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TECHNICAL MANUAL

for

SIDEBAND EXCITER

MODEL CMRA-4



THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, N. Y.

OTTAWA, CANADA

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SIDEBAND EXCITER CMRA-4

1. INTRODUCTION

TMC Model CMRA-4 Sideband Exciter includes all circuitry of Model CMRA-1 except alarm circuitry, it includes an automated keying MODE switch (S1005) to permit a choice of keying sources. Both terminal board TB1002 and relay K1002 (formerly used to trigger an external alarm and/or indicator in the presence of audio input) are now modified, rewired, and relabelled for use with the MODE switch. Alarm circuitry has been deleted in the CMRA-4.

2. TB1002

Terminal board TB1002 is mounted on the lower rear panel of the CMRA-4. TB1002 is an 18-terminal barrier-type strip; however, connections are made only to terminals 3 thru 10, inclusive. The remaining terminals are not connected. TB1002 terminal connections (via the front-panel MODE switch) are outlined in Table 1. When the CMRA-4 is used with a suitable external translator (such as TMC Model CHGR-4) having external keying inputs, the external translator will key with the CMRA-4, by means of an inter-connecting cable between appropriate terminals of TB1002 and the translator itself.

3. K1002

Relay K1002 is mounted within the main chassis of the CMRA-4, and operates in conjunction with MODE switch S1005 and Logic card Z1002. K1002 is energized via a ground supplied by the Logic card, in presence of suitable audio input to the CMR. K1002 closure causes TB1002 terminal 8 to be grounded, when MODE switch S1005 is in the VOX position. External equipment, therefore, will key with K1002 as noted in (2) above.

4. S1005

Automated MODE switch S1005 provides the various enables and disables of, and inter-connects between, the appropriate terminals of TB1002, such that proper mode switching and keying occurs in both CMRA-4 and associated external equipment. Table 2 shows the various TB1002 switching functions that occur in each position of S1005. Note that Table 1 treats the interconnects in terms of individual TB1002 terminals, whereas Table 2 approaches the TB1002 terminal functions in terms of S1005 position.

Figure 1 is a simplified schematic diagram depicting MODE switch connections to TB1002, and also depicting TB1002 connections to an external frequency translator (in the case of Figure 1, TMC Model CHGR-4).

5. CMRA-4 Ledex Operation. Refer to Figure 2.

Remote operation of the Carrier Suppression and Mode selector switches consists of two steps. First, remotely positioning a master step switch so that control may be directed to the switch's associated Ledex motor. Second, supplying an externally controlled ground through the Ledex Motor's notch homing wafer to determine the position that the switch will stop.

If control were to be directed to the Mode selector switch to place it into the CW position, the external master step switches would initially be positioned as shown in figure 2. An externally supplied ground would then be applied to pin "J" of J1015. The ground is routed through the Mode selector notch homing wafer (S1006) and the prepositioned master step switches to the Mode Ledex motor. The motor will rotate until the notch on the Mode selector notch homing wafer removes the ground, de-energizing the motor.

To remotely place the Carrier Suppression switch in the CW position, control would initially have to be directed to the Carrier Suppression Ledex motor. An external ground at pin "J" of J1015 would be routed through the Carrier Suppression switch (S1003) and the external master step switches to the Carrier Suppression Ledex.

Figure 2 supplies basic functioning of the automated circuits. Refer to CK 1640 for more detailed information.

TB1002 Term.

FUNCTION

3	ground
4	to external PTT contacts (connect to term 3 for keying)
5	internally connected to term. 6 in PTT, VOX, and NORM positions of MODE switch for external equipment keying (eg. CHG()-4)
6	internally connected to term. 5 in PTT, VOX, and NORM positions of MODE switch; in CW position of MODE, routed thru a blocking diode to term. 9 for eventual ground thru external CW hand key.
7	internally connected to term. 8 in CW position of MODE switch; also routed thru a blocking diode to term. 9 (CW) in all modes, for eventual ground thru a CW hand key.
8	CW pos: internally connected directly to term. 7; also connected to term. 9 (CW) thru blocking diode. PTT pos: connected directly to term. 4 (PTT) via MODE switch. VOX pos: routed to arm of VOX relay K1002; grounded upon VOX actuation. NORM pos: routed directly to ground, for direct actuation of external equipment.
9	t $\bar{0}$ external CW hand key (short to term. 10 for keying).
10	ground.

