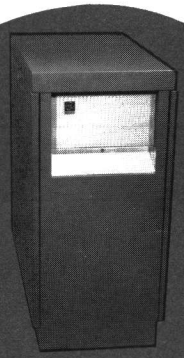
MOBILE RADIO

MASTR

Progress Line

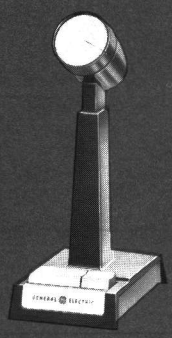
MAINTENANCE MANUAL



DESK-MATE STATION

TWO-WAY FM
DESK-MATE
STATION
COMBINATION

952-960 MHz
LOCAL CONTROL
OR
LOCAL/REMOTE CONTROL
LBI-4088A



DESK MICROPHONE

DF-9023

GENERAL ELECTRIC

TABLE OF CONTENTS

WARNING

Under no circumstances should any person 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
Converter Panel & Signal Generator	19D413291-G1 19D413397-G1
Transmitter	4ET59C42, C43
Receiver	4ER42H11, H17
Desk-Mate Cabinet	7354211-G4
Station Power Supply	4EP38A12
Antenna Relay (mounts on Converter Panel)	19B216688-G1
Local Control Panel	19D402460-G1
Local/Remote Control Panel	19D402460-G4
Remote Control Panel	4KC16A12
Remote Channel Guard Control	19A122231-G8
Microphone (with Channel Guard) (without Channel Guard)	4EM28B10 4EM28A10
117-VAC Power Cable	7491206-P1
Two-Prong Plug Adapter	7160486-P1
Alignment Tools (hex slug type) (slotted screw type)	4038831-P2 4033530-G2
Lock Assembly Keys Lock (with key)	 5491682-P4 (BF-10A) 5491682-P13

OPTIONAL EQUIPMENT

EQUIPMENT	OPTION NO.	TYPE OR MODEL NUMBER
Handset Hookswitch	7701 & 7703	4EM26C10 19B204867-G2
Control Panel (with Channel Guard Switch)	7703 & 7707	19D402460-G3
Application Kit for Type 90 and Type 99 Tone Decoders	7711	19B204996-G1
Station Test Metering Panel: Meter Panel Assembly Meter Switching Panel Assembly	7609	 19A121953-G1 19A121460-G1
Transmitter Metering Cover	7648	19C303676-G3
Receiver Metering Cover	7649	19C303676-G2
220/110-volt Stepdown Transformer Kit	7608	19A121971-G1
Military Microphone	7705 & 7707	19B209102-P1

SPECIFICATIONS*

GENERAL

FCC FILING NUMBER	ES-34-A
DIMENSIONS	
Desk-Mate Station	30-3/8" x 14" x 25-1/2"
Pole-Mount Station	42" x 23" x 12-1/2"
Floor-Mount Station	69" x 22" x 23"
WEIGHT	
Desk-Mate	Approximately 150 pounds
Pole-Mount	Approximately 200 pounds
Floor-Mount	Approximately 300 pounds
DUTY CYCLE (Transmit & Receive)	Continuous
INPUT VOLTAGE	117 VAC, ±10%, 50/60 Hz
INPUT POWER	Transmit: 1.66 amps max, 195 watts Receive: 0.8 amps max, 95 watts
OPERABLE TEMPERATURE RANGE	-30°C (-22°F) to +60°C (+140°F)
FREQUENCY RANGE	952-960 Megahertz

TRANSMITTER

(Includes Converter & Driver Transmitter)

RF Power Output: **	10 watts
RF Output Impedance:	50 ohms
Spurious and Harmonic Emission:	-60 dB
Modulation Deviation:	0 to ±15 kHz (36F3)
Frequency Stability:	±0.0002% from -30°C. to +60°C., ±25°C. Reference
FM Noise:	-50 dB
Audio Response:	Within +1 and -3 dB of 6 dB/octave pre-emphasis, 300 to 3000 Hz per E1A
Audio Distortion:	Less than 3%

RECEIVER

(Includes Converter & 450 MHz Rec)

RF Input Impedance:	50 ohms
Channel Spacing:	100 kHz
Sensitivity:**	
E1A 12 dB SINAD	1.0 µV
20 dB Quieting	1.25 µV
Critical Squelch	0.60 µV
Channel Guard Squelch	10 dB SINAD
Selectivity:	
E1A 2-Signal (100 kHz channels)	-90 dB
Frequency Stability (1st Oscillator)	+0.0002% from -30°C. to +60°C. +25°C. Reference
Modulation Acceptance:	±19 kHz
Spurious and Image Rejection:	-60 dB
Audio Response	Within +1 and -8 dB of 6 dB/octave de-emphasis, 300 to 3000 Hz
Audio Output:	5 watts at 3.5 ohms +18 dBm at 600 ohms at less than 5% distortion

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

** Rating is based on using a separate antenna for the receiver and transmitter. When using a single antenna with antenna relay, power output and receiver sensitivity will be 1.5 dB lower.

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	**4** 8-16 watts	**8** 50 KHz (Rating of 450 MHz Receiver)	**K** Local/ Remote Control Station	**A** 1-Freq. T 1-Freq. R	**S** Standard	**99** 952-960 MHz
				L Local Control Station		**U** Channel Guard	

DESCRIPTION

General Electric MASTR Progress Line Desk Mate Stations are attractively styled base stations that operate in the 952-960 megahertz band. This band is normally utilized for radio link operation in radio controlled base station systems.

The Desk Mate cabinet can be located on either side of a desk to provide additional working space. All operating controls are conveniently located on the control panel on the front of the cabinet. Both the transmitter exciter and the receiver are fully transistorized. Silicon transistors are used throughout for added reliability.

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 swingout chassis for simplified alignment and troubleshooting.

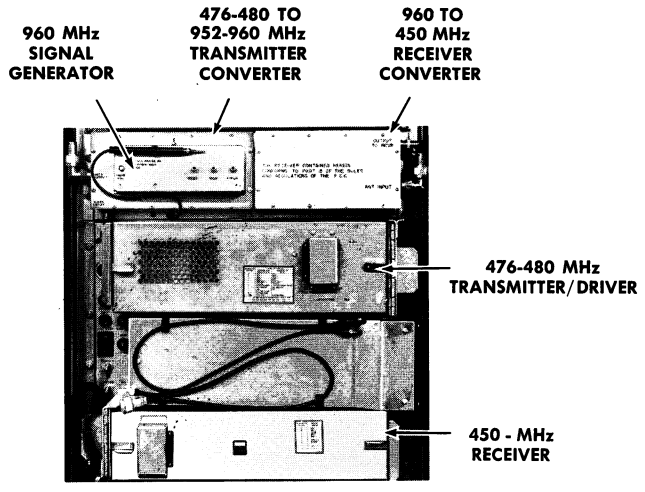


Figure 1 - Typical Station Equipment Arrangement

CONVERTER PANEL & SIGNAL GENERATOR

The Converter Panel with built-in Signal Generator provides both transmit and receive functions in the 952-960 megahertz band. The panel includes:

- 960 to 450 megahertz receiver converter stage.
- 476-480 to 952-960 megahertz transmitter doubler stage.
- 960 megahertz crystal controlled signal generator.
- Antenna Switching Relay K2651.

