GE MOBILE RADIO

MAINTENANCE MANUAL
FOR
DIGITAL DIAL ENCODER
(OPTIONS 8570, 8571)

CONTENTS

DESCRIPTION

The Digital Dial Encoder is used with the General Electric MASTR®Controller or MASTR® Local Controller for selective signaling applications. The dial and encoder board are installed in the center position of the Controller switch panel. Option 8570 provides 1500 Hertz encoding and Option 8571 provides 2805 Hertz encoding. A digital decoder is used at the receiving end of the system to decode the dialed digits and activate external devices such as a CALL light, a sounder or an external alarm.

When the encoder dial is moved off normal, S1 contacts W-W close and apply a positive voltage to the base of Q7 turning the transistor on. Conduction of Q7 turns off Q6, allowing Q5 to conduct. Conduction of Q5 applies ground to the PTT lead to key the station transmitter and also turn off Q4. The high at the collector of Q4 turns on Q3. Conduction of Q3 applies 13 Volts to the tone oscillator (Q1) and tone amplifier (Q2), allowing both transistors to conduct. The tone level generated is determined by adjustment of potentiometer R6. The tone is applied to the TONE output lead through S1 contacts G-BL and resistor R19.

S1 contacts G-BL pulse as the dial returns to normal, resulting in a series of tone pulses at the TONE output lead corresponding to the digit dialed. When the dial returns to normal, contacts W-W open. A time delay network consisting of C7 and R17, holds the keying circuit on for approximately 2.5 seconds after the dial returns to normal.

ADJUSTMENT

After installation of the Digital Dial Encoder has been completed, move the dial off normal and hold while adjusting R6 for a deviation of ±3 kHz as measured with a deviation monitor at the station transmitter.

