

RCA VICTOR MODELS T 6-7 and C 6-8

Six-Tube, Three-Band, A-C, D-C, Superheterodyne Receivers

TECHNICAL INFORMATION

Electrical Specifications

RADIOTRON COMPLEMENT

- | | |
|---|---|
| (1) RCA-6A8.....First Detector-Oscillator | (4) RCA-6J7.....Audio Voltage Amplifier |
| (2) RCA-6K7.....Intermediate Amplifier | (5) RCA-25A6.....Audio Power Amplifier |
| (3) RCA-6H6.....Second Detector—A.V.C. | (6) RCA-25Z6.....Half-Wave Rectifier |

FREQUENCY RANGES

Band A.....	540- 1,600 kc.
Band B.....	1,600- 5,500 kc.
Band C.....	5,500-18,000 kc.

ALIGNMENT FREQUENCIES

Band A.....	600 kc. (osc.), 1,400 kc. (osc., ant.)
Band B.....	None required
Band C.....	18,000 kc. (osc., ant.)

Intermediate Frequency.....**460 kc.**

POWER SUPPLY RATINGS

Rating A	{ 105-125 Volts, 50-100 Cycles, 60 Watts 105-125 Volts, D-C 50 Watts
Rating B	{ 105-125 Volts, 25-100 Cycles, 80 Watts 105-125 Volts, D-C 50 Watts

POWER OUTPUT (125 V. Line)

Undistorted ..0.5 Watt (A-C)....0.4 Watt (D-C)
Maximum1.2 Watts (A-C)....1.0 Watt (A-C)

LOUDSPEAKER

Type	Electrodynamic
Voice Coil Impedance.....	2.25 Ohms—400 Cycles

Mechanical Specifications

Chassis Base Dimensions	12 inches x 7 inches x 2 $\frac{1}{2}$ inches
Tuning Drive Ratio	10-to-1 and 50-to-1

MODEL T 6-7

Height	19 $\frac{1}{8}$ inches
Width	13 $\frac{5}{8}$ inches
Depth	8 $\frac{1}{2}$ inches
Weight (Net)	17 pounds
Weight (Shipping)	22 pounds

MODEL C 6-8

Height	37 $\frac{1}{4}$ inches
Width	23 $\frac{1}{2}$ inches
Depth	11 inches
Weight (Net)	39 $\frac{1}{2}$ pounds
Weight (Shipping)	54 pounds

General Features

These two models each employ the same six-tube chassis. They have the new metallic tubes. The tuning range is from 540 to 18,000 kc. The coverage includes domestic broadcast, police, aircraft and amateur services, and also the important foreign short-wave broadcast bands at 49, 31, 25, 19 and 16 meters. Chassis features include automatic volume control, high-frequency tone control, antenna wave trap and audio tone compensation. The table model (T 6-7) uses an 8-inch dynamic speaker, and the

console model (C 6-8) uses an improved 12-inch dynamic speaker. The tuning dial is an illuminated semi-airplane type. Positions of the range selector knob are marked on the control panel to show which tuning band is in use. The tuning control is of the dual-ratio type, which permits rough tuning through a 10-1 drive ratio and vernier tuning through a 50-1 drive ratio. The latter is especially advantageous for accurate tuning of the short-wave stations.

