

RCA VICTOR MODEL 5T4

Five-Tube, Three-Band, A-C, Superheterodyne Receiver

TECHNICAL INFORMATION

Electrical Specifications

FREQUENCY OR WAVE-LENGTH RANGES		ALIGNMENT FREQUENCIES	
Band "X" . . .	145-350 kc (approx. 2,068-857 meters)	Band "X"	175 kc (osc.), 350 kc (osc., det., ant.)
Band "A" . . .	525-1,550 kc (approx. 571-193 meters)	Band "A"	600 kc (osc.), 1,500 kc (osc., det., ant.)
Band "C"	5.8-22 megacycles	Band "C"	20,000 kc (osc., ant.)
Intermediate Frequency			460 kc
RADIOTRON COMPLEMENT		(3) RCA-75	Second Det., A-F Amp. and A.V.C.
(1) RCA-6A7	First Det.—Oscillator	(4) RCA-42	Audio Power Amplifier
(2) RCA-6D6	Intermediate Amplifier	(5) RCA-80	Full-Wave Rectifier
Pilot Lamps (2)			Mazda No. 46, 6.3 volts, 0.25 ampere
POWER SUPPLY RATINGS			
Rating A			105-125 volts, 50-60 cycles, 75 watts
Rating B			105-125 volts, 25-50 cycles, 75 watts
Rating C			100-125/200-250 volts, 50-60 cycles, 75 watts
POWER OUTPUT RATING		LOUDSPEAKER	
Undistorted	2.0 watts	Type	Electrodynamic
Maximum	4.5 watts	Voice Coil Impedance	2.2 ohms at 400 cycles

Mechanical Specifications

Height			11 $\frac{3}{8}$ inches
Width			23 $\frac{1}{8}$ inches
Depth			10 $\frac{1}{16}$ inches
Weight (Net)			29 pounds
Weight (Shipping)			34 pounds
Chassis Base Dimensions			13 $\frac{1}{2}$ inches x 7 $\frac{3}{4}$ inches x 3 inches
Over-all Chassis Height			8 $\frac{7}{8}$ inches
Operating Controls	(1) Volume, (2) Tuning, (3) Range Selector, (4) Power Switch—Tone		
Tuning Drive Ratio			10 to 1 and 50 to 1

General Features

This receiver is of the superheterodyne type and has many distinctive features. Its design includes magnetite core adjusted i-f transformers and wave-trap, pre-selector stage on "A" and "X" bands, aural compensated volume control, tone control, resistance-coupled audio system, phonograph terminal board, and an 8-inch dust-proof electrodynamic loudspeaker.

Tuning range includes the "X," "A," and "C"

bands. The "C" band of this extensive range includes channels assigned for amateur, and international short-wave broadcast on 49, 31, 25, 19, 16 and 13 meters. Trimming adjustments are located at accessible points. Their number is reduced to the least that is consistent with efficient operation. The tuning dial ratio of 10 to 1, with a 50 to 1 vernier, permits ease of tuning, especially in the "C" band.

Circuit Arrangement

The first-detector and oscillator functions are accomplished in a single tube, an RCA-6A7. The antenna is coupled to this tube through a tuned transformer in the "C" band, while a pre-selector stage is employed on bands "X" and "A" prior to the usual tuned detector circuits. A magnetite core adjusted

wave-trap is connected in series with the antenna to effectively prevent signals of intermediate frequency (460 kc) from being introduced into the detector stage as interference. A three-section gang condenser tunes the antenna and detector transformer secondaries and the heterodyne oscillator coils. These