Table 1. TB1002 TERMINAL CONNECTIONS

<u>S1005 pos.</u>	<u>terminal</u>	Connected to	<u>terminal</u>	
CW	3	ground.		
	4	open.		
	5	open.		
	6	9, thru blocking diode.		
	7	9, thru blocking diode.*		
	8	7, directly; therefore, to 9, thru diode.		
	9	6, 7, as above.		
	10	ground.		
	*isolated from term. 6 by diode.			
	PTT	3	ground.	
4		8, directly		
5		6, directly.		
6		5, directly.		
7		9, thru blocking diode.		
8		4, directly		
9		7, thru blocking diode.		
10		ground.		
VOX		3	ground.	
		4	open.	
	5	6, directly.		
	6	5, directly		
	7	9, thru blocking diode.		
	8	Arm of VOX relay (gnd upon actuation)		
	9	7, thru blocking diode.		
	10	ground.		

Table 2. S1005 FUNCTIONS

Table 2. S1005 FUNCTIONS (Cont'd)

<u>S1005 pos.</u>	<u>TB1002</u>	
	<u>terminal</u>	Connected to <u>terminal</u>
NORM	3	ground.
	4	open
	5	6, directly.
	6	5, directly.
	7	9, thru blocking diode.
	8	ground, directly.
	9	7, thru blocking diode.
	10	ground.

