

RCA VICTOR MODELS T 4-8 and T 4-9

Four-Tube, Single Band, A-C, Superheterodyne Receivers

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type of Circuit	Superheterodyne					
Radiotron Complement	<table border="0"> <tr> <td rowspan="4" style="font-size: 3em; vertical-align: middle;">{</td> <td>(1) RCA-6A7, First Detector and Oscillator</td> </tr> <tr> <td>(2) RCA-6F7, I-F Amplifier and Second Detector</td> </tr> <tr> <td>(3) RCA-41, Power Output Amplifier</td> </tr> <tr> <td>(4) RCA-1v, Half-wave Rectifier</td> </tr> </table>	{	(1) RCA-6A7, First Detector and Oscillator	(2) RCA-6F7, I-F Amplifier and Second Detector	(3) RCA-41, Power Output Amplifier	(4) RCA-1v, Half-wave Rectifier
{	(1) RCA-6A7, First Detector and Oscillator					
	(2) RCA-6F7, I-F Amplifier and Second Detector					
	(3) RCA-41, Power Output Amplifier					
	(4) RCA-1v, Half-wave Rectifier					
Tuning Range	540-1720 kc.					
Intermediate Frequency	460 kc.					
Alignment Frequencies	460 kc. (i.f.), 600 kc. (det., osc.), 1720 kc. (det., osc.)					
Voltage and Frequency Ratings	<table border="0"> <tr> <td rowspan="3" style="font-size: 3em; vertical-align: middle;">{</td> <td>105-125 volts, 50-60 cycles</td> </tr> <tr> <td>105-125 volts, 25-60 cycles</td> </tr> <tr> <td>200-250 volts, 50-60 cycles</td> </tr> </table>	{	105-125 volts, 50-60 cycles	105-125 volts, 25-60 cycles	200-250 volts, 50-60 cycles	
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	200-250 volts, 50-60 cycles					
Power Consumption	40 watts at 115 volts					
Undistorted Audio Output	1.75 watts					
Maximum Audio Output	2.50 watts					
Loudspeaker	6 inch, Electrodynamic					

PHYSICAL SPECIFICATIONS

	Model T 4-8	Model T 4-9
Height	14 $\frac{1}{8}$ inches	7 $\frac{7}{8}$ inches
Width	11 $\frac{1}{4}$ inches	10 $\frac{1}{8}$ inches
Depth	6 $\frac{1}{4}$ inches	4 $\frac{3}{8}$ inches
Weight (Net)	12 pounds	13 $\frac{1}{2}$ pounds
Weight (Shipping)	15 pounds	16 $\frac{1}{2}$ pounds
Number of Operating Controls	Two	

GENERAL DESCRIPTIVE DATA

These two receivers have identical chassis assemblies. The T 4-8 is mounted in a cathedral type, table cabinet, while the T 4-9 is housed in a wooden chest type of cabinet. The chassis is constructed and wired in such a manner as to facilitate servicing when necessary. An open face dial is used with a direct coupled station

selector. The dial is calibrated in kilocycles. On-off control of power is combined with the volume control by means of a switch. The frequency range extends from 540 to 1720 kc. which includes one of the regular police bands. An adjustable wave trap is incorporated for suppression of code interference.

DESCRIPTION OF CIRCUIT

The first two stages of the electrical circuit are arranged to have two functions each. One operates as first detector and local oscillator, using an RCA-6A7 pentagrid-converter tube, and the second, an RCA-6F7 triode-pentode is employed for i-f amplification and final detection. Power amplification at the output stage is handled by an RCA-41 power-amplifier pentode. Rectification of high voltage a.c. is accomplished through an RCA-1v half-wave tube. Direct current from the rectifier stage is supplied to the various stages of the receiver through a filter system which includes the speaker field as a reactor.

Radio-frequency and intermediate-frequency stages are intercoupled by means of transformers. The antenna

transformer couples directly into the first detector having its secondary tuned by one section (front) of the two-gang tuning condenser. The oscillator system is tuned by the second (rear) section of the condenser. Trimmer condensers are connected to the first i-f transformer for resonating it to 460 K.C. The second i-f transformer has a natural tuning inherent to the design of its windings. Trimmer condensers for alignment purposes are also employed on the antenna and oscillator coils.

