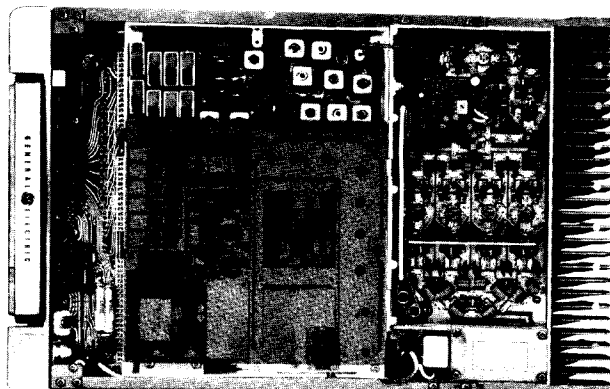


MASTR II MAINTENANCE MANUAL

25-50 MHz, 100-WATT TRANSMITTER (MOBILE)



Maintenance Manual LB14898E
DATAFILE FOLDER DF3155
(Supersedes LB14600)

25-50 MHz EXCITER 19D416659G1-8
100-WATT PA ASSEMBLY 19C321295G5-8

SPECIFICATIONS *

Frequency Range	25-50 MHz	
Power Output	100 Watts (Adjustable from 50 to 100 Watts at 30 to 50 MHz, and from 75 to 100 Watts at 25 to 30 MHz)	
Crystal Multiplication Factor	3	
Frequency Stability	±0.0005% (-40°C to +70°C)	
5C-ICOM with EC-ICOM	±0.0002% (0°C to +55°C)	
5C-ICOM or EC-ICOM	±0.0002% (-40°C to +70°C)	
2C-ICOMS		
Spurious and Harmonic Emission	At least 85 dB below full rated power output	
Modulation	Adjustable from 0 to ±5 kHz swing with instantaneous modulation limiting.	
Modulation Sensitivity	80 to 120 Millivolts	
Audio Frequency Characteristics	Within +1 dB to -3 dB of a 6-dB/octave pre-emphasis from 300 to 3000 Hz per EIA standards. Post limiter filter per FCC and EIA.	
Distortion	Less than 2% (1000 Hz) Less than 3% (300 to 3000 Hz)	
Deviation Symmetry	0.5 kHz maximum	
Duty Cycle	EIA 20% Intermittent	
Maximum Frequency Spread: (2 to 8 channels)	Full Specifications	1 dB Degradation
25-30 MHz	.160 MHz	.320 MHz
30-36 MHz	.200 MHz	.400 MHz
36-42 MHz	.240 MHz	.470 MHz
42-50 MHz	.280 MHz	.540 MHz

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

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WARNING

Although the highest DC voltage in MASTR II Mobile Equipment is supplied by the vehicle battery, high currents may be drawn under short circuit conditions. These currents can possibly heat metal objects such as tools, rings, watchbands, etc., enough to cause burns. Be careful when working near energized circuits!

High-level RF energy in the transmitter Power Amplifier assembly can cause RF burns upon contact. KEEP AWAY FROM THESE CIRCUITS WHEN THE TRANSMITTER IS ENERGIZED!

DESCRIPTION

MASTR II transmitters are crystal-controlled phase modulated and designed for one- through eight-frequency operation in the 25 to 50 megahertz band. The solid state transmitter utilizes both integrated circuits (ICs) and discrete components, and consists of the following assemblies:

- Exciter Board; with audio, modulator, amplifier and multiplier stages.
- Power Amplifier Assembly; with amplifier, driver, PA, power control, filter and antenna switch.

CIRCUIT ANALYSIS

EXCITER

The exciter uses nine transistors and two integrated circuits to drive the PA assembly. The exciter can be equipped with up to eight Integrated Circuit Oscillator Modules (ICOMs). The ICOM crystal frequency ranges from approximately 8.33 to 16.67 megahertz, and the crystal frequency is multiplied three times (divided by four

and multiplied by 12 for a multiplication factor of three).

Audio, supply voltages and control functions are connected from the system board to the exciter board through P902.

Centralized metering jack J103 is provided for use with GE Test Set Model 4EX3A11 or Test Kit 4EX8K12. The test set meters the modulator, multiplier and amplifier stages.

ICOMS

Three different types of ICOMs are available for use in the exciter. Each of the ICOMs contains a crystal-controlled Colpitts oscillator, and two of the ICOMs contain compensator ICs. The different ICOMs are:

- 5C-ICOM - contains an oscillator and a 5 part-per-million ($\pm 0.0005\%$) compensator IC. Provides compensation for EC-ICOMs.
- EC-ICOM - contains an oscillator only. Requires external compensation from a 5C-ICOM.
- 2C-ICOM - contains an oscillator and a 2 PPM ($\pm 0.0002\%$) compensator IC. Will not provide compensation for an EC-ICOM.

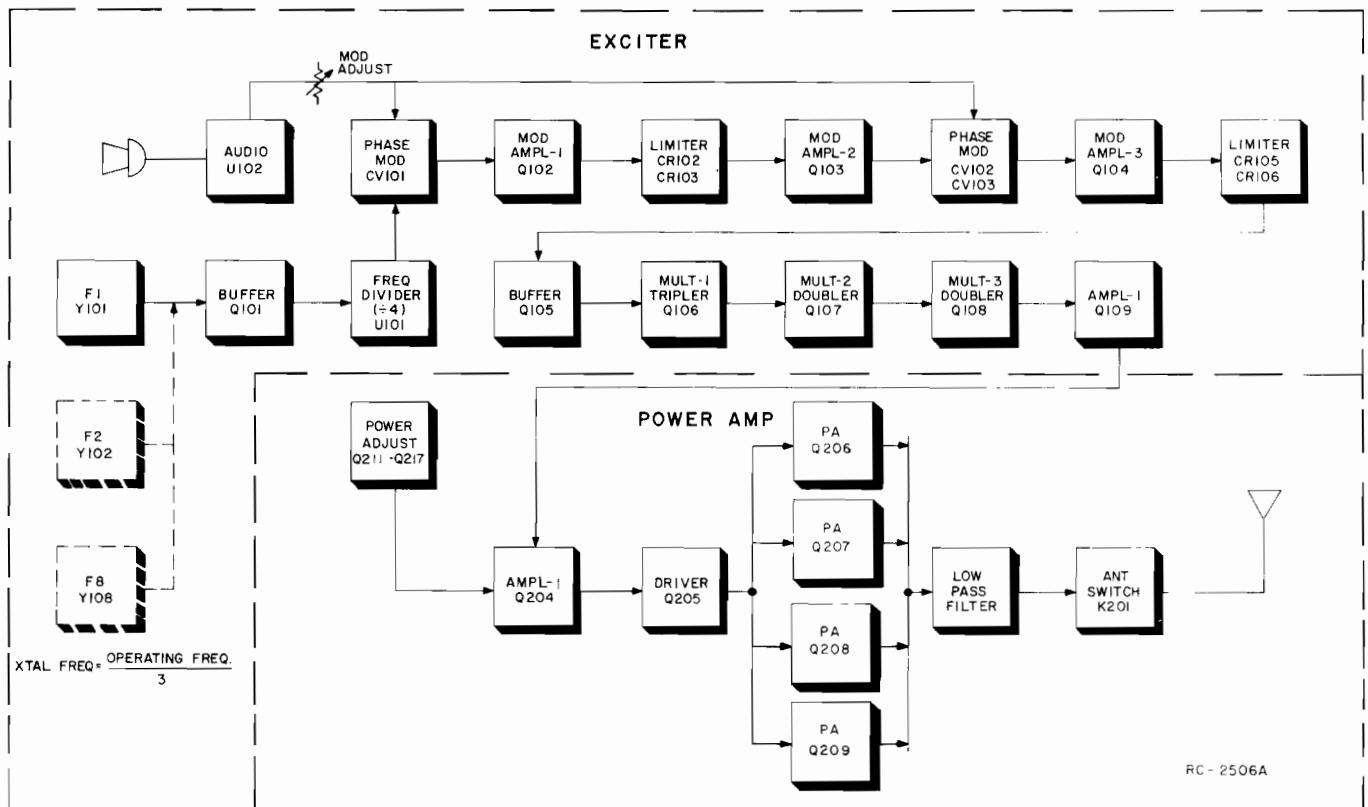


Figure 1 - Transmitter Block Diagram

The ICOMs are enclosed in an RF shielded can with the type ICOM (5C-ICOM, EC-ICOM or 2C-ICOM) printed on the top of the can. Access to the oscillator trimmer is obtained through a hole on the top of the can.

Frequency selection is accomplished by switching the ICOM keying lead (terminal 6) to A- by means of the frequency selector switch on the control unit. In single-frequency radios, a jumper from H9 to H10 in the control unit connects terminal 6 of the ICOM to A-. The oscillator is turned on by applying a keyed +10 Volts to the external oscillator load resistor. RF bypassing is provided for all unused keying loads in eight frequency radios. In two frequency radios the six unused keying leads are shorted to ground.

CAUTION

All ICOMs are individually compensated at the factory and cannot be repaired in the field. Any attempt to repair or change an ICOM frequency will void the warranty.

In standard 5 PPM radios using EC-ICOMs, at least one 5C-ICOM must be used. The 5C-ICOM is normally used in the receiver F1 position, but can be used in any transmit or receive position. One 5C-ICOM can provide compensation for up to 15 EC-ICOMs in the transmit and receiver. Should the 5C-ICOM compensator fail in the open mode, the EC-ICOMs will still maintain 2 PPM frequency stability from 0°C to 55°C (+32°F to 131°F) due to the regulated compensation voltage (5 Volts) from the 10-Volt regulator IC. If desired, up to 16 5C-ICOMs may be used in the radio.

The 2C-ICOMs are self-compensated at 2 PPM and will not provide compensation for EC-ICOMs.

Oscillator Circuit

The quartz crystals used in ICOMs exhibit the traditional "S" curve characteristics of output frequency versus operating temperature.

At both the coldest and hottest temperatures, the frequency increases with increasing temperature. In the middle temperature range (approximately 0°C to +55°C), frequency decreases with increasing temperature.

Since the rate of change is nearly linear over the mid-temperature range, the output frequency change can be compensated by choosing a parallel compensation capacitor with a temperature coefficient approximately equal and opposite that of the crystal.

Figure 2 shows the typical performance of an uncompensated crystal as well as the typical performance of a crystal which has been matched with a properly chosen compensation capacitor.

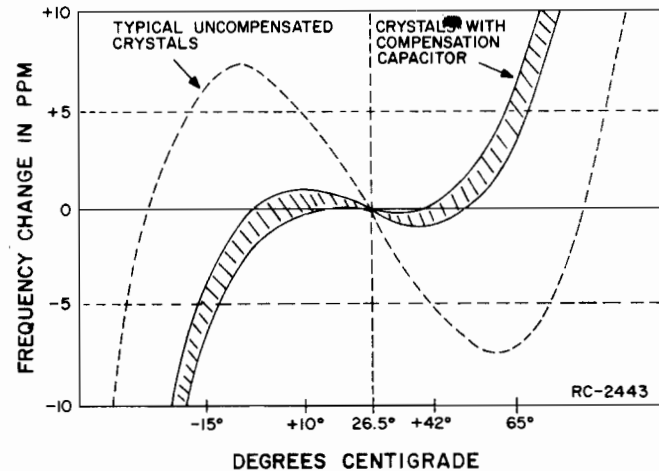


Figure 2 - Typical Crystal Characteristics

At temperatures above and below the mid-range, additional compensation must be introduced. An externally generated compensation voltage is applied to a varactor (voltage-variable capacitor) which is in parallel with the crystal.

A constant bias of 5 Volts (provided from Regulator IC U901 in parallel with the compensator) establishes the varactor capacity at a constant value over the entire mid-temperature range. With no additional compensation, all of the oscillators will provide 2 PPM frequency stability from 0°C to 55°C (+32°F to 131°F).

Compensator Circuits

Both the 5C-ICOMs and 2C-ICOMs are temperature compensated at both ends of the temperature range to provide instant frequency compensation. An equivalent ICOM circuit is shown in Figure 3.

The cold end compensation circuit does not operate at temperatures above 0°C. When the temperature drops below 0°C, the circuit is activated. As the temperature decreases, the equivalent resistance decreases and the compensation voltage increases.

The increase in compensation voltage decreases the capacity of the varactor in the oscillator, increasing the output frequency of the ICOM.

