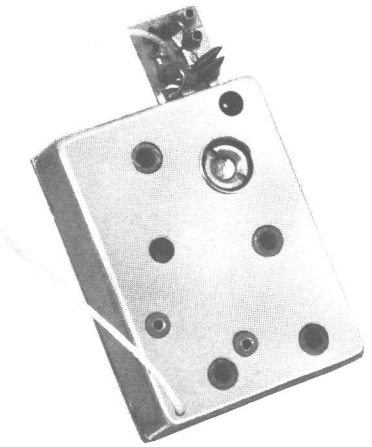
MOBILE RADIO

MASTR Personal Series
PROGRESS LINE

PE MODELS
66-88 MHz, 2 WATT TRANSMITTER TYPE KT-127-A



KT-127-A

SPECIFICATIONS *

Type Numbers	KT-127-A
Power Output	2 Watts
Modulation Deviation	0 to ±5 kHz
Spurious Conducted	Less than -70 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 10%
Crystal Multiplication Factor	6
RF Load Impedance	50 ohms
Modulation Sensitivity	2 millivolts
Maximum Frequency Spacing	0.4% of highest frequency no degradation
	1.0% 1 dB degradation in power output

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

GENERAL ELECTRIC

TABLE OF CONTENTS

ILLUSTRATIONS

WARNING

No one should be permitted to handle any portion of the equipment that is supplied with voltage or RF power; or to connect any external apparatus to the units while the units are supplied with power. KEEP AWAY FROM LIVE CIRCUITS.

DESCRIPTION

Transmitter Type KT-127-A is a crystal controlled, phase modulated transmitter for one- through eight-frequency operation in the 66-88 MHz band. The transmitters utilize both discrete components and Integrated Circuit Modules (IC's) consisting of audio amplifier module A1, 5.4 regulator module A2, compensator module A3, modulator module A4, oscillator modules A5 through A12 and Exciter/PA module 19D423332G1 or G2. The Exciter/PA module provides an RF power output of over two watts. All of the transmitter modules are mounted on the system board. Supply voltages for the transmitter are provided by the battery and Regulator. The different transmitter voltages are shown in the following chart:

Voltage	Used for:
Continuous 7.5 Volts	Regulator module
Keyed 7.5 Volts	Regulator 5.4-Volt keying, Exciter/PA module
Keyed 5.4 Volts	Compensator, Oscillator, Audio and Modulator modules, and optional Compressor module.

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

CIRCUIT ANALYSIS

REGULATOR A2

The regulator module operates from the 7.5-Volt from the battery, and provides a continuous, regulated 5.4 Volts and a switched 5.4 Volts for operating the transmitter, receiver and tone options. A typical regulator circuit is shown in Figure 2.

Turning on the radio applies the battery voltage to Pin 2 of the Regulator, causing Q2 and then Q1 to conduct. When conducting, the continuous 5.4 Volts at the collector of Q1 is taken from Pin 4 and applied to the receiver Compensator and Oscillator module.

