Customer_____

G. E. Req. No._____

Customer Order No._____

5001

INSTRUCTIONS

for

GENERAL ELECTRIC PROGRESS LINE

REED CHANNEL GUARD

MODEL 4EK10B10

LBI-3463

GENERAL ELECTRIC

COMMUNICATION PRODUCTS DEPARTMENT
LYNCHBURG, VIRGINIA

Printed in U.S.A

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SERVICE SHEET

(Channel Guard Unit Model 4EK10B10) RC-1065

GENERAL INFORMATION EBI-41468
DISTRICT SALES OFFICES EBI-4851

EQUIPMENT INDEX

Equipment	G-E Model or Part No.
Tone Squelch Unit	Model 4EK10B10
Option Panel	PL-7489145-G5 or G6
Transmitter Modification Kit	PL-7160582-G1 or G2
Receiver Modification Kit	PL-4036613-G4 or G5
Receiver Modification Kit	PL-7161355-G2
Power Supply Modification Kit	PL-4029282-G1
Power Supply Modification Kit	PL-4029265-G1
Desk Microphone	Model 4EM28B1
Microphone Application Kit	PL-4029242-G1
Hookswitch	PL-7150899-G8 or G10
Remote Control Modification Kit	PL-7143269-G4
Antenna Cable	PL-7488600-G25
Reed Encoder	3R161-P*
Reed Decoder	3R160-P*

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* Part No. for Encoder and Decoder determined by multiplying the tone frequency by 10. Example: 156.7 cps x 10 = Part No. 1567.

MOBILE OPTIONS

OPTION NO.	TYPE OF MTG.	POWER SUPPLY	FREQUENCY AND BANDWIDTH
4531	Trunk Mount	Transistorized	25-54 MC, 130-174 MC, 450-470 MC, W-B
4532	Front Mount	Transistorized	25-54 MC, 130-174 MC, 450-470 MC, W-B
4533	Trunk Mount	Dynamotor	25-54 MC, 130-174 MC, 450-470 MC, W-B
4534	Front Mount	Dynamotor	25-54 MC, 130-174 MC, 450-470 MC, W-B
4536	Trunk Mount	Transistorized	25-54 MC, 130-174 MC, N-B
4537	Front Mount	Transistorized	25-54 MC, 130-174 MC, N-B
4538	Trunk Mount	Dynamotor	25-54 MC, 130-174 MC, N-B
4539	Front Mount	Dynamotor	25-54 MC, 130-174 MC, N-B
4541	Trunk Mount	Transistorized	2-Freq 25-54 MC, 130-174 MC, 450-470 MC, W-B
4542	Trunk Mount	Transistorized	2-Freq 25-54 MC, 130-174 MC, N-B
4543	Trunk Mount	Vibrator	25-54 MC, 130-174 MC, 450-470 MC, W-B
4544	Front Mount	Vibrator	25-54 MC, 130-174 MC, 450-470 MC, W-B
4546	Trunk Mount	Vibrator	2-Freq 25-54 MC, 130-174 MC, 450-470 MC, W-B
4547	Trunk Mount	Vibrator	2-Freq 25-54 MC, 130-174 MC, N-B
4548	Front Mount	Vibrator	25-54 MC, 130-174 MC, N-B
4549	Trunk Mount	Vibrator	2-Freq 25-54 MC, 130-174 MC, N-B
STATION OPTIONS			
4401	Table Station	117 VAC	25-54 MC, 130-174 MC, 450-470 MC, W-B
4402	Table Station	117 VAC	2-Freq 25-54 MC, 130-174 MC, 450-470 MC, W-B
4403	Table Station	117 VAC	Single Freq Transmit & Rec 25-54 MC, 130-174 MC, N-B
4404	Table Station	117 VAC	2-Freq 25-54 MC, 130-174 MC, N-B
4731	Local Control DO Station	117 VAC	Single Freq Trans & Rec 25-54 MC, 130-174 MC, 450-470 MC, W-B
4733	Local/Remote DO Station	117 VAC	Single Freq Trans & Rec 25-54 MC, 130-174 MC, 450-470 MC, W-B
4734	15 Watt Remote	117 VAC	Single Freq Trans & Rec 25-54 MC, 130-174 MC, 450-470 MC, W-B
4735	250-330 W. Remote	117 VAC	Single Freq Trans & Rec 25-54 MC, 130-174 MC, 450-470 MC, W-B
4736	Local Control DO Station	117 VAC	Single Freq Trans & Rec 25-54 MC, 130-174 MC, N-B
4738	250-330 W Remote	117 VAC	Single Freq Trans & Rec 25-54 MC, 130-174 MC, N-B
4739	Local Control DO Station	117 VAC	2-Freq Trans & 1 or 2 Freq Rec 25-54 MC, 130-174 MC, N-B
4741	15-100 W. Remote	117 VAC	Single Freq Transmit & Rec 25-54 MC, 130-174 MC, N-B
4751	Local Control DO Station	117 VAC	2-Freq Trans & 1 or 2 Freq Rec 25-54 MC, 130-174 MC, 450-470 MC, W-B

INSTRUCTIONS
FOR
PROGRESS LINE REED CHANNEL GUARD MODEL 4EK10B10

General Electric CHANNEL GUARD Options permit all signals on a particular channel to be locked out except those from transmitters which are properly tone coded for positive recognition by a receiver equipped with CHANNEL GUARD.

G-E CHANNEL GUARD provides automatic channel monitoring, enabling the operator to comply with FCC requirements that the channel be monitored before transmission. This is accomplished by reverting to the standard mobile receiver squelch when the handset is removed from the hang-up bracket (in mobile installations) or the MONITOR switch is depressed in station installations.

The Model 4EK10B10 Tone Transmitter-Receiver unit operates as a single-tone oscillator (tone transmitter) and as a single-tone selective amplifier (tone receiver). The tones used range in frequencies from 71.9 to 156.7 cps and are determined by electromechanical (reed) resonant devices which plug into the unit. When operated as a tone receiver, a low-frequency tone signal corresponding to the resonant frequency of the unit's reed decoder unsquelches the radio receiver. As a tone transmitter, the single-tone oscillator supplies a continuous tone at the frequency determined by the reed encoder. This tone frequency modulates the radio transmitter.

CHANNEL GUARD Options are available as listed on page v.

INSTALLATION

If the CHANNEL GUARD Option was installed before shipment, the installation of the Combination will not differ from the procedure outlined in the instructions for the Combination. When installation of CHANNEL GUARD is to be performed in the field, refer to the Installation Instructions provided in this manual.

The following modifications of the mobile or station combination are required, whether performed at the factory or in the field.

A. Transmitter Tone-Squelch Modification Kit PL-7160582 (G1 for 25-54 MC or G2 for 130-174 MC and 450-470 MC) permits the tone transmitter in the CHANNEL GUARD unit to frequency modulate the carrier of the radio transmitter with a low frequency tone to open the squelch of an associated receiver. For field installation of this kit refer to RC-876.

B. Receiver Modification Kit PL-7161355-G2 adds connectors to the radio receiver for making DC amplifier and discriminator connections to the tone squelch unit. R330 (the 33,000 ohms resistor in the screen circuit of the 2nd limiter) is replaced by a voltage sensitive resistor (CR1) to regulate the tone output from the limiter. Refer to RC-875.

C. Receiver Modification Kit PL-4036613-G4 or -G5 provides an inductor in the output of the discriminator to filter tone from the audio stages of the receiver. See RC-875.

D. The Transmitter Power Supply Modification Kit PL-4029282-G1 for station installations modifies the Type EP-4-A Power Supply so that it will supply continuous B-plus. The power rating of one resistor is increased and a second resistor is added to handle the additional load presented by the tone squelch unit. See RC-922.

E. Receiver Power Supply Modification Kit PL-4029265-G1 modifies the Type EP-3-A Power Supply in station installations so that it will supply continuous B-plus. A resistor is added to stabilize the B-plus voltage while the receiver is muted. See RC-922.

F. The Tone Squelch Option Panel PL-7489145- (G5 for mobile installations and G6 for station installations) is used for mounting the tone squelch unit. The panel is 13-1/2-inches long by 3-inches wide and mounts in the mobile case (in mobile installations) or in the station cabinet between the transmitter and receiver (in station installations). The tone squelch unit mounts in one of the 4-11/16 inch x 2-7/16 inch cutouts. The plug (P601) on the tone squelch unit plugs into one of the 11-pin receptacles on the panel. Refer to the Installation Diagrams (RC-1057 for mobile installations and RC-1062 for station installations) and the Interconnection Diagrams (RC-1061 for mobile installations and RC-1060 for station installations). If the EZ-15-A Noise Blanker is to be installed along with CHANNEL GUARD in the option panel, refer to the Noise Blanker Instruction Book.

G. Mobile combinations equipped with CHANNEL GUARD normally employ a Hookswitch (PL-7150899-G8 or -G10) to provide automatic channel monitoring. See RC-878 for installation instructions.

H. Station options supplied with an EM-28-B desk microphone are modified by Microphone Application Kit PL-4029242-G1. This modification permits the microphone to control the tone squelch cathode-grounding connection. With the MONITOR switch on the microphone in the down position, the CHANNEL GUARD cathode connection is ungrounded, unmuting the receiver audio. The TRANSMIT bar cannot be depressed until the MONITOR bar has been actuated. Thus, the operator is forced to monitor the channel before transmission. Refer to RC-1059.

J. Local/Remote and Remote-Control station installations require Modification Kit PL-7143269-G4 for modifying the KC-7-B Remote Control Panel. This modification permits ungrounding of the DC amp cathode and disabling the receive CHANNEL GUARD function when +40-VDC control voltage is applied to the telephone control line. See EE-7352399, Sheet 5.

SYSTEM DESCRIPTION

Tone Transmitter

V603 and its associated circuitry constitutes the low-frequency oscillator which is a modified multivibrator controlled by the reed RD601. The output of the oscillator is coupled through a three-section RC filter which removes harmonics from the generated tone. The signal is then coupled to the third section of V603 which serves as a Class A Amplifier to amplify the tone before applying it to the tone gain control R622. This control provides gain adjustment of the tone for Channel A. Another gain control (R626) is provided for Channel B when two frequency options are utilized.

The radio transmitter oscillator crystal is modulated by varying the capacity of a silicon diode (CR1) across the crystal at the tone rate. The capacitance of a silicon diode varies with the amount of bias voltage impressed upon it in the reverse direction. Diode CR1 rectifies a portion of the RF voltage generated by the crystal, producing a bias on the diode of approximately -3 volts. At this voltage, the diode looks like a 4.5 pf capacitor in the trimmer circuit of the crystal. By varying the diode voltage across R1, the capacitance of CR1 is made to vary at the tone frequency. This causes the crystal frequency to vary at the same rate, producing frequency modulation.

Tone Receiver

Audio output from the discriminator of the radio receiver is applied to P601-1. A three-section RC filter passes only the tone, filtering out the higher audio frequencies. The tone signal is amplified by the first section of V601, passed through a "T" filter to further limit the audio pass-band and is then amplified by the first section of V602. The tone signal is fed to a cathode follower (second section of V602) which drives the reed decoder RD602. The rectified output from the reed contacts control a triode DC amplifier (second half of V601).

