Maintenance Manual LBI-4729D
DATAFILE FOLDER DF8397

MOBILE RADIO

MASTR® II MAINTENANCE MANUAL

POWER CALL and POWER CALL/SIREN

MODELS 4EA22A12 AND 4EA22B12

POWER CALL/SIREN
MODEL 4EA22B12

POWER CALL
MODEL 4EA22A12

SPECIFICATIONS *

Model Numbers 4EA22A12 (Power Call) & 4EA22B12 (Power Call/Siren)

Current Drain & Power Output (measured across resistive load)

Speakers	Watts	Power Call	Watts	Power Call/Siren
1	35	5.3 amps @ 13.6 VDC	55	6.5 amps @ 13.6 VDC
2	45	6.5 amps @ 13.6 VDC	85	10.5 amps @ 13.6 VDC
1	35	2.8 amps @ 28.0 VDC	55	3.2 amps @ 28.0 VDC
2	45	3.5 amps @ 28.0 VDC	100	5.5 amps @ 28.0 VDC

Standby Current Drain	0.85 amps
Frequency Response	±3 dB from 300 to 3000 Hz
Output Impedance	5 ohms
Duty Cycle	Continuous in all positions
Transistors	7 -- Amplifier Circuit 8 -- Siren Circuit
Temperature Range	-30°C to +60°C (-22°F to +140°F)
Dimensions (H x W x D)	2-3/4" x 6-1/2" x 7-1/2"
Weight	7 pounds, 10 ounces

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

4EA22A12 & B12

GENERAL ELECTRIC

TABLE OF CONTENTS

ILLUSTRATIONS

WARNING

Although the highest DC voltage in the radio is supplied by the vehicle battery, high current 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. KEEP AWAY FROM THESE CIRCUITS WHEN THE TRANSMITTER IS ENERGIZED!

COMBINATION NOMENCLATURE

1st Digit Model	2nd Digit Adaptor Option	3rd Digit Speaker Option
P Power Call	**A** MASTR®II	**01** Single Standard Speaker
S Power Call/ Siren		**02** Dual Standard Speaker
		04 Single Chromium Speaker
		05 Dual Chromium Speaker
		07 Single Low Profile Speaker
		08 Dual Low Profile Speaker
		10 Single Short Length Speaker
		11 Dual Short Length Speaker

DESCRIPTION

The General Electric Power Call and Power Call/Siren operate as mobile public address systems, and high power amplifiers for two-way radio receivers. The Power Call/Siren includes an electronic siren with four modes of operation. The units can be used in 12-Volt or 28-Volt vehicles with either positive or negative battery ground.

NOTE

The Power Call and Power Call/Siren units are shipped wired for 12-Volt operation. Refer to MAINTENANCE for 28-Volt system circuit changes.

The Power Call and Power Call/Siren are capable of continuous operation as a 45-watt amplifier. The Power Call/Siren is also capable of continuous operation as a 100-watt siren. The amplifier unit is completely housed in a compact, splash-proof case. The speaker is a re-entrant weatherproof horn with a cast base to provide greater strength and ease in mounting. The speaker cable is connected under the base of the speaker for protection against weather and vandalism.

MODES OF OPERATION

A Selector Switch is located on the front of the control panel which provides radio and PA positions, as well as the four modes of siren operation for the Power Call/Siren. The Selector Switch positions are described as follows:

With the Selector Switch on the Power Call/Siren in the MANual position, the siren is started by pressing the red rectangular pushbutton (pilot light). Holding the pushbutton in causes the siren to build-up and remain on a steady audio pitch as long as the pushbutton is held depressed. When the pushbutton is released, the siren tone decays to a frequency approximately one-half the maximum frequency before cutting off. Depressing the pushbutton with the Selector Switch in the WAIL position overrides the siren signal, causing a rapid build-up to the maximum frequency. The siren will start automatically when the Selector Switch is turned to the WARBLE, WAIL or STEADY siren positions.

CONNECTOR PANEL

The microphone, mobile radio, power input, and speaker cables connect to jacks on the unit connector panel. (Refer to the OUTLINE AND TROUBLESHOOTING DIAGRAM for connector panel jack locations.)

MICROPHONES

MASTR® Professional Series and Executive Series, Progress Line, PORTA-Mobile (with microphone adaptor 19A122754G1) and MASTR II microphones may be used with the Power Call and Power Call/Siren.

The mobile/PA microphone will transmit over the mobile radio with the Selector Switch in any position except the PA position. With the Selector Switch in the PA position, the output is heard only over the PA system.

Switch Position	Function
RADIO	Calls received on mobile radio can be heard from weather-proof speaker by operator while outside vehicle.
PA	Mobile radio microphone can be used for a public address system.
MAN Siren	Provides a siren tone that builds up from 0 to 1000 Hz when the red pushbutton (S1502) is depressed. The build-up time is 6-seconds and the decay time to cutoff is 12 seconds, when push-button is released.
WAIL Siren	Provides a continuously varying tone from 650 Hz to 1000 Hz at a rate of 6 cycles per minute.
WARBLE Siren	Provides a continuously rapid warble tone from 0 to 1000 Hz at a warble rate of 2 Hz.
STEADY Siren	Provides a steady, continuous 1000-Hz tone.

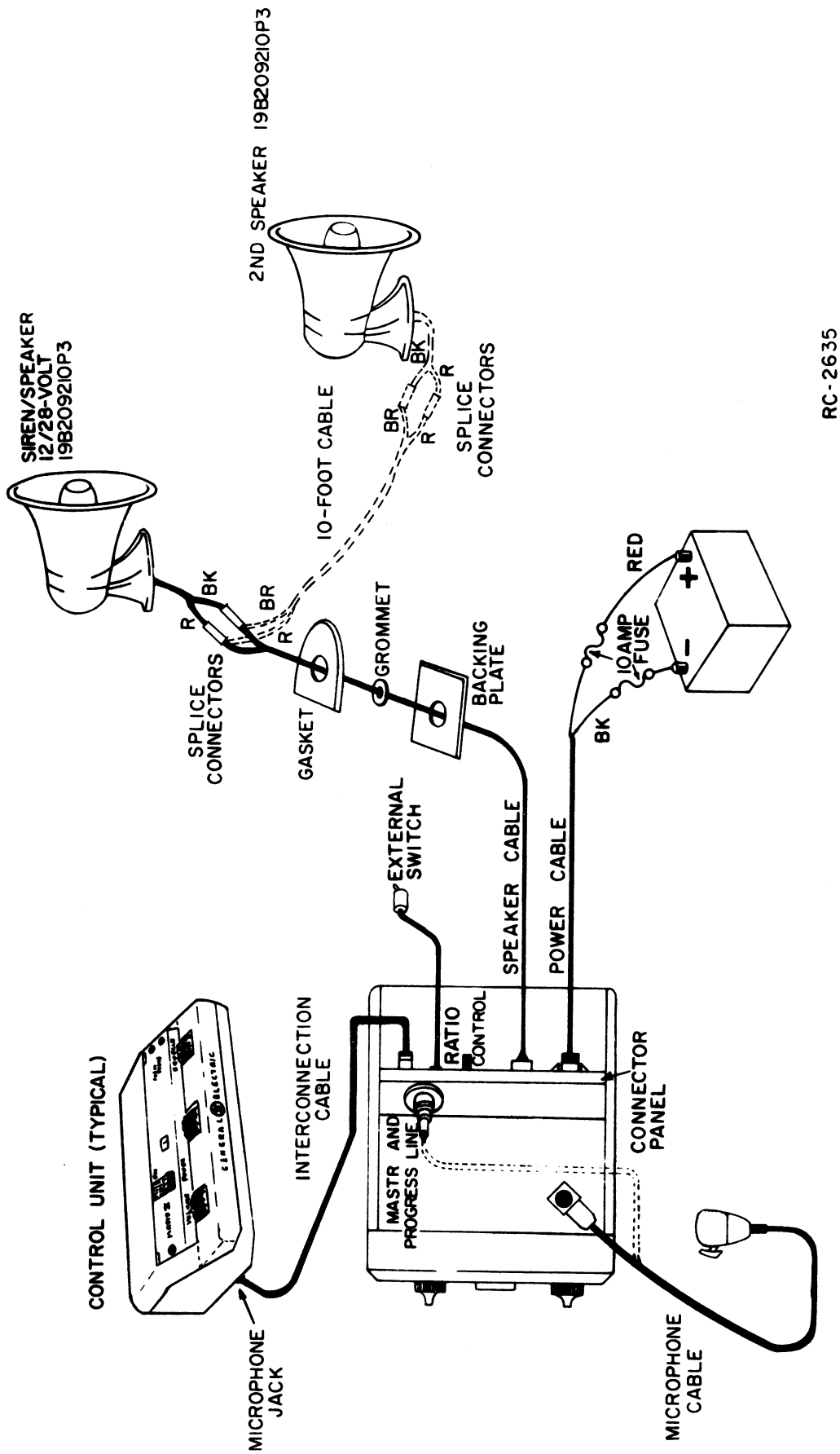


Figure 1 - Cabling Diagram

The Power Call and Power Call/Siren units are factory wired to operate with MASTR II transistorized microphones.