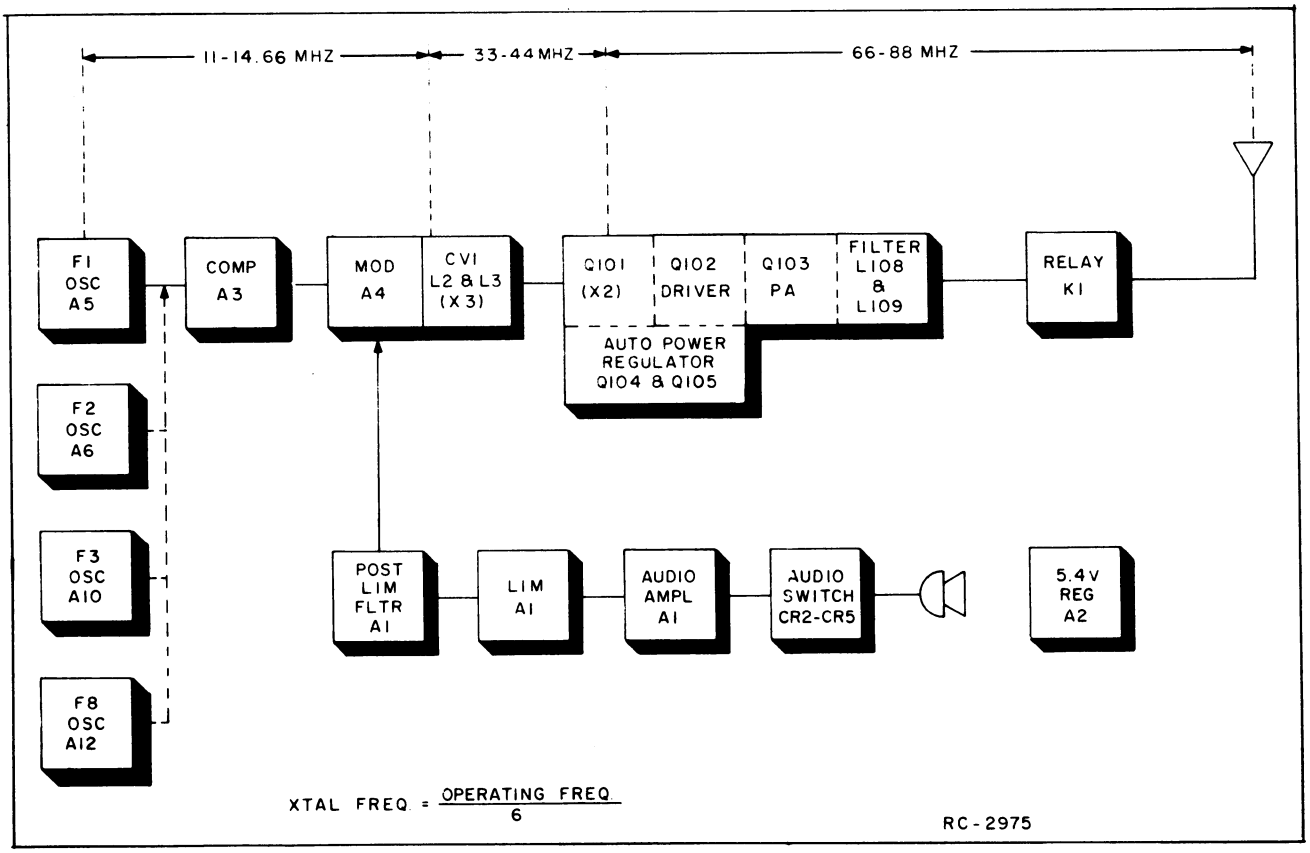


Figure 1 - Transmitter Block Diagram

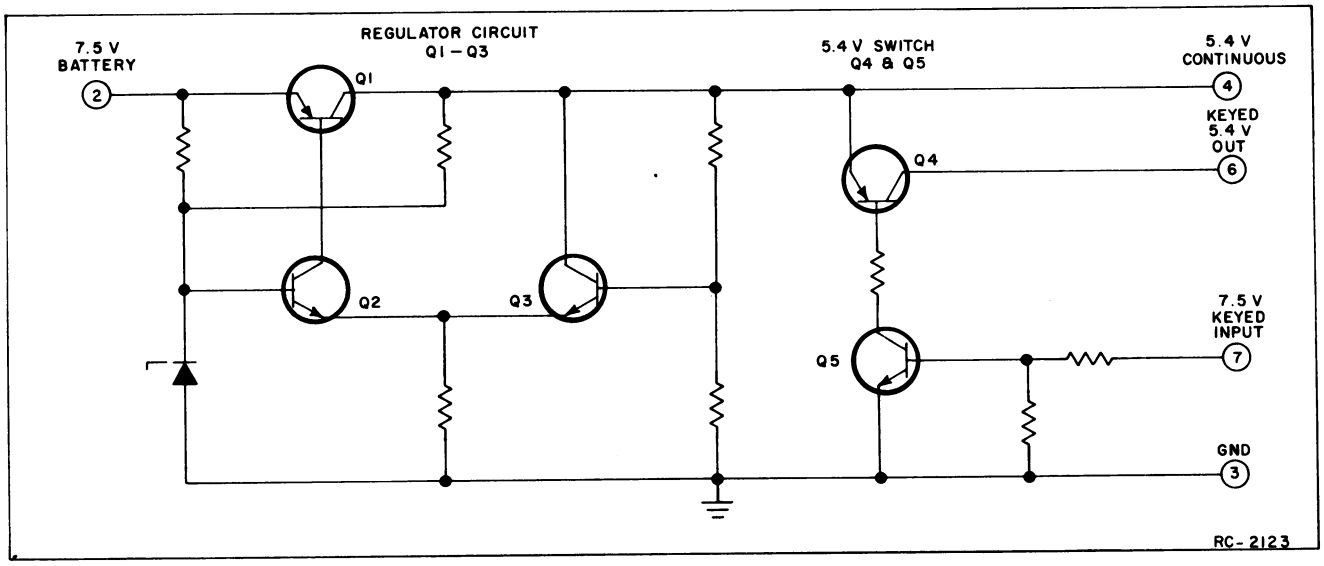


Figure 2 - Typical Regulator Circuit

Regulation is provided by Q2 and Q3, which operate as a differential amplifier. If the output of Q1 starts to increase, Q3 conducts harder, causing Q2 to conduct less. This causes Q1 to conduct less, keeping its output at 5.4 Volts. If the output of Q1 starts to decrease, Q3 conducts less, causing Q2 to conduct harder. This causes Q1 to conduct harder, keeping the output constant.

Q4 and Q5 operate as a DC switch. Keying the transmitter applies the battery voltage to Pin 7 and to the base of Q5, turning it on. This turns on PNP transistor Q4, so that the regulated 5.4 volts at Pin 6 is applied to the transmitter Compensator, Modulator, and audio module, and to the optional Compressor module and multi-frequency switch S1.

OSCILLATOR MODULES

Oscillator Model 4EG27A13 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 11 to 14.66 MHz, and the crystal frequency is multiplied 6 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 A3. A typical oscillator circuit is shown in Figure 3.

In single-frequency transmitters, a jumper from Hole 20 to Hole 21 on the System Board connects the keyed 5.4 Volt supply voltage to the oscillator modules. Keying the transmitter applies the supply voltage to the oscillator, turning it on. The oscillator output is applied to Compensator A3.

In multi-frequency transmitters, additional Oscillator Modules are mounted on the board. The single-frequency supply jumper is removed, and the proper frequency is selected by connecting the keyed 5.4 Volts to the selected oscillator module through frequency selector switch S1 on the control unit.

For Channel Guard applications, tone from the Channel Guard encoder is applied 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 A3

Compensator module A3 contains a buffer-amplifier, and the temperature compensating network for the oscillator. A typical Compensator circuit is shown in Figure 4.