The DC amplifier in the tone squelch unit is connected to the squelch control amplifier in the radio receiver. When no carrier signal is present, both stages are conducting and the radio receiver is normally squelched. When a signal is received which is not modulated by the coded tone assigned to the tone squelch unit the DC amplifier continues to conduct, keeping the radio receiver squelched. This uncoded transmission is thus inaudible at the output of the radio receiver. If the RF signal is modulated by the coded tone assigned to the tone squelch unit, both the DC amplifier in the tone squelch unit and the receiver's squelch amplifier are cut off, completely unsquelching the radio receiver.

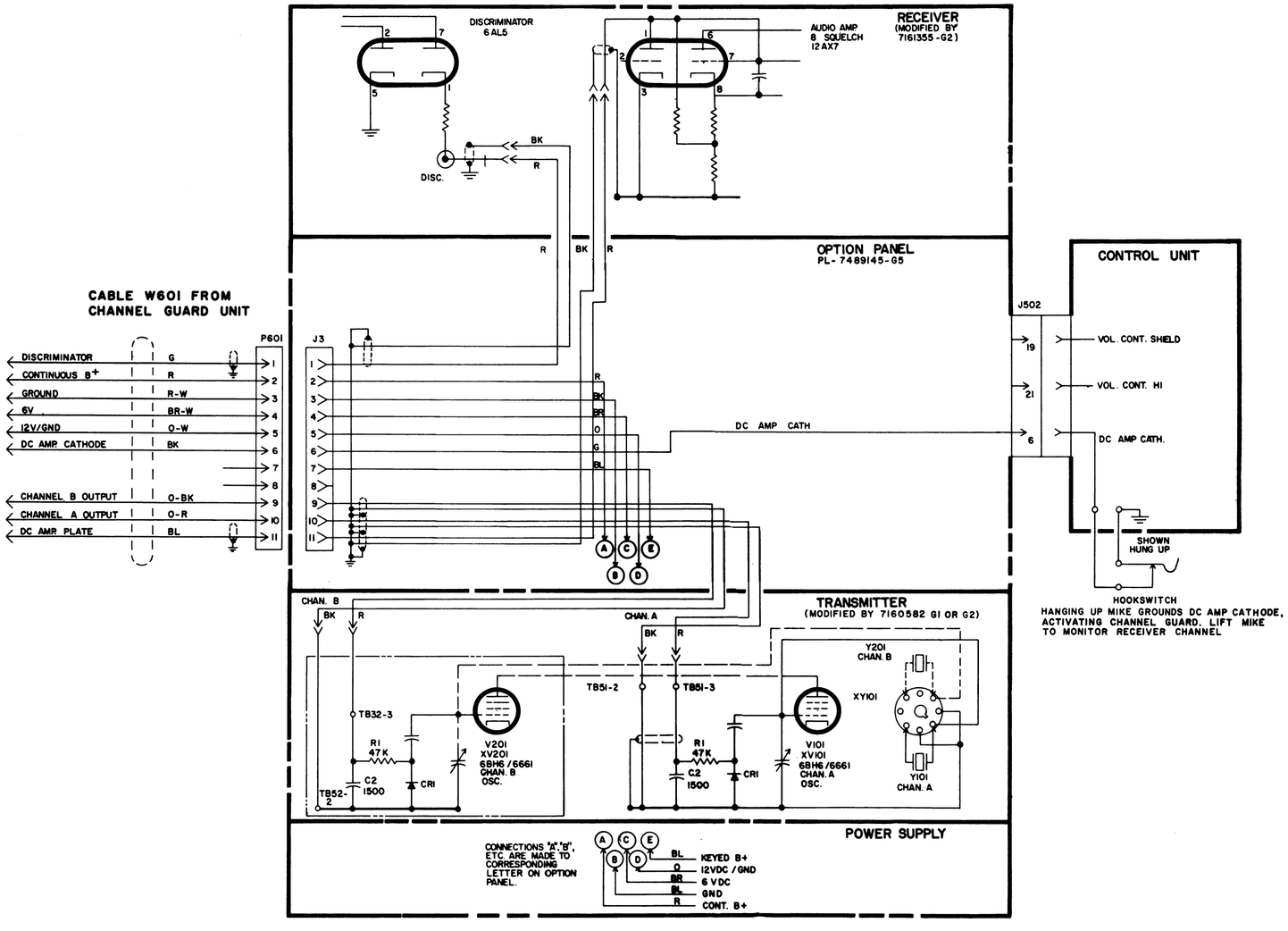
ADJUSTMENT

If the 4EK10B10 was installed at the factory, no additional adjustment is necessary to place the tone squelch unit in operation.

If the unit is to be added to an existing system, the tone levels must be adjusted to provide proper deviation.

1. With the tone oscillator operating, adjust R622 (Channel A) for a deviation of 0.75 KC (narrow band) or 1.0 KC (wide band) as read on a deviation monitor connected to the radio transmitter.

2. If two-frequency operation is employed, adjust R626 (Channel B) for the same deviation as obtained in Step 1. It may be necessary to readjust R622 after adjustment of R626.

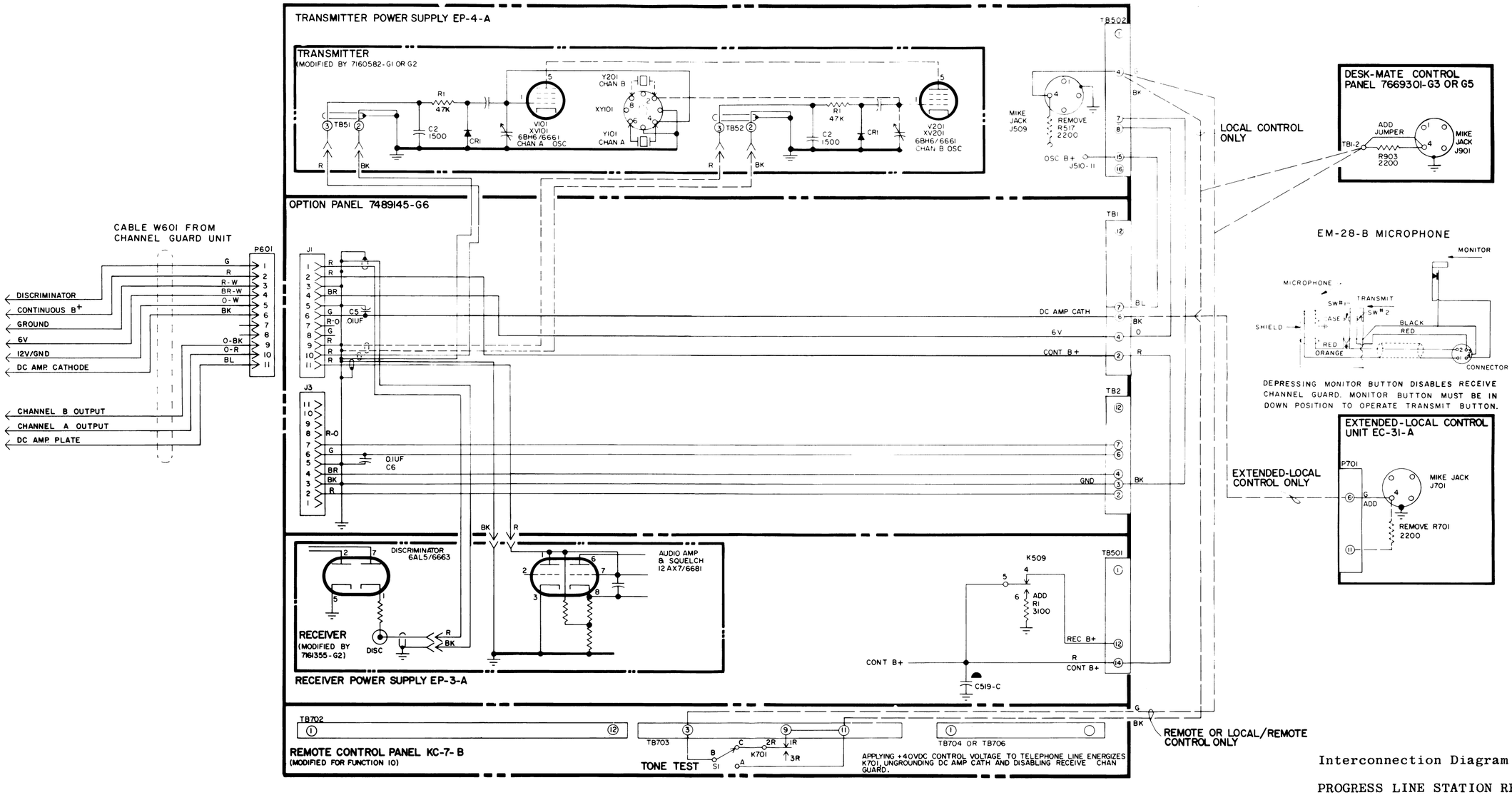


Interconnection Diagram

PROGRESS LINE MOBILE REED
CHANNEL GUARD MODEL 4EK10B10

(RC-1061)

15274



Interconnection Diagram

PROGRESS LINE STATION REED
CHANNEL GUARD MODEL 4EK10B10

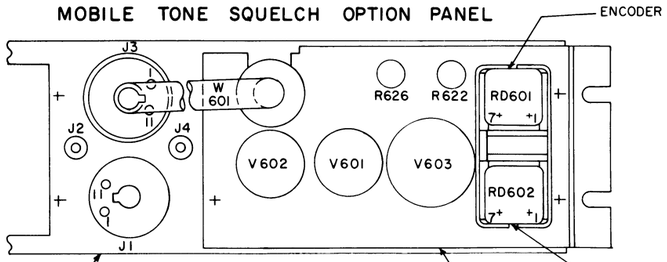
(RC-1060)

INSTALLATION INSTRUCTIONS:

FOR PROGRESS LINE MOBILE REED CHANNEL GUARD FIELD INSTALLATIONS:

1. MOUNT 4EK10B CHANNEL GUARD UNIT IN CUTOUT ON OPTION PANEL AS SHOWN. PLUG CABLE (W601) FROM 4EK10B INTO J3 ON THE PANEL. IF NOISE BLANKER EZ15 IS USED REFER TO NOISE BLANKER INSTRUCTION MANUAL.
2. ROUTE THE BLUE, RED, BLACK, BROWN AND ORANGE WIRES FROM J3 TO THE POWER SUPPLY THROUGH CHANNEL IN FRONT OF OPTION PANEL TO J502.
3. CLIP THE RED LEAD BETWEEN J3-2 AND J1-2 AND REPLACE IT WITH THE 2200 OHM 2 WATT RESISTOR INCLUDED IN HARDWARE KIT 4038799.
4. ROUTE SHIELDED WIRE FROM J3-8 AND GREEN WIRE FROM J3-6 THROUGH FRONT OF OPTION OPTION PANEL TO J502. SECURE ALL WIRES TO THE SIDE OF OPTION PANEL WITH CABLE CLAMP.
5. ROUTE THE SHIELDED WIRES FROM J3-1 AND J3-11 TO THE RECEIVER THROUGH FRONT CHANNEL OF MOBILE CASE AND SECURE TO SIDE OF OPTION PANEL WITH TWO TINNERMAN CLIPS.
6. ROUTE THE SHIELDED WIRES FROM J3-9 AND J3-J10 TO THE TRANSMITTER THROUGH THE REAR CHANNEL OF THE MOBILE CASE AND SECURE THE WIRES TO THE SIDE OF THE OPTION PANEL WITH TWO TINNERMAN CLIPS.
7. CONNECT SHIELDED WIRES TO RECEIVER PER TABLE 3
8. CONNECT WIRES TO POWER SUPPLY PER TABLE 1.
9. CONNECT WIRES TO TRANSMITTER PER TABLE 2.
10. CONNECT CENTER CONDUCTOR OF SHIELDED WIRE FROM J3-8 TO J502-21. CONNECT SHIELD OF THIS WIRE TO J502-19.
11. CONNECT GREEN WIRE FROM J3-6 TO J502-6.
12. FOLD BACK AND TAPE WIRES AT J2 AND J4.