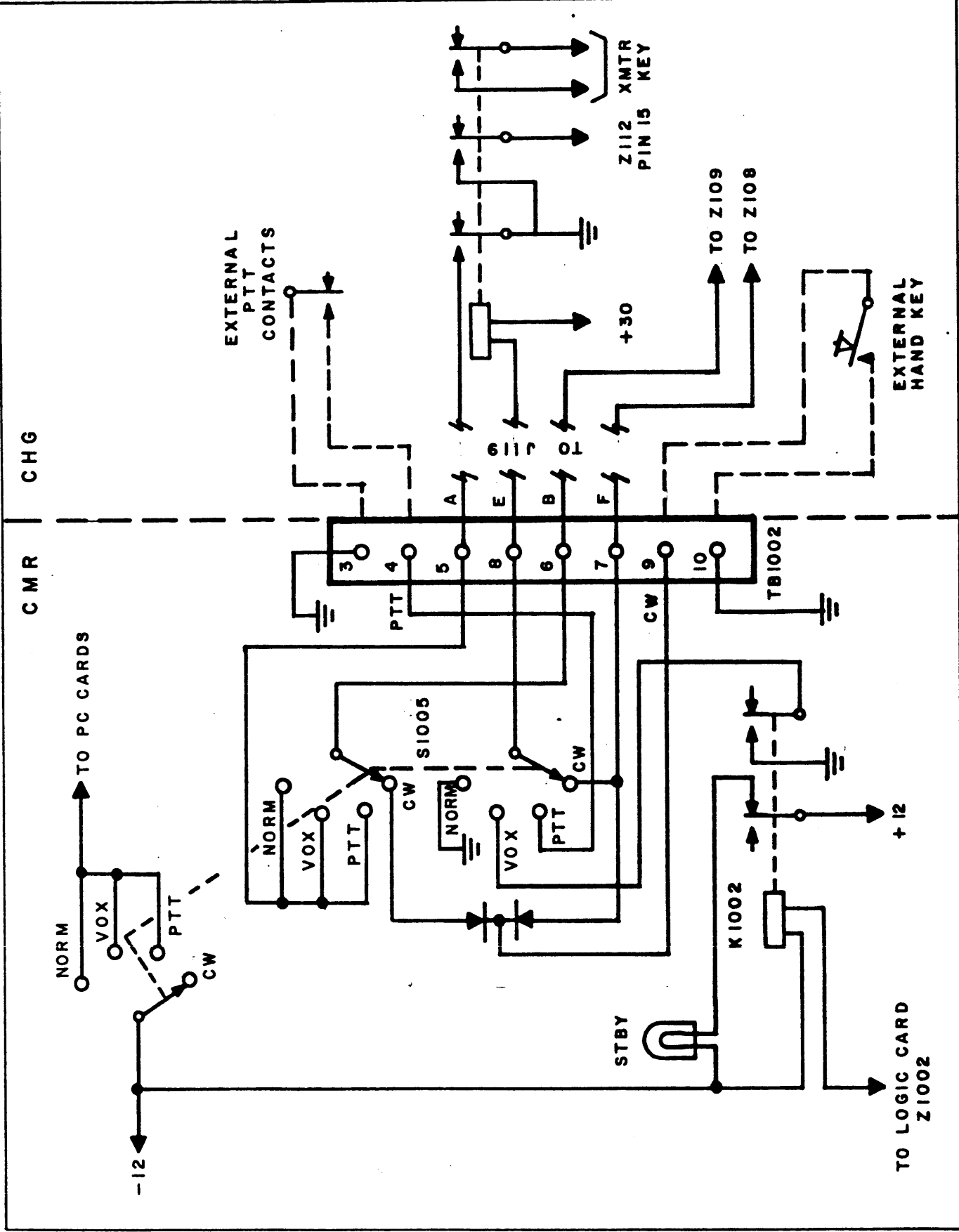