Volume control of the received signal is accomplished in the cathode circuits of the first two tubes of the receiver by variation of a biasing resistance which is common to both stages.

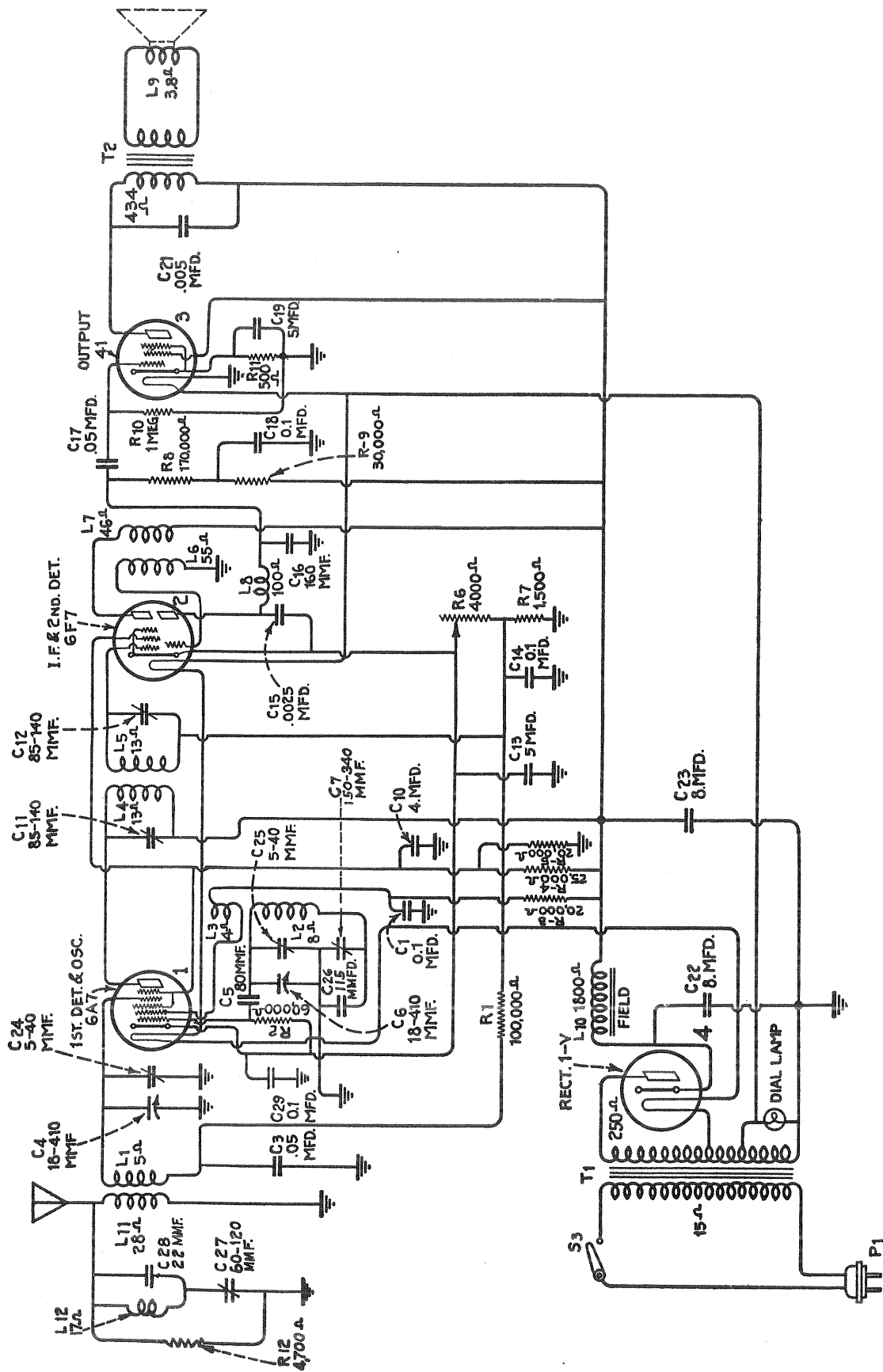


Figure 1—Schematic Circuit Diagram

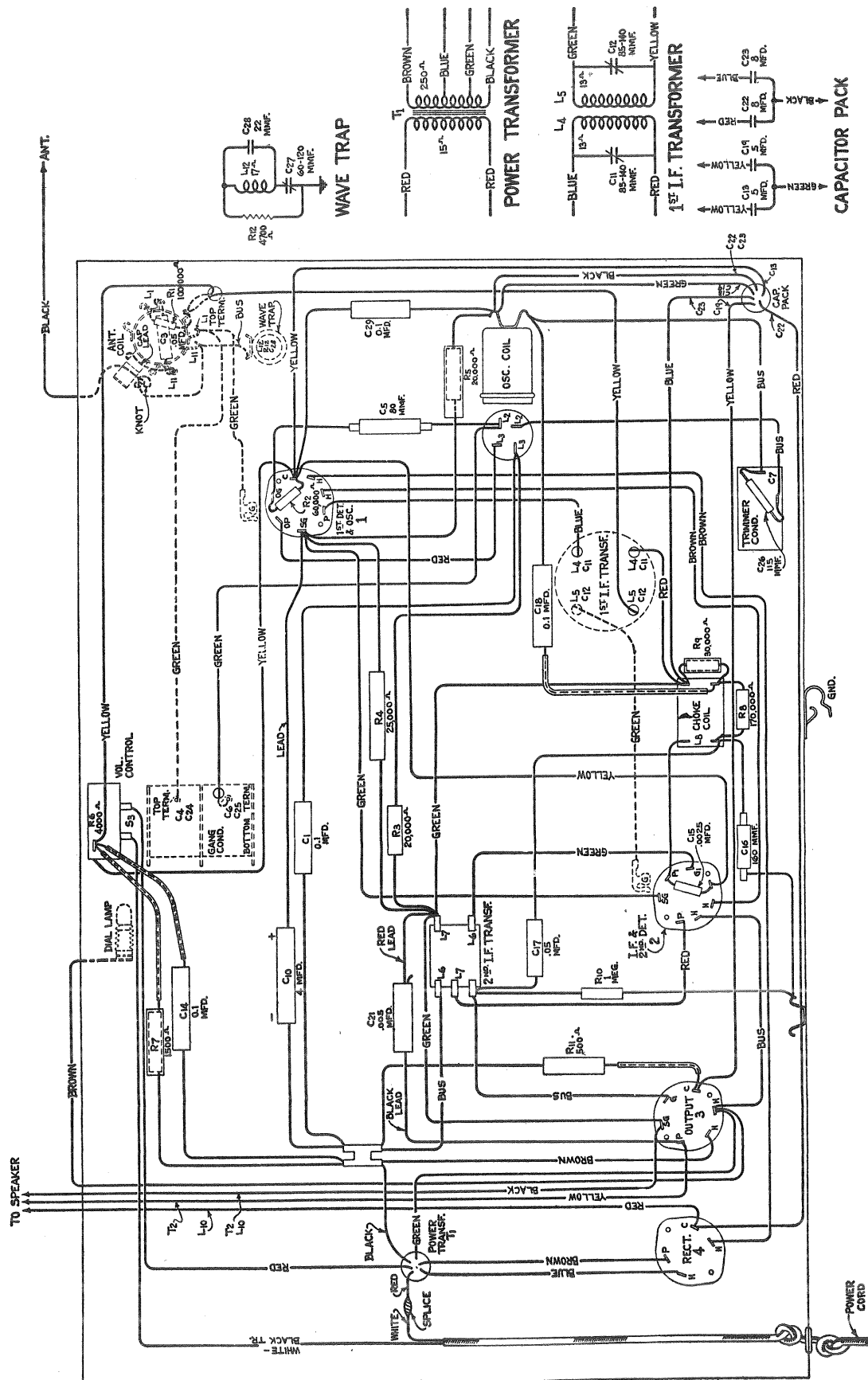


Figure 2—Chassis Wiring Diagram

SERVICE DATA

Alignment Procedure

Five aligning trimmers are provided, the physical locations of which are indicated on Figure 3. These trimmers are accurately adjusted during manufacturing tests and should remain in proper alignment indefinitely unless affected by abnormal conditions of temperature or humidity, or unless they have been altered for service purposes. Loss of sensitivity, improper tone quality and poor selectivity usually indicate necessity for re-alignment.

