

DC REMOTE CONTROL BOARD 19C328223GI
(CUSTOM MVP OPTIONS 1942, 1943 & 1947)

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DESCRIPTION

The General Electric Custom MVP Station Options 1942 and 1943 provide Local/DC Remote Control of the station. A DC Remote Control Board is used to interface with a remote control console. The board provides remote single-frequency transmit and Channel Guard monitor functions. Two current levels may be applied to the telephone line at the remote control console: +6 mA and -2.5 mA. These control currents are provided by the General Electric MASTR® Controller or DESKON II. For functions provided by the TCC or DESKON units (6 mA for Channel Guard and 15 mA for transmit control), jumper changes are required on the control board.

The DC Remote Control Board is a printed wire board mounted to a sheet-metal plate. The plate has standoffs and press-in nuts are used to mount the plate to the Power Supply chassis. All connections to the Power Supply and the radio are made through leads hanging from the control board and are terminated with spade lugs. These leads connect to a terminal board mounted on the Power Supply Assembly. Connections to the radio follow two routes:

Through Power Plug

Volume HI
 Volume LO
 RUS

Through MIC Connector

Tx Audio HI
 Tx Audio LO
 CG Monitor
 PTT

Option 1942 provides Local/Remote Control without desk microphone. Option 1943 provides Local/Remote Control with desk microphone. Option 1947 is required for modifying the radio in remote applications.

Table 1 - Control Current and Function

FUNCTION	Control Current in Milliamperes		
	-2.5	+6	0
1 Freq. Transmit			
1 Freq. Receive		Transmit	Receive
1 Freq. Transmit			
1 Freq. Receive			
CG Monitor	Receive with CG Disable	Transmit	Receive with CG

TELEPHONE LINE CHARACTERISTICS

The key link in a remote control installation is the telephone pair between the Controller and the base station. To obtain the most satisfactory service over this link, some general knowledge of the capabilities of such lines is required.

A telephone pair is simply a pair of wires, normally ranging from AWG #19 to AWG #26 in size. These wires, furnished by the local telephone company, pass through overhead cables, underground cables, through junction points, and switchboards. To the user, however, they may be considered a simple pair of wires. Equipment that is designed to operate with such a pair should have nominal impedance of 600 ohms. A telephone pair will normally have a maximum length of about 12 miles before amplification is added by the telephone company to make up for line losses. There is an inherent loss in any telephone line installation due to the series inductance and resistance and the shunt capacitance of the wires.

This loss is a direct function of the length of the line, and varies with the wire size used. As an example, with AWG #19 wire, a distance of six miles may be covered before one-half the input voltage of a 1,000 Hz tone is lost. With AWG #26 wire, only two and one-quarter miles may be covered before one-half the input voltage is lost. Line losses as high as 30 dB can be tolerated in operating a transmitter

from the Remote but such high losses should be avoided whenever possible. Although the telephone pair is fairly well balanced, some noise will be induced into the line, especially if an unshielded run has to be made in a fluorescent-lighted building.

The DC resistance of any telephone pair will affect the control circuits between the Controller and the base station. Current regulators incorporated in the Remote Control minimize these variations after initial adjustment. The Remote operates with a total control line loop resistance as great as 11,000 ohms. There is a possibility, however, that stray currents, due to leakage, noise, faults, earth currents, etc., may cause faulty operation.

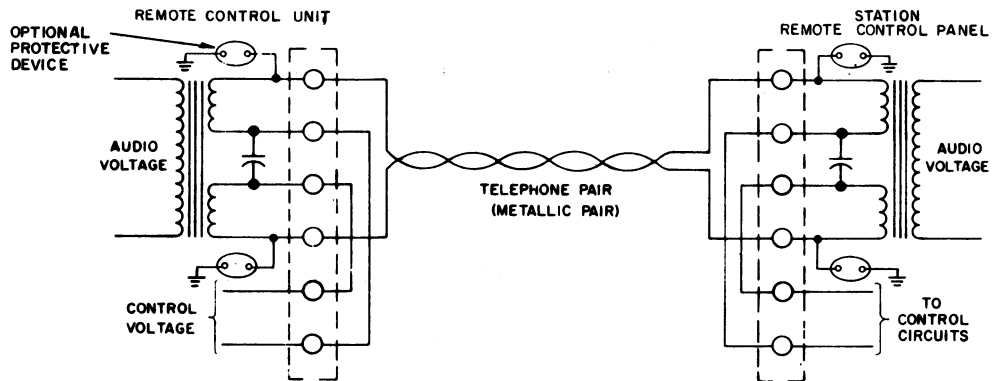
Three types of telephone line connections are commonly used. Before choosing one of these types, consider the cost and performance of each, as one type may be available at a much lower rate. Also, some telephone companies offer no choice. The following chart contains information to assist in selecting the control method and type of telephone line to be used in DC control applications. Refer to Figure 1.

METHOD	DESCRIPTION	ADVANTAGES OR DISADVANTAGES
1	One metallic pair: for both audio and control voltages with control voltage from line to line.	Economical; dependable where earth currents may be large; slight keying clicks will be heard in paralleled Remote Control Units. In most applications, preferred over Method No. 2.
2.	One metallic pair: for both audio and control voltages with control voltages from line to ground.	Economical; earth ground currents may result in interference with control functions; keying click minimized. Good earth to ground required at station and all control points.
3.	Two telephone pairs; one for audio voltage and one for control voltage (metallic pair).	Provides best performance; keying clicks will not be heard. Requires 2 pair.

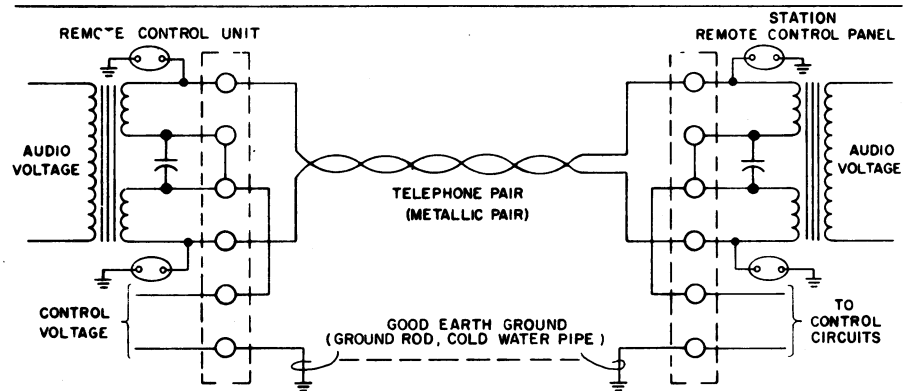
TELEPHONE LINE CONNECTIONS

The station is normally shipped with jumpers connected on the Remote Control Board as described in Method 1. If Method 2 or 3 is to be used, connect the jumpers as shown in the following chart.

