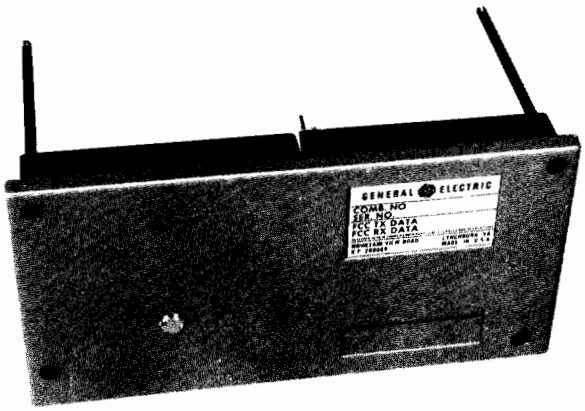
MOBILE RADIO

Porta-Mobil II™

406-512 MHz TRANSMITTER TYPE KT-131-A/B



SPECIFICATIONS *

Type Numbers	KT-131-A	KT-131-B
POWER OUTPUT	Adjustable from 5 to 18 Watts	Adjustable from 5 to 25 Watts
MODULATION DEVIATION	0 to ±5 kHz	
SPURIOUS		
RADIATED	-57 dB	
CONDUCTED	-57 dB	
AUDIO RESPONSE	Within +1 and -3 dB of a 6-dB/octave pre-emphasis from 300 to 3000 Hz except for an additional 6-dB/octave roll-off from 2500 to 3000 Hz per EIA.	
AUDIO DISTORTION	Less than 8%	
CRYSTAL MULTIPLICATION	24	
RF LOAD IMPEDANCE	50 ohms	
MODULATION SENSITIVITY	0.5 to 1.5 millivolts	
MAXIMUM FREQUENCY SPACING		
406-420 MHz	0.4% of highest frequency with no degradation--5.5 MHz with less than 1 dB degradation	
450-512 MHz	0.4% of highest frequency with no degradation--3.5 MHz with less than 1 dB degradation	

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

KT-131-A/B

GENERAL ELECTRIC

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WARNING

Although the highest DC voltage in Porta•Mobil II™ Equipment is supplied by a portable or vehicular 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

Porta-Mobil II transmitter types KT-131-A and KT-131-B are crystal controlled, phase modulated transmitters for one-through twelve-frequency operation in the 406-420 and 450-512 MHz bands. The transmitters are single unit construction in the rear cover for the Porta-Mobil II case assembly and utilize both discrete components and integrated circuit modules.

Each transmitter consists of exciter board 19D417887 and power amplifier 19D423036. The exciter board consists of audio module A101, oscillator modules A104 through A115, compensator module A102, modulator module A103, optional compressor module A116 and exciter module types 4EF41A10, 4EF41A11 and 4EF41A12.

The application of each transmitter type is shown in the following chart:

Transmitter Type No.	Exciter No.	Exciter Module Type No.	PA No.	Frequency Range	Number Frequencies	Power Output
KT-131-A	19D417887G1	4EF41A10	19D423036G1	406-420 MHz	12	18 Watts
		4EF41A11	19D423036G2	450-470 MHz	12	18 Watts
	19D417887G2	4EF41A12	19D423036G3	470-512 MHz	12	16 Watts
KT-131-B	19D417887G1	4EF41A10	19D423036G4	406-420 MHz	12	25 Watts
		4EF41A11	19D423036G5	450-470 MHz	12	25 Watts
	19D417887G2	4EF41A12	19D423036G6	470-512 MHz	12	20 Watts

Operating voltages for the transmitter are provided by a 10-Volt battery pack, a 7.5 Volt regulator circuit and a 5.4 Volt regulator circuit. The 10 Volts from the battery pack is applied directly to the power amplifier circuit and also the 7.5 Volt regulator circuit and power amplifier circuit through POWER OFF-ON switch S701 on the case assembly. The 7.5 Volt regulator is part of the receiver audio amplifier and is interfaced by the system board to the transmitter. A keyed 7.5 volts is connected to the power adjust circuit in the power amplifier, and the modulator module and 5.4 volt regulator circuit on the transmitter exciter board. The 5.4 volt regulator circuit provides voltage for the audio module, compensator module and the optional compressor module.

References to symbol numbers mentioned in the following text are found on the Schematic Diagrams, Outline Diagrams and Parts Lists (see Table of Contents). The typical, simplified circuit diagrams used in the text are representative of the circuit in the IC modules. A block diagram of the transmitter is shown in Figure 1.

CIRCUIT ANALYSIS

OSCILLATOR MODULE (A104 through A115)

Oscillator Model 4EG27A11 consists of a crystal-controlled Colpitts oscillator and a Channel Guard tone modulator. The entire oscillator is contained in a metal can with the transmitter operating frequency printed on the top. The crystal frequency ranges from 16.9 to 21.3 MHz, and the crystal frequency is multiplied 24 times.

The oscillator frequency is temperature compensated to provide instant frequency compensation, with a frequency stability of ±.0002% from 0°C to +55°C and ±.0005% from -30°C to +60°C. The temperature compensation network is contained in Compensator module A102.

A typical oscillator circuit is shown in Figure 2.

In single-frequency transmitters, a jumper from Hole 39 to Hole 78 on the System Board connects the continuous 5.4 Volt supply voltage to the oscillator module. Oscillator output is applied to Compensator A102.

In multi-frequency transmitters, the single-frequency supply jumper on the system board is removed, and the proper frequency is selected by connecting 5.4 Volts to the oscillator module through frequency selector switch S704 on the control unit. For multi-frequency modifications refer to the Table of Contents in LBI-30100.