TRANSMITTER/DRIVER

The Transmitter/Driver is a single frequency transmitter which provides a 476-480 megahertz signal output to the doubler stage of the converter panel. The transmitter/driver is available with or without Channel Guard capability.

RECEIVER (450-470 mHz)

A 450 megahertz output from the receiver converter stage of the converter panel connects to a single frequency, 450-470 megahertz Receiver (Model 4ER42H11 & H17). This receiver acts as an IF amplifier and is available with and without Channel Guard capability. The receiver is completely contained in an aluminum casting, which provides excellent shielding.

POWER SUPPLY

Station Power Supply Model 4EP38A12 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, receiver converter, and for transmitter Channel Guard.
- Regulated +13.4 volts for transmitter filaments, receiver audio, relays, and pilot lights

LOCAL CONTROL PANEL

The Local Control Panel is conveniently located on the front of the Desk Mate Station and contains all operating controls for the station.

THE VOLUME control, SQUELCH control, ON-OFF switch, and indicator lamps are located on the front of the control panel below the speaker grille. (For Local/Remote Stations, an INTERCOM-SUPV switch is also located below the speaker grille).

A loudspeaker is mounted on the rear of the control panel. In Local Control Stations, a microphone preamplifier is also mounted on the rear of the control panel.

Microphone Pre-Amplifier A901 (Local Control Station)

Microphone pre-amplifier A901 provides an additional 10-dB gain for use with desk-type microphones. When a military mike or handset is used, the pre-amplifier is disconnected from the circuit by moving lead P1 from J1 to J2 (refer to Front Panel Outline Diagram) so that the signal is connected directly to the transmitter.

The audio signal from the desk-type mike is connected to the pre-amp transistor Q1 through coupling capacitor C1. Following amplifier Q1, the signal is coupled through audio coupling capacitor C2 to the transmitter.

Base bias for Q1 is provided through voltage divider circuit R1 and R2 from the 10-volt regulated supply.

AC Input (Local Control Station)

The 117-volt AC input is connected directly to terminals 1 and 2 of TB903. All power to the station is controlled by switch S901. Turning S901 ON lights the green Power-On light. This indicates that the transmitter and receiver are turned on.

An optional 220/110 VAC Step Down Transformer Kit is available for use when the input line voltage is 220 VAC.

WARNING

117-volts AC is always present at terminals 1 and 2 of TB903, even when S901 is in the OFF position. Always use care when servicing the Control Panel.

Intercon-Supervisory Switch S903 (Local/Remote Stations)

Intercom-Supervisory Switch S903 is a two-position toggle switch located in the station transmitter keying circuit. When S903 is in the INTERCOM-SUPV position, transmitter keying is disabled. This prevents station operation by associated Transistorized Control Consoles (giving the station supervisory control), and permits intercom operation between the station and the consoles. The normal (down) position of S903 permits normal remote control station operation.

Optional Handset and Hookswitch

Handset Model 4EM26C10 and Hookswitch 19B204867-G2 are optional equipment for the Stations. With the handset on the hookswitch, audio can be heard through speaker LS901. When the handset is lifted off the hookswitch, the normally closed contacts of S1 in the hookswitch open, muting the speaker. The call can be heard in the handset earpiece. The push-to-talk button on the handset is pressed to transmit a message.

The handset plug connects to J901 located on the rear grille of the station cabinet.

REMOTE CONTROL PANEL (LOCAL/REMOTE STATIONS)

The Remote Control Panel contains the AC input circuit, remote channel guard control, Intercom-Compressor and telephone line connections. The panel is mounted on the chassis mounting frame below the Transmitter-Receiver Power Supply.

AC Input

The 117-VAC input is connected directly to TB706-1 and -2 on the Remote Control Panel. Power switch S702 is wired in series with the Local Control Panel power switch S901. To operate the station, S702 must always be in the ON position as both S702 and S901 are in series. Turning off either switch will cut off the power to the station. When both switches are in the ON position the green pilot light will be illuminated.

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

WARNING

117-VAC is always present at terminals 1 and 2 of TB706, even when S901 is in the OFF position. Always use care when servicing the Remote Control Panel

Intercom-Compressor

A 19A122231-G9 Intercom-Compressor is used in Local/Remote Station applications to equalize audio output levels over a wide range of microphone or line input levels. The circuit operates as a mike-to-line Compression Amplifier in the transmit or intercom mode, and as a line-to-speaker or receiver-to-speaker Compression Amplifier in the receive mode. The Intercom-Compressor is described in the Remote Control Panel Maintenance Manual.

Telephone Lines

Instructionsfor connecting the Remote Station to the telephone line(s) are included in the Maintenance Manual for the Remote Control Panel.

INITIAL ADJUSTMENT

After the MASTR Desk Mate Station has been installed as described in the Installation Manual, the transmitter, receiver, power supply and Remote 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 Test Meter Type EX-3-A or EX-8-K, Station Test Metering Panel (Optional), or a 20,000 ohms-per-volt multimeter.
3. A signal source operating at the system frequency (preferably the transmitter which will normally be monitored by the receiver).
4. Wattmeter

TRANSMITTER/DRIVER ADJUSTMENT

The initial adjustment for the transmitter/driver includes checking the frequency and modulation. For the initial adjustment procedure, refer to the MAINTENANCE MANUAL for transmitter Models 4ET59C42 & 43.

TRANSMITTER CONVERTER

The initial adjustment for the transmitter converter includes final tuning, loading, and checking the power output. (While inserting a 25-watt input from the transmitter/driver, check for at least 10 watts at the converter output). For the initial adjustment procedure, refer to the MAINTENANCE MANUAL for the converter panel.

RECEIVER (Models 4ER42H11 & 17)

The initial adjustment for the 450-470 mHz receiver includes adjusting the receiver operating frequency to the output frequency of the receiver converter. To obtain the converter output frequency, subtract the oscillator mixing frequency (marked on the ICOM in the converter) from the system operating frequency. For the initial adjustment procedure, refer to the MAINTENANCE MANUAL for the receiver.

RECEIVER CONVERTER

The initial adjustment from the receiver converter includes matching to the antenna and adjusting frequency to the system operating frequency. For the initial adjustment procedure, refer to the MAINTENANCE MANUAL for the converter panel.

POWER SUPPLY ADJUSTMENT

Local Control Stations

The initial adjustment for power supply Model 4EP38A12 includes setting the VOLUME control (R511) on the power supply to mid-range and setting the SQUELCH control (R512) on the power supply fully clockwise.

After these adjustments are made, the VOLUME and SQUELCH controls on the station Control Panel will normally operate near mid-range.

Local/Remote Stations

The initial adjustment for the power supply includes turning the power switch (S501) ON and adjusting the VOLUME (R511) and SQUELCH (R512) as follows:

Connect signal generator to receiver with maximum system deviation at 1000 Hz. Adjust VOLUME Control R511 for approximately 6.0 VRMS across the 600-ohm telephone line terminals TB701-1 and -2. (Do not reset R511 after making this adjustment). Turn the SQUELCH Control R512 fully clockwise. By making these adjustments, the front panel VOLUME and SQUELCH controls can be adjusted approximately in mid-range.

REMOTE CONTROL PANEL ADJUSTMENT

The initial adjustment for the remote control panel includes turning the power switch (S701) ON and adjusting the AUDIO LEVEL CONTROL R701.

