AD8-EA
analog-to-digital
converter
engineering drawings

digital equipment corporation · maynard. massachusetts

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission.

MASTER DRAWING LIST

DWG. NO.	REV. LET.	NO. OF SHEETS	TITLE
C-UL-AD8-EA-Ø	B	1	10 BIT A/D CONVERTER
A-PL-AD8-EA-Ø	B	1	10 BIT A/D CONVERTER (PL)
E-CS-A841-Ø-1	#	2	A/D CONVERTER
E-CS-A231-Ø-1	#	2	AD8-E CONTROL (AD8-EA)
A-SP-AD8-EA-1	REF	14	AD8EA ENGINEERING SPECIFICATION
A-SP-AD8-EA-2	REF	14	ACCEPTANCE PROCEDURE
A-AL-AD8-EA-3	B	2	ACCESSORY LIST (AD8-EA)
D-IA-7008533-0-0 *	REF	1	AD/AM ANALOG CABLE

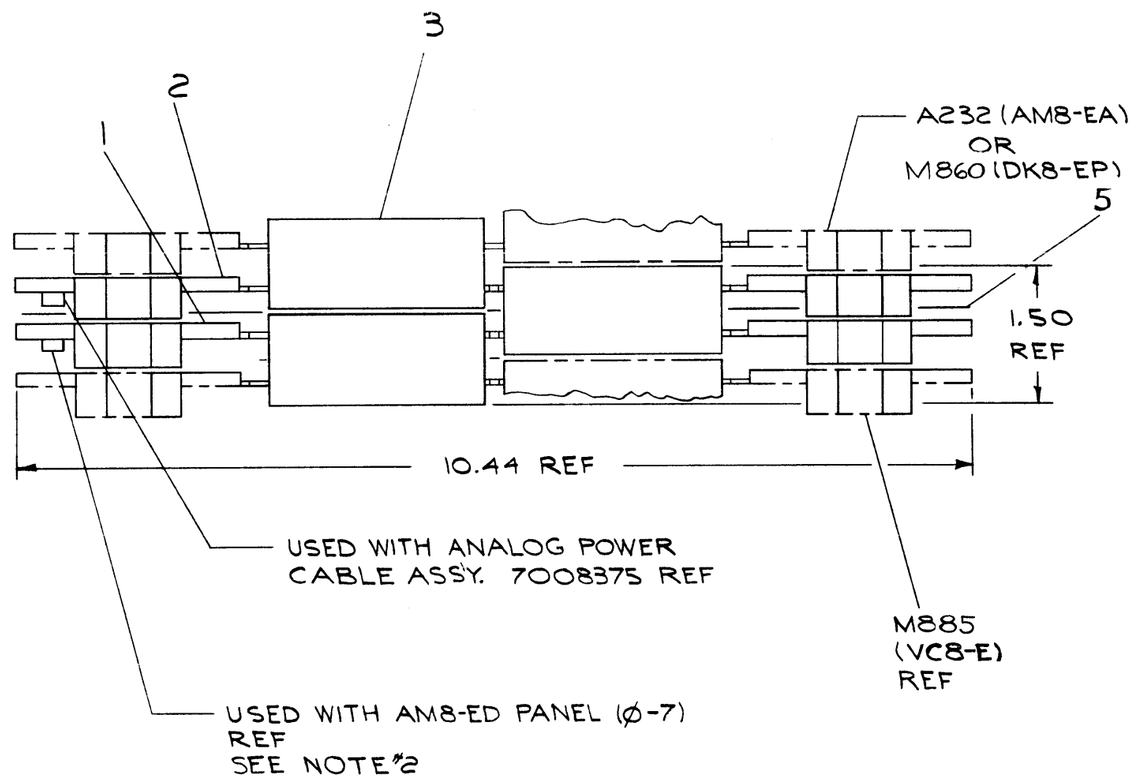
*INCLUDED IN A-ML-LAB8-E

REVISIONS			
REV.	DATE	CHG. NO.	APP'D.
A	11/71	AD8E-1	A.W.
B	1/72	LAB8E-13	G.B.
C	4/72	LAB8E-14	[illegible]
D	12/72	LAB8E-17	[illegible]

DRN. D. CRABBE	DATE 4-5-71	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	
CHK'D. [illegible]	DATE [illegible]		
ENG. [illegible]	DATE [illegible]	TITLE 10 BIT CONVERTER	
PROJ. ENG.	DATE		
PROD.	DATE		
FIRST USED ON L[illegible]-E		SIZE A	CODE ML	NUMBER AD8-EA	REV. D
SCALE			
SHEET OF		DIST.	

This drawing and specifications, herein, are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission. 1973

NOTES:
1. ITEM NO.1 AND ITEM NO.2 MUST ALWAYS BE FACING FRONT OF MACHINE AS SHOWN.
2. NO CONNECTION WHEN AM8-EA IS USED.
3. SHIELD, ITEM 5, IS DROPPED BETWEEN A841 AND A231.



