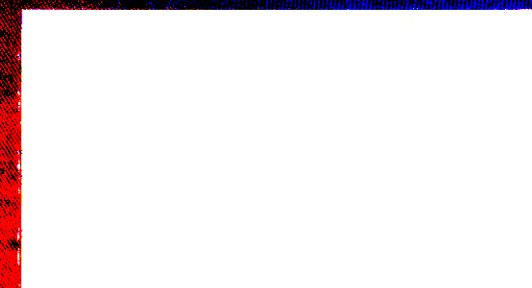


pdpon



digital

**MS11-C**  
**bipolar memory**  
**engineering drawings**

2

3

## CUSTOMER PRINT SET INDEX

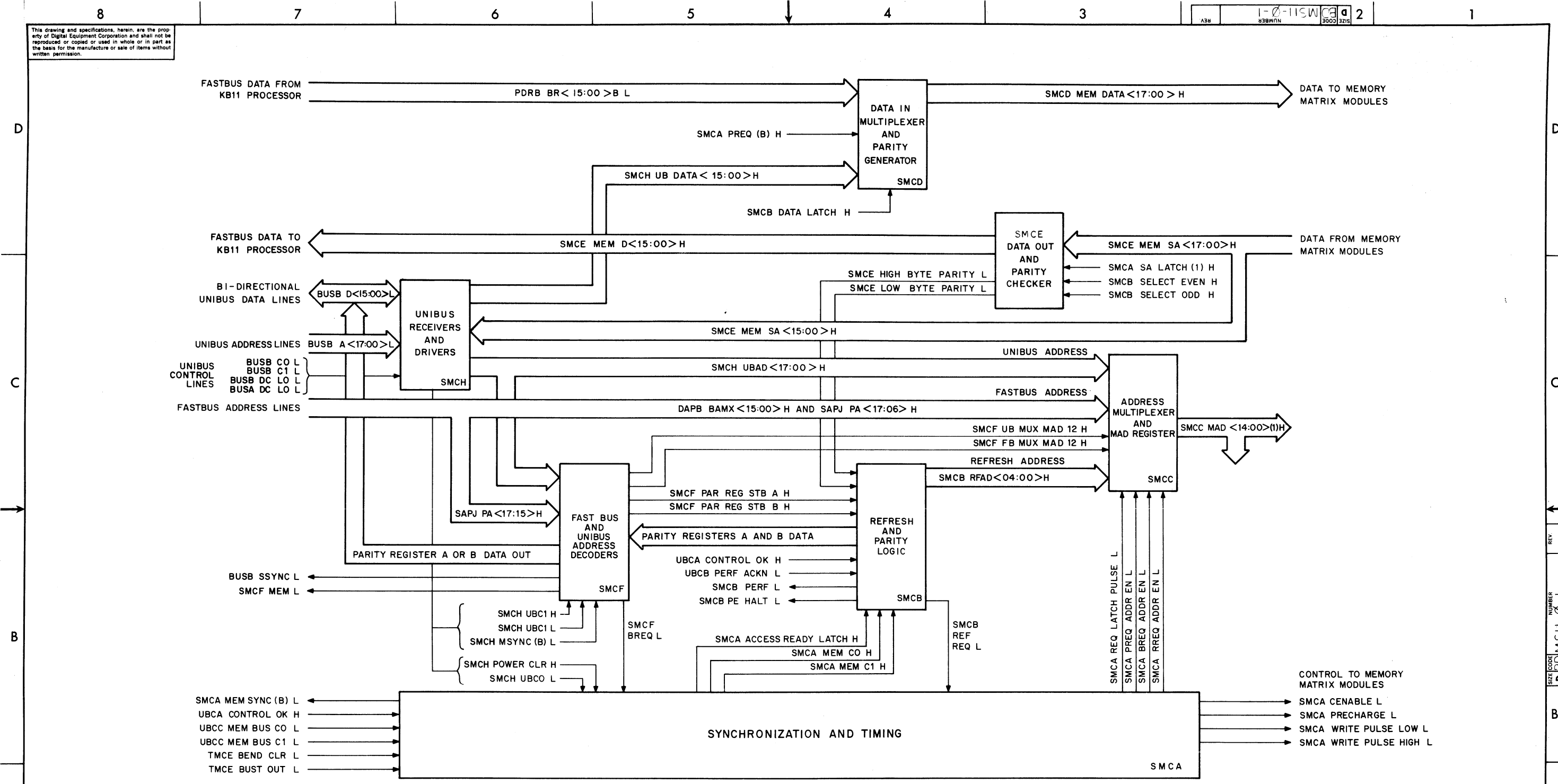
THIS IS PRINT SET

SEQUENCE		SEQUENCE		UNIT VARIATIONS			PRINT SET		
PRINT SET #1		PRINT SET #1		VAR	TITLE	MS11-C1	MS11-C2	MS11-C3	
DRAWING DIRECTORY	B-DD-MS11-C (SHEET ONE ONLY)			MS11-CC	BIPOLAR CONTROL	X			
BLOCK DIAGRAM	D-BD-MS11-0-1			MS11-CM	BIPOLAR MATRIX		X		
MOS/BIPOLAR MEMORY CNTL	E-CS-M811Ø-0-1			MS11-CP	BIPOLAR MATRIX W/PARITY			X	
ACCESSORY LIST	A-AL-MS11-0-2								
MOS/BIPOLAR MEMORY CNTL	E-CS-M811Ø-0-1								
SPECIAL REVISION									
PRINT SET #2									
DRAWING DIRECTORY	B-DD-MS11-C (SHEET ONE ONLY)								
BIPOLAR MEMORY MATRIX	E-CS-M8111-0-1								
ACCESSORY LIST	A-AL-MS11-0-2								
PRINT SET #3									
DRAWING DIRECTORY	B-DD-MS11-C (SHEET ONE ONLY)								
BIPOLAR MEMORY W/PARITY	E-CS-M8111-YA-1								
ACCESSORY LIST	A-AL-MS11-0-2								

DEC 16 (325)-1062-1A-R972

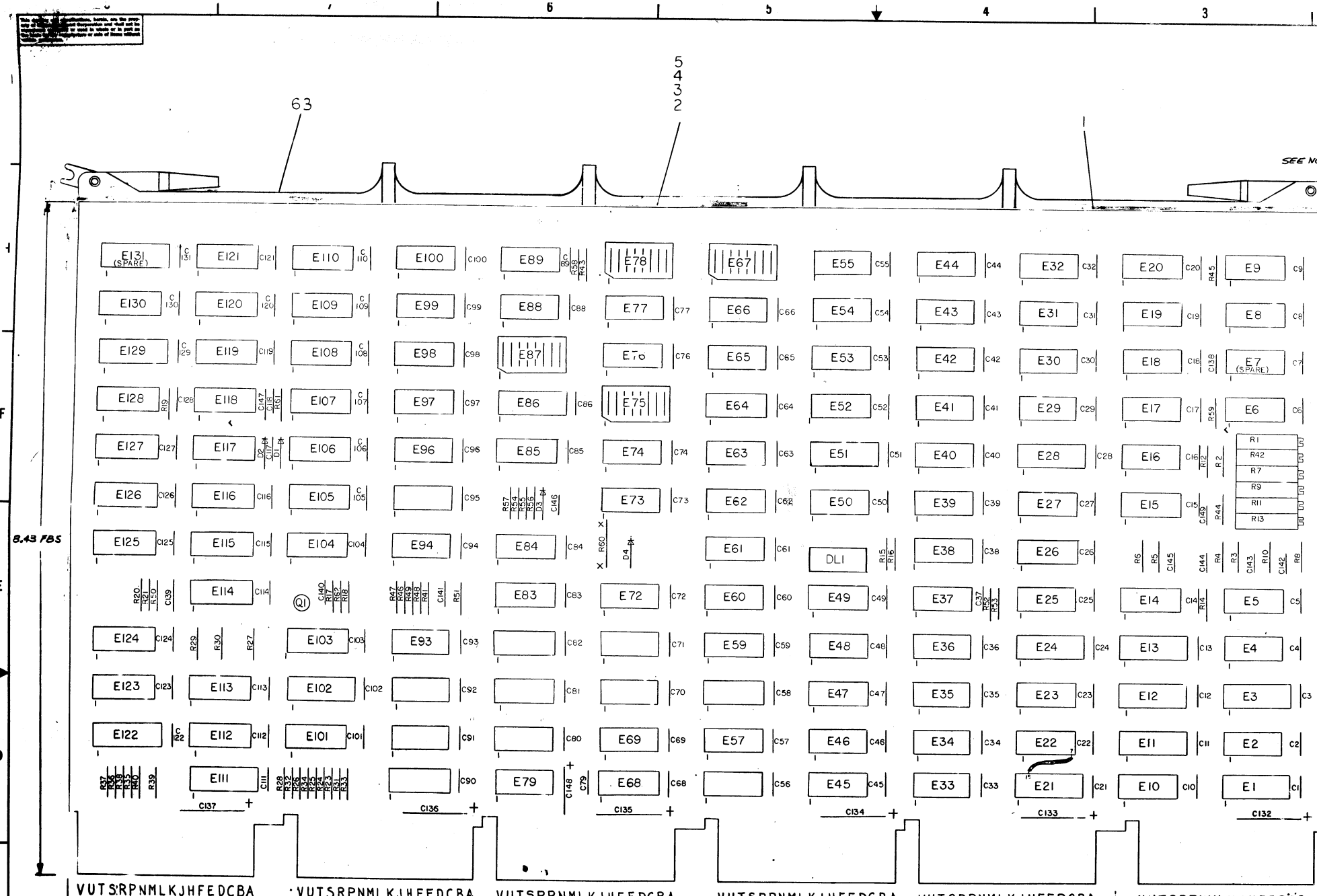
REVISIONS	CHG. NO.	REV	USED ON OPTION/MODEL	DRN.	DATE	TITLE				
		A		R. COOK	3/30/72	BIPOLAR MEMORY				
		B	11/45	CHK'D.	DATE					
	MS11C-1			R. COOK	3/30/72					
	MS11C-2			PROJ ENG.	DATE					
				J. ZEE	3/30/72	SIZE	CODE	NUMBER		REV
	6/72			PROD.	DATE	B	DD	MS11-C		B
	12/73			J. ZEE	3/30/72					
				FIELD SERV.	DATE					
			SHEET 1 OF 3	J. ZEE	3/30/72					
						DIST				

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REV.	NO.
CHK	NO.

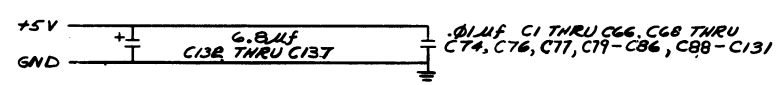
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45		PARTS LIST		
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES		DATE 4/22/72		
DECIMALS .XXX = .005	ANGLES ± 0° 30'	DATE 4/25/72		
.XX = .02		DATE 4/25/72		
X = .1		DATE 4/25/72		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓		DATE 4/25/72	TITLE	
MATERIAL		DATE 4/25/72	BLOCK DIAGRAM	
NEXT HIGHER ASSY.		DATE	SIZE CODE NUMBER REV.	
FINISH		SCALE	D BD MS11-0-1	
SHEET 1 OF 1		DIST.		



QTY	REF DESIGNATION	DESCRIPTION	PART NO.	REV
4	E67, E75, E78, E87	SOCKET	12-11323	64
1	DL1	HANDLE MODULE	12-10711-2	63
1	C14B	DELAY LINE DL-5184	1605528	62
1	C13B	CAP., 14K, 35V, 10%	1001776	61
1	E129	CAP., 150PF, 100V, 5% DM	1000019	60
1	E98	I.C. 74191	19-10096	59
1	E98	I.C. 74130	19-09059	58
2	E84, E93	I.C. 74120	19-05635	57
2	E74, E85	I.C. 74101	19-09849	56
4	E76, E80, E95, E97	I.C. 8242	19-09712	55
5	E69, E72, E73, E127, E130	I.C. 74174	19-09667	54
11	E61, E105-E109, E116-E120	I.C. 74152	19-09061	53
2	E55, E93	I.C. 74522	19-10540	52
1	E50	I.C. 74150	19-09060	51
1	E44	I.C. 74100	19-09056	50
1	E43	I.C. 74155	19-09063	49
3	E40, E45-E48, E60, E57	I.C. 8881	19-09705	48
3	E39, E100, E104	I.C. 74104	19-09931	47
4	E38, E59, E83, E97	I.C. 74102	19-09004	46
11	E33-E37, E43, E66, E96, E10, E121, E126	I.C. 300	19-09485	45
2	E27, E53	I.C. 74540	19-10541	44
2	E43, E52	I.C. 74110	19-09057	43
7	E19, E25, E29, E120	I.C. 74500	19-10532	42
6	E18, E41, E62-E65	I.C. 74544	19-10542	41
1	E16	I.C. 74511	19-10537	40
3	E14, E15, E125	I.C. 75107	19-10268	39
4	E11, E12, E21, E24	I.C. 74515B	19-10549	38
9	E10, E17, E22, E23, E26, E54, E60, E73, E114	I.C. 74504	19-10534	37
3	E9, E30, E42	I.C. 74574	19-10544	36
3	E8, E31, E52	I.C. 74510	19-10536	35
2	E6, E15	I.C. 74505	19-10535	34
6	E5, E7, E10, E12, E13, E123	I.C. 74503	19-10533	33
4	E2, E4, E103, E124	I.C. 82562	19-11291	32
8	E1, E3, E13, E20, E51, E102, E111, E122	I.C. 3404	19-0723	31
1	R16	RESISTOR 390 1/4W, 5%	13-00309	30
1	Q1	TRANSISTOR DEC 3009-B	15-08100	29
1	R52	RESISTOR 150, 1/4W, 5%	13-00250	28
1	R50	RESISTOR 10K, 1/4W, 5%	13-00479	27
1	R60	RESISTOR 220, 1/4W, 5%	13-00274	26
2	R47, R49	RESISTOR, 500, 1/4W, 5%	13-01870	25
1	R41	RESISTOR, 100, 1/4W, 5%	13-00229	24
4	R15, R44, R53, R62	RESISTOR 470, 1/4W, 5%	13-00316	23
3	R20, R21, R59	RESISTOR, 270, 1/4W, 5%	13-01972	22
10	R4, R6, R48, R8, R54 THRU R58, R61	RESISTOR 1K, 1/4W, 5%	13-00345	21
22	R17, R23 THRU R40, R43, R45, R51	RESISTOR 330 1/4W 5%	1300295	20
6	R12, R14, R42, R41, R13	RESISTOR 10K, 1/4W, 5%	13-01982-09	19
7	R56, R4, R46, R44, R40	RESISTOR, 20K, 1/4W, 5%	13-05124	18
2	R3, R2	RESISTOR 170K, 1/4W, 5%	13-02612	17
1	E86	I.C. 74565	19-10543	16
1	D3	DIODE .4MS, 1A21 ZENER	11-05878	14
1	D4	DIODE D662	11-00118	13
2	D1, D2	DIODE D662	11-00118	12
1	C141	CAP. 470PF, 50V, 5% DM	1000084	11
2	C146, C147	CAP., 330P, 50V, 10% DM	1010274	10
1	C139	CAP. 150PF, 25V, 10% DM	1000054	9
5	C141, C42 THRU C45	CAP., 100PF, 50V, 5% DM	1000018	8
6	C132 THRU C137	CAP., 6.8UF, 35V, 10% STANT	1005306	7
1	C136, C68-C70, C76, C77, C79-C85, C88-C131, C40	CAP., .01UF, 50V, 20% AXIAL	1001610-00	6
1		ETCHED CIRCUIT BOARD	5009798	5
1		MODULE ECO HISTORY	5009888-0-6	4
1		ASSEMBLY HOLE LAYOUT	5009888-0-5	3
1		D-Y COORDINATE HOLE LOCATION	5009888-0-4	2
1		EYELET	9006732	1

NOTES:  
 1. UNLESS OTHERWISE NOTED, RESISTANCE IS IN  $\Omega$  AND CAPACITANCE IS IN PICOFARADS. CAPS WITHOUT VALUE NOTED ARE .01MFD.  
 2. SECURE DELAY LINE ITEM #2 TO BOARD WITH ADHESIVE, LEAVING PART # SIDE UP.  
 3. ADD JUMPER FROM E21-PIN 15 TO E22-PIN 7

