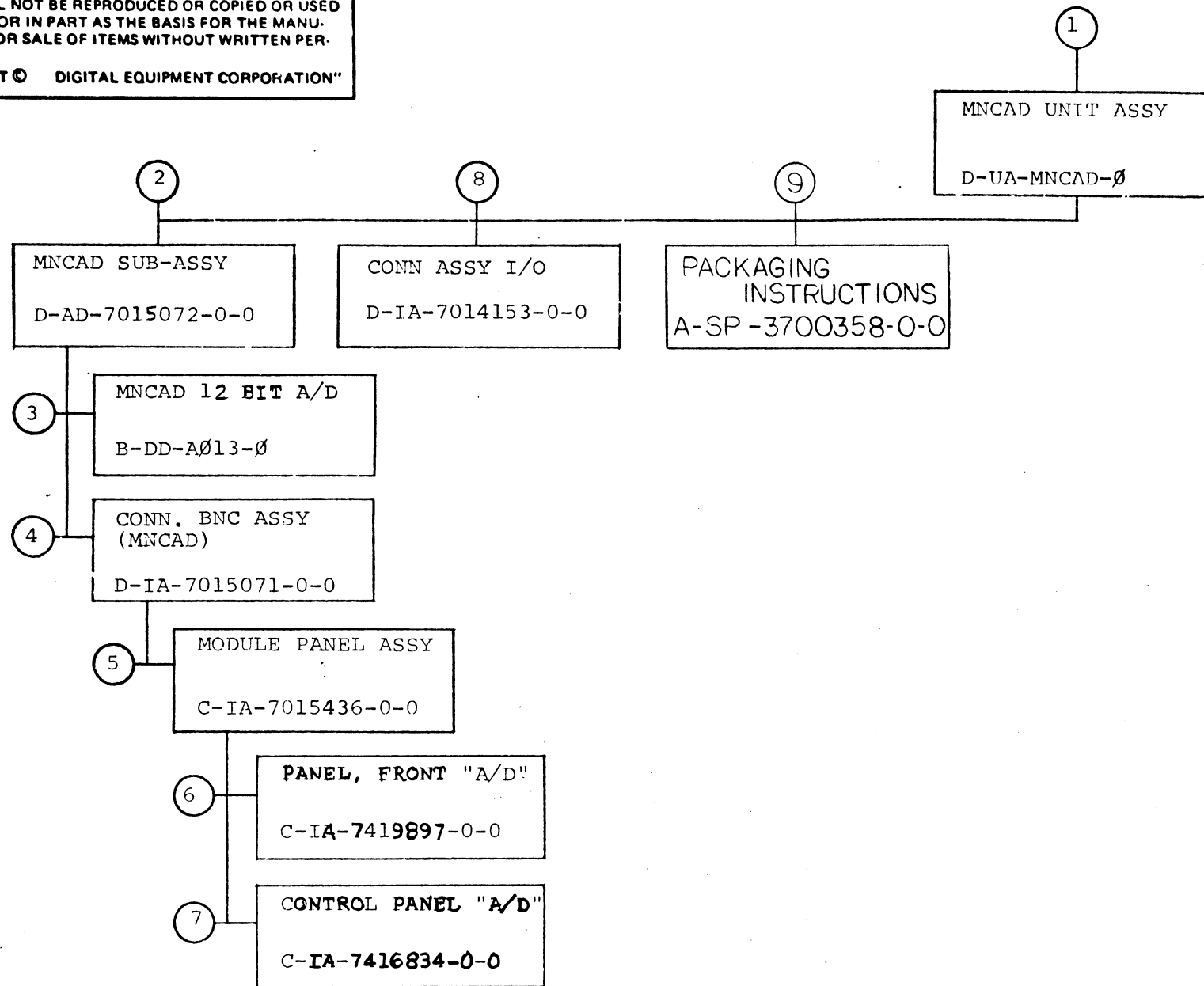






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TITLE	MNCAD UNIT ASSY	SIZE CODE	NUMBER	REV
		B DD	MNCAD-Ø	B
SHEET 2 OF 3				

FIND NO.	DRAWING NO.	DESCRIPTION	TYPE	FIND NO.	DRAWING NO.	DESCRIPTION	TYPE
1	MP00592	FIELD MAINTENANCE PRINT SET	-	5	C-IA-7015436-0-0	MODULE PANEL ASSY	M
	B-TC-MNCAD-0-1	FIELD MAINTENANCE PRINT SET	-				
	D-UA-MNCAD-0-0	MNCAD UNIT ASSY	E/M				
	C-MD-7419869-0-0	PLATE, COMP SIDE	M				
	C-MD-7419868-0-0	PLATE, ETCH SIDE	M				
	A-DC-3615260-0-0	DECAL, I/O SCHEMATIC	E/M				
	A-DC-3615264-0-0	DECAL, INFORMATION (MNCAD)	E/M				
	A-PL-MNCAD-0-5	PARTS LIST MNCAD	E/M				
	A-PL-MNCAD-0-SH	SHIP LIST MNCAD	E/M				
	A-SP-MNCAD-0-2	MNCAD ENGINEERING SPEC.	E/M	6	C-IA-7419897-0-0	PANEL, FRONT "A/D"	M
	A-SP-MNCAD-0-3	CHECKOUT & ACCEPTANCE PROCEDURE	E/M		C-PS-4830033-0-0	EXTRUSION, FRONT PANEL "A/D"	M
	A-SP-MNCAD-0-4	INSTALLATION & ACCEPTANCE PROCEDURE	E/M				
2	D-AD-7015072-0-0	MNCAD SUB-ASSY	M				
	B-MD-7420242-0-0	SPACER, MODULE	M				
	C-IA-7419864-0-0	SUB PANEL	M				
				7	C-IA-7416834-0-0	CONTROL PANEL "A/D"	M
					C-SS-7416834-01	CONTROL PANEL	M
					C-SS-7416834-02	CONTROL PANEL	M
					C-SS-7416834-03	CONTROL PANEL	M
					C-SS-7416834-04	CONTROL PANEL	M
					C-SS-7416834-05	CONTROL PANEL	M
3	B-DD-A013-0	MNCAD 12 BIT A/D	E/M				
	A-PL-A013-0-0	12 BIT A/D	E/M				
	D-UA-A013-0-0	12 BIT A/D	E/M				
	D-CS-A013-0-1	12 BIT A/D	E/M				
				8	D-IA-7014153-0-0	CONN ASSY I/O	E/M
					A-DC-7416836-0-0	DECAL, I/O CONN	E/M
					A-DC-7418934-0-0	DECAL, I.D. I/O CONN	E/M
4	D-IA-7015071-0-0	CONN. BNC ASSY (MNCAD)	E/M				
				9	A-SP-3700358-0-0	PACKAGING INSTRUCTIONS	M