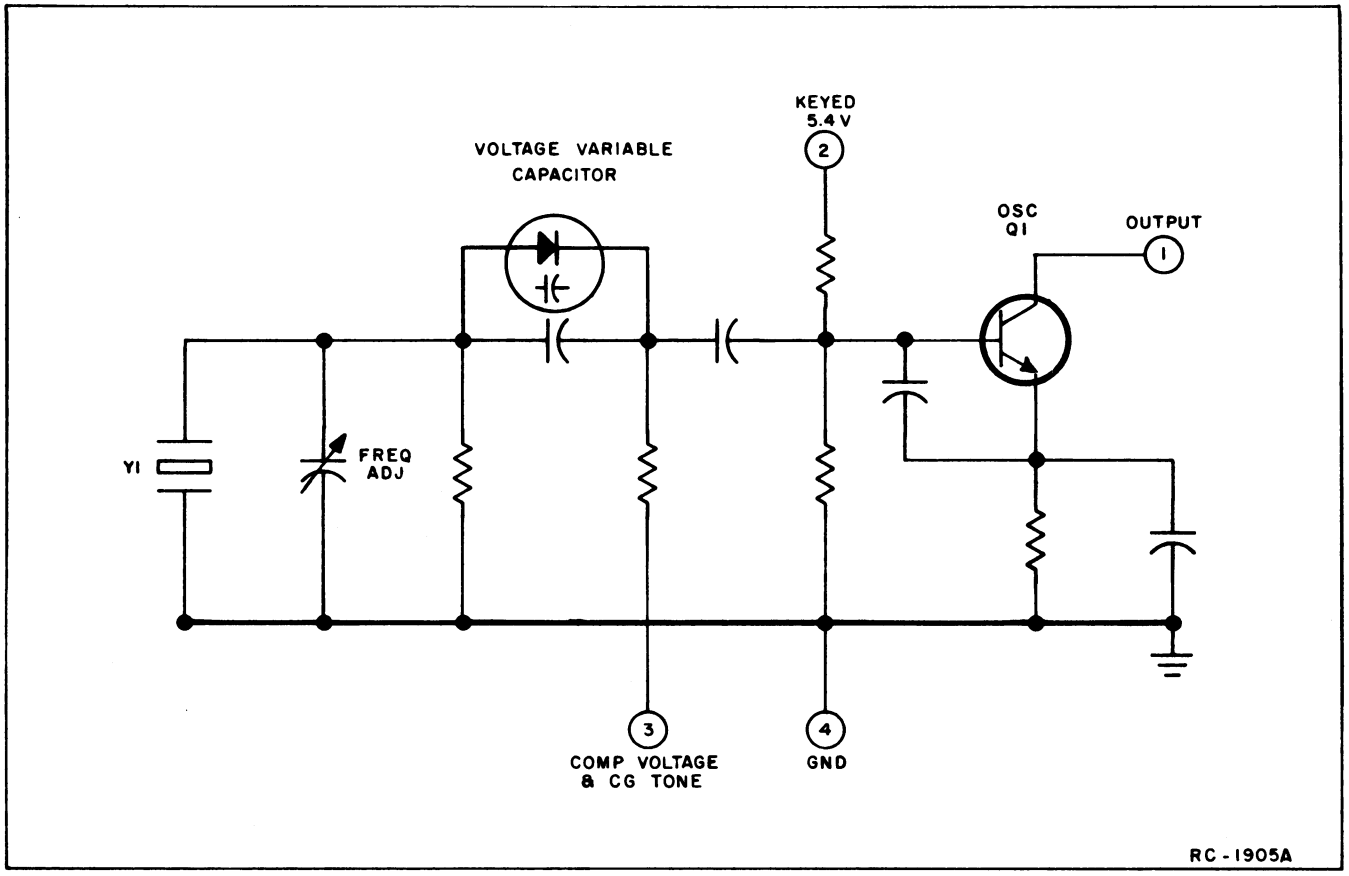


Figure 3 - Typical Oscillator Circuit

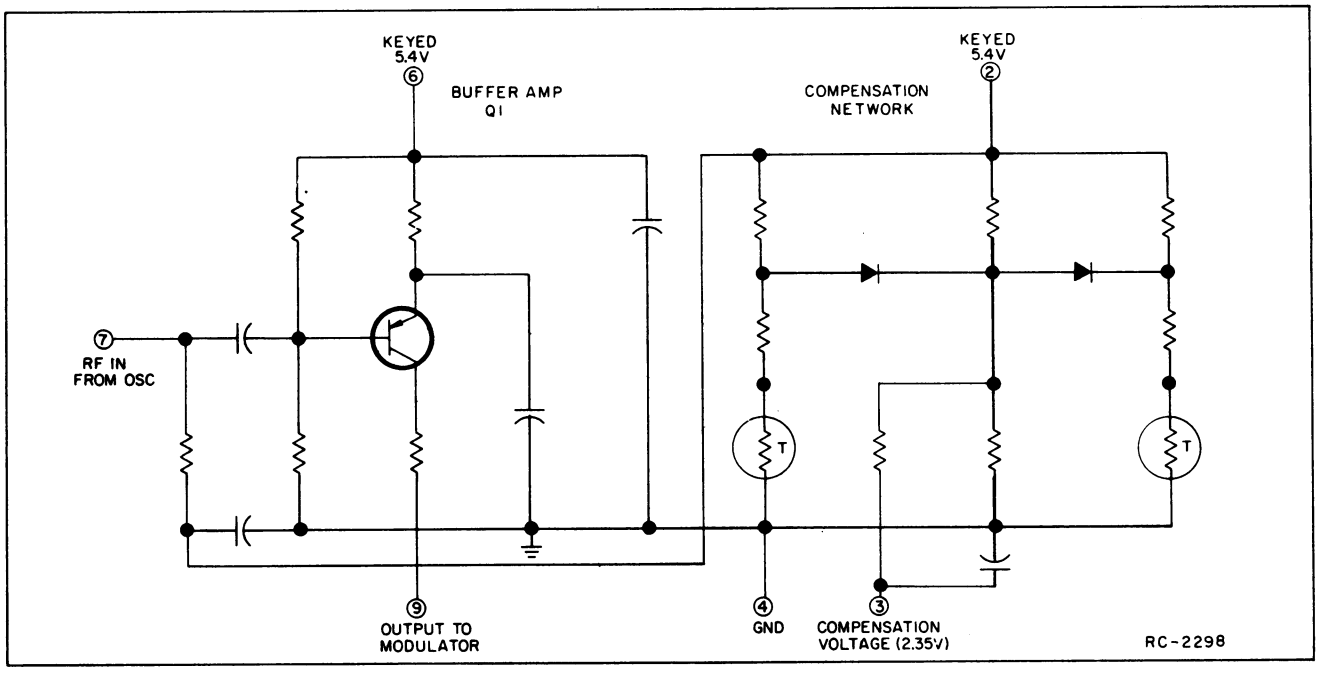


Figure 4 - Typical Compensator Circuit

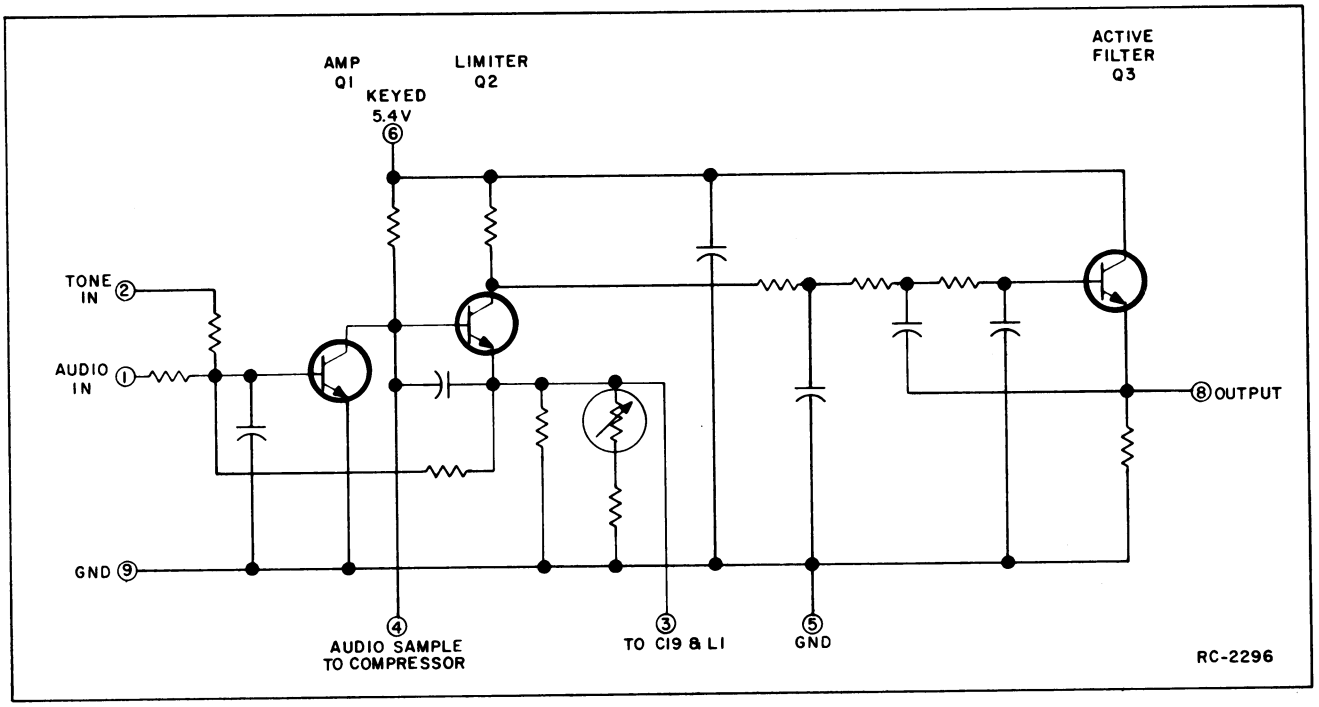


Figure 5 - Typical Audio Amplifier and Limiter Circuit

RF from the oscillator at Pin 7 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 the modulator.