If the Power Call or Power Call/Siren is used with MASTR Professional Series and Executive Series, Progress Line combinations, or PORTA-Mobile equipment, then the Power Call or Power Call/Siren must be modified. Refer to Modification Instruction for details.

If using MASTR Professional series equipment that utilizes a military microphone, it will be necessary to modify the MASTR Professional Control Unit. Refer to Modification Instructions for details.

When the Power Call/Siren is used with Progress Line Equipment combinations, it is necessary that a modification be made to the Progress Line Control Unit. Refer to Modification instructions for details.

SPEAKERS

Model 19B209210P3 speakers are furnished with the Power Call and Power Call/Siren for 12- and 28-volt systems. This same speaker is also available in a chrome-plated version (Model 19B209210P5).

Other available speakers for 12- and 28-volt systems are:

- Model 19B209210P7 (low profile type)
- Model 19B209210P9 (short length type)

SECOND SPEAKER

A second speaker can be used with 12- and 28-volt systems. Connect the second speaker in parallel and in phase with the first speaker for optimum performance. Connect the speakers as shown in Figure 1.

EXTERNAL SWITCH (MODEL 4EA22B12)

A foot switch, vehicle horn-ring, or other types of external switches may be used to manually operate the siren. Connect a single-wire extension cable to proper point in the amplifier unit as indicated in the following:

12/28 VDC Positive Going Control	12/28 VDC Negative Going Control
H55	H54

Bring the wire out through the hole in the connector panel and connect to external switch.

POWER CALL/SIREN MODIFICATION INSTRUCTIONS

Model 4EA22A12 Power Call

The following instructions cover the installation of Modification Kit 19A130030G1 for modifying Model 4EA22A12, MASTR II Power Call (Public Address Amplifier) to operate with MASTR Professional Series and Executive Series, Progress Line equipment combinations or PORTA-MOBILE equipment combinations.

STEP 1: Remove two (2) #8 screws on rear of unit and remove top cover.

STEP 2: Remove four (4) #6 screws that assemble the printed wiring board to heat sink. Swing board out on wiring harness.

STEP 3: Unsolder and remove Bus Wire jumper between holes H57 and H58 on printed wire board.

STEP 4: Solder bus wire jumper between holes H52 and H53 on printed wire board.

STEP 5: Solder SF24 wire between hole H59 on printed wire board and J1502-1 (MASTR and Progress Line Microphone Jack). Dress wire to existing harness and reassemble unit.

Model 4EA22B12 Power Call/Siren

The following instructions cover the installation of Modification Kit 19A130030G1 for modifying Model 4EA22B12, MASTR II Power Call/Siren (Public address/Siren Amplifier) to operate with MASTR Professional Series and Executive Series, Progress Line equipment combinations, or PORTA-MOBILE Equipment combinations.

STEP 1: Remove two (2) #8 screws on rear of unit and remove top cover.

STEP 2: Remove four (4) #6 screws that assemble the printed wiring board to heat sink. Swing board out on wiring harness.

STEP 3: Unsolder and remove bus wire jumper between holes H57 and H58 on printed wiring board.

STEP 4: Solder bus wire jumper between holes H52 and H53 on printed wiring board.

STEP 5: Solder SF24 wire between hole H59 on printed wire board and S1503B-8S (Selector Switch). Dress wire to existing harness and reassemble unit.

MASTR PROFESSIONAL SERIES EQUIPMENT MODIFICATION

If the MASTR II Power Call/Siren is used with MASTR Professional Series Equipment which utilizes a military microphone, it will be necessary to modify the MASTR Professional control unit (System Connector-P701). Locate two connector pins (supplied in hardware kit with MASTR Professional control unit) and solder these to each end of a short piece of insulated wire. Insert pins into pin position 3 and pin position 12 on the 13-pin vehicle systems plug (P701).

PROGRESS LINE EQUIPMENT MODIFICATION

If the MASTR II Power Call/Siren is used with Progress Line Equipment combinations, it is necessary that a jumper be soldered across the 2200-ohm resistor connected to Pin-4 of the Progress Line Control Unit microphone jack.

ADJUSTMENTS

RADIO/PA INPUT LEVEL

The Radio/PA input level is adjusted by the Ratio Control (R1504) located on the connector panel and is used to obtain the desired ratio of audio output between the mobile speaker and the external PA speaker.

To adjust the Radio/PA input level:

1. Turn the Power Call or Power Call/Siren OFF, and set the mobile radio VOLUME control to the desired listening level inside the vehicle.

2. Turn the Power Call or Power Call/Siren ON, and set the Selector Switch to the RADio position. Then set the Ratio Control (R1504) for the outside audio level required for the PA system.

Increasing or decreasing the mobile audio level with the mobile radio VOLUME control will simultaneously change audio level of the mobile speaker and Power Call or Power Call/Siren speaker at the same ratio.

BIAS ADJUST

The "A" and "B" bias voltage readings should be checked and adjusted if necessary, when the power input (12 or 28-Volts) is changed. Bias adjustments are measured with the Selector Switch in the PA position. (Refer to "Bias Adjustments" on the OUTLINE AND TROUBLESHOOTING DIAGRAM.)

CIRCUIT ANALYSIS

AUDIO AMPLIFIER

The Power Call and Power Call/Siren Amplifier circuits consists of a pre-amplifier, common emitter and emitter follower circuits, a Class B push-pull power output amplifier, and a tapped output choke.

The 12 or 28-volt battery connects to J1505. J1505-2 is connected to the negative side of the battery and J1505-3 is connected to the positive side of the battery. Vehicle ground connections may be disregarded as the amplifier circuitry does not depend on a vehicle ground.

Bias for Q1, Q2, Q3, Q4 and Q1501 is regulated through a bias circuit composed of CR1, CR2, CR3 and CR4. The bias for Q1 is filtered by the R14-C13 network.

The audio signal from the mobile radio is coupled through the radio/amplifier cable to J1503-D on the amplifier. The signal level is adjustable by the radio volume control R1504. The output is connected through S1503B-13L-8S (S1504B-4S-7S on Power Call) to T1. With S1503 in this position, the base of Q2 is shorted, thereby reducing the direct current in the T1 primary to a minimum. The output of T1 is coupled to emitter follower amplifier Q4-A1501 to produce the power gain necessary to drive the Class B push-pull amplifier Q1502 and Q1503. The amplifier output is coupled through choke T1502 to speaker output jack J1504-1-2.

In the PA position, the microphone low and high wires are connected from J1506 or J1502, pins 1 and 2 to S1503A, B-13L and 9S (S1504A-2L-3S on Power Call). The signal is coupled through resistor R55 and capacitor C1 to the base of pre-amp Q1. The pre-amp output is taken from PA volume control R1501 and coupled through C3 (and S1503B-2S-6L Power Call/Siren) to the common emitter amplifier circuit Q2-Q3. The signal is connected to the primary of T1 from Q2 and Q3. The secondary of T1 drives the base of Q4-Q1501.

The jumper between holes H57 and H58 provides the connections to the 5-volt source required by the MASTR II transistorized microphone. Resistors R50 and R51 and capacitor C17 comprise a voltage divider which reduces the input voltage to +6.5 VDC. This jumper is removed when the Power Call or Power Call/Siren is used with MASTR Professional Series and Executive Series or Progress Line equipment combinations.

