

# Instructions for RCA Victor 261

## Ten-Tube Double-Range Superheterodyne Console

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### INTRODUCTION

Excellent performance, including splendid voice and musical reproduction, characterizes this distinctive console radio receiver. In addition to a refined superheterodyne circuit, this instrument embodies such features as aural (automatic tone) compensation, automatic volume control, silent-tuning control and a push-pull power output stage using two pentode RCA-2A5 Radiotrons. Its tuning range is from 540 to 2800 kilocycles, permitting reception of municipal and state police calls together with amateur and other phone communications as a diversion from standard broadcast entertainment (540-1500 kc).

Aural compensation tends to maintain throughout the entire volume range the correct balance between the various tones of the musical scale,

thereby insuring pleasing reproduction at any desired volume setting. This effect is achieved electrically, the volume control circuit serving to introduce compensation for variations in the sensitivity of the human ear throughout its frequency range. The automatic volume control built into this instrument minimizes fading effects and prevents "blasting" when the receiver is being tuned to or past a local or powerful station.

In addition to the foregoing features, this instrument may be adjusted for quiet tuning between station settings. While the intensity of background noise (static) is subject to wide variation because of local atmospheric influences, reproduction of that noise when tuning the receiver can be prevented by proper initial adjustment of the silent-tuning control.

### INSTALLATION

**Preliminary**—Remove the internal packing material used to protect the tubes during shipment, then refer to the chassis diagram (printed on rating label attached to rear of receiver) and *make certain*:

- (a) That all tubes are in the proper sockets and pressed down firmly. *Never apply power to the instrument unless all tubes are in place.*
- (b) That all shields are rigidly in place over the tubes represented by double circles on the diagram.
- (c) That the spring connectors of the short flexible (grid) leads, shown on the diagram, are securely attached to the dome terminals of the proper tubes. It is important that the adjacent green and black leads shall be connected as indicated—that is, not reversed.
- (d) That the lid is securely in place on the shield of that RCA-58 Radiotron designated by the heavy circle on the diagram.

**Location**—The instrument should be placed convenient to the antenna and ground connections and to an electrical outlet.

**Antenna and Ground**—An outdoor antenna of maximum convenient height and having a length of from 25 to 75 feet, including the lead-in and ground wiring, is recommended. The antenna should be well insulated from all objects and should run

neither close nor parallel to electric circuits inside or outside the building. While an indoor antenna of short or medium length should provide generally satisfactory reception, best results will be obtained with a properly erected outdoor antenna. The latter is essential when the receiver is installed in a building of metallic construction and should prove advantageous in localities remote from broadcasting stations.

A *good* ground connection is necessary for best performance of this receiver. The ground lead should be as short as possible and preferably attached to a cold-water pipe. The pipe should be scraped clean and an approved ground clamp used to insure a tight and permanent connection.

A terminal board, located on the receiver chassis at the rear, is provided for connection to the antenna and ground. Attach the antenna lead to the left-hand terminal (marked "ANT") and the ground lead to the right-hand terminal (marked "GND"). Tighten the terminals securely with a screw-driver.

**Power Supply**—Connect the power cord to an electrical outlet supplying alternating current at the voltage and frequency (cycles) specified on the rating label.

## OPERATION

The operating controls are shown in Figure 1. Proceed as follows:

1. Set the Frequency Range Switch as indicated below for reception in either band:

- (a) *Counter-clockwise*—540–1500 kilocycles (broadcast band). Using the large numerals, the dial scale reads directly in kilocycles for this band.
- (b) *Clockwise*—1400–2800 kilocycles. Frequencies in this band are indicated approximately by the positions of the small numerals at the bottom of the dial (add two ciphers to obtain kilocycles). Available services therein include the following:
  - (1) **Police Calls**—Stations operating at 1574 and 1712 kilocycles and between 2400 and 2500 kilocycles.
  - (2) **Amateur Radio "Phone"**—Assigned band 1800–2000 kilocycles.
  - (3) **Aviation Communications "Phone"**—Between 2500 and 2800 kilocycles.

