2-WAY MOBILE RADIO

MAINTENANCE MANUAL

FOR

TRANSISTORIZED PROGRESS LINE CONTROL UNIT

SPECIFICATIONS

Type	EC-37-A
Description	Control Unit for Front or Split Mount Transistorized Progress Line Two-Way Mobile Radios
Used With	Transistorized Progress Line Transmitters and Receivers
Controls	STBY-ON-OFF Switch SQUELCH Control VOLUME Control Accessory Control (such as Channel-Selector Switch for two-frequency operation)
Indicators	Transmitter Filaments On Light (green) Transmit Light (red)

40093

GENERAL ELECTRIC

CONTENTS

ILLUSTRATIONS

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 the 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.

GENERAL ELECTRIC
TRANSISTORIZED PROGRESS LINE
CONTROL UNIT MODEL 4EC37A10

INTRODUCTION

Control Unit Model 4EC37A10 is designed for use with Transistorized Progress Line Two-Way Radios. The Control Unit mounts on the Front Section of the radio and includes all controls for operating the radio. Cable Connections to the Speaker-Amplifier, the Solenoid Assembly, the Microphone, and any external options are made to jacks beneath the Control Unit. All connections to units mounted in the Front Section of the Two-Way Radio are made by means of quick-disconnect plugs on wires from the back of the Control Unit.

Instructions for adjusting the SQUELCH and VOLUME controls are included in the OPERATOR'S MANUAL for the Radio.

CIRCUIT DESCRIPTION

The position of the STBY-ON-OFF switch (S701) determines whether or not the transmitter and receiver are operative. In the OFF position all power is removed from the TWO-WAY Radio. Turning the switch to STBY (standby) applies power only to the receiver.

In vehicles in average commercial use, it is entirely feasible to leave the receiver operating continuously on STBY due to the extremely low battery drain. Ignition switch control can therefore be eliminated, if the switch is turned to STBY whenever the engine is turned off.

OLD CIRCUIT (Figure 1)

The old muting circuit is present in receivers using Audio Boards Model 4EA10A10, Revision T and earlier, or 4EA10B10 Revision A or earlier. Note that the receiver draws current through the solenoid. Due to the small amount of current and the low resistance of the solenoid, the relay does not pull in while the receiver is operating.

Turning the STBY-ON-OFF switch to ON applies filament voltage to the tubes in the transmitter, activates the push-to-talk (PTT) circuit, and lights the green pilot light. After a short warm-up time, the PTT button on the microphone may be pressed to key the transmitter. Notice that pressing the PTT switch shorts the voltage across the receiver, muting the receiver, energizing the solenoid, and lighting the red pilot light. As the solenoid contactors close, they apply power to the power supply, which, in turn, supplies B-plus and bias voltages to the transmitter, placing the transmitter on the air.

NEW CIRCUIT (Figure 2)

The new muting circuit is present in receivers using Audio Assembly Model 4EA10A10, Revision U or later, and in Audio Assembly 4EA10B10, Revision C or later. The new circuit was required to permit the use of the tinsel-cord microphone Model 4EM18D10. The additional resistance in the microphone cord would not completely short the voltage across the receiver if the old mute circuit was used. With approximately 4 volts remaining across the receiver, the receiver would not be completely cut off (muted) when the transmitter was keyed. With the new muting circuit, power is continuously across the receiver while the unit is on. This makes the receiver self-netting.

Turning the STBY-ON-OFF switch to ON applies filament voltage to the tubes in the transmitter, activates the push-to-talk (PTT) circuit, and lights up the green pilot light. After a short warm-up time, the PTT button on the microphone may be pressed to key the transmitter. Pressing the PTT switch changes the voltage of the muting circuit from negative to positive. This positive voltage cuts off an audio stage, muting the receiver. At the same time, it energizes the solenoid and lights the red pilot light. When the solenoid contacts close, power is applied to the power supply, which provides B-plus and bias voltages for the transmitter, putting the transmitter on the air.

CONTROLS

SQUELCH and VOLUME control potentiometers for the receiver are also located on the Control Unit. The fourth control knob is not operative unless used to control an option, such as a two-frequency transmitter and/or receiver. For two-frequency operation, the knob controls the Channel-Selector Switch for selecting the channel desired for transmitting and/or receiving. The switch connects the emitter of the selected transmitter oscillator or the receiver first oscillator to the positive side of the supply voltage, so that the unit will operate on the frequency determined by that crystal-controlled oscillator.