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

digital

TITLE MNCAD UNIT ASSY

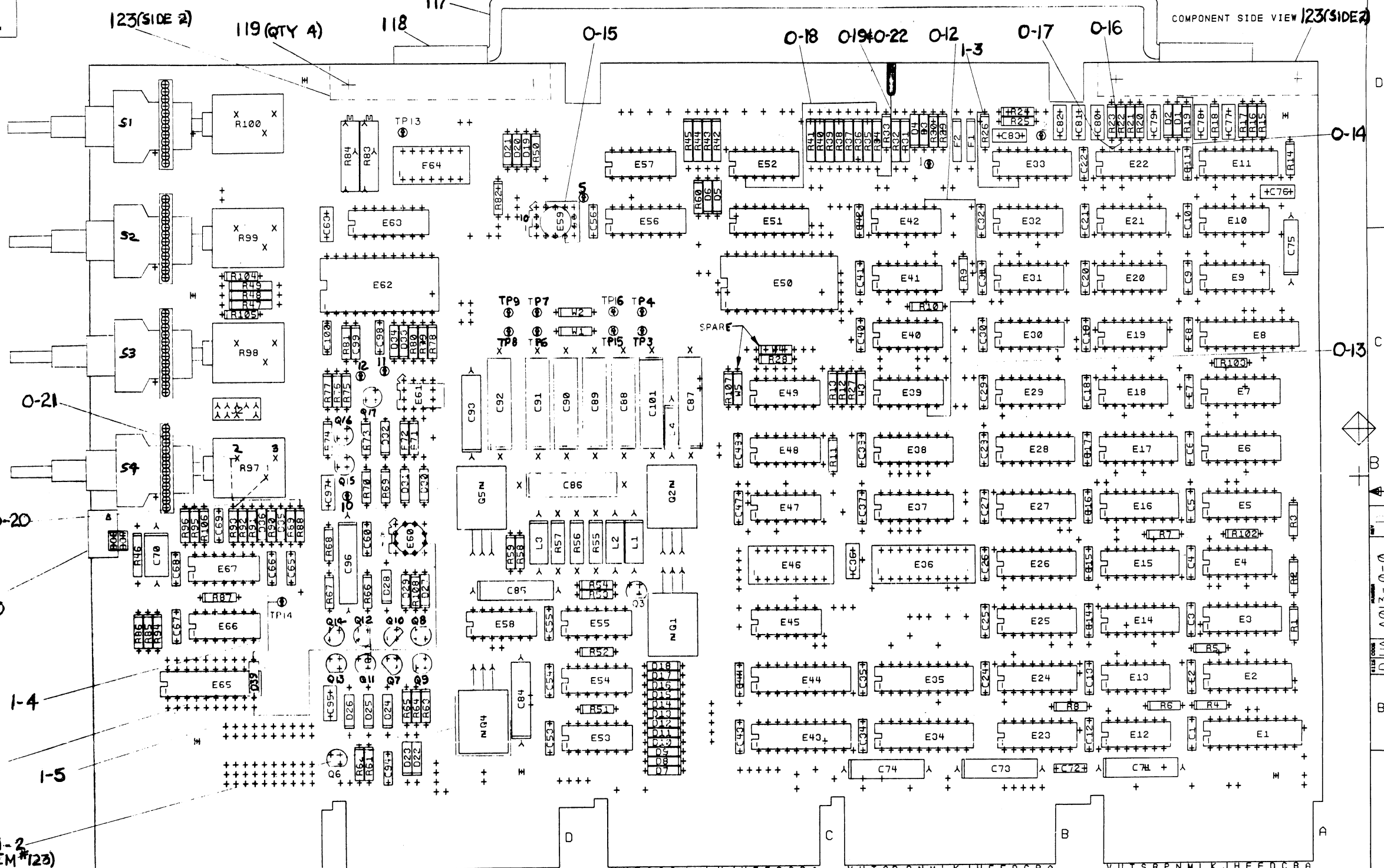
SHEET 3 OF 3

SIZE CODE  
B DD

NUMBER  
MNCAD-0

REV  
B

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NOTES:

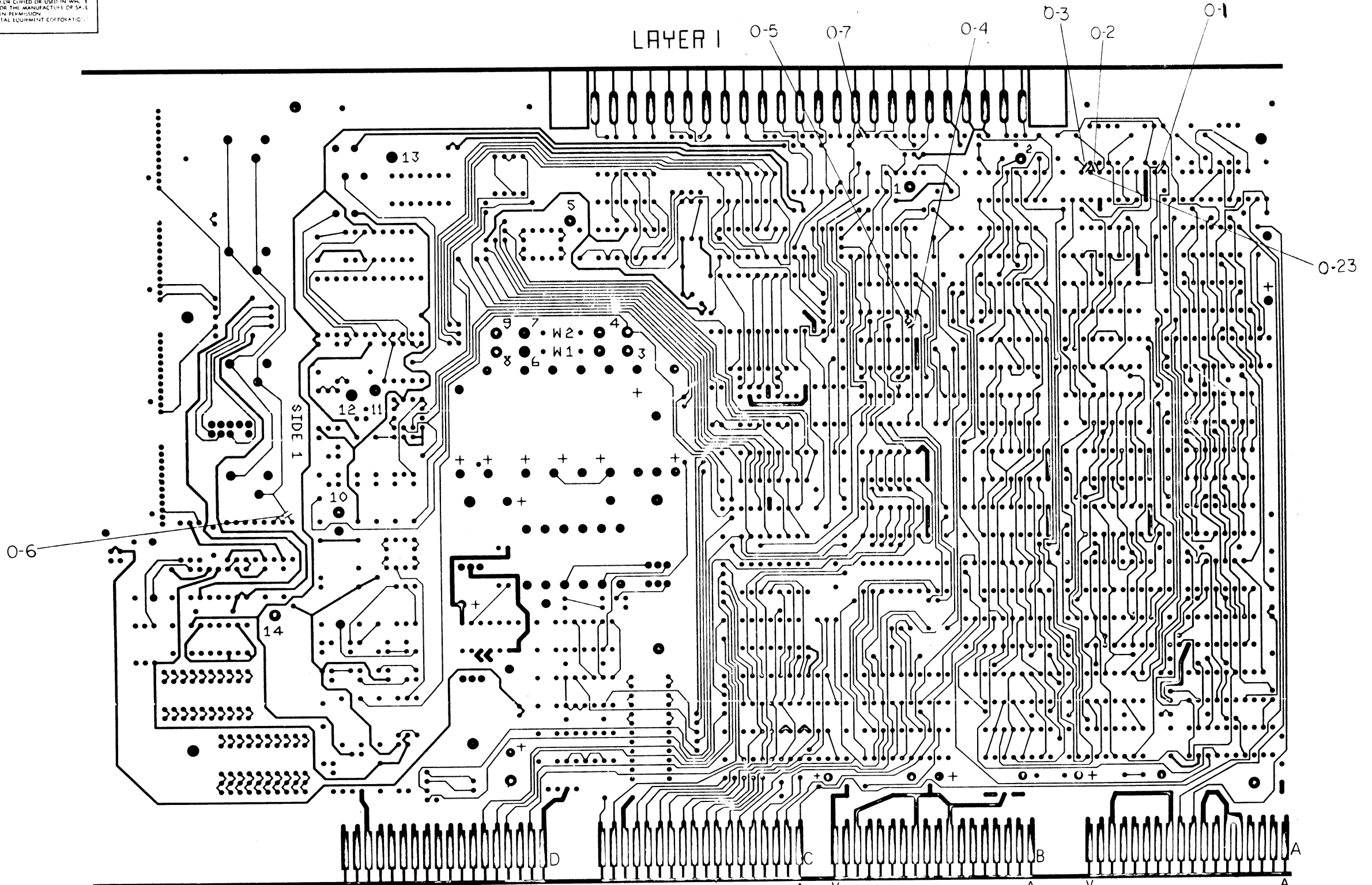
CHK CHANGE NO	REV	DATE
1	1	12/1/77
2	1	12/1/77
3	1	12/1/77
4	1	12/1/77
5	1	12/1/77

ETCH REV.	0
P.C. DESIGN DATA BASE REV.	A

SIGNATURES	DATE	digital
DRN. E. WILSON	12/1/77	
CHK'D: R. W. CANTON	12/1/77	TITLE
ENG. [Signature]	12/1/77	A-D FOR MINC
PROD. [Signature]	12/1/77	SCALE
SCALE 2X	1 OF 4	SIZE CODE
SHT. 1 OF 4	0 UA	NUMBER
NEXT HIGHER ASSY. B-DD-A013-0		REV
		0

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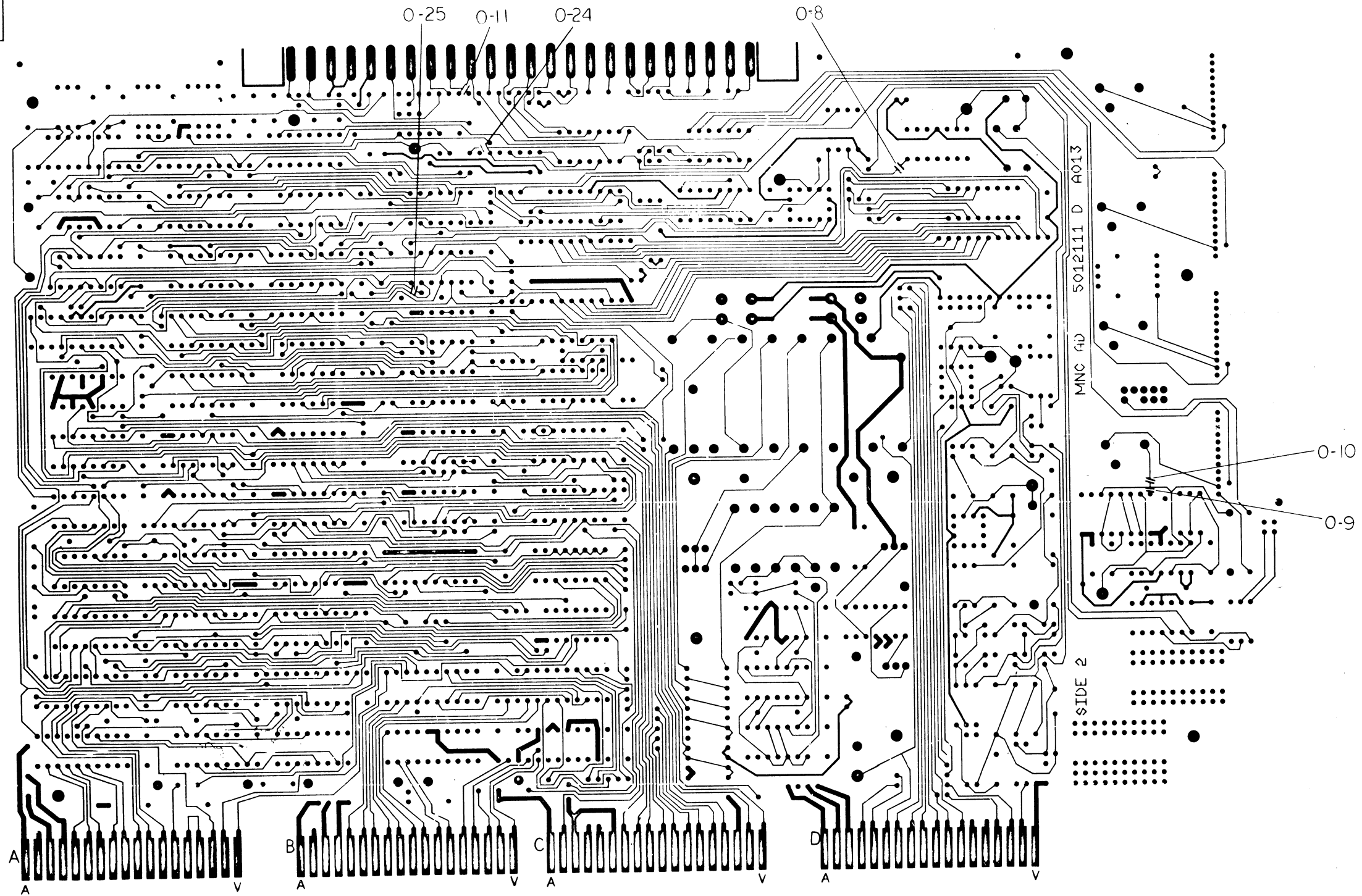
LAYER 1