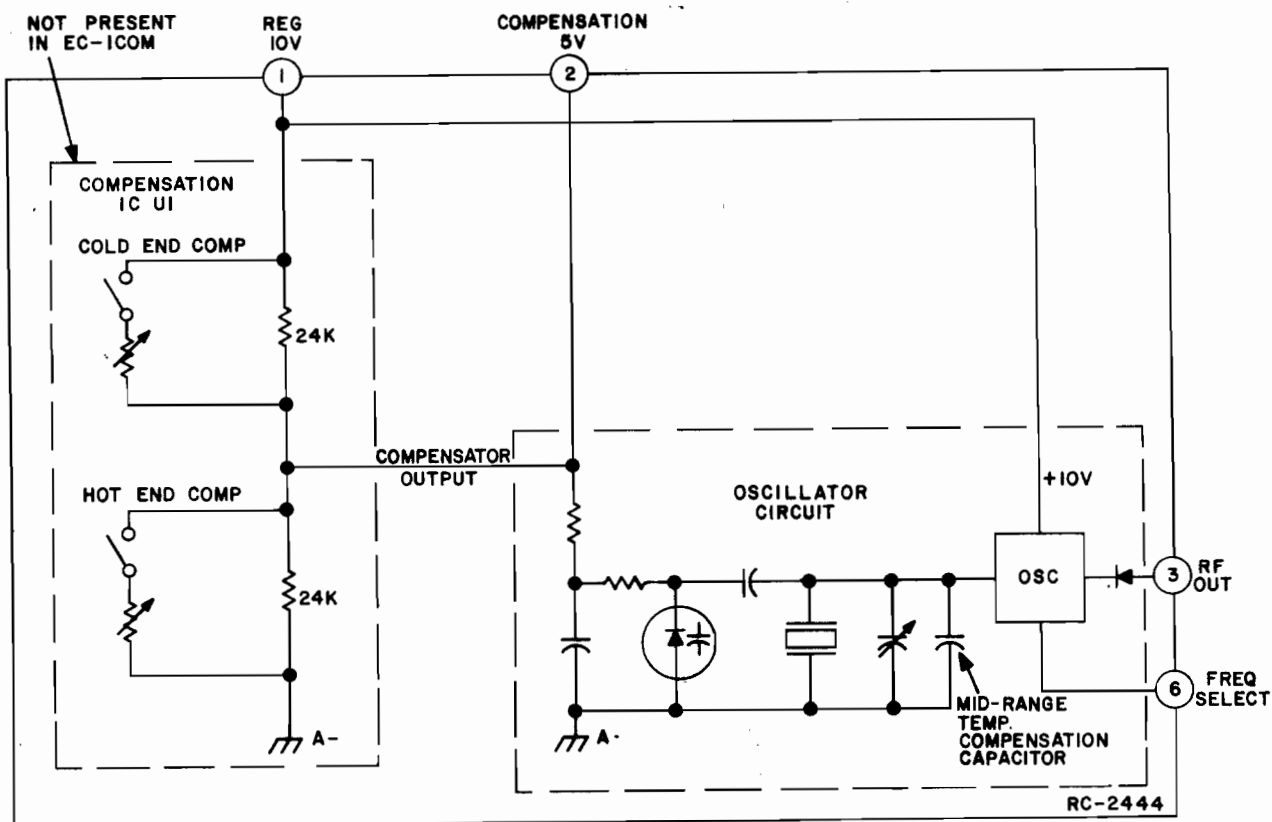


Figure 3 - Equivalent ICOM Circuit

The hot end compensation circuit does not operate at temperatures below +55°C. When the temperature rises above +55°C, the circuit is activated. As the temperature increases, the equivalent resistance decreases and the compensation voltage decreases. The decrease in compensation voltage increases the capacity of the varactor, decreasing the output frequency of the ICOM.

SERVICE NOTE: Proper ICOM operation is dependent on the closely-controlled input voltages from the 10-Volt regulator. Should all of the ICOMs shift off frequency, check the 10-Volt regulator module.

AUDIO IC

The transmitter audio circuitry is contained in audio IC U102. A simplified drawing of the audio IC is shown in Figure 4.

Audio from the microphone at pin 12 is coupled through pre-emphasis capacitor C1 to the base of Q1 in the operational amplifier-limiter circuit. Collector voltage for the transistorized microphone preamplifier is supplied from pin 11 through microphone collector load resistor R18 to pin 12.

The operational amplifier-limiter circuit consists of Q1, Q2 and Q3. Q3 provides limiting at high signal levels. The gain of the operational amplifier circuit is fixed by negative feedback through R19, R20 and the resistance in the network (pin 9).

The output of Q3 is coupled through a de-emphasis network (R10 and C3) to an active post-limiter filter consisting of C4, C5, C6, R11, R12, R13, R15, R17, and Q4.

Following the post-limiter filter is class A amplifier Q5. The output of Q5 is coupled through MOD ADJUST potentiometer R127 to the phase modulators.

SERVICE NOTE: If the DC voltages to the Audio IC are correct and no audio output can be obtained, replace U102.

For radios equipped with Channel Guard, tone from the encoder is applied to the phase modulators through CHANNEL GUARD MOD ADJUST potentiometer R128, and resistors R110, R121 and R124. Instructions for setting R128 are contained in the modulation adjustment section of the Transmitter Alignment Procedure.

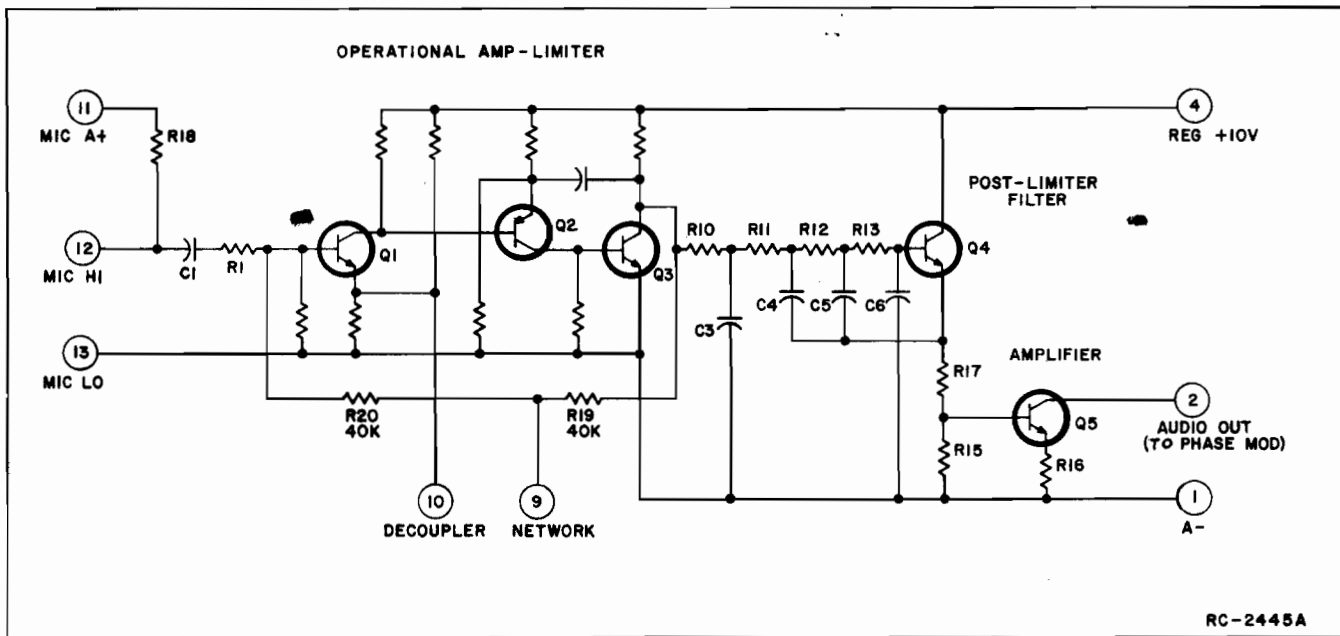


Figure 4 - Simplified Audio IC

FREQUENCY DIVIDER IC

The output at pin 3 of the selected ICOM is coupled through buffer amplifier Q101 to frequency divider U101, which divides the oscillator frequency by 4. The divider consists of two J-K flip-flops connected as a binary counter.

When the transmitter is not keyed (no ICOMs on), Q101 is saturated (turned on) with its collector voltage near zero. Keying the transmitter starts one of the ICOMs, and its output cuts Q101 on and off once each cycle. As Q101 turns off during each cycle, the drop in collector voltage causes the left flip-flop to change state. Assume the flip-flop was in the "0" state (the output at "Q" near A-). The first cycle of the oscillator output causes it to switch to the "1" stage (output at "Q" approximately 5 Volts). The second cycle will cause the flip-flop to switch back to the "0" state. Therefore, it requires two oscillator cycles to switch the left flip-flop through one complete cycle from "0" to "1" and back to "0".

When the left flip-flop switches from "1" to "0", it causes the right flip-flop to change state. It requires two cycles of the left flip-flop to switch the right flip-flop from "0" to "1" and back to "0". Therefore, four cycles of the oscillator output are required for each cycle of output from pin 9 of U101.

If U101 was operating into a pure resistive load, its output would be a square wave. However, the modulator circuit presents a tuned load to the IC, so that harmonics are filtered out and the waveform at the junction of C102 and C103 (modulator input) is essentially a sine wave at one-fourth the oscillator frequency. The output of the frequency divider is coupled through DC blocking capacitor C102 to the first modulator stage.

PHASE MODULATORS, AMPLIFIER & MULTIPLIERS

The first phase modulator is varactor (voltage-variable capacitor) CV101 in series with tunable coil L101. This network appears as a series-resonant circuit to the RF output of the oscillator. An audio signal applied to the modulator circuit through blocking capacitor C115 varies the bias of CV101, resulting in a phase modulated output. A voltage divider network (R108 and R109) provides the proper bias for varactors CV101, CV102 and CV103.

The output of the first modulator is coupled through blocking capacitor C106 to the base of Class A amplifier Q102. The first modulator stage is metered through a metering network consisting of R115, R150, C107 and CR101. Diodes CR102 and CR103 remove any amplitude modulation in the modulator output.

Following Q102 is another Class A Amplifier, Q103. The output of Q103 is applied to the second modulator stage. The second modulator consists of two cascaded modulator circuits consisting of CV102, L102, L103 and CV103. Following the second modulator is a Class A amplifier Q104. The output of the second modulator stage is metered through R133, R145, C117 and CR104, and is applied to the base of buffer Q105. Diodes CR105 and CR106 remove any amplitude modulation in the second modulator output.

Buffer Q105 is saturated when no RF signal is present. Applying an RF signal to Q105 provides a sawtooth waveform at its collector to drive the class C tripler, Q106. The tripler stage is metered through R146. The output of Q106 is coupled through tuned circuits T101, T102 and T103 to the base of doubler Q107. T101, T102 and T103 are tuned to one-fourth of the operating frequency. The doubler stage is metered through R147.

The output of Q107 is coupled through tuned circuits T104 and T105 to the base of second doubler Q108. T104 and T105 are tuned to one-half the operating frequency. Q108 is metered through R148.

The output of Q108 is coupled through three tuned circuits (T106, T107 and T108) to the base of amplifier Q109. The circuits are tuned to the transmitter operating frequency.

Q109 is a class C amplifier with a collector feed network consisting of C139, C141, L104, L108 and R143. The stage is metered through R149. The amplifier collector circuit consists of C142, C143, C146 and L105, and matches the amplifier output to the input of the power amplifier assembly.

POWER AMPLIFIER

The PA assembly uses six RF power transistors and seven transistors in the Power Control circuitry to provide a power output of 100 Watts. The broadband PA has no adjustments other than Power Control potentiometer R261.

Supply voltage for the PA is connected through power leads from the system board to feedthrough capacitors C297 and C298 on the bottom of the PA assembly. C297, C298 and C299, L297 and L298 prevent RF from getting on the Power leads. Diode CR295 will cause the main fuse in the fuse assembly to blow if the polarity of the power leads is reversed.

Centralized metering jack J205 is provided for use with GE Test Set Model 4EX3A11 or Test Kit 4EX8K12. The Test Set meters the Ampl-1 drive (exciter output), Ampl-1 power control, Driver and PA current. L251 through L257 in conjunction with bypass capacitors C4210 through C4216 keep RF off of the metering leads.

