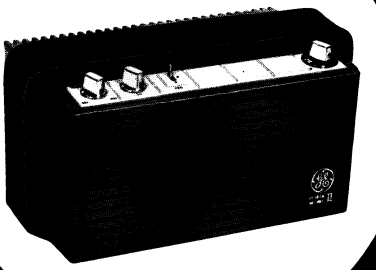
MOBILE RADIO

Porta-Mobil II™

MAINTENANCE MANUAL LBI-30382

DATAFILE FOLDER DF-9042



66 – 88 MHz
MOTORCYCLE
TWO-WAY FM RADIO

GENERAL ELECTRIC

TABLE OF CONTENTS

ILLUSTRATIONS

WARNING

Although the highest DC voltage in Porta● Mobil II™ Equipment is supplied by a portable or vehicular battery, high currents may be drawn under short circuit conditions. These currents can possibly heat metal objects such as tools, rings, watchbands, etc., enough to cause burns. Be careful when working near energized circuits! High-level RF energy in the transmitter Power Amplifier assembly can cause RF burns upon contact. Keep away from these circuits when the transmitter is energized!

EQUIPMENT INDEX

EQUIPMENT	TYPE OR PART NUMBER
Transmitter	66-88 MHz
Receiver	ER-87-A
System Board and Case Assembly	19D423076G3
Front Cover and Audio Amplifier	19C321258G4
Antenna	19C311006P9
Power Cable and Microphone Assembly	19C321929G1
Ignition Noise Filter	19C321889G1

INSTRUCTION BOOK INDEX
FOR
HIGH BAND PORTA•MOBIL II™

PUBLICATION	LBI NUMBER	DATAFILE FOLDER NUMBER
Installation Manual	LBI-30292	DF-9042
Operator's Manual	LBI-30084	-------
Combination Manual	LBI-30382	DF-9042
Transmitter	LBI-30368	DF-3167
Receiver	LBI-30184	DF-1102
System Board and Case Assembly 19D423076G3	LBI-30285	DF-4103
Audio Power Amplifier 19C321258G4	LBI-30098	DF-8377

SPECIFICATIONS*

GENERAL

FREQUENCY RANGE	66-88 MHz
DIMENSIONS (HXWXD)	
Includes Power Plug and Antenna Connector	5.25" x 9.0" x 5.4"
OPERABLE TEMPERATURE RANGE	-30°C to +60°C
BATTERY DRAIN (@ 13.8 Volts)	
Standby	30 milliamps
Receive	2 amperes (rated 10 watts audio)
Transmit	4.5 amperes

MAXIMUM FREQUENCY SPACING

TRANSMITTER

Frequency Range	No Degradation	
66-88 MHz	Low Side	High Side
	+600 MHz	+800 MHz

RECEIVER

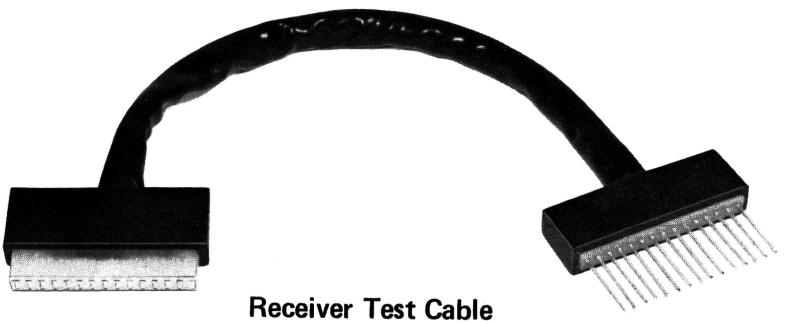
Frequency Range	No Degradation		3 dB Degradation (Sensitivity)	
66-88 MHz	Low Side	High Side	Low Side	High Side
	±300 kHz	±400 kHz	±600 kHz	±800 kHz