MOBILE TONE SQUELCH OPTION PANEL



OPTION PANEL

CHANNEL GUARD UNIT

TABLE 1

POWER SUPPLY	CONNECT BLUE WIRE FROM J3-7 TO	CONNECT RED WIRE FROM J3-2 TO	CONNECT BLACK WIRE FROM J3-3 TO	CONNECT BROWN WIRE FROM J3-4 TO	CONNECT ORANGE WIRE FROM J3-5 TO
4EP2AI	K502 - 3L	C504 - A □	TB9 - 2	TB5 - 1	TB6 - 3
4EP2BI	K502 - 3L	C504 - A □	TB9 - 2	TB5 - 1	TB6 - 3
4EP2EI	K506 - 3R	C504 - A □	TB8 - 2	TB6 - 2	TB8 - 2
4EP2FI	K506 - 3R	C504 - A □	TB8 - 2	TB6 - 2	TB8 - 2
4EP2CI	K506 - 3L	C519 - A □	C503 - G1	TB3 - 2	TB7 - 1
4EP2DI	K506 - 3L	C519 - A □	C503 - G1	TB3 - 2	TB7 - 1
4EP2KI	K506 - 3L	C519 - A □	C503 - G1	TB3 - 2	TB7 - 1
4EP2GI	K502 - 3L	C504 - A □	TB9 - 3	TB5 - 2	TB4 - 1
4EP2HI	K506 - 3L	C504 - A □	TB9 - 3	TB9 - 4	TB4 - 2
4EP2JI	K506 - 3L	C504 - A □	TB9 - 3	TB9 - 4	TB4 - 2
4EP2LI	K502 - 6L	C519 - A □	TB9 - 2	C554 - □	TB6 - 3
4EP14 AI, BI, CI, DI	TB2 — 21	TB2 - 19	C501 — G	J502 - 14	L502 - 1
4EP14EI0	TB2 — 21	TB2 — 19	C501 — G	J502 — 14	L502 - 2

17-INCH MOBILE CASE (BOTTOM VIEW)

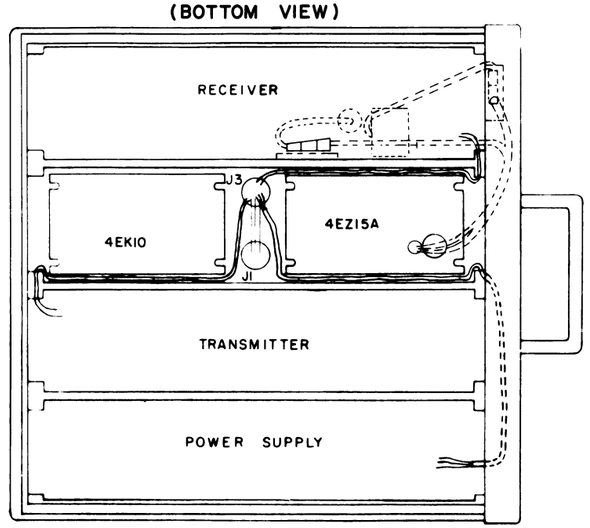


FIGURE 2

14-INCH MOBILE CASE (BOTTOM VIEW)

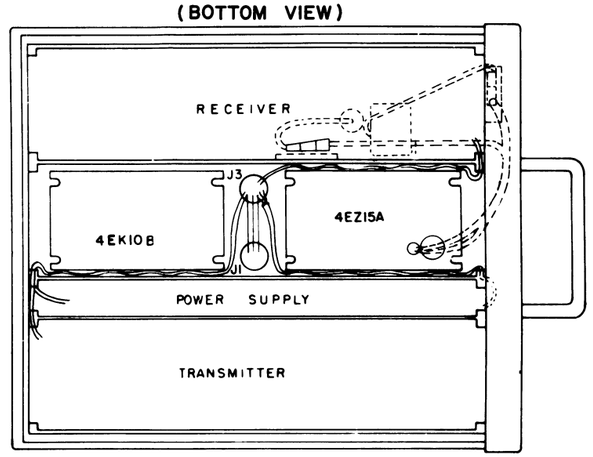


FIGURE 3

PARTS LIST

MOBILE TONE SQUELCH OPTION PANEL
PL-7489145-G5

SYMBOL	G-E PART NO.	DESCRIPTION
C5	7491096-P33	Capacitor, paper, molded plastic case; 0.10 µf ±20%, 400 VDCW. Sim to Sprague 109P10404.
J1 & J3	1R14-P28	Socket: mica-filled phenolic, 11 contacts. Sim to Amphenol Type MIP-11T.
W7 & W8	7147206-G12	Connector assembly; sim to Winchester 21803.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

TABLE 2

TRANSMITTER	CONNECT SHIELDED RED WIRE FROM J3-10 TO	CONNECT SHIELDED BLACK WIRE & SHIELD OF WIRE ON J3-10 TO	CONNECT SHIELDED RED WIRE FROM J3-9 TO *	CONNECT SHIELDED BLACK WIRE & SHIELD OF WIRE ON J3-9 TO *
ET20-A	TB51-3	TB51-2	TB52-3	TB52-2
ET21-A	TB51-3	TB51-2	TB52-3	TB52-2
ET22-A	TB51-3	TB51-2	TB52-3	TB52-2
ET23-A	TB51-3	TB51-2	TB52-3	TB52-2
ET24-A	TB51-3	TB51-2	TB52-3	TB52-2

* THESE CONNECTIONS ARE MADE FOR CHANNEL B FOR TWO FREQUENCY TRANSMITTERS. FOR SINGLE FREQUENCY TRANSMITTERS CUT OFF THESE WIRES.

TABLE 3

RECEIVER TYPE	CABLES FROM			
	J3-I		J3-II	
	RED	BLACK	RED	BLACK
ER-24,25-A,B	J304	XV309-GI	XV312-1	XV312-C
ER-26-A,B	J310	XV313-GI	XV316-1	XV316-GI

Installation Diagram

PROGRESS LINE MOBILE REED CHANNEL GUARD MODEL 4EK10B10

(RC-1057A)

PARTS LIST

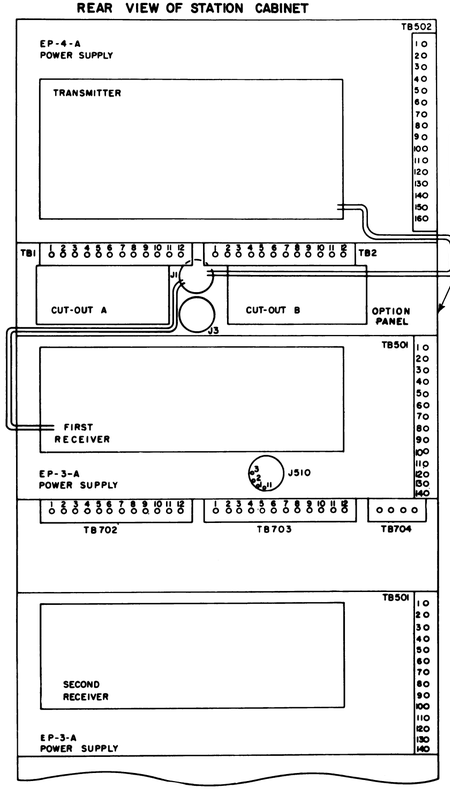
STATION TONE SQUELCH OPTION PANEL
PL-7489145-G6

SYMBOL	G-E PART NO.	DESCRIPTION
C5 & C6	7491096-P33	Capacitor, paper, molded plastic case; 0.10 µf ±20%, 400 VDCW. Sim to Sprague 109P10404.
J1 & J3	1R14-P28	Socket: mica-filled phenolic, 11 contacts. Sim to Amphenol Type MIP-11T.
TB1 & TB2	19C301086-P8	Terminal Board: feed-thru type; 12 terminals; sim to G-E CR151D-75412AB.
W7 & W8	7147206-G12	Connector assembly; sim to Winchester 21803.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

INSTALLATION INSTRUCTIONS FOR PROGRESS LINE STATION REED CHANNEL GUARD FIELD INSTALLATIONS: TONE SQUELCH OPTION PANEL PL-7489145-G6

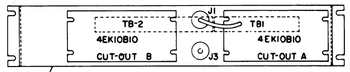
REAR VIEW OF STATION CABINET



ORDER OF UNITS IN ALL CABINETS

INSTALLATION:

1. MOVE ALL UNITS BELOW TRANSMITTER DOWN 3 1/2 INCHES (TWO-RACK UNITS) AND MOUNT OPTION PANEL ON RACK BETWEEN TRANSMITTER AND FIRST RECEIVER WITH TERMINAL BOARDS TBI AND TB2 AT THE TOP. THE TONE SQUELCH UNIT MOUNTS IN ONE OF THE CUT-OUTS.



FRONT VIEW

2. ROUTE SHIELDED WIRES AS SHOWN AND FASTEN TO OPTION PANEL WITH TINNERMAN CLIPS PROVIDED. FOR 450 MC TRANSMITTER, ROUTE SHIELDED WIRES TO TRANSMITTER AROUND LEFT SIDE INSTEAD OF AS SHOWN.

