

RCA VICTOR MODEL T 6-9

Six-Tube, Two-Band, A-C, Superheterodyne, Table Receiver

SERVICE NOTES

Electrical Specifications

FREQUENCY RANGES

Broadcast Band (A)540-1850 kc.
 Shortwave Band (B)1850-6900 kc.

ALIGNMENT FREQUENCIES

Broadcast Band (A)600 kc. and 1720 kc.
 Shortwave Band (B)No Adjustments Required

RADIOTRON COMPLEMENT

(1) RCA-6A8First Detector-Oscillator	(4) RCA-6F5Audio Voltage Amplifier
(2) RCA-6K7Intermediate Amplifier	(5) RCA-6F6Audio Power Amplifier
(3) RCA-6H6Second Detector-A.V.C.	(6) RCA-80Full Wave Rectifier

VOLTAGE AND FREQUENCY

Rating A 105-125 volts, 50-60 cycles
 Rating B 105-125 volts, 25-60 cycles
 Rating C 100-130/140-160/195-250 volts, 40-60 cycles

Power Consumption90 watts

Intermediate Frequency.....460 kc.

POWER OUTPUT

Undistorted2.0 watts
 Maximum4.5 watts

LOUDSPEAKER

Type8 inch, Electrodynamic
 Voice Coil Impedance.....2.25 ohms at 400 cycles

Mechanical Specifications

Height.....17¹/₄ inches
 Width.....13³/₈ inches
 Depth 8¹/₄ inches
 Weight (Net).....19¹/₂ pounds
 Weight (Shipping).....24 pounds
 Chassis Base Size.....12 inches x 7 inches x 2¹/₂ inches
 Controls.....(1) H-F Tone Control-Power Switch, (2) Tuning, (3) Volume Control, (4) Range Selector
 Tuning Ratio.....6 to 1

General Features

This table-type receiver has many distinctive features. It employs the new RCA All-Metal tubes operating in a Superheterodyne circuit. The tuning ranges cover the standard broadcast band and extend above it to include the 49 meter short wave broadcast band. The short wave portion of this extensive range also includes the channels assigned for police, amateur and aviation communication.

A high-ratio gang condenser drive is provided to facilitate accurate tuning. This feature is especially valuable for short wave reception. The dial is clearly

graduated and uniformly illuminated.

Automatic volume control is incorporated in the circuit to compensate for fluctuations of signal strength due to fading.

High-frequency tone control enables the listener to reduce unavoidable noises and static.

An adjustable series wave-trap in parallel with the antenna input serves to suppress code interference which may be encountered in certain localities from intermediate frequency radio telegraph signals.

Circuit Arrangement

The first detector and oscillator functions are accomplished in a single tube, an RCA-6A8. The input of this tube is coupled to the antenna through a tuned trans-

former. A shunt (series tuned) wave-trap is connected across the primary of this transformer to prevent signals of intermediate frequency (460 kc) from being intro-