**NOTE**—The majority of stations in this range do not offer continuous programs. Police calls are usually intermittent, at regular or irregular intervals. Strong local stations in the broadcast band may be audible (sometimes at more than one point on the dial) when the Frequency Range Switch is set for 1400–2800 kilocycles.

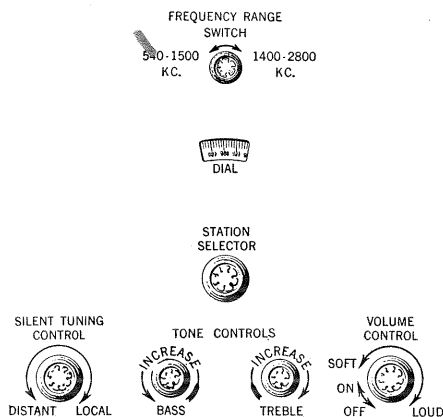


Figure 1

2. Apply power by turning the Volume Control knob clockwise from the "off" position. Set this control near the middle of its range. Wait a few seconds for the tubes to heat before attempting further operation.

3. With the Silent-Tuning Control set in the extreme counter-clockwise position, turn the Station Selector to a point, near the middle of the dial range, at which no station is heard within several scale divisions. Then turn the Silent-Tuning Con-

trol clockwise until the background noise (static) just disappears.

**NOTE**—The adjustment just described provides quiet tuning (that is, *suppression of background noise between station settings*) and permits reception of all stations whose signals are above the existing noise level.

4. Tune the receiver by rotating the Station Selector either at random until a desirable program is heard or in an endeavor to locate any particular station whose assigned frequency is known. In the latter case, turn the selector slowly throughout a narrow range on each side of that dial setting corresponding to the station frequency.

**NOTE**—In the event that any particular station cannot be reached in this manner, its signal intensity probably is below the prevailing level of background noise. If especially desired, however, weak signals often may be received by turning the Silent-Tuning Control gradually counter-clockwise, thus calling upon the reserve sensitivity of the instrument. Under such conditions, background noise reproduction naturally will be appreciably greater.

5. After locating a station, turn the Volume Control counter-clockwise (if necessary), until the sound level is fairly low and then adjust the Station Selector accurately to that position mid-way between the points on the dial at which the program becomes unintelligible or disappears. At this setting only will the fine quality of reproduction provided in this instrument be realized and least background noise interference be obtained.

