Instructions for

RCA Victor 120

Six-Tube, Double-Range Superheterodyne

INSTALLATION

Preliminary—After unpacking the instrument, refer to the tube location diagram on rear of receiver, 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 Radiotrons shown by double circles on the diagram.

(c) That the short flexible leads shown on the diagram are attached to the top grid contacts of the proper Radiotrons as indicated, and that the spring contact caps are pressed down firmly.

NOTE—For the 2B7 Radiotron *only*, the grid lead 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 to an electrical outlet.

Antenna and Ground—An antenna 25 to 75 feet long, including the lead-in and ground connections, is recommended. The antenna should be well insulated from all objects and run neither close nor parallel to electric circuits inside or outside the building. Generally, an indoor antenna of short or medium length will be found satisfactory. An outdoor antenna of greater length, however, should improve reception and is recommended for use in localities remote from broadcasting stations. When the receiver is installed in a building of metallic construction, an outdoor antenna is *required* for satisfactory results.

A *good* ground connection is essential for best performance. It should be as short and direct as possible, and preferably should be made to a cold water pipe. An approved ground clamp should be used to insure a tight and permanent connection.

Two flexible leads are provided at the rear of the receiver for connecting to the antenna and ground. Connect the *black* lead to the antenna wire or lead-in and the *yellow* lead to the ground wire. Both connections should be soldered and wrapped with insulating tape.

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

OPERATION

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 on the power. Extreme clockwise position gives full range reproduction—counter-clockwise rotation decreases high frequency (treble) response and reduces static interference.

(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 the *counter-clockwise* position, broadcasting stations in the 540–1500 kilocycle range will be received (frequencies in this range are indicated by the large numerals adjacent to the scale graduations). With the knob in the *clockwise* position, stations operating in the 1400–2800 kilocycle range will be received (frequencies in this range are indicated approximately by the small numerals at the top of the dial), as follows:

(a) **Police Calls**—At dial settings near "80" for stations transmitting at 1712 kilocycles, and at "118–122" for stations operating in the 2450 kilocycle band.

(b) **Amateur Radio "Phone"**—At dial settings "90–95" (assigned band 1900–2000 kilocycles).

(c) **Aviation Reports, Airport Beacons, Etc.**—At dial settings "95–118" (assigned band 2000–2400 kilocycles)

(d) **Amateur Radio "CW" (Code)**—At dial settings "80–90" (assigned band 1715–1900 kilocycles). Signals of this class are normally unintelligible or inaudible with this type of receiver.

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 on 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* 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 off the power by turning the Tone Control knob to the extreme counter-clockwise position.

Radiotrons—Improved results may sometimes be obtained by interchanging the RCA-58 Radiotrons in their sockets. *The power should be switched off before removing any Radiotron from its socket.* Spare Radiotrons should be kept on hand.

