

Instructions for RCA Victor 124

Six-Tube Double-Range Superheterodyne

INSTALLATION

Preliminary—After unpacking the instrument, refer to the tube location diagram printed on the license label attached to the cabinet, and *make certain*:

- (a) That all tubes are in the proper sockets and pressed down firmly.
- (b) That all shields are rigidly in place over the tubes shown by double circles on the diagram.
- (c) That the short flexible (grid) leads shown on the diagram are attached to the dome contacts of the proper tubes as indicated, and that the spring contact clips are pressed down firmly.

NOTE—The grid lead for the RCA-2B7 Radiotron must be enclosed by the cylindrical tube shield. A slot is provided at the bottom of this shield for entrance of the lead.

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

Antenna and Ground—A well-insulated outdoor antenna having a length of from 50 to 100 feet, including the lead-in wire, is recommended. It should be erected as high as con-

veniently possible and sufficiently remote from power lines and street railways to prevent excessive local interference. If the instrument is installed in a building of non-metallic construction, an indoor antenna ordinarily will afford satisfactory reception and may be considered the most practical. Buildings in which the roof or framework is of metal, however, form an effective shield which greatly impedes the passage of radio waves; to insure best results in such installations, therefore, an outdoor antenna is essential.

A good ground connection also is essential for best performance. The ground lead should be as short as possible and preferably attached to a cold-water pipe. An approved ground clamp should be used to insure a tight and permanent connection.

A terminal board is provided at the rear of the receiver chassis for connection to the antenna and ground. Attach the antenna wire or lead-in to the left-hand terminal (marked "ANT.") and the ground wire to the right-hand terminal (marked "GND."). Tighten both terminals with a screw-driver to insure permanent electrical connections.

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

OPERATION

Controls—The instrument has four operating controls, located on the front panel of the cabinet as follows:

- (1) **Volume Control** (Left-hand Knob)—Volume increases with clockwise rotation.
- (2) **Power Switch and Tone Control** (Middle Knob)—In extreme counter-clockwise position, power is "off"—slight clockwise rotation turns the power "on." Extreme clockwise position gives *full range* reproduction—counter-clockwise rotation decreases treble response and static interference (when latter is present).
- (3) **Station Selector** (Right-hand Knob—Symmetrical with Volume Control)—Equipped with an illuminated dial, calibrated to facilitate location and identification of stations (add one cipher to scale numerals to obtain frequency in kilocycles).
- (4) **Frequency Range Switch** (Below and to Right of Station Selector)—With this knob in its *counter-clockwise* position, stations in the standard broadcast band (540-1500 kilocycles) will be received, frequencies in this range being indicated by the large numerals adjacent to the scale graduations. With the knob in its *clockwise* position, stations transmitting between 1400 and 2800 kilocycles may be received. Frequencies in the latter range are indicated approximately by the small numerals at the top of the dial and include the following services:
 - (a) **Police Calls**—At dial settings near "170" for stations transmitting at 1712 kilocycles, and slightly above "240" for stations operating in the 2450 kilocycle band.
 - (b) **Amateur Radio "Phone"**—At dial settings between "180" and "200" (assigned band 1800-2000 kilocycles).
 - (c) **Aviation Communications "Phone"**—At dial settings above "240" (2400-2800 kilocycles).

Procedure—To operate the receiver, proceed as follows:

1. Set the Frequency Range Switch for the desired frequency band—see preceding paragraph (4).
2. Apply power by turning the Tone Control knob clockwise from the "off" position; continue rotation of this control to the opposite extremity for *full-range* reproduction. Set the Volume Control near the middle of its range.
3. Allow approximately one-half minute for the tubes to heat, then turn the Station Selector slowly over the range of the dial until a desirable station program is heard. If no station is heard, advance the Volume Control further in a clockwise direction and again rotate the Station Selector.

NOTE—The majority of stations in the 1400-2800 kilocycle band do not offer continuous programs. Police calls are usually intermittent, at regular or irregular intervals. Local or strong stations in the 540-1500 kilocycle 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.

4. After receiving a signal, turn the Volume Control counter-clockwise until the volume is reduced to a low level. Now readjust the Station Selector accurately to the position mid-way between the points where the quality becomes poor or the signal disappears. *This setting minimizes the proportion of background noise and provides the fine quality of reproduction possible with this instrument.*

5. Adjust the Volume Control to the desired volume level.

NOTE—The *automatic volume control* built into this instrument maintains the volume level substantially constant irrespective of normal fluctuations of signal strength (fading). Also, other stations with good signal strength will be received at approximately the same volume without readjustment of the Volume Control.