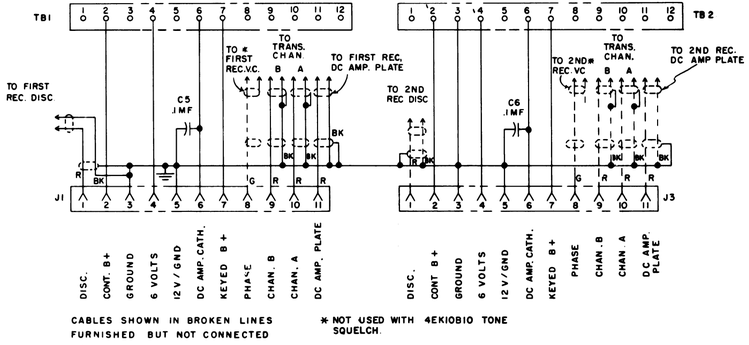
TABLE 2

RECEIVER TYPE	CABLE FROM J1-1 OR J3-1 RED	J1-1 OR J3-1 BLACK	J1-11 OR J3-11 RED	J1-11 OR J3-11 BLACK
ER24, 25-A, B	J304	V309-G1	XV312-1	XV312-C
ER26-A, B	J310	XV313-G1	XV316-1	XV316-G1

OPTION PANEL CONNECTIONS: TABLE 1

OPTION	CONNECT P601 TO	CONNECT TBI-2 TO	CONNECT TBI-4 TO	CONNECT TBI-6 TO	CONNECT TBI-7 TO	CONNECT J1-1 TO	CONNECT J1-9 RED	CONNECT J1-9 BK & S	CONNECT J1-10 RED	CONNECT J1-10 BK & S	CONNECT J1-11 TO	CONNECT TB2-3 TO
4731	J1	TB501-14	TB502-8	* TB502-4	TB502-15	SEE TABLE 2	CUT	OFF	* TB51-3	* TB51-2	SEE TABLE 2	TB502-7
4733	J1	TB501-14	TB502-8	* TB502-4	TB502-15	SEE TABLE 2	CUT	OFF	* TB51-3	* TB51-2	SEE TABLE 2	TB502-7
4734	J1	TB501-14	TB502-8	NONE	TB502-15	SEE TABLE 2	CUT	OFF	* TB51-3	* TB51-2	SEE TABLE 2	TB502-7
4735	J1	TB501-14	TB502-8	NONE	TB502-15	SEE TABLE 2	CUT	OFF	* TB51-3	* TB51-2	SEE TABLE 2	TB502-7
4736	J1	TB501-14	TB502-8	* TB502-4	TB502-15	SEE TABLE 2	CUT	OFF	* TB51-3	* TB51-2	SEE TABLE 2	TB502-7
4737	J1	TB501-14	TB502-8	* TB502-4	TB502-15	SEE TABLE 2	CUT	OFF	* TB51-3	* TB51-2	SEE TABLE 2	TB502-7
4738	J1	TB501-14	TB502-8	NONE	TB502-15	SEE TABLE 2	CUT	OFF	* TB51-3	* TB51-2	SEE TABLE 2	TB502-7
4739	J1	TB501-14	TB502-8	* TB502-4	TB502-15	SEE TABLE 2	* * TB52-3	TB52-2	* TB51-3	* TB51-2	SEE TABLE 2	TB502-7
4741	J1	TB501-14	TB502-8	NONE	TB502-15	SEE TABLE 2	CUT	OFF	* TB51-3	* TB51-2	SEE TABLE 2	TB502-7
4751	J1	TB501-14	TB502-8	* TB502-4	TB502-15	SEE TABLE 2	* * TB52-3	TB52-2	* TB51-3	* TB51-2	SEE TABLE 2	TB502-7

NOTES:
* DELETE WIRE TO TB502-4 WHEN EM-28-B MICROPHONE IS USED.
* * THESE TERMINAL BOARDS ADDED BY TRANSMITTER MODIFICATION KIT PL 7160582.



CABLES SHOWN IN BROKEN LINES FURNISHED BUT NOT CONNECTED

* NOT USED WITH 4EK10B10 TONE SQUELCH.

Installation Diagram

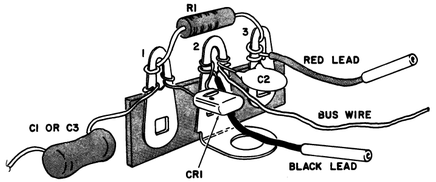
PROGRESS LINE STATION REED CHANNEL GUARD MODEL 4EK10B10

(RC-1062)

PARTS LIST

TRANSMITTER TONE SQUELCH MODIFICATION KIT
PL-7160582-G1 & G2

SYMBOL	G-E PART NO.	DESCRIPTION
C1	7770468-P233	Capacitor: ceramic, temp compensating; 2.0 pf ±0.25 pf, 500 VDCW, -80 temp coef. Used in Group 2 only.
C2	7774750-P5	Capacitor: Hi-K disc; 0.0015 µf +100% -0%, 500 VDCW.
C3	7770468-P15	Capacitor: temp compensating; 33 pf ±10%, 500 VDCW. Used in Group 1 only.
C4	7481115-P3	Capacitor: variable air; 2.53 to 12.78 pf, 1250 volts peak, sim to E.F. Johnson 160-107-43. Used in Group 1 only.
C5	7473485-P9	Capacitor: ceramic, temp compensating; 100 pf ±10%, 500 VDCW, sim to Erie 331. Used in Group 1 only.
C6	7774750-P5	Capacitor: ceramic, Hi-K disk; .0015 µf +100% -0%, 500 VDCW. Used in Group 1 only.
C8	7473485-P2	Capacitor: ceramic, temp compensating; 47 pf ±5%, 500 VDCW. Used in Group 1 only.
C9	7770468-P634	Capacitor: ceramic, temp compensating; 3.0 pf ±5%, 500 VDCW; used in Group 2 only.
CR1	5490510-P2	Diode, silicon.
R1	3R77-P473K	Resistor, fixed composition; 47,000 ohms ±10%, 1/2 w.
R101/201	3R77-P104K	Resistor, fixed composition; 0.1 megohm ± 10% 1/2 w. used in PL- 7160582-G1 only.
TB51/52	7775500- P7	Terminal board: phenolic, 3 terminals.
---	714719y-P2	Connector: 1 female cont; sim to Winchester Electronics 21804



COMPONENTS MOUNTED ON TB51/TB52

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

72-76 MC TRANSMITTER TYPES ET-35-A
25-54 MC TRANSMITTER TYPES ET-22-A, ET-23-A
MODIFICATION KIT PL-7160582-G1
(7776578, Rev. 9)

1. MODIFY THE CHANNEL "A" OSCILLATOR IN ALL TRANSMITTERS AS FOLLOWS:

   A. Remove the following components:

   1) C101 and C102 and associated wiring ☐
   2) C104 from XY101-6 to XV101-G4 (ground) ☐
   3) R101 from XY101-4 to XY101-6 ☐
   4) R102 from XY101-2 to XY101-3 ☐
   5) Bus wire from XY101-6 to XY101-5 ☐
   6) Bus wire from XY101-6 to XY101-8 ☐
   7) C103 from XV101-6 to XV101-2 (except in 30—42 MC transmitters) ☐

   B. Mount variable capacitor C4 in place of C101. ☐

   C. Mount TB51 (with its components) as shown in Figure 1. ☐

   D. Connect C3 (hanging from TB51-1) to XY101-4. ☐

   E. Connect bus wire (hanging from TB51-2) to C4-2, using sleeving on wire. ☐

   F. Connect the following components:

   1) Bus wire from C4-1 to XY101-4 ☐
   2) Bus wire from C4-1 to XY101-1 ☐
   3) Bus wire from C4-2 to XY101-5 ☐
   4) Bus wire from XY101-2 to XY101-G2 (ground) (in single-frequency transmitters only) ☐
   5) R101 (100K) from XY101-4 to C4-2 ☐
   6) C6 (1500 pf) from XY101-7 to XY101-6 (use XY101-8 in transmitters with heated crystals) ☐
   7) C8 (47 pf) from XY101-2 to XY101-6 ☐
   8) C5 (100 pf) from XY101-2 to XY101-6 (in 25—30 MC transmitters only) ☐

   G. Check the oscillator circuit with Figure 1. ☐

2. MODIFY THE CHANNEL "B" OSCILLATOR IN 2-FREQ. TRANSMITTERS AS FOLLOWS:

   A. Remove the following components:

   1) C201 and C202 and their associated wiring ☐
   2) C204 from XV201-6 to XV201-C (center terminal) ☐
   3) R102 from XY101-2 to TB1-3 ☐
   4) R201 from XY101-2 to XY101-8 ☐
   5) R202 from XV201-2 to TB6-1 ☐
   6) C203 from XV201-2 to XV201-6 (except in 30—42 MC transmitters) ☐

   B. Relocate C207 from (TB6-1 to XY101-8) to (TB6-1 to TB6-4). ☐

   C. Mount variable capacitor C4 in place of C201. ☐

   D. Mount TB52 (with its components) as shown in Figure 1. ☐

   E. Connect C3 (hanging from TB52-1) to XY101-2. ☐

   F. Connect bus wire (hanging from TB52-2) to C4-2 (CHAN. B trimmer), using sleeving on wire. ☐

   G. Connect the following components:

   1) Bus wire from XY101-2 to C4-1 (CHAN. B) ☐
   2) Bus wire from XY101-2 to TB1-3 ☐
   3) Bus wire from XV201-2 to TB6-1 ☐
   4) R201 (100K) from XY101-2 to XV201-G2 (ground) ☐
   5) C6 (1500 pf) from XV201-7 to XY101-8 (use XY101-6 in transmitters with heated crystals) ☐
   6) C8 (47 pf) from XV201-2 to XV201-6 ☐
   7) C5 (100 pf) from XV201-2 to XV201-6 (in 25—30 MC transmitters only) ☐

   H. Check the oscillator circuit with Figure 1. ☐

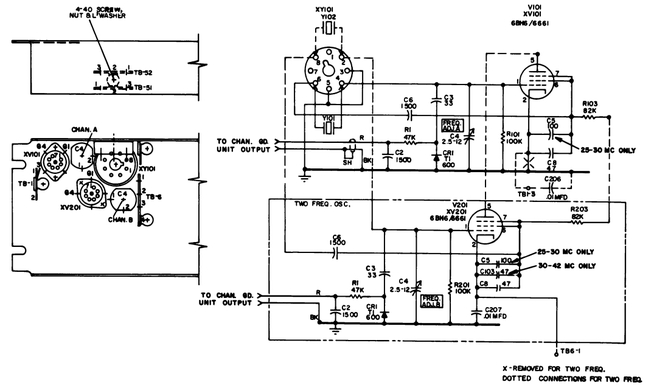
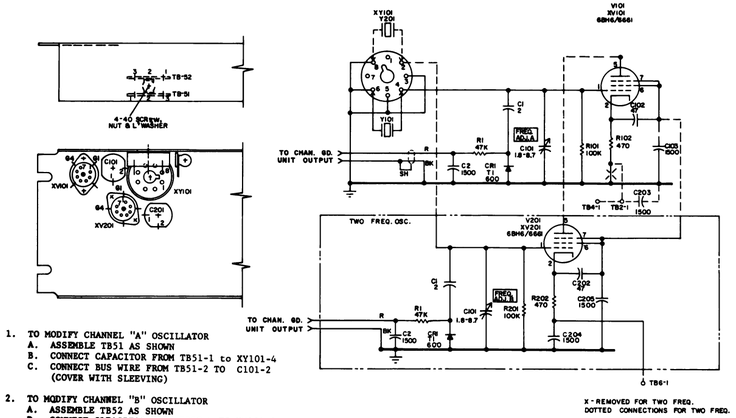


FIG. 1

HIGH BAND TRANSMITTER TYPES ET-20-A, ET-21-A & ET-48-A
MODIFICATION KIT PL-7160582-G2
(7776579, Rev. 0)