6. Set the Volume Control for the desired sound level.

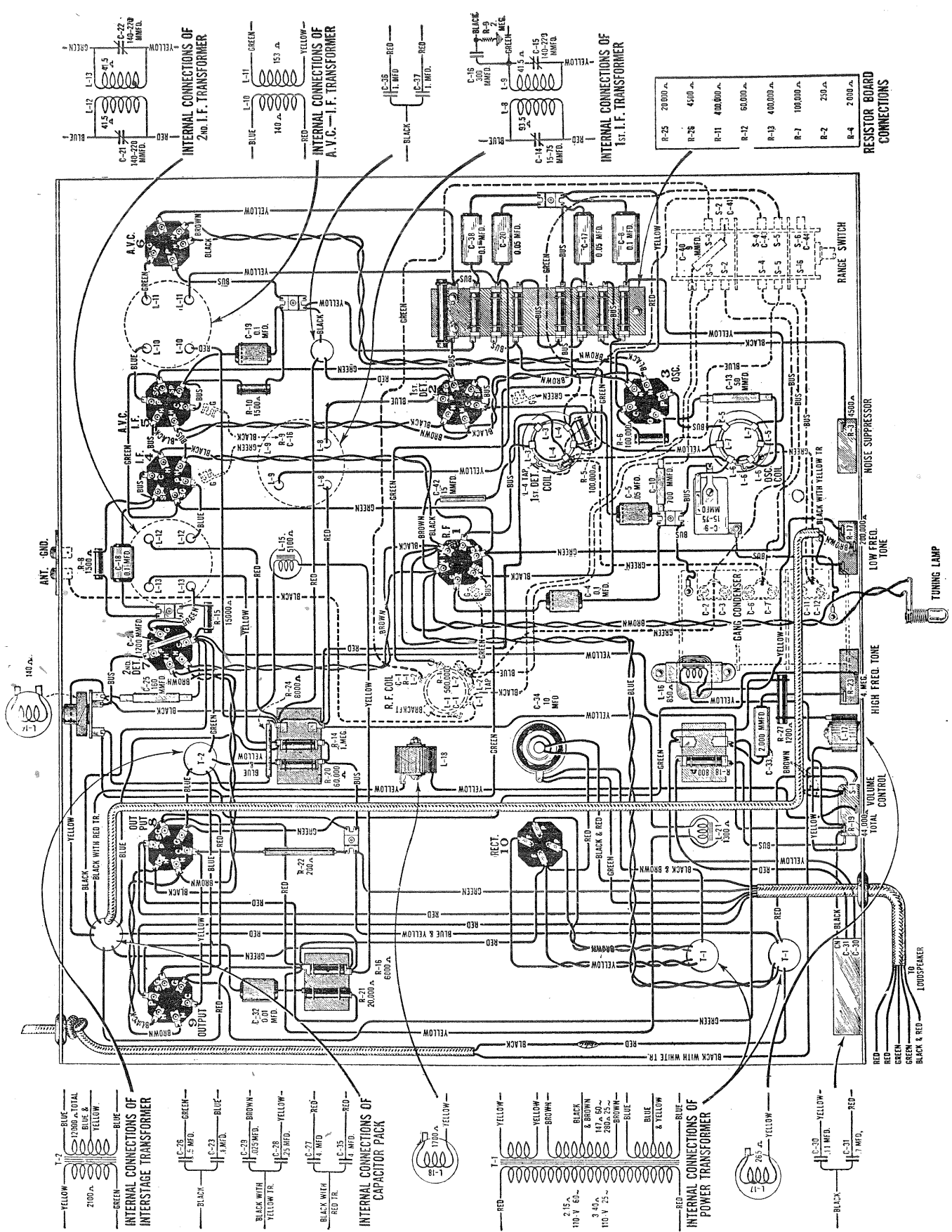
7. Adjust the two Tone Controls to obtain the tone shading preferred. The full range of musical reproduction is obtained with the right-hand knob turned fully clockwise and the left-hand knob turned to its counter-clockwise extremity. Modifications of the tone range may be obtained as follows:

- (a) To reduce the high-frequency (treble) response, or to decrease the background noise (static) interference on station settings, turn the right-hand tone control knob counter-clockwise.
- (b) To reduce the low-frequency (bass) response, or to decrease low-pitched hum present on the signals of some stations, turn the left-hand tone control knob clockwise.

8. When through operating, turn the Volume Control fully counter-clockwise, thus switching the power "off."

**Tubes**—Improved results may sometimes be obtained by interchanging tubes of the same type, either RCA-56 or RCA-58, in their sockets. Spare tubes should be kept on hand.





R-25	20000 Ω
R-26	4500 Ω
R-11	400,000 Ω
R-12	60,000 Ω
R-13	400,000 Ω
R-7	100,000 Ω
R-2	250 Ω
R-4	2,000 Ω

Figure B—Wiring Diagram

# SERVICE DATA

## Electrical Specifications

Voltage Rating.....	105-125 Volts
Power Consumption.....	120 Watts
Type and Number of Radiotrons.....	3 RCA-56, 4 RCA-58, 1 RCA-80, 2 RCA-2A5—Total, 10
Frequency Range.....	540 K. C.—1500 K. C. 1400 K. C.—2800 K. C.
Undistorted Output.....	4.0 Watts

This receiver is a ten-tube Superheterodyne radio receiver. Features such as improved automatic volume control, noise suppressor, compensated volume control, heater pentode output tubes operated as a push-pull stage and the inherent sensitivity, selectivity and tone quality of the Superheterodyne are included in this instrument.