COMBINATION NOMENCLATURE

1st Digit	2nd Digit	3rd Digit	4th Digit	5th Digit	6th Digit	7th Digit	8th Digit	9th Digit	10th Digit
Product Line	System Voltage	RF Power Output Range	Channel Spacing	System	Number of Xmit Freq.	Options	Number Rcvr Frequency	Frequency Range	Frequency Range DFE
J Motorcycle	**G** 12 VDC Neg. Grd.	**5** 15-32 Watts	**4** 20 kHz	**S** Standard	**A** 1 Freq Xmit	**S** Standard	**A** 1 Freq Rcvr.	**D** 66-76 MHz	**X** NO DFE
					B 2 Freq Xmit	**W** Channel Guard Encode/Decode	**B** 2 Freq Rcvr.	**E** 76-88 MHz	
					C 3 Freq Xmit	**R** 2 Tone CG Encode	**C** 3 Freq Rcvr.		
					D 4 Freq Xmit	**B** T90 Encode/Decode	**D** 4 Freq Rcvr.		
					E 5 Freq Xmit	**C** T90 2-Tone Encode	**E** 5 Freq Rcvr.		
					F 6 Freq Xmit	**L** T99 Ind. Call	**F** 6 Freq Rcvr.		
					G 7 Freq Xmit	**M** T99 Ind. & Group Call	**G** 7 Freq Rcvr.		
					H 8 Freq Xmit		**H** 8 Freq Rcvr.		
					I 9 Freq Xmit		**I** 9 Freq Rcvr.		
					J 10 Freq Xmit		**J** 10 Freq Rcvr.		
					K 11 Freq Xmit		**K** 11 Freq Rcvr.		
					L 12 Freq Xmit		**L** 12 Freq Rcvr.		

ACCESSORIES

RF Test Connector
19B227389G1
(Option 2106)



Receiver Test Cable
19C327327G1
(Option 2118)

Transmitter Test Cable
19D424148G1
(Option 2118)

DESCRIPTION

General Electric Porta • Mobil II Mid Band Motorcycle combinations are compact, high performance two-way FM Radios designed for complete two-way communications in the 66-88 MHz frequency range. The radios utilize both discrete components and integrated circuit modules.

All Porta • Mobil II component boards are housed in a ruggedly constructed, weather-proof Lexan® case with aluminum front and back covers. The center of the case contains the system board with the receiver board and tone and control option boards. The front cover contains the 10 Watt audio amplifier, speaker and 7.5 Volt regulator module. The back cover contains the complete transmitter assembly: exciter board and RF power amplifier board.

Operating controls for the Porta • Mobil II are mounted along the top of the case assembly. The controls consist of an OFF-ON Volume control with a red LED transmit indicator, a Squelch control and a two-frequency toggle switch or a multi-frequency rotary selector switch. There is no frequency selector switch for single frequency radios. Control positions for multiple options are also along the top of the case assembly.

Porta • Mobil II Motorcycle combinations may be equipped with several options. The combination may have multiple Channel Guard Encoder/Decoder, Type 90 Encoder/Decoder or Type 99 Decoder Tone options.

Carrier Operated Relay, BUSY light, Automatic Monitor, SLM, and GATE, CALL INDICATOR and Hailer are a few of the other options offered.

OPERATION

Before adjusting the receiver, disable any options by placing the option switch(es) in the OFF or M (Monitor) position. After adjusting the receiver, place the option switch(es) back in the ON or N (Normal) position to enable the option. Refer to LBI-30084 for complete operating instructions.

TO RECEIVE A MESSAGE

1. Turn the OFF-VOLUME control about half-way to the right.

2. Turn the SQUELCH (SQ) control to the right as far as possible. A hissing sound will be heard from the speaker.

3. Adjust the VOLUME control until the hissing sould is easily heard but not annoyingly loud.

4. Turn the SQUELCH control slowly to the left until the hissing noise just fades out.

With the frequency selector switch, select the proper frequency. You are now ready to receive messages from other radios in your system.