MAINTENANCE

Access to the inside of the Control Unit for replacing pilot lamps, etc., is obtained by removing a screw at each side of the frame and pivoting the front casting outward on the spring clips. This procedure is illustrated in the SYSTEM MAINTENANCE INSTRUCTIONS for the Two-Way Radio.

TPL POWER-DISTRIBUTION DIAGRAMS

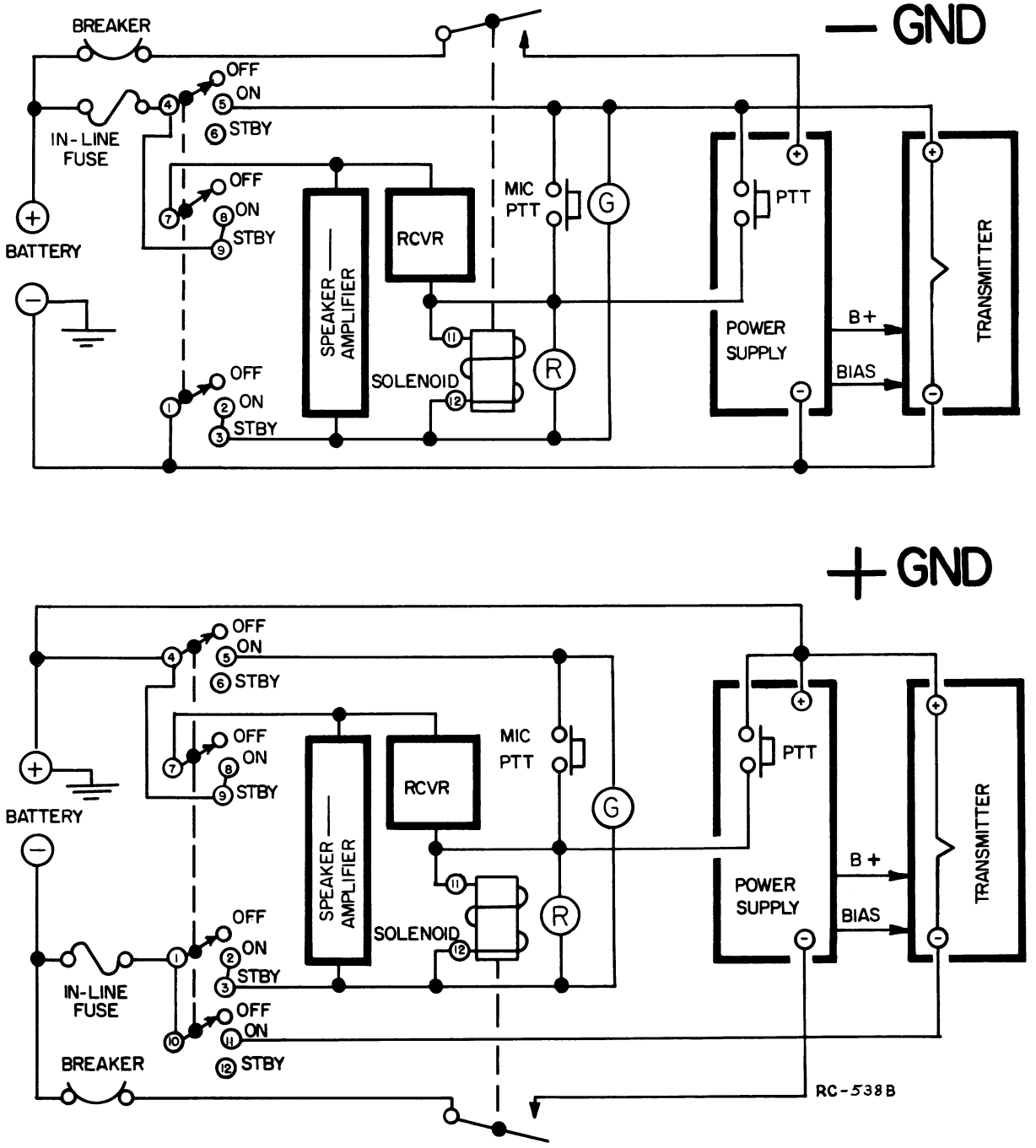
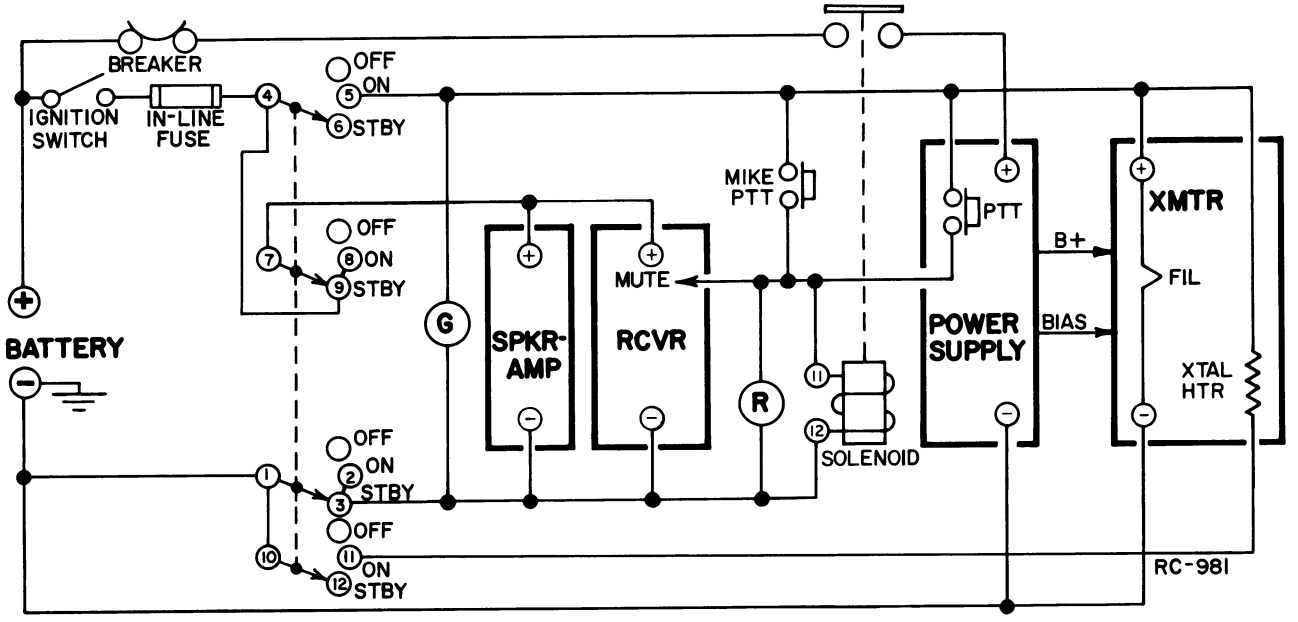