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 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 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 AND LIMITER A1

Audio from the microphone is coupled through the audio switching circuit to Pin 1 and then to the base of audio amplifier Q1 (see Figure 5). In Type 90 encoder applications, the encode tone is applied to the amplifier at Pin 2.

The amplifier output is applied directly to the transistorized limiter stage (Q2). Following the limiter is a combined post-limiter filter and de-emphasis network. Q3 operates as an active filter. The filter output at Pin 8 is coupled through Mod Adjust potentiometer R8 to the Modulator module A4.

When the Audio Compressor option is used, audio from the microphone is coupled through the compressor and then applied to the audio amplifier stage. An audio sample from the collector of amplifier Q1 is connected from Pin 4 to the compressor circuit, keeping the audio output to the modulator constant.

PHASE MODULATOR

The phase modulator circuit consists of Modulator A4, voltage-variable capacitor CV1 and tuneable coil L2. CV1 and L2 are mounted on the system board. A typical modulator circuit is shown in Figure 6.

With CV1 in series with L2, the network appears as a series-resonant circuit when RF from the oscillator is applied to Pin 1. Applying audio from Audio Limiter A1 to Pin 4 of Modulator A4 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

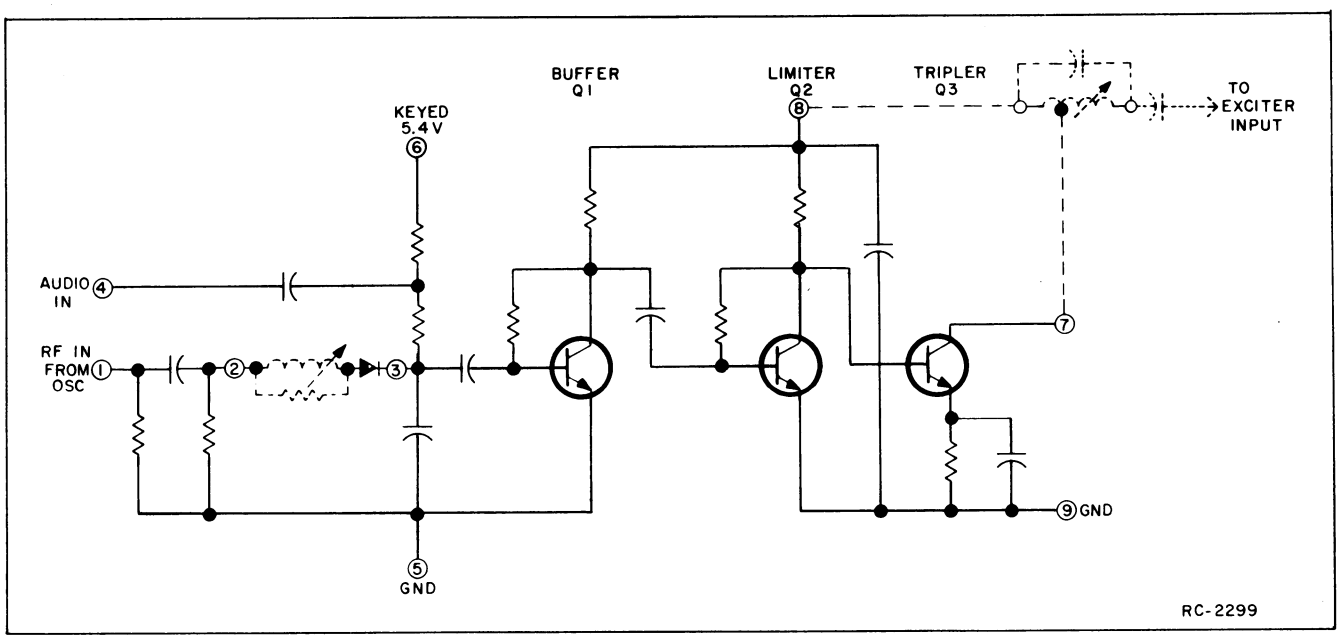


Figure 6 - Typical Phase Modulator Circuit

amplification. Following the buffer stage is tripler Q2. The output of Q2 is coupled through L3 (on the System Board) to the exciter module. L3 is tuned to three times the crystal frequency.

EXCITER/PA

The Exciter/PA module consists of a doubler, driver, power amplifier, matching network, low pass filter and an Automatic Power Level Control (APLC) circuit.

The modulator output is coupled through T101 to the base of 1st doubler Q101. The 1st doubler stage as well as the modulator stage is metered at TP1. The 1st doubler output is coupled through T102 and impedance matching network C105/C106, C107 and L110 to the base of driver Q2. T102 is tuned to six times the crystal frequency.

Following the driver is an impedance-matching network consisting of C109/C110, C111, C113, C117/C118 and L103. The network matches the high impedance driver output to the low impedance PA input. L103 is tuned to 6 times the crystal frequency.

Doubler Q101, driver Q102 and PA transistor Q103 are tuned by measuring the total current drain of the radio. An ammeter with a one ampere full scale meter is used in series with the radio 7.5-Volt supply. GE Test Regulator Model 4EX19A10 and Test Set Model 4EX3A10 may be used in place of the ammeter.

The output from PA transistor Q103 is coupled through impedance matching network C133/C138, C121/C122, C123/C124, C136, C137/C125, and L107 to Low Pass Filter C126/C127, C128/C129, C130, L108 and L109. The filter output is fed to system switching relay K1, then coupled through a 50-ohm antenna matching network to the antenna.

APLC CIRCUIT

The APLC Circuit (Q104 and Q105) provides a more constant transmitter power output level by controlling the output of doubler transistor Q101. The circuit also extends battery life by regulating the collector current of driver transistor Q102.

When Q102 starts to conduct harder and draw more collector current, the voltage drop across R112 increases, causing transistor Q105 to conduct harder. Transistor Q105 conducting harder increases the voltage at the base of transistor Q104 causing Q104 to conduct less. Transistor Q104 conducting less reduces the collector voltage of doubler transistor Q101. The reduced collector voltage of Q101 reduces the drive to Q102 and Power Transistor Q103. The reduced drive to Q103 reduces the power output level.