A special feature is the Range Switch that allows reception of signals either of the broadcast band or higher frequencies. With the switch in the broadcast band position, the frequency range is from 540 to 1500 K. C. At the higher frequency position, the receiver covers the 1400 to 2800 K. C. band.

Figure A shows the schematic circuit, Figure B the wiring diagram, Figure C the location of the adjustable capacitors, and Figure D the loudspeaker wiring. The Radiotron socket voltages, the line-up procedure and the replacement parts are given on the following pages.

## R. F. and Oscillator Line-up Capacitor Adjustments

Four adjustable capacitors are provided for aligning the R. F. circuits and adjusting the oscillator frequency so that the oscillator will maintain a constant frequency—175 K. C.—difference from that of the incoming signal. Poor quality, insensitivity, poor A. V. C. action and possible inoperation of the receiver may be caused by these capacitors being out of adjustment.

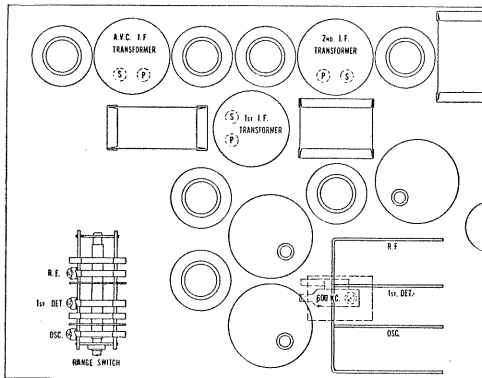


Figure C—Location of Adjustable Capacitors

If the other adjustments have not been tampered with—the intermediate transformer tuning capacitors—the following procedure may be used for aligning these capacitors:

- Procure an R. F. Oscillator such as Stock No. 9050 giving a modulated signal at 600 K. C., 1400 K. C. and 2440 K. C. Also procure a non-metallic screwdriver such as Stock No. 7065.
- An output meter is necessary. This may be a current squared galvanometer connected to the secondary of the output transformer instead of the cone coil, a 0.5 milliammeter connected in series with the plate supply to the second detector or a low range A. C. voltmeter connected across the reproducer unit cone coil.
- A dummy Radiotron RCA-56 is necessary to substitute for the one normally used in the A. V. C. socket. This should be a tube that is otherwise normal in all respects but having one heater prong removed. Insert this tube in the A. V. C. socket.
- First check the chassis and carefully ascertain that the dial pointer reads exactly at the first line on the scale when the tuning capacitor rotor plates are fully meshed with the stator plates.
- Place the oscillator in operation at exactly 1400 K. C. and couple its output to the antenna. Set the Range Switch counter-clockwise and the dial scale at exactly 1400. Connect the output meter to the set and place the volume control and suppressor control,

if noise level will permit, at its maximum position. Adjust the oscillator input so that an excessive reading on the output meter is not obtained.

- With a suitable socket wrench—the nuts are at ground potential—adjust the oscillator, first detector and R. F. line-up capacitors, until a maximum deflection is obtained in the output meter.
- The high frequency band is adjusted at 2440 K. C. This is done in a similar manner to the R. F. adjustments except that the oscillator is set at 2440 K. C., the dial at 1200 and the Range Switch in the clock-wise position. The line-up capacitors on the selector switch are adjusted for maximum output at this frequency.
- Set the oscillator at 600 K. C. Tune in the signal with the receiver until a maximum deflection is obtained in the output meter. Now adjust the 600 K. C. series capacitor, Figure C, until a maximum deflection is obtained in the output meter. Rock the tuning capacitor back and forth while making this adjustment, as the tuning capacitor and oscillator series capacitor adjustments interlock.
- Change the frequency of the oscillator to 1400 K. C. and set the dial at 1400. Again make the adjustments given under (f), (g) and then (h).