For Channel Guard applications, tone from the Channel Guard encoder is applied

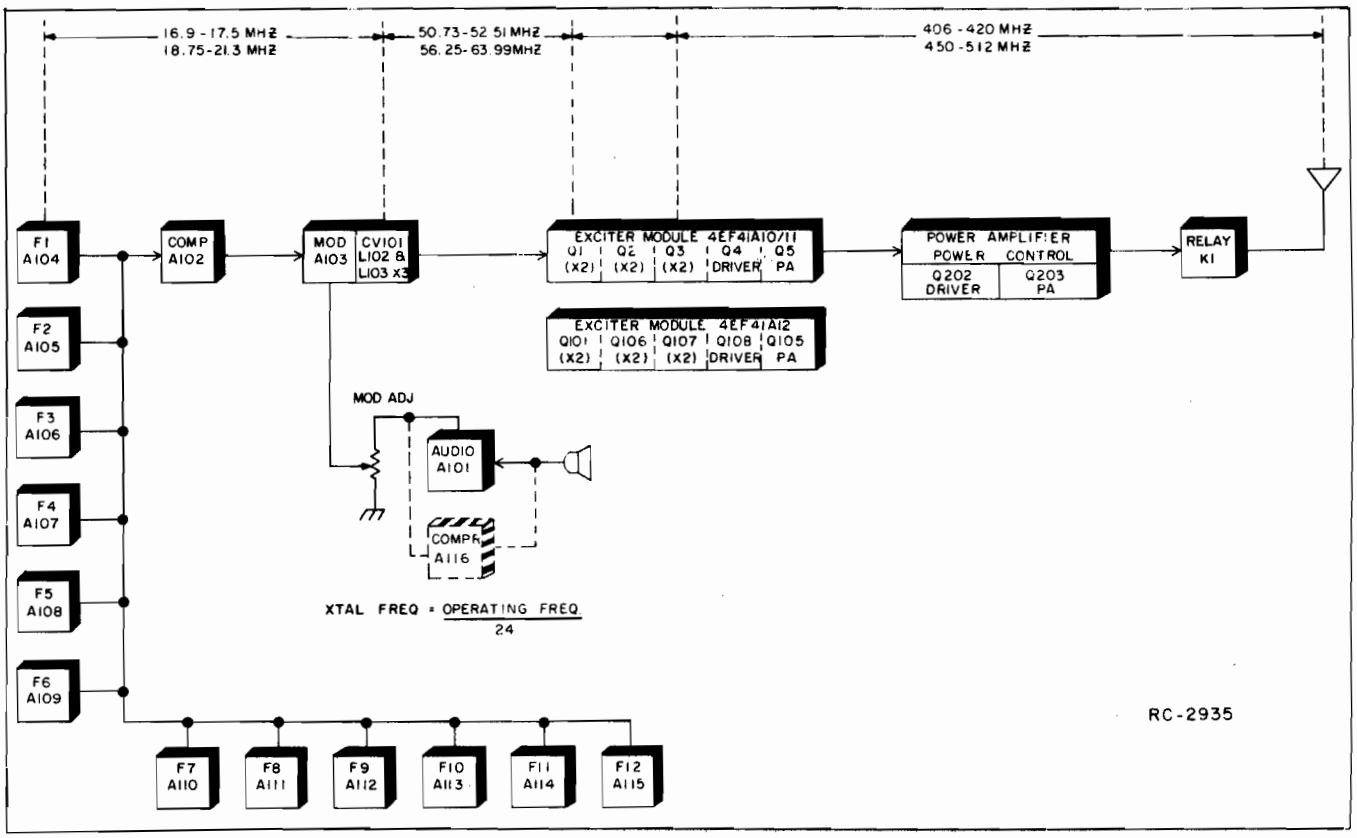


Figure 1 - Block Diagram

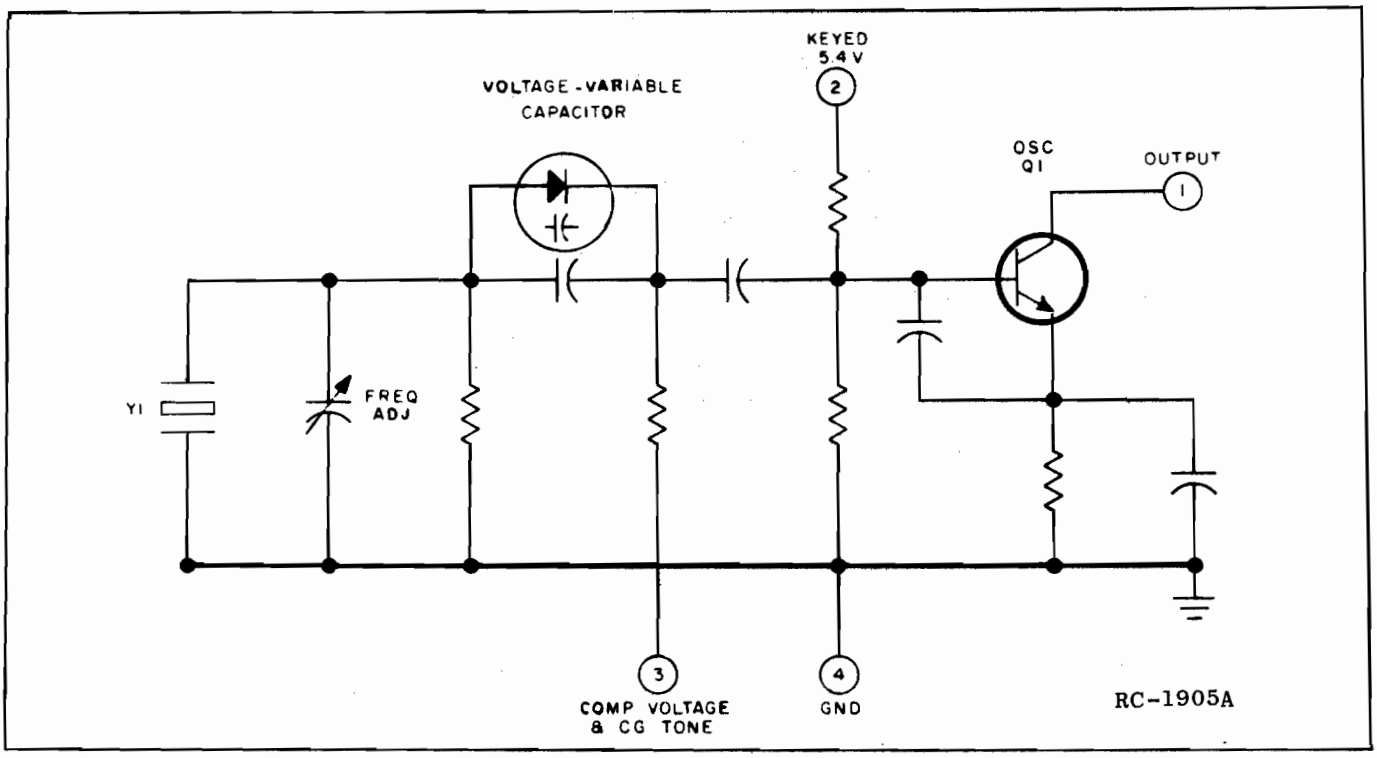


Figure 2 - Typical Oscillator Circuit

to the oscillator module. The tone is applied through Pin 3 to the voltage-variable capacitor on the oscillator module, which frequency modulates the oscillator output.

> NOTE
>
> All oscillator modules are individually compensated at the factory and cannot be repaired in the field. Any attempt to remove the oscillator cover will void the warranty.

COMPENSATOR MODULE A102

Compensator module A102 contains a buffer-amplifier, and the temperature compensating network for the oscillator. A typical compensator circuit is shown in Figure 3.

RF from the oscillator at Pin 7 of the compensator module, is coupled through a DC-blocking capacitor to the base of buffer-amplifier Q1. This stage isolates the oscillator from the modulator. The output of Q1 connects from Pin 9 to Pin 1 of modulator module A103.

In the compensation network, the keyed 5.4 Volts at Pin 2 is applied to a thermistor-compensated voltage divider. The output at Pin 3 (2.35 Volts measured with a VTVM) is applied to Pin 3 and to the voltage-variable capacitor in the selected oscillator module. At temperatures below -10°C, the compensated voltage increases to maintain the proper voltage on the oscillator voltage-variable capacitor.

Service Note: An abnormally low VTVM reading (or no reading) at Pin 3 of the oscillator may indicate a short or leakage path in the oscillator. This can be checked by unsoldering Pin 3, raising it off the printed board and taking another reading. If this reading is normal the problem is in the oscillator module. If the reading remains low (or zero) the problem is in the Compensator.

AUDIO AMPLIFIER MODULE A101

Audio from the microphone is coupled to Pin 1 of Audio Amplifier Module A101 and then to the base of audio amplifier transistor Q1 (see Figure 4). In Type 90 encoder applications, the encode tone is applied to the amplifier at Pin 2.

The amplifier output is applied directly to the limiter stage (Q2). Following the limiter is a combined post-limiter filter and de-emphasis network. The filter output at Pin 8 is coupled through Mod Adjust potentiometer R103 to the modulator module A103.

MODULATOR MODULE A103

The phase modulator circuit consists of modulator module A103, voltage-variable capacitor CV101 and tuneable coil L102. A typical modulator circuit is shown in Figure 5.