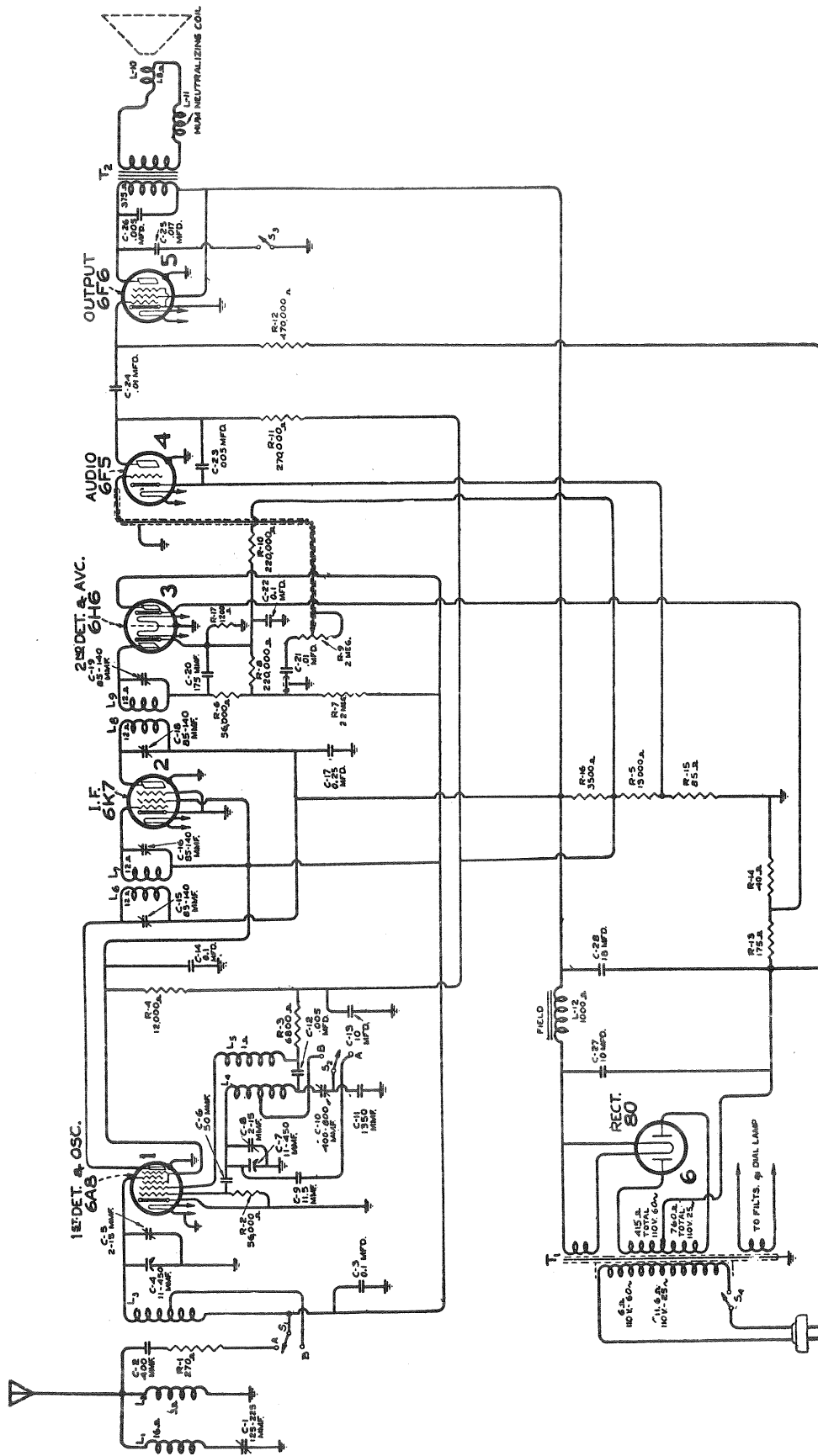


Figure 1—Schematic Circuit Diagram

On some instruments, R-10, R-17 and C-22 are omitted and the RCA-6H6 first Cathode is directly grounded.