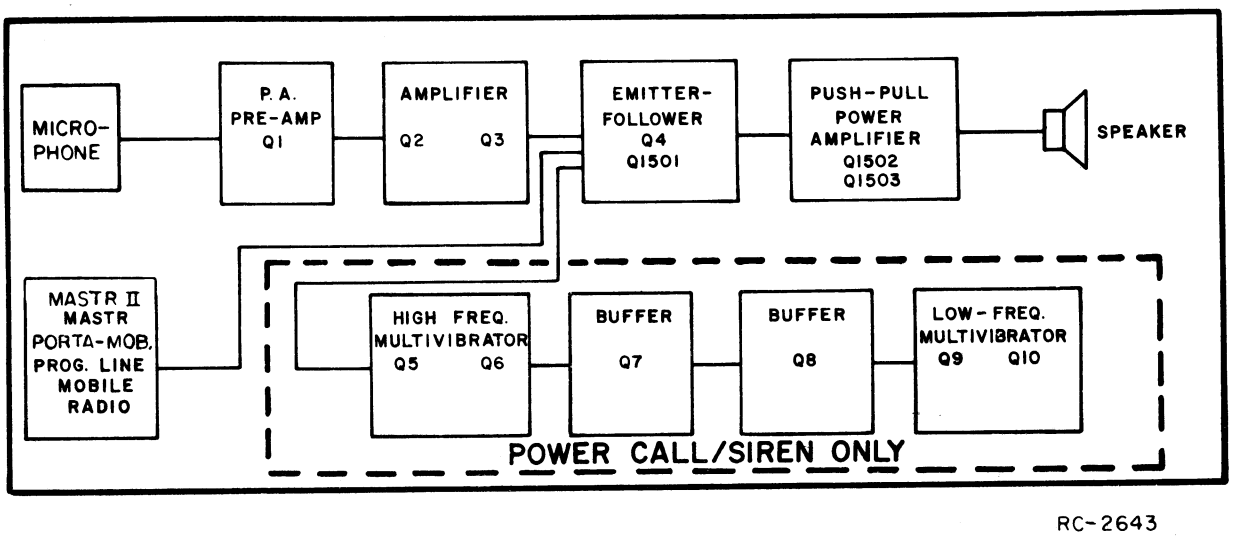


Figure 2 - Block Diagram

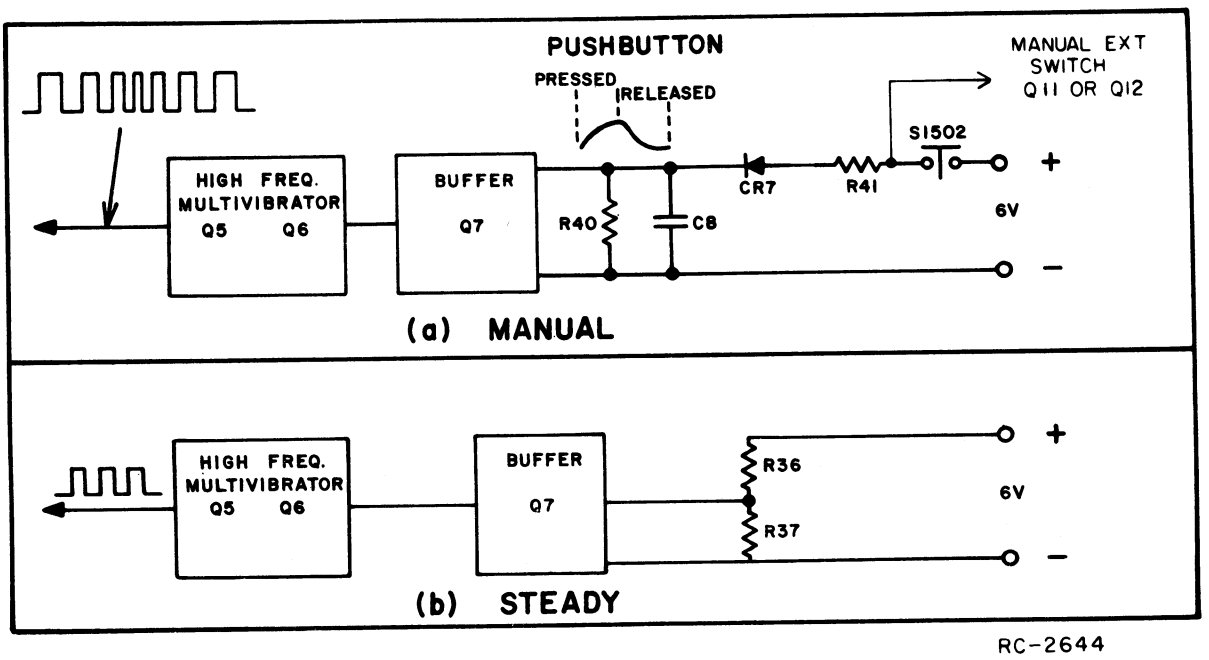


Figure 3 - Manual and Steady Siren Circuit

POWER CALL/SIREN (4EA22B12)

The siren circuit consists of a high frequency multivibrator (Q5-Q6), a low frequency multivibrator (Q9-Q10) and external siren manual keying switches Q11 and Q12. The frequency of the high frequency multivibrator is controlled by the time period of the low frequency multivibrator in the WAIL and WARBLE positions. The resultant signal produces typical siren audio characteristics.

External Manual Siren Keying Switches

Transistors Q11 and Q12 allow external manual keying of the siren when the external switch, horn ring foot switch, etc., provides either a 12/28 VDC positive control voltage or a 12/28 VDC negative control voltage. A 12/28 VDC negative input at H54 turns Q11 ON, applying a positive voltage (approximately 6 VDC) through Q11 to the junction CR7 and CR8.

Q11 or Q12, when turned on, performs the same function as depressing the MANUAL siren switch S1502.

High Frequency Multivibrator

The astable multivibrator (Q5-Q6) is essentially a nosinusoidal two-stage oscillator in which one stage conducts while the other is cut off, until a point is reached at which the stages reverse their conditions.

When power is applied to the multivibrator, one of the transistors will conduct more than the other due to variations in component tolerances. Assuming that Q5 is conducting more than Q6, the negative-going collector voltage of Q5 is coupled through C4 to the base of Q6, decreasing the conduction of Q6. The positive-going collector voltage of Q6 is coupled through C5 to the base of Q5, aiding the increase in conduction of Q5. Q5 quickly saturates under these conditions and Q6 is turned off. C4 now begins to discharge through R31 and R33. After C4 has discharged to zero, it immediately starts to charge positive through R33. This positive-going voltage at the base of Q6 starts Q6 conducting. The negative-going collector voltage of Q6 is coupled through C5 to the base of Q5. Q5 starts to turn off. The positive-going collector voltage of Q5 is coupled to the base of Q6 through C4, aiding the increase in conduction of Q6. Q6 quickly saturates and Q5 turns off.

The multivibrator has now returned to its original state, and the cycle will repeat as long as power is applied to the circuit.

The output of the multivibrator to the amplifier stage is essentially a square wave; the frequency of oscillation is determined by the RC time constants of the siren circuit, and the DC voltage level fed to the control point by Q7.

This control voltage is determined by the charging circuit R41-C8 in MANUAL position (Figure 3a), by voltage divider R36-R37 in STEADY position (Figure 3b), or by a varying voltage derived from low frequency multivibrator Q9-Q10 in WAIL and WARBLE modes.

Low Frequency Multivibrator

The low-frequency multivibrator (Q9-Q10) provides an immediate siren buildup as soon as voltage is applied across the multivibrator circuit. Voltage is applied by switching S1503 to WAIL or WARBLE positions. Initially, both Q9 and Q10 conduct, and C9 or C10 have no charge. The proportioning of voltage and resistor values of R47 and R42 for WAIL, and R46 and R42 for WARBLE are such that saturation does not occur under these conditions.

When an unstable condition occurs, the emitter voltage of Q9 rises to the full multivibrator supply. C9 remains initially uncharged as the supply voltage appears across R46, causing Q10 to cut off. In the WARBLE position, C9 becomes charged through R46 and Q9. In the WAIL position, C10 is charged through R47 and Q9.

The charging voltage terminates when the voltage across R46 or R47 equals the divider voltage on R45 and R48 minus the voltage drop of the Q10 base-emitter junction.

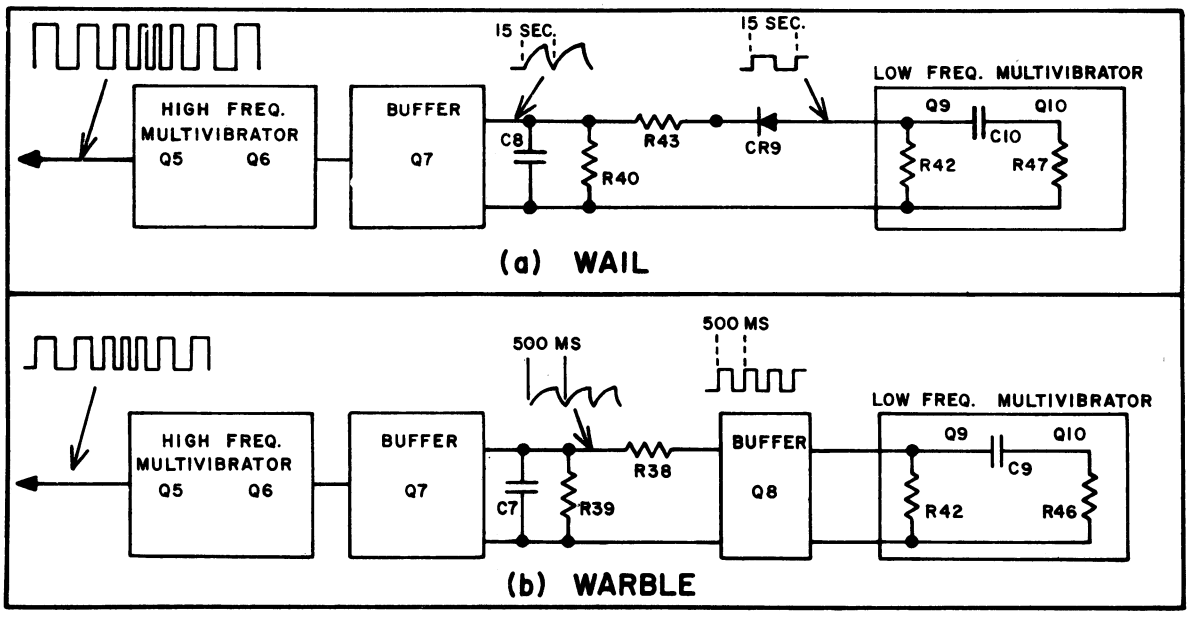


Figure 4 - Wail and Warble Siren Circuit

Then Q10 begins to conduct. Q10 is now conducting and Q9 is cut off. C9 or C10 discharges through R42 and the Q10 emitter resistance. Q9 remains cut off until C9 or C10 discharges. The multivibrator cycling continues as long as the Selector Switch (S1503) is in the WARBLE or WAIL position.

The WAIL rate is determined by the frequency of Q9-Q10 and established by the time constant of C10-R47 (Figure 4a). Pressing pushbutton S1502 causes C8 to charge at a faster rate through CR7 and R41. This causes the audio build-up to the high frequency rate, and will occur even if C8 is building up or decaying normally.