RF AMPLIFIERS

The exciter output is coupled through an RF cable to PA input jack J201. RF from the exciter is coupled through DC blocking capacitor C201 to the base of Class C amplifier Q204 through a matching network. The network matches 50-ohm input to the base of Q204, and consists of C205, C206, C207, L201 and L202. R203 and R204 lower the gain of the amplifier stage.

Part of the RF input is rectified by CR201 and used to activate the Power Control circuit. Another portion of the rectified RF is applied to voltage dividers R201 and R202 for metering the Ampl-1 drive at J205.

Collector voltage to Q204 (Ampl-1) is controlled by the Power Control Circuit, and is applied through a collector stabilizing network consisting of L258 and R272 and collector feed network L205 and C213. The collector voltage of Q204 is metered through R271 at J205.

Following Q204 is a matching network (C208 through C212, L204 and L206) to a resistive pad (R207, R208 and R209). The output of the resistor network is applied to the base of the Class C driver (Q205) through a matching network consisting of C218, C219, C220, L207 and L208. Resistors R207 through R215 lower the gain of driver Q205.

Collector voltage to Q205 is coupled through a collector stabilizing network consisting of L259 and R273 and collector feed network L211 and C226. Collector current for Q205 is metered across tapped manganin resistor R249 at J205 (DRIVER CURRENT). The reading is taken on the one-Volt scale with the High Sensitivity button pressed, and read as 10 amperes full scale.

Following Q205 is a matching network (C221 through C225, L210 and L214) that matches the driver output to the input of the first power divider circuit (C230, C231, L214, L215 and L216).

The power amplifier stages consist of four identical paralleled Class C amplifiers (Q206 through Q209). The output of the first power divider circuit is applied to four additional power dividers. C234-L217 and C235-L218 provide drive for Q206 and Q207, while C236-L219 and C237-L220 provide drive for Q208 and Q209.

The output of C234-L217 is applied to the base of Q206 an impedance-matching network (L217, L221, C238, C242 and C243). Resistors R220 through R223, R236 and R237 lower the gain of Q206. Supply voltage for Q206 is coupled through a collector-stabilizing network consisting of L260 and R274 and collector feed network L223 and C270.

Collector current for Q206 through Q209 is metered across tapped manganin resistors R250 and R251 at J205 (PA CURRENT). The

reading is taken on the one-Volt scale with the High Sensitivity button pressed, and read as 30 amperes full scale.

The output of Q206 is coupled through a matching network (C250, C251, L229, C258, C259, C266 and L237), applied to a lumped-constant combiner circuit (C280, L237 and L241), and added to the output of Q207. The outputs of Q206 and Q207 are added to the outputs of Q208 and Q209 through lumped-constant power combiner circuit C284, L249, C294, L250 and C285. The combined PA output is applied to 50-ohm microstrip W205, and then to an M-derived, constant K low-pass filter. The filter output is applied to the antenna through antenna switch K201.

Capacitors C286 through C293, C217, C228 and C233 provide ground isolation for \pm ground operation.

WARNING

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

POWER CONTROL CIRCUIT

When the transmitter is keyed, rectified RF from CR201 is applied to the base of switch Q211, turning it on. Turning on Q211 turns on voltage regulator Q212 which supplies a constant voltage to Power Adjust potentiometer R261.

Q215, Q216 and Q217 operate as an amplifier chain to supply voltage to the collector of Q204 (Ampl-1). The setting of R261 determines the voltage applied to the base of Q215. The higher the voltage at the base of Q215, the harder the amplifiers conduct, supplying more collector voltage to Q204. The lower the voltage at the base of Q215, the less collector voltage is supplied to Q204. Reducing the supply voltage to Q204 reduces the drive to Q205, thereby reducing the power output of the PA. The power output can be adjusted by R261 from approximately 50 to 100 Watts (75 to 100 Watts at 25-30 MHz).

Temperature protection is provided by Q213, Q214, and thermistor RT201 which is mounted in the PA heatsink. Under normal operating conditions, the circuit is inactive (Q213 is on and Q214 is off). When the heatsink temperature reaches approximately 100°C, the resistance of RT201 decreases. This increases the base voltage applied to Q213, turning it off. Turning off Q213 allows Q214 to turn on, decreasing the voltage at Power Adjust potentiometer R261. This reduces the base voltage to Q215 which causes Q216 and Q217 to conduct

less, reducing the collector voltage to Q204 (Ampl-1). This reduces the transmitter output power, keeping the heatsink at a maximum of approximately 100°C. When the heatsink temperature decreases below 100°C, the temperature control circuit turns off, allowing the normal transmitter power output.

CARRIER CONTROL TIMER

The Carrier Control Timer option shuts off the transmitter on each transmission after a one-minute timing cycle, and alerts the operator that the transmitter is off by means of an alarm tone in the speaker. The transmitter can be turned on again by releasing and keying the push-to-talk switch on the microphone.

The timing cycle (transmitter keyed time) is normally set at the factory for a duration of one minute. A potentiometer permits the timing cycle to be adjusted from approximately 15 seconds to 3 minutes.

MAINTENANCE

DISASSEMBLY

To service the transmitter from the top:

1. Pull the locking handle down, then pry up the top cover at the front notch and lift off the cover.

To service the transmitter from the bottom:

1. Pull the locking handle down and pull the radio out of the mounting frame.
2. Remove the top cover, then loosen the two bottom cover retaining screws and remove the bottom cover (see Figure 5).
3. To gain access to the bottom of the exciter board, remove the six screws (A) holding the exciter board and its bottom cover to the module mounting frame, and remove the bottom cover.

To remove the exciter board from the radio:

1. Unplug the exciter/PA cable (B) .
2. Remove the six screws (A) holding the exciter board and its bottom cover to the module mounting frame (see Figure 6).
3. Press straight down on the plug-in exciter from the top to avoid bending the pins when unplugging the board from the system board jack.

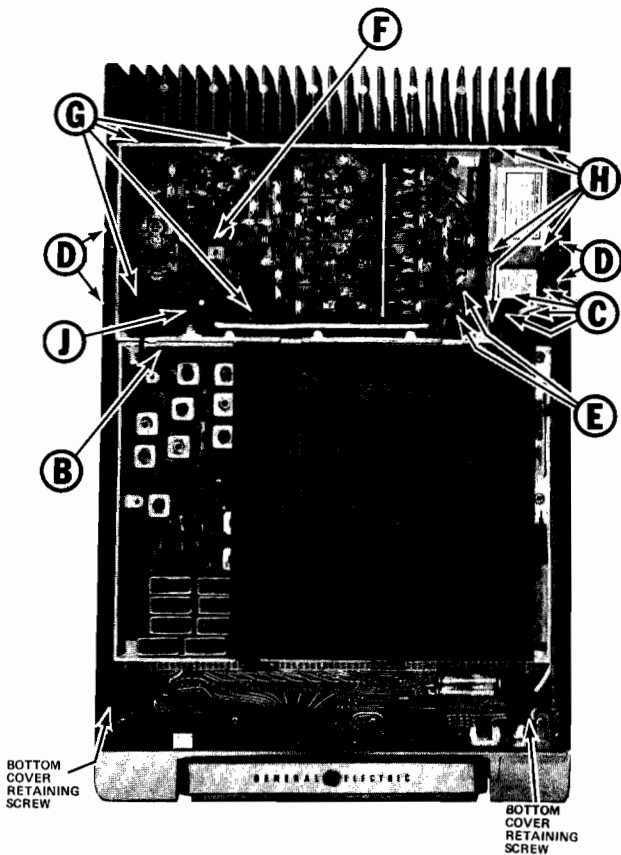


Figure 5 - Disassembly Procedure-Top View

To remove the PA assembly:

1. Remove the PA top cover and unplug the exciter/PA cable (B), the antenna, receiver and PTT cables (C).
2. Remove the four side-rail screws (D), and unsolder the power cables from the bottom of the PA assembly if desired.

To remove the PA board:

1. Remove the PA top cover and unplug the exciter/PA cable (B).
2. Unsolder the two feedthrough coils (E) and the thermistor leads (F).
3. Remove the PA transistor hold-down nuts and spring washers on the bottom of the PA assembly.
4. Remove the four PA board mounting screws (G), the five screws in the filter casting (H), and the retaining screw in Q210 (J), and lift the board out.

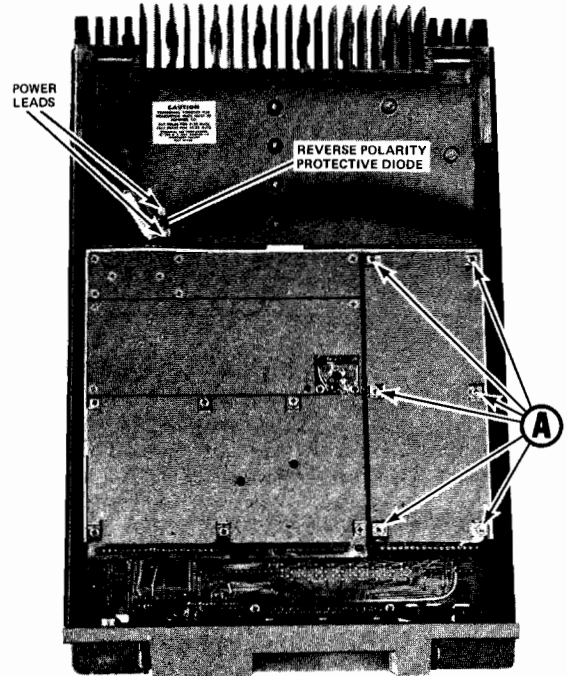


Figure 6 - Disassembly Procedure-Bottom View

PA TRANSISTOR REPLACEMENT

WARNING

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

To replace the PA RF transistors:

1. Unsolder one lead at a time with a 50-Watt soldering iron. Use a scribe to hold the lead away from the printed circuit board until the solder cools.
2. Turn the transmitter over.
3. Hold the body of the transistor to prevent it from turning. Remove the transistor hold-down nut and spring washer through the hole in the heatsink with an 11/32-inch nut-driver. Lift out the transistor, and remove the old solder from the printed circuit board with a de-soldering tool such as a SOLDA PULLT®. Special care should be taken to prevent damage to the printed circuit board runs.

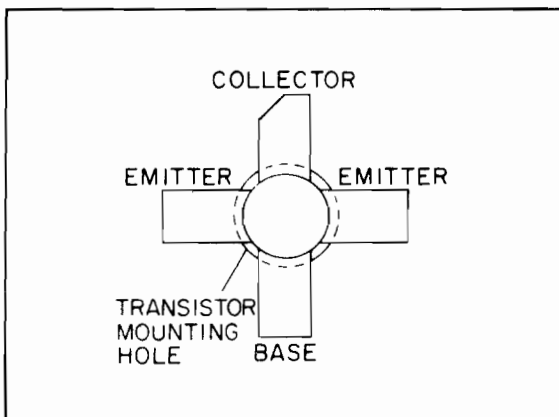


Figure 7 - Lead Identification

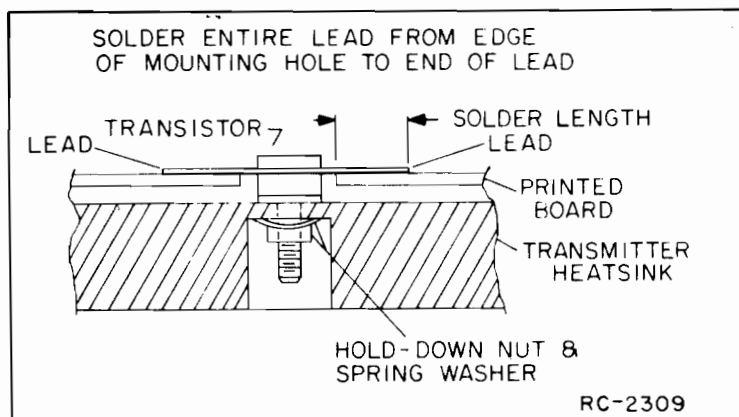


Figure 8 - Lead Forming

4. Trim the new transistor leads (if required) to the lead length of the removed transistor. Cut the collector lead at a 45° angle for future identification (see Figure 7). The letter "C" on the top of the transistor indicates the collector.
5. Apply a coating of silicon grease around the transistor mounting surface, and place the transistor in the mounting hole. Align the leads as shown in the Outline Diagram. Then hold the body of the transistor and replace the holding-down nut and spring-washer using moderate torque (8 inch-pounds). A torque wrench must be used for this adjustment since transistor damage can result if too little or too much torque is used.
6. Make sure that the transistor leads are formed as shown in Figure 8 so that the leads can be soldered to the printed circuit pattern, starting from the inner edge of the mounting hole.
7. Solder the leads to the printed circuit pattern. Start at the inner edge of mounting hole and solder the remaining length of transistor lead to the board. Use care not to use excessive heat that causes the printed wire board runs to lift up from the board. Check for shorts and solder bridges before applying power.