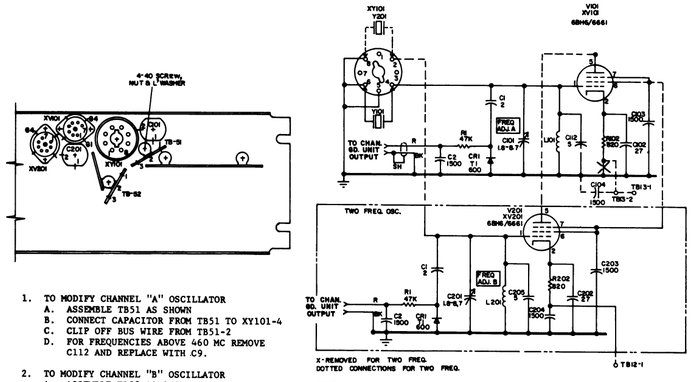


1. TO MODIFY CHANNEL "A" OSCILLATOR
   A. ASSEMBLE TB51 AS SHOWN
   B. CONNECT CAPACITOR FROM TB51-1 to XY101-4
   C. CONNECT BUS WIRE FROM TB51-2 TO C101-2 (COVER WITH SLEEVING)

2. TO MODIFY CHANNEL "B" OSCILLATOR
   A. ASSEMBLE TB52 AS SHOWN
   B. CONNECT CAPACITOR FROM TB52-1 TO XY101-2
   C. CONNECT BUS WIRE TB52-2 TO C101-2 (COVER WITH SLEEVING)

FIG. 2

450-470 MC TRANSMITTER TYPE ET-24-A
MODIFICATION KIT PL-7160582-G2
(7776580, Rev. 2)



1. TO MODIFY CHANNEL "A" OSCILLATOR
   A. ASSEMBLE TB51 AS SHOWN
   B. CONNECT CAPACITOR FROM TB51 TO XY101-4
   C. CLIP OFF BUS WIRE FROM TB51-2
   D. FOR FREQUENCIES ABOVE 460 MC REMOVE C112 AND REPLACE WITH C9.

2. TO MODIFY CHANNEL "B" OSCILLATOR
   A. ASSEMBLE TB52 AS SHOWN
   B. CONNECT CAPACITOR FROM TB52-1 TO XY101-2
   C. CLIP OFF BUS WIRE FROM TB52-2
   D. FOR FREQUENCIES ABOVE 460 MC REMOVE C205 AND REPLACE WITH C9.

FIG. 3

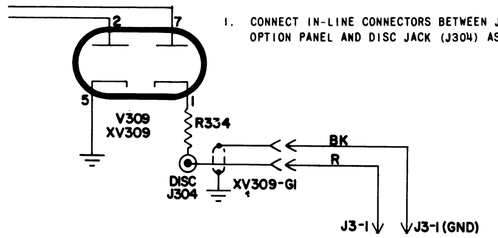
Field Installation

TRANSMITTER MODIFICATION KITS
PL-7160582-G1 & -G2 (for PROGRESS LINE REED CHANNEL GUARD UNITS)

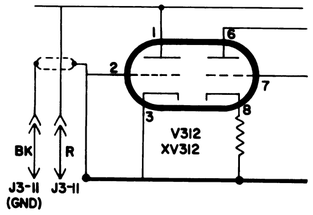
RC-876C

RECEIVER MODIFICATION INSTRUCTIONS:
FOR PROGRESS LINE REED CHANNEL GUARD FIELD INSTALLATIONS

RECEIVER TYPES ER-24, ER-25, ER-30
MODIFICATION KIT PL-7161355-G2



1. CONNECT IN-LINE CONNECTORS BETWEEN J3 ON TONE SQUELCH OPTION PANEL AND DISC JACK (J304) AS SHOWN.



2. CONNECT IN-LINE CONNECTORS BETWEEN J3 ON TONE SQUELCH OPTION PANEL AND XV312 AS SHOWN.

3. REPLACE R330 (33K OHMS) IN THE RECEIVER WITH VOLTAGE SENSITIVE RESISTOR (CR1) SUPPLIED WITH THE KIT.

MODIFICATION KIT PL-4036613-G4

1. FOR RECEIVER TYPE ER-24 AND ER-30

   MOUNT INDUCTOR (USING HARDWARE PROVIDED) ON INNER SIDE OF RECEIVER CHASSIS IN HOLES PROVIDED BETWEEN XV305 AND XV306. CONNECT ONE LEAD TO TB16-2; THE OTHER LEAD TO TB-6-2. CONNECT C432 FROM TB16-1 TO TB16-2.

2. FOR RECEIVER TYPE ER-25

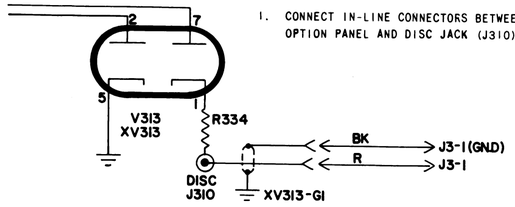
   MOUNT INDUCTOR (USING HARDWARE PROVIDED) ON INNER SIDE OF RECEIVER CHASSIS IN HOLES PROVIDED BETWEEN XV305 AND XV306. CONNECT ONE LEAD TO TB17-2; THE OTHER LEAD TO TB7-2. CONNECT C432 FROM TB17-1 TO TB17-2.

Installation Diagram

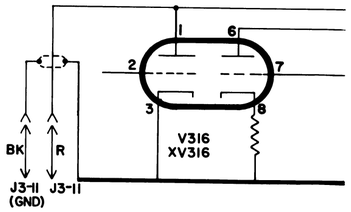
RECEIVER MODIFICATION KITS
PL-7161355-G2 & PL-4036614-G4, -G5

(RC-875B)

RECEIVER TYPE ER-26
MODIFICATION KIT PL-7161355-G2



1. CONNECT IN-LINE CONNECTORS BETWEEN J3 ON TONE SQUELCH OPTION PANEL AND DISC JACK (J310) AS SHOWN.

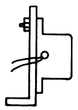


2. CONNECT IN-LINE CONNECTORS BETWEEN J3 ON TONE SQUELCH OPTION PANEL AND XV316 AS SHOWN.

3. REPLACE R330 (33K OHMS) IN THE RECEIVER WITH VOLTAGE SENSITIVE RESISTOR (CR1) SUPPLIED WITH THE KIT.

MODIFICATION KIT PL-4036613-G5

1. MOUNT INDUCTOR ON BRACKET AS SHOWN.



2. REMOVE 2 4-40 NUTS AND WASHERS NEAREST "RF PLATE" AND "MULT PLATE" MARKINGS.

3. MOUNT BRACKET AND RE-ASSEMBLE HARDWARE.

4. DRESS LEADS THROUGH HOLE ADJACENT TO Z305.

5. DRESS LEADS NEAR CHASSIS AND CONNECT ONE LEAD TO TB17-1; THE OTHER TO TB17-3.

6. CONNECT C397 FROM TB17-1 TO TB17-4.

PARTS LIST

RECEIVER TONE SQUELCH MODIFICATION KIT
PL-4036613-G4 & G5

SYMBOL	G-E PART NO.	DESCRIPTION
C397 & C432	5491189-P3	Capacitor, mylar dielectric; .033 µf ±20%, 50 VDCW.
L311 & L318	19C301200-P1	Inductor; 46 HY ±6 HY @ 100-cps; res 350 ohms min, 525 ohms max.
		RECEIVER TONE SQUELCH MODIFICATION KIT PL-7161355-G2
CR1	7486533-P3	Diode: voltage sensitive resistor; 50,000 ohms ±10%, 1/2 w; sim to Globar 479BNR-7.
	7147206-G10	Cable assembly: sim to Winchester 21804.
	7147206-G11	Cable assembly: sim to Winchester 21804.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PARTS LIST

TRANSMITTER POWER SUPPLY MODIFICATION KIT
PL-4029282-G1

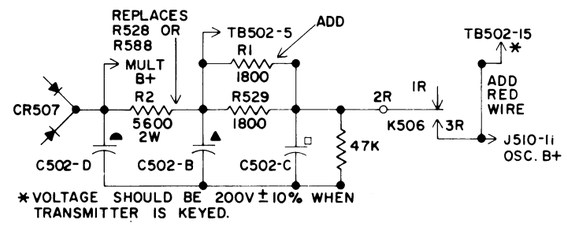
SYMBOL	G-E PART NO.	DESCRIPTION
R1	3R78-P182K	Resistor: fixed composition; 1800 ohms ±10%, 1 w.
R2	3R79-P562K	Resistor: fixed composition; 5600 ohms ±10%, 2 w.
R3	7478711-P44	Resistor: wirewound, 20,000 ohms ±5%, 5 w. sim to Sprague 5KT.
		RECEIVER POWER SUPPLY MODIFICATION KIT PL-4029265-G1
R1	2R14-P36	Resistor: wirewound, 3100 ohms ±5%, 25 w. sim to Ward Leonard K41383-1.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

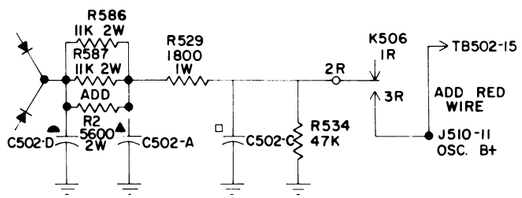
POWER SUPPLY MODIFICATION INSTRUCTIONS

MODIFICATION KIT PL-4029282-G1 FOR EP-4-A POWER SUPPLIES
MODIFICATION KIT PL-4029265-G1 FOR EP-3-A POWER SUPPLIES

MODIFICATION KIT PL-4029282-G1
FOR 4EP4A1 & A2 TRANSMITTER POWER SUPPLIES



FOR 4EP4A3 TRANSMITTER POWER SUPPLY



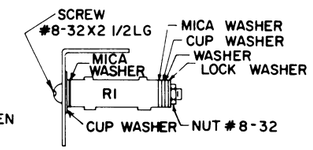
MODIFICATION KIT PL-4029265-G1
FOR 4EP3A1 RECEIVER POWER SUPPLY

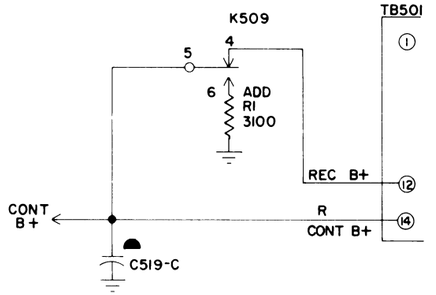
① MOUNT R1 IN SPACE NEAR TB25.

② CONNECT BLACK WIRE BETWEEN R1 & C519-G.

③ CONNECT BLUE WIRE BETWEEN R1 & K509-6.

④ CONNECT RED WIRE BETWEEN C519 (-) & TB501-14.





Installation Diagram

POWER SUPPLY MODIFICATION KITS
PL-4029282-G1 & PL-4029265-G1

(RC-922B)

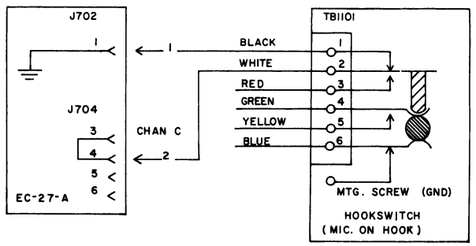
INSTALLATION INSTRUCTIONS:

HANDSET HOOKSWITCH PL-7150899-G10 AND MILITARY MICROPHONE HOOKSWITCH PL-7150899-G8 FOR PROGRESS LINE REED CHANNEL GUARD FIELD INSTALLATION.

