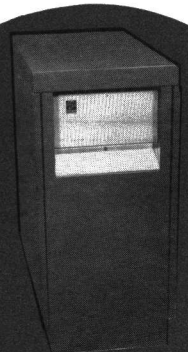
MOBILE RADIO

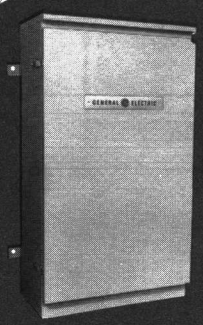
MASTR

Progress Line

MAINTENANCE MANUAL



DESK-MATE STATION



POLE-MOUNT STATION

952-960 MHz
TWO-WAY FM
STATION COMBINATIONS
REMOTE CONTROL
LBI-4089B

FLOOR-MOUNT STATION

DF-9023

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	TYPE OR MODEL NUMBER
Converter Panel & Signal Generator	19D413291-G1 19D413397-G1
Transmitter	4ET59C42,C43
Receiver	4ER42H11, H17
Desk-Mate (DM) Cabinet	7354211-G4
Pole-Mount (PM) Cabinet	7132483-G6
Floor-Mount (VM) Cabinet	19C303465-G3
Station Power Supply	4EP38A10
Antenna Relay (mounts on Converter Panel)	19B216688-G1
Remote Control Panel	4KC16A10
Meter Switching Circuit (VM station)	19A121460-G1
Meter Panel (VM station)	19C303519-G1
Microphone	4EM25A10
Microphone Mounting Kit	7141414-G2
Speaker Assembly	19B219618-G1
117-VAC Power Cable (DM & VM stations)	7491206-P1
Two-Prong Plug Adapter (DM & VM stations)	7160486-P1
Alignment Tools (hex slug type) (slotted screw type)	4038831-P2 4033530-G2
Keys (DM & VM stations)	LL201
Handle (PM station)	7145676-P2

OPTIONAL EQUIPMENT

EQUIPMENT	OPTION NO.	TYPE OR MODEL NUMBER
Transmitter Metering Cover	7648	19C303676-G3
Receiver Metering Cover	7649	19C303676-G2
220/110 volt Stepdown Transformer Kit	7608	19A121971-G1
Line Voltmeter (VM stations)	7901	19A120042-G5
Intercom Kit	7620	19A122231-G9
Test Meter Panel (DM & PM stations)	7609	19A121953-G1
Meter Switching Panel (DM & PM stations)	7609	19A121460-G1
Heater Kit (PM stations)	3551	4KZ3A1

SPECIFICATIONS*

GENERAL

FCC FILING NUMBER	ES-34-A
DIMENSIONS (H x W x D)	
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 EIA
Audio Distortion:	Less than 3%

RECEIVER

(Includes Converter & 450 MHz Rec)

RF Input Impedance:	50 ohms
Channel Spacing:	100 kHz
Sensitivity:	
EIA 12 dB SINAD	1.0 µV
20 dB Quieting	1.25 µV
Critical Squelch	0.35 µV
Channel Guard Squelch	10 dB SINAD
Selectivity:	
EIA 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	-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.

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)	**R** Remote Control Station	**A** 1-Freq.T 1-Freq.R	**S** Standard	**99** 952—960 MHz
P Pole-Mount Station						**U** Channel Guard	
V Floor-Mount Station							

DESCRIPTION

The General Electric MASTR Progress Line Remote Control Stations operate in the 952—960 megahertz band. This band is normally utilized for radio link operation in radio controlled base station systems.

Three Cabinet styles (Desk-Mate, Pole-Mount & Floor-Mount) are available to meet different system requirements. Individual characteristics of the cabinets are listed in the following paragraphs.

- Desk-Mate - The Desk-Mate station can be conveniently located adjacent to a desk to provide additional working area, or in some other suitable area as required. Both side panels on the station can be easily removed to gain access to the unit modules for servicing.
- Pole-Mount - The Pole-Mount station is ruggedly build and can be mounted outdoors in remote locations regardless of weather conditions. An optional heater kit is available for installations where the climate is such that the cabinet temperature drops below 5°F. The unit modules are mounted to a "swing out" rack to facilitate servicing either side of the equipment.
- Floor-Mount - The Floor-Mount station can be placed in the control building adjacent to the antenna installation or it may be located in another area as required. Front and back doors on the station cabinet can be opened to gain access to the unit modules. The rear door is interlocked to protect personnel from contact with voltages. When the rear door is opened, the interlock switch opens the power supply output to the transmitter. A 117-VAC receptacle is mounted inside the rear of the cabinet for plug-in of service equipment.

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.

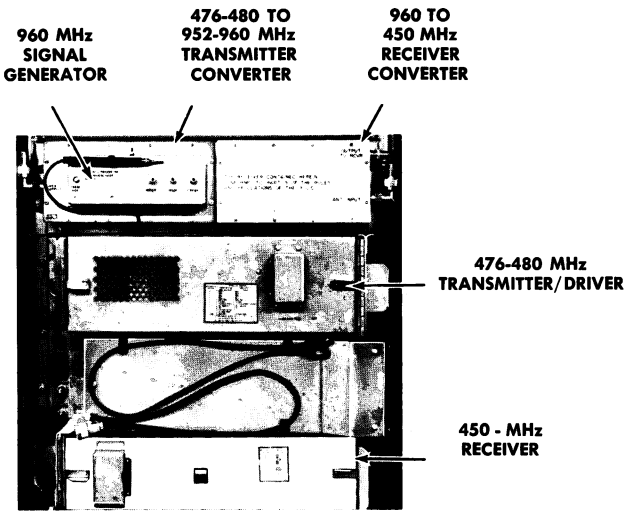


Figure 1 - Typical Station Equipment Arrangement

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 or without Channel Guard capability. The receiver is completely contained in an aluminum casting, which provides excellent shielding.