When Q102 starts to conduct less and draw less current, the voltage drop across R112 decreases.

The voltage drop across R112 decreasing causes Q105 to conduct less and Q104 to conduct more, increasing the collector voltage to Q101 and the drive to power transistor Q103. The increased drive to Q103 increases the power output level.

MODULATION LEVEL ADJUSTMENT

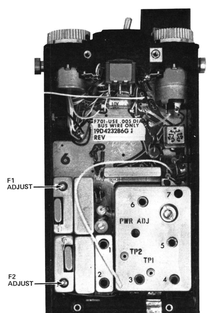
The MOD ADJUST (R8) was adjusted to the proper setting before shipment and should not normally require readjustment. This setting permits approximately 75% modulation for the average voice level. The audio peaks which would cause over-modulation are clipped by the modulation limiter. The limiter, in conjunction with the de-emphasis network, instantaneously limits the slope of the audio wave to the modulator, thereby preventing overmodulation while preserving intelligibility.

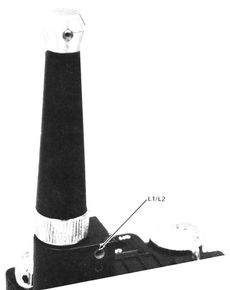
TEST EQUIPMENT

1. Audio oscillator Model 4EX6A10
2. A deviation meter
3. An output meter or a VTVM
4. Test Adaptor Model 4EX12A10

PROCEDURE

1. Connect the equipment as shown in the Test Procedure on the back of this page.
2. Apply a 140 millivolt signal at 1000 Hz to the Test Adaptor. If the Test Adaptor is not used, apply a 14 millivolt signal to Pin 4 (Mike Hi) and Pin 1 of Accessory Jack J701.
3. With the signal applied, adjust Modulation Tuning Control 1 for zero modulation symmetry on the lowest channel frequency.
4. For transmitters without Channel Guard, set MOD ADJUST R8 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 multifrequency transmitters, set the deviation as described in Step 4 on the channel producing the largest amount of deviation.





1 to 2 WATT TRANSMITTER ALIGNMENT (KT-127-A)

EQUIPMENT REQUIRED:

- GE Test Set Model 4EX3A10 (or 4EX8K11) or equivalent 20,000 ohm-per-volt meter.
- GE Test Regulator Model 4EX19A10, or an ammeter capable of measuring one ampere.
- A 50-ohm, terminating wattmeter connected to external antenna jack J702 thru RF adaptor cable 19C317633G2 (Option 4466).
- 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 5 even with the top of the can. When properly aligned, the slugs will be between the top of the can and the coil.
3. Set PWR ADJ fully clockwise.
4. If using Test Set 4EX3A10 and Test Regulator 4EX19A10, connect the Test Set to the metering jack on the Test Regulator. Then connect the Regulator output to J704 on the radio, and set the Regulator for 6 Volts. Switch the Test Set range to the Test 1 position. Place the test selector switch on position "I" to check the supply voltage (read on the 1-Volt scale as 10-Volts full scale). Switch to position "G" for current drain readings (read on the 1-Volt scale as 1 ampere full scale).
5. Test Point meter reading made with (+) meter lead to TP1 and the (-) lead to system ground.
6. All adjustments made with the transmitter keyed.

ALIGNMENT PROCEDURE

STEP	TUNING CONTROL	TYPICAL METER READING	PROCEDURE
1.	1	Maximum mA	Adjust Tuning Control 1 for maximum transmitter current.
2.	2	Minimum mA	Adjust Tuning Control 2 for minimum transmitter current.
3.	3	Maximum TP1 or mA	Adjust Tuning Control 3 for maximum meter reading at TP1 or maximum transmitter current.
4.	4	Maximum mA	Adjust Tuning Control 4 for maximum transmitter current.
5.	5 & 6	Maximum Power Output	Adjust Tuning Controls 5 and 6 for maximum transmitter power output.
6.	7	2.5 Watts	If the power output is greater than 2.5 Watts adjust Tuning Control 7 for 2.5 Watts. If the power output is less than 2.5 Watts adjust Tuning Control 7 for 2.5 Watts or maximum power output.
7.	PWR ADJ.	2 Watts	Adjust PWR ADJ counterclockwise for 2 Watts.
8.			Decrease supply voltage to 6.0 VDC.
9.	1 & 2	Maximum power output or minimum TP2	Adjust Tuning Controls 1 and 2 for maximum power output or minimum reading at TP2.
10.	PWR ADJ.		Turn PWR ADJ clockwise and supply voltage to 7.5 VDC. Retune 5 & 6 if necessary.
11.			Check Step 7.
12.	PWR ADJ.	2.0 Watts	Adjust PWR ADJ for rated RF power output.
		FREQUENCY ADJUSTMENT	
13.			With no modulation, adjust the F1 (and F2 thru F8) crystal trimmer for proper oscillator frequency. 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.
		ANTENNA LOADING	
14.	L1/L2	Maximum Meter reading	With the antenna fully extended, key the transmitter and radiate a signal into the tuning meter. Set L1/L2 for a maximum meter reading starting with the slug at the top of the coil.

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

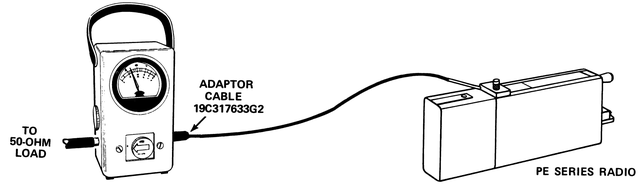
for test hookup shown:

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
5. GE Test Adaptor Model 4EX12A10.

STEP 1
POWER MEASUREMENT

TEST PROCEDURE

A. Connect transmitter output to wattmeter as shown below. GE adaptor cable 19C317633G2 is recommended for accurate power output readings.



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

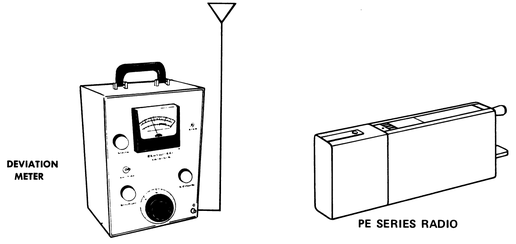
SERVICE CHECK

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 R8 fully counterclockwise.

