KE8-E extended arithmetic element engineering drawings

digital equipment corporation · maynard, massachusetts

MASTER DRAWING LIST

MAINTENANCE MANUALS NO.	TITLE	UNIT VARIATIONS KE8-E
KE8-E	EXT ARITH ELEM	X

USED ON OPTIONS							
PDP8-E							
PDP8-M							
PDP8-F							

REVISIONS REV.	DATE	CHG. NO.	APP'D.
A	2/72	KE8E-00001	
B	4/72	KE8E-00002	
C	4/72	00003	

DRN. K. GULICK	DATE 7-26-71	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS
CHK'D. K. GULICK	DATE 7-26-71	TITLE EXTENDED ARITH ELEMENT
ENG.	DATE 8/18/71	
PROJ. ENG.	DATE 8/18/71	
PROD.	DATE 8/18/71	
FIRST USED ON PDP8-E		SIZE A · CODE ML · NUMBER KE8-E · REV. C
SCALE NONE		
SHEET 1 OF 2		DIST.

PRINT SET KE8-E	DWG. NO.	REV. LET.	NO. OF SHEETS	TITLE	OPTION NO.
X	D-UA-KE8-E-Ø		1	EXTENDED ARITH ELEMENT	
X	A-PL-KE8-E-Ø		1	EXTENDED ARITH ELEMENT (PL)	
X	E-CS-M834Ø-Ø-1	#	2	DECODER & STEP COUNTER EAE	
X	E-CS-M8341-Ø-1	#	3	MULTIPLEXER & TIMING GEN EAE	
X	B-UA-H851-Ø-Ø		1	H851 EDGE CONNECTOR	MM8-E
X	D-FD-KE8-E-1		1	EAE FLOW DIAGRAM	
X	D-FD-KE8-E-2	A	1	ROM ENCODING FOR EAE CONT	
-	DEC 8E DOLA-PB			KE8/E EAE INSTRUCTION TEST 1	
-	DEC 8E DOLA-D			KE8/E EAE INSTRUCTION TEST 1	
-	DEC 8E DOMA-PB			KE8/E EAE INSTRUCTION TEST 2	
-	DEC 8E DOMA-D			KE8/E EAE INSTRUCTION TEST 2	
-	A-SP-KE8-E-3		1	ENGINEERING SPECIFICATIONS	
X	A-SP-KE8-E-4		1	ACCEPTANCE PROCEDURE	
-	A-SP-KE8-E-5		1	CHECKOUT PROCEDURE	
X	A-AL-KE8-E-6		1	ACCESSORY LIST	

TITLE		SIZE	CODE	NUMBER	REV.
EXTENDED ARITH ELEMENT	SHEET 2 OF 2	A	ML	KE8-E	C

DRA 132

DEC 16-(325)-1048-1-N471

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ACCESSORY LIST

MADE BY J. McCluskey DATE 4/19/72	CHECKED DATE 2/9/72	SECTION
ENG L. KLOTZ DATE 4/19/72	PROD DATE 4/19/72	ISSUED SECT.

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 KE8-E	KIT CHECK BY ____ DATE ____	INSTALLATION CHECK BY ____ DATE ____
1	M8340	EAE Decoder and Stepcounter module	1		
2	M8341	EAE Multiplexer and Timing Generator Module	1		
3	H851	Edge Connectors	3		
4	LIBKIT-8E-KE8-E	Program Library Kit For KE8-E	1		
5	KE8-E	KE8-E Maintenance Manual	1		
		Note: If item 5 is temporarilly waivered ship the			
		following.			
	A-SP-KE8-E-3	KE8-E Engineering Specifications	1		
	A-SP-KE8-E-4	KE8-E Acceptance Procedure	1		

TITLE	ASSY. NO	SIZE	CODE	NUMBER	REV.	ECO NO
Accessory List.	SHEET OF	A	AL	KE8-E-6		
		DIST.				

DEC 16-(325)-1075-N172 DRA 121

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

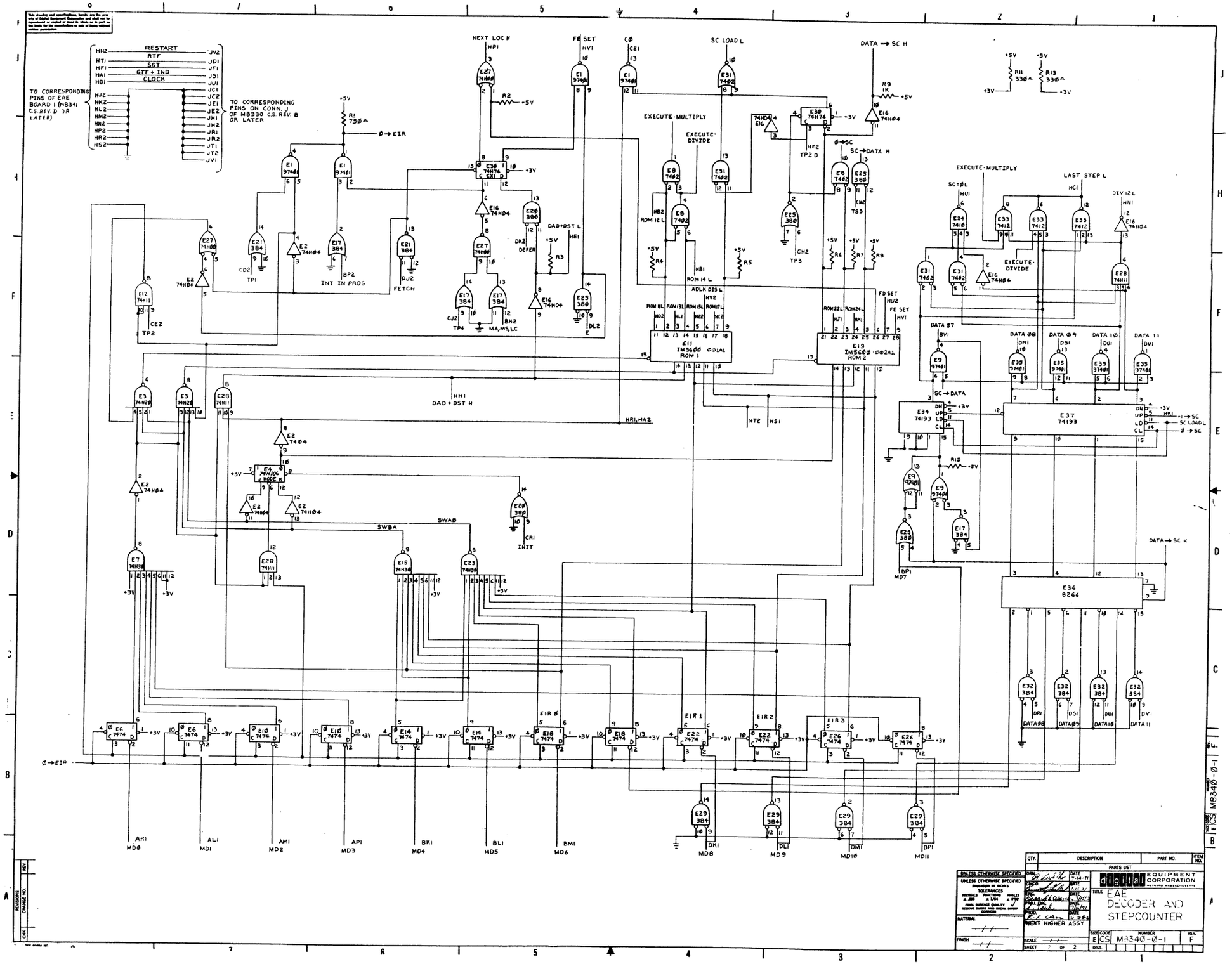
PARTS LIST

MADE BY KEN GULICK	CHECKED KEN GULICK	SECTION 1
DATE 7/29/71	DATE 7/29/71	
ENG Richard H. Thieme	PROD R. Peterson	ISSUED SECT. 1
DATE 8/18/71	DATE 8/19/71	