POWER SUPPLY

Station Power Supply Model 4EP38A10 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.

REMOTE CONTROL PANEL

The Remote Control Panel contains the AC input circuit, remote control kits, 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. All power to the station is controlled by switch S701 on the control panel. When S701 is turned ON, the green Power-On light on the meter panel will become 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-volts AC is always present at TB706-1 and 2. Always use care when servicing the Control Panel, even when S701 is in the OFF position.

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 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 4KC16A10 to obtain complete information on remote control telephone lines.

MICROPHONE

A microphone is provided for use during service and maintenance work by the serviceman. The microphone connects to mike jack J902 located on the front side of the Transmitter-Receiver 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 Model 4EP38A12.

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.

HEATER MODEL 4KZ3A1 (OPTIONAL)

The Heater is an option used with Pole-Mount Stations where the climate is such that an auxiliary cabinet heater is required. The heater consists of a 250-watt heater strip and a temperature-operated switch. When the temperature of the cabinet drops below 5°F, the switch closes, thereby applying power to the heater strip. When the temperature rises above 5°F, the heater will be turned off by the opening of the switch. The heater strip is usually mounted on the bottom of the cabinet on the inside in a convenient location. Splice one lead from the temperature switch to a lead from the heater strip. Connect other lead from the temperature switch to Power Supply 4EP38A10, TB502-14 and other lead from heater strip to TB502-15. For complete Installation Instructions of Heater Kit refer to EBI-4353.

METERING CIRCUITS

(FLOOR-MOUNT STATION)

METER PANEL (19C303519-G1)

The Meter Panel is located above the front door on the Floor-Mount station cabinet. The panel contains the following meters for making voltage test readings in the transmitter and receiver:

- Meter M901--measures test voltages in transmitter circuits.
- Meter M902--measures test voltages in receiver circuits.
- Line Voltmeter 19A120042-G5 (option)--continuously monitors line voltage. The meter is a 0-150 VAC voltmeter connected across the 117-VAC line.

METER SWITCHING PANEL ASSEMBLY (19A121460-G1)

The Meter Switching Panel Assembly is mounted on the front of the accessory panel and contains the switches and circuitry for switching from stage to stage in the receiver and transmitter. The voltage readings for each stage is indicated on the meters located in the Meter Panel. The Meter Switching Panel Assembly includes:

- Plug P1001--plugs into transmitter centralized metering jack J102. (or J1001 if optional transmitter top cover is used).
- Plug P1002--plugs into receiver centralized metering jack J442. (or J1002 if optional receiver top cover is used).
- Test Probe P1003--for external metering (3-volt full scale meter range).
- Switch S1001--to switch transmitter voltage test points into the test meter circuit.
- Switch S1002--to switch receiver voltage test points into the test meter circuit.
- Switch S1004--test probe polarity reversing switch.

The meter voltage check points are shown in Table 1.

Refer to the transmitter and/or receiver maintenance manual for the proper voltage readings for each stage tested.

Transmitter voltage readings will be indicated on transmitter "tune up" meter (M901) and receiver readings will be indicated on the receiver "tune up" meter (M902). Both meters are located on the Meter Panel.

CIRCUIT ANALYSIS

The voltage test points in the receiver and transmitter are connected through the connecting cables to lug terminals on the receiver and transmitter voltage wafer switches. With the receiver switch in the "A" meter switch position for example, the

TABLE 1

Tx (S1001 & Rx (S1002) Switch Position No.	Transmitter Function (Models 4ET59042 & 43)	Meter Range Full Scale	Receiver Function	Meter Range Full Scale
A	MULT 1	1 v	DISC	1 v*
B	MULT 2	1 v	2nd IF	1 v*
C	AMPL 3	1 v	1st LIM	1 v*
D	MULT 3	1 v	MULT 1	1 v*
E	AMPL/MULT 4	1 v	MULT 2	1 v*
F	PA GRID	1 v	------	
G	PA PLATE CURRENT	1 v	AUDIO PA	1 v*
H	POWER OUTPUT	1 v	BLANKER	1 v*
I	20 VOLTS	30 v	------	
J	PA PLATE VOLTAGE	1,000 v	10-VOLTS	15 v
K	EXTERNAL PROBE	3 v	------	
L/VM	RECEIVER 2nd IF	1 v	------	

* can be increased to 3-v by switch S1003.

discriminator output voltage is connected by the switch to TB901-11 and 12 through wire numbers 22 and 23 to receiver meter (M902) in the Meter Panel. If the transmitter switch is in the "F" position, for example, the PA grid voltage is connected by the switch to TB901-9 and 10, through wire numbers 20 and 22 to meter (M901) in the Meter Panel.

Switch S1003 is used to connect the 3-volt multiplying resistor into the receiver meter circuit. Test probe P1003 is used for external metering. When using the test probe, turn the transmitter switch S1001 to the "External" position. R1002 is a multiplier resistor in series with the test probe to make the meter 3-volts full scale when using the external probe.

Resistor R1007 is a multiplier resistor in series with the receiver meter when switch S1003 is in the 3-volt position. Silicon rectifiers CR1001, CR1002, resistors R1003 and R1004 in the transmitter meter circuit and CR1003, CR1004, R1005 and R1006 in the receiver meter circuit protect the meters from overload and voltage spikes.

NOTE

For continuous monitoring of test voltages, optional transmitter and receiver top covers, (19C303676-G3 and -G2, respectively) are available. The covers contain external sockets to attach the transmitter and receiver cables from the Meter Switching Panel Assembly.

