RESTRICTED

SERIAL NO.______

649

INSTRUCTION BOOK

FOR

MODEL RBK-13

RADIO RECEIVING EQUIPMENT

FOR

AMPLITUDE AND FREQUENCY MODULATED SIGNALS

FREQUENCY RANGE — 27.8 to 143 MEGACYCLES

NXsr-67988

the hallicrafters co.

CHICAGO, ILL., U. S. A.

94X060

- ERRATA -

SCHEMATIC - Page 3.

(1) Add capacitor C_{82} between the plate of tube V_5 and the plate of tube V_6

(2) Add resistor R_{23} in series with position #3 of switch section SW_{7C} at transformer T_{12}

LIST OF REPLACEABLE PARTS -

(1) In the NAME AND DESCRIPTION of R_5 delete reference to R_{71}.

(2) Change entry for R_{23} on page 21 from "Not used." to "Resistor, fixed, 10 ohm ±10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21 AWG wire leads 1-½" long. - - 3rd I-F band expansion on transformer T_{12} - - ASA - - RC21AE100K."

(3) Change entry for R_{71} on page 25 from "Same as R_5" to "Resistor, fixed, 27,000 ohm ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21 AWG wire leads 1-½" long - - Panoramic isolating resistor - - ASA - - RC21AE273K."

(4) Add the following entry for C_{82} to page 35: "Capacitor fixed, bakelite dielectric, 2-½ mmfd. ± 20%, 500 V. D-C working, 5/32" diameter x 3/16" long, two axial #20 AWG wire leads 1-½" long - - Coupling for transformer T_{13} - - SC, Special - - 49A001."

(5) In the NAME AND DESCRIPTION of R_{24} delete reference to R_{42}, R_{44}, R_{45}, R_{49} and R_{50}

(6) In the NAME AND DESCRIPTION of R_{34}, in addition to circuit symbols R_{36} and R_{39}, add symbols R_{42}, R_{44}, R_{45}, R_{49} and R_{50}.

(7) Change entries for R_{42}, R_{44}, R_{45}, R_{49} and R_{50} on page 23 from "Same as R_{24}" to "Same as R_{34}."

INDEX TO PARTS MANUFACTURED. -

(1) Add to the list on page 53 the following:

SC Stackpole Carbon Co.
St. Mary's, Pa.

INSTRUCTION BOOK

FOR

MODEL RBK-( )

RADIO RECEIVING EQUIPMENT

FOR

AMPLITUDE AND FREQUENCY MODULATED SIGNALS

FREQUENCY RANGE: 27.8 to 143 MEGACYCLES

RESTRICTED

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THE HALLICRAFTERS CO.

CHICAGO, ILL. U.S.A.

94X060

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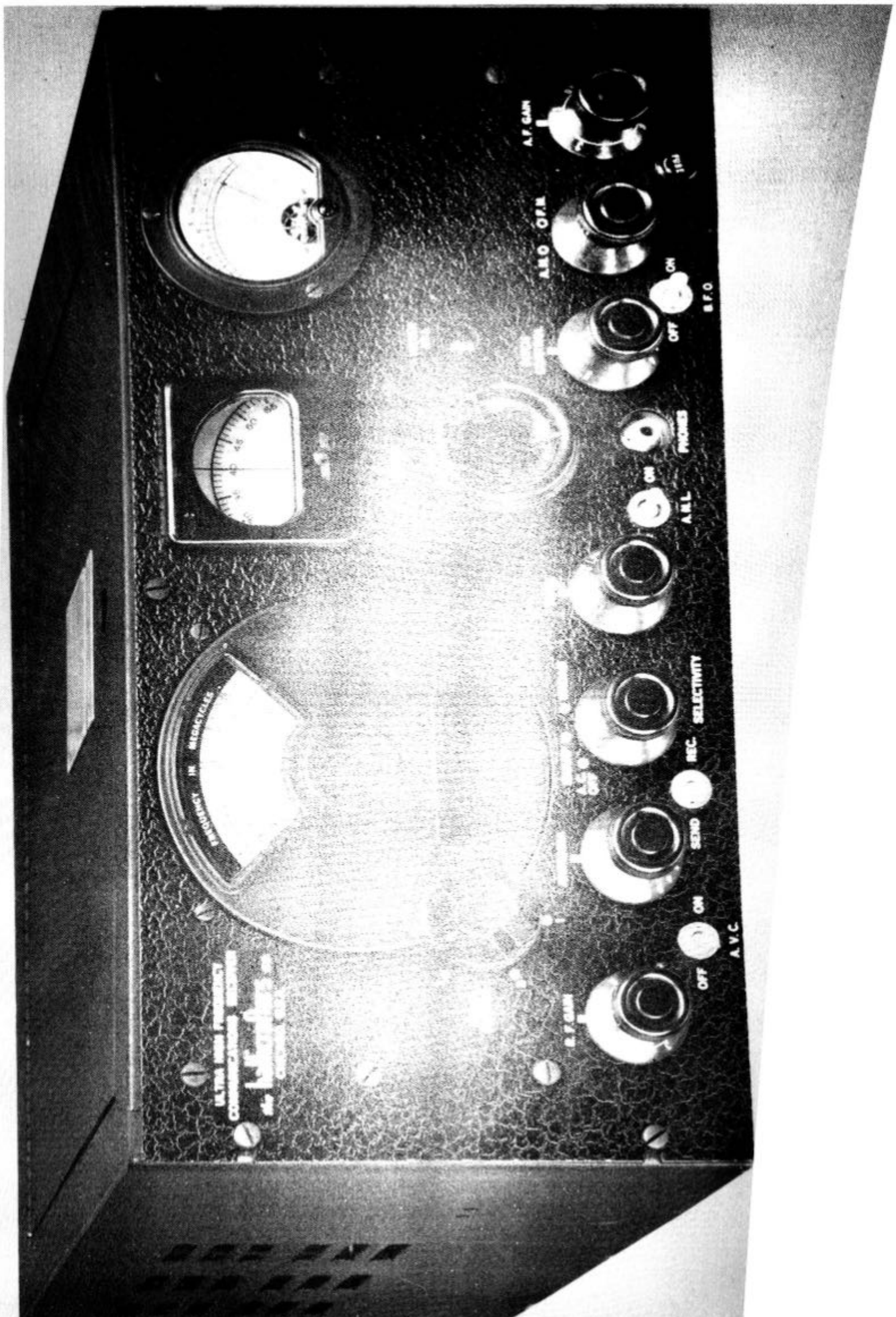

Figure 1. Radio Receiver CHL-46130-C, Front View

A. DESCRIPTION OF EQUIPMENT

A-1. GENERAL.- The Model RBK-( ) radio receiving equipment consists of a type CHL-46130-C ultra-high frequency radio receiver mounted in a sheet steel table mounted cabinet. The receiver is entirely self contained except for headset or speaker, panoramic adapter, and 115/230-volt source.

A-2. RECEIVER UNIT.- Radio Receiver CHL-46130-C is a ultra-high frequency superhetrodyne radio receiver capable of receiving both amplitude modulated (A-M) and frequency modulated (F-M) phone signals and continuous wave (C-W) telegraph signals. Automatic volume control (A-V-C) and automatic noise limiter (A-N-L) circuits are incorporated. See figure 3 for the schematic circuit diagram.

a. The frequency range of the receiver is from 27.8 megacycles to 143 megacycles and is divided into three bands. Each band is provided with sufficient overlap to insure continuity of coverage over the entire tuning range.

b. The complete tube compliment is as follows:

Symbol	Tube Type	Function
V_1	JAN- 956	R-F amplifier
V_2	JAN- 954.	Converter
V_3	JAN- 6AC7	1st I-F amplifier
V_4	JAN- 6AB7	2nd I-F amplifier
V_5	JAN- 6SK7	3rd I-F amplifier
V_6	JAN- 6H6	A-M second detector and automatic noise limiter
V_7	JAN- 6AC7	F-M limiter
V_8	JAN- 6H6	F-M discriminator
V_9	JAN- 6SL7GT	Audio voltage amplifier
V_{10}	JAN- 0D3/ VR-150/30	Voltage regulator
V_{11}	JAN- 6V6GT/G	Audio power amplifier
V_{12}	JAN- 6V6GT/G	Audio power amplifier
V_{13}	JAN- 5U4G	Full wave rectifier
V_{14}	JAN- 6J5	Beat frequency oscillator
V_{15}	JAN- 955	High frequency oscillator

c. All tubes with the exception of the three acorn type tubes can be reached from the top of the chassis. Acorn tubes V_1, V_2 and V_{15} are reached by removing the top cover plate of the r-f sections. See figure 4 for location of all tubes.

d. When receiving a-m signals the circuit consists basically of a stage of radio frequency amplification, a converter stage, a high frequency oscillator, three stages of intermediate frequency amplification, a second detector, an audio frequency voltage amplifier, a push-pull audio frequency power amplifier, a signal level indicator, an automatic volume control circuit and an automatic noise limiter circuit.

e. When receiving f-m signals the circuit consists basically of a stage of tuned radio frequency amplification, a converter stage, a high frequency oscillator, two stages of intermediate frequency amplification, an amplitude limiter stage, a discriminator, a tuning indicator, an audio frequency voltage amplifier, and a push-pull audio frequency power amplifier.

Reference to the block diagram, figure 2, will illustrate the above circuit arrangements.

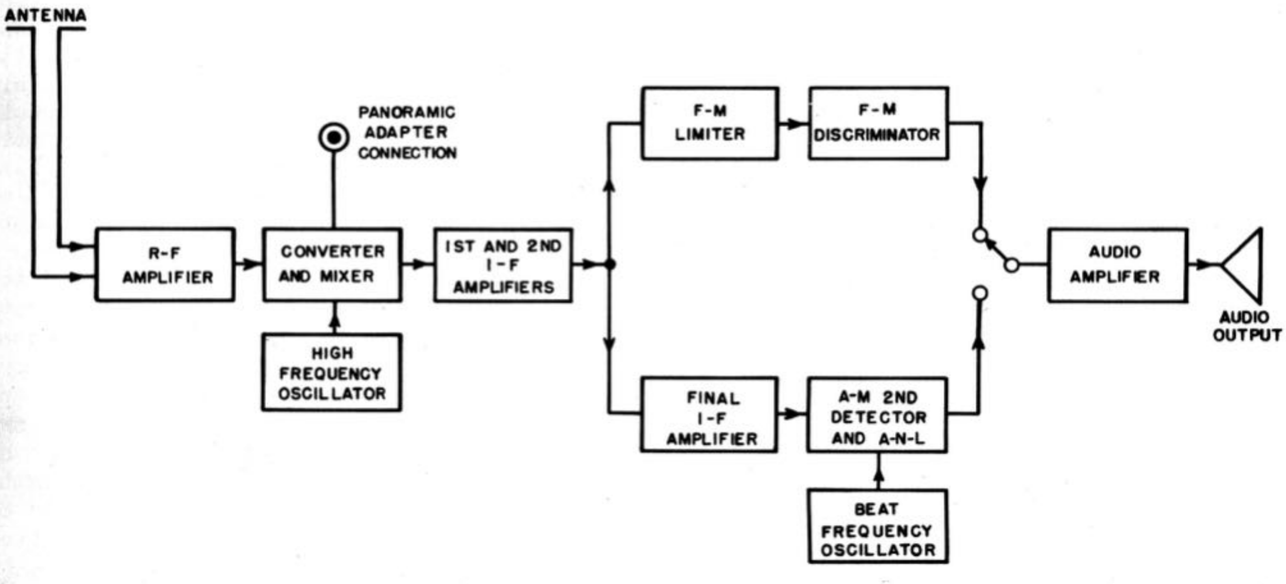

Figure 2. Radio Receiver CHL-46130-C, Block Diagram

A-3. CIRCUIT DESCRIPTION.- Refer to the schematic diagram, figure 3. Since the circuit functions of bands 1, 2 and 3 are essentially identical this discussion will describe the circuit with the BAND SWITCH (SW_{1A} to SW_{1G}) set at band 3, as shown in the schematic diagram. The BAND SWITCH (SW_1) selects the proper radio frequency, converter, and high frequency oscillator transformers to tune a given frequency range.

a. Signals picked up by the antenna enter the receiver through the antenna binding posts on terminal strip TS_2 (Marked A_1 and A_2.) on the rear apron of the chassis. (Refer to figure 6) The signal is fed to the radio frequency amplifier tube (V_1) through the antenna transformer (T_3). The secondary of this transformer (T_3) is tuned by capacitor C_{1A} and trimmed by capacitor C_2.

b. The amplified radio frequency signal at the plate circuit of tube V_1 is coupled to the control grid of the converter tube (V_2) through the radio frequency transformer T_6.

c. Another signal generated in the high frequency oscillator tube (V_{15}) is fed to the cathode of the tube V_2 through capacitor C_9. These two signals mix and heterodyne within the converter tube (V_2) and produce a third signal the frequency of which is the same as the intermediate frequency amplifier channel band-pass frequency or 5.25 MC. The frequency of the signal generated in the high frequency oscillator tube (V_{15}) is controlled by the high frequency oscillator transformer (T_9) which is tuned by capacitor C_{1C}. On band #1 the oscillator tunes 5.25 MC. higher in frequency than the received signal frequency and on bands #2 and #3 it is 5.25 MC lower in frequency than the incoming signal.

d. A shielded lead from the plate circuit of the converter tube (V_2) feeds the intermediate frequency signal voltage, through an isolating resistor (R_{71}), to a panoramic adapter connection. This output connection is an Amphenol type 83-1R coaxial socket. It is located on terminal strip TS_2, on the rear apron of the chassis. Refer to figure 6.

e. The intermediate frequency amplifier consists of tubes V_3, V_4 and V_5 and associated transformers T_{10}, T_{11}, T_{12}, and T_{13}. The i-f channel band width provided by transformer T_{10}, T_{11}, and T_{12} is expanded by a third winding, controlled by SELECTIVITY switch SW_{7A} to $_{7C}$. Expanding the i-f amplifier band-pass frequency allows high fidelity f-m reception.

f. The R.F. GAIN control (R_{11}), connected in series with the cathodes of tubes V_3 and V_4 and ground, varies the sensitivity of the receiver by controlling the gain in the first two i-f stages. This is accomplished by varying the self biasing voltage developed by these tubes.

g. The i-f amplifier terminates in two separate detectors, namely the amplitude modulation detector and the frequency modulation discriminator.