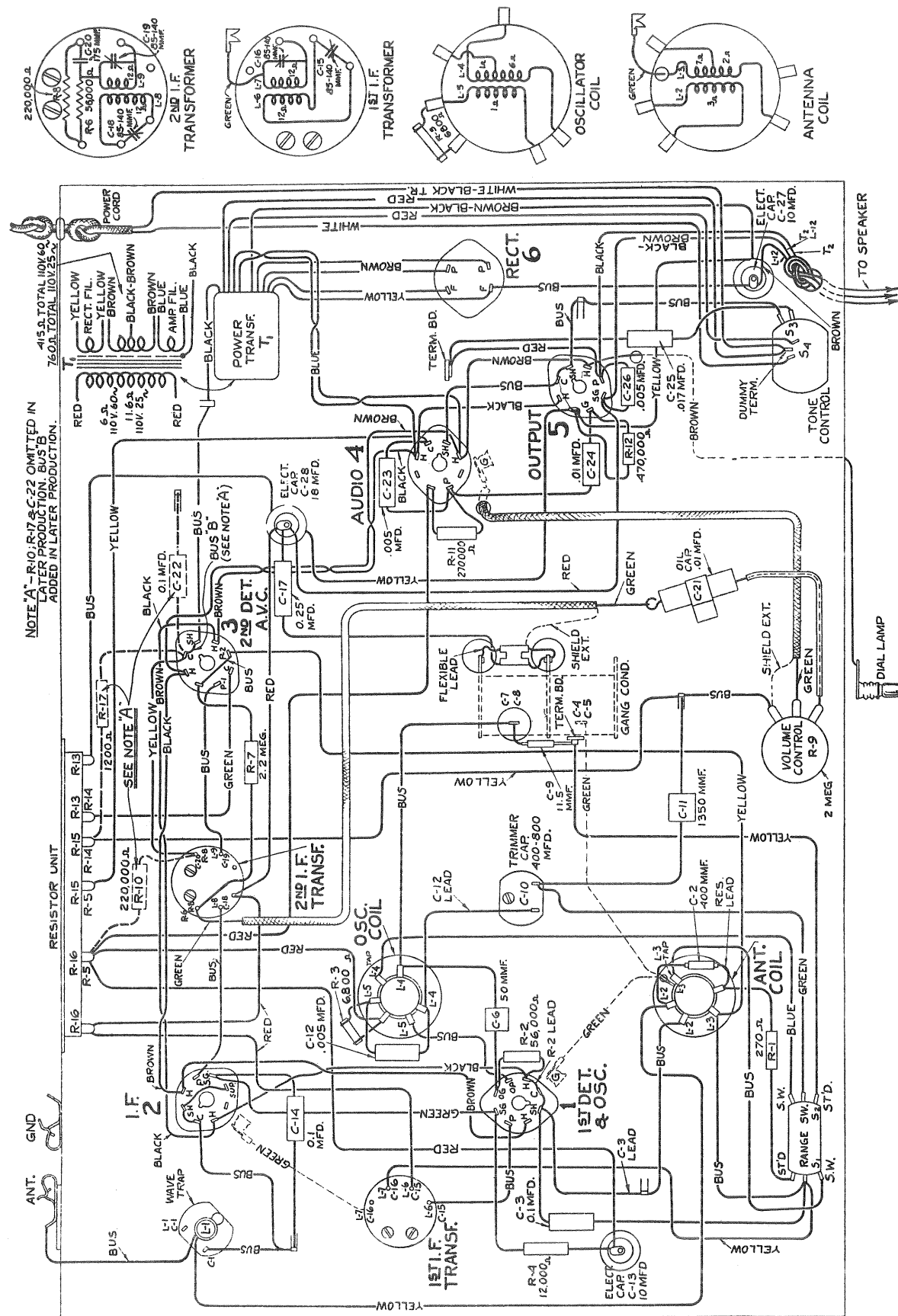


Figure 2—Chassis Wiring Diagram

duced into the first stage as interference. The two-section gang condenser which tunes the antenna transformer secondary and the heterodyne oscillator coil has adjustable trimmers for use in obtaining exact alignment. Each of these coils is tapped so that the range switch increases the range of tuning by decreasing the amount of inductance.

The intermediate frequency stage is coupled to the RCA-6A8 and to the RCA-6H6 second detector by means of tuned transformers. These transformers are adjusted to resonance at 460 kc. by means of trimmers.

The modulated signal as obtained from the output of the i-f system is detected by the RCA-6H6 double diode tube. Audio frequency secured by this process is passed on to the a-f system for amplification and final reproduction. The d-c voltage, which results from detection of the signal, is used for automatic volume control. This voltage, which develops across resistor R-8, is applied as automatic control grid bias to the first detector and i-f tubes through a suitable resistance filter. The second diode of the RCA-6H6 is used to supply residual bias for the controlled tubes under conditions of little or no signal. This auxiliary diode, under such conditions, draws current which flows through resistors R-7, R-8 and R-10, thereby maintaining the desired minimum operating bias on such tubes. On application of signal energy above a certain level, however, the auxiliary bias diode ceases to draw current and the a.v.c. diode takes over the biasing function. The cathode and anode of the signal-a.v.c. diode have positive potential in respect to chassis-ground and cathodes of the a.v.c.-controlled tubes when no signal is being received.