REVISIONS		
REV	DATE	BY

A/D FOR MINC		SIZE CODE	NUMBER	REV.
SCALE 2/1	SHEET 2 OF 4	DUA	A013 - 0 - 0	0
		DIST		

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REVISIONS		
CHK	CHANGE NO	REV

TITLE		SIZE CODE	NUMBER	REV
A-D FOR MINC		D UA	A013-0-0	D
SCALE	2/1	SHEET	3 OF 4	DIST

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REWORK INSTRUCTIONS  
FIRST RELEASE

- ETCH CUTS, SIDE #1 (AS SHOWN)  
 0-1 AT TOP OF C11  
 0-2, 0-3 AT BOTH SIDES OF E22(15)  
 0-4, 0-5 AT BOTH SIDES OF PTH BELOW E41(16)  
 0-6 AT TOP OF R88  
 0-7 AT TOP OF R34  
 ETCH CUTS, SIDE #2 (AS SHOWN)  
 0-8 AT E64(7)  
 0-9 AT TOP OF R93  
 0-10 ON ETCH RUNNING FROM R93 TO R97(2)  
 0-11 AT TOP OF R34  
 0-24 AT BOTTOM OF R34  
 0-25 AT PTH BELOW E41(16)  
 WIRE ADDS, SIDE #1 (AS SHOWN)  
 0-12 FROM E42(9) TO PTH TO THE RIGHT OF R9  
 0-13 FROM E39(16) TO PTH BELOW AND TO THE RIGHT OF R9  
 0-14 FROM TOP OF D1 TO PTH AT C11  
 0-15 FROM E59(4) TO E59(9)  
 0-16 LIFT PIN E22(15) AND ADD WIRE FROM E22(15) TO BOTTOM OF R22  
 0-17 FROM E22(15) TO BOTTOM OF C80  
 0-18 FROM E52(2) TO TOP OF R34  
 0-19 FROM BOTTOM OF R34 TO J11(16)  
 WIRE ADDS SIDE #2 (AS SHOWN)  
 0-20 FROM TOP OF R93 TO R97(1)  
 0-21 FROM TOP OF R88 TO R97(2)  
 0-22 FROM BOTTOM OF R34 TO J11(16)  
 DRILLING  
 0-23 DRILL OUT E22(15) (REF A-SP-7665169-0-0)

ECO #1

COMPONENT ADDS SIDE #1 (AS SHOWN)

- I-1 ADD DIODE (MCL1304) D39 IN LOCATION E65 BETWEEN PINS 10 AND 11. INSERT CATHODE IN PIN 10 HOLE AND ANODE LEAD IN OUTER HOLE ATTACHED TO PIN 11.  
 I-2 ADD TAPE (ITEM 123) TO BOTTOM OF Q4. PLACE TAPE ON PART NOT ON THE BOARD.

WIRE ADDS SIDE #1 (AS SHOWN)

- I-3 FROM TOP R26 TO E33 PIN 3  
 I-4 FROM TP14 TO ANODE END OF D39  
 I-5 FROM CATHODE END OF D39 TO E60 PIN 4

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	A-D FOR MINC	SIZE CODE	DUA	NUMBER	A013-0-0	REV.	D
SCALE	+	SHEET	4	OF	4	DIST.	



LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
1	1	D-MD-5012111-0-0	5012111-00	ETCH BD (A013)	1	
2	2		1010274-01	.22 MFD 50V XZ 3C023 CER.	56	C1-C22,C24-C32,C34,C35,C37, CONT C38,C40-C44,C47,C48,C53-C56, CONT C60,C65-C69,C72,C94,C98,C100
3	3		1000042-00	1000.0 MMF 100V 5%200PFM DM15S (10-00)	2	C36,C80
4	4		1000027-00	820.0 MMF 100V 5%200PFM DM15S (10-00)	1	C63
5	5		1004812-00	15 MFD 20V 10% 150D S.TA (10-00)	5	C71,C73,C74,C85,C93
6	6		1001776-00	1 MFD 35V 10% 150D S.TA (10-00)	1	C75
7	7		1000026-00	680.0 MMF 100V 5%200PFM DM15S (10-00)	1	C76
8	8		1000021-00	220.0 MMF 100V 5%200PFM DM15S (10-00)	3	C77,C78,C79
9	9		1000020-00	180.0 MMF 100V 5%200PFM DM15S (10-00)	1	C81
10	10		1000022-00	270.0 MMF 100V 5%200PFM DM15S (10-00)	1	C82
11	11		1000024-00	470.0 MMF 100V 5%200PFM DM15S (10-00)	1	C83
12	12		1005306-00	6.8MFD 35V 10% 150D S.TA (10-00)	1	C84
13	13		1005335-00	39 MFD 20V 10% 150D S.TA (10-00)	4	C86,C87,C88,C89
14	14		1002433-00	22 MFD 35V 20% 150D S.TA (10-00)	4	C90,C91,C92,C101
15	15		1005820-00	22.0 MMF 100V 5%200PFM DM15S (10-00)	1	C95
16	16		1009939-01	.0022 MFD 100V 10% 863UWPLYST	1	C96
17	17		1000016-00	100.0 MMF 100V 5%200PFM DM15S (10-00)	1	C97
18	18		1001610-00	.01 MFD 50V 25U 309CER/8000PF MIN	1	C99
19	19		1010031-03	.22 MFD 50V 10% M.POLYCARB	1	C70
20	20		1105275-00	D 672 TR= 15NS FIV= 60V SP	28	D1-D18,D19,D21,D29-D36
21	21		1109502-00	1N 4742 VZ= 12.0 10% 1W Y	1	D20
22	22		1109991-00	1N 754A VZ= 6.8 5% .40W	1	D22
23	23		1110232-00	MCL1304 CL04MA FROM10-80V	3	D23,D28,D39
24	24		1103041-00	DEC 777 OS=12FCR FIV= 8VS	3	D24,D25,D26
25	25		1104860-00	1N 746A VZ= 3.3 5%	1	D27
26	26		1211164-06	SW,DIP 1P 1A 10POS	1	E36
27	27		1211164-04	SW,DIP 1P 1A 8POS	1	E46
28	28		1213488-00	CONN 10POS HOUSING	1	J2

REVISION HISTORY				VARIATIONS FOR THIS ASSY.			
CHK	ECO NO	REV		FIRST USED ON:		DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	
---	INIT	C	00	MADE BY:	E.WILSON	DATE:	12-DEC-77
MN	MRO01	D				TITLE	PARTS LIST
				CHECKED:	R.W.CAUNTER	DATE:	13-DEC-77
				DSN.ENG.:	G.SIROIS	DATE:	3-FEB-78
				PROD.:	R.REBELLO	DATE:	3-FEB-78
				RESP.ENG.:	A.FILZ	DATE:	3-FEB-78
						ASSY.NO.:	D-UA-A013-0-0
							EDIT# 14