R42, R41, R42, R41, R43, R45, R51  
 R42, R41, R42, R41, R43, R45, R51  
 R42, R41, R42, R41, R43, R45, R51

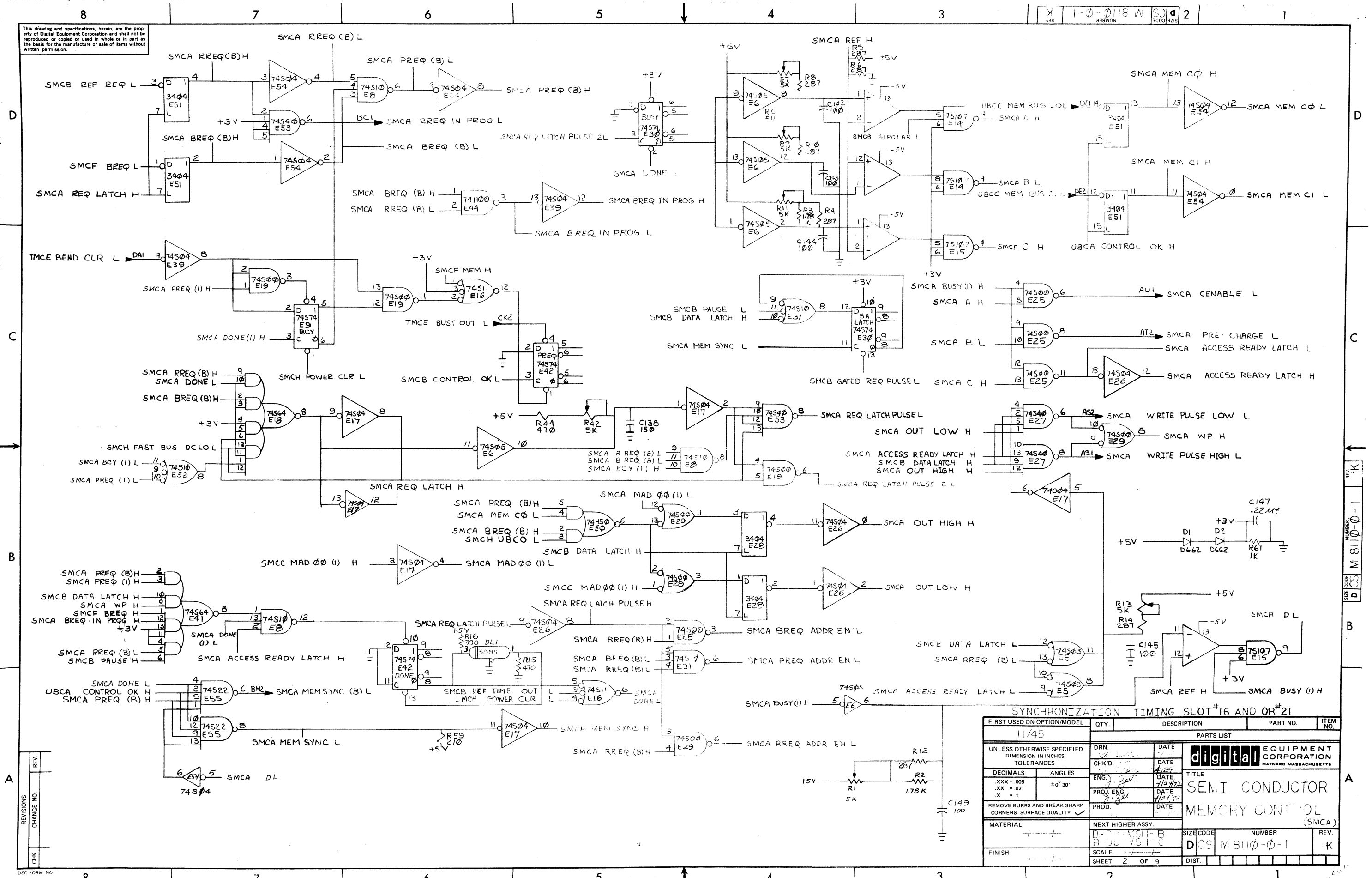


REV	DATE	BY	CHKD	APP'D	DESCRIPTION
1	DEC 300				
2	DEC 304				
3	DEC 74191				
4	DEC 74348				

REV	DATE	BY	CHKD	APP'D	DESCRIPTION
1	DEC 300				
2	DEC 304				
3	DEC 74191				
4	DEC 74348				

EQUIPMENT CORPORATION  
 MOS/BIPOLAR  
 MEMORY CONTROL

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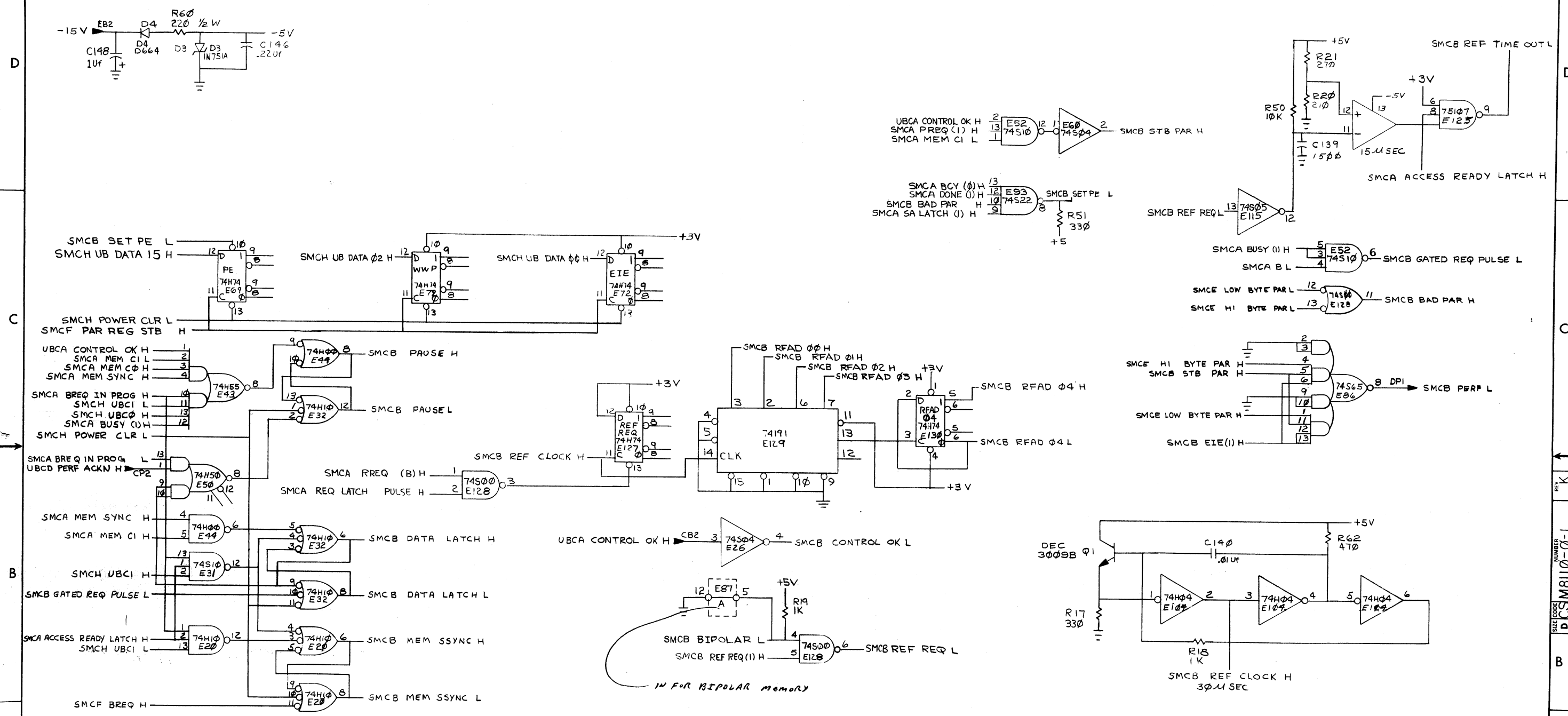
**SYNCHRONIZATION TIMING SLOT #16 AND OR #21**

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45		PARTS LIST		
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES:		DRN.	DATE	<b>digital</b> EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
TOLERANCES		CHK'D.	DATE	
DECIMALS	ANGLES	ENG.	DATE	TITLE <b>SEMI CONDUCTOR</b> <b>MEMORY CONTROL</b> (SMCA)
.xxx = .005	±0° 30'	PROJ. ENG.	DATE	
.xx = .02		PROD.	DATE	MATERIAL
.x = .1				NEXT HIGHER ASSY.
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY		D-10-MSII-B		SIZE CODE
		B-00-7511-C		NUMBER
				FINISH
				SCALE
				SHEET 2 OF 9
				DIST.

REV.	CHANGE NO.

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1-0-0118WSC 2



REV	
CHG	

DEC FORM NO. DRD 102-B

REFRESH & PARITY LOGIC SLOT 16 AND OR 21

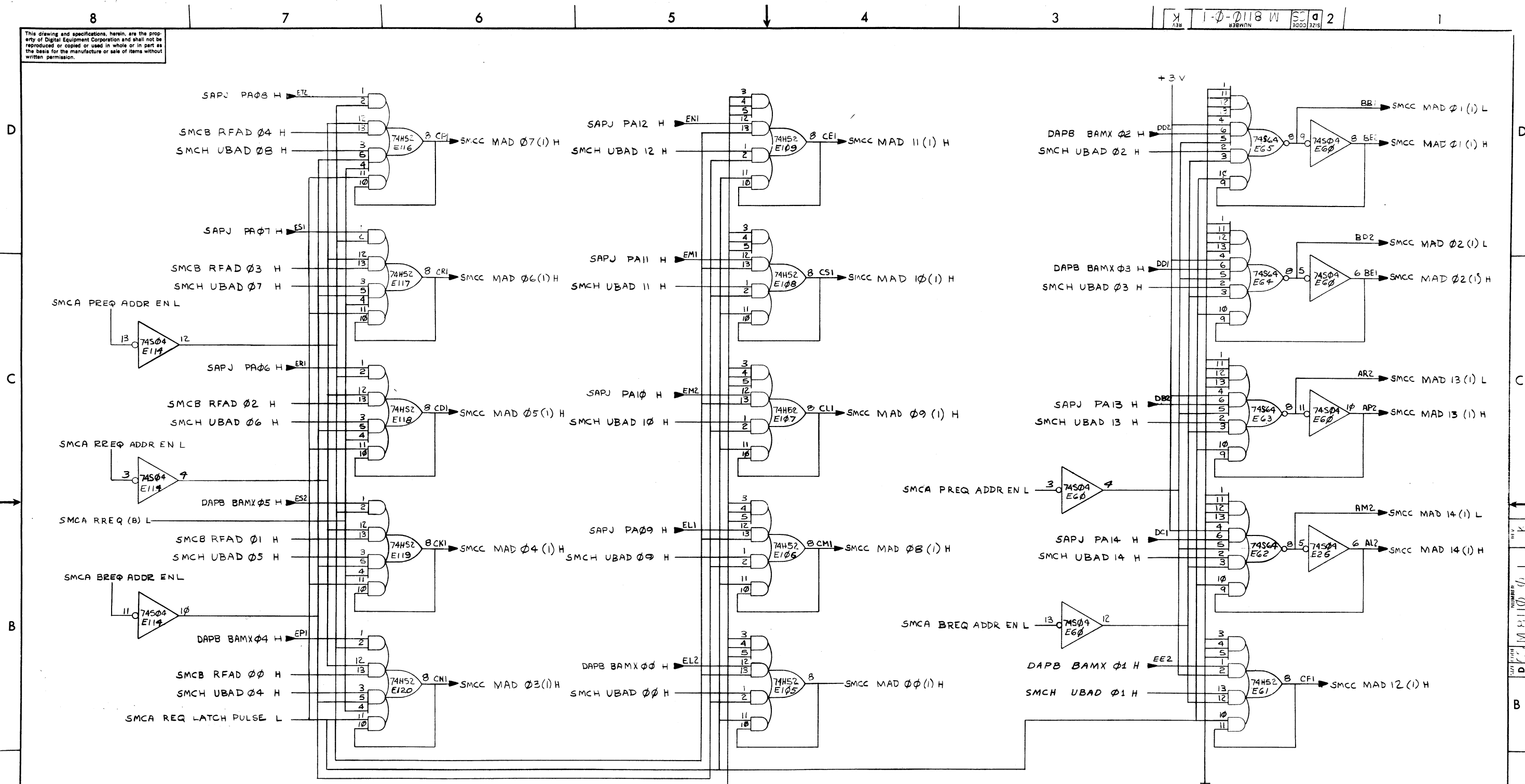
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES				
DECIMALS .005	ANGLES ±0° 30'	DRN	DATE	
.XX .02		CHK'D	DATE	
.X .1		ENG	DATE	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY				
MATERIAL				
NEXT HIGHER ASSY.				
FINISH				
		B-DD-MS11-B	SIZE CODE	NUMBER
		B-DD-MS11-C	DCS M8110-0-1	REV.
		SCALE		K
		SHEET 3 OF 3	DIST.	

SIZE CODE NUMBER DCS M8110-0-1 REV. K

A



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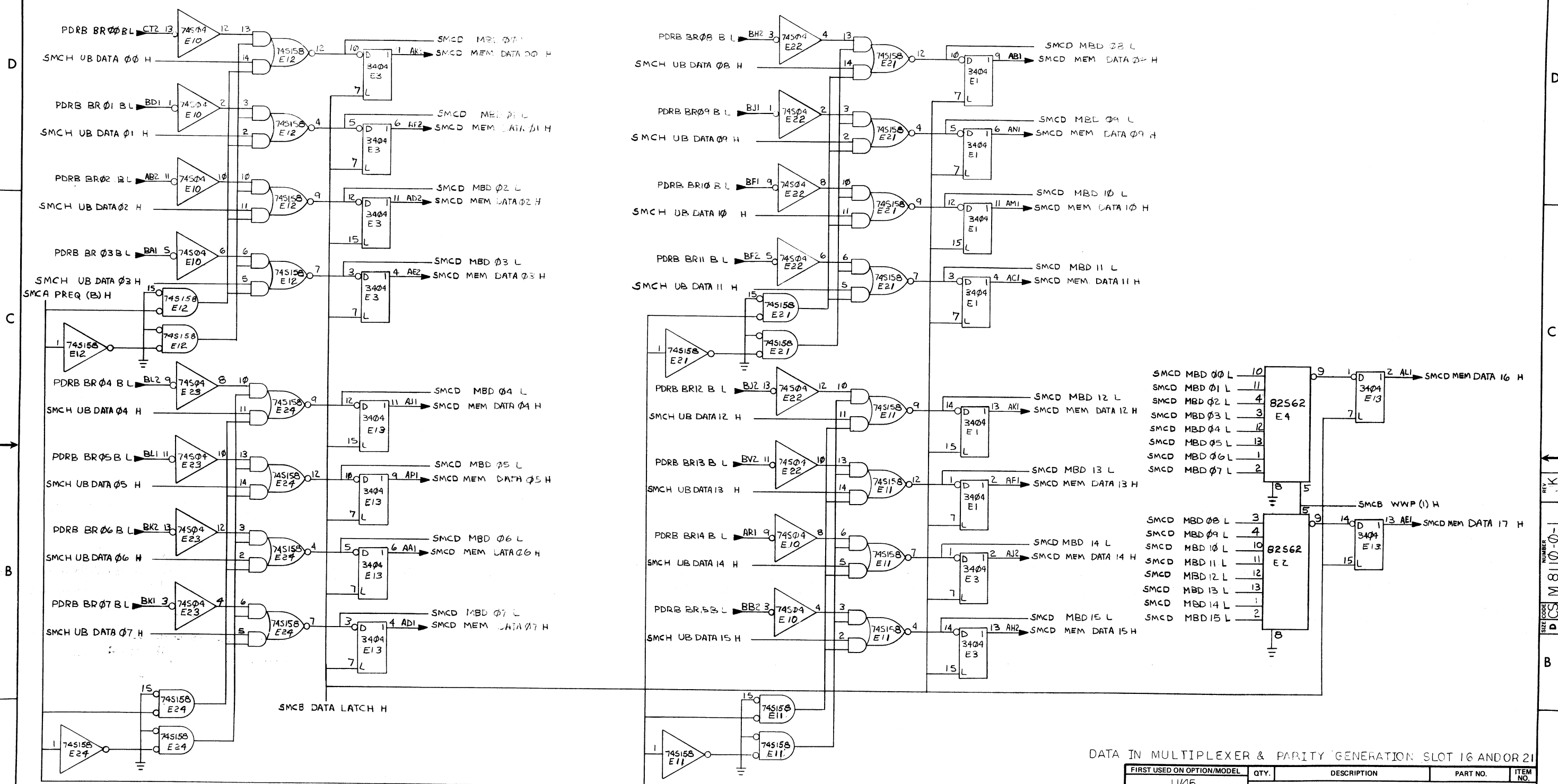


ADDRESS MULTIPLEXER SLOT 16 AND OR 21

REVISIONS	REV
CHANGE NO.	
CHK	

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45		PARTS LIST		
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES	DRN <i>[Signature]</i>	DATE 8-13-71	digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS	
DECIMALS .XXX = .005 .XX = .02 .X = .1	ENG <i>[Signature]</i>	DATE 4/2/72	TITLE SEMI CONDUCTOR MEMORY CONTROL (SMCC)	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROJ. ENG. <i>[Signature]</i>	DATE 4/2/72	MATERIAL NEXT HIGHER ASSY. B-DD-MS11-B B-DD-MS11-C	
	PROD. <i>[Signature]</i>	DATE 11/1/72	SIZE CODE DCS	NUMBER M8117-0-1
			SCALE	REV. K
			SHEET 4 OF 9	DIST.

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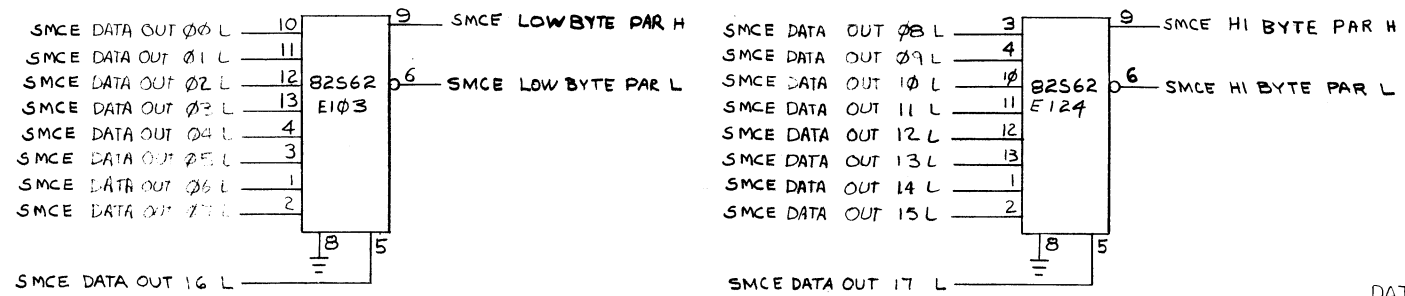
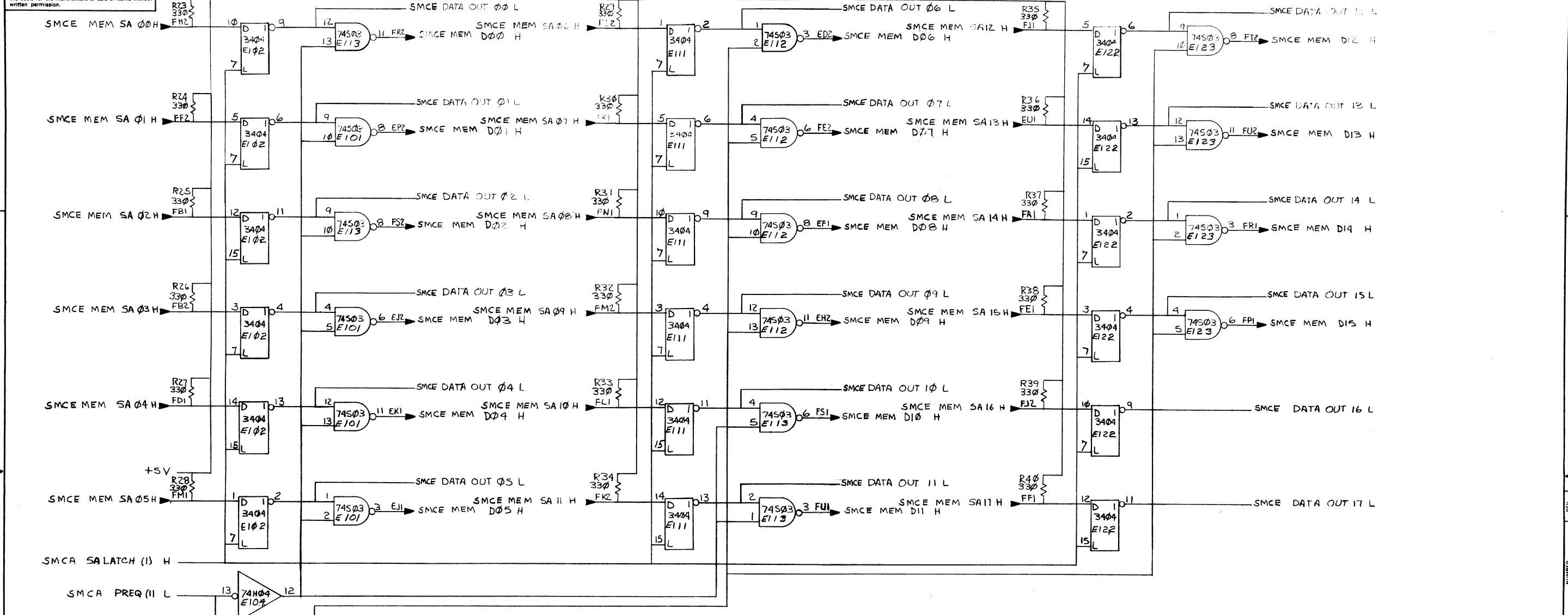
SMCD MBD 00 L	10	9	1	2	ALI	SMCD MEM DATA 16 H
SMCD MBD 01 L	11					
SMCD MBD 02 L	4					
SMCD MBD 03 L	3					
SMCD MBD 04 L	12					
SMCD MBD 05 L	13					
SMCD MBD 06 L	1					
SMCD MBD 07 L	2					
SMCD MBD 08 L	3					
SMCD MBD 09 L	4					
SMCD MBD 10 L	10					
SMCD MBD 11 L	11					
SMCD MBD 12 L	12					
SMCD MBD 13 L	13					
SMCD MBD 14 L	1					
SMCD MBD 15 L	2					

DATA IN MULTIPLEXER & PARITY GENERATION: SLOT 16 AND/OR 21

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45		PARTS LIST		
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES		DRN. DATE 8/13/71		
DECIMALS	ANGLES	CHK'D. DATE 11/21/72		
.XXX = .005	± 0° 30'	ENG. DATE 7/24/72	TITLE SEMI CONDUCTOR MEMORY CONTROL (SMCD)	
.XX = .02		PROJ. ENG. DATE 7/24/72		
.X = .1		PROD. DATE 7/24/72	SIZE CODE NUMBER REV. DCS M8110-0-1 K	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY		NEXT HIGHER ASSY.	SCALE SHEET 5 OF 9 DIST.	
MATERIAL		B-DD-MS11-F		
FINISH		B-DD-MS11-C		

REV	
CHG	
NO	

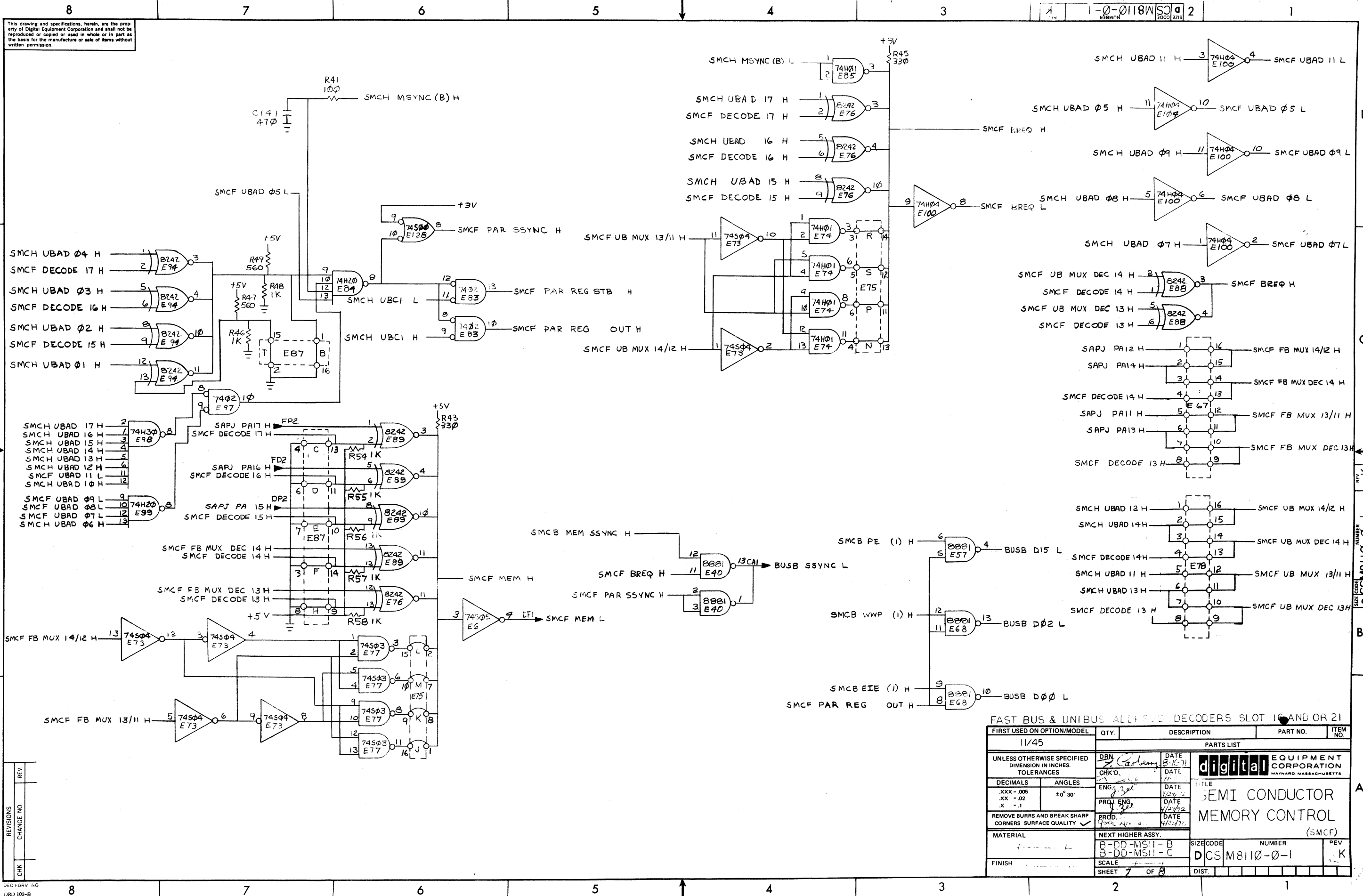
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DATA OUT & PARITY CHECK SLOT #16 AND OR #21

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES	DRN. <i>[Signature]</i>	DATE <i>4/24/72</i>	 <b>digital</b> EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS TITLE <b>SEMI CONDUCTOR MEMORY CONTROL</b> (SMCE)	
DECIMALS .XXX = .005	CHK'D <i>[Signature]</i>	DATE <i>4/24/72</i>		
ANGLES ±0° 30'	ENG. <i>[Signature]</i>	DATE <i>4/24/72</i>		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROJ. ENG. <i>[Signature]</i>	DATE <i>4/24/72</i>		
MATERIAL	PRD. <i>[Signature]</i>	DATE <i>4/24/72</i>	NEXT HIGHER ASSY. B-DD-MSI I-B B-DD-MSI I-C SIZE CODE NUMBER REV. DCS M 8110-0-1 K	
FINISH	SCALE	SHEET 6 OF 9	DIST.	

