COMMUNICATIONS

MAINTENANCE MANUAL

MODEL 4EC76A14 CONTROL PANEL (FOR MULTI-STATION CONTROL)

SPECIFICATIONS *

Audio Output	
Speaker	Greater than 10 watts, less than 1-1/2% distortion @ 5 watts, 117 VAC, -15% +20%.
Line	+16 dBm maximum with less than 1-1/2% distortion, with compression, 117 VAC -15% +20%.
Frequency Response	
Model 4EC76A14	+1/2 to -3 dB, 200 to 10,000 Hz, reference 1000 Hz.
Compression Range	With audio input increase of 30 dB beyond start of compression, output level increases less than 3 dB.
Power Requirements	65 watts, 117 VAC, 50/60 Hz.
Input & Output Impedance	600 ohms
Temperature Range	-30°C to +60°C (-22°F to +140°F)

*These specifications are intended primarily for the use of the serviceman. Refer to the appropriate Specification Sheet for the complete specifications.

GENERAL ELECTRIC

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OPTION	EQUIPMENT
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5128	Receiver Mute
5130	Supervisory Control
5145	12/24-Hour, 60-Hz Clock
5146	12-Hour, 50-Hz Clock
5147	12/24-Hour, 50-Hz Clock
5155	Tone Alert
5160	VU Meter
5161	Intercom
5166	Repeat Disable & Channel Guard

WARNING

No one should 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.**

DESCRIPTION

General Electric Control Panel Model 4EC76A14 is designed for use in the turret center section of a Radio Control Center. Electrical components are mounted on a 19-inch drawer-type chassis which can easily be removed from the turret to facilitate maintenance and servicing. The panel provides pushbutton selection of remote control functions on up to 6 base stations by changing the level and polarity of DC control currents.

Printed circuit board techniques, silicon transistors and other solid state devices are designed into the basic modules of the panel to assure maximum reliability. The audio section of the panel contains a compression-amplifier for equalizing audio output levels over a wide range of microphone and line input levels. When sending messages, the compression-amplifier helps compensate for variations in speech levels. When receiving messages, the compression-amplifier prevents speaker "blasting" caused by variations in the input signal levels from stations or paralleled control equipment. A compression-amplifier accessory is available for use with the 4KC16A10 Remote Control Panel (at the base station) for simplifying or eliminating line level settings in parallel operations.

External control connections are made to the panel at TB801. Power cable W801 connects to AC power through a convenience outlet on the console turret. Switch S801 on back of the panel chassis turns power ON and OFF.

Table 1 lists options which are available to meet different requirements of individual two-way radio systems.

ADJUSTMENT

Before adjusting the control panel, make sure that all AC power lines, phone lines and ground connections have been completed at the control panel location and the base station. Also, the base station should have been properly aligned, and the station VOLUME control (R511 on the EP-38-A in MASTR stations) set for not more than 6 volts RMS at the audio pair with maximum system deviation at 1000 Hz applied to the base station receiver antenna jack.

LINE INPUT

The LINE INPUT has been adjusted at the factory for an input of 180 millivolts RMS (-12 dBm) for threshold of compression. Use of excessive compression will accent background and line noise during pauses in transmission.

PROCEDURE:

1. Feed a 1000-Hz signal onto the audio pair from the source with the largest line loss (this may be the base station or another console). Adjust the audio generator output to the maximum

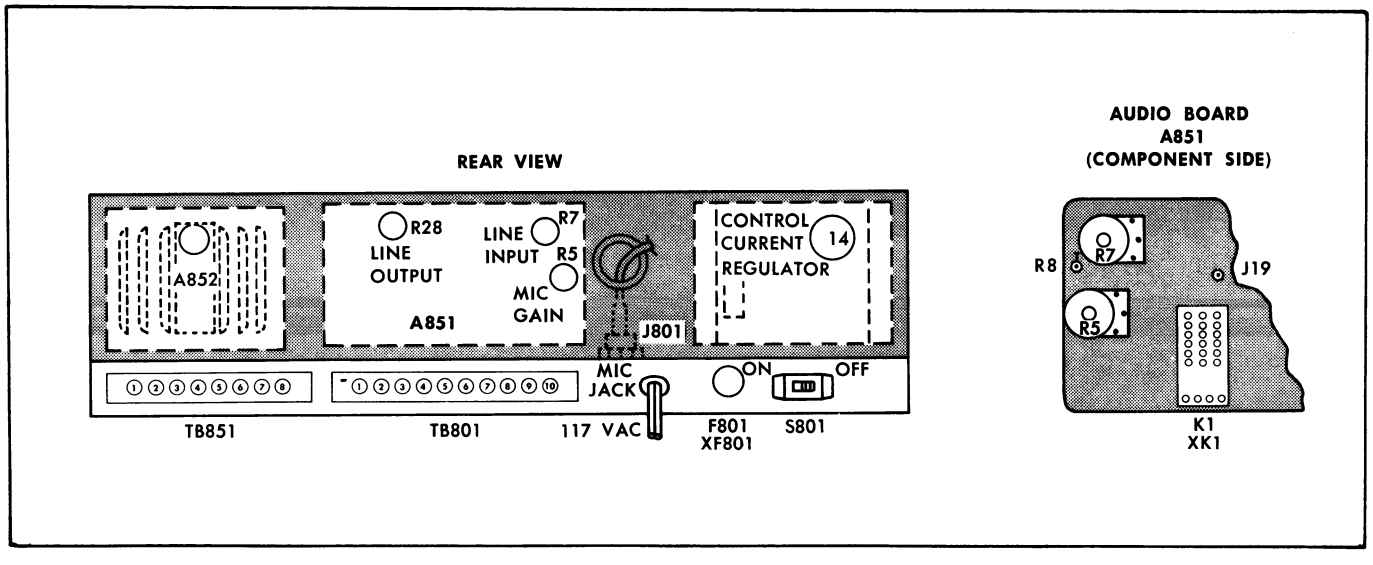


Figure 1 - Control Panel Adjustments

allowable amplitude (up to +16 dBm).

2. Press the Station Select Switch for the line being used.

3. Adjust LINE INPUT control R7 on A851 for the threshold of compression as indicated by the line between the red and green area on the Compression Meter, or by a reading of 0.4 volt DC on a 20,000 ohm-per-volt meter connected from A851-J19 to ground.

RELEASE TIME FOR COMPRESSOR

The release time of the compressor-amplifier circuit (on audio board A851) is the time required for the unit to restore full gain after an input signal that has driven the unit into compression is removed.

The release time is determined by the value of R25 which was selected at the factory for average operating conditions. When overall system requirements indicate that a shorter release time is needed, R25 may be replaced with a different value resistor as shown in Table 2.

Table 2-Compressor Release Time

Value of R25	Release Time
100K-ohms (standard)	2 seconds
27K-ohms	1 second
16K-ohms	0.5 second

Reducing the release time, however, will result in an increase in background noise picked up during pauses in transmission.

MIC GAIN

The MIC GAIN control (R5) has been adjusted at the factory according to the type of microphone ordered with the control equipment. Setting R5 for excessive compression will accent background noise during pauses in transmission.

Procedure:

1. Key the microphone and speak into it from a normal distance (12 to 15 inches for the desk or swinging arm microphone).

2. Adjust MIC GAIN control R5 on A851 for threshold of compression as indicated by the compression meter or by a reading of 0.4 volt DC on a 20,000 ohm-per-volt meter connected from A851-J19 to ground.

LINE OUTPUT

The control panels have been set at the factory for maximum line output of 4.8 volts RMS (+16 dBm). The line output may be reduced when required by local telephone company regulations or whenever line losses and noise pickup permit an adequate signal-to-noise ratio.

PROCEDURE:

1. Select the line with the greatest loss by pressing the appropriate Station Select Switch.

2. Feed a 1000 Hz, 30-millivolt signal onto pins 1 and 2 of microphone jack J801.

3. Connect an AC-VTVM across the audio pair selected. Use a 0.5-mFd capacitor in series with the meter if DC is being simplexed line-to-line.

4. Adjust LINE OUTPUT control R28 for the maximum allowable level (up to +16 dBm).

NOTE

If the selected station has parallel control consoles, adjust the LINE LEVEL to maximum (up to +16 dBm) at the control point that is farthest from the station. When no compressor is used at the station, adjust all other parallel control consoles to produce the same level at the station as the first console. When a compressor is used at the station, it is still desirable to adjust each console to produce the same level at the station. However, if line losses do not allow this, adjust the line level at each console to just produce threshold of compression at the farthest control point from the console being adjusted.

CONTROL VOLTAGES

Two-Frequency Transmit

1. Select the control pair with the greatest line loss by pressing the associated Station Select Switch.

2. Connect a DC milliammeter in series with the control line (positive lead of meter to TB801-5).

3. Select XMIT 1. Key the transmitter and set CONTROL CURRENT regulator R14 for 6 milliamps.

Two Separate Receivers or Receiver with Search-Lock Monitor

1. Select the control pair with the greatest line loss by pressing the associated Station Select Switch.

2. Connect a DC milliammeter in series with the control line (negative lead of meter to TB801-5).

3. Push in RECEIVER 1 push button and set R14 for 6 milliamps.

Channel Guard

1. Select the control pair with the greatest line loss by pressing the associated Station Select Switch.

2. Connect a DC milliammeter in series with the control line (positive lead of the meter to TB801-5).

3. Push in the CHANNEL GUARD MONITOR switch and adjust the CONTROL CURRENT regulator R14 for 6 milliamps.

SPEAKER-AMPLIFIER BIAS CONTROL

BIAS ADJ control R5 on A852 is pre-set at the factory and should not require further adjustment. However, if adjustment is necessary, use the following procedure.

1. Disconnect the wire from J3 and insert a milliammeter in series with J3 and the wire.

2. With no signal input, adjust BIAS ADJ control for 20 milliamps.

TONE ALERT OSCILLATOR (Option 5155)

The Tone Alert Oscillator has been adjusted at the factory to provide 2 volts RMS output and should not require readjustment. If adjustment is necessary, use the following procedure.

1. Remove the control panel from the console turret and set panel on its side to expose the Tone Alert Oscillator Board.

2. Connect an AC-VTVM across audio pair TB801-1 and -2.

3. Press the TONE pushbutton.

4. Adjust R8 on the Tone Alert Oscillator Board for a meter reading of 2 volts RMS (or less when required by local regulations).

SETTING THE CLOCK

To set the clock, turn power OFF. (This may be done by unplugging the control panel line cord from the AC receptacle in the turret, or by operating the main power switch S1 on the desk console.) Turn the indicator wheels in either direction until the correct time shows in the window, then turn power ON.

CIRCUIT ANALYSIS

The control panel circuitry consists of audio amplifier stages, a self contained power supply, and controls and indicator lights.

Audio circuits consist of audio board A851, speaker-amplifier A852 and two PA transistors (Q851 and Q852) mounted in a heat sink on the control panel chassis.

The power supply provides the control currents for the switching functions, and the supply voltages for the audio stages, relay and indicator lights.

The VOLUME control, push-button switches, indicator lights, clocks and meters mount on the front of the control panel.

For ease of adjustment, the LINE INPUT, LINE OUTPUT and MIC GAIN controls are adjusted through holes in the back panel. Instructions for setting the controls are contained in the Adjustment Procedure Section.

AUDIO BOARD A851

Audio board A851 is used as a mike-to-line amplifier in the transmit or intercom mode, and as a line-to-speaker amplifier in the receive mode. A simplified switching diagram is shown in Figure 2.

Transmit Mode

Pressing the TRANSMIT switch energizes relay K1, which mutes the loudspeaker and applies audio from the common-emitter preamplifier (Q1) through MIKE GAIN control R5 to the compressor-amplifier (Q2 through Q7). The output of the compressor-amplifier is connected through LINE OUTPUT control R28 and contacts of K1 to class A audio amplifier Q9. A temperature compensating thermister (RT2) keeps the audio level to Q9 constant over wide variations in temperature. The output of Q9 is coupled through line matching transformer T802 to the audio pair.