6. Turn the Tone Control counter-clockwise if reduced treble response is preferred, or if interference (static) is excessive.

7. When through operating, switch the power "off" by turning the Tone Control knob to its extreme counter-clockwise position.

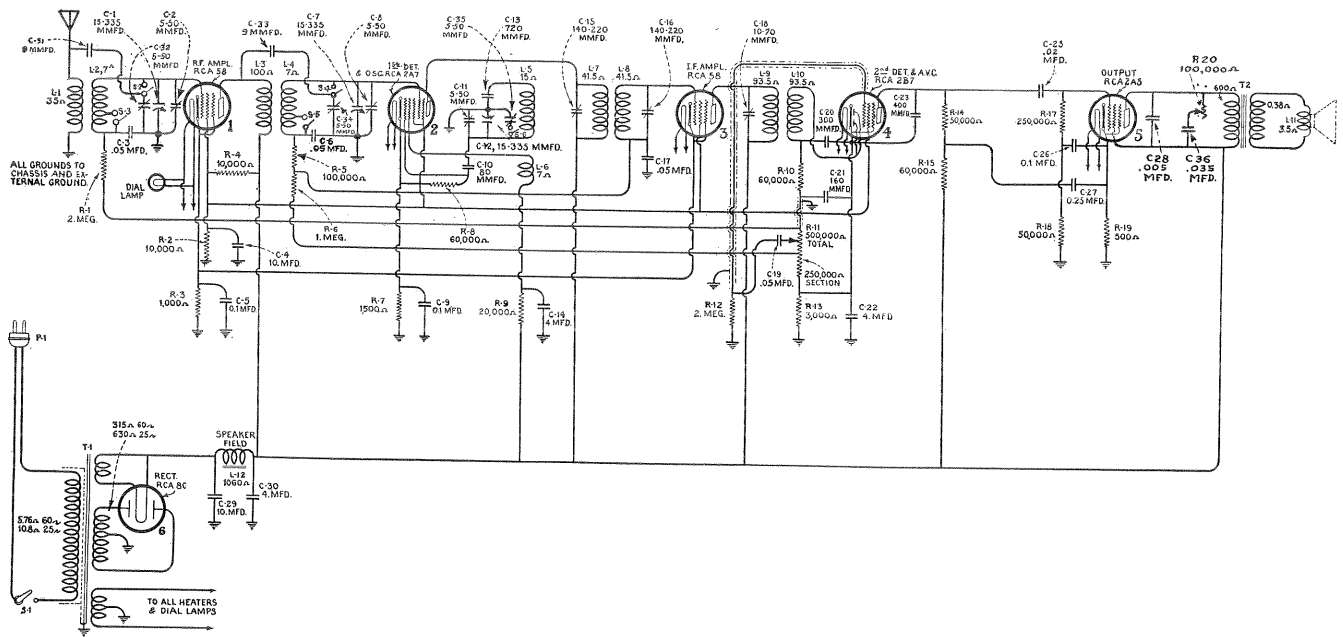


Figure A—Schematic Circuit Diagram

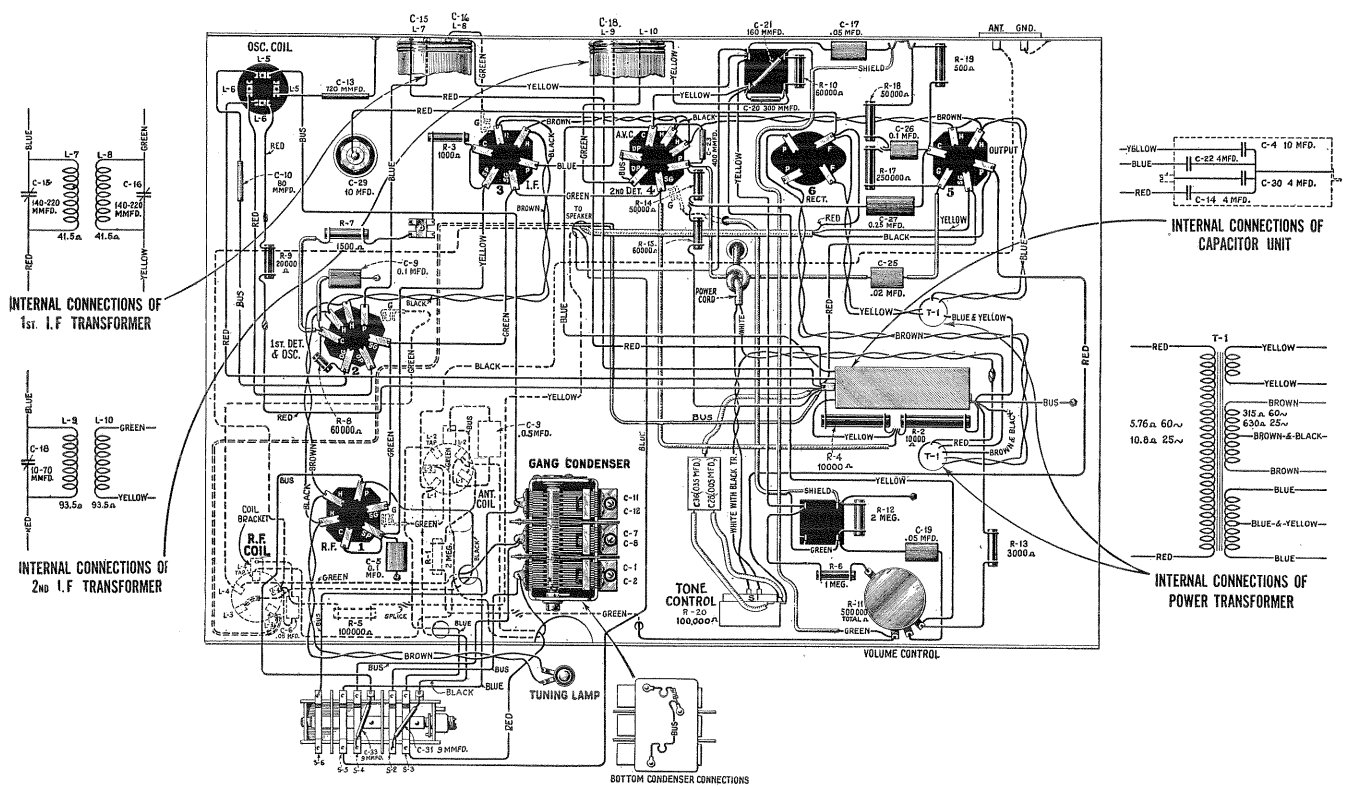


Figure B—Wiring Diagram

SERVICE DATA

ELECTRICAL SPECIFICATIONS

Voltage Rating	105-125 Volts
Frequency Rating	25-60 and 50-60 Cycles
Power Consumption	60 Cycle 75 Watts, 25 Cycle 80 Watts
Number and Types of Radiotrons	2 RCA-58, 1 RCA-2A7, 1 RCA-2B7, 1 RCA-2A5, 1 RCA-80—Total 6
Undistorted Output	1.75 Watts
Frequency Range	540 K. C. to 1500 K. C. and 1400 to 2800 K. C.

