 A1 DØ CØ BØ AØ S1 SØ F1 FØ
CIBN HALT REQ H — BS1
ICLD HP (1) H
CEHP ID30 H — BV2
ICLD PSL T (1) H
ICLD PSL TP (1) H
F1 → 5 (4 BIT REG)
FØ → 4 (4 BIT REG)
S1 = 2, SØ = 14

ICLD IACK L
ICLD EACK L
ICLH ID TO PSL L
74S10 E98 → 12
CEHF IRD STATE H — CD2 — 74S04 E97
74S51 E126
IRCE STALL+SVC L — FA1 — 74S04 E136

74S153-9:1 MUX			
STB	S1	SØ	OUTPUT
H	X	X	L
L	L	L	A → F
L	L	H	B → F
L	H	L	C → F
L	H	H	D → F

74S158 E111: B3 A3 B2 A2 B1 A1 BØ AØ STB SØ F3 F2 F1 FØ
CEHR INTR REQ L — AD1
ICLB +3V A H
ICLC EXT INTR REQ L
74S00 E110 → 11
ICLD PSL TP (1) H
CEHF IRD STATE H — CD2
74S00 E110 → 8
ICLD ARITH TRAP L
ICLD HP (1) H
F3 → EU1 — ICLD SERV BIT 2 H (IRCE,N)
F2 → EU2 — ICLD SERV BIT 1 H (IRCE,N)
FØ → EV2 — ICLD SERV BIT Ø H (IRCE,N)
STB = 1, SØ = 15

74S158-2:1 MUX		
STB	SØ	OUTPUT
H	X	H
L	L	Ā → F
L	H	B̄ → F

ICLD EACK H — 74S04 E110 → ICLD EACK PULSE L (ICLD)
ICLD IACK H — 74S04 E110 → ICLD IACK PULSE L (ICLD)
ICLS CPTØ A H

ICLH ID TO PSL H
74S194 E98: S1 SØ DSR D3 D2 D1 DØ A3(1) A2(1) A1(1) AØ(1) CLR CLK
ICLS ID07 H → A3(1) — ICLD PSL DV (1) H (ICLP)
ICLS ID06 H → A2(1) — ICLD PSL FU (1) H (ICLP)
ICLS ID05 H → A1(1) — ICLD PSL IV (1) H (ICLP)
ICLS ID04 H → AØ(1) — ICLD PSL T (1) H (ICLD, P)
S1 = 10, SØ = 9, DSR = 2, CLR = 1, CLK = 11, 7

ICLF SYS INIT B L
ICLD EACK PULSE L
ICLD IACK PULSE L
74S11 E169 → 8
ICLS CPTØ A H

74S194-4 BIT REG		
S1	SØ	FUNCTION
L	L	HOLD
H	H	LOAD

2:4 DECODER

2:4 DECODER 74S139 E96: B2 A2 FBØ FB1 FB2 FB3 ENB2
CEHD UIEK1 (1) H — CC1
CEHD UIEKØ (1) H — CD1
ENB2 = 15
FBØ → 12 — GS1 — 74S04 E97 → ICLD ISTR H (ICLA)(CCIBM)
FB1 → 11 — ICLD IACK L (ICLD)
FB2 → 10 — ICLD EACK L (ICLD)
FB3 → 9 — 74S04 E97 → 8 — ICLD EACK H (ICLD)
74S04 E97 → 6 — ICLD IACK H (ICLC, D)

(A FORK SERVICE LOGIC & PSL BITS) (SLOT 15)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: INTERRUPT CONTROL AND LOW BITS (ICLD)
SIZE D | CODE CS | NUMBER M8231-Ø-1 | REV. C
SCALE | SHEET 6 OF 21 | DIST.

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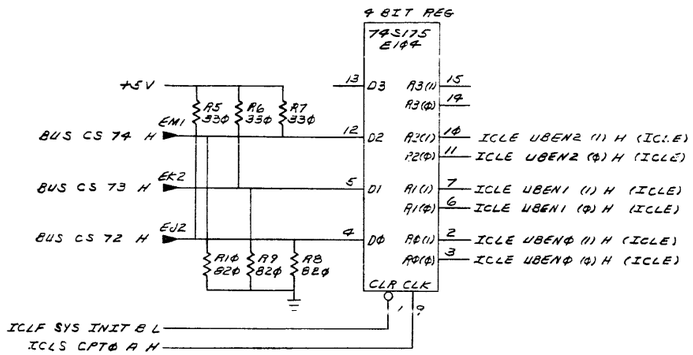

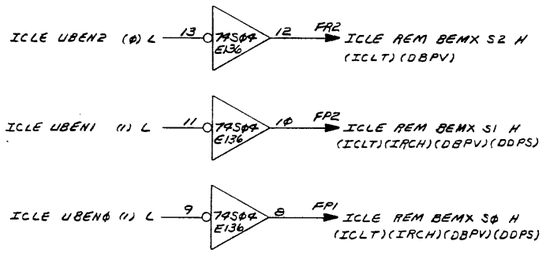

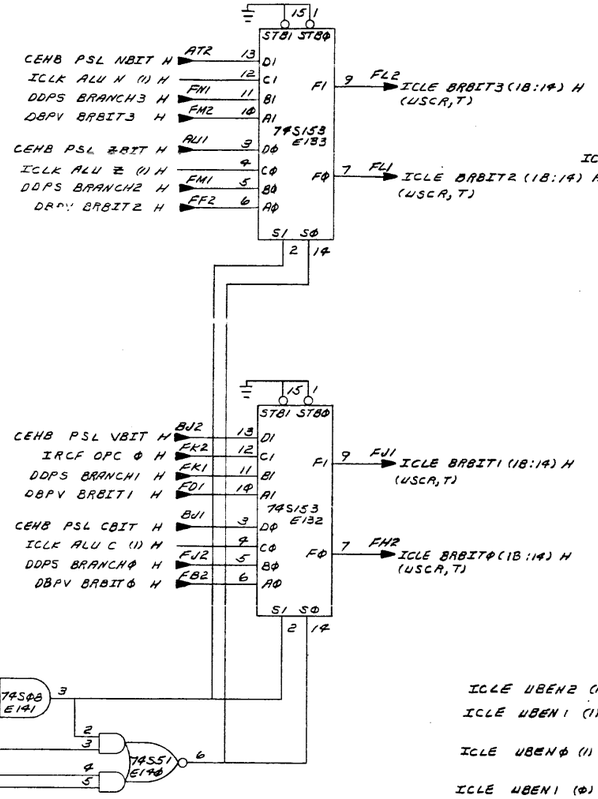

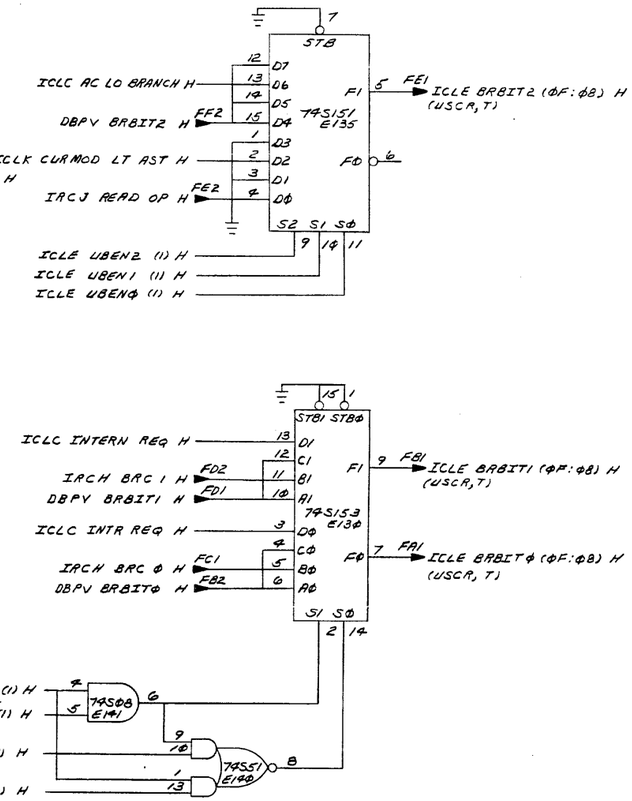

BEN (18:14) MUXES

74S153-4:1 MUX				BEN SELECTED
ST8	S1	SØ	OUTPUT	
H	X	X	L	X
L	L	L	A→F	19,18
L	L	H	B→F	17:14
L	H	L	C→F	18
L	H	H	D→F	1A

BEN (ØF:Ø8) MUXES

74S153-4:1 MUX				BEN SELECTED
ST8	S1	SØ	OUTPUT	
H	X	X	L	X
L	L	L	A→F	ØØ, ØC
L	L	H	B→F	Ø8 : Ø8
L	H	L	C→F	ØF
L	H	H	D→F	ØE

74S151-8:1 MUX					BEN SELECTED
ST8	S2	S1	SØ	OUTPUT	
H	X	X	X	F1=L	X
L	L	L	L	D0→F1	Ø8
L	L	L	H	D1→F1	Ø9
L	L	H	L	D2→F1	ØA
L	L	H	H	D3→F1	ØB
L	H	L	L	D4→F1	ØC
L	H	L	H	D5→F1	ØD
L	H	H	L	D6→F1	ØE
L	H	H	H	D7→F1	ØF

REVISIONS		
CHK	CHANGE NO.	REV.

(UBEN & UBRANCH MULTIPLEXORS) (SLOT 15)

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLE)	D	CS	M8231-Ø-1	C
SCALE	SHEET 7 OF 21	DIST.		

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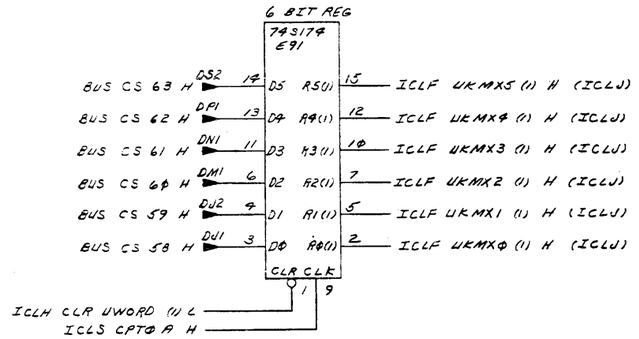

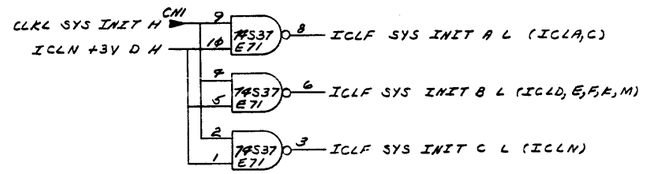

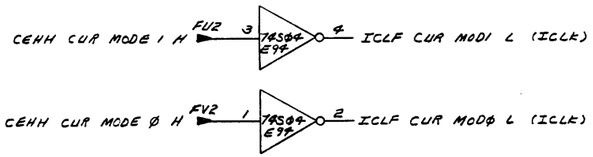

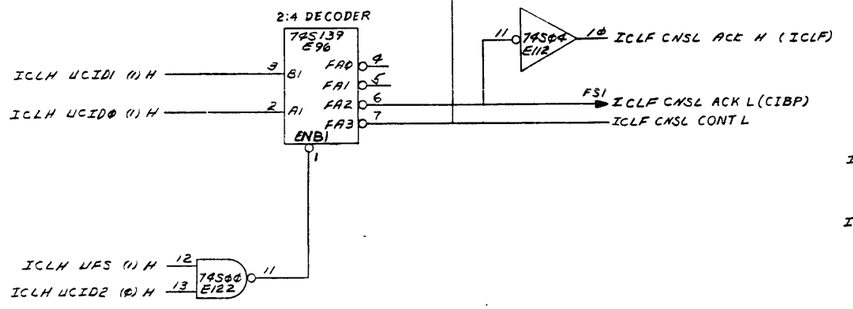

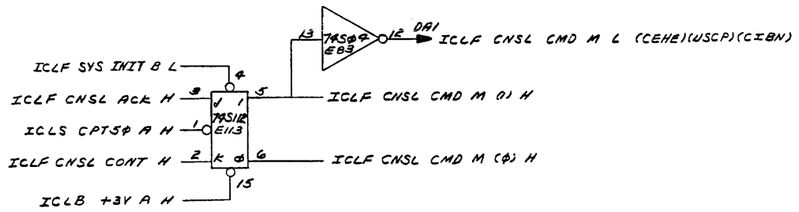

REVISIONS		
CHK	CHANGE NO.	REV.

(CONSOLE MODE CONTROL LOGIC & UKMX) (SLOT 15)

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLF)	D	CS	M8231-0-1	C
SCALE	SHEET 8 OF 21	DIST.		

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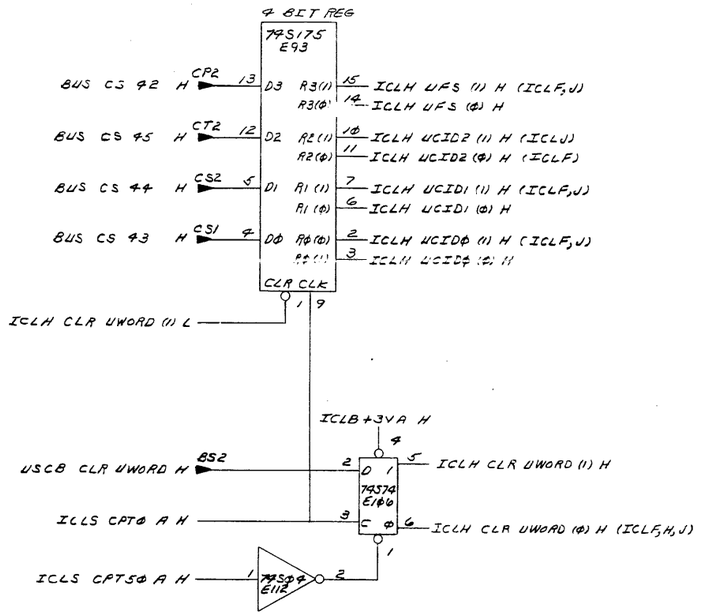

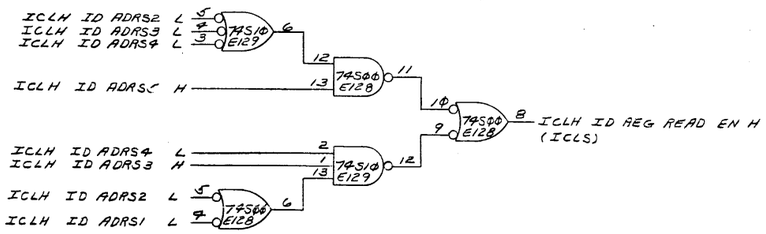

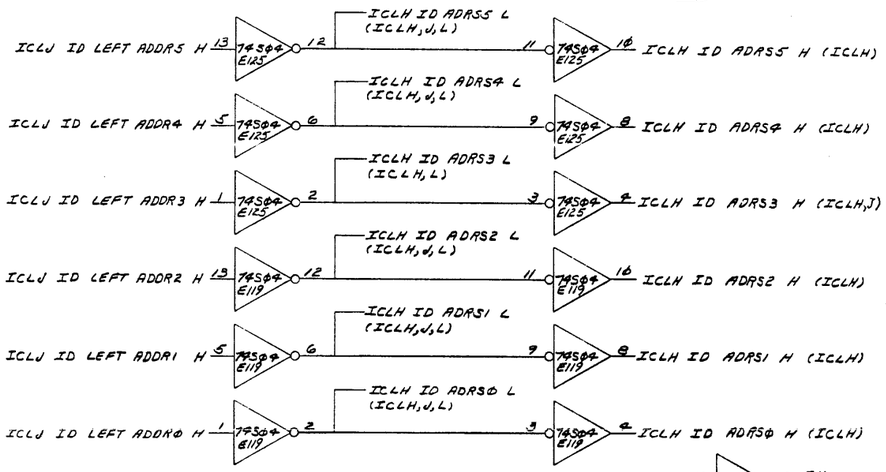

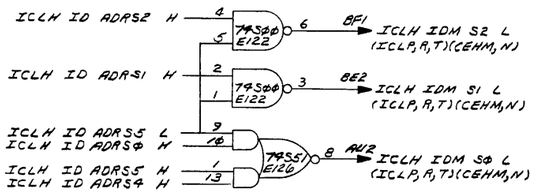

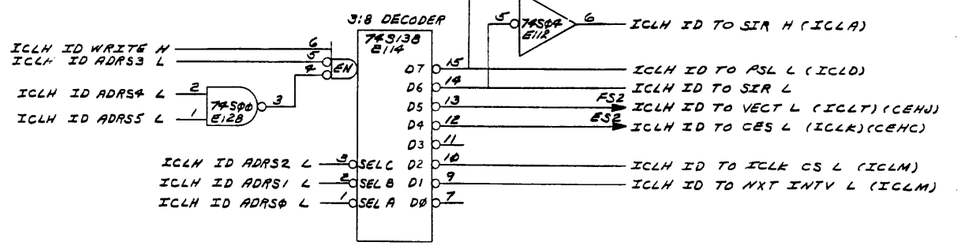

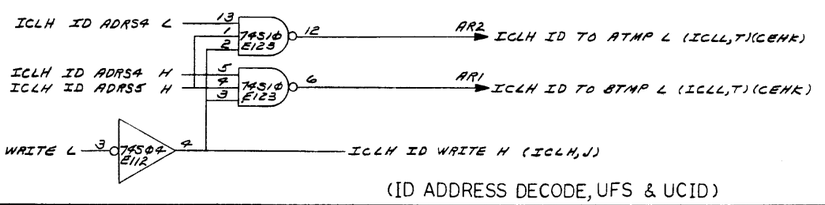

(ID ADDRESS DECODE, UFS & UCID) (SLOT 15)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: INTERRUPT CONTROL AND LOW BITS (ICLH)	SIZE: D	CODE: CS	NUMBER: M8231-0-1	REV: C
SCALE:	SHEET: 9 OF 21	DIST:		

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ICLH ID ADRS 5 L
ICLH ID ADRS 4 L
ICLH ID ADRS 3 H
74S11 E127
ICLH ID ADRS 2 L
ICLH ID ADRS 1 L
ICLH ID ADRS Ø L
74S11 E127
74S11 E127
ICLJ DQ ADRS H (ICLJ)
ICLJ ID MAINT H

74S157 E118
ICLJ ID MID WRITE H (ICLH,J,S)
ICLJ ID RIGHT WRITE L (SBHP)(TBMD)(IDPL)(IRCM)
ICLJ ID LEFT WRITE L (USCE)(CIBF)(SLOT 26)
CIBF XMT WRITE L
ICLH UFS (1) H
ICLH UCID2 (1) H
ICLH UCID1 (1) H
ICLH CLR UWORD (Ø) H
74S20 E128
CIBF ID MAINT (Ø) H
74S64 E121
ICLJ ID MID WRITE L
ICCS CPTØ BF L
ICLH UFS (1) H
ICLH UCID2 (1) H
ICLH UCID1 (1) H
74SØØ E122
ICLJ DQ ADRS H
ICLH ID WRITE H
ICLJ ID TO ID L (ICLT)(DCPC)(DDPC)(DEPL,M)
ICLJ ID TO Q L (ICLT)(DAPP)

74S158 - 2:1 MUX		
STB	SØ	OUTPUT
H	X	H
L	L	A → F
L	H	B → F

ICLF UKMX5 (1) H
DDPR SCØ5 (1) H
ICLF UKMX4 (1) H
DDPR SCØ4 (1) H
74S158 E103
CIBF XMT ADRS 5 L
CIBF XMT ADRS 4 L
74S158 E117
ICLJ ID RIGHT ADDR 5 H (SBHP)(TBMD)(IDPL)
ICLJ ID LEFT ADDR 5 H (ICLH)(USCE)(CIBF) (SLOT 24)
ICLJ ID RIGHT ADDR 4 H (SBHP)(TBMD)(IDPL)
ICLJ ID LEFT ADDR 4 H (ICLH)(USCE)(CIBF) (SLOT 24)

ICLF UKMX3 (1) H
DDPR SCØ3 H
ICLF UKMX2 (1) H
DDPR SCØ2 H
ICLF UKMX1 (1) H
DDPR SCØ1 H
ICLF UKMXØ (1) H
DDPR SCØØ H
74S158 E92
CIBF XMT ADRS 3 L
CIBF XMT ADRS 2 L
CIBF XMT ADRS 1 L
CIBF XMT ADRS Ø L
74S158 E116
74S158 E90
ICLJ ID RIGHT ADDR 3 H (SBHP)(TBMD)(IDPL) (CEHK)
ICLJ ID LEFT ADDR 3 H (ICLH)(USCE)(CIBF) (SLOT 24)
ICLJ ID RIGHT ADDR 2 H (SBHP)(TBMD)(IDPL) (CEHK)
ICLJ ID LEFT ADDR 2 H (ICLH)(USCE)(CIBF) (SLOT 24)
ICLJ ID RIGHT ADDR 1 H (SBHP)(TBMD)(IDPL) (CEHK)
ICLJ ID LEFT ADDR 1 H (ICLH)(USCE)(CIBF) (SLOT 24)
ICLJ ID RIGHT ADDR Ø H (SBHP)(TBMD)(IDPL) (CEHK)
ICLJ ID LEFT ADDR Ø H (ICLH)(USCE)(CIBF) (SLOT 24)

ICLH CLR UWORD (Ø) H
ICLH UFS (1) H
ICLH UCID2 (1) H
ICLH UCIDØ (1) H
74SØ1 E123
CIBF ID MAINT (1) L
74SØ4 E120
ICLJ ID MAINT H (ICLJ)

REVISIONS		
CHK	CHANGE NO.	REV.

(ID BUS CONTROL) (SLOT 15)

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLJ)	D	CS	M8231-Ø-1	C
SCALE	SHEET 10 OF 21	DIST.		

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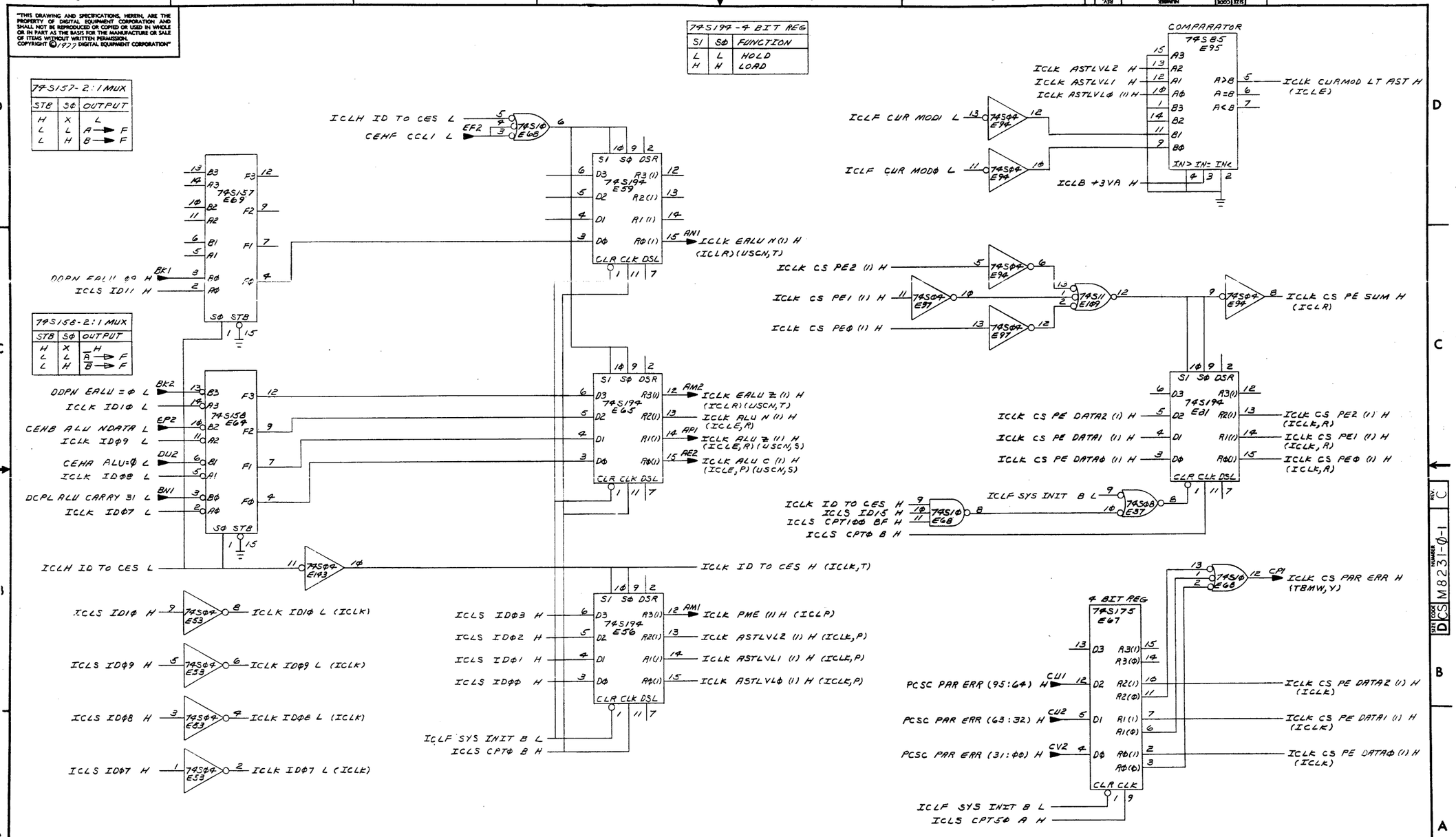
74S157 - 2:1 MUX		
STB	S0	OUTPUT
H	X	L
L	L	A → F
L	H	B → F

74S158 - 2:1 MUX		
STB	S0	OUTPUT
H	X	$\overline{A}$ → F
L	L	$\overline{B}$ → F
L	H	

74S194 - 4 BIT REG		
S1	S0	FUNCTION
L	L	HOLD
H	H	LOAD



REVISIONS		
CHK	CHANGE NO.	REV.

(CPU ERROR/STATUS REG (CES)) (SLOT 15)

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLK)	D	CS	M8231-0-1	C
SCALE	SHEET 11 OF 21	DIST.		

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85S68-16X4 EDGE TRIGGERED REG

ICLD +3V B H
ICLS CPTI5Φ C H
ICLH ID TO BTMP L

ICLM +3V C H

ICLS ID15 H — E18 — ICLL BTMPI5 H (ICLR)
ICLS ID14 H — E18 — ICLL BTMPI4 H (ICLR)
ICLS ID13 H — E18 — ICLL BTMPI3 H (ICLR)
ICLS ID12 H — E18 — ICLL BTMPI2 H (ICLR)

ICLS ID07 H — E30 — ICLL BTMPΦ7 H (ICLP)
ICLS ID06 H — E30 — ICLL BTMPΦ6 H (ICLP)
ICLS ID05 H — E30 — ICLL BTMPΦ5 H (ICLP)
ICLS ID04 H — E30 — ICLL BTMPΦ4 H (ICLP)

ICLS ID03 H — E92 — ICLL BTMPΦ3 H (ICLP)
ICLS ID02 H — E92 — ICLL BTMPΦ2 H (ICLP)
ICLS ID01 H — E92 — ICLL BTMPΦ1 H (ICLP)
ICLS ID00 H — E92 — ICLL BTMPΦΦ H (ICLP)

ICLL TMP A3 H
ICLL TMP A2 H
ICLL TMP A1 H
ICLL TMP AΦ H

ICLM +3V C H
ICLS CPTI5Φ B H
ICLH ID TO BTMP L

ICLS ID11 H — E19 — ICLL BTMPII H (ICLR)
ICLS ID10 H — E19 — ICLL BTMPI0 H (ICLR)
ICLS ID09 H — E19 — ICLL BTMPΦ9 H (ICLR)
ICLS ID08 H — E19 — ICLL BTMPΦ8 H (ICLR)

ICLD +3V B H
ICLH ID TO ATMP L

ICLS ID15 H — E17 — ICLL ATMPI5 H (ICLR)
ICLS ID14 H — E17 — ICLL ATMPI4 H (ICLR)
ICLS ID13 H — E17 — ICLL ATMPI3 H (ICLR)
ICLS ID12 H — E17 — ICLL ATMPI2 H (ICLR)

ICLM +3V C H

ICLS ID07 H — E43 — ICLL ATMPΦ7 H (ICLP)
ICLS ID06 H — E43 — ICLL ATMPΦ6 H (ICLP)
ICLS ID05 H — E43 — ICLL ATMPΦ5 H (ICLP)
ICLS ID04 H — E43 — ICLL ATMPΦ4 H (ICLP)

ICLH ID ADRSΦ L — 74S04 E12Φ — ICLL TMP AΦ H (ICLL)
ICLH ID ADRS1 L — 74S04 E12Φ — ICLL TMP A1 H (ICLL)
ICLH ID ADRS2 L — 74S04 E12Φ — ICLL TMP A2 H (ICLL)
ICLH ID ADRS3 L — 74S04 E12Φ — ICLL TMP A3 H (ICLL)

ICLM +3V C H
ICLS CPTI5Φ B H
ICLH ID TO ATMP L

ICLS ID11 H — E20 — ICLL ATMPII H (ICLR)
ICLS ID10 H — E20 — ICLL ATMPI0 H (ICLR)
ICLS ID09 H — E20 — ICLL ATMPΦ9 H (ICLR)
ICLS ID08 H — E20 — ICLL ATMPΦ8 H (ICLR)

ICLB +3V A H

ICLS ID03 H — E66 — ICLL ATMPΦ3 H (ICLP)
ICLS ID02 H — E66 — ICLL ATMPΦ2 H (ICLP)
ICLS ID01 H — E66 — ICLL ATMPΦ1 H (ICLP)
ICLS ID00 H — E66 — ICLL ATMPΦΦ H (ICLP)

(ID REGISTERS (24 TO 2F) LOW BITS) (SLOT 15)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLL)	D	CS	M8231-Φ-1	C
SCALE	SHEET 12 OF 21	DIST.		

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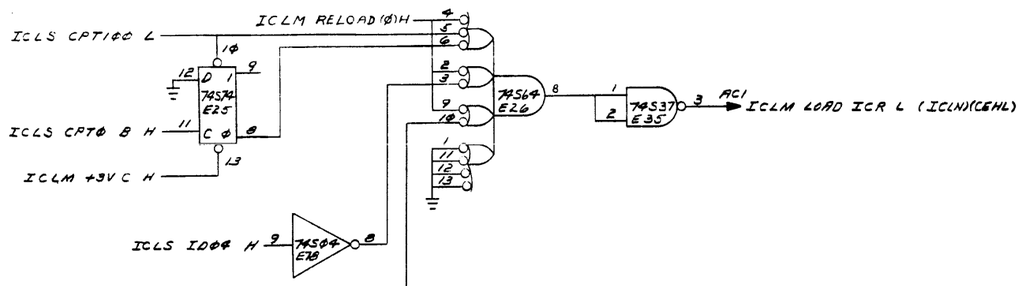
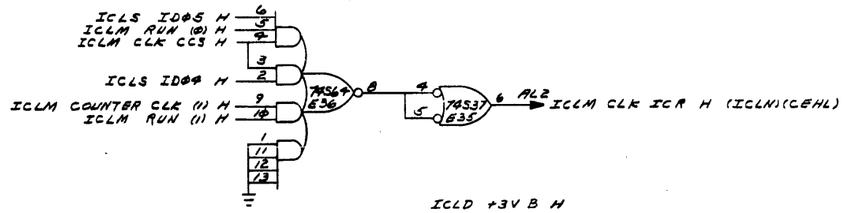
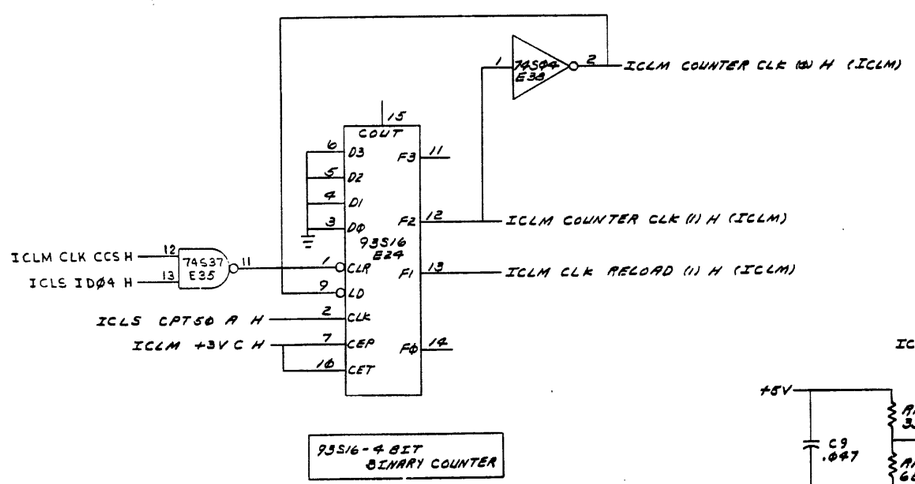
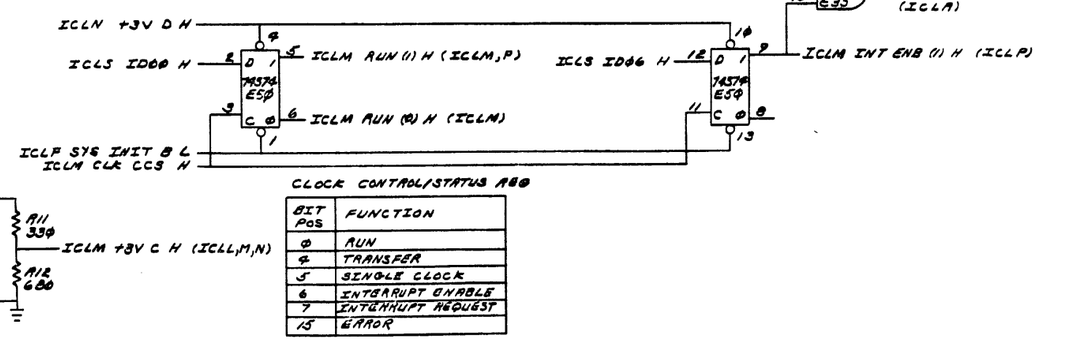
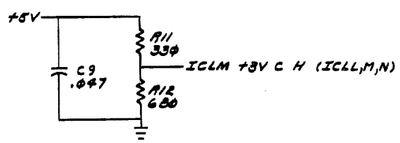






93S16-4 BIT BINARY COUNTER





CLOCK CONTROL/STATUS A8Ø

BIT POS	FUNCTION
Ø	RUN
4	TRANSFER
5	SINGLE CLOCK
6	INTERRUPT ENABLE
7	INTERRUPT REQUEST
15	ERROR

(INTERVAL CLOCK CONTROL) (SLOT 15)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLM)	D	CS	M8231-Ø-1	C
SCALE	SHEET 13 OF 21		DIST.	

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+5V
C8 .047
R13 33Ø
R14 68Ø
ICLN +3V D H (ICLB;C;F;M)

93S16 - 4 BIT BINARY COUNTER

6 BIT REG 74S174 E8
ICLS ID15 H
ICLS ID14 H
ICLS ID13 H
ICLS ID12 H
ICLN NINTV15 (1) H
ICLN NINTV14 (1) H
ICLN NINTV13 (1) H
ICLN NINTV12 (1) H

6 BIT REG 74S174 E22
ICLS ID11 H
ICLS ID1Ø H
ICLS ID09 H
ICLS ID08 H
ICLS ID07 H
ICLS ID06 H
ICLN NINTV11 (1) H
ICLN NINTV1Ø (1) H
ICLN NINTV09 (1) H
ICLN NINTV08 (1) H
ICLN NINTV07 (1) H
ICLN NINTV06 (1) H

6 BIT REG 74S174 E11
ICLS ID05 H
ICLS ID04 H
ICLS ID03 H
ICLS ID02 H
ICLS ID01 H
ICLS ID00 H
ICLN NINTV05 (1) H (ICLN)
ICLN NINTV04 (1) H (ICLN)
ICLN NINTV03 (1) H (ICLN)
ICLN NINTV02 (1) H (ICLN)
ICLN NINTV01 (1) H (ICLN)
ICLN NINTV00 (1) H (ICLN)
ICLF SYS INIT C L
ICLM LOAD NICR H

93S16 E9
ALL → ICLN ENT (19:16) H (CEHL)
ICLN INTV CNT15 (1) H (ICLR)
ICLN INTV CNT14 (1) H (ICLR)
ICLN INTV CNT13 (1) H (ICLR)
ICLN INTV CNT12 (1) H (ICLR)

93S16 E10
ICLN INTV CNT11 (1) H (ICLR)
ICLN INTV CNT10 (1) H (ICLR)
ICLN INTV CNT09 (1) H (ICLR)
ICLN INTV CNT08 (1) H (ICLR)

93S16 E23
ICLN ENT (11:08) H (ICLN)
ICLN NINTV07 (1) H
ICLN NINTV06 (1) H
ICLN NINTV05 (1) H
ICLN NINTV04 (1) H
ICLM +3V C H
ICLN INTV CNT07 (1) H (ICLP)
ICLN INTV CNT06 (1) H (ICLP)
ICLN INTV CNT05 (1) H (ICLP)
ICLN INTV CNT04 (1) H (ICLP)

93S16 E12
ICLN NINTV03 (1) H
ICLN NINTV02 (1) H
ICLN NINTV01 (1) H
ICLN NINTV00 (1) H
ICLN INTV CNT03 (1) H (ICLP)
ICLN INTV CNT02 (1) H (ICLP)
ICLN INTV CNT01 (1) H (ICLP)
ICLN INTV CNT00 (1) H (ICLP)

ICLN ENT (11:08) H
ICLF SYS INIT C L
ICLM LOAD ICR L
ICLM CLK ICR H
ICLO +3V B H

(NEXT INTERVAL REG & INTERVAL COUNTER LOW BITS) (SLOT 15)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLN)	D	CS	M8231-Ø-1	C
SCALE	SHEET 14 OF 21	DIST.		

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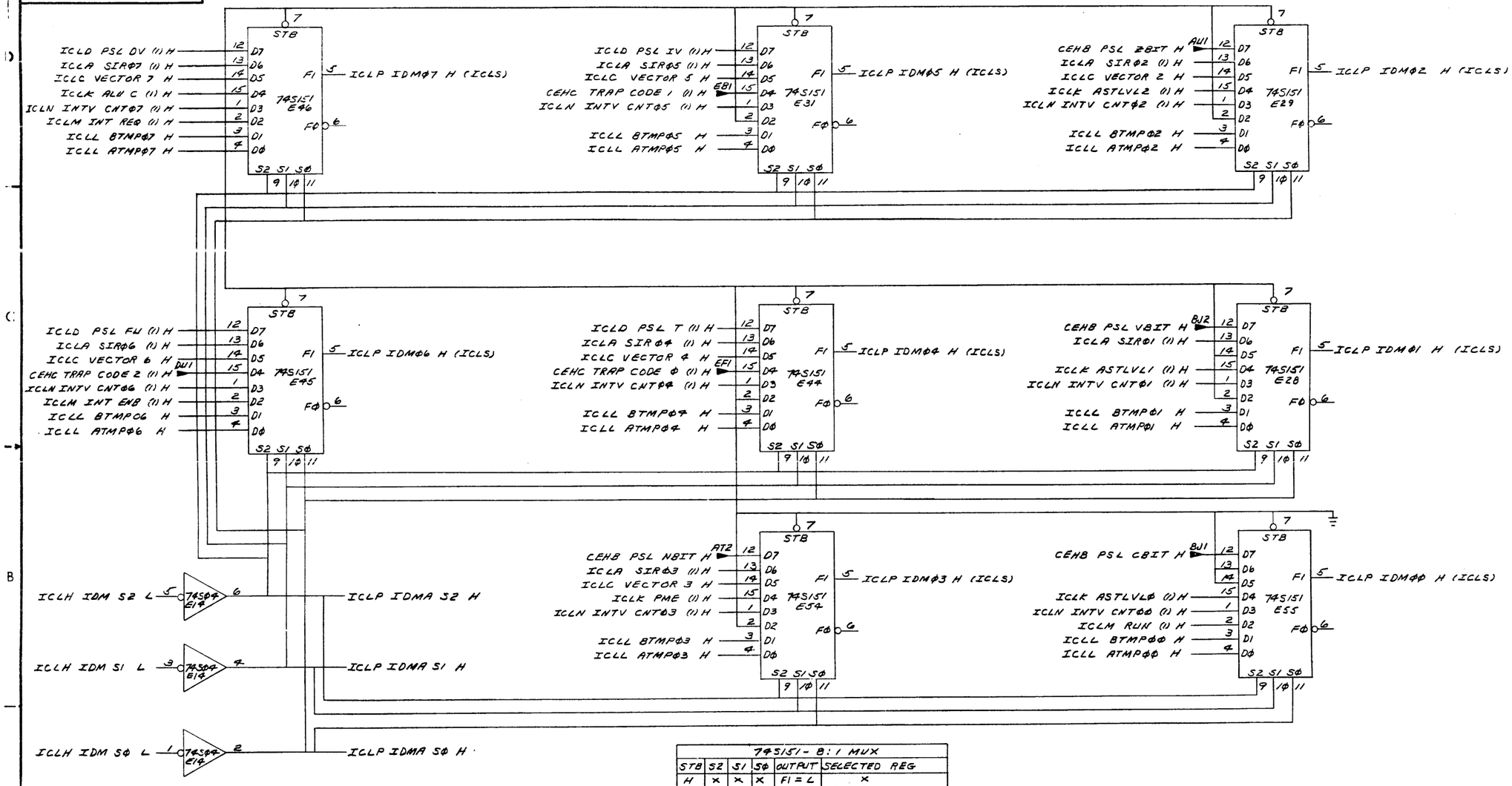

74S151 - 8:1 MUX					
STB	S2	S1	S0	OUTPUT	SELECTED REG
H	X	X	X	F1 = L	X
L	L	L	L	D0 → F1	ATMP
L	L	L	H	D1 → F1	BTMP
L	L	H	L	D2 → F1	CLOCK CS
L	L	H	H	D3 → F1	INTERVAL COUNTER
L	H	L	L	D4 → F1	CES
L	H	L	H	D5 → F1	VECTOR
L	H	H	L	D6 → F1	SIR
L	H	H	H	D7 → F1	PSL

REVISIONS		
CHK	CHANGE NO.	REV.

(ID DATA MULTIPLEXOR (IDM) BITS 07:00) (SLOT 15)

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLP)	D	CS	M8231-0-1	C
SCALE	SHEET 15 OF 21		DIST.	

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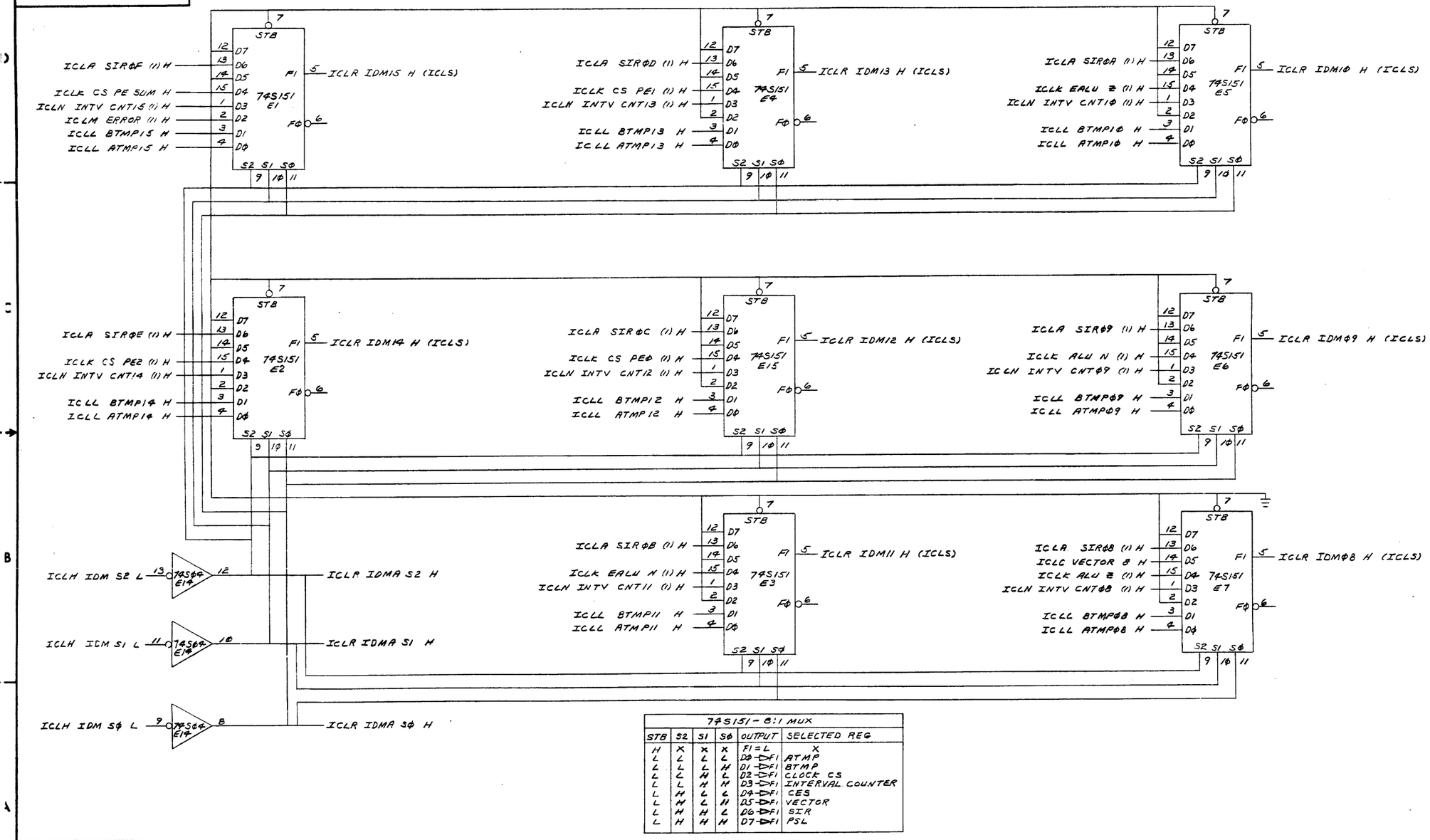

74S151 - 8:1 MUX					
STB	S2	S1	S@	OUTPUT	SELECTED REG
H	X	X	X	F1 = L	X
L	L	L	L	D@ ▷ F1	ATMP
L	L	L	H	D1 ▷ F1	BTMP
L	L	H	L	D2 ▷ F1	CLOCK CS
L	L	H	H	D3 ▷ F1	INTERVAL COUNTER
L	H	L	L	D4 ▷ F1	CES
L	H	L	H	D5 ▷ F1	VECTOR
L	H	H	L	D6 ▷ F1	SIR
L	H	H	H	D7 ▷ F1	PSL

REVISIONS		
CHK	CHANGE NO.	REV.

(ID DATA MULTIPLEXOR (IDM) BITS 15:@8) (SLOT 15)

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLR)	D	CS	M8231-@-1	C
SCALE	SHEET 16 OF 21	DIST.		

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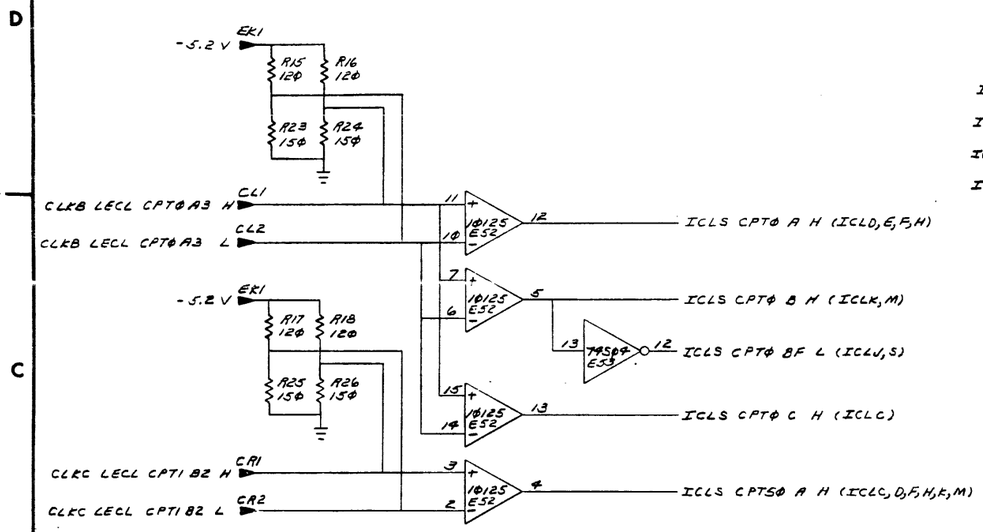

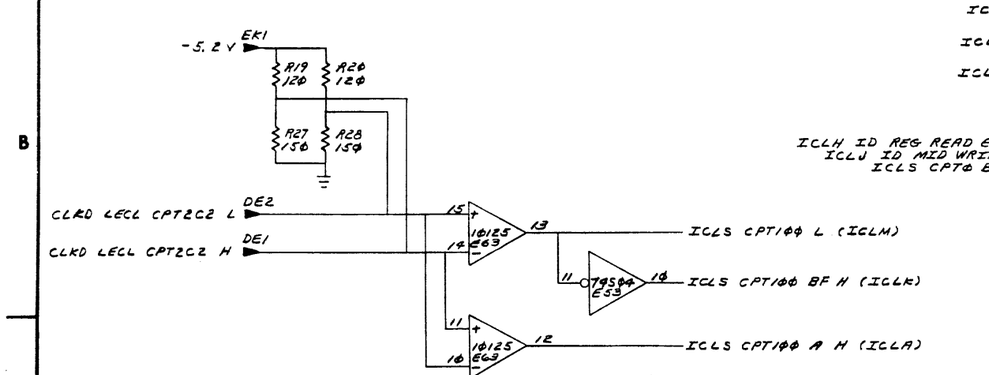

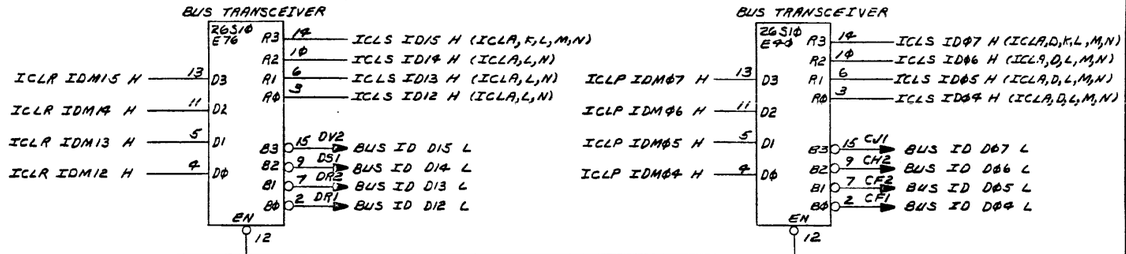

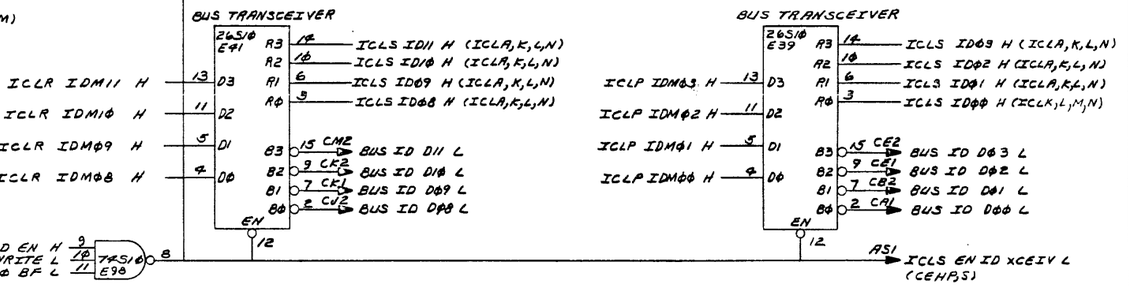

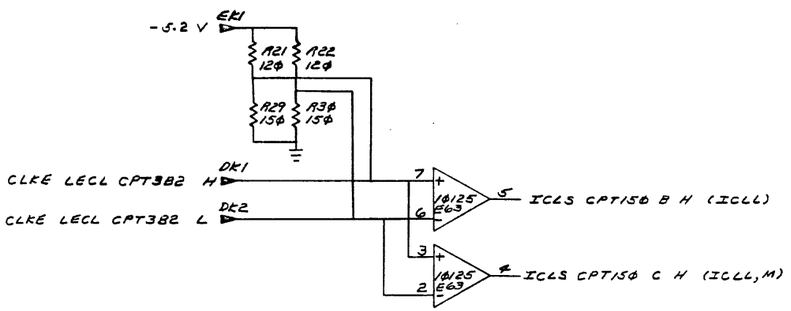

REVISIONS		
CHK	CHANGE NO.	REV.

(CLOCK LOGIC & ID XCEIVERS LOW BITS) (SLOT 15)

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLS)	D	CS	M8231-Φ-1	C
SCALE	SHEET 17 OF 21	DIST.		

M8231-Φ-1 REV C

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74LS165 - 8 BIT SHIFT REG

ICLH ID TO ATMP L
ICLH ID TO BTMP L
ICLH IDM S2 L
ICLH IDM S1 L
ICLH IDM S0 L
DDPR SC05 (1) H
DDPR SC04 (1) H
DDPR SC03 H
RB(1)
RA(1)
74LS165 E27

CIBH SDMS SLF TST H

DDPR SC02 H
DDPR SC01 H
DDPR SC00 H
ICLJ D TO ID L
ICLJ ID TO Q L
DDPN EALU 09 H
DDPN EALU = 0 L
74LS165 E78

CEHC TRAP CODE 0 (1) H
CEHP ID30 H
IRCE STALL + SVC L
CIBH HALT REQ H
DDPS BRANCH3 H
DBPV BRBIT3 H
DDPS BRANCH2 H
74LS165 E139

DBPV BRBIT2 H
DDPS BRANCH1 H
DBPV BRBIT1 H
DDPS BRANCH0 H
DBPV BRBIT0 H
IRCH BRC 1 H
IRCH BRC 0 H
IRCF OPC 0 H
74LS165 E131

WCSC WCS EVEN PAR H
SBLN TIMO CNF INTR L
SBHL FAULT INTR H
SBHE SBI ALERT R H
SBLM CRD RDS INTR L
SBHL COMP INTR H
SBHE SBI REQ 7 R H
SBHE SBI REQ 6 R H
74LS165 E80
DL2 ICLT SDMS CHNL 2A H (DAPR)

SBHE SBI REQ 5 R H
SBHE SBI REQ 4 R H
ICLB IPL ACT 4 H
ICLB IPL ACT 3 H
ICLB IPL ACT 2 H
ICLB IPL ACT 1 H
ICLB IPL ACT 0 H
CEHJ PRIOR 3 H
74LS165 E89

IRCJ READ OP H
ICLE REM BEMX S2 H
ICLE REM BEMX S1 H
ICLE REM BEMX S0 H
ICLH ID TO PSL H
ICLH ID TO VECT L
ICLK ID TO CES H
74LS165 E137

CEHJ PRIOR 2 H
CEHJ PRIOR 1 H
CEHJ PRIOR 0 H
CEHR INTR REQ L
CIBS CNSL RCV INTR H
CIBS CNSL XMIT INTR H
CEHC TRAP CODE 2 (1) H
CEHC TRAP CODE 1 (1) H
74LS165 E82

CIBH SDMS LOAD H
CIBH SDMS DEL CLK L
8G00 E77

SHIFT LD
SER IN
D7 D6 D5 D4 D3 D2 D1 D0
CLK INH CLK

REVISIONS		
CHK	CHANGE NO.	REV.

(SDMS BUS LOGIC) (SLOT 15)

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICLT)	D	CS	M8231-0-1	C
SCALE	SHEET 18 OF 21	DIST.		

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VECTOR PROM - (23Ø22B1-Ø1)

PROM ADDR	IPL ACT	VECBIT (7,6)H	VECBIT (5.2) L						X	VECTOR
		PROM DATA								
		M7	M6	M5	M4	M3	M2	M1	M0	
ØØ	ØØ	L	L	H	H	H	H	L	L	X
Ø1										
Ø2										
Ø3										
Ø4										
Ø5										
Ø6										
Ø7										
Ø8	Ø1	H	L	H	H	H	L	L	L	84
Ø9										
ØA										
ØB										
ØC										
ØD										
ØE										
ØF										
1Ø	Ø2	H	L	H	H	L	H	L	L	88
11										
12										
13										
14										
15										
16										
17										
18	Ø3	H	L	H	H	L	L	L	L	8C
19										
1A										
1B										
1C										
1D										
1E										
1F										

PROM ADDR	IPL ACT	VECBIT (7,6)H	VECBIT (5.2) L						X	VECTOR
		PROM DATA								
		M7	M6	M5	M4	M3	M2	M1	M0	
2Ø	Ø4	H	L	H	L	H	H	L	L	9Ø
21										
22										
23										
24										
25										
26										
27										
28	Ø5	H	L	H	L	H	L	L	L	94
29										
2A										
2B										
2C										
2D										
2E										
2F										
3Ø	Ø6	H	L	H	L	L	H	L	L	98
31										
32										
33										
34										
35										
36										
37										
38	Ø7	H	L	H	L	L	L	L	L	9C
39										
3A										
3B										
3C										
3D										
3E										
3F										

PROM ADDR	IPL ACT	VECBIT (7,6)H	VECBIT (5.2)L						X	VECTOR
		PROM DATA								
		M7	M6	M5	M4	M3	M2	M1	M0	
4Ø	Ø8	H	L	L	H	H	H	L	L	A0
41										
42										
43										
44										
45										
46										
47										
48	Ø9	H	L	L	H	H	L	L	L	A4
49										
4A										
4B										
4C										
4D										
4E										
4F										
5Ø	ØA	H	L	L	H	L	H	L	L	A8
51										
52										
53										
54										
55										
56										
57										
58	ØB	H	L	L	H	L	L	L	L	AC
59										
5A										
5B										
5C										
5D										
5E										
5F										

PROM ADDR	IPL ACT	VECBIT (7,6)H	VECBIT (5.2) L						X	VECTOR
		PROM DATA								
		M7	M6	M5	M4	M3	M2	M1	M0	
6Ø	ØC	H	L	L	L	H	H	L	L	B0
61										
62										
63										
64										
65										
66										
67										
68	ØD	H	L	L	L	H	L	L	L	B4
69										
6A										
6B										
6C										
6D										
6E										
6F										
7Ø	ØE	H	L	L	L	L	H	L	L	B8
71										
72										
73										
74										
75										
76										
77										
78	ØF	H	L	L	L	L	L	L	L	BC
79										
7A										
7B										
7C										
7D										
7E										
7F										

REVISIONS

CHK	CHANGE NO.	REV.

(VECTOR PROM TRUTH TABLE)

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICL)	D	CS	M8231-Ø-1	C
SCALE	SHEET 19 OF 27	DIST.		

DEC FORM NO. 370

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VECTOR PROM - (23Ø228B1-Ø1)

PROM ADDR	IPL ACT	VECBIT (7,6) H	VECBIT (5:2) L				X		VECTOR
		PROM DATA							
		M7	M6	M5	M4	M3	M2	M1	MØ	
8Ø	1Ø	L	L	H	H	H	H	L	L	X
81										
92										
83										
84										
85										
86										
87										
89	11	L	L	H	H	H	H	L	L	X
89										
8A										
8B										
8C										
8D										
8E										
8F										
9Ø	12	L	L	H	H	H	H	L	L	X
91										
92										
93										
94										
95										
96										
97										
98	13	L	L	H	H	H	H	L	L	X
99										
9A										
9B										
9C										
9D										
9E										
9F										

PROM ADDR	IPL ACT	VECBIT (7,6) H	VECBIT (5:2) L				X		VECTOR
		PROM DATA							
		M7	M6	M5	M4	M3	M2	M1	MØ	
AØ	14	L	L	H	H	H	H	L	L	18Ø TO 13C
A1										
A2		H	H	L	L	L	L	L	L	FC
A3										
A4		H	H	L	L	L	H	L	L	F8
A5										
A6		L	L	H	H	H	H	L	L	X
A7										
A8	15	L	H	H	H	H	H	L	L	148 TO 17C
A9										
AA										
AB										
AC										
AD										
AE										
AF										
BØ	16	H	L	H	H	H	H	L	L	18Ø TO 1BC
B1										
B2										
B3										
B4										
B5										
B6										
B7										
B8	17	H	H	H	H	H	H	L	L	1CØ TO 1FC
B9										
BA										
BB										
BC										
BD										
BE										
BF										

PROM ADDR	IPL ACT	VECBIT (7,6) H	VECBIT (5:2) L				X		VECTOR
		PROM DATA							
		M7	M6	M5	M4	M3	M2	M1	MØ	
CØ	18	H	H	H	H	H	H	L	L	CØ
C1										
C2										
C3										
C4										
C5										
C6										
C7										
C8	19	L	H	H	L	H	H	L	L	5Ø
C9										
CA										
CB										
CC										
CD										
CE										
CF										
DØ	1A	L	H	H	L	H	L	L	L	54
D1										
D2										
D3										
D4										
D5										
D6										
D7										
D8	1B	L	H	H	L	L	H	L	L	58
D9										
DA										
DB										
DC										
DD										
DE										
DF										

PROM ADDR	IPL ACT	VECBIT (7,6) H	VECBIT (5:2) L				X		VECTOR
		PROM DATA							
		M7	M6	M5	M4	M3	M2	M1	MØ	
EØ	1C	L	H	H	L	L	L	L	L	5C
E1										
E2										
E3										
E4										
E5										
E6										
E7										
E8	1D	L	H	L	H	H	H	L	L	6Ø
E9										
EA										
EB										
EC										
ED										
EE										
EF										
FØ	1E	L	L	H	H	L	L	L	L	9C
F1										
F2										
F3										
F4										
F5										
F6										
F7										
F8	1F	L	L	H	H	H	H	L	L	X
F9										
FA										
FB										
FC										
FD										
FE										
FF										

(VECTOR PROM TRUTH TABLE)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
INTERRUPT CONTROL AND LOW BITS (ICL)	D	CS	M8231-Ø-1	C
SCALE	SHEET 2Ø OF 21	DIST.		

