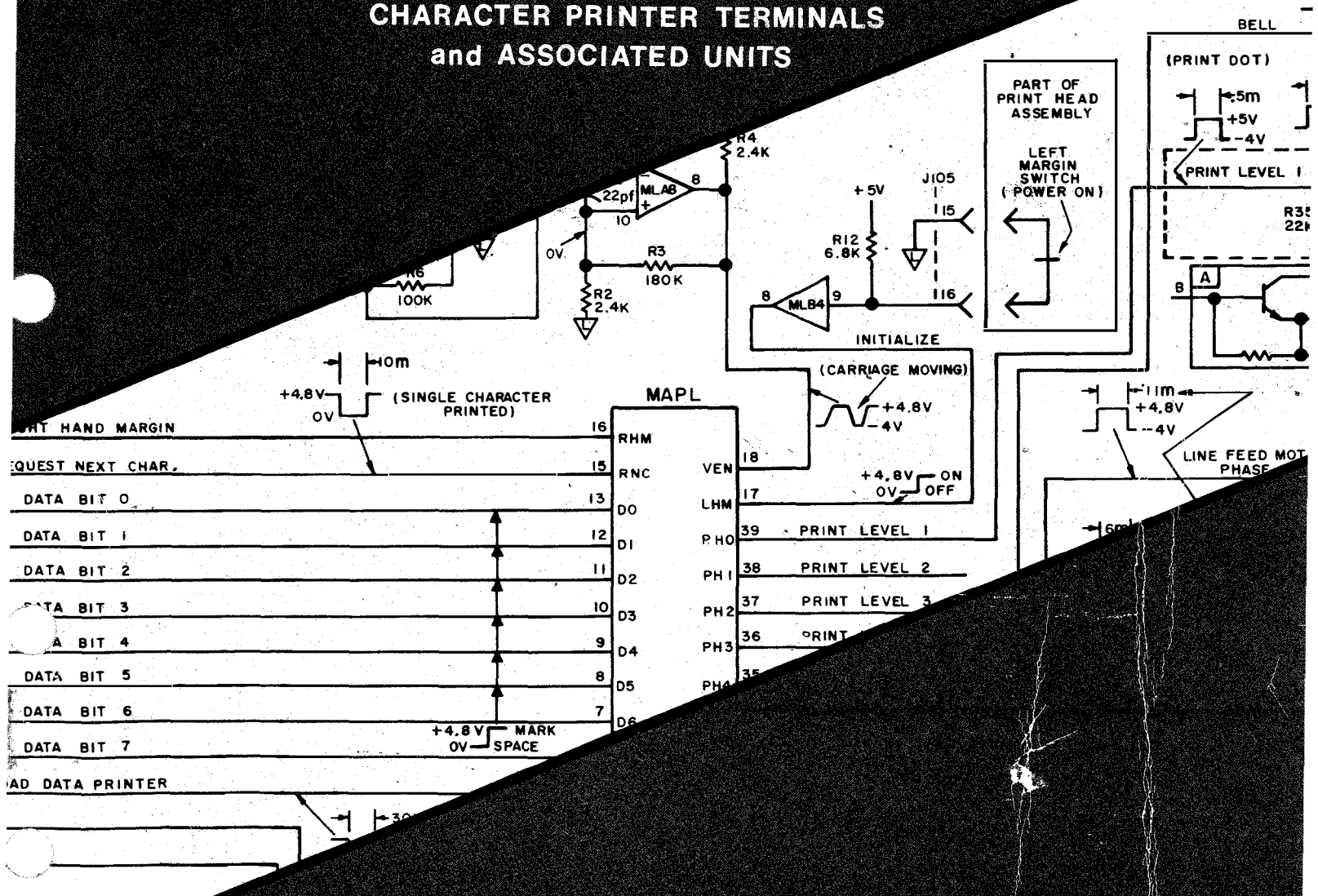


CIRCUIT DIAGRAMS MANUAL

for
COMPONENTS USED IN 42/43 and 45-30 CPS
CHARACTER PRINTER TERMINALS
and ASSOCIATED UNITS



TELETYPE
CORPORATION

CIRCUIT DIAGRAM

MANUAL 385

INTRODUCTION

This manual provides circuit information extracted from the following repair manuals:

- 391 — 43 Teleprinter Basic KSR and RO Without Internal Data Set
- 442 — 42/43 Paper Tape Unit
- 522 — TTL and SSI Logic Cards Used in 42/43 and 45 30 CPS Character Printers
- 523 — Power Supplies Used in 42/43 and 45 30 CPS Character Printer Terminals
Without Internal Data Set
- 525 — Keyboards Used in 42/43 Basic Terminals
- 534 — Interfaces, Controllers and Modification Kit Circuit Cards Associated With
42/43 Terminals

The component layouts, lead designations and schematic diagrams for each circuit are combined into single fold-out sheets for the convenience of field or shop personnel when repairing major components.

Complete repair information, including circuit descriptions, parts, troubleshooting, etc, is provided in the repair manuals listed above. Service personnel should be familiar with the contents of these manuals and be properly trained before attempting maintenance or repair of the 42/43 and 45 30 CPS Character Printer Terminals.

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INTERFACES

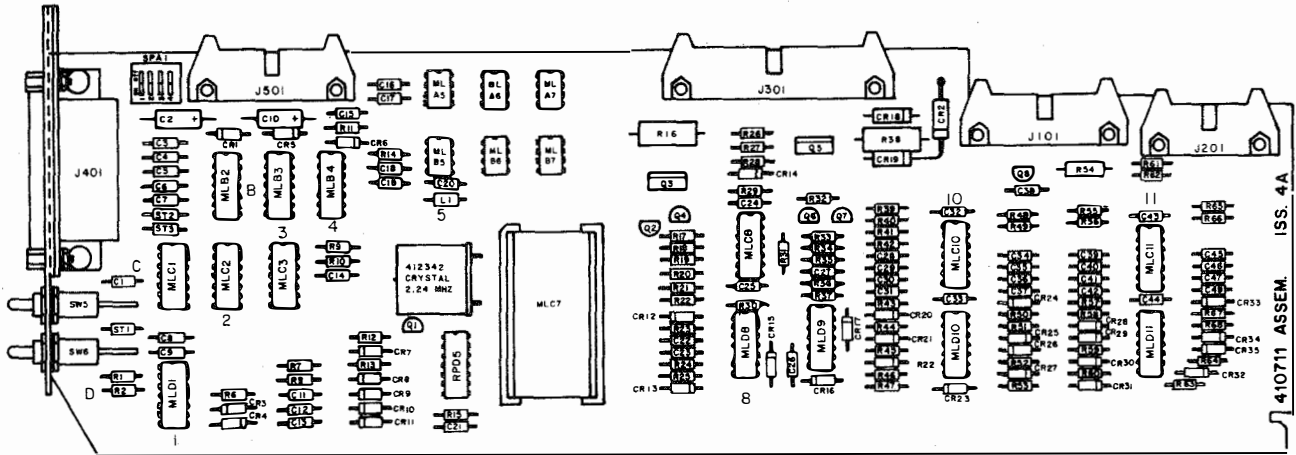
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LOGIC CARDS



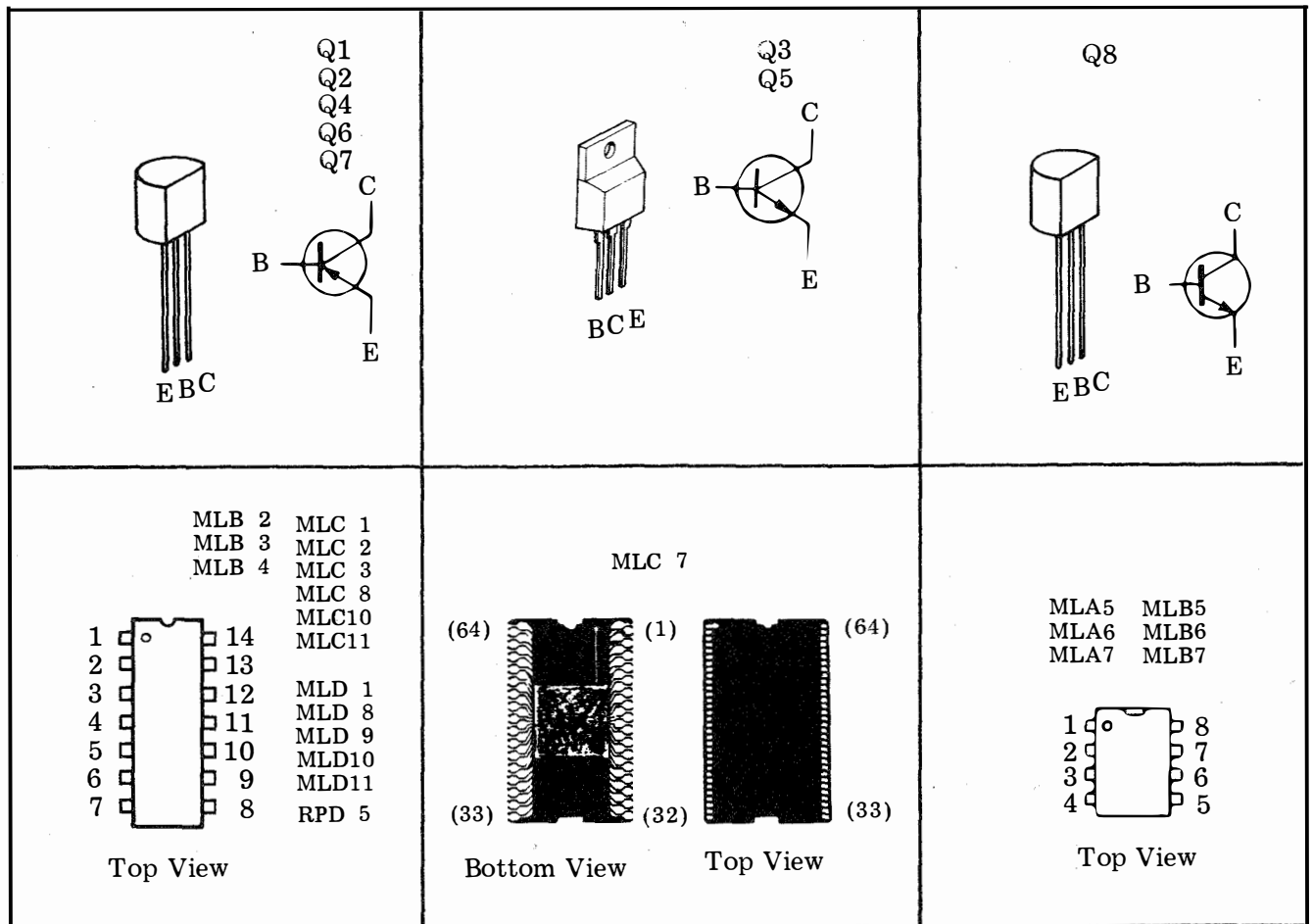
410711 PAPER TAPE PUNCH AND READER LOGIC CARD

CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION

B = Base E = Emitter C = Collector



PAPER TAPE PUNCH AND READER CIRCUIT CARD

410711 ISSUE 4A

CIRCUIT NOTES:
101. VOLTAGE VOLTAGE RANGE
+12 10.8 TO 13.2
+5 4.5 TO 5.5
-5 -4.5 TO -5.5
-12 -10.8 TO -13.2

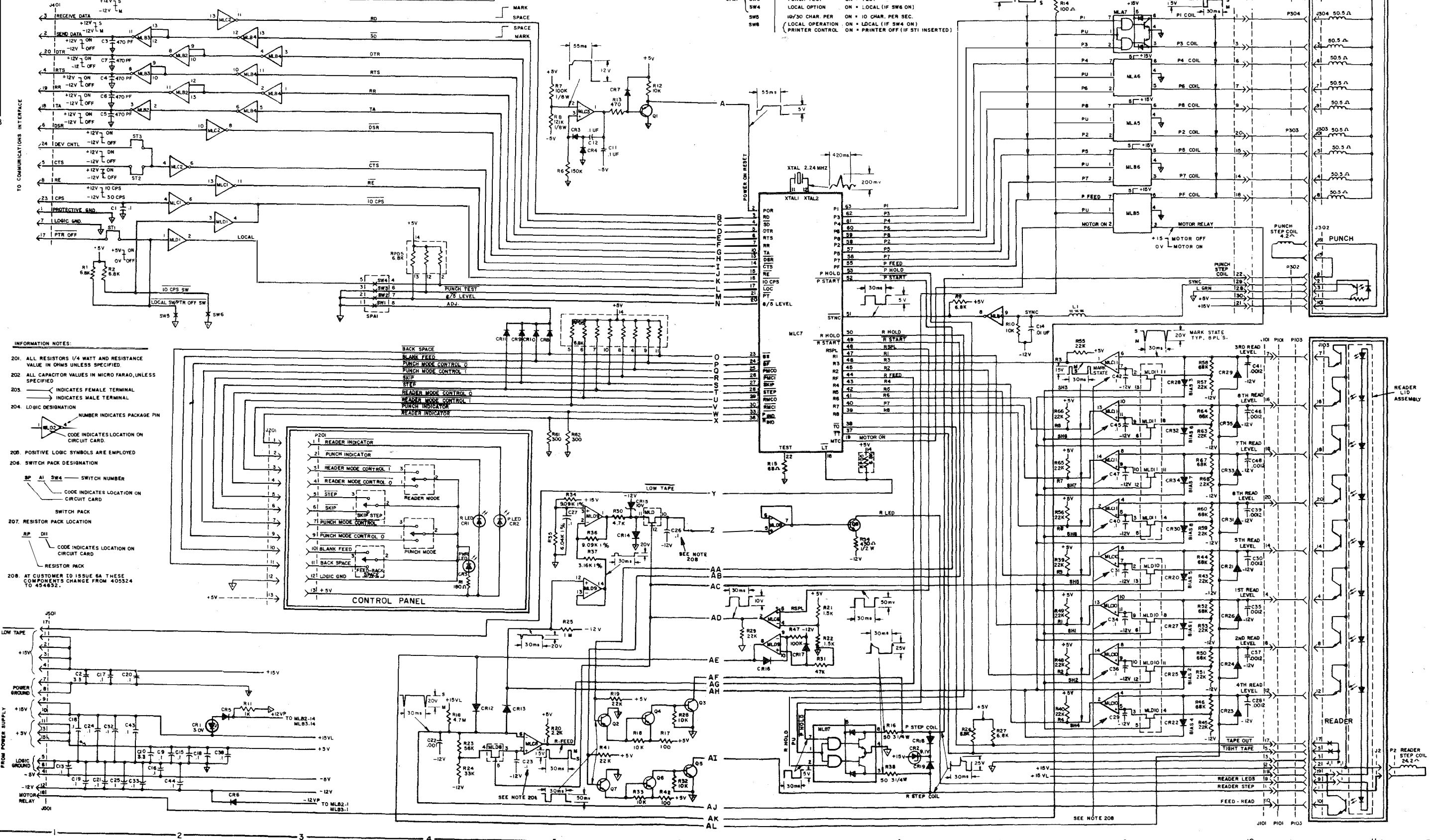
102 INTEGRATED CIRCUIT POWER CONNECTIONS

DESIGNATION	TYPE	PART NO.	#2	#6	LOGIC GND	POWER GND	-5	-12	+15VL
MLB4	TTL	474014	14	14	7				
MLC1, C2	TTL	335529	14	14	7				
MLB2, B3	TTL	335528	14	14	7				
MLD1	TTL	335417	14	14	7				
MLA5, A6, A7, B5, B6, B7	TTL	404477	14	14	7	4			
MLC8, C10, C11	LINEAR	404239						12	3
MLC3, D9	LINEAR	404324						11	7
MLD8, D10, D11	CMOS	404016						11	7
MLC7	MOS	412541	1, 3, 4	14	9, 5, 4			33	32

10. SWITCH OPTIONS
OFF = SWITCH OPEN
ON = CLOSED

DESIGNATION FUNCTION SWITCH STATE (TO ENABLE FUNCTION)

SW2	ADJUST	ON = ADJUST
SW3	8 OR 5 LEVEL	ON = 5 LEVEL
SW4	PUNCH TEST	ON = TEST
SW5	LOCAL OPTION	ON = LOCAL (IF SW6 ON)
SW6	10/30 CHAR. PER	ON = 10 CHAR. PER SEC.
SW8	LOCAL OPERATION (PRINTER CONTROL)	ON = LOCAL (IF SW4 ON) ON = PRINTER OFF (IF ST1 INSERTED)



- INFORMATION NOTES:**
- 201. ALL RESISTORS 1/4 WATT AND RESISTANCE VALUE IN OHMS UNLESS SPECIFIED
 - 202. ALL CAPACITOR VALUES IN MICRO FARAD, UNLESS SPECIFIED
 - 203. \ominus INDICATES FEMALE TERMINAL
 - 204. \oplus INDICATES MALE TERMINAL
 - 205. LOGIC DESIGNATION
 - 206. POSITIVE LOGIC SYMBOLS ARE EMPLOYED
 - 207. SWITCH PACK DESIGNATION
 - 208. AT CUSTOMER TO ISSUE 6A THESE COMPONENTS CHANGE FROM 405524 TO 454632.

410711 ASSEM. ISS. 4A

B5
B6
B7
18
16
15
W

READER LID ASSEMBLY

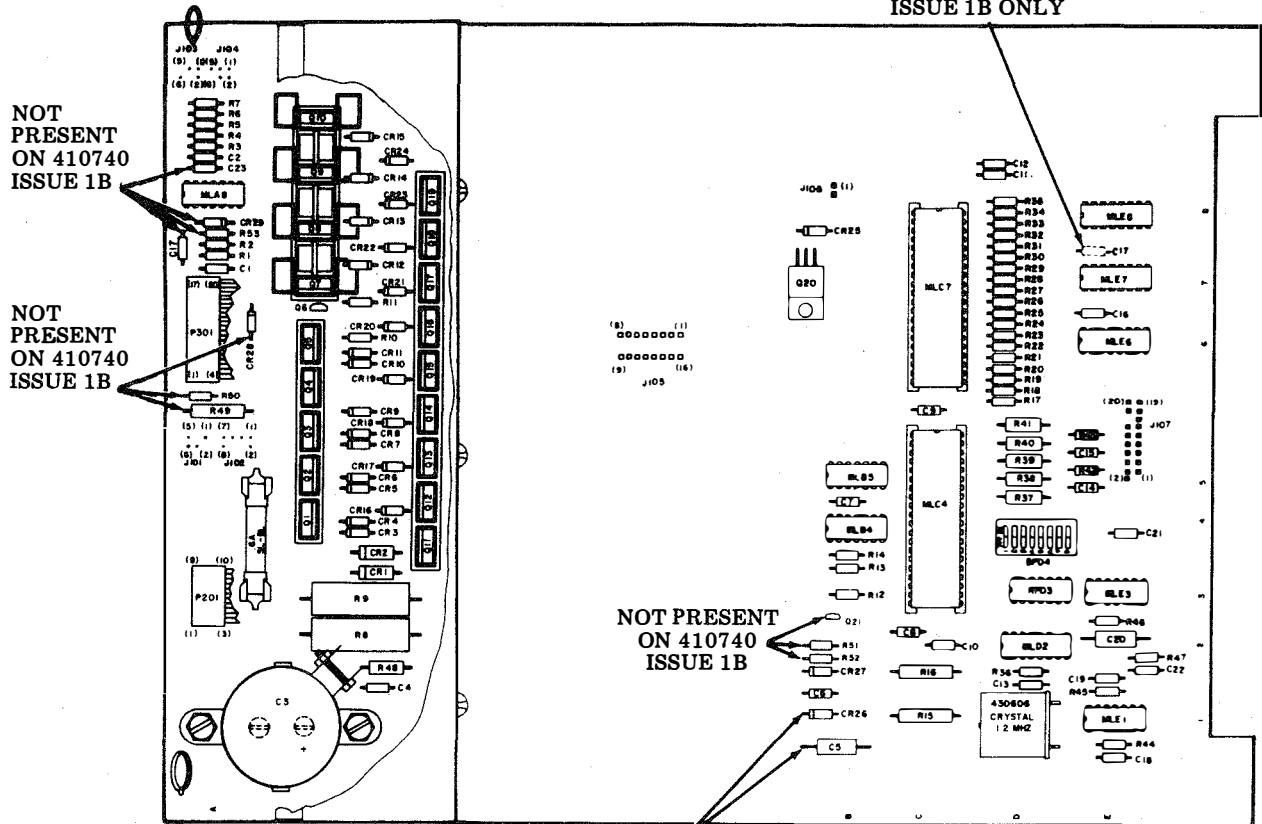
READER

410740, 410742, 410786 AND 410788 PRINTER LOGIC CARDS

CIRCUIT CARD COMPONENT LAYOUT

Note: 0.025 inch dot next to diode represents cathode.

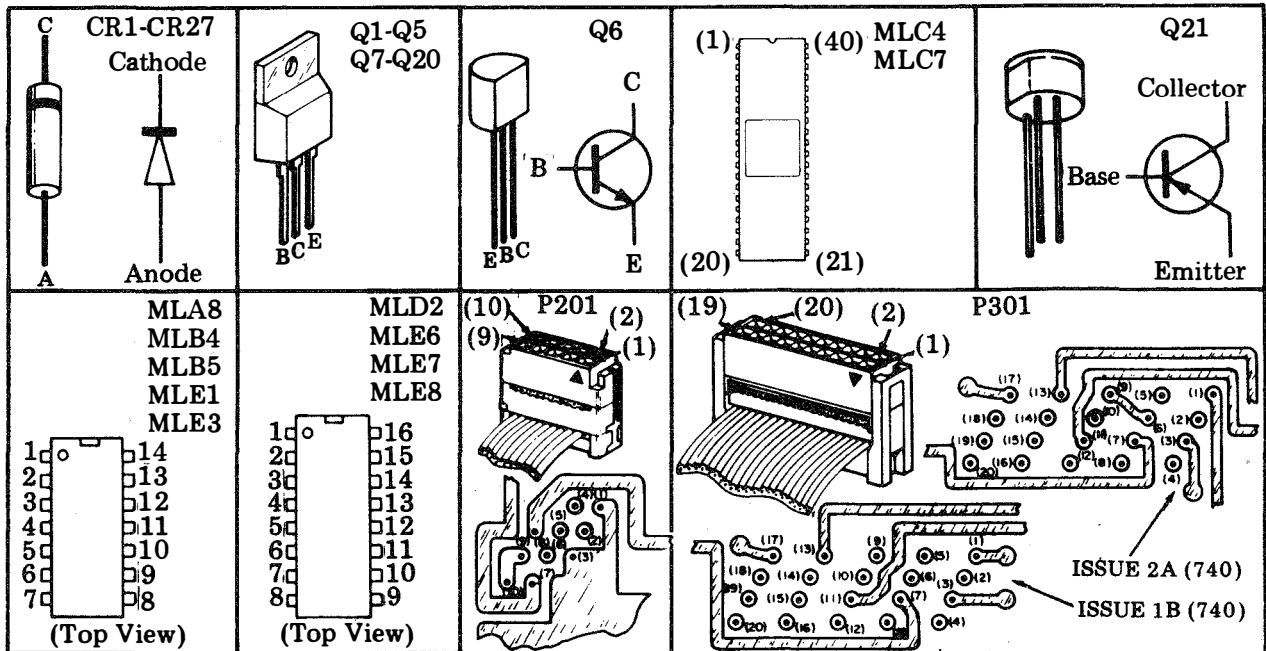
PRESENT ON 410740
ISSUE 1B ONLY



POSITIONS REVERSED ON 410740 ISSUE 1B

COMPONENT IDENTIFICATION AND LEAD DESIGNATION

B = Base E = Emitter C = Collector



CIRCUIT NOTES:

101. VOLTAGE: VOLTAGE RANGE:
 +42V +37.8 TO +46.2
 +12V +10.8 TO +13.2
 +5V +4.5 TO +5.5
 -4V -3.4 TO -4.6
 -5V -3.5 TO -5.5
 -12V -10.8 TO -13.2

102. INTEGRATED CIRCUIT BATTERY CONNECTIONS:

TYPE	DESIG.	+5V	LOGIC GND.	-4V	-5V	-12V
TTL	MLD2	16	8			
TTL	MLB4, E3	14	7			
TTL	MLB5	14	7			
DTL	MLE1	8	1			
LINEAR	MLA8	4			11	
CMOS	MLE6, E7, E8	1	20	8	40	21
MOS	MLC7	1	20			
MOS	MLC4	1, 33	40			

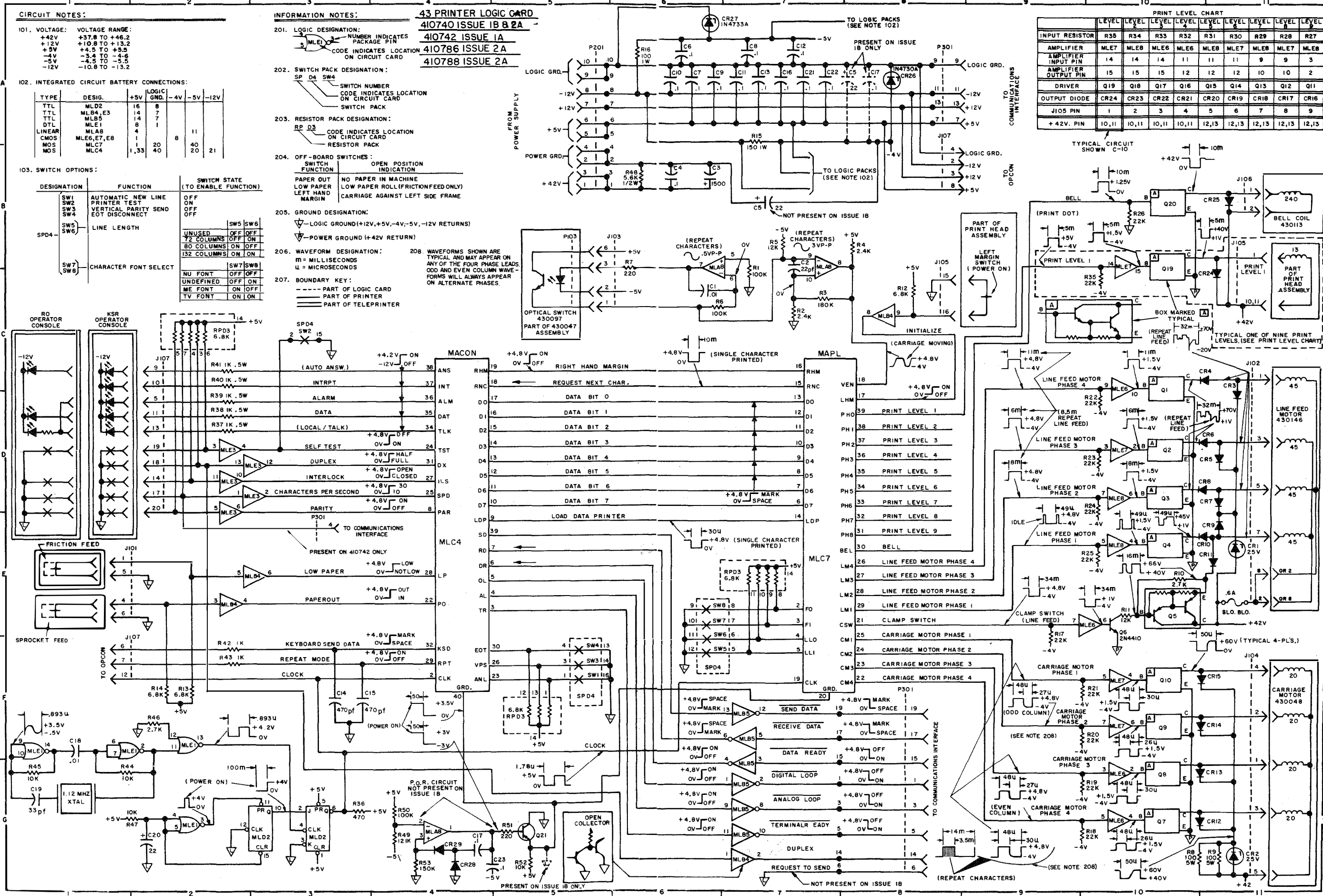
103. SWITCH OPTIONS:

DESIGNATION	FUNCTION	SWITCH STATE (TO ENABLE FUNCTION)
SW1	AUTOMATIC NEW LINE	OFF
SW2	PRINTER TEST	ON
SW3	VERTICAL PARITY SEND	OFF
SW4	EOT DISCONNECT	OFF
SW5	LINE LENGTH	SW5 SW6
SW6		UNUSED OFF OFF
SPD4	CHARACTER FONT SELECT	72 COLUMNS ON OFF
		80 COLUMNS ON OFF
		132 COLUMNS ON ON
SW7	CHARACTER FONT SELECT	NU FONT OFF OFF
SW8		UNDEFINED OFF ON
		ME FONT ON OFF
		TV FONT ON ON

INFORMATION NOTES:

201. LOGIC DESIGNATION:
 NUMBER INDICATES PACKAGE PIN
 CODE INDICATES LOCATION ON CIRCUIT CARD
202. SWITCH PACK DESIGNATION:
 SWITCH NUMBER
 CODE INDICATES LOCATION ON CIRCUIT CARD
 SWITCH PACK
203. RESISTOR PACK DESIGNATION:
 CODE INDICATES LOCATION ON CIRCUIT CARD
 RESISTOR PACK
204. OFF-BOARD SWITCHES:
 SWITCH FUNCTION OPEN POSITION INDICATION
 PAPER OUT NO PAPER IN MACHINE
 LOW PAPER ROLL (FRICTION FEED ONLY)
 LEFT HAND MARGIN CARRIAGE AGAINST LEFT SIDE FRAME
205. GROUND DESIGNATION:
 LOGIC GROUND (+12V, +5V, -4V, -5V, -12V RETURNS)
 POWER GROUND (+42V RETURN)
206. WAVEFORM DESIGNATION:
 m = MILLISECONDS
 u = MICROSECONDS
207. BOUNDARY KEY:
 PART OF LOGIC CARD
 PART OF PRINTER
 PART OF TELEPRINTER
208. WAVEFORMS SHOWN ARE TYPICAL AND MAY APPEAR ON ANY OF THE FOUR PHASE LEADS. ODD AND EVEN COLUMN WAVEFORMS WILL ALWAYS APPEAR ON ALTERNATE PHASES.

43 PRINTER LOGIC CARD
 410740 ISSUE 1B & 2A
 410742 ISSUE 1A
 410786 ISSUE 2A
 410788 ISSUE 2A



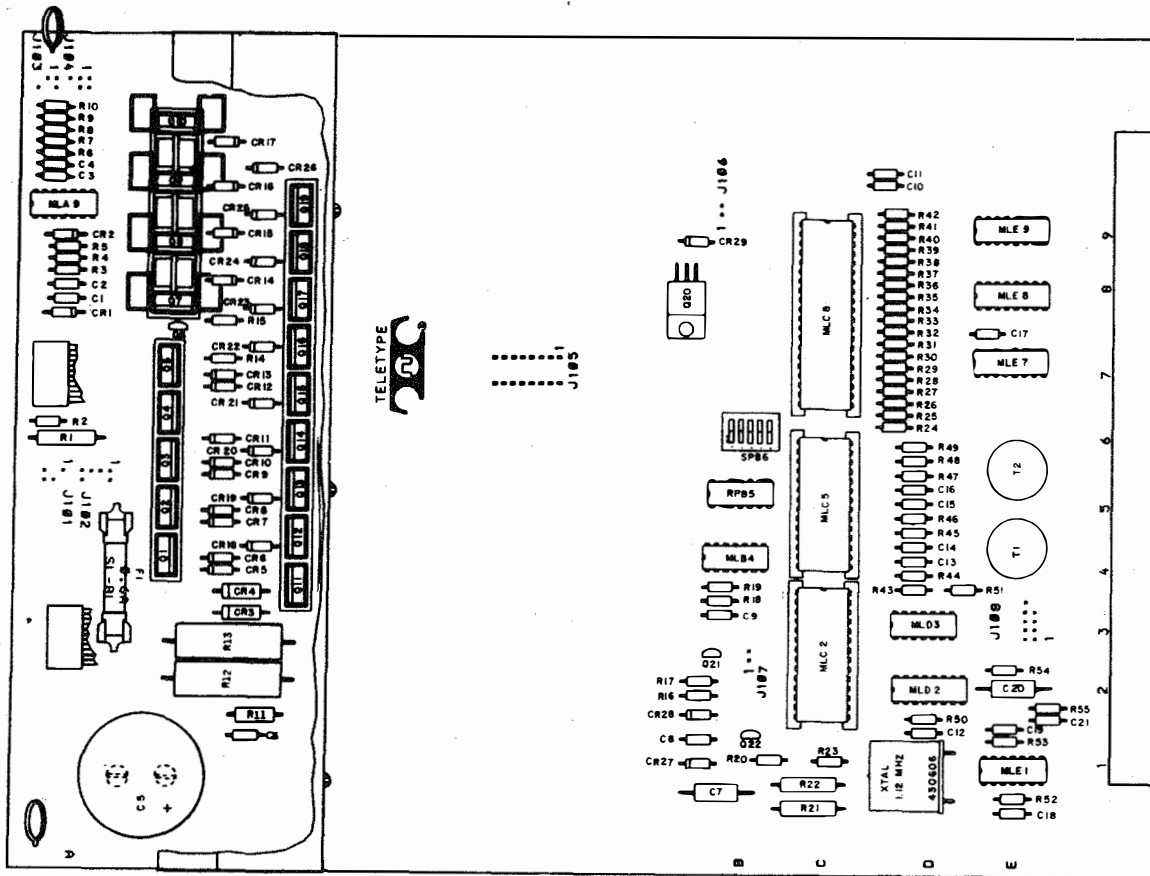
PRINT LEVEL CHART

LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL
INPUT RESISTOR	R35	R34	R33	R32	R31	R30	R29	R28	R27
AMPLIFIER	MLE7	MLE8	MLE6	MLE6	MLE8	MLE7	MLE8	MLE7	MLE8
AMPLIFIER INPUT PIN	14	14	14	11	11	11	9	9	3
AMPLIFIER OUTPUT PIN	15	15	15	12	12	12	10	10	2
DRIVER	Q19	Q18	Q17	Q16	Q15	Q14	Q13	Q12	Q11
OUTPUT DIODE	CR24	CR23	CR22	CR21	CR20	CR19	CR18	CR17	CR16
J105 PIN	1	2	3	4	5	6	7	8	9
+42V. PIN	10,11	10,11	10,11	10,11	12,13	12,13	12,13	12,13	12,13

ector
 itter
 740)
 (740)

410745, 410785 AND 410787 PRINTER LOGIC CARDS

CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION

B = BASE E = Emitter C = Collector

<p>C CR1-CR29 Cathode</p> <p>A Anode</p>	<p>Q1-Q5 Q7-Q20</p> <p>BCE</p>	<p>Q6</p> <p>BCE</p>	<p>(1) (40) MLC8 (20) (21)</p>	<p>Q21 Q22 Collector</p> <p>BCE Emitter</p>
<p>MLA9 MLB4 MLD3 MLE1</p> <p>(Top View)</p>	<p>MLD2 MLE7 MLE8 MLE9</p> <p>(Top View)</p>	<p>(10) P201 (2) (9) (1)</p>	<p>(10) (2) P301 (9) (1)</p>	<p>MLC2 MLC5 (28)</p> <p>(14) (15)</p>

CIRCUIT NOTES:

101. VOLTAGE: VOLTAGE RANGE:

+42V	+37.8 TO +46.2
+12V	+10.8 TO +13.2
+5V	+4.5 TO +5.5
-4V	-3.4 TO -4.6
-5V	-4.5 TO -5.5
-12V	-10.8 TO -13.2

102. INTEGRATED CIRCUIT BATTERY CONNECTIONS:

TYP	DESIG.	+5V	LOGIC GND.	-4V	-5V	-12V
TTL	MLD2	16	8			
DTL	MLB4	14	7			
LINEAR	MLE1	8	1			
CMOS	MLE7, E8, E9	4	1	8	12	
MOS	MLC8	1	1	20	40	
	MLC2, MLC5	1	1	15	14	

103. SWITCH OPTIONS:

DESIGNATION	FUNCTION	SWITCH STATE (TO ENABLE FUNCTION)			
SPB6	PRINTER TEST LINE LENGTH	ON	SW4	SW3	
		> 132	OFF	OFF	
SW1	CHARACTER * FONT SELECT	80 COLUMNS	ON	OFF	
		132 COLUMNS	ON	ON	
		NU FONT	OFF	OFF	
	UNDEFINED ME FONT	ON	ON		
	TV FONT	ON	OFF		

* NOT FUNCTIONAL ON 410787

INFORMATION NOTES:

201. LOGIC DESIGNATION:
 NUMBER INDICATES PACKAGE PIN
 CODE INDICATES LOCATION ON CIRCUIT CARD

202. SWITCH PACK DESIGNATION:
 SWITCH NUMBER
 CODE INDICATES LOCAT-JN ON CIRCUIT CARD
 SWITCH PACK

203. RESISTOR PACK DESIGNATION:
 CODE INDICATES LOCATION ON CIRCUIT CARD
 RESISTOR PACK

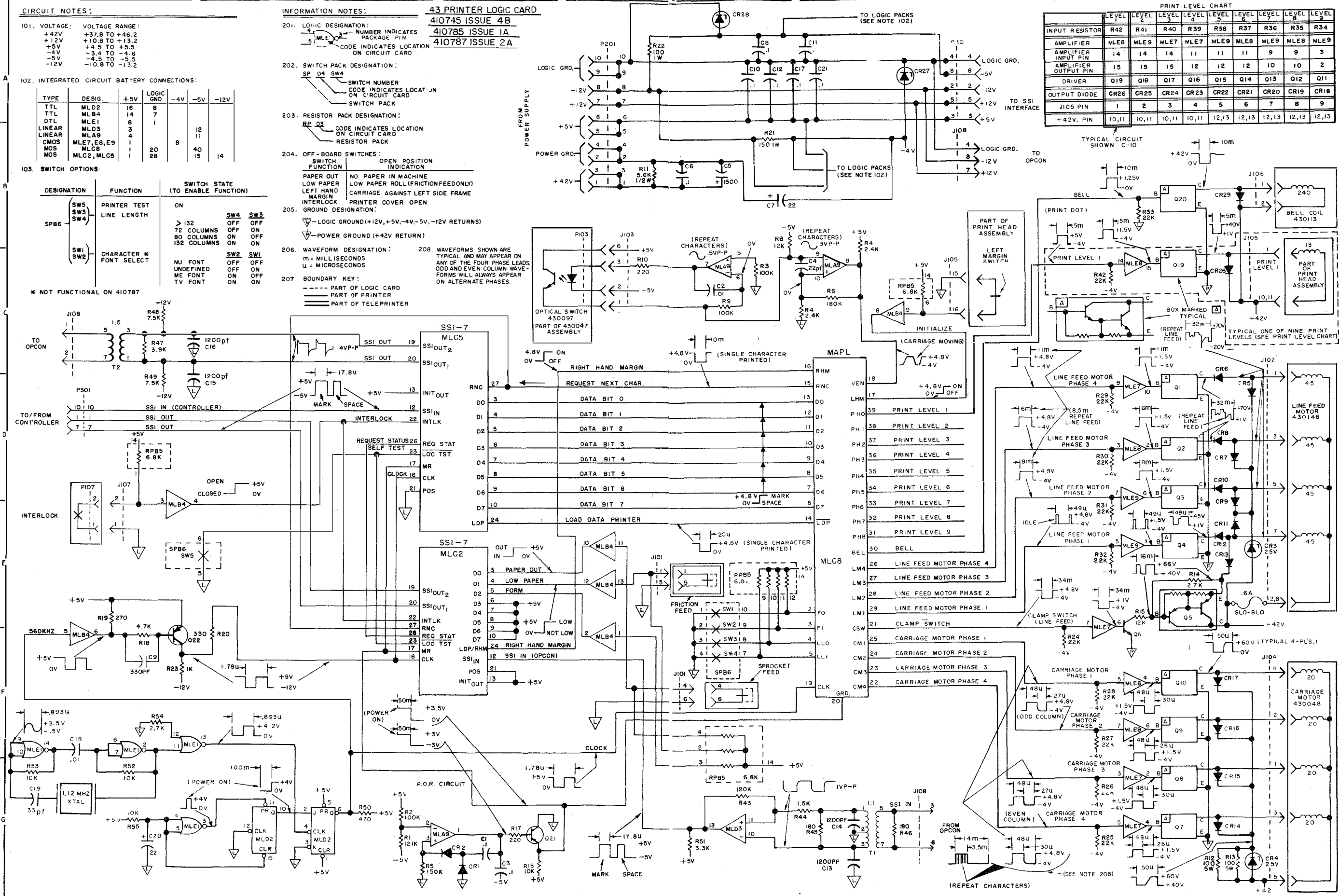
204. OFF-BOARD SWITCHES:
 SWITCH FUNCTION
 OPEN POSITION INDICATION

205. WAVEFORM DESIGNATION:
 PAPER OUT NO PAPER IN MACHINE
 LOW PAPER ROLL (FRICTION FEED ONLY)
 LEFT HAND MARGIN CARRIAGE AGAINST LEFT SIDE FRAME
 INTERLOCK PRINTER COVER OPEN
 GROUND DESIGNATION:
 ▽ - LOGIC GROUND (+12V, +5V, -4V, -5V, -12V RETURNS)
 ▽ - POWER GROUND (+42V RETURN)