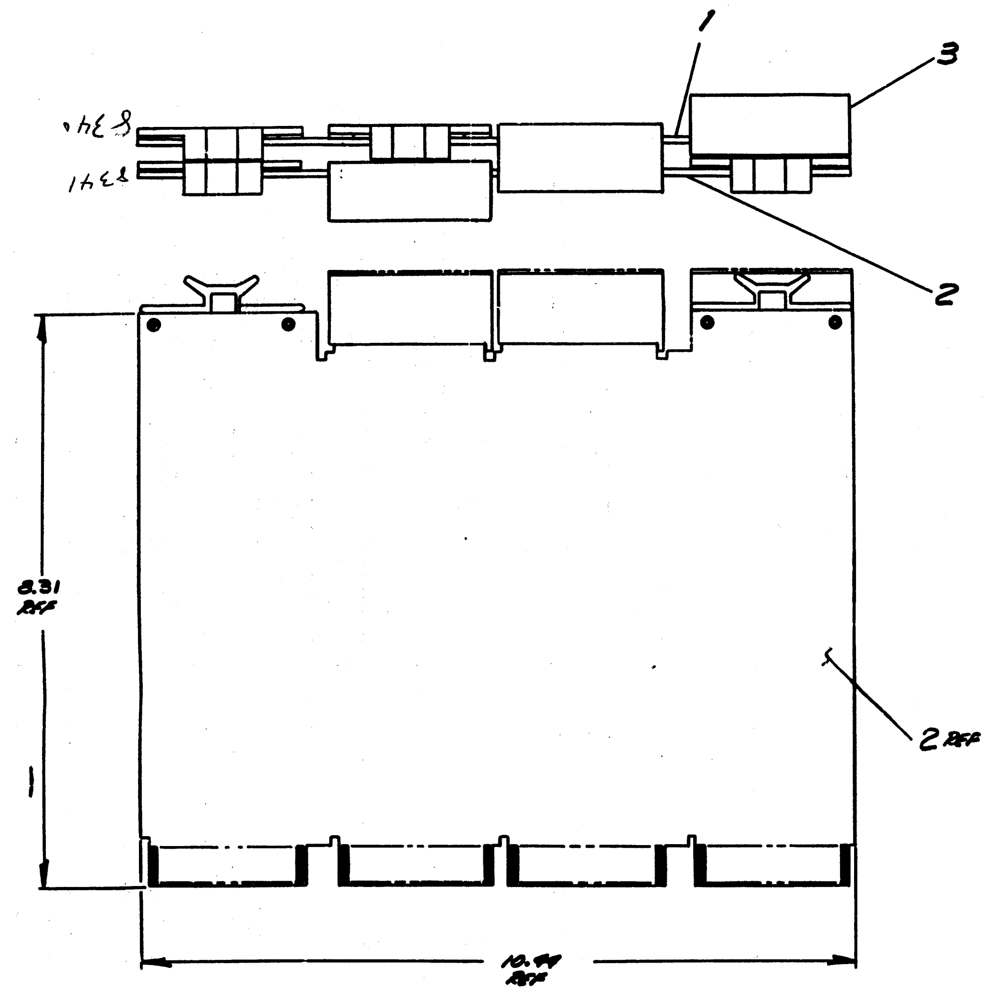
ITEM NO.	DWG NO./PART NO.	DESCRIPTION	QUANTITY/VARIATION KE8-E
1	E-CS-M834Ø-Ø-1	DECODER & STEP COUNTER EAE	1
2	E-CS-M8341-Ø-1	MULTIPLEXER & TIMING GEN. EAE	1
3	B-UA-H851-Ø-Ø	H851 EDGE CONNECTOR	3

TITLE	ASSY NO.	SIZE	CODE	NUMBER	REV.	ECO NO.
EXTENDED ARITH ELEMENT	D-UA-KE8-E-Ø	A	PL	KE8-E-Ø		
	SHEET 1 OF 1	DIST.	G			

DEC FORM DEC 16-(325)-1031-N870
DRA 110


RESTART
RTF
SGT
GTF + IND
CLOCK
TO CORRESPONDING PINS OF EAE BOARD 1 (M8341 C.S. REV. D OR LATER)
TO CORRESPONDING PINS ON CONN. J OF M8330 C.S. REV. B OR LATER
NEXT LOC H
FE SET
C0
SC LOAD L
DATA → SC H
EXECUTE·MULTIPLY
EXECUTE·DIVIDE
LAST STEP L
ROM 1
ROM 2
DAD + DST H
DAD + DST L
INT IN PROG
FETCH
SWBA
SWAB
INIT
E37 74193
E36 8266
E34 74193
MD0
MD1
MD2
MD3
MD4
MD5
MD6
MD7
MD8
MD9
MD10
MD11
digital EQUIPMENT CORPORATION
MAYNARD MASSACHUSETTS
EAE DECODER AND STEPCOUNTER
M8340-0-1
F

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.



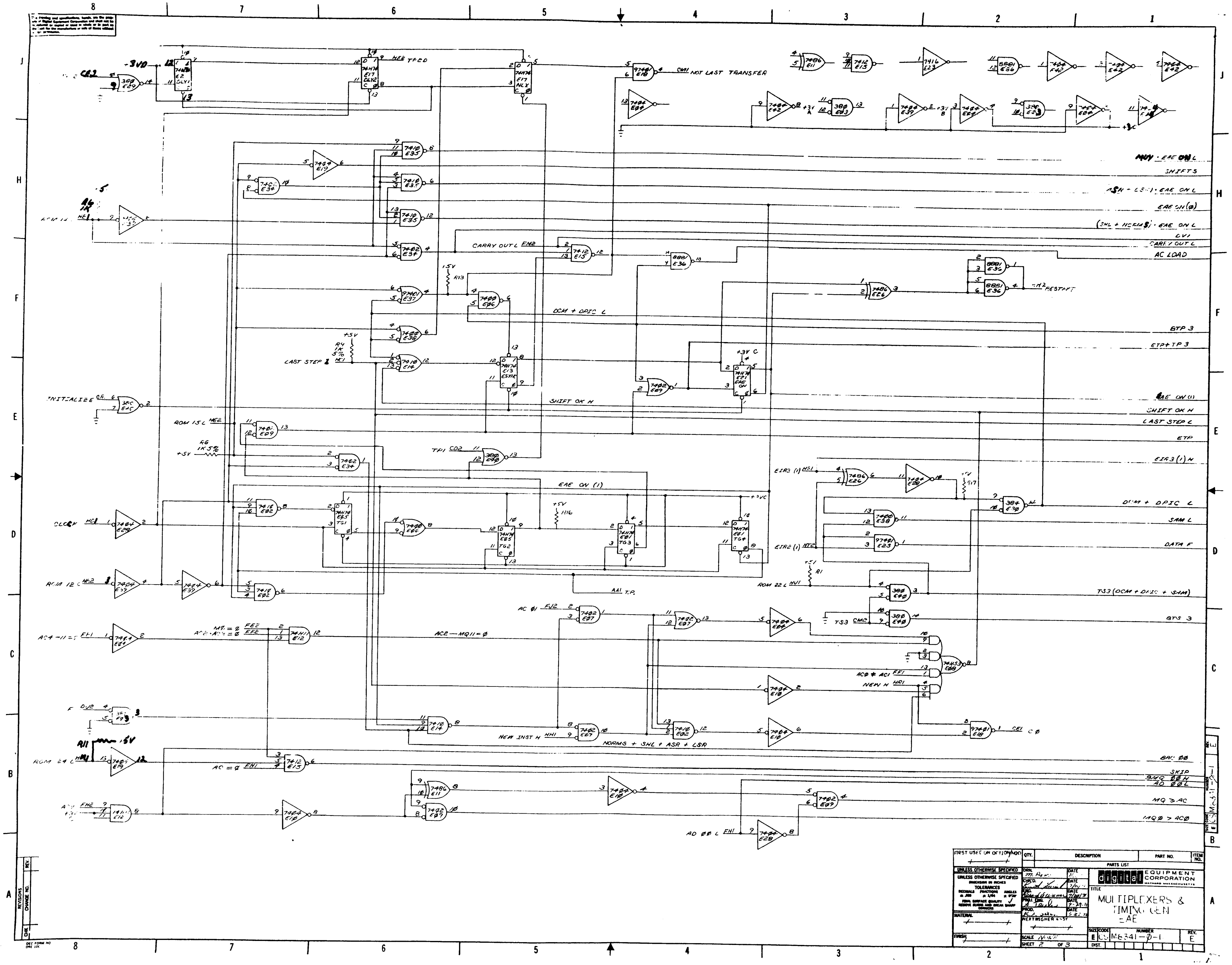
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PDP8-E	PARTS LIST			

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES	DRN.	DATE 7-28-71	digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
DECIMALS .XXX = .005 .XX = .02 .X = .1 / ANGLES ±0° 30'	CHK'D.	DATE 7/29/71	TITLE EXTENDED ARITH ELEMENT
	ENG.	DATE 8/18/71	
	PROJ. ENG. S. Teichi	DATE 8/18/71	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓	PROD. R Peterson	DATE 8/18/71	
MATERIAL —	NEXT HIGHER ASSY. —	SIZE D / CODE UA / NUMBER KE8-E-Ø	REV.
FINISH —	SCALE NONE / SHEET 1 OF 1	DIST. G	

