MOBILE RADIO

MASTR

Progress Line

MAINTENANCE MANUAL

DESK MATE STATION

TWO-WAY FM
DESK-MATE
STATION
COMBINATION

REMOTE CONTROL

LBI-4145C

MICROPHONE

DF-9014

GENERAL ELECTRIC

TABLE OF CONTENTS

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.

EQUIPMENT INDEX

EQUIPMENT	TYPE OR MODEL NUMBER
Transmitter	ET-55-A through ET-60-D
Receiver	ER-39-A through ER-42-H
Desk Mate Cabinet	7354211G4
Station Power Supply	EP-38-A
Antenna Relay (mounts on EP-38-A)	19A121260G1
Line Amplifier	EA-24-A
Remote Control Panel	4KC16A12
Microphone	4EM25A10
Microphone Mounting Kit	7141414G2
Speaker Assembly	19B219618G1
117-VAC Power Cable	7491206P1
Alignment Tools (hex slug type) (slotted screw type)	4038831P2 4033530G2
Lock Assembly Keys Lock (with key)	 5491682P1 (BF-10A) 5491682P13

OPTIONAL EQUIPMENT

EQUIPMENT	OPTION NO.	TYPE OR MODEL NUMBER
Priority Search Lock Monitor Remote Kit	7678 7679	19A122231G16 19A122231G15
Priority Search Lock Monitor	7678, 7679	19A127679G1
Receiver Power Supply	7708, 7709	4EP39A11
Antenna Relay (7723 option only)	7708, 7709	19A121260G2
Intercom Kit	7620	19A122231G9
220/110 volt stepdown transformer kit	7608	19A121971G1
Test Meter Panel	7609	19A121953G1
Meter Switching Panel	7609	19A121460G1
Transmitter Metering Cover	7648	19C303676G3
Receiver Metering Cover	7649	19C303676G2
Line Compensation Kit	5167	19B216906G1

SPECIFICATIONS *

DIMENSIONS (H x W x D)	30-3/8" x 14" x 25-1/2"
WEIGHT	Approximately 112 pounds
DUTY CYCLE (Transmit & Receive)	Continuous
INPUT VOLTAGE	117 VAC, ±10%, 50/60 Hz
INPUT POWER	Transmit: 1100 watts Receive: 176 watts
OPERABLE TEMPERATURE RANGE	-30°C (-22°F) to +60°C (+140°F)

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

COMBINATION NOMENCLATURE

1st Digit	2nd Digit	3rd Digit	4th Digit	5th Digit	6th Digit	7th Digit	8th & 9th Digits
Mechanical Package	Operating Voltage	RF Power Output Range	Channel Spacing	Control	Number of Freq.	Options	Frequency Range
D Desk Mate Station	**M** 117 VAC	**5** 16—38 watts	**4** 20 kHz	**R** Remote Control Station	**A** 1-Freq. T 1-Freq. R	**S** Standard	**11** 25—33 MHz
		6 38—64 watts	**6** 30 kHz		**B** 2-Freq. T 1-Freq. R	**N** Noise Blanker	**22** 33—42 MHz
		7 64—128 watts	**7** 40 kHz		**C** 2-Freq. T 2-Freq. R	**U** Channel Guard	**33** 42—50 MHz
			8 50 kHz		**D** 1-Freq. T 2-Freq. R	**W** Noise Blanker & Channel Guard	**44** 66—77 MHz
			9 60 kHz		**E** 3-Freq. T 3-Freq. R	**P** UHS Receiver	**45** 77—88 MHz
					F 4-Freq. T 4-Freq. R	**G** UHS Receiver & Channel Guard	**55** 132—150.8 MHz
							66 150.8—174 MHz
							77 406—420 MHz
							88 450—470 MHz

DESCRIPTION

General Electric MASTR Progress Line Desk Mate Stations are attractively styled base stations that are designed to meet the most stringent requirements in the field of Two-Way FM Radio.

The Desk Mate cabinet can be conveniently located adjacent to a desk to provide additional working area -- or it can be placed in any suitable location. Both the transmitter exciter and the receiver are fully transistorized. Silicon transistors are used throughout for added reliability.

SERVICING

Both side panels on the station cabinet can be easily removed to gain access to the transmitter, receiver and power supply. The transmitter and receiver modules are equipped with centralized metering jacks, and are mounted on swing-out chassis for simplified alignment and troubleshooting.