CAUTION

Failure to solder the transistor leads as directed may result in the generation of RF loops that could damage the transistor or may cause low power output.

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

GENERAL  **ELECTRIC**

MODULATION LEVEL ADJUSTMENT

The MOD ADJUST (R127) was adjusted to the proper setting before shipment and should not normally require readjustment. This setting permits approximately 75% modulation for the average voice level. The audio peaks which would cause overmodulation are clipped by the modulation limiter. The limiter, in conjunction with the de-emphasis network, instantaneously limits the slope of the audio wave to the modulator, thereby preventing over-modulation while preserving intelligibility.

TEST EQUIPMENT

1. An audio oscillator (GE Model 4EX6A10)
2. A frequency modulation monitor
3. An output meter or a VTVM
4. GE Test Set Models 4EX3A11 or 4EX8K12

PROCEDURE

1. Connect the audio oscillator and the meter across audio input terminals J10 (Green-Hi) and J11 (Black-Lo) on GE Test Set, or across P902-6 (Mike High) through a 0.5 microfarad (or larger) DC blocking capacitor, and P902-5 (Mike-Low) on the System Board.
2. Adjust the audio oscillator for 1-Volt RMS at 1000 Hz.
3. For transmitters without Channel Guard, set MOD ADJUST R127 for a 4.5-kilo-hertz swing with the deviation polarity which gives the highest reading as indicated on the frequency modulation monitor.
4. For transmitters with Channel Guard, set Channel Guard MOD ADJUST R128 for zero tone deviation. Next, with the 1-Volt signal at 1000 Hz applied, set MOD ADJUST R127 for a 3.75 kHz deviation. Then remove the signal from the audio oscillator and set Channel Guard MOD ADJUST R128 for 0.75 kHz tone deviation.
5. For multi-frequency transmitters, set the deviation as described in Steps 3 or 4 on the channel producing the largest amount of deviation.

PA POWER INPUT

For FCC purposes, the PA power input can be determined by measuring the PA supply voltage and PA current, and using the following formula:

$$P_i = \text{PA voltage} \times \text{PA current}$$

where:

P_i is the power input in Watts,

PA voltage is measured with Test Set Model 4EX3A11 in Position G on the 15-Volt range (read as 15 Volts full scale), and with the polarity switch in the (-) position. With Test Set Model 4EX8K12, use the B+ position and the 1-Volt range (read as 15 Volts full scale), with the HIGH SENSITIVITY button pressed and the polarity switch in the (-) position.

PA current is measured with the Test Set in Position G in the Test 1 position, and with the HIGH SENSITIVITY button pressed (30 amperes full scale).

Example:

$$P_i = 12.4 \text{ Volts} \times 8.5 \text{ amperes} = 105.4 \text{ Watts}$$

ICOM FREQUENCY ADJUSTMENT

First, check the frequency to determine if any adjustment is required. The frequency should be set with a frequency meter or counter with an absolute accuracy that is 5 to 10 times better than the tolerance to be maintained, and with the entire radio as near as possible to an ambient temperature of 26.5°C (79.8°F).

MASTR II ICOMs should be reset only when the frequency shows deviations in excess of the following limits:

- A. ±0.5 PPM, when the radio is at 26.5°C (79.8°F).
- B. ±2 PPM at any other temperature within the range of -5°C to +55°C (+23°F to +131°F).
- C. The specification limit (±2 PPM or ±5 PPM) at any temperature within the ranges of -40°C to -5°C (-40°F to +23°F) or +55°C to +70°C (+131°F to +158°F).

If an adjustment is required, pry up the cover on the top of the ICOM to expose the trimmer, and use one of the following procedures:

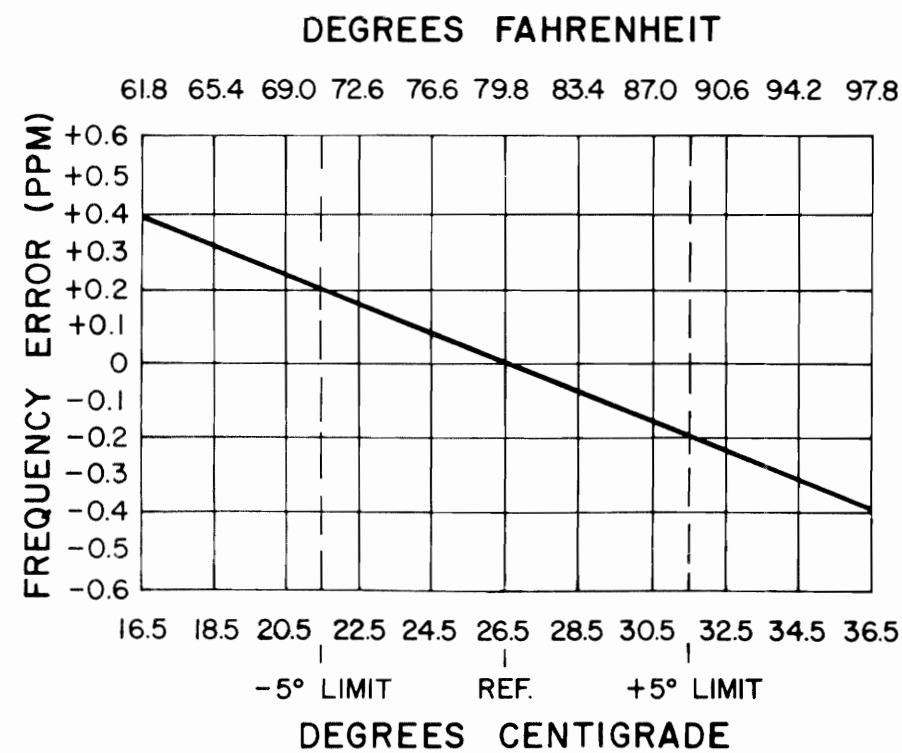
If the radio is at an ambient temperature of 26.5°C (79.8°F), set the oscillator for the correct operating frequency.

If the radio is not at an ambient temperature of 26.5°C, setting errors can be minimized as follows:

- A. To hold setting error to ±0.6 PPM (which is considered reasonable for 5 PPM ICOMs):
 1. Maintain the radio at 26.5°C (±5°C) and set the oscillator to desired frequency, or-
 2. Maintain the radio at 26.5°C (±10°C) and offset the oscillator, as a function of actual temperature, by the amount shown in Figure 9.
- B. To hold setting error to ±0.35 PPM (which is considered reasonable for 2 PPM ICOMs): Maintain unit at 26.5°C (±5°C) and offset the oscillator, as a function of actual temperature, by the amount shown in Figure 9.

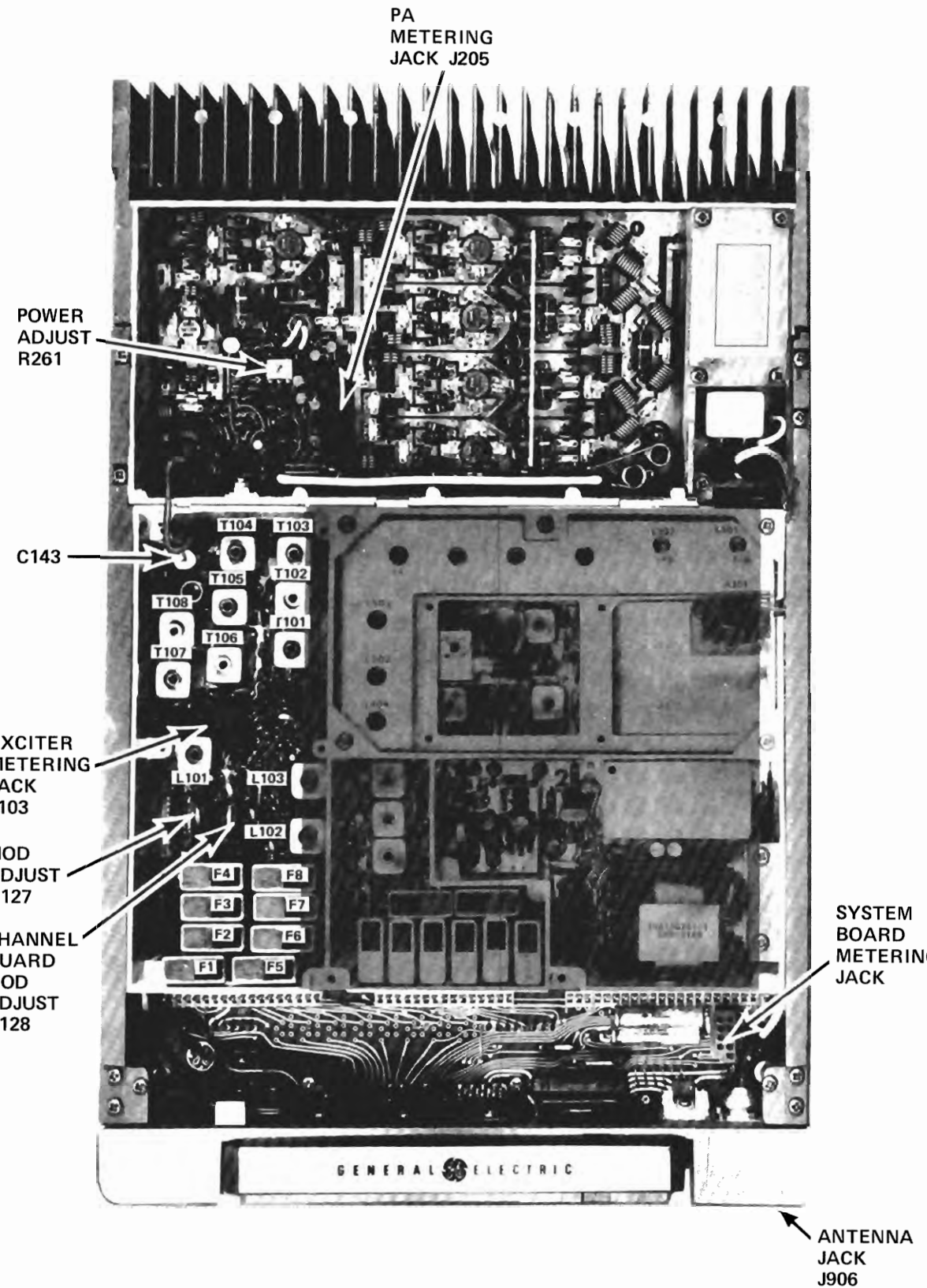
For example: Assume the ambient temperature of the radio is 18.5°C (65.4°F). At that temperature, the curve shows a correction factor of 0.3 PPM. (At 25 MHz, 1 PPM is 25 Hz. At 50 MHz, 1 PPM is 50 Hz).

With an operating frequency of 50 MHz, set the oscillator for a reading of 15 Hz (0.3 x 50 Hz) higher than the licensed operating frequency. If a negative correction factor is obtained (at temperatures above 26.5°C), set the oscillator for the indicated PPM lower than the licensed operating frequency.



RC-2453

Figure 9 - Frequency Characteristics Vs. Temperature



TRANSMITTER ALIGNMENT

EQUIPMENT REQUIRED

1. GE Test Set Model 4EX3A11 or Test Kit 4EX8K12.
2. A 50-ohm wattmeter connected to antenna jack J906.
3. A frequency counter.

PRELIMINARY CHECKS AND ADJUSTMENTS

1. Place ICOMs on Exciter Board (crystal frequency = operating frequency ÷ 3).
2. For a large change in frequency or a badly mis-aligned transmitter, pre-set the slugs in T101 through T108, and L101, L102 and L103 to the bottom of the coil form.

The tuning frequency for multi-frequency transmitters is determined by the operating frequency and the frequency spread between transmitters. Refer to the table below for maximum frequency spread.

3. For multi-frequency transmitters with a frequency spread less than that specified in column (1), tune the transmitters to the lowest frequency.

For frequency spread exceeding the limits specified in column (1), tune the transmitters using a center frequency tune up ICOM. Except the maximum frequency spread can be extended to the limits specified in column (3) with 1 dB degradation.