Manual volume control is by means of an acoustically

tapered potentiometer connected as a variable coupling element between the output of the second detector and the first audio control grid. After amplification by the RCA-6F5, the audio signal is transmitted by resistance-capacitance coupling to the input of the RCA-6F6 power output stage which in turn is transformer-coupled to the dynamic speaker. High-frequency tone control is provided by means of a shunt capacitor across the plate circuit of the output tube, which may be cut in or out of the circuit with a control switch (S3).

The power supply system consists of a RCA-80 rectifier tube which is supplied from an efficiently designed power transformer and which works into a suitable filter. The various potentials required for the plate, screen, control grid, and cathode circuits are obtained from the output of the filter on a resistance-divider system. The electrodynamic loudspeaker field coil is used as a filter reactor.

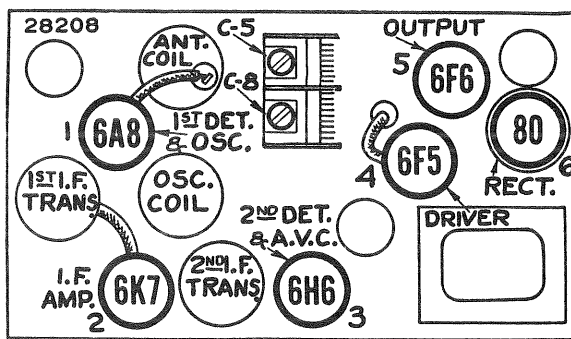


Figure 3—Radiotron and Coil Locations

SERVICE DATA

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation when such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R-3, L-2, C-1, etc., are provided for reference between the illustrations and the Replacement Parts List. The coils, reactors, and transformer windings are rated in terms of their d-c resistances only, and when the resistance is less than one ohm, no rating is given.

Alignment Procedure

There are three alignment trimmers provided in the antenna transformer and oscillator coil tuned circuits and four are used in the i-f system. All of these have been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions of climate or have been altered for service purposes. Loss of sensitivity, improper tone quality and poor selectivity are the usual indications of improper alignment.

The correct performance of this receiver can only be obtained when the aligning has been done with adequate and reliable apparatus. The manufacturer of this receiver has available for sale through its distributors and dealers, a complete assortment of such service equipment as may be needed for the alignment operation. These instruments are illustrated and described on a separate

page of this book.

An oscillator (signal generator), such as the RCA Stock No. 9595, is required as a source of the specified alignment frequencies. Visual indication of receiver output during the adjustment is necessary and should be accomplished by the use of an indicator such as the RCA Victor Stock No. 4317 Neon Output Indicator.

The following method of procedure should be followed in adjusting the various trimmer capacitors:

I-F Trimmer Adjustment

The four trimmers of the two i-f transformers are located as shown by Figure 4. Each trimmer must be aligned to a basic frequency of 460 kc. To do this, attach the output indicator across the voice coil or across the output transformer primary. Connect the output of the test oscillator between the control grid of the RCA-6A8 and chassis-ground. Tune the oscillator to 460 kc. Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point within its range where no interference is encountered either from local broadcast stations or from the heterodyne oscillator. Increase the output of the test oscillator until a slight indication is present on the output indicator. Then, adjust the two trimmers of the second i-f transformer to produce maximum (peak) indicated receiver output. Then, adjust the two trimmers of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. During these

adjustments, regulate the test oscillator output so that the indication is always as low as possible. By doing so, broadness of tuning due to a.v.c. will be avoided. It is advisable to repeat the adjustment of all i-f trimmers to assure that the interaction between them has not disturbed the original adjustment.

R-F Trimmer Adjustment

Calibrate the tuning dial by setting pointer to horizontal line at low frequency end of broadcast band scale while variable condenser is at maximum capacity.