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LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
29	29		1214352-00	SW,ROT 1P 4A 3POS	4	S1,S2,S3,S4
30	30		1300295-00	330 1/4W 5%	2	R1,R4
31	31		1301424-00	680 1/4W 5%	2	R2,R6
32	32		1300365-00	1 K 1/4W 5%	34	R3,R5,R7-R14,R16,R20,R23,R26, CONT R27,R28,R33,R107,R102-R106, CONT R29,R30,R50-R53,R62,R66,R82, CONT R85,R86
33	33		1302388-00	2 K 1/4W 5%	1	R15
34	34		1304870-00	6.81 K 1/4W 1% RN55D-F 100PPM	2	R17,R18
35	35		1300271-00	220 1/4W 5%	1	R19
36	36		1304854-00	5.11 K 1/4W 1% RN55D-F 100PPM	1	R21
37	37		1309416-00	31.6 K 1/4W 1% RN55D-F 100PPM	1	R22
38	38		1300479-00	10 K 1/4W 5%	6	R24,R25,R61,R81,R87,R96
39	39		1310881-00	1 K 1/4W 1% FUSIBLE	16	R34-R49
40	40		1310881-02	47 1/4W 1% FUSIBLE	2	R31,R32
41	41		1300250-00	150 1/4W 5%	1	R54
42	42		1300315-00	470 1/2W 5%	2	R55,R57
43	43		1301781-00	82 1/2W 5%	1	R56
44	44		1309422-00	5.1 1/4W 5%	2	R58,R59
45	45		1301425-00	300 1/4W 5%	1	R60
46	46		1300496-00	15 K 1/4W 5%	1	R64
47	47		1300229-00	100 1/4W 5%	2	R63,R65
48	48		1303178-00	620 1/4W 5%	1	R67
49	49		1300426-00	2.7 K 1/4W 5%	2	R68,R69
50	50		1300432-00	3 K 1/4W 5%	2	R70,R108
51	51		1302685-00	909 1/4W 1% RN55D-F 100PPM	3	R71,R88,R93
52	52		1305114-00	3.48 K 1/4W 1% RN55D-F 100PPM	1	R72
53	53		1302955-00	750 1/4W 1% RN55D-F 100PPM	1	R73
54	54		1305516-00	128 K 1/4W 1% RN55E-B 25PPM	1	R74
55	55		1302379-00	75 1/4W 5%	2	R75,R76
56	56		1302859-00	5.76 K 1/4W 1% RN55D-F 100PPM	1	R77
57	57		1302899-00	30.1 1/4W 1% RN55D-F 100PPM	1	R78
58	58		1303313-00	12.1 K 1/4W 1% RN55D-F 100PPM	1	R79
59	59		1303038-00	133 1/4W 1% RN55D-F 100PPM	1	R80
60	60		1309143-13	50 K 3/4W20% POT 100PPM	1	R83
61	61		1309143-05	200 3/4W10% POT 100PPM	1	R84
62	62		1302396-00	150 K 1/4W 5%	1	R90
63	63		1300488-00	12 K 1/4W 5%	2	R94,R95
64	64		1314457-00	5 K 5% 10 TURN POT,PC MNT	4	R97,R98,R99,R100
65	65		1300005-01	R NETWORK 13-1K RESISTORS 5% DIP	2	E41,E48
66	66		1315012-00	300 K 1/4W 5%	1	R89
67	67		1303312-00	10.0 K 1/4W 1% RN55D-F 100PPM	1	R92
68	68		1309418-00	24.3 K 1/4W 1% RN55D-F 100PPM	1	R91
69	69		1510414-00	D 45C6 PNP 30WT SI 45 20 Y	1	Q1
70	70		1510171-00	D 44C3 NPN 30WT SI 30 20 Y	3	Q2,Q4,Q5
71	71		1503409-00	DEC6534D PNP 310MW SI 40 90 P	1	Q3
72	72		1509587-00	SE 4020 NPN 200MW SI 60120 M	5	Q6,Q9,Q11,Q13,Q15
73	73		1509681-00	2N 5245 FET 360MW SIN CHNNL	1	Q7

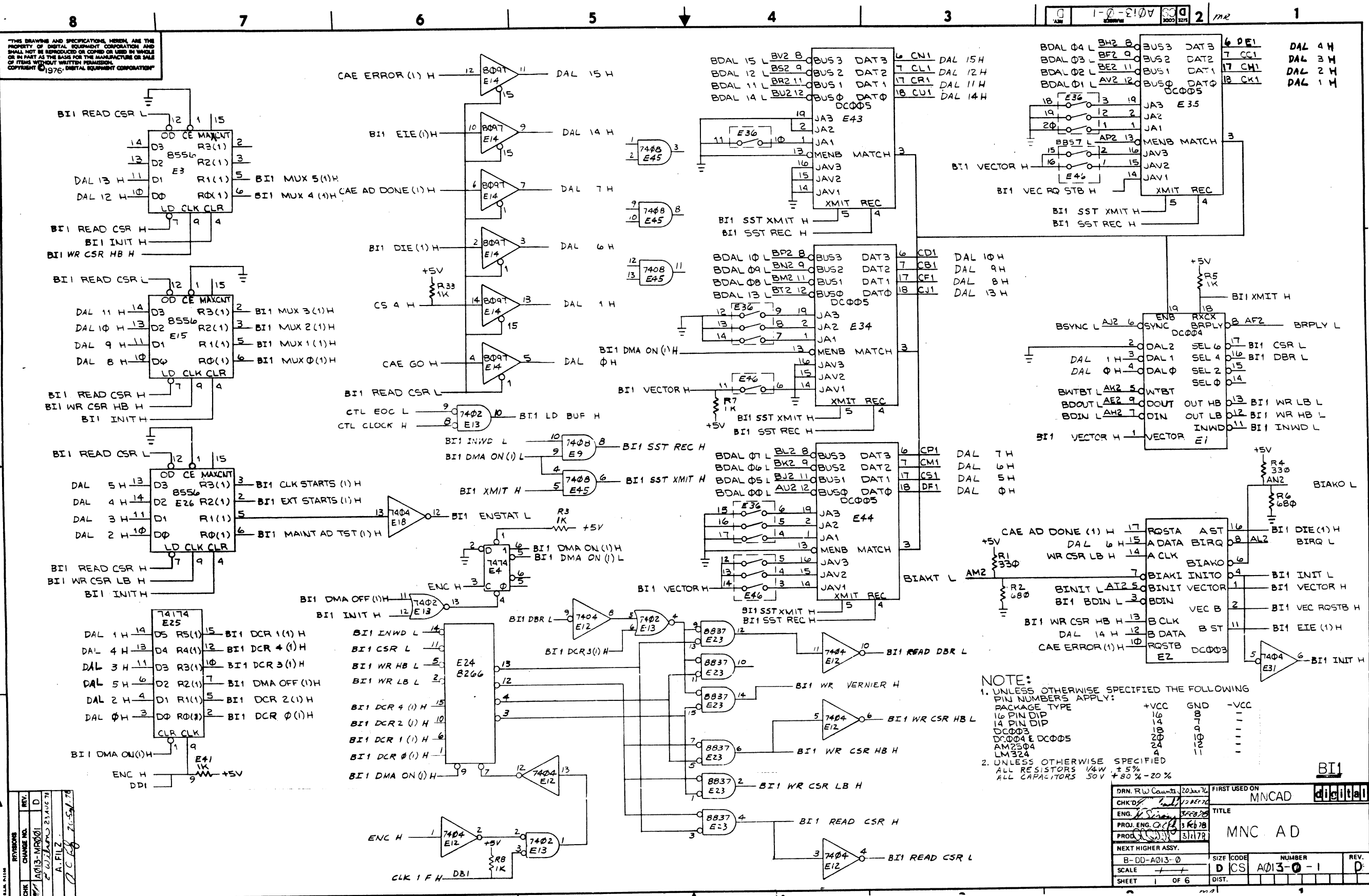
TITLE	PARTS LIST	SIZE	CODE	DOCUMENT NUMBER	REV
DIGITAL EQUIPMENT CORPORATION	A/D FOR MINC				
MAYNARD, MASSACHUSETTS		K	PL	A013-0-DRP	10

