

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS				
CHNG. CODE	SYM	NO	DESCRIPTION	APPROVED
	A		PRODUCTION RELEASE PER EN 82171	W. Brown
-	B	82311	REVISED SHTS. 2, 3, & 5 PER EN 82311	W. Brown
-	C	82682	REVISED SHTS 5 & 7 PER EN 82682	W. Brown

REFERENCE DESIGNATIONS	
LAST USED	NOT USED
J2	J1
C21	
P1	

REFERENCE DRAWINGS	
95W0998	WIRE LIST
44F0684	BOARD ASSY P/L
44D0684	BOARD ASSY
40D0175	BOARD DETAIL

DR		 varian data machines / a varian subsidiary 2722 michelson drive / irvine / california / 92664	
CHK W. Brown	7/6/73		
DSGN			
ENGR W. Brown	7/6/73		
APPD E. H. Hester	7/7/73		
THIS DOCUMENT MAY CONTAIN PROPRIETARY INFORMATION AND SUCH INFORMATION MAY NOT BE DISCLOSED TO OTHERS FOR ANY PURPOSE OR USED TO PRODUCE THE ARTICLE OR SUBJECT, WITHOUT WRITTEN PERMISSION FROM VDM		TITLE LOGIC DIAGRAM CARD READER CONTROLLER MODEL 620-2B	
CODE IDENT NO.	SIZE	DWG NO	REV
21101	C	91C0455	C
SCALE		SHEET 1 OF 8	

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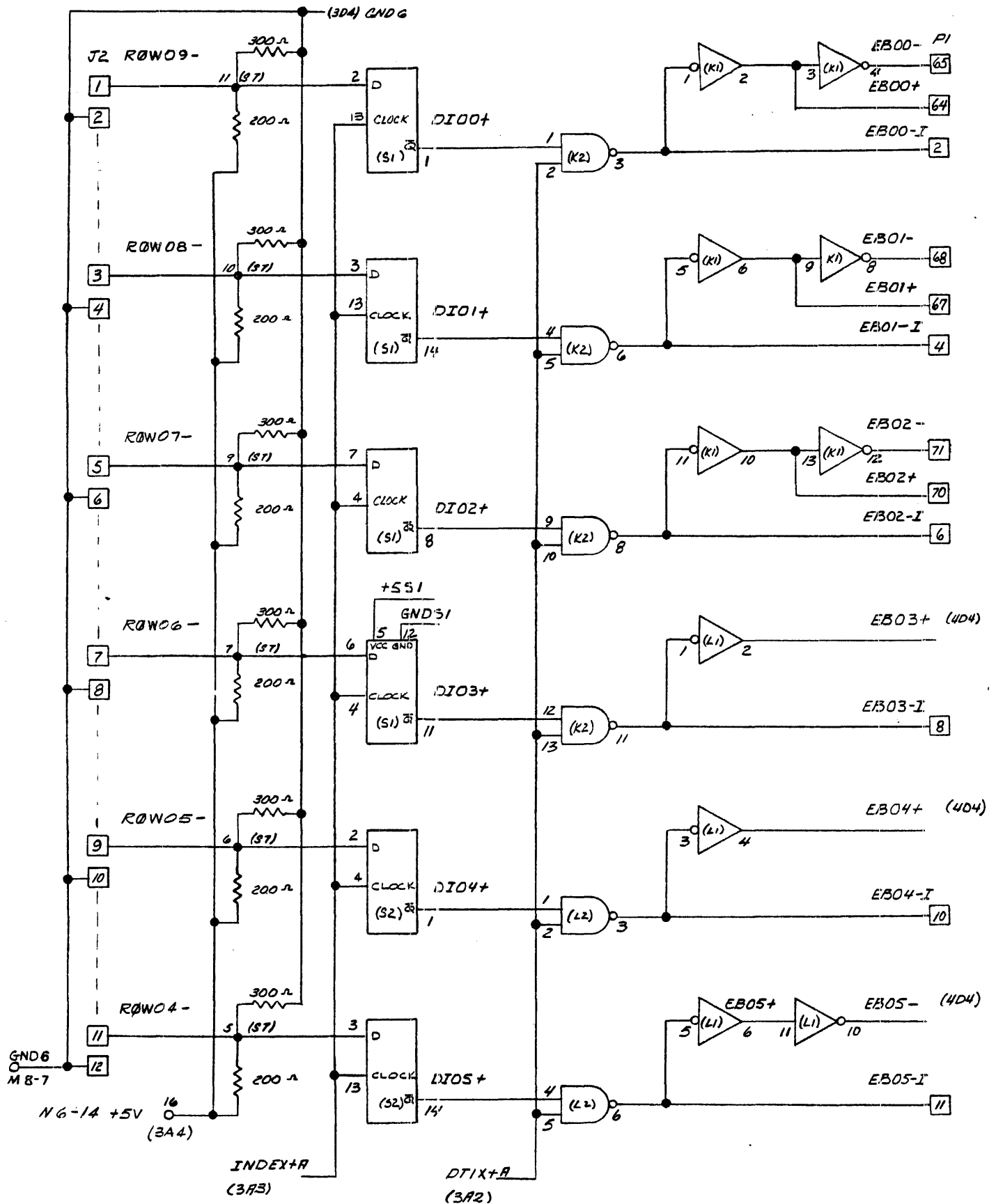
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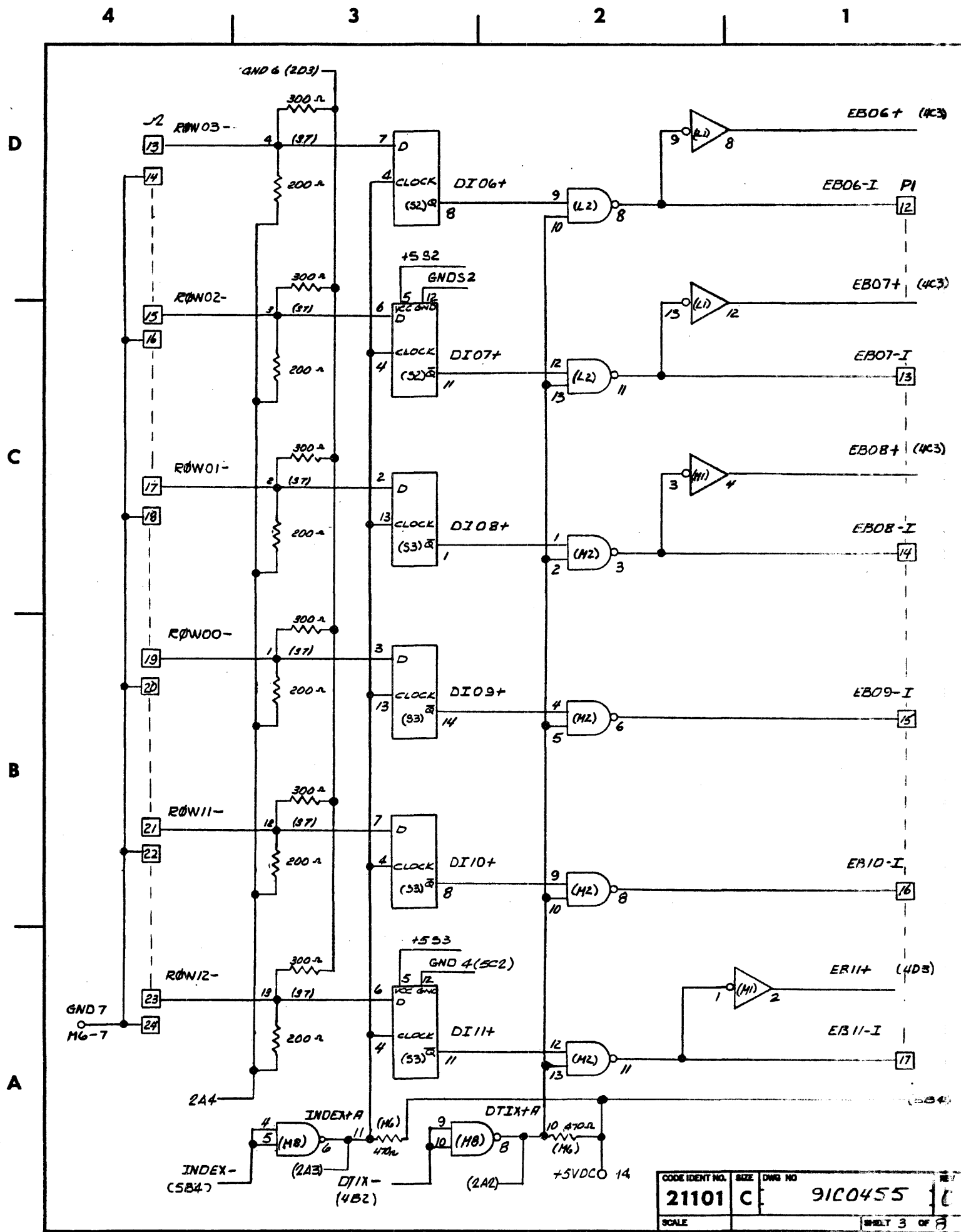
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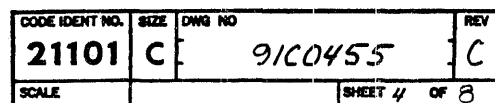
B

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CODE IDENT NO.	SIZE	DWG NO	REV
21101	C	91C0455	C
SCALE			
		SHEET 2 OF 8	





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C

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PI
 1
 2 EBOO-I (2D1)
 3 GND
 4 EBOI-I (2C1)
 5 GND
 6 EBO2-I (2C1)
 7 GND
 8 EBO3-I (2B1)
 9 GND
 10 EBO4-I (2B1)
 11 EBO5-I (2A1)
 12 EBO6-I (3D1)
 13 EBO7-I (3C1)
 14 EBO8-I (3C1)
 15 EBO9-I (3B1)
 16 EBO10-I (3B1)
 17 EBO11-I (3A1)
 18 EBO12-I (4B4)
 19 EBO13-I (4C4)
 20
 21
 22 GND
 23
 24 GND
 25
 26
 27 FRYX-I (4B4)
 28
 29 DRYX-I (4C4)
 30 GND
 31 SERX-I (4B1)
 32 GND

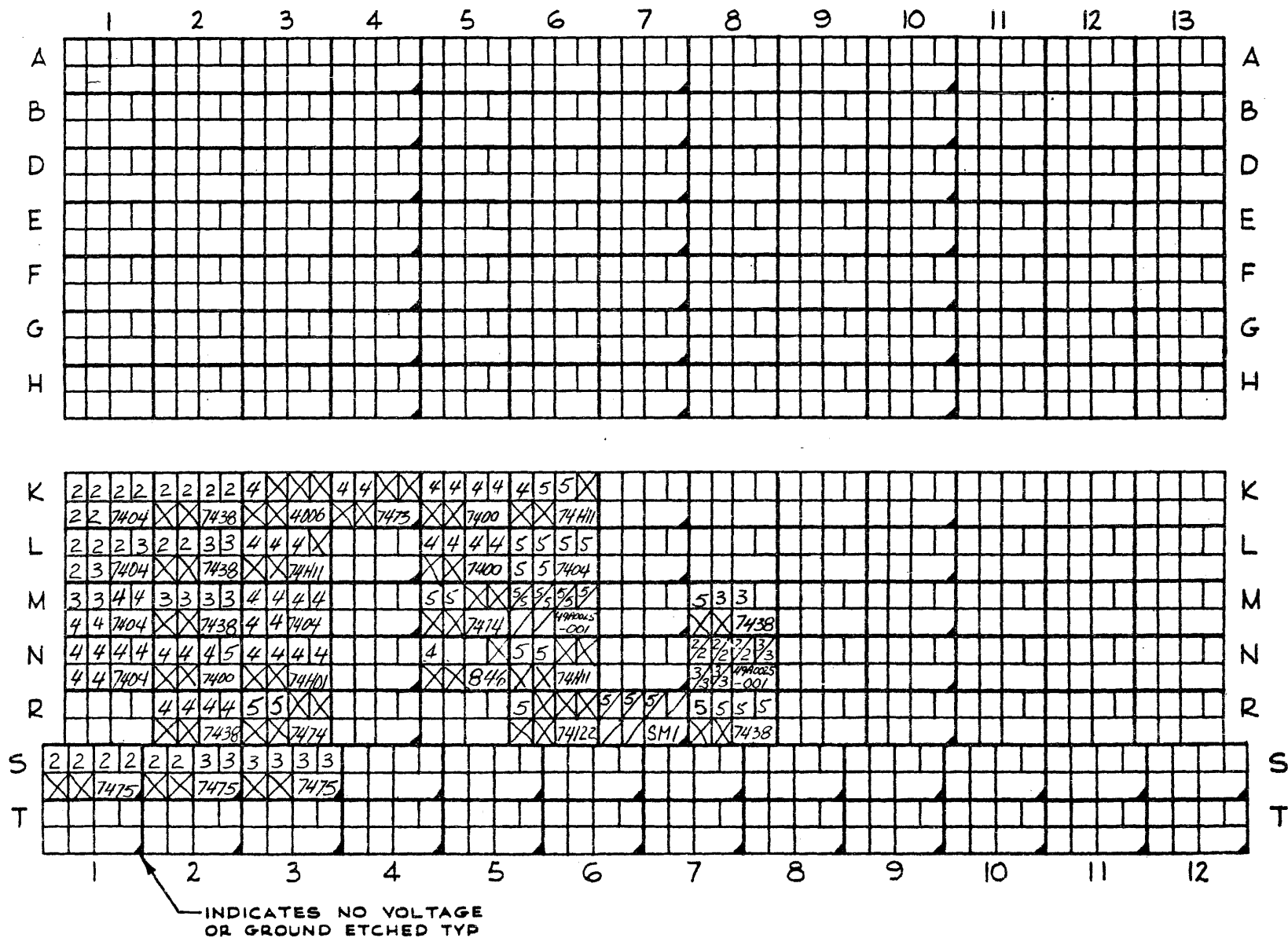
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 41
 42
 43 SYRT-I (4D4)
 44 IURX-I (4C4)
 45
 46
 47
 48 GND
 49 TRGX-B (4A1)
 50
 51
 52 BCDX-B (4B1)
 53
 54 CDCX-B (4A1)
 55 GND
 56 DCEX-B (4A4)
 57 GND
 58 TAKX-I (4B4)
 59 GND
 60 DESX-B (4A4)
 61
 62
 63
 64 EBOO+ (2D1)
 65 EBOO- (2D1)
 66 EBOI+ (4D4)
 67 EBOI+ (2C1)
 68 EBOI- (2C1)
 69 EBI+ (4D4)
 70 EBO2+ (2C1)
 71 EBO2- (2C1)

PI
 72 EB2I+ (4D4)
 73
 74
 75 CRDYI- (5B1)
 76
 77 ERRORI- (5B1)
 78
 79 READYI- (5B1)
 80
 114
 115
 116
 117
 118 +5V
 119
 120
 121 +5V
 122 GND
 J2
 1 ROW09- (2D4)
 2 GND G (2A4)
 3 ROW08- (2C4)
 4 GND G (2A4)
 5 ROW07 (2C4)
 6 GND G (2A4)
 7 ROW06- (2B4)
 8 GND G (2A4)
 9 ROW05- (2B4)
 10 GND G (2A4)
 11 ROW04- (2A4)
 12 GND G (2A4)

J2
 13 ROW03- (3D4)
 14 GND 7 (3D4)
 15 ROW02- (3C4)
 16 GND 7 (3C4)
 17 ROW01- (3C4)
 18 GND 7 (3C4)
 19 ROW00- (3B4)
 20 GND 7 (3B4)
 21 ROW11- (3B4)
 22 GND 7 (3B4)
 23 ROW12- (3A4)
 24 GND 7 3A4
 25 CLEARA- (5D1)
 26 GND B (5D1)
 27 PICK-A (5C1)
 28 GND B (5C1)
 29 ITR- (5D4)
 30 GND B (5D4)
 31 IPF- (5D4)
 32 GND B (5D4)
 33 IHE- (5D4)
 34 GND B (5C4)
 35 READY- (5C4)
 36 GND B (5C4)
 37 CI- (5C4)
 38 GND B (5C4)
 39 INDEX- (5B4)
 40 GND B (5B4)
 41
 42
 43
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CODE IDENT NO.	SIZE	DWG NO	REV
21101	C	91C0455	C
SCALE	SHEET 6 OF 8		