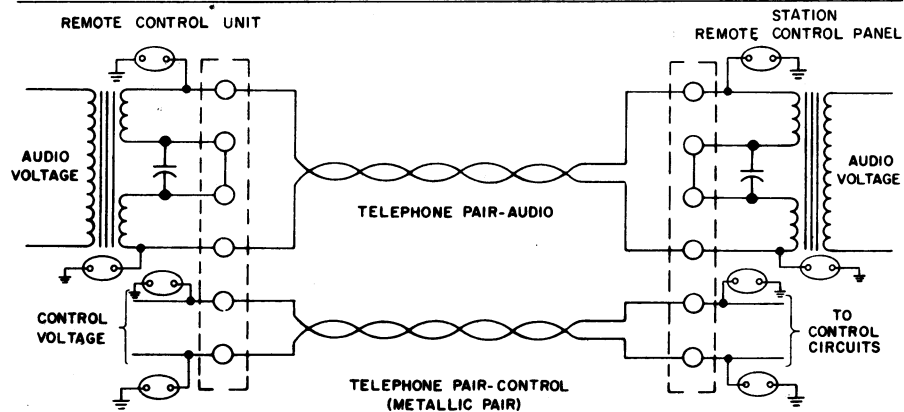
CONTROL METHOD	TELEPHONE LINE CONNECTIONS	JUMPER CONNECTIONS
1	Connect telephone lines to TB1-4 and -5.	
2	Connect telephone lines to TB1-4 and -5. Connect <u>good earth ground</u> to TB1-1.	
3	Connect audio telephone lines to TB1-4 and -5 and control lines to TB1-1 and -2.	See Notes 1 and 2 on Schematic Diagram



METHOD 1 - SINGLE TELEPHONE PAIR WITH CONTROL
LINE TO LINE



METHOD 2 - SINGLE TELEPHONE PAIR WITH CONTROL
BETWEEN CENTER TAP AND GROUND



METHOD 3 - SEPARATE CONTROL AND AUDIO PAIRS

RC-2556B

Figure 1 - Telephone Line Connections

Proper Grounding Practices (Method 2)

The telephone company specifies that their customer's equipment signal ground should be made using the proper connection to a ground electrode such as a metallic cold water pipe. The ground connection should be made with a single No. 14 AWG or larger copper conductor. The conductor should be short, straight and a continuous piece of wire. Attention should be given to providing the lowest possible resistance at the connection at each end of the ground wire.

When option line surge protection devices are provided in the customer equipment, it is imperative that the good earth ground be used. If the telephone company also provides protective devices, the customer provided device earth ground connections should be located close to the telephone company earth ground connections but should not use the same ground clamp that the telephone company uses.

If a good earth ground as described above cannot be obtained, Method 2 should not be used. Also, the addition of surge protective devices are of little value without the proper earth ground.

REMOTE CONTROL ADJUSTMENTS

When the station is equipped with a DC Remote Control board, REMOTE TX MOD LEVEL and REC LINE LEVEL controls must be adjusted before placing the station in operation.

A. REMOTE TX MOD LEVEL

1. Feed a 1000 Hertz tone at the required level into a microphone jack on the remote control console. Adjust the remote control console line output control for 2.7 Volts RMS as measured across the audio pair at the remote control console.
2. Key the station transmitter from the remote control console and adjust the REMOTE TX MOD LEVEL Control R34 on the DC Remote Control Board for 4.5 kHz system deviation as measured at the station transmitter.

B. REC LINE LEVEL

1. Connect a signal generator to the station receiver. Adjust the generator to the receiver frequency, modulated at 3 kHz

deviation by a 1000 Hertz tone. Disable Channel Guard if present.

2. Adjust the REC LINE LEVEL control R24 on the DC Remote Control Board for a reading of 2.7 Volts RMS as measured at the station audio pairs (TB1-4 and -5).

CIRCUIT ANALYSIS

Single Frequency Transmit and Receive

The DC Remote Control Board contains two optocouplers (Q11 and Q12) used for current control and line isolation. Each coupler contains a Light Emitting Diode (LED) serving as a light source and a light-sensitive phototransistor serving as a light detector. The light source and detector are both housed in a single package, sealed from outside light. When a DC current of the correct polarity to forward bias the LED is applied to the input of the optocoupler, the LED conducts and emits light. This light is detected by the phototransistor, turning it on and coupling the input signal to the output of the optocoupler.

When zero current is present on the control pair, the LED in Q11 and Q12 is turned off. The phototransistor is not conducting, holding Q14 off. This is the receive mode of the control circuit. Applying +6 mA to the control pair will result in the voltage at the base of Q8 being clamped to 6 VDC. The voltage at the emitter of Q8 rises to 0.6 VDC above the base and the transistor is turned off, allowing the LED in Q11 to conduct. The phototransistor detects the light and turns on. The high at the emitter of the phototransistor turns on Q14-C. Conduction of Q14-C turns on emitter-follower Q14-D which, in turn, operates Q10. Conduction of Q10 applies ground to the PTT terminal TB1901-8 on the Power Supply to key the station transmitter.

Audio Control

Audio circuits provided on the Remote Control Board include a high-pass filter, audio amplifier, a de-emphasis network and a line driver for feeding the receive audio to the telephone lines. A modulation amplifier and level control are provided for controlling the line audio fed to the transmitter modulator. Audio and RUS switches are included for switching the transmit and receive audio paths.

Audio from the station receiver is coupled to audio amplifier AR1 and de-emphasis network C2 and R4. The de-emphasis

network provides a 6 dB/octave rolloff. The signal is coupled to the CG Notch Filter which is composed of Q1, Q2 and associated circuitry. Negative feedback for the Notch Filter is connected from the collector of Q2 to the junction of C7 and R8. The Notch Filter output is applied to a 300 Hz High-Pass Filter consisting of Q3 and Q4. Negative feedback is developed across R16.

The output of the filter is coupled to audio amplifier Q5. The REC LINE LEVEL control R24 is connected in the emitter circuit of Q15 and allows feeding the audio to the line amplifier at the proper level.

The audio is coupled to the LINE AMPLIFIER by means of C14. Q6 and Q7 amplify the signal and pass the audio to the line transformer T1. Q13-A and Q13-B serve as audio switches controlled by the Receiver Unsquenced sensor (RUS) circuit. As long as the RUS switch Q13-E is turned off (receiver squelched), CR1 and CR2 are forward biased, allowing Q13-A and Q13-B to conduct. Conduction of Q13-A and Q13-B grounds the audio path, preventing the received audio from passing to the line. When the receiver is unsquelched the RUS lead goes high. This turns Q13-E on, turning off Q13-A and Q13-B. The audio is now allowed to pass to the line amplifier. VR1 is provided for line surge protection.

Audio from the remote control unit applied to the telephone pair is coupled to the input of the transmit audio amplifier Q13-C. The proper audio level for the transmitter modulator is adjusted by TX MOD LEVEL control R34.

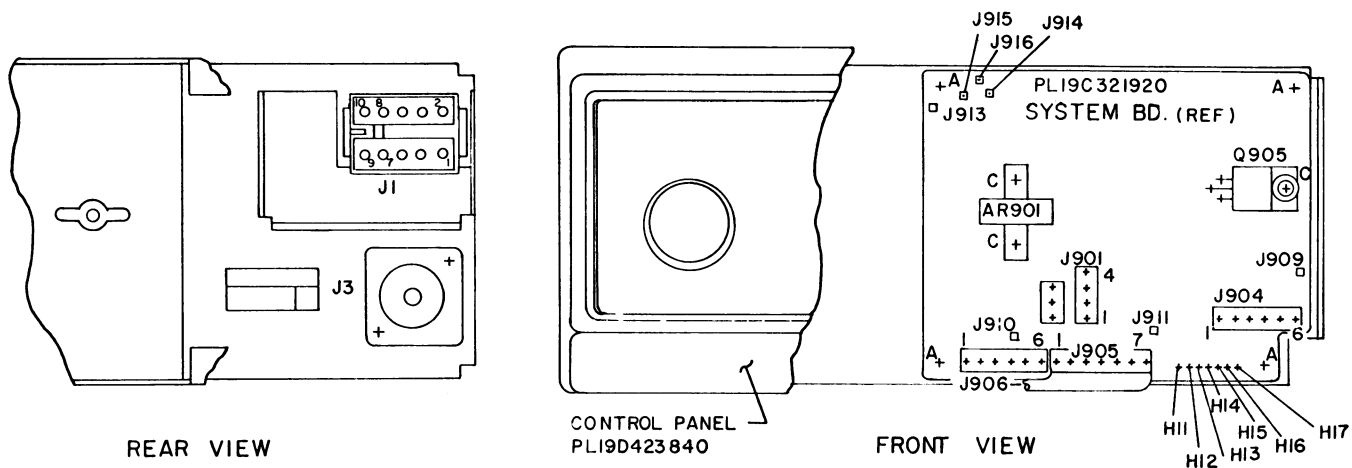
Transistor Q13-D is controlled by the transmit PTT circuit. If Q14-D is conducting (the control circuit in the transmit mode), the base of Q13-D is high, allowing the transmit audio to pass to TB1901-4 (TX AUDIO HI). When Q14-D is turned off (receive mode), Q13-D is held off and prevents the transmit audio from passing to the transmitter modulator.