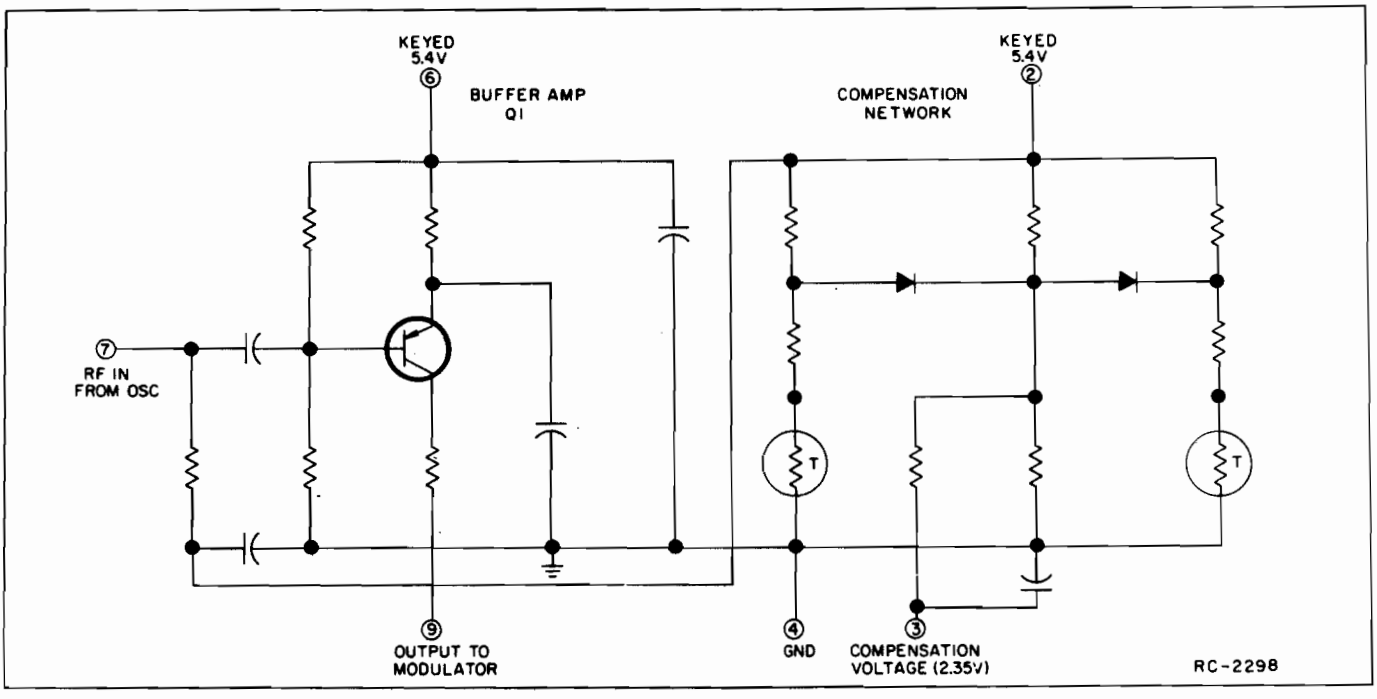


Figure 3 - Typical Compensator Circuit

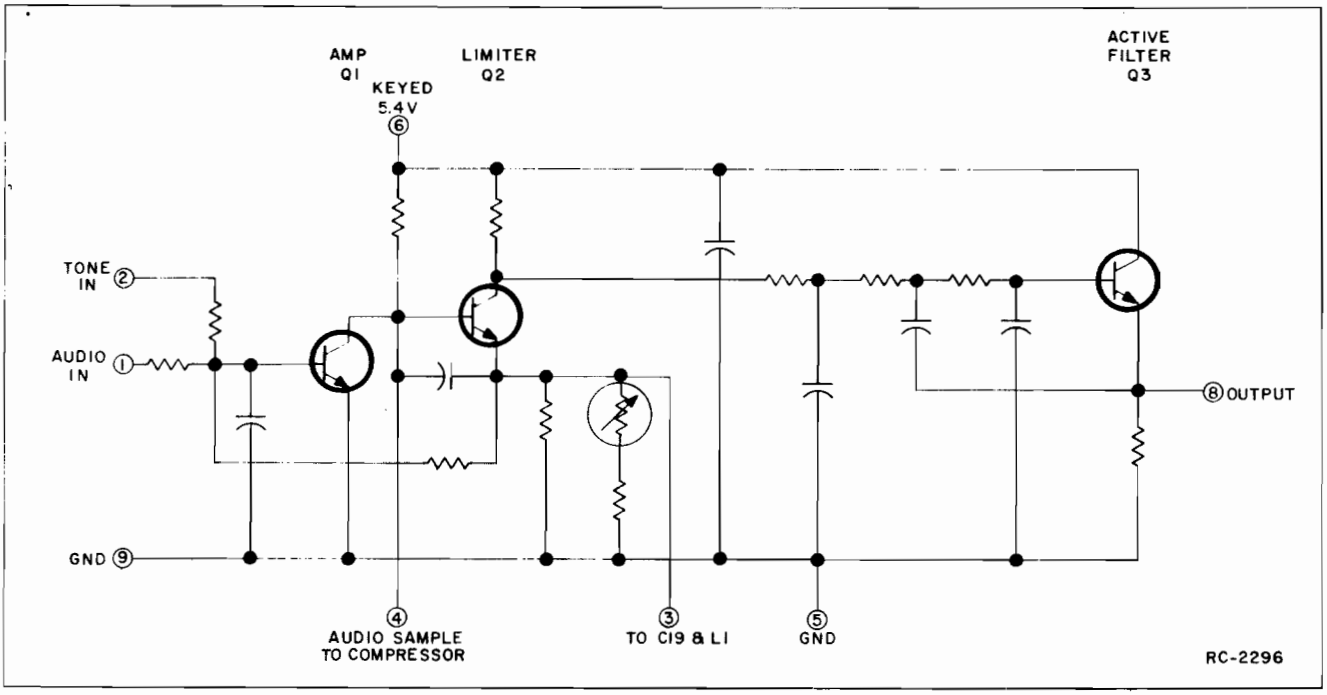


Figure 4 - Typical Audio Amplifier Circuit

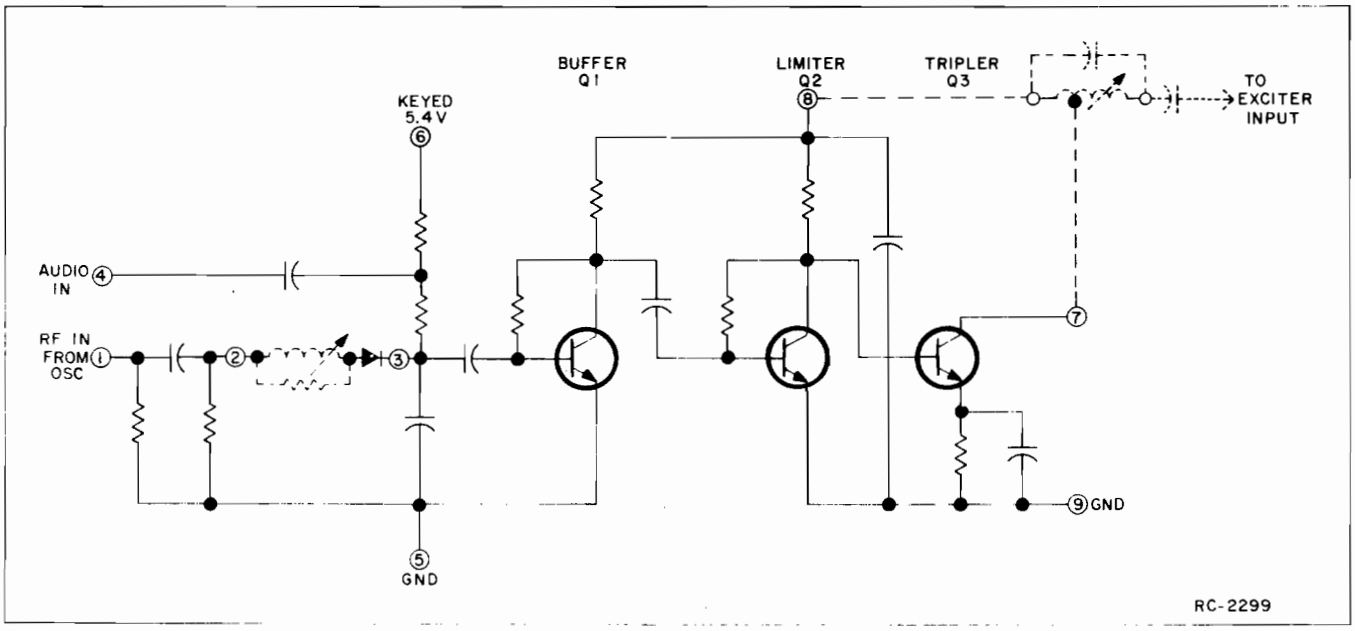


Figure 5 - Typical Phase Modulator Circuit

With CV101 in series with L102, the network is a series-resonate circuit when RF from the compensator is applied to Pin 1 of modulator module A103. Applying audio to Pin 4 of A103 varies the bias of CV1, resulting in a phase modulated output.

Buffer Q1 isolates the modulator from the loading effects of the following multiplier stage, and also provides some amplification. Following the buffer stage is tripler Q2. The output of Q2 is coupled through L103/L104 to the exciter module. L103/L104 is tuned to three times the crystal frequency.

EXCITER MODULES 4EF41A10 and 4EF41A11

Exciter Models 4EF41A10 (406-420 MHz) and 4EF41A11 (450-470 MHz) consists of three class C doubler stages, a class C driver stage and a class C power amplifier stage.

All of the stages are supplied by a type of constant-K, DC collector feed network.

Doubler Stages

The modulator output is coupled through T101 to the base of 1st doubler Q101. T101 is tuned to three times the crystal frequency. The modulator coils and the 1st doubler base circuit are metered at TP1. The 1st doubler collector circuit is metered at TP2.

The output of the 1st doubler is coupled through T102 (untuned) and T103 to the base of 2nd doubler Q102. T103 is tuned to six times the crystal frequency, and is metered at TP2.

An impedance-matching network couples the output of Q102 to the base of Q103. The network consists of C112, C113, L105/L121, C114/C136 and C115, and also provides some selectivity. L105/L121 is tuned to 12 times the crystal frequency.

Driver & PA

Following the third doubler is an impedance-matching network consisting of L107, C118, L108, C119 and C120/C140. The network matches the high impedance doubler output to the low impedance driver input. C119 is tuned to 24 times the crystal frequency.

The driver output is coupled through a similar impedance-matching network to the base of class C power amplifier Q105. The power amplifier output is applied to the input of the power amplifier board through a series-tuned matching network (L115, L122/L113, C128, L114 and C129).

EXCITER MODULE 4EF41A12

Exciter Models 4EF41A12 (470-512 MHz) consists of three class C doubler stages, a class C driver stage and a class C power amplifier stage.

All of the stages are supplied by a type of constant-K, DC collector feed network.

Doubler Stages

The modulator output is coupled through T101 to the base of 1st doubler Q101. T101 is tuned to three times the crystal frequency. The modulator coils and the 1st doubler base circuit are metered at TP1. The 1st doubler collector circuit is metered at TP2.

The output of the 1st doubler is coupled through T102 (untuned) and T103 to the base of 2nd doubler Q106. T103 is tuned to six times the crystal frequency, and is metered at TP2.

An impedance-matching network couples the output of Q106 to the base of Q107. The network consists of C112, C113, L105, C114, and C115, and also provides some selectivity. L105 is tuned to 12 times the crystal frequency.

Driver & PA

Following the third doubler is an impedance-matching network consisting of L107, C146, L108, C119 and C120. The network matches the high impedance doubler output to the low impedance driver input. C119 is tuned to 24 times the crystal frequency.

The driver output is coupled through a similar impedance-matching network to the base of class C power amplifier Q105. The power amplifier output is applied to the input to the power amplifier board through a series-tuned matching network (L115, L124, C149, L114 and C150).

POWER AMPLIFIER BOARD 19D423036G1-G6

Driver

RF power from the exciter is coupled through impedance matching network C202, C203/C226/C227, R217 and L201 to the base of driver transistor Q202 on power amplifier board 19D423036. See Schematic Diagram. The collector voltage of Q202 is controlled by the power control circuit, limiting the drive to the base of PA transistor Q203 in reduced power operation.

PA

RF is coupled from the collector of Q202 through impedance matching network C209, C210, C235, L210, L211, C212, C214/C230/C231, C213/C228, C237 and L204 to the base of PA transistor Q203. The RF output at the collector of Q203 is coupled through matching network C229, C216/C232/C233, C221, L207, C225, low pass filter C222/C234, L208, C223/C236, L209, and C224/C238 and system relay K1 to the antenna.

Power Control Circuit

The Power Control Circuit maintains a constant current through PA transistor Q203 to control the transmitter power output when the supply voltage or load changes.

The voltage drop across metering resistor R204 is monitored by operational amplifier AR201. Initially, the negative and positive inputs to AR201, at Pins 2 and 3, are balanced by BIAS BAL ADJ R206 and PWR ADJ R211 for a nominal voltage output at Pin 6. If the current through PA transistor Q203 starts to increase the voltage drop across R204 will increase proportionally. The voltage on the negative input of AR201 will be smaller than the voltage on the positive input. The output on Pin 6 will be larger than nominal. The increased voltage on the base of pass transistor Q201 will cause Q201 to conduct less and reduce the collector voltage of driver transistor Q202. The reduced collector voltage on Q202 reduces the RF drive to Q203 porportionally, maintaining a constant current through Q203.

If the current through Q203 starts to fall, the voltage on the negative input of AR201 will increase and the voltage on Pin 6 will decrease. The decreased voltage on the base of Q201 will cause Q201 to conduct harder increasing the collector voltage on Q202. The drive to Q203 will increase proportionally maintaining constant current through Q203.

MODULATION LEVEL ADJUSTMENT

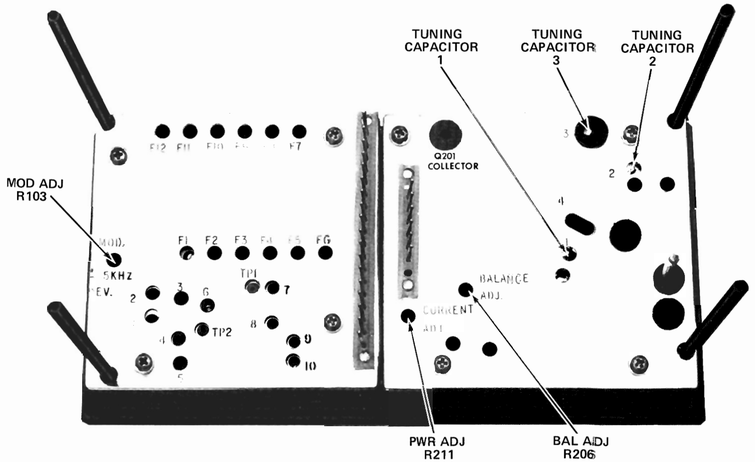
The MOD ADJUST (R103) was adjusted to the proper setting before shipment and should not normally require readjustment. This setting permits approximately 75% modulation for the average voice level. The audio peaks which would cause over-modulation are clipped by the modulation limiter. The limiter, in conjunction with the de-emphasis network, instantaneously limits the slope of the audio wave to the modulator, thereby preventing overmodulation while preserving intelligibility.

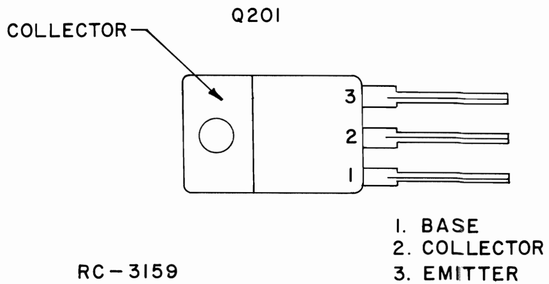
TEST EQUIPMENT

1. Audio Oscillator Model 4EX6A10
2. A deviation meter
3. An output meter or a VTVM
4. A Transmitter Test Cable 19D424148G1

PROCEDURE

1. Connect the equipment as shown in the Test Procedure on the back of this page.
2. Apply a 14 millivolt signal at 1000 Hz to Pin 2 of microphone jack J701.
3. With the signal applied, adjust Tuning Control 1 for zero modulation symmetry on the lowest channel frequency.
4. For transmitters without Channel Guard, set MOD ADJUST R108 for a 4.5-kilohertz swing with the deviation polarity which gives the highest reading as indicated on the frequency modulation monitor.
5. For transmitters with Channel Guard, check the Channel Guard modulation as shown in Step 2 of the transmitter Test Procedure. With Channel Guard tone applied, set the deviation as described in Step 4 above.
6. For multi-frequency transmitters, set the deviation as described in Step 4 on the channel producing the largest amount of deviation.





RC-3159

TRANSMITTER ALIGNMENT

EQUIPMENT REQUIRED:

- GE Test Set Model 4EX3A11 (or 4EX8K12) or equivalent 20,000 ohm-per-Volt meter.
- Regulated power supply capable of 16 volts at 6 amperes.
- A transmitter test cable 19D424148G1 connected between the transmitter and system board.
- An ammeter capable of measuring 6 amperes.
- A 50-ohm, terminating wattmeter connected to external antenna jack J704 thru RF adaptor cable 19B227389.
- A frequency counter.

PRELIMINARY CHECKS AND ADJUSTMENTS

1. In multi-frequency transmitters, set the channel selector switch to the lowest channel frequency.
2. Set the slugs in Tuning Controls 1 thru 6 even with the top of the can (there is no slug in Tuning Control 4). When properly aligned, the slugs will be between the top of the can and the coil.
3. Set BAL ADJ R206 fully counterclockwise.
4. Set PWR ADJ R211 fully clockwise.
5. Set capacitors 1, 2 & 3 on the power amplifier to approximately mid-range.
6. Connect the ammeter in series with the positive lead from the power supply and J703-8.
7. Set supply voltage at 10.0 Volts for transmitter KT-131-A or 13.6 Volts for transmitter KT-131-B.
8. Test Point meter reading made with the (+) meter lead to TP1 and TP2, and the (-) lead to system ground.
9. All adjustments made with the transmitter keyed.