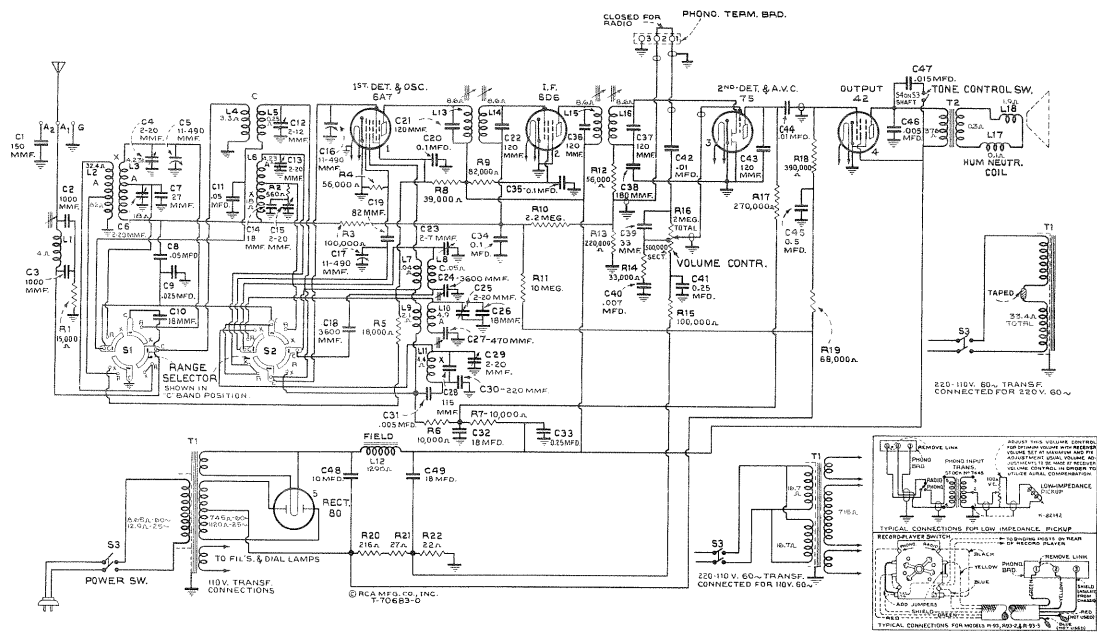


Figure 1—Schematic Wiring Diagram

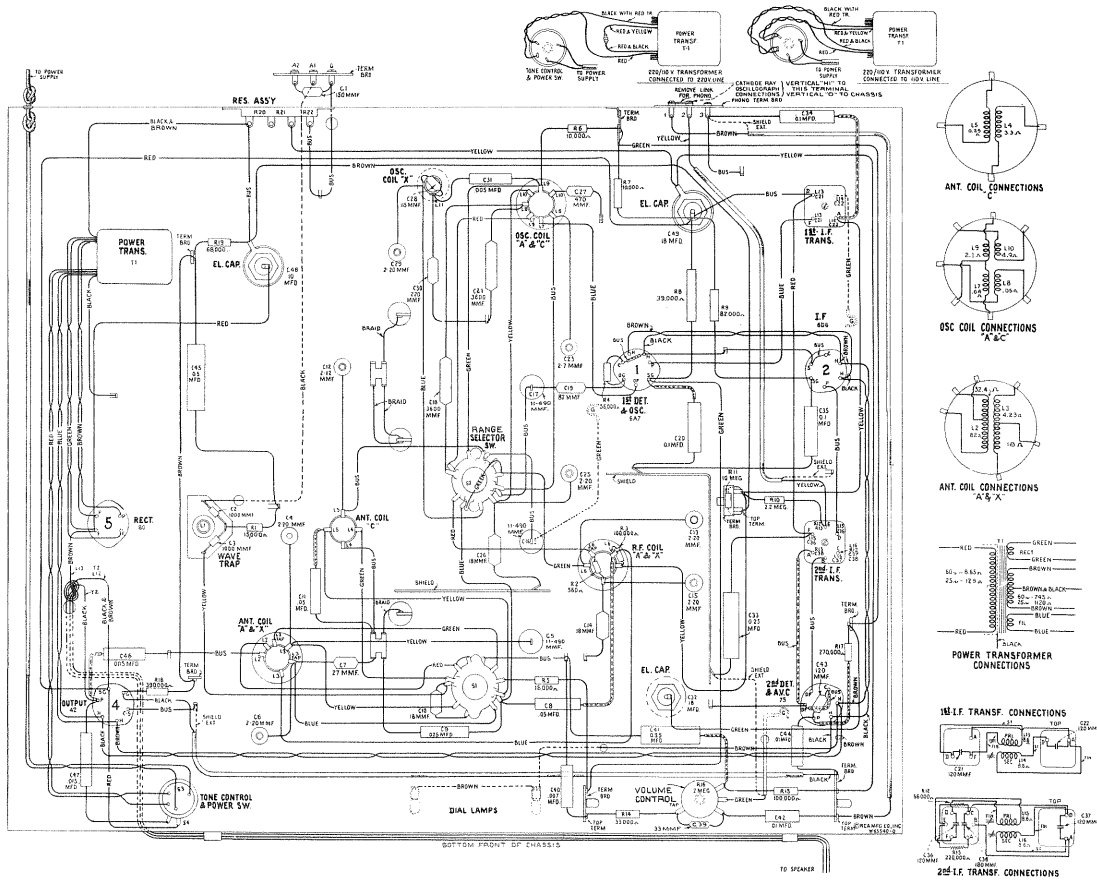


Figure 2—Chassis Wiring Diagram

coils are shunted by improved plunger-type, air-dielectric, adjustable trimming capacitors, for obtaining exact alignment.