HANDSET HOOKSWITCH PL-7150899-G10

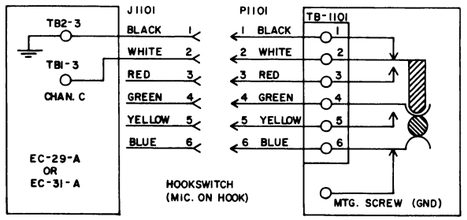
MOUNTING USE THE HOOKSWITCH AS A TEMPLATE AND DRILL THE MOUNTING HOLES WITH A #30 (0.1285 INCH OR 1/8 INCH) DRILL FOR THE #8 SELF-TAPPING SCREWS.

FOR USE WITH EC-27-A CONTROL UNIT



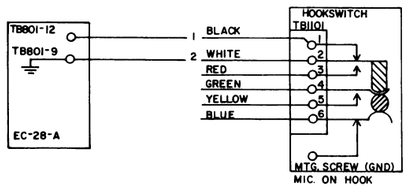
1. USE ONLY THE CABLE WITH SPADE TERMINALS ON ONE END AND NUMBER TABS ON THE OTHER
2. CONNECT AS SHOWN
3. TAPE BACK THE RED, GREEN, YELLOW, AND BLUE WIRES AT THE CONTROL UNIT END
4. THE EC-27-A MUST BE MODIFIED BY CONNECTING J704-3 TO J704-4. IN MODELS 4EC27A1 AND 4EC27A2 BEFORE REV. A, THE WIRE TO J702-1 MUST BE REMOVED AND J702-1 THEN CONNECTED TO J704-6.

FOR USE WITH EC-29-A OR EC-31-A CONTROL UNIT



1. CONNECT THE MALE 6-PIN JONES CONNECTOR TO THE HOOKSWITCH AS FOLLOWS:
   BLACK WIRE - HOOKSWITCH TB1101-1
   WHITE WIRE - HOOKSWITCH TB1101-2
   TAPE BACK OTHER WIRES OR CONNECT TO TB1101 AS SHOWN
2. PASS THE FEMALE 6-PIN JONES CONNECTOR CABLE THROUGH THE PLUG ADJACENT TO THE POWER LEAD (IN THE EC-29-A) OR THROUGH THE REAR ENTRY HOLE (IN THE EC-31-A). CONNECT THE BLACK WIRE TO TB2-3 (GND) AND THE WHITE WIRE TO TB1-3. TAPE BACK THE OTHER WIRES.
3. CONNECT THE TWO JONES CONNECTORS TOGETHER TO COMPLETE THE INSTALLATION.

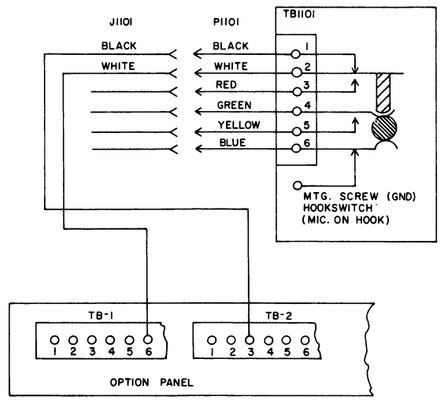
FOR USE WITH AN EC-28-A REMOTE CONTROL UNIT



1. USE ONLY THE CABLE WITH THE SPADE TERMINALS ON ONE END AND NUMBER TABS ON THE OTHER.
2. REPLACE NUMBER TABS ON BLACK AND WHITE WIRES WITH SPADE LUGS PROVIDED. CONNECT AS SHOWN. TAPE BACK OTHER WIRES.

HANDSET HOOKSWITCH PL-7150899-G10 (CONTINUED)

FOR USE WITH LOCALLY CONTROLLED STATIONS



1. CONNECT THE MALE 6-PIN JONES CONNECTOR TO THE HOOKSWITCH AS FOLLOWS:
   BLACK WIRE - HOOKSWITCH TB1101-1
   WHITE WIRE - HOOKSWITCH TB1101-2
   OTHER WIRES - TAPE BACK OR CONNECT TO TB1101 AS SHOWN
2. CONNECT THE FEMALE 6-PIN JONES CONNECTOR TO THE STATION OPTION PANEL USING THE TWO SPADE TERMINALS PROVIDED AS SHOWN.
3. CONNECT THE TWO JONES CONNECTORS TOGETHER TO COMPLETE THE INSTALLATION.

MILITARY MICROPHONE HOOKSWITCH PL-7150899-G8

MOUNTING USE THE HOOKSWITCH AS A TEMPLATE TO DRILL THE MOUNTING HOLES WITH A #30 (0.1286 INCH OR 1/8 INCH) DRILL FOR THE #8 SELF-TAPPING SCREWS. DRILL A CLEARANCE HOLE FOR THE LEAD WITH A 1/4 INCH DRILL.

FOR USE WITH EC-27-A CONTROL UNIT

1. SOLDER THE #4 MARKER PIN TO THE WIRE FROM THE HOOKSWITCH
2. CONNECT THE #4 LEAD TO J704-4 IN THE EC-27-A. THE EC-27-A MUST BE MODIFIED BY CONNECTING J704-3 to J704-4 AND J704-5 to J702-1. THE CONNECTION TO J702-1 WILL BE MADE ON 4EC27A2 REV. A AND LATER.

FOR USE WITH EC-29-A OR EC-31-A CONTROL UNIT

1. PASS THE WHITE WIRE THROUGH THE HOLE ADJACENT TO THE POWER LEAD (IN EC-29-A) OR THROUGH THE BACK CABLE ENTRY HOLE (IN EC-31-A). CONNECT THE WHITE WIRE TO TB1-3.

FOR USE WITH EC-28-A REMOTE CONTROL UNIT

1. ASSEMBLE THE SPADE TERMINAL TO THE WIRE FROM THE HOOKSWITCH AND CONNECT TO TB801-12 IN THE EC-28-A.
2. THE EC-28-A MUST BE MODIFIED BY REMOVING THE WIRE BETWEEN TB801-12 AND TB804-1. CONNECT THE BLACK WIRE FROM K1 to TB801-12.

FOR USE WITH LOCALLY CONTROLLED STATIONS

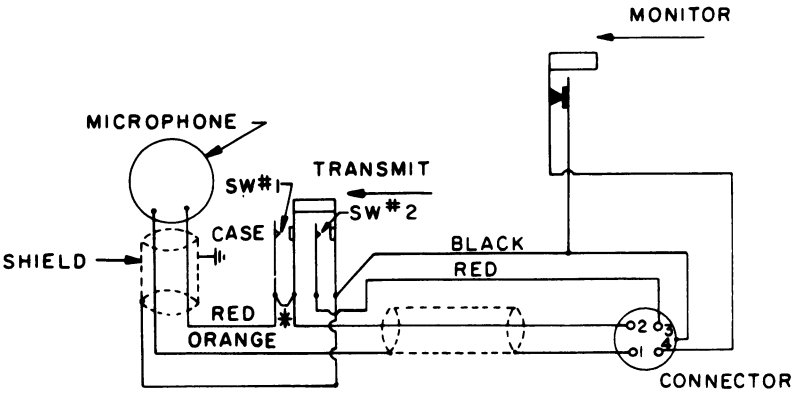
1. ASSEMBLE THE SPADE TERMINAL TO THE WIRE FROM THE HOOKSWITCH AND CONNECT TO THE TONE SQUELCH OPTION PANEL AT TB1-5. WHEN STATION HAS REMOTE CONTROL OPTION, CONNECT TO TB703-3 INSTEAD OF TB1-5.

Installation Diagram

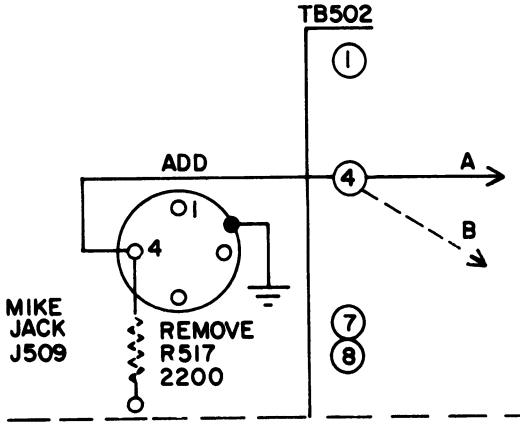
HOOKSWITCH INSTALLATION PL-7150899-G8 & 10

(RC-878)

WHEN MONITOR SWITCH IS IN "DOWN" POSITION, RECEIVE CHANNEL GUARD IS DISABLE. MECHANICAL INTERLOCK PREVENTS OPERATION OF TRANSMIT SWITCH UNLESS MONITOR SWITCH IS IN "DOWN" POSITION. MONITOR SWITCH WILL LOCK IN "DOWN" POSITION WHEN DEPRESSED AND SLID TOWARD NAMEPLATE.

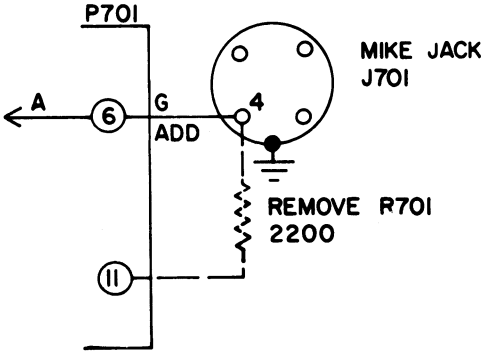


EP-4-A POWER SUPPLY



LOCAL CONTROL EC-29A, EC-31-A, EC-39-A

EC-29A, EC-31-A, EC-39-A



EC-28-A REMOTE CONTROL

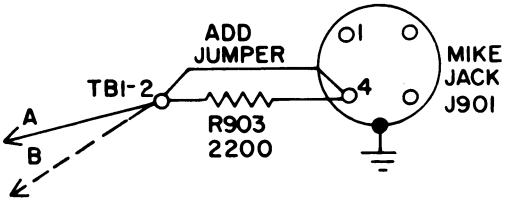
REMOVE GREEN WIRE BETWEEN J801-4 AND TB14; CONNECT BLACK WIRE FROM K1 TO J801-4. SEE FUNCTION 10 OF RC-4 COMBINATION (EE-7352399).

A- CONNECTS TO TB1-6 ON TONE SQUELCH OPTION PANEL IN LOCAL CONTROL OPTIONS.

B- CONNECTS TO TB703-3 OF KC-7-B REMOTE CONTROL PANEL IN REMOTE CONTROL & LOCAL/REMOTE CONTROL OPTIONS.