The correct performance of the receiver can only be obtained when the aligning has been done with adequate and reliable apparatus. Such test apparatus as may be required for this operation should be in the hands of a skilled service engineer. The manufacturer of this receiver has available for sale through its distributors and dealers, a complete assortment of service test equipment. The instruments needed for alignment operations are illustrated and described on a separate page of this booklet.

An oscillator or signal generator is required as a source of the standard alignment frequencies recommended under Electrical Specifications. Visual indication of receiver output during the adjustments is very advantageous and may be accomplished by use of a Cathode Ray Oscillograph such as the RCA Victor Stock No. 9545. The method of alignment is explained in the instruction booklet for this instrument. Where an oscillograph is not available, an RCA Victor Neon Type Output Indicator may be used with good

results. It should be connected to the voice coil circuit of the loudspeaker so as to be actuated by the audio signal voltage.

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

- (1) **Intermediate Frequency Amplifier**—The first i-f transformer has two trimmers identified as C-11 and C-12 on the diagram, Figure 3. Each must be tuned to 460 kc. by feeding a signal of this frequency from the Full Range Oscillator into the RCA-6A7 control grid and chassis-ground and adjusting both trimmers to the point giving maximum output. The oscillator output and the receiver volume control should be regulated so as to produce a sensitive indication on the receiver output indicator. If interference is noticed from strong local stations during these adjustments, the station selector should be tuned to a point at which they will be subdued.
- (2) **Detector and Oscillator**—A total of three adjustments are necessary on the detector and oscillator coil systems. Two of these are to be made at 1720 kc. and the other at 600 kc. The 1720 kc. trimmers are mounted on the variable tuning condenser and are accessible from the top of the chassis. The 600 kc. trimmer, which is associated with the oscillator system, is located on the rear apron of the chassis as shown by Figure 3. To align these