COMPONENT MAP



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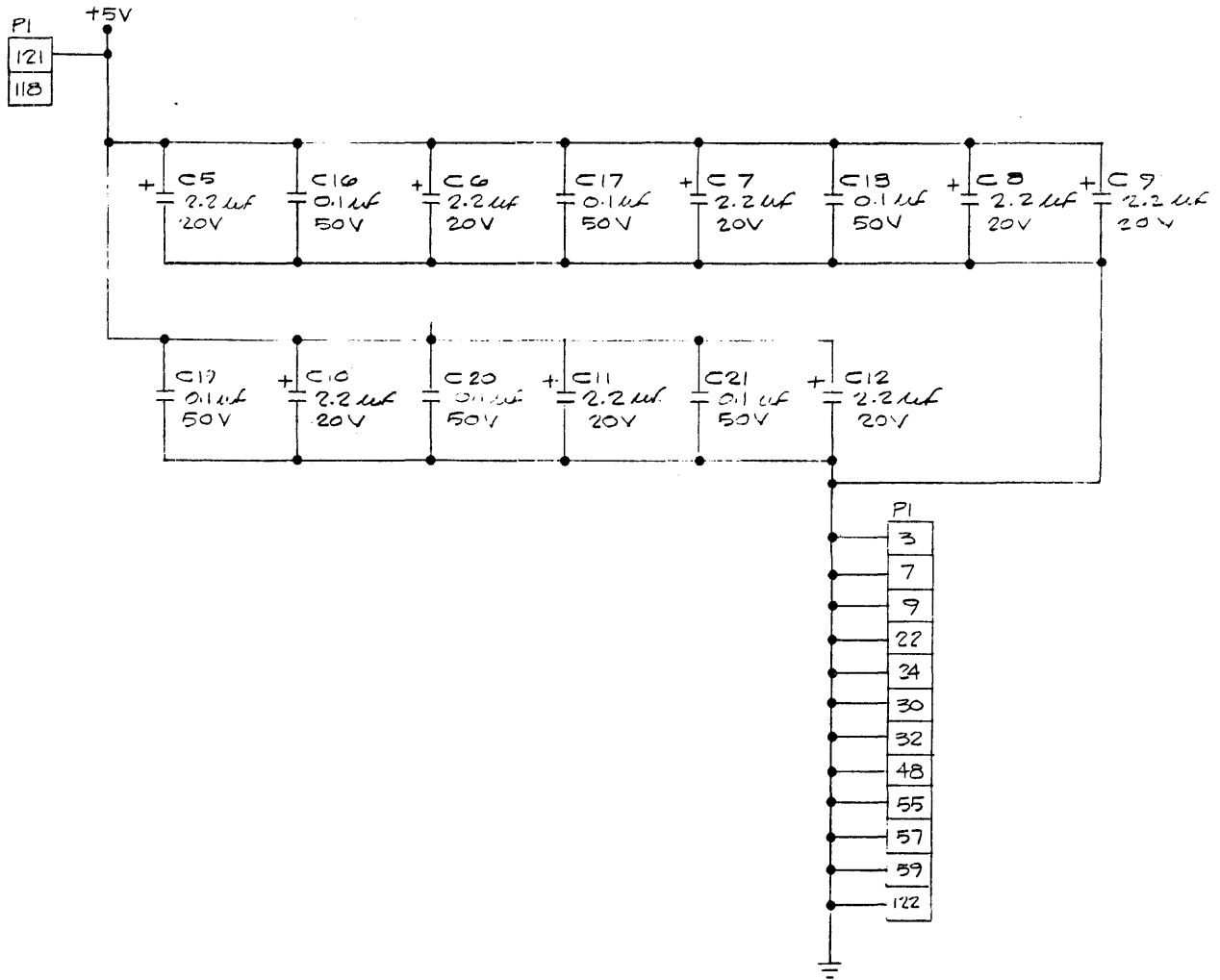
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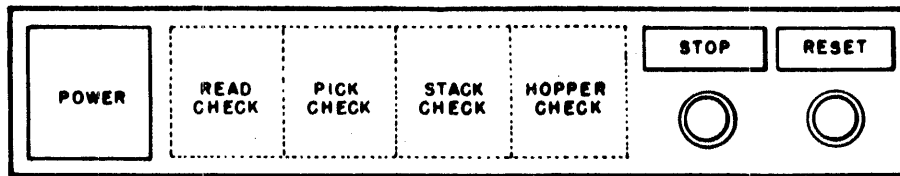
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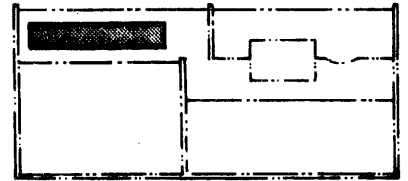
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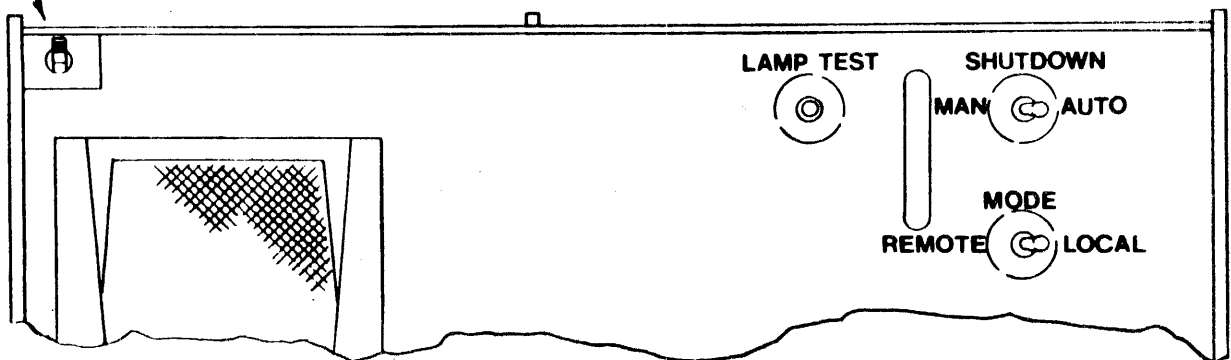
CODE IDENT NO.	SIZE	DWG NO	REV
21101	C	71C0455	C
SCALE			SHEET 3 OF 3



FRONT CONTROL PANEL



AC POWER SWITCH



REAR PANEL

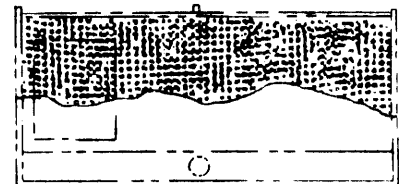


Figure 3. Switch Location

when the input hopper is empty. The motors will automatically restart when cards are placed in the hopper and the RESET switch is depressed. Expect a delay of approximately 3 seconds for the motors to run up.

OPERATIONAL FLOW CHART

Figure 4 shows a flow chart of the sequence of events which may be encountered in operating the reader. If trouble is experienced, refer to this check list before calling for maintenance.

