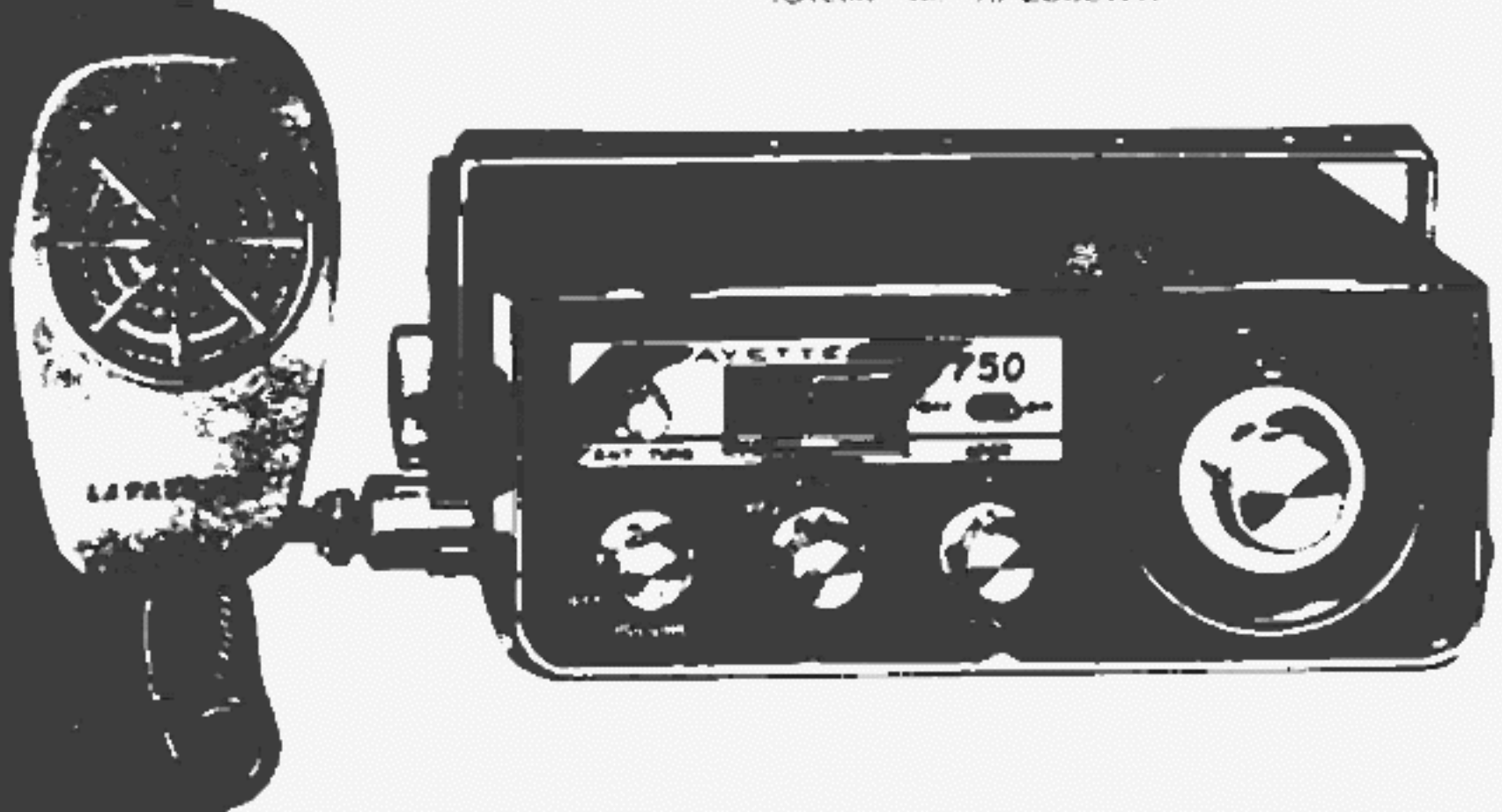




# LAFAYETTE

## Model HA-750

(Stock No. 99-2605WX)



### **6-METER SOLID-STATE MOBILE TRANSCEIVER**



*INSTALLATION AND OPERATING MANUAL*

## TECHNICAL SPECIFICATIONS

### RECEIVER

FREQUENCY COVERAGE ..... 50-52 Mc.  
FINE TUNING RANGE .....  $\pm 200$  Kc.  
SENSITIVITY .....  $1 \mu\text{V}$  for 10 db  $\frac{S+N}{N}$   
SELECTIVITY ..... 7 Kc - 6 db, 40 Kc - 30 db.  
INTERMEDIATE FREQUENCY ..... 1.65 Mc.  
ANTENNA IMPEDANCE ..... 30-100 ohms. (Nominal 50 ohms).  
AUDIO OUTPUT ..... 2 watts.  
CURRENT DRAIN ..... 65-600 Ma. at 12.6 volts DC.

### TRANSMITTER

FREQUENCY COVERAGE ..... 50-52 Mc.  
FREQUENCY CONTROL ..... VFO or crystal.  
POWER INPUT ..... 5 watts.  
ANTENNA IMPEDANCE ..... 30-100 ohms (Nominal 50 ohms).  
TRANSMISSION MODE ..... A3 emission (AM).  
CRYSTAL TYPE ..... HC-6U 3rd overtone.  
CURRENT DRAIN ..... .65 - 1.2 amperes at 12.6 volts DC.

### GENERAL

SEMICONDUCTORS ..... Transistors -- 18.  
Diodes -- 8.  
Zener diodes -- 2.  
POWER SOURCE ..... Operates from 11.5 to 14.5 volts DC with  
optional 117 volt AC solid state power supply  
(Lafayette Model HB-502A).  
DIMENSIONS ..... 2-3/8" H x 6-1/4" W x 8" D.  
NET WEIGHT ..... 4-1/2 lbs.

## GENERAL DESCRIPTION

The Lafayette Model HA-750 is a compact, self-contained, fully transistorized combination transmitter and receiver designed to cover the most popular portion of the 6-meter amateur band (50-52 Mc). Its compact size and ease of operation make this unit ideally suitable for 12 volt DC (negative ground only) mobile operation, or "fixed" station operation with the optional solid state AC power supply (Lafayette Model HB-502). It is supplied complete with push-to-talk dynamic microphone, a fused power cable for DC operation and a mobile mounting bracket.

Housed in a rugged metal case, the transmitter, receiver and audio sections employ rugged, heat-resistant silicon transistors in all critical areas to assure trouble-free, dependable operation. Equipped with 18 transistors, 8 diodes and 2 zener diodes, the unit employs a continuously tuneable superheterodyne receiver circuit with one stage of RF and three stages of IF, and a seven-stage crystal or VFO controlled transmitter for precise dependable performance.

The transmitter is designed to operate with an input of 5 watts to the final RF stage, and offers full VFO or crystal-controlled operation. When using VFO operation, the transmitter frequency tracks with the frequency of the receiver. When operating the unit crystal-controlled, the transmitter operates independently of the receiver, and the frequency of transmission is determined by the crystal being used. The unit is normally supplied without crystals but may be operated by inserting any third-overtone HC-6U crystal into the socket provided.

### NOTE

**AN FCC AMATEUR LICENSE IS REQUIRED BY ANYONE OPERATING THIS EQUIPMENT**

### FEATURES

- Crystal-controlled or VFO transmitter operation.
- Transmitter VFO tracks with receiver frequency.
- ±200 Kc vernier offset receiver tuning.
- Spot switch.
- S-meter/relative power indicator.
- Built-in 3 x 5" speaker.

### TRANSISTOR COMPLEMENT

TR1	2SCF2	Receiver RF amplifier
TR2	2SCF2	Mixer
TR3	2SCF2	Receiver tuneable oscillator
TR4, 5	2SCF2	IF amplifiers
TR6	2SDF1	Receiver voltage regulator
TR7	2SBF1	Audio preamplifier
TR8	2SBF1A	Audio Driver
TR9, 10	2SBF5	Push-pull power amp/modulators
TR11	2SC55	Transmitter crystal oscillator
TR12	2SCF2	VFO
TR13	2SCF2	VFO Buffer multiplier
TR14	2SC55	VFO Multiplier driver
TR15	2SCF5	Amplifier driver
TR16	2SCF6	Amplifier driver
TR17	2SCF10	RF power amplifier
TR18	2SDF1	VFO voltage regulator

## DIODE COMPLEMENT

D1, 2	FV-23	Receiver overload protector
D3	1S446	RF indicator rectifier
D4	1S446	Detector
D5	1S446	ANL
D6	1S446	S-meter rectifier
D7	FR-1P	Polarity reversal protector
D8	FR-1P	Switching gate
ZD1	FV-21 (Zener)	Receiver voltage regulator
ZD2	RD-11 (Zener)	VFO voltage regulator

## CONTROL FUNCTIONS

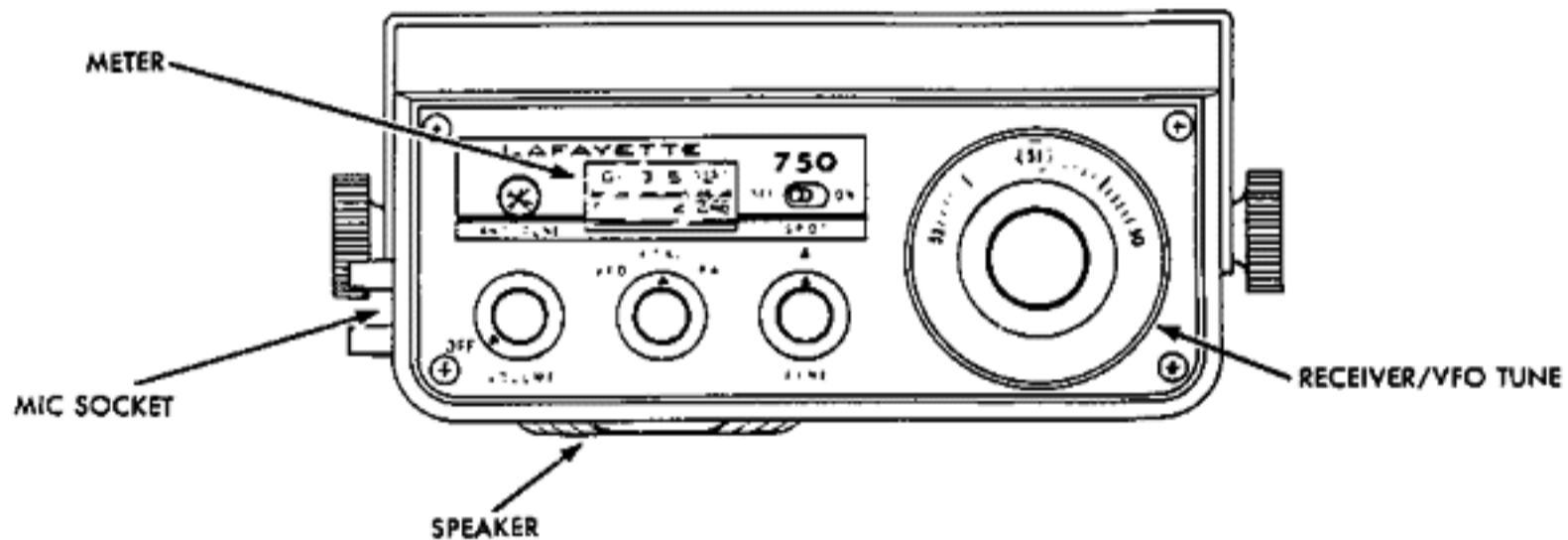


FIGURE 1. FRONT PANEL

- ANT TUNE ..... Tunes transmitter pi-network to the antenna for maximum RF power output.
- S-METER/RELATIVE POWER METER..... Receive Mode: Indicates strength of received signal on S-meter calibrated in S-units from 1 to 9 and 30 db above S9.  
Transmit Mode: Indicates relative power output of transmitter.
- SPOT Switch ..... When in the "on" position applies voltage to the transmitter oscillator. This causes generation of a strong unmodulated signal which may be tuned in on the receiver to determine the frequency of transmission.
- VOLUME/OFF..... Varies the audio output to the speaker. Also incorporates an "on-off" switch at the extreme counter-clockwise direction.
- VFO/XTAL/PA..... Selects either built-in VFO, Crystal or PA (Public Address) operation. When in the XTAL mode, a crystal must be inserted into the crystal socket. In the PA mode an external speaker must be connected to the PA jack on the rear panel.

- FINE Tuning ..... Offsets the receiver frequency  $\pm 200$  Kc.
- RECEIVER/VFO TUNE ..... Simultaneously tunes the frequency of the receiver and transmitter (when in the VFO mode) over the entire operating range. In the VFO mode, the transmitter VFO tracks with the receiver frequency. When crystal-controlled operation is used, the transmitter frequency is independent of the receiver frequency.
- MICROPHONE Socket ..... Four-pin socket for connection of push-to-talk microphone (supplied).
- SPEAKER..... 5 x 3" oval PM speaker located behind grille (underside).

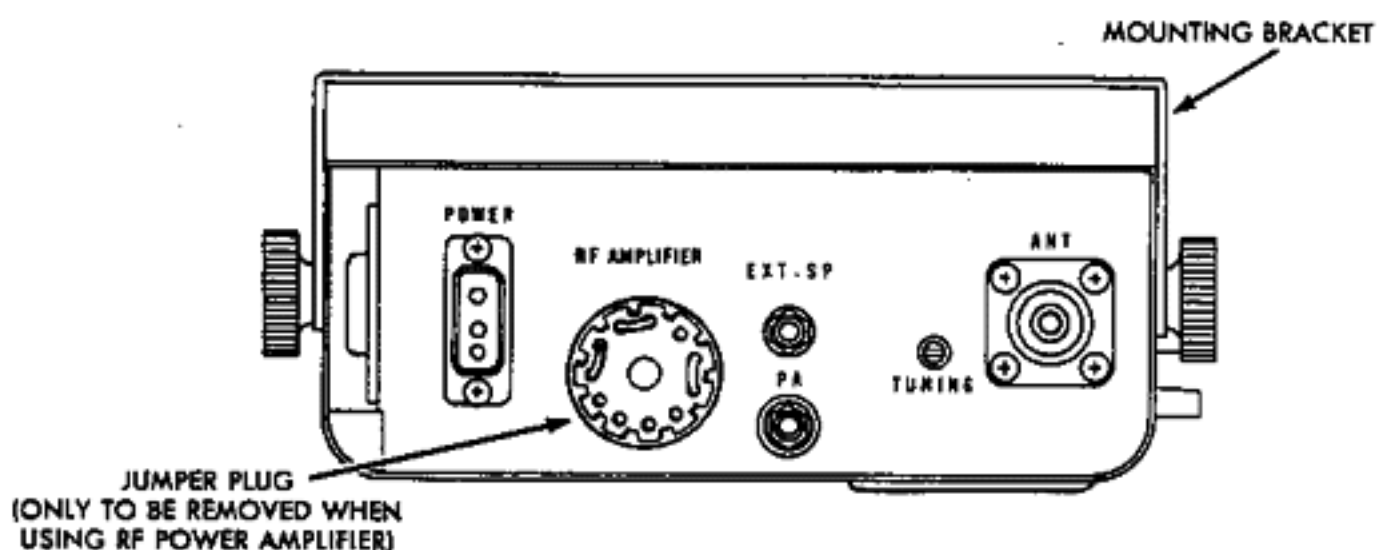


FIGURE 2. REAR PANEL

- MOUNTING BRACKET ..... Simplifies mounting of transceiver for mobile installations. Also acts as a stand for fixed installations when mounted to underside of unit.
- POWER..... Polarized DC power input socket accepts DC power cord or plug from optional AC power supply.
- RF AMPLIFIER ..... Socket to accept an RF power amplifier for higher power operation of the HA-750. A 25 watt RF power amplifier may be available from Lafayette Radio in the near future. For normal operation, the jumper plug must always remain inserted in the RF amplifier socket.
- EXT SP..... Accepts phone plug for use of external speaker or headphones. Insertion of plug automatically silences the internal speaker.
- PA ..... Accepts phone plug for use of external public address speaker.
- TUNING ..... Tunes antenna input for maximum efficiency on both transmit and receive.
- ANT..... For connection of antenna transmission line.

## MOBILE INSTALLATION

### MOUNTING

Before installing the HA-750 in a car, truck, boat, etc., be sure to choose a location which is convenient to the operating controls, and will not interfere with the normal functions of the driver. The unit may be mounted to the underside of the instrument panel or dashboard of a car, truck, etc., by means of the special bracket that is supplied. Attach the bracket to the underside of the instrument panel using four self-threading screws (See Fig. 3A). Secure the unit to the bracket by means of the large knurled thumbscrews. Figure 3B illustrates the manner in which the bracket may be used for either top or bottom mounting and the different angles that it may be mounted.

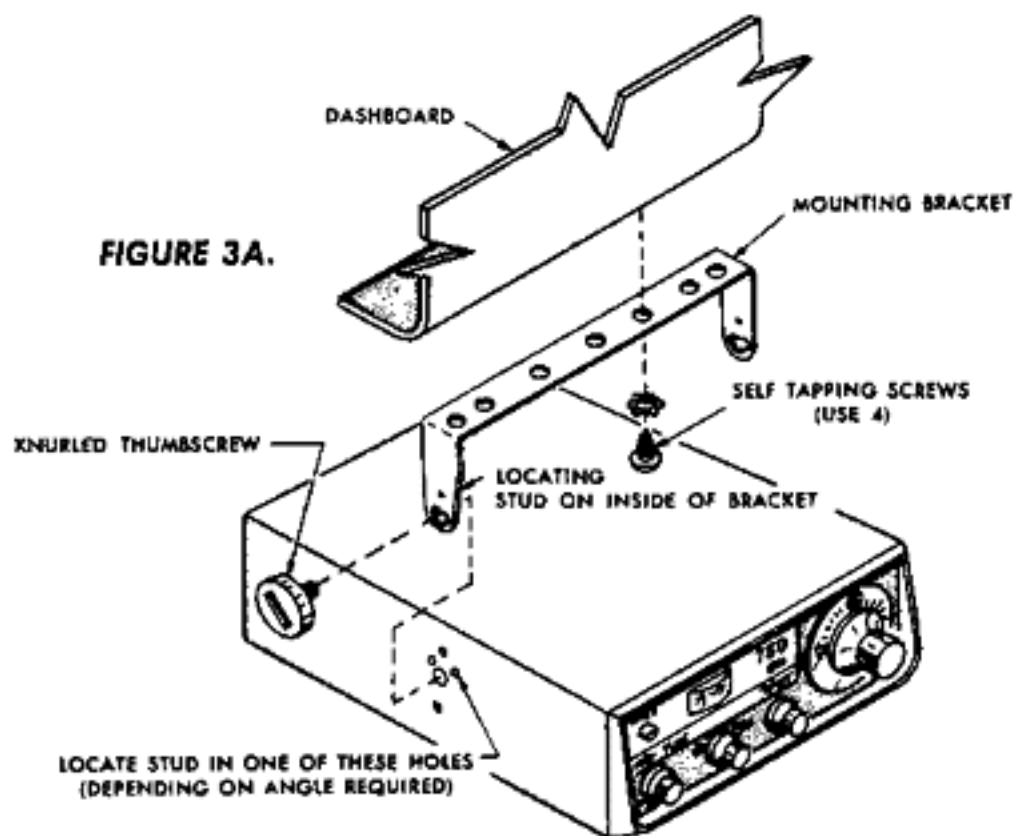


FIGURE 3A.

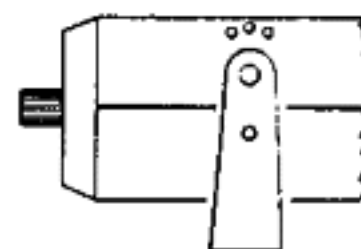
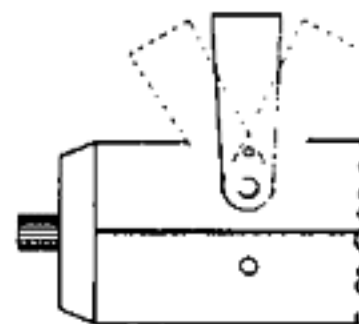


FIGURE 3B.



### DC POWER CONNECTIONS

**WARNING:** The HA-750 is designed to operate from a battery source of 11.5 to 14.5 volts DC, on negative ground only. Connecting the HA-750 to a positive ground vehicle will severely damage the unit.

Connect the fused positive power lead (RED) of the DC power cord to the positive side of the electrical system. Points normally available for this purpose are the accessory post on the ignition switch, the voltage regulator side of the ammeter or the accessory side of the fuse block. However, for best results it is recommended that connection be made directly to the positive battery terminal.

Connect the negative power lead (BLACK) to the metal firewall or any other point that is connected to the vehicle chassis.

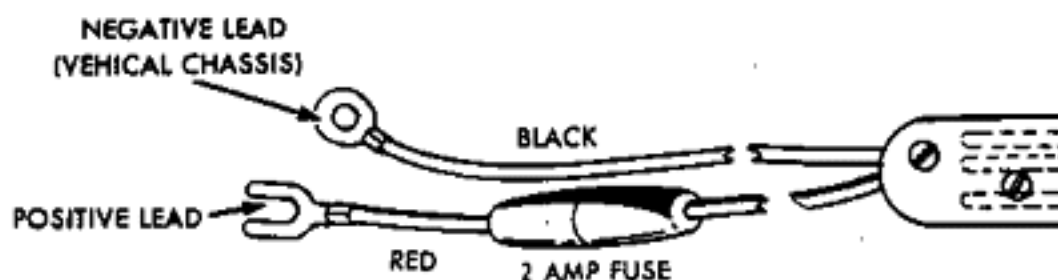
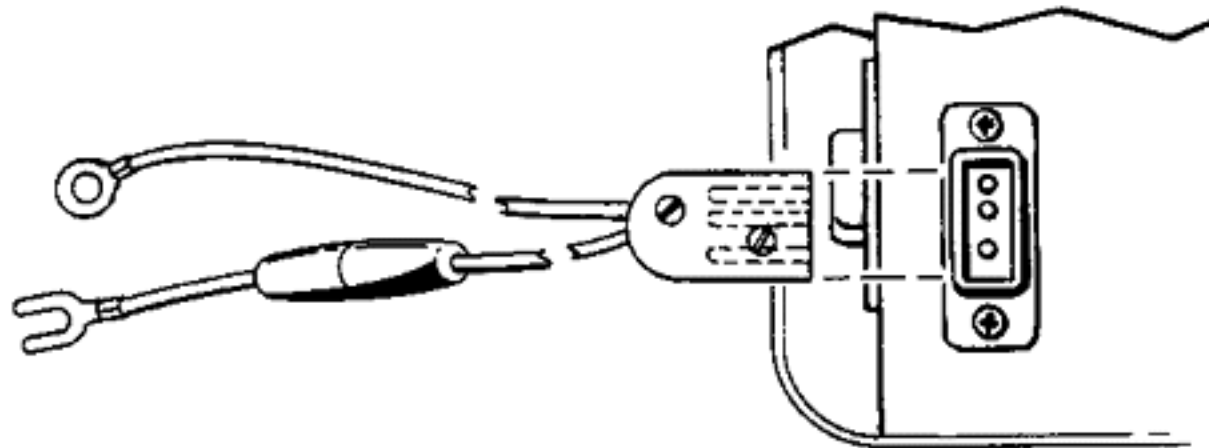


FIGURE 4. DC POWER CABLE

## ATTACHING POWER CORD

The plug at the end of the DC power cord is attached to the power socket at the rear of the unit. Notice that the pins are unequally spaced, allowing the plug to be inserted only in one direction (See Fig. 5).

FIGURE 5.



## AUTO IGNITION INTERFERENCE

The seriesgate ANL (Automatic Noise Limiter) circuit incorporated in the HA-750 should eliminate all or most of the ignition interference. However, an excess amount of noise may be generated by some vehicles making it necessary to take additional steps toward the suppression of these ignition noises.

Electrical or ignition noise interference can arise from several different sources. The interference may be experienced from ignition noise, generator or alternator noise, voltage regulator hash, or tire static. Because of the complexity of the subject, it is not within the scope of this manual to attempt to cover all the problems involved. However, some general information is given. Additional information on automobile ignition interference may be found in the ARRL Radio Amateurs Handbook or in various publications on the subject.

Ignition noises may be suppressed by the use of resistor type spark plugs and/or a suppressor resistor inserted in the center tower of the distributor. A coaxial capacitor should also be connected to the ignition coil primary as close to the coil terminal as possible.

Alternators do not usually cause the noise problem that generators will. However, defective diodes or dirty slip rings in the alternator may cause some electrical noise. Alternator noise may be eliminated or reduced by adding a .5 mfd, 40-ampere, 50 volt coaxial capacitor to the "battery" terminal of the alternator. Adding a 5-ohm resistor in series with a .002 mfd capacitor at the "field" terminal of the voltage regulator to ground may also aid in the reduction of noise.

Generator noise may be noticed by a distinctive "whine" produced in the receiver. One method of eliminating this "whine" is to install a .1 to .5 mfd, 40-ampere, 50 volt coaxial capacitor to the "armature" terminal of the generator. The armature terminal may already have a conventional factory-installed capacitor at this point. Remove this capacitor and install the new coaxial-type capacitor.

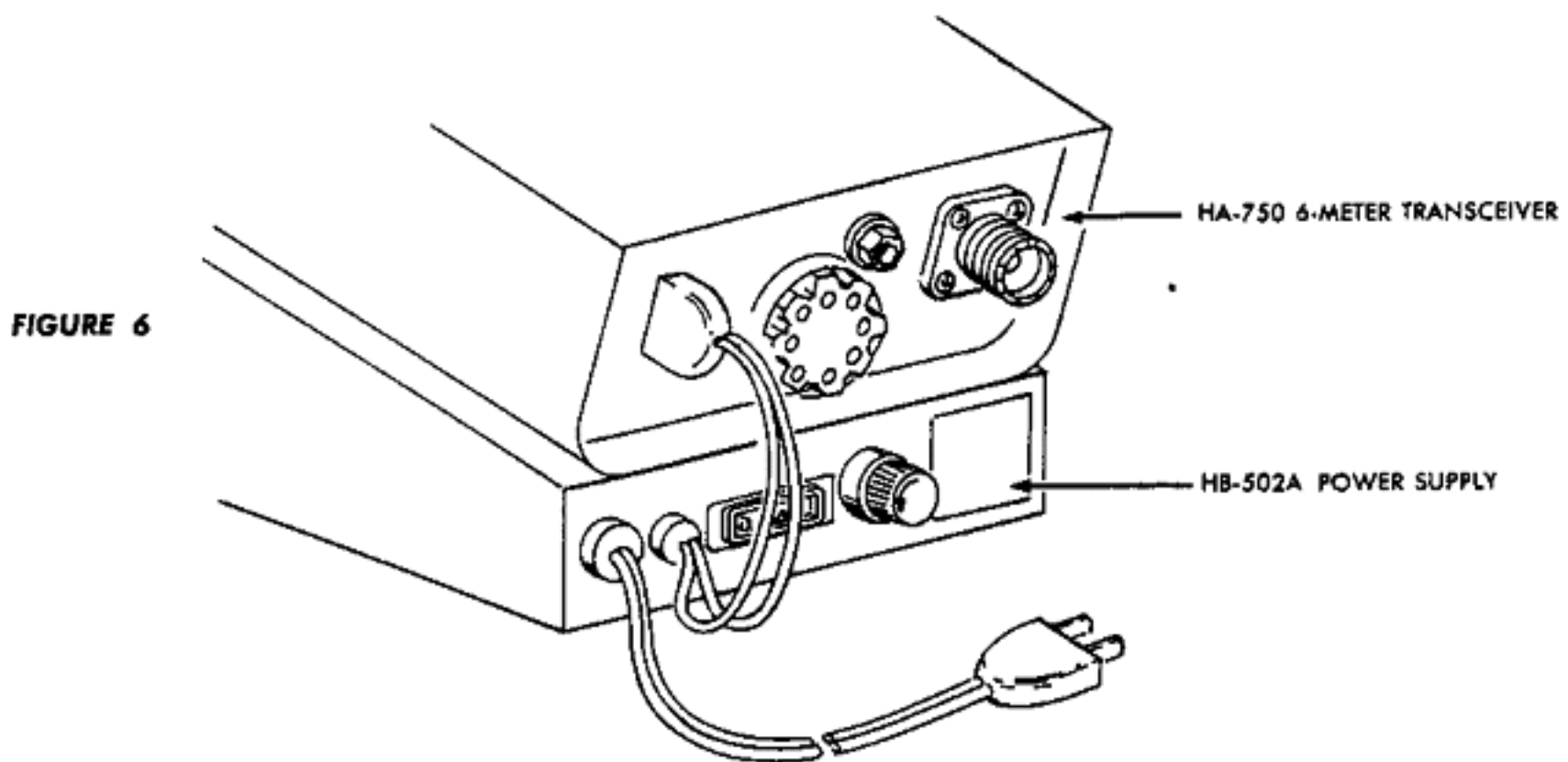
In either case, alternator or generator, it is important that the housing make good ground to the engine block. To insure good ground between the alternator (or generator) and the engine block, a heavy braided strap should be used as an added electrical connection between them.

Several noise suppressor kits are available (such as a Lafayette HP-204, Stock No. 42-09-01) which include all necessary parts and instructions for elimination of these noises. Individual components (such as coaxial capacitors, alternator and generator filters, etc.) are also available from Lafayette Radio Electronics.

## BASE STATION INSTALLATION

As supplied, the HA-750 is designed to operate from a 12 volt DC battery source. For 110 volt 50/60 cycle AC operation, the Lafayette solid state power supply Model HB-502A is required.

The HA-750 conveniently mounts on top of the HB-502A power supply for base operation. Connection of the power supply is simple -- the HB-502A power plug plugs into the power socket on the HA-750; the AC line cord connects to an outlet supplying 105-120 volts, 50/60 cycles AC.



## ANTENNAS

The HA-750 is designed to be used with any 6-meter antenna providing 30-100 ohms (Nominal 50 ohms) impedance. Antenna polarization is very important at these frequencies and should be considered when choosing an antenna. Generally speaking, the antenna polarization should be compatible with that of the stations you will normally be in contact with.

The antenna should be connected to the antenna receptacle on the back of the unit using RG-58/U (RG-8/U is recommended for lengths in excess of 100 feet).

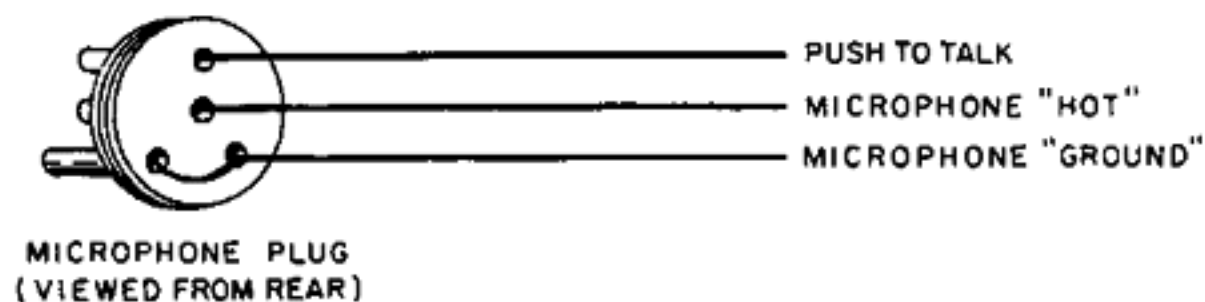
It is important that the antenna be adjusted for the lowest possible VSWR at the operating frequency. Additional information on antennas may be found in the ARRL Handbook or in the ARRL Antenna Manual.

## OPERATING INSTRUCTIONS

### NEVER ATTEMPT TO TRANSMIT WITHOUT AN ANTENNA CONNECTED

Make sure the HA-750 is properly installed for mobile or base operation (as indicated previously) and that the antenna and power source are connected. If you have not already done so, plug the microphone into the MIC receptacle. If other than the standard microphone is used, any push-to-talk dynamic (low impedance) microphone may be used if wired in accordance with the microphone wiring diagram in Figure 7. Additional microphone plugs are available from Lafayette Radio Electronics under stock number 99-0283.





**FIGURE 7. MICROPHONE WIRING DIAGRAM**

## RECEIVING

To operate the receiver portion of the HA-750 proceed as follows:

1. Turn power "on" by rotating the VOLUME control clockwise. The front panel meter should become illuminated. Since the unit is fully transistorized, operation will be instantaneous.
2. Rotate the RECEIVER/VFO TUNE control to the desired frequency.
3. Adjust the VOLUME control for the desired audio level.

NOTE: If desired, headphones or an external speaker may be used in place of the internal speaker. To use headphones or an external speaker simply plug them into the "EXT SP" jack on the rear panel. Insertion of this plug will automatically silence the internal speaker.

## TRANSMITTER ADJUSTMENT AND OPERATION

Set VFO/XTAL/PA switch to either VFO or XTAL control operation depending on the desired mode of operation.

NOTE: If this switch is switched to the VFO position, the operating frequencies of both the transmitter and receiver are the same. In the XTAL mode of operation, a crystal must be inserted in the crystal socket. When operating crystal-controlled, the frequency of transmission is equal to that of the crystal frequency.

### Preliminary Adjustment

1. Set the RECEIVER/VFO TUNE control to mid-range on the dial (approximately 51 Mc). If crystal operation is used, choose a crystal frequency in the area of 51 Mc.
2. With the microphone push-to-talk button depressed, adjust the front panel "ANT TUNE" and rear panel "TUNING" control for maximum meter indication. Repeat adjustments until no further increase in meter reading is obtainable.

NOTE: At this point the "TUNING" control should not require any readjustment regardless of the operating frequency.

### Operation

1. Set the RECEIVER/VFO TUNE to the desired operating frequency.
2. With the microphone push-to-talk button depressed, adjust the ANT TUNE control for maximum meter indication.

NOTE: Any time the operating frequency is changed, the ANT TUNE control must be re-adjusted for maximum output.

3. The transmitter is now ready for transmission. To transmit, press the push-to-talk button on the microphone and talk into it.
4. When using the XTAL mode of operation if it is desired to locate the frequency of transmission on the RECEIVER/VFO TUNE dial, set the SPOT switch "on" and tune the dial until a strong unmodulated signal is heard. Return the "SPOT" switch to "off" and proceed with the transmitter operation.

## TRANSMITTER CRYSTALS

Crystals are available from Lafayette Radio or any of the well-known crystal manufacturers. Crystals may be purchased from Lafayette Radio under Stock No. 40-5701CY.

The crystal order to the manufacturer should contain the following information:

Crystal Holder ..... HC-6U  
 Crystal Type ..... 3rd Overtone  
 Crystal Frequency ..... Desired operating frequency

To install a crystal in the HA-750 for crystal-controlled operation, remove the "speaker-mounted" chassis cover by removing the five (5) Phillips-head screws on the side of the cover. When removing the cover, care should be taken not to damage the speaker lead wires. Orient the unit with the front panel facing inwards, or as shown in Figure 9. The crystal socket is located on the left-hand portion of the chassis. The crystal will be selected in the XTAL mode of operation.

## PUBLIC ADDRESS OPERATION

Special provision has been made for Public Address (PA) operation utilizing the microphone and audio stages in the HA-750. For PA operation, use an external 8-16 ohm speaker (mounted on the exterior of a car or building, etc.) connected to the "PA" jack. Set the VFO/XTAL/PA switch to the PA position, depress the push-to-talk button on the microphone and talk into it -- your voice will be heard from the external PA speaker. Note also that the Volume control on the HA-750 does NOT control the speaker output during PA operation.

## THEORY OF OPERATION

### INTRODUCTION

The following discussion of the theory of operation for the HA-750 Solid State Transceiver is divided into three parts. The first part discusses the operation of the receiver section. The second part discusses the operation of the transmitter section, the third part the S-meter relative power indicator. While reading the following description, refer to the functional block diagram. Or, if greater detail is desired at any point, refer to the schematic diagram at the end of this manual.

### RECEIVER

When an RF signal (50-52 Mc) is applied to the antenna input of the HA-750 it is fed through the antenna coils (L-16, L-1) and the changeover relay (RY) to the input of the RF amplifier (TR-1). The RF amplifier transistor is protected from possible signal overload by the diodes D-1 and D-2.

After amplification, the RF signal (50-52 Mc) is linked coupled through the RF coil (L-2) to the input of the mixer stage (TR-2). Here the RF signal is heterodyned with the frequency of the local oscillator. The local oscillator (TR-3) has a tuning range of 48.35-50.35 Mc. The frequency of the oscillator is determined by the RECEIVER/VFO TUNE control. The local oscillator is voltage regulated by zener diode (ZD-1) and transistor TR-6. The voltage regulation on the local oscillator eliminates the possibility of frequency variations under a fluctuation of DC input voltage.

The heterodyning of the RF frequency (50-52 Mc) and oscillator frequency (48.35-50.35 Mc) within the mixer stage (TR-2) produces a frequency output, or intermediate frequency of 1.65 Mc. The intermediate frequency (1.65 Mc) is the difference between the RF and oscillator frequencies.

The output of the mixer stage is fed through a passband tuning arrangement (L-4, L-5, L-6) to the input of the first intermediate amplifier (TR-4). The amplified IF output (1.65 Mc) is then fed through an additional stage of IF amplification (TR-5) where the output is coupled through the last IF transformer (L-8) to the diode detector (D-4). The diode detector rectifies the IF signal to produce the audio signal and necessary AVC voltage.

The AVC voltage, after filtering, is applied to the RF and first IF amplifiers to provide for automatic volume control (AVC).

The audio signal, after filtering, is fed through a self-adjusting automatic noise limiter (D-5) to the volume control (VR-1). The volume control varies the gain of the audio signal to the input of the audio preamplifier (TR-7). The amplified output of TR-7 is capacity coupled to the audio driver (TR-8) where the audio signal is further amplified. The audio driver transformer (T-1) couples the output of TR-8 to the input of the push-pull power amplifier/modulators (TR-9, TR-10). The combined audio output/modulation transformer (TR-2) couples the final audio signal to the speaker.

The secondary of transformer T-2 serves a dual purpose. On receive, the audio signal is fed to the speaker, whereas on transmit the secondary winding is used to modulate the transmitter section of the HA-750.

## TRANSMITTER

The transmitter signal may be either crystal or VFO controlled. VFO or XTAL operation of the transmitter can be obtained by the selection of the VFO XTAL switch (SW1).

When in the VFO mode of operation, TR-12 operates as a variable frequency oscillator producing a fundamental frequency of 8.33 to 8.67 Mc. The frequency of the oscillator is determined by the setting of the RECEIVER/VFO TUNE control. The VFO buffer multiplier (TR-13) and VFO multiplier driver (TR-14) amplify and multiply the fundamental frequency of the VFO to the actual operating frequency of the HA-750 (50-52 Mc). To eliminate the possibility of undesired frequency drift, the VFO and VFO multiplier stages are voltage regulated by transistor TR-10 and zener diode RD-11.

In the XTAL mode, voltage is removed from the VFO stages and transistor TR-11 operates as the transmitter crystal oscillator. The crystal oscillator is of the overtone type, therefore overtone crystals must be inserted in the crystal socket when crystal controlled operation is used. The frequency output of the crystal oscillator is dependent upon the frequency of the crystal.

Depending upon the frequency control being used (VFO or XTAL) the operating frequency is capacity coupled to the input of the RF amplifier stage TR-15. The operating frequency is further amplified by an additional RF amplifier stage TR-16 where the amplified signal is capacity coupled to the input of the RF power amplifier (TR-17).

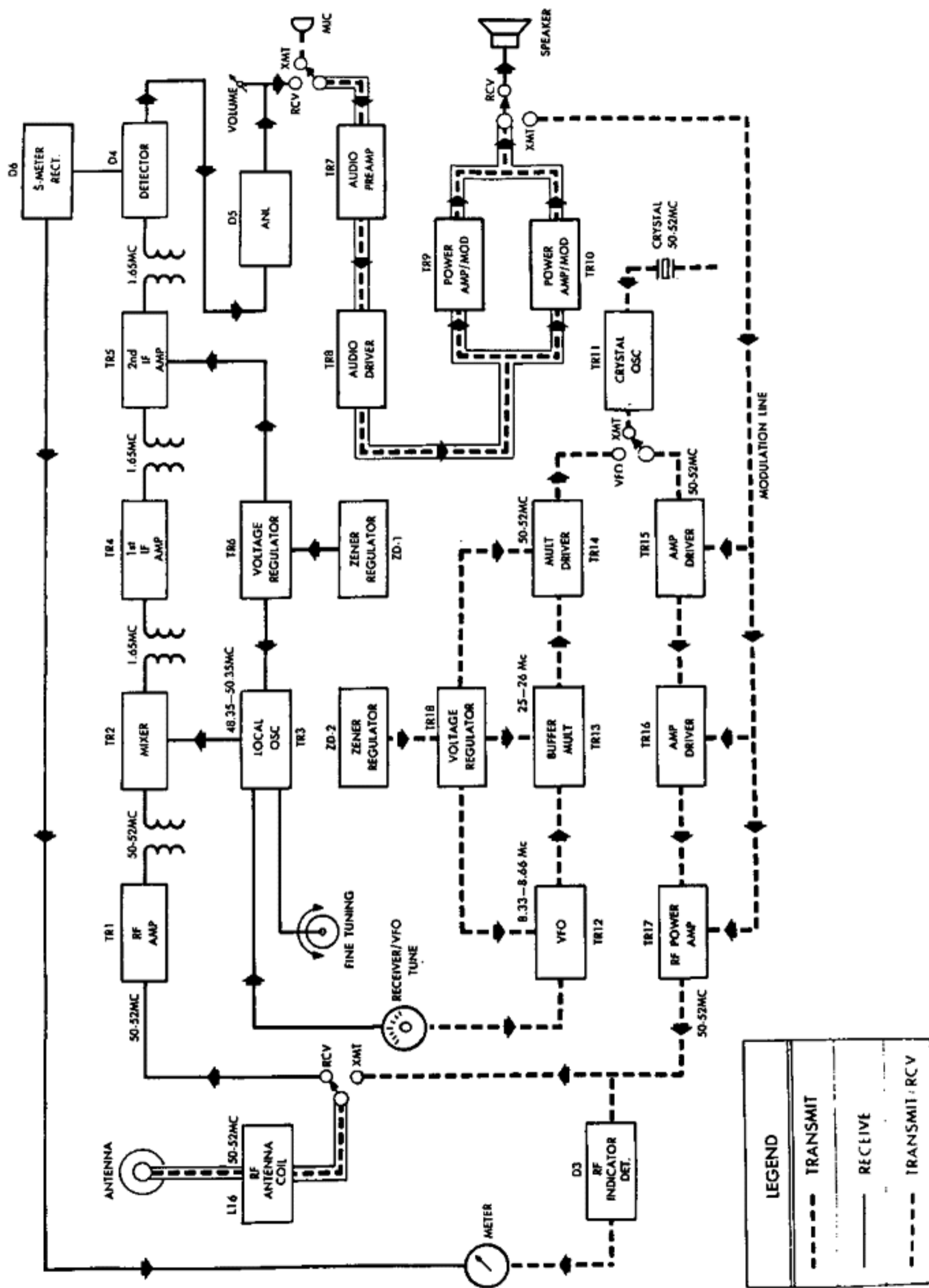


FIGURE 8. FUNCTIONAL BLOCK DIAGRAM

The RF power amplifier (TR-17) operates as the final amplifier for the operating frequency and couples the amplified output to the antenna through a pi-network output circuit. The pi-network is tuned by the ANT TUNE control (VC-2) which transforms the collector impedance to the desired impedance of the antenna.

To modulate the transmitter, an audio signal must be introduced into the microphone. The audio preamplifier (TR-7), audio driver (TR-8) and power amplifier/modulators (TR-9, TR-10) function in the same manner as in receive. The audio output of the amplifier/modulators is applied through transformer T-2 to the collectors of the RF amplifier transistors (TR-15, TR-16 and TR-17). Conventional high level modulation is obtained in this manner.

### S-METER/RELATIVE POWER INDICATOR

A special dual-function meter circuit has been incorporated in the HA-750 to provide indication in both the "receive" and "transmit" modes of operation. In the "receive" mode, the meter functions as a signal strength meter, whereas in the "transmit" mode, the meter functions as a relative RF power indicator for accurate tune-up of the transmitter.

When in the "receive" mode, a small amount of voltage is rectified at the secondary of the last IF transformer (L-8) by the S-meter diode (D-6). The rectified voltage is indicated on the S-meter (M) which is calibrated in "S" units from S1 to S9 and 30 decibels above S9. The stronger the received signal, the greater amount of voltage will appear at the meter thereby giving indication of signal strength of the incoming signal.

In the "transmit" mode, a small portion of the RF output signal is rectified by RF indicator rectifier (D-3) and filtered by capacitors C26 and C27. The rectified voltage after filtering is measured by the meter (M) and gives an indication of relative output of the transmitter.

## ALIGNMENT

The Model HA-750 has been fully aligned and calibrated at the factory and, with normal usage, will not require further adjustment. Service or replacement of major components may require subsequent realignment, but under no circumstances should realignment be attempted unless the malfunction has been analyzed and definitely traced to mis-alignment. Alignment should only be performed by persons experienced in this work, using the proper test equipment.

Do not make any adjustments unless the operation of this unit is fully understood and adequate test equipment is available. Refer to Figure 9 for the location of all alignment points.

### TEST EQUIPMENT REQUIRED

Calibrated RF Signal Generator	5 watt, 50 ohm RF Wattmeter
AC Voltmeter or VTVM	Non-metallic alignment tools
	12-15 volt DC power supply

### SET CONTROLS AS FOLLOWS

VOLUME/OFF..... 1/2 clockwise	SPOT..... OFF
VFO/XTAL/PA..... VFO	RECEIVER/VFO TUNE..... 51 Mc
FINE Tuning..... 1/2 rotation (red pointer straight up)	

## INITIAL TEST SET-UP

1. Set the unit down with the speaker grill facing upwards. Remove the five (5) Phillips-head screws securing the "speaker-mounted" chassis cover.

NOTE: When removing the cover, care should be taken not to damage the speaker lead wires. These wires should remain connected to the speaker terminals to insure a proper load across the secondary of the output transformer. If the output meter used for alignment is terminated with an 8-16 ohm load, the speaker lead wires may be connected directly to the output meter.

2. Connect the unit to a suitable DC power source. If a variable DC power supply is used, the DC voltage should be set to approximately 13.5 volts.
3. For receiver alignment, the RF signal generator should be terminated into a 50-ohm impedance before connection to the receiver. Set the signal generator to provide a 30% modulated signal at approximately 400 cycles.

TABLE 1. RECEIVER ALIGNMENT

STEP	INPUT SIGNAL AND S. G. COUPLING	REC/VFO TUNE	ADJUST	AC VOLTMETER CONNECTIONS	INDICATION
IF Alignment	1.65 Mc Metallic case of TR2	51 Mc	L-4, 5, 6, 7, 8	Across  speaker  terminals	Maximum
Receiver Oscillator Tuning	ANTenna Connector 50 Mc	50 Mc	L-3*		output
	ANTenna Connector 52 Mc	52 Mc	VC-3 Trimmer "B"*		on
Antenna Input	ANTenna Connector 50 Mc	50 Mc	L-1*, L-2*		AC Voltmeter
	ANTenna Connector 52 Mc	52 Mc	VC-3 Trimmer "C"*		
S-Meter	ANTenna Connector 51 Mc (100 $\mu$ V signal)	51 Mc	VR-4	-----	"S9" on S-Meter

\*Adjustments should be repeated until calibration is correct at both ends of dial.

## TRANSMITTER VFO

Do not attempt to align the VFO section unless the receiver portion of the HA-750 is accurately calibrated or some means of accurate frequency measurement equipment is available.

1. Set all controls as indicated previously.
2. Set SPOT switch to "ON".
3. Follow procedure given in Table 2.

**TABLE 2. VFO ALIGNMENT**

REC/VFO TUNE	ADJUST	INDICATION
50 Mc	L-10*	Unmodulated tone as heard on receiver.
51 Mc	VC-3 Trimmer "A"*	Unmodulated tone as heard on receiver.

\*Repeat adjustments until calibration is correct at 50 and 51 Mc.

4. After VFO alignment is complete, return the SPOT switch to "OFF".

NOTE: When aligning the VFO section, a slight tracking error may be noted between transmit and receive frequencies. The front panel FINE Tuning adjustment for the receiver is used to correct any frequency error that may be noticed.

**TRANSMITTER**

IMPORTANT: Attempting to tune transmitter without a proper antenna or dummy load can damage the final output transistor.

1. Set all controls as indicated previously.
2. Connect the push-to-talk microphone to the MIC jack.
3. Connect a 5 watt, 50 ohm RF Wattmeter to the ANT coax connector.
4. Preset REC/VFO TUNE to 51 Mc.

The microphone's push-to-talk switch should be depressed only while performing each adjustment step in Table 3.

**TABLE 3. TRANSMITTER ADJUSTMENT**

PURPOSE	ADJUST	INDICATION
VFO Multipliers	L-11, L-12	Maximum Indication on RF Wattmeter
Crystal Oscillator (See Note 1)	L-9	
1st Amplifier Driver	L-13	
2nd Amplifier Driver	L-14	
Power Amplifier	L-15, L-16 VC-1*, VC-2	
Spotting Level**	VR-5	
Power Meter	VR-2	"S-5" on S-Meter (See Note 2)

\* Located on rear panel.  
\*\* SPOT switch "ON".

NOTE 1: To adjust crystal oscillator the proper crystal must be inserted in the crystal socket and the VFO/XTAL/PA switch set to "XTAL". At the point of oscillation, screw in the core an additional 1.5 turns. After performing this step, be sure to return to VFO position.

NOTE 2. The front panel relative power meter should be adjusted to read the same power (in watts) as that indicated on the RF wattmeter. For example, if the RF wattmeter indicates 2 watts, the front panel meter should be set to read "2" on the Power scale.

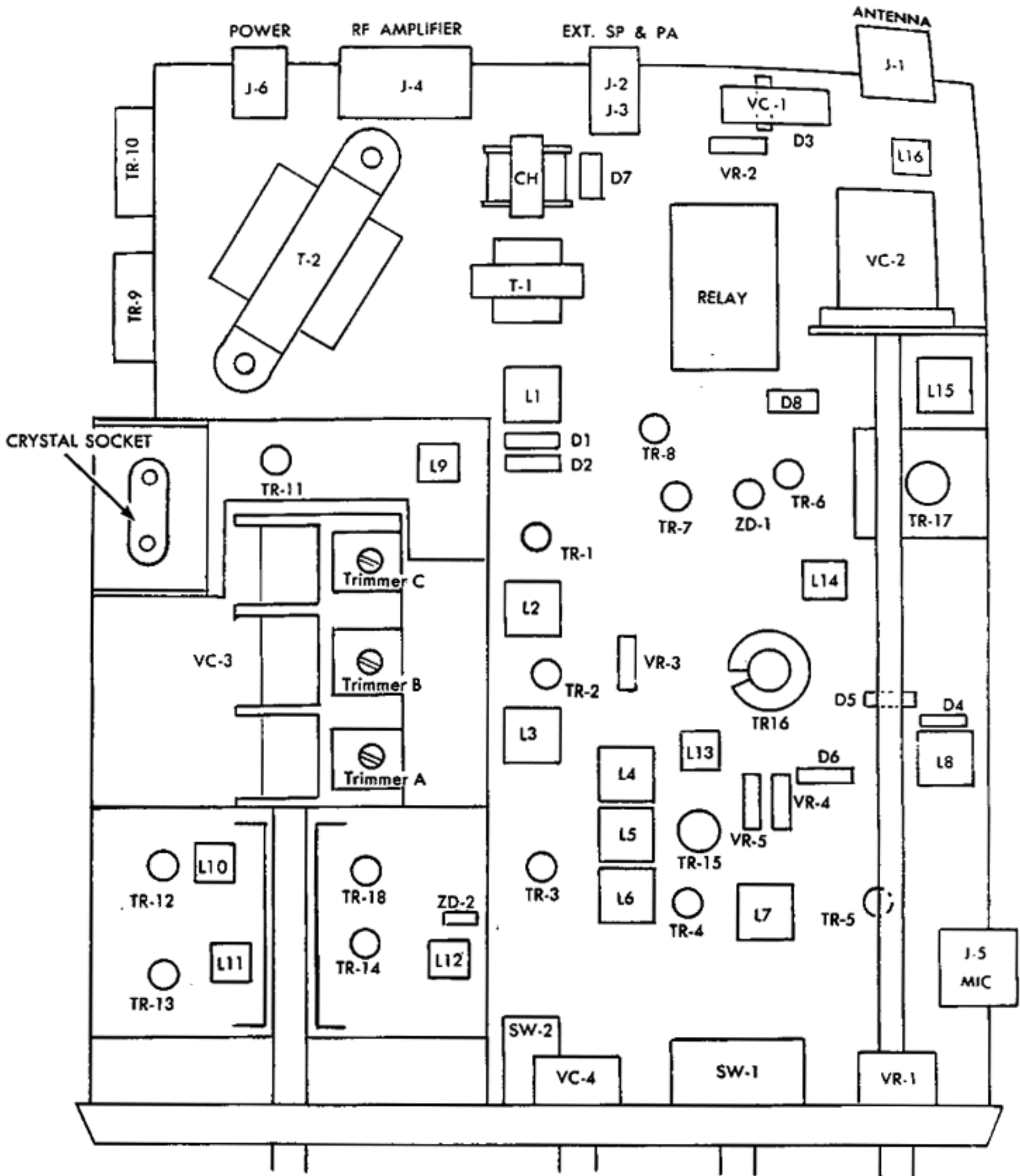
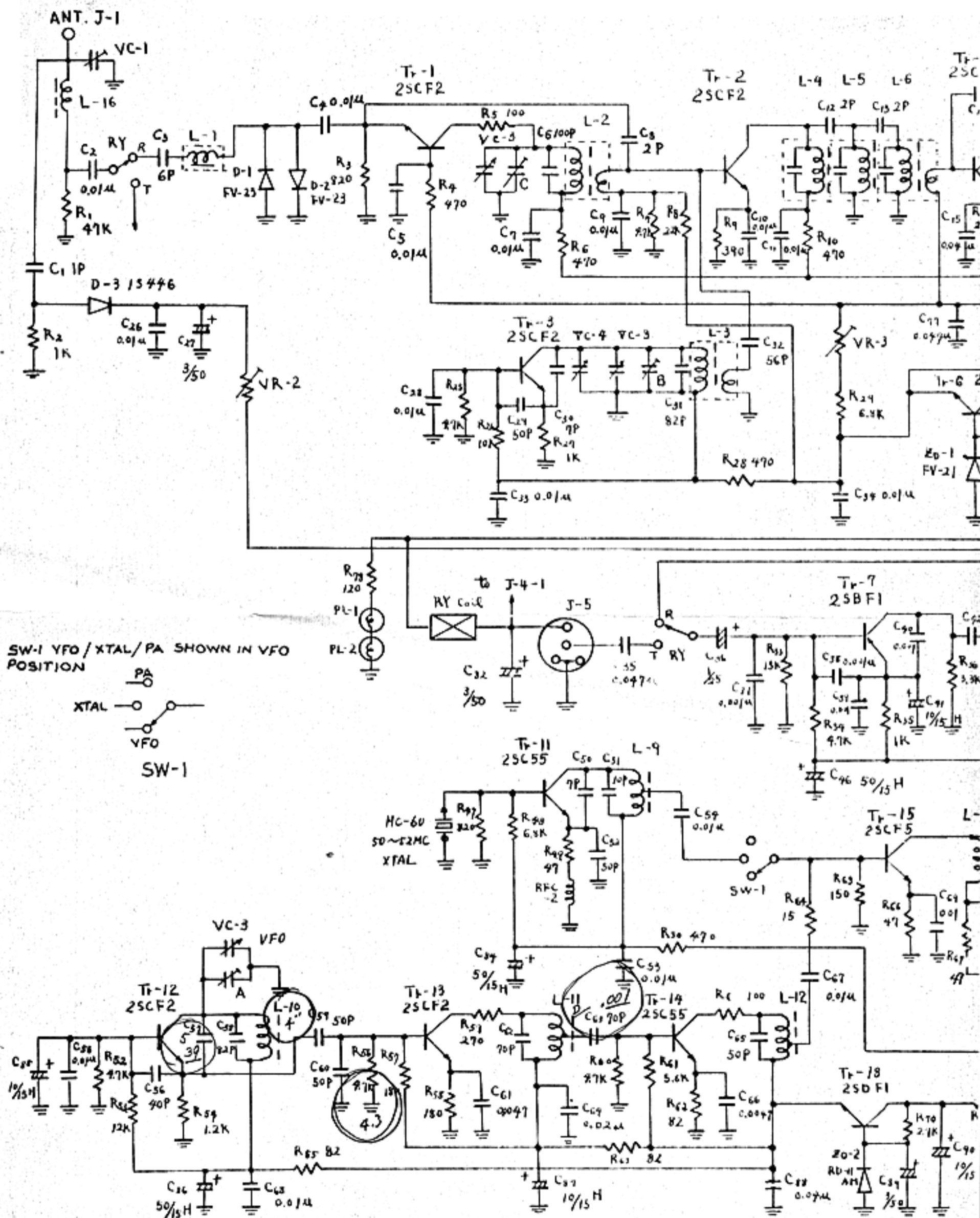


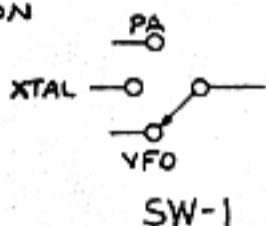
FIGURE 9. COMPONENT AND ALIGNMENT POINT LOCATION

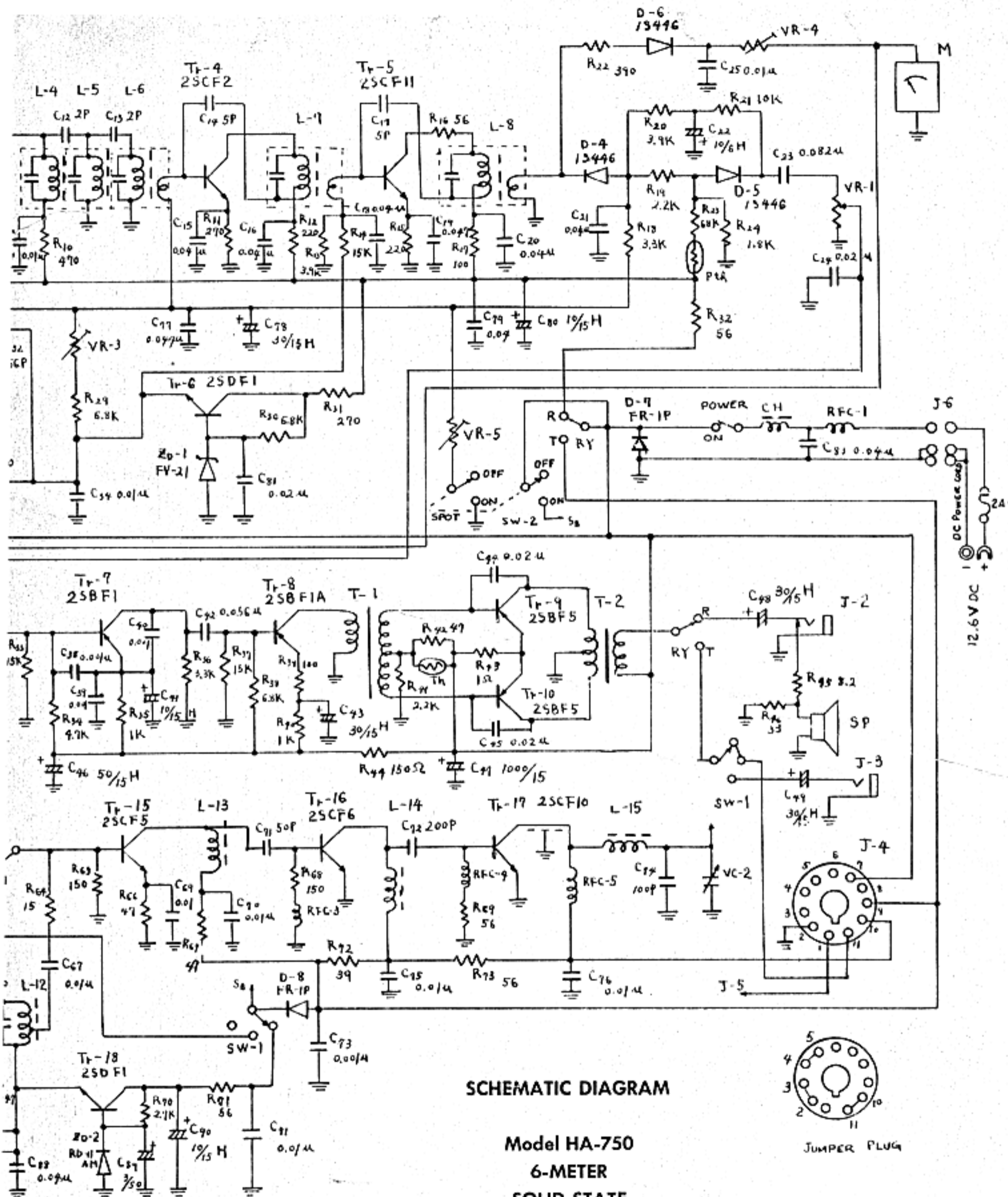


750 mds



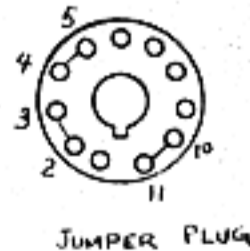
SW-1 YFO/XTAL/PA SHOWN IN VFO POSITION





**SCHEMATIC DIAGRAM**

**Model HA-750  
6-METER  
SOLID-STATE  
MOBILE TRANSCEIVER**



JUMPER PLUG