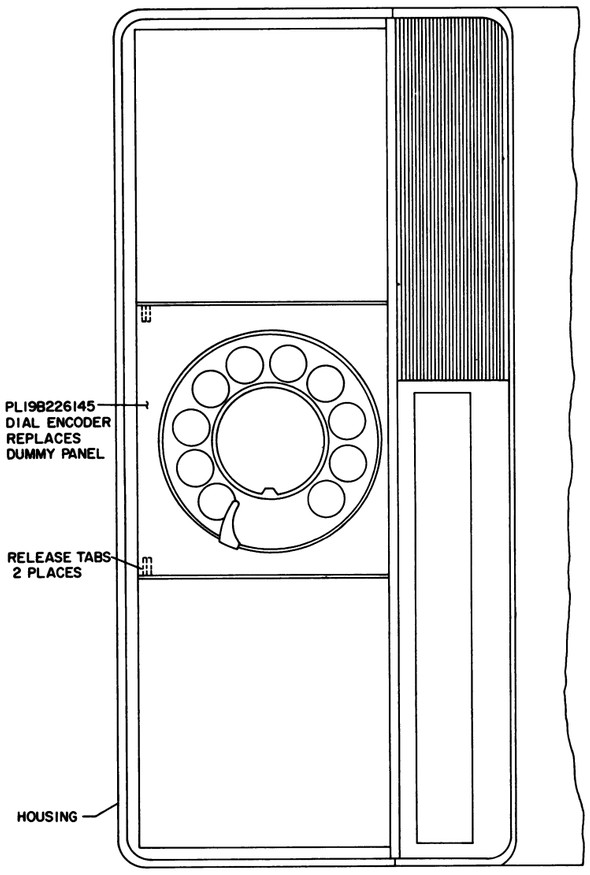


FIG. 1

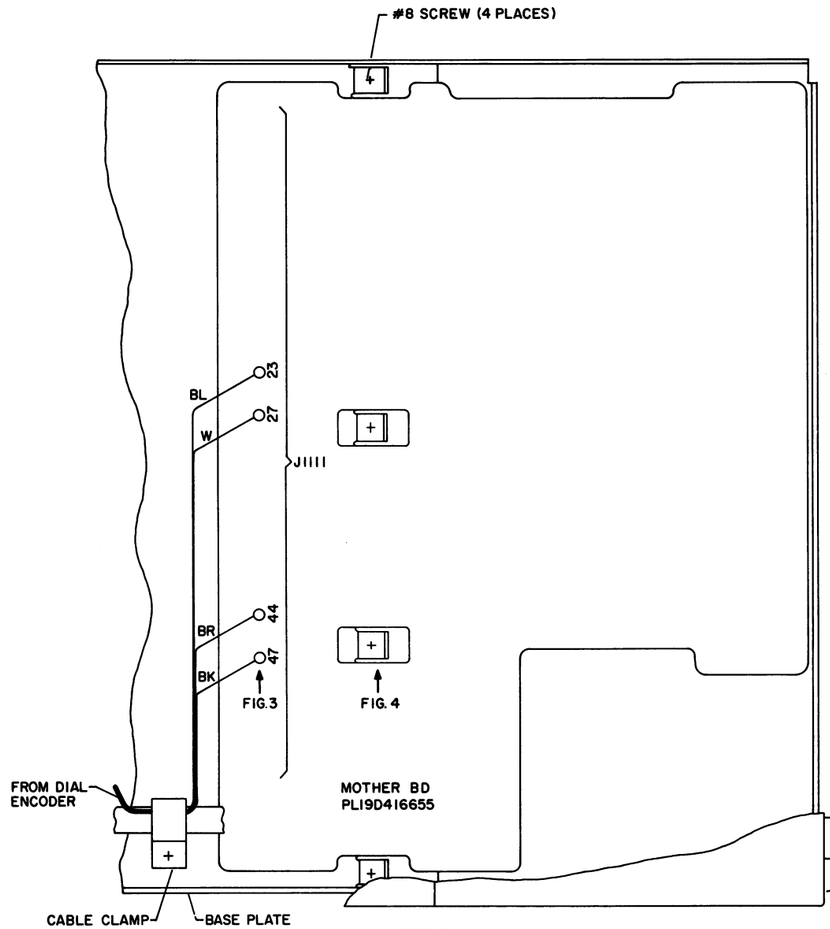


FIG. 2

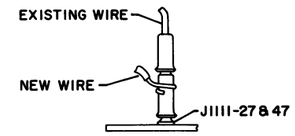


FIG. 3

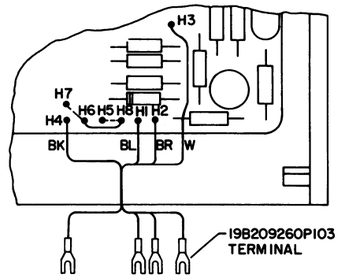


FIG. 6

ENLARGMENT OF DIAL ENCODER PL19B226145
MODIFIED FOR EXTENDED LOCAL OPTION

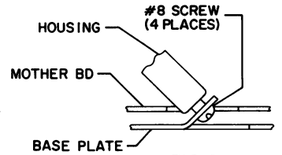


FIG. 4

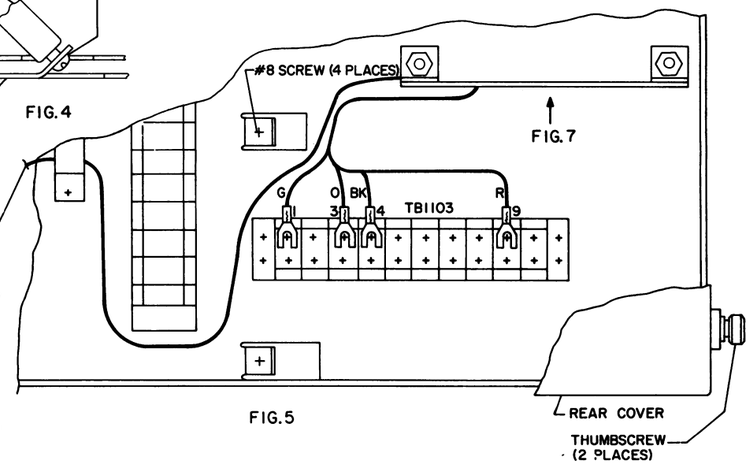


FIG. 5

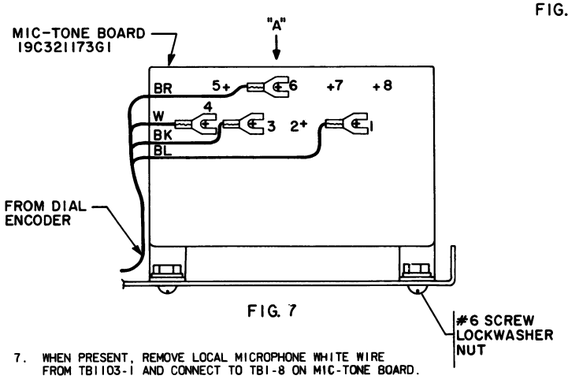
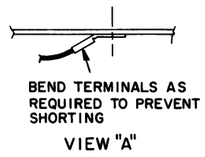


FIG. 7



VIEW "A"

(1) THESE INSTRUCTIONS COVER THE INSTALLATION OF THE DIAL ENCODER TO THE MASTR CONTROLLER.

1. DISCARD 4 SPADE LUG TERMINALS SUPPLIED IN KIT.
2. LOOSEN 2 THUMBSCREWS AT REAR OF UNIT AND REMOVE REAR COVER. SEE FIG. 2.
3. REMOVE 4- #8 SCREWS AT BOTTOM OF UNIT AND REMOVE HOUSING FROM BASE PLATE. SEE FIG. 2 & 4.
4. REMOVE DUMMY PLATE, IF PRESENT, BY DEPRESSING 2 RELEASE TABS WHICH ARE AVAILABLE FROM THE BOTTOM OF HOUSING. SEE LOCATION AT FIG. 1. RETURN PLATE TO STOCK.
5. ASSEMBLE DIAL ENCODER PL19B226145 IN VACANT AREA. SEE FIG. 1.
   a. SECURE 4 WIRES IN CABLE CLAMP AND SPOT TIE TO EXISTING WIRING.
   b. REMOVE ANY WIRES WHICH MAY BE AT 2 TERMINATION LOCATIONS (J1111-27 & 47). ASSEMBLE NEW WIRES AND PRESS ON EXISTING WIRES AT TOP OF NEW TERMINALS AS SHOWN IN FIG. 3.
6. REPLACE HOUSING AND REAR COVER.

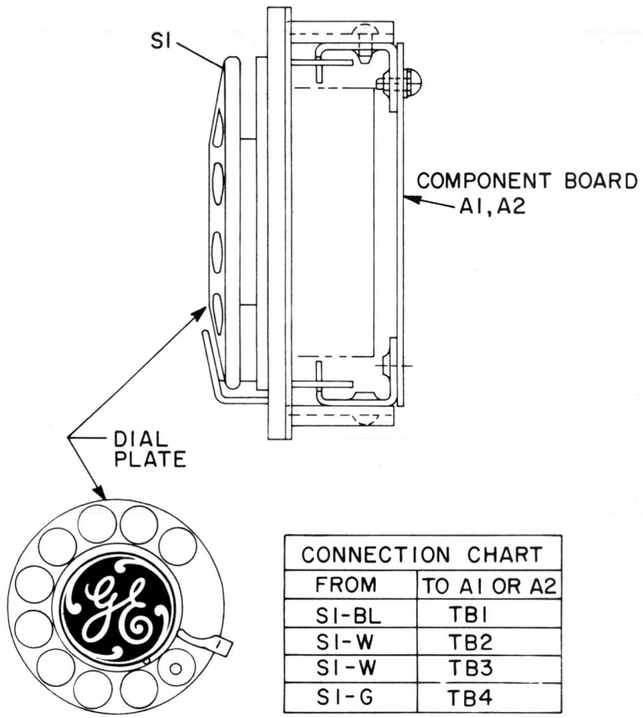
(2) THESE INSTRUCTIONS COVER THE INSTALLATION OF THE MODIFIED DIAL ENCODER TO THE LOCAL CONTROLLER.

1. LOOSEN 2 THUMBSCREWS AT REAR OF UNIT AND REMOVE REAR COVER. SEE FIG. 5.
2. REMOVE 4- #8 SCREWS AT BOTTOM OF UNIT AND REMOVE HOUSING FROM BASE PLATE. SEE FIG. 1 & 5.
3. REMOVE DUMMY PLATE, IF PRESENT, BY DEPRESSING 2 RELEASE TABS WHICH ARE AVAILABLE FROM THE BOTTOM OF HOUSING. SEE LOCATION AT FIG. 1. RETURN PLATE TO STOCK.
4. MODIFY DIAL ENCODER PL19B226145 (SEE FIG. 6) TO THE FOLLOWING INSTRUCTIONS:
   a. REMOVE JUMPERS BETWEEN H8 & H5 AND H6 & H7. ADD JUMPER (DA WIRE) BETWEEN H8 & H6.
   b. CLIP OFF EXISTING TERMINALS FROM 4 WIRES IN CABLE AT JUNCTION OF WIRE & TERMINAL.
   c. CRIMP 4 SPADE LUG TERMINALS SUPPLIED WITH DIAL ENCODER TO HARNESS WIRES.
5. ASSEMBLE DIAL ENCODER (MODIFIED TO STEP 4 ABOVE) IN VACANT AREA. SEE FIG. 1.
   a. SECURE 4 WIRES IN CABLE CLAMP AND SPOT TIE TO EXISTING WIRING. SEE FIG. 5.
   b. SECURE TERMINALS TO MIC-TONE BOARD (SEE FIG. 7).
6. MOUNT MIC-TONE BOARD TO BASE PLATE (SEE FIG. 5) USING SCREW, NUT, & LOCK WASHER SUPPLIED WITH MIC-TONE BOARD.
   a. CONNECT MIC-TONE BOARD WIRES TO TERMINAL BOARD TB1103 (SEE FIG. 5). TERMINALS MAY BE ATTACHED TO EITHER SIDE TO TB1103. SPOT TIE WIRES TO EXISTING WIRING.
7. WHEN PRESENT, REMOVE LOCAL MICROPHONE WHITE WIRE FROM TB1103-1 AND CONNECT TO TB1-8 ON MIC-TONE BOARD.
8. DISCARD UNUSED PARTS SUPPLIED WITH MIC-TONE BOARD.
9. REPLACE HOUSING AND REAR COVER.

(19D417512, Rev. 5)

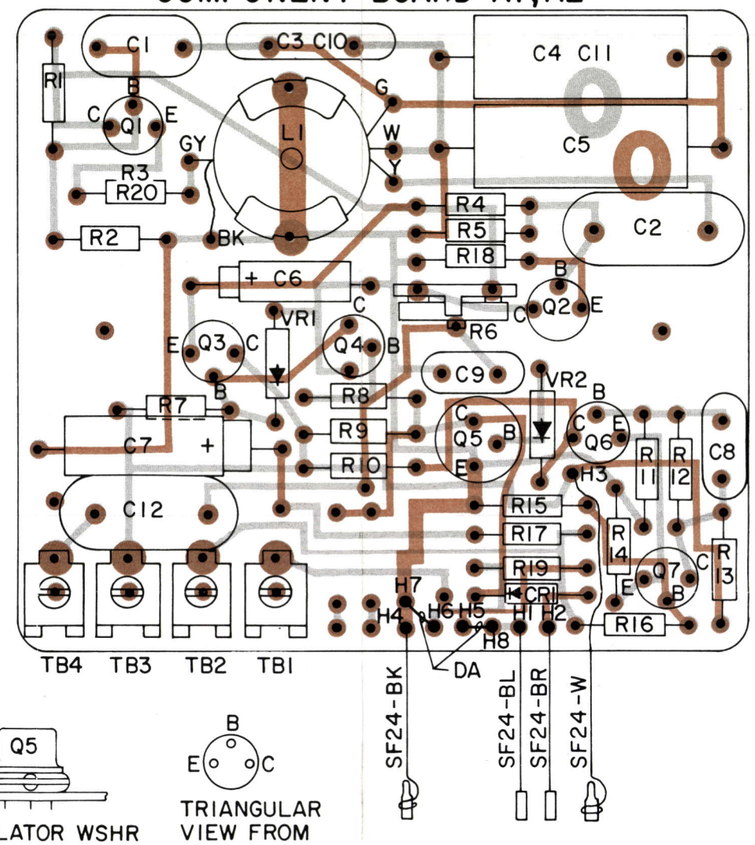
INSTALLATION INSTRUCTIONS

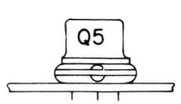
DIGITAL DIAL ENCODER



CONNECTION CHART	
FROM	TO A1 OR A2
S1-BL	TB1
S1-W	TB2
S1-W	TB3
S1-G	TB4

COMPONENT BOARD A1, A2

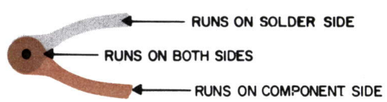




INSULATOR WSHR
FOR Q5

TRIANGULAR
VIEW FROM
LEAD END
Q1-Q7

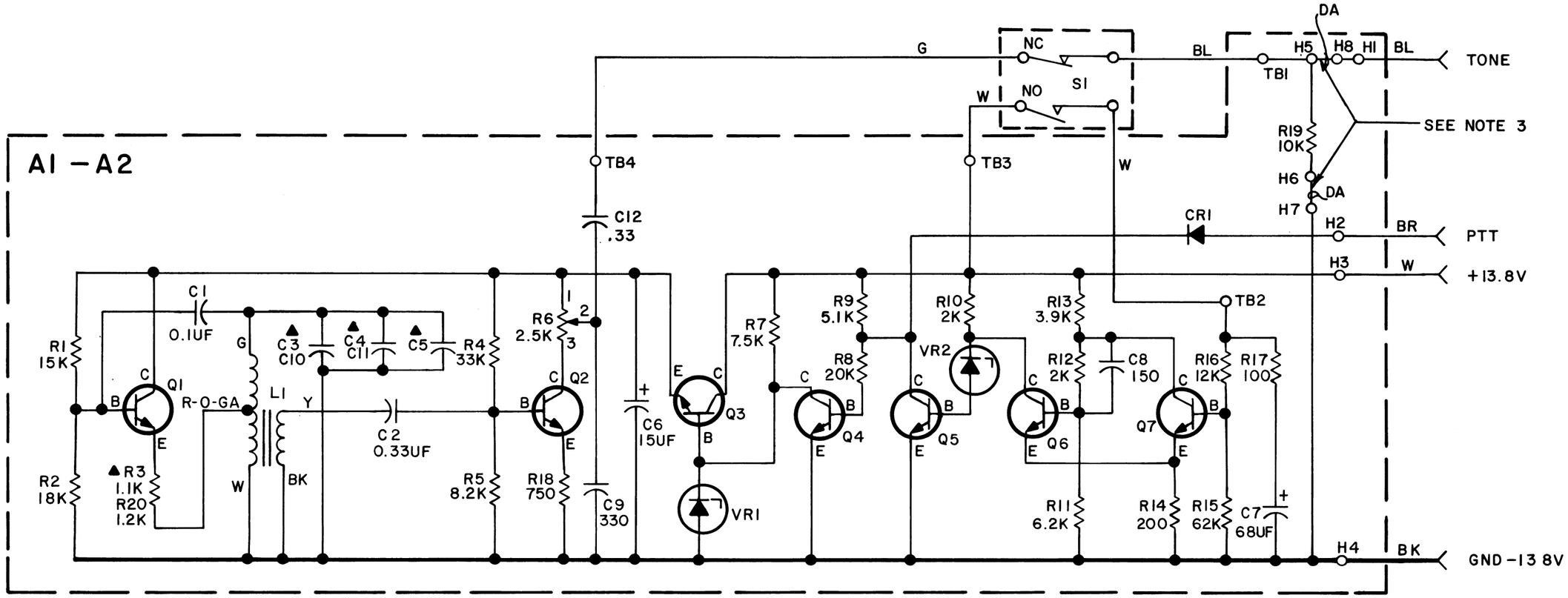
(19C321715, Rev. 0)
(19C320821, Sh. 2, Rev. 0)
(19C320821, Sh. 3, Rev. 0)



OUTLINE DIAGRAM

DIGITAL DIAL ENCODER

4 Issue 1



△ IN G1 FOR 1500 Hz APPLICATION USE C3, C4, C5, & R3
IN G2 FOR 2805 Hz APPLICATION USE C10, C11, & R20

SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.	
THIS ELEM DIAG APPLIES TO	
MODEL NO	REV LETTER
19B226145G1	A
19B226145G2	A

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.

NOTES:

1. ALL WIRES ARE SF24.
2. ALL RESISTORS ARE 1/4 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.
3. FOR EXTENDED LOCAL OPTION REMOVE JUMPER BETWEEN H5 & H8 AND JUMPER BETWEEN H6 & H7. ADD JUMPER BETWEEN H6 & H8.

(19C320827, Rev. 3)

SCHEMATIC DIAGRAM

DIGITAL DIAL ENCODER

PARTS LIST

LBI-4948A

DIGITAL DIAL ENCODER
19B226145G1 1500 Hz
19B226145G2 2805 Hz

SYMBOL	GE PART NO.	DESCRIPTION
A1 and A2		COMPONENT BOARD A1 19B226144G1 1500 Hz A2 19B226144G2 2805 Hz
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C2	19A116080P110	Polyester: 0.33 µf ±10%, 50 VDCW.
C3	5496203P479	Ceramic disc: 910 pf ±10%, 500 VDCW, temp coef -5600 PPM.
C4 and C5	19B209322P1	Polystyrene: 0.039 µf ±2%, 100 VDCW.
C6	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C7	5496267P11	Tantalum: 68 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C8	7489162P31	Silver mica: 150 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C9	7489162P39	Silver mica: 330 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C10	5496218P773	Ceramic disc: 270 pf ±5%, 500 VDCW, temp coef -750 PPM.
C11	19B209322P5	Polystyrene: 0.0232 µf ±2%, 100 VDCW.
C12	19A116080P110	Polyester: 0.33 µf ±10%, 50 VDCW.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1	19A115250P1	Silicon.
		- - - - - - - - - - INDUCTORS - - - - - - - - -
L1	19B205360G1	Coil.
		- - - - - - - - - - TRANSISTORS - - - - - - - -
Q1 thru Q4	19A115720P1	Silicon, NPN; sim to Type 2N2222.
Q5	19A115300P4	Silicon, NPN.
Q6 and Q7	19A115720P1	Silicon, NPN; sim to Type 2N2222.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R2	3R152P183J	Composition: 18,000 ohms ±5%, 1/4 w.
R3	3R152P112J	Composition: 1100 ohms ±5%, 1/4 w.
R4	3R152P333J	Composition: 33,000 ohms ±5%, 1/4 w.
R5	3R152P822J	Composition: 8200 ohms ±5%, 1/4 w.
R6	19B209358P104	Variable, carbon film: approx 100 to 2500 ohms ±10%, 0.2 w; sim to CTS Type X-201.
R7	3R152P752J	Composition: 7500 ohms ±5%, 1/4 w.
R8*	3R152P203J	Composition: 20,000 ohms ±5%, 1/4 w.
		Earlier than REV A:
	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R9*	3R152P512J	Composition: 5100 ohms ±5%, 1/4 w.
		Earlier than REV A:
	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R10	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R11	3R152P622J	Composition: 6200 ohms ±5%, 1/4 w.
R12	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R13	3R152P392J	Composition: 3900 ohms ±5%, 1/4 w.
R14	3R152P201J	Composition: 200 ohms ±5%, 1/4 w.
R15	3R152P623J	Composition: 62,000 ohms ±5%, 1/4 w.
R16	3R152P123J	Composition: 12,000 ohms ±5%, 1/4 w.
R17	3R152P101J	Composition: 100 ohms ±5%, 1/4 w.
R18	3R152P751J	Composition: 750 ohms ±5%, 1/4 w.
R19	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R20	3R152P122J	Composition: 1200 ohms ±5%, 1/4 w.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1 thru TB4	19A116667P5	Nut plate; sim to Cinch 495-64-00-024.
		- - - - - - - - - VOLTAGE REGULATORS - - - - - - -
VR1	4036887P11	Silicon, Zener.
VR2	4036887P5	Silicon, Zener.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	19B200269P2	Telephone dial: sim to ITT Kellogg 3300D.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	4036555P1	Insulator, washer: nylon. (Used with Q5).
	4029840P2	Contact, electrical: sim to AMP 42827-2. (Hung in wiring-MASTR Controller application).
	4033348P1	Contact, electrical: sim to Bead Chain M125-34. (Hung in wiring-MASTR Controller application).
	19B209260P103	Terminal, solderless: sim to AMP 60495-1. (Hung in wiring-MASTR Local Controller).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

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.

REV. A - To prevent PTT LED from glowing in the OFF position.
Changed R8 and R9.

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.

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GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

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