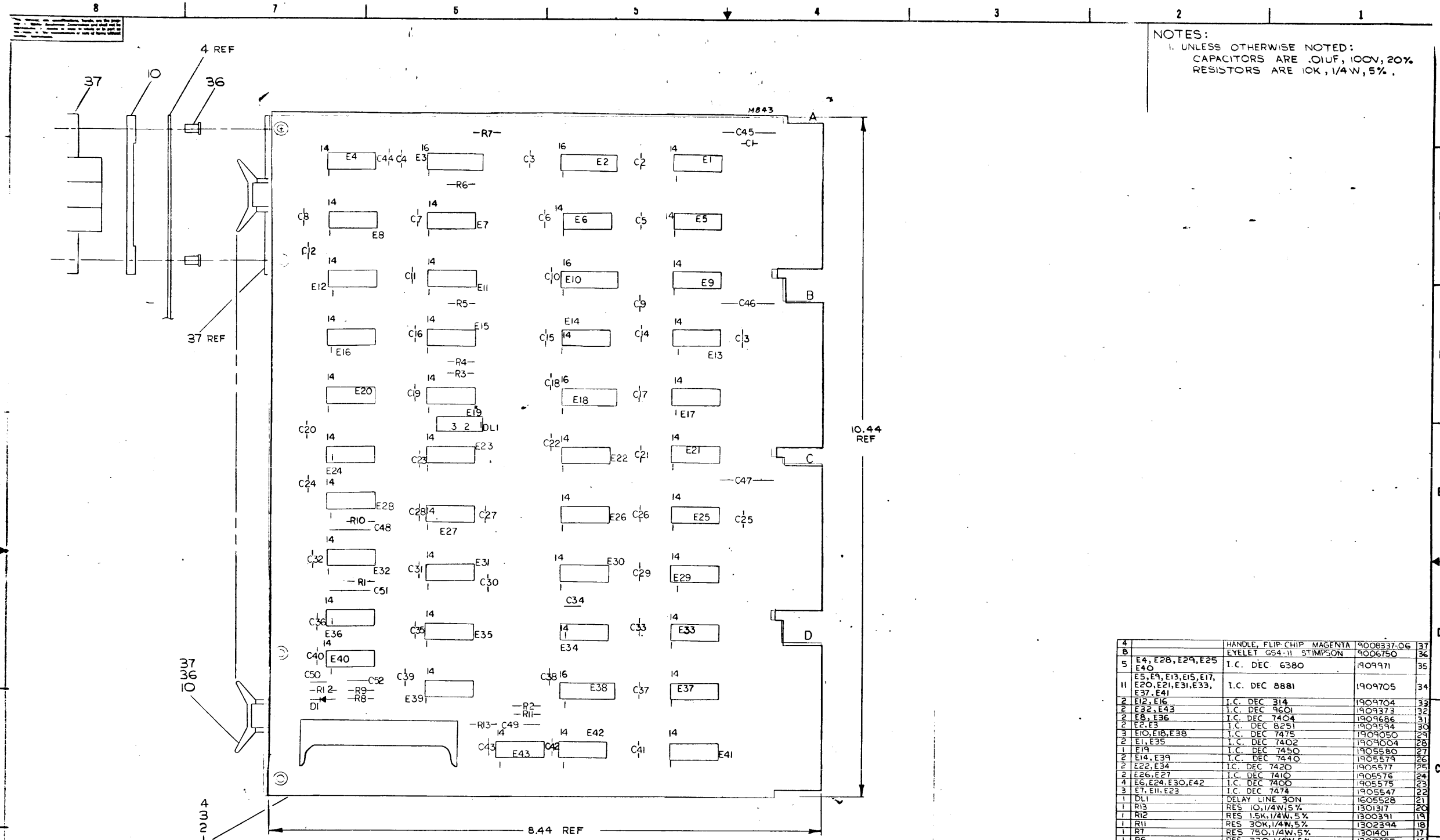


**CR8-E card reader
engineering drawings**



NOTES:
 1. UNLESS OTHERWISE NOTED:
 CAPACITORS ARE .01UF, 100V, 20%
 RESISTORS ARE 10K, 1/4W, 5%.