In the WARBLE position the low frequency rate of Q9-Q10 is established by the time constant of C9 and R46 with the output applied to buffer C8 through R38, R39 and C7 (Figure 4b). This causes the output signal to build-up and decay to produce the desired WARBLE characteristics.

MAINTENANCE

DISASSEMBLY

To service the amplifier unit, remove the top cover and the circuit board as follows:

1. Remove hex-head screws holding amplifier unit to mounting bracket and slide unit forward off bracket.
2. Remove two screws on rear of unit.
3. Lift up top cover and slide off.
4. Remove four screws holding circuit board. Lift circuit board out to approximately a 150° angle.

VOLTAGE CONVERSIONS

(for 12 or 28 volt Battery Systems)

The following circuit changes must be made before plugging the battery cable into J1505 when converting the unit from a 12 or 28 volt battery system:

12-VOLT OPERATION
1. Remove top cover. Solder jumper across "12" volt designations and the "12-24" designation, if not already jumpered. These are Holes H31-H32, H35-H36, H37-H38 and H29-H30, respectively. 2. Remove circuit board and replace pilot lamp with a 12-volt lamp #756. 3. Converting from a 28-volt system -- Unsolder orange wire from TB1503-1 and solder it to Q1502 collector.

28-VOLT OPERATION
1. Remove top cover. Remove all jumpers across "12" volt designations (H31-H32, H35-H36, H37-H38). Solder jumper across the "12-24" volt designation H29-H30 (if not already jumpered). 2. Remove circuit board and replace pilot lamp with 28-volt lamp #757. 3. Unsolder orange wire from collector of Q1502 and solder it to TB1503-1.

CAUTION

Check for proper connections before connecting battery cable to amplifier, otherwise damage to transistors, pilot lights, and other components may result.

POWER CALL/SIREN FREQUENCY & CYCLING CHANGES

The Power Call siren frequency, build-up and decay times may be varied by changing appropriate components on the circuit board. The changes for each siren mode are listed below:

CHANGING BUILD-UP TIME (MANUAL)	FOR BUILD-UP TIME OF:	CHANGE R41 TO:
By increasing R41, the rise rate of the manual siren tone will be slowed. The fall rate of the siren is determined by R40. However, R40 also controls fall rate in the WAIL position and if changed, should be adjusted for a satisfactory decay rate in WAIL position.	2.0 sec. 3.0 sec. 4.0 sec. 5.0 sec. 6.0 sec. 7.0 sec.	5 K ohms 10 K ohms 15 K ohms *30 K ohms 62 K ohms 82 K ohms
CHANGING CYCLE (WAIL)	**PERIOD OF CYCLE**	**CHANGE C10 TO:**
Changing C10 changes the period of the low frequency multivibrator Q9/Q10 in WAIL mode. As the period is made considerably longer, the siren pitch will rise to and stabilize at a steady high tone at the top of each cycle. If it is desired to counteract this effect, R43 may be increased to slow the rate of rise of the siren tone. Likewise, R40 may be increased to slow the rate of fall and thus prevent the siren tone from going undesirably low at the bottom of each WAIL cycle. Note however, that R40 also controls fall rate in the MANUAL position.	12 sec. 10 sec. 7 sec.	120 µf *100 µf 68 µf
CHANGING CYCLE (WARBLE)	**PERIOD OF CYCLE**	**CHANGE C9 TO:**
The WARBLE period is controlled by C9. As in the case of WAIL, if the WARBLE period is changed, tone rise rate and fall rate may also be adjusted (R38 and R39 respectively) to achieve the desired effect. Changes of R38 and R39 will not affect operation of any other siren mode.	300 ms 400 ms 500 ms	3.3 µf 4.7 µf *6.8 µf
CHANGING FREQUENCY (STEADY)	**FOR BUILD-UP TIME OF:**	**CHANGE R36 TO:**
Frequency of the STEADY siren is determined by the constant voltage applied to the multivibrator by R36.	1200 Hz 1100 Hz 1000 Hz 900 Hz 800 Hz	4.7 K ohms 8.2 K ohms *18.0 K ohms 22.0 K ohms 33.0 K ohms

* Denotes component value shipped from the factory.

GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.

GENERAL ELECTRIC*
U.S.A.

TROUBLESHOOTING PROCEDURE

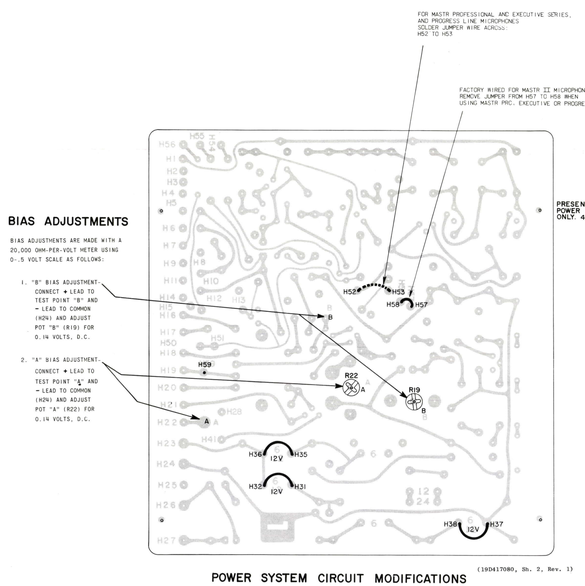
The Power Call and Power Call/Siren have "built-in" troubleshooting systems. Use the "Quick Checks" to quickly locate faulty circuits. Certain parts of the circuit are common to all modes of operation, therefore audio circuits are checked out first before the siren circuits (in Power Call/Siren) are tested.

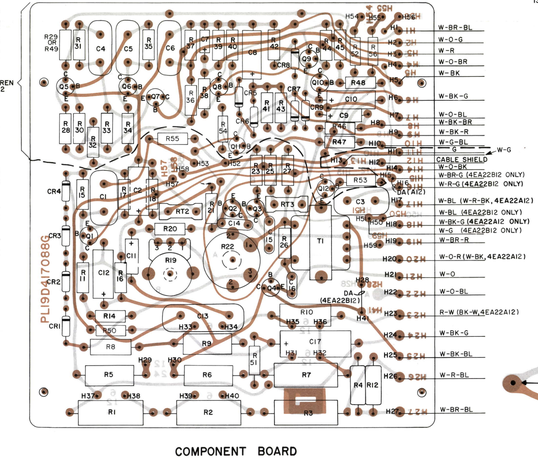
SYMPTOM	CHECK THE FOLLOWING IN SEQUENCE
No Audio in any position of Selector Switch	Turn Selector Switch to RADIO. 1. Make sure all jumpers on the circuit board are correct for the voltage being used.
	2. Check speaker for open or short.
	3. Turn ON-OFF switch ON. If pilot lamp is not at normal brilliance, check for correct lamp for voltage being used.
	4. Measure B-plus voltage from J1505-3 to J1505-2.
	4a. If voltage is present, check S1501.
	4b. If voltage is not present, check plug P1501, both fuses, and connection to battery.
	5. If unit repeatedly blows fuses, check for shorted lead or transistor.
	6. Measure voltage at Test Point "A" for approximately 0.14 volts.
	6a. If no voltage at Test Point "A", measure voltage at anode of CR1 for approximately 7.5 volts.
	6b. If voltage is present at CR1 anode, proceed to Step 7.
	6c. If no voltage at CR1 anode, check CR1, CR2, CR3, CR4, R8, R9, R10, Q4, and Q1501 for opens or shorts.
	7. Measure voltage at Q4 collector for 6.6 volts (approximately).
	7a. If voltage is 6.6 volts, proceed to Step 8.
	7b. If voltage is not present, check R5, R6, R7, Q4 and Q1501 for opens or shorts.
	8. Measure voltage from battery positive (TB1501-1) to emitter of Q1502, Q1503 for .05 volts (approx.)
	8a. If present, proceed to Step 9.
	8b. If not present, check Q1502, Q1503, R1 through R5, RT1501 for opens and shorts.
	9. Connect audio generator to J1503-D-H. Set generator to 1000 Hz.
	9a. If audio is not heard through speaker, move generator to H19-H20.
	9b. If audio is present, check lead from H19 and H20 to J1503-D-H.
	9c. If not present, check T1.