Channel Guard Monitor

When the Channel Guard disable control current (-2.5 mA) is applied to the control pair, Q8 is allowed to conduct but Q9 is turned off. Thus optocoupler Q12 is operated and optocoupler Q11 is turned off. The high at the emitter of the Q12 phototransistor is connected to the base of Q14-B, turning the transistor on. Conduction of Q14-B operates Q14-E, applying ground to the CG MONITOR lead P1901-1. With Channel Guard disabled, the station receiver now operates only on noise squelch so that all transmissions on the receiver frequency will be heard.

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

GENERAL  ELECTRIC



INSTALLATION INSTRUCTIONS FOR OPTION 1947

RADIO

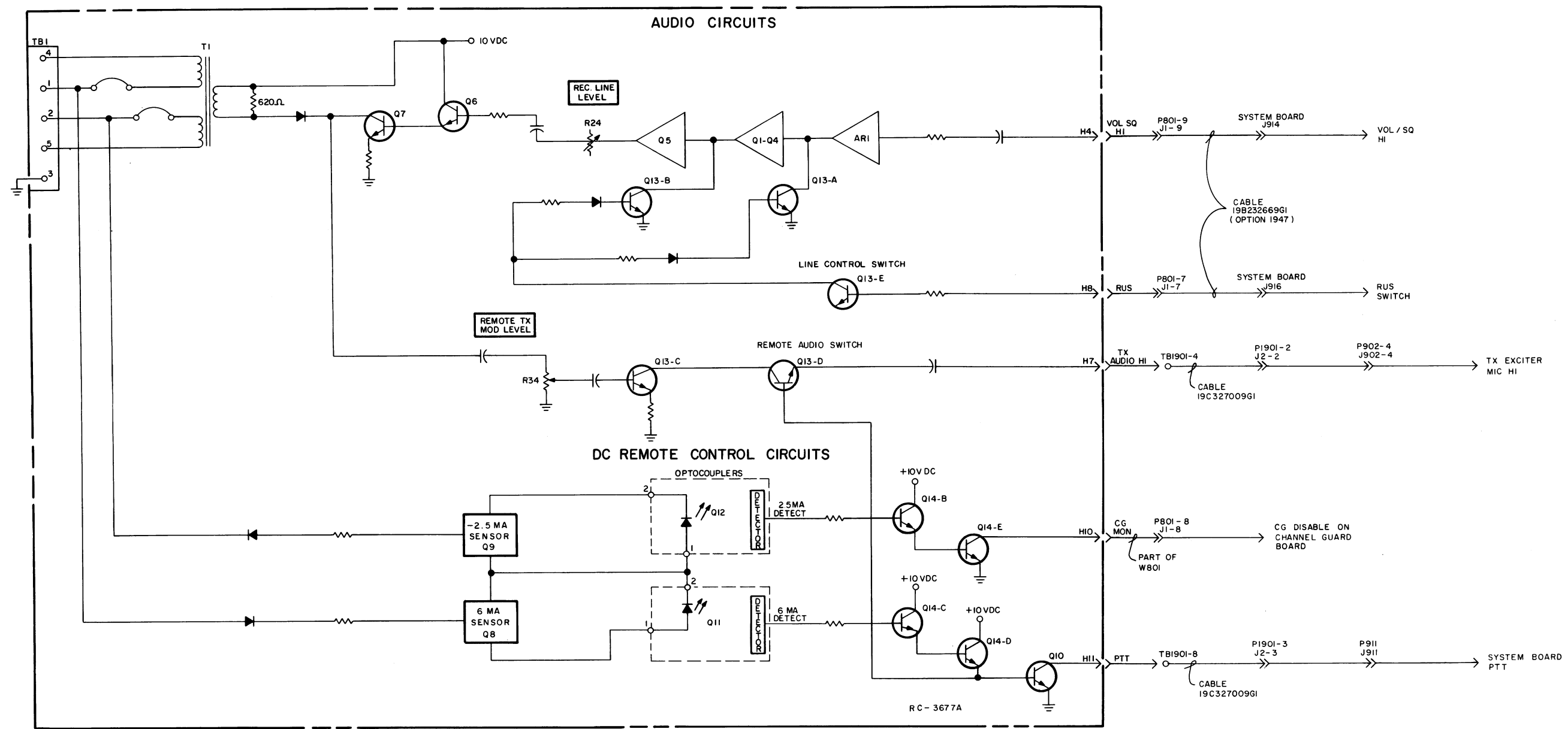
1. INSTALL CABLE 198232669 IN THE RADIO. MAKE THE CONNECTIONS BY INSERTING ENDS OF THE LEADS INTO J1 AND PLUGGING ON TO THE JACKS ON THE SYSTEM BOARD AS FOLLOWS:

FROM	COLOR	TO
J1-9	R	J914
J1-7	BK	J916
J1-10	SHIELD	J915

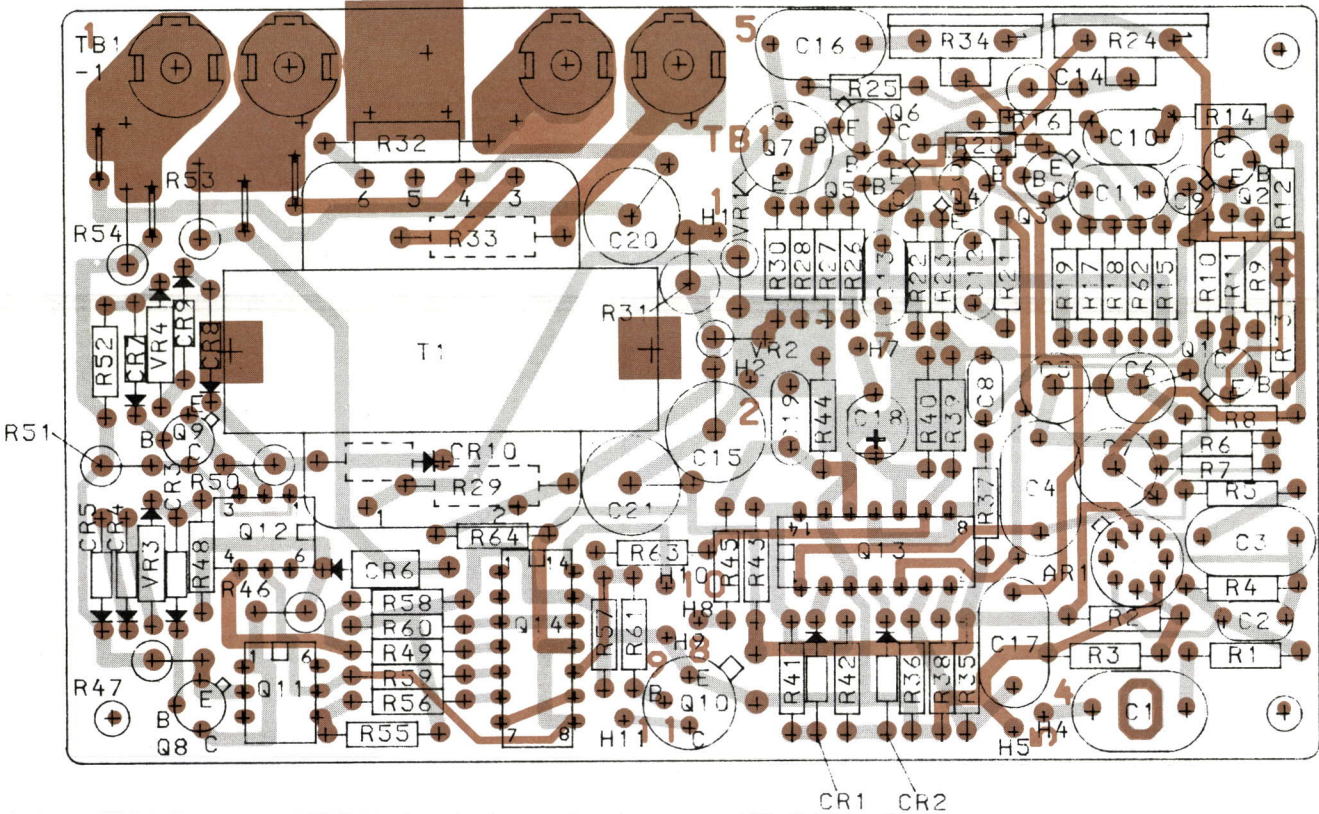
(19D430164, Rev. 0)

INSTALLATION INSTRUCTIONS

RADIO MODIFICATION KIT OPTION 1947

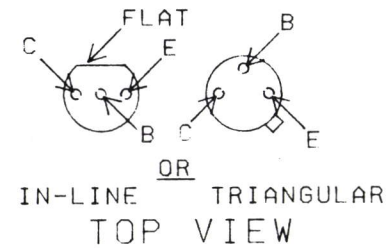


SYSTEM DIAGRAM
DC REMOTE CONTROL
Issue 2



(19C328224, Rev. 0)
(19B232501, Sh. 1, Rev. 0)
(19B232501, Sh. 2, Rev. 0)

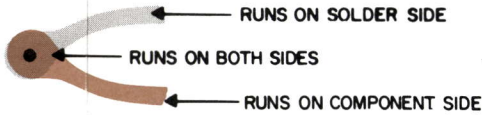
LEAD IDENTIFICATION
FOR Q1 THRU Q10

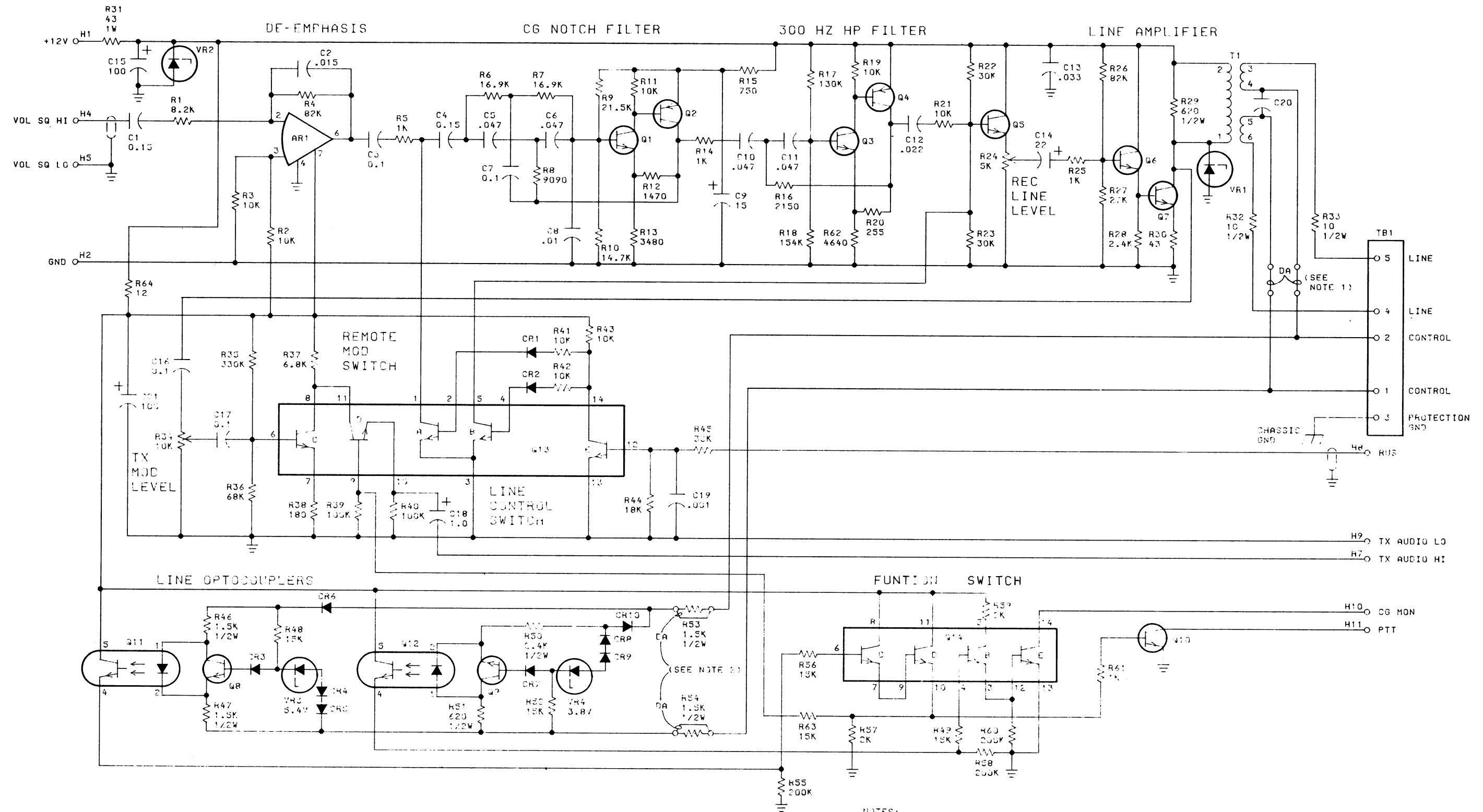


NOTE: LEAD ARRANGEMENT, AND NOT
CASE SHAPE, IS DETERMINING
FACTOR FOR LEAD IDENTIFICATION.

OUTLINE DIAGRAM

DC REMOTE CONTROL BOARD
19C328223G1





ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS.

MODEL NO	REV LETTER
PL19C328223G1	

IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

- NOTES:
1. REMOVE JUMPERS WHEN USING SEPARATE CONTROL AND AUDIO PAIRS.
 2. REMOVE JUMPERS WHEN USING DESKTOP T.C.S. OR OTHER VOLTAGE SOURCE CONTROL UNIT OR USING SEPARATE CONTROL AND AUDIO PAIRS.