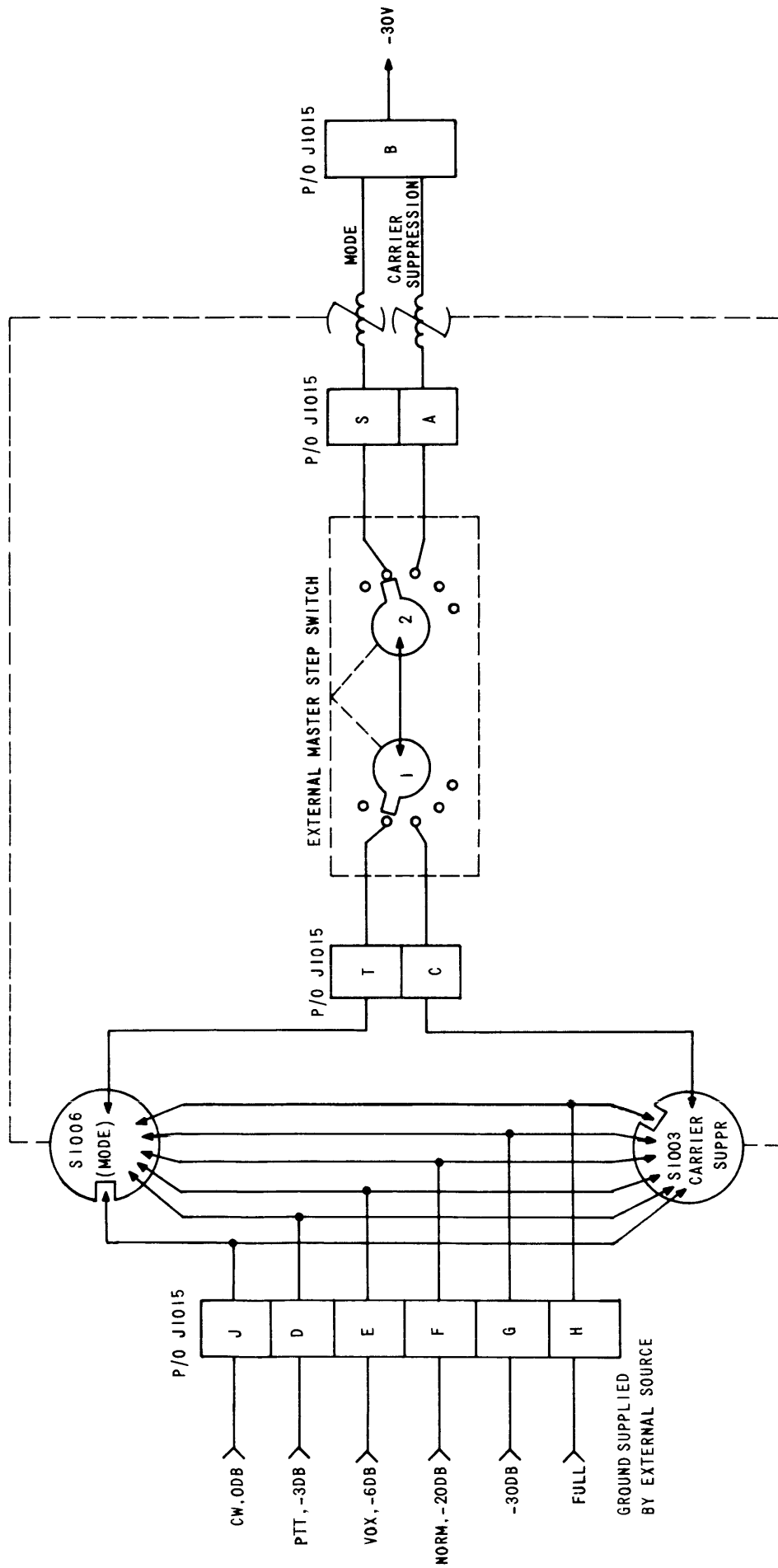