(1) The amplitude modulation (A-M) detector tube (V_6) is fed by the fourth i-f transformer (T_{13}). The diode load resistor net-work for the first diode section of the tube V_6 consists of resistors R_{31}, R_{33}, R_{34}, and R_{36}. From this voltage divider network the audio voltage developed is fed to the A.F. GAIN control (R_{43}) through capacitor C_{33} and section SW_{8D} of the AM/FM switch. An automatic volume control (A-V-C) voltage developed in this same network is applied to the grids of the 1st and 2nd intermediate amplifier tubes (V_3 and V_4) through the isolating networks consisting of resistor R_{10} and capacitor C_{12} for the tube V_3, resistor R_{19} and capacitor C_{16} for tube V_4 and resistor R_{35} and capacitor C_8 for both tubes when the receiver is set for A-M reception. The A.V.C. switch (SW_4) shorts out the a-v-c voltage when automatic volume control is not required. The second diode section of the A-M detector tube (V_6) is used as an automatic noise limiter (A-N-L), and is activiated by switch SW_6. This circuit functions as follows: Capacitor C_{25} becomes charged by the rectified carrier voltage when the A.N.L. switch (SW_6) is set at ON. The time constant of this capacitor and associated network is such that the audio frequency variations do not alter this charge. However, during a severe noise pulse the cathode of the second diode section of tube V_6 becomes more negative than the charge held by capacitor C_{25}, hence, current flows shorting the audio voltage to ground through capacitor C_{25} until the cathode voltage of the a-n-l diode of tube V_6 reaches a higher negative potential than its plate. By this action noise peaks are clipped off

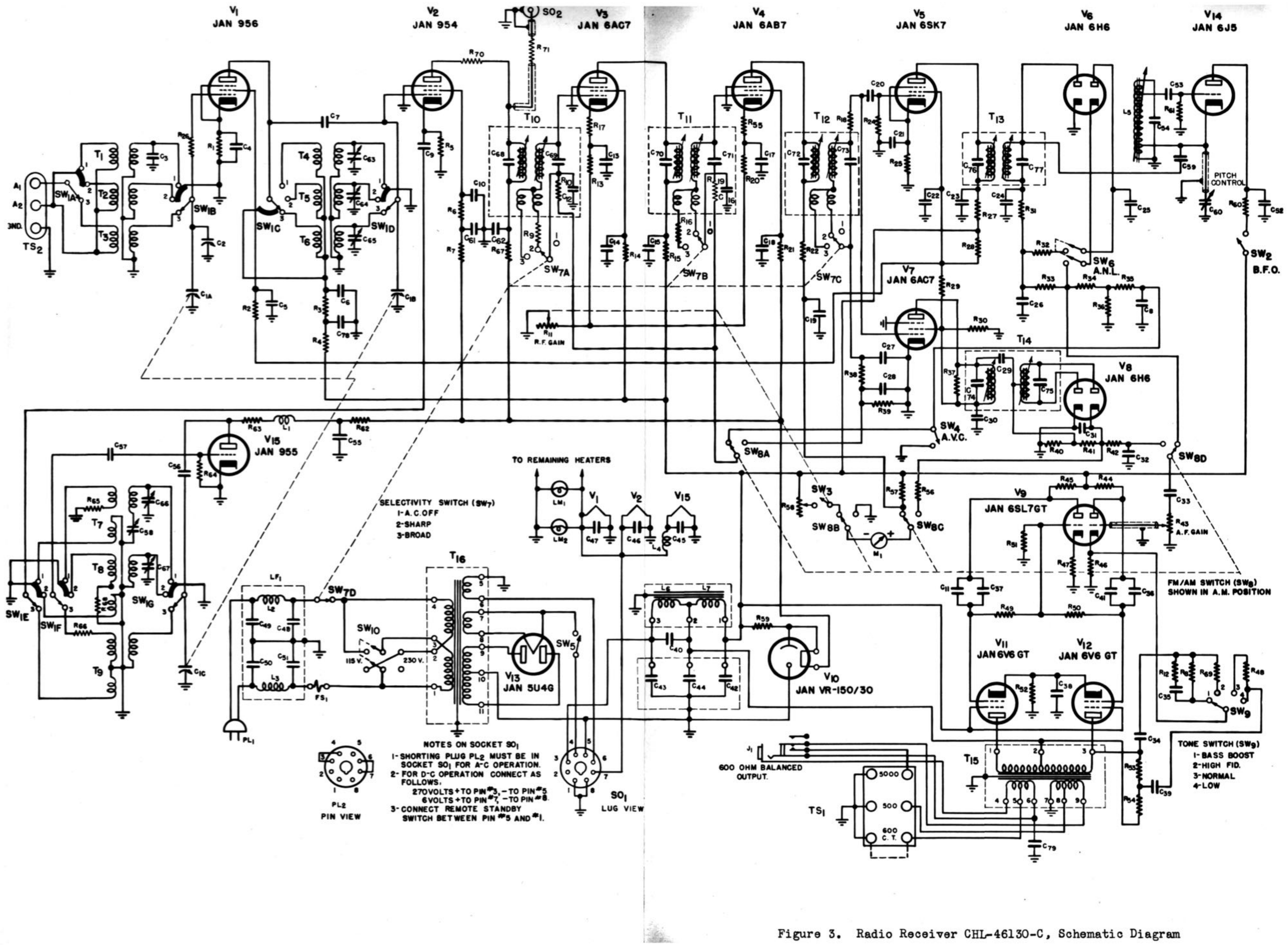

Figure 3. Radio Receiver CHL-46130-C, Schematic Diagram

and do not appear in the output as sudden blasts of noise.

(2) The frequency modulation detector circuit consists of a limiter stage and a discriminator stage. The limiter tube (V_7) is fed by the third i-f transformer (T_{12}). This stage operates as a saturated amplifier in which the output remains constant over a large range of input levels thus eliminating variations in the amplitude of the received carrier signal. When operating as an f-m receiver, automatic volume control action is obtained by applying a part of the voltage developed across resistor R_{39} to the control grids of the first and second i-f amplifier tubes (V_3 and V_4) through section SW_{8A} of the F.M./A.M. switch in the same manner as in a-m reception. The constant level output signal from the limiter tube (V_7) is fed to the discriminator tube (V_8) through the discriminator transformer (T_{14}) and coupling capacitor C_{29}. The discriminator circuit, consisting of transformer (T_{14}), tube V_8 and load resistor R_{40} and R_{41}, converts the frequency variations in the f-m signal into amplitude variations or an audio signal. The de-emphasis network consisting of a resistor R_{42} and capacitor C_{32} attenuates the high frequency end of audio range since these frequencies are emphasized at the transmitter. From the de-emphasis network the audio signal is fed to the A.F. GAIN control (R_{43}) in the same way as the signal from the amplitude modulation detector tube (V_6).

h. The audio amplifier consists of a voltage amplifier and phase inverter stage (tube V_9) and a push-pull power amplifier stage (tubes V_{11} and V_{12}). The audio signal from either the a-m detector or the f-m discriminator is fed to the control grid of the first triode section of tube (V_9) through the A.F. GAIN control (R_{43}) which controls the amount of excitation to the audio amplifier circuit. The amplified audio signal from the first triode section of tube V_9 is fed to the audio power amplifier tube (V_{12}) and to the second triode section of tube V_9. The audio signal on the plate of the second triode section of tube V_9, which is now 180° out of phase, is fed to the remaining power amplifier tube V_{11}. The output of the audio power amplifier tubes (V_{11} and V_{12}) is fed to the output terminals through transformer T_{15}, the secondary of which provides output impedances of 500 ohms, 5000 ohms to ground and 600 ohms balanced to ground. The network consisting of resistors R_8, R_{12}, R_{48}, R_{53}, R_{54} and R_{69} and capacitors C_{34}, C_{35} and C_{39} provide inverse feedback in varying degrees in the audio amplifier tubes to allow tone control ranging from bass boost to high frequency cut off. TONE SWITCH (SW_9) selects the desired fidelity.

i. The tuning meter (M_1) is used to indicate correct tuning for both amplitude modulation and frequency modulation reception. It is switched from one circuit to the other by sections SW_{8B} and SW_{8C} of the A.M./F.M. switch.

(1) When receiving amplitude modulated signals the tuning meter indicates a change in the plate current drawn by the second intermediate amplifier tube (V_4). This tube (V_4) draws maximum current with zero signal level. Current drain decreases with an increase in signal level causing the meter to fluctuate in accordance with the strength of the received signal. The meter circuit is completed by turning the R.F. GAIN control (R_{11}) full on (to the extreme right hand position). This activates switch SW_3 which is ganged to the control. When switch SW_3 is "on" the meter and the METER ADJ. resistor (R_{58}) are shunted across resistor R_{57}).

(2) When receiving frequency modulated signals the meter indicates resonance by indicating the voltage developed across load resistors R_{40} and R_{41}. When the receiver is in exact tune with the received signal the voltages developed across the two load resistors cancel out while detuning the receiver on either side of the incoming signal frequency causes a difference in the voltage developed across each resistor which is shown on the meter by a deflection on either side of zero.

j. The beat frequency oscillator stage consists of a triode oscillator tube (V_{14}) and a resonant circuit (L_5). The frequency of the oscillator is adjusted to approximately the i-f frequency plus 1000 cycles by varying the inductance of L_5 with an adjustable iron slug. B.F.O. switch (SW_2) activates this circuit by applying plate voltage to tube V_{14}. Capacitor C_{60} varies the pitch of the note to suit the operator.