DEC FORM NO. DBD 137

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DECODING LOGIC DESCRIPTION

(ICLD) HALT PENDING & TRACE TRAP PENDING

FUNCTION	HP LOAD COND	TP LOAD COND
ID TO PSL	HP	ID30
IACK	HALT REQ	0
EACK	HALT REQ	0
CNSL CONT	0	PSL TP
DO NEXT INSTRUCTION (IND STATE * $\overline{STALL}$ * $\overline{SVC}$)	HALT REQ	PSL T

(ICLF)
(ICLH)
(ICLJ) UNIBORD CONSOLE & ID BUS CONTROL

UFS	UCID	FUNCTIONS	
0	X	NO-OP	
1	0	NO-OP	
1	1	UNUSED	
1	2	CNSL ACK	
1	3	CNSL CONT	
1	4	ID DATA ← ID REG	ID ADDRS ← SC(5:0)
1	5		ID ADDRS ← UKUX
1	6	ID REG ← ID DATA	ID ADDRS ← SC(5:0)
1	7		ID ADDRS ← UKUX

(ICLD) UIEK DECODE

UIEK	FUNCTION
0	NO-OP
1	ISTR
2	IACK
3	EACK

(ICLD) A FORK PRIORITY

	CONDITION	SERV BIT CODE	PRIOR
SVC	ARITHMETIC TRAP	7	HIGHEST
SVC	HALT PENDING (HP)	5	
SVC	INTERRUPT REQ*EXT.DEV (NI)	6	
SVC	INTERRUPT REQ*INT.COND (NI)	4	
SVC	TRACE TRAP PENDING (TP)	1	
STALL	IBUF STALL	0	
STALL	IBUF ERROR	0	
	NEXT INSTRUCTION	0	LOWEST

NI - MUTUALLY EXCLUSIVE

(ICLH) ID ADDRESS DECODE

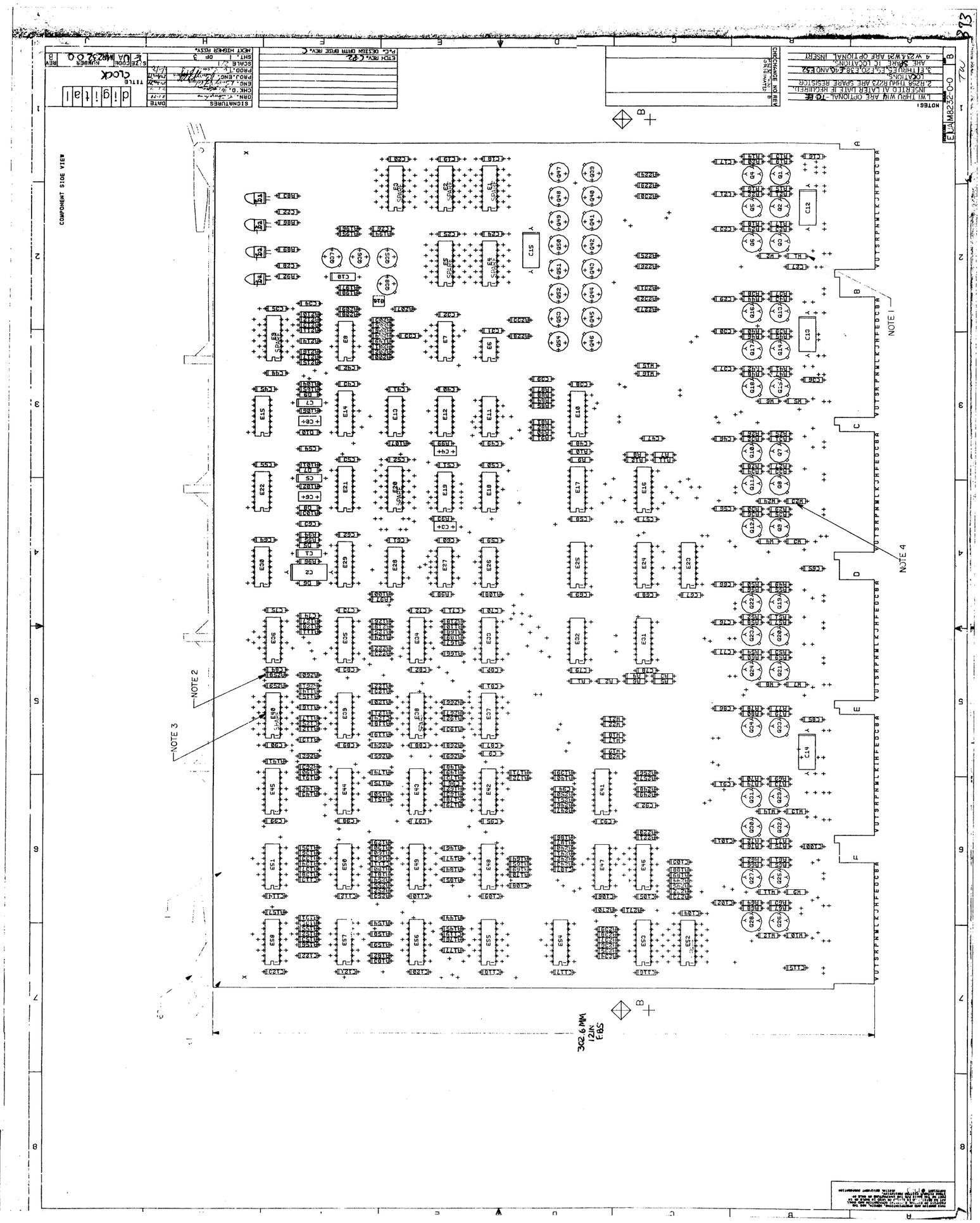
ID ADDRS	ID REGISTER	ID REG READ EN H	IDM(S2:S0) L		
			S2	S1	S0
08	DQ (ID MAINT. ONLY)	L	X	X	X
09	NXT INTV	L	X	X	X
0A	CLOCK CS	H	H	L	H
0B	INTV CNT	H	H	L	L
0C	CES	H	L	H	H
0D	VECT	H	L	H	L
0E	SIR	H	L	L	H
0F	PSL	H	L	L	L
24-2F	ATHP	H	H	H	H
30-3F	BTHP	H	H	H	L

REVISIONS		
CHK	CHANGE NO.	REV.

(DECODING LOGIC DESCRIPTION)

TITLE INTERRUPT CONTROL AND LOW BITS (ICL)
SIZE D CODE CS NUMBER M8231-0-1 REV. C
SCALE — SHEET 21 OF 21 DWG.

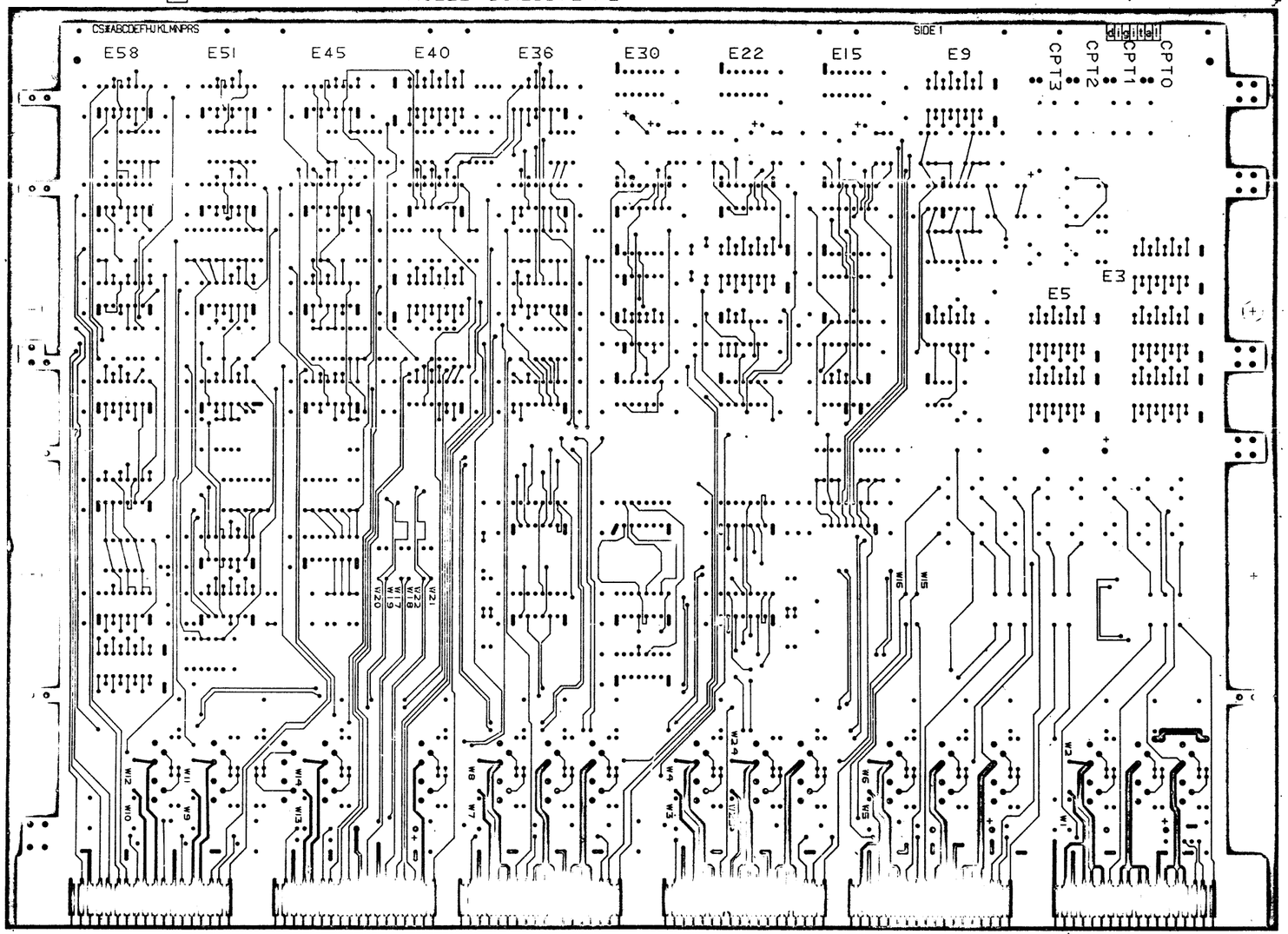
372


COMPONENT SIDE VIEW
NOTE 1
NOTE 2
NOTE 3
NOTE 4
NOTES:
1. W1 THRU W14 ARE OPTIONAL - TO BE INSERTED AT LATER DATE IF NECESSARY.
2. R298 THRU R272 ARE SPARE RESISTOR LOCATIONS.
3. E1 THRU E5, E70 THRU E78 & C40 AND C52 ARE SPARE IC LOCATIONS.
4 W23 AND W24 ARE OPTIONAL INSERT
REVISIONS
CHG NO
REV
ETCH REV. C
P.C. DESIGN DATA BASE REV. C
NEXT HIGHER ASSY.
QTY.
SHT. 1 OF 3
SCALE 2/1
PROJ. ENG.
DRN.
CHK'D.
ENG.
DATE
ELEMENTARY
S.ZE CODE NUMBER REV
E 04 M8232 00 B
TITLE
digital clock
362.6 MM
12.8 K
E65

LAYER 1

L1

M8232 5012597E-P2



REVISIONS		
CHK	CHANGE NO.	REV.

TITLE: CLOCK	SIZE/CODE: E UA	NUMBER: M8232-0-0	REV: B
SCALE	SHEET 2 OF 3	DIST.	

PRO CODE E UA M8232-0-0 REV. B

374

REVISIONS		
ECO	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK	E	UA	M8232-0-0	B
SCALE	SHEET 3 OF 3		DIST.	

AUTOMATED BY PRTLST,3L(34)

P A R T S L I S T

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION 00	REFERENCE DESIGNATOR
1	1	E-ME-5012597-0-0	5012597-00	M8232	1	
2	2		1000021-00	220.0 MMF 100V 5%200PPM DM15S	2	C6,C8
3	3		1000024-00	470.0 MMF 100V 5%200PPM DM15S	2	C3,C4
4	4		1001776-00	1 MFD 35V 10% S.TANT	1	C5
5	5		1004813-00	10 MFD 20V 10% S.TANT	1	C2
6	6		1009964-00	.68 MFD 35V 10% 150D S.TA	3	C1,C7,C10
7	7		1011740-00	5600.0 MMF 50V 10% CW15C CER.	1	C11
8	8		1012084-01	8 MFD 25V G% 30D AL EL	4	C12-C15
9	9		1012784-00	.047 MFD 50V -20+80 CER	111	C9,C16-C125
10	10		1100114-00	D 664 QS\75PCB PIV= 25V SP	6	D5-D10
11	11		1110864-00	LED 2MCD@10MA	4	D1-D4
12	12		1300247-00	120 1/4W 5% CC	92	R1,R3,R5,R7,R9,R11,R13,R15,R17, CONT R19,R21,R23,R25,R27,R29,R31,R33, CONT R35,R37,R39,R41,R43,R45,R47,R49, CONT R51,R53,R55,R57,R59,R61,R63,R65, CONT R67,R69,R71,R73,R75,R77,R79,R82, CONT R85,R88,R91,R112,R114,R116,R118, CONT R120,R122,R129,R131,R133,R135, CONT R137,R139,R142,R144,R146,R148, CONT R150,R152,R158,R160,R162,R164, CONT R169,R171,R174,R176,R178,R180, CONT R182,R184,R186,R188,R190,R192, CONT R220,R222,R234,R236,R238,R240, CONT R242,R244,R246,R248,R250,R252, CONT R254,R256
13	13		1300250-00	150 1/4W 5% CC	4	R81,R84,R87,R90
14	14		1300271-00	220 1/4W 5% CC	2	R93,R99
15	15		1300295-00	330 1/4W 5% CC	4	R83,R86,R89,R92
16	16		1300365-00	1 K 1/4W 5% CC	28	R94,R97,R98,R100,R103,R108-R111, CONT R124-R128,R166-R168,R196,R218,

REVISION HISTORY			BASIC PART NO: M8232										
ENG	ECO NUMBER	REV	SECTION A OF A	DRN: P.TELLIER	DATE: 16-JUL-79		D	I	G	I	T	A	L
	INITIAL	B	SECTION.VARIATION INDEX [A] 00 [B] [C] [D] [E] [F] [H] [J] [K] [L] [M] [N]	CHK'D: L.GIAMMARINO	DATE: 16-JUL-79	TITLE: PARTS LIST CLOCK							
				DES.ENG: B.FLAHIVE	DATE: 16-JUL-79								
				RESP.ENG.: B.FLAHIVE	DATE: 16-JUL-79	DOCUMENT NUMBER SIZE: K / CODE: PL / NUMBER: M8232-0-DBP / REV: B							
				MFG.ENG.: M.TERELLA	DATE: 16-JUL-79								
				ASSEMBLY NUMBER: E-UA-M0232-0-0	TOP DOCUMENT NUMBER: B-DD-M8232-0-0	FILE NAME: M8232.PLS	EDIT #: 3						

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TW

AUTOMATED BY PRTLST,3L(34)

P A R T S L I S T

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION					QTY PER VARIATION 00	REFERENCE DESIGNATOR
										CONT R219,R224-R227,R229-R232
17	17		1300391-00	1.5	K	1/4W	5%	CC	1	R195
18	18		1300439-00	3.3	K	1/4W	5%	CC	1	R209
19	19		1300479-00	10	K	1/4W	5%	CC	2	R104,R107
20	20		1301310-00	270	K	1/4W	5%	CC	4	R199,R203,R210,R214
21	21		1301322-00	180		1/4W	5%	CC	88	R2,R4,R6,R8,R10,R12,R14,R16,R18,
										CONT R20,R22,R24,R26,R28,R30,R32,R34,
										CONT R36,R38,R40,R42,R44,R46,R48,R50,
										CONT R52,R54,R56,R58,R60,R62,R64,R66,
										CONT R68,R70,R72,R74,R76,R78,R80,
										CONT R113,R115,R117,R119,R121,R123,
										CONT R130,R132,R134,R136,R138,R140,
										CONT R143,R145,R147,R149,R151,R153,
										CONT R159,R161,R163,R165,R170,R172,
										CONT R175,R177,R179,R181,R183,R185,
										CONT R187,R189,R191,R193,R221,R223,
										CONT R235,R237,R239,R241,R243,R245,
										CONT R247,R249,R251,R253,R255,R257
22	22		1301423-00	6.8	K	1/4W	5%	CC	1	R208
23	23		1301972-00	270		1/4W	5%	CC	8	R141,R154-R157,R173,R228,R223
24	24		1302091-00	330	K	1/4W	5%	CC	1	R198
25	25		1302092-00	220	K	1/4W	5%	CC	4	R201,R205,R212,R216
26	26		1302394-00	30	K	1/4W	5%	CC	6	R95,R96,R101,R102,R105,R106
27	27		1309595-00	1	M	1/4W	5%	CC	4	R202,R206,R213,R217
28	28		1310867-00	680	K	1/4W	5%	CC	1	R197
29	29		1312930-00	5.1	K	1/4W	5%	CC	6	R194,R200,R204,R207,R211,R215
30	30		1510959-00	2N 3725 NPN 3.5WC SI 50 60 P					38	Q1-Q38
31	31		1511686-00	DEC5433 FET N 350MW 10 25 1A					16	Q39-Q54
32	32		1814057-00	OSCILLATOR, CRYSTAL 40.0 MHZ					1	E22
33	33		1814057-01	OSCILLATOR, CRYSTAL 42.1 MHZ					1	E15
34	34		1814057-02	OSCILLATOR, CRYSTAL 35.7 MHZ					1	E30
35	35		1910436-00	DEC 74123 ONE SHOT-DUAL,RETRIG					3	E14,E21,E29
36	36		1910534-00	74S04 INVERTER GATE-HEX 1I					1	E18
37	37		1910537-00	74S11 AND GATE-TRIPLE 3INP					1	E13
38	38		1910544-00	74S74 FF-D DUAL,EDGE TRIGG					2	E27,E28
39	39		1910645-00	75452 DRIVER,PERIPH,DUAL,					1	E6
40	40		1911324-00	7414 INVERTER,HEX 1IN SCH					1	E7
41	41		1911398-00	10101 OR/NOR GATE,4-2IN					5	E16,E17,E31,E32,E44
42	42		1911401-00	10104 AND GATE,QUAD 2IN					2	E48,E54
43	43		1911402-00	10105 OR/NOR GATE,2-3-2					4	E23,E24,E43,E53
44	44		1911404-00	10107 XOR/NOR GATE,3-2IN					1	E55
45	45		1911413-00	10121 OR/AND GATE,4WIDE					1	E49
46	46		1911414-00	10124 TTL TO ECL TRNSLTR					4	E33,E34,E35,E36
47	47		1911415-00	10125 ECL TO TTL TRNSLTR					2	E10,E37
48	48		1911416-00	10131 DUAL D MSTR/SL,FF					9	E42,E45,E46,E47,E50,E51,E56,E57,
										CONT E58
49	49		1911420-00	10174 DUAL 4 TO 1 MUX					1	E39
50	50		1911469-00	DEC 8640 RECEIVER,BUS,QUAD,U					1	E11

DIGITAL	TITLE	SIZE	CODE	DOCUMENT NUMBER	REV
	CLOCK SECTION A OF A	K	PL	M8232-0-DBP	B

AUTOMATED BY PRTLST,3L(32)

P A R T S L I S T

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION 00	REFERENCE DESIGNATOR
51	51		1911507-00	10176 FF-D HEX	1	E41
52	52		1912108-00	339 VOLT CMPRTR,QUAD	1	E8
53	53		1912746-00	DEC 74S37 NAND GATE-QUAD 2IN	1	E26
54	54		1912811-00	LS21 AND GATE-DUAL 4IN,PO	1	E12
55	55		1912838-00	LS132 NAND GATE-QUAD 2IN P	1	E19
56	56		1913220-00	10216 RECEIVER,TRIPLE LINE	1	E25
57	57		9009185-00	JUMPER, WIRE, INSULATED, BLACK B	8	W15-W22
58	58		1210711-02	HANDLE,MODULE,HEX	1	
59	59		9000024-02	EYELET, FLAT FLANGE, .093 OD X .	12	
60	60		9007210-00	FUSE, REG BLOW, .750A, 250V, G	36	

NOTE: SPARE I.C. LOCATIONS ARE: E1-E5,E9,E38,E40,E52,E20

DIGITAL	TITLE	SECTION A OF A	SIZE	CODE	DOCUMENT NUMBER	REV
	CLOCK		K	PL	M8232-0-DBP	B

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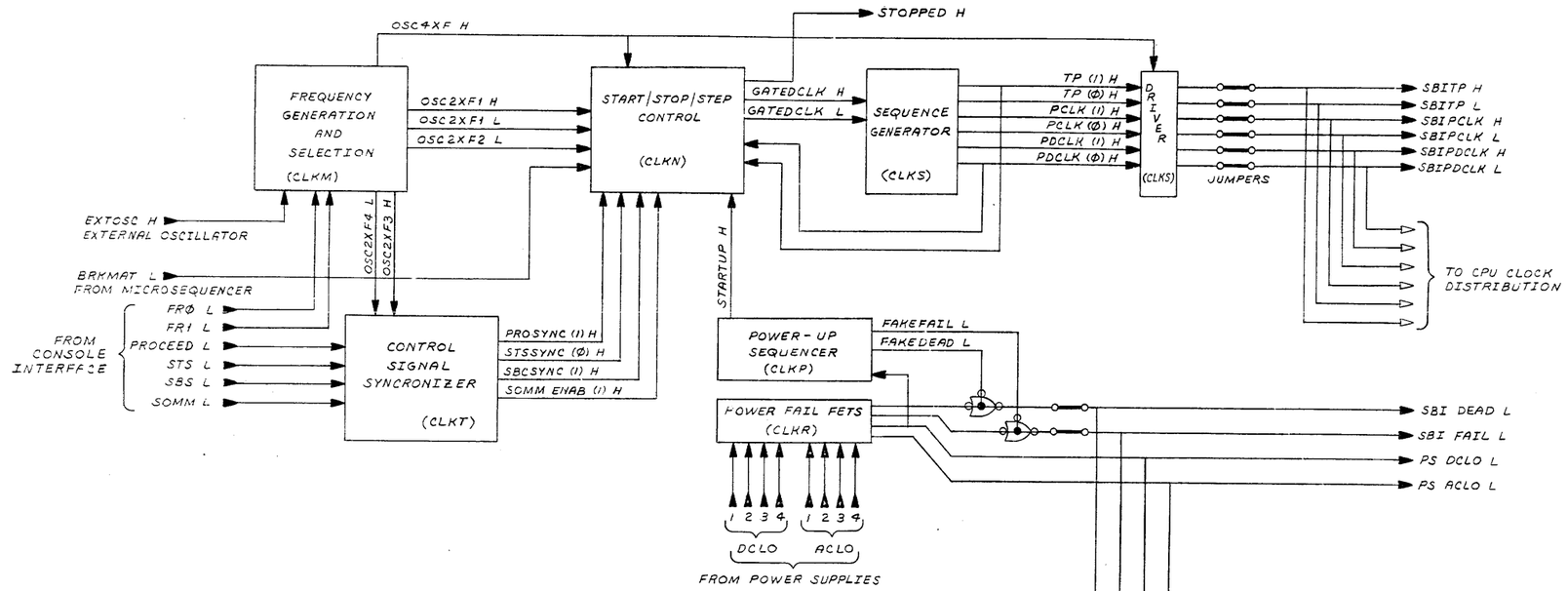
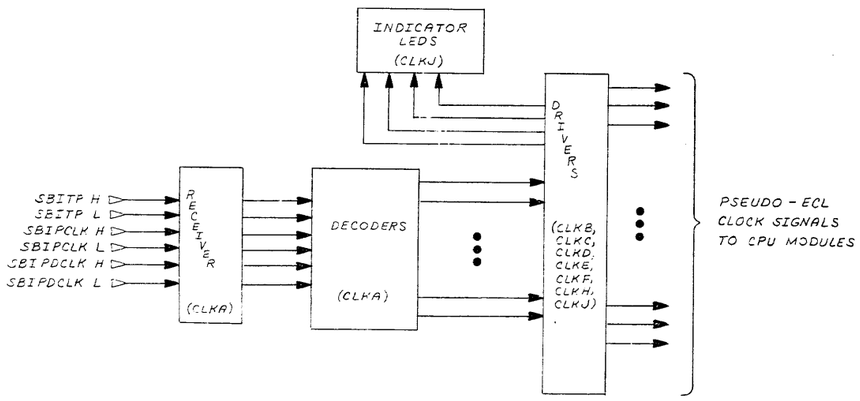
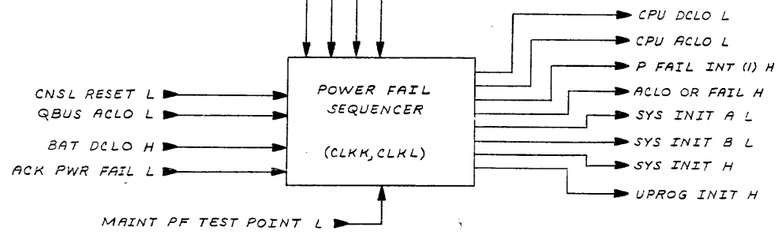
SBI CLOCK



CPU CLOCK DISTRIBUTION





CPU POWER FAIL SEQUENCER

REVISIONS			
CHK	CHANGE NO.	REV.	
DC	M8232 TWO(1)	B	17 Mar 79
DC Vincent	B SMS		
Geoff Perkins	23 Aug 79		

(BLOCK DIAGRAM) (SLOT 16)

DRN. G. Vincent	5-19-77	FIRST USED ON: digital
CHK'D. [illegible]	[illegible]	TITLE: CLOCK
ENG. [illegible]	6/29/77	
PROJ. ENG. [illegible]	6/29/77	
PROD. Geoff Perkins	6/30/77	
NEXT HIGHER ASSY.		SIZE D | CODE CS | NUMBER M8232-Ø-1 | REV. B
SCALE		SHEET 1 OF 22 | DIST.

DEC FORM NO. ORD 102-D

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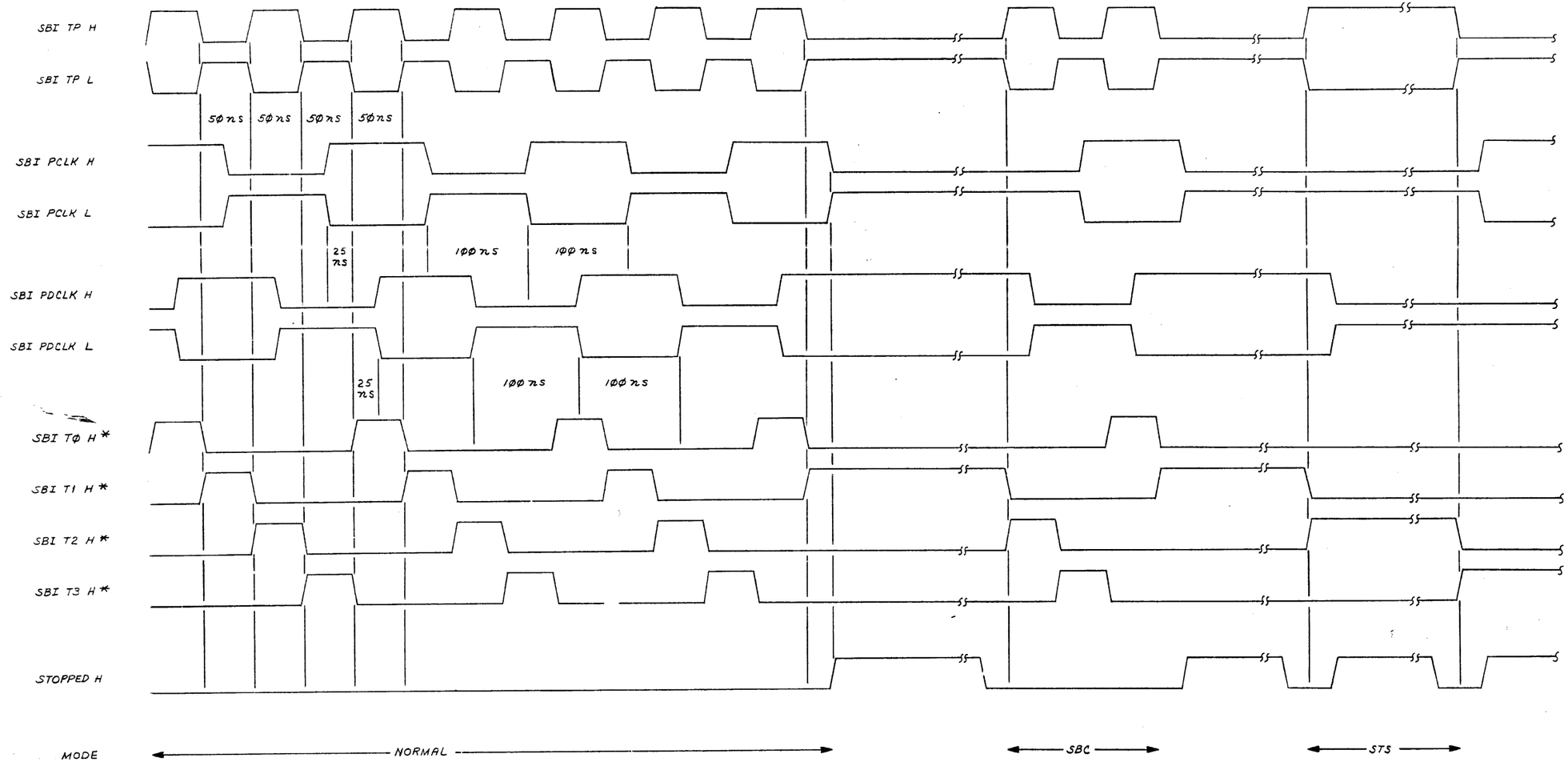

* NOTE: CPU AND SBI TIME STATES ARE NOT EQUIVALENT.
CPT0 = SBI T1 CPTP = SBI TP
CPT1 = SBI T2 CPPCLK = SBI PCLK
CPT2 = SBI T3 CPPDCLK = SBI PDCLK
CPT3 = SBI T0

(SBI TIMING) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK	D	CS	M8232-0-1	B
SCALE —	SHEET 2 OF 22	DIST.		

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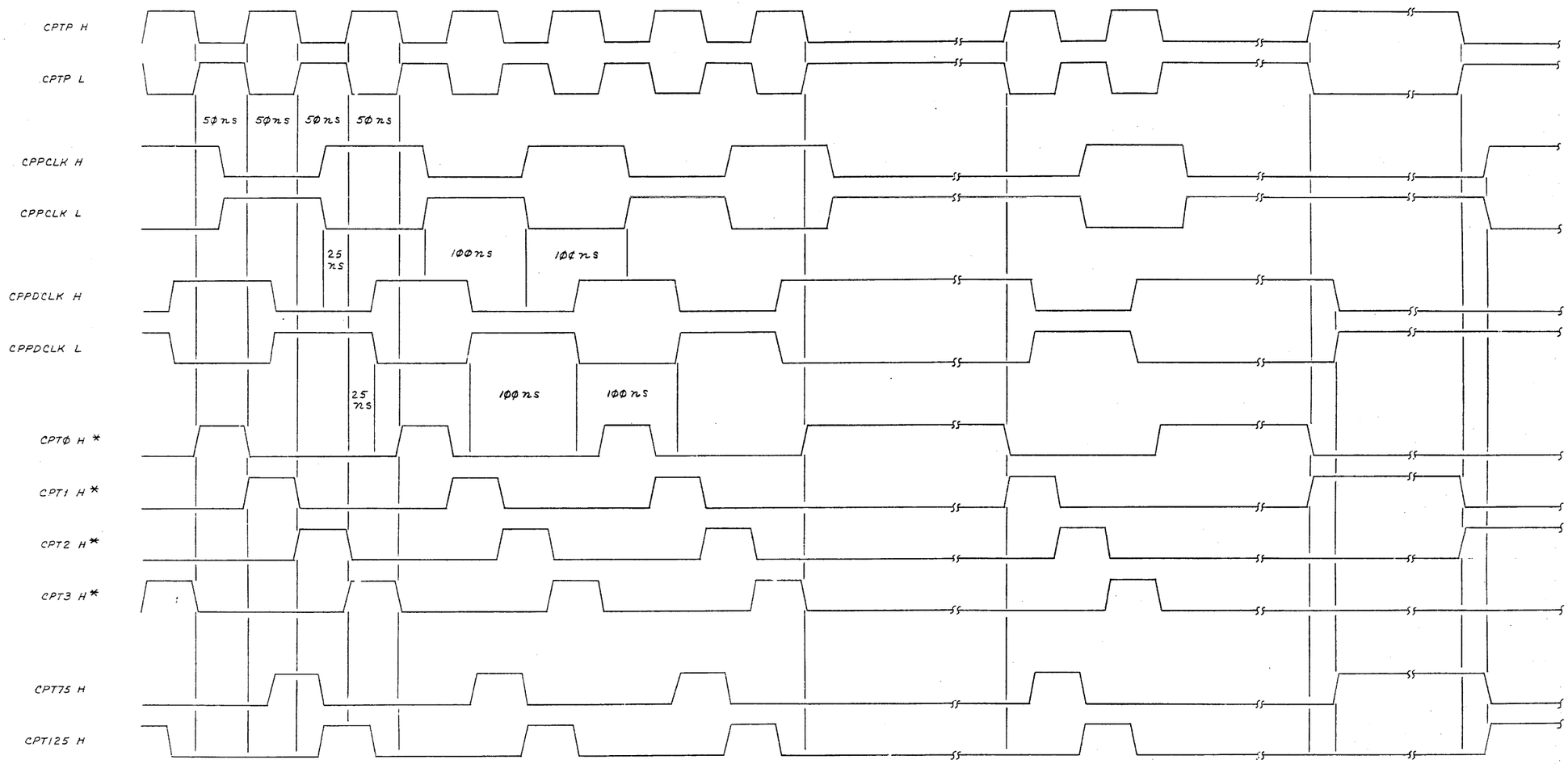

*NOTE: CPU AND SBI TIME STATES ARE NOT EQUIVALENT.

CPTØ = SBI T1	CPTP = SBI TP
CPT1 = SBI T2	CPPCLK = PCLK
CPT2 = SBI T3	CPPDCLK = PDCLK
CPT3 = SBI TØ	

(CPU TIMING) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK	D	CS	M8232-Ø-1	B
SCALE — // —	SHEET 3 OF 22		DIST.	

DEC FORM NO. DRG 138

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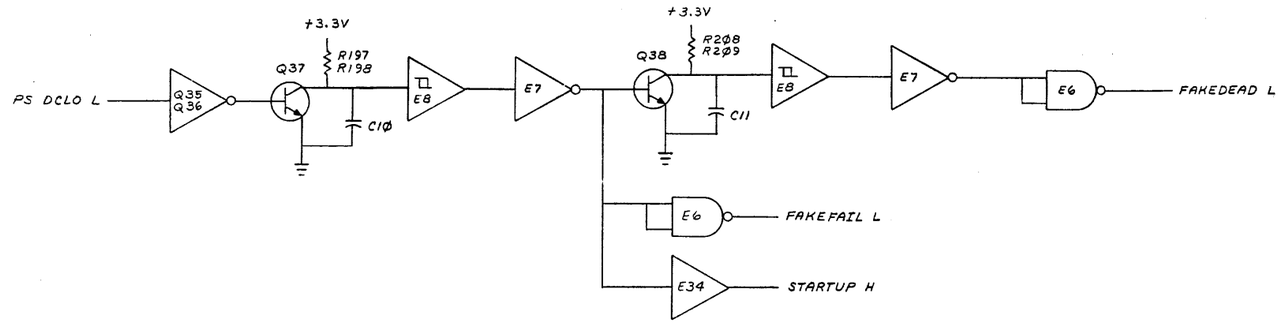

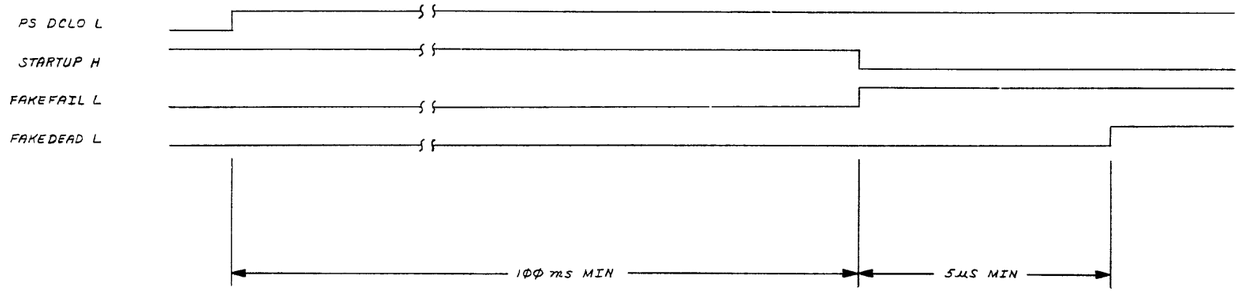

(SBI CLOCK POWER UP SEQUENCER TIMING) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK	D	CS	M8232-0-1	B
SCALE —// — SHEET 4 OF 22	DIST.			

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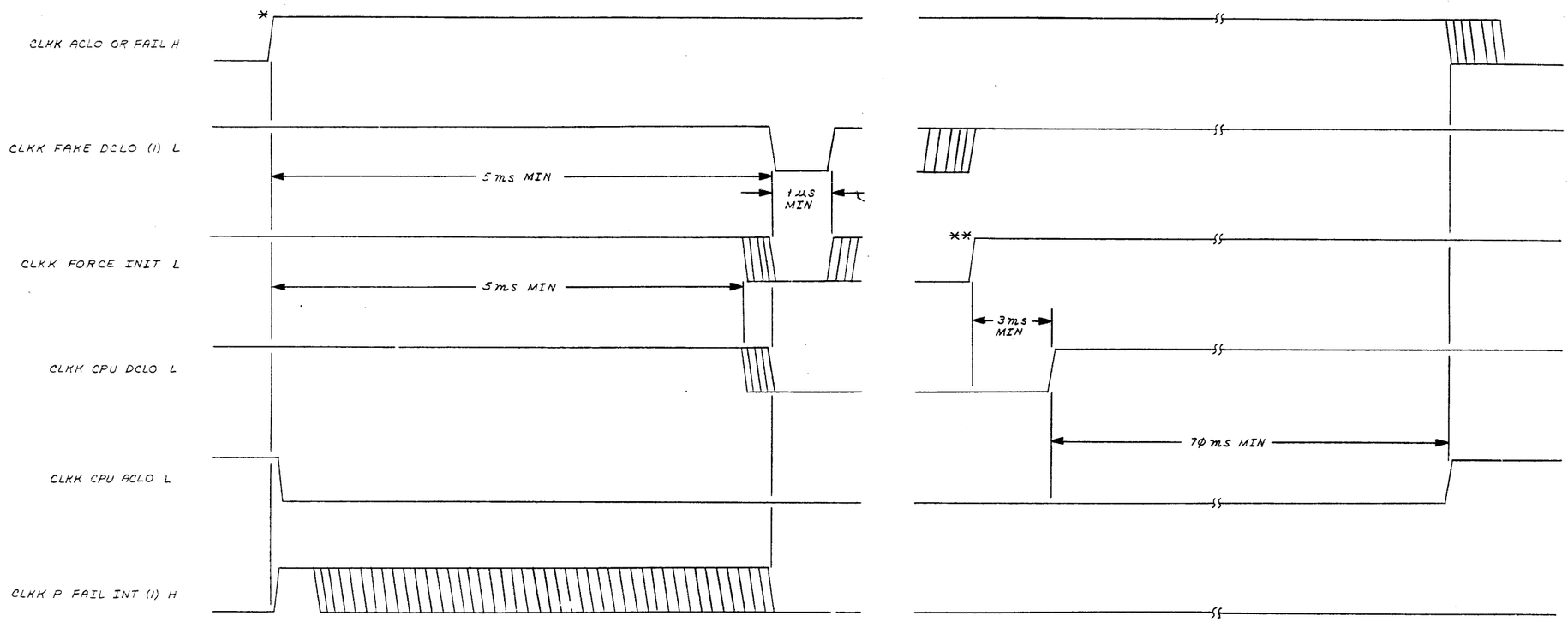

POWER DOWN SEQUENCE
* TRIGGERED FROM THE FIRST ASSERTION OF AN ACLO EQUIVALENT SIGNAL

POWER UP SEQUENCE
** TRIGGERED FROM THE LAST DEASSERTION OF A DCLO EQUIVALENT SIGNAL

ACLO EQUIVALENT SIGNALS:
CLKR PS ACLO L
BUS SBI FAIL L
CIBV QBUS ACLO L
IRCM BAT DCLO H
CLKL MAINT PF (I) H

DCLO EQUIVALENT SIGNALS:
CLKR PS DCLO L
BUS SBI DEAD L
CLKK FAKE DCLO (I) L

(CPU POWER FAIL SEQUENCER TIMING) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK	D	CS	M8232-Ø-1	B
SCALE —"	SHEET 5 OF 22	DIST.		

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JUMPER DATA

JUMPER IDENTIFICATION	SCHEMATIC REFERENCE	PURPOSE	INSTALLATION DATA
W1 THROUGH W14	CLKB, CLKC CLKD, CLKE CLKF, CLKH	SEND ECL CLOCK SIGNALS TO THE ACCELERATOR (SLOT 24, 25, 26 AND 28)	INSTALLED ONLY WHEN ACCELERATOR IS INSTALLED
W23, W24	CLKC	SEND ECL CLOCK SIGNALS TO THE OPTIONAL CONTROL STORE (SLOT 18)	INSTALLED ONLY WHEN OPTIONAL CONTROL STORE IS INSTALLED
W15, W16	CLKR	DRIVE SBI FAIL AND SBI DEAD ONTO THE BUS IN THE EVENT OF POWER FAILURE IN THE CPU SUBSYSTEM	W15 THROUGH W22 ARE REMOVED ONLY WHEN THE CPU RECEIVES ITS CLOCK SIGNALS FROM ANOTHER DEVICE ON THE SBI (SUCH AS A SECOND CPU)
W17 THROUGH W22	CLKS	DRIVE THE SBI CLOCK SIGNALS ONTO THE BUS	

(JUMPER DATA) (SLOT 16)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE: CLOCK
SIZE: D | CODE: CS | NUMBER: M8232-Ø-1 | REV: B
SCALE: — | SHEET 6 OF 22 | DIST.

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BUS SBI TP L — EF2 9 — 10216 E25 — 6 — R5 12Ø — R6 18Ø — -5.2V
BUS SBI TP H — EF1 1Ø — 10216 E25 — 7 — R7 12Ø — R8 18Ø — -5.2V

BUS SBI PDCLK L — EK2 12 — 10216 E25 — 14 — R9 12Ø — R1Ø 18Ø — -5.2V
BUS SBI PDCLK H — EJ2 13 — 10216 E25 — 15 — R11 12Ø — R12 18Ø — -5.2V

BUS SBI PCLK L — EJ1 4 — 10216 E25 — 2 — R1 12Ø — R2 18Ø — -5.2V
BUS SBI PCLK H — EH2 5 — 10216 E25 — 3 — R3 12Ø — R4 18Ø — -5.2V

12, 4	1Ø1Ø1 E17	2	CLKA DECD TØA H (CLKB)	
		5	CLKA DECD TØA L (CLKB)	
12, 7	1Ø1Ø1 E17	3	CLKA DECD TØB H (CLKB)	
		6	CLKA DECD TØB L (CLKB)	
12, 1Ø	1Ø1Ø1 E17	14	CLKA DECD TØC H (CLKB)	
		11	CLKA DECD TØC L (CLKB)	
12, 4	1Ø1Ø1 E16	2	CLKA DECD T2A H (CLKD)	
		5	CLKA DECD T2A L (CLKD)	
12, 7	1Ø1Ø1 E16	3	CLKA DECD T2B H (CLKD)	
		6	CLKA DECD T2B L (CLKD)	
12, 1Ø	1Ø1Ø1 E16	14	CLKA DECD T2C H (CLKD)	
		11	CLKA DECD T2C L (CLKD)	
12, 13	1Ø1Ø1 E16	15	CLKA DECD TP L (CLKF)	
		9	CLKA DECD TP H (CLKF)	
12, 4	1Ø1Ø1 E31	2	CLKA DECD T1A H (CLKC)	
		5	CLKA DECD T1A L (CLKC)	
12, 7	1Ø1Ø1 E31	3	CLKA DECD T1B H (CLKC)	
		6	CLKA DECD T1B L (CLKC)	
12, 1Ø	1Ø1Ø1 E31	14	CLKA DECD T1C H (CLKC)	
		11	CLKA DECD T1C L (CLKC)	
12, 4	1Ø1Ø1 E32	2	CLKA DECD T3A H (CLKE)	
		5	CLKA DECD T3A L (CLKE)	
12, 7	1Ø1Ø1 E32	3	CLKA DECD T3B H (CLKE)	
		6	CLKA DECD T3B L (CLKE)	
12, 1Ø	1Ø1Ø1 E32	14	CLKA DECD T3C H (CLKE)	
		11	CLKA DECD T3C L (CLKE)	
4, 5	1Ø1Ø5 E24	3	CLKA DECD PCLK H (CLKF)	
		2	CLKA DECD PCLK L (CLKF)	
13, 12	1Ø1Ø5 E23	14	CLKA DECD PDCLK H (CLKH)	
		15	CLKA DECD PDCLK L (CLKH)	
1Ø, 9	1Ø1Ø5 E24	6	CLKA DECD T75 H (CLKH)	
11		7	CLKA DECD T75 L (CLKH)	
12, 13	1Ø1Ø5 E24	14	CLKA DECD T125 H (CLKJ)	
		15	CLKA DECD T125 L (CLKJ)	

(CPU CLOCK DECODER/ BUFFER) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKA)	D	CS	M8232-Ø-1	B
SCALE —	SHEET 7 OF 22	DIST.		

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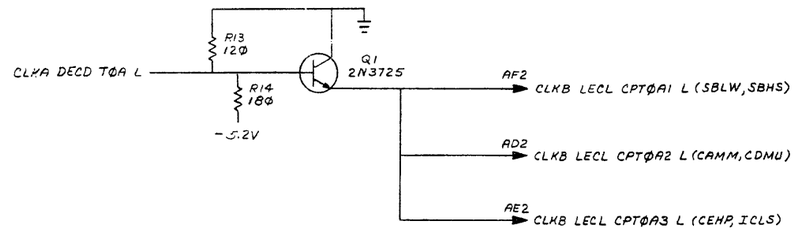

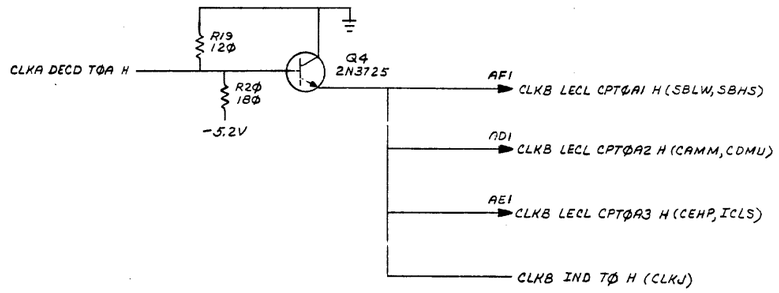

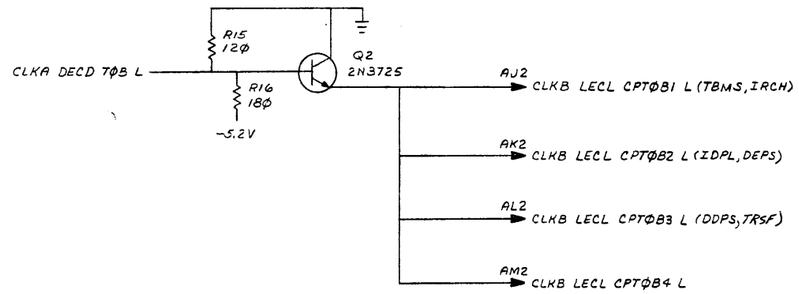

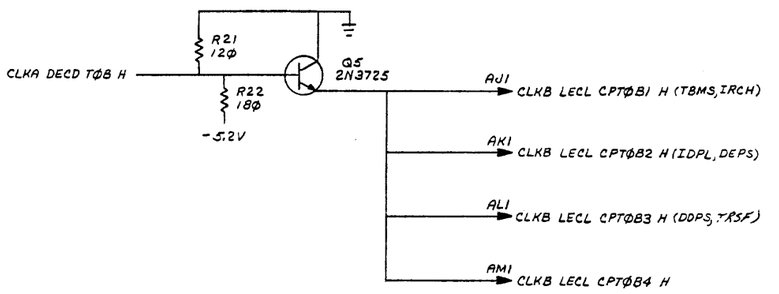

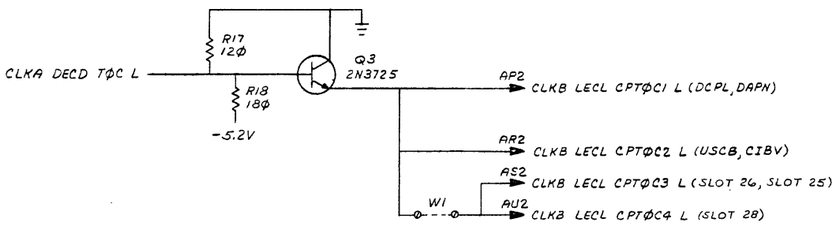

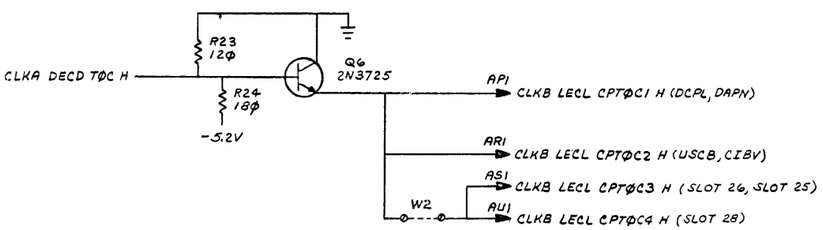

(CPU CLOCK TO DRIVER) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKB)	D	CS	M8232-Ø-1	B
SCALE —	SHEET 8 OF 22	DIST.		

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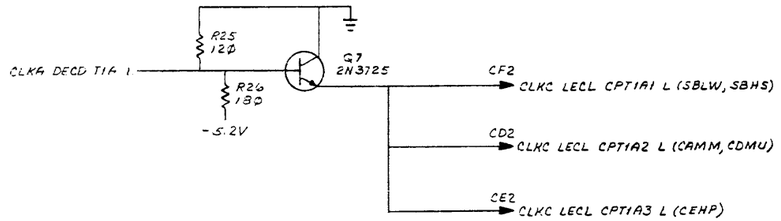

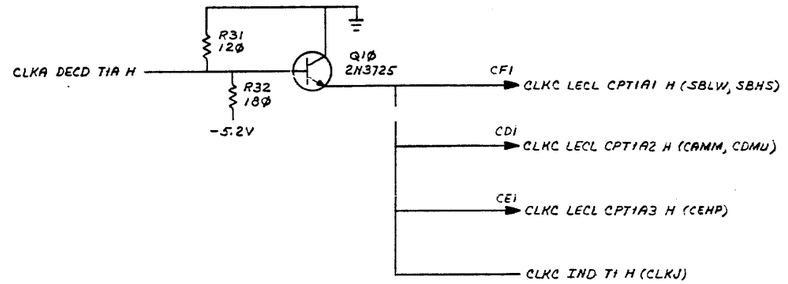

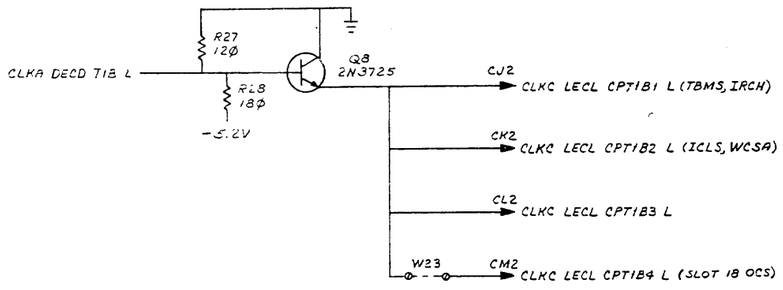

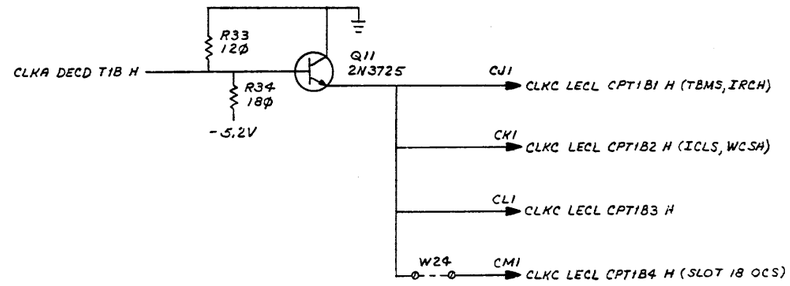

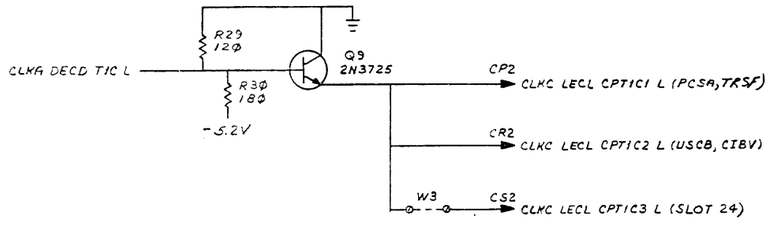

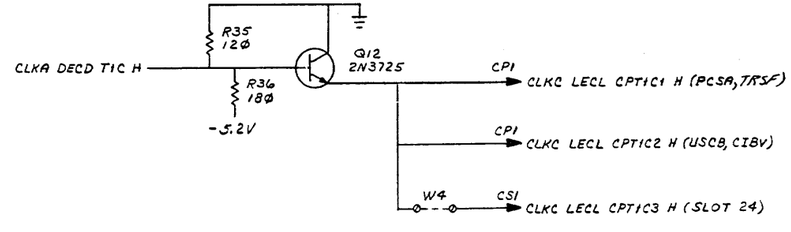

(CPU CLOCK T1 DRIVER) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKC)	D	CS	M8232-Ø-1	B
SCALE - -H-	SHEET 9 OF 22	DIST.	TW1	

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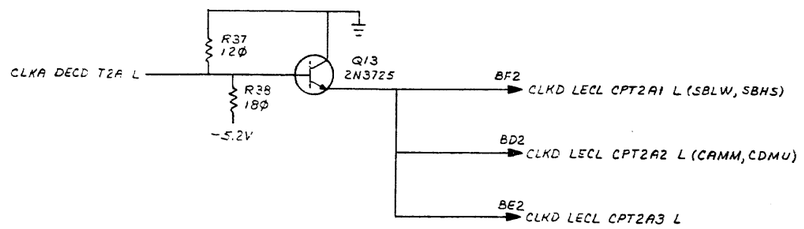

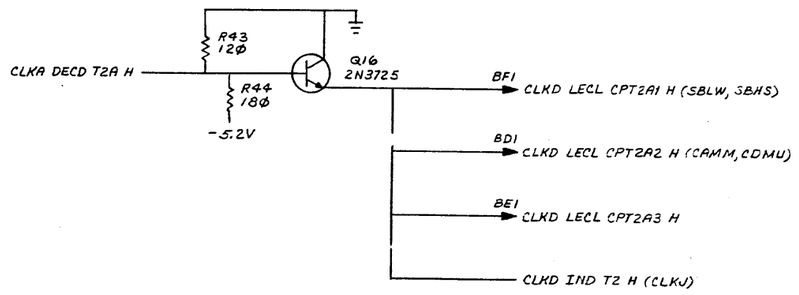

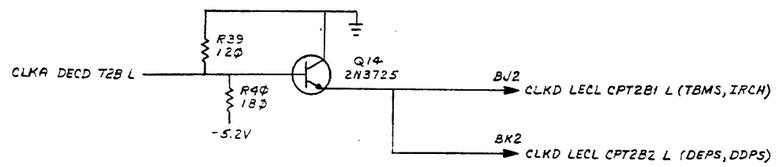

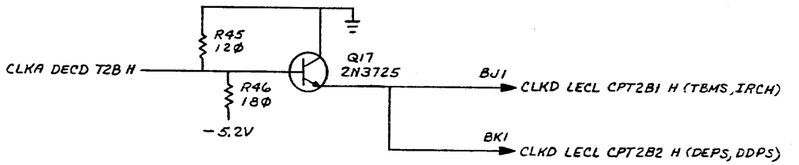

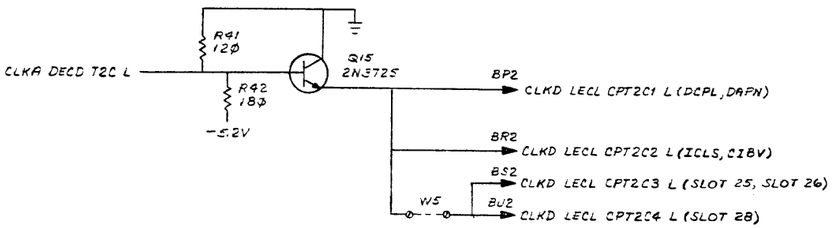

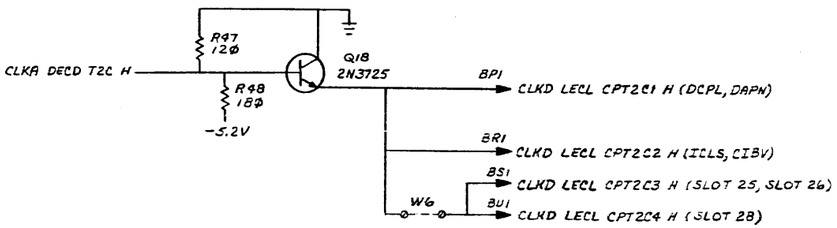

(CPU CLOCK T2 DRIVER) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKD)	D	CS	M8232-Ø-1	B
SCALE —	SHEET 10 OF 22	DIST.		

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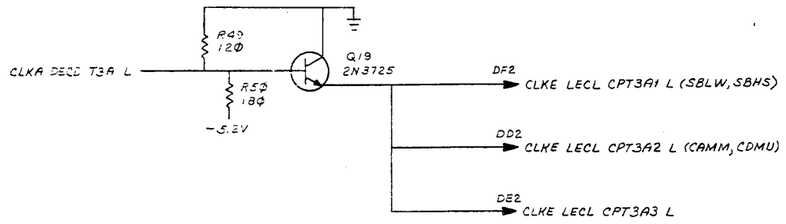

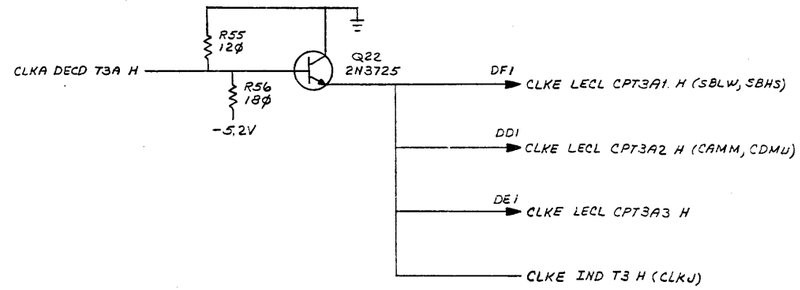

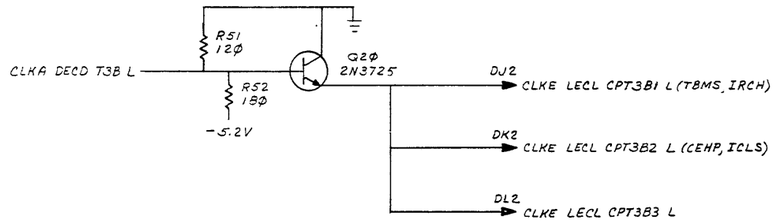

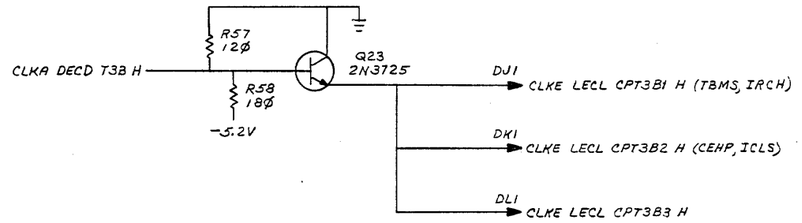

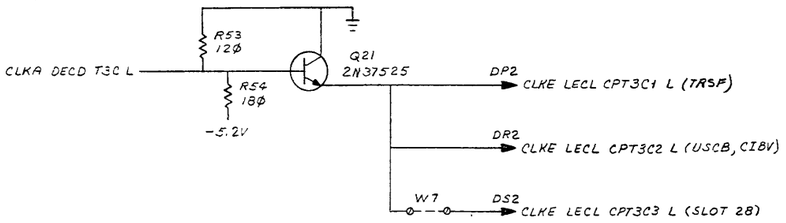

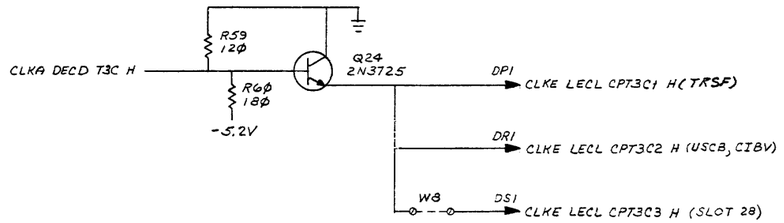

(CPU CLOCK T3 DRIVER) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKE)	D	CS	M8232-0-1	B
SCALE —	SHEET 11 OF 22	DIST.		

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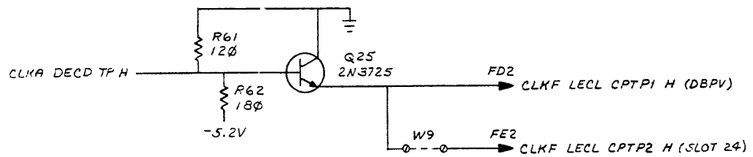

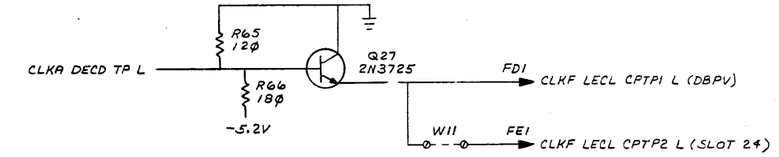

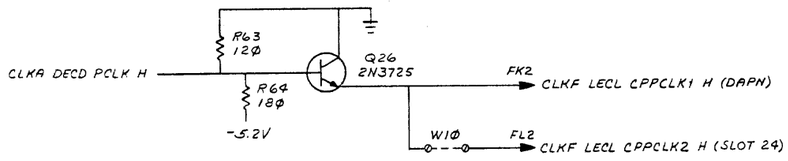

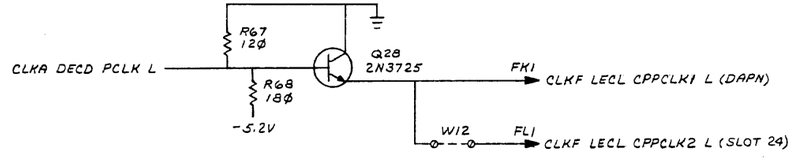

(CPU CLOCK TP, PCLK DRIVER) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKF)	D	CS	M8232-0-1	B
SCALE —	SHEET 12 OF 22	DIST.		

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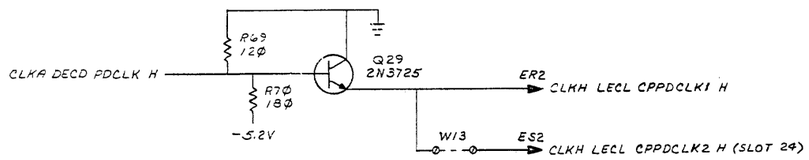

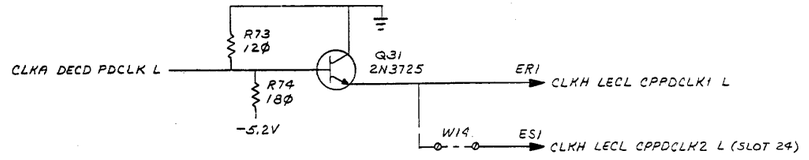

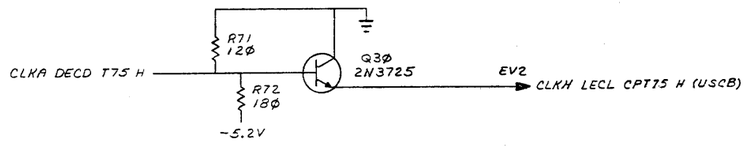

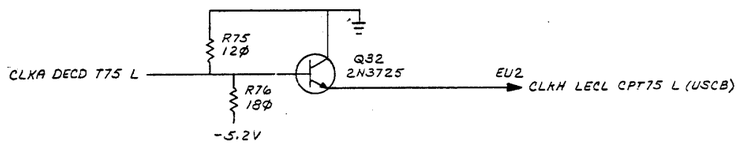

(CPU CLOCK PDCLK, T75 DRIVER) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKH)	D	CS	M8232-0-1	B
SCALE — // — SHEET 13 OF 22	DIST.			