206. WAVEFORM DESIGNATION:
 m = MILLISECONDS
 μ = MICROSECONDS

207. BOUNDARY KEY:
 --- PART OF LOGIC CARD
 --- PART OF PRINTER
 --- PART OF TELEPRINTER

43 PRINTER LOGIC CARD
 410745 ISSUE 4B
 410785 ISSUE 1A
 410787 ISSUE 2A



PRINT LEVEL CHART

LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL
INPUT RESISTOR	R42	R41	R40	R39	R38	R37	R36	R35	R34
AMPLIFIER	MLE8	MLE9	MLE7	MLE7	MLE9	MLE9	MLE9	MLE8	MLE9
AMPLIFIER INPUT PIN	14	14	14	11	11	11	9	9	3
AMPLIFIER OUTPUT PIN	15	15	15	12	12	12	10	10	2
DRIVER	Q19	Q18	Q17	Q16	Q15	Q14	Q13	Q12	Q11
OUTPUT DIODE	CR26	CR25	CR24	CR23	CR22	CR21	CR20	CR19	CR18
J105 PIN	1	2	3	4	5	6	7	8	9
+42V. PIN	10,11	10,11	10,11	10,11	12,13	12,13	12,13	12,13	12,13

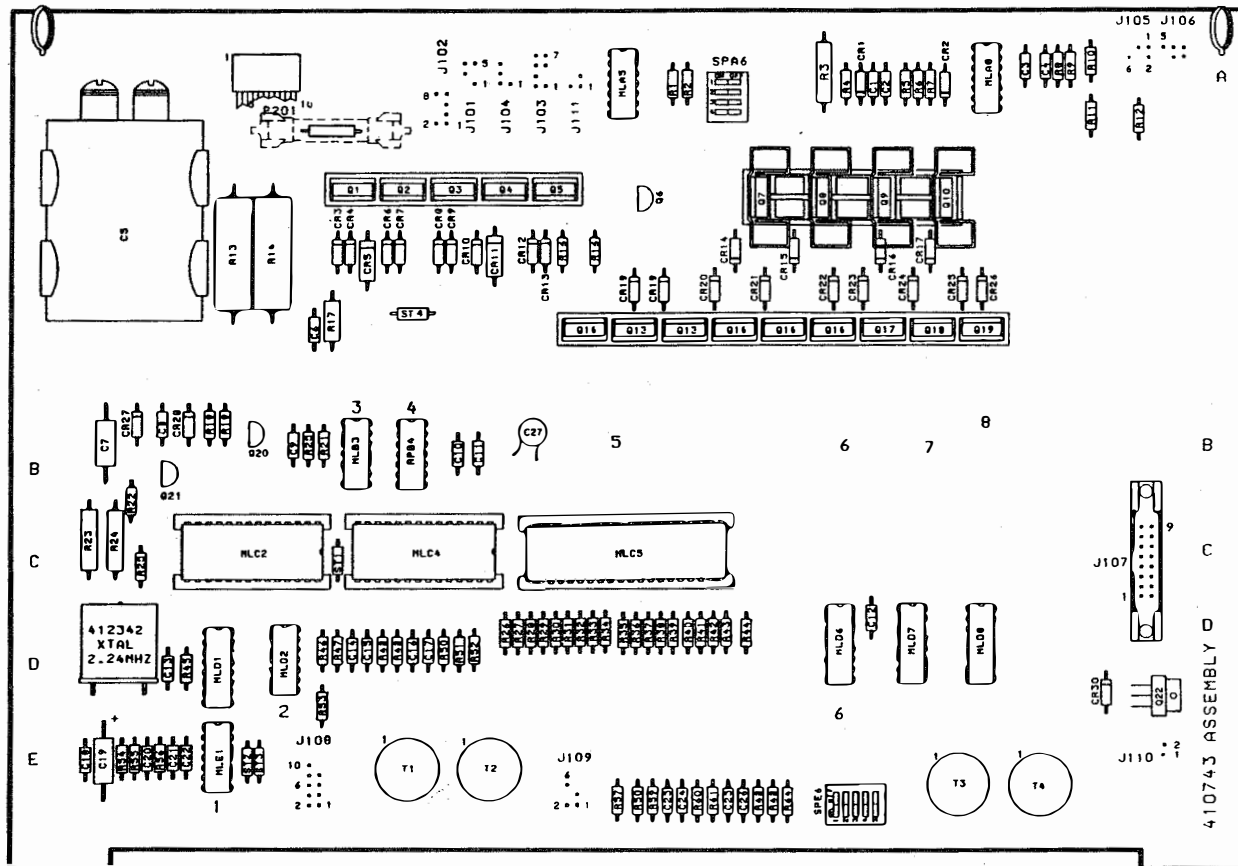
1
2
ctor

itter
LC2
LC5
28)

15)

410743 PRINTER LOGIC CARD

CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION

B = Base E = Emitter C = Collector

<p>CR1-CR30 Cathode</p> <p>Anode</p>	<p>Q1-Q5 Q7-Q19 Q22</p> <p>BCE</p>	<p>Q6 Q20 Q21</p> <p>EBC</p>	<p>MLC5</p> <p>(1) (20) (40) (21)</p>
<p>MLA5 MLA8 MLB3 MLD2 MLE1</p> <p>(Top View)</p>	<p>MLD1 MLD6 MLD7 MLD8</p> <p>(Top View)</p>	<p>P201</p> <p>(10) (9) (2) (1) (3)</p>	<p>MLC2 MLC4</p> <p>(1) (14) (28) (15)</p>

45 PRINTER LOGIC CARD
410743 ISSUE 4A

CIRCUIT NOTES:

101. VOLTAGE: VOLTAGE RANGE:

+42V	+37.8 TO +46.2
+12V	+10.8 TO +13.2
+5V	+4.5 TO +5.5
-4V	-3.4 TO -4.6
-5V	-4.5 TO -5.5
-12V	-10.8 TO -13.2

102. INTEGRATED CIRCUIT BATTERY CONNECTIONS:

TYPE	DESIG.	+5V	LOGIC GND.	-4V	-5V	-12V
TTL	MLD1	16	8			
TTL	MLB3	14	7			
DTL	MLE1	8	1			
LINEAR	MLD2	3		12		
LINEAR	MLA8	4			11	
CMOS	MLD7,08,09	1		8		
MOS	MLC5	1	20	40		
MOS	MLC2,MLC4	1	28	15	14	

103. SWITCH OPTIONS:

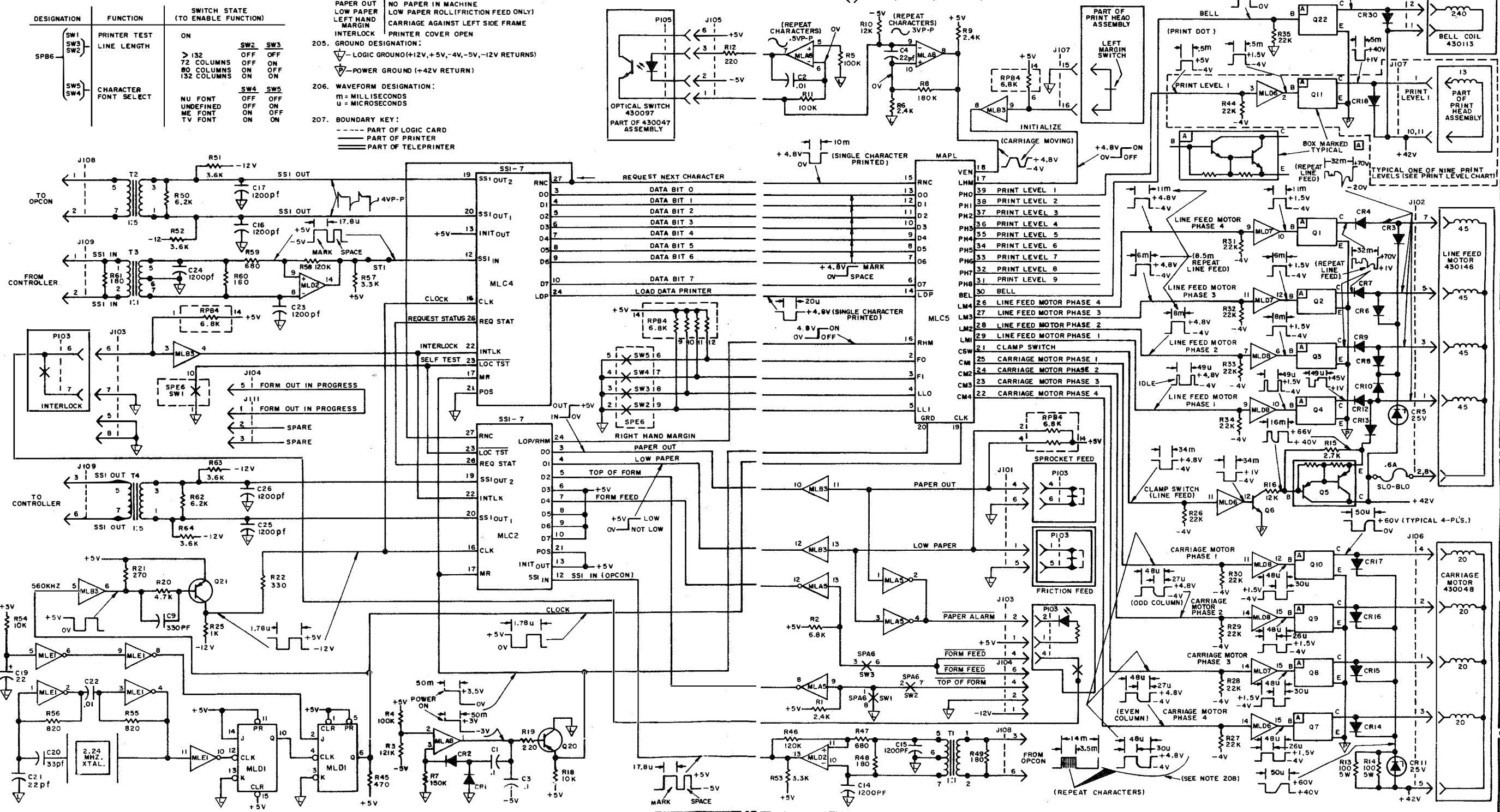
DESIGNATION	FUNCTION	SWITCH STATE (TO ENABLE FUNCTION)			
SPB6	PRINTER TEST LINE LENGTH	ON	SW2	SW3	
		> 132 COLUMNS 72 COLUMNS 80 COLUMNS 132 COLUMNS	OFF OFF ON OFF	OFF ON OFF ON	
SW5 SW4	CHARACTER FONT SELECT	NU FONT	OFF	OFF	
		UNDEFINED	OFF	OFF	
		ME FONT	ON	OFF	
		TV FONT	ON	ON	

INFORMATION NOTES:

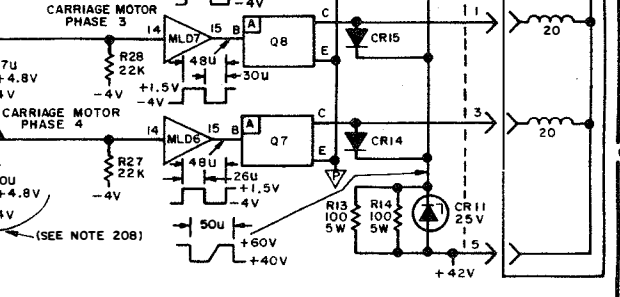
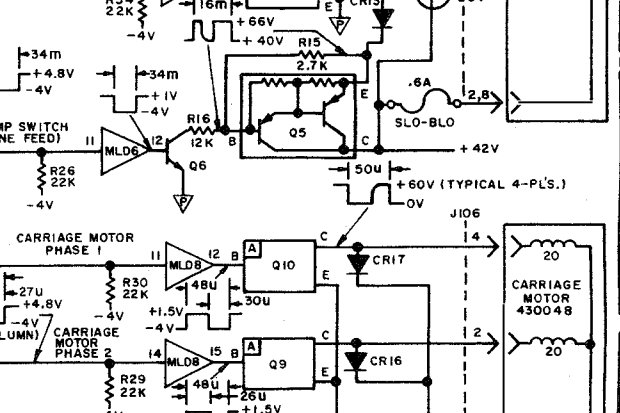
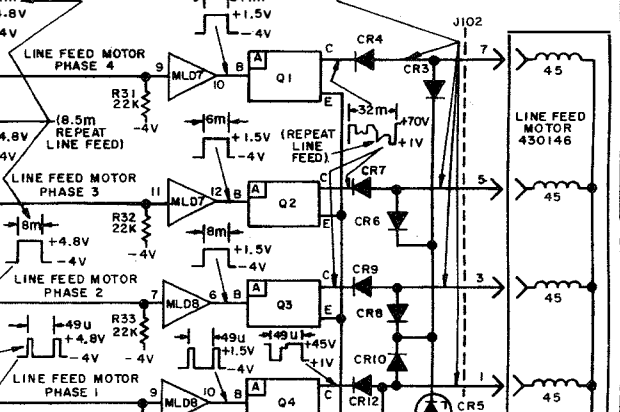
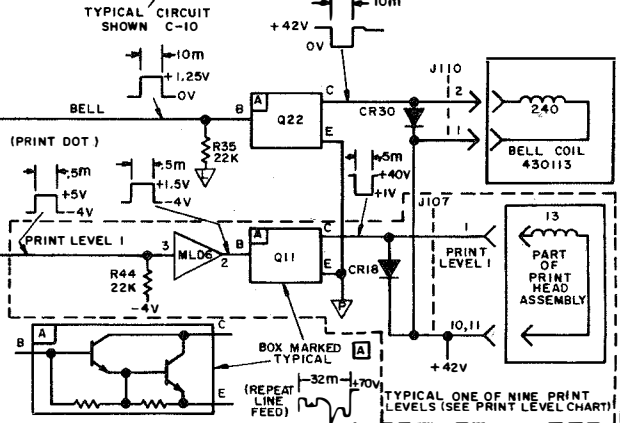
201. LOGIC DESIGNATION:
 NUMBER INDICATES PACKAGE PIN
 CODE INDICATES LOCATION ON CIRCUIT CARD
202. SWITCH PACK DESIGNATION:
 SP D4 SW4
 SWITCH NUMBER
 CODE INDICATES LOCATION ON CIRCUIT CARD
203. RESISTOR PACK DESIGNATION:
 RP D3
 CODE INDICATES LOCATION ON CIRCUIT CARD
 RESISTOR PACK
204. OFF-BOARD SWITCHES:
 SWITCH FUNCTION OPEN POSITION INDICATION
 PAPER OUT NO PAPER IN MACHINE
 LOW PAPER ROLL (FRICTION FEED ONLY)
 LEFT HAND MARGIN CARRIAGE AGAINST LEFT SIDE FRAME
 INTERLOCK PRINTER COVER OPEN
205. GROUND DESIGNATION:
 LOGIC GROUND (+12V, +5V, -4V, -5V, -12V RETURNS)
 POWER GROUND (+42V RETURN)
206. WAVEFORM DESIGNATION:
 M = MILLISECONDS
 U = MICROSECONDS
207. BOUNDARY KEY:
 PART OF LOGIC CARD
 PART OF PRINTER
 PART OF TELEPRINTER

INFORMATION NOTES CONT'D.:

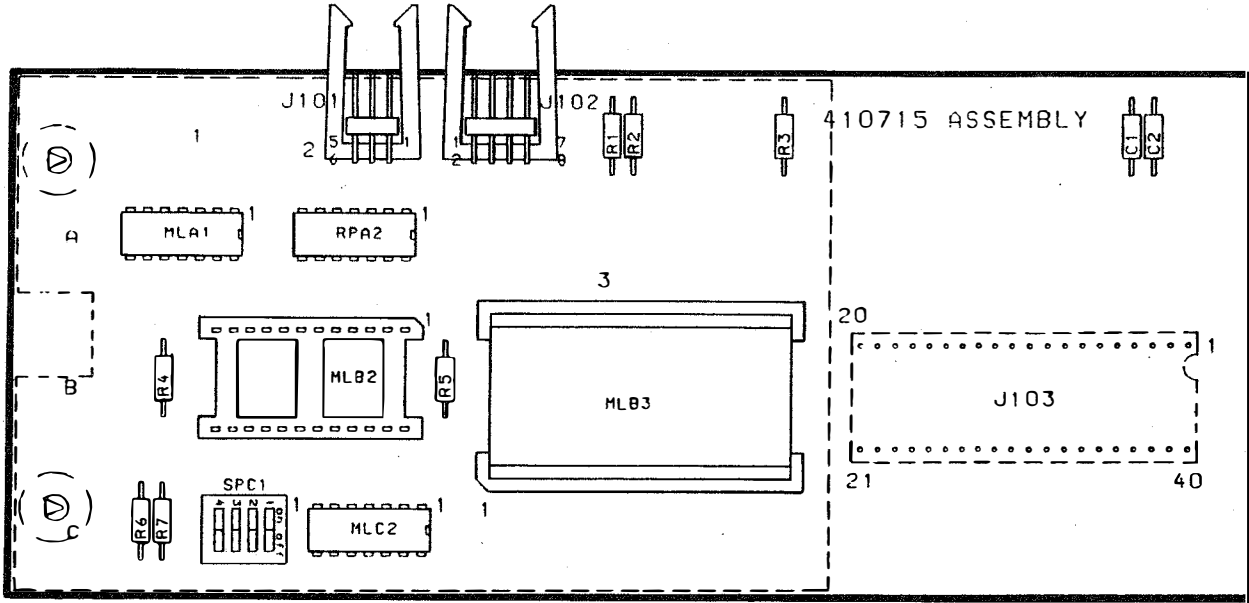
208. WAVEFORMS SHOWN ARE TYPICAL AND MAY APPEAR ON ANY OF THE FOUR PHASE LEADS, ODD AND EVEN COLUMN WAVEFORMS WILL ALWAYS APPEAR ON ALTERNATE PHASES.



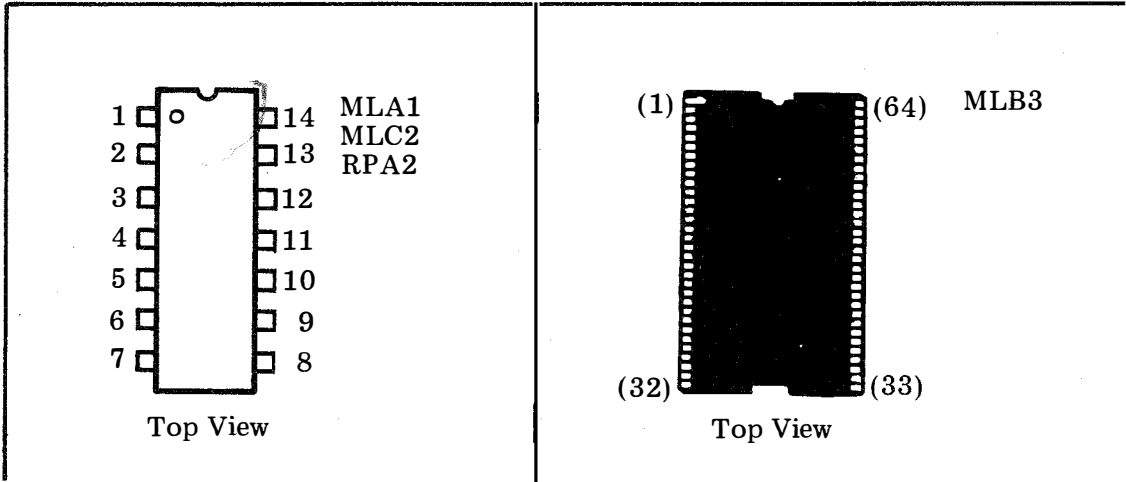
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6	LEVEL 7	LEVEL 8	LEVEL 9
INPUT RESISTOR	R44	R43	R42	R41	R40	R39	R38	R37	R36
AMPLIFIER INPUT PIN	MLD8	MLD6	MLD7	MLD9	MLD7	MLD7	MLD7	MLD8	MLD8
AMPLIFIER OUTPUT PIN	3	5	7	9	3	5	7	3	5
DRIVER	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19
OUTPUT DIODE	CR18	CR19	CR20	CR21	CR22	CR23	CR24	CR25	CR26
J107 PIN	1	2	3	4	5	6	7	8	9
+42V. PIN	10,11	10,11	10,11	10,11	12,13	12,13	12,13	12,13	12,13



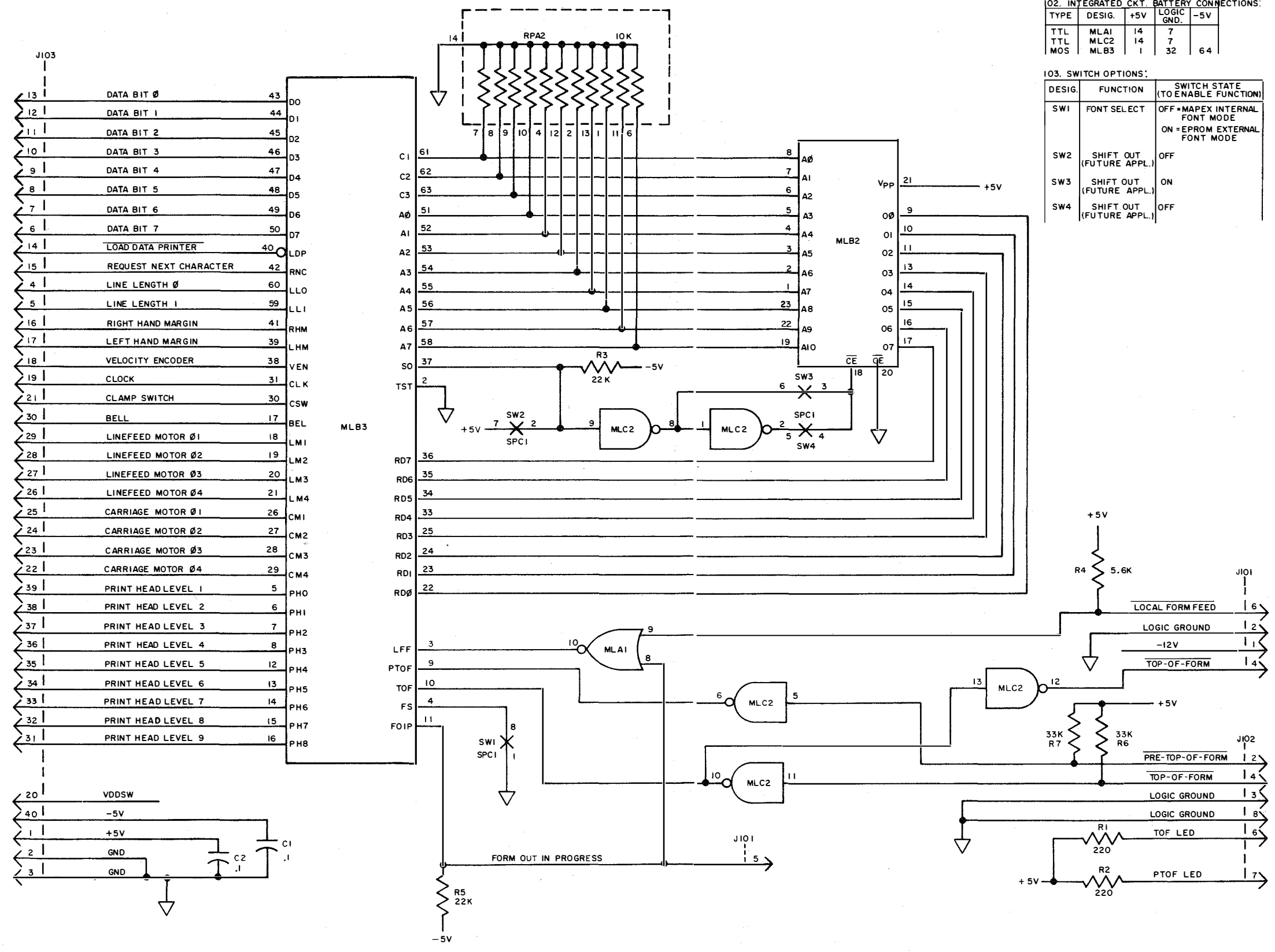
410715 TOP OT FORM LOGIC CARD
CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION

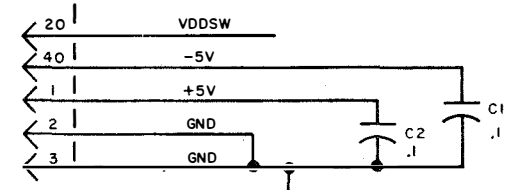


TOP OF FORM LOGIC CARD
410715 ISSUE 1A



J103

13	DATA BIT 0	43	D0
12	DATA BIT 1	44	D1
11	DATA BIT 2	45	D2
10	DATA BIT 3	46	D3
9	DATA BIT 4	47	D4
8	DATA BIT 5	48	D5
7	DATA BIT 6	49	D6
6	DATA BIT 7	50	D7
14	LOAD DATA PRINTER	40	LDP
15	REQUEST NEXT CHARACTER	42	RNC
4	LINE LENGTH 0	60	LLO
5	LINE LENGTH 1	59	LLI
16	RIGHT HAND MARGIN	41	RHM
17	LEFT HAND MARGIN	39	LHM
18	VELOCITY ENCODER	38	VEN
19	CLOCK	31	CLK
21	CLAMP SWITCH	30	CSW
30	BELL	17	BEL
29	LINEFEED MOTOR 01	18	LM1
28	LINEFEED MOTOR 02	19	LM2
27	LINEFEED MOTOR 03	20	LM3
26	LINEFEED MOTOR 04	21	LM4
25	CARRIAGE MOTOR 01	26	CM1
24	CARRIAGE MOTOR 02	27	CM2
23	CARRIAGE MOTOR 03	28	CM3
22	CARRIAGE MOTOR 04	29	CM4
39	PRINT HEAD LEVEL 1	5	PH0
38	PRINT HEAD LEVEL 2	6	PH1
37	PRINT HEAD LEVEL 3	7	PH2
36	PRINT HEAD LEVEL 4	8	PH3
35	PRINT HEAD LEVEL 5	12	PH4
34	PRINT HEAD LEVEL 6	13	PH5
33	PRINT HEAD LEVEL 7	14	PH6
32	PRINT HEAD LEVEL 8	15	PH7
31	PRINT HEAD LEVEL 9	16	PH8



CIRCUIT NOTES:

101. VOLTAGE RANGE

+5V	+4.5 TO +5.5
-5V	-4.5 TO -5.5

102. INTEGRATED CKT. BATTERY CONNECTIONS:

TYPE	DESIG.	+5V	LOGIC GND.	-5V
TTL	MLA1	14	7	
TTL	MLC2	14	7	
MOS	MLB3	1	32	64

103. SWITCH OPTIONS:

DESIG.	FUNCTION	SWITCH STATE (TO ENABLE FUNCTION)
SW1	FONT SELECT	OFF = MAPEX INTERNAL FONT MODE ON = EPROM EXTERNAL FONT MODE
SW2	SHIFT OUT (FUTURE APPL.)	OFF
SW3	SHIFT OUT (FUTURE APPL.)	ON
SW4	SHIFT OUT (FUTURE APPL.)	OFF

INFORMATION NOTES:

201. LOGIC DESIGNATION:

8 MLC2

9 NUMBER INDICATES PACKAGE PIN

CODE INDICATES LOCATION ON CIRCUIT CARD

202. SWITCH PACK DESIGNATION:

SP C1 SW2

SWITCH NUMBER

LOCATION ON CIRCUIT CARD

SWITCH PACK

203. RESISTOR PACK DESIGNATION:

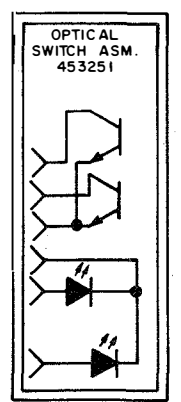
RP A2

LOCATION ON CIRCUIT CARD

RESISTOR PACK

204. GROUND DESIGNATION:

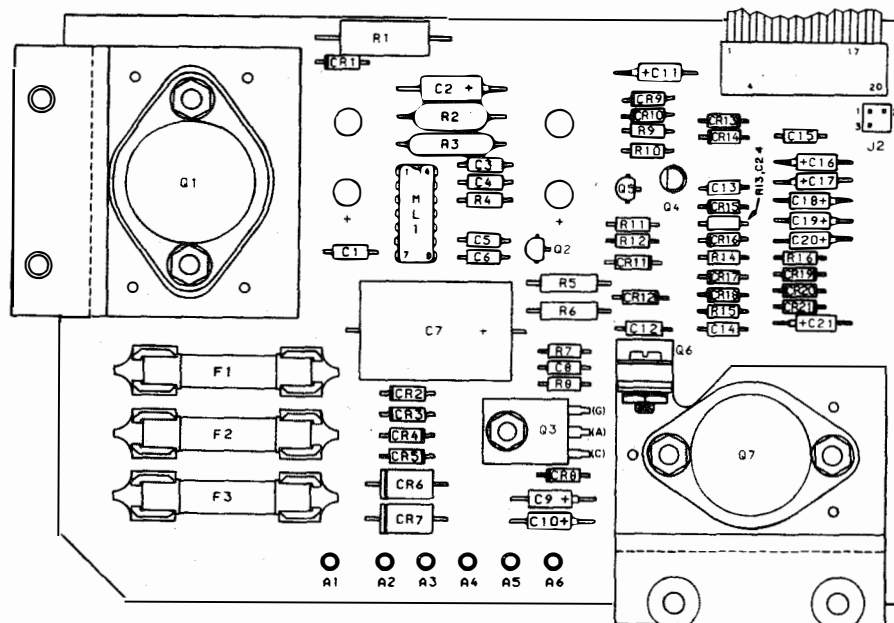
LOGIC GROUND



POWER SUPPLY CIRCUIT CARDS

410477 PAPER TAPE PUNCH AND READER POWER SUPPLY CIRCUIT CARD

CIRCUIT CARD COMPONENT LAYOUT



SEMICONDUCTORS AND INTEGRATED CIRCUITS IDENTIFICATION AND LEAD DESIGNATION



<p>Q3</p> <p>CA G</p>	<p>Q4</p> <p>AG C</p>	<p>Q2</p> <p>CG A</p>	<p>Q5</p> <p>EBC</p>
<p>Q7</p> <p>REFERENCE OUTPUT INPUT</p>	<p>ML1</p> <p>Top View</p>	<p>Q6</p> <p>BC E</p>	<p>Q1</p> <p>C B E</p>

412283 & 412300 P/T UNIT
POWER SUPPLY
410477 CIRCUIT CARD ISSUE 2A

CIRCUIT NOTES:

VOLTAGE	VOLTAGE RANGE
+15V	14.4 TO 15.6
+5V	4.75 TO 5.25
-12V	-11.4 TO -12.6
-5V	-4.75 TO -5.25

INFORMATION NOTES:

- 201. ALL RESISTORS 1/4 WATT AND RESISTANCE VALUES IN OHMS UNLESS SPECIFIED.
- 202. ALL CAPACITOR VALUES IN MICROFARADS UNLESS SPECIFIED.
- 203.  INDICATES FEMALE CONNECTOR
- 203.  INDICATES MALE CONNECTOR

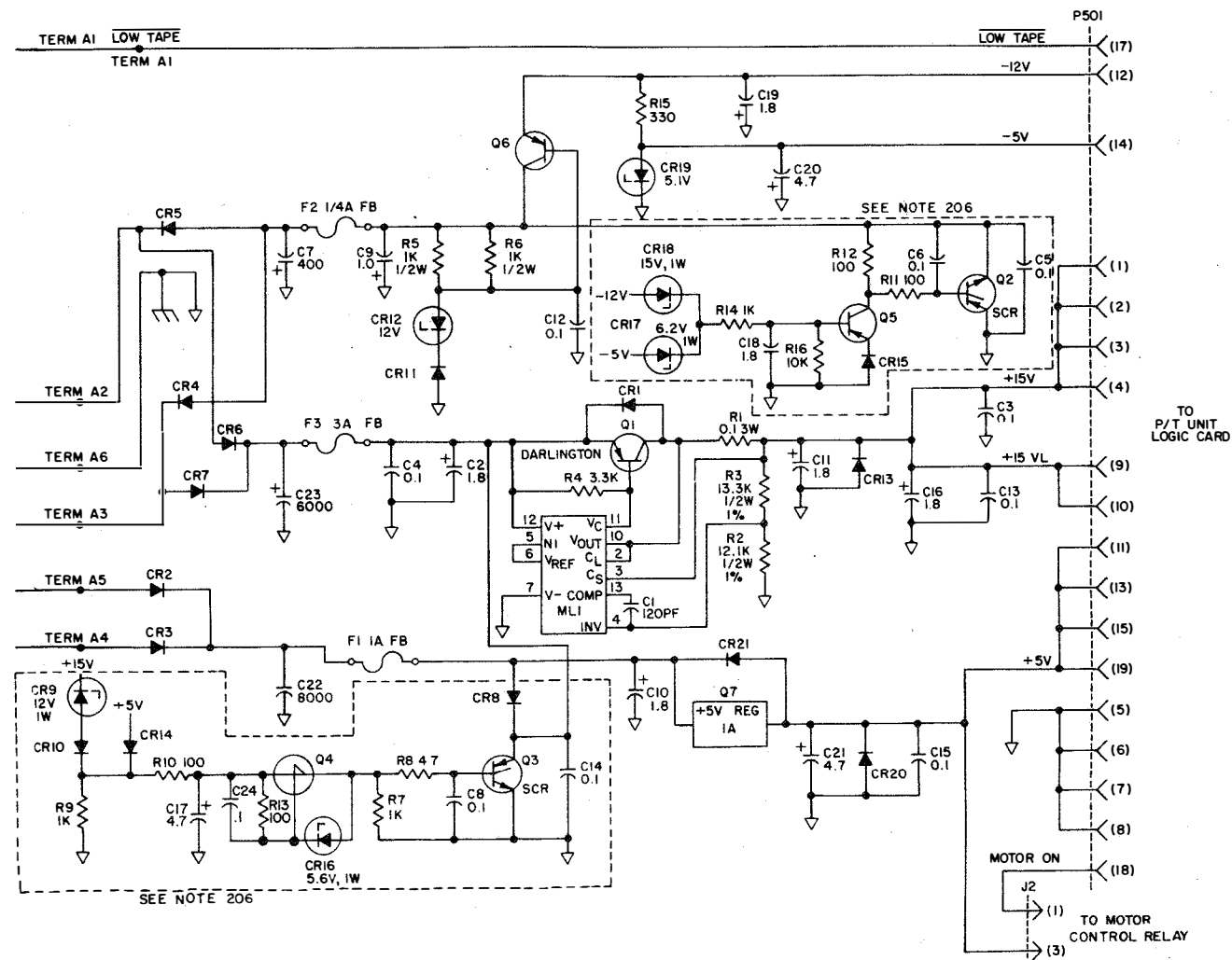
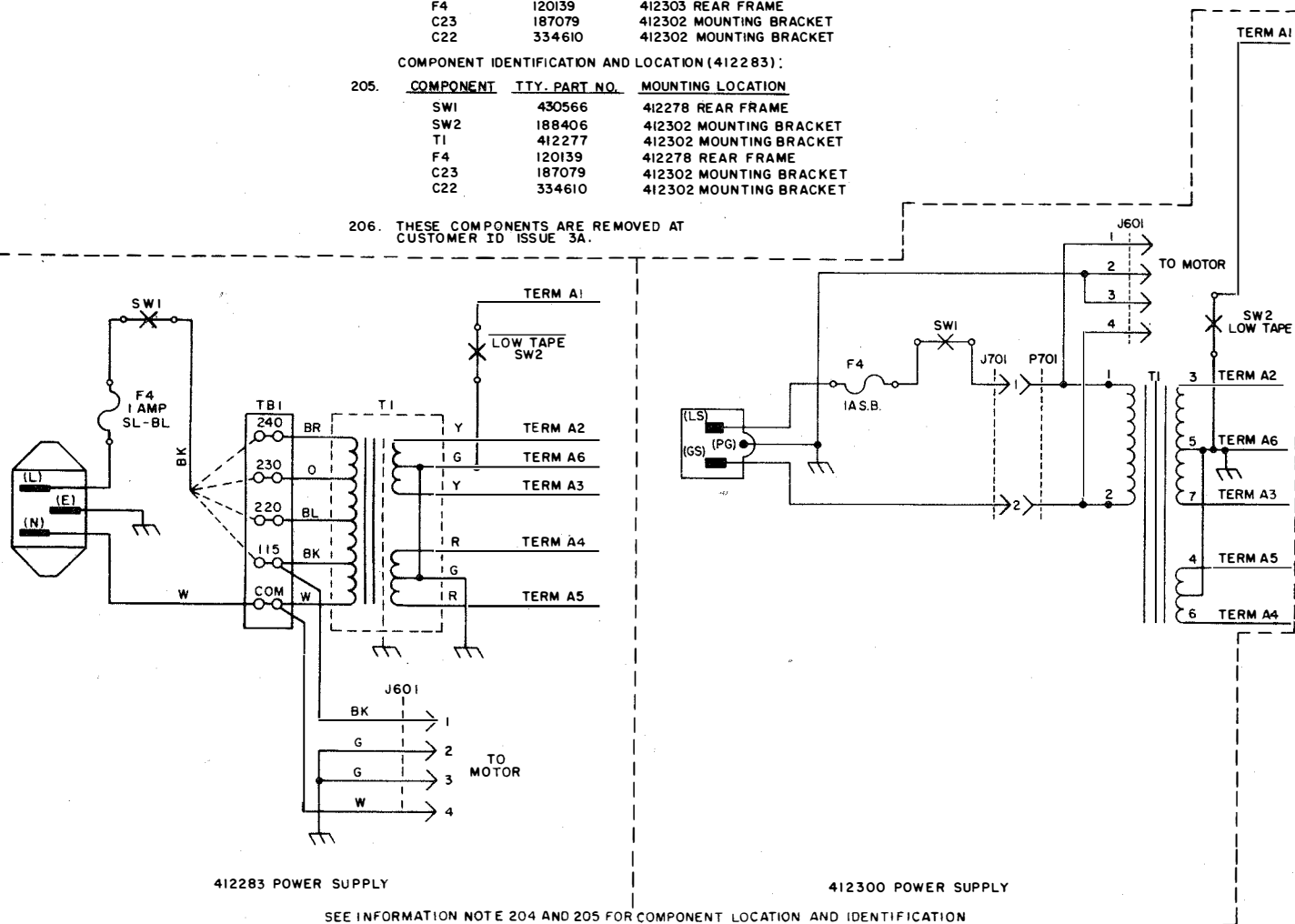
COMPONENT IDENTIFICATION AND LOCATION (412300):