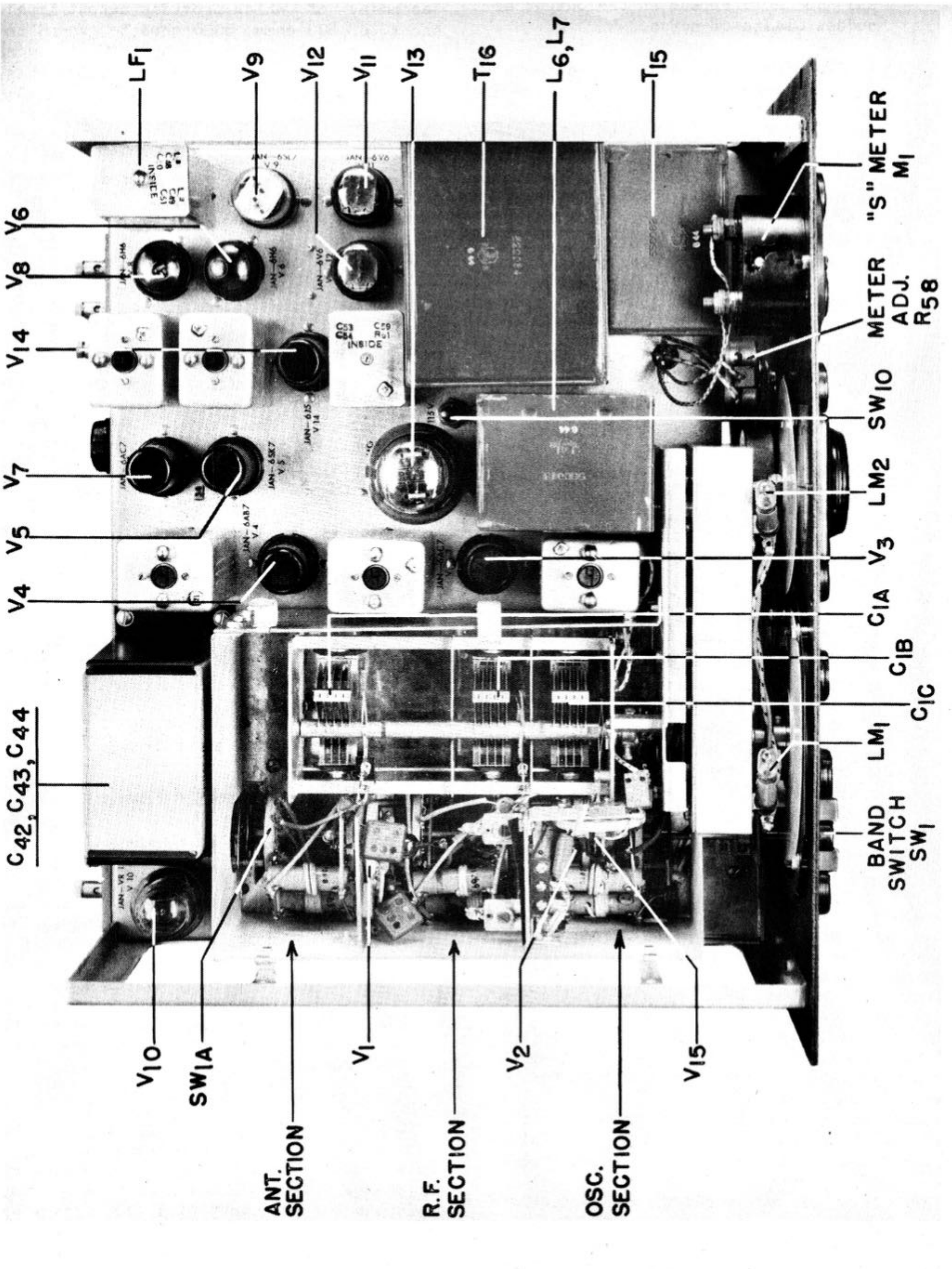

Figure 4. Radio Receiver CHL-46130-C, Top View Of Chassis

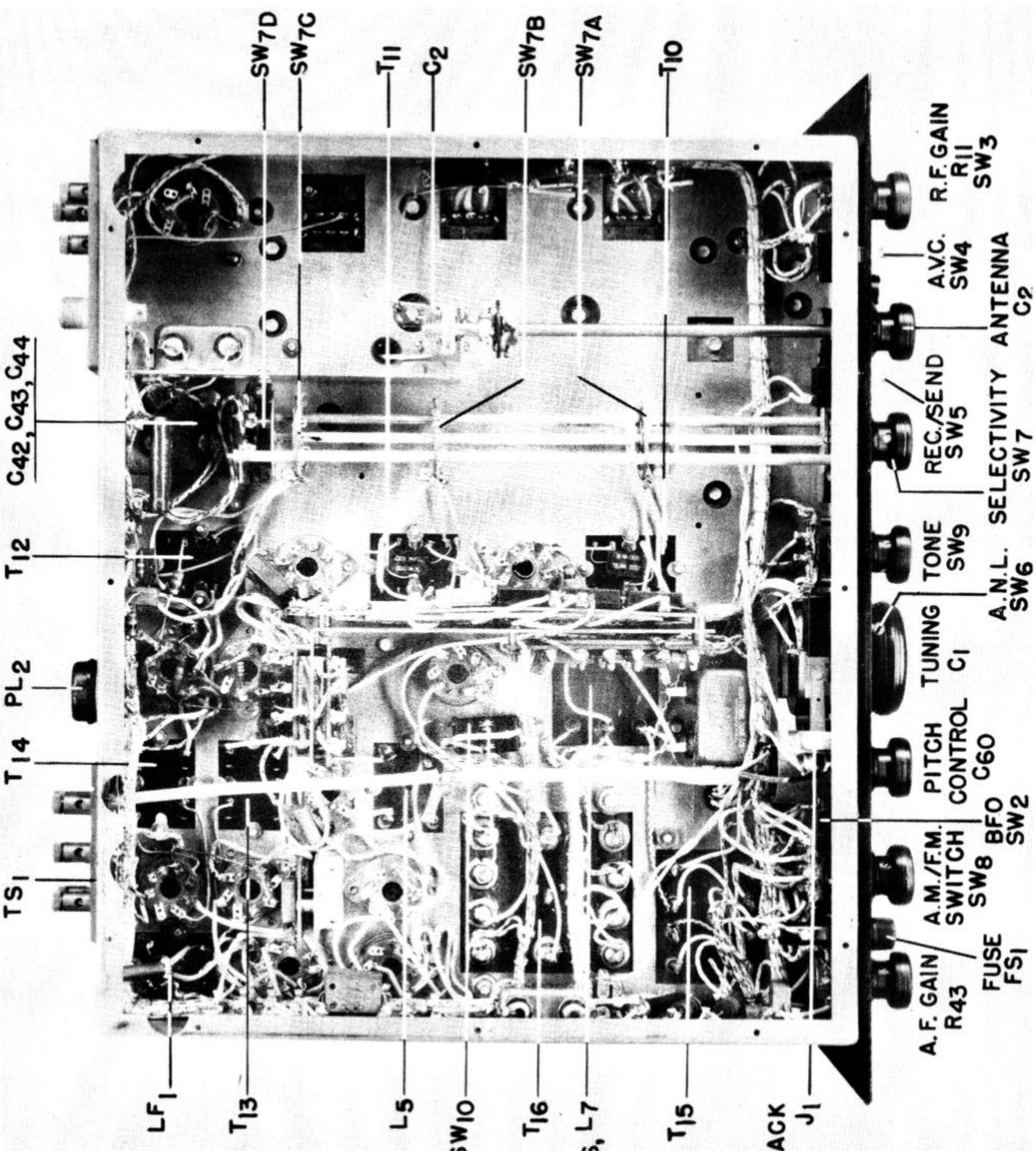

Figure 5. Radio Receiver CHL-46130-C, Bottom View Of Chassis

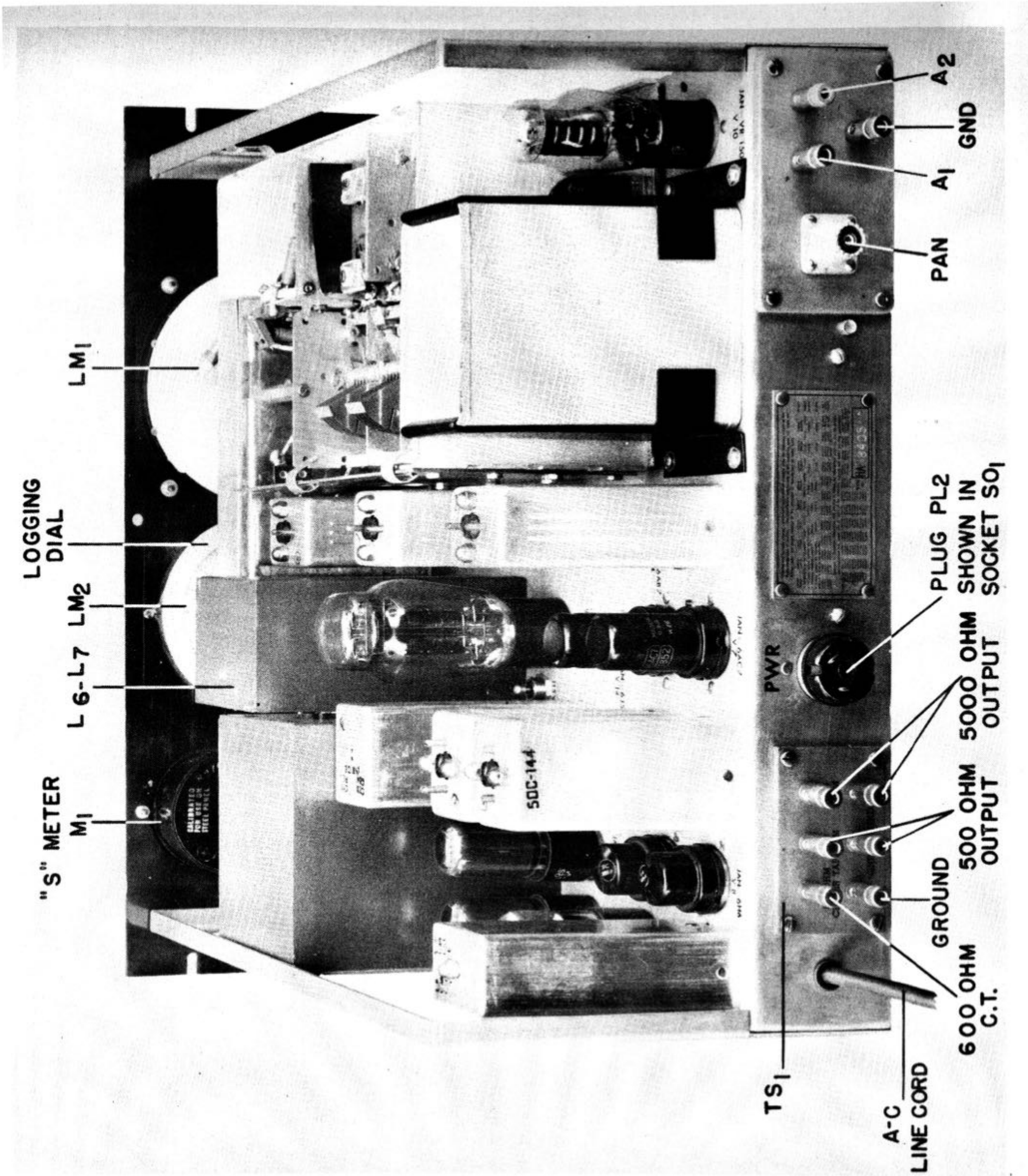

Figure 6. Radio Receiver CHL-46130-C, Top Rear View

k. The voltage regulator tube (V_{10}) supplies a constant voltage to the plate and screen of the mixer tube (V_2), the screen grid of the second i-f amplifier tube (V_4) and the plate of the high frequency oscillator tube (V_{15}).

l. Socket SO_1 provides for operation from an external d-c voltage source. When so operated the heater voltage is supplied directly to the tubes while the plate and screen voltage is applied through the filter network and voltage regulator tube (V_{10}) just as when operating from a-c source.

B. INSTALLATION

B-1. CAUTION.- Voltages appearing within the receiver chassis are high and dangerous. Exercise care in making adjustments. Before making any repairs on the receiver, remove the power cord plug from supply receptacle or disconnect the d-c source from socket SO_1.

B-2. UNPACKING.- Carefully unpack and inspect the receiver for possible damage during transit. Claim for any damage should be made immediately to the transportation carrier.

B-3. INSPECTION.- After the receiver has been unpacked and BEFORE power is applied, check the following items:

a. See that the tubes are secure and in their proper sockets. Reference to figure 4 will show their proper location. The three acorn type tubes are made accessible by removing the shield cover over the r-f section.

b. Check pilot lamps behind the translucent tuning dials. These can be checked by simply raising the cabinet cover.

c. Check the line fuse located in the fuse container on the front panel to see that it is in operating order.

B-4. ANTENNA CONNECTIONS.- Three terminals are provided at terminals strip TS_2 located on the rear apron of the receiver's chassis. Terminals A_1 and A_2 are connected to the primary winding of the r-f stage transformers and the GND. terminal is connected to the receiver's ground system. Refer to figure 9 for suggested antenna.

a. Single Wire Antenna.- When receiving with a single wire antenna, connect a jumper between terminals A_2 and GND. A single wire antenna of about 50 to 75 feet (including lead-in) is then connected to terminal A_1. This type of antenna works well where the signal to noise ratio is relatively high and a more elaborate installation is not available. Erect the antenna as high and free from surrounding objects as possible.

b. Doublet Antenna.- The doublet antenna is recommended where receiving conditions are difficult or where maximum sensitivity is required over a relatively narrow range of frequencies. The transmission line from the antenna is connected to antenna terminals A_1 and A_2. If a concentric line with a grounded outer conductor is used, connect the inner conductor to terminal A_1, the outer conductor to terminal A_2 and connect a jumper between terminals A_2 and GND. To determine the proper length in inches for the doublet antenna, divide 5540 by the frequency of reception in megacycles. After cutting the wire to the length determined above, cut it in half and insert an insulator at that point. Solder the two wires of the transmission line to each of the quarter wave sections at the insulator. Keep in mind that this type of antenna is directional broadside to its length and should be so oriented if maximum pickup from a certain direction is desired.

B-5. POWER INPUT CIRCUITS.- The receiver is designed to operate from either a 115/230-volt, 50-60 cycle, a-c power source, or from a 6-volt storage battery and 270-volts of "B" battery or vibrator supply.

a. A-C Operation.- If the receiver is to be operated from an a-c line, check the setting of the 115/230-volt change-over switch (SW_{10}), located on the chassis deck to the left of the power transformer, and see that it is set for the proper line voltage. Also see that the plug (PL_2) on the rear apron of the receiver is in place. This is necessary to provide continuity in the power circuits. Refer to figure 3.

b. D-C Operation.- To operate the receiver from external batteries delivering 6-volts at 4.5 amperes and 270-volts at 145 milliamperes (or from a vibrator supply of like capacity), connect plug PL_2 as shown in figure 7 and insert it in socket SO_1 in place of the jumper plug used for a-c operation.

B-6. AUDIO OUTPUT CIRCUITS.- A headset or loudspeaker may be used with the receiver.

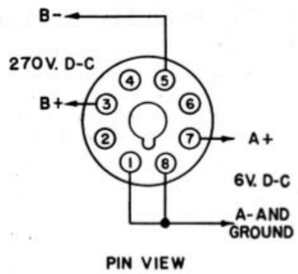

Figure 7. D-C Power Plug Connections

a. The headset jack (J_1) marked PHONES and located on the front panel provides a 600 ohm outlet for headset operation. Both terminals of this outlet are insulated from ground. By connecting a jumper between the terminals marked 600 OHM C.T. and GND. on terminal strip TS_1, located on the rear apron of the chassis, this 600 ohm line may be balanced to ground for other uses.

b. The speaker terminal board (TS_1) located on the rear apron of the receiver's chassis provides output impedances of 500 and 5000 ohms for loudspeaker operation.

B-7. PANORAMIC ADAPTER.- A coaxial cable connector (SO_2) is provided at terminal strip TS_2 for connection of a panoramic adapter designed to be used with Model RBK receiving equipment. The panoramic adapter is coupled to the plate circuit of the receiver's converter tube V_2 through isolating resistor R_{71}.

B-8. REMOTE STAND-BY OPERATION.- Remote control of the stand-by switch in the receiver can be obtained by removing the jumper wire between pins #3 and #4 and connecting leads to pins #3 and #4 of either the jumper plug (PL_2) used for a-c operation or its substitute plug used for battery operation, and connecting the leads to an external relay or switch. Note: The remote relay or switch must be insulated for high voltage, since this switch is wired into the plate voltage circuit of the receiver.

C. ADJUSTMENT AND OPERATION

C-1. PANEL CONTROLS.- Reading across the front panel from left to right the control markings and functions are as follows: (Refer to figure 1.)

a. R.F. GAIN (radio frequency gain) Control.- It controls the sensitivity of the receiver. Ganged to this control is the "S" meter switch which connects the tuning meter into the circuit when the control is rotated completely to the right.

b. BAND SWITCH.- This switch is used to select the desired frequency range covering the frequencies shown on the main tuning dial.

c. A.V.C. (automatic volume control) Switch.- It switches in a circuit which controls the sensitivity of the receiver. This action provides a more nearly constant audio output level over reasonable variations in signal strength at the antenna.

d. ANTENNA Control.- This control is used to compensate for misalignment of antenna transformers T_1, T_2 and T_3 due to antenna impedance variations. Once set for a given antenna its calibration will hold for a wide range of frequencies. Since this capacitor acts as a trimmer for the main tuning capacitor (C_{1A}), its use will have a slight detuning effect on the high frequency end of Band 3 and will have to be "touched-up" to retune the desired signal.

e. REC./SEND Switch.- This switch is used to silence the receiver for short periods of time. It connects the high voltage to the receiver circuits when set at REC.

f. SELECTIVITY Switch.- This switch controls the a-c line voltage to the receiver when operating from an a-c power source and in addition sets the band width of the intermediate frequency amplifier stages in its SHARP and BROAD positions.

g. TONE Switch.- It controls a feedback circuit in the audio amplifier stages which allows the audio frequency response to be modified from bass boost through high fidelity to high frequency cut-off.

h. A.N.L. Switch.- This switch cuts in a circuit which will increase the intelligibility of the received signal when a high noise level distorts the signal. The circuit clips the noise peaks in excess of the normal signal level. The switch should be left at OFF when the receiving conditions are normal.

i. TUNING Wheel.- This control varies the capacity of capacitor C_1 which tunes the receiver to the desired frequency. The frequency of reception is read directly from the main tuning dial. The scale on the logging dial is used in conjunction with the outer-most scale on the main tuning dial for logging purposes.

j. PHONES Jack.- It is connected to the 600 ohm secondary winding of the output transformer and is insulated from the chassis. It can be used to feed a headset or a 600 ohm line.

k. METER ADJ.- This adjustment is used to set the "S" meter to its "0" signal position when the receiver is set for amplitude modulation reception.

l. PITCH CONTROL.- This control varies the pitch of the c-w signal for code reception.

m. B.F.O. Switch.- It turns on the beat frequency oscillator, used to produce the beat note for the reception of c-w (telegraph) signals.

n. A.M./F.M. Switch.- It connects the output of either the a-m detector or the f-m discriminator to the audio amplifier and switches the tuning meter from one circuit to the other.

o. "S" meter or tuning meter.- When the receiver is set to receive amplitude modulated signals the tuning meter indicates the carrier strength of the received signal. To put the meter in operation, turn the R.F. GAIN control to the extreme right until the switch (SW_3) snaps "on". The meter is not used when receiving c-w signals.

When the receiver is set to receive frequency modulated signals the tuning meter is used to indicate resonance with the carrier. As the receiver is tuned through an f-m carrier the meter pointer will first deflect to one side of "0", return to "0" and deflect an equal distance on the opposite side of "0", and return to "0". The zero center position in the middle of the swing represents the correct setting of the receiver tuning dial and indicates resonance.

p. The FUSE holder contains a 3 amp., 250-volt fuse which protects the receiver against accidental overloads.

q. A.F. GAIN Control.- The audio output level of the receiver is controlled by varying the signal level to the grid of the first audio amplifier tube (V_9).

C-2. OPERATION.-

a. A.M. SIGNAL RECEPTION.- To receive amplitude modulated signals set the front panel controls as follows:

SELECTIVITY switch	- Set at A.C. OFF when the set is not in use. Set at SHARP for reception of phone signals.
A.M./F.M. switch	- Set at A.M.
BAND SWITCH	- Set to band covering desired frequency
A.V.C.	- Set at ON
REC./SEND switch	- Set at REC. Set in SEND position to disable the receiver for short periods.
B.F.O. switch	- Set at OFF
PITCH CONTROL	- Not used
TUNING wheel	- Set dial to frequency of desired signal adjust for maximum tuning meter reading
R.F. GAIN control	- Turn to right until tuning meter switch snaps on
ANTENNA trimmer	- Adjust for maximum tuning reading
A.F. GAIN control	- Adjust for desired signal level at headset or speaker
TONE switch	- Set at HIGH FID. or BASS BOOST when signal to noise ratio is high or at NORMAL or LOW when signal to noise ratio is low.
A.N.L. switch	- Set at OFF unless background noise is excessive

b. F-M SIGNAL RECEPTION.- To receive frequency modulated signals set the front panel controls as follows:

SELECTIVITY switch	- Set at A.C. OFF when set is not in use. Set at BROAD for reception of phone signals.
A.M./F.M. switch	- Set at F.M.
BAND SWITCH	- Set at band covering desired frequency.
A.V.C. switch	- Not used
REC./SEND switch	- Set at REC. Set in SEND position to disable the receiver for short periods.
B.F.O. switch	- Set at OFF
PITCH CONTROL	- Not used
TUNING wheel	- Set dial to frequency of desired signal adjust for center "0" position of tuning meter
R.F. GAIN control	- Turn all the way to the right
ANTENNA TRIMMER	- Adjust for maximum audio level
A.F. GAIN control	- Adjust for desired signal level at headset or speaker.