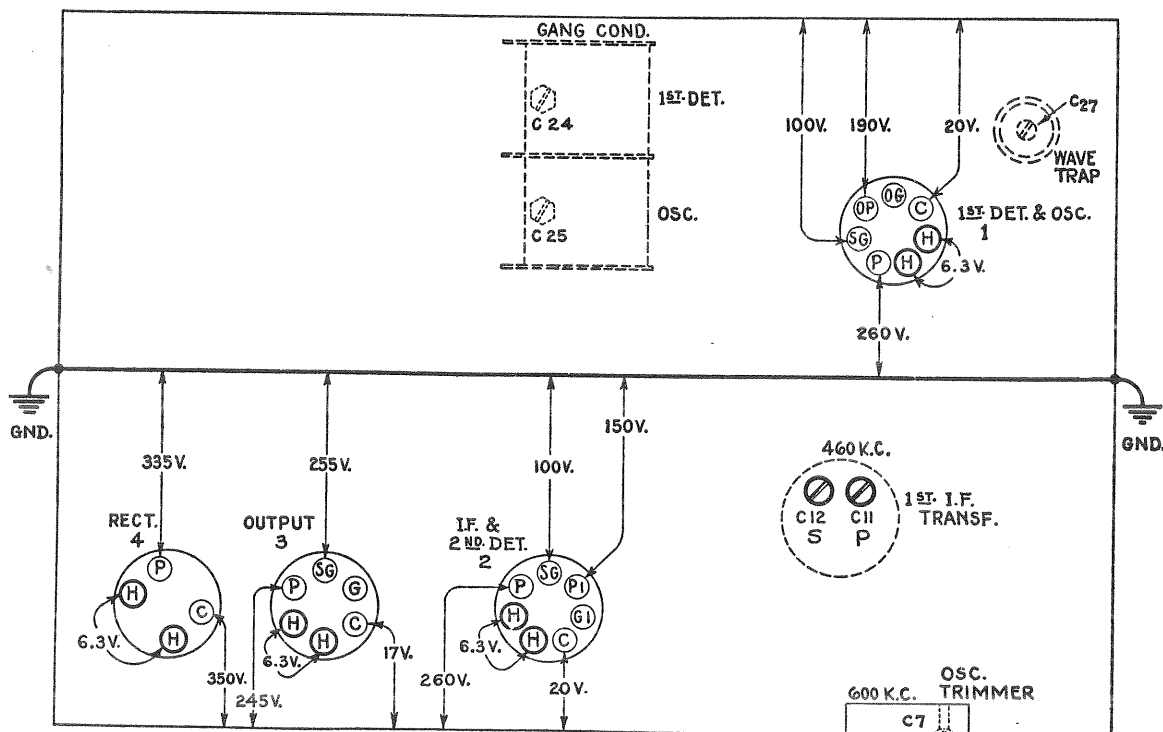


Figure 3—Trimmer Locations and Radiotron Socket Voltages to Chassis Measured at 120 volts A-C Supply—No Signal — Volume Control Maximum

various trimmers, after correcting the i-f alignment, proceed in the following manner. Supply a 1720 kc. signal from the standard oscillator to the receiver input (ant-gnd) terminals and accurately set the station selector to the 1720 kc. dial marking. (If for any reason, the dial pointer has slipped or been misplaced on the tuning shaft, it should be checked for proper calibration at full mesh of the variable condenser. With the station selector set to 1720 kc. adjust the trimmers C-25 and C-24 so that each produces maximum (peak) receiver output. Then shift the test oscillator frequency to 600 kc. and tune this standard signal on the receiver, disregarding the dial reading at which it is received. Adjust the 600 kc. oscillator trimmer C-7, simultaneously rocking the variable gang condenser backward and forward through the signal so

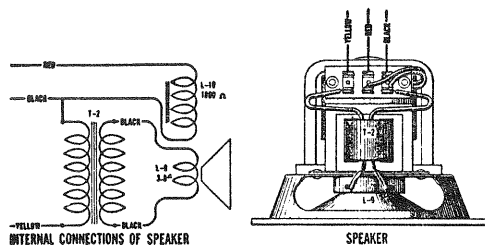


Figure 4—Loudspeaker Wiring

that maximum receiver output results from the combined operations. The point at which maximum output is obtained will not always be exactly at 600 kc. on the dial. The error should be disregarded. It is advisable to repeat the adjustments of C-24 and C-25 as explained above to correct for any reflective changes brought about by the adjustment of C-7.

Radiotron Socket Voltages

The voltage values indicated from socket contacts to chassis-ground on Figure 3 will serve to assist in locating causes for faulty operation when such a condition develops. Each value as specified may be expected to hold within $\pm 20\%$ when the supply voltage is normal. Variations in excess of this limit will usually be indicative of trouble in the receiver circuits. Voltages given are actual operating values and do not allow for

inaccuracies which may be caused by loading effect of a voltmeter's internal resistance. This resistance should be duly considered for all readings. The amount of circuit resistance shunting the meter during measurement will determine the accuracy to be obtained, the error increasing as the meter resistance is comparable to or less than the circuit resistance. For the majority of readings, a meter having an internal resistance of 1000 ohms per volt will be satisfactory when the range used for each check is chosen as high as possible consistent with good readability.

Circuit Constants

Ratings of resistors and capacitors are indicated adjacent to their respective parts on the schematic and wiring diagrams and in the Replacement Parts List. Note that each is numbered for identification purposes when referring between the diagrams and parts section. The numbering begins at the left of the schematic and increases to the right as the signal would progress through the circuit. Transformer windings, reactors and miscellaneous coils are rated in terms of d-c resistance only. Where the resistance is less than one ohm, no rating is given.

Code Interference

In some localities near to high-powered, radio-telegraph communication stations, slight interference may be encountered. This trouble may be remedied by adjustment of the 460 kc. wave trap provided in the antenna circuit. Adjust the wave trap trimmer C-27 to produce a minimum of interference.