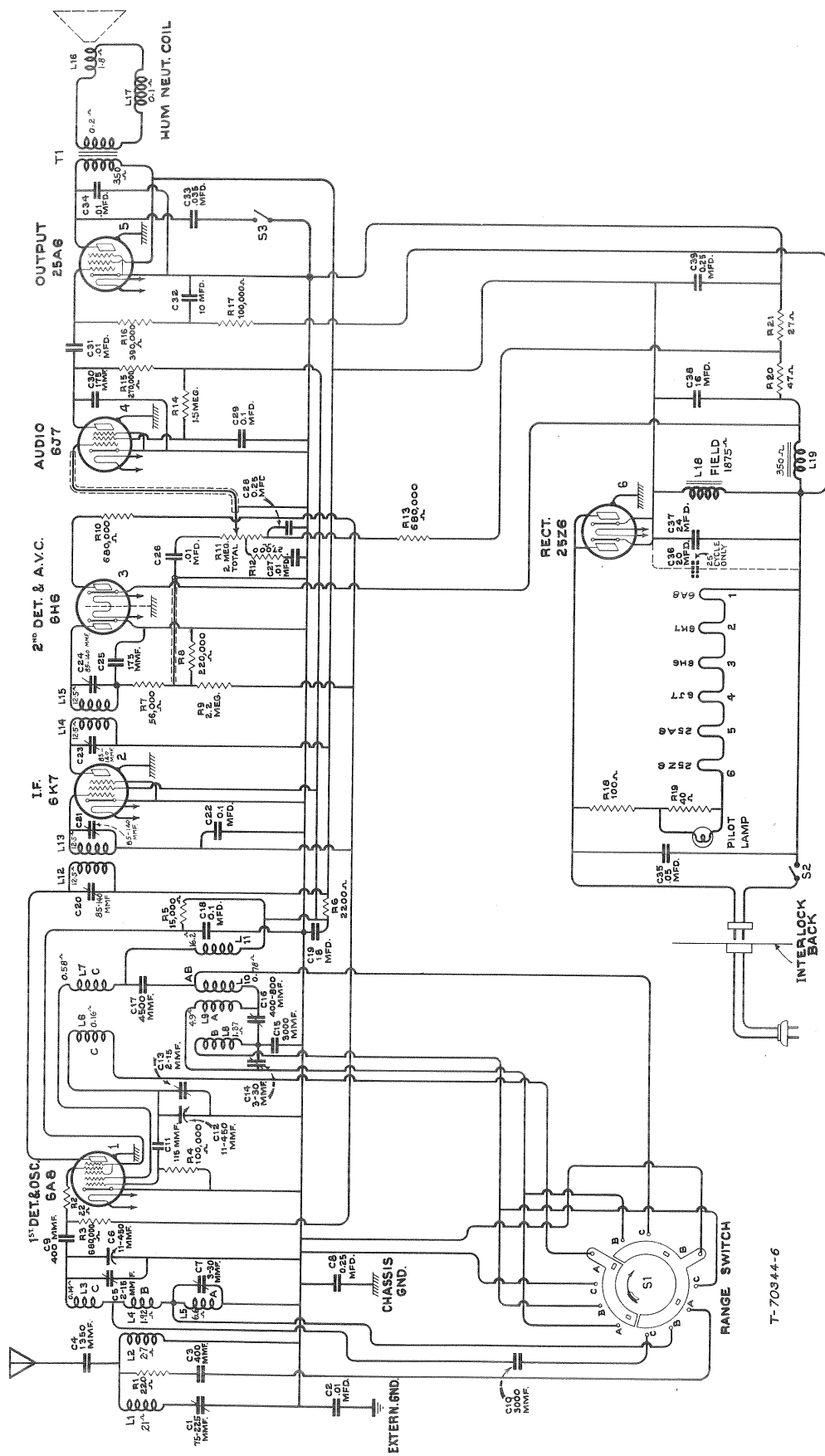


Figure 1—Schematic Circuit Diagram

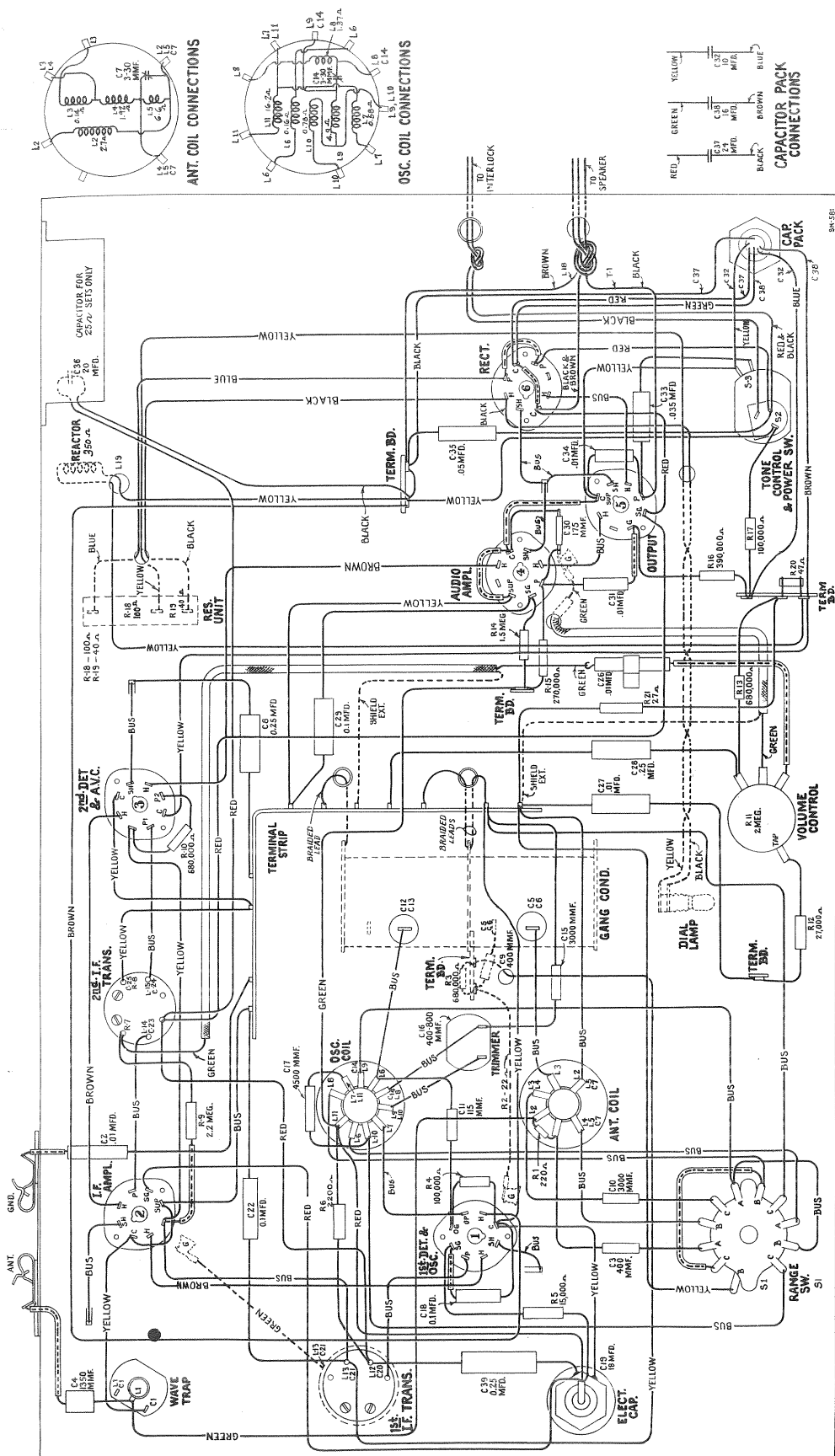


Figure 2—Chassis Wiring Diagram

Circuit Arrangement

The conventional superheterodyne type of circuit, consisting of a combined first detector-oscillator stage, a single i-f stage, a diode detector-automatic volume control stage, an audio voltage amplifier stage, an audio power output stage and a half-wave rectifier power supply stage, is used.

Tuned Circuits

The antenna coil system consists of a single primary and three series-connected secondary windings to provide the three ranges of tuning. The oscillator coil system is similarly wound on a single form. A range selector switch (S-1) is used for connecting the various sections of these two coil systems into the circuit to provide operation on the band desired. The coils are tuned by a variable two-section gang condenser having trimmer capacitors in shunt with each section. There are additional trimmer capacitors across the section of each coil used for Band "A." A series trimmer is also associated with the Band "A" oscillator coil.

The intermediate frequency amplifier system consists of an RCA-6K7 in a transformer-coupled circuit. This stage operates at a basic frequency of 460 kc. Each winding of both i-f transformers (input and output) is tuned by an adjustable trimmer.

Detector and A.V.C.