Figure 1 - TPL Power Distribution Diagram with Old Muting Circuit

TPL FRONT-MOUNT POWER-DISTRIBUTION DIAGRAM

NEGATIVE GROUND



POSITIVE GROUND

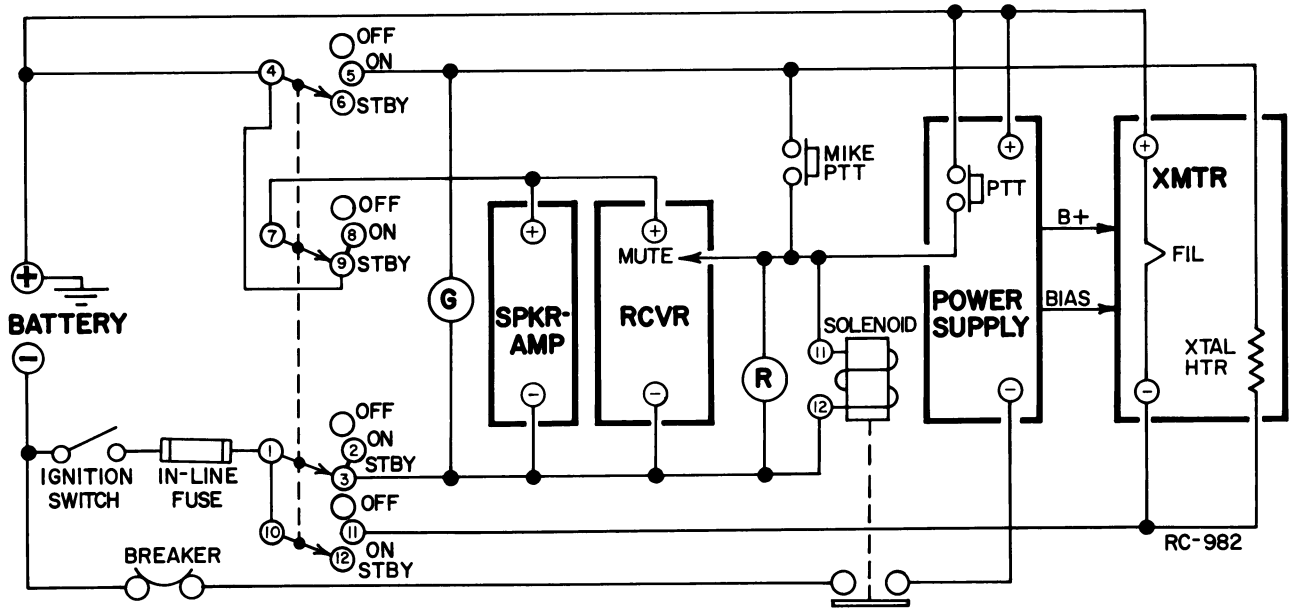
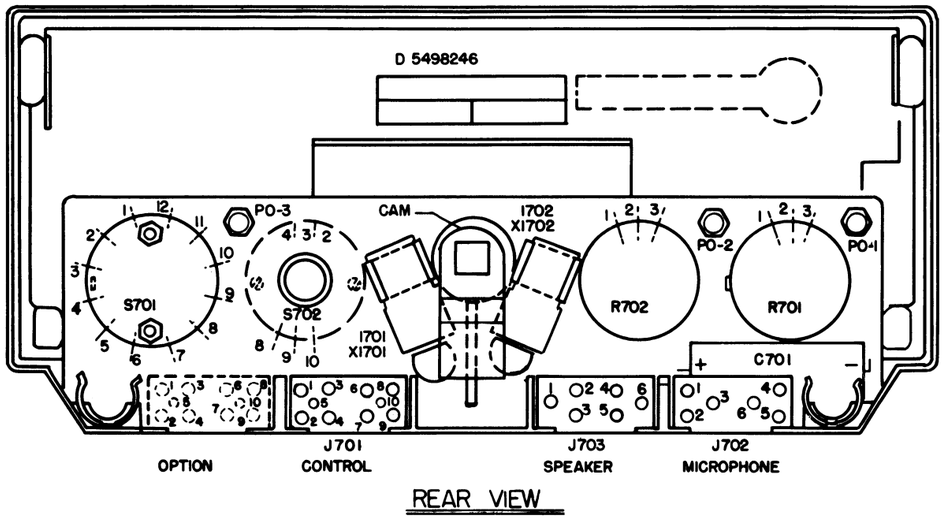
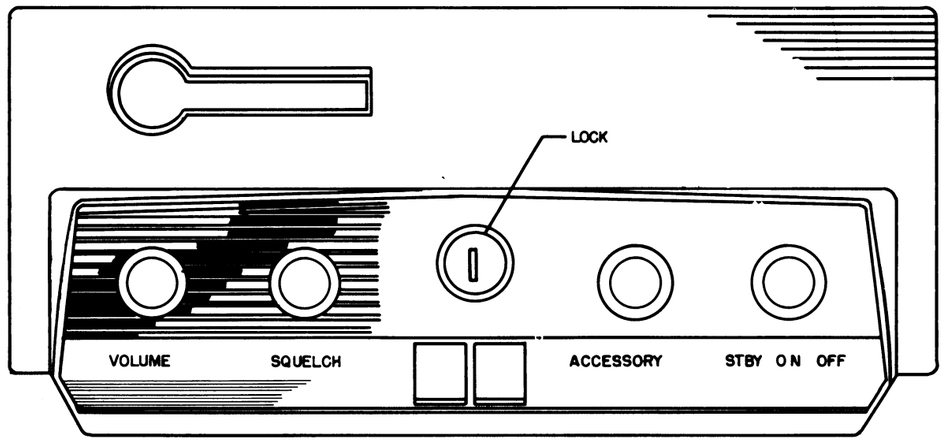


Figure 2 - TPL Power Distribution Diagram with New Muting Circuit.