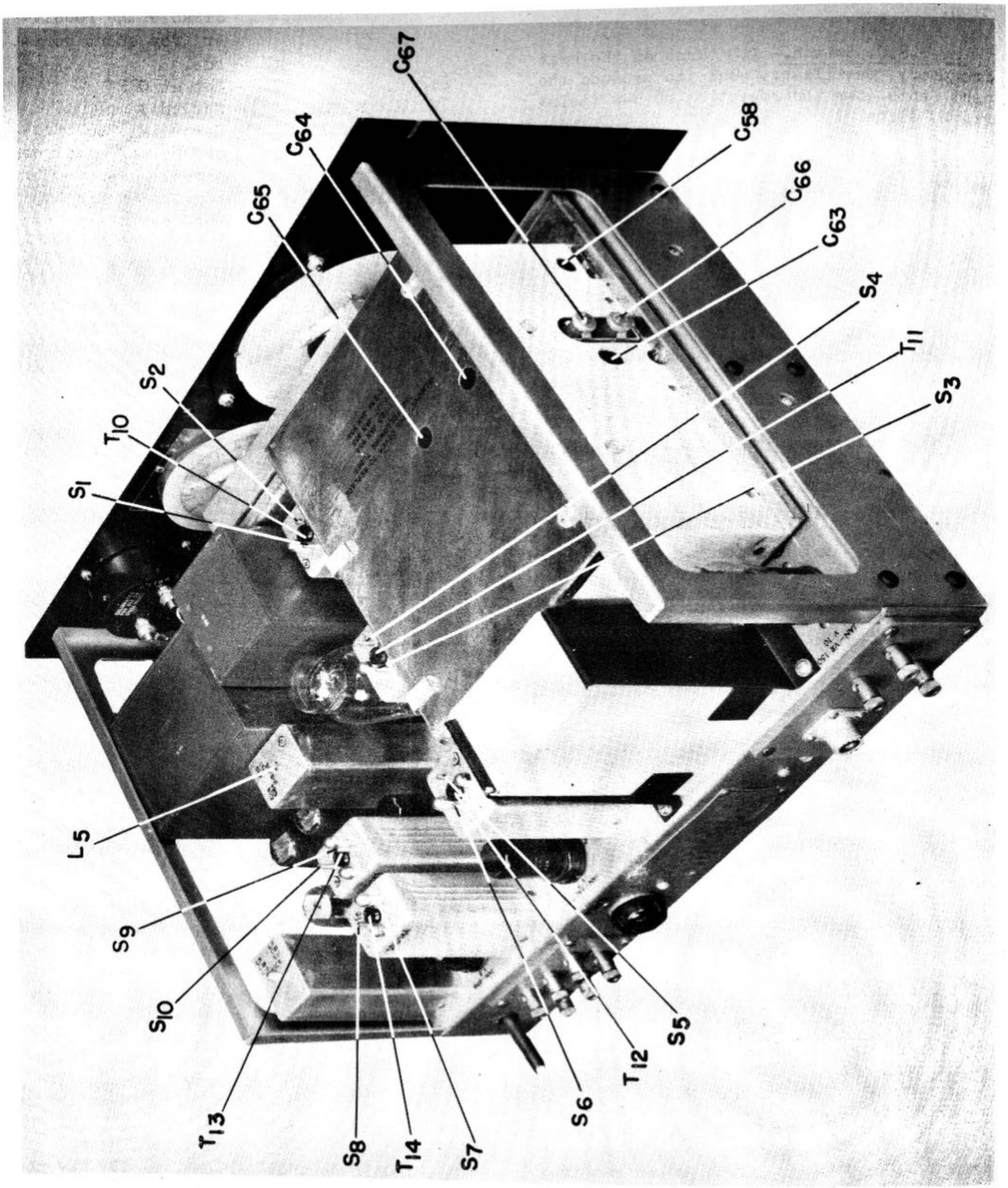

Figure 8. Radio Receiver CHL-46130-C, Top View Showing Alignment Points

TONE switch	- Set at BASS BOOST or HIGH FID.
A.N.L. switch	- Set at OFF

c. C-W (TELEGRAPH)RECEPTION.- To receive continuous-wave (telegraph) signals set the front panel controls as follows:

SELECTIVITY switch	- Set at A.C. OFF when the set is not in use. Set at SHARP for c-w telegraph reception.
A.M./F.M. switch	- Set a A.M.
BAND SWITCH	- Set to band covering desired frequency
A.V.C. switch	- Set at OFF
REC./SEND switch	- Set at REC. Set in SEND position when disabling receiver for short periods of time.
B.F.O. switch	- Set at ON
PITCH CONTROL	- Adjust to produce approximately a 1000 cycle code signal.
TUNING wheel	- Set dial to frequency of signal. Tune for maximum signal level at headset or speaker
R.F. GAIN control	Turn up as high as the signal strength of the received signal will allow
ANTENNA trimmer	- Adjust for maximum signal level at headset or speaker
A.F. GAIN control	- Adjust for desired signal level at headset or speaker
TONE switch	- Set at LOW

C-3. CALIBRATION AND LOGGING.- The three frequency ranges shown on the main tuning dial are calibrated directly in megacycles. The fourth or outside scale on the calibrated dial is used for logging purposes. The logging scale runs from 1 to 23. Each of the 23 divisions are further divided into 100 parts by the vernier dial scale, located just above the TUNING wheel. The vernier dial makes one revolution as the calibrated dial moves one division along the logging scale, hence, the log reading will be the calibrated dial log reading followed by a decimal point and the vernier dial reading.

C-4. "S" METER ADJUSTMENT.- With the set turned off check the resting position of the meter. Adjust the screw on the meter face for zero. (Right side of meter face.) Set up the receiver for amplitude modulation reception and set the receiver at a frequency not being used for communications. With zero signal level and no noise being received set the METER ADV. screw located on the front panel for an "S" meter reading of zero db. (left side of meter scale).

D. ALIGNMENT AND SERVICE

CAUTION - Voltages at various points in the r-f stages and under the chassis are sufficiently high to produce a severe shock. When working on the set avoid contact with the high voltage points and remember, improper or rough handling may disable certain component parts. BE CAREFUL.

D-1. INSPECTION.- All components of the radio set should be given a thorough inspection upon issue and at regular intervals thereafter. Keep the equipment dry. Moisture, even in a completely tropicalized set may cause deterioration of material and produce general unsatisfactory operation. Dust and dirt materially effect both electrical and mechanical operation. Keep the various parts clean especially the tuning capacitors and gear drive. A minute amount of oil in the gear drive occasionally will provide smoother operation. Do not oil the condenser wipers. Noisey reception may be caused by dirty condenser wipers, gain controls, switches loose connections in the cables, tubes, wiring contacts etc. in the installation. Do not oil any of the switch contacts. Check accessable connections and tubes regularly making sure that all contacts are clean and tight and that tubes are held securely in their sockets.

D-2. REPLACING TUBES, LAMPS AND FUSES.- All tubes with the exception of the three acorn types are accessible at the top of the chassis. The three acorn tubes are reached by removing the top cover of the r-f assembly. These tubes should be inserted with the short end of the body in the socket. The two pilot lamps, LM_1 and LM_2, are identical and are located behind the translucent dials. They are of the bayonet type and are removed by pressing down slightly in the socket and turning counter-clockwise. The fuse is replaceable from the front panel. It is contained in the bayonnet type holder that is removed by pressing in slightly and turning counter-clockwise to release.

D-3. ALIGNMENT.-

a. GENERAL.- The receiver has been carefully aligned at the factory and alignment should not be attempted unless it is known that the adjustments have been tampered with or that tubes of a different manufacturer have been substituted. The equipment required to align this receiver will be:

(1) Signal Generator capable of tuning from 5 to 140 MC.
(2) Non-metalic screw driver
(3) 50 ohm non-inductive resistor for a dummy antenna
(4) Output meter.

b. I-F ALIGNMENT.-

(1) Disconnect the grid lead of the 954 converter tube (V_2) and connect the signal generator output between the grid and ground. Make the connection with a small clip or wind a piece of flexible wire around the grid terminal, but do not attempt to solder a lead to the terminal as the heat is sure to crack the glass envelope. Connect the output meter to either the headset jack or the speaker terminal board.

(2) Set the controls on the receiver as follows:

(a) R.F. GAIN control at maximum gain.
(b) A.F. GAIN control at maximum gain.
(c) SELECTIVITY switch at SHARP.
(d) AM/FM switch AM.
(e) BAND SWITCH at band #2
(f) A.V.C. switch at OFF.
(g) SEND/REC. switch at REC.
(h) A.N.L. switch at OFF.
(i) B.F.O. switch at OFF.
(j) TONE control at NORMAL.

(3) Set the signal generator frequency at 5.25 MC. and with the 400 cycle modulation turned on, align transformer T_{10}, T_{11}, T_{12} and T_{13} by adjusting the slug adjustment screws S_1, S_2, S_3, S_4, S_5, S_6, S_9 and S_{10}. Refer to figure 8 for location of these adjustment screws. A bakelite screw driver with a metal or insulated tip is necessary of accurate alignment.

(4) Repeat the alignment procedure at least once to insure an accurate alignment.

(5) The discriminator transformer T_{14} is aligned as follows:

(A) Set the SELECTIVITY switch at BROAD and FM/AM switch at FM.

(b) With the signal generator set at the 5.25 MC. i-f frequency and with the 400 cycle modulation on, rotate the slug adjustment screw S_8 until the signal level read on the output meter drops to zero. This null point is approached very suddenly, therefore, the slug adjustment screw must be turned very slowly. NOTE: The output of the signal generator should be approx. 1000 microvolts for good results. Back off the audio gain slightly if necessary.

(c) Now detune this adjustment slightly so that the output meter gives a readable indication.

(d) Adjust the primary slug adjustment, S_7, of the discriminator transformer for maximum response.

(e) Retune the secondary slug adjustment until the output again drops to zero.

(f) Detune the signal generator to a frequency lower than the i-f frequency until the maximum output point is reached. Note the output meter reading and the frequency deviation from the i-f frequency. (5.25. MC.)

(g) Repeat the procedure above the i-f frequency. The frequency deviation and maximum output should be the same for good balance. If they are not, then tune the signal generator to the lower of the two peaks and adjust the primary slug adjustment, S_7, until the output rises an amount equal to about half the difference of the two outputs previously noted.

(h) Retest for balance as above and readjust the primary slug adjustment until both maximum readings are alike when the signal generator is detuned approximately the same amount on either side of resonance (5.25 MC.) If a balance cannot be obtained, it is an indication that the discriminator transformer secondary slug adjustment has been adjusted off its proper center and will require a very slight readjustment in either direction. The direction of adjustment that will cause the off-time peaks to assume the same values is the correct one. Care must be taken in adjusting the discriminator secondary control as even a very slight misadjustment will result in distortion in frequency modulated signals.

c. B.F.O. ADJUSTMENT.- With the signal generator connected as for i-f alignment above, set the generator's frequency to 5.25 MC. and turn off the 400 cycle modulation. Turn on the receiver's B.F.O. switch and back off the A.F. GAIN control slightly. Adjust the iron core screw on top of coil L_5 until a 1000 cycle note is obtained in the headset. The headset should replace the output meter for this operation. Note that the 1000 cycle note appears at two settings of this screw. Either setting is useable. It merely means that the oscillator is set 1000 cycles above or below the i-f frequency.

d. R-F ALIGNMENT.- Refer to figure 8 for location of alignment controls.

(1) Connect the signal generator to the antenna terminals A_1 and A_2 and wire the dummy antenna resistor (50 ohm noninductive resistor) across the generator terminals. Connect the output meter to the speaker terminals.

(2) Set the controls on the receiver as for i-f amplifier alignment. Refer to paragraph D-3. b. (2).

(3) Turn on 400 cycle tone modulation on the signal generator.

(4) Align the three bands as follows:

(a) BAND 1.

1. Set signal generator and receiver at 45 MC.

2. Adjust trimmer capacitor C_{66} for maximum output. Note that the frequency at which the receiver's oscillator operates on this band, is higher than the signal frequency.

3. Adjust trimmer capacitor C_{63} for maximum output.

4. Set signal generator and receiver at 30 MC.

5. Set padder capacitor C_{58} for maximum output while rocking the tuning control to obtain the optimum setting of the padder.

6. Repeat the above operations for alignment of the high frequency end of the band as described.

7. Check the 40 MC. check point for alignment.

(b) BAND 2.

1. Set signal generator and receiver at 80 MC.

2. Adjust trimmer capacitor C_{67} for maximum output. Note that the frequency at which the receiver's oscillator operates on this band is lower than the signal frequency

3. Adjust trimmer capacitor C_{64} for maximum output.

4. No padder capacitor adjustment is provided for the low frequency end of this band.

5. Check the 60 MC. check point for alignment.

(c) BAND 3.

1. Set signal generator and rereceiver at 135 MC.

2. Adjust trimmer capacitor C_{65} for maximum output. Rock the tuning control while making the adjustment to obtain the optimum settings.

3. It is not recommended that the frequency of the oscillator in this band be adjusted except at the factory or at a depot. Should it be impractical to return the receiver to a depot or the factory for adjustment, then make the following adjustments;

a. Remove the top cover of the r-f unit and locate the high frequency oscillator coil T_9.

b. Set the signal generator and receiver at 135 MC.

c. Locate the white cellanese wire on the coil form of transformer T_9, and carefully shift its position for maximum output. Note that the frequency at which the receiver's oscillator operates on this band is lower than the signal frequency.

d. Set the signal generator and receiver at 90 MC.

e. Locate the heavy tinned wire on the coil form of transformer T_9 and carefully shift the turns until maximum signal output is obtained. Note that this transformer does not have a padding capacitor.

f. Recheck the high frequency end of the band and then cement the windings in place with "Q-Max" or equivalent low loss cement.

g. Set the signal generator and receiver at 135 MC.

h. Reset trimmer capacitor C_{65} for maximum output.

E. ELECTRICAL AND MECHANICAL DATA

E-1. RESISTANCE CHART.- All measurements were made from the tube socket terminals to ground. The tubes were in their sockets. The power was disconnected from the receiver, all front panel switches were set at ON and both GAIN controls were turned to their maximum output position. The AM/FM switch was set at A.M. All measurements were made with a Weston Model 772 analyzer.

ACORN TYPE TUBES

TUBE	JAN	PIN						
		H	G1	G2	G3	P	H	K
V_1	956	very high	8.5	23,000	250	42,000	0	250
V_2	954	0	0	160,000	0	34,000	very high	2,000
V_{15}	955	0	21,500	X	X	38,000	very high	0

STANDARD TYPE TUBES

TUBE	JAN	PIN							
		1	2	3	4	5	6	7	8
V_3	6AC7	0	0	0	over 500,000	170	75,000	0	30,000
V_4	6AB7	0	0	0	over 500,000	180	34,000	0	30,000
V_5	6SK7	0	0	290	over 500,000	290	22,500	0	31,000
V_6	6H6	0	0	over 500,000	0	over 500,000	NC	0	over 500,000
V_7	6AC7	0	0	0	33,500	0	20,000	0	20,000
V_8	6H6	0	0	120,000	240,000	120,000	NC	0	0
V_9	6SL7GT	over 500,000	295,000	5750	100,000	310,000	5750	0	0
V_{10}	VR-150/30	0	0	33,000	NC	33,000	NC	33,000	NC
V_{11}	6V6GT/G	0	0	30,000	30,000	340,000	NC	0	250
V_{12}	6V6GT/G	0	0	30,000	30,000	340,000	NC	0	250
V_{13}	5U4G	NC	30,000	NC	45	NC	45	NC	30,000
V_{14}	6J5	0	0	54,000	NC	50,000	NC	0	0

NC - No Connection

X - No Pin

E-2. VOLTAGE CHART.- All measurements were made from the tube socket terminals to ground. The tubes were in their sockets. All front panel switches were set at ON (REC.-SEND switch at REC.) and both GAIN controls were turned to their maximum output position. The AM/FM switch was set at AM, the SELECTIVITY switch at SHARP, and the BAND SWITCH at #1 position. A jumper was connected across the antenna terminals A_1, A_2 and GND, and a 5000-ohm 10-watt resistor was connected across the 5000 ohm speaker terminals to protect the receiver components during this check. All measurements were made with an RCA Volt Ohmyst Junior and with a line voltage of 117-volts.