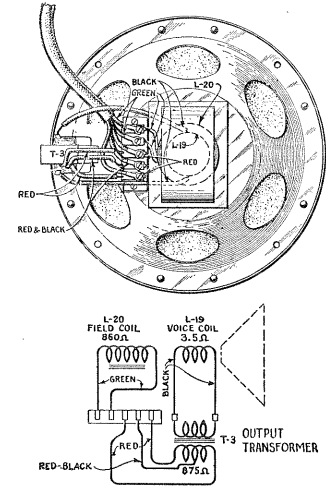


Figure D—Loudspeaker Wiring

So adjusted, the R. F. circuits are properly aligned and the oscillator will maintain a constant frequency difference from the incoming R. F. signal.

## I. F. Tuning Capacitor Adjustments

Although this receiver has two I. F. stages, one for the second detector and one for the A. V. C., only two of the three I. F. transformers are tuned by adjustable capacitors and require adjustment. The stage used for the A. V. C. is broadly tuned and does not require any adjustment.

The transformers are all tuned to 175 K. C. and the circuits broadly peaked.

A detailed procedure for making this adjustment follows:

- Procure a modulated R. F. Oscillator that gives a modulated 175 K. C. signal. Also procure a non-metallic screwdriver such as Stock No. 7065.
- An output meter is necessary. This may be a current squared galvanometer connected to the secondary of the output transformer instead of the cone coil, a 0.5 milliammeter connected in series with the plate supply to the second detector or a low range A. C. voltmeter connected across the reproducer unit cone coil.
- A dummy Radiotron RCA-56 is necessary to substitute for the one normally used in the A. V. C. socket.
- Remove the oscillator tube and make a good ground connection to the chassis. Place the oscillator in operation and couple its output from the control grid of the first detector to ground. Adjust the oscillator output, with the receiver volume control at maximum, until a deflection is obtained in the output meter.
- Refer to Figure C. Adjust the secondary and primary of the second and then the first I. F. transformer until a maximum deflection is obtained in the output meter. Go through these adjustments a second time, as a slight readjustment may be necessary.

When the adjustments are made the set should perform at its maximum efficiency. However, due to the interlocking of adjustments, it is good practice to follow the I. F. adjustments with the R. F. and oscillator line-up capacitor adjustments. The correct method of doing this is given in the preceding section.

## RADIOTRON SOCKET VOLTAGES

120 Volt, A. C.—No signal being received—Volume Control at minimum

Radiotron No.	Cathode to Control Grid Volts, D. C.	Cathode or Filament to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts, D. C.	Plate Current, M. A.	Heater or Filament Volts, A. C.
1. R. F.	3.0	100	230	7.0	2.4
2. 1st Detector	8.0	95	220	2.5	2.4
3. Oscillator	—	—	105	6.0	2.4
4. I. F.	7.5	100	225	2.5	2.4
5. A. V. C.—I. F.	7.5	100	225	2.5	2.4
6. A. V. C.	20.0	—	0	—	2.4
7. 2nd Detector	17.0	—	250	1.2	2.4
8. Power	18.0	255	245	33.0	2.4
9. Power	18.0	255	245	33.0	2.4