This receiver is a six-tube Superheterodyne incorporating features such as Dynamic Loudspeaker, automatic volume control, single heater type Pentode output tube, continuously variable type tone control and the inherent sensitivity, selectivity and tone quality of the Superheterodyne.

A special feature is a Range Switch that allows reception of signals either of the broadcast band or higher frequencies. Figure A shows the schematic circuit, Figure B the wiring diagram and Figure C the loudspeaker wiring. 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.

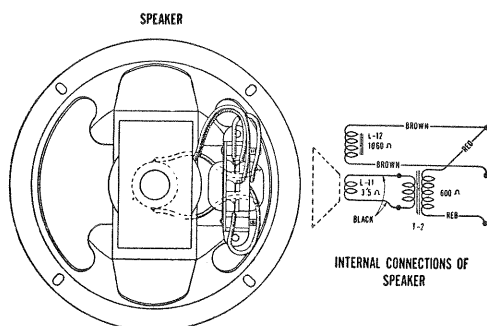


Figure C—Loudspeaker Wiring

The circuit consists of an R. F. stage using Radiotron RCA-58, a combined oscillator and first detector in the RCA-2A7 tube, an intermediate stage using Radiotron RCA-58, an RCA-2B7 functioning a combined second detector and automatic volume control, an output stage using the new heater Pentode RCA-2A5 and the RCA-80 functioning as a rectifier.