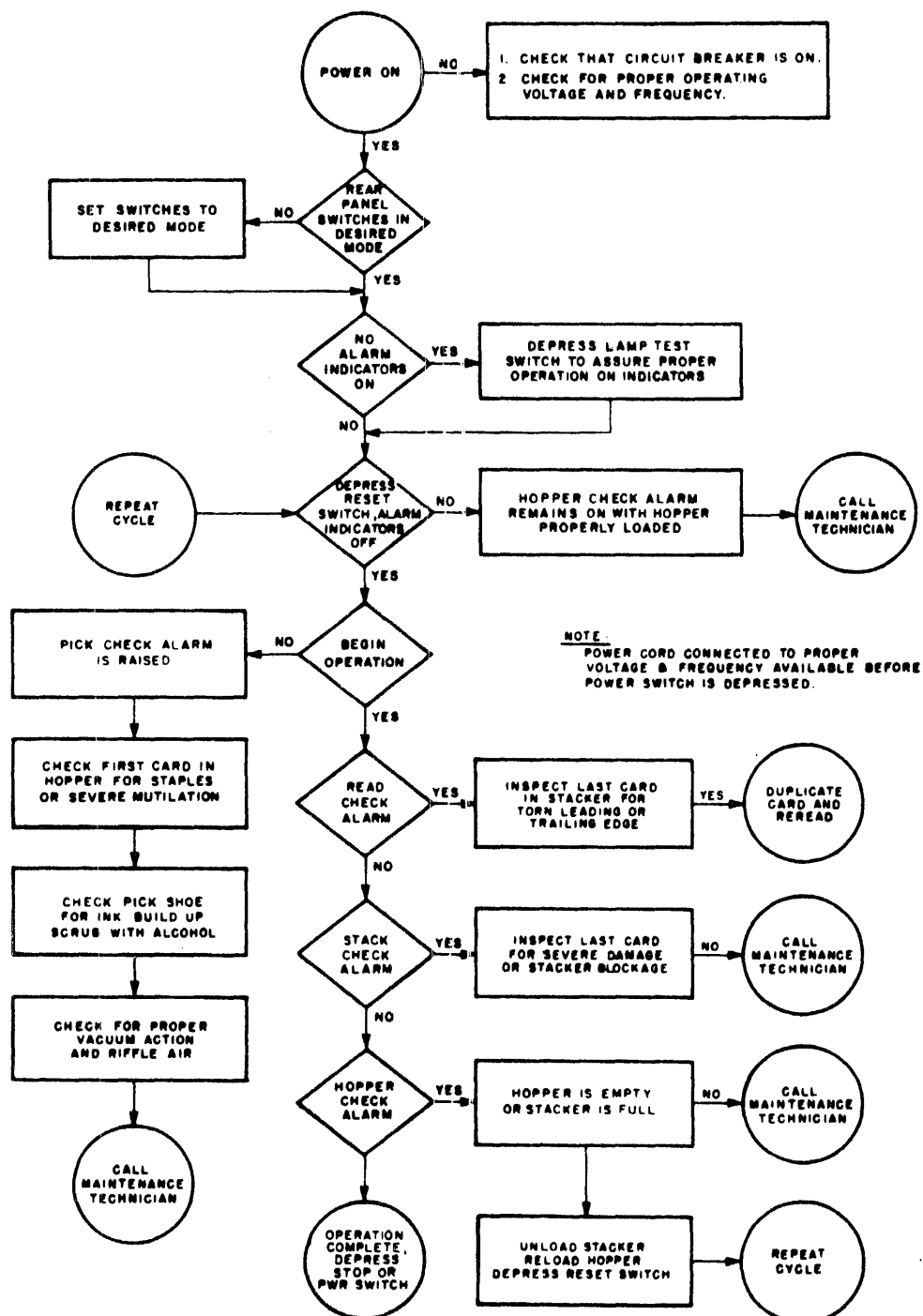


Figure 4. Operational Flow Chart

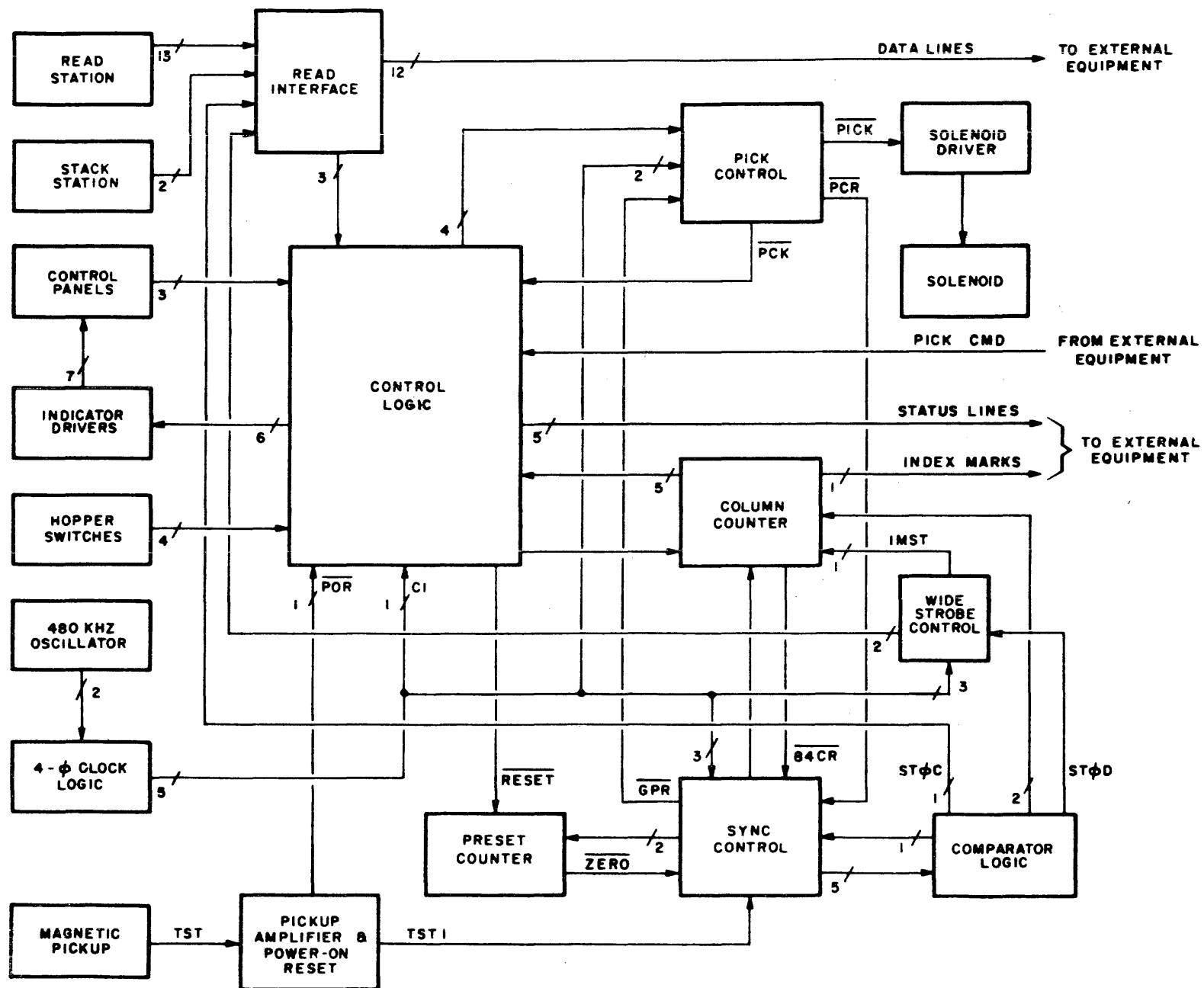


Figure 5. M Series Card Reader Logic Block Diagram

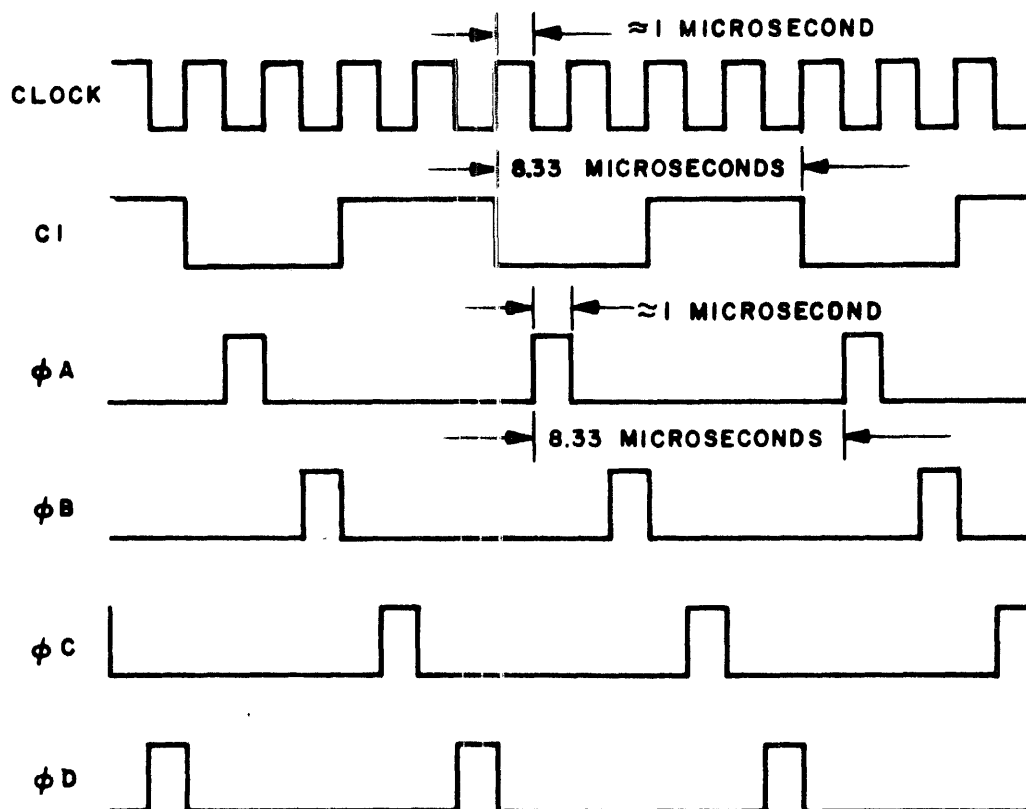
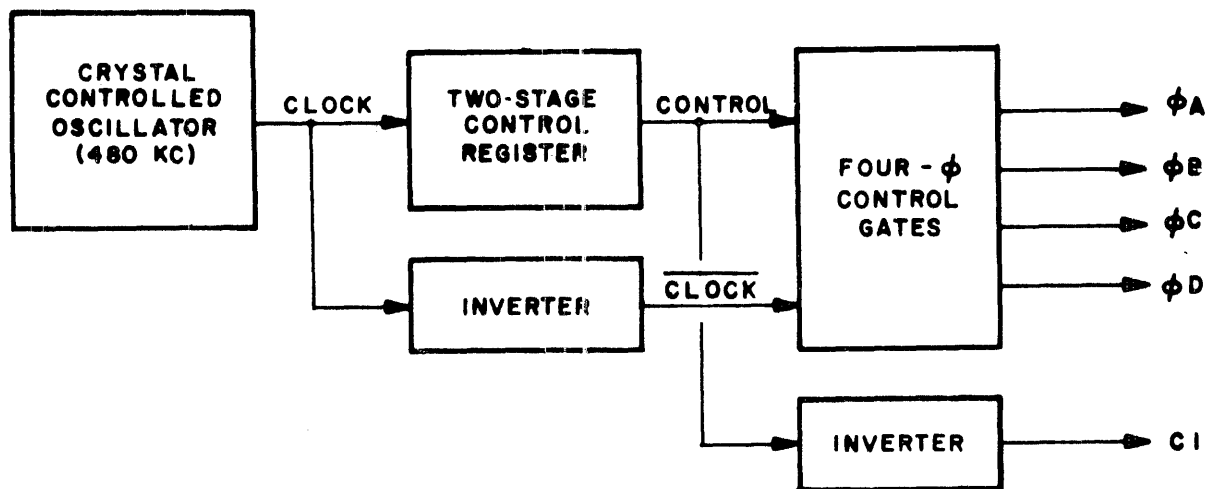
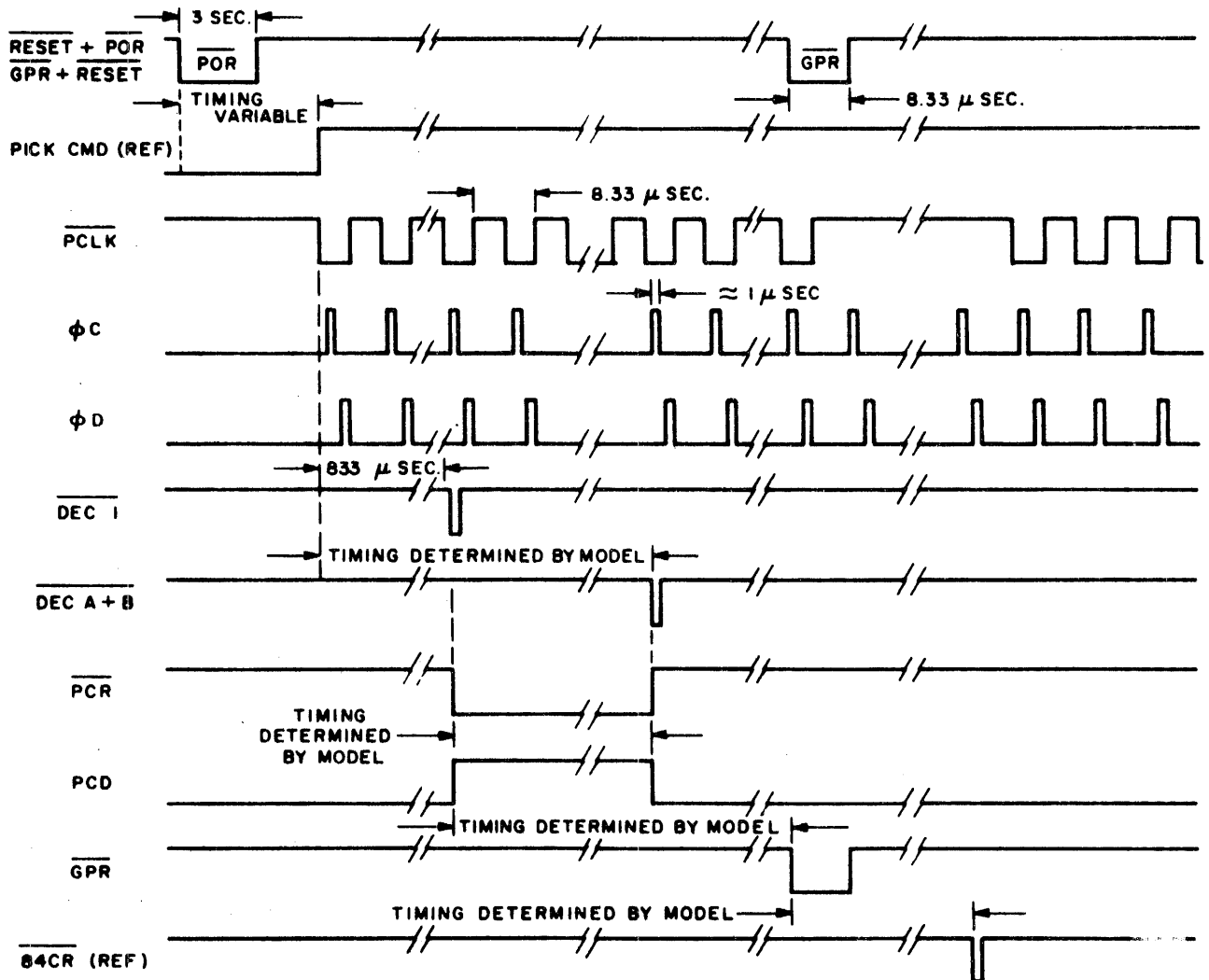
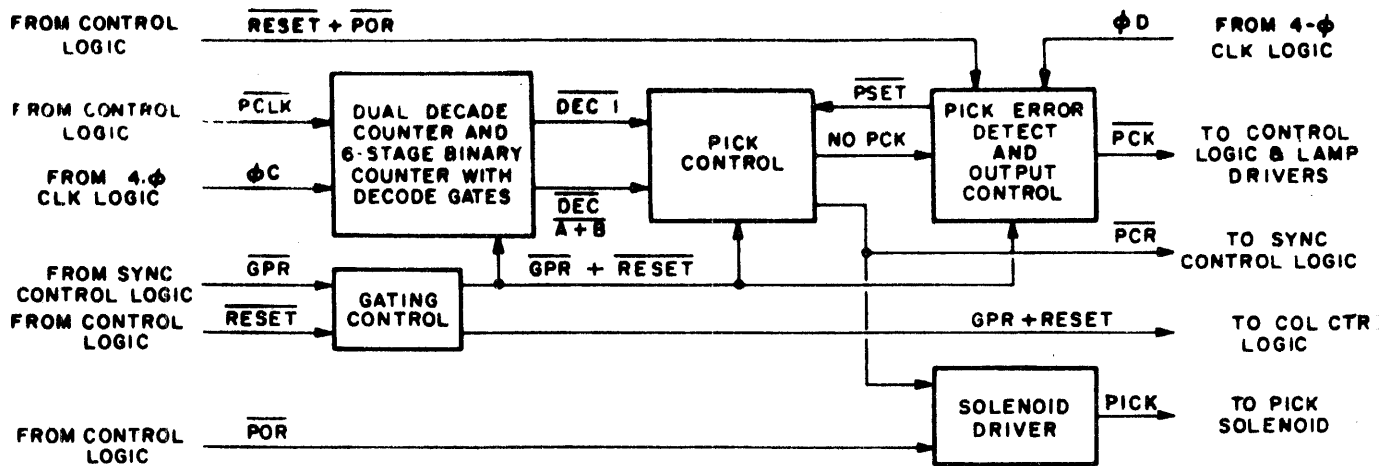
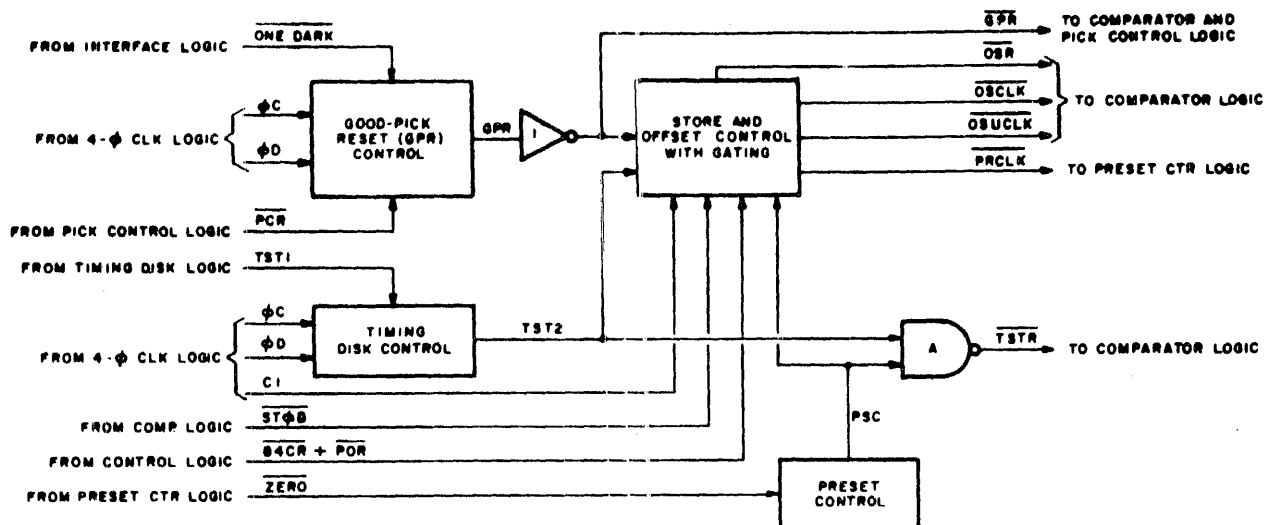


Figure 7. Oscillator/Four-Phase Clock Logic Block Diagram



NOTE: TIMING NOT SHOWN TO SCALE.

Figure 8. Pick Control Logic Block Diagram



NOTES

- (1) FOLLOWING TIMING NOT SHOWN TO SCALE.
- (2) TIME SCALE OF SECOND GROUP NOT SAME AS FIRST GROUP

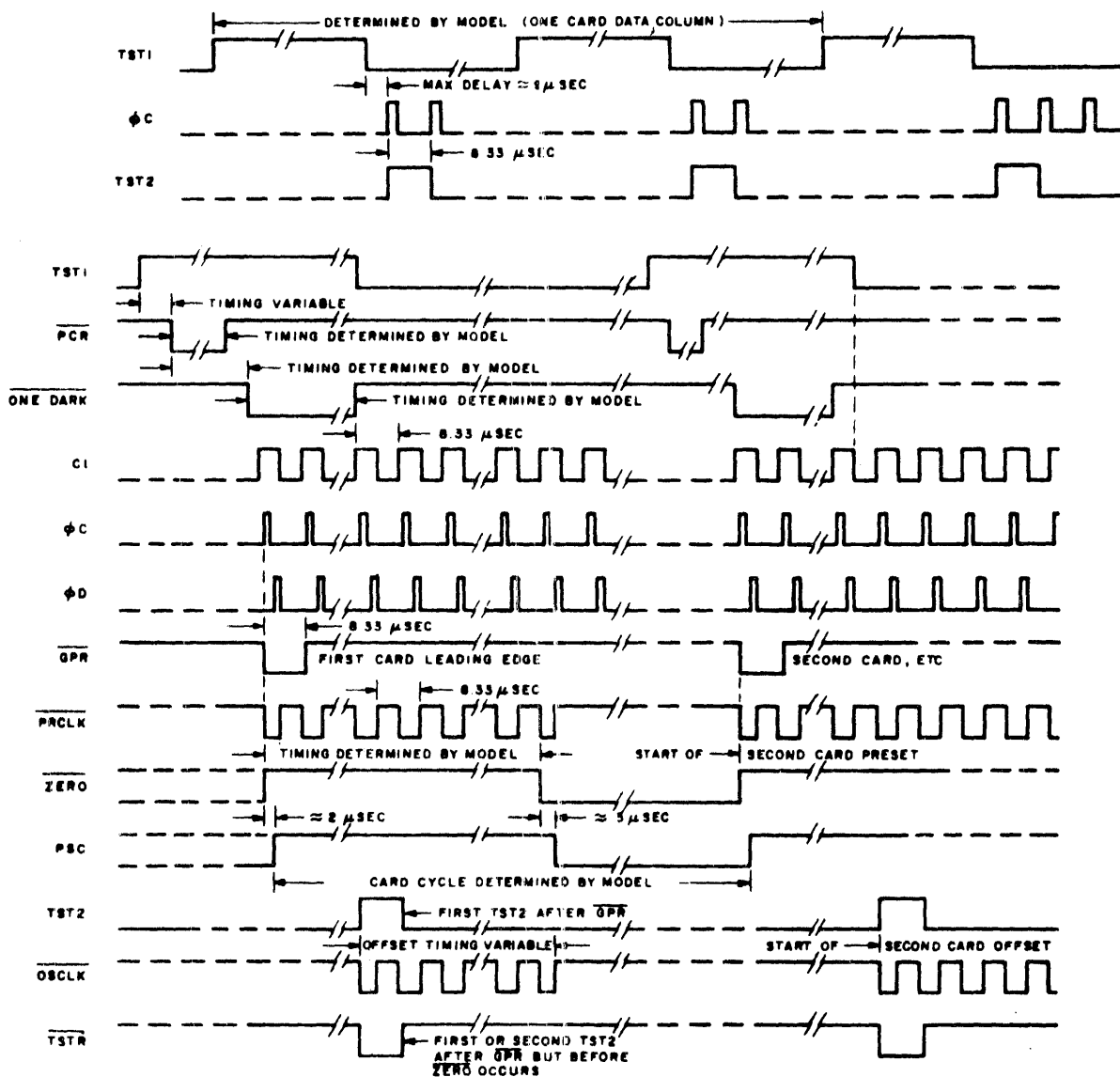


Figure 9. Sync Control Logic Block and Timing Diagram
(Sheet 1 of 2).

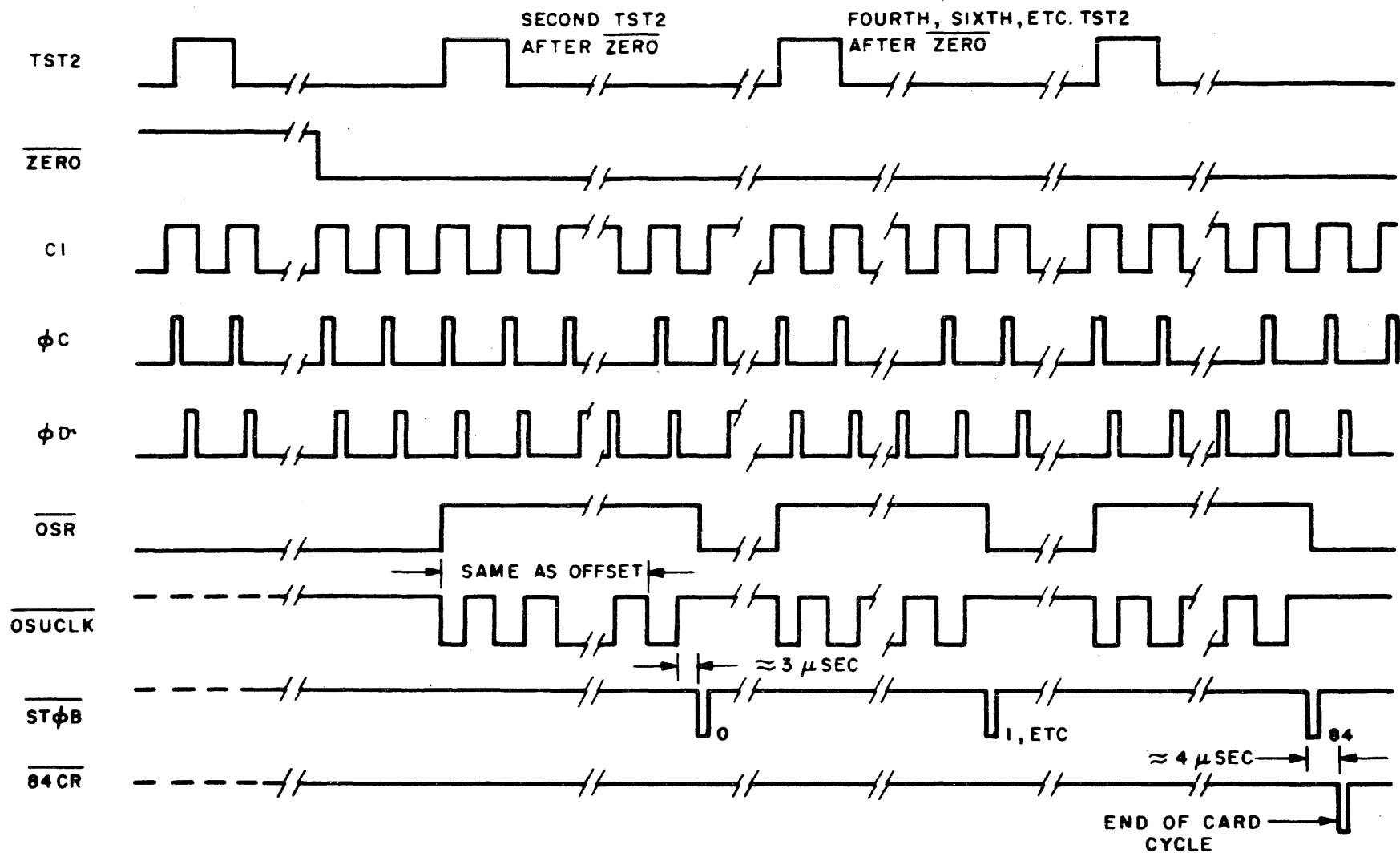
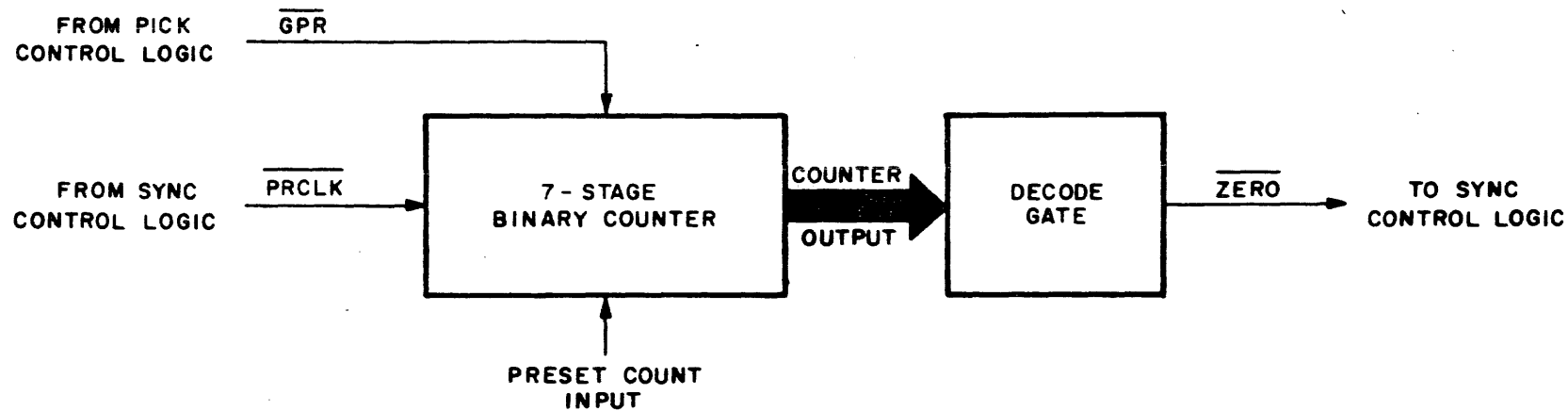


Figure 9. Sync Control Logic Block and Timing Diagram
(Sheet 2 of 2)



NOTE :