TO SEND A MESSAGE

1. Turn the radio on as directed in the "To Receive a Message" section.

2. With the frequency selector switch, select the proper frequency. Then listen to make sure that no one is using the channel.

3. Press the Push-To-Talk (PTT) switch and speak directly into the microphone in a normal tone of voice. Release the PTT switch as soon as you stop talking. You cannot receive messages when the PTT switch is pressed.

OPERATING TIPS

The following conditions tend to reduce the effective range of Two-Way Radios, and should be avoided whenever possible.

- Operating the radio in low areas of the terrain, or while under power lines or bridges.

- Operating the radio inside of a vehicle, or in a metal or steelframed building unless using an outside antenna.

- Obstructions such as mountains or buildings between the person sending and the person receiving the messages.

In areas where transmission or reception is poor, some improvement may be obtained by insuring the antenna is fully extended and verticle. Moving a few yards in another direction or moving to a higher elevation may also improve communication.

MAINTENANCE

SERVICING THE RADIO

A complete procedure is provided in this manual for disassembling the radio for servicing. The procedure also contains instructions for replacing the different assemblies, integrated circuit modules and transmitter PA transistors. Refer to the Disassembly Procedure as listed in the Table of Contents.

If the radio should begin to operate improperly, (i.e., transmitter messages start getting weak and hard to understand,

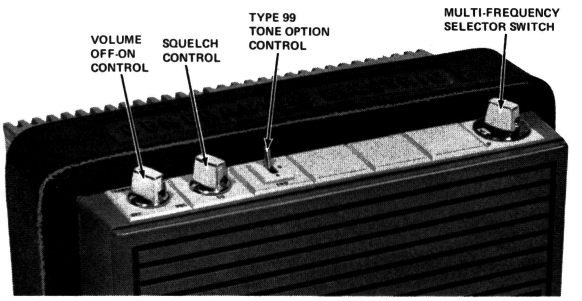


Figure 3 - Operating Controls

or the receiver won't squelch properly), the first thing to suspect is run-down batteries. If a freshly recharged battery pack fails to restore the radio to its normal operating condition, refer to the appropriate Troubleshooting Procedure for help in isolating and correcting the problem.

TEST AND TROUBLESHOOTING PROCEDURES

Whenever difficult servicing problems occur, the Test Procedures for the transmitter and receiver can be used by the serviceman to compare the actual performance of the unit to the specifications met by the unit when shipped from the factory.

In addition, specific Troubleshooting Procedures are available for the transmitter, receiver and tone options. For best results, the Test Procedures should be used in conjunction with the Troubleshooting Procedures when servicing the radio. Refer to the applicable Maintenance Manual.

CHANGING FREQUENCIES

To change the operating frequency of the transmitter or receiver, it is necessary to replace the entire oscillator module as directed in the Disassembly Procedure. Always give the model number of the module and the exact operating frequency required when ordering new oscillator modules.

After replacing the oscillator module, re-align the transmitter or receiver as directed in the Alignment Procedure (refer to the applicable Maintenance Manual).

DISASSEMBLY PROCEDURE

Do not attempt to remove a module from the printed wiring board until troubleshooting indicates that the module is bad. Remove or replace the assemblies or modules as directed.

Caution: Always remove the power source before removing any component board to avoid blowing the fuse.

Equipment Required

Small Phillips-head screwdriver.

Pencil-type soldering iron (40-60 watts) with a fine tip for unsoldering module leads and component leads, and a medium tip for unsoldering module mounting tabs.

Needlenose pliers for removing slotted nuts.

Tuning tool 19B219079-P1 for removing Allen-head set screws in the controls.

Allen-head #8, wrench 7150729P11 for removing bolts in the case assembly.

STEP 1

To remove the antenna, unscrew the antenna nut (A) and remove the antenna.