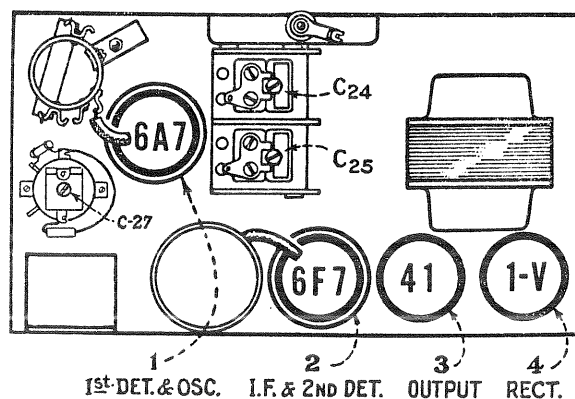


Figure 5—Radiotron Locations



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					
4244	Cap—Grid contact cap—Package of 5....	\$0.20	3602	Resistor—60,000 ohms—Carbon type—1/4 watt (R2)—Package of 5.....	\$1.00
4000	Capacitor—Adjustable capacitor (C7)....	.78	3118	Resistor—100,000 ohms—Carbon type—1/4 watt (R1)—Package of 5.....	1.00
3459	Capacitor—80 mmfd. (C5).....	.44	3869	Resistor—170,000 ohms—Carbon type—1/2 watt (R8)—Package of 5.....	1.00
11302	Capacitor—115 mmfd. (C26).....	.15	3076	Resistor—1 megohm—Carbon type—1/2 watt (R10)—Package of 5.....	1.00
3865	Capacitor—160 mmfd. (C16).....	.30	3584	Ring—Oscillator coil shield ring—Package of 5.....	.40
5107	Capacitor—0.0025 mfd. (C15).....	.16	6665	Shield—Oscillator coil shield and bracket assembly.....	.34
6787	Capacitor—0.005 mfd. (C21).....	.30	3942	Shield—I. F. and second detector Radiotron shield.....	.18
4836	Capacitor—0.05 mfd. (C3).....	.30	8098	Socket—Dial lamp socket.....	.10
4886	Capacitor—0.05 mfd. (C17).....	.20	11187	Transformer—First intermediate frequency transformer (L4, L5, C11, C12).....	1.72
4835	Capacitor—0.1 mfd. (C1).....	.28	6663	Transformer—Second intermediate frequency transformer (L6, L7).....	1.06
4885	Capacitor—0.1 mfd. (C14, C18).....	.28	9465	Transformer—Power transformer—105-125 volts—25-50 cycles.....	4.38
4841	Capacitor—0.1 mfd. (C29).....	.22	9464	Transformer—Power transformer—105-125 volts—50-60 cycles (T1).....	3.20
6832	Capacitor—4.0 mfd. (C10).....	.85	9466	Transformer—Power transformer—200-250 volts—50-60 cycles.....	3.28
6661	Capacitor pack—Comprising two 5.0 mfd. and two 8.0 mfd. capacitors (C13, C19, C22, C23).....	2.70	11224	Trap—Wave trap (R12, L12, C27, C28).	.90
5051	Coil—Antenna coil (L1, L11, C3, R1).....	1.28	REPRODUCER ASSEMBLIES		
3857	Coil—Choke coil (L8).....	.90	9548	Coil assembly—Comprising field coil, magnet and cone support (L10).....	\$3.08
5050	Coil—Oscillator coil (L2, L3).....	.56	9588	Cone—Reproducer cone—(L9)—Package of 5.....	3.55
6660	Condenser—Two-gang variable tuning condenser (C4, C6, C24, C25).....	2.78	9547	Reproducer—Complete.....	5.45
6667	Volume control (R6, S3).....	1.58	4447	Shield—Terminal board shield for reproducer.....	.18
11301	Dial—Station selector dial.....	.40	4803	Transformer—Output transformer (T2)...	1.45
4340	Lamp—Dial lamp—Package of 5.....	.60			
3632	Resistor—500 ohms—Carbon type—1 watt (R11)—Package of 5.....	1.10			
3047	Resistor—1500 ohms—Carbon type—1/2 watt (R7)—Package of 5.....	1.00			
6114	Resistor—20,000 ohms—Carbon type—1 watt (R3, R5)—Package of 5.....	1.10			
3889	Resistor—25,000 ohms—Carbon type—3 watt (R4).....	.25			
3077	Resistor—30,000 ohms—Carbon type—1/2 watt (R9)—Package of 5.....	1.00			