Receive Mode

Incoming audio is coupled through line-matching transformer T802 to audio board A851. The audio input (from J17) is connected through the normally closed relay

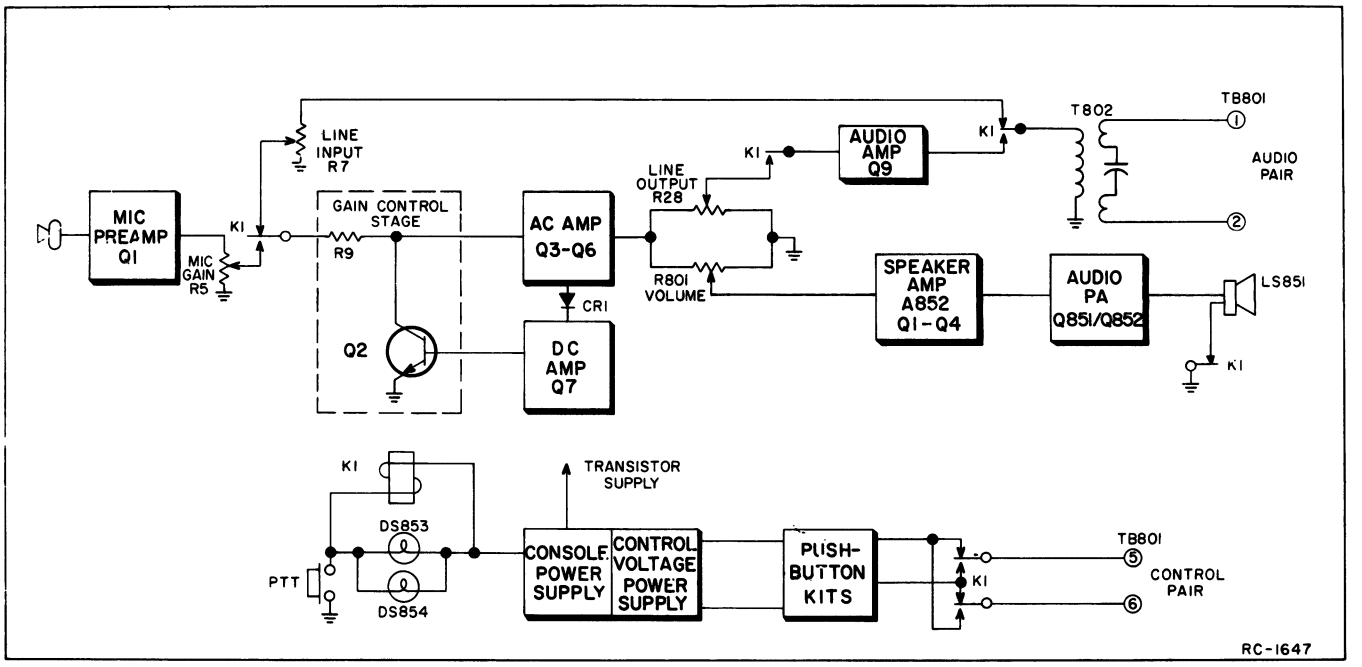


Figure 2 - Block Diagram of Model 4EC76A14 Control Panel

contact to LINE INPUT control R7, and then to the compressor-amplifier. Following the compressor-amplifier the audio is connected to speaker-amplifier A852.

Compressor-Amplifier

The compressor-amplifier circuit consists of gain control stage Q2, high gain audio amplifiers Q3 through Q6, and DC amplifier Q7.

When audio is applied to the compressor-amplifier, resistor R9 and the AC impedance of transistor Q2 act as a voltage divider for the AC input signal. The output of Q2 is amplified by a four stage, direct-coupled amplifier (Q3 through Q6). Both AC and DC feedback in the amplifier circuit provides for extremely stable operation.

One portion of the amplified output is fed through line output control R28 to audio amplifier Q9 (in the transmit mode) or through VOLUME control R801 to speaker-amplifier A852 (in the Receive Mode). The remaining portion is rectified by detector CR1, filtered by C8 and amplified by DC current amplifier Q7. This DC output is fed-back to the base of gain control transistor Q2.

The amount of DC feedback to the gain control stage determines the AC impedance of Q2. When the input level rises, the AC amplifier output starts to increase. The output is detected, amplified, and fed back to the base of Q2. The increase in feedback reduces the AC impedance of Q2 which decreases the audio voltage to the AC amplifier, keeping the amplifier output constant.

When the audio input decreases, the output of the AC amplifier starts to decrease, reducing the feedback to Q2. This raises the AC impedance of Q2 and increases the audio voltage to the AC amplifier, keeping the amplifier output constant.

SPEAKER AMPLIFIER

The speaker-amplifier consists of Q1, Q2, Q3 and Q4 mounted on a printed board (A852) and power transistors Q851 and Q852 mounted on a separate heat sink. The input audio signal at J1 is applied to the base of Q1. The output of Q1 is applied to driver transistors Q3 and Q4 and then to power amplifiers Q851 and Q852. The amplified output at J2 of A852 is connected to the speaker high lead by means of jumpers on TB801.

Q2 provides a slight forward bias to the base circuit of driver transistors Q3 and Q4 to prevent cross-over distortion. The bias is controlled by R5 which is set at the factory for optimum circuit performance (refer to the Adjustment Section).

POWER SUPPLY

Turning OFF-ON switch S801 to the ON

position applies 117 volts AC to the primary of power transformer T801. The primary is fused by F801. The power supply contains two rectifier circuits in the secondary of T801 to provide control and operating voltages for the control panel.

Full-wave bridge rectifiers CR801 through CR804 supply the control current. R806 is a bleeder resistor for filter capacitor C801. The output is connected to TB802 for application of the push-button switch kits.

Full-wave rectifiers CR805 and CR806 supply four operating voltages for the transistorized audio stages, indicator lights and switching relay. Two unregulated voltages operate the indicator lamps, relay K1 and supply the audio driver and final audio amplifier circuits. Two regulated outputs supply the AC and DC amplifiers and microphone preamplifier. The voltage regulator consists of C804, R804 and zener diode VR801.

CONTROL CIRCUITS

Through the use of accessory kits and options, the control panel can perform a maximum of five different control functions. This is accomplished by applying two different levels and polarities of control current to activate up to four relays on the station remote control panel. The control current required to select each function is listed in Table 3. Instructions for setting control currents are given in the Adjustment Procedure Section.

Single Frequency Transmit and Receive

When no accessory kits or options are used, the control panel provides a single, non-regulated DC control output of approximately 6 milliamps into a 7,500 ohm load (the equivalent of a 2,500 ohm line in series with a 5,000 ohm station control panel).

Table 3 - Control Current and Function Chart

FUNCTION	CURRENT AT TB801-5 (relative to TB801-6)				
	0	+6ma	+15ma	-6ma	-15ma
One Frequency Transmit and 1 Frequency Receive (P)	Receive	Transmit			
Two Frequency Transmit and 1 Frequency Receive (P)	Receive	Transmit (Tx-F1)	Transmit (Tx-F2)		
One Frequency Transmit and 2 Frequency Receive	Receive (Rx-F1)	Transmit		Receive (Rx-F2)	
Two Frequency Transmit and 2 Frequency Receive	Receive (Rx-F1)	Transmit (Tx-F1)	Transmit (Tx-F2)	Receive (Rx-F2)	
One Frequency Transmit and SLM or 2 Separate Receivers	Receive (Rx-F1 & F2)	Transmit		Receive (Rx-F1)	Receive (Rx-F2)
Two Frequency Transmit and SLM or 2 Separate Receivers	Receive (Rx-F1 & F2)	Transmit (Tx-F1)	Transmit (Tx-F2)	Receive (Rx-F1)	Receive (Rx-F2)
One Frequency Transmit and Receive with Channel Guard (P)	Channel Gd. Receive	Monitor (noise squelch)	Transmit		
Repeater Disable (Option 5126)	Receive	Transmit		Repeater Disable	
Repeater Disable & Channel Guard (Option 5166)	Channel Gd. Receive	Monitor (noise squelch)	Transmit	Repeater Disable	Repeater Disable & Monitor (noise squelch)

NOTE

Only those functions followed by the symbol (P) can be used in parallel consoles.

Multi-Frequency Switching

Whenever two polarities are required for switching functions, connections from the power supply to the control pair are transposed by the push-button switch kit and relay K1 as shown in Figure 3.

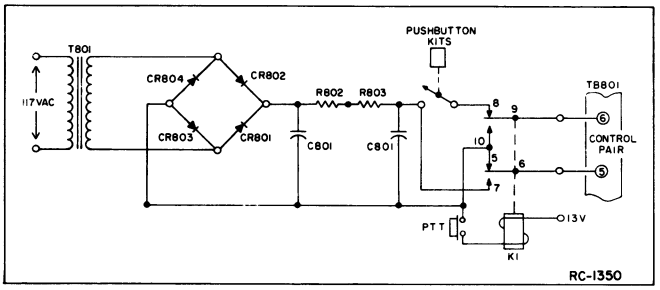


Figure 3 - Simplified Polarity Switching Diagram

When two levels of the same polarity are required, a high voltage regulator and an adjustable current regulator are provided in the power supply circuit as shown in Figure 4.

The high voltage regulator stabilizes the output of the control panel at 125 volts DC. This is to comply with the telephone company regulations which require a maximum line-to-ground voltage of 135 volts DC.

The current regulator compensates for the different loads encountered in multi-station control. This circuit stabilizes the low level control current output at 6-mA to assure proper pickup of the 6-mA relay, as well as the dropout of the 15-mA relay at the station control panel. The high level control current is not adjustable, since the 15-mA relay will operate satisfactorily at levels above 15-mA.

Channel Guard

In standard Channel Guard applications, the CHANNEL GUARD MONITOR switch is located on the front panel. In addition, a high voltage regulator (Q1) and a current regulator (Q2) are used. The current regulator is set for 6 mA and compensates for the different line resistances encountered in multi-station control. A current detector circuit (CR2, R13, R15 & Q4) is incorporated into the regulator to prevent current from soaring when several control consoles are operated in parallel.

When the CHANNEL GUARD MONITOR push-button switch is not depressed, bias for the current regulator is grounded through contacts 1 and 2 of the switch, and no control current is applied to the control pair. This selects Channel Guard operation at the base station, and only those transmissions coded by the proper Channel Guard tone will be heard at the control panel.

Pressing the CHANNEL GUARD MONITOR push-button, removes the ground on the current regulator, and applies 6 milliamps to the control pair. This disables the station Channel Guard, so that the transmission on the receiver frequency can be heard. Pressing the TRANSMIT button applies 15 milliamps to the control pair to key the transmitter.

When an optional 4EM28B10 microphone is used, the station can be monitored by

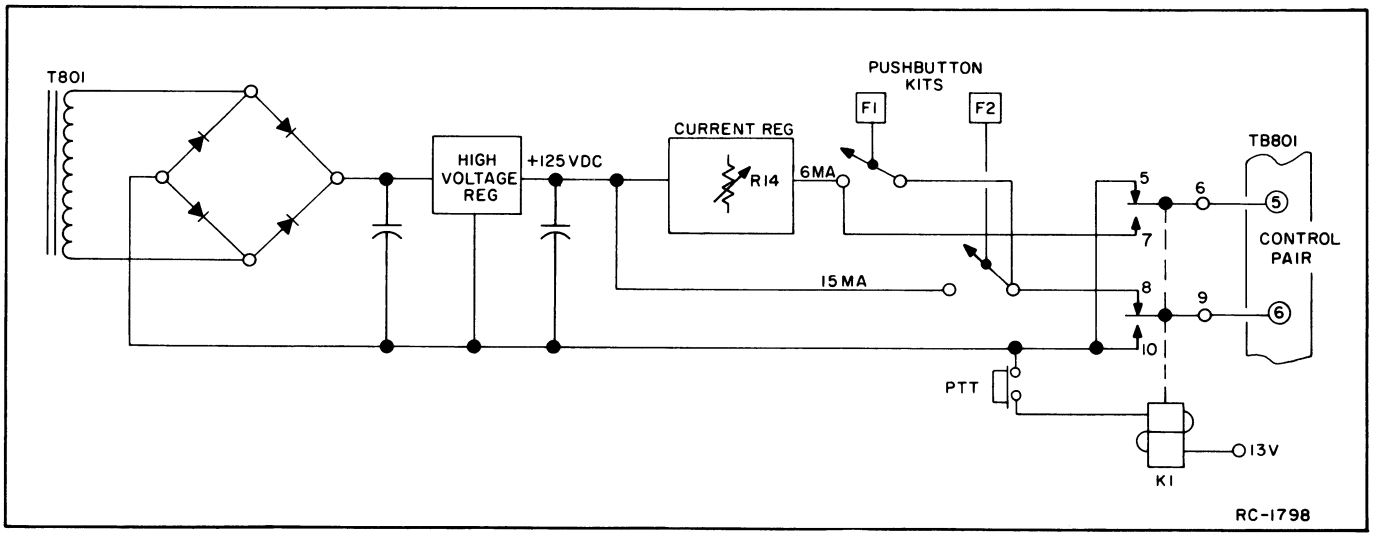


Figure 4 - Simplified Control Current Switching Diagram

pressing the MONITOR button on the microphone.