COMPONENT	TTY. PART NO.	MOUNTING LOCATION
SW1	430566	412303 REAR FRAME
SW2	188406	412302 MOUNTING BRACKET
T1	412301	412302 MOUNTING BRACKET
F4	120139	412303 REAR FRAME
C23	187079	412302 MOUNTING BRACKET
C22	334610	412302 MOUNTING BRACKET

COMPONENT IDENTIFICATION AND LOCATION (412283):

COMPONENT	TTY. PART NO.	MOUNTING LOCATION
SW1	430566	412278 REAR FRAME
SW2	188406	412302 MOUNTING BRACKET
T1	412277	412302 MOUNTING BRACKET
F4	120139	412278 REAR FRAME
C23	187079	412302 MOUNTING BRACKET
C22	334610	412302 MOUNTING BRACKET

206. THESE COMPONENTS ARE REMOVED AT CUSTOMER ID ISSUE 3A.



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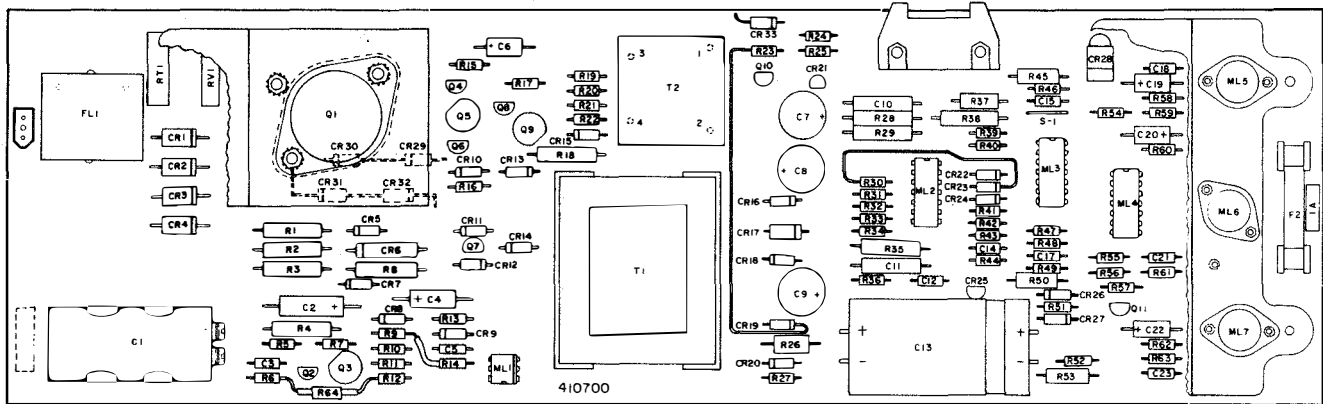
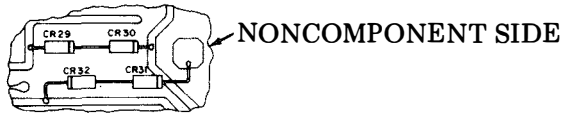
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TO P/T UNIT LOGIC CARD

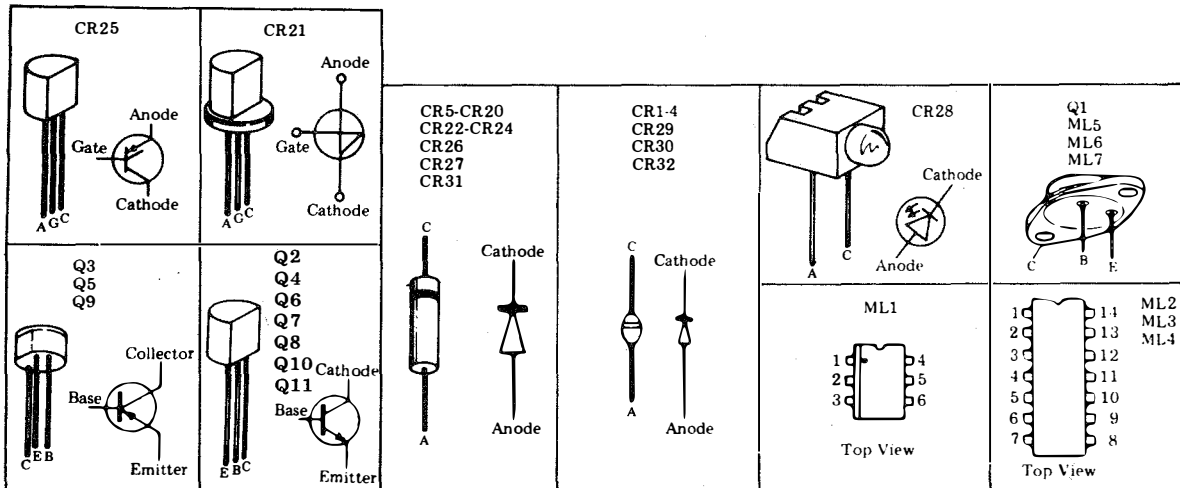
MOTOR ON (18)
TO MOTOR CONTROL RELAY (1) (3)

410700 POWER SUPPLY CIRCUIT CARD
(Issue 1A Through 4D)

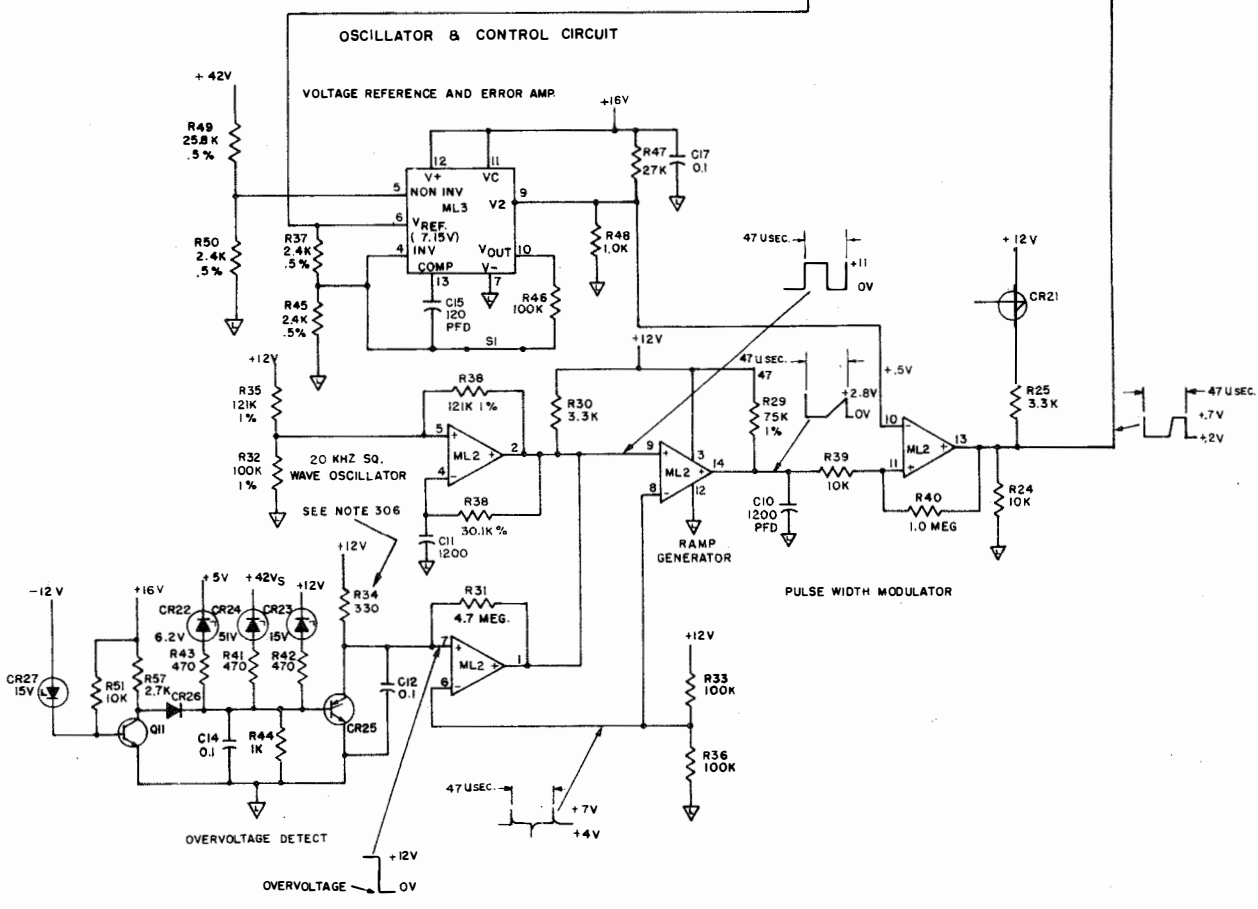
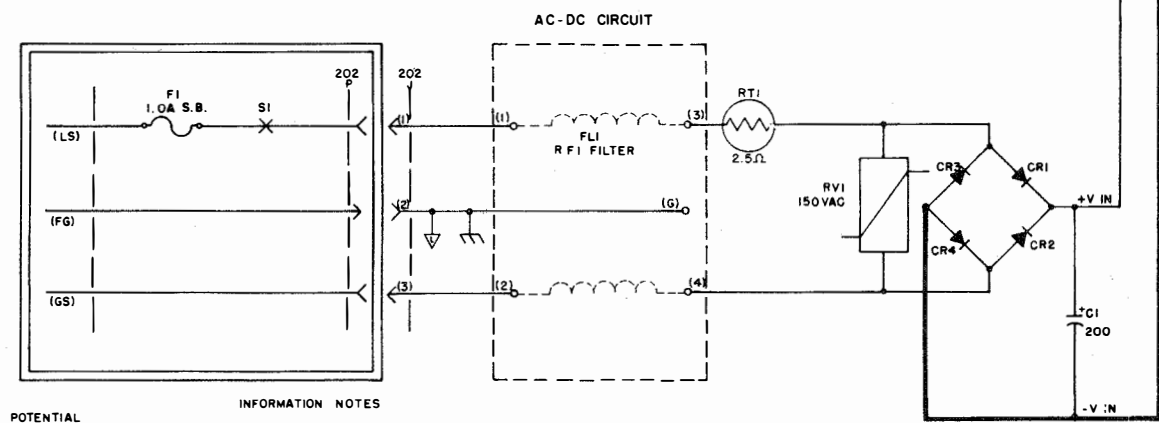
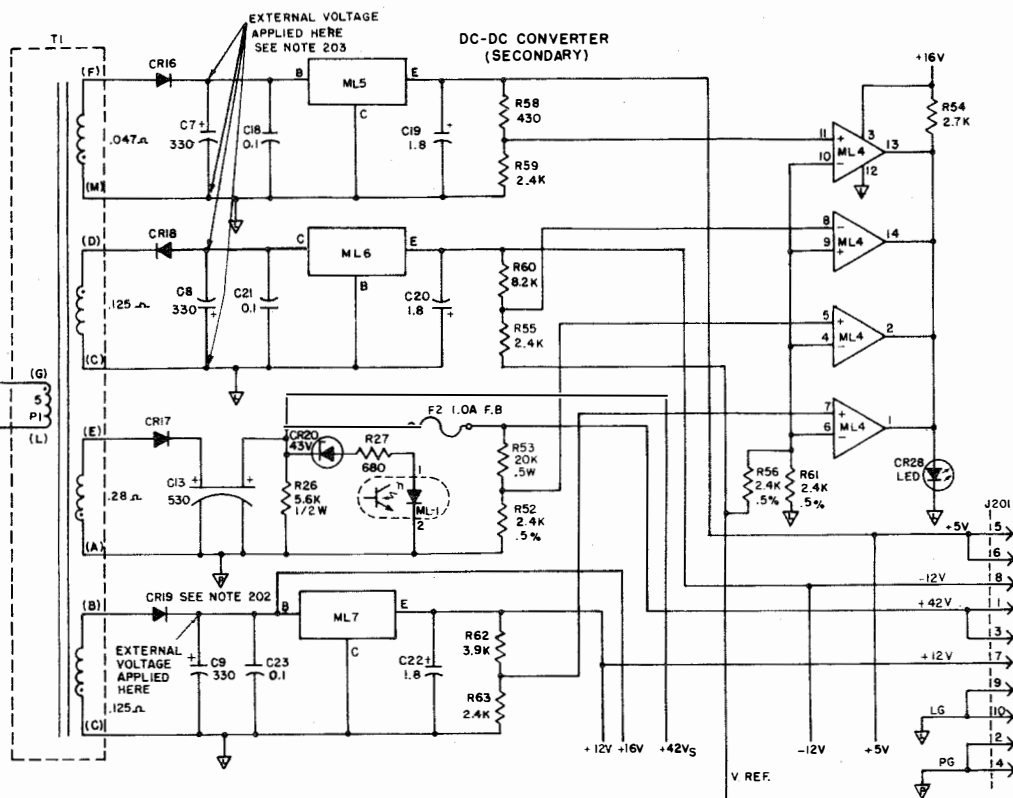
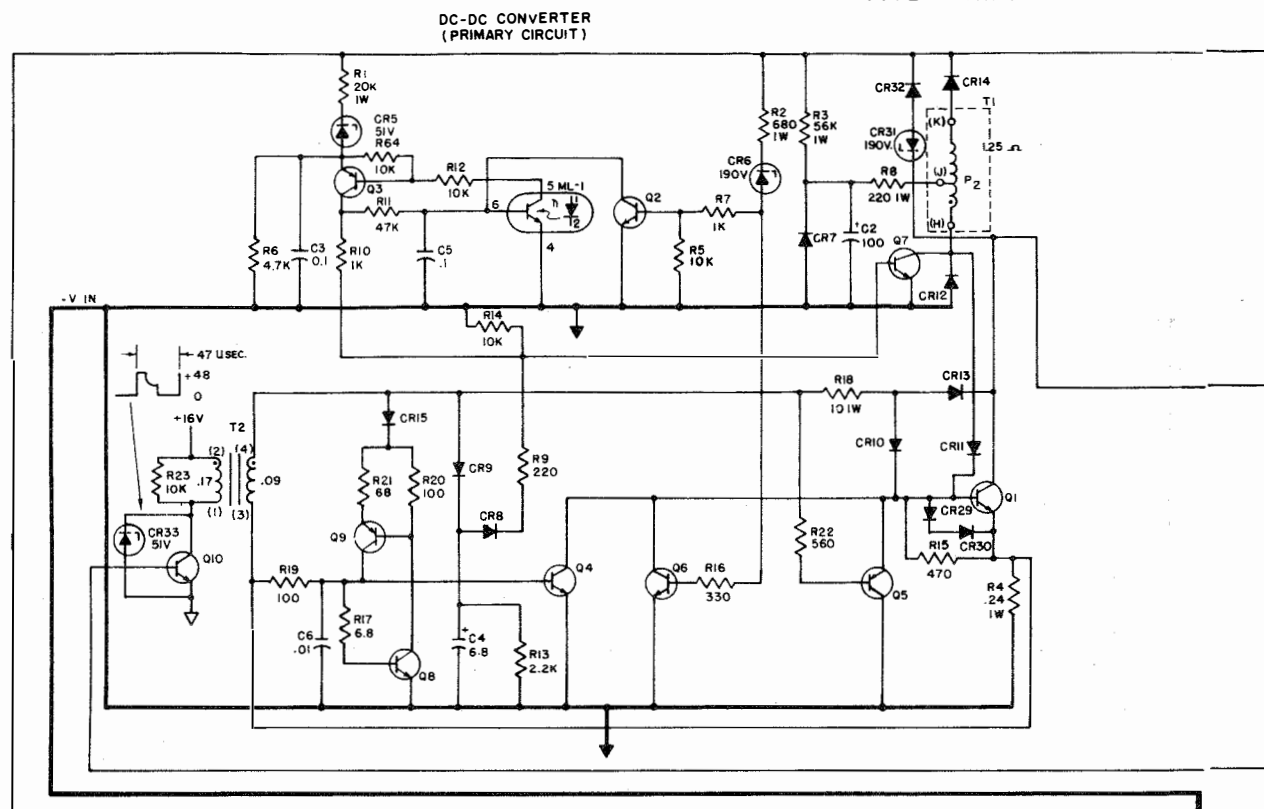
CIRCUIT CARD COMPONENT LAYOUT



SEMICONDUCTORS AND INTEGRATED CIRCUITS IDENTIFICATION AND LEAD DESIGNATION



410700 POWER SUPPLY CIRCUIT CARD
ISSUE 1A THRU 4D



CAUTION
SEE NOTE 201

101. DESIG.	FUSE	POTENTIAL
F2	1.0A FB	42VDC

102. BATTERY SYMBOL	VOLTAGE RANGE
VREF	8.80 TO 7.50
+16V DC	15.4 TO 19.5
-16 DC	-15.4 TO -19.5
+9V DC	8.2 TO 10.4
+5V DC	4.6 TO 5.4
+12V DC	11.1 TO 12.8
-12V DC	-11.1 TO -12.8
+42 DC	39 TO 45
115V AC	103 TO 127

EQUIPMENT NOTES

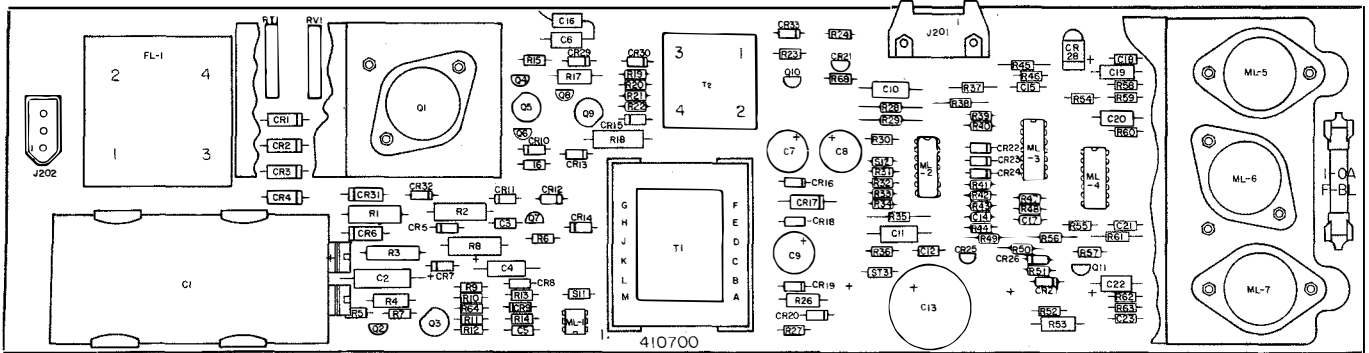
- 201. THE PROTECTIVE GROUND IS NOT CONNECTED TO THE PRIMARY CIRCUIT GROUND. CARE MUST BE EXERCISED TO PREVENT DIRECT CONNECTION OF THESE GROUNDS UNLESS THE POWER SUPPLY IS PLUGGED INTO AN ISOLATION TRANSFORMER. DIRECT CONNECTION TO THESE GROUNDS WITHOUT ISOLATION WILL CAUSE COMPONENTS TO FAIL.
- 202. THE OSCILLATOR AND CONTROL CIRCUIT CAN BE CHECKED BY APPLYING AN EXTERNAL +16V 200mA SOURCE VOLTAGE TO THE CATHODE OF CR19. THE WAVEFORMS SHOWN ARE WITH +16V APPLIED TO CR19.
- 203. THE +5V AND -12V REGULATOR CIRCUITS CAN BE CHECKED BY APPLYING AN EXTERNAL +9V AND -16V 200MA SOURCE VOLTAGE ACROSS C7 AND C8 RESPECTIVELY.

INFORMATION NOTES

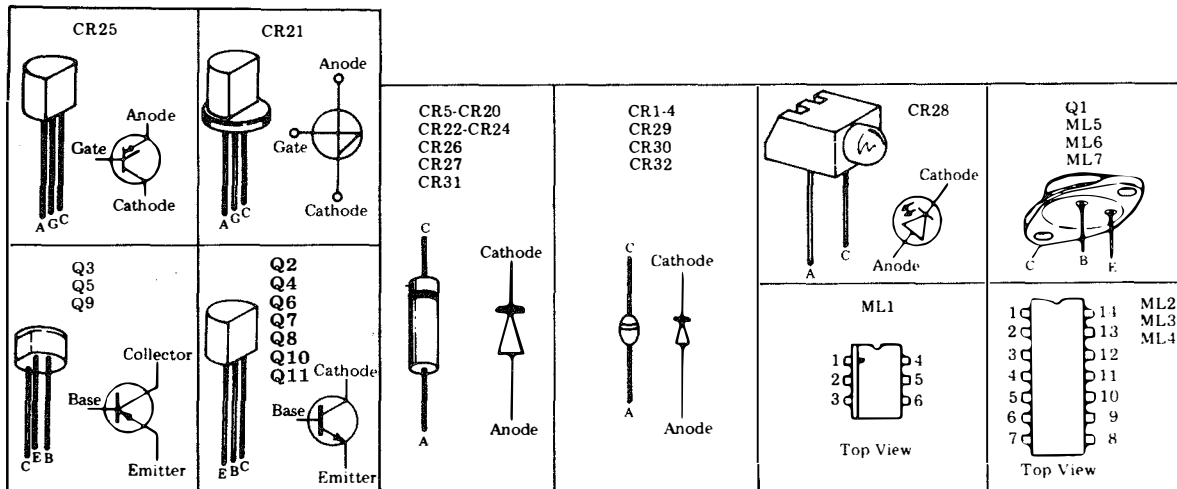
- 301. TERMINALS DESIGNATION ENCLOSED IN PARENTHESIS ARE NOT MARKED ON THE COMPONENT.
- 302. ALL RESISTORS ARE 1/4 W, ±5% AND ALL IN OHMS UNLESS OTHERWISE SPECIFIED.
- 303. ALL CAPACITORS VALUES IN MICRO FARADS UNLESS OTHERWISE SPECIFIED.
- 304. TRANSFORMER WINDINGS DC RESISTANCE INDICATED IN OHMS.
- 305. CONNECTORS (PIN NUMBERS) (TOP VIEW)
KEY
J201
J202
- 306. R34, 1K - ISSUE 4C OR LOWER.
- 307. INDICATES +42V DC GROUND
- INDICATES ±12V, AND +5 DC GROUND
- INDICATES FRAME GROUND (PROTECTIVE)
- INDICATES FULL WAVE BRIDGE COMMON (NOT GROUND)
- INDICATES TRANSIENT PROTECTION
- INDICATES FOUR TERMINAL LOW INDUCTANCE CAPACITOR

410700 POWER SUPPLY CIRCUIT CARD
(Issue 5A Through 8B)

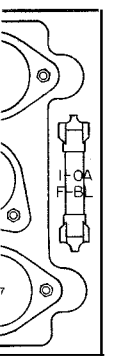
CIRCUIT CARD COMPONENTS LAYOUT



SEMICONDUCTORS AND INTEGRATED CIRCUITS IDENTIFICATION AND LEAD DESIGNATION



410700 POWER SUPPLY CIRCUIT CARD
ISSUE 5A THROUGH 8B



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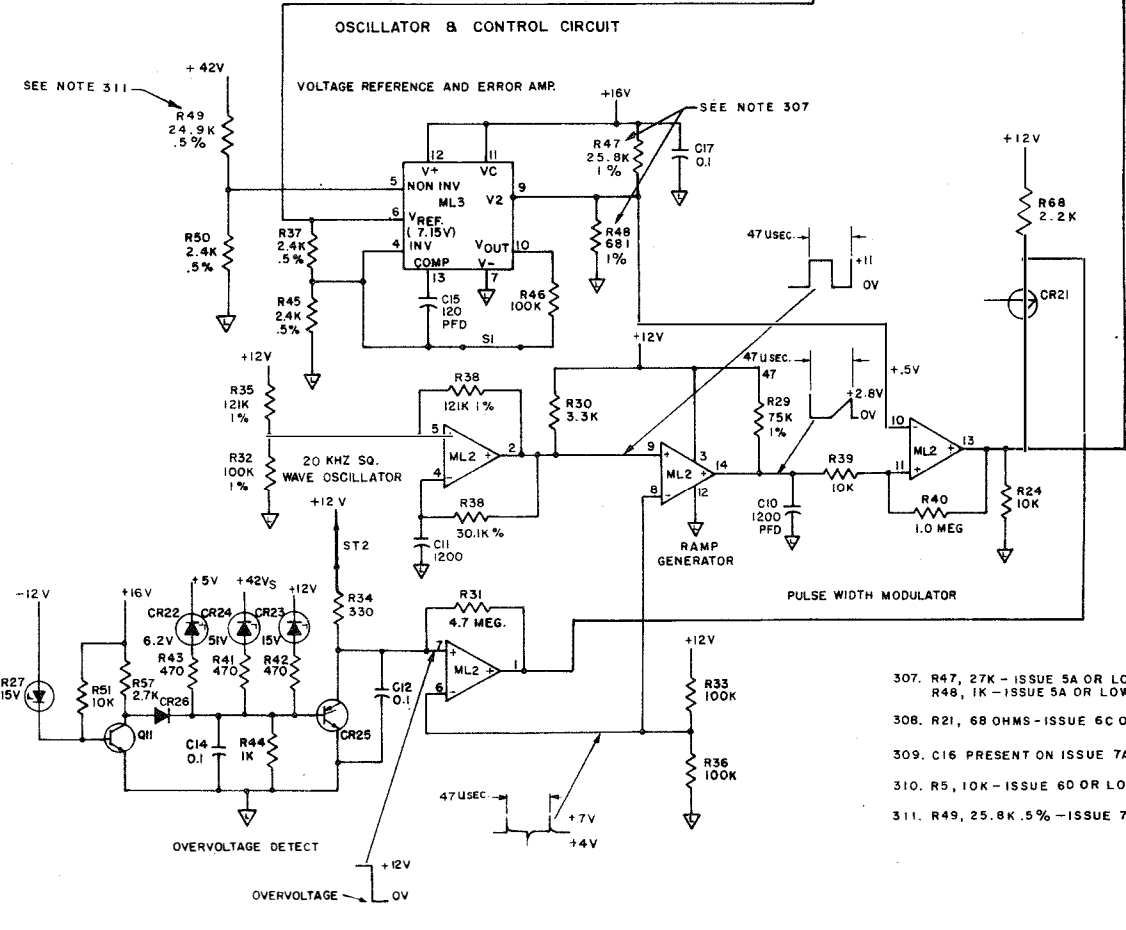
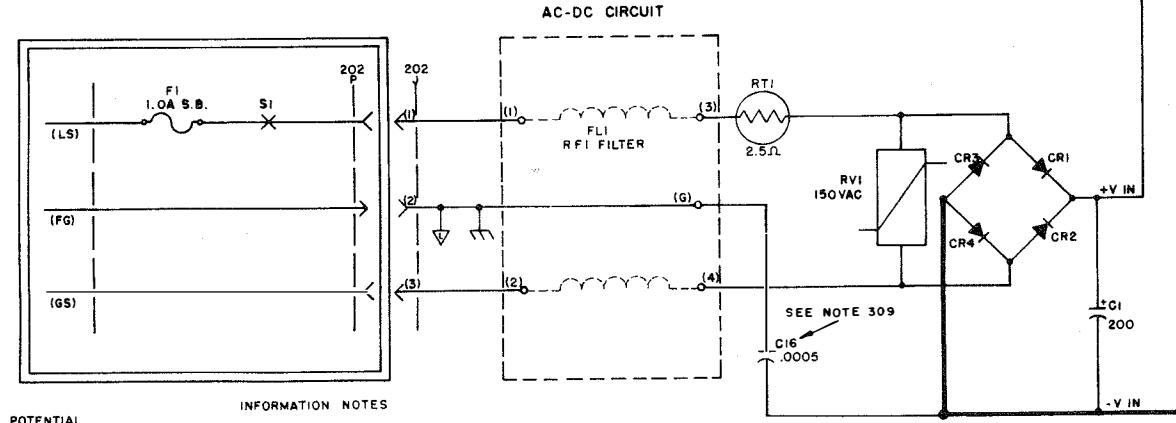
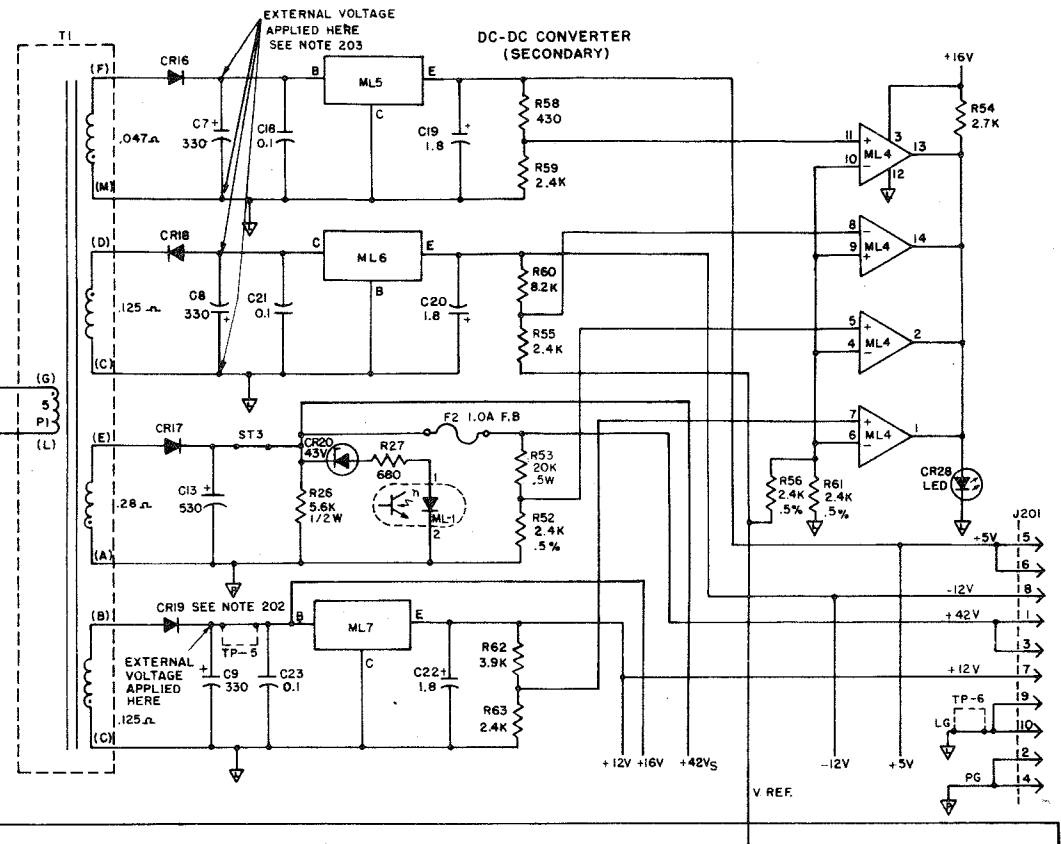
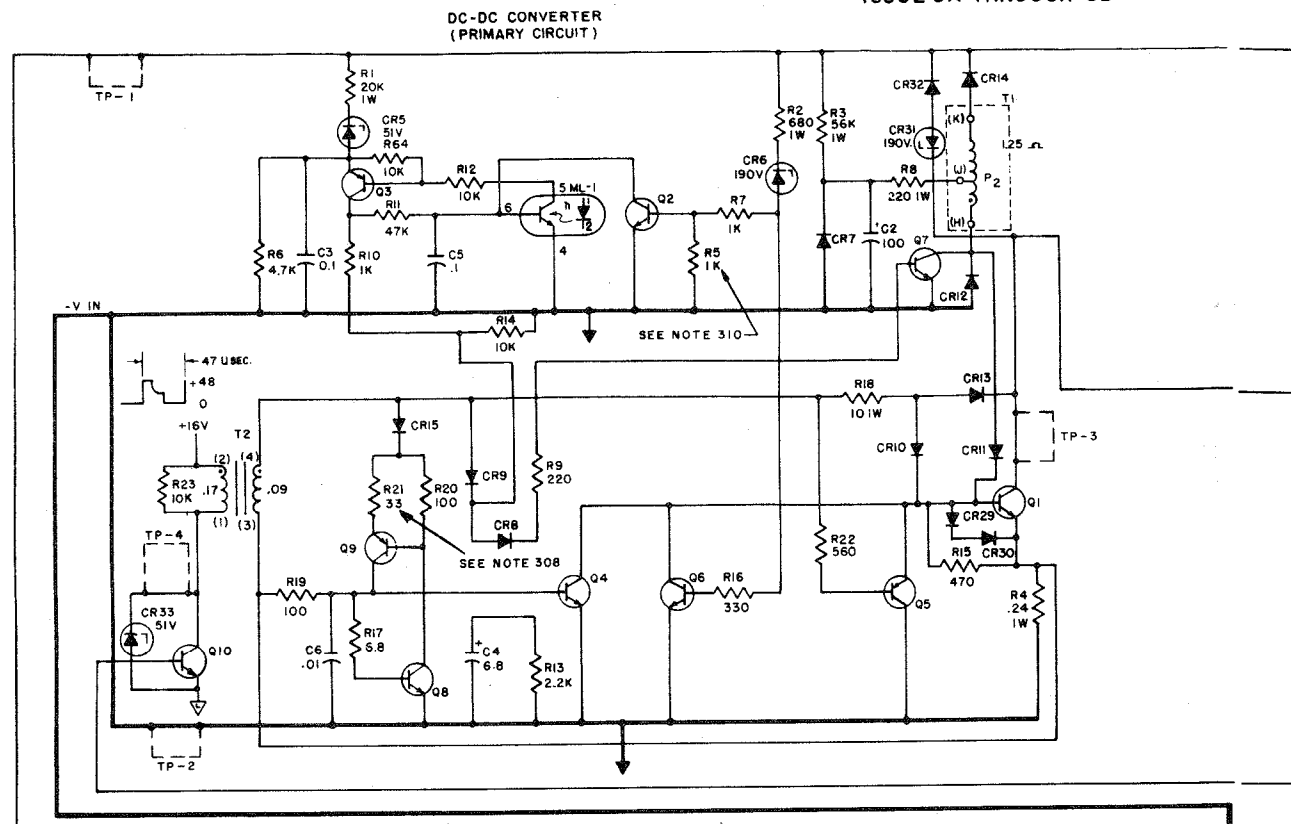
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CAUTION
SEE NOTE 201

101. DESIG. FUSE POTENTIAL
F2 1.0 FB 42VDC

102. BATTERY SYMBOL VOLTAGE RANGE
VREF 6.80 TO 7.50
+16V DC 15.4 TO 19.5
-16 DC -15.4 TO -19.5
+9V DC 8.2 TO 10.4
+5V DC 4.6 TO 5.4
+12V DC 11.1 TO 12.8
-12V DC -11.1 TO -12.8
+42 DC 39 TO 45
115V AC 103 TO 127

EQUIPMENT NOTES

- 201. THE PROTECTIVE GROUND IS NOT CONNECTED TO THE PRIMARY CIRCUIT GROUND. CARE MUST BE EXERCISED TO PREVENT DIRECT CONNECTION OF THESE GROUNDS UNLESS THE POWER SUPPLY IS PLUGGED INTO AN ISOLATION TRANSFORMER. DIRECT CONNECTION TO THESE GROUNDS WITHOUT ISOLATION WILL CAUSE COMPONENTS TO FAIL.
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- 203. THE +5V AND -12V REGULATOR CIRCUITS CAN BE CHECKED BY APPLYING AN EXTERNAL +9V AND -16V 200MA SOURCE VOLTAGE ACROSS C7 AND C8 RESPECTIVELY

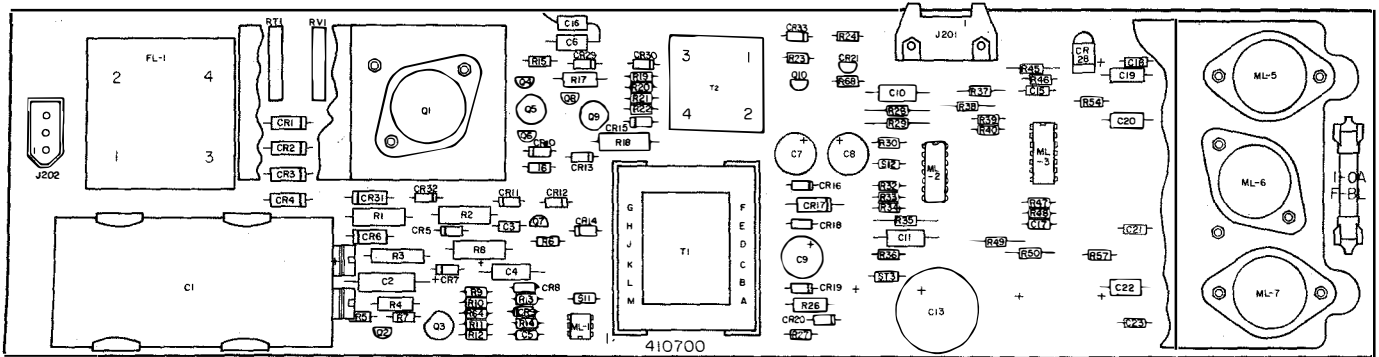
INFORMATION NOTES

- 301. TERMINALS DESIGNATION ENCLOSED IN PARENTHESIS ARE NOT MARKED ON THE COMPONENT.
- 302. ALL RESISTORS ARE 1/4 W, ±5% AND ALL IN OHMS UNLESS OTHERWISE SPECIFIED.
- 303. ALL CAPACITORS VALUES IN MICRO FARADS UNLESS OTHERWISE SPECIFIED
- 304. TRANSFORMER WINDINGS DC RESISTANCE INDICATED IN OHMS.
- 305. CONNECTORS (PIN NUMBERS) (TOP VIEW)
- 306. INDICATES +42V DC GROUND
- INDICATES ±12V, AND +5V DC GROUND
- INDICATES FRAME GROUND (PROTECTIVE)
- INDICATES FULL WAVE BRIDGE COMMON (NOT GROUND)
- INDICATES TRANSIENT PROTECTION
- INDICATES FOUR TERMINAL LOW INDUCTANCE CAPACITOR

