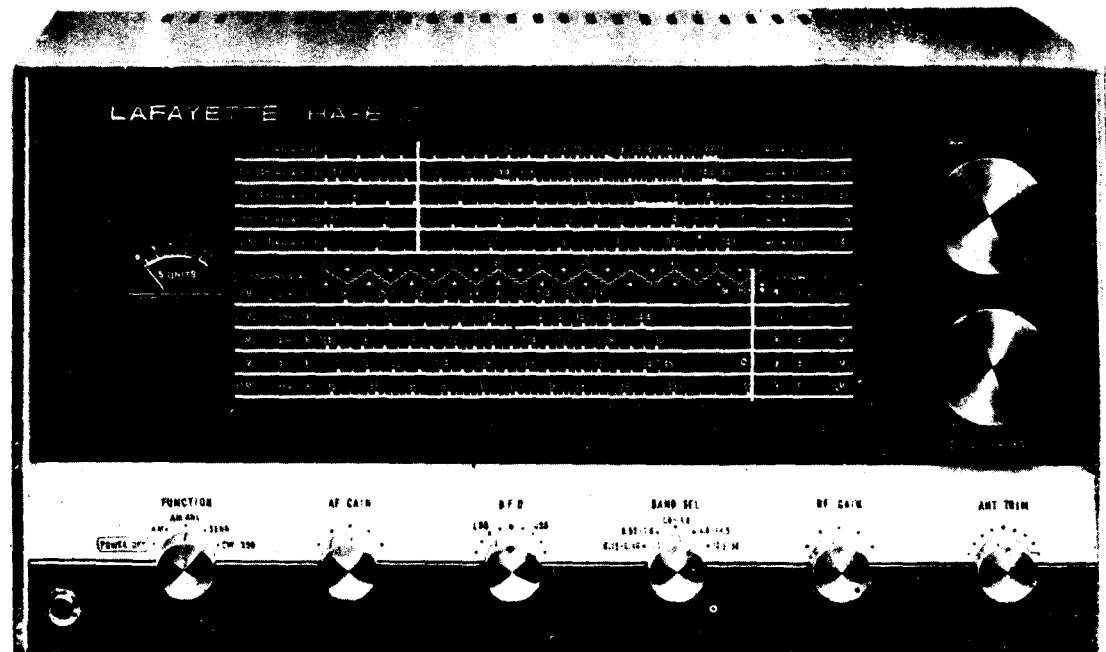




# LAFAYETTE

## Model HA-600

(Stock No. 99-2595WX)



## SOLID STATE AMATEUR AND SHORTWAVE RECEIVER



INSTALLATION AND OPERATING MANUAL



# TECHNICAL SPECIFICATIONS

FREQUENCY RANGE .....	150 Kc to 30 Mc in 5 bands.		
	0.15 - 0.40 Mc.		
	0.55 - 1.6 Mc.		
	1.6 - 4.8 Mc.		
	4.8 - 14.5 Mc.		
	10.5 - 30.0 Mc.		
SENSITIVITY .....	1 $\mu$ V at 10 db S/N ratio.		
SELECTIVITY .....	$\pm$ 6 Kc at 60 db down; $\pm$ 2 Kc at 6 db down.		
INTERMEDIATE FREQUENCY .....	455 Kc.		
BFO FREQUENCY .....	455 Kc $\pm$ 2.5 Kc.		
ANTENNA INPUT IMPEDANCE .....	50 - 400 ohms.		
AUDIO OUTPUT IMPEDANCE .....	4, 8 and 500 ohms.		
AUDIO POWER OUTPUT .....	3 watts at 4 ohms.		
TRANSISTOR COMPLEMENT .....	TR-1	2SC784	RF Amplifier
	FET-1	TI712A	Mixer
	FET-2	TI712A	Local Oscillator
	TR-2	2SCF11	1st IF Amplifier
	TR-3	2SCF11	2nd IF Amplifier
	TR-4	2SCF11	Beat Frequency Oscillator
	TR-5	2SCF11	Product Detector
	TR-6	2SDF1	1st Audio
	TR-7	2SBF1	Audio Driver
	TR-8,9	2SBF5	Push-Pull Audio Output
	TR-10	2SDF11	Voltage Regulator
DIODES .....	D-1	FV-23	RF Overload Protector
	D-2	1S446	AM Detector
	D-3	1S446	Automatic Noise Limiter
	D-4	1S446	S-Meter Rectifier
	D-5	RD-9A	Voltage Regulator
	D-6	RD-11A	Voltage Regulator
	D-7, 8	DS-1P	Power Supply Rectifiers
POWER REQUIREMENTS .....	105-120 volts 50/60 cycles AC or 12 volts DC (Negative Ground Only).		
POWER CONSUMPTION (MAX.) .....	AC: 1 ampere; DC: 1/2 ampere.		
DIMENSIONS .....	15" W. x 9-3/4" D. x 8-1/4" H.		
NET WEIGHT .....	17 lbs.		

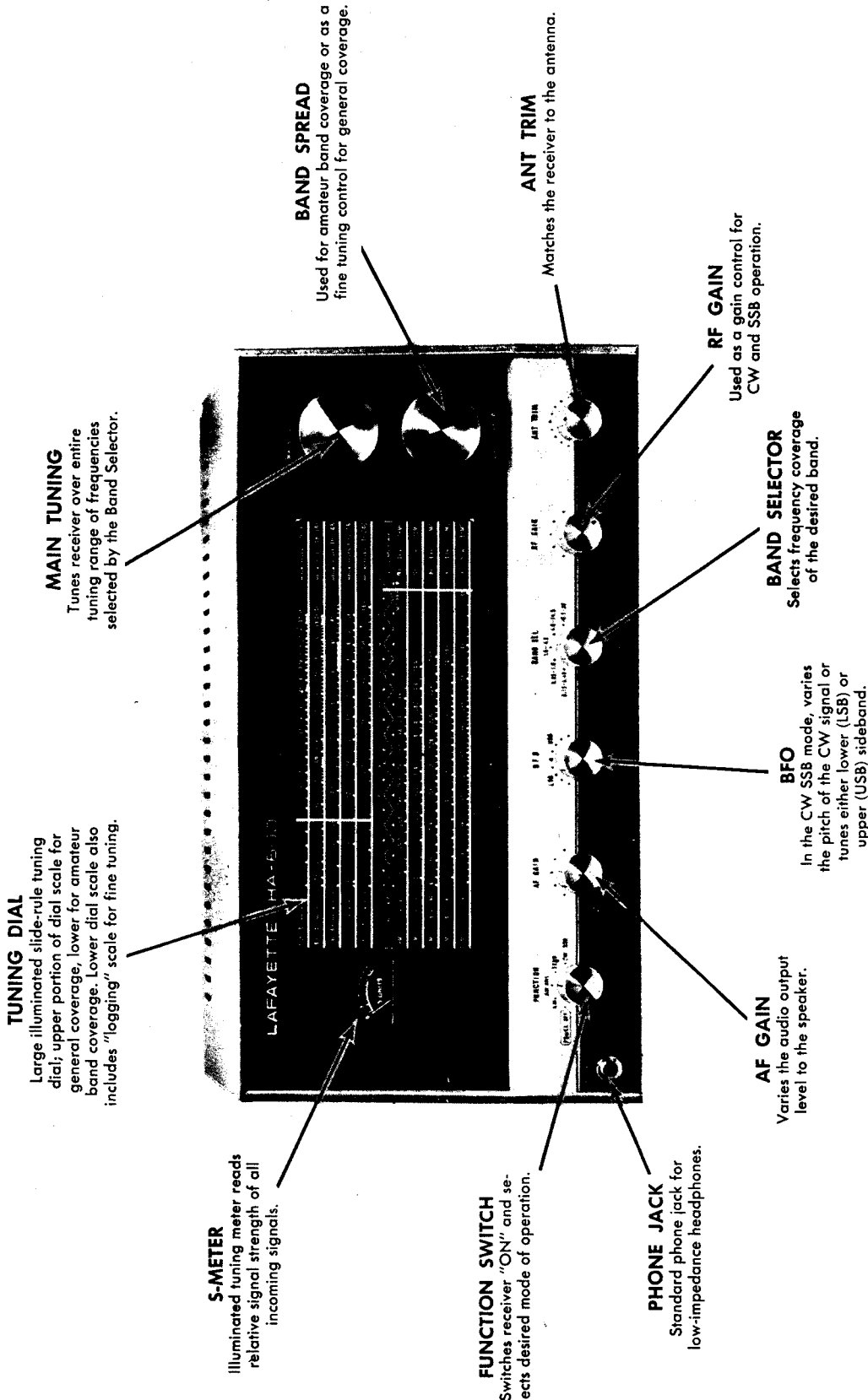


Figure 1. Front View

## GENERAL DESCRIPTION

The Lafayette Model HA-600 is a sensitive solid state superheterodyne receiver designed to meet the needs of the Radio Amateur as well as the most demanding short-wave listener. The large illuminated slide rule tuning dial clearly and accurately indicates receiver frequencies from 150 Kc to 30 Mc in five bands. For extreme accuracy, a band spread tuning dial is incorporated with direct dial calibrations on the 80, 40, 20, 15 and 10 meter amateur bands. A 0-100 logging scale is also included on the band spread dial to assist in logging other than amateur band frequencies. Through the use of two separate tuning dials, optimum read-out and operation is provided. The HA-600 is designed to receive CW (code), AM (phone) and SSB (single sideband) within the frequencies covered by the receiver. When receiving SSB or CW signals, the variable BFO (beat frequency oscillator) may be used to select the desired sideband or adjust the pitch of the CW signal.

The receiver employs a tuned RF and Mixer stage to give maximum sensitivity and a high signal-to-noise ratio, while two Intermediate Frequency stages and a mechanical filter provide a high degree of selectivity. A product detector operating in conjunction with the BFO is employed for CW and SSB operation, while a separate diode detector is used for AM reception.

The all transistor design of the receiver offers all the advantages expected from solid state circuitry -- instant operation, low current consumption and cool operation. The universal type power supply incorporated within the receiver is designed to operate from both 110 volts 50/60 cycles AC or 12 volts DC.

The antenna input is designed for use with unbalanced type lines of 50-400 ohms impedance. An antenna trimmer control provides the required matching of the antenna to the receiver. A tape recorder output as well as audio outputs of 4, 8 or 500 ohm impedance are provided on the rear panel. Other features include an illuminated "S" meter, RF gain control, AM automatic noise limiter and a full time AVC circuit.

The HA-600 receiver will provide reliable short-wave and amateur band reception in its intended application if operated in accordance with this manual. We suggest that you keep the manual close at hand and in a safe place so that you may refer to it whenever necessary.

## UNPACKING INSTRUCTIONS

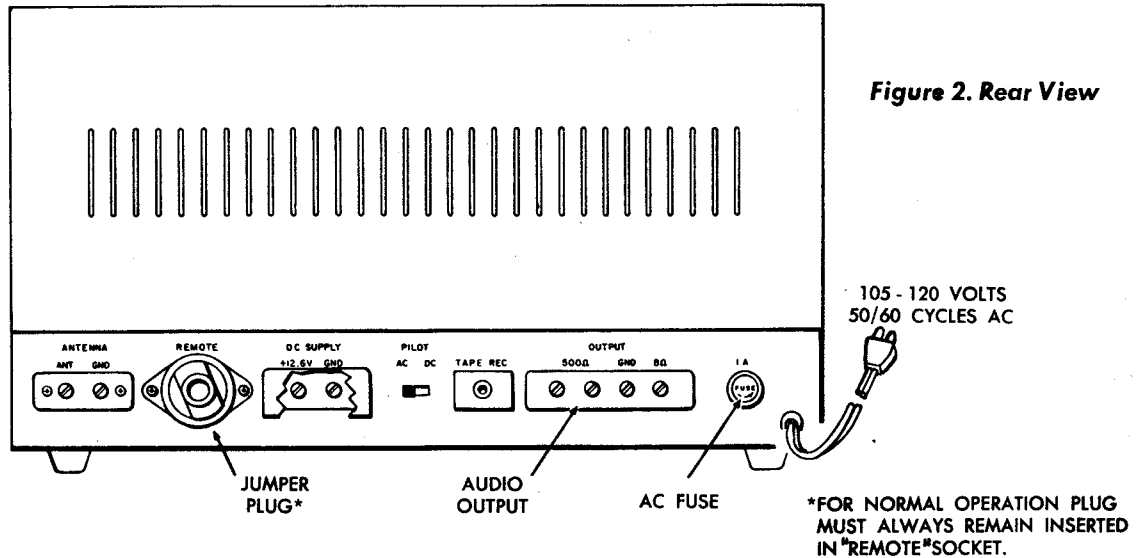
The receiver has been packed with adequate internal carton bracing and cushioning to withstand normal handling in shipment on common carriers. Examine the carton exterior for signs of severe damage (crushing, piercing, etc.). In the event of obvious serious damage, examine the equipment carefully to determine the extent of internal damage, save packing material and make claim against transportation company.

It would be a good idea if the shipping carton and internal packing were saved for a period of time. Many customers have found that saving the carton is a great convenience in the event of moving or prolonged storage. It should also be kept in mind that if it should become necessary to return the receiver for repair under Warranty, it must be returned in the original shipping carton.

## INSTALLATION

### LOCATION

In general the location of the receiver is not critical; it may be placed in any location that proves convenient to the operating controls. Care should be taken to avoid excessively warm locations such as those near radiators and/or heating vents. An inch or so of clearance between the back of the receiver and the wall should be allowed for proper ventilation.



## ELECTRICAL POWER

The receiver is designed to operate from both a 12 volt DC and 105-120 volt 50/60 cycle AC power source. Operating the receiver on any other AC or DC power source will severely damage the unit. On AC power the tuning dial lamps will become illuminated. However, to prevent excess current consumption when operating the receiver on DC the tuning dial lamps may be switched off by placing the PILOT switch on the rear apron in the "AC" position.

### AC (Alternating Current)

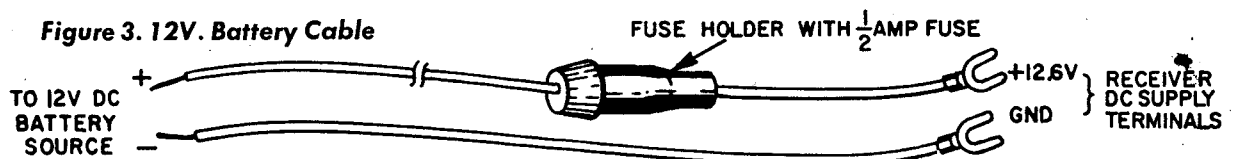
Set the PILOT switch on the rear apron to the "AC" position and insert the standard AC line plug into an outlet supplying 105-120 volts 50/60 cycles AC.

### DC (Direct Current)

**IMPORTANT:** The receiver is designed so that it may be operated on a 12 volt DC battery source for field use, or as an emergency portable if AC power fails. If the receiver is connected to an existing 12 volt DC electrical system, make certain that the system employs a common Negative Ground only.

Set the PILOT switch on the rear apron to the "DC" position and remove the "cover plate" shielding the DC SUPPLY terminal strip. Removal of this plate will expose two screw type terminals. Connect a wire line from the +12.6V screw terminal to the positive battery terminal. The other screw terminal (marked GND) should connect to the negative, or ground side of the battery. When connecting the receiver to the 12 volt power source, wire no smaller than No. 18 AWG should be used.

**NOTE:** The protective fuse incorporated in the receiver protects the unit from overloads when operating on AC only. When operating the receiver on DC, it is recommended that a fuse (1/2 ampere) and fuse holder be inserted in the positive DC battery line. See Figure 3.



## HEADPHONES

The front panel PHONES jack is provided for operation where headphone listening is desired. This jack matches with a standard 2-conductor phone plug available from any local electronics parts store or Lafayette Radio Electronics under Stock No. 99-6223. For optimum results, the headphones should be of the low-impedance type although impedances up to 2000 ohms will provide satisfactory operation. Insertion of the phone plug into the front panel jack automatically silences the speaker and/or phones connected to the 8 or 500 ohm output terminals.

## SPEAKER CONNECTIONS

A 4-screw terminal strip (marked OUTPUT) is provided on the rear of the receiver for speaker or headphone connection. Any PM (permanent magnet) speaker with a 4-8 ohm impedance may be used when connected directly across the terminals marked GND and 8  $\Omega$ . An excellent speaker for this purpose is the Lafayette Model HE-48A speaker (available under Stock No. 99-2569).

If it is desired to have speaker and headphone operation simultaneously, phones may be wired directly across the 500  $\Omega$  output terminals. The headphones connected to these terminals should be of the low impedance type (up to 2000 ohms).

## TAPE RECORDER CONNECTION

Provision has been made in the receiver to permit recording of all signals being received. A special output jack on the rear chassis (marked TAPE REC) is provided for connection to the Radio/Aux input on a tape recorder. Use a shielded audio cable terminated with an RCA-type phono plug (this plug matches the TAPE REC jack on the receiver) to connect the receiver to the tape recorder. The audio output at this jack is present during all modes of receiving.

## REMOTE SOCKET/JUMPER PLUG

The REMOTE socket end plug on the back of the HA-600 allows control of the receiver when used in conjunction with a transmitter. Most transmitters contain terminals for receiver switching, if not, an external switching device can be constructed. In the case of remote switching, the FUNCTION switch should be set to the AM, AM/ANL or CW/SSB position depending on the desired mode. For normal operation the jumper plug must always remain inserted in the REMOTE socket. Figure 4A reflects the original Remote Plug wiring. Figure 4B illustrates the manner in which the plug is wired for transmitters containing a pair of relay contacts for receiver control. Removing the original jumper wire at point "X" and connecting a pair of wire leads to the relay, switches the B+ to the receiver. With the contacts closed, voltage will be applied in the usual manner; contacts opened will break the B+ line and put the receiver in a "standby" mode. Figure 4B illustrates the plug wiring when the receiver is used with a transmitter that provides a "muting" voltage. This muting voltage (available on most SSB transmitters) mutes or quiets the receiver during transmissions. If it is desired to only connect a remote 8-ohm speaker to the plug, it may be connected directly across pins 1 and 8 with the original jumper wires connected.

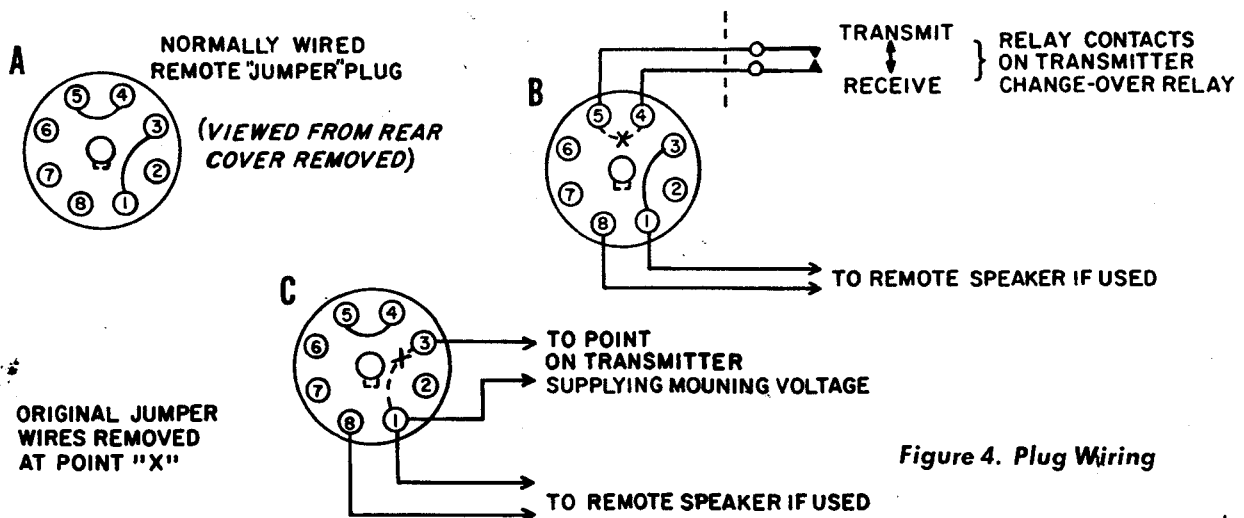


Figure 4. Plug Wiring

## FUSE

The fuse socket on the rear chassis contains a 1-ampere (slow-blow) protective fuse. If replacement becomes necessary, replace only with one of the same rating. Unscrew the spring loaded cap (marked FUSE) to remove the fuse.

## ANTENNAS

The receiving capabilities of your Lafayette HA-600 receiver will be greatly determined by the efficiency of the antenna system used. Best results will be obtained with any antenna if it is installed as high and in the clear as possible. This will ensure minimum noise pick-up and permit better reception of signals. Due to the complexity of the subject, it is not within the scope of this manual to provide extensive information on antenna systems. Although this section does contain some general information that will be of value.

The receiver is designed to operate from a single wire or balanced type antenna. The front panel antenna trimmer control permits a good match to most antenna systems of 50-400 ohms. The antenna input circuit is of the unbalanced type and is ideally suited for use with a coaxial transmission line.

More elaborate antenna systems than that suggested in this section may be installed to provide better performance. Information on a number of different types can be obtained by referring to the Radio Amateur's Handbook or the ARRL Antenna Book, both published by the American Radio Relay League, West Hartford, Conn.

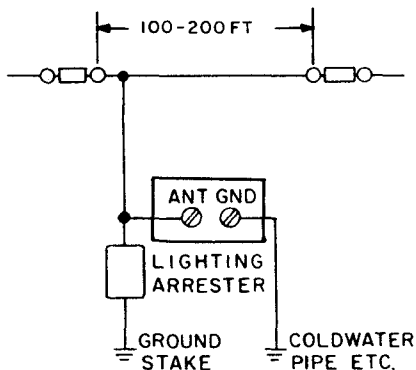


Figure 5. A

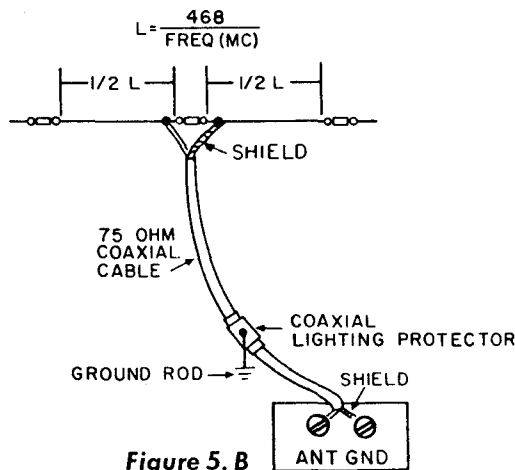


Figure 5. B

## SINGLE WIRE ANTENNA

The end fed or single wire antenna will provide satisfactory performance over the entire tuning range. Simply connect the antenna wire to the Antenna "ANT" terminal on the rear apron. For good reception, the antenna wire should be placed as high as possible and 100-200 feet long (See Fig. 5A). Generally, this type antenna provides maximum pick-up at right angles to its entire length. This should be kept in mind when installing the antenna. In some locations, reception may be improved by connecting a ground wire from the Antenna "GND" terminal to a cold water-pipe or outside ground rod. For protection against lightning, a lightning arrester should be installed in the antenna system.



## DIPOLE ANTENNA

A dipole or doublet antenna will give excellent results, especially on amateur bands. A 75 ohm coaxial cable transmission line should be used to connect the antenna to the receiver as shown in Figure 5B. Since the dipole antenna provides optimum performance only at a given frequency, it should be cut to the length for the most used band of frequencies. The overall length of the dipole antenna may be determined by using the following formula:

$$\frac{468}{\text{Frequency in Megacycles}} = L \text{ (Length in feet)}$$

For example: If operation is desired on 3.5 Mc (the low end of the 80 meter amateur band), the length of the antenna should be approximately 134 feet as determined by the formula.

$$\frac{468}{3.5 \text{ Mc}} = \text{Approximately 134 feet.}$$

Since the dipole antenna displays directional properties broadside to its length, it should be oriented in such a manner that maximum signal pick-up can be obtained from the desired direction. An antenna height of 30-50 feet is recommended for good reception of weak signals.

## OPERATION

### TUNING

The main and band spread tuning dials are calibrated in megacycles and contain markings throughout the dial to simplify tuning. The major amateur radio bands are contained in the 1.6-4.8, 4.8-14.5 and 10.5-30 megacycle scales. The location of each amateur band is indicated by a small circled letter or letter and number that appears near the amateur band frequencies on the main tuning dial. These amateur band markings may be found on, or near 4.0, 7.0, 14, 22 and 30 megacycles on the main tuning dial. The BAND SElector must be set to the range or band of frequencies desired to be tuned.

Bandspreading on the amateur bands is carried out by initially setting the bandspread pointer to 100 on the Logging Scale and the main tuning pointer directly over the circled letter (or letter and number) for the band to be tuned. The tuning range of the calibrated bandspread dial to be used is indicated by the corresponding letter (or letter and number) to the left and right-hand side of the bandspread scale. On the 40 meter amateur band it will be noted that the band is split between two markings (B1 and B2). B1 and B2 together cover the full range of frequencies on the 40 meter band (7.0 to 7.3 Mc) -- B1 from 7.0 to 7.145 Mc, B2 from 7.145 to 7.3 Mc. Thus, if the main tuning pointer is set over B1, the bandspread scale to be used is the one marked B1. In turn, when the BAND SElector is set to the desired band, and the main tuning pointer is set to a letter (or letter and number) marking, the tuning is accomplished solely with the BAND SPREAD control on the appropriate scale.

For tuning other than the amateur radio bands, the HA-600 may also be operated as a general coverage shortwave receiver. On the shortwave bands radio stations are found transmitting from all over the world. Many of these stations provide English-language broadcasts; however there are also stations transmitting in different foreign-languages. The frequencies on which most shortwave broadcast stations operate are found in the two upper bands of your receiver. The majority of shortwave broadcast stations operate within certain internationally assigned groups of frequencies or "bands".

For your convenience, a list of the shortwave bands which offer best reception has been provided. Since shortwave reception varies with the time of day, season of the year and weather conditions, recommended listening times have also been shown along with each shortwave band.

**Table 1. Shortwave Bands**

SHORTWAVE BROADCAST BAND*	FREQUENCY (Megacycles)	LISTENING TIME
60 meter band	4.80 to 5.00	Winter nights
49 meter band	5.90 to 6.40	Winter nights
41 meter band	7.10 to 7.40	Winter nights
31 meter band	9.20 to 9.70	Nights, all year
25 meter band	11.60 to 12.00	Nights, all year
19 meter band	15.10 to 15.45	Days, all year and Summer nights
16 meter band	17.70 to 17.90	Days, all year and Summer nights
13 meter band	21.45 to 21.75	Days, all year
11 meter band	25.40 to 26.10	Days, all year

\*These are separate and distinct from the Amateur Shortwave bands which operate over different groups of frequencies.

When tuning shortwave stations, the BAND SElector should be set to the desired band, the bandsread pointer should initially be set to 100 on the Logging Scale and the main tuning pointer to the high end of the shortwave frequency to be tuned. The BAND SPREAD control may then be used to tune over the band. Moving the bandsread pointer towards "0" on the Logging Scale subtracts from the frequency indicated on the main tuning scale. Logging of shortwave stations is possible by noting the readings on both the Main Tuning and Logging Scales.

If additional information is required, many publications are available on the subject of listening and locating various shortwave broadcast stations. One such publication is "Better Shortwave Reception" (available from Lafayette Radio Electronics under Stock No. 10-5006) which is highly recommended for the shortwave listener. It provides an introduction to shortwave radio for the beginner and presents some of the more practical aspects and advice for the more experienced listener.

### S-METER READINGS

The front panel illuminated S-Meter provides a means of measuring the relative strength of all incoming signals. These meter readings are only correct when the RF GAIN control is fully clockwise. The S-Meter is directly calibrated in "S" units from 1 to 9, and to 30 decibels above S9.

### INITIAL CONTROL SETTINGS

Initially the BAND SElector should be switched to the desired frequency range, the Main and Band Spread tuning controls should be set as outlined under "Tuning" and the ANT TRIM control to mid-position. The following chart indicates additional control settings for each mode of operation. Thereafter, the degree of strength or clarity with which signals will be received will depend upon proper readjustment of these controls as outlined under each paragraph for a specific mode.

**Table 2. Initial Control Settings**

CONTROL	AM RECEPTION	CW RECEPTION	SSB RECEPTION
FUNCTION	AM or AM ANL	CW SSB	CW SSB
RF GAIN	Maximum	Adjust for desired level	Adjust for desired level
BFO	Not in use	Mid-position	Mid-position
AF GAIN	Adjust for desired speaker output level	Maximum	Maximum

### **AM OPERATION (Phone)**

For the reception of amateur or broadcast stations, short-wave listening, etc., place all controls in the positions as indicated previously. Tune in station using the Main and Band Spread tuning controls as outlined in the section "Tuning" and adjust the ANT TRIM for highest S-Meter reading of the incoming signal. The antenna control setting is satisfactory while operating over a limited frequency range, therefore when tuning over a wide range of frequencies this control should always be repeated at the operating frequency. If excessive spurious noises such as those caused by auto ignition make reception difficult, place the FUNCTION switch in the AM ANL position. The automatic noise limiter (ANL) should be used only when necessary, since it tends to reduce the overall efficiency of the receiver.

### **CW OPERATION (Code)**

The control settings required for the reception of code signals are indicated in the chart. The AF GAIN control should be set to full clockwise rotation (maximum) and the RF GAIN control used as a volume control. Tune in the CW signal to "zero beat" and adjust the BFO control to either side of the center dot for the desired pitch.

NOTE: The markings LSB/USB on the BFO scale are insignificant for CW operation. These markings are used only when tuning single sideband stations.

### **SSB OPERATION (Single Sideband)**

In most cases the only stations that will be received operating single sideband will be amateur radio operators. However, some commercial radio stations may also be found operating SSB. Control settings for sideband reception are virtually the same as for CW. Note, however, that LSB (lower sideband) and USB (upper sideband) markings are provided on the BFO scale to permit selection of either sideband as necessary. The sideband that must be selected will usually depend upon the band in use. The lower sideband (LSB) is usually required for SSB stations operation on the lower amateur bands (80 and 40 meters) whereas the upper sideband (USB) is usually required for stations operating on the higher bands (20, 15 and 10 meters).

The AF GAIN control is set to full clockwise rotation (maximum) and the RF GAIN is used to adjust the signal level. With the main tuning pointer set to the desired band, tune station in with the BAND SPREAD control and then adjust the BFO control in the direction for either LSB or USB until clarity of speech is obtained. If the speech remains garbled and cannot be clarified, select the other sideband and retune slowly. You may have made an error in sideband selection, or the station may be transmitting a sideband other than the one used in the band. Slight readjustment of the BAND SPREAD may be necessary to provide best audio quality.

# RETURNING THE UNIT FOR REPAIR

In the event that repair is necessary (either in or out of warranty), we recommend that you return the receiver to the Lafayette store from which it was purchased. If the unit is to be shipped to our main office for service, please read the instructions which follow.

## SHIPPING INSTRUCTIONS

Pack the unit very carefully to avoid damage in transit, preferably in its original carton. If the original carton is not available, use a sturdy carton with at least 3 inches of shredded paper or excelsior around the unit. In the latter case, wrap the unit in paper first to avoid particles of packing material getting into it. Include with the unit a letter explaining exactly what difficulties you have encountered (remember to add an extra 6¢ postage and indicate on the outside of the carton that First Class Mail is enclosed). Ship by prepaid express if possible and mark **ELECTRONIC EQUIPMENT -- FRAGILE**. Clearly address the carton as follows:

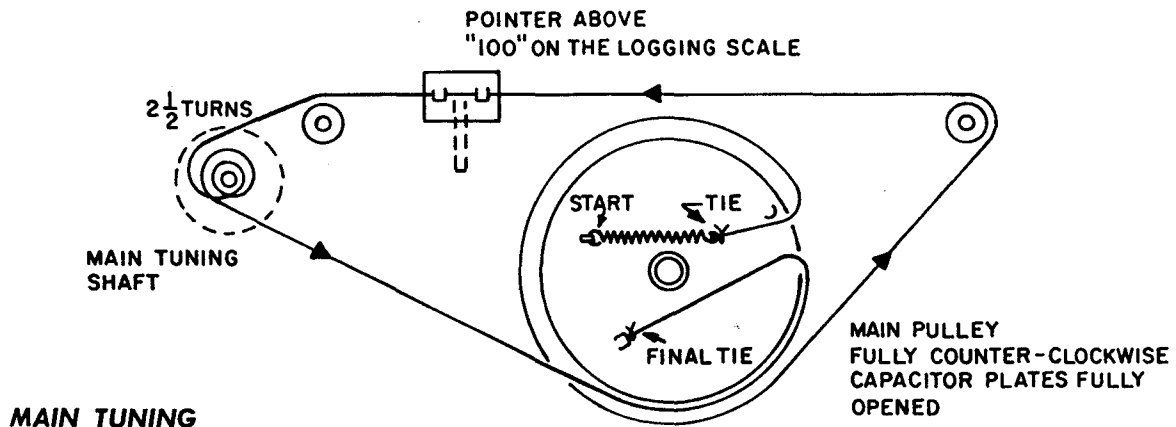
SERVICE DIVISION  
LAFAYETTE RADIO ELECTRONICS CORP.  
111 JERICO TURNPIKE  
SYOSSET, L. I., N. Y. 11791

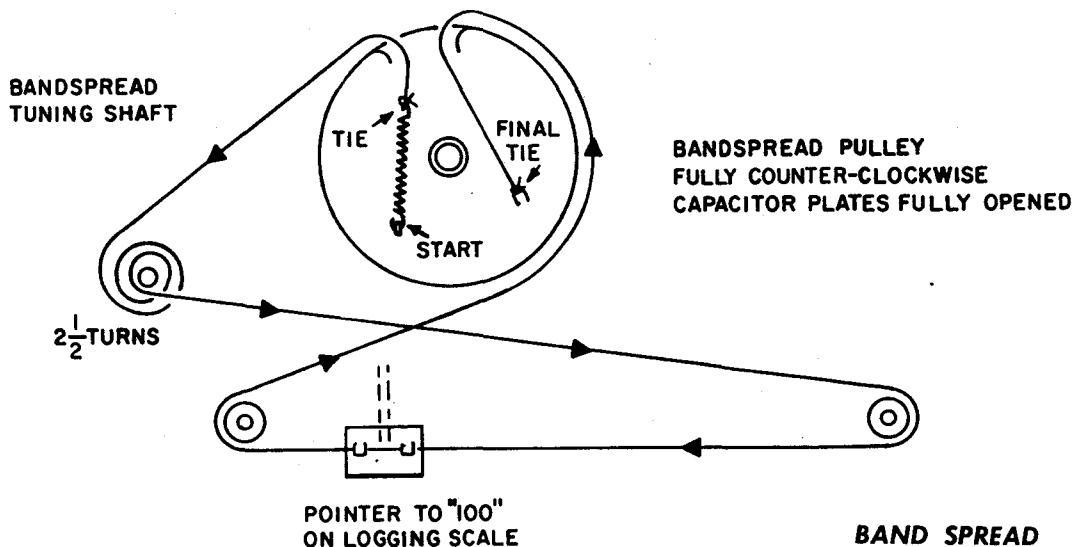
# SERVICE INFORMATION

## DIAL CORD STRINGING

Set the Main or Band Spread tuning capacitor indicated. It should be noted that the illustrations are viewed from the rear of the chassis. In either case (Main or Band Spread) tie one end of the dial cord to the spring at the starting point and restring in the direction indicated with moderate tension. Applying a firm tension on the dial cord, make final tie at the point shown on the drawing. Cut away all excess dial cord.

NOTE: Due to the variable capacitor plates having to be fully opened, extreme care should be exercised while stringing the new dial cord.





## ALIGNMENT

The Model HA-600 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. Unless otherwise stated, the bandspread pointer should be set at "100" and all other controls should be set as outlined under "Initial Control Settings" for AM reception.

Do not make any adjustments unless the operation of this unit is fully understood and adequate test equipment is available. Refer to Figure 6 for the location of all alignment points.

### COVER REMOVAL

Remove the four screws on the sides of the receiver and remove the top cover. During RF alignment (adjustments on underside of unit) the procedure should be followed with the bottom cover in place. Access holes have been provided on the bottom plate for slug and trimmer adjustments. If it becomes necessary to remove the bottom cover, the six slotted hex-head screws should be removed.

### TEST EQUIPMENT REQUIRED

Calibrated RF Signal Generator, AC Voltmeter or VTVM and Non-metallic alignment tools.

Table 3. Alignment Chart

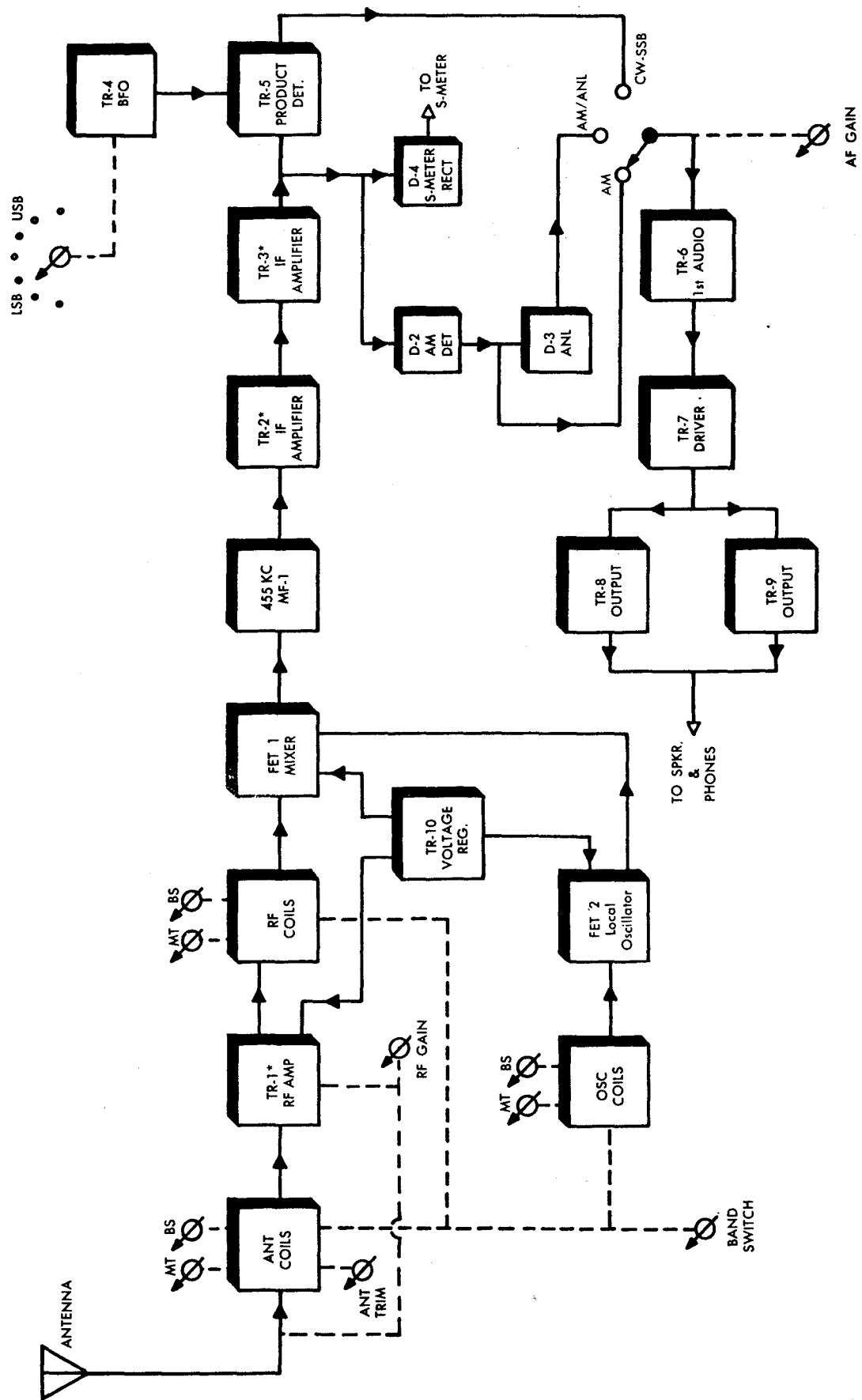
STEP	INPUT SIGNAL AND S. G. COUPLING	BAND SELECTOR	MAIN TUNING DIAL SETTING	ADJUST	OUTPUT INDICATION	
IF and mechanical filter alignment	455 Kc at Point "A" on VC-1	.55- 1.6	.55 Mc	MF-1, L16, L17, L18 (Adjustments should be repeated several times to insure that all adjustments are peaked at 455 Kc).	Maximum output	
	.16 Mc (160 Kc)	0.15- 0.40	.16 Mc	L11 (Osc) L6 (Mixer)	on	
	.38 Mc (380 Kc)		.38 Mc	TC6 (Osc) TC1 (Mixer)	AC	
	.25 Mc (250 Kc)		.25 Mc	L1 (Ant)		
	RF alignment (S. G. across antenna terminals) See note below	.6 Mc (600 Kc)	0.55- 1.6	.6 Mc	L12 (Osc) L7 (Mixer)	Voltmeter (connected across speaker output terminals).
		1.4 Mc (1400 Kc)		1.4 Mc	TC7 (Osc) TC2 (Mixer)	
		1.0 Mc (1000 Kc)	1.6 - 4.8	1.0 Mc	L2 (Ant)	Zero beat (minimum reading on AC Voltmeter).
		1.8 Mc (1800 Kc)		1.8 Mc	L13 (Osc) L8 (Mixer)	
		4.0 Mc (4000 Kc)		4.0 Mc	TC8 (Osc) TC3 (Mixer)	
		2.5 Mc (2500 Kc)	4.8 - 14.5	2.5 Mc	L3 (Ant)	"S-9" on front panel S-meter.
5.0 Mc		5.0 Mc		L14 (Osc) L9 (Mixer)		
14.0 Mc		14.0 Mc		TC9 (Osc) TC4 (Mixer)		
8.0 Mc		8.0 Mc		L4 (Ant)		
BFO*		11.0 Mc	10.5 - 30	11.0 Mc	L15 (Osc) L10 (Mixer)	Zero beat (minimum reading on AC Voltmeter).
	29.0 Mc	29.0 Mc		TC10 (Osc) TC5 (Mixer)		
S-METER	16.0 Mc	.55- 1.6	16.0 Mc	L5 (Ant)	Zero beat (minimum reading on AC Voltmeter).	
	455 Kc (unmodulated) across antenna terminals		7.0 Mc	.55 Mc		L19
	7.0 Mc (100 $\mu$ V level) across antenna terminals	4.8 - 14.5	7.0 Mc	RV-3		

\* Switch FUNCTION control to CW SSB position.

Note: All "Osc" and "Mixer" adjustments should be repeated for each band until calibration is correct at both ends of the dial.

On all bands, the oscillator should be set on the high frequency side of the incoming signal.

Unless otherwise specified, the signal generator should be set for 400 cycles 30% modulation at the alignment frequency.



NOTES:  
 \* AVC Controlled  
 MT = Main Tuning Capacitor (Ganged Sections)  
 BS = Band Spread Capacitor (Ganged Sections)

Functional Block Diagram

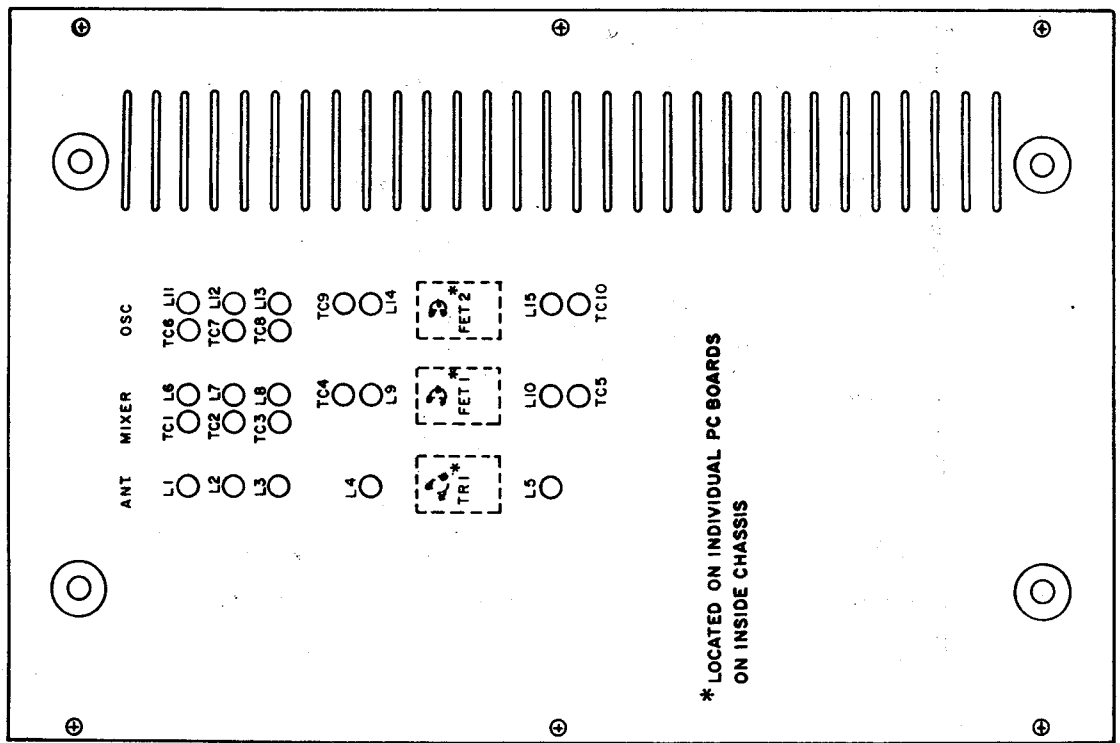
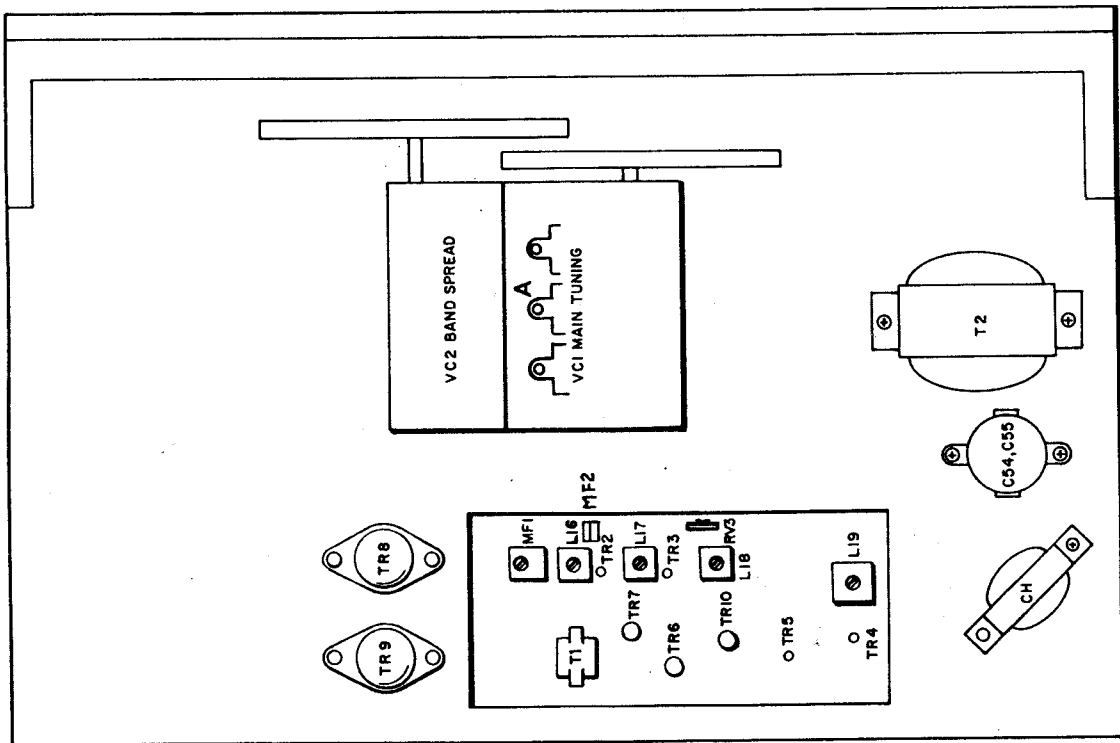
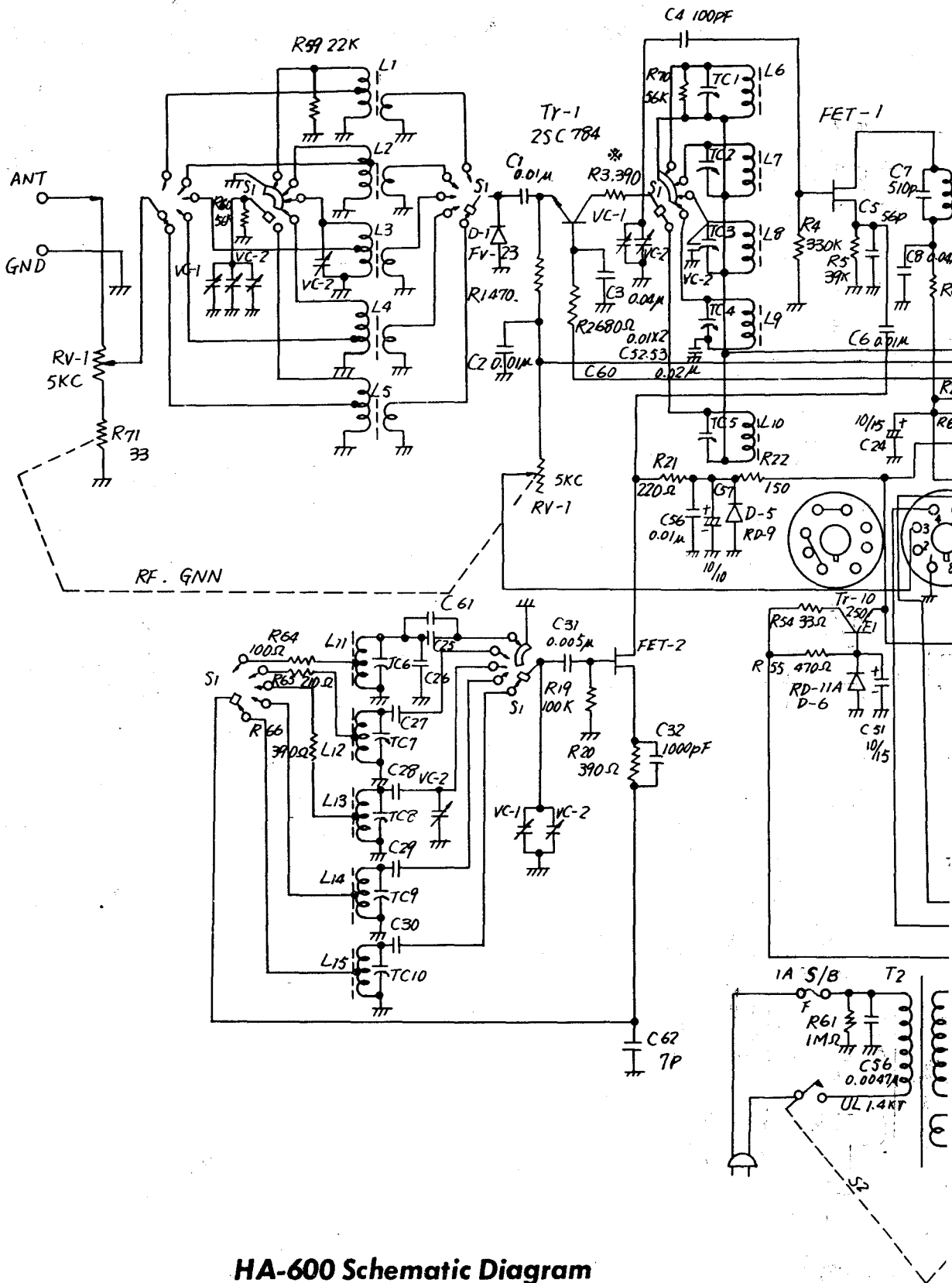
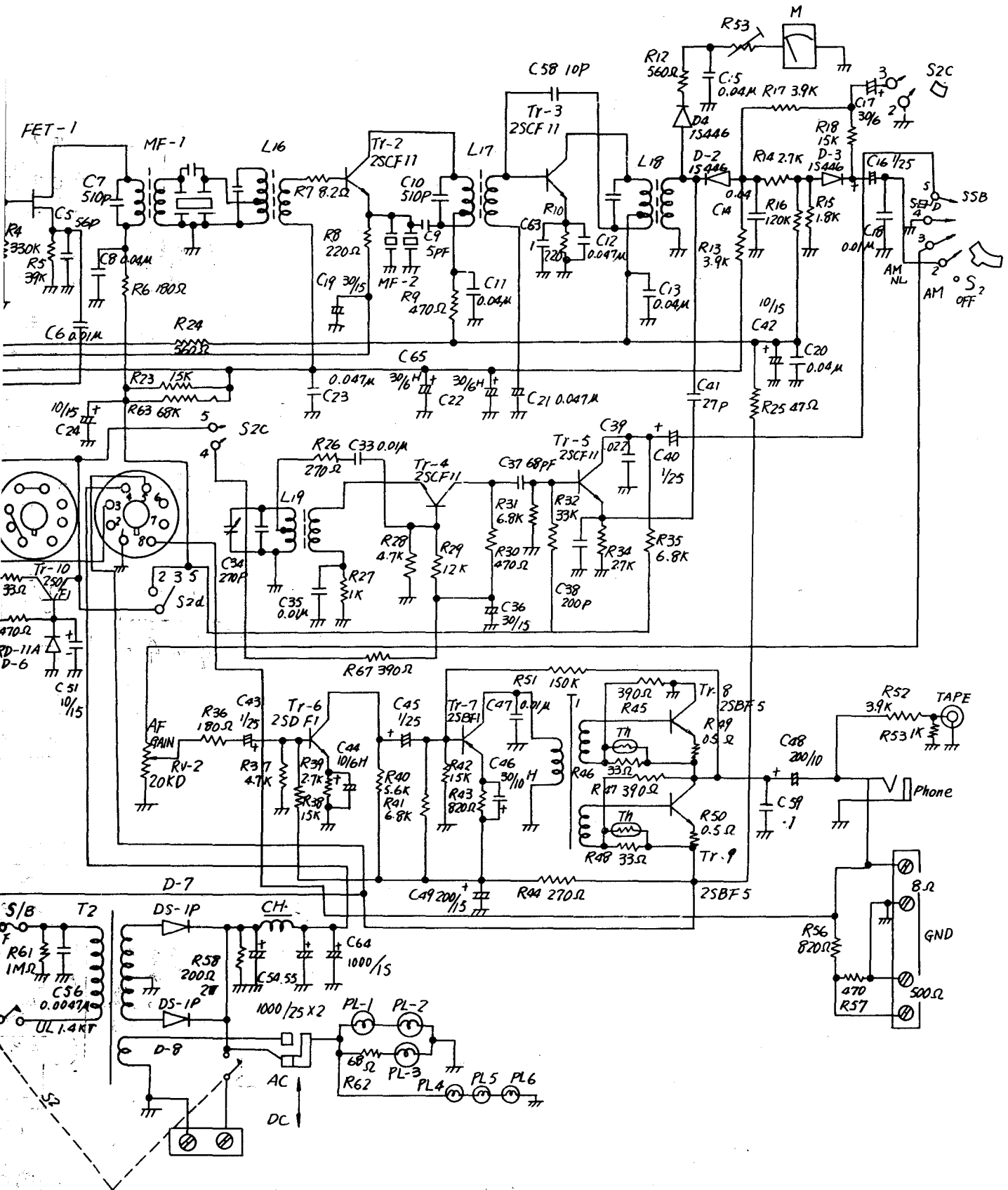


Figure 6. Component and Alignment Point Location





HA-600 Schematic Diagram



LAFAYETTE HABOO

SUPPLEMENTRY INFORMATION

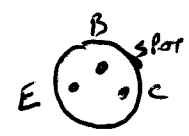
SEMICONDUCTORS FITTED

VOLTAGES MEASURED

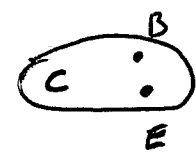
FET 1	MPF 107
FET 2	MPF 107
TR 1	2SC 784
TR 2	? POSSIBLE BF 183
TR 3	? POSSIBLE BF 183
TR 4	? POSSIBLE BF 183
TR 5	? POSSIBLE BF 183
TR 6	2SD 37
TR 7	2SB 60
TR 8	2SB 337
TR 9	2SB 337
TR 10	2SD 37
D5	9V ZENER
D6	10V ZENER



MPF107



2SB 60  
2SD 37

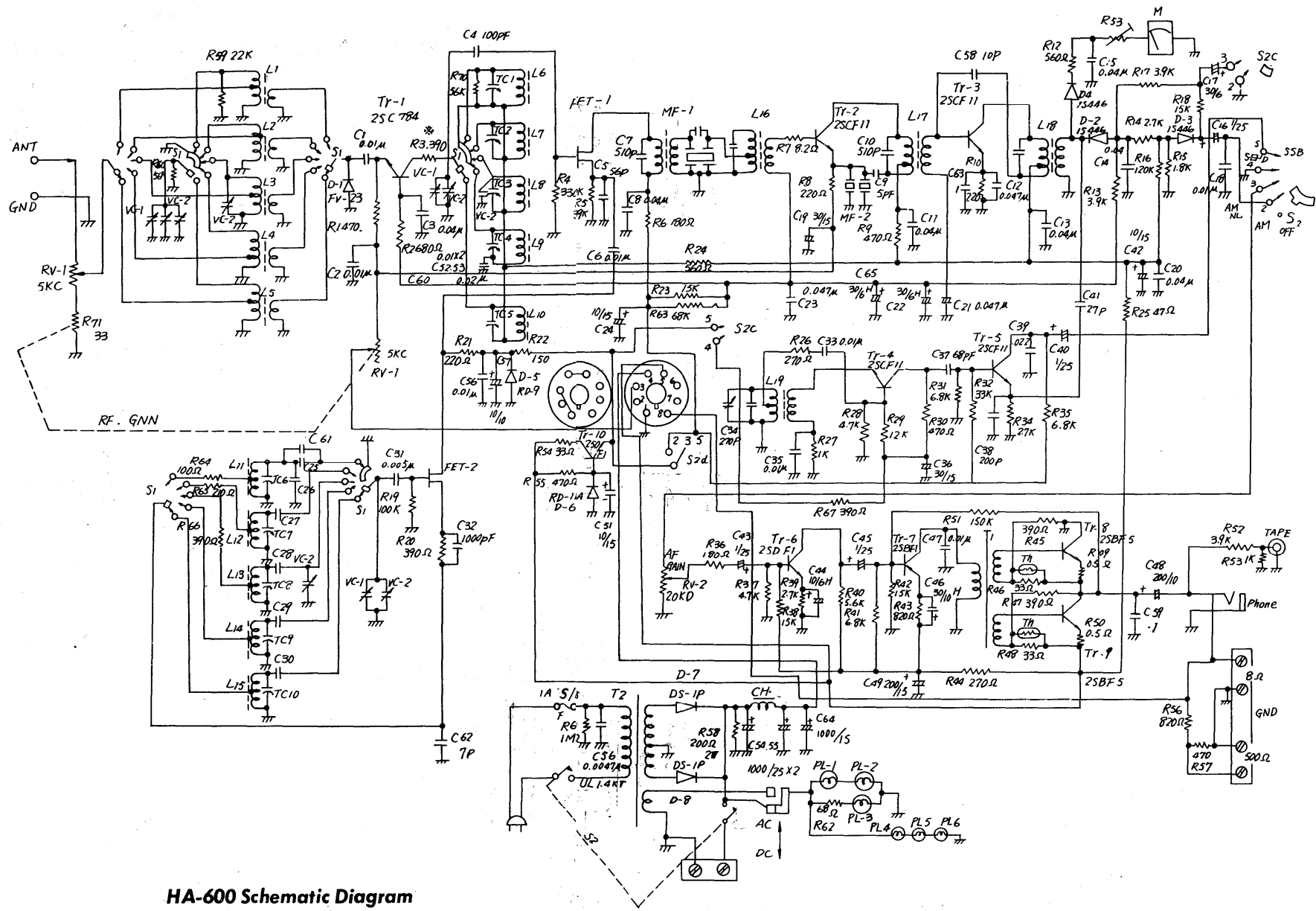


2SB 337

	E	B	C
	S	G	D
FET 1	9.5	4	0
FET 2	8	2.5	-0.5
TR 1	1.8	1.1	9.5
TR 2	1.2	1.9	10
TR 3	1.2	1.9	13
TR 4	1.6	2	8.2
TR 5	1.2	1.8	6
TR 6	2.4	2.5	7.5
TR 7	8.5	8.2	0.9
TR 8	13.5	16	7
TR 9	6.5	6.5	0
TR 10	10	10	13.5

NO SIGNAL / 20 K/V

DFO OM



HA-600 Schematic Diagram