Remote/Repeater Control

In Remote/Repeater applications, the station transmitter may be keyed by either an incoming RF signal (repeater operation), or by a control current from the control panel. Two different methods may be employed to give the dispatcher priority over repeater operations.

1. Without Repeater Disable Option: When the Repeater Disable option is not used, pressing the TRANSMIT switch applies +6 milliamps to the control pair. This energizes the transmit relay on the remote control panel, which opens the ground return of the carrier operated switch or relay on the repeater panel. The station will operate as a remote only as long as the TRANSMIT switch at the control panel is pressed.

2. Repeater Disable (Option 5126): With the Repeater Disable option, pressing in the REPEATER DISABLE pushbutton applies -6 milliamps to the control pair. This energizes an optional relay on the remote control panel which opens the ground return to the carrier operated switch or relay on the repeater panel. The station will operate as a remote as long as the push-button remains depressed.

OTHER ACCESSORIES AND OPTIONS

Station Select Switches

The station select switches are momentary-action, electrically interlocked push-button switches that light when in the select mode. When a station is selected, its audio is transferred from the monitor panel to the control panel and the remote control functions applicable to that station (see Table 3) can be selected from the control panel. Selecting another station automatically reverts the first station to channel 1 receive and returns its audio to the monitor panel.

Supervisory Control (Option 5130)

According to FCC regulations, if other parallel remote control consoles are employed in the system and their number and location are not specified on the station license, the dispatcher must be able to cut any conversation off the air that he judges unfit for transmission.

Pressing the SUPV CONTROL push-button shorts the control pair, terminating the transmission. The dispatcher can use the intercom (if present) to prevent a recurrence of the unauthorized transmission before releasing the short on the control pair.

Tone Alert Oscillator (Option 5155)

The Tone Alert Oscillator accessory is used by the dispatcher to transmit an alerting tone to call attention to messages of more than usual importance. The accessory consists of a tone board, push-button switch and indicator light. The tone oscillator includes a multivibrator circuit and a two section RC filter.

Pressing the tone alert push-button applies a 13.5 volt supply voltage to the tone oscillator, switches relay K1 to the transmit mode, keys the transmitter and lights the red transmit light. The nominal 1000 Hz output of the tone oscillator board is connected to J6 and J7 on audio board A801/A851, fed to the audio pair and is then transmitted by the station. R8 has been adjusted to provide a tone output of approximately 2 volts RMS at the audio pair (TB801-1 and -2).

Intercom Switch Kit (Option 5161)

The Intercom Switch Kit permits communication between paralleled Radio Control Centers without keying the transmitter. It also permits inter-communication between the control center and the base station when the remote control panel (4KC16A10) has been equipped with the intercom accessory.

Pressing the INTERCOM switch energizes relay K1 on the audio board, switching the board to the transmit mode. It also opens the control current path and disables the transmit light.

VU and Compression Meters

The control panel is supplied with a compression meter which enables the operator to check the line level of the control panel in the transmit, intercom or receive mode. The dial of the compression meter is not numerically calibrated. The line levels are indicated by red and green areas. The threshold of compression is marked by the line between the red and green areas. A meter reading in the red area indicates undercompression, while a reading anywhere in the green area indicates a proper output level (with 1 dB of normal).

An optional VU meter (Option 5160) is available for use in place of the compression meter if desired. The VU meter is calibrated to indicate the line levels in volume units. With a line level of +8 VU, the meter reads "0 VU". Levels lower than 8 VU are indicated by negative VU readings, and levels higher than 8 VU are indicated by positive VU readings. If the transmitter MOD ADJUST is set so that a line level of 8 VU produces maximum system deviation,

the lower scale on the meter will indicate percentage of full modulation being produced. The meter can be adjusted to read "0 VU" with a line level of +4 VU by removing R4 and jumpering TB1-1 and TB1-5.

Clocks

A 12-hour clock, which operates on 117 VAC at 60 Hz, is provided on the control panel to facilitate log keeping. The clock is connected so that it operates with power switch S801 ON or OFF. Optional clocks are available for operation on 50 or 60 Hz as described in the Option Index.

Speaker Muting (Option 5128)

The speaker muting option permits the dispatcher to temporarily reduce the volume of incoming calls to a low level for business discussion, telephone calls, etc.

Pressing in the MUTE push-button connects two parallel 82K-ohm resistors into the volume high lead, reducing the speaker output approximately 20 dB. If additional muting is desired, clipping out one of the parallel resistors will provide approximately 35-dB muting.

Repeater Disable & Channel Guard Monitor (Option 5166)

With the CHANNEL GUARD MONITOR push-button not depressed, Channel Guard relay K1 is energized and no control current is applied to the control pair. This permits Channel Guard operation at the station so that only those transmissions that are tone coded by the proper channel guard tone are heard at the console. Pressing the CHANNEL GUARD MONITOR push-button de-energizes channel guard relay K1 and applies 6 milliamps to the control pair. This disables the station channel guard so that all transmissions on the receiver frequency can be heard. The station will still operate as a repeater whenever a properly tone-coded message is received.

Pressing the REPEATER DISABLE push-button energizes repeater disable relay K2, applying -6 milliamps to the control pair. This energizes a relay at the remote control panel, and removes the ground to the carrier operated switch (COS) on the repeater panel. This disables the COS so that the station will operate as a remote as long as the REPEATER DISABLE push-button is depressed.

Pressing in both the CHANNEL GUARD MONITOR and REPEATER DISABLE push-buttons applies -15 milliamps to the control pair. This provides Channel Guard monitoring and also disables the COS so that the station will operate as a remote.

Pressing the TRANSMIT switch at the console switches both K1 and K2 out of the circuit, and applies +15 milliamps to the control pair. This disables the repeater function and keys the station transmitter.

MAINTENANCE

REMOVING CONTROL PANEL FROM TURRET

Remove the control panel from the console turret in the following manner:

1. Grasp the control panel frame and pull the panel forward until the stop is reached.

2. To completely remove the panel from the turret, lift the panel to clear the stop and pull forward. No electrical disconnections are required to set the panel on the desk top.

INDICATOR LAMP REPLACEMENT

Replace defective push-button switch indicator lamps as follows:

1. Grasp the switch lens (nameplate) and pull forward to remove the indicator assembly and gain access to the indicator lamps.

2. Remove the defective indicator lamp from its socket by pressing on the bulb end, and install the new lamp.

3. Reinstall the indicator assembly. The assembly must be in the extended configuration shown in Figure 5 before it can be reinstalled in the panel.

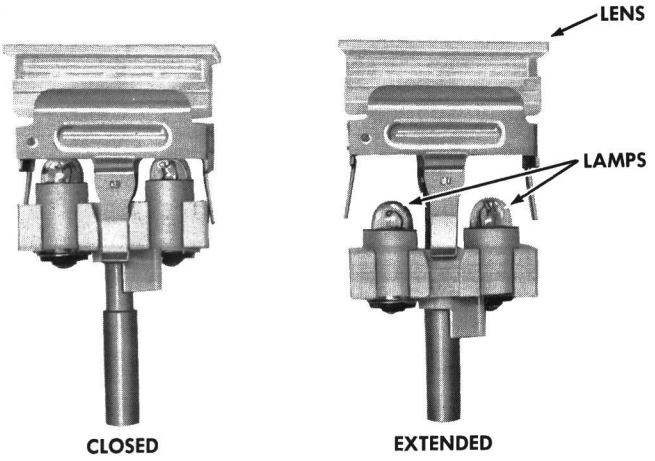


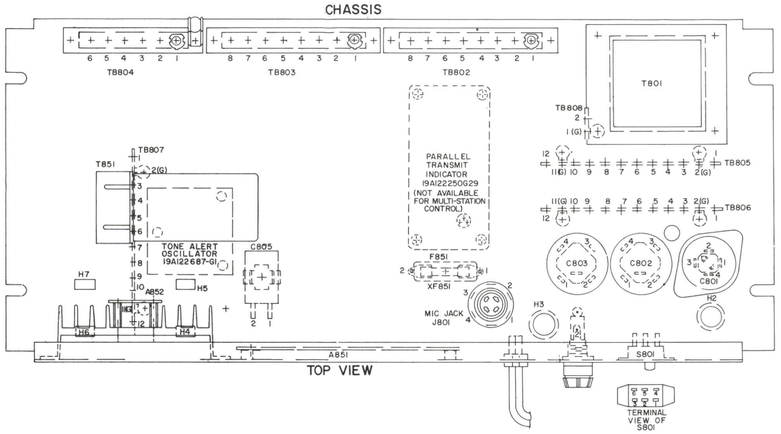
Figure 5 - Switch Indicator Assembly

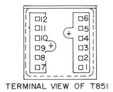
TROUBLESHOOTING PROCEDURE

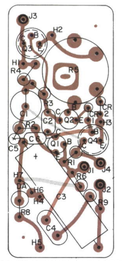
A step-by-step Troubleshooting Procedure is provided by Table 4 to help the serviceman quickly isolate and correct any problem that may arise.

Table 4 - Troubleshooting Procedure

Symptom	Procedure
No audio from the speaker.	1. Check the audio input with an AC-VTVM across TB801-1 & -2.
	2. Make sure that VOLUME control R801 is not set at minimum (fully counterclockwise).
	3. Check to see that the control center is not in the transmit mode (red Transmit light on). If the light is on, check for a short in the push-to-talk circuit.
	4. Check the audio input with an AC-VTVM at A851-J17. If no audio, check T851 and C805.
	5. Check the setting of LINE INPUT control R7 (refer to the Adjustment Procedure). If R7 cannot be adjusted for the correct reading, check relay contacts K1-11, -12 and -13.
	6. Check supply voltages at J1, J2, and J13 on A851 and J3 on A852.
	7. Check Bias Adj Control R5 on A852 for setting described in the Adjustment Procedure. If R5 cannot be adjusted for the correct reading, check Q1-Q4, Q851 and Q852.
	8. Check the DC voltages on Q3 thru Q6 (refer to the Schematic Diagram).
No audio on the line when the microphone is keyed.	1. Check the microphone leads, and relay contacts K1-11 thru -22. 2. Check the setting of MIC GAIN R5 and LINE OUTPUT R28 (refer to the Adjustment Procedure). 3. Key the microphone and check the DC voltages on Q1 (refer to the Schematic Diagram). 4. Check capacitor C13 on A851.
No control current at the control pair. Refer to Table 3 for control currents and functions.	1. Check to see that relay K1 picks up when the microphone is keyed. If the relay doesn't pick up, check for 24 volts DC at A851-J30. If 24 volts is present, check continuity between J801-3 and J29, and check for an open between J29 and J30 (relay coil). 2. With the microphone unkeyed, check for a reading of 150 to 200 volts DC between TB802-3 and TB802-6. 3. Check the jumper connections on TB801 and TB802 (refer to the Schematic Diagram and to the applicable Service Sheet for accessory kits and options).