REVISIONS		
CHK	CHANGE NO.	REV.
	A	A
	LAB8E-00017	B
	BUDIANSKY 11/9/73	

FIRST USED ON OPTION MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
LAB8-E		PARTS LIST		

UNLESS OTHERWISE SPECIFIED

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

MATERIAL —

FINISH —

DRN.	E. Ferguson	DATE 4-27-71
CHK'D.		DATE 4-28-71
ENG.		DATE 4-28-71
PROJ. ENG.		DATE 4-28-71
PROD.		DATE

NEXT HIGHER ASSY. A-PL-LAB8-E-Ø

SCALE 1/1

SHEET 1 OF 1

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE
1Ø BIT A/D CONVERTER

SIZE	CODE	NUMBER	REV.
C	UA	AD8-EA-Ø	B

DIST.

SIZE	CODE	NUMBER	REV.
C	UA	AD8-EA-Ø	B

DEC FORM NO. DRC 100

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

MADE BY D.K. CRAPPE	CHECKED	SECTION
DATE 4-5-71	DATE 4-28-71	1
ENG	PROD	ISSUED SECT.
DATE 4-28-71	DATE	1

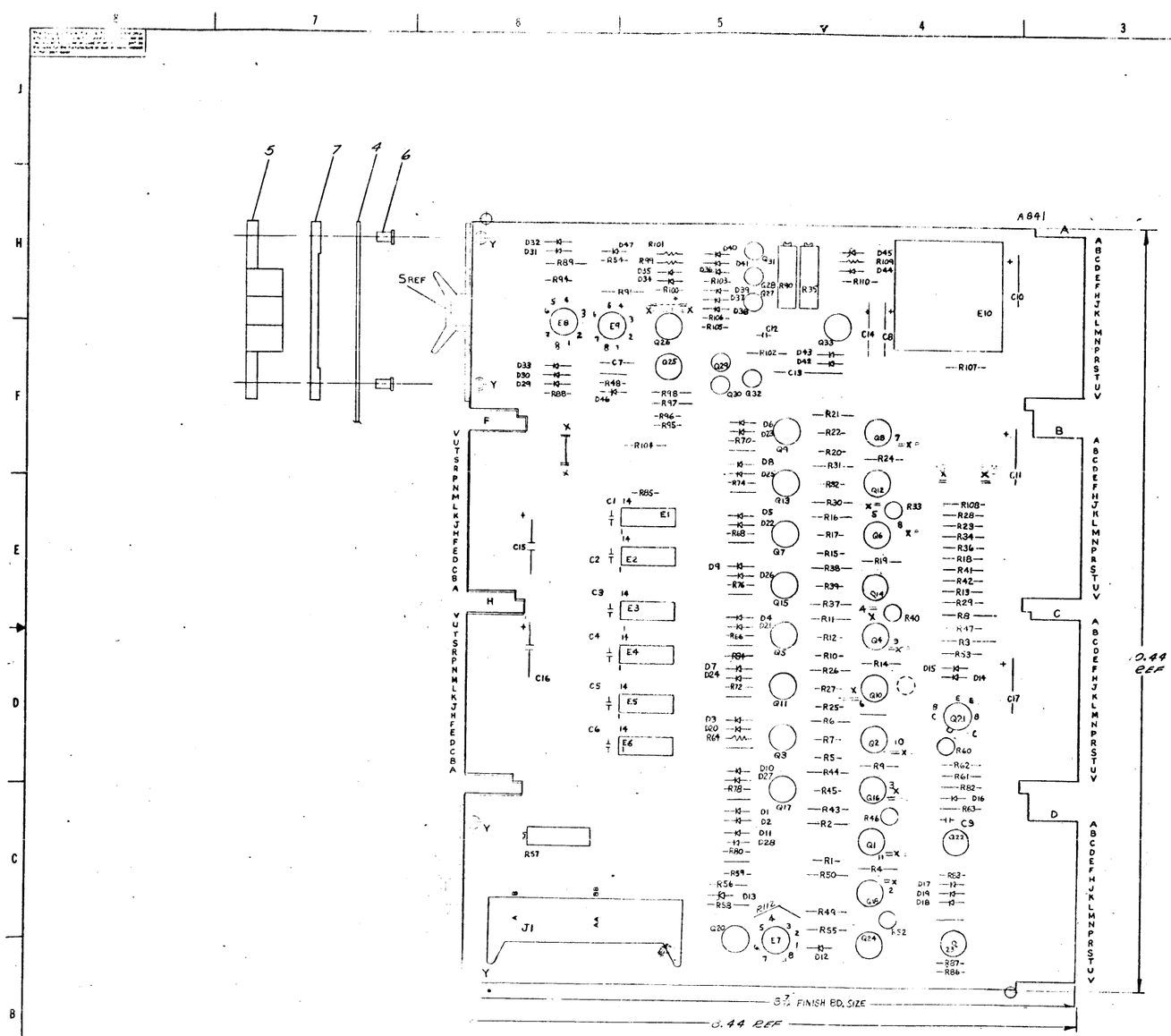
ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION
1	A841	A/D CONVERTER	1
2	A231	AD8-E CONTROL (AD8-EA)	1
3	P-UA-H851-Ø-Ø	EDGE CONNECTOR H851	2
4	7008533	ANALOG INPUT CABLE ASSY	*
5	1700021-1	ELECTROMAGNETIC SHIELD	1
*	SUPPLIED ONLY WHEN NO AM8EC OR AM8ED PANEL IN SYSTEM - 1 AD8EA RECEIVES 1 CABLE - 1 AD8EA & 1 AM8EA RECEIVES 1 CABLE -1 AD8EA AND 2 AM8EA RECEIVES 2 CABLES.		