For the Remote Control Panel Initial Adjustment Procedure, refer to the Maintenance Manual for the Remote Control Panel.

OPERATION

The basic procedures for receiving and transmitting messages are as follows:

TO RECEIVE A MESSAGE

1. Turn the radio on by pressing the ON button to the ON position. The green power-on light will glow, indicating that power is applied to the unit.
2. Turn the SQUELCH control clockwise (to the right) as far as possible.
3. Adjust the VOLUME control until the "hissing" sound is easily heard but not annoyingly loud.
4. Now, slowly turn the SQUELCH control counterclockwise (to the left) until the "hissing" sound disappears.

The radio is now ready to receive messages from other radios in the system.

TO TRANSMIT A MESSAGE

1. Apply power to the transmitter by pressing the ON button to the ON position. Let the unit warm up for 30 seconds.
2. Press the push-to-talk button on the microphone and speak in a normal (or softer) voice six inches away from the front of the mike. Release the button as soon as the message has been given. The red signal light on the Control Panel will glow each time the microphone button is pressed, indicating that the transmitter is on the air. The receiver is muted whenever the transmitter is keyed.

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.

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 and electrical parts. This preventive maintenance should include the maintenance checks listed in Table 1.

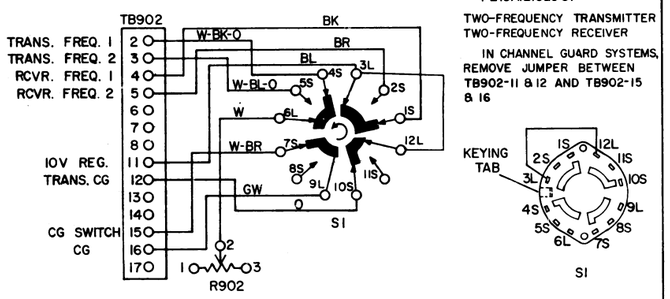
TABLE 1

PREVENTIVE MAINTENANCE PROGRAM

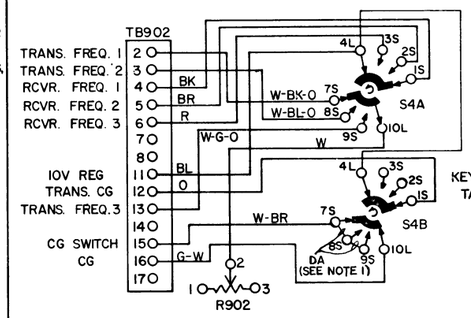
	CHECK THE FOLLOWING ONCE A YEAR:	
1.	Transmitter frequency and deviation (FCC requires this check-up ONCE a year).	☐
2.	Measure and record the forward and reflected power to the antenna system.	☐
3.	Check input voltage at TB706-1 and -2 on control panel. Reading should be within 10% of 117 VAC. (Also check during routine service calls).	☐
4.	Record transmitter meter readings. Compare with readings taken during initial tune-up. Retune, if necessary.	☐
5.	Record receiver meter readings. Compare with readings 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.	☐
	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).	☐

(DF-9023)

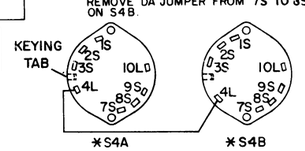
FREQUENCY SELECTOR SWITCHES
PL19A121629G1-G5 & G9
ALL SWITCHES ARE SHOWN IN THE F1 POSITION. ARROW INDICATES CLOCKWISE ROTATION, VIEWED FROM KNOB END (CCW ROTATION FROM TERMINAL END.)

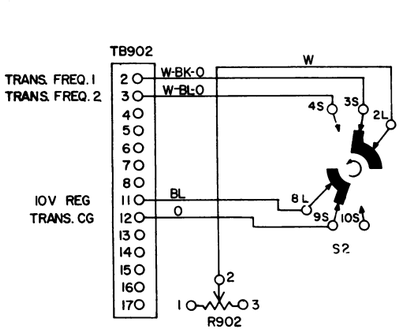


PL19A121629G1
TWO-FREQUENCY TRANSMITTER
TWO-FREQUENCY RECEIVER
IN CHANNEL GUARD SYSTEMS, REMOVE JUMPER BETWEEN TB902-11 & 12 AND TB902-15 & 16

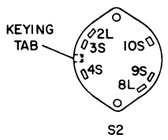


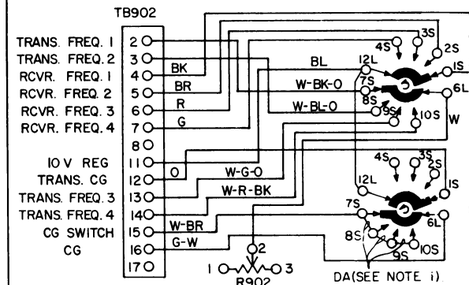
PL19A121629G4
THREE-FREQUENCY TRANSMITTER
THREE-FREQUENCY RECEIVER
IN CHANNEL GUARD SYSTEMS, REMOVE JUMPER BETWEEN TB902-11 & 12 AND TB902-15 & 16
NOTES:
1. FOR CHANNEL GUARD ON F1 ONLY, REMOVE DA JUMPER FROM 7S TO 8S ON S4B.



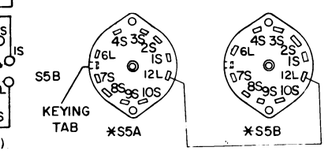


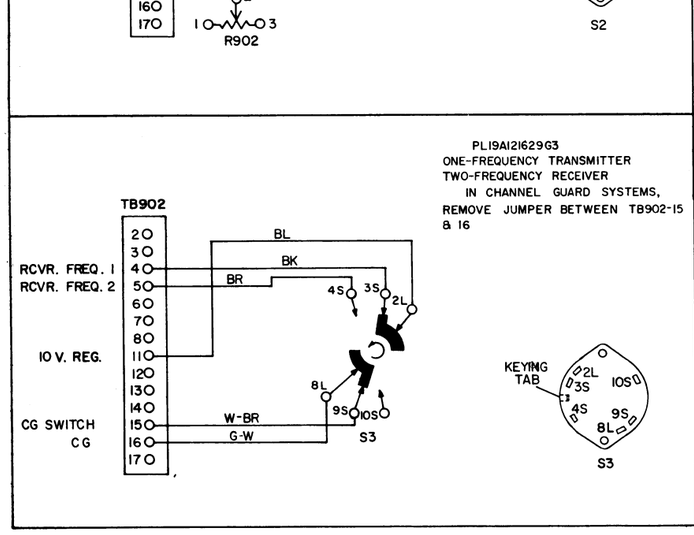
PL19A121629G2
TWO-FREQUENCY TRANSMITTER
ONE-FREQUENCY RECEIVER
IN CHANNEL GUARD SYSTEMS, REMOVE JUMPER BETWEEN TB902-11 & 12