The modulated signal as obtained from the output of the i-f stage is detected by an RCA-6H6 twin-diode tube. The audio frequency secured by this process is transferred 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 circuit. The second (auxiliary) diode of the RCA-6H6 is used to supply residual bias for the controlled tubes under conditions of little or no signal. This diode, under such conditions, draws current which flows through resistors R-8, R-9 and R-10, thereby maintaining the desired minimum operating bias on such tubes. As soon as

the rectified signal current develops sufficient voltage across resistor R-8, in opposition to that across resistors R-20 and R-21, current ceases to flow in the auxiliary diode circuit and the signal A.V.C. diode takes over the biasing function.

Audio System

The manual volume control consists of an acoustically tapered potentiometer in the audio circuit between the output of the detector diode and the input grid of the audio voltage amplifier tube. This control has a tone compensating filter connected to it, so that the correct aural balance will be obtained at different volume settings.

Resistance-capacitance coupling is used between the first audio stage and the power output stage. The output of the power amplifier is transformer-coupled into the dynamic loudspeaker. High-frequency tone control is effected by a capacitor across the plate circuit of the output tube. This capacitor may be cut in or out of the circuit as desired by means of a switch (S-3).

Rectifier

The plate, grid, and cathode voltages required for the operation of this receiver are supplied by the RCA-25Z6 rectifier (plates and cathodes connected in parallel respectively) in series with the supply line operating as a half-wave rectifier. The field of the loudspeaker is connected across the input to the filter. The filter circuit consists of reactor L-19 and capacitors C-37 and C-38. An additional capacitance C-36 is connected in parallel with C-37 in models designed for 25-cycle operation.

The filaments of all six tubes are connected in series and are fed direct from the supply line, the voltage being dropped to the required value by resistors R-18 and R-19. The correct operating voltage for the pilot lamp is developed across resistor R-19. This voltage across the pilot lamp will be slightly high when the set is first turned on, but will quickly drop to a normal value as soon as the tube filaments reach their operating temperature.

SERVICE DATA

CAUTION: Grid caps, tuning condenser, and resistor on top of chassis may be hot with respect to external ground and should be avoided when servicing, unless due precautions are taken.

The various diagrams of this bulletin contain such information as will be needed to isolate causes for defective operation when such a condition develops. 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 diagrams and the replacement parts list. Locating of the parts in the schematic circuit is facilitated

by the fact that the numerical titles increase from left to right on the diagram. The coils, reactors, and transformer windings are rated in terms of their d-c resistances only.

Alignment Procedure

Precise alignment is vital to the proper functioning of this receiver. There are four trimming adjustments provided in the i-f system, three in the oscillator coil system and two in the antenna coil system. These trimmers 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. Incorrect alignment is usually evidenced by loss of sensitivity, improper tone quality and poor selectivity. These indications will generally be present together.

The correct performance of the receiver can only be obtained when the alignment is performed with adequate and reliable test apparatus. The manufacturer of this instrument has a complete assortment of such service equipment available. This equipment may be purchased from authorized distributors and dealers.

An oscillator (signal generator) is required as a source of the specified alignment frequencies. Visual indication of receiver output during the adjustment is necessary to enable the serviceman to obtain an accuracy of alignment which is not possible by listening to the signal. The RCA Victor Stock No. 9595 Full Range Oscillator and the RCA Victor Stock No. 4317 Neon Output Indicator are especially suitable and fulfill the above requirements.

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

I-F Trimmer Adjustments

The four trimmers of the two i-f transformers are located as shown by Figure 4. Each must be aligned to a basic frequency of 460 kc. To do this, attach the output indicator across the voice coil circuit or across the output transformer primary. Connect the output of the test oscillator through a .05 mfd. condenser to the RCA-6A8 control grid. 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 the heterodyne oscillator. Increase the output of the test oscillator until a slight indication is apparent on the output indicator. Then adjust the two trimmers, C-23 and C-24, of the second i-f transformer to produce maximum (peak) indicated receiver output. Then, adjust the two trimmers, C-20 and C-21, 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. action will be avoided. It is advisable to repeat the adjustment of all i-f trimmers a second time to assure that the interaction between them has not disturbed the original adjustment.