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
10 BIT A/D CONVERTER	C-UA-AD8-EA-Ø	A	PL	AD8-EA-Ø	P	LARGE-COOL
	SHEET 1 OF 1	DIST.				

DEC FORM NO.16-1031
DRA 110

NOTES:

1. UNLESS OTHERWISE NOTED:
   CAPACITORS ARE .01UF 35V 20%
   RESISTORS ARE 1.3K 1/4W 5%
   DIODES ARE D664
   ICS ARE DEC 7402
2. *INSTALL JUMPER WHEN NO AMB-E (A232) OPTIONS ARE NEED.
3. MODULES C5 AND E REQUIRE A 12-10090 I/O CONNECTOR WITH JUMPER FROM NN TO MM WHEN W1 IS NOT INSTALLED.



QTY.	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
2	D12, D44	DIODE 1N752A 5.6V	1102608	77
1	C8	CAP 33UF, 6W, 20%, S.TANT	1000086	76
1	R62	RES 4.64K 1/8W, 2% MF	1304856	75
6	R44, R56	RES. 4.7K 1/4W, 5%	1302447	74
1	R63	RES. 61.5K 1/8W, 1% MF	1303153	73
1	R82	RES. 1.6K 1/8W, 1% MF	1303313	72
1	R112	RES. 1K 1/4W, 5%	1302365	71
1	J1	CONN 40PIN 2ROW HEADER	1209341	70
AR		WIRE BESSING #22AWG	9 07560-01	69
1	R31	RES 34.3K 1/8W 1%	1309418	68
16		SPLICE WIRE	1006735	67
1	C12	CAP 470 5% 100V DM	1000101	66
1	C7	CAP. 33PF 100V 5% DM	1000069	65
1	C13	CAP. 0.01UF 100V 20% DISC	1009939	64
7	C1-C6, C9	CAP. 0.01UF 100V 20% DISC	1001670	63
6	C10, C11, C14-C17	CAP 6.8UF 35V 20% S.TANT	1000067	62
		~~RESISTOR 1K 1/4W 1%~~	~~1309~~	~~61~~
6	R21, R26, R211, R216, R221, R226	RESISTOR 31.6K 1/8W 1%	1309416	60
3	R218, R229, R291	RESISTOR 11.5K 1/8W 1%	1309413	59
6	R230, R272, R273, R283, R261, R263	RESISTOR 3.83K 1/8W 1%	1309413	58
2	R246, R252	RES 50 1/4W 20% 22TR POT	1309150-11	57
1	R293	RES 200 5W 10% LEAD POT	1309150-09	56
1	R240	RES 50 1/4W 20% 22TR POT	1309150-03	55
1	R260	RES. 5T 1/4W 20% LEAD POT	1309150-01	54
1	R251	RES. 2A 3/4W 10% TRIMPOT	1309143-08	53
1	R255	RES 1000 3/4W 10% TRIMPOT	1309143-07	52
1	R290	RES 200 3/4W 20% TRIMPOT	1309143-05	51
1	R3	RESISTOR 162K 1/8W 1% MF	1305279	50
1	R9	RESISTOR 51K 1/8W 1% MF	1305214	49
1	R13	RESISTOR 226K 1/8W 1% MF	1305277	48
1	R18	RESISTOR 182K 1/8W 1% MF	1305276	47
1	R24	RESISTOR 681 1/8W 1% MF	1305112	46
1	R59	RESISTOR 39K 1/8W 1% MF	1305214	45
5	R220, R297, R98, R102, R106	RESISTOR 2K 1/8W 1% MF	1305353	44
1	R224	RESISTOR 68.1K 1/8W 1% MF	1303232	43
2	R241, R256	RESISTOR 7.87K 1/8W 1% MF	1303205	42
2	R247, R250	RESISTOR 1.96K 1/8W 1% MF	1302833	41
1	R19	RESISTOR 46.4K 1/8W 1% MF	1303311	40
3	R4, R7, R14	RESISTOR 24.9K 1/8W 1% MF	1303126	39
2	R33, R56	RESISTOR 1K 1/8W 1% MF	1302114	38
1	R35	RESISTOR 4.7K 1/4W 5%	1300447	37
1	R107	RESISTOR 267 1/8W 1% MF	1302122	36
1	R42	RESISTOR 750 1/8W 1% MF	1303012	35
1	R36	RESISTOR 19.1K 1/8W 1% MF	1303117	34
1	R37	RESISTOR 2.87K 1/8W 1% MF	1302873	33
1	R53	RESISTOR 6.98K 1/8W 1% MF	1302677	32
6	R40, R54, R59, R55, R109, R110	RESISTOR 680 1/4W 5%	1301424	31
2	R74, R96	RESISTOR 180 1/4W 5%	1301322	30
1	R88	RESISTOR 10K 1/4W 5%	1300419	29
15	R1, R5, R10, R15, R20, R25, R64, R66, R68, R70, R72, R74, R76, R78, R80	RESISTOR 3.3K 1/4W 5%	1300439	28
7	R7, R12, R17, R22, R27, R32, R39,	RESISTOR 2.2K 1/4W 5%	1300417	27
10	R85, R87, R95, R84, R99, R100, R101, R103, R105, R106	RESISTOR 1.5K 1/4W 5%	1300391	26
1	R104	RESISTOR 17 1/4W 5%	1300364	25
1				24
3	D39, D46, D47	DIODE 1N756A 8.2V	1102441	23
2	D13, D45	DIODE 1N825 6.2V	1101285	22
40	D1-D11, D14-D32, D40-D43	DIODE D664	1100114	21
4	Q27, Q33, Q37, Q38	TRANSISTOR 2N3245	1509681	20
12	Q13, Q14, Q15, Q16, Q17, Q19, Q7, Q9, Q11, Q12, Q18, Q8	TRANSISTOR DEC 653	1509338	19
8	Q22, Q23	TRANSISTOR 2N4250	1509142	18
3	Q20, Q29, Q30	TRANSISTOR DEC62	1507030-01	17
1	Q24	TRANSISTOR DEC 300B	1503100	16
1	Q31	TRANSISTOR 30A-55	1509351	15
9	Q1, Q2, Q4, Q6, Q8, Q10, Q33, Q25, Q26	TRANSISTOR DEC2219	1501881	14
2	E3, E5	IC DEC 7416	1309923	13
1	E10	IC SEE 13-2114	1503[illegible]	12
1	E9	IC DEC 7A	1909[illegible]	11
2	E7, E8	IC DEC 5A	1507343	10
3	E2, E4, E6	IC DEC 7473	1509004	9
1	E1	IC DEC 7475	1509[illegible]47	8
6		(340) (REF. LINE)	1202504	7
4		(REF. 3411 [illegible])	1[illegible]	6
4		[illegible]	[illegible]	5
1		[illegible]	631	4
[illegible]		[illegible]	A841-04	3
[illegible]		[illegible]	A841-05	2
[illegible]		[illegible]	A841-04	1