ADJUSTMENT PROCEDURE

STEP	TUNING CONTROL	TYPICAL METER READING	PROCEDURE
		EXCITER	
1.	1, 2 and 3	Maximum (at TP1)	Adjust Tuning Controls 1, 2 and 3 for maximum meter reading at TP1. If no reading is obtained, adjust Tuning Control 3 for maximum transmitter current, and then re-adjust 1, 2 and 3 for maximum meter reading at TP1.
2.	5	Maximum (at TP2)	Adjust Tuning Control 5 for maximum meter reading at TP2.
3.	6	Maximum (at TP1)	Adjust Tuning Control 6 for maximum meter reading at TP1.
4.	1, 2, 3 and 5	Maximum (at TP1)	Retune 1, 2, 3, 5, and 6 for maximum meter reading at TP1.
5.	6	Maximum current	Tune 6 for maximum transmitter current.
6.	7 and 8	Maximum Power Output	Adjust Tuning Controls 7 and 8 for maximum power output. If no power reading is obtained, tune 7 and 8 for maximum transmitter current.
7.	9 and 10	Maximum Power Output	Tune 9 and 10 for maximum power output.
8.	6 thru 10	Maximum Power Output	Retune Tuning Controls 6 thru 10 until no further increase in power output is obtained.
		POWER AMPLIFIER	
9.	1, 3 and 2	Maximum Power Output	Tune 1, 3 and 2 in that order for maximum power output.
10.	2 and 3	Optimized Power Output	Decrease power output slightly with 2 and peak power output with 3 until optimized.
11.	9 and 10	Maximum Power Output	Retune 9 and 10 on the EXCITER until no further increase in power is obtained.
12.	R211		Turn PWR ADJ R211 fully counterclockwise.
13.	R206	0.5 VDC	Carefully turn BAL ADJ R206 clockwise until the lowest positive voltage is read on the collector of Q201.
14.	R211		Set PWR ADJ R211 for the desired total current.
15.	2 and 3	Optimized Power Output	If necessary, repeat step 10.
16.	1	decreased current	If the total current exceeds 5.5 amperes for KT-131-A or 5.9 amperes for KT-131-B, turn, only slightly, tuning control 1, in the direction which decreases the current, until the current decreases approximately 0.2 amperes.
17.	2	decreased current	Repeat step 16 with tuning control 2.
18.			Increase the supply voltage to the highest voltage to be used with the transmitter. The total current increase should be less than 0.2 ampere. If the current increase is larger, repeat steps 12, 13, 14 and 18.
19.			With no modulation, adjust F1 through 12 crystal trimmers for proper oscillator frequencies. Next, refer to the Modulation Adjustment. NOTE It is recommended that all frequency adjustments be made when the equipment is at a temperature of approximately 75°F. In no case should frequency adjustments be made when the equipment is outside the temperature range of 60°F to 90°F.

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. By following the sequence of test steps starting with Step 1, the defect can be quickly localized. 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.

TEST EQUIPMENT REQUIRED

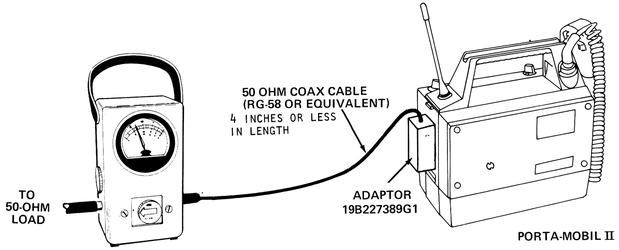
for test hookup shown:

1. Wattmeter similar to:
   Bird # 43
2. VTVM similar to:
   Triplett # 850
   Heath # 1M-21
3. Audio Generator similar to:
   GE Model 4EX6A10 or
   Heath # IG-72
4. Deviation Meter (with a .75 kHz scale) similar to:
   Measurements # 140
   Lampkin # 205A

STEP 1
POWER MEASUREMENT

TEST PROCEDURE

A. Correct transmitter output to wattmeter as shown below. GE adaptor 19B227389G1 and 4 inches (or less) of 50 ohm coax cable is recommended for accurate power output readings.



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B. Key transmitter and check wattmeter for desired power output..

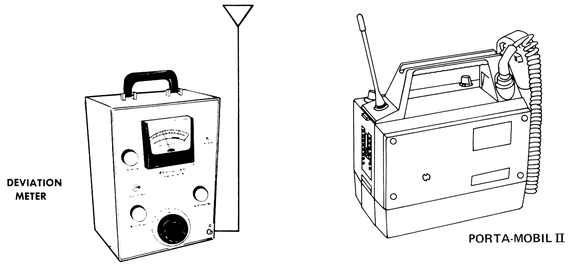
SERVICE CHECK

Refer to Service Hints on Transmitter Troubleshooting Procedure.

STEP 2
TONE DEVIATION WITH CHANNEL GUARD

TEST PROCEDURE

A. Set up Deviation Meter and monitor output of transmitter as shown below:



B. Set MOD ADJUST R103 fully counterclockwise.

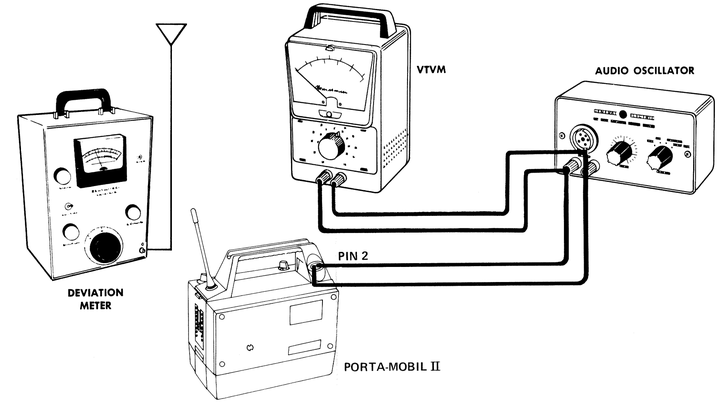
C. Key transmitter and check for approximately 0.75-kHz deviation. If reading is low or high, refer to the Channel Guard Troubleshooting Procedure (see Table of Contents)

NOTES--The Tone Deviation Test Procedures should be repeated every time the Tone Frequency is changed.

STEP 3
VOICE DEVIATION AND SYMMETRY

TEST PROCEDURE

A. Connect test equipment to transmitter as shown below:



B. Set the generator output to .48 Volts and frequency to 1 kHz.

C. Key the transmitter and adjust Deviation Meter to carrier frequency.

D. Deviation reading should be ±4.5 kHz. If the deviation is not 4.5 kHz, set the deviation as directed on the Transmitter Alignment Procedure (see Table of Contents).

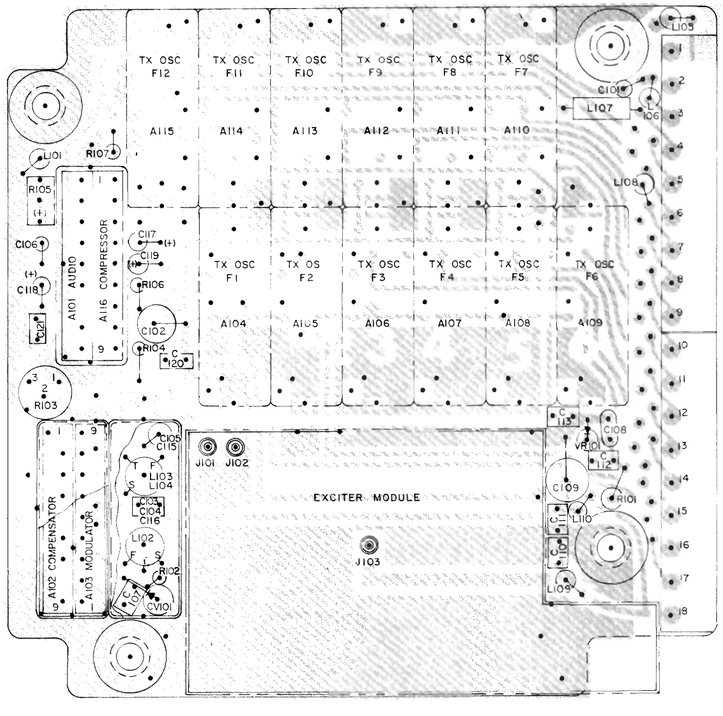
NOTES --These transmitters are adjusted for 4.5 kHz deviation at the factory. The factory adjustment will prevent the transmitter from deviating more than 5.0 kHz under the worst conditions of frequency, voltage and temperature.

If the deviation reading plus (+) or minus (-) differs by more than 0.5 kHz:

E. Refer to the Modulation Adjustment on the Transmitter Alignment Procedure.

F. Check Audio Sensitivity by reducing generator output until deviation falls to 3 kHz. Voltage should be LESS than 14 millivolts.

COMPONENT SIDE



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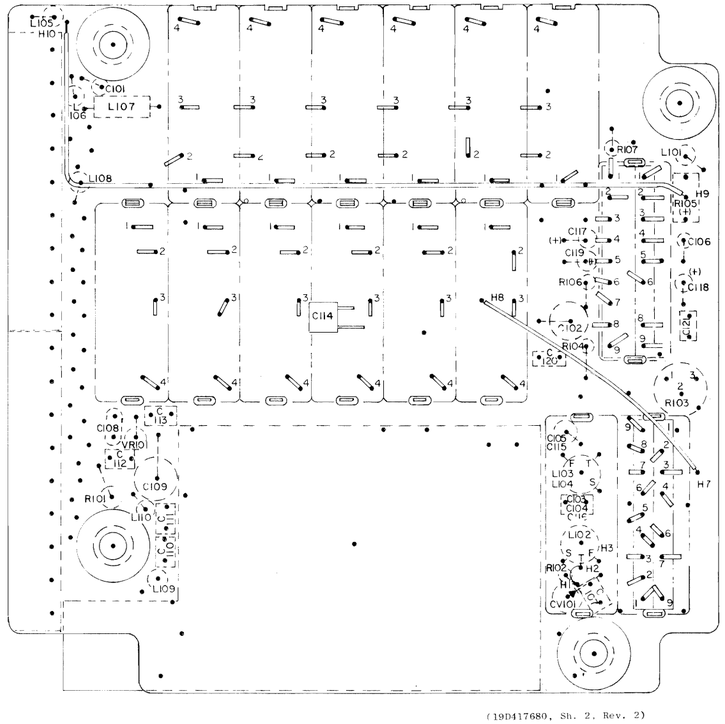
(19D417680, Sh. 3, Rev. 2)