ITEM NO	AWG	FROM PT	TO PT
1	12	5	
2	8	16	
3	1	8	
4	1	8	

C PWR LOCATIONS

ITEM NO	AWG	FROM PT	TO PT
1	12	5	
2	8	16	
3	1	8	
4	1	8	

C45 C46 C47 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25 C26 C27 C28 C29 C30 C31 C32 C33 C34 C35 C36 C37 C38 C39 C40 C41 C42 C43

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	REV
1	D1	DIODE D6G4	1100114	1
2	C51, C52	CAP .560 MMF, 100V, 5% D.M.	1000025	1
2	C48, C49	CAP .100UF, 100V, 5% D.M.	1000016	1
5	C45-C47	CAP .01UF, 100V, 20% S. TANT	1000067	1
45	C1-C44, C50	CAP .01UF, 100V, 20% DISC	1001610	1
1		ETCHED CIRCUIT BOARD	5009624	4
REF		MODULE ECO HISTORY	8-MH-M843 0-6	3
REF		ASSY DRILLING HOLE LAYOUT	8-MH-M843 0-5	2
REF		X-Y COORDINATE HOLE LOC	X-CO-M843 0-4	1

QTY	REF DESIGNATION	DESCRIPTION	PART NO.	REV
4		HANDLE, FLIP-CHIP MAGENTA	9008337-06	37
5	E4, E28, E29, E25	EYELET GS4-11 STIMPSON	9006750	36
5	E40	I.C. DEC 6380	909971	35
11	E5, E9, E13, E15, E17, E20, E21, E31, E33, E37, E41	I.C. DEC 8881	1909705	34
2	E12, E16	I.C. DEC 314	1909704	33
2	E32, E43	I.C. DEC 9601	1909373	32
2	E8, E36	I.C. DEC 7404	1909166	31
2	E2, E3	I.C. DEC 8251	909594	30
3	E10, E18, E38	I.C. DEC 7475	1909050	29
2	E1, E35	I.C. DEC 7402	1909004	28
1	E14	I.C. DEC 7450	1905580	27
2	E14, E39	I.C. DEC 7440	1905579	26
2	E22, E34	I.C. DEC 7420	1905577	25
2	E26, E27	I.C. DEC 7410	1905576	24
4	E6, E24, E30, E42	I.C. DEC 7400	1905575	23
3	E7, E11, E23	I.C. DEC 7474	1905547	22
1	DL1	DELAY LINE 30N	1605528	21
1	R13	RES 10.1/4W, 5%	1301317	20
1	R12	RES 15K, 1/4W, 5%	1300391	19
1	R11	RES 30K, 1/4W, 5%	1302394	18
1	R7	RES 750, 1/4W, 5%	150401	17
1	R6	RES 330, 1/4W, 5%	1300295	16
2	R4, R5	RES 470, 1/4W, 5%	1300316	15
1	R3	RES 390, 1/4W, 5%	1300309	14
2	R2, R8	RES 4.7K, 1/4W, 5%	1300447	13
3	R1, R9, R10	RES 10K, 1/4W, 5%	1300479	12
1	J1	HEADER, RIGHT ANGLE 40PIN	1209941	11
4		SPACER (CABLE CLAMP)	1202704	10

ETCH BOARD REV E

DATE	BY	REVISION
12/11/77	H. L.	1

SEMICONDUCTOR CONVERSION CHART

DEC NO.	EIA NO.	DEC NO.	EIA NO.
D6G4	IN 3406		

SCALE: 1" = 1.000"

SHEET 1 OF 1

SEMICONDUCTOR CORPORATION

TITLE: CARD READER CONTROL

DATE: 12/11/77

BY: H. L.