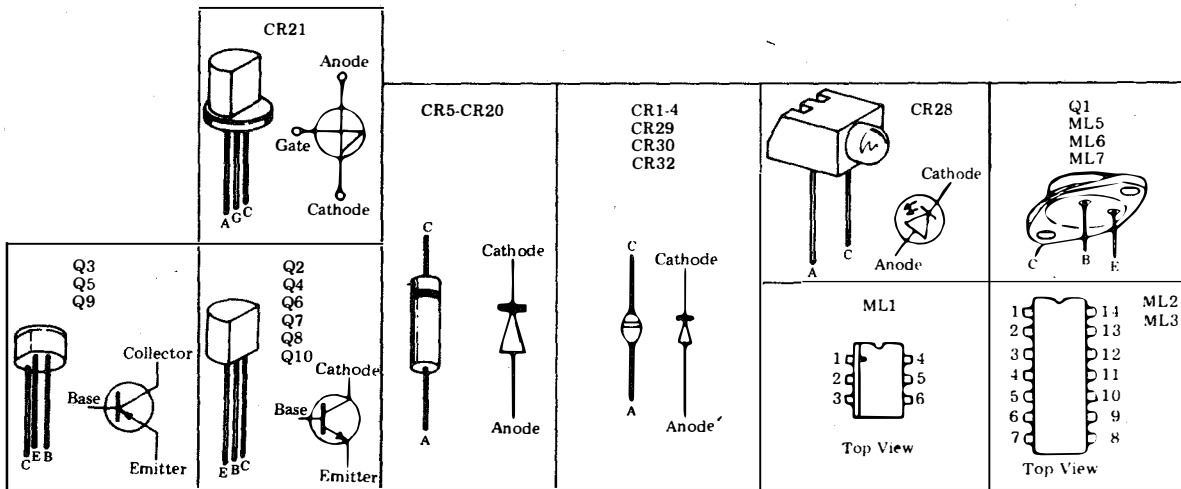
- 307. R47, 27K - ISSUE 5A OR LOWER
R49, 1K - ISSUE 5A OR LOWER
- 308. R21, 68 OHMS - ISSUE 6C OR LOWER
- 309. C16 PRESENT ON ISSUE 7A OR HIGHER
- 310. R5, 10K - ISSUE 6D OR LOWER
- 311. R49, 25.8K .5% - ISSUE 7A OR LOWER

410700 POWER SUPPLY CIRCUIT CARD (Issue 9A)

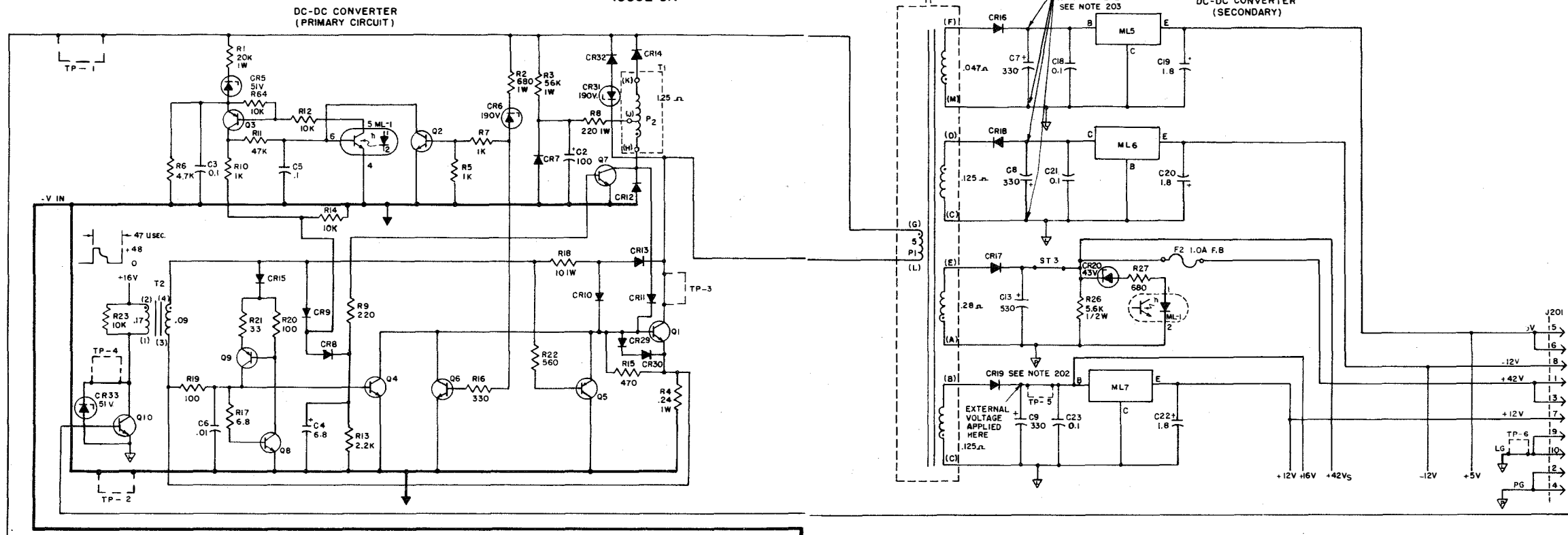
CIRCUIT CARD COMPONENT LAYOUT



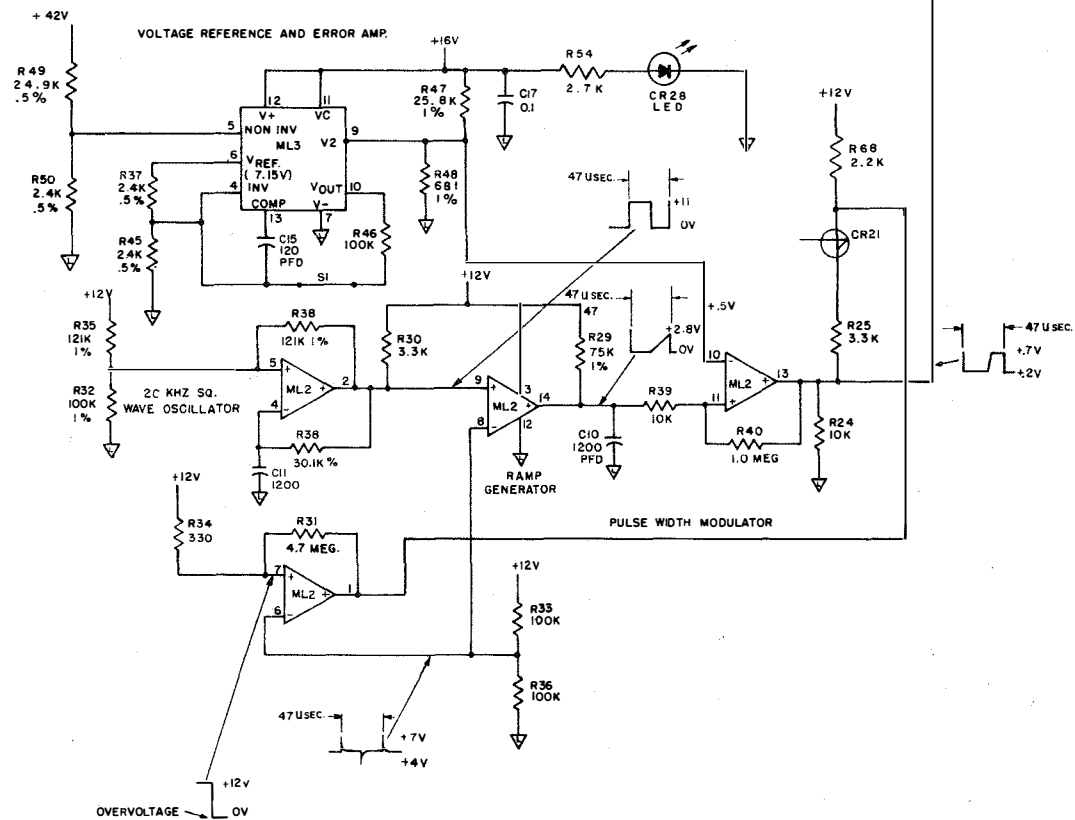
SEMICONDUCTORS AND INTEGRATED CIRCUITS IDENTIFICATION AND LEAD DESIGNATION



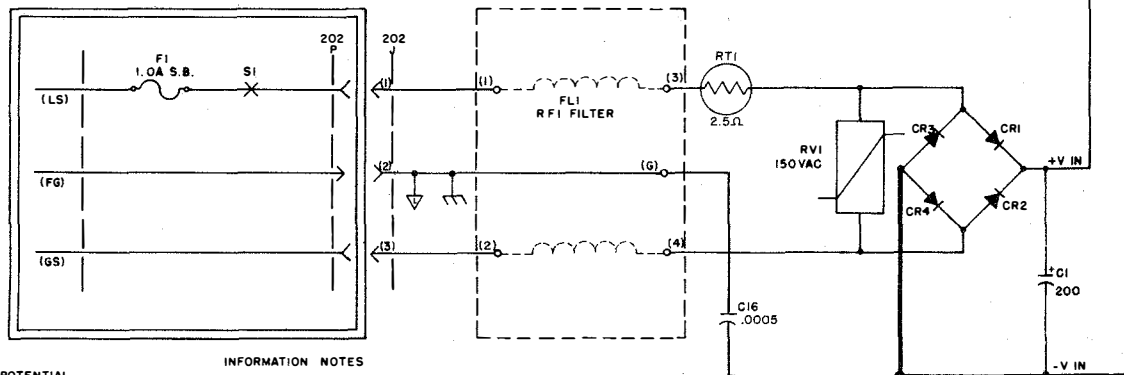
410700 POWER SUPPLY CIRCUIT CARD
ISSUE 9A



OSCILLATOR & CONTROL CIRCUIT



CAUTION
SEE NOTE 201



INFORMATION NOTES

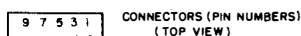
101. DESIG.	FUSE	POTENTIAL
F2	1.0 FB	42VDC

102. BATTERY SYMBOL	VOLTAGE RANGE
VREF	6.80 TO 7.50
+16V DC	15.4 TO 19.5
-16 DC	-15.4 TO -19.5
+9V DC	8.2 TO 10.4
+5V DC	4.6 TO 5.4
+12V DC	11.1 TO 12.8
-12V DC	-11.1 TO -12.8
+42 DC	39 TO 45
115V AC	103 TO 127

EQUIPMENT NOTES

- 201. THE PROTECTIVE GROUND IS NOT CONNECTED TO THE PRIMARY CIRCUIT GROUND. CARE MUST BE EXERCISED TO PREVENT DIRECT CONNECTION OF THESE GROUNDS UNLESS THE POWER SUPPLY IS PLUGGED INTO AN ISOLATION TRANSFORMER. DIRECT CONNECTION TO THESE GROUNDS WITHOUT ISOLATION WILL CAUSE COMPONENTS TO FAIL.
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- 203. THE +5V AND -12V REGULATOR CIRCUITS CAN BE CHECKED BY APPLYING AN EXTERNAL +9V AND -16V 200MA SOURCE VOLTAGE ACROSS C7 AND C8 RESPECTIVELY.

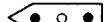
- 301. TERMINALS DESIGNATION ENCLOSED IN PARENTHESIS ARE NOT MARKED ON THE COMPONENT.
- 302. ALL RESISTORS ARE 1/4 W. ±5% AND ALL IN OHMS UNLESS OTHERWISE SPECIFIED.
- 303. ALL CAPACITORS VALUES IN MICRO FARADS UNLESS OTHERWISE SPECIFIED
- 304. TRANSFORMER WINDINGS DC RESISTANCE INDICATED IN OHMS.
- 305. CONNECTORS (PIN NUMBERS) (TOP VIEW)



KEY

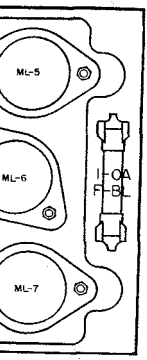


J201



J202

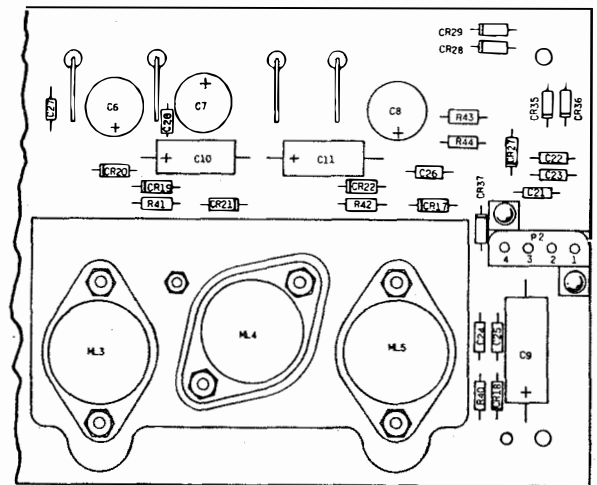
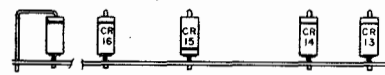
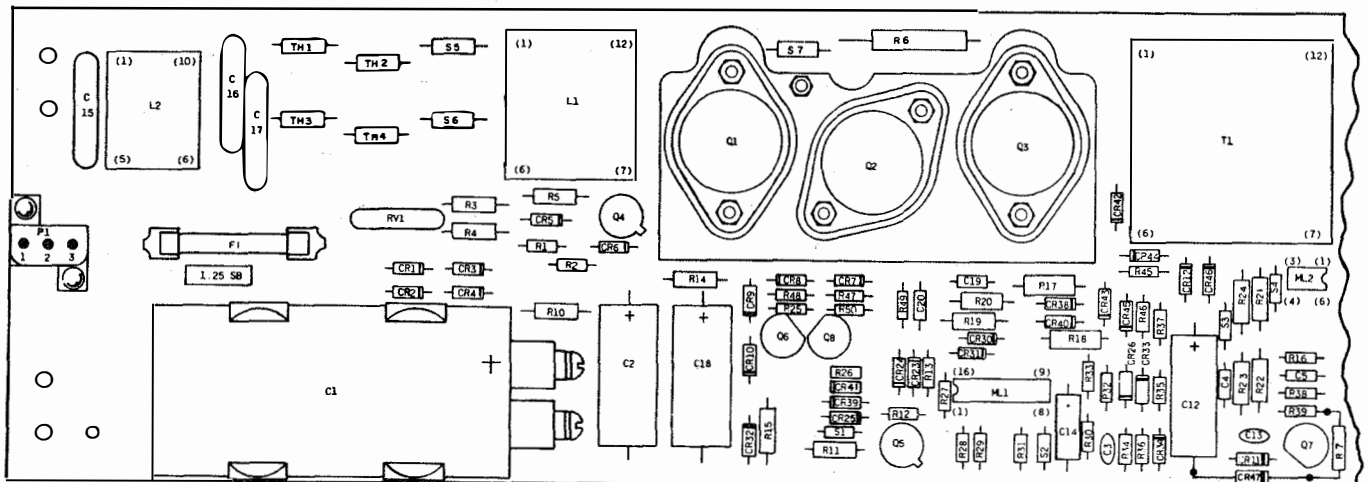
- 306. INDICATES +42V DC GROUND
- INDICATES ±12V, AND +5 DC GROUND
- INDICATES FRAME GROUND (PROTECTIVE)
- INDICATES FULL WAVE BRIDGE COMMON (NOT GROUND)
- INDICATES TRANSIENT PROTECTION
- INDICATES FOUR TERMINAL LOW INDUCTANCE CAPACITOR



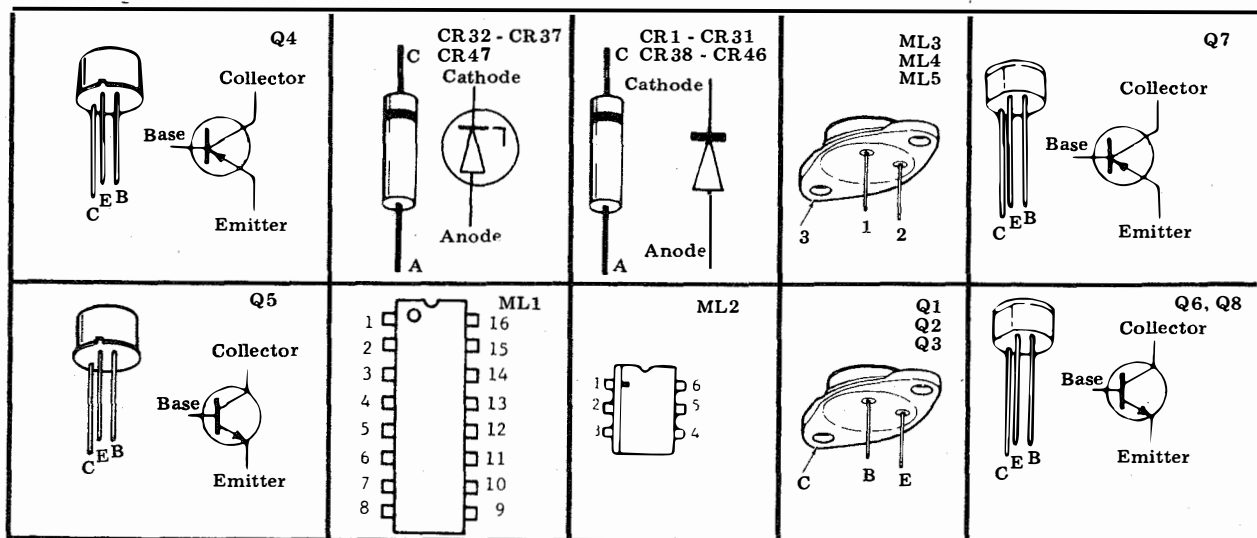
NATION

410701 POWER SUPPLY CIRCUIT CARD

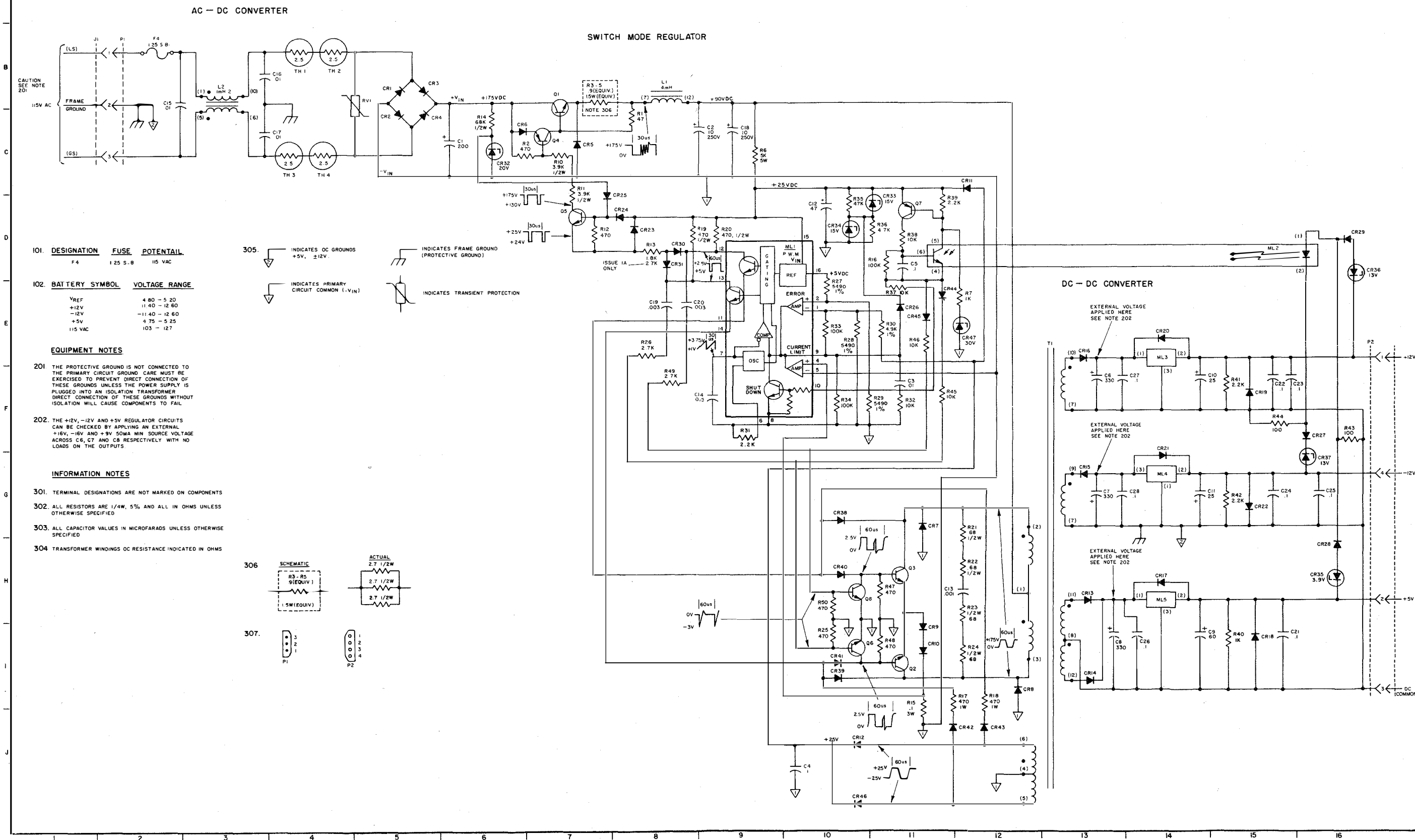
CIRCUIT CARD COMPONENT LAYOUT



SEMICONDUCTORS AND INTEGRATED CIRCUITS IDENTIFICATION AND LEAD DESIGNATION



410701 POWER SUPPLY CIRCUIT CARD
ISSUE 1A & 2A



101. DESIGNATION FUSE POTENTIAL

F4	1.25 S.B	115 VAC
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102. BATTERY SYMBOL VOLTAGE RANGE

VREF	4.80 - 5.20
+12V	11.40 - 12.60
-12V	-11.40 - -12.60
+5V	4.75 - 5.25
115 VAC	103 - 127

EQUIPMENT NOTES

201. THE PROTECTIVE GROUND IS NOT CONNECTED TO THE PRIMARY CIRCUIT GROUND CARE MUST BE EXERCISED TO PREVENT DIRECT CONNECTION OF THESE GROUNDS UNLESS THE POWER SUPPLY IS PLUGGED INTO AN ISOLATION TRANSFORMER DIRECT CONNECTION OF THESE GROUNDS WITHOUT ISOLATION WILL CAUSE COMPONENTS TO FAIL.

202. THE +12V, -12V AND +5V REGULATOR CIRCUITS CAN BE CHECKED BY APPLYING AN EXTERNAL +15V, -15V AND +9V 50MA MIN SOURCE VOLTAGE ACROSS C6, C7 AND C8 RESPECTIVELY WITH NO LOADS ON THE OUTPUTS.

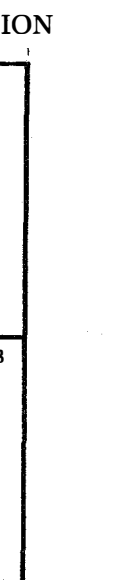
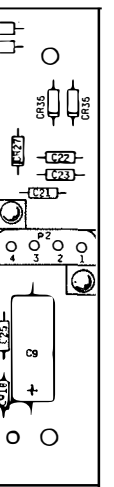
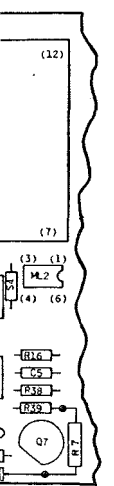
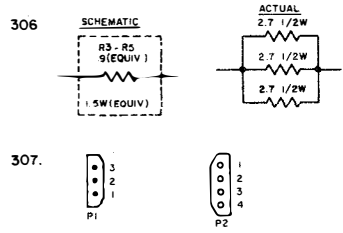
- INFORMATION NOTES**
- 301. TERMINAL DESIGNATIONS ARE NOT MARKED ON COMPONENTS
 - 302. ALL RESISTORS ARE 1/4W, 5% AND ALL IN OHMS UNLESS OTHERWISE SPECIFIED
 - 303. ALL CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED
 - 304. TRANSFORMER WINDINGS DC RESISTANCE INDICATED IN OHMS

305. INDICATES OC GROUNDS +5V, ±12V

INDICATES FRAME GROUND (PROTECTIVE GROUND)

INDICATES PRIMARY CIRCUIT COMMON (-V_{IN})

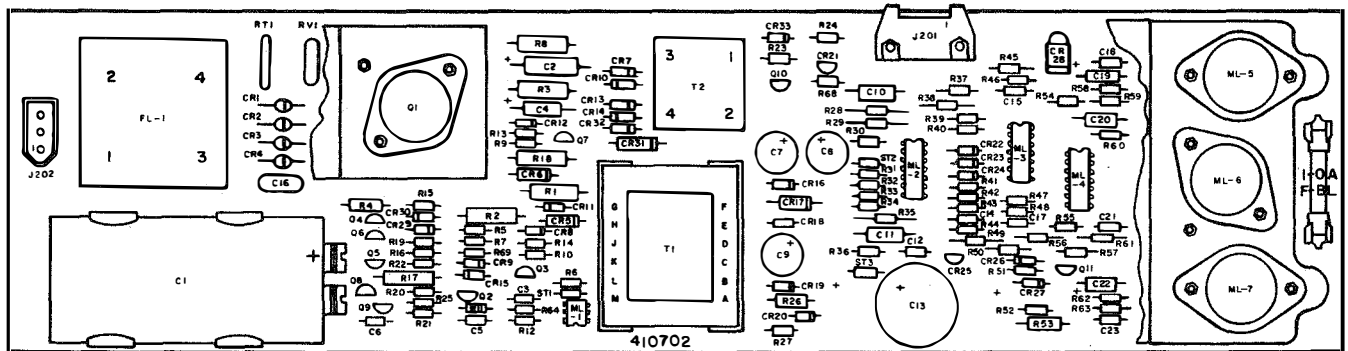
INDICATES TRANSIENT PROTECTION



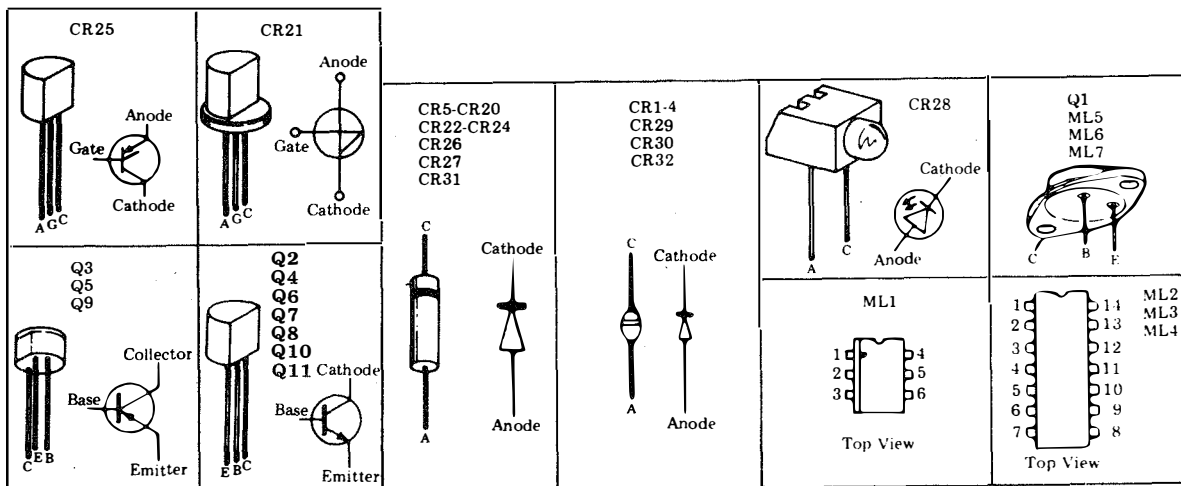
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410702 POWER SUPPLY CIRCUIT CARD (Issue 1A Through 2B)

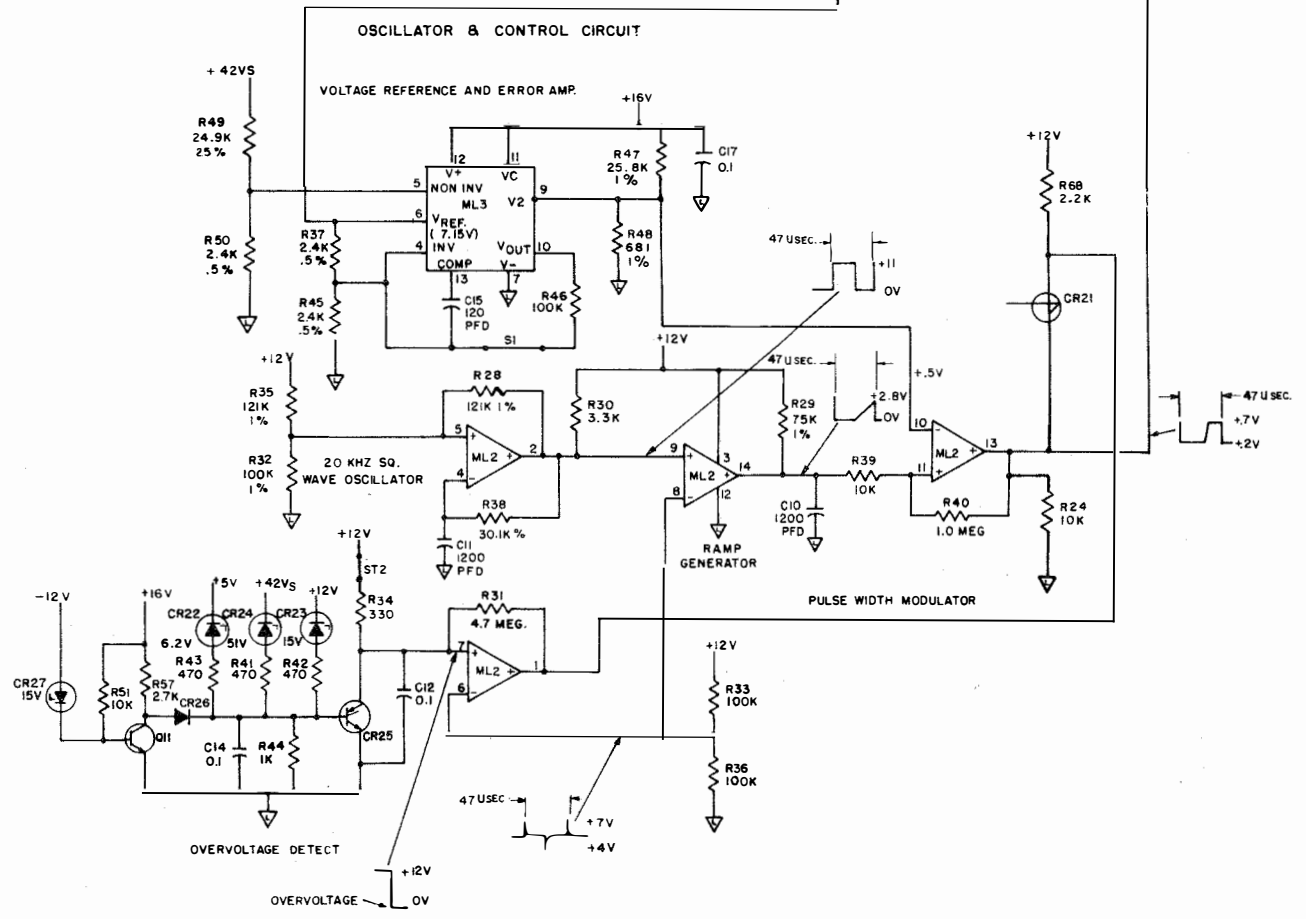
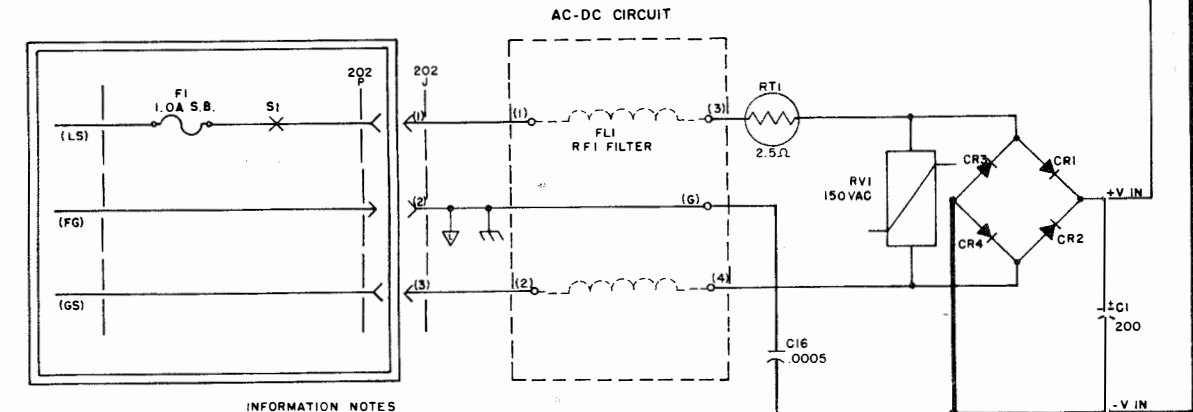
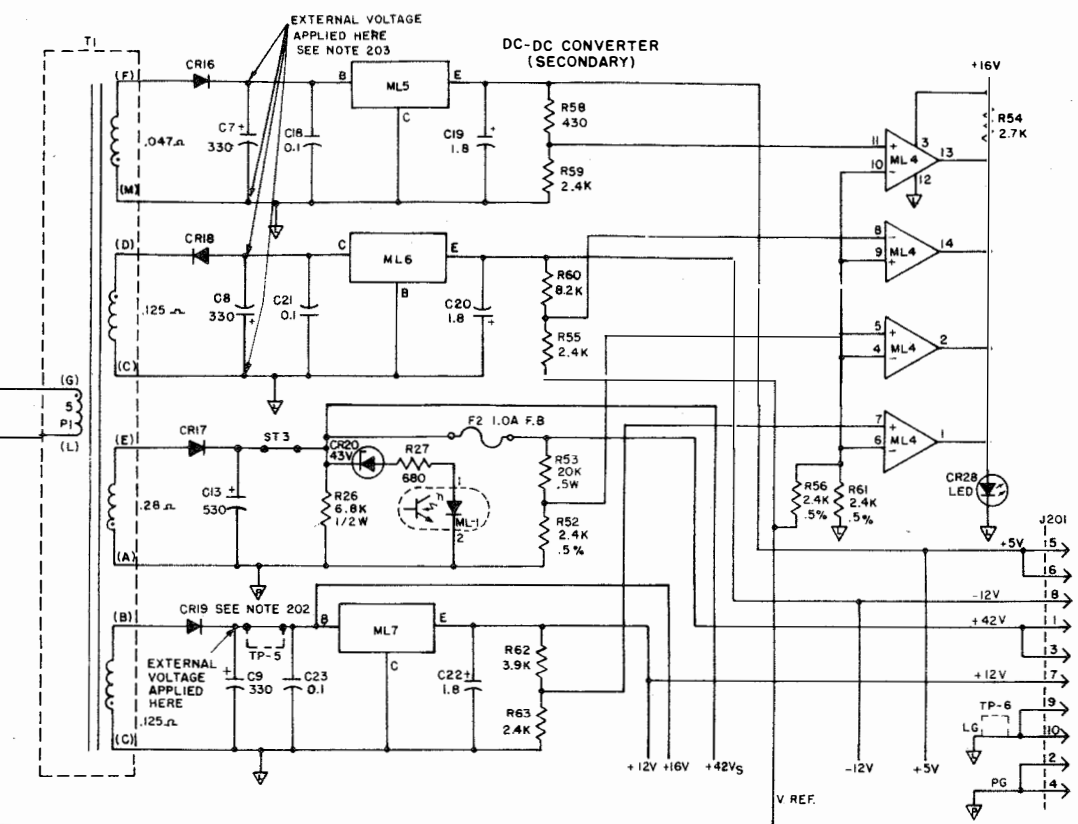
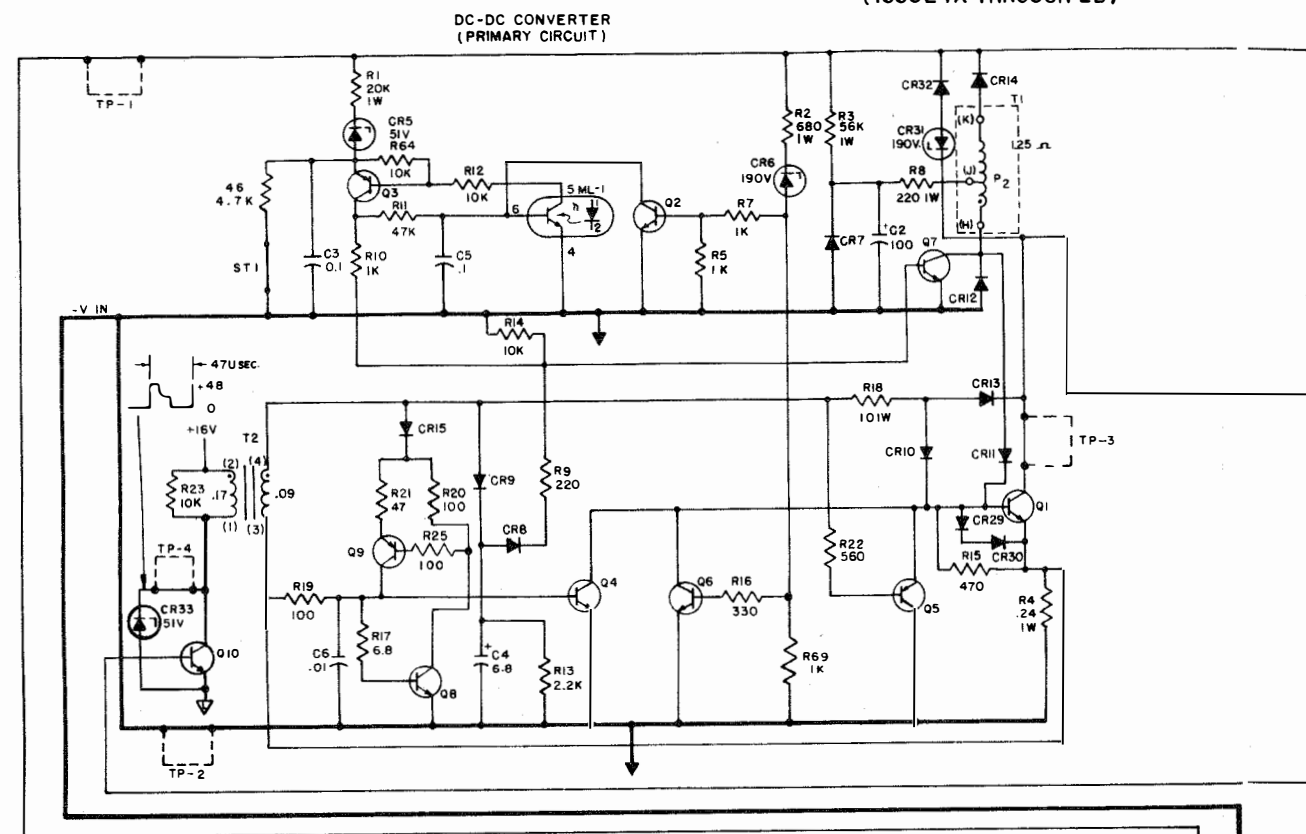
CIRCUIT CARD COMPONENT LAYOUT