SOLDER SIDE



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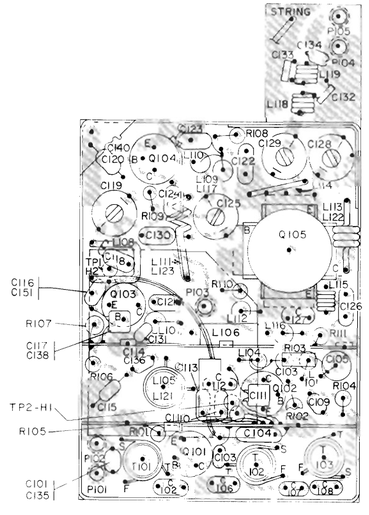
4EF41A10 & 11



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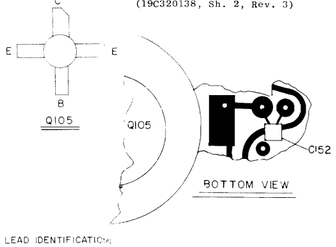
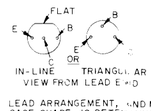
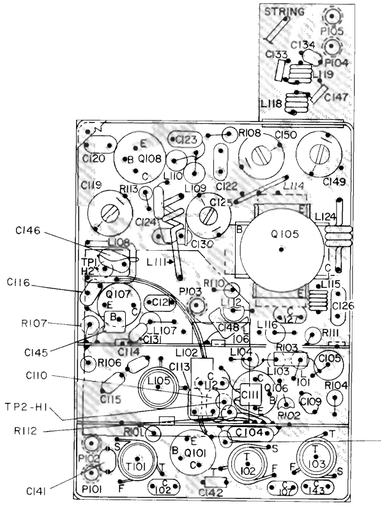


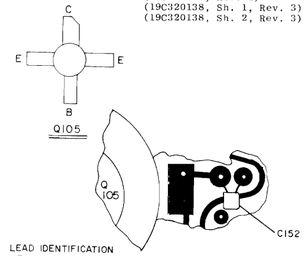


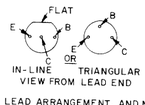
NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.

4EF41A12



(19C320878, Rev. 1)
(19C320138, Sh. 1, Rev. 3)
(19C320138, Sh. 2, Rev. 3)



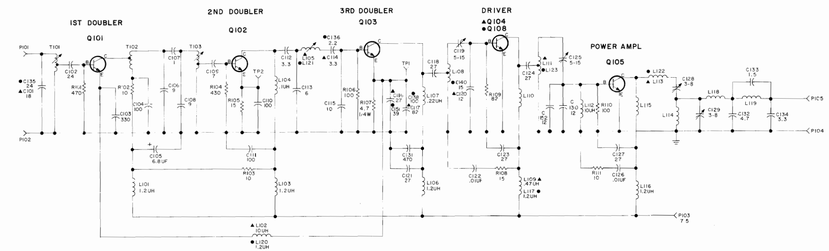


NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.

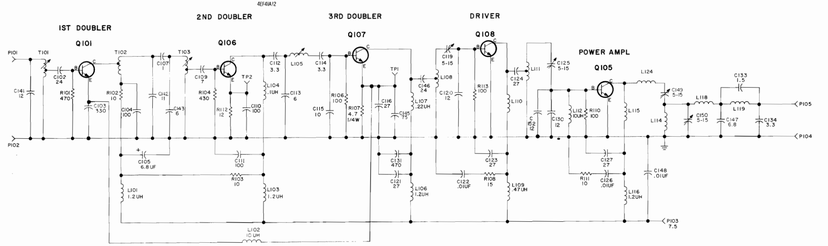
RUNS ON SOLDER SIDE
RUNS ON BOTH SIDES
RUNS ON COMPONENT SIDE

OUTLINE DIAGRAM

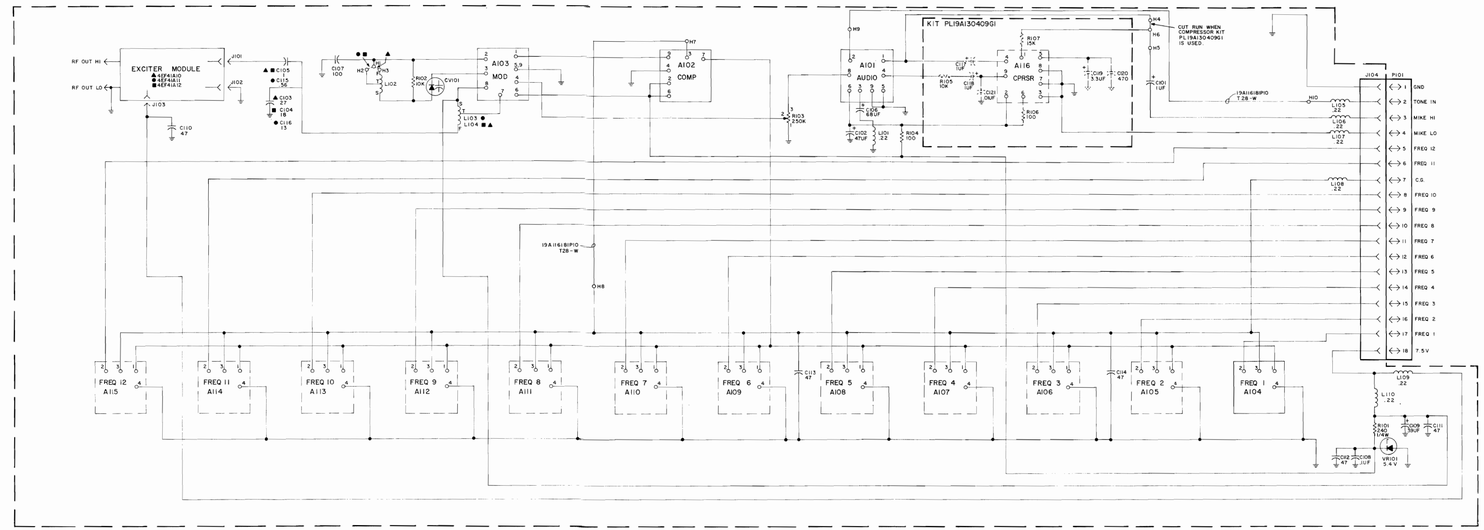
406—512 MHz EXCITER BOARD



(19D416544, Rev. 9)



(19D417123, Rev. 3)



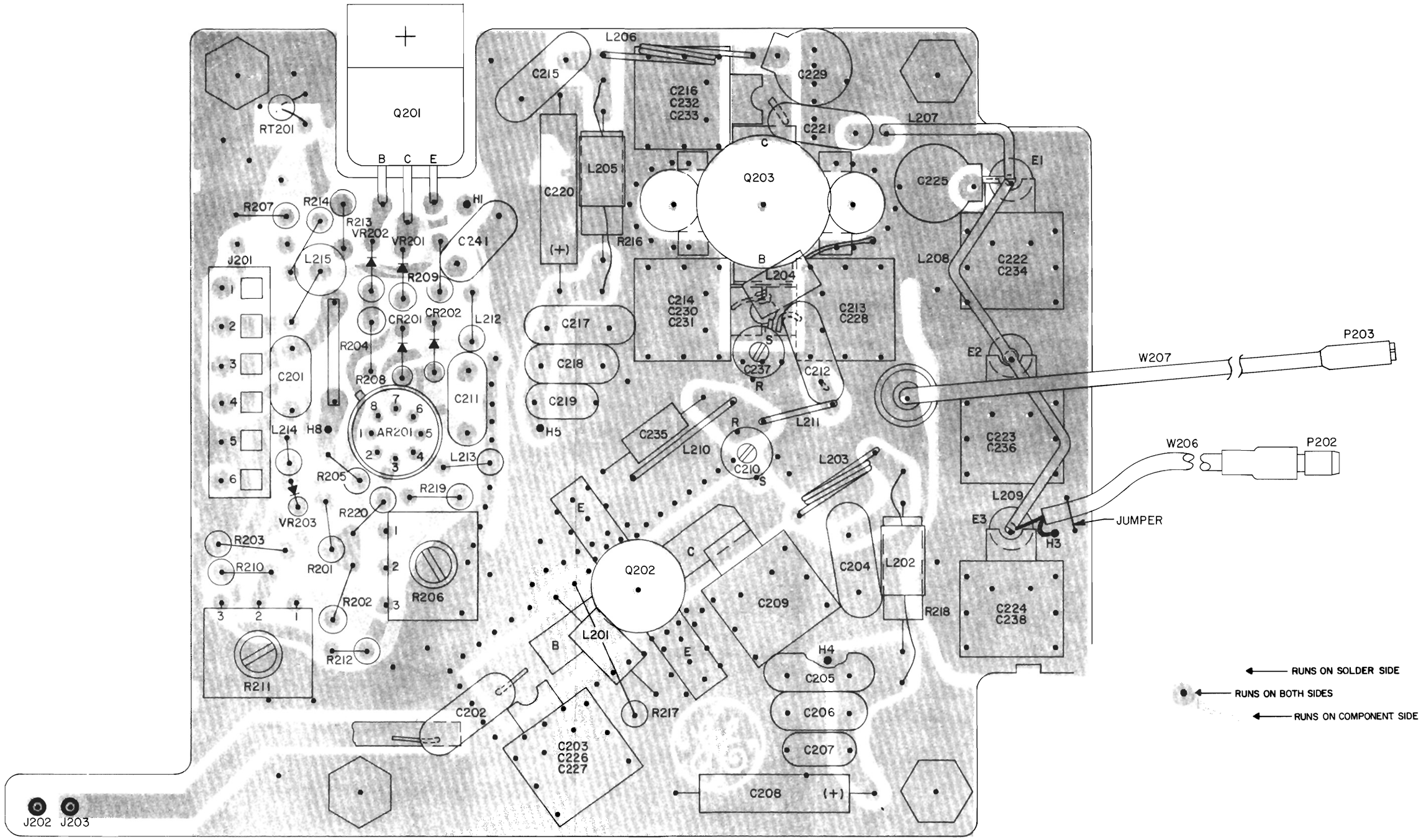
(19B632122, Rev. 4)