R-F Trimmer Adjustments

The two trimmers, which are at all times directly in shunt with the variable tuning condenser, necessitate that the high-frequency range (Band C) be aligned first. The range selector switch should, therefore, be turned to its Band C position for the initial adjustment. The output indicator should be left connected to the output system and the volume control kept at maximum. Attach the output terminals of the test oscillator to the antenna and ground terminals of the receiver input.

Calibrate the dial by rotating the tuning control until the variable condenser plates are in their full mesh (maximum capacity) position and adjusting the dial pointer so that its end points to the horizontal graduation (approximately 530 kc.) at the low-frequency end of the Band A scale.

Proceed further as follows:

- (a) Adjust the test oscillator to 18,000 kc. and set the receiver tuning control to a dial reading of 18,000 kc.
- (b) Regulate the output of the test oscillator until a slight indication is perceptible at the receiver output. Then adjust the trimmer C-13 on the oscillator section of the variable condenser to the point at which it produces maximum indicated receiver output. Two points may be found, each of which produces such a maximum. The one of *maximum trimmer capacitance* is correct and should be used. (The oscillator will be 460 kc. below the signal frequency at this adjustment point.)

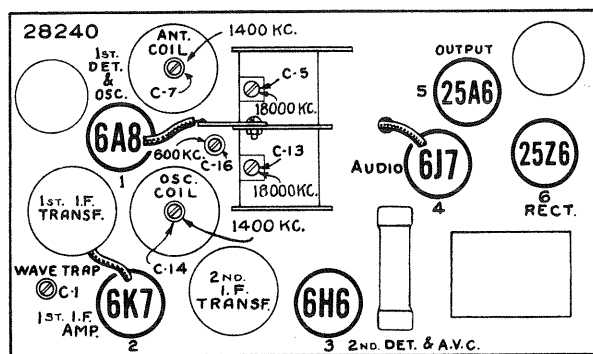


Figure 3—Radiotron, Coil and Trimmer Locations
—R. F. Trimmer Adjustment

- (c) Adjust the trimmer C-5 of the antenna section of the variable condenser, simultaneously rocking the receiver tuning control backward and forward through the 18,000 kc. input signal, until maximum receiver output results from these combined operations. Rocking of the variable condenser will prevent inaccurate adjustment, which would otherwise be caused by the interaction between the heterodyne oscillator circuit and the antenna tuned circuit.
- (d) Change the receiver range selector to its Band A position and set the receiver tuning control to a dial reading of 1400 kc. Tune the test oscillator to this same frequency and regulate its output to produce a slight indication on the receiver output indicating device.
- (e) Adjust the high-frequency trimmers of the Band A oscillator and antenna coils, C-14 and C-7 respectively, to the points at which each produces maximum indicated receiver output.

- (f) Shift the test oscillator frequency to **600 kc.** and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received.
- (g) Tune the low-frequency trimmer C-16 of the oscillator Band A coil, simultaneously rocking the tuning control of the receiver backward and forward through the signal, until maximum indicated receiver output results from these combined operations. The adjustment of C-14 and C-7 should be corrected at **1400 kc.** to compensate for any changes caused by the adjustment of the low-frequency oscillator coil trimmer.

active at its rated line voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. These voltages were measured with set tuned to approximately 900 kc. (Band A); no signal being received and volume control at minimum. To duplicate the conditions under which the voltages were measured requires a 1000-ohm-per-volt d-c meter, having ranges of 10, 50 and 250 volts. Voltages below 10 read on 10-volt scale, between 10 and 50 on 50-volt scale, and between 50 and 250 on 250-volt scale. A-C voltages were measured with a corresponding a-c meter.

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts and grid caps to -B ground bracket on Figure 4 will assist in the location of causes for faulty operation. Each value as specified should hold within $\pm 20\%$ when the receiver is normally oper-

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.