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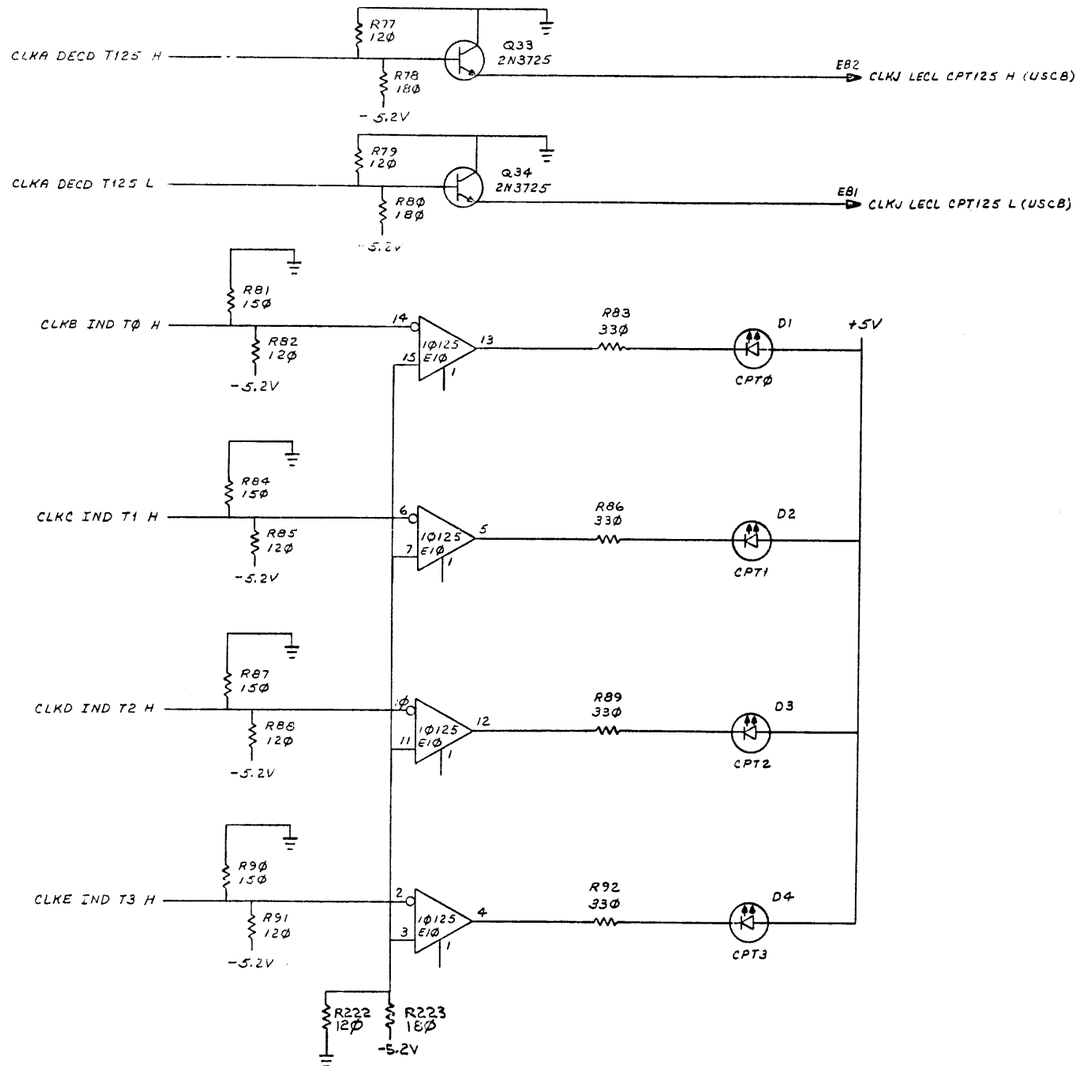

(CPU CLOCK T125 DRIVER & LED DISPLAY) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV

TITLE	SIZE	CODE	NUMBER	REV
CLOCK (CLKJ)	D	CS	M8232-Ø-1	B
SCALE —	SHEET 14 OF 22			

M8232-Ø-1 B

392

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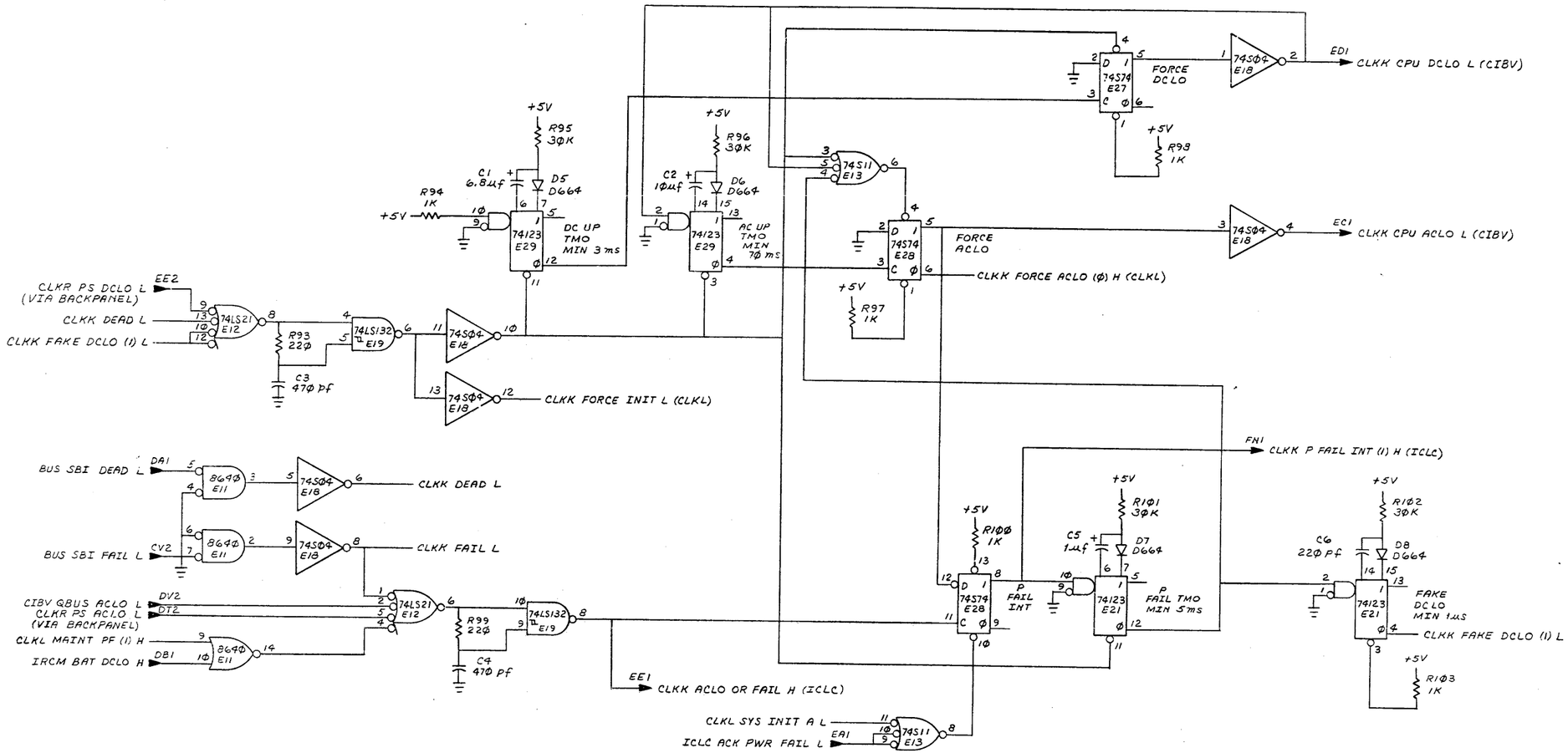

(CPU POWER FAIL SEQUENCER) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE	CODE	NUMBER	REV.
CLOCK (CLKK)		D	CS	M8232-Ø-1	B
SCALE	SHEET 15 OF 22	DIST.			

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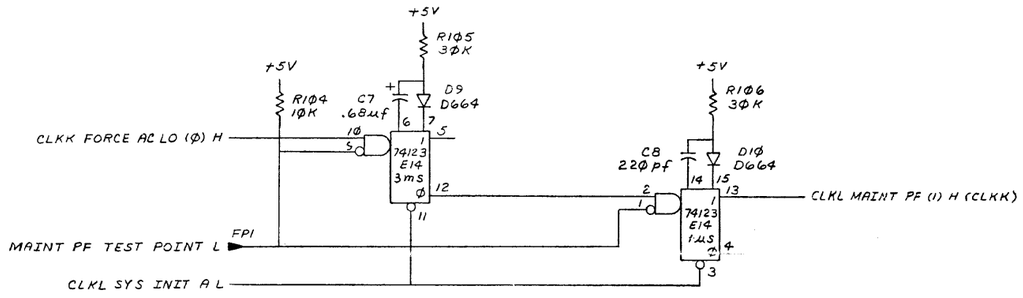

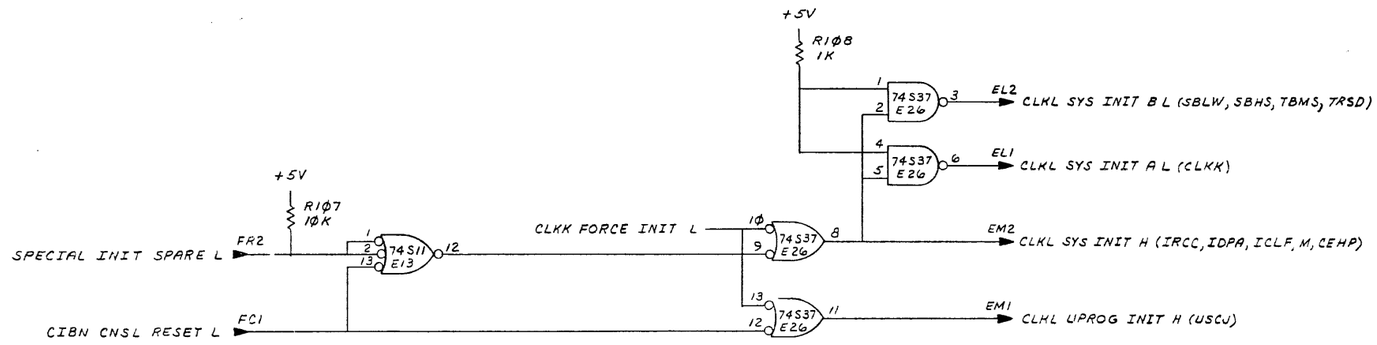

(CPU POWER FAIL SEQUENCER) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKL)	D	CS	M8232-Ø-1	B
SCALE —	SHEET 16 OF 22	DIST.		

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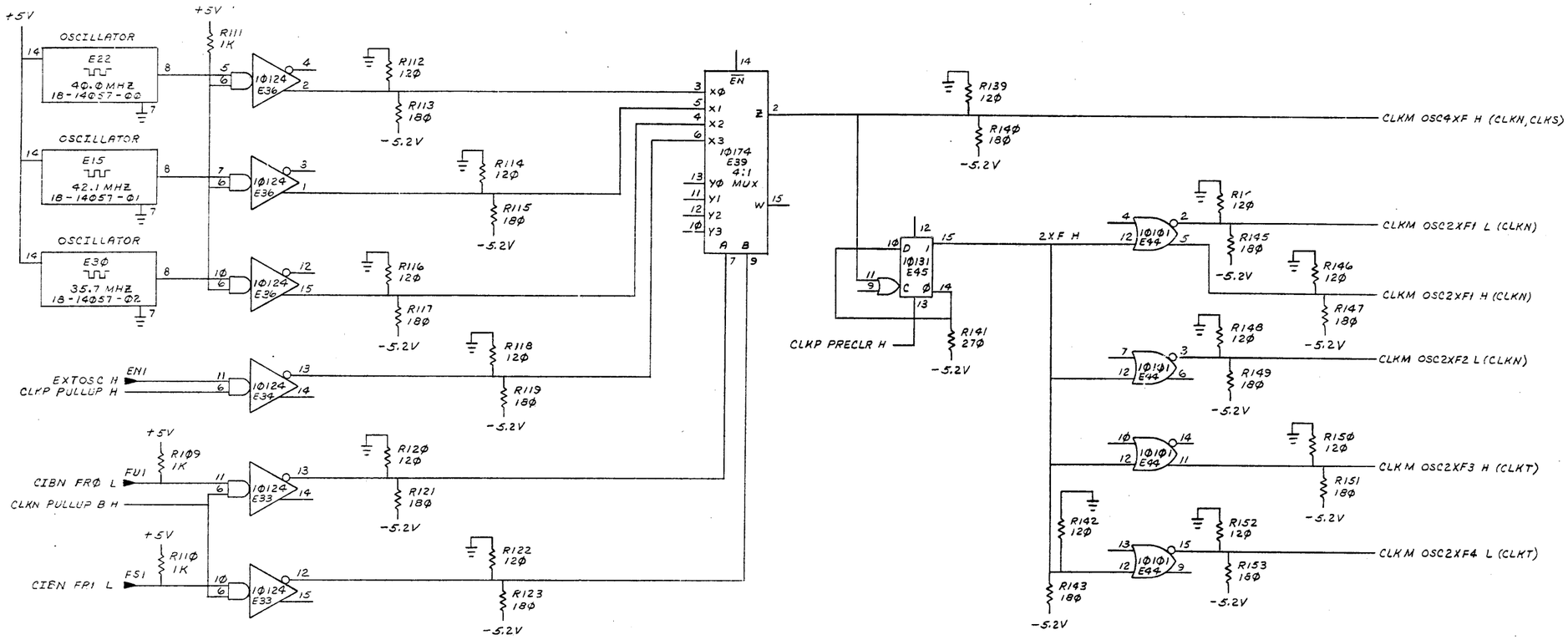

NOTE: EXTERNAL OSCILLATOR INPUT RANGE IS CONFIGURATION DEPENDANT. GUARANTEED MAXIMUM FREQUENCY IS 40.0 MHZ (200NS CYCLE). TYPICAL MAXIMUM FREQUENCY IS 44.4 MHZ (180NS CYCLE). TYPICAL MINIMUM FREQUENCY IS LESS THAN 13.3 MHZ (600NS CYCLE).
THE RELATION OF CYCLE TIME TO FREQUENCY IS:

$$\text{CYCLE (IN SECONDS)} = \frac{8.0}{\text{FREQUENCY (IN HERTZ)}}$$

1Ø174		
A	B	FUNCTION
L	L	Z = XØ
H	L	Z = X1
L	H	Z = X2
H	H	Z = X3

(SBI CLOCK FREQUENCY GENERATION & SELECTION)(SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKM)	D	CS	M8232-Ø-1	B
SCALE — H — SHEET 17 OF 22	DIGT.			

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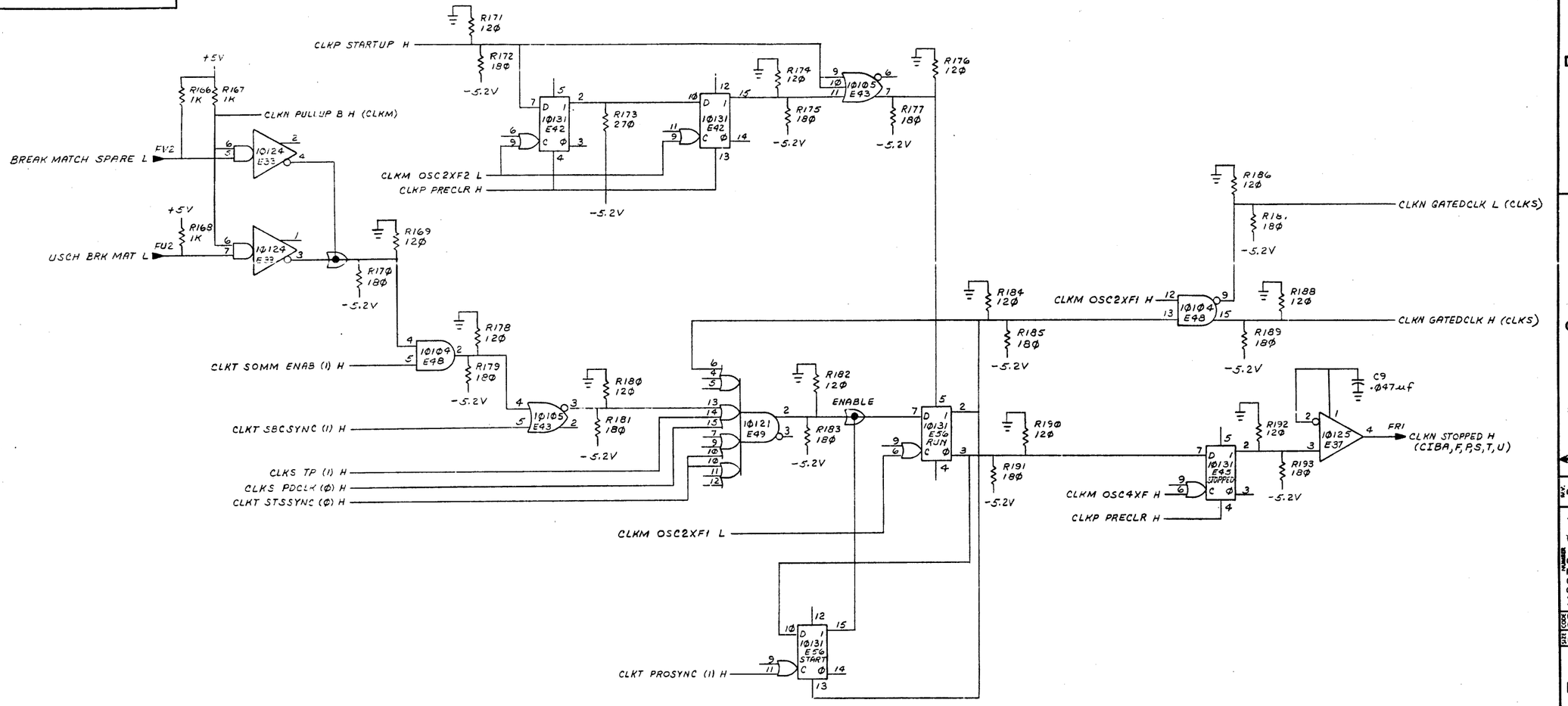

REVISIONS		
CHK	CHANGE NO.	REV.

(SBI CLOCK START/STOP/STEP CONTROL) (SLOT 16)

TITLE		SIZE	CODE	NUMBER	REV.
CLOCK	(CLKN)	D	CS	M8232-Ø-1	B
SCALE —//—	SHEET 18 OF 22	DIST.			

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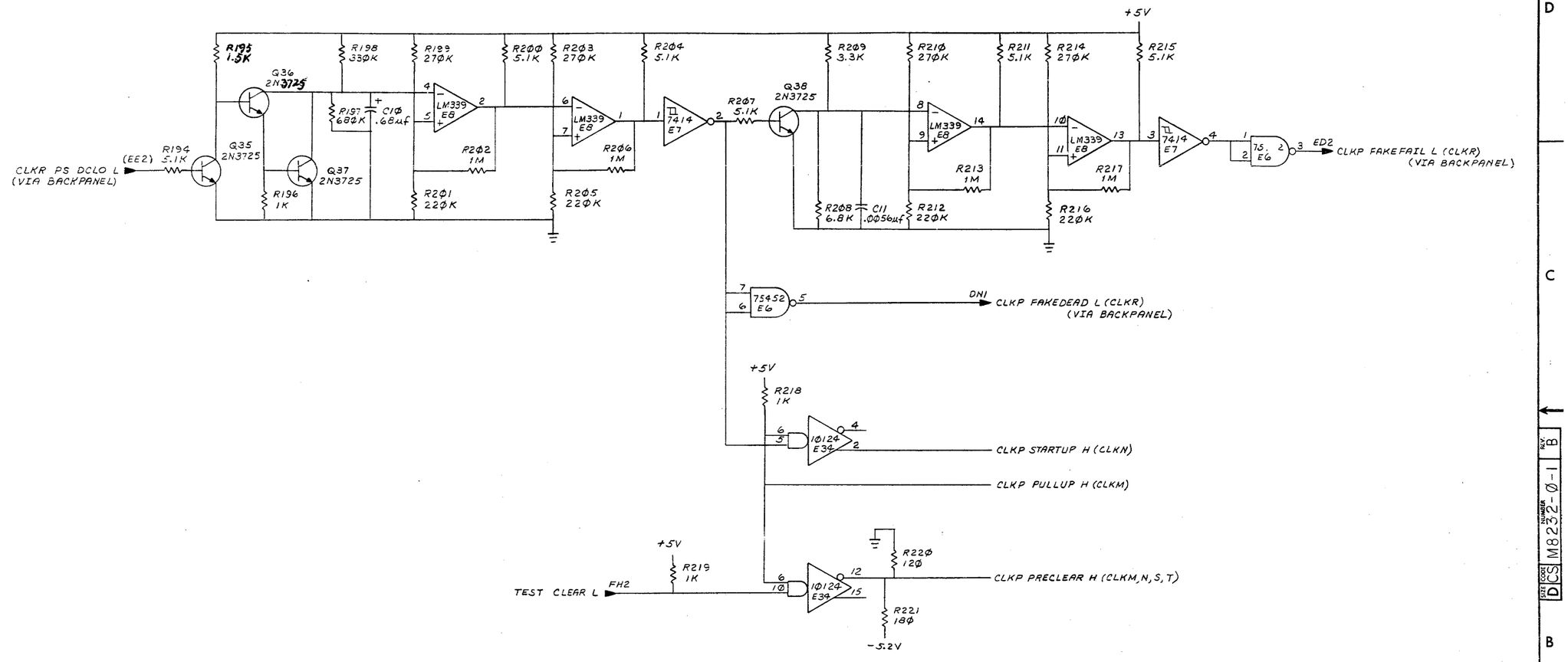

(SBI CLOCK POWER UP SEQUENCE) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKP)	D	CS	M8232-Ø-1	B
SCALE — H — SHEET 19 OF 22	DIST.			

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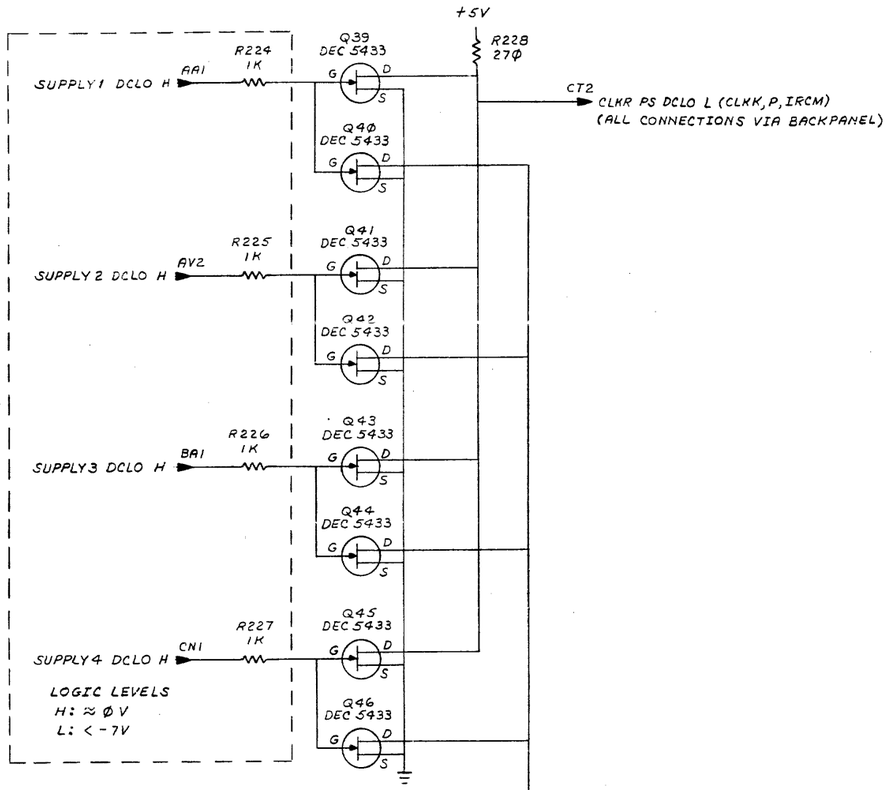

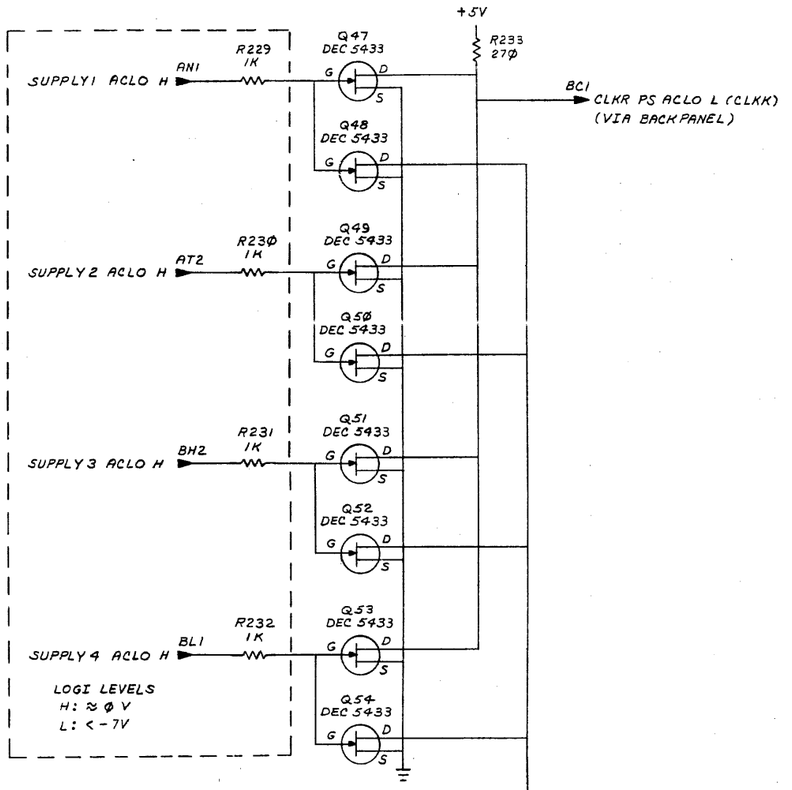

NOTE: FOR TEST AND DIAGNOSIS PURPOSES THE CIRCUITS ON THIS PAGE ARE CONNECTED TO OTHER PARTS OF THE MODULE BY BACKPANEL CONNECTION.

(POWER FAIL LEVEL TRANSLATION) (SLOT 16)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKR)	D	CS	M8232-Ø-1	B
SCALE — // — SHEET 20 OF 22	DIST.			

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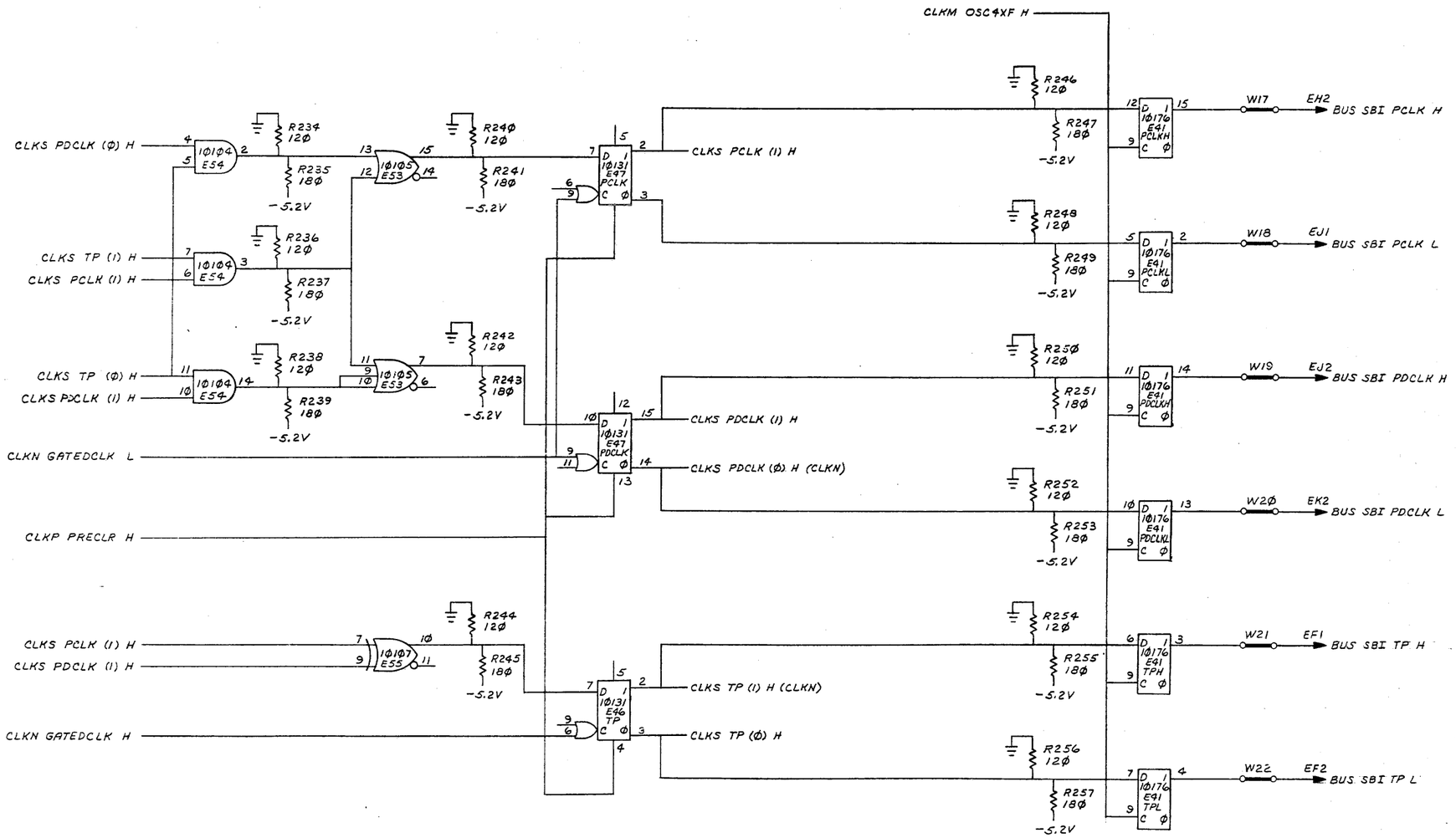

(SLOT 16)

(SBI CLOCK SEQUENCE GENERATOR & DRIVER)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKS)	D	CS	M8232-Ø-1	B
SCALE —11— SHEET 21 OF 22	DIST.			

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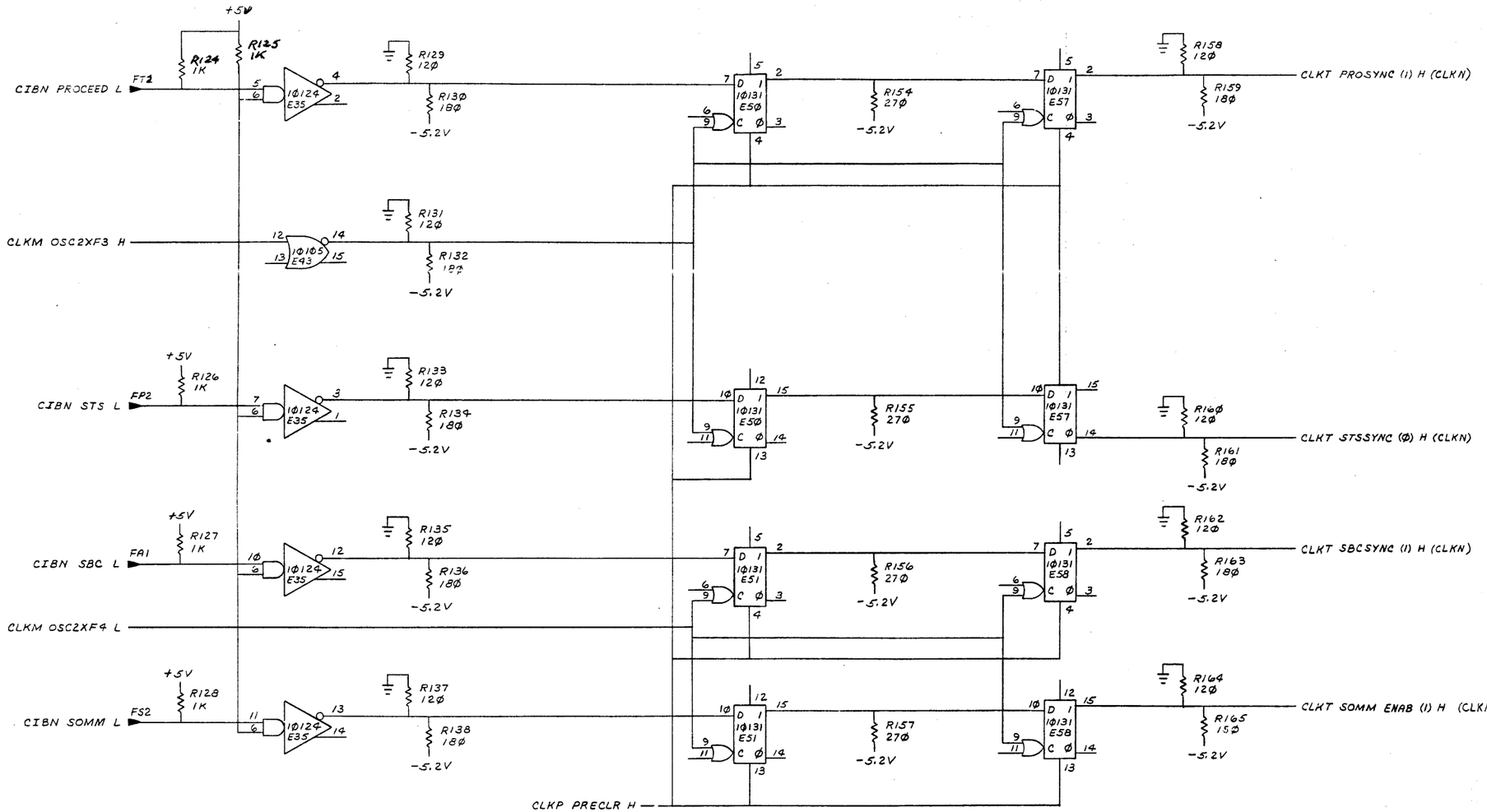

(SLOT 16)

(SBI CLOCK CONTROL SIGNAL SYNCHRONIZATION)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CLOCK (CLKT)	D	CS	M8232-Ø-1	B
SCALE — // — SHEET 22 OF 22	DIST.			

480

REWORK INSTRUCTIONS
ECO # 1
ETCH CUTS SIDE 2:
1. BETWEEN E128-7 AND E128-8

COMPONENT SIDE VIEW

SIGNATURES	DATE
DRN. J. FERGUSON	4/1/72
CHK'D. F. STUART	5/1/72
ENG.	4/5/72
PROD. ENG.	4/25/72
PRODUCTION	4/25/72

digital

TITLE WRITEABLE CONTROL STORE

SIZE E | CODE UA | NUMBER M8233-0-0 | REV B

SCALE 2:1 | SHT 1 OF 3

NEXT HIGHER ASSY E.C.O. 1982330-0

ETCH REV. B
P.C. DESIGN DATA BASE REV. B

CHANGE NO. REV

NOTES:

E | UA | M8233-0-0 | B

401

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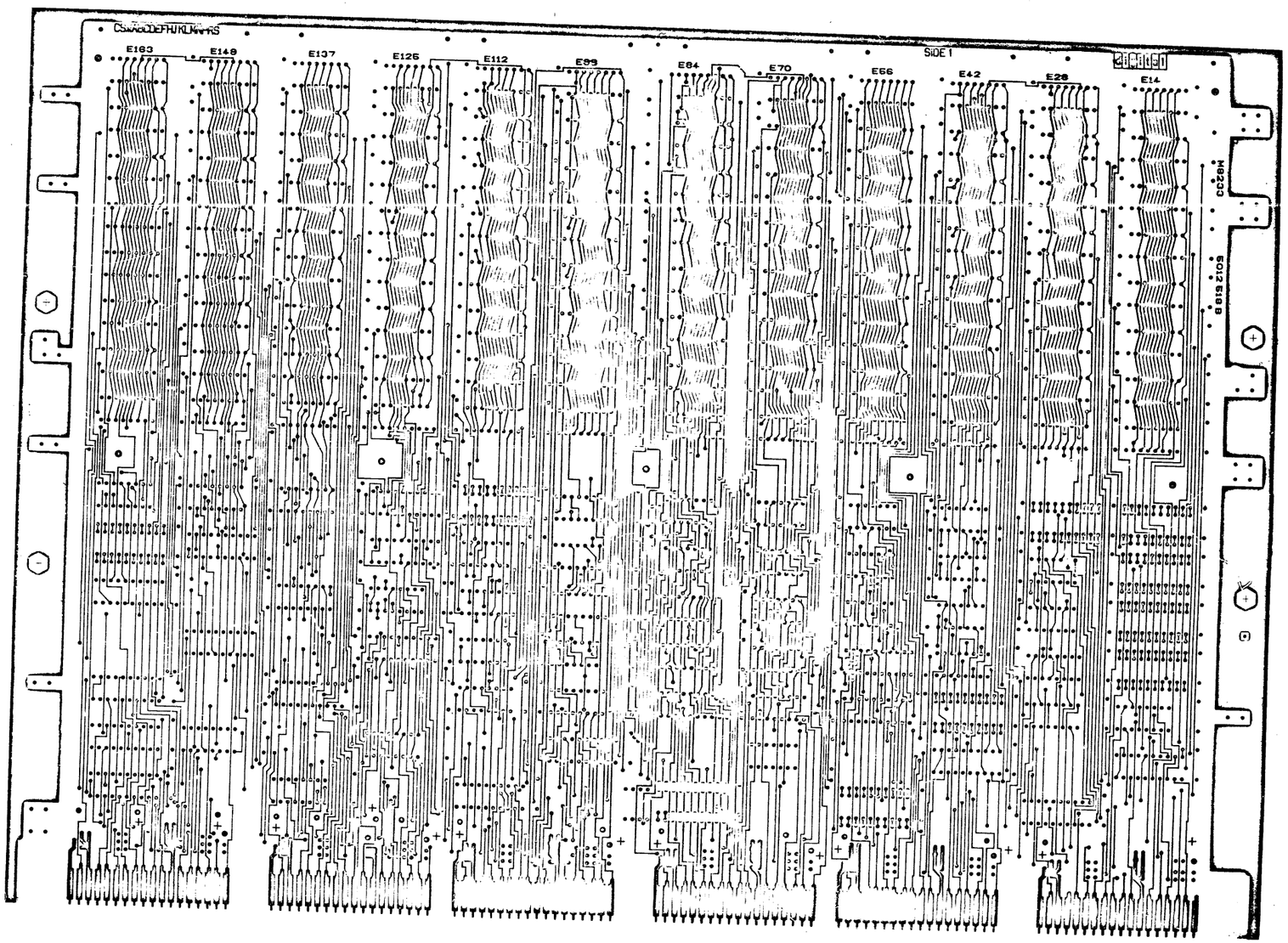
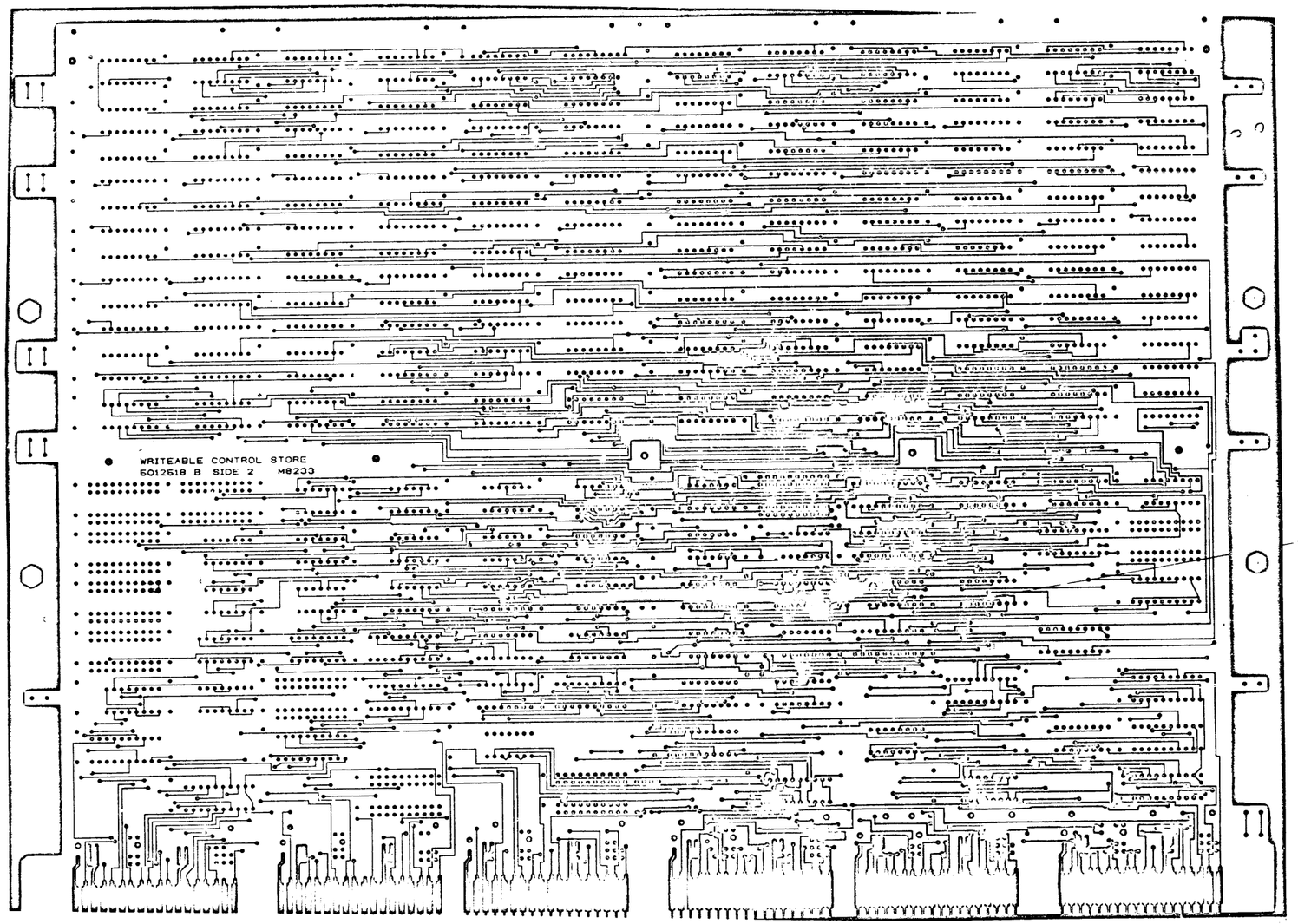


REVISIONS		
LTR	CHANGE NO	REV

TITLE	SIZE	CODE	NUMBER	REV
WRITEABLE CONTROL STORE	E	UA	M8233-0	B
SCALE 2-1	SHEET 2 OF 3	DIST		

402



TITLE	WRITEABLE CONTROL STORE	SIZE	CODE	NUMBER	REV
SCALE 2 -	SHEET 3 OF 3	E	UA	M8233-0	B
		DST			

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY F Smart DATE 6-1-77	CHECKED F. Smart DATE 6-1-77	SECTION
ENG L Dickey DATE 6-8-77	PROD Mike Tirella DATE 6-1-77	ISSUED SECTION

NOTES:
MS 104809
CS REV A
ETCH REV 3

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8233-Ø-Ø	REF DESIGNATION
1	E-MD-5012518-0-0	5012518	ETCH BOARD	1	
2		1012084-01	CAPACITOR, 8 uf 25 V	13	C168 thru C170,C172 thru C181
3		1012784	CAPACITOR, .047 uf 50 V	168	C1 thru C167,C182
4		1210711-02	HANDLE ASSY	1	
5		1300250	RESISTOR, 150, 1/4W, 5%	2	R8,R9
6		1300247	RESISTOR, 120, 1/4W, 5%	2	R6 R7
7		1300365	RESISTOR, 1K, 1/4W, 5%	5	R1 thru R5
8		1913462	I.C. DEC 74S24Ø	18	E1,E15 E29 E44,E45,E72,E85,E99,E150 thru E153,E139,E140 E114,E116 E117,E127
9		1913788	I.C. DEC 26S1Ø	8	E100,E73,E58,E59,E2,E16,E17,E31
10		1913662	I.C. DEC 93425A	99	E129,E141,E155,E7 thru E14,E21 thru E28 E35 thru E42,E49 thru E56,E63 thru E70, E77 thru E84 E91 thru E98,E105 thru E112, E118 thru E125,E130 thru E137,E142 thru E149,E156 thru E163
11		1910532	I.C. DEC 74SØØ	8	E61,E62 E75,E76,E33,E34,E18,E48
12		1910534	I.C. DEC 74SØ4	4	E89,E47,E60,E57
13		1910546	I.C. DEC 74S14Ø	2	E87,E101
14		1910549	I.C. DEC 74S158	3	E113,E126,E138
15		1911573	I.C. DEC 74S28Ø	4	E32,E19,E46,E74
16		1910956	I.C. DEC 74S151	2	E128,E115
17		1911415	I.C. DEC 10125	1	E86
18		1911675	I.C. DEC 74S138	1	E102

E.C.O. NO. 10001

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE	E-UA-M8233-Ø-Ø	B	PL	M8233-Ø-Ø	B
	SHEET 1 OF 2	INSERTION PARTS LIST DATA BASE REV			

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY F. SmarT DATE 6-1-77	CHECKED F. SmarT DATE 6-1-77	SECTION
ENG Lee Dickey DATE 6-8-77	PROD Mike Tirella DATE 6-1-77	ISSUED SECTION

NOTES:
MS 104809
CS REV A
ETCH REV B

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8233-0-0	REF DESIGNATION
19		1912746	I.C. DEC 74S37	2	E90,E103
20		1912796	I.C. DEC 74148	1	E88
		9000024-01	EYELET	12	
			I.C. SPARE	10	E3,E4,E5,E6,E20,E30,E43,E71,E104,E154

E.C.O. NO.

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DRB 125

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE	E-UA-M8233-0-0	B	PL	M8233-0-0	B
	SHEET 2 OF 2	INSERTION PARTS LIST DATA BASE REV			

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CP CLK T1 L
CP CLK T1 H
(SEE CLOCK NAME-SLOT TABLE)

SLOTS 22, 20, 18 CAN ACCEPT EITHER PROM CONTROL STORE (PCS) OR WRITEABLE CONTROL STORE (WCS)		
SLOT 22 PCS NORMAL	SLOT 20 WCS NORMAL	SLOT 18 OCS OPTIONAL WCS OR PCS
CLKC LECL CPTICI H CLKC LECL CPTICI L	CLKC LECL CPTIB2 H CLKC LECL CPTIB2 L	CLKC LECL CPTIB4 H CLKC LECL CPTIB4 L

BUS CS<UPAR2, UPAR1, UPARØ, (95:ØØ) > H
WCSA TSØ DELAYED H
+3V
ISCE WCS WR CYCLE H
WCSA WR SEL L
1K
3 93425A | 32 93425A | 32 93425A | 32 93425A
CE
WCSD CSA (Ø9:ØØ) L
USCE CS WR (95:ØØ) H
WCSB WR SEL H
USCC WCS ADRS 12 L
USCC WCS ADRS 11 L
USCC WCS ADRS 1Ø L
WCSA TSØ DELAYED H
BUS UPC 12 L
BUS UPC 11 L
BUS UPC 1Ø L
ID BUS
26S1Ø TRANS /REC
USCE WCS MEM AVAIL L
USCC WCS PAR INV (1) L
PAR GEN 74S28Ø
WCSC WCS EVEN PAR H
WCSA WR SEL L
WCSB WR SEL H
BUS UPC <Ø9:ØØ> L
USCC WCS ADRS<Ø9:ØØ>L
+5V
R5
R4 R3 R2 R1
J5 J4 J3 J2 J1

BANK SEL	J5	J4	J3	J2	J1
Ø-1K	OUT	IN	IN	IN	OUT
1-2K	OUT	IN	IN	OUT	IN
2-3K	OUT	IN	OUT	IN	IN
3-4K	OUT	IN	OUT	IN	IN
4-5K	IN	IN	IN	IN	OUT
5-6K	IN	IN	IN	OUT	IN
6-7K	IN	IN	OUT	IN	IN
7-8K	IN	IN	OUT	IN	IN

RES R1-R5 ARE 1KΩ, 1/4W, 5%

(NORMAL SLOT 2Ø)
(OPTION SLOT 18)

REVISIONS		
CHK	CHANGE NO.	REV.
[illegible]	M8233-00001	B
L DICKEY		
[illegible] 9-26-77	M8233-TW002	C
R CHUSMAE		

DRN. [illegible]	8-29-77	FIRST USED ON digital
CHK'D [illegible]	9-9-77	
ENG. [illegible]	9-9-77	TITLE WRITEABLE CONTROL STORE (BLOCK DIAGRAM)
PROJ. ENG. [illegible]	9-9-77	
PROD. [illegible]	9/21/77	
NEXT HIGHER ASSY.		SIZE D CODE CS NUMBER M8233-Ø-1 REV. C
SCALE		
SHEET 1 OF 17		DIST.

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-5.2V

CLKC LECL CPTI B2 L (CR2)

CLKC LECL CPTI B2 H (CR1)

(SEE CLOCK NAME SLOT TABLE)

R6 120Ω, R7 120Ω, R8 150Ω, R9 150Ω

10125 E66

74S04 E57 → WCSA T5Ø DELAYED H (WCSA)

74S04 E47 → WCSA +3V (WCSA, WCSB)

74S04 E60 → WCSA BD SEL 7 H (WCSB)

74S04 E60 → WCSA BD SEL 6 H (WCSB)

74S04 E60 → WCSA BD SEL 5 H (WCSB)

74S04 E60 → WCSA BD SEL 4 H (WCSB)

74S04 E60 → WCSA BD SEL 3 H (WCSB)

74S04 E60 → WCSA BD SEL 2 H (WCSB)

74S04 E89 → WCSA BD SEL 1 H (WCSB)

74S04 E89 → WCSA BD SEL Ø H (WCSB)

BANK SEL	J5	J4	J3	J2	J1
Ø - 1K	OUT	IN	IN	IN	OUT
1 - 2K	OUT	IN	IN	OUT	IN
2 - 3K	OUT	IN	OUT	IN	IN
3 - 4K	OUT	OUT	IN	IN	IN
4 - 5K	IN	IN	IN	IN	OUT
5 - 6K	IN	IN	IN	OUT	IN
6 - 7K	IN	IN	OUT	IN	IN
7 - 8K	IN	OUT	IN	IN	IN

SLOTS 22, 20, 18 CAN ACCEPT EITHER PROM CONTROL STORE (PCS) OR WRITEABLE CONTROL STORE (WCS)

SLOT 22 PCS NORMAL	SLOT 20 WCS NORVAL	SLOT 18 OCS OPTIONAL WCS OR PCS
CLKC LECL CPTIC1 H CLKC LECL CPTIC1 L	CLKC LECL CPTIB2 H CLKC LECL CPTIB2 L	CLKC LECL CPTIB4 H CLKC LECL CPTIB4 L

74S158 E138 → BUS UPC Ø9 L (FE2), USCC WCS ADRS Ø9 L (EL2) → WCSA CSA (95:ØØ) Ø9 H (WCSD)

74S158 E138 → BUS UPC Ø8 L (FE1), USCC WCS ADRS Ø8 L (EL1) → WCSA CSA (95:ØØ) Ø8 H (WCSD)

74S158 E126 → BUS UPC Ø7 L (FD2), USCC WCS ADRS Ø7 L (EF2) → WCSA CSA (95:ØØ) Ø7 H (WCSD)

74S158 E126 → BUS UPC Ø6 L (FD1), USCC WCS ADRS Ø6 L (EF1) → WCSA CSA (95:ØØ) Ø6 H (WCSD)

74S158 E126 → BUS UPC Ø5 L (FB2), USCC WCS ADRS Ø5 L (EE2) → WCSA CSA (95:ØØ) Ø5 H (WCSD)

74S158 E126 → BUS UPC Ø4 L (EV2), USCC WCS ADRS Ø4 L (EE1) → WCSA CSA (95:ØØ) Ø4 H (WCSD)

74S158 E113 → BUS UPC Ø3 L (EU2), USCC WCS ADRS Ø3 L (ED2) → WCSA CSA (95:ØØ) Ø3 H (WCSD)

74S158 E113 → BUS UPC Ø2 L (ES1), USCC WCS ADRS Ø2 L (ED1) → WCSA CSA (95:ØØ) Ø2 H (WCSD)

74S158 E113 → BUS UPC Ø1 L (ER2), USCC WCS ADRS Ø1 L (EC1) → WCSA CSA (95:ØØ) Ø1 H (WCSD)

74S158 E113 → BUS UPC ØØ L (EA1), USCC WCS ADRS ØØ L (EB2) → WCSA CSA (95:ØØ) ØØ H (WCSD)

WCSA +3V

74S140 E87 → WCSA CS EN (31:ØØ) L (WCSE, WCSF, WCSH, WCSJ)

74S140 E87 → WCSA CS EN (63:32) L (WCSK, WCSL, WCSM, WCSN)

74S140 E101 → WCSA CS EN (95:64) L (WCSC, WCSP, WCSR, WCSS, WCST)

USCE WCS WR CYCLE H, DL1 → 74S37 E103 → WCSA WR SEL L (WCSB, WCSC)

74S37 E90 → WCSA WR EN (31:ØØ) A L (WCSC, WCSE, WCSF, WCSH, WCSJ)

74S37 E90 → WCSA WR EN (31:ØØ) B L (WCSE, WCSF, WCSH, WCSJ)

74S37 E90 → WCSA WR EN (63:32) A L (WCSC, WCSK, WCSL, WCSM WCSN)

74S37 E90 → WCSA WR EN (63:32) B L (WCSK, WCSL, WCSM, WCSN)

74S37 E103 → WCSA WR EN (95:64) A L (WCSC, WCSP, WCSR, WCSS, WCST)

74S37 E103 → WCSA WR EN (95:64) B L (WCSP, WCSR, WCSS, WCST)

WCSA WR SEL L

STB 74S151 E115 → F1, FØ

USCC WCS ADRS 12 L (FN1)
USCC WCS ADRS 11 L (ER1)
USCC WCS ADRS 1Ø L (EM2)
WCSA T5Ø DELAYED H

STB 74S151 E128 → F1, FØ

BUS UPC 12 L (FH2)
BUS UPC 11 L (FF2)
BUS UPC 1Ø L (FF1)

74148 E88 → 74S138 E102 (EN, SELC, SELB, SELA; D7–DØ)

+5V, R4 1K, CM1, J4
+5V, R3 1K, CL2, J3
+5V, R2 1K, CL1, J2
+5V, R1 1K, CB1, J1
+5V, R5 1K, CV2, J5

USCE CS WR (31:ØØ) H (DA1)
USCE CS WR (63:32) H (DB1)
USCE CS WR (95:64) H (DB2)

-5V, EK1, C169 8µf, C99 .047, C168–C17Ø, C172–C181, C182, C1ØØ–C167 .047, +5V

AC2, AH1, AN2, BC2, BH1, BN2, CC2, CH1, CN2, DC2, DH1, CN2, EC2, EH1, EN2, FC2, FH1, FN2, AT1, BT1, CT1, DT1, ET1, FT1

AA2, AV1, EA2, EV1, BA2, BV1, FA2, FV1, CA2, CV1, DA2, DV1

WCSA +3V

WCSA WR SEL L

(NORMAL SLOT 2Ø)
(OPTION SLOT 18)
(ADRS AND BRD SELECTION)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØZ1	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSA)	D	CS	M8233-Ø-1	C
SCALE —	SHEET 2 OF 17	DIST.		

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WCSA WR SEL L → 74S04 E47 (3→4)

26S10 E100
- D3 ← WCSB DATA 15 H (WCSC)
- D2 ← WCSB DATA 14 H (WCSC)
- D1 ← WCSB DATA 13 H (WCSC)
- D0 ← WCSB DATA 12 H (WCSC)
- B3 → DV2 → BUS ID D15 L
- B2 → DS1 → BUS ID D14 L
- B1 → DR2 → BUS ID D13 L
- B0 → DR1 → BUS ID D12 L
- EN ← WCSA +3V

26S10 E73
- D3 ← WCSB DATA 11 H (WCSC)
- D2 ← WCSB DATA 10 H (WCSC)
- D1 ← WCSB DATA 09 H (WCSC)
- D0 ← WCSB DATA 08 H (WCSC)
- B3 → CM2 → BUS ID D11 L
- B2 → CK2 → BUS ID D10 L
- B1 → CK1 → BUS ID D09 L
- B0 → CJ2 → BUS ID D08 L
- EN ← WCSA +3V

26S10 E59
- WCSA BD SEL 7 H → D3
- WCSA BD SEL 6 H → D2
- WCSA BD SEL 5 H → D1
- WCSA BD SEL 4 H → D0
- D3 ← WCSB DATA 07 H (WCSC)
- D2 ← WCSB DATA 06 H (WCSC)
- D1 ← WCSB DATA 05 H (WCSC)
- D0 ← WCSB DATA 04 H (WCSC)
- B3 → CJ1 → BUS ID D07 L
- B2 → CH2 → BUS ID D06 L
- B1 → CF2 → BUS ID D05 L
- B0 → CF1 → BUS ID D04 L
- EN ← DK2 ← USCE WCS MEM AVAIL L

26S10 E58
- WCSA BD SEL 3 H → D3
- WCSA BD SEL 2 H → D2
- WCSA BD SEL 1 H → D1
- WCSA BD SEL 0 H → D0
- D3 ← WCSB DATA 03 H (WCSC)
- D2 ← WCSB DATA 02 H (WCSC)
- D1 ← WCSB DATA 01 H (WCSC)
- D0 ← WCSB DATA 00 H (WCSC)
- B3 → CE2 → BUS ID D03 L
- B2 → CE1 → BUS ID D02 L
- B1 → CB2 → BUS ID D01 L
- B0 → CA1 → BUS ID D00 L
- EN ← WCSA +3V

74S00 E76
- 1,2 → 3: WCSB WR DATA 15 L (WCSF, WCSL, WCSR)
- 4,5 → 6: WCSB WR DATA 14 L (WCSF, WCSL, WCSR)
- 9,10 → 8: WCSB WR DATA 13 L (WCSF, WCSL, WCSR)
- 12,13 → 11: WCSB WR DATA 12 L (WCSF, WCSL, WCSR)

74S00 E75
- 1,2 → 3: WCSB WR DATA 11 L (WCSF, WCSL, WCSR)
- 4,5 → 6: WCSB WR DATA 10 L (WCSF, WCSL, WCSR)
- 9,10 → 8: WCSB WR DATA 09 L (WCSF, WCSL, WCSR)
- 12,13 → 11: WCSB WR DATA 08 L (WCSF. WCSL, WCSR)

74S00 E62
- 1,2 → 3: WCSB WR DATA 07 L (WCSE, WCSK, WCSP)
- 4,5 → 6: WCSB WR DATA 06 L (WCSE, WCSK, WCSP)
- 9,10 → 8: WCSB WR DATA 05 L (WCSE WCSK, WCSP)
- 12,13 → 11: WCSB WR DATA 04 L (WCSE, WCSK, WCSP)

74S00 E61
- 1,2 → 3: WCSB WR DATA 03 L (WCSE, WCSK, WCSP)
- 4,5 → 6: WCSB WR DATA 02 L (WCSE, WCSK, WCSP
- 9,10 → 8: WCSB WR DATA 01 L (WCSE, WCSK, WCSP)
- 12,13 → 11: WCSB WR DATA 00 L (WCSE, WCSK, WCSP)

WCSA WR SEL L → 74S04 E47 (1→2)

WCSA WR SEL L → 74S04 E47 (9→8)

26S10 E31
- D3 ← WCSB DATA 31 H (WCSC)
- D2 ← WCSB DATA 30 H (WCSC)
- D1 ← WCSB DATA 29 H (WCSC)
- D0 ← WCSB DATA 28 H (WCSC)
- B3 → BK2 → BUS ID D31 L
- B2 → BK1 → BUS ID D30 L
- B1 → BJ2 → BUS ID D29 L
- B0 → BJ1 → BUS ID D28 L
- EN ← WCSA +3V

26S10 E17
- D3 ← WCSB DATA 27 H (WCSC)
- D2 ← WCSB DATA 26 H (WCSC)
- D1 ← WCSB DATA 25 H (WCSC)
- D0 ← WCSB DATA 24 H (WCSC)
- B3 → BH2 → BUS ID D27 L
- B2 → BF2 → BUS ID D26 L
- B1 → AU1 → BUS ID D25 L
- B0 → AT2 → BUS ID D24 L
- EN ← WCSA +3V

26S10 E16
- D3 ← WCSB DATA 23 H (WCSC)
- D2 ← WCSB DATA 22 H (WCSC)
- D1 ← WCSB DATA 21 H (WCSC)
- D0 ← WCSB DATA 20 H (WCSC)
- B3 → AS2 → BUS ID D23 L
- B2 → AP2 → BUS ID D22 L
- B1 → AP1 → BUS ID D21 L
- B0 → AN1 → BUS ID D20 L
- EN ← WCSA +3V

26S10 E2
- D3 ← WCSB DATA 19 H (WCSC)
- D2 ← WCSB DATA 18 H (WCSC)
- D1 ← WCSB DATA 17 H (WCSC)
- D0 ← WCSB DATA 16 H (WCSC)
- B3 → AM1 → BUS ID D19 L
- B2 → AJ1 → BUS ID D18 L
- B1 → AH2 → BUS ID D17 L
- B0 → AF2 → BUS ID D16 L
- EN ← WCSA +3V

74S00 E48
- 1,2 → 3: WCSB WR DATA 31 L (WCSJ, WCSN, WCST)
- 4,5 → 6: WCSB WR DATA 30 L (WCSJ, WCSN, WCST)
- 9,10 → 8: WCSB WR DATA 29 L (WCSJ, WCSN, WCST)
- 12,13 → 11: WCSB WR DATA 28 L (WCSJ, WCSN, WCST)

74S00 E18
- 1,2 → 3: WCSB WR DATA 27 L WCSJ, WCSN, WCST)
- 4,5 → 6: WCSB WR DATA 26 L (WCSJ, WCSN, WCST)
- 9,10 → 8: WCSB WR DATA 25 L (WCSJ, WCSN, WCST)
- 12,13 → 11: WCSB WR DATA 24 L (WCSJ, WCSN, WCST)

74S00 E34
- 1,2 → 3: WCSB WR DATA 23 L (WCSH, WCSM, WCSS)
- 4,5 → 6: WCSB WR DATA 22 L (WCSH, WCSM, WCSS)
- 9,10 → 8: WCSB WR DATA 21 L (WCSH, WCSM, WCSS)
- 12,13 → 11: WCSB WR DATA 20 L (WCSH, WCSM, WCSS)

74S00 E33
- 1,2 → 3: WCSB WR DATA 19 L (WCSH, WCSM, WCSS)
- 4,5 → 6: WCSB WR DATA 18 L (WCSH, WCSM, WCSS)
- 9,10 → 8: WCSB WR DATA 17 L (WCSH, WCSM, WCSS)
- 12,13 → 11: WCSB WR DATA 16 L (WCSH WCSM, WCSS)

WCSA WR SEL L → 74S04 E47 (5→6)

(NORMAL SLOT 20)
(OPTION SLOT 18)
(ID BUS TRANCEIVERS)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO 0001	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSB)	D	CS	M8233-0-1	C
SCALE	SHEET 3 OF 17		DIST.	

DEC FORM NO. ORD 138

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WCSA WR SEL L → 74S240 E151 pin 19

WCSA CS EN (95:64) L → 74S240 E151 pin 1

74S240 E151 pin 17 → 74S240 E151 pin 3 → DM2 WCSC WCS EVEN PAR H (ICLT)

74S280 E32

USCC WCS PAR INV (1) L (DL2) → D8
WCSB DATA 31 H → D7
WCSB DATA 30 H → D6
WCSB DATA 29 H → D5
WCSB DATA 28 H → D4
WCSB DATA 27 H → D3
D2
D1
DØ
Σ EVEN → 5
Σ ODD → 6

74S280 E19

WCSB DATA 26 H → D8
WCSB DATA 25 H → D7
WCSB DATA 24 H → D6
WCSB DATA 23 H → D5
WCSB DATA 22 H → D4
WCSB DATA 21 H → D3
WCSB DATA 20 H → D2
WCSB DATA 19 H → D1
WCSB DATA 18 H → DØ
Σ EVEN → 5
Σ ODD → 6

74S280 E74

WCSB DATA 17 H → D8
WCSB DATA 16 H → D7
WCSB DATA 15 H → D6
WCSB DATA 14 H → D5
WCSB DATA 13 H → D4
WCSB DATA 12 H → D3
WCSB DATA 11 H → D2
WCSB DATA 10 H → D1
WCSB DATA 9 H → DØ
Σ EVEN → 5
Σ ODD → 6

74S280 E46

WCSB DATA Ø8 H → D8
WCSB DATA Ø7 H → D7
WCSB DATA Ø6 H → D6
WCSB DATA Ø5 H → D5
WCSB DATA Ø4 H → D4
WCSB DATA Ø3 H → D3
WCSB DATA Ø2 H → D2
WCSB DATA Ø1 H → D1
WCSB DATA ØØ H → DØ
Σ EVEN → 5
Σ ODD → 6

74S37 E103 pin 12, 13 → pin 11

WCSB WR SEL L → 74S37 E103

93425A E129

WCSD CSA (23:ØØ) Ø9 L → A9
WCSD CSA (23:ØØ) Ø8 L → A8
WCSD CSA (23:ØØ) Ø7 L → A7
WCSD CSA (23:ØØ) Ø6 L → A6
WCSD CSA (23:ØØ) Ø5 L → A5
WCSD CSA (23:ØØ) Ø4 L → A4
WCSD CSA (23:ØØ) Ø3 L → A3
WCSD CSA (23:ØØ) Ø2 L → A2
WCSD CSA (23:ØØ) Ø1 L → A1
WCSD CSA (23:ØØ) ØØ L → AØ
WE CE
DIN
DOUT → 74S240 E151 pin 2 → pin 18 → FL2 BUS CS UPAR Ø H (PCSC)

WCSA WR EN (31.ØØ) A L → WE pin 14, CE pin 1

93425A E141

WCSD CSA (47:24) Ø9 L → A9
WCSD CSA (47:24) Ø8 L → A8
WCSD CSA (47:24) Ø7 L → A7
WCSD CSA (47:24) Ø6 L → A6
WCSD CSA (47:24) Ø5 L → A5
WCSD CSA (47:24) Ø4 L → A4
WCSD CSA (47:24) Ø3 L → A3
WCSD CSA (47:24) Ø2 L → A2
WCSD CSA (47:24) Ø1 L → A1
WCSD CSA (47:24) ØØ L → AØ
WE CE
DIN
DOUT → 74S240 E151 pin 4 → pin 16 → FM1 BUS CS UPAR 1 H (PCSC)

WCSA WR EN (63.32) A L → WE pin 14, CE pin 1

93425A E155

WCSD CSA (71:48) Ø9 L → A9
WCSD CSA (71:48) Ø8 L → A8
WCSD CSA (71:48) Ø7 L → A7
WCSD CSA (71:48) Ø6 L → A6
WCSD CSA (71:48) Ø5 L → A5
WCSD CSA (71:48) Ø4 L → A4
WCSD CSA (71:48) Ø3 L → A3
WCSD CSA (71:48) Ø2 L → A2
WCSD CSA (71:48) Ø1 L → A1
WCSD CSA (71:48) ØØ L → AØ
WE CE
DIN
DOUT → 74S240 E151 pin 6 → pin 14 → FM2 BUS CS UPAR 2 H (PCSC)

WCSA WR EN (95:64) A L → WE pin 14, CE pin 1

(NORMAL SLOT 20)
(OPTION SLOT 18)

(PARITY)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ1	B

TITLE	WRITEABLE CONTROL STORE (WCSC)	SIZE D	CODE CS	NUMBER M8233-Ø-1 REV. C
SCALE		SHEET 4 OF 17	DIST.	