REV.	CHANGE NO.



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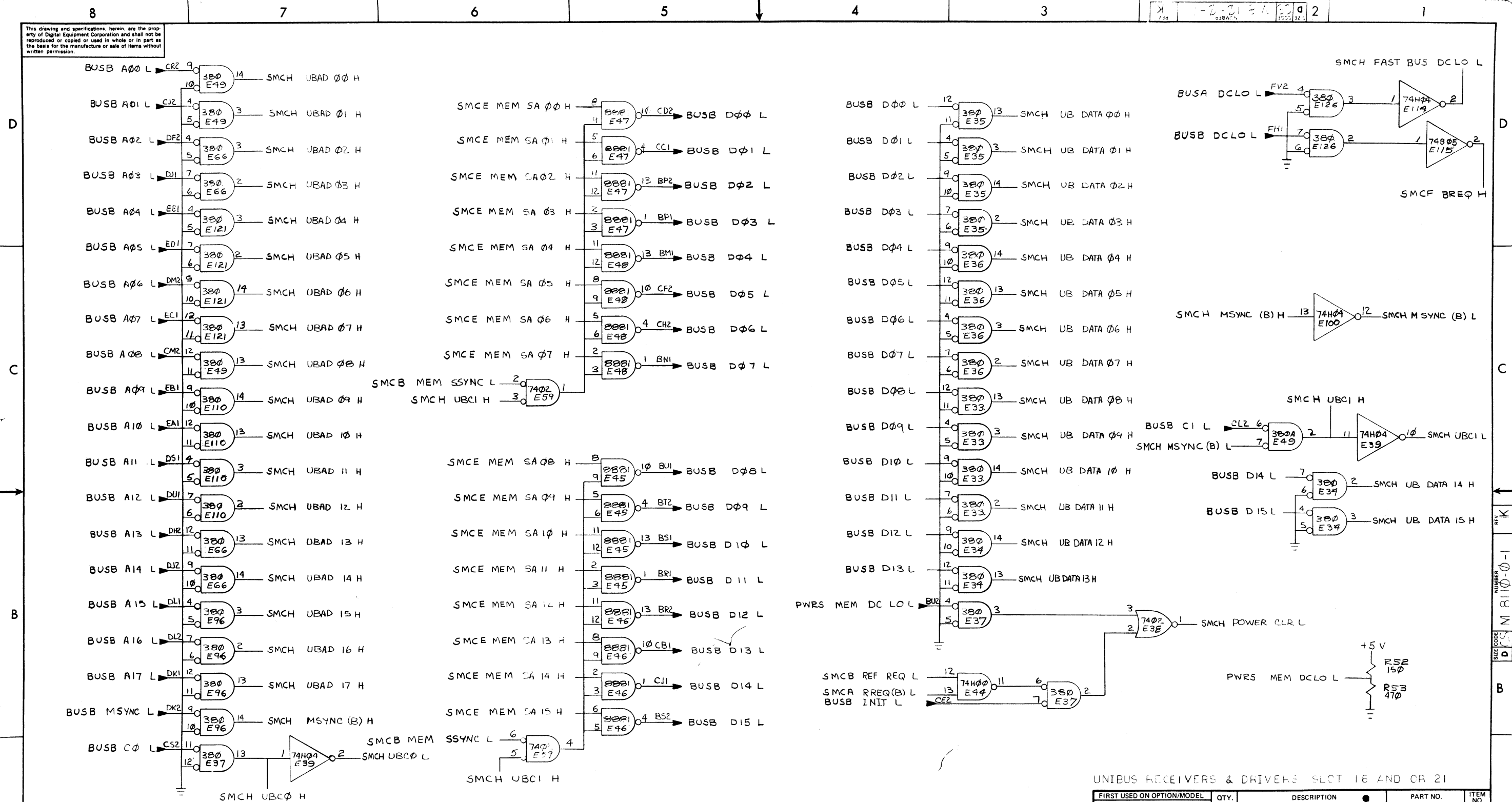
REV	
CHANGE NO.	
CHK	
REVISIONS	

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES				
DECIMALS	ANGLES	DATE		
.xxx = .005	±0° 30'	8/16/71		
.xx = .02		DATE		
.x = .1		11/11/71		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY		DATE		
		4/18/72		
MATERIAL	NEXT HIGHER ASSY.	TITLE		
	B-DD-MS11-B	SEMICONDUCTOR		
	B-DD-MS11-C	MEMORY CONTROL		
FINISH	SCALE	SIZE CODE	NUMBER	REV
	7 OF 8	DCS M8110-0-1		K

FAST BUS & UNIBUS ADDRESS DECODERS SLOT 16 AND OR 21

REV. K  
NUMBER DCS M8110-0-1  
SIZE CODE B

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REV	CHANGE NO.

DEC FORM NO. 1145-102-B

FIRST USED ON OPTION/MODEL		QTY.	DESCRIPTION	PART NO.	ITEM NO.
1145					
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES		DRN	DATE	PARTS LIST	
DECIMALS	ANGLES	CHK'D	DATE	digital EQUIPMENT CORPORATION	
.XXX = .005	± 0° 30'	ENG.	DATE	MAYNARD, MASSACHUSETTS	
.XX = .02		PROJ. ENG.	DATE	TITLE	
.X = .1		PROD.	DATE	SEMI CONDUCTOR MEMORY CONTROL	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY		MATERIAL			
		NEXT HIGHER ASSY.			
		B-DD-VISH-B		SIZE CODE	NUMBER
		E-DD-MC-L		D05	M8110-0-1
		FINISH		SCALE	REV
				SHEET 8 OF 9	K

REV. K

A

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**A**  
TO SET UP MEMORY CONTROL FOR BIPOLAR MEMORY

1) CUT JUMPERS IN THE FOLLOWING LOCATIONS:

E8702 E7802  
E8704 E7804  
E8706 E7806  
E8708 E7808

NOTE 2: ADJUSTMENT FOR SINGLE/DOUBLE SYNCHRONIZING.  
M8109 REV C ETCH - IF JUMPERS HAVE BEEN INSTALLED ON THE PREVIOUSLY UNUSED HALF (PINS 11, 12 ETC) OF THE FLIP FLOP AT E8 OF THE M8109, R1 OF THE M8110 SHOULD BE ADJUSTED TO 30NS. IF THE FLIP FLOP IS UNUSED, ADJUST R1 TO 60NS.  
M8109 REV F ETCH - OBSERVE JUMPERS W6 AND W5 ON THE M8109. IF W6 IS IN AND W5 IS OUT, ADJUST R1 OF THE M8110 TO 60NS. IF W6 IS OUT AND W5 IS IN, ADJUST R1 FOR 30NS.

2) DECODE ADDRESS BITS 17-13 BY CUTTING THE FOLLOWING JUMPERS FOR A ONE AND LEAVING IN JUMPERS FOR A ZERO.

ADDRESS BIT	JUMPER	LOCATION
17	C	E8704
16	D	E8706
15	E	E8707
14	F	E8708
13	H	E8708

3) DECODE ADDRESS BITS 11 AND 12 FOR THE FAST BUS BY CUTTING THE JUMPERS FOR THE ADDRESS COMBINATION WHERE MEMORY EXISTS.

12	11	JUMPER	LOCATION
0	0	J	E7501
0	1	K	E7508
1	0	L	E7502
1	1	M	E7507

4) DECODE ADDRESS BITS 11 AND 12 FOR THE UNIBUS BY CUTTING THE JUMPERS FOR THE ADDRESS COMBINATION WHERE MEMORY EXISTS.

12	11	JUMPER	LOCATION
0	0	N	E7504
0	1	P	E7506
1	0	R	E7503
1	1	S	E7505

5) CUT JUMPER T, LOCATED AT E8702, TO SELECT PARITY REGISTER ADDRESS BIT 1 AS A 1. LEAVE IN FOR A 0.

6) TO ENABLE PARITY CONTROL REG. CUT JUMPER B LOCATED AT E8701.

7) CUT THE FOLLOWING RESISTORS OUT:

R2  
R3

8) TIMING ADJUSTMENT  
A) SYNC PROBE 1  
B) ALL MEASUREMENTS AT THE 1.5V POINTS OF LOW GOING EDGES UNLESS OTHERWISE NOTED.  
C) POS. TRANSITION  
D) \* ADJUST WIDTH OF PULSE  
E) LOOP ON DATA

TO ADJUST	PROBE 1	PROBE 2	ADJUST	FOR
ADDRESS-SET-UP	E18 PIN 8	E25 PIN 8	R42	95 NS
PRE-CHARGE	E25 PIN 8	R9	R9	80 NS
ACCESS TIME	E25 PIN 8	▲ E27 PIN 13	R11	90 NS
MEM SYNC	E25 PIN 8	E55 PIN 6	R1	60/30 NS SEE NOTE 2
WRITE PULSE	*E27 PIN 8	-	R13	60 NS

**B**  
TO SET UP MEMORY CONTROL FOR MOS MEMORY

1) CUT JUMPERS IN THE FOLLOWING LOCATIONS:

E8701 E7801  
E8703 E7803  
E8705 E7805  
E8707 E7807

E 8705 (JUMPER A)

NOTE 1: ADJUSTMENT FOR SINGLE/DOUBLE SYNCHRONIZING.  
M8109 REV C ETCH - IF JUMPERS HAVE BEEN INSTALLED ON THE PREVIOUSLY UNUSED HALF (PINS 11, 12 ETC) OF THE FLIP FLOP AT E8 OF THE M8109, R1 OF THE M8110 SHOULD BE ADJUSTED TO 210NS. IF THE FLIP FLOP IS UNUSED, ADJUST R1 TO 240NS.  
M8109 REV F ETCH - OBSERVE JUMPERS W6 AND W5 ON THE M8109. IF W6 IS IN AND W5 IS OUT, ADJUST R1 OF THE M8110 TO 240NS. IF W6 IS OUT AND W5 IS IN, ADJUST R1 TO 210NS.

2) DECODE ADDRESS BITS 17-15 BY CUTTING THE FOLLOWING JUMPERS FOR A ONE AND LEAVING IN JUMPERS FOR A ZERO.

ADDRESS BIT	JUMPER	LOCATION
17	C	E8704
16	D	E8706
15	E	E8707

3) DECODE ADDRESS BITS 13 AND 14 FOR THE FAST BUS BY CUTTING THE JUMPERS FOR THE ADDRESS COMBINATION WHERE MEMORY EXISTS.

14	13	JUMPER	LOCATION
0	0	J	E7501
0	1	K	E7508
1	0	L	E7502
1	1	M	E7507

4) DECODE ADDRESS BITS 13 AND 14 FOR THE UNIBUS BY CUTTING THE JUMPERS FOR THE ADDRESS COMBINATION WHERE MEMORY EXISTS.

14	13	JUMPER	LOCATION
0	0	N	E7504
0	1	P	E7506
1	0	R	E7503
1	1	S	E7505

5) CUT JUMPER T, LOCATED AT E8702 TO SELECT PARITY REGISTER ADDRESS BIT 1 AS A 1. LEAVE IN FOR A 0.

6) TO ENABLE PARITY CONTROL REG. CUT JUMPER B LOCATED AT E8701.

7) CUT THE FOLLOWING RESISTORS OUT:

R12  
R4

8) TIMING ADJUSTMENT  
A) SYNC PROBE 1  
B) ALL MEASUREMENTS AT THE 1.5V POINTS OF LOW GOING EDGES UNLESS OTHERWISE NOTED  
C) POS. TRANSITION  
D) \* ADJUST WIDTH OF PULSE  
E) LOOP ON DATA

TO ADJUST	PROBE 1	PROBE 2	ADJUST	FOR
ADDRESS-SET-UP	E18 PIN 8	E25 PIN 8	R42	95 NS
PRE-CHARGE	E25 PIN 8	E25 PIN 6	R7	70 NS
PRE-CHARGE	*E25 PIN 8	R9	R9	90 NS
ACCESS TIME	E25 PIN 8	▲ E27 PIN 13	R11	230 NS
MEM SYNC	E25 PIN 8	E55 PIN 6	R1	240/210 NS SEE NOTE 1
WRITE PULSE	* E27 PIN 8	-	R13	60NS

JUMPER NOTES SLOT #16 AND OR #21

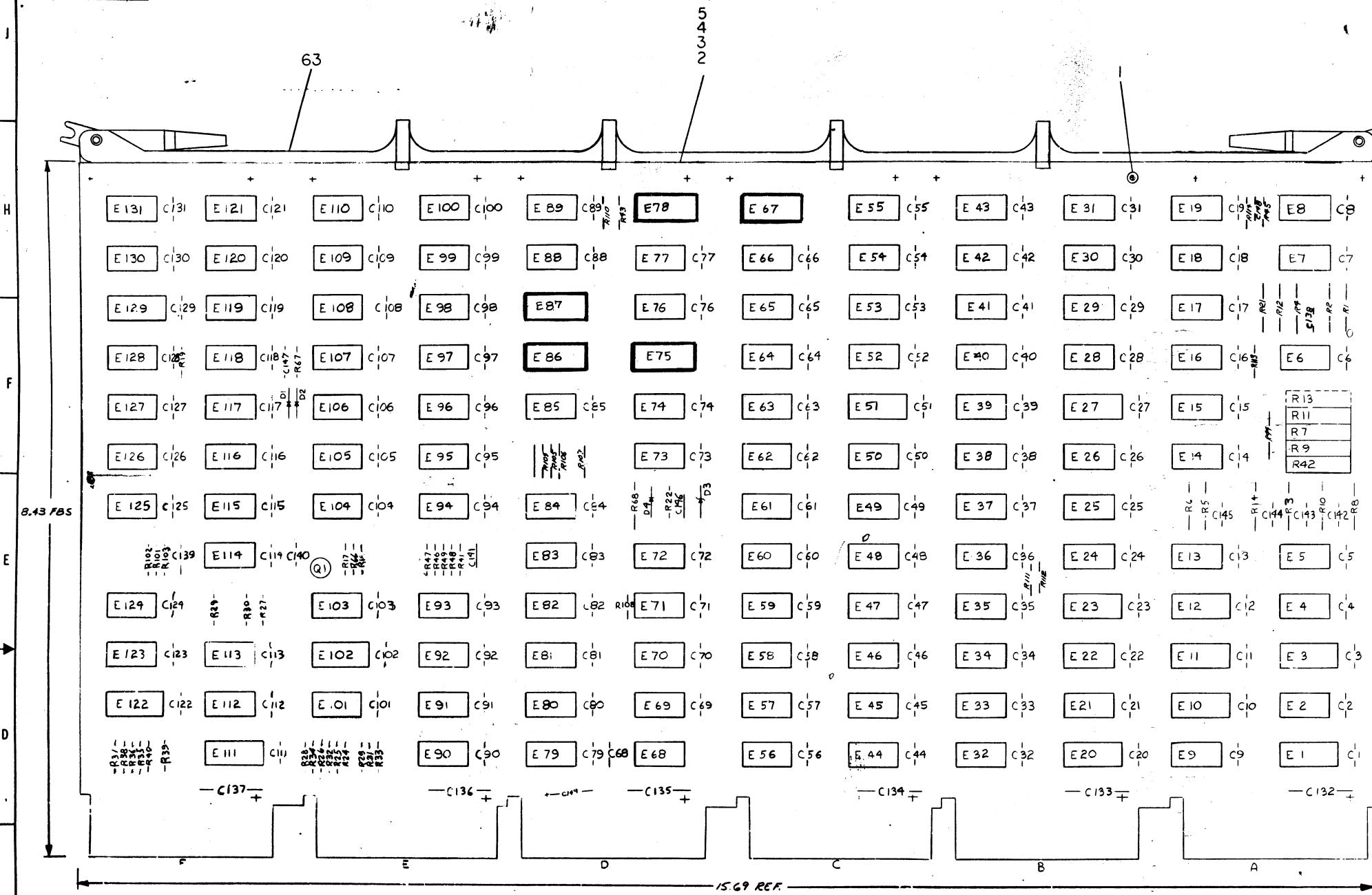
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES				
DECIMALS	ANGLES	TITLE		
.XXX - .006	± 0° 30'	SEMI CONDUCTOR MEMORY CONTROL		
.XX - .02		(SMC)		
.X - .1				
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY				
MATERIAL	NEXT HIGHER ASSY.			
FINISH	B-DD-MS11-B B-DD-MS11-C			
SCALE	DCS M8110-0-1 K			
SHEET	9 OF 9			

DRAWING 40-102 100-0

DRAWING 40-102 100-0

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS			LEGEND		QUANTITY/VARIATION												
ACCESSORY LIST			D	DOCUMENT	MOS	BIPOLAR					KIT CHECK	BY	DATE	INSTALLATION CHECK	BY	DATE	
MADE BY	CHECKED	SECTION	DN	DOCUMENT CHANGE NOTICE													
DATE	DATE	ISSUED SECT.	PA	PAPER TAPE ASCII													
ENG	PROD		PB	PAPER TAPE BINARY													
DATE	DATE		PM	PAPER TAPE READ-IN-MODE													
ITEM NO.	DWG NO. / PART NO.	DESCRIPTION															
	DEC-11-HMSB-D	Maint Manual	1	1													
	MS11-B	Print Set	1														
	MS11-C	Print Set		1													
TITLE			ASSY. NO.		SIZE	CODE	NUMBER						REV.	ECO NO			
MEMORIES & CONTROLLERS					A	AL	MS11-0-2										
SHEET 1 OF 1					DIST.												

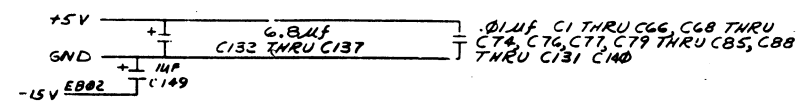
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NOTES:  
 1. UNLESS OTHERWISE NOTED RESISTANCE IS IN  $\Omega$  AND CAPACITANCE IS IN PICOFARADS.  
 CAPS WITHOUT VALUE NOTED ARE .01 MFD.