STEP 2

To gain access to the internal circuitry, loosen the four captive Allen-head bolts (B) with the Allen-head wrench and carefully remove the front or rear cover of the case assembly. The RF power cable must be disconnected by unplugging an in-line connector between the rear cover and the system board.

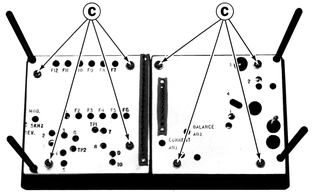
CAUTION

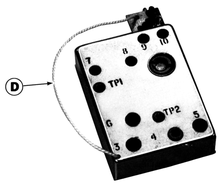
When replacing the front and rear assemblies a torque wrench should be used to tighten the captive Allen-head bolts (B). A torque of 20 inch-pounds should NOT be exceeded.

STEP 3

To gain access to the transmitter circuitry remove the four Phillips-head screws (C) holding the cover on the exciter or the PA.

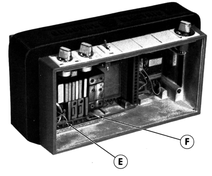
The exciter module can be unplugged by pulling on lifting strap (D).





STEP 4

To gain access to the receiver unplug plugs (E) and lift the receiver board out of the case by lifting strap (F). Option boards can be removed from the case by the same method.



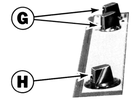
CAUTION

Do not place a circuit board on metal or other conductive surface with power applied. To do so will damage the Integrated Circuit modules. A small "pancake" of Duxseal® provides an excellent insulated work surface for the receiver or tone board.

STEP 5

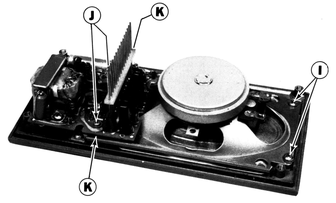
To remove the Volume or Squelch Control, remove the set screw (G) in the side of the control with the tuning tool. Then unscrew the slotted nut and remove the control.

To remove the Multi-Frequency switch, remove the set screw (H) as directed above. Then remove the washer, unscrew the slotted nut and remove the control.



STEP 6

To replace the speaker, remove the two Phillips-head screws I and loosen the two Phillips-head screws (J). With a pair of needlenose pliers loosen standoff (K). Remove speaker retaining plate and speaker.

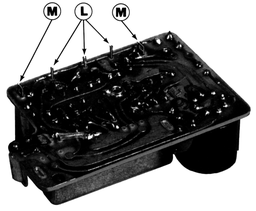


STEP 7

To replace one of the modules, unsolder and straighten up the module wire leads (L). Remove any solder accumulation from the leads.

Unsolder and straighten up the module mounting tabs (M) and remove any solder accumulation.

If replacing the receiver front end or mixer modules, also remove the small screws holding the helical resonators. Replace the module and solder down the mounting tabs and then the wire leads. Refer to the appropriate Outline Diagram (see Table of Contents) for the wire lead placement, if required.

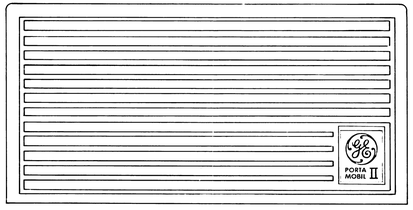


WARNING

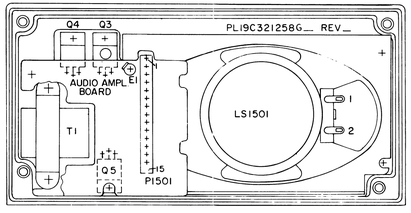
The stud mounted RF Power Transistor used in the PA Module contain Beryllium Oxide, a TOXIC substance. If the ceramic or other encapsulation is opened, crushed, broken or abraded, the dust may be hazardous if inhaled. Use care in replacing transistors of this type.