TIMING NOT SHOWN TO SCALE

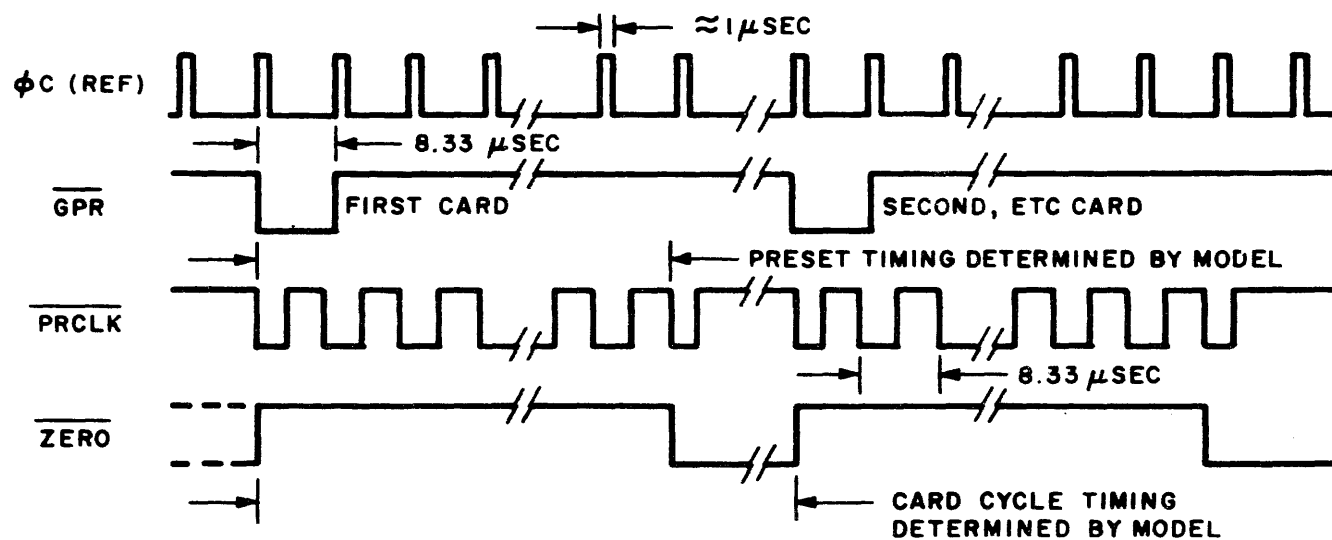


Figure 10. Preset Counter Logic Block Diagram

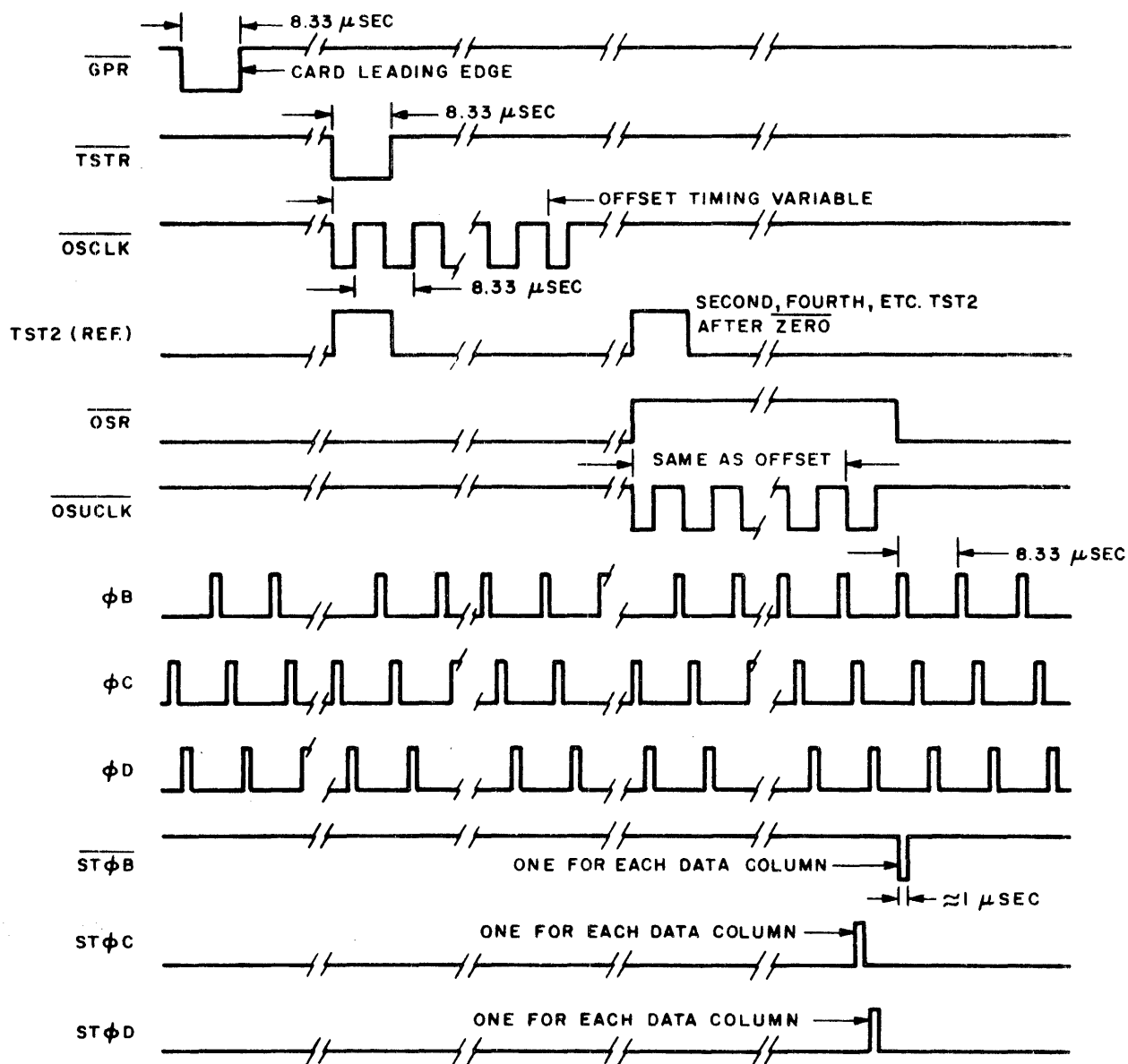
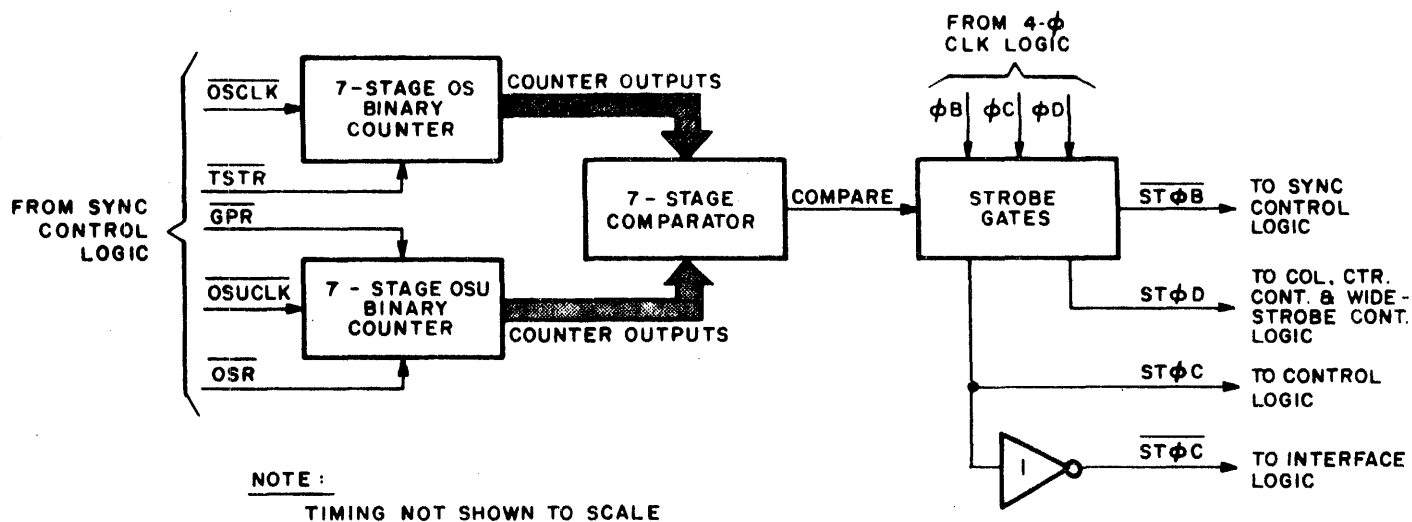
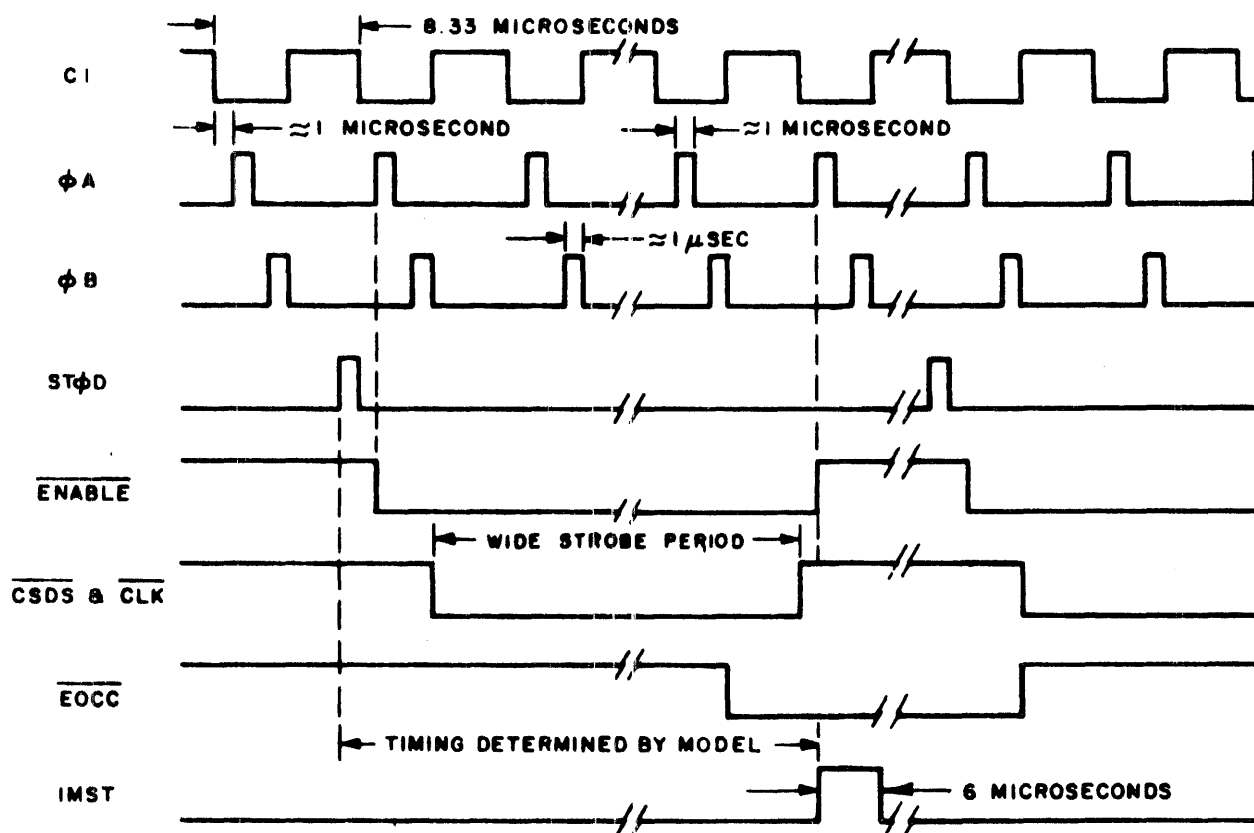
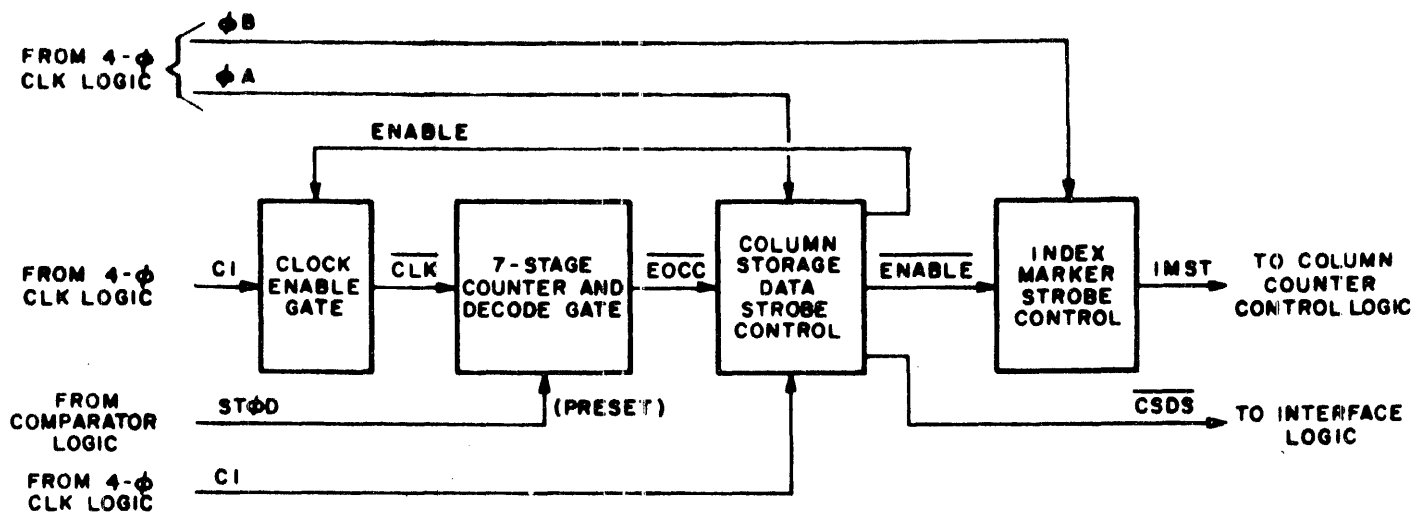


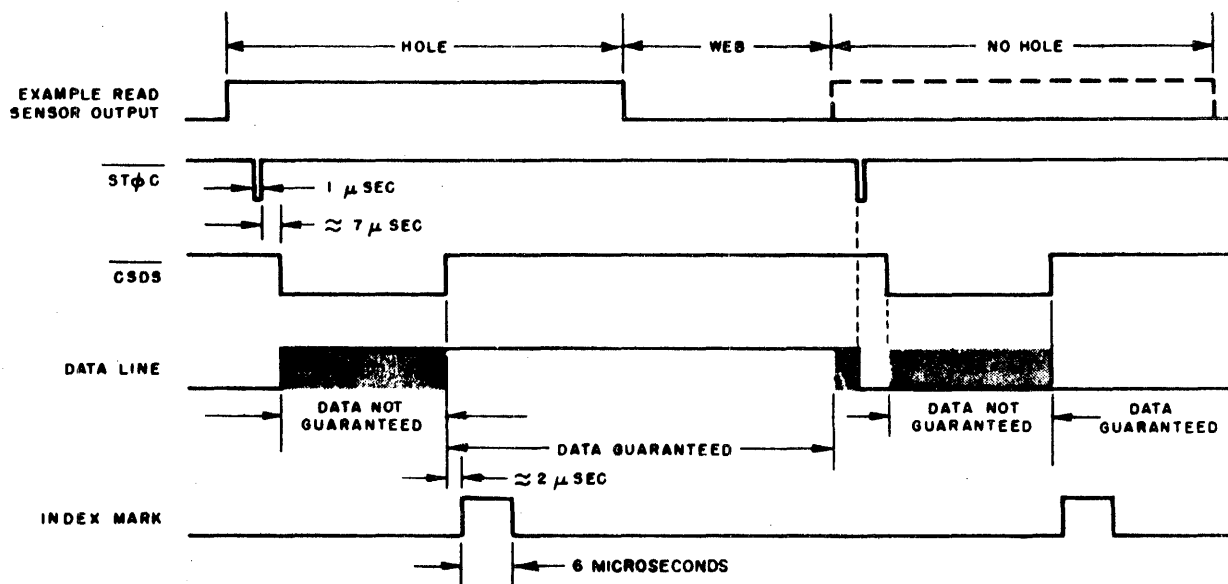
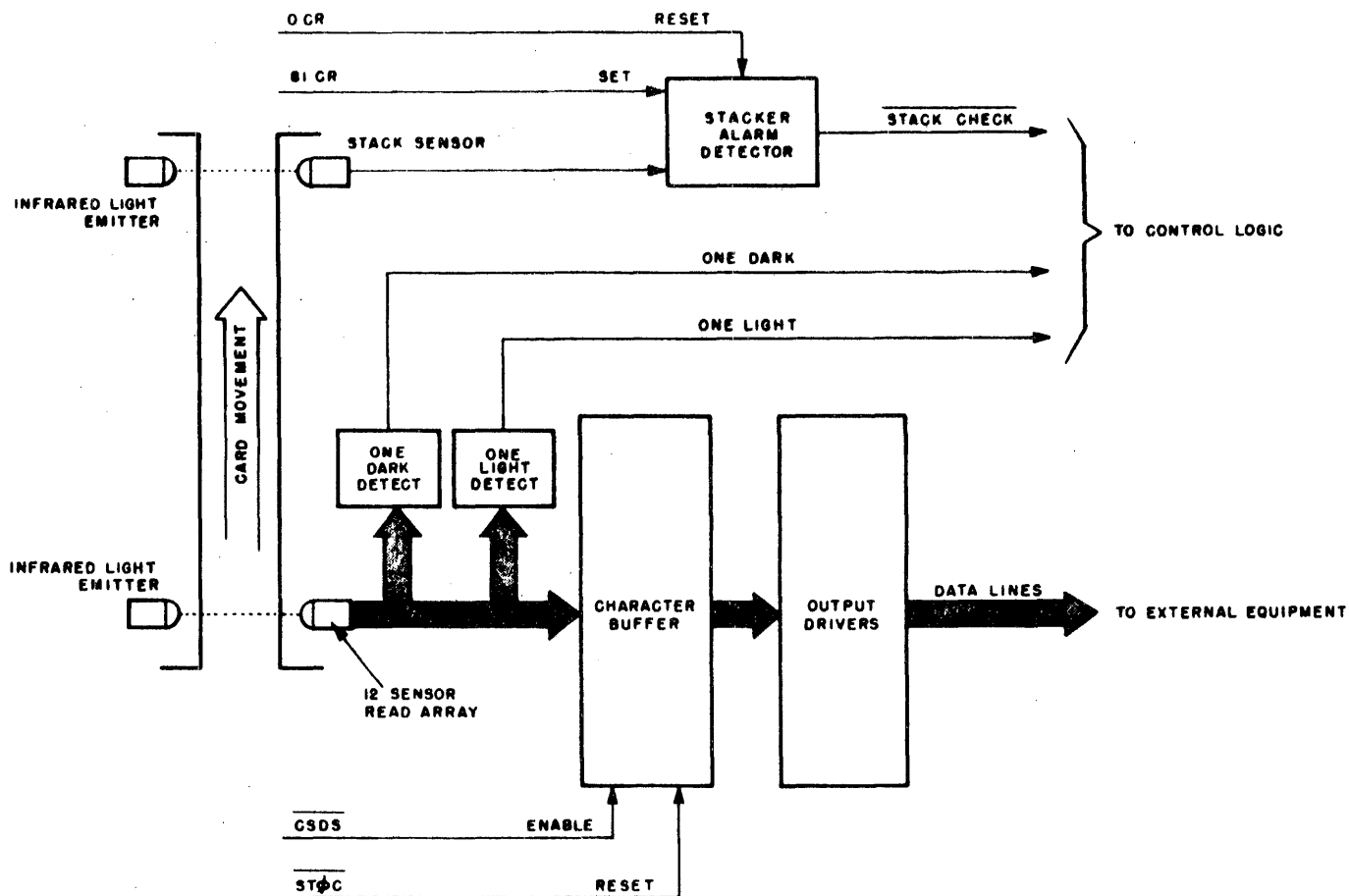
Figure 11. Comparator Logic Block Diagram



NOTES:

- (1) STφD SYNCHRONIZED TO CARD DATA COLUMNS.
- (2) TIMING NOT SHOWN TO SCALE.