For tuning L101, L102, L103, Always tune L101, L102, L103 on the lowest frequency.

Multi-frequency Transmitter Tuning

Transmitter Frequency Range	MAXIMUM FREQUENCY SPREAD		
	(1) without center tuning	with center tuning	with center tuning (1dB degradation)
25 - 30 MHz	.080 MHz	.160 MHz	.320 MHz
30 - 36 MHz	.100 MHz	.200 MHz	.400 MHz
36 - 42 MHz	.120 MHz	.240 MHz	.470 MHz
42 - 50 MHz	.140 MHz	.280 MHz	.540 MHz

4. Connect the red plug on the GE Test Set to the System Board metering jack, and the black plug to the Exciter metering jack. Set the polarity to +, and set the range to the Test 1 position (1-Volt position for 4EX8K12) for all adjustments. NOTE: With the Test Set connected to the PA metering jack, the voltage reading at position "F" with the HIGH SENSITIVITY button pressed may be converted to driver collector current by reading the current as 10 amperes full scale. The voltage reading at position "G" with the HIGH SENSITIVITY button pressed may be converted to PA collector current by reading the current as 30 amperes full scale.
5. All adjustments are made with the transmitter keyed. Unkey the transmitter between steps to avoid unnecessary heating.

STEP	METER POSITION	TUNING CONTROL	METER READING	PROCEDURE
1.	A MOD-1	L101	Maximum	Tune L101 for maximum meter reading.
2.	B	L102 & L103	Maximum	Tune L102 and then L103 for the maximum meter reading.
3.	C MULT-1	T101 & T102	See Procedure	Tune L101 for a dip in meter reading, and then tune T102 for maximum meter reading.
4.	D MULT-2	T103, T102, T101 & T104	See Procedure	Tune T103 for maximum meter reading and re-adjust T102 and T101 for maximum meter reading. Then tune T104 for a dip in meter reading.
5.	F MULT-3	T105, T104, T106 & T107	See Procedure	Tune T105 for maximum meter reading and re-adjust T104 for maximum meter reading. Then tune T106 for a dip in meter reading and T107 for maximum meter reading.
6.	G AMPL-1	T108, T107 & T106	See Procedure	Tune T108 for maximum meter reading, and then re-adjust T107 and T106 for maximum meter reading.
7.	D AMPL-1 (on PA)	C143, C156	Maximum	Move the black metering plug to the Power Amplifier metering jack and tune C143 and C156 for maximum meter reading.
8.		R261		With the battery voltage at 13.4 Volts or the PA collector voltage at 12.4 Volts, set Power Adjust potentiometer R261 on the PA board for the desired power output (from 50 to 100 Watts at 30-50 MHz, or from 75 to 100 Watts at 25-30 MHz). If the battery voltage is not at 13.4 Volts or the collector voltage at 12.4 Volts and full rated output is desired (50 to 100 Watts at 30-50 MHz, or from 75 to 100 Watts at 25-30 MHz), set R261 for the output power according to the battery voltage or collector voltage shown in Figure 10. NOTE The PA collector voltage is measured as described in the PA POWER INPUT section.

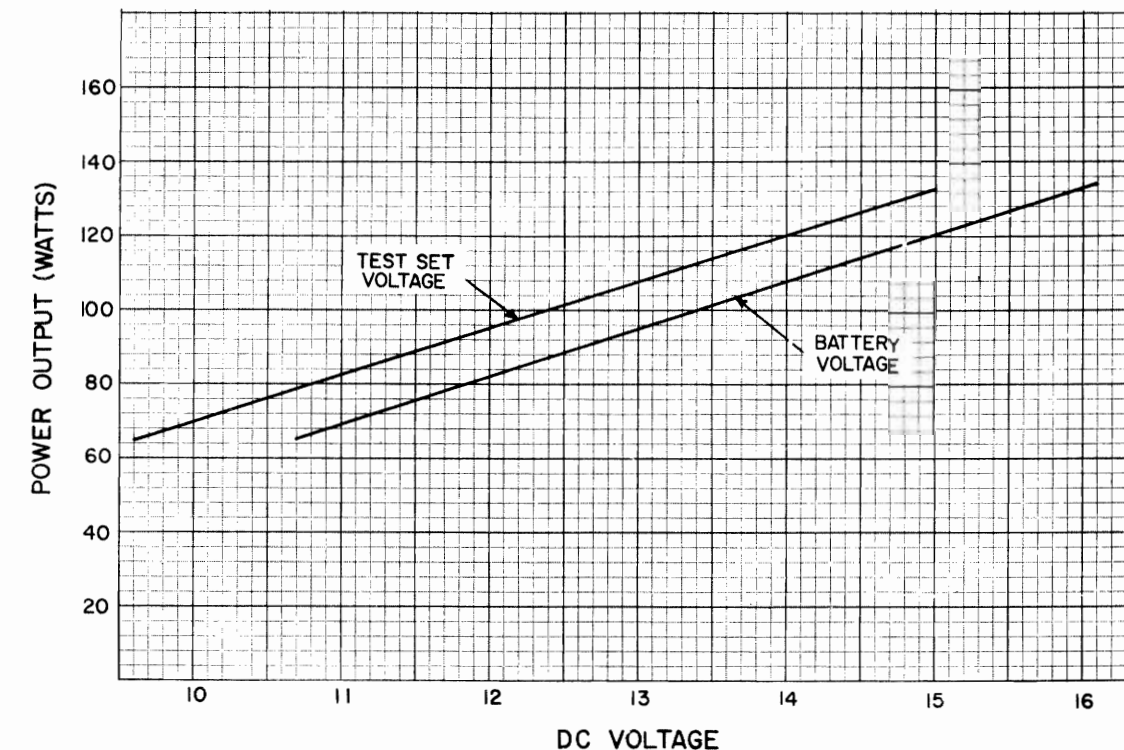


Figure 10 - Power Output Setting Chart

ALIGNMENT PROCEDURE

25-50 MHz, 100-WATT TRANSMITTER

TEST PROCEDURES

These Test Procedures are designed to assist you in servicing a transmitter that is operating-- but not properly. Problems encountered could be low power output, tone and voice deviation, defective audio sensitivity, and modulator adjust control set too high. Once a defect is pin-pointed,

refer to the "Service Check" and the additional corrective measures included in the Transmitter Troubleshooting Procedure. Before starting with the Transmitter Test Procedures, be sure the transmitter is tuned and aligned to the proper operating frequency.

CAUTION

Before bench testing the MASTR II Mobile Radio, be sure of the output voltage characteristics of your bench power supply.

To protect the transmitter power output transistors from possible instant destruction, the following input voltages must not be exceeded:

Transmitter unkeyed: 20 Volts
 Transmitter keyed (50 ohm resistive load): 18 Volts
 Transmitter keyed (no load or non-resistive load): 15.5 Volts

These voltages are specified at the normal vehicle battery terminals of the radio and take the voltage drop of standard cables into account. The voltage limit shown for a non-optimum load is for "worst case" conditions. For antenna mismatches likely to be encountered in practice, the actual limit will approach the 18 Volt figure.

Routine transmitter tests should be performed at EIA Standard Test Voltages (13.6 VDC for loads of 6 to 16 amperes; 13.4 VDC for loads of 16 to 36 amperes). Input voltages must not exceed the limits shown, even for transient peaks of short duration.

Many commonly used bench power supplies cannot meet these requirements for load regulation and transient voltage suppression. Bench supplies which employ "brute force" regulation and filtering (such as Lapp Model 73) may be usable when operated in parallel with a 12-Volt automotive storage battery.

TEST EQUIPMENT REQUIRED

for test hookup as shown:

- | | | |
|---|---|--|
| 1. Wattmeter similar to:
Bird # 43
Jones # 711N | 2. VTVM similar to:
Triplet # 850
Heath # IM-21 | 3. Audio Generator similar to:
GE Model 4EX6A10 |
| 4. Deviation Meter (with a .75 kHz scale) similar to:
Measurements # 720 | 5. Multimeter similar to:
GE TEST SET MODEL 4EX3A11,
MODEL 4EX8K12 or
20,000 ohms-per-Volt voltmeter | |

POWER MEASUREMENT

TEST PROCEDURE

1. Connect transmitter output from the antenna jack to the wattmeter through a 50-ohm coaxial cable. Make sure the wattmeter is terminated into a 50-ohm load.
2. Key the transmitter and check the wattmeter for the desired power output.

SERVICE CHECK

Check the setting of the Power Adjust Control (R261).

Refer to the QUICK CHECKS on the Transmitter Troubleshooting Procedure.

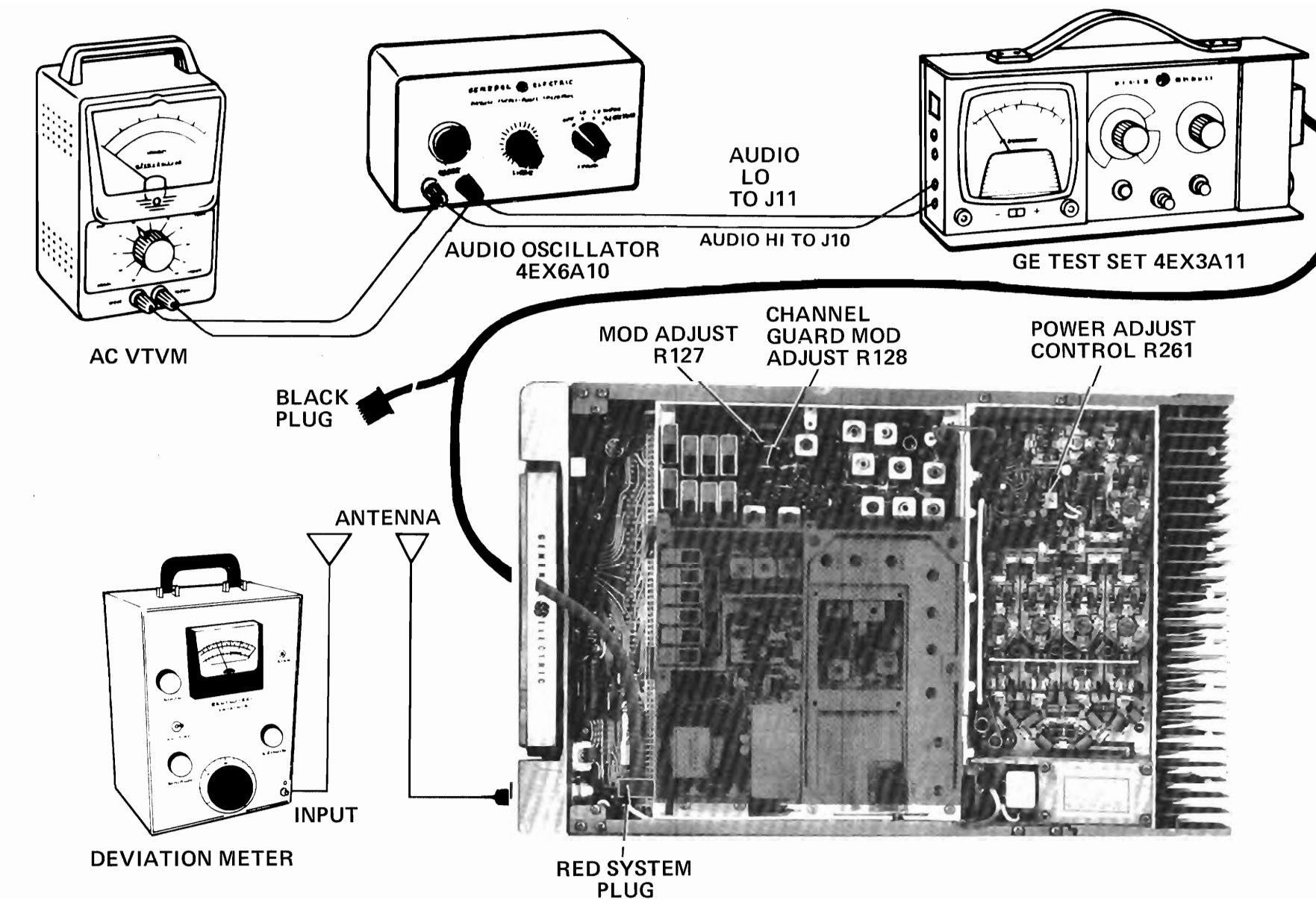
VOICE DEVIATION, SYMMETRY AND AUDIO SENSITIVITY

TEST PROCEDURE

1. Connect the test equipment to the transmitter as shown.
2. In radios with Channel Guard, set Channel Guard Mod Adjust R128 for zero tone deviation.
3. Set the Audio generator output to 1.0 VOLTS RMS and frequency to 1 kHz.
4. Key the transmitter and adjust Deviation Meter to carrier frequency.
5. Deviation reading should be ± 4.5 kHz in radios without Channel Guard, and ± 3.75 kHz in radios with Channel Guard.
6. If necessary, adjust MOD ADJUST control R127 for the proper deviation on plus (+) or minus (-) deviation, whichever is greater.