FRONT COVER

FRONT VIEW

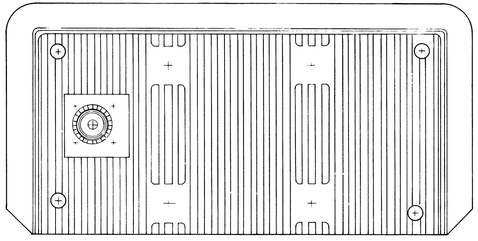


REAR VIEW

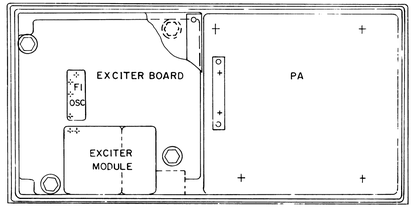


REAR COVER

FRONT VIEW



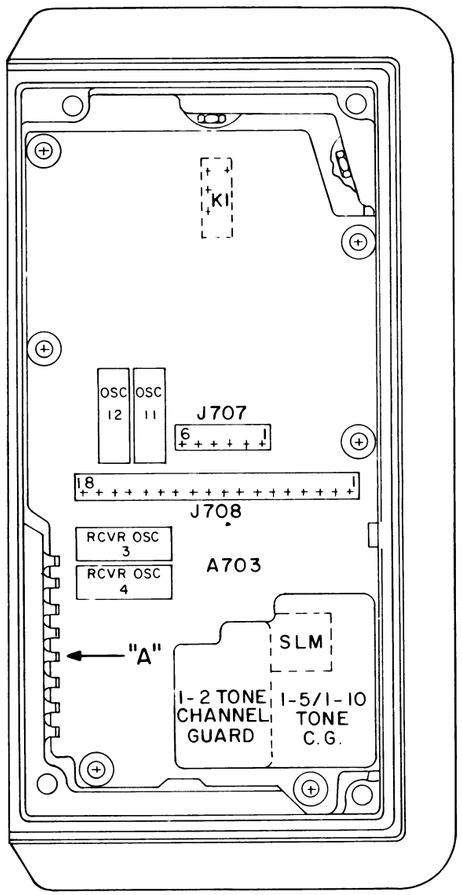
REAR VIEW

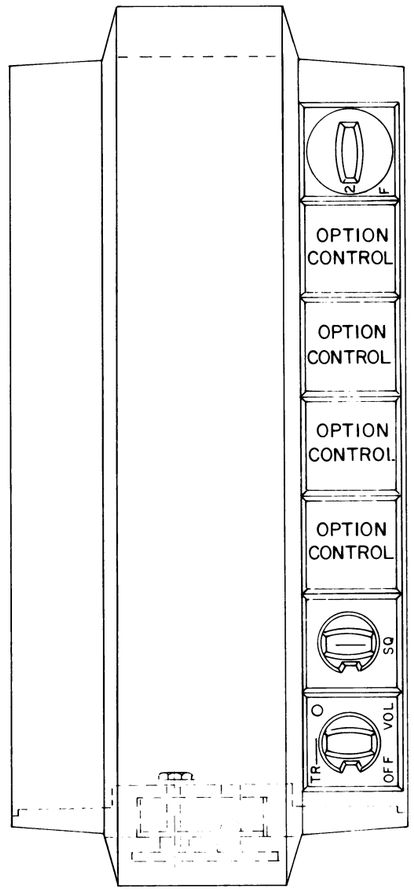