INITIAL ADJUSTMENT

After the station has been installed as described in the Installation Manual, the converter panel, 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. A signal source operating at the system frequency (preferably the transmitter which will normally be monitored by the receiver).
3. The Floor-Mount Station contains built-in metering circuits. For Desk-Mate or Pole-Mount Stations, one of the following is required:

   A GE Portable Test Set Model 4EX3A10 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.
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

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

Connect signal generator to receiver at maximum system deviation with 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 this adjustment). Set the SQUELCH control R512 to quieting.

CONTROL PANEL ADJUSTMENT

The initial adjustment for the control panel includes turning power switch S701 ON and adjusting 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.

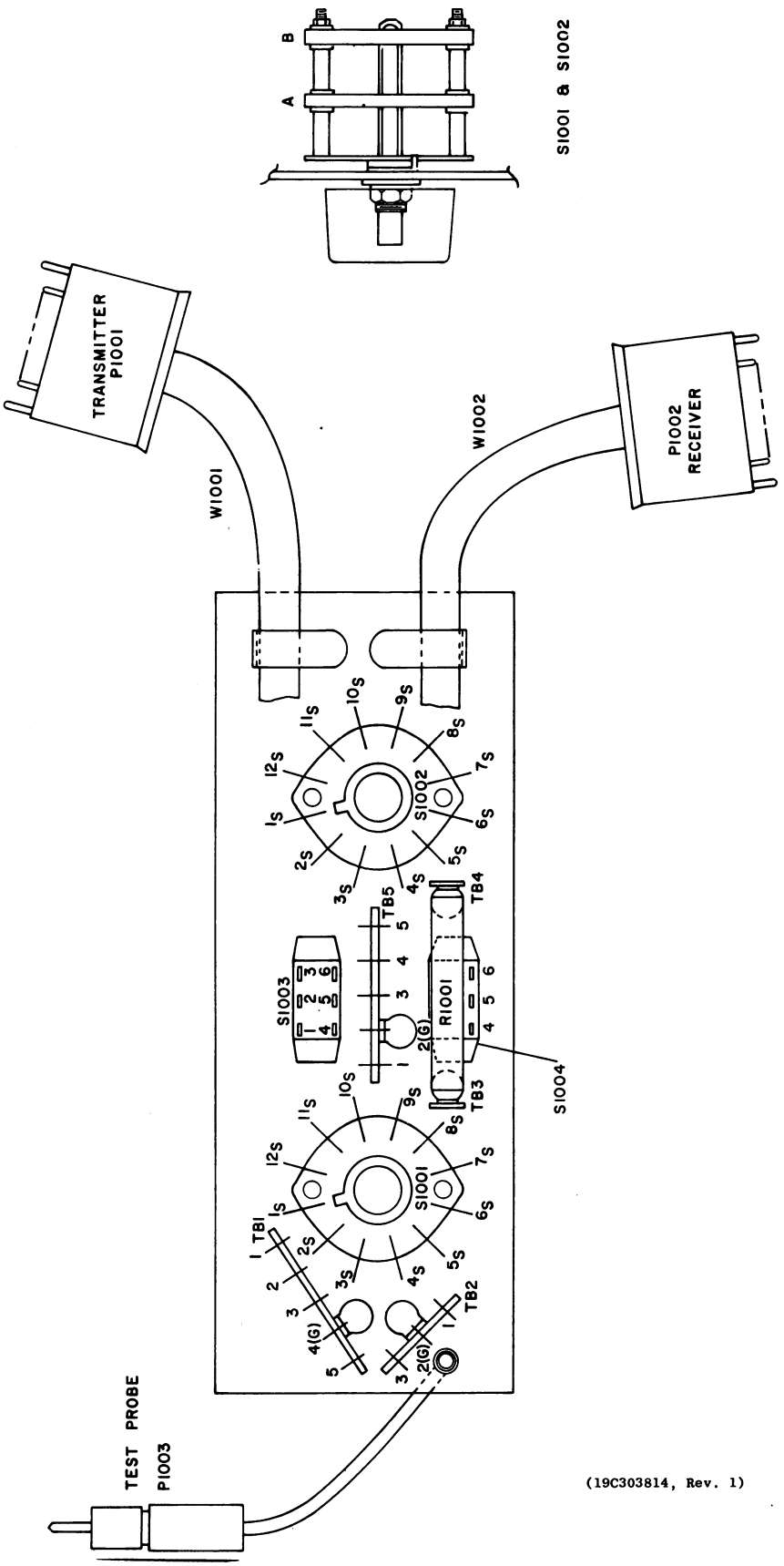
PREVENTIVE MAINTENANCE

To insure high operating efficiency and to prevent mechanical and electrical failures from interrupting system operations, routine checks should be made of all mechanical and electrical parts. This preventive maintenance should include the maintenance checks listed in Table 2.