The output indicator should be left connected to the output system. Attach the output of the test oscillator between the antenna and ground terminals of the receiver input. Adjust the oscillator to 1720 kc. and set the receiver tuning control to a dial reading of 1720 kc. Leave the volume control of the receiver at its maximum position. Make sure that the range selector is at its broadcast position. Regulate the output of the test oscillator until a slight indication is perceptible at the receiver output. Then adjust the two trimmers of the oscillator and antenna transformer coils (mounted on the variable condenser) so that each produces maximum (peak) receiver output. After this maximum has been accurately obtained, shift the test oscillator to 600 kc. Tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then adjust the receiver oscillator series trimmer, simul-

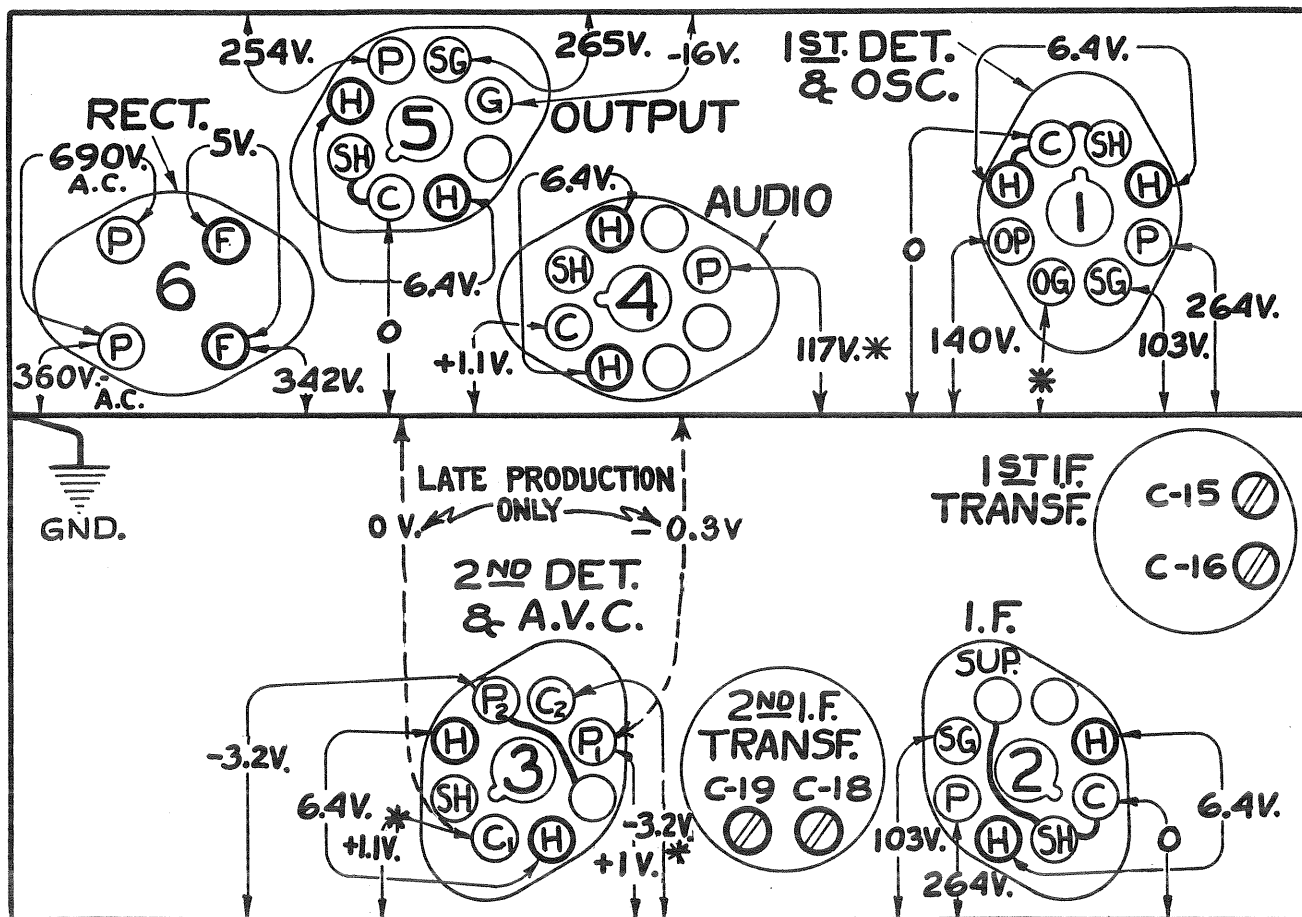
taneously rocking the tuning control backward and forward through the signal until maximum receiver output results from these combined operations. The adjustment at 1720 kc. should then be repeated to correct for any change which may have been caused by the oscillator series trimmer adjustment.