The transmitter and receiver modules may be used interchangeably in mobile and station installations. No modifications are required when transferring the units from one type of operation to another.

The station may also be equipped with an optional built-in Test Set to facilitate servicing.

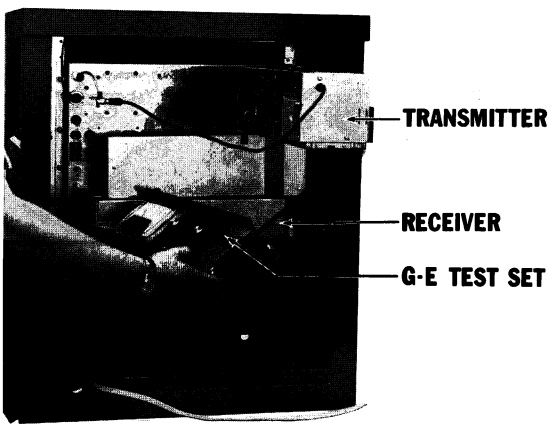


Figure 1 - Transmitter-Receiver Test

TRANSMITTER

The transmitter assembly consists of the transistorized exciter board and the power amplifier section. The standard transmitter may be equipped with:

- One through four frequencies
- Channel Guard (tone squelch)

RECEIVER

The fully transistorized reciever is completely contained in an aluminum casting, which provides excellent electrical shielding and reduces the effects of vibration. The standard receiver may be equipped with:

- One through four frequencies
- Channel Guard (tone squelch)
- Noise Blanker

POWER SUPPLIES

Station Power Supply Type EP-38-A provides operating voltages for both the transmitter and receiver. In addition to plate, screen and bias voltages for the transmitter, the power supply provides:

- Regulated -20 volts for the transistorized transmitter exciter-board.
- Regulated +10 volts for the receiver and for transmitter Channel Guard.
- Regulated +12.6 volts for transmitter filaments, receiver audio, relays & pilot lights.

Antenna Switching Relay

The antenna switching relay (K502) is mounted on the power supply. Keying the transmitter energizes the relay, which connects the transmitter output to the antenna. When the transmitter is unkeyed, K502 is de-energized and the receiver is connected to the antenna.

Receiver Power Supply (Optional)

Receiver power supply Type EP-39-A is provided when the Desk Mate Station is equipped with a second receiver.

LINE AMPLIFIER

Line Amplifier Type EA-24-A are used for matching the receiver output to a

600-ohm telephone pair in remote control applications.

The amplifier assembly is mounted on the back of the power supply over the VOLUME and SQUELCH Controls.

CONTROL PANEL

The Control Panel contains the AC input circuit, remote control multi-frequency kits and telephone line connections. The panel is mounted on the chassis mounting frame below the Transmitter-Receiver Power Supply.

AC Input

The 117-Volt AC input is connected directly to TB706-1 and 2. All power to the station is controlled by switch S701 on the Control Panel.

An optional 220/110 Volt AC Stepdown Transformer Kit is available for use when the input line voltage is 220 Volts AC.

WARNING

117-Volts AC is always present at TB706-1 and 2 even when S701 is in the OFF position. Always use care when servicing the Remote Control Panel.

Telephone Lines

The key link in a Remote Control installation is the telephone line from the Dispatcher Unit to the Remote Control Station. The telephone line is connected directly from the dispatcher's console to the Remote Desk Mate Station wherever it may be located.

There are three methods of telephone line control:

1. Two telephone pair--one for audio and one for control.
2. One metallic pair for both audio and control, simplexing the control voltage from the center-tap of the output transformer to ground.
3. One metallic pair for both audio and control, simplexing the control voltage from one line to the other by splitting the output transformer with a capacitor.

Refer to the Maintenance Manual for Remote Control Panel Model 4KC16A12 for complete information on Remote Control Telephone lines.

MICROPHONE (MODEL 4EM25A10)

A microphone is mounted inside the station for use during service and maintenance work by the serviceman. The Microphone connects to mike jack J902 located on the front side of the power supply.

SPEAKERS

Speaker Assembly

Speaker Assembly 19B219618G1 is used in later station combinations, and provides an audio output of 1.5 Watts. The speaker assembly mounts on the chassis of transmitter Receiver power supply Type EP-38-A.