TABLE 2

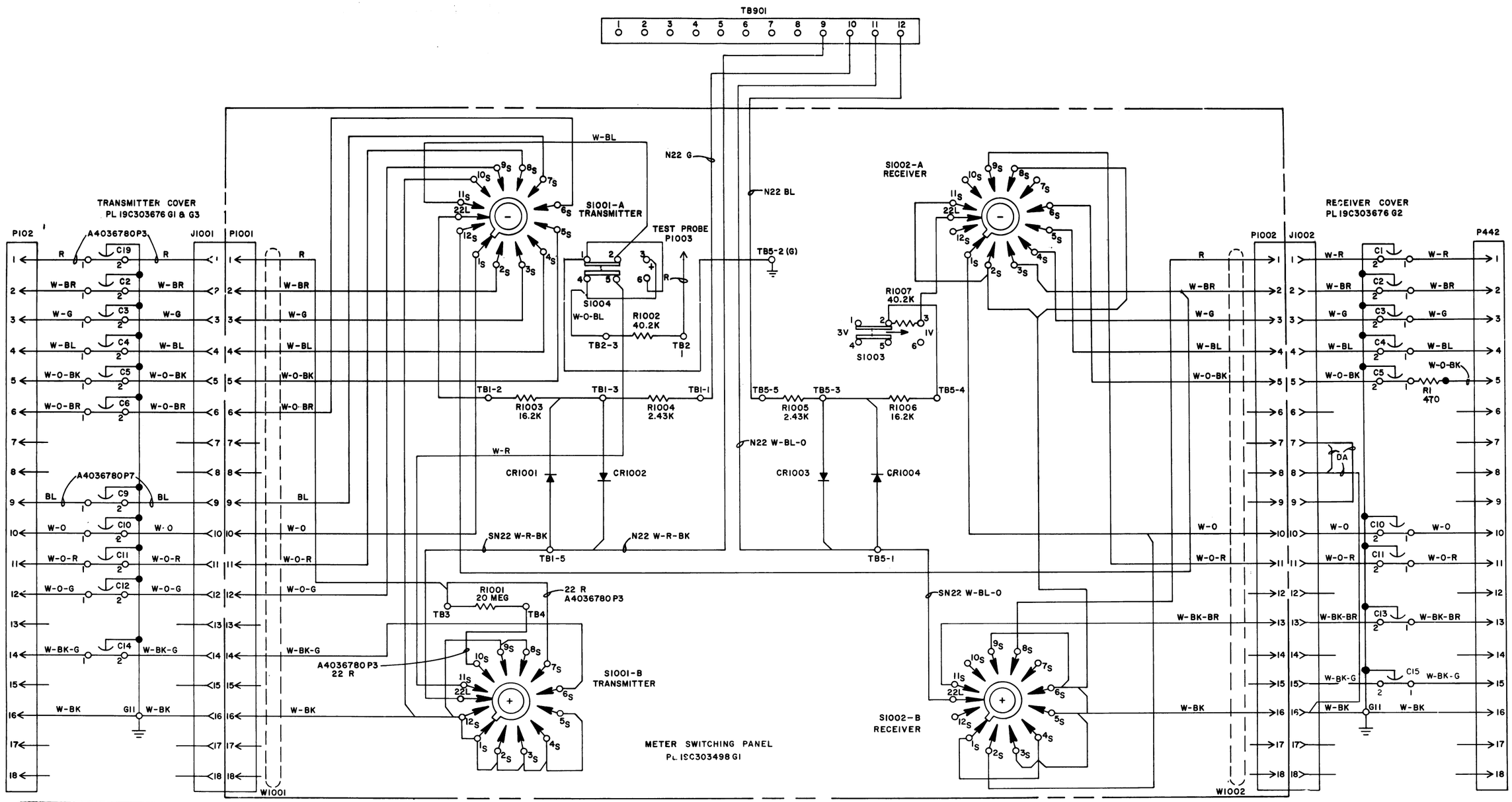
PREVENTIVE MAINTENANCE PROGRAM

	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 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).	☐



OUTLINE DIAGRAM

MASTR FLOOR-MOUNT STATION COMBINATION
METER SWITCHING PANEL



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
19C303498G1	A
19C303676G2	B

ALL RESISTORS ARE ½ 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.

(19D402334, Rev. 9)

SCHEMATIC DIAGRAM

MASTR FLOOR-MOUNT STATION COMBINATION
METER SWITCHING PANEL

PARTS LIST

LBI-3565C

METER SWITCHING PANEL ASSEMBLY
19A121460-G1

SYMBOL	G-E PART NO.	DESCRIPTION
		METER SWITCHING PANEL 19C303498-G1
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1001 thru CR1004	5494922-P1	Silicon; sim to Type 1N456.
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P1001		(Part of W1001).
P1002		(Part of W1002).
P1003	4032797-P1	Probe, test; sim to Birnbach Type 415 (red).
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1001	5496955-P576	Deposited carbon: 20 megohms ±2%, 2 w; sim to Texas Instruments Type CD2R.
R1002	5495948-P359	Deposited carbon: 40,200 ohms ±1%, 1/2 w; sim to Texas Instruments Type CD1/2MR.
R1003	5495948-P321	Deposited carbon: 16,200 ohms ±1%, 1/2 w; sim to Texas Instruments Type CD1/2MR.
R1004 and R1005	5495948-P238	Deposited carbon: 2430 ohms ±1%, 1/2 w; sim to Texas Instruments Type CD1/2MR.
R1006	5495948-P321	Deposited carbon: 16,200 ohms ±1%, 1/2 w; sim to Texas Instruments Type CD1/2MR.
R1007	5495948-P359	Deposited carbon: 40,200 ohms ±1%, 1/2 w; sim to Texas Instruments Type CD1/2MR.
		- - - - - - - - - - SWITCHES - - - - - - - - -
S1001 and S1002	19C307113-P2	Rotary: 2 sections, 2 poles, 12 positions, non-shorting contacts, 2 amps at 28 VDC or 1 amp at 110 VDC; sim to Oak 235585-K2.
S1003 and S1004	7145098-P1	Slide: DPDT, 3/4 amp at 125 VAC or 1/2 amp at 125 VDC; sim to Stackpole SS-150.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7775500-P9	Phen: 5 terminals.
TB2	7775500-P7	Phen: 3 terminals.
TB3 and TB4	7775500-P46	Phen: 1 terminal.
TB5	7775500-P9	Phen: 5 terminals.
		- - - - - - - - - - - CABLES - - - - - - - - - -
W1001	19C303568-P2	Metering: includes 18 pin plug (P1001) rated at 1000 VDC max, approx 38 inches long.
W1002	19C303568-P2	Metering: includes 18 pin plug (P1002) rated at 1000 VDC max, approx 38 inches long.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	19B204861-G1	Chassis. (Used in 19C303498-G1).
	7763541-P5	Cable, clamp. (Used with W1001 and W1002 in 19C303498-G1).
	7487773-P6	Knob: red; sim to Eastman Chemical 28739. (Used with S1001 and S1002 in 19C303498-G1).
	19B204590-G1	Box. (Used in 19A121460-G1).
	4029030-P11	Rubber channel seal: approx 2-1/2 inches long. (Used in 19A121460-G1).