Radiotron Socket Voltages

Voltage values indicated at the Radiotron socket contacts on Figure 4 form a reference basis for test of the receiver. It is to be noted that all voltages are given with respect to chassis-ground, excepting those appearing across the heaters (H-H). The values shown are obtainable when the receiver is in normal operating condition with all tubes intact. They do not take into account inaccuracy caused by the resistance of the voltmeter used for the tests, the lower the voltmeter resistance, the lower the degree of accuracy. Allowance must, therefore, be made, dependent upon the type of test instrument used, for the loading effect of the voltmeter on the circuit.

Wave-Trap Adjustment

With the receiver in operation using its normal antenna, tune station selector to the point at which the intermediate frequency interference is most intense. Then adjust the wave trap trimmer to the point which causes maximum suppression of the interference.



(*) CANNOT BE MEASURED WITH ORDINARY VOLTMETER

Figure 4—Radiotron Socket Voltages
Measured at 115 volts, 60 cycle supply—No signal being received

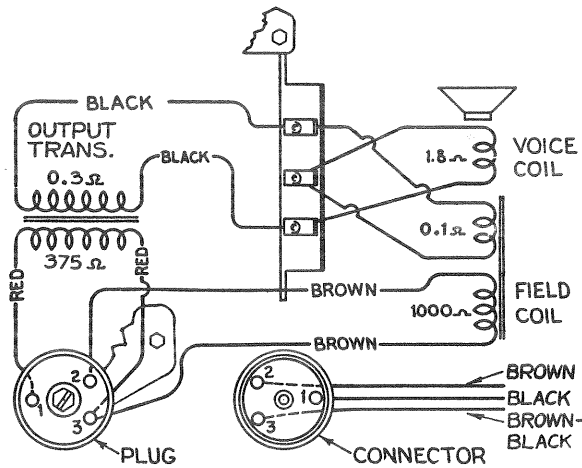
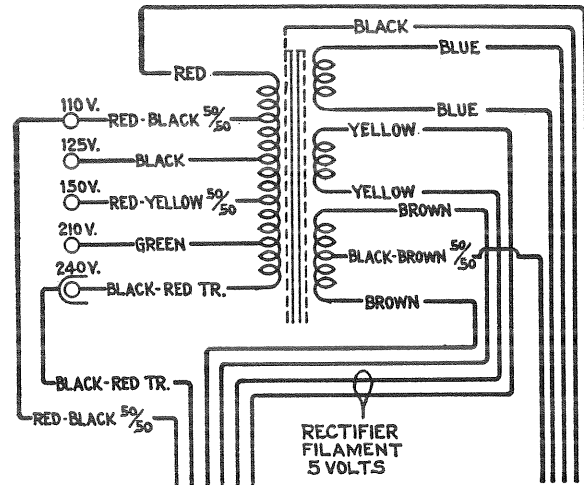


