



**LAFAYETTE**

Model HA-310 A



**CITIZENS BAND  
"WALKIE TALKIE"**

**3 CHANNELS  
WITH  
RANGE BOOST**

**STOCK NO. 99-31593L**



**LAFAYETTE RADIO ELECTRONICS**

**OPERATING MANUAL**

## GENERAL

The LAFAYETTE HA-310A is a 13 transistor compact hand-held 3 channel transceiver designed to operate with an input of 1.5 watt to the final RF power stage. It is intended for use in these D Citizens Radio Service under conditions prescribed in Part 95 of the FCC Rules and Regulations. This requires a simple licensing procedure and permits operation on Channels 1 through 23.

Housed in a rugged metal case, the HA-310A comprises a fully miniaturized transmitter and receiver--both crystal controlled for precise, dependable operation. The sensitive superheterodyne receiver section consists of 1 stage of radio frequency amplification, crystal controlled local oscillator, 2 stages of intermediate frequency amplification, automatic gain control for preventing overload of strong signals as well as maintaining signals at approximately the same level, plus an automatic noise limiter for suppression of ignition and similar type electrical disturbances. A 1 stage adjustable squelch circuit is included to quiet the receiver during standby periods in the absence of a signal. A 3 stage push-pull amplifier provides an undistorted high output through the built-in speaker/microphone. In transmit mode the push-pull amplifier in conjunction with RANGE BOOST is used as a high level modulator for the 3 stage crystal controlled transmitter. The RANGE BOOST amplifies the weak voice components generated by the speaker/microphone to produce a higher percentage of modulation and to limit the higher level components to 100% modulation, resulting in increased power in the sidebands with extended transmitting range.

Unless otherwise ordered, the HA-310A is normally supplied with crystals for operation on channel 10. Additional matched pairs of crystals (transmit and receive) are available for operation on any of the other channels.

Although built to withstand a certain amount of abuse, the HA-310A should be treated with the care normally accorded to electronic equipment. Always protect the unit against dirt and water. If the unit is treated with reasonable care, the only maintenance likely to be needed to maintain peak performance is the replacement of the battery when necessary.

# TECHNICAL SPECIFICATIONS

## SPECIFICATIONS

Frequency range.....	26.965 to 27.255 megacycles (channels 1-23)
Number of channels.....	3
Operating frequency .....	Supplied with one set of plug-in crystals for channel 10 (27.075 MHz) in position A. May be operated on any other channels by inserting crystals in position B and C sockets.
Transmitter .....	Crystal controlled: 1.5 watt input to the final RF amplifier. Meets F. C. C. reg. Part 95.
Modulation .....	High level push-pull modulators, 100% capability.
Receiver .....	Crystal controlled with RF stage, 455 KHz I.F.
Sensitivity .....	100 mw. or more at 1 uv input 1 uv for 10 db S+N/N or better
Selectivity .....	6 KC less than 6 db, more than 25 db $\pm$ 15KC
Audio output.....	More than 500 mw.
Power supply .....	12volts, 8 UM-3 type battery
Antenna .....	50" fully extended 9 section telescoping
Transistors.....	13
Diodes.....	5
Varistor .....	1 (temperature compensating)

## ACCESSORIES

### Included with HA-310A

- 1 hand strap
- 8 99-6258 battery cells
- 1 transmit crystal channel 10
- 1 receive " " 10
- 1 instruction manual

### Optional

- Low impedance dynamic earphone
- Receive and transmit crystals for channels 1-23
- External power supply (117 volts AC input 12 volts DC output)

## LICENSING REQUIREMENTS

You are not allowed to transmit unless you are licensed by the FCC either as an individual licensee or operating as an additional station under the license of a station that has been granted permission by the FCC for additional stations. Please refer to FCC Rules and Regulations \*Part 95 section 95.87 also Form 505 Item 8. When you receive your license, fill out TRANSMITTER IDENTIFICATION CARD, FORM 452-C, and affix same to the rear cover.

\*Available by sending \$ 1.25 to the Superintendent of Documents, Government Printing Office, Washington 25 D. C., and requesting Volume VI of FCC Rules and Regulations (which includes Part 95) .