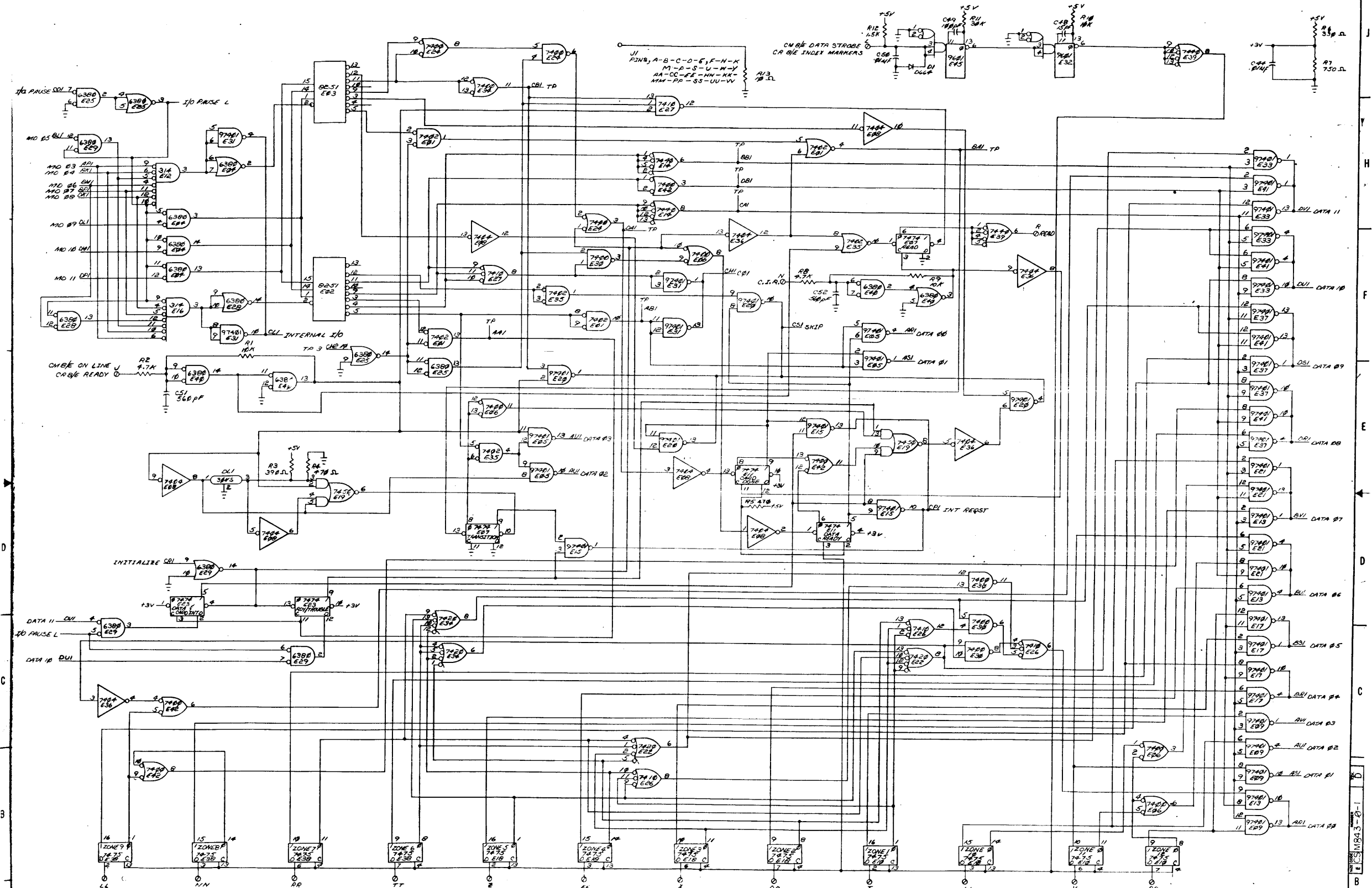
REV: 1

DEC NO: 813

EIA NO: ME-13-0-1

SHEET 1 OF 1

In drawing and specifications, refer to the pages of Digital Equipment Corporation and that will be furnished to you in order to obtain a copy of the drawing.