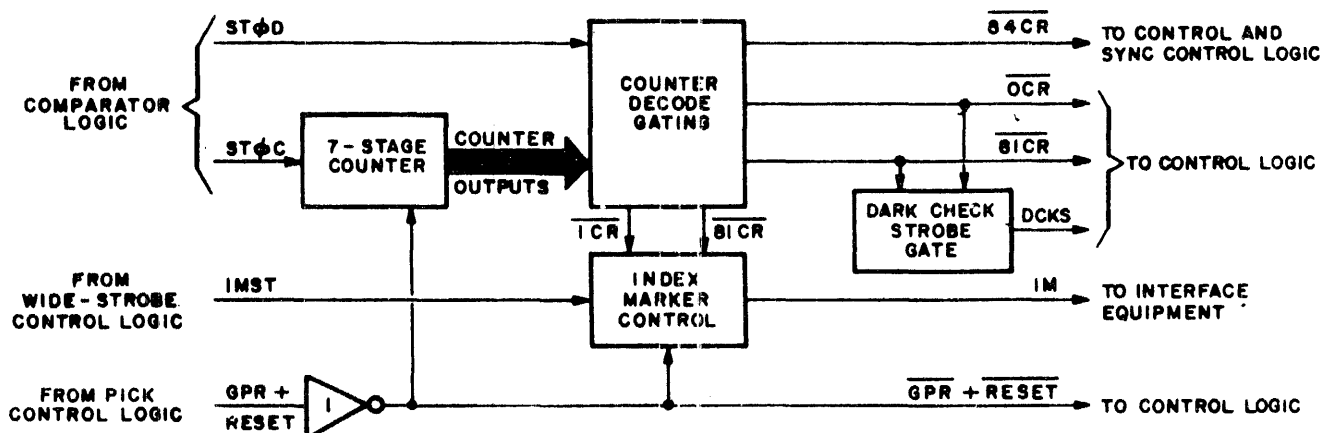
Figure 12. Wide-Strobe Control Logic Block Diagram



NOTES:

- (1) TIMING NOT SHOWN TO SCALE.
- (2) THE SPACING BETWEEN STφC, THE DURATION OF CSDS, AND THE GUARANTEE PERIOD OF THE DATA DIFFERS DEPENDING ON READER MODEL. REFER TO INTERFACE SECTION FOR SPECIFIC TIMING.

Figure 13. Character Buffer Storage Logic Block Diagram



NOTE :

- (1) TIMING NOT SHOWN TO SCALE.
- (2) GPR OCCURS AT LEADING EDGE OF CARD.

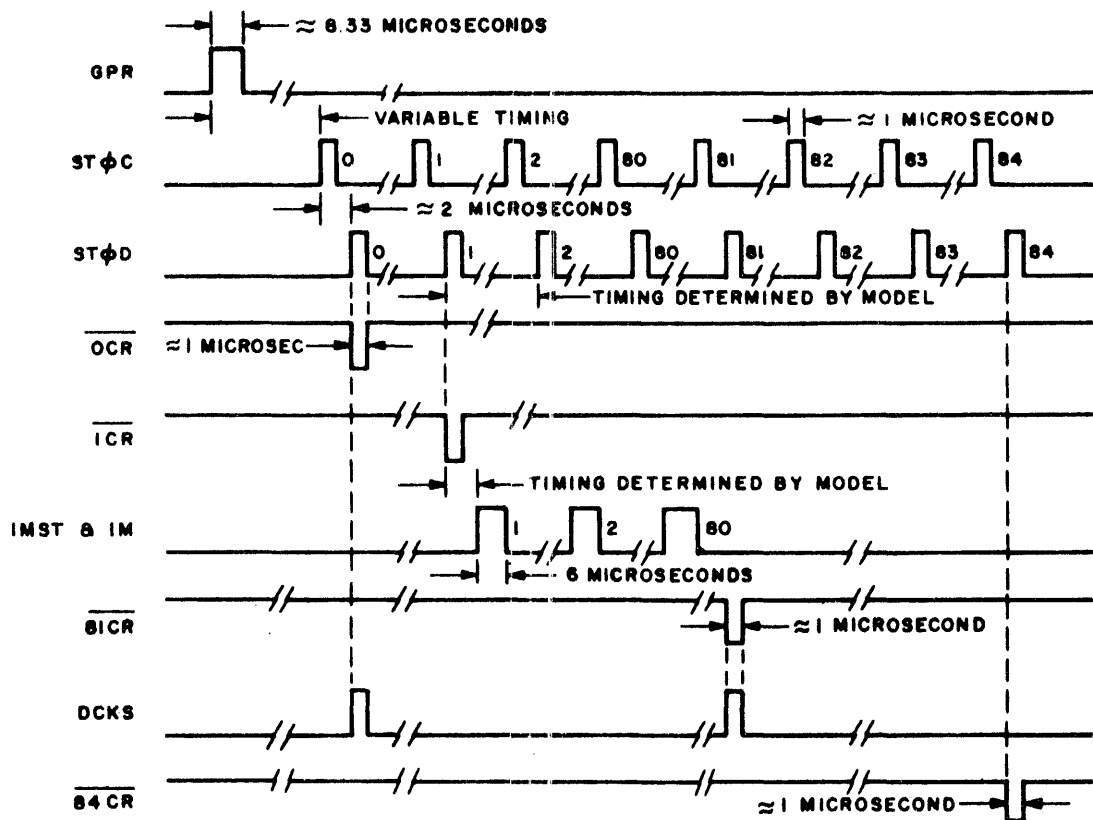
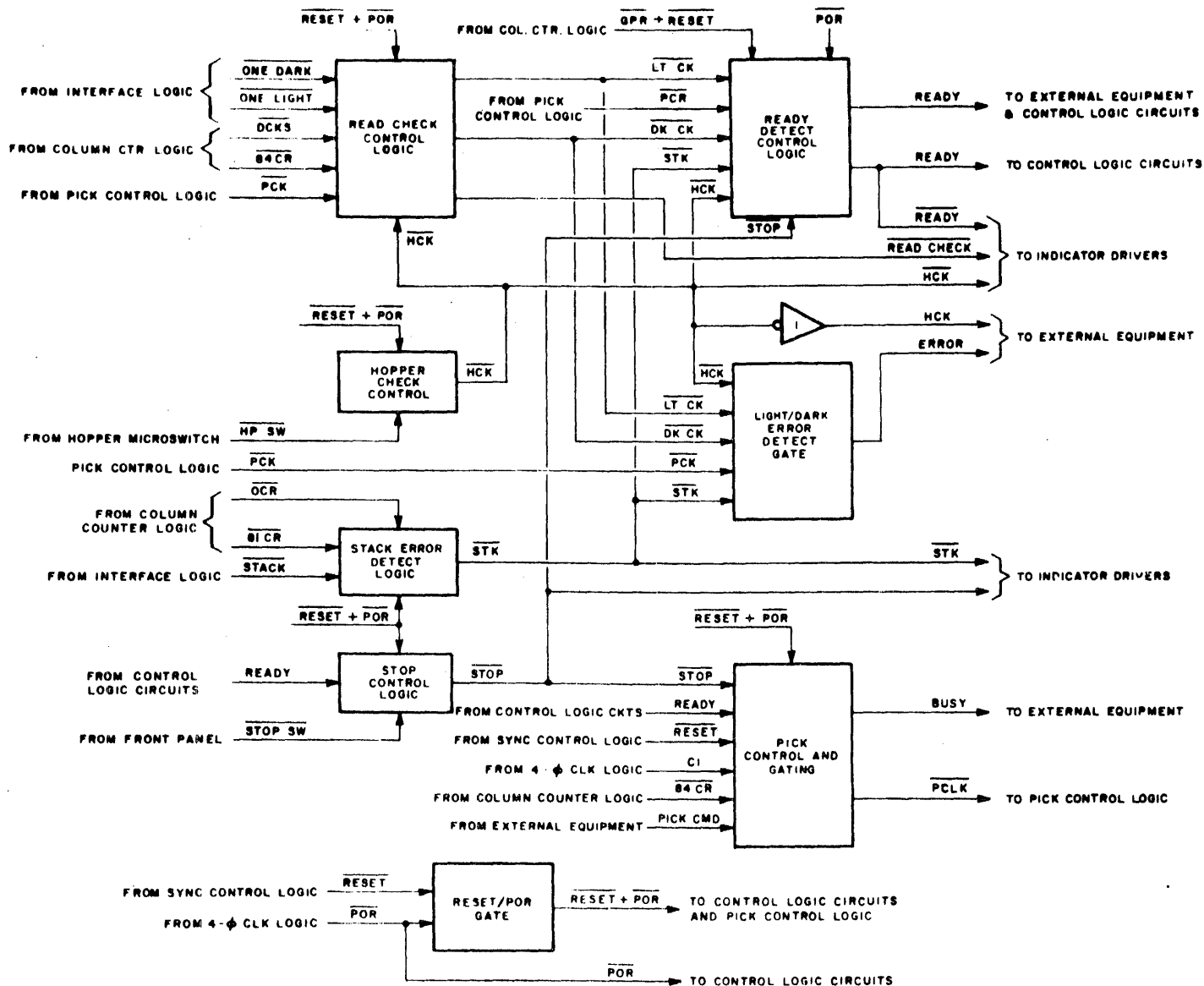


Figure 14. Column Counter Control Logic Block Diagram



NOTE:
TIMING NOT SHOWN TO SCALE

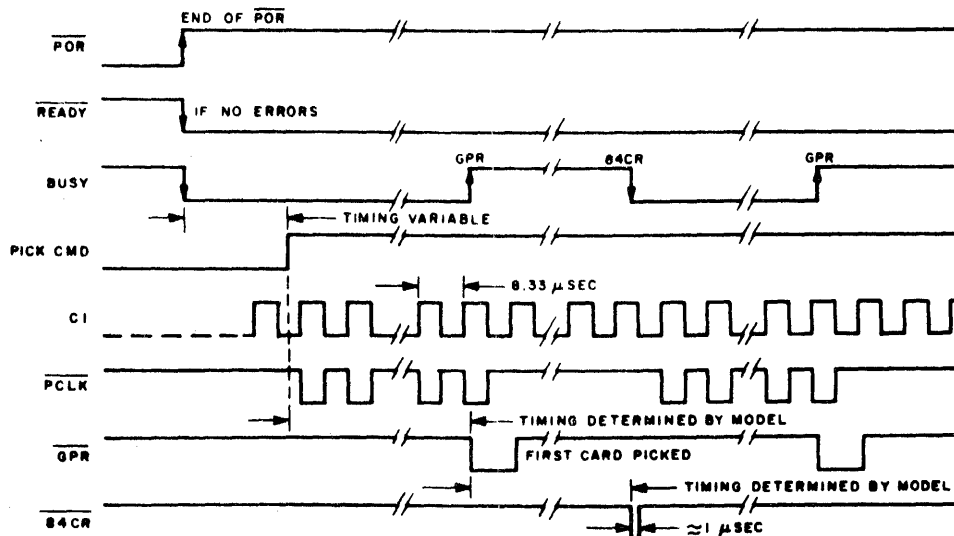
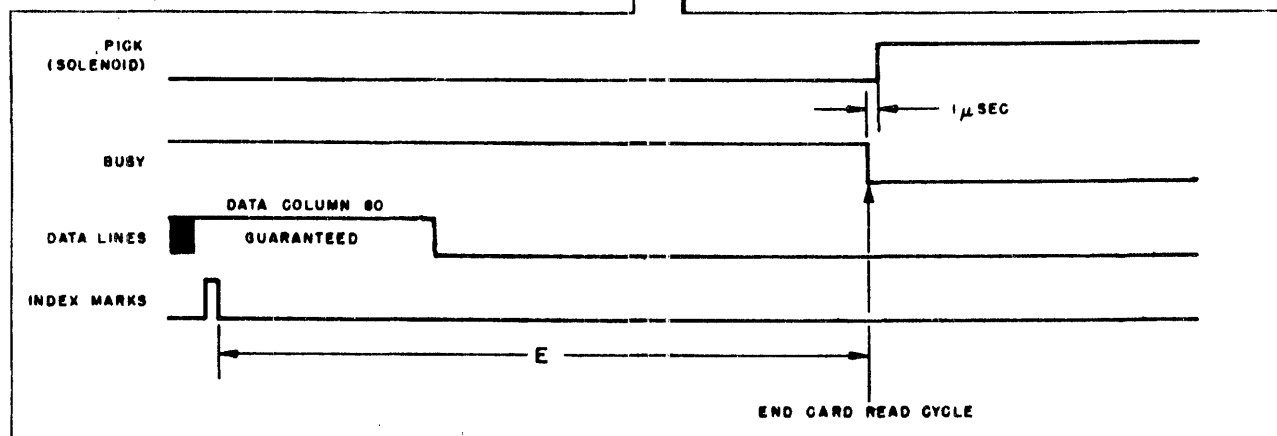
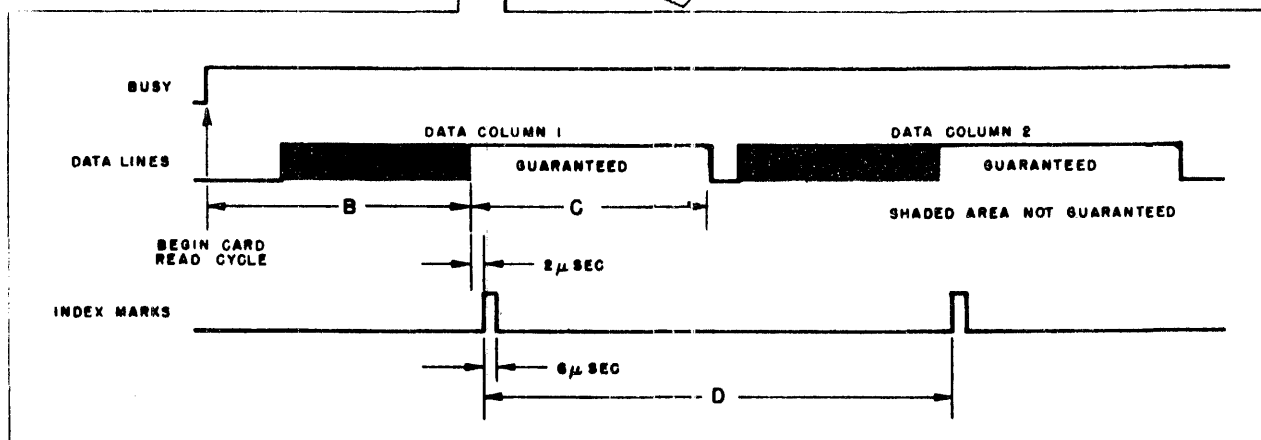
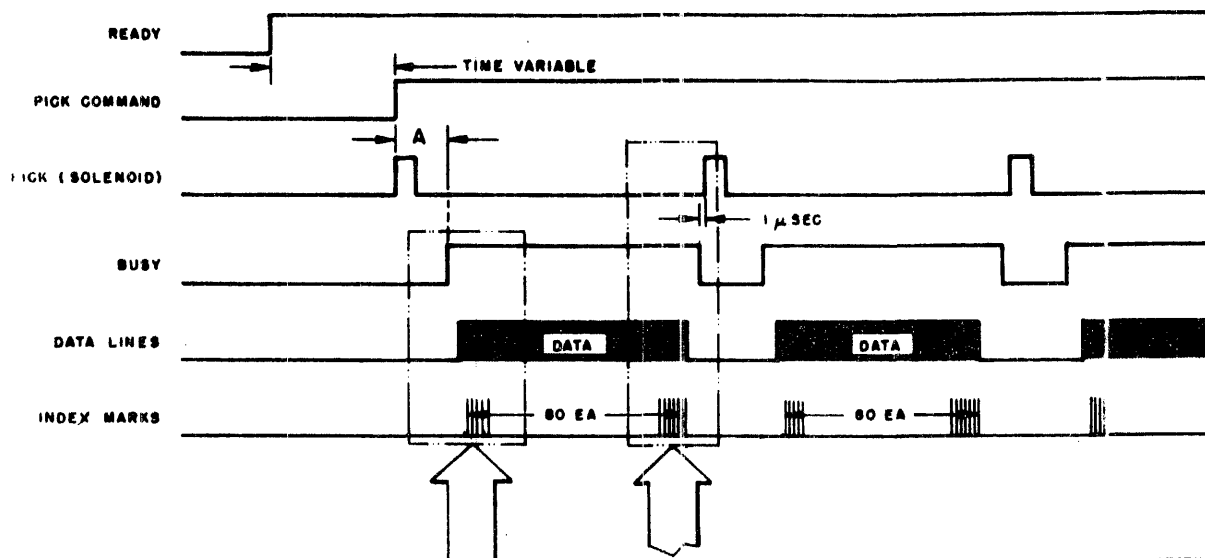


Figure 15. Control Logic Block and Timing Diagram



NOTE:
WAVEFORMS NOT
SHOWN TO SCALE.