SYMPTOM	CHECK THE FOLLOWING IN SEQUENCE
No Audio in PA (or Siren) positions of Selector Switch but OK in RADio position	Turn Selector Switch to PA and measure voltage at Test point "B" for 0.14 volts (approximately). Set by R19 labeled "B". If correct, check input wire from H15 to S1503B-6L. (C3 Power Call). If not correct, check Q2, Q3, and T1.
No Audio in PA position of Selector Switch. Audio in all other positions.	Turn Selector Switch to PA and measure voltage at Q1 emitter for .5 volts (approximately). a. If correct, check leads from microphone connections to Q1 input and Q1 output to H15. b. If not correct, check R1501, R14, Q1, R15, R16, and R17. c. For MASTR II Transistorized microphones, check +6.5 DC supply line (R30, R31 and C17) with microphone keyed.
SIREN POSITIONS No Audio in Siren Positions of Selector Switch. Audio in RADio and PA positions 6.0V E 2.5V 0 — 1MS — T Waveform 1	Connect voltmeter to TB1502-5 and H2 and measure for 6.6 volts (approximately) with the Selector Switch in MAN, WAIL, WARBLE, and STEADY positions. a. If voltage is in all positions, turn to STEADY position, attach scope to emitter of Q5 and common (TB1502-5) and check for waveform #3. b. If waveform is correct, check H1 to H15 for open. c. If no waveform appears, jumper H3 to H2. d. If waveform then appears, check H3 to H4 for open and correct voltage at H4 (approximately 4.5 volts). e. If waveform is not present when H2 is shorted to H3, check voltage at Q7 emitter for 6 volts (approximately) when H2 is shorted to H3. f. If voltage is present, check Q5 and Q6 for opens or shorts.
No Audio in MAN position of Selector Switch. Audio in RADio, PA, WAIL, WARBLE and STEADY positions.	Turn Selector Switch to MAN, and measure voltage from TB1502-5 to H2 for 6.6 volts (approximately). With S1502 depressed, measure voltage at TB1502-5 to H7 for 6.6 volts (approximately). 1a. If not present, check S1502. 1b. If present, check CR7, R41, wire H9 to S1503. 2. Turn Selector Switch to STEADY and measure voltage at H4 for 4.5 volts (approximately). 2a. If not present, check R36, R37, C6. 2b. If present, check wire from H4 to H3.
No Audio in WAIL position of Selector Switch. 6.0V E 2.5V 0 — 1MS — Waveform 2	Turn Selector Switch to WAIL and check waveform #2 at Q9 emitter. a. If waveform is correct, check CR9 and R43. b. If not as shown, check Q9, Q10, R42, C10 wire from H6 to H10.
No Audio in WARBLE position of Selector Switch	Turn Selector Switch to WARBLE, and check for waveforms #2 at Q9 emitter. a. If present, check Q8, R38, R39, C7, wire from H5 to H3. b. If not present, check C9, R46, wire from H6 to H8.

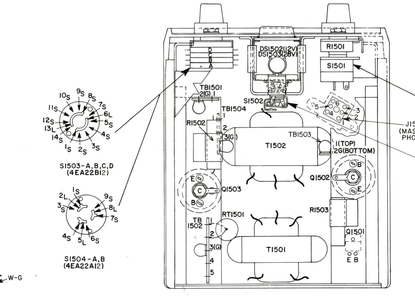
OUTLINE & TROUBLESHOOTING DIAGRAM

POWER CALL — MODEL 4EA22A12
POWER CALL/SIREN — MODEL 4EA22B12



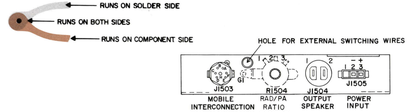


COMPONENT BOARD
(19D417080, Sh. 2, Rev. 1)
(19D417080, Sh. 3, Rev. 1)
(19B622140, Rev. 4)

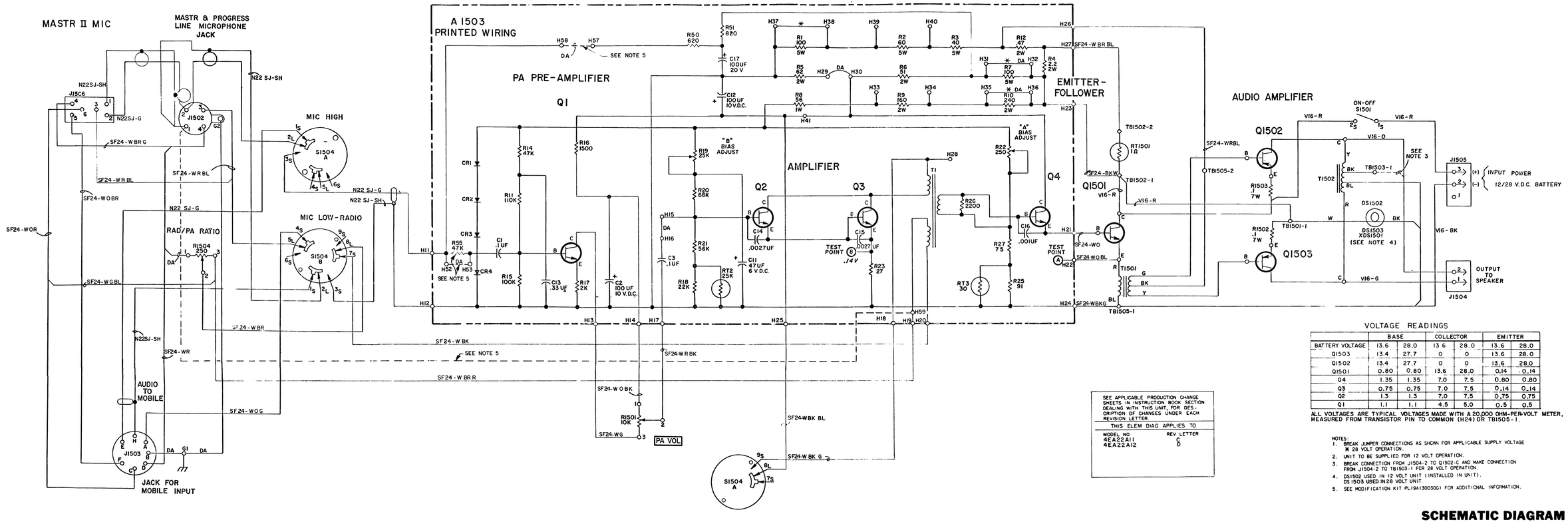


AMPLIFIER ASSEMBLY (TOP VIEW)

FRONT CONNECTOR PANEL



REAR CONNECTOR PANEL



VOLTAGE READINGS

	BASE		COLLECTOR		EMITTER	
BATTERY VOLTAGE	13.6	28.0	13.6	28.0	13.6	28.0
Q1503	13.4	27.7	0	0	13.6	28.0
Q1502	13.4	27.7	0	0	13.6	28.0
Q1501	0.80	0.80	13.6	28.0	0.14	0.14
Q4	1.35	1.35	7.0	7.5	0.80	0.80
Q3	0.75	0.75	7.0	7.5	0.14	0.14
Q2	1.3	1.3	7.0	7.5	0.75	0.75
Q1	1.1	1.1	4.5	5.0	0.5	0.5

ALL VOLTAGES ARE TYPICAL VOLTAGES MADE WITH A 20,000 OHM-PER-VOLT METER, MEASURED FROM TRANSISTOR PIN TO COMMON (H24) OR TB1505-1.

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
4EA22A11	C
4EA22A12	D

NOTES:
1. BREAK JUMPER CONNECTIONS AS SHOWN FOR APPLICABLE SUPPLY VOLTAGE * 28 VOLT OPERATION.
2. UNIT TO BE SUPPLIED FOR 12 VOLT OPERATION.
3. BREAK CONNECTION FROM J1504-2 TO Q1502-C AND MAKE CONNECTION FROM J1504-2 TO TB1503-1 FOR 28 VOLT OPERATION.
4. DS1502 USED IN 12 VOLT UNIT (INSTALLED IN UNIT). DS1503 USED IN 28 VOLT UNIT.
5. SEE MODIFICATION KIT PL19A130030G1 FOR ADDITIONAL INFORMATION.

SCHEMATIC DIAGRAM

POWER CALL MODEL 4EA22A12

Issue 4

(DF-8409)