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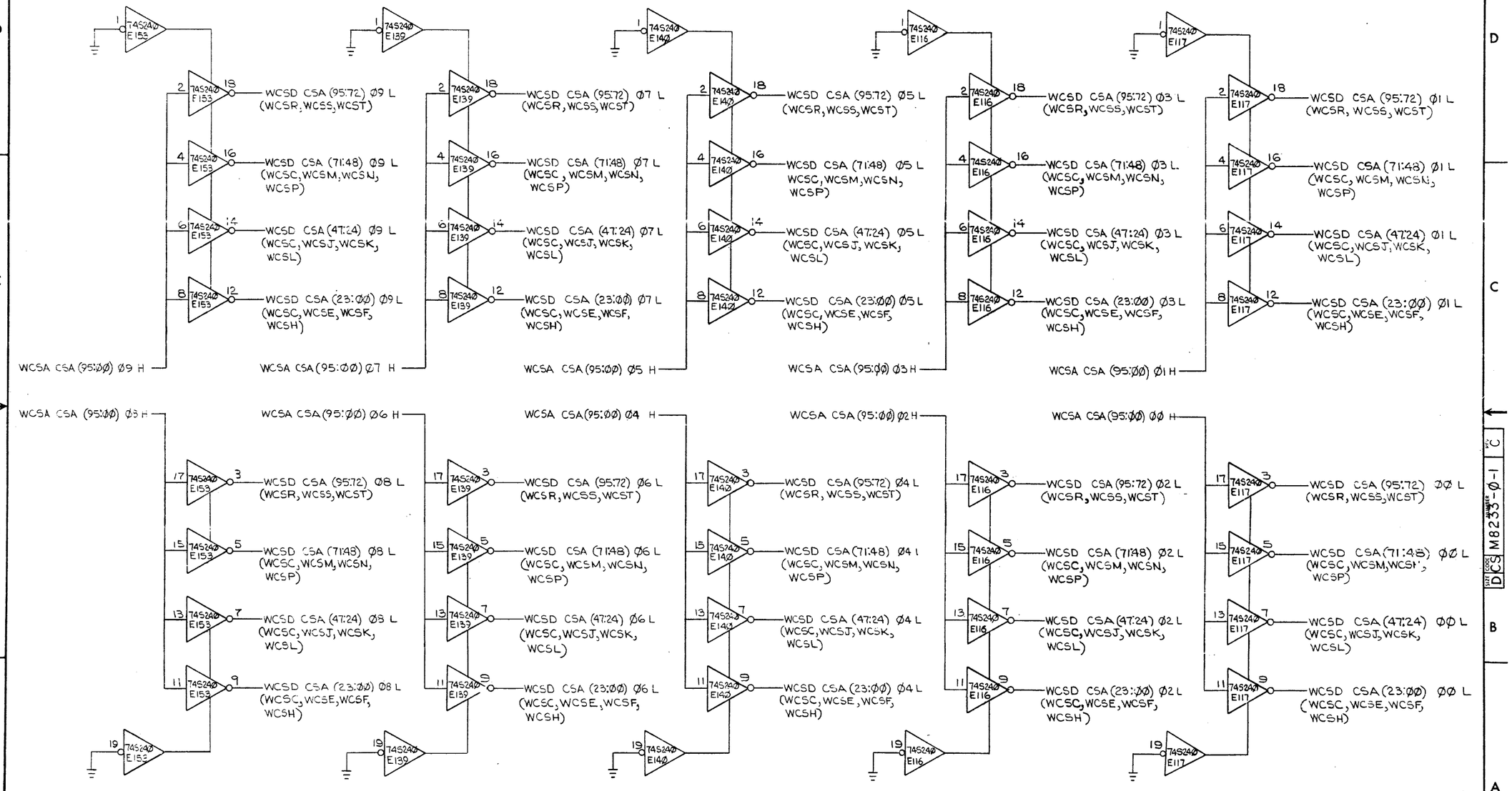

(NORMAL SLOT 2Ø)
(OPTION SLOT 18)
(MEMORY ADDRESS DRVS)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ1	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSD)	D	CS	M8233-Ø-1	C
SCALE —	SHEET 5 OF 17	DIST.		

DEC FORM NO. DRD 130

410

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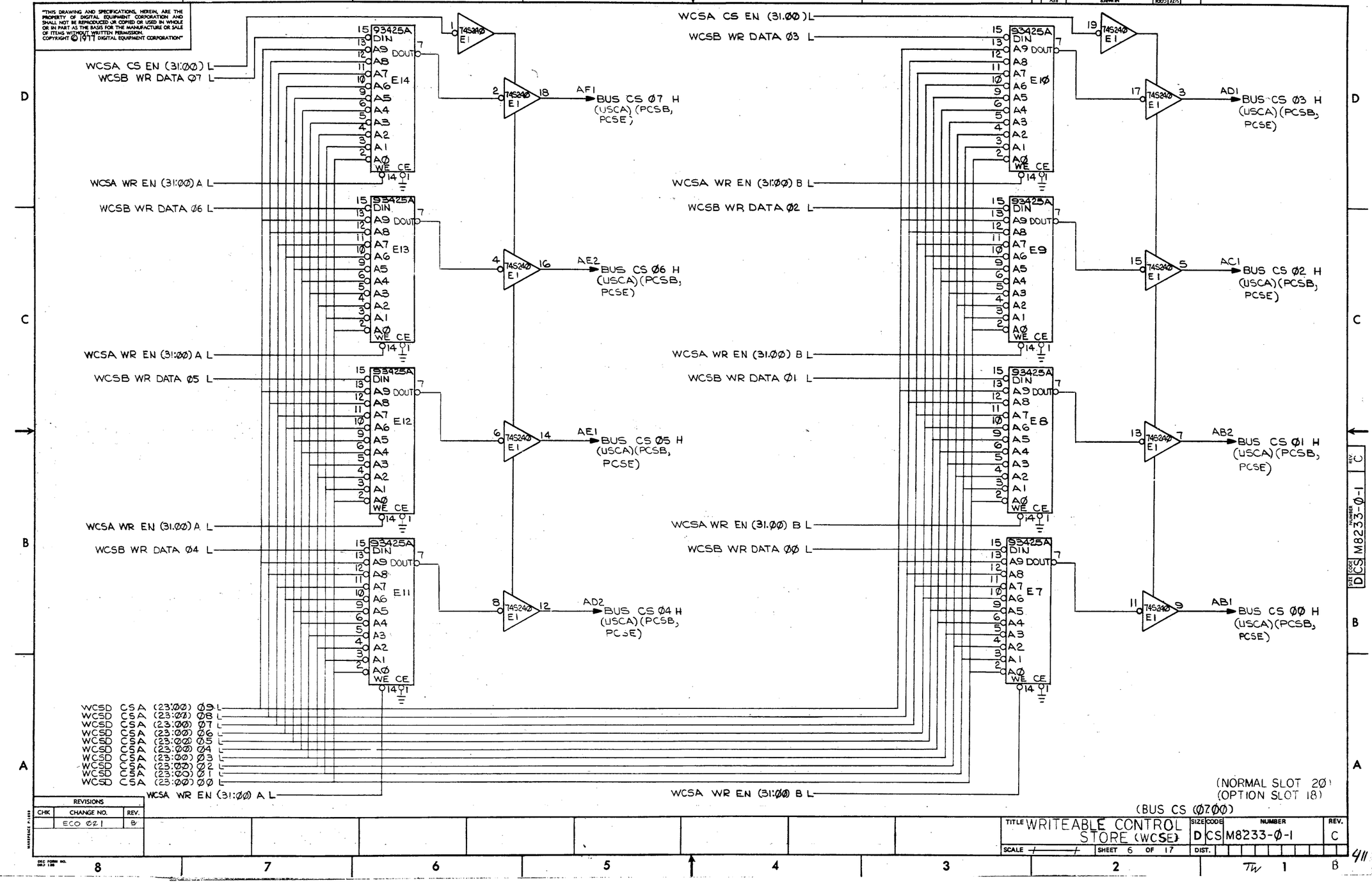

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO 021	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSE)	D	CS	M8233-00-1	C
SCALE —	SHEET 6 OF 17	DIST.		

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WCSA CS EN (31:00) L
WCSB WR DATA 15 L
WCSA WR EN (31:00) A L
WCSB WR DATA 14 L
WCSA WR EN (31:00) A L
WCSB WR DATA 13 L
WCSA WR EN (31:00) A L
WCSB WR DATA 12 L
WCSD CSA (23:00) 09 L
WCSD CSA (23:00) 08 L
WCSD CSA (23:00) 07 L
WCSD CSA (23:00) 06 L
WCSD CSA (23:00) 05 L
WCSD CSA (23:00) 04 L
WCSD CSA (23:00) 03 L
WCSD CSA (23:00) 02 L
WCSD CSA (23:00) 01 L
WCSD CSA (23:00) 00 L
WCSA WR EN (31:00) A L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE — E28, E27, E26, E25

74S240 E15 (1, 2, 4, 6, 8)

AR2 BUS CS 15 H (DDPP)(PCSB, PCSF)
AR1 BUS CS 14 H (DDPP)(PCSB, PCSF)
AM2 BUS CS 13 H (DDPP)(PCSB, PCSF)
AL2 BUS CS 12 H (USCA)(PCSB, PCSF)

WCSA CS EN (31:00) L
WCSB WR DATA 11 L
WCSA WR EN (31:00) B L
WCSB WR DATA 10 L
WCSA WR EN (31:00) B L
WCSB WR DATA 09 L
WCSA WR EN (31:00) B L
WCSB WR DATA 08 L
WCSA WR EN (31:00) B L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE — E24, E23, E22, E21

74S240 E15 (19, 17, 15, 13, 11)

ALI BUS CS 11 H (USCA)(PCSB, PCSF)
AK2 BUS CS 10 H (USCA)(PCSB, PCSF)
AKI BUS CS 09 H (USCA)(PCSB, PCSF)
AJ2 BUS CS 08 H (USCA)(PCSB, PCSF)

(NORMAL SLOT 20)
(OPTION SLOT 18)
(BUS CS (15.08)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO 0001	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSF)	D	CS	M8233-01	C
SCALE —	SHEET 7 OF 17	DIST.		

M8233-01 REV C

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WCSA CS EN (31:ØØ) L
WCSB WR DATA 23 L
93425A E42 → 74S24Ø E29 → AV2 → BUS CS 23 H (DDPJ)(PCSB, PCSH)

WCSA WR EN (31:ØØ) A L
WCSB WR DATA 22 L
93425A E41 → 74S24Ø E29 → BM2 → BUS CS 22 H (CEHF)(PCSB, PCSH)

WCSA WR EN (31:ØØ) A L
WCSB WR DATA 21 L
93425A E40 → 74S24Ø E29 → BMI → BUS CS 21 H (CEHF)(PCSB, PCSH)

WCSA WR EN (31:ØØ) A L
WCSB WR DATA 2Ø L
93425A E39 → 74S24Ø E29 → BLI → BUS CS 2Ø H (CEHF)(PCSB, PCSH)

WCSD CSA (23:ØØ) ØØ L
WCSD CSA (23:ØØ) Ø1 L
WCSD CSA (23:ØØ) Ø2 L
WCSD CSA (23:ØØ) Ø3 L
WCSD CSA (23:ØØ) Ø4 L
WCSD CSA (23:ØØ) Ø5 L
WCSD CSA (23:ØØ) Ø6 L
WCSD CSA (23:ØØ) Ø7 L
WCSD CSA (23:ØØ) Ø8 L
WCSD CSA (23:ØØ) Ø9 L

WCSA WR EN (31:ØØ) A L

WCSA CS EN (31:ØØ) L
WCSB WR DATA 19 L
93425A E38 → 74S24Ø E29 → BC1 → BUS CS 19 H (DDPJ)(PCSB, PCSH)

WCSA WR EN (31:ØØ) B L
WCSB WR DATA 18 L
93425A E37 → 74S24Ø E29 → BB2 → BUS CS 18 H (DDPJ)(PCSB, PCSH)

WCSA WR EN (31:ØØ) B L
WCSB WR DATA 17 L
93425A E36 → 74S24Ø E29 → BBI → BUS CS 17 H (DDPJ)(PCSB, PCSH)

WCSA WR EN (31:ØØ) B L
WCSB WR DATA 16 L
93425A E35 → 74S24Ø E29 → BAI → BUS CS 16 H (DDPJ)(PCSB, PCSH)

WCSA WR EN (31:ØØ) B L

(NORMAL SLOT 2Ø)
(OPTION SLOT 18)
(BUS CS (23.16)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO Ø2	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSH)	D	CS	M8233-Ø-1	C

SCALE — SHEET 8 OF 17 DIST.

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WCSA CS EN (31.ØØ) L
WCSB WR DATA 31 L
WCSA WR EN (31.ØØ) A L
WCSB WR DATA 30 L
WCSA WR EN (31.ØØ) A L
WCSB WR DATA 29 L
WCSA WR EN (31.ØØ) A L
WCSB WR DATA 28 L
WCSA WR EN (31.ØØ) A L

WCSD CSA (47:24) Ø9 L
WCSD CSA (47:24) Ø8 L
WCSD CSA (47:24) Ø7 L
WCSD CSA (47:24) Ø6 L
WCSD CSA (47:24) Ø5 L
WCSD CSA (47:24) Ø4 L
WCSD CSA (47:24) Ø3 L
WCSD CSA (47:24) Ø2 L
WCSD CSA (47:24) Ø1 L
WCSD CSA (47:24) ØØ L

93425A: DIN, A9 DOUT, A8, A7, A6, A5, A4, A3, A2, A1, AØ, WE, CE

E56 (WCSA CS EN (31.ØØ) L, WCSB WR DATA 31 L) → 74S240 E44 pin 1 → 74S240 E44 pin 2 → pin 18 → BS1 → BUS CS 31 H (CEHD, PCSC, PCSJ)

E55 (WCSA WR EN (31.ØØ) A L, WCSB WR DATA 30 L) → 74S240 E44 pin 4 → pin 16 → BR2 → BUS CS 30 H (CEHD, PCSC, PCSJ)

E54 (WCSA WR EN (31.ØØ) A L, WCSB WR DATA 29 L) → 74S240 E44 pin 6 → pin 14 → BR1 → BUS CS 29 H (CEHD, CEHF, PCSC, PCSJ)

E53 (WCSA WR EN (31.ØØ) A L, WCSB WR DATA 28 L) → 74S240 E44 pin 8 → pin 12 → BP2 → BUS CS 28 H (CEHD, CEHF, PCSC, PCSJ)

WCSA CS EN (31.ØØ) L
WCSB WR DATA 27 L
WCSA WR EN (31.ØØ) B L
WCSB WR DATA 26 L
WCSA WR EN (31.ØØ) B L
WCSB WR DATA 25 L
WCSA WR EN (31.ØØ) B L
WCSB WR DATA 24 L
WCSA WR EN (31.ØØ) B L

E52 (WCSA CS EN (31.ØØ) L, WCSB WR DATA 27 L) → 74S240 E44 pin 19 → pin 17 → pin 3 → BP1 → BUS CS 27 H (CEHD, CEHF, PCSC, PCSJ)

E51 (WCSA WR EN (31.ØØ) B L, WCSB WR DATA 26 L) → 74S240 E44 pin 15 → pin 5 → BN1 → BUS CS 26 H (CEHD, CEHF, PCSB, PCSJ)

E50 (WCSA WR EN (31.ØØ) B L, WCSB WR DATA 25 L) → 74S240 E44 pin 13 → pin 7 → BD2 → BUS CS 25 H (DCPH)(PCSB, PCSJ)

E49 (WCSA WR EN (31.ØØ) B L, WCSB WR DATA 24 L) → 74S240 E44 pin 11 → pin 9 → BD1 → BUS CS 24 H (DDPJ)(PCSB, PCSJ)

(NORMAL SLOT 2Ø)
(OPTION SLOT 18)
(BUS CS (31:24)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ1	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSJ)	D	CS	M8233-Ø-1	C
SCALE —	SHEET 9 OF 17	DIST.		

M8233-Ø-1 REV C

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WCSA CS EN (63:32) L
WCSB WR DATA Ø7 L
WCSA WR EN (63:32) A L
WCSB WR DATA Ø6 L
WCSA WR EN (63:32) A L
WCSB WR DATA Ø5 L
WCSA WR EN (63:32) A L
WCSB WR DATA Ø4 L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 AØ WE CE — E70, E69, E68, E67

74S240 E45 — BV2 → BUS CS 39 H (DAPJ, PCSB, PCSK)
74S240 E45 — BU2 → BUS CS 38 H (DAPJ, PCSB, PCSK)
74S240 E45 — BU1 → BUS CS 37 H (DAPJ, PCSB, PCSK)
74S240 E45 — BT2 → BUS CS 36 H (DAPJ, PCSB, PCSK)

WCSA CS EN (63:32) L
WCSB WR DATA Ø3 L
WCSA WR EN (63:32) B L
WCSB WR DATA Ø2 L
WCSA WR EN (63:32) B L
WCSB WR DATA Ø1 L
WCSA WR EN (63:32) B L
WCSB WR DATA ØØ L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 AØ WE CE — E66, E65, E64, E63

74S240 E45 — BS2 → BUS CS 35 H (DAPJ, PCSB, PCSK)
74S240 E45 — BF1 → BUS CS 34 H (DCPH, PCSB, PCSK)
74S240 E45 — BE2 → BUS CS 33 H (DCPH, PCSB, PCSK)
74S240 E45 — BE1 → BUS CS 32 H (DCPH, PCSB, PCSK)

WCSD CSA (47:24) Ø9 L
WCSD CSA (47:24) Ø8 L
WCSD CSA (47:24) Ø7 L
WCSD CSA (47:24) Ø6 L
WCSD CSA (47:24) Ø5 L
WCSD CSA (47:24) Ø4 L
WCSD CSA (47:24) Ø3 L
WCSD CSA (47:24) Ø2 L
WCSD CSA (47:24) Ø1 L
WCSD CSA (47:24) ØØ L

(NORMAL SLOT 2Ø)
(OPTION SLOT 18)
(BUS CS (39:32)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ1	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSK)	D	CS	M8233-Ø-1	C
SCALE —	SHEET 10 OF 17	DIGT.		

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WCSA CS EN (63:32) L
WCSB WR DATA 15 L
WCSA WR EN (63:32) A L
WCSB WR DATA 14 L
WCSA WR EN (63:32) A L
WCSB WR DATA 13 L
WCSA WR EN (63:32) A L
WCSB WR DATA 12 L
WCSA WR EN (63:32) A L

93425A DIN A9 A8 A7 A6 A5 A4 A3 A2 A1 A0 DOUT WE CE — E84, E83, E82, E81

74S240 E72 — CU2 → BUS CS 47 H (TBMN, PCSB, PCSL)
74S240 E72 — CU1 → BUS CS 46 H (TBMN, PCSB, PCSL)
74S240 E72 — CT2 → BUS CS 45 H (TBMN, ICLH, PCSB, PCSL)
74S240 E72 — CS2 → BUS CS 44 H (TBMN, ICLH, PCSB, PCSL)

WCSA CS EN (63:32) L
WCSB WR DATA 11 L
WCSA WR EN (63:32) B L
WCSB WR DATA 10 L
WCSA WR EN (63:32) B L
WCSB WR DATA 09 L
WCSA WR EN (63:32) B L
WCSB WR DATA 08 L
WCSA WR EN (63:32) B L

93425A DIN A9 A8 A7 A6 A5 A4 A3 A2 A1 A0 DOUT WE CE — E80, E79, E78, E77

74S240 E72 — CS1 → BUS CS 43 H (TBMN, ICLH, PCSB, PCSL)
74S240 E72 — CP2 → BUS CS 42 H (TBMN, ICLH, PCSB, PCSL)
74S240 E72 — CD1 → BUS CS 41 H (DAPT, PCSB, PCSL)
74S240 E72 — CC1 → BUS CS 40 H (DAPJ, PCSB, PCSL)

WCSD CSA (47:24) 09 L
WCSD CSA (47:24) 08 L
WCSD CSA (47:24) 07 L
WCSD CSA (47:24) 06 L
WCSD CSA (47:24) 05 L
WCSD CSA (47:24) 04 L
WCSD CSA (47:24) 03 L
WCSD CSA (47:24) 02 L
WCSD CSA (47:24) 00 L

WCSA WR EN (63:32) A L
WCSA WR EN (63:32) B L

(NORMAL SLOT 20)
(OPTION SLOT 18)
(BUS CS (47:40))

REVISIONS		
CHK	CHANGE NO	REV
	ECO 0001	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSL)	D	CS	M8233-01	C

SCALE — SHEET 11 OF 17 — DIST.

M8233-01 REV C

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WCSA CS EN (63:32) L
WCSB WR DATA 23 L
WCSA WR EN (63:32) A L
WCSB WR DATA 22 L
WCSA WR EN (63:32) A L
WCSB WR DATA 21 L
WCSA WR EN (63:32) A L
WCSB WR DATA 20 L

93425A DIN A9 A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE DOUT — E98, E97, E96, E95

74S240 E85 → DD2 → BUS CS 55 H (DAPH, ACC-SLOT 28, PCSB, PCSM)
74S240 E85 → DU2 → BUS CS 54 H (DAPP, PCSB, PCSM)
74S240 E85 → DU1 → BUS CS 53 H (DAPP, PCSB, PCSM)
74S240 E85 → DT2 → BUS CS 52 H (DAPP, PCSB, PCSM)

WCSA CS EN (63:32) L
WCSB WR DATA 19 L
WCSA WR EN (63:32) B L
WCSB WR DATA 18 L
WCSA WR EN (63:32) B L
WCSB WR DATA 17 L
WCSA WR EN (63:32) B L
WCSB WR DATA 16 L

93425A DIN A9 A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE DOUT — E94, E93, E92, E91

74S240 E85 → DP2 → BUS CS 51 H (DAPP, PCSB, PCSM)
74S240 E85 → CP1 → BUS CS 50 H (DAPD, PCSB, PCSM)
74S240 E85 → CN1 → BUS CS 49 H (DAPD, PCSB, PCSM)
74S240 E85 → CD2 → BUS CS 48 H (DAPD, PCSB, PCSM)

WCSD CSA (71:48) Ø9 L
WCSD CSA (71:48) Ø8 L
WCSD CSA (71:48) Ø7 L
WCSD CSA (71:48) Ø6 L
WCSD CSA (71:48) Ø5 L
WCSD CSA (71:48) Ø4 L
WCSD CSA (71:48) Ø3 L
WCSD CSA (71:48) Ø2 L
WCSD CSA (71:48) Ø1 L
WCSD CSA (71:48) ØØ L

WCSA WR EN (63:32) A L
WCSA WR EN (63:32) B L

(NORMAL SLOT 2Ø)
(OPTION SLOT 18)
(BUS CS (55:48)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ1	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSM)	D	CS	M8233-Ø-1	C
SCALE —	SHEET 12 OF 17	DIST.		

DEC FORM NO. DRD 128

4/17

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WCSA CS EN (63:32) L
WCSB WR DATA 31 L
WCSA WR EN (63:32) A L
WCSB WR DATA 30 L
WCSA WR EN (63:32) A L
WCSB WR DATA 29 L
WCSA WR EN (63:32) A L
WCSB WR DATA 28 L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE
E112, E111, E110, E109

74S240 E99

DS2 → BUS CS 63 H (DCPK, ICLF, PCSC, PCSN)
DP1 → BUS CS 62 H (DCPK, ICLF, PCSC, PCSN)
DN1 → BUS CS 61 H (DCPK, ICLF, PCSC, PCSN)
DM1 → BUS CS 60 H (DCPK, ICLF, PCSC, PCSN)

WCSA CS EN (63:32) L
WCSB WR DATA 27 L
WCSA WR EN (63:32) B L
WCSB WR DATA 26 L
WCSA WR EN (63:32) B L
WCSB WR DATA 25 L
WCSA WR EN (63:32) B L
WCSB WR DATA 24 L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE
E108, E107, E106, E105

74S240 E99

DJ2 → BUS CS 59 H (DCPK, ICLF, PCSC, PCSN)
DJ1 → BUS CS 58 H (DCPK, ICLF, PCSB, PCSN)
DH2 → BUS CS 57 H (DAPH, ACC-SLOT 28, PCSB, PCSN)
DF2 → BUS CS 56 H (DAPH, ACC-SLOT 28, PCSB, PCSN)

WCSD CSA (71:48) Ø9 L
WCSD CSA (71:48) Ø8 L
WCSD CSA (71:48) Ø7 L
WCSD CSA (71:48) Ø6 L
WCSD CSA (71:48) Ø5 L
WCSD CSA (71:48) Ø4 L
WCSD CSA (71:48) Ø3 L
WCSD CSA (71:48) Ø2 L
WCSD CSA (71:48) Ø1 L
WCSD CSA (71:48) ØØ L

WCSA WR EN (63:32) A L
WCSA WR EN (63:32) B L

(NORMAL SLOT 2Ø)
(OPTION SLOT 18)

BUS CS (63:56)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ1	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSN)	D	CS	M8233-Ø-1	C
SCALE —	SHEET 13 OF 17	DIST.		

M8233-Ø-1 REV C

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WCSA CS EN (95:64) L
WCSB WR DATA Ø7 L
WCSA WR EN (95:64) A L
WCSB WR DATA Ø6 L
WCSA WR EN (95:64) A L
WCSB WR DATA Ø5 L
WCSA WR EN (95:64) A L
WCSB WR DATA Ø4 L
WCSA WR EN (95:64) A L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 AØ WE CE — E125, E124, E123, E122

74S240 E114 — DD1 → BUS CS 71 H (ACC-SLOT 28, PCSB, PCSP)
74S240 E114 — DC1 → BUS CS 70 H (ALL-SLOT 28, PCSB, PCSP)
74S240 E114 — EJ1 → BUS CS 69 H (DAPA, DAPB, PCSB, PCSP)
74S240 E114 — ET2 → BUS CS 68 H (DAPA, DAPB, PCSB, PCSP)

WCSD CSA (71:48) Ø9 L
WCSD CSA (71:48) Ø8 L
WCSD CSA (71:48) Ø7 L
WCSD CSA (71:48) Ø6 L
WCSD CSA (71:48) Ø5 L
WCSD CSA (71:48) Ø4 L
WCSD CSA (71:48) Ø3 L
WCSD CSA (71:48) Ø2 L
WCSD CSA (71:48) Ø1 L
WCSD CSA (71:48) ØØ L
WCSA WR EN (95:64) A L

WCSA CS EN (95:64) L
WCSB WR DATA Ø3 L
WCSA WR EN (95:64) B L
WCSB WR DATA Ø2 L
WCSA WR EN (95:64) B L
WCSB WR DATA Ø1 L
WCSA WR EN (95:64) B L
WCSB WR DATA ØØ L
WCSA WR EN (95:64) B L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 AØ WE CE — E121, E120, E119, E118

74S240 E114 — ES2 → BUS CS 67 H (DAPA, DAPB, PCSB, PCSP)
74S240 E114 — EP2 → BUS CS 66 H (DAPA, DAPB, PCSB, PCSP)
74S240 E114 — EJ1 → BUS CS 65 H (USCA, PCSB, PCSP)
74S240 E114 — EH2 → BUS CS 64 H (USCA, PCSB, PCSP)

(NORMAL SLOT 2Ø)
(OPTION SLOT 18)
(BUS CS (71:64)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ1	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSP)	D	CS	M8233-Ø-1	C
SCALE —	SHEET 14 OF 17	DIST.		

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WCSA CS EN (95:64) L
WCSB WR DATA 15 L
WCSA WR EN (95:64) A L
WCSB WR DATA 14 L
WCSA WR EN (95:64) A L
WCSB WR DATA 13 L
WCSA WR EN (95:64) A L
WCSB WR DATA 12 L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE — E137, E136, E135, E134

74S240 E127 — FB1 → BUS CS 79 H (DAPC, CEHD, PCSB, PCSR)
74S240 E127 — FA1 → BUS CS 78 H (DAPC, CEHD, PCSB, PCSR)
74S240 E127 — EB1 → BUS CS 77 H (DAPH, PCSB, PCSR)
74S240 E127 — EP1 → BUS CS 76 H (USCA, PCSB, PCSR)

WCSA CS EN (95:64) L
WCSB WR DATA 11 L
WCSA WR EN (95:64) B L
WCSB WR DATA 10 L
WCSA WR EN (95:64) B L
WCSB WR DATA 09 L
WCSA WR EN (95:64) B L
WCSB WR DATA 08 L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE — E133, E132, E131, E130

74S240 E127 — EN1 → BUS CS 75 H (USCA, PCSB, PCSR)
74S240 E127 — EM1 → BUS CS 74 H (ICLE, USCA, PCSB, PCSR)
74S240 E127 — EK2 → BUS CS 73 H (ICLE, USCA, PCSB, PCSR)
74S240 E127 — EJ2 → BUS CS 72 H (ICLE, USCA, PCSB, PCSR)

WCSD CSA (95:72) 09 L
WCSD CSA (95:72) 08 L
WCSD CSA (95:72) 07 L
WCSD CSA (95:72) 06 L
WCSD CSA (95:72) 05 L
WCSD CSA (95:72) 04 L
WCSD CSA (95:72) 03 L
WCSD CSA (95:72) 02 L
WCSD CSA (95:72) 01 L
WCSD CSA (95:72) 00 L

WCSA WR EN (95:64) A L
WCSA WR EN (95:64) B L

(NORMAL SLOT 20)
(OPTION SLOT 18)
(BUS CS (79:72)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO 0001	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSR)	D	CS	M8233-01	C
SCALE —	SHEET 15 OF 17	DIST.		

DCS M8233-01 REV C

420 — TW 1 — B

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WCSA CS EN (95:64) L
WCSB WR DATA 23 L
WCSA WR EN (95:64) A L
WCSB WR DATA 22 L
WCSA WR EN (95:64) A L
WCSB WR DATA 21 L
WCSA WR EN (95:64) A L
WCSB WR DATA 20 L
WCSA WR EN (95:64) A L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE — E149, E148, E147, E146

74S240 E152 — FV2 → BUS CS 87 H (DAPE, PCSB, PCSS)
74S240 E152 — FU2 → BUS CS 86 H (DAPE, PCSB, PCSS)
74S240 E152 — FU1 → BUS CS 85 H (DAPE, PCSB, PCSS)
74S240 E152 — FT2 → BUS CS 84 H (DAPD, PCSB, PCSS)

WCSD CSA (95:72) Ø9 L
WCSD CSA (95:72) Ø8 L
WCSD CSA (95:72) Ø7 L
WCSD CSA (95:72) Ø6 L
WCSD CSA (95:72) Ø5 L
WCSD CSA (95:72) Ø4 L
WCSD CSA (95:72) Ø3 L
WCSD CSA (95:72) Ø2 L
WCSD CSA (95:72) Ø1 L
WCSD CSA (95:72) ØØ L

WCSA CS EN (95:64) L
WCSB WR DATA 19 L
WCSA WR EN (95:64) B L
WCSB WR DATA 18 L
WCSA WR EN (95:64) B L
WCSB WR DATA 17 L
WCSA WR EN (95:64) B L
WCSB WR DATA 16 L
WCSA WR EN (95:64) B L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE — E145, E144, E143, E142

74S240 E152 — FS2 → BUS CS 83 H (DAPD, PCSB, PCSS)
74S240 E152 — FS1 → BUS CS 82 H (DAPD, PCSB, PCSS)
74S240 E152 — FL1 → BUS CS 81 H (DAPC, PCSB, PCSS)
74S240 E152 — FC1 → BUS CS 80 H (DAPC, PCSB, PCSS)

(NORMAL SLOT 20)
(OPTION SLOT 18)
(BUS CS (87:80)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ1	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCSS)	D	CS	M8233-Ø-1	C
SCALE —	SHEET 16 OF 17	DIST.		

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WCSA CS EN (95:64) L
WCSB WR DATA 31 L
WCSA WR EN (95:64) A L
WCSB WR DATA 30 L
WCSA WR EN (95:64) A L
WCSB WR DATA 29 L
WCSA WR EN (95:64) A L
WCSB WR DATA 28 L
WCSA WR EN (95:64) A L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE — E163, E162, E161, E160

74S240 E150 — FK2 → BUS CS 95 H (IDPH, PCSC, PCST)
74S240 E150 — FK1 → BUS CS 94 H (IDPH, PCSC, PCST)
74S240 E150 — FJ2 → BUS CS 93 H (IDPH, PCSC, PCST)
74S240 E154 — FJ1 → BUS CS 92 H (IDPH, PCSC, PCST)

WCSA CS EN (95:64) L
WCSB WR DATA 27 L
WCSA WR EN (95:64) B L
WCSB WR DATA 26 L
WCSA WR EN (95:64) B L
WCSB WR DATA 25 L
WCSA WR EN (95:64) B L
WCSB WR DATA 24 L
WCSA WR EN (95:64) B L

93425A DIN A9 DOUT A8 A7 A6 A5 A4 A3 A2 A1 A0 WE CE — E159, E158, E157, E156

74S240 E150 — FR2 → BUS CS 91 H (DBPA, PCSC, PCST)
74S240 E150 — FR1 → BUS CS 90 H (DBPA, PCSC, PCST)
74S240 E150 — FP2 → BUS CS 89 H (DBPA, PCSB, PCST)
74S240 E150 — FP1 → BUS CS 88 H (DBPA, PCSB, PCST)

WCSD CSA (95:72) Ø9 L
WCSD CSA (95:72) Ø8 L
WCSD CSA (95:72) Ø7 L
WCSD CSA (95:72) Ø6 L
WCSD CSA (95:72) Ø5 L
WCSD CSA (95:72) Ø4 L
WCSD CSA (95:72) Ø3 L
WCSD CSA (95:72) Ø2 L
WCSD CSA (95:72) Ø1 L
WCSD CSA (95:72) ØØ L

WCSA WR EN (95:64) A L
WCSA WR EN (95:64) B L

(NORMAL SLOT 2Ø)
(OPTION SLOT 18)
(BUS CS (95:88)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ1	B

TITLE	SIZE	CODE	NUMBER	REV.
WRITEABLE CONTROL STORE (WCST)	D	CS	M8233-Ø-1	C

SCALE — SHEET 17 OF 17 — DIST.

DEC FORM NO. DRD 158

COMPONENT SIDE VIEW

SIGNATURES		DATE
DRN.		
CHK'D		
ENG.		
PROD. ENG.		
PROD. MGR.		

digital

TITLE
PROM CONTROL STORE

SIZE CODE NUMBER REV
E 07A MR8340-D A

SCALE 6/1 OF 3
SHT
NEXT HIGHER ASSY. MR8340-D

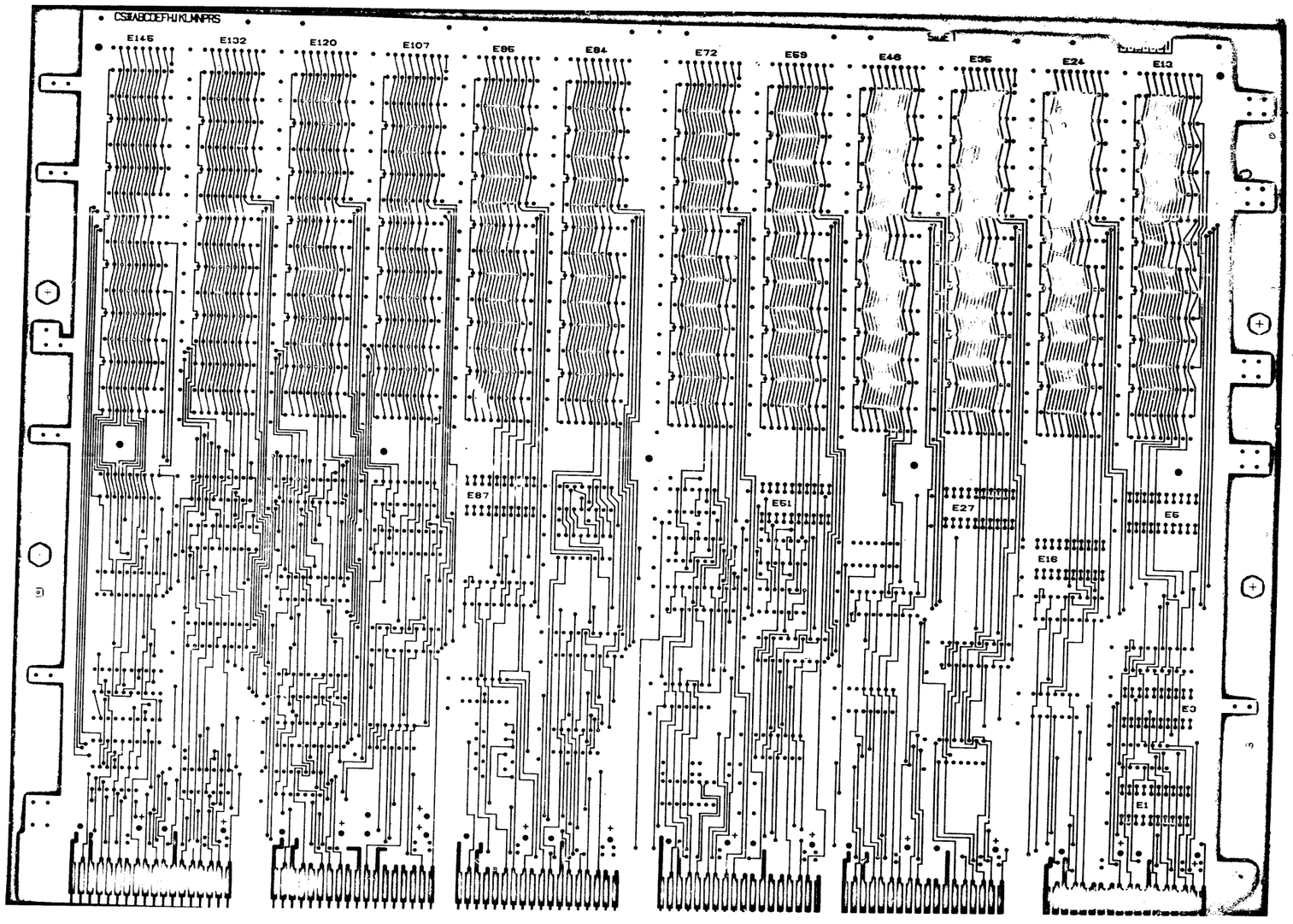
ETCH REV.
P.C.B. DESIGN DATA BASE REV.

CHANGE NO. REV

NOTES:

ELA MR8340Ø

1977



TITLE	SIZE	CODE	NUMBER	REV
PROM CONTROL STORE	E	UA	M82340-0	A
SCALE 2-1	SHEET 2 OF 3	DRF		

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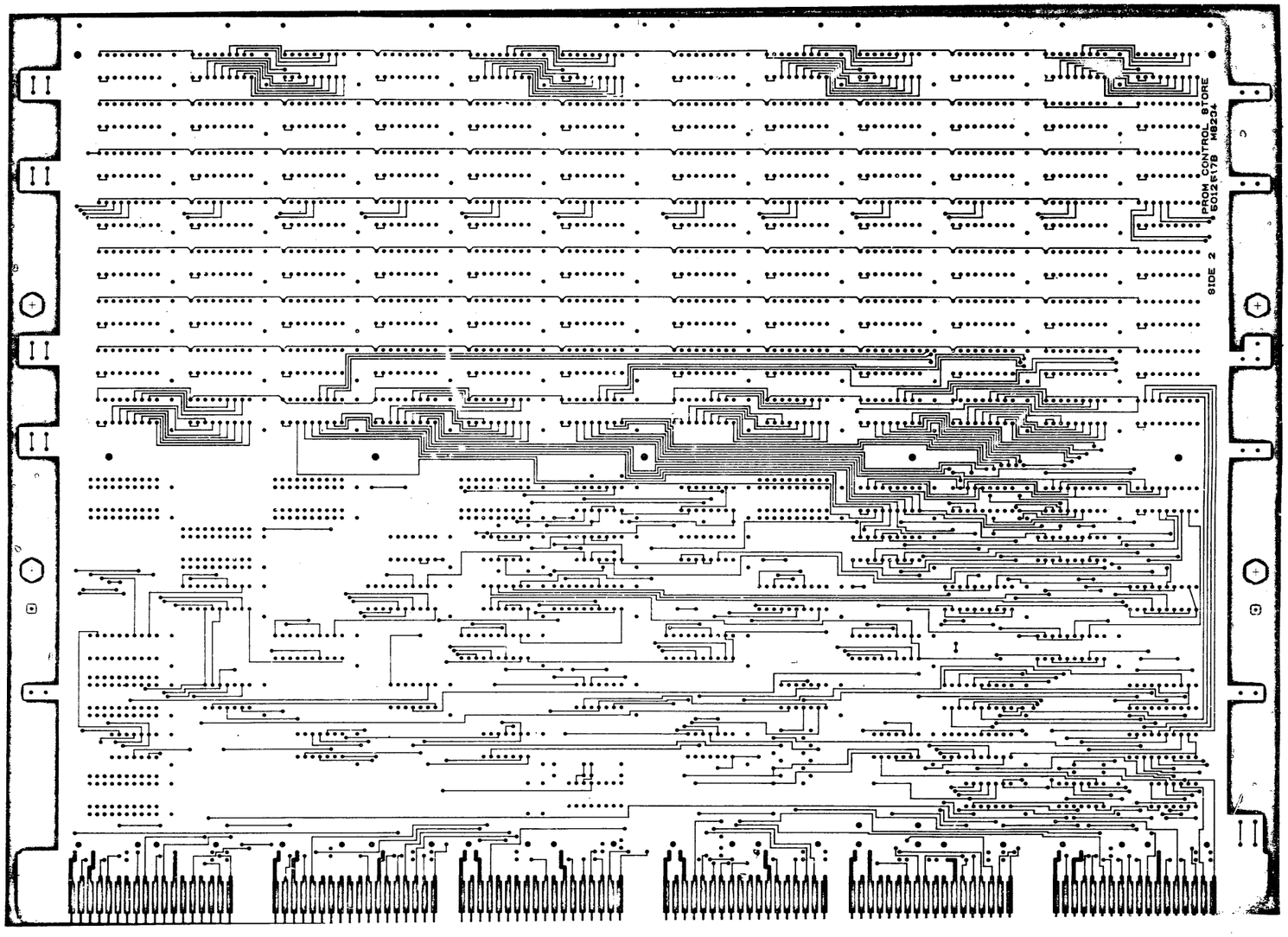

TITLE	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE	E	UA	M8234-0-0	A
SCALE 2-1	SHEET 3 OF 3		DIST	

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY Frank E Smart	CHECKED Frank E Smart	SECTION
DATE 5-24-77	DATE 5-24-77	
ENG Lee Dickey	PROD Nick Tirello	ISSUED SECTION
DATE 8-17-77	DATE 5-2-77	

NOTES:

ETCH REV B
CS REV A

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8234-0-0	REF DESIGNATION
1	E-MD-5012517-0-0	50-12517	ETCH BOARD	1	
2		12-10711-2	MODULE HANDLE	1	
3		90-00024-01	MODULE HANDLE EYELETS	12	
4		10-12784-0	CAPACITOR, .047UF 50 V	133	C14-C146
5		10-12084-1	CAPACITOR, 8UF, 25V	13	C1-C13
6		13-00365-0	RESISTOR, 1K, 1/4W, 5%	5	R1-R5
7		13-00295-0	RESISTOR, 330 Ω, 1/4W, 5%	5	R6, R8, R10, R12, R14
8		13-01775-0	RESISTOR, 820 Ω, 1/4W, 5%	5	R7, R9, R11, R13, R15
9		13-00247-0	RESISTOR, 120 Ω, 1/4W, 5%	2	R16, R17
10		13-00250-0	RESISTOR, 150 Ω, 1/4W, 5%	2	R18, R19
11		19-11573-0	I.C. DEC 74S280	12	E2, E14, E25, E36, E47, E61, E73, E85, E96, E108, E121, E133
12		19-13462	I.C. DEC 74S240	18	E4, E15, E26, E37, E48, E62, E74, E86, E97, E98, E109, E110, E111, E122, E123, E134, E135, E136
13		19-10546-0	I.C. DEC 74S140	4	E49, E50, E63, E64
14		19-10549-0	I.C. DEC 74S158	1	E76
15		19-11675-0	I.C. DEC 74S138	1	E75
16		19-11415-0	I.C. DEC 10125	1	E60
17		19-10534	I.C. DEC 74S04	1	E38
18			SPARES	7	E1, E3, E5, E16, E27, E51, E87

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE	E-UA-8234-0-0	B	PL	M8234-0-0	A
	SHEET 1 OF 6	INSERTION PARTS LIST DATA BASE REV			

426 DRB 125

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY Lf Smart DATE 5-24-77	CHECKED Lf Smart DATE 5-24-77	SECTION
ENG Lee Dickey DATE 8-17-77	PROD Mike Trullo DATE 8-2-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8234-Ø-Ø	NOTES: REF DESIGNATION
19		23-Ø44F1-ØØ	PROM	1	E6
20		23-Ø45F1-ØØ	"	1	E1Ø
21		23-Ø46F1-ØØ	"	1	E17
22		23-Ø47F1-ØØ	"	1	E21
23		23-Ø48F1-ØØ	"	1	E28
24		23-Ø49F1-ØØ	"	1	E32
25		23-Ø5ØF1-ØØ	"	1	E39
26		23-Ø51F1-ØØ	"	1	E43
27		23-Ø52F1-ØØ	"	1	E52
28		23-Ø53F1-ØØ	"	1	E56
29		23-Ø54F1-ØØ	"	1	E65
30		23-Ø55F1-ØØ	"	1	E69
31		23-Ø56F1-ØØ	"	1	E77
32		23-Ø57F1-ØØ	"	1	E81
33		23-Ø58F1-ØØ	"	1	E88
34		23-Ø59F1-ØØ	"	1	E92
35		23-Ø6ØF1-ØØ	"	1	E1ØØ
36		23-Ø61F1-ØØ	"	1	E1Ø4
37		23-Ø62F1-ØØ	"	1	E113
38		23-Ø63F1-ØØ	"	1	E117

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE	E-UA-M8234-Ø-Ø	B	PL	M8234-Ø-Ø	A
	SHEET 2 OF 6	INSERTION PARTS LIST DATA BASE REV			

DRB 125

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY / DATE: D. Smart 5-24-77	CHECKED / DATE: D. Smart 5-24-77	SECTION
ENG / DATE: Lee Dickey 8-17-77	PROD / DATE: Mike Tirella 8-2-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8234-Ø-Ø	REF DESIGNATION
39		23-Ø64F1-ØØ	PROM	1	E125
40		23-Ø65F1-ØØ	"	1	E129
41		23-Ø66F1-ØØ	"	1	E138
42		23-Ø67F1-ØØ	"	1	E142
43		23-Ø68F1-ØØ	"	1	E99
44		23-Ø69F1-ØØ	"	1	E7
45		23-Ø7ØF1-ØØ		1	E11
46		23-Ø71F1-ØØ	"	1	E18
47		23-Ø72F1-ØØ	"	1	E22
48		23-Ø73F1-ØØ	"	1	E29
49		23-Ø74F1-ØØ	"	1	E33
50		23-Ø75F1-ØØ	"	1	E4Ø
51		23-Ø76F1-ØØ	"	1	E44
52		23-Ø77F1-ØØ	"	1	E53
53		23-Ø78F1-ØØ	"	1	E57
54		23-Ø79F1-ØØ	"	1	E66
55		23-Ø8ØF1-ØØ	"	1	E7Ø
56		23-Ø81F1-ØØ	"	1	E78
57		23-Ø82F1-ØØ	"	1	E82
58		23-Ø83F1-ØØ	"	1	E89

NOTES:

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
FROM CONTROL STORE	E-UA-M8234-Ø-Ø	B	PL	M8234-Ø-Ø	A
	SHEET 3 OF 6	INSERTION PARTS LIST DATA BASE REV			

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY N. Smart	CHECKED N. Smart	SECTION
DATE 5-24-77	DATE 5-24-77	
ENG Lee Dubey	PROD Mike Tirella	ISSUED SECTION
DATE 8-17-77	DATE 8-2-77	

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8234-0-0	NOTES: REF DESIGNATION
59		23-Ø84F1-ØØ	PROM	1	E93
60		23-Ø85F1-ØØ	"	1	E1Ø1
61		23-Ø86F1-ØØ	"	1	E1Ø5
62		23-Ø87F1-ØØ	"	1	E114
63		23-Ø88F1-ØØ	"	1	E118
64		23-Ø89F1-ØØ	"	1	E126
65		23-Ø9ØF1-ØØ	"	1	E13Ø
66		23-Ø91F1-ØØ	"	1	E139
67		23-Ø92F1-ØØ	"	1	E143
68		23-Ø93F1-ØØ	"	1	E112
69		23-Ø94F1-ØØ	"	1	E8
70		23-Ø95F1-ØØ	"	1	E12
71		23-Ø96F1-ØØ	"	1	E19
72		23-Ø97F1-ØØ	"	1	E23
73		23-Ø98F1-ØØ	"	1	E3Ø
74		23-Ø99F1-ØØ	"	1	E34
75		23-1ØØF1-ØØ	"	1	E41
76		23-1Ø1F1-ØØ	"	1	E45
77		23-1Ø2F1-ØØ	"	1	E54
78		23-1Ø3F1-ØØ	"	1	E58

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE	E-UA-M8234-Ø-Ø	B	PL	M8234-Ø-Ø	A
	SHEET 4 OF 6	INSERTION PARTS LIST DATA BASE REV			

DRB 125

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY / DATE J. Smart 5-24-77	CHECKED / DATE J. Smart 5-24-77	SECTION
ENG / DATE Lee Dunkey 8-17-77	PROD / DATE Mike Tirello 8-3-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8234-0-0	REF DESIGNATION
79		23-104F1-00	PRCM	1	E67
80		23-105F1-00	"	1	E71
81		23-106F1-00	"	1	E79
82		23-107F1-00	"	1	E83
83		23-108F1-00	"	1	E90
84		23-109F1-00	"	1	E94
85		23-110F1-00	"	1	E102
86		23-111F1-00	"	1	E106
87		23-112F1-00	"	1	E115
88		23-113F1-00	"	1	E119
89		23-114F1-00	"	1	E127
90		23-115F1-00	"	1	E131
91		23-116F1-00	"	1	E140
92		23-117F1-00	"	1	E144
93		23-118F1-00	"	1	E124
94		23-119F1-00	"	1	E9
95		23-120F1-00	"	1	E13
96		23-121F1-00	"	1	E20
97		23-122F1-00	"	1	E24
98		23-123F1-00	"	1	E31

NOTES:

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE	E-UA-M8234-0-0	B	PL	M8234-0-0	A
	SHEET 5 OF 6	INSERTION PARTS LIST DATA BASE REV			

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY / DATE J. Smart 7-24-77	CHECKED / DATE J. Smart 5-24-77	SECTION
ENG / DATE Lee Dubey 8-17-77	PROD / DATE Mike Tirella 8-2-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION M8234-Ø-Ø	NOTES: REF DESIGNATION
99		23-124F1-ØØ	PROM	1	E35
100		23-125F1-ØØ	"	1	E42
101		23-126F1-ØØ	"	1	E46
102		23-127F1-ØØ	"	1	E55
103		23-128F1-ØØ	"	1	E59
104		23-129F1-ØØ	"	1	E68
105		23-13ØF1-ØØ	"	1	E72
106		23-131F1-ØØ	"	1	E8Ø
107		23-132F1-ØØ	"	1	E84
108		23-133F1-ØØ	"	1	E91
109		23-134F1-ØØ	"	1	E95
110		23-135F1-ØØ	"	1	E1Ø3
111		23-136F1-ØØ	"	1	E1Ø7
112		23-137F1-ØØ	"	1	E116
113		23-138F1-ØØ	"	1	E12Ø
114		23-139F1-ØØ	"	1	E128
115		23-14ØF1-ØØ	"	1	E132
116		23-141F1-ØØ	"	1	E141
117		23-142F1-ØØ	"	1	E145
118		23-143F1-ØØ	"	1	E137

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE	E-UA-M8234-Ø-Ø	B	PL	M8234-Ø-Ø	A
	SHEET 6 OF 6	INSERTION PARTS LIST DATA BASE REV			

DRB 125

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SLOTS 22, 2Ø, 18 CAN ACCEPT EITHER PROM CONTROL STORE (PCS) OR WRITEABLE CONTROL STORE (WCS)		
SLOT 22 PCS NORMAL	SLOT 2Ø WCS NORMAL	SLOT 18 OCS (OPTICNAL CS, EITHER WCS OR PCS)
CLKC LECL CPTIC1 H CLKC LECL CPTIC1 L	CLKC LECL CPTIB2 H CLKC LECL CPTIB2 L	CLKC LECL CPTIB4 H CLKC LECL CPTIB4 L

PARITY ERROR INDICATORS TO CONSOLE AND T41

74S28Ø ① 74S28Ø ① 74S28Ø ①

74S28Ø ③ 74S28Ø ③ 74S28Ø ③

BUS CS ◄ ► BUS CS

+5V

J1 J2 J3 J4 : OF 4-IK BANK SEL

(SEE NAME-SLOT TABLE FOR CLOCK NAMES)

CP CLK T1 L

CP CLK T1 H

10125 74S04 74S04 ①

PCSA T5Ø DELAYED L

+3V

74S14Ø ②

74S14Ø

74S24Ø ① 74S24Ø ④ 74S24Ø ④ 74S24Ø ④

1K	7643 ①	7643 ⑧	7643 ⑧	7643 ⑧
1K	7643 ①	7643 ⑧	7643 ⑧	7643 ⑧
1K	7643 ①	7643 ⑧	7643 ⑧	7643 ⑧
1K	7643 ①	7643 ⑧	7643 ⑧	7643 ⑧

74S24Ø ⑤ ½ 74S24Ø ⑤ ½

BUS UPC Ø9 L BUS UPC ØØ L

PCSA T5Ø DELAYED L

74S138 74S158

BUS UPC 12 L
BUS UPC 11 L
BUS UPC 1Ø L

+5V

J5

L-LOWER 4K
H-UPPER 4K
BOARD SELECT

BANK SEL	J5	J4	J3	J2	J1
1K	IN	IN	IN	IN	OUT
2K	IN	IN	IN	OUT	IN
3K	IN	IN	OUT	IN	IN
4K	IN	OUT	IN	IN	IN
5K	OUT	IN	IN	IN	OUT
6K	OUT	IN	IN	OUT	IN
7K	OUT	IN	OUT	IN	IN
8K	OUT	OUT	IN	IN	IN

JUMPER J1 THROUGH J4 MAY BE IN ANY COMBINATION TO SELECT ANY OR ALL AVAILABLE 1K SEGMENTS UP TO 4 MAXIMUM.

REVISIONS			
REV.	CHANGE NO.		CHK
B	M8234-TWOOI ECO Ø95	Programmed Expertise R. CHUSMAE	
		R. Chusmae 4/5/77	

(NORMAL SLOT 22)
(BLOCK DIAGRAM)(OPTION SLOT 2Ø OR 18)

DRN.	5-19-77	FIRST USED ON: digital
CHK'D	5-19-77	
ENG.	5-13-77	TITLE: PROM CONTROL STORE
PROJ. ENG.	5-19-77	
PROD.	6/3/77	
NEXT HIGHER ASSY.		
SCALE		SIZE D, CODE CS, NUMBER M8234-Ø-1, REV. B
SHEET 1 OF 17		DIST.

DEC FORM NO. DRD 103-0

432

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SLOTS 22, 20, & CAN ACCEPT EITHER PROM CONTROL STORE (PCS) OR WRITEABLE CONTROL STORE (WCS)		
SLOT 22 PCS NORMAL	SLOT 20 WCS NORMAL	SLOT 18 OCS (OPTIONAL, CS EITHER WCS OR PCS)
CLKC LECL CPTICI H CLKC LECL CPTICI L	CLKC LECL CPTIB2 H CLKC LECL CPTIB2 L	CLKC LECL CPTIB4 H CLKC LECL CPTIB4 L

(SEE NAME-SLOT TABLE FOR CLOCK NAMES)
CLKC LECL CPTICI L
CLKC LECL CPTICI H
-5.2V R17 120Ω
-5.2V R16 120Ω
R19 150Ω
R18 150Ω
10125 E60
74504 E38
74504 E38
PCSA T5Ø DELAYED L (PCSA)

PCSA T5Ø DELAYED L

74S140 E49 — PCSA CS EN (95:64) L (PCSC, PCSP-PCST)
74S140 E63 — PCSA CS EN (63:32) L (PCSK-PCSN)
74S140 E63 — PCSA CS EN (31:ØØ) L (PCSE-PCSJ)
74S140 E49

PCSA +3V

74S140 E5Ø — PCSA CE 3K L (PCSC, PCSE-PCST)
74S140 E5Ø — PCSA CE 2K L (PCSC, PCSE-PCST)
74S140 E64 — PCSA CE 1K L (PCSC, PCSE-PCST)
74S140 E64 — PCSA CE ØK L (PCSC, PCSE-PCST)

BUS UPC 10 L
BUS UPC 11 L
BUS UPC 12 L
74S138 E75 (SEL A, SEL B, SEL C; F7, F3, F6, F2, F5, F1, F4, F0)
PCSA T5Ø DELAYED L → EN
74S158 E76 (B3, A3, B2, A2, B1, A1, BØ, AØ; f3, f2, f1, fØ)
STB SØ

+5V
R5 1K, R4 1K, R3 1K, R2 1K, R1 1K
J5 CV2
J4 CM1
J3 CL2
J2 CL1
J1 CB1

BANK SEL	J5	J4	J3	J2	J1
1K	IN	IN	IN	IN	OUT
2K	IN	IN	IN	OUT	IN
3K	IN	IN	OUT	IN	IN
4K	IN	OUT	IN	IN	IN
5K	OUT	IN	IN	IN	OUT
6K	OUT	IN	IN	OUT	IN
7K	OUT	IN	OUT	IN	IN
8K	OUT	OUT	IN	IN	IN

JUMPER J1 THROUGH J4 MAY BE IN ANY COMBINATION TO SELECT ANY OR ALL AVAILABLE 1K SEGMENTS UP TO 4 MAXIMUM

AA2, AV1, BA2, BV1,
CA2, CV1, LA2, DV1,
EA2, EV1, FA2, FV1,
AC2, AH1, AN2, AT1,
BC2, BH1, BN2, BT1,
CC2, CH1, CN2, CT1,
DC2, DH1, DN2, DT1,
EC2, EH1, EN2, ET1,
FC2, FH1, FN2, FT1 → EK1
+5V
C1-C12 8µf
C13 8µf
C14-C72, C74-C146 .047µf
C73 .047µf
-5.2V

74524Ø E135 — PCSA +3V (PCSA)

+5V
R6 33Ø
R7 82Ø — FL2 — BUS CS UPAR Ø H (PCSC, WCSC)
R8 33Ø
R9 82Ø — FM1 — BUS CS UPAR 1 H (PCSC, WCSC)
R1Ø 33Ø
R11 82Ø — FM2 — BUS CS UPAR 2 H (PCSC, WCSC)
R12 33Ø
R13 82Ø — DC1 — BUS CS 7Ø H (PCSB, PCSP, WCSP) (ACC - SLOT 28)
R14 33Ø
R15 82Ø — DD1 — BUS CS 71 H (PCSB, PCSP, WCSP) (ACC - SLOT 28)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO 023	B

(PROM MEMORY SELECT)
(NORMAL SLOT 22)
(OPTION SLOT 20 OR 18)

TITLE PROM CONTROL STORE (PCSA)
SIZE D | CODE CS | NUMBER M8234-Ø-1 | REV. B
SCALE — | SHEET 2 OF 17 | DIST.

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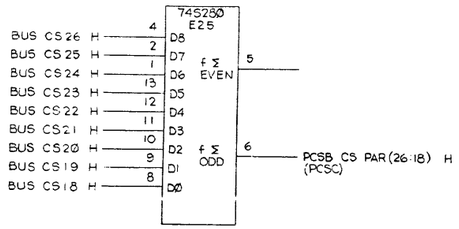

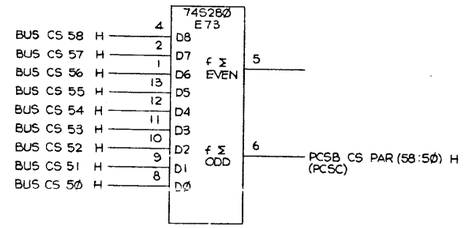

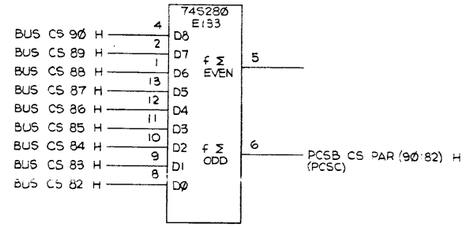

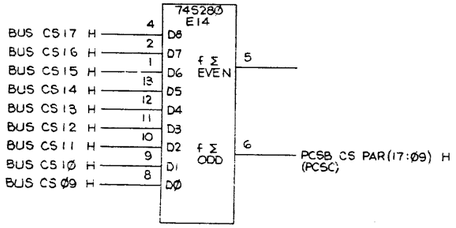

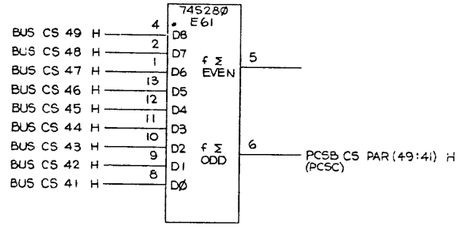

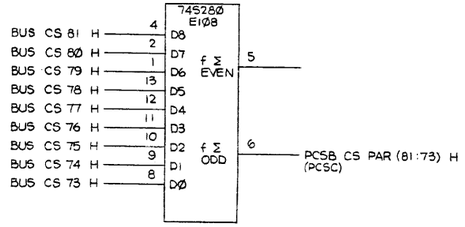

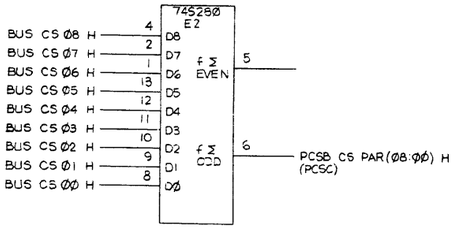

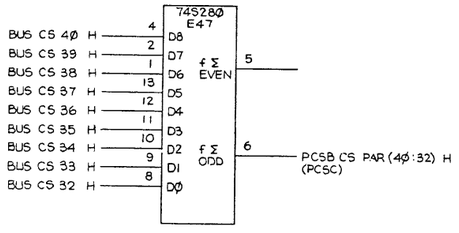

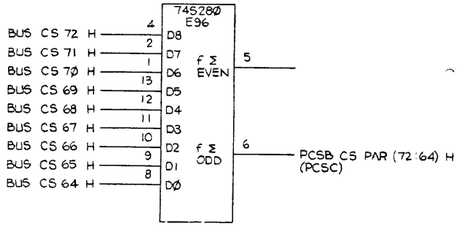

REVISIONS		
CHK	CHANGE NO	REV.
	ECO ØZ3	B

(PARITY) (NORMAL SLOT 22) (OPTION SLOT 2Ø OR 18)

TITLE	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE (PCSB)	D	CS	M8234 - Ø - 1	B
SCALE	SHEET 3 OF 17		DWG.	