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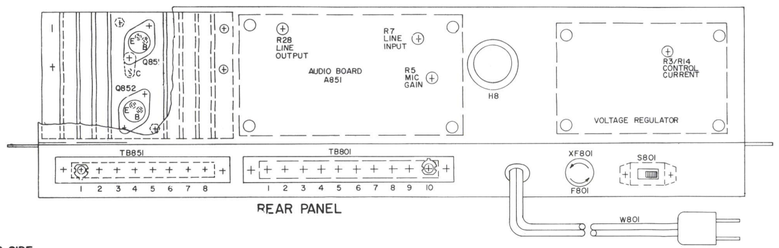
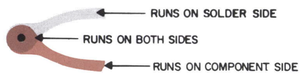
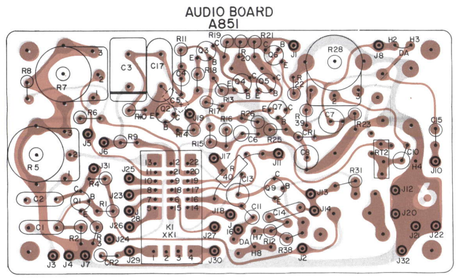
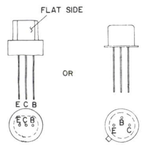
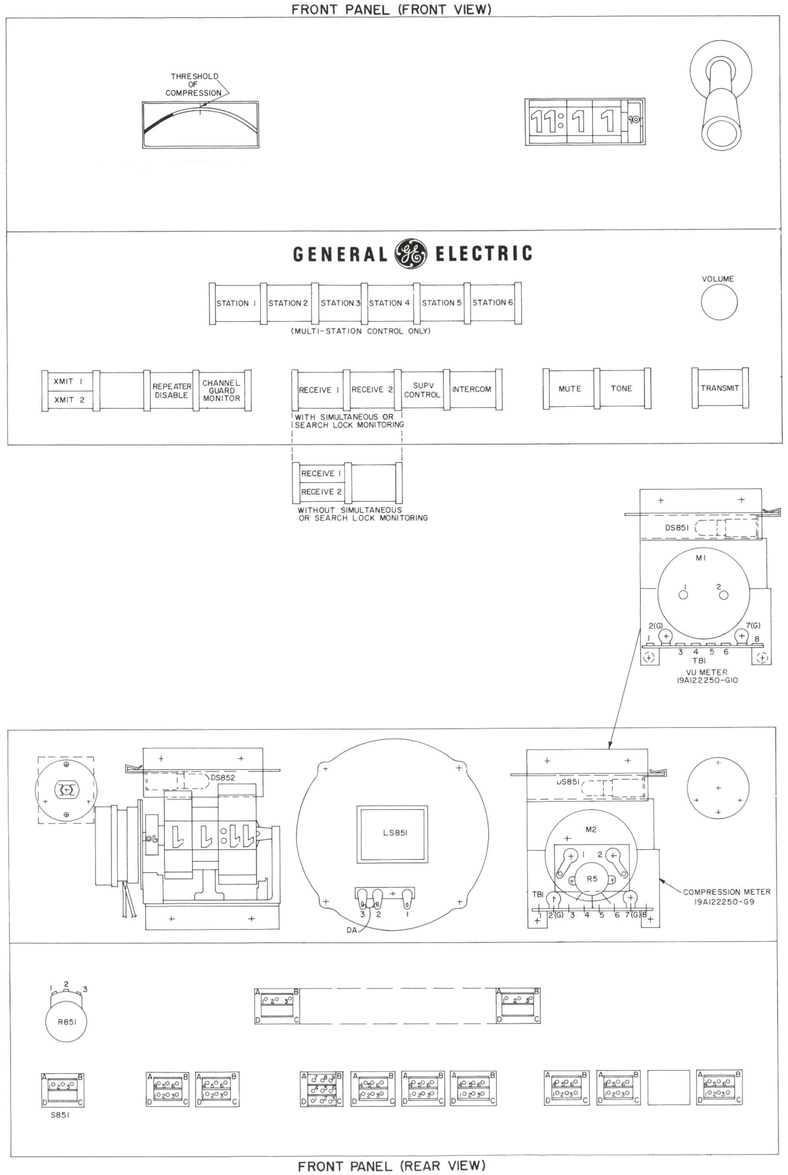








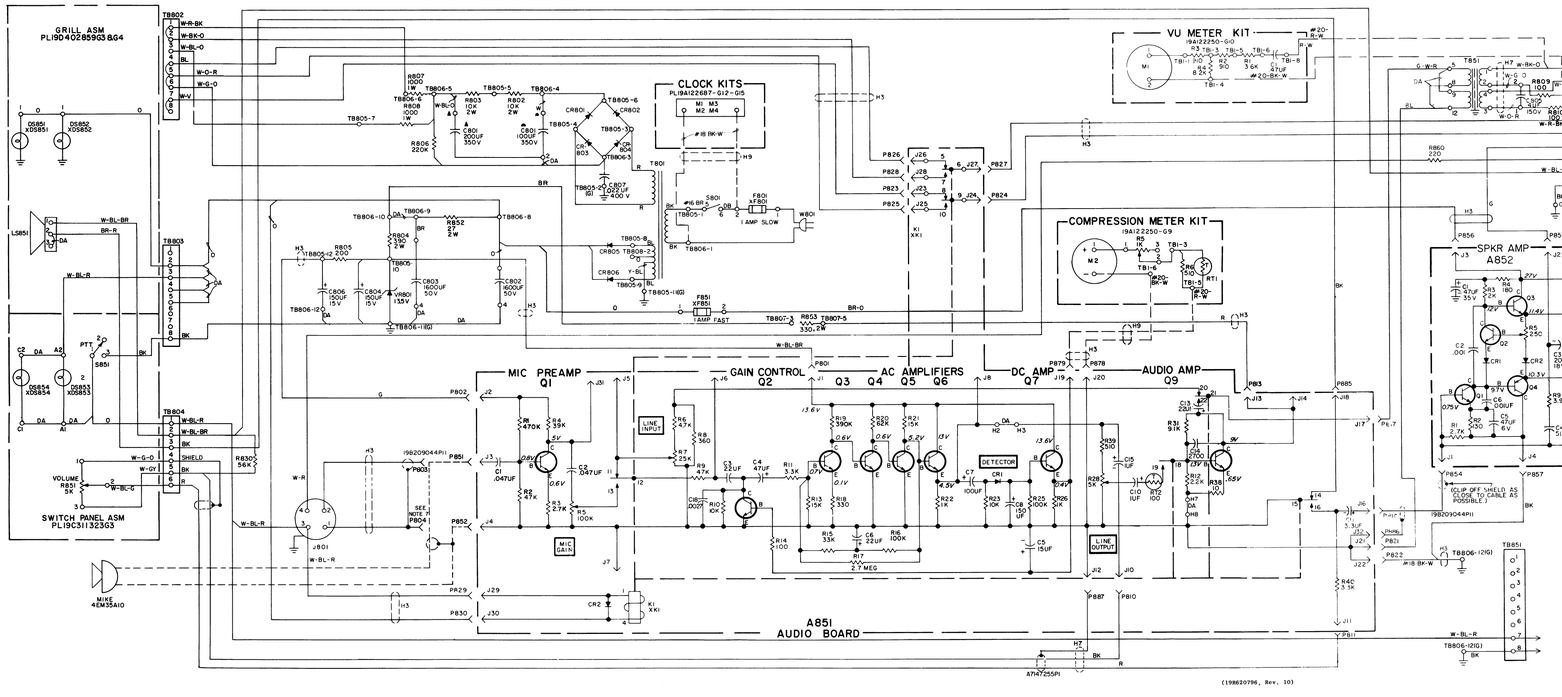
(19C303937, Sh. 1, Rev. 6)
(19C303937, Sh. 2, Rev. 6)



(19R640730, Rev. 4)

OUTLINE DIAGRAM

CONTROL PANEL
MODEL 4EC76A14



VOLTAGE READINGS

ALL READINGS ARE DC VOLTAGES TAKEN WITH A 20,000 OHMS/VOLT METER AND MEASURED FROM THE TRANSISTOR PIN TO GROUND WITH NO SIGNAL APPLIED TO THE CONSOLE. READING AT EMITTER OF Q7 INDICATES THRESHOLD OF COMPRESSION.

NOTES:

1. IF THE LOOP RESISTANCE OF THE TELEPHONE PAIR IS 1000 OHMS OR GREATER, CONNECT A JUMPER ACROSS R807 & R808.
2. FOR PARALLEL OPERATION, REMOVE RESISTOR R8 FROM BOARD A851 IN ALL PARALLEL UNITS EXCEPT MASTER UNIT.
3. TERMINATE ALL WIRES GOING TO A851 & A852* WITH A402984G2* EXCEPT AS NOTED IN NOTE *.
4. ALL WIRES N22 UNLESS OTHERWISE SPECIFIED.
5. JUMPERS, USED ON TB801 AND TB802 ARE 471472791 LINK.
6. LEADS FROM GRILL ASM PL19D402859G3&G4 & SWITCH PANEL ASM PL19C311323G3 GOING TO TB802 & TB804 TO BE TERMINATED WITH PADDLES.
7. P804, P886 & P887 TERMINALS ARE A402984G1.

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 ARE IN MICROFARADS (DECIMAL POINTS REPRESENTED BY R) UNLESS FOLLOWED BY UF= MICROFARADS, INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH= MILLIHENRYS OR HENRYS.

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.	P/W LETTER
PL19D402859G3	—
PL19D402859G4	—
PL19C311323G1	—
PL19C311323G3	D
PL19E500582G2	

SCHEMATIC DIAGRAM

CONTROL PANEL
MODEL 4EC76A14

PARTS LIST

LBI-3886B

CENTER CONTROL PANEL
MODEL 4EC7614

SYMBOL	G-E PART NO.	DESCRIPTION
		CONTROL PANEL CHASSIS 19E500826-G2 REV D
A851		AUDIO BOARD 19C307830-G5
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 and C2	19B209243-P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C3	19A115028-P116	Polyester: 0.22 µf ±20%, 200 VDCW.
C4	5496267-P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C5	5496267-P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C6	5496267-P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C7	5496267-P107	Tantalum: 100 µf ±20%, 10 VDCW; sim to Sprague Type 150D.
C8	5496267-P103	Tantalum: 150 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C10	5496267-P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C11	5496267-P9	Tantalum: 3.3 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C13	5496267-P19	Tantalum: 22 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C14	5494481-P128	Ceramic disc: 2700 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C15	5496267-P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C17*	19A115028-P107	Polyester: 0.01 µf ±20%, 200 VDCW. Added by REV C. Deleted by REV D.
C18*	5494481-P27	Ceramic disc: 2700 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. Added by REV D.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1	19A115250-P1	Silicon.
CR2	4037822-P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J6	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
J10 thru J14	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
J16 thru J32	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - RELAYS - - - - - - - - - -
K1	19C307010-P14	Armature: 24 VDC nominal, 1.5 w max operating, 430 ohms ±15% coil res, 6 form C contacts; sim to Allied Control T154-5-743.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 thru Q7	19A115889-P1	Silicon, NPN; sim to Type 2N2712.
Q9	19A115786-P1	Silicon, NPN.