## BATTERY INSTALLATION

Using a coin as a screw driver, turn the large rear cover holding screw in a counter-clockwise direction and remove the cover. Pry off the snap connector attached to the battery holder and remove the empty holder. Insert the 8 1.5 volt penlight battery cells as indicated graphically in each compartment of the holder. Note that the negative end (case) of each cell makes contact with a spring. When inserting a cell, always insert this end first into the compartment, then the other. When all cells have been inserted in the holder, attach the snap connector and install holder into place. Replace rear cover and fasten screw.

## BATTERY METER

To check the batteries, simply switch the unit on (receive mode). The meter pointer will indicate in the green area for good batteries, white area for doubtful or weak batteries and if the pointer indicates in the red area, the batteries should be replaced.

**IMPORTANT:** Do not leave weak or exhausted batteries in the holder, especially if unit is not used or stored for a long period of time as chemical action of weak or exhausted batteries may cause possible damage to battery holder or compartment.

# OPERATING INSTRUCTIONS

Do not attempt to transmit until you receive your license from the FCC.

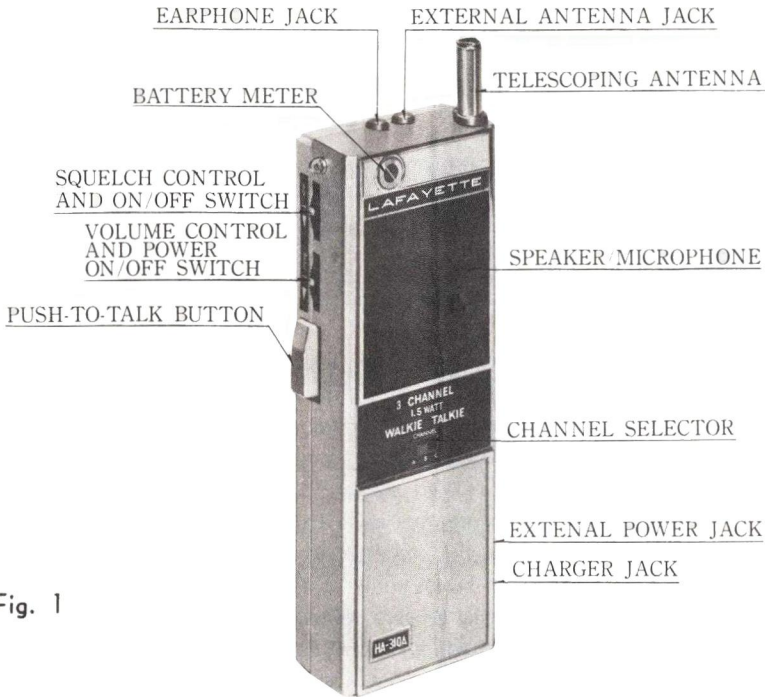


Fig. 1

1. Extend the telescoping whip antenna to its full length. Avoid bending the slim, top section of the antenna when extending or collapsing it.

To extend the antenna, grasp the button-shaped tip and extend the antenna partially. Next, grasp the center sections and extend the lower sections fully. Extend the top sections by pulling gently on tip. To collapse the antenna, grasp the center sections and collapse the lower sections first, then the remainder, with slim top section pushed in by pressing on the tip with the index finger.

2. Turn VOLUME control in a downward direction to switch unit on. Set the SQUELCH control to the fully "open" position initially (upward), and increase volume until background noise is heard. Set channel selector to desired channel (remember, the unit is originally

supplied with crystals for operation on channel 10 only, usually in the A section).

3. The HA-310A is equipped with a combined speaker/microphone which is located behind the grille on the unit. To transmit, hold the unit so that the grille is 3 to 5 inches away from your lips and fully depress the push-to-talk button. Speak clearly and at a normal level. When you have completed your message, release the button.

NOTE: When one unit is transmitting, it is not possible for this unit to hear any messages directed to it. Do not, therefore, attempt to talk until the other station has finished transmitting.

4. The squelch circuit in the receiver section of the transceiver is used to eliminate annoying background noise when no signals are present.

To adjust the SQUELCH control properly during reception, turn up VOLUME until background noise is heard (no signals should be present). Rotate the SQUELCH slowly downward until the background noise just disappears, then rotate slightly further. At this point, the receiver will be quiet between transmitters, but a transmitted signal will overcome the squelch action and be heard. Do not advance the control too far or some of the weaker signals will not be heard. If you wish to receive extremely weak signals or disable the squelch circuit, simply turn the control to the fully upward position.