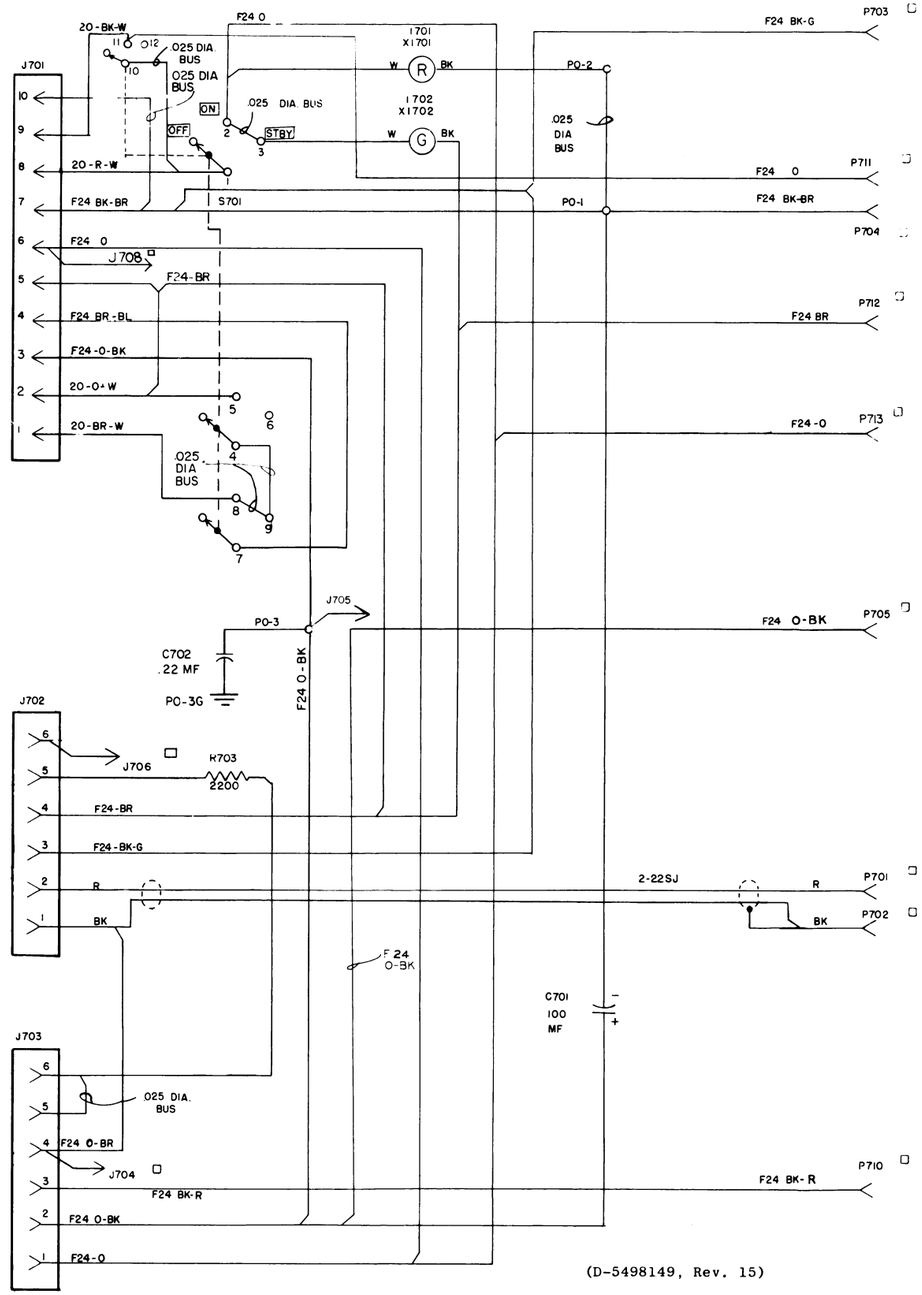


REAR VIEW

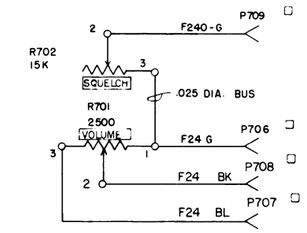


FRONT VIEW

(C-5495693, Rev. 0)



(D-5498149, Rev. 15)



ALL RESISTORS ARE IN OHMS AND ARE HALF WATT UNLESS OTHERWISE SHOWN.
K = 1000 OHMS

ALL CAPACITORS ARE IN MICROMICROFARADS
MF = MICROFARADS

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.