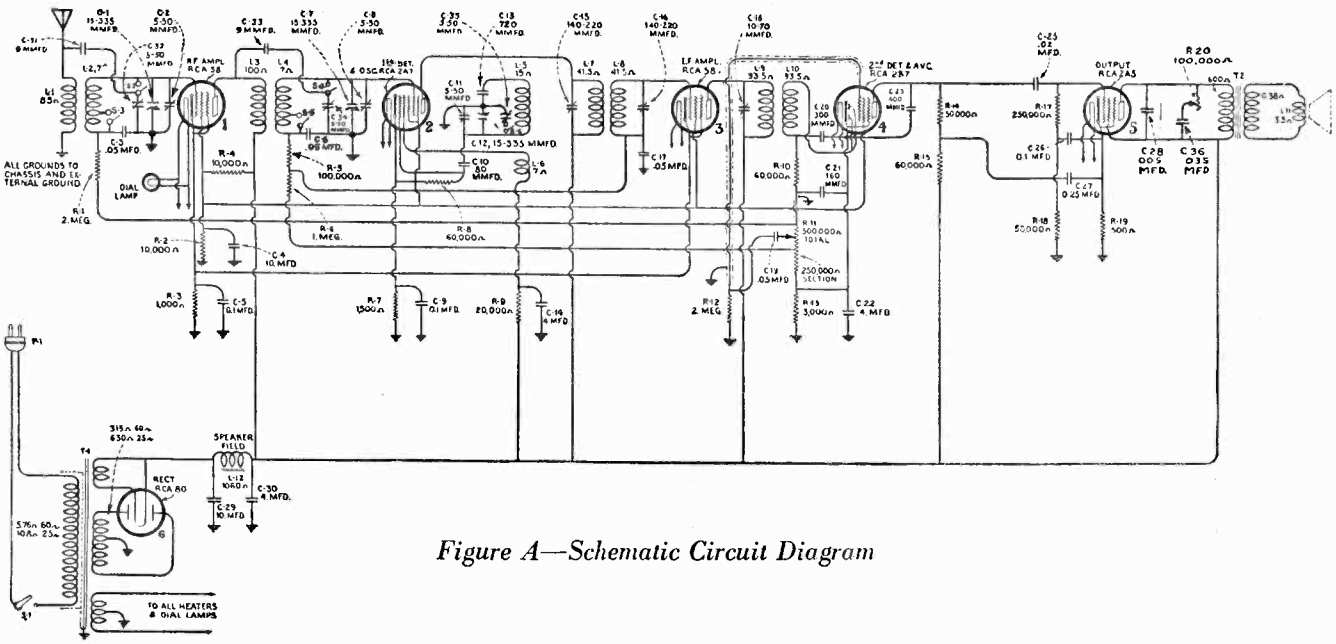

Figure A—Schematic Circuit Diagram

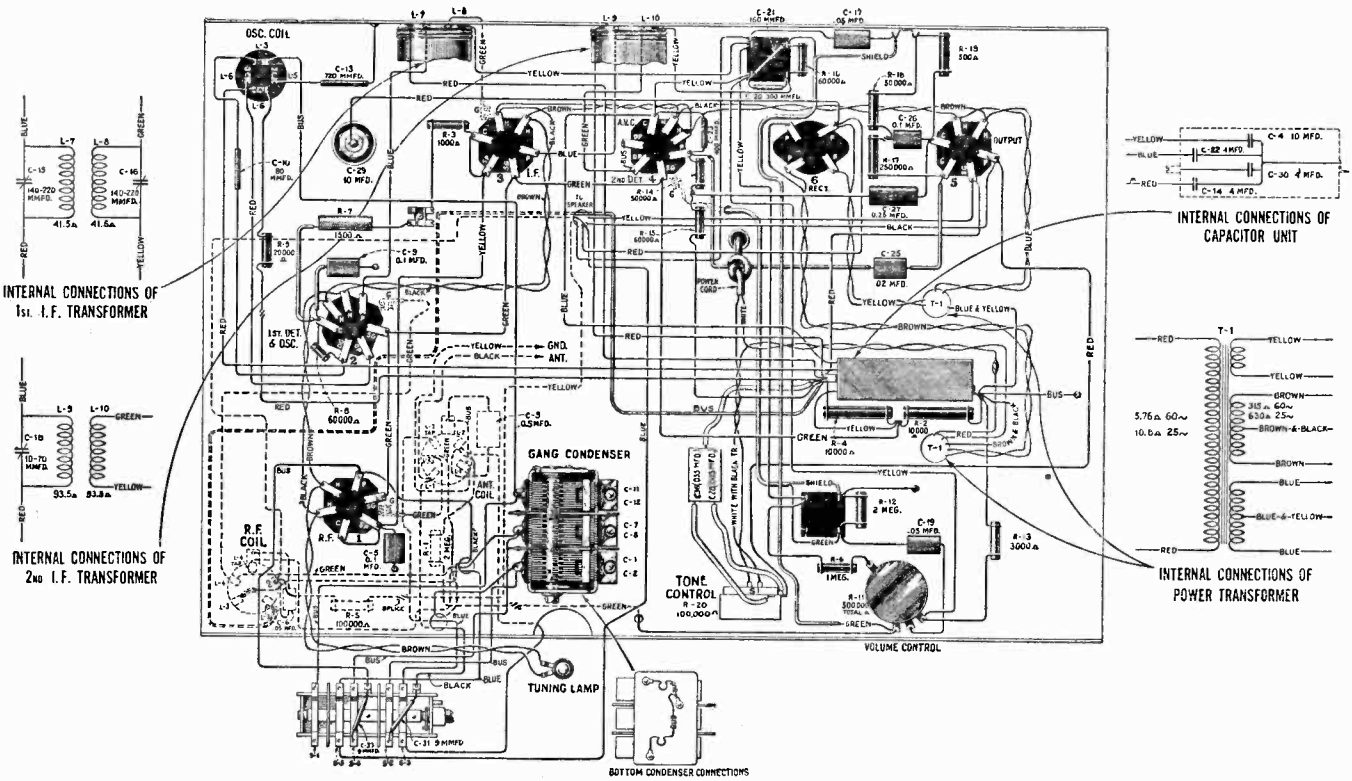

Figure B—Wiring Diagram

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.

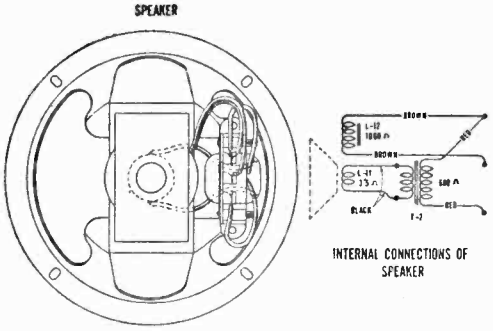

Figure C—Loudspeaker Wiring

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:

(a) 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.

(b) 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.

(c) 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.

(d) 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.