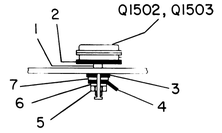
PARTS LIST

LBI4731D

POWER CALL
MODEL 4EA22A12

SYMBOL	GE PART NO.	DESCRIPTION
A1503		COMPONENT BOARD ASSEMBLY 19D417088G1
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	19A115028P114	Polyester: 0.1 µf ±20%, 200 VDCW.
C2	5496267P7	Tantalum: 100 µf ±20%, 10 VDCW.
C3	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C11	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW.
C12	5496267P7	Tantalum: 100 µf ±20%, 10 VDCW.
C13	19A115028P117	Polyester: 0.33 µf ±20%, 100 VDCW.
C14 and C15	5494481P127	Ceramic disc: 2700 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C16	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C17	5496267P16	Tantalum: 100 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1* thru CR4*	19A115775P1	Silicon, fast recovery, 225 mA, 50 PIV.
		In REV B & earlier:
	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1 thru Q4	19A115889P1	Silicon, NPN.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1	5493035P13	Wirewound: 100 ohms ±5%, 5 w; sim to Hamilton Hall Type HR.
R2	5493035P12	Wirewound: 60 ohms ±5%, 5 w; sim to Hamilton Hall Type HR.
R3	5493035P11	Wirewound: 40 ohms ±5%, 5 w; sim to Hamilton Hall Type HR.
R4	19B209022P23	Wirewound, phen: 2.2 ohms ±5%, 2 w; sim to IRC Type BWH.
R5	3R79P620J	Composition: 62 ohms ±5%, 2 w.
R6	3R79P510J	Composition: 51 ohms ±5%, 2 w.
R7	5493035P13	Wirewound: 100 ohms ±5%, 5 w; sim to Hamilton Hall Type HR.
R8	3R78P560J	Composition: 56 ohms ±5%, 1 w.
R9	3R79P161J	Composition: 160 ohms ±5%, 2 w.
R10	3R79P241J	Composition: 240 ohms ±5%, 2 w.
R11	3R77P114J	Composition: 110K ohms ±5%, 1/2 w.
R12	19B209022P7	Wirewound, phen: 0.47 ohms ±5%, 2 w; sim to IRC Type BWH.
R14	3R77P473J	Composition: 47K ohms ±5%, 1/2 w.
R15	3R77P104J	Composition: 100K ohms ±5%, 1/2 w.
R16	3R77P152J	Composition: 1.5K ohms ±5%, 1/2 w.
R17	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R18	3R77P223J	Composition: 22K ohms ±5%, 1/2 w.
R19*	19B209246P7	Variable, carbon film: 25K ohms ±20%, 1/8 w; sim to UPE-200 RE.
		In REV C & earlier:
	19B209115P2	Variable, carbon film: 25K ohms ±20%, 0.1 w; sim to UPE-70.
R20*	3R77P563J	Composition: 56K ohms ±5%, 1/2 w.
		In REV B and earlier:
	3R77P683J	Composition: 68K ohms ±5%, 1/2 w.
		In REV A and earlier:
	3R77P563J	Composition: 56K ohms ±5%, 1/2 w.
R21	3R77P363J	Composition: 36K ohms ±5%, 1/2 w.
R22	19209113P1	Variable, wirewound: 250 ohms ±20%, 2.5 w; sim to CTS Series 110.
R23	3R77P270J	Composition: 27 ohms ±5%, 1/2 w.
R25	3R77P910J	Composition: 91 ohms ±5%, 1/2 w.
R26	3R77P222J	Composition: 2.2K ohms ±5%, 1/2 w.
R27	3R77P750J	Composition: 75 ohms ±5%, 1/2 w.
R50	3R77P621J	Composition: 620 ohms ±5%, 1/2 w.
R51	3R77P821J	Composition: 820 ohms ±5%, 1/2 w.
R55	3R77P473J	Composition: 47K ohms ±5%, 1/2 w.
		- - - - - - - - - THERMISTORS - - - - - - - - -
RT2	5490828P12	25K ohms ±10%, temp coef 3900 ±5%; sim to Carborundum 783H-2.
RT3	5490828P2	30 ohms ±10%, temp coef 1500 ±10%; sim to Carborundum 783F-2.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T1	19B209219P1	Audio freq: 300 to 3000 Hz. Pri 1: 36 ohms ±10% DC res. Pri 2: 17 ohms ±10% DC res. Sec: 100 ohms ±10% DC res.
		AMPLIFIER ASSEMBLY 19D402487G9
		- - - - - - - - - INDICATING DEVICES - - - - - - -
DS1502	19C307037P19	Lamp, incandescent: 14 v; sim to GE Lamp Dept. 756.
DS1503	19C307037P20	Lamp, incandescent: 28 v; sim to GE Lamp Dept. 757.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1502		Connector. Includes:
	19A116061P2	Receptacle: 4 female contacts; sim to Amphenol Type 91-PM4F-1000.
	19A116061P4	Lockwasher, internal tooth.
	19A116061P5	Nut, knurled.
	19A116049P1	Terminal, solderless.
J1503	7489183P8	Plug: 7 contacts rated at 7.5 amps max.
J1504*	19A134156P1	Connector, receptacle: sim to Heyco DC-68-2-2 with 2 brass terminals T-202-S.
		Earlier than REV A:
J1504*		Includes:
	5492450P2	Shell: sim to Heyman Mtg. Co. DC-202-1.
	5492450P12	Contact: sim to Heyman Mtg. Co. T-202-S.
J1505		Includes:
	5492497P20	Shell connector: 3 circuits; sim to Amp 480059-1.
	5492497P2	Contact (2), crimp, with lock spring; sim to Amp 42641-1.
J1506	19B219627G1	Connector: 6 contacts.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1501	19A116118P3	Silicon, NPN.
Q1502 and Q1503	5490810P1	Germanium, PNP.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1501	19C307089P13	(Part of S1501).
R1502 and R1503	5493035P14	Wirewound: 0.1 ohm ±10%, 7 w; sim to Hamilton Hall Type HR.
R1504	19B209114P2	Variable, wirewound: 250 ohms ±20%, 2.25 w; sim to CTS Series 117.
RT1501	19C300048P3	Disc: 1 ohm ±10% at 25°C; sim to NL Ind. 3D754.
		- - - - - - - - - SWITCHES - - - - - - - - -
S1501	19C307089P13	Switch/Resistor: includes Switch, rotary, 1 pole, 2 position, non-shorting contacts; Resistor (R1501) variable, 10K ohms ±10%, 1/2 w; sim to Mallory Type 1JC.
S1504	19C307060P2	Switch, rotary: 2 sections, 8 poles, 6 positions, non-shorting contacts, 0.5 amps at 125 VAC.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T1501	19B209216P1	Audio freq: 200 to 5000 Hz, Pri: 42 ohms ±5% imp, 1.25 ohms ±15% DC res, Sec: 40 ohms imp, 1.7 ohms DC res.
T1502	19B209221P1	Autotransformer.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1501	7775500P1	Phen: 2 terminals.
TB1502	7775500P5	Phen: 3 terminals.
TB1503	7775500P144	Phen: 2 terminals.
TB1505	7775500P147	Phen: 5 terminals.
		- - - - - - - - - SOCKETS - - - - - - - - -
XDS1501	4032220P3	Lampholder: sim to Drake N517 Miniature Bayonet Socket.
		HARNESS ASSEMBLY 19D402487G7 (Includes DS1502, DS1503, J1502, J1505, R1501, R1504, S1501, S1504, TB1501, XDS1501)
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19A121733G2	Mounting bracket.
	19A121771G1	Speaker Cable, 20 ft.
	19B204987G1	Power Cable, with fuse holders and fuses.
	7484390P1	Fuse, 10-amp.
	19A121683G1	Support, pushbutton.
	19A121684G1	Support, pilot lamp, with spring clips.
	19B204907P1	Dummy button.
	19A122754G1	Microphone adaptor. (PORTA-MOBIL).
	403248OP1	Nut, sheet spring: sim to Vector Electronic Co. 440. (Used with R1504).
	7160861P13	Nut, sheet spring: sim to Tinnerman CS14-832-157. (Secures top cover to bottom cover).
	NP243G6	Nameplate. (Faceplate).
	19C303413P1	Knob. (Used with S1501).
	19A121761P1	Knob, dummy. (Used with S1503).
	19B204443G3	Knob. (Used with S1501 and S1503).
	7147306P2	Insulator, bushing: sim to H.H. Smith Inc 2150. (Used with Q1501).
	19A116023P1	Insulator, plate. (Used with Q1501).
	4036994P1	Solderless terminal: sim to Zierick Mfg. 505. (Used with Q1501).
	19A121765G2	Top cover.
	4038930P1	Clip. (Secures R1502, R1503).
	19A116061P5	Nut, knurled. (Secures J1502).
	19C303660P3	Side rail. (J1505 side).
	19C303660P4	Side rail. (J1503 side).
		MECHANICAL PARTS (SEE RC2642)
1	4034215P1	Bushing, sleeve.
2	4031291P1	Insulator, plate.
3	19A115221P3	Insulator, plate.
4	4036835P1	Solderless terminal; sim to Shakeproof 2118-10-01-2520N.
5	4032596P1	Hex nut: No. 10-32.
6	N405P9C13	Lockwasher, spring type.
7	4034225P1	Flat washer: approx 1/2 inch dia.

TRANSISTOR MOUNTING



RC-2642

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.

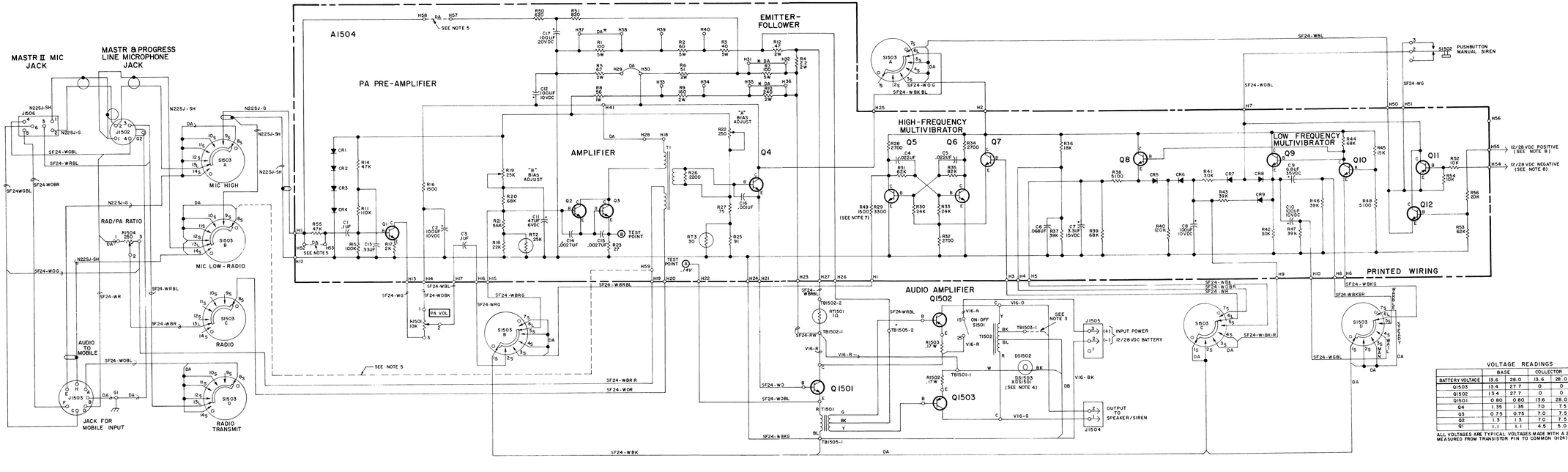
REV. A - To incorporate improved speaker connection.
Changed J1504.