NOTES: -- MASTR II transmitters are adjusted for 4.5 kHz deviation at the factory. The factory adjustment will prevent the transmitter from deviating more than 5.0 kHz under the worst conditions of frequency, voltage and temperature.

7. If the deviation reading plus (+) or minus (-) differs by more than 0.5 kHz, recheck Steps 1 and 2 as shown in the Transmitter Alignment Chart.
8. Check Audio Sensitivity by reducing generator output until deviation falls to 3.0 kHz for radios without Channel Guard, or 2.25 kHz for radios with Channel Guard. Voltage should be LESS than 120 millivolts. If not, refer to the Transmitter Troubleshooting Procedure.



TEST PROCEDURE

TEST PROCEDURE

1. Set up the Deviation Meter and monitor the output of the transmitter.
2. Remove the 1000 Hz signal from the audio generator.
3. Key the transmitter and check for 0.75 kHz deviation. If the reading is low or high, adjust Channel Guard MOD ADJUST R128 for a reading of 0.75 kHz.

NOTES:

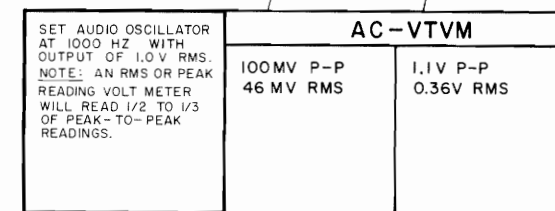
1. On units supplied with Channel Guard, the Phase Modulator Tuning should be adjusted carefully to insure proper performance. (Refer to Steps 1 and 2 in the Transmitter Alignment Chart).
2. The Tone Deviation Test Procedures should be repeated every time the Tone Frequency is changed.

STEP I - QUICK CHECKS

METER POSITION	PROBABLE DEFECTIVE STAGE		
	TEST SET	HIGH METER READING	LOW METER READING
EXCITER			
A (MOD-1)	Q102, 10-Volt regulator	Q102, CV101, L101, 10-Volt regulator	ICOM, Q101, U101, L101, Q102, CR101, 10-Volt regulator or Channel Selector switch ground.
B (MOD-2)	Q104, 10-Volt regulator	Q103, L102, L103, CV102, CV103, Q104	Q103, L102, CV102, L103, CV103, CR104, Q104
C (MULT-1)	Q105, Q106, T101	Q105, Q106	Q105, Q106, T101
D (MULT-2)	Q107, T104	T101, T102, T103, Q107	T101, T102, T103, Q107, T104
F (MULT-3)	Q108, T106	T104, T105, Q108	T104, T105, Q108, T106
G (AMPL-1)	Q109, C146, R144	T106, T107, T108, Q109, L108	T106, T107, T108, Q109, L104, L107
POWER AMPLIFIER			
"D" (AMPL-1 DRIVE)		Low Output from Exciter	No output from Exciter, CR201
"C" (AMPL-1 CONTROL VOLTAGE)	Q217	Q217	No Exciter output, Q217, Q211, CR201
"F" (DRIVER CURRENT)	Q205	Q205, Low Output from Q204	Q205, Q204, Check Pos. D & C
"G" (PA CURRENT)	Q206, Q207, Q208, Q209	Q204, Q205, Q206-Q209	Q204, Q205, Q206-Q209 ANTENNA SWITCH K201

STEP 3 CHECK AUDIO AC VOLTAGES

- EQUIPMENT REQUIRED
- AUDIO OSCILLATOR
 - AC VTVM

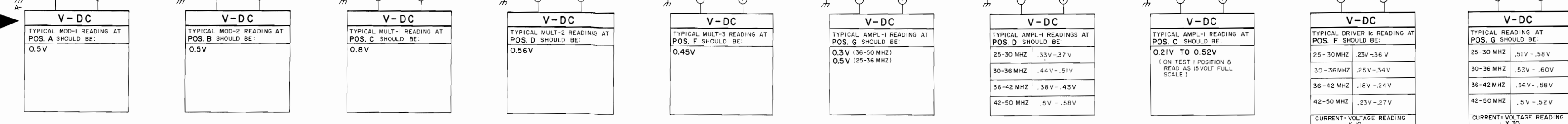


SCOPE SETTING	HORIZONTAL	VERTICAL
0.5 MS/DIV	0.5 MS/DIV	50 MV/DIV
0.5 MS/DIV	0.5 MS/DIV	0.5 VOLT/DIV

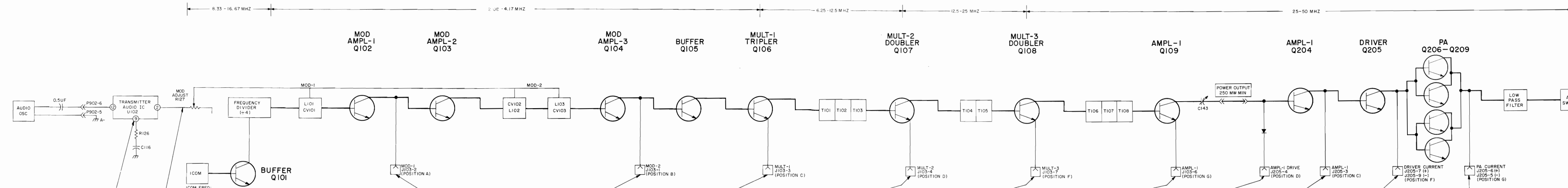
SET AUDIO OSCILLATOR AT 1000 HZ WITH OUTPUT OF 1.0 V. RMS.

STEP 2 CHECK TYPICAL DC VOLTAGES

- EQUIPMENT REQUIRED
- G.E. TEST MODEL 4EX3A11 OR
 - 20,000 OHM-PER-VOLT METER
- NOTE: ALL DC READINGS TAKEN WITH THE TRANSMITTER KEYS.



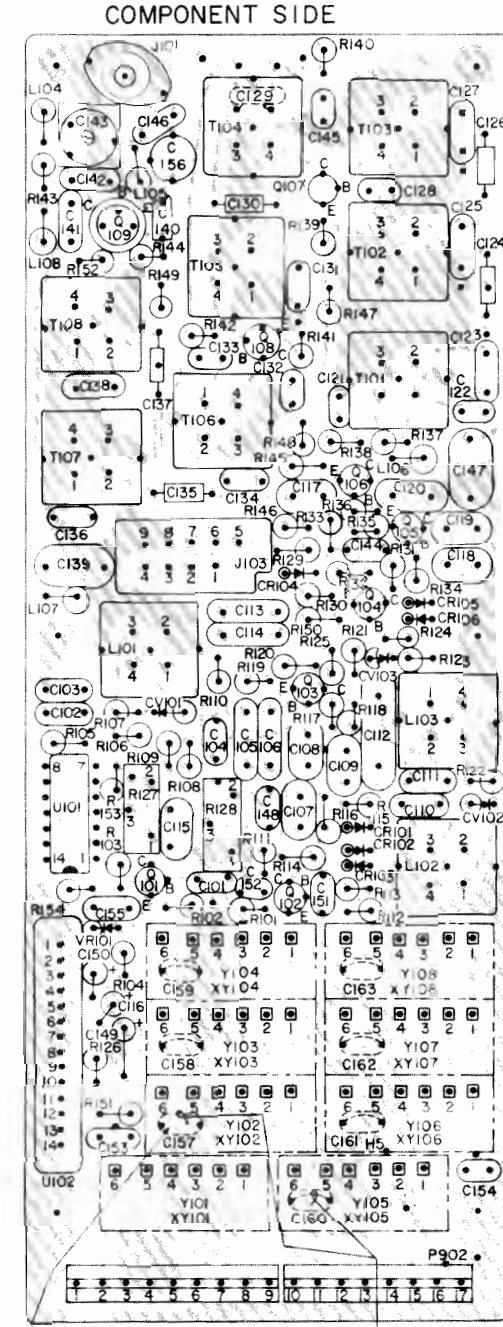
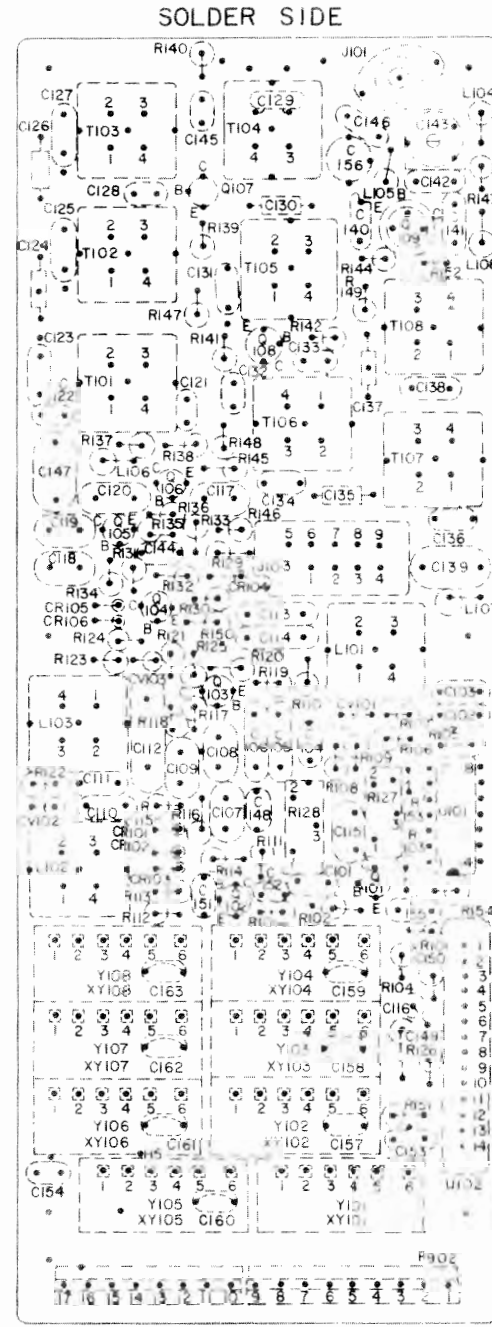
MEASUREMENT POINT	TYPICAL READING
MOD-1 (POSITION A)	0.5V
MOD-2 (POSITION B)	0.5V
MULT-1 (POSITION C)	0.8V
MULT-2 (POSITION D)	0.56V
MULT-3 (POSITION E)	0.45V
AMPL-1 (POSITION F)	0.3V (36-50 MHz) 0.5V (25-36 MHz)
AMPL-1 DRIVE (POSITION G)	0.21V TO 0.52V (ON TEST POSITION B READ AS 15 VOLT FULL SCALE)
DRIVER CURRENT (POSITION H)	25-30 MHz .23V-.36V 30-36 MHz .25V-.34V 36-42 MHz .18V-.24V 42-50 MHz .23V-.27V
PA CURRENT (POSITION I)	25-30 MHz .51V-.58V 30-36 MHz .53V-.60V 36-42 MHz .56V-.58V 42-50 MHz .5V-.52V



TROUBLESHOOTING PROCEDURE

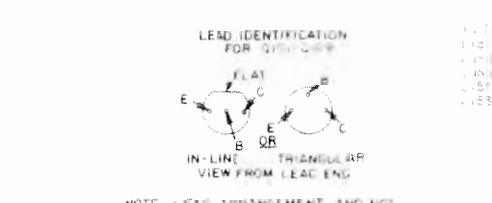
25-50 MHz, 100-WATT TRANSMITTER

EXCITER BOARD



(19D423167, Sh. 2, Rev. 1)
(19D423167, Sh. 3, Rev. 1)