SCHEMATIC DIAGRAM

DC REMOTE CONTROL BOARD
19C328223G1

Issue 1

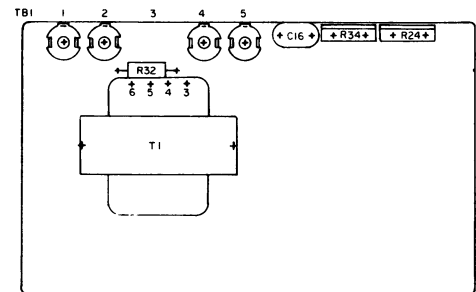
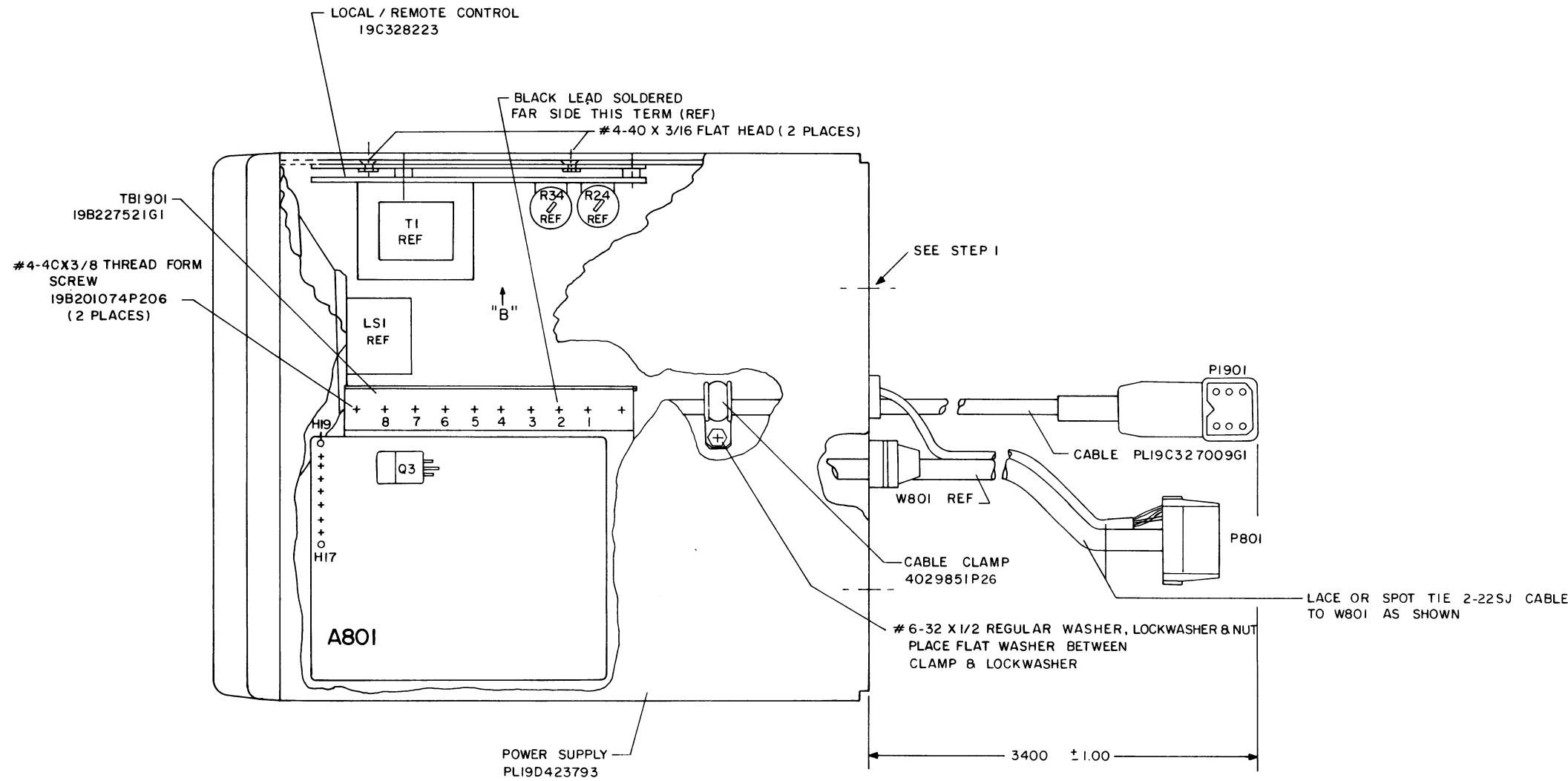
PARTS LIST

CUSTOM MVP DC REMOTE CONTROL BOARD
19C328223G1

SYMBOL	GE PART NO.	DESCRIPTION
AR1	19A116297P2	Integrated circuit, Linear: with T099 Package, operational amplifier.
		- - - - - CAPACITORS - - - - -
C1	19A116080P108	Polyester: 0.15 μ f \pm 10%, 50 VDCW.
C2	19A116080P102	Polyester: 0.015 μ f \pm 10%, 50 VDCW.
C3	19A116080P7	Polyester: 0.1 μ f \pm 20%, 50 VDCW.
C4	19A116080P8	Polyester: 0.15 μ f \pm 20%, 50 VDCW.
C5 and C6	19C300075P47001G	Polyester: 47,000 pf \pm 2%, 100 VDCW; sim to GE Type 61F.
C7	19C300075P10002G	Polyester: 100,000 pf \pm 2%, 100 VDCW; sim to GE Type 61F.
C8	19A116080P101	Polyester: 0.01 μ f \pm 10%, 50 VDCW.
C9	5496267P14	Tantalum: 15 μ f \pm 20%, 20 VDCW; sim to Sprague Type 150D.
C10 and C11	19A116080P205	Polyester: 0.047 μ f \pm 5%, 50 VDCW.
C12	19A116080P103	Polyester: 0.022 μ f \pm 10%, 50 VDCW.
C13	19A116080P4	Polyester: 0.033 μ f \pm 20%, 50 VDCW.
C14	5496267P10	Tantalum: 22 μ f \pm 20%, 15 VDCW; sim to Sprague Type 150D.
C15	19A115680P7	Electrolytic: 100 μ f +150% -10%, 15 VDCW; sim to Mallory Type TTX.
C16 and C17	19A116080P107	Polyester: 0.1 μ f \pm 10%, 50 VDCW.
C18	19A134202P14	Tantalum: 1 μ f \pm 20%, 35 VDCW.
C19	5494481P111	Ceramic disc: 1000 pf \pm 20%, 1000 VDCW; sim to RMC Type JF Discap.
C20	19A134549P4	Electrolytic, non polarized: 4 μ f +50% -10%, 150 VDC; sim to Sprague 30D.
C21	19A115680P7	Electrolytic: 100 μ f +150% -10%, 15 VDCW; sim to Mallory Type TTX.
		- - - - - DIODES AND RECTIFIERS - - - - -
CR1 thru CR5	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR6	4037822P2	Silicon, 1000 mA, 600 PIV.
CR7 thru CR9	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR10	4037822P2	Silicon, 1000 mA, 600 PIV.
		- - - - - TRANSISTORS - - - - -
Q1	19A116774P1	Silicon, NPN; sim to Type 2N5210.
Q2	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q3	19A116774P1	Silicon, NPN; sim to Type 2N5210.
Q4	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q5 and Q6	19A116774P1	Silicon, NPN; sim to Type 2N5210.
Q7	19A115300P4	Silicon, NPN.
Q8 and Q9	19A115910P1	Silicon, NPN; sim to Type 2N3904.