LINE	ITEM	DOCUMENT NO.	PART NO.	DESCRIPTION	QTY	REFERENCE DESIGNATORS
74	74		1509142-00	DEC4250 FNP 200MW SI 40250 P	4	Q8,Q12,Q16,Q17
75	75		1509525-00	2N 3906 FNP 310MW SI 40100 Y	2	Q10,Q14
76	76		I303377-00	.22UH 10% 2.7A #WEE.22	2	L1,L2
77	77		1602254-00	22. UH 10% 430MA #RFS22	1	L3
78	78		1610662-00	100.0 UH 10% 165MA #DDI 00	1	L4
79	79		9009122-00	FUSE, SUB-MINI, .062A, 125V, AXIAL LEAD	2	F1,F2
80	80		1912729-00	DC 004 PROTOCOL,REG. SELECTOR	1	E1
81	81		1912730-00	DC 003 INTERRUPT,2 CIRCUIT	1	E2
82	82		1912951-00	DM 8556 COUNTER,BINARY,4BIT	3	E3,E15,E26
83	83		1905547-00	DEC 7474 FF-D DUAL,EDGE TRIGGER,15MHZ	3	E4,E20,E30
84	84		1910652-00	74174 FF-D HEX	2	E5,E25
85	85		1911527-00	8097 BUFFER GATE-HEX 2INPUT TRI-STA	3	E6,E7,E14
86	86		1910155-00	DEC 7408 AND GATE,POS.QUAD 2IN 14	3	E9,E32,E45
87	87		1909686-00	7404 INVERTER GATE-HEX 1IN	5	E10,E12,E18,E29,E31
88	88		1912858-00	LS221 ONE SHOT-DUAL,SCHMITT TRIGGER	1	E11
89	89		1909004-00	DEC 7402 NOR GATE-QUAD 2IN	2	E13,E21
90	90		1911330-00	74173 FF-D QUAD,TRISTATE	6	E16,E17,E27,E28,E37,E38
91	91		1905590-00	DEC 7401 NAND GATE-QUAD 2IN,OPN COLLECT	1	E19
92	92		1910436-00	DEC 74123 ONE SHOT-DUAL,RETRIGGERABLE	2	E22,E33
93	93		1911116-00	DEC 8837 RECEIVER,BUS,HEX,UNIBUS	1	E23
94	94		1909934-00	8266 MUX 1 OF 2 (QUAD)	1	E24
95	95		1913040-00	DC 005 TRANSCEIVER 4BIT	4	E34,E35,E43,E44
96	96		1905580-00	DEC 7450 A-O-I XPENABLE GATE-DUAL 2X2	1	E39
97	97		1909705-00	DEC 8881-1NAND GATE-QUAD 2IN,OPN COLL.	1	E40
98	98		1905575-00	7400 NAND GATE-QUAD 2IN	1	E42
99	99		1910741-00	7406 INVERTER GATE-HEX 1IN,BUFFER,0	3	E47,E53,E66
100	100		1909490-00	DEC 8281 COUNTER,ASYNCH UP,BINARY	2	E49,E55
101	101		1911628-00	AM 2504 SUCCESSIVE APPROX REG 24 P	1	E50
102	102		1911598-00	501C MUX,8CHNL,ANALOG	2	E51,E56
103	103		1910010-01	DEC 2501-1 2501 WITH VR=40V 14	2	E52,E57
104	104		1905576-00	7410 NAND GATE-TRIPLE 3IN	1	E54
105	105		1913218-00	325 VOLT.REG.FIX +/-15V 50MA 14	1	E58
106	106		2111285-02	HI 200-5 DUAL ANALOG SW,CMOS	1	E59
107	107		1911144-00	2505 OP AMP .1% SETTLE	1	E60
108	108		1910235-01	3100 OP AMP UNITY GAIN VOLT. FOLLOW	1	E61
109	109		1912401-00	AD562 DAC,12BIT,MULT	1	E62
110	110		1911629-00	140818 DAC, 8BIT	1	E63
111	111		1913219-00	AD 2700/L ANALOG SWITCH 10V PRECISION RE	1	E64
112	112		1912107-00	324 OP AMP,QUAD	1	E67
113	113		9006735-00	EYELET, FUNNEL FLANGE, .059 OD X .187 LG	16	TP1-TP16
114	114		9009185-00	JUMPER, WIRE, INSULATED, BLACK BAND	3	W1,W2,W3
115	115		1114494-00	LED 1.0MCD@20MA	2	D37,D38
116	116		23040B1-00	B1-01 PROM,	1	E8
117	117	C-MD-7420191-0-0	7420191-00	HANDLE	1	
118	118	C-MD-7420192-0-0	7420192-00	HANDLE RETAINER	2	
119	119		9006732-00	EYELET, ROLLED FLANGE, .121 OD X .219 LG	4	
120	120		9009783-00	SCREW, SLOTTED ROUND HD. 2-56 X 1/4 TYPE F	1	
121	121		1215265-00	HOLDER,LED	1	

TITLE	PARTS LIST	SIZE	CODE	DOCUMENT NUMBER	REV
DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	A/D FOR MINC	K	FL	A013-0-DBP	D



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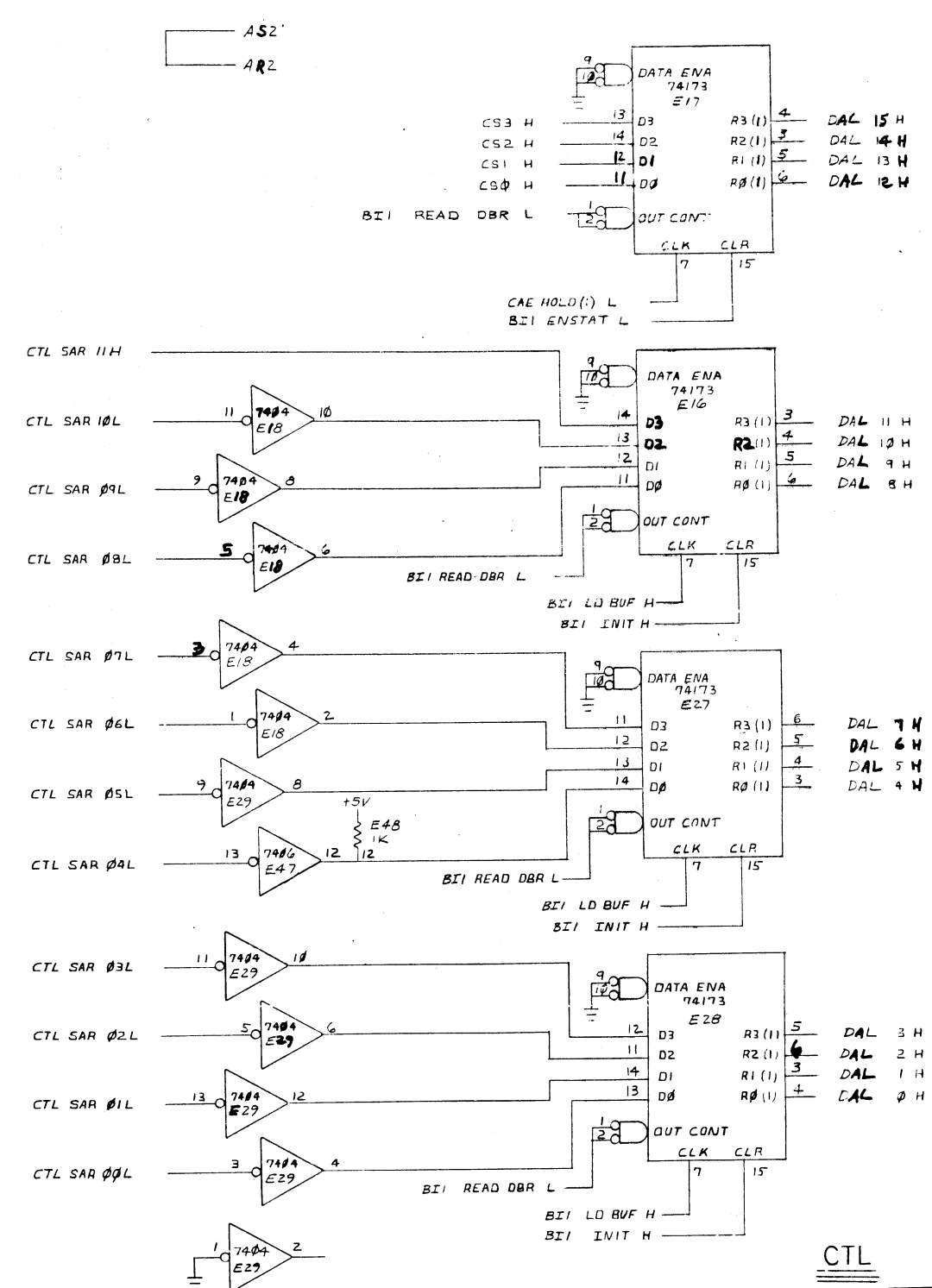
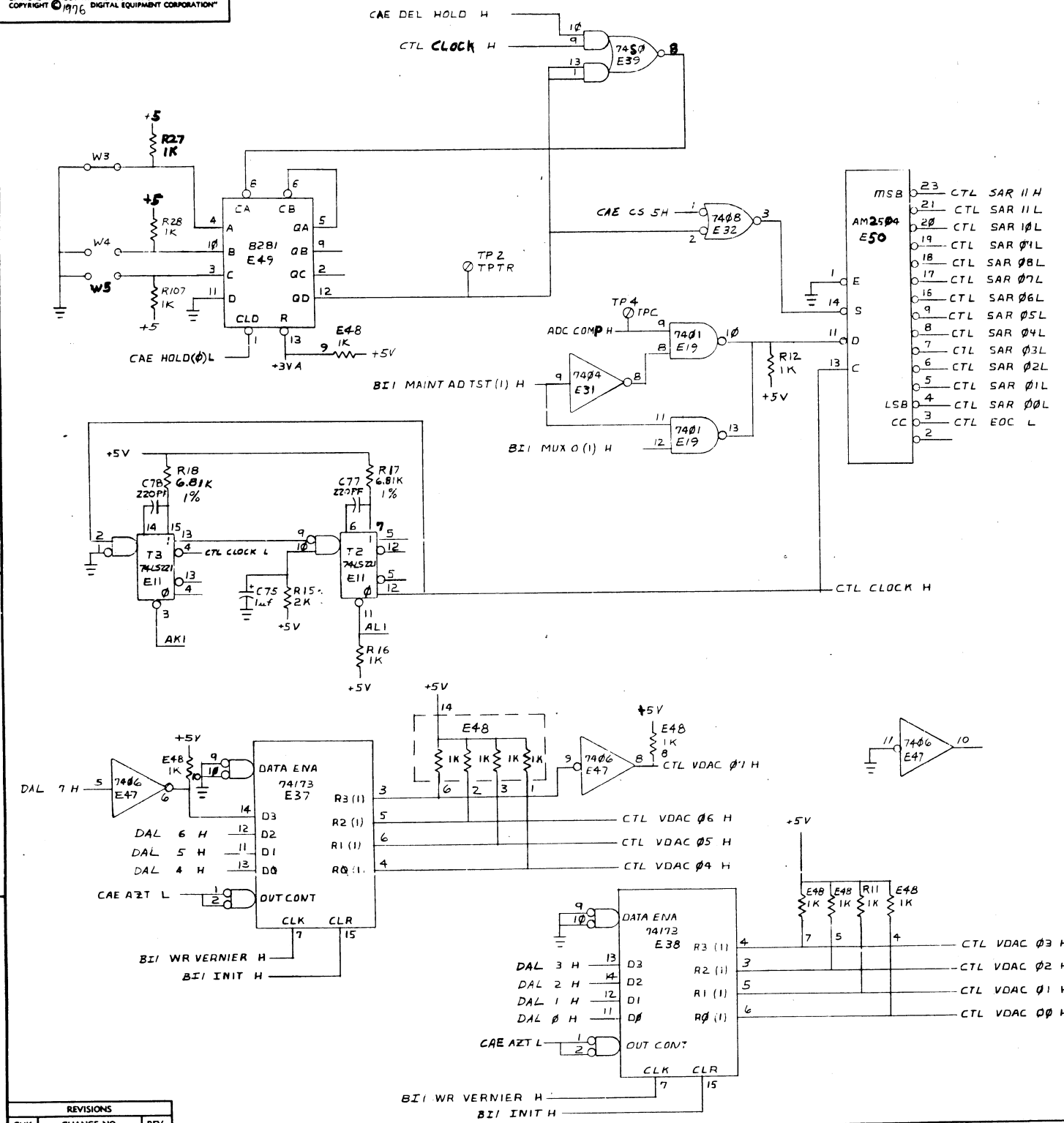