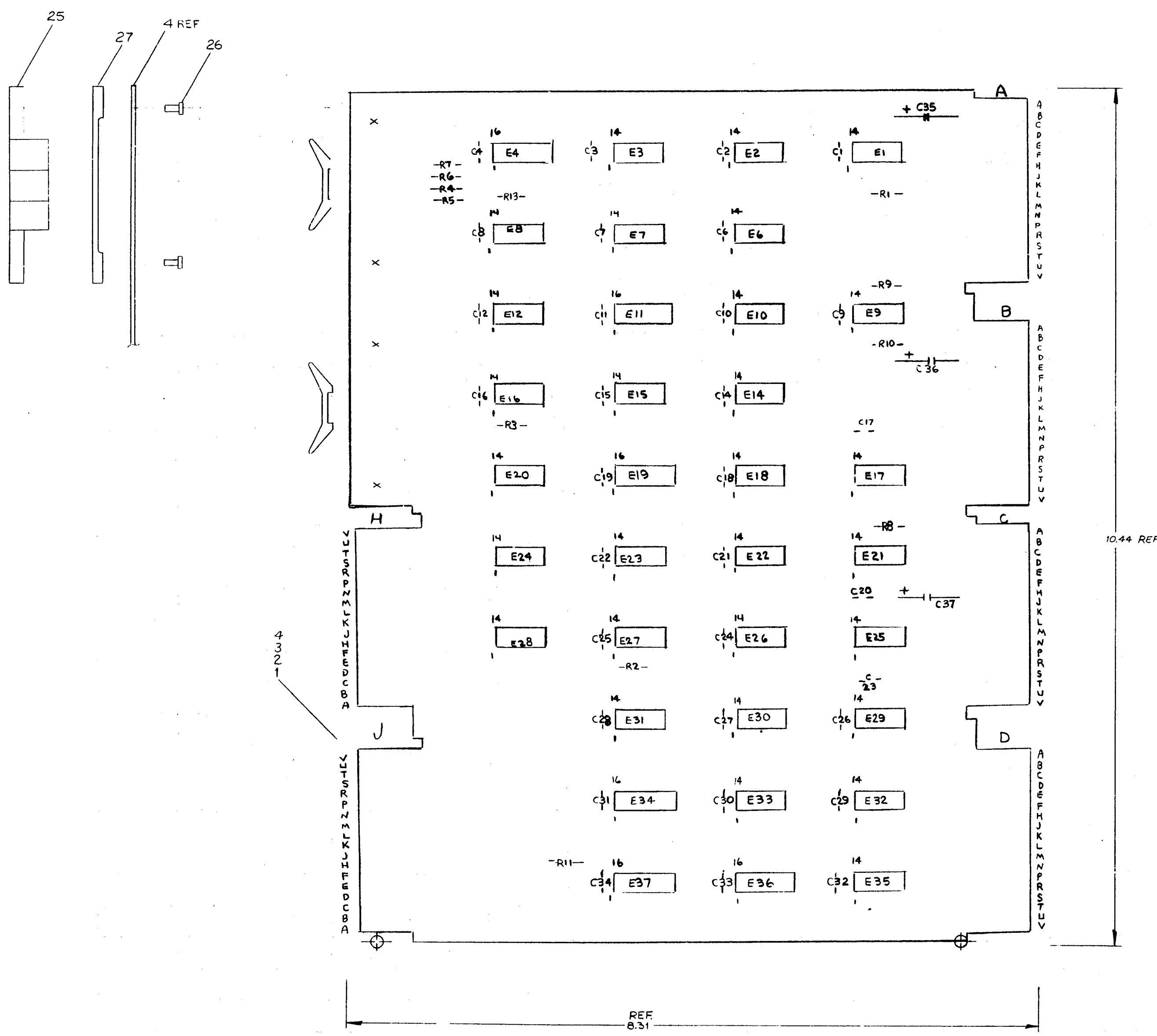
REVISIONS | REV. | CHANGE NO. | CHK

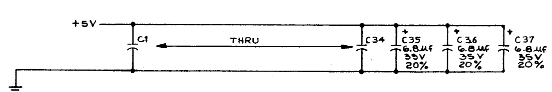
D UA KE8-E-Ø

DEC FORM NO
DRD 100-A



NOT LAST TRANSFER
MUY · EAE ON L
SHIFTS
ASH + LSH) · EAE ON L
EAE SN (Ø)
(SHL + NORMS) · EAE ON L
CARRY OUT L
AC LOAD
RESTART
DCM + DPIC L
ETP 3
ETP + TP 3
LAST STEP 3
INITIALIZE
SHIFT OK H
LAST STEP L
ETP
EIR3 (1) H
EAE ON (1)
CLOCK
DCM + DPIC L
SAM L
DATA F
ROM 12 L
ROM 15 L
ROM 22 L
TS3 (DCM + DPIC + SAM)
BTS 3
AC2 — MQ11 = Ø
AC Ø1
NEW INST H
NORMS + SHL + ASR + LSR
NEW H
ROM 24 L
AC = Ø
SKIP
MQ ≥ AC
MQØ > ACØ
AD ØØ L
FIRST USED ON OPTION
QTY.
DESCRIPTION
PART NO.
ITEM NO.
PARTS LIST
UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES
MATERIAL
FINISH
DRN.
CHK'D.
ENG.
PROJ. ENG.
PROD.
DATE
digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS
TITLE
MULTIPLEXERS & TIMING GEN EAE
SIZE E
CODE CS
NUMBER M6341-Ø-1
REV. E
SCALE NONE
SHEET 2 OF 3
REVISIONS
CHANGE NO.
REV.





BC1, CC1, DC1,
AC2, BC2, CC2, DC2,
AF1, BF1, CF1, DF1,
AF2, BF2, CF2, DF2,
AN1, BN1, CN1, DN1
AN2, BN2, CN2, DN2,
AT1, BT1, CT1, DT1,
AT2, BT2, CT2, DT2,

QTY.	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM NO.
1	E11	IC IM5600	23-001A1	33
6	E6, E10, E14, E18, E22, E26	IC DEC 7474	1905547	32
2	E2, E16	IC DEC 74H04	1909931	31
1	E27	IC DEC 74H00	1909056	30
1	R1	RESISTOR 750 1/4W 5%	1301401	29
A/R		GRIPLET	1210244-0	28
2		SPACER (CABLE CLAMP)	1202704	27
4		EYELET GS4-11 STIMPSON	9006750	26
2		HANDLE FLIP CHIP MAGENTA	9008337-06	25
1	E4	IC DEC 74H106	1910408	24
1	E24	IC DEC 7410	1905576	23
1	E33	IC DEC 7412	1909955	22
2	E34, E37	IC DEC 74193	19010018	21
1	E36	IC DEC 8266	1909934	20
2	E28, E12	IC DEC 74H11	1909267	19
1	E3	IC DEC 74H20	1905635	18
				17
4	E17, E21, E29, E32	IC DEC 384	1909486	16
2	E8, E31	IC DEC 7402	1909004	15
1	E30	IC DEC 74H74	1909667	14
3	E7, E15, E23	IC DEC 74H30	1909059	13
3	E1, E9, E35	IC DEC 97401	1909973	12
2	E20, E25	IC DEC 380	1909485	11
1	E19	IC IM 5600	23-002A1	10
2	R11, R13	RESISTOR 330 1/4W 5%	1300295	9
1	R9	RESISTOR 1K 1/4W 5%	1300365	8
8	R2-R8, R10	RESISTOR 470 1/4W 10%	1300317	7
3	C35, C36, C37	CAP 6.8 uf 35V 20% S. TANT	1000067	6
32	C1-C4, C6-C12, C14-C34	CAP .01 uf 100V 20% DISC	1001610	5
1		ETCHED BOARD	5009603	4
REF		MODULE ECO HISTORY	B-MH-M8340-0-6	3
REF		ASSY/DRILLING HOLE LAYOUT	D-AH-M8340-0-5	2
REF		X-Y COORDINATE HOLE LOCATION	K-CO-M8340-0-4	1

PARTS LIST

ETCH BOARD REV E

IC TYPE	GND	+5V
DEC 74193	8	16
DEC 8271	8	16
DEC 384	1	8
DEC 380	1	8
DEC 7476	5	13

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

IC PIN LOCATIONS

ITEM NO	AWG	FROM PT	TO PT

JUMPER LIST

SEMICONDUCTOR CONVERSION CHART

DEC NO.	EIA NO	DEC NO	EIA NO

DRN.	T. Quinlin	DATE	5-26-71
CHK'D.	[signature]	DATE	6/1/71
ENG.	Richard E. [signature]	DATE	7/15/71
PROJ. ENG.	[signature]	DATE	7/15/71
PROD.	R.E. [signature]	DATE	[illegible]

FIRST USED ON

digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS

TITLE EAE DECODER & STEP COUNTER

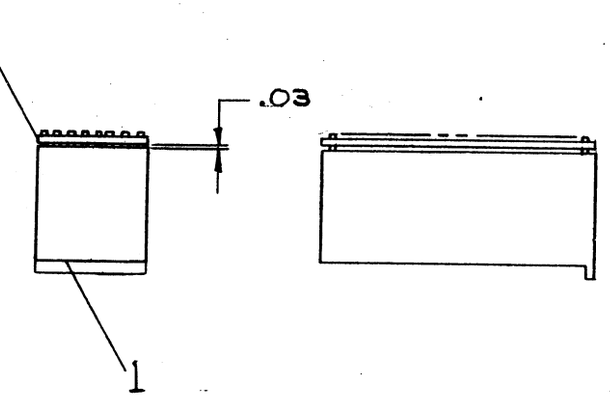
SIZE E CODE CS NUMBER M8340-0-1 REV. F

SCALE 2-1 SHEET 1 OF 2

DIST.