RA2, RV1, BA2, BV1,  
 CA2, CV1, DA2, DV1,  
 EA2, EV1, FA2, FV1

RA2, AN2, AV1, AV1,  
 BC2, BN2, BV1, BV1,  
 CC2, CN2, CV1, CV1,  
 DC2, DN2, DV1, DV1,  
 EC2, EN2, EV1, EV1,  
 FC2, FN2, FV1, FV1



REV	DATE	BY	CHKD	DESCRIPTION
1	8/16			DEC 360A
2	8/16			DEC 360B
3	8/16			DEC 74191
4	8/16			DEC 7431A8

IC PIN LOCATIONS	JUMPER LIST
IC 1	
IC 2	
IC 3	
IC 4	
IC 5	
IC 6	
IC 7	
IC 8	

CAUTION  
 NON-STANDARD DRILL  
 FOR SPECIAL APPLICATIONS

REF	DESIGNATION	DESCRIPTION	PART NO.	QTY
1	C138	CAP PF 100V 5% DM	1000019	64
5	E47, E75, E87, E94	COMPONENT SOCKET ADAPTER	1211323	62
1	DL1	DELAY LINE DL-5184	1605528	62
1	R116	RESISTOR 300, 1/4W, 5%	1300309	61
1	C149	CAP, 1uF, 35V, 10%	1001776	60
1	E98	HANDLE MODULE	1210711-2	59
3	E84, E92, E99	I.C. 74H20	19-05635	57
3	E74, E81, E85	I.C. 74H01	19-09849	56
6	E16, E26, E28, E29, E30, E31, E32, E33, E34, E35, E36, E37, E38, E39, E40, E41, E42, E43, E44, E45, E46, E47, E48, E49, E50, E51, E52, E53, E54, E55, E56, E57, E58, E59, E60, E61, E62, E63, E64, E65, E66, E67, E68, E69, E70, E71, E72, E73, E74, E75, E76, E77, E78, E79, E80, E81, E82, E83, E84, E85, E86, E87, E88, E89, E90, E91, E92, E93, E94, E95, E96, E97, E98, E99, E100, E101, E102, E103, E104, E105, E106, E107, E108, E109, E110, E111, E112, E113, E114, E115, E116, E117, E118, E119, E120, E121, E122, E123, E124, E125, E126, E127, E128, E129, E130, E131	I.C. 8242	19-09712	55
7	E69, E72, E79, E80, E90, E97, E130	I.C. 74H74	19-09667	54
11	E41, E105, E106, E116, E120	I.C. 74H52	19-09061	53
1	E55	I.C. 74522	19-10540	52
1	E50	I.C. 74H52	19-09060	51
3	E43, E58, E128	I.C. 74H00	19-09056	50
1	E42	I.C. 74H55	19-09063	49
8	E39, E44, E45, E56, E57, E68	I.C. 8881	19-09705	48
5	E38, E70, E93, E100, E104	I.C. 74H04	19-09931	47
4	E37, E59, E88, E97	I.C. 7402	19-09004	46
11	E32, E36, E48, E64, E76, E110, E121, E126	I.C. 300	19-09485	45
2	E26, E53	I.C. 74540	19-10541	44
5	E16, E34, E52, E82, E91	I.C. 74H10	19-09057	43
3	E18, E24, E28	I.C. 74500	19-10532	42
6	E17, E40, E62 THRU E65	I.C. 74564	19-10542	41
1	E15	I.C. 74511	19-10537	40
5	E13, E14, E125	I.C. 75107	19-10268	39
4	E10, E14, E20, E23	I.C. 74515B	19-10549	38
9	E82, E82, E85, E85, E86, E86, E11, E11A	I.C. 74504	19-10534	37
3	E8, E29, E41	I.C. 74574	19-10544	36
2	E7, E30	I.C. 74510	19-10536	35
2	E6, E115	I.C. 74505	19-10535	34
6	E5, E7, E10, E12, E13, E101	I.C. 74503	19-10533	33
4	E2, E4, E13, E18	I.C. 74100	19-10724	32
1	E129	I.C. 74191	19-10096	31
8	E45, E12, E12, E51, E102, E11, E12	I.C. 300A	19-10723	30
1	Q1	TRANSISTOR DEC 3009-B	15-08100	29
1	R111	RESISTOR 150, 1/4W, 5%	13-00250	28
1	R103	RESISTOR 10K, 1/4W, 5%	13-00479	27
1	R68	RESISTOR 220, 1/2W, 5%	13-00274	26
2	R47, R49	RESISTOR, 500, 1/4W, 5%	13-01890	25
2	R41, R114	RESISTOR, 100, 1/4W, 5%	13-00229	24
9	R44, R66, R112, R115	RESISTOR, 470, 1/4W, 5%	13-00316	23
4	R22, R101, R102, R113	RESISTOR, 270, 1/2W, 5%	13-01972	22
10	R19, R16, R108, R67, R105 THRU R107, R109, R110, R116	RESISTOR 1K 1/4W 5%	13-00365	21
22	R17, R23 THRU R40, R43, R45, R100	RESISTOR 330 1/4W 5%	1300295	20
4	R12, R14, R42	MELTRIM 100, 5K, 1/4W, 5% 24R	13-0188-09	19
6	R5, R6, R8, R10, R12, R14	RESISTOR, 281, 1/4W, 1/8W	13-05124	18
1	R3	RESISTOR, 170K, 1/4W, 1/8W	13-02612	17
2	R2, R4	RESISTOR, 51K, 1/4W, 1/8W	13-02411	16
2	R1, R21	RESISTOR 316, 1/4W, 1/8W	13-04663	15
1	D3	DIODE INT51A ZENER	11-05873	14
1	D4	DIODE D664	11-00114	13
2	D1, D2	DIODE D662	11-00113	12
2	C141, C148	CAP, 470PF, 100V, 5% DM	1000024	11
2	C146, C147	CAP, 22uF, 50V, 150-200 CERAM	1010274	10
1	C139	CAP, 1500PF, 200V, 5% DM	1000054	9
4	C42 THRU C145	CAP, 100PF, 100V, 5% DM	1000016	8
6	C132 THRU C137	CAP, 6.8uF, 35V, 20% STANT	1000067	7
127	C136, C137, C76, C76, C77, C79, C85, C88, C131, C140	CAP, 2uF, 100V, 20% DISC	1001610	6
1		ETCHED CIRCUIT BOARD	500979B	5
REF		MODULE ECO HISTORY	500979B-2	4
REF		ASSY DRILLING HOLE LAYOUT	500979B-5	3
REF		X-Y COORDINATE HOLE LOCATION	500979B-4	2
1		EYELET	9006732	1

ETCH BOARD REV	DATE	BY	CHKD	DESCRIPTION
1	8/16			DEC 360A
2	8/16			DEC 360B
3	8/16			DEC 74191
4	8/16			DEC 7431A8

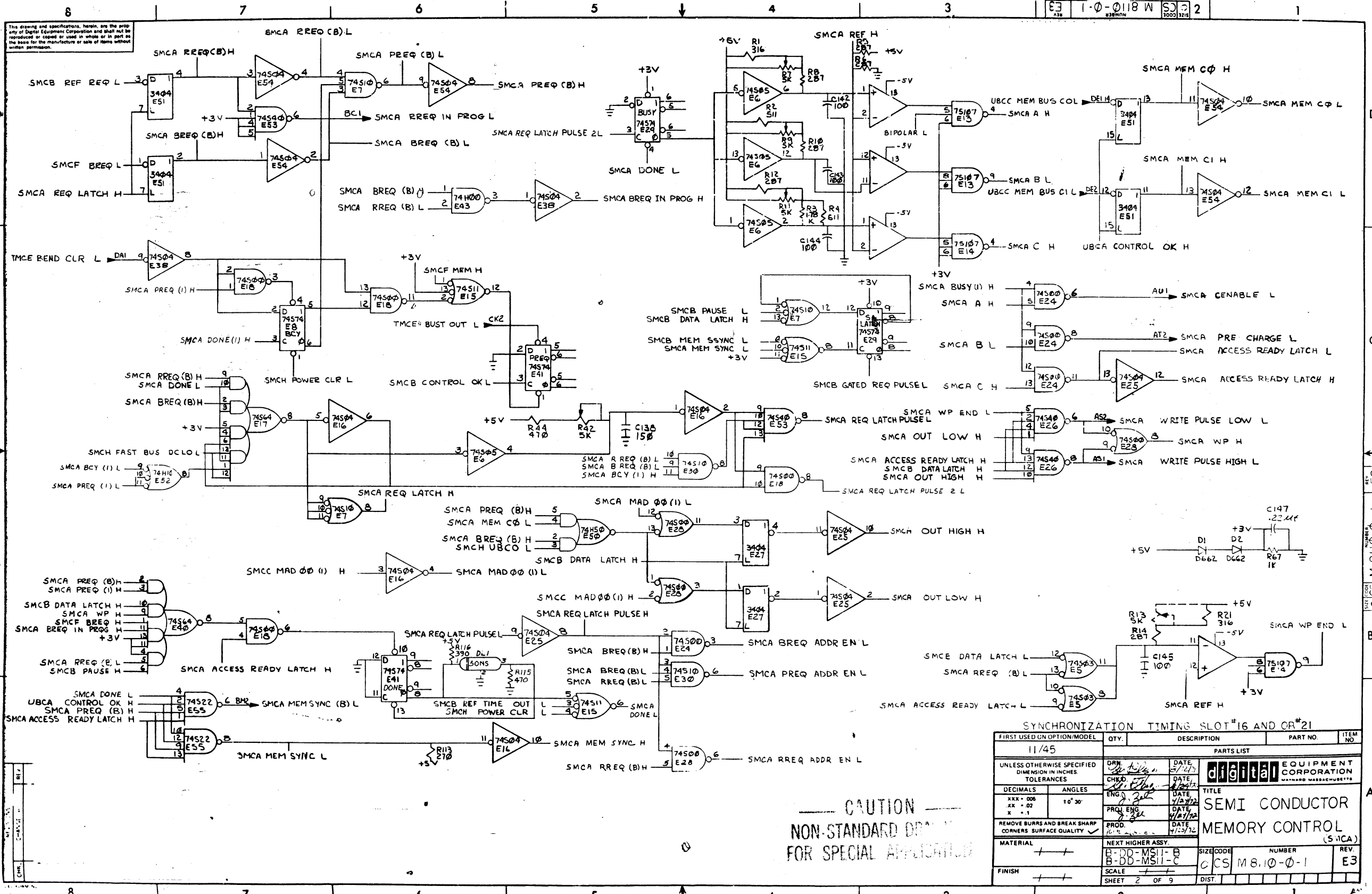
DEC NO.	EIA NO.	DEC NO.	EIA NO.
DEC 360A	113606	DEC 360B	113606
DEC 74191	113606	DEC 7431A8	113606

DEC NO.	EIA NO.	DEC NO.	EIA NO.
DEC 360A	113606	DEC 360B	113606
DEC 74191	113606	DEC 7431A8	113606

CSMB110-0-1





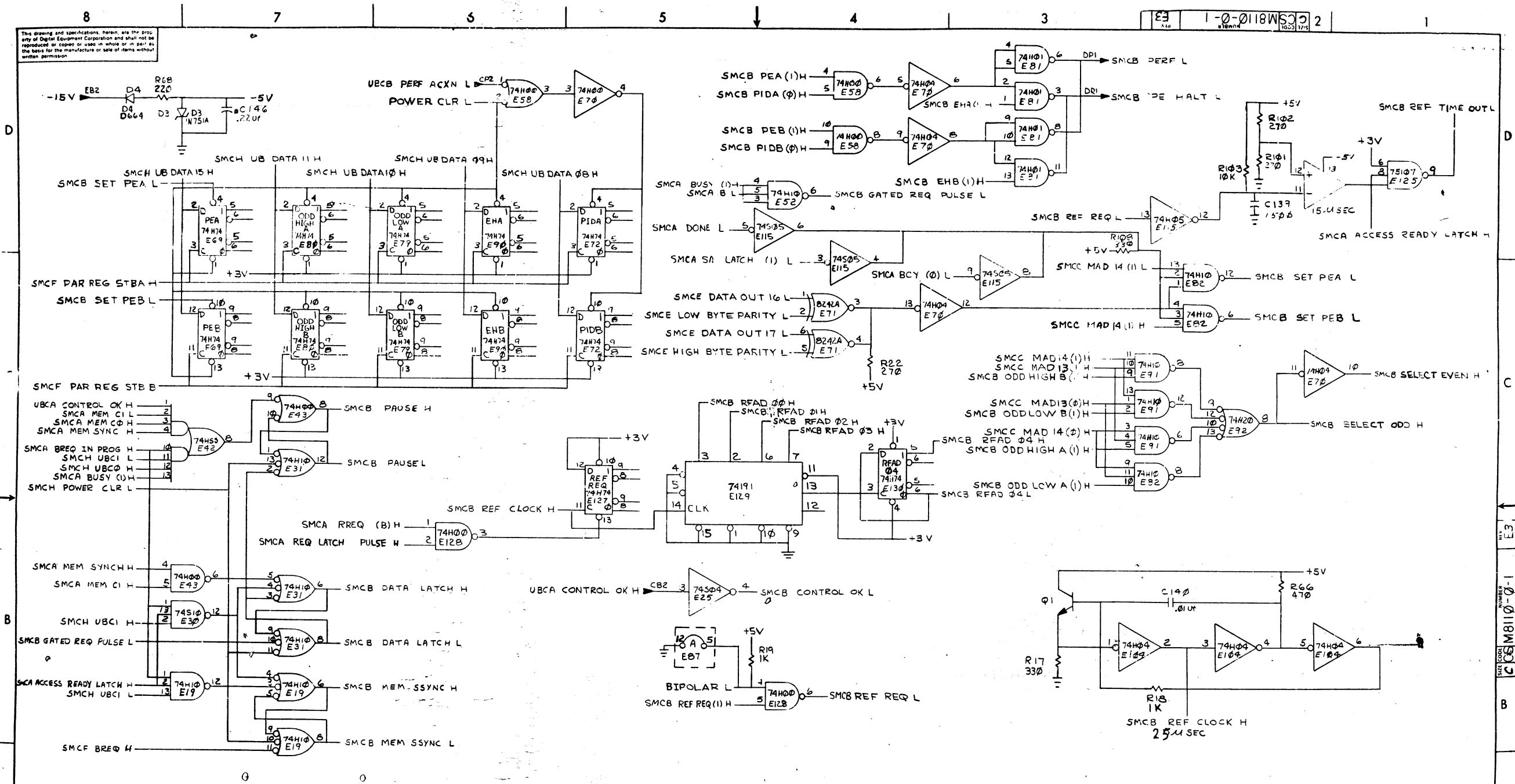
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1-0-0118 W 2

CAUTION  
NON-STANDARD DRILLING  
FOR SPECIAL APPLICATIONS

SYNCHRONIZATION TIMING SLOT #16 AND OR #21

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES	DRN	DATE	 DIGITAL EQUIPMENT CORPORATION MASSACHUSETTS	
DECIMALS	CHKD	DATE		
ANGLES	ENG	DATE		
XXX - 000 XX - 00 X - 0	PRQ. ENG	DATE		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROD.	DATE	TITLE SEMI CONDUCTOR MEMORY CONTROL (S-11CA)	
MATERIAL	NEXT HIGHER ASSY.	DATE		
FINISH		DATE		
		DATE		
	B-DD-MS11-B	SIZE CODE	NUMBER	REV.
	B-DD-MS11-C	CCS	M8.10-0-1	E3
SCALE				
SHEET 2 OF 9				



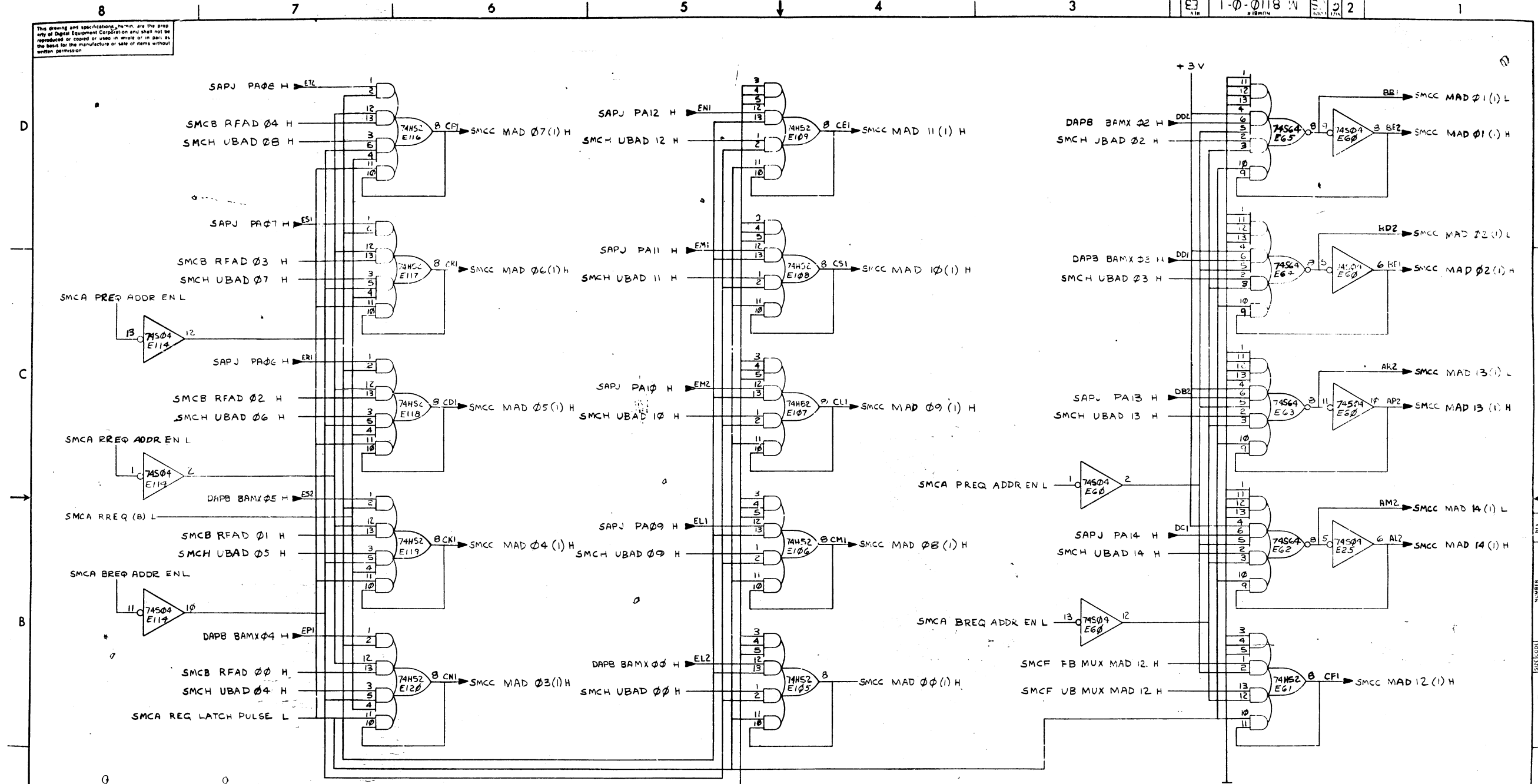
**CAUTION**  
NON-STANDARD DRAWING  
FOR SPECIAL APPLICATION

REFRESH & PARITY LOGIC SLOT 16 AND OR 21				
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES		DRN: <i>[Signature]</i> DATE: <i>[Date]</i>	PARTS LIST	
DECIMALS	ANGLES	CHMO: <i>[Signature]</i> DATE: <i>[Date]</i>	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	
.XXX - .005		ENG: <i>[Signature]</i> DATE: <i>[Date]</i>	TITLE	
.XX - .02	±0° 30'	PRD: <i>[Signature]</i> DATE: <i>[Date]</i>	SEMI CONDUCTOR MEMORY CONTROL (SMCB)	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY				
MATERIAL	NEXT HIGHER ASSY.	SCALE	SIZE CODE	NUMBER
FINISH	B-DD-VIS11-B B-DD-MS11-C	11	C	CSM8110-0-1
SHEET 3 OF 3			DIST	REV E3

REVISIONS	REF
CHANGE NO.	