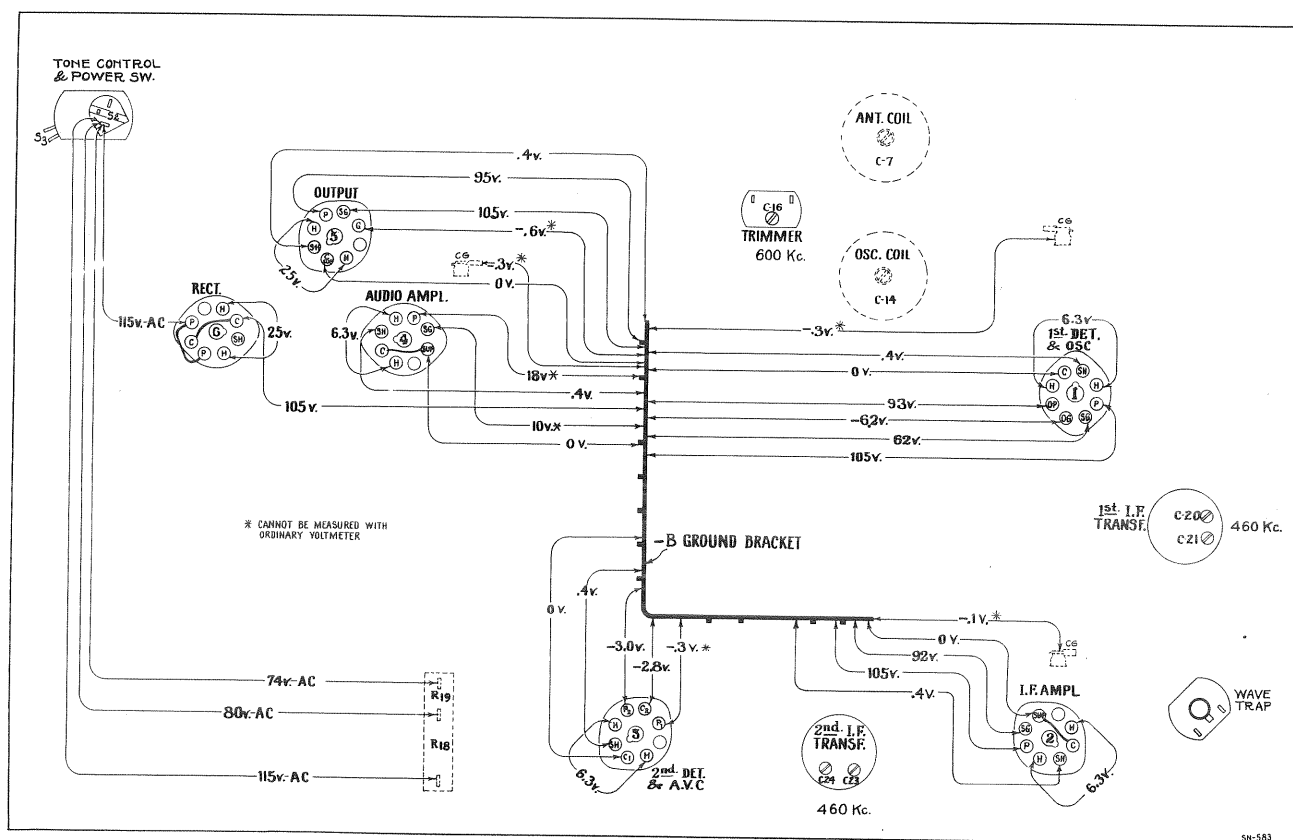


Figure 4—Radiotron Socket Voltages

Measured at 115 volts, 60-cycle supply—For 115 volt D-C approximately 5% lower
Tuned to approximately 900 kc. (Band A)—No Signal Being Received—Volume control set at minimum