DEC FORM NO. DRL 1410

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.



ITEM NO.	PART NO.	DESCRIPTION	QTY.
5	B-MH-H851-0-6	MODULE ECO HISTORY	REF
4	C-AH-H851-0-5	ASSY HOLE LAYOUT	REF
3	B-CS-H851-0-1	CIRCUIT SCHEMATIC	REF
2	D-IA-5008903-0-0	ETCH BOARD	1
1	1210152	CONN BLOCK, 72 PIN	1

PARTS LIST

FIRST USED ON OPTION/MODEL
H851

UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED
DIMENSION IN INCHES
TOLERANCES
~~DECIMALS~~ ~~FRACTIONS~~ ANGLES ± 0°30'
FINAL SURFACE QUALITY
REMOVE BURRS AND BREAK SHARP CORNERS

TOLERANCES
DECIMALS
.XXX = ± .005
.XX = ± .02
.X = ± .1

MATERIAL
—//—

FINISH
—//—

		DATE
DRN.	H. Flandin	7/28/70
CHK'D.	R. Russo	8/13/70
ENG.	Jack Briere	8-13-70
PROJ. ENG.	Jack Briere	8-13-70
PROD.	W. Miller	8-13-70

NEXT HIGHER ASSY
—//—

SCALE —//—

SHEET 1 OF 1

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TITLE
H851
EDGE CONNECTOR

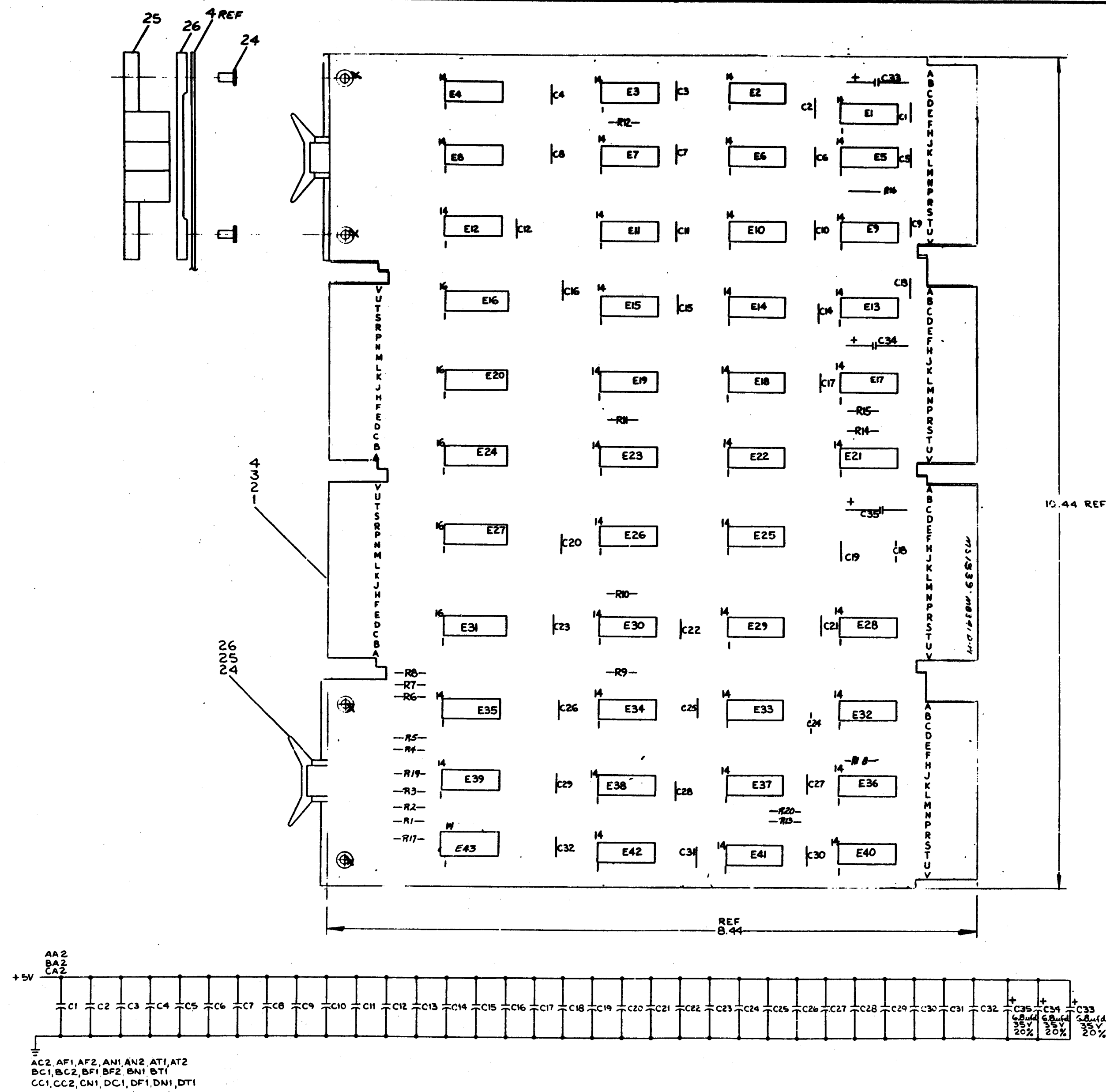
SIZE	CODE	NUMBER	REV.
B	UA	H851-Ø-Ø	B

DIST. G

REVISIONS			
CHANGE NO.	REV.	CHK.	
H851-00001	A		12-10-70 P. GARDNER 12-14-70
H851-00002	B		8-3-72 P. GARDNER 8-9-72

DEC FORM NO.
DRB 100

NOTES:



DEC 8093	7	14
DEC 380	1	8
DEC 8235	8	16
DEC 384	1	8
IC TYPE	GND	+5V

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

IC PIN LOCATIONS

ITEM NO	AWG	FROM PT	TO PT

JUMPER LIST

QTY.	REF DESIGNATION	DESCRIPTION	PART NO.	ITEM
1	E43	IC DEC 8093	1910837	28
A/R		GRIPLET	1210244-C	27
2		SPACER (CABLE CLAMP)	1202704	26
2		HANDLE, FLIP CHIP - MAGENTA	9008337-06	25
4		EYELET GS4-11 STIMPSON	9006750	24
1	E15	IC DEC 7412	1909955	23
1	E23	IC DEC 7416	1909928	22
3	E32, E36, E22	IC DEC 8881	1909705	21
1	E12	IC DEC 74H11	1909267	20
3	E7, E9, E34	IC DEC 7402	1909004	19
6	E4, E10, E19, E28, E39, E42	IC DEC 7404	1907686	18
4	E2, E14, E33, E35	IC DEC 7410	1905576	17
1	E8	IC DEC 74H53	1909062	16
2	E11, E26	IC DEC 7486	1910011	15
3	E18, E25, E37	IC DEC 97401	1909473	14
3	E3, E29, E40	IC DEC 380	1909485	13
5	E16, E20, E24, E27, E31	IC DEC 8235	1909935	12
6	E1, E5, E13, E17, E21 E41	IC DEC 74H74	1907667	11
1	E30	IC DEC 384	[illegible]09486	10
2	E6, E38	IC DEC 7400	1905575	9
4	R6, R8, R9, R15	RES 1K 1/4W 5%	1300365	8
16	R1, R2, R3, R4, R5, R7, R10, R11, R12, R20, R13, R14, R16, R17, R18, R19	RES. 470 1/4W 10%	130[illegible]317	7
3	C33, C34, C35	CAP 6.8 ufd 35V 20% TANT	10000[illegible]7	6
32	C1 THRU C32	CAP .01 ufd 100V 20% DISC	1001610	5
1		ETCHED CIRCUIT BOARD	5009604	4
REF		MODULE ECO HISTORY	B-MH-M8341-[illegible]	3
REF		ASSY/DRILLING HOLE LAYOUT	D-AH-M8341-0[illegible]	2
REF		X-Y COORDINATE HOLE LOCATION	K-CO-M8341-0-[illegible]	1

PARTS LIST

ETCH BOARD REV D

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

SEMICONDUCTOR CONVERSION CHART

EQUIPMENT CORPORATION

TITLE: MULTIPLEXERS & TIMING GEN EAE

SCALE 2/1 SHEET 1 OF 3

E CS M8341-0-1 E

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

NOTES:

1. IF ANY CHANGES ARE TO BE MADE TO THIS PRINT FIRST CHECK WITH PURCHASE SPEC'S A-PS-23-001A1 AND A-SP-23-002A1.

E D C B A

Ø0 Ø1 Ø2 Ø3
Ø4 Ø5 Ø6 Ø7
1Ø 11 12 13
14 15 16 17
2Ø 21 22 23
24 25 26 27
30 31 32 33
34 35 36 37

ROM 1

ENABLE IF MAJOR STATE = F OR E
EIR 3 → A
EIR 2 → B
EIR 1 → C
EIR Ø · NEW → D
EXECUTE → E

FUNCTION	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	OCTAL
F · NOP	1	1	1	1	1	1	1	1	377
F · (ACS + SCL)	1	1	1	1	1	1	1	1	377
F · MUY	1	1	1	1	1	0	0	1	371
F · DVI	1	1	1	1	1	1	1	1	377
F · NMI	0	1	1	0	0	0	1	1	143
F · SHL	1	1	1	1	1	1	1	1	377
F · ASR	0	1	1	1	1	0	0	1	171
F · LSR	1	1	1	1	1	0	0	1	371
F · SCA	1	1	1	1	1	1	1	1	377
F · DAD	1	1	1	1	1	0	0	1	371
F · DST	1	1	1	1	1	1	1	1	377
NOP	1	1	1	1	1	1	1	1	377
F · DPSZ	1	1	1	1	1	1	1	1	377
F · DPIC	1	0	0	1	1	0	0	1	231
F · DCM	1	0	0	1	1	0	0	1	231
F · SAM	1	1	0	1	1	0	0	1	331
E · NOP	1	1	1	1	1	1	1	1	377
E · SCL	1	1	1	1	1	1	1	0	376
E · MUY	1	0	1	1	0	1	1	1	267
E · DVI	1	0	1	0	0	0	0	1	241
NOT USED									X
E · SHL	0	1	1	0	0	0	1	0	142
E · ASR	1	1	1	1	0	1	1	0	366
E · LSR	1	1	1	1	0	1	1	0	366
NOT USED									X
E · DAD	1	1	0	1	1	0	0	1	331
E · DST	1	1	1	1	1	1	1	1	377
NOT USED									X
NOT USED									X
NOT USED									X
NOT USED									X
NOT USED									X

Ø INDICATES ACØ→LINK DATA AT TS3
Ø INDICATES TG SLOW—ADD (NOT MERELY SHIFT)
Ø INDICATES CARRY COUPLE AT TS3 (1→CARRY IN, CARRY OUT→DATA)
Ø INDICATES LEFT SHIFT
Ø INDICATES A SHIFT OPERATION
Ø DISABLES CPU ADDER LINK GATING
Ø INDICATES LINK LOAD AT TP3
Ø INDICATES LOAD SC AT TP2

ROM 2

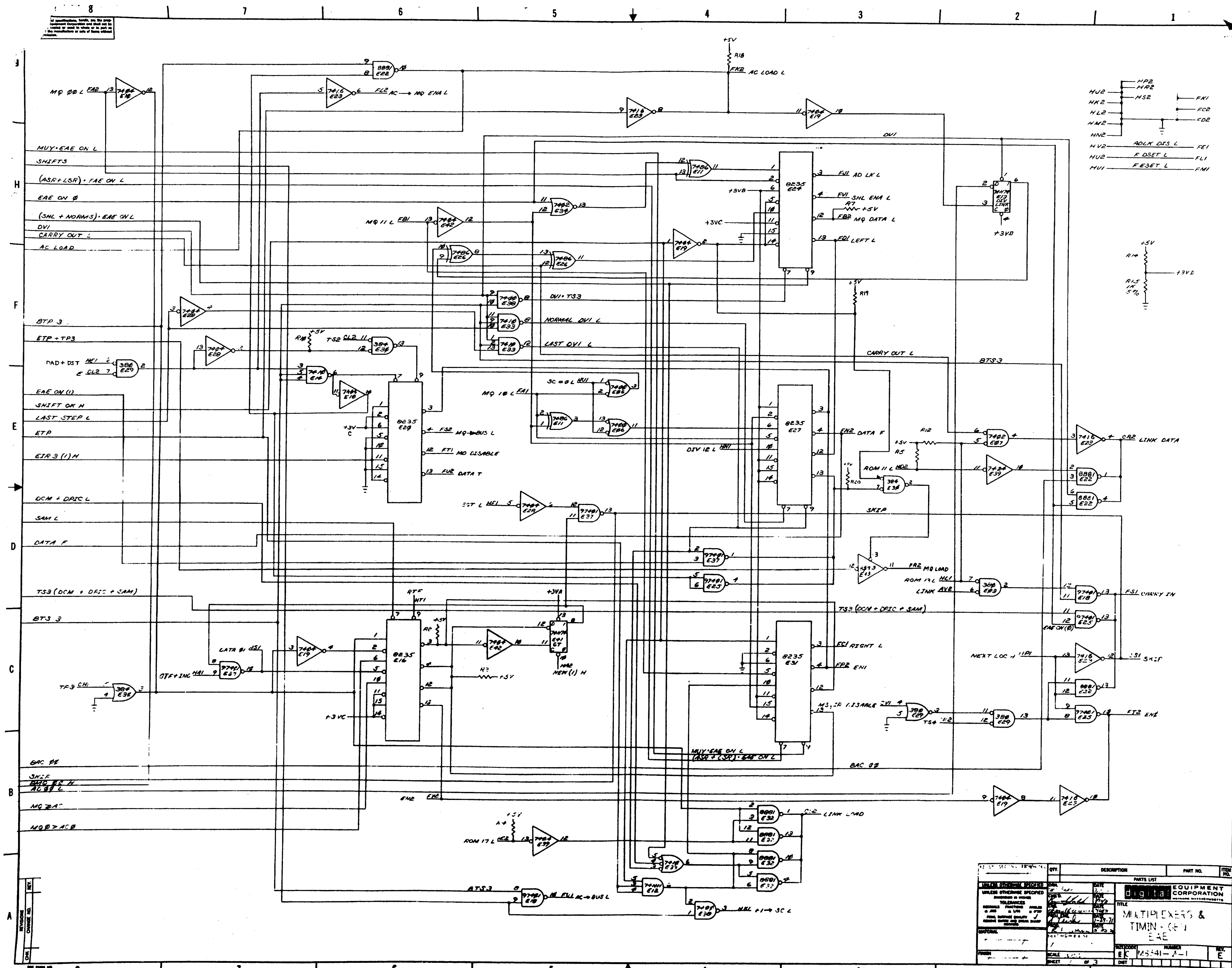
ENABLE IF MAJOR STATE = F
EIR 3 → A
EIR 2 → B
EIR 1 → C
EIR Ø → D
OLD → E

FUNCTION	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	OCTAL
NOP	1	1	1	1	1	1	1	1	377
ACS	0	1	1	1	1	1	1	1	177
NEW MUY	1	1	0	1	1	0	0	1	331
NEW DVI	1	1	0	1	1	0	0	1	331
NMI	1	1	0	1	1	1	1	1	337
SHL	1	1	1	1	1	0	1	0	372
ASR	1	1	1	1	1	0	1	0	372
LSR	1	1	1	1	1	0	1	0	372
SCA	1	1	1	1	0	1	1	1	367
DAD	1	1	1	1	1	0	0	1	371
DST	1	1	1	1	1	0	0	1	371
NOP	1	1	1	1	1	1	1	1	377
DPSZ	1	1	1	0	1	1	1	1	357
DPIC	1	0	1	1	1	1	1	1	277
DCM	1	0	1	1	1	1	1	1	277
SAM	1	0	1	1	1	1	1	1	277
NOP	1	1	1	1	1	1	1	1	377
SCL	1	1	1	1	1	0	1	0	372
OLD MUY	1	1	0	1	1	0	1	0	332
OLD DVI	1	1	0	1	1	0	1	0	332
NMI	1	1	0	1	1	1	1	1	337
SHL	1	1	1	1	1	0	1	0	372
ASR	1	1	1	1	1	0	1	0	372
LSR	1	1	1	1	1	0	1	0	372
SCA	1	1	1	1	0	1	1	1	367
SCA · SCL	1	1	1	1	0	0	1	0	362
SCA · OLD MUY	1	1	0	1	0	0	1	0	322
SCA · OLD DVI	1	1	0	1	0	0	1	0	322
SCA · NMI	1	1	0	1	0	1	1	1	327
SCA · SHL	1	1	1	1	0	0	1	0	362
SCA · ASR	1	1	1	1	0	0	1	0	362
SCA · LSR	1	1	1	1	0	0	1	0	362

Ø INDICATES ACS
Ø INDICATES DCM+SAM+DPIC
Ø INDICATES Ø→SC AT F · TP3
Ø INDICATES DPSZ
Ø INDICATES SCA
Ø INDICATES MA+1→MA, 1→SKIP
Ø INDICATES DSET
Ø INDICATES ESET

REVISIONS		
REV	CHANGE NO	CHK
A	KE8E-00003	
	ESSER	

FIRST USED ON OPTION/MODEL	KE8-E
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES	DECIMALS .XXX = .005 .XX = .02 .X = .1; ANGLES ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	✓
MATERIAL	
FINISH	
DRN.	DATE 21 Jun 71
CHK'D. W. MAKO	DATE
ENG.	DATE
PROJ. ENG.	DATE
PROD.	DATE
NEXT HIGHER ASSY.	A-ML-KE8-E
SCALE	NONE
SHEET	1 OF 1
QTY. / DESCRIPTION / PART NO. / ITEM NO.	PARTS LIST
	digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS
TITLE	ROM ENCODING
SIZE / CODE / NUMBER / REV	D FD KE8-E-Ø2 A


MQ 00 L
MUY • EAE ON L
SHIFTS
(ASR + LSR) • EAE ON L
EAE ON 0
(SHL + NORMS) • EAE ON L
DVI
CARRY OUT L
AC LOAD
BTP 3
ETP + TP3
EAE ON (1)
SHIFT OK H
LAST STEP L
ETP
DCM + DPIC L
SAM L
DATA F
TS3 (DCM + DPIC + SAM)
BTS 3
EAC 00
SHIF
MQ>AC
MQ0>AC0
AC LOAD L
MQ ENA L
DVI • TS3
NORMAL DVI L
LAST DVI L
AD LK L
SHL ENA L
MQ DATA L
LEFT L
MQ→BUS L
MQ DISABLE
DATA T
DATA F
CARRY OUT L
BTS 3
LINK DATA
SKIP
MQ LOAD
CARRY IN
SKIP
RIGHT L
ENI
LINK LOAD
FULL AC→BUS L
+1→SC L
ADLK DIS L
F DSET L
F ESET L
PARTS LIST
QTY.
DESCRIPTION
PART NO.
ITEM NO.
UNLESS OTHERWISE SPECIFIED
TOLERANCES
MATERIAL
FINISH
SCALE
SHEET
OF 3
digital EQUIPMENT CORPORATION
TITLE
MULTIPLEXERS &
TIMIN - GEN
EAE
SIZE
CODE
NUMBER
REV.
E
C
M8341 - 0 - 1
E
DIST

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ACCESSORY LIST

MADE BY J. McCluskey DATE 4/19/72	CHECKED [illegible] DATE 2/9/72	SECTION
ENG L. Klotz DATE 4/19/72	PROD [illegible] DATE 4/19/72	ISSUED SECT.

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 KE8-E	KIT CHECK BY ____ DATE ____	INSTALLATION CHECK BY ____ DATE ____
1	M8340	EAE Decoder and Stepcounter module	1		
2	M8341	EAE Multiplexer and Timing Generator Module	1		
3	H851	Edge Connectors	3		
4	LIBKIT-8E-KE8-E	Program Library Kit For KE8-E	1		
5	KE8-E	KE8-E Maintenance Manual	1		
		Note: If item 5 is temporarilly waivered ship the			
		following.			
	A-SP-KE8-E-3	KE8-E Engineering Specifications	1		
	A-SP-KE8-E-4	KE8-E Acceptance Procedure	1		

TITLE	ASSY. NO	SIZE	CODE	NUMBER	REV.	ECO NO
Accessory List.	SHEET OF	A	AL	KE8-E-6		
		DIST.				

DEC 16-(325)-1075-N172 DRA 121

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.

EAE FLOW DIAGRAM

MAJ STATE	TIME STATE	CP EVENTS	ACS EIR = 1 (NEW ONLY)	MUY 2 (NEW OR OLD)	DVI 3 (NEW OR OLD)	NMI 4 (NEW OR OLD)
F	TS1	PC UPDATE				
	TS2	MDØ-2 → IR				
	TS3	AC LOAD AT TP3 DATA T L MQ LOAD AT TP3 IF MD7 = 1	SET SCLD AT TP2 L DATA BUS → SC CØL	0 → SC LINK LOAD (Ø → L) ADLK DIS L 1 → SKIP	0 → SC 1 → SKIP	0 → SC START EAE TO AT TP3 ACØ → L DATA IF EAE ON, SHIFT LEFT UNTIL ACØ ≠ AC1, OR AC1-MQ11 = Ø. +1 → SC RESTART CP IF ''NEW'' AND AC, MØ = 40000000. CØL ADLK DIS L
	TS4		1 → F	ENØ, CARRY IN (MA+1 → MA) NEW; 1 → D OLD; 1 → E	ENØ, CARRY IN (MA+1 → MA) NEW; 1 → D OLD; 1 → E	1 → F
D	ALL	OBTAIN OPERAND ADDRESS				
E1	TS2					
	TS3	DATA T L				
	TS4					
E	TS2					
	TS3	DATA T L		AC → BUS L START EAE TC AT TP3 IF EAE ON; RIGHT L IF MQ11 = 1, EN 1 L AC LOAD, MQ LOAD REPEAT 12 TIMES RESTART CP WHEN SC = 13_8 ADLK DIS **MUST** BE HIGH	ADLK DIS L: AC → BUS L 1 → LINK DATA: LINK LOAD START EAE TC AT TP3 **IF** CARRY OUT L IF SC = Ø, DATA F L IF MQ10 ≠ MQ11 AND SC ≠ 13, **DATA** F L IF EAE OFF, MQØ → ADLK L, IF IF EAE ON, MQØ XOR MQ11 → ADLK L ADØ → DIV LNK IF MQ1Ø = 1 OR SC ≠ Ø, DIV LNK XOR CARRY OUT → MQ DATA L SHL+LD ENA L. EN1 L LEFT L SC=13: LEFT H. IF MQ11 = 1, DATA F IF DIV LNK (Ø), EN1 L MQ LOAD, AC LOAD L LOAD (Ø → LINK)	
	TS4			1 → F	1 → F	

MAJ STATE	TIME STATE	SHL (NEW OR OLD)	ASR 6 (NEW OR OLD)	LSR 7 (NEW OR OLD)	SCA NEW; 10 OLD; 1X
F	TS1				
	TS2				
	TS3	1 → SKIP	ACØ → LINK DATA ADLK DIS L LINK LOAD (ACØ → LINK) 1 → SKIP	ADLK DIS L LINK LOAD (Ø → LINK)	SCV DATA → DATA
	TS4	ENØ, CARRY IN (MA+1 → MA) 1 → E	ENØ, CARRY IN (MA+1 → MA) 1 → E		1 → F
D	ALL				
E1	TS2				
	TS3				
	TS4				
E	TS2	$\overline{MD}$ → SC	$\overline{MD}$ → SC		
	TS3	START EAE TC AT TP3. IF EAE ON; LEFT L SHL + LD EN L ACØ → LINK DATA MQ LOAD, LINK LOAD AC LOAD ADLK DIS L MQØ → ADLK L	START EAE TC AT TP3. IF EAE ON; RIGHT L MQ11 → GT DATA MQ LOAD, GT LOAD AC LOAD ADLK DIS **MUST** BE HIGH		
		RESTART CP WHEN SC = 37 IF ''NEW'' AND SC = 37, DISABLE SHIFT PATHS, NO MQ, LINK OR GT LOAD.			
	TS4	1 → F			

MAJ STATE	TIME STATE	DAD 14 (NEW ONLY)	DST 12 (NEW ONLY)	SWAB OR SWBA (NEW ONLY)
F	TS1			
	TS2			
	TS3	ADLK DIS L LINK LOAD (Ø → L) 1 → SKIP	1 → SKIP	IF MODE = A AND SWAB, SET MODE B IF MODE = B AND SWBA SET MODE A
	TS4	ENØ, CARRY IN (MA+1 → MA) 1 → D	ENØ, CARRY IN (MA+1 → MA) 1 → D	1 → F
D	ALL	1 → EX1	1 → EX1	
E1	TS2		MQ → BUS, DATA T, MD DIS } MQ → MB AC → MQ ENA L	
	TS3	L → CARRY IN EN1 (MD) MQ → BUS AC → MQ ENA L CARRY OUT → LINK DATA AC LOAD MQ LOAD LINK LOAD ADLK DIS L	MQ → BUS AC → MQ ENA L AC LOAD (SWAP AC, MQ LOAD MQ)	
	TS4	ENØ CARRY IN 1 → E	ENØ CARRY IN 1 → E	
E	TS2		SAME AS E1	
	TS3	SAME AS E1	SAME AS E1	
	TS4	1 → F	1 → F	

MAJ STATE	TIME STATE	DPIC 14 (NEW ONLY)	DPSZ 15 (NEW ONLY)	DCM 16 (NEW ONLY)	SAM 17 (NEW ONLY)	SCL 1 (OLD ONLY)	COMMON EAE EVENTS
F	TS1						
	TS2						0 → EIR
	TS3	AC → MQ, MQ → AC BECAUSE OF INSTR. ADLK DIS L CARRY IN CARRY OUT → LINK DATA [MQ LOAD, AC LOAD] LINK LOAD START EAE TC, ONE CYCLE ONLY L → CARRY IN CARRY OUT → LINK DATA AC LOAD, MQ LOAD LINK LOAD	IF AC, MQ = Ø, 1 → SKIP	AC → MQ, MQ → AC BECAUSE OF INSTR. ADLK DIS L CARRY IN CARRY OUT → LINK DATA DATA F [MQ LOAD, AC LOAD] LINK LOAD START EAE TC, ONE CYCLE L → CARRY IN CARRY OUT → LINK DATA DATA F AC LOAD, MQ LOAD LINK LOAD	ADLK DIS L DATA F CARRY IN ENØ L, EN 2 L } MQ → ADDERS CARRY OUT → LINK DATA [AC LOAD] LINK LOAD GT GATING ENA GT LOAD	1 → SKIP	IF EAE INST. MD6,8,9/Ø → EIR
	TS4	1 → F	1 → F	1 → F	1 → F	ENØ CARRY IN (MA+1 → MA) 1 → E	
D	ALL						
E1	TS2						
	TS3						
	TS4						
E	TS2					$\overline{MD}$ → SC	
	TS3						FOR EACH EAE TIME PULSE, +1 → SC UNLESS RESTART WITH NO SHIFT ENABLES.
	TS4					1 → F	

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
KE8-E		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES
DECIMALS .XXX ± .005, .XX ± .02, .X ± .1 — ANGLES ±0° 30'
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓
MATERIAL —
FINISH —

DRN. Norm Crepeau DATE 22 Jun 71
CHK'D. W. Mabe DATE 8/10/71
ENG. DATE 8/18/71
PROJ. ENG. DATE 8/18/71
PROD. DATE 8/18/71
NEXT HIGHER ASSY. A-ML-KE8-E
SCALE NONE
SHEET 1 OF 1

digital EQUIPMENT CORPORATION MAYNARD MASSACHUSETTS

TITLE: EAE FLOW DIAGRAM

SIZE D | CODE FD | NUMBER KE8-E-Ø1 | REV.

DIST.

DEC FORM NO DRD 100-A

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.

DIGITAL EQUIPMENT CORPORATION

MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION

DATE 2/15/72

TITLE KE8E ACCEPTANCE PROCEDURE

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE

ENG	APPD	SIZE	CODE	NUMBER	REV
[signature]	[signature]	A	SP	KE8-E-0-4	

ENGINEERING SPECIFICATION

CONTINUATION SHEET

TITLE KE8E ACCEPTANCE PROCEDURE

1.Ø Equipment Required
- A. PDP-8E or PDP-8M
- B. M8340
- C. M8341
- D. 3-H851's
- E. Teletype
- F. Maindec-8E-DØLB-D-PB KE8E Instruction Test 1
- G. Maindec-8E-DØMB-D-PB KE8E Instruction Test 2
- H. Maindec-8E-DØRA-D-PB KE8E Extended Memory Exerciser

2.Ø Check that the M8340 and M8341 have:
- A. Proper circuit revision.
- B. Day code.

3.Ø Load and run the following diagnostics, consulting the Diagnostic Document for proper operating procedure.
- A. Maindec-8E-DØLB for two complete program passes which will be indicated by "KE81" being typed out twice.
- B. Maindec-8E-DØMB for two complete program passes which will be indicated by "KE8E" being typed out twice.
- C. Maindec-8E-DØRA for five complete program passes which will be indicated by "KE8EME" being typed out five times. At the beginning of the program, be sure to type the correct value defining the maximum amount of memory.

4.Ø Shipping Hardware
- A. M8340
- B. M8341
- C. 3-H8351's

5.Ø Shipping Software
- A. Libkit-8E-KE8E
- B. KE8E Print Set
- C. KE8E Maintenance Manual

	SIZE	CODE	NUMBER	REV
	A	SP	KE8-E-0-4	

DIGITAL EQUIPMENT CORPORATION WORLD-WIDE SALES AND SERVICE

146 Main Street, Maynard, Massachusetts, U.S.A. 01754
Telephone: From Metropolitan Boston: 646-8600 • Elsewhere: (617)-897-5111
TWX: 710-347-0212 Cable: DIGITAL MAYN Telex: 94-8457

UNITED STATES

NORTHEAST

REGIONAL OFFICE
275 Wyman Street, Waltham, Massachusetts 02154
Telephone: (617)-890-0320/0330 TWX: 710-324-6919

WALTHAM
15 Lunda Street, Waltham, Massachusetts 02154
Telephone: (617)-891-1030 TWX: 710-324-6919

CAMBRIDGE/BOSTON
899 Main Street, Cambridge, Massachusetts 02139
Telephone: (617)-491-6130 TWX: 710-320-1167

ROCHESTER
130 Allens Creek Road, Rochester, New York 14618
Telephone: (716)-461-1700 TWX: 710-253-3078

CONNECTICUT
240 Pomeroy Ave., Meriden, Conn 06450
Telephone: (203)-237-8441/7466 TWX: 710-461-0054

MID-ATLANTIC — SOUTHEAST

REGIONAL OFFICE:
U.S. Route 1, Princeton, New Jersey 08540
Telephone: (609)-452-2940 TWX: 510-685-2338

NEW YORK
95 Cedar Lane, Englewood, New Jersey 07631
Telephone: (201)-871-4984, (212)-594-6955, (212)-736-0447
TWX: 710-991-9721

NEW JERSEY
1259 Route 46, Parsippany, New Jersey 07054
Telephone: (201)-335-3300 TWX: 710-987-8319

PRINCETON
U.S. Route 1
Princeton, New Jersey 08540
Telephone: (609) 452-2940 TWX: 510-685-2338

LONG ISLAND
1 Huntington Quadrangle
Suite 1SO7 Huntington Station, New York 11746
Telephone: (516)-694-4131, (212)-895-8095

PHILADELPHIA
Station Square Three, Paoli, Pennsylvania 19301
Telephone: (215)-647-4900/4410 Telex: 510-668-8395

WASHINGTON
Executive Building
6811 Kenilworth Ave., Riverdale, Maryland 20840
Telephone: (301)-779-1600/752-8797 TWX: 710-826-9662

DURHAM/CHAPEL HILL
2704 Chapel Hill Boulevard
Durham, North Carolina 27707
Telephone: (919)-489-3347 TWX: 510-927-0912

ORLANDO
Suite 130, 7001 Lake Ellenor Drive, Orlando, Florida 32809
Telephone: (305)-851-4450 TWX: 810-850-0180

ATLANTA
2815 Clearview Place, Suite 100,
Atlanta, Georgia 30340
Telephone: (404)-451-3734/3735/3736 TWX: 810-757-4223

MID-ATLANTIC — SOUTHEAST (cont.)

KNOXVILLE
6311 Kingston Pike, Suite 21E
Knoxville, Tennessee 37919
Telephone: (615)-588-6571 TWX: 810-583-0123

CENTRAL

REGIONAL OFFICE:
1850 Frontage Road, Northbrook, Illinois 60062
Telephone: (312)-498-2500 TWX: 910-686-0655

PITTSBURGH
400 Penn Center Boulevard
Pittsburgh, Pennsylvania 15235
Telephone: (412)-243-9404, TWX: 710-797-3657

CHICAGO
1850 Frontage Road, Northbrook, Illinois 60062
Telephone: (312)-498-2500 TWX: 910-686-0655

ANN ARBOR
230 Huron View Boulevard, Ann Arbor, Michigan 48103
Telephone: (313)-761-1150 TWX: 810-223-6053

INDIANAPOLIS
21 Beachway Drive — Suite G
Indianapolis, Indiana 46224
Telephone: (317)-243-8341 TWX: 810-341-3436

MINNEAPOLIS
Suite 111, 8030 Cedar Avenue South,
Minneapolis, Minnesota 55420
Telephone: (612)-854-6562-3-4-5 TWX: 910-576-2818

CLEVELAND
Park Hill Bldg., 35104 Euclid Ave.
Willoughby, Ohio 44094
Telephone: (216)-946-8484 TWX: 810-427-2608

ST. LOUIS
Suite 110, 115 Progress Pky., Maryland Heights,
Missouri 63043
Telephone: (314)-878-4310 TWX: 910-764-0831

DAYTON
3101 Kettering Blvd., Dayton, Ohio 45439
Telephone: (513)-299-7377 TWX: 810-459-1676

MILWAUKEE
8531 W. Capitol Drive, Milwaukee, Wisconsin 53222
Telephone: (414)-463-9110 TWX: 910-262-1199

DALLAS
8855 North Stemmons Freeway
Dallas, Texas 75247
Telephone: (214)-638-4880 TWX: 910-861-4000

HOUSTON
3417 Milam Street, Suite A, Houston, Texas 77002
Telephone: (713)-524-2961 TWX: 910-881-1651

CENTRAL (cont.)

NEW ORLEANS
3100 Ridgelake Drive, Suite 108
Metairie, Louisiana 70002
Telephone: 504-837-0257

WEST

REGIONAL OFFICE
310 Soquel Way, Sunnyvale, California 94086
Telephone: (408)-735-9200

ANAHEIM
801 E. Ball Road, Anaheim, California 92805
Telephone: (714)-776-6932/8730 TWX: 910-591-1189

WEST LOS ANGELES
1510 Cotner Avenue, Los Angeles, Californa 90025
Telephone: (213)-479-3791/4318 TWX: 910-342-6999

SAN DIEGO
3444 Hancock Street
San Diego, California 92110
Telephone: (714)-298-0591, 0593 TWX: 910-335-1230

SAN FRANCISCO
1400 Terra Bella
Mountain View, California 94040
Telephone: (415)-964-6200 TWX: 910-373-1266

PALO ALTO
560 San Antonio Rd., Palo Alto, California 94306
Telephone: (415)-969-6200 TWX: 910-373-1266

OAKLAND
7850 Edgewater Drive
Oakland, California 94621
Telephone: (415)-635-5453/7830 TWX: 910-366-7238

ALBUQUERQUE
6303 Indian School Road, N.E.
Albuquerque, N.M. 87110
Telephone: (505)-296-5411/5428 TWX: 910-989-0614

DENVER
2305 South Colorado Blvd., Suite #5
Denver, Colorado 80222
Telephone: (303)-757-3332/758-1656/758-1659
TWX: 910-931-2650

SEATTLE
1521 130th N.E., Bellevue, Washington 98005
Telephone: (206)-454-4058/455-5404 TWX: 910-443-2306

SALT LAKE CITY
431 South 3rd East, Salt Lake City, Utah 84111
Telephone: (801)-328-9838 TWX: 910-925-5834

PHOENIX
4358 East Broadway Road
Phoenix, Arizona 85040
Telephone: (602) 268-3488 TWX: 910-950-4691

PORTLAND
Suite 168
5319 S.W. Canyon Court, Portland, Ore. 97221
Telephone: (503) 297-3761/3765

INTERNATIONAL

EUROPEAN HEADQUARTERS

Digital Equipment Corporation International Europe
81 Route de l'Aire
1211 Geneva 26, Switzerland
Telephone: 42 79 50 Telex: 22 683

SWEDEN

Digital Equipment Aktiebolag
STOCKHOLM
Vretenvagen 2, S-171 54 Solna, Sweden
Telephone: 98 13 90 Telex: 170 50
Cable: Digital Stockholm

NEW ZEALAND

Digital Equipment Corporation Ltd.
AUCKLAND
Hilton House, 430 Queen Street, Box 2471 A,
Auckland, New Zealand
Telephone: 75-533

INTERNATIONAL (cont.)

FRANCE

Equipment Digital S.A.R.L.
PARIS
327 Rue de Charenton, 75 Paris 12 ème, France
Telephone: 344-76-07 Telex: 21339
GRENOBLE
10 rue Auguste Ravier, F-38 Grenoble, France
Telephone: (76) 87 87 32 Telex: 32 882 F (Code 212)

GERMANY

Digital Equipment GmbH
MUNICH
8 Muenchen 13, Wallensteinplatz 2
Telephone: 0811-35031 Telex: 524-226
COLOGNE
5 Koeln, Bismarckstrasse 7,
Telephone: 0221-522181 Telex: 888-2269
Telegram: Flip Chip Koeln
FRANKFURT
6078 Neu-Isenburg 2
Am Forsthaus Gravenbruch 5-7
Telephone: 06102-5526 Telex: 41-76-82
HANNOVER
3 Hannover, Podbielskistrasse 102
Telephone: 0511-69-70-95 Telex: 922-952

AUSTRIA

Digital Equipment Corporation Ges.m.b.H
VIENNA
Mariahilferstrasse 136, 1150 Vienna 15, Austria
Telephone: 85 51 86

UNITED KINGDOM

Digital Equipment Co., Ltd.
U.K. HEADQUARTERS
Arkwright Road, Reading, Berks.
Telephone: 0734-583555 Telex: 84327
READING
The Evening Post Building, Tessa Road
Reading, Berks.
BIRMINGHAM
29/31, Birmingham Road, Sutton Coldfield, Warwicks.
Telephone: (0044) 21-355 5501 Telex: 337 060
MANCHESTER
13 Upper Precinct, Walkden, Manchester M28 5AZ
Telephone: 061-790-8411 Telex: 668666
LONDON
Bilton House, Uxbridge Road, Ealing, London W.5.
Telephone: 01-579-2334 Telex: 22371
EDINBURGH
Shiel House, Craigshill, Livingston,
West Lothian, Scotland
Telephone: 32705 / Telex: 727113

NETHERLANDS

THE HAGUE
Digital Equipment N.V.
Sir Winston Churchilllaan 370
Rijswijk/The Hague, Netherlands
Telephone: 070-995-160 Telex: 32533

BELGIUM

BRUSSELS
Digital Equipment N.V./S.A.
108 Rue D'Arlon
1040 Brussels, Belgium
Telephone: 02-139256 Telex: 25297

NORWAY

Digital Equipment
OSLO
c/o Firma Service
Waldenmarthranesgate 84-B-86
Oslo 1, Norway
Telephone: 37 19 85, 37 02 30 Telex: 166 43

DENMARK

Digital Equipment Corporation
COPENHAGEN
Vesterbrogade 140, 1620 Copenhagen V

SWITZERLAND

Digital Equipment Corporation S.A.
GENEVA
81 Route de l'Aire
1211 Geneva 26, Switzerland
Telephone: 42 79 50 Telex: 22 683
ZURICH
Scheuchzerstrasse 21
CH-8006 Zurich, Switzerland
Telephone: 01/60 35 66 Telex: 56059

ITALY

Digital Equipment S.p.A.
MILAN
Corso Garibaldi 49, 20121 Milano, Italy
Telephone: 872 748 694 394 Telex: 33615

SPAIN

MADRID
Ataio Ingenieros S.A., Enrique Larreta 12, Madrid 16
Telephone: 215 35 43 / Telex: 27249

BARCELONA
Ataio Ingenieros S.A., Ganduxer 76, Barcelona 6
Telephone: 221 44 66
Digital Equipment Corporation Ttd.

AUSTRALIA

Digital Equipment A a Pty. Ltd.
SYDNEY
P.O. Box 491, Crows Nest
N.S.W. Australia 3065
Telephone: 439-2566 Telex: AA20740
Cable: Digital, Sydney

MELBOURNE
60 Park Street, South Melbourne, Victoria, 3205
Telephone: 696-142 Telex: AA40616

PERTH
643 Murray Street
West Perth, Western Australia 6005
Telephone: 214-993 Telex: AA92140

BRISBANE
139 Merivale Street, South Brisbane
Queensland, Australia 4101
Telephone 444-047 Telex: AA40616

ADELAIDE
6 Montrose Avenue
Norwood, South Australia 5067
Telephone: 631-339 Telex: AA82825

CANADA

Digital Equipment of Canada, Ltd.
CANADIAN HEADQUARTERS
150 Rosamond Street, Carleton Place, Ontario
Telephone: (613)-257-2615 TWX: 610-561-1651
OTTAWA
120 Holland Street, Ottawa 3, Ontario K1Y 0X7
Telephone: (613)-725-2193 TWX: 610-562-8907
TORONTO
230 Lakeshore Road East, Port Credit, Ontario
Telephone: (416)-274-1241 TWX: 610-492-4306
MONTREAL
9675 Cote de Liesse Road
Dorval, Quebec, Canada 760
Telephone: 514-636-9393 TWX: 610-422-4124
EDMONTON
5531 - 103 Street
Edmonton, Alberta, Canada
Telephone: (403)-434-9333 TWX: 610-831-2248
VANCOUVER
Digital Equipment of Canada, Ltd.
2210 West 12th Avenue
Vancouver 9, British Columbia, Canada
Telephone: (604)-736-5616 TWX: 610-929-2006

ARGENTINA

BUENOS AIRES
Coasin S.A.
Virrey del Pino 4071, Buenos Aires
Telephone: 52-3185 Telex: 012-2284

VENEZUELA

CARACAS
Coasin S.A. (Sales only)
Apartado 50939
Salana Grande No. 1, Caracas
Telephone: 72-9637 Cable: INSTRUVEN

CHILE

SANTIAGO
Coasin Chile Ltda. (sales only)
Casilla 14588, Correo 15, Santiago
Telephone: 396713 Cable: COACHIL

JAPAN

TOKYO
Rikei Trading Co., Ltd. (sales only)
Kozato-Kaikan Bldg.
No. 18-14, Nishishimbashi 1-chome
Minato-Ku, Tokyo, Japan
Telephone: 5915246 Telex: 781-4208
Digital Equipment Corporation International
Kowa Building No. 17, Second Floor
2-7 Nishi-Azabu 1-Chome
Minato-Ku, Tokyo, Japan
Telephone: 404-5894/6 Telex: TK-6428

PHILIPPINES

Stanford Computer Corporation
P.O. Box 1608
416 Dasmarinas St., Manila
Telephone: 49-68-96 Telex: 742-0352

INDIA

H.S. Sonawala Mg Director (Sales Only)
HINDITRON SERVICES PUT LTD.
69/A Nepean Sea Road
Bombay, India