PARTS LIST

ETCH BOARD REV

FIRST USED ON OPTION/MOD

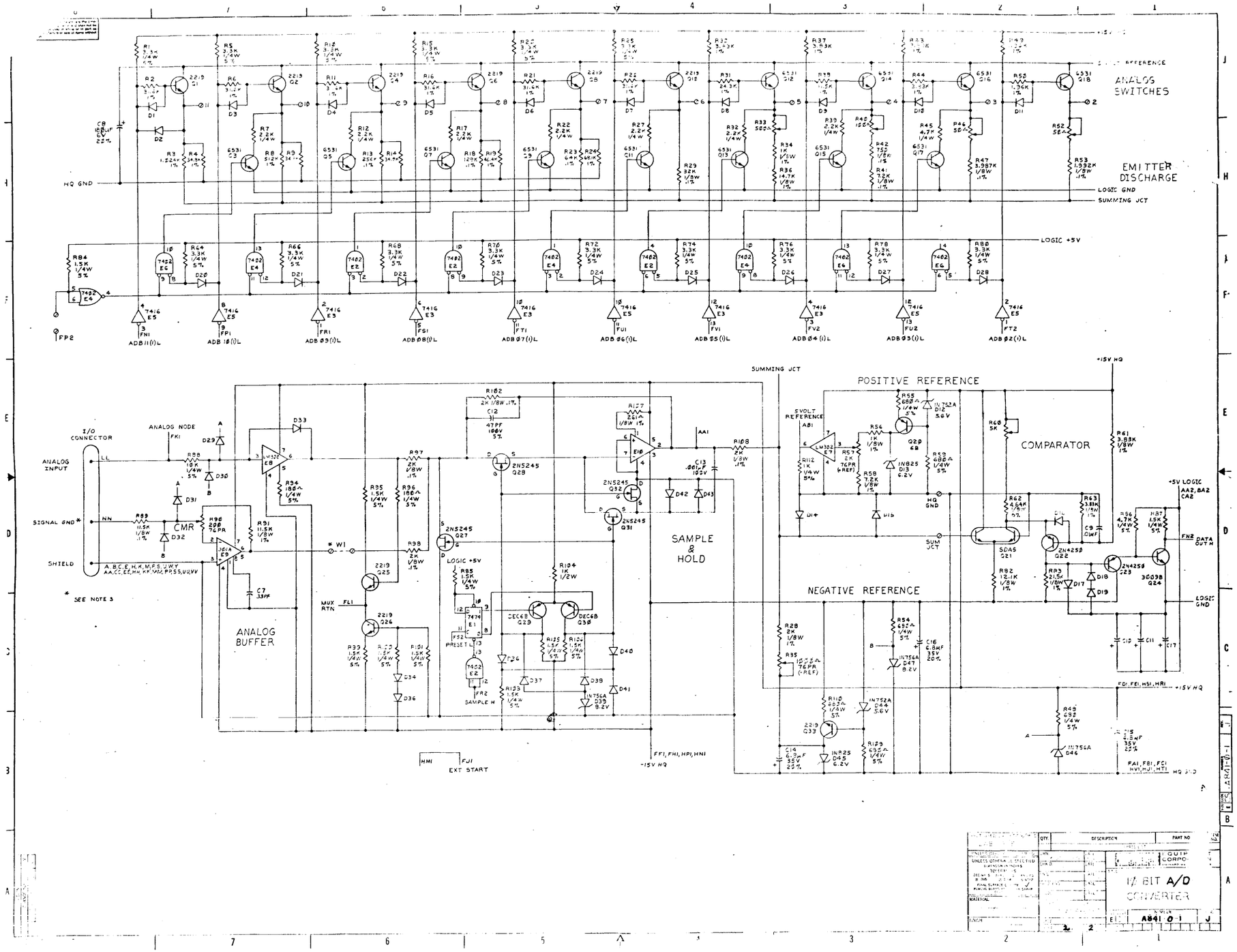
LAB 8/E

EQUIPMENT CORPORATION

TITLE 10 BIT A/D CONVERTER

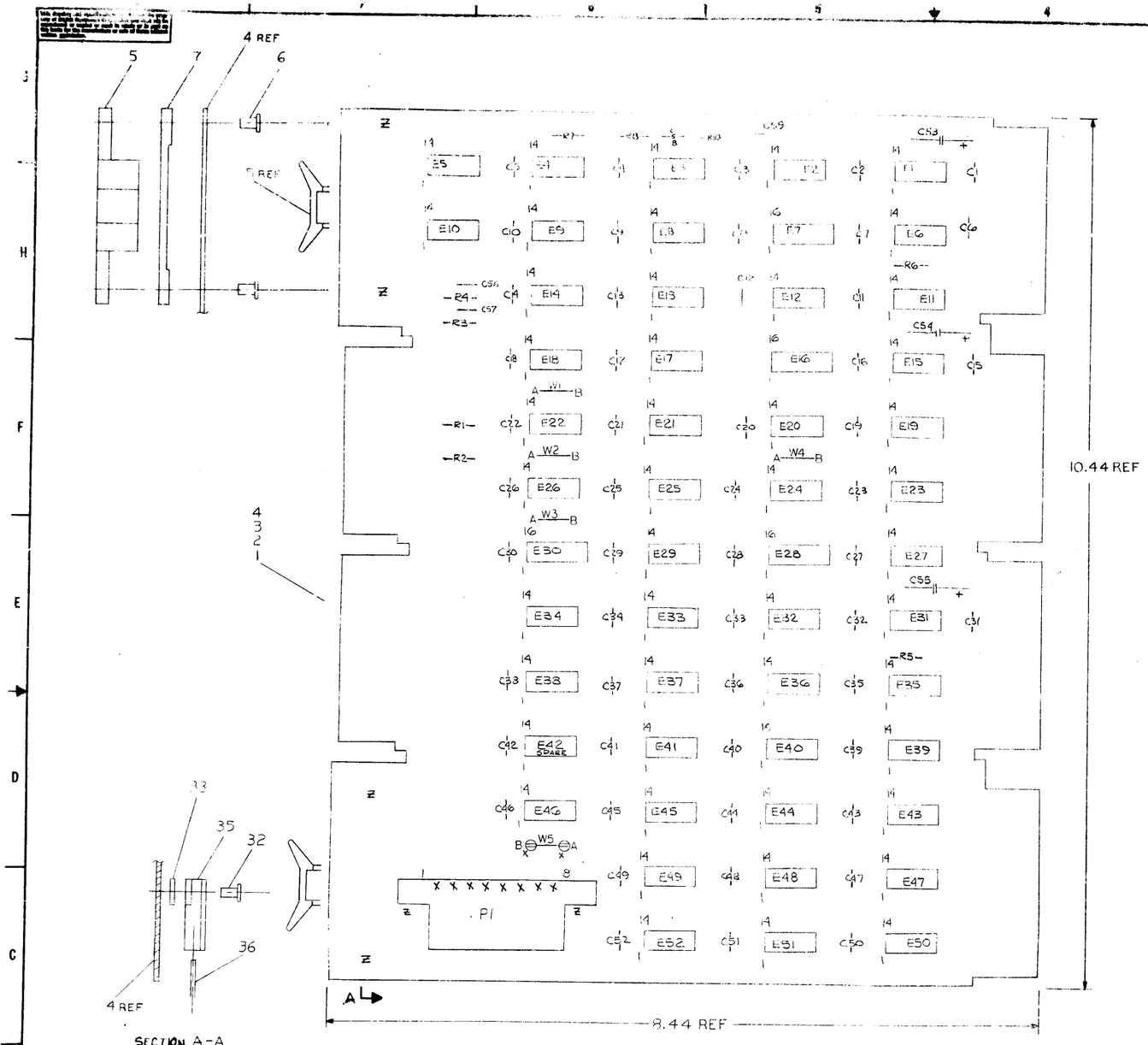
A841-0-1

NOTE	SUB	REF	ADD	FROM PT	TO PT
[illegible]					


ANALOG SWITCHES
EMITTER DISCHARGE
HQ GND
LOGIC GND
SUMMING JCT
LOGIC +5V
SUMMING JCT
POSITIVE REFERENCE
COMPARATOR
NEGATIVE REFERENCE
SAMPLE & HOLD
ANALOG BUFFER
I/O CONNECTOR
ANALOG INPUT
SIGNAL GND
SHIELD
CMR
ANALOG NODE
MUX RTN
SAMPLE H
EXT START
5 VOLT REFERENCE
+5V LOGIC
DATA OUT H
+15V HQ
-15V HQ
12 BIT A/D CONVERTER
A841 0-1

NOTES:

1. UNLESS OTHERWISE INDICATED: CAPACITORS ARE .01μF 100V 20%
2. JUMPER W5 TO BE REMOVED DURING AUTOMATIC TEST ONLY; RACK ALWAYS BE INSTALLED DURING USE. W1 THRU W4 ARE REMOVED FOR REPAIR PURPOSES ONLY AND MUST ALWAYS BE INSTALLED FOR OPERATION.



DEC 390	1	8					
DEC 8235	8	16	34	22	W5-A	W5-B	