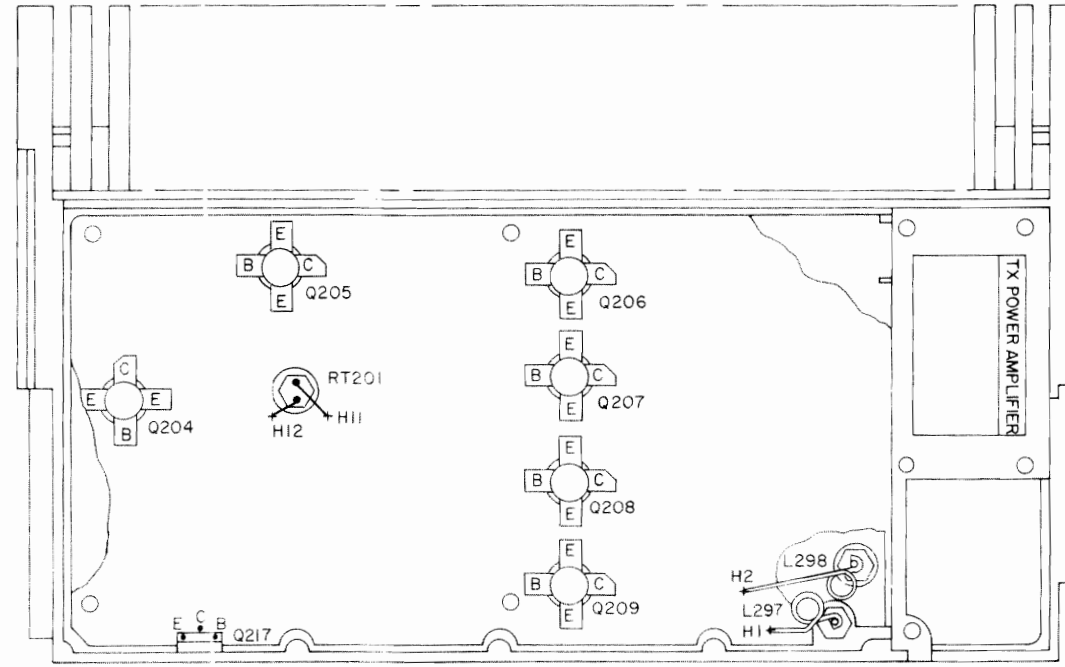
(19D423167, Sh. 2, Rev. 1)



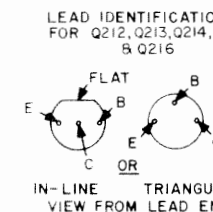
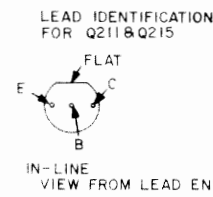
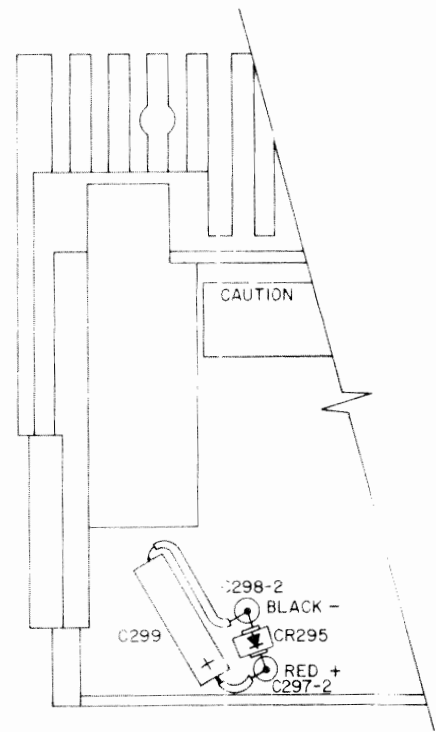
1. TRIMMER POTENTIOMETERS (GROUPS 5-B) CAPACITORS (10-15) ARE SHIPPED OUT AS REQUIRED TO MEET THE OPERATIONAL REQUIREMENTS FOR PROGRAMS. EXCEPT FOR TRIMMER POTENTIOMETERS FOR F-1, F-2, F-3, F-4, F-5, F-6, F-7, F-8, F-9, F-10, F-11, F-12, F-13, F-14, F-15, F-16, F-17, F-18, F-19, F-20, F-21, F-22, F-23, F-24, F-25, F-26, F-27, F-28, F-29, F-30, F-31, F-32, F-33, F-34, F-35, F-36, F-37, F-38, F-39, F-40, F-41, F-42, F-43, F-44, F-45, F-46, F-47, F-48, F-49, F-50, F-51, F-52, F-53, F-54, F-55, F-56, F-57, F-58, F-59, F-60, F-61, F-62, F-63, F-64, F-65, F-66, F-67, F-68, F-69, F-70, F-71, F-72, F-73, F-74, F-75, F-76, F-77, F-78, F-79, F-80, F-81, F-82, F-83, F-84, F-85, F-86, F-87, F-88, F-89, F-90, F-91, F-92, F-93, F-94, F-95, F-96, F-97, F-98, F-99, F-100, F-101, F-102, F-103, F-104, F-105, F-106, F-107, F-108, F-109, F-110, F-111, F-112, F-113, F-114, F-115, F-116, F-117, F-118, F-119, F-120, F-121, F-122, F-123, F-124, F-125, F-126, F-127, F-128, F-129, F-130, F-131, F-132, F-133, F-134, F-135, F-136, F-137, F-138, F-139, F-140, F-141, F-142, F-143, F-144, F-145, F-146, F-147, F-148, F-149, F-150, F-151, F-152, F-153, 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F-869, F-870, F-871, F-872, F-873, F-874, F-875, F-876, F-877, F-878, F-879, F-880, F-881, F-882, F-883, F-884, F-885, F-886, F-887, F-888, F-889, F-890, F-891, F-892, F-893, F-894, F-895, F-896, F-897, F-898, F-899, F-900, F-901, F-902, F-903, F-904, F-905, F-906, F-907, F-908, F-909, F-910, F-911, F-912, F-913, F-914, F-915, F-916, F-917, F-918, F-919, F-920, F-921, F-922, F-923, F-924, F-925, F-926, F-927, F-928, F-929, F-930, F-931, F-932, F-933, F-934, F-935, F-936, F-937, F-938, F-939, F-940, F-941, F-942, F-943, F-944, F-945, F-946, F-947, F-948, F-949, F-950, F-951, F-952, F-953, F-954, F-955, F-956, F-957, F-958, F-959, F-960, F-961, F-962, F-963, F-964, F-965, F-966, F-967, F-968, F-969, F-970, F-971, F-972, F-973, F-974, F-975, F-976, F-977, F-978, F-979, F-980, F-981, F-982, F-983, F-984, F-985, F-986, F-987, F-988, F-989, F-990, F-991, F-992, F-993, F-994, F-995, F-996, F-997, F-998, F-999, F-1000.

(19D423167, Rev. 2)

PA ASSEMBLY TOP VIEW



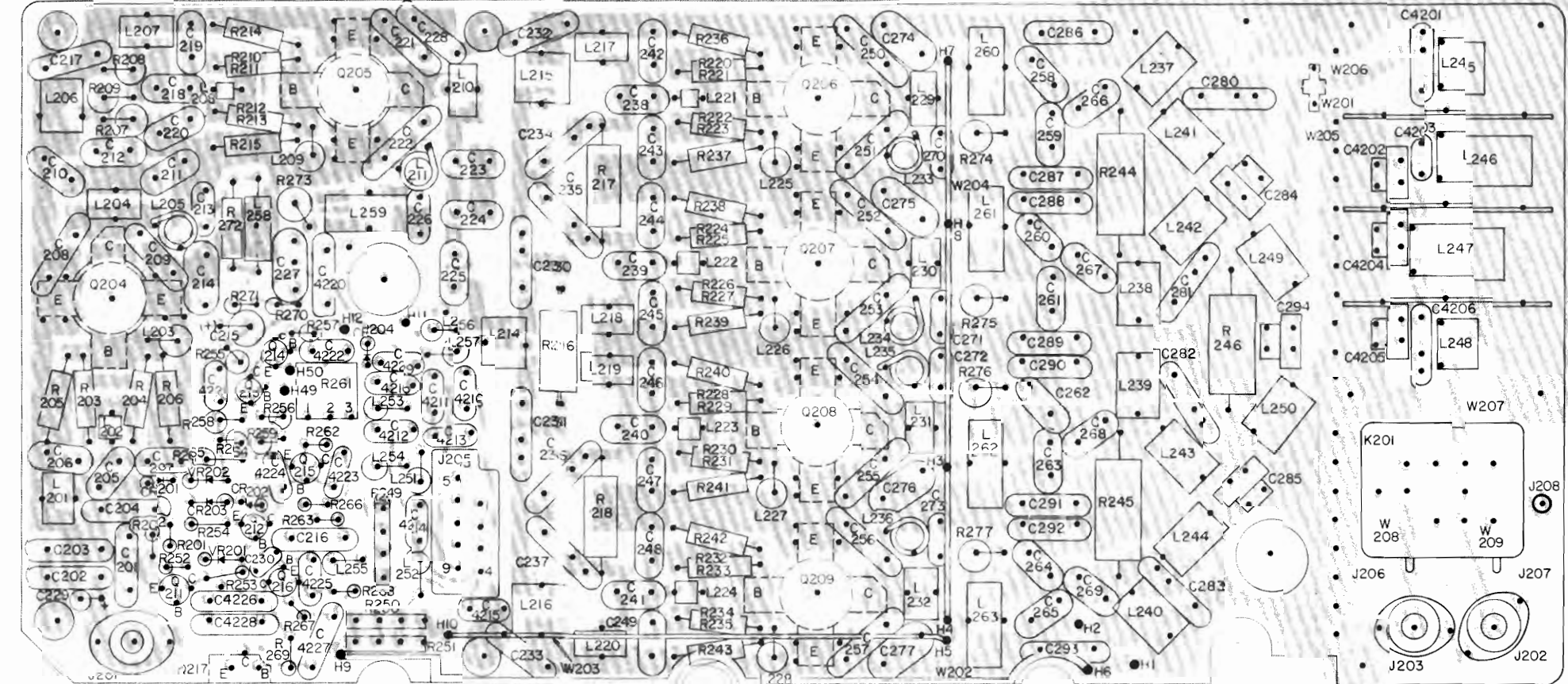
BOTTOM VIEW



NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION

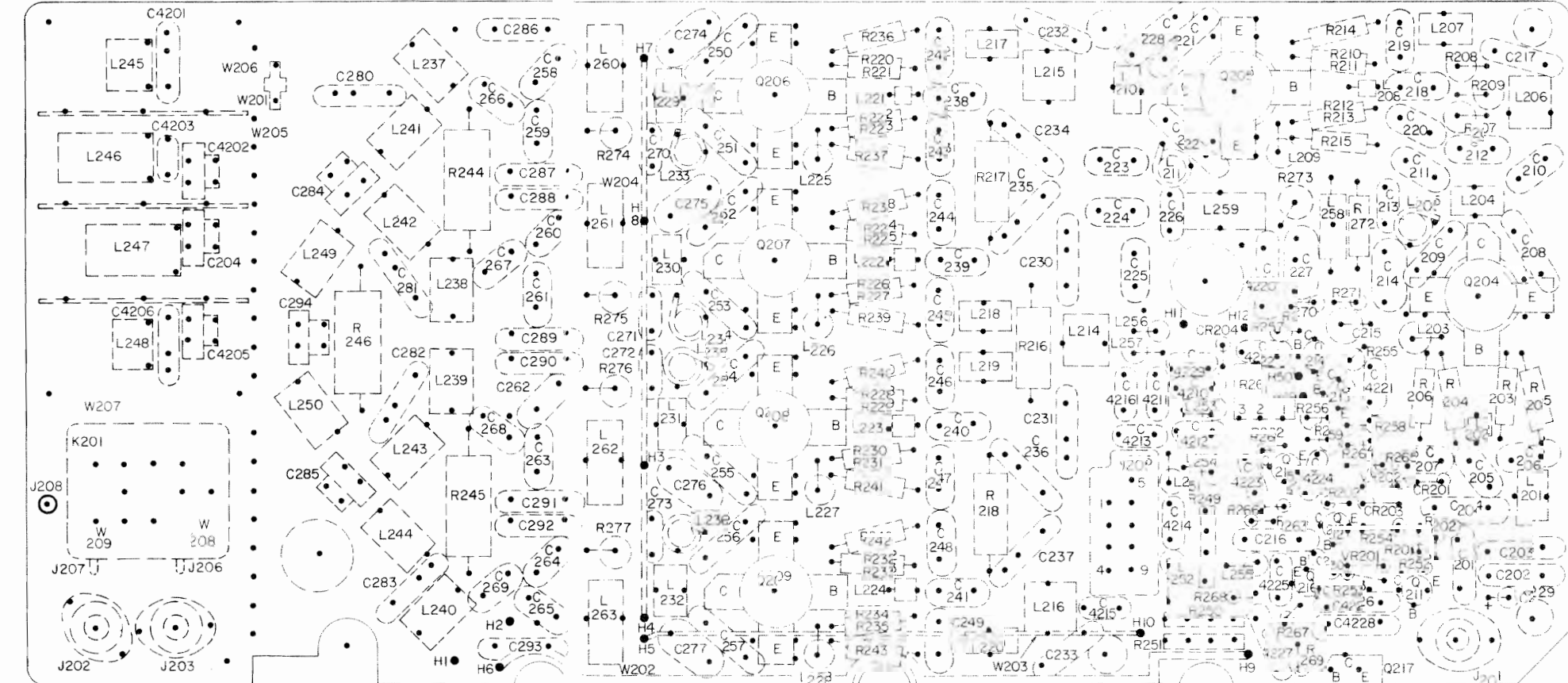
(19R622110, Rev. 4)

PA BOARD COMPONENT SIDE



(19D417923, Sh. 2, Rev. 3)
(19D417923, Sh. 3, Rev. 1)

SOLDER SIDE



(19D417923, Sh. 2, Rev. 3)

OUTLINE DIAGRAM

25-50 MHz, 100-WATT TRANSMITTER

← RUNS ON SOLDER SIDE

● RUNS ON BOTH SIDES

← RUNS ON COMPONENT SIDE

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 description of parts affected by these revisions.