FIGURE 1 SIMPLIFIED SCHEMATIC, CMR 4 MODE SWITCH CONNECTIONS



SIMPLIFIED, REMOTE LEDEX CONTROL, CMRA-4
(SHOWN IN CW MODE)

FIGURE 2

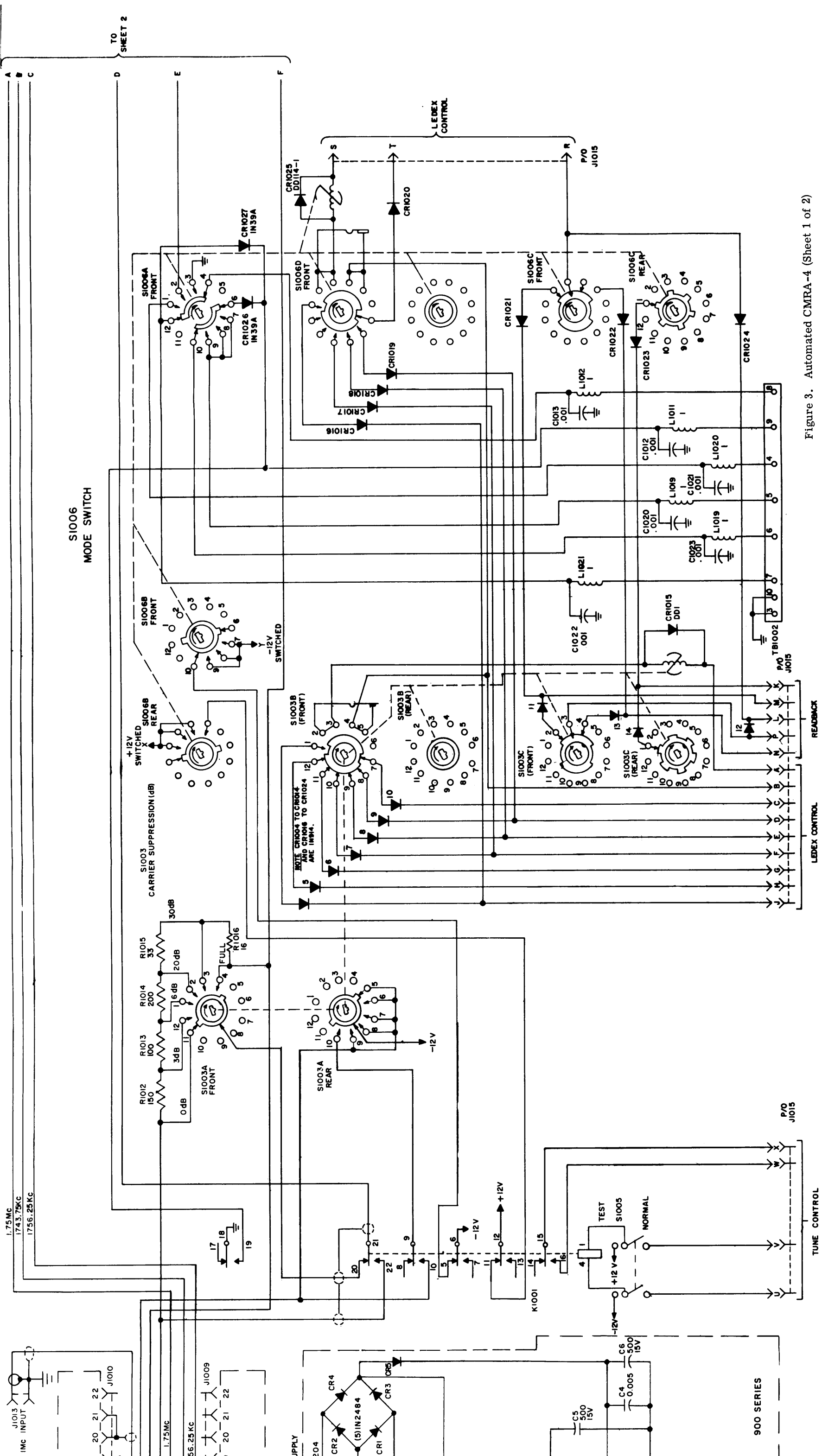
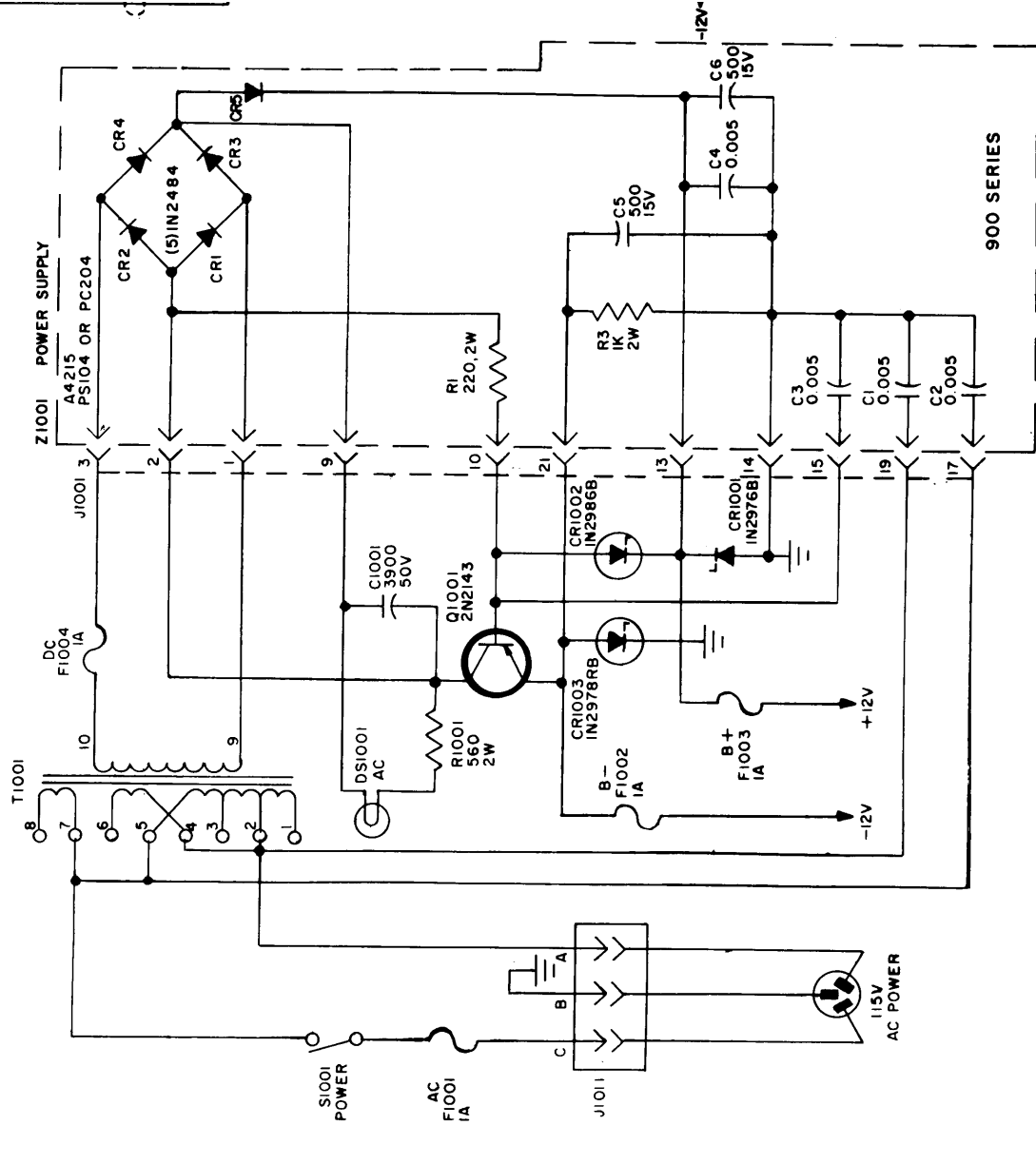