DEC 384	1	8	34	22	W4-A	W4-B	
DEC 314	1	8	34	22	W3-A	W3-B	
DEC 8251	8	16	34	22	W2-A	W2-B	
IC TYPE	GND	+5V	34	22	W1-A	W1-B	
GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTFULLY. EXCEPTIONS ARE STATED ABOVE			ITEM NO	AWG	FROM PT	TO PT	
IC PIN LOCATIONS			JUMPER LIST				

QTY.	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM
2		SPLIT LUGS	9006128	36
8		PIN #61320-1 AMP	1209456	35
1	P1	MATE-N-LOCK CONN 8 CIR	1209340	34
AR		WIRE BUSSING #22 AWG	9107560-01	33
2		WASHER #6 #2162 SMITH	9006593	32
2		EYELET #A-1733 STIMSON	9006745	31
AR		GRIPLET	1210244-0	30
3	C56,C58,C59	CAP 1000MMF 100V 5% MICA	1000042	29
52	C1 THRU C52	CAP .01μF 100V 20% DISC	1001610	28
3	C53,C54,C55	CAP 6.8μF 35V 20% TANT	1000067	27
1	C57	CAP 27PF 100V 5% MICA	1001739	26
1	R10	RES 22Ω 1/4W 5%	1301969	25
2	R5,R6	RES 470Ω 1/4W 5%	1300316	24
3	R3,R8,R4	RES 4.7K 1/4W 5%	1300447	23