FIRST USED ON OPTION MODEL:		QTY.	DESCRIPTION	PART NO.	ITEM NO.
UNLESS OTHERWISE SPECIFIED					
DRAWN BY: [Signature]		DATE: [Date]		EQUIPMENT CORPORATION	
UNLESS OTHERWISE SPECIFIED		DRAWN IN INCHES		CONTROL CARD READER	
TOLERANCES: DIMENSIONS: ANGLES: [Values]		DATE: [Date]		REV. D	
MATERIAL: [Material]		NEXT HIGHER ASSY: [Part No.]		SCALE: 1:1	
FINISH: [Finish]		SHEET: 2 OF 2		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.

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION

DATE 7/16/71

TITLE CR8-E ACCEPTANCE PROCEDURE

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
-----	-------------	--------	------	------	---------	------

ENG	John McNamara	APPD	<i>[Signature]</i>	SIZE	A	CODE	SP	NUMBER	CR8-E 1	REV	
-----	---------------	------	--------------------	------	---	------	----	--------	---------	-----	--

DEC FORM NO. DRA 107

ENGINEERING SPECIFICATION



CONTINUATION SHEET

TITLE CR8-E ACCEPTANCE PROCEDURE

Scope: To define the criteria to accept a CR8-E for shipment.

Test Software:

GDI Technical Manual	GDI Model 100 -
Card Reader Diagnostic	Maindec - 8E - D2EA-D(D)
Alpha Card Deck	Maindec - 89 - D2A1 - C
Binary Card Deck	Maindec - 89 - D2A2 - C

Test Hardware:

PDP8/E
Oscilloscope

Procedure:

Run Maindec - 8/E - D2EA - D(D). Read one new deck of binary cards twenty times and one new deck of alpha cards twenty times.*
Perform standard vibration checks. Complete option check list.

Shipping Software:

GDI Technical Manual	GDI Model 100
Diagnostic Program	Maindec - 8E - D2EA - D(D)
Alpha Card Deck	Maindec - 89 - D2A1 - C
Binary Card Deck	Maindec - 89 - D2A2 - C
Prints	All prints on Master List
Manual	DEC - 8E - HR313-D-CR8E

Shipping Hardware:

Cable Assembly - H856 to Amp	DEC #7007252
Cord, AC extension - 9 ft.	DEC #1201265
Card Reader Control	DEC Module #M843

*Note: For each diagnostic deck run twenty times, there shall be no errors of any kind for twenty consecutive runs of that deck.

DEC FORM NO 16-1022

SIZE	A	CODE	SP	NUMBER	CR8-E 1	REV	
------	---	------	----	--------	---------	-----	--

SHEET 2 OF 2

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 8/30/71

TITLE CR8-E TEST PROCEDURE

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE

ENGINEERING SPECIFICATION



CONTINUATION SHEET

TITLE CR8-E TEST PROCEDURE

Test Equipment Required:

Oscilloscope
PDP-8/E
CR8-E Card Reader, Interface and Cable #7007252

Test Software Required:

GDI Technical Manual	GDI Model 100
Card Reader Diagnostic	Maindec 8E-D2EA-D(D)
Alpha Card Deck	Maindec 89-D2A1-C
Binary Card Deck	Maindec 89-D2A2-C

Procedure:

- A. The equipment is interfaced by means of an M843 module and a 7007252 cable. Any Omnibus slot may be used.
- B. Load Diagnostic Maindec-8E-D2EA-D(D).

NOTICE: If DF32 Disk is part of the system, it would be in the Operate Mode. When DF32 Disk is in Maintenance mode, it shares device codes with the card reader and therefore the card reader diagnostic cannot validly run.

Static test and manual intervention tests should operate correctly before attempting to operate all other tests.