Service work in conjunction with this receiver will be similar to that of other Superheterodyne receivers incorporating a similar type automatic volume control.

LINE-UP ADJUSTMENTS

I. F. Tuning Adjustments—Two transformers comprising three tuned circuits (the secondary of the second transformer is untuned) are used in the intermediate amplifier.

These are tuned to 175 K. C. and the adjustment screws are accessible as shown in Figure D. Proceed as follows:

- Procure a modulated oscillator giving a signal at 175 K. C., a non-metallic screw driver such as Stock No. 7065 and an output meter.
- Short-circuit the antenna and ground terminals and tune the receiver so that no signal is heard. Set the volume control at maximum and connect a ground to the chassis.
- Connect the oscillator output between the first detector control grid and chassis ground. Connect the output meter across the voice coil of the loudspeaker and adjust the oscillator output so that with the receiver volume control at maximum, a slight deflection is obtained in the output meter.
- Adjust the primary of the second, and the secondary and primary of the first I. F. transformers until a maximum deflection is obtained. Keep the oscillator output at a low value so that only a slight deflection is obtained on the output meter at all times. Go over these adjustments a second time, as there is a slight interlocking of adjustments. This completes the I. F. adjustments.

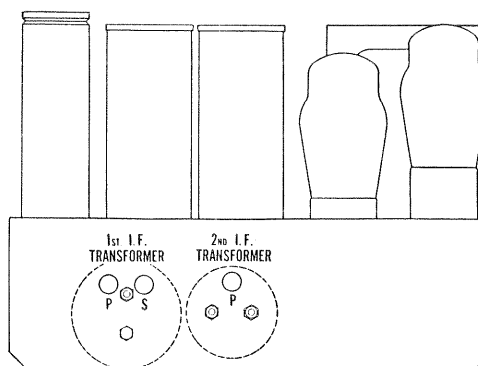


Figure D—Location of I. F. Line-up Adjustment Screws

R. F. and Oscillator Adjustments—The three gang capacitor screws are accessible at the bottom of the chassis. The high frequency capacitor screws are located on the Range Switch. Proceed as follows:

- Procure a modulated oscillator giving a signal at 1400 and 2440 K. C., a non-metallic screw driver such as Stock No. 7065 and an output meter.
- Connect the output of the oscillator to the antenna and ground terminals of the receiver. Check the dial at the extreme maximum position of the tuning capacitor. The indicator should be opposite the last division of the low frequency end of scale with the indicator at its center position. Then set the dial at 140, the oscillator at 1400 K. C. and connect the output meter across the cone coil. Adjust the oscillator output so that a slight deflection is obtained when the receiver volume control is at maximum.
- With the Range Switch at the counter-clockwise position, adjust the three tuning condenser line-up capacitors until maximum deflection is obtained in the output meter. Then shift the oscillator to 2440 K. C., the Range Switch to the clockwise position and the dial to 120. The three line-up capacitors located on the Range Switch should then be adjusted for maximum output.

When making both the I. F. and R. F. adjustments, the important points to remember are that the receiver volume control must be at its maximum position and that the input signal from the external oscillator must be no greater than necessary.

TUBE SOCKET VOLTAGES

115 Volts, A. C. Line—No Signal

Radiotron No.	Cathode to Control Grid, Volts	Cathode to Screen Grid, Volts	Cathode to Plate, Volts	Plate Current M. A.	Heater Volts
1. RCA-58 R. F.	4.0	95	255	5.0	2.31
2. RCA-2A7 1st Det. Osc.	5.0*	95*	255*	3.0*	2.31
3. RCA-58 I. F.	4.0	95	255	5.0	2.31
4. RCA-2B7 2nd Det. A. V. C.	7.5	92	60	2.0	2.31
5. RCA-2A5 Power	20.0	250	235	33.0	2.81
6. RCA-80 Rectifier	700-350 Volts—75 M. A. Total Current				4.82

*The voltages and current refer to the detector part of the tube. The total cathode current is 10 M. A.