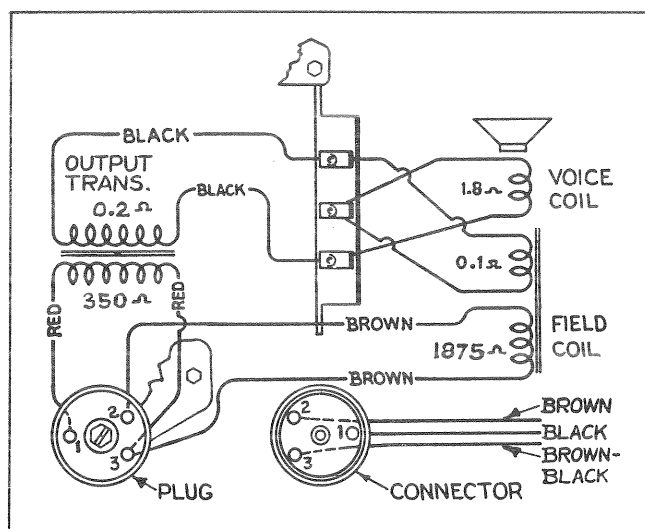


Figure 5—Loudspeaker Wiring

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					
5237	Bushing—Variable tuning condenser mounting bushing assembly—Package of 3	\$0.43	11977	Resistor—Wire wound—Comprising one 100- and one 40-ohm section—(R18, R19)	\$0.58
11350	Cap—Grid contact cap—Package of 5	.20	11624	Resistor—22 ohms—Flexible type—complete with contact cap—(R2)	.22
11465	Capacitor—Adjustable capacitor—(C16)	.48	11955	Resistor—27 ohms—Carbon type— $\frac{1}{4}$ watt—(R21)—Package of 5	1.00
11291	Capacitor—115 Mmfd.—(C11)	.24	11372	Resistor—47 ohms—Carbon type— $\frac{1}{4}$ watt—(R20)—Package of 5	1.00
5116	Capacitor—175 Mmfd.—(C30)	.18	5159	Resistor—2,200 ohms—Carbon type— $\frac{1}{4}$ watt—(R6)—Package of 5	1.00
11290	Capacitor—400 Mmfd.—(C3, C9)	.25	3998	Resistor—15,000 ohms—Carbon type— $\frac{1}{4}$ watt—(R5)—Package of 5	1.00
11449	Capacitor—1350 Mmfd.—(C4)	.26	11400	Resistor—27,000 ohms—Carbon type— $\frac{1}{4}$ watt—(R12)—Package of 5	1.00
11622	Capacitor—3000 Mmfd.—(C10, C15)	.36	3118	Resistor—100,000 ohms—Carbon type— $\frac{1}{4}$ watt—(R4, R17)—Package of 5	1.00
11287	Capacitor—4500 Mmfd.—(C17)	.30	11323	Resistor—270,000 ohms—Carbon type— $\frac{1}{4}$ watt—(R15)—Package of 5	1.00
5196	Capacitor—.035 Mfd.—(C33)	.18	11847	Resistor—390,000 ohms—Carbon type— $\frac{1}{4}$ watt—(R16)—Package of 5	1.00
4858	Capacitor—.01 Mfd.—(C2, C27, C31, C34)	.25	11811	Resistor—680,000 ohms—Carbon type— $\frac{1}{4}$ watt—(R10)—Package of 5	1.00
11395	Capacitor—.01 Mfd.—(C26)	.18	11980	Resistor—680,000 ohms—Carbon type— $\frac{1}{10}$ watt—(R3, R13)—Package of 5	.75
4886	Capacitor—.05 Mfd.—(C35)	.20	11981	Resistor—1.5 megohms—Carbon type— $\frac{1}{10}$ watt—(R14)—Package of 5	.75
4840	Capacitor—.025 Mfd.—(C28)	.30	11626	Resistor—2.2 megohms—Carbon type— $\frac{1}{4}$ watt—(R9)—Package of 5	1.00
5170	Capacitor—.025 Mfd.—(C8, C35)	.25	11603	Shield—Antenna or oscillator coil shield	.26
4839	Capacitor—.01 Mfd.—(C18)	.28	11390	Shield—Intermediate frequency transformer shield	.25
4841	Capacitor—.01 Mfd.—(C22, C29)	.22	3529	Socket—Dial lamp socket	.32
5212	Capacitor—18 Mfd.—(C19)	1.16	11198	Socket—7-contact 6J7, 25Z6 or 25A6 Radiotron socket	.15
11821	Capacitor Pack—Comprising one 24 Mfd., one 16 Mfd., and one 10 Mfd. sections—(C32, C37, C38)	3.60	11196	Socket—8-contact 6H6, 6K7 or 6A8 Radiotron socket	.15
11617	Coil—Antenna coil—(L2, L3, L4, L5, C7, R1)	1.68	11614	Spring—Coil spring for large gears on variable tuning condenser—Package of 10	.70
11618	Coil—Oscillator coil—(L6, L7, L8, L9, L10, L11, C14)	2.22			
11612	Condenser—2-gang variable tuning condenser—(C5, C6, C12, C13)	3.80			
11979	Connector—2-contact male connection plug	.30			
11974	Dial—Station selector dial scale	.65			
11613	Drive—Variable tuning condenser drive	1.00			
11893	Indicator—Station selector indicator pointer	.28			
4340	Lamp—Dial lamp—Package of 5	.60			
11818	Reactor—Filter reactor—(L19)	1.85			