ACORN TYPE TUBES

TUBE	JAN	PIN						
		H	G1	G2	G3	P	H	K
V_1	956	6.3 (a-c)	0	100	2.8	160	0	2.8
V_2	954	0	0	80	4.2	120	6.3 (a-c)	4.2
V_{15}	955	0	-2.6	X	X	100	6.3 (a-c)	0

STANDARD TYPE TUBES

TUBE	JAN	PIN							
		1	2	3	4	5	6	7	8
V_3	6AC7	0	0	0	-3	1.5	180	6.3 (a-c)	260
V_4	6AB7	0	0	0	-2.8	0.8	125	6.3 (a-c)	260
V_5	6SK7	0	6.3 (a-c)	4	0	4	100	0	240
V_6	6H6	0	0	-5.6	0	-6.8	X	6.3 (a-c)	-5.8
V_7	6AC7	0	0	0	-0.9	0	78	6.3 (a-c)	78
V_8	6H6	0	0	-1.0	0	-1.0	X	6.3 (a-c)	0
V_9	6SL7GT	0	150	2.2	0	150	2.2	0	6.3 (a-c)
V_{10}	VR-150/30	NC	0	120	X	120	X	120	NC
V_{11}	6V6GT/G	0	6.3 (a-c)	280	260	0.2	X	0	14
V_{12}	6V6GT/G	0	6.3 (a-c)	260	250	0.2	X	0	14
V_{13}	5U4G	0	300	X	280	X	280	X	300
V_{14}	6J5	0	0	110	X	-7.8	X	6.3 (a-c)	0

NC - No Connection X - No pin * - Tie Lug

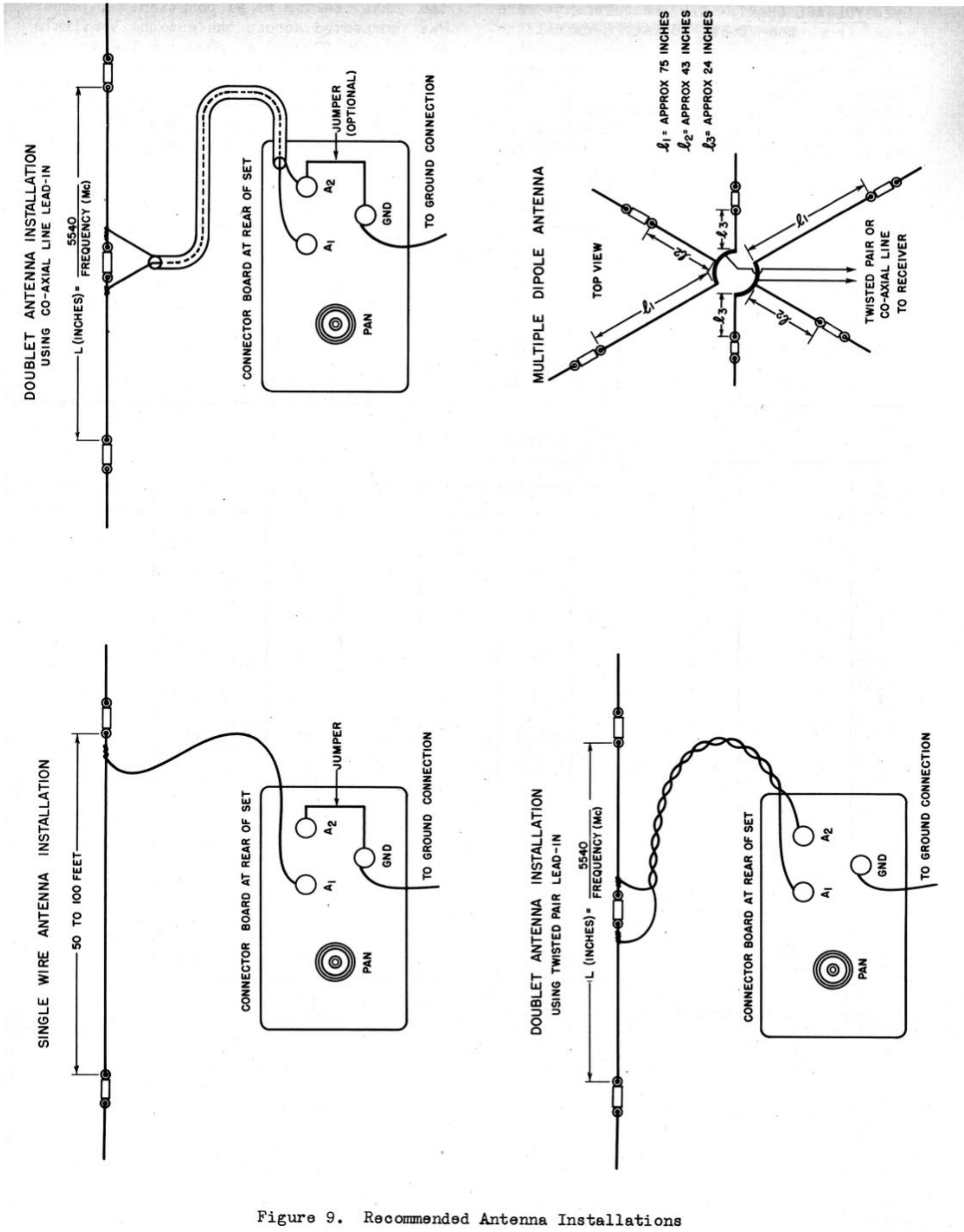

Figure 9. Recommended Antenna Installations

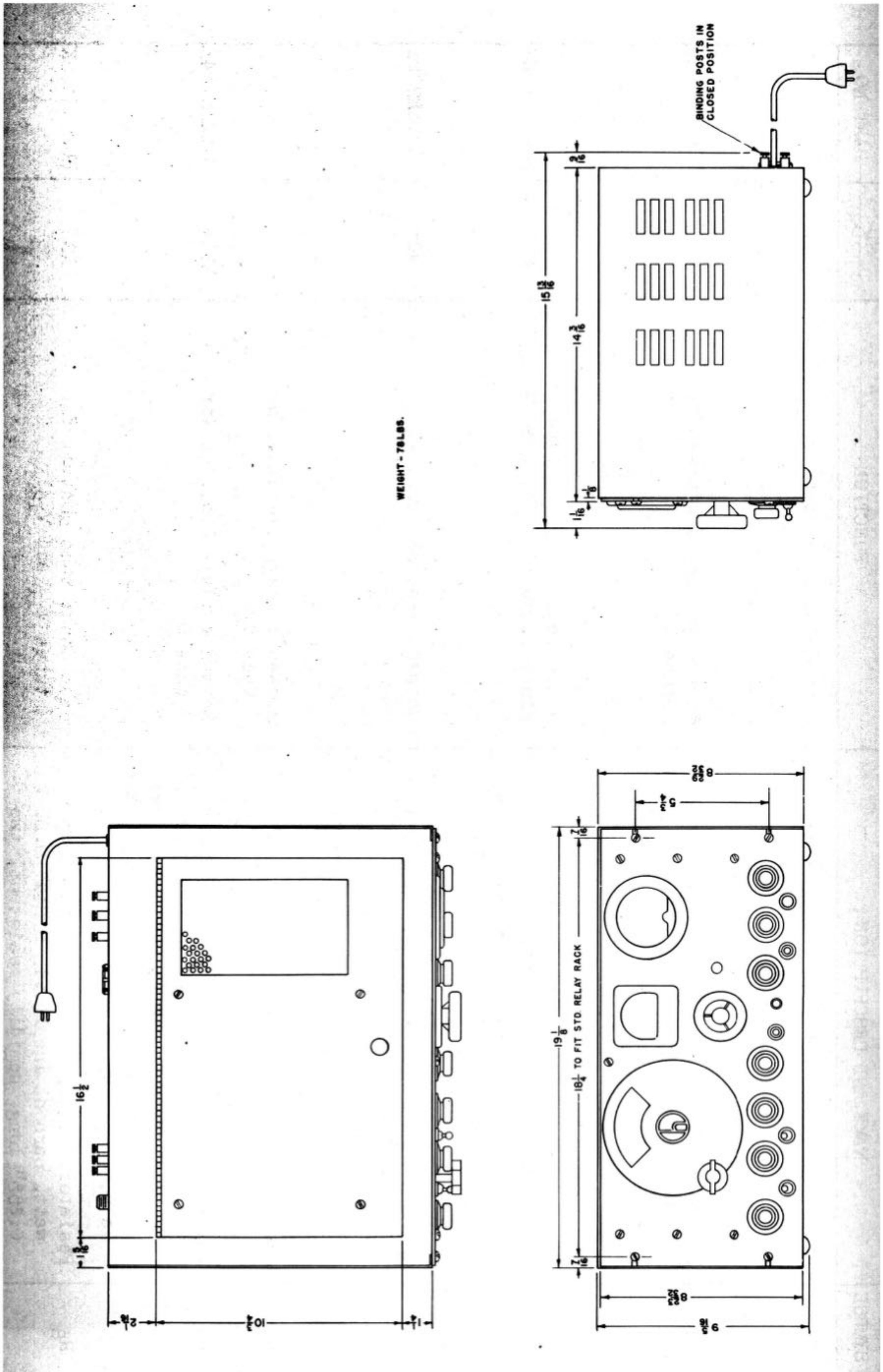

Figure 10. Radio Receiver CHL-46130-C, Outline Dimensional Sketch

F. LIST OF REPLACEABLE PARTS - MODEL RBK - ( )

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
R_1	Resistor, fixed, 270 ohms ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-½" long	Cathode bias for tube V_1	ASA	RC21AE271K
R_2	Resistor, fixed, 1000 ohms ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x C.655" long, humidity resistant, two axial #21AWG wire leads 1-½" long; same as R_3, R_6, R_{21}, R_{27}, R_{67}	Screen voltage dropping for tube V_1	ASA	RC21AE102K
R_3	Same as R_2	Plate decoupling for tube V_1	-	-
R_4	Resistor, fixed, 10,000 ohms ± 20%, 2 watt, carbon, insulated, 0.342" O.D x 1.76" long, humidity resistant, two axial #19AWG wire leads 1-½" long	Plate decoupling for tube V_1	ASA	RC41AE103M
R_5	Resistor, fixed, 2200 ohms ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-½" long; same as R_{29}, R_{71}	Cathode bias for tube V_2	ASA	RC21AE222K
R_6	Same as R_2	Screen voltage dropping for tube V_2	-	-
R_7	Resistor, fixed, 100,000 ohms ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-½" long, same as R_{33}, R_{40}, R_{41}, R_{48}, R_{51}	Screen voltage dropping for tube V_2	ASA	RC21AE104K
R_8	Resistor, fixed, 1.5 megohms ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-½" long; same as R_{69}	Base boost tone control for tubes V_{11} and V_{12}	ASA	RO21AE155K

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
R_9	Resistor, fixed, 10 ohms ± 10%, $\frac{1}{2}$ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-$\frac{1}{2}$" long; same as R_{16}, R_{26}	1st I-F band expansion on transformer T_{10}	ASA	RC21AE100K
R_{10}	Resistor, not a replaceable part. Refer to description of transformer T_{10}. Shown for reference only.	A-V-C decoupling for tube V_3	-	-
R_{11}	Resistor, variable 10,000 ohm ± 20%, #8 reversed taper, shaft 1" long x $\frac{1}{4}$" dia., 3 solder lug terminals with the variable contact located in the center and the fixed contacts 1-7/16" apart, no taps; includes a toggle action switch (SW_3) on rear which closes the circuit when the control is turned to the extreme right (clockwise)		CT type 135	25C058G
R_{12}	Resistor, fixed 1.0 megohms ± 10%, $\frac{1}{2}$ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-$\frac{1}{2}$" long	Base boost tone control for tubes V_{11} and V_{12}	ASA	RC21AE105K
R_{13}	Resistor, fixed 120 ohms ± 10%, $\frac{1}{2}$ watt, carbon, insulated 0.249" O.D. x 0.655" long, humidity resistant, two axial #21 AWG wire leads 1-$\frac{1}{2}$" long; same as R_{20}	Cathode bias for tube V_3	ASA	RC21AE121K
R_{14}	Resistor, fixed, 39,000 ohms ± 10%, $\frac{1}{2}$ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-$\frac{1}{2}$" long	Screen voltage dropping for tube V_3	ASA	RC21AE393K
R_{15}	Resistor, fixed, 330 ohms ± 10%, $\frac{1}{2}$ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-$\frac{1}{2}$" long; same as R_{22}, R_{25}, R_{62}	Plate decoupling for tube V_3	ASA	RC21AE331K

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
R_{16}	Same as R_9	2nd I-F band expansion on transformer T_{11}	-	-
R_{17}	Resistor, fixed, 33 ohms ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-½" long, same as R_{18}, R_{55}, R_{57}, R_{65}	Degeneration for tube V_3	ASA	RC21AE330K
R_{18}	Same as R_{17}	Parasitic suppressor for tube V_5	-	-
R_{19}	Resistor, not a replaceable part. Refer to description of transformer T_{11}. Shown for reference only.	A-V-C decoupling for tube V_4	-	-
R_{20}	Same as R_{13}	Cathode bias for tube V_4	-	-
R_{21}	Same as R_2	Screen voltage dropping for tube V_4	-	-
R_{22}	Same as R_{15}	Plate decoupling for tube V_4	-	-
R_{23}	Not used.			
R_{24}	Resistor, fixed, 470,000 ohms ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-½" long; same as R_{35}, R_{42}, R_{44}, R_{45}, R_{49}, R_{50}, R_{56}	Grid return for tube V_5	ASA	RC21AE474K
R_{25}	Same as R_{15}	Cathode bias for tube V_5	-	-
R_{26}	Same as R_9	Parasitic suppressor for tube V_1	-	-
R_{27}	Same as R_2	Plate decoupling for tube V_5	-	-

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
R_{28}	Resistor, fixed, 7500 ohms ± 5%, 10 watt, wire wound, coated with baked vitreous enamel, 3/8" O.D. x 1-3/4" long, resistance wire bonded to solder lug at each end to which #18AWG wire leads 1-3/8" long are attached	Screen voltage dropping for tubes V_1, V_5 and V_7	IRC type AB	24BG752D
R_{29}	Same as R_5	Screen and plate voltage dropping for tube V_7	-	-
R_{30}	Resistor, fixed, 22,000 ohms ± 10%, 2 watt, carbon, insulated, 0.342" O.D. x 1.76" long, humidity resistant, two axial #19AWG wire leads 1-½" long; same as R_{60}	Screen voltage dropping for tube V_7	ASA	RC41AE223K
R_{31}	Resistor, fixed, 47,000 ohms ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resisting, two axial #21AWG wire leads 1-½" long, same as R_{53}, R_{54}	Diode load for tube V_6	ASA	RC21AE473K
R_{32}	Resistor, fixed, 1 megohm ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-½" long	A-N-L load	ASA	RC21AE105K
R_{33}	Same as R_7	Diode load for tube V_6	-	-
R_{34}	Resistor, fixed, 220,000 ohms ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21 AWG leads 1-½" long; same as R_{36}, R_{39}	Diode load for tube V_6	ASA	RC21AE224K
R_{35}	Same as R_{24}	A-V-C load	-	-
R_{36}	Same as R_{34}	Diode load for tube V_6	-	-

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
R_{37}	Resistor, fixed 15,000 ohms ± 10%, $\frac{1}{2}$ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21 AWG wire leads 1-$\frac{1}{2}$" long	Primary load for discriminator transformer T_{14}	ASA	RC21AE153K
R_{38}	Resistor, fixed, 56,000 ohms ± 10%, $\frac{1}{2}$ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21 AWG wire leads 1-$\frac{1}{2}$" long	Grid return for tube V_7	ASA	RC21AE563K
R_{39}	Same as R_{34}	Grid return for tube V_7	-	-
R_{40}	Same as R_7	Diode load for tube V_8	-	-
R_{41}	Same as R_7	Diode load for tube V_8	-	-
R_{42}	Same as R_{24}	De-emphasis network for tube V_8	-	-
R_{43}	Resistor, variable, 1 megohm ± 20%, carbon, #6 taper, shaft 1" long x $\frac{1}{4}$" dia., 3 solder lug terminals with the variable contact located in the center and the fixed contacts 1-7/16" apart, no taps	A. F. GAIN in to tube V_9	CT type 125	25C059
R_{44}	Same as R_{24}	Plate load for tube V_9	-	-
R_{45}	Same as R_{24}	Plate load for tube V_9	-	-
R_{46}	Resistor, fixed, 4700 ohms ± 10%, $\frac{1}{2}$ watt, carbon, insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21 AWG wire leads 1-$\frac{1}{2}$" long; same as R_{47},R_{63}	Cathode bias for tube V_9	ASA	RC21AE472K
R_{47}	Same as R_{46}	Cathode bias for tube V_9	-	-
R_{48}	Same as R_7	Low tone control for tubes V_{11} and V_{12}	-	-
R_{49}	Same as R_{24}	Grid return for tube V_{11}	-	-
R_{50}	Same as R_{24}	Grid return for tube V_{12}	-	-
R_{51}	Same as R_7	A-F balancing for tube V_9	-	-