DESK-MATE CONTROL PANEL 7669301-G3 OR G5

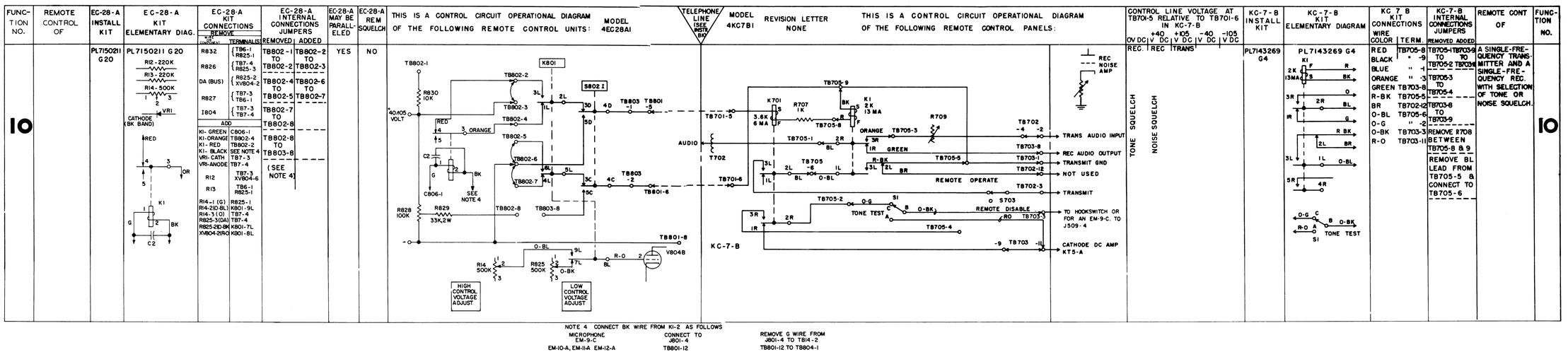
REMOVE WIRE #342.
DISCONNECT WIRE #331 FROM TB1-2



Installation Diagram

MICROPHONE APPLICATION KIT PL-4029242-G1

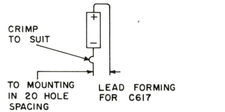
(RC-1059)

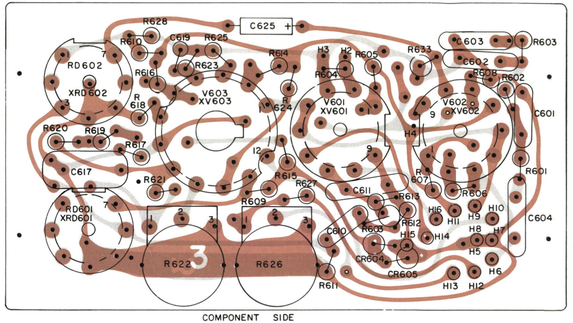


Installation Diagram

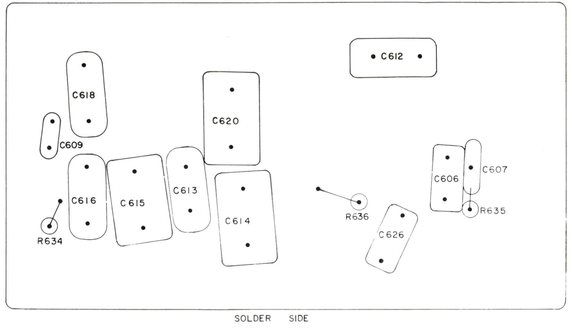
CONTROL FUNCTION MODIFICATION KITS FOR REMOTE CONTROL UNIT MODEL 4EC28A1 AND REMOTE CONTROL PANEL MODELS 4KC7B1, 2

(EE-7352399, Sh. 5, Rev. 3)





COMPONENT SIDE

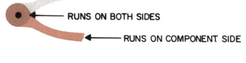


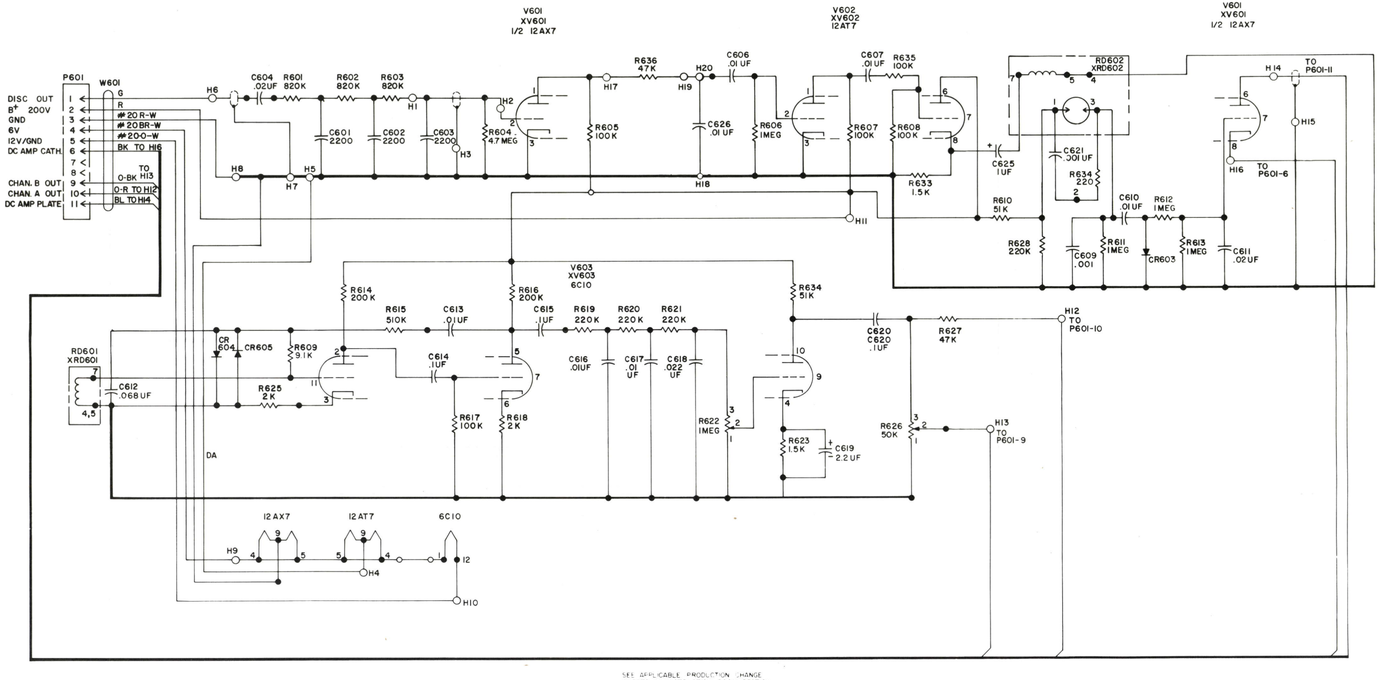
SOLDER SIDE

CHART

FROM	TO	WIRE
XDR602-2	XDR602-1	C621
XDR602-2	XDR602-3	R634
H1	H2	PT. 6
	H3	SH. OF PT. 6
H4	H5	DA
	H10	#16-O
	H7	SHIELD OF 22 SJ-G
	H8	#16-W
W601	H9	#16-BR
	H6	22 SJ-I
	H11	N22-P
	H12	N22-O-R
	H13	N22-O-BK
	H14	22 SJ-BL
	H15	SHIELD OF 22 SJ-BL
	H16	N22-BK

(19C303670, Rev. 3)
(19C303350, Sh. 1, Rev. 3)
(19C303350, Sh. 2, Rev. 3)





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.

ALL RESISTORS ARE 1/2 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.

(19D402208, Rev. 6)

SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

THIS ELEM DIAG APPLIES TO

MODEL NO	REV. LETTER
4EK10B10	C

Service Sheet

PROGRESS LINE REED CHANNEL GUARD
MODEL 4EK10B10

(RC-1065C)

PARTS LIST

CHANNEL GUARD
MODEL 4EK10B10, REV. C
(PL-19B204468-G1)

SYMBOL	G-E PART NO.	DESCRIPTION
		---------- SUBASSEMBLIES ----------
		COMPONENT BOARD ASSEMBLY PL-19C303351-G1
		---------- CAPACITORS ----------
C601 thru C603	7491395-P14	Fixed ceramic disc: .0022 µf ±20%, 500 VDCW.
C604	7491393-P3	Fixed ceramic disc: .02 µf +100% -0%, 500 VDCW; sim to Sprague 1236C1.
C606	19A115028-P107	Mylar® dielectric: .01 µf ±20%, 200 VDCW.
C607	7491393-P2	Fixed ceramic disc: .01 µf +100% -0%, 500 VDCW.
C609	7491395-P9	Fixed ceramic disc: .001 µf ±20%, 500 VDCW.
C610	7491393-P2	Fixed ceramic disc: .01 µf +100% -0%, 500 VDCW.
C611	7491393-P3	Fixed ceramic disc: .02 µf +100% -0%, 500 VDCW; sim to Sprague 1236C1.
C612*	19A115028-P12	Mylar®, epoxy-dipped: .068 µf ±20%, 50 VDCW; sim to Good-All 501PE. Changed by Rev. A.
C613	19A115028-P47	Mylar® dielectric: .01 µf ±20%, 400 VDCW.
C614 and C615	19A115028-P54	Mylar® dielectric: 0.1 µf ±20%, 400 VDCW.
C616 and C617	19A115028-P7	Mylar® dielectric: .01 µf ±20%, 200 VDCW.
C618	19A115028-P9	Mylar® dielectric: .022 µf ±20%, 200 VDCW.
C619	5496267-P13	Tantalum, dry solid: 2.2 µf ±20%, 20 VDCW; sim to Sprague 150D225X0020A2.
C620	19A115028-P54	Mylar® dielectric: 0.1 µf ±20%, 400 VDCW.
C621	5494481-P12	Ceramic disc: .001 µf ±10%, 500 VDCW; sim to RMC Type JF Discap.
C622* and C623*	4029003-P24	Silver mica, dipped phenolic case: .0047 µf ±10%, 300 VDCW; sim to Electro Motive Type DM20. Deleted by REV. C.
C624*	19A115028-P7	Mylar® dielectric: .022 µf ±20%, 200 VDCW. Deleted by REV. C.
C625*	5496267-P17	Capacitor, tantalum: 1.0 µf ±20%, 35 VDCW.
C626*	19A115028-P107	Capacitor, Mylar®: .01 µf ±20%, 200 VDCW.
		---------- RECTIFIERS ----------
CR603	5494922-P4	Silicon; sim to 1N459.
CR604 and CR605	5494922-P1	Silicon; sim to 1N456.
CR606*	5494922-P4	Silicon; sim to 1N459. Deleted by Rev. B.
		---------- RESISTORS ----------
R601 thru R603	3R77-P824J	Fixed composition: 0.82 megohm ±5%, 1/2 w.
R604	3R77-P475J	Fixed composition: 4.7 megohms ±5%, 1/2 w.
R605	3R77-P104J	Fixed composition: 0.1 megohm ±5%, 1/2 w.
R606	3R77-P105J	Fixed composition: 1 megohm ±5%, 1/2 w.
R607	3R77-P104J	Fixed composition: 0.1 megohm ±5%, 1/2 w.
R608*	3R77-P104J 3R77-P105J	Resistor: 100K ohms ±5%, 1/2 watt. In Models earlier than REV. C: Fixed composition: 1 megohm ±5%, 1/2 w.