SYMBOL	G-E PART NO	DESCRIPTION
		COVER ASSEMBLY 19C303676-G1 (TRANSMITTER STATION METERING) 19C303676-G2 (RECEIVER STATION METERING) 19C303676-G3 (TRANSMITTER STATION METERING, VENTILATED)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1 thru C6	5493392-P7	Ceramic, feed-thru: .001 µf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C9	19B209282-P1	Ceramic, feed-thru: 680 pf ±20%, 1000 VDCW; sim to Sprague Type 544C.
C10 thru C14	5493392-P7	Ceramic, feed-thru: .001 µf +100% -0% 500 VDCW; sim to Allen-Bradley Type FA5C.
C15*	5493392-P7	Ceramic, feed-thru: .001 µf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C. Added by Rev B.
C19	19B209282-P1	Ceramic, feed-thru: 680 pf ±20%, 1000 VDCW; sim to Sprague Type 544C.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - -
J1001 and J1002	19B205689-G2	Connector: 18 contacts.
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P102	19B204727-P1	Connector: 18 contacts rated at 1000 VDC max.
P442	19B204727-P1	Connector: 18 contacts rated at 1000 VDC max.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1*	3R77-P471K	Composition: 470 ohms ±10%, 1/2 w. Added by Rev A.

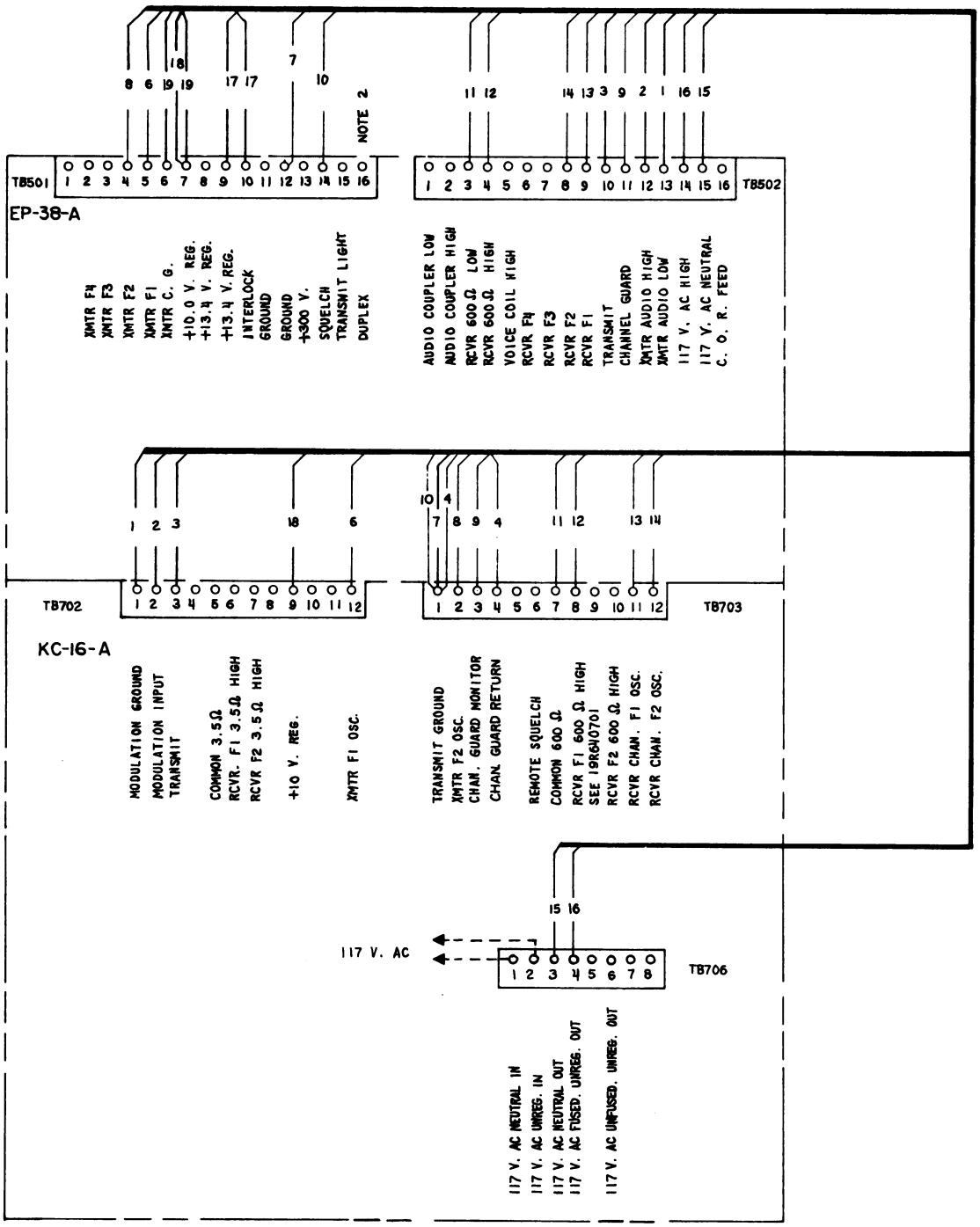
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

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 eliminate 3 db loss in receiver sensitivity with cover on. Added R1 to receiver metering cover.