3	R1,R2,R7	RES 1.5K 1/4W 5%	1300391	22
14	E8,E9,E13,E14,E18,E22 E26,E34,E38,E50,E51 E24,E20,E12	I.C. DEC 7474	1905547	21
6	E2,E7,E25,E43,E44,E47	I.C. DEC 7400	1905575	20
6	E1,E42,E41,E45,E49,E52	I.C. DEC 7402	1909004	19
3	E4,E,9,E46	I.C. DEC 7440	1905579	18
2	E35,E39	I.C. DEC 8881	1909705	17
5	E6,E15,E23,E27,E32	I.C. DEC 380	1903485	16
3	E11,E36,E48	I.C. DEC 7404	1909686	15
3	E7,E16,E30	I.C. DEC 8235	1909935	14
3	E3,E5,E10	I.C. DEC 9601	1909373	13
2	E33,E37	I.C. DEC 7450	1905580	12
1	E31	I.C. DEC 384	1909486	11
1	E23	I.C. DEC 314	1909704	10
1	E28	I.C. DEC 8251	1909594	9
1	E21	I.C. DEC 74164	1910041	8
2		#940 (CABLE CLAMP)	1202704	7
4		EYELET #654-1 STIMPSON	9006750	6
2		HANDLE FLIP CHIP AMBER	9008337-0	5
1		ETCHED CIRCUIT BOARD	5009643	4
REF		MODULE HISTORY DWG	B-MH-A231-0-6	3
REF		ASSY/DRILLING HOLE LAYOUT	D-AH-A231-0-8	2
REF		X-Y COORDINATE HOLE LOC	K-CO-A231-0-4	1