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					
2269	Capacitor—720 mmfd. (C13).....	\$0.75	4135	Socket—Dial lamp socket.....	\$0.25
2747	Cap—Contact cap—Package of 5.....	.50	4140	Shield—Radiotron shield—1st detector.....	.30
3047	Resistor — 1500 ohms — Carbon type — ½ watt (R7)—Package of 5.....	1.00	4141	Shield—Radiotron shield—2nd detector.....	.36
3076	Resistor — 1 megohm — Carbon type — ½ watt (R6)—Package of 5.....	1.00	6188	Resistor — 2 megohm — Carbon type — ½ watt (R1, R12)—Package of 5.....	1.00
3252	Resistor—100,000 ohms—Carbon type—½ watt (R5)—Package of 5.....	1.00	6282	Resistor—60,000 ohms—Carbon type—½ watt (R8, R10, R15)—Package of 5.....	1.00
3358	Resistor — 3,000 ohms — Carbon type — ½ watt (R13)—Package of 5.....	1.00	6300	Socket—Radiotron 4-contact socket.....	.35
3459	Capacitor—80 mmfd. (C10).....	.44	6303	Resistor—20,000 ohms—Carbon type—½ watt (R9)—Package of 5.....	1.00
3514	Resistor—250,000 ohms—Carbon type—½ watt (R17)—Package of 5.....	1.00	6471	Coil—Oscillator coil (L5, L6).....	.74
3572	Socket—Radiotron 7-contact socket.....	.38	6483	Transformer—1st intermediate frequency transformer (L7, L8, C15, C16).....	1.84
3584	Ring—R. F. or oscillator coil retaining ring—Package of 5.....	.40	6484	Transformer—2nd intermediate frequency transformer (L9, L10, C18).....	1.70
3594	Resistor—50,000 ohms—Carbon type—½ watt (R14, R18)—Package of 5.....	1.00	6485	Volume control—With mounting nut (R11).....	1.20
3597	Capacitor—0.25 mfd. (C27).....	.40	6487	Capacitor assembly—Comprising three 4.0 mfd. and one 10.0 mfd. capacitors (C4, C14, C22, C30).....	2.90
3598	Capacitor—0.1 mfd.—R. F. and I. F. by-pass (C5).....	.36	6527	Coil—Antenna coil (L1, L2).....	1.08
3616	Capacitor—300 mmfd. (C20).....	.34	6528	Coil—R. F. coil (L3, L4).....	.94
3623	Shield—Antenna or R. F. coil shield.....	.30	6534	Switch—Range switch (S2, S3, S4, S5, S6, C32, C34, C35).....	1.25
3626	Shield—Oscillator coil shield.....	.22	6598	Condenser—3-gang variable tuning condenser (C1, C2, C7, C8, C11, C12).....	3.00
3630	Resistor — 10,000 ohms — Carbon type — 3 watt (R2, R4).....	.25	6619	Tone control with mounting nut (R20).....	1.44
3632	Resistor — 500 ohms — Carbon type — 1 watt (R19)—Package of 5.....	1.10	6620	Capacitor—Comprising one .005 and one .035 mfd. (C28, C36).....	.50
3633	Capacitor—400 mmfd. (C23).....	.38	6851	Scale—Dial scale and drive assembly.....	1.22
3634	Capacitor—160 mmfd. (C21).....	.34	6853	Escutcheon—Station selector escutcheon.....	.34
3639	Capacitor—0.02 mfd. (C25).....	.25	7485	Socket—Radiotron 6-contact socket.....	.40
3640	Capacitor—0.05 mfd. (C3, C6, C17, C19).....	.25	7590	Capacitor—10.0 mfd. (C29).....	1.40
3641	Capacitor—0.1 mfd. (C9, C26).....	.35	9005	Transformer—Power transformer—105–125 volts, 50–60 cycles (T1).....	4.80
3721	Resistor — 1,000 ohms — Carbon type — ½ watt (R3)—Package of 5.....	1.00	9006	Transformer—Power transformer—200–250 volts, 50–60 cycles.....	5.05
3783	Capacitor—9 mmfd. (C31, C33)—Package of 2.....	.50	9024	Transformer—Power transformer—105–125 volts, 25–50 cycles.....	5.85
4103	Shield—Radiotron shield—I. F. or R. F.....	.20	REPRODUCER ASSEMBLIES		
4133	Knob—Station selector, volume control, tone control or range switch knob—Package of 5.....	.80	6476	Transformer—Output transformer (T2).....	1.44
			6852	Cable—3-conductor reproducer cable.....	.26
			9032	Coil assembly—Comprising coil, magnet and cone support (L12).....	2.35
			9428	Cone—Reproducer cone (L11)—Package of 5.....	5.00
			9440	Reproducer complete.....	4.75

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