**NOTE:**  
 1. UNLESS OTHERWISE SPECIFIED THE FOLLOWING PIN NUMBERS APPLY:  
 PACKAGE TYPE      +VCC      GND      -VCC  
 16 PIN DIP      16      18      -  
 14 PIN DIP      14      9      -  
 DC003      18      10      -  
 DC004 & DC005      20      12      -  
 AM2504      24      12      -  
 LM324      4      11      -  
 2. UNLESS OTHERWISE SPECIFIED  
 ALL RESISTORS 1/4W ± 5%  
 ALL CAPACITORS 50V ± 20%

REV.	D
DATE	23 AUG 76
BY	A. FILZ
CHK	C. E. G. / J. S. G.

DRN. RW Counts	20 Jun 76	FIRST USED ON	MNCAD
CHK'D	12 Oct 76	TITLE	MNC AD
ENG.	13 Oct 76	NUMBER	A013-0-1
PROJ. ENG.	3 Feb 78	REV.	D
PROD.	31 Jul 78	SCALE	D CS
NEXT HIGHER ASSY.	B-DD-A013-0	SIZE	CS
SCALE	+	DIST.	
SHEET	1 OF 6		

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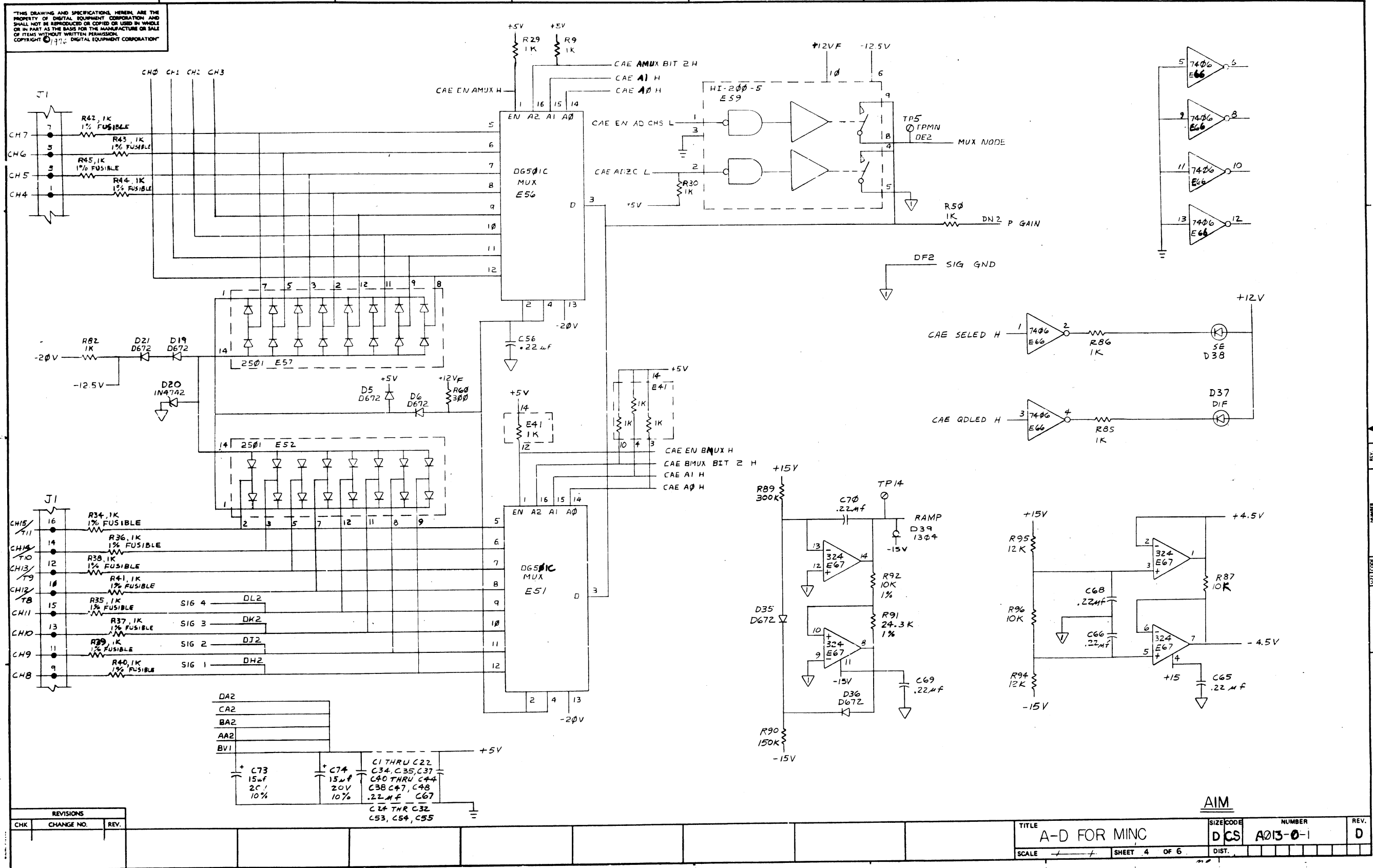


REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	A-D FOR MINC	SIZE CODE	D CS	NUMBER	A013-0-1	REV.	D
SCALE	1:1	SHEET	2	OF	6	DIST.	



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REVISIONS		
CHK	CHANGE NO.	REV.

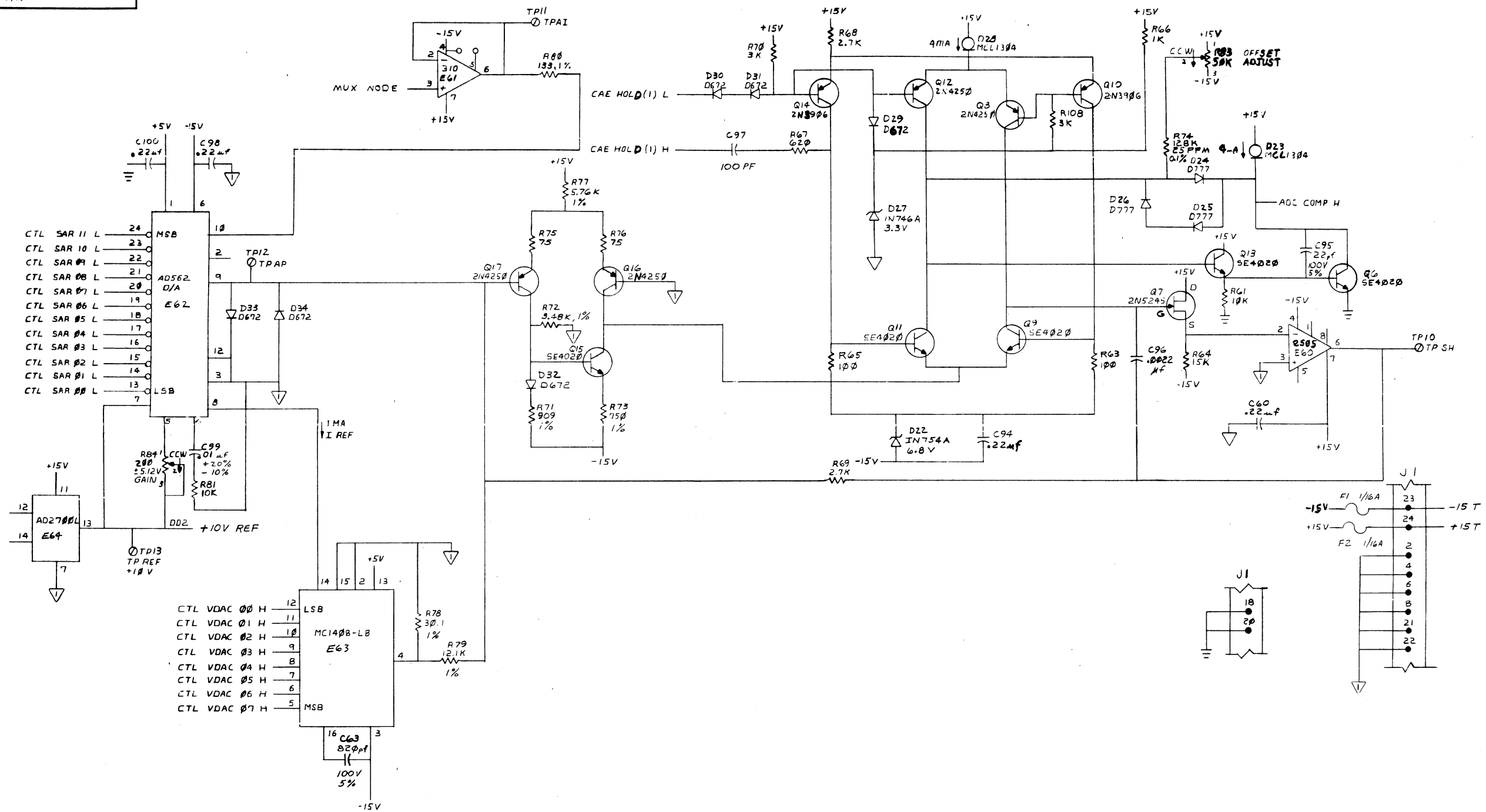
- DA2
  - CA2
  - BA2
  - AA2
  - BV1
- +5V
- C73 15µF 20V 10%
  - C74 15µF 20V 10%
  - C1 THRU C22
  - C34, C35, C37
  - C40 THRU C44
  - C38, C47, C48
  - .22µF C67
  - C24 THRU C32
  - C53, C54, C55