MODEL	A (MIN)	B	C	D	E	CARD PICK CYCLE
M200	24	6250	1314	2014	8050	200
M300	24	2600	435	870	102,660	200
M600	24	2600	435	870	3480	100
M1000	15	1860	240	478	1910	60
M1800	14	1120	240	405	1529	50
	M SEC	μ SEC	μ SEC	μ SEC	μ SEC	M SEC

Figure 16. Standard Interface Timing for M Series Readers



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[illegible][illegible]

TO BOARD 10264-36
TO BOARD 10264-36

PICK PICK STN DC RTN YSG

J3 SYNC

A B C D

PARTIAL CABLE ASSY 10264-36

[illegible]

J2-TT	05Y	STN	WPT	1	
J2-CC	06	STN	WSD	2	
J2-W	06	STN	WSD	3	
J2-DB	07	STN	WSD	4	
J2-T	07	STN	WSD	5	
J2-S	07	STN	WSD	6	
J2-J	01	STN	BLK	7	
J2-P	02	STN	BLK	8	
J2-M	00	STN	BLK	9	
J2-E	07	STN	BLK	10	
J2-R	01	STN	BLK	11	
J2-E	03	STN	BLK	12	
J2-S	04K	STN	BLK	13	
J2-M	06	STN	BLK	14	

- CABLE ABBY
11256600

		INTERCONNECT		J6	
J6-12	BLK	2	COM VEE	BLK	
J6-11	BLU	3	COM L	BLU	
J6-10	RD P	4	RD L	RD L	
J6-9	GRN	5	GRN D	GRN	
J6-8	YE	6	GRN 1	YE	
J6-7	GRN	7	GRN 2	GRN	
J6-6	BLU	8	GRN 3	BLU	
J6-5	RED/WHIT	9	RED/WHIT	RED/WHIT	
J6-4	RED/WHIT	10	RED/WHIT	RED/WHIT	
J6-3	GRN/WHIT	11	GRN 5	GRN/WHIT	
J6-2	GRN/WHIT	12	GRN 6	GRN/WHIT	
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J6-U	GRN/WHIT	14	GRN 8	GRN/WHIT	
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J6-U	GRN/WHIT	17	GRN 11	GRN/WHIT	
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J6-U	GRN/WHIT	24	GRN 18	GRN/WHIT	
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J6-U	GRN/WHIT	26	GRN 20	GRN/WHIT	
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J6-U	GRN/WHIT	28	GRN 22	GRN/WHIT	
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J6-U	GRN/WHIT	31	GRN 25	GRN/WHIT	
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J6-U	GRN/WHIT	47	GRN 41	GRN/WHIT	
J6-U	GRN/WHIT	48	GRN 42	GRN/WHIT	
J6-U	GRN/WHIT	49	GRN 43	GRN/WHIT	
J6-U	GRN/WHIT	50	GRN 44	GRN/WHIT	
J6-U	GRN/WHIT	51	GRN 45	GRN/WHIT	
J6-U	GRN/WHIT	52	GRN 46	GRN/WHIT	
J6-U	GRN/WHIT	53	GRN 47	GRN/WHIT	
J6-U	GRN/WHIT	54	GRN 48	GRN/WHIT	
J6-U	GRN/WHIT	55	GRN 49	GRN/WHIT	
J6-U	GRN/WHIT	56	GRN 50	GRN/WHIT	
J6-U	GRN/WHIT	57	GRN 51	GRN/WHIT	
J6-U	GRN/WHIT	58	GRN 52	GRN/WHIT	
J6-U	GRN/WHIT	59	GRN 53	GRN/WHIT	
J6-U	GRN/WHIT	60	GRN 54	GRN/WHIT	
J6-U	GRN/WHIT	61	GRN 55	GRN/WHIT	
J6-U	GRN/WHIT	62	GRN 56	GRN/WHIT	
J6-U	GRN/WHIT	63	GRN 57	GRN/WHIT	
J6-U	GRN/WHIT	64	GRN 58	GRN/WHIT	
J6-U	GRN/WHIT	65	GRN 59	GRN/WHIT	
J6-U	GRN/WHIT	66	GRN 60	GRN/WHIT	
J6-U	GRN/WHIT	67	GRN 61	GRN/WHIT	
J6-U	GRN/WHIT	68	GRN 62	GRN/WHIT	
J6-U	GRN/WH				

TO
STAND
ALONE



MOTHER BOARD		
POS.	BOARD	ORIGIN
1	VCC	POWER SUP
2	EMMIT	BEEROR
3	COMMON LIGHT	COMMON
4	BASE	SWING
5	COLL	CLOCK
6	SWING BASE	COMMON
7	STDB	SWING
8	COLL	CLOCK
9	STB	CLOCK
10	REF	CLOCK
11	POWER	BEEROR
12	FE	BEEROR
13	COLL	CLOCK
14	ST	CLOCK
15	FECLZ	CLOCK
16	EMMIT	BEEROR
17	FECLZ	SWING
18	CEBZ	SWING
19	COMMON	POWER
20	FE	SWING
A	FECLZ	CLOCK
B	BASE	CLOCK
C	STDB	BEEROR
D	STB	CLOCK
E	REF	CLOCK
F	POWER	CLOCK
G	FE	CLOCK
H	FECLZ	COMMON
I	FECLZ	COMMON
J	FECLZ	COMMON
K	FECLZ	COMMON
L	FECLZ	COMMON
M	FECLZ	COMMON
N	FECLZ	COMMON
O	FECLZ	COMMON
P	FECLZ	COMMON
Q	FECLZ	COMMON
R	FECLZ	COMMON
S	FECLZ	COMMON
T	FECLZ	COMMON
U	FECLZ	COMMON

NOTES:

△. SWITCH SHOWN IN "OUTPUT HOPPER FULL" CONDITION.

⚠. SWITCH SHOWN IN "INPUT NOT PRESENT" CONDITION.

Figure A1. Wiring Diagram, Card Cage
(Dwg. No. 1141934) CS 139A

Figure A2. 5 Volt Power Supply
Dwg. No. 1140637

Figure A2A. 5 Volt Power Supply

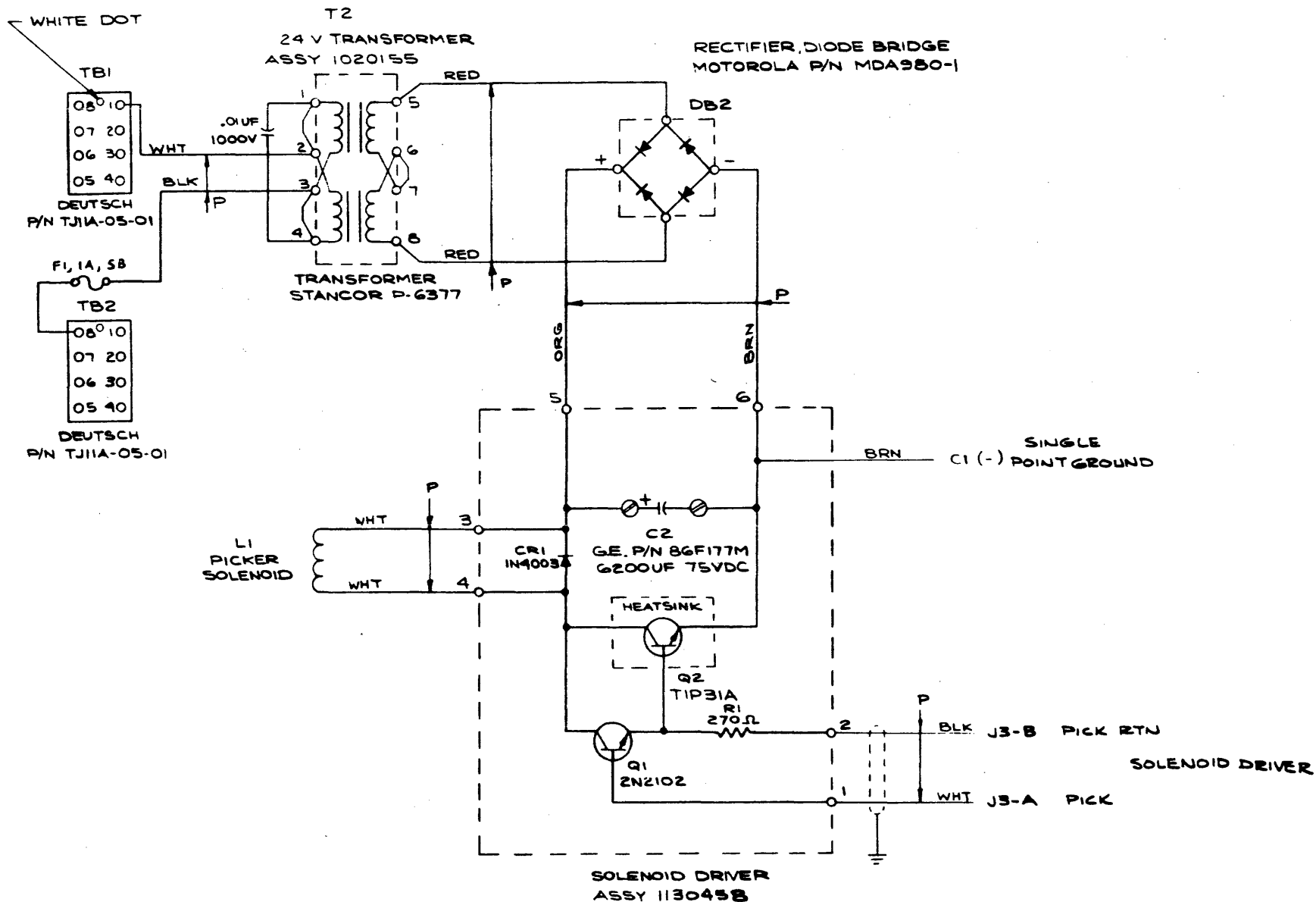


Figure A3. Solenoid Driver
Dwg. No. 1140623

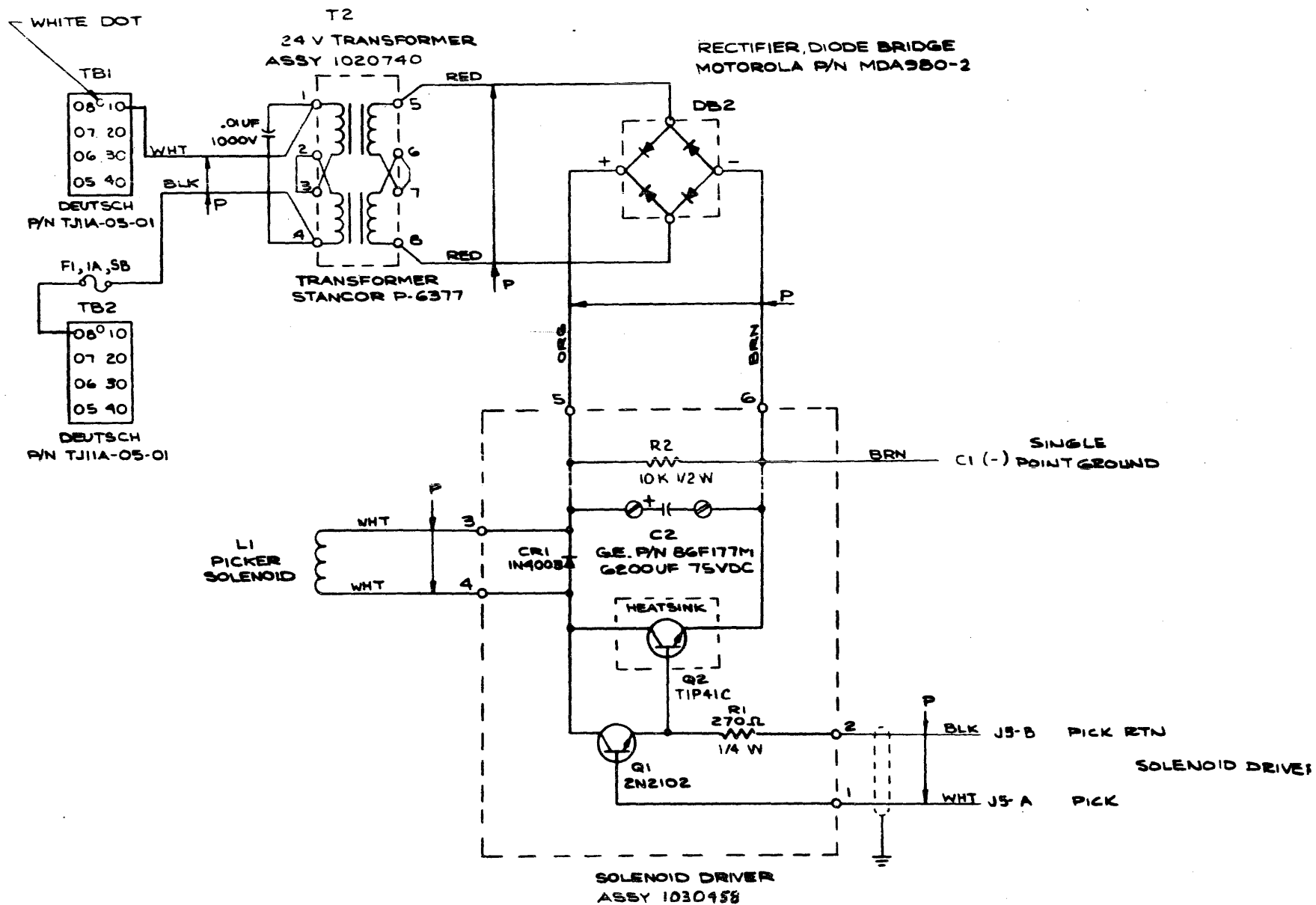
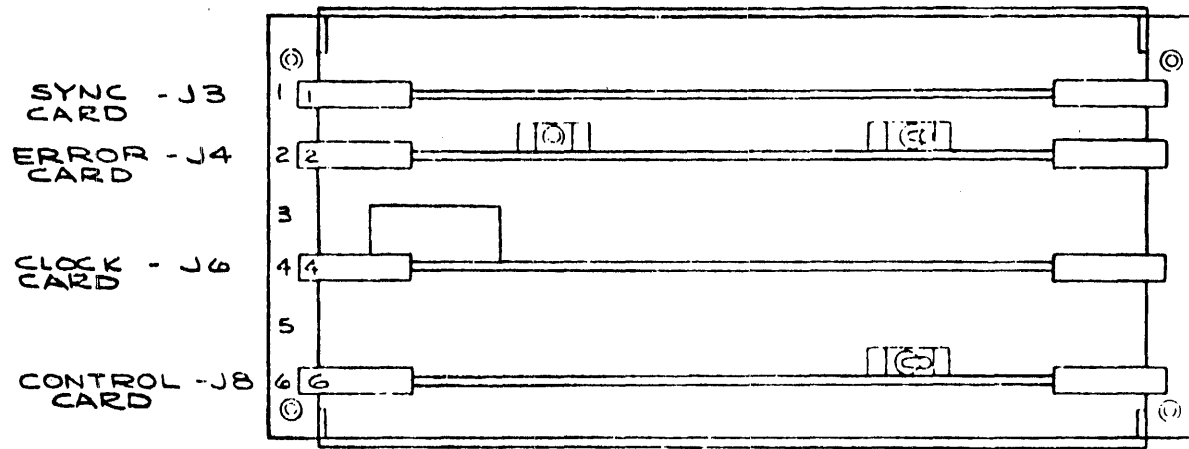
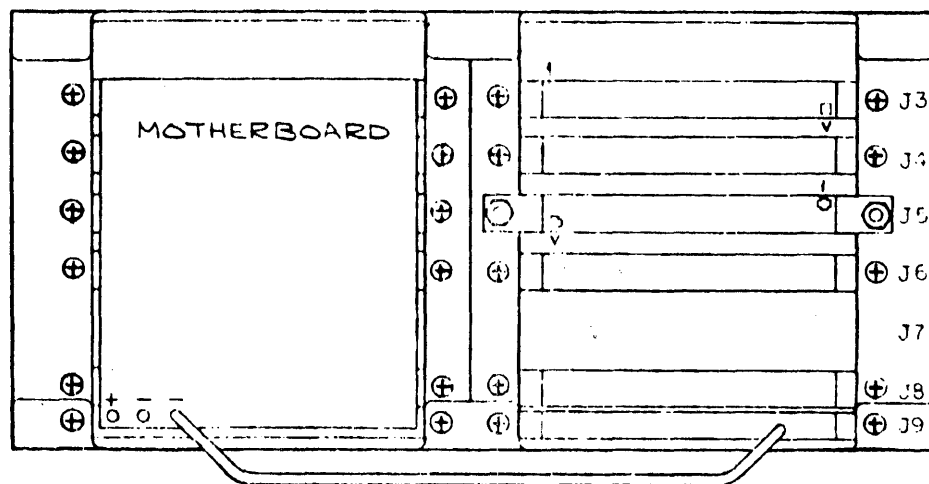


Figure A3A. Solenoid Driver



CARD FILE, REAR VIEW
COVER REMOVED



CONNECTOR VIEW

Figure A4. Card File

A6

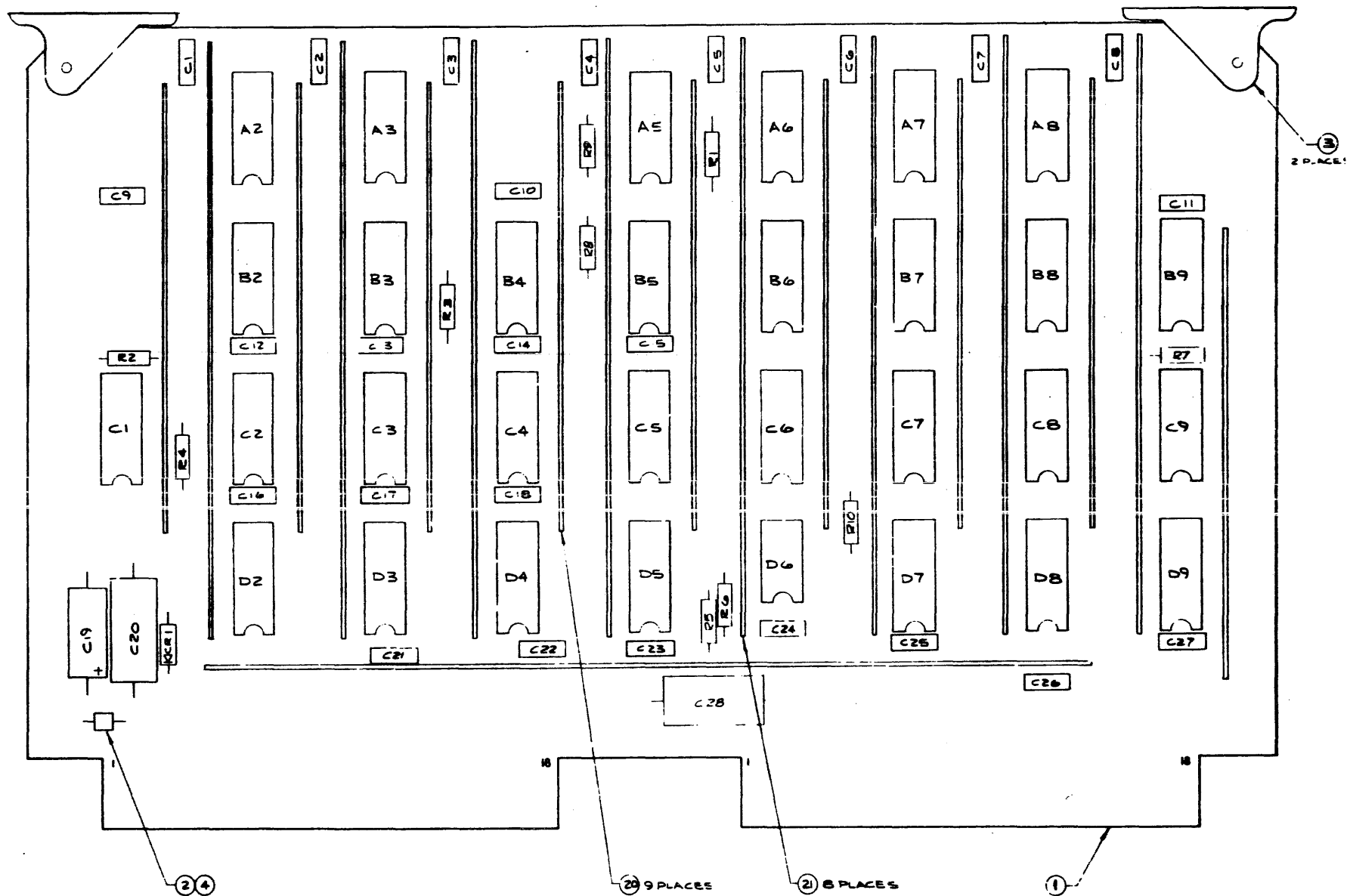


Figure A5. Sync Card Assembly
Dwg. No. 1040353

Figure A6. Sync Card Schematic Dwg. No. 1640943 (Sheet 1 of 3) (M-200)