SCHEMATIC DIAGRAM

406—512 MHz EXCITER BOARD

POWER AMPLIFIER

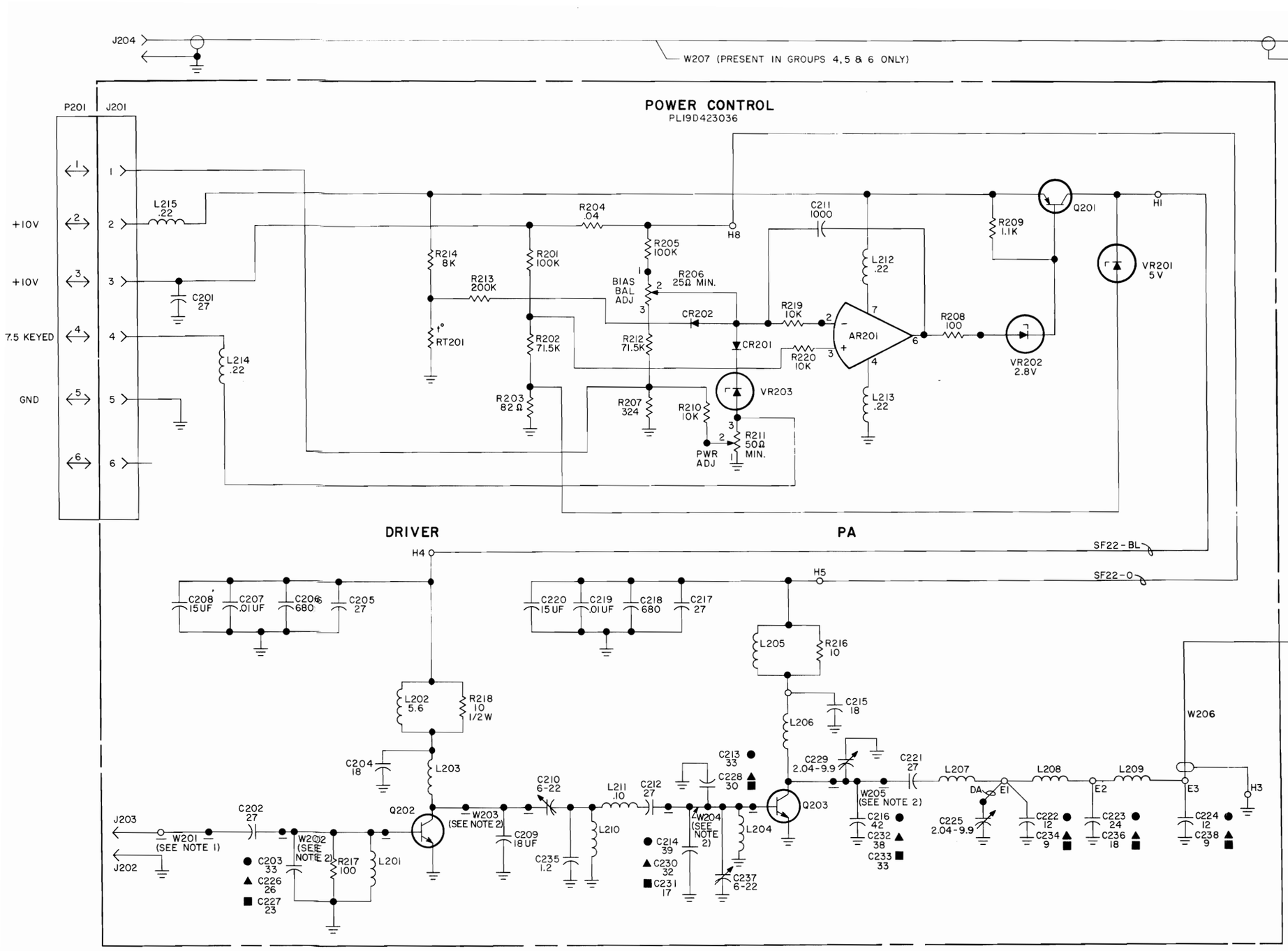
19D423036



OUTLINE DIAGRAM

406—512 MHz POWER AMPLIFIER

(19D424033, Rev. 2)
(19D417675, Sh. 2, Rev. 4)
(19D417675, Sh. 3, Rev. 4)



NOTES:

1. 50 OHM MICROSTRIP PART OF P.W.B.
2. PART OF P.W.B.
3. ● 406-420 MHZ
   ▲ 450-470 MHZ
   ■ 470-512 MHZ

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS

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.

MODEL NO	REV LETTER
PLI19D42303661	
PLI19D42303662	
PLI19D42303663	
PLI19D42303664	
PLI19D42303665	
PLI19D42303666	

(19D423037, Rev. 4)

SCHEMATIC DIAGRAM

406—512 MHz
POWER AMPLIFIER

Issue 1

PARTS LIST

LBI-30086A

TRANSMITTER
KT-131-A/B

SYMBOL	GE PART NO.	DESCRIPTION
		EXCITER BOARD 19D417887G1 406-470 MHz 19D417887G2 470-512 MHz
A101	19C320092G1	Audio Transmitter.
A102	19C320000G1	Oscillator Compensator.
A103	19C320084G1	Modulator.
		- - - - - - - - OSCILLATOR MODULES - - - - - - - -
		NOTE: When reordering A104-A115, give GE Part Number and specify exact frequency needed.
		Crystal Freqs Xx 34
A104 thru A115	4E227A11	Oscillator Module.
		- - - - - - - - - CAPACITORS - - - - - - - - -
C101	5491674P1	Tantalum: 1.0 µf ±40% -20%, 10 VDCW; sim to Sprague Type 162D.
C102	5491674P42	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 162D.
C105	5491601P120	Phenolic: 1.0 pf ±5%, 500 VDCW.
C106	19C307102P19	Tantalum: 68 µf ±20%, 4 VDCW.
C107	19A116114P8065	Ceramic: 100 pf ±5%, 100 VDCW; temp coef -1500 PPM.
C108	19A116080P101	Polyester: 0.01 µf ±10%, 50 VDCW.
C109	5491674P30	Tantalum: 39 µf ±20%, 10 VDCW; sim to Sprague Type 162D.
C110 thru C114	19A116114P2053	Ceramic: 47 pf ±5%, 100 VDCW; temp coef -80 PPM.
C115	5491601P115	Phenolic: 0.56 pf ±5%, 500 VDCW.
C116	19A116114P2035	Ceramic: 13 pf ±5%, 100 VDCW; temp coef -80 PPM.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR101	5490769P9	Diode, silicon.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - -
J101 thru J103		Connector. (Part of printed board 19B226575G13).
J104	19A130856G2	Connector, printed wiring: 9 contacts; sim to Molex 09-52-3093. (Quantity 2).
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L101	19D209420P105	Coil, RF: 0.22 µh ±10%, 0.14 ohms DC res max; sim to Jeffers 4416-5.
L102	19A127798G2	Coil. Includes:
	19B209436P1	Tuning slug.
L103	19B219527G3	Coil. Includes:
	19B209436P1	Tuning slug.
L104	19B219527G1	Coil. Includes:
	19B209436P1	Tuning slug.
L105 thru L110	19D209420P105	Coil, RF: 0.22 µh ±10%, 0.14 ohms DC res max; sim to Jeffers 4416-5.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - PLUGS - - - - - - - - -
P101	19A116559P72	Connector, printed wiring: 18 contacts.
		- - - - - - - - - RESISTORS - - - - - - - - -
R101	3R152P241J	Composition: 240 ohms ±5%, 1/4 w.
R102	3R151P103J	Composition: 10,000 ohms ±5%, 1/8 w.
R103	19A116412P4	Variable, cermet: 250,000 ohms ±10%, 0.16 w; sim to Helipot Model 62 PF.
R104	3R151P101K	Composition: 100 ohms ±10%, 1/8 w.
		- - - - - - - - VOLTAGE REGULATORS - - - - - - - -
VR101	403688TP5	Silicon, Zener.
		EXCITER MODULE 4E241A10 19D416545G2 406-420 MHz 4E241A11 19D416545G1 450-470 MHz 4E241A12 19D416545G3 470-512 MHz
		- - - - - - - - - CAPACITORS - - - - - - - - -
C101	19A116114P2038	Ceramic: 18 pf ±5%, 100 VDCW; temp coef -80 PPM.
C102	19A116114P2042	Ceramic: 24 pf ±5%, 100 VDCW; temp coef -80 PPM.
C103	19A116192P7	Ceramic: 330 pf ±10%, 50 VDCW; sim to Erie 8101-A050-W5R.
C104	19A116114P8064	Ceramic: 100 pf ±10%, 100 VDCW; temp coef -1500 PPM.
C105	5491674P39	Tantalum: 6.8 µf ±20%, 15 VDCW; sim to Sprague Type 162D.
C106	19A116114P2030	Ceramic: 9 pf ±5%, 100 VDCW; temp coef -80 PPM.
C107	19A116114P1	Ceramic: 1 pf ±10%, 100 VDCW; temp coef 0 PPM.
C108	19A116114P2030	Ceramic: 9 pf ±5%, 100 VDCW; temp coef -80 PPM.
C109	19A116114P24	Ceramic: 7 pf ±5%, 100 VDCW; temp coef 0 PPM.
C110 and C111	19A116114P8064	Ceramic: 100 pf ±10%, 100 VDCW; temp coef -1500 PPM.
C112	19A116114P12	Ceramic: 3.3 pf ±5%, 100 VDCW; temp coef 0 PPM.
C113	19A116114P20	Ceramic: 6 pf ±5%, 100 VDCW; temp coef 0 PPM.
C114	19A116114P12	Ceramic: 3.3 pf ±5%, 100 VDCW; temp coef 0 PPM.
C115	19A116114P2032	Ceramic: 10 pf ±5%, 100 VDCW; temp coef -80 PPM.
C116	19A116114P2044	Ceramic: 27 pf ±5%, 100 VDCW; temp coef -80 PPM.
C117	19A116114P2062	Ceramic: 82 pf ±5%, 100 VDCW; temp coef -80 PPM.
C118	19A116114P2044	Ceramic: 27 pf ±5%, 100 VDCW; temp coef -80 PPM.
C119	19A116149P2	Variable: 4.5 to 15 pf, 63 VDCW, temp coef -75 PPM.
C120	19A116114P2033	Ceramic: 12 pf ±5%, 100 VDCW; temp coef -80 PPM.
C121	19A116114P2044	Ceramic: 27 pf ±5%, 100 VDCW; temp coef -80 PPM.
C122	19A116192P1	Ceramic: 0.01 µf ±20%, 50 VDCW; sim to Erie 8121-A000-W5R.
C123 and C124	19A116114P2044	Ceramic: 27 pf ±5%, 100 VDCW; temp coef -80 PPM.
C125	19A116149P2	Variable, ceramic: 4.5 to 15 pf, 63 VDCW, temp coef -75 PPM.
C126	19A116192P1	Ceramic: 0.01 µf ±20%, 50 VDCW; sim to Erie 8121-A050-W5R.
C127	19A116114P2044	Ceramic: 27 pf ±5%, 100 VDCW; temp coef -80 PPM.
C128 and C129	19A116149P1	Variable: 3 to 8 pf, 63 VDCW, temp coef -75 PPM.
C130	19A116114P2033	Ceramic: 12 pf ±5%, 100 VDCW; temp coef -80 PPM.
C131	19A116192P2	Ceramic: 470 pf ±20%, 50 VDCW; sim to Erie 8111-A050-W3R.
C132	19A116114P16	Ceramic: 4.7 pf ±5%, 100 VDCW; temp coef 0 PPM.
C133	19A116114P4	Ceramic: 1.5 pf ±5%, 100 VDCW; temp coef 0 PPM.
C134	19A116114P12	Ceramic: 3.3 pf ±5%, 100 VDCW; temp coef 0 PPM.