M8234-Ø-1 D CS B

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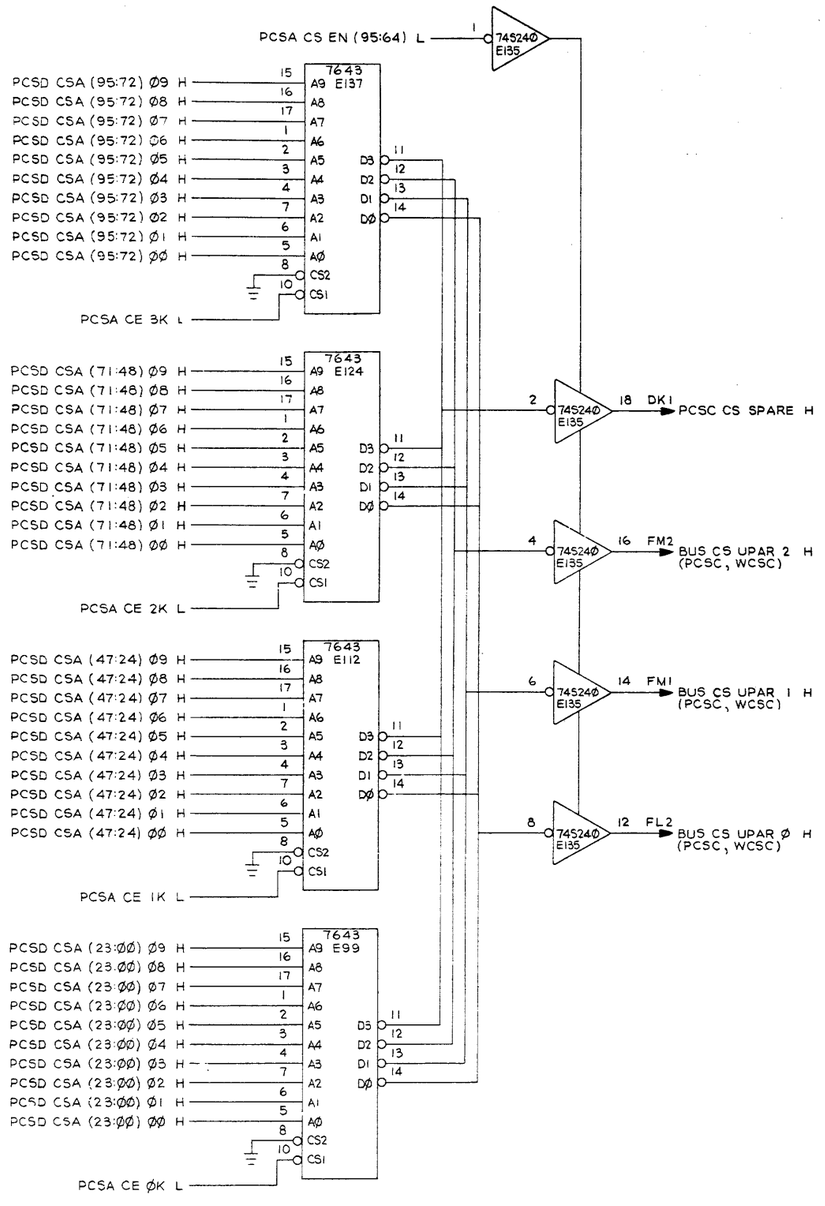

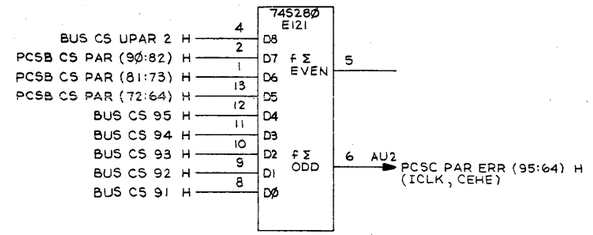

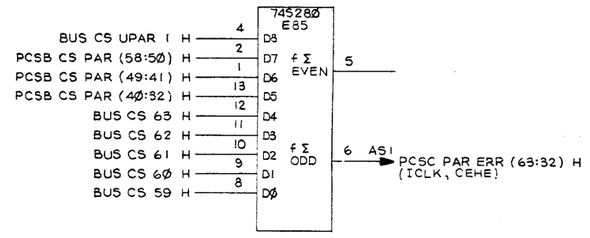

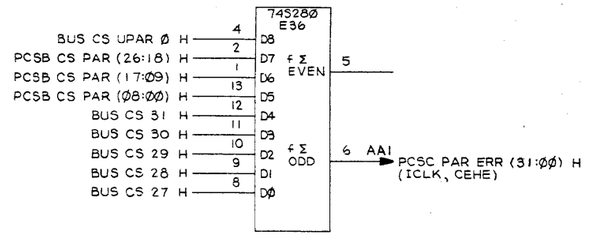

(PARITY CHECK)

(NORMAL SLOT 22)
(OPTION SLOT 2Ø OR 18)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE (PCSC)	D	CS	M8234 - Ø - 1	B
SCALE —	SHEET 4 OF 17	DIST.		

M8234-Ø-1 REV B

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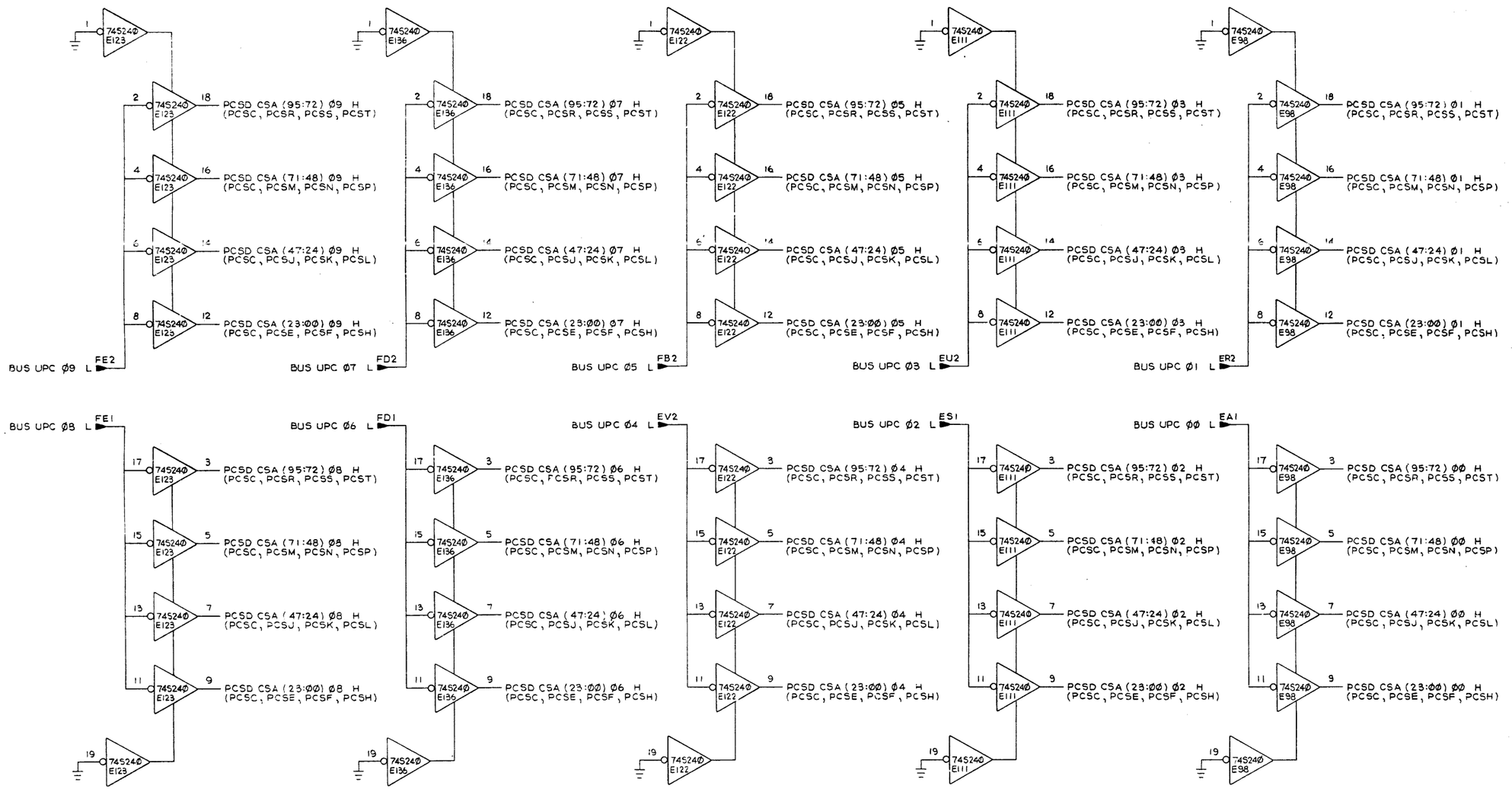

REVISIONS		
CHK	CHANGE NO.	REV.

(PROM MEMORY DRIVERS) (NORMAL SLOT 22) (OPTION SLOT 20 OR 18)

TITLE	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE (PCSD)	D	CS	M8234 - Ø - 1	B

SCALE — SHEET 5 OF 17 DIST.

MACRODATA P1888 DEC FORM NO. DRD 130

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PCSA CS EN (31:ØØ) L

PCSA CE 3K L

PCSA CE 2K L

PCSA CE 1K L

PCSA CE ØK L

PCSD CSA (23:ØØ) ØØ H
PCSD CSA (23:ØØ) Ø1 H
PCSD CSA (23:ØØ) Ø2 H
PCSD CSA (23:ØØ) Ø3 H
PCSD CSA (23:ØØ) Ø4 H
PCSD CSA (23:ØØ) Ø5 H
PCSD CSA (23:ØØ) Ø6 H
PCSD CSA (23:ØØ) Ø7 H
PCSD CSA (23:ØØ) Ø8 H
PCSD CSA (23:ØØ) Ø9 H

7643 E13 — A9 A8 A7 A6 A5 A4 A3 A2 A1 AØ CS2 CS1 — D3 D2 D1 DØ

7643 E12 — A9 A8 A7 A6 A5 A4 A3 A2 A1 AØ CS2 CS1 — D3 D2 D1 DØ

7643 E11 — A9 A8 A7 A6 A5 A4 A3 A2 A1 AØ CS2 CS1 — D3 D2 D1 DØ

7643 E10 — A9 A8 A7 A6 A5 A4 A3 A2 A1 AØ CS2 CS1 — D3 D2 D1 DØ

7643 E9 — A9 A8 A7 A6 A5 A4 A3 A2 A1 AØ CS2 CS1 — D3 D2 D1 DØ

7643 E8 — A9 A8 A7 A6 A5 A4 A3 A2 A1 AØ CS2 CS1 — D3 D2 D1 DØ

7643 E7 — A9 A8 A7 A6 A5 A4 A3 A2 A1 AØ CS2 CS1 — D3 D2 D1 DØ

7643 E6 — A9 A8 A7 A6 A5 A4 A3 A2 A1 AØ CS2 CS1 — D3 D2 D1 DØ

74S24Ø E4 (pin 1) → AF1 → BUS CS Ø7 H (USCA, PCSB, WCSE)

74S24Ø E4 (pin 4) → AE2 → BUS CS Ø6 H (USCA, PCSB, WCSE)

74S24Ø E4 (pin 6) → AE1 → BUS CS Ø5 H (USCA, PCSB, WCSE)

74S24Ø E4 (pin 8) → AD2 → BUS CS Ø4 H (USCA, PCSB, WCSE)

74S24Ø E4 (pin 19) → AD1 → BUS CS Ø3 H (USCA, PCSB, WCSE)

74S24Ø E4 (pin 15) → AC1 → BUS CS Ø2 H (USCA, PCSB, WCSE)

74S24Ø E4 (pin 13) → AB2 → BUS CS Ø1 H (USCA, PCSB, WCSE)

74S24Ø E4 (pin 11) → AB1 → BUS CS ØØ H (USCA, PCSB, WCSE)

(BUS CS (Ø7:ØØ))

(NORMAL SLOT 22)
(OPTION SLOT 20 OR 18)

REVISIONS		
CHK	CHANGE NO.	REV.

MANUFACTURING PLANS

DEC FORM NO. DRD 130

TITLE PROM CONTROL STORE (PCSE)

SIZE D | CODE CS | NUMBER M8234 - Ø - 1 | REV. B

SCALE — | SHEET 6 OF 17 | DIST.

DATA CODE DCS | NUMBER M8234-Ø-1 | REV B

TW

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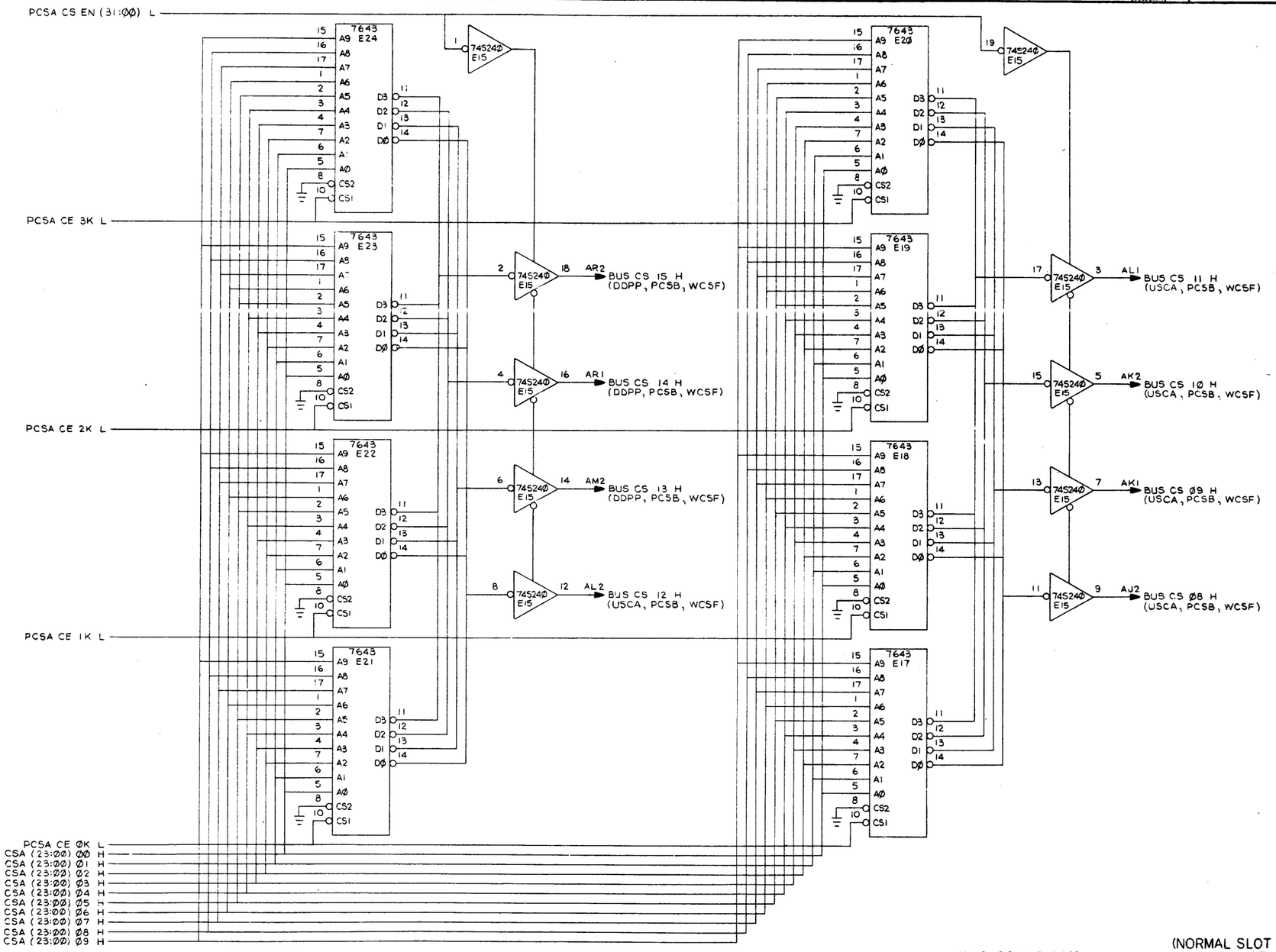

REVISIONS		
CHK	CHANGE NO.	REV.

(BUS CS (15:08))

(NORMAL SLOT 22)
(OPTION SLOT 2Ø OR 18)

TITLE	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE (PCSF)	D	CS	M8234-Ø-1	B
SCALE	SHEET 7 OF 17		DIST.	

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PCSA CS EN (31:ØØ) L
PCSA CE 3K L
PCSA CE 2K L
PCSA CE 1K L
PCSA CE ØK L
PCSD CSA (23:ØØ) ØØ H
PCSD CSA (23:ØØ) Ø1 H
PCSD CSA (23:ØØ) Ø2 H
PCSD CSA (23:ØØ) Ø3 H
PCSD CSA (23:ØØ) Ø4 H
PCSD CSA (23:ØØ) Ø5 H
PCSD CSA (23:ØØ) Ø6 H
PCSD CSA (23:ØØ) Ø7 H
PCSD CSA (23:ØØ) Ø8 H
PCSD CSA (23:ØØ) Ø9 H

7643 A9 E35 — 74S24Ø E26 (1)
7643 A9 E34 — 74S24Ø E26 (2) → AV2 → BUS CS 23 H (DDPJ, PCSB, WCSH)
7643 A9 E33 — 74S24Ø E26 (4) → BM2 → BUS CS 22 H (CEHF, PCSB, WCSH)
7643 A9 E32 — 74S24Ø E26 (6) → BM1 → BUS CS 21 H (CEHF, PCSB, WCSH)
74S24Ø E26 (8) → BL1 → BUS CS 20 H (CEHF, PCSB, WCSH)

7643 A9 E31 — 74S24Ø E26 (19)
7643 A9 E30 — 74S24Ø E26 (17) → BC1 → BUS CS 19 H (DDPJ, PCSB, WCSH)
7643 A9 E29 — 74S24Ø E26 (15) → BB2 → BUS CS 18 H (DDPJ, PCSB, WCSH)
7643 A9 E28 — 74S24Ø E26 (13) → BB1 → BUS CS 17 H (DDPJ, PCSB, WCSH)
74S24Ø E26 (11) → BA1 → BUS CS 16 H (DDPJ, PCSB, WCSH)

(BUS CS (23:16))
(NORMAL SLOT 22)
(OPTION SLOT 20 OR 18)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE (PCSH)	D	CS	M8234 - Ø - 1	B
SCALE —	SHEET 8 OF 17		DIST.	

M8234-Ø-1 REV B
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PCSA CS EN (31:00) L

PCSA CE 3K L

PCSA CE 2K L

PCSA CE 1K L

PCSA CE 0K L

PCSD CSA (47:24) 00 H
PCSD CSA (47:24) 01 H
PCSD CSA (47:24) 02 H
PCSD CSA (47:24) 03 H
PCSD CSA (47:24) 04 H
PCSD CSA (47:24) 05 H
PCSD CSA (47:24) 06 H
PCSD CSA (47:24) 07 H
PCSD CSA (47:24) 08 H
PCSD CSA (47:24) 09 H

7643 A9 E46 — 74S240 E37 (1) → BS1 (18) → BUS CS 31 H (CEHD, PCSC, WCSJ)
7643 A9 E45 — 74S240 E37 (2) → BR2 (16) → BUS CS 30 H (CEHD, PCSC, WCSJ)
7643 A9 E44 — 74S240 E37 (6) → BR1 (14) → BUS CS 29 H (CEHD, CEHF, PCSC, WCSJ)
7643 A9 E43 — 74S240 E37 (8) → BP2 (12) → BUS CS 28 H (CEHD, CEHF, PCSC, WCSJ)
7643 A9 E42 — 74S240 E37 (19) → BP1 (3) → BUS CS 27 H (CEHD, CEHF, PCSC, WCSJ)
7643 A9 E41 — 74S240 E37 (17) → BN1 (5) → BUS CS 26 H (CEHD, CEHF, PCSC, WCSJ)
7643 A9 E40 — 74S240 E37 (13) → BD2 (7) → BUS CS 25 H (DCPH, PCSB, WCSJ)
7643 A9 E39 — 74S240 E37 (11) → BD1 (9) → BUS CS 24 H (DDPJ, PCSB, WCSJ)

(BUS CS (31:24))

(NORMAL SLOT 22)
(OPTION SLOT 20 OR 18)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	PROM CONTROL STORE (PCSJ)	SIZE D	CODE CS	NUMBER M8234-0-1 REV. B
SCALE		SHEET 9 OF 17	DIST.	

M8234-0-1 REV. B
SIZE D CODE CS NUMBER M8234-0-1

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PCSA CS EN (63:32) L

PCSA CE 3K L

PCSA CE 2K L

PCSA CE 1K L

PCSA CE ØK L

PCSD CSA (47:24) ØØ H
PCSD CSA (47:24) Ø1 H
PCSD CSA (47:24) Ø2 H
PCSD CSA (47:24) Ø3 H
PCSD CSA (47:24) Ø4 H
PCSD CSA (47:24) Ø5 H
PCSD CSA (47:24) Ø6 H
PCSD CSA (47:24) Ø7 H
PCSD CSA (47:24) Ø8 H
PCSD CSA (47:24) Ø9 H

7643 E59 — 74S24Ø E48 → BV2 → BUS CS 39 H (DAPJ, PCSB, WCSK)
7643 E58 — 74S24Ø E48 → BU2 → BUS CS 38 H (DAPJ, PCSB, WCSK)
7643 E57 — 74S24Ø E48 → BU1 → BUS CS 37 H (DAPJ, PCSB, WCSK)
7643 E56 — 74S24Ø E48 → BT2 → BUS CS 36 H (DAPJ, PCSB, WCSK)
7643 E55 — 74S24Ø E48 → BS2 → BUS CS 35 H (DAPJ, PCSB, WCSK)
7643 E54 — 74S24Ø E48 → BF1 → BUS CS 34 H (DCPH, PCSB, WCSK)
7643 E53 — 74S24Ø E48 → BE2 → BUS CS 33 H (DCPH, PCSB, WCSK)
7643 E52 — 74S24Ø E48 → BE1 → BUS CS 32 H (DCPH, PCSB, WCSK)

(BUS CS (39:32))

(NORMAL SLOT 22)
(OPTION SLOT 2Ø OR 18)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	PROM CONTROL STORE (PCSK)	SIZE D	CODE CS	NUMBER M8234-Ø-1 REV. B
SCALE		SHEET 10 OF 17	DIST.	

M8234-Ø-1 REV B

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PCSA CS EN (63:32) L

PCSA CE 3K L

PCSA CE 2K L

PCSA CE 1K L

PCSA CE ØK L

PCSD CSA (47:24) ØØ H
PCSD CSA (47:24) Ø1 H
PCSD CSA (47:24) Ø2 H
PCSD CSA (47:24) Ø3 H
PCSD CSA (47:24) Ø4 H
PCSD CSA (47:24) Ø5 H
PCSD CSA (47:24) Ø6 H
PCSD CSA (47:24) Ø7 H
PCSD CSA (47:24) Ø8 H
PCSD CSA (47:24) Ø9 H

7643 E72 — 74S240 E62 → BUS CS 47 H (TBMN, PCSB, WCSL)
7643 E71 — 74S240 E62 → BUS CS 46 H (TBMN, PCSB, WCSL)
7643 E70 — 74S240 E62 → BUS CS 45 H (TBMN, ICLH, PCSB, WCSL)
7643 E69 — 74S240 E62 → BUS CS 44 H (TBMN, ICLH, PCSB, WCSL)
7643 E68 — 74S240 E62 → BUS CS 43 H (TBMN, ICLH, PCSB, WCSL)
7643 E67 — 74S240 E62 → BUS CS 42 H (TBMN, ICLH, PCSB, WCSL)
7643 E66 — 74S240 E62 → BUS CS 41 H (DAPJ, PCSB, WCSL)
7643 E65 — 74S240 E62 → BUS CS 40 H (DAPJ, PCSB, WCSL)

(BUS CS (47:40))

(NORMAL SLOT 22)
(OPTION SLOT 20 OR 18)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE (PCSL)	D	CS	M8234 - Ø - 1	B
SCALE —	SHEET 11 OF 17		DIST.	

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PCSA CS EN (63:32) L

PCSA CE 3K L

PCSA CE 2K L

PCSA CE 1K L

PCSA CE ØK L

PCSD CSA (71:48) ØØ H
PCSD CSA (71:48) Ø1 H
PCSD CSA (71:48) Ø2 H
PCSD CSA (71:48) Ø3 H
PCSD CSA (71:48) Ø4 H
PCSD CSA (71:48) Ø5 H
PCSD CSA (71:48) Ø6 H
PCSD CSA (71:48) Ø7 H
PCSD CSA (71:48) Ø8 H
PCSD CSA (71:48) Ø9 H

7643 A9 E84 — 74S24Ø E74 → DD1 → BUS CS 53 H (DAPP, PCSB, WCSM)
7643 A9 E83 — 74S24Ø E74 → DD2 → BUS CS 55 H (DAPH, ACC-SLOT 28, PCSB, WCSM)
7643 A9 E82 — 74S24Ø E74 → DT2 → BUS CS 52 H (DAPP, PCSB, WCSM)
7643 A9 E81 — 74S24Ø E74 → DU2 → BUS CS 54 H (DAPP, PCSB, WCSM)
7643 A9 E80 — 74S24Ø E74 → CP1 → BUS CS 5Ø H (DAPD, PCSB, WCSM)
7643 A9 E79 — 74S24Ø E74 → DP2 → BUS CS 51 H (DAPP, PCSB, WCSM)
7643 A9 E78 — 74S24Ø E74 → CN1 → BUS CS 49 H (DAPD, PCSB, WCSM)
7643 A9 E77 — 74S24Ø E74 → CD2 → BUS CS 48 H (DAPD, PCSB, WCSM)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ3	B

(BUS CS (55:48))
(NORMAL SLOT 22)
(OPTION SLOT 2Ø OR 18)

TITLE: PROM CONTROL STORE (PCSM)
SIZE: D | CODE: CS | NUMBER: M8234-Ø-1 | REV: B
SCALE: — | SHEET 12 OF 17 | DIST.

M8234-Ø-1 B

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PCSA CS EN (63:32) L
PCSA CE 3K L
PCSA CE 2K L
PCSA CE 1K L
PCSA CE ØK L
PCSD CSA (71:48) ØØ H
PCSD CSA (71:48) Ø1 H
PCSD CSA (71:48) Ø2 H
PCSD CSA (71:48) Ø3 H
PCSD CSA (71:48) Ø4 H
PCSD CSA (71:48) Ø5 H
PCSD CSA (71:48) Ø6 H
PCSD CSA (71:48) Ø7 H
PCSD CSA (71:48) Ø8 H
PCSD CSA (71:48) Ø9 H

7643 A9 E95 — 74S24Ø E86 (1) — DØ
7643 A9 E94 — 74S24Ø E86 (2) — 18 DS2 → BUS CS 63 H (DCPK, ICLF, PCSC, WCSN)
7643 A9 E93 — 74S24Ø E86 (4) — 16 DP1 → BUS CS 62 H (DCPK, ICLF, PCSC, WCSN)
7643 A9 E92 — 74S24Ø E86 (6) — 14 DN1 → BUS CS 61 H (DCPK, ICLF, PCSC, WCSN)
7643 A9 E91 — 74S24Ø E86 (8) — 12 DM1 → BUS CS 60 H (DCPK, ICLF, PCSC, WCSN)
7643 A9 E9Ø — 74S24Ø E86 (19) — 3 DJ2 → BUS CS 59 H (DCPK, ICLF, PCSC, WCSN)
7643 A9 E89 — 74S24Ø E86 (17) — 5 DJ1 → BUS CS 58 H (DCPK, ICLF, PCSB, WCSN)
7643 A9 E88 — 74S24Ø E86 (13) — 7 DH2 → BUS CS 57 H (DAPH, ACC - SLOT 28, PCSB, WCSN)
74S24Ø E86 (11) — 9 DF2 → BUS CS 56 H (DAPH, ACC - SLOT 28, PCSB, WCSN)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ3	B

(BUS CS (63:56))
(NORMAL SLOT 22)
(OPTION SLOT 20 OR 18)

TITLE PROM CONTROL STORE (PCSN)
SIZE D | CODE CS | NUMBER M8234-Ø-1 | REV. B
SCALE — | SHEET 13 OF 17 | DIST.

SIZE D | CODE CS | NUMBER M8234-Ø-1 | REV. B

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PCSA CS EN (95:64) L

PCSA CE 3K L

PCSA CE 2K L

PCSA CE 1K L

PCSA CE ØK L

PCSD CSA (71:48) ØØ H
PCSD CSA (71:48) Ø1 H
PCSD CSA (71:48) Ø2 H
PCSD CSA (71:48) Ø3 H
PCSD CSA (71:48) Ø4 H
PCSD CSA (71:48) Ø5 H
PCSD CSA (71:48) Ø6 H
PCSD CSA (71:48) Ø7 H
PCSD CSA (71:48) Ø8 H
PCSD CSA (71:48) Ø9 H

7643 E1Ø7 — 74S24Ø E97 (1) → DD1 BUS CS 71 H (WCSP, ACC - SLOT 28, PCSA, PCSB)

7643 E1Ø6 — 74S24Ø E97 (2) → DC1 BUS CS 70 H (WCSP, ACC - SLOT 28, PCSA, PCSB)

7643 E1Ø5 — 74S24Ø E97 (6) → EU1 BUS CS 69 H (WCSP, PCSB, DAPA, DAPB)

7643 E1Ø5 — 74S24Ø E97 (8) → ET2 BUS CS 68 H (DAPA, DAPB, PCSB, WCSP)

7643 E1Ø4

7643 E1Ø3 — 74S24Ø E97 (19)

7643 E1Ø2 — 74S24Ø E97 (17) → ES2 BUS CS 67 H (DAPA, DAPB, PCSB, WCSP)

7643 E1Ø2 — 74S24Ø E97 (15) → EP2 BUS CS 66 H (DAPA, DAPB, PCSB, WCSP)

7643 E1Ø1 — 74S24Ø E97 (13) → EU1 BUS CS 65 H (USCA, PCSB, WCSP)

7643 E1Ø1 — 74S24Ø E97 (11) → EH2 BUS CS 64 H (USCA, PCSB, WCSP)

7643 E1ØØ

(BUS CS (71:64))

(NORMAL SLOT 22)
(OPTION SLOT 2Ø OR 18)

REVISIONS		
CHK	CHANGE NO.	REV.
	ECO ØØ3	B

TITLE PROM CONTROL STORE (PCSP)
SIZE D CODE CS NUMBER M8234 - Ø - 1 REV. B
SCALE — SHEET 14 OF 17 D.I.T.

M8234 - Ø - 1 REV. B

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PCSA CS EN (95:64) L

PCSA CE 3K L

PCSA CE 2K L

PCSA CE 1K L

PCSA CE ØK L

PCSD CSA (95:72) ØØ H
PCSD CSA (95:72) Ø1 H
PCSD CSA (95:72) Ø2 H
PCSD CSA (95:72) Ø3 H
PCSD CSA (95:72) Ø4 H
PCSD CSA (95:72) Ø5 H
PCSD CSA (95:72) Ø6 H
PCSD CSA (95:72) Ø7 H
PCSD CSA (95:72) Ø8 H
PCSD CSA (95:72) Ø9 H

7643 A9 E12Ø — 74S24Ø E1Ø9
7643 A9 E119 — 74S24Ø E1Ø9 → FB1 → BUS CS 79 H (DAPC, CEHD, PCSB, WCSR)
7643 A9 E118 — 74S24Ø E1Ø9 → EA1 → BUS CS 78 H (DAPC, CEHD, PCSB, WCSR)
7643 A9 E117 — 74S24Ø E1Ø9 → EB1 → BUS CS 77 H (DAPH, PCSB, WCSR)
74S24Ø E1Ø9 → EP1 → BUS CS 76 H (USCA, PCSB, WCSR)

7643 A9 E116 — 74S24Ø E1Ø9
7643 A9 E115 — 74S24Ø E1Ø9 → EN1 → BUS CS 75 H (USCA, PCSB, WCSR)
7643 A9 E114 — 74S24Ø E1Ø9 → EM1 → BUS CS 74 H (USCA, ICLE, PCSB, WCSR)
7643 A9 E113 — 74S24Ø E1Ø9 → EK2 → BUS CS 73 H (USCA, ICLE, PCSB, WCSR)
74S24Ø E1Ø9 → EJ2 → BUS CS 72 H (USCA, ICLE, PCSB, WCSR)

(BUS CS (79:72))

(NORMAL SLOT 22)
(OPTION SLOT 2Ø OR 18)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE (PCSR)	D	CS	M8234-Ø-1	B
SCALE —	SHEET 15 OF 17	DIST.		

M8234-Ø-1 REV B

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PCSA CS EN (95:64) L

PCSA CE 3K L

PCSA CE 2K L

PCSA CE 1K L

PCSA CE ØK L

PCSD CSA (95:72) ØØ H
PCSD CSA (95:72) Ø1 H
PCSD CSA (95:72) Ø2 H
PCSD CSA (95:72) Ø3 H
PCSD CSA (95:72) Ø4 H
PCSD CSA (95:72) Ø5 H
PCSD CSA (95:72) Ø6 H
PCSD CSA (95:72) Ø7 H
PCSD CSA (95:72) Ø8 H
PCSD CSA (95:72) Ø9 H

7643 E132 — A9 A8 A7 A6 A5 A4 A3 A2 A1 AØ CS2 CS1 — D3 D2 D1 DØ
7643 E131
7643 E130
7643 E129
7643 E128
7643 E127
7643 E126
7643 E125

74S240 E110

- FV2 — BUS CS 87 H (DAPE, PCSB, WCSS)
- FU2 — BUS CS 86 H (DAPE, PCSB, WCSS)
- FU1 — BUS CS 85 H (DAPE, PCSB, WCSS)
- FT2 — BUS CS 84 H (DAPD, PCSB, WCSS)
- FS2 — BUS CS 83 H (DAPD, PCSB, WCSS)
- FS1 — BUS CS 82 H (DAPD, PCSB, WCSS)
- FL1 — BUS CS 81 H (DAPC, PCSB, WCSS)
- FC1 — BUS CS 80 H (DAPC, PCSB, WCSS)

(BUS CS (87:80))

(NORMAL SLOT 22)
(OPTION SLOT 20 OR 18)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	PROM CONTROL STORE (PCSS)	SIZE D / CODE CS	NUMBER M8234-Ø-1 / REV. B
SCALE	—	SHEET 16 OF 17	DIST.

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PCSA CS EN (95:64) L

PCSA CE 3K L

PCSA CE 2K L

PCSA CE 1K L

PCSA CE ØK L

PCSD CSA (95:72) ØØ H
PCSD CSA (95:72) Ø1 H
PCSD CSA (95:72) Ø2 H
PCSD CSA (95:72) Ø3 H
PCSD CSA (95:72) Ø4 H
PCSD CSA (95:72) Ø5 H
PCSD CSA (95:72) Ø6 H
PCSD CSA (95:72) Ø7 H
PCSD CSA (95:72) Ø8 H
PCSD CSA (95:72) Ø9 H

7643 A9 E145 — 74S240 E134 — FK2 — BUS CS 95 H (IDPH, PCSC, WCST)
7643 A9 E144 — 74S240 E134 — FK1 — BUS CS 94 H (IDPH, PCSC, WCST)
7643 A9 E143 — 74S240 E134 — FJ2 — BUS CS 93 H (IDPH, PCSC, WCST)
7643 A9 E142 — 74S240 E134 — FJ1 — BUS CS 92 H (IDPH, PCSC, WCST)
7643 A9 E141 — 74S240 E134 — FR2 — BUS CS 91 H (DBPA, PCSC, WCST)
7643 A9 E140 — 74S240 E134 — FR1 — BUS CS 90 H (DBPA, PCSB, WCST)
7643 A9 E139 — 74S240 E134 — FP2 — BUS CS 89 H (DBPA, PCSB, WCST)
7643 A9 E138 — 74S240 E134 — FP1 — BUS CS 88 H (DBPA, PCSB, WCST)

REVISIONS		
CHK	CHANGE NO.	REV.

(BUS CS (95:88))

(NORMAL SLOT 22)
(OPTION SLOT 20 OR 18)

TITLE	SIZE	CODE	NUMBER	REV.
PROM CONTROL STORE (PCST)	D	CS	M8234-Ø-1	B
SCALE —	SHEET 17 OF 17	DIST.		

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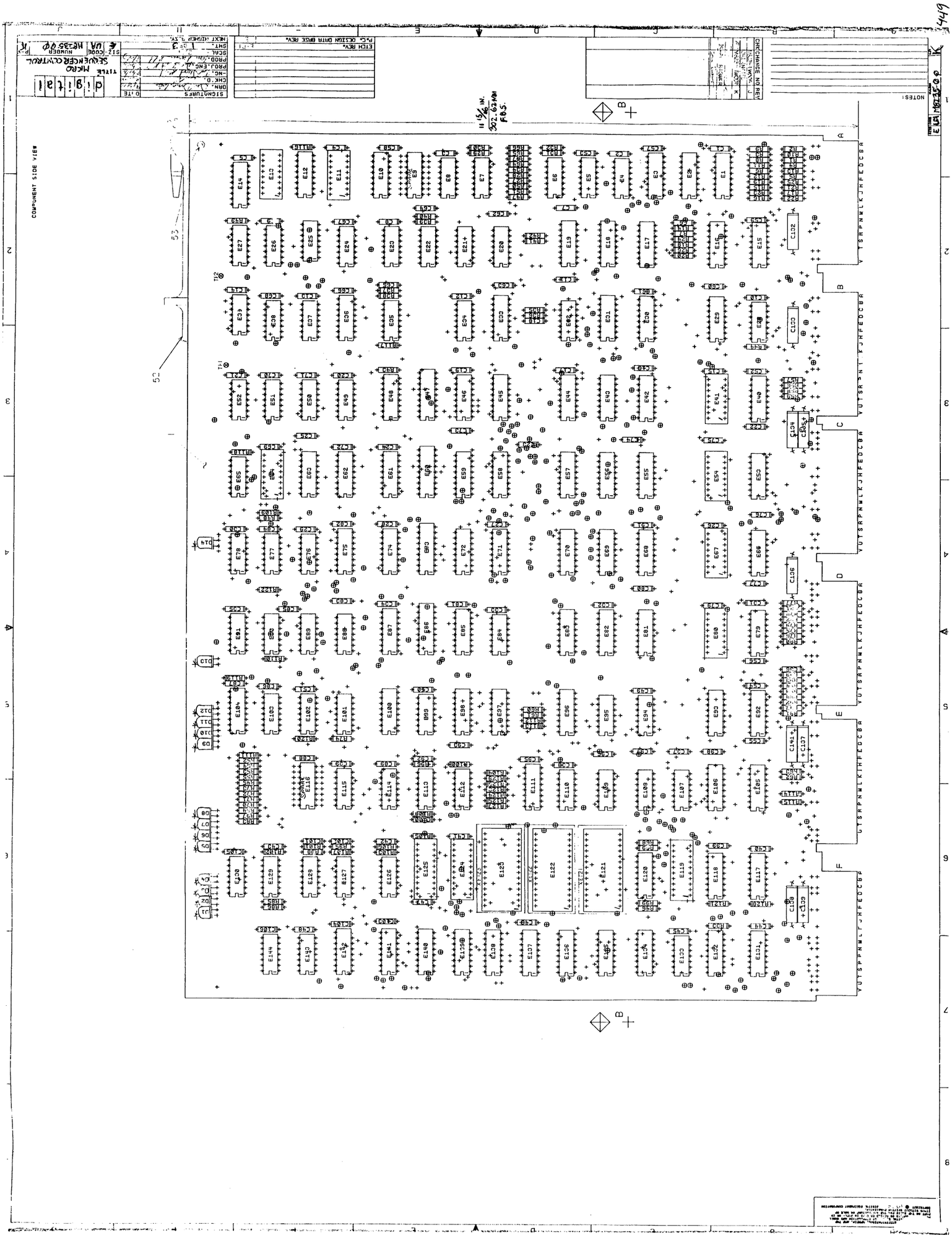
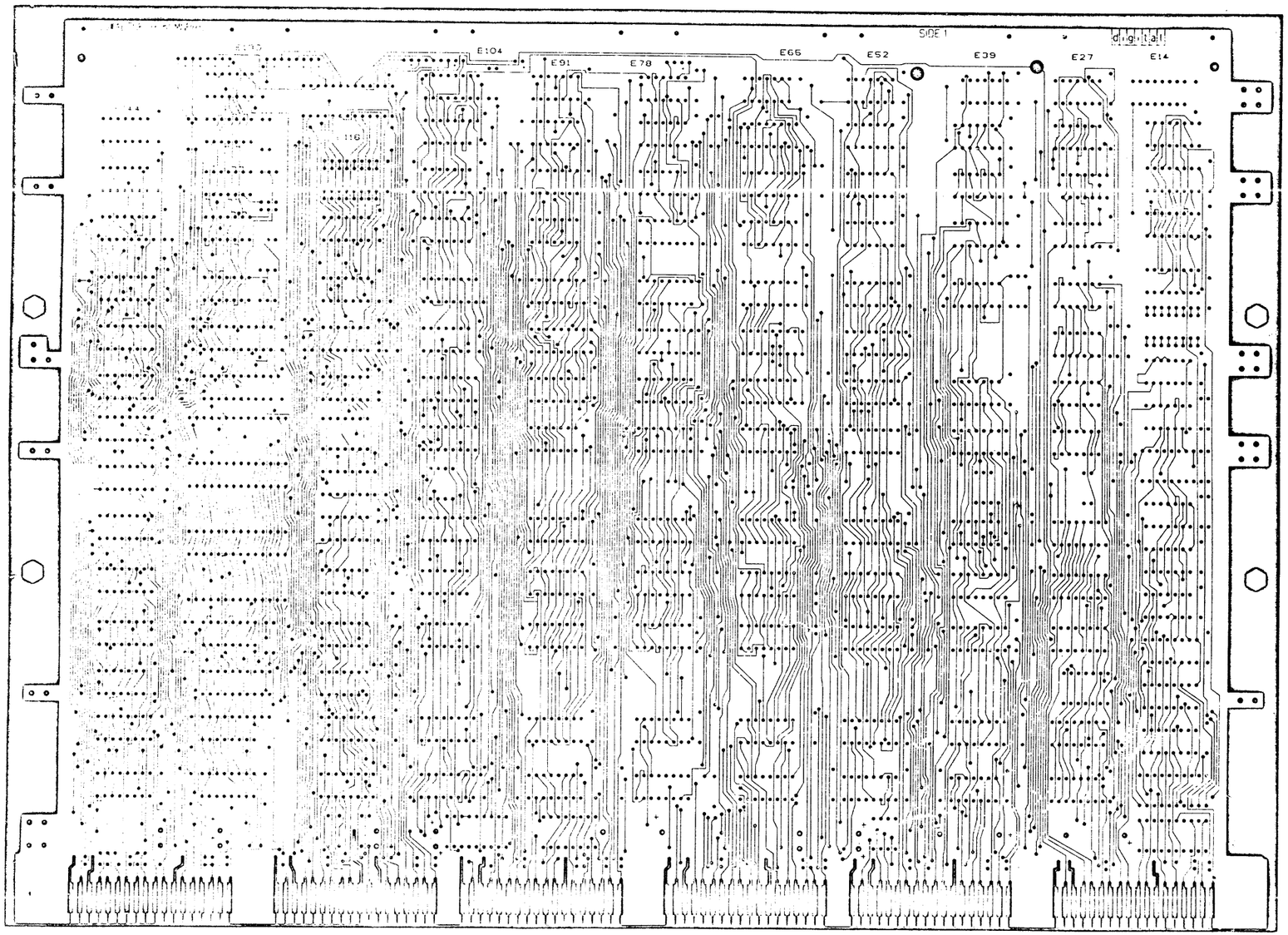

COMPONENT SIDE VIEW
11 1/16 IN.
282.62MM
F.O.S.
NOTES:
ECN 1449
digital
MICRO
SCSI/EXPERT CONTROL
SIZE CODE
NUMBER
A
HC235-60
SHT. 1 OF 3
NEXT ASSEMBLY U.S.E.
PROD. ENG.
MFG.
CHK'D.
DRN.
SIGNATURES
PCB DESIGN DATA SPEC REV.
ETCH REV.
ECN/CHANGE ORDER
REV
DESCRIPTION
DATE
APPROVED

LAYER 1



MICRO SEQUENCER CONTROL

EUA MB23-0-C K

450

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL	E	UA	M8235-0-0	K
SCALE 2/1 SHEET 3 OF 3	DIST			

P A R T S L I S T

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION 00	REFERENCE DESIGNATOR
1	1	E-MD-5012546-0-0	5012546-00	M8235	1	
2	2		1012784-00	.047 MFD 50V -20+80 CER	103	C1-C77,C79-C89,C91-C93,C95-C106
3	3		1012084-01	8 MFD 25V G% 30D AL EL	9	C132-C139,C141
4	4		1110324-00	LED 1MCD@10MA PIV=3	14	D1-D14
5	5		9008085-00	TERM PCB 1POS SOLDER TURRET	2	TP1,TP2
6	6		1215006-07	SOCKET 28PIN IC LOW PROFILE	3	XE121,XE122,XE123
7	7		1300295-00	330 1/4W 5% CC	17	R1,R3,R4,R9,R12-R15,R18,R19,R22,
						CONT R23,R26,R60,R62,R112,R114
8	8		1301775-00	820 1/4W 5% CC	30	R2,R5-R8,R10,R11,R16,R17,R20,
						CONT R21,R24,R25,R27,R30,R32,R34,R36,
						CONT R37,R40,R41,R47,R50,R61,R63,R65,
						CONT R66,R69,R113,R115
9	9		1300365-00	1 K 1/4W 5% CC	35	R43,R44,R48,R49,R74,R95-R110,
						CONT R116-R129
10	10		1300247-00	120 1/4W 5% CC	10	R56,R50,R76,R78,R79,R81,R90-R93
11	11		1300250-00	150 1/4W 5% CC	10	R57,R59,R75,R77,R80,R82,R87-R89,
						CONT R94
12	12		1910532-00	74S00 NAND GATE-QUAD 2INS	3	E51,E89,E110
13	13		1912388-00	74S02 NOR GATE-QUAD 2IN,PO	2	E103,E143
14	14		1910533-00	74S03 NAND GATE-QUAD 2IN,O	3	E4,E6,E7
15	15		1910534-00	74S04 INVERTER GATE-HEX 1I	5	E49,E76,E94,E108,E133
16	16		1910535-00	74S05 INVERTER GATE-HEX 1	4	E5,E114,E115,E144
17	17		1910536-00	74S10 NAND GATE-TRIPLE 3IN	3	E91,E109,E107
18	18		1912389-00	74S08 AND GATE-QUAD 2IN,PO	1	E39
19	19		1910537-00	74S11 AND GATE-TRIPLE 3INP	5	E27,E77,E78,E88,E95
20	20		1910539-00	74S20 NAND GATE-DUAL 4INPU	1	E99
21	21		1910540-00	74S22 NAND GATE-DUAL 4INPU	7	E112,E113,E126-E130
22	22		1910542-00	74S64 A-O-I GATE 4-2-3-2	2	E52,E65
23	23		1910543-00	74S65 A-O-I GATE 4-2-3-2	8	E8,E20,E21,E22,E23,E32,E34,E35
24	24		1910545-00	74S112 FF-JK DUAL,EDGE TRIG	1	E14

REVISION HISTORY			BASIC PART NO: M8235										
ENG	ECO NUMBER	REV	SECTION A OF A	DRN: M. FUNARO	DATE: 12-APR-78		D	I	G	I	T	A	L
S,C	00004	F	SECTION,VARIATION INDEX	CHK'D: F. GAROFALO	DATE: 12-APR-78	TITLE	PARTS LIST						
LD	TW006	J	[A] 00			MIRCO SEQ. CONTROL							
S,J	TW007	K	[B]	DES,ENG: BOB SIMS	DATE: 18-MAY-78								
			[C]										
			[D]			DOCUMENT NUMBER							
			[E]										
			[F]	RESP,ENG,: L,DICKEY	DATE: 18-MAY-78	SIZE	CODE	NUMBER				REV	
			[H]										
			[J]										
			[K]	MFG,ENG,: M. TERELLA	DATE: 18-MAY-78	K	PL	M8235-0-DBP				K	
			[L]										
			[M]	ASSEMBLY NUMBER:	TOP DOCUMENT NUMBER:			FILE NAME:				EDIT #	
			[N]	E-UA-M8235-0-0	M8235			Z0387J,PLS				15	

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AUTOMATED BY PMTLST,2D(14)

P A R T S L I S T

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION 00	REFERENCE DESIGNATOR
25	25		1910546-00	74S140 NAND GATE-DUAL 4INPU	1	E28
26	26		1910547-00	74S153 MUX 1 OF 4 (DUAL)	13	E1,E31,E42,E43,E55,E56,E68,E69,
					CONT	E53,E66,E81,E82,E93
27	27		1910548-00	74S157 MUX 1 OF 2 (QUAD)	5	E12,E48,E61,E74,E87
28	28		1910550-00	74S174 FF-D HEX	4	E2,E3,E58,E71
29	29		1910552-00	74S194 SHIFT REG,,4BIT RIGH	5	E10,E46,E59,E72,E85
30	30		1910950-00	74S74 FF-D DUAL (-45 VERSI	5	E26,E37,E38,E84,E90
31	31		1910956-00	74S151 MUX 1 OF 8	3	E17,E18,E29
32	32		1910957-00	74S175 FF-D QUAD COMMON CLO	6	E63,E96,E106,E136,E138,E140
33	33		1911415-00	10125 ECL TO TTL TRNSLTR	3	E40,E79,E92
34	34		1911469-00	DEC 8640 RECEIVER,BUS,QUAD,U	1	E101
35	35		1911675-00	74S138 DECODER/DEMUX 3-8 LIN	1	E105
36	36		1911676-00	74S139 DECODER-DUAL TWO-INP	1	E75
37	37		1911712-00	74S51 AND-OR GATE-INVERT D	1	E24
38	38		1912089-00	74S85 CMPRTR-4BIT MAGNITUD	4	E97,E98,E104,E111
39	39		1912586-00	DM 85S68N REGISTER,64BIT EDGE	4	E47,E60,E73,E86
40	40		1912660-00	74S253 MUX 1 OF 4 (DUAL)	6	E117,E118,E120,E131,E132,E134
41	41		1912728-00	74S251 MUX 1 OF 8 TRI-STA	1	E135
42	42		1912746-00	DEC 74S37 NAND GATE-QUAD 2IN	2	E50,E102
43	43		1912796-00	74148 EXCODER,PRIORITY,8 T	1	E64
44	44		1912820-00	LS51 A-O-I GATE 2-WIDE 2I	1	E25
45	45		1912865-00	LS283 ADDER-4BIT BINARY FU	2	E11,E13
46	46		1913462-00	74S240 OCTAL BUFFER,INVERTI	2	E124,E125
47	47		1913671-00	74S374 FF-D OCTAL TRISTATE	1	E119
48	48		1913839-00	74LS165 SHIFT REG,,8BIT	13	E15,E16,E19,E30,E33,E36,E45,E62,
					CONT	E100,E137,E139,E141,E142
49	49		1913788-00	26S10 TRANSCEIVER,BUS,QUA	4	E41,E54,E67,E80
50	50		1913294-00	93S16 COUNTER,SYNCH UP BIN	4	E44,E57,E70,E83
51	51		23021C6-00	C5-02	1	E121
52	52		1210711-02	HANDLE,MODULE,HEX	1	
53	53		9000024-01	EYELET, ROLLED FLANGE, .121 OD X	12	
54	54		9105740-55	WIRE(WRAP)30AWG UL1423	A/R	
55	55		1300316-00	470 1/4W 5% CC	27	R29,R31,R33,R35,R38,R39,R42,R45,
					CONT	R46,R51-R55,R64,R67,R68,R70-R73,
					CONT	R83-R86,R111,R28
56	56		23039C6-00	C6-02	1	E122

0 NOTE: COMPONENTS NOT USED: C78,C90,C94,C107-C131,C140
1 NOTE: SPARE I.C.'S E9,E116

DIGITAL	TITLE	SIZE	CODE	DOCUMENT NUMBER	REV
	MIRCO SEQ. CONTROL	K	PL	M8235-0-DBP	K
	SECTION A OF A				

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+5V

DECISION POINT BRANCH (USUB CODE 3) UPC <07:00> (FROM IRC)

BUS UPC <12:00>

(USCM) 74S22

ENA BETWEEN T125 → T50

(USCM) 74S240

PICO SEQUENCER CNTL AND USUB CODE 3 (USCJ)

(USCL) UMX <12> (8:1)

UMX <11:00> (9:1)

+5V

(USUB CODE 3)

ACC OVERRIDE L

CIBN UPC 12 L

8

13

UTRAP VECTORS

(USCF) ECO DISPATCH (FPLA)

(BIT 6) NO-OP UWORD (TO STALL)

(USCF) UECO REG — T0

(USCF) UPCSV REG

VBUS IN AND VBUS CON

(USCS) (USCT) VBUS SHIFT REGISTER → VBUS OUT

COND BRANCHES

UPC SV <12:00>

(USCB) STALL + NO-OP CONTROL → CLR UWORD, ABORT CYCLE

STALL
UTRAP
PAR ERR TRAP
ECO DISPATCH
ROM NO-OP

COMPARE (A, B, A=B)

(USCH) UPC BREAK REG

(USCH) 74S20

T150 L — 8640 → SYNC PULSE

BREAK MATCH (TO CLOCK CONTROL)

(USCN) (USCP) (USCR) COND BRANCHS

NUA TERMINATOR NETWORK (USCR)

BEN <F:00> 8 WAY BR (15) — 3

BEN <17:10> 16 WAY BR (8) — 4

BEN <1B:13> 16 WAY BR (4) — 4

BEN <1D:1C> 32 WAY BR (3) — 5

UST MUX (USCK)

(USCK) MICRO STACK (85S68) 16 X 16

(USCJ) USTACK CNTL

USUB CODE 1
USUB CODE 2

T0 — USTACK REG (USCK)

(USCA) (USCN) UBEN REG AND DECODE CLR

BUS CS <76:72>

BUS CS <12:00> (USCA) UJMP REG CLR — 13

(USCA) (USCL) (USCM) BUS CS <65,64> USUB REG AND DECODE CLR

MAINT RET + CLR UWORD + INIT L

USUB CODE 0 (NO-OP)
USUB CODE 1 (USTACK PUSH)
USUB CODE 2 (USTACK POP)
USUB CODE 3 (DECISION POINT BRANCH)

(USCR) 74S22 — RETURN + MAINT RETURN

(USCC) 74S04 → WCS ADRS

(USCE) WE CNTL → WCS WRITE ENABLE

(USCC) PARITY INVERT <15>

(USCC) 13 BIT CNTR <12:00>

(USCC) MODULO 3 CNTR <14,13>

(USCC) WCS ADRS CNTR CNTL

(USCE) ID ADRS AND DIR DECODE → WCS MEM AVAILABLE

ID MUX (USCD)

(USCE) ID BUS TRANSCIEVER

ID BUS

CPU
CLK
CLOCK TRANSLATOR (USCB) → MICRO SEQ CLOCKS

REVISIONS				
CHK	CHANGE NO.	REV.		
JD	M8235-00001	C	L DICKEY	4 Nov 77
JD	M8235-00002	D	L DICKEY	21 MAR 78
JD	M8235-00003	E	L DICKEY	4 APR 78
	M8235-TW004	F	L DICKEY	10 MAY 78
JD	M8235-TW005	H	L DICKEY	12 MAY 78
	M8235-TW006	J	D. BISSON	2-9-79
JD	M8235-TW007	K	B SIMS	10 May 79
			ISAAC RAGWAR	

(BLOCK DIAGRAM) (SLOT 23)

DRN. J. Vincent	6-23-77	FIRST USED ON: digital
CHK		
ENG.		TITLE: MICRO SEQUENCER CONTROL
PROJ. ENG.		
PROD.		
NEXT HIGHER ASSY.		
SCALE		SIZE D, CODE CS, NUMBER M8235-0-1, REV. K
SHEET 1 OF 17		DIST.

DEC FORM NO. 1010-0

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NOTE: IF NOTES ON RES VALUES ARE ON ORIGINAL CK FOR PROPER RESISTORS DESIGNATIONS.

USCJ MAINT RET (I) L
USCA USUB ØI (I) H
USCA USUB ØØ (I) L
74S00 E51
74S37 E50
USCA RETURN H (USCR)

USUB FIELD		FUNCTION
ØI	ØØ	
L = Ø	L = Ø	NONE
L = Ø	H = 1	CALL (PUSH)
H = 1	L = Ø	RETURN (POP)
H = 1	H = 1	DECISION POINT BRANCH AND F.P.A.

74S175 E96.

(USCA) BUS CS 65 H — EJ1 — 13 D3 R3(I) — 15 USCA USUB ØI (I) H (USCA,J,L,M)
R3(Ø) — 14 USCA USUB ØI (I) L (USCJ)
(USCA) BUS CS 64 H — EH2 — 12 D2 R2(I) — 10 USCA USUB ØØ (I) H (USCJ,L,M)
R2(Ø) — 11 USCA USUB ØØ (I) L (USCA,J)
(USCA) BUS CS 76 H — EP1 — 5 D1 R1(I) — 7 USCA UBEN Ø4 (I) H (USCN)
R1(Ø) — 6 USCA UBEN Ø4 (I) L (USCN)
(USCA) BUS CS 12 H — AL2 — 4 DØ RØ(I) — 2 USCA UJMP 12 (I) H (USCR)
RØ(Ø) — 3
CLR CLK — 1 — 9

USCB CLK TØ B H

74S174 E3

(USCA) BUS CS 11 H — AL1 — 14 D5 R5(I) — 15 USCA UJMP 11 (I) H (USCR)
(USCA) BUS CS 10 H — AK2 — 13 D4 R4(I) — 12 USCA UJMP 1Ø (I) H (USCR)
(USCA) BUS CS Ø9 H — AK1 — 11 D3 R3(I) — 10 USCA UJMP Ø9 (I) H (USCR)
(USCA) BUS CS Ø8 H — AJ2 — 6 D2 R2(I) — 7 USCA UJMP Ø8 (I) H (USCR)
(USCA) BUS CS Ø7 H — AF1 — 4 D1 R1(I) — 5 USCA UJMP Ø7 (I) H (USCR)
(USCA) BUS CS Ø6 H — AE2 — 3 DØ RØ(I) — 2 USCA UJMP Ø6 (I) H (USCR)
CLR CLK — 1 — 9

74S174 E2

(USCA) BUS CS Ø5 H — AE1 — 14 D5 R5(I) — 15 USCA UJMP Ø5 (I) H (USCR)
(USCA) BUS CS Ø4 H — AD2 — 13 D4 R4(I) — 12 USCA UJMP Ø4 (I) H (USCR)
(USCA) BUS CS Ø3 H — AD1 — 11 D3 R3(I) — 10 USCA UJMP Ø3 (I) H (USCR)
(USCA) BUS CS Ø2 H — AC1 — 6 D2 R2(I) — 7 USCA UJMP Ø2 (I) H (USCR)
(USCA) BUS CS Ø1 H — AB2 — 4 D1 R1(I) — 5 USCA UJMP Ø1 (I) H (USCR)
(USCA) BUS CS ØØ H — AB1 — 3 DØ RØ(I) — 2 USCA UJMP ØØ (I) H (USCR)
CLR CLK — 1 — 9

USCB CLK TØ A H

USCJ INIT SEQ (I) L — 11
USCB MNT RET SEQ (I) L — 9
USCE CLR UWORD (I) L — 10
74S11 E78 — 8

+5V
R112 33Ø
R113 82Ø — EP1 — BUS CS 76 H (PCSB,R,USCA,WCSR)
R114 33Ø
R115 82Ø — EN1 — BUS CS 75 H (PCSB,R,USCA,WCSR)
R62 33Ø
R63 82Ø — EJ1 — BUS CS 65 H (PCSB,P,USCA,WCSP)
R60 33Ø
R61 82Ø — EH2 — BUS CS 64 H (PCSB,P,USCA,WCSP)
R14 33Ø
R7 82Ø — AL2 — BUS CS 12 H (PCSB,F,USCA,WCSF)
R26 33Ø
R20 82Ø — AL1 — BUS CS 11 H (PCSB,F,USCA,WCSF)
R23 33Ø
R17 82Ø — AK2 — BUS CS 10 H (PCSB,F,USCA,WCSF)

+5V
R22 33Ø
R16 82Ø — AK1 — BUS CS Ø9 H (PCSB,F,USCA,WCSF)
R15 33Ø
R21 82Ø — AJ2 — BUS CS Ø8 H (PCSB,F,USCA,WCSF)
R18 33Ø
R24 82Ø — AF1 — BUS CS Ø7 H (PCSB,E,USCA,WCSE)
R19 33Ø
R25 82Ø — AE2 — BUS CS Ø6 H (PCSB,E,USCA,WCSE)
R12 33Ø
R5 82Ø — AE1 — BUS CS Ø5 H (PCSB,E,USCA,WCSE)
F4 33Ø
R11 82Ø — AD2 — BUS CS Ø4 H (PCSB,E,USCA,WCSE)
R1 33Ø
R8 82Ø — AD1 — BUS CS Ø3 H (PCSB,E,USCA,WCSE)
R9 33Ø
R2 82Ø — AC1 — BUS CS Ø2 H (PCSB,E,USCA,WCSE)
R3 33Ø
R10 82Ø — AB2 — BUS CS Ø1 H (PCSB,E,USCA,WCSE)
R13 33Ø
R6 82Ø — AB1 — BUS CS ØØ H (PCSB,E,USCA,WCSE)

74S175 E106

(USCA) BUS CS 75 H — EN1 — 13 D3 R3(I) — 15 USCA UBEN Ø3 (I) H (USCN)
R3(Ø) — 14 USCA UBEN Ø3 (I) L (USCN)
(USCA) BUS CS 74 H — EM1 — 12 D2 R2(I) — 10 USCA UBEN Ø2 (I) H (USCN)
R2(Ø) — 11 USCA UBEN Ø2 (I) L (USCN)
(USCA) BUS CS 73 H — EK2 — 5 D1 R1(I) — 7 USCA UBEN Ø1 (I) H (USCN,P)
R1(Ø) — 6
(USCA) BUS CS 72 H — EJ2 — 4 DØ RØ(I) — 2 USCA UBEN ØØ (I) H (USCN,P)
RØ(Ø) — 3
CLR CLK — 1 — 9

USCB CLK TØ B H

(MICRO FIELD REGISTERS) (SLOT 23)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCA)	D	CS	M8235-Ø-1	K
SCALE —//— SHEET 2 OF 17 DIST.				

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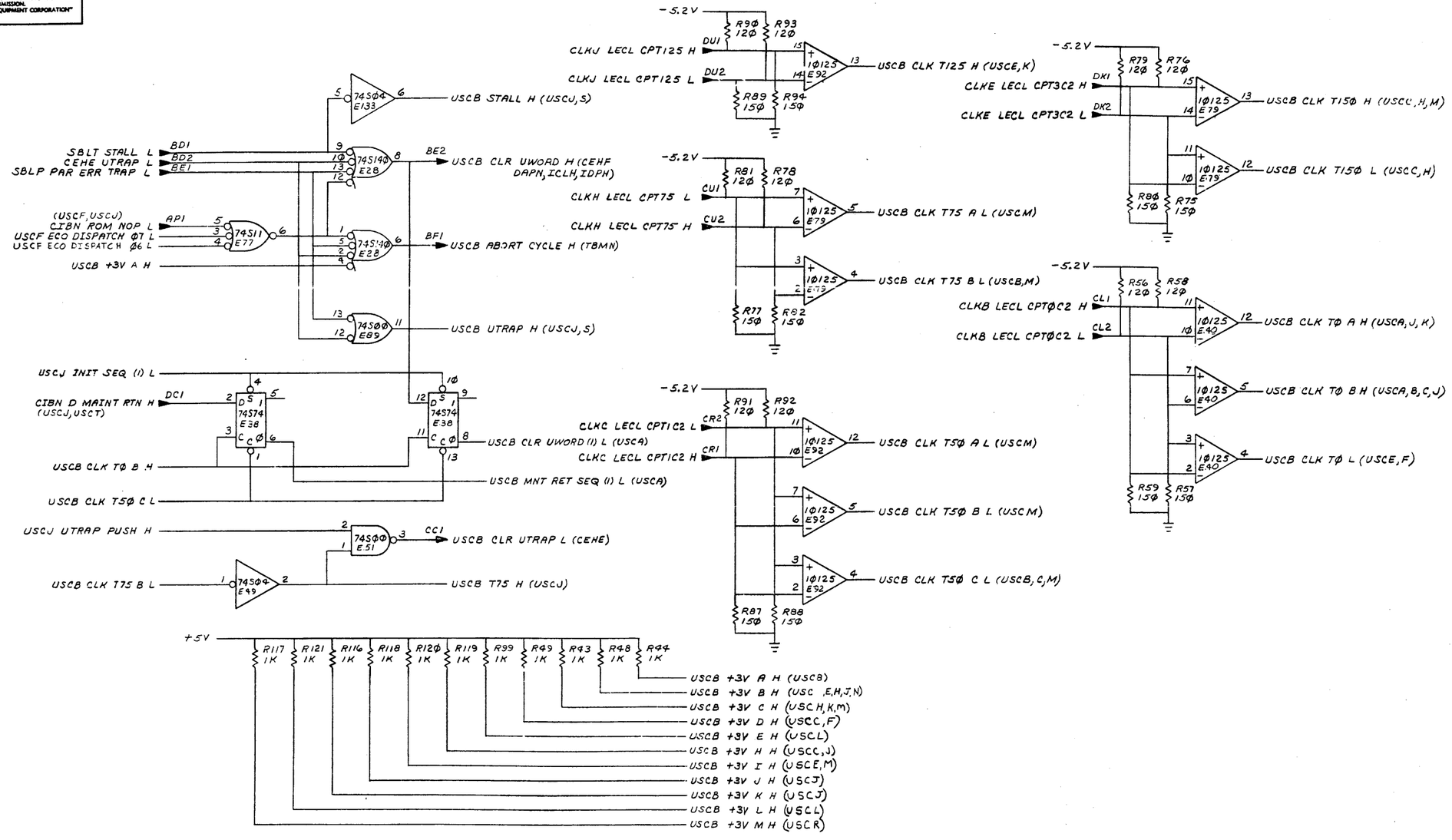

(CLOCK AND STALL CONTROL) (SLOT 23)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCB)	D	CS	M8235-Ø-1	K
SCALE —	SHEET 3 OF 17	DIST.		