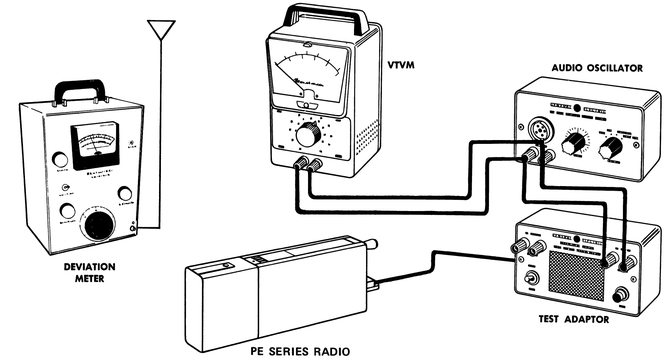
C. Key transmitter and check for approximately 0.75-kHz deviation. If reading is low or high, refer to the Channel Guard Troubleshooting Procedure (see Table of Contents)

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 140 millivolts RMS and frequency to 1 kHz. If the Test Adaptor is not used, set the generator output for 14 millivolts.

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

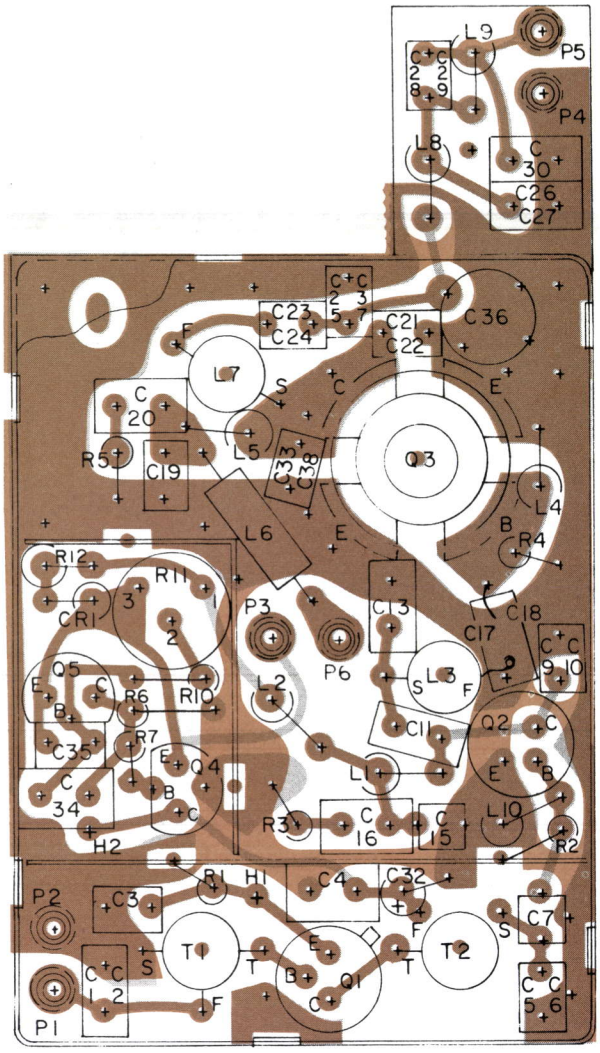
D. Deviation reading should be ±4.5 kHz. If the deviation is not 4.5 kHz, set the deviation as directed on the Transmitter Alignment Procedure (see Table of Contents).

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:

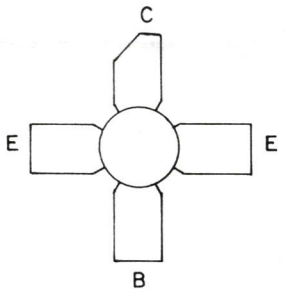
E. Refer to the Modulation Adjustment on the Transmitter Alignment Procedure.

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

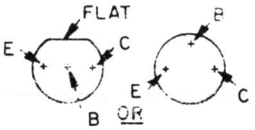


(19C327313, Rev. 0)
(19D417780, Sh. 2, Rev. 0)
(19D417780, Sh. 3, Rev. 0)

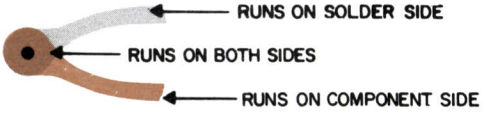
LEAD IDENT
FOR Q3



LEAD IDENTIFICATION
FOR Q1, Q2, Q4, Q5

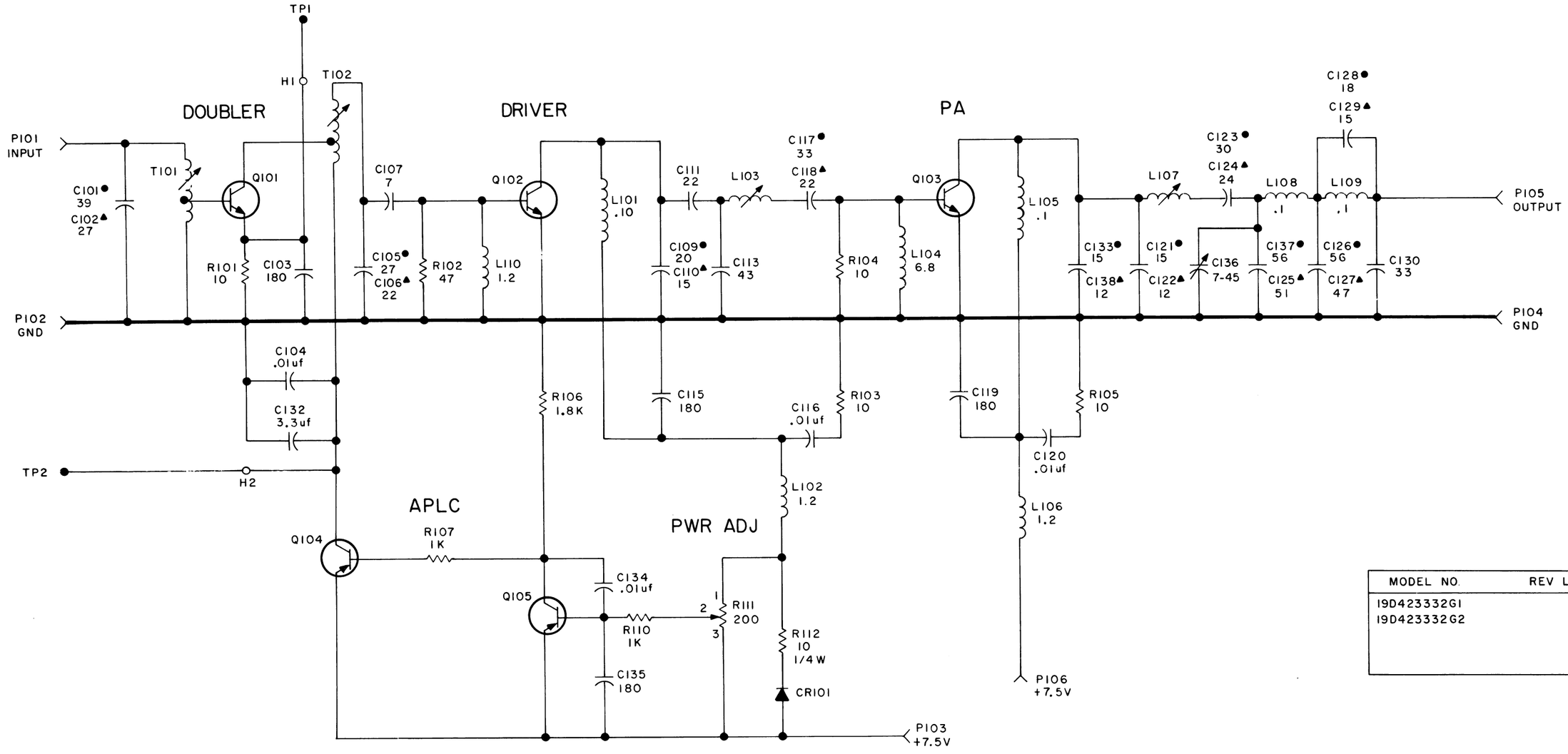


NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.