SYMBOL	GE PART NO.	DESCRIPTION
Q10	19A115300P2	Silicon, NPN; sim to Type 2N3053.
Q11 and Q12	19A116908P1	Optoelectronic coupler: Dual In Line 6 Pin Mini Dip Package; sim to TI TL1112.
Q13 and Q14	19A116623P1	Silicon, NPN (5 Transistor Array): 300 MW per transistor, 750 MW per package.
		- - - - - RESISTORS - - - - -
R1	3R152P822J	Composition: 8.2K ohms \pm 5%, 1/4 w.
R2 and R3	3R152P103J	Composition: 10K ohms \pm 5%, 1/4 w.
R4	3R152P823J	Composition: 82K ohms \pm 5%, 1/4 w.
R5	3R152P102J	Composition: 1K ohms \pm 5%, 1/4 w.
R6 and R7	19C314256P21692	Metal film: 16.9K ohms \pm 1%, 1/4 w.
R8	19C314256P29091	Metal film: 9.09K ohms \pm 1%, 1/4 w.
R9	19C314256P22152	Metal film: 21.5K ohms \pm 1%, 1/4 w.
R10	19C314256P21472	Metal film: 14.7K ohms \pm 1%, 1/4 w.
R11	3R152P103J	Composition: 10K ohms \pm 5%, 1/4 w.
R12	19C314256P21471	Metal film: 1.47K ohms \pm 1%, 1/4 w.
R13	19C314256P23481	Metal film: 3.48K ohms \pm 1%, 1/4 w.
R14	19C314256P21001	Metal film: 1K ohms \pm 1%, 1/4 w.
R15	3R152P751J	Composition: 750 ohms \pm 5%, 1/4 w.
R16	19C314256P22151	Metal film: 2.15K ohms \pm 1%, 1/4 w.
R17	19C314256P21303	Metal film: 130K ohms \pm 1%, 1/4 w.
R18	19C314256P21543	Metal film: 154K ohms \pm 1%, 1/4 w.
R19	3R152P103J	Composition: 10K ohms \pm 5%, 1/4 w.
R20	19C314256P22550	Metal film: 255 ohms \pm 1%, 1/4 w.
R21	3R152P103J	Composition: 10K ohms \pm 5%, 1/4 w.
R22 and R23	3R152P303J	Composition: 30K ohms \pm 5%, 1/4 w.
R24	19B209358P105	Variable, carbon film: approx 200 to 5K ohms \pm 20%, 0.25 w; sim to CTS Type X-201.
R25	3R152P102J	Composition: 1K ohms \pm 5%, 1/4 w.
R26	3R152P823J	Composition: 82K ohms \pm 5%, 1/4 w.
R27	3R152P273J	Composition: 27K ohms \pm 5%, 1/4 w.
R28	3R152P242J	Composition: 2.4K ohms \pm 5%, 1/4 w.
R29	3R77P621J	Composition: 620 ohms \pm 5%, 1/4 w.
R30	3R152P430J	Composition: 43 ohms \pm 5%, 1/4 w.
R31	3R78P430J	Composition: 43 ohms \pm 5%, 1 w.
R32 and R33	3R77P100K	Composition: 10 ohms \pm 5%, 1/2 w.
R34	19B209358P106	Variable, carbon film: approx 300 to 10K ohms \pm 10%, 0.25 w; sim to CTS Type X-201.
R35	3R152P334J	Composition: 330K ohms \pm 5%, 1/4 w.
R36	3R152P683J	Composition: 68K ohms \pm 5%, 1/4 w.
R37	3R152P682J	Composition: 6.8K ohms \pm 5%, 1/4 w.
R38	3R152P181J	Composition: 180 ohms \pm 5%, 1/4 w.
R39 and R40	3R152P104J	Composition: 100K ohms \pm 5%, 1/4 w.
R41 thru R43	3R152P103J	Composition: 10K ohms \pm 5%, 1/4 w.
R44	3R152P183J	Composition: 18K ohms \pm 5%, 1/4 w.
R45	3R152P333J	Composition: 33K ohms \pm 5%, 1/4 w.
R46 and R47	3R77P152J	Composition: 1.5K ohms \pm 5%, 1/4 w.

SYMBOL	GE PART NO.	DESCRIPTION
R48 and R49	3R152P153J	Composition: 15K ohms \pm 5%, 1/4 w.
R50	3R77P242J	Composition: 2.4K ohms \pm 5%, 1/2 w.
R51	3R77P621J	Composition: 620 ohms \pm 5%, 1/2 w.
R52	3R152P153J	Composition: 15K ohms \pm 5%, 1/4 w.
R53 and R54	3R77P152J	Composition: 1.5K ohms \pm 5%, 1/2 w.
R55	3R152P204J	Composition: 200K ohms \pm 5%, 1/4 w.
R56	3R152P153J	Composition: 15K ohms \pm 5%, 1/4 w.
R57	3R152P202J	Composition: 2K ohms \pm 5%, 1/4 w.
R58	3R152P204J	Composition: 200K ohms \pm 5%, 1/4 w.
R59	3R152P512J	Composition: 5.1K ohms \pm 5%, 1/4 w.
R60	3R152P204J	Composition: 200K ohms \pm 5%, 1/4 w.
R61	3R152P102J	Composition: 1K ohms \pm 5%, 1/4 w.
R62	19C314256P24641	Metal film: 4.6K ohms \pm 1%, 1/4 w.
R63	3R152P153J	Composition: 15K ohms \pm 5%, 1/4 w.
R64	3R152P120J	Composition: 12 ohms \pm 5%, 1/4 w.
		- - - - - TRANSFORMERS - - - - -
T1	19A134368P1	Audio freq: 300 to 6000 Hz, response +0.7 dB, -0.5 dB; power +12 dBm, max DC, 45 ma, combined Primary: 600 ohms, Secondary 1&2: 600 ohms, split.
		- - - - - TERMINAL BOARDS - - - - -
TB1	19A116667P3	Nut, plate; sim to Malco XO-2879. (Quantity 4).
		- - - - - VOLTAGE REGULATORS - - - - -
VR1	19A116325P6	Zener: 5 w, 20 v.
VR2	19A116325P4	Zener: 5 w, 12 v.
VR3 and VR4	4036887P5	Zener: 500 mW, 5.4 v. nom.
		- - - - - MISCELLANEOUS - - - - -
	4036555P1	Insulator, washer: nylon. (Used with Q7 & Q10).
	19A115884P4	Connector. (Wire terminations from H4, H5, H8).
	19B209260P102	Terminal, solderless; sim to AMP 40763. (Wire terminations from H1, H2, H7, H9-H11).
	19B232509G1	Support. (Mounts DC Remote Control Board).



VIEW "B"

INSTALLATION INSTRUCTIONS FOR OPTION 1942.