The intermediate frequency stage is coupled to the RCA-6A7 and to the RCA-75 by means of tuned transformers. These transformers resonate with fixed capacitors and are adjusted by molded magnetite cores to tune to 460 kc.

The modulated signal as obtained from the output of the i-f system is detected by one of the diodes of the RCA-75 tube. Audio frequency secured by this process is passed on to the control grid of this same tube for amplification before 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 R13, is applied as auto-

matic control grid bias to the first-detector and i-f tubes through a suitable resistance filter.

Manual volume control is effected 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-75, the audio signal is transmitted by resistance-capacitance coupling to the input of the RCA-42 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 S4.

The power supply system consists of an RCA-80 rectifier tube, power transformer, and filter.

SERVICE DATA

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if 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 L1, C1, R1,

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.

A test oscillator, 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 Stock No. 4317 Neon Output Indicator.

The procedure outlined below should be followed in adjusting the various trimmer capacitors and molded cores:

I-F Adjustments

The four adjustment screws (attached to molded magnetite cores) of the two i-f transformers (one on top and one on bottom of each i-f transformer) are located as shown by figures 3 and 6. Each circuit must be aligned to a basic frequency of 460 kc. To do this, attach the output indicator across the loud-speaker voice coil.

Connect the "Ant" output of the test oscillator to the control grid of the RCA-6A7 through a .001 mfd. capacitor. Connect the test oscillator "Gnd" terminal to the ground terminal of the receiver chassis. 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 from local broadcast stations or from the local (heterodyne) oscillator. To eliminate signals from the local oscillator short stator of C17 to chassis-ground. Increase the output of the test oscillator until a slight indication is present on the output indicator. Adjust the two magnetite core screws of the second i-f transformer L16 and L15 to produce maximum (peak) indicated receiver output. Then adjust the two magnetite core screws L14 and L13 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 magnetite core screws to assure

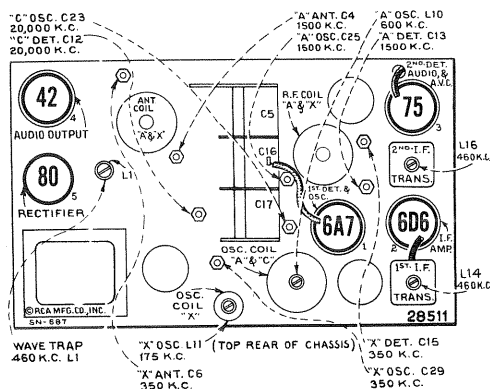


Figure 3—Radiotron, Coil, and Trimmer Locations

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. Ratings of less than one ohm are generally omitted.

Alignment Procedure

There are ten alignment trimmers provided in the antenna transformer, detector, and oscillator coil tuned circuits. The i-f transformer, low-frequency oscillator, and wave-trap adjustments are made by means of screws attached to molded magnetite cores. All of these circuits have been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions or altered during servicing. 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

that the interaction between them has not disturbed the original adjustment. Remove temporary jumper, stator C17 to chassis-ground if used.

R-F Adjustments

Calibrate the tuning dial by adjusting the scale pointer to the extreme right-hand end calibration mark, on any scale, while the three-gang tuning condenser plates are in full mesh.

Wave-Trap Adjustment

Attach the "Ant" output of the test oscillator to the receiver "A1" terminal through a 200 mmfd. (important) capacitor. The ground connections remain connected together. Leave the test oscillator adjusted to 460 kc. Adjust range selector to band "A" position. Then adjust the wave-trap screw to the point which causes maximum suppression (minimum output) of the 460 kc signal.