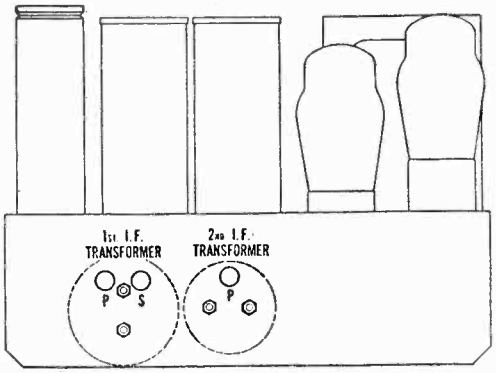

Figure D—Location of I. F. Line-up Adjustment Screws

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:

(a) 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.

(b) 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.

(c) 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.

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REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLIES	
2269	Capacitor—720 mmfd.—(C13)	$0.75
2747	Cap—Contact cap—Package of 5	.50
3047	Resistor — 1500 ohms — Carbon type — ½ watt—(R7)—Package of 5	1.00
3076	Resistor — 1 megohm — Carbon type — ½ watt—(R6)—Package of 5	1.00
3252	Resistor—100,000 ohms—Carbon type—½ watt—(R5)—Package of 5	1.00
3358	Resistor — 3,000 ohms — Carbon type — ½ watt—(R13)—Package of 5	1.00
3459	Capacitor—80 mmfd.—(C10)	.44
3514	Resistor—250,000 ohms—Carbon type—½ watt—(R17)—Package of 5	1.00
3572	Socket—Radiotron 7 contact socket	.38
3584	Ring—R. F. or oscillator coil retaining ring—Package of 5	.40
3594	Resistor—50,000 ohms—Carbon type—½ watt—(R14, R18)—Package of 5	1.00
3597	Capacitor—0.25 mfd.—(C27)	.40
3598	Capacitor—0.1 mfd.—R. F. and I. F. by-pass—(C5)	.36
3615	Knob—Tone control or range switch knob—Package of 5	.60
3616	Capacitor—300 mmfd.—(C20)	.34
3622	Shield—Radiotron shield—2nd detector	.36
3623	Shield—Antenna or R. F. coil shield	.30
3624	Socket—Dial lamp socket and bracket	.40
3626	Shield—Oscillator coil shield	.22
3627	Knob—Station selector or volume control knob—Package of 5	.75
3630	Resistor — 10,000 ohms — Carbon type — 3 watt—(R2, R4)	.25
3632	Resistor — 500 ohms — Carbon type—1 watt—(R19)—Package of 5	1.10
3633	Capacitor—400 mmfd.—(C23)	.38
3634	Capacitor—160 mmfd.—(C21)	.34
3639	Capacitor—0.02 mfd.—(C25)	.25
3640	Capacitor—0.05 mfd.—(C3, C6, C17, C19)	.25
3641	Capacitor—0.1 mfd.—(C9, C26)	.35
3642	Capacitor—0.008 mfd.—(C24)	.25
3682	Shield—Radiotron shield—1st detector	.22
3721	Resistor — 1,000 ohms — Carbon type — ½ watt—(R3)—Package of 5	1.00
3783	Capacitor—9 mmfd.—(C31, C33)—Package of 2	$0.50
3789	Shield—Radiotron shield—I. F. or R. F.	.25
3881	Escutcheon—Station selector escutcheon	.42
3882	Escutcheon—Volume control escutcheon	.42
6188	Resistor — 2 megohm — Carbon type — ½ watt—(R1, R12)—Package of 5	1.00
6282	Resistor—60,000 ohms—Carbon type—½ watt—(R8, R10, R15)—Package of 5	1.00
6300	Socket—Radiotron 4 contact socket	.35
6303	Resistor—20,000 ohms—Carbon type—½ watt—(R9)—Package of 5	1.00
6471	Coil—Oscillator coil—(L5, L6)	.74
6483	Transformer—1st intermediate frequency transformer—(L7, L8, C15, C16)	1.84
6484	Transformer—2nd intermediate frequency transformer—(L9, L10, C18)	1.70
6485	Volume control—With mounting nut—(R11)	1.20
6487	Capacitor assembly—Comprising three 4.0 mfd. and one 10.0 mfd. capacitors—(C4, C14, C22, C30)	2.90
6527	Coil—Antenna coil—(L1, L2)	1.08
6528	Coil—R. F. coil—(L3, L4)	.94
6534	Switch—Range switch	1.25
6598	Condenser—3 gang variable tuning condenser	3.00
6619	Tone control with mounting nut—(R20)	1.44
6620	Capacitor—Comprising one .005 and one .035 mfd.—(C28, C36)	.50
6622	Scale—Dial scale and drive assembly	.95
7485	Socket—Radiotron 6 contact socket	.40
7590	Capacitor—10.0 mfd.—(C29)	1.40
9005	Transformer—Power transformer—105–125 volts, 50–60 cycles—(T1)	4.80
9006	Transformer—Power transformer—200–250 volts, 50–60 cycles	5.05
9024	Transformer—Power transformer—105–125 volts, 25–40 cycles	5.85
	REPRODUCER ASSEMBLIES	
6476	Transformer—Output transformer—(T2)	1.44
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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