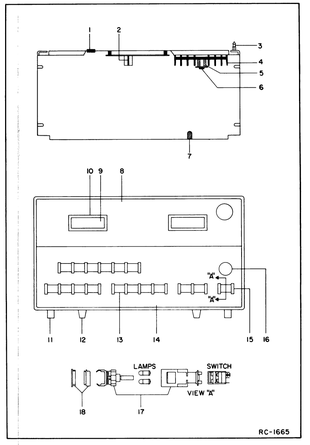
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P474J	Composition: 0.47 megohm ±5%, 1/2 w.
R2	3R77-P473J	Composition: 47,000 ohms ±5%, 1/2 w.
R3	3R77-P272J	Composition: 2700 ohms ±5%, 1/2 w.
R4	3R77-P393J	Composition: 39,000 ohms ±5%, 1/2 w.
R5	19B209115-P7	Variable, carbon film: 100,000 ohms ±20%, 0.5 w; sim to CTS Type UPE-70.
R6	3R77-P472K	Composition: 4700 ohms ±10%, 1/2 w.
R7	19B209115-P6	Variable, carbon film: 25,000 ohms ±20%, 0.5 w; sim to CTS Type UPE-70.
R8 thru R9	3R77-P361J	Composition: 360 ohms ±5%, 1/2 w.
R10	3R77-P473K	Composition: 47,000 ohms ±10%, 1/2 w.
R11	3R77-P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R12	3R77-P332J	Composition: 3300 ohms ±5%, 1/2 w.
R13	3R77-P222J	Composition: 2200 ohms ±5%, 1/2 w.
R14	3R77-P153J	Composition: 15,000 ohms ±5%, 1/2 w.
R15	3R77-P103J	Composition: 100 ohms ±5%, 1/2 w.
R16	3R77-P333J	Composition: 33,000 ohms ±5%, 1/2 w.
R17	3R77-P104J	Composition: 0.10 megohm ±5%, 1/2 w.
R18	3R77-P273J	Composition: 2.73 megohm ±5%, 1/2 w.
R19	3R77-P331J	Composition: 330 ohms ±5%, 1/2 w.
R20	3R77-P394J	Composition: 0.39 megohm ±5%, 1/2 w.
R21	3R77-P623J	Composition: 62,000 ohms ±5%, 1/2 w.
R22	3R77-P153J	Composition: 15,000 ohms ±5%, 1/2 w.
R23	3R77-P102K	Composition: 1000 ohms ±10%, 1/2 w.
R24	3R77-P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R25	3R77-P104K	Composition: 0.10 megohm ±10%, 1/2 w.
R26	3R77-P102K	Composition: 1000 ohms ±10%, 1/2 w.
R28	19B209115-P4	Variable, carbon film: 5000 ohms ±20%, 0.8 w; sim to CTS Type UPE-70.
R31	3R77-P913J	Composition: 9100 ohms ±5%, 1/2 w.
R38	3R77-P100K	Composition: 10 ohms ±10%, 1/2 w.
R39	3R77-P511J	Composition: 510 ohms ±5%, 1/2 w.
R40	3R77-P332K	Composition: 3300 ohms ±10%, 1/2 w.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT2	5490828-P14	Thermistor: 100 ohms ±5%, color code white; sim to Global Typ 7B3F-6.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XK1	19B209172-P1	Relay, phen: 22 contacts; sim to Allied Control 30054-24.
A852		SPEAKER AMPLIFIER BOARD 19B205803-G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5496267-P20	Tantalum: 47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C2	7774750-P4	Ceramic disc: .001 µf +100% -0%, 500 VDCW.
C3	19A115680-P10	Electrolytic: 200 µf +150% -10%, 18 VDCW; sim to Mallory Type TT.
C4	7489162-P44	Silver mica: 510 pf ±5%, 300 VDCW; sim to Electro Motive Type DM-15.
C5	5496267-P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C6*	7774750-P4	Ceramic disc: .001 µf +100% -0%, 500 VDCW. Added by REV C.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 and CR2	19A115250-P1	Silicon.

SYMBOL	G-E PART NO	DESCRIPTION
J1 thru J4	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
P684 thru P687	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P685	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P686 and P687	4029840-P1	Contact, electrical: sim to AMP 41854.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q851	19A115527-P1	Silicon, NPN.
Q852	19A115790-P1	Silicon, PNP.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R802 and R803	3R79-P103K	Composition: 10,000 ohms ±10%, 2 w.
R804	3R79-P330K	Composition: 390 ohms ±10%, 2 w.
R805	3R77-P201K	Composition: 200 ohms ±10%, 1/2 w.
R806	3R77-P224J	Composition: 0.22 megohm ±5%, 1/2 w.
R807 and R808	3R78-P102K	Composition: 1000 ohms ±10%, 1 w.
R809 and R810	3R77-P101J	Composition: 100 ohms ±5%, 1/2 w.
R830*	3R77-P563K	Composition: 56,000 ohms ±10%, 1/2 w. Added by REV C.
R852	3R79-P270K	Composition: 27 ohms ±10%, 2 w.
R853	3R79-P331J	Composition: 330 ohms ±5%, 2 w.
R860	3R77-P221K	Composition: 220 ohms ±10%, 1/2 w.
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C801	7772471-P42	Electrolytic: 100-200 µf +100% -10%, 300 VDCW; sim to Mallory Type PF.
C802 and C803	7476442-P20	Electrolytic: 1600 µf +250% -10%, 50 VDCW; sim to PR Mallory WT-068.
C804	5496267-P12	Tantalum: 150 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C805	7486445-P1	Electrolytic, non polorized: 4 µf +100% -10%, 150 VDCW.
C806	5496267-P12	Tantalum: 150 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C807	19A115028-P49	Polyester: .022 µf ±20%, 400 VDCW.
C854*	5494481-P27	Ceramic disc: 2700 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. Added by Rev A.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR801 thru CR804	4037822-P1	Silicon.
CR805 and CR806	4037822-P1	Silicon.
		- - - - - - - - - - FUSES - - - - - - - - - -
F801	7487942-P5	Slow blowing: 1 amp at 250 v; sim to Bussman MDL-1.
F851	1A16-P3	Quick blowing: 1 amp at 250 v; sim to Littelfuse 312001 or Bussman AGC-1.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J801	19A116061-P1	Connector, chassis: 4 female contacts.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P801 thru P803	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P804	4029840-P1	Contact, electrical: sim to AMP 41854.
P810 and P811	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P813	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P816 and P817	4029840-P2	Contact, electrical: sim to AMP 42827-2.
P821 thru P830	4029840-P2	Contact, electrical: sim to AMP 42827-2.

SYMBOL	G-E PART NO	DESCRIPTION
		GRILLE ASSEMBLY 19D402859-G3 and G4
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS851 and DS852	19C307037-P20	Lamp, incandescent: 28 v; sim to GE 757.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L5851	5491290-P7	Permanent magnet, 5-inch: 3.2 ohms ±10% voice coil imp, 15 w max operating, 385 Hz ±15% resonance, paper dust cap; sim to Jensen Model PS-VA512761.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS851 and XDS852	19B209342-P2	Lampholder: sim to Leecraft 7-04-1.
		SWITCH PANEL ASSEMBLY 19C311323-G1
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R851	5496870-P11	Variable, carbon film: 5000 ohms ±20%; sim to Mallory LC10A).
A851		- - - - - - - - - - SWITCHES - - - - - - - - - - TRANSMIT SWITCH AND INDICATOR ASSEMBLY 19B205756-G1
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS853 and DS854	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P20	Push: lighted, 1 circuit SPDT, momentary action, 5 amps at 250 VAC; sim to Micro Switch 2D100, (See RC-1663).
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS853 and CDS854		Part of Actuator and holder. (Refer to Mechanical Parts breakdown and RC-1665).
		ACCESSORY KITS
		COMPRESSION METER 19A122250-G9
		METER ASSEMBLY 19B205370-G2
		- - - - - - - - - - METERS - - - - - - - - - -
M2	19A115695-P1	Panel, DC: 1 ma mechanism.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R6*	3R77-P511J thru 3R77-P533J	Composition: 510 ohms ±5%, 1/2 w, Earlier than REV B. Composition: 3300 ohms ±5%, 1/2 w.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT1	5490828-P33	Rod: 2200 ohms ±10%; sim to Global Type 0325F.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7775500-P24	Phen: 8 terminals.
		VU METER 19A122250-G10
		METER ASSEMBLY 19B205370-G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A115028-P59	Polyester: 0.47 µf ±20%, 400 VDCW.

SYMBOL	G-E PART NO	DESCRIPTION
M1	19A115713-P1	- - - - - - - - - - METERS - - - - - - - - - - Audio level, VU: -20 to +3 scale.
R1	3R77-P362J	- - - - - - - - - - RESISTORS - - - - - - - - - - Composition: 3600 ohms ±5%, 1/2 w.
R2 and R3	3R77-P911J	Composition: 910 ohms ±5%, 1/2 w.
R4	3R77-P822J	- - - - - - - - TERMINAL BOARDS - - - - - - - - Composition: 8200 ohms ±5%, 1/2 w.
TB1	7775500-P24	Phen: 8 terminals. 12 HOUR CLOCK 19A122687-G12 CLOCK ASSEMBLY 19B205805-G2
M1	7491080-P5	- - - - - - - - - - METERS - - - - - - - - - - Clock, cyclometer: 117 VAC, 50 Hz; sim to Pennwood Numechron 1P-12H. 12 HOUR CLOCK 19A122687-G3 CLOCK ASSEMBLY 19B205805-G2
M2	7491080-P1	- - - - - - - - - - METERS - - - - - - - - - - Clock, cyclometer: 117 VAC, 60 Hz; sim to Pennwood Numechron 1P-12H. 24 HOUR CLOCK 19A122687-G14 CLOCK ASSEMBLY 19B205805-G3
M3	7491080-P6	- - - - - - - - - - METERS - - - - - - - - - - Clock, cyclometer: 117 VAC, 50 Hz; sim to Pennwood Numechron 1P-24H-AM/PM. 24 HOUR CLOCK 19A122687-G15 CLOCK ASSEMBLY 19B205805-G4
M4	7491080-P2	- - - - - - - - - - METERS - - - - - - - - - - Clock, cyclometer: 117 VAC, 60 Hz; sim to Pennwood Numechron 1P-24H-AM/PM.
	4EM35A10	- - - - - - - - - - MICROPHONES - - - - - - - - - - Microphone.
		MECHANICAL PARTS (SEE RC-1665)
1	19A115725-P1	Strain relief. (Used with W801).
2	19A115368-P1	Retainer. (Used with K1 on A851).
3	19B205762-P1	Locking pin. (Part of Control panel latch assembly).
4	19B205792-P1	Heat sink. (Used with Q851 and Q852).
5	7142162-P91	Spacer. (Used with A852).
6	4036555-P1	Insulator, disc. (Used with Q3 and Q4 on A852).
7	4029801-P8	Clip, loop. (Located by TB803 and TB804).
8	19C311303-P3	Grille. (Used with 19D402859-G3).
	19C311302-P4	Grille. (Used with 19D402859-G4).
9	19A122700-P1	Window. (Used with clock and meter).
10	19B205766-P1	Escutcheon. (Used with clock and meter).



RC-1665

SYMBOL	G-E PART NO	DESCRIPTION
11	19A115873-P1	Bumper, (Located on bottom (back edge) of Control panel).
12	19A115873-P2	Bumper, (Located on bottom (front edge) of Control panel).
13	19C311304-P1	Dummy switch.
14	19A122697-G5	Nameplate.
15	19C307029-P3	Retainer. (Used with panel switches).
16	19A115837-P1	Knob, push on. (For R851).
17	19C307029-P16	Actuator-Holder. (Includes XDS853 and XDS854).
18	19C307029-P10	Pushbutton-Lens.

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter", which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for descriptions of parts affected by these revisions.

CONTROL PANEL CHASSIS 19E500862-G2

Rev. A - To prevent audio oscillation in speaker. Added CR54.

Rev. B - To make Channel Guard and Intercom Options compatible. Changed wiring in the Intercom switch circuit.