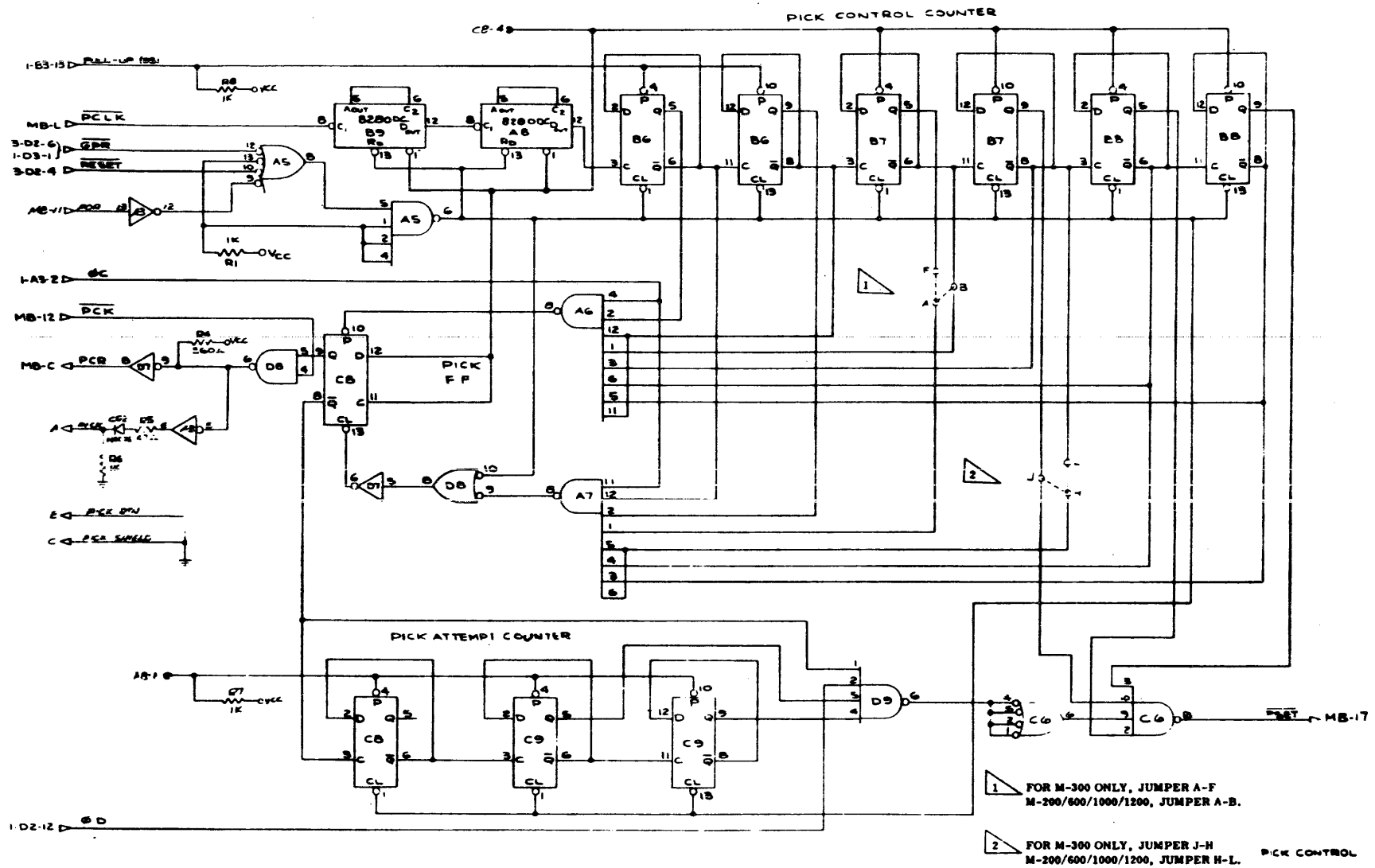


Figure A6. (Sheet 2 of 3)

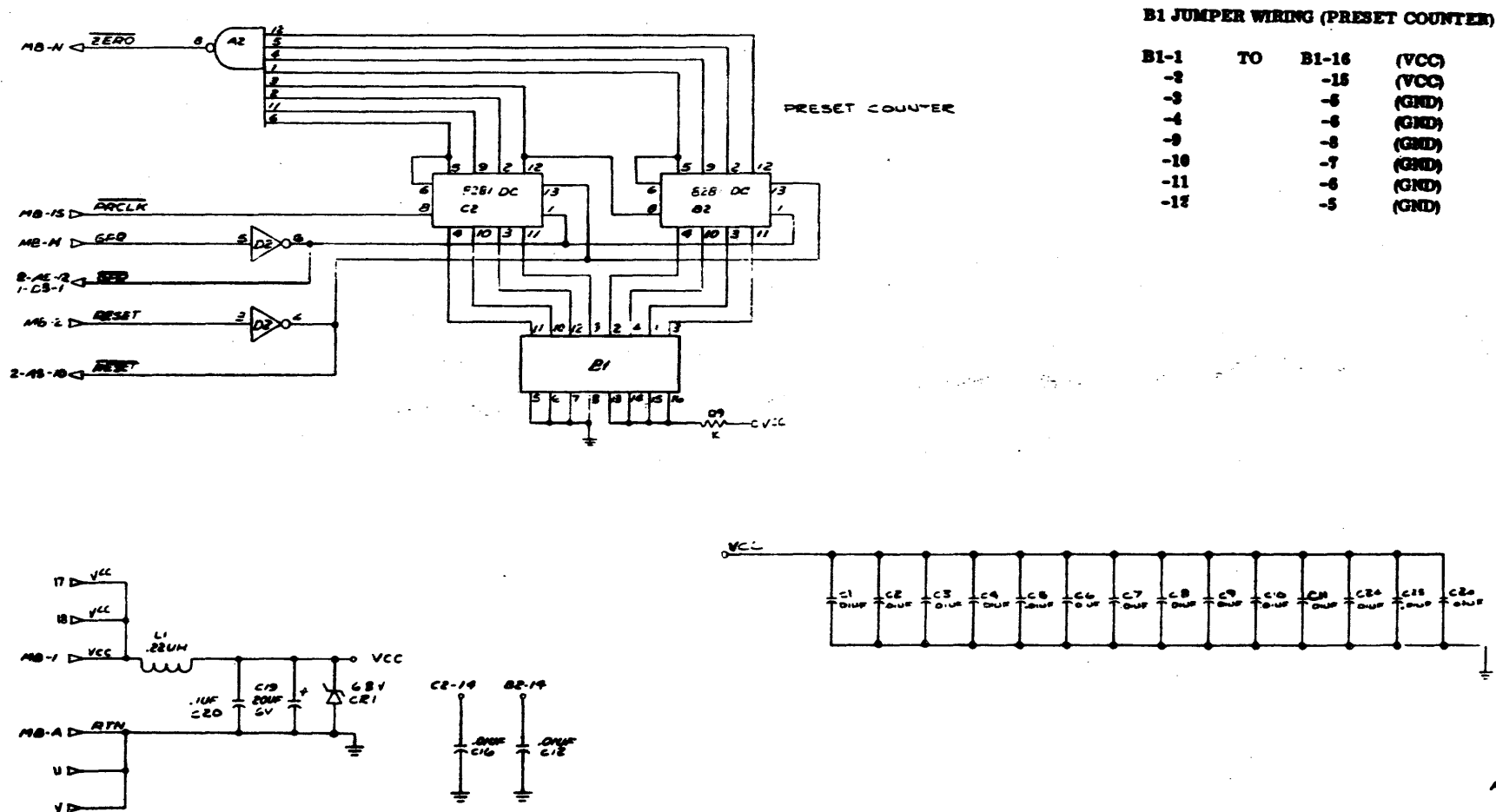


Figure A8. Assembly Diagram, Clock Card
(Dwg. No. 1040765)



Clock Card Schematic (Sheet 1 of 3)
Dwg. No. 1040800C

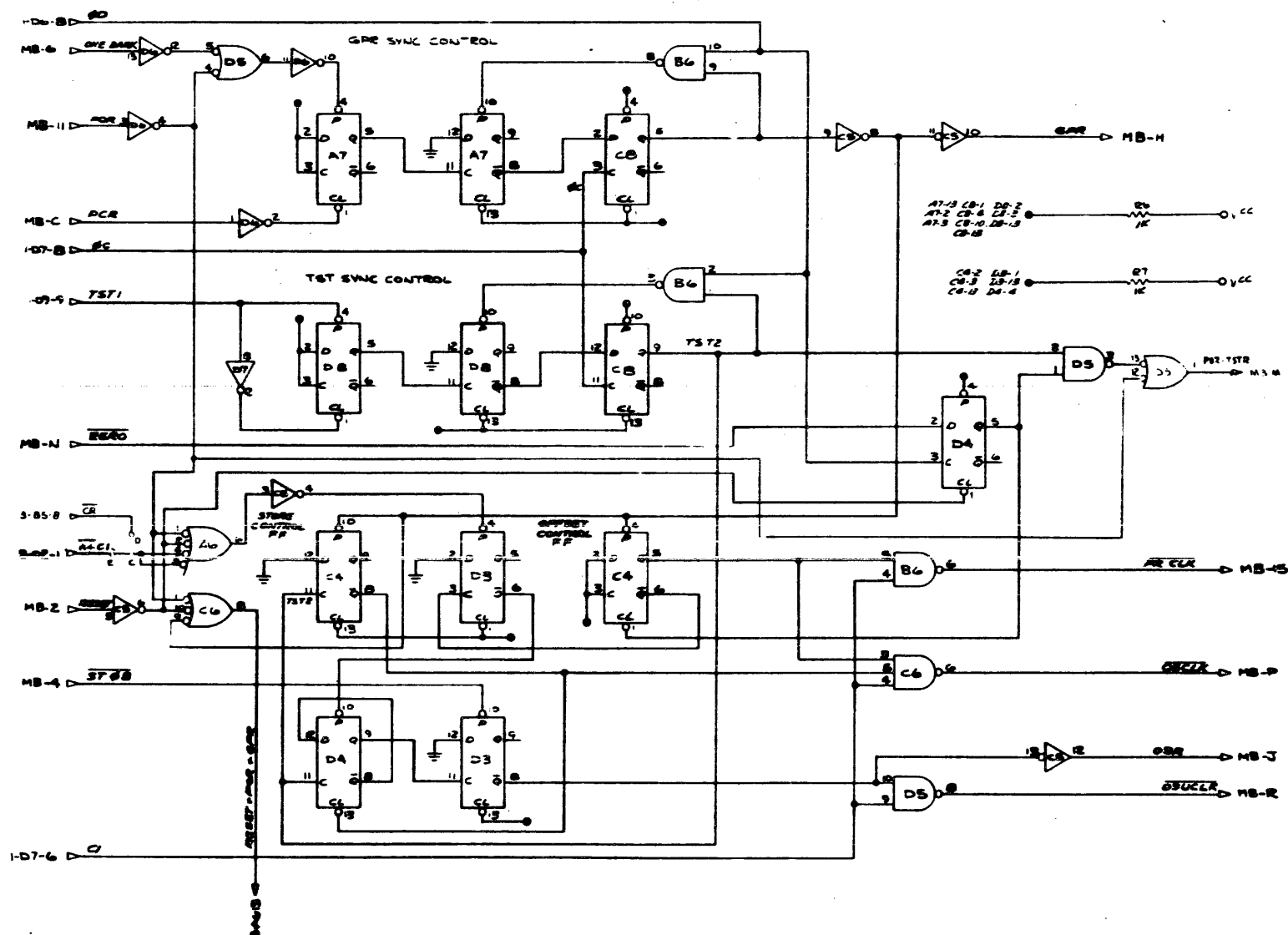


Figure A8. (Sheet 2 of 3)