## CHANNEL SELECTOR

This switch enables you to select one of three frequencies of operation. In one position, position A is selected; in the other positions, either B or C is selected. The actual channels on which the unit is able to operate are determined by the frequencies of the crystals inserted in the unit. As mentioned previously, most units are equipped with crystals for operation on channel 10 inserted in the "A" position. If you decide to insert additional crystals for the other channels, a record should be kept of the channel and its corresponding position in the transceiver to avoid confusion when using the channel selector switch.

## OPERATING RANGE

The HA-310A has been factory-adjusted to provide optimum performance. Its operating range will vary with surrounding conditions and will generally fall into one of the following categories:

**ADVERSE CONDITIONS** (In or around buildings, with poor line-of-sight) -- Under such conditions range may be restricted to several hundred yards.

**NORMAL CONDITIONS** (Line-of-sight conditions, with few intervening obstacles) -- Range may extend up to 1 mile or more.

**FAVORABLE CONDITIONS** (Over flat terrain with no obstructions and no interference or noise) -- Range may extend up to several miles.

## FREQUENCY OF OPERATION

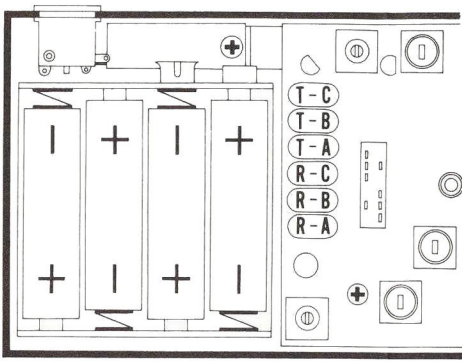
The HA-310A transceiver may be operated on channels 1 to 23 in the 27 MHz Citizens Band. Both receiver and transmitter are crystal-controlled, and are normally equipped with channel 10 crystals unless otherwise ordered. Additional matched pairs of crystals (transmit and receive) may be ordered for operation on other channels.

Note that the crystal in the receiving section of the HA-310A is used for the oscillator and is therefore 455KHz lower than the actual frequency of operation. However, when ordering, you need only specify the stock number and channel for which crystals are required.

## ADDING NEW CHANNEL CRYSTALS

To insert additional crystals in the transceiver, simply remove the back cover (one large screw) and insert the new crystals in the places shown in Figure 2.

**IMPORTANT:** Be sure to insert the receiving (R) and transmitting (T) crystals in their proper location. If their positions are reversed, the HA-310A will transmit on one frequency and receive on another, both of which will be outside the Citizens Band.



R : RECEIVING CRYSTAL  
T : TRANSMITTING CRYSTAL

Fig. 2

## CRYSTAL CHART

CHANNEL		FREQ. (MC.)	FREQ. (MC.)	CHANNEL		FREQ. (MC.)	FREQ. (MC.)
U. S.	CANADA	TRANSMIT CRYSTAL	RECEIVE CRYSTAL	U. S.	CANADA	TRANSMIT CRYSTAL	RECEIVE CRYSTAL
1		26.965	26.510	13	10	27.115	26.660
2		26.975	26.520	14	11	27.125	26.670
3		26.985	26.530	15	12	27.135	26.680
4	1	27.005	26.550	16	13	27.155	26.700
5	2	27.015	26.560	17	14	27.165	26.710
6	3	27.025	26.570	18	15	27.175	26.720
7	4	27.035	26.580	19	16	27.185	26.730
8	5	27.055	26.600	20	17	27.205	26.750
9	6	27.065	26.610	21	18	27.215	26.760
10	7	27.075	26.620	22	19	27.225	26.770
11	8	27.085	26.630	23*		27.255	26.800
12	9	27.105	26.650				

Although receive crystals are 0.455 MHz lower than transmit crystals, the receiver and transmitter both tune to the channel frequency shown in column "FREQ. (MHz) TRANSMIT CRYSTAL"

\*Channel 23 is shared with other Radio Services, including Class C radio control.

## BATTERY REPLACEMENT

When battery replacement becomes necessary, any of the batteries listed may be used.

MFR'S NO.	STANDARD DRY CELL	ALKALINE CELL	MERCURY CELL
LAFAYETTE	99-6258	33-1505	33-1450
JIS	UM 3, UM 3 A	.....	.....
EVEREADY	915	E-91	E-9, E502
BURGESS	Z	AL 9	HG 9
RCA	VS 034	VS 1334	VS 313
RAY-O-VAC	7 R or 7 LP	.....	15M
MALLORY	M-15F	MN-1500	ZM-9, DM-9 N

MERCURY CELLS, which offer the longest life, have opposite polarity to standard or alkaline cells and MUST BE INSERTED IN THE BATTERY HOLDER IN THE OPPOSITE DIRECTION TO THAT OUTLINED IN THE HOLDER.

## EARPHONE OPERATION

If you wish to use the earphone for private listening, simply plug it into the small jack at the top of the unit. This will automatically cut off sound from the speaker.

## OPERATION ON 117 VOLTS 50/60 CYCLE AC

The HA-310A may be operated from 117 volts 50/60 cycle AC when used with an AC adaptor (available as an optional accessory at extra cost). Although this restricts mobility to a certain extent, it does provide battery conservation in those cases where one unit is used as a base station. The HA-310A is equipped with a special jack at the side into which the AC adaptor plug is inserted for AC operation.

## SERVICE AND MAINTENANCE

If trouble is experienced with the unit, we recommend that you check the following:

1. Check battery for weak or discharged condition. Replace if necessary.

2. Make sure the channel selector is set to the position in which crystals have been inserted (The unit is normally supplied with crystals in position A only).
3. If trouble is experienced with transmission, make sure you are depressing the push-to-talk button fully. Also, the antenna must be fully extended for proper operation.
4. Make sure crystals are firmly seated. Check the frequencies or channel markings. Make sure crystals (T & R) are inserted in their proper positions and not reversed.
5. If checks above fail to disclose the trouble, do not attempt repairs or adjustments yourself. The unit should be serviced only by a qualified radio technician. Whenever possible, we recommend that you return a defective unit to the store from which it was purchased.

## RETURNING THE UNIT FOR SERVICE

In the event that repair is necessary [either in or out of warranty], we recommend that you return the unit to the store from which it was purchased. In most cases, this will be your fastest and most efficient method of obtaining service.

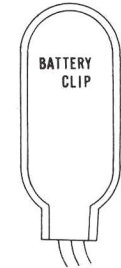
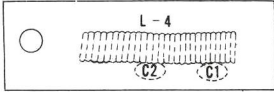
If you wish to ship the unit to our main service center, please read the instructions which follow.

### SHIPPING INSTRUCTIONS

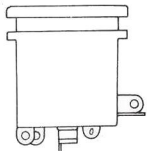
Pack the unit very carefully to avoid damage in transit, preferably in its original carton. If the original carton is not available, use a sturdy carton with at least 3 inches of shredded paper or excelsior around the unit. In the latter case, wrap the unit in paper first to avoid particles of packing material getting into it. Include with the unit a letter explaining exactly what difficulties you have encountered [remember to add extra First Class 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.  
150 Engineers Road  
Hauppauge, L. I., N. Y. 11787

LOADING COIL



CHANNEL SWITCH



PWR. CHG. JACK

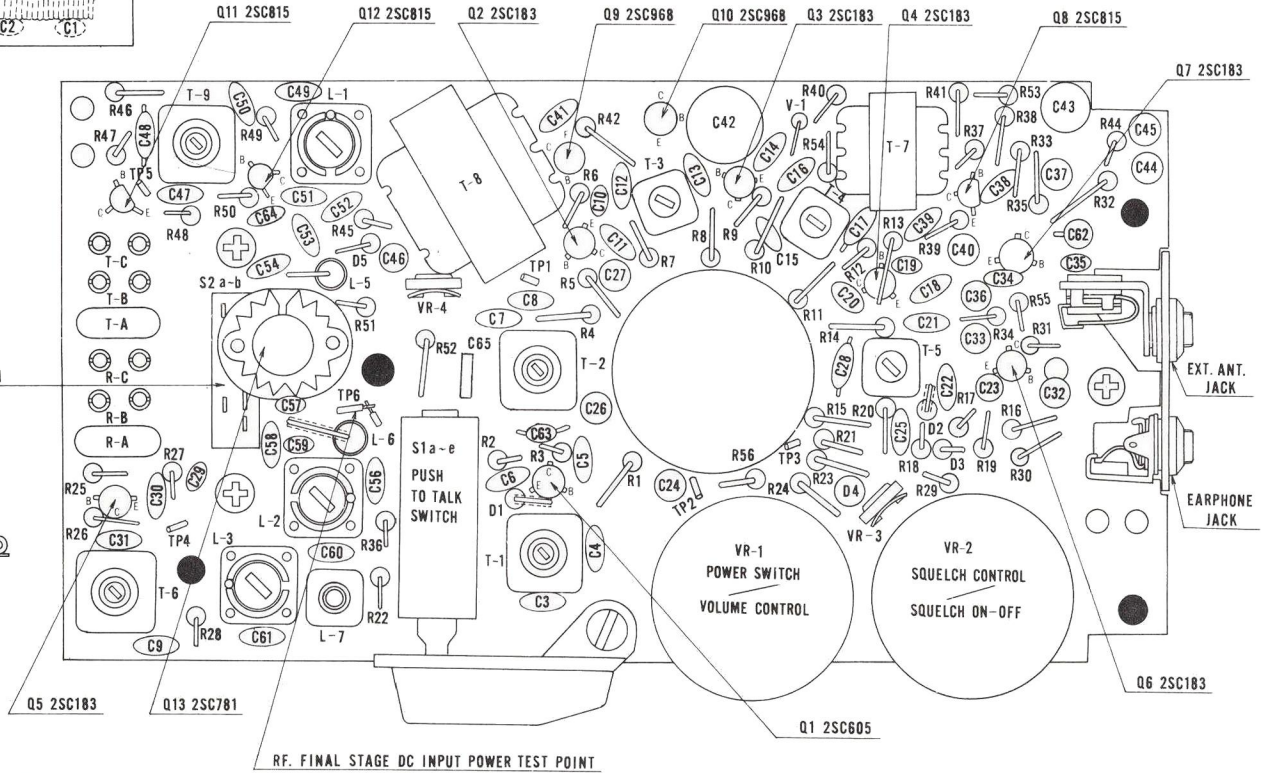
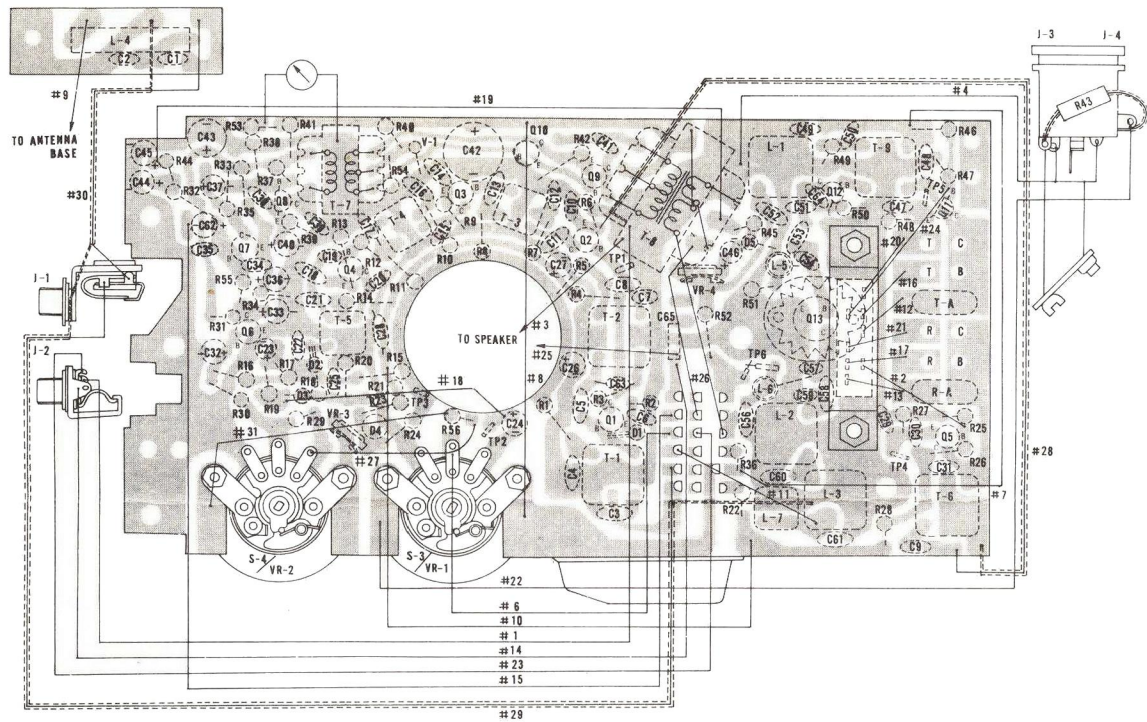
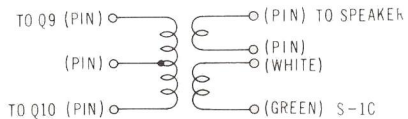


Figure 3.



T-8 OUTPUT TRANS

PRIMARY : SECONDRY



PUSH-TO-TALK SWITCH  
(BOTTOM VIEW)

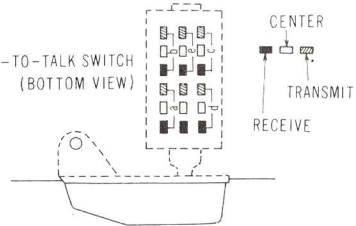
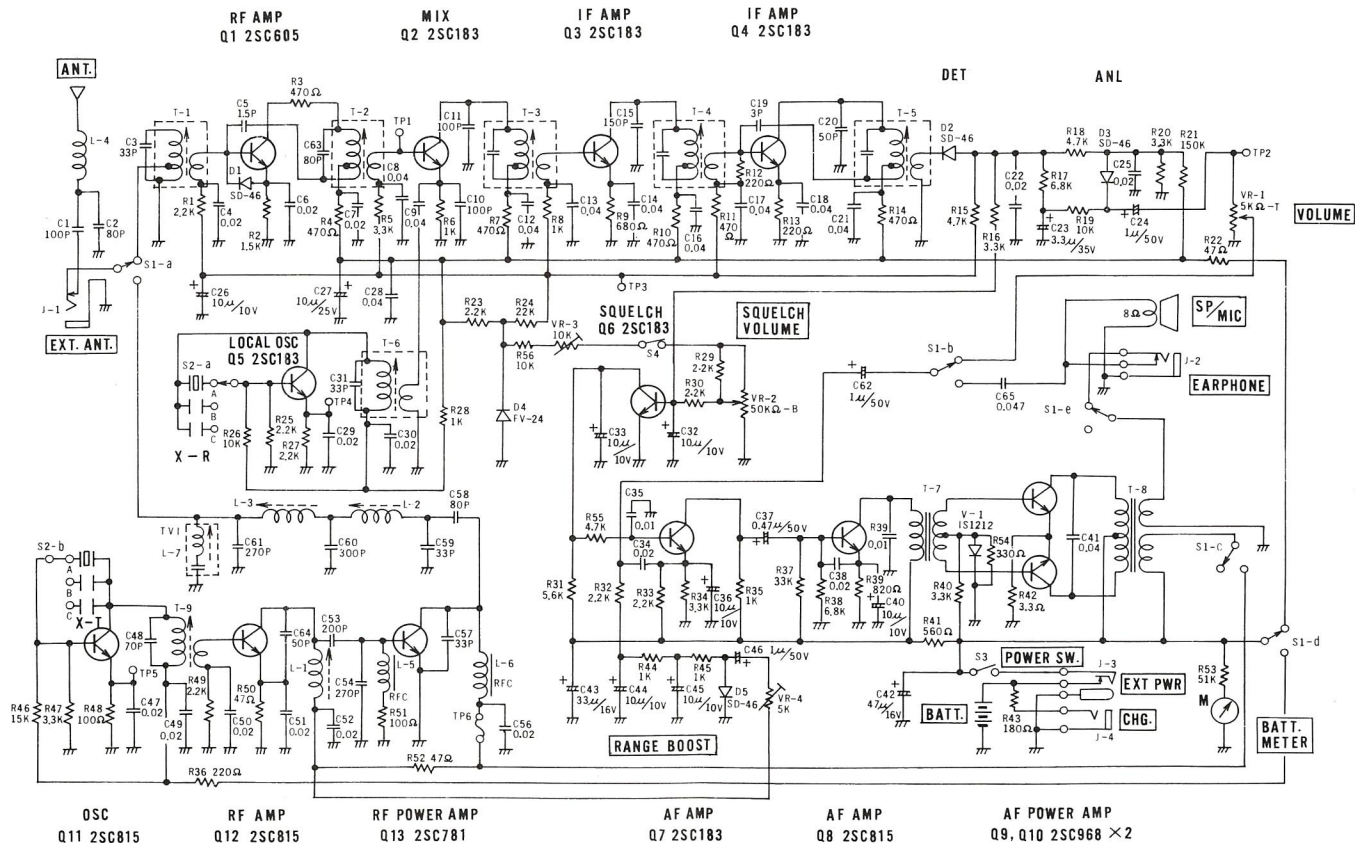


Figure 4.

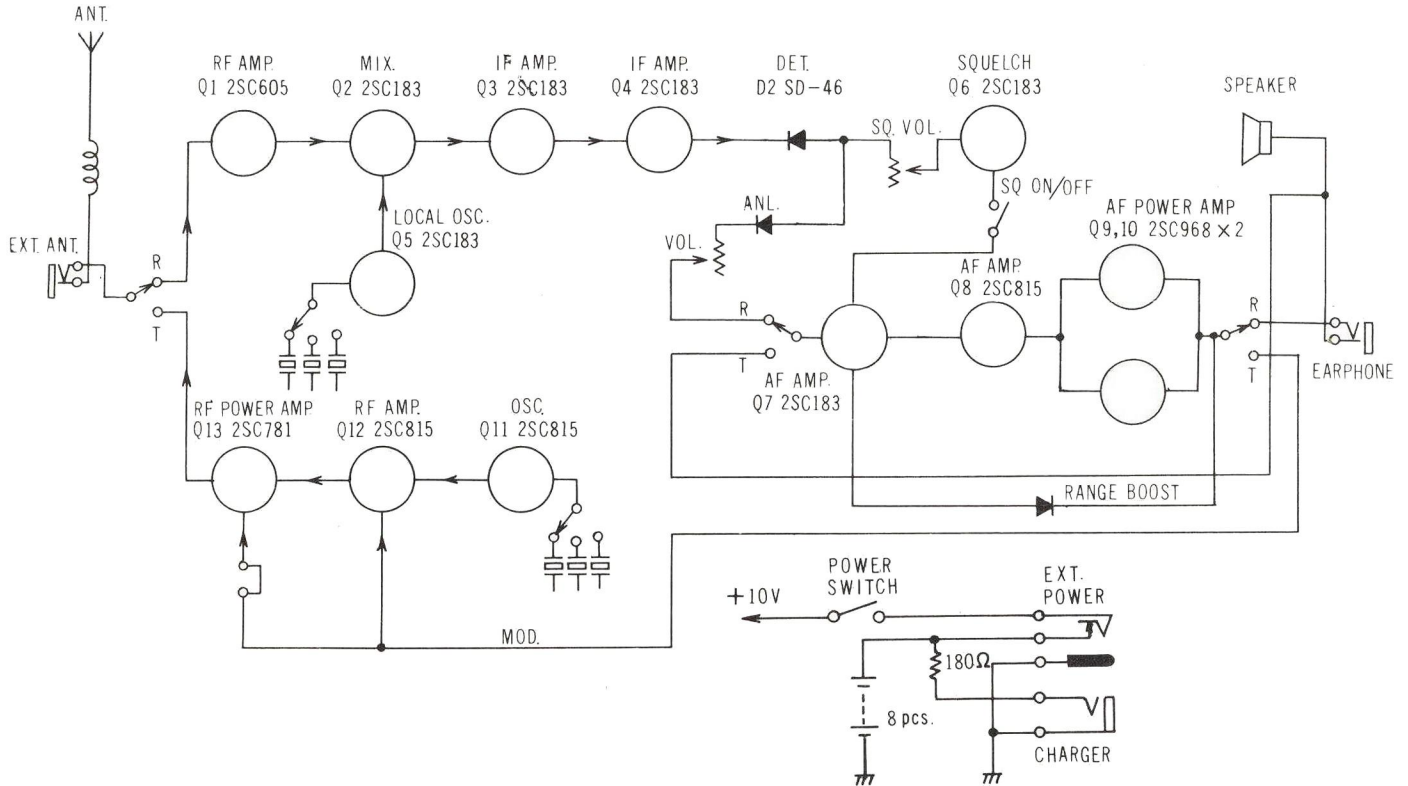
# SCHEMATIC DIAGRAM



S-1a-f : PUSH-TO-TALK SWITCH.  
 S-2 : CHANNEL SWITCH.

S-3 : POWER SWITCH WITH VOLUME CONTROL.  
 S-4 : SQUELCH SWITCH WITH SQUELCH CONTROL.

# BLOCK DIAGRAM



**LAFAYETTE RADIO ELECTRONICS CORP.**

111 JERICHO TURNPIKE · SYOSSET, L. I., NEW YORK

Printed in Japan LM-10A