"C" Band

- Attach the "Ant" output of the test oscillator to the receiver "A1" terminal through a 300-ohm resistor, leaving the "Gnd" of the oscillator connected to the receiver chassis. Adjust range selector to band "C" position. Set receiver dial pointer to 20,000 kc (20 on scale).
- Tune test oscillator to 20,000 kc. Set oscillator trimmer C23 to minimum capacity (plunger full out), and detector trimmer C12 to maximum capacity (plunger full in). Slowly push in oscillator trimmer C23 until maximum (peak) output is reached. Two peaks may be found. Adjust

C23 to the peak with minimum capacity (plunger near out) for maximum indication. Tighten lock nut. Slowly pull out plunger of detector trimmer C12 until maximum (peak) indicated output is reached while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacity (plunger near in) should be used. Tighten lock nut.

"A" Band

- Attach the "Ant" output of the test oscillator to the receiver "A1" terminal through a 200 mmfd. capacitor, leaving the "Gnd" of the oscillator connected to the receiver chassis. Adjust range selector to band "A" position. Reduce output of test oscillator to a minimum. Tune the test oscillator to 600 kc and set receiver dial pointer to 600 kc (500 meters). Adjust output of test oscillator until a slight indication of output is visible.
- Adjust the oscillator magnetite core screw L10 (top of oscillator coil) so that maximum (peak) indicated output results.
- Set receiver dial pointer to 1,500 kc (200 meters). Tune the test oscillator to 1,500 kc. Carefully adjust the oscillator, detector, and antenna trimmers C25, C13 and C4 respectively so that each brings about maximum (peak) indicated output.
- Tune the test oscillator to 600 kc. Adjust the receiver to pick up this signal disregarding the dial reading at which it is best received. Adjust

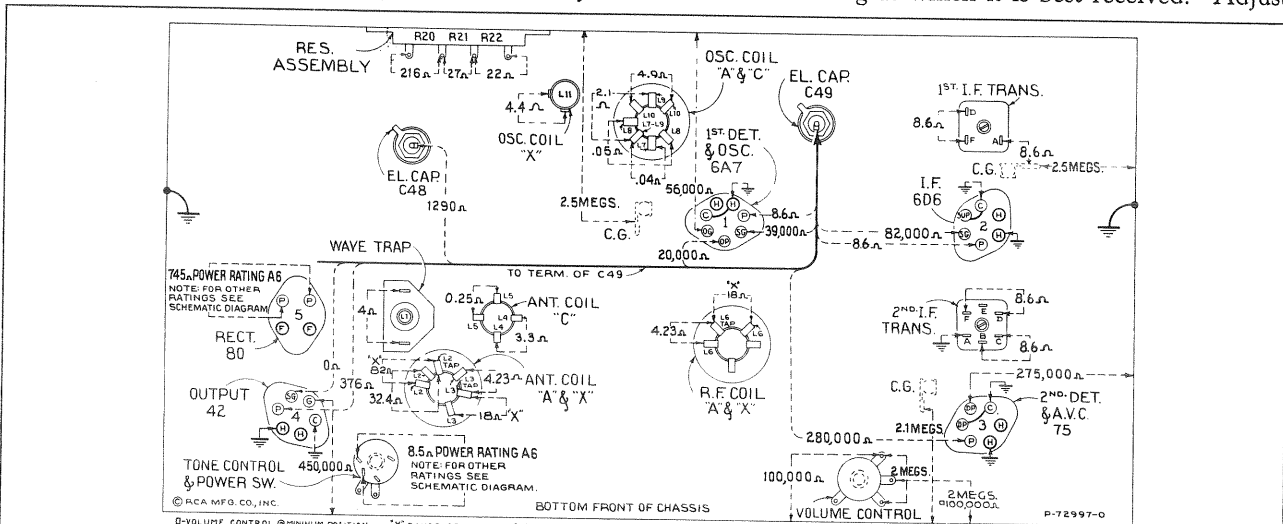


Figure 4—Resistance Diagram

Power supply disconnected—Radiotrons in sockets—Tuning condenser in full mesh—
Volume control maximum—Range selector in "A" position

Resistance Measurements

The resistance values shown between Radiotron socket contacts, grid caps, resistors, and terminals to receiver chassis-ground or other pertinent point on figure 4, permit a rapid continuity check of the circuits. The use of this diagram in conjunction with the Schematic Circuit Diagram, figure 1, and Wiring Diagram, figure 2, will permit the location of certain troubles which might otherwise be difficult to ascertain. Each value as specified should hold within

± 20%. Variations in excess of this limit will usually be indicative of trouble in circuit under test. When measuring the resistance between points of the circuit and ground, it will be necessary to connect the negative terminal of the resistance meter to chassis-ground. If the polarity of the resistance meter is not known, it may be readily ascertained by connecting a d-c voltmeter of indicated polarity across the terminals of the device.