Figure 5—Loudspeaker Wiring



Primary Resistance—17.3 ohms, Total
Secondary Resistance—408 ohms, Total

Figure 6—Universal Transformer

T6-9 REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	LIST PRICE	STOCK No.	DESCRIPTION	LIST PRICE
RECEIVER ASSEMBLIES					
11468	Bracket—Dial mounting bracket	\$0.14	11626	Resistor—2.2 Megohms—Carbon type— $\frac{1}{4}$ watt (R7)—Package of 5	1.00
11465	Capacitor—Adjustable capacitor—(C10)	.48	11464	Shield—Antenna or oscillator coil shield	.25
11450	Capacitor—11.5 Mmfd. (C9)	.14	11390	Shield—Intermediate frequency transformer shield	.25
11289	Capacitor—50 Mmfd. (C6)	.26	11383	Shield—Radiotron shield	.20
4297	Capacitor—400 Mmfd. (C2)	.30	11461	Switch—Range switch (S1, S2)	.56
11449	Capacitor—1350 Mmfd. (C11)	.26	5238	Terminal—Antenna terminal board assembly— with clip, insulation strip and rivets	.14
4868	Capacitor—0.005 Mfd. (C12, C23, C26)	.20	11460	Tone Control—Tone control and power switch (S3, S4)	.95
4858	Capacitor—0.01 Mfd. (C24)	.25	11388	Transformer—First intermediate frequency transformer (L6, L7, C15, C16)	1.90
4624	Capacitor—0.01 Mfd. (C21)	.54	11389	Transformer—Second intermediate frequency transformer (L8, L9, C18, C19, C20, R6, R8)	3.02
11451	Capacitor—0.017 Mfd. (C25)	.18	11458	Transformer—Power transformer—105-125 volts—50-60 cycles (T1)	4.85
11414	Capacitor—0.1 Mfd. (C14)	.20	11585	Transformer—Power transformer—105-125 volts—25-50 cycles	7.00
4841	Capacitor—0.1 Mfd. (C3, C22*)	.22	11584	Transformer—Power transformer—100-130/140-160/195-250 volts—40-60 cycles	5.05
5170	Capacitor—0.25 Mfd. (C17)	.25	11391	Trap—Wave trap (L1, C1)	1.22
11387	Capacitor—10 Mfd. (C13)	.86	11459	Volume Control (R9)	.85
11240	Capacitor—10 Mfd. (C27)	1.08	REPRODUCER ASSEMBLIES		
5212	Capacitor—18 Mfd. (C28)	1.16	11232	Board—Terminal board assembly with two lead wire clips	.18
11462	Coil—Antenna coil (L2, L3)	1.85	11231	Bolt—Yoke and core assembly bolt and nut	.16
11463	Coil—Oscillator coil (L4, L5)	1.65	8060	Bracket—Output transformer mounting bracket	.14
11457	Condenser—Two-gang variable tuning condenser—complete with mounting bushing assembly (C4, C5, C7, C8)	3.46	11257	Clamp—Cone center suspension clamping nut and screw assembly—Package of 5	.25
11583	Dial—Dial scale	.40	11470	Coil—Field coil (L12)	2.16
12042	Drive—Vernier drive for tuning condenser	.35	11469	Coil—Neutralizing coil (L11)	.20
11467	Indicator—Station selector indicator pointer	.10	11235	Cone—Reproducer cone (L10)—Package of 5	3.50
5226	Lamp—Dial lamp—Package of 5	.70	5118	Connector—Three-contact male connector for reproducer	.25
11466	Resistor—Voltage divider resistor—comprising one 3,500 ohm, one 13,000 ohm, one 85 ohm, one 40 ohm and one 175 ohm sections (R5, R13, R14, R15, R16)	.95	5119	Connector—Three-contact female connector for reproducer cable	.25
6135	Resistor—270 Ohms—Carbon type— $\frac{1}{4}$ watt (R1)—Package of 5	1.00	9621	Reproducer—Complete	6.85
11283	Resistor—1200 Ohms—Carbon type— $\frac{1}{4}$ watt (R17*)—Package of 5	1.00	11253	Transformer—Output transformer (T2)	1.56
11454	Resistor—6800 Ohms—Carbon type— $\frac{1}{4}$ watt (R3)—Package of 5	1.00	11230	Washer—Binders board "C" washer—Used to hold field coil assembly—Package of 5	.18
3066	Resistor—12,000 Ohms—Carbon type—1 watt (R4)—Package of 5	1.10			
5029	Resistor—56,000 Ohms—Carbon type— $\frac{1}{4}$ watt (R2)—Package of 5	1.00			
11453	Resistor—270,000 Ohms—Carbon type— $\frac{1}{10}$ watt (R11)—Package of 5	.75			
11452	Resistor—470,000 Ohms—Carbon type— $\frac{1}{10}$ watt (R12)—Package of 5	.75			
5158	Resistor—220,000 Ohms—Carbon type— $\frac{1}{4}$ watt (R10*)—Package of 5	1.00			

* C-22, R-10 and R-17 used in some models