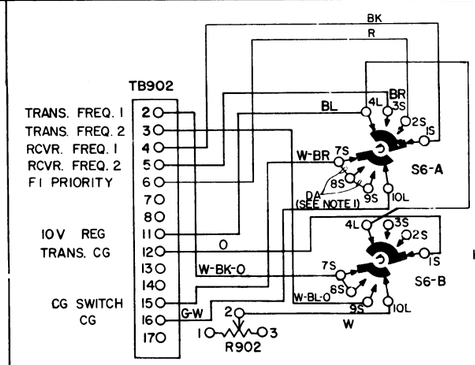


PL19A121629G5
FOUR-FREQUENCY TRANSMITTER
FOUR-FREQUENCY RECEIVER
IN CHANNEL GUARD SYSTEMS, REMOVE JUMPER BETWEEN TB902-11 & 12 AND TB902-15 & 16
NOTES:
1. FOR CHANNEL GUARD ON F1 ONLY, REMOVE DA JUMPER FROM 7S TO 8S ON S5B

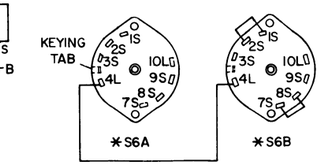


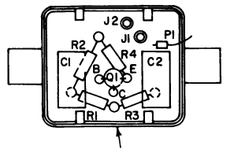


PL19A121629G3
ONE-FREQUENCY TRANSMITTER
TWO-FREQUENCY RECEIVER
IN CHANNEL GUARD SYSTEMS, REMOVE JUMPER BETWEEN TB902-15 & 16

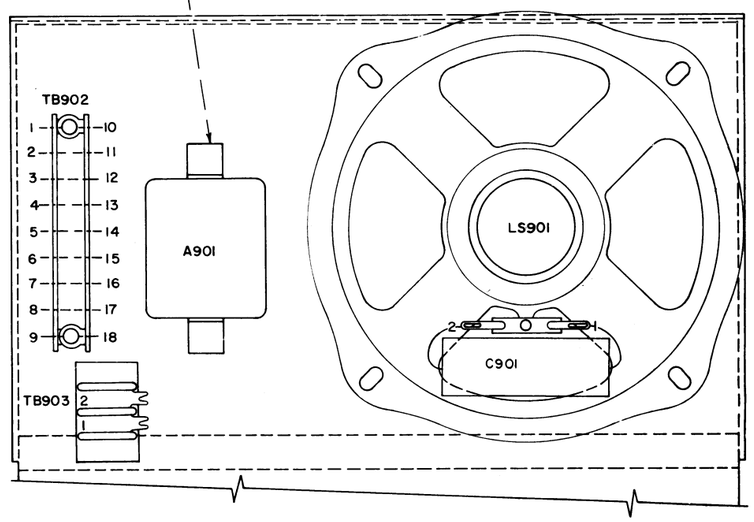


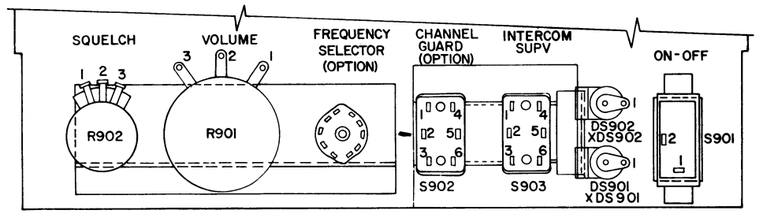
PRIORITY SEARCH LOCK MONITOR
PL19A121629G9
TWO-FREQUENCY TRANSMITTER
TWO-FREQUENCY RECEIVER
IN CHANNEL GUARD SYSTEMS, REMOVE JUMPER BETWEEN TB902-11 & 12 AND TB902-15 & 16
NOTES
1. FOR CHANNEL GUARD ON F1 ONLY, REMOVE DA JUMPER FROM 7S TO 8S ON S6A

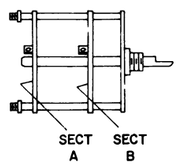




MICROPHONE PREAMPLIFIER A901



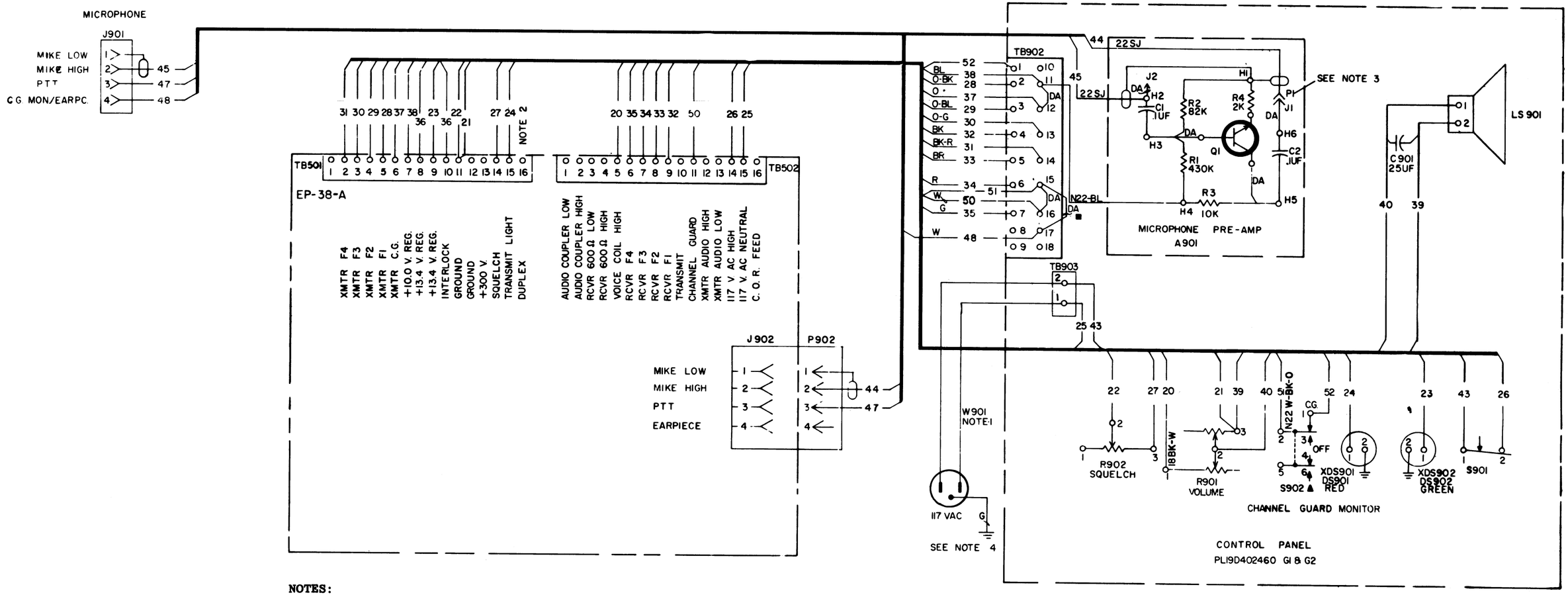




* MOUNT SWITCH WAFERS SECTION A AND SECTION B AS SHOWN ABOVE

OUTLINE DIAGRAM

MASTR DESK-MATE STATION COMBINATIONS
LOCAL OR LOCAL/REMOTE CONTROL PANEL



▲-OMIT S902 IN G1
■-OMIT JUMPER IN G2

NOTES:

1. PLUG OF W901 SHOULD BE INSERTED SO THAT WIRE #25 CONNECTS TO NEUTRAL OF BUILDING WIRING SYSTEM.
2. IF RECEIVER MUTE IS NOT DESIRED, MOVE N22-BL WIRE INSIDE 4EP38A FROM TB501-16 TO TB501-7.
3. WHEN USING MIL. WIKE OR HANDSET, REMOVE PRE-AMP A901 FROM CIRCUIT BY MOVING P1 FROM J1 TO J2.
4. CONNECT TO CONVENIENT CHASSIS MOUNTING SCREW.