F. LIST OF REPLACEABLE PARTS -(Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
R_{52}	Resistor, fixed, 220 ohms ± 10%, 2 watt, carbon, insulated, 0.342" O.D x 1.76" long humidity resistant, two axial #19AWG leads 1-½" long; same as R_{70}	Cathode bias for tubes V_{11} and V_{12}	ASA	RC41AE221K
R_{53}	Same as R_{31}	Tone control on tubes V_{11} and V_{12}	-	-
R_{54}	Same as R_{31}	Tone control on tubes V_{11} and V_{12}	-	-
R_{55}	Same as R_{17}	Degeneration for tube V_4	-	-
R_{56}	Same as R_{24}	"S" meter current limiting	-	-
R_{57}	Same as R_{17}	"S" meter shunt	-	-
R_{58}	Resistor, variable, 1500 ohms ± 20%, wire wound, st. line taper, shaft 3/8" long x ¼" dia. slotted 1/16" x 1/16", 3 solder lug terminals with the variable contact located is the center and the fixed contacts 1-7/16" apart, no taps.	R.F. GAIN control on tubes V_3 and V_4	CT type 125	25C960
R_{59}	Resistor, fixed, 3300 ohms ± 5%, 10 watt, wire wound, coated with baked vitreous enamel 3/8" O.D. x 1-3/4" long, resistance wire bonded to solder lug at each end to which #12AWG wire leads 1-3/8" long are attached.	Voltage dropping for tube V_{10}	IRC type AB	24BG332D
R_{60}	Same as R_{30}	Plate decoupling for tube V_{14}	-	-
R_{61}	Resistor, not a replaceable part. Refer to description of inductor L_5. Shown for reference only.	Grid return for tube V_{14}	-	-

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
R_{62}	Same as R_{15}	Plate decoupling for tube V_{15}	-	-
R_{63}	Same as R_{46}	Plate decoupling for tube V_{15}	-	-
R_{64}	Resistor, fixed, 22,000 ohms ± 10%, ½ watt, carbon insulated, 0.249" O.D. x 0.655" long, humidity resistant, two axial #21AWG wire leads 1-½" long	Grid return for tube V_{15}	ASA	RC21AE223K
R_{65}	Same as R_{17}	Grid current limiter for tube V_{15}	-	-
R_{66}	Resistor, fixed, 6 ohms ± 10%, ½ watt, carbon, insulated, 0.215" O.D. x 7/16" long, two axial #20AWG wire leads 1-½" long	Grid current limiter for tube V_{15}	ER type 504	23A011
R_{67}	Same as R_2	Plate decoupling for tube V_2	-	-
R_{68}	Resistor, fixed, 8 ohms ± 10%, ½ watt, carbon, insulated, 0.215" O.D. x 7/16" long, two axial #21AWG wire leads 1-½" long	Grid current limiter for tube V_{15}	ER type 504	23A019
R_{69}	Same as R_8	High fidelity tone control on tubes V_{11} and V_{12}	-	-
R_{70}	Same as R_{52}	Parasitic suppressor for tube V_2	-	-
R_{71}	Same as R_5	Panoramic isolating resistor	-	-

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
C_1	Capacitor, variable, air dielectric, 3 section, 9 plates with double spacing between plates, min. cap, 6 mmfd., max. cap. 547 mmfd., plates are aluminum, shaft silver plated brass ½" long x 0.375" dia., with x 2B insulation on stators, front rotor section grounded to frame, other two sections insulated from frame, spade lug mtg., solder lug terminals	Secondary tuning of transformers T_1 to T_9 inclusive	OM special	48C124
C_2	Capacitor, variable, air dielectric, single section, 7 plates, min. cap. 3 mmfd., max. cap. 25 mmfd., aluminum plates, ceramic insulation, brass shaft 3/4" long x ¼" dia., mtg. base ¼" thick x 1-7/32" dia., mtg. centers 21/32", total depth of unit 7/8", solder lug terminals	Vernier tuning on secondary of transformers T_1, T_2 and T_3	BC type 22-7	48A039
C_3	Capacitor, fixed, ceramic dielectric, 5.75 mmfd. ± 0.75 mmfd., 500 V. D-C working, temp. coeff.-0.00075 mfd./ mmfd./ degree Cent. case 0.625" long x 0.225 dia., two #22AWG wire leads 1-½" long, power factor not to exceed 0.1% at 1500 KC	Secondary shunt on transformer T_1	CRL type 807-004	47A005
C_4	Capacitor, fixed, mica dielectric, 2200 mmfd. ± 10%, 500 V. D-C working, case 53/64" long x 53/64" wide x 9/32" thick, humidity resistant, two axial #18AWG wire leads 1-1/8" long; same as C_6, C_{52}, C_{61}	Cathode by-pass for tube V_1	ASA	CM30A222K

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
C_5	Capacitor, fixed, mica dielectric, 330 mmfd. ± 10%, 500 V. D-C working, case, 51/64" long x 15/32" wide x 7/32" thick, humidity resistance, two axial #20AWG wire leads 1-1/8" long; same as C_9, C_{10}, C_{45}, C_{46}, C_{47}, C_{55}	Screen by-pass for tube V_1	ASA	CM20A331K
C_6	Same as C_4	Plate return for tube V_1	-	-
C_7	Capacitor, fixed, ceramic dielectric, 10 mmfd. ± 10%, 500 V. D-C working, temp. coeff. -0.00055 mmfd/ mmfd/ deg., Cent. case 0.625" long x 0.225" dia., two #22 AWG wire leads 1-½" long power factor not to exceed 0.1% at 1500 KC	Coupling between tubes V_1 and V_2	CRL type 811-077	47A006
C_8	Capacitor, fixed, mica dielectric, 8200 mmfd. ± 10%, 500 V. D-C working, case 1-1/32" long x 41/64" wide x 11/32" thick, humidity resistant, two axial #18AWG wire leads 1-3/8" long; Same as C_{11}, C_{13}, C_{14}, C_{15}, C_{17} C_{18}, C_{19}, C_{21}, C_{22}, C_{23}, C_{30}, C_{33}, C_{34}, C_{36}, C_{37}, C_{41}, C_{62}, C_{78}	A-V-C filter	ASA	CM40A822K
C_9	Same as C_5	Coupling between oscillator tube V_{15} and mixer tube V_2	-	-
C_{10}	Same as C_5	Screen grid return for tube V_2	-	-
C_{11}	Same as C_8	Coupling between tubes V_9 and V_{11}	-	-
C_{12}	Capacitor, not a replaceable part. Refer to description of transformer T_{10}. Shown for reference only	A-V-C filter for tube V_3	-	-
C_{13}	Same as C_8	Cathode by-pass for tube V_3	-	-

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
C_{14}	Same as C_8	Screen grid by-pass for tube V_3	-	-
C_{15}	Same as C_8	Plate by-pass for tube V_3	-	-
C_{16}	Capacitor, not a replaceable part. Refer to description of transformer T_{11}.	A-V-C filter for tube V_3	-	-
C_{17}	Same as C_8	Cathode by-pass for tube V_4	-	-
C_{18}	Same as C_8	Screen grid by-pass for tube V_4	-	-
C_{19}	Same as C_8	Plate return for tube V_4	-	-
C_{20}	Capacitor, fixed, mica dielectric, 47 mmfd. ± 10%, 500 V. D-C working, case 51/64" long x 15/32" wide x 7/32" thick, humidity resistant, two axial #20AWG wire leads 1-1/8" long	Coupling between transformers T_{12} and tube V_5	ASA	CM20A470K
C_{21}	Same as C_8	Cathode by-pass for tube V_5	-	-
C_{22}	Same as C_8	Screen grid by-pass for tube V_5	-	-
C_{23}	Same as C_8	Plate return for tube V_5	-	-
C_{24}	Capacitor, fixed, mica dielectric, 56 mmfd. ± 10%, 500 V. D-C working, case 53/64" long x 53/64" wide x 9/32" thick, humidity resistant, two axial #18AWG wire leads 1-1/8" long; same as C_{26}	Diode return for tube V_6	ASA	CM20A560K

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
C_{25}	Capacitor, fixed, paper dielectric, .05 mfd. - 6 + 14%, V. D-C working, metal case 1-25/32" long x 1-1/32" deep x 13/16" high with 2 mtg. feet with 2-1/8" mtg. centers, 2 solder lug terminals insulated from case by neoprene seals and phenolic washers	A-N-L by-pass	IC type 7678	46A005
C_{26}	Same as C_{24}	Diode filter for tube V_6	-	-
C_{27}	Capacitor, fixed, mica dielectric, 100 mmfd. ± 10%, 500 V. D-C working, case 53/64" square x 9/32" thick, humidity resistant, two axial #20AWG wire leads 1-1/8" long.	A-V-C filter	ASA	CM20A101K
C_{28}	Capacitor, fixed, mica dielectric, 560 mmfd. ± 10%, 500 V. D-C working, case 53/64" long x 53/64" wide x 9/32" thick, humidity resistant, two axial #18AWG wire leads 1-1/8" long	A-V-C filter	ASA	CM30A561K
C_{29}	Capacitor, not a replaceable part. Refer to description of transformer T_{14}. Shown for reference only.	Coupling between tube V_7 and discriminator transformer T_{14}	-	-
C_{30}	Same as C_8	Plate return for tube V_7	-	-
C_{31}	Capacitor, fixed, mica dielectric, 47 mmfd. ± 10%, 500 V. D-C working, case 53/64" square x 9/32" thick, humidity resistant, two axial #20AWG wire leads 1-1/8" long	Cathode by-pass for tube V_8	ASA	CM20A470K

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
C_{32}	Capacitor, fixed, mica dielectric, 560 mmfd. ± 10%, 500 V. D-C working, case 1-1/16" long x 15/32" wide x 7/32" thick, humidity resistant, two axial #20AWG wire leads 1-1/8" long	De-emphasis for tube V_8	ASA	CM25A561K
C_{33}	Same as C_8	Coupling between tubes V_6, V_8 and V_9	-	-
C_{34}	Same as C_8	Tone control for tubes V_{11} and V_{12}	-	-
C_{35}	Capacitor, fixed, mica dielectric, 1800 mmfd. ± 10%, 500 V. D-C working, case 53/64" long x 53/64" wide x 9/32" thick, humidity resistant, two axial #18AWG wire leads 1-1/8" long	Tone control for tubes V_{11} and V_{12}	ASA	CM30A182K
C_{36}	Same as C_8	Coupling between tubes V_9 and V_{12}	-	-
C_{37}	Same as C_8	Coupling between tubes V_9 and V_{11}	-	-
C_{38}	Capacitor, fixed, paper dielectric, 20 mfd. - 10 + 75%, 25 V. D-C working, case hermetically sealed metal 2-1/8" long x 1" deep x 13/16" high, 2 mtg. feet with 2-1/8" mtg. centers, 2 solder lug terminals insulated from the case	Cathode by-pass for tubes V_{11} and V_{12}	IC type 1B113	46A011
C_{39}	Capacitor, fixed, mica dielectric, 150 mmfd. ± 10%, 500 V. D-C working, case 53/64" square x 9/32" thick, humidity resistant, two axial #18AWG wire leads 1-1/8" long	Tone control for tubes V_{11} and V_{12}	ASA	CM20A151K

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
C_{40}	Capacitor, fixed, oil-filled paper dielectric, .5 mfd. - 6 + 14%, 400 V. D-C working, case hermetically sealed metal 1-13/16" long x 1" deep x 7/8" high, 2 mtg. feet with 2-1/8" mtg. centers, 2 solder lug terminals insulated from the case; built in accordance with U.A. Army Spec. #71-516( ) and Signal Dwgs SCD-512-( ) and RL-D-6222	Power supply filter	IC type 6BA50	46A050
C_{41}	Same as C_8	Coupling between tubes V_9 and V_{12}	-	-
C_{42} C_{43} C_{44}	Capacitor, fixed, paper dielectric, triple unit; unit #1 is 4 mfd. 650 V. D-C working (C_{42}), unit #2 is 8 mfd. 650 V. D-C working (C_{43}), unit #3 is 8 mfd. 650 V. D-C working (C_{44}); hermetically sealed metal case 4-½" long x 2-½" deep x 5-7/16" high, 2 mtg. feet with 4-3/4" x 2" mtg. centers, 4 solder lug terminals (one common to all units) insulated from the case by bakelite and neoprene washers, terminals marked "8", "4", "6"	Power Supply filter	IC type 7392E	42B043
C_{45}	Same as C_5	Heater by-pass for tube V_{15}	-	-
C_{46}	Same as C_5	Heater by-pass for tube V_2	-	-
C_{47}	Same as C_5	Heater by-pass for tube V_1	-	-
C_{48}	Capacitors not a replaceable part. Part of line filter LF_1. Shown for reference only.	Power line filter in LF_1	-	-
C_{49}	Same as C_{48}	Power line filter in LF_1	-	-
C_{50}	Same as C_{48}	Power line filter in LF_1	-	-
C_{51}	Same as C_{48}	Power line filter in LF_1	-	-

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
C_{52}	Same as C_4	Plate decoupling for tube V_{14}	-	-
C_{53}	Capacitor, not a replaceable part. Refer to description of inductor L_5. Shown for reference only.			
C_{54}	Capacitor, not a replaceable part. Refer to description of inductor L_5. Shown for reference only.	B-F-O tuning on L_5	-	-
C_{55}	Same as C_5	Plate decoupling for tube V_{15}	-	-
C_{56}	Capacitor, fixed, ceramic dielectric, 50 mmfd. ± 10%, 500 V. D-C working, temp. coeff. -0.00075 mmfd./ mmfd./ deg. Cent., case 0.625" long x 0.225" dia., two #22AWG wire leads 1-½" long, power factor not to exceed 0.1% at 1500 KC	Plate blocking for tube V_{15}	CRL type 812-109	47A025
C_{57}	Capacitor, fixed, mica dielectric, 1000 mmfd. ± 10%, 500 V. D-C working, case 1-1/16" long x 15/32" wide x 7/32" thick, humidity resistant, two axial #20AWG wire leads 1-1/8" long	Grid coupling for tube V_{15}	ASA	CM25A102K
C_{58}	Capacitor, adjustable, mica dielectric, 450 mmfd. ± 10%, adjustable, bakelite mtg. insulation, 2 solder lug terminals to which are attached #18AWG tinned copper leads 1" long, both leads insulated from the frame, special L shaped mtg. frame 1" x 7/8" x 1" octagon condenser frame 3/4" dia.	Padder for transformer T_7	UE type S81A	44A050

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
C_{59}	Capacitor, not a replaceable part. Refer to description of inductor L_5. Shown for reference only.	Coupling between tubes V_{14} and V_6	-	-
C_{60}	Capacitor, variable, air dielectric, min. cap. 3.5 mmfd., max. cap. 23 mmfd., ceramic insulation, 2 mtg. holes with 21/32" mtg. centers, one solder lug terminals (rotor plates), wire slot on stator plates mtg. posts, shaft 29/32" long x $\frac{1}{4}$" dia., base 1-7/32" long x 15/16" wide, overall depth 2-3/8"	Pitch control for tube T_{14}	RC type 22-7	48A064
C_{61}	Same as C_4	Screen grid decoupling for tube V_2	-	-
C_{62}	Same as C_8	Plate decoupling for tube V_2	-	-
C_{63}	Capacitor, adjustable, mica dielectric min. cap. 3 mmfd., max. cap. 50 mmfd., ceramic insulation, compression type adjustment, unit is 3/4" long x 5/8" wide x 11/16" deep including 2 solder lug terminals	Secondary trimmer for transformer T_4	UE Special	44A049
C_{64}	Same as C_{63}	Secondary trimmer for transformer T_5	-	-
C_{65}	Same as C_{63}	Secondary trimmer for transformer T_6	-	-
C_{66}	Capacitor, adjustable, air dielectric, min. cap. 1 mmfd., max cap. 12 mmfd., bakelite insulation, 2 solder lug terminals, one at each end of the unit, provide mtg. and electrical connection, case 1-3/32" long x 0.441" dia., hex. headscrew 5/64" thick for adjustments; same as C_{67}	Secondary trimmer for transformer T_7	MN type 22-5230	48A031