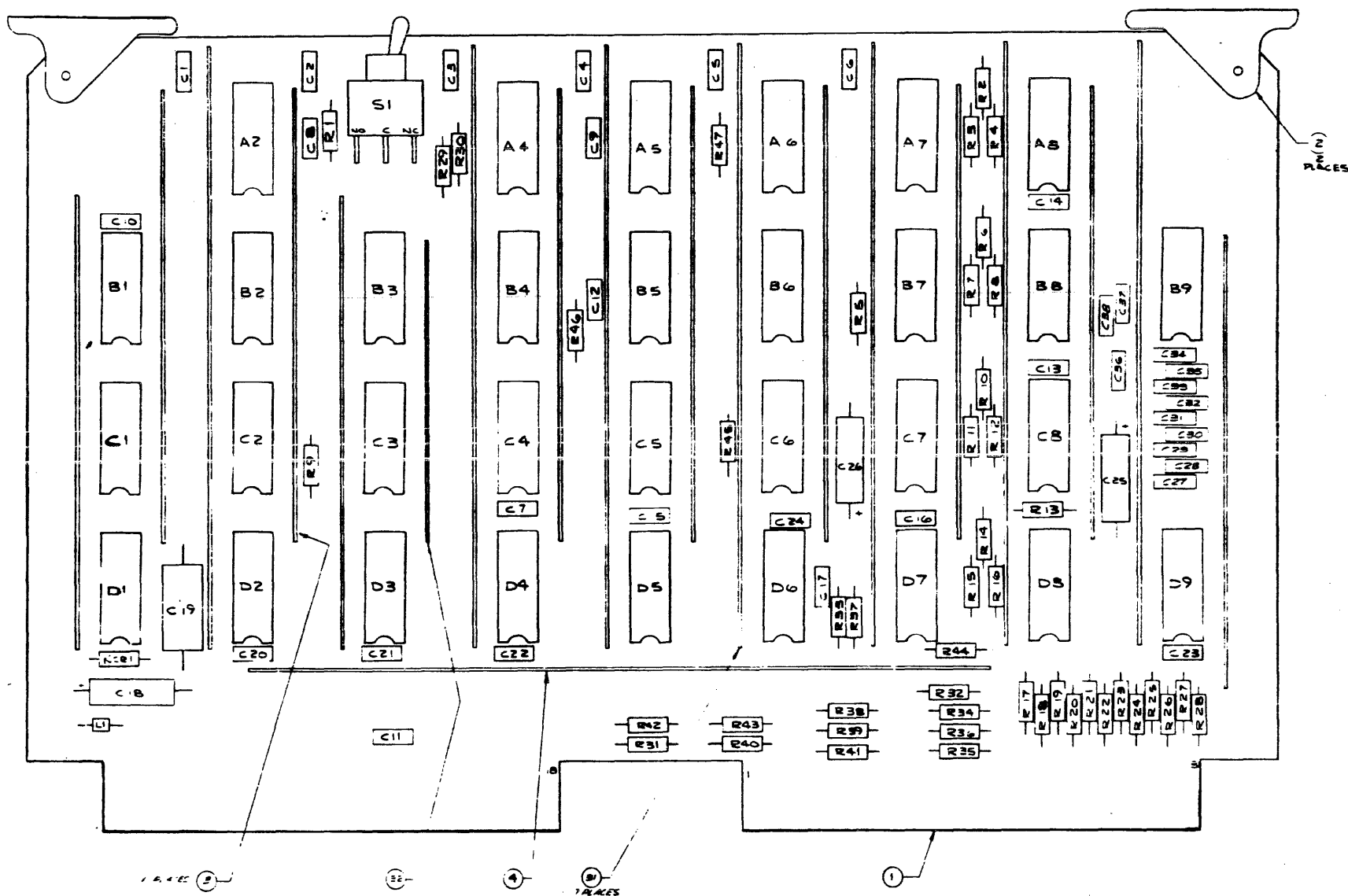


Figure A9. Control Card Assembly
Dwg. No. 1040619

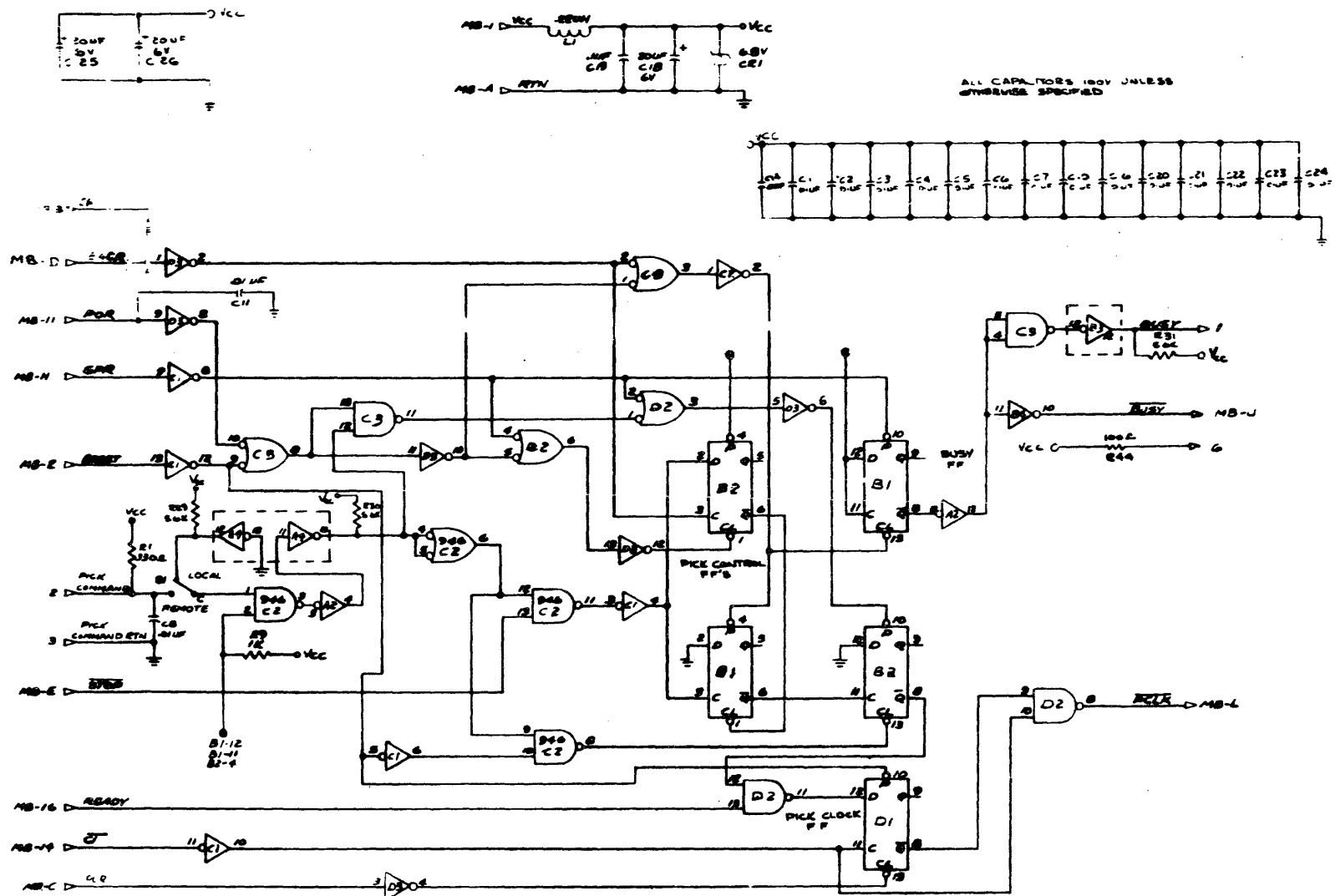


Figure A10. Control Card Schematic (Sheet 1 of 2)
Dwg. No. 1040650D

Figure A10. (Sheet 2 of 2)

A17

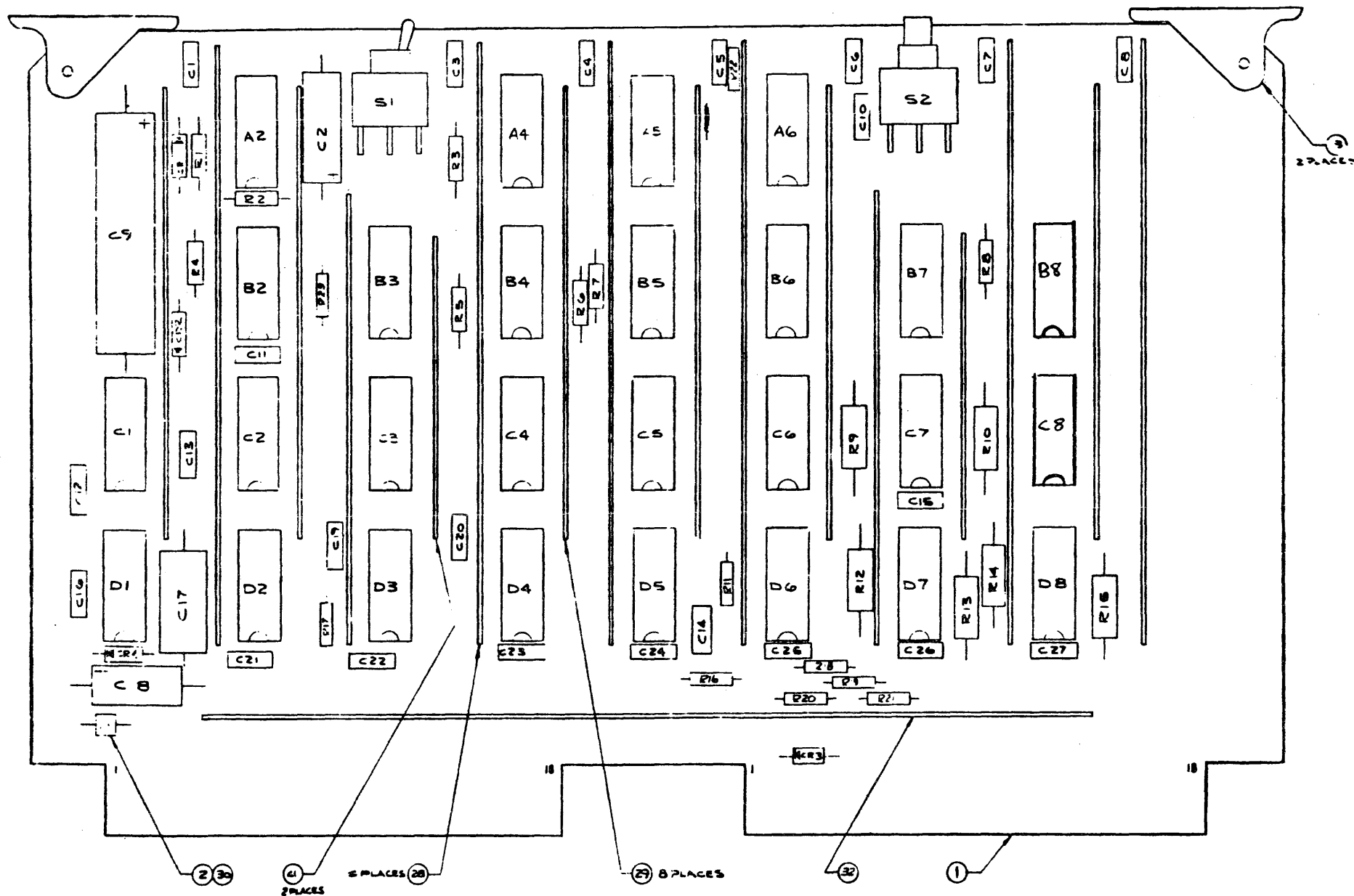


Figure A11. Error Card Assembly
(Dwg. No. 1040610)
CS 139A

Figure ^{H12}~~A8~~. Schematic Diagram, Error Card (sheet 1 of 2)
(Dwg. No. 1041908)

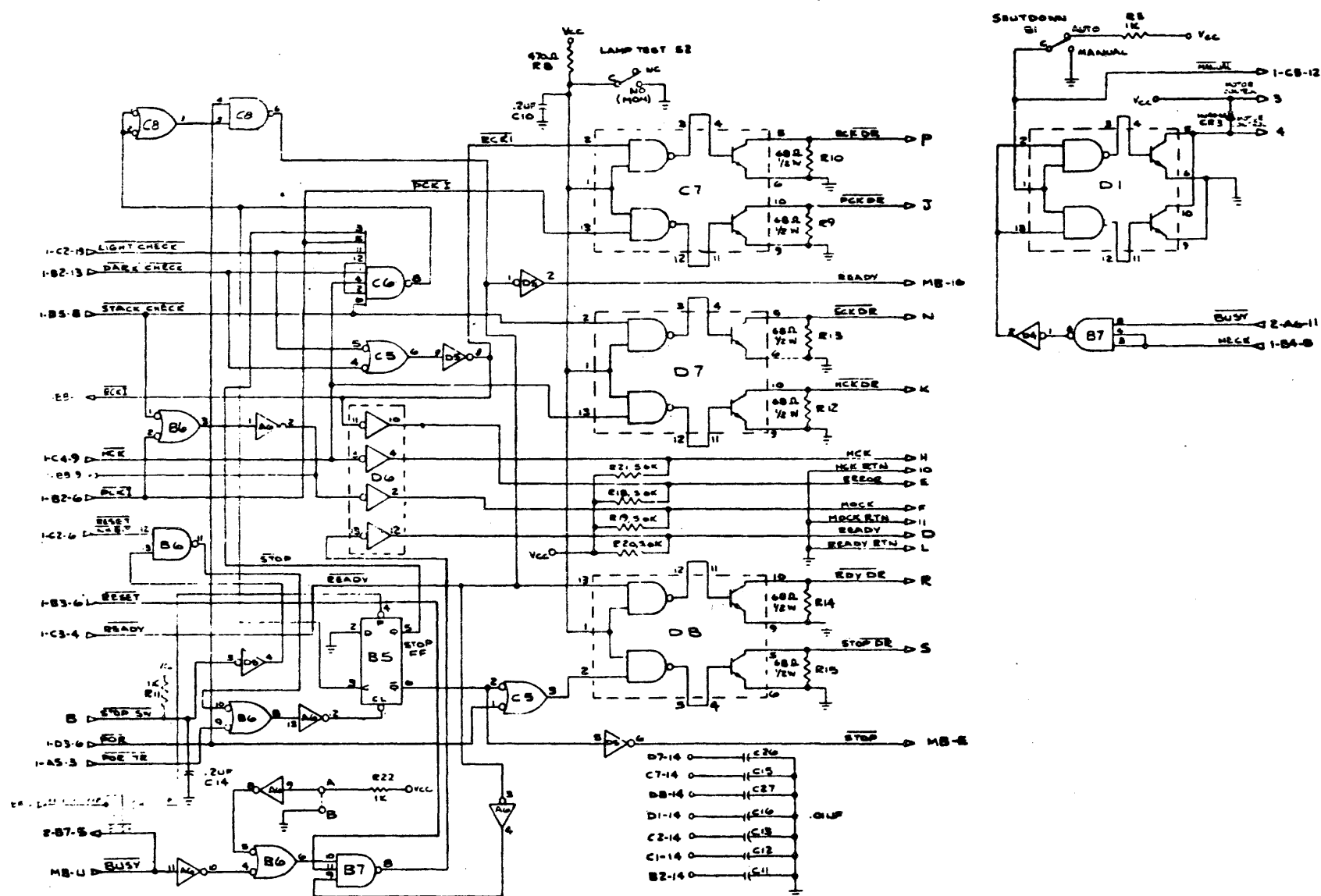


Figure A8. Schematic Diagram, Error Card (sheet 2 of 2)

SIGNAL MNEMONICS AND ABBREVIATIONS

MNEMONIC	DESCRIPTION	LOCATION	ORIGINATING SOURCE
Vcc	+5 volts	MB-1	5 volt power supply (Mother Board)
RTN	+5 volt return	MB-A	5 volt power supply (Mother Board)
TST	Timing Strobe	J3-T	Reluctance Pickup
TST RTN	Timing Strobe Return	J3-S	Reluctance Pickup
SHIELD	Shield for Timing Strobe	J3-R	Reluctance Pickup
TST1	Timing Strobe One	D9-9	Clock Card
ϕA	Clock Phase A	MB-S	Clock Card
C1	Basic Clock	MB-14	Clock Card
ϕB	Clock Phase B	MB-F	Clock Card
ϕC	Clock Phase C	MB-K	Clock Card
ϕD	Clock Phase D	MB-9	Clock Card
ONE DARK	Read Station Any Dark	MB-6	Control Card
POR	Power On Reset	MB-11	Error Card
PCR	Pick Control Reset	MB-C	Sync Card
ZERO	Preset Decode	MB-N	Sync Card
RESET	Gated Reset Switch	MB-2	Sync Card
ST ϕ B	Column Strobe Phase B	MB-4	Sync Card
GPR	Good Pick Reset	MB-H	Clock Card
TST2	Timing Strobe Two	C8-9	Clock Card
TSTR	Timing Strobe Reset	MB-N	Clock Card
PRCLK	Preset Clock	MB-15	Clock Card
OSCLK	Offset Clock	MB-P	Clock Card
OSR	Offset Reset	MB-J	Clock Card
OSUCLK	Offset Up-Clock	MB-R	Clock Card
ST ϕ C	Column Strobe Phase C	MB-V	Sync Card
ST ϕ D	Column Strobe Phase D	MB-7	Sync Card
IMST	Index Mark Strobes	MB-T	Sync Card
IM	Index Marks	J3-A	Clock Card
IM RTN	Return for Index Marks	J3-B	Clock Card
SHIELD	Shield for Index Marks	J3-C	Clock Card
CR	Column Reset	MB-B	Clock Card
OCR	Zero Column Reset	MB-5	Clock Card

SIGNAL MNEMONICS AND ABBREVIATIONS
(Continued)

MNEMONIC	DESCRIPTION	LOCATION	ORIGINATING SOURCE
DCKS	Dark Check Strobes	MB-8	Clock Card
81CR	81st Column Reset	MB-13	Clock Card
84CR	84th Column Reset	MB-D	Clock Card
PICK COMMAND	Pick Command Input	J8-2	Control Card
PICK COMMAND RTN	Pick Command Input Return	J8-3	Control Card
STOP	Stop	MB-E	Error Card
READY	Ready	MB-16	Error Card
BUSY	Busy Output	J8-1	Control Card
PCLK	Pick Clock	MB-L	Control Card
Vcc	+5V to Read Sensor Array	J8-12	Control Card
Row 12	Read Sensor Input Row 12	J8-13	Control Card
Row 11	Read Sensor Input Row 11	J8-14	Control Card
Row 0	Read Sensor Input Row 0	J8-15	Control Card
Row 1	Read Sensor Input Row 1	J8-16	Control Card
Row 2	Read Sensor Input Row 2	J8-17	Control Card
Row 3	Read Sensor Input Row 3	J8-18	Control Card
Row 4	Read Sensor Input Row 4	J8-P	Control Card
Row 5	Read Sensor Input Row 5	J8-R	Control Card
Row 6	Read Sensor Input Row 6	J8-S	Control Card
Row 7	Read Sensor Input Row 7	J8-T	Control Card
Row 8	Read Sensor Input Row 8	J8-U	Control Card
Row 9	Read Sensor Input Row 9	J8-V	Control Card
ONE LIGHT	Read Station Any Light	MB-3	Control Card
D12	Data Row 12 Output	J8-L	Control Card
D11	Data Row 11 Output	J8-M	Control Card
D0	Data Row 0 Output	J8-K	Control Card
D1	Data Row 1 Output	J8-H	Control Card
D2	Data Row 2 Output	J8-J	Control Card
D3	Data Row 3 Output	J8-N	Control Card
D4	Data Row 4 Output	J8-F	Control Card
D5	Data Row 5 Output	J8-E	Control Card
RTN	Data Drivers Return	J8-5	Control Card
D6	Data Row 6 Output	J8-B	Control Card

SIGNAL MNEMONICS AND ABBREVIATIONS
(Continued)

MNEMONIC	DESCRIPTION	LOCATION	ORIGINATING SOURCE
D7	Data Row 7 Output	J8-D	Control Card
D8	Data Row 8 Output	J8-A	Control Card
D9	Data Row 9 Output	J8-C	Control Card
CSDS	Column Storage Data Strobe	MB-18	Sync Card
HOPPER FULL	Hopper Full Switch	J4-1	Error Card
HOPPER FULL RTN	Hopper Full Switch Return	J4-A	Error Card
HOPPER EMPTY RTN	Hopper Empty Switch Return	J4-6	Error Card
HOPPER EMPTY	Hopper Empty Switch	J4-5	Error Card
STACK	Stack Sensor Input	J4-C	Error Card
STACK Vcc	Stack Sensor +5 volts	J4-2	Error Card
RESET SW	Reset Switch Normally Open	J4-9	Error Card
RESET SW	Reset Switch Normally Closed	J4-7	Error Card
PSET	Pick Check Set	MB-17	Sync Card
LIGHT CHECK	Light Check	C2-9	Error Card
DARK CHECK	Dark Check	B2-9	Error Card
HECK	Hopper Empty Check	B4-8	Error Card
PCK	Pick Check	B2-5	Error Card
STACK CHECK	Output Stacker Check	B5-8	Error Card
PCKI	Pick Check Indicator	B2-2	Error Card
HCK	Input or Output Hopper Check	C4-9	Error Card
SHUTDOWN STATUS	Mode Switch Input	S1-C	Error Card
POR TR	Power on Reset Trigger	A5-12	Error Card
STOP SW	Stop Switch Input	J4-B	Error Card
RCK DR	Read Check Lamp Driver	J4-P	Error Card
PCK DR	Pick Check Lamp Driver	J4-P	Error Card
SCK DR	Stack Check Lamp Driver	J4-N	Error Card
HCK DR	Hopper Check Lamp Driver	J4-K	Error Card
HCK	Hopper Check Output	J4-H	Error Card
HCK RTN	Hopper Check Output Return	J4-10	Error Card
ERROR	Error Output	J4-E	Error Card
ERROR RTN	Error Output Return	J4-M	Error Card
MOCK	Motion Check Output	J4-F	Error Card

SIGNAL MNEMONICS AND ABBREVIATIONS
(Continued)

MNEMONIC	DESCRIPTION	LOCATION	ORIGINATING SOURCE
MOCK RTN	Motion Check Output Return	J4-11	Error Card
READY	Ready Output	J4-D	Error Card
READY RTN	Ready Output Return	J4-L	Error Card
RDY DR	Ready Lamp Driver	J4-R	Error Card
STOP DR	Stop Lamp Driver	J4-S	Error Card
PICK	Pick Driver Output	J5-A	Sync Card
PICK RTN	Pick Driver Output Return	J5-B	Sync Card
SHIELD	Shield for PICK	J5-C	Sync Card
BUSY	Busy Signal	MB-U	Control Card