NUMBER: CSM8110-0-1  
 DATE: 11/77

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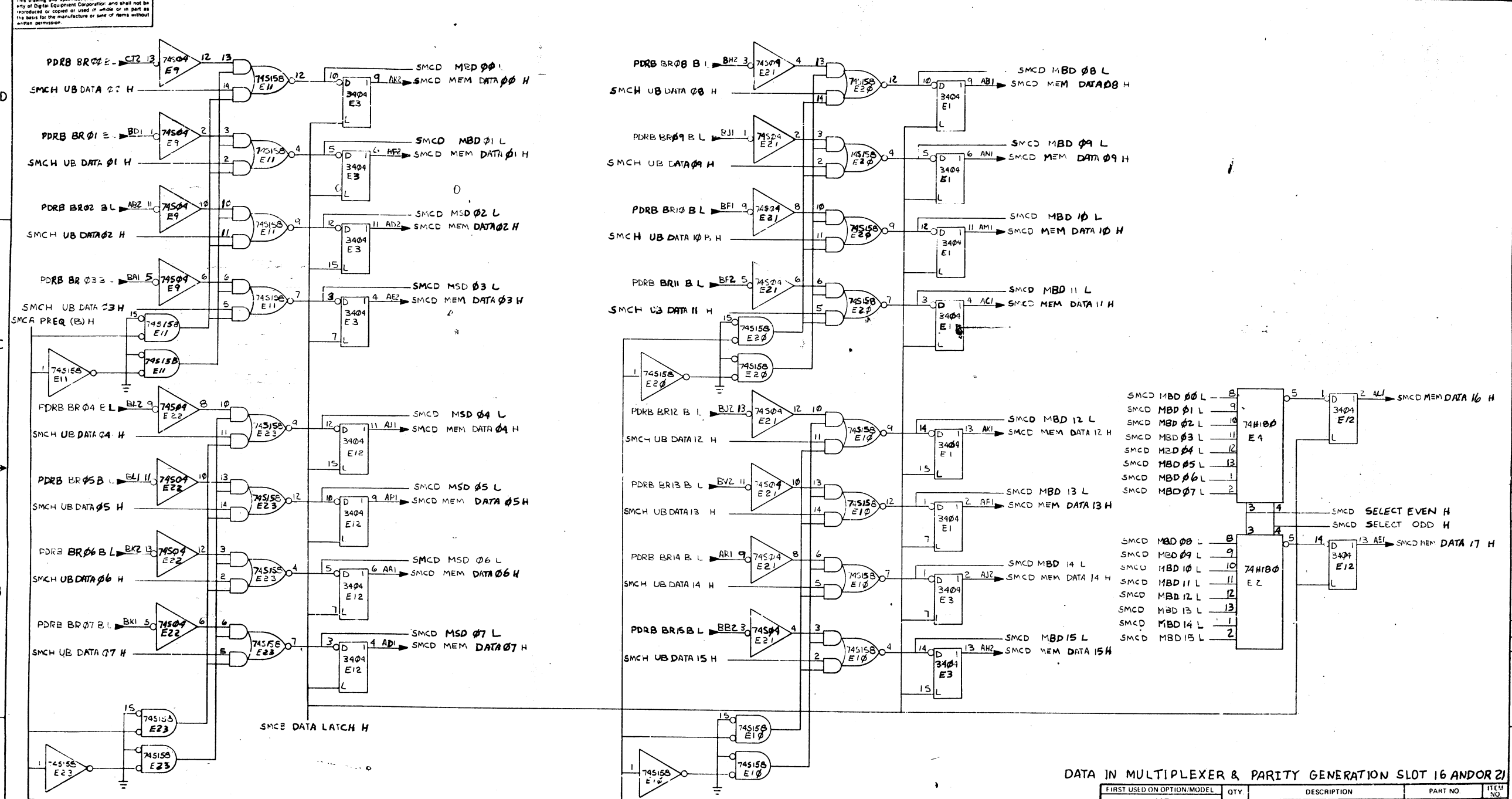
ADDRESS MULTIPLEXER SLOT 16 AND OR 31

REV	CHANGE NO

**CAUTION**  
NON-STANDARD DRAWING  
FOR SPECIAL APPLICATION

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45		PARTS LIST		
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES	DRN	DATE	digital EQUIPMENT CORPORATION	
TOLERANCES	CHKD	DATE	WAYNAD MASSACHUSETTS	
DECIMALS	ENG	DATE	TITLE	
ANGLES	PROJ. ENG.	DATE	SEMI CONDUCTOR	
XXX + .005	PROD.	DATE	MEMORY CONTROL	
.XX + .02		DATE	(SMCC)	
.X + .1		DATE		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY		DATE		
MATERIAL	NEXT HIGHER ASSY.		SIZE CODE	NUMBER
+	B-DD-MS11-B		CSS M8110-0-1	REV. E3
FINISH	B-DD-MS11-C			
	SCALE	SHEET	DIST.	
	4 OF 9			

NUMBER 8110-0-1 E3  
 SIZE CODE M8110-0-1 E3



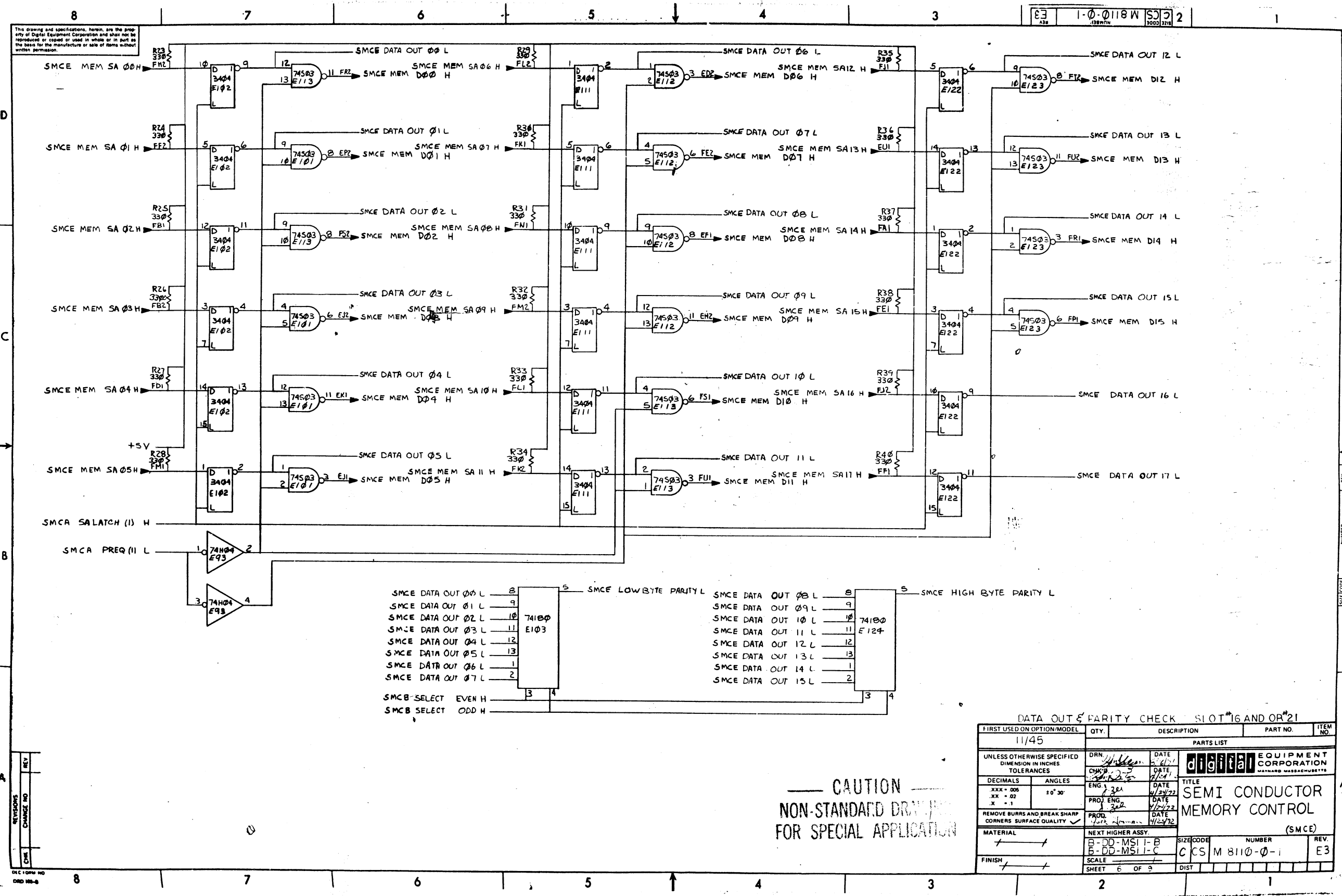
REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		

**CAUTION**  
NON-STANDARD PARTS  
FOR SPECIAL APPLICATION

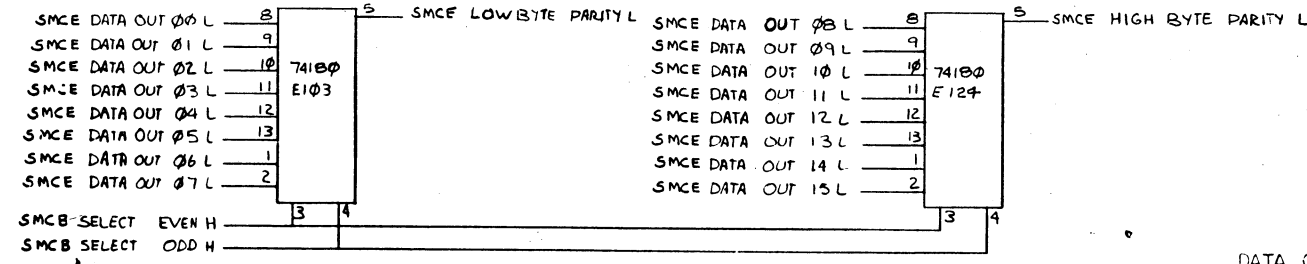
DATA IN MULTIPLEXER & PARITY GENERATION SLOT 16 AND/OR 21

FIRST USED ON OPTION/MODEL	QTY	DESCRIPTION	PART NO	ITEM NO
11/65				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES	DRN	DATE	<b>digital EQUIPMENT CORPORATION</b> TITLE <b>SEMI CONDUCTOR MEMORY CONTROL</b> (SMCD)	
TOLERANCES	CHK'D	DATE		
DECIMALS	ENGR	DATE		
ANGLES	PRQJ ENG	DATE		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROD	DATE		
MATERIAL	NEXT HIGHER ASSY		SIZE CODE	NUMBER
	3-DD-MS11-B		C3S	M8110-01
FINISH	SCALE		SHEET	REV
	4 OF 9		1	E3



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E3 1-0-0118 W S 2

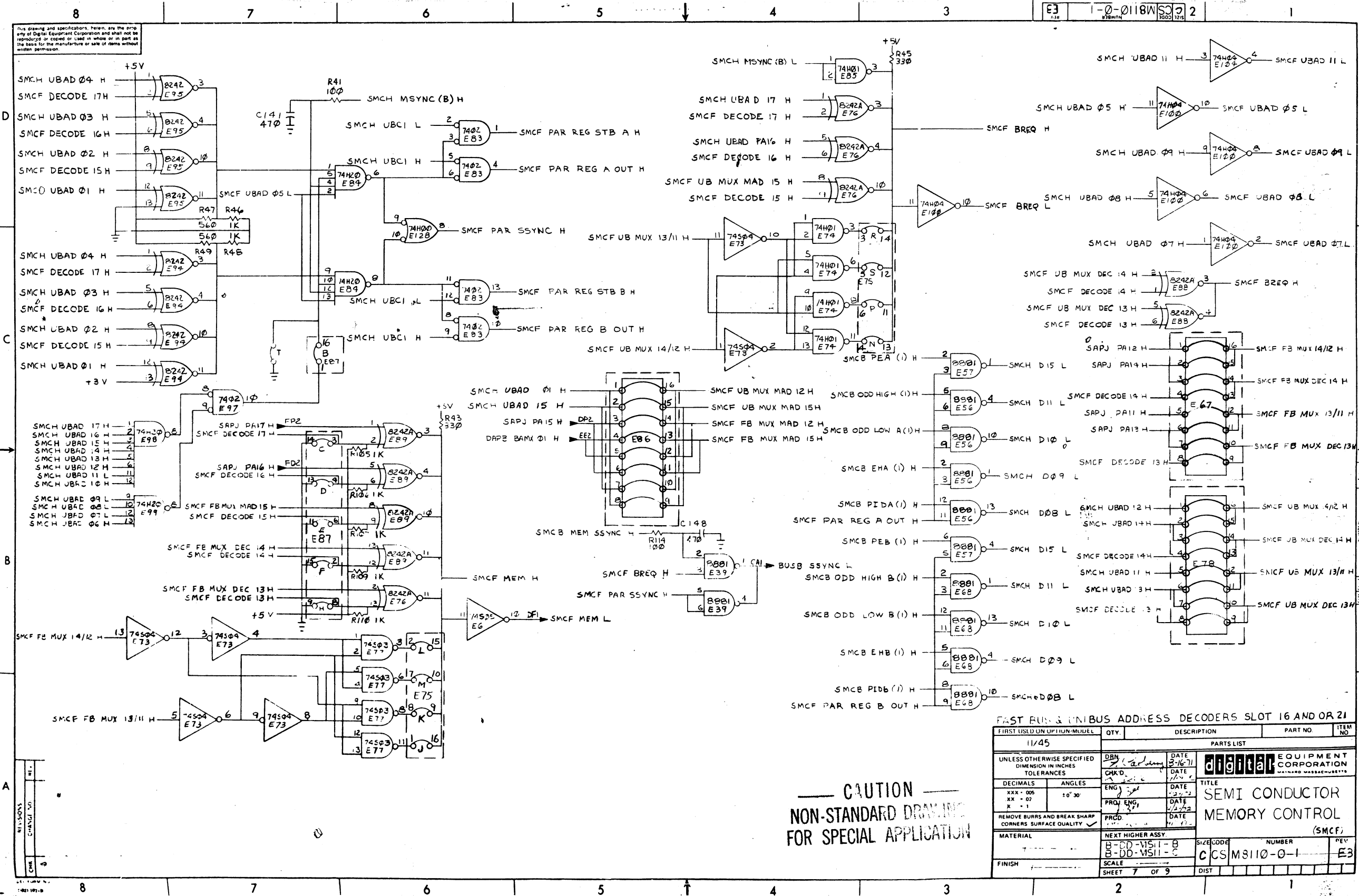


CAUTION  
NON-STANDARD DRAWING  
FOR SPECIAL APPLICATION

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES				
DECIMALS	ANGLES	DRN	DATE	<b>digital</b> EQUIPMENT CORPORATION NAYARD MASSACHUSETTS
XXX - 006	± 0° 30'	CHK'd	DATE	
XX - 02		ENG	DATE	
X - 1		PROJ ENG	DATE	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY				
MATERIAL				
NEXT HIGHER ASSY.				
B-DD-MSI I-B			SIZE CODE	NUMBER
B-DD-MSI I-C			C CS	M 8110-0-1
FINISH				
SCALE			SHEET	REV.
SHEET 6 OF 9			DIST	E3

REV	DESCRIPTION

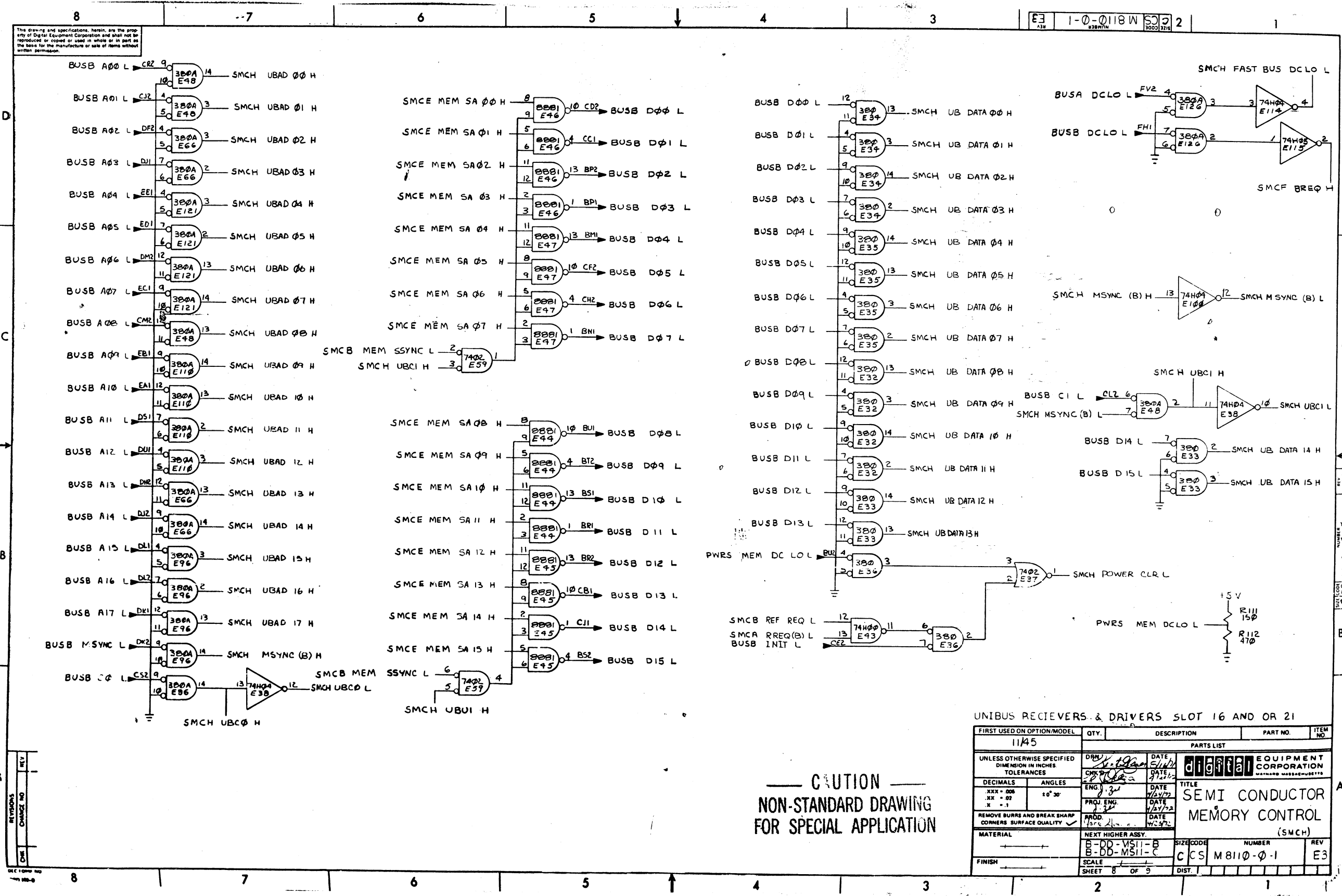
REV. E3



CAUTION  
NON-STANDARD DRAWING  
FOR SPECIAL APPLICATION

FAST RUN UNIBUS ADDRESS DECODERS SLOT 16 AND OR 21

FIRST USED ON OPTIMUM MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45		PARTS LIST		
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES	DBY [Signature]	DATE 3-16-71	EQUIPMENT CORPORATION	
DECIMALS	ANGLES	ENG [Signature]	DATE 1/24/71	TITLE
XXX - 005	10° 30'	PRJ [Signature]	DATE 1/27/71	SEMI CONDUCTOR
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PRCD [Signature]	DATE 1/21/71		MEMORY CONTROL
MATERIAL	NEXT HIGHER ASSY.		SIZE CODE	NUMBER
	B-DD-VIS11-B		C	CSMS110-0-1
FINISH	SCALE		DIST	REV
	SHEET 7 OF 9			E3



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1-0-0118 W 2

CAUTION  
NON-STANDARD DRAWING  
FOR SPECIAL APPLICATION

UNIBUS RECEIVERS & DRIVERS SLOT 16 AND OR 21

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
1145				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES				
DECIMALS	ANGLES	TITLE		
.XXX - .008	± 0° 30'	SEMI CONDUCTOR MEMORY CONTROL (SMCH)		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY				
MATERIAL	NEXT HIGHER ASSY.	SIZE CODE	NUMBER	REV
	B-DD-VS11-B	C CS	M 8110-0-1	E3
FINISH	SCALE	SHEET	OF	
		8	9	

REV	
CHANGE NO.	
DATE	

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1-0-0118 W 53 2

**A**  
TO SET UP MEMORY CONTROL FOR BIPOLAR MEMORY

1) CUT JUMPERS IN THE FOLLOWING LOCATIONS:

E8702	E7802	E8603
E8704	E7804	E8604
E8706	E7806	E8607
E8708	E7808	E8608
		E8701

2) DECODE ADDRESS BITS 17-13 BY CUTTING THE FOLLOWING JUMPERS FOR A ONE AND LEAVING IN JUMPERS FOR A ZERO.