Was

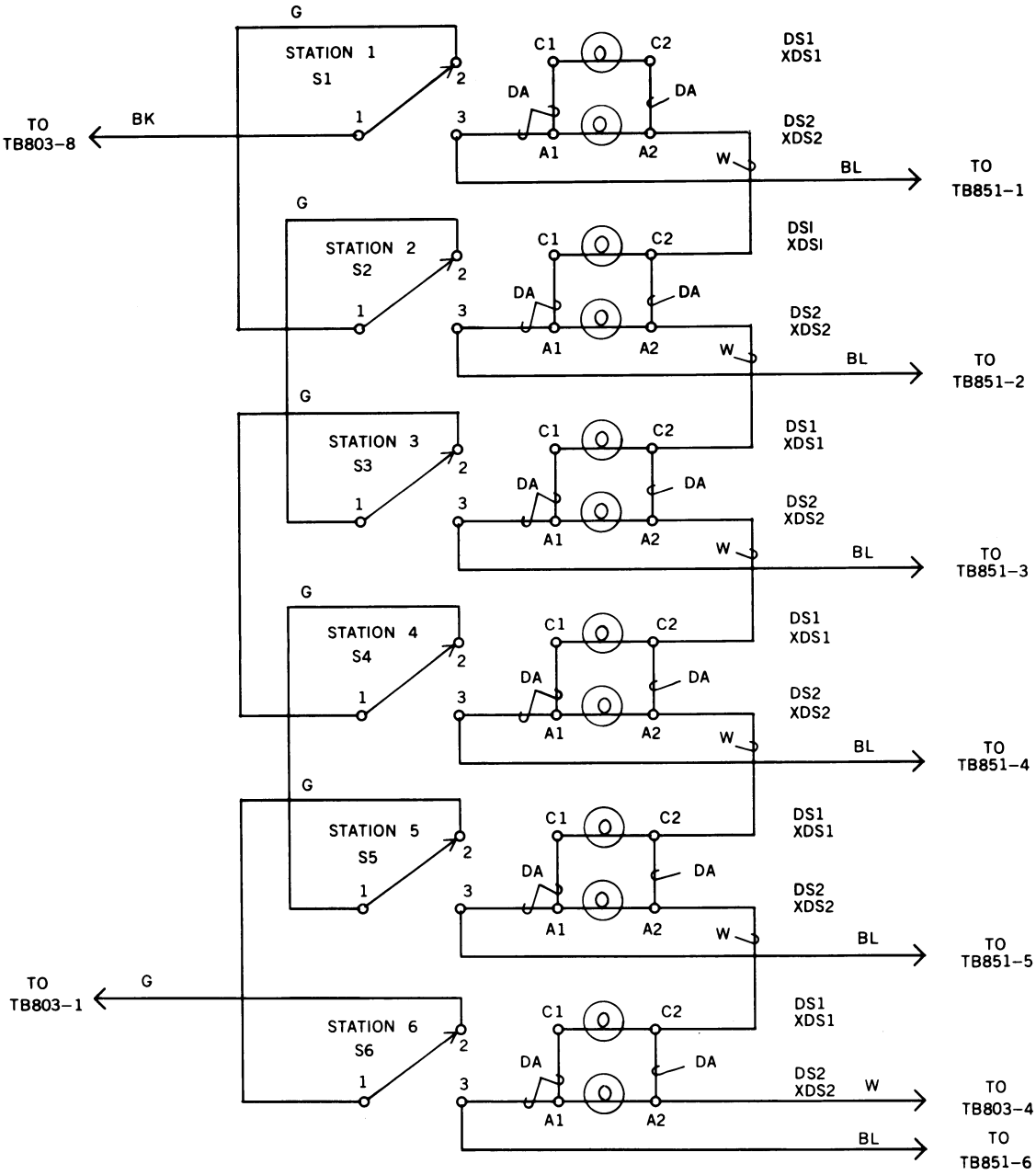
Changed to

To provide threshold of compression indication at the center (red line) of the compression meter. Changed R6.

Rev. C - To prevent oscillation from occurring in speaker amplifier. Added C6, C17 and R830.

Rev. D - To improve high frequency response. Deleted C17 and added C18.

STATION SELECT SWITCHES



NOTES:

1. WIRING SHOWN FOR 6 STATION CONTROL (19C311620, Rev. 1)

2. CHANGES IN WIRING FOR 2, 3, 4 OR 5 STATION CONTROL

   2 STATION CONTROL
   - A OMIT S3, S4, S5 & S6
   - B CONNECT GREEN LEAD TO TB803-1
   - C. CONNECT WHITE LEAD TO TB803-4

   3 STATION CONTROL
   - A OMIT S4, S5 & S6
   - B. CONNECT GREEN LEAD TO TB803-1
   - C. CONNECT WHITE LEAD TO TB803-4

   4 STATION CONTROL
   - A OMIT S5 & S6
   - B. CONNECT GREEN LEAD TO TB803-1
   - C. CONNECT WHITE LEAD TO TB803-4

   5 STATION CONTROL
   - A OMIT S6
   - B. CONNECT GREEN LEAD TO TB803-1
   - C CONNECT WHITE LEAD TO TB803-4

SERVICE SHEET

STATION SELECT SWITCHES

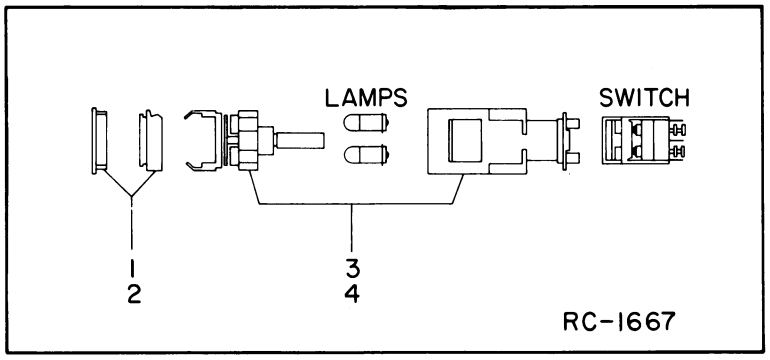
PARTS LIST

LBI-4010

STATION SELECT SWITCHES

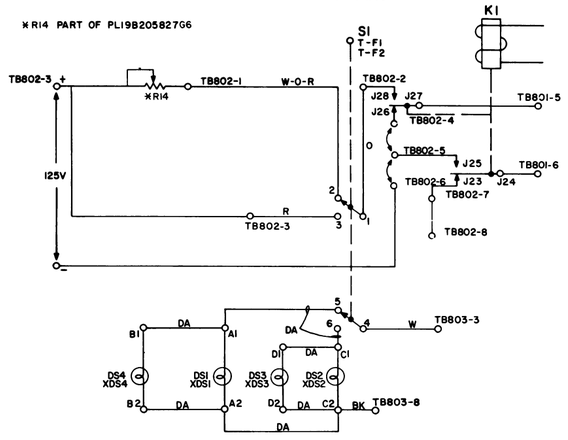
SYMBOL	G-E PART NO.	DESCRIPTION
S1 thru S6		SWITCH ASSEMBLY 19B216223-G1
		- - - - - - - - - INDICATING DEVICES - - - - - - - - -
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - - SWITCHES - - - - - - - - - - -
	19C307029-P20	Push: lighted, 1 circuit, SPDT, Momentary action, 5 amps at 250 VAC; sim to Micro Switch 2D100.
		- - - - - - - - - - - SOCKETS - - - - - - - - - - -
XDS1 and XDS2		Part of Actuator and Holder. (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
2	19C307029-P24	Pushbutton - lens.
4	19C307029-P16	Actuator-Holder. (Includes XDS1 and XDS2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



2 FREQ TRANSMIT – 1 FREQ RECEIVE

SCHEMATIC DIAGRAM



(19B216451, Rev. 0)

PARTS LIST

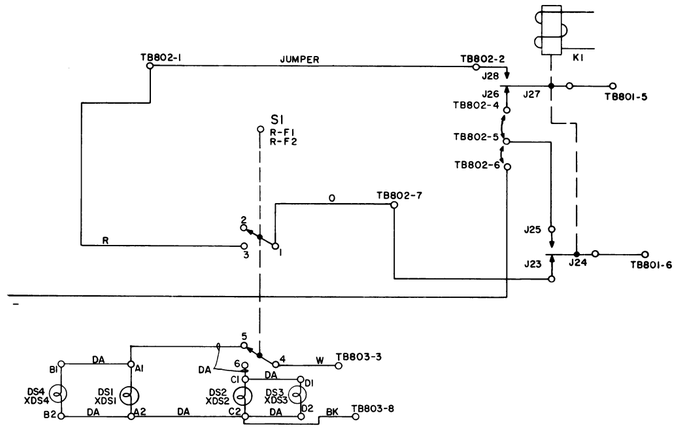
2 FREQ TRANSMIT - 1 FREQ RECEIVE

SYMBOL	G-E PART NO.	DESCRIPTION
S1		SWITCH ASSEMBLY 19C311259-G1
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 thru DS4	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 thru XDS4		Part of Actuator and Holder (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
1	19C307029-P15	Pushbutton-Lens.
3	19C307029-P17	Actuator-Holder. (Includes XDS1 thru XDS4).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

1 FREQ TRANSMIT – 2 FREQ RECEIVE

SCHEMATIC DIAGRAM



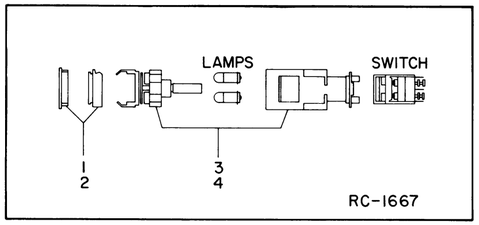
(19B205775, Rev. 0)

PARTS LIST

1 FREQ TRANSMIT - 2 FREQ RECEIVE

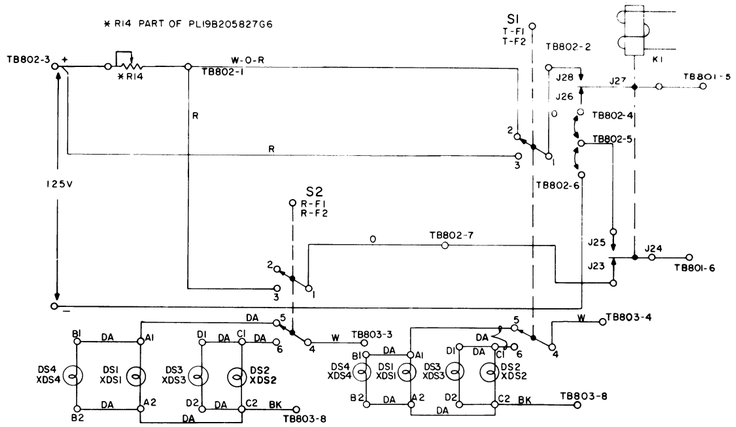
SYMBOL	G-E PART NO.	DESCRIPTION
S1		SWITCH ASSEMBLY 19C311259-G1
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 thru DS4	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 thru XDS4		Part of Actuator and Holder (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
1	19C307029-P15	Pushbutton-Lens.
3	19C307029-P17	Actuator-Holder. (Includes XDS1 thru XDS4).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



2 FREQ TRANSMIT – 2 FREQ RECEIVE

SCHEMATIC DIAGRAM



(19B216452, Rev. 0)

PARTS LIST

2 FREQ TRANSMIT - 2 FREQ RECEIVE

SYMBOL	G-E PART NO.	DESCRIPTION
S1 and S2		SWITCH ASSEMBLY 19C311259-G1
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 thru DS4	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 thru XDS4		Part of Actuator and Holder (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
1	19C307029-P15	Pushbutton-Lens.
3	19C307029-P17	Actuator-Holder. (Includes XDS1 thru XDS4).