AIM

TITLE	A-D FOR MINC	SIZE CODE	DCS	NUMBER	A013-0-1	REV.	D
SCALE	1:1	SHEET	4	OF	6	DIST.	



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REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE	CODE	NUMBER	REV.
A-D FOR MINC		D	CS	A013-0-1	D
SCALE	SHEET 5 OF 6	DIST.			

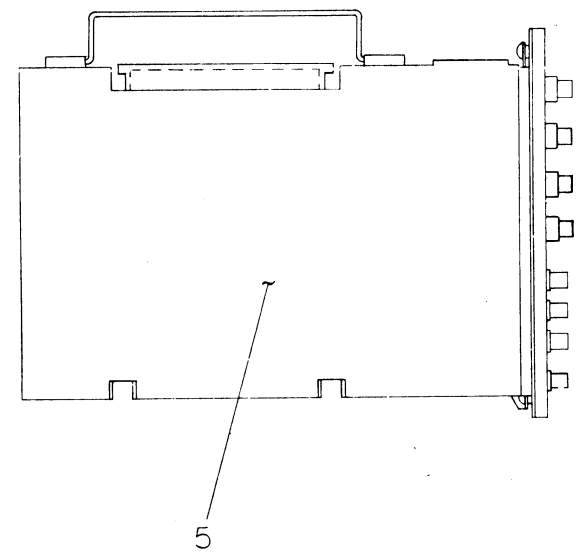
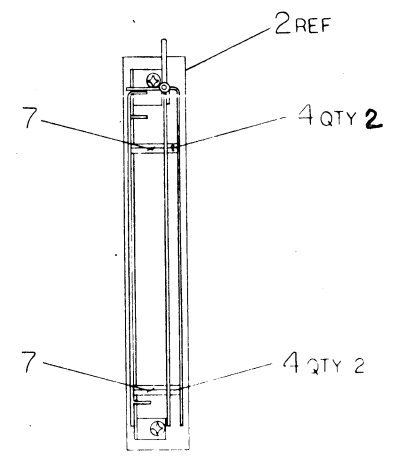
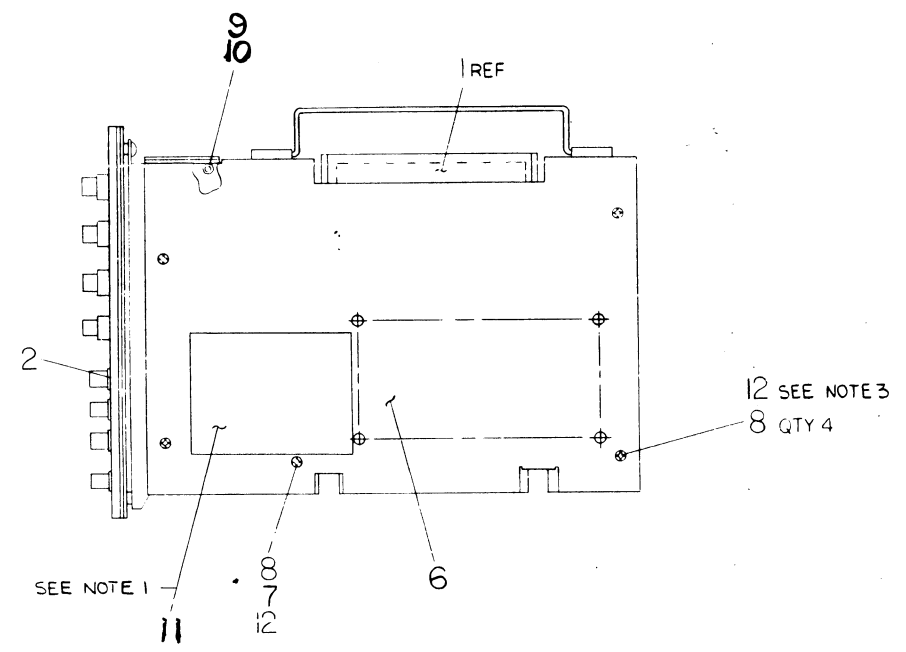
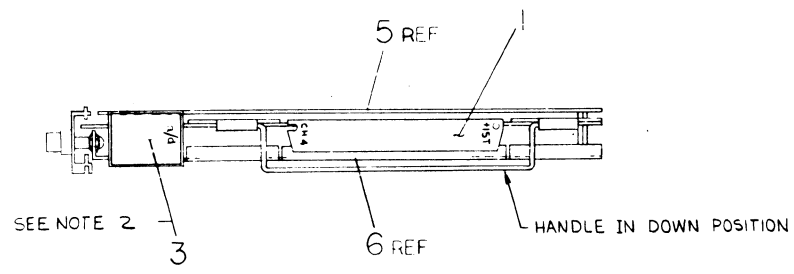
ADC





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NOTES:  
 1. ITEM #11 IS PUT ON BY ALIGNING THE RIGHT HAND EDGE OF DECAL UP AGAINST HOLES AND BOTTOM EDGE JUST ABOVE MOUNTING HOLE.  
 2. ITEM #3 IS PUT ON BY ALIGNING THE TOP EDGE AND RIGHT HAND EDGE EVEN WITH THE TOP EDGE AND RIGHT HAND EDGE OF ITEM #5.  
 3. USING ITEM #12 ADD ONE DROP TO EACH LOCATION.



DESCRIPTION	DWG/PART NO.	ITEM NO.
1 PACKAGING INSTRUCTIONS	A-PS-3700358-0-0	14
REF CHKOUT & ACCEPT. PROCEDURE	A-SP-MNCAD-0-3	13
A/R LOCKTITE	9009321	12
1 DECAL, INFORMATION(MNCAD)	A-DC-3615264-2-0	11
1 NUT, KEPS #6-32	9008185	10
1 WASHER, FLAT	9006653	9
5 SCR, FLAT HD #6-32x.25	9006020-02	8
3 SPACER, THREADED #6-32x.88	9006861	7
1 PLATE, COMP SIDE	D-MD-7419869-0-0	6
1 PLATE, ETCH SIDE	D-1A-7419868-0-0	5
4 SPACER, THREADED #6-32x.25	9006841	4
1 DECAL, I/O SCHEMATIC	A-DC-3615260-2-0	3
1 MNCAD SUB ASSY	D-AD-7015072-0-0	2
1 CONN ASSY, I/O	D-1A-7014153-0-0	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
ANGLES ±0° 30'	CLASS OF ACCURACY (CHECK ONE)
SURFACE QUALITY IN	NOMINAL DIMENSION RANGE INCHES
IN	OVER 0 TO 0.2
MEDIUM	OVER 0.2 TO 4.0
±0.04	OVER 4.0 TO 12.0
±0.08	OVER 12.0 TO 40.0
±0.012	OVER 40.0 TO 80.0
±0.016	±0.024
±0.025	±0.04
±0.031	±0.1

THIRD ANGLE PROJECTION  
 REMOVE BURRS AND BREAK SHARP CORNERS  
 DO NOT SCALE DWG  
 MATERIAL SEE PARTS LIST  
 FINISH NONE

DR. *A. Arling* 2/1/78  
 CHK'D *A. Arling* 2/1/78  
 ENG. *A. Arling* 3/1/78  
 PROJ. ENG. *A. Arling* 3/1/78  
 PROD. *A. Arling* 3/1/78

FIRST USED ON  
 MNCAD digital

TITLE  
 MNCAD UNIT ASSY

SIZE CODE NUMBER REV  
 D UA MNCAD-0-0 A

SHEET 1 OF 1 DIST.