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

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

(19D402404, Rev. 7)

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	REV LETTER
PLI9D402460G1	C
PLI9D402460G2	C

(DF-9023)

INTERCONNECTION DIAGRAM

MASTR DESK-MATE STATION COMBINATION LOCAL CONTROL

Issue 1

PARTS LIST

LBI-3625C

DESK-MATE STATION
FRONT END CONTROL PANEL
19D402460-G1 and G2
REV C

SYMBOL	G-E PART NO.	DESCRIPTION
A901		PRE-AMPLIFIER MICROPHONE ASSEMBLY 19B204663-G1
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1 and C2	19A115028-P114	Polyester: 0.1 µf ±20%, 200 VDCW.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1 and J2	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P1	4029840-P2	Contact, electrical: sim to Amp 42827-2.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P434J	Composition: 0.43 megohm ±5%, 1/2 w.
R2	3R77-P823K	Composition: 82,000 ohms ±10%, 1/2 w.
R3	3R77-P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R4	3R77-P202J	Composition: 2000 ohms ±5%, 1/2 w.
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C901*	19B209233-P2	Electrolytic, non-polorized: 25 µf ±20%, 25 VDCW; sim to Sprague Type 44DC. Added by Rev B.
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS901 and DS902	19C307037-P19	Lamp, incandescent: miniature, 14 v; sim to GE 756.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J901	7117934-P2	Connector, chassis: 4 female contacts; sim to Amphenol Type 91-PC4F.
		- - - - - - - - - - LOUDSPEAKERS - - - - - - - - - -
LS901*	19C307123-P3	Permanent magnet, 6-inch: 3.2 ohms ±10% Voice Coil imp., 3 W maximum operating, 150-300 Hz resonance, paper dust cap; sim to Pioneer 5-709524. In Models earlier than Rev. C:
	19C307123-P1	Permanent magnet, 6-inch: 3.2 ohms ±10% voice coil imp, 3 w max operating, 150-300 Hz resonance, paper dust cap; sim to Russell Speaker S-3406.
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P902	7478726-P6	Connector, cable: 4 male contacts; sim to Amphenol Type 91-MC4M.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R901	7478301-P48	Attenuator, variable, audio, L pad: 3.5 ohms, 4 w, 40 db max attenuation min.
R902	5493662-P5	Variable, carbon film: 2500 ohms ±20%, 0.5 w; sim to CTS Series 45.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S901	19B209147-P1	Push: SPST, 3 amps at 250 VAC or 6 amps at 125 VAC; sim to Cutler-Hammer 8134K6.
S902	5491899-P4	Toggle: DPDT, 3 amps at 250 VAC or 6 amps at 125 VDC; sim to Cutler-Hammer 8373K8. (Used in 19D402460-G2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PARTS LIST

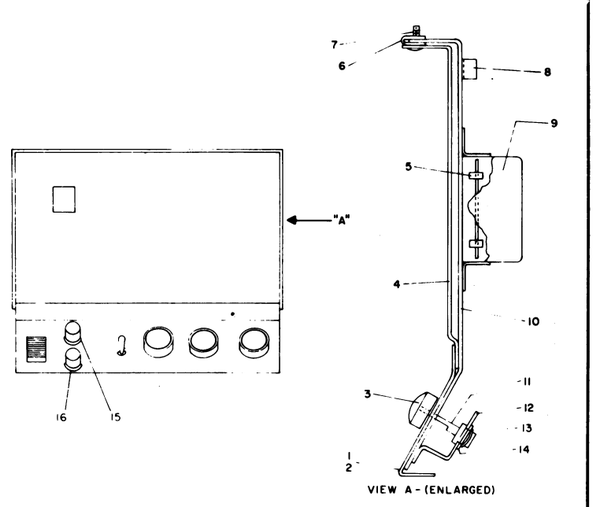
LBI-3561

DESK-MATE STATION CABINET
PL-7354211-G4

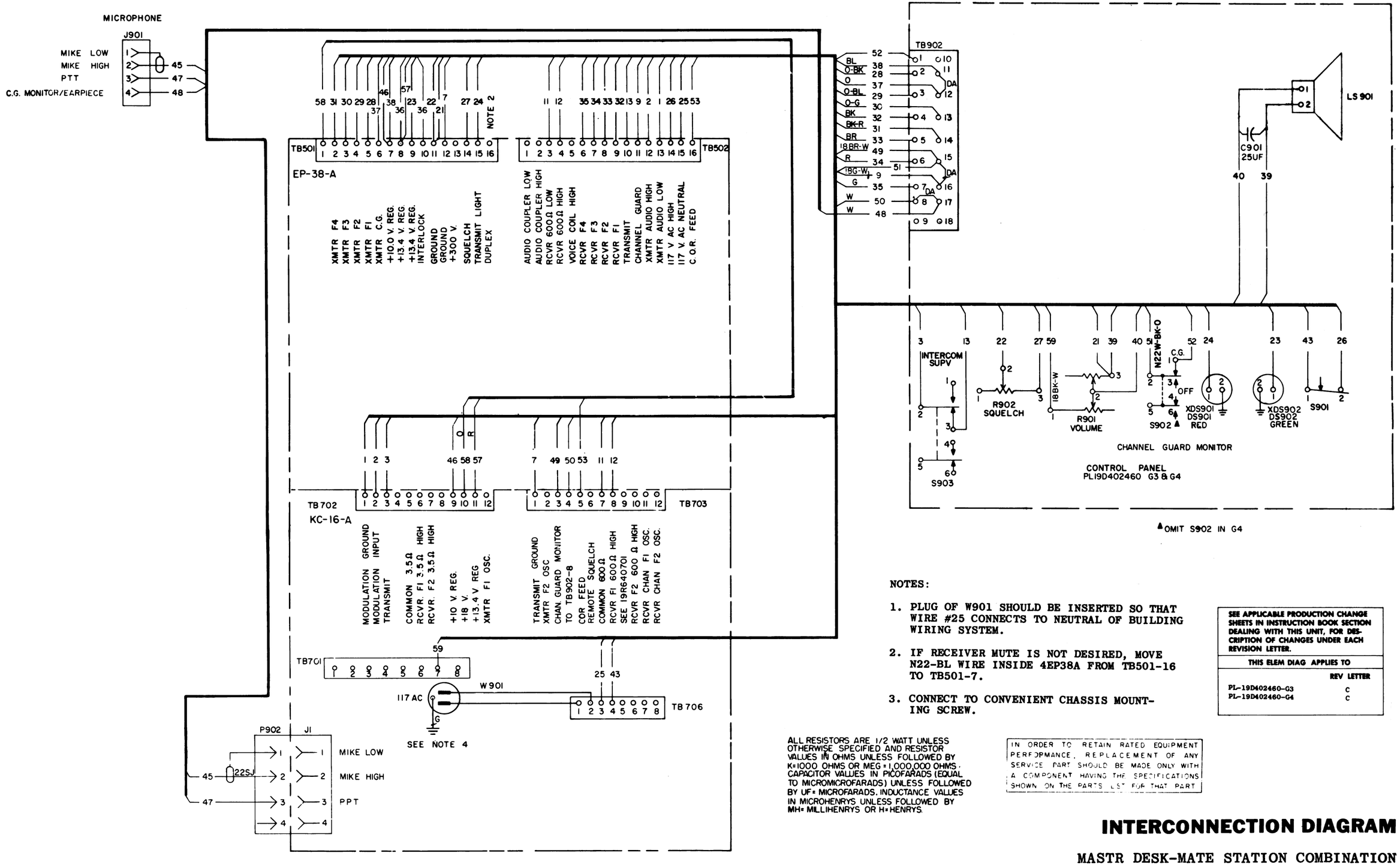
SYMBOL	G-E PART NO.	DESCRIPTION
	7354211-P4	Cabinet Assembly
	7354211-P8	Door (fits either side)
	4035449-P5	Bumper, door: rubber, sim to Atlantic India Ruber Co. 1165.
	4033979-P1	Lock and Key: sim to Yale & Towne 6678DX1.
		Key: Yale & Towne LL201.
	N529P38C	Plug (for cable knockouts at bottom of assembly)
	7354211-P7	Mounting rack (2 drilled angles)