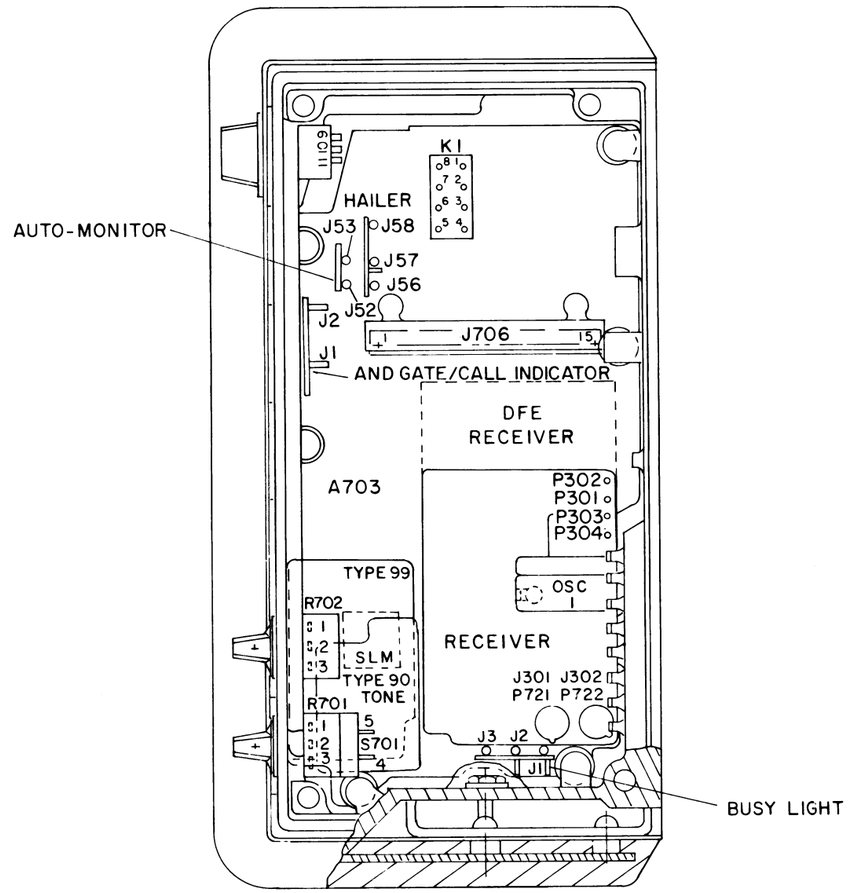
MODULE LAYOUT DIAGRAM

(19D424016, Sh. 1, Rev. 2)

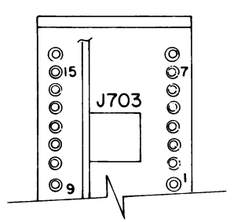
66—88 MHz MOTORCYCLE







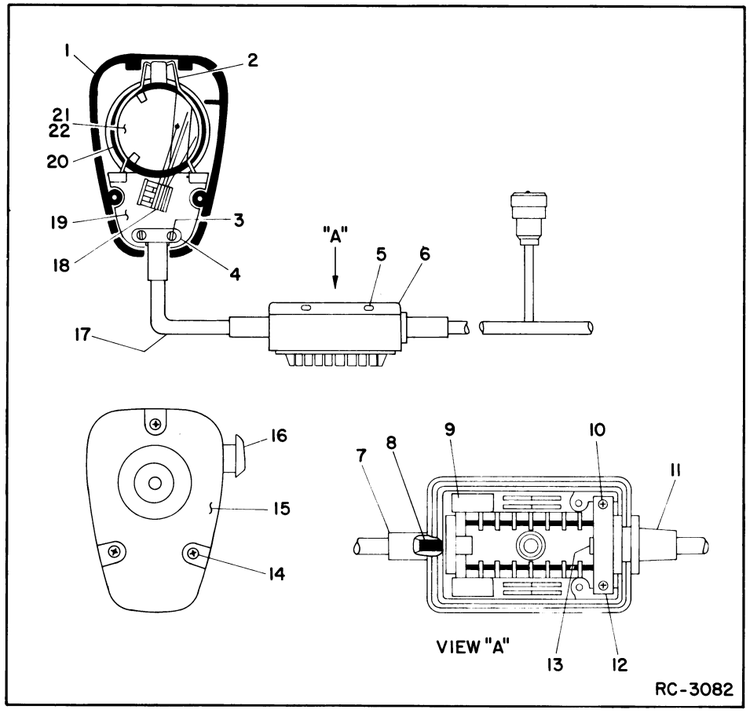
(19D424016, Sh. 3, Rev. 0)