NOTE

When a speaker is not used, a 3.5-ohm, 10-Watt resistor must be connected from TB501-11 to TB502-5 as a substitute for the speaker load impedance.

Speaker 4EZ16A20

Speaker Model 4EZ16A20 is used in earlier station combinations, and provides an audio output of 5 Watts, an attenuator is located on the speaker case for adjustment of audio output level by the serviceman.

The 4EZ16A20 is available as an external speaker option.

INITIAL ADJUSTMENT

After the MASTR Desk Mate Station has been installed as described in the Installation Manual, the transmitter, receiver, power supply and Control Panel must be adjusted by an electronics technician who holds a 1st or 2nd Class FCC Radiotelephone or Radiotelegraph license before the station can be placed in operation.

TEST EQUIPMENT REQUIRED

The following test equipment is required for the adjustment of both transmitter and receiver:

1. A tuning tool and a screwdriver.
2. GE Portable Test Set Type EX-3-A which is especially designed for testing the MASTR Station transmitter and receiver --or a 20,000 ohms-per-volt multimeter --or an optional built-in Station Test Metering Panel.
3. A signal source operating at the system frequency (preferably the transmitter which will normally be monitored by the receiver.

TRANSMITTER ADJUSTMENT

The initial adjustment for the transmitter includes:

- Loading the power amplifier into the antenna.
- Checking the frequency and modulation.

For the Initial Adjustment procedure, refer to the ALIGNMENT PROCEDURE in the MAINTENANCE MANUAL for the transmitter.

RECEIVER ADJUSTMENT

The initial adjustment for the receiver includes:

- Zeroing the receiver to the system operating frequency.
- Matching the antenna transformer to the antenna.

For the Receiver Initial Adjustment Procedure, refer to the FRONT END ALIGNMENT PROCEDURE in the MAINTENANCE MANUAL for the receiver.

POWER SUPPLY ADJUSTMENT

The initial adjustment for the power supply includes:

- Turning on power switch S501.
- Setting VOLUME control R511 to mid-range, and setting SQUELCH control R512 for quieting.

LINE AMPLIFIER ADJUSTMENT

The initial adjustment for the line amplifier consists of setting LINE LEVEL ADJUST R1501 located on the power supply for 2.7 Volts RMS (+11 dB) at the telephone pair.

For the line amplifier adjustment procedure, refer to the Maintenance Manual for the power supply.

CONTROL PANEL ADJUSTMENT

The initial adjustment for the remote control panel includes:

- Turning the power switch (S701) ON.
- Adjusting the AUDIO LEVEL CONTROL R701.

For the Initial Adjustment Procedure, refer to the Maintenance Manual for the control panel.

MAINTENANCE

TEST AND TROUBLESHOOTING PROCEDURES

The individual Maintenance Manuals for the transmitter and receiver describe standard test procedures which the serviceman can use to compare the actual performance of the transmitter or receiver against the specifications of the unit when shipped from the factory.

In addition, specific troubleshooting procedures are available to assist the serviceman in troubleshooting the transmitter, receiver and power supply.

For best results in servicing the station, the TEST PROCEDURES should be used in conjunction with the TROUBLESHOOTING PROCEDURES. Both sheets are listed in the Table of Contents of the applicable Maintenance Manual.

PREVENTIVE MAINTENANCE

To insure high operating efficiency and to prevent mechanical and electrical failures from interrupting system operations, routine checks should be made of all mechanical andelectrical parts. This preventive maintenance should include the maintenance checks listed in the chart on the next page.