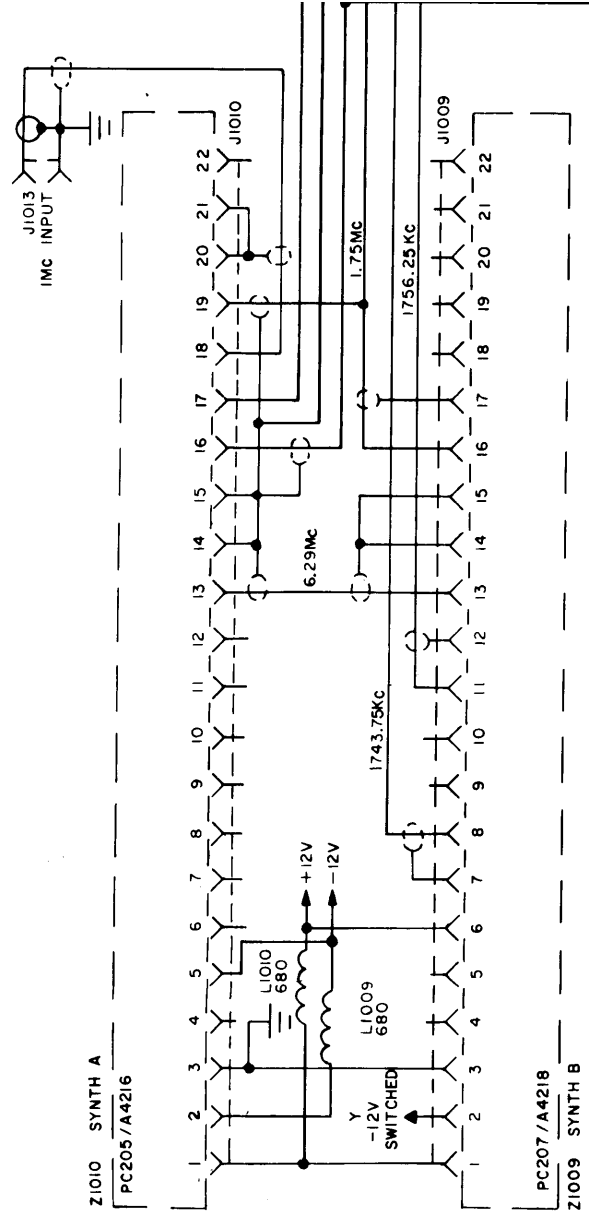
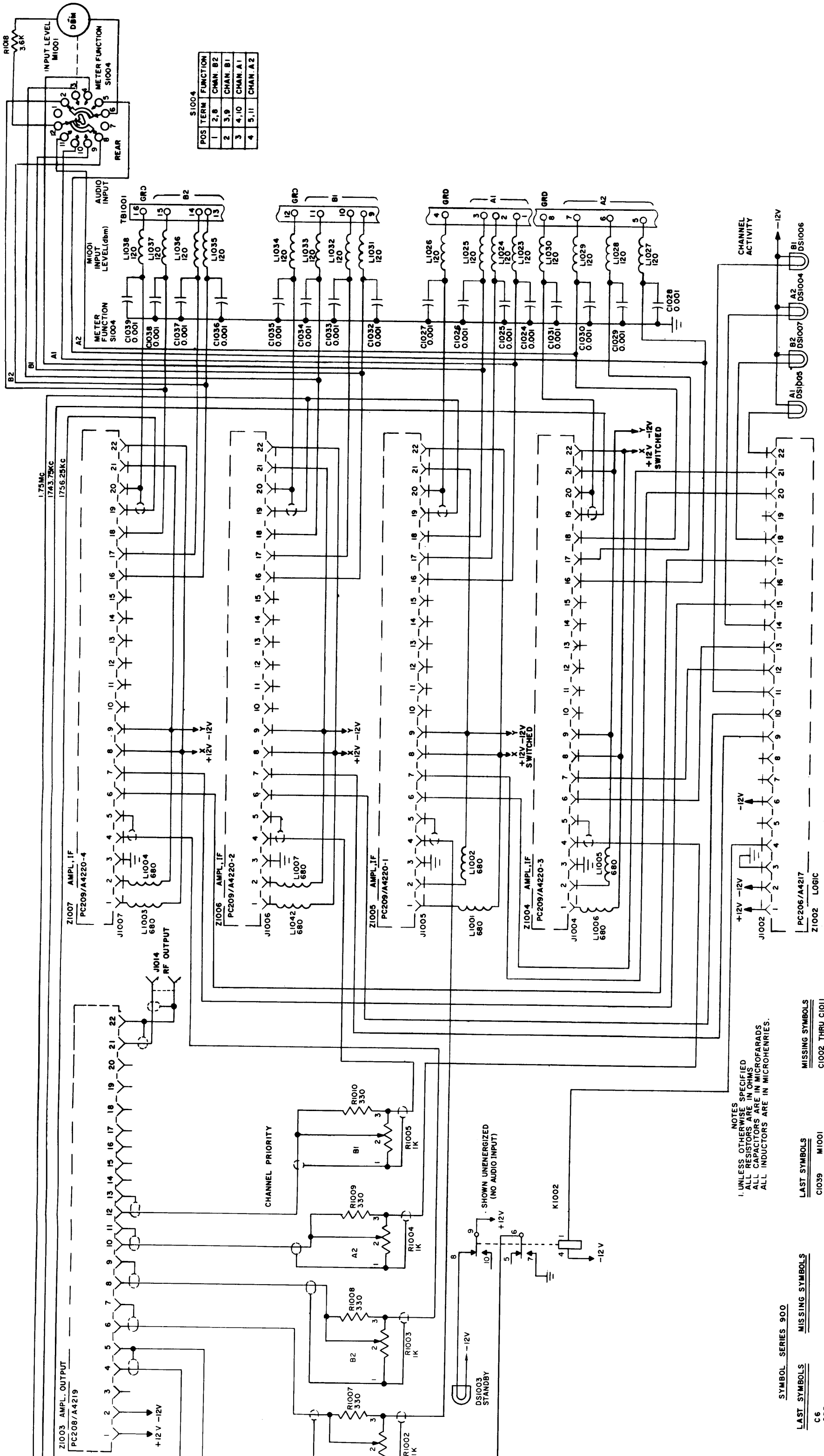