C. Control Switch Settings:

- SW0 = 0 Test Alphanumeric Deck
- SW0 = 1 Test Binary Deck
- SW1 = 0 Print Data Error
- SW1 = 1 Suppress Print Data Error
- SW2 = 0 Halt After Data Error
- SW2 = 1 Suppress Halt After Data Error
- SW3 = 0 Halt At End of Test Deck
- SW3 = 1 Continue to Next Test Deck Without Halt

ENG	9-14-71	APPD	SIZE	CODE	NUMBER	REV
<i>[Signature]</i>		<i>[Signature]</i>	A	SP	CR8-E-2	

DEC FORM NO. DRA 107

DEC FORM NO 16-1022

SIZE	CODE	NUMBER	REV
A	SP	CR8-E-2	

ENGINEERING SPECIFICATION



CONTINUATION SHEET

TITLE CR8-E TEST PROCEDURE

D. Starting Addresses of Card Reader Tests:

- Ø2ØØ = Alpha and Binary Data Reliability Tests
- Ø2Ø2 = Static IOT Tests
- Ø2Ø4 = Manual Intervention Tests
- Ø2Ø6 = Compressed Code Data Reliability Tests
- Ø21Ø = Validity Bit Data Reliability Tests
- 23ØØ = Scope Loop

E. Program and/or Operator Action:

The tests provided in the diagnostic should be run in the following sequence:

1. Static IOT Tests

- a. Turn on card reader power.
- b. At this point the only red light to be on should be card supply. Reference GDI manual to remedy other red light error conditions.
- c. Load address Ø2Ø2.
- d. Depress Clear and then depress Continue
- e. Program will print "IOTs OK" if test runs. Program will halt if test fails. Reference symbolic listing and comments for appropriate error description.

2. Manual Intervention Tests:

- a. Place alphanumeric or binary test deck in lower hopper.
- b. Turn on card reader power.
- c. Depress card reader start.
At this point all red lights should be off.
- d. Load address Ø2Ø4.
- e. Select appropriate switch control (reference C above).

SIZE	CODE	NUMBER	REV
A	SP	CR8-E-2	

ENGINEERING SPECIFICATION



CONTINUATION SHEET

TITLE CR8-E TEST PROCEDURE

- f. Depress Clear and then depress Continue.
- g. At this point program will attempt to read four cards and then issue message "operator must now press read stop".
- h. After read stop is pressed, program will then issue message "operator must now press read start".
- i. Program will print "Manual Tests OK" if test runs. Program will halt if test fails. Reference symbolic listing and comments for appropriate error description.

3. Validity Bit Data Reliability Tests:

Static IOT tests must operate correctly before attempting this test.

- a. Place Binary test deck in lower hopper.
- b. Turn on card reader power.
- c. Depress card reader start.
At this point all read lights should be off.
- d. Load address Ø21Ø.
- e. Select appropriate switch control (reference C above).
- f. Depress Clear, then depress Continue.
- g. Program will ring bell and print "*" when finished with an 8Ø card test deck.
- h. If more than 1 test deck has been loaded, repeat step e and press Continue.

SIZE	CODE	NUMBER	REV
A	SP	CR8-E-2	

TITLE CR8-E TEST PROCEDURE

4. Compressed Code Data Reliability Tests

Static IOT test must operate correctly before attempting this test.

- a. Place Alphanumeric test deck in lower hopper.
- b. Turn on card reader power.
- c. Depress card reader start.
At this point all red lights should be off.
- d. Load address 0206.
- e. Select appropriate switch control (reference C above).
- f. Depress clear then depress continue.
- g. Program will ring bell and print "*" when finished with an 80 card test deck.
- h. If more than 1 test deck has been loaded, repeat Step e and press continue.

5. Alphanumeric and Binary Data Reliability Tests

Static test must operate correctly before attempting this test.

- a. Place Alphanumeric or Binary test deck in lower hopper.
- b. Turn on card reader power.
- c. Depress card reader start.
At this point all red lights should be off.
- d. Load address 0200.
- e. Select appropriate switch control (reference C above).
- f. Depress clear and then depress continue.