REV. B — To allow audio metering with cover. Added C15.



NOTES:

1. T8706-1 MUST BE CONNECTED TO GROUND OR NEUTRAL OF THE BUILDING WIRING SYSTEM.
2. IF RECEIVER MUTE IS NOT DESIRED, MOVE N22-BL WIRE INSIDE MEP38A 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.

(19D402348, Rev. 7)

(DF-9023)

INTERCONNECTION DIAGRAM

MASTR DESK-MATE &
POLE-MOUNT STATION COMBINATIONS
REMOTE CONTROL PANEL

PARTS LIST
LBI-3562

POLE MOUNT STATION CABINET
PL-7132483-G6

SYMBOL	G-E PART NO.	DESCRIPTION
	7353495-P5,18, 19,20	Door Assembly: weather seal: rubber, Manhatten Div. of Raybestos Manhatten Inc.; Passaic, N.J. ½" OD x ¼" ID x 9'7". A12A2A
	7769652-G1	Hinge Assembly: (for swing out mounting bracket)
		Hinge, door: Stanley, cat #195 with leaves assembled reversed, no swage, without mounting holes. (give all above information when re-ordering)
		Pull-Latch: Corbin Cab Lock Co. #015642SD.
	7769631-G1	Mounting bracket: (mounts on swing away hinge assembly.)

*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 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)

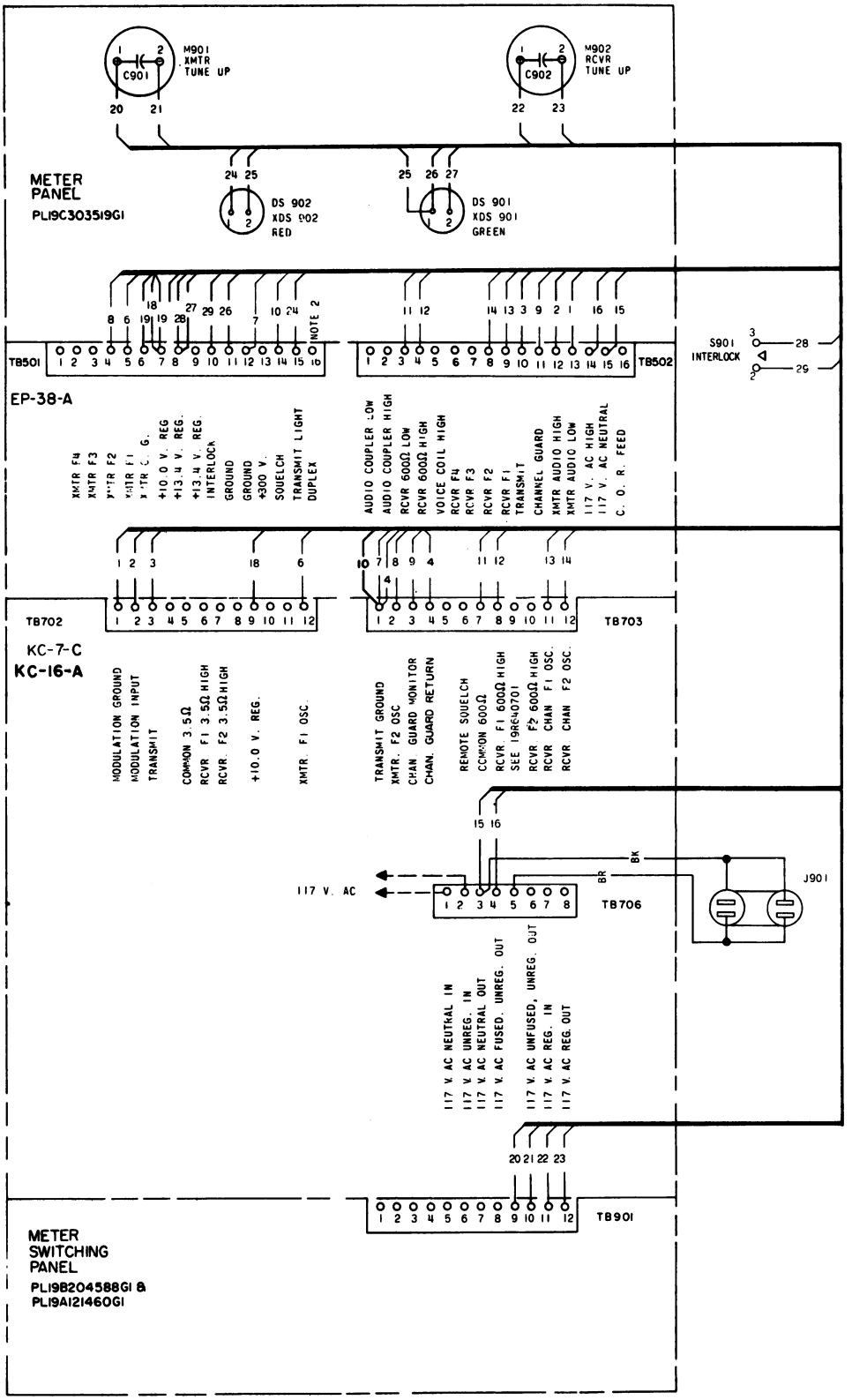
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PARTS LIST

HEATER
MODEL 4KZ3A1

SYMBOL	G-E PART NO.	DESCRIPTION
HR901		Heater Strip: sim to General Electric 51-344.
S901		Thermo-switch: adjusted to +5°F, sim to Fenwall Inc. A-7300.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



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 W RE INSIDE HEP38A FROM TB501-16 TO TB501-7.
3. IF REMOTE SQUELCH IS DESIRED, REMOVE SQUELCH POT WIRE #10 FROM TB703-1 AND CONNECT TO TB703-6 AND ADD JUMPER FROM TB701-6 TO TB702-1.