Figure 3. Automated CMRA-4 (Sheet 1 of 2)

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CK-1640



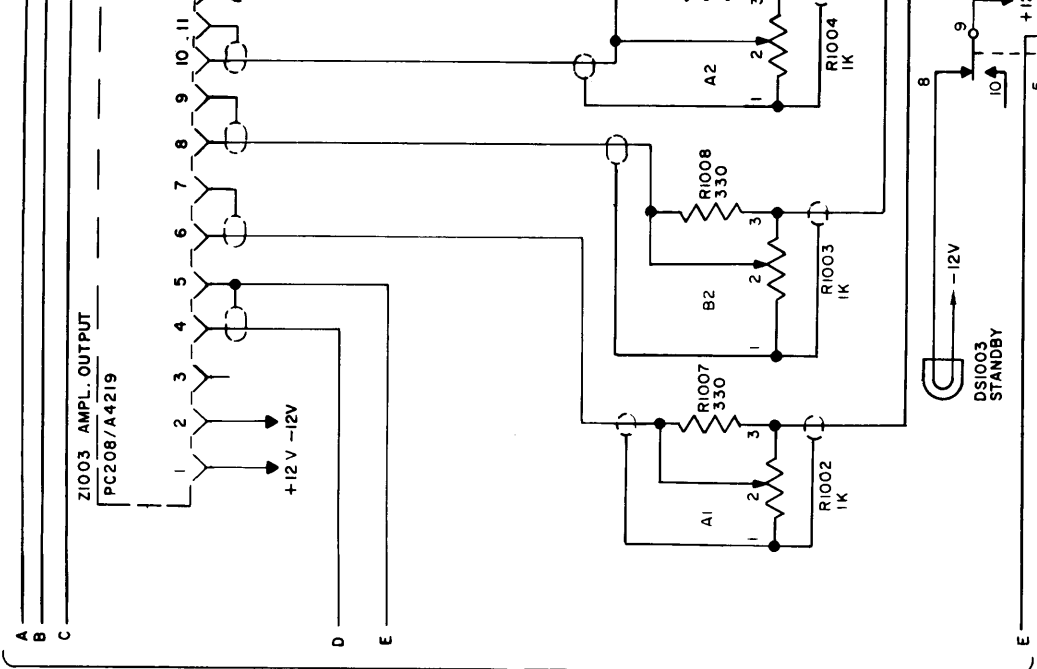
POS	TERM	FUNCTION
1	2,8	CHAN. B2
2	3,9	CHAN. B1
3	4,10	CHAN. A1
4	5,11	CHAN. A2

NOTES
 1. UNLESS OTHERWISE SPECIFIED
 ALL RESISTORS ARE IN OHMS
 ALL CAPACITORS ARE IN MICROFARADS
 ALL INDUCTORS ARE IN MICROHENRIES.

SYMBOL	SERIES	900
LAST SYMBOLS	C6	
	CR5	
	R3	
	R2	
MISSING SYMBOLS		
LAST SYMBOLS	M1001	
	C1039	
	Q1001	
	DS1007	
	F1004	
	S1005	
	J1015	
	T1001	
	K1003	
	L1042	
MISSING SYMBOLS		
	C1002 THRU C1011	
	C1014 THRU C1019	
	DS1002	
	J1008, J1012	
	L1008	
	L1013 THRU L1018	
	L1039 THRU L1041	
	R1006, R1011, R1017	
	S1002	
	Z1008	

Figure 3. Automated CMRA-4 (Sheet 2 of 2)

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FROM SHEET 1

SYMBOL SERIES 900	
LAST SYMBOLS	MISSING SYMBOLS
C6	
CR5	
R3	
	R2

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