ADDRESS BIT	JUMPER	LOCATION
17	C	E8703
16	D	E8704
15	E	E8706
14	F	E8702
13	H	E8708

3) DECODE ADDRESS BITS 11 AND 12 FOR THE FAST BUS BY CUTTING THE JUMPERS FOR THE ADDRESS COMBINATION WHERE MEMORY EXISTS.

12	11	JUMPER	LOCATION
0	0	J	E7501
0	1	K	E7508
1	0	L	E7502
1	1	M	E7507

4) DECODE ADDRESS BITS 11 AND 12 FOR THE UNIBUS BY CUTTING THE JUMPERS FOR THE ADDRESS COMBINATION WHERE MEMORY EXISTS.

12	11	JUMPER	LOCATION
0	0	N	E7504
0	1	P	E7506
1	0	R	E7503
1	1	S	E7505

5) USE ETCH REV C OR LATER FOR PARITY CONTROL.

6) CUT THE FOLLOWING RESISTORS OUT:

- R1
- R2
- R12
- R3

7) TIMING ADJUSTMENT.  
A) SYNC PROBE 1  
B) ALL MEASUREMENTS AT THE 1.5V POINTS OF LOW GOING EDGES UNLESS OTHERWISE NOTED.

TO ADJUST	PROBE 1	PROBE 2	ADJUST	FOR
ADDRESS SET-UP	E17 PIN 8	E24 PIN 8	R42	95 NS
PRE-CHARGE	E24 PIN 8		R9	80 NS
ACCESS TIME	E24 PIN 8	E55 PIN 6	R11	80 NS

\* ADJUST WIDTH OF PULSE.

**B**  
TO SET UP MEMORY CONTROL FOR MOS MEMORY

1) CUT JUMPERS IN THE FOLLOWING LOCATIONS:

E8701	E7801	E8603
E8703	E7803	E8604
E8705	E7805	E8607
E8707	E7807	E8608
		E8701

E8705 (JUMPER A)

2) DECODE ADDRESS BITS 17-15 BY CUTTING THE FOLLOWING JUMPERS FOR A ONE AND LEAVING IN JUMPERS FOR A ZERO.

ADDRESS BIT	JUMPER	LOCATION
17	C	E8703
16	D	E8704
15	E	E8706

3) DECODE ADDRESS BITS 13 AND 14 FOR THE FAST BUS BY CUTTING THE JUMPERS FOR THE ADDRESS COMBINATION WHERE MEMORY EXISTS.

14	13	JUMPER	LOCATION
0	0	J	E7501
0	1	K	E7508
1	0	L	E7502
1	1	M	E7507

4) DECODE ADDRESS BITS 13 AND 14 FOR THE UNIBUS BY CUTTING THE JUMPERS FOR THE ADDRESS COMBINATION WHERE MEMORY EXISTS.

14	13	JUMPER	LOCATION
0	0	N	E7504
0	1	P	E7506
1	0	R	E7503
1	1	S	E7505

5) USE ETCH REV C OR LATER FOR PARITY CONTROL.

6) CUT THE FOLLOWING RESISTORS OUT:

- R1
- R2
- R12
- R4

7) TIMING ADJUSTMENT.

- A) SYNC PROBE 1
- B) ALL MEASUREMENTS AT THE 1.5V POINTS OF LOW GOING EDGES UNLESS OTHERWISE NOTED.

TO ADJUST	PROBE 1	PROBE 2	ADJUST	FOR
ADDRESS SET-UP	E17 PIN 8	E24 PIN 8	R42	95 NS
CENABLE	E24 PIN 8	E24 PIN 6	R7	70 NS
PRE-CHARGE	*E24 PIN 8		R9	90 NS
ACCESS TIME	E24 PIN 8	E55 PIN 6	R11	240/210 NS SEE NOTE 1.

\* ADJUST WIDTH OF PULSE.

NOTE:

ADJUSTMENT FOR SINGLE/DOUBLE SYNCHRONIZING. M8109 REV C ETCH - IF JUMPERS HAVE BEEN INSTALLED ON THE PREVIOUSLY UNUSED HALF (PINS 11, 12, ETC.) OF THE FLIP FLOP AT E8 OF THE M8109, R11 OF THE M8110 SHOULD BE ADJUSTED TO 210 NS. IF THE FLIP FLOP IS UNUSED, ADJUST R11 TO 240 NS.

M8109 REV F ETCH - OBSERVE JUMPERS W6 AND W5 ON THE M8109. IF W6 IS IN AND W5 IS OUT, ADJUST R11 OF THE M8110 TO 240 NS. IF W6 IS OUT AND W5 IS IN, ADJUST R11 TO 210 NS.

JUMPER NOTES SLOT #16 AND OR #21

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11745				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES				
DECIMALS	ANGLES	PARTS LIST		
.XXX - .005	±0° 30'	digital EQUIPMENT CORPORATION		
.XX - .02		CORPORATION		
.X - .1		MAYFIELD MASSACHUSETTS		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY				
NEXT HIGHER ASSY				
MATERIAL	FINISH	SIZE CODE	NUMBER	REV
++	++	B-DD-MSII-B	C CS M8110-0-1	E3
		B-DD-MSII-C		
		SCALE	DIST	
		SHEET 9 OF 9		

**CAUTION**  
NON-STANDARD DRAWING  
FOR SPECIAL APPLICATION

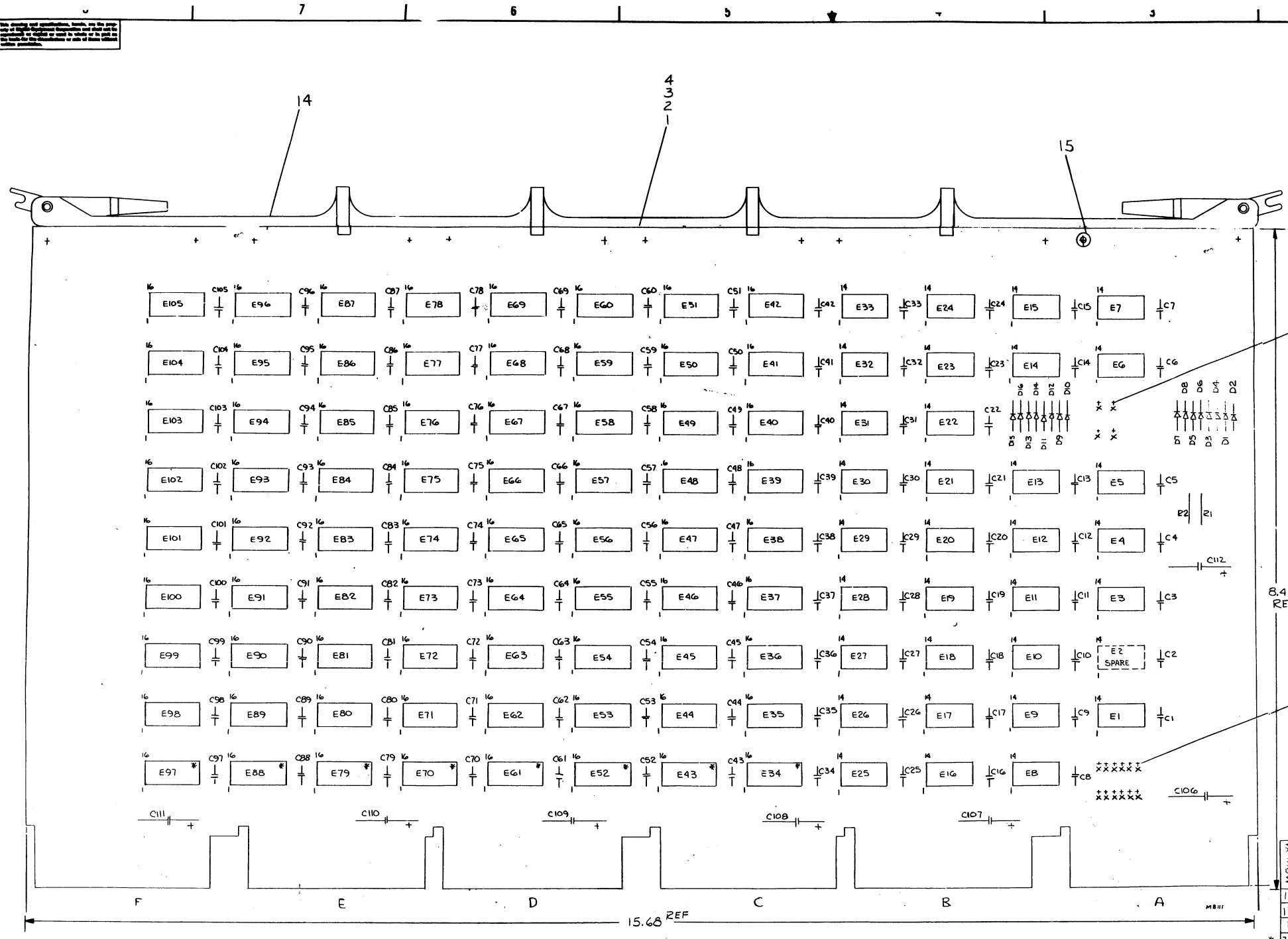
REVISIONS  
DATE  
BY  
CHANGED BY

NUMBER  
C CS M8110-0-1  
REV  
E3

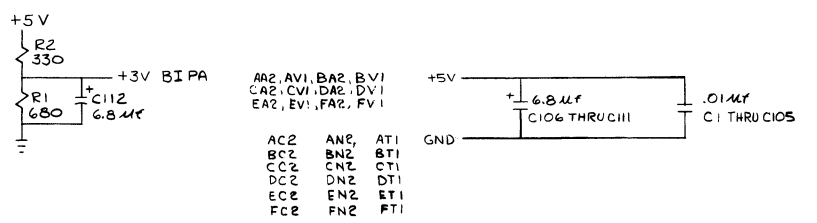


For drawing and specifications, refer to the parts list and drawing. For components not shown, refer to the parts list and drawing. For components not shown, refer to the parts list and drawing.

**NOTE:**  
 1. UNLESS OTHERWISE NOTED RESISTANCE IS IN  $\Omega$  AND CAPACITANCE IS IN PICOFARADS. CAPS WITHOUT VALUE NOTED ARE .01 MFD.  
 \* 2. E34, E43, E52, E61, E70, E79, E88, E97 ARE USED FOR MB111-VA ONLY.  
 3. THE FOLLOWING I.C.'S MAY BE USED INTERCHANGEABLY. 74200 (TEXAS INST.) 3107A (INTEL) LOCATIONS E34 THRU E105



ITEM NO.	REF DESIGNATION	DESCRIPTION	PART NO.	QTY	
16	16	WIRE WRAPABLE PIN	9009149	16	
12	12	EYELET	9006732	15	
1	1	HANDLE MODULE	E-PS-1210711-2	14	
* 72	E4	E34 THRU E105	IC 256 BIT BIPOLAR RAM	1910818-00	13
25	E25	E3 THRU E7, E12 THRU E24, E26 THRU E33	IC DEC 74S40	1910541	12
1	E8	IC DEC 74S10	1910536	11	
6	E1E9, E10, E11, E16, E25	IC DEC 74S04	1910534	10	
1	R1	RESISTOR 680 $\Omega$ 1/4W 10%	1300350	9	
1	R2	RESISTOR 330 $\Omega$ 1/4W 10%	1300293	8	
16	D1 THRU D16	DIODE D664	1100114	7	
105	C1 THRU C105	CAP .01 $\mu$ F, 100V, 20% DISC	1001610	6	
7	C106 THRU C112	CAP 6.8 $\mu$ F, 35V, 20%	1000067	5	
1	1	ETCHED CIRCUIT BOARD	5009797	4	
1	1	MODULE ECO HISTORY	B-MH-MB111-0-6	3	
REF	REF	ASSY/DRILLING HOLE LAYOUT	EAH-MB111-0-5	2	
REF	REF	X-Y COORDINATE HOLE LOCATION	X-CO-MB111-0-4	1	
QTY	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.	



- AC2 AN2 AT1
- BC2 BN2 BT1
- CC2 CN2 CT1
- DC2 DN2 DT1
- EC2 EN2 ET1
- FC2 FN2 FT1

DEC NO.	ITEM NO.	ANG	FRM PT.	TO PT.
DEC 74200	8	16		
IC PIN LOCATIONS				
JUMPER LIST				

**ETCH BOARD REV** C

**DATE** 12-17-72

**DRG** [Signature]

**PREPARED BY** [Signature]

**REV** A

**ITEM NO.** D664

**TITLE** BIPOLAR MEMORY MATRIX

**PREPARED BY** [Signature]

**DATE** 12-17-72

**REV** A

**ITEM NO.** D664

**DESCRIPTION** B-D0-MS11-C

**SCALE** 2:1

**SHEET** 7 OF 11

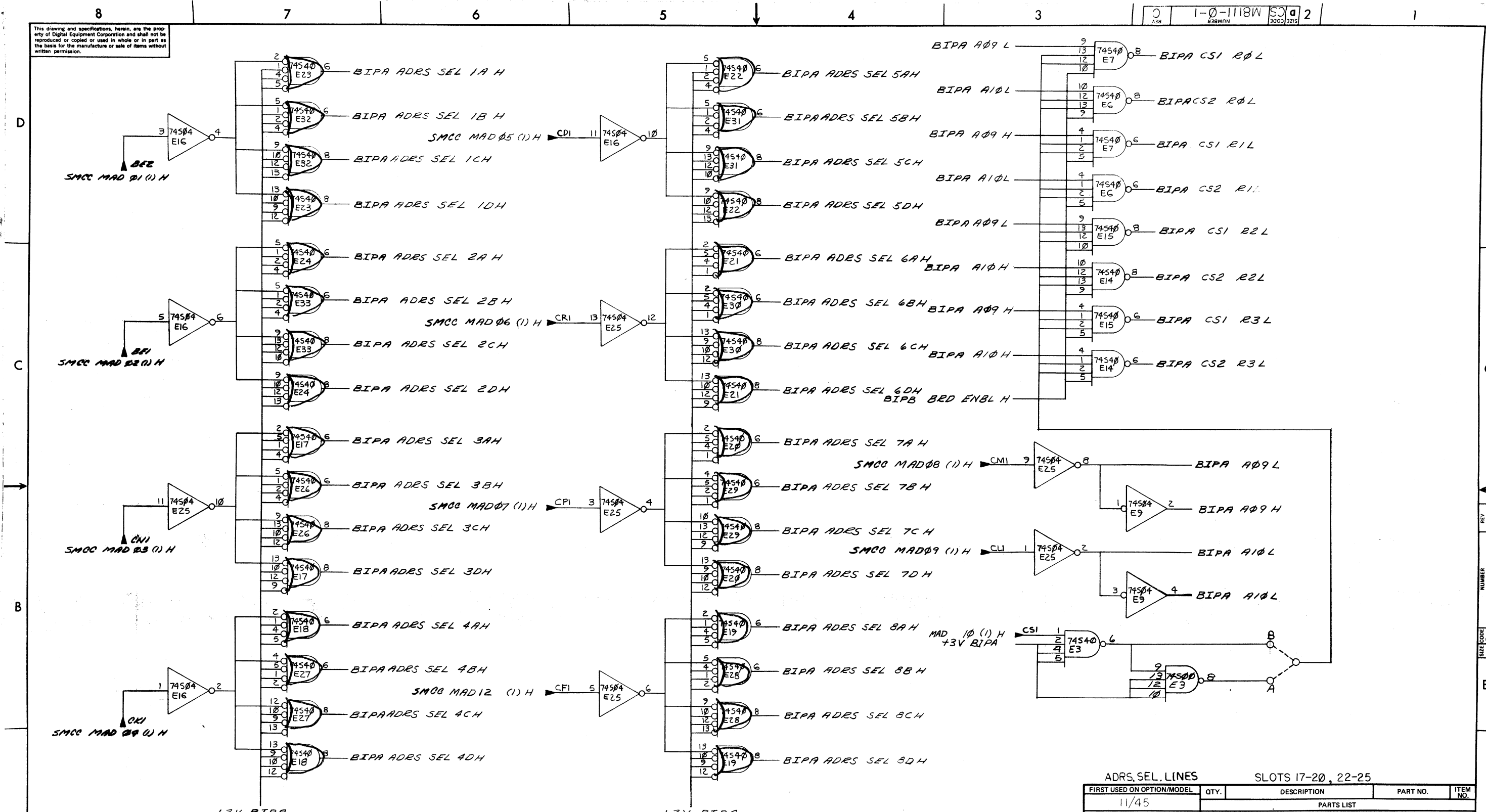
**SEMICONDUCTOR CONVERSION CHART**

**DEC NO.** 74200 **ISA NO.** 74200 **ISA NO.** 74200

**EQUIPMENT CORPORATION**

**BIPOLAR MEMORY MATRIX**

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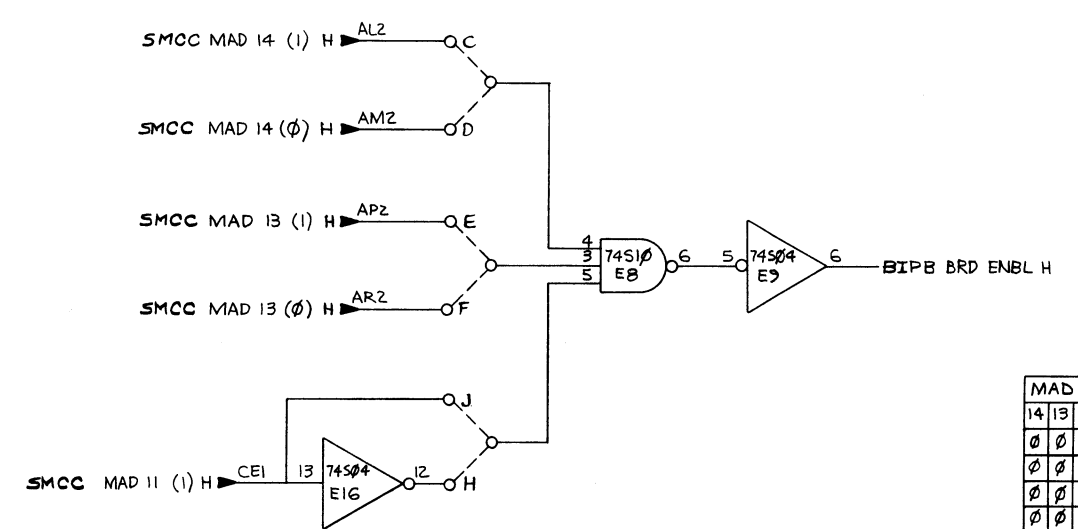
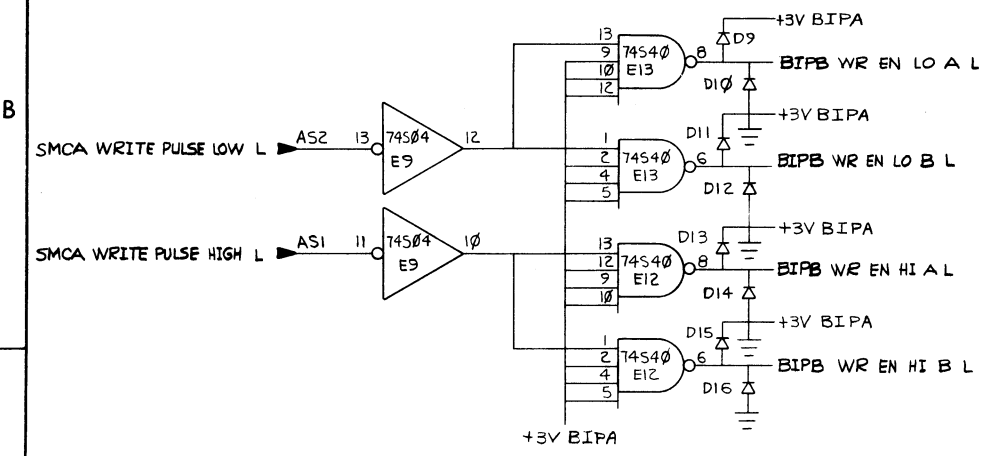
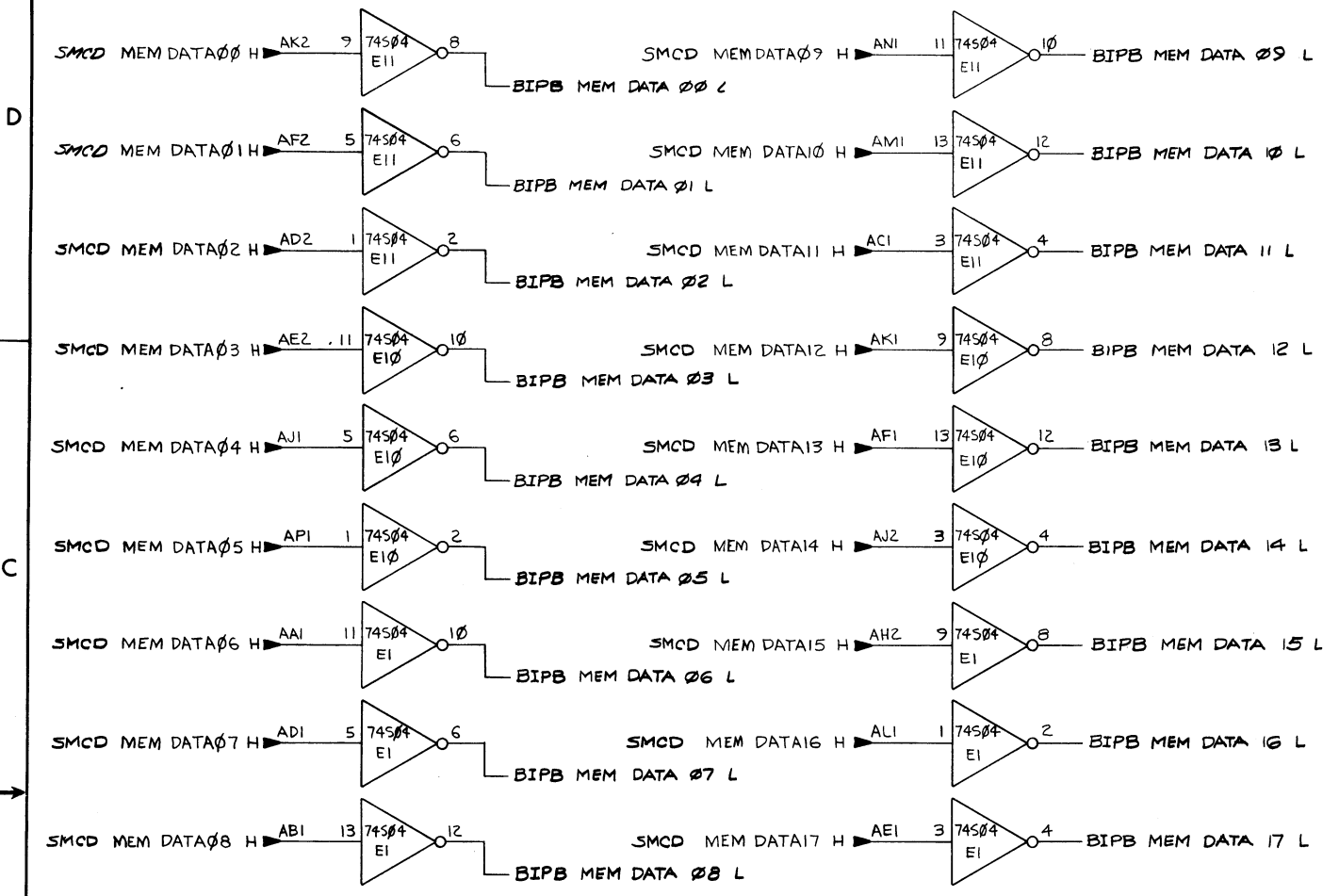
REV	CHANGE NO.