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					
12806	Board—Antenna and ground terminal board	\$0.25	5145	Resistor—100,000 ohms, carbon type, ¼ watt—Package of 5 (R3, R15)	\$1.00
12717	Board—Phonograph terminal board	.22	11398	Resistor—220,000 ohms, carbon type, 1/10 watt—Package of 5 (R13)	.75
5237	Bushing—Variable condenser mounting bushing assembly—Package of 3	.43	12199	Resistor—270,000 ohms, insulated, ¼ watt—Package of 5 (R17)	1.00
12118	Cap—Grid contact cap—Package of 5	.15	11847	Resistor—390,000 ohms, carbon type, ¼ watt—Package of 5 (R19)	1.00
12722	Capacitor—15 Mmfd. (C10, C14, C26)	.20	11626	Resistor—2.2 meg., carbon type, ¼ watt—Package of 5 (R10)	1.00
13605	Capacitor—27 Mmfd. (C7)	.25	13601	Resistor—10 meg., insulated, ¼ watt—Package of 5 (R11)	1.00
12948	Capacitor—33 Mmfd. (C39)	.20	12004	Resistor—Voltage divider resistor, comprising one 216-ohm, one 27-ohm and one 22-ohm sections (R20, R20, R22)	.45
12813	Capacitor—82 Mmfd. (C19)	.20	12008	Shield—First or second I. F. transformer shield	.28
13604	Capacitor—115 Mmfd. (C28)	.25	12607	Shield—First I. F. transformer shield top	.30
12724	Capacitor—120 Mmfd. (C43)	.28	12581	Shield—Second I. F. transformer shield top	.36
12404	Capacitor—120 Mmfd. (C21, C22, C36, C37)	.26	4233	Shield—6D6 Radiotron shield	.22
12725	Capacitor—150 Mmfd. (C1)	.28	3682	Shield—6A7 or 75 Radiotron shield	.22
12406	Capacitor—180 Mmfd. (C38)	.26	11383	Shield—42 Radiotron shield	.20
13602	Capacitor—220 Mmfd. (C30)	.25	13591	Shield—Chassis bottom shield and mounting foot assembly	1.30
13603	Capacitor—470 Mmfd. (C27)	.25	12710	Shield—Coil shield for Stock Nos. 13587 and 13588	.28
13593	Capacitor—1,000 Mmfd. (C2, C3)	.25	12799	Shield—Coil shield for Stock No. 12798	.15
12811	Capacitor—3,600 Mmfd. (C18, C24)	.35	12883	Shield—Coil shield for Stock No. 13590	.20
4868	Capacitor—.005 Mfd. (C31)	.20	4794	Socket—4-contact 80 Radiotron socket	.15
4838	Capacitor—.005 Mfd. (C46)	.20	4786	Socket—6-contact 6D6, 42 or 75 Radiotron socket	.15
5148	Capacitor—.007 Mfd. (C40)	.28	4787	Socket—7-contact 6A7 Radiotron socket	.15
13138	Capacitor—.01 Mfd. (C42)	.25	11199	Socket—Dial lamp socket	.14
4858	Capacitor—.01 Mfd. (C44)	.28	12007	Spring—Retaining spring for core, Stock Nos. 12006, 12800, 12882, 12664—Package of 10	.36
11315	Capacitor—.015 Mfd. (C47)	.20	13585	Switch—Range switch (S1, S2)	2.15
13606	Capacitor—.025 Mfd. (C9)	.20	13586	Switch—Tone control and power switch (S3, S4)	1.20
13607	Capacitor—.05 Mfd. (C8)	.20	12652	Transformer—First I. F. transformer (L13, L14, C21, C22)	1.60
4836	Capacitor—.05 Mfd. (C11)	.30	13392	Transformer—Power transformer, 100-120 volts, 50-60 cycles (T1)	4.95
4841	Capacitor—.01 Mfd. (C20, C34, C35)	.22	13566	Transformer—Power transformer, 100-120 volts, 25-50 cycles (T1)	4.08
4840	Capacitor—.025 Mfd. (C41)	.25	13393	Transformer—Power transformer, 110 and 220 volts, 50-60 cycles (T1)	4.95
5170	Capacitor—.025 Mfd. (C33)	.30	12653	Transformer—Second I. F. transformer (L15, L16, C36, C37, C38, R12, R13)	2.06
12741	Capacitor—.05 Mfd. (C45)	.30	13592	Trap—Wave-trap complete (L1, C2, C3, R1)	1.60
11240	Capacitor—10 Mfd. (C48)	1.08	13144	Volume control (R16)	1.00