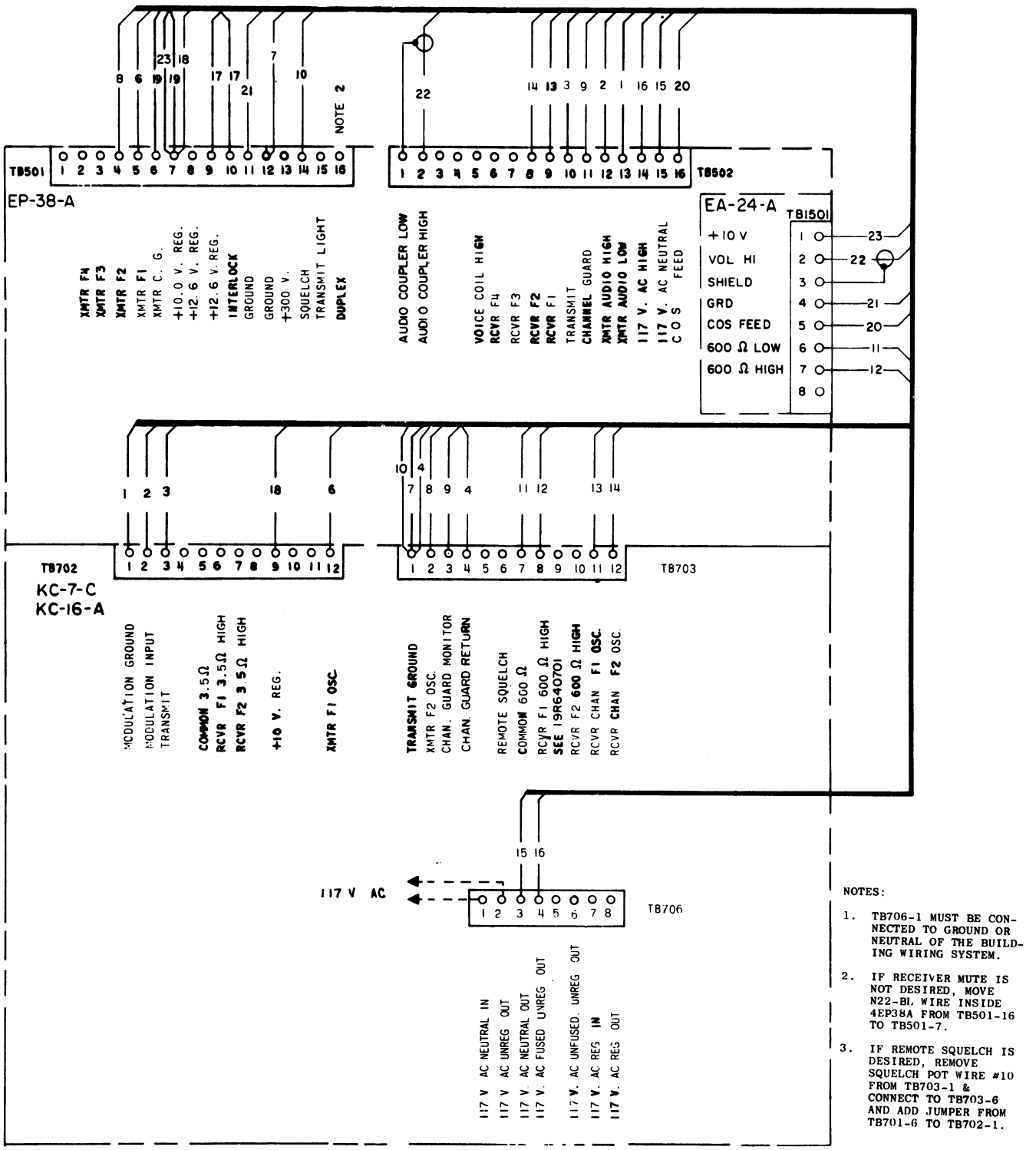
PREVENTIVE MAINTENANCE PROGRAM

CHECK THE FOLLOWING ONCE A YEAR:

1. Transmitter frequency and deviation (FCC requires this check-up ONCE a year) ..... ☐
2. Measure and record the antenna system V.S.W.R. ..... ☐
3. Check input voltage at TB706-1 and -2 on control panel. Reading should be within 10% of 117 VAC. (Also check during routine service calls). ..... ☐
4. Compare and record transmitter meter readings with voltages taken during initial tune-up. Retune, if necessary ..... ☐
5. Compare and record receiver meter readings with voltages taken during initial tune-up. Retune, if necessary ..... ☐
6. Check for positive indication of pressure on transmission line pressure gauge (if pressurized line is used) ..... ☐
7. Clean dust from fan blades and lubricate bearings ..... ☐
8. Burnish pitted or coated relay contacts to smooth out metallic deposits or remove the coating ..... ☐

MAKE THE FOLLOWING MAINTENANCE CHECKS DURING ROUTINE SERVICE CALLS:

1. Check antenna lines and mast for mechanical stability ..... ☐
2. Visually check:
   - External cables ..... ☐
   - Internal cables ..... ☐
   - plugs ..... ☐
   - sockets ..... ☐
   - terminal boards ..... ☐
3. Check for tightness of nuts, bolts, and screws to make sure nothing is working loose from its mounting ..... ☐
4. Replace tubes as necessary. (It may be convenient to replace all station tubes during the yearly check-up) ..... ☐



NOTES:

1. TB706-1 MUST BE CONNECTED TO GROUND OR NEUTRAL OF THE BUILDING WIRING SYSTEM.
2. IF RECEIVER MUTE IS NOT DESIRED, MOVE N22-BL WIRE INSIDE 4EP38A FROM TB501-16 TO TB501-7.
3. IF REMOTE SQUELCH IS DESIRED, REMOVE SQUELCH POT WIRE #10 FROM TB703-1 & CONNECT TO TB703-6 AND ADD JUMPER FROM TB701-6 TO TB702-1.

INTERCONNECTION DIAGRAM

(19D413495, Rev. 2)

MASTR DESK MATE STATION COMBINATION
REMOTE CONTROL PANEL

PARTS LIST

LBI-4149

MASTR DESK MATE STATION CABINET
7354211-G2

SYMBOL	GE PART NO.	DESCRIPTION
	7354211-P8	Door: (fits either side).
	4035449-P5	Bumper, door: rubber, sim to Atlantic India Rubber 1165.
	N529P38C	Plug. (for cable Knockouts at bottom of assembly).
	7354211-P7	Mounting rack. (2 drilled angles).
	5491682-P13	Lock and Key. Sim to Yale and Towne F7678DX1. Includes Key 5491682-P4 (Yale and Towne BF-10A).
	N80P19008C13	Screw, phillips: 12-24 x 1/2. (Used to secure rack panel assemblies).
	N403P21C13	Lockwasher: external tooth, No. 12. (Used to secure rack panel assemblies).
	19A121317-G15	Interconnection Harness.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

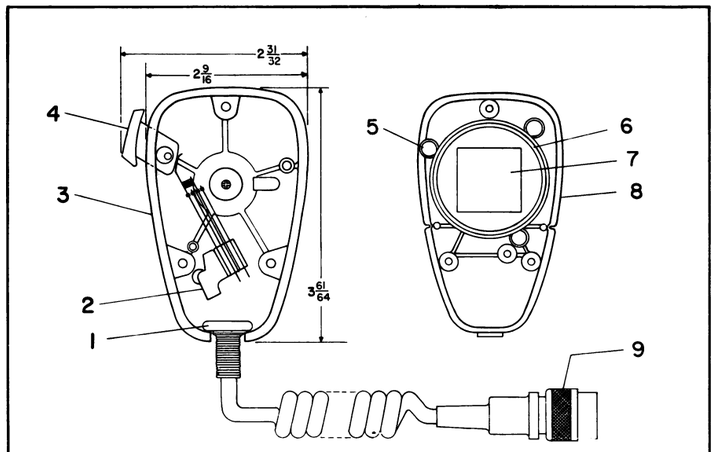
PARTS LIST

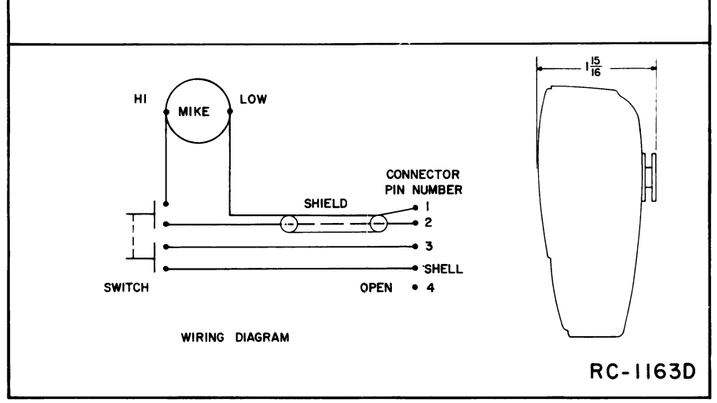
LBI-3558B

MILITARY MICROPHONE
MODEL 4EM25A10
(PL-19B209102-P1)
(SEE RC-1163)