The prices quoted above are subject to change without notice.

REPLACEMENT PARTS (Continued)

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
11975	Switch—Range switch—(S1)	\$0.95			
11460	Switch—Tone control and power switch—(S2, S3)	.95			
5238	Terminal—Antenna terminal board with clip insulating strip and rivets	.14	11827	Coil—Field coil—(L18)	\$1.92
11976	Terminal—Ground terminal clip assembly	.15	11235	Cone—Reproducer cone—(L16)—Package of 5	3.50
11388	Transformer—First intermediate frequency transformer—(L12, L13, C20, C21)	1.90	5118	Connector—Three-contact male connector for reproducer	.25
11389	Transformer—Second intermediate frequency transformer—(L14, L15, C23, C24, C25, R7, R8)	3.02	5119	Connector—Three-contact female connector for reproducer cable	.25
11391	Trap—Wave trap—(L1, C1)	1.22	11826	Reproducer complete	6.50
11237	Volume control—(R11)	1.20	11828	Transformer—Output transformer—(T1)	1.46
	REPRODUCER ASSEMBLIES CONSOLE MODEL			MISCELLANEOUS ASSEMBLIES	
11232	Board—Terminal board assembly	.18	11823	Cord—Power cord and connector assembly	.65
11231	Bolt—Yoke and core assembly bolt and nut	.16	11376	Escutcheon—Station selector escutcheon and crystal	.70
8060	Bracket—Output transformer mounting bracket	.14	11609	Knob—Range switch knob—Package of 5	.52
11257	Clamp—Cone center suspension clamping nut and screw assembly—Package of 5	.25	11973	Knob—Station selector knob assembly—comprising one large and one small knob—Package of 5	.90
11827	Coil—Field coil—(L18)	1.92	11455	Knob—Volume control or tone control knob—Package of 5	.48
11469	Coil—Neutralizing coil—(L17)	.20	11210	Screw—Chassis mounting screw assembly for Console Model—Package of 4	.28
11258	Cone—Reproducer cone complete—(L16)—Package of 5	3.85	11377	Screw—Chassis mounting screw assembly for Table Model—Package of 4	.12
5118	Connector—Three-contact male connector for reproducer	.25	11348	Screw—8-32 x 7/16" headless cupped-point set screw for small knob in Stock No. 11973—Package of 10	.32
5119	Connector—Three-contact female connector for reproducer cable	.25	11349	Spring—Retaining spring for knobs—Stock No. 11455 and No. 11609—Package of 5	.15
11828	Transformer—Output transformer—(T1)	1.46	4982	Spring—Retaining spring for large knobs—Stock No. 11973—Package of 10	.26
11886	Washer—Spring washer—used to hold speaker field coil securely—Package of 5	.20			

The prices quoted above are subject to change without notice.

NOTES

- (1) Beat notes or heterodyning (whistles) may be encountered in some instances on these receivers due to excessive antenna capacitance. This condition may be corrected by reducing the size of the antenna or by inserting a 150 mmfd. capacitor in series with the antenna lead at the antenna terminal. Interference in the form of "beats" from a combination of local stations may frequently be remedied by tuning the wave trap to one of the interfering stations.
- (2) In the event that unsatisfactory service is obtained from the standard rectifier, an RCA type 25Z6-G may be used for replacement.
- (3) Failures of capacitors C-37 or C-38 may produce hum. The rectifier tube should be replaced along with the capacitors.