OUTLINE DIAGRAM

66—88 MHz TRANSMITTER
TYPE KT-127-A



MODEL NO.	REV LETTER
19D423332G1	
19D423332G2	

● LOW SPLIT (66-76 MHZ)

▲ MID SPLIT (75-88 MHZ)

IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

ALL RESISTORS ARE 1/8 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.

(19D423327, Rev. 1)

SCHEMATIC DIAGRAM

66—88 MHz TRANSMITTER TYPE KT-127-A

Issue 1

PARTS LIST

LBI-30183

EXCITER/PA MODULE
19D423332G1 LOW SPLIT
19D423332G2 MID SPLIT

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C101	19A116114P2050	Ceramic: 39 pf ±5%, 100 VDCW; temp coef -80 PPM.
C102	19A116114P2043	Ceramic: 27 pf ±10%, 100 VDCW; temp coef -80 PPM.
C103	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.
C104	19A116192P1	Ceramic: 0.01 µf ±20%, 50 VDCW; sim to Erie 8121-M050-W5R-103M.
C105	19A116114P2044	Ceramic: 27 pf ±5%, 100 VDCW; temp coef -80 PPM.
C106	19A116114P2041	Ceramic: 22 pf ±5%, 100 VDCW; temp coef -80 PPM.
C107	19A116114P2024	Ceramic: 7 pf ±5%, 100 VDCW; temp coef -80 PPM.
C109	19A116114P2039	Ceramic: 20 pf ±5%, 100 VDCW; temp coef -80 PPM.
C110	19A116114P36	Ceramic: 15 pf ±5%, 100 VDCW; temp coef 0 PPM
C111	19A116114P2041	Ceramic: 22 pf ±5%, 100 VDCW; temp coef -80 PPM.
C113	19A116114P2051	Ceramic: 43 pf ±5%, 100 VDCW; temp coef -80 PPM.
C115	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.
C116	19A116192P1	Ceramic: 0.01 µf ±20%, 50 VDCW; sim to Erie 8121-M050-W5R-103M.
C117	19A116114P46	Ceramic: 33 pf ±10%, 100 VDCW; temp coef 0 PPM.
C118	19A116114P2041	Ceramic: 22 pf ±5%, 100 VDCW; temp coef -80 PPM.
C119	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.
C120	19A116192P1	Ceramic: 0.01 µf ±20%, 50 VDCW; sim to Erie 8121-M050-W5R-103M.
C121	19A116114P36	Ceramic: 15 pf ±5%, 100 VDCW; temp coef 0 PPM.
C122	19A116114P33	Ceramic: 12 pf ±5%, 100 VDCW; temp coef 0 PPM.
C123	19A116114P2045	Ceramic: 30 pf ±5%, 100 VDCW; temp coef -80 PPM.
C124	19A116114P2042	Ceramic: 24 pf ±5%, 100 VDCW; temp coef -80 PPM.
C125	19A116114P2054	Ceramic: 51 pf ±5%, 100 VDCW; temp coef -80 PPM.
C126	19A116114P3056	Ceramic: 56 pf ±5%, 100 VDCW; temp coef -150 PPM.
C127	19A116114P2053	Ceramic: 47 pf ±5%, 100 VDCW; temp coef -80 PPM.
C128	19A116114P2038	Ceramic: 18 pf ±5%, 100 VDCW; temp coef -80 PPM.
C129	19A116114P2036	Ceramic: 15 pf ±5%, 100 VDCW; temp coef -80 PPM.
C130	19A116114P46	Ceramic: 33 pf ±10%, 100 VDCW; temp coef 0 PPM.
C132	5491674P36	Tantalum: 3.3 µf ±20%, 10 VDCW; sim to Sprague Type 162D.
C133	19A116114P36	Ceramic: 15 pf ±5%, 100 VDCW; temp coef 0 PPM.
C134	19A116192P1	Ceramic: 0.01 µf ±20%, 50 VDCW; sim to Erie 8121-M050-W5R-103M.
C135	19A116114P10073	Ceramic: 180 pf ±10%, 100 VDCW; temp coef -3300 PPM.
C136	19A134162P2	Variable, ceramic: 7 to 40 pf; sim to Erie Style 513-001.
C137	19A116114P3056	Ceramic: 56 pf ±5%, 100 VDCW; temp coef -150 PPM.
C138	19A116114P33	Ceramic: 12 pf ±5%, 100 VDCW; temp coef 0 PPM.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR101	19A115250P1	Silicon.
		- - - - - - - - - - INDUCTORS - - - - - - - - -
L101	19B209420P101	Coil, RF: 0.10 µh ±10%, 0.08 ohms DC res max; sim to Jeffers 4416-1.
L102	19B209420P114	Coil, RF: 1.20 µh ±10%, 0.18 ohms DC res max; sim to Jeffers 4438-1.
L103	19B226948G1	Coil.
L104	19B209420P123	Coil, RF: 6.80 µh ±10%, 1.80 ohms DC res max; sim to Jeffers 4446-2.
L105	19B209420P101	Coil, RF: 0.10 µh ±10%, 0.08 ohms DC res max; sim to Jeffers 4416-1.
L106	19B209420P114	Coil, RF: 1.20 µh ±10%, 0.18 ohms DC res max; sim to Jeffers 4436-1.
L107	19B226947G1	Coil.
L108 and L109	19B209420P101	Coil, RF: 0.10 µh ±10%, 0.08 ohms DC res max; sim to Jeffers 4416-1.
L110	19B209420P114	Coil, RF: 1.20 µh ±10%, 0.18 ohms DC res max;
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P101 thru P106	19A115834P4	Contact, electrical: sim to AMP 2-332070-9.
		- - - - - - - - - - TRANSISTORS - - - - - - - -
Q101	19A115328P1	Silicon, NPN.
Q102	19A116201P3	Silicon, NPN.
Q103	19A116191P1	Silicon, NPN.
Q104 and Q105	19A115852P1	Silicon, PNP; sim to Type 2N3906.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R101	3R151P100J	Composition: 10 ohms ±5%, 1/8 w.
R102	3R151P470J	Composition: 47 ohms ±5%, 1/8 w.
R103 thru R105	3R151P100J	Composition: 10 ohms ±5%, 1/8 w.
R106	3R151P182J	Composition: 1800 ohms ±5%, 1/8 w.
R107	3R151P102J	Composition: 1000 ohms ±5%, 1/8 w.
R110	3R151P102J	Composition: 1000 ohms ±5%, 1/8 w.
R111	19A116412P1	Variable, cermet: 200 ohms ±10%, 1/2 w; sim to Helipot Model 62 PF.
R112	3R152P100J	Composition: 10 ohms ±5%, 1/4 w.
		- - - - - - - - - - TRANSFORMERS - - - - - - - -
T101	19B216910G2	Coil. Includes:
	19B209436P1	Tuning slug.
T102	19B216934G1	Coil. Includes:
	19B209436P1	Tuning slug.
		- - - - - - - - - MISCELLANEOUS - - - - - - - -
	19A130617P1	Shield. (L shaped).
	19A130616P1	Shield. (Straight).
	19A129245P1	Nut: thd. size No. 8-32. (Used with Q3).
	4035306P11	Washer, fiber. (Used with Q1 and Q2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

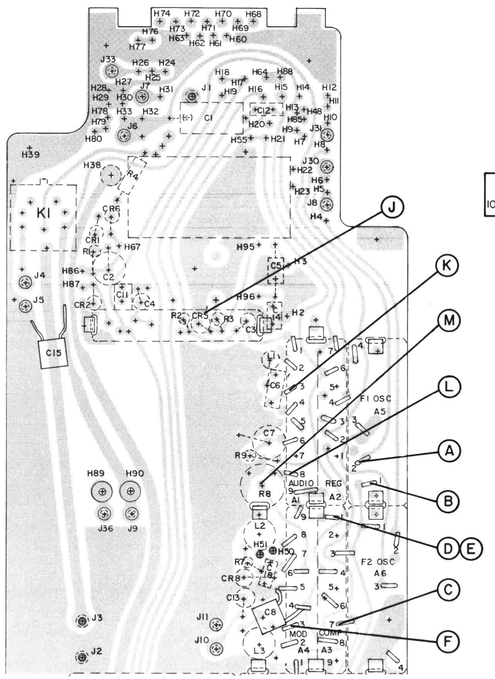
STEP 1- QUICK CHECKS

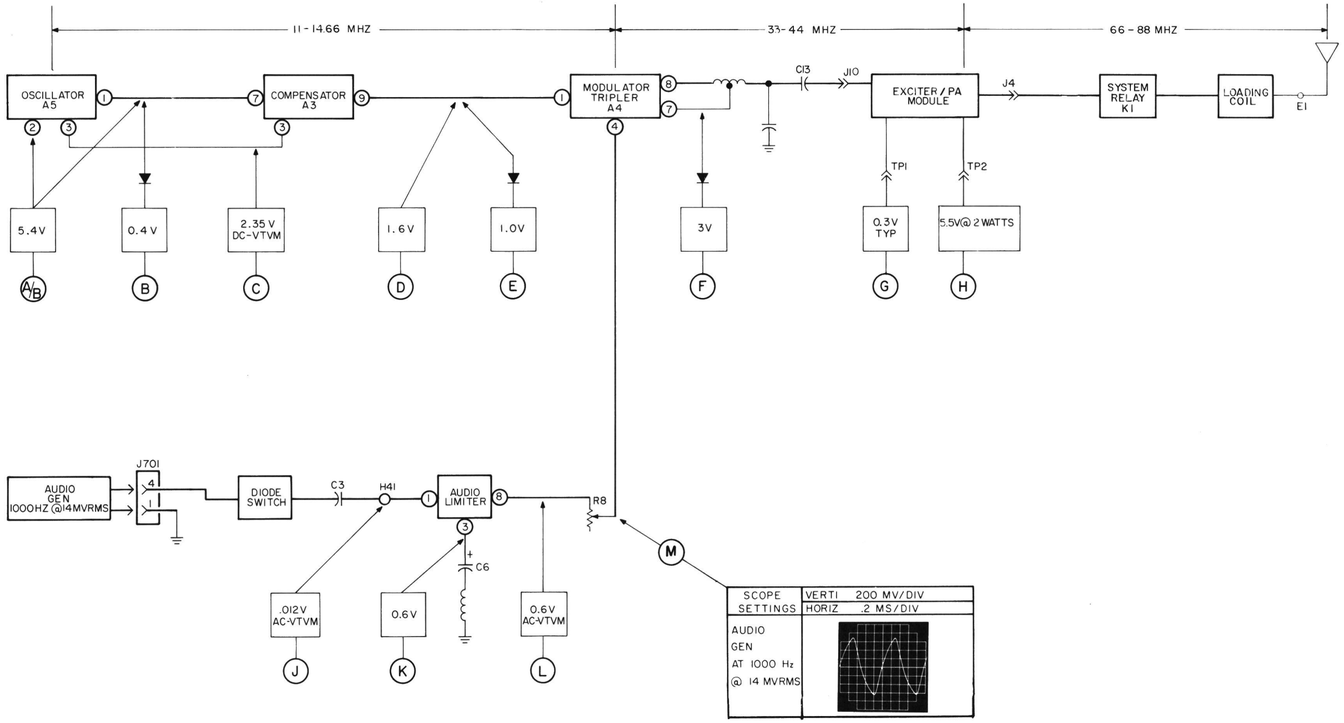
SYMPTOM	QUICKCHECK
No power output	If no power output is obtained, check the reading at TP1. If no reading is obtained at TP1, check readings at (F), (E), and (B). If TP1 reading is correct, replace the Exciter/PA module.
Low power output	1. Low battery voltage (refer to Battery Checks in operation section of the manual). 2. Check the transmitter alignment.
Distorted or no audio with normal RF output.	1. Check voltage readings at (J), (K), (L) and (M). 2. Improper setting of Mod Adjust R8. 3. Shorted C3 or C6 on Audio Board. 4. 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.





(RC-2156)
(19D424125, Rev. 1)
(19D416614, Sh. 2, Rev. 6)

ORDERING SERVICE PARTS

Each component appearing on the schematic diagram is identified by a symbol number, to simplify locating it in the parts list. Each component is listed by symbol number, followed by its description and GE Part number.

Service parts may be obtained from Authorized GE Communication Equipment Service Stations or through any GE Radio Communication Equipment Sales Office. When ordering a part, be sure to give:

1. GE Part Number for component
2. Description of part
3. Model number of equipment
4. Revision letter stamped on unit

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance.

Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact the nearest Radio Communication Equipment Sales Office of the General Electric Company.

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MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

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