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB902	7775500-P19	Phen: 9 terminals.
TB903	19C301088-P1	Phen: 15 amps at 1200 VRMS, 2 terminals; sim to GE CR151D.
		- - - - - - - - - - - CABLES - - - - - - - - - - -
W901	7491206-P1	Cord and plug: 3 conductor, 10 amps at 125 VRMS max, approx 15 feet long.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS901*	19B209342-P2	Lamp; sim to Leecraft 7-04-1.
	7141855-P12	In Models earlier than Rev A: Lamp: cylindrical red plastic lens; sim to Dialight 135-410-1431.
XDS902*	19B209342-P2	Lamp: sim to Leecraft 7-04-1.
	7141855-P13	In Models earlier than Rev A: Lamp: cylindrical green plastic lens; sim to Dialight 135-410-1432.
		MECHANICAL PARTS (SEE RC-1153)
1	NP243558	Nameplate; etched aluminum. (Used in 19D402460-G1).
2	NP243557	Nameplate; etched aluminum. (Used in 19D402460-G2).
3	19A121675-G1	Knob. (Used with R901, R902 and Dummy).
4	19B204642-P1	Grille.
5	19B201879-P1	Spring tension clip; sim to Tinnerman C42798-011-2. (Used with printed board).
6	7160861-P4	Nut: sheet spring; sim to Tinnerman C6452-82-157.
7	N111P1508C13	Phillips* screw: No. 8-18 x 1/2 inch.
8	7763541-P7	Cable clamp.
9	19A121365-G1	Can. (Used with A901).
10	19B204803-G1	Support.
11	4032256-P1	Shaft: nylon, dummy.
12	19B204800-P1	Support. (Used with R901 and R902).
13	4032230-P1	Retaining ring: sim to Waldes Kohinoor 5131-37.
14	N402P13C13	Plain washer.
15	4032237-P1	Lens, green.
16	4032237-P2	Lens, red.



DESK MATE CONTROL PANEL RC-1153A



▲OMIT S902 IN G4

NOTES:

1. PLUG OF W901 SHOULD BE INSERTED SO THAT WIRE #25 CONNECTS TO NEUTRAL OF BUILDING WIRING SYSTEM.
2. IF RECEIVER MUTE IS NOT DESIRED, MOVE N22-BL WIRE INSIDE 4EP38A FROM TB501-16 TO TB501-7.
3. CONNECT TO CONVENIENT CHASSIS MOUNTING SCREW.

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	
	REV LETTER
PL-19D402460-G3	C
PL-19D402460-G4	C

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.

(19D402406, Rev. 11)

INTERCONNECTION DIAGRAM

MASTR DESK-MATE STATION COMBINATION
LOCAL/REMOTE CONTROL PANEL

PARTS LIST

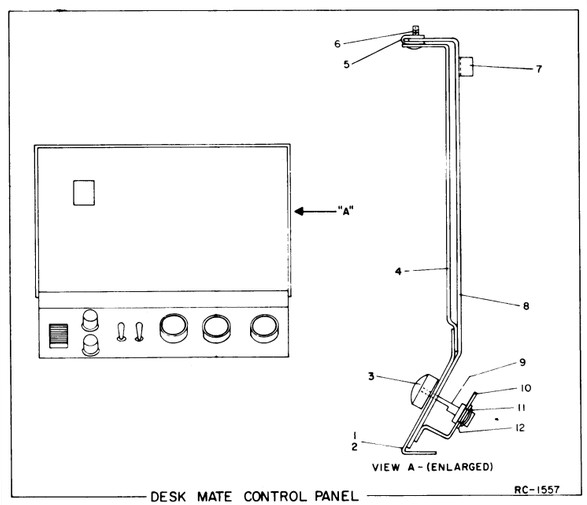
LBI-3557B

DESK-MATE STATION
FRONT END CONTROL PANEL
19D402460-G3 and G4
REV C

SYMBOL	G-E PART NO.	DESCRIPTION
A901*		PRE-AMPLIFIER MICROPHONE ASSEMBLY 19B204663-G1 Deleted by Rev A
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 and C2	19A115028-P114	Polyester: 0.1 µf ±20%, 200 VDCW.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1 and J2	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - - PLUGS - - - - - - - - - - -
P1	4029840-P2	Contact, electrical; sim to Amp 42827-2.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P434J	Composition: 0.43 megohm ±5%, 1/2 w.
R2	3R77-P823K	Composition: 82,000 ohms ±10%, 1/2 w.
R3	3R77-P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R4	3R77-P202J	Composition: 2000 ohms ±5%, 1/2 w.
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C901*	19B209233-P2	Electrolytic, non-polorized: 25 µf ±20%, 25 VDCW; sim to Sprague 4DC. Added by Rev B.
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS901 and DS902	19C307037-P19	Lamp, incandescent: 14 v; sim to GE 756.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J901	19A116061-P1	Connector, chassis: 4 female contacts.
		- - - - - - - - - - LOUDSPEAKERS - - - - - - - - - -
LS901*	19C307123-P3	Permanent magnet, 6-inch: 3.2 ohms ±10% voice coil imp, 3 w max operating, 150-300 Hz resonance, paper dust cap; sim to Pioneer 5-709524.
	19C307123-P1	In Models earlier than Rev C: Permanent magnet, 6-inch: 3.2 ohms ±10% voice coil imp, 3 w max operating, 150-300 Hz resonance, paper dust cap; sim to Russell Speaker S-3406.
		- - - - - - - - - - - PLUGS - - - - - - - - - - -
P902	7478726-P6	Connector, cable: 4 male contacts; sim to Amphenol Type 91-MC4M.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R901	7478301-P48	Attenuator, variable, audio, L pad: 3.5 ohms, 4 w, 40 db max attenuation min.
R902	5493662-P5	Variable, carbon film: 2500 ohms ±20%, 0.5 w; sim to CTS Series 45.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S901	19B209147-P1	Push: SPST, 3 amps at 250 VAC or 6 amps at 125 VAC; sim to Cutler-Hammer 8134K6.
S902	5491899-P4	Toggle: DPDT, 3 amps at 250 VAC or 6 amps at 125 VDC; sim to Cutler-Hammer 8373K8.
S903*	5491899-P4	Toggle: DPDT, 3 amps at 250 VAC or 6 amps at 125 VDC; sim to Cutler-Hammer 8373K8. Added by Rev A.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB902	7775500-P19	Phen: 9 terminals.
		- - - - - - - - - - - CABLES - - - - - - - - - - -
W901	7491206-P1	Cord and plug: 3 conductor, 10 amps at 125 VRMS max, approx 15 feet long.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS901 and XDS902	19B209342-P2	Lamp: sim to Leecraft 7-04-1.
		MECHANICAL PARTS (SEE RC-1557)
1	NP257587	Nameplate: etched aluminum. (Used in 19D402460-G4).
2	NP249235	Nameplate: etched aluminum. (Used in 19D402460-G3).
3	19A115679-P1	Knob. (Used with R901, R902 and Dummy).
4	19B204642-P1	Grille.
5	7160861-P4	Nut: sheet spring; sim to Tinnerman C6452-82-157.
6	N111P1508C13	Phillips® screw: No. 8-18 x 1/2 inch.
7	7763541-P8	Cable clamp.
8	19B204803-G1	Support.
9	4032256-P1	Shaft: nylon, dummy.
10	19B204800-P1	Support. (Used with R901 and R902).
11	4032230-P1	Retaining ring: sim to Waldes Kohinoor 5131-37.
12	N402P13C13	Plain washer.