PARTS LIST

EYCH BOARD REV F

FIRST USED ON OPTION/MOD: LAB 8/E

REC NO.	EIA NO.	REC NO.	EIA NO.

SUBROOM FACTOR CONVERSION CHART

[redacted] EQUIPMENT CORPORATION.

AD8-E CONTROL

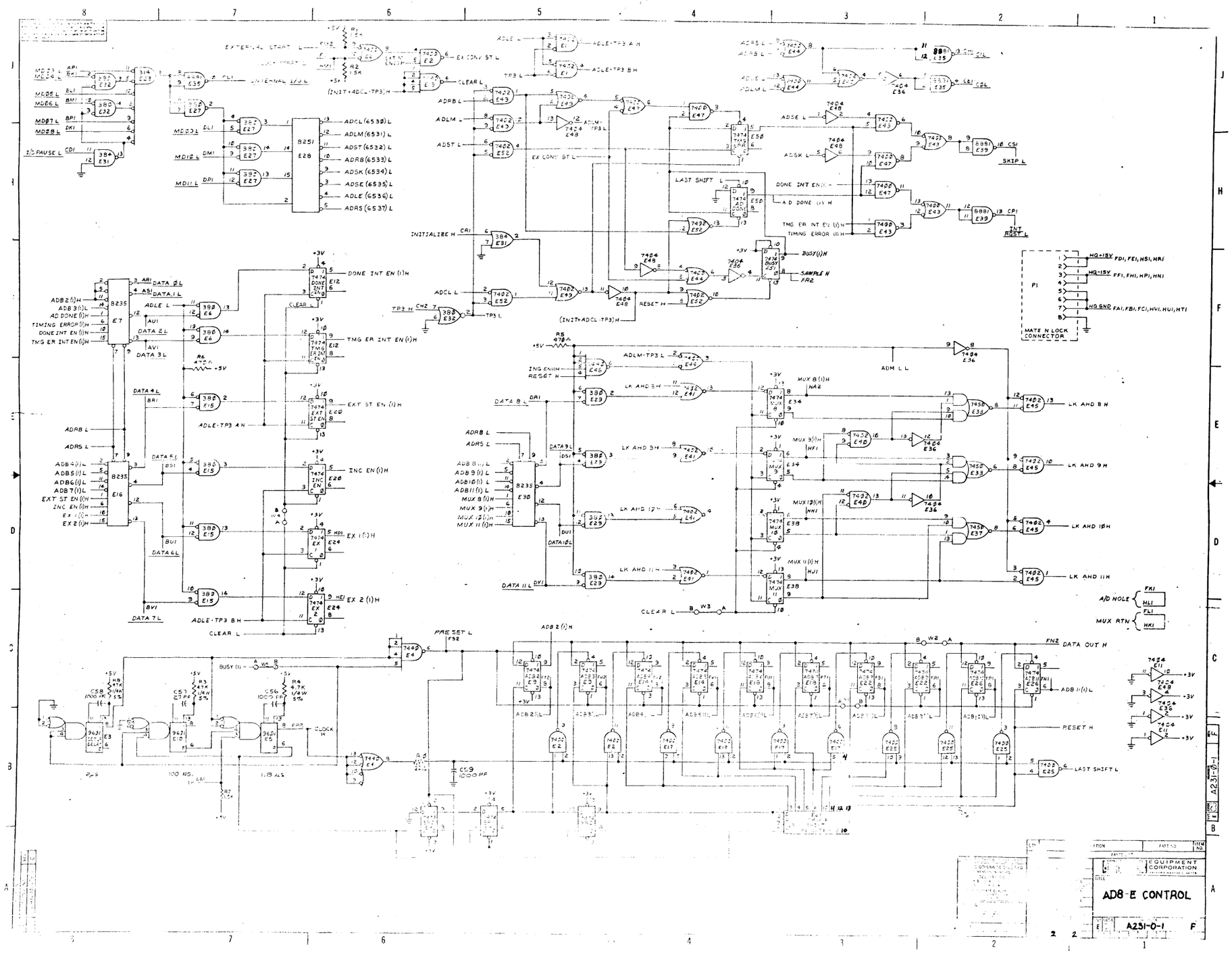
NEXT HIGHER ASSY: C-UA-AD8-EA-0

SCALE 2/1

SHEET 1 OF 2

ECS A231-0-1 F

REV


AD8-E CONTROL
A231-0-1
EQUIPMENT CORPORATION
8251
E28
8235
E7
E16
E30
P1
MATE N LOCK CONNECTOR
EXTERNAL START L
INTERNAL I/O L
I/O PAUSE L
ADCL (6530) L
ADLM (6531) L
ADST (6532) L
ADRB (6533) L
ADSK (6534) L
ADSE (6535) L
ADLE (6536) L
ADRS (6537) L
INITIALIZE H
DONE INT EN (I) H
TMG ER INT EN (I) H
EXT ST EN (I) H
INC EN (I) H
EX 1 (I) H
EX 2 (I) H
LAST SHIFT L
BUSY (I) H
SAMPLE H
FRZ
RESET H
SKIP L
CPI
INT RQST L
LK AHD 8 H
LK AHD 9 H
LK AHD 10 H
LK AHD 11 H
MUX 8 (I) H
MUX 9 (I) H
MUX 10 (I) H
MUX 11 (I) H
A/D NOLE
MUX RTN
FN2 DATA OUT H
ADB 11 (I) L
LAST SHIFT L
CLOCK H
PRESET L
CLEAR L

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ACCESSORY LIST

MADE BY K.Symes	CHECKED M.Laurence	SECTION
DATE 12-17-71	DATE 12/21/71	
ENG D.Bartosinsky	PROD Paul Gagne	ISSUED SECT.
DATE 12-12-71	DATE 1/4/72	

LEGEND
- D DOCUMENT
- DN DOCUMENT CHANGE NOTICE
- PA PAPER TAPE ASCII
- PB PAPER TAPE BINARY
- PM PAPER TAPE READ-IN-MODE

ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION: AD8EA Alone	AD8EA with AM8EA, AM8EC, or AM8ED						KIT CHECK BY ____ DATE ____	INSTALLATION CHECK BY ____ DATE ____
1	A231	AD8E Control Module	1	1							
2	A841	10 Bit A/D Converter Module	1	1							
3	H851	Edge Connector	2	2							
4	7008533	Analog Cable	1	-							
5	--	Analog High Quality Power Assembly	*	*							
	7008370-1	115V Table-top Mounting or									
	7008370-2	230V Table-top Mounting or									
	7008377-1	115V Rack Mounting or									