DEC FORM NO DRD 102-B

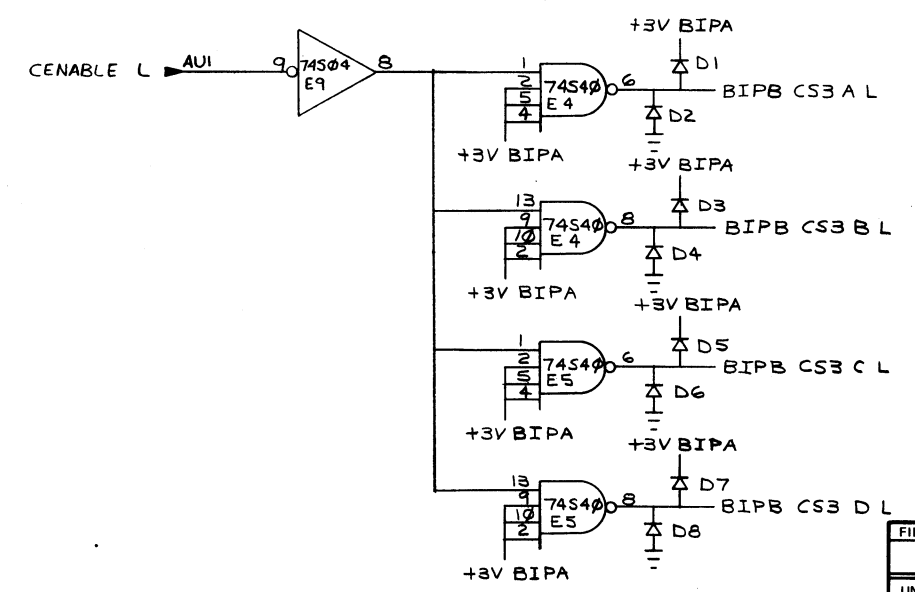
ADRS. SEL. LINES		SLOTS 17-20, 22-25	
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.
11/45			
PARTS LIST			
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES	DRN. <i>[Signature]</i>	DATE <i>[Date]</i>	<b>digital</b> EQUIPMENT CORPORATION <small>MAYNARD, MASSACHUSETTS</small>
DECIMALS ANGLES	CHK'D. <i>[Signature]</i>	DATE <i>[Date]</i>	
.XXX = .005 .XX = .02 .X = .1	ENG. <i>[Signature]</i>	DATE <i>[Date]</i>	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROD. <i>[Signature]</i>	DATE <i>[Date]</i>	
MATERIAL		NEXT HIGHER ASSY.	
FINISH		B-DD-MSII-C	
		SCALE	
		SHEET 2 OF 11	
		DIST.	
		SIZE CODE	
		NUMBER	
		REV.	
		DCS	
		M8111-0-1	
		C	

REV. C  
NUMBER M8111-0-1  
SIZE CODE DCS  
REV. C

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MAD BIT	K-WORD
14 13 11 10	1ST
0 0 0 0	2ND
0 0 1 0	3RD
0 0 1 1	4TH
0 1 0 0	5TH
0 1 0 1	6TH
0 1 1 0	7TH
0 1 1 1	8TH
1 0 0 0	9TH
1 0 0 1	10TH
1 0 1 0	11TH
1 0 1 1	12TH
1 1 0 0	13TH
1 1 0 1	14TH
1 1 1 0	15TH
1 1 1 1	16TH

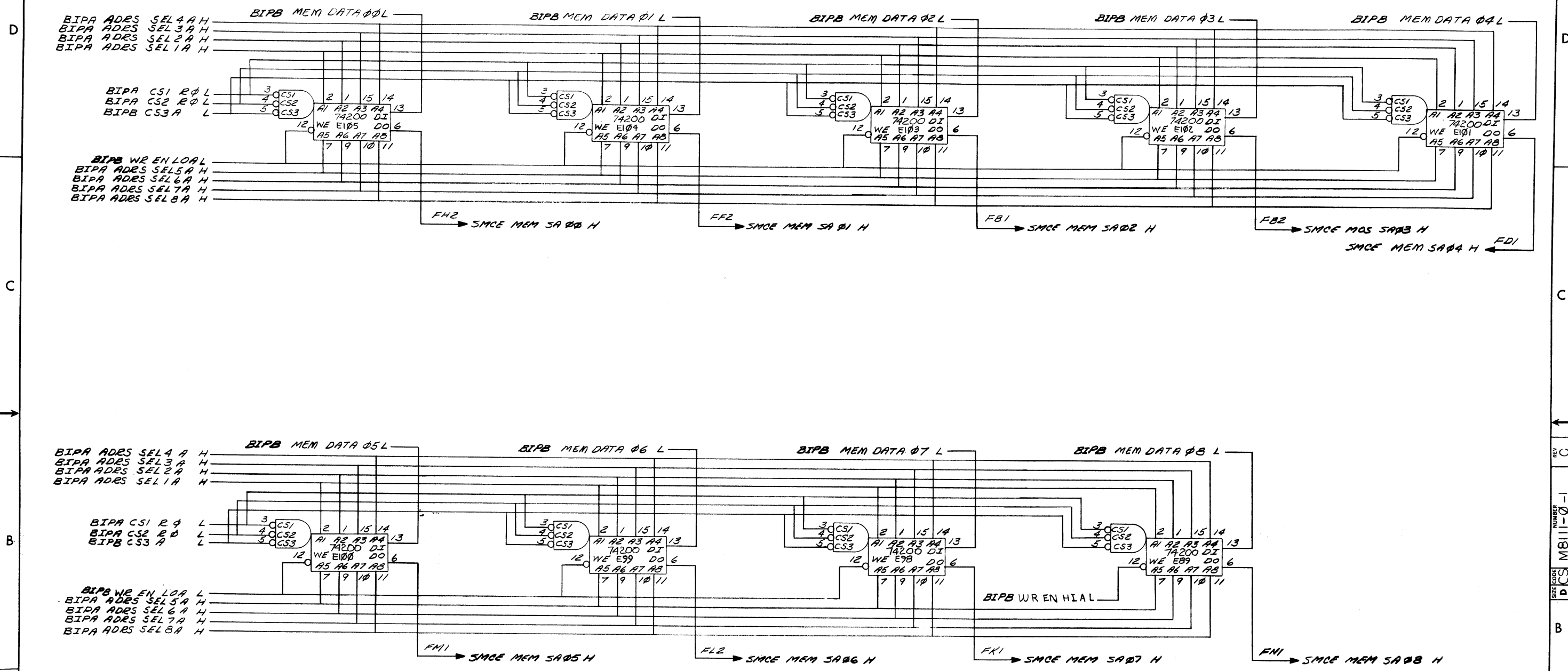


MEM DATA 00 TO 17 SLOTS 17-20, 22-25

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES	DRN	DATE	digital EQUIPMENT CORPORATION	
DECIMALS .XXX = .005	CHK'D	DATE	MAYNARD, MASSACHUSETTS	
ANGLES ±0° 30'	ENG.	DATE	TITLE	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROJ. ENG.	DATE	MEMORY MATRIX, BIPOLAR (BIPB)	
MATERIAL	NEXT HIGHER ASSY.	DATE	SIZE CODE	NUMBER
FINISH	B-DD-MSII-C	4-13-72	D CS	M8111-0-1
	SCALE		DIST.	REV. C
	SHEET 3 OF 11			

REV	CHANGE NO.

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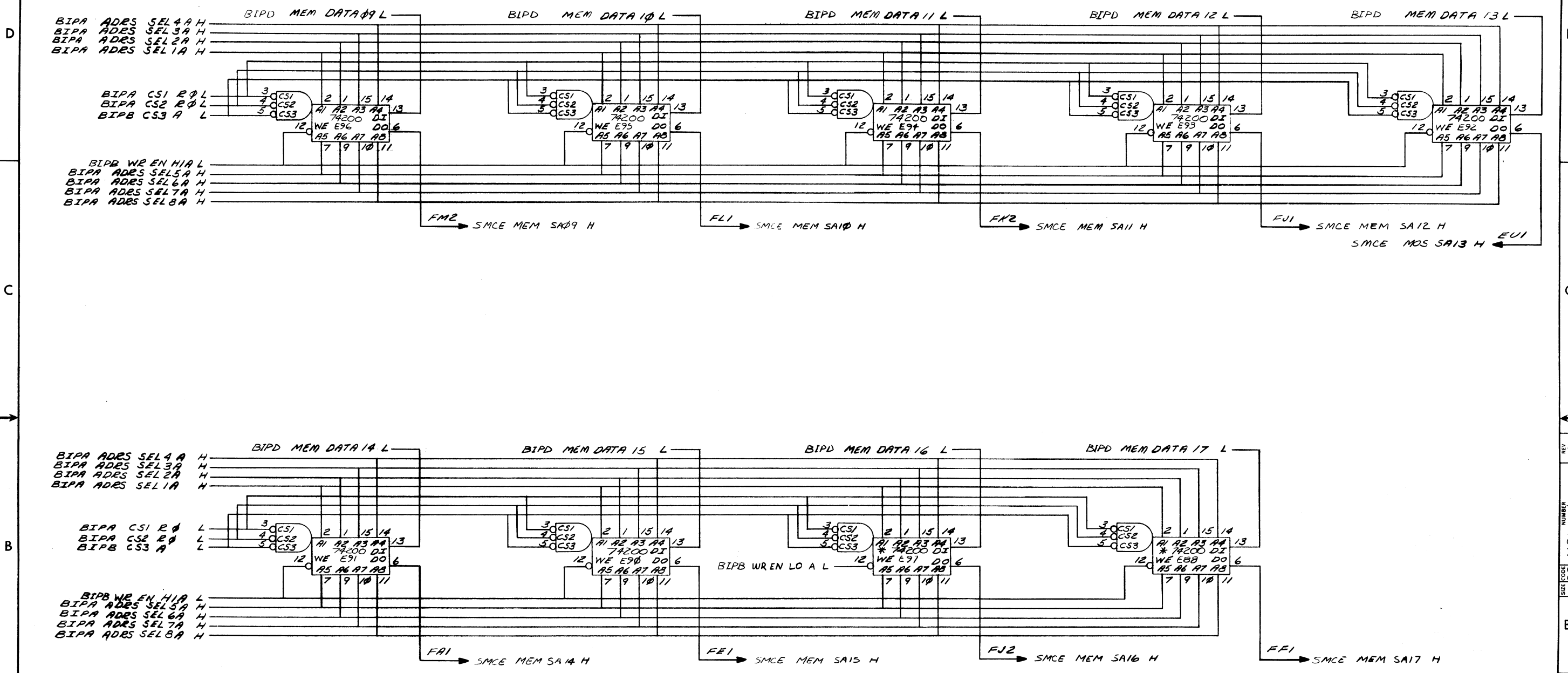
REV.	
CHANGE NO.	
CHK	

DEC FORM NO DRD 102-B

FIRST USED ON OPTION/MODEL 11/45		QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES		DRN <i>[Signature]</i>	DATE 4-7-72	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	
DECIMALS	ANGLES	CHK'D <i>[Signature]</i>	DATE 4/10/72	TITLE	
.XXX = .005	±0° 30'	ENG <i>[Signature]</i>	DATE 4/17/72	MEMORY MATRIX, BIPOLAR (BIPC)	
.XX = .02		PRD. ENG. <i>[Signature]</i>	DATE 4-17-72	MATERIAL	
.X = .1		PROD. <i>[Signature]</i>	DATE 4-13-72	NEXT HIGHER ASSY.	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓				B-DD-MS11-C	SIZE CODE D CS
					NUMBER M8111-0-1
				SCALE 4 OF 11	REV. C
				SHEET	

REV. C  
 NUMBER MB111-0-1  
 SIZE CODE D CS

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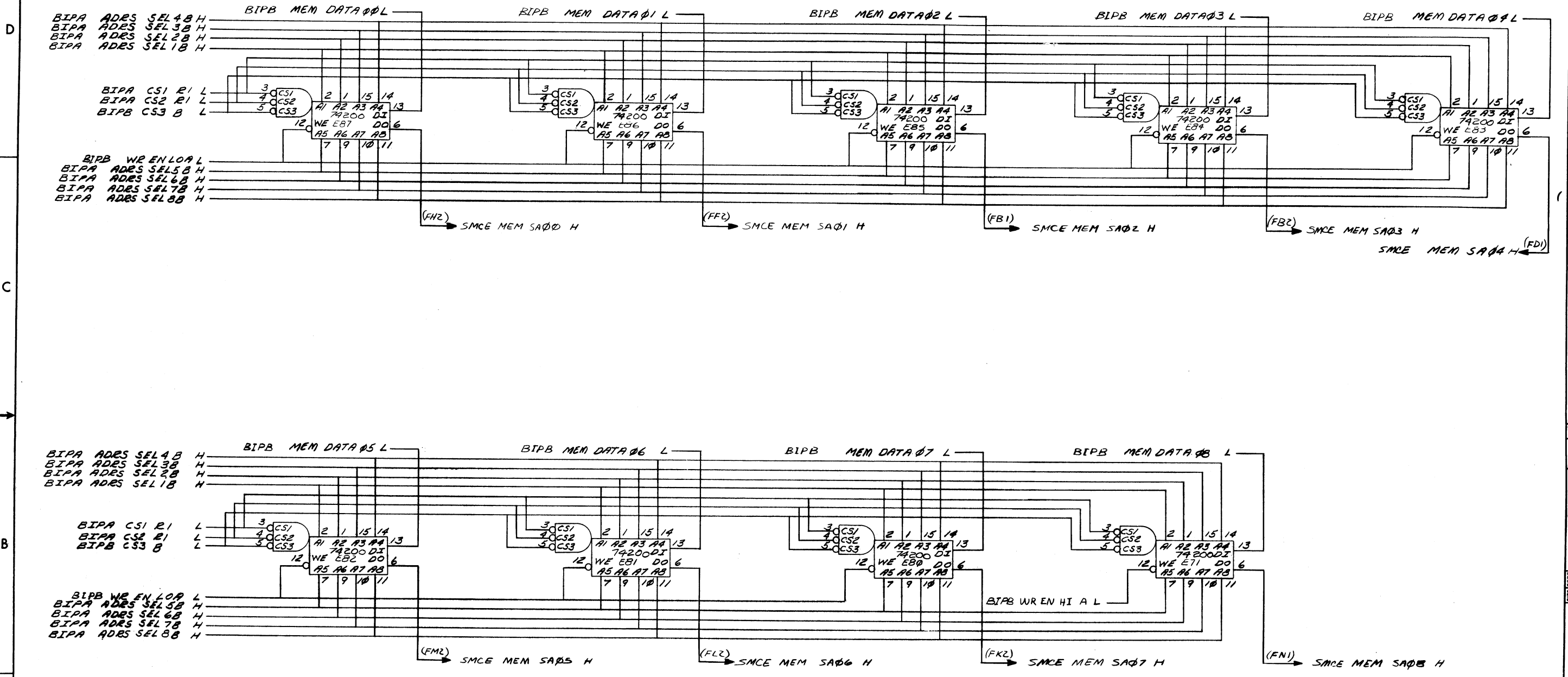


ROW 0 BITS 09-17 SLOTS 17-20, 22-25

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES	DRN. J. Davis	DATE 9-7-71	<b>digital</b> EQUIPMENT CORPORATION <small>MAYNARD, MASSACHUSETTS</small>	
DECIMALS	CHKD. [Signature]	DATE 11/17/71		
ANGLES	ENG. [Signature]	DATE 11/17/71		
.XXX - .005 .XX - .02 .X - .1	PROD. ENG. [Signature]	DATE 7/14/72		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROD. [Signature]	DATE 1/13/72	<b>MEMORY MATRIX, BIPOLAR</b> (BIPD)	
MATERIAL	NEXT HIGHER ASSY.			
FINISH	B-DD-MS11-C			
		SCALE	SIZE CODE	NUMBER
		SHEET 5 OF 11	DCS	M8111-0-1
			DIST.	REV. C

REV.	
CHG. NO.	
CHK.	