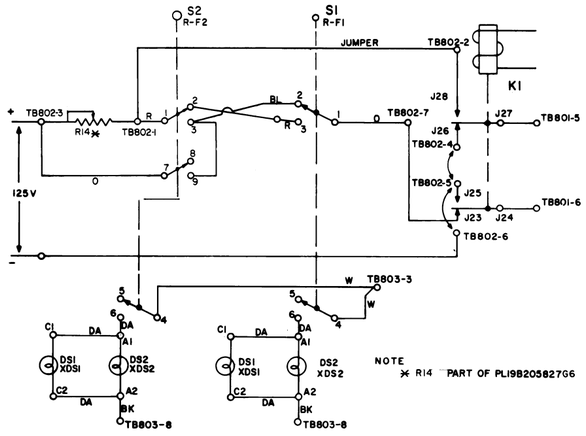
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SERVICE SHEET

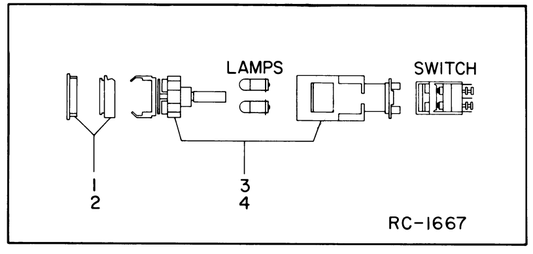
2-FREQ TRANSMIT & 1-FREQ RECEIVE;
1-FREQ TRANSMIT 7 2-FREQ RECEIVE AND
2-FREQ TRANSMIT & 2-FREQ RECEIVE

1 FREQ TRANSMIT – 2 RECEIVERS (OR SLM)

SCHEMATIC DIAGRAM



(19B216453, Rev. 0)



PARTS LIST

LBI-4005

1 FREQ TRANSMIT - 2 RECEIVERS (or SLM)

SYMBOL	G-E PART NO.	DESCRIPTION
S1		SWITCH ASSEMBLY 19C311259-G2
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 and XDS2		Part of Actuator and Holder. (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
2	19C307029-P4	Pushbutton-lens.
4	19C307029-P16	Actuator-Holder. (Includes XDS1 and XDS2).
S2		SWITCH ASSEMBLY 19C311259-G11
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P18	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 and XDS2		Part of Actuator and Holder. (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
2	19C307029-P4	Pushbutton-lens.
4	19C307029-P16	Actuator-Holder. (Includes XDS1 and XDS2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

2 FREQ TRANSMIT – 2 RECEIVERS (OR SLM)

PARTS LIST

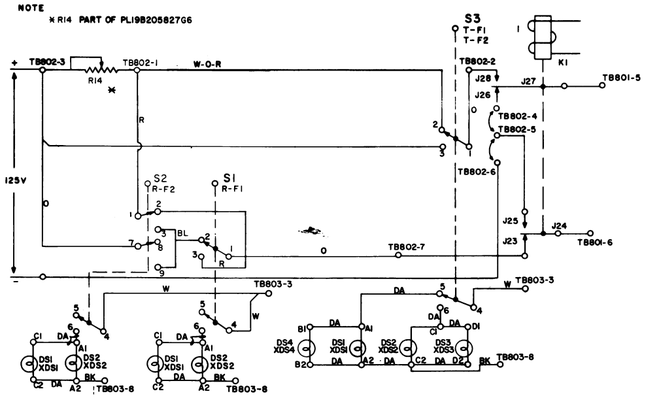
LBI-4006

2 FREQ TRANSMIT - 2 RECEIVERS (or SLM)

SYMBOL	G-E PART NO.	DESCRIPTION
S1		SWITCH ASSEMBLY 19C311259-G2
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 and XDS2		Part of Actuator and Holder. (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
2	19C307029-P4	Pushbutton-lens.
4	19C307029-P16	Actuator-Holder. (Includes XDS1 and XDS2).
S2		SWITCH ASSEMBLY 19C311259-G11
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P18	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 and XDS2		Part of Actuator and Holder. (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
2	19C307029-P4	Pushbutton-lens.
4	19C307029-P16	Actuator-Holder. (Includes XDS1 and XDS2).
S3		SWITCH ASSEMBLY 19C311259-G1
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 thru DS4	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 thru XDS4		Part of Actuator and Holder. (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
1	19C307029-P15	Pushbutton-lens.
3	19C307029-P17	Actuator-Holder. (Includes XDS1 thru XDS4).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SCHEMATIC DIAGRAM



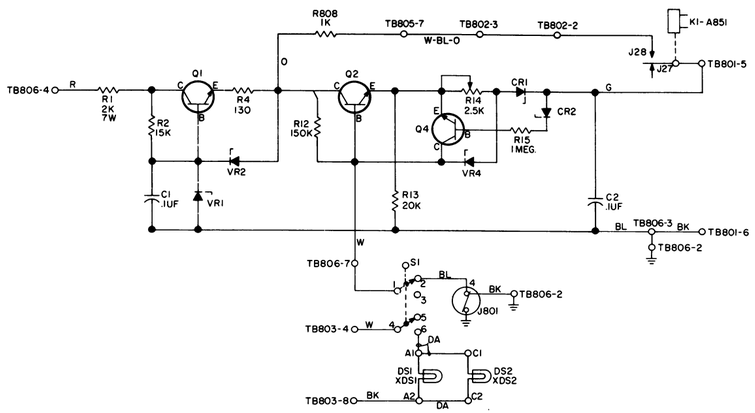
(19B216454, Rev. 0)

SERVICE SHEET

1-FREQ TRANSMIT - 2 RECEIVERS (OR SLM)
2-FREQ TRANSMIT - 2 RECEIVERS (OR SLM)

CHANNEL GUARD

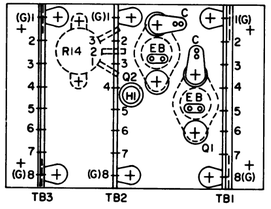
SCHEMATIC DIAGRAM



(19B216456, Rev. Rev. 0)

OUTLINE DIAGRAM

CHANNEL GUARD REGULATOR
19A122737-G6



(19A127532, Rev. 0)

PARTS LIST

LBI-4007

CHANNEL GUARD

SYMBOL	G-E PART NO.	DESCRIPTION
		MODIFICATION KIT 19A122687-G25
		REGULATOR BOARD 19A122737-G6
		---------- CAPACITORS ----------
C1 and C2	19A115028-P14	Polyester: 0.1 µf ±20%, 200 VDCW.
		-------- DIODES AND RECTIFIERS --------
CR1 and CR2	4037822-P1	Silicon.
		---------- TRANSISTORS ----------
Q1 and Q2	19A115783-P1	Silicon, NPN.
Q4	19A115362-P1	Silicon, NPN; sim to type 2N2925.
		---------- RESISTORS ----------
R1	7478711-P34	Wirewound: 2000 ohms ±5%, 7 w; sim to Sprague Type 454E.
R2	3R77-P153K	Composition: 15,000 ohms ±10%, 1/2 w.
R4	3R77-P131J	Composition: 130 ohms ±5%, 1/2 w.
R12	3R77-P154J	Composition: 0.15 megohm ±5%, 1/2 w.
R13	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R14	19B209244-P4	Variable, wirewound: 2500 ohms ±20%, 2 w; sim to CTS Type 117.
R15	3R77-P105J	Composition: 1 megohm ±5%, 1/2 w.
		--------- TERMINAL BOARD ---------
TB1 thru TB3	7775500-P18	Phen: 8 terminals.
		---------- VOLTAGE REGULATORS ----------
VR1	19A115528-P28	Silicon, Zener.
VR2	4036887-P3	Silicon, Zener.
VR4	4036887-P6	Silicon, Zener.
S1		SWITCH ASSEMBLY 19C311259-G2
		-------- INDICATING DEVICES --------
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		---------- SWITCHES ----------
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		---------- SOCKETS ----------
XDS1 and XDS2		Part of Actuator and Holder. (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
2	19C307029-P4	Pushbutton-lens.
4	19C307029-P16	Actuator-Holder. (Includes XDS1 and XDS2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

HIGH VOLTAGE REGULATOR 19A122737-G7

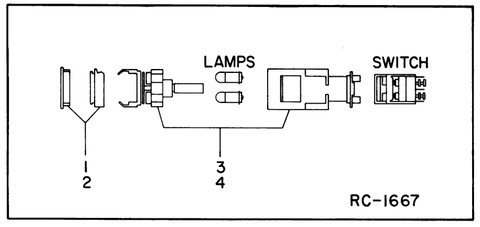
PARTS LIST

LBI-4008

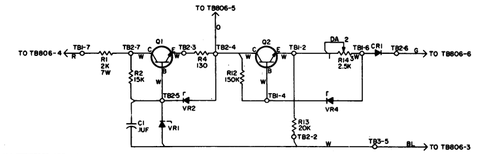
HIGH VOLTAGE REGULATOR
19A122737-G7

SYMBOL	G-E PART NO.	DESCRIPTION
		---------- CAPACITORS ----------
C1	19A115028-P14	Polyester: 0.1 µf ±20%, 200 VDCW.
		------- DIODES AND RECTIFIERS -------
CR1	4037822-P1	Silicon.
		---------- TRANSISTORS ----------
Q1 and Q2	19A115783-P1	Silicon, NPN.
		---------- RESISTORS ----------
R1	7478711-P34	Wirewound: 2000 ohms ±5%, 7 w; sim to Sprague Type 454E.
R2	3R77-P153K	Composition: 15,000 ohms ±10%, 1/2 w.
R4	3R77-P131J	Composition: 130 ohms ±5%, 1/2 w.
R12	3R77-P154J	Composition: 0.15 megohm ±5%, 1/2 w.
R13	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R14	19B209244-P4	Variable, wirewound: 2500 ohms ±20%, 2 w; sim to CTS Type 117.
		--------- TERMINAL BOARDS ---------
TB1 thru TB3	7775500-P18	Phen: 8 terminals.
		--------- VOLTAGE REGULATORS ---------
VR1	19A115528-P28	Silicon, Zener.
VR2	4036887-P3	Silicon, Zener.
VR4	4036887-P6	Silicon, Zener.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



SCHEMATIC DIAGRAM



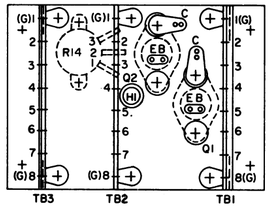
ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF= MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH= MILLIHENRYS OR H=HENRYS.

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.

(19B216457, Rev. 1)

OUTLINE DIAGRAM

HIGH VOLTAGE REGULATOR
19A122737-G7



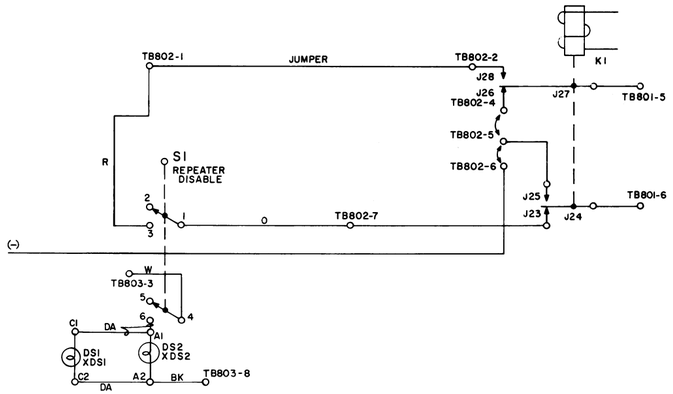
(19A127532, Rev. 0)

SERVICE SHEET

CHANNEL GUARD AND
HIGH VOLTAGE REGULATOR

REPEATER DISABLE
OPTION 5126

SCHEMATIC DIAGRAM



(19B205779, Rev. 0)

PARTS LIST

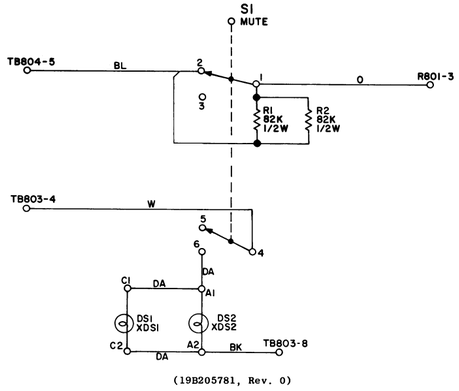
REPEATER DISABLE (OPTION 5126)

SYMBOL	G-E PART NO.	DESCRIPTION
S1		SWITCH ASSEMBLY 19C311259-G2
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - - SWITCHES - - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 and XDS2		Part of Actuator and Holder (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
2	19C307029-P4	Pushbutton-Lens.
4	19C307029-P16	Actuator-Holder. (Includes XDS1 and XDS2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PARTIAL MUTE
OPTION 5128

SCHEMATIC DIAGRAM



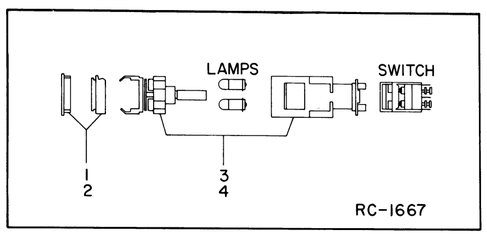
(19B205781, Rev. 0)

PARTS LIST

PARTIAL MUTE (OPTION 5128)

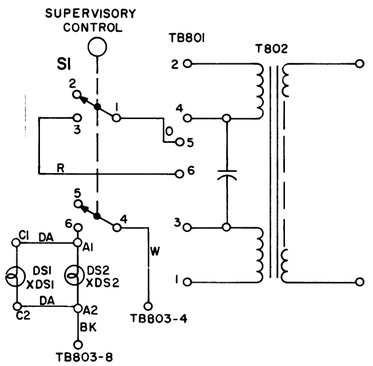
SYMBOL	G-E PART NO.	DESCRIPTION
S1		SWITCH ASSEMBLY 19C311259-G7
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - - SWITCHES - - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1 and R2	3R77-P823K	Composition: 82,000 ohms ±10%, 1/2 w.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 and XDS2		Part of Actuator and Holder (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
2	19C307029-P4	Pushbutton-Lens.
4	19C307029-P16	Actuator-Holder. (Includes XDS1 and XDS2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



SUPERVISORY CONTROL
OPTION 5130

SCHEMATIC DIAGRAM



(19A122684, Rev. 0)

PARTS LIST

SUPERVISORY CONTROL (OPTION 5130)

SYMBOL	G-E PART NO.	DESCRIPTION
S1		SWITCH ASSEMBLY 19C311259-G2
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - - SWITCHES - - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 and XDS2		Part of Actuator and Holder (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
2	19C307029-P4	Pushbutton-Lens.
4	19C307029-P16	Actuator-Holder. (Includes XDS1 and XDS2).