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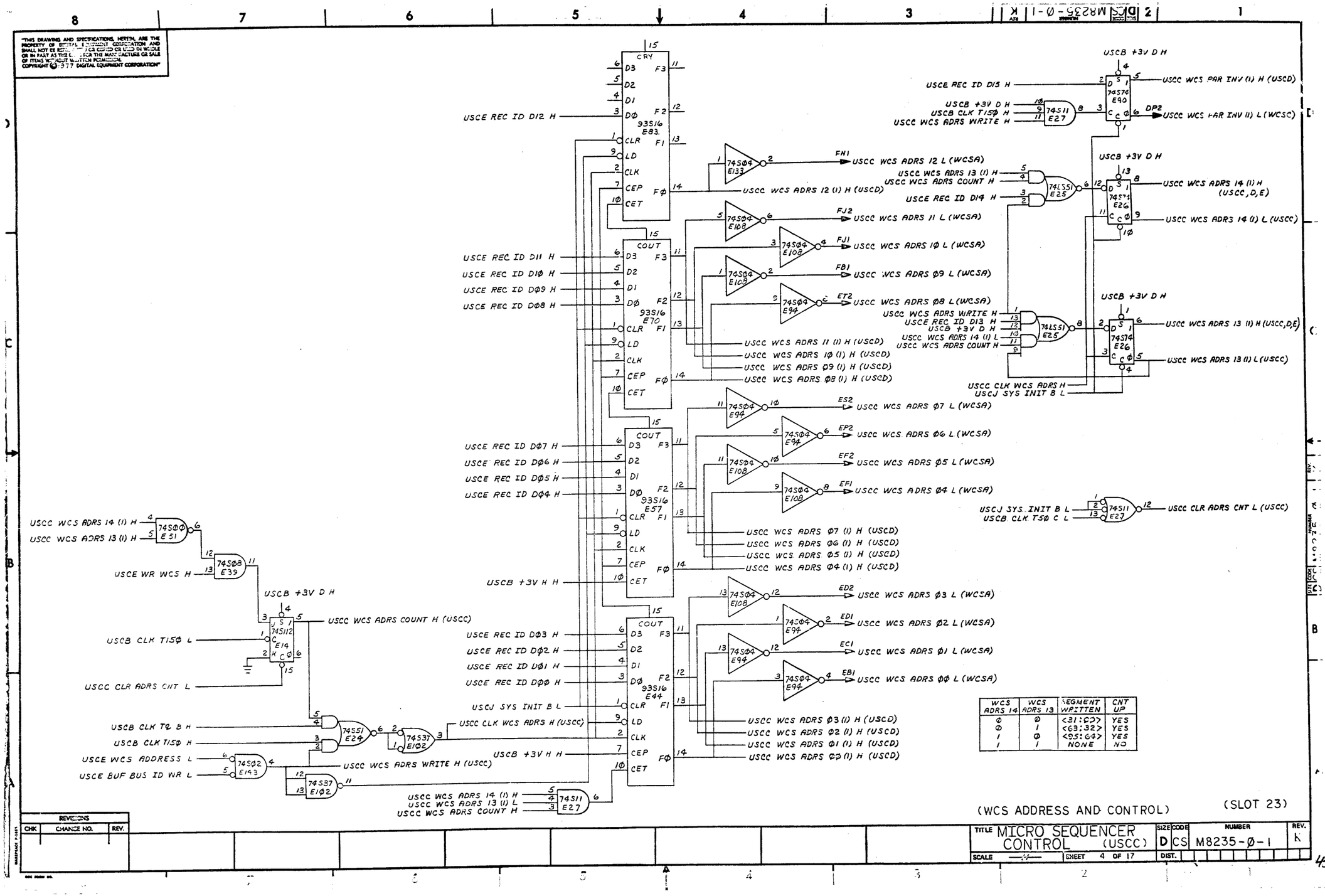

WCS ADRS 14	WCS ADRS 13	SEGMENT WRITTEN	CNT UP
Ø	Ø	<31:00>	YES
Ø	1	<63:32>	YES
1	Ø	<95:64>	YES
1	1	NONE	NO

(WCS ADDRESS AND CONTROL) (SLOT 23)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCC)	D	CS	M8235-Ø-1	K
SCALE —"	SHEET 4 OF 17	DIST.		

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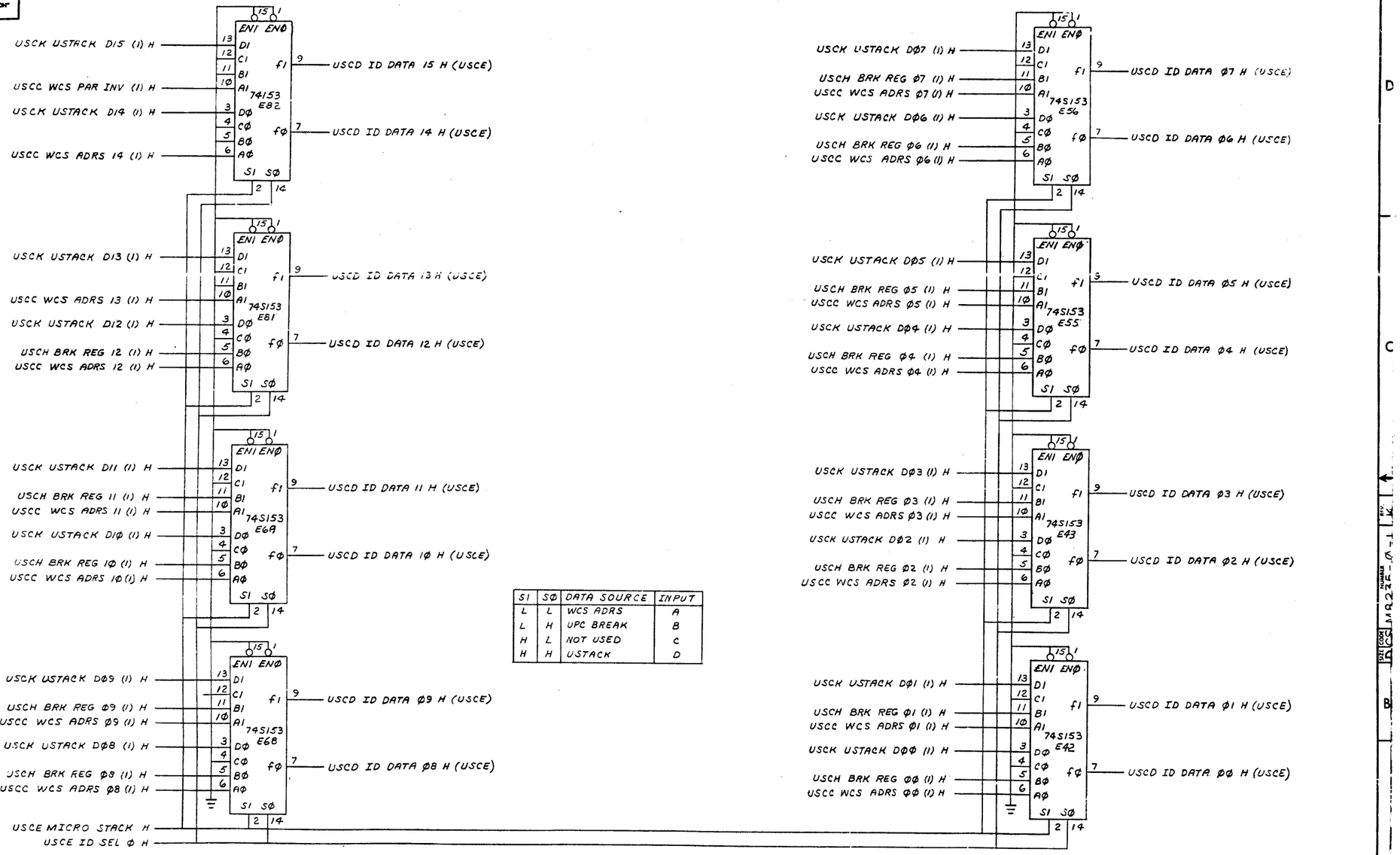

S1	SØ	DATA SOURCE	INPUT
L	L	WCS ADRS	A
L	H	UPC BREAK	B
H	L	NOT USED	C
H	H	USTACK	D

(ID BUS DATA MUX) (SLOT 23)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE MICRO SEQUENCER CONTROL (USCD)
SIZE D | CODE CS | NUMBER M8235-Ø-1 | REV K
SCALE — | SHEET 5 OF 17 | DIST.

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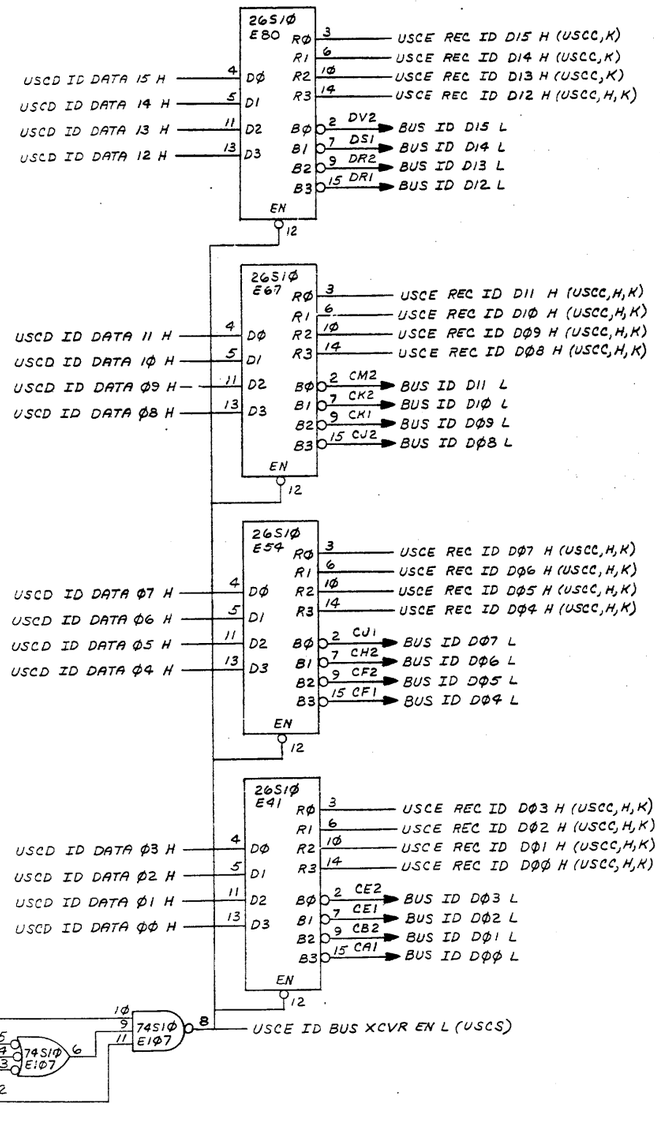
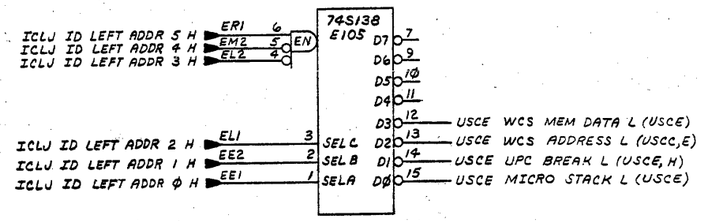
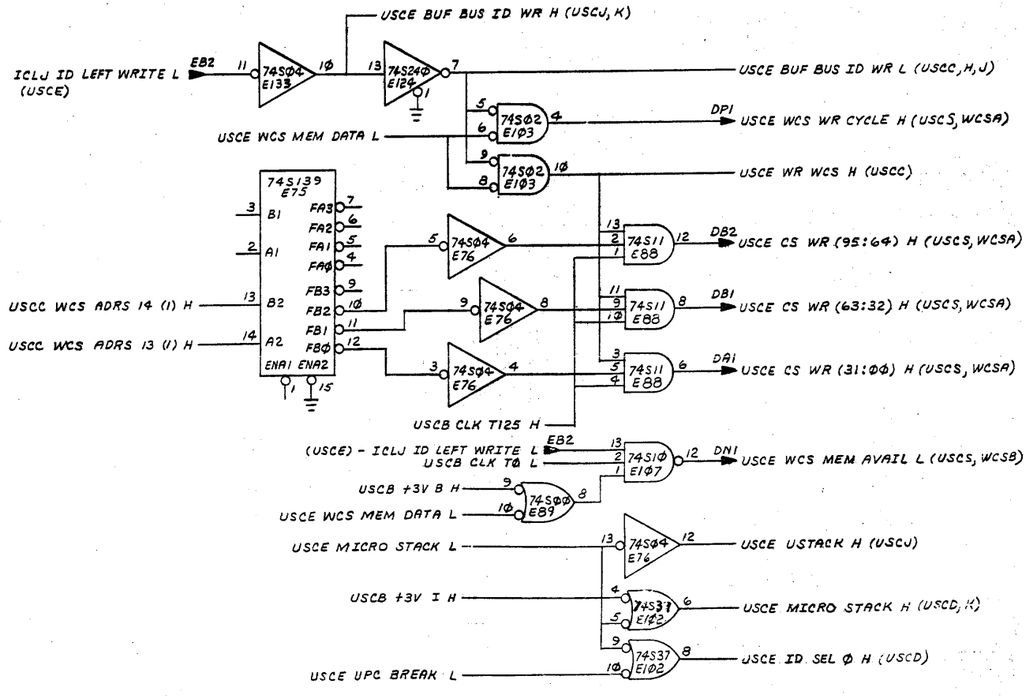
ID ADRS BIT						FUNCTION	HEX ADDRESS
Ø5	Ø4	Ø3	Ø2	Ø1	ØØ		
L	X	X	X	X	X	NONE	ØØ - 17
H	L	H	X	X	X	NONE	28 - 2F
H	H	L	X	X	X	NONE	3Ø - 37
H	H	H	X	X	X	NONE	38 - 3F
H	L	L	L	L	L	MICRO STACK	2Ø
H	L	L	L	L	H	UPC BREAK	21
H	L	L	L	H	L	WCS ADDRS	22
H	L	L	L	H	H	WCS MEM DATA	23
H	L	L	H	X	X	NONE	24 - 27







(ID BUS DRIVERS AND SELECTION DECODE) (SLOT 23)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCE)	D	CS	M8235-Ø-1	K
SCALE — H —	SHEET 6 OF 17	DIST.		

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+5V
R122 1K
RIØ9 1K

USCF ECO DISPATCH Ø7 L (USCB, J)
USCF ECO DISPATCH Ø6 L (USCB, J)

745374 E119
D7 F7 — USCF UECO Ø7 (1) L (USCL)
D6 F6 — USCF UECO Ø6 (1) L (USCL)
D5 F5 — USCF UECO Ø5 (1) L (USCL)
D4 F4 — USCF UECO Ø4 (1) L (USCL)
D3 F3 — USCF UECO Ø3 (1) L (USCL)
D2 F2 — USCF UECO Ø2 (1) L (USCL)
D1 F1 — USCF UECO Ø1 (1) L (USCL)
DØ FØ — USCF UECO ØØ (1) L (USCL)
CLK ENAB

USCF +3V F H
USCM BUF UPC 12H
DS 1 E90 S74
USCF UPCSV 12 (1) H (USCK, L, M, S.)
USCF +3V F H

745175 E140
D3 R3(1) — USCF UPCSV 11 (1) H (USCK, M, S)
R3(Ø) — USCF UPCSV 11 (1) L (USCL)
D2 R2(1) — USCF UPCSV 10 (1) H (USCK, M, S)
R2(Ø) — USCF UPCSV 10 (1) L (USCL)
D1 R1(1) — USCF UPCSV Ø9 (1) H (USCK, M, S)
R1(Ø) — USCF UPCSV Ø9 (1) L (USCL)
DØ RØ(1) — USCF UPCSV Ø8 (1) H (USCK, M, S)
RØ(Ø) — USCF UPCSV Ø8 (1) L (USCL)
CLR CLK

+5V
R11Ø 1K
FK1
USCF +3V F H (USCF, H)

745175 E138
D3 R3(1) — USCF UPCSV Ø7 (1) H (USCK, M, S)
R3(Ø) — USCF UPCSV Ø7 (1) L (USCL)
D2 R2(1) — USCF UPCSV Ø6 (1) H (USCK, M, S)
R2(Ø) — USCF UPCSV Ø6 (1) L (USCL)
D1 R1(1) — USCF UPCSV Ø5 (1) H (USCK, M, S)
R1(Ø) — USCF UPCSV Ø5 (1) L (USCL)
DØ RØ(1) — USCF UPCSV Ø4 (1) H (USCK, M, S)
RØ(Ø) — USCF UPCSV Ø4 (1) L (USCL)
CLR CLK

745175 E136
D3 R3(1) — USCF UPCSV Ø3 (1) H (USCK, M, S)
R3(Ø) — USCF UPCSV Ø3 (1) L (USCL)
D2 R2(1) — USCF UPCSV Ø2 (1) H (USCK, M, S)
R2(Ø) — USCF UPCSV Ø2 (1) L (USCL)
D1 R1(1) — USCF UPCSV Ø1 (1) H (USCK, M, S)
R1(Ø) — USCF UPCSV Ø1 (1) L (USCL)
DØ RØ(1) — USCF UPCSV ØØ (1) H (USCK, M, S)
RØ(Ø) — USCF UPCSV ØØ (1) L (USCL)
CLR CLK

CEHE CS PE TRAP H
CIBN ROM NOP L (USCB, USCJ)
USCB +3V D H
USCB CLK TØ L
74S51 E24

8251Ø1 E122 FPLA
USCM BUF UPC 12 H
USCM BUF UPC 11 H
USCM BUF UPC 10 H
USCM BUF UPC Ø9 H
USCM BUF UPC Ø8 H
USCM BUF UPC Ø7 H
USCM BUF UPC Ø6 H
USCM BUF UPC Ø5 H
USCM BUF UPC Ø4 H
USCM BUF UPC Ø3 H
USCM BUF UPC Ø2 H
USCM BUF UPC Ø1 H
USCM BUF UPC ØØ H
CF CE

8251Ø1 E121 FPLA
USCM BUF UPC 12 H
USCM BUF UPC 11 H
USCM BUF UPC 10 H
USCM BUF UPC Ø9 H
USCM BUF UPC Ø8 H
USCM BUF UPC Ø7 H
USCM BUF UPC Ø6 H
USCM BUF UPC Ø5 H
USCM BUF UPC Ø4 H
USCM BUF UPC Ø3 H
USCM BUF UPC Ø2 H
USCM BUF UPC Ø1 H
USCM BUF UPC ØØ H
CF CE

8251Ø1 E123 FPLA
USCM BUF UPC 12 H
USCM BUF UPC 11 H
USCM BUF UPC 10 H
USCM BUF UPC Ø9 H
USCM BUF UPC Ø8 H
USCM BUF UPC Ø7 H
USCM BUF UPC Ø6 H
USCM BUF UPC Ø5 H
USCM BUF UPC Ø4 H
USCM BUF UPC Ø3 H
USCM BUF UPC Ø2 H
USCM BUF UPC Ø1 H
USCM BUF UPC ØØ H
CF CE

+5V
R123 1K
R124 1K
R125 1K
R126 1K
R127 1K
R128 1K

E11Ø S00
R129 1K
+5V

(MICRO PC SAVE AND ECO REGISTER) (SLOT 23)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	MICRO SEQUENCER CONTROL (USCF)
SIZE	D
CODE	CS
NUMBER	M8235-Ø-1
REV.	K
SCALE	—
SHEET	7 OF 17
DIST.	

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USCB +3V C H

USCE REC ID D12 H

74S174 E84 — D5 D4 D3 D2 D1 D0 | C C Φ | CLR CLK

USCH BRK REG 12 (I) H (USCD)

USCM BUF UPC 12 H

74S85 E104 — B3 A3 B2 A2 B1 A1 B0 A0 | A>B A=B A<B | IN> IN= IN<

USCE REC ID D11 H
USCE REC ID D10 H
USCE REC ID D09 H
USCE REC ID D08 H
USCE REC ID D07 H
USCE REC ID D06 H

74S174 E71 — D5 D4 D3 D2 D1 D0 | R5(I) R4(I) R3(I) R2(I) R1(I) R0(I) | CLR CLK

USCH BRK REG 11 (I) H (USCD)
USCH BRK REG 10 (I) H (USCD)
USCH BRK REG 09 (I) H (USCD)
USCH BRK REG 08 (I) H (USCD)

USCM BUF UPC 11 H
USCM BUF UPC 10 H
USCM BUF UPC 09 H
USCM BUF UPC 08 H

74S85 E98 — B3 A3 B2 A2 B1 A1 B0 A0 | A>B A=B A<B | IN> IN= IN<

USCH BRK REG 07 (I) H (USCD)
USCH BRK REG 06 (I) H (USCD)
USCH BRK REG 05 (I) H (USCD)
USCH BRK REG 04 (I) H (USCD)

USCM BUF UPC 07 H
USCM BUF UPC 06 H
USCM BUF UPC 05 H
USCM BUF UPC 04 H

74S85 E97 — B3 A3 B2 A2 B1 A1 B0 A0 | A>B A=B A<B | IN> IN= IN<

USCE REC ID D05 H
USCE REC ID D04 H
USCE REC ID D03 H
USCE REC ID D02 H
USCE REC ID D01 H
USCE REC ID D00 H

74S174 E58 — D5 D4 D3 D2 D1 D0 | R5(I) R4(I) R3(I) R2(I) R1(I) R0(I) | CLR CLK

USCF +3V F H

USCH BRK REG 03 (I) H (USCD)
USCH BRK REG 02 (I) H (USCD)
USCH BRK REG 01 (I) H (USCD)
USCH BRK REG 00 (I) H (USCD)

USCM BUF UPC 03 H
USCM BUF UPC 02 H
USCM BUF UPC 01 H
USCM BUF UPC 00 H

74S85 E111 — B3 A3 B2 A2 B1 A1 B0 A0 | A>B A=B A<B | IN> IN= IN<

USCB +3V C H

USCE UPC BREAK L
USCE BUF BUS ID WR L
USCB +3V B H
USCB CLK T150 H

8640 E101 — 74S11 E77

USCH WR BRK H (USCH)

USCB CLK T150 L

8640 E101

AV2
USCH SYNC PULSE H (USCT)

SYNC PULSE IS BROUGHT TO A TEST POINT NEAR MODULE HANDLE

74S20 E99

BT2
USCH BRK MAT L
(TO CLOCK CONTROL)

(MICRO BREAK REG AND COMPARE) (SLOT 23)

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCH)	D	CS	M8235-0-1	K

SCALE — H — SHEET 8 OF 17 DIST.

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USCJ STALL (I) L
USCJ UTRAP (I) H
74S11 E77
USCJ UTRAP PUSH H (USCB)

(USCB, USCF)
CIBN ROM MOP L API

USCE BUF BUS ID WR H
USCE USTACK H
74S64 E52
USCJ USTACK DEC L (USCK)

USCJ STALL (I) H
USCJ MAINT RET (I) H
74S02 E103
USCA USUB ØI (I) L
USCA USUB ØØ (I) H

USCB +3V H H
74S10 E91
USCJ USTACK LOAD H (USCJ,K)

USCJ MAINT RET (I) H
USCB +3V H H
USCE BUF BUS ID WR L
USCE USTACK H
USCB +3V J H
74S64 E65
USCJ USTACK INC L (USCJ)

USCJ STALL (I) L
USCA USUB ØI (I) H
USCA USUB ØØ (I) L

USCJ USTACK LOAD H
C4 74LS283 E11
USCB +3V K H
74S194 E10 S1 S0 DSR D3 R3(I) D2 R2(I) D1 R1(I) D0 R0(I) CLR CLK DSL
USCB SYS INIT A L
USCB CLK T0 A H
74S157 E12 B3 A3 B2 A2 B1 A1 B0 A0 STB S0 F3 F2 F1 F0
USCJ USP03 H (USCK)
USCJ USP02 H (USCK)
USCJ USP01 H (USCK)
USCJ USP00 H (USCK)
USCJ USTACK INC L

C4 74LS283 E13
USCB +3V K H

USCJ SYS INIT B L
USCJ INIT SEQ (I) H
74S74 E37
USCJ INIT (I) H (USCN,T)
USCB T75 H
USCB CLK T0 B H
USCB +3V J H
USCJ INIT (I) L (USCJ)
USCJ INIT SEQ (I) L (USCA,B,J)

USCJ PRIOR 02 L (USCL,T)

74S74 E37
USCB UTRAP H
74S175 E63 D3 R3(I) R3(0) D2 R2(I) R2(0) D1 R1(I) R1(0) D0 R0(I) R0(0) CLR CLK
USCJ UTRAP (I) H (USCJ,T)
USCJ UTRAP (I) L (USCJ)
CIBN D MAINT RTN H DC1 (USCB, USCT)
USCJ MAINT RET (I) H (USCJ,T)
USCJ MAINT RET (I) L (USCA,J)
USCB STALL H
USCJ STALL (I) H (USCJ, M, T)
USCJ STALL (I) L (USCJ, L, M)
USCJ UECO (I) H (USCT)
USCJ UECO (I) L (USCJ)
USCJ INIT SEQ (I) L
USCB CLK T0 B H

74S04 E76
74S00 E89
74S02 E103
USCJ UMX SEL 1 H (USCL,N)
USCJ PRIOR 01 L (USCL,T)
USCJ UMX SEL 0 H (USCL)
USCJ PRIOR 00 L (USCL,T)

USCJ MAINT RET (I) H
USCB +3V B H
USCJ INIT (I) L
USCJ STALL (I) L
USCJ UTRAP (I) L
USCJ UECO (I) L
74148 E64 E1 GS A2 A1 A0 E0
USCF ECO DISPATCH 07 L
USCF ECO DISPATCH 06 L
S37 E50
USCJ ECO DISPATCH H (USCS)

CLKL UPROG INIT H EV2
USCB +3V J H
74S37 E50
USCJ SYS INIT A L (USCJ,K)
USCJ SYS INIT B L (USCC,J)

INIT	STALL	UTRAP	UECO	74148 OUTPUT A2	A1	A0	FUNCTION
H	H	H	H	H	H	H	NORMAL
H	H	H	L	H	H	L	UECO
H	H	L	X	H	L	H	UTRAP
H	L	X	X	H	L	L	STALL
L	X	X	X	L	H	H	INIT

(INTERNAL CONTROL, MICRO STACK POINTER, AND INIT) (SLOT 23)

REVISIONS
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCJ)	D	CS	M8235-0-1	K
SCALE —	SHEET 9 OF 17	DIST.		

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USCB CLK T125 H → 74S04 E49 → 74S04 E49

74S157 E87
USCE REC ID DI5 H
USCE REC ID DI4 H
USCE REC ID DI3 H
USCF UPCSV I2 (I) H
USCE REC ID DI2 H
USCE MICRO STACK H
USCE BUF BUS ID WR H
74S00 E89

74S157 E74
USCF UPCSV II (I) H
USCE REC ID DII H
USCF UPCSV IØ (I) H
USCE REC ID DIØ H
USCF UPCSV Ø9 (I) H
USCE REC ID DØ9 H
USCF UPCSV Ø8 (I) H
USCE REC ID DØ8 H

74S157 E61
USCF UPCSV Ø7 (I) H
USCE REC ID DØ7 H
USCF UPCSV Ø6 (I) H
USCE REC ID DØ6 H
USCF UPCSV Ø5 (I) H
USCE REC ID DØ5 H
USCF UPCSV Ø4 (I) H
USCE REC ID DØ4 H

74S157 E98
USCF UPCSV Ø3 (I) H
USCE REC ID DØ3 H
USCF UPCSV Ø2 (I) H
USCE REC ID DØ2 H
USCF UPCSV Ø1 (I) H
USCE REC ID DØ1 H
USCF UPCSV ØØ (I) H
USCE REC ID DØØ H

SØ	INPUT	DATA SOURCE
H	B	UPCSV
L	A	ID

85S68 E86 (WE CLK LE OE; D3 D2 D1 DØ; A3 A2 A1 AØ; L3 L2 L1 LØ)
85S68 E73
85S68 E60
85S68 E47

USCB +3V C H
USCJ USTACK DEC L
USCJ USP Ø3 H
USCJ USP Ø2 H
USCJ USP Ø1 H
USCJ USP ØØ H

74S194 E85 (SI SØ DSR; D3 D2 D1 DØ; R3(I) R2(I) R1(I) RØ(I); CLR CLK DSL)
USCK USTACK DI5 (I) H (USCD)
USCK USTACK DI4 (I) H (USCD)
USCK USTACK DI3 (I) H (USCD)
USCK USTACK DI2 (I) H (USCD,R)

74S194 E72
USCK USTACK DII (I) H (USCD,R)
USCK USTACK DIØ (I) H (USCD,R)
USCK USTACK DØ9 (I) H (USCD,R)
USCK USTACK DØ8 (I) H (USCD,R)

74S194 E59
USCK USTACK DØ7 (I) H (USCD,R)
USCK USTACK DØ6 (I) H (USCD,R)
USCK USTACK DØ5 (I) H (USCD,R)
USCK USTACK DØ4 (I) H (USCD,R)

74S194 E96
USCJ USTACK LOAD H
USCK USTACK DØ3 (I) H (USCD,R)
USCK USTACK DØ2 (I) H (USCD,R)
USCK USTACK DØ1 (I) H (USCD,R)
USCK USTACK DØØ (I) H (USCD,R)

USCJ SYS INIT A L
USCB CLK TØ A H

(MICRO STACK) (SLOT 23)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCK)	D	CS	M8235-Ø-1	K
SCALE —	SHEET 10 OF 17		DIST.	

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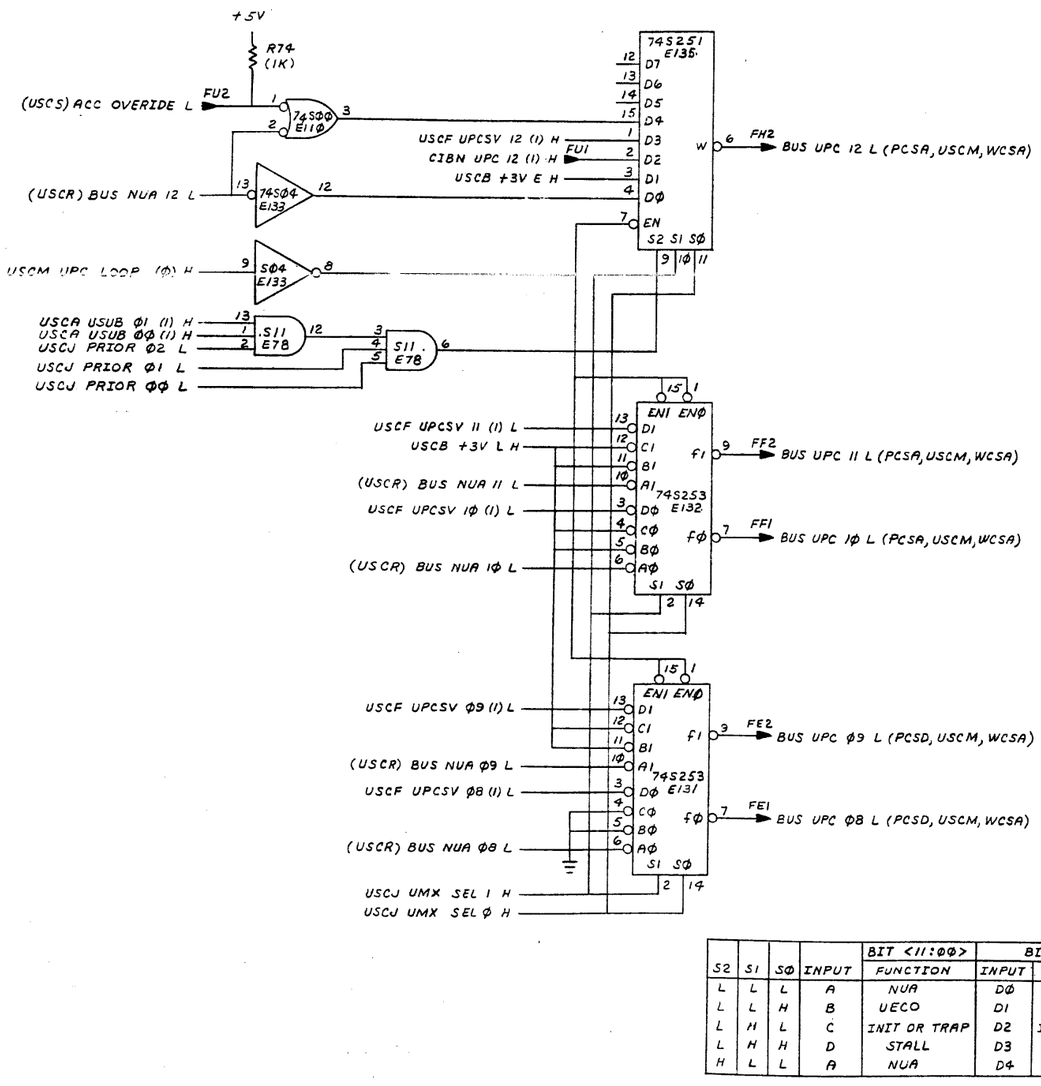
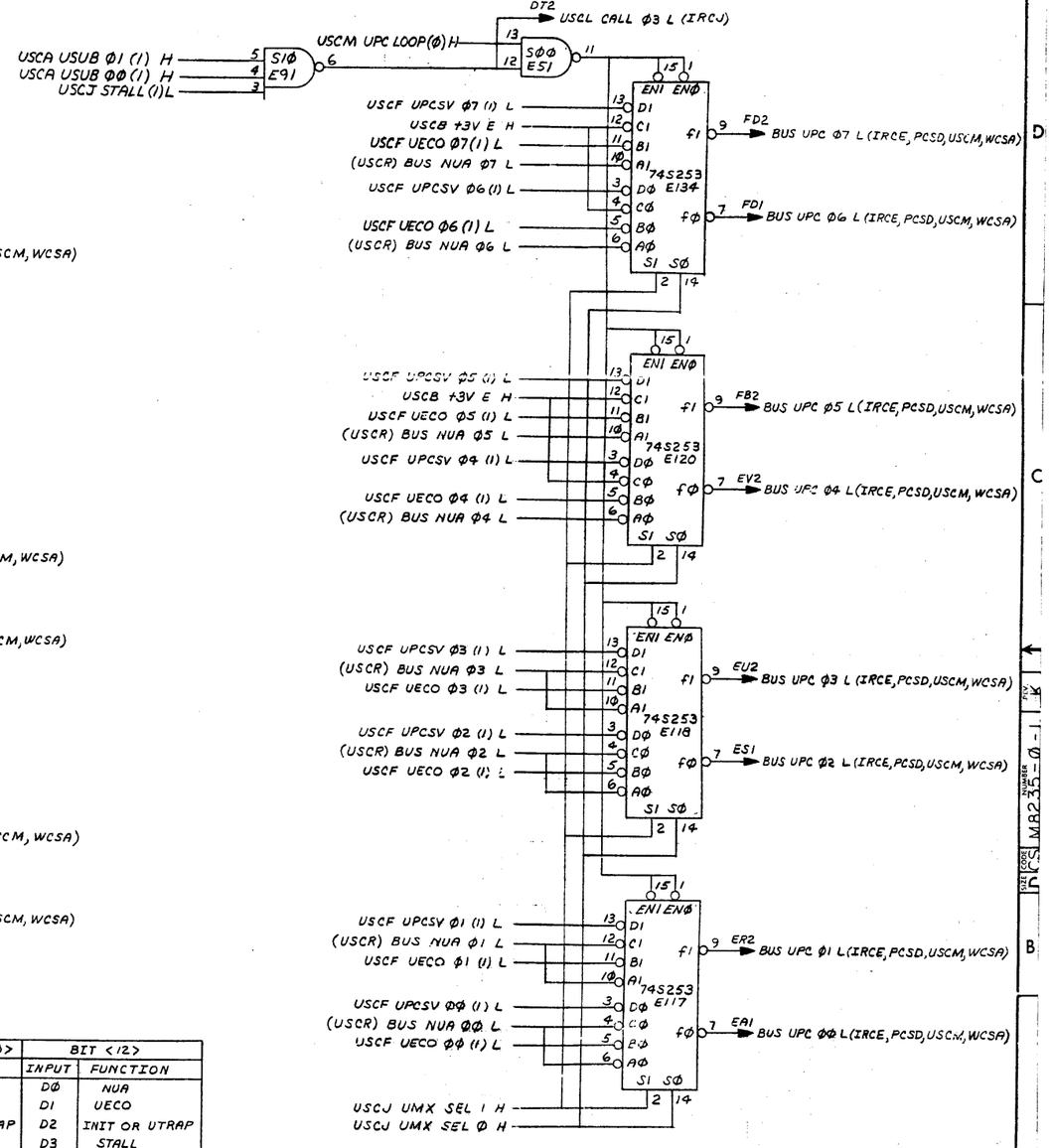


S2	S1	SØ	INPUT	BIT <11:ØØ> FUNCTION	BIT <12> INPUT	BIT <12> FUNCTION
L	L	L	A	NUA	DØ	NUA
L	L	H	B	UECO	D1	UECO
L	H	L	C	INIT OR TRAP	D2	INIT OR UTRAP
L	H	H	D	STALL	D3	STALL
H	L	L	A	NUA	D4	FPA



(MICRO MULTIPLEXER) (SLOT 23)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCL)	D	CS	M8235-Ø-1	K
SCALE —	SHEET 11 OF 17	DIST.		

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USCB +3V I H
USCB CLK T75 B L
USCB CLK T5Φ B L

(USCL,M) BUS UPC 12 L (PCSA,WCSA) — FH2 — USCM BUF UPC 12 H (USCF,H,T) — BUS UPC 12 L (USCL,M) (PCSA,WCSA)
(USCL,M) BUS UPC 11 L (PCSA,WCSA) — FF2 — USCM BUF UPC 11 H (USCF,H,T) — BUS UPC 11 L (USCL,M) (PCSA,WCSA)
(USCL,M) BUS UPC 1Φ L (PCSA,WCSA) — FF1 — USCM BUF UPC 1Φ H (USCF,H,T) — BUS UPC 1Φ L (USCL,M) (PCSA,WCSA)
(USCL,M) BUS UPC Φ9 L (PCSO,WCSA) — FE2 — USCM BUF UPC Φ9 H (USCF,H,T) — BUS UPC Φ9 L (USCL,M) (PCSO,WCSA)
(USCL,M) BUS UPC Φ8 L (PCSO,WCSA) — FE1 — USCM BUF UPC Φ8 H (USCF,H,T) — BUS UPC Φ8 L (USCL,M (PCSO,WCSA)
(USCL,M) BUS UPC Φ7 L (PCSO,WCSA,IRCE) — FD2 — USCM BUF UPC Φ7 H (USCF,H,T) — BUS UPC Φ7 L (USCL,M) (PCSO,WCSA,IRCE)
(USCL,M) BUS UPC Φ6 L (PCSO,WCSA,IRCE) — FD1 — USCM BUF UPC Φ6 H (USCF,H,T) — BUS UPC Φ6 L (USCL,M) (PCSO,WCSA,IRCE)
(USCL,M) BUS UPC Φ5 L (PCSO,WCSA,IRCE) — FB2 — USCM BUF UPC Φ5 H (USCF,H,T) — BUS UPC Φ5 L (USCL,M) (PCSO,WCSA,IRCE)
(USCL,M) BUS UPC Φ4 L (PCSO,WCSA,IRCE) — EV2 — USCM BUF UPC Φ4 H (USCF,H,T) — BUS UPC Φ4 L (USCL,M) (PCSO,WCSA,IRCE)
(USCL,M) BUS UPC Φ3 L (PCSO,WCSA,IRCE) — EU2 — USCM BUF UPC Φ3 H (USCF,H,T) — BUS UPC Φ3 L (USCL,M) (PCSO,WCSA,IRCE)
(USCL,M) BUS UPC Φ2 L (PCSO,WCSA,IRCE) — ES1 — USCM BUF UPC Φ2 H (USCF,H,T) — BUS UPC Φ2 L (USCL,M) (PCSO,WCSA,IRCE)
(USCL,M) BUS UPC Φ1 L (PCSO,WCSA,IRCE) — ER2 — USCM BUF UPC Φ1 H (USCF,H,T) — BUS UPC Φ1 L (USCL,M) (PCSO,WCSA,IRCE)
(USCL,M) BUS UPC ΦΦ L (PCSO,WCSA,IRCE — EA1 — USCM BUF UPC ΦΦ H (USCF,H,T) — BUS UPC ΦΦ L (USCL,M) (PCSO,WCSA,IRCE)

USCB CLK T5Φ A L
USCB CLK T75 A L

+5V

USCB +3V C H
USCB CLK T15Φ H
USCB CLK T5Φ C L
USCM UPC LOOP (Φ') H (USCL)

USCA USUB ΦΦ (1) H
USCA USUB Φ1 (1) H
USCJ STALL (1) L
USCJ STALL (1) H
USCB +3V I H
BNI USCM IBUF EN (Φ7:ΦΦ) L (USCS) (IRCE)

USCF UPCSV 12 (1) H — D14
USCF UPCSV 11 (1) H — D13
USCF UPCSV 1Φ (1) H — D12
USCF UPCSV Φ9 (1) H — D11
USCF UPCSV Φ8 (1) H — D10
USCF UPCSV Φ7 (1) H — D9
USCF UPCSV Φ6 (1) H — D8
USCF UPCSV Φ5 (1) H — D7
USCF UPCSV Φ4 (1) H — D6
USCF UPCSV Φ3 (1) H — D5
USCF UPCSV Φ2 (1) H — D4
USCF UPCSV Φ1 (1) H — D3
USCF UPCSV ΦΦ (1) H — D2
USCF UPCSV Φ0 (1) H — D1

LEDS ARE TO BE IN HEX NUMBERS WITH L12 TOWARD "A" PADDLE AND L00 TOWARD "F" PADDLE. LEDS ARE TO BE LOCATED BETWEEN HANDLES FOR VIEWING. LEDS POLARITIES AND NUMBER IS TO BE ETCHED BY EACH LED. LED LEADS WILL BE BENT SO LED LAYS FLAT AGAINST THE BOARD.

REVISIONS		
CHK	CHANGE NO.	REV.

(UPC LATCH) (SLOT 23)

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCM)	D	CS	M8235-Φ-1	K
SCALE	SHEET 12 OF 17	DIST.		

4C5

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ΦF	Φ3	Φ2	Φ1	ΦΦ	FUNCTION	BEN EN	BEN
Φ	Φ	X	X	X	NORMAL	<Φ7:ΦΦ>	DETERMINED BY X
Φ	/	X	X	X	NORMAL	<ΦF:Φ8>	DETERMINED BY X
/	Φ	Φ	X	X	NORMAL	<13:1Φ>	DETERMINED BY X
/	Φ	/	X	X	NORMAL	<17:14>	DETERMINED BY X
/	/	Φ	X	X	NORMAL	<18:18>	DETERMINED BY X
/	/	/	X	X	NORMAL	<1F:1C>	DETERMINED BY X
Φ	Φ	Φ	Φ	Φ	INIT OR UTRAP	<13:1Φ>	BEN 1Φ

USCJ INIT (1) H

(USCT) TT
(USCT) ICLK EALU N (1) H
(USCT) CEHH FPD BIT L
(USCT) CEHE UTRAP VECT 3 H
(USCT) NN
(USCT) ICLK EALU Z (1) H
(USCT) CEHF NESTED ERR (1) H
(USCT) CEHE UTRAP VECT 2 H

74S153 E31 → USCN BRMX (13:1Φ) Φ3 H (USCR)

(USCT) JJ
(USCT) DDPS SC N.E. Φ H
(USCT) TBMD LAST REF CODE Φ H
(USCT) CEHE UTRAP VECT 1 H
(USCT) DD
(USCS) DAPD SS (1) H
(USCS) TBMD LAST REF CODE 1 H
(USCS) CEHE UTRAP VECT Φ H

74S153 E1 → USCN BRMX (13:1Φ) Φ2 H (USCR)

74S153 E1 → USCN BRMX (13:1Φ) Φ1 H (USCR)

74S153 E1 → USCN BRMX (13:1Φ) ΦΦ H (USCR)

USCA UBEN Φ1 (1) H
USCA UBEN ΦΦ (1) H

USCA UBEN Φ4 (1) L
USCA UBEN Φ3 (1) H
USCB +3V C H
→ 74S11 E95 → USCN BEN EN (ΦF:Φ8) H (USCR,T)

USCA UBEN Φ3 (1) L
USCA UBEN Φ4 (1) L
→ 74S11 E95 → USCN BEN EN (Φ7:ΦΦ) H (USCR,T)

USCJ UMX SEL 1 H → 74S04 E132

74S00 E110 → USCN BEN EN (13:1Φ) H (USCR,T)

USCA UBEN Φ4 (1) H
USCA UBEN Φ3 (1) L
USCA UBEN Φ2 (1) L
→ 74S10 E109

USCA UBEN Φ3 (1) H
USCA UBEN Φ2 (1) H
→ 74S11 E95 → USCN BEN EN (1F:1C) H (USCR,T)

74S10 E109 → 74S00 E110 → USCN BEN EN (18:14) H (USCR,T)

74S151 E29

(USCS) S
(USCS) ACCA UB2 H
(USCS) Y
(USCS) X
(USCS) V
(USCS) DCPA LAD1 H
(USCS) T

→ USCN BRMX (Φ7:ΦΦ) Φ2 H (USCR)

74S151 E17

(USCS) J
(USCS) ACCA UB1 H
(USCS) P
(USCS) N
(USCS) ICLK ALU C (1) H
(USCS) CEHB PSL CBIT H
(USCS) L

→ USCN BRMX (Φ7:ΦΦ) Φ1 H (USCR)

74S151 E18

(USCS) A
(USCS) ACCA UBΦ H
(USCS) F
(USCS) E
(USCS) D
(USCS) DCPA LAΦΦ H
(USCS) ICLK ALU Z (1) H

→ USCN BRMX (Φ7:ΦΦ) ΦΦ H (USCR)

USCA UBEN Φ2 (1) H
USCA UBEN Φ1 (1) H
USCA UBEN ΦΦ (1) H

(BRANCH ENABLE CONTROL) (SLOT 23)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCN)	D	CS	M8235-0-1	K
SCALE	SHEET 13 OF 17	DIST.		

DEC FORM NO. 5103 138

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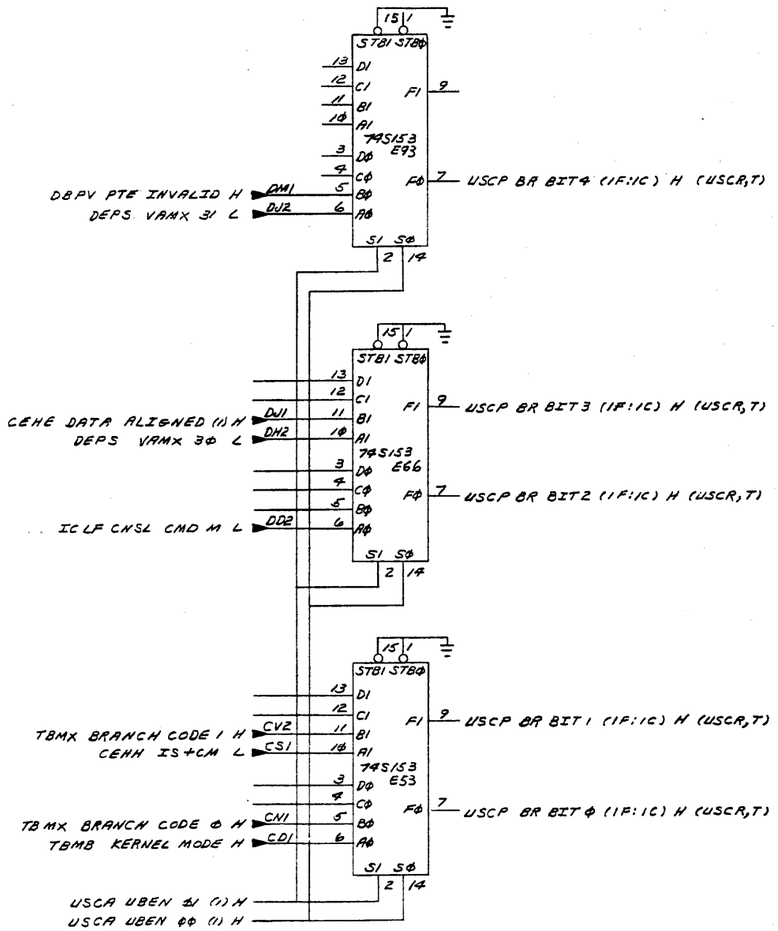

REVISIONS		
CHK	CHANGE NO.	REV.

(BRANCH) (SLOT 23)

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCP)	D	CS	M8235-Ø-1	K
SCALE	SHEET 14 OF 17	DIST.		

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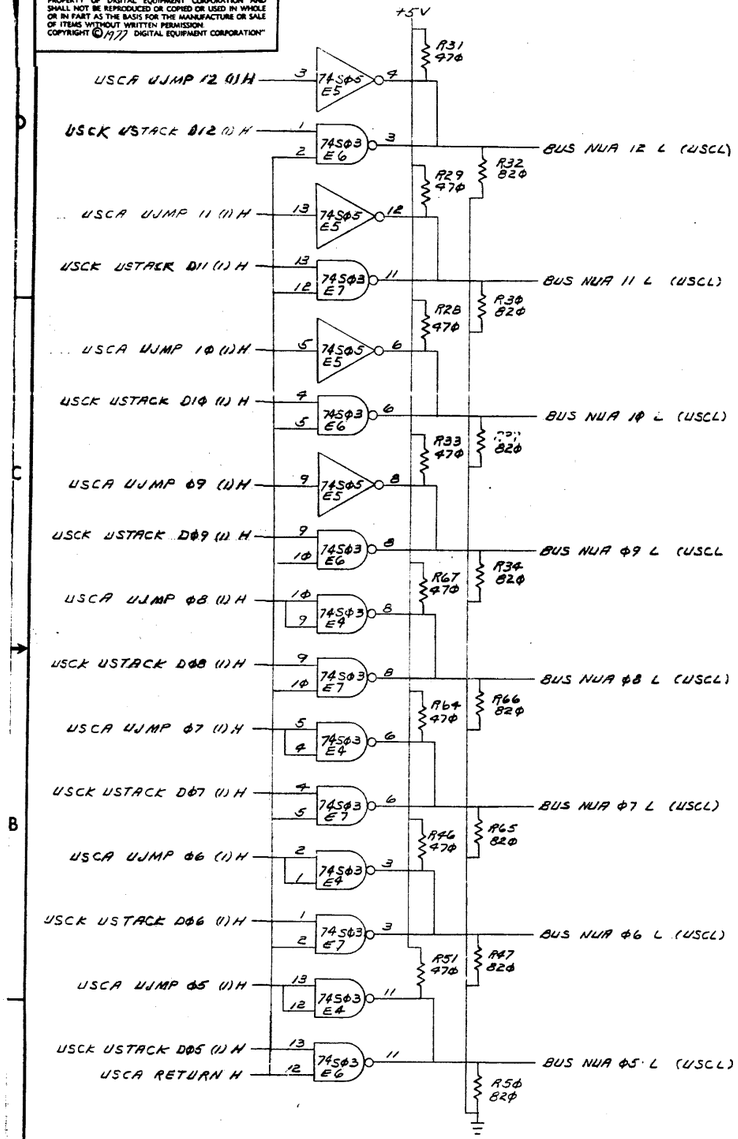

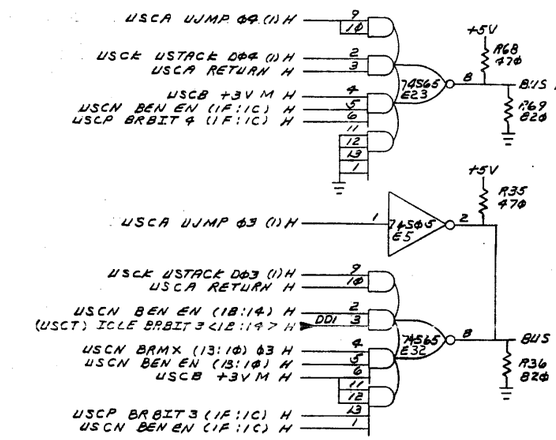

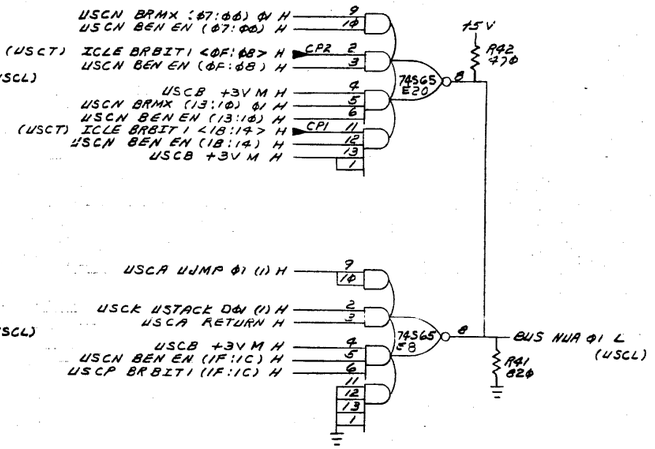

REVISIONS		
CHK	CHANGE NO.	REV.

(NEXT MICRO ADDRESS) (SLOT 23)

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCR)	D	CS	M8235-0-1	K
SCALE	SHEET 15 OF 17	DIST.		

468

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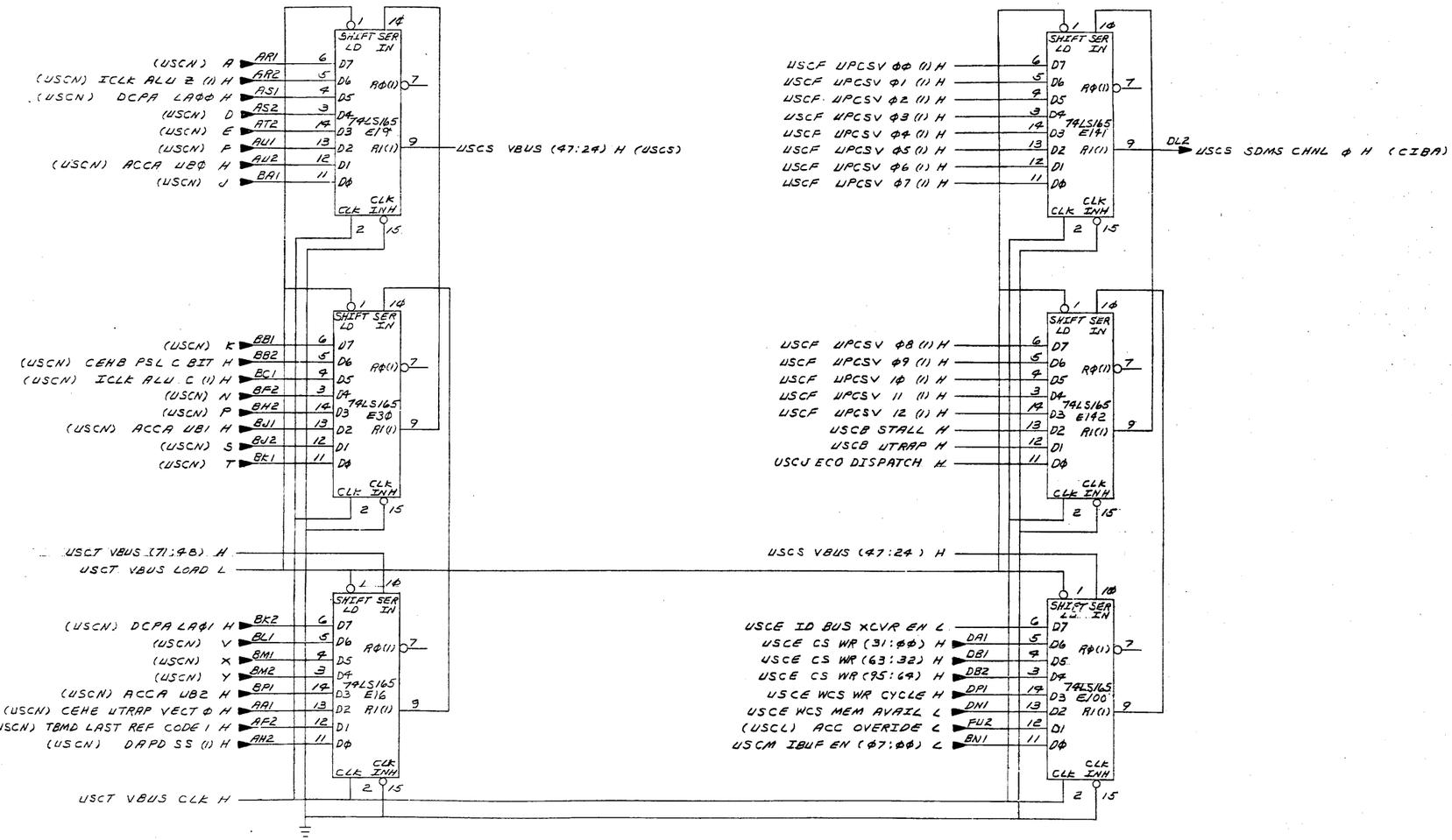

REVISIONS		
CHK	CHANGE NO.	REV.

(VBUS) (SLOT 23)

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCS)	D	CS	M8235-Ø-1	K

SCALE — SHEET 16 OF 17 DIST.

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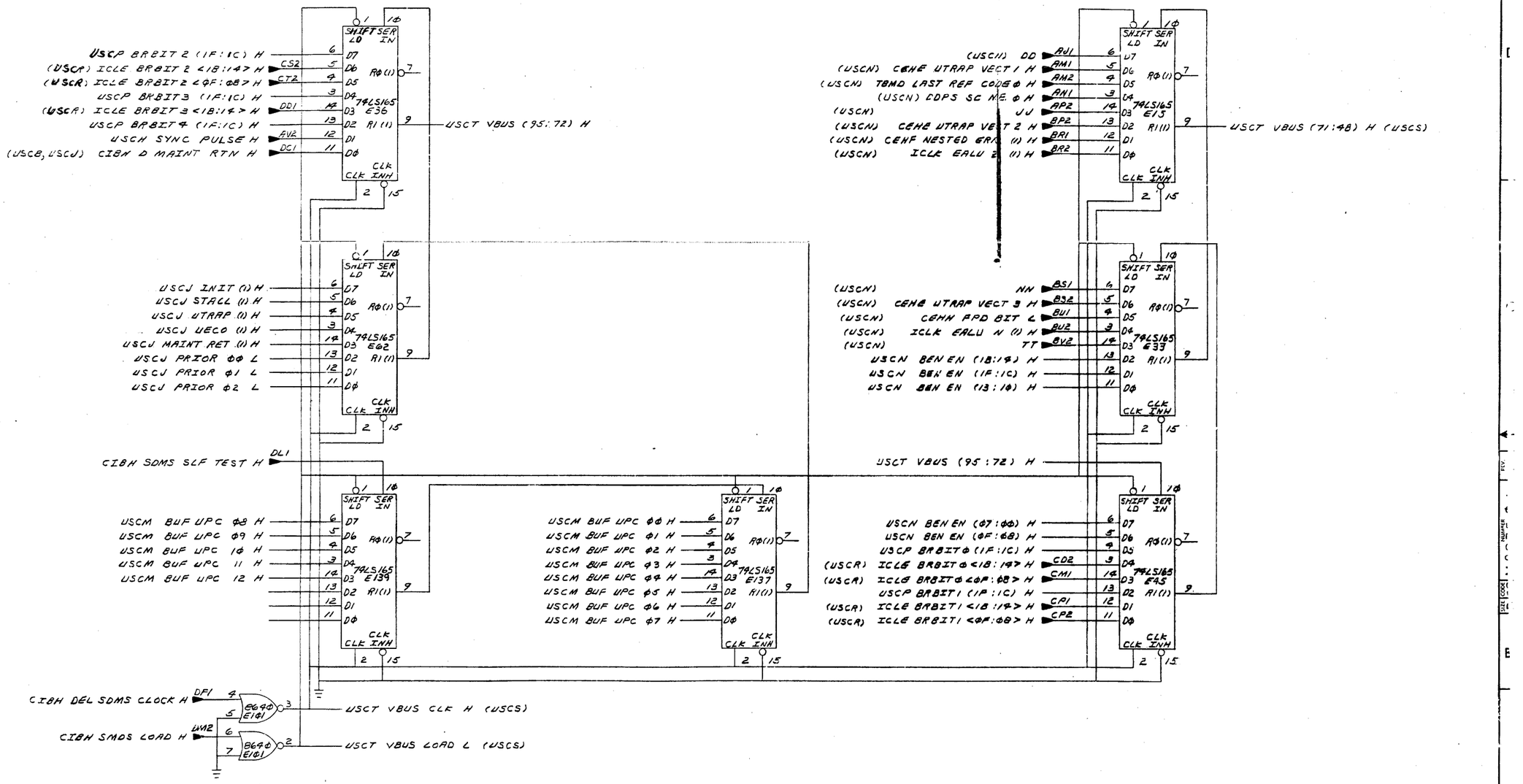


REVISIONS		
CHK	CHANGE NO.	REV.

(VBUS) (SLOT 23)

TITLE	SIZE	CODE	NUMBER	REV.
MICRO SEQUENCER CONTROL (USCT)	D	CS	M8235-0-1	K
SCALE	SHEET 17 OF 17		DIST.	