SEMICONDUCTORS AND INTEGRATED CIRCUITS IDENTIFICATION AND LEAD DESIGNATION



410702 POWER SUPPLY CIRCUIT CARD
(ISSUE 1A THROUGH 2B)



CAUTION
SEE NOTE 201

101. DESIG. FUSE POTENTIAL
F2 1.0 FB 42VDC

102. BATTERY SYMBOL VOLTAGE RANGE
+16V DC 6.80 TO 7.50
-16 DC 15.4 TO 19.5
+9V DC 8.2 TO 10.4
+5V DC 4.6 TO 5.4
+12V DC 11.1 TO 12.8
-12V DC 11.1 TO 12.8
+42V DC 39 TO 45
115V AC 103 TO 127

INFORMATION NOTES

- EQUIPMENT NOTES
201. THE PROTECTIVE GROUND IS NOT CONNECTED TO THE PRIMARY CIRCUIT GROUND. CARE MUST BE EXERCISED TO PREVENT DIRECT CONNECTION OF THESE GROUNDS UNLESS THE POWER SUPPLY IS PLUGGED INTO AN ISOLATION TRANSFORMER. DIRECT CONNECTION TO THESE GROUNDS WITHOUT ISOLATION WILL CAUSE COMPONENTS TO FAIL.
202. THE OSCILLATOR AND CONTROL CIRCUIT CAN BE CHECKED BY APPLYING AN EXTERNAL +16V 200mA. SOURCE VOLTAGE TO THE CATHODE OF CR19. THE WAVEFORMS SHOWN ARE WITH +16V APPLIED TO CR19.
203. THE +5V AND -12V REGULATOR CIRCUITS CAN BE CHECKED BY APPLYING AN EXTERNAL +9V AND -16V 200mA SOURCE VOLTAGE ACROSS C7 AND C8 RESPECTIVELY

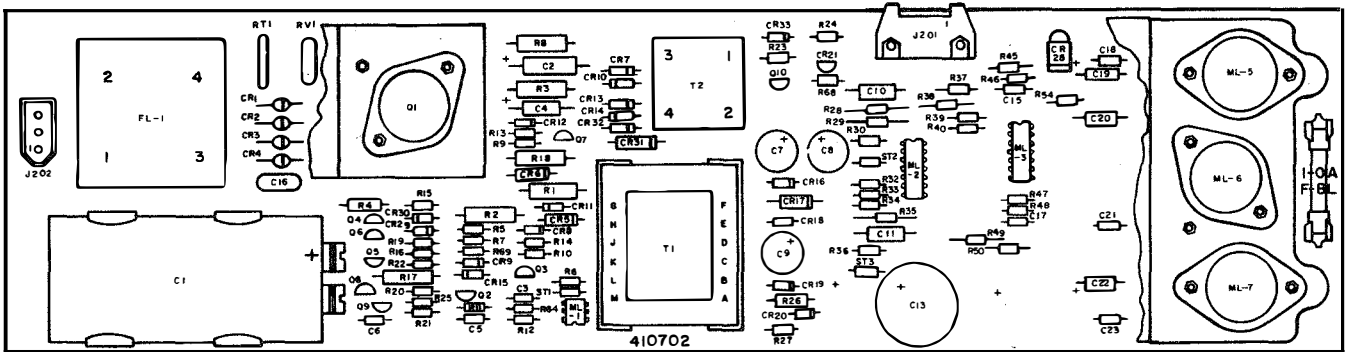
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303. ALL CAPACITORS VALUES IN MICRO FARADS UNLESS OTHERWISE SPECIFIED
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- INDICATES ±12V, AND +5 DC GROUND
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- INDICATES TRANSIENT PROTECTION
- INDICATES FOUR TERMINAL LOW INDUCTANCE CAPACITOR

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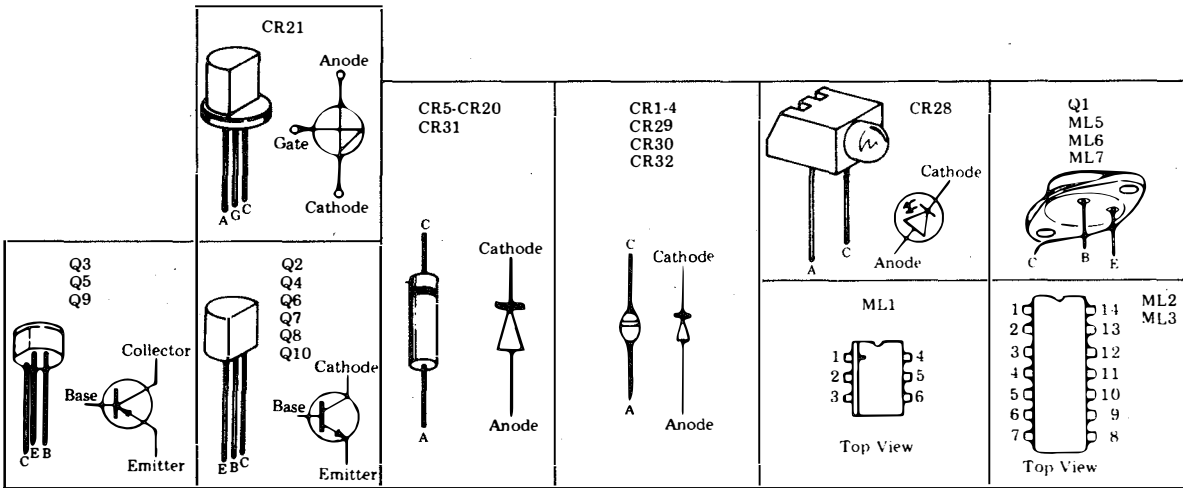
410702 POWER SUPPLY CIRCUIT CARD
(Issue 3A)

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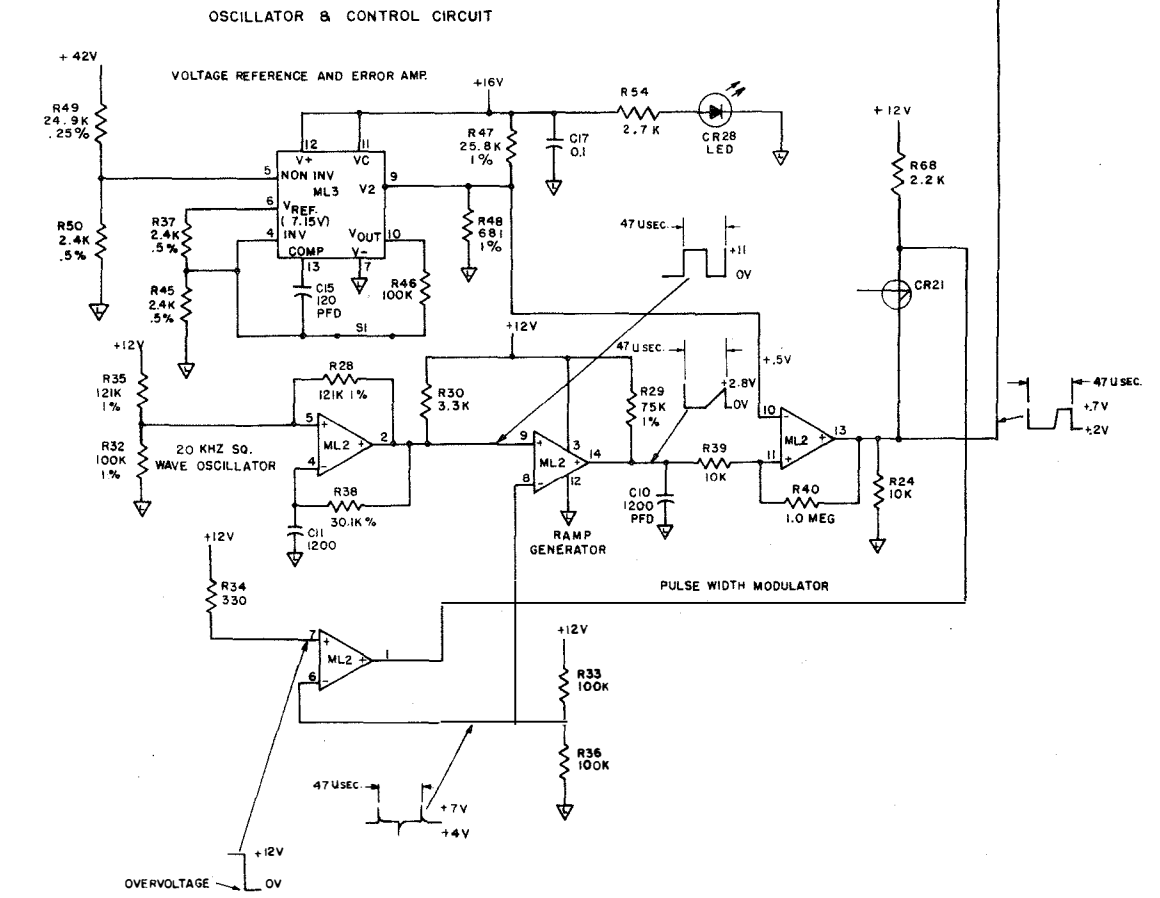
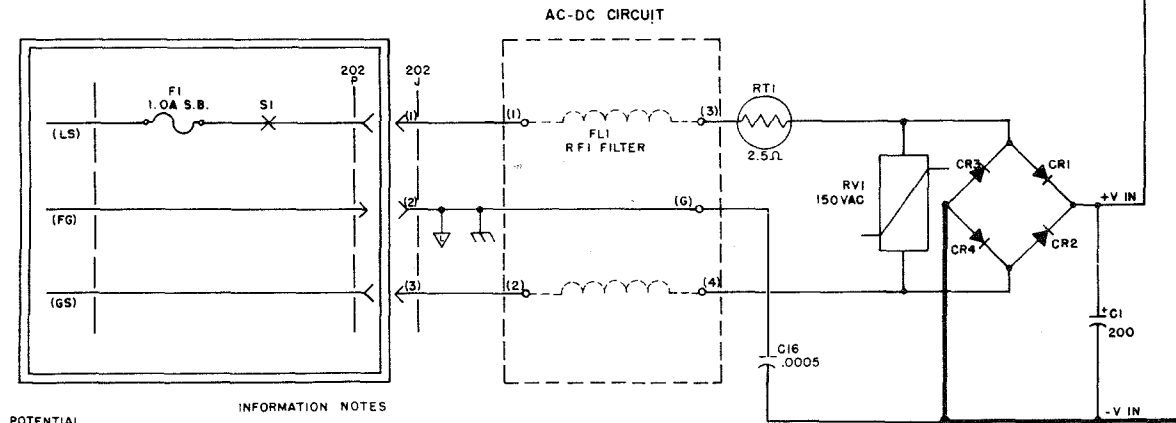
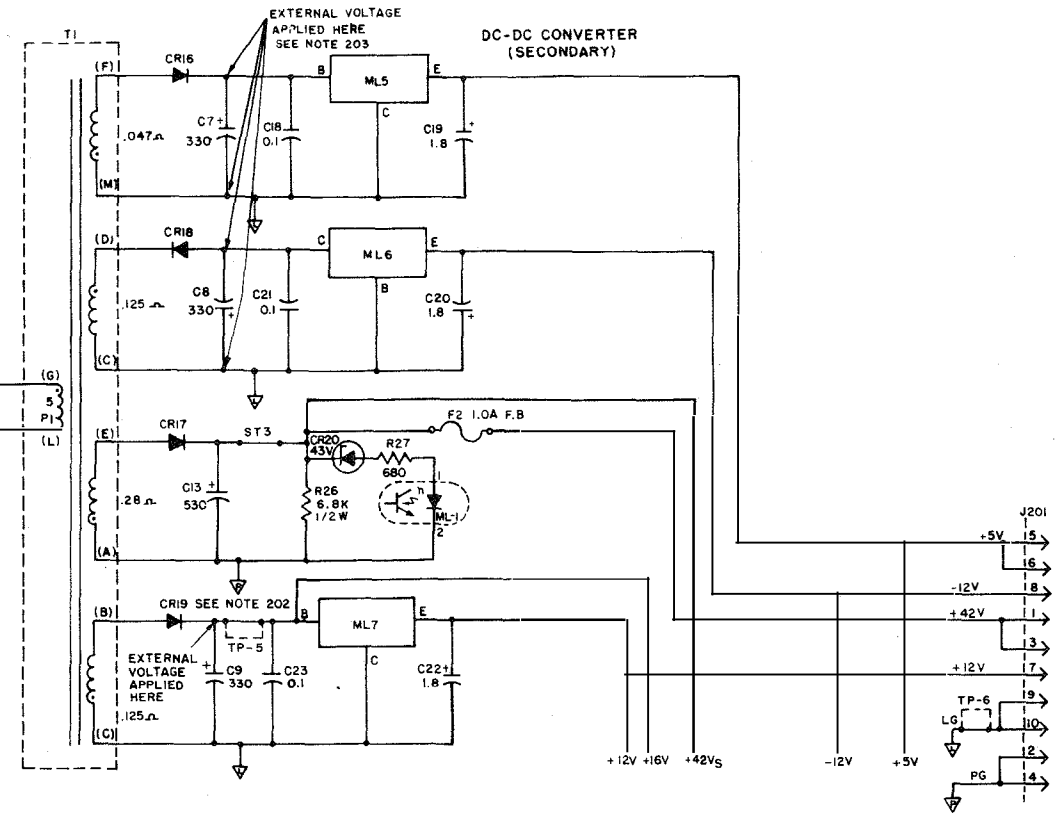
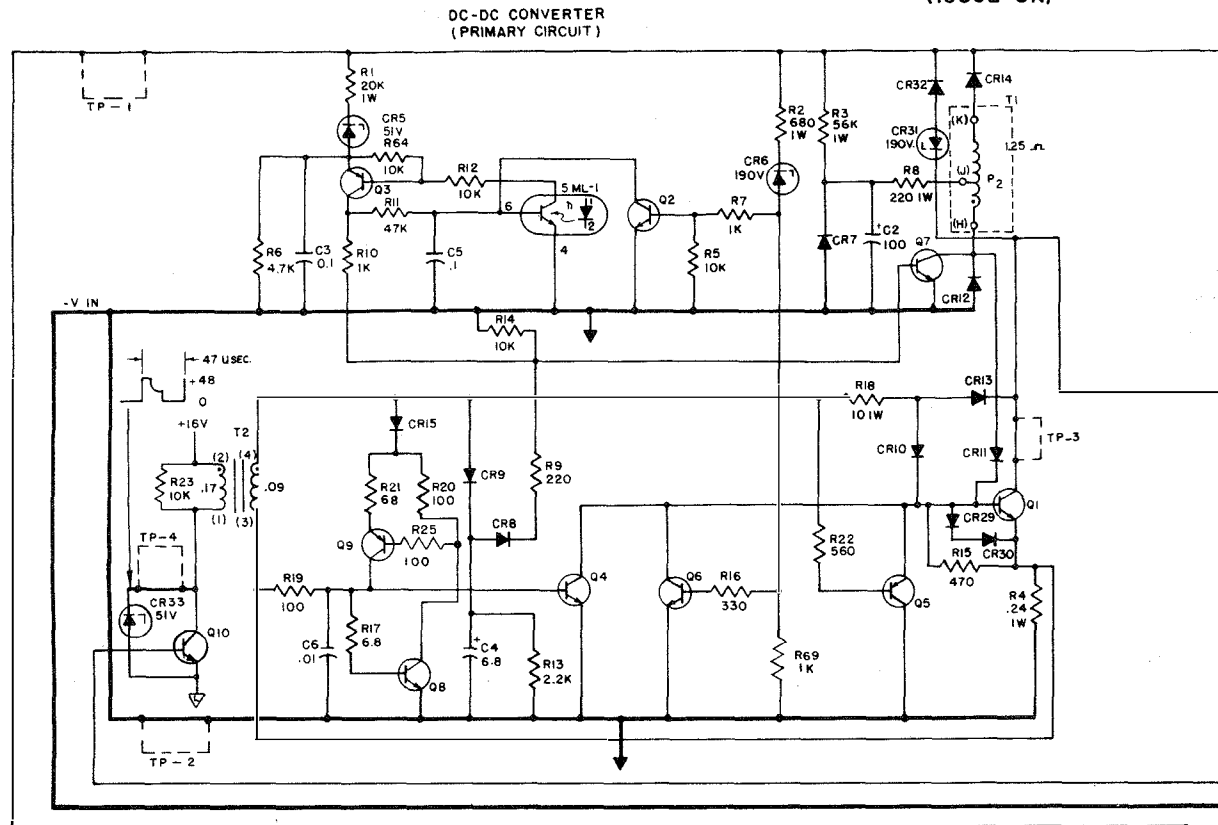
CIRCUIT CARD COMPONENT LAYOUT



SEMICONDUCTORS AND INTEGRATED CIRCUITS IDENTIFICATION AND LEAD DESIGNATION



410702 POWER SUPPLY CIRCUIT CARD
(ISSUE 3A)



CAUTION
SEE NOTE 201

INFORMATION NOTES

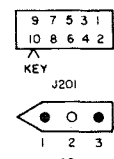
101. DESIG.	FUSE	POTENTIAL
F2	1.0 FB	42VDC

102. BATTERY SYMBOL	VOLTAGE RANGE
VREF	6.80 TO 7.50
+16V DC	15.4 TO 19.5
-16 DC	-15.4 TO -19.5
+9V DC	8.2 TO 10.4
+5V DC	4.6 TO 5.4
+12V DC	11.1 TO 12.8
-12V DC	-11.1 TO -12.8
+42 DC	39 TO 45
115V AC	103 TO 127

EQUIPMENT NOTES

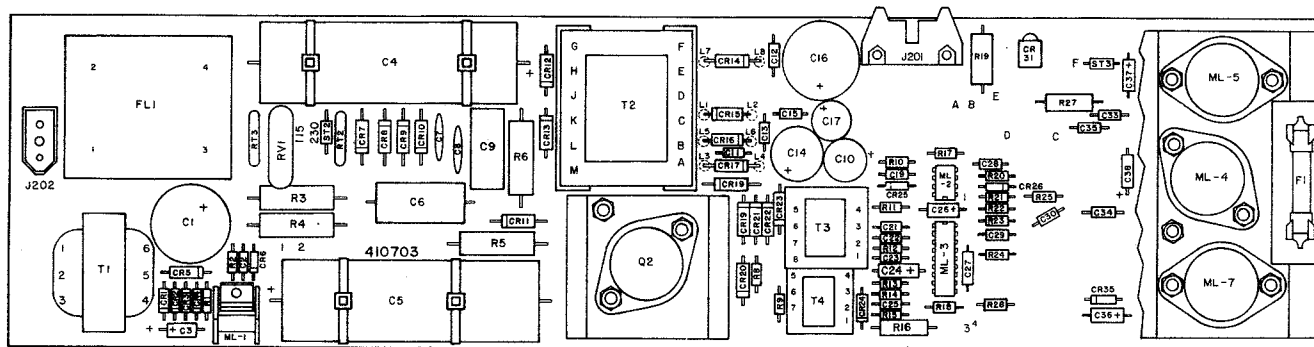
201. THE PROTECTIVE GROUND IS NOT CONNECTED TO THE PRIMARY CIRCUIT GROUND. CARE MUST BE EXERCISED TO PREVENT DIRECT CONNECTION OF THESE GROUNDS UNLESS THE POWER SUPPLY IS PLUGGED INTO AN ISOLATION TRANSFORMER. DIRECT CONNECTION TO THESE GROUNDS WITHOUT ISOLATION WILL CAUSE COMPONENTS TO FAIL.
202. THE OSCILLATOR AND CONTROL CIRCUIT CAN BE CHECKED BY APPLYING AN EXTERNAL +16V 200mA SOURCE VOLTAGE TO THE CATHODE OF CR19. THE WAVEFORMS SHOWN ARE WITH +16V APPLIED TO CR19.
203. THE +5V AND -12V REGULATOR CIRCUITS CAN BE CHECKED BY APPLYING AN EXTERNAL +9V AND -16V 200mA SOURCE VOLTAGE ACROSS C7 AND C8 RESPECTIVELY.

301. TERMINALS DESIGNATION ENCLOSED IN PARENTHESIS ARE NOT MARKED ON THE COMPONENT.
302. ALL RESISTORS ARE 1/4 W, 5% AND ALL IN OHMS UNLESS OTHERWISE SPECIFIED.
303. ALL CAPACITORS VALUES IN MICRO FARADS UNLESS OTHERWISE SPECIFIED.
304. TRANSFORMER WINDINGS DC RESISTANCE INDICATED IN OHMS.
305. CONNECTORS (PIN NUMBERS) (TOP VIEW)
306. INDICATES +42V DC GROUND
- INDICATES ±12V, AND +5 DC GROUND
- INDICATES FRAME GROUND (PROTECTIVE)
- INDICATES FULL WAVE BRIDGE COMMON (NOT GROUND)
- INDICATES TRANSIENT PROTECTION
- INDICATES FOUR TERMINAL LOW INDUCTANCE CAPACITOR

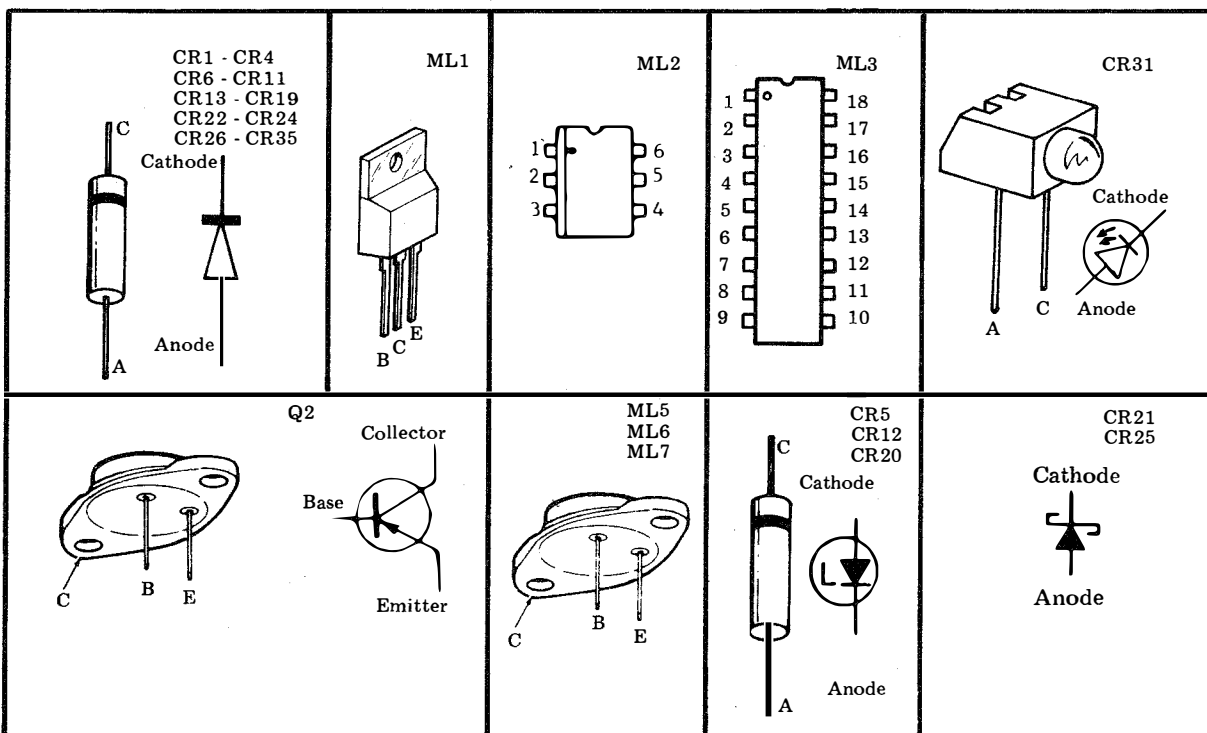


410703 POWER SUPPLY CIRCUIT CARD
(Issue 1A)

CIRCUIT CARD COMPONENT LAYOUT



SEMICONDUCTORS AND INTEGRATED CIRCUITS IDENTIFICATION AND LEAD DESIGNATION



CIRCUIT NOTES

101. VOLTAGE SYMBOL AND RANGE:

SYMBOL	DC	VOLTAGE RANGE
VREF	DC	4.95 TO 5.05
VSTART	DC	11.4 TO 12.6
+42Vs	DC	38.6 TO 42.0
+VIN	DC	275 TO 375 WITH RESPECT TO PRIMARY COMMON
-VIN	DC	PRIMARY COMMON
+42V	DC	38.6 TO 42.0
+12V	DC	11.4 TO 12.6
+5V	DC	4.75 TO 5.25
-12V	DC	-11.4 TO -12.6
115V	AC	103 TO 127
230V	AC	195 TO 265

102. STRAP NOTES:
 WITH ST-2 IN THE 230V POSITION, THE FUSE F1 SHALL BE A 1.0A SLOW BLOW.
 ON THE CIRCUIT BOARD PROVISIONS HAVE BEEN MADE TO MOVE THE ST-2 STRAP TO THE 115V POSITION; THE FUSE F1 SHALL THEN BE A 1.5A SLOW BLOW.

EQUIPMENT NOTES

201. THE PROTECTIVE GROUND IS NOT CONNECTED TO THE PRIMARY CIRCUIT COMMON. CARE MUST BE EXERCISED TO PREVENT DIRECT CONNECTION OF THESE POINTS, UNLESS THE POWER SUPPLY IS PLUGGED INTO AN ISOLATION TRANSFORMER. DIRECT CONNECTION OF THESE POINTS WITHOUT THE USE OF AN ISOLATION TRANSFORMER WILL CAUSE COMPONENTS TO FAIL.
202. THE PULSE WIDTH MODULATOR ML-3 CAN BE CHECKED BY APPLYING AN EXTERNAL +12 VDC 200 MA. SOURCE VOLTAGE TO THE CATHODE OF CR6 WITH NO AC POWER APPLIED.
203. THE +5V, +12V AND -12V REGULATOR CIRCUITS CAN BE CHECKED BY APPLYING AN EXTERNAL +9VDC, +16VDC AND -16VDC 200 MA. SOURCE VOLTAGE ACROSS C33, C34 AND C35 RESPECTIVELY.

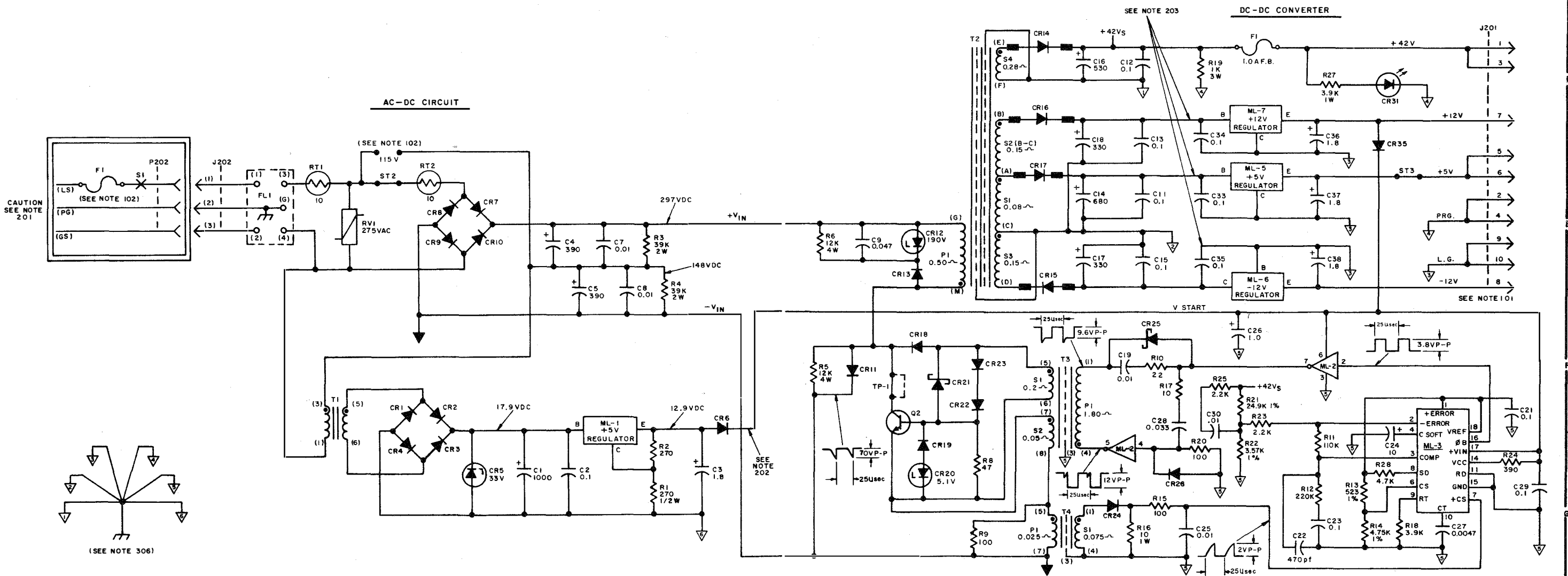
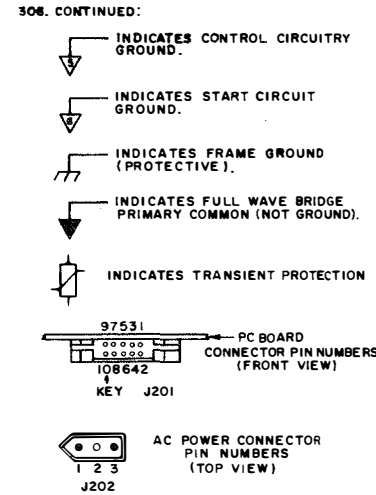
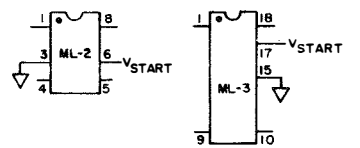
410703 POWER SUPPLY
 CIRCUIT CARD
 (ISSUE 1A)

INFORMATION NOTES

301. SHEET COORDINATE LOCATION LEGEND:
 2 C 5
 C COLUMN
 ROW
 SHEET NUMBER
302. TERMINAL DESIGNATION ENCLOSED IN PARENTHESIS ARE NOT MARKED ON THE COMPONENT.
303. ALL RESISTORS ARE 1/4W, ±5%; VALUES ARE IN OHMS UNLESS OTHERWISE SPECIFIED.
304. ALL CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
305. TRANSFORMER WINDINGS DC RESISTANCE INDICATED IN OHMS.
306. INDICATES +42VDC FILTER CAPACITOR GROUND.
 INDICATES LOGIC VOLTAGES FILTER CAPACITOR GROUND.
 INDICATES LOGIC VOLTAGES CONNECTOR GROUND.
 INDICATES +42VDC CONNECTOR GROUND.

INFORMATION NOTES CONT'D.

307. SUPPLY VOLTAGES FOR DUAL-IN-LINE INTEGRATED CIRCUIT PACKAGES UNLESS OTHERWISE SPECIFIED:



CAUTION
 SEE NOTE 201

(SEE NOTE 306)

SEE NOTE 202

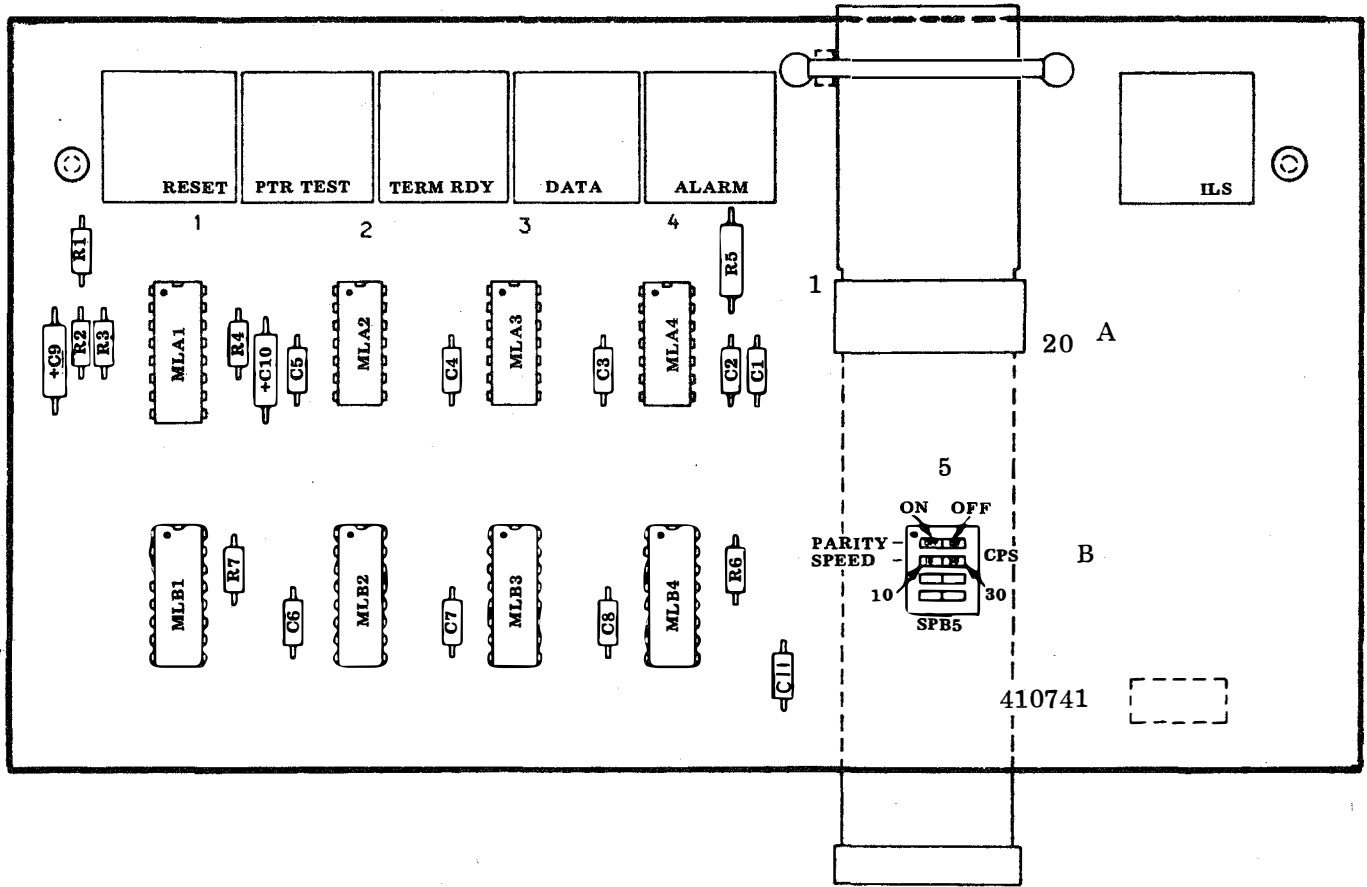
SEE NOTE 203

SEE NOTE 101

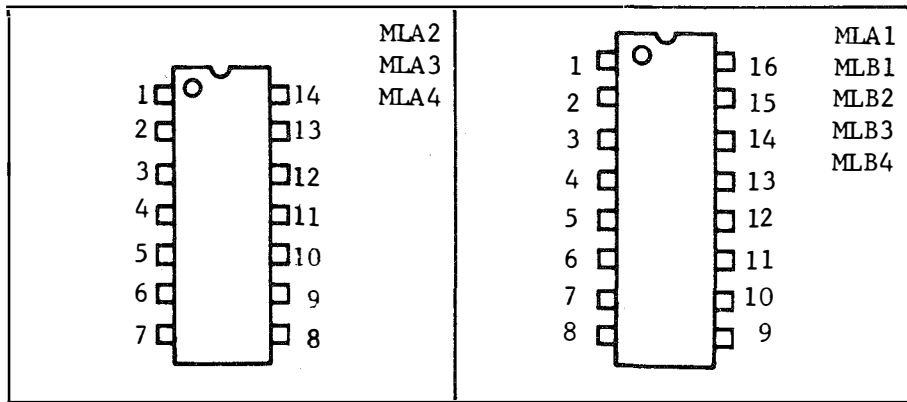
KEYBOARD CIRCUIT CARDS

43K001/CAA KEYBOARD CIRCUIT CARD

CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION



43K001/AAA OPERATOR

CIRCUIT NOTES:

101. VOLTAGE

VOLTAGE RANGE	+5V	+4.5 TO 5.5
	-12V	-10.8 TO -13.2

102. INTEGRATED CIRCUITS POWER CONNECTIONS:

TYPE	DESIG.	+5V	LOGIC GRD.
TTL (LS)	MLA2, A3	14	7
TTL (LS)	MLB1, B2, B3	16	8
TTL	MLA1	16	8
TTL	MLA4	5	10
ROM (BIPOlar)	MLB4	16	8

103. SWITCH OPTIONS:

OFF = SWITCH OPEN

ON = SWITCH CLOSED

DEPRESS SWITCH HERE OR SLIDE TO ON POSITION TO CLOSE

(Q) PARITY OPTION

* SW-1 OFF (OPEN) PARITY DETECT ON EVEN ON (CLOSED) PARITY DETECT OFF

(b) SPEED SELECT

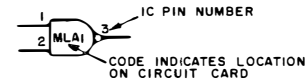
* SW-2 OFF (OPEN) 30 CHAR. PER SECOND ON (CLOSED) 10 CHAR. PER SECOND

* FACTORY FURNISHED STATE

INFORMATION NOTES:

201. ALL RESISTORS 1/4 WATT AND VALUES IN OHMS UNLESS OTHERWISE SPECIFIED. ALL CAPACITORS VALUES IN MICROFARADS.

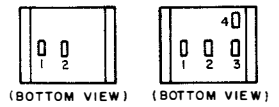
202. LOGIC DESIGNATION:



203. SWITCH PACK DESIGNATION:

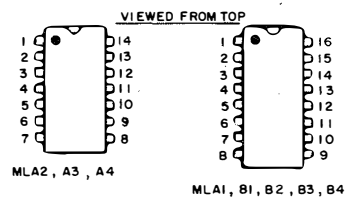
SWITCH PACK LOCATION SWITCH NO. SP B5 SW1

204. KEYSWITCH AND INDICATORS TERMINAL DESIGNATIONS:



INFORMATION NOTES CONT.

205. INTEGRATED CIRCUITS- EXTERNAL VIEW AND LEAD DESIGNATION:



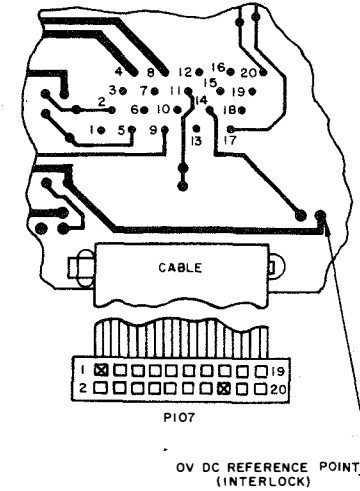
206. CONNECTOR INFORMATION P107 (FEMALE PLUG):

PIN NO.	DESIGNATION	INPUT	OUTPUT
1	KEY POSITION		
2	-12V	X	
3	LOGIC GROUND	X	
4	ALARM	X	
5	SEND DATA		X
6	REPEAT		X
7	+5V	X	
8	AUTO ANSWER	X	
9		X	
10			
11	DATA	X	
12	CLOCK	X	
13	LOCAL	X	
14	INTERLOCK		X
15			
16	KEY POSITION		
17	CHARACTERS PER SECOND		X
18			
19	PRINTER TEST		X
20	PARITY		X

CONSOLE LOGIC

INFORMATION NOTES CONT.