SIZE	CODE	NUMBER	REV
A	SP	CR8-E-2	

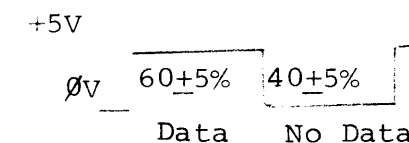
TITLE CR8-E TEST PROCEDURE

g. Program will ring bell and print "*" when finished with an 80 card deck test.

h. If more than 1 test deck has been loaded, repeat Step e and press continue.

F. If the Diagnostic Does Not Run Properly

1. Load input hopper with cards of "0"'s and "1"'s pattern. Load and start computer with SR = 2300g (scope mode).
2. With a "0"'s and "1"'s deck cycling through the reader, the 12 amplified data bits can be observed by looking at the collector outputs of the photocell transistors. (Ref GDI Schematic #4003.) The output waveform should be:

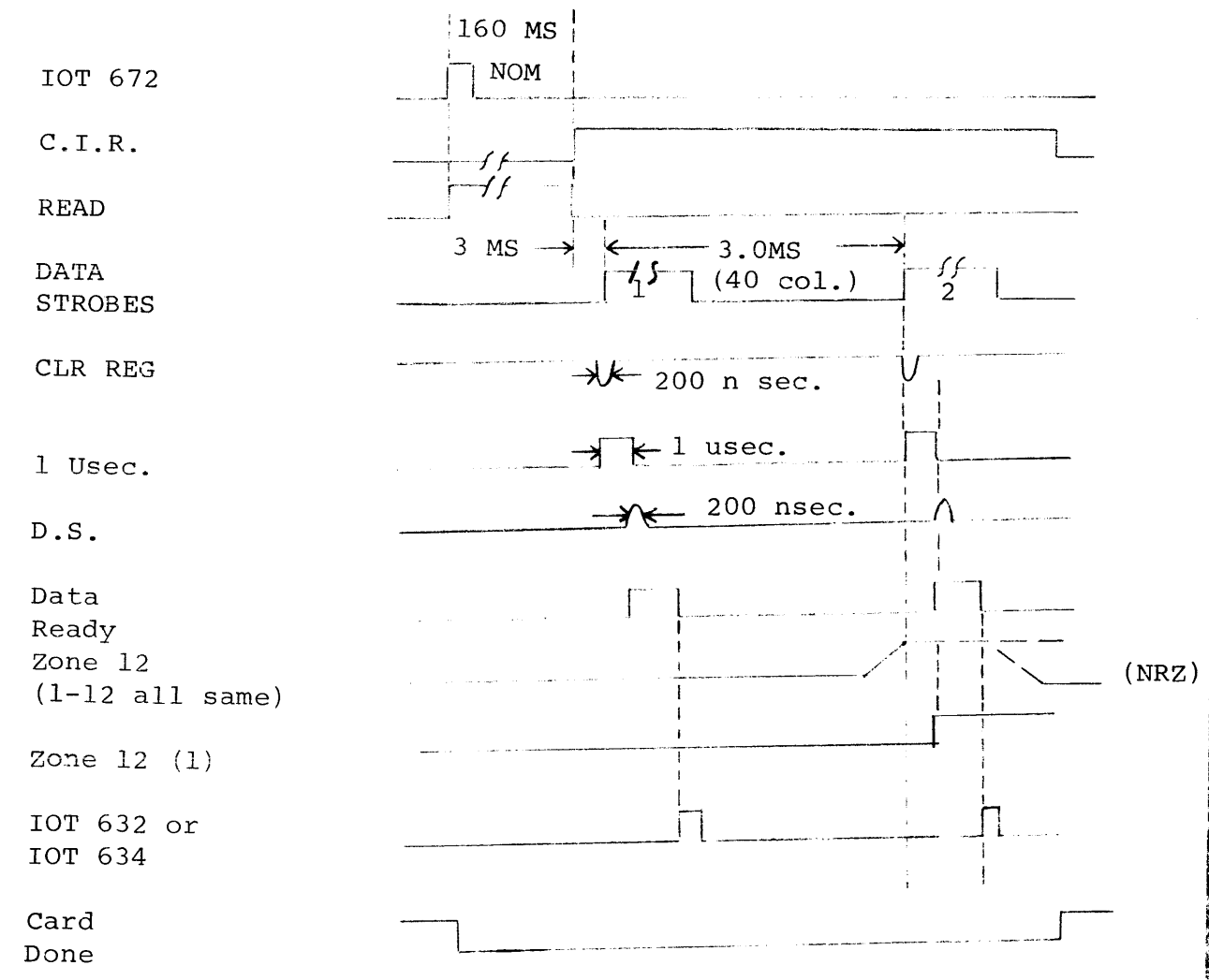


3. The timing chart may be used as a guide to trouble-shoot the unit.

SIZE	CODE	NUMBER	REV
A	SP	CR8-E-2	

TITLE CR8-E TEST PROCEDURE

G. The CR8-E is checked out when 4 decks of binary, 4 decks of alpha numeric cards and 4 decks of test pattern cards have been run for 10 passes each.



SIZE	CODE	NUMBER	REV
A	SP	CR8-E-2	

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ACCESSORY LIST

LEGEND

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

QUANTITY / VARIATION

MADE BY J. Mc Cluskey	CHECKED <i>J. Mc Cluskey</i>	SECTION
DATE 1/26/72	DATE 1-28-72	
ENG <i>J. Mc Cluskey</i>	PROD <i>J. Mc Cluskey</i>	ISSUED SECT.
DATE 1-28-72	DATE 1-28-72	

ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	QUANTITY / VARIATION						KIT CHECK		INSTALLATION CHECK	
			CR8-E	CR8-EA					BY	DATE	BY	DATE
1	M843	Card Reader Control	1	1								
2	7007252	Cable Assembly	1	1								