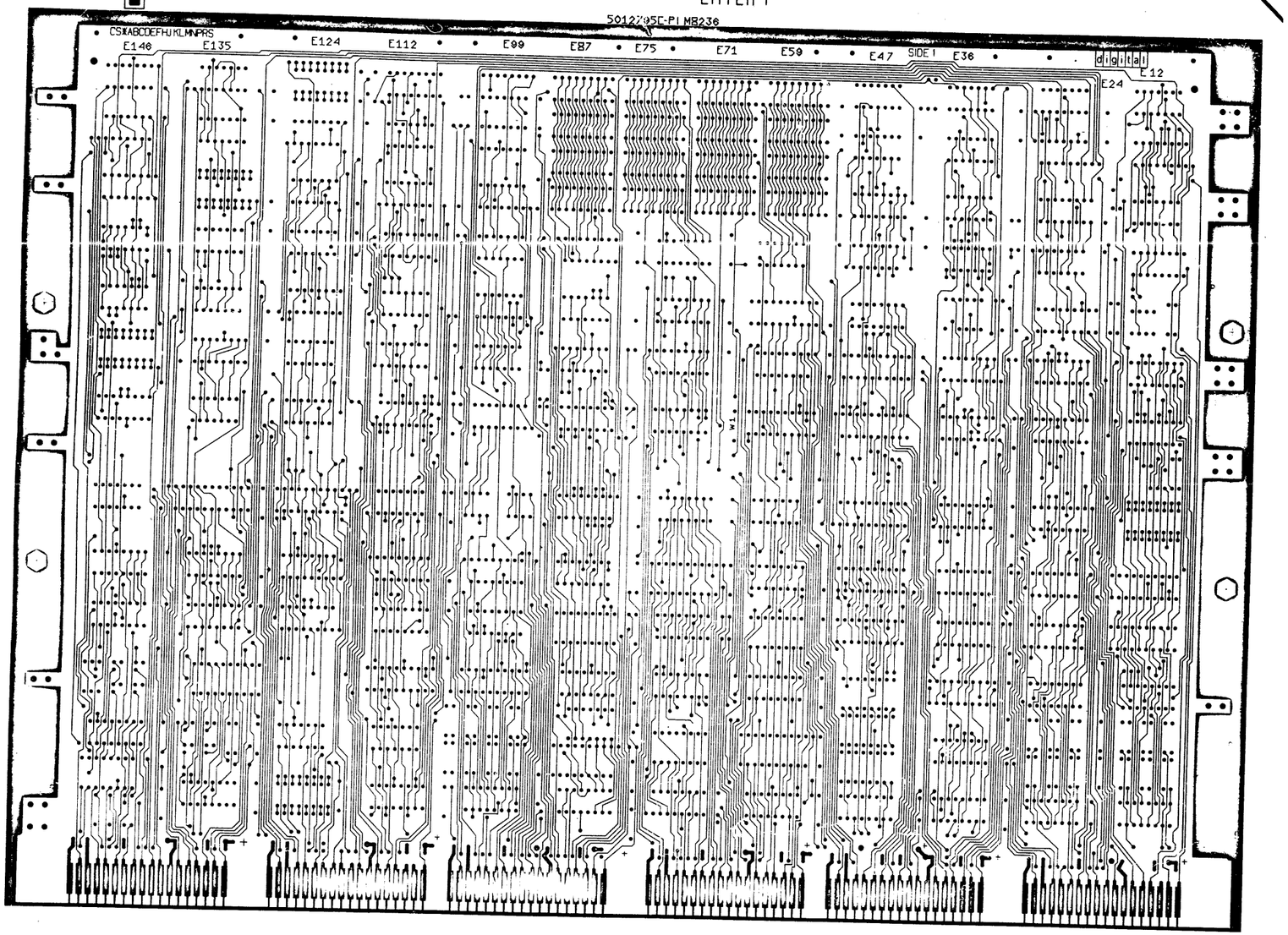
COMPONENT SIDE VIEW

1191
302 62 AM
FRS REF

471

LAYER 1

5012795C-P1 MB236



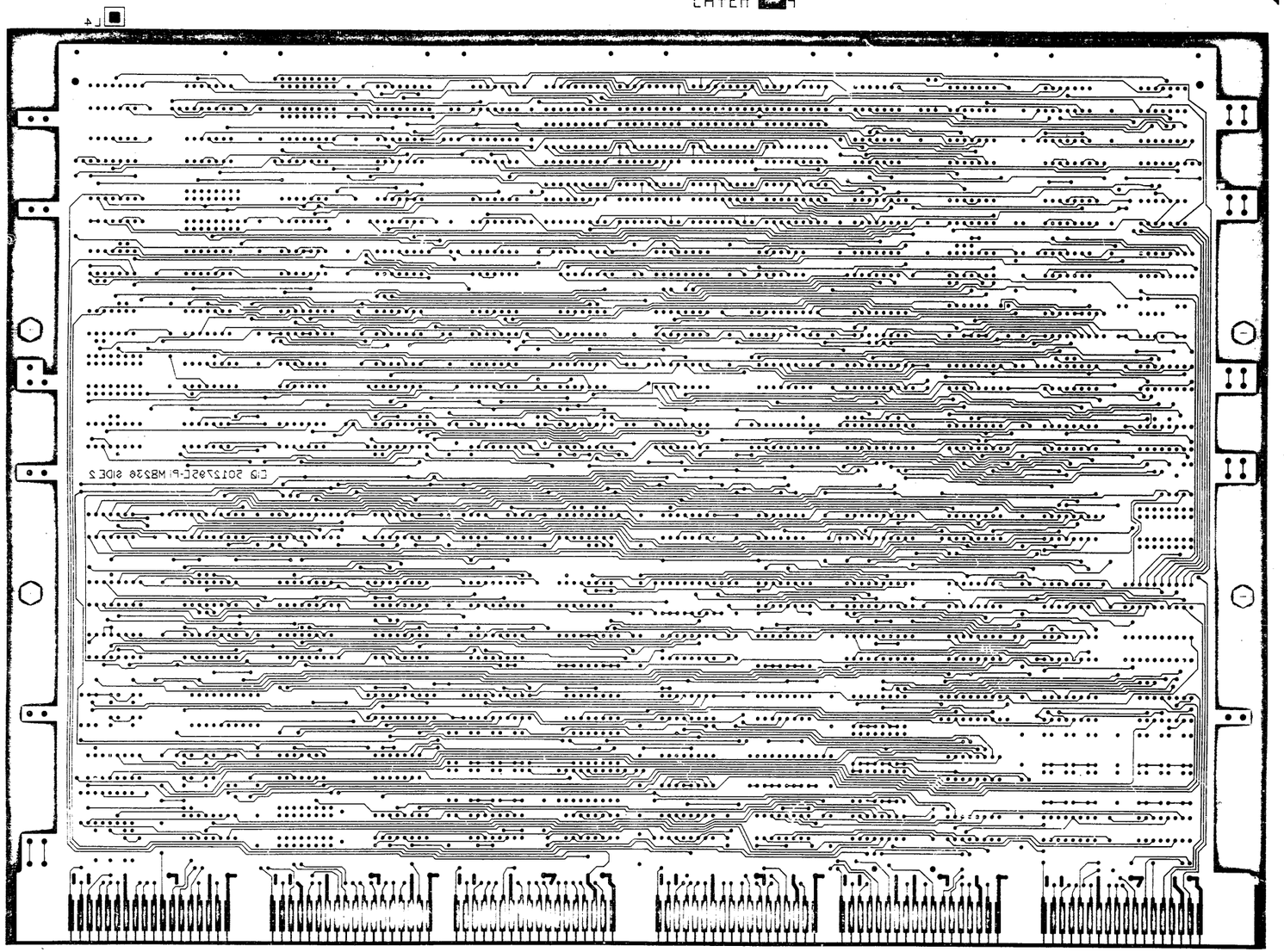
REVISIONS		
LTR	CHANGE NO.	BY

TITLE	SIZE	CODE	NUMBER	REV
CONSOLE INTERFACE BOARD (CIB)	E	UA	M8236-0-0	D
SCALE 2/1 SHEET 2 OF 3	DIST			

M8236-0-0 REV D

1 2 3 4 5 6 7 8

LAYER 4



REVISIONS		
LTR	CHANGE NO	REV

TITLE: CONSOLE INTERFACE BOARD		DRAWING NUMBER: E UA M8236-Ø-Ø	REV: D
SCALE: 2/1	SHEET 3 OF 3	DIST	

AUTOMATED BY PRTLST.1D(6) P A R T S L I S T SHEET A1 OF A3

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION 00	REFERENCE DESIGNATOR
1	1		5012795-00	CONSOLE INTERFACE BOARD	1	
2	2		1000016-00	100.0 MMF 100V 5%200PPM DM15S	3	C70,C73,C74
3	3		1012084-01	8 MFD 25V G% 30D AL EL	7	C63-C69
4	4		1012784-00	.047 MFD 50V -20+80 CER	64	C1-C26,C28-C62,C71,C72,C75
5	5		1300247-00	120 1/4W 5% CC	12	R37-R40,R119,R120,R123-R126,
					CONT	R129,R130
6	6		1313469-00	240 1/4W 5% CC	64	R1-R32,R139-R170
7	7		1300250-00	150 1/4W 5% CC	8	R117,R118,R121,R127,R128,R131,
					CONT	R132,R122
8	8		1301322-00	180 1/4W 5% CC	5	R101,R108,R133,R135,R137
9	9		1301972-00	270 1/4W 5% CC	32	R43-R74
10	10		1300309-00	390 1/4W 5% CC	7	R41,R99,R102,R109,R134,R136,R138
11	11		1301424-00	680 1/4W 5% CC	3	R36,R42,R100
12	12		1300365-00	1 K 1/4W 5% CC	34	R75-R88,R91-R98,R103-R107,
					CONT	R110-R115,R34
13	13		1312930-00	5.1 K 1/4W 5% CC	2	R33,R116
14	14		1302391-00	20 K 1/4W 5% CC	3	R35,R89,R90
15	15		1311003-01	R NETWORK 14-180 14-390	3	E29,E43,E53
16	16		1300005-01	R NETWORK 13-1K RESISTORS 5% DIP	1	E51
17	17		1511686-00	DEC5433 FET N 350MW 10 25 1A	8	Q1-Q8
18	18		1910532-00	74S00 NAND GATE-QUAD 2IN$	3	E46,E121,E123
19	19		1912799-00	LS00 NAND-GATE-QUAD 2IN,P	2	E24,E119
20	20		1912388-00	74S02 NOR GATE-QUAD 2IN,PO	3	E12,E118,E134
21	21		1912801-00	LS02 NOR-GATE-QUAD 2IN	2	E35,E95
22	22		1910534-00	74S04 INVERTER GATE-HEX 1I	9	E16,E44,E101,E105,E107,E111,
					CONT	E114,E139,E146
23	23		1912803-00	LS04 INVERTER GATE-HEX 1I	1	E47
24	24		1912805-00	LS08 AND GATE-QUAD 2IN,PO	2	E97,E129
25	25		1910536-00	74S10 NAND GATE-TRIPLE 3IN	1	E99
26	26		1910537-00	74S11 AND GATE-TRIPLE 3INP	2	E55,E98

REVISION HISTORY			BASIC PART NO: M8236
ENG	ECO NUMBER	REV	SECTION A OF A
W.H	00002	B	SECTION,VARIATION INDEX
PG	00003	C	[A] 00
BS	TW004	D	[B]
BS	TW004	D	[C]
			[D]
			[E]
			[F]
			[H]
			[J]
			[K]
			[L]
			[M]
			[N]

							D	I	G	I	T	A	L	

DRN: L. GIAMMARINO DATE: 02-FEB-78

CHK'D: L. GIAMMARINO DATE: 02-FEB-78

DES.ENG: K. DUGGAN DATE: 02-FEB-78

RESP.ENG.: K. DUGGAN DATE: 02-FEB-78

MFG.ENG.: M. TERILLO DATE: 02-FEB-78

TITLE PARTS LIST

CONSOLE INTERFACE BOARD

DOCUMENT NUMBER

SIZE	CODE	NUMBER	REV
K	PL	M8236-0-DBP	D

ASSEMBLY NUMBER: E-UA-M8236-0-0

TOP DOCUMENT NUMBER:

FILE NAME: Z0642D.PLS

EDIT #: 14

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LINE	ITEM	DOCUMENT NUMBER	PART NUMBER		DESCRIPTION	QTY PER VARIATION 00		REFERENCE DESIGNATOR
27	27		1910539-00		74S20 NAND GATE-DUAL 4INPU	1		E132
28	28		1912810-00		LS20 NAND GATE-DUAL 4IN	1		E36
29	29		1912813-00		LS27 NOR GATE-TRIPLE 3IN	1		E108
30	30		1913340-00		74S32 OR GATE-QUAD 2IN	6		E10,E21,E22,E23,E82,E131
31	31		1911712-00		74S51 AND-OR GATE-INVERT D	1		E122
32	32		1912820-00		LS51 A-O-I GATE 2-WIDE 2I	2		E110,E144
33	33		1910542-00		74S64 A-O-I GATE 4-2-3-2	3		E33,E142,E143
34	34		1910544-00		74S74 FF-D DUAL,EDGE TRIGG	5		E96,E109,E135,E145,E94
35	35		1912824-00		LS74 FF-D DUAL,EDGE TRIGG	2		E34,E81,
36	36		1912834-00		LS112 FF-JK DUAL,EDGE TRIG	1		E130
37	37		1910436-00	DEC	74123 ONE SHOT-DUAL,RETRIG	1		E93
38	38		1912837-00		LS123 ONE SHOT-DUAL,RETRIG	2		E80,E112
39	39		1911675-00		74S138 DECODER/DEMUX 3-8 LIN	1		E120
40	40		1911676-00		74S139 DECODER-DUAL TWO-INP	3		E9,E11,E67
41	41		1910547-00		74S153 MUX 1 OF 4 (DUAL)	1		E78
42	42		1910548-00		74S157 MUX 1 OF 2 (QUAD)	8		E2,E15,E50,E63,E90,E91,E125,E136
43	43		1911330-00		74173 FF-D QUAD,TRISTATE	1		E106
44	44		1910550-00		74S174 FF-D HEX	2		E45,E83
45	45		1912697-00		LS174 FF-D HEX W/CLEAR	1		E17
46	46		1912853-00		LS175 FF-D QUAD	2		E30,E140
47	47		1912728-00		74S251 MUX 1 OF 8 TRI-STA	16		E6,E7,E18,E19,E31,E32,E64,E65,
							CONT	E103,E104,E115,E116,E126,E127,
							CONT	E137,E138
48	48		1911641-00	SN	74S257 MUX,QUAD 2 TO 1	5		E14,E25,E61,E79,E100
49	49		1912863-00		LS273 FF-D OCTAL W/CLEAR	9		E3,E38,E39,E40,E89,E102,E117,
							CONT	E128,E27
50	50	(SEE NOTE 75)	1910406-00		75451 DRIVER,PERIPH,DUAL,	3		
51	51		1913788-00		26S10 TRANSCEIVER,BUS,QUA	9		E1,E13,E26,E37,E48,E49,E62,E77,
							CONT	E88
52	52		1911579-00		8641 TRANSCEIVER,BUS,QUA	1		E28
53	53		1911415-00		10125 ECL TO TTL TRNSLTR	2		E60,E76
54	54		1912730-00	DC	003 INTERRUPT,2 CIRCUIT	1		E20
55	55		1912729-00	DC	004 PROTOCOL,REG. SELECT	1		E4
56	56		1913040-00	DC	005 TRANSCEIVER 4BIT	4		E41,E42,E52,E54
57	57		1210711-02		HANDLE,MODULE,HEX	1		
58	58		9000024-01		EYELET, ROLLED FLANGE, .121 OD X	12		
59	59		1215006-03		SOCKET 18PIN IC LOW PROFILE	16		XE56-XE59,XE68-XE75,XE84-XE87
60	60		23144F1-00		F1-01	1		E56
61	61		23145F1-00		F1-01	1		E68
62	62		23146F1-00		F1-01	1		E84
63	63		23147F1-00		F1-01	1		E72
64	64		23148F1-00		F1-01	1		E58
65	65		23149F1-00		F1-01	1		E70
66	66		23150F1-00		F1-01	1		E86
67	67		23151F1-00		F1-01	1		E74
68	68		23236F1-00		F1-01	1		E57
69	69		23237F1-00		F1-01	1		E69
70	70		23238F1-00		F1-01	1		E85

D	I	G	I	T	A	L	TITLE	SECTION A OF A
							CONSOLE INTERFACE BOARD	

SIZE	CODE	DOCUMENT NUMBER	REV
K	PL	M8236-0-DBP	D

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION 00	REFERENCE DESIGNATOR
71	71		23239F1-00	F1-01	1	E73
72	72		1912746-00	DEC 74S37 NAND GATE-QUAD 2IN	1	E66
73	73		1300479-00	10 K 1/4W 5% CC	1	R171
74	74		9105740-55	*** THIS ITEM IS NOT USED ***	-	

0 NOTE: REF DESIG. FOR ITEM 50 ARE E8,E92A,E92B

D	I	G	I	T	A	L	TITLE	SECTION A OF A	SIZE	CODE	DOCUMENT NUMBER	REV
							CONSOLE INTERFACE BOARD		K	PL	M8236-0-DBP	D

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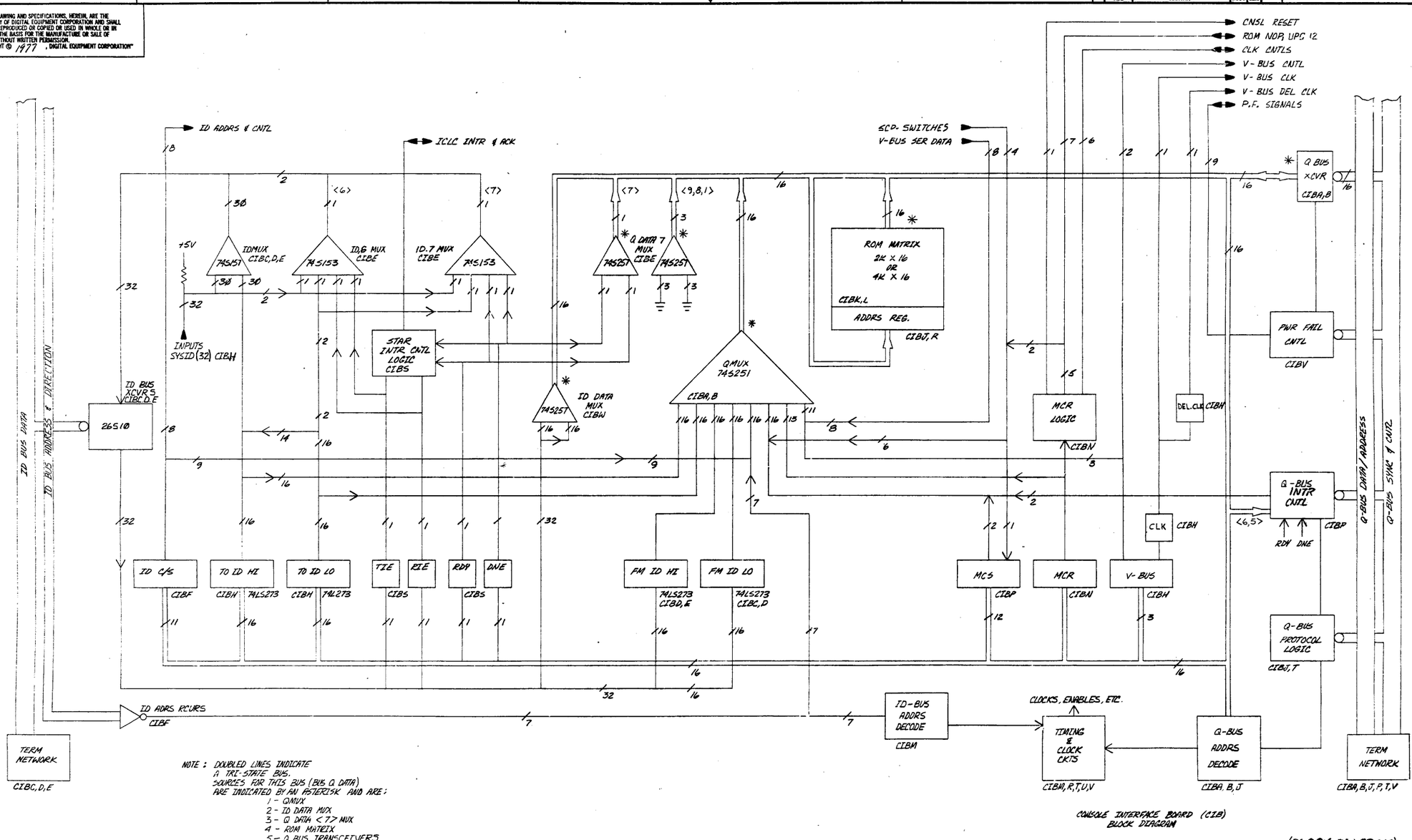

NOTE : DOUBLED LINES INDICATE A TRI-STATE BUS. SOURCES FOR THIS BUS (BUS Q DATA) ARE INDICATED BY AN ASTERISK AND ARE:
1 - QMUX
2 - ID DATA MUX
3 - Q DATA < 7 > MUX
4 - ROM MATRIX
5 - Q BUS TRANSCEIVERS

CONSOLE INTERFACE BOARD (CIB) BLOCK DIAGRAM

REVISIONS			
CHK	CHANGE NO.	REV.	
K.DUGGAN	M8236 - 00001	A	10/3/77
K.DUGGAN	M8236-00002	B	24 JAN 78
K.DUGGAN	M8236-00003	C	8-MAR 78
K.DUGGAN	M8236-TW0004	D	23 May 79
B.SIMS			8/29/25

(BLOCK DIAGRAM)

DRN. E. Fraser	6/14/77	FIRST USED ON
CHK'D	7/10/77	digital
ENG.	7/6/77	
PROJ. ENG.	7/11/77	TITLE CONSOLE INTERFACE BOARD
PROD.	7/5/77	
NEXT HIGHER ASSY.		SIZE D CODE CS NUMBER M8236-01 REV. D
SCALE		
SHEET 1 OF 21		DIST.

DEC FORM NO. DRD 102-0

TW 1

477

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CIBR QMUX STROBE L

CEMS SDMS CHNL 1 H
CIBN ATTN H
CIBN UPC 12 (1) H
CIBF ID ADRS 1 L
CIBE FM IDHI 09 H
CIBD FM IDLO 09 H
CIBH TO IDHI 09 H
CIBH TO IDLO 09 H
→ 745251 E104

VSCS SDMS CHNL 0 H
CIBN RUN (1) H
CIBN STAR INTR DISAB H
CIBF ID ADRS 0 L
CIBE FM IDHI 08 H
CIBD FM IDLO 08 H
CIBH TO IDHI 08 H
CIBH TO IDLO 08 H
→ 745251 E103

CIBV CPT 0 H
CIBP CUSL ACK H
CIBN ROM NOP H
CIBF ID MAINT (1) H
CIBD FM IDHI 07 H
CIBC FM IDLO 07 H
CIBH TO IDHI 07 H
CIBH TO IDLO 07 H
→ 745251 E65

CIBH SDMS LOAD (1) H
SCPA REMOTE H
CIBN SBC H
CIBF XMT ADRS 1 H
CIBD FM IDHI 01 H
CIBC FM IDLO 01 H
CIBH TO IDHI 01 H
CIBH TO IDLO 01 H
→ 745251 E7

CIBR QMUX SEL 2 H
CIBR QMUX SEL 1 H
CIBR QMUX SEL 0 H

FUNCTION TABLE 745251

INPUTS				OUTPUTS	
SELECT			STROBE		
C	B	A	S	Y	W
X	X	X	H	Z	Z
L	L	L	L	D0	D0
L	L	H	L	D1	D1
L	H	L	L	D2	D2
L	H	H	L	D3	D3
H	L	L	L	D4	D4
H	L	H	L	D5	D5
H	H	L	L	D6	D6
H	H	H	L	D7	D7

H = HIGH LEVEL, L = LOW LEVEL
X = IRRELEVANT, Z = HIGH IMPEDENCE (OFF)
D0, D1 .... D7 = THE LEVEL OF THE RESPECTIVE D INPUT

DC005 E91
CIBP VECTOR H
CIBT XMT RPLY H
CIBT INWD L
CIBA MATCH H
BUS QDATA 09 H
BUS QDATA 08 H
BUS QDATA 07 H
BUS QDATA 01 H
+5V
E43
BDAL 09 L
BDAL 08 L
BDAL 07 L
BDAL 01 L

CIBR QMUX STROBE L

CIBV CPT 50 H
CIBP RDY INTR ENAB H
CIBN SSMM H
CIBF XMT WRITE H
CIBD FM IDHI 06 H
CIBC FM IDLO 06 H
CIBH TO IDHI 06 H
CIBH TO IDLO 06 H
→ 745251 E64

CIBV CPT 100 H
CIBP DNE INTR ENAB H
CLKN STOPPED H
CIBF XMT ADRS 5 H
CIBD FM IDHI 05 H
CIBC FM IDLO 05 H
CIBH TO IDHI 05 H
CIBH TO IDLO 05 H
→ 745251 E32

CIBH SDMS SLFTST (1) H
SCPA AUTO-RESTART H
CIBN STS H
CIBF XMT ADRS 2 H
CIBD FM IDHI 02 H
CIBC FM IDLO 02 H
CIBH TO IDHI 02 H
CIBH TO IDLO 02 H
→ 745251 E18

SCPA LOCK H
CIBF XMT ADRS 0 H
CIBD FM IDHI 00 H
CIBC FM IDLO 00 H
CIBH TO IDHI 00 H
CIBH TO IDLO 00 H
→ 745251 E6

NOTE: ALL UNMARKED RESISTORS ARE DIP LSI-11 BUS TERMINATORS PART NO. 13-11003-01 VALUES ARE 180Ω TO +5V AND 390Ω TO GND

DC005 CONTROL

RECEIVE	TRANSMIT	MODE
L	L	DISABLE: BUS, DATA HI-Z
L	H	XMT: BUS ← DATA
H	L	RCV: DATA ← BUS
H	H	RCV: DATA ← BUS

DC005 E92
CIBP VECTOR H
CIBP VECTOR B H
CIBR QBUS XMT H
CIBT INWD L
BBS7 L
CIBA MATCH H
BUS QDATA 06 H
BUS QDATA 05 H
BUS QDATA 02 H
BUS QDATA 00 H
+5V
E29
E53
BDAL 06 L
BDAL 05 L
BDAL 02 L
BDAL 00 L

(QMUX<9:5>, 2, 1, 0 QBUS TRANSCEIVERS (SLOT 29))

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBA)	D	CS	M8236-0-1	D
SCALE —	SHEET 2 OF 21	DIST.		

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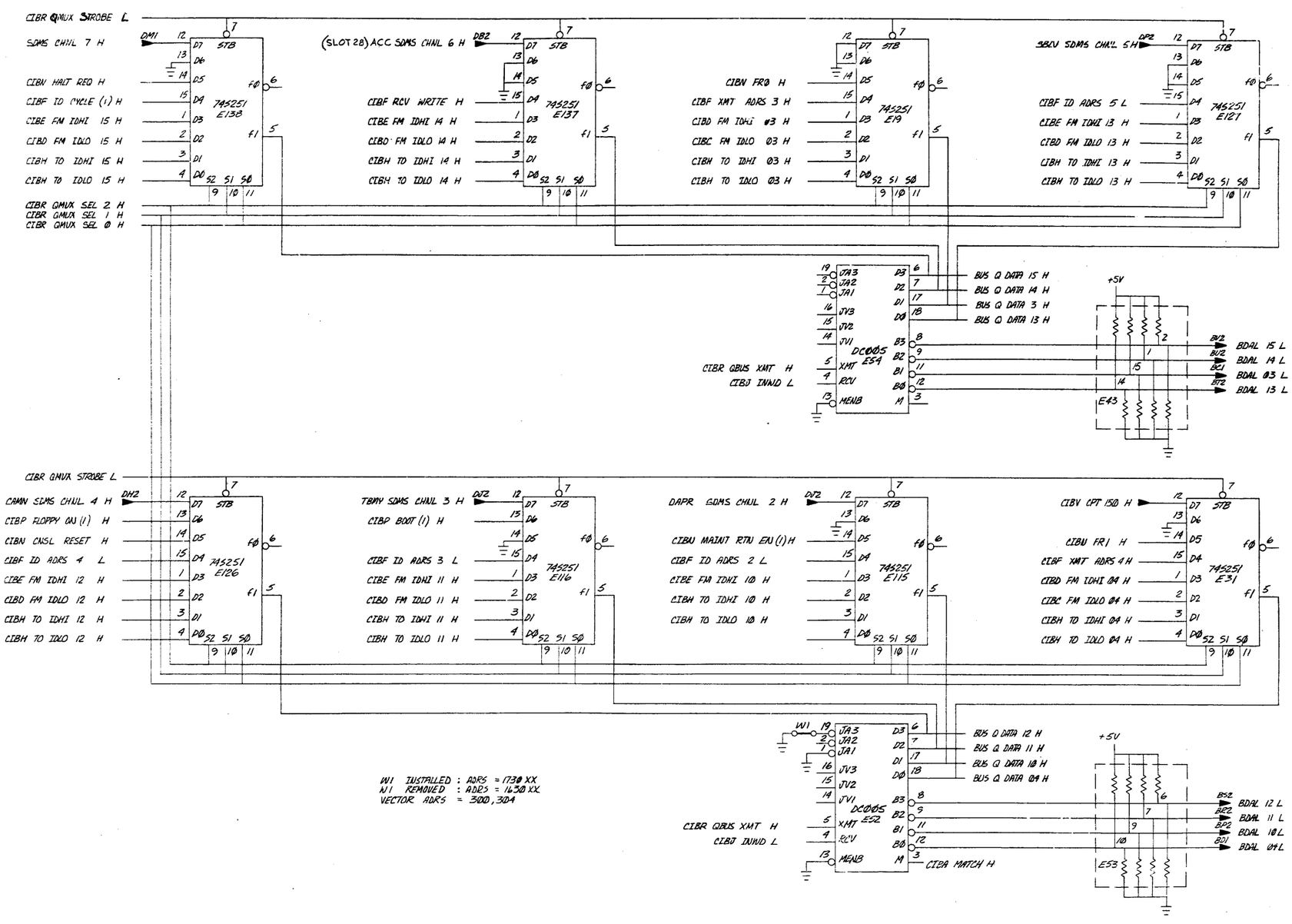

(QMUX <15:10>, 4,3 QBUS TRANSCEIVERS (SLOT 29))

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBB)	D	CS	M8236-0-1	D
SCALE —	SHEET 3 OF 21		DIST.	

DEC FORM NO. DRD 138

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CIBH SYSID SW 13 H
CIBH TO IDLO 13 H
CIBH SYSID SW 12 H
CIBH TO IDLO 12 H
74S157 E91
STB S0
CIBC ID 13 MUX H (CIBD)
CIBC ID 12 MUX H (CIBD)

CIBH SYSID SW 11 H
CIBH TO IDLO 11 H
CIBH SYSID SW 10 H
CIBH TO IDLO 10 H
74S151 E90
STB S0

CIBH SYSID SW 09 H
CIBH TO IDLO 09 H
CIBH SYSID SW 08 H
CIBH TO IDLO 08 H
74S157 E63

CIBH SYSID SW 05 H
CIBH TO IDLO 05 H
CIBH SYSID SW 04 H
CIBH TO IDLO 04 H
STB S0

CIBH SYSID SW 03 H
CIBH TO IDLO 03 H
CIBH SYSID SW 02 H
CIBH TO IDLO 02 H
CIBH SYSID SW 01 H
CIBH TO IDLO 01 H
CIBH SYSID SW 00 H
CIBH TO IDLO 00 H
74S157 E50
STB S0
CIBM ID MUX SEL L

26S10 E62
CIBC RCV ID D11 H (CIBD,W)
CIBC RCV ID D10 H (CIBD,W)
CIBC RCV ID D09 H (CIBD,W)
CIBC RCV ID D08 H (CIBD,W)
5V
R139 240Ω R140 240Ω R141 240Ω R142 240Ω R1 240Ω R2 240Ω R3 240Ω R4 240Ω
CM2 BUS ID D11 L
CK2 BUS ID D10 L
CK1 BUS ID D09 L
CK2 BUS ID D08 L
R43 270Ω R44 270Ω R45 270Ω R46 270Ω

CIBC RCV ID D07 H (CIBW)
CIBC RCV ID D06 H (CIBW)
CIBC RCV ID D05 H (CIBW)
CIBC RCV ID D04 H (CIBW)
26S10 E49
5V
R143 240Ω R144 240Ω R5 240Ω R6 240Ω
CF2 BUS ID D05 L
CF1 BUS ID D04 L
R47 270Ω R48 270Ω

CIBE RCV ID D07 H
CIBE RCV ID D06 H
74LS273 E27
CIBC FM IDLO 07 H (CIBA)
CIBC FM IDLO 06 H (CIBA)
CIBC FM IDLO 05 H (CIBA)
CIBC FM IDLO 04 H (CIBB)
CIBC FM IDLO 03 H (CIBB)
CIBC FM IDLO 02 H (CIBA)
CIBC FM IDLO 01 H (CIBA)
CIBC FM IDLO 00 H (CIBA)
CIBV INIT L
CIBJ CLK FM ID H

CIBC RCV ID D03 H (CIBW)
CIBC RCV ID D02 H (CIBW)
CIBC RCV ID D01 H (CIBW)
CIBC RCV ID D00 H (CIBW)
26S10 E48
5V
R145 240Ω R146 240Ω R147 240Ω R148 240Ω R7 240Ω R8 240Ω R9 240Ω R10 240Ω
CE2 BUS ID D03 L
CE1 BUS ID D02 L
CR2 BUS ID D01 L
CA1 BUS ID D00 L
R49 270Ω R50 270Ω R51 270Ω R52 270Ω
CIBM ID ENDAT ALL L

-26S10-

EN	D	B	R
L	L	H	L
L	H	L	H
H	X	Y	Y

X = DON'T CARE
Y = BUS STATE WHILE CONTROLLED BY ANOTHER 26S10

(ID MUX<13:00>, ID BUS <11:08>, <05:00> FROM ID LO <07:00> (SLOT 29))

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBC)	D	CS	M8236-0-1	D
SCALE	SHEET 4 OF 21	DIST.		

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CIBH SYSID SW 25 H
CIBH TO IDHI 09 H
CIBH SYSID SW 24 H
CIBH TO IDHI 08 H
745157 E136
CIBD ID 25 MUX H (CIBE)
CIBD ID 24 MUX H (CIBE)
STB S0

CIBH SYSID SW 23 H
CIBH TO IDHI 07 H
CIBH SYSID SW 22 H
CIBH TO IDHI 06 H
745157 E15
STB S0

CIBH SYSID SW 21 H
CIBH TO IDHI 05 H
CIBH SYSID SW 20 H
CIBH TO IDHI 04 H
745157 E15
STB S0

CIBH SYSID SW 19 H
CIBH TO IDHI 03 H
CIBH SYSID SW 18 H
CIBH TO IDHI 02 H
745157 E2
STB S0

CIBH SYSID SW 17 H
CIBH TO IDHI 01 H
CIBH SYSID SW 16 H
CIBH TO IDHI 00 H
745157 E2
STB S0

CIBH SYSID SW 15 H
CIBH TO IDLO 15 H
CIBH SYSID SW 14 H
CIBH TO IDLO 14 H
745157 E90
STB S0

CIBM ID MUX SEL L

26S10 E13
CIBD RCV ID D23 H (CIBW)
CIBD RCV ID D22 H (CIBW)
CIBD RCV ID D21 H (CIBW)
CIBD RCV ID D20 H (CIBW)
5V
R149 240Ω R150 240Ω R151 240Ω R152 240Ω R11 240Ω R12 240Ω R13 240Ω R14 240Ω
R53 270Ω R54 270Ω R55 270Ω R56 270Ω
AS2 BUS ID D23 L
AP2 BUS ID D22 L
AP1 BUS ID D21 L
AN1 BUS ID D20 L
EN

26S10 E1
CIBD RCV ID D19 H (CIBW)
CIBD RCV ID D18 H (CIBW)
CIBD RCV ID D17 H (CIBW)
CIBD RCV ID D16 H (CIBW)
5V
R153 240Ω R154 240Ω R155 240Ω R156 240Ω R15 240Ω R16 240Ω R17 240Ω R18 240Ω
R57 270Ω R58 270Ω R59 270Ω R60 270Ω
AM1 BUS ID D19 L
AU1 BUS ID D18 L
AH2 BUS ID D17 L
AF2 BUS ID D16 L
EN

26S10 E88
CIBD RCV ID D15 H (CIBW)
CIBD RCV ID D14 H (CIBW)
CIBD RCV ID D13 H (CIBW)
CIBD RCV ID D12 H (CIBW)
CIBC ID 13 MUX H
CIBC ID 12 MUX H
CIBM ID ENDAT ALL L
5V
R157 240Ω R158 240Ω R159 240Ω R160 240Ω R19 240Ω R20 240Ω R21 240Ω R22 240Ω
R61 270Ω R62 270Ω R63 270Ω R64 270Ω
DV2 BUS ID D15 L
DS1 BUS ID D14 L
DX2 BUS ID D13 L
DR1 BUS ID D12 L
EN

74LS273 E3
CIBD FM IDHI 07 H (CIBA)
CIBD FM IDHI 06 H (CIBA)
CIBD FM IDHI 05 H (CIBA)
CIBD FM IDHI 04 H (CIBB)
CIBD FM IDHI 03 H (CIBB)
CIBD FM IDHI 02 H (CIBA)
CIBD FM IDHI 01 H (CIBA)
CIBD FM IDHI 00 H (CIBA)
CIBU INIT L
CIBU CLK FM ID H
CLR CLK

74LS273 E89
CIBD FM IDLO 15 H (CIBB)
CIBD FM IDLO 14 H (CIBB)
CIBD FM IDLO 13 H (CIBB)
CIBD FM IDLO 12 H (CIBB)
CIBD FM IDLO 11 H (CIBB)
CIBD FM IDLO 10 H (CIBB)
CIBD FM IDLO 09 H (CIBB)
CIBD FM IDLO 08 H (CIBA)
CIBC RCV ID D11 H
CIBC RCV ID D10 H
CIBC RCV ID D09 H
CIBC RCV ID D08 H
CIBV INIT L
CIBU CLK FM ID H
CLR CLK

(ID MUX<25:14>,ID BUS<23:12>,FROM ID HI<07:00>,FROM ID LO<15:08>) (SLOT 29)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBD)	D	CS	M8236-0-1	D
SCALE -/-/-	SHEET 5 OF 21		DIST.	

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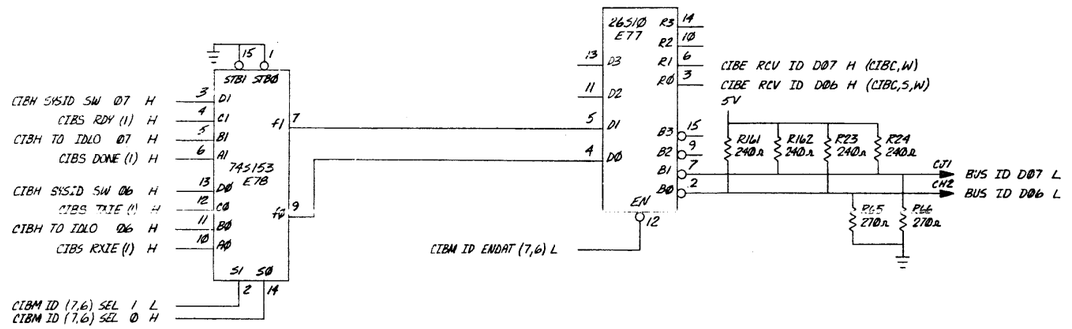
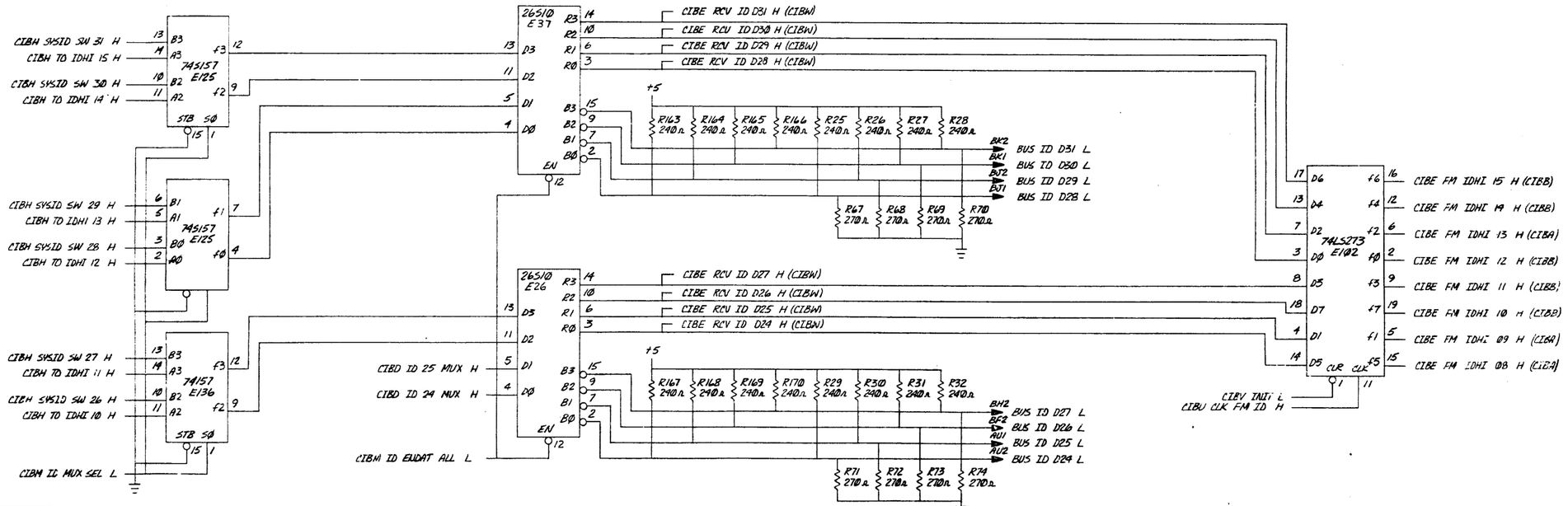
- 74S153 -
FUNTION TABLE

SELECT INPUT		DATA INPUTS				STROBE	OUTPUT
B	A	C0	C1	C2	C3	G	Y
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

SELECT INPUTS A AND B ARE COMMON TO BOTH SECTIONS.
H = HIGH LEVEL L = LOW LEVEL
X = IRRELEVANT





(ID <7:6> MUX, ID MUX <31:26>, ID BUS <31:24>, 7, 6 FROM ID HI <15:08>, QDATA <7> MUX (SLOT 29))

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBE)	D	CS	M8236-0-1	D
SCALE —	SHEET 6 OF 21		DIST.	

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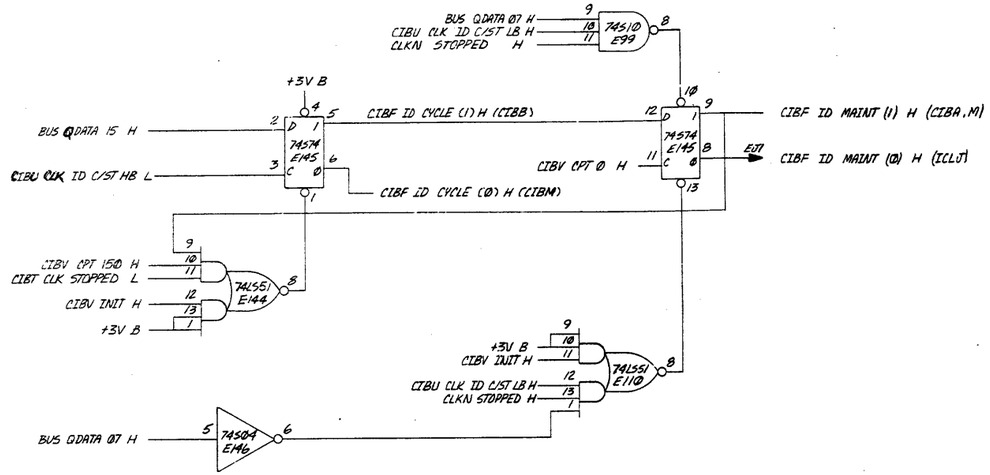

REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 29)
(ID CONTROL/STATUS REG ID ADRS/CONTROL RECEIVERS)

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE (CIBF) INTERFACE BOARD	D	CS	M8236-01	D
SCALE	SHEET 7 OF 21	DIST.		

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74LS175 E30 — CIBH SDMS SLFTST (1) H (CIBA)
CIBH SDMS LOAD (1) H (CIBA)
BUS QDATA 02 H
BUS QDATA 01 H
CIBV INIT L
CIBU CLK VBUS LB L
74LS04 E47 — BUS QDATA 00 H
74LS00 E24
C73 100 pfd, C74 100 pfd, R89 20K, R90 20K
74LS123 E80, 74123 E93
+3VC
75451 E92A — DL2: CIBH SDMS SLF TST H (CDMV, CEHS, DAPR, ICLT IRCM, SBHT, TBMV, USCT, SLOT 27)
75451 E92A — DM2: CIBH SDMS LOAD H (CAMN, CDMV, CEHS, DAPR, ICLT IRCM, SBHT, TBMV, USCT, SBLV, SLOT 27)
75451 E92B — DF1: CIBH SDMS CLOCK H (CAMN CDMV DAPR IRCM SBLV TBMV)
75451 92B — DF2: CIBH SDMS DEL CLK H (CEHS, ICLT, SBHT, USCT, SLOT 27)

5V — R73 1K, R76 1K, R77 1K, R78 1K, R79 1K, R80 1K, R81 1K, R91 1K
FE2 — CIBH SYSID SW 31 H (CIBE)
FU2 — CIBH SYSID SW 30 H (CIBE)
FV2 — CIBH SYSID SW 29 H (CIBE)
FT2 — CIBH SYSID SW 28 H (CIBE)
FL2 — CIBH SYSID SW 27 H (CIBE)
FP2 — CIBH SYSID SW 26 H (CIBE)
FM2 — CIBH SYSID SW 25 H (CIBD)
FS2 — CIBH SYSID SW 24 H (CIBD)

5V — R83 1K, R84 1K, R85 1K, R86 1K, R87 1K, R88 1K, ES1
CD2 — CIBH SYSID SW 23 H (CIBD)
CU1 — CIBH SYSID SW 22 H (CIBD)
FK2 — CIBH SYSID SW 21 H (CIBD)
FB1 — CIBH SYSID SW 20 H (CIBD)
EP1 — CIBH SYSID SW 19 H (CIBD)
EN1 — CIBH SYSID SW 18 H (CIBD)
EA1 — CIBH SYSID SW 17 H (CIBD)
ER2 — CIBH SYSID SW 16 H (CIBD)

5V — ES1 — R93 1K, R94 1K, R95 1K, R96 1K, R97 1K, R98 1K
DP1 — CIBH SYSID SW 15 H (CIBD)
DP1 — CIBH SYSID SW 14 H (CIBD)
EH2 — CIBH SYSID SW 13 H (CIBC)
DA1 — CIBH SYSID SW 12 H (CIBC)
DN1 — CIBH SYSID SW 11 H (CIBC)
DB1 — CIBH SYSID SW 10 H (CIBC)
CS2 — CIBH SYSID SW 09 H (CIBC)
CT2 — CIBH SYSID SW 08 H (CIBC)

5V — ES1 — R91 1K, R92 1K
CV2 — CIBH SYSID SW 07 H (CIBE)
CU1 — CIBH SYSID SW 06 H (CIBE)
CP2 — CIBH SYSID SW 05 H (CIBC)
CP1 — CIBH SYSID SW 04 H (CIBC)
CN1 — CIBH SYSID SW 03 H (CIBC)
CB1 — CIBH SYSID SW 02 H (CIBC)
CC1 — CIBH SYSID SW 01 H (CIBC)
CN1 — CIBH SYSID SW 00 H (CIBC)

74LS273 E117 — CIBH CLK TO ID LO HB L
BUS QDATA 15 H — CIBH TO IDLO 15 H (CIBB,D)
BUS QDATA 14 H — CIBH TO IDLO 14 H (CIBB,D)
BUS QDATA 13 H — CIBH TO IDLO 13 H (CIBB,C)
BUS QDATA 12 H — CIBH TO IDLO 12 H (CIBB,C)
BUS QDATA 11 H — CIBH TO IDLO 11 H (CIBB,C)
BUS QDATA 10 H — CIBH TO IDLO 10 H (CIBB,C)
BUS QDATA 09 H — CIBH TO IDLO 09 H (CIBA,C)
BUS QDATA 08 H — CIBH TO IDLO 08 H (CIBA,C)

74LS273 E39 — CIBV INIT L; CIBU CLK TO ID LO LB L
BUS QDATA 07 H — CIBH TO IDLO 07 H (CIBA,E)
BUS QDATA 06 H — CIBH TO IDLO 06 H (CIBA,E)
BUS QDATA 05 H — CIBH TO IDLO 05 H (CIBA,C)
BUS QDATA 04 H — CIBH TO IDLO 04 H (CIBB,C)
BUS QDATA 03 H — CIBH TO IDLO 03 H (CIBB,C)
BUS QDATA 02 H — CIBH TO IDLO 02 H (CIBA,C)
BUS QDATA 01 H — CIBH TO IDLO 01 H (CIBA,C)
BUS QDATA 00 H — CIBH TO IDLO 00 H (CIBA,C)

74LS273 E128 — CIBU CLK TO ID HI HB L
BUS QDATA 15 H — CIBH TO IDHI 15 H (CIBB,E)
BUS QDATA 14 H — CIBH TO IDHI 14 H (CIBB,E)
BUS QDATA 13 H — CIBH TO IDHI 13 H (CIBB,E)
BUS QDATA 12 H — CIBH TO IDHI 12 H (CIBB,E)
BUS QDATA 11 H — CIBH TO IDHI 11 H (CIBB,E)
BUS QDATA 10 H — CIBH TO IDHI 10 H (CIBB,E)
BUS QDATA 09 H — CIBH TO IDHI 09 H (CIBA,D)
BUS QDATA 08 H — CIBH TO IDHI 08 H (CIBA,D)

74LS273 E38 — CIBV INIT L; CIBU CLK TO ID HI LB L
BUS QDATA 07 H — CIBH TO IDHI 07 H (CIBA,D)
BUS QDATA 06 H — CIBH TO IDHI 06 H (CIBA,D)
BUS QDATA 05 H — CIBH TO IDHI 05 H (CIBA,D)
BUS QDATA 04 H — CIBH TO IDHI 04 H (CIBB,D)
BUS QDATA 03 H — CIBH TO IDHI 05 H (CIBB,D)
BUS QDATA 02 H — CIBH TO IDHI 02 H (CIBA,D)
BUS QDATA 01 H — CIBH TO IDHI 01 H (CIBA,D)
BUS QDATA 00 H — CIBH TO IDHI 00 H (CIBA,D)

(TO ID LO, HI REGS. SYSTEM ID REG. VBUS CONTROL (SLOT 29))

REVISIONS

CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBH)	D	CS	M8236-0-1	D
SCALE —	SHEET 8 OF 21	DIST.		

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745174 E83

BUS QDATA 12 H → D2 (6) → R2(I) (7) → CIBJ LADRS 12 H (CIBR)
BUS QDATA 11 H → D3 (11) → R3(I) (10) → CIBJ LADRS 11 H (CIBR)
BUS QDATA 10 H → D4 (13) → R4(I) (12) → CIBJ LADRS 10 H (CIBR)
BUS QDATA 09 H → D5 (14) → R5(I) (15) → CIBJ LADRS 09 H (CIBR)
BUS QDATA 08 H → D0 (3) → R0(I) (2) → CIBJ LADRS 08 H (CIBK,L)
BUS QDATA 07 H → D1 (4) → R1(I) (5) → CIBJ LADRS 07 H (CIBK,L)
CIBV INIT L → CLR (1), CLK (9)

745174 E45

BUS QDATA 06 H → D2 (6) → R2(I) (7) → CIBJ LADRS 06 H (CIBK,L)
BUS QDATA 05 H → D1 (4) → R1(I) (5) → CIBJ LADRS 05 H (CIBK,L)
BUS QDATA 04 H → D0 (3) → R0(I) (2) → CIBJ LADRS 04 H (CIBK,L,R)
BUS QDATA 03 H → D5 (14) → R5(I) (15) → CIBJ LADRS 03 H (CIBK,L,R)
BUS QDATA 02 H → D4 (13) → R4(I) (12) → CIBJ LADRS 02 H (CIBJ,K,L,R)
BUS QDATA 01 H → D3 (11) → R3(I) (10) → CIBJ LADRS 01 H (CIBJ,K,L,R)
CLR (1), CLK (9)

BUS QDATA 13 H → 74S04 E111 (5→6) → (3) → 74S11 E98 (3)
BUS QDATA 14 H → (4)
BUS QDATA 15 H → (5)
74S11 E98 (6) → 74S04 E16 (11→10) → CIBJ INWD L

+3V B → 74S74 E96 (PRE 10, D 12, Q 9; C 11, CLR 13, Q 8)
CIBV INIT L → 74S02 E12 (12→13) → 74S74 E96 (CLR 13)
CIBJ INWD L → 74S04 E16 (11→10)

5V → E29 → 8641 E28 (2, 1, 3, 7, 9)
BSYNC L → ADJ2 → E29 → 8641 E28 (1)

BUS QDATA 04 H → 74S04 E16 (1→2)
BUS QDATA 03 H → 74S04 E16 (3→4)
BUS QDATA 00 H → 74S04 E16 (5→6)

5V → E29 → BWTBT L (ADJ2), BDOUT L (AE2), BDIN L (AD2)

CIBA MATCH H → R107 1K, R33 5K (+5V), C70 100 pf
DC0004 E71: GNB (19), SYNC (6), DA2 E4 (2), DA1 (3), DA0 (4), WTBT (5), DOUT (9), DIN (7), VEC (1); BRGX E27 (18), SEL6 (17), SEL4 (16), SEL2 (15), SEL0 (14), OUTH (13), OUTL (12), INWD (11)
5V → E29 → CIBJ TRPLY L (CIBR,T)

NOTE: SEE PAGE CIBN FOR DC0004 TRUTH TABLE

CIBJ OUTHB L (CIBJT)
CIBJ OUTLB L (CIBJT)
CIBJ UNWD L (CIBA,B,R,T)

745139 E9

A1 (2)	FA0 (4)
	FA1 (5)
B1 (3)	FA2 (6)
	FA3 (7)
A2 (14)	FB0 (12)
	FB1 (11)
B2 (13)	FB2 (10)
	FB3 (9)
ENB1 (1)	ENB2 (15)

CIBJ SEL TO IDLO L (CIBH,U)
CIBJ SEL TO IDHI L (CIBH,U)
CIBJ SEL ID C/ST L (CIBU)
CIBJ SEL MCR L (CIBU)
CIBJ SEL MCS L (CIBU)
CIBJ SEL VBUS L (CIBU)

745139 E11

A1 (2)	FA0 (4)
	FA1 (5)
B1 (3)	FA2 (6)
	FA3 (7)
A2 (14)	FB0 (12)
	FB1 (11)
B2 (13)	FB2 (10)
	FB3 (9)
ENB1 (1)	ENB2 (15)

CIBJ SEL ROM 0 L (CIBR)
CIBJ SEL ROM 1 L (CIBR)
CIBJ SEL ID DATA LO L (CIBR,N)
CIBJ SEL ID DATA HI L (CIBR)
CIBJ SEL DONE L (CIBR,U)
CIBJ SEL RDY L (CIBR,U)
CIBJ SPARE H (CIBT)

745139 E11 (FA0) → 74S10 E99 (6, 4, 3 → 6) → 74S04 E111 (9→8) → CIBJ GATE ROM H (CIBR,T)
74S10 E99 (6) → CIBJ GATE ROM L (CIBR)
745139 E11 (FB0) → 74S00 E46 (6, 4 → 6)

745139 E11 (ENB1 → 1, ENB2 → 15) → 745139 E9 (ENB1 → 1, ENB2 → 15)

-745139-
EACH DECODER / DEMULTIPLEXER FUNCTION TABLE

INPUTS			OUTPUTS			
ENABLE	SELECT					
G	B	A	Y0	Y1	Y2	Y3
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

H = HIGH LEVEL L = LOW LEVEL
X = IRRELEVANT

(SLOT 29)
(ROM ADRS DECODE LATCH ADRS BITS <12:01> QBUS REG SELECTS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	CONSOLE INTERFACE BOARD (CIBJ)		
SIZE D	CODE CS	NUMBER M8236-0-1	REV. D
SCALE	SHEET 9 OF 21	DIST.	

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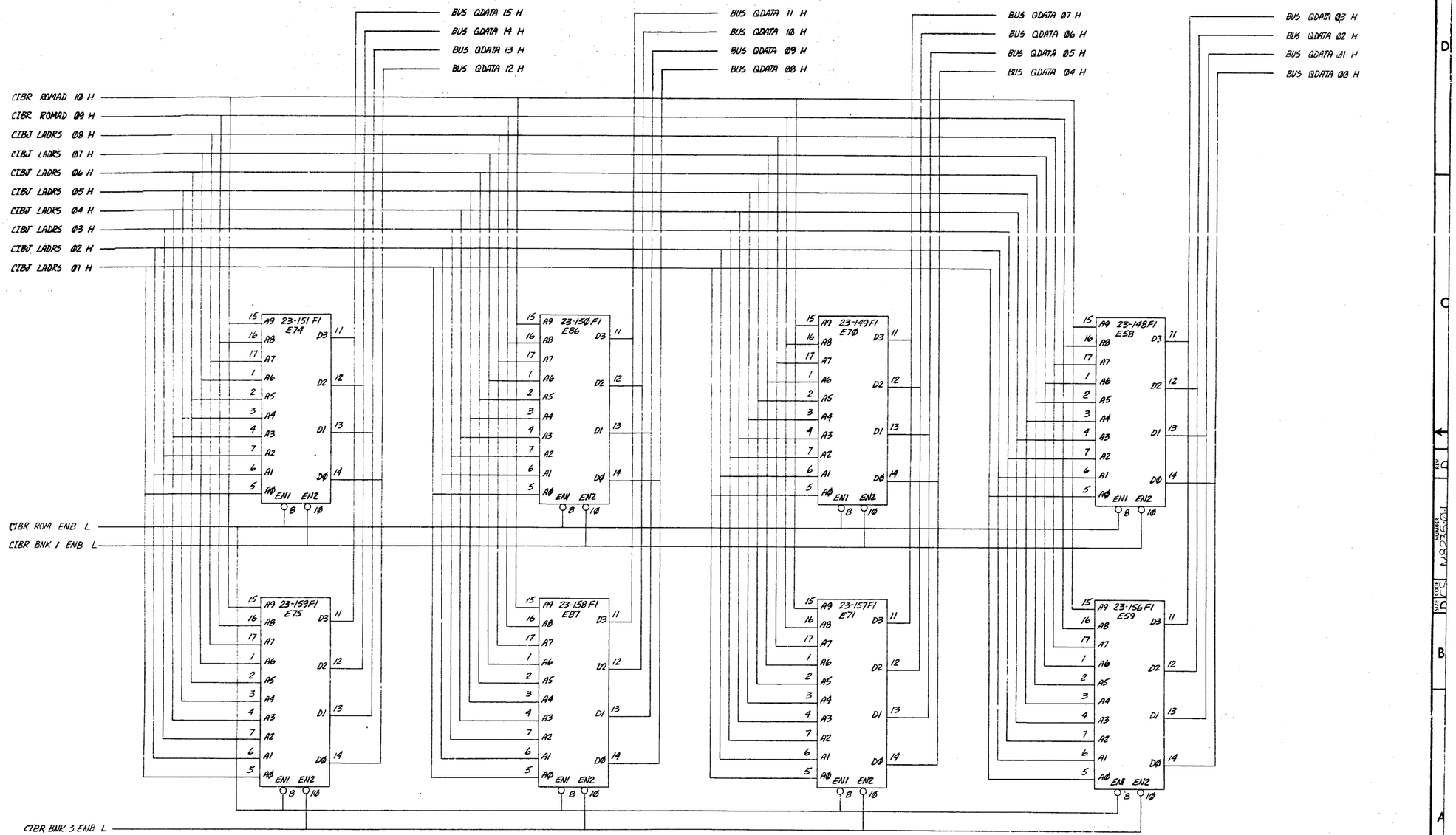

REVISIONS		
CHK	CHANGE NO.	REV.

(ROM MATRIX (SLOT 29))

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBK)	D	CS	M8236-0-1	D
SCALE —	SHEET 10 OF 21	DIST.		

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BUS QDATA 15 H
BUS QDATA 14 H
BUS QDATA 13 H
BUS QDATA 12 H
BUS QDATA 11 H
BUS QDATA 10 H
BUS QDATA 09 H
BUS QDATA 08 H
BUS QDATA 07 H
BUS QDATA 06 H
BUS QDATA 05 H
BUS QDATA 04 H
BUS QDATA 03 H
BUS QDATA 02 H
BUS QDATA 01 H
BUS QDATA 00 H

CIBR ROMAD 10 H
CIBR ROMAD 09 H
CIBJ LADRS 08 H
CIBJ LADRS 07 H
CIBJ LADRS 06 H
CIBJ LADRS 05 H
CIBJ LADRS 04 H
CIBJ LADRS 03 H
CIBJ LADRS 02 H
CIBJ LADRS 01 H

23-147F1 E72
23-146F1 E84
23-145F1 E68
23-144F1 E56
23-239F1 E73
23-238F1 E85
23-237F1 E69
23-236F1 E57

CIBR ROM ENB L
CIBR BNK 0 ENB L
CIBR BNK 2 ENB L

REVISIONS		
CHK	CHANGE NO.	REV.

(ROM MATRIX (SLOT 29))

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBL)	D	CS	M8236-0-1	D
SCALE —	SHEET 11 OF 21	DIST.		

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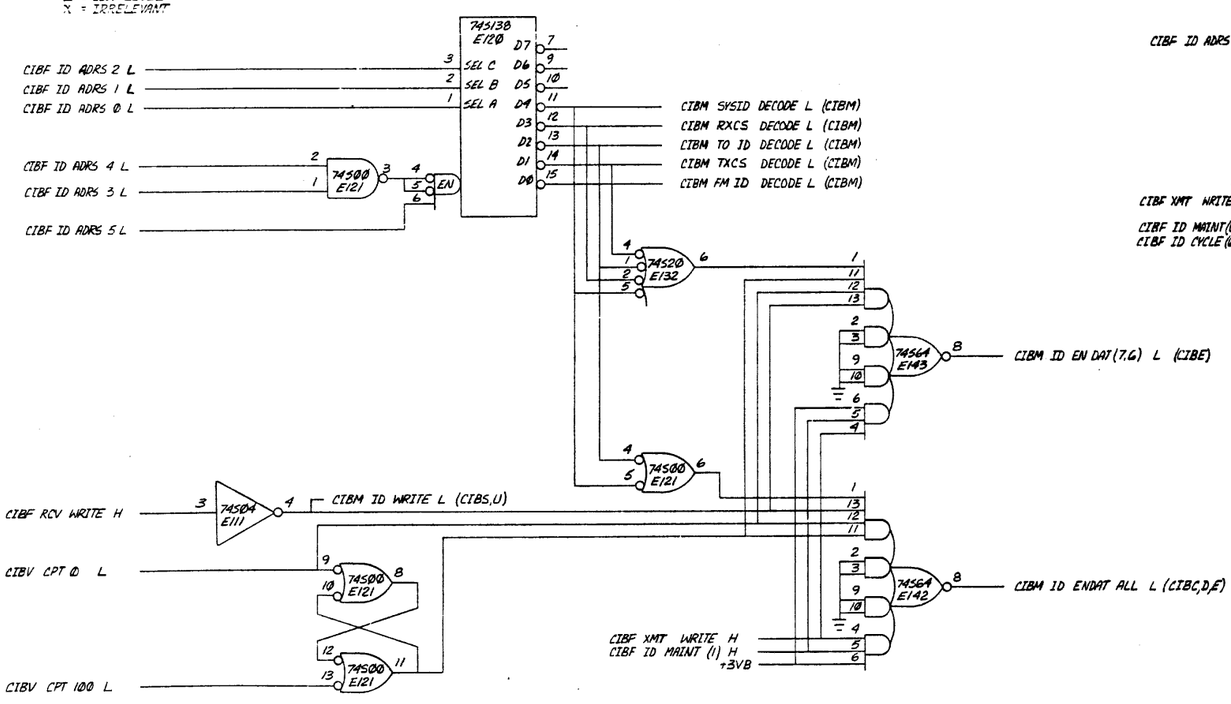
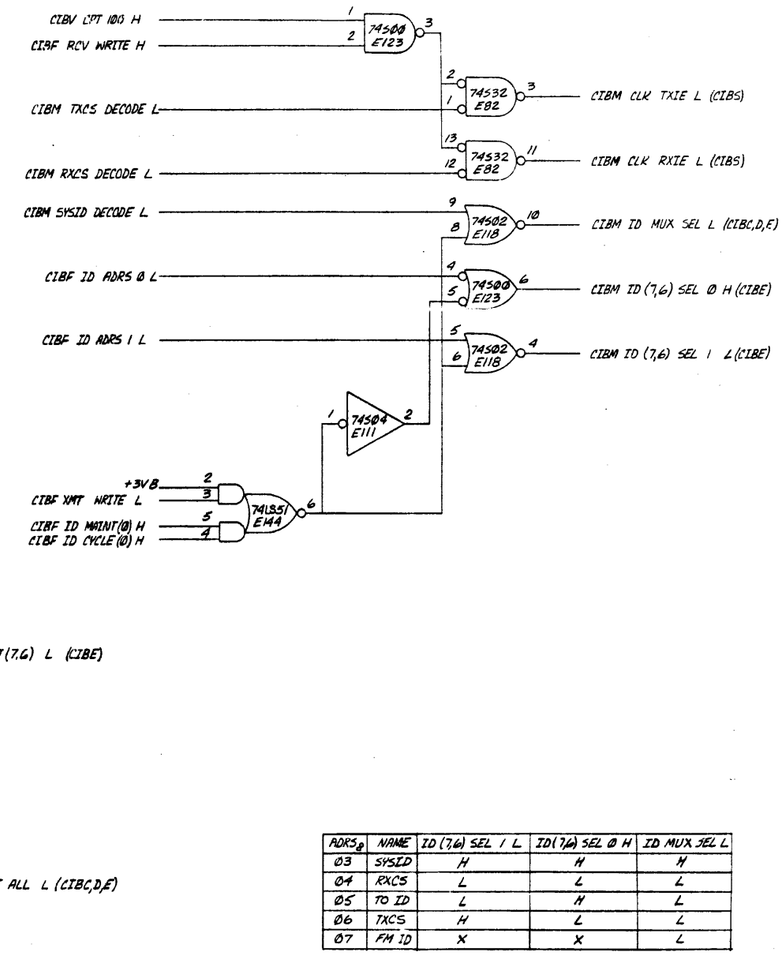
-74S138-
FUNCTION TABLE

INPUTS					OUTPUTS						
ENABLE		SELECT									
G1	G2	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

* G2 = G2A + G2B
H = HIGH LEVEL
L = LOW LEVEL
X = IRRELEVANT





ADRS 0	NAME	ID (7,6) SEL 1 L	ID (7,6) SEL 0 H	ID MUX SEL L
03	SYSID	H	H	H
04	RXCS	L	L	L
05	TO ID	L	H	L
06	TXCS	H	L	L
07	FM ID	X	X	L

(SLOT 29)
(ID BUS DATA ENABLES, ID REG ADRS DECODE, ID MUX SELECT, CLOCKS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBM)	D	CS	M8236-0-1	D
SCALE	SHEET 12 OF 21	DIST.		

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CIBN CNSL RESET H (CIBB,S)

74S04 E107 → FM1 → CIBN CNSL RESET L (CLKL)

74173 E106

BUS QDATA 15 H → D3
BUS QDATA 12 H → D2
BUS QDATA 09 H → D1
BUS QDATA 08 H → D0
CLK, CLR

R3(I) → EU1 → CIBN HALT REQ H (CIBB ICLD,T)
R2(I) → EU1 → CIBN UPC 12 (I) H (USCL)
R1(I) → CIBN STAR INTR DISAB H (CIBA,S)
R0(I)

CIBV INIT H
CIBU CLK MCR LB L

+3V B
BUS QDATA 10 L → 74S74 E135 D
CIBN MAINT RTN EN (I) H (CIBB)
CIBV INIT H → 74S02 E134
CIBV CPT 150 H → 74S74 E135 C
CIBU CPT 50 H → 74S02 E134
74S04 E107 → DC1 → CIBN DMAINT RTN H (USCB,JJ)

ICLF CNSL CMD M L → CV2 → 74S04 E107 → AE1 → CIBN ATTN H (CIBA,SCPA)

CIBN ROM NOP H (CIBA)
74S04 E116 → BU1 → CIBN ROM NOP L (CEHE,USCB,F,J)
CIBN SOMM H (CIBA)
74S04 E139 → FL1 → CIBN SOMM L (CLKT)
CIBN FR1 H (CIBB)
74S04 E139 → FK1 → CIBN FR1 L (CLKM)
CIBN FR0 H (CIBB)
74S04 E139 → FJ1 → CIBN FR0 L (CLKM)
CIBN STS H (CIBA)
74S04 E139 → FF1 → CIBN STS L (CLKT)
CIBN SBC H (CIBA)
74S04 E139 → FE1 → CIBN SBC L (CLKT)

74LS174 E17

BUS QDATA 07 H → D2 R2(I)
BUS QDATA 06 H → D3 R3(I)
BUS QDATA 04 H → D0 R0(I)
BUS QDATA 03 H → D4 R4(I)
BUS QDATA 02 H → D5 R5(I)
BUS QDATA 01 H → D1 R1(I)
CLR, CLK

CIBV INIT L
CIBU CLK MCR LB L

+5V → R171 10K → C75 .047 µf → ICLD ISTR H (EJ2) → 74LS123 E112
+5V → R35 2ØK → C72 .047 µf → 74LS123 E8Ø
CIBN RUN(I) H (CIBA)
74S04 E107 → AD1 → CIBN RUN H (SCPA)
+3V C
+3V B

+3V A
BUS QDATA 00 H → 74LS74 E34 D
74S04 E44 → FD1 → CIBN PROCEED L (CLKT)
CIBV INIT H → 74S02 E134
CIBT STOPPED L

(MACHINE CONTROL REG; RUN AND ATTENTION INDICATORS (SLOT 29))

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBN)	D	CS	M8236-Ø-1	D
SCALE —	SHEET 13 OF 21		DIST.	