SYMBOL	G-E PART NO	DESCRIPTION
		---------- SUBASSEMBLIES(Cont'd) ----
		---------- RESISTORS(Cont'd) ------
R609*	3R77-P912J	Fixed composition: 9100 ohms ±5%, 1/2 w. Changed by Rev. A.
R610	3R77-P513J	Fixed composition: 51,000 ohms ±5%, 1/2 w.
R611 thru R613	3R77-P105J	Fixed composition: 1 megohm ±5%, 1/2 w.
R614	3R77-P204J	Fixed composition: 0.2 megohm ±5%, 1/2 w.
R615	3R77-P514J	Fixed composition: 0.51 megohm ±5%, 1/2 w.
R616	3R77-P204J	Fixed composition: 0.2 megohm ±5%, 1/2 w.
R617	3R77-P104J	Fixed composition: 0.1 megohm ±5%, 1/2 w.
R618	3R77-P202J	Fixed composition: 2000 ohms ±5%, 1/2 w.
R619 thru R621	3R77-P224J	Fixed composition: 0.22 megohm ±5%, 1/2 w.
R622	7491365-P106	Variable, carbon film: 1 megohm ±20%, .05 w, non linear taper; sim to CTS Type UPE-70.
R623	3R77-P152J	Fixed composition: 1500 ohms ±5%, 1/2 w.
R624	3R77-P513J	Fixed composition: 51,000 ohms ±5%, 1/2 w.
R625	3R77-P202J	Fixed composition: 2000 ohms ±5%, 1/2 w.
R626	7491365-P7	Variable, carbon film: .05 megohm ±20%, 0.1 w, linear taper; sim to CTS Type UPE-70.
R627	3R77-P473J	Fixed composition: 47,000 ohms ±5%, 1/2 w.
R628	3R77-P224J	Fixed composition: 0.22 megohm ±5%, 1/2 w.
R629* and R630*	3R77-P124J	Fixed composition: 0.12 megohm ±5%, 1/2 w. Deleted by REV. C.
R631*	3R77-P623J	Fixed composition: 62,000 ohms ±5%, 1/2 w. Deleted by REV. C.
R633*	3R77-P152J 3R77-P821K	Resistor: 100K ohms ±5%, 1/2 watt. In Models earlier than REV. C: Fixed composition: 820 ohms ±10%, 1/2 w. Added by REV. B.
R634*	3R77-P221K	Resistor: 220 ohms ±10%, 1/2 watt.
R635*	3R77-P104J	Resistor: 100K ohms ±5%, 1/2 watt.
R636*	3R77-P473J	Resistor: 47K ohms ±5%, 1/2 watt.
		---------- TERMINAL BOARDS ----------
TB1*	7487424-P13	Miniature: phenolic, 4 terminals. Deleted by REV. C.
TB2*	7487424-P8	Miniature: phenolic, 4 terminals. Deleted by REV. C.
		---------- TUBES ----------
V601		Type 12AX7.
V602		Type 12AT7.
V603		Type 6C10.
		---------- CABLES ----------
W601		CABLE ASSEMBLY PL-19B204326-G1
		---------- PLUGS ----------
P601	7478603-P15	Male: 11 contacts, phenolic; sim to Amphenol 6-PM11-11.
		---------- MISCELLANEOUS ----------
		Cable: approximately 8.5 inches, shielded.
		---------- SOCKETS ----------
XRD601 and XRD602	19B201499-P2	Tube: 7 pin, XXXP phenolic; sim to United International Dynamics PCS-7093-0-PHE.
XV601 and XV602	19B201503-P2	Tube: 9 pin, XXXP phenolic; sim to United International Dynamics PCS-9093-0-PHE.

SYMBOL	G-E PART NO	DESCRIPTION
		---------- SOCKETS(Cont'd) ----------
XV603	19B209130-P2	Tube: 12 contacts, glaskyd Grade 772; sim to Alcon Metal Products 370G.
		---------- MISCELLANEOUS ----------
	4039300-P1	Insulator: 0.5 x .01 inches, pressboard. (Used with XRD601 and XRD602).
	4039300-P3	Insulator: 0.875 x .01 inches, pressboard. (Used with XV603).
	4039300-P2	Insulator: 0.625 x .01 inches, pressboard. (Used with XV601 and XV602).
	PL-19A121150-G1	Support Assembly. 4.9 x 2.84 x 1.05 x 0.87 inches, chromate coated steel.
	4032591-P24	Pad: 0.75 x 1 x 0.125 inches, sponge rubber. (Used with RD601 and RD602).
	PL-19A121211-G1	Clamp Assembly. 2.3 x 1.56 x 0.5 x .064 inches, chromate coated aluminum magnesium alloy. (Used with RD601 and RD602).
		---------- RESONANT REED ENCODER ----------
RD601		Reed, governor: frequency range 67 to 1600 cps, temp range -40°C to +100°C, (Coil): 600 ohms ±10%, standard 7-pin tube socket mounting; sim to Security Devices Laboratory J-610.
	3R161-P670	67.0 cps
	3R161-P719	71.9 cps
	3R161-P770	77.0 cps
	3R161-P825	82.5 cps
	3R161-P885	88.5 cps
	3R161-P948	94.8 cps
	3R161-P1000	100.0 cps
	3R161-P1035	103.5 cps
	3R161-P1072	107.2 cps
	3R161-P1109	110.9 cps
	3R161-P1148	114.8 cps
	3R161-P1188	118.8 cps
	3R161-P1230	123.0 cps
	3R161-P1273	127.3 cps
	3R161-P1312	131.2 cps
	3R161-P1365	136.5 cps
	3R161-P1413	141.3 cps
	3R161-P1462	146.2 cps
	3R161-P1514	151.4 cps
	3R161-P1567	156.7 cps
	3R161-P1622	162.2 cps
	3R161-P1676	167.6 cps
		---------- RESONANT REED DECODER ----------
RD602*		Reed, detector: Coil - 600 ohms ±10%, standard 7-pin tube socket mounting. (Used in Models 4EK12A10, 11, 4EJ14A10, 11).
		LO RANGE
	19C307140-P719	71.9 cps
	19C307140-P770	77.0 cps
	19C307140-P825	82.5 cps
	19C307140-P885	88.5 cps
	19C307140-P948	94.8 cps
	19C307140-P1000	100.0 cps
	19C307140-P1035	103.5 cps
	19C307140-P1072	107.2 cps
	19C307140-P1109	110.9 cps
	19C307140-P1148	114.8 cps
	19C307140-P1188	118.8 cps
	19C307140-P1230	123.0 cps
	19C307140-P1273	127.3 cps
	19C307140-P1318	131.8 cps
	19C307140-P1365	136.5 cps
	19C307140-P1413	141.3 cps
	19C307140-P1462	146.2 cps
	19C307140-P1514	151.4 cps
	19C307140-P1567	156.7 cps
		HIGH RANGE
	19C307140-P1318	131.8 cps
	19C307140-P1365	136.5 cps
	19C307140-P1413	141.3 cps
	19C307140-P1462	146.2 cps
	19C307140-P1514	151.4 cps
	19C307140-P1567	156.7 cps
	19C307140-P1622	162.2 cps
	19C307140-P1679	167.9 cps
	19C307140-P1738	173.8 cps
	19C307140-P1799	179.9 cps
	19C307140-P1862	186.2 cps
	19C307140-P1928	192.8 cps
	19C307140-P2035	203.5 cps

SYMBOL	G-E PART NO	DESCRIPTION
		----- RESONANT REED DECODER(Cont'd) -----
		In Models earlier than REV. C:
		Reed, detector: frequency range 67 to 1600 cps, temp range -40°C to +100°C, (Coil): 600 ohms ±10%; standard 7-pin tube socket mounting; sim to Security Devices Laboratory J-610.
	3R160-P670	67.0 cps
	3R160-P719	71.9 cps
	3R160-P770	77.0 cps
	3R160-P825	82.5 cps
	3R160-P885	88.5 cps
	3R160-P948	94.8 cps
	3R160-P1000	100.0 cps
	3R160-P1035	103.5 cps
	3R160-P1072	107.2 cps
	3R160-P1109	110.9 cps
	3R160-P1148	114.8 cps
	3R160-P1188	118.8 cps
	3R160-P1230	123.0 cps
	3R160-P1273	127.3 cps
	3R160-P1312	131.2 cps
	3R160-P1365	136.5 cps
	3R160-P1413	141.3 cps
	3R160-P1462	146.2 cps
	3R160-P1514	151.4 cps
	3R160-P1567	156.7 cps
	3R160-P1622	162.2 cps
	3R160-P1676	167.6 cps

PRODUCTION CHANGES

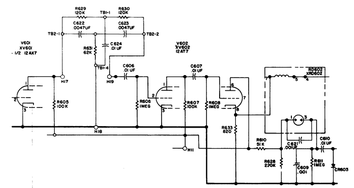
(Refer to Parts List for description of parts affected by these revisions.)

REV. A — To increase frequency stability changed C612 and R609.

REV. B — To eliminate reed overdrive which causes excessive bandwidth, Replaced CR606 with R633.

REV. C — To permit use of improved decoder reed 19C307140.
Deleted notch filter R629, R630, R631, C622, C623, C624, and TB1 and TB2.
Added low-pass filter R636 and C626.
Changed R608, R633 and RD602. Added R634, R635 and C625.

Circuit was:



GENERAL INFORMATION

The following information has been included to assist the customer and serviceman in the use of this instruction book.

PRODUCTION CHANGES

From time to time, changes are made to the production equipment described in this book, either to improve performance or to simplify the circuits. Any change made on a production unit will be assigned a Revision Letter, which will be stamped after the model number or PL number on the nameplate or on the chassis. A Revision Letter system is used as a means of identifying equipment and recording the changes made. Any given revision will always include all previous revisions.

A Production Change Sheet is located at the front of the section of the instruction book covering a unit that has been revised. This sheet lists the changes in the instruction book necessitated by each revision made on the unit. The Production Change Sheets should be used for checking and/or correcting instructional material to correspond with the revision/s of the equipment being serviced.

REPLACEMENT PARTS

A list of all principal replacement parts for each unit of this equipment is included in the section of the book covering the unit. The symbol numbers used are the same as those appearing on the elementary diagram and other drawings. Replacement parts may be obtained from authorized G-E Service Stations or ordered through any G-E Communications Equipment District Sales Office. When ordering a part, please include the symbol number, description, and drawing number of the part and the model or PL number and revision letter stamped on the unit.

SAFETY NOTICE

Since the use of high voltages is necessary for the successful operation of the equipment described in this instruction book, certain reasonable precautions must be carefully observed by the operating personnel during the installation, operation and maintenance of the equipment.

Although every practicable safety measure has been incorporated in this equipment, the following rule must be strictly observed:

WARNING

Under no circumstances should any person be permitted to handle any portion of the equipment that is supplied with high voltage, or to connect any external apparatus to the units while the units are supplied with power. KEEP AWAY FROM LIVE CIRCUITS.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the nearest General Electric Company District Sales Office.

COMMUNICATION PRODUCTS DEPARTMENT
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