5212	Capacitor—18 Mfd. (C32, C49)	1.16	REPRODUCER ASSEMBLIES		
12807	Capacitor—Trimmer capacitor (C23)	.35	12641	Board—3-contact reproducer terminal board	.15
12714	Capacitor—Trimmer capacitor (C12)	.38	12640	Bracket—Output transformer mounting bracket	.18
12884	Capacitor—Trimmer capacitor (C4, C6, C13, C15, C25, C29)	.40	12012	Coil—Field coil (L12)	1.85
13587	Coil—Antenna coil and shield, X and A bands (L2, L3)	2.00	11469	Coil—Neutralizing coil (L17)	.20
13589	Coil—Antenna coil, C band (L4, L5)	.55	12642	Cone—Reproducer cone and dust cap (L18)	.94
12798	Coil—Oscillator coil and shield, A and C bands (L7, L8, L9, L10)	1.65	5118	Connector—3-contact male speaker cable connector	.25
13590	Coil—Oscillator coil and shield, X band (L11)	.95	9699	Reproducer—Reproducer complete	6.38
13588	Coil—R. F. coil and shield, X and A bands (L6)	1.45	11253	Transformer—Output transformer (T2)	1.56
13584	Condenser—3-gang variable tuning condenser (C5, C16, C17)	5.65	11886	Washer—Spring washer to hold field coil securely—Package of 5	.20
5119	Connector—3-contact female speaker cable connector	.25	MISCELLANEOUS ASSEMBLIES		
11979	Connector—2-contact male connector for power cable, mounts on back of cabinet	.30	11824	Connector—2-contact female power cord connector	.34
12006	Core—Adjustable core and stud for I. F. transformer, Stock Nos. 12652 and 12653	.22	11823	Cord—Power cord and connector assembly	.65
12800	Core—Adjustable core and stud for Stock No. 12798	.20	12698	Escutcheon—Station selector escutcheon and crystal	1.02
12882	Core—Adjustable core and stud for Stock No. 13590	.20	12699	Knob—Large station selector knob—Package of 5	.68
12664	Core—Adjustable core and stud for wave-trap, Stock No. 13592	.22	12700	Knob—Small (vernier) station selector knob—Package of 5	.58
13595	Dial—Station selector dial and mounting bracket assembly	1.00	11582	Knob—Range switch knob—Package of 5	.50
12702	Drive—Vernier drive and pinion gear for variable condenser	.68	11347	Knob—Volume control or tone control and power switch knob—Package of 5	.75
12712	Indicator—Station selector indicator pointer	.22	11210	Screw—Chassis mounting screw assembly, comprising one screw, one washer and one lockwasher—Package of 4	.28
5226	Lamp—Dial lamp—Package of 5	.70	11349	Spring—Retaining spring for knob, Stock Nos. 11347, 11582, 12700—Package of 5	.25
11324	Resistor—560 ohms, carbon type, ¼ watt—Package of 5 (R2)	1.00	4982	Spring—Retaining spring for knob, Stock No. 12699—Package of 10	.50
3078	Resistor—10,000 ohms, carbon type, ½ watt—Package of 5 (R6, R7)	1.00			
13594	Resistor—15,000 ohms, carbon type, 1/10 watt—Package of 5 (R1)	.75			
3219	Resistor—18,000 ohms, carbon type, ½ watt—Package of 5 (R5)	1.00			
11364	Resistor—33,000 ohms, carbon type, ¼ watt—Package of 5 (R14)	1.00			
13206	Resistor—39,000 ohms, carbon type, 2 watts (R8)	.30			
5029	Resistor—56,000 ohms, carbon type, ¼ watt—Package of 5 (R4)	1.00			
11282	Resistor—56,000 ohms, carbon type, 1/10 watt—Package of 5 (R12)	.75			
12333	Resistor—68,000 ohms, carbon type, ¼ watt—Package of 5 (R19)	1.00			
8064	Resistor—82,000 ohms, carbon type, ½ watt—Package of 5 (R9)	1.00			

First Edition

Prices quoted above are subject to change without notice.