DESK MATE CONTROL PANEL — RC-1557

PARTS LIST

LBI-3561
DESK MATE STATION CABINET
PL-7354211-G4

SYMBOL	G-E PART NO.	DESCRIPTION
	7354211-P4	Cabinet Assembly
	7354211-P8	Door (fits either side)
	4035449-P5	Bumper, door: rubber, sim to Atlantic India Rubber Co. 1165.
	4033979-P1	Lock and Key: sim to Yale & Towne 6678DX1.
		Key: Yale & Towne LL201.
	N529P38C	Plug (for cable knockouts at bottom of assembly)
	7354211-P7	Mounting rack (2 drilled angles)

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PARTS LIST

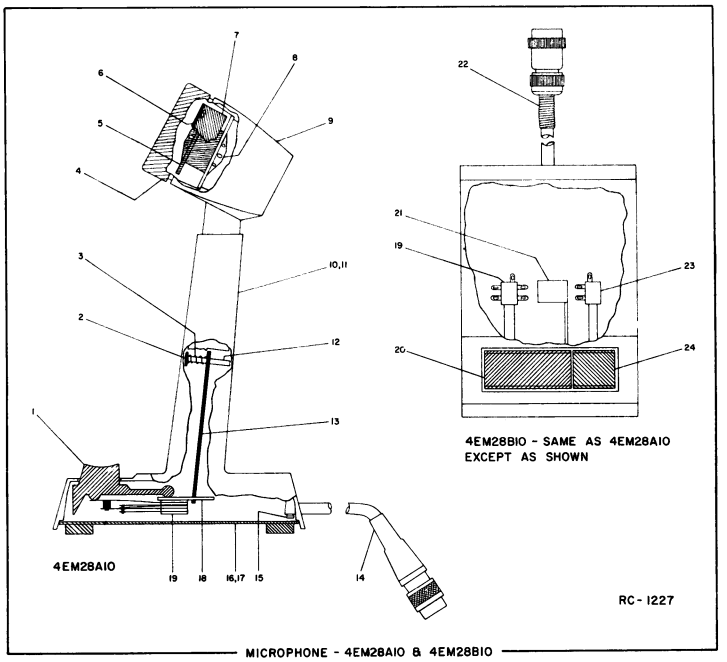
LBI-3623B

MAGNETIC CONTROLLED DESK MICROPHONE

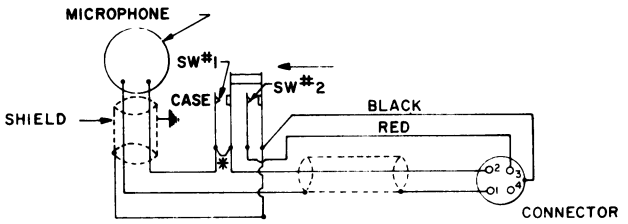
MODEL 4EM28A10 (19C307105-P1)
MODEL 4EM28B10 (19C307106-P1)
(SEE RC-1227)

SYMBOL	G-E PART NO.	DESCRIPTION
		MECHANICAL PARTS
		MODEL 4EM28A10
1		Pushbutton. Shure Brothers RP-68.
2		Washer. Shure Brothers 30A697.
3		Spring. Shure Brothers 44A149.
4		Cap and grille. Shure Brothers RP-72.
5		Magnetic controlled cartridge. Shure Brothers RP-13.
6		Washer. Shure Brothers 34A223.
7		Shield. Shure Brothers 53A528.
8		Damping pad. Shure Brothers 20B33.
9		Housing. (Part of item 4).
10		Base. (Part of item 4).
11		(Not used).
12		Pin. Shure Brothers 31A848.
13		Bracket. Shure Brothers 53A637.
14		Cable and plug. Shure Brothers RP-65.
15		Cable clamp. Shure Brothers 53A532.
16		Bottom plate. Shure Brothers 90A1015.
17		(Not used).
18		Mounting bracket. Shure Brothers 53A633.
19		Switch. Shure Brothers RP-70.
		MODEL 4EM28B10
1		(Not used).
2		Washer. Shure Brothers 30A697.
3		Spring. Shure Brothers 44A149.
4		Cap and grille. Shure Brothers RP-72.
5		Magnetic controlled cartridge. Shure Brothers RP-13.
6		Washer. Shure Brothers 34A223.
7		Shield. Shure Brothers 53A528.
8		Damping pad. Shure Brothers 20B33.
9		Housing. (Part of item 4).
10		(Not used).
11		Base. (Part of item 4).
12		Pin. Shure Brothers 31A848.
13		Bracket. Shure Brothers 53A637.
14		(Not used).
15		Cable clamp. Shure Brothers 53A532.
16		(Not used).
17		Bottom plate. Shure Brothers 90B1015.
18		Mounting bracket. Shure Brothers 53A633.
19		Switch. Shure Brothers RP-71.
20		Pushbutton (Transmit). Shure Brothers RP-69.
21		Locking arm. Shure Brothers 53A667.
22		Cable and plug. Shure Brothers RP-66.
23		Switch. (Part of item 19).
24		Pushbutton (Monitor). (Part of item 20).