SYMBOL	GE PART NO.	DESCRIPTION
C135	19A116114P2042	Ceramic: 24 pf ±5%, 100 VDCW; temp coef -80 PPM.
C136	19A116114P8	Ceramic: 2.2 pf ±5%, 100 VDCW; temp coef 0 PPM.
C138	19A116114P8064	Ceramic: 100 pf ±5%, 100 VDCW; temp coef -1500 PPM.
C140	19A116114P2036	Ceramic: 15 pf ±5%, 100 VDCW; temp coef -80 PPM.
C141	19A116114P2033	Ceramic: 12 pf ±5%, 100 VDCW; temp coef -80 PPM.
C142	19A116114P2142	Ceramic: 24 pf ±5%, 100 VDCW; temp coef -80 PPM.
C143	19A116114P2020	Ceramic: 6 pf ±5%, 100 VDCW; temp coef -80 PPM.
C145	19A116114P2060	Ceramic: 75 pf ±5%, 100 VDCW; temp coef -80 PPM.
C146	19A116114P2042	Ceramic: 24 pf ±5%, 100 VDCW; temp coef -80 PPM.
C147	19A116114P22	Ceramic: 6.8 pf ±5%, 100 VDCW; temp coef 0 PPM.
C148	19A116192P1	Ceramic: 0.01 µf ±20%, 50 VDCW; sim to Erie 8121-A050-W5R.
C149 and C150	19A116149P2	Variable: 4.5 to 15 pf, 63 VDCW, temp coef -75 PPM.
C151	19A116114P6050	Ceramic: 39 pf ±5%, 100 VDCW; temp coef -470 PPM.
C152	19A116114P2033	Ceramic: 12 pf ±5%, 100 VDCW; temp coef -80 PPM.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L101	19B209420P114	Coil, RF: 1.20 µh ±10%, 0.18 ohms DC res max; sim to Jeffers 4436-1.
L102	19B209420P125	Coil, RF: 10.0 µh ±10%, 3.10 ohms DC res max; sim to Jeffers 4446-4.
L103	19B209420P114	Coil, RF: 1.20 µh ±10%, 0.18 ohms DC res max; sim to Jeffers 4436-1.
L104	19B209420P101	Coil, RF: 0.10 µh ±10%, 0.08 ohms DC res max; sim to Jeffers 4416-1.
L105	19B219526G1	Coil. Includes:
	19A127805P1	Tuning slug.
L106	19B209420P114	Coil, RF: 1.20 µh ±10%, 0.18 ohms DC res max; sim to Jeffers 4436-1.
L107	19B209420P105	Coil, RF: 0.22 µh ±10%, 0.14 ohms DC res max; sim to Jeffers 4416-5.
L108	19B219534P1	Coil.
L109	19B209420P109	Coil, RF: 0.47 µh ±10%, 0.34 ohms DC res max; sim to Jeffers 4426-2.
L110	19A129251P1	Coil.
L111	19B219525P1	Coil.
L112	19B209420P125	Coil, RF: 10.0 µh ±10%, 3.10 ohms DC res max; sim to Jeffers 4446-4.
L113	19A129230G1	Coil.
L114	19A129250P1	Coil.
L115	19A129231P1	Coil.
L116 and L117	19B209420P114	Coil, RF: 1.20 µh ±10%, 0.18 ohms DC res max; sim to Jeffers 4436-1.
L118 and L119	19A129247P1	Coil.
L120	19B209420P114	Coil, RF: 1.20 µh ±10%, 0.18 ohms DC res max; sim to Jeffers 4436-1.
L121	19B219526G2	Coil. Includes:
	19B209436P1	Tuning slug.
L122	19A129230G2	Coil.
L123	19B219566P1	Coil.
L124	19A129230G3	Coil.
		- - - - - - - - - PLUGS - - - - - - - - -
P101 thru P105	19A115834P4	Contact, electrical: sim to AMP 2-332070-9.
		- - - - - - - - TRANSISTORS - - - - - - - -
Q101 thru Q104	19A116201P3	Silicon, NPN.

SYMBOL	GE PART NO.	DESCRIPTION
Q105	19B227818G5	Silicon, NPN.
Q106 thru Q108	19A116201P3	Silicon, NPN.
		- - - - - - - - - RESISTORS - - - - - - - - -
R101	3R151P471K	Composition: 470 ohms ±10%, 1/8 w.
R102 and R103	3R151P100K	Composition: 10 ohms ±10%, 1/8 w.
R104	3R151P431J	Composition: 430 ohms ±5%, 1/8 w.
R105	3R151P150K	Composition: 15 ohms ±10%, 1/8 w.
R106	3R151P101K	Composition: 100 ohms ±10%, 1/8 w.
R107	19A116070P16	Composition: 4.7 ohms ±5%, 1/4 w.
R108	3R151P150K	Composition: 15 ohms ±10%, 1/8 w.
R109	3R151P820K	Composition: 82 ohms ±10%, 1/8 w.
R110	3R151P101K	Composition: 100 ohms ±10%, 1/8 w.
R111	3R151P100K	Composition: 10 ohms ±10%, 1/8 w.
R112	3R151P120K	Composition: 12 ohms ±10%, 1/8 w.
R113	3R151P101K	Composition: 100 ohms ±10%, 1/8 w.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T101	19B219527G2	Coil.
T102	19B219533G2	Coil.
T103	19B219533G1	Coil.
		PA BOARD 19D423039G1 406-420 MHz PORTABLE 19D423039G2 450-470 MHz PORTABLE 19D423039G3 470-512 MHz PORTABLE 19D423039G4 406-420 MHz MOTORCYCLE 19D423039G5 450-470 MHz MOTORCYCLE 19D423039G6 470-512 MHz MOTORCYCLE
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
AR201	19A116297P2	Linear with TO-99 Case, operational amplifier.
		- - - - - - - - - CAPACITORS - - - - - - - - -
C201 and C202	19A116656P27G1	Ceramic disc: 27 pf ±0.25 pf, 500 VDCW, temp coef -150 PPM.
C203	19A116952P33	Metallized teflon: 33 pf ±2%, 250 VDCW; sim to Underwood Type J18F.
C204	748916299	Silver mica: 18 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C205	19A116656P27G1	Ceramic disc: 27 pf ±0.25 pf, 500 VDCW, temp coef -150 PPM.
C206	5494481P109	Ceramic disc: 680 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C207	19A116080P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C208	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C209	19A116952P18	Metallized teflon: 18 pf ±0.5 pf, 250 VDCW; sim to Underwood Type J18F.
C210	19A116149P3	Variable: 6 to 22 pf, 63 VDCW, temp coef -1500 PPM.
C211	19A116655P19	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C212	19A116656P27G1	Ceramic disc: 27 pf ±0.25 pf, 500 VDCW, temp coef -150 PPM.
C213	19A116952P33	Metallized teflon: 33 pf ±2%, 250 VDCW; sim to Underwood Type J18F.
C214	19A116952P39	Metallized teflon: 39 pf ±2%, 250 VDCW; sim to Underwood Type J18F.
C215	748916299	Silver mica: 18 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C216	19A116952P42	Metallized teflon: 42 pf ±2%, 250 VDCW; sim to Underwood Type J18F.
C217	19A116656P27G1	Ceramic disc: 27 pf ±0.25 pf, 500 VDCW, temp coef -150 PPM.