POWER SUPPLY

1. REMOVE COVER OF CUSTOM MVP POWER SUPPLY BY REMOVING FOUR (4) SCREWS AT REAR OF UNIT. (SAVE COVER AND SCREWS).
2. POSITION TERMINAL BOARD TBI901 AS SHOWN IN VIEW AND ATTACH WITH TWO (2) 4-40 X 3/8 THREAD FORMING SCREWS SUPPLIED.
3. MAKE THE FOLLOWING SOLDER CONNECTIONS BETWEEN THE TERMINAL BOARD AND A801:

FROM	COLOR	TO
TBI901-2	BK	A801-H17
TBI901-3	O	A801-H19
4. POSITION THE REMOTE CONTROL BOARD ASSEMBLY ON THE CHASSIS AS SHOWN AND FASTEN WITH TWO (2) 4-40 X 3/16 SCREWS SUPPLIED.
5. CONNECT THE LEADS HANGING FROM THE BOARD TO TBI901 AS FOLLOWS:

FROM	TO
BK-R-W	TC TBI901-1
BK	TC TBI901-2
R	TC TBI901-3
W	TC TBI901-4
BR	TC TBI901-6
W-BL-O	TC TBI901-8

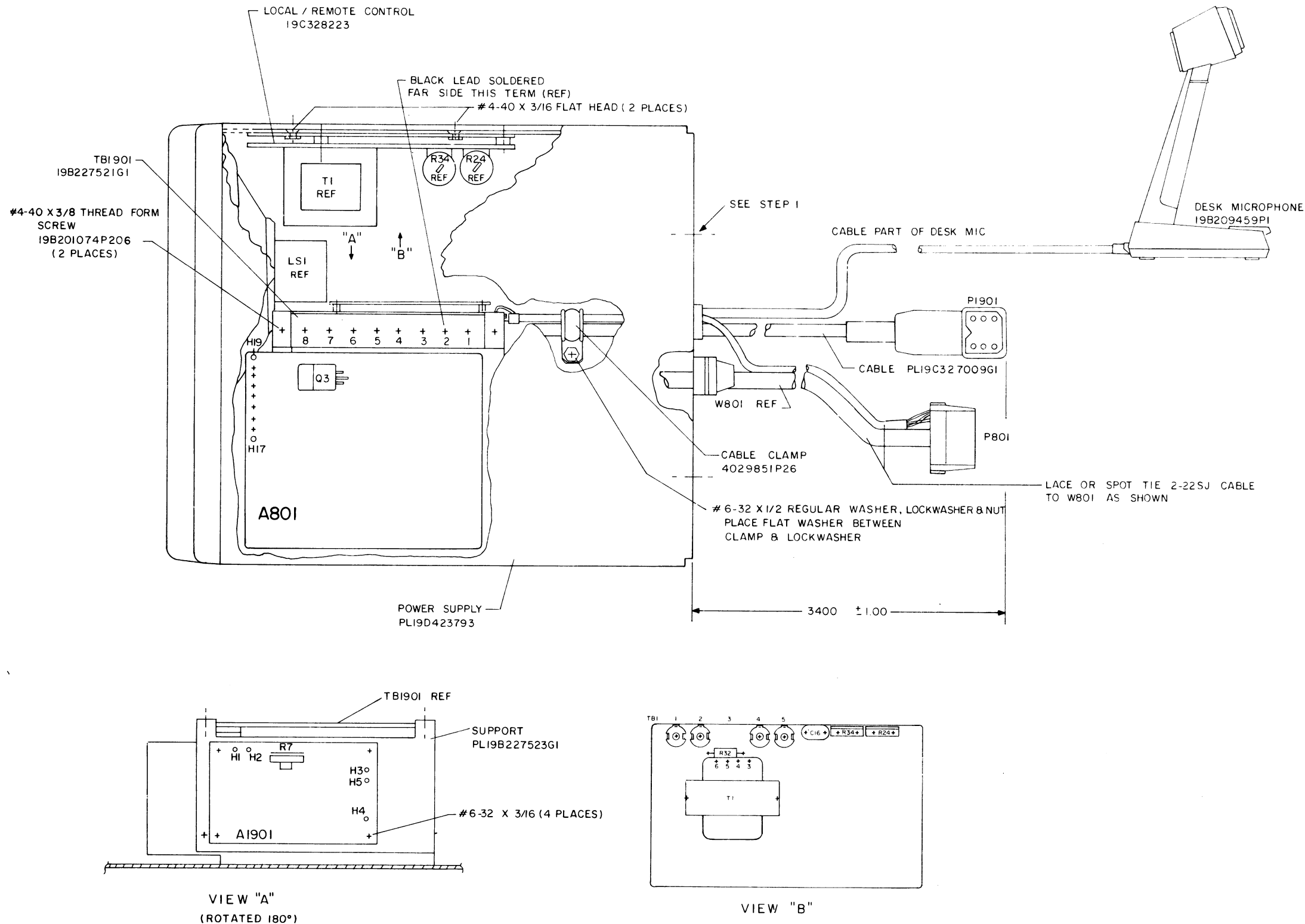
DRESS THE SHIELDED CABLE ALONG THE POWER SUPPLY OUTPUT CABLE AS SHOWN AND INSERT THE CONNECTORS INTO P801 AS FOLLOWS:

FROM	TO
BK	INTC P801-7
R	INTC P801-9
SHIELD	INTC P801-10
6. INSTALL CABLE 19C327009G1 AS FOLLOWS: INSERT THE END OF THE CABLE WITH SPADE LUGS THROUGH THE EYELET IN THE REAR OF THE POWER SUPPLY. MAKE CONNECTIONS TO TBI901 AS FOLLOWS:

FROM	TO
BK	TC TBI901-6
R	TC TBI901-4
W	TC TBI901-8
7. REPLACE COVER WITH SCREWS SAVED FROM STEP 1.

INSTALLATION INSTRUCTIONS

DC LOCAL/REMOTE OPTION 1942



INSTALLATION INSTRUCTIONS FOR OPTION 1943 (HOWE SUPPLIED IN KIT 19A137601).

POWER SUPPLY

1. INSTALL DESK MIC AND PREAMP PER INSTALLATION INSURUCTION 19D424152.
2. INSTALL THE LOCAL/REMOTE CONTROL ASSEMBLY ON THE SIDE RAIL OF THE CHASSIS AS SHOWN. FASTEN IN PLACE WITH THE TWO 4-40 X 3/16 SCREWS

3. CONNECT THE LEADS HANGING FROM THE LOCAL/REMOTE CONTROL BOARD AS FOLLOWS:

BK-R-W	TO	TB1901-1
BK	TO	TB1901-2
R	TO	TB1901-3
W	TO	TB1901-4
BR	TO	TB1901-6
W-BL-O	TO	TB1901-8

DRESS THE SHIELDED CABLE ALONG THE POWER SUPPLY OUTPUT CABLE AND INSERT THE CONNECTORS INTO P801 AS FOLLOWS:

BK	INTC	P801-7
R	INTC	P801-9
SHIELD	INTC	P801-10

4. INSTALL CABLE 19C327009G1 AS FOLLOWS:

INSERT THE END OF THE CABLE WITH SPADE LUGS THRU THE EYELET IN THE REAR OF THE POWER SUPPLY. MAKE CONNECTIONS TO TB1901 AS FOLLOWS:

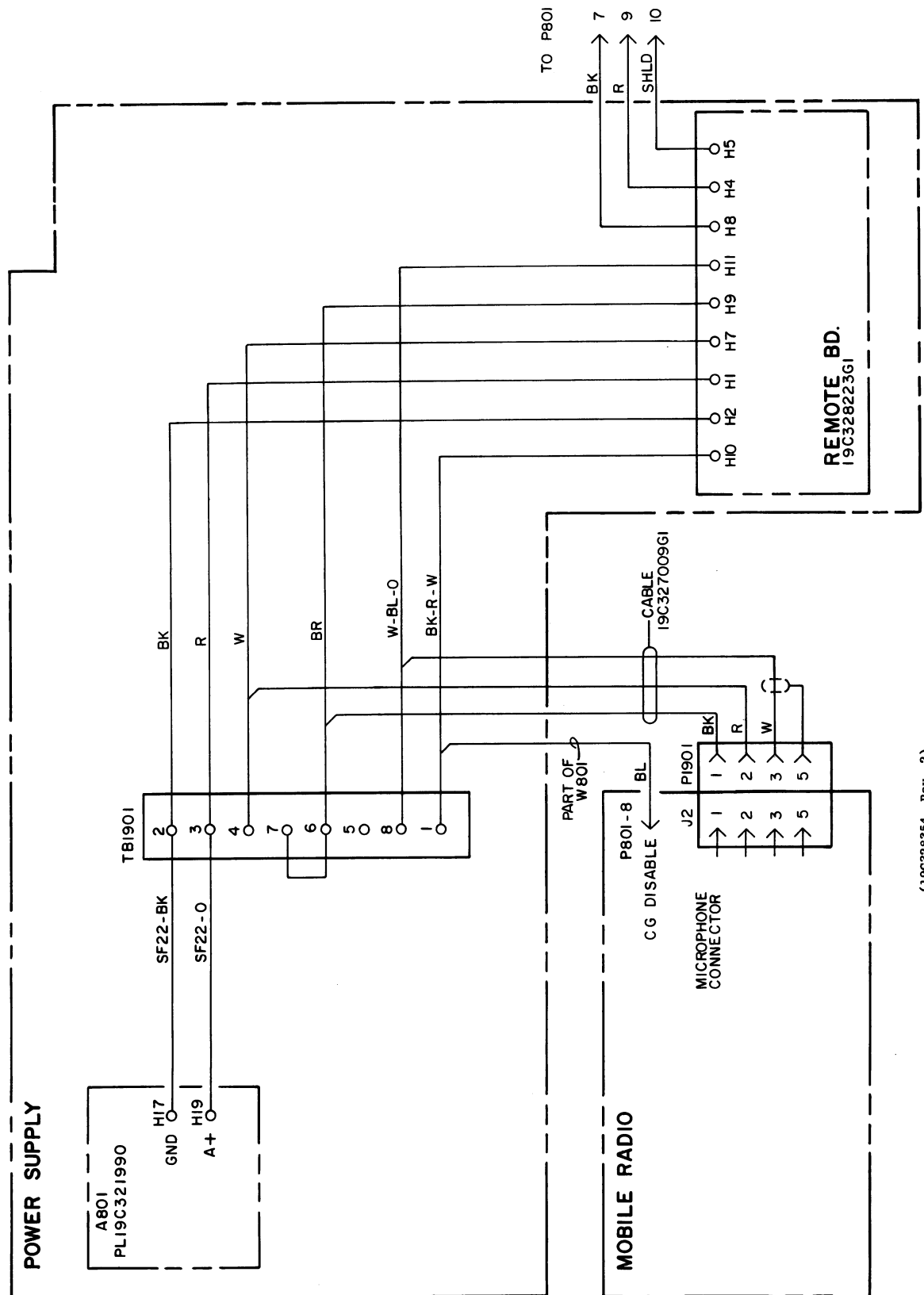
BK	TO	TB1901-6
R	TO	TB1901-4
W	TO	TB1901-8

5. REPLACE COVER

* CLIP WHITE WIRE IN MIDDLE AND INSTALL 1/4W 22K RESISTOR IN SERIES AND SLEEVE AS REQUIRED.

INSTALLATION INSTRUCTIONS

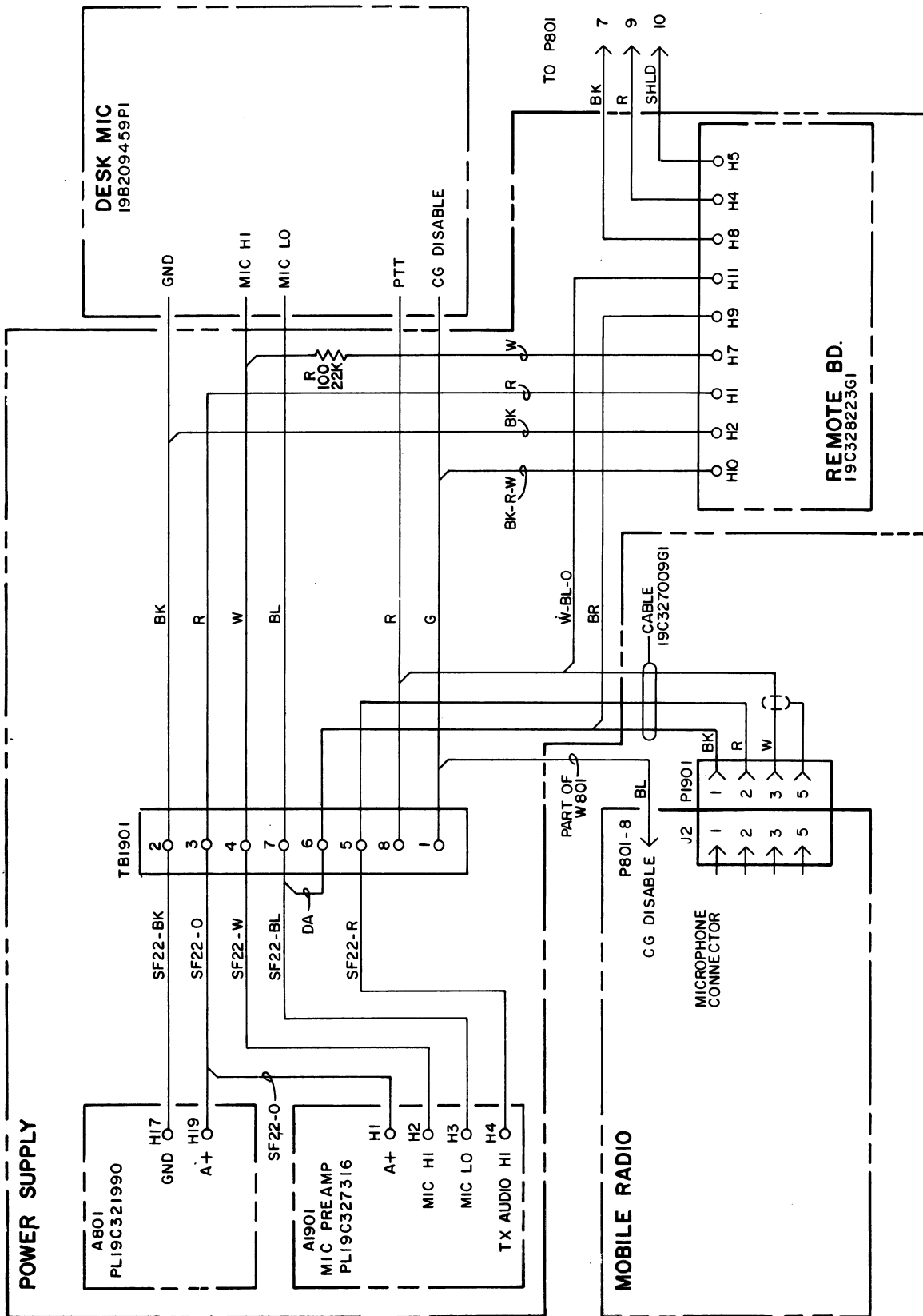
DC LOCAL/REMOTE WITH DESK MICROPHONE
OPTION 1943



(19C328354, Rev. 2)

INTERCONNECTION DIAGRAM

OPTION 1942



(19C328355, Rev. 2)

INTERCONNECTION DIAGRAM

OPTION 1943