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
4EC37A10	L

40093

Service Sheet

TPL CONTROL UNIT
MODEL 4EC37A10; REV. L

(RC-987)

PARTS LIST
FOR
TRANSISTORIZED PROGRESS LINE CONTROL UNIT

MODEL 4EC37A10, REV. L

SYMBOL	DESCRIPTION	G-E DRAWING & PART NO.
	CAPACITOR	
C701	Electrolytic, miniature, hermetically sealed in metal tube; 100 mfd +100% -15%, 25 v d-c w. Sprague Cat. #30D188A1.	B-7489483-P18
C702#	≠ Mylar, dielectric; 0.22 µf ±20%, 100 VDCW. Good-All Electric Co Type 663-UW. Added by Rev. E.	B-7491930-P10
	INDICATING DEVICES	
I701 and I702	G-E Type 53 Lamp.	
	JACKS AND RECEPTACLES	
J701	Connector: 10-pin, male, black phenolic. Component Mfg Service Part No. 6601-CM10.	B-5495345-P2
J702	Connector: 6-pin, female, black phenolic. Component Mfg Service Part No. 6601-CF6.	B-5495345-P3
J703	Connector: 6-pin, male, black phenolic. Component Mfg Service Part No. 6601-CF6A.	B-5495345-P4
J704	Jack formed from 1/2" of AWG #18 wire on J703-4.	
J705	Jack formed from 1/2" of AWG #18 wire on PO-3.	
J706	Jack formed from 1/2" of AWG #18 wire on J702-6.	
	PLUGS	
P701 thru P713	Terminal: 1-pin, female, for .093" pin. Amp Inc Cat. #47745.	A-4029840-P1
	TERMINAL POSTS	
PO-1 thru PO-3	Standoff Terminal.	A-7143206-P1
	RESISTORS	
R701	Potentiometer, composition, for push-on knob; 2500 ohms ± 20%, mod. log taper. Similar to Allen Bradley Type J.	B-5491971-P2
R702	Potentiometer, composition, for push-on knob; 15,000 ohms ±20%, linear taper. Similar to Allen Bradley Type J.	B-5491971-P1
R703	Composition, 2200 ohms ± 10%, 1/2 w.	C-3R77-P222K
	SWITCHES	
S701	Switch, Rotary: 4-pole, 3-position. Oak Mfg Co. Type F.	C-5495227-P4
S702	Switch, Rotary: 1-section, 2-pole, 2-position, non-shorting type contacts. Similar to Oak Mfg Co. Type A. (Part of 2-Freg. Switch Kit)	C-5495454-P1
	SOCKETS	
XI701 and XI702	Lamp sockets, similar to Drake Mfg Co. miniature bayonet socket with plastic insulating sleeve, 6-inch leads.	A-4032220-P1
	MISCELLANEOUS MECHANICAL PARTS	
	Jewel: red Plexiglas. (R)	A-4031265-P1
	Jewel: green Plexiglas. (R)	A-4031265-P2
	Knobs: red-orange, for flatted shaft.	C-5495256-P1
	Lock Components:	
	Lock	B-5491682-P2
	Cam	A-4032757-P1
	Key Set	B-5491682-P4

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PRODUCTION CHANGES

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

REV. A & B - These revisions were value improvements incorporated into original production.

REV. C - To assure RF grounds. Added contact strip to allow ground connection between phono connector and control unit.

REV. D - To eliminate "mid-air" connection when unit is used with "Channel Guard". Lead from R703 which was connected to J702-6 is now connected to J703-6.

REV. E - To reduce possibility of broadcast signal intermodulation.
Change:
Added C702 between PO-3 and PO-3G (Grd).

REV. F - Deleted contact strip between phono connection and control unit.

REV. G - To adapt TPL control head for use with the 4EM18B10 microphone. Delete circuit between J702-6 and J702-5.

REV. H - To eliminate polarity reversal at P711 when unit is placed on standby in positive ground system.
Change: Removed F24-0 wire between No. 3 Terminal (STBY) on S701 and P711. Connect F24-0 wire from P711 to No. 11. Terminal of S701.

REV. J - To allow option operation in standby.
Change: Add wire from J701-6 to J708 when unit is equipped with either secode or tone squelch option.

REV. K - To reduce alternator interference in TPL receiver.
Change: Delete 0-BK F24 wire from P705 to PO-3
Add 0-BK F24 wire from P705 to J703-2

REV. L - To increase reliability of control connector J701 by paralleling contacts. Removed wire from Pin No. 10 and connected to Pin No. 7. Ran jumper from Pin 19 to Pin 7. Removed wire from Pin 5 and connected to Pin 2. Ran jumper from Pin 5 to Pin 2.