REV. A - D: - Exciter Board 19D416659G1-8, Incorporated in initial shipment

REV. E - To increase audio sensitivity. Changed R126.

REV. F - To eliminate possible shorting of shield to wire runs on printed wire board. Changed T104LL, T104L, T104M and T104H. Deleted shield (19B219619P1), C129LL, C129L, C129M and C129H.

Exciter Board 19D416659G4-8

REV. G - To improve multi-frequency spread performance in cold temperatures. Changed C130H.

REV. G - Exciter Board 19D416659G3, 7 To improve operation. Changed C130.

Table with 3 columns: SYMBOL, GE PART NO., DESCRIPTION. Contains parts list for LBI4440G, 23-50 MHz EXCITER, 19D416659G1-8.

Table with 3 columns: SYMBOL, GE PART NO., DESCRIPTION. Contains parts list for various electronic components.

Table with 3 columns: SYMBOL, GE PART NO., DESCRIPTION. Contains parts list for various electronic components.

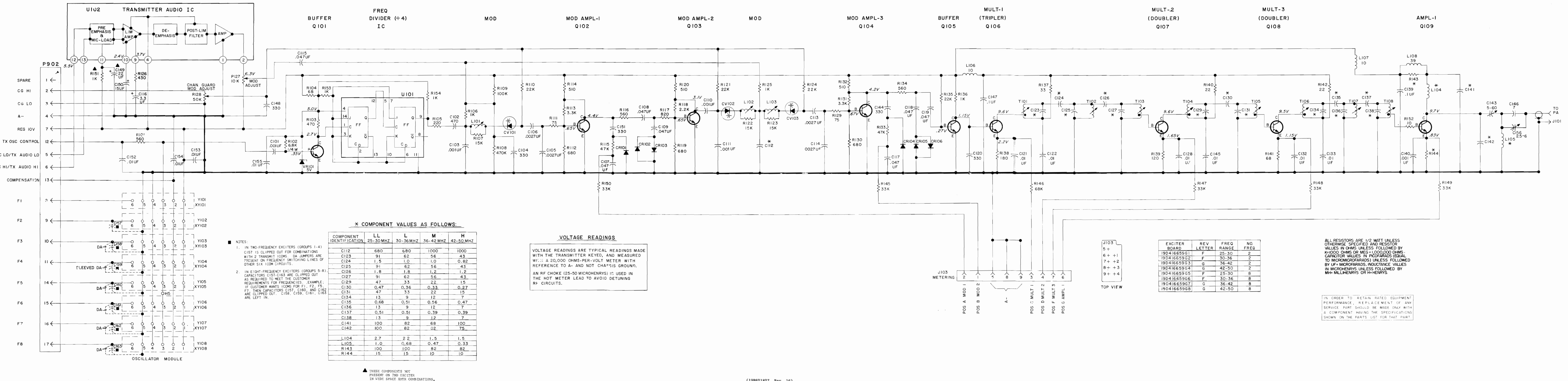
Table with 3 columns: SYMBOL, GE PART NO., DESCRIPTION. Contains parts list for various electronic components.

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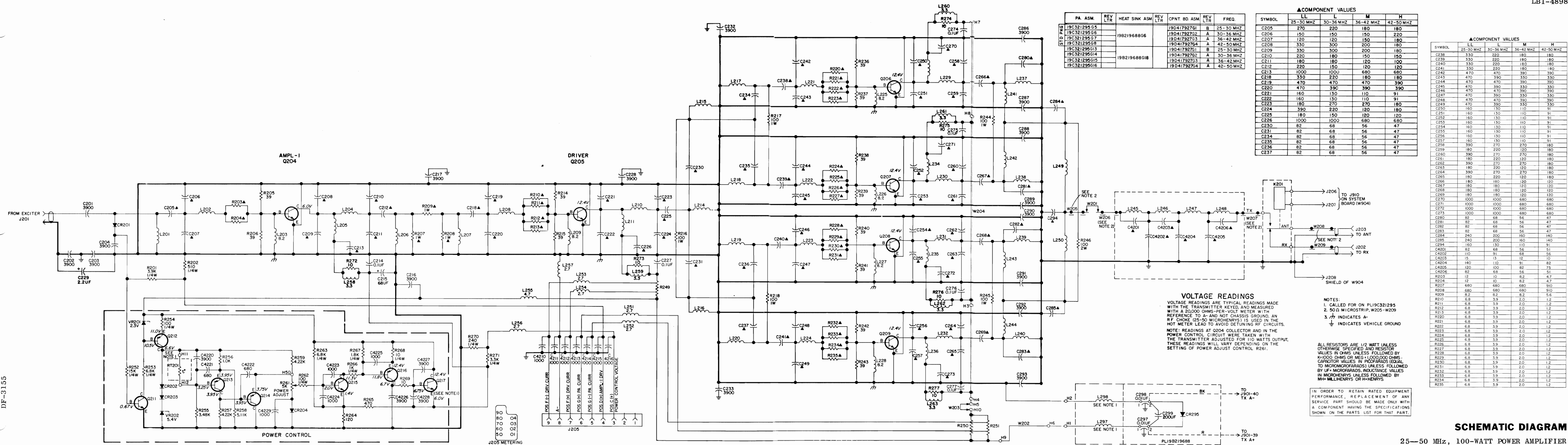
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES



(19621827, Rev. 16)

SCHEMATIC DIAGRAM

25—50 MHz, EXCITER BOARD 19D416659G1-G8



PA. ASM.	REV LTR	HEAT SINK ASM	REV LTR	CPNT. BD. ASM	REV LTR	FREQ.
19C321295G5				19D417927G1	B	25-30 MHZ
19C321295G6		19B219688G6		19D417927G2	A	30-36 MHZ
19C321295G7				19D417927G3	A	36-42 MHZ
19C321295G8				19D417927G4	A	42-50 MHZ
19C321295G13				19D417927G1	B	25-30 MHZ
19C321295G14		19B219688G18		19D417927G2	A	30-36 MHZ
19C321295G15				19D417927G3	A	36-42 MHZ
19C321295G16				19D417927G4	A	42-50 MHZ

▲COMPONENT VALUES				
SYMBOL	LL	L	M	H
C205	270	220	180	180
C206	150	150	150	220
C207	120	120	150	180
C208	330	300	200	180
C209	330	300	200	180
C210	220	180	150	150
C211	180	180	120	100
C212	220	150	120	120
C213	1000	1000	680	680
C218	330	220	180	180
C219	470	470	470	390
C220	470	390	390	390
C221	160	130	110	91
C222	160	130	110	91
C223	180	270	270	180
C224	390	220	120	180
C225	180	150	120	120
C226	1000	1000	680	680
C230	82	68	56	47
C231	82	68	56	47
C234	82	68	56	47
C235	82	68	56	47
C236	82	68	56	47
C237	82	68	56	47

▲COMPONENT VALUES				
SYMBOL	LL	L	M	H
C238	330	220	180	180
C239	330	220	180	180
C240	330	220	180	180
C241	330	220	180	180
C242	470	470	390	390
C243	470	390	330	330
C244	470	470	390	390
C245	470	390	330	330
C246	470	470	390	390
C247	470	390	330	330
C248	470	470	390	390
C249	470	390	330	330
C250	160	130	110	91
C251	160	130	110	91
C252	160	130	110	91
C253	160	130	110	91
C254	160	130	110	91
C255	160	130	110	91
C256	160	130	110	91
C257	160	130	110	91
C258	390	270	270	180
C259	180	220	120	180
C260	390	270	270	180
C261	180	220	120	180
C262	390	270	270	180
C263	180	220	120	180
C264	390	270	270	180
C265	180	220	120	180
C266	180	180	120	120
C267	180	180	120	120
C268	180	180	120	120
C269	180	180	120	120
C270	1000	1000	680	680
C271	1000	1000	680	680
C272	1000	1000	680	680
C273	1000	1000	680	680
C280	82	68	56	47
C281	82	68	56	47
C282	82	68	56	47
C283	68	56	47	47
C284	240	200	160	140
C285	240	200	160	140
C294	160	130	110	91
C4201	82	68	56	51
C4202	110	91	68	56
C4203	15	13	12	10
C4204	140	110	91	82
C4205	120	100	82	75
C4206	82	68	56	51
R204	12	10	8.2	4.7
R207	680	680	680	910
R208	680	680	680	910
R209	8.2	8.2	2.0	5.6
R210	6.8	3.9	2.0	1.2
R211	6.8	3.9	2.0	1.2
R212	6.8	3.9	2.0	1.2
R213	6.8	3.9	2.0	1.2
R220	6.8	3.9	2.0	1.2
R221	6.8	3.9	2.0	1.2
R222	6.8	3.9	2.0	1.2
R223	6.8	3.9	2.0	1.2
R224	6.8	3.9	2.0	1.2
R225	6.8	3.9	2.0	1.2
R226	6.8	3.9	2.0	1.2
R227	6.8	3.9	2.0	1.2
R228	6.8	3.9	2.0	1.2
R229	6.8	3.9	2.0	1.2
R230	6.8	3.9	2.0	1.2
R231	6.8	3.9	2.0	1.2
R232	6.8	3.9	2.0	1.2
R233	6.8	3.9	2.0	1.2
R234	6.8	3.9	2.0	1.2
R235	6.8	3.9	2.0	1.2

VOLTAGE READINGS
 VOLTAGE READINGS ARE TYPICAL READINGS MADE WITH THE TRANSMITTER KEYS, AND MEASURED WITH A 20,000 OHMS-PER-VOLT METER WITH REFERENCE TO A- AND NOT CHASSIS GROUND. AN RF CHOKE (25-50 MICROHENRYS) IS USED IN THE HOT METER LEAD TO AVOID DETUNING RF CIRCUITS.
 NOTE: READINGS AT Q204 COLLECTOR AND IN THE POWER CONTROL CIRCUIT WERE TAKEN WITH THE TRANSMITTER ADJUSTED FOR 110 WATTS OUTPUT. THESE READINGS WILL VARY DEPENDING ON THE SETTING OF POWER ADJUST CONTROL R261.

- NOTES:
 1. CALLED FOR ON PL19C321295
 2. 50 Ω MICROSTRIP, W205-W209
 3. ⚡ INDICATES A-
 ⊥ INDICATES VEHICLE GROUND

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.

SCHEMATIC DIAGRAM

25-50 MHz, 100-WATT POWER AMPLIFIER

DF-3155

PARTS LIST

LBI-4899A
25-50 MHz, 100 WATT
POWER AMPLIFIER
19C321295G5-G8
19C321295G13-G16

Table with 3 columns: SYMBOL, GE PART NO., DESCRIPTION. Includes sections for INDUCTORS, TRANSISTORS, THERMISTORS, CAPACITORS, and POWER AMPLIFIER BOARD.

Table with 3 columns: SYMBOL, GE PART NO., DESCRIPTION. Lists various electronic components like silver mica capacitors, ceramic discs, and tantalum capacitors.

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