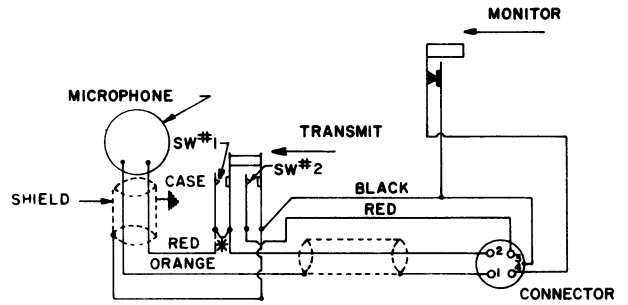
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



MICROPHONE - 4EM28A10 & 4EM28B10



CIRCUIT DIAGRAM
4EM28A10



CIRCUIT DIAGRAM
4EM28B10

* JUMPER MAY BE REMOVED FOR PARALLEL OR SPECIAL OPERATION

NOTES:

1. SWITCH #1 OF THE MICROPHONE CIRCUIT MUST CLOSE FIRST AND OPEN LAST.
2. MONITOR AND TRANSMIT BUTTONS ARE MECHANICALLY INTERLOCKED, MAKING IT NECESSARY TO PRESS MONITOR BUTTON BEFORE TRANSMITTING. TO MONITOR CONTINUOUSLY, PRESS MONITOR BUTTON DOWN AND SLIDE FORWARD TO "LOCK" POSITION. PRESS AND PUSH BACK BUTTON TO RELEASE. TO OPERATE MONITOR AND TRANSMIT FUNCTIONS INDEPENDENTLY, REMOVE LOCKING ARM BRACKET (PART 21 SHOWN ABOVE AND IN PARTS LIST).

(RC-302A, Sh. 2)

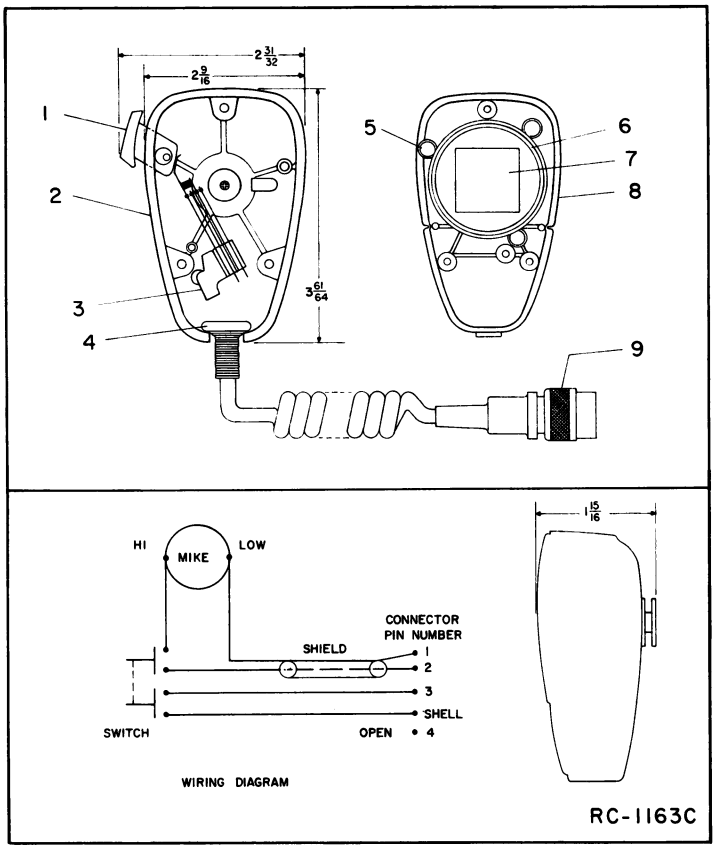
(DF-9023)

PARTS LIST

LBI-3558B

MILITARY MICROPHONE
MODEL 4EM25A10
(PL-19B209102-G1)
(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.

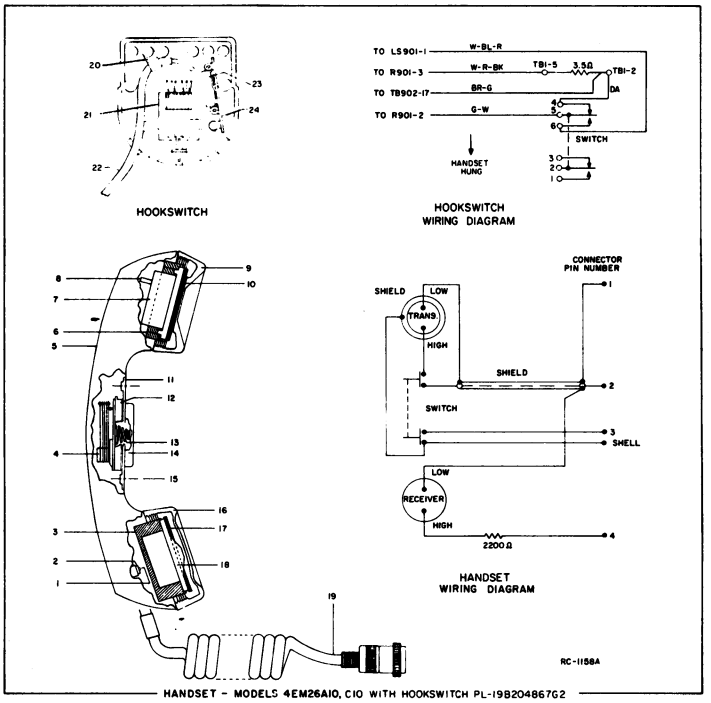
PARTS LIST

LBI-3559B

HANDSET
MODEL 4EM26A10
MODEL 4EM26C10
19B209100G1

SYMBOL	GE PART NO.	DESCRIPTION
		(REFER TO RC-1158)
1		Self tap screw, bind head: No. 4 x 5/16. Shure Brothers 30C640C.
2		Cable clamp. Shure Brothers 53A532.
3		Shield. Shure Brothers RP19.
4		Switch. Shure Brothers RP81.
5		Case. Shure Brothers RP49. (Used in 4EM26A10).
		Case. Shure Brothers 21RP899F. (Used in 4EM26C10).
6		Adapter. Shure Brothers 65A230.
7		Magnetic controlled cartridge. Shure Brothers RP41.
8	3R77P222K	Composition: 2200 ohms ±10%, 1/2 w.
9		Receiver cap. (Part of item 5).
10		Washer. Shure Brothers 34A321.
11		Escutcheon. Shure Brothers 53A536A.
12		Actuator. Shure Brothers 53A556.
13		Spring. Shure Brothers 44A140.
14		Plunger bar. Shure Brothers RP82.
15		Flat head screw, socket cap: No. 4-40 x 1/4. Shure Brothers 30C557B.
16		Transmitter cap. (Part of RP49).
17		Washer. Shure Brothers 34A309.
18		Magnetic controlled cartridge. Shure Brothers RP13.
19		Cable and plug. Shure Brothers RP48. (Used in 4EM26A10).
		Cable and plug. Shure Brothers 21RP738F. (Used in 4EM26C10).
		HOOKSWITCH ASSEMBLY 19B204867G2
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
20	4029851P5	Cable clamp; sim to WEC Kesser 3/16-4.
21	19A121612P1	Holder and switch: thermoplastic case, contact rating 1 amp at 125 v.
22	19A121720G1	Cable: approx 8-1/2 feet long.
23	5493035P10	Resistor, wirewound, ceramic: 3.5 ohms ±5%, 5 w; sim to Hamilton Hall Type HR.
24	7775500P55	Terminal board, phen: 5 terminals.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES



HANDSET - MODELS 4EM26A10, C10 WITH HOOKSWITCH PL-19B204867G2

(DF-9023)

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-4088

MICROWAVE EQUIPMENT DEPARTMENT
GENERAL ELECTRIC COMPANY, LYNCHBURG, VIRGINIA 24502

GENERAL ELECTRIC

DLP-7023