SYMBOL	G-E PART NO.	DESCRIPTION
		MECHANICAL PARTS
		MODEL 4EM25A10
1		Cable clamp. Shure Brothers RP-16.
2		Switch. Shure Brothers RP26.
3		Case (back) and mounting button: plastic. Shure Brothers RP-67.
4		Switch button: red plastic. Shure Brothers RP-25.
5		Spring. Shure Brothers RP-1.
6		Shield. Shure Brothers RP-23.
7		Magnetic controlled cartridge. Shure Brothers RP-13.
8		Case (front) plastic. (Part of item 3).
9		Cable and plug: approx 6 feet long. Shure Brothers RP-14.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.





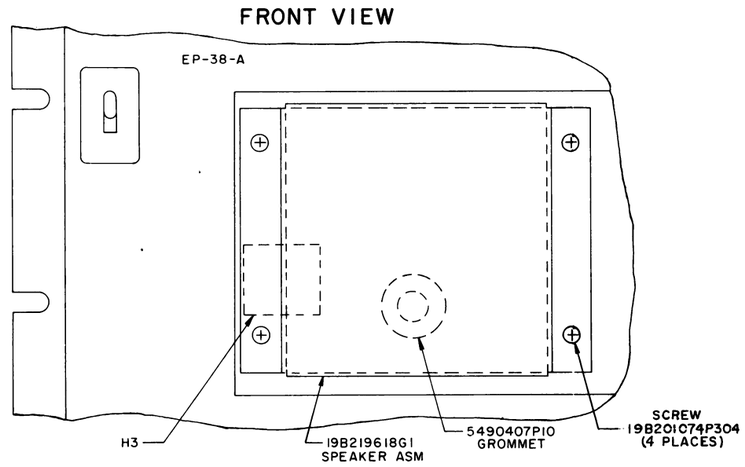
PARTS LIST

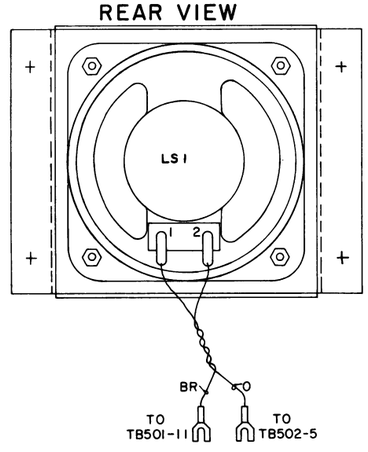
LBI-4427

STATION SPEAKER
19B219618G1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - LOUDSPEAKERS - - - - - - - - -
LS1	19A115964P1	Weatherproof, Permanent Magnet: 3-1/2 inch, 18 ohm ±10% imp at 1000 Hz, 15-19 ohms DC; sim to Oaktron S-9847.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	19B219615P1	Cover.
	19B209260P103	Terminal, solderless: sim to AMP 60495-1.
	5490407P10	Grommet.
	19B201074P304	Tap screw: No. 6-32 x 1/4.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.