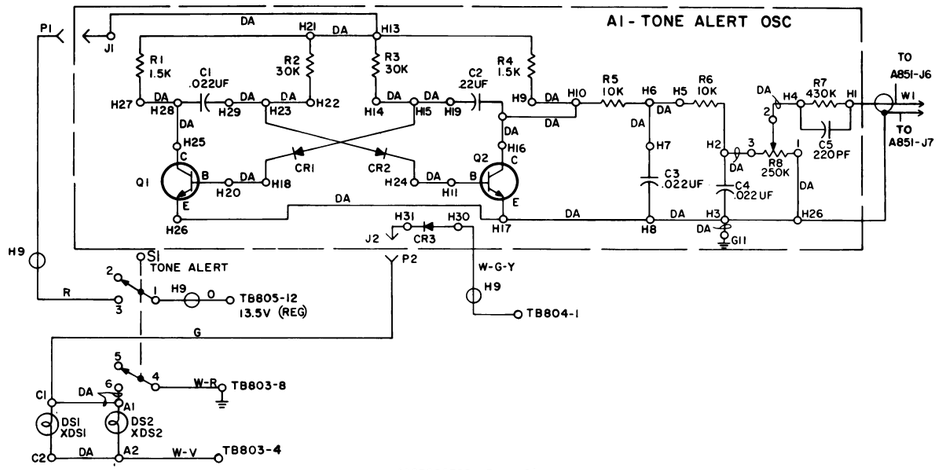
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SERVICE SHEET

REPEATER DISABLE;
PARTIAL MUTE AND
SUPERVISORY CONTROL

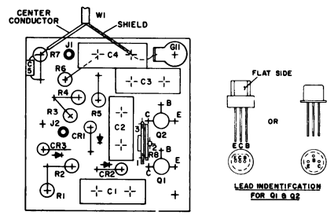
INTERCOM
OPTION 5161

SCHEMATIC DIAGRAM

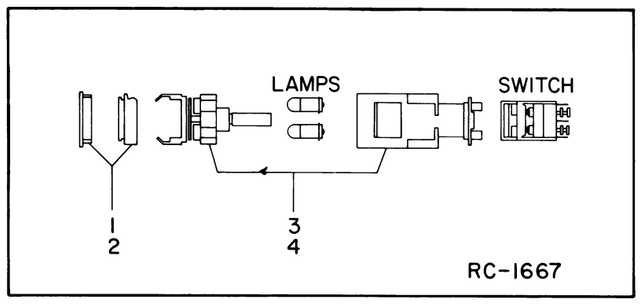


(19B205780, Rev. 1)

OUTLINE DIAGRAM



(19B205610, Rev. 1)



PARTS LIST

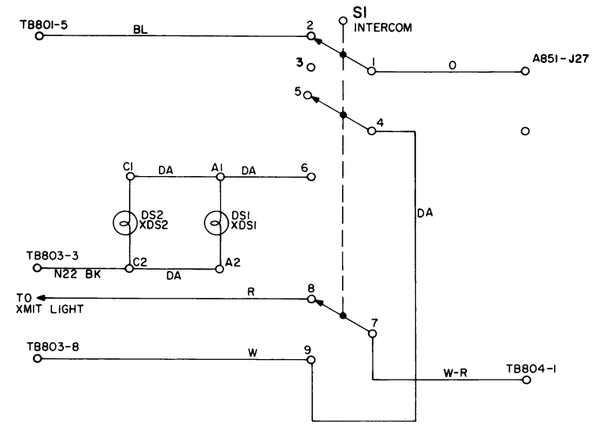
TONE ALERT (OPTION 5155)

SYMBOL	G-E PART NO.	DESCRIPTION
		MODIFICATION KIT 19A122687-G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 thru C4	19A115028-P109	Polyester: 0.022 µf ±20%, 200 VDCW.
C5	7489162-P35	Silver mica: 220 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR3	19A115250-P1	Silicon.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 and J2	4033513-P2	Contact, electrical: sim to Bead Chain L93-2.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 and Q2	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P152K	Composition: 1500 ohms ±10%, 1/2 w.
R2 and R3	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.
R4	3R77-P152K	Composition: 1500 ohms ±10%, 1/2 w.
R5 and R6	3R77-P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R7	3R77-P434K	Composition: 0.43 megohms ±10%, 1/2 w.
R8	19B209358-P110	Variable, carbon film: approx 500 to 250,000 ohms ±20%, 0.25 w; sim to CTS Type X-201.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1	19A122228-G1	Cable assembly. Approx 15 inches long. Includes:
	4029840-P2	Electrical contact.
S1		SWITCH ASSEMBLY 19C311259-G3
		- - - - - - - - - INDICATING DEVICES - - - - - - -
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P6	Push: lighted, 2 circuits, SPDT each, momentary action, 5 amps at 250 VAC; sim to Micro Switch 2D2.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 and XDS2		Part of Actuator-Holder. (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
2	19C307029-P4	Pushbutton-Lens.
4	19C307029-P16	Actuator-Holder. (Includes XDS1 and XDS2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

TONE ALERT
OPTION 5155

SCHEMATIC DIAGRAM



(19B205786, Rev. 1)

PARTS LIST

INTERCOM (OPTION 5161)

SYMBOL	G-E PART NO.	DESCRIPTION
S1		SWITCH ASSEMBLY 19C311259-G1
		- - - - - - - - - INDICATING DEVICES - - - - - - - - -
DS1 thru DS4	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC; sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 thru XDS4		Part of Actuator and Holder (Refer to RC-1667).
		MECHANICAL PARTS (SEE RC-1667)
1	19C307029-P15	Pushbutton-Lens.
3	19C307029-P17	Actuator-Holder. (Includes XDS1 thru XDS4).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SERVICE SHEET

TONE ALERT AND INTERCOM

Issue 1 19

REPEATER DISABLE & CHANNEL GUARD MONITOR OPTION 5163

PARTS LIST

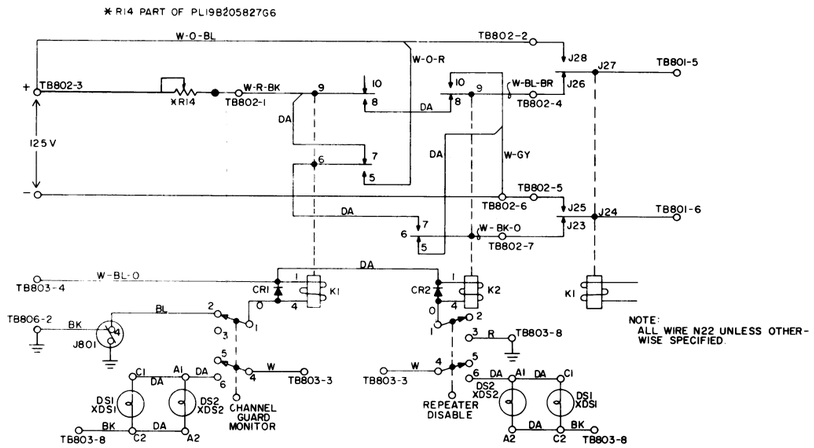
LBI-4009

REPEATER DISABLE AND CHANNEL GUARD MONITOR (OPTION 5166)

SYMBOL	G-E PART NO.	DESCRIPTION
		MODIFICATION KIT 19A122687-G30
		RELAY BOARD 19B216075-G1
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1 and CR2	4037822-P1	Silicon.
		- - - - - - - - - - RELAYS - - - - - - - - - - -
K1 and K2	5491595-P3	Armature: 1.5 w operating, 700 ohms ±15% coil res, 2 form C contacts; sim to Allied Control T154-X-101.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XK1 and XK2	5491595-P4	Relay: 10 contacts; sim to Allied Control T154-X-101.
	5491595-P8	Retainer. (Used with K1 and K2).
	5491595-P10	Ground clip. (Used with K1 and K2).
S1		SWITCH ASSEMBLY 19C3[illegible]-G2
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1 and DS2	19C307037-P26	Lamp, incandescent: 28 v; sim to GE 387.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
	19C307029-P11	Push: lighted, 2 circuits, SPDT each, alternate action, 5 amps at 250 VAC: sim to Micro Switch 2D26.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS1 and XDS2		Part of Actuator and Holder. (Refer to RC-1667).
		REGULATOR BOARD 19A122727-G7
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A115028-P14	Polyester: 0.1 µf ±20%, 200 VDCW.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR1	4037822-P1	Silicon.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 and Q2	19A115783-P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	7478711-P34	Wirewound: 2000 ohms ±5%, 7 w; sim to Sprague Type 454E.
R2	3R77-P153K	Composition: 15,000 ohms ±10%, 1/2 w.
R4	3R77-P131J	Composition: 130 ohms ±5%, 1/2 w.
R12	3R77-P154J	Composition: 0.15 megohm ±5%, 1/2 w.
R13	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R14	19B209244-P4	Variable, wirewound: 2500 ohms ±20%, 2 w; sim to CTS Type 117.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB1 thru TB3	7775500-P18	Phen: 8 terminals.
		- - - - - - - - VOLTAGE REGULATORS - - - - - - - -
VR1	19A115528-P28	Silicon, Zener.
VR2	4036887-P3	Silicon, Zener.
VR4	4036887-P6	Silicon, Zener.

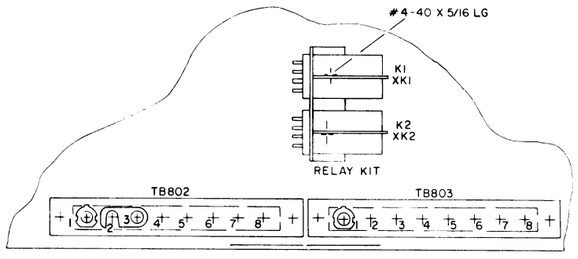
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SCHEMATIC DIAGRAM

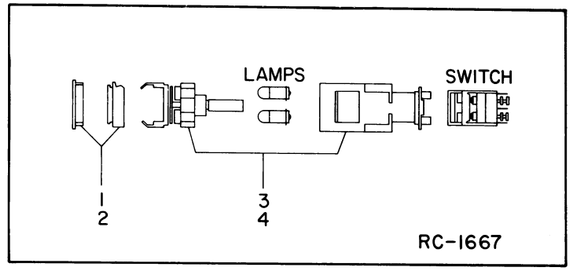


(19B216450, Rev. 0)

OUTLINE DIAGRAM



(19D402850, Sh. 3, Rev. 0)



ORDERING SERVICE PARTS

Each component appearing on the schematic diagram is identified by a symbol number, to simplify locating it in the parts list. Each component is listed by symbol number, followed by its description and GE Part Number.

Service parts may be obtained from Authorized GE Communication Equipment Service Stations or through any GE Radio Communication Equipment Sales Office. When ordering a part, be sure to give:

1. GE Part Number for component
2. Description of part
3. Model number of equipment
4. Revision letter stamped on unit

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, contact the nearest Radio Communication Equipment Sales Office of the General Electric Company.

MAINTENANCE MANUAL

LBI-4002

DF-4083

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