VIEW AT "A"

MODULE LAYOUT DIAGRAM

66—88 MHz MOTORCYCLE



PARTS LIST

LBI-30299

POWER CABLE AND MICROPHONE ASSEMBLY
19C321929G1 STANDARD
19C321929G2 REAR MOUNT

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - MICROPHONES - - - - - - - - - -
MK1	19C320270G10	Microphone, dynamic. Includes P6-P9.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1	19C321269G2	Connector: 16 contacts.
P2	7147199P2	Contact, electrical: female; sim to Winchester Electronics 21804. (Part of W2).
P3	7147199P2	Contact, electrical: female; sim to Winchester Electronics 21804. (Part of W3).
P4	7147199P2	Contact, electrical: female; sim to Winchester Electronics 21804. (Part of W4).
P5	7147199P2	Contact, electrical: female; sim to Winchester Electronics 21804. (Part of W5).
P6 thru P9	7147199P1	Contact, electrical: male; sim to Winchester Electronics 21737.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1 and R2	3R77P472K	Composition: 4700 ohms ±10%, 1/2 w.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1	19A134268P1	Conduit, nonmetallic: approx 8 feet long; sim to Co-Operative Ind. C-11000-18.
W2	19B227262G1	Cable: approx 3 inches long. (Includes P2).
W3	19B227262G2	Cable: approx 3 inches long. (Includes P3).
W4	19B227262G3	Cable: approx 3 inches long. (Includes P4).
W5	19B227262G4	Cable: approx 3 inches long. (Includes P5).
W6		RP129 (See item 17 on RC-3082).
W7	19B227391G1	Cable assembly.
		MECHANICAL PARTS (SEE RC-3082)
1		Front Case assembly. RP127. (Includes items 14 and 15).
2		Retaining spring. (Part of item 19).
3		Tap screw, phillips. (Part of item 17).
4		Retaining bar. (Part of item 17).
5	19A116773P106	Tap screw, Phillips POZIDRIV®: No. 7-19 x 3/8.
6	19D417745P1	Cover.
7	19B219749P1	Flex relief.
8	19A130080P1	Cable clip.
9	19A130903P1	Support.
10	19A116773P105	Tap screw, Phillips POZIDRIV®: No. 7-19 x 5/16.
11	19B226586P1	Seal.
12	19A130897P1	Strain relief.
13	19A134268P1	Conduit, non-metallic, 8 feet long; sim to Co-Operative Industries Inc. C-11000-18.
14		Tap screw, phillips. (Part of item 1).
15		Rear Case assembly. (Part of item 1).
16		Switch button kit. RP126.
17		Cable assembly. RP129. (Includes items 3 and 4).
18		Switch assembly. RP128.
19		Grille assembly. RP130. (Includes items 2, 20, and 21).
20		"O" Ring. (Part of item 19).
21		Washer. (Located under cartridge- Part of item 19).
22		Dynamic cartridge, 200 ohms nominal imp: Shure Brothers 99A668.
23	7488373P2	Cable clamp. 5/16 inch loop; sim to Thomas Associates TA717-SS5.
24	N80P21006C6	Machine screw: No. 1/4-20 x 3/8.
25	N405P41C15	Lockwasher, spring type: 1/4 inch.
26	N22P21022C13	Cap screw: size No. 1/4.
27	19A134297P1	Lockwasher, steel: sim to Shakeproof 3079-14-00.
28	4037064P21	Washer, non-metallic: .281 ID.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SERVICE SHEET

POWER CABLE & MICROPHONE

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.

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

GENERAL ELECTRIC

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