# 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
<b>RECEIVER ASSEMBLIES</b>					
3024	Capacitor—9 mmfd. (C40)—Package of 2 . . .	\$0.50	6323	Shaft—Three gang variable tuning condenser drive shaft—Comprising 1 shaft, 2 "C" washers and 2 flat washers—Package of 2.	\$0.20
3047	Resistor—1,500 ohms—Carbon type— $\frac{1}{2}$ watt (R8, R10)—Package of 5 . . . . .	1.00	6429	Capacitor pack—Comprising one 0.11 mfd. and one 0.7 mfd. capacitor in metal container (C30, C31) . . . . .	.98
3076	Resistor—1 megohm—Carbon type— $\frac{1}{2}$ watt (R14)—Package of 5 . . . . .	1.00	6430	Capacitor pack—Comprising two 4.0 mmfd., one 0.25, one 0.025, one 0.1, and one 0.5 mfd. capacitors in metal container (C23, C26, C27, C28, C29, C35) . . . . .	3.78
3252	Resistor—100,000 ohms—Carbon type— $\frac{1}{2}$ watt (R5, R6, R7)—Package of 5 . . . . .	1.00	6431	Reactor—Filter reactor (L21) . . . . .	1.92
3435	Resistor—250 ohms—Carbon type— $\frac{1}{2}$ watt (R2)—Package of 5 . . . . .	1.00	6432	Transformer—Interstage audio transformer (T2) . . . . .	3.69
3455	Capacitor—0.01 mfd. capacitor (C32) . . . . .	.44	6434	Reactor—Second detector plate coupling reactor (L15) . . . . .	1.96
3460	Capacitor—1,200 mmfd. (C24) . . . . .	.30	6435	Transformer—First intermediate frequency transformer (L8, L9, C14, C15, C16, R9) . . . . .	2.54
3513	Capacitor—700 mmfd. (C10) . . . . .	.48	6436	Reactor—High frequency tone control compensating reactor (L17) . . . . .	.70
3526	Resistor—2,000 ohms—Carbon type— $\frac{1}{2}$ watt (R4)—Package of 5 . . . . .	1.00	6437	Coil—Oscillator coil assembly (L5, L6, L7) . . . . .	1.24
3527	Resistor—800 ohms—Carbon type— $\frac{1}{2}$ watt (R18)—Package of 5 . . . . .	1.00	6439	Reactor—High frequency tone control reactor (L16) . . . . .	1.14
3530	Coil—Second detector plate choke coil (L14) . . . . .	.72	6440	Transformer—Second intermediate frequency transformer (L2, L3, C21, C22) . . . . .	1.94
3551	Screw assembly—Chassis mounting washer and screw assembly—Comprising 4 screws, 4 lock washers, 4 washers, 8 cushions and 4 spacers . . . . .	.68	6441	Transformer—Third intermediate frequency transformer (L10, L11) . . . . .	1.76
3552	Resistor—200 ohms—Porcelain type—20 watts (R22) . . . . .	.80	6442	Reactor—Volume control series reactor (L18) . . . . .	.88
3553	Resistor—8,000 ohms—Porcelain type—20 watts (R24) . . . . .	.80	6443	Capacitor—10 mmfd. (C34) . . . . .	1.50
3554	Resistor—1,200 ohms—Carbon type— $\frac{1}{2}$ watt (R27)—Package of 5 . . . . .	1.00	6447	Volume control—Complete with mounting nut (R19) . . . . .	1.92
3556	Capacitor—0.05 mfd. capacitor (C1, C5, C17, C20) . . . . .	.34	6448	Tone control—Low frequency tone control complete with mounting nut (R17) . . . . .	1.04
3557	Capacitor—0.002 mfd. capacitor (C33) . . . . .	.30	6449	Tone control—High frequency tone control complete with mounting nut (R23) . . . . .	1.06
3558	Capacitor—50 mmfd. capacitor (C13) . . . . .	.36	6450	Rheostat—Noise suppressor rheostat (R3) . . . . .	1.24
3564	Bracket—Station selector dial lamp mounting bracket . . . . .	.25	6537	Switch—Range switch (S2, S3, S4, S5, S6, C41, C43, C44) . . . . .	1.30
3565	Socket—Dial lamp socket . . . . .	.50	6538	Coil—Antenna coil (L1, L2, R1, C1) . . . . .	1.80