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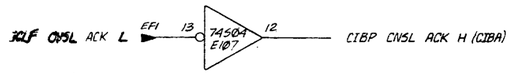

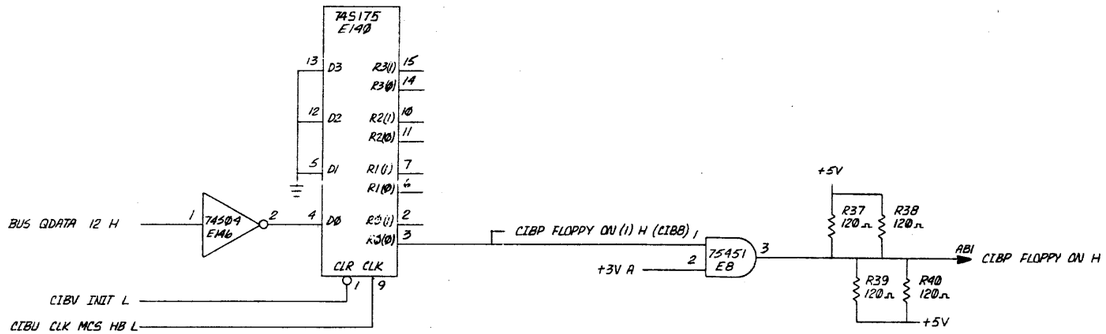

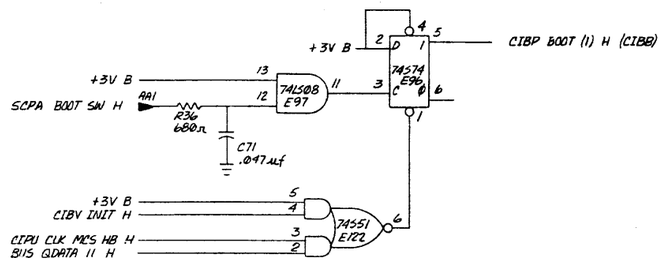

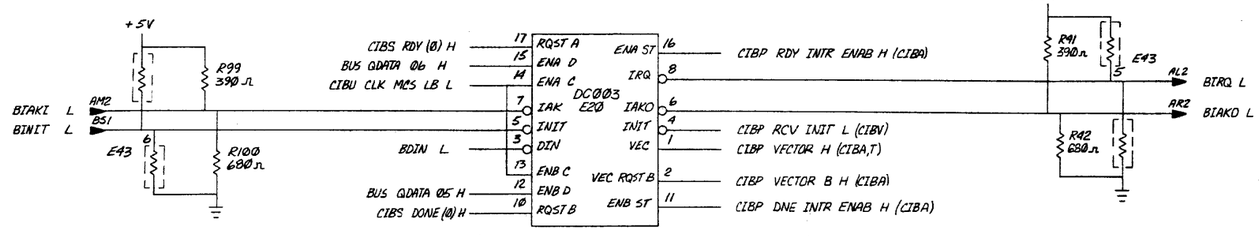

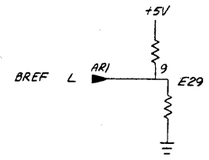

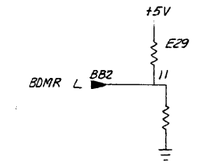

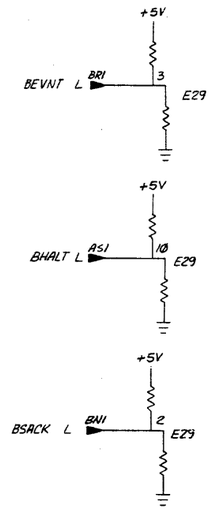

REVISIONS		
CHK	CHANGE NO.	REV.

(MACHINE CONTROL/STATUS, CONSOLE ACKNOWLEDGE (SLOT 29))

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBP)	D	CS	M8236Ø-1	D
SCALE — / — SHEET 14 OF 21	DIST.			

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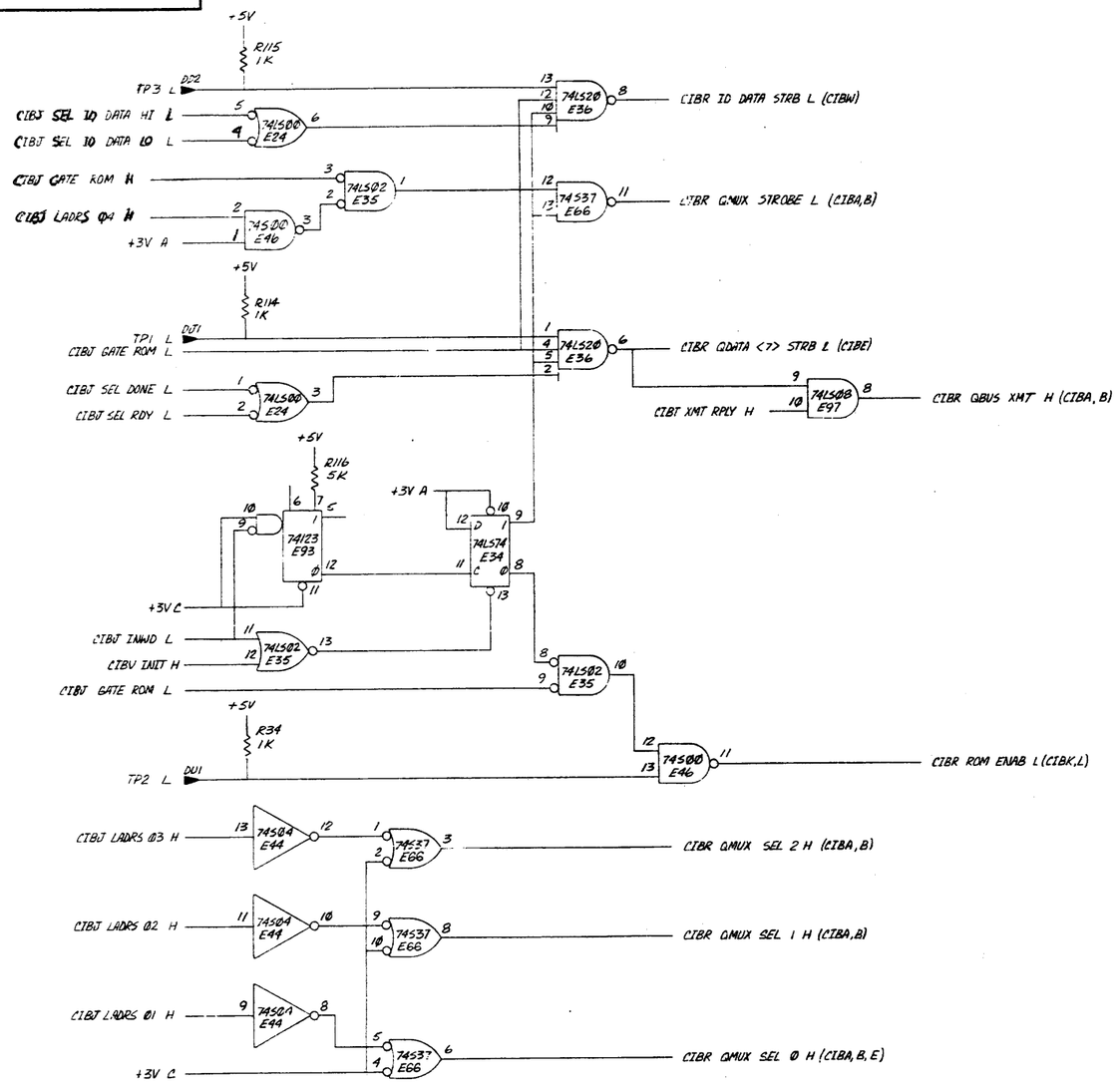

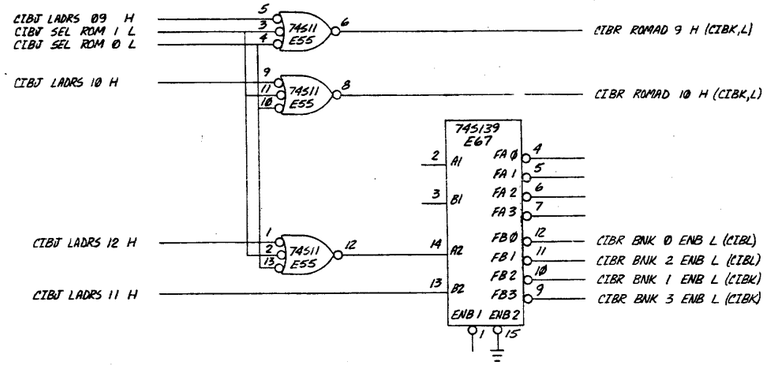

(QMUX SELECTS ROM BANK DECODE, ENABLE ID DATA, QMUX STROBES QBUS XMT (SLOT 29))

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBR)	D	CS	M8236-0-1	D

SCALE — SHEET 15 OF 21 DIST.

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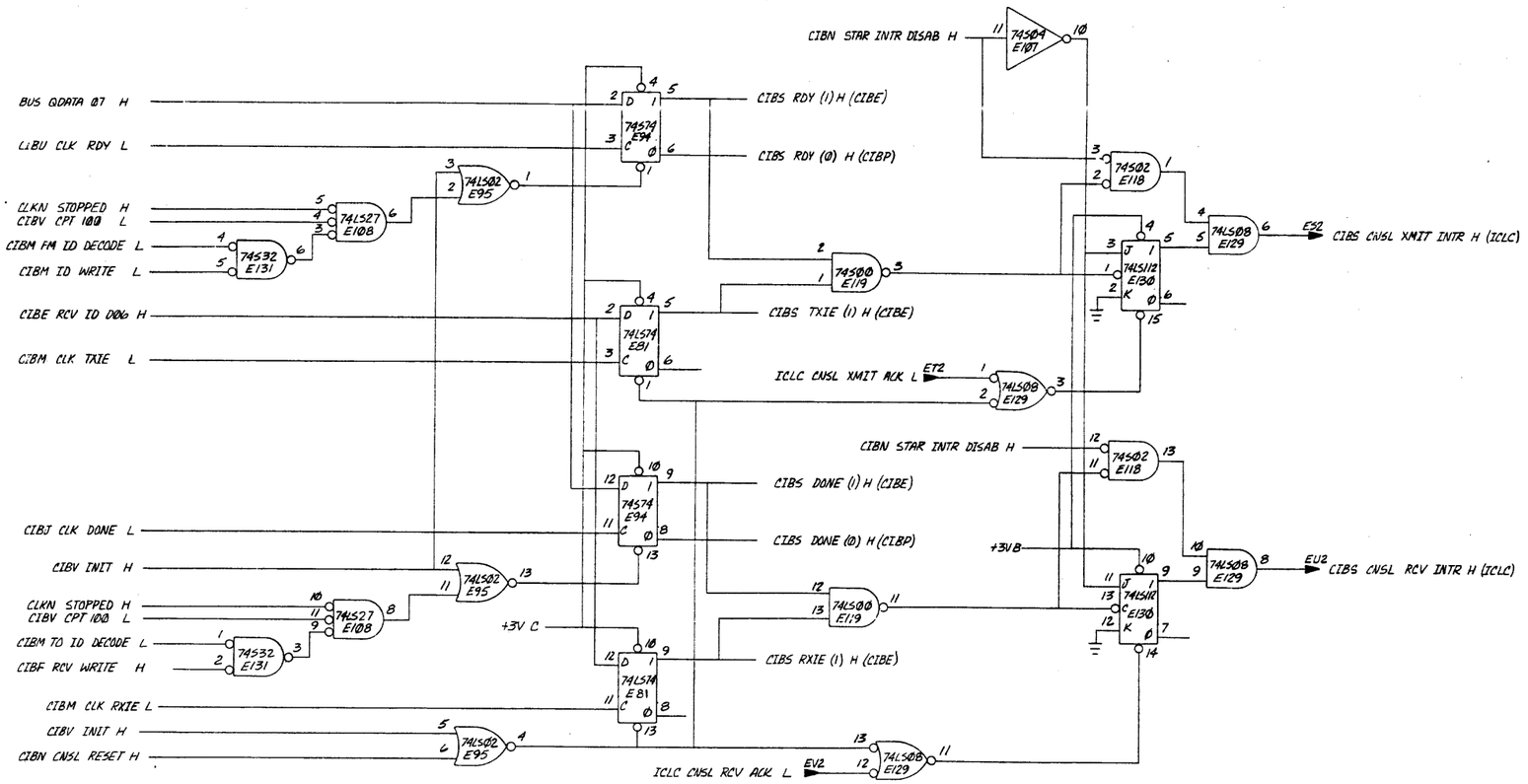

REVISIONS		
CHK	CHANGE NO.	REV.

(READY, DONE, TRANSMIT AND RECEIVE INTERRUPT ENABLES (SLOT 29))

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE (CIBS) INTERFACE BOARD	D	CS	M8236-Ø-1	D

SCALE — SHEET 16 OF 21 — DIST.

DEC FORM NO. DNB 136

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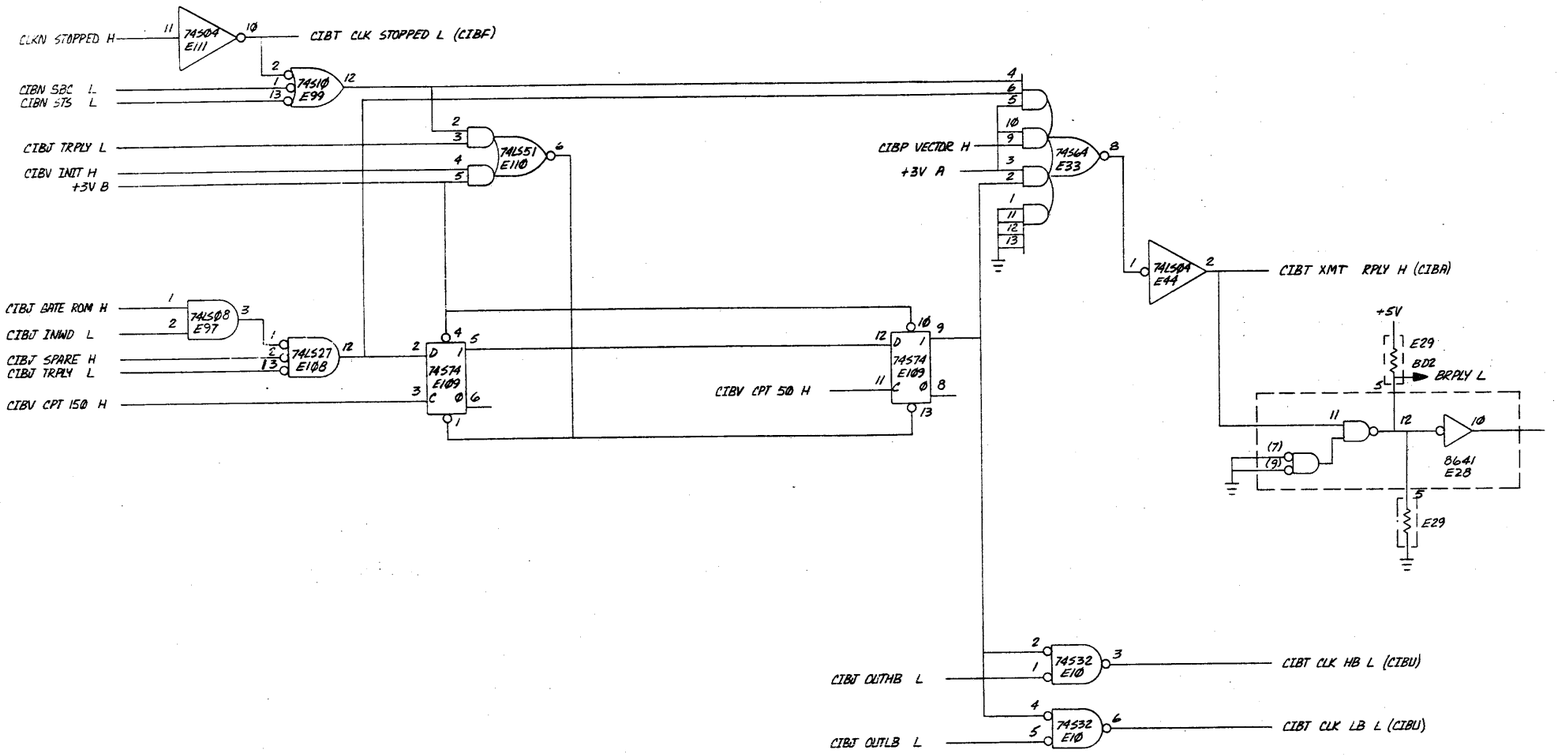

REVISIONS		
CHK	CHANGE NO.	REV.

(QBUS REPLY SYNCHRONIZER (SLOT 29))

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE (CIBT) INTERFACE BOARD	D	CS	M8236-Ø-1	D
SCALE	SHEET 17 OF 24	DIST.		

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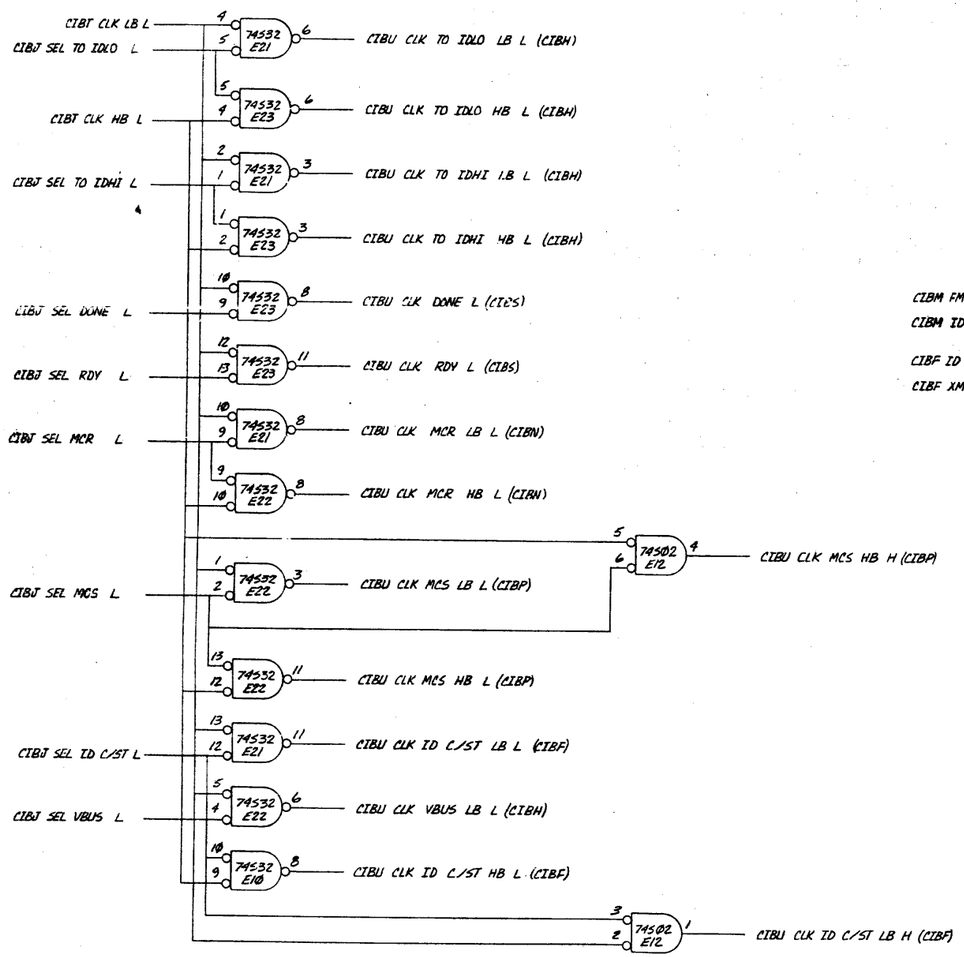

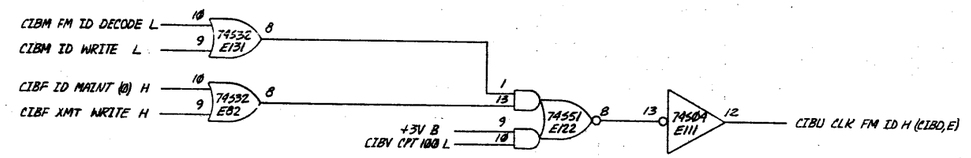

(ID REG CLOCKS (SLOT 29))

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE (CIBU) INTERFACE BOARD	D	CS	M8236-Ø-1	D
SCALE — SHEET 18 OF 21	DIST.			

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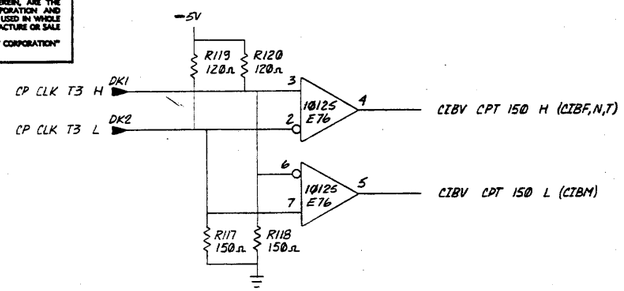

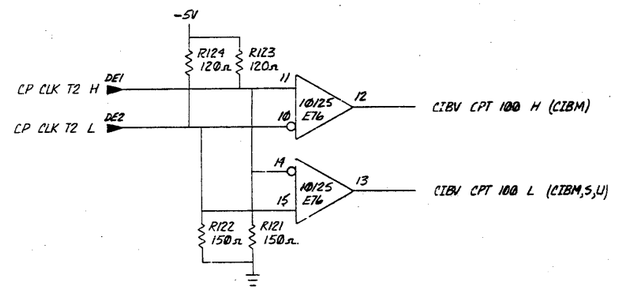

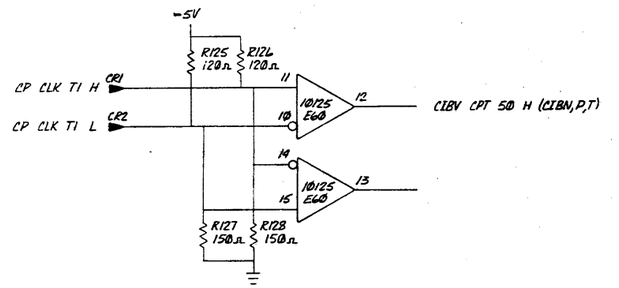

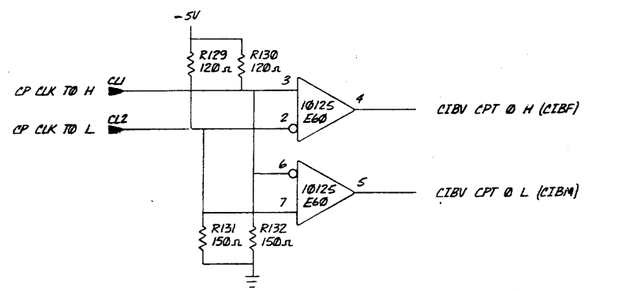

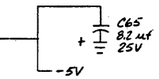

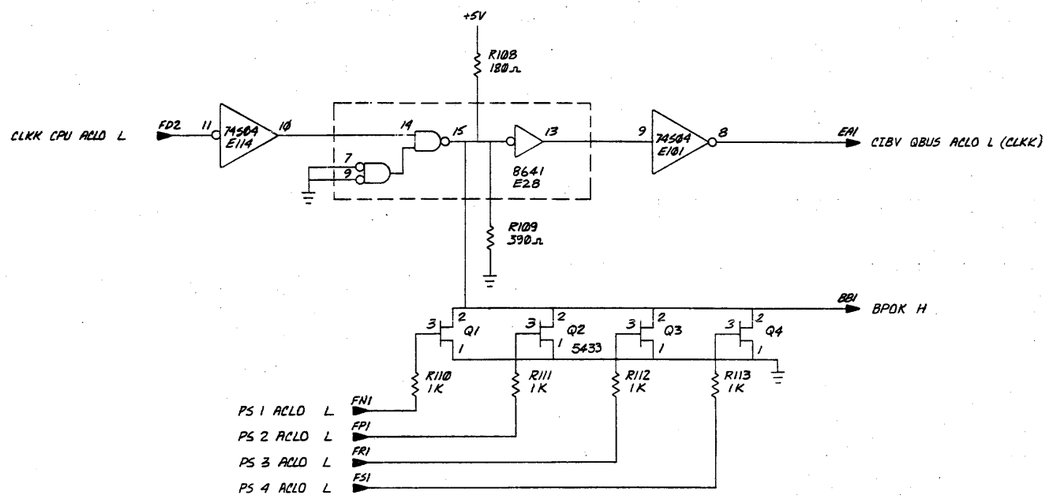

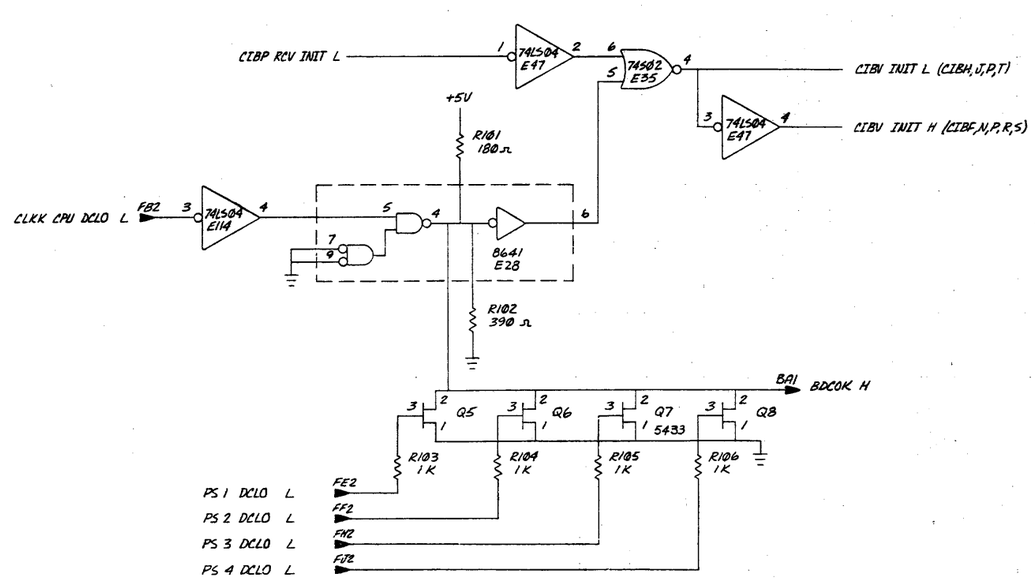

REVISIONS		
CHK	CHANGE NO.	REV.

(ECL CLOCK RECEIVERS, DCLO AND ACLO (SLOT 29))

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE (CIBV) INTERFACE BOARD	D	CS	M8236-Ø-1	D
SCALE —	SHEET 19 OF 21	DIST.		

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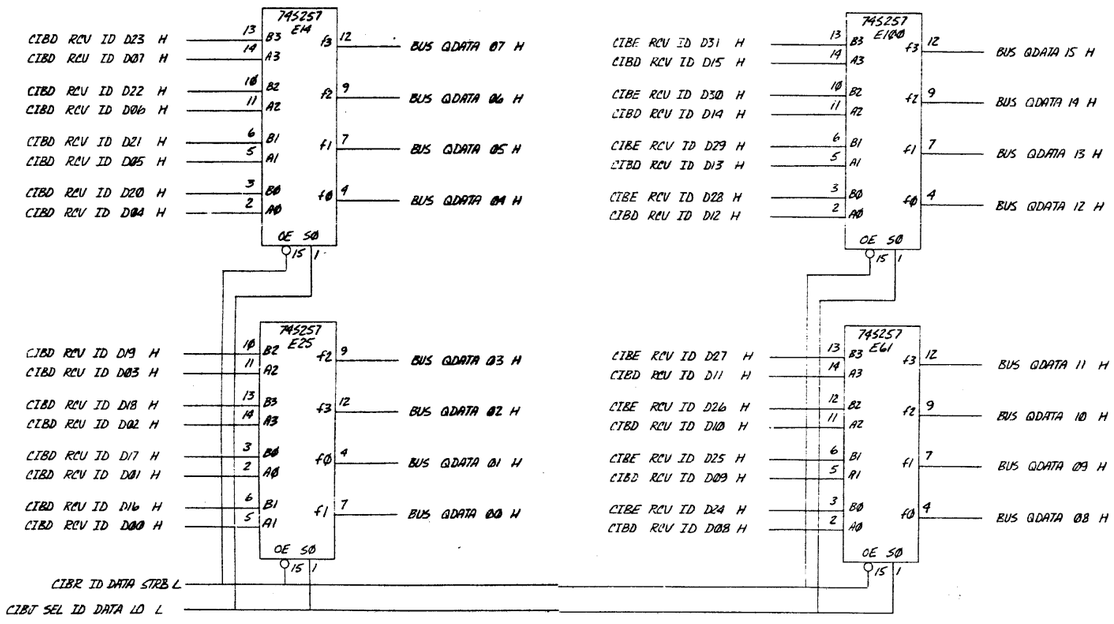
+5V
R133 180Ω
+3V A (CIBA, P, R, T)
R134 390Ω

+5V
R135 180Ω
+3V B (CIBF, M, N, P, T, U)
R136 390Ω

+5V
R137 180Ω
+3V C (CIBH, N, R, S)
R138 390Ω



NOTE: SEE CIBT

- DC004 -

TRUTH TABLE

INPUTS				OUTPUTS			
BSYNC	ENB	BDAL 2	BDAL 1	SEL 6	SEL 4	SEL 2	SEL 0
H	X	X	X	H	H	H	H
L	L *	X	X	H	H	H	H
L	H *	L *	L *	L	H	H	H
L	H *	L *	H *	H	L	H	H
L	H *	H *	L *	H	H	L	H
L	H *	H *	H *	H	H	H	L

INPUTS				OUTPUTS				
BSYNC	ENB	BDOUT	DIAGT	BDAL0	OUTLB	OUTHB	BRPLY	RXCX
H	X	X	X	X	H	H	H	L
L	X	H	X	X	H	H	H	L
L	L *	L	H	X	L	L	H	L
L	L *	L	L	H *	L	H	H	L
L	L *	L	L	L *	H	L	H	L
L	H *	L	H	X	L	L	L	H
L	H *	L	L	H *	L	H	L	H
L	H *	L	L	L *	H	L	L	H

INPUTS		OUTPUTS				INPUT	OUTPUTS	
BSYNC	ENB	BDIN	INWD	BRPLY	RXCX	VECTOR	BRPLY	RXCX
H	X	X	H	H	L	H	L	H
L	X	H	H	H	L	L	H	L
L	L *	L	L	H	L			
L	H *	L	L	L	H			

NOTES:
1.) H'S AND L'S MARKED WITH * INDICATES THE STATE OF THE INPUT LINE AT THE FALLING EDGE OF BSYNC, ASSUMING THE PROPER SET-UP AND HOLD TIMES, OUTSIDE OF THIS INTERVAL, THE INPUT LEVEL ON THESE LINES IS X.
2.) "X" IMPLIES A DON'T CARE CONDITION.
3.) NOTE THAT "BRPLY" IS PRODUCED BY THREE MEANS. THE ACTUAL OUTPUT IS L IF ANY OF THE THREE TRUTH TABLES INDICATE L. THE OUTPUTS ARE H ONLY IF ALL THREE TRUTH TABLES INDICATE H. RXCX IS THE LOGICAL INVERSION OF BRPLY.

REVISIONS		
CHK	CHANGE NO.	REV.

(ID DATA MUX (SLOT 29))

TITLE	SIZE	CODE	NUMBER	REV.
CONSOLE INTERFACE BOARD (CIBW)	D	CS	M8236-Ø-1	D
SCALE —	SHEET 20 OF 21	DIST.		

DEC FORM NO. 080 138

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(163*/173) ϕϕϕ ROM ϕ — ROM ϕ DATA <15:ϕ> — R/O
(163/173) ϕϕ2 ROM 1 — ROM 1 DATA <15:ϕ> — R/O
(163/173) ϕϕ4 SPARE — SPARE — TIME OUT
(163/173) ϕϕ6 ID DATA LO — ID DATA <15:ϕ> — R/O
(163/173) ϕ1ϕ ID DATA HI — ID DATA <31:16> — R/O
(163/173) ϕ12 SPARE — SPARE — TIME OUT
(ϕ4) (163/173) ϕ14 RX DONE — ϕ ... ϕ | RX DNE | ϕ ... ϕ — R/W
(ϕ6) (163/173) ϕ16 TX READY — ϕ ... ϕ | TX RDY | ϕ ... ϕ — R/W

(ϕ5) (163/173) ϕ2ϕ TO ID LO — TO ID <15:ϕ> — R/W
(ϕ5) (163/173) ϕ22 TO ID HI — TO ID <31:16> — R/W
(ϕ7) (163/173) ϕ24 FM ID LO — FM ID <15:ϕ> — R/O
(ϕ7) (163/173) ϕ26 FM ID HI — FM ID <31:16> — R/O
(163/173) ϕ3ϕ ID C/S — ID CYCLE | RCV WRITE | REC ID ADDRS <5:ϕ> (INVERTED) | ID MAINT | ID WRITE | ID ADDRS <5:ϕ> — R/W
(163/173) ϕ32 MCR — HLT REQ | CPU RESET | MAINT RET ENAB | UPC 12 | STAR INTR DISAB | ROM NOP | SOMM | CLK STPD | FREQ <1> | FREQ <ϕ> | STS | SBC | PROCEED — R/W
(163/173) ϕ34 MCS — FLPY ON | BOOT | CNSL CMND MODE | RUN | HALT STATE | RDY IE | DNE IE | AUTO RST | RE-MDTE | LOCK — R/W
(163/173) ϕ36 V-BUS — VBUS SER CHNL <7:ϕ> | CPT ϕ | CPT 1 | CPT 2 | CPT 3 | ϕ | V SLFTST | V LOAD | V CLK — R/W

ϕ3 SYSID — CONTENTS SELECTED BY BACK PANEL JUMPERS. JUMPER INDICATES A 1.

* START ADRS DETERMINED BY JUMPER W1 ON M8236. SEE PAGE C1B8 OF M8236 PRINTS FOR JUMPER DEFINITION.

(CIB REGISTER DEFINITION (SLOT 29))

DRN. R Richardson	8-15-77	FIRST USED ON	3-Hill-1
CHK'D [illegible]	10-17-77	TITLE	CONSOLE (CIBX) INTERFACE BOARD
ENG. [illegible]	12/77		
PROJ. ENG. [illegible]	12/77		
PROD. [illegible]	12/19/77		
NEXT HIGHER ASSY.			
SCALE —		SIZE D / CODE CS / NUMBER M8236-Ø-1 / REV. D	
SHEET 21 OF 21		DIST.	

REVISIONS: REV. | CHANGE NO. | CHK.

DEC FORM NO. UBO 188-0

COMPONENT SIDE VIEW

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

TITLE

TERMINATOR SILO

SIZE E | CODE | NUMBER 108-2370-002 | REV A

SCALE | SHT 3 OF 3

ETCH REV. A-1

PLC DESIGN DATA @ SE REV. DL 7/84

15/16 F.B.S.
23.51 MM

CHK CHANGE NO REV

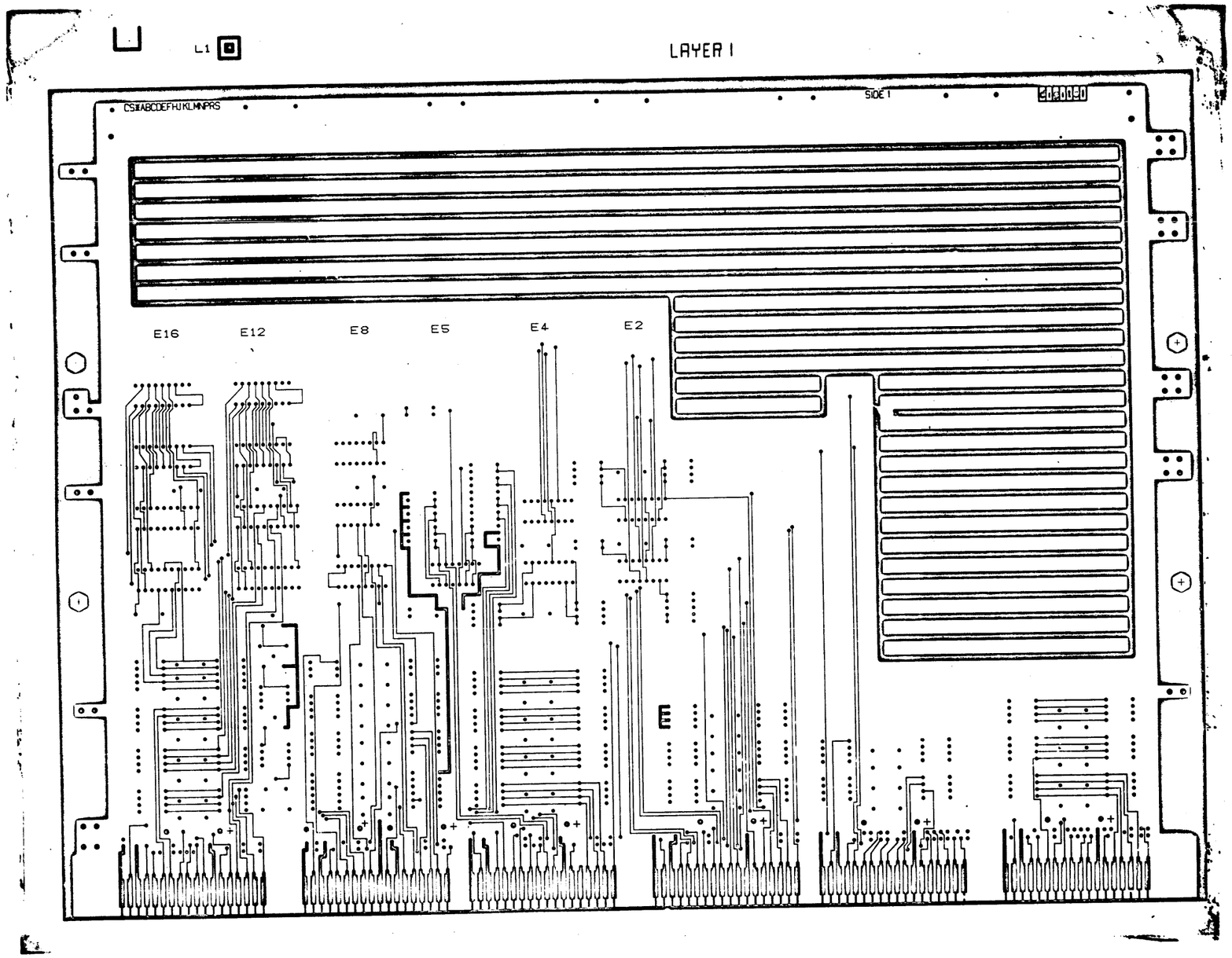
NOTES:

108-2370-002 A

498

L1

LAYER 1



REVISIONS		
DATE	CHANGE NO.	REV.

TITLE: TERMINATOR + SILO
SCALE 2-1 SHEET 2 OF 2
SIZE CODE: E
NUMBER: LAM8237-00
REV: A
DIST:

2499

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LAYER 4

L4

SIDE 2

M8237 5013083B-P1

TERMINATOR AND SILO

REVISIONS		
CHK	CHANGE NO.	REV.

DEC FORM NO DRE 156

TITLE	SIZE	CODE	NUMBER	REV
TERMINATOR + SILO	E		MAM8237 0-0	A
SCALE 2 - 1	SHEET 3 OF 3		DIST.	

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY F. MALANSON
DATE 5/24/77

CHECKED Brad E Smart
DATE 8-11-77

SECTION

ENG Tom E. Molonski
DATE 8-11-77

PROD Mike Tirella
DATE 8-16-77

ISSUED SECTION

NOTES:

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION	REF DESIGNATION
1	E-MD-5013083-0-0	5013083	ETCH BOARD	1	
2		1012784	CAPACITOR, .047UF,50V CER	57	C1-C42,C50-C64
3		1012084-01	CAPACITOR, 8UF,25V	7	C43-C49
4		1103041-00	DIODE, FD777	1	D1
5		1311422	RESISTOR, 178,1/4W,1%	84	R83-R166
6		1300365	RESISTOR, 1K,1/4W,5%	4	R169-R172
7		1300295	RESISTOR, 330,1/4W,5%	1	R173
8		1301424	RESISTOR, 680,1/4W,5%	1	R174
9		1302957	RESISTOR, 121,1/4W,1%	106	R1-R82,R167,R168,R175-R178,R183-R186,R21 R191-R194 R199-R202,R207,R208,R211,R212, R215
10		1301972	RESISTOR, 270,1/4W,5%	16	R179-R182,R187-R190,R195-R198,R203-R206
11		1300250	RESISTOR, 150,1/4W,5%	6	R209,R210,R213,R214,R217,R218
12		1511686	TRANSISTOR, DEC 5433 FET	4	Q1,Q2,Q3,Q4
13		1913294	IC DEC 93S16	1	E8
14		1912731	IC DEC 8646	4	E13,E14,E9,E10
15		1912586	IC DEC 85S68	4	E15,E16,E11,E12
16		1913788	IC DEC 26S10	4	E1,E2.E3.E4
17		1910956	IC DEC 74S151	1	E6
18		1910539	IC DEC 74S20	1	E7
19		1911415	IC DEC 10125	1	E5

E.C.O. NO. 00001

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TITLE
TERMINATOR AND SILO

ASSY NO.

SIZE B | CODE PL | NUMBER M8237-0-0 | REV. A

SHEET 1 OF 2

INSERTION PARTS LIST DATA BASE REV

501

DRB 125

DIGITAL EQUIPMENT CORPORATION
PARTS LIST

MADE BY F. MALANSON DATE 5/24/77	CHECKED Brad E. Smart DATE 8-11-77	SECTION
ENG Tom Eimbond DATE 8-11-77	PROD Mike Tenilla DATE 8-16-77	ISSUED SECTION

ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	QUANTITY / VARIATION	REF DESIGNATION
20		1210711-02	HEX HANDLE ASSEMBLY	1	
21		9000024-01	EYELET	12	

NOTES:

E.C.O. NO.

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TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.
TERMINATOR AND SILO		B	PL	M8237-0-0	A
	SHEET 2 OF 2	INSERTION PARTS LIST DATA BASE REV			

562

DRB 125

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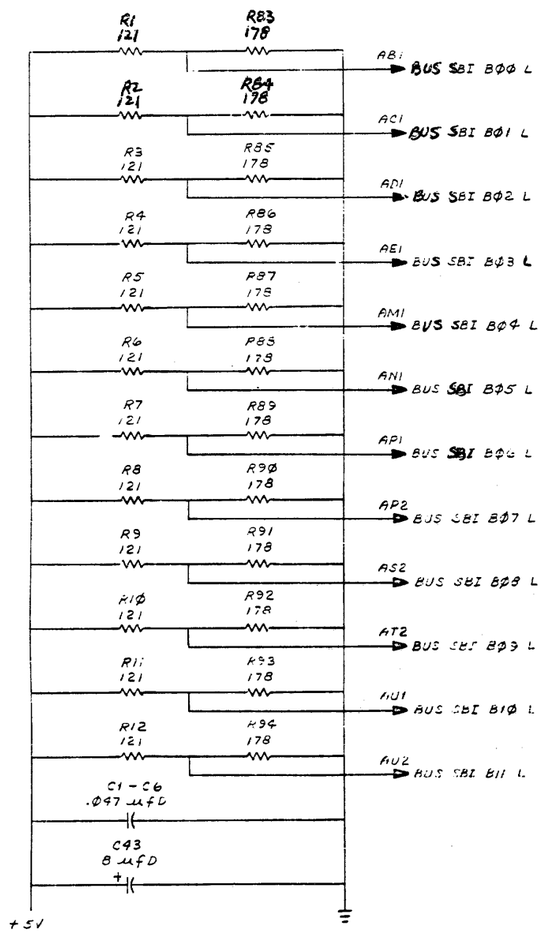

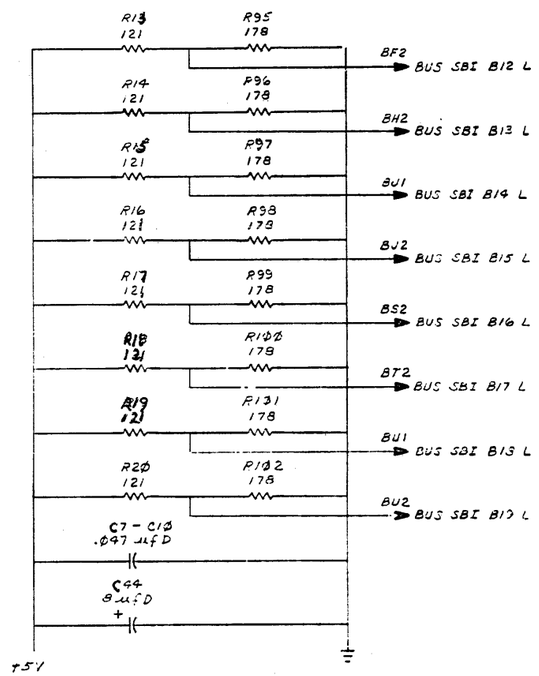

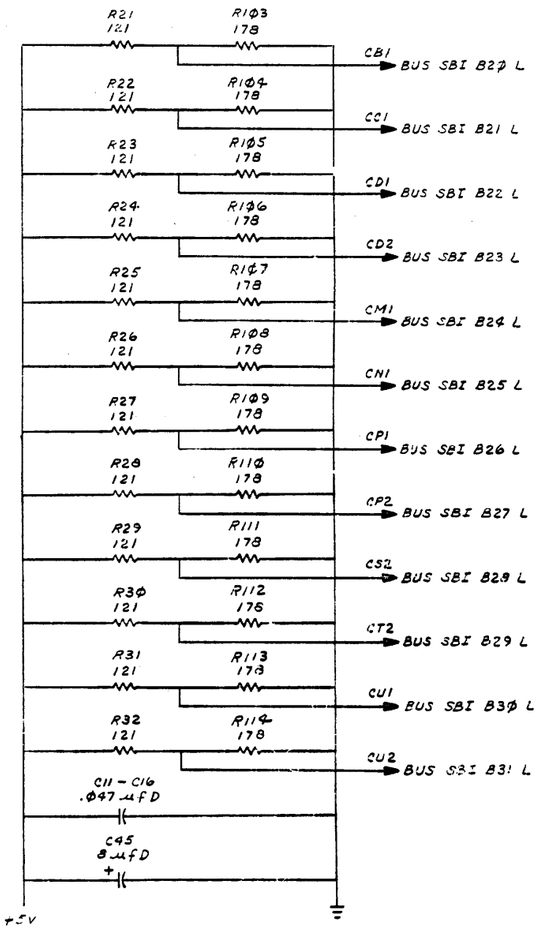

NOTE: UNLESS OTHERWISE SPECIFIED
ALL RESISTORS ARE 1/4W ±1%.

(SBI TERMINATORS)

REVISIONS		
CHK	CHANGE NO.	REV.
K	M8237-1	A

K FITZGERALD
TEMKOVICH

DRN.	T 2671	Final Check Out
CHK'D		
ENG.		
PROJ. ENG.		
PROD.		
NEXT HIGHER ASSY.		
SCALE		
SHEET 1 OF 6		

TITLE: TERMINATOR AND SILO (TRSA)

SIZE	CODE	NUMBER	REV.
D	CS	M8237-Ø-1	A
DIGT.			

503

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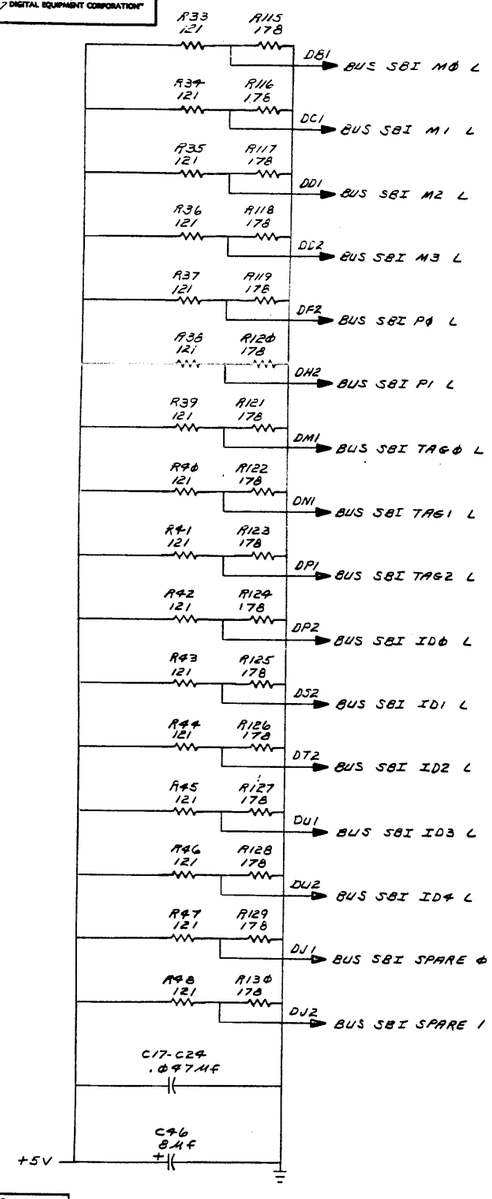

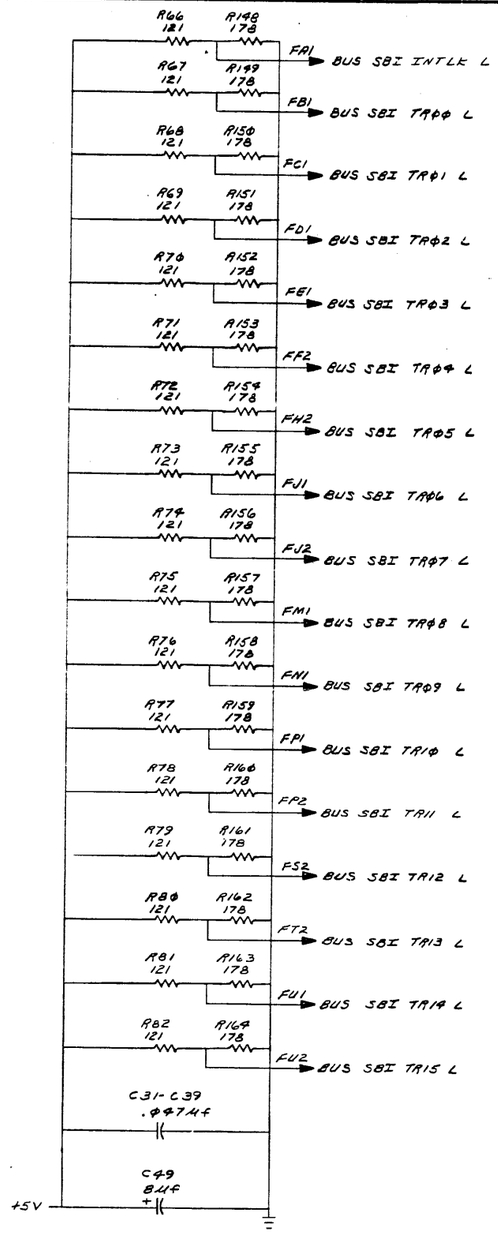

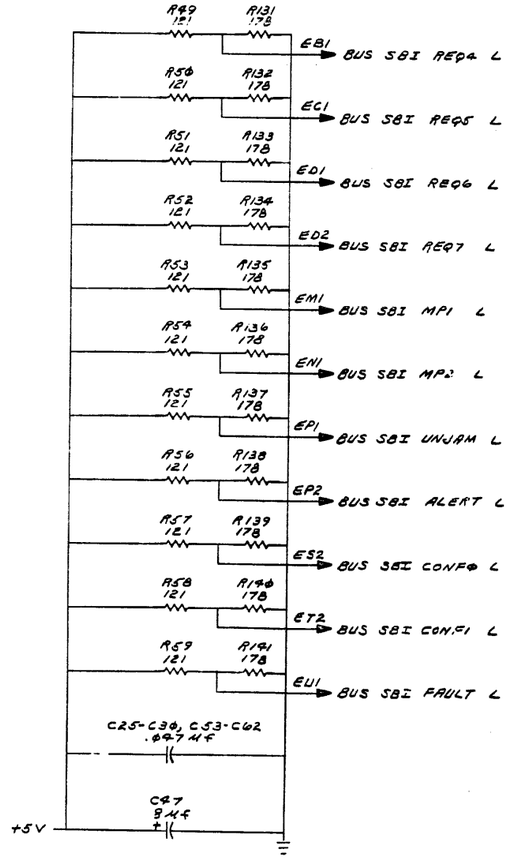

(SBI TERMINATORS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	TERMINATOR AND SILO (TRSB)		
SIZE	CODE	NUMBER	REV.
D	CS	M8237-0-1	A
SCALE		SHEET 2 OF 6	DIST.

DEC FORM NO. DRD 138

504

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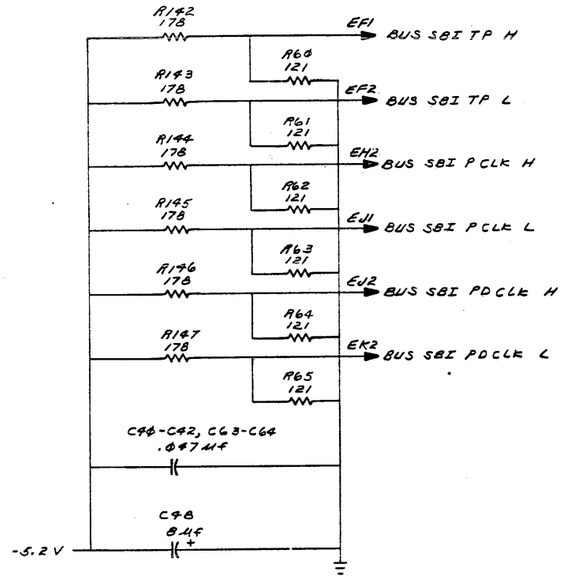

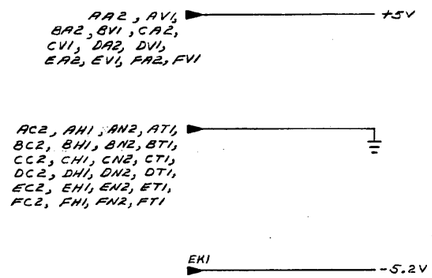

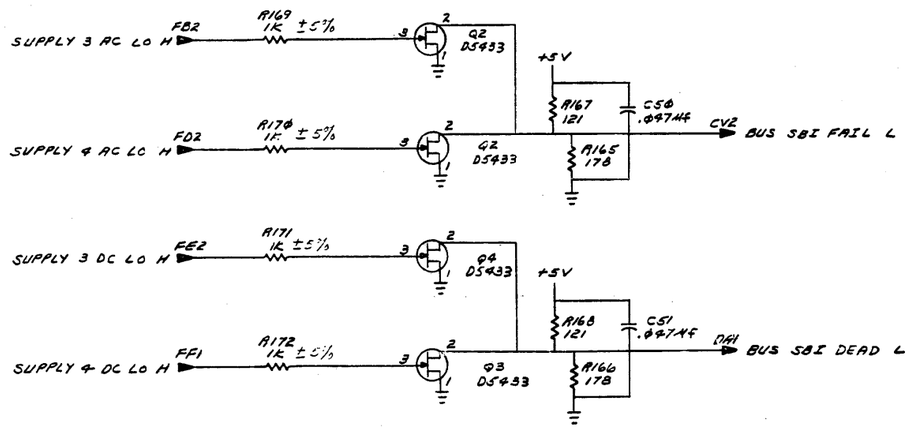

(SBI CLOCK TERMINATORS AND POWER FAIL SENSORS)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE	CODE	NUMBER	REV.
TERMINATOR AND SILO (TRSC)		D	CS	M8237-0-1	A
SCALE	SHEET 3 OF 6	DIST.			

505

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+5V
A173 330 ±5%
A174 680 ±5%
C52 .047μF
TRSD +3V H (TRSE)

TRSF CPT3 H
SBHK WRITE SILO L BR1
TRSD +3V H

BUS XCVR 8646 E9
BUS SBI TR Φ7 L
BUS SBI TR Φ6 L
BUS SBI TR Φ5 L
BUS SBI TR Φ4 L
TRANS
REC
REC PAR
EN TRANS PAR
RCLK TCLK
TRSD +3V H
TRSF CPT1 H

B5568 E12
OE LE WE CLK
TRSD SILO DATA Φ7 H (TRSF)
TRSD SILO DATA Φ6 H (TRSF)
TRSD SILO DATA Φ5 H (TRSF)
TRSD SILO DATA Φ4 H (TRSF)
A0 A2 A3 A1

BUS XCVR 8646 E10
BUS SBI TR Φ3 L
BUS SBI TR Φ2 L
BUS SBI TR Φ1 L
BUS SBI TR ΦΦ L
TRANS
REC
REC PAR
EN TRANS PAR
RCLK TCLK
TRSD +3V H
TRSF CPT1 H

B5568 E11
OE LE WE CLK
TRSD SILO DATA Φ3 H (TRSF)
TRSD SILO DATA Φ2 H (TRSF)
TRSD SILO DATA Φ1 H (TRSF)
TRSD SILO DATA ΦΦ H (TRSF)
A0 A2 A3 A1

93S16 E8
COUT
D3 D2 D1 DΦ
F3 F2 F1 FΦ
CLR LD CLK CEP CET
CLKL SYS INIT Φ L BV2
TRSD +3V H
TRSF CPTΦ H
SBHK SILO COUNT EN H BR2

TRSD SILO ADRS 3 H (TRSE)
TRSD SILO ADRS 2 H (TRSE)
TRSD SILO ADRS 1 H (TRSE)
TRSD SILO ADRS Φ H (TRSE)

(TR SILO BITS 7-0)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
TERMINATOR AND SILO (TRSD)	D	CS	M8237-0-1	A
SCALE	SHEET 4 OF 6	DIST.		

506
DEC FORM NO. CRD 1/78

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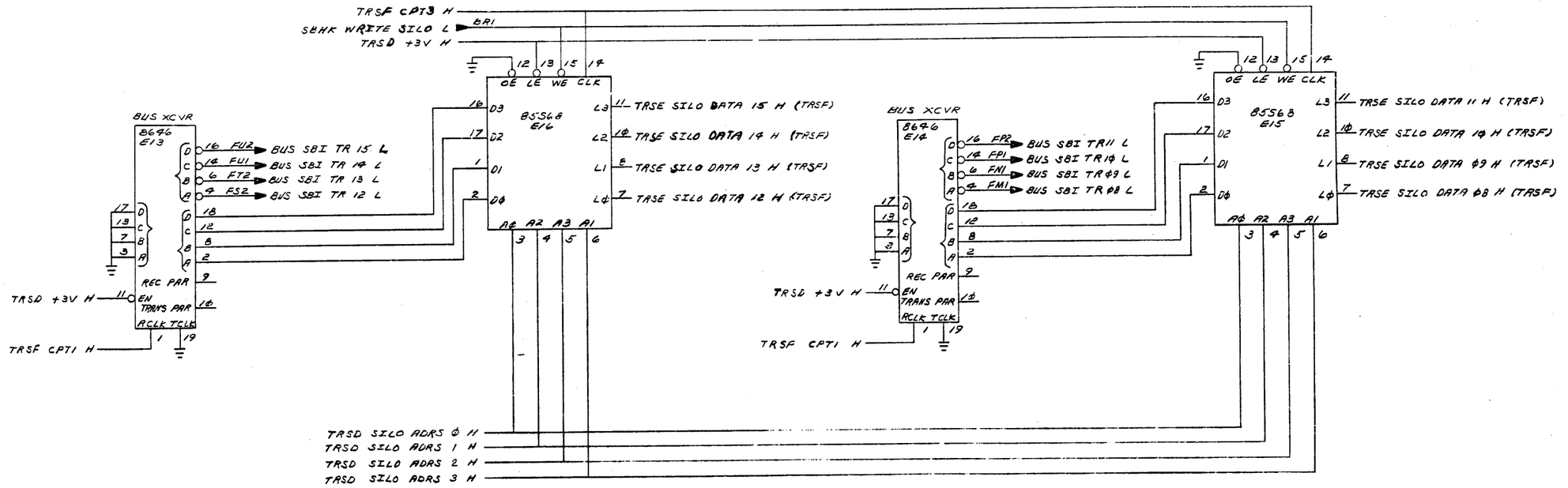

(TR SILO BITS 15-8)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE	CODE	NUMBER	REV.
TERMINATOR AND SILO (TRSE)	D	CS	M8237-0-1	A
SCALE	SHEET 5 OF 6	DIST.		

DEC FORM NO. DRD 138

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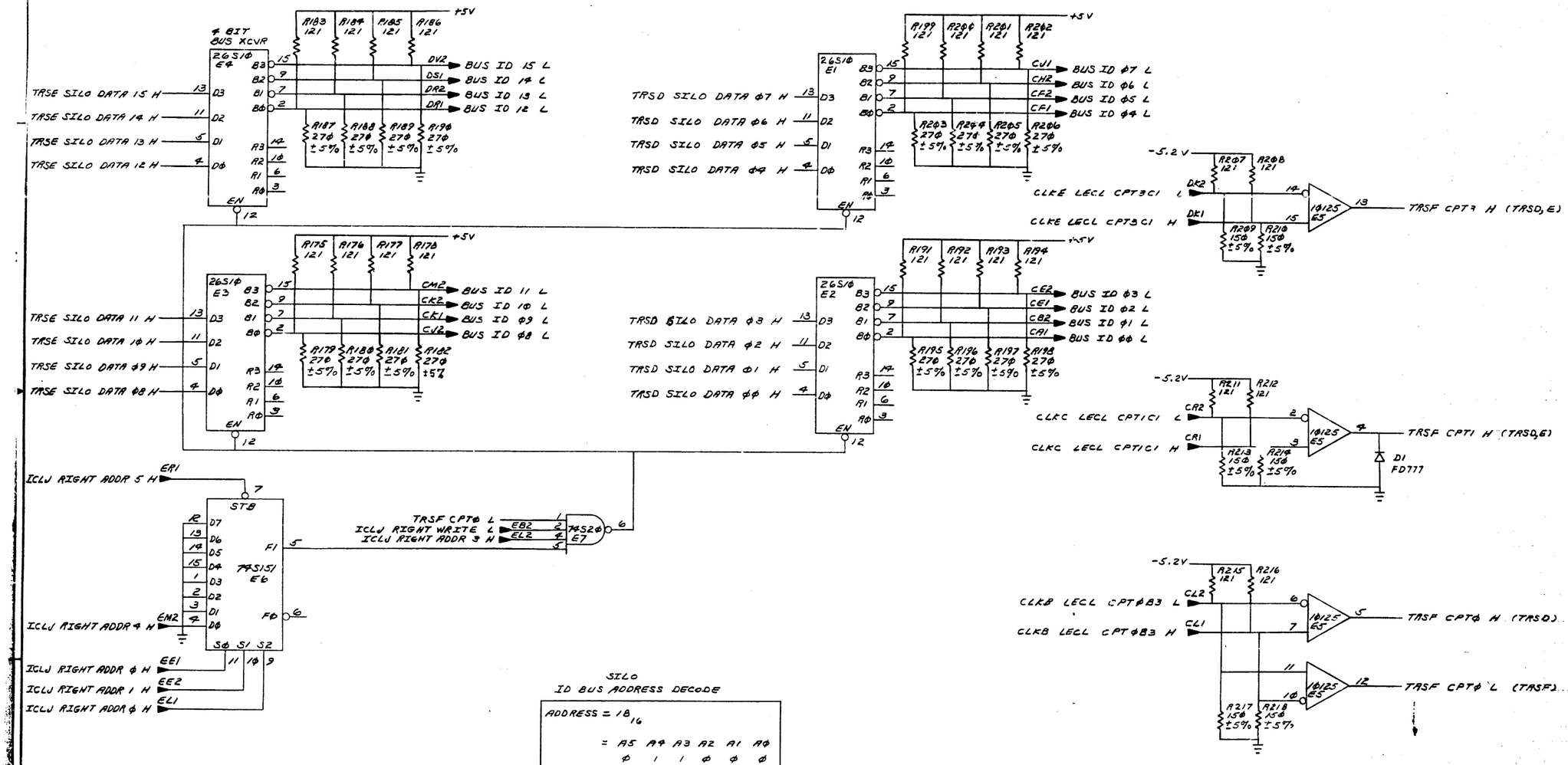

REVISIONS		
CHK	CHANGE NO.	REV.

(ID BUS INTERFACE)

TITLE		SIZE	CODE	NUMBER	REV.
TERMINATOR AND SILO (TRSF)		D	CS	M8237-0-1	A
SCALE	SHEET 6 OF 6	DIST.			

DEC FORM NO. DRD 138

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