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
C_{67}	Same as C_{66}	Secondary trimmer for transformer T_8	-	-
C_{68}	Capacitor, not a replaceable part. Refer to description of transformer T_{10}. Shown for reference only.	Primary trimmer for transformer T_{10}	-	-
C_{69}		Secondary trimmer for transformer T_{10}		
C_{70}	Capacitors, not a replaceable part. Refer to description of Transformer T_{11}. Shown for reference only.	Primary trimmer for transformer T_{11}	-	-
C_{71}		Secondary trimmer for transformer T_{11}		
C_{72}	Capacitor, not a replaceable part. Refer to description of transformer T_{12}. Shown for reference only.	Primary trimmer for transformer T_{12}	-	-
C_{73}		Secondary trimmer for transformer T_{12}		
C_{74}	Capacitor, not a replaceable part. Refer to description of transformer T_{14}. Shown for reference only.	Primary trimmer for transformer T_{14}	-	-
C_{75}		Secondary trimmer for transformer T_{14}		
C_{76}	Capacitors, not a replaceable part. Refer to description of transformer T_{13}. Shown for reference only.	Primary trimmer for transformer T_{13}	-	-
C_{77}		Secondary trimmer for transformer T_{13}		
C_{78}	Same as C_8	Plate decoupling for tube V_1	-	-

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
C_{79}	Capacitor, fixed, mica dielectric, 330 mmfd. ± 10%, 500 V. D-C working, case 53/64" square x 9/32" thick, humidity resistant, two axial #20AWG wire leads 1-1/8" long	A-F balance for transformer T_{15}	ASA	CM20A331K
L_1	Inductor, R-F, 75 turns of #38SCE single layer winding, inductance 15.5 microhenries ± 10%, d-c resistance 4.10 ohms ± 3%, wound on molded bakelite coil form 15/16" long x 5/32" dia., coated with Chinese red lacquer, 2 axial #20 AWG wire leads 1-½" long, air core	Plate choke for tube V_{15}	SWI type 661	53A008
L_2	Inductor, not a replaceable part. Refer to description of line filter LF_1. Shown for reference only	Power line filter choke	-	-
L_3	Same as L_2	Power line filter choke	-	-
L_4	Inductor, R-F, 42 turns of #28SCE single layer winding, inductance 4.20 microhenries ± 10%, d-c resistance 0.25 ohms ± 70%, wound on molded bakelite coil form 7/8" long x 9/32" dia., coated with Chinese blue lacquer, 2 axial #20 AWG wire leads 1-½" long, air core	Choke for heater of tube V_{15}	SWI type 662	53A009

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
L_5	Inductor, beat frequency oscillator, 15-7/8" turns of #15/44 D cel. litz single layer winding tapped 3-1/8" turns and 10-7/8 turns from start of winding, coil wound on xx bakelite tube 1-5/8" long x ½" O.D. x 0.409" I.D., tuned by adjustable iron core; unit shielded; assembly includes resistor R_{61} and capacitors C_{53}, C_{54}, and C_{59}. Resistor R_{61}, fixed, 47000 ohms ± 10%, ½ watt, carbon, insulated, 0.249" O.D. x 0.488" long, humidity resistant, two axial #21AWG wire leads 1-½" long. Capacitor C_{53}, fixed, mica dielectric, 100 mmfd. ± 10%, 500 V. D-C working, case 51/64" long x 15/32" x 7/32" thick, humidity resistant, two axial #20AWG wire leads 1-1/8" long. Capacitor C_{54}, fixed, ceramic dielectric, 200 mmfd. ± 10%, 500 V. D-C working, temp. coeff. zero mmfd./ mmfd./ deg. Cent., case 1.875" long x 0.265" dia., two #20AWG wire leads 1-½" long, power factor not to exceed 0.1% at 1500 KC. Capacitor C_{59}, fixed, bakelite dielectric, 2-½ mmfd. ± 20%, 500 V. D-C working, body 3/16" long x 5/32" dia. 2 axial #20AWG wire leads 1-½" long.	Beat frequency oscillator (B-F-O) coil	SWI type 3491	54C024

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
L_6 L_7	Inductor assembly, filter, 2 section unit; section #1 inductance 3 henries - 10 + 30% @150 milliamperes, d-c resistance 85 ohms ± 10%, connected to solder lug terminals #2 and #3 (L_6), section #2 inductance 12 henries - 10 + 20%, @90 milliamperes d-c resistance 215 ohms ± 10%, connected to solder lug terminals #1 and #2 (L_7), each section has a separate iron core, coils and cores located so no mutual coupling exists, hermetically sealed case 3-$\frac{1}{4}$" long x 2-9/16" deep x 5-$\frac{1}{2}$" high, unit mounts by 4 threaded lugs with 2-5/8" x 1-9/16" mtg. centers breakdown between core and windings 2000 V. RMS, heat rise under rated load 40 deg. Cent. or less	Power supply filter choke	ST type 10CU23	56C048
LF_1	Line filter assembly, consists of inductors L_2 and L_3, and capacitors C_{48}, C_{49}, C_{50} and C_{51}, mounted in drawn aluminum can 4-15/32" high, x 1-3/8" wide x 1-13/16" deep with solder lug terminals and mounted by 4 spade lugs. Inductors L_2 and L_3, 57 turns of #22 SCE universal winding, inductance 46 microhenries, distributed capacity 12 mmfd., coil wound on round coil form 1" long x $\frac{1}{2}$" dia., coil O.D. 1-1/16", extended leads insulated by spaghetti and taped to one end of coil form. Capacitors C_{48}, C_{49}, C_{50} and C_{51}, fixed paper dielectric, 8000 mmfd. ± 10%, 600 V. D-C working, tubular paper case 1-$\frac{1}{4}$" long x 3/8" dia., two axial #22AWG wire leads 2" long.	A-C line filter	SWI type 3492	53A056

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
T_1	Transformer, R-F, 27.8 to 47 megacycles, one primary and one secondary winding; primary 1-$\frac{1}{2}$ turns of #30SCE single layer winding with a Q at 85 of 44 megacycles with 96.8 micro-microfarads, secondary 5 turns of #22 D cel. single layer winding with a Q of 163 at 26 megacycles with 93.5 micro-microfarads; air cores, coils wound on a xx bakelite tube 1-5/8" long x $\frac{1}{2}$" O.D. x 3/8" I.D., solder lug terminals	Coupling between antenna and grid of tube V_1 for band 1	SWI type 651	51A265
T_2	Transformer, R-F, 46 to 82 megacycles, one primary and one secondary winding; primary 1-$\frac{1}{2}$ turns of #30SCE single layer winding with a Q of 67 at 45 megacycles with 105 micro-microfarads, secondary 1-7/8 turns of #18 D cel. braid single layer winding with a Q of 158 at 45 megacycles with 99 micro-microfarads; air cores, coils wound on a bakelite tube 1-5/8" long x $\frac{1}{2}$" O.D. x 3/8" I.D., solder lug terminals	Coupling between antenna and grid of tube V_1 for band 2	SWI type 654	51A268
T_3	Transformer, R-F, 82 to 143 megacycles, one primary and one secondary winding; primary 3-$\frac{1}{4}$ turns of #28 braided cel. single layer winding with a Q of 98 to 35 megacycles with 85.3 micro-microfarads, secondary 1-$\frac{1}{4}$ turns of #14 solid copper single layer winding with a Q of 185 at 70 megacycles with 95.7 micro-microfarads; air cores, coils wound on a solid form 3/4" long x $\frac{1}{4}$" dia., extended coil winding leads for terminals	Coupling between antenna and grid of tube V_1 for band 3	SWI type 657	51A271

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
T_4	Transformer, R-F, 27.8 to 47 megacycles, one primary and one secondary winding; primary 28-½ turns of #34SCE single layer winding with a Q of 89 at 5 megacycles with 94 micro-microfarads, secondary 5-½ turns of #22 D cel. braid with a Q of 161 at 25 megacycles with 95 micro-microfarads; air cores, coils wound on a bakelite tube 1-5/8" long x ½" O.D. x 3/8" I.D. solder lug terminals	Coupling between tubes V_1 and V_2 for band 1	SWI type 652	51A266
T_5	Transformer, R-F. 46 to 82 megacycles, one primary and one secondary winding; primary 11-½ turns of #34SCE single layer winding with a Q of 83 at 10 megacycles with 94 micro-microfarads (wound counter-clockwise), secondary 2-1/8 turns of #18 D cel. braid single layer winding with a Q of 173 at 45 megacycles with 85 micro-microfarads (wound clockwise); air cores, coils wound on a bakelite tube 1-5/8" long x ½" O.D. x 3/8" I.D. solder lug terminals	Coupling between tubes V_1 and V_2 for band 2	SWI type 655	51A269
T_6	Transformer, R-F, 82 to 143 megacycles, one secondary winding; primary 8-¼ turns of #36SCE single layer winding with a Q of 69 at 18 megacycles with 91 micro-micro-farads, secondary 1-3/4"turns of #14 solid copper single layer winding with a Q of 173 at 65 megacycles with 92.5 micro-microfarads; air cores, coils are wound on a solid bakelite from 7/8" long x ¼" dia., extended coil winding leads for terminals	Coupling between tubes V_1 and V_2 for band 3	SWI type 658	51A272

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
T_7	Transformer, R-F, 27.8 to 47 megacycles, one primary and two secondary windings; primary 1-3/4 turns of #34SCE with a Q of 63 at 40 megacycles with 93 micro-micro-farads, first secondary 4-1/8 turns of #22 D cel. braid with a Q of 160 at 30 megacycles with 89 micro-microfarads, second secondary 2-½ turns of #30DCE with a Q of 96 at 35 megacycles with 86 micro-micro-farads; air cores, coils are wound on a bakelite tube 1-5/8" long x ½" O.D. solder lug terminals	Tuned circuit of oscillator stage for band 1	SWI type 653	51A267
T_8	Transformer, R-F, 46 to 82 megacycles, one primary and two secondary windings; primary 3/4 turn of #30S cel. braid with a Q of 92 at 50 megacycles with 104 micro-microfarads, first secondary 2-½ turns of #18D cel. braid with a Q of 176 at 40 megacycles with 92 micro-microfarads; second secondary ½ turn of #22D cel. braid with a Q of 157 at 60 megacycles with 89 micro-microfarads; air cores, coils are wound on a bakelite tube 1-5/8" long x ½" O.D. x solder lug terminals	Tuned circuit of oscillator stage for band 2	SWI type 656	51A270
T_9	Transformer, R-F, 82 to 143 megacycles, two primary and two secondary windings; first primary 9/16 turn of #26S cel., second primary 9/16 turn of #26 plain enamel, each primary has a Q of 88 at 44 megacycles with 97.3 micro-microfarads, first secondary 1-½ turns of #16 bare copper wire with a Q of 119 at 60 megacycles with 95 micro-micro-farads, second secondary 2 turns of #28D cel. braid with a Q of 115 at 60 megacycles with 97 micro-microfarads; air core, coils are wound on xx bakelite tube 1-5/8" long x 3/8" dia., one solder lug and extended coil winding leads provide terminals	Tuned circuit of oscillator stage for band 3	SWI type 659	51A273

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
T_{10}	Transformer, intermediate-frequency, 5.25 megacycles; one primary and three secondary windings; primary $16\frac{1}{2}$ turns single layer winding on adjustable polyiron core assembly; first secondary $1\frac{1}{2}$ turns single layer winding on same form as primary; second secondary $21\frac{1}{2}$ turns single layer winding on adjustable polyiron core assembly; third secondary $2\frac{1}{2}$ turns wound on same form as second secondary; coil forms black bakelite 3-21/64" long x $\frac{1}{2}$" dia. with iron cores adjusted by brass bolts threaded 6-32 notched for screw driver, coil forms mounted at base to black bakelite board 7/32" thick x 1-25/32" long x 1-3/8" wide and at top to black bakelite board 5/32" thick x 1-17/32" long x 1-1/8" wide; additional support is had by two brass brackets 3.32" long x $\frac{1}{4}$" wide bent at each end at right angles to form a $\frac{1}{4}$" square mtg. surface with a hole 0.145" dia. extruded and tapped 6-32 NC 2; a fixed ceramic trimmer capacitor (C_{68}) 100 mmfd., 300 V. D-C working for primary winding, a fixed ceramic trimmer capacitor (C_{69}) 100 mmfd., 300 V. D-C working for secondary winding, a fixed resistor (R_{10}) 100,000 ohms, $\frac{1}{4}$ watt within the shield can, and a fixed capacitor (C_{12}) 1000 mmfd., 300 V. D-C working connected between terminal #5 and ground lug at base of unit complete the assembly; aluminum shield can 4" high x 1-7/8" long x 1-7/16" wide with 4 spade lugs centered one on each side of shield mounted 9/32"	Coupling between tubes V_2 and V_3	EW Special	50C140

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
	from base, top has a $\frac{1}{2}$" dia. hole centered and 4 holes 0.144" dia., centered by pairs at right angles to each other and sides of shield with 29/32" and 13/16" mtg. centers; solder lug terminals at base numbered 1 thru 8 and a $7\frac{1}{2}$" insulated stranded wire lead brought out through a hole in the side of the shield provide connections.			
T_{11}	Transformer, intermediate frequency, 5.25 megacycles; one primary and three secondary windings; primary $16\frac{1}{2}$ turns single layer winding on adjustable polyiron core assembly; first secondary $1\frac{1}{2}$ turns winding on same form as primary; second secondary 20 turns single layer winding on adjustable polyiron core assembly; third secondary $2\frac{1}{2}$ turns winding on same form as second secondary; coil forms black bakelite 3-21/64" long x $\frac{1}{2}$" dia. with iron cores adjusted by brass bolts threaded 6-32 notched for screw driver; coil forms mounted at base to a black bakelite board 7/32" thick x 1-25/32" long x 1-3/8" wide, and at the top to black bakelite boards 5/32" thick x 1-17/32" long x 1-1/8" wide; additional support is had by two brass brackets 3.32" long x $\frac{1}{4}$" wide bent at each end at right angles to form a $\frac{1}{4}$" square mtg. surface with a hole 0.145" dia. extruded and tapped 6-32 NC 2; a fixed ceramic trimmer capacitor (C_{70}) 100 mmfd., 300 V. D-C working for primary; a fixed ceramic trimmer (C_{71}) 100 mmfd., 300 V. D-C	Coupling between tubes V_3 and V_4	EW Special	50C141

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S PART NO.
	working for secondary; a fixed resistor (R_{19}) 100,000 ohm, $\frac{1}{4}$ watt, within the shield can, and a fixed capacitor (C_{16}) 1000 mmfd. 300 V. D-C working connected between terminal #8 and ground lug at base of unit complete the assembly; aluminum shield can 4" high x 1-7/8" long x 1-7/16" wide with 4 spade lugs centered one on each side of shield mounted 9/32" from base, top has a $\frac{1}{2}$" dia. hole centered and 4 holes 0.144" dia. centered by pairs at right angles to each other and to the sides of the shield with 29/32" and 13/16" mtg. centers; solder lug terminals at the base numbered 1 thru 8 provide connections.			
T_{12}	Transformer, intermediate-frequency, 5.24 megacycles; one primary and three secondary windings; primary 16$\frac{1}{2}$ turns single layer winding or adjustable polyiron core assembly; first secondary 1$\frac{1}{2}$ turns winding on same form as primary; second secondary 20$\frac{1}{2}$ turns single layer winding on adjustable polyiron core assembly; third secondary 2$\frac{1}{2}$ turns winding on same form as second secondary; coil forms black bakelite 3-21/64" long x $\frac{1}{2}$" dia. with iron cores adjusted by brass bolts threaded 6-32 notched for screw driver; coil forms mounted at base to a black bakelite board 7/32" thick x 1-25/32" long x 1-3/8" wide; and at the top to a black bakelite board 5/32" thick x 1-17/32" long x 1-1/8" wide; additional	Coupling between tubes V_4 and V_5	EW Special	50C142