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ROW 1 BITS 00-08 SLOTS 17-20, 22-25

REV	
CHANGE NO.	
CHK	

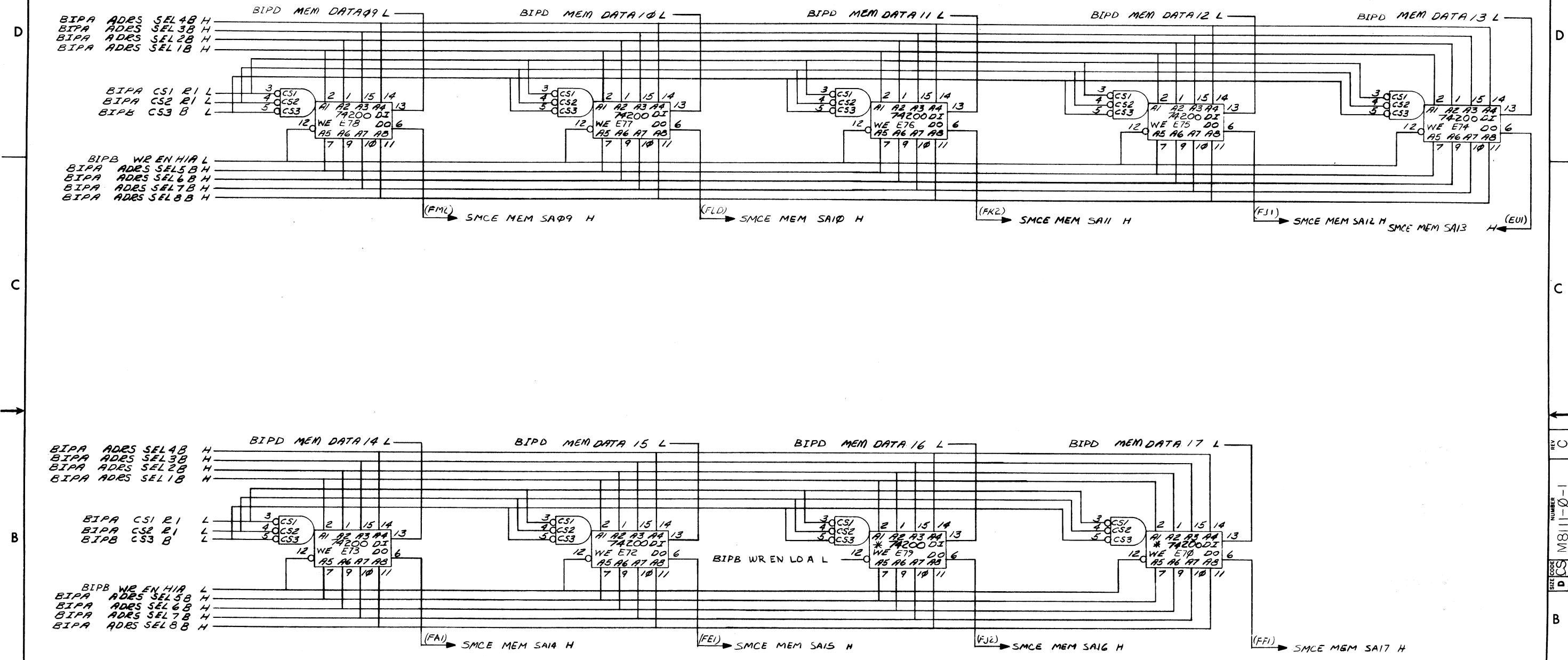
DEC FORM NO. DRD 102-B

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES		DRN. <i>J. Lewis</i> DATE 9-7-71	 digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS	
DECIMALS	ANGLES	CHK'D. <i>[Signature]</i> DATE 11/10/72		
.xxx = .005	± 0° 30'	ENG. <i>[Signature]</i> DATE 11/10/72	TITLE <b>MEMORY MATRIX, BIPOLAR (BIPE)</b>	
.xx = .02		PROD. ENG. <i>[Signature]</i> DATE 11/10/72		
.x = .1		PROD. <i>[Signature]</i> DATE 4-13-72		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY				
MATERIAL	NEXT HIGHER ASSY.		SIZE CODE	NUMBER
FINISH	B-DD-MS11-C		DCS	M8111-0-1
	SCALE		DIST.	
	SHEET 6	OF 11		

REV. C  
NUMBER M8111-0-1  
SIZE CODE DCS

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1-0-1118W SCD 2

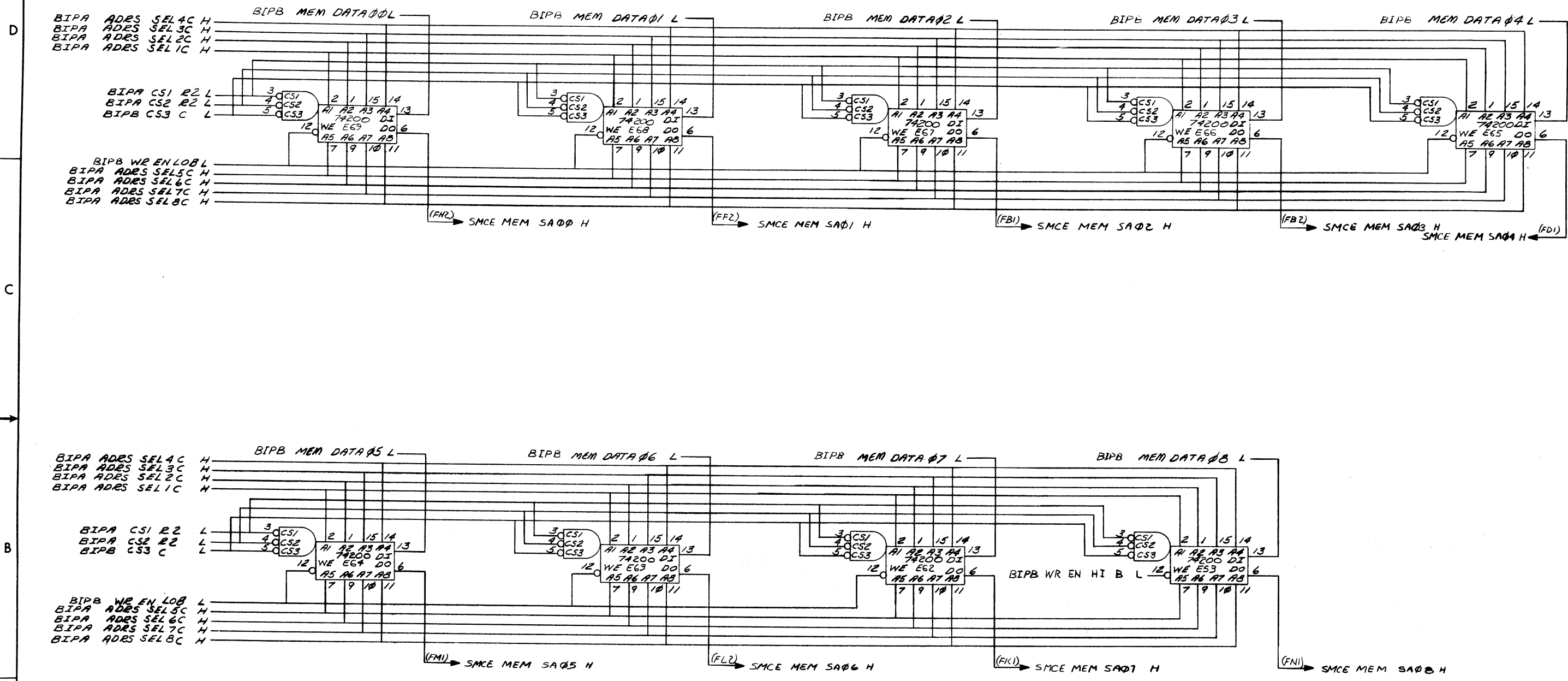


REV	
CHG	
NO.	

FIRST USED ON OPTION/MODEL		QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45					
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES		DRN. <i>A. Davis</i>	DATE 9-7-71	digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS	
DECIMALS .xxx = .005	ANGLES ±0° 30'	CHK'D. <i>John Deane</i>	DATE 4/10/72	TITLE	
.xx = .02	.x = .1	ENG. <i>John Deane</i>	DATE 1/14/72	MEMORY MATRIX, BIPOLAR (BIPF)	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY		PROD. <i>John Deane</i>	DATE 4-13-72	MATERIAL	
				NEXT HIGHER ASSY.	
				B-DD-MS11-C	
				SCALE	SIZE CODE
				SHEET 7 OF 11	DCS
					NUMBER
					M8111-0-1
					REV
					C

REV C  
NUMBER M8111-0-1  
SIZE CODE DCS

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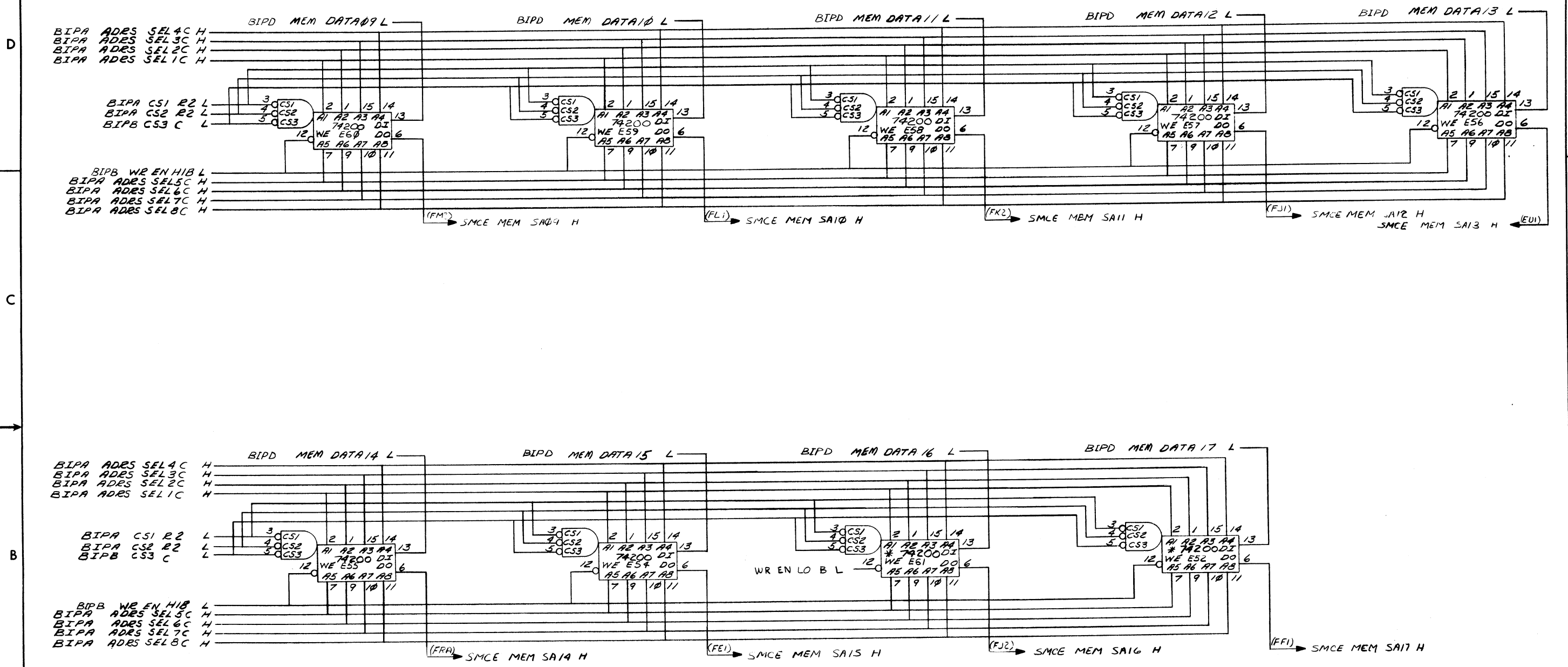
ROW 2 BITS 00-08 SLOTS 17-20, 22-25

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES	DRN <i>A. Davis</i>	DATE 9-7-71	<b>digital</b> EQUIPMENT CORPORATION MAYFORD, MASSACHUSETTS	
DECIMALS ANGLES	CHKD <i>John DeLoach</i>	DATE 11/01/72		
.XXX = .006 .XX = .02 .X = .1	ENG <i>Avramon</i>	DATE 11/77	TITLE <b>MEMORY MATRIX, BIPOLAR (BIPH)</b>	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROD. ENG. <i>Avramon</i>	DATE 11/77		
MATERIAL	NEXT HIGHER ASSY.	DATE 4-13-72	SIZE CODE <b>DCS</b>	NUMBER <b>M8111-0-1</b>
FINISH	B-DD-MS11-C	DATE 4-13-72	REV. <b>C</b>	
	SCALE			
	SHEET 8 OF 11			

REV.	CHANGE NO.



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ROW 2 BITS 09-17 SLOTS 17-20, 22-25

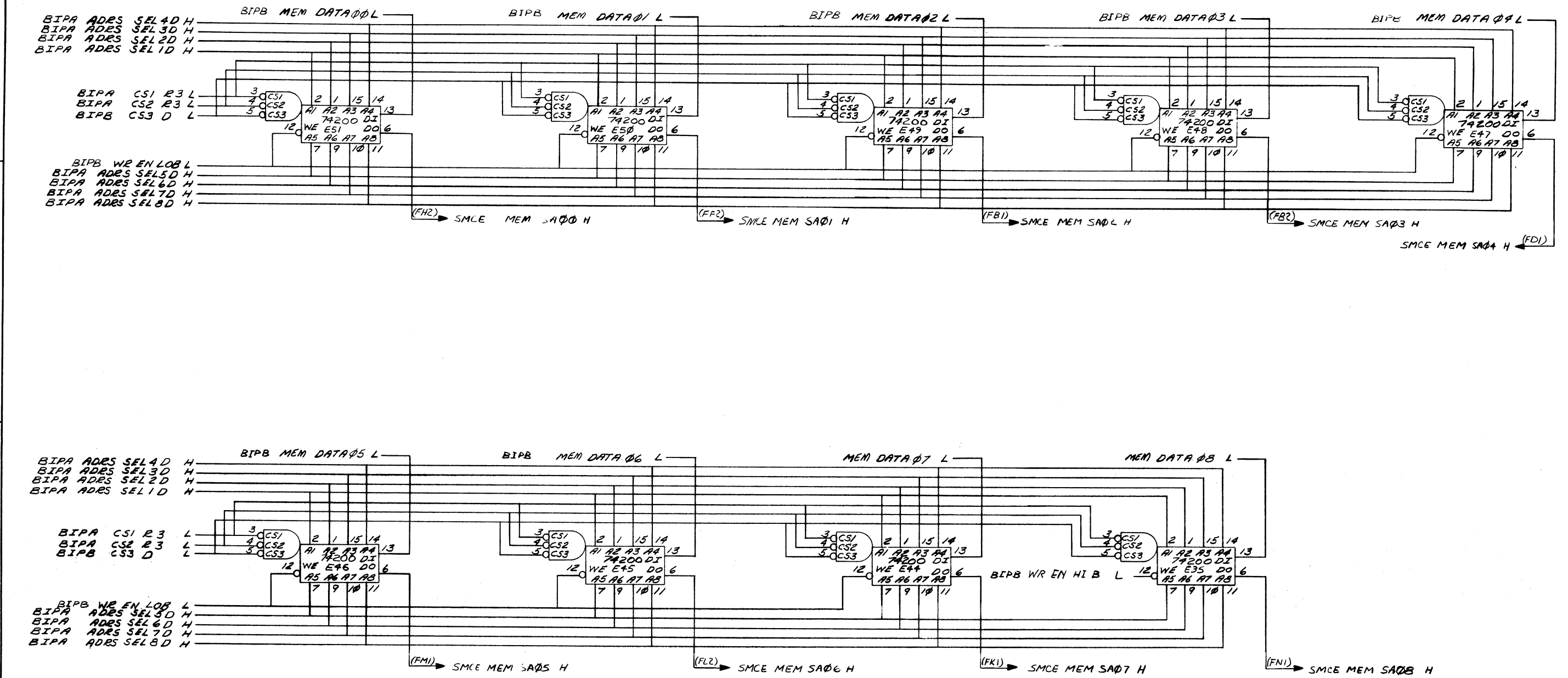
REV	
CHANGE NO.	
CHK	

DEC FORM NO DRD 102-B

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES.		DRN. <i>A. Sando</i> DATE 9-7-71	<b>digital</b> EQUIPMENT CORPORATION WATNARD MASSACHUSETTS	
TOLERANCES		CHK'D. <i>W. Sando</i> DATE 11/10/71		
DECIMALS .XXX - .005	ANGLES ±0° 30'	ENG. <i>W. Sando</i> DATE 11/17/71	TITLE <b>MEMORY MATRIX, BIPOLAR (BIPJ)</b>	
.XX - .02		APP. ENG. <i>W. Sando</i> DATE 11/16/71		
.X - .1		PROD. <i>W. Sando</i> DATE 11-13-71		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓		NEXT HIGHER ASSY.		
MATERIAL --//--		B-DD-MS11-C	SIZE CODE DCS	NUMBER M8111-0-1
FINISH --//--		SCALE --//--	SHEET 9 OF 11	REV. C

REV. C  
NUMBER M8111-0-1  
SIZE CODE DCS

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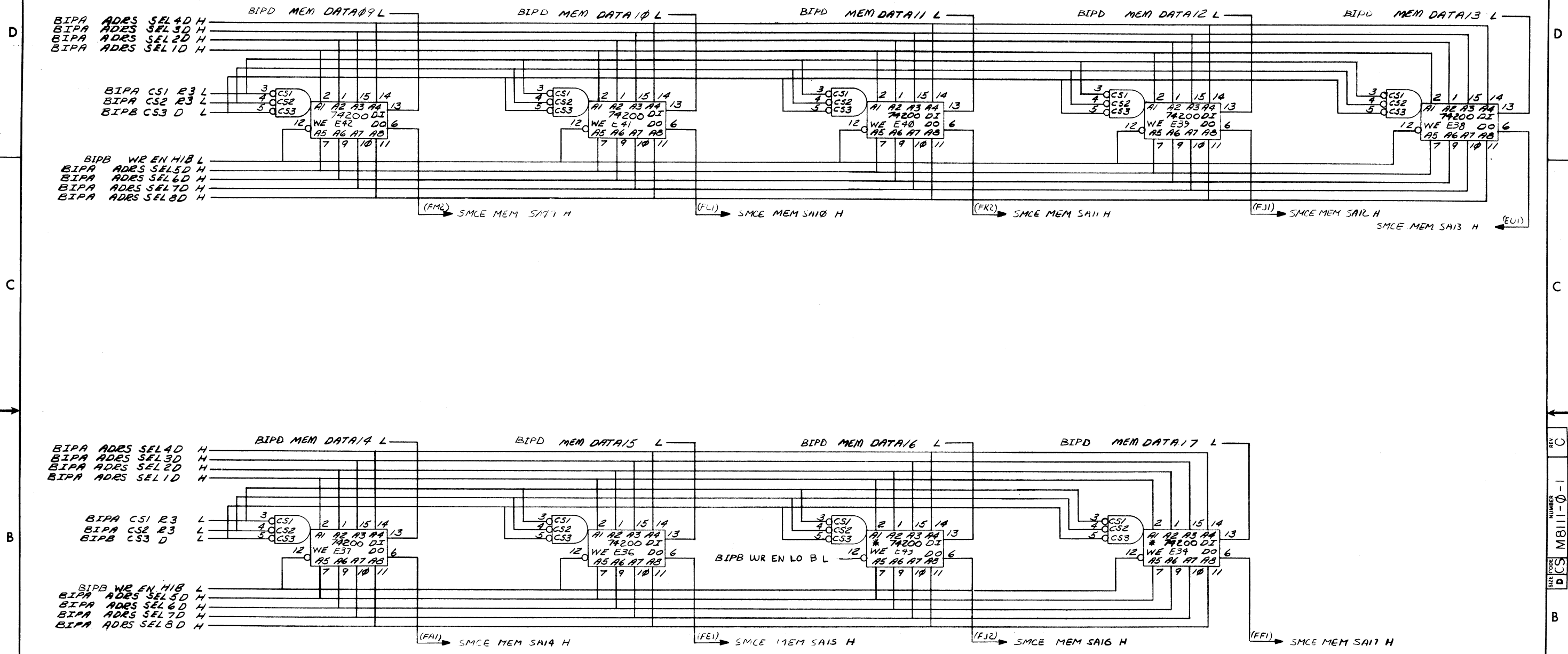
REV.	
CHG.	
CHK.	

DEC FORM NO. DRD 102-B

ROW 3 BITS 00-08		SLOTS 17-20, 22-25	
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO. ITEM NO.
11/45		PARTS LIST	
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES		DRN <i>X. Davis</i> DATE 7-7-71	 <b>digital</b> EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
DECIMALS	ANGLES	CHK'D <i>[Signature]</i> DATE 11/10/71	
.XXX = .005	±0° 30'	ENG'G <i>[Signature]</i> DATE 7/10/71	
.XX = .02		PROD. ENG. <i>[Signature]</i> DATE 7/14/71	
.X = .1		PROD. <i>[Signature]</i> DATE 11-13-72	TITLE
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓		MEMORY MATRIX, BIPOLAR (BIPK)	
MATERIAL	NEXT HIGHER ASSY.	SIZE CODE	NUMBER
— / —	B-DD-MS11-C	D CS	M8111-0-1
FINISH	SCALE	DIST.	REV.
— / —	10 OF 11		C

REV. C  
NUMBER M8111-0-1  
SIZE CODE DCS

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REVISIONS	REV.
CHANGE NO.	
CHK	

ROW 3 BITS 09 17      SLOT 17-20 22-25

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
11/45				
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES		DRN <i>J. Davis</i> DATE 9-7-71	 digital EQUIPMENT CORPORATION MATTAPOWSETT, MASSACHUSETTS	
DECIMALS	ANGLES	CHK'D <i>J. Davis</i> DATE 11/10/71		
.XXX = .005	± 0° 30'	ENG. <i>J. Davis</i> DATE 11/10/71	TITLE MEMORY MATRIX, BIPOLAR (BIPL)	
.XX = .02		PROJ. ENG. <i>J. Davis</i> DATE 11/10/71		
.X = .1		PROD. <i>J. Davis</i> DATE 4-13-72	SIZE CODE NUMBER REV. D CS M8111-0-1 C	
MATERIAL	NEXT HIGHER ASSY.	SCALE	DIST.	
FINISH	B-DD-MS11-C	SHEET 11 OF 11		

**digital**

**DIGITAL EQUIPMENT CORPORATION  
MAYNARD, MASSACHUSETTS 01754**