	7008377-2	230V Rack Mounting									
	7008375	Analog Power Cable									
		* Item 5 is not to be supplied to systems in field with a VC8-E already installed. HQ Power supply type # is tailored to specific systems in Systems Productions.									
6	AD8-EA-0	AD8-EA Print Set	1	1							
7	LAB8-E	LAB8-E Print Set	1	1							
8	MAINDEC8E-D6BB-PB	AD8E/AM8E Diagnostic - Binary Tape	1	1							
9	MAINDEC8E-D6BB-D	AD8E/AM8E Diagnostic - Document	1	1							

TITLE	ASSY. NO.	SIZE	CODE	NUMBER	REV.	ECO NO
AD8-EA Accessory List	SHEET 1 OF 2	A	AL	AD8-EA-3	B	LAB8E-00017
		DIST.				

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ACCESSORY LIST

MADE BY K.Symes	CHECKED M.Laurence	SECTION
DATE 12-17-71	DATE 12/21/71	
ENG D.Bartosinsky	PROD Paul Gagne	ISSUED SECT.
DATE 12-12-71	DATE 1/4/72	

LEGEND
- D DOCUMENT
- DN DOCUMENT CHANGE NOTICE
- PA PAPER TAPE ASCII
- PB PAPER TAPE BINARY
- PM PAPER TAPE READ-IN-MODE

ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION: AD8EA Alone	AD8EA with AM8EA, AM8EC, or AM8ED						KIT CHECK BY ____ DATE ____	INSTALLATION CHECK BY ____ DATE ____
10	DEC-LB-HRZA-D	LAB8-E User's Handbook	1	1							
11	DEC-LB-HXZA-D	LAB8-E Maintenance Manual	1	1							
12		LAB8-E Programming Card	1	1							
13	9107703	BELDEN #8451 #22 AWG TWP STR.	5'	5'							
14	1700021-1	ELECTROMAGNETIC SHIELD	1	1							
		NOTE: When item 10 or 11 is temporarily waived, ship the following:									
	A-SP-AM8EA-1	Engineering Specifications, AM8EA	1	1							
	A-SP-AD8EA-1	Engineering Specifications, AD8EA	1	1							
	A-SP-AD8EA-2	Acceptance Procedure, AD8EA/AM8EA	1	1							

TITLE	ASSY. NO.	SIZE	CODE	NUMBER	REV.	ECO NO
AD8-EA Accessory List	SHEET 2 OF 2	A	AL	AD8-EA-3	B	
		DIST.				

DEC FORM NO.
DRA 121