SYMBOL	GE PART NO.	DESCRIPTION
C218	5494481P109	Ceramic disc: 680 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C219	19A116080P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C220	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C221	19A116656P27G1	Ceramic disc: 27 pf ±0.25 pf, 500 VDCW, temp coef -150 PPM.
C222	19A116952P12	Metallized teflon: 12 pf ±0.5 pf, 250 VDCW; sim to Underwood Type J18F.
C223	19A116952P24	Metallized teflon: 24 pf ±0.5 pf, 250 VDCW; sim to Underwood Type J18F.
C224	19A116952P12	Metallized teflon: 12 pf ±0.5 pf, 250 VDCW; sim to Underwood Type J18F.
C225	19B209544P3	Variable, air: 1.56 to 4.86 pf, 250 VDCW; sim to E. F. Johnson Type T 187-0109-005.
C226	19A116952P26	Metallized teflon: 26 pf ±2%, 250 VDCW; sim to Underwood Type J18F.
C227	19A116952P23	Metallized teflon: 23 pf ±0.5 pf, 250 VDCW; sim to Underwood Type J18F.
C228	19A116952P30	Metallized teflon: 30 pf ±2%, 250 VDCW; sim to Underwood Type J18F.
C229	19B209544P3	Variable, air: 1.56 to 4.86 pf, 250 VDCW; sim to E. F. Johnson Type T 187-0109-005.
C230	19A116952P32	Metallized teflon: 32 pf ±2%, 250 VDCW; sim to Underwood Type J18F.
C231	19A116952P17	Metallized teflon: 17 pf ±0.5 pf, 250 VDCW; sim to Underwood Type J18F.
C232	19A116952P38	Metallized teflon: 38 pf ±2%, 250 VDCW; sim to Underwood Type J18F.
C233	19A116952P33	Metallized teflon: 33 pf ±2%, 250 VDCW; sim to Underwood Type J18F.
C234	19A116952P9	Metallized teflon: 9 pf ±0.5 pf, 250 VDCW; sim to Underwood Type J18F.
C235	5491601P122	Phenolic: 1.1 pf ±5%, 500 VDCW.
C236	19A116952P18	Metallized teflon: 18 pf ±0.5 pf, 250 VDCW; sim to Underwood Type J18F.
C237	19A116149P3	Variable: 6 to 22 pf, 63 VDCW, temp coef -1500 PPM.
C238	19A116952P9	Metallized teflon: 9 pf, 0.5 pf, 250 VDCW; sim to Underwood Type J18F.
C239	19A116149P1	Variable: 3 to 8 pf, 63 VDCW, temp coef -75 PPM.
C240	19A116952P24	Metallized teflon: 24 pf, 0.5 pf, 250 VDCW; sim to Underwood Type J18F.
C241*	19A116656P27G1	Ceramic disc: 27 pf ±2%, 500 VDCW, temp coef -150 PPM. Added by REV A.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR201 and CR202	19A115250P1	Silicon.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L201 and L202	19A129773G2	Coil.
L203	19A130418P2	Coil.
L204 and L205	19A129773G2	Coil.
L206	19A130418P1	Coil.
L207	19A130422P1	Coil.
L208	19A130421P1	Coil.
L209		(Part of L204).
L210	19A130419P1	Coil.
L211	19A130420P1	Coil.
L212 thru L214	19B209420P105	Coil, RF: 0.22 µh ±10%, 0.14 ohms DC res max; sim to Jeffers 4416-5.
L215	748807SP2	Choke, RF: 6.22 µh ±20%, 0.04 ohms DC res max; sim to Jeffers 4411-2.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J201	19A130856G1	Connector, printed wiring: 6 contacts; sim to Molex 09-52-3063.
J202 and J203	19A116366P6	Contact, electrical: sim to Concord 10-891-2.
		- - - - - - - - - PLUGS - - - - - - - - -
P201	19A116656P71	Connector, printed wiring: 6 contacts.
		- - - - - - - - TRANSISTORS - - - - - - - -
Q201	19A116942P1	Silicon, PNP.
Q202	19A134173P1	Silicon, NPN.
Q203	19A134171P1	Silicon, NPN.
Q204	19A134171P3	Silicon, NPN.
		- - - - - - - - - RESISTORS - - - - - - - - -
R201	19C314256P21003	Metal film: 100,000 ohms ±1%, 1/4 w.
R202	19C314256P27152	Metal film: 71,500 ohms ±1%, 1/4 w.
R203	3R152P82KJ	Composition: 82 ohms ±5%, 1/4 w.
R204		Resistor. Includes:
	19A134225P1	Wirewound, manganin: wire size No. 22 AWG.
	403859395	Insulated sleeving.
R205	19C314256P21003	Metal film: 100,000 ohms ±1%, 1/4 w.
R206	19A116559P106	Variable, cermet: 10,000 ohms ±20%, .5 w; sim to CTS Series 360.
R207	19C314256P23240	Metal film: 324 ohms ±1%, 1/4 w.
R208*	3R152P470J	Composition: 47 ohms ±5%, 1/4 w. Earlier than REV A:
	3R152P103J	Composition: 100 ohms ±5%, 1/4 w.
R209	3R152P132J	Composition: 1300 ohms ±5%, 1/4 w.
R210	19C314256P21002	Metal film: 10,000 ohms ±1%, 1/4 w.
R211	19A116559P102	Variable, cermet: 5000 ohms ±20%, .5 w sim to CTS Series 360.
R212	19C314256P27152	Metal film: 71,500 ohms ±1%, 1/4 w.
R213	3R152P204J	Composition: 200,000 ohms ±5%, 1/4 w.
R214	19C314256P28061	Metal film: 8060 ohms ±1%, 1/4 w.
R216	3R77P100K	Composition: 10 ohms ±10%, 1/2 w.
R217	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R218	3R77P100K	Composition: 10 ohms ±10%, 1/2 w.
R219 and R220	3R152P103K	Composition: 10,000 ohms ±10%, 1/4 w.
		- - - - - - - - - THERMISTORS - - - - - - - - -
RT201	19C300048P6	Disc: 50,000 ohms ±10%; sim to NL Ind. 4D163.
		- - - - - - - - VOLTAGE REGULATORS - - - - - - - -
VR201	403688TP55	Silicon, Zener.
VR202	403688TP1	Silicon, Zener.
VR203	403688TP2	Silicon, Zener.
		- - - - - - - - - - CABLES - - - - - - - - - -
W201 thru W205		(Part of printed board 19D417675P1).
W206	19A130433G2	Cable assembly, RF: coaxial; sim to Solitron/ Microwave 8100-0003. Includes (P202).
W207	19A130432G4	Cable assembly, RF: coaxial; sim to Solitron/ Microwave 8120-0003. Include J204 and P203.
		ASSOCIATED ASSEMBLIES
		COMPRESSOR KIT 19A130409G1
A116	19C311907G2	Audio Compressor.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C117 and C118	5491674P1	Tantalum: 1.0 µf ±40-20%, 10 VDCW; sim to Sprague Type 162D.
C119	5491674P36	Tantalum: 3.3 µf ±20%, 10 VDCW; sim to Sprague Type 162D.
C120	19A116192P2	Ceramic: 470 pf ±20%, 50 VDCW; sim to Erie 8111-A050-W5R-471K.
C121	19A116192P1	Ceramic: 0.01 µf ±20%, 50 VDCW; sim to Erie 8121 SPECIAL.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R105	3R151P103J	Composition: 10,000 ohms ±5%, 1/8 w.
R106	3R151P101J	Composition: 100 ohms ±5%, 1/8 w.
R107	3R151P153J	Composition: 15,000 ohms ±5%, 1/8 w.
R108	3R151P433J	Composition: 43,000 ohms ±5%, 1/8 w.
		CAPACITOR KIT 19A130374G1 406-420 MHz 19A130374G2 450-470 MHz
		- - - - - - - - - - CAPACITORS - - - - - - - -
C103	19A116114P2044	Ceramic: 27 pf ±5%, 100 VDCW; temp coef -80 PPM.
C104	19A116114P2038	Ceramic: 18 pf ±5%, 100 VDCW; temp coef -80 PPM.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19C311491P3	Can, vertical. (Used with A101-A103).
	19B216869G2	Can. (Located next to A102 and A103).
	19A129245P1	Nut: thd. size No. 8-32. (Used with Q105).
	4035306P11	Washer, fiber: 1/8 dia. (Used with Q101-Q104, Q106-Q108).
	19C320692G1	Back cover. KT-131-A.
	19D423486G1	Back cover. KT-131-B.
	19B226408P1	Nut: thd. size No. 8-32. (Used with Q202).
	19A116022P1	Insulator, bushing. (Used with Q201).
	19A116023P1	Insulator, plate. (Used with Q201).
	19B226409P2	Spacer. (Used to secure PA Board to cover).
	403257P24	Gasket. (Located on back cover).

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 - 4EF414A10, 11 & 12

To incorporate a new trimmer capacitor. Changed C129, C129, C149 and C150.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

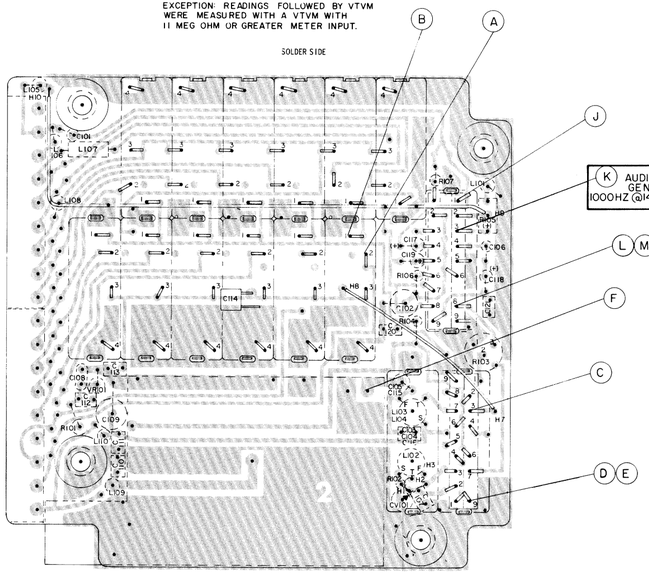
STEP 1- QUICK CHECKS

SYMPTOM	QUICKCHECK
No Power Output	1. Check the current drain. 2. If the current is approximately normal or higher, check the antenna relay, internal/external antenna switch, PA board coaxial cable output connector, or transmitter alignment. 3. If current is much lower than normal check, all of the above; check to see that transmitter is plugged properly to system (i.e, that all pins are in the proper holes). Check for proper voltages to exciter board and PA board.
Low Power Output	1. Low battery voltage (refer to Battery Checks in Maintenance Manual LBI-30083). 2. Check the transmitter alignment. 3. As heat sink temperature increases power out decreases. Check the heat sink for excessive heat. The thermal cutback feature will cut the transmitter off altogether if the heat sink temperature is greater than approximately 70°C.
Distorted or no audio with normal RF output	1. Check voltage readings at (J), (K), (L), and (M). 2. Improper setting of Mod Adjust R103. 3. Check Mod coil L103/L104. 4. Shorted C102 or C106. 5. Bad microphone.
No reading at TP1	Check voltage readings at (A), (B), (D), (E) and (F).

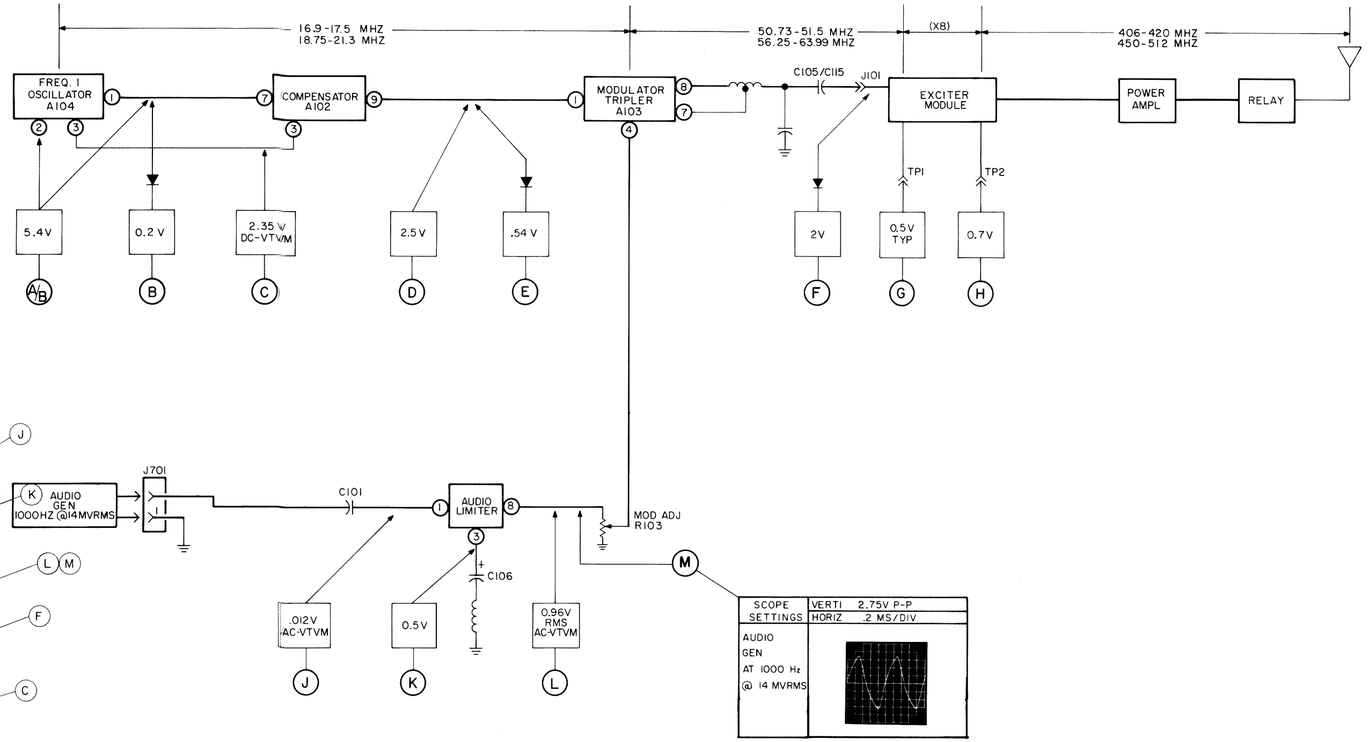
STEP 2 - TYPICAL VOLTAGE READINGS

DC READINGS MADE WITH GE TEST SET MODEL 4EX3A10 OR EQUIVALENT. READINGS SHOWN IN SERIES WITH A DIODE ARE RF READINGS TAKEN WITH RF PROBE 19C311370-G1 AND TEST SET MODEL 4EX3A10 ON 3 VOLT SCALE.

EXCEPTION: READINGS FOLLOWED BY VTVM WERE MEASURED WITH A VTVM WITH 11 MEG OHM OR GREATER METER INPUT.



(19D424006, Rev. 2)
(19D417680, Sh. 2, Rev. 2)
(RC-2944, Rev. 0)



RC-2956

END OF DOCUMENT