3	1201265	AC Extension Cord 9 Ft.	1	1								
4	3005998-1	GDI Card Reader	1	0								
5	GDI Model 100	GDI Technical Manual	1	1								
6	Maindec-89-D1B1-C	Alpha Card Deck (80 Cards)	1	1								
7	Maindec-89-D1B2-C	Binary Card Deck (80 Cards)	1	1								
8	Maindec-8E-D2EB-PB	CR8/E Card Reader Test (Paper Tape)	1	1								
9	Maindec-8E-D2EB-D	CR8/E Card Reader Test (Document)	1	1								
10	A-ML-CR8-E	CR8/E Print Set	1	1								
11	Dec-8E-HR313-D-CR8/E	CR8/E Maintance Manual	1	1								
12	3005998-2	GDI Card Reader	0	1								
		Note When Item 11 Is Temporarily Waived										
		Ship The Following										
	A-S-CR8-E-1	Acceptance Procedure										
	A-SP-CR8-E-3	Engineering Specifications										

TITLE CARD READER	ASSY. NO.	SIZE CODE A AL	NUMBER CR8-E-4	REV.	ECO NO
	SHEET OF	DIST.			

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

PARTS LIST

QUANTITY / VARIATION

MADE BY KEN GULICK	CHECKED KEN GULICK	SECTION
DATE 7-26-71	DATE 7-26-71	1
ENG <i>John H. ...</i>	PROD <i>...</i>	ISSUED SECT.
DATE 7-30-71	DATE <i>8/2</i>	1

ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	CR8-E	60HZ	CR8-E	50HZ	CR8-F	60HZ	CR8-F	50HZ					
1	E-CS-M843-0-1	CONTROL CARD READER	1	1											
2	D-IA-7007252-0-0	CABLE, CARD READER INTERFACE	1	1											
3	3005998	CARD READER	1	1											
2	D-IA-7008738-0-0	CABLE, CARD READER INTERFACE				1	1								
3	30-10639-1, 2	CARD READER				1	1								

TITLE CARD READER & CONT	ASSY NO. NONE	SIZE A	CODE PL	NUMBER CR8-E-0	REV. A	ECO NO. CR8E- 00001
SHEET <u>1</u> OF <u>1</u>		DIST.				