207. CONNECTOR TERMINATION (ON CIRCUIT CARD):



INFORMATION NOTES CONT.

208. MLB4 ROM ENCODING TABLE:

ADDRESS COUNT	OUTPUT 4321	ADDRESS COUNT	OUTPUT 4321	ADDRESS COUNT	OUTPUT 4321
0	0111	19	0011	38	0001
1	0001	20	0001	39	0011
2	0001	21	0001	40	0011
3	0001	22	0001	41	0011
4	0001	23	0001	42	0011
5	0001	24	0011	43	0001
6	0001	25	0011	44	0001
7	0001	26	0011	45	0011
8	0001	27	0011	46	0001
9	0011	28	0011	47	0001
10	0011	29	0001	48	0001
11	0011	30	0001	49	0001
12	0011	31	0011	50	0001
13	0011	32	0001	51	0011
14	0011	33	0011	52	0001
15	0001	34	0001	53	0011
16	0011	35	0001	54	0110
17	0001	36	0001		
18	0011	37	0001		

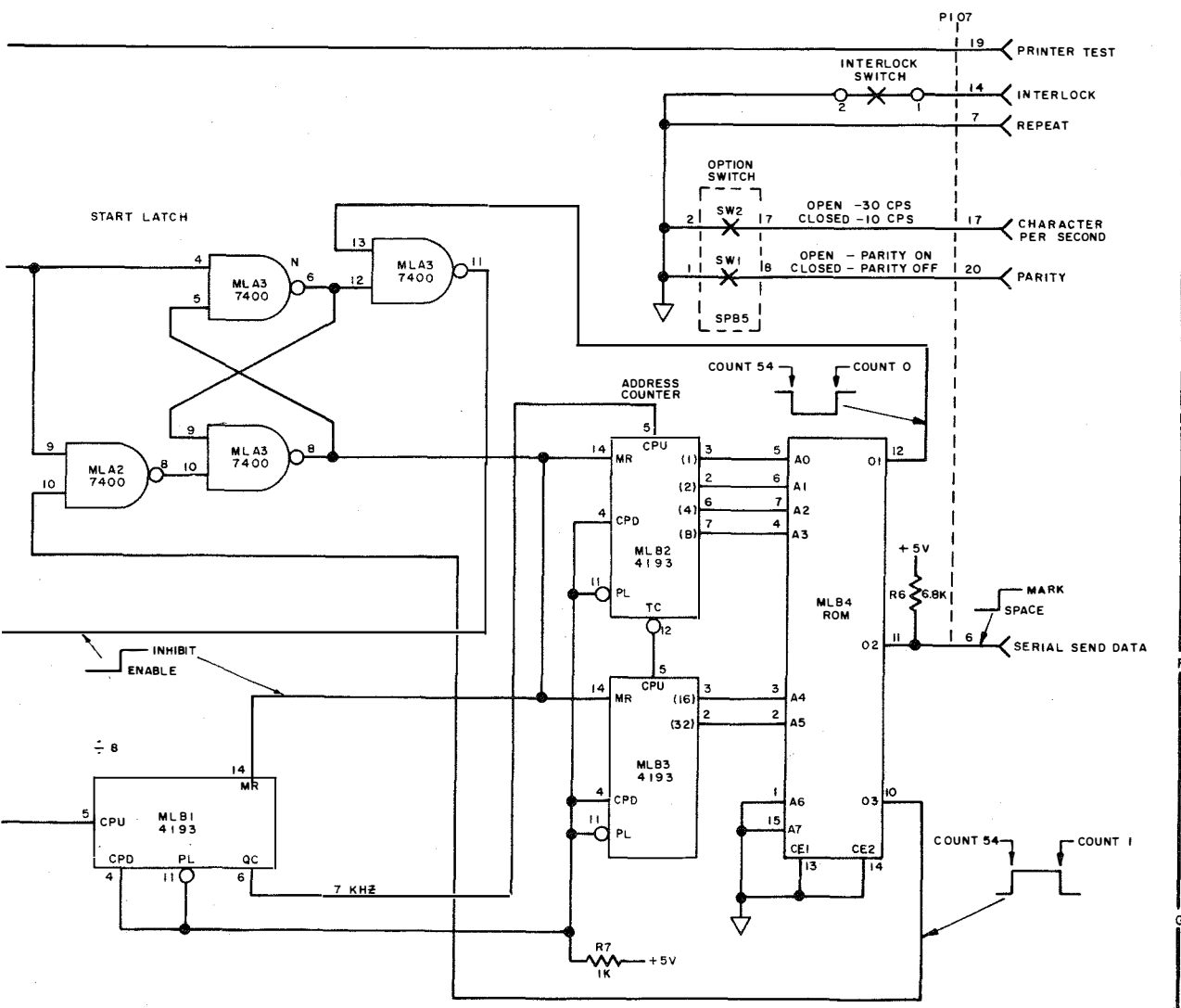
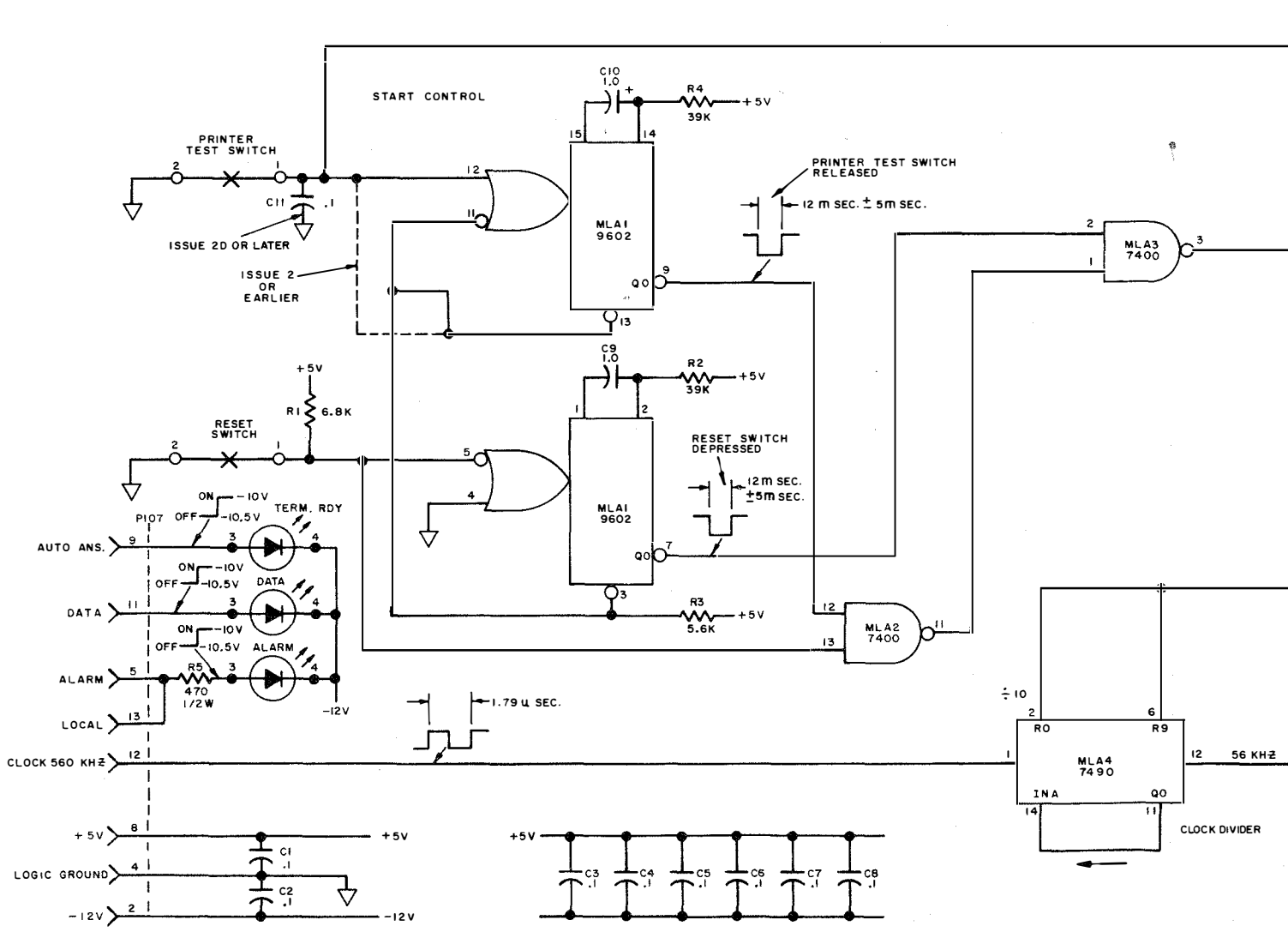
0 = LO
1 = HI

209. SERIAL SEND DATA BITS:

CHARACTER	0	1	2	3	4	5	6	7	8	S T O P	S T O P	S T O P	S T O P
LOCAL CARRIAGE RETURN	0	0	0	0	0	0	0	1	1	1	1	1	1
LINE FEED	0	0	1	0	1	0	0	0	0	1	1	1	1
AUTO. ANS.	0	0	1	0	0	0	0	1	0	1	1	1	1

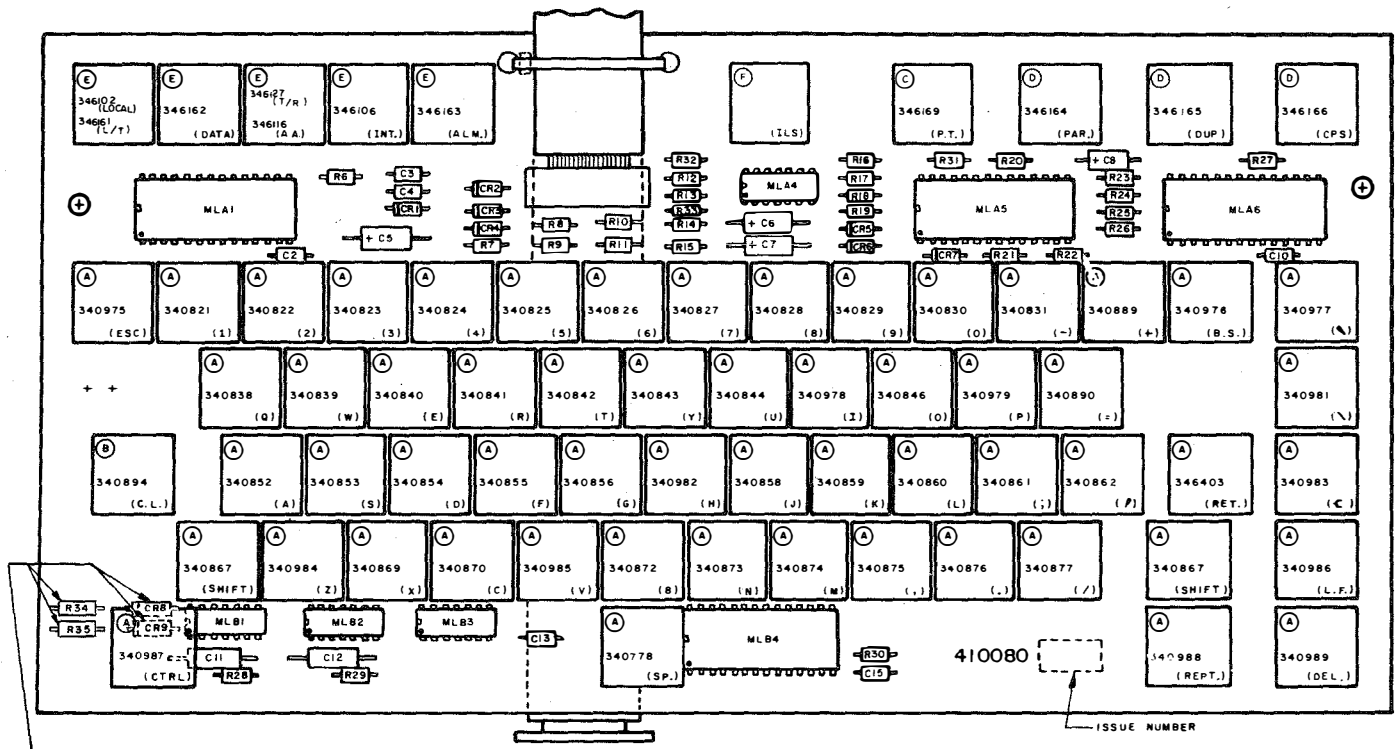
0 = SPACE
1 = MARK

210. ADDRESSES 55 THROUGH 255 CONTAIN "1" IN LEVELS 1 THROUGH 4.



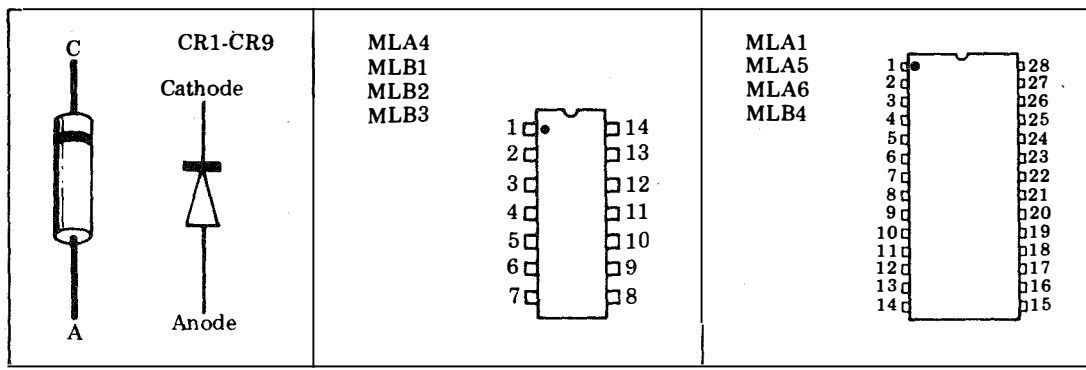
43K101/CAA AND CAB KEYBOARD CIRCUIT CARD

CIRCUIT CARD COMPONENT LAYOUT



Not present on Issue 1A.

COMPONENT IDENTIFICATION AND LEAD DESIGNATION



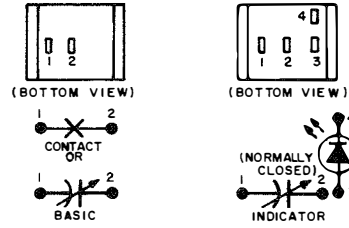
43K101/CAA AND CAS OPERATOR CONSOLE LOGIC

INFORMATION NOTES:

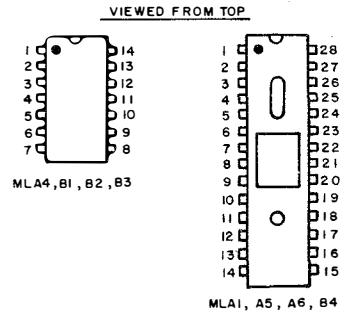
201. ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.

202. ALL CAPACITANCE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.

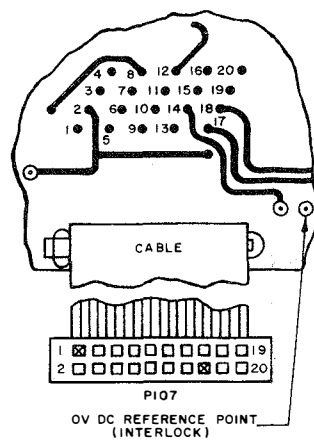
203. KEYSWITCH AND INDICATORS TERMINAL DESIGNATIONS:



204. INTEGRATED CIRCUITS-EXTERNAL VIEW AND LEAD DESIGNATION:



205. CONNECTOR TERMINATION (ON CIRCUIT CARD):



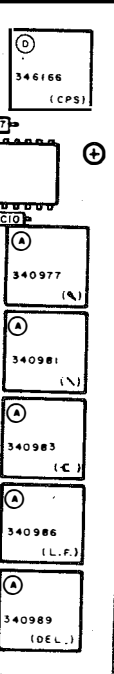
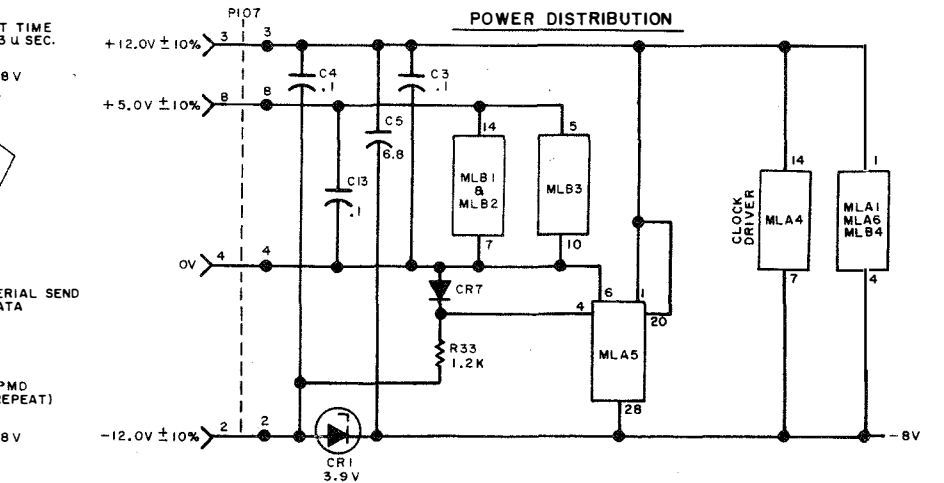
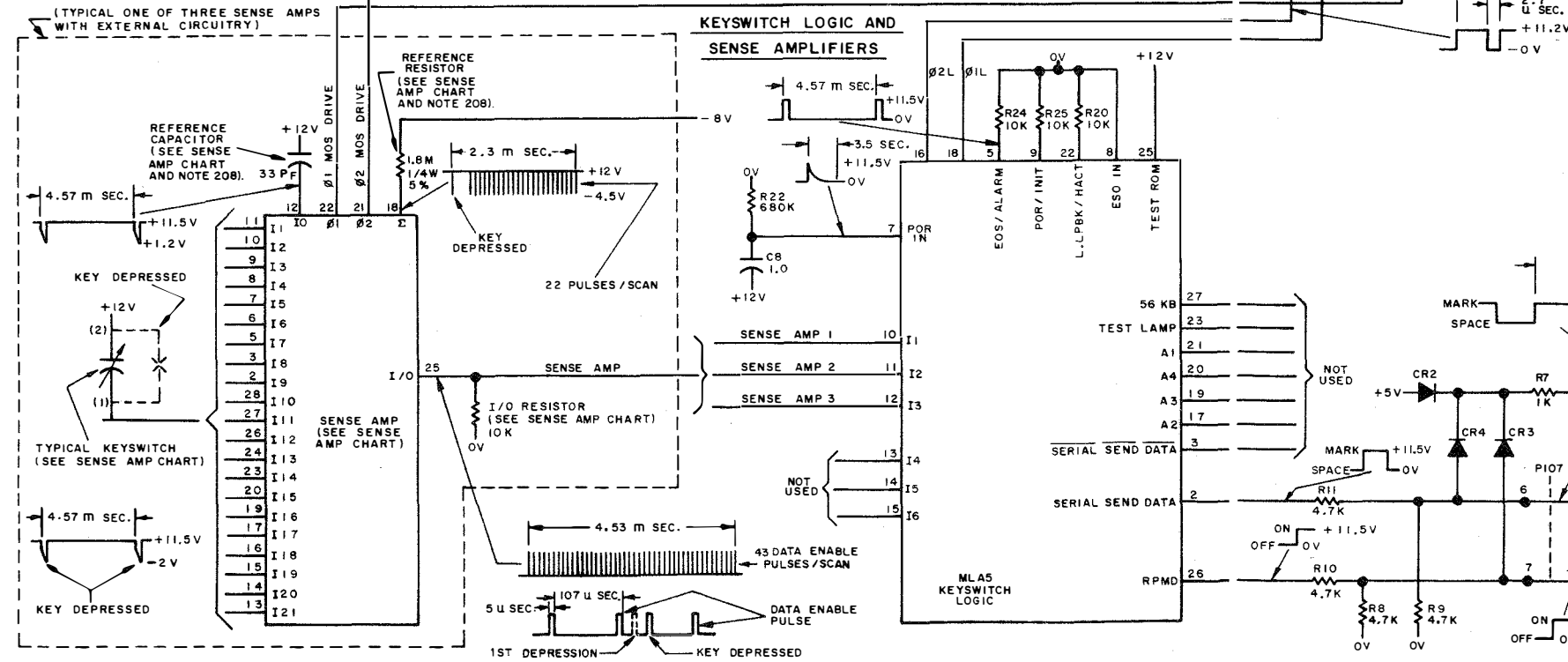
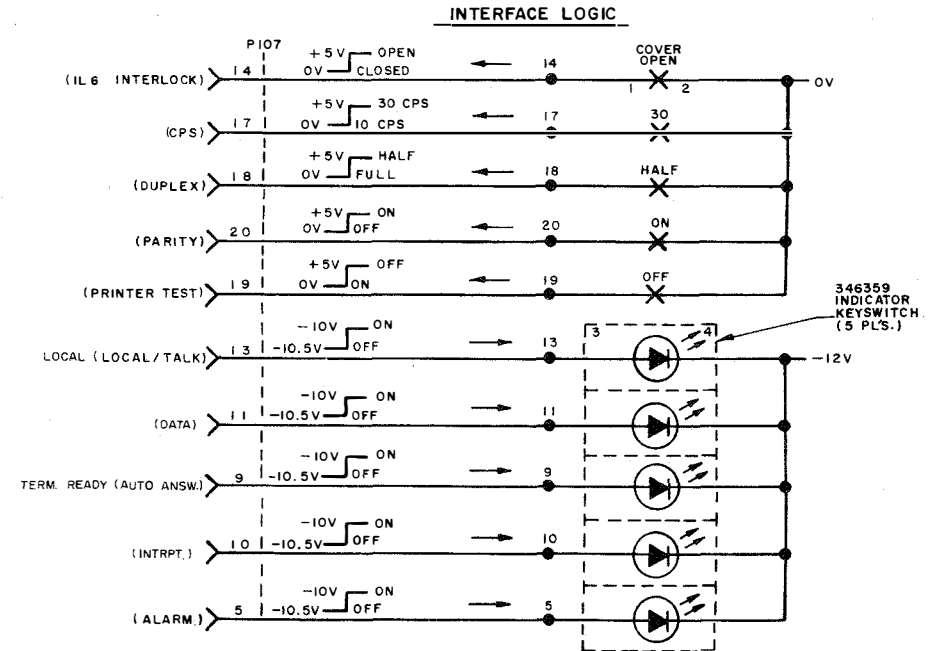
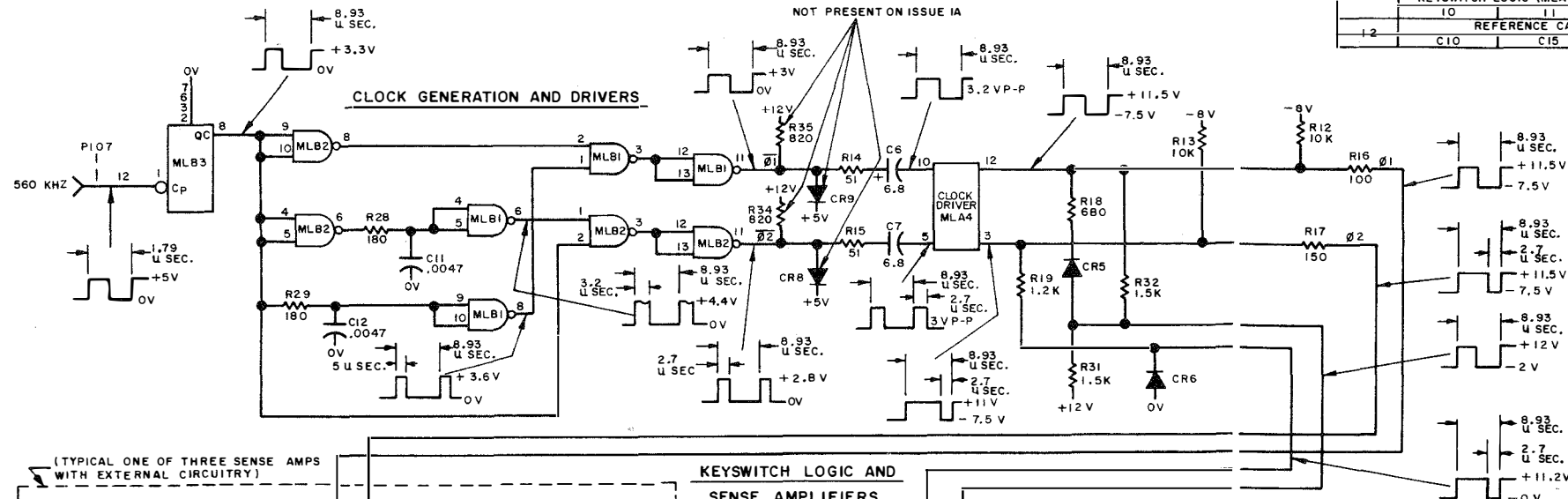
206. SENSE AMP CHART:

Table mapping SENSE AMP PIN NO. to KEYTOP CHARACTER for SENSE AMP 1 (MLA6), SENSE AMP 2 (MLB4), and SENSE AMP 3 (MLA1). Includes a list of reference resistors and capacitors.

207. INTEGRATED CIRCUIT PART NUMBERS:

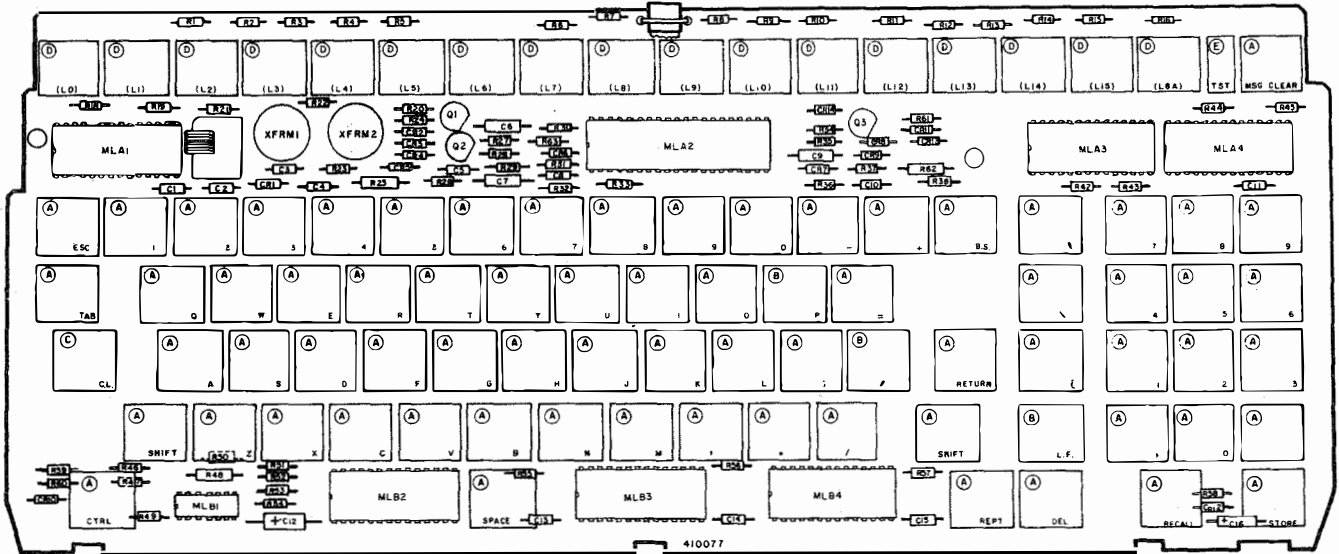
Table listing part numbers and designations for integrated circuits: 342280 (MLA1, A6, B4), 339002 (MLB1, B2), 315990 (MLB3), 404027 (MLA4), 342238 (MLA5).

208. RESISTOR IS 2.7 MEGOHMS AND CAPACITOR IS 22 PF ON ISSUE 16 OR HIGHER.

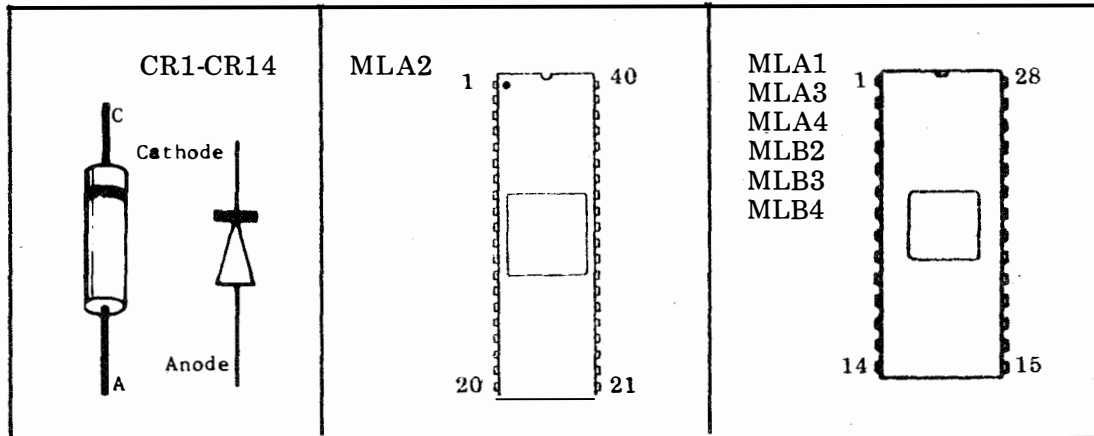


43K202/GA - KEYBOARD CIRCUIT CARD

CIRCUIT CARD COMPONENT LAYOUT



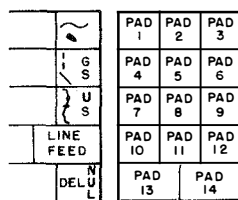
COMPONENT IDENTIFICATION AND LEAD DESIGNATION



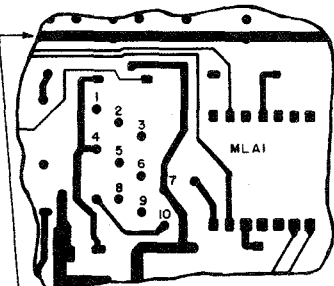
INFORMATION NOTES:

- 101. ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
- 102. ALL CAPACITANCE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
- 103. KEYSWITCH AND INDICATORS TERMINAL DESIGNATIONS:
 - (BOTTOM VIEW) (BOTTOM VIEW) (BOTTOM VIEW)
 - REPEAT (NORMALLY CLOSED)
- 104. VOLTAGE:
 - +12V
 - 12V
 VOLTAGE RANGE:
 - +10.8 TO +13.2
 - 10.8 TO -13.2
- 105. ABBREVIATIONS:
 - DE - DATA ENABLE
 - DEP - DEPRESSION
 - MR - MASTER RESET
 - EOS - END OF SCAN
 - L.LPBK - LOCAL LOOPBACK
 - ITD - INFORMATION TO DEVICE
 - I/O - INPUT/OUTPUT
 - Σ - SUMMATION
 - P-P - PEAK TO PEAK
 - INIT - INITIALIZE
 - ITC - INFORMATION TO CONTROLLER
 - POR - POWER ON RESET
 - KL - KEYSWITCH LOGIC
 - REF - REFERENCE CAPACITOR
 - RREF - REFERENCE RESISTOR
 - MOS - METAL OXIDE SILICON CIRCUIT PACK

106. PAD LOCATIONS (KEY CLUSTER ON RIGHT SIDE OF CONSOLE)



107. CONNECTOR TERMINATION (ON CIRCUIT CARD):



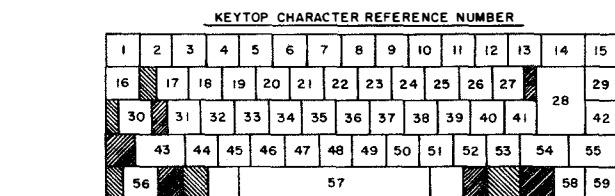
OV DC REFERENCE POINT KEYSWITCH-PIN 4

108. SENSE AMP CHART

SENSE AMP PIN NO	SENSE AMP 1 (MLB3)	SENSE AMP 2 (MLB4)	SENSE AMP 3 (MLB2)	SENSE AMP 4 (MLA1)	SENSE AMP 5 (MLA4)
11	52	59	23	3	PAD 8
10	40	PAD 13	9	4	PAD 6
9	26	PAD 10	36	21	PAD 3
8	51	55	8	20	PAD 5
7	11	42	48	6	PAD 9
6	10	29	22	5	PAD 7
5	24	15	35	7	PAD 4
3	37	27	34	19	PAD 2
2	49	12	47	18	PAD 1
28	25	13	45	31	PAD 11
27	38	53	44	32	PAD 12
26	50	41	33	17	PAD 14
24	39	28	46	2	L15
23	+12V	41 (TEST)	16	L0	L10
20	L7	26 (TEST)	43	L1	L14
19	L8	54	56	L6	L13
17	+12V	14	+12V	L2	L12
16	+12V	+12V	+12V	L4	L11
15	+12V	55 (TEST)	+12V	1	L9
14	+12V	+12V	57	L3	60
13	+12V	+12V	30	L5	L8A
REFERENCE RESISTOR					
18	R45	R57	R55	R19	R56
I/O RESISTOR					
25	R44	R42	R49	R18	R43
KEYSWITCH LOGIC (MLA3) INPUT PIN NO.					
	10	11	12	13	14
REFERENCE CAPACITOR					
12	C11	C15	C13	C1	C14

109. INDICATOR LAYOUT

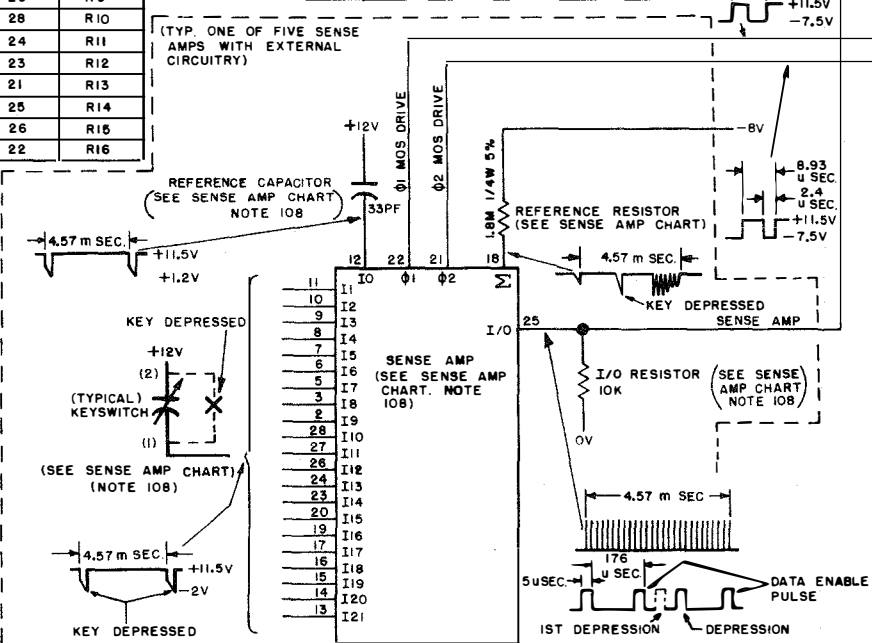
LAMP NO.	PIN NO. ON LD10 CHIP	RESISTOR NO.
L0	33	R1
L1	35	R2
L2	37	R3
L3	38	R4
L4	36	R5
L5	32	R6
L6	31	R7
L7	30	R8
L8A	29	R9
L9	28	R10
L10	24	R11
L11	23	R12
L12	21	R13
L13	25	R14
L14	26	R15
L15	22	R16