REV. B - To permit proper setting of "B" bias adjustment.
Changed R20.

REV. C - To incorporate an improved diode.
Changed CR1 thru CR4 and R20.

REV. D - To incorporate new variable resistor.
Changed R19.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES



(198621966, 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	
MODEL NO	REV LETTER
4EA22B11	C
4EA22B12	D

NOTES:

1. BREAK JUMPER CONNECTIONS AS SHOWN FOR APPLICABLE SUPPLY VOLTAGE. ▶ 28 VOLT OPERATION.
2. UNIT TO BE SUPPLIED FOR 12 VOLT OPERATION.
3. BREAK CONNECTION FROM J1504-2 TO Q1502-C AND MAKE CONNECTION FROM J1504-2 TO TB1503-1 FOR 28 VOLT OPERATION.
4. DS1502 USED IN 12 VOLT UNIT (INSTALLED IN UNIT). DS1503 USED IN 28 VOLT UNIT.
5. SEE MODIFICATION KIT PL19A13003091 FOR ADDITIONAL INFORMATION.
7. ONLY ONE OF THESE RESISTORS WILL BE FOUND IN UNIT AND IT WILL BE SELECTED IN THE FACTORY FOR OPTIMUM PERFORMANCE.
8. EXTERNAL SWITCH CONNECTION FOR REMOTE MANUAL SIREN OPERATION.

VOLTAGE READINGS

	BASE		COLLECTOR		EMITTER	
BATTERY VOLTAGE	13.6	28.0	13.6	28.0	13.6	28.0
Q1503	13.4	27.7	0	0	13.6	28.0
Q1502	13.4	27.7	0	0	13.6	28.0
Q1501	0.80	0.80	13.6	28.0	0.14	0.14
Q4	1.35	1.35	7.0	7.5	0.80	0.80
Q3	0.75	0.75	7.0	7.5	0.14	0.14
Q2	1.3	1.3	7.0	7.5	0.75	0.75
Q1	1.1	1.1	4.5	5.0	0.5	0.5

ALL VOLTAGES ARE TYPICAL VOLTAGES MADE WITH A 20,000 OHM-PER-VOLT METER, MEASURED FROM TRANSISTOR PIN TO COMMON (H24 FOR TB1505-1).

SCHEMATIC DIAGRAM

POWER CALL/SIREN MODEL 4EA22B12

Issue 4

PARTS LIST

LBI4730D

POWER CALL/SIREN
MODEL 4EA23B12

SYMBOL	GE PART NO.	DESCRIPTION
A1504		COMPONENT BOARD ASSEMBLY 19D417088G2
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	19A115028P114	Polyester: 0.1 µf ±20%, 200 VDCW.
C2	5496267P7	Tantalum: 100 µf ±20%, 10 VDCW.
C3	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C4 and C5	19A115028P509	Polyester: 0.022 µf ±20%, 200 VDCW.
C6	19A115028P112	Polyester: 0.068 µf ±20%, 200 VDCW.
C7	5496267P9	Tantalum: 3.3 µf ±20%, 15 VDCW.
C8	5496267P7	Tantalum: 100 µf ±20%, 10 VDCW.
C9	5496267P18	Tantalum: 6.8 µf ±20%, 35 VDCW.
C10	5496267P7	Tantalum: 100 µf ±20%, 10 VDCW.
C11	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW.
C12	5496267P7	Tantalum: 100 µf ±20%, 10 VDCW.
C13	19A115028P117	Polyester: 0.33 µf ±20%, 100 VDCW.
C14 and C15	5494481P127	Ceramic disc: 2700 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C16	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C17	5496267P16	Tantalum: 100 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1* thru CR4*	19A115775P1	Silicon, fast recovery, 225 mA, 50 PIV. In REV B & earlier:
	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR5 thru CR9	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1 thru Q10	19A115889P1	Silicon, NPN.
Q11	19A115768P1	Silicon, PNP; sim to Type 2N3702.
Q12	19A115889P1	Silicon, NPN.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1	5493035P13	Wirewound, ceramic: 100 ohms ±5%, 5 w; sim to Hamilton Ball Type HK.
R2	5493035P12	Wirewound, ceramic: 60 ohms ±5%, 5 w; sim to Hamilton Ball Type HK.
R3	5493035P11	Wirewound, ceramic: 40 ohms ±5%, 5 w; sim to Hamilton Ball Type HK.
R4	19B209022P23	Wirewound, phen: 2.2 ohms ±5%, 2 w.
R5	3B79620J	Composition: 62 ohms ±5%, 2 w.
R6	3B79551J	Composition: 51 ohms ±5%, 2 w.
R7	5493035P13	Wirewound, ceramic: 100 ohms ±5%, 5 w; sim to Hamilton Ball Type HK.
R8	3B78566J	Composition: 56 ohms ±5%, 1 w.
R9	3B79161J	Composition: 160 ohms ±5%, 2 w.
R10	3B79241J	Composition: 240 ohms ±5%, 2 w.
R11	3B77P114J	Composition: 110K ohms ±5%, 1/2 w.
R12	19B209032P7	Wirewound, phen: 0.47 ohms ±5%, 2 w.
R14	3B77P473J	Composition: 47K ohms ±5%, 1/2 w.

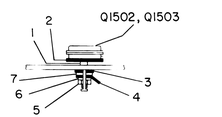
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
R15	3B77P104J	Composition: 100K ohms ±5%, 1/2 w.
R16	3B77P152J	Composition: 1.5K ohms ±5%, 1/2 w.
R17	3B77P202J	Composition: 2K ohms ±5%, 1/2 w.
R18	3B77P223J	Composition: 22K ohms ±5%, 1/2 w.
R19*	19B209246P7	Variable, carbon film: 25K ohms ±20%; sim to CTS Type UPM-200 RE. In REV C and earlier:
	19B209115P2	Variable, carbon film: 25K ohms ±20%; sim to UPM-70.
R20*	3B77P563J	Composition: 56K ohms ±5%, 1/2 w. In REV B and earlier:
	3B77P683J	Composition: 68K ohms ±5%, 1/2 w. In REV A and earlier:
	3B77P563J	Composition: 56K ohms ±5%, 1/2 w.
R21	3B77P263J	Composition: 36K ohms ±5%, 1/2 w.
R22	19B209113P1	Variable, wirewound: 250 ohms ±20%, 2.5 w; sim to CTS Series 110.
R23	3B77P270J	Composition: 27 ohms ±5%, 1/2 w.
R25	3B77P910J	Composition: 91 ohms ±5%, 1/2 w.
R26	3B77P222J	Composition: 2.2K ohms ±5%, 1/2 w.
R27	3B77P750J	Composition: 75 ohms ±5%, 1/2 w.
R28	3B77P272J	Composition: 2.7K ohms ±5%, 1/2 w.
R29	3B77P332J	Composition: 3.3K ohms ±5%, 1/2 w.
R30	3B77P243J	Composition: 24K ohms ±5%, 1/2 w.
R31	3B77P823J	Composition: 82K ohms ±5%, 1/2 w.
R32	3B77P272K	Composition: 2.7K ohms ±10%, 1/2 w.
R33	3B77P243J	Composition: 24K ohms ±5%, 1/2 w.
R34	3B77P272J	Composition: 2.7K ohms ±5%, 1/2 w.
R35	3B77P823J	Composition: 82K ohms ±5%, 1/2 w.
R36	3B77P183K	Composition: 18K ohms ±10%, 1/2 w.
R37	3B77P393K	Composition: 39K ohms ±10%, 1/2 w.
R38	3B77P513J	Composition: 5.1K ohms ±5%, 1/2 w.
R39	3B77P683K	Composition: 68K ohms ±10%, 1/2 w.
R40	3B77P124K	Composition: 120K ohms ±10%, 1/2 w.
R41 and R42	3B77P303J	Composition: 30K ohms ±5%, 1/2 w.
R43	3B77P393K	Composition: 39K ohms ±10%, 1/2 w.
R44	3B77P683K	Composition: 68K ohms ±10%, 1/2 w.
R45	3B77P153K	Composition: 15K ohms ±10%, 1/2 w.
R46 and R47	3B77P393K	Composition: 39K ohms ±10%, 1/2 w.
R48	3B77P513J	Composition: 5.1K ohms ±5%, 1/2 w.
R49	3B77P153J	Composition: 1.5K ohms ±5%, 1/2 w.
R50	3B77P621J	Composition: 620 ohms ±5%, 1/2 w.
R51	3B77P821J	Composition: 820 ohms ±5%, 1/2 w.
R52	3B77P103J	Composition: 10K ohms ±5%, 1/2 w.
R53	3B77P623J	Composition: 62K ohms ±5%, 1/2 w.
R54	3B77P103J	Composition: 10K ohms ±5%, 1/2 w.
R55	3B77P473J	Composition: 47K ohms ±5%, 1/2 w.
R56	3B77P203J	Composition: 20K ohms ±5%, 1/2 w.
		- - - - - - - - - THERMISTORS - - - - - - - - -
RT2	5490828P12	Rod: 25,000 ohms ±10%, color code red; sim to Carborundum 783H-2.
RT3	5490828P2	Rod: 30 ohms ±10%, color code green; sim to Carborundum 783F-2.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T1	19B209219P1	Audio freq: 300 to 3000 Hz. Pri 1: 30 ohms ±10% DC res. Pri 2: 17 ohms ±10% DC res. Sec: 100 ohms ±10% DC res.