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S PART NO.
	support is had by two brass brackets 3.32" long x $\frac{1}{4}$" wide bent at each end at right angles to form a $\frac{1}{4}$" square mtg. surface with a hole 0.145" dia. extruded and tapped 6-32 NC 2; a fixed ceramic trimmer capacitor (C_{72}) 100 mmfd., 300 V. D-C working for primary, a fixed ceramic trimmer capacitor (C_{73}) for secondary within the shield can complete the assembly; aluminum shield can 4" high x 1-7/8" long x 1-7/16" wide with 4 spade lugs centered one on each side of shield mounted 9/32" from base, top has a $\frac{1}{2}$" dia. hole centered and 4 holes 0.144" dia. centered by pairs at right angles to each other and sides of shield with 29/32" and 13/16" centers; solder lug terminals at base numbered 1 thru 8 provide connections			
T_{13}	Transformer, intermediate-frequency, 5.25 megacycles; one primary and one secondary winding; primary 17$\frac{1}{2}$ turns single layer winding on adjustable polyiron core assembly; secondary 17$\frac{1}{2}$ turns single layer winding, then spaced and continued for 7$\frac{1}{2}$ turns more for a total of 25 turns on adjustable polyiron core assembly; coil forms black bakelite 3-21/64" long x $\frac{1}{2}$" dia. with iron cores adjusted by brass bolts threaded 6-32 notched for screw driver; coil forms mounted at base to a black bakelite board 7/32" thick x 1-25/32" long x 1-3/8" wide and at top to a black bakelite board 5/32" thick x 1-17/32" long x 1-1/8" wide; additional	Coupling between tubes V_5 and V_6	EW Special	50C143

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S PART NO.
	support is had by two brass brackets 3.32" x $\frac{1}{4}$" wide bent at each end at right angles to form a $\frac{1}{4}$" square mtg. surface with a hole 0.145" dia. extruded and tapped 6-32 NC 2; 2 fixed ceramic trimmer capacitor (C_{76} and C_{77}) 100 mmfd., 300 V. D-C working for primary and secondary within the shield can complete the assembly; aluminum shield can 4" high x 1-7/8" long x 1-7/16" wide with 4 spade lugs centered one on each side of shield mounted 9/32" from base, top has a $\frac{1}{2}$" dia. hole centered and 4 holes 0.144" dia. centered by pairs at right angles to each other and sides of shield with 29-32" and 13/16" centers; solder lug terminals at base numbered 1 thru 8 provide connections.			
T_{14}	Transformer, intermediate-frequency, 5.25 megacycles one primary and one secondary winding; primary 25 turns single layer winding on adjustable polyiron core assembly; secondary 31 turns center tapped single layer winding on polyiron core assembly; coil forms black bakelite 3-21/64" long x $\frac{1}{2}$" dia. with iron cores adjusted by brass bolts threaded 6-32 notched for screw driver; coil forms mounted at base to a black bakelite board 7/32" thick x 1-25/32" long x 1-3/8" wide and at top to a black bakelite board 5/32" thick x 1-1/8" wide; additional support is had by two brass brackets 3.32" long x $\frac{1}{4}$" wide bent at each end at right angles to	Coupling between tubes V_7 and V_8	EW Special	50C144

F. LIST OF REPLACEABLE PARTS (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
	form a $\frac{1}{4}$" square mtg. surface with a hole 0.145" dia. extruded and tapped 6-32 NC 2; 2 fixed ceramic trimmer capacitors (C_{74} and C_{75}) 50 mmfd., 300 V. D-C working; and a fixed ceramic coupling capacitor (C_{29}) 25 mmfd., 300 V. D-C working, within the shield can complete the assembly; aluminum shield can 4" high x 1-7/8" long x 1-7/16" wide with 4 spade lugs centered one on each side of shield mounted 9/32" from base, top has a $\frac{1}{2}$" dia. hole centered and 4 holes 0.144" dia. centered by pairs at right angles to each other and sides of shield with 29/32" and 13/16" centers; solder lug terminals at base numbered 1 thru 8 provide connections.			
T_{15}	Transformer, A-F, one primary and 2 secondary windings, primary to match a 12,000 ohm push-pull load @35 ma. of each tube first secondary to match an A-C line of 600 ohms, center tapped, second secondary to match an A-C line of 5000 ohms, tapped at 500 ohms, iron core, case hermetically sealed, vacuum impregnated, coil and core assemblies bolted to brackets spot welded to case, solder lug terminals marked 1 through 9 at base of transformer, 4 mtg. lugs at base with 3-1/16" x 1-11/16" mtg. centers, breakdown between windings; and core 1000 R.M.S. volts.	Coupling between audio out-put tubes V_{11} and V_{12} and load	ST type 10A40	55C062

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
T_{16}	Transformer, power; primary 2 section winding connected in parallel for 115 V. A-C, and connected in series for 230 V. A-C operation, 50/60 cycles, single phase; first secondary center tapped to provide 270 V. D-C @150 milliamperes across 10 mfd. capacitor and a 2 henry 85 ohm choke with a 5 U4G rectifier tube; second secondary 6.4 V. A-C @4 amperes; third secondary 5 V. A-C @3 amperes, hermetically sealed case 4-15/16" long x 3-3/4" deep x 5-5/16" high spot welded at all joints, coil and core assemblies bolted to brackets spot welded to case, vacuum impregnated, mounted by 4 lugs at base with 3-5/8" x 2-3/8" mtg. centers; 4 terminals threaded 8-32 NC-2 connected to primary as follows; 1 and 3 to one section of primary, 2 and 4 to other section of primary; 7 solder lug terminals connected as follows; 5 and 6 connect to secondary #2 (6.4 V. A-C), 7 and 8 connect to secondary #3 (5 V. A-C), 9 and 11 connect to secondary #1 (540 V. D-C), 10 is center tap for secondary #1 and ground for transformer case and core, iron core; breakdown voltages as follows between windings and core and case; primary - 1500 V. RMS, secondary #1-2500 V- RMS, secondary #2-1500 V. RMS. secondary #3-2500 V. RMS.	A-C power transformer	ST type 10P51	52C084

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
SW_1	Switch, rotary selector, 3 position single pole, 7 section, non-shorting type contacts, ceramic wafers oval shaped 1-7/8" x 1-5/8" x 5/32" thick, 2 holes 0.144" dia. x 1-9/16" mtg. centers mount wafers individually, entire shaft 11-3/4" long x 0.249" dia. squared on two opposite sides to 0.185" dia., with index plate 1-7/8" x 1-3/8" x 0.038" thick and having two 0.1875" stainless steel balls; 3 stops, each 60 degrees apart and position 1 symetrical to mtg. holes, minimum torque not less than 70 inch ounces	BAND SWITCH	OM type HC	60B181
SW_2	Switch, toggle, SPST, rated 3 amperes @250V., case 1" long threaded 15/32-32, solder lug contacts; same SW_4, SW_5,	B.F.O. ON/OFF	CH type 8280	60A175
SW_3	Switch, toggle action, SPST, part of resistor R_{58}	"S" meter switch		
SW_4	Same as SW_2	A.V.C ON/OFF	-	-
SW_5	Same as SW_2	REC./SEND	-	-
SW_6	Switch, toggle, DPST, rated 3 amperes @250V., case 1-3/32" long x 17/32" wide x 9/16", deep, mounted by bushing 15/32" long threaded 15/32-32, solder lug contact	A.N.L. ON/OFF	CH type 8360 KZ	60A123
SW_{7A} SW_{7B} SW_{7C} SW_{7D}	Switch, rotary selector, 3 section 3 position, 2 shields separate section #1 from rest of the assembly, a single pole A-C power switch is included at rear and is open at position #1 and closed in positions #2 and #3 all metal parts silver plated brass except for stainless steel index spring and ball, vacuum wax impregnated phenolic wafers, shorting type rotor contacts, frame 11" long including special mtg. bracket at rear of assembly, front of assembly mounts by 3/8-32 bushing ½" long, shaft 1" long x ¼" dia.	SELECTIVITY control and A.C ON/OFF	OM type H	60B178

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
SW_{8A} SW_{8B} SW_{8C} SW_{8D}	Switch, rotary selector, single section 2 position, all metal parts silver plated brass except for stainless steel index spring and ball, vacuum wax impregnated phenolic wafer, non shorting teeth at contacts 5 and 8, frame 5/16" long, mounts by 3/8-32 bushing ½" long, shaft 1" long x ¼" dia.	A.M./F.M. selection	OM type QH	60A177
SW_9	Switch, rotary selector, single section 4 position, all metal parts phosphor bronze, vacuum wax impregnated bakelite wafer, shorting type rotor contact, over all dimensions excluding solder lug terminals 1-½" x 1-5/32", mounts by 3/8-32 bushing ½" long, shaft ¼" dia.	TONE switching	CRL type BFX7360X	60B176
SW_{10}	Switch, toggle, DPDT, rated 3 amperes @250 V., 1-3/4" long x 21/32" wide x 5/8" deep, mounted by bushing 13/32" long threaded 15/32-32, solder lug contacts	115/230 volt A-C change over	HH	60A090
J_1	Jack, phone, switching-one make one break, steel frame, silver contacts, rubber and bakelite insulation, mounted by 3/8-32 brass bushing ½" long, frame dimensions 1-19/32" x 27/32" x 3/4", solder lug contacts, 1" from front of bushing to tip contact	600 ohm ungrounded phone output	U type ST-687 modified	36B008

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
SO_1	Socket, octal, female, high dielectric mica filled bakelite body 1-7/64" dia. x 31/64" thick, silver plated phosphor bronze solder lugs, molded on steel mtg. plate 1-9/32" wide x 0.031 thick having 2 mtg. holes of 5/32" dia. x 1-½" mtg. centers, pins are numbered on back of socket clockwise from locating pin	D-C power input and remote stand-by connection	AP type MIP8TM	6A200
SO_2	Socket, not a replaceable part. Refer to description of Terminal Strip TS_1. Shown for reference only	Panoramic Adapter Socket	-	-
PL_1	Plug and line cord assembly, 2 conductor #18 type S-J all rubber covered cord 6 feet long with a spring type (allied type 371) molded on plug at one end and stripped and tinned for 5/8" at the other end	A-C power line connection	B type 1750	87A125
PL_2	Plug, octal, male bakelite body 1-¼" O.D. x 7/16" thick, metal contact prongs 7/16" long, supplied with insulated jumpers between contacts 3 and 4, and contacts 6 and 7	Shorting plug for A-C operating and remote stand-by connection	AP type CP-8	35A003
FS_1	Fuse, 3 amperes @250 V., type 4AG, glass enclosed, 1-¼" long x 9/32" dia., caps nickle plated copper alloy, carries 110% of rated current, vibration factor is 200	Power transformer primary protection	LF type 1093	39A318

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
TS_1	Output terminal board assembly, consists of vacuum impregnated natural linen bakelite mtg. board $3\frac{1}{4}$" long x 2" wide x 1/8" thick with 4 mtg. holes 0.144" dia. and having 2-7/8" x 1-5/8" mtg. centers, marked "600 OHM CENTER TAP - GND. and OHM, 5000 OHM-GND", six brass knurled thumb screw binding posts provide electrical connection	500 ohm, 5000 ohm and center tap of 600 ohm output connections	H Special	41X2606
TS_2	Antenna input and Panoramic output terminal board assembly, consists of vacuum impregnated natural paper bakelite mtg. board 4-5/16" long x $2\frac{1}{2}$" wide x 3/16" thick with 4 mtg. holes 0.144" dia. and having 3-13/16" x 2" mtg. centers marked A_1, A_2, GND. and PAN.; 3 brass knurled thumb screw binding posts and 1 Amphenol type 83-IR co-ax cable connector provide electrical connections	Ant. and Panoramic Adapter Connections	H Special	41X2609
M_1	Meter, "S" meter, calibrated 160-0-40 microamperes, body 2.82" dia. x 1.66" deep, round flush type mtg. plate 3.5 O.D., with 3 mtg. holes 120 degrees apart, includes 2 terminals $\frac{1}{4}$-28-WF2 which project 0.69" from rear of meter	A.M./F.M. Tuning meter	MCM type 3001	82A065
LM_1	Lamp, bayonet base 6 to 8 volts @250 milliamperes, glass bulb	Main tuning dial lamp	GE type 44	39A003
LM_2	Same as LM_1	Vernier tuning dial lamp	-	-
V_1	Tube, acorn pentode	R-F amplifier	RCA type 956	90X956

F. LIST OF REPLACEABLE PARTS - (Cont'd.)

REF. SYMBOL	NAME AND DESCRIPTION	FUNCTION	MFG. CODE AND TYPE NO.	CONTR'S. PART NO.
V_2	Tube, acorn pentode	Converter-mixer	RCA type 954	90X954
V_3	Tube, R-F pentode; same as V_7	1st I-F amplifier	RCA type 6AC7	90X6AC7
V_4	Tube, R-F pentode	2nd I-F amplifier	RCA type 6AB7	90X6AB7
V_5	Tube, R-F pentode	3rd I-F amplifier	RCA type 6SK7	90X6SK7
V_6	Tube, double diode; same as V_8	A-M second detector	RCA type 6H6	90X6H6
V_7	Same as V_3	F-M limiter	-	-
V_8	Same as V_6	F-M discriminator	-	-
V_9	Tube, duo-triode	Audio voltage amplifier	RCA type 6SL7GT	90X6SL7GT
V_{10}	Tube, gas filled diode	Voltage regulator	RCA type VR-150/30	90XVR-150/30
V_{11}	Tube, beam power amplifier; same as V_{12}	Audio power amplifier	RCA type 6V6GT/G	90X6V6GT/G
V_{12}	Same as V_{11}	Audio power amplifier	-	-
V_{13}	Tube, full wave diode	Plate supply rectifier	RCA type 5U4G	90X5U4G
V_{14}	Tube, triode amplifier	Beat frequency oscillator	RCA type 6J5	90X6U5
V_{15}	Tube, acorn triode	High frequency oscillator	RCA type 955	90X955

G. INDEX TO PARTS MANUFACTURED

SYMBOL	MANUFACTURED
AP	American Phenolic Corp. Chicago, Illinois
ASA	Any manufacturer meeting the applicable American Standards Association specifications.
B	Belden Mfg. Co. Chicago, Illinois
BC	Brenner Chemical Co. Chicago, Illinois
CH	Cutler-Hammer Milwaukee, Wis.
CRL	Centralab Milwaukee, Wis.
CT	Chicago Telephone & Supply Co. Elkhart, Indiana
ER	Erie Resistor Erie, Pa.
EW	Electronic Winding Corp. Chicago, Illinois
GE	General Electric Co. Schenectady, N.Y.
H	The Hallicrafters Co. Chicago, Illinois
HH	Hart & Hegeman Electric Co. Hartford, Conn.

SYMBOL	MANUFACTURED
IC	Industrial Condenser Chicago, Illinois
IRC	International Resistance Co. Philadelphia, Pa.
LF	Littlefuse, Inc. Chicago, Illinois
MCM	McClintock Meter Co. Minneapolis, Minn.
MN	Meissner Manufacturing Co. Mt. Carmel, Illinois
OM	Oak Manufacturing Co. Chicago, Illinois
RC	Radio Condenser Corp. Chicago, Illinois
RCA	RCA Manufacturing Co., Inc., Camden, N.J.
ST	Standard Transformer Corp. Chicago, Illinois
SWI	S.W. Inductor Co. Chicago, Illinois
U	Utah Products Company Chicago, Illinois
UE	Underwood Electric Co. Chicago, Illinois