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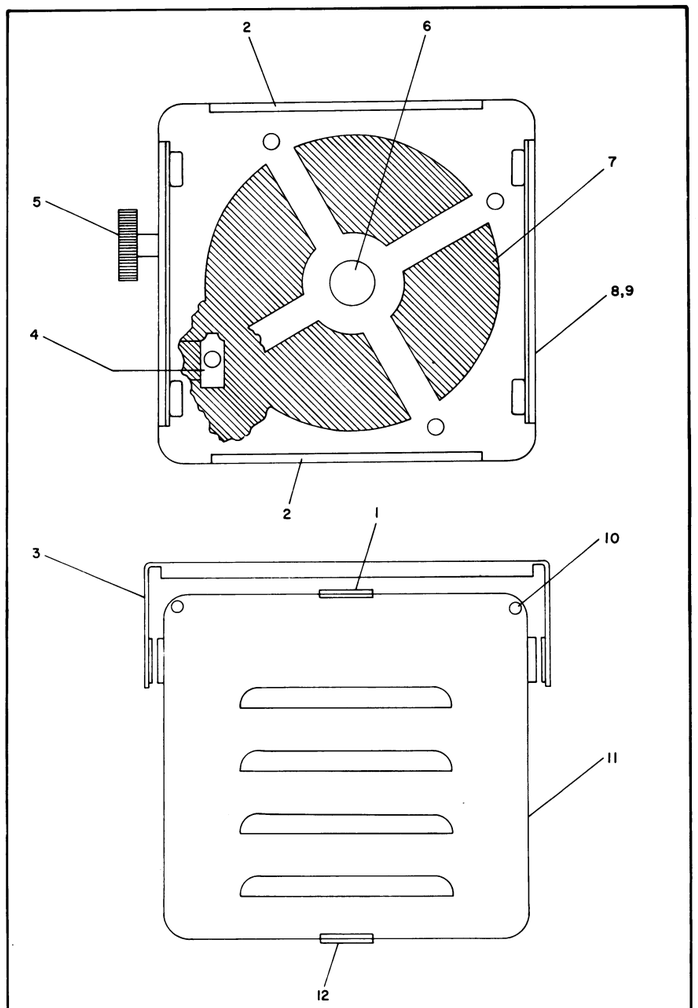
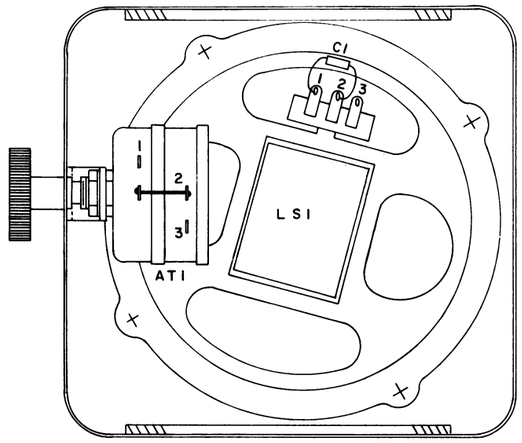
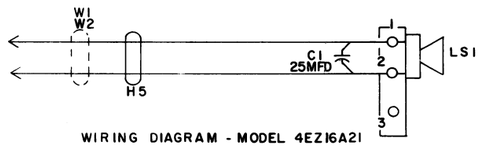


RC-1164B



NOTE: ATTENUATOR (AT1) USED ON MODEL 4EZ16A20 ONLY

RC-1363 B



WIRING DIAGRAM - MODEL 4EZ16A21

RC-1118 B

The speaker leads connect to TB501-11 and TB502-5 on the Transmitter-Receiver Power Supply.

SPECIFICATIONS

Audio Power Input:	5-watts
Frequency Range:	300-3000 Hz
Input Impedance:	3.2 ohms
Attenuator:	3.5 ohms

PARTS LIST

LBI-4081

FIVE-WATT STATION SPEAKER

MODEL 4EZ16A20 19D402449-G13
MODEL 4EZ16A21 19D402449-G14

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - - ATTENUATORS - - - - - - - - - -
AT1	7478301-P48	L-pad, variable, audio: 3.5 ohms res, 4 w, 40 db min attenuation max, 294° rotation.
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19B209233-P1	Electrolytic, non-polorized: 25 µf ±20%, 25 VDCW; sim to Sprague 41D.
		- - - - - - - - - - LOUDSPEAKERS - - - - - - - - - -
LS3	19B209422-P1	Permanent magnet: 5 inch, 3.2 ohms ±10% imp, 2.98 ohms ±15% DC res, 7.5 w max operating.
		- - - - - - - - - - - - CABLES - - - - - - - - - - -
W2	7484521-G7	Speaker: 2 conductor with 2 spade tongue terminals, approx 4 feet long.
		MECHANICAL PARTS (SEE RC-1164)
1	5490407-P3	Neoprene grommet.
2	19A121623-P1	(Not used).
3	19A121521-G1	Mounting support.
4	7160861-P20	(Not used).
5	19A115837-P1	Plastic knob. (Used in Model 4EZ16A20).
6	19A12467-P1	(Not used).
7	19C303500-P1	(Not used).
8	19B216269-G3	Can. (Used in Model 4EZ16A20).
9	19B216269-G2	Can. (Used in Model 4EZ16A21).
10	4037072-P10	(Not used).
11	19A121550-G3	Speaker cover.
12	19A115470-P1	Rubber grommet: approx 3/4 inch dia; sim to Atlantic Rubber 2279 (without hole).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

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-4145

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

GENERAL ELECTRIC

DF-9014

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