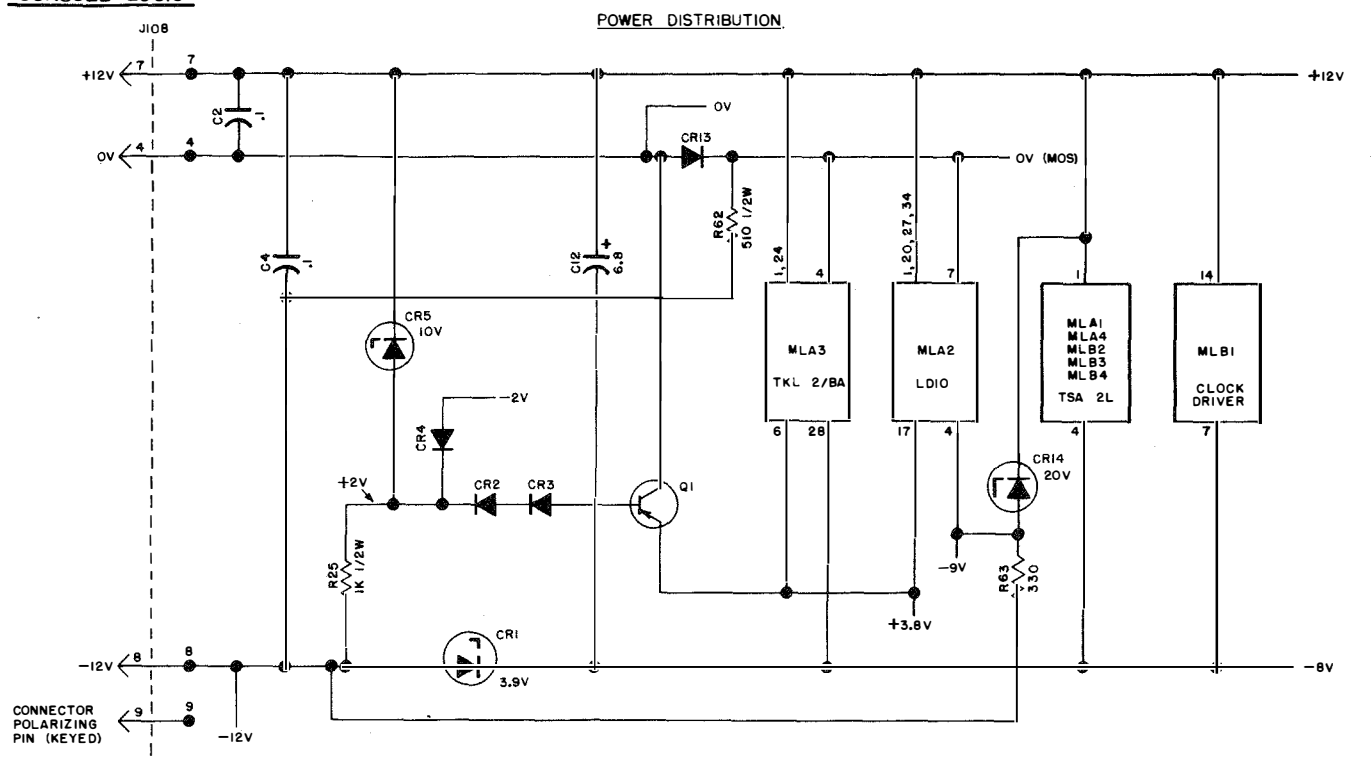
CONTROL ROW



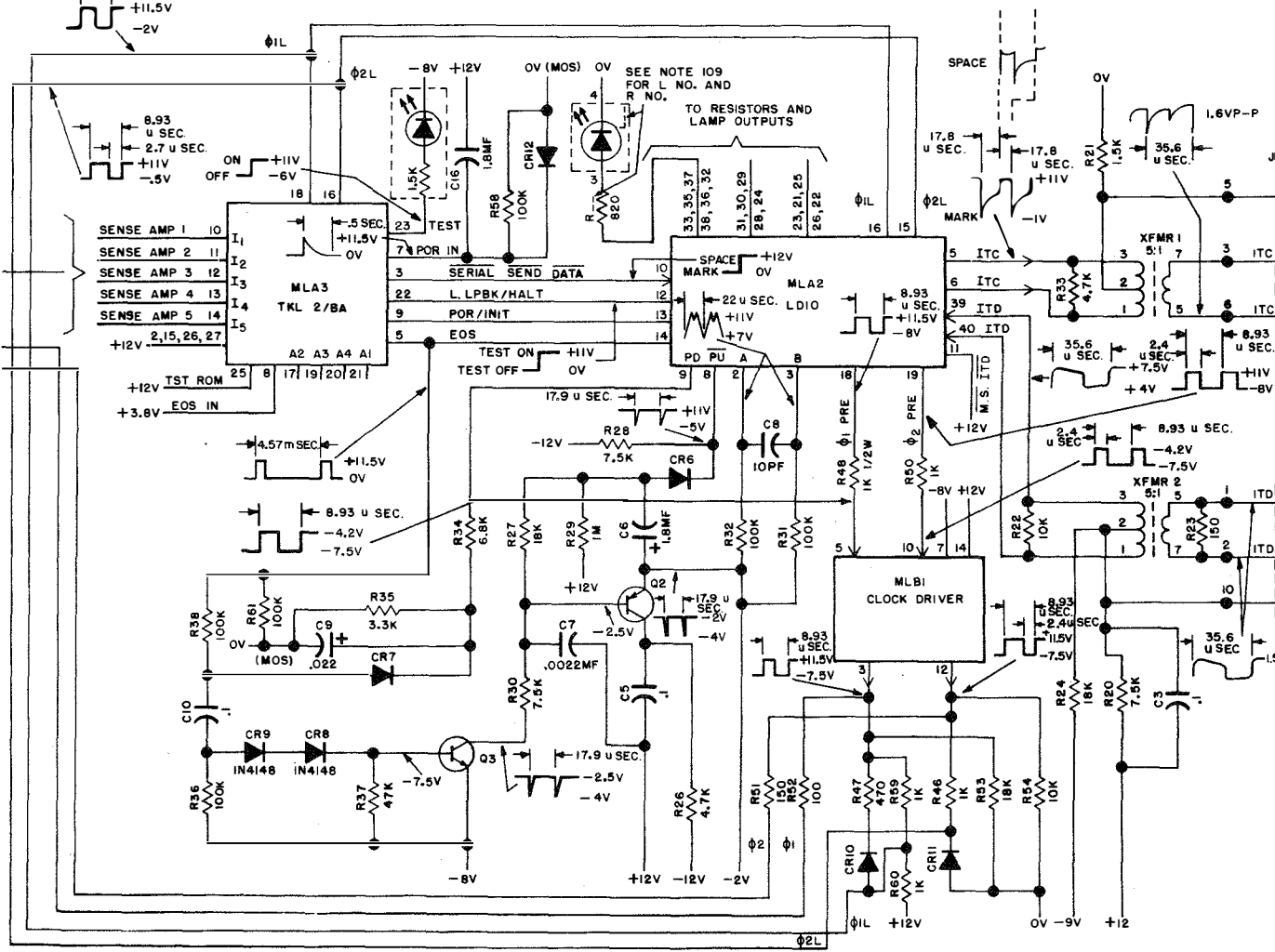
KEYSWITCHES AND SENSE AMPLIFIERS



43K202/GA - OPERATOR CONSOLE LOGIC

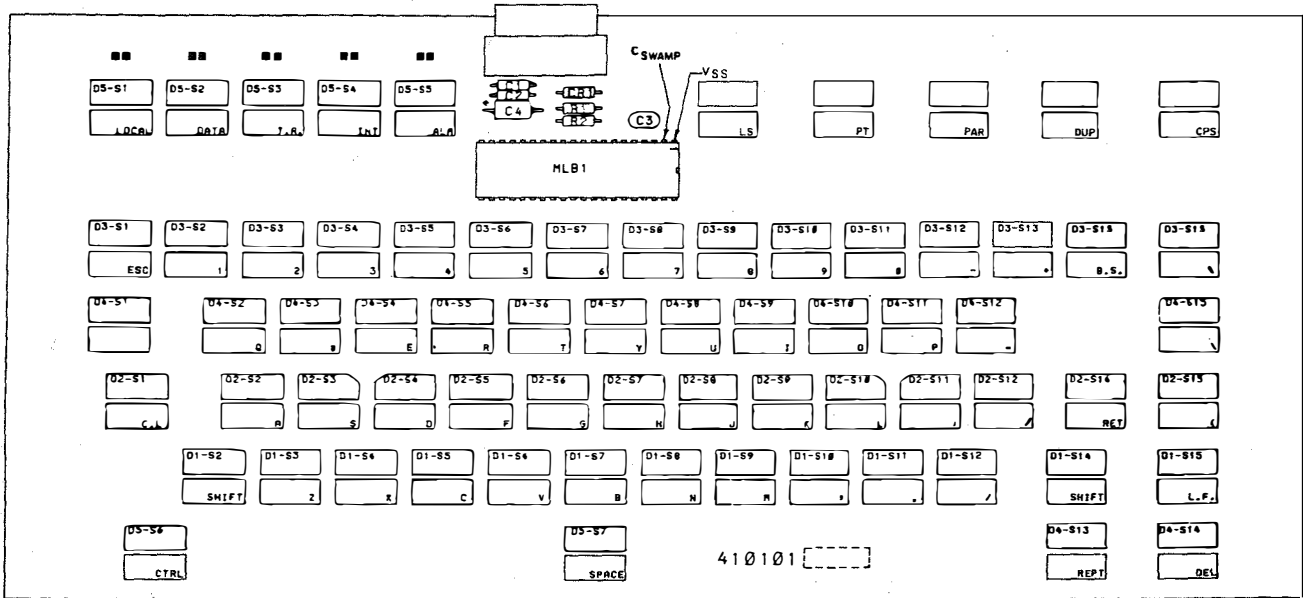


KEYSWITCH AND INTERFACE LOGIC

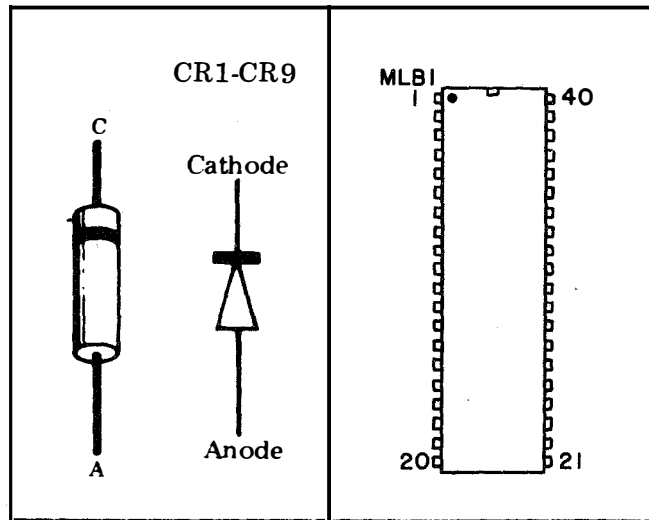


50K122/AA — KEYBOARD CIRCUIT CARD

CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION



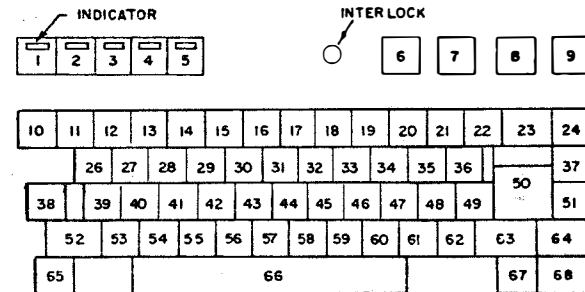
INFORMATION NOTES:

50K122/AA - KEYBOARD LOGIC

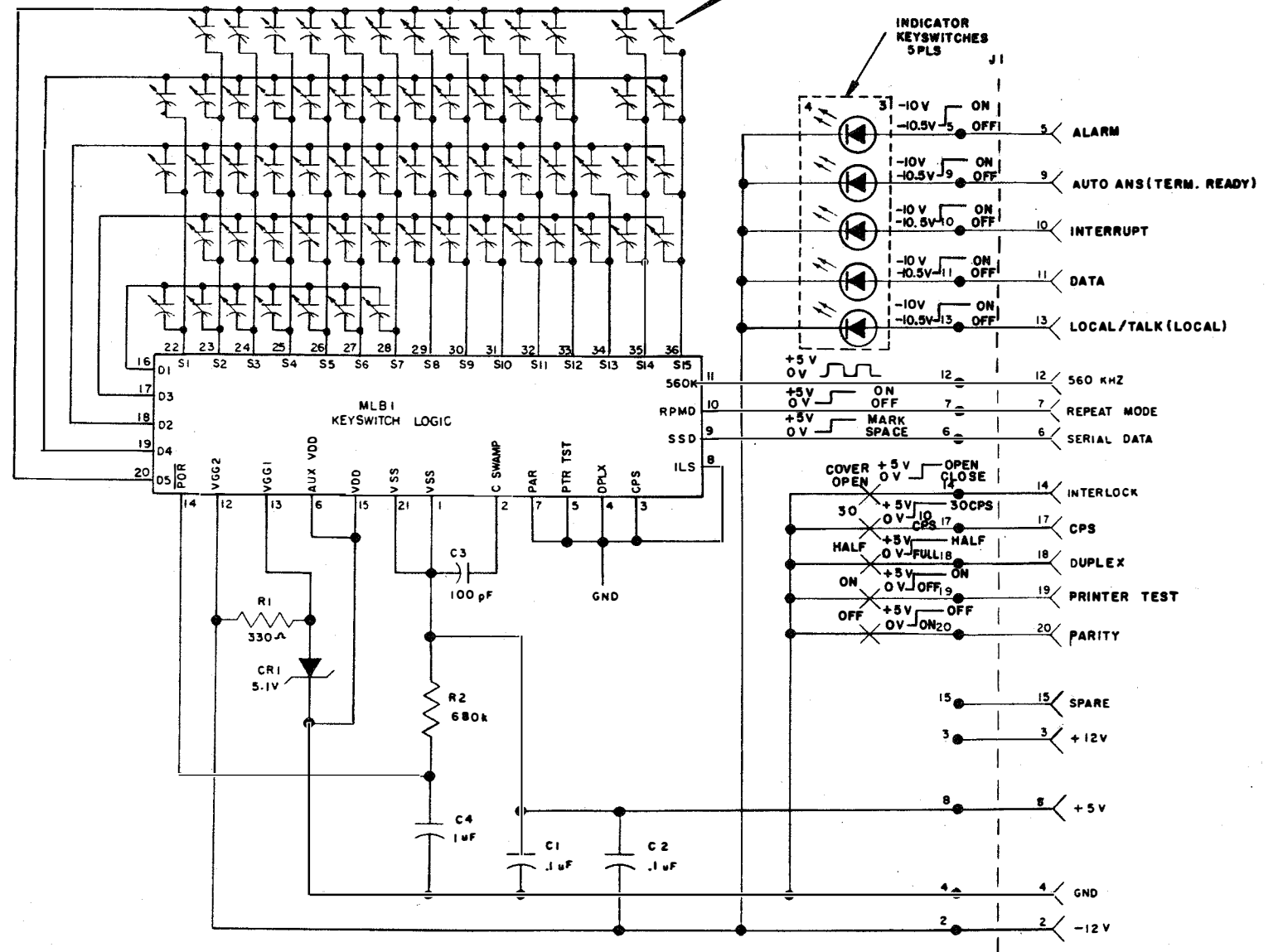
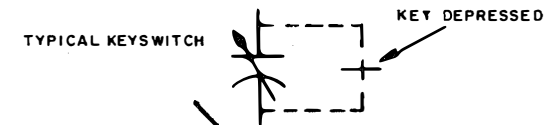
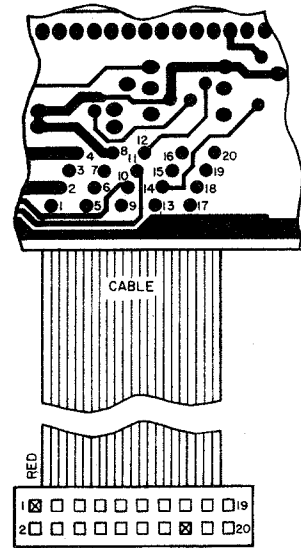
201. SENSE AND DRIVE LINE CHART

MLB1					
KEYSWITCH POSITION NOS. (SEE FIGURE BELOW)					
SENSE	DRIVE				
	D5	D4	D2	D3	D1
S1		38	10		1
S2	52	39	11	26	2
S3	53	40	12	27	3
S4	54	41	13	28	4
S5	55	42	14	29	5
S6	56	43	15	30	65
S7	57	44	16	31	66
S8	58	45	17	32	
S9	59	46	18	33	
S10	60	47	19	34	
S11	61	48	20	35	
S12	62	49	21	36	
S13			22	67	
S14	63	50	23	68	
S15	64	51	24	37	

202. KEYSWITCH POSITION NUMBERS



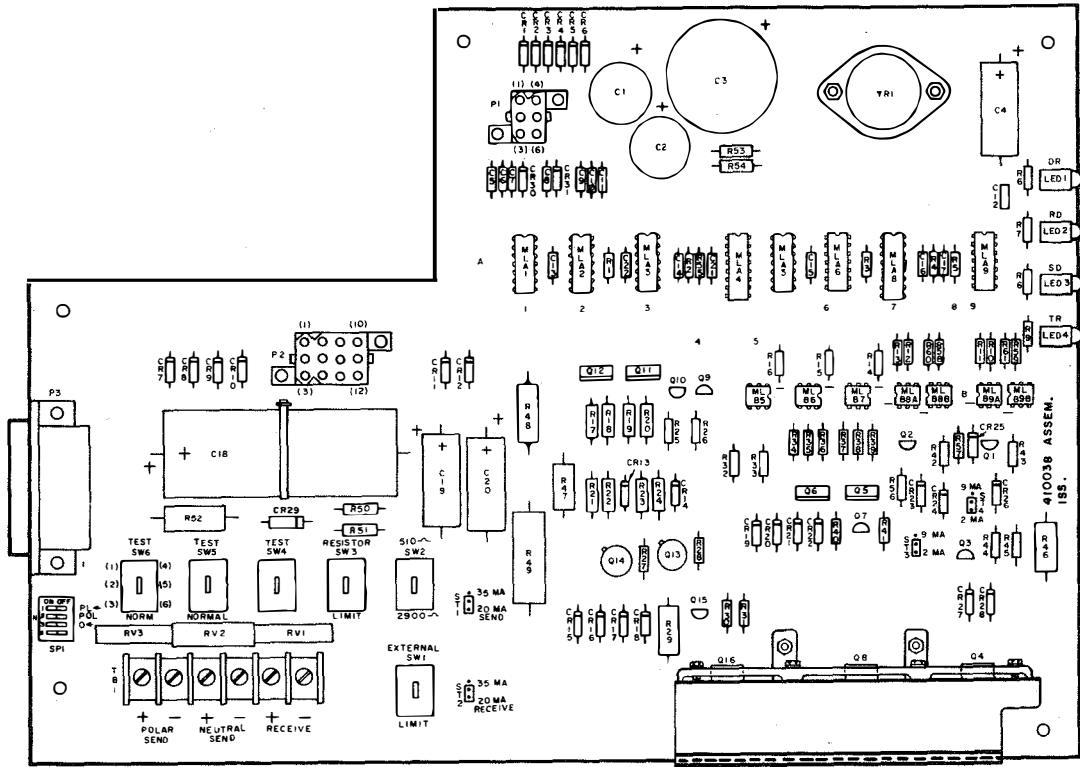
203. CONNECTOR TERMINATION ON CIRCUIT CARD



INTERFACES

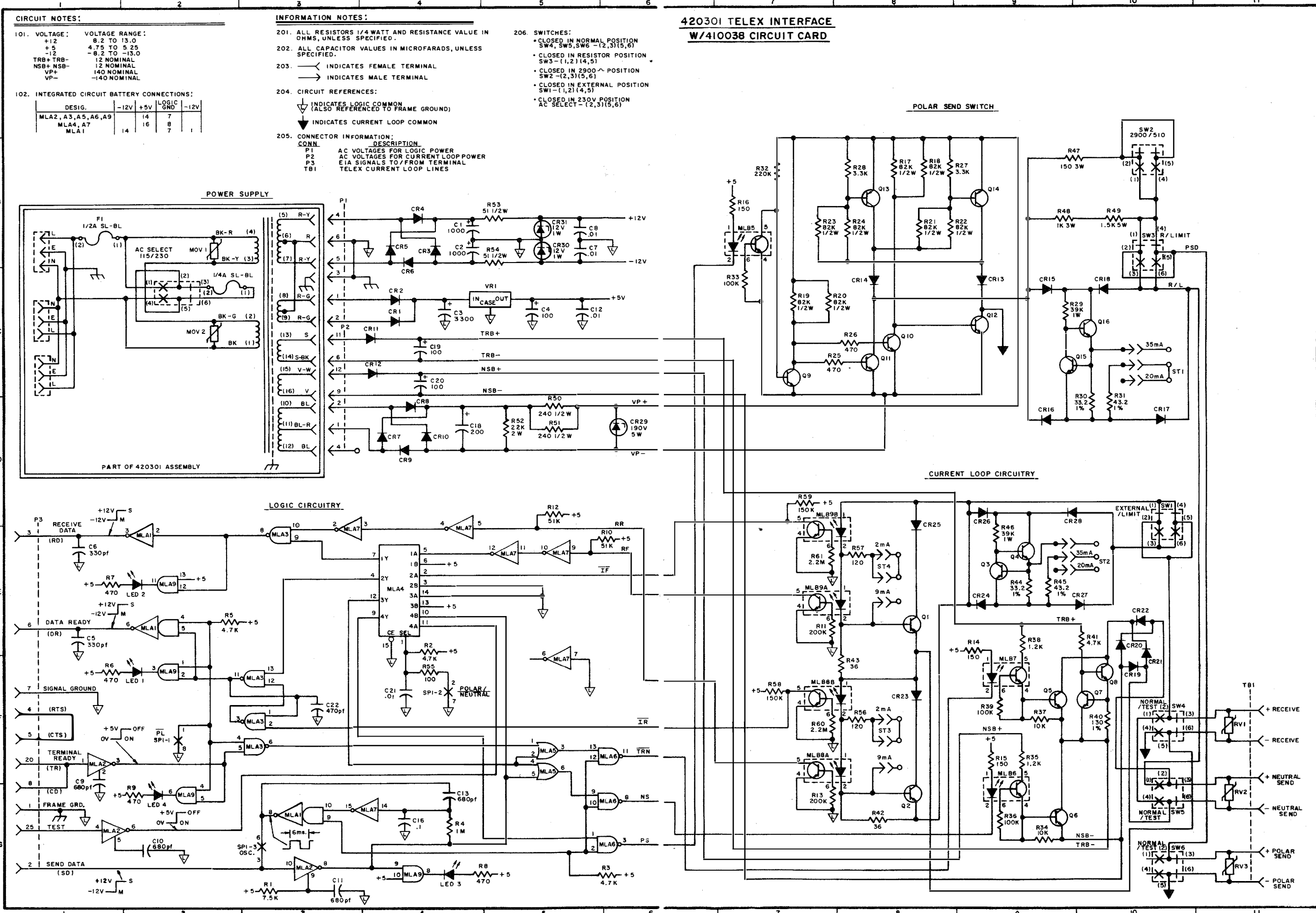
410038 TELEX INTERFACE CIRCUIT CARD

CIRCUIT CARD COMPONENT LAYOUT



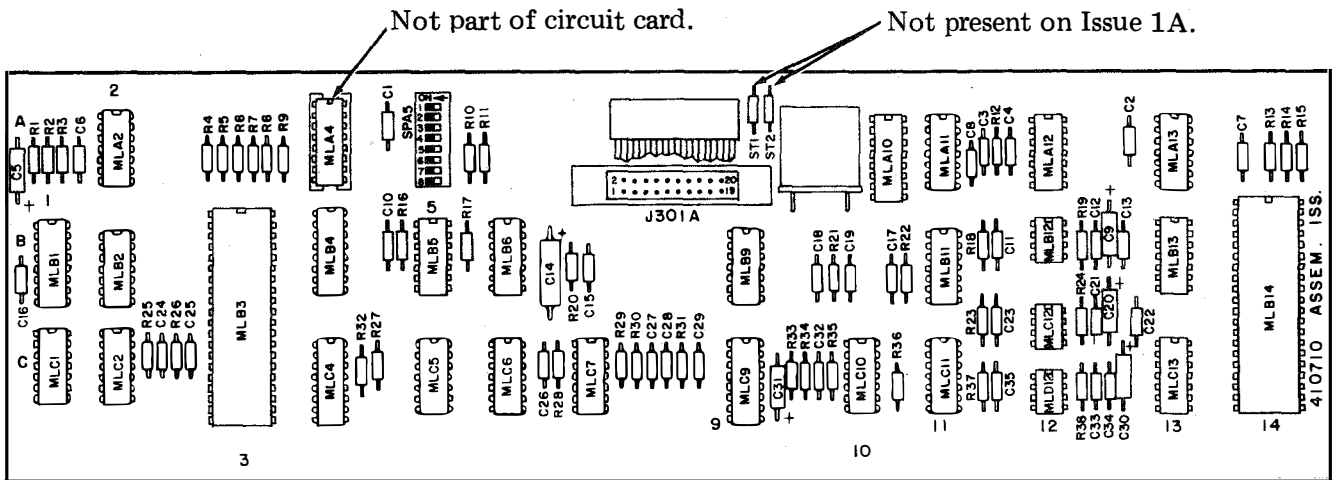
COMPONENT IDENTIFICATION AND LEAD DESIGNATION

<p>CR1-CR31 Cathode Anode</p>	<p>Q4 - Q6 Q8 Q11 - Q12 Q16 B C E</p>	<p>Q1 - Q3 Q7 Q9 - Q10 E B C</p>	<p>Q13-Q14 C E B</p>	<p>VR1 CASE IN OUT</p>
<p>MLB5-MLB9 (Top View)</p>	<p>MLA1 - MLA3 MLA5 - MLA6 MLA9 (Top View)</p>	<p>MLA4 MLA7 (Top View)</p>	<p>LED1-LED4 Cathode Anode</p>	

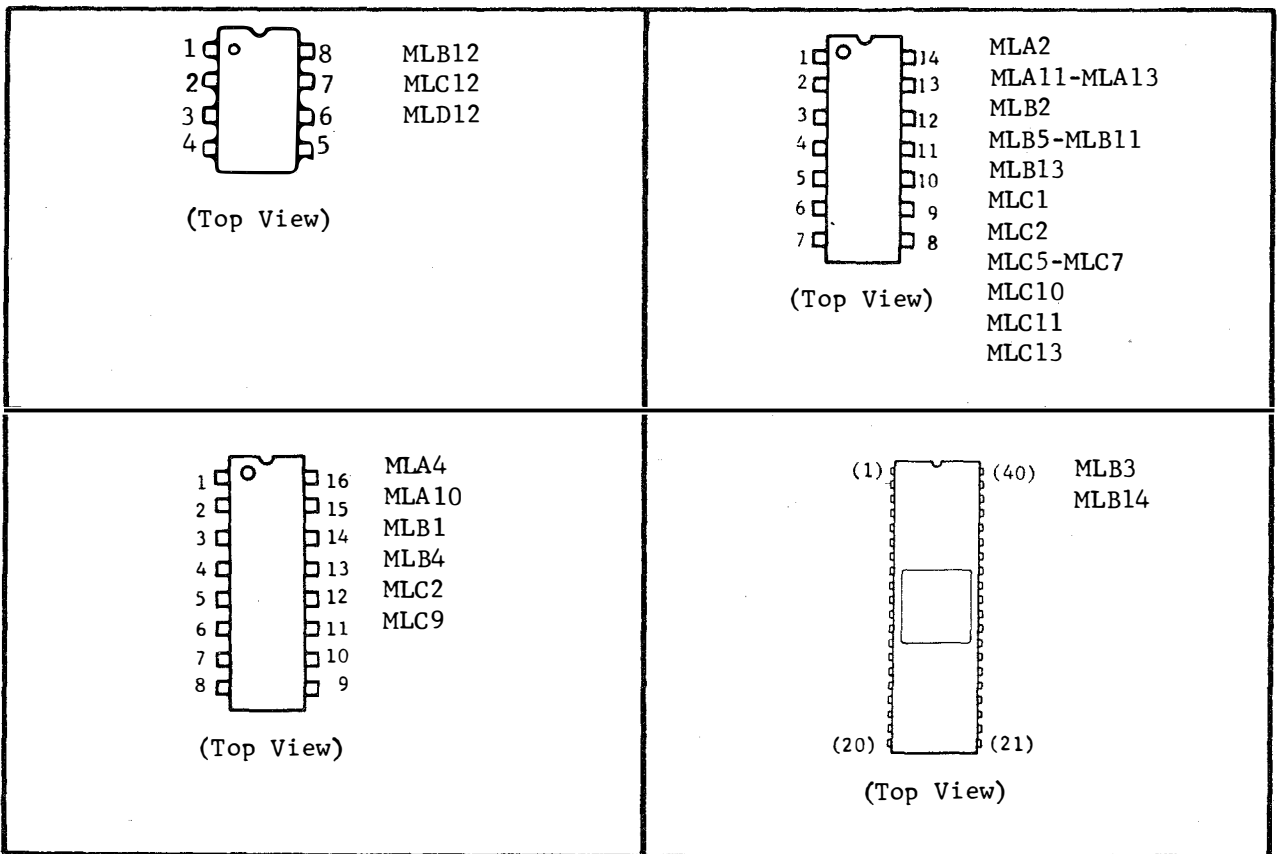


410710 ANSWER-BACK CIRCUIT CARD

CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION



CIRCUIT NOTES:

101. VOLTAGE: VOLTAGE RANGE:
+5V +4.5V TO +5.5V

102. INTEGRATED CIRCUIT POWER CONNECTIONS:

DESIGNATION	TYPE	PART NO.	+5V	LOGIC GND
MLA12, C2, C7	TTL	339009	14	7
MLB1, C9	TTL	339602	16	8
MLA2, B5, B9, B11, C10	LOW POWER SCHOTTKY	474000	14	7
MLB2, C6, C13	"	474002	14	7
MLA13, C1, C5, C11	"	474004	14	7
MLB9, B13	"	474008	14	7
MLB4, C4	"	474151	16	8
MLB3, B14	CMOS	404006	1	3
MLA10	"	404202	16	8
MLB12, C12, D12	MONOLITHIC SILICON BIPOLAR (SEE NOTE 205)	404555	8	1
MLA4	"	339600	16	8
MLA11	LINEAR	335529	14	7

103. SWITCH OPTIONS:

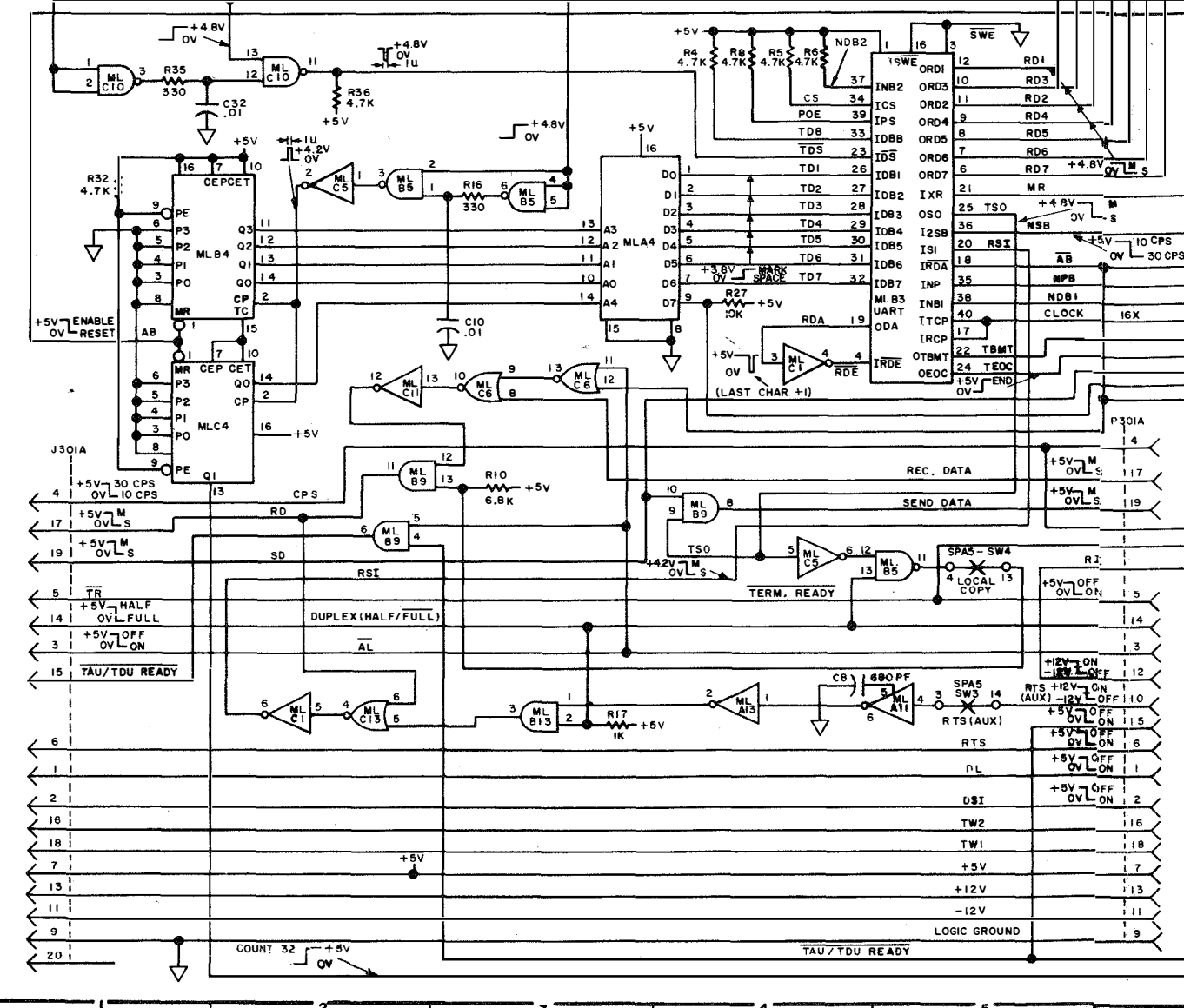
DESIGNATION	FUNCTION	SWITCH STATE (TO ENABLE FUNCTION)	
		SW1 SW2	SW1 SW2
SW1 SW2	PARITY BIT SENT	EVEN	ON ON
SW3	BLIND ENQ FROM AUX R-T	ON	ON
SW4	LOCAL COPY OF ANSWER BACK	ON	ON
SW5	ANSWER BACK ON ANSWER	ON	ON
SW6	INTERFACE UNIT	TDU-ON	ALL OTHERS-OFF
SW7	ANSWER BACK ON HERE-IS	ON	ON
SW8	ANSWER BACK ON ENQ	ON	ON

INFORMATION NOTES:

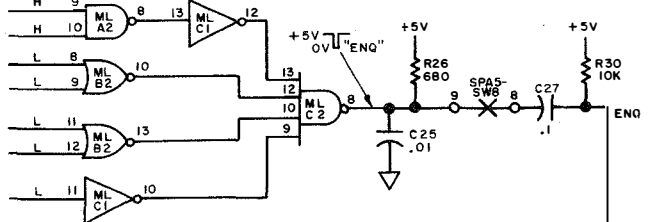
- 201. ALL RESISTORS 1/4 WATT AND RESISTANCE VALUE IN OHMS, UNLESS OTHERWISE SPECIFIED.
- 202. ALL CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
- 203. INDICATES FEMALE TERMINAL
- 204. INDICATES MALE TERMINAL
- 204. LOGIC DESIGNATION:
4 MLC6 3 - NUMBER INDICATES PACKAGE PIN
5 MLC6 3 - CODE INDICATES LOCATION ON CIRCUIT CARD.
- 205. *ROM (32 X 8) IS NOT PART OF 410710. PROVIDED UNPROGRAMMED IN 430900 ANSWER BACK MOD KIT.
- 206. SWITCH PACK DESIGNATION:
SPA5 SW4 - SWITCH NUMBER
CODE INDICATES LOCATION ON CIRCUIT CARD
SWITCH PACK
- 207. GROUND DESIGNATION:
LOGIC GND.
- 208. AT CUSTOMER ID ISSUE 2A:
A. STRAPS ST1 AND ST2, ADDED FOR MANUFACTURING PURPOSES.
- 209. WAVEFORM DESIGNATION:
m= MILLISECONDS
u= MICROSECONDS

43 ANSWER
410710

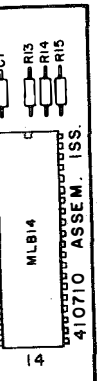
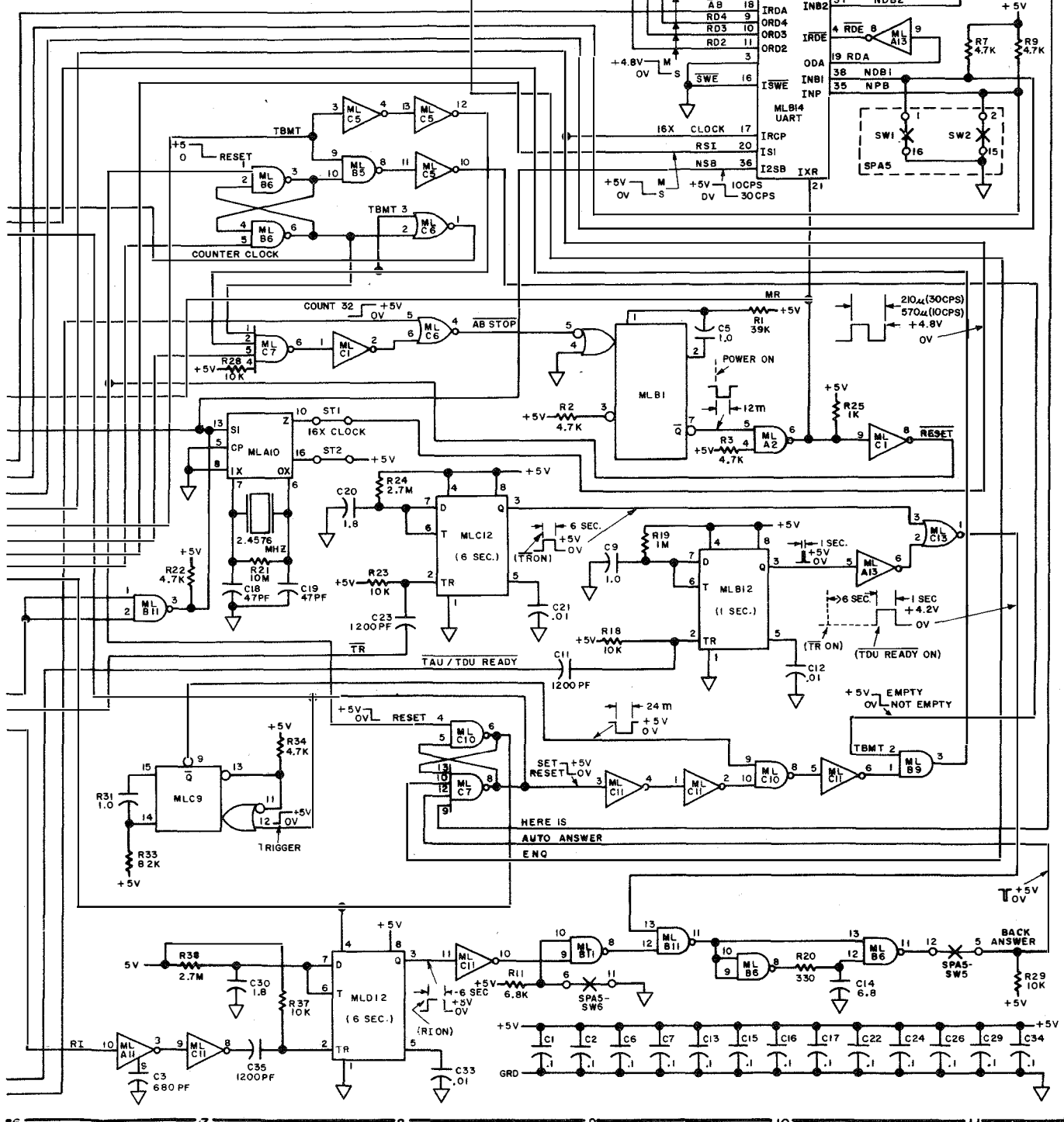
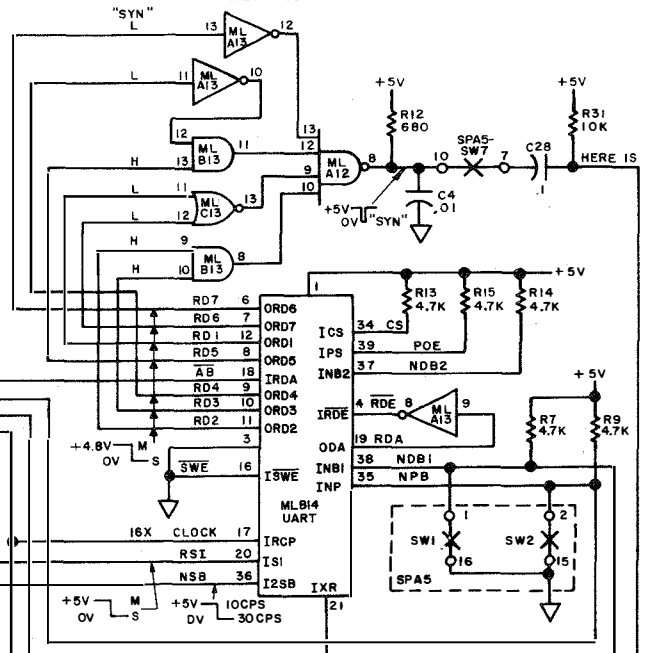
BACK CARD
ISSUE 1A & 2A



"ENQ" DECODER



"HERE IS" DECODER



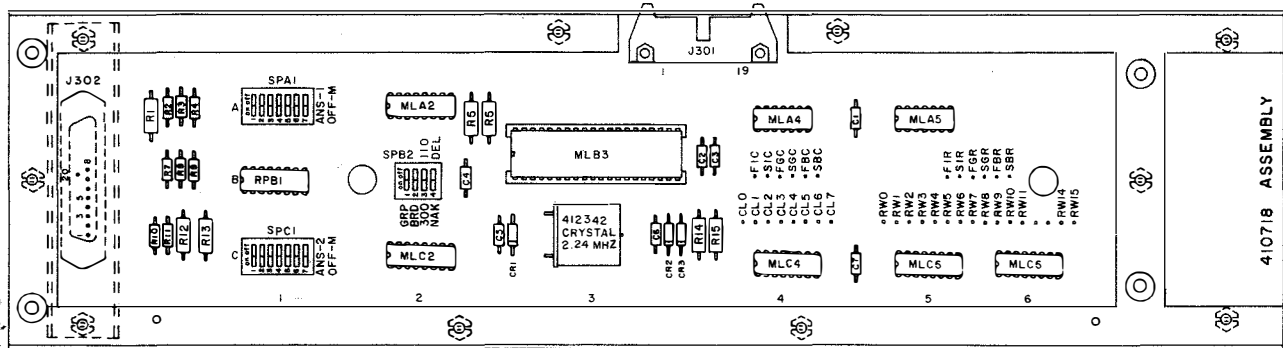
14



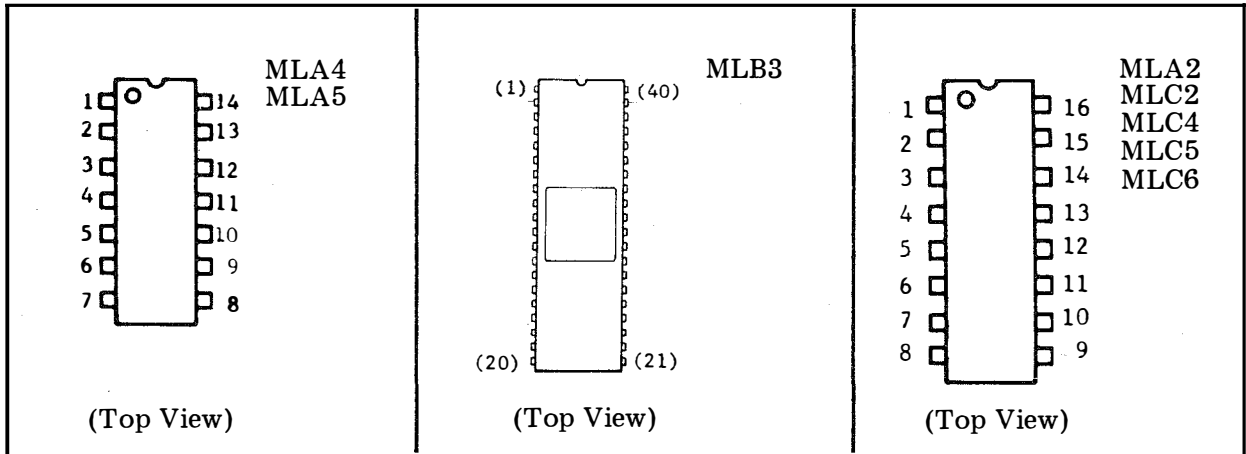
410710 ASSEM. ISS.