3598	Capacitor—0.1 mmfd. (C4, C8, C18, C19, C38) . . . . .	.36	6539	Coil—Detector coil (L3, L4) . . . . .	1.44
3726	Arm—Range switch operating arm assembly—Comprising arm, link, studs and set screws . . . . .	.45	6541	Scale—Dial and dial scale . . . . .	.75
3747	Capacitor—15 mmfd. (C42) . . . . .	.36	6785	Cable—Braid covered—Five conductor reproducer cable . . . . .	.80
3900	Resistor—2,600 ohms—Carbon type— $\frac{1}{2}$ watt (R26)—Package of 5 . . . . .	1.00	6786	Condenser—3-gang variable tuning condenser assembly (C2, C3, C6, C7, C11, C12) . . . . .	7.12
4022	Shaft—Shaft and bushing assembly for range switch operating arm—Comprising two washers, shaft, bushing and nut . . . . .	.54	7062	Capacitor—Adjustable trimming capacitor—15 to 70 mmfd. (C9) . . . . .	.50
4023	Escutcheon—Station selector escutcheon . . . . .	.42	7439	Drum—Dial drum with set screws and three dial mounting nuts . . . . .	.35
4080	Knob—Range switch knob—Package of 5 . . . . .	.75	7484	Socket—Five contact Radiotron socket . . . . .	.35
4081	Knob—Volume control or noise suppressor knob—Package of 5 . . . . .	1.08	7485	Socket—Six contact Radiotron socket . . . . .	.40
4082	Knob—High or low frequency tone control knob—Package of 5 . . . . .	1.08	7487	Shield—Radiotron tube shield . . . . .	.25
4160	Trimmer adjustment wrench and screw-driver . . . . .	1.00	7488	Shield—Tube shield top . . . . .	.20
6114	Resistor—20,000 ohms—Carbon type—1 watt (R21, R25)—Package of 5 . . . . .	1.10	8978	Transformer—Power transformer—105-120 volts—50-60 cycles (T1) . . . . .	8.50
6142	Resistor—6,000 ohms—Carbon type— $\frac{1}{2}$ watt (R16)—Package of 5 . . . . .	1.00	8979	Transformer—Power transformer—105-120 volts—25-40 cycles . . . . .	12.88
6186	Resistor—500,000 ohms—Carbon type— $\frac{1}{4}$ watt (R1)—Package of 5 . . . . .	1.00	8980	Transformer—Power transformer—210-240 volts—50-60 cycles . . . . .	9.36
6192	Spring—Three gang tuning condenser drive cord tension spring—Package of 10 . . . . .	.30	8982	Capacitor pack—Comprising two 1.0 mfd. capacitors in metal container . . . . .	1.44
6242	Resistor—2 megohm—Carbon type— $\frac{1}{4}$ watt (R9)—Package of 5 . . . . .	1.00	9050	Oscillator—Test oscillator—150-25,000 K. C. . . . .	29.50†
6279	Resistor—15,000 ohms—Carbon type— $\frac{1}{2}$ watt (R15)—Package of 5 . . . . .	1.00	<b>REPRODUCER ASSEMBLIES</b>		
6280	Resistor—400,000 ohms—Carbon type— $\frac{1}{2}$ watt (R11, R12, R13)—Package of 5 . . . . .	1.00	6184	Board—Terminal board complete with three terminals—Package of 5 . . . . .	.50
6282	Resistor—60,000 ohms—Carbon type— $\frac{1}{2}$ watt (R20)—Package of 5 . . . . .	1.00	6455	Transformer—Output transformer (T3) . . . . .	1.95
6298	Cord—Three gang tuning condenser drive cord—Package of 5 . . . . .	.60	8920	Ring—Cone retaining ring . . . . .	.35
6300	Socket—Four contact Radiotron socket . . . . .	.35	8969	Cone—Reproducer cone (L19)—Package of 5 . . . . .	6.35
6314	Capacitor—160 mmfd. (C25)—Package of 5 . . . . .	2.00	9425	Coil assembly—Comprising field coil, magnet and cone support (L20) . . . . .	4.94
			9463	Reproducer complete . . . . .	9.42

0761 † Full discount not allowed.

## RCA Victor Company, Inc.

CAMDEN, NEW JERSEY, U. S. A.