SYMBOL	GE PART NO.	DESCRIPTION
		AMPLIFIER ASSEMBLY 19D402487G10
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS1501	19C307037P18	Lamp, incandescent: 6.3 v; sim to GE 755.
DS1502	19C307037P19	Lamp, incandescent: 14 v; sim to GE 756.
DS1503	19C307037P20	Lamp, incandescent: 28 v; sim to GE 757.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1502		Connector. Includes:
	19A116061P2	Receptacle: 4 female contacts; sim to Amphenol Type 91-PS47-1000.
	19A116061P4	Lockwasher, internal tooth.
	19A116061P5	Nut, knurled.
J1503	7489183P8	Plug: 7 contacts rated at 7.5 amps max.
J1504*	19A134156P1	Connector, receptacle: sim to Beyco DC-68-2-2 with 2 brass terminals No. T-202-3. Earlier than REV A:
J1504*		Includes:
	5492450P2	Shell.
	5492450P12	Contact.
J1505		Includes:
	5492497P30	Shell, connector: 3 circuits; sim to Amp 480059-1
	5492497P2	Contact (2), crimp, with lock spring; sim to Amp 42641-1.
J1506	19B210627G1	Connector: 6 contacts.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1501	19A116118P3	Silicon, NPN.
Q1502 and Q1503	5490810P1	Germanium, PNP.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1501	19C307089P13	(Part of S1501).
R1502 and R1503	5493035P14	Wirewound, ceramic: 0.1 ohm ±10%, 7 w; sim to Hamilton Ball Type HR.
R1504	19B209114P2	Variable, wirewound: 250 ohms ±20%, 2.25 w; sim to CTS Series 117.
		- - - - - - - - - THERMISTORS - - - - - - - - -
RT1501	19C300048P3	Disc: 1 ohm ±10% at 25°C.
		- - - - - - - - - SWITCHES - - - - - - - - -
S1501	19C307089P13	Switch/Resistor: includes Switch, rotary, 1 pole, 2 positions, non-shorting contacts; Resistor (R1501), variable, 10,000 ohms ±10%, 1/2 w; sim to Mallory Type LC10E.
S1502	5490868P1	Switch, push button: red, non-locking SPDT; sim to Switchcraft "Tini Switch" No. 85-1016.
S1503	19C307066P1	Rotary: 4 sections, 8 poles, 6 positions, non-shorting; sim to CTS 213-13048-4.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T1501	19B209216P1	Audio freq: 200 to 5000 Hz. Pri: 42 ohms ±5% inp, 1.25 ohms ±15% DC res, Sec: 40 ohms imp, 1.7 ohms DC res.
T1502	19B209221P1	Autotransformer.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1501	7775500P1	Phen: 2 terminals.
TB1502	7775500P5	Phen: 3 terminals.
TB1503	7775500P144	Phen: 2 terminals.
TB1505	7775500P147	Phen: 5 terminals.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - SOCKETS - - - - - - - - -
XDS1501	403222DP3	Lamp, miniature; sim to Drake H517.
		HARNESS ASSEMBLY 19D402487G8 (Includes DS1501-DS1503, J1502, J1505, R1501, R1504, S1501, S1503, XDS1501):
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19A121733G1	Mounting bracket.
	19A121771G1	Speaker Cable, 20 ft.
	19B204987G1	Power Cable, with fuse holders and fuses.
	7484539P1	Fuse, 10-amp.
	19A121683G1	Support, pushbutton.
	19A121684G1	Support, pilot lamp, with spring clips.
	19B204907P2	Lens cap, red, pushbutton.
	19A121768P1	Spring, pushbutton.
	7115130P6	Lockwasher, internal tooth: sim to Shakeproof 1214.
	19A122754G1	Microphone adaptor. (PORTA-MOBIL).
	403248P1	Nut, sheet spring: sim to Vector Electronic Co. No. 440. (Used with S1504).
	19C303413P1	Knob. (Used with S1501).
	19A121761P1	Knob. (Used with S1504).
	19B204443G3	Knob. (Used with S1501 and S1504).
	403893DP1	Clip: approx 13/16 x 13/16 inches. (Secures S1503).
	7160861P13	Nut, sheet spring; sim to Tinnerman CB14-832-157. (Secures top cover to bottom cover).
	7147309P2	Insulator, bushing: No. 6; sim to H. H. Smith Inc. 2150. (Used with Q1501).
	19A116023P1	Insulator, plate. (Used with Q1501).
	403699AP1	Terminal, solder: sim to Zierick Mfg Corp 505. (Used with Q1501).
	19A121765G2	Top cover.
	RP243596	Nameplate, etched aluminum. (POWER CALL/SIREN).
	7165075P2	Hex nut, brass: thd. size No. 3/8-32. (Secures S1501, S1502).
	7115130P9	Lockwasher, internal tooth: No. 3/8. (Secures S1501, S1502).
	19C303660P3	Side rail. (J1505 side).
	19C303660P4	Side rail. (J1503 side).
		MECHANICAL PARTS (SEE RC2642)
1	403421SP1	Bushing, sleeve.
2	403129P1	Insulator, plate.
3	19A115221P3	Insulator, plate.
4	403683SP1	Solderless, terminal: sim to Shakeproof 2118-10-01-2S206.
5	403259SP1	Hex nut, steel: No. 10-32.
6	M4059PC13	Lockwasher, spring type.
7	403422SP1	Flatwasher: No. 10.

TRANSISTOR MOUNTING



RC-2642

PRODUCTION CHANGES

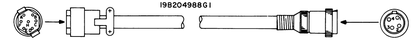
Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter", which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts list for descriptions of parts affected by these revisions.

REV. A - To incorporate an improved speaker connector.
Changed J1504.

REV. B - To permit proper setting of "R" bias adjustment.
Changed R20.

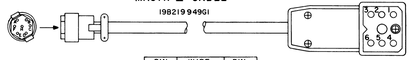
REV. C - To incorporate an improved diode.
Changed CR1 thru CR4 and R20.

MASTR PRO, EXECUTIVE & PROGRESS LINE CABLE
19B204988G1



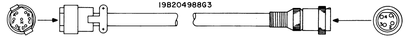
PIN	WIRE	PIN
A	RED	3
B	BLACK	SHELL
D	WHITE	4
E	GREEN	2
H	SHIELD ON GREEN	1

MASTR II CABLE
19B219949G1



PIN	WIRE	PIN
A	RED	3
C	BLUE	6
D	WHITE	4
E	GREEN	2
F	BLACK	5
H	SHIELD ON GREEN	1

PORTA MOBIL CABLE
19B204988G3



PIN	WIRE	PIN
A	RED	3
B	BLACK	SHELL
D	WHITE	4
E	GREEN	2
H	SHIELD ON GREEN	1

(19C321E2), Rev. D)

INTERCONNECTION CABLES

MASTR & PROGRESS LINE	19B204988G1
PORTA-MOBIL	19B204988G3
MASTR II	19B219949G1

PARTS LIST

LBI-4729

INTERCONNECTION CABLES
19B204988G1 MASTR AND PROGRESS LINE
19B204988G3 PORTA-MOBIL
19B219949G1 MASTR II

SYMBOL	GE PART NO.	DESCRIPTION
		MASTR AND PROGRESS LINE INTERCONNECTION CABLE 19B204988G1
	7489183P9	Receptacle: 7 contacts rated at 7.5 amps max; sim to Winchester MTS-LS-BIRC.
	7478726P6	Plug: 6 male contacts; sim to Amphenol Type 91-MC6R.
	403466P24	Cable: approx 3 feet. (Specify length).
		PORTA-MOBIL INTERCONNECTION CABLE 19B204988G3
	7489183P9	Receptacle: 7 contacts rated at 7.5 amps max; sim to Winchester MTS-LS-BIRC.
	19B209201P3	Plug: 4 contacts, Delrins; sim to Switchcraft 2504W.
	403466P24	Cable: approx 3 feet. (Specify length).
		MASTR II INTERCONNECTION CABLE 19B219949G1
	7489183P9	Receptacle: 7 contacts rated at 7.5 amps max; sim to Winchester MTS-LS-BIRC.
	403466P3	Cable: approx 3 feet. (Specify length).
	19D416769P1	Cover.
	19D416766P1	Base.
	7109043P1	Retaining ring.
	19A129433P1	Pin.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES