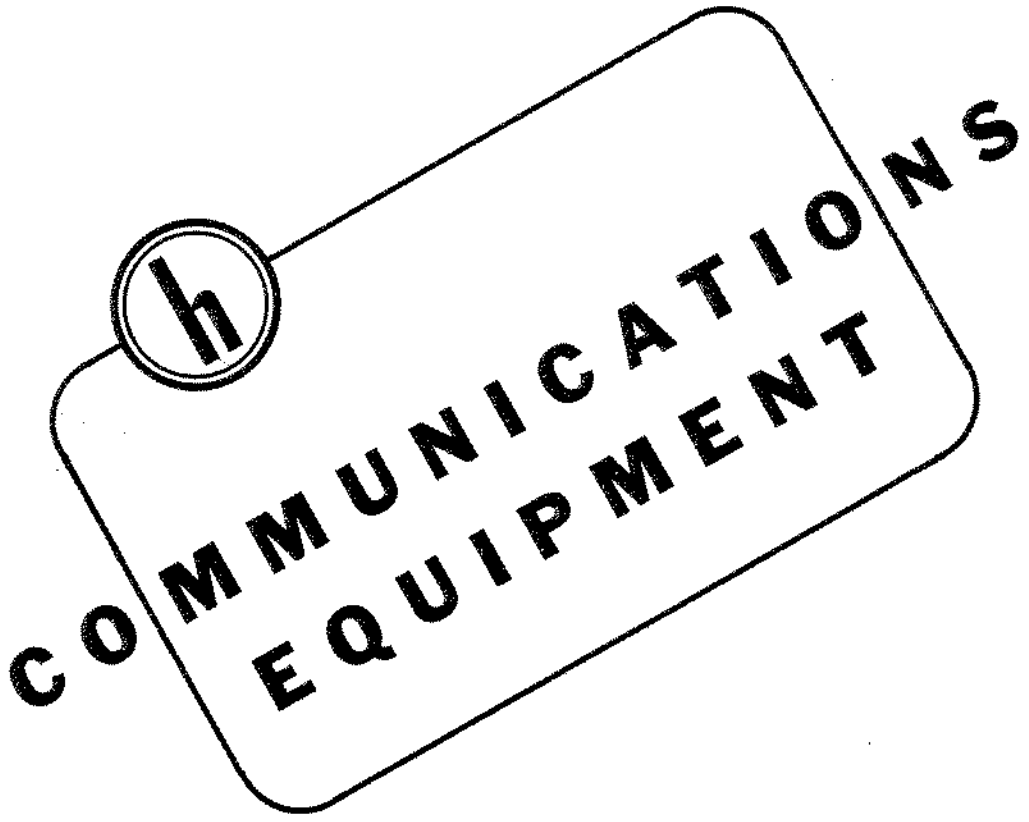


MODELS SR-34 & SR-34AC

2 & 6 Meter Transmitter/Receiver

the hallicrafters co.
4401 W. FIFTH AVENUE · CHICAGO 24, ILLINOIS

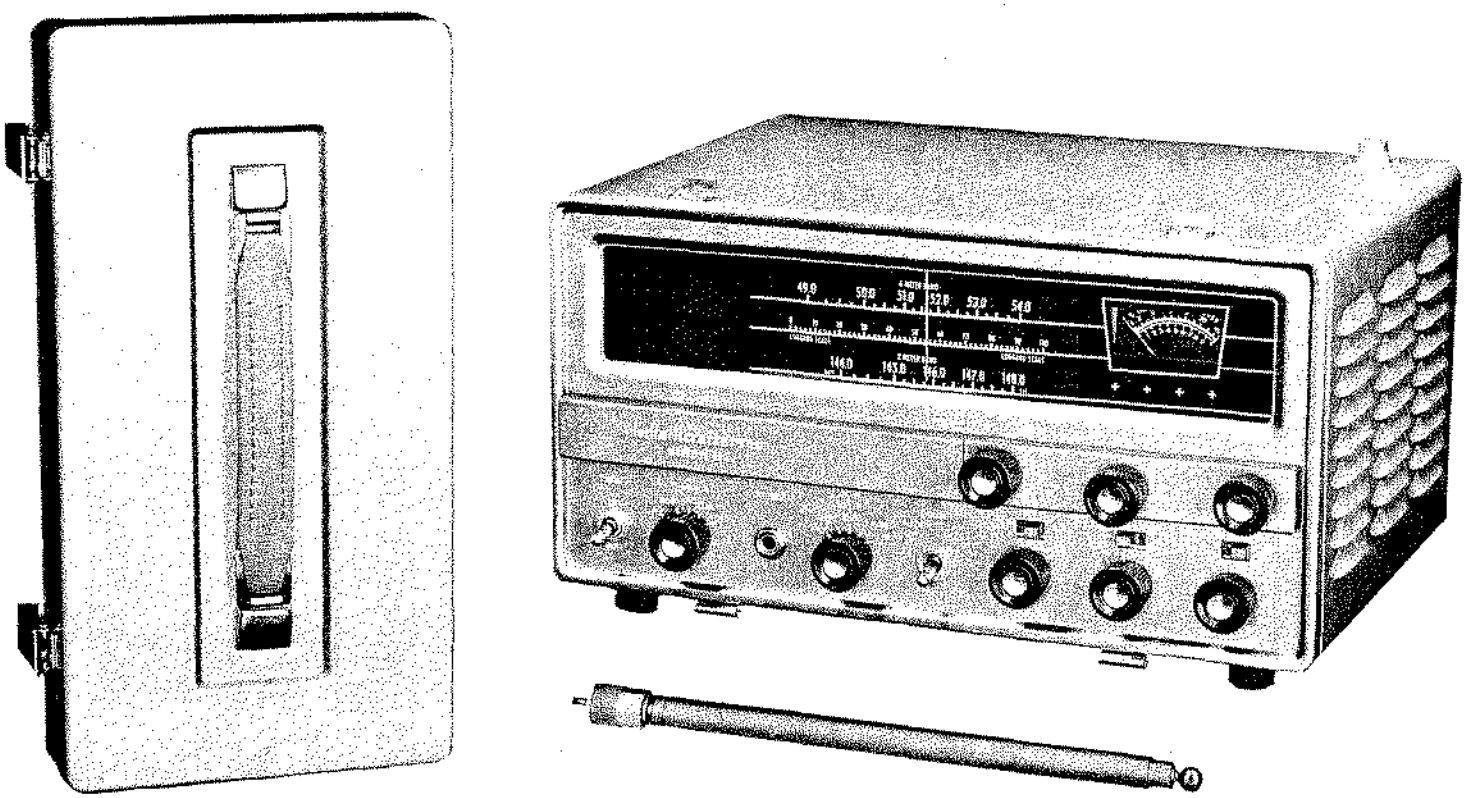


Figure 1. Hallicrafter's Model SR-34 2 & 6 Meter Transmitter / Receiver.

SECTION 1
GENERAL

1-1 General Description

The Hallicrafters Models SR-34 and SR-34AC are designed to provide the radio amateur with a complete two and six (143. 9 to 148. 1 MC and 48. 9 to 54. 1 MC) meter radio station in one complete package. These models provide full AM-CW operation and are capable of "Crossbanding" between two and six meters. Each receiver band employs completely separate R. F., Mixer, and Oscillator stages ensuring maximum efficiency and stability. A highly efficient transistorized power supply for both 6 and 12 volt direct current operation, in addition to a 115 volt alternating current power supply, offers the flexibility required for fixed, portable, or mobile communications. Instantaneous selection of desired voltage as well as complete coverage of the two and six meter bands opens a new era in amateur equipment.

The transmitter is crystal controlled and utilizes any one of four quartz crystals which may be selected by a switch located on the front panel. This crystal selector switch includes a fifth position for use with an external variable frequency oscillator (VFO) which may be plugged into the rear of the chassis. Oscillator, Doubler, Tripler, Final, and Antenna tuning is monitored on a front panel meter by means of a meter switch. A hinged door on the front panel conceals the transmitter tuning controls. A separate door on the side of the cabinet encloses the crystal sockets and both doors may be sealed in order to prevent tampering with the crystals or tuning controls.

The receiver is of double conversion superheterodyne design with a quartz crystal controlled second oscillator. Voltage regulated oscillators ensure stability. Special circuits include an "S" meter,

squelch, automatic noise limiter (ANL), and beat frequency oscillator (BFO) used in conjunction with a BFO pitch control. Band selection is accomplished by a two position switch on the front panel which functions independently of the transmitter bandswitch. The internal speaker is automatically disabled when a headphone plug is inserted into "Phones" Jack on the front panel. Easy and accurate tuning is made possible by an illuminated "Slide Rule" type dial scale.

Public address operation is available by placing the function switch in the P. A. position and inserting a microphone plug into the microphone jack on the rear apron. An external speaker with a 3. 2 ohm impedance capable of handling 10 watts should be connected to terminals #1 and #2 on the rear apron. A two way microphone selector switch permits the use of either a high impedance or carbon microphone.

An extra relay switching contact is available between terminal #3 and terminal #1 (ground). This contact closes in "TRANSMIT" position and may be used for external relay or bias switching if a linear amplifier is used.
NOTE: One relay contact is grounded to chassis.

These models comply with F. C. D. A. specifications for matching funds.

1-2 Model SR-34

The SR-34 is a universal model and may be operated from any of three power sources: 6 volts direct current, 12 volts direct current, or 115 volts alternating current. This Transmitter/Receiver is supplied with a cover that includes a sturdy carrying handle, a special collapsible whip antenna, a 115 volt power cord, a 12 volt negative ground power cord, and an extra plug that may be wired for 6 volt operation.

1-3 Model SR-34AC

The SR-34AC is designed for fixed station operation and requires a power source of 115 volts alternating current. This Transmitter/Receiver is supplied with a 115 volt power cord.

SPECIFICATIONS

GENERAL

Frequency Coverage . . . . . 48. 9 - 54. 1 MC
143. 9 - 148. 1 MC

Microphone Input. . . . . High Impedance or Carbon

Power Consumption

	6. 3 VDC	14. 4 VDC	117 VAC
Receive.	.14. 5 A.	8 A.	112 W
Transmit	.15. 5 A.	9 A.	130 W

Power Input. . . . . 6 VDC
12 VDC
115 VAC

Transmitter Output Impedance } 50 OHMS Unbalanced
Receiver Input Impedance. . . . }

VFO Jack . . . . . .Accepts R. C. A. Type Phono Plug.

Headphone Jack. . . . . Accepts Standard 1/4" Plug.

Key Jack. . . . . .Accepts Standard 1/4" Plug.

Microphone Jack. . . . . Accepts PL-68 Type Plug.

Antenna Receptacle . . . Accepts Amphenol 83-1SP connector.

Crystal Sockets . . . .Accepts FT-243 Type Holders.
Pin diameter - . 093 Inches
Pin spacing - . 486 Inches

Over-all Dimensions SR-34. . . 8-9/16" x 14-1/4" x 12-7/8"

Over-all Dimensions SR-34AC. . 8-9/16" x 14-1/4" x 11-1/2"

Weight SR-34. . . . 26 LBS.

Weight SR-34AC. . 32 LBS.

MINIMUM PERFORMANCE

SPECIFICATIONS

RECEIVER

Frequency Range

2 Meters . . . . . 143. 9 to 148. 1 MC
6 Meters . . . . . 48. 9 to 54. 1 MC

Frequency Stability (-20° C to +40° C Ambient Air)

50 to 54 MC 0. 05%
144 to 148 MC. 0. 05%

Sensitivity

For 10 DB S/N Ratio. . . . . .1. 5 UV or less

Noise Figure

50 to 54 MC . . . . . 6 DB or less
144 to 148 MC . . . . . 8 DB or less

Squelch Sensitivity

50 to 54 MC . . . . . .1. 5 UV
144 to 148 MC. . . . . .1. 5 UV

Selectivity

10 KC. . . . . .6 DB down
50 KC. . . . . .60 DB down

Image Rejection

50 to 54 MC . . . . . .55 DB
144 to 148 MC. . . . . .55 DB

IF Rejection

50 to 54 MC. . . . . .not less than 60 DB
144 to 148 MC . . . . . .not less than 60 DB

Modulation

Input 0. 06 V at 1000 CPS 100%

Power Output (AM or CW)

50 to 54 MC. . . . . .7. 5 watts
144 to 148 MC. . . . . .6. 0 watts

Spurious Output

Noise at 100% Modulation. . .40 DB down or more
Spurious. . . . . .50 DB down or more

Distortion

100% Modulation at 1000 CPS 15% or less

SECTION II

INSTALLATION

2-1 Unpacking

After unpacking the Transmitter/Receiver examine it closely for damage which may have occurred in transit. Should any sign of damage be apparent, file a claim immediately with the carrier stating the extent of damage. Carefully check all shipping labels and tags for instructions before removing or destroying them.

2-2 Location

Since the cabinet is equipped with rubber feet for table or shelf mounting, the Transmitter/Receiver may be placed in any location that will permit free air circulation through the ventilation holes and openings in the cabinet. Avoid excessively warm locations in closed areas such as those near radiators and heating vents.

The operating range will depend upon the geographical and physical characteristics of the operating location as well as the height of the antenna above ground. For maximum coverage, locate the unit as high as possible when using the whip antenna.

2-3 Power Source

The SR-34 Transmitter/Receiver utilizes a highly efficient transistorized power supply for both 6 and 12 volt direct current operation. A separate power transformer is employed for 115 volt alternating current operation.

The SR-34AC is designed for 115 volt alternating current operation only.

CAUTION

Do not attempt to operate Model SR-34AC from a 6 or 12 VDC power source. Do not attempt to operate Model SR-34 or Model SR-34AC from a 110/220 volt direct current source. If in doubt about your power source contact your power company before connecting the power cable.

Incorrect voltages or operating voltages above the expressed limits may result in serious damage to the equipment. The following chart indicates the minimum and maximum voltages at which this equipment should be operated:

6 VDC operation	5. 5 to 8. 0 VDC
12 VDC operation	10. 4 to 16 VDC
115 VAC operation	105 to 125 VAC

CAUTION

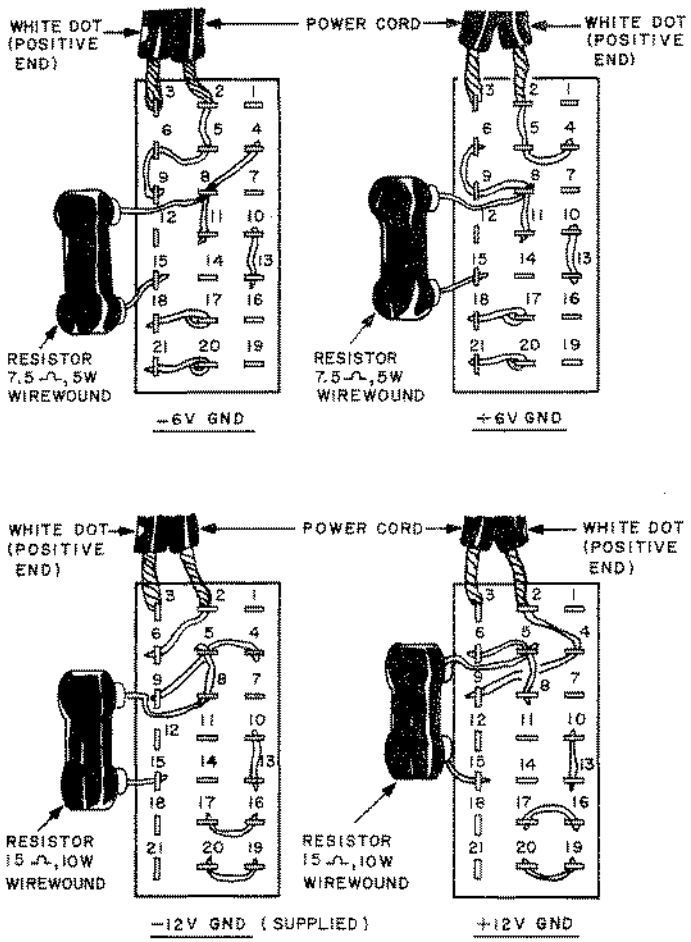
Excessive voltages or improper polarity will result in damage to the transistors. Check all power sources.

2-4 Fixed Station Installation

Models SR-34 and SR-34AC are both capable of fixed station operation. Model SR-34AC, however, has been designed especially for this purpose. Rubber feet are provided on the cabinet for table or shelf mounting. Any convenient location allowing sufficient space for air circulation will suffice. Such a fixed station should include provisions for an outside antenna. Any whip or dipole antenna designed for 2 and 6 meter operation with 50 ohm termination may be used. (Refer to paragraph 2-8 "Antennas"). Connection should be made to the antenna output connector mounted on the top of the cabinet. The antenna output connector may be moved to the rear of the cabinet if desired. Follow the procedure outlined for "Chassis Removal" paragraph 2-9 and use the same mounting hardware. An external receiver speaker (3. 2 ohms impedance) such as Hallicrafters Model R-47 may be used by connecting the speaker voice coil to a standard 1/4" phone plug and inserting it into the headphone jack. The headphone jack located on the front panel will disable internal speaker operation when a headphone plug is inserted. A microphone jack, located on the rear apron, will accommodate a high impedance or carbon microphone. Place the microphone selector switch in the appropriate position. Connect the 115 volt power cord to any convenient AC outlet.

2-5 Portable Installation

The Model SR-34 is ideal for portable operation because of its compact design and flexibility. Place the Transmitter/Receiver in a convenient location allowing sufficient space for air circulation. Connect the special whip antenna to the connector on top of the cabinet. Extend the antenna approximately 18" for 2 meter operation or approximately 54" for 6 meter operation. Connect a microphone and check the microphone selector switch for proper placement. Use the PHONES jack on the front panel for headset operation. If 6 volt direct current operation is desired replace the DC fuse with one rated at 20 amperes and connect the six volt power cable. A 6 volt power cable may be wired with the extra plug supplied. Wiring should be accomplished in accordance with Figure 2.



NOTE:
FOR JUMPER TERMINAL CONNECTIONS 4 THRU 21, USE # 20 SIZE WIRE. USE # 12 SIZE WIRE OR HEAVIER FOR POWER CORD TERMINAL CONNECTIONS 2 AND 3. (6V PLUG)

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Figure 2. 6 and 12 Volt Power Cable Wiring Diagram.

If 12 volt direct current or 115 volt alternating current operation is desired select the corresponding power cable. The fuses supplied with the Transmitter/Receiver need not be changed for use with either of these power sources.

CAUTION

Observe Battery Polarity

2-6 Mobile Installation

The Model SR-34 may be used for a mobile radio station. The installation for this type of operation may vary according to individual requirements and different types of vehicles.

The simplest installation is to place the Transmitter/Receiver in a convenient location on the seat or floor of the vehicle. The proper 6 or 12 volt power cable is then connected under the dash panel.

WARNING

Replace the DC fuse with one rated at 20 amperes for 6 volt operation. Measure the voltage of the power source in order to be sure that it does not exceed the specified voltage limits of this equipment. Be sure that the terminal selected for the voltage source is capable of supplying the necessary current. If in doubt, connect the SR-34 directly to the car battery.

Permanent mounting is accomplished by securing the case to any flat surface. A permanent mounting under the dash panel may be used; however, the necessary mounting brackets should be designed for the specific vehicle. Since any number of different types of antennas may be used an extension cable may be necessary. Such a cable is made from a length of RG-8/U coaxial cable and a PL-259 (Amphenol 83-1SP) connector. If a power cable of additional length is required care should be exercised to use a cable with equivalent current carrying capabilities.

2-7 Noise Suppression

Although the SR-34 has a highly efficient automatic noise limiting circuit, special ignition noise problems may arise. Most installations will not require elaborate noise suppression of the motor vehicle. Therefore, before proceeding with the various methods of noise suppression, it is advisable first to determine the need for it. This is accomplished by moving the vehicle to a remote location at the outer limit of the equipments range. The location selected should be as free from man-made interference as possible.

While receiving the distant station, determine the source of interference by noting the noise level with the vehicle at rest and motor off, and comparing it with the vehicle in motion and motor running. If there is no difference in the noise level, noise suppression of the vehicle would be of little use; if, however, the noise generated by the vehicle is heard above the external noise, suppression of the motor vehicle will be required.

The most common types of noise interference in a vehicle are ignition noise, generator "hash", voltage regulator interference, wheel and tire static, and noise caused by loose mechanical connections. The most effective way to suppress noise is to identify and locate each source and to apply a suppression component to each one in turn. Use the information which

follows as a guide. Figure 3 shows a typical battery ignition system and the correct placement of noise suppression components.

2-7-1 Ignition Noise

Ignition noise can be identified as a regular clicking or popping noise which varies with the speed of the motor. In most installations, it can be effectively suppressed by applying one or more of the methods listed below.

a. Insert a good grade 10, 000 ohm carbon suppressor at the center tower of the distributor and a 5000-ohm carbon suppressor at each spark plug tower on the distributor. Replace existing spark plugs with resistor type spark plugs or fit them with good grade 10, 000-ohm carbon suppressors. The motor timing should be readjusted after installing the suppressors.

b. Place a 0. 1 mfd. capacitor in the lead from the ignition switch to the ignition coil, mounted as close as possible to the coil, to prevent high frequency energy from getting back into the low voltage wiring of the vehicle. Additional noise suppression may be obtained by shielding the lead from the coil to the switch and grounding the shield at the fire wall.

c. The metal caps terminating the ignition wires at the distributor are simply clamped to the ends of the cables and depend upon uncertain pressure contact with the wire. These caps should be cleaned and then soldered to the wire to prevent sparking at these points. The cable insulation should be closely inspected for breakdown between wires and ground. Use fiber spacers to keep the cables away from ground and, if necessary, reroute the cables to minimize coupling with the low voltage wiring.

2-7-2 Generator 'Hash'

Generator "hash" is caused by sparking at the commutator and can be identified as a high pitched whine which varies with the speed of the motor. This trouble usually can be remedied by mounting a . 1 mfd coaxial type condenser directly on the generator frame and connecting it in series with the armature lead. If the noise persists or is still excessive, a parallel trap, tuned to the receiver frequency, should be inserted in series with the generator output lead.

2-7-3 Voltage Regulator Interference

Voltage regulator interference is caused by sparking at the regulator points as they operate to reduce the charging rate as the battery approaches full charge. It appears as a distinct but irregular clicking sound which tends to be less steady than that from the ignition system. Regulator interference can usually be remedied by connecting a . 002 mfd mica capacitor in series with a 4-ohm carbon resistor between the field terminal of the regulator and ground. Further suppression may be obtained by inserting a 0. 1 mfd coaxial capacitor in series with the voltage regulator leads to the battery and the generator armature. All components should be mounted as close to the regulator as possible for effective suppression.

2-7-4 Wheel Static

Wheel static is caused by grease in the front wheel bearings insulating the wheels from the chassis

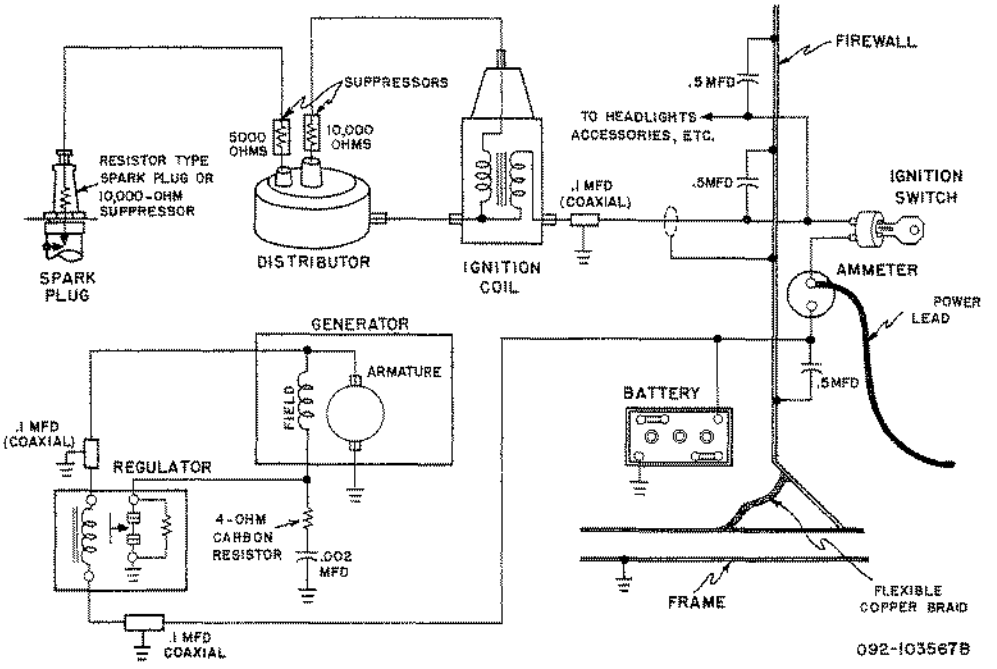

Figure 3. Typical Ignition System Showing Placement of Noise Suppression Components.

of the vehicle. It appears as a steady popping in the receiver at speeds over about 15 mph on smooth roads. Generally, it will not be present on dirt, gravel, or wet roads. Wheel static can be eliminated by installing front wheel static collectors available through most automotive dealers. These collectors usually will require replacement every 10,000 miles.

2-7-5 Tire Static

Tire static causes an erratic popping noise heard only with the car in motion. This noise can usually be eliminated by injecting an anti-static powder into the inner tubes through the valve stems.

2-7-6 Miscellaneous

1. When mounting the noise suppression components, thoroughly clean the contacting surfaces and use external tooth-type lockwashers under all mounting nuts or bolts.

2. The battery leads to the ammeter, gasoline gauge, ignition switch, headlights taillights, and any accessories should be bypassed to ground with 0.5 mfd metal-case capacitors.

3. The fire wall should be bonded to both the frame of the vehicle and the motor block with flexible copper braid. If the exhaust pipe and muffler are insulated from the frame, ground them to the frame with flexible copper braid.

4. The steering post, as well as any control rods, metal tubes, etc. which pass through the fire wall should be securely bonded to the fire wall with flexible braid.

5. Tighten any loose bolts, especially bumper and fender bolts, and use external tooth-type lockwashers to ensure good electrical contact.

This manual will not attempt to suggest all of the possible solutions since they are too numerous to mention; the "ARRL" Handbook for Mobile Operation should be consulted for particular problems.

2-8 Antennas

The whip antenna supplied with the SR-34 should be extended to approximately 18 inches for 2 meter operation and approximately 54 inches for 6 meter operation, (1/4 wavelength).

For fixed operation, a good beam antenna is recommended. Regardless of the type of antenna, it is extremely important that it be installed as high as possible for best results. The antenna selected should present a 50 ohm load to the SR-34 with the lowest possible V.S.W.R.

A common type of antenna employed for mobile operation is the quarter-wave radiator which is fed with a coaxial line. The antenna, which may be a flexible vertical whip, is mounted in any of several places on the vehicle. A good match may be obtained by using a 50 ohm coaxial line; however, it is well to provide some means of tuning the system so that all variables can be adjusted. For further information concerning antennas refer to the "Radio Amateurs Handbook" or the "ARRL Antenna Handbook".

2-9 Chassis Removal

Remove all power and accessory cables from the unit. Remove rear cover. Remove the 2 screws located at the top front of the cabinet. Remove the 2 screws and 4 mounting feet from the bottom of the case. Carefully pull the front panel and chassis forward until the panel is free of the case. Disconnect the antenna connector before attempting complete removal of the chassis. Reverse this procedure to place the chassis into the cabinet. Replace the mounting screws only after the front panel has been fully seated around the cabinet.

SECTION III

FUNCTION OF OPERATING CONTROLS

3-1 POWER, OFF-ON Switch

The POWER Switch controls the AC or battery power for the entire unit. (117 VAC., 12 VDC, or 6 VDC).

3-2 FUNCTION Switch

The FUNCTION control is a five position rotary switch which selects P.A., RCVR, CAL, AM, and CW as desired by the operator. An analysis of each position is as follows:

Public Address (P.A.) - The public address position operates the SR-34 as an audio amplifier. A carbon or high impedance microphone, or a record player using a crystal cartridge - or magnetic cartridge with a suitable pre-amplifier may be connected through the MIKE jack on the rear apron. In this position only the audio tube heaters are energized.

In P.A. position, an external speaker capable of handling 10 watts and having an impedance of 3.2 ohms must be used. The SR-34 must be placed in "Transmit" or "Push to TALK" position for use as a P.A. system.

Receiver (RCVR) - The receiver position operates the SR-34 as a 2 Meter or 6 Meter receiver; the transmitter heaters are turned off.

Calibrate (CAL) - The calibrate position provides an indication of the transmitting frequency when the tuning pointer passes 6 times the crystal frequency on the 6 Meter band or 18 times the crystal frequency on the 2 Meter band. This control also turns on the Transmitter filaments.

Amplitude Modulation (AM) - The amplitude modulation position provides normal transmission of AM phone signals.

Continuous Wave (CW) - In the continuous wave position the modulation transformer is removed from the circuit and the transmitter may be keyed by inserting a key in the key jack on the rear apron.

3-3 METER, Switch

The OSC., TRIP., and DOUB. positions are used in tune-up for transmission. When set at any one of these positions, the meter will indicate the output as adjusted by the corresponding transmitter control. This switch is used in conjunction with the voltmeter mounted on the front panel. The meter indicates R. F. voltage, not plate current, and should always be tuned for maximum deflection. Never attempt to dip the meter.

R. F. OUTPUT - In the R. F. OUTPUT position, the meter is set to read maximum R. F. output voltage for the FINAL and ANTENNA transmitter tuning adjustments.

S METER - In the S METER position the meter indicates the accuracy of tuning and the relative strength of received signals.

3-4 TRANSMIT-RECEIVE Switch

When the FUNCTION switch is in either CAL., AM, or CW position and the POWER switch is ON, the receiving and transmitting heaters and plate supply are energized. The TRANSMIT-RECEIVE Switch connects the antenna for the mode of operation.
NOTE: In normal operation after tune-up the TRANSMIT-RECEIVE Switch is left in RECEIVE POSITION; the relay automatically switches to TRANSMIT when the "MIKE" button is closed. (Push to talk).

3-5 Squelch - The SQUELCH control is first turned fully clockwise. Adjust control counterclockwise until background noise is barely audible with no signal present. The squelch should be used with the AVC on.

3-6 Tuning - The TUNING control is used to tune the receiver within the selected frequency band. The vertical pointer on the slide-rule dial indicates the selected frequency in megacycles.

3-7 Volume - The VOLUME control increases volume when turned clockwise. Volume is decreased by turning this knob counterclockwise.

3-8 BFO/OFF-ON Switch - The Beat-Frequency-Oscillator is turned "OFF" when listening to AM phone signals and to the "ON" position when receiving CW transmissions.

3-9 ANL/OFF-ON Switch - The Automatic Noise Limiter switch is normally left in the OFF position. When pulse type noise such as ignition or electrical disturbance becomes troublesome this switch is turned to "ON".

3-10 AVC/OFF-ON Switch The Automatic Volume Control when turned "ON" places the AVC circuit in operation to maintain the output level of the receiver constant regardless of normal input-signal variations. AVC control is normally left in the "ON" position. It is turned to "OFF" when listening to weak signals. This control should be placed in the "ON" position when the "SQUELCH" is used.

3-11 BFO PITCH - The Beat Frequency Oscillator pitch control varies the frequency of the audio tone heard on CW reception. The red indicator line on the knob will normally be straight up (12:00 o' clock).

3-12 BAND SW - The Band Switch selects the frequency band (2M or 6M) of the receiver.
NOTE: Receiver and Transmitter Bandswitches are separate and individually controlled.

3-13 RF GAIN - The RF GAIN or sensitivity control is normally turned fully clockwise for maximum sensitivity. Sensitivity may be reduced for strong signal reception by turning the control counterclockwise until satisfactory reception is obtained.

3-14 XTAL - The Crystal selector switch permits panel selection of 4 crystal controlled frequencies. A fifth position is provided for selection of an external VFO.

3-15 OSC. - The Oscillator control tunes the basic oscillator circuit.

3-16 TRIPLER - The TRIPLER control tunes the tripler circuit for the 2 Meter band and is used with the DOUBLER control for tuning the doubler circuit for the 6 Meter band.

3-17 DOUBLER - The DOUBLER control tunes the doubler circuit.

3-18 FINAL - The FINAL control is used for final tuning adjustment.

3-19 BAND SW - The Band Switch selects the 2 Meter or 6 Meter band for the transmitter.

3-20 ANTENNA - The ANTENNA control adjusts the antenna load.
NOTE: Both "FINAL" and "ANTENNA" controls are adjusted for maximum upward deflection on the R. F. Output Meter.

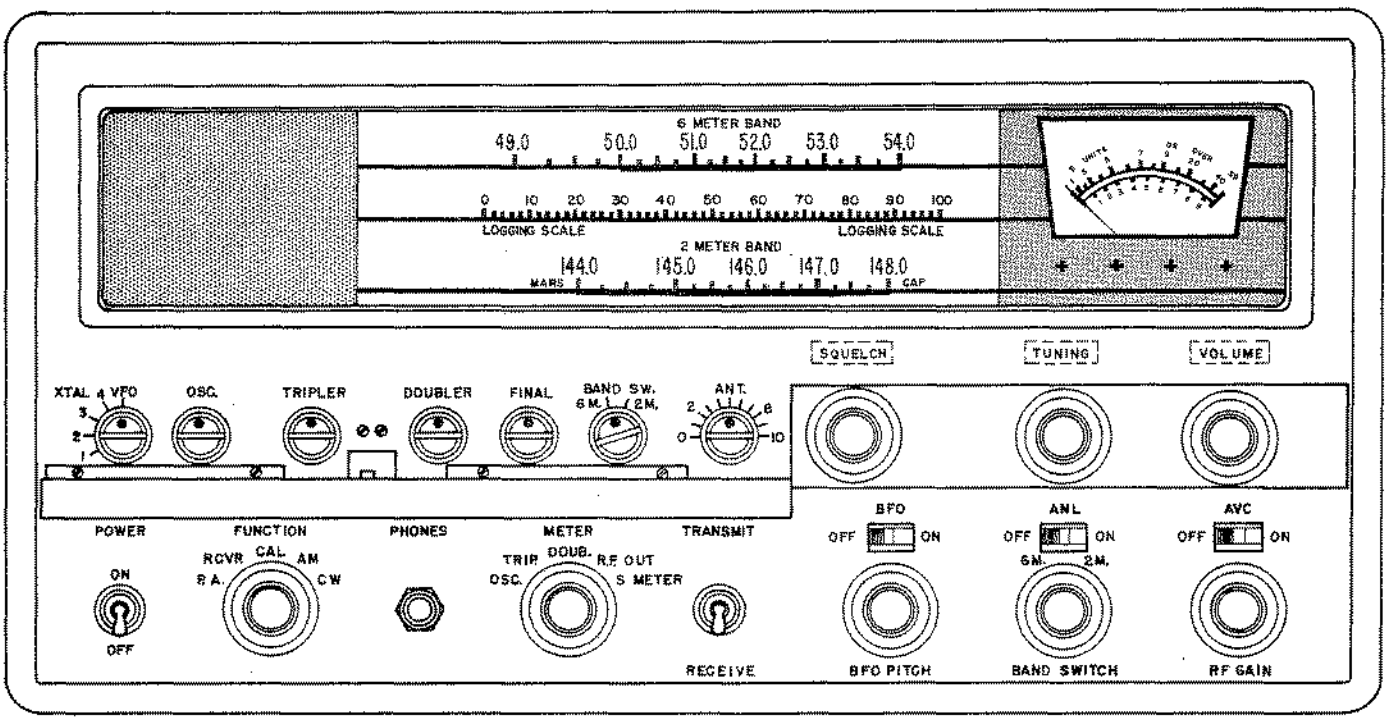

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Figure 4A. Front Panel Controls.

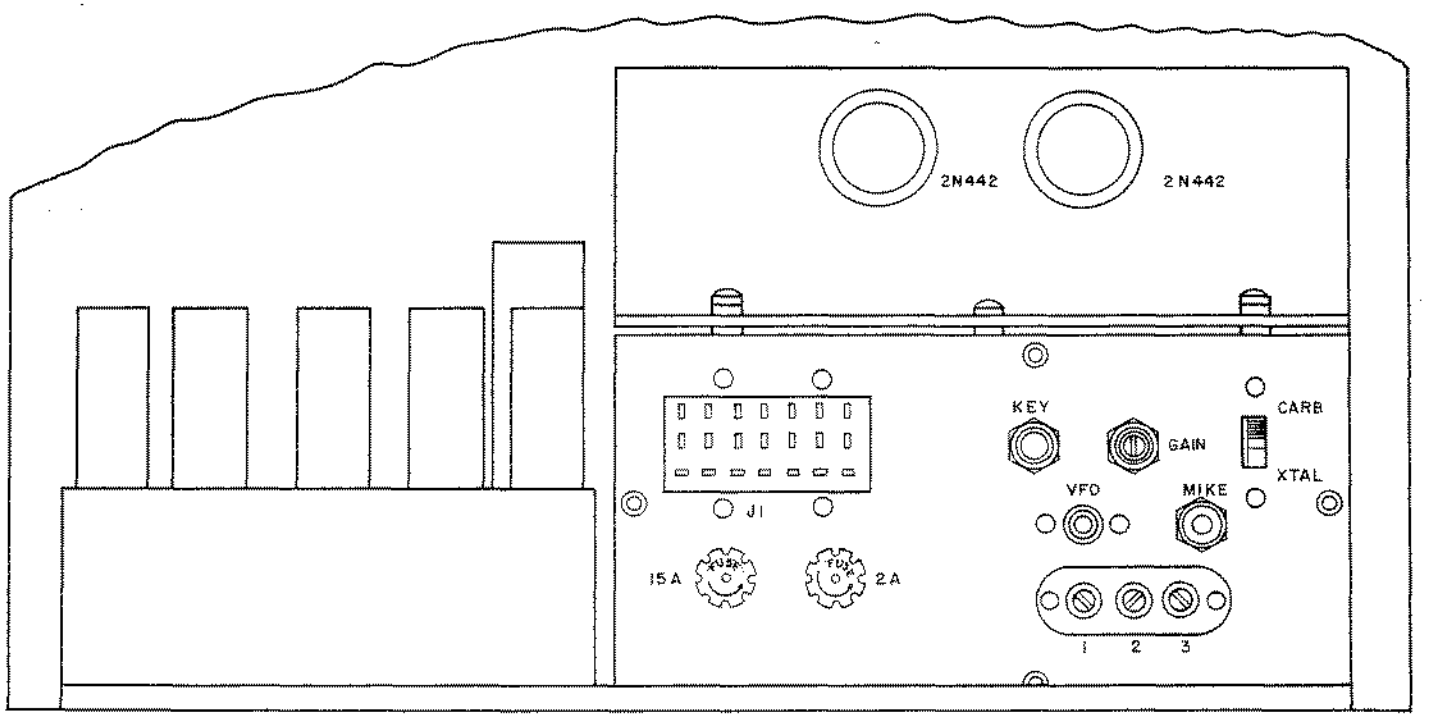

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Figure 4B. Rear Panel Controls.

SECTION IV
OPERATION

4-1 Receiver Operation

The Receiver is of double conversion superheterodyne design with a quartz crystal controlled second oscillator. The two and six meter bands employ completely separate RF and oscillator sections ensuring maximum efficiency and stability. Operation of this Receiver is smooth and efficient because of the simple arrangement of the controls on the right side of the front panel.

4-1-1 AM Operation

Operation for AM reception is as follows: Place the POWER switch in the ON position. Place the TRANSMIT/RECEIVE in the RECEIVE position. Turn the FUNCTION switch to the RECEIVE position. Place the AVC switch in the ON position. Place the BFO switch in the OFF position. Turn the RF GAIN control to a maximum clockwise position. Turn the BANDSWITCH to 2 or 6 meters as desired. Advance the VOLUME control approximately one quarter to one half turn. Turn the METER SWITCH to "S" METER position and use the TUNING control to select a desired signal. Tune for maximum indication on the "S" METER. Place the ANL switch in the "ON" or "OFF" position depending upon the amount of noise present. Rotate SQUELCH control fully clockwise if no squelch action is desired.

4-1-2 CW Operation

The initial procedure for AM reception is used for continuous wave (CW) reception. However, in addition to this procedure, place the BFO switch in the ON position and adjust the BFO PITCH control for the desired tone. Best reception will be realized with the AVC switch OFF and the sensitivity control adjusted for optimum signal level.

4-2 Transmitter Operation

The operating frequency is dependent upon the fundamental frequency of the VFO or crystal selected for operation. These fundamental frequencies are expressed by the following formulae:

6 Meter

$$\text{Fundamental Frequency in MC} = \frac{\text{Operating Frequency in MC}}{6}$$

or

$$\text{Operation Frequency} = 6\text{X Fundamental Frequency (In MC)}$$

2 Meter

$$\text{Fundamental Frequency in MC} = \frac{\text{Operating Frequency in MC}}{18}$$

or

$$\text{Operation Frequency (MC)} = 18\text{X Fundamental Frequency}$$

In either case the limits for the fundamental frequency are as follows:

BAND		OPERATING FREQ. IN MC		CRYSTAL OR VFO FREQ. IN MC
6 Meters	=	50 to 54	=	8.334 to 9.000
2 Meters	=	144 to 148	=	8.000 to 8.222

NOTE: F. C. C. regulations require that all sidebands be inside the band edges. Do not attempt to operate at band edges unless accurate frequency measuring equipment is available.

4-2-1 Crystal Selection

If crystal control is desired, crystal sockets are available under the cover on the left side of the case. These four crystal positions are selectable by the XTAL switch (See Transmitter Controls). Crystals may be selected in any combination for 2 and 6 meter band operation. Type FT-243 crystals are recommended for use in the SR-34 and SR-34AC.

Typical examples of crystal frequencies required to obtain various operating frequencies are listed in the crystal table.

6 Meter

CRYSTAL FREQUENCY (MC)	RESULTANT OPERATING FREQUENCY
8.4	50.4
8.5	51.0
8.6	51.6
8.7	52.2
8.8	52.8
8.9	53.4

2 Meter

CRYSTAL FREQUENCY (MC)	RESULTANT OPERATING FREQUENCY
8.02	144.36
8.06	145.08
8.09	145.62
8.16	146.88
8.18	147.24
8.20	147.60

4-2-2 Tuning Procedure - 6 Meter Operation

After a particular crystal or basic frequency from an external VFO has been selected for 6 Meter operation, place the BANDSWITCH in the 6 meter position. Insert the crystal in any one of the four crystal sockets and place the CRYSTAL SELECTOR switch in the corresponding position. While the POWER switch is in the OFF position set the Tuning controls as follows:

OSC.	Mid-range Red dot up
TRIPLER.	
DOUBLER	
FINAL	
ANTENNA	
FUNCTION SWITCH . . .	AM or CW
METER SWITCH	OSC
TRANSMIT-RECEIVE . .	RECEIVE

CAUTION

Never operate the Transmitter without the proper load (or antenna) connected.

Place the POWER switch in the ON position and allow a few minutes for warm-up. Place the TRANSMIT-RECEIVE switch in the TRANSMIT position and proceed as follows:

Adjust OSC. for maximum meter deflection.

Place METER switch in DOUBLER position.

Adjust DOUBLER and TRIPLER together for maximum deflection.

Place METER switch in R. F. OUT position.

Adjust FINAL and ANTENNA for maximum deflection.

NOTE: The meter is an R. F. voltmeter and not a plate current meter. **Do not attempt to 'dip' this meter.**

Repeat the tuning procedure from OSC. to ANTENNA and tune each control for maximum meter indication. Return the TRANSMIT-RECEIVE switch to the RECEIVE position. The transmitter is now tuned for either AM or CW operation. Select the mode desired and plug the microphone or key into the rear apron. Advance microphone gain control clockwise approximately 3/4 of rotation or until best modulation is obtained.

4-2-3 Tuning Procedure - 2 Meter Operation

Select the particular crystal desired for 2 meter operation and insert it into any one of the four unused crystal sockets. Place the CRYSTAL SELECTOR switch in the corresponding position. Place the BANDSWITCH control in the 2 METER position. While the POWER switch is in the OFF position set the tuning controls as follows:

OSC.	Mid-Range Red dot up
TRIPLER.	
DOUBLER	
FINAL	
ANTENNA	
FUNCTION SWITCH . . .	AM or CW
METER SWITCH.	OSC
TRANSMIT-RECEIVE . .	RECEIVE

CAUTION

Never operate the Transmitter without the proper load (or antenna) connected.

Place the POWER switch in the ON position and allow a few minutes for warm-up. Place the TRANSMIT-RECEIVE switch in the TRANSMIT position and proceed as follows:

Adjust OSC for maximum meter deflection.

Place METER switch in TRIPLER position.

Adjust TRIPLER for maximum deflection.

Place METER in R. F. OUT position.

Adjust DOUBLER for maximum deflection.

Place METER in RF OUT position.

Adjust FINAL and ANTENNA together for maximum deflection.

Repeat the tuning procedure from OSC to ANTENNA and tune each control for maximum meter indication. Return the TRANSMIT-RECEIVE switch to the RECEIVE position. The transmitter is now tuned for either AM or CW operation. Select the mode desired and plug the microphone or key into the rear apron.

Advance microphone gain control clockwise approximately 3/4 of rotation or until best modulation is obtained.

NOTE: If the microphone is equipped with a "Push to Talk" switch, the TRANSMIT-RECEIVE switch will remain in the RECEIVE position during transmission periods.

If the microphone is not equipped with a "Push to Talk" switch it will be necessary to operate the TRANSMIT-RECEIVE switch manually. There will be no audio feedback between the microphone and speaker as the microphone input is automatically disabled when the receiver is "ON".

For CW operation the TRANSMIT-RECEIVE switch must be operated manually.

SECTION V

SERVICE AND ALIGNMENT PROCEDURE

5-1 General

The SR-34 has been carefully aligned at the factory by specially trained and experienced personnel using precision equipment. Alignment should not be attempted until all other possible causes of faulty operation have been investigated. Alignment should not be required unless components have been replaced in the IF or RF stages. Alignment should be made only by persons familiar with communication receivers and transmitters. Refer to Figures 5 and 6 for location of alignment adjustments.

5-2 Preliminary Control Settings

A. Set FUNCTION Switch to "RCVR" position.

B. Set TRANSMIT-RECEIVE Switch to "RECEIVE" position.

C. Turn POWER Switch to "ON".

D. Set SQUELCH control fully clockwise.

E. Set RF GAIN control fully clockwise.

F. Set VOLUME control for sufficient indication on output meter.

5-3 R.F. Alignment for 6 Meters 48.9 - 54.1 MC

A. Set R. F. Signal Generator frequency to 50 MC, with 400 cycles - 30% modulation.

B. Set Receiver Tuning to 50 MC.

C. Pre-set 6M oscillator trimmer (C160) to pre-determined point (approximately 9/16" from chassis).

D. Adjust 6M oscillator coil (L102) for maximum output.

E. Set Generator frequency to 54 MC.

F. Set Receiver Tuning to 54 MC.

G. Adjust 6M oscillator trimmer (C160) for maximum output.

H. Repeat D-E-F-G until calibration is correct at 50 and 54 MC.

I. Adjust 6M mixer coil (L110B) for maximum output at 52 MC.

J. Adjust 6M antenna coil (L108) for maximum output at 50 MC.

NOTE: The noise figure will be improved if the antenna slug is adjusted to the low frequency side of resonance. The optimum point will be when the output drops 4 DB below maximum output.

K. Since there is some interaction between the 6 M mixer and 23. 25 MC trap adjustments, both operations should be repeated until there is no further change when either adjustment is made.

5-4 23.25 MC Trap Coil Adjustment

A. Connect RF Generator to SR-34 Ant. Receptacle.

B. Set the RF Signal Generator frequency to 23. 25 MC with 400 cycles at 30% modulation.

C. Increase the RF Signal Generator Output and Receiver Volume (R-137) control for sufficient output voltage indication on the Output Meter.

D. Adjust the 23. 25 MC trap coil slug (L-110A) for a minimum output.

Image Rejection Adjustment.

A. Set the Receiver Tuning to 51 MC.

B. Set the Receiver Bandswitch to 6M position.

C. Tune the R. F. generator frequency to approximately 97. 5 MC and rock for maximum output.

D. Adjust bottom slug of image rejection coil (L-107A) for minimum audio output.

NOTE: R. F. generator output should be adjusted simultaneously so that the absolute null may be found.

E. Set Receiver Tuning to 53 MC.

F. Set R. F. generator to approximately 99. 5 MC and rock for maximum output.

G. Adjust the upper slug (L-107B) for minimum audio output.

H. Repeat steps A through G until no appreciable change in the slug position of either trap occurs.

5-5 R.F. Alignment for 2 Meters 143.9 to 148.1 MC

A. Set Bandswitch to 2 M position.

B. Set R. F. generator frequency at 144 MC-400 cycles 30% modulation.

C. Set Receiver Tuning at 144 MC.

D. Pre-set 2M oscillator trimmer (C145) to pre-determined point (approximately 1/2" from chassis).

E. Adjust 2M oscillator coil (L101) for maximum output.

F. Set Receiver Tuning at 148 MC.

G. Set R. F. generator at 148 MC.

H. Adjust 2M oscillator trimmer (C145) for maximum output.

I. Repeat steps B through H until calibration is correct at 144 and 148 MC.

J. Set Receiver Tuning at 146 MC.

K. Compress or expand 2M mixer coil (L104) for maximum audio output using internal receiver noise as a signal source.

L. Set Receiver Tuning to 144 MC.

M. Set R. F. generator to 144 MC.

N. Compress or expand 2M antenna coil (L-111) for maximum audio output.

NOTE: The noise figure will be improved if the antenna coil is tuned to low frequency side of resonance (turns compressed). The optimum point will be when the audio output drops 4 DB below maximum.

5-6 1650 KC IF Equipment Test Set-up

A. Connect Output Meter leads to Speaker terminal.

B. Turn POWER switch to "ON"

5-7 Initial Control Settings of 1650 KC IF Alignment

SQUELCH.....Fully Clockwise

RF GAIN .....Fully Clockwise

BANDSWITCH ..... 2-Meter position

TUNING..... Mid-range

VOLUME..... As indicated in alignment procedure.

BFO..... OFF

ANL.....OFF

AVC.....OFF

5-8 1650 KC IF Alignment

A. Set RF Generator frequency to 1650 KC with 400 cycles at 30% modulation.

B. Connect the RF Signal Generator "hot" lead thru a 0. 02 MFD ceramic disc capacitor to lug #3 of T-101 and the ground lead to chassis.

C. Increase the RF Signal Generator output and Receiver VOLUME control for a sufficient output voltage indication on Output Meter.

D. Adjust the upper and lower slugs of T-102, T-103, and T-104 for maximum output voltage.

NOTE: RF Signal Generator Output should be simultaneously decreased as output voltage increases during the peaking of slugs to prevent overloading.

5-9 BFO Alignment

A. Decrease RF GAIN (R-155) control to mid-range.

B. Turn "OFF" modulation on RF Signal Generator.

C. Set BFO Switch to "ON" position.

D. Check BFO control for mid-capacity position.

E. Adjust slug of BFO coil (L-112) for null output. (Zero beat).

F. Set BFO switch to "OFF" position.

G. Remove RF Signal Generator leads.

H. Turn "ON" modulation of RF Signal Genator.

5-10 23.25 MC IF Alignment

A. Set RF GAIN control fully clockwise.

B. Adjust 21. 6 MC oscillator coil (L-106) for maximum noise output on Output Meter.

C. Set RF Signal Generator frequency to 23. 25 MC with 400 cycles at 30% modulation.

D. Connect RF Signal Generator thru 0. 02 MFD ceramic disc capacitor to pin #2 of V-104 (2M Mixer, 6U8) and ground shield to chassis.

E. Increase RF Signal Generator output and Receiver VOLUME control (R-137) for sufficient output voltage indication on Output Meter.

F. Adjust upper and lower slugs of T-101 for maximum output voltage.

NOTE: RF Signal Generator outputs should be simultaneously decreased as output voltage increases during peaking of slugs.

5-11 "S" Meter Adjustments

The mechanical adjustment of the "S" meter has been accurately set at the factory and will not require further adjustment.

The electrical adjustment is made by carefully turning the "S" METER ADJ. control (R-144) located on top of the receiver chassis (Figure 5), until the pointer is in line with the left-hand index mark. The electrical adjustment should be made with the receiver in the "ON" position, antenna shorted, AVC switch at "OFF", TRANSMIT-RECEIVE switch at "RECEIVE", BFO at "OFF", and the RF GAIN control fully clockwise. The settings of the remaining controls do not affect the "S" meter reading.

5-12 Tube & Dial Lamp Replacement

To gain access to the tubes and dial lamps, remove the chassis from cabinet. The tube locations are shown in Figure 5.

5-13 Tuning Dial Cord Re-stringing

A. Remove the chassis from the cabinet (paragraph 2-9).

B. Remove the "S" Meter.

C. Turn the tuning shaft fully counterclockwise so that the tuning gang capacitor is fully meshed.

D. Re-string the dial cord as follows: (Figure 7):

1. Attach the end of the cord to the tab (1) and pull the cord up and around wheel A. Proceed clockwise down wheel A down behind wheel B (2).

2. Complete 2-1/4 turns of cord on wheel B (3) and proceed up and over wheel C (4). Continue around wheel C up and around the tabs (5 and 6).

3. Proceed down wheel C through the wheel slot (7). Continue up and around wheel A (8).

4. Complete the stringing by routing the cord into the wheel slot (9) and attach the spring on the tab.

5-14 Dial Scale Cord Re-Stringing

A. Remove the chassis from the cabinet (paragraph 2-9).

B. Remove the "S" Meter.

C. Turn the tuning shaft fully counterclockwise so that the tuning gang capacitor is fully meshed.

D. Re-string the dial cord as follows (Figure 8):

1. Attach the end of the cord to the spring (1) and proceed under and around wheel A (2). Proceed clockwise around wheel B (3) down behind wheel C (4).

2. Continue down through the wheel slot of wheel D (5). Proceed under the tab (6) up and out of the wheel slot.

3. Complete 1-1/2 turns of cord on wheel D and proceed up and around wheel C (7).

4. Complete the stringing by attaching dial cord to spring.

5. Set the pointer on the pointer rail and engage the dial cord. Do not crimp any tabs at this time.

6. Line-up the pointer on the left-hand low frequency marks on the dial.

7. Crimp the tabs and place a drop of cement on the pointer tabs and dial cord to secure permanently the pointer and dial.

8. Rotate the tuning shaft from the low end to the high end, and back to the low end. Do this several times. Check for backlash or jerky motion of the pointer. If this occurs, it may be necessary to shorten and tighten the dial cord, straighten the pointer, or both.

9. Replace the "S" Meter, and return chassis to the cabinet.

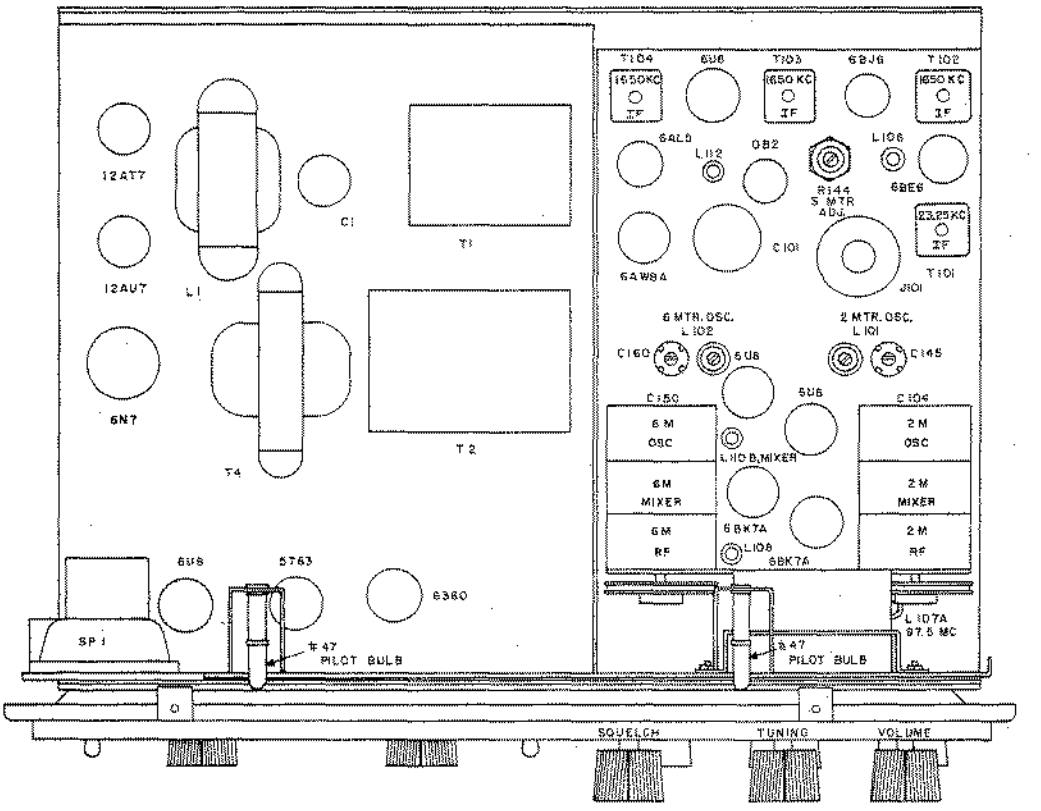

Figure 5. Internal Top View.

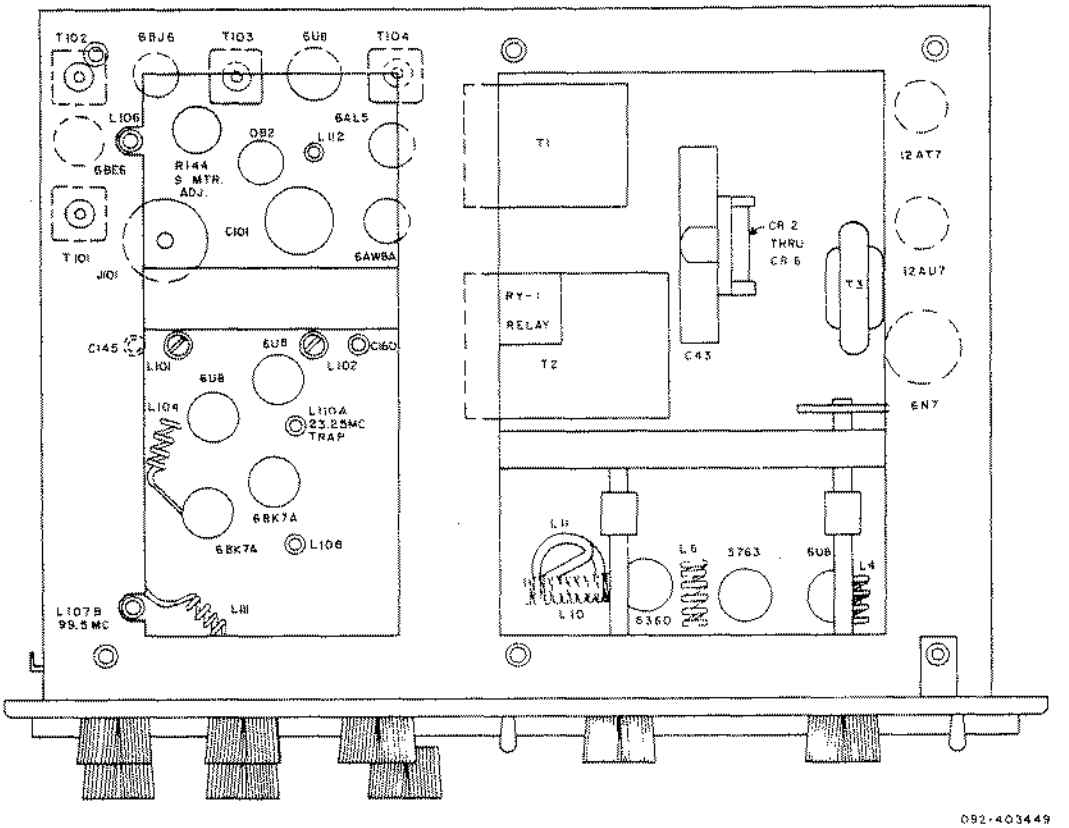

Figure 6. Internal Bottom View.

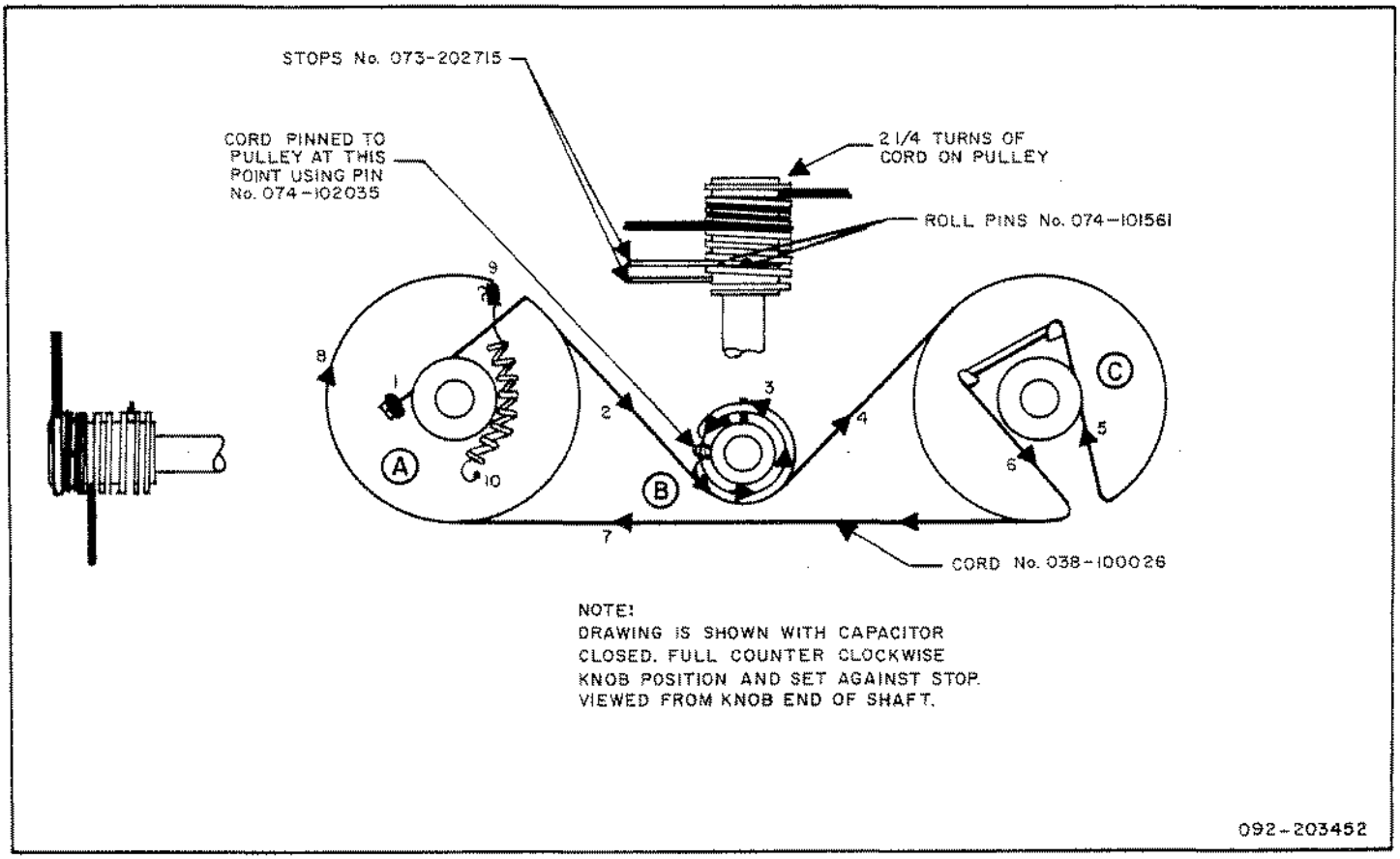

Figure 7. Tuning Dial Cord Stringing Diagram.

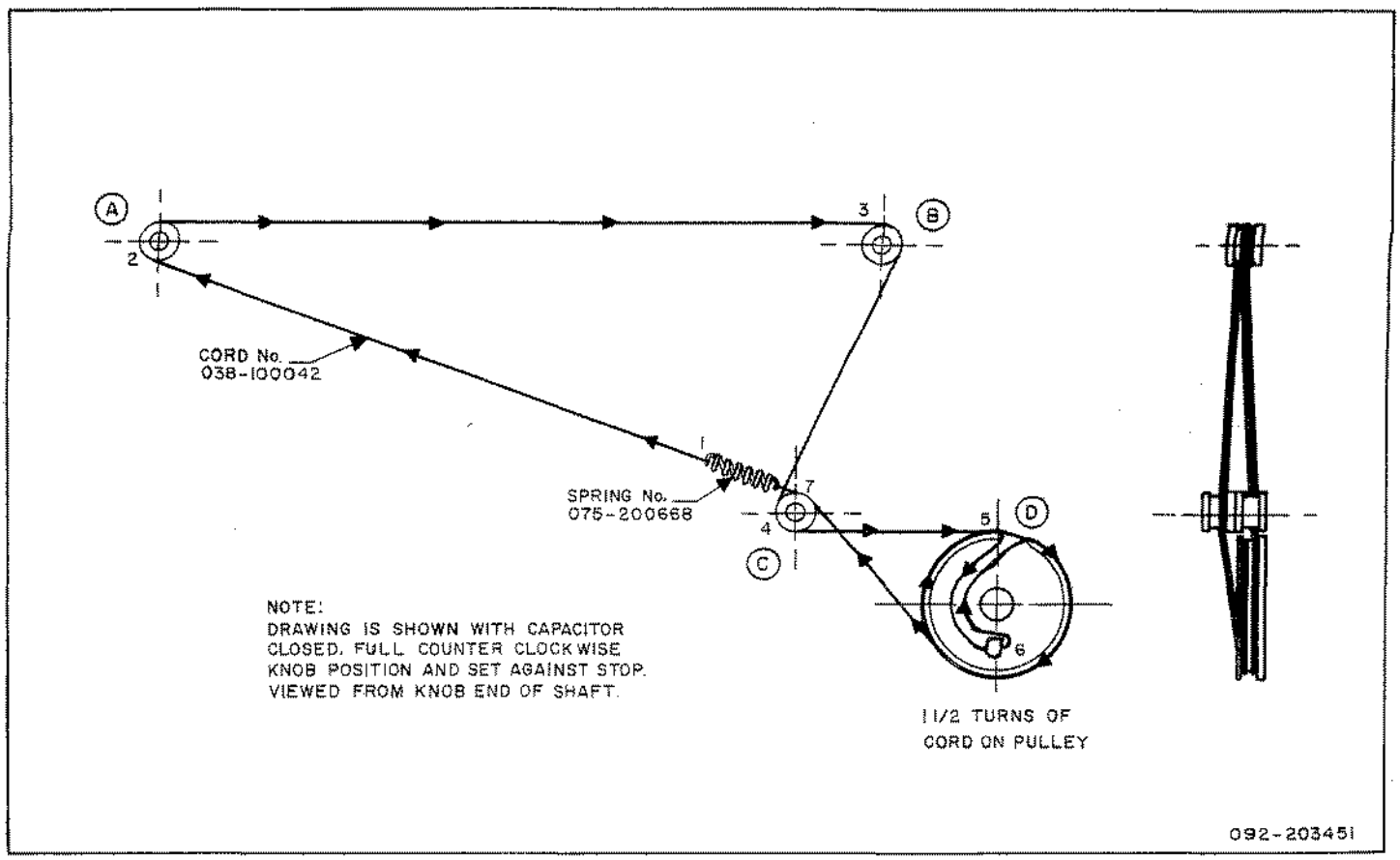

Figure 8. Dial Scale Stringing Diagram.

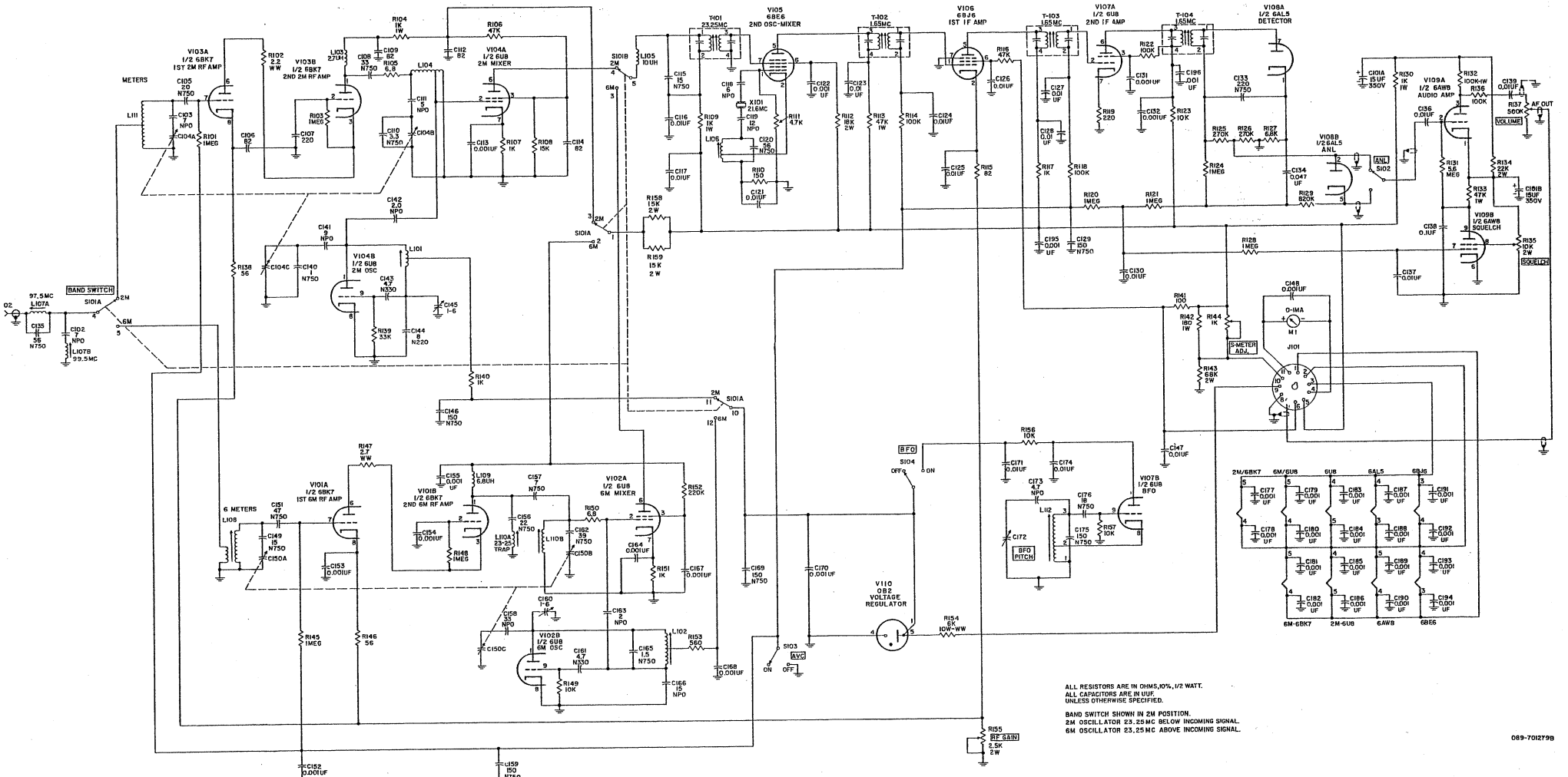

Figure 9. Receiver Schematic Diagram.

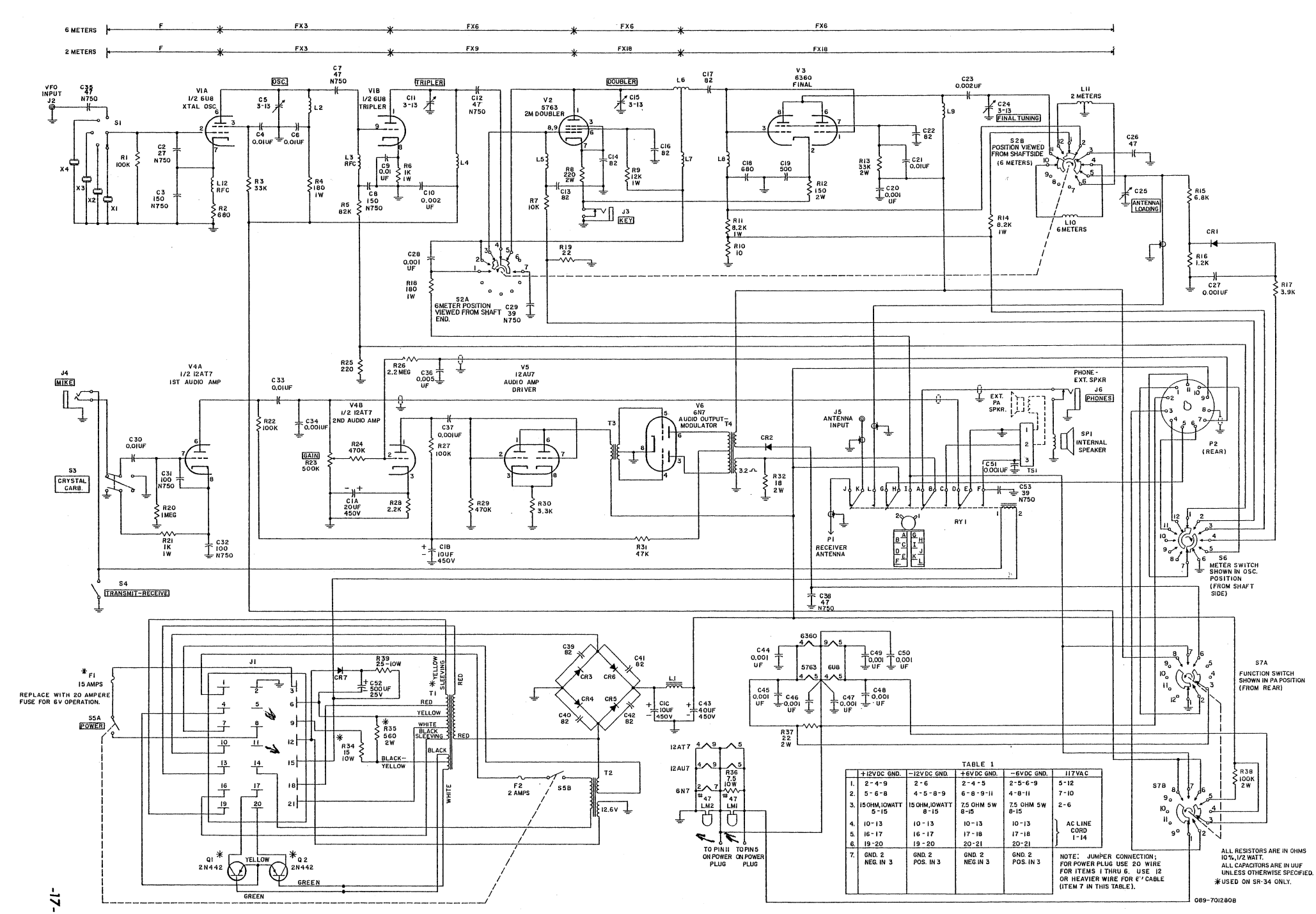

Figure 10. Transmitter Schematic Diagram.

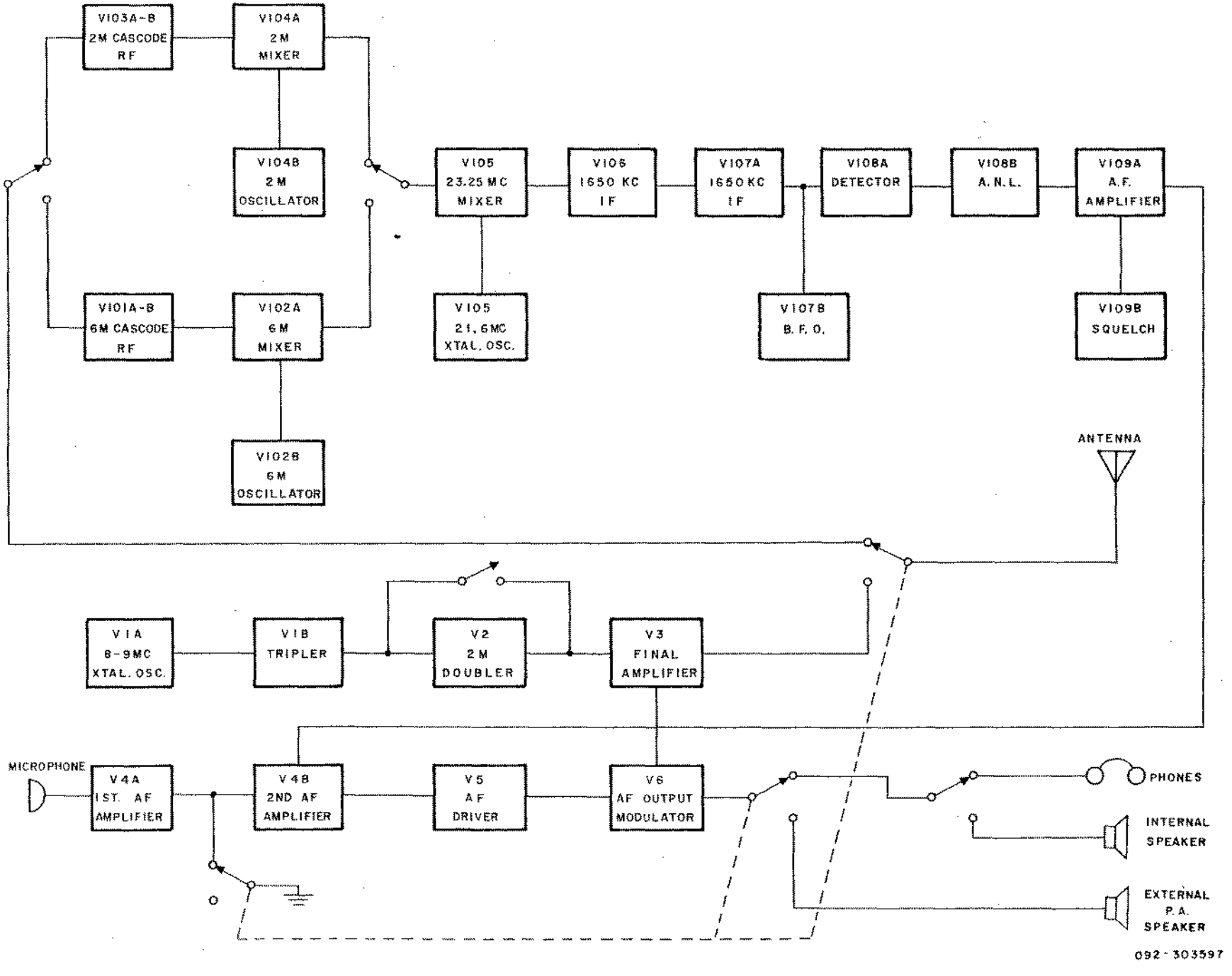

Figure 11. Block Diagram.

Schematic Symbol	Description	Part Number
	Capacitors	
C-1A, -1B, -1C	20 UF @ 25V, 20 UF @ 450V; Electrolytic	045-100508
C-2	27 UUF, N750; Ceramic Tubular	491-106270-95
C-3, 6, 128, 146, 159, 169	150 UUF, N750; Ceramic Tubular	491-126151-95
C-4, 6, 9, 21, 30, 33, 116, 117, 121, 123, 124, 125, 126, 127, 128, 130, 136, 137, 139, 147, 171, 174	.01 UF, 500V; Ceramic Disc	047-100224
C-5, 11, 15, 24	Variable (8-13 UUF) (OSC., TRIPLER DOUBLER, FINAL TUNING)	048-200316
C-7, 12, 26, 35, 38, 151	47 UUF, N750; Ceramic Tubular	491-106470-95
C-10, 23	.002 UF, 20%, 1000V Ceramic Disc	047-100794
C-13, 14, 16, 17, 22, 39, 40, 41, 42, 108, 109, 112, 114	82 UUF, 10%, 1000V; Ceramic Disc	047-100792
C-18	680 UUF, 10%, Mica	470-213681
C-19	500 UUF, Tooth-Pick, Mica	047-100783
C-20, 27, 28, 34, 37, 44, 45, 46, 47, 48, 49, 50, 51, 113, 122, 131, 132, 148, 152, 153, 154, 155, 164, 167, 168, 170, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196	.001 UF, GMV, 500V; Ceramic Disc	047-200230
C-25	Variable, ANTENNA LOADING	048-200413
C-29, 162	39 UUF, N750; Ceramic Tubular	491-106390-95
C-31, 32	100 UUF, N750; Ceramic Tubular	491-126101-95
C-36	.005 UF, 20%, 500V; Ceramic Disc	047-200442
C-43	40 UF @ 450V; Electrolytic	045-000366
C-52	500 UF, @25V; Electrolytic	045-100567
C-101A, -B	15 UF, @350V; Electrolytic	045-100505
C-102, 103	7 UUF, NPO; Ceramic Tubular	491-102070-23
C-104A, B, C C150A, B, C	Variable, Tuning (2&8M)	048-300414
C-105	20 UUF, N750; Ceramic Tubular	491-106200-95
C-107	220 UUF, 20%, 1000V; Ceramic Disc	047-100791
C-108	33 UUF, N750; Ceramic Tubular	491-106330-95
C-110	3.3 UUF, N750; Ceramic Tubular	491-106033-95
C-111	5 UUF, NPO; Ceramic Tubular	491-102050-23

Schematic Symbol	Description	Part Number
	Capacitors (cont)	
C-115, 149	15 UUF, N750; Ceramic Tubular	491-106150-95
C-118	6 UUF, NPO; Ceramic Tubular	491-102060-23
C-119	12 UUF, NPO; Ceramic Tubular	491-105120-23
C-120, 135	56 UUF, N750; Ceramic Tubular	491-106560-95
C-133	220 UUF, N750; Ceramic Tubular	491-156221-95
C-134	.047 UF, 20%, 400V; Molded Paper Tubular	499-024473
C-138	.1 UF, 20%, 400V; Molded Paper Tubular	499-024104
C-140	1 UUF, N750; Ceramic Tubular	491-101010-95
C-141	9 UUF, NPO; Ceramic Tubular	491-102090-23
C-142	2 UUF, NPO; Ceramic Tubular	491-102020-25
C-143, 161	4.7 UUF, N330; Ceramic Tubular	491-102047-74
C-144	8 UUF, N220; Ceramic Tubular	491-102080-64
C-145, 160	Trimmer, (1.0 UUF to 8.0 UUF)	044-200499
C-156	22 UUF, N750; Ceramic Tubular	491-106220-95
C-157	7 UUF, N750; Ceramic Tubular	491-106070-95
C-158	33 UUF, NPO; Ceramic Tubular	491-106330-25
C-163	2 UUF, NPO; Ceramic Tubular	491-101020-25
C-166	1.5 UUF, N750; Ceramic Tubular	491-101015-95
C-169	15 UUF, NPO; Ceramic Tubular	491-106150-25
C-172	Variable, BFO PITCH	048-100182
C-173	4.7 UUF, NPO; Ceramic Tubular	491-102047-33
C-175	150 UUF, 10%, Silver Mica	470-123151
C-176	18 UUF, N750; Ceramic Tubular	491-106180-95
	***Resistors**	
R-1, 22, 27, 114, 118, 122, 136	100K	451-252104
R-2	680	451-252681
R-3	33K, 1W	451-452333
R-4, 18, 142	180, 1W	451-452181
R-5	82K	451-252823
R-6, 104, 109, 130	1K, 1W	451-452102
R-7, 123, 149, 156, 157	10K	451-252103
R-8	220, 2W	451-652221
R-9	12K, 1W	451-452123
R-10	10	451-252100
R-11, 14	8.2K, 1W	451-452822
R-12	150, 2W	451-652151
R-13	33K, 2W	451-652333
R-15, 127	6.8K	451-252682

Schematic Symbol	Description	Part Number
	***Resistors (cont)**	
R-16	1.2K	451-252122
R-17	3.9K	451-252392
R-19	22	451-252220
R-20, 101, 103, 130, 121, 124, 128, 145, 148	1 Megohm	451-252105
R-21, 107, 117, 151	1K	451-252102
R-23	Variable, 500K, GAIN	025-201542
R-24, 29	470K	451-252474
R-25, 119	220	451-252221
R-26	2.2 Megohm	451-252225
R-28	2.2	451-252222
R-30	3.3K	451-252332
R-31, 106, 116	47K	451-252473
R-32	18, 2W	451-652180
R-34	15, 10W, W.W.	453-062150
R-35	560, 2W	451-652561
R-36	7.5, 10W, W.W.	453-062075
R-37	22, 2W	451-652220
R-38	100K, 2W	451-652104
R-39	25, 10W	453-062250
	15, 10W, W.W. (Part of 12 Volt Plug)	453-062150
R-102	2.2, W.W.	453-012022
R-108	15K	451-252153
R-110	150	451-252151
R-111	4.7K	451-252472
R-112	18K, 2W	451-652183
R-113, 139	47K, 1W	451-452473
R-115	82	451-252820
R-125, 126	270K	451-252274
R-129	820K	451-252824
R-131	5.6 Megohm	451-252565
R-132	100K, 1W	451-452104
R-134	22K, 2W	451-652223
R-135	Variable, 10K, 2W, SQUELCH	025-201545
R-137	Variable, 500K, VOLUME	025-201543
R-138, 146	56	451-252560
R-139	33K	451-252333
R-141	100	451-252101
R-140	1K (Part of L101)	
R-143	68K, 2W	451-652683
R-144	Variable, (1K) S-METER ADJ.	025-201541
R-147	2.7 W.W.	453-012027
R-105, 150	6.8	451-252068
R-152	220K	451-252224
R-153	560 (Part of L-102)	
R-154	6K, 10W, W.W.	453-062602
R-155	Variable, 2.5K, 2W, RF GAIN	025-201544
R-158, 159	15K, 2W	451-652153

* All resistors are in ohms, 10%, 1/2 watt unless otherwise specified

Schematic Symbol	Description	Part Number
	Coils	
L-1	Choke, Filter	056-200164
L-2	Coil, Oscillator-Tripler	051-202333
L-3	Choke, RF	053-200474
L-4	Coil, Tripler Plate	051-202329
L-5	Choke, RF; 7 UH @ 100 MA	053-100348
L-6	Coil, Doubler Plate	051-202330
L-7, 8, 9	Choke, RF; 1.8 UH @ 100 MA	053-100489
L-10	Coil, Final Plate (6 Meters)	051-202332
L-11	Coil, Final Plate (2 Meters)	051-202331
L-12	Choke, RF	053-200473
L-101	Coil, Oscillator (2 Meter) (Inc. R140)	051-202364
L-102	Coil, Oscillator (6 Meters) (Inc. R153)	051-202365
L-103	Choke, RF (2.7 UH)	053-100490
L-104	Coil, Mixer (2 Meters)	051-202367
L-105	Choke, RF (10 UH)	053-100445
L-106	Coil, Crystal Oscillator	051-202363
L-107A, B	Coil, Antenna Trap	053-200492
L-108	Coil, Antenna (6 Meters)	053-200494
L-109	Choke, RF (6.6 UH)	053-100207
L-110A, B	Coil, Mixer (6 Meters) & 23.25 MC Trap	051-202366
L-111	Coil, Antenna (2 Meters)	053-200493
L-112	Coil, BFO Oscillator	051-202368
	Transformers	
T-1	Transistor Power	052-300583
T-2	AC Power	052-300590
T-3	Driver	052-200543
T-4	Modulation	052-200542
T-101	IF (23.25 MC)	050-200723
T-102, 103 104	IF (1.65 MC)	050-200722
	Fuses	
F-1	15 Amp, 250V	039-100317
F-2	2 Amp, 250V	039-100307
	Connectors and Sockets	
J-1	Receptacle, Power (21-Prong Male)	010-301278
J-2, 102	Jack, Phono (VFO & Receiver Ant.)	036-100041
J-3, 6	Jack, Key	036-100002
J-4	Jack, Mike	036-200119
J-5	Receptacle, Coax. (Antenna)	010-100056
J-101	Receptacle, (11-Prong Male) Inc. Retaining Ring	006-200793
P-1	Plug, Phono	010-101327
P-2	Plug (11-Pin Female)	006-100797
	Plug, Power (21 Contact, Female)	010-301299
	AC Cord & Plug	087-100078
	Socket, Crystal	006-100346
	Socket, Tube; Min 7 Pin	006-100644
	Socket, Tube; Min 7 Pin	006-200759
	Socket, Tube; Min 9 Pin	006-200672
	Socket, Tube; Min 9 Pin	006-200778
	Socket, Tube; Octal	006-200760
	Switches	
S-1	Wafer (Crystal)	060-200894
S-2A	Wafer (Band, Buffer)	060-200895
S-2B	Wafer (Band, Final)	060-200893
S-3	Slide, DPDT (Microphone)	060-100381
S-4	Toggle, SPST (Transmit-Receive)	060-200650
S-5A, B	Toggle, DPST, (Power-OFF/ON)	060-100908
S-6	Wafer (Meter)	060-200901
S-7A, B	Wafer (Function)	060-300902
S-101A	Wafer (Band, Main Section	060-200905
S-101B	Wafer (Band, IF Section)	060-200906
S-102, 103 104	Slide, SPDT (ANL, AVC, BFO)	060-200907
	Tubes, Semi-Conductors, Transistors & Lamps	
V-1, 102, 104, 107	6U8, Xtal Osc. and Tripler; 6M Osc. and Mixer; 2M Osc. and Mixer; 2nd IF Amp. and BFO	090-901144
V-2	5763, Doubler	090-901241
V-3	6360, Final	090-901253
V-4	12AT7, 1st and 2nd Audio Amp.	090-900034
V-5	12AU7, Audio Amp. Driver	090-900036
V-6	6N7, Audio Output Modulator	090-900863
V-101, 103	6BK7, 1st and 2nd 6M RF Amp, ; 1st and 2nd 2M RF Amp.	090-901247
V-105	6BE6, 2nd Osc. and Mixer	090-901124
V-106	6BJ6, 1st IF Amp.	090-900822
V-108	6AL5, Detector and ANL	090-901163
V-109	6AW8, Audio Amp. and Squelch	090-901169
V-110	OB2, Voltage Regulator	090-900005
CR-1	Semi-Conductor Diode, IN295	019-201980
CR-2, 3, 4, 5, 6	Semi-Conductor Diode, M500	227-300001
CR-7	Semi-Conductor Diode, 1N1439	019-102298
Q-1, 2	2N442	112-300041
LM-1, 2	Pilot Lamp #47	039-100004
	Knobs	
	Knob, METER, FUNCTION, VOLUME SQUELCH, RF GAIN BANDSWITCH, BFO PITCH	015-201239
	Knob, TUNING	015-301240
	Knob, XTAL, ANT., BAND SW.	015-201252
	Knob, OSC., TRIPLER, DOUBLER, FINAL	015-201253
	Miscellaneous	
	Antenna	057-300317
	Clip, Antenna	076-202722
	Clip, Dial Window (Top)	076-202334
	Clip, Microphone	076-202719
	Clip, Socket	076-202720
	Dial Cord (Specify Length)	038-100026
	Foot (Cabinet)	016-201072
	Foot (Rear Panel)	016-201073
	Fuseholder	006-100451
	Lamp Holder	086-100440
	Lamp Holder (Grounded Shell)	086-200443
M-1	Meter (0-1MA)	082-200371
	Pointer, Dial	082-100364
	Retainer, Tube (OB2)	076-202277
	Retainer, Tube (5763)	076-102278
	Retainer, Tube (6U8)	076-102279
	Retainer, Tube (6360)	076-202321
RY-1	Relay Transmitter	021-300376
	Shield, Tube (6BE6, 6BJ7)	069-100328
	Shield, Tube (6AW8)	069-100406
	Shield, Tube (6U8, 6BK7)	069-100430
	Shield, Tube (12AT7), 12AU7)	069-200655
	Shield, Tube (6AL5)	069-100666
	Spring, Dial Cord (BAND SPREAD)	075-100012
	Spring, Dial Cord (TUNING)	075-200668
	Spring, Arm Stop	075-200678
SP-1	Speaker	085-200200
	Window Dial	022-200581