410718 SELECTIVE CALLING UNIT CIRCUIT CARD

CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION



410718 ASSEMBLY

A2
C2
C4
C5
C6

CIRCUIT NOTES:

101. VOLTAGE VOLTAGE RANGE

+12V	+10.8 TO +13.2
+5V	+4.5 TO +5.5
-12V	-10.8 TO -13.2

102. INTEGRATED CIRCUIT BATTERY CONNECTIONS:

TYPE	DESIG.	+7.5V	+5V	LOGIC GND.	-12V
TTL	MLA4, A5	14	7		
TTL	MLC4, C5, C6	16	8		
TTL	MLA2, C2	16	8		
MOS	MLB3	1	40	20	21


CIRCUIT NOTES CONT'D:

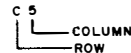
103. SWITCH OPTIONS:

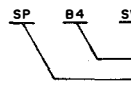
DESIGNATION	FUNCTION	SWITCH STATE (TO ENABLE FUNCTION)
SPA1 (SW1, SW2, SW3, SW4, SW5, SW6, SW7)	LEVEL 1	
	FIRST ANSWERBACK CHARACTER	OFF = MARK ON = SPACE
SPC1 (SW1, SW2, SW3, SW4, SW5, SW6, SW7)	LEVEL 1	
	SECOND ANSWERBACK CHARACTER	OFF = MARK ON = SPACE
SPB2 (SW1, SW2)	GROUP ANSWERBACK BROADCAST ANSWERBACK	ON ON
	SPEED SELECT	ON = 300 BAUD OFF = 110 BAUD
SW4	ANSWERBACK - SELECT	ON = FIRST AND SECOND ANSWERBACK CHARACTER PROGRAMMED (POSITIVE REPLY) FIRST ANSWERBACK CHARACTER PROGRAMMED PLUS DELETE (NEGATIVE REPLY) OFF = FIRST ANSWERBACK CHARACTER PROGRAMMED PLUS ACK (POSITIVE REPLY) FIRST ANSWERBACK CHARACTER PROGRAMMED PLUS NAK (NEGATIVE REPLY)

410718 SELECTIVE CALLING UNIT

INFORMATION NOTES:


- 201. ALL RESISTORS 1/4 WATT AND RESISTANCE IN OHMS UNLESS SPECIFIED.
- 202. ALL CAPACITOR VALUES IN MICROFARADS UNLESS SPECIFIED.
- 203. → INDICATES MALE TERMINAL.
- 204. LOGIC DESIGNATION:


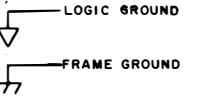
NUMBER INDICATES PACKAGE PIN
CODE INDICATES LOCATION ON CIRCUIT CARD
- 205. POSITIVE LOGIC SYMBOLS ARE EMPLOYED.
- 206. CROSS REFERENCE DESIGNATION:


C 5 COLUMN
ROW
- 207. SWITCH PACK DESIGNATION:


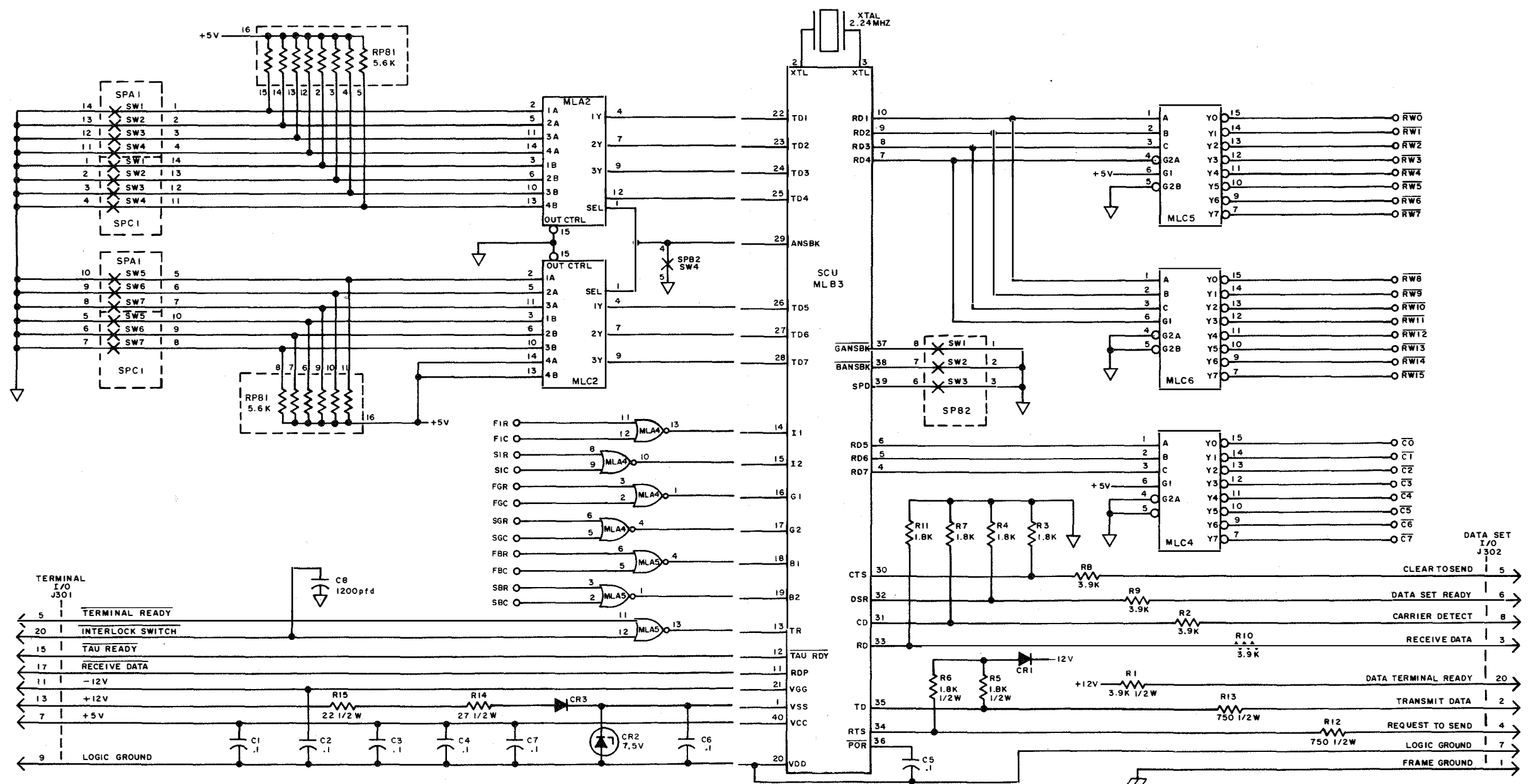
SP SWITCH NUMBER
B4 LOCATION ON CIRCUIT CARD
SW4 SWITCH PACK

INFORMATION NOTES CONT'D.

- 208. RESISTOR PACK DESIGNATION:


RP LOCATION ON CIRCUIT CARD
DS RESISTOR PACK
- 209. GROUND DESIGNATION:


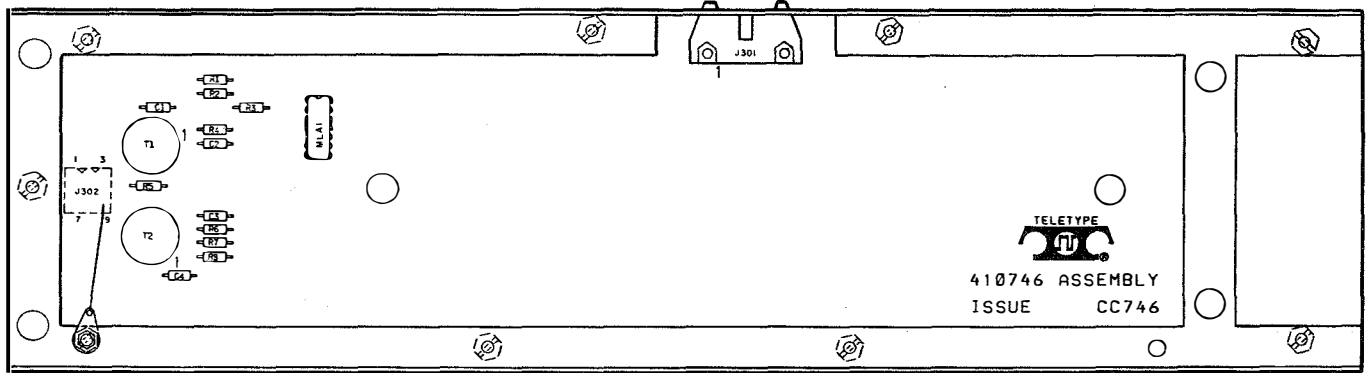
LOGIC GROUND
FRAME GROUND



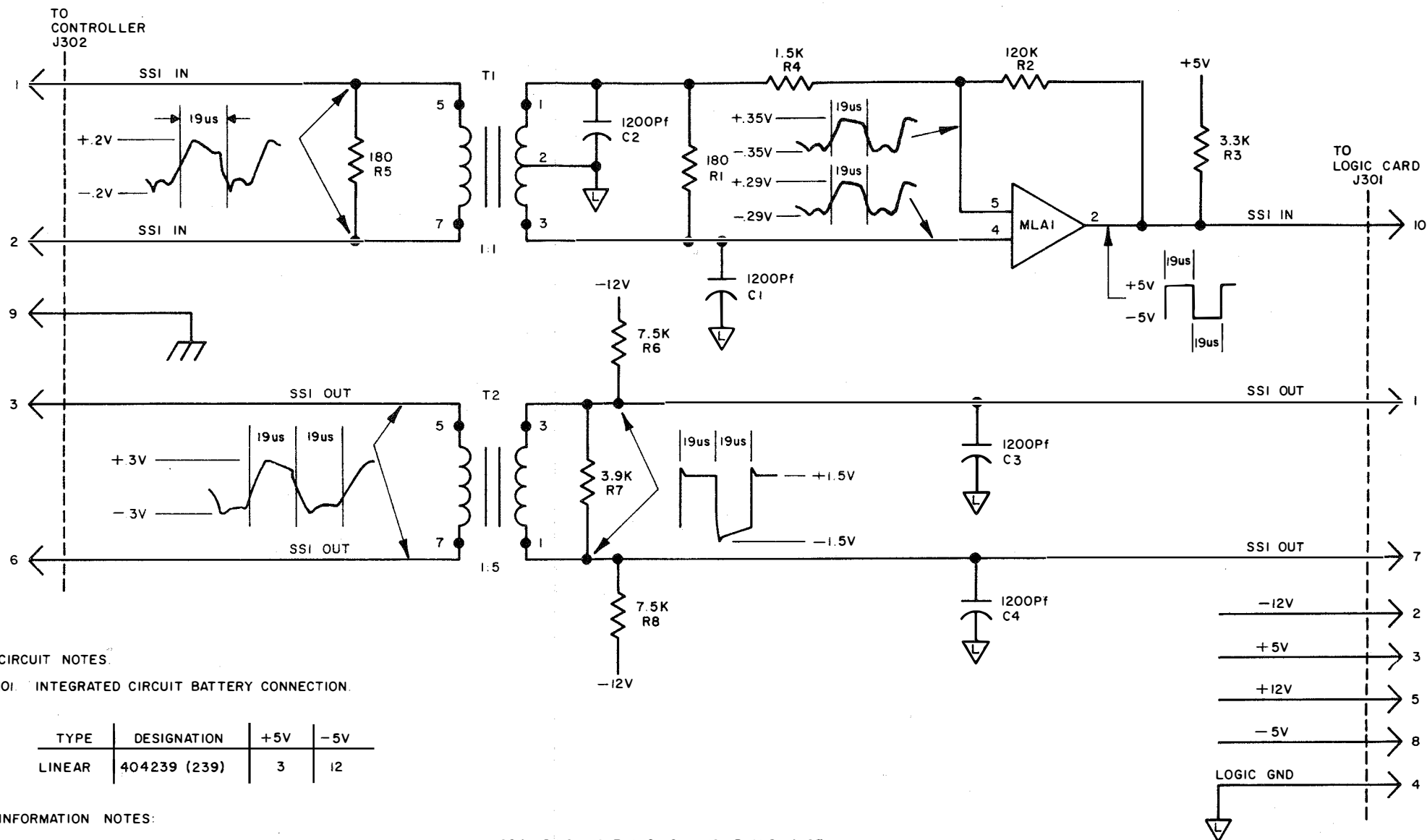
21

410746 SSI INTERFACE CIRCUIT CARD

CIRCUIT CARD COMPONENT LAYOUT



410746 SSI INTERFACE CIRCUIT CARD



CIRCUIT NOTES

101. INTEGRATED CIRCUIT BATTERY CONNECTION.

TYPE	DESIGNATION	+5V	-5V
LINEAR	404239 (239)	3	12

INFORMATION NOTES:

201. ALL RESISTORS 1/4 WATT AND RESISTANCE VALUE IN OHMS, UNLESS SPECIFIED.

202. → INDICATES MALE TERMINAL

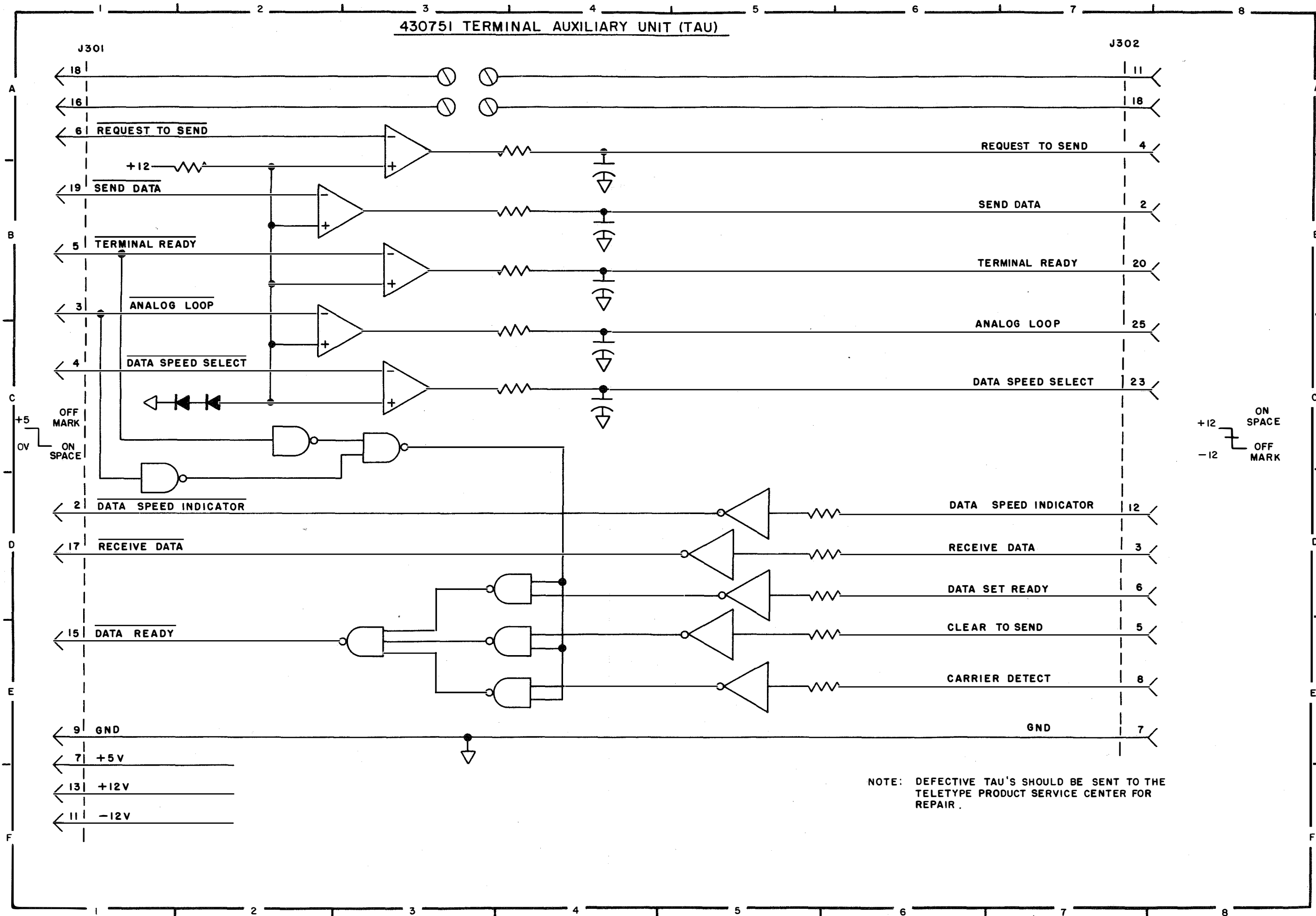
203. GROUND DESIGNATION

⏏ LOGIC GROUND (+5V, -5V, -12V RETURNS)

⏏ CHASIS GROUND

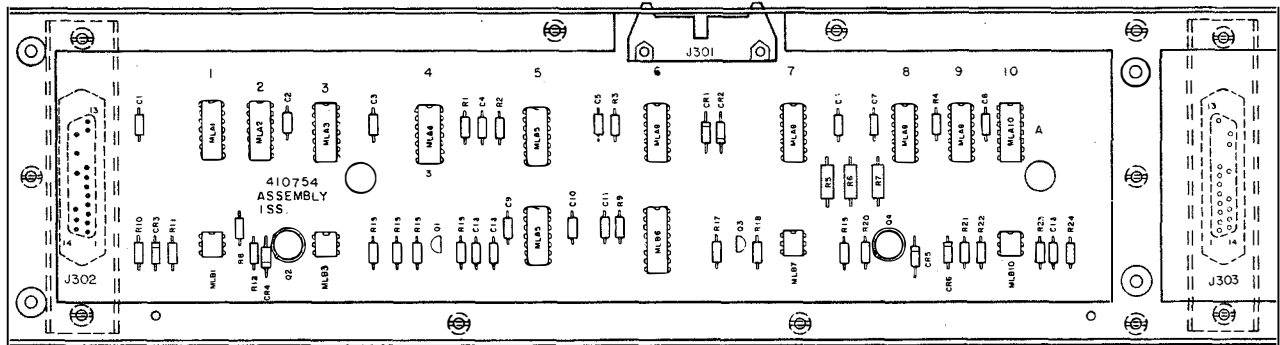
204. PINS 1, 6, 7, 8, 9, 10, 11, 12, 13 AND 14 OF MLAI ARE ALL CONNECTED TOGETHER ON ISSUE 3A.

430751 TERMINAL AUXILIARY UNIT - TAU

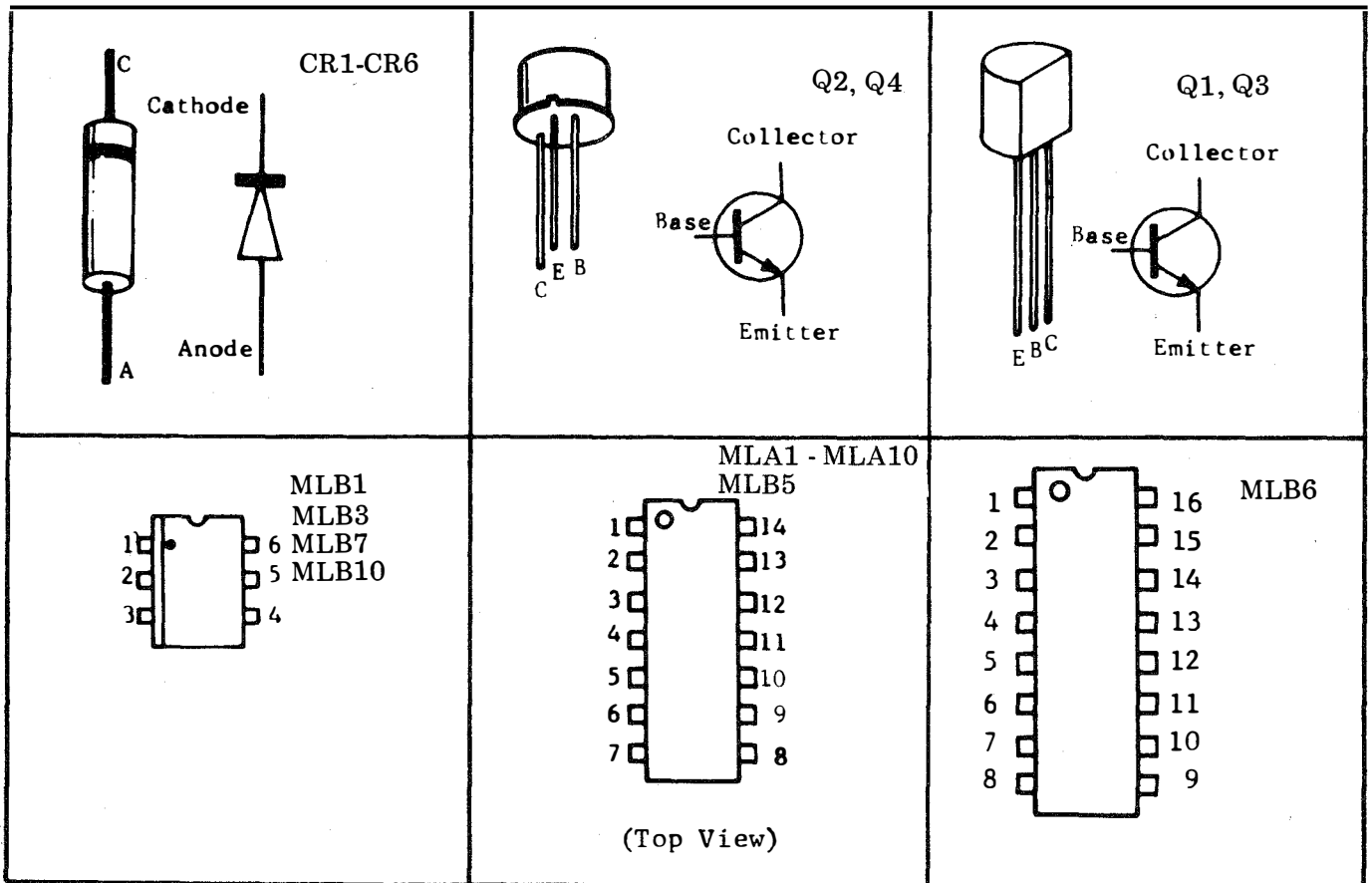


410754 TERMINAL AUXILIARY UNIT - TAU2

CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION



CIRCUIT NOTES:



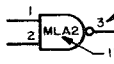

101. VOLTAGE RANGE

+12V	+10.8 TO 13.2
+5V	+4.5 TO 5.5
-12V	-10.8 TO 13.2

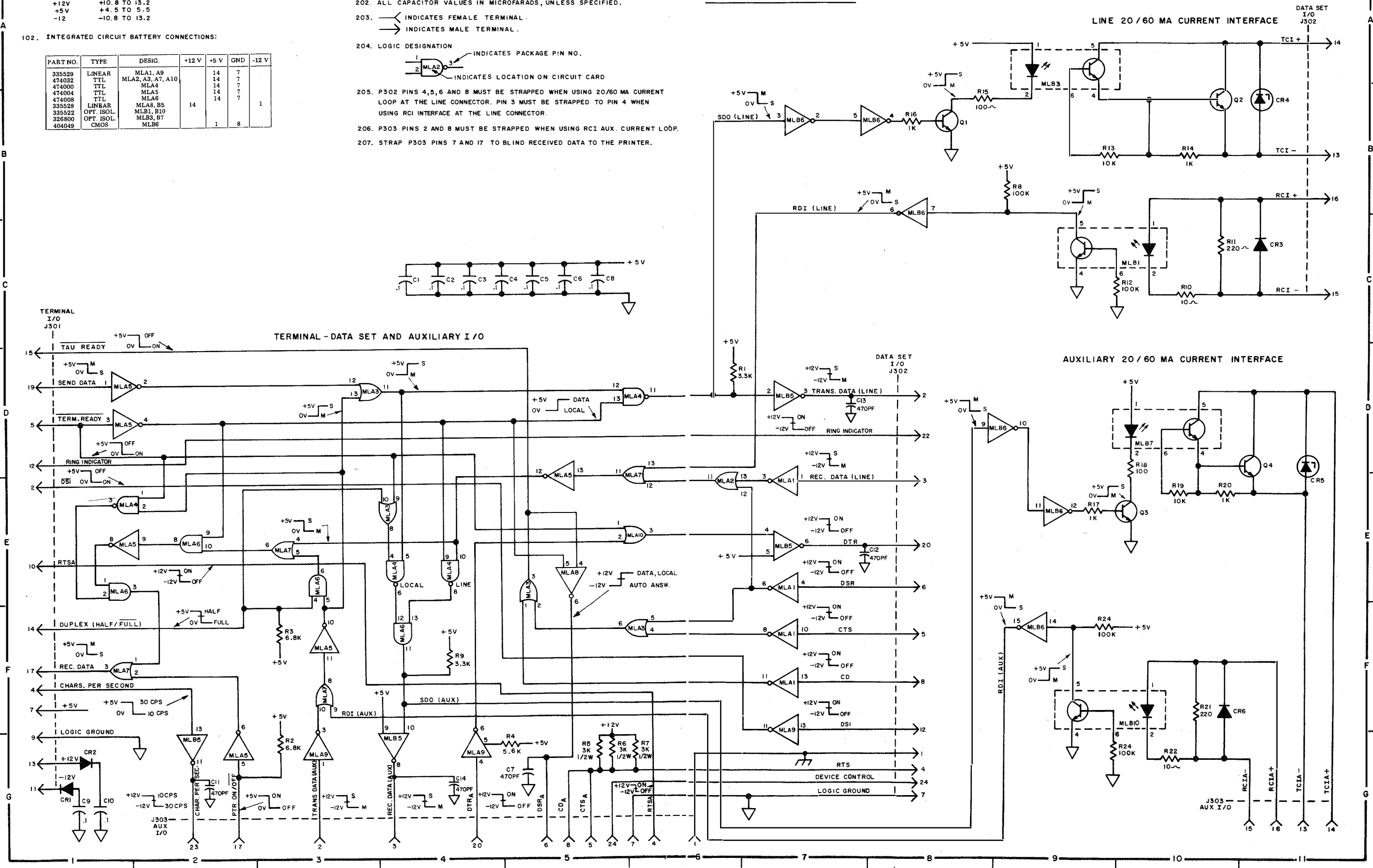
102. INTEGRATED CIRCUIT BATTERY CONNECTIONS:

PART NO.	TYPE	DESIG.	+12 V	+5 V	GND	-12 V
385529	LINEAR	MLA1, A9	14	7		
474032	TTL	MLA2, A3, A7, A10	14	7		
474000	TTL	MLA4	14	7		
474004	TTL	MLA5	14	7		
474008	TTL	MLA6	14	7		
385528	LINEAR	MLA8, B5	14	7		
335522	OPT. ISOL.	MLB1, B10				1
326800	OPT. ISOL.	MLB3, B7				1
404049	CMOS	MLB6	1	8		

INFORMATION NOTES:

- 201. ALL RESISTORS 1/4 WATT AND RESISTANCE VALUE IN OHMS, UNLESS SPECIFIED.
- 202. ALL CAPACITOR VALUES IN MICROFARADS, UNLESS SPECIFIED.
- 203.  INDICATES FEMALE TERMINAL.
- 203.  INDICATES MALE TERMINAL.
- 204. LOGIC DESIGNATION  INDICATES PACKAGE PIN NO.
- 204.  INDICATES LOCATION ON CIRCUIT CARD
- 205. P302 PINS 4,5,6 AND 8 MUST BE STRAPPED WHEN USING 20/60 MA CURRENT LOOP AT THE LINE CONNECTOR. PIN 3 MUST BE STRAPPED TO PIN 4 WHEN USING RCI INTERFACE AT THE LINE CONNECTOR.
- 206. P303 PINS 2 AND 8 MUST BE STRAPPED WHEN USING RCI AUX. CURRENT LOOP.
- 207. STRAP P303 PINS 7 AND 17 TO BLIND RECEIVED DATA TO THE PRINTER.

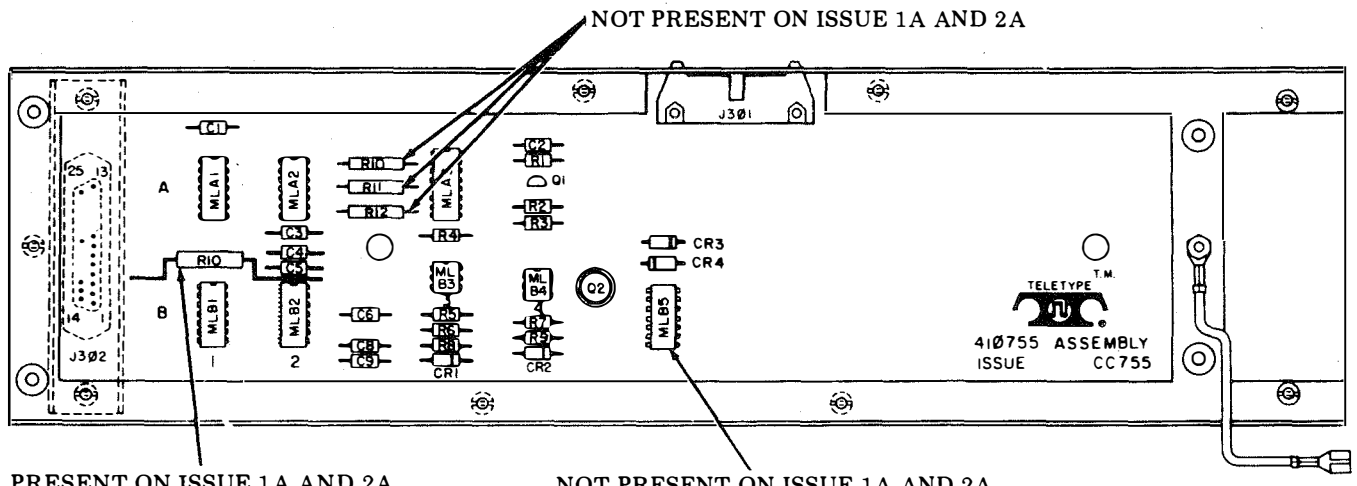
**410754 TERMINAL
AUXILIARY UNIT TAU-2**



LB6

410755 TERMINAL AUXILIARY UNIT - TAU1

CIRCUIT CARD COMPONENT LAYOUT



PRESENT ON ISSUE 1A AND 2A

NOT PRESENT ON ISSUE 1A AND 2A

COMPONENT IDENTIFICATION AND LEAD DESIGNATION

<p>CR1-CR4</p>	<p>Q2</p>	<p>Q1</p>
<p>MLB3 MLB4</p>	<p>MLA1 MLA2 MLB1 MLB2 MLB5</p> <p>(Top View)</p>	<p>MLA3</p>

410755 TERMINAL
AUXILIARY UNIT TAU-1
ISSUE 1A, 2A, & 3A

CIRCUIT NOTES

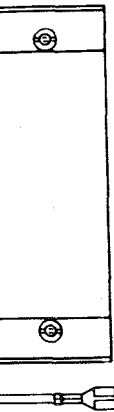
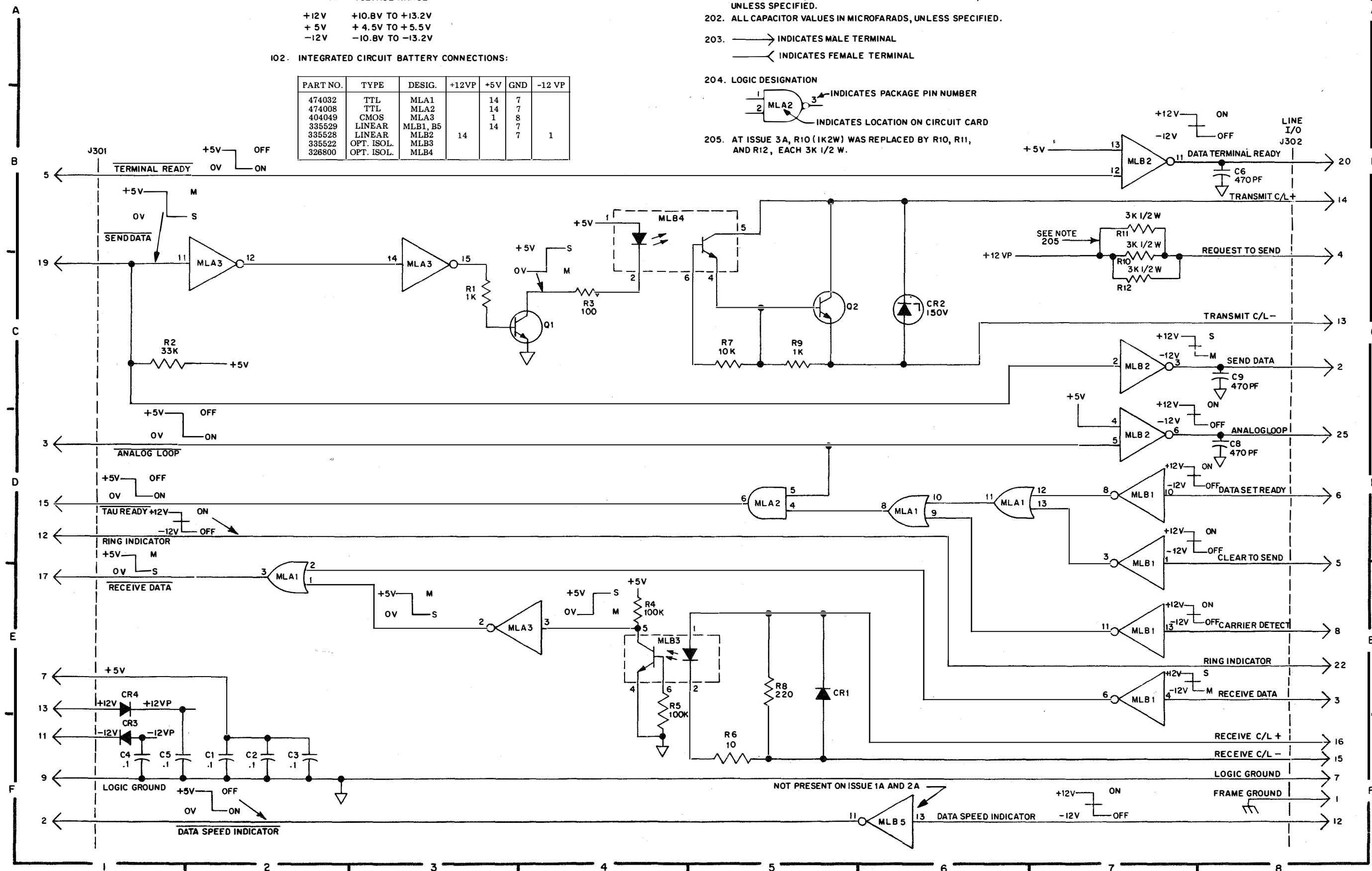
101. VOLTAGE VOLTAGE RANGE
 +12V +10.8V TO +13.2V
 +5V +4.5V TO +5.5V
 -12V -10.8V TO -13.2V

102. INTEGRATED CIRCUIT BATTERY CONNECTIONS:

PART NO.	TYPE	DESIG.	+12VP	+5V	GND	-12 VP
474032	TTL	MLA1		14	7	
474008	TTL	MLA2		14	7	
404049	CMOS	MLA3		1	8	
335529	LINEAR	MLB1, B5	14	14	7	
335528	LINEAR	MLB2				1
335522	OPT. ISOL.	MLB3				
326800	OPT. ISOL.	MLB4				

INFORMATION NOTES:

201. ALL RESISTORS 1/4 WATT AND RESISTOR VALUE IN OHMS, UNLESS SPECIFIED.
 202. ALL CAPACITOR VALUES IN MICROFARADS, UNLESS SPECIFIED.
 203. ———> INDICATES MALE TERMINAL
 <———— INDICATES FEMALE TERMINAL
 204. LOGIC DESIGNATION
 1 3
 2 MLA2 ———> INDICATES PACKAGE PIN NUMBER
 ———> INDICATES LOCATION ON CIRCUIT CARD
 205. AT ISSUE 3A, R10 (1K2W) WAS REPLACED BY R10, R11, AND R12, EACH 3K 1/2 W.



MLA3

NOT PRESENT ON ISSUE 1A AND 2A



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