REVISIONS	CHANGE NO.	REV.
1	MNCAD-MR002	A
B.C. Pillitteri / NOV 78		
A. FILZ / NOV 78		



**ENGINEERING SPECIFICATION** CONTINUATION SHEET

TITLE MNCAD INSTALLATION/ACCEPTANCE PROCEDURE

2.2 LOCATION

The MNCAD acts as the partition separating the analog options from the digital options and the MNCAA option. When selecting the MNCAD slot, sufficient room should be left on either side of the MNCAD for the desired number of each group of options. Analog options are inserted to the left of the MNCAD; digital options and MNCAA options are inserted to the right of the MNCAD. No empty slot should be allowed to the right of the MNCAD. With power off, insert the MNCAD option into the selected slot.

2.3 TEST MODULE

If the MNCAD test module is available it should be plugged onto the I/O connector fingers on the MNCAD at this point, before power to the system is applied. If no test module is present plug-on the I/O connector with pins 17 and 18 wired together.

2.4 POWER UP

All other options to be tested and any of their test modules should be mounted in the system, then power may be applied. Allow a 5 minute warm-up period before continuing.

2.5 DIAGNOSTIC

The MNCAD diagnostic program should now be loaded into the processor and started at location 200. The diagnostic heading will be typed followed by:

"SWR = 000000 NEW = "

Type "RETURN". The program will ask if a test module is connected; type "N" for no if one is not present or "Y" for yes if one is present, followed by a "RETURN".

3.0 ACCEPTANCE

3.1 The diagnostic will list the MNCAD tests. If the CSR address switch pack was set for an address other than 171000 or if the DONE vector switch pack was set for an address other than 400, type "B" followed by "RETURN" at the end of the test list. The diagnostic will now type:

"MNCAD (A/D) BASE ADDRESS <171000> ?

Enter the CSR address followed by "RETURN". The diagnostic will respond:

"MNCAD (A/D) VECTOR ADDRESS <400> ?

Enter the DONE vector address followed by "RETURN".

3.2 Type "L" to start the logic test, and then "RETURN". The program will type the number of MNCAD's it detected in the system.

SIZE	CODE	NUMBER	REV
A	SP	MNCAD-0-4	

**ENGINEERING SPECIFICATION** CONTINUATION SHEET

TITLE MNCAD INSTALLATION/ACCEPTANCE PROCEDURE

If the test module is not present the diagnostic will indicate "ENDPASS" and "GOOD UNITS" and will continue to loop on the logic test indicating "ENDPASS" and "GOOD UNITS" on subsequent runs.

When the test module is present the diagnostic will type:

"PRESS EXTERNAL START ON MNCAD AT ADDRESS"

"DEPRESS 'RETURN' WHEN READY"

Press the push button switch on the test module on the MNCAD at the indicated address, then type "RETURN". If there is no error the diagnostic will indicate "ENDPASS" and "GOOD UNITS" and will continue to loop on the logic test indicating "ENDPASS" and "GOOD UNITS" on subsequent runs.

To exit this test press the "C" key while holding the CNTL key down. The diagnostic will respond with:

"TYPE THE 'TEST CHARACTER' THEN DEPRESS 'RETURN KEY'"

3.3 Type "C" to start the calibration routine. The diagnostic will then respond:

"TYPE CHANNEL & DEPRESS 'RETURN'"

Enter "0" and type "RETURN". The program will now instruct:

"TYPE 'O' FOR OFFSET, 'G' FOR GAIN & DEPRESS 'RETURN'"

Type the letter "O" and then "RETURN".

The diagnostic will now direct:

"INPUT A GROUND ON THE CHANNEL"

"DEPRESS 'RETURN' WHEN READY"

Switch channel "0" on front panel of the MNCAD to TEST, then type "RETURN". The diagnostic will type:

"ADJUST R83 FOR 0.00 LSB ERROR"

"DEPRESS 'RETURN' WHEN ADJUSTED"

Offset print outs will occur about every 12 seconds. Adjust R83 (50K pot) until the offset is within 0.04 LSB of 0.00 LSB. Note: the first print out after an adjustment will not be true since the value was varying while data was being taken. Therefore, wait for the second print out after each adjustment before making any subsequent adjustment.

To exit this routine type "RETURN" or press the "C" key while holding the "CNTL" key down until the diagnostic responds:

"TYPE THE 'TEST CHARACTER' THEN DEPRESS 'RETURN KEY'"

SIZE	CODE	NUMBER	REV
A	SP	MNCAD-0-4	

**ENGINEERING SPECIFICATION** CONTINUATION SHEET

TITLE MNCAD INSTALLATION/ACCEPTANCE PROCEDURE

3.4 Type "C" again to start the calibration routine. The diagnostic will respond:

"TYPE CHANNEL & DEPRESS 'RETURN'"

Type "7" and then "RETURN". If a test module is present, connect the +precision voltage source output to J5 & the -output to J4; otherwise connect the +output to pin 7 (channel 7) on the I/O connector & the -output to pin 8 (analog ground). The terminal shall have printed:

"TYPE 'O' FOR OFFSET, 'G' FOR GAIN & DEPRESS 'RETURN'"

Type "G" and then "RETURN". The terminal will respond:

"INPUT +5.115 VOLTS ON THE CHANNEL"

"TYPE CR WHEN READY"

Adjust the precision voltage source for +5.115 volts and type "RETURN". The program will respond:

"ADJUST R84 FOR 0.00 LSB ERROR"

"DEPRESS 'RETURN' WHEN ADJUSTED"

Print outs will occur about every 12 seconds. Adjust R84 (200 ohm pot) until the error is within 0.04 LSB of 0.00 LSB. Note: the first print out after an adjustment will not be true since the value was varying while data was being taken. Therefore, wait for the second print out after each adjustment before making any subsequent adjustment.

To exit this routine type "RETURN" or press the "C" key while holding the "CNTL" key down until the diagnostic responds:

"TYPE THE 'TEST CHARACTER' THEN DEPRESS 'RETURN KEY'"

3.5 If no graphics video display terminal (VT55, VT105, etc.) is used type "W" and then "RETURN"; if such a terminal is used:

Type "G" and set the switch register to 2000, then type "RETURN". Now type the "TEST CHARACTER" "V" followed by "RETURN".

3.5.1 Without Test Module

The terminal will print the number of A/D's detected and then instruct:

"SET MNCAD (A/D) FRONT PANEL SWITCHES TO 'TEST'"  
"DEPRESS 'RETURN' WHEN READY"

Set all four front panel switches to the TEST position, then type "RETURN". The channel modes (single ended or differential) will be listed. This will be followed by the offset and then the noise test (rms and peak) on channels 0 through 3. After this, the settling test on channels 1 and 2 will be executed. Then the offset, noise, and settling tests will be repeated. The differential linearity test will be entered and will require approximately 14 minutes to complete. The last test will

SIZE	CODE	NUMBER	REV
A	SP	MNCAD-0-4	

**ENGINEERING SPECIFICATION** CONTINUATION SHEET

TITLE MNCAD INSTALLATION/ACCEPTANCE PROCEDURE

be relative accuracy. To continue after a halt, press "P".

3.5.2 With Test Module

The terminal will print the number of A/D's detected and then instruct:

"SET TEST MODULE(S) TO SINGLE ENDED"  
"SET MNCAD (A/D) FRONT PANEL SWITCHES TO 'TEST'"  
"DEPRESS 'RETURN' WHEN READY"

Set the switch on the test module for single ended operation and all four front panel switches to the TEST position, then type "RETURN". The channel modes (single ended for channels 00 through 17) will be listed. The diagnostic will ask if channels 00 through 17 are to be tested by:

"TESTING CHANNELS 0-7?"

Type "Y" and then "RETURN".

"TESTING CHANNELS 10-17?"

Again type "Y" followed by "RETURN". The program will report the channels under test and then instruct:

"SET TEST MODULE(S) ON CHANNELS UNDER TEST TO DIFFERENTIAL"  
"DEPRESS 'RETURN' WHEN READY"

Set the switch on the test module for single ended operation and then type "RETURN". If no errors occur the following will be printed:

"SET TEST MODULE(S) TO SINGLE ENDED"  
"DEPRESS 'RETURN' WHEN READY"

Return the test module switch to single ended operation and type "RETURN". The offset will be printed followed by the noise test on channels 0 through 2, 4 through 6, and 10 through 17. After this, the settling test on channels 1 and 2 will be executed. Then the offset, noise and settling tests will be repeated. The differential linearity test will be entered and will require approximately 14 minutes to complete. The last test will be relative accuracy. To continue after a halt, press "P".

SIZE	CODE	NUMBER	REV
A	SP	MNCAD-0-4	