(19D402346, Rev. 6)

INTERCONNECTION DIAGRAM

MASTR FLOOR-MOUNT REMOTE CONTROL STATION COMBINATION MEDIUM POWER

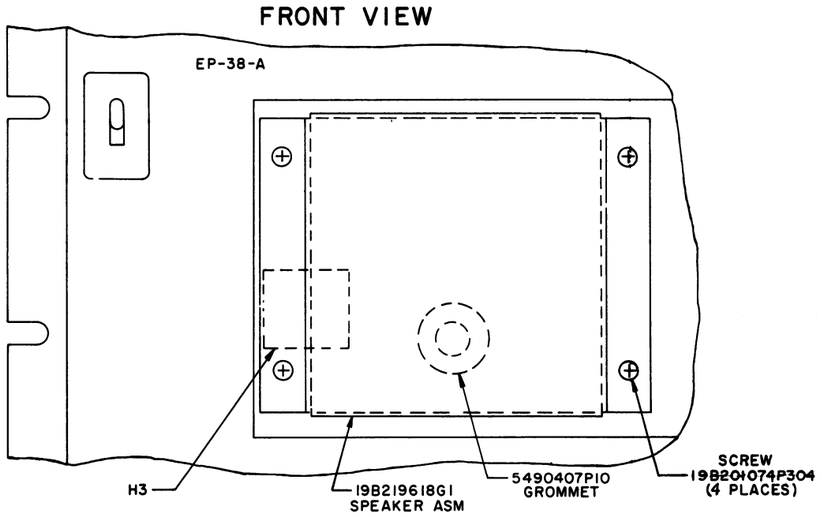
PARTS LIST

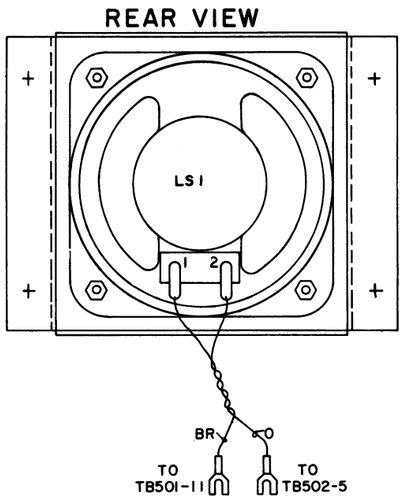
LBI-3563A

MEDIUM POWER FLOOR MODEL STATION CABINET
19C303465-G3 and G4

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - -
J901	4029758-G1	Duplex outlet, phen: polarized, 15 amps at 125 v.
		- - - - - - - - - - SWITCHES - - - - - - - - -
S901	19A115887-P1	Push, door interlock: SPDT, 10 amps at 125 or 250 VAC.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	N529P30C13	Plug button. (Located on top of cabinet).
	5491480-P5	Cable clamp: sim to Adel Precision Type 754. (Located in top of cabinet).
	19B215165-P3	Cable clamp: sim to Thomas and Betts 3302. (Located in bottom of cabinet).
		CABINET ASSEMBLY 19D402873-G1
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	5498454-G1	Cabinet shell: approx 69 x 22 x 5/8 inches.
	5495572-G1	Rear door.
	7774537-P1	Angle mounting.
	7488490-P4	Door handle: includes key LL-802; sim to Yale and Towne S1410S.
	5495571-G6	Front door.
	4031566-P1	Rear door grille.
	5493646-G1	Instruction book holder.
		Ground lug. Ilsco SLU-70.
		- - - - - - - - - - SUBASSEMBLIES - - - - - - - -
		METER PANEL ASSEMBLY 19C303519-G1 (Used in 19C303465-G3) 19C303519-G2 (Used in 19C303465-G4)
		- - - - - - - - - - CAPACITORS - - - - - - - -
C901 and C902	5494481-P11	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - INDICATING DEVICES - - - - - - -
DS901 and DS902	19C307037-P19	Lamp, incandescent: miniature, 14 v; sim to GE 756.
		- - - - - - - - - - - METERS - - - - - - - - -
M901 and M902	5491869-P11	Microammeter: -10/0/+50 µa, 3-1/2 inch; sim to GE Type DO-91.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS901	7141855-P13	Lamp: Green plastic lens; sim to Dialight 135.
XDS902	7141855-P12	Lamp: red plastic lens; sim to Dialight 135.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	NP243463	Chassis, nameplate: etched aluminum.
		LINE VOLTMETER 19A120042-G5
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1	3R81-P102M	Ceramic disc: .001 µf ±20%, 500 VDCW.
		- - - - - - - - - - - METERS - - - - - - - - -
M1	5491869-P7	Voltmeter, AC: 0-150 VAC, 100 ohms per volt movement, 3-1/2 inch; sim to GE Type DO-91.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.





(19C320601)

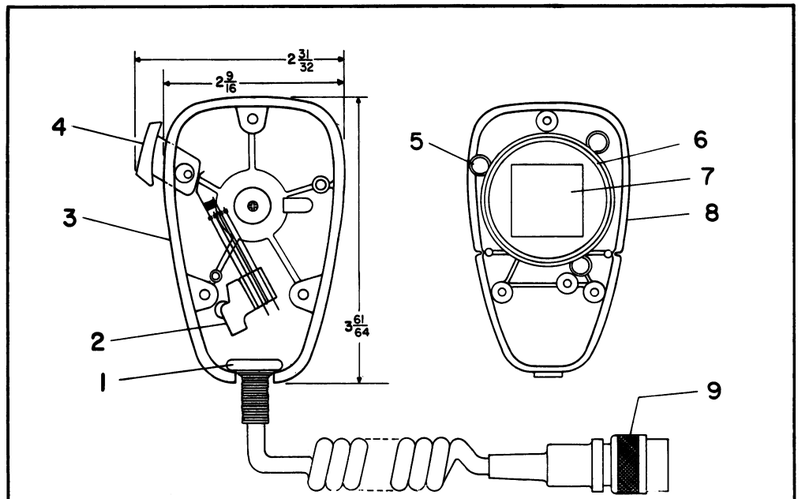
PARTS LIST

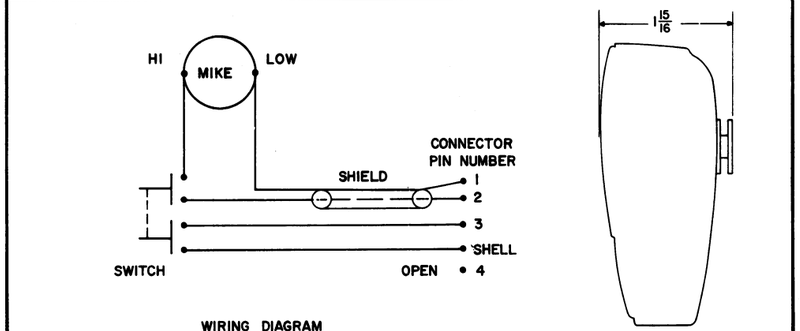
LBI-4427

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.



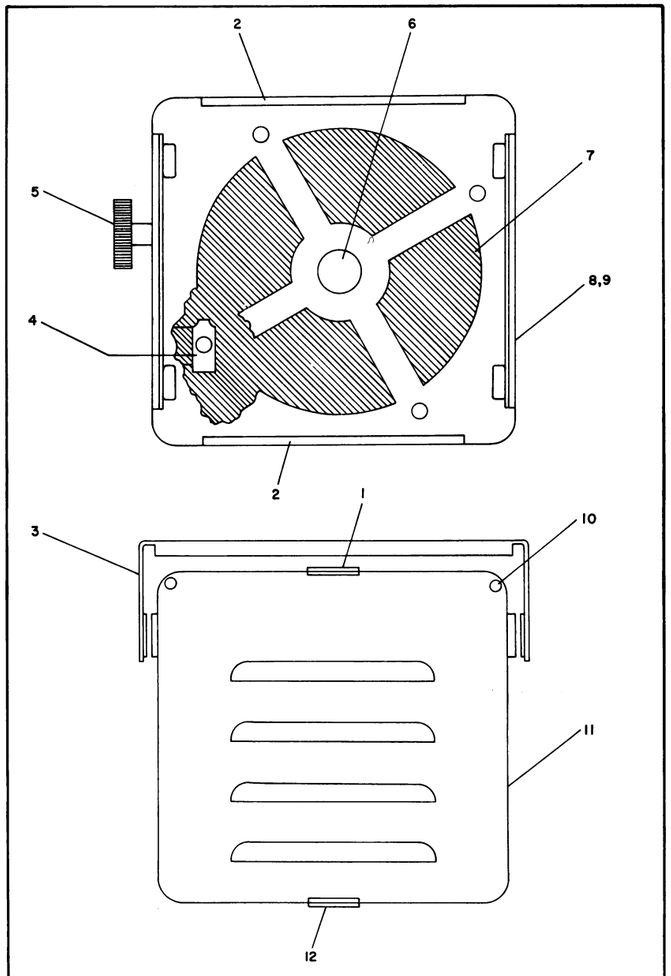


PARTS LIST

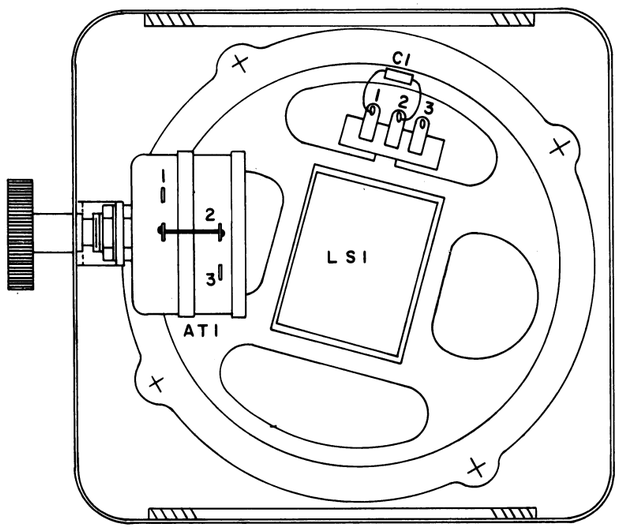
LBI-3558B

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.

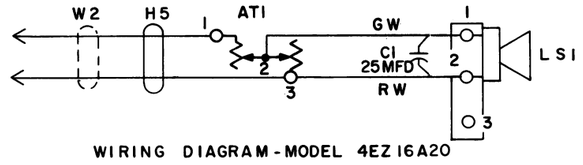


RC-1164B



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

RC-1363 B



WIRING DIAGRAM